NORTHWEST CORRIDOR LIGHT RAIL TRANSIT LINE
TO
FARMERS BRANCH AND CARROLLTON

DALLAS AND DENTON COUNTIES, TEXAS

FINAL ENVIRONMENTAL IMPACT STATEMENT

prepared by

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL TRANSIT ADMINISTRATION

and

DALLAS AREA RAPID TRANSIT

with

FEDERAL AVIATION ADMINISTRATION
as a cooperating agency

Pursuant to:

National Environmental Policy Act of 1969, Section 102(2), 42 U.S.C. 4332 (2); National Historic Preservation Act of 1966, Section 106, 16 U.S.C. 470 et seq; Executive Order 11990 (Protection of Wetlands); Executive Order 12898 (Environmental Justice for Low Income and Minority populations); Federal Transit Act, 53 U.S.C. Section 5323(b), Section 5309(e)(2)-(7), 5301(e), and 5324(b)(1)-(3); Title 49 U.S.C. Section 303, formerly Department of Transportation Act of 1966, Section 4(f).

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For DART: _____ **Date:** 9/5/03
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President/Executive Director
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Cover Sheet

Abstract: This Final Environmental Impact Statement (EIS) describes the transportation and environmental impacts associated with the construction and operation of the Northwest Corridor Light Rail Transit (LRT) Line to Farmers Branch and Carrollton in Dallas and Denton Counties, Texas. A No-Build Alternative is defined and analyzed to provide the base against which the Selected LRT Alternative can be compared. The Final EIS details the alignment concepts, their capital and operating costs, and considers the potential effects on a broad range of environmental and transportation categories including: transportation service, traffic, transit ridership, accessibility, land use, air quality, noise, vibration, visual and aesthetics, ecosystems, hazardous materials, water resources, cultural resources, historic resources, parklands, safety and security, and neighborhoods.

The proposed undertaking consists of a 17.6-mile light rail transit project from downtown Dallas to Farmers Branch and Carrollton. The project will provide connections to major activity centers, employment centers, community resources, and other regional transit services provided by DART. The Selected LRT Alternative would increase mobility in the congested corridor, and provide an alternative to the single occupant vehicle. Additionally, the Selected LRT Alternative would provide dependable service to employment opportunities and increase investment within the corridor.

Comments: The Draft EIS was made available to the public for a 45-day review and comment period from June 14, 2002 to July 30, 2002. Public hearings were conducted during the review and comment period on July 11 in Dallas, July 15 in Farmers Branch, and July 16 in Carrollton. Following the Draft EIS public comment period, the DART Board of Directors selected the preferred site for the Northwest Rail Operating Facility and the preferred alignments in the Love Field and Medical Center areas.

In early 2003, subsequent coordination in the Medical Center area resulted in alignment and station changes that were not addressed in the DEIS or at the July public hearings. A public hearing was held on April 10, 2003 to obtain comments on the proposed changes. The DART Board subsequently approved those changes on May 13, 2003.

This Final EIS reflects the key decisions referenced above and includes revisions to the Draft EIS, a summary of the comments and recommendations received on the Draft EIS and subsequent project changes, a list of persons, organizations, and agencies commenting on the Draft EIS and subsequent project changes, and responses to substantive comments raised in the review and consultation process. Changes to the text of the Draft EIS are indicated in the Final EIS by a vertical line in the margin.

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FOREWORD

This Final Environmental Impact Statement (EIS) for the Northwest Corridor LRT Line to Farmers Branch and Carrollton has been prepared in accordance with regulations developed by the Council on Environmental Quality for the National Environmental Policy Act (NEPA) and the U.S. Department of Transportation's Federal Transit Administration (FTA), as well as Federal Aviation Administration (FAA) Order 1050.1D, Policies and Procedures for Considering Environmental Impacts and the Airport Environmental Handbook, FAA Order 5050.4A.

The Final EIS is organized as follows:

- Executive Summary: Provides a summary of the project's definition, purpose and need, impacts it is expected to cause, and the recommended impact mitigations.

- Chapter 1 – Purpose and Need: Presents a discussion of corridor transportation goals as they compare to the existing transportation conditions in the local area and the region.

- Chapter 2 – Alternatives Considered: Provides an overview of the alternatives considered during the course of the Northwest Corridor Major Investment Study (MIS) leading up to the alternatives examined in the Draft and Final EIS. The discussion also presents the selected project's definition and description.

- Chapter 3 – Affected Environment: Describes the existing social and natural environmental conditions in the study area. The discussion provides an understanding of the environment and resources within the project's study area.

- Chapter 4 – Transportation Impacts: Presents transit and highway impacts that would result from the No-Build and the LRT Alternatives. Potential mitigation measures to address impacts are defined where appropriate.

- Chapter 5 – Environmental Consequences: Discusses the LRT and No-Build Alternatives' potential impacts on the built and natural environments. Potential mitigation measures to address impacts are defined where appropriate.

- Chapter 6 – Public and Agency Involvement: Presents a summary of agency (DART) efforts to solicit staff, committee and public comment during the Draft EIS comment period and subsequent coordination efforts. Public comments and responses are also included.

- Appendices:

    - Appendix A - List of Recipients
    - Appendix B - List of Preparers
    - Appendix C - Plan and Profile Drawings
    - Appendix D - Letters of Coordination
    - Appendix E - Love Field Access Alternatives
    - Appendix F - Love Field Tunnel Alignment Study
    - Appendix G - DART LRT Rail Operating Facility – Phase 1 Site Selection Study, Executive Summary
    - Appendix H - Section 106 Memorandum of Agreement (MOA)

Executive Summary

EXECUTIVE SUMMARY

The subject of this Final Environmental Impact Statement (EIS) is a 17.6-mile light rail transit (LRT) project that extends from the existing Dallas Area Rapid Transit (DART) LRT system in the downtown Dallas West End area, through northwest Dallas and Farmers Branch, to Frankford Road in Carrollton. This Selected LRT Alternative is illustrated in **Figure S-1**.

The National Environmental Policy Act (NEPA) of 1969 requires that federal agencies prepare an EIS for any major federal action that may have a significant impact on the environment. A Draft EIS was prepared by DART under its responsibilities as the local lead agency to implement the LRT project. This Final EIS documents all comments received during the Draft EIS public comment period and reflects key decisions made by the DART Board of Directors. This document has been submitted in coordination with the Federal Transit Administration (FTA), the lead Federal agency, and in cooperation with the Federal Aviation Administration (FAA).

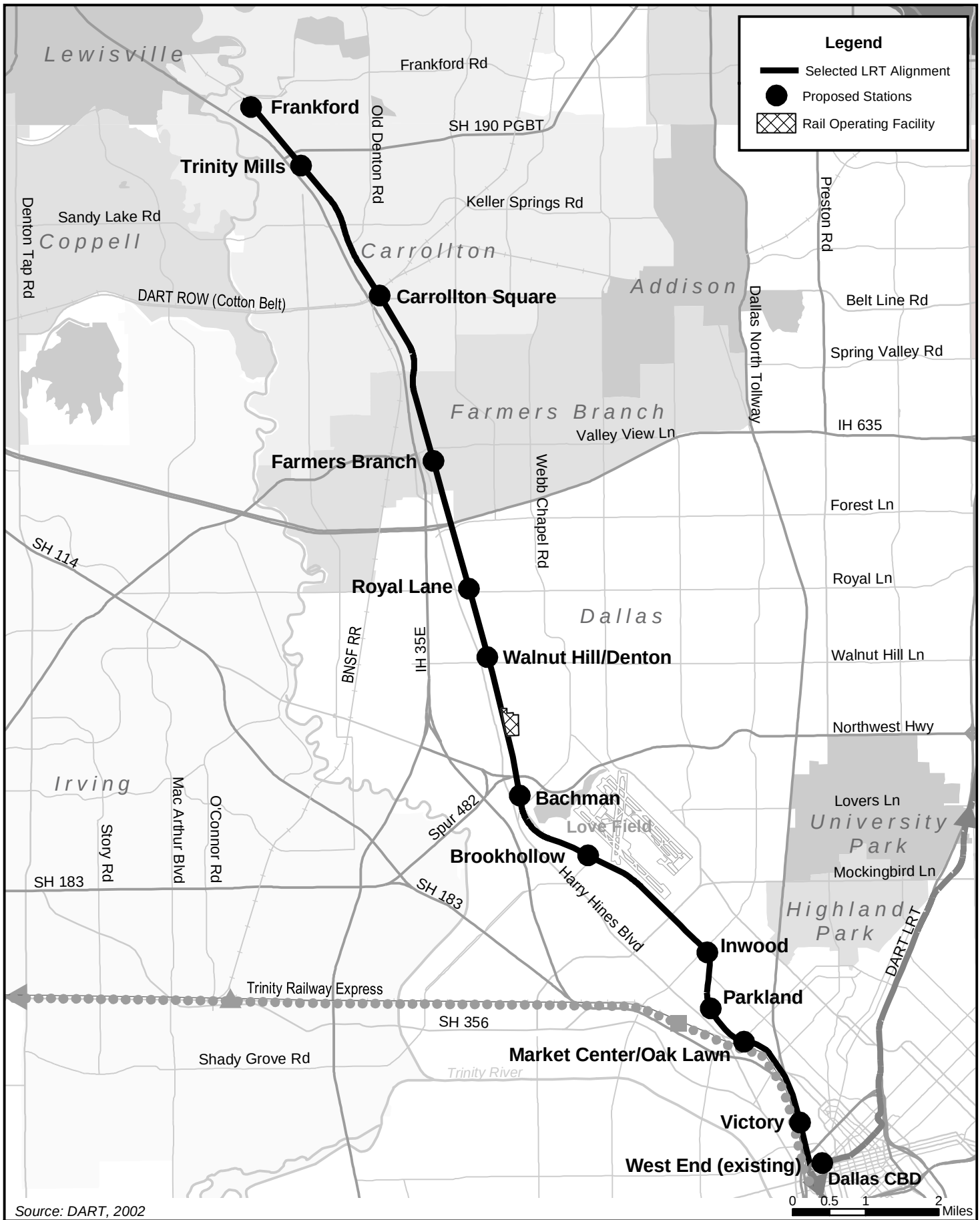
The purpose of the EIS is to inform the public of potential environmental, social, and economic impacts associated with the proposed LRT project and the No-Build Alternative. The No-Build Alternative represents the base condition for identifying impacts associated with the proposed project. The EIS serves as the primary document to facilitate review of the proposed project by federal, state, and local agencies and the general public. The EIS documents the purpose and need for the project and describes the alternatives considered. It addresses in detail the anticipated transportation and environmental impacts of the project and identifies any appropriate mitigation measures that may be required to minimize such impacts.

The Draft EIS was circulated for a required 45-day public review and comment period, beginning June 14, 2002 and concluding July 30, 2002. During this comment period, the Draft EIS was made available to interested parties including private citizens, community groups, the business community, elected officials and public agencies. A series of public hearings was held within the Study Area to formally receive comments. Public hearings were conducted on July 11 in Dallas, July 15 in Farmers Branch, and July 16 in Carrollton. Public comments were also submitted in writing during the comment period.

The proposed project reflects decisions made by the DART Board of Directors after the completion of the Draft EIS public review and comment period. On August 13, 2002, the Board approved Northwest Rail Operating Facility Site 3 at Lombardy Lane and Denton Drive. Also, on September 17, 2002, the Board selected Medical Center Design Option D as the preferred alignment through the Medical Center area. In the Love Field area, the Base Alignment was selected.

After circulation of the Draft EIS, and following the preceding actions by the DART Board, preliminary engineering and environmental studies were completed, including identification of mitigation commitments where necessary. Subsequent coordination efforts with Parkland Hospital representatives on Option D resulted in proposed project alignment and station changes not addressed in the Draft EIS or at the July public hearings. The reasons for these changes are described in Section 2.3.2. As a result of the changes, DART held another public hearing on April 10, 2003 to obtain comments on the proposed changes. On May 13, 2003, the DART Board approved the proposed project changes.

This Final EIS reflects the decisions made by the DART Board and also includes responses to comments received during the Draft EIS comment period and during the April 10, 2003 public hearing on the subsequent project changes.



Source: DART, 2002

Figure S-1

Selected LRT Alternative

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

This Final EIS incorporates all of these elements and has been published and made available to the public. The Final EIS identifies the Selected LRT Alternative and also identifies the selected alignments where design options were considered in the Draft EIS (Medical Center and Love Field). Completion of the Final EIS, followed by the signed Record of Decision (ROD) by the FTA, will permit the project to be advanced to final design and construction.

This Executive Summary highlights the most significant findings of the Final EIS relative to the document's major headings:

- Purpose and Need
- Alternatives Considered
- Affected Environment
- Transportation Impacts
- Environmental Consequences
- Public and Agency Involvement
- Issues Resolved Following the Draft EIS

PURPOSE AND NEED

Current and projected travel patterns, levels of roadway congestion, growth in population and employment in the region and in the corridor require that the proposed project be built in order to address the need for additional transportation capacity. To illustrate this trend, the DFW region's population is expected to increase from 4.2 million to approximately 7 million, or 67%, by the year 2025. Over the same time period, regional employment is expected to increase from 2.3 million to 3.9 million, or 70%.

The number of people traveling on the regional roadway network will increase proportionally, creating significant burdens on today's crowded roads. Traffic volumes on Dallas freeways have increased 5% to 10% per year since 1995. Traffic volumes on IH 35E are expected to be as much as 290,000 vehicles per day in 2025, representing increases of as much as 45%. The high volumes and associated poor levels of service on the freeway will have the effect of making congestion worse on adjacent surface streets in the corridor.

The need for transportation improvements is demonstrated by the following conditions that have been documented in the study area:

- The Dallas-Fort Worth region is currently designated as a serious non-attainment area for ozone by the Environmental Protection Agency;
- The project corridor parallels IH 35E (Stemmons Freeway), one of the most congested highway corridors in the region;
- The corridor intersects IH 635 (LBJ Freeway), the highest volume corridor in the Dallas metropolitan region;
- The entire Study Area falls within a region identified for the year 2025 as an "area of severe peak-period congestion " by the North Central Texas Council of Governments (NCTCOG);
- Existing and planned roadway improvements are insufficient to meet the demand within this corridor;
- Travel time delay and congestion levels in the corridor are increasing; and,
- A significant amount of employment and population growth is forecast for the corridor.

Roadway congestion has worsened, leading to further congestion on surface streets and increasing travel times for drivers and transit riders. One effect of this is deteriorating air quality. Anticipated population and employment growth in the region will worsen these conditions and are indicators of the need for major transportation improvements. The proposed project is intended to fulfill the following needs:

- Reduce travel times in the corridor
- Increase transit efficiency and effectiveness in the corridor
- Increase connectivity in the region, particularly from residential areas in the region to employment in the study area
- Provide additional people-carrying capacity in the corridor
- Improve unacceptable regional air quality

Four primary project purposes have been identified for the Northwest Corridor LRT Line to Farmers Branch and Carrollton project. These four purposes are briefly summarized below.

Increase Regional Connectivity / Transit Effectiveness

The existing DART transit system provides reasonable access to job opportunities in the corridor and elsewhere in the Service Area and region, especially for transit-dependent populations. The proposed extension of the LRT system will expand those opportunities for current and prospective transit riders both in the corridor and in the region as a whole.

Access to jobs in the corridor from southern Dallas and access to central Dallas from the north and northwest will be improved. The combinations of residence-employment locations accessible by transit in the region will increase. The implementation of this project will improve access opportunities for transit patrons, thereby enhancing regional desires to balance jobs and housing.

Offer an Alternative to Single-Occupancy Vehicle (SOV) travel

Traffic congestion in the corridor has increased and will continue at significant pace. Options to increase roadway capacity are limited. These limitations are both physical (right-of-way and land use pattern) and financial (limited available funding). Improving the transit system offers an alternative to Single-Occupancy Vehicle (SOV) travel in the corridor and is an effective operational strategy to reduce peak period congestion levels.

Increase People-carrying Capacity in the Corridor

Regional demand for radial travel in the corridor will increase, and additional capacity is needed to meet this demand. North-south travel patterns include residents from the north traveling to jobs in the corridor and in downtown Dallas, and residents from the south traveling to jobs in the corridor (reverse commute). Again, the proposed project is most effective in peak periods when congestion levels are highest and people-carrying capacity is needed most.

Improve Accessibility and Increase Economic Development Opportunities

The proposed project will provide access for residents and visitors to the employment centers, health services, entertainment, and regional airport in the corridor. Access to and from the regional destinations served by DART's LRT and bus service will also be enhanced. This increased accessibility will strengthen economic conditions at existing activity centers, and provide an opportunity for development of further economic activity at other locations in the corridor.

ALTERNATIVES CONSIDERED

Two alternatives are being considered in this EIS, a No-Build Alternative and an LRT Alternative. The No-Build Alternative includes transportation and transit projects that have a reasonable expectation of funding and are programmed for implementation. The No-Build Alternative is used as a basis for determining the potential environmental impacts that would be associated with the proposed LRT Alternative. The LRT Alternative is a 17.6-mile light rail transit project that generally

parallels IH 35E from downtown Dallas, through Farmers Branch, to Frankford Road in Carrollton. Both alternatives are described in detail in Chapter 2 of the Final EIS.

The LRT Alternative was derived from the Northwest Corridor Major Investment Study (MIS) that was initiated by DART in 1998 and was concluded in Spring 2000. The Northwest Corridor MIS evaluated a wide range of transportation and transit solutions to respond to the growing mobility problems in the corridor. The MIS resulted in the identification of a Locally Preferred Investment Strategy that addressed three major component groups: Transportation System Management/Travel Demand Management (TSM/TDM), Highway and High-Occupancy Vehicle (HOV) lane improvements, and Light Rail Transit. The Texas Department of Transportation (TXDOT), NCTCOG, DART, and/or local jurisdictions will accomplish the TSM/TDM, Highway and HOV lane elements of the LPIS through separate efforts. The LRT element of the LPIS was divided into two projects: the Carrollton Line and the Irving/DFW Line. The Irving/DFW Line will be advanced to the PE/EIS phase in 2003. The focus of this EIS is solely on the LRT Line to Farmers Branch and Carrollton.

The No-Build Alternative includes committed transportation improvements and bus service improvements that are intended to keep pace with population and employment growth in the region. Planned transit facility improvements include a new Park-and-Ride facility in the vicinity of SH 114 and International Parkway on the north side of DFW Airport and a new Northwest Plano Transit Center near Parker Road and the North Dallas Tollway. Transit improvements also include the extension of the North Central LRT line to Plano and the Northeast LRT line to Garland, both of which were opened for service in late 2002.

The LRT Alternative includes all of the projects in the No-Build Alternative, plus the LRT project. The LRT Alternative results in modifications to the No-Build bus system to minimize redundant transit service in the LRT corridor and to provide for feeder bus routes to directly serve the proposed LRT stations. The proposed LRT Line to Farmers Branch and Carrollton is included in the third phase of expansion to DART's LRT system. Phase 1 included the 20-mile LRT Starter System that was opened in 1996. Phase 2 included extensions of the North Central LRT Line to Richardson and Plano, and the Northeast Line to Garland. Phase 3 of LRT development will include the Northwest Corridor projects to Carrollton and Irving/DFW, and the Southeast Corridor project from downtown Dallas to Fair Park and the Pleasant Grove area.

The proposed LRT project parallels IH 35E (Stemmons Freeway) from downtown Dallas north through the cities of Dallas, Farmers Branch, and Carrollton. The corridor is linked at the south end to the Dallas Central Business District with its 120,000 jobs and a variety of employment, education, health, entertainment and residential areas. Activity centers in the corridor include the new American Airlines Center professional sports and entertainment arena and associated Victory office, retail, and residential development; the Stemmons Business Corridor/Dallas Market Center wholesale district; the health services, medical research and employment in the Medical Center District area; Dallas Love Field airport; various commercial and industrial activities; and employment centers and residential areas in Dallas, Farmers Branch and Carrollton.

The Selected LRT Alternative generally follows the former Union Pacific Railroad (UPRR) right-of-way. The Selected LRT Alternative features twelve new stations: Victory, Market Center/Oak Lawn, Parkland, Inwood, Brookhollow, Bachman, Walnut Hill/Denton, Royal Lane, Farmers Branch, Carrollton Square, Trinity Mills, and Frankford. Parking will be provided at nine of these twelve stations, providing approximately 3,500 parking spaces. Bus access will be provided at each station. The Selected LRT Alternative is illustrated in **Figure S-1**.

The Draft EIS evaluated several design options to serve the Medical Center area and the Dallas Love Field Airport area. At the conclusion of the Draft EIS comment period, the DART Board of Directors selected Medical Center Design Option D and the Love Field Base Alignment for

implementation. Subsequent coordination efforts with Parkland Hospital representatives on Option D resulted in proposed project alignment and station changes. These project changes included use of the UPRR through the Medical Center area and relocation of the Parkland Station. Refinements to the Market Center/Oak Lawn Station and Inwood Station were also made. An additional public hearing in April 2003 was held to address these changes. The DART Board subsequently approved these changes on May 13, 2003. **Figures S-2 and S-3** depict the selected alignments and the options considered for the Medical Center and Love Field areas.

The capital cost of the Selected LRT Alternative is estimated to be $938 million in 2002 dollars.

AFFECTED ENVIRONMENT

Qualified professionals in their field have identified the existing natural and built environmental conditions in the Study Area. These existing conditions were identified in accordance with the ***Environmental Impact Assessment Methodology Report (PTG, 2000),*** which was developed for this project. This existing conditions information formed the basis of impact assessment investigations for each category. Impact assessment categories that were identified in the Study Area include:

- Land Use
- Socioeconomic Characteristics and Neighborhoods
- Transportation
- Air Quality
- Noise
- Vibration
- Visual and Aesthetic Resources
- Cultural Resources and Parklands
- Ecosystems
- Geology
- Hydrology and Water Quality
- Hazardous and Regulated Materials

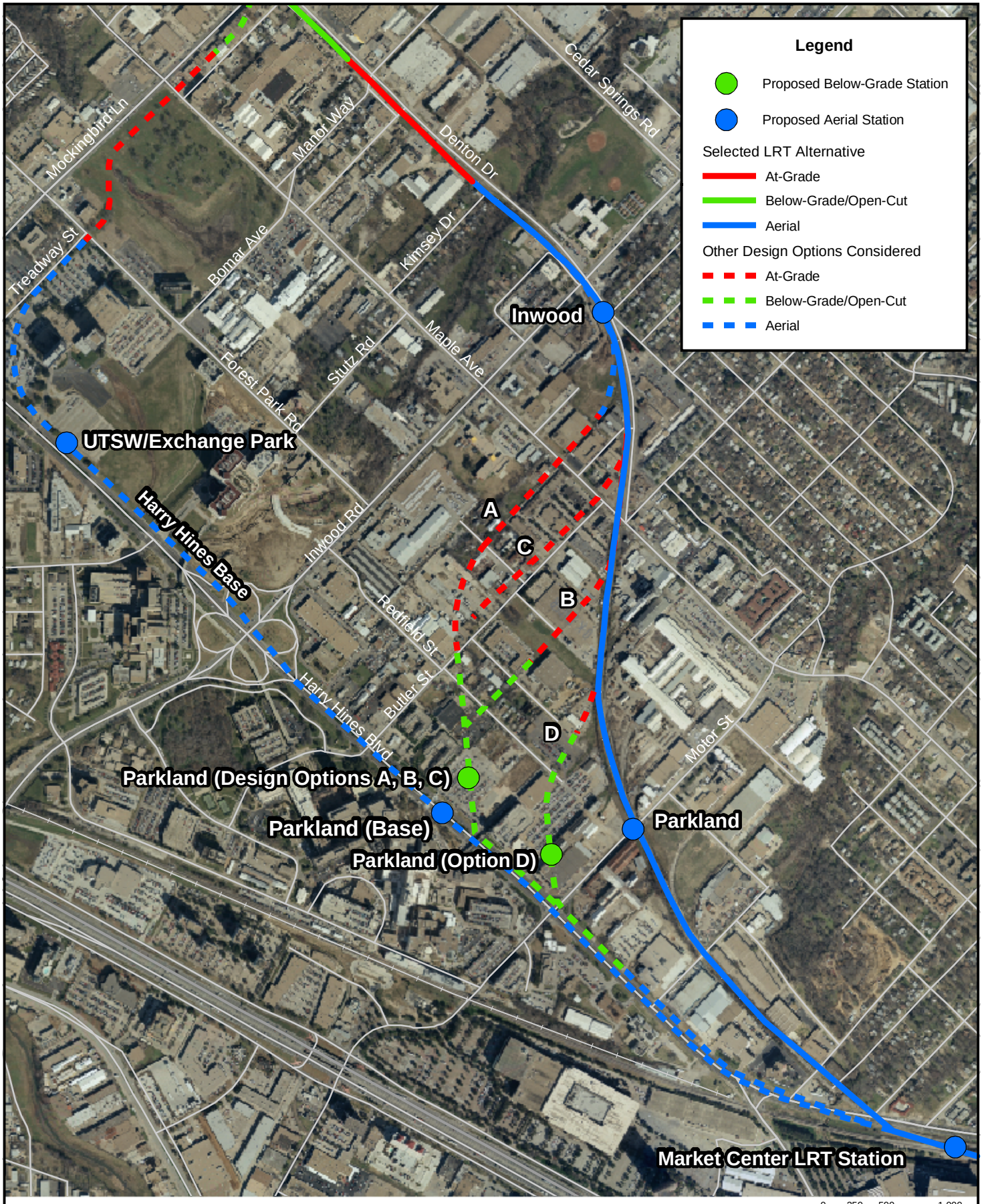
Detailed information regarding the affected environment in the project Study Area is provided in Chapter 3 of the Final EIS.

TRANSPORTATION IMPACTS

Under the No-Build Alternative, transit service coverage would only expand to meet increases in population and employment, but increasing traffic congestion would decrease bus transit's reliability. There would be no travel time savings for transit riders compared to automobile travel. Average daily Vehicle Miles Traveled (VMT) would increase by about 622,000 miles in the corridor between 1995 and 2025. Major highways (freeways and tollways) would see continued increases in Average Daily Traffic (ADT) volumes, and related decreases in Level of Service (LOS). Major arterial roadways would continue to have increasing ADT volumes and decreasing LOS.

The Selected LRT Alternative will expand the geographic coverage of transit in the corridor over a larger area compared to the No-Build Alternative. Reliability would be increased with the LRT operating in a separate guideway and not subject to traffic congestion delays. The Selected LRT Alternative will also provide travel time savings for transit riders during peak periods.

The Selected LRT Alternative will attract almost 34,000 more transit riders and add 12,500 transfers to the DART system, compared to the No-Build Alternative. Total LRT ridership will increase from 35,200 for the No-Build to 53,400 for the Selected LRT Alternative. The Selected LRT Alternative will add 11,600 new transit riders compared to the No-Build Alternative. Total system-wide passenger miles will increase from 1.66 million for the No-Build Alternative to 1.77 million for the Selected LRT Alternative, an increase of about seven percent.



Source: DART, 2002

Figure S-2

Medical Center Design Options

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

Source: DART, 2002

Figure S-3

Love Field Design Option

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

The Selected LRT Alternative will reduce regional Vehicle Miles Traveled (VMT) by approximately 159,100 miles per day, and several major highway segments will see decreases in average daily traffic volumes for the LRT Alternative compared to the No-Build Alternative. Most arterial roadways will see no change in volumes or level of service, with a few slight decreases. There will be small amounts of localized added congestion or delay in the immediate vicinity of some LRT stations, and at some at-grade LRT crossings. Mitigation measures are proposed to address traffic impacts associated with the project, including grade separations of major roadways, and signal and roadway intersection improvements in the vicinity of stations.

The Selected LRT Alternative will also have impacts on freight operations in the corridor, particularly related to train storage for customers in the corridor. Additional freight modifications, related to access and severing of the freight line from approximately Walnut Hill to south of Crosby Road in Carrollton are planned by DART and the short-line operator, Dallas Garland and Northeastern (DGNO) Railroad. Mitigation measures for impacts associated with the LRT Alternative are included in the Final EIS.

Additional detailed transportation impact information is provided in Chapter 4 of the Final EIS.

ENVIRONMENTAL IMPACTS

This Final EIS identifies the potential environmental consequences of the No-Build and LRT Alternatives. The majority of the proposed undertaking is located within an active railroad right-of-way. Consequently, there are limited environmental impacts due to the character of the surrounding land uses. The exception to this arises where the proposed LRT alignment departs from the railroad right-of-way, primarily in the vicinity of the Bachman Station. Where the LRT alignment is located outside of the railroad right-of-way, significant property acquisitions are required and associated land use impacts are identified. Chapter 5 of the Final EIS details these and all other associated environmental consequences associated with the No-Build and Selected LRT Alternatives. No significant impacts are anticipated with the No-Build Alternative. **Table S-2** summarizes the potential impacts of the Selected LRT Alternative and related mitigation measures.

PUBLIC AND AGENCY INVOLVEMENT

The public and agency involvement program for the proposed project has been accomplished through an extensive effort that was initiated during the Major Investment Study for the Northwest Corridor. During the PE/EIS process, a modified public outreach program was developed, including the continuation of the Community Work Group and a Staff Work Group. These Work Groups were assembled at key times during the development of preliminary engineering plans and the preparation of the environmental impact statement, providing important input to DART staff and consultants. Following these work group meetings, a round of public meetings was conducted in order to reach the broader community. Five rounds of work group and public meetings have been conducted during the PE/EIS process.

The Draft EIS was circulated for a 45-day public review and comment period. During this comment period, the Draft EIS was made available to interested parties including private citizens, community groups, the business community, elected officials and public agencies. A series of public hearings was held within the Study Area to formally receive comments. Public hearings were conducted on July 11 in Dallas, July 15 in Farmers Branch, and July 16 in Carrollton. Public comments were also submitted in writing during the comment period.

TABLE S-1
SUMMARY OF SELECTED LRT ALTERNATIVE ENVIRONMENTAL IMPACTS

Subject	Impacts	Mitigation Approach
Transportation	- 103 existing crossings (99 at-grade), 7 new crossings - 22 crossings would be closed or removed; 61 grade-separated; 27 at-grade - 45 of 99 existing at-grade freight crossings removed; 8 of 99 at-grade roadway/freight crossings removed - 11 at-grade joint freight/ LRT crossings - 33 grade-separated LRT crossings would have at-grade freight crossings - LRT will be grade-separated over UP/BNSF freight-rail connection - Localized traffic impacts at stations	- Grade separations, crossings removed or combined - Install new signals / improve timing at crossings and stations - Street, signal and intersection improvements near stations
Land Use and Economics	- Neighborhood integrity impacts at Bachman Station - Market Center/Oak Lawn Station has land use impacts on adjacent residential areas - Pedestrian access from Kimsey Drive to Rusk Middle School	- Bachman Station area redevelopment west of Denton must be sensitive to neighborhood - Alternative design developed for Market Center/Oak Lawn Station to reduce impacts. Remaining impacts to be addressed during final design. - During final design, DART will consider ways to provide pedestrian access between Kimsey Drive and Rusk Middle School.
Property Acquisitions and Displacements	- Occur at most stations and along all line sections - Approximately 125.2 acres of private property acquired: 72.9 acres for stations, 34.3 acres for the Rail Operating Facility, and 18.0 acres for LRT alignment, street improvements, traction power substations and construction staging - Approximately 180 households displaced: 13 single-family structures, one four-plex, and one 170-unit apartment complex. (163 units occupied in 2001). - Approximately 67 businesses displaced	- Acquisition and relocation assistance following DART and Federal policies and procedures.
Air Quality	No impacts anticipated	N / A
Noise and Vibration	- 4 severe noise impacts. - One moderate noise impact (single-family residence) of more than 3 dB (A) increase near Northside Drive. - Moderate noise impacts of 3 dB (A) or less at one hotel (Red Roof Inn, Valwood at Broadway); 76 apartment units (24 units at Crosby Creek Apts., 52 units at Cambridge and Rush Creek Apts.); and 5 single-family residences near Northside Drive/Donald Avenue; and one single-family residence (Kimsey Drive) - One Category 2 vibration impact. (one-single family residence on Kimsey Drive) - One potential Category 1 vibration impact (Southwestern Gage) near Inwood Road.	- Severe impacts to be acquired for right-of-way purposes. - Noise barriers will be included to mitigate one moderate impact of more than 3 dB (A) and one adjacent moderate impact of less than 3 dB (A) near Northside Drive. - Other moderate impacts do not require mitigation (increase in noise levels is less than 3 dB (A)). - Vibration impact to be acquired - Detailed analysis to be done during final design to refine projections and determine appropriate mitigation, if warranted.

TABLE S-1 (continued)
SUMMARY OF SELECTED LRT ALTERNATIVE ENVIRONMENTAL IMPACTS

Subject	Impacts	Mitigation Approach
Visual and Aesthetic Resources	Visual impacts at 4 locations: - Market Center/Oak Lawn Station: impacts to residential area to south and east - Aerial structure and Inwood Station: visual impact to Cherrywood residential area - Crosby Road: aerial crossing affects Crosby Creek apartments - Downtown Carrollton: new aerial structure visible from Carrollton Square.	- Design treatment of LRT structures - Landscape treatment of LRT project components
Ecosystems	- Very minor impact to one U.S. jurisdiction waterway at Market Center/Oak Lawn Station (.01 Ac.)	- Review and obtain Corps of Engineers permit, and replace or enhance if required.
Geology	No impacts anticipated	N / A
Hydrology / Water Quality	- Some additional runoff potential; temporary and limited duration during construction.	- TPDES permitting process and standards will address issues.
Hazardous/ Regulated Materials	- 46 sites total; 28 High concern sites, 18 Moderate concern sites - Of all the sites, 8 sites identified for acquisition, 16 sites in RR or street ROW	- Detailed impacts to be determined during final design. - Mitigation needs dependent on impacts to be addressed during acquisition.
Safety and Security	- Pedestrian crossings at Market Center, Parkland, and Brookhollow stations	- Pedestrian bridges / tunnel - Pedestrian-activated signalized crossings - Time separation of freight & LRT operations - Pedestrian gates - Fencing where LRT speed over 45 mph
	- Pedestrian access to Hernandez Elementary School	- LRT grade-separation at Maple will not impair pedestrian access to Hernandez Elementary School.
	- Pedestrian access from Kimsey Drive to Rusk Middle School	- During final design, DART will consider ways to provide pedestrian access between Kimsey Drive and Rusk Middle School.
Construction	- Temporary and limited duration impacts	- Coordination with affected cities and property owners
Cultural Resources (including Historic, Archeological and Parks)	- "Adverse effect" findings for three historic properties: - Carrollton crossing depot relocated - Club Schmitz - Continental Avenue Bridge - "No Adverse Effect" findings for four historic properties - "No Effect" findings for eight historic properties - No direct, temporary, or constructive use of park properties - Constructive Use finding for one historic property: Club Schmitz	- Section 106 Memorandum of Agreement (MOA) identifies commitments to mitigate "adverse effects" and "no adverse effects" properties - Design efforts to minimize harm to adjacent park properties

Source: Parsons, S.R. Beard & Associates, April 2003

After circulation of the Draft EIS, preliminary engineering and environmental studies were completed, including identification of mitigation commitments where necessary. Subsequent coordination efforts with Parkland Hospital representatives on Option D resulted in proposed project alignment and station changes not addressed in the Draft EIS or at the July public hearings. The reasons for these changes are described in Section 2.3.2. As a result of the changes, DART held another public hearing on April 10, 2003 to obtain comments on the proposed changes. On May 13, 2003, the DART Board approved the project changes.

This Final EIS reflects the decisions made by the DART Board where design options were considered (Medical Center and Love Field) and also includes responses to comments received during the Draft EIS comment period and during the April 10, 2003 public hearing on the subsequent project changes. Completion of the Final EIS, followed by the signed Record of Decision (ROD) by the FTA, will permit the project to be advanced to final design and construction.

ISSUES RESOLVED FOLLOWING THE DRAFT EIS

Following the Draft EIS public review and comment period including the April 2003 public hearing on subsequent project changes, the DART Board of Directors considered all public comments to resolve several issues. These issues were examined in further detail and the resolution of these issues are documented in the Final EIS.

- **Medical Center Design Options** - Three Medical Center Design Options, and a Base Alignment, were developed for consideration in the Draft EIS. During the public comment period, a fourth design option – Medical Center Design Option D – was presented for DART's consideration. After additional study and consideration the DART Board of Directors selected Design Option D for implementation. Subsequent to approval of Option D, additional coordination was conducted with Parkland Hospital on integrating Option D into their master plan. During this coordination, significant cost and design issues led to the development of a fifth design option along the UPRR alignment. A public hearing was held for the UPRR alignment on April 10, 2003. The UPRR alignment was subsequently approved by the DART Board and is reflected as the Selected LRT Alignment in this Final EIS.

- **Love Field Design Option -** A Base Alignment, west of Love Field on railroad right-of-way, and a design option that would directly serve Dallas Love Field using a tunnel alignment, were developed for consideration in the Draft EIS. Following the Draft EIS circulation period and a substantive degree of public debate, the DART Board of Directors selected the Love Field Base Alignment for implementation. Policymakers will continue to examine future options to directly serve Dallas Love Field.

- **Rail Operating Facility -** Three alternative sites were identified in the Draft EIS to accommodate a planned rail operating facility. Public comment prior to the Draft EIS was received, during a Public Hearing held on April 29, 2002. A recommended site was indicated in the Draft EIS. Additional public comment on the selection of this facility site was afforded by the Draft EIS public comment period. Following the Draft EIS public comment period the DART Board selected Site 3 for implementation.

- **Mitigation Measures -** Proposed mitigation measures, or in some cases a range of mitigation measures, were presented in the Draft EIS. Mitigation commitments were determined following the Draft EIS public review and comment period and following the completion of preliminary engineering and environmental studies. Final mitigation commitments are documented in the Final EIS.

Chapter One

Purpose and Need

1.0 PURPOSE AND NEED

This chapter documents the need for transit improvements in the Northwest Corridor and the purposes that the proposed project is intended to serve. An overview of the study corridor summarizes current and projected population and employment, and existing and proposed transportation services and facilities. The chapter also summarizes the planning context and history of local decision-making regarding the proposed improvements. It sets out the mobility, economic and community development, and environmental objectives to be addressed by the project.

Dallas Area Rapid Transit (DART) initiated a Major Investment Study (MIS) in early 1998 to examine transportation needs in the Northwest Corridor. The Northwest Corridor MIS Influence Area included a large part of northwest Dallas County. It extended from downtown Dallas on the south, to SH 121 on the west and north, Marsh Lane to the east and Dallas/Fort Worth Airport to the west. The Locally Preferred Investment Strategy (LPIS), adopted on February 22, 2000, included two Light Rail Transit (LRT) lines, the LRT Line to Farmers Branch and Carrollton and the Irving/DFW Line.

DART is proposing to implement the Northwest Corridor LRT Line to Farmers Branch and Carrollton with construction of 17.6 miles of double-tracked light rail transit from downtown Dallas to Carrollton. The Irving/DFW Line has independent utility and is on a separate schedule and would be implemented at a later date. The Northwest Corridor LRT Line to Farmers Branch and Carrollton Study Area is shown in **Figure 1-1.**

The purposes of the LRT Line to Farmers Branch and Carrollton are to increase regional connectivity and transit effectiveness, to offer an alternative to single-occupancy vehicle (SOV) travel, and to improve travel time. The project is intended to increase the people-carrying capacity in the corridor and support increased economic development opportunities through improved accessibility to sites along the corridor.

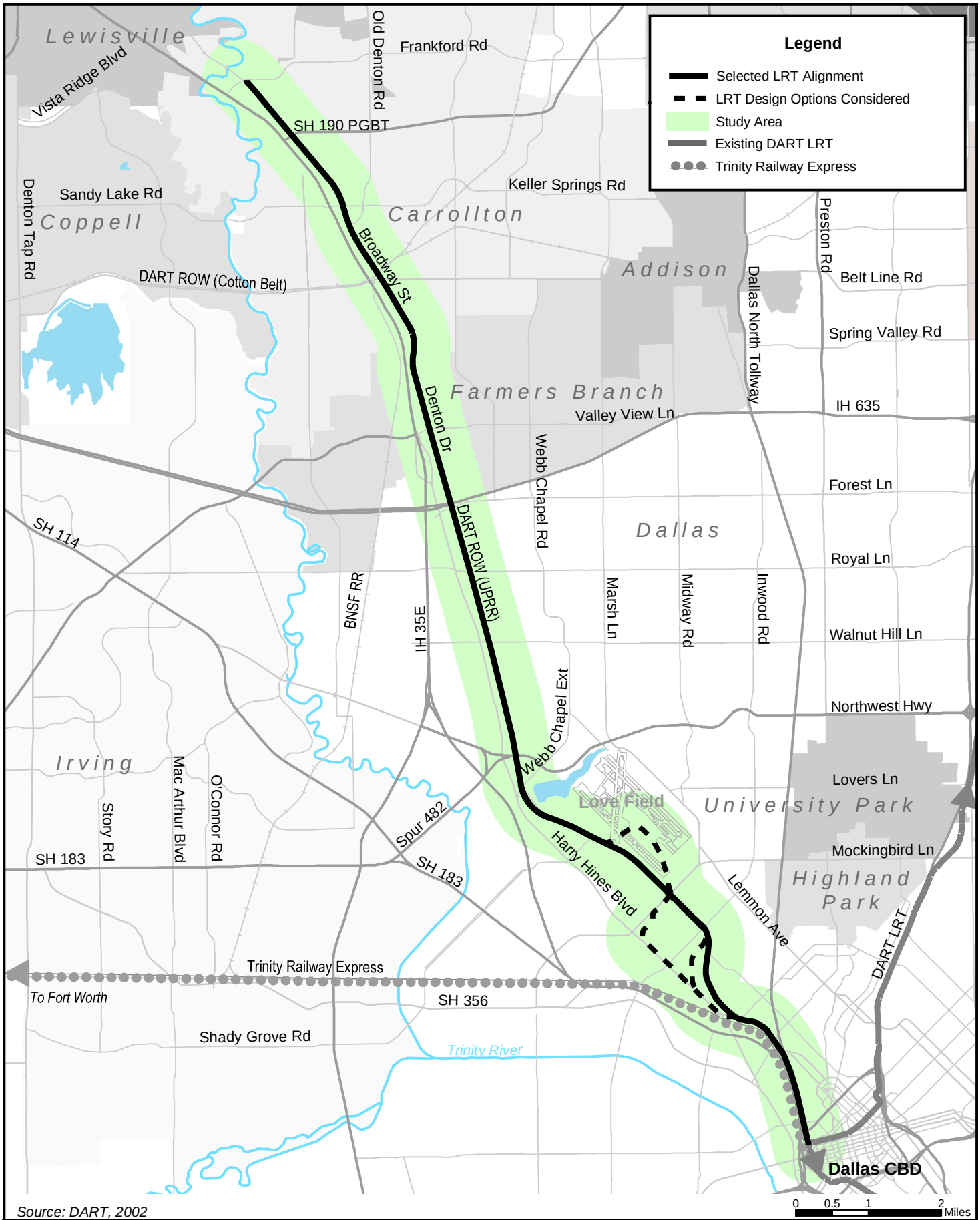
1.1 GOALS AND OBJECTIVES

DART is the Dallas area's regional transit agency providing service within a 700-square mile area comprised of 13 member cities. Citizens and staff from the Cities of Dallas, Farmers Branch and Carrollton have contributed to DART's consideration of alternative transportation investments in the Northwest Corridor. The DART Board of Directors has established a set of goals for transportation improvements in the Northwest Corridor. The goals and objectives respond to the underlying transportation needs defined in this chapter. They are based on the goals adopted in May 1983 to guide development of the ***DART Transit System Plan*** and goals stated in the DART Mission Statement:

> *The mission of Dallas Area Rapid Transit is to build and operate an efficient and effective transportation system that, within the DART Service Area, provides mobility, improves the quality of life, and stimulates economic development through the implementation of the DART Service Plan as adopted by the voters on August 13, 1983, and as amended from time to time.*

The primary objective of the Northwest Corridor MIS was to identify an LPIS for transportation improvements in the corridor. This study identified the following purposes for transportation improvements in the Northwest Corridor:

- **Enhance Mobility** by offering travel choices to and from, and through, the corridor;
- **Provide Additional Capacity** for heavily-traveled radial directions;
- **Reduce Congestion** by reducing automobile dependence;
- **Enhance the Quality and Reliability of Transit Service** for existing and potential riders;
- **Improve Safety and Operating Efficiency** of roadways; and
- **Strengthen Economic Conditions** in the corridor.



Source: DART, 2002

Figure 1-1
Study Area Map

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

1.2 RELEVANT SYSTEM PLANNING ACTIVITIES

The Northwest Corridor (formerly known as the Stemmons Corridor) has been included in DART's and other regional transportation improvement plans for nearly 20 years. A summary of these efforts is presented in this section.

- DART's ***1983 Final Service Plan*** included a 160-mile heavy rail system. The Northwest Corridor was to be built in two phases along the Union Pacific Railroad (UPRR) line, first to LBJ Freeway, then to Belt Line Road with an extension west to Las Colinas.

- The ***2010 Service Plan*** (1988) reduced the heavy rail system to 93 miles. The Northwest Corridor showed rail from downtown Dallas to LBJ Freeway with extensions to Belt Line Road along the UPRR line and west to Las Colinas along the Mañana spur. With the failure of the 1988 bond election, DART re-evaluated the rail system and developed a new cost-effective program in 1989.

- The ***1989 Transit System Plan*** showed a light rail line from downtown Dallas to Valley View Lane in Farmers Branch, and future expansion north to the North Carrollton Transit Center. A branch west to the North Irving Transit Center was also included. DART purchased the UPRR line in 1990 for future use as a rail transit line.

- The ***1995 Transit System Plan*** updated the 1989 plan and showed a 19-mile commuter rail line along the UPRR from downtown Dallas to the North Carrollton Transit Center and a branch west to the North Irving Transit Center.

- The ***Northwest Corridor Needs Assessment*** (December 1997) identified north-south travel as the primary need in the Dallas-Carrollton-Farmers Branch subarea. This includes travel from residential origins in the north to employment destinations along the corridor and in downtown Dallas. It also includes travel from residential origins south of downtown Dallas to employment destinations along the corridor and elsewhere in the region (reverse commute).

- The North Central Texas Council of Governments (NCTCOG) developed the ***Mobility 2025 Plan*** (January, 2000) using demographic projections for the year 2025. The plan generally reflected the ***DART 1995 Transit System Plan***, with the exception that it showed LRT instead of commuter rail in the Northwest Corridor based on the MIS results. ***The Mobility 2025 Plan*** was updated again in May 2001.

- The ***Northwest Corridor Major Investment Study*** was initiated in early 1998 and completed in early 2000. The study identified LRT on the UPRR alignment from downtown Dallas to Frankford Road in Carrollton, with a section along Harry Hines Boulevard in the Medical Center area. It also identified a branch at Northwest Highway through Irving and to DFW International Airport. The DART Board approved the LPIS for the Northwest Corridor on February 22, 2000, and amended the ***1995 Transit System Plan*** to reflect these changes. The two lines were to be treated as separate projects, with an EIS to be prepared for each. The Irving to DFW line Preliminary Engineering (PE) and EIS efforts are anticipated to begin in early 2003.

- In August 2000 DART conducted a special election requesting voter approval for the agency to issue long-term bonds to finance capital improvements. Previously, DART had funded projects on a "pay-as-you-go" basis. The issue passed overwhelmingly, and permitted DART to accelerate implementation of several projects, including the proposed project.

- DART initiated an update to its ***Transit System Plan*** in mid-2001. The plan will reflect the latest year 2030 demographic projections from NCTCOG. Previous planning efforts reflected

population and employment projections for the year 2010. DART expects to complete the effort in Fall 2003.

1.3 OVERVIEW OF THE CORRIDOR

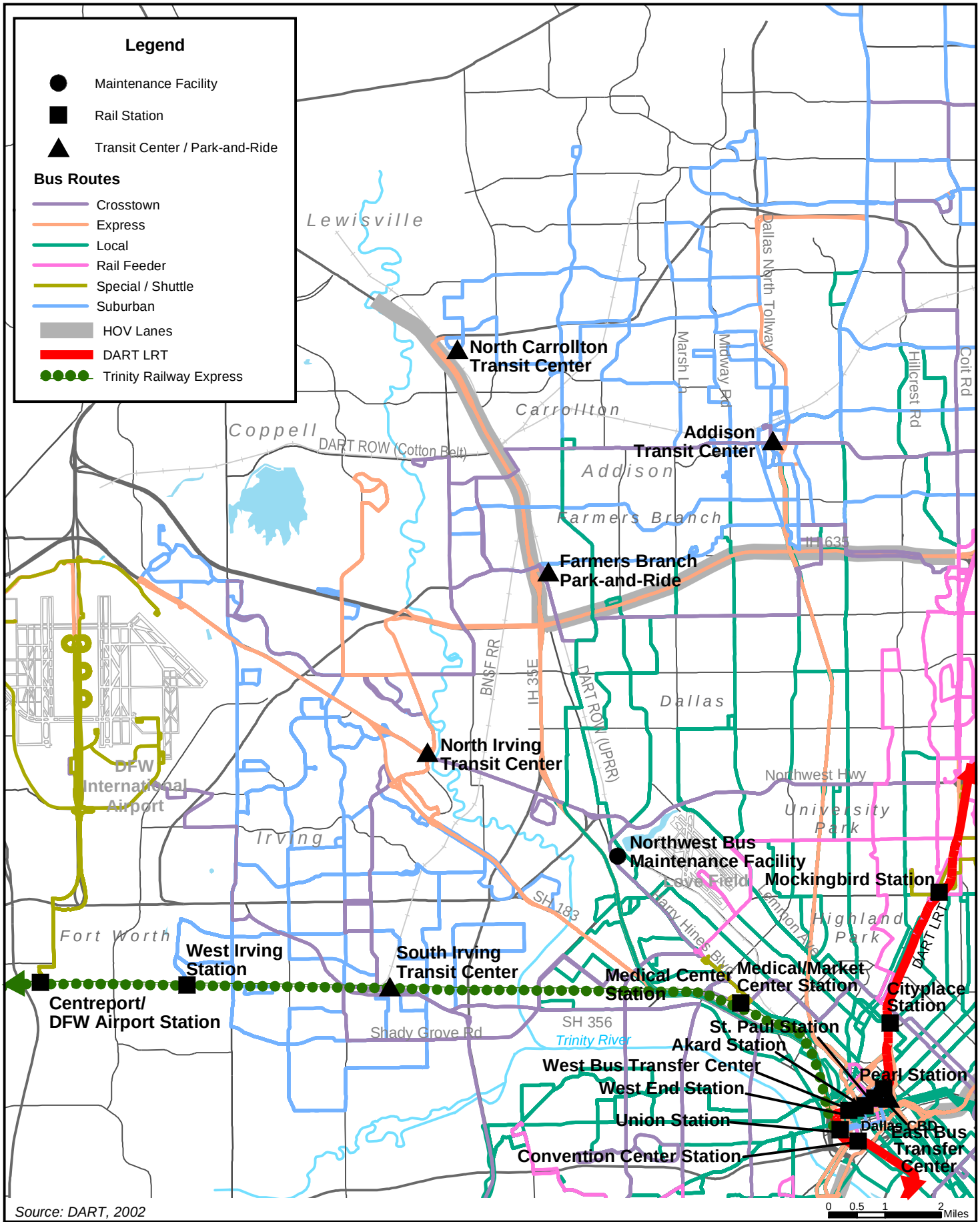
The transportation system in the project corridor includes three major freeways, a grid system of arterial and local streets, a portion of the Trinity Railway Express (TRE) line, and a bus system operating daily on surface streets and the freeway. The bus system includes five local, two express, five circulator, one rail-feeder, and six cross-town routes in the corridor. The circulator routes operate between transit centers in outer Dallas and in nearby suburban communities. Existing transportation services and facilities are illustrated in **Figure 1-2**.

The proposed project is included in the third phase of expansion to DART's LRT system. Phase 1 includes the 20-mile LRT Starter System that was opened in 1996. Phase 2 includes recent openings of extensions along the North Central LRT Line to Richardson (July 2002) and Plano (December 2002), and the Northeast Line to Garland (November 2002). Phase 3 of LRT development would include the Northwest Corridor projects to Farmers Branch and Carrollton and Irving/DFW, and the Southeast Corridor project, as shown in **Figure 1-3.**

The proposed project parallels IH 35E (Stemmons Freeway) from downtown Dallas north through the cities of Dallas, Farmers Branch and Carrollton. The corridor is linked at the south end to the Dallas Central Business District with its 120,000 jobs, and a variety of employment, education, health, entertainment and residential areas. These corridor activity centers include the new American Airlines Center professional sports and entertainment arena and associated Victory office, retail, and residential development; the Stemmons Business Corridor/Dallas Market Center wholesale district; the health services, medical research and employment in the Medical Center District area; Dallas Love Field; various commercial and industrial activities; and employment centers and residential areas in Dallas, Farmers Branch and Carrollton.

1.3.1 Population and Employment

The Dallas/Fort Worth region is growing at a tremendous pace, placing significant demands on the transportation system. Population in the region is forecast to grow by 67% between 1995 and 2025. Employment in the region is forecast to grow by 72% in this same time period. A significant amount of this growth will occur in northern Dallas County, northeast Tarrant County, and southeast Denton County, at the outer edges of the Study Area. In 1995, employment within the Study Area outnumbered population by over 200,000 jobs. In 2025, the surplus of jobs over population is expected to grow to more than 250,000. Current population and employment and forecast growth are shown in **Table 1-1**.

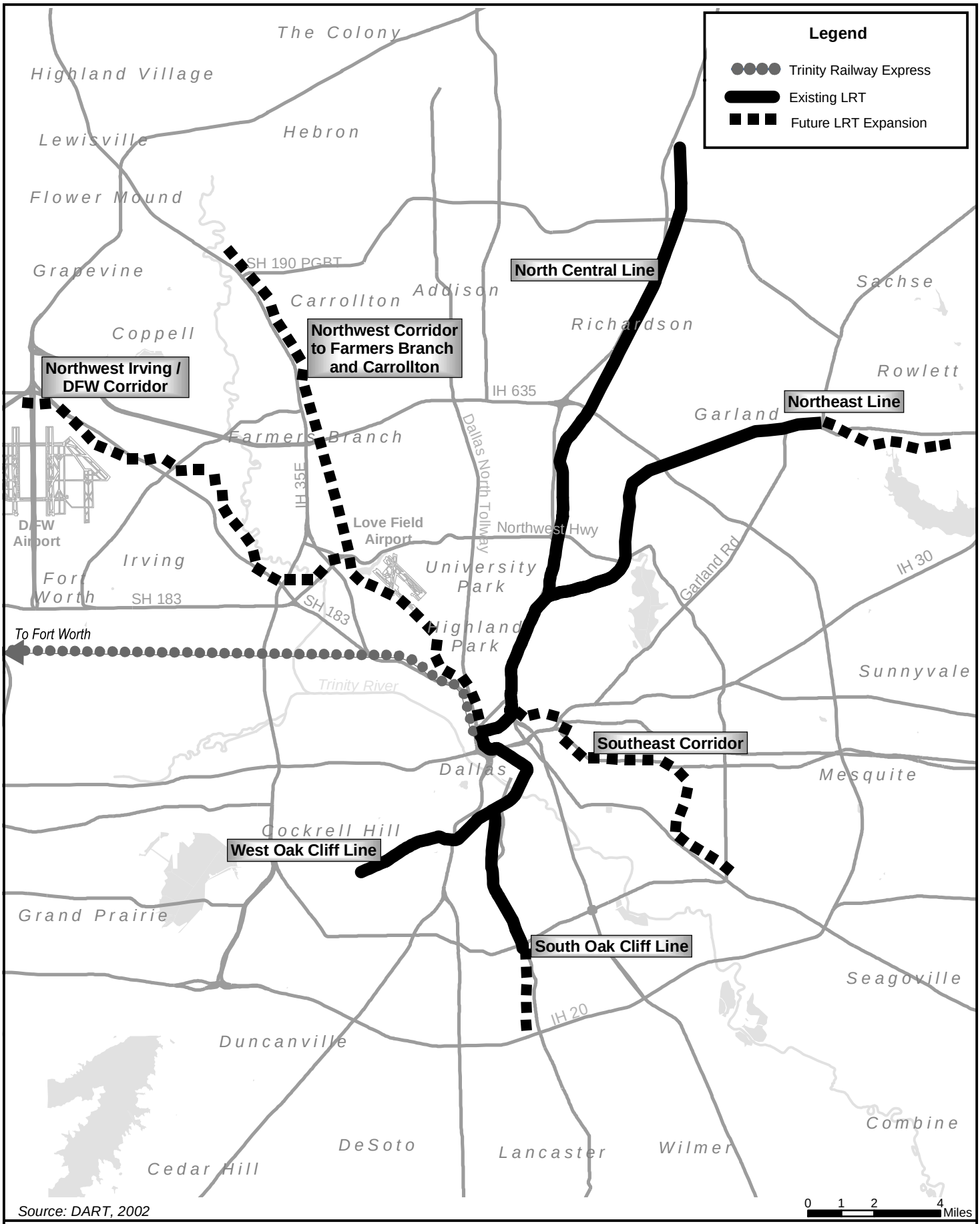


Source: DART, 2002

Figure 1-2

Existing Transportation Services and Facilities

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: DART, 2002

Figure 1-3

Existing and Planned Light Rail Transit System

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

TABLE 1-1
FORECAST POPULATION AND EMPLOYMENT GROWTH

	Population			Employment		
Area	**1995**	**2025**	**% Change**	**1995**	**2025**	**% Change**
Dallas	1,034,400	1,263,550	22	857,150	1,195,250	39
Carrollton	90,950	128,700	42	47,200	73,300	55
Farmers Branch	24,500	29,400	20	53,850	79,350	47
Corridor Study Area	81,920	114,122	39	298,449	365,747	22
Dallas/Ft. Worth Region	4,212,900	7,076,300	67	2,296,200	3,952,700	72

Source: NCTCOG North Texas 2000 Demographic Forecast, November 2000

1.3.2 Travel Patterns and Congestion

Existing and projected traffic volumes are shown in **Table 1-2**. Traffic volumes are currently at or near capacity on almost all major roadways approaching IH 35E and IH 635 (LBJ Freeway). IH 35E carries an average of 155,000 to 289,000 vehicles per day within the Corridor. IH 635 provides east-west access through the corridor and carries an average of 166,000 vehicle per day west of the corridor and 297,000 vehicles per day east of the corridor. The freeways in and near the corridor operate at Level of Service (LOS) F at peak periods. Volumes stay high at many locations (near capacity), and will worsen by 2025 without improvements.

TABLE 1-2
EXISTING AND PROJECTED TRAFFIC VOLUMES

Roadway	Location	2000		2025		
Freeways		**ADT[1]**	**LOS[2]**	**ADT[1]**	**LOS[2]**	**% Change**
IH 35E Stemmons Frwy.	Frankford Road	155	F	226	F	+ 45
	Valley View Lane	207	F	173	F	- 16
	Royal Lane	243	F	294	F	+ 21
	Webb Chapel Extension	160	F	128	F	- 20
	Inwood Road	289	F	235	F	- 19
IH 635 LBJ Frwy.	Webb Chapel Road (E. of IH 35E)	297	F	252	F	- 3
	Luna Road (W. of IH 35E)	166	F	255	F	+ 53
Arterials						
Harry Hines Blvd.	Lombardy Lane	37	F	36	F	- 3
	Burbank St. (S. of Loop 12)	30	F	27	F	- 23
Denton Drive	Burbank St. (S. of Loop 12)	12	D	19	F	+ 58
	Merrell St. (N. of Walnut Hill Lane)	9	D	12	F	+ 33
Royal Lane	Brockbank	26	D	39	F	+ 50
Belt Line Road	Josey Lane	36	F	39	F	+ 8
	Luna Road	30	D	31	F	+ 3
Keller Springs Road	McCoy Road	21	D	43	F	+ 105
Frankford Road	Dickerson Parkway	27	D	26	D	- 4

[1] ADT = Average Daily Traffic volume (in thousands)
[2] LOS = Level of Service, a measure of traffic flow and delay. LOS "A" is free flow/no delays, LOS "F" is congested/long delays.

Source: NCTCOG Mobility 2025 Update, 2001

Traffic volumes on Dallas freeways have increased 5% to 10% per year since 1995. Traffic volumes on IH 35E are expected to be as much as 294,000 vehicles per day in 2025, representing increases of as much as 45%. The high volumes and poor levels of service on the freeway will have the effect of making congestion worse on adjacent surface streets in the corridor.

1.4 NEED FOR ACTION

Current and projected travel patterns, levels of roadway congestion, growth in population and employment in the region and in the corridor require that the proposed project be built in order to address the need for additional capacity.

The need for transportation improvements is demonstrated by the following:

- The Dallas-Fort Worth region is currently designated as a serious non-attainment area for ozone by the Environmental Protection Agency;
- The project corridor parallels IH 35E (Stemmons Freeway), one of the most congested highway corridors in the region;
- The corridor intersects IH 635 (LBJ Freeway), the highest volume corridor in the Dallas metropolitan region;
- The entire Study Area falls within a region identified for the year 2025 as an "area of severe peak-period congestion" by the NCTCOG;
- Existing and planned roadway improvements are insufficient to meet the demand within this corridor;
- Travel time delay and congestion levels in the corridor are increasing; and,
- A significant amount of employment and population growth is forecast for the corridor.

1.4.1 Specific Transportation Needs in the Corridor

The Stemmons Business District, which extends north of downtown Dallas along IH 35E, is bounded on the west by the Trinity River and on the east by Harry Hines Boulevard. This area has been growing and is expected to continue to grow at a rate greater than that of the region. It added 8,100 jobs from 1995 to 1998, and is forecasted to contain 31% of total employment in the Dallas-Fort Worth region by 2010.

Roadway congestion has worsened, leading to further congestion on surface streets and increasing travel times for drivers and transit riders. One effect of this is deteriorating air quality. The expected growth that will worsen these conditions indicates the need for major transportation improvements. These needs are:

- Need to reduce travel times in the corridor;
- Need to increase transit efficiency and effectiveness in the corridor;
- Need to increase connectivity in the region, particularly from residential areas in the region to employment in the study area;
- Need to provide additional people-carrying capacity in the corridor; and
- Need to contribute to improvements in unacceptable regional air quality.

1.4.2 Purposes of the Proposed Action

The proposed project would serve the following purposes:

- **Increase Regional Connectivity / Transit Effectiveness**
  The existing DART transit system provides reasonable access to job opportunities in the corridor and elsewhere in the Service Area and region, especially for transit-dependent populations. The proposed extension of the LRT system would expand those opportunities for current and prospective transit riders both in the corridor and in the region as a whole. Access to jobs in the corridor from southern Dallas and access to central Dallas from the north and northwest would be improved. The combinations of residence-employment locations accessible by transit in the region would increase. The implementation of this project would improve access opportunities for transit patrons, thereby enhancing regional desires to balance jobs and housing.

- **Offer an Alternative to Single-Occupancy Vehicle (SOV) travel**
  Traffic congestion in the corridor has increased and will continue at a significant pace. Options to increase roadway capacity are limited. These limitations are both physical (right-of-way and land use pattern) and financial (limited available funding). Improving the transit system offers an alternative to Single-Occupancy Vehicle (SOV) travel in the corridor and is an effective operational strategy to reduce peak period congestion levels.

- **Increase People-carrying Capacity in the Corridor**
  Regional demand for radial travel in the corridor will increase, and additional capacity is needed to meet this demand. North-south travel patterns include residents from the north traveling to jobs in the corridor and in downtown Dallas, and residents from the south traveling to jobs in the corridor (reverse commute). Again, the proposed project would be most effective in peak periods when congestion levels are highest and people-carrying capacity is needed most.

- **Improve Accessibility and Increase Economic Development Opportunities**
  The proposed project would provide access for residents and visitors to the employment centers, health services, entertainment, and regional airport in the corridor. Access to and from the regional destinations served by DART's LRT and bus service would also be enhanced. This increased accessibility would strengthen economic conditions at existing activity centers, and provide an opportunity for development of further economic activity at other locations in the corridor.

The described transportation needs demonstrate that improvements are needed to meet the anticipated demands of travelers in the corridor and region.

The DART LRT, commuter rail and bus system offers travel choices for current and prospective transit riders. The proposed project would further add to those choices for transit users in the corridor and from throughout the region.

1.5 PLANNING CONTEXT

The evaluation of transportation needs in the Northwest Corridor has been oriented toward the Federal Transit Administration's (FTA) planning, project development and funding approval process. The decision-making framework and the process used in selecting the recommended improvements are described below.

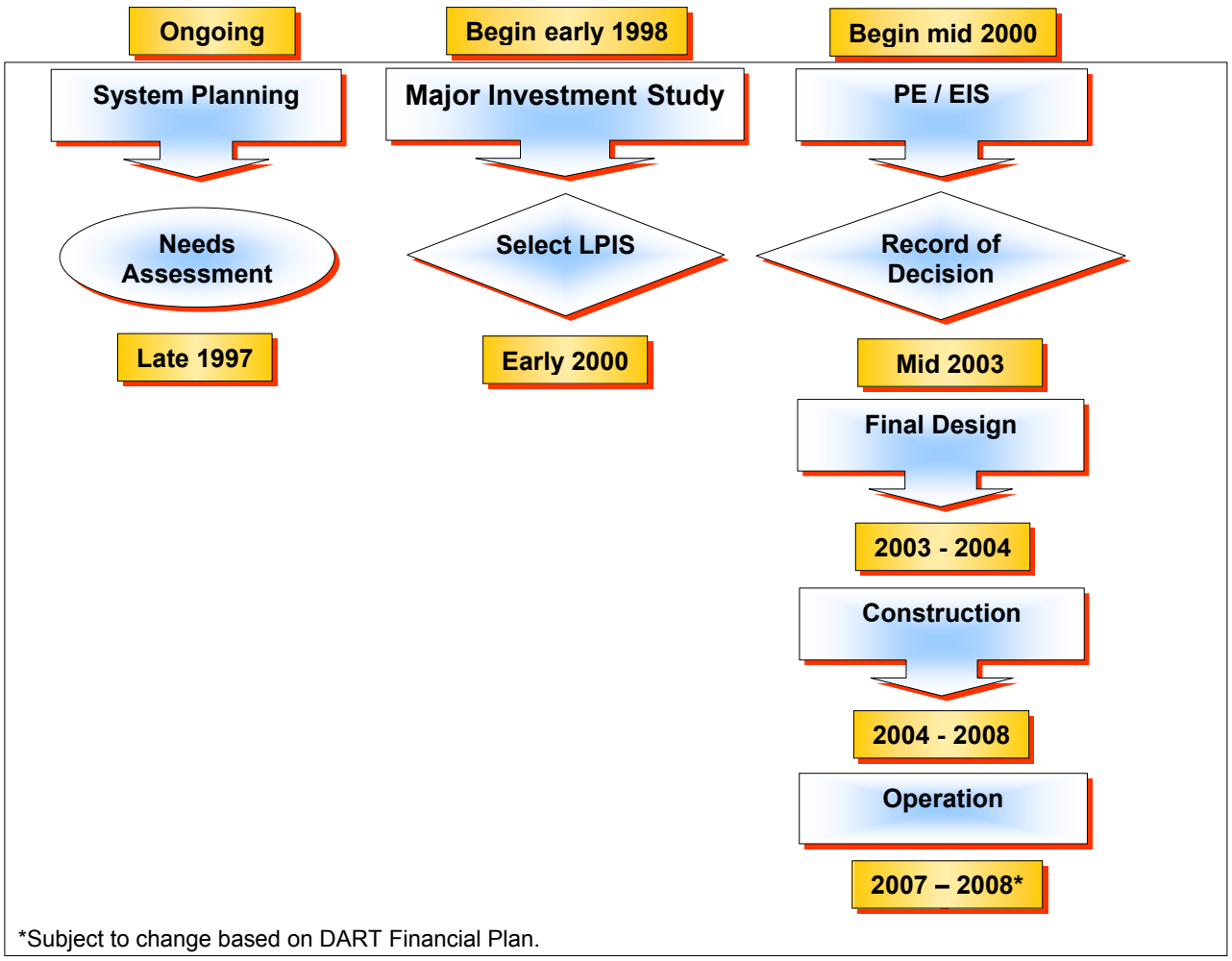
1.5.1 Decision Framework

The decision-making process is framed by DART's adoption of its ***Transit System Plan*** in 1995, which identified a need in the Northwest Corridor. As shown in **Figure 1-4**, DART completed a Needs Assessment in 1997. This initial step examined the corridor needs and defined the issues to be addressed in the MIS. The Needs Assessment also defined a comprehensive Public and Agency Involvement Program that provided specific opportunities for review and input from the general public, public agencies and other stakeholders. In the spring of 1998, DART initiated the MIS process for the Northwest Corridor. These efforts were coordinated with the NCTCOG, and other affected agencies such as the cities of Carrollton, Dallas, and Farmers Branch, and the Texas Department of Transportation (TxDOT).

1.5.2 Selection of the LPIS

The Northwest Corridor MIS provided a decision-making process for determining transportation investments in the Northwest Corridor and relied upon technical analyses and community and agency input for determining the preferred alternative. On February 22, 2000, the DART Board of Directors approved an LPIS that combined LRT improvements in the corridor with Highway/High Occupancy Vehicle (HOV) and Transportation System Management (TSM) components (low-cost transportation improvements and freeway bottleneck removal projects).

FIGURE 1-4 PROJECT DEVELOPMENT PROCESS

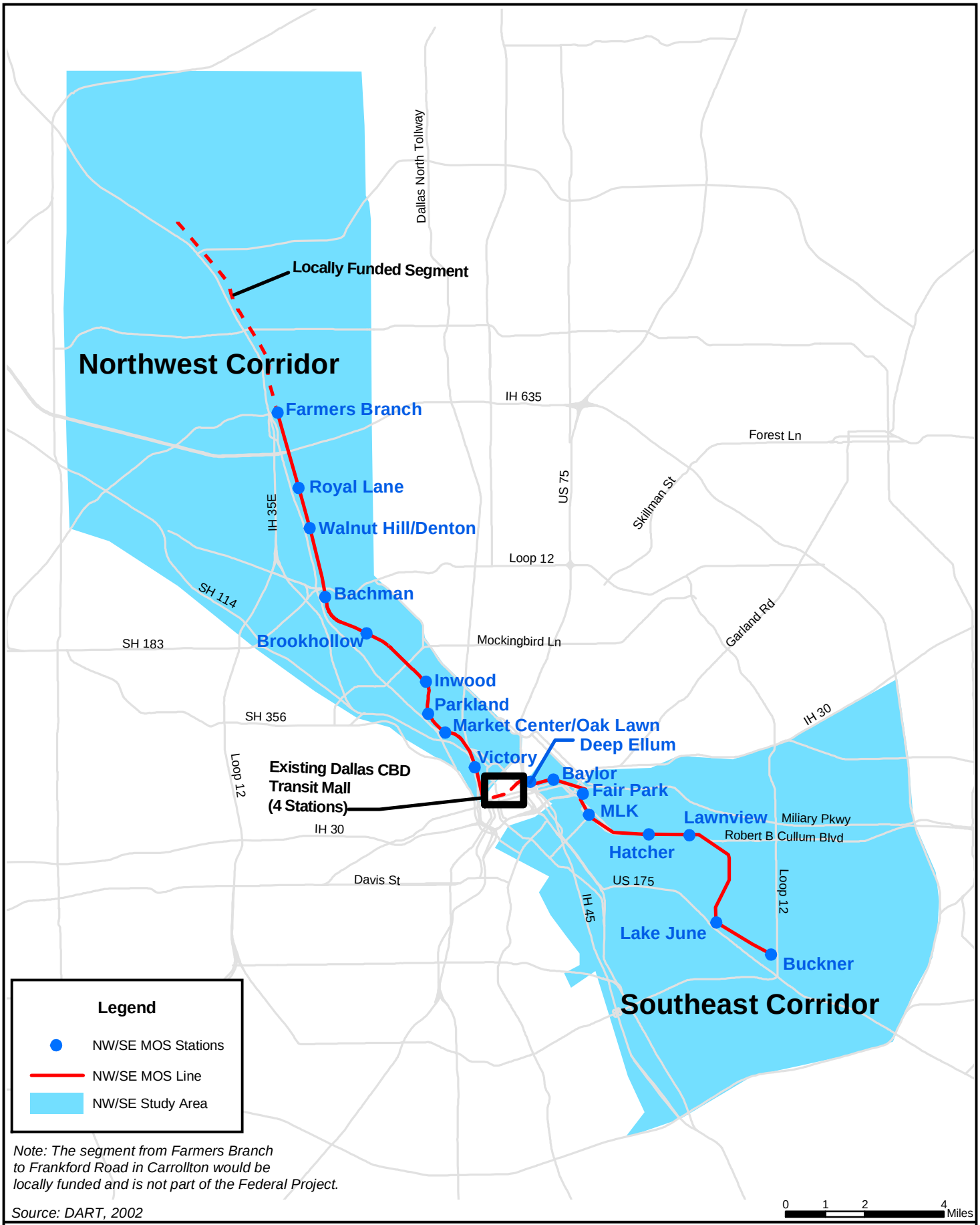


Source: FTA, DART; 2003

The Northwest Corridor LRT Line is being advanced in accordance with the project development process outlined by the FTA for major transit capital investments and in accordance with FTA rules and regulations specified under the National Environmental Policy Act (NEPA). During the preliminary engineering (PE) process, a 10% level of engineering detail was developed to fully support this EIS document. Public and agency involvement has continued in this phase to ensure that the EIS is consistent with local guidelines, took public input into consideration, identified possible impacts, and recommended appropriate mitigation measures.

1.5.3 Description of Federal Project (New Starts)

For purposes of defining the "Federal Project" for a FTA Section 5309 New Starts submission, DART has combined the Southeast Corridor project and a majority of the Northwest Corridor. This Federal Project forms a single, federally funded, comprehensive, and cost-effective project to meet the wide range of mobility, community, and financial needs in both the Northwest and Southeast Corridors. A separate EIS is being done for each of the corridors. The 22-mile Minimum Operable Segment (MOS) reflects an LRT line from Farmers Branch (Northwest Corridor) through the Dallas CBD, to Buckner Boulevard (Southeast Corridor), as shown in **Figure 1-5**. This Federal Project would link key activity and employment centers in the MOS corridor, including Dallas Love Field Airport, Medical Center District (Parkland, Children's, Zale Lipshy, St. Paul and University of Texas Southwestern Medical Center), Market Center, Victory Development and the American Airlines Center, the Dallas CBD, Baylor Hospital, Deep Ellum, and Fair Park, with the rest of the regional



Note: The segment from Farmers Branch to Frankford Road in Carrollton would be locally funded and is not part of the Federal Project.

Source: DART, 2002

Figure 1-5

Federal New Starts Project Definition

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

rail system. If approved, the project would be completed and opened for revenue service in staged line segments during the years 2007 and 2008 (working schedule, subject to change). DART's dedicated local sales tax, as well as long term bond financing, would fund the remainder of the Northwest Corridor LRT line from Farmers Branch to Frankford, also planned to be open for revenue service in 2008 (subject to change).

Given the definition of the Federal Project and the similar revenue service dates for the Northwest and Southeast Corridors, the ridership forecasts and operating plans in each project's EIS document assume both corridors are in place for the Build Alternatives. Each No-Build Alternative assumes neither corridor is in place. This ensures an accurate portrayal of future ridership and operating plans, while addressing the effects of each corridor in separate EIS documents.

1.5.4 The Role of the EIS in Project Development

The EIS is prepared as a full-disclosure document to meet the requirements of NEPA and is intended to inform the public of potential environmental, social, and economic impacts associated with the proposed LRT project and the No-Build Alternative. The No-Build Alternative represents the base condition for identifying impacts associated with the proposed project (Build Alternative).

The EIS serves as the primary document to facilitate review by federal, state, and local agencies and the general public of the proposed project. The EIS documents the purpose and need for the project and describes the alternatives considered. It addresses in detail the anticipated transportation and environmental impacts of the project and identifies appropriate mitigation measures.

The Draft EIS was circulated for a required 45-day review and public comment period from June 14 to July 30, 2002. During this comment period, the Draft EIS was made available to interested parties including private citizens, community groups, the business community, elected officials and public agencies. Three public hearings were held in July 2002 in the Study Area to formally receive comments. Public comments were submitted in writing throughout the full comment period (See Chapter 6).

The Draft EIS included design options in two areas of consideration: the Medical Center area and the Love Field area. It also identified three candidate sites for the Northwest Rail Operating Facility (NWROF) as part of the project. The Draft EIS identified potential impacts associated with the LRT Alternative's Base Alignment and the Design Option alignments for both of these areas, and for the candidate NWROF sites. After the Draft EIS comment period, on August 13, 2002, the DART Board selected NWROF site 3, located at Denton Drive and Lombardy Lane. On September 17, 2002 the DART Board selected Design Option D in the Medical Center area and the Base Alignment in the Love Field area for implementation. Medical Center Design Option D was presented as a refinement to the Draft EIS Medical Center Design Options in response to public and stakeholder comments (See Chapter 2).

After circulation of the Draft EIS, and following the preceding actions by the DART Board, preliminary engineering and environmental studies were completed, including mitigation commitments where necessary. Subsequent coordination efforts with Parkland hospital representatives on Option D resulted in proposed project alignment and station changes not addressed in the Draft EIS or at the July public hearings. The reasons for these changes are described in Section 2.3.2. As a result of the changes, DART held an additional public hearing on April 10, 2003 to obtain comments on the proposed changes. An environmental study which summarized the changes and any associated potential impacts and mitigation was made available prior to the public hearing to allow interested persons an opportunity to review the changes prior to the public hearing. On May 13, 2003, the DART Board approved the proposed project changes.

This Final EIS reflects the decisions made by the DART Board and also includes responses to comments received during the Draft EIS comment period and during the April 10, 2003 public hearing on the subsequent project changes. This Final EIS has been published and made available to the public. The Final EIS identifies the selected LRT alignment, and also describes areas where design options were under consideration (Medical Center and Love Field). Refer to Chapter 2 for a full description of the Selected LRT Alternative. Completion of the Final EIS, followed by the signed Record of Decision (ROD) by the FTA, will permit the project to be advanced to the final design and construction phases. The Federal Aviation Administration, as a cooperating agency, will not issue a ROD for the project, since the preferred project does not include the Love Field Design Option.

Chapter Two

Alternatives Considered

2.0 ALTERNATIVES CONSIDERED

This chapter describes the alternatives considered during the Northwest Corridor Major Investment Study (MIS) and the alternatives considered in the Draft and Final Environmental Impact Statements (EIS).

2.1 MAJOR INVESTMENT STUDY (MIS) ALTERNATIVES

The Northwest Corridor MIS covered a large study area that included both the Farmers Branch/Carrollton corridor, a long identified and defined candidate travel corridor for transit improvements, and the Irving/DFW corridor, an emerging transit corridor. The MIS alternatives served both travel corridors. As noted previously, a separate EIS will be prepared for the Irving/DFW corridor. Thus, the discussion below focuses on the MIS alternatives developed for the Northwest Corridor LRT Line to Farmers Branch and Carrollton.

2.1.1 Screening and Selection Process

The screening and selection process for the Northwest Corridor MIS consisted of two distinct phases: Conceptual and Detailed Evaluation. The Conceptual phase considered single-mode elements and evaluated their performance. The most promising were carried forward to the Detailed Evaluation phase. The Detailed Evaluation phase refined each element and grouped them into "packages" of strategies to address transportation needs. The packages were analyzed, and from these a single LPIS was selected. The No-Build and Transportation System Management/Transportation Demand Management (TSM/TDM) Alternatives were carried through the entire evaluation process for comparison. LRT and Commuter Rail were carried forward as rail technologies to consider. Many alignment alternatives were considered. High Occupancy Vehicle (HOV) Lane and Highway widening options were also carried forward into the Conceptual and Detailed Evaluation.

2.1.2 Conceptual MIS Alternatives

The conceptual alternatives considered during the Northwest Corridor MIS focused on the range of LRT and Commuter Rail options available to serve corridor travel needs. The No-Build, TSM/TDM, and HOV/Highway options were carried forward to the Detailed Evaluation.

Commuter Rail alignments generally followed the DART-owned UPRR ROW to SH 121. Routing options examined included use of the Burlington Northern Santa Fe railroad north of Belt Line Road to Legacy Park and an option to serve Love Field Airport directly. Commuter rail alternatives emphasized use of existing railroad rights-of-way.

Several LRT alternatives were evaluated. More LRT alternatives were defined given the flexibility of LRT to deviate from railroad rights-of-way, provide a greater number of stations, and provide appropriate vertical separation from streets. As with Commuter Rail, LRT alignments also generally followed the UPRR to SH 121. Routing options included the use of portions of Harry Hines Boulevard in the Medical Center area and potentially to LBJ Freeway, as well as direct access to Love Field.

The full evaluation of conceptual alternatives is documented in the ***Conceptual Definition of Alternatives and Conceptual Evaluation Results Report*** (DART, March 1999). Based on the evaluation results a range of alternatives was defined for the detailed evaluation as described in the following section. The key alignment decisions resulting from the conceptual evaluation are as follows:

- Stay in the UPRR corridor but revise the alignment to reflect a Harry Hines alignment through the Medical Center district based on higher ridership potential, as well as public, Medical Center, and City of Dallas support;

- Continue to study the tunnel option to serve Love Field for LRT only; and
- Continue to examine a potential Griffin LRT alignment through the new Arena development.

2.1.3 Detailed MIS Alternatives

The Detailed Evaluation phase considered the alternatives carried forward from the conceptual phase. The No-Build and TSM/TDM Alternatives were carried forward through the Detailed Evaluation for comparison purposes. Several highway widening and HOV Lane Alternatives were also defined. The ***Final MIS Report*** (DART, October 2000) documents these as well as the rail alternatives in detail.

The evaluation of the detailed alternatives focused on ridership, costs, and cost-effectiveness. Several refinements were made throughout the process to optimize these factors, while minimizing potential social, economic and environmental impacts.

Commuter Rail Alternatives Considered

The Commuter Rail Alternatives defined for detailed evaluation in the MIS generally followed the UPRR alignment. North of Belt Line Road, two options were considered: to SH 121 on the UPRR, or to Legacy Park on the BNSF RR. The key refinement to the Commuter Rail alternatives was to truncate the UPRR option at Frankford Road to enhance cost-effectiveness and maintain services within the DART Service Area.

LRT Alternatives Considered

Several LRT alternatives were developed for the detailed evaluation. Alignments generally followed the UPRR Corridor to SH 121, with the Harry Hines alignment through the Medical Center. Routing options were examined near downtown (follow the TRE Corridor west of new Victory development and arena, or use a potential Griffin Street alignment that could be integrated into the Victory development) and to Love Field (stay on the UPRR corridor west of Love Field or access the terminal area via a tunnel alignment). As with Commuter Rail, one alternative tested the use of the BNSF RR north of Belt Line Road. The key refinement during the detailed evaluation was to truncate the UPRR alignment options at Frankford Road.

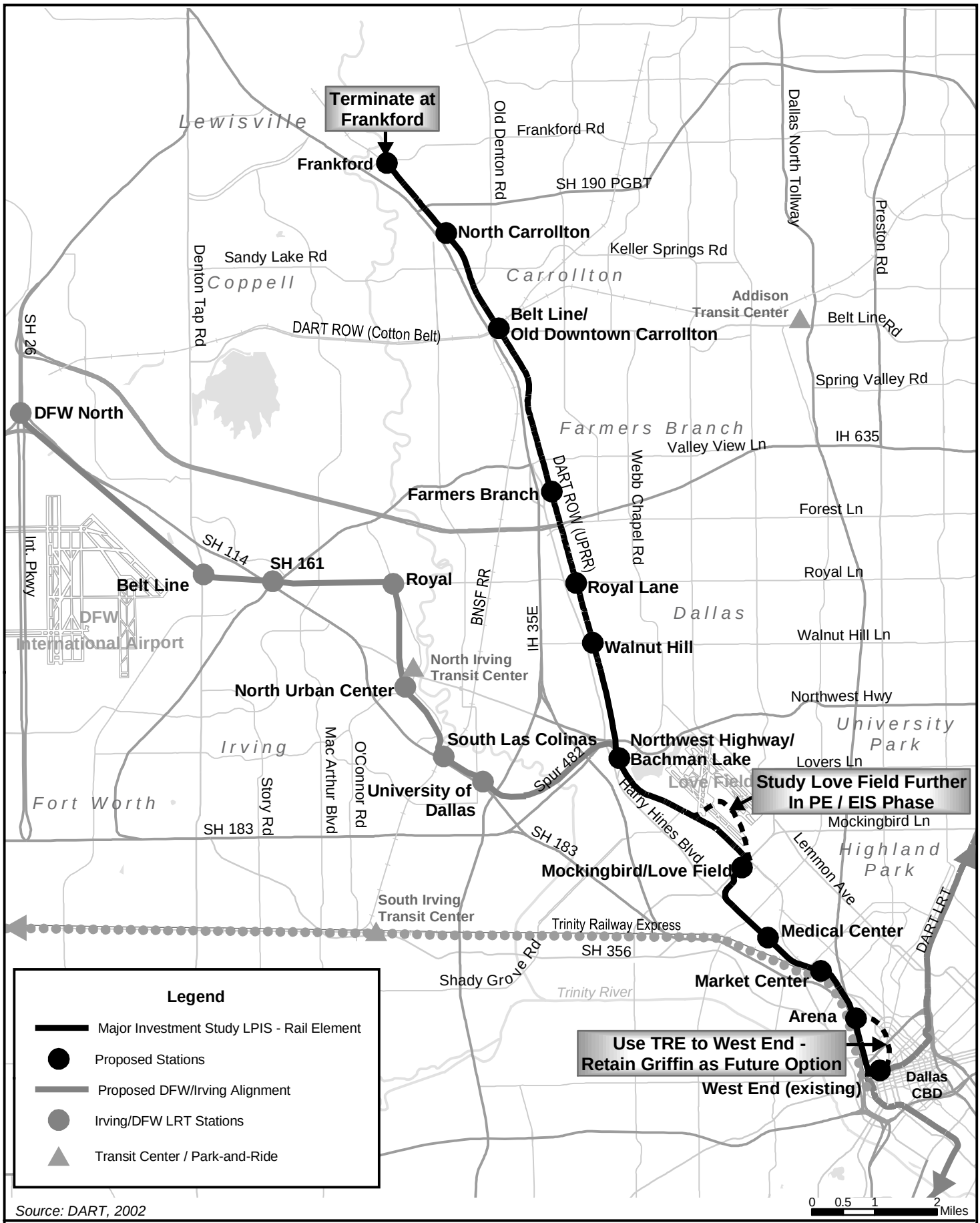
Based on the detailed evaluation results, the rail element of the LPIS was selected to reflect LRT in the Northwest Corridor as shown in **Figure 2-1**. In addition to the rail element, the LPIS recommended highway and HOV improvements to the IH 35E and SH 114 freeway corridors and LRT in the Irving/DFW corridor. These recommendations are fully documented in the ***Final MIS Report*** (DART, October 2000).

2.1.4 Rationale For Choosing The Locally Preferred Investment Strategy (LPIS)

The Northwest Corridor MIS resulted in the identification of a Locally Preferred Investment Strategy (LPIS) that included TSM/TDM, Highway and HOV lane improvements, and Light Rail Transit. TXDOT, NCTCOG, DART, and/or local jurisdictions will accomplish the TSM/TDM, Highway and HOV lane elements of the LPIS through separate efforts. The LRT element of the LPIS was divided into two projects: The LRT Line to Farmers Branch and Carrollton and the Irving/DFW Line. The Irving/DFW Line will be advanced to the PE/EIS phase in early 2003. The focus of this EIS is solely on the LRT Line to Farmers Branch and Carrollton.

The rationale for selecting the LPIS was based on a comprehensive evaluation and trade-off analysis and an extensive public and agency involvement program as documented in **the *Final MIS Report*** (DART, October 2000). Key findings that support the selection of the LPIS include:

- LRT alternatives were more cost-effective and had higher system-wide and corridor transit ridership than Commuter Rail;



Source: DART, 2002

Figure 2-1

Locally Preferred Investment Strategy (LPIS)

Rail Element - Approved February 2000

LRT Line to Farmers Branch and Carrollton

Final Environmental Impact Statement

- Public and agency input supported LRT over Commuter Rail, given the ability to have more stations, penetrate key activity centers, and influence land use planning;
- Remaining on the UPRR served the travel pattern better, avoided sensitive neighborhoods and was more cost-effective than the BNSF RR;
- Truncating LRT at Frankford was more cost-effective than extending it to SH 121 and located the project within the DART Service Area boundary; and,
- Public and agency input, at the time of the MIS, supported access to Love Field and the use of Harry Hines through the Medical Center area.

Based on the above findings, the DART Board approved the Northwest Corridor LPIS on February 22, 2000. As shown in **Figure 2-1**, the LPIS recommendation included further consideration of LRT alignments – or design options – in two areas: Love Field and the Victory Development area (American Airlines Center) along Griffin Street.

The Love Field area was considered during the Draft EIS process, and is discussed further in Section 2.3.2. The Griffin alignment, though included as an area for further study as part of the LPIS recommendation, is not being addressed in this EIS. Rather, this alignment option will be examined in the context of the need for additional CBD transit capacity as part of the DART 2030 Transit System Plan effort (currently underway).

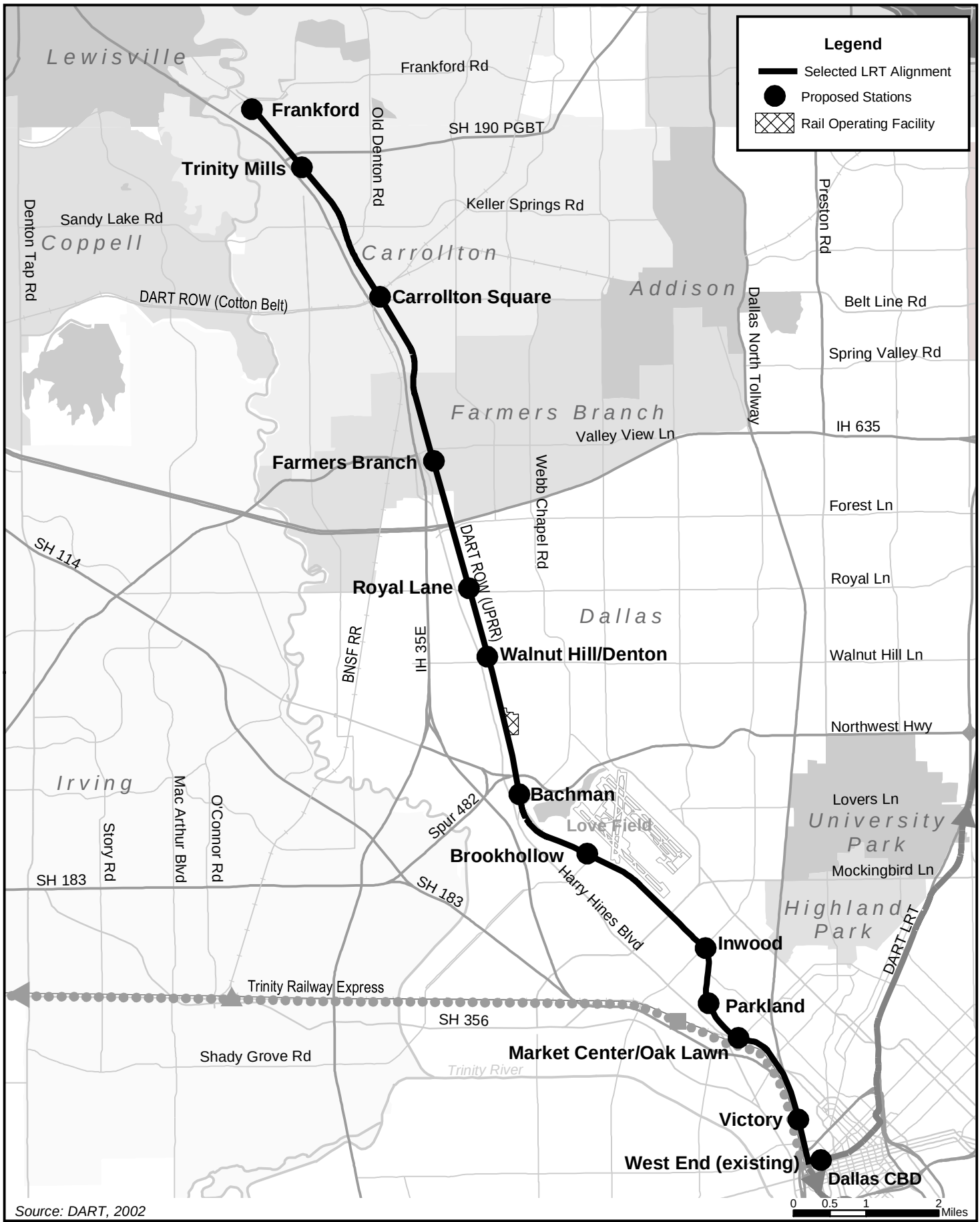
2.2 SELECTED LRT ALTERNATIVE

The Selected LRT Alternative is shown in **Figure 2-2**. The proposed project reflects decisions made by the DART Board after the Draft EIS circulation period and after the subsequent April 2003 public hearing regarding project changes in the Medical Center area. The first decision, made on August 13, 2002, approved Northwest Rail Operating Facility (NWROF) Site 3 at Lombardy Lane and Denton Drive. Information related to other sites considered is included in Section 2.3.3 and Appendix G. The second decision was made on September 17, 2002, and approved an amendment to the DART Service Plan to select Medical Center Design Option D as the preferred alignment through the Medical Center area. The Base Alignment was retained in the Love Field area due to financial constraints associated with the implementation of the Love Field Design Option as part of the Northwest Corridor build-out.

After approval of Option D, DART began more detailed coordination with Parkland Hospital on integrating Option D into their master plan. Significant design and cost issues resulted in re-examination of the DART-owned UPRR right-of-way through the Medical Center area. This alignment change, as well as refinements to the Market Center/Oak Lawn and Inwood Stations and a new grade separation of Maple Avenue was presented at a public meeting on April 3, 2003. A formal public hearing to obtain comments to support the Service Plan amendment and for inclusion in the Final EIS was held on April 10, 2003. Following this public hearing, the DART Board approved the alignment and station changes in the Medical Center area. The Selected LRT Alternative reflects these changes and is described below. More detailed information related to the Medical Center alignment, as well as on other alignments considered in the Draft EIS, is contained in Section 2.3.

The project would include approximately 17.6 miles of double-tracked LRT from downtown Dallas through the cities of Dallas and Farmers Branch to Frankford Road in Carrollton.

Two principal features define the physical aspects of the Selected LRT Alternative. The first is the proposed alignment for the LRT guideway, which includes the tracks, trackbed, overhead electric system (catenary), and ancillary equipment (including Traction Power Substations). The second feature is the stations where patrons will board and alight from LRT vehicles. In addition, the Selected LRT Alternative includes the Northwest Rail Operating Facility (NWROF). The proposed project, including a discussion of the plans for rail and bus operations, is described below.



Source: DART, 2002

Figure 2-2

Selected LRT Alternative

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

2.2.1 Alignment

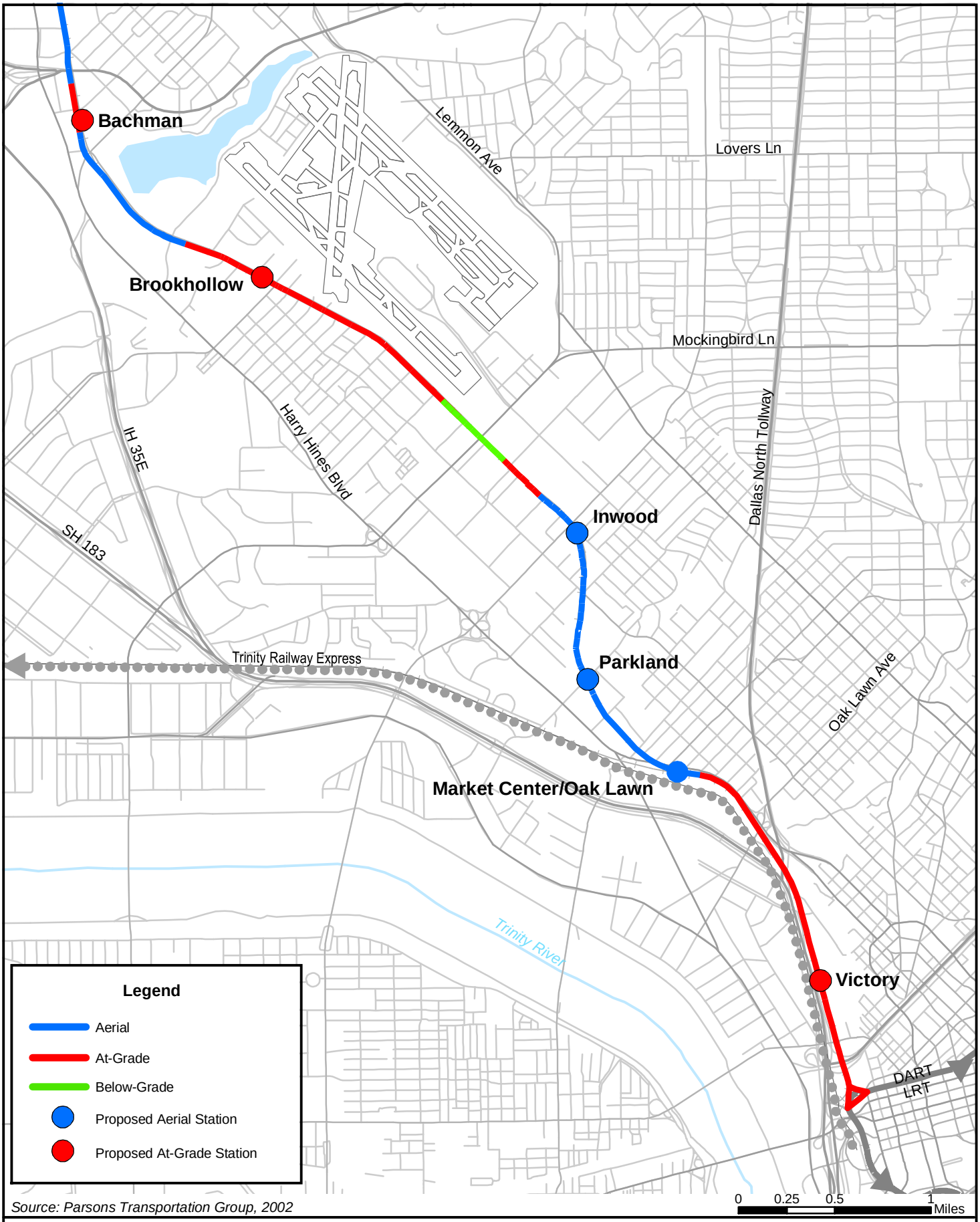
Figures 2-3, 2-4, and **2-5** identify the vertical alignment of the project: at-grade, below-grade, and aerial configurations. The proposed project would be an extension of the existing DART LRT system, which operates on two-track, two-way continuously welded steel rails. The line would be served by twelve new stations: Victory, Market Center/Oak Lawn, Parkland, Inwood, Brookhollow, Bachman, Walnut Hill/Denton, Royal Lane, Farmers Branch, Carrollton Square, Trinity Mills, and Frankford.

The alignment would begin in downtown Dallas at the west end of the existing LRT transitway mall near Houston Street and Pacific Avenue. It would extend west and north to join the TRE corridor and continue north to an at-grade station at Victory. The initial segment of the project, from downtown Dallas to the Victory Station at American Airlines Center, is being implemented in advance to meet ridership demands at that location. This initial line section has independent utility as an important link in DART's rail system, connecting to a special events venue and providing a much needed transfer location between TRE and LRT services. This initial segment was found to be a Categorical Exclusion in accordance with 23 CFR 771.117(c)(18) and does not warrant additional environmental analysis beyond that recommended in the environmental study prepared for it on April 30, 2001. FTA issued their finding on this subject in a letter to DART dated May 16, 2001.

An aerial station would be located at Market Center near Wycliff Avenue and Harry Hines Boulevard. North of the Market Center/Oak Lawn Station, the alignment would continue aerial within DART-owned right-of-way (ROW), crossing over Harry Hines Boulevard, Lucas Street and Kendall Drive/Macatee Drive. The alignment would remain aerial over Motor Street, with an aerial station, Parkland, provided over Motor Street with access to both sides of the street.

North of the Parkland Station, the alignment would continue aerial within the DART-owned ROW crossing over Maple Avenue and Butler Street. North of Butler an aerial station (Inwood Station) would be provided in the southwest quadrant of Inwood Road and Denton Drive. The alignment would continue north, descending to grade north of Knight's Branch. It would pass Bomar Avenue, which would be closed, and would cross Manor Way at grade. The alignment would enter a cut-and-cover tunnel portal and cross under several minor streets, freight spurs and Mockingbird Lane to avoid obstructions associated with runways at Dallas Love Field. It would then return to grade at Empire Central and continue north in the DART-owned ROW at grade on the east side of the existing freight track. An at-grade station, Brookhollow, would be provided north of Burbank Street. The alignment would continue north and become elevated to cross over Shorecrest Drive and past DART's Northwest Bus Operating Facility. The line would continue over a freight spur and Webb Chapel Extension, then leave the DART-owned ROW and descend to the west side of Denton Drive to provide an at-grade station south of Community Drive. An at-grade junction with the future Irving/DFW LRT Line would be provided just north of the Bachman Station.

The alignment would continue north at grade from Northwest Highway then rise to pass over Storey Lane and Denton Drive to transition back into the DART-owned ROW on the east side of Denton Drive. The line would continue north on an aerial alignment crossing Lombardy Lane. Adjacent to the Northwest Rail Operating Facility (NWROF) north of Lombardy, the northbound tracks remain aerial. The southbound track and a pocket track descend to grade to provide access to the NWROF site at grade under the northbound track (refer to Section 2.2.5 for further information). It then ascends to the north to re-join the northbound track on the aerial structure crossing several additional minor streets up to Walnut Hill Lane. An aerial station would be provided on the north side of Walnut Hill Lane. The line would continue north on aerial structure to pass over Royal Lane and adjacent streets. An aerial station would be provided on the north side of Royal Lane.



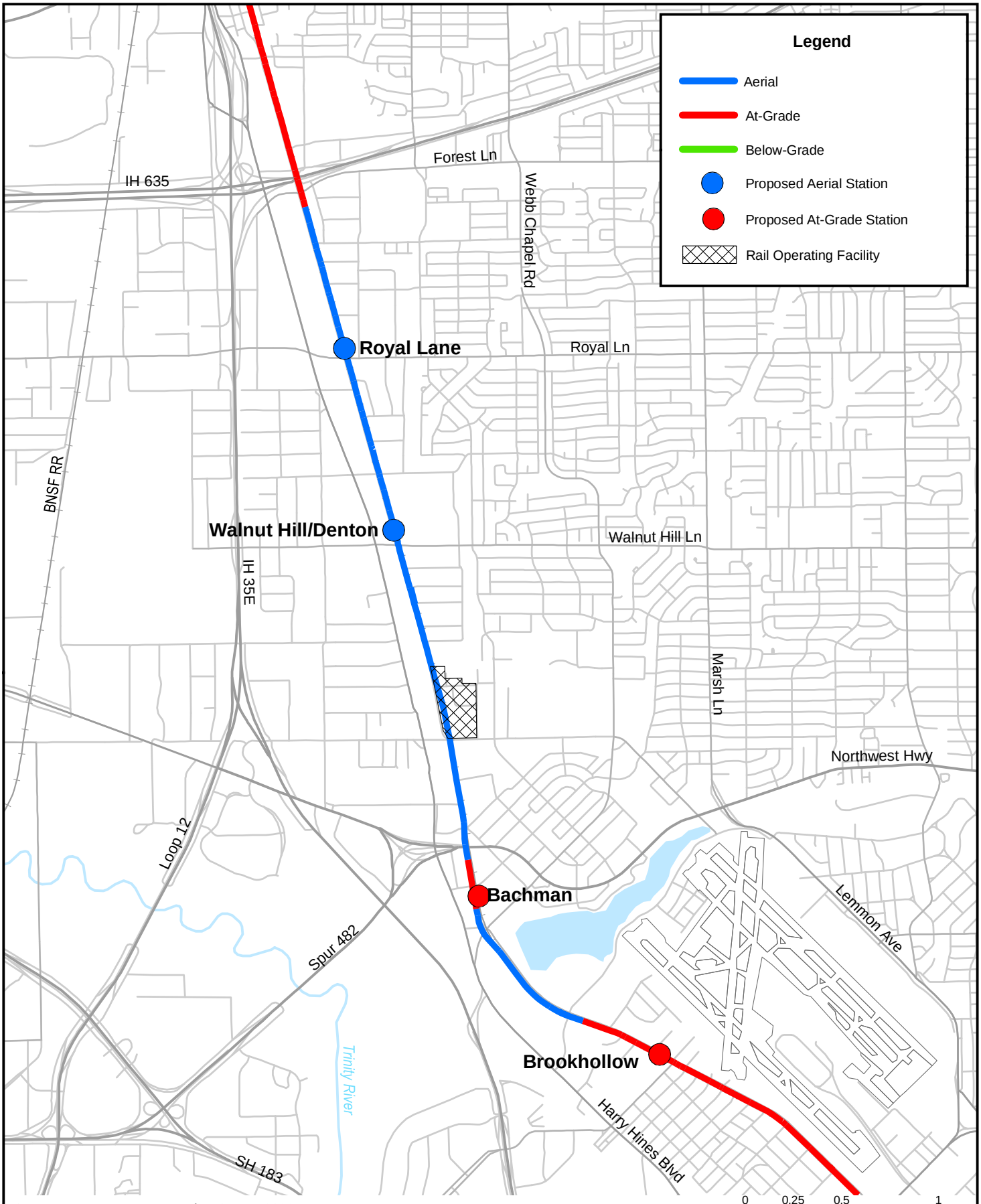
Source: Parsons Transportation Group, 2002

Figure 2-3

Vertical Alignment of the Proposed Project

South Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



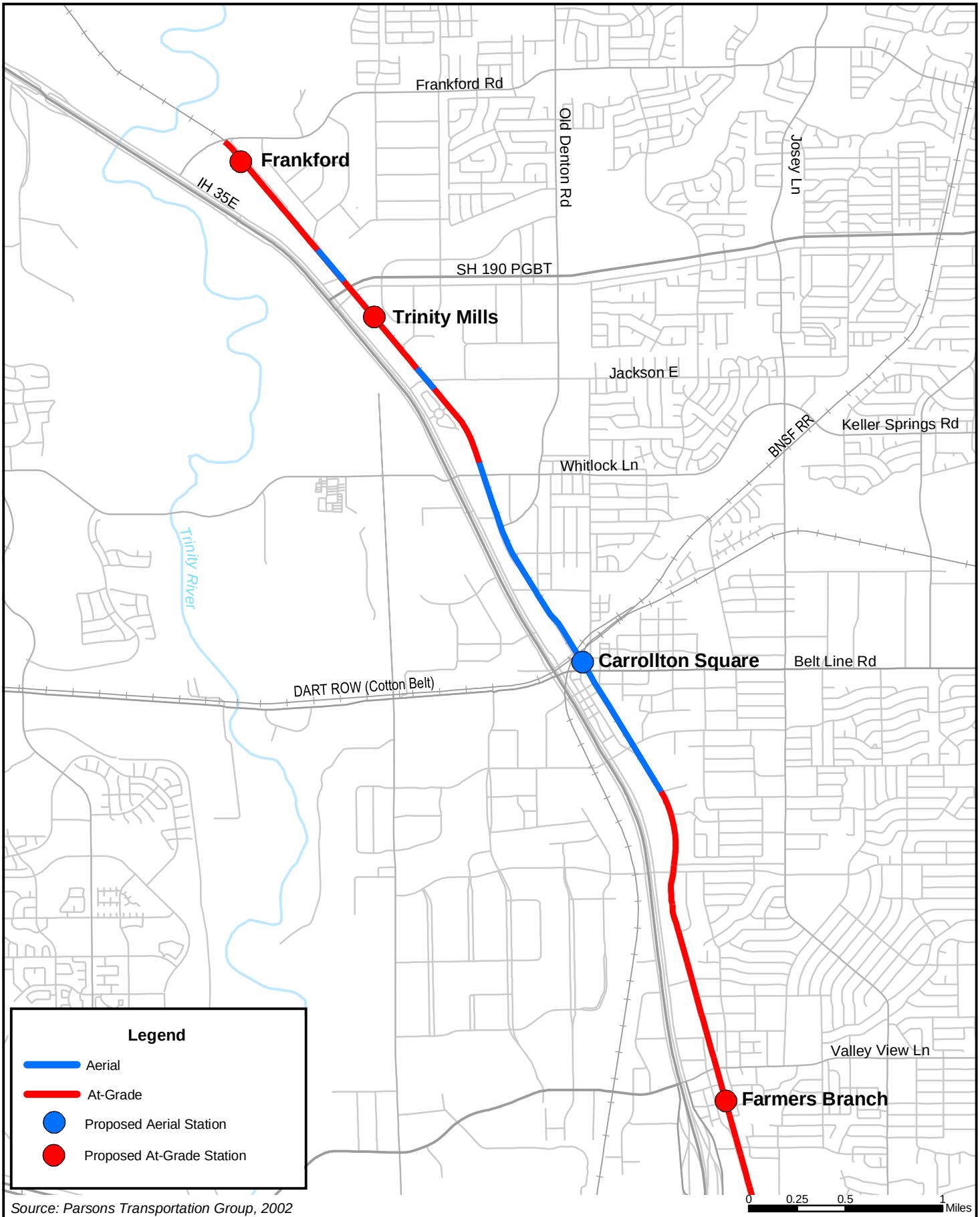
Source: Parsons Transportation Group, 2002

Figure 2-4

Vertical Alignment of the Proposed Project

Middle Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Parsons Transportation Group, 2002

Figure 2-5

Vertical Alignment of the Proposed Project

North Section

LRT Line to Farmers Branch and Carrollton

Final Environmental Impact Statement

The line would continue north on aerial structure until north of Northaven Lane, then descend to grade. At-grade crossings would be provided at Forest Lane and at the eastbound and westbound service roads of LBJ Freeway. With planned IH 35E/IH 635 interchange improvements, Forest Lane will be reconfigured as the eastbound frontage road. The line would stay at grade to pass under the main lanes of the LBJ Freeway. An at-grade station south of Valley View Lane would be provided in the City of Farmers Branch.

The alignment would cross Valley View Lane and Valwood Parkway at grade, continuing to just south of Crosby Road where it would become aerial to cross Crosby Road and the major Belt Line Road / BNSF RR / Cotton Belt RR crossing. An aerial station, Carrollton Square, would be provided just north of Belt Line Road. The alignment would stay aerial to the north and pass over Old Denton Road and Whitlock Road. The alignment would be grade-separated at Jackson Road, and cross Ismaili Center Circle at grade. The Trinity Mills Station would be located at grade just south of SH 190 (President George Bush Turnpike). The Trinity Mills Station would replace the existing North Carrollton Transit Center, which would be closed when the LRT project is opened for service. The line would cross the SH 190 eastbound and westbound service roads at-grade (under the main lanes), and continue north at grade to the last station just south of Frankford Road.

2.2.2 LRT Stations

Station platforms would be at-grade or aerial depending on the vertical alignment of the LRT guideway. Aerial stations would have 400-foot long platforms. At-grade stations would be 300 feet long with the capability of being expanded to 400 feet in the future. Weather protection for patrons would be provided by canopies covering the width of the platform for a minimum of one-third of its length. All platforms as well as LRT vehicles would be fully accessible for elderly and handicapped patrons during all hours of operation. Typical patron amenities at each station include bench seating, leaning rails, windscreens, trash receptacles, newspaper racks, and artwork.

Bus access would be provided at each station for various local, crosstown, express, and circulator/shuttle routes, depending on the station (refer to Section 2.2.3 for further information). Bus pullout bays would typically be adjacent to the rail platform to provide convenient transfers for passengers. Parking would be provided at some stations, depending on modes of access used by the riders to be served in the area. Kiss-and-Ride drop-off spaces and handicapped parking would also be provided. LRT station characteristics are summarized in **Table 2-1.**

TABLE 2-1
STATION CHARACTERISTICS
SELECTED LRT ALTERNATIVE

Station	Station Type At-grade, aerial, or below grade; and center or side platform	Station Location and Description	Estimated Parking Spaces
Victory	At Grade – Side TRE - Center	Platform and pedestrian plaza east side of TRE ROW	None
Market Center/ Oak Lawn	Aerial - Center	East side of TRE tracks; pedestrian connection to parking east of Harry Hines Boulevard and west to Market Center	230
Parkland	Aerial - Center	Platform over Motor Street; bus transfer east of platform and north of Motor Street. Site layout to be coordinated with Parkland Master Plan.	None
Inwood	Aerial - Center	Bus transfer east of platform along Denton; parking west of ROW	386

TABLE 2-1 (continued)
STATION CHARACTERISTICS
SELECTED LRT ALTERNATIVE

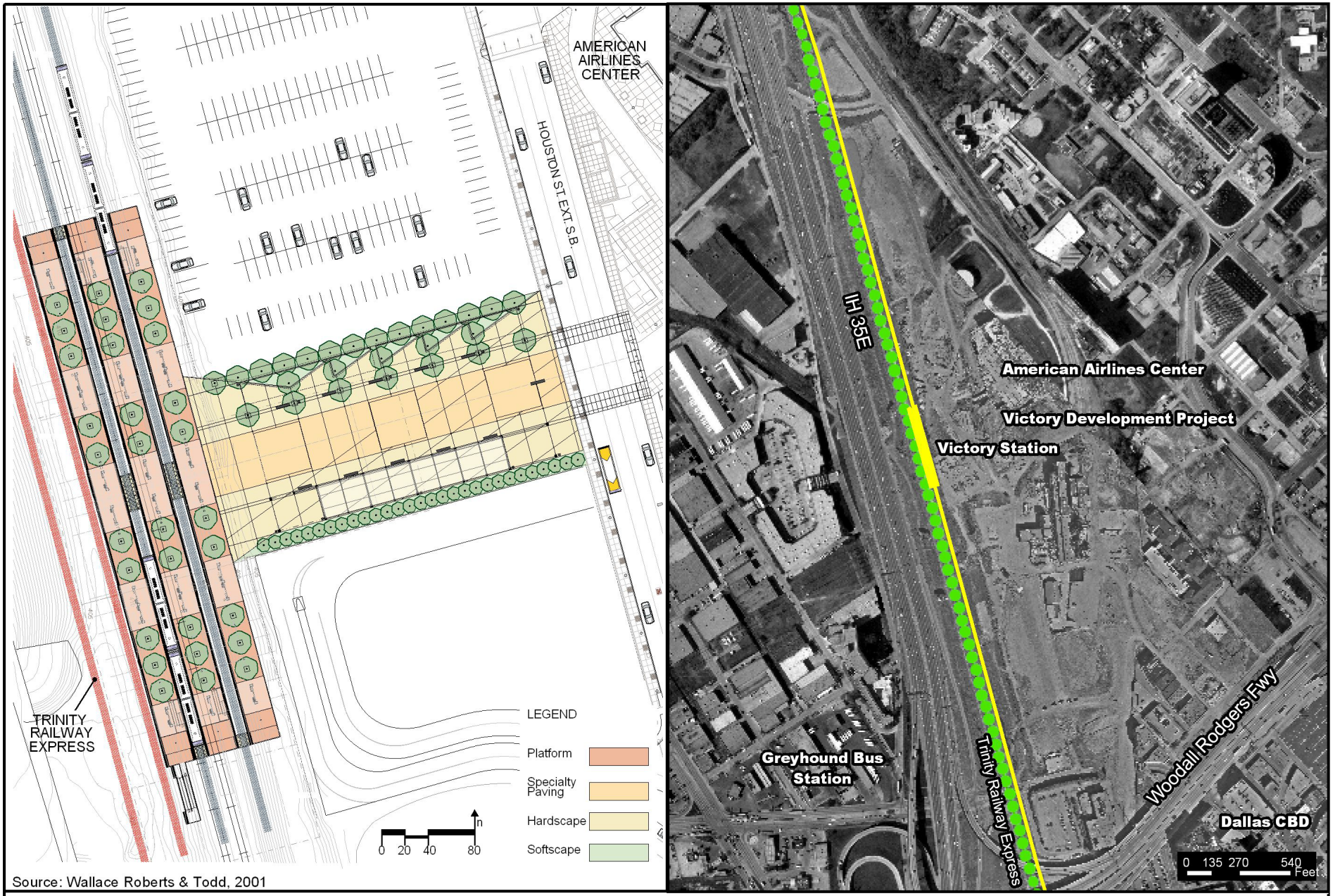
Station	Station Type At-grade, aerial, or below grade; and center or side platform	Station Location and Description	Estimated Parking Spaces
Brookhollow	At Grade - Side	West of Denton Drive (to be coordinated with Southwest Airlines Master Plan)	None
Bachman	At-Grade - Side/ Bus Transfer Center	West of Denton Drive	443
Walnut Hill/Denton	Aerial - Center	North of Walnut Hill, east of rail ROW.	361
Royal Lane	Aerial - Center	North of Royal Lane, east of rail ROW.	235
Farmers Branch	At Grade - Side	South of Valley View Lane; to be coordinated with Farmers Branch Station Development Plan	179
Carrollton Square	Aerial - Center	North of Belt Line with aerial pedestrian bridge to downtown south of Belt Line	253
Trinity Mills	At Grade - Side	North of Dickerson Parkway extension	495
Frankford	At Grade - Center Terminal station	South of Frankford	887

Source: DART; Chiang, Patel & Yerby, Inc.; Wallace, Roberts & Todd, 2002

Summary descriptions of the station facilities are provided below. Most changes identified in this section of the Final EIS reflect station site plan adjustments and result in minor adjustments to the number of parking spaces to be provided.

Victory Station – (**Figure 2-6**) This station, cleared by FTA for early implementation because it has independent utility, will be located at the American Airlines Center arena and is part of the initial segment that is being constructed in advance of the rest of the project. The LRT shares ROW with the TRE at this point, and a new commuter rail platform is being constructed to serve the arena and related development. The LRT station will be adjacent to and share platforms with the TRE commuter rail station, and will permit cross-platform transfers between modes. The station is primarily a destination. Surrounding land uses are the arena and proposed multi-family housing, commercial and office. Direct pedestrian access will be provided from the station to the arena entrance, and on sidewalks in the station vicinity. An on-street bus stop will be located adjacent to the station on southbound Griffin Street. No Kiss-and-Ride or long-term parking is anticipated at this station.

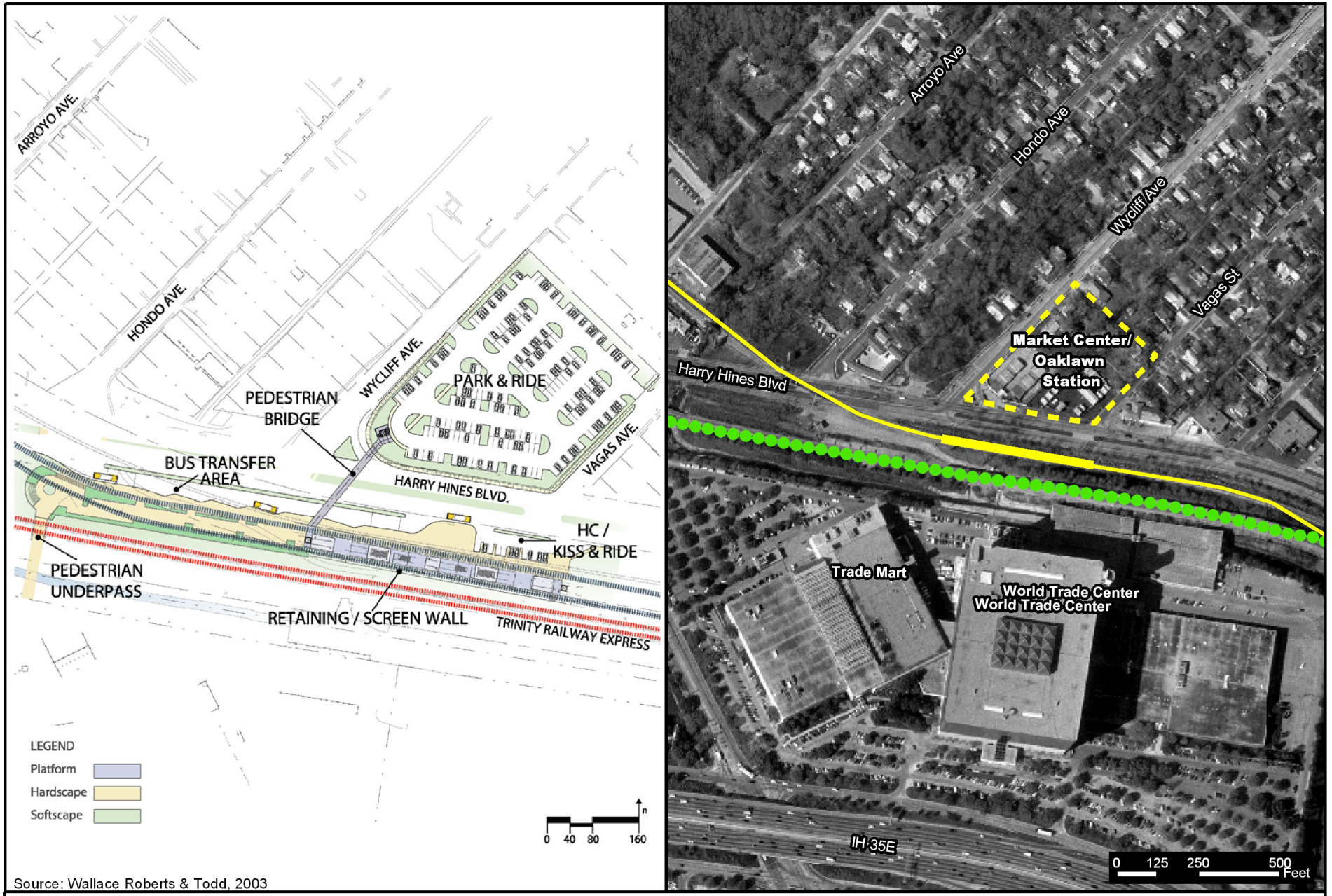
Market Center/Oak Lawn Station (South) – *(***Figure 2-7***)* This would be an aerial station adjacent to the existing TRE tracks. Approximately 230 long-term parking spaces would be provided across Harry Hines Boulevard. An aerial walkway would connect the platform to the parking and areas to the east. One paratransit and five DART fixed-route bus bays would be provided, along with five Kiss-and-Ride and seven handicapped spaces. This is both a destination and neighborhood access station, with the Dallas Market Center to the west and the Oak Lawn residential and commercial areas to the east. There are also some local retail and hotel uses on Harry Hines across from the station. Access would be from Harry Hines, and from Wycliff Avenue and Vagas Street from the east. A pedestrian connection north of the station and under the TRE would provide access to the Market Center.



Source: Wallace Roberts & Todd, 2001

Figure 2-6
Victory Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Wallace Roberts & Todd, 2003

Figure 2-7
Market Center/Oak Lawn Station (South)

LRT Line to Farmers Branch and Carrollton
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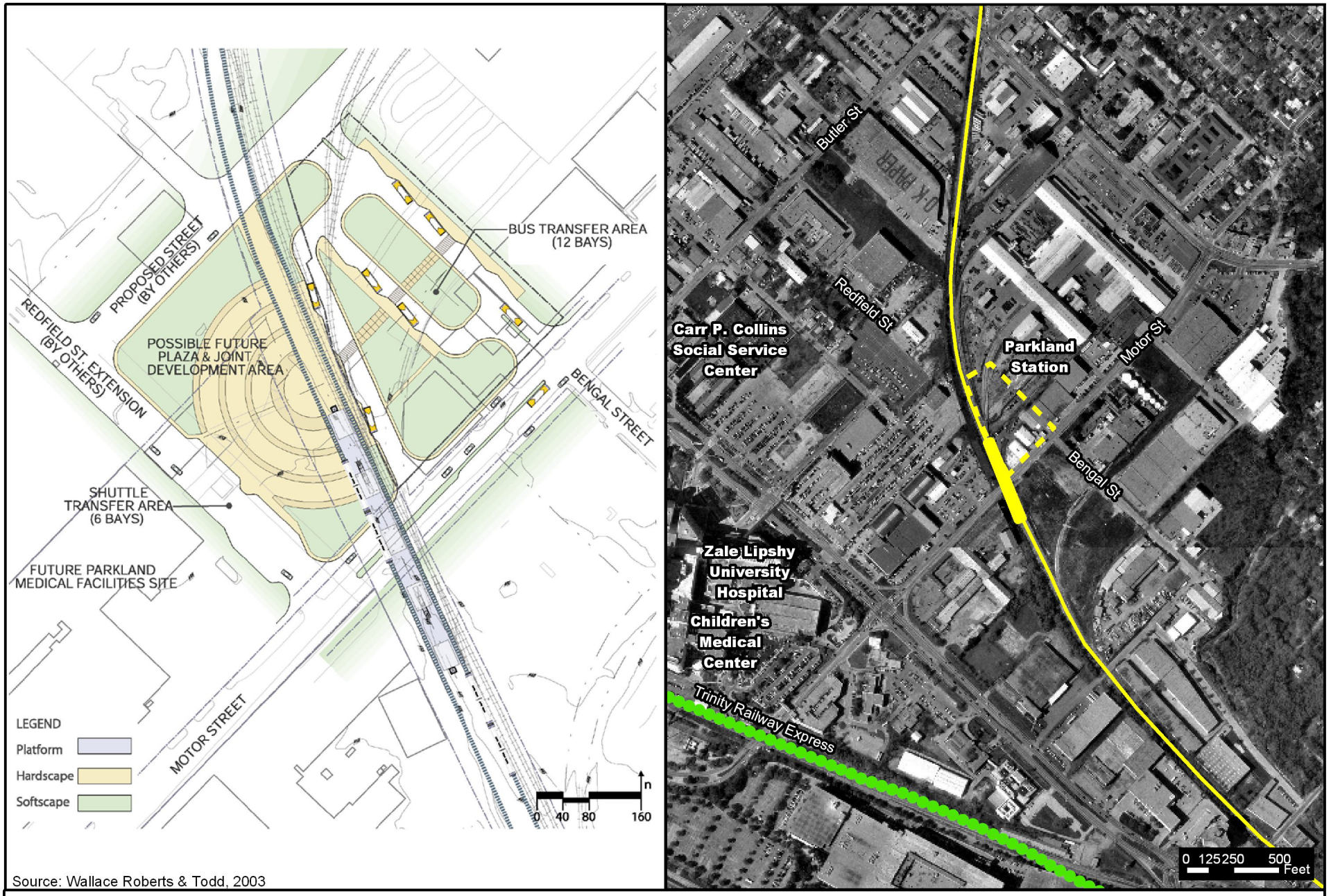
Parkland Station (UPRR) – (**Figure 2-8**) This station would be an aerial station straddling over Motor Street within the DART-owned ROW. Several new Parkland facilities including a Women and Infants Hospital, Ambulatory Surgery Center and Trauma Center are planned to be built immediately near the station. Thus, patrons will be within walking distance to these new facilities as well within ¼ mile of existing facilities west of Harry Hines Boulevard. A bus transfer facility with 12 bus bays will be provided immediately east of the station north of Motor Street. Space for up to six circulator shuttles could be provided west of the station. These bus and shuttle routes will provide service to the larger Medical Center complex. The plan could also include a plaza area to visually link the station to the Medical Center facilities. As coordination with the Parkland Hospital Master Plan continues during final design, some modifications may occur to the station design and bus transfer area in order to best meet both DART and Parkland objectives.

Inwood Station (South) – (**Figure 2-9)** This station would be located at the southwest corner of the intersection of Inwood Road and Denton Drive diagonally across from Rusk Middle School and close to the Cedar Springs residential neighborhood. The station would be an aerial station with the guideway grade separated over Inwood Road. There would be five bus bays (one paratransit/shuttle, and four fixed-route), and approximately 386 parking spaces including eight handicap spaces.

Brookhollow Station – (**Figure 2-10**) This would be an at-grade side platform station located just north of Burbank Street, west of Denton Drive, and within walking distance of Southwest Airlines headquarters and future expansion area, and other aviation-related employment. This would be a neighborhood and destination station, serving the nearby Love Field West neighborhood and Southwest Airlines employees. Access would be provided from Denton Drive via Burbank Street on the south. Burbank Street would serve as a primary arterial access point connecting the station to Stemmons Freeway via Regal Row. One paratransit and seven fixed-route bus bays, and three Kiss and Ride spaces would be located west of the station platform. No parking would be provided.

Bachman Station – (**Figure 2-11**) The Bachman Station would be at-grade, just south of Northwest Highway on the west side of Denton Drive, and the DART rail ROW. There would be one paratransit and nine fixed-route bus bays, an estimated 443 long-term parking spaces, including five Kiss-and-Ride spaces provided. Access would be from Denton Drive, Harry Hines Boulevard and Community Drive. This would be a commuter and neighborhood station with industrial, retail, and commercial uses north, south and west of the station, and multi-family residential to the east. Due to the high bus volumes expected at this station, a continuous canopy would be provided to accommodate bus patrons. The proposed Irving/DFW LRT Line would branch off to the northwest just north of this station.

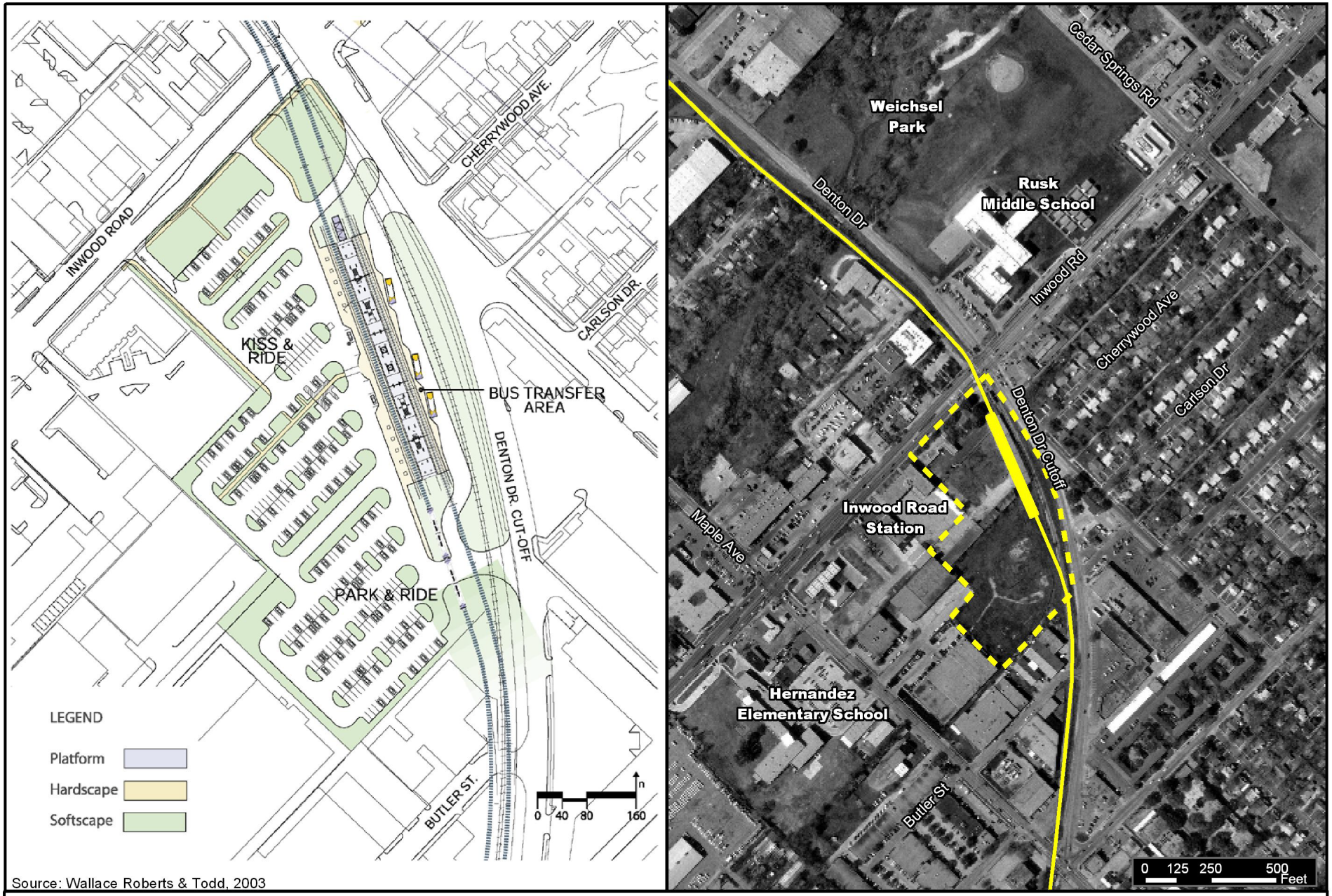
Walnut Hill/Denton Station – (**Figure 2-12**) This would be an aerial center platform station, located on the north side of Walnut Hill Lane. One paratransit and four fixed-route bus bays, and about 361 long-term parking spaces including seven handicapped spaces would be provided, along with three Kiss-and-Ride spaces. This is a commuter station for residential areas to the east, but it would also provide access to employment and retail uses in the area. Access would be from Walnut Hill Lane and Denton Drive, and a pedestrian connection would be provided to United Parcel Service on the north side of the station. An area for future joint development or parking expansion (about 3.7 acres) would be available on the site fronting Walnut Hill Lane.



Source: Wallace Roberts & Todd, 2003

Figure 2-8
Parkland Station (UPRR)

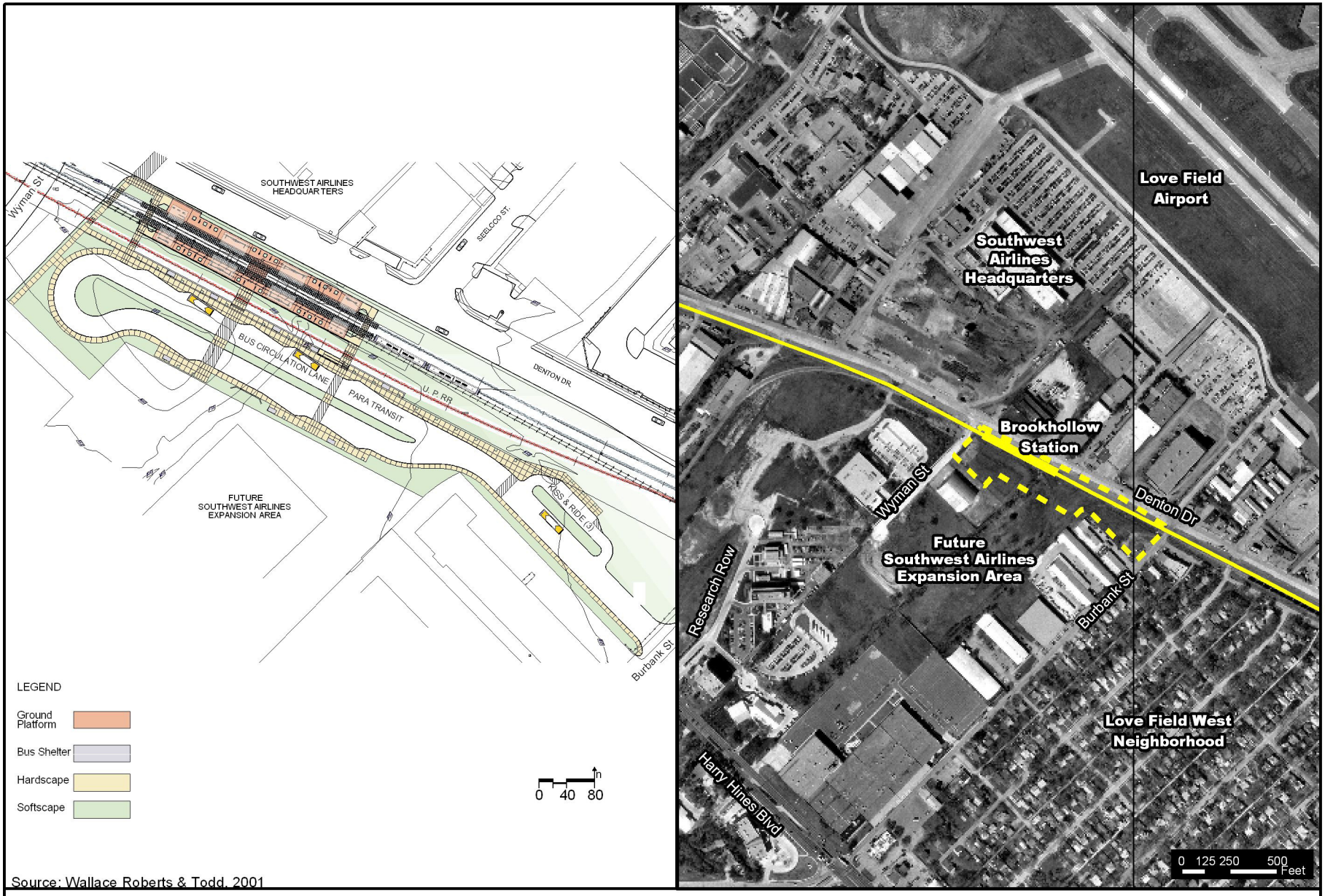
LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Wallace Roberts & Todd, 2003

Figure 2-9
Inwood Station (South)

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Wallace Roberts & Todd, 2001

Figure 2-10
Brookhollow Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

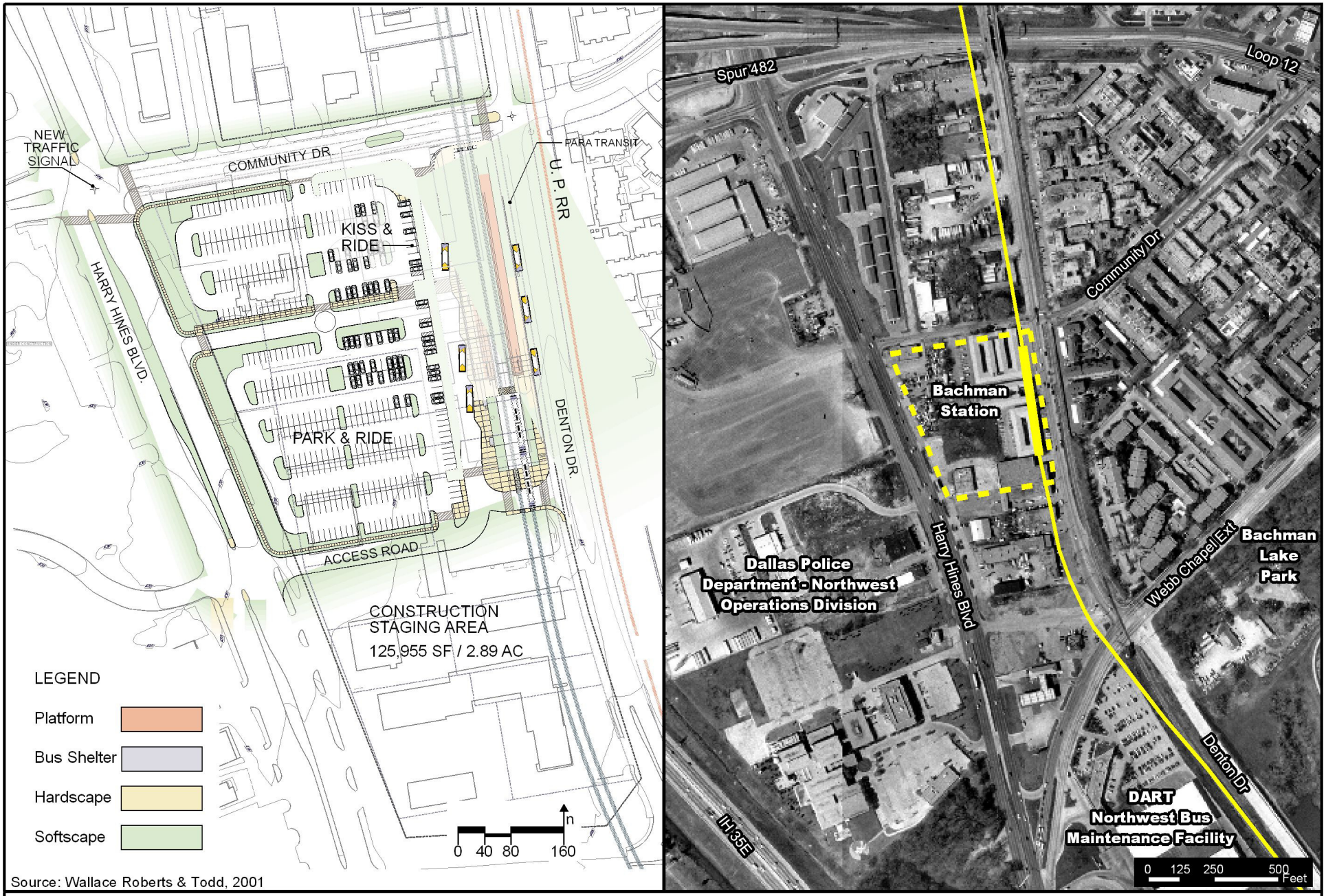
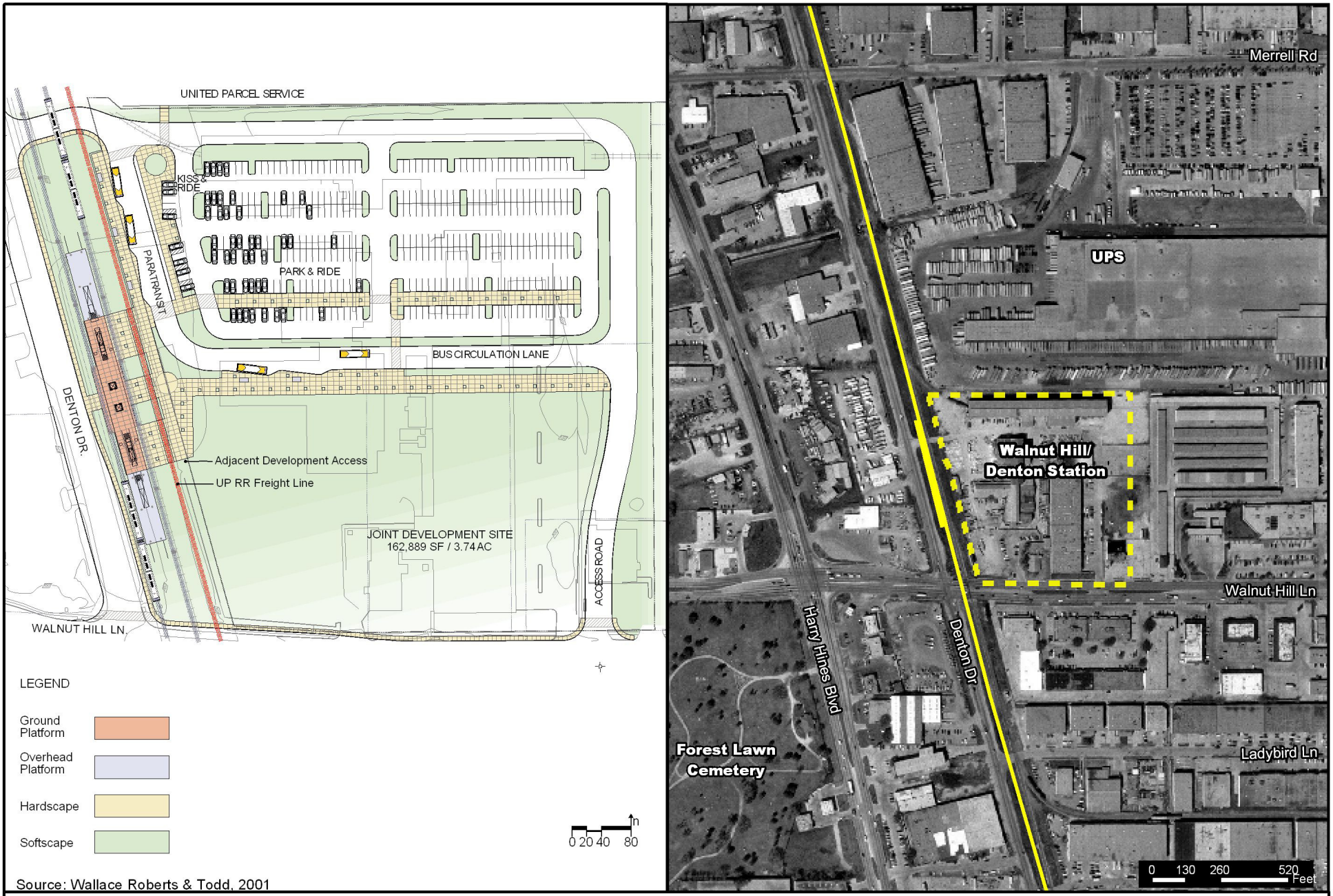


Figure 2-11
Bachman Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N



Source: Wallace Roberts & Todd, 2001

Figure 2-12
Walnut Hill/Denton Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

Royal Lane Station – **(Figure 2-13**) This would be an aerial center platform station located on the north side of Royal Lane. One paratransit and four fixed-route bus bays, three Kiss-and-Ride, as well as about 354 long-term parking spaces including five handicapped spaces would be provided. This would be a commuter station for residential areas to the east, as well as a destination for the industrial, retail and commercial uses near the station. There is an emerging Asian trade district in the area, with merchants and businesses accessible to the station. Access to the station would be from Royal Lane, Denton Drive, and Grissom Lane.

Farmers Branch Station – (**Figure 2-14**) The Farmers Branch Station would be an at-grade side platform station, located just south of Valley View Lane. The City of Farmers Branch has been developing a Transit Oriented Development (TOD) plan for the old downtown area for several years, with the DART station an integral part of it. The City Hall and a park are located east of the station. Other retail, residential, and office uses are projected for the surrounding area, with parking shared for the station with these uses. There would be approximately 237 long-term including four handicapped parking spaces, four Kiss-and-Ride spaces, one paratransit and six fixed-route off-street bus bays provided. Parking would be accommodated in the area of the existing Farmers Branch Park-and-Ride with the possible future development of a parking structure depending on future TOD plans. Access to the station would be from Valley View Lane via Denton Drive.

Carrollton Square Station – (**Figure 2-15**) This would be an aerial center platform station located just north of Belt Line Road. The alignment would be aerial in order to cross over the Cotton Belt, UPRR and BNSF RR tracks, and Belt Line Road. The station would serve commuters in Carrollton, and the Old Downtown Carrollton area. The surrounding downtown has a mixture of retail, commercial, and office uses. One paratransit and four fixed-route bus bays, three Kiss-and-Ride, and an estimated 253 long-term parking spaces including six handicapped spaces would be provided. Access to the station would be from Belt Line Road, Main Street, Denton Drive, and Broadway Street. Part of the station site (about 50,000 SF) could be used for future joint development or additional parking. The station would be adjacent to a site for a possible rail station on the Cotton Belt corridor.

Trinity Mills Station – (**Figure 2-16**) This station would be at-grade, located just south of the President George Bush Turnpike (PGBT) and close to the existing 1,021-space North Carrollton Transit Center. Land uses and ownership are changing in the area, and the City of Carrollton is developing a revised thoroughfare plan for the area around the station. The thoroughfare modifications would provide additional access for future development and the parking area adjacent to the rail line. The station would have about 494 long-term parking, including ten handicapped spaces, five Kiss-and-Ride, one paratransit and six fixed-route bus bays. Access would be from Broadway Street (parallel to the LRT line on the west); the PGBT frontage roads (Trinity Mills Road), and from a new street to the east of the station.

Frankford Station – (**Figure 2-17**) The Frankford Station would be at-grade, located on the south side of Frankford Road. There are industrial uses to the south and east of the station as part of the Frankford Trade Center. The station would have one paratransit and four fixed-route bus bays, and about 887 long-term parking spaces including twenty handicapped, and five Kiss-and-Ride spaces. Access would be from Frankford Road via Trade Center Boulevard east of the rail ROW.

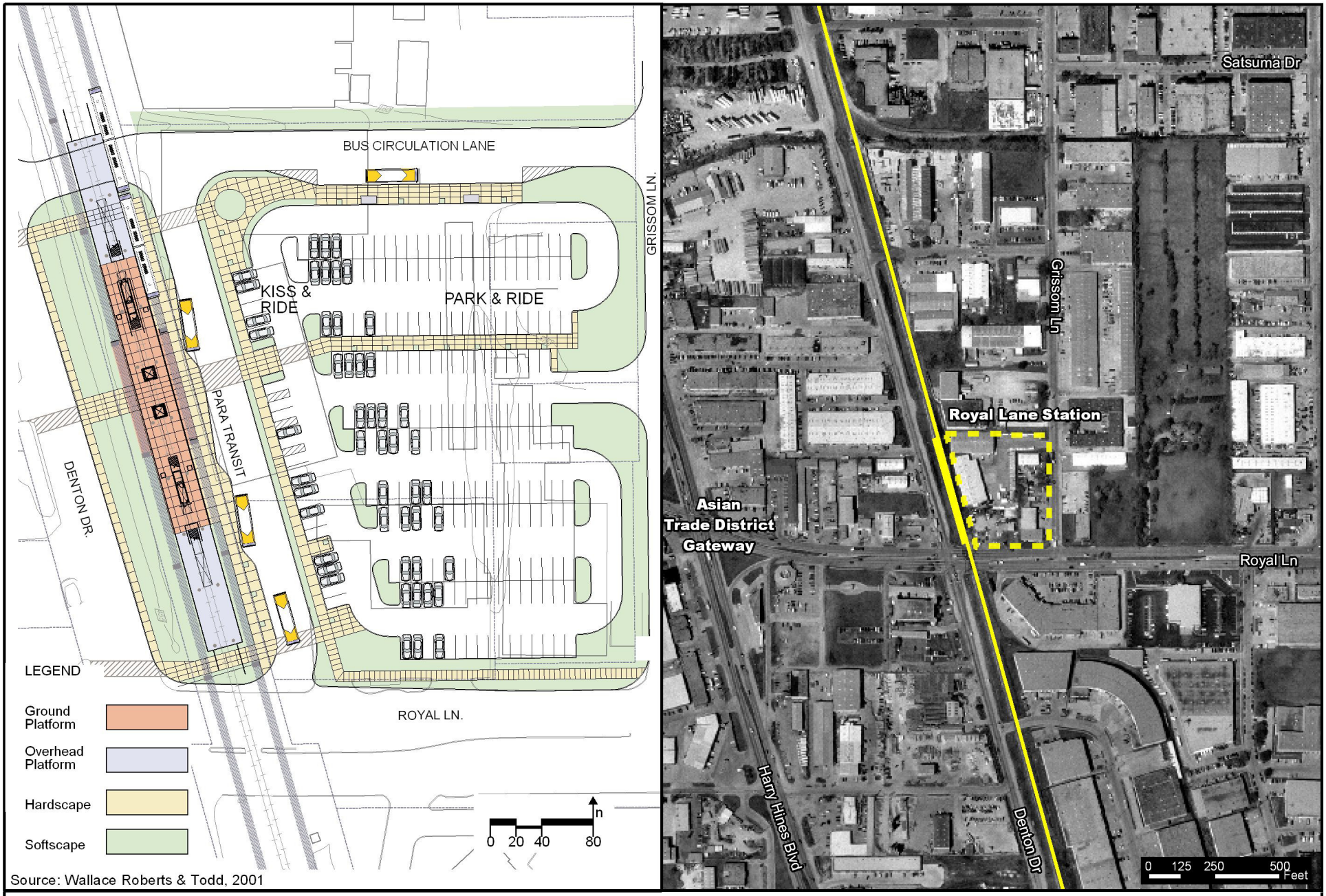
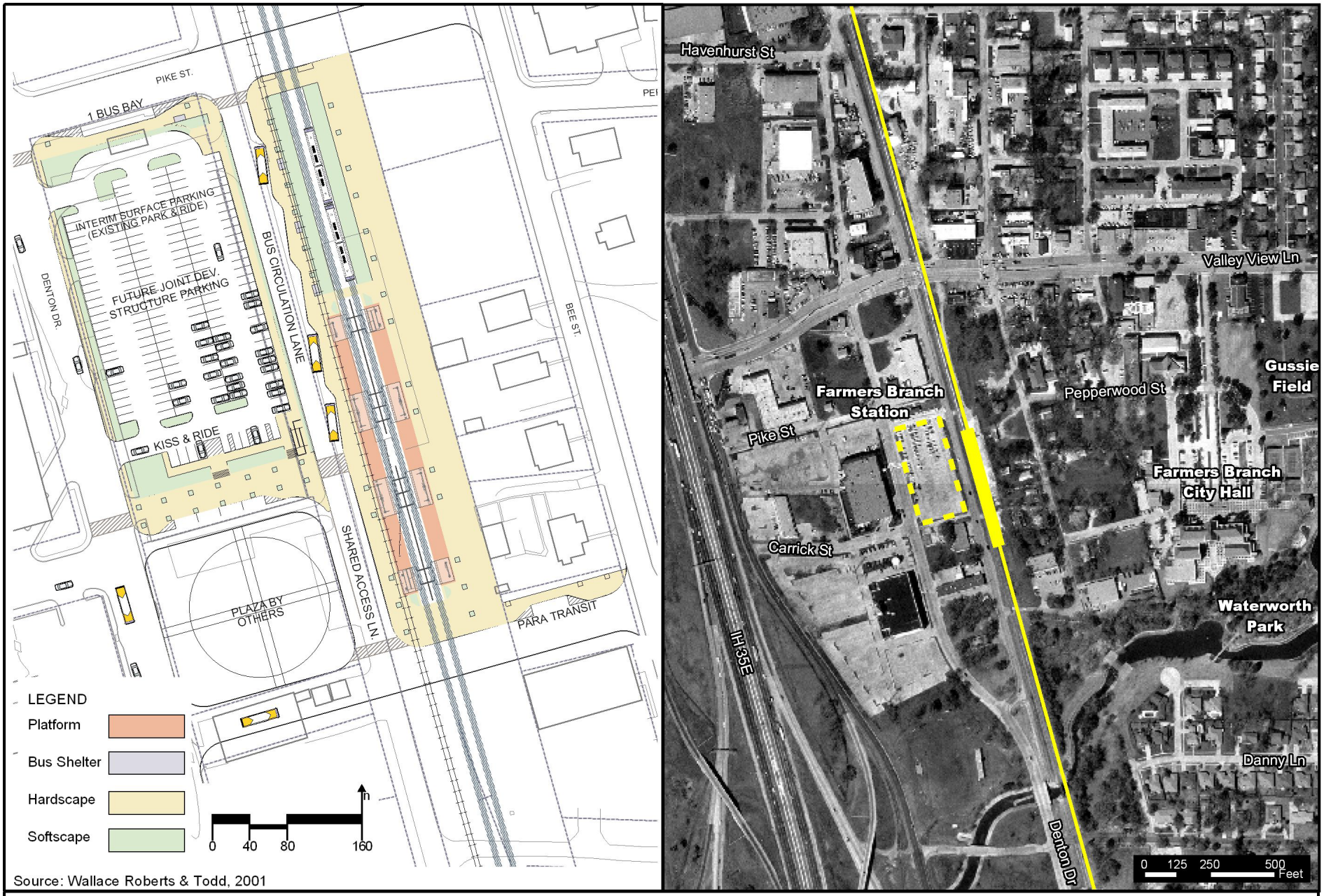


Figure 2-13
Royal Lane Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Wallace Roberts & Todd, 2001

Figure 2-14
Farmers Branch Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

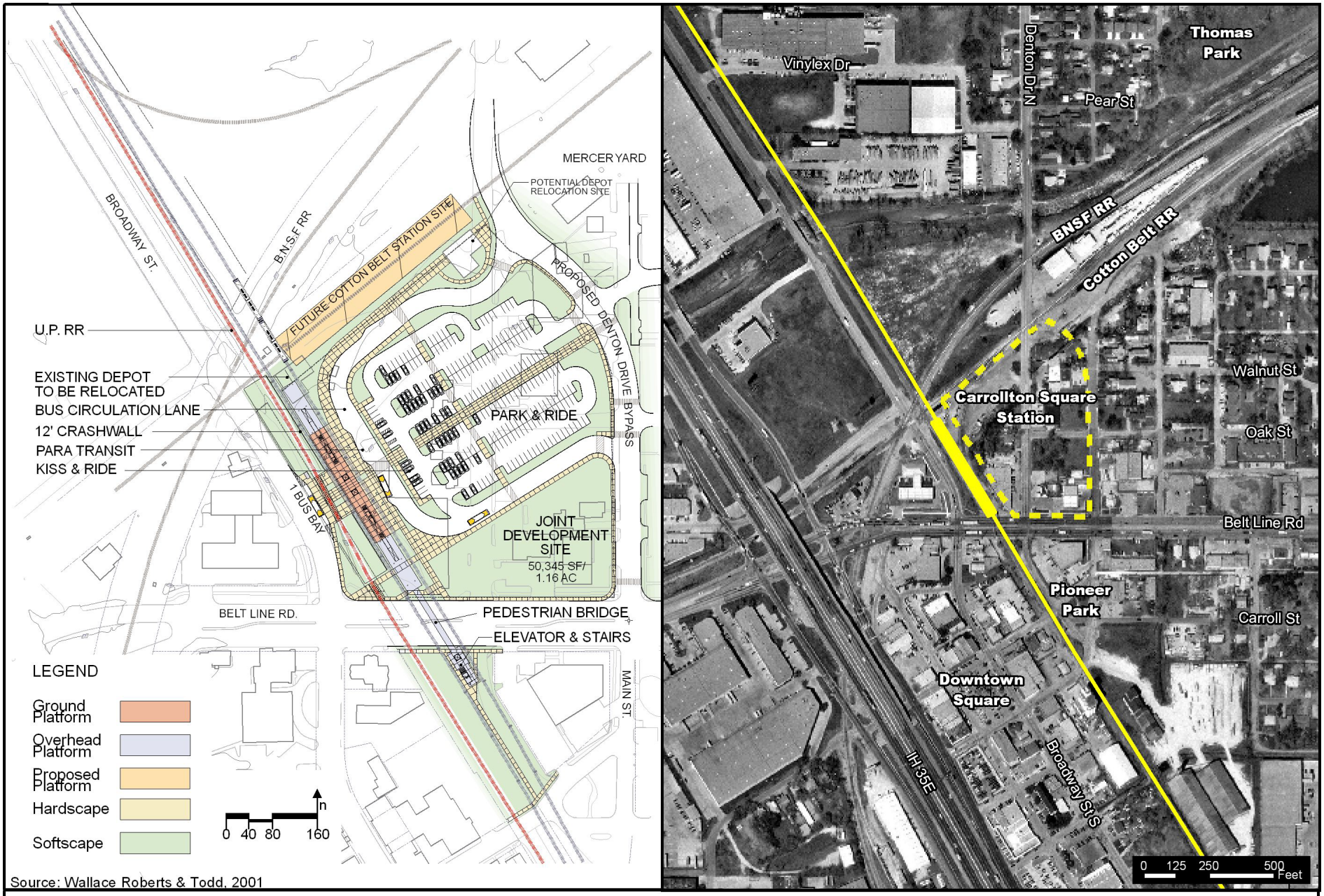
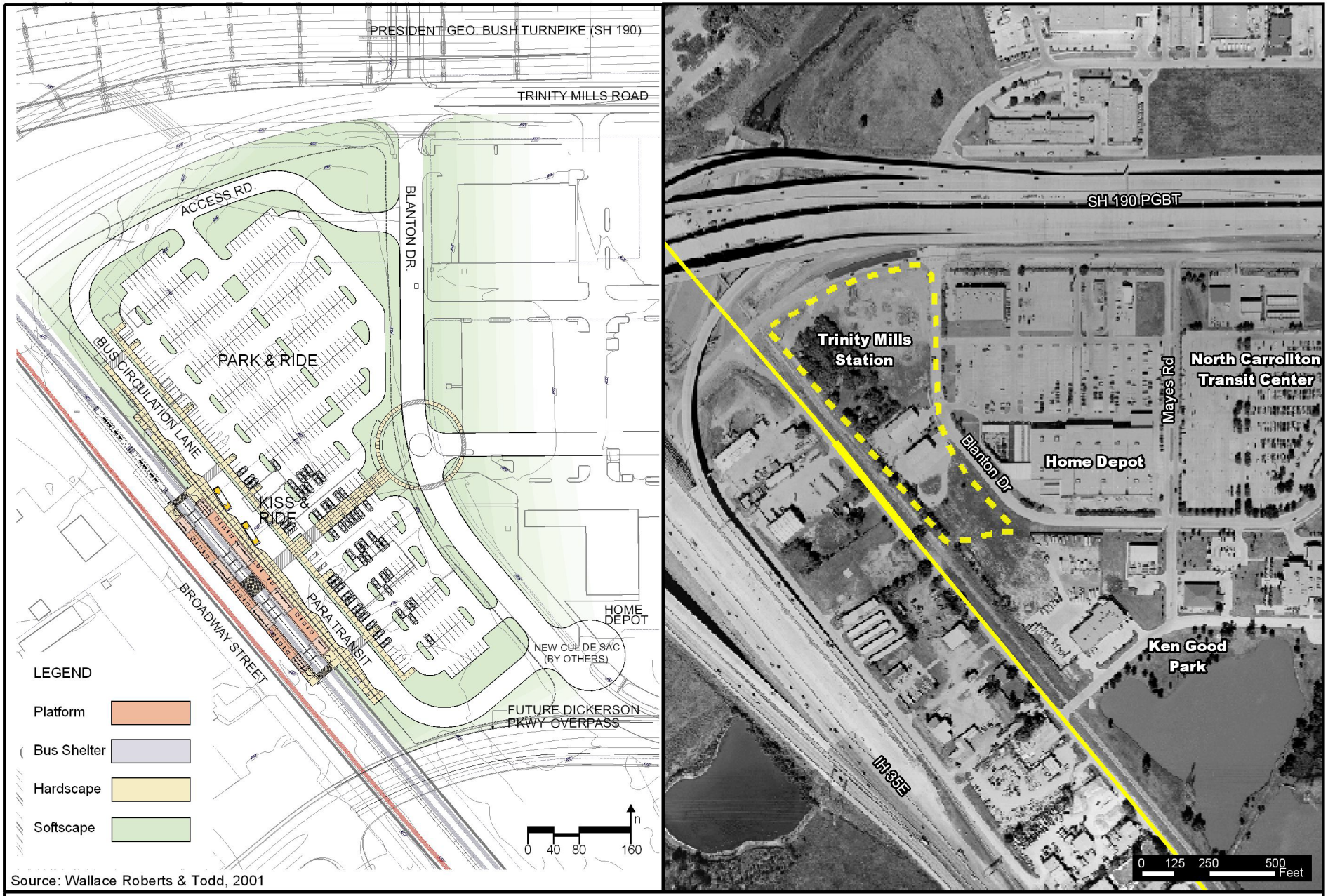


Figure 2-15
Carrollton Square Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Wallace Roberts & Todd, 2001

Figure 2-16
Trinity Mills Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

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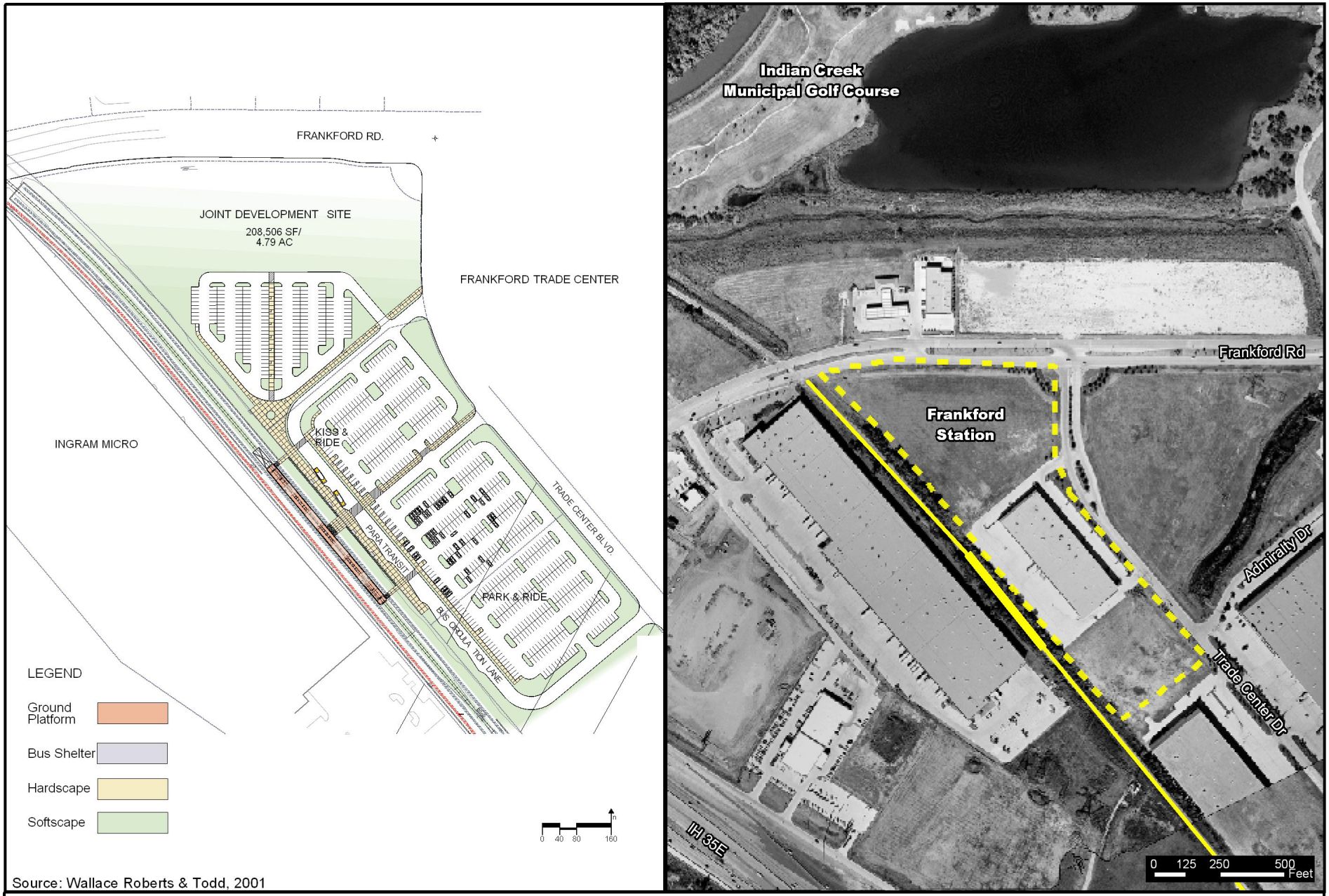


Source: Wallace Roberts & Todd, 2001

Figure 2-17
Frankford Station

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

2.2.3 Bus Operating Plan

The LRT Bus Operating Plan would be based on the No-Build operating plan (created during the MIS process) with routes being restructured or realigned to feed LRT stations. Some bus routes would serve the role of feeder buses, while others would perform the dual role of feeder bus plus local or Dallas CBD service. Two express routes (204 and 247), paralleling the LRT service would be eliminated to avoid duplicative service.

Feeder bus service would consist of a network of approximately 30 bus routes and two On-Call zones providing direct service to the LRT stations. Service would be designed to meet the anticipated demand in 2025 and provide for as many connections as possible between buses and the proposed LRT service (see **Figure 2-18**).

The two On-Call zones would serve the Trinity Mills and Frankford Stations. DART On-Call is a van-based demand responsive feeder service that replaces traditional fixed route feeder service in lower density residential areas which are proximate to the rail corridor. The concept requires that customers directly contact a van operator via cellular phone to arrange pick-ups and drop-offs. A six to nine square mile residential zone can be accommodated with one van, making connections to a rail station or transit center. With On-Call service, one trip end of all peak period trips must be at the rail station or transit center. In addition, the service is partially scheduled in that the van is required to be at the rail station or transit center twice an hour, at specified train meet times, during the peak periods and at least once per hour during base periods.

Other factors taken into consideration in the development of the plan include:

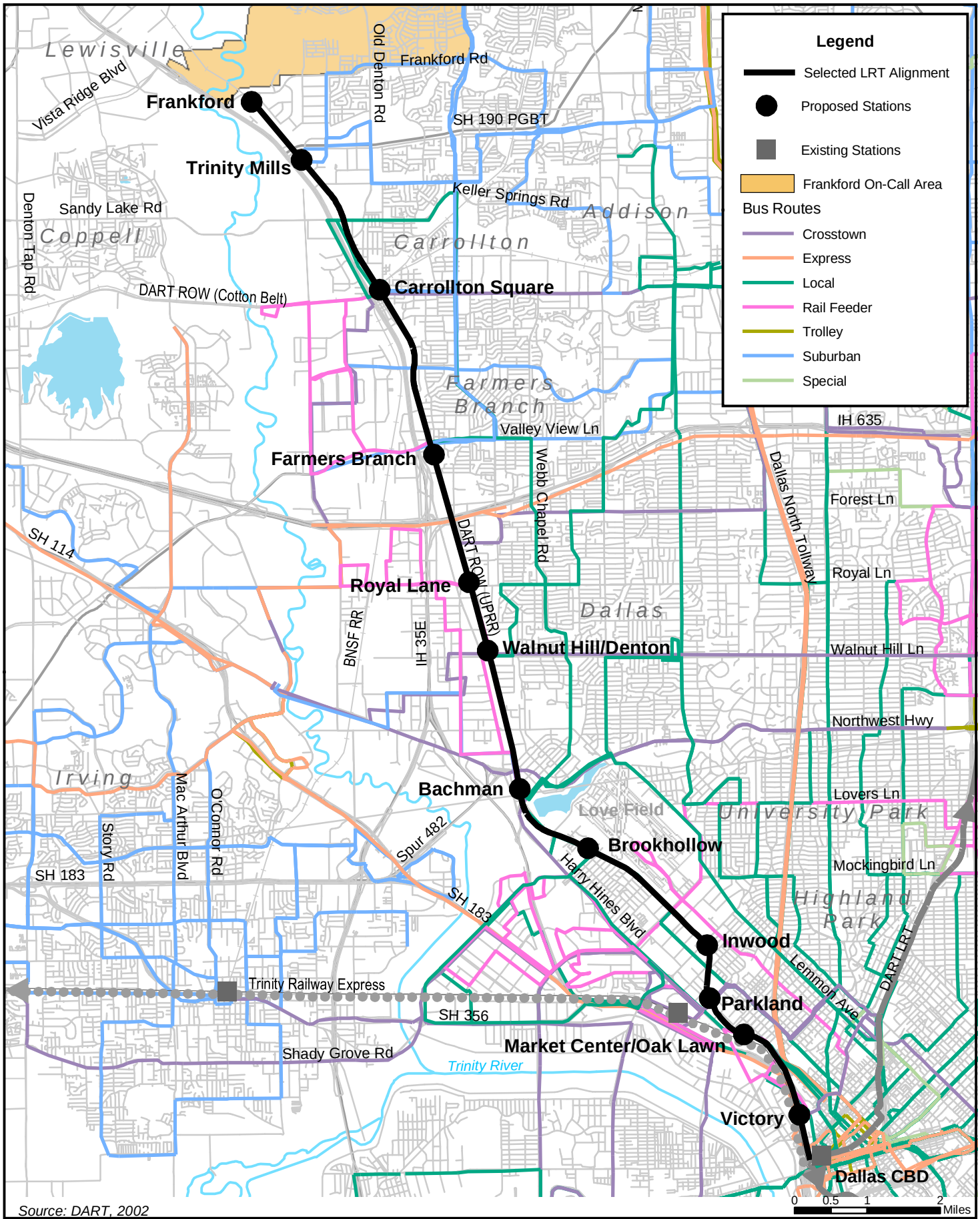
- Add routes to areas with gaps in service coverage;
- Adjust bus route headways to match needs associated with rail service schedule;
- Minimize bus-to-rail access time through the use of appropriate alignment diversions; and
- Extend routes that end within one mile of a rail station to have a new terminus at the rail station.

Details of the bus-operating plan are provided in **Table 2-2**. The table lists the bus routes serving each station and each route's peak and off-peak headway.

2.2.4 Rail Operating Plan

The proposed project is planned to operate from its northern terminus at Frankford Road in Carrollton, through downtown Dallas along the CBD transitway mall, and connect to the proposed Southeast LRT project that would extend to Buckner Boulevard. Additionally, the DART LRT System is planned to extend an LRT branch line to Irving and DFW Airport that would merge with the proposed project just north of the Bachman Station. The focus in this EIS is the LRT project that extends from downtown Dallas to Frankford Road in Carrollton.

The proposed project is planned to accommodate two LRT routes operating during the peak period and one or two routes that would operate in the off-peak periods. During peak periods, the primary LRT route would operate from Frankford to the Dallas CBD (interlined with Southeast Corridor) on ten minute headways. A secondary route would operate between the Bachman Station and the Dallas CBD (interlined with the North Central line), also on ten minute headways. Each route is estimated to operate with two-car trains. During the off-peak operating period (mid-day, evening, and weekend), each route is planned to operate on 20-minute headways with two-car trains. Depending on passenger demand, some trips during the peak periods may operate with three-car trains. Weekend service would operate on either the weekday base or evening service, depending on observed demand. The proposed project's operating plan complies with existing agreements for LRT operations in the Dallas CBD.



Source: DART, 2002

Figure 2-18
LRT Bus Operating Plan

LRT Line to Farmers Branch and Carrollton
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TABLE 2-2
BUS OPERATING PLAN
SELECTED LRT ALTERNATIVE

		Minutes	
Station	**Route**	**Peak**	**Off-Peak**
Victory	49A	10	30
	401 Crosstown	10	30
Market Center/Oak Lawn	44 Thru	10	20
	49A	10	30
	Scottish Rite Shuttle	25	25
	Market Center Shuttle	20	20
Parkland Route	26A	15	30
	29	20	40
	44 Thru	10	20
	49B	10	30
	49D	10	30
	63B	10	30
	405	30	30
	409	15	30
	409 Shortline	10	20
	453	15	30
	UTSW Shuttle - Red	15	15
	UTSW Shuttle - Blue	15	15
Inwood	49D	10	30
	39	15	30
	49C	10	30
	539	30	30
Brookhollow	26B	10	30
	63B	10	30
	44 Thru	10	30
Bachman	44 Thru	10	30
	44 to Farmers Branch	15	30
	44/59	10	30
	51A	10	30
	51B	10	20
	428	15	30
	63B	10	20
	N Irving via Mañana	10	30
Walnut Hill/Denton	Old 43	20	40
	44/59	10	30
	Walnut Hill Crosstown	20	40
Royal Lane	44/59	10	30
	Western Circulator	10	30
Farmers Branch	44 to Farmers Branch	15	30
	Old 59	15	30
	Old 331	20	40
	321	20	40
	322	20	40
	486	20	40
	West Circulator	20	40
Carrollton Square	Old 59	15	30
	Old 331	20	40
	400	30	40
	Luna Circulator	20	40
Trinity Mills	333	20	40
	344	20	40
	Texas Instruments Express	30	60
	On Call	n/a	n/a
Frankford	On Call	n/a	n/a

Source: DART, LKC; March 2003

LRT service on the line would have a maximum operating speed of 65 mph. Average train speed would be about 28 mph. The average train speed is influenced by civil engineering design conditions, alignment location conditions, and time spent at each passenger station (dwell time). Station dwell times average 20 seconds for each station stop.

Technology
The vehicles and systems technologies to be utilized for this project would be identical to the light rail services currently operating in the DART Service Area. The electrically powered vehicles collect primary electrical power [845 Volts-Direct Current (Vdc)] via a pantograph from an overhead contact system that distributes the power from wayside traction power substations. Vehicle control is primarily the responsibility of the light rail vehicle operator with guidance from a wayside signal system, grade crossing protection, and operating rules.

Fare Collection
Fare collection for the line would continue to use DART's current self-service, barrier-free concept. Fares and fare collection policies would be consistent with current operations. In accordance with current DART policy, LRT fares would be integrated and equal to the fares of local bus service.

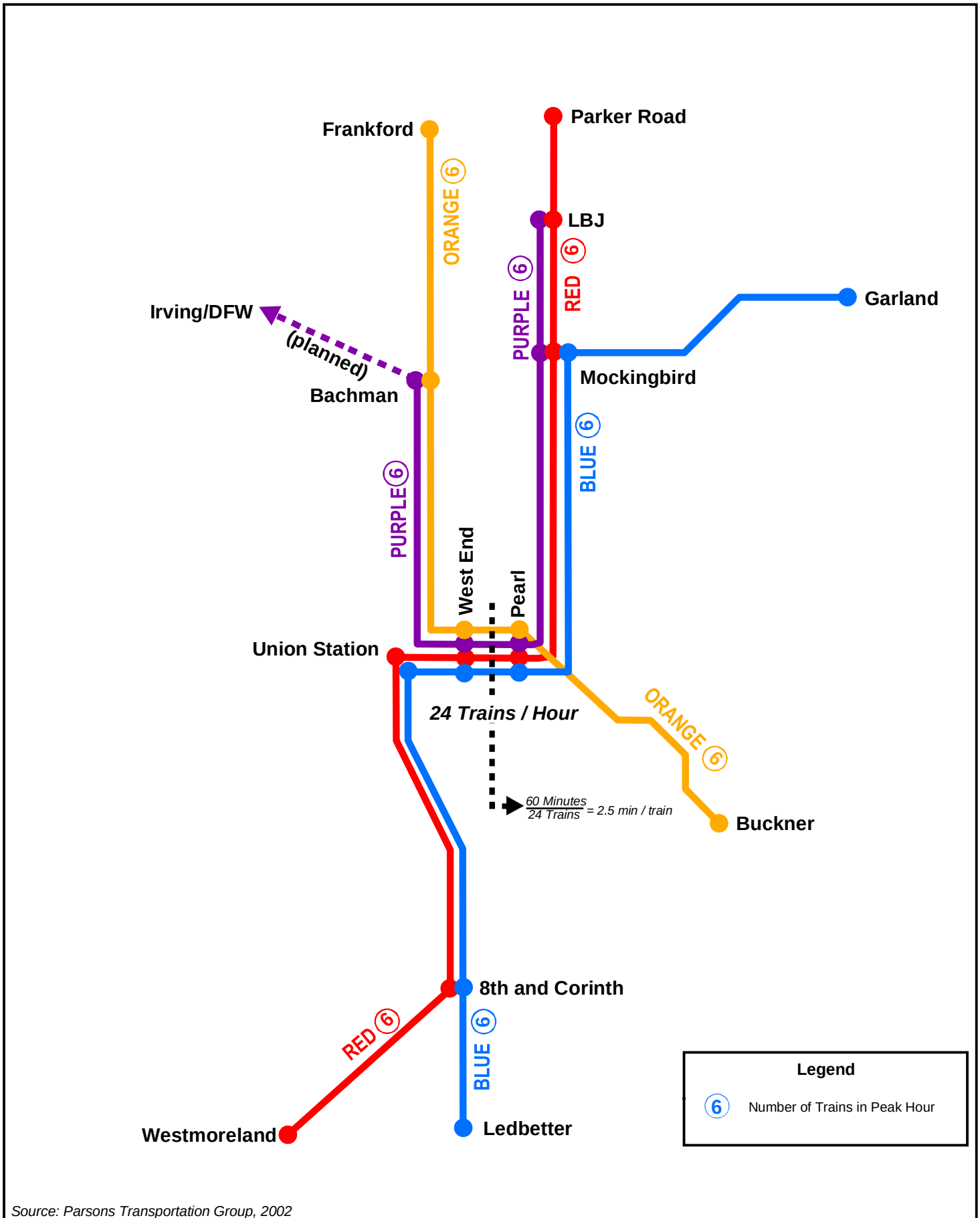
Electric Power Substations and Special Trackwork
Approximately fourteen traction power substations (TPSS) would be located along the proposed project to supply sufficient power to meet the operating plan. The substations would be 2.5 megawatt prefabricated units. The actual number and location of substations would be refined and confirmed during detailed final design. TPSS locations are typically spaced one mile apart and have a typical 80 feet by 40 feet dimension. To the extent possible, TPSS locations would be accommodated within DART right-of-way.

The track layout would incorporate special trackwork (switches) to permit service under track outage conditions and to facilitate LRT operating moves to reverse train direction. Special trackwork would be located where trains can most conveniently switch from one track to the other based on LRT operating requirements. Features associated with the LRT operating plan are depicted in **Figure 2-19**.

2.2.5 Rail Operating Facility
DART's current light rail operating facility is located at the Central Rail Operations division immediately southeast of the Dallas CBD. The facility performs major maintenance functions on light rail vehicles, as well as cleaning, washing, and sanding. DART also has an associated facility, the Facilities Rail Operating Building (FROB) that is responsible for wayside maintenance—signals, traction electrification, track, and station.

The current DART fleet of 95 LRT vehicles (for existing LRT service, and expansion into the North Central and Northeast lines in 2002-2003) will expand to 160 with the addition of the Southeast Corridor and Northwest Corridor lines in 2007-2008 (dates subject to change). Phase III expansion into Irving, Rowlett and South Oak Cliff will increase the light rail fleet size to approximately 205 vehicles.

The existing light rail operating facility will be expanded to maintain 125 vehicles. This leaves 80 or more vehicles to be maintained and stored at a second facility, with the trigger for this new facility being the expansion of light rail into the Northwest Corridor. The Southeast Corridor LRT vehicles would be accommodated within the expanded Central Rail Operations Facility.



Source: Parsons Transportation Group, 2002

Figure 2-19

LRT Operating Plan

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

After a preliminary assessment of potential environmental impacts, size, and access, three sites were found to meet the requirements for a second facility and were considered in the Draft EIS. The site selection process and options considered are discussed in detail in Section 2.3.3. DART held a Public Hearing on April 29, 2002 to receive public comment on the three Northwest Rail Operating Facility (NWROF) site options. The public hearing period was held open until the end of the Draft EIS public comment period. Based on an evaluation of the sites and public input, the DART Board approved a Service Plan Amendment on August 13, 2002 selecting Site 3, at the northeast corner of Lombardy Lane and Denton Drive. The conceptual layout for the facility is shown in **Figure 2-20.** This layout takes into consideration public comments received during circulation of the Draft EIS by leaving some existing businesses in place at the northeast corner of the site and allowing for visual mitigation around the site.

2.3 OTHER ALTERNATIVES CONSIDERED

Several alternatives were considered in the Draft EIS, but were not selected for implementation. Another alternative, Medical Center Design Option D, was developed during the DEIS comment period. These alternatives and LRT alignment options are presented in this section.

2.3.1 No-Build Alternative

The No-Build Alternative is used to determine the environmental impacts of not making major transit improvements in the project corridor. Evaluating this alternative also helps determine whether the benefits to be realized by implementation of the Build Alternative are acceptable, considering environmental, economic, and social impacts and their mitigation costs. The No-Build Alternative must be given full consideration and a thorough evaluation in order to compare it adequately to the proposed project.

The No-Build Alternative includes all improvements contained in the ***2000 TIP,*** Congestion Management System (CMS) improvements mandated to address regional air quality, and DART's planned transit system improvements as shown in **Figure 2-21**. The bus service improvements are intended to keep pace with population and employment growth, consistent with trends in the Northwest Corridor Study Area. The bus operating plan for the corridor is the level of service expected to be provided in 2025 (**Figure 2-22**). Reassignments of vehicles among routes are made to balance service with demand, with no major changes beyond those in the DART ***Five Year Action Plan***.

This level of service assumes the service standard policies adopted by the DART Board of Directors as follows:

- Continue to provide service to all areas currently receiving bus service;
- Expand service consistent with DART's existing policy of servicing new demand;
- Maintain existing service standards and provide more frequent service to the extent warranted by increased ridership; and
- Add direct bus service to corridor and non-corridor major employment areas, with service originating from the transit centers.

Planned transit facility improvements include a new SH 114 Park-and-Ride near the north end of DFW Airport and a new Northwest Plano Park-and-Ride near Parker Road and the Tollway. Other programmed rail transit improvements outside the Northwest Corridor Study Area are included in the No-Build Alternative. Transit improvements include extensions of the North Central LRT line to Plano and Northeast LRT Line to Garland, both of which are now complete.

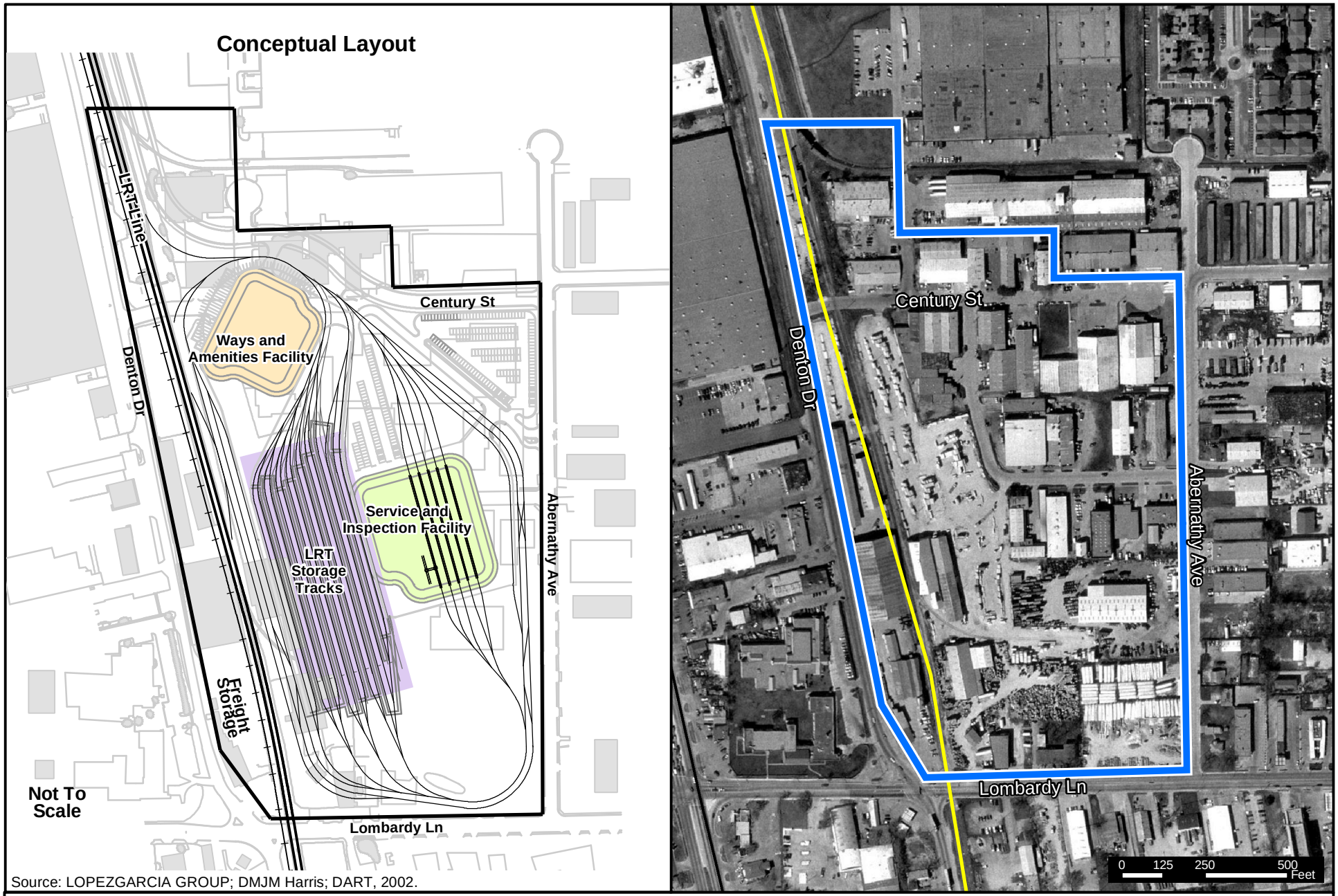
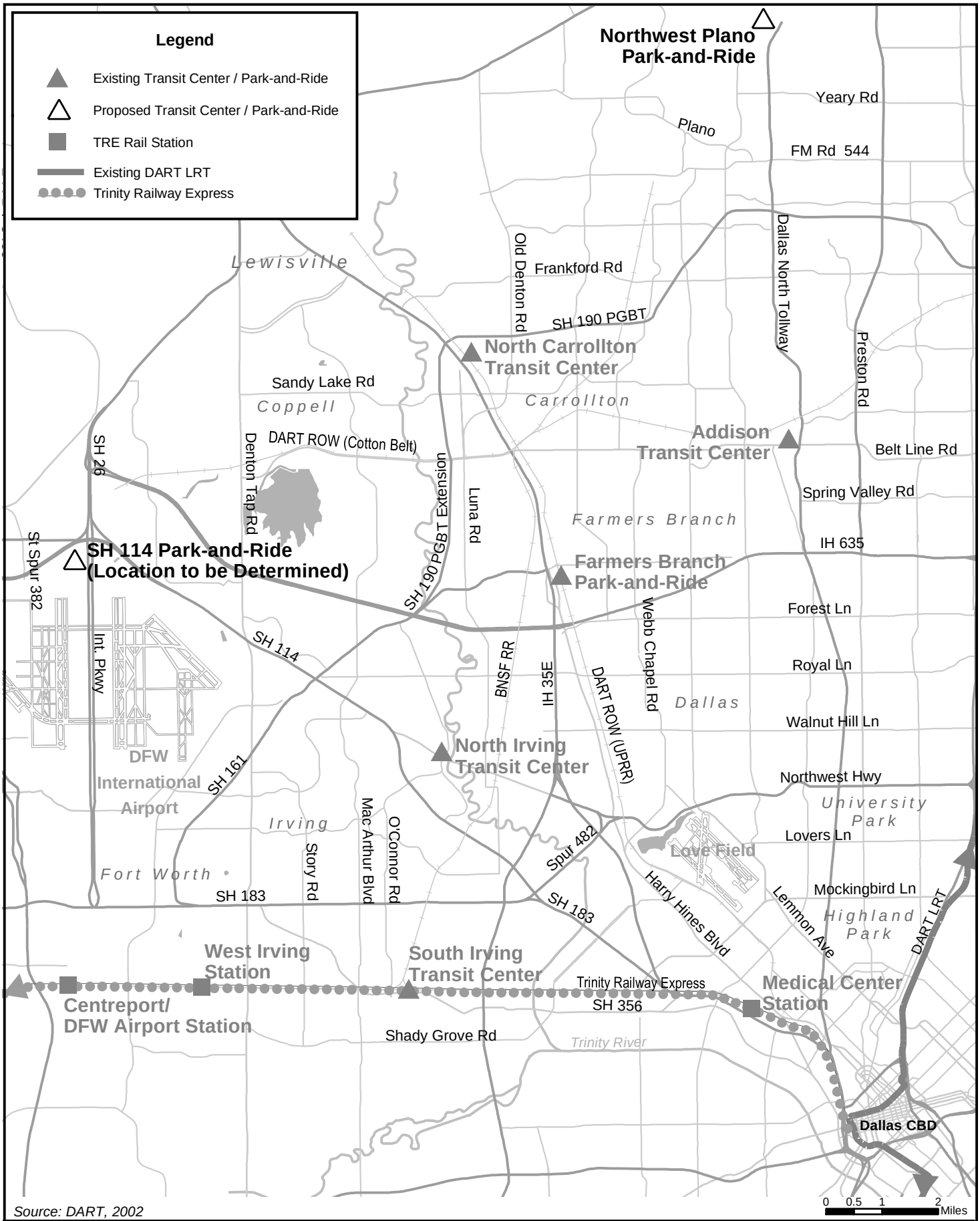


Figure 2-20
Northwest Rail Operating Facility Site

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: DART, 2002

Figure 2-21
EIS No-Build Alternative

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

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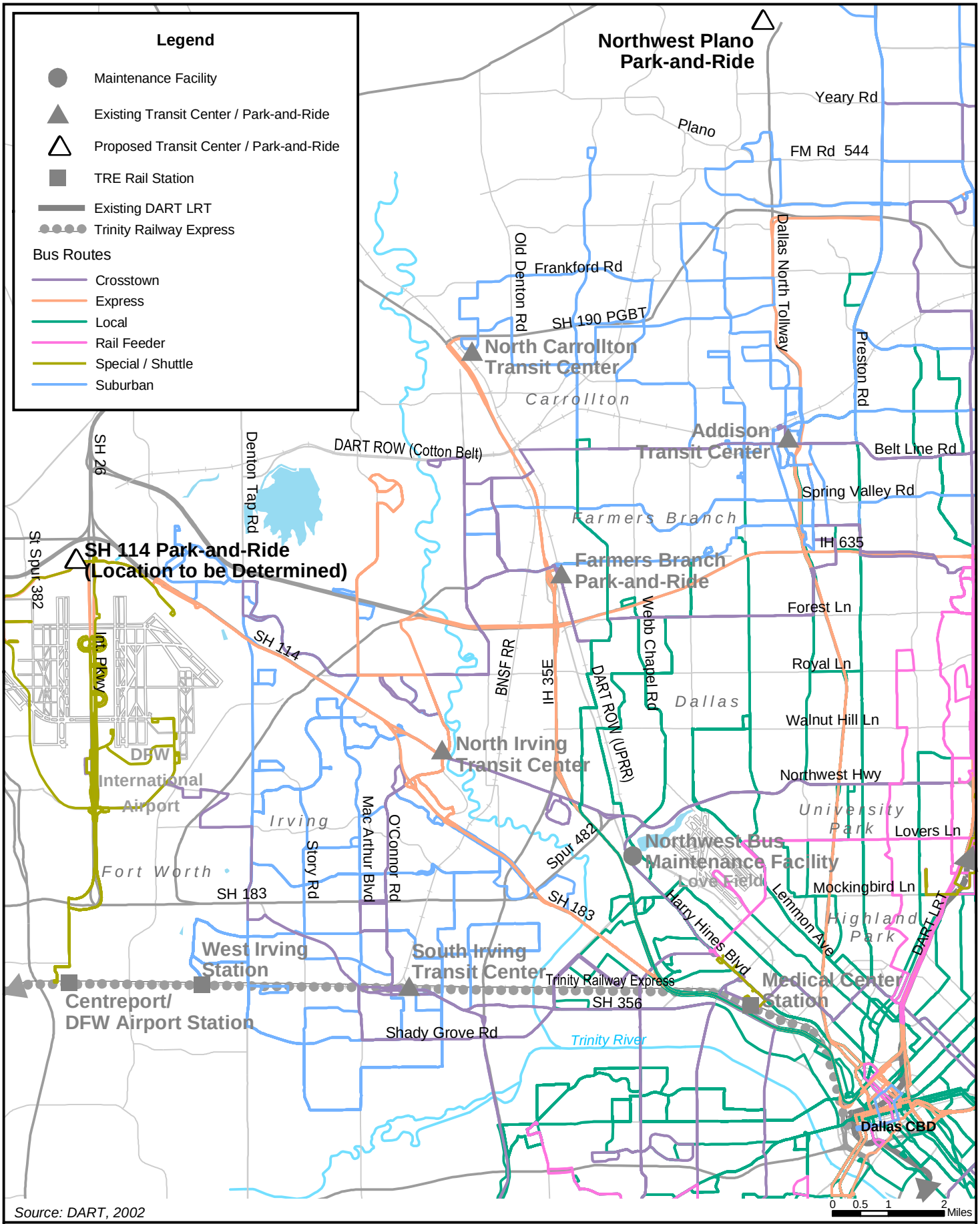


Source: DART, 2002

Figure 2-22

2025 No-Build Bus Operating Plan

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

Planned and programmed roadway improvements are also included in the No-Build Alternative. Highway improvements based on recently completed TxDOT MIS's are included in the network assumptions of the regional travel demand model. These projects are Loop 12 /IH 35E, SH 183 / West Fork, President George Bush Turnpike (SH 190), IH 35E North, and SH 114 / 121. The most probable level of improvement for each of these projects is included in the No-Build Alternative.

2.3.2 Other LRT Alignments Considered

The Draft EIS also considered four LRT alignment options in the Medical Center area and one in the Love Field area. A fifth Medical Center design option (Design Option D) was developed during the DEIS comment period. These design options and the decisions that led to the Selected LRT Alternative are described below for each.

Medical Center Design Options

Background

The Northwest Corridor LPIS reflected an LRT alignment in the vicinity of the Medical Center that would have deviated from the existing rail corridor north of the Market Center/Oak Lawn Station to continue north elevated in the median of Harry Hines Boulevard. An aerial station would have been provided for the Medical Center in the median north of Lofland Street at Parkland Hospital. The alignment would have continued elevated in the median of Harry Hines Boulevard, then transitioned to the east side of Harry Hines south of Inwood Road. A station would have been provided north of the entrance to the University of Texas Southwestern (UTSW) Medical Center North Campus just south of Exchange Park Boulevard. The LPIS alignment continued east along Bomar Avenue to return to the UPRR corridor and was mostly elevated with some at-grade sections.

In summer 2000, prior to the EIS scoping process and issuance of the Notice of Intent to prepare an EIS, DART initiated meetings with representatives of the Medical Center district hospital facilities to discuss potential refinements of the LPIS alignment. Through a series of meetings from November 2000 to February 2001, the alignment in this area was refined to remove at-grade sections and provide a mostly elevated alignment, and to use Treadway Street rather than Bomar Avenue to return to the UPRR corridor. Use of Treadway Street would avoid possible conflicts with future buildings on the UTSW North Campus. Therefore, the route was modified to turn east and descend to grade along Treadway Street to cross Forest Park Road. A reverse curve north would take the alignment to the south side of Mockingbird Lane, and further east at-grade to Maple Avenue. After crossing Maple, the alignment would descend into a short tunnel to cross under Mockingbird Lane and avoid flight zone restrictions at Love Field Airport. It would curve to the north to rejoin the UPRR ROW and return to grade between Hawes Avenue and Empire Central Drive in the median of Harry Hines Boulevard. This alignment provided the foundation for the Base Alignment in the Medical Center area that was assessed in the Draft EIS and also discussed in this Final EIS.

During the coordination meetings, Medical Center representatives also indicated a desire to examine the feasibility and costs of a tunnel alignment along Harry Hines. In February 2001, DART presented an option with a short tunnel section from an area south of Motor Street to approximately Inwood Road with an open-cut station near Parkland Hospital. At that meeting, Medical Center representatives indicated their desire for a tunnel along the length of Harry Hines to address visual and construction issues associated with the elevated alignment in the UTSW North Campus area north of Inwood Road. This desire was restated in a consensus letter to DART from the Medical Center leadership in March 2001.

In response, DART held a meeting in April 2001 to discuss cost issues associated with the tunnel alignment and positive attributes of the aerial Base Alignment. A tunnel alignment from south of Motor Street to an area north of the UTSW Medical Center North Campus was estimated to cost an additional $250 million and was found to be cost-prohibitive by both DART and the Medical Center.

It was after this meeting that the Medical Center requested that DART develop other routing options to address their concerns with the Base Alignment.

Six different alternative routing options through the Medical Center area were developed during Summer 2001 and presented at three public meetings on August 27, September 13, and September 20, 2001. Following an evaluation of the alignments and consideration of public and Medical Center comments received, the DART Board approved Alternative 3A as the Medical Center Design Option on September 25, 2001.

Design Options Explored During the Draft EIS

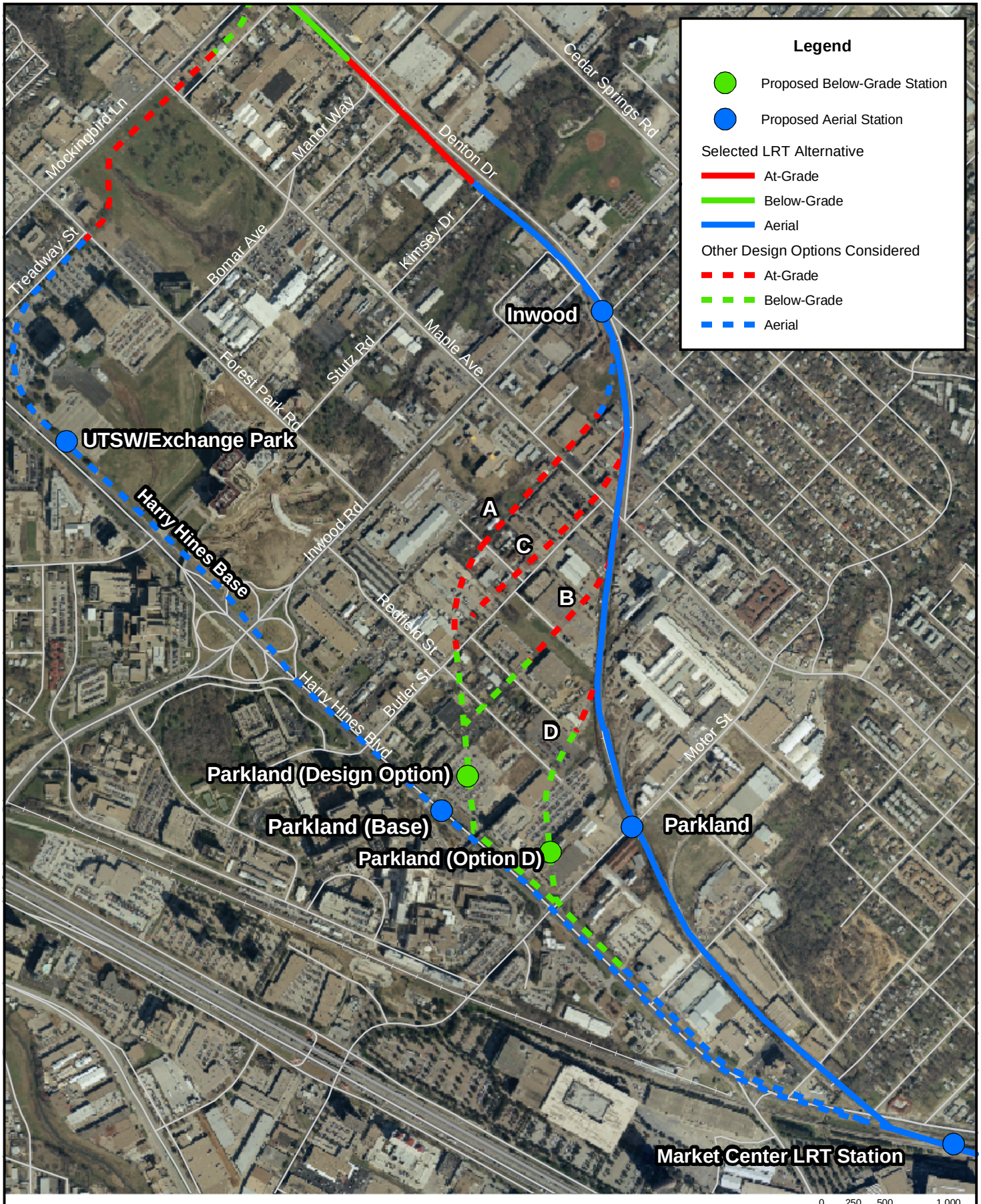
The Draft EIS examined the Base Alignment (described above) along Harry Hines Boulevard, Medical Center Design Option A (the original 3A alignment referenced above), as well as two additional Medical Center Design Options B and C that were developed so that more than one option could be explored given the number of acquisitions and displacements required. The Design Options are further described below.

The Medical Center Design Options (see **Figure 2-23**) differ only in the area in which they transition between the Market Center/Oak Lawn Station and the Inwood Station. All options would begin just north of the Market Center/Oak Lawn Station and transition to become aerial, crossing over Market Center Boulevard and continuing in the median of Harry Hines Boulevard. While the Base Alignment would have remained aerial within the median of Harry Hines, the Design Option alignments would descend to grade and enter a tunnel portal in the median of Harry Hines Boulevard at a point south of Motor Street. The alignment would remain in a tunnel under Motor Street, turning north and northeast to leave Harry Hines Boulevard.

All three options would have crossed Harry Hines north of Lofland Street opposite the main entrance to Parkland Hospital. An open-cut station would have been provided north of Lofland and east of Harry Hines Boulevard. North of the station, the options would have continued in open cut, crossing under Redfield Street in a cut and cover double box. Options A and C would have risen to cross Butler Street and Maple Avenue at-grade. Option B would have continued in an open cut but would have turned to the east sooner and remained parallel to and south of Butler Street, joining the right-of-way about 500 feet south of the Maple Avenue at-grade crossing. Tex Oak Street would have been closed under all three options, and a cul-de-sac and street connector from Redfield would have been created. Option C would have joined the right-of-way near Butler Street, and Option A would not join the right-of-way until just south of Inwood. South of Inwood Road, all options would then have transitioned into an aerial section to cross over Inwood Road and Knight's Branch. An aerial station would have been provided in the northwest quadrant of Inwood Road and Denton Drive. The alignment would then have descended to grade and entered a tunnel portal to cross under Mockingbird Lane. Between Harry Hines Boulevard and the UPRR right-of-way, the Medical Center Design Option alignments would not have been located in either railroad or roadway right-of-way, thus requiring the acquisition of private property for the project.

Design Option Refinements Made as a Result of Public Comments on the Draft EIS (Medical Center Design Option D)

After preparation of the Draft EIS (June 2002) and during the 45-day circulation period, DART staff continued to explore ways to further reduce property acquisitions and relocations, in response to public comments regarding the additional cost and displacements associated with Design Options A, B and C. Through refinements to Medical Center Design Option B, the staff developed Medical Center Design Option D (see **Figure 2-23**), which directly addresses concerns about property acquisitions, relocations and costs. As previously noted, this was the option selected by the DART Board for implementation as part of the LRT Alternative. This alignment is located about 500 feet south of, and parallel to, Design Option B. Instead of crossing under Harry Hines Boulevard north of Lofland Street, Option D would cross under Harry Hines at Motor Street, with an open-cut station located on the east side of Harry Hines Boulevard north of Motor Street and south of Lofland.



Source: DART, 2002

Figure 2-23

Medical Center Design Options

LRT Line to Farmers Branch and Carrollton
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N

This option would cross in a double box under a potential extension of Redfield, then re-join the DART owned right-of-way about 1,000 feet south of the Maple Avenue at-grade crossing. South of Inwood Road, Option D would then make the same transition and continue as previously described for Options A, B, and C.

Option D was developed through discussions with Parkland Hospital, which has long-term plans to expand its facilities on the east side of Harry Hines Boulevard. Medical Center Design Option D resulted in a smaller number of property acquisitions, fewer displacements, and cost savings as compared to the other options considered in the Medical Center area.

Medical Center Design Option D was presented to the public at the Draft EIS public hearings on July 11, 15 and 16, 2002. DART also briefed the stakeholders and property owners in the Medical Center area. Many of the verbal comments at the public hearings and written comments on the Draft EIS addressed the alignment options in the Medical Center area. As a result of the public input received, the DART Board selected Option D because it provided the best opportunity to address concerns of both the Medical Center as well as local property owners.

Subsequent Refinements in Medical Center Area

During preparation of this Final EIS, Parkland Hospital and DART continued coordination on the Option D alignment and station in conjunction with more detailed planning and facility concepts for the Parkland Master Plan. One of the key complicating factors that has arisen is the issue of service tunnels and basement-level connections between proposed Parkland facilities, which would be separated by the below-grade, open-cut LRT alignment. The initial design of Option D and the station focused on providing a fairly shallow tunnel and station over which Parkland could use air rights for development. Automobile and pedestrian connections across the alignment would generally take place over the station and in the vicinity of the potential Redfield Street extension. Given the early stage of their planning process, Parkland wishes to maintain maximum flexibility for these service connections depending on the ultimate placement of buildings. This desire translates into a need to lower the LRT profile approximately 10-15 feet and provide a covered area of between 200-800 feet that could be used for these service connections. These project changes are estimated to add up to $20 million to the project due to increased excavation, a longer tunnel section, and potentially increased ventilation requirements.

This issue, coupled with the planned expansion of Medical Center facilities eastward towards Maple Avenue, led the Medical Center representatives to request that DART re-examine the feasibility of using the DART-owned UPRR right-of-way for the alignment through the Medical Center area.

While a compromise solution has been pursued, the additional cost required and the availability of DART-owned UPRR right-of-way immediately east of planned Parkland development supports the use the UPRR right-of-way. While this right-of-way appeared too far removed from the Medical Center district during the Major Investment Study (MIS) and early PE/EIS efforts, Parkland's recent announcements of property acquisition east of the alignment towards Maple Avenue and recent discussions of a private transit-oriented development south of Motor Street on vacant property adjacent to the alignment, make the UPRR alignment a more attractive alternative since a cost-effective solution to Option D is not available.

In addition to the issues and changed conditions in the vicinity of Parkland Hospital, DART has received rights-of-entry from and has initiated discussions with several property owners along the alignment and at proposed station sites. The Federal Transit Administration (FTA) provided approval for these early real estate activities by letter to DART on August 15, 2002. The results of these efforts as well as other environmental and alignment issues, have led to refinements to the Inwood and Market/Center Oak Lawn Stations (see discussion below for DEIS options and Section 2.2.2 for station refinements).

Prior to seeking DART Board approval of using the UPRR right-of-way rather than Option D through the Medical Center area, DART held an informational public meeting on April 3, 2003 and a formal public hearing on April 10, 2003 to take comments on the proposed alignment and station refinements. A summary of the changes was available at the meetings. Verbal and written comments postmarked by April 12, 2003 are included in Chapter 6 with responses to each comment. The DART Board approved the changes on May 13, 2003. These changes are reflected in this Final EIS as the Selected LRT Alternative.

Love Field Design Option

The MIS included a recommendation that direct LRT access to Love Field be studied further during the PE/EIS effort. During the PE/DEIS phase, DART initiated coordination with the City of Dallas Aviation Department to develop an alignment compatible with the recently completed Love Field Master Plan. Consideration was also given to the airfield (taxiways and runways) area and the runway protection zones (RPZ's) at the airport. DART coordinated with the FAA and Southwest Airlines on the development and evaluation of alignments to directly serve Love Field. Other airport tenants were indirectly involved through their participation in the Love Field Master Plan. Airport tenants also had the opportunity to comment on the Draft EIS.

Several alternatives were developed and evaluated with the objective of providing convenient and direct access to the terminal area in a cost-effective manner. A detailed description of the Love Field alternatives, including the option carried through the Draft EIS, is included in Appendix E.

The Love Field Design Option (see **Figure 2-24**) would have consisted of a deep bore tunnel alignment starting near Maple Avenue on the south side of Mockingbird Lane with the Harry Hines Base Alignment or near Manor Way south of Mockingbird under any of the Medical Center Design Options.

At the intersection of Mockingbird Lane and Denton Drive (parallel to the former UPRR right-of-way), the tunnel alignment would have headed northeast. The alignment would have remained in a tunnel below Dallas Love Field property, passing below the southern edge of primary runway 13R/31L. The alignment would have continued in a northeastern direction, crossing below Cedar Springs Road, the airport access road. A below-grade, open-cut station was proposed on the southeast side of the terminal building, in the vicinity of a possible future ticketing and baggage wing included in the airport facilities Master Plan. (The Dallas Love Field Master Plan improvements are not the subject of this EIS.) The tunnel alignment would have continued north then turn west to cross under the airfield and Denton Drive, rejoining the Base Alignment on the UPRR ROW and returning to grade just south of Burbank Street and the Brookhollow Station.

The Federal Aviation Administration (FAA) was requested to be a cooperating agency with FTA for purposes of this EIS. An Aeronautical Study (Form 7460-1) for the Love Field Design Option was submitted to the City of Dallas Aviation Department and FAA on November 13, 2001. The form was also submitted for the Base Alignment and Medical Center Design Options on December 5, 2001 to determine any air space issues. Based on letters received June 4, 2002 (regarding stations on the Base Alignment or Medical Center Design Options) and on September 23, 2002 (regarding the Love Field Design Option), the FAA had no objections to the project as proposed. The Love Field Design Option is not included in the Selected LRT Alternative based on the Service Plan Amendment approved by the DART Board on September 17, 2002.

Stations Considered During the Draft EIS Comment Period

One station was proposed for the Medical Center Area Design Options (Parkland and UTSW/Exchange Park), and two for the Love Field Design Option. None of these station locations are part of the Selected LRT Alternative since all are associated with alignments that were not approved by the DART Board. Three locations for the Parkland Station were considered. The station characteristics are summarized in **Table 2-3** and described below.

Source: DART, 2002

Figure 2-24
Love Field Design Option

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

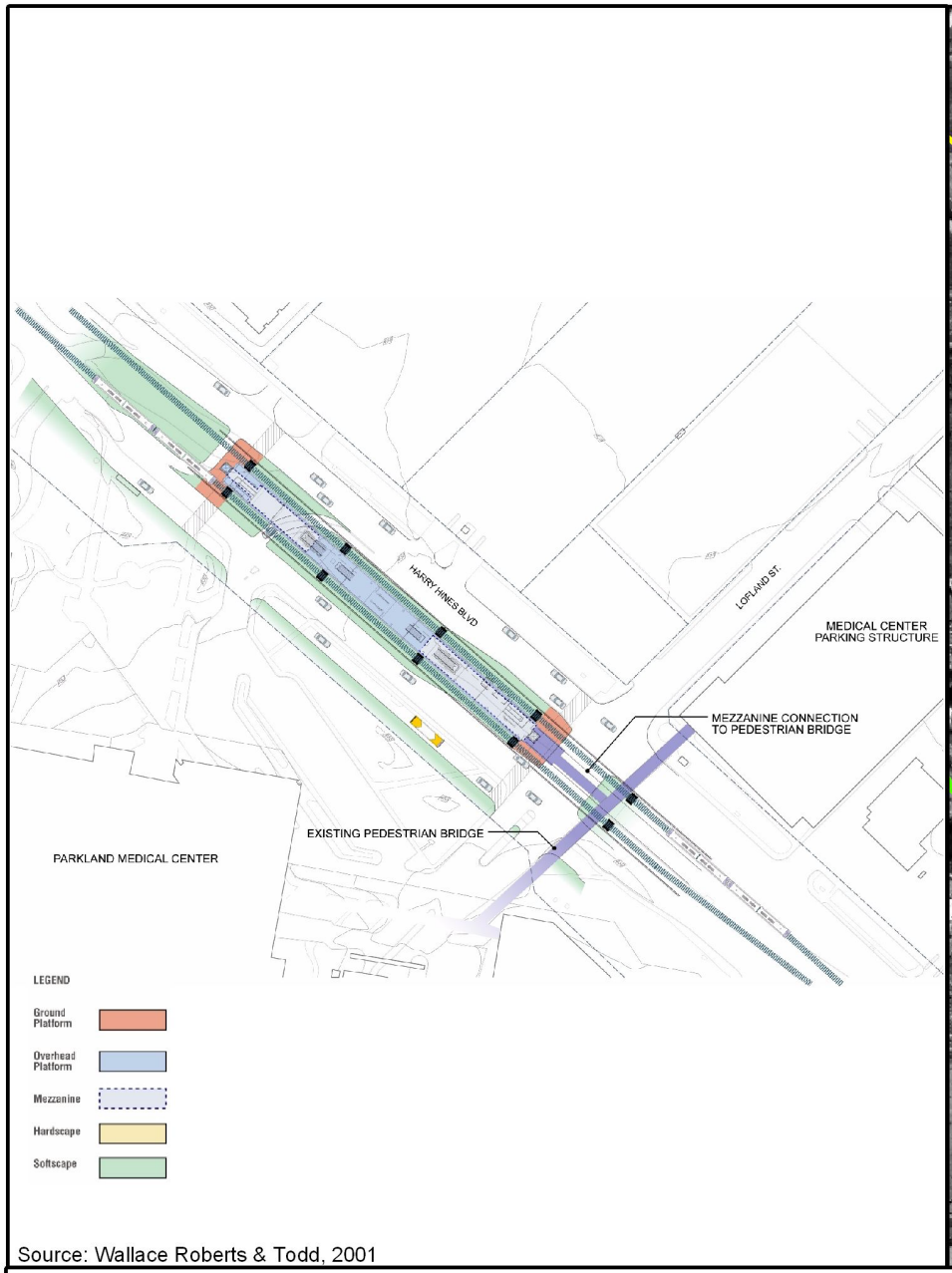
TABLE 2-3
STATION CHARACTERISTICS
OTHER ALTERNATIVES CONSIDERED

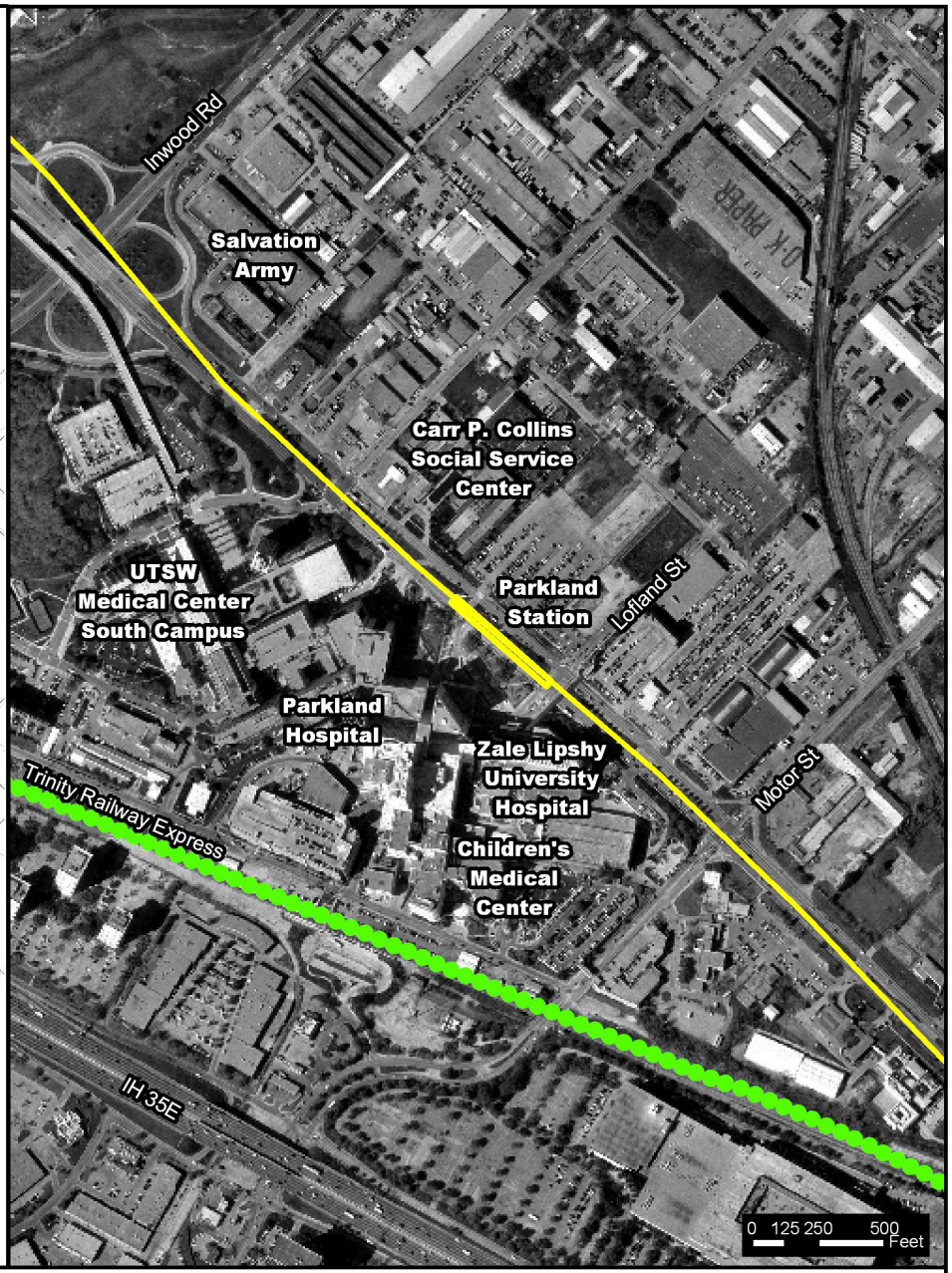
Station	Station Type At-grade, aerial, or below grade; and center or side platform	Station Location and Description	Estimated Parking Spaces
Medical Center Design Options (A, B, C, D and Harry Hines Base Alignment)			
Parkland (Base Alignment)	Aerial w/ Mezzanine - Center	Harry Hines median; connection to existing pedestrian bridge; buses on Harry Hines	None
Parkland (Design Options A, B, C)	Below grade, open-cut Center	North of Lofland Street; bus transfer plaza north of Lofland Street	None
Parkland (Design Option D)	Below grade, open-cut Center	South of Lofland Street; bus transfer on Lofland Street	None
UTSW/Exchange Park (Base Alignment)	Aerial - Center	Bus transfer on east side of Harry Hines Boulevard	None
Love Field Design Option			
Love Field	Below grade, open cut- Center	Adjacent to possible new Love Field ticket/baggage claim building based on tunnel approach on east side of Cedar Springs Road	None

Source: DART; Chiang, Patel & Yerby, Inc.; Wallace, Roberts & Todd, 2002

Parkland Station (Harry Hines Base Alignment) – (**Figure 2-25**) This station would have been aerial with a center platform, located in the median of Harry Hines Boulevard. It would have been directly in front of the main entrance to Parkland Hospital, in the very heart of the medical institutions it would serve: Children's Medical Center, Zale Lipshy University Hospital, and UT Southwestern Medical Center's South Campus. A mezzanine level below the station platform would have given direct access to the existing pedestrian bridge over Harry Hines to connect with the hospitals on the west side of the street. Bus access would have been provided at on-street bus stops, four each direction on Harry Hines Boulevard. Pedestrian access between the bus stops on southbound Harry Hines and the LRT platform would have used existing signalized crosswalks. There would have been no long-term parking at this destination station.

Parkland Station (Design Options A, B, C) – (**Figure 2-26**) The station would have been located in an open cut just east of Harry Hines Boulevard, north of Lofland Street, across from the Parkland Hospital front entrance. The below grade station location would allow for optimal joint development potential by retaining property on both sides of the station. The station would have had an open-air platform with terraced planters stepped back up to the ground level. The platform would have been accessed at the ends as well as from a central mezzanine spanning the tracks below. A bus transfer facility with six bus bays would have been located along Lofland Street. The overall plan would have also featured a landscaped plaza space that would visually connect with Parkland's front entrance.





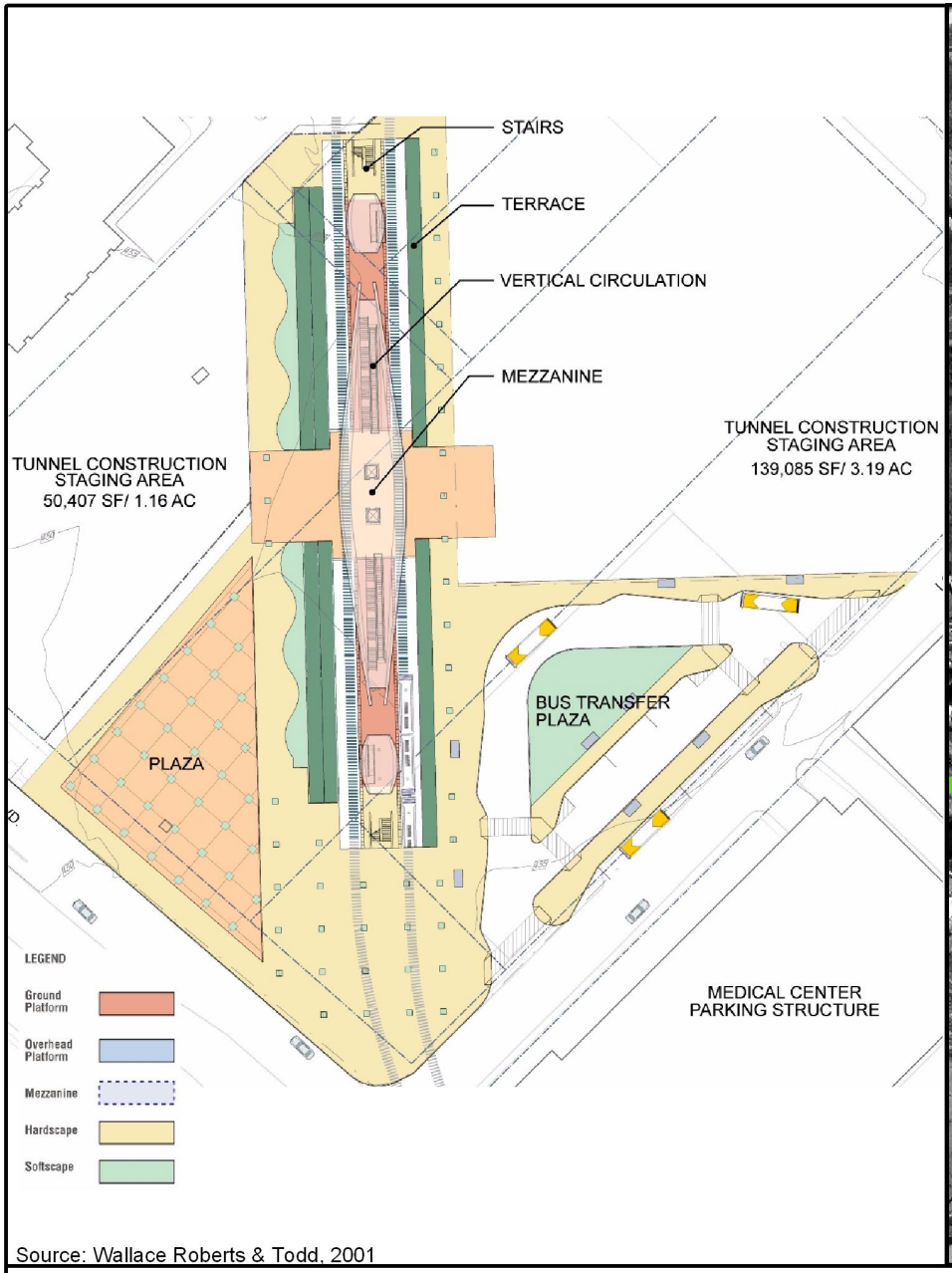
Source: Wallace Roberts & Todd, 2001

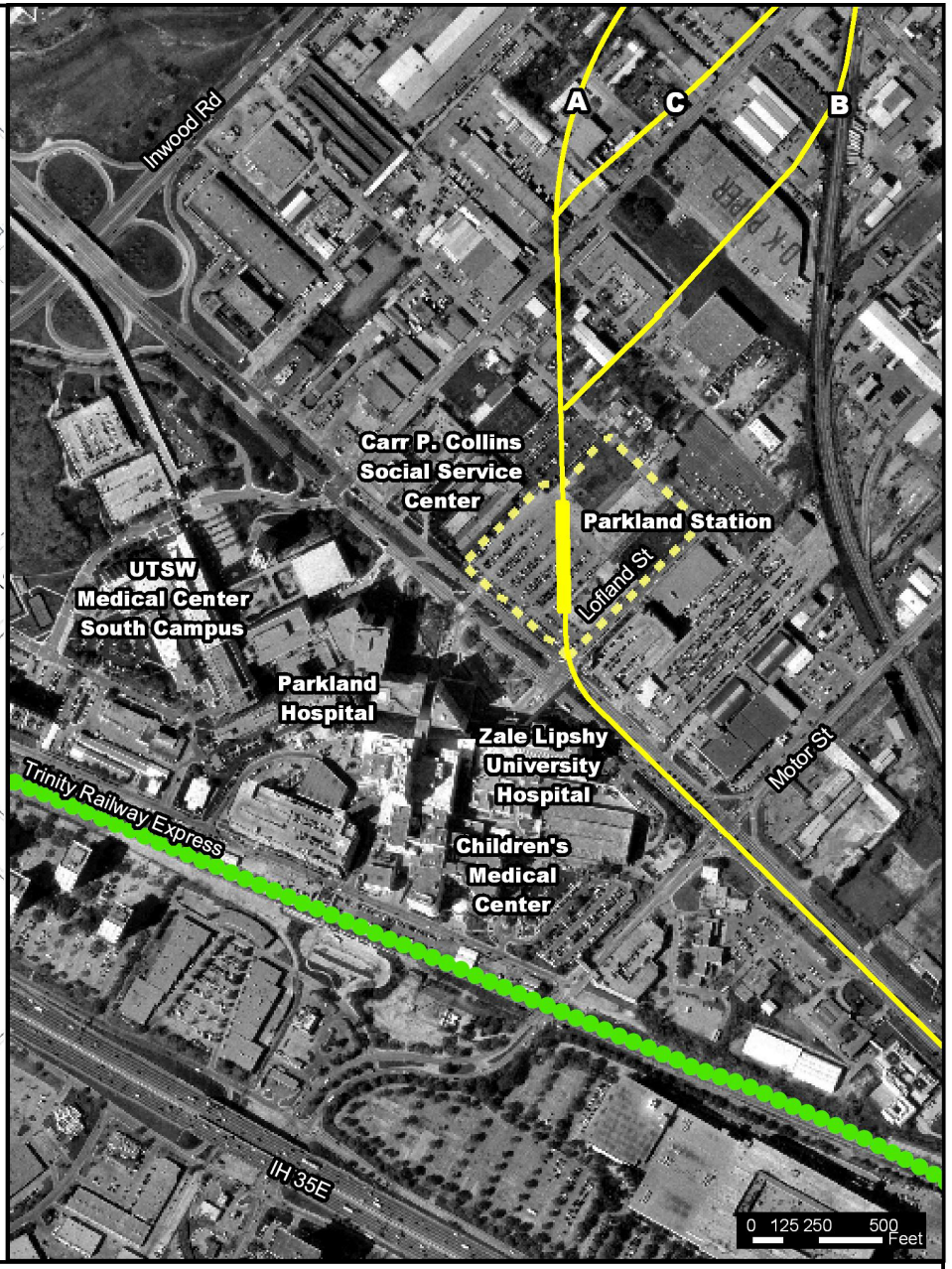
Figure 2-25

Parkland Station

(Harry Hines Base Alignment) Considered But Not Selected

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement





Source: Wallace Roberts & Todd, 2001

Figure 2-26

Parkland Station

(Design Options A, B, C) Considered But Not Selected

LRT Line to Farmers Branch and Carrollton
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Parkland Station (Design Option D)– (**Figure 2-27**) This station was developed during the DEIS comment period for Medical Center Design Option D. It would have been located in an open cut just east of Harry Hines Boulevard, north of Motor Street, across Harry Hines from Parkland Hospital. The below grade station location would allow for optimal joint development potential by retaining property on both sides of the station. The station would have an open-air platform with terraced planters stepped back up to the ground level. The platform would be accessed at the ends as well as from a central mezzanine spanning the tracks below. A bus transfer facility with 13 bus bays (11 fixed-route, one paratransit, and one shuttle) would be located along Lofland Street. The overall plan could also feature a landscaped plaza space that would visually connect with Parkland's front entrance.

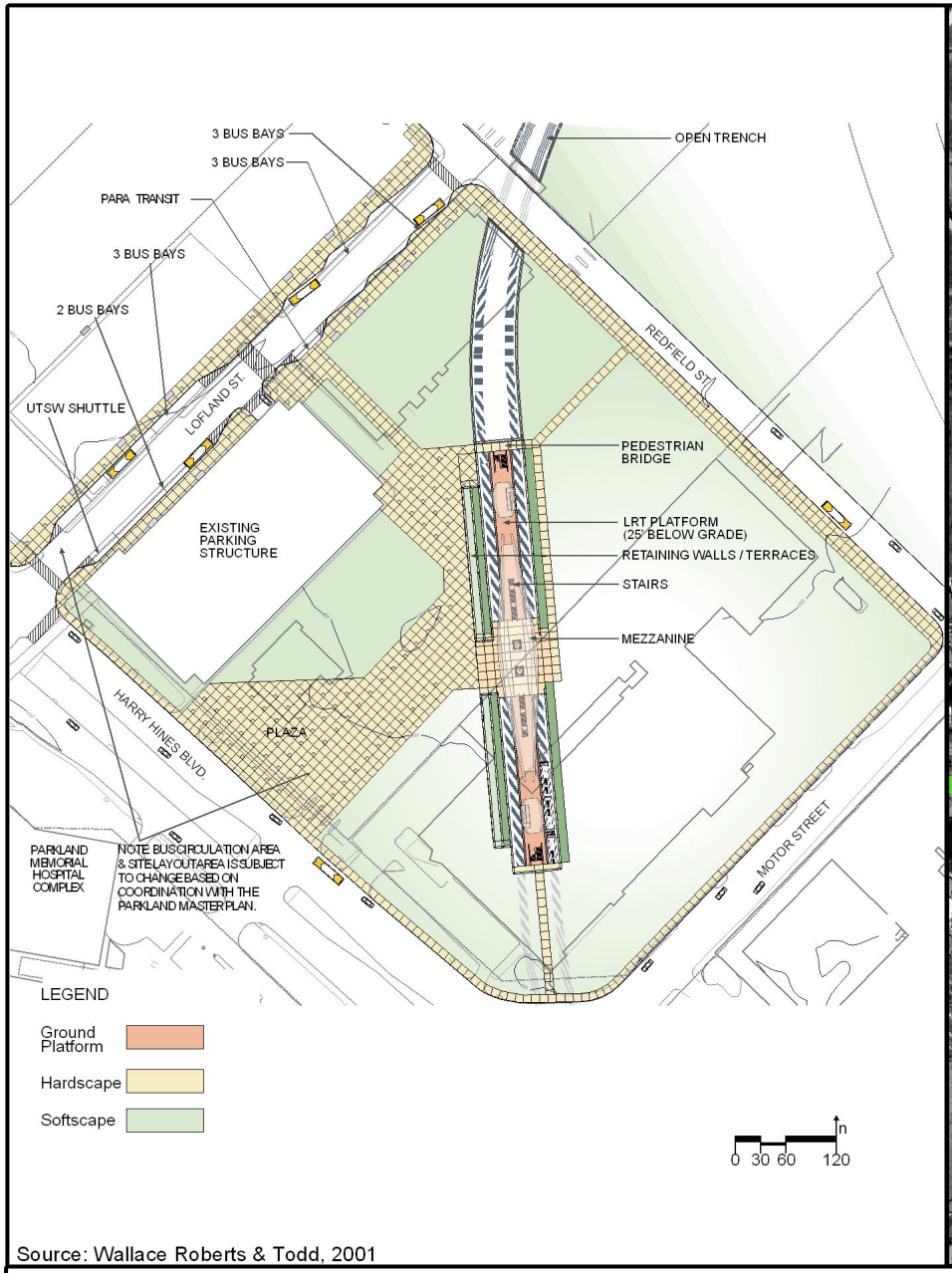
UTSW/Exchange Park Station (Harry Hines Base Alignment) – (**Figure 2-28**) This would have been an aerial center platform station located along the east side of Harry Hines Boulevard and just south of Exchange Park. This would have been a destination station, serving UTSW's North Campus to the south, St. Paul University Hospital on the west side of Harry Hines, and the Exchange Park office development to the north. The station would also have functioned as a hub for bus service in the Stemmons Business Corridor. One paratransit and 10 fixed-route bus bays would have been provided, along with six Kiss-and-Ride spaces. These would have been located off-street on the east side of Harry Hines Boulevard adjacent to the station platform. No long-term parking would have been provided.

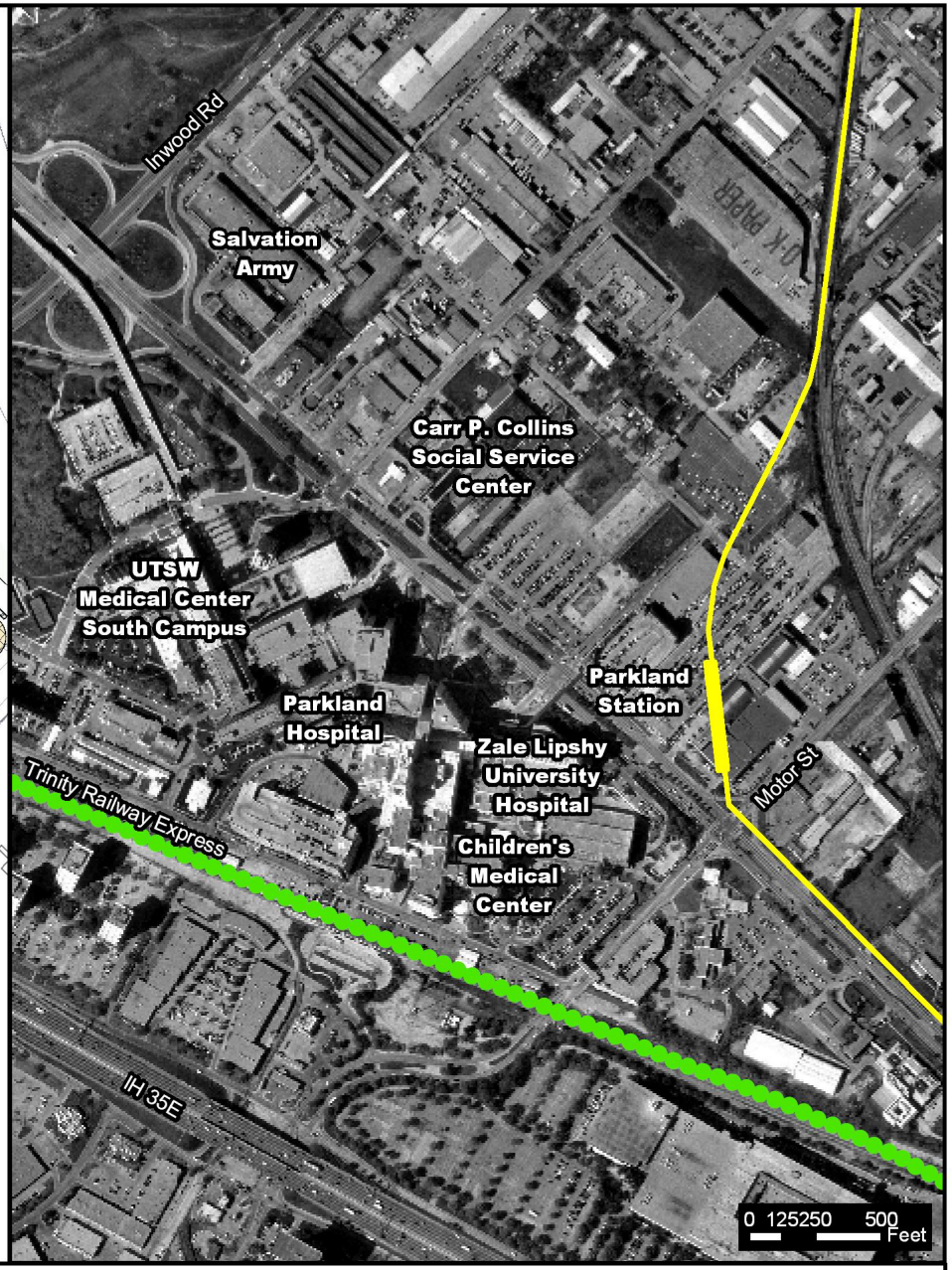
Love Field Station (Design Option) – (**Figure 2-29**) This station would have been located underground in an open-cut configuration on the east side of Cedar Springs Road in the vicinity of a possible future ticketing and baggage wing included in the airport facilities Master Plan. It would have had vertical pedestrian circulation to the existing terminal building. This pedestrian circulation would have been modified should the proposed ticket wing be built. There would have been no parking or Kiss-and-Ride. Limited bus access would have been provided along Cedar Springs Road, the airport access road. It would have been intended to serve airport employees and passengers at Love Field airport.

Station Locations Affected By Subsequent Project Changes

The April 10, 2003 public hearing also addressed refinements to the Market Center/Oak Lawn and Inwood Stations. The Market Center/Oak Lawn Station refinement is a direct result of the alignment change to the UPRR. The Inwood Station refinement was based on DEIS comments and recent property owner interviews as well as other environmental issues. Section 2.2.2 describes the refined stations that are reflected in the Selected LRT Alternative. Stations examined in the DEIS, but not selected, are described below.

Market Center/Oak Lawn Station (North) – (**Figure 2-30**) This would be an at-grade station on retained fill adjacent to the existing TRE tracks. Approximately 308 long-term parking spaces including seven handicapped spaces would be provided across Harry Hines Boulevard. Because the elevation of both the station and the parking area is higher than Harry Hines Boulevard, an aerial walkway would connect the platform to the parking and areas to the east. One paratransit and five DART fixed-route bus bays would be provided, along with five Kiss-and-Ride and six handicapped spaces. This is both a destination and neighborhood access station, with the Dallas Market Center to the west and the Oak Lawn residential and commercial areas to the east. There are also some local retail and hotel uses on Harry Hines across from the station. Access would be from Harry Hines, and from Wycliff Avenue and Hondo Street from the east. A pedestrian walkway connection under the TRE would provide access to the Market Center.





Source: Wallace Roberts & Todd, 2001

Figure 2-27

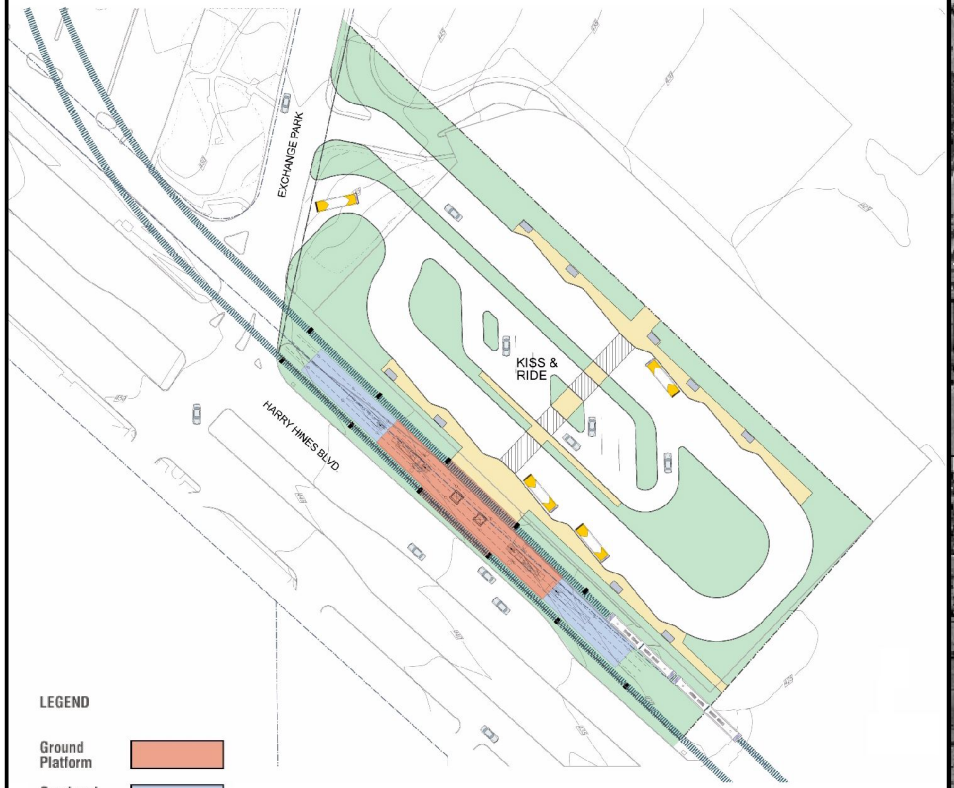
Parkland Station

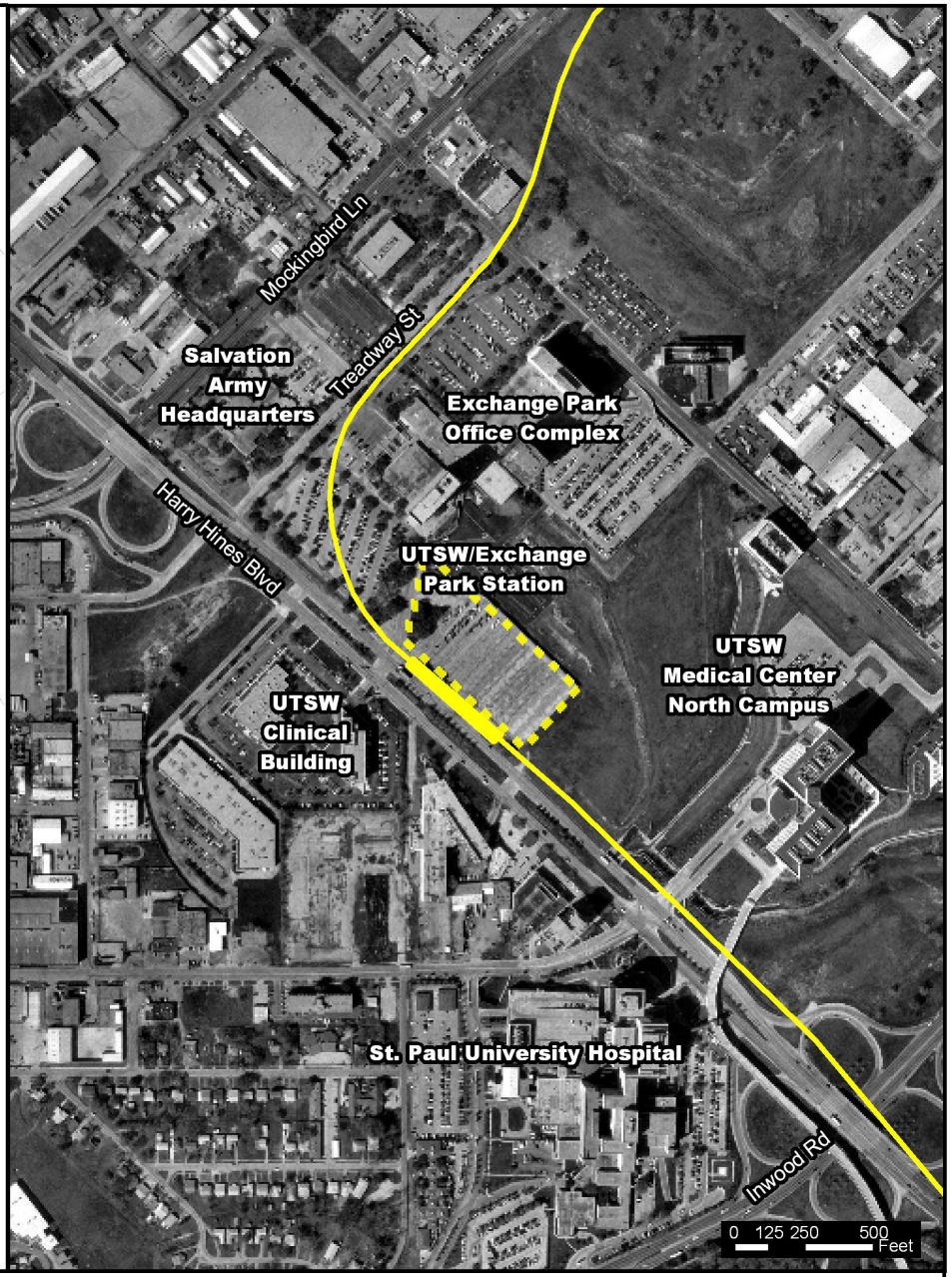
(Design Option D) Considered But Not Selected

LRT Line to Farmers Branch and Carrollton

Final Environmental Impact Statement

N





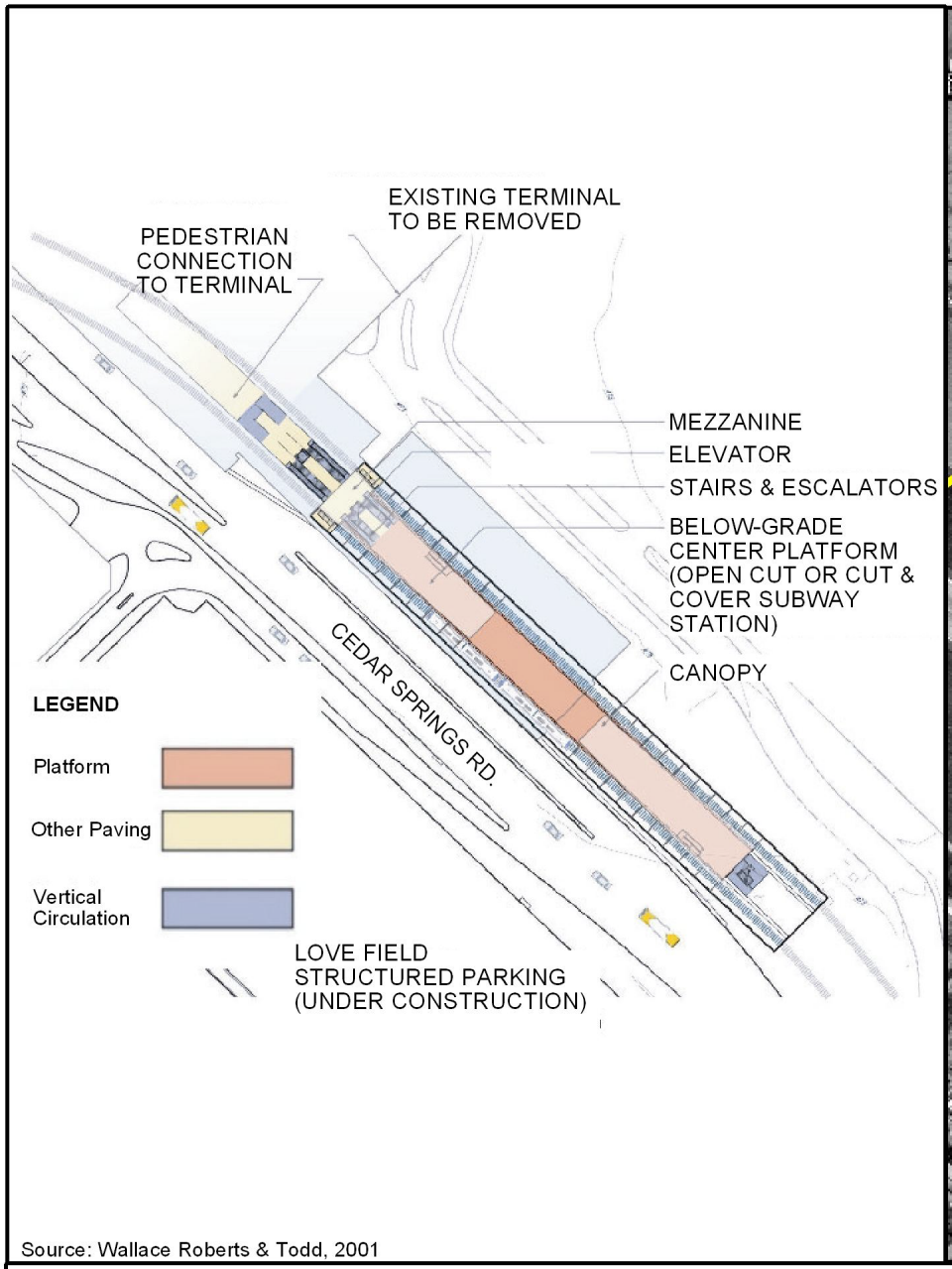
Source: Wallace Roberts & Todd, 2001

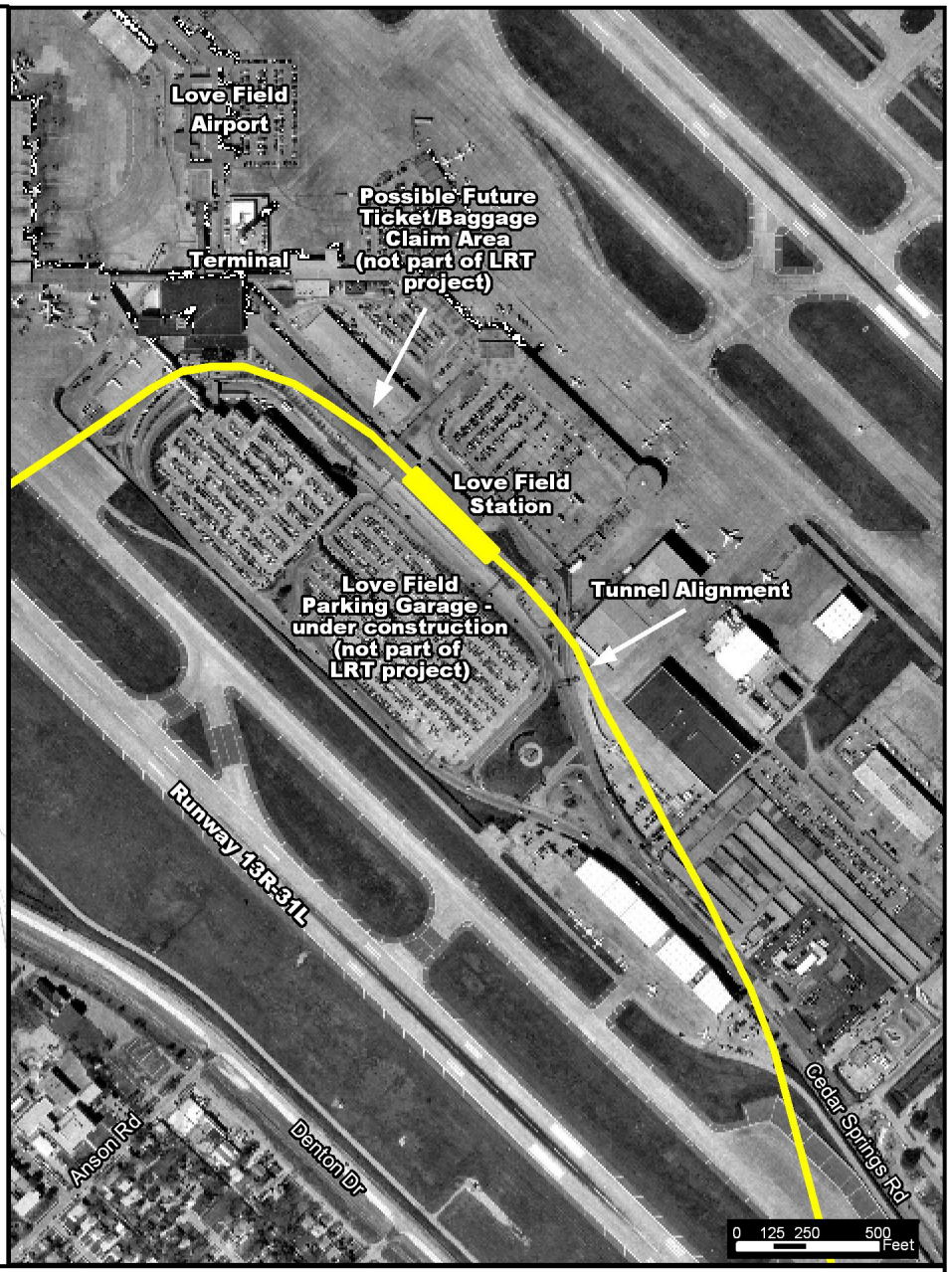
Figure 2-28

UTSW/Exchange Park Station

(Harry Hines Base Alignment) Considered But Not Selected

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



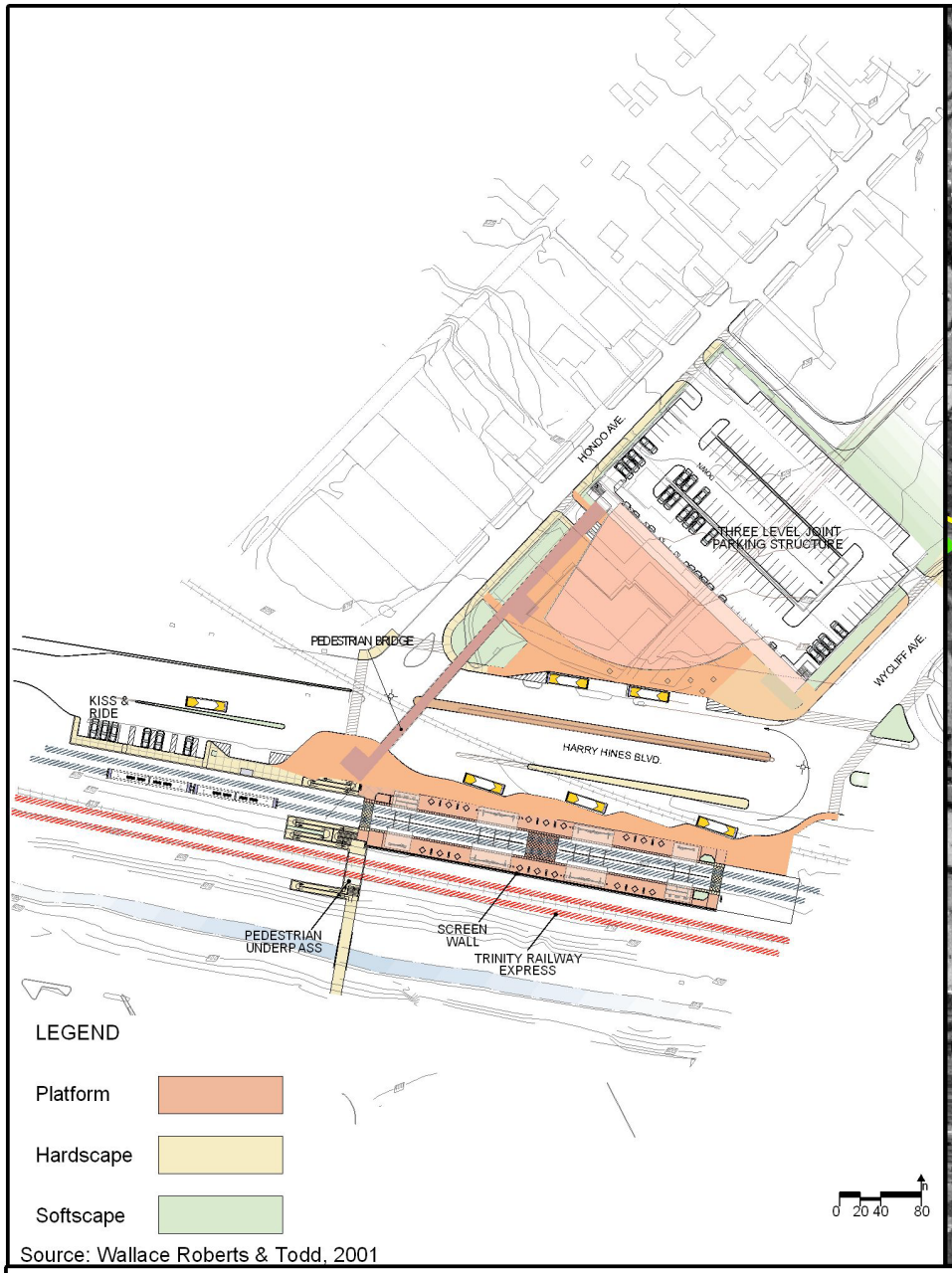


Source: Wallace Roberts & Todd, 2001

Figure 2-29
Love Field Station (Design Option)
Considered But Not Selected

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N



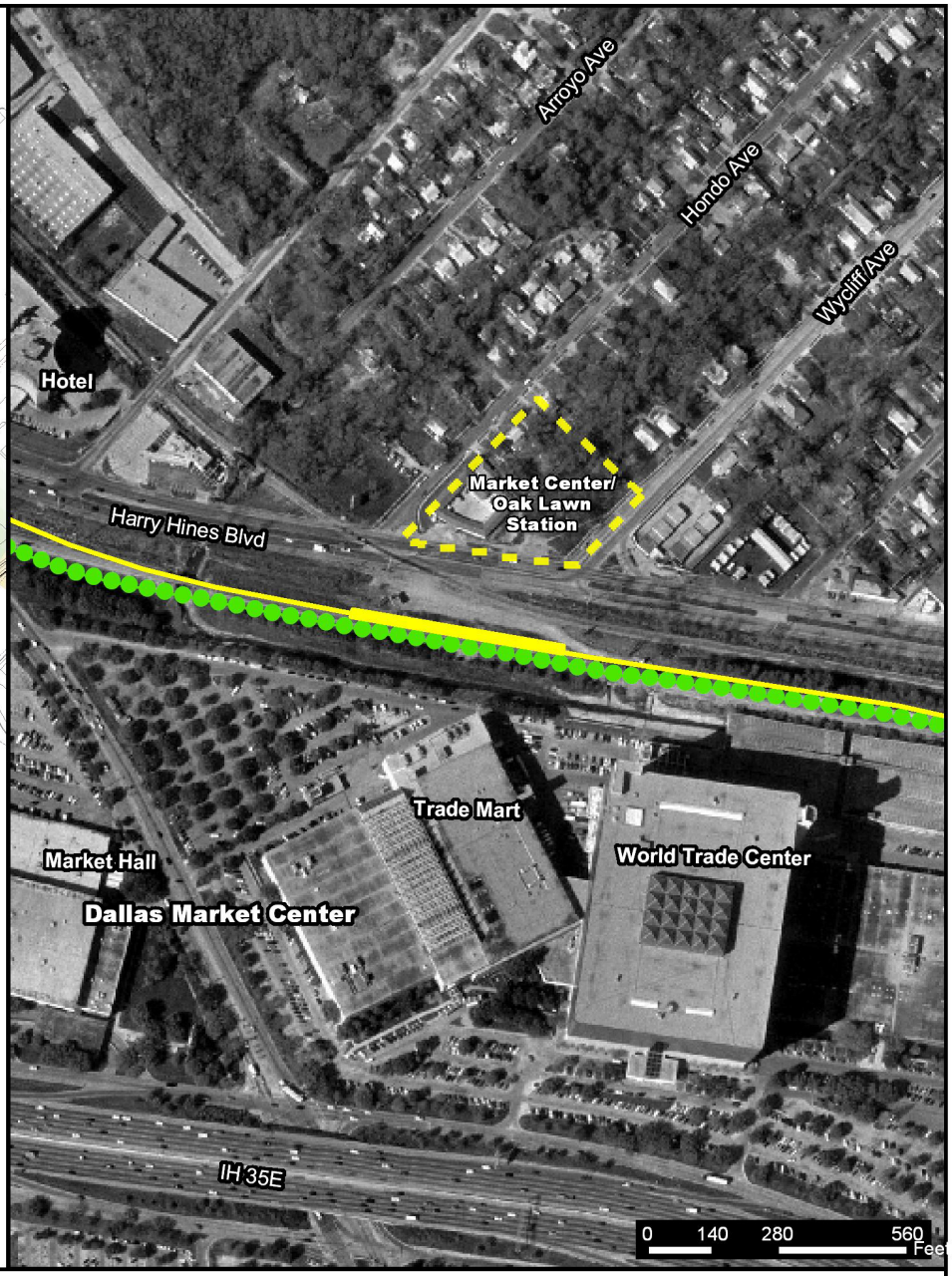


Figure 2-30

Market Center/Oak Lawn Station (North)

Considered But Not Selected

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

Inwood Station (North) – (**Figure 2-31)** This station would be located at the northwest corner of the intersection of Inwood Road and Denton Drive across from Rusk Middle School and close to the Cedar Springs residential neighborhood. The station would be an aerial station with the guideway grade separated over Inwood Road. There would be seven bus bays (one paratransit, one shuttle, and five fixed-route), and approximately 264 parking spaces including six handicapped spaces.

2.3.3 Other Rail Operating Facility Sites Considered

DART determined that for maximum operational efficiency, the new rail operating facility should be located along the Northwest Corridor near the future junction with the Irving/DFW Line and be approximately 30 acres in size. The FTA determined that the EIS needed to address this facility, although site selection was conducted as a separate effort. Based on preliminary site requirements, eight areas along the alignment were examined as to their suitability for the new facility. After a preliminary assessment of potential environmental impacts, size, and access, three sites were found to meet the requirements and were considered in the Draft EIS. Appendix G contains the Executive Summary of the report documenting the development and evaluation of the eight sites, titled ***DART LRT Rail Operating Facility – Phase 1 Site Selection Study***.

Figure 2-32 shows the location of the sites considered in the Draft EIS: Site 1 (Webb Chapel), Site 2 (Northwest Highway), and Site 3 (Lombardy). Site 3 was selected for the facility (see Section 2.2.5).

The Webb Chapel site (Site 1) is approximately 36 acres, and is located between Denton Drive and Harry Hines Boulevard south of Webb Chapel Extension. The site encompasses the City of Dallas Solid Waste Transfer Facility and the DART Northwest Bus Operating Facility. Both facilities are about 18 acres each in size, and would have been relocated to accommodate the new rail operating facility.

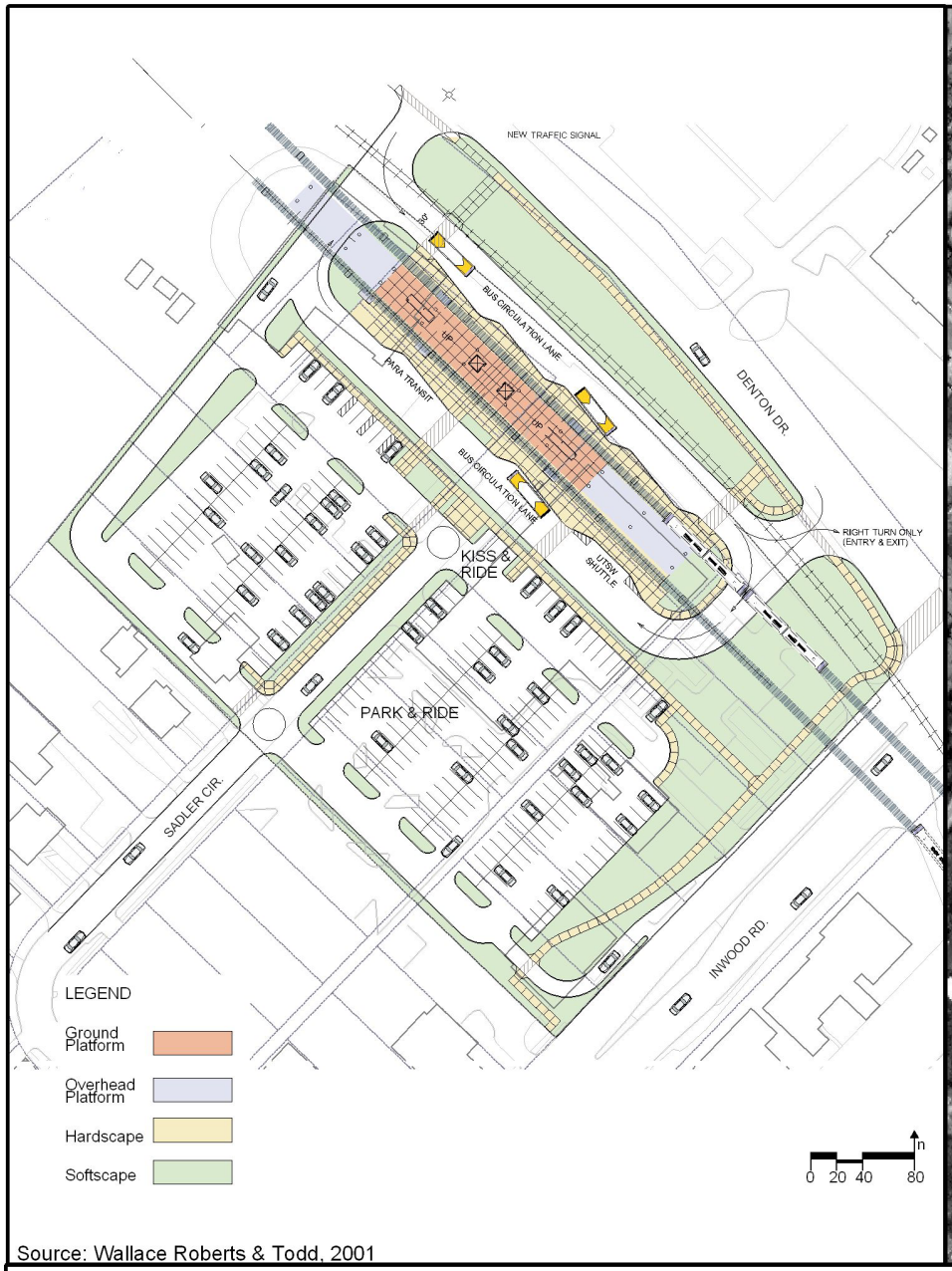
The Northwest Highway site (Site 2) is an active commercial area of about 23 acres, located just north of Northwest Highway between Denton Drive and Harry Hines. The site is zoned IR (industrial/research). There is a historic structure (Bingo Theater) on the property. This site was not large enough to accommodate the facility and has higher redevelopment potential.

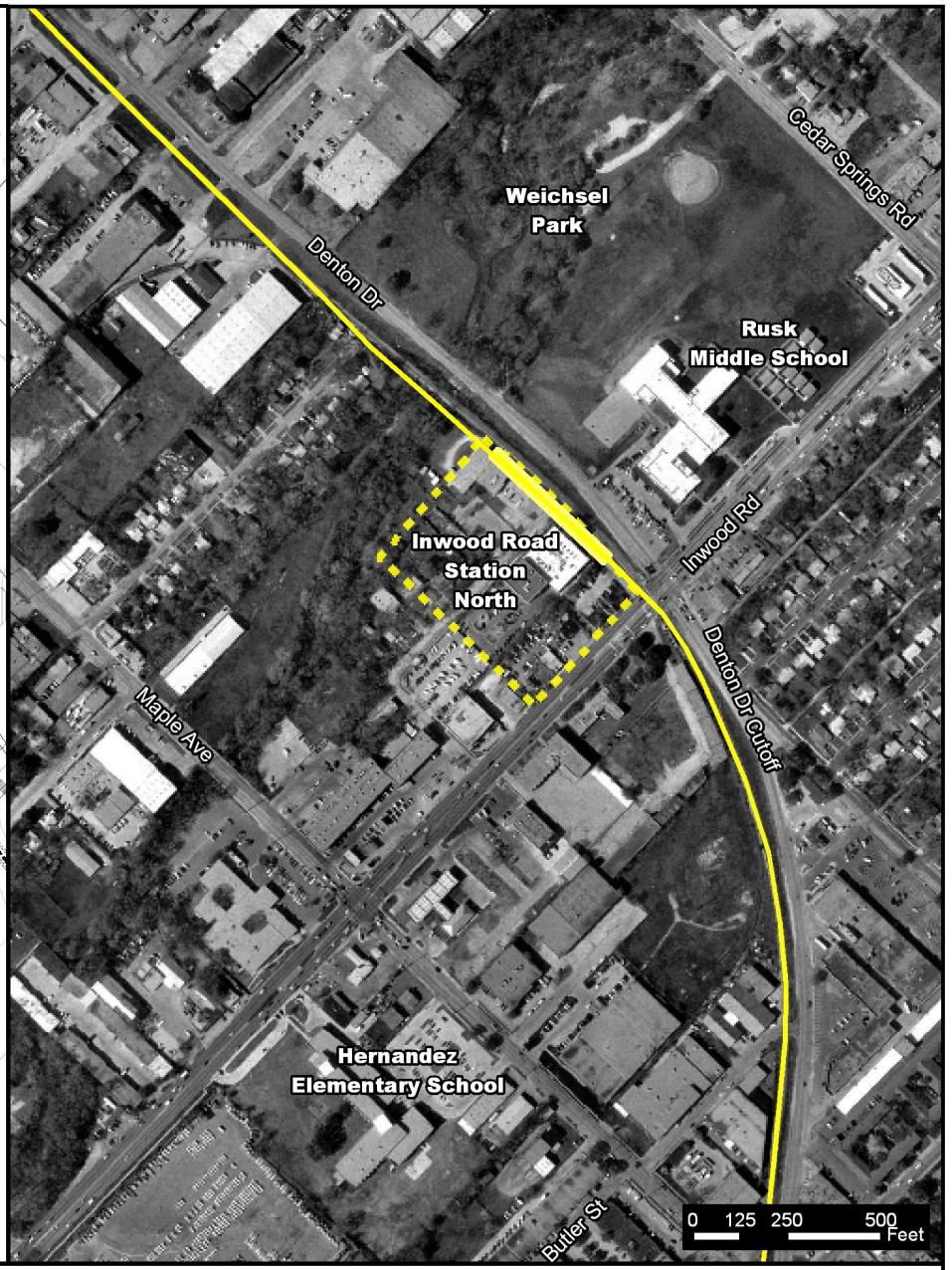
2.4 CAPITAL COSTS

Capital cost estimates reflect preliminary engineering and understanding of the principal structural and system elements. The estimated cost to construct the required facilities, acquire necessary system control and operating equipment and vehicles for the Selected LRT Alternative is $938 million in 2002 dollars. This estimate includes expenses for the development of civil/structural elements, accommodation of known site conditions, purchase and installation of system control components, and vehicle acquisition. The cost to develop transit passenger stations is included in the total capital cost estimate.

As compared to the Selected LRT Alternative, the costs of other Medical Center Design Options considered ranged from approximately $40 million more (for Harry Hines Base Alignment and Medical Center Design Option D), to approximately $60 to $65 million more (for Medical Center Design Option A, B, or C). The Love Field Design Option would have added approximately $160 million to the project cost.

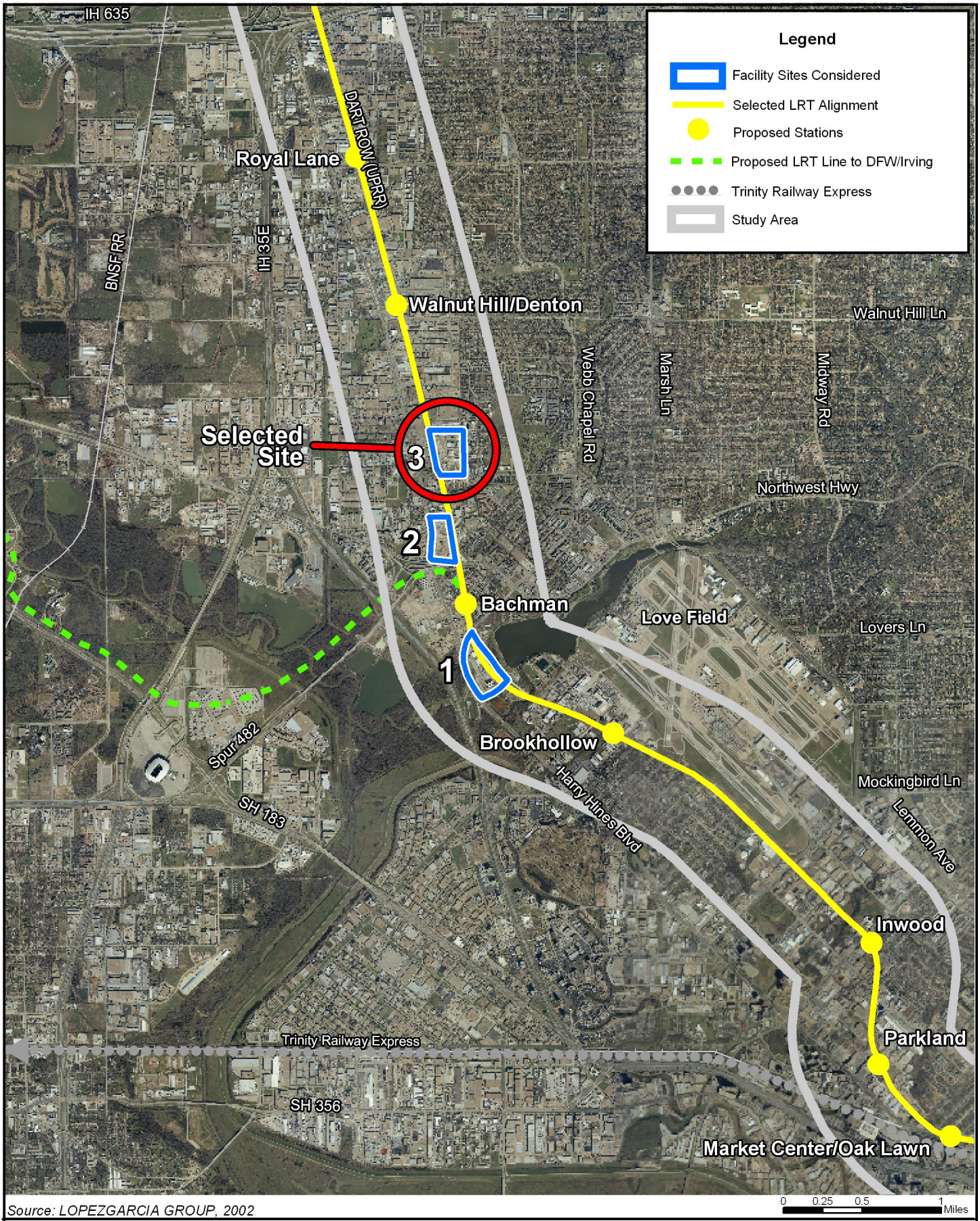
The conceptual composite unit prices were developed by using unit prices recently experienced by DART. Various major elements of the estimates include: right-of-way, utilities, special construction, grade preparation, trackwork, structures, grade crossings, stations, ticket vending machines, park and ride lots, traction electrification, communications, signals, maintenance facility and vehicles. Cost estimates for right-of-way acquisition are also included.





Source: Wallace Roberts & Todd, 2001

Figure 2-31
Inwood Station (North)
Considered But Not Selected
LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: LOPEZGARCIA GROUP, 2002

Figure 2-32

Rail Operating Facility Sites Considered in the Draft EIS

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

Cost estimates have been developed based upon the current 10% level of preliminary engineering design. The cost estimate for the Selected LRT Alternative is provided in **Table 2-4.**

TABLE 2-4
CAPITAL COST ESTIMATES

	Estimated Cost (millions)
Selected LRT Alternative (Base LRT + UPRR Medical Center alignment)	$ 938

Source: Sunland Engineering, Inc., March 2003

2.5 OPERATIONS AND MAINTENANCE COSTS

2.5.1 Bus System

A spreadsheet-based cost model was developed to estimate the annual operating budget required for DART to provide service according to the alternative bus operating plans. The operating and maintenance (O&M) model is based on DART's FY 2001 costs to operate, maintain, and administer bus services.

O&M cost variable information (cost/mile, cost/hour, cost/peak vehicle) for directly-operated fixed-route services was provided by the DART Office of Management and Budget. Directly-operated fixed-route cost variables reflect a cost allocation model that includes all costs within the bus services area. O&M cost variables (cost/hour) for purchased fixed-route services and On Call services were drawn from current contract rates for similar services.

The DART Service Area is not expected to increase or decrease in size as a result of the implementation of the proposed project. Thus, DART Paratransit expenses are presumed to remain unchanged and are, therefore, not included in the cost estimation analysis.

Additional model input was drawn from several sources. Those sources included:

- Route alignments and headways for routes serving rail stations – from the *Northwest LRT Corridor Station by Station Bus Feeder Plan* created by DART Service Planning;
- Route speed – extracted from DART and NCTCOG TNET modeling output;
- Route length – measured in ArcView GIS (Geographic Information Systems) software; and,
- Northwest Corridor Major Investment Study (MIS) – provided model input for the No-Build Alternative.

Using the above data, estimates were made of the annual number of weekday hours, miles, and peak vehicles which would be required to operate bus service according to the alternative bus operating plans. Two hundred and sixty (260) weekdays of operation were assumed.
Table 2-5 presents the calculated estimates of hours, miles, and peak vehicles for the bus operating alternatives.

TABLE 2-5
ANNUAL HOURS, MILES, AND PEAK VEHICLE ESTIMATE SUMMARY

Alternative	Hours (millions)	Miles (millions)	Peak Vehicles
Selected LRT Alternative (Base Alignment Center with UPRR alignment)	2.22	30.93	850
Other Alternatives Considered			
No-Build	2.08	29.38	809
Harry Hines Base Alignment	2.28	31.10	857
Harry Hines Base Alignment with Love Field Design Option	2.28	31.10	857
Base Alignment with Love Field and Medical Center Design Options A, B, C, or D	2.22	30.93	850

Source: LKC, Inc. January 2002; DART, March 2003

The appropriate O&M cost variables were then applied to the mile, hour, and peak vehicle estimates to calculate an estimation of annual operating costs. **Table 2-6** presents annual O&M cost estimates of the bus operating alternatives and the corresponding incremental cost over No-Build.

TABLE 2-6
BUS OPERATIONS AND MAINTENANCE COSTS

Alternative	Annual O&M Cost (millions) 2001 $	Increase Over No Build (millions) 2001 $
Selected LRT Alternative (Base Alignment with UPRR Medical Center alignment)	$122.46	$6.85
Other Alternatives Considered		
No-Build	$115.61	n/a
Harry Hines Base Alignment	$124.43	$8.82
Harry Hines Base Alignment with Medical Center Design Options A, B, C, or D	$122.43	$6.82
Harry Hines Base Alignment with Love Field Design Option	$124.43	$8.82
Base Alignment with Love Field and Medical Center Design Options A, B, C, or D	$122.43	$6.82

Source: LKC, Inc. January 2002; DART, March 2003

2.5.2 LRT System

The proposed LRT service is estimated to add 114,400 annual vehicle operating hours and 2,828,800 annual vehicle operating miles to the No-Build Alternative LRT system. The No-Build Alternative, which includes the existing 43-mile LRT system, is expected to be in full operation in 2004. The proposed project, which adds 17.6 miles to the LRT system, is estimated to add $23.5 million (2001 dollars) to the LRT operating costs for a total of $82.3 million in annual LRT operating and maintenance costs.

2.5.3 Systemwide Operations and Maintenance Costs

Implementation of the proposed project, and associated changes to the bus system, will result in increased systemwide operating and maintenance (O&M) costs. Costs for other alternatives considered are also shown. **Table 2-7** summarizes these systemwide O&M costs.

TABLE 2-7
ANNUAL SYSTEMWIDE OPERATING AND MAINTENANCE COSTS

MODE	ALTERNATIVES CONSIDERED (millions 2001 $)					
	SELECTED LRT ALTERNATIVE	NO BUILD	BASE	BASE + MEDICAL (A, B, C, or D)	BASE + LOVE	BASE + MEDICAL + LOVE
Bus[1]	$122.46	$115.61	$124.43	$122.43	$124.43	$122.43
Light Rail[2]	$82.20	$58.80	$82.50	$82.50	$82.80	$82.50
TRE[3]	$20.40	$20.40	$20.40	$20.40	$20.40	$20.40
Paratransit[3]	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00
HOV Transitways[3]	$5.70	$5.70	$5.70	$5.70	$5.70	$5.70
General Mobility-TDM[3]	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00
Total	$253.73	$223.51	$256.03	$256.03	$256.33	$254.03

[1] Calculated by LKC Consulting Services, Inc. based on FY02 bus operations costs
[2] Calculated by Parsons Transportation Group
[3] DART FY 2002 Business Plan (Exhibit 4.2: FY 2002 through FY 2006 Sources and Uses of Cash, 2002 column)

Source: LKC Consulting Services, Inc.; Parsons Transportation Group; DART, 2002

Chapter Three

Affected Environment

3.0 AFFECTED ENVIRONMENT

This chapter describes the existing natural and built environment conditions in the project corridor that would be affected by the Selected LRT Alternative and the other alternatives and design options considered during the Draft EIS. This information provides a baseline against which each alternative is compared for environmental changes or impact.

3.1 LAND USE

This section describes current land use patterns in the DART Service Area and in the project corridor. It also outlines land use policies and plans of the local jurisdictions in the corridor and identifies major activity centers and community facilities. The project corridor is defined as an area approximately one-half mile wide on either side of the Selected LRT Alignment and the other Design Option alignments that were considered in the Love Field and the Medical Center areas during the Draft EIS.

3.1.1 Regional Summary

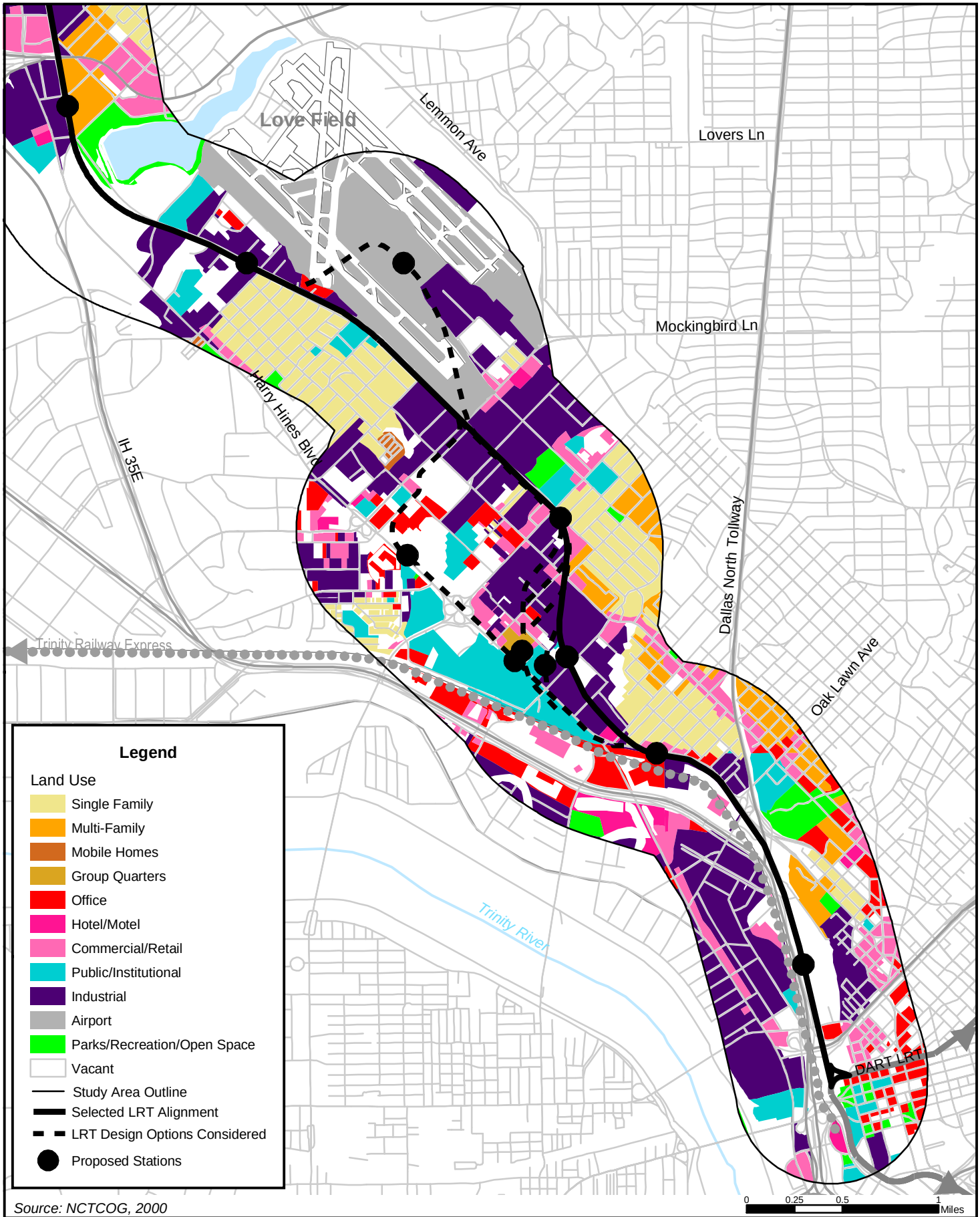
The DART Service Area is located in the Dallas/Fort Worth Metroplex – one of the fastest growing major metropolitan areas in the nation. DART provides transit service to 13 member cities within a 700 square mile region, with the City of Dallas as its urban center. All of DART's light rail transit lines provide access to downtown Dallas. The proposed project would be located within three cities – Dallas, Farmers Branch and Carrollton. The Dallas Central Business District (CBD) is the southern anchor of the corridor and Frankford Road in Carrollton is the northern terminus. The majority of the project corridor lies within the City of Dallas. Dallas is the commercial and industrial center for the Metroplex – approximately 15% of the City's land area is devoted to commercial, industrial and institutional uses. The City has a substantial residential population. In 2000, Dallas had a population of 1,188,580. According to NCTCOG, the largest single land use within the City is single-family residential, comprising 31% of the land area.

The City of Farmers Branch is the smallest of the cities within the corridor. As of the 2000 Census, the City had 27,508 residents. According to NCTCOG, approximately 33% of Farmers Branch's land area is devoted to residential uses. Commercial, industrial and institutional land uses comprise 32% of the land area. The City of Carrollton lies in the northern portion of the project corridor. It is the ninth largest city in the Metroplex with a 2000 population of 109,576. Residential land uses within Carrollton comprise 33% of its land area according to NCTCOG. Commercial, industrial and institutional land uses comprise 16% of the land area.

A very high percentage of the industrial and commercial land uses within Carrollton, Farmers Branch and the northwest sector of Dallas lie within the project corridor. The land use pattern in the area surrounding the corridor is heavily influenced by transportation accessibility. In the western portions, commercial and industrial uses are dominant. These areas are accessible to rail and major highways including IH 35E, IH 635, Northwest Highway and the new SH 190 President George Bush Turnpike (PGBT). In areas just to the east of the project corridor, land uses are mostly residential with a mixture of multi and single-family housing. The Elm Fork of the Trinity River lies just west of the project corridor.

3.1.2 Existing Land Use

Land use along the Selected LRT Alignment in the project corridor are described in this section. **Figures 3-1 to 3-3** illustrate general land use patterns within the corridor. (These maps were prepared from NCTCOG's 2000 Land Use Data.) **Table 3-1** below provides the number of acres and percentage of land area by each land use category.



Source: NCTCOG, 2000

Figure 3-1

Generalized Land Use

South Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

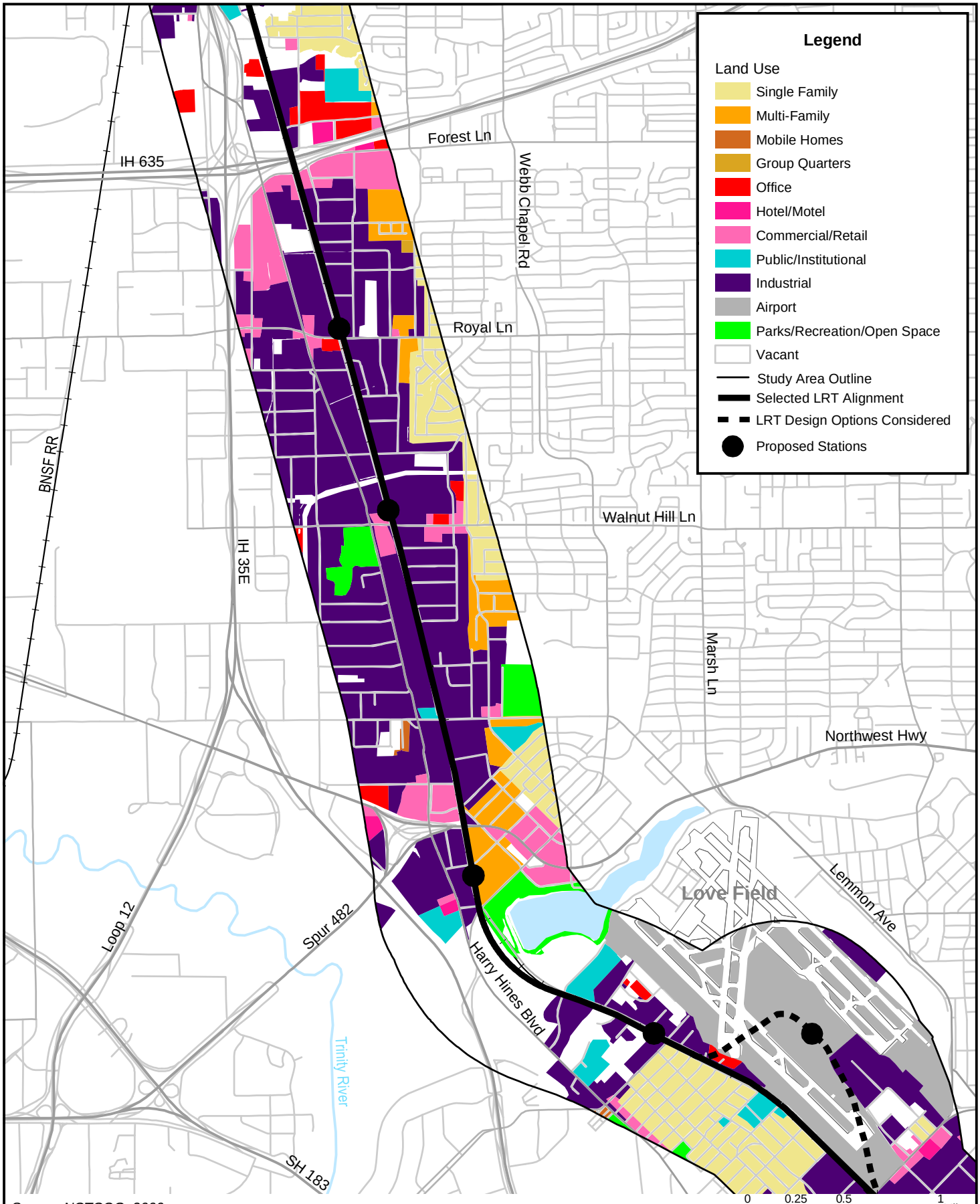
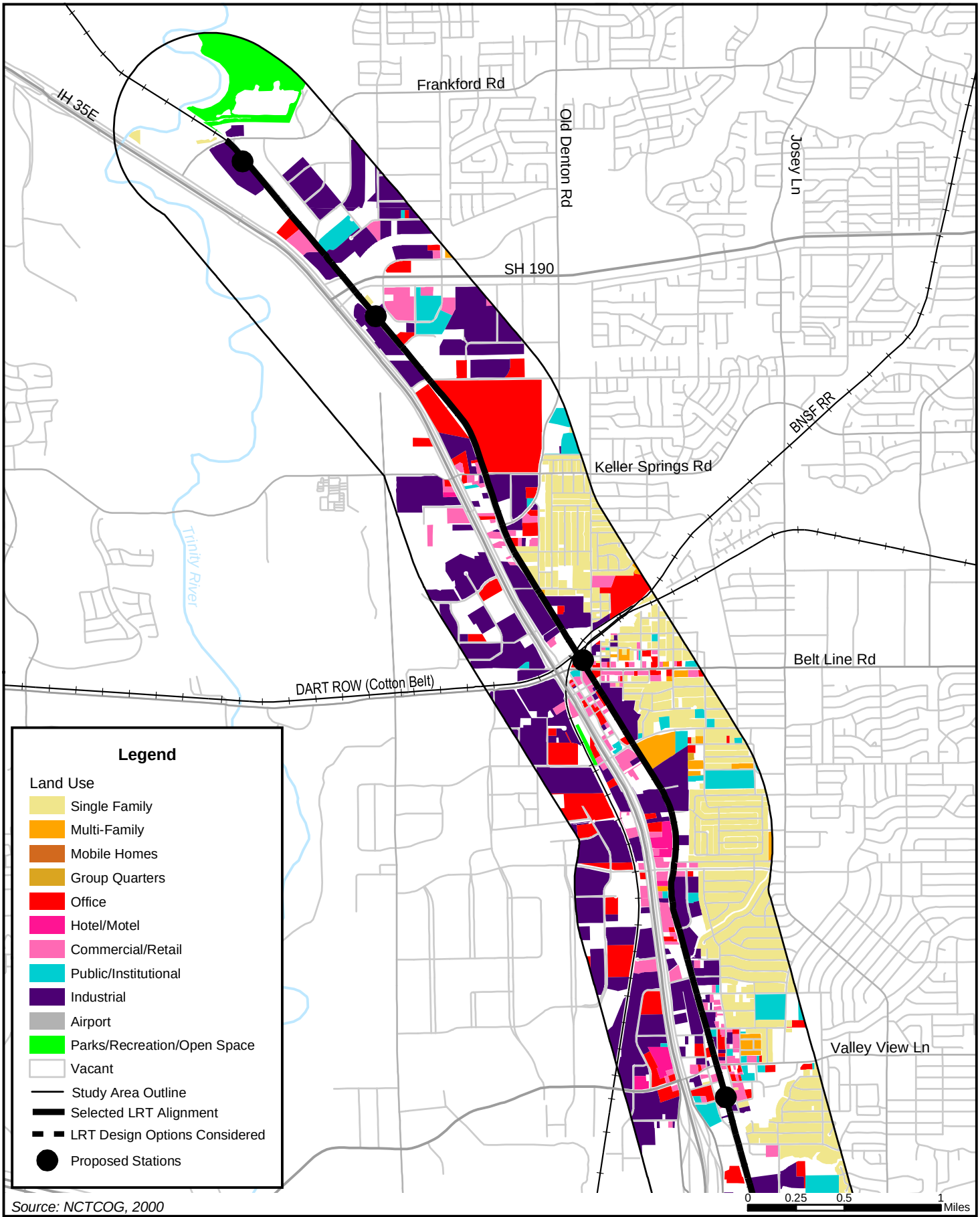


Figure 3-2

Generalized Land Use

Middle Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: NCTCOG, 2000

Figure 3-3

Generalized Land Use

North Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

TABLE 3-1 CORRIDOR LAND USE		
Land Use Category	**Acres**	**% of Land Area**
Commercial	1,587	13%
Dedicated Land	469	4%
Industrial	3,499	29%
Infrastructure	2,030	17%
Institutional	526	4%
Multi-family	354	3%
Other Residential	54	0.4%
Single Family	1,499	12%
Under Construction	8	0.1%
Vacant	1,994	16%
Water	128	1%
Total Acres	12,148	

Source: Renee Perkins Jaynes; North Central Texas Council of Governments; April 2001

The table and figures clearly illustrate the high concentration of nonresidential land uses within the corridor. Industrial uses comprise 29% of the land area. This is a much higher percentage than any of the corridor cities. Dallas, Farmers Branch and Carrollton range from 7% to 15%. The second most prevalent use in the corridor is infrastructure – 17% of the land area. This compares to 4% to 5% for the corridor cities. Commercial uses within the corridor are also higher-13% compared to 4% for Carrollton, 5% for Dallas, and 11% for Farmers Branch.

As expected, residential land use within the project corridor is much lower than the corridor cities. Only 16% of the land area is devoted to residential compared to 36% for Dallas and 33% for Farmers Branch and Carrollton. The corridor also has less vacant land than the cities, with 16% vacant compared to 22% for Farmers Branch, 24% for Dallas, and 36% for Carrollton. A more detailed description of land use in each city within the corridor is presented below.

Dallas

The Dallas Central Business District (CBD) anchors the southern portion of the project corridor. The predominant land use within the CBD is commercial, representing over half the land area. Downtown Dallas is the location of over 2,500 businesses and approximately 29.4 million square feet of office space. The second highest land use in the Dallas CBD is institutional. The uses in this category include governmental agency offices, educational facilities, and arts and cultural institutions. Within the last decade, the downtown area has been experiencing an increase in multi-family residential housing. The Central Dallas Association reports that as of the third quarter 2000, 31 housing developments were either planned or under construction within one mile of downtown Dallas. This represents a total of 6,100 units, with over 2,000 of these units planned within the CBD Freeway Loop. Just north of the CBD, the line is adjacent to the new American Airlines Center. A 70-acre mixed-use redevelopment and in-fill project, known as the Victory Development, is planned for the area adjacent to the Center.

North of downtown, the land use pattern in the corridor becomes more varied and mixed. The western portion of the corridor is heavily dominated by industrial and commercial uses. The eastern portion is a mixture of residential, commercial and industrial. The residential uses include some single-family structures, however the majority are higher density multi-family uses. Reverchon Park, a major recreational facility and park, is also located in this portion of the project corridor.

Heading north along the line, the proposed alignment parallels Harry Hines Boulevard. Just west of Harry Hines is the Dallas Market Center complex. This complex is the world's largest wholesale merchandise mart comprised of six buildings containing 6.9 million square feet of space. Numerous hotels can be found in this area, with frontage along IH 35E (Stemmons Freeway). East of the Market Center is a mixture of uses, from single family residential to industrial and commercial. North of Wycliff Avenue the proposed alignment crosses over Harry Hines Boulevard and rejoins the DART-owned UPRR right-of-way. The land uses immediately east of the proposed alignment are primarily older industrial uses, with some vacant land and structures. The exception to this is 5225 Maple where an apartment complex is currently under construction by the Maple Avenue Development Corporation. Land uses fronting on Maple Avenue are primarily retail and office, with some light industrial. Single-family and multi-family residential uses are located east of Maple. The land uses immediately west of the proposed alignment are predominantly social and medical service businesses, and parking for Parkland Hospital. Approximately ¼ mile west of the alignment is Parkland Hospital, Salvation Army facilities, Children's Medical Center and Zale Lipshy Hospital. The University of Texas Southwestern Medical School is within ½ mile of the proposed alignment.

Along Denton Drive, south of Inwood, the land uses are residential and commercial to the east, with commercial and industrial uses to the west and fronting along Denton Drive and Inwood Road. Rusk Middle School is located at the northeast corner of Inwood and Denton. Heading north along Denton to Mockingbird, land uses are primarily commercial and industrial with some small pockets of residential west of Denton Drive. There is active rail freight activity in the area. Weichsel Park is located on the east side of Denton Drive, north of Inwood Road.

North of the Medical District, the proposed alignment continues in the DART-owned UPRR ROW. In this area, the Dallas Love Field influences the land uses in the corridor. Dallas Love Field is the City of Dallas' central hub for regional business and commuter air travel and home to Southwest Airlines. Industrial and heavy commercial uses can be found around Dallas Love Field, particularly to the south and east. Just west of Dallas Love Field, the corridor contains single-family residential areas. North of Dallas Love Field the proposed alignment lies primarily within the DART ROW and parallels Denton Drive. The land use pattern along the remaining parts of the corridor reflects the influence of the railroad and the interstate access – industrial with a number of warehouse/distribution uses. The area just north of Dallas Love Field includes the Bachman Lake recreational area – a major recreational facility for the City of Dallas. The corridor also intersects Northwest Highway where the primary land uses are commercial and multi-family. The area also contains several governmental facilities including DART's Northwest Bus Operations Facility, the City of Dallas Northwest Police Substation, City of Dallas sanitation facilities and the Bachman Water Treatment Plant.

North of Northwest Highway, the land uses along the corridor are primarily industrial and heavy commercial. The alignment parallels Denton Drive, and Harry Hines Boulevard is located just to the west. A site has been selected at the northeast corner of Denton Drive and Lombardy Lane for the new Northwest Rail Operating Facility. Land uses surrounding the site include industrial, commercial, institutional, and multi-family.

The Asian Trade District is located just west of the proposed alignment in this section of the corridor north and south of Royal Lane. Multi-family and single-family residential uses begin approximately 1/4 to 1/2 mile east of the corridor. At LBJ Freeway, highway commercial is the dominant use including several automobile dealerships. North of LBJ, office and industrial continue as the dominant use in the corridor.

Farmers Branch

In the City of Farmers Branch, the Farmers Branch Historical Park is located in the project corridor. This 22-acre park contains several historical structures and a visitor's information center promoting

the heritage of Farmers Branch. Single family residential is also found in this section of the corridor. North of Valley View Lane, industrial land uses are again predominant in the corridor. The western portion of the corridor contains heavy commercial uses fronting IH 35E. The eastern portion of the corridor contains single-family residential uses.

Carrollton
North of Valwood Parkway, the uses are primarily industrial and heavy commercial to the west, and industrial and single family to the east. Old Downtown Carrollton is located just south of Belt Line Road. In this historical area, land uses include retail and public open spaces. North of Belt Line, the predominant land uses are industrial on the west and adjacent to the rail line, and single family to the east. A City of Dallas Water Treatment Plant is also in this portion of the project corridor, south of SH 190 President George Bush Turnpike. The Frankford Trade Center, a major industrial park, is located south of Frankford Road, the project terminus. Trinity River (Elm Fork) floodplain and a gold course property lie just north of the LRT terminus.

3.1.3 Land Uses in Design Option Areas

Several design options were considered during the Draft EIS. In the Dallas Love Field area, a tunnel alignment to serve the airport and a station at Dallas Love Field was analyzed but not selected. In the Medical Center area, five alternative alignments through that area were considered (Harry Hines Base and Options A, B, C, D). The Harry Hines Base Alignment located the LRT and two stations within the median of Harry Hines Boulevard. The northernmost UTSW/Exchange Park Station was on the east side of Harry Hines at the UTSW North Campus. Four additional Design Options (A, B, C, and D) were considered. Design options A, B, and C, turned the LRT east just north of Lofland and placed a station at the northeast corner of Lofland and Harry Hines. Design Option D turned the LRT just north of Motor and placed a station at the northeast corner of Motor and Harry Hines. Land uses in the areas where Design Options were considered during the Draft EIS are described below. The land uses adjacent to the Selected LRT Alternative are included in the previous section.

Dallas – Love Field Design Option
Land uses at Dallas Love Field are primarily aviation-related. In order to assess the effects of implementing an LRT tunnel under airport property and station near a planned terminal, an understanding of the uses and facilities is provided in this section. Airport facilities are divided into two categories: landside and airside. Airside facilities include the runways, taxiways and other facilities associated with the movement of aircraft. Landside facilities include those uses that support airport operations and related businesses.

Dallas Love Field airside facilities include two parallel east-west runways (13L-31R and 13R-31L), and a single north-south runway (18-36). Full-length Taxiways A and B (13L-31R), C (13R-31L), and D (18-36) provide the entrance and exits at each runway end. Other taxiways provide additional access to and from runways and taxiways to non-movement areas. Runway protection zones (RPZ's) are located at both runway ends and influence land uses to keep runways clear of objects and development.

Related to the airside facilities are navigational aids (NAVAIDs). NAVAIDs provide pilots with guidance and position information and are used to define airspace routes. Primary terminal NAVAIDs (those facilities located at airports) include Instrument Landing Systems (ILS) and supplementary aids.

The ILS provides the aircraft with three basic types of navigational information. Lateral guidance information indicates to the aircraft whether it is to the right, left, or aligned with the runway approach course line. This information is provided by the ILS Localizer (LOC). Vertical guidance information indicates the aircraft position above, below, or along the proper descent angle towards the runway touchdown point. This information is provided by the ILS Glide-Slope (GS). Distance

information indicates the aircraft's approximate distance from the runway threshold. This information is provided indirectly by the ILS Outer and Middle Markers (OM, MM) in conjunction with the applicable instrument approach procedure chart, and directly by the Distance Measuring Equipment (DME) located at the LOC. Supplementary aids such as Compass Locators (LOM) are sometimes provided at one or both of the Marker sites to assist the aircraft in locating the ILS course. Approach lighting systems with sequenced flashers and other visual aids are usually provided to work in conjunction with the ILS. Use of ILS facilities becomes mandatory in poor weather conditions – providing the landing approach path information necessary when visibility is obscured.

FAA uses a 'three or four letter identifier' located before the acronym of the NAVAID to identify the location of the NAVAID, as shown below:

- LOC – Localizer
- GS – Glide Slop
- MM – Middle Marker
- OM – Outer Marker
- RVR – Runway Visual Range
- MALSR – Medium-Intensity Approach Lighting System With runway Alignment Indicator
- LOM – Compass Locator at the ILS
- VASI – Visual Approach Slope Indicator
- SSALR – Simplified Short Approach Lighting System with Rail
- DME – Distance Measuring Equipment
- REIL – Runway End Identification Lights

Dallas Love Field has four Instrument Landing Systems on runways 31L, 31R, 13L, and 13R. All runways at Dallas Love Field have some type of visual aid. These facilities are identified below:

- Runway 31L – LVF LOC, LVF GS, LVF MM, LVF OM, LVF RVR, LVR MALSR, CONIS LOM
- Runway 31R – OVW LOC, OVW GS, OVW MM, OVW MALSR, DAL RVR, DAL VASI
- Runway 13R – DPX LOC, DPX GS, DPX MM, DALB VASI, DALB SSALR
- Runway 13L – DAL LOC, DAL GS, DAL MM, DAL OM, DAL DME, DAL RVR, DAL MALSR
- Runway 36 – DALC VASI, DALA REIK
- Runway 18 – DALA VASI

Landside facilities include the terminal building and associated facilities and gates. Currently, Dallas Love Field has 17 gates in use. The West Concourse has 14 gates in use. The North Concourse has 10 available gates, but all are used for loading, office or training spaces. The East Concourse was demolished in Spring 2002. Southwest Airlines occupies the West Concourse. Passenger and public functions are located on the second level, while operations and administrative-related uses are at ground level and the second floor. The Central Lobby is the focal space of the terminal building, providing ticketing, concessions, seating and public amenities. The area southeast of the terminal building includes the old East Ticket Wing, which is mostly vacant.

Dallas – Medical Center Design Options

Design Options A, B, and C, would have left Harry Hines right-of-way just east of Parkland Hospital, in a shallow tunnel. The land uses in the area include parking, commercial and industrial. The Salvation Army's Carr P. Collins Social Services Center is adjacent to the proposed alignment options in this area. The land uses heading east along the three alignments to Maple Avenue are primarily light and heavy industrial, with some limited office uses. Hernandez Elementary School is located just north of Medical Center Design Option A, west of Maple Avenue. Along Maple Avenue, there are retail and industrial uses. Maple Avenue is known as the "Main Street" of the

area (historically known as "Little Mexico"). Medical Center Design Option D, developed during the DEIS comment period, would have left the Harry Hines right-of-way north of Motor Street in a shallow tunnel. Land uses along Option D are similar to those for Option B, with the exception that the land uses around the station area are primarily Parkland Hospital support facilities and parking. Northeast of Parkland property, the alignment would re-join the UPRR south of O-K Paper. East of Maple along Denton, the design options share a common alignment with the Selected LRT Alternative.

The fifth alignment option considered in this area (the Harry Hines Base Alignment) would have continued north in the median and along the eastern side of Harry Hines Boulevard north of Inwood Road. It would have turned east at Treadway Drive and paralleled Mockingbird Lane on its south side, then re-joined the UPRR ROW north of Mockingbird. The area along Harry Hines Boulevard from Motor Street to Mockingbird Lane is dominated by the social and medical service industry including the University of Texas Southwestern Medical Center, Parkland Hospital, Children's Medical Center, and Salvation Army facilities. Land uses around the Medical Center District are primarily office and industrial, with some pockets of older residential uses to the east and west. The south side of Mockingbird Lane is primarily office and light industrial uses, including the Exchange Park office complex.

3.1.4 Local Land Use Plans/Policies

Local plans and policies related to land use and growth need to be considered when examining existing conditions. The corridor lies within the jurisdiction of three municipalities: Dallas, Farmers Branch and Carrollton. A review of the plans and policies affecting property within the project corridor is summarized below by city.

Dallas

The City of Dallas adopted ***The Growth Policy Plan*** in 1987 as a policy framework for land use and development within the City. The plan was amended in 1990 and 1993. The plan calls for the City to support growth nodes, where appropriate, to utilize the transportation capacity provided by the DART system. The plan encourages transit-supportive development by calling for higher density mixed-use development around transit stations in areas appropriate for redevelopment or new development. The plan also states that station area plans should be prepared to address transportation linkage issues, site layout and design, and possible increased densities around DART stations.

In addition to ***The Growth Policy Plan***, the City has several subarea plans covering the project corridor. The following is a brief outline of these studies.

- ***The Northwest Highway Urban Design Study*** (1999) – This study supports planning efforts by DART and recognizes the economic potential for redevelopment with the construction of a light rail station at the intersection of UP (DART) railroad right-of-way and Northwest Highway.

- ***The Stemmons/Harry Hines Corridor Implementation Study*** (1996) – This study addresses land use, infrastructure and transportation issues within the corridor. It recommends revitalization strategies for strengthening businesses within the corridor, particularly the Asian Trade District.

- ***The Northwest Highway Area Revitalization Neighborhood Improvement Study*** (1992) – This study focuses on revitalization and stabilization strategies for the residential and commercial areas along Northwest Highway. The report references the Dallas Love Field North Land Use Study and that report's recommendations for the DART rail line and station.

- ***Dallas Love Field - North Area Land Use Study*** (1988) – This study addresses land use and airport related issues for the residential area just north of Dallas Love Field Airport. The study recommends that any light rail alignment in the area should provide access to Bachman Lake Park and the Bachman Recreational Facility. The study also recommends that DART concentrate parking facilities for the line near the Northwest Highway Station and provide only limited parking at the Walnut Hill Station. The study also requests DART to consider shared parking facilities in the Bachman Lake Park area.

- ***Dallas Love Field West Land Use Study*** (1987) - This study addresses land use issues for the residential areas immediately west of Dallas Love Field Airport. The plan discusses the proposed light rail alignment as one source of mass transportation available to the community. One concern expressed in the study was the potential impact of the DART line. The report recommends that DART consider the Harry Hines Corridor as an alternative to the railroad corridor. It also recommends that station area plans be prepared to analyze the potential impact of proposed transit stations on existing residential areas. If a station is placed adjacent to a residential area, the study recommends that commercial redevelopment be limited and of a neighborhood-service scale.

- ***Dallas Love Field East Land Use Study*** (1986) - This study addresses land use issues for the residential and commercial areas immediately east of Dallas Love Field. The report references the proposed Denton Drive alignment for the LRT line stating that the project would bring enhanced bus service to the Study Area.

Farmers Branch
The City adopted a ***Comprehensive Plan*** in 1989 and it is currently being updated. It addresses land use, transportation, public services and utilities, and city design. It sets forth a generalized pattern of land use and transportation, and establishes policies and guidelines for the City's future development.

The City of Farmers Branch has prepared plans for the Old Farmers Branch Area in anticipation of the future rail line. The report entitled ***Revitalization of the Old Farmers Branch Area*** was prepared for the City in 1991. This report recommends strategies for redevelopment of the area noting the major influence the DART rail station would have on the viability and character of the area's redevelopment. The report includes a conceptual development plan identifying potential joint development opportunities. The City has purchased several parcels in the station vicinity and is planning for transit-supportive land uses around the station. The City has also created a Tax Increment Financing (TIF) district designed to attract transit-supportive development near the proposed station area. In Fall 2000, the city revisited its revitalization plan and is currently conducting more detailed land planning and public involvement activities to build support for transit-oriented land uses around the Farmers Branch Station.

Carrollton
The City of Carrollton's ***Comprehensive Plan*** was adopted in 1991 and has been amended several times, most recently in October 2001. The City is currently updating the plan and staff anticipates its completion by early 2003. The current plan addresses DART issues in its Transportation Section. The two policies addressing DART focus on the mode of public transportation provided (encouraging paratransit as an alternative to cross-town fixed route service) and stressing coordination of local transportation improvements with DART's transit facilities. The ***Comprehensive Plan*** also identifies the future DART rail line in its Transportation Plan. The plan update will address several planning issues related to the DART project, focusing on the neighborhoods and commercial areas in proximity to the LRT stations.

The City's ***Old Downtown Carrollton Plan*** (1988) encourages the development of a light rail transit station in the vicinity of the Old Downtown area. The plan focuses on increasing pedestrian access in the downtown area. The City has recently completed a study called the ***Carrollton Renaissance Initiative***. It examines the commercial and residential redevelopment opportunities in Old Downtown Carrollton. This included planning for the DART station near Old Downtown Carrollton focusing on station location, conceptual layout of the station, urban design, parking, and opportunities for linkages with adjacent land uses. The study also examined planning issues for the Trinity Mills and Frankford station areas.

Other Land Use and Master Plans

There are several other land use and land development plans affecting property within the project corridor. Several of these are large-scale master plans developed by private and institutional property owners within the corridor.

- ***Dallas Plan*** – The Dallas Plan is a citywide plan developed by a privately funded, non-profit organization created to form a partnership between the City of Dallas and hundreds of local organizations and individuals. This plan was initiated in 1992 and adopted by the Dallas City Council in 1994. It is a 30-year comprehensive plan that focuses on citywide projects and policy issues. The Dallas Plan organization recently completed a study of the biotechnology industry in Dallas. Focus of the study was the "biotech corridor" that is located in the Harry Hines Medical District. The report proposes an action plan for enhancing the biotechnology industry in Dallas. They recommend creating a biotechnology area near UTSW. LRT is considered an important transportation component of achieving the plans.

- ***UTSW Medical Center Master Plan*** – Located within the City of Dallas, the UTSW Medical Center has a Master Plan to accommodate their future facility needs. The initial Master Plan used by DART in the early stages of planning focused on their needs through approximately 2010. This plan showed a light rail corridor that generally followed the Harry Hines Base Alignment for LRT service to the Medical District area. The major components of the plan included development of several buildings in the North Campus area (some of which are under construction), and construction of student housing south of Mockingbird between Forest Park and Maple Avenue (completed in 2001).

  UTSW updated their Master Plan at the end of 2001 to extend the plan to the years 2012 and 2025. The new 2012 and 2025 Master Plans reflect an LRT alignment consistent with the Selected LRT Alternative. The new plans also include renovations and new buildings in the North Campus and South Campus areas, additional student housing, and new clinical facilities. Footprints for future buildings are now located in the area that was designated for the UTSW/Exchange Park Station bus facility area (under the Harry Hines Base Alignment) and in an area where the alignment alternative would have transitioned from Treadway to Mockingbird.

- ***Dallas Love Field Master Plan*** – This plan was adopted in 2001 by the City of Dallas to guide the airport's future landside and airside development. Phase 1 of the Master Plan entails opening additional gates, relocating a cargo building, developing a new commercial vehicle courtyard, demolition of the East Concourse, and initiating new roadway development. Phase 2 is demand-driven and emphasizes maximizing use of additional gates, completing the roadway development, and constructing a possible new East Terminal where the vacant ticket wing is located south of the existing terminal. The landside phasing approach could end with demolition of the vacant ticket wing, construction of roadways at the location of a possible East Terminal and adding a potential LRT station, followed by construction of the proposed new East Terminal. The Master Plan includes the proposed LRT and a Love Field Station in its landside development phasing plans, and reflects the station in the vicinity of the possible

future East Terminal building. Phase 1 elements are underway, whereas Phase 2 elements include potential projects under the ***Master Plan****;* no final decisions or plans have been made.

- ***Southwest Airlines Master Plan*** – This plan is currently being developed by Southwest Airlines for the build-out of their headquarters along Denton Drive at the northwest end of Dallas Love Field airport. In addition to several new facilities to accommodate planned growth, the Master Plan identifies a potential future DART light rail station north of Burbank Street.

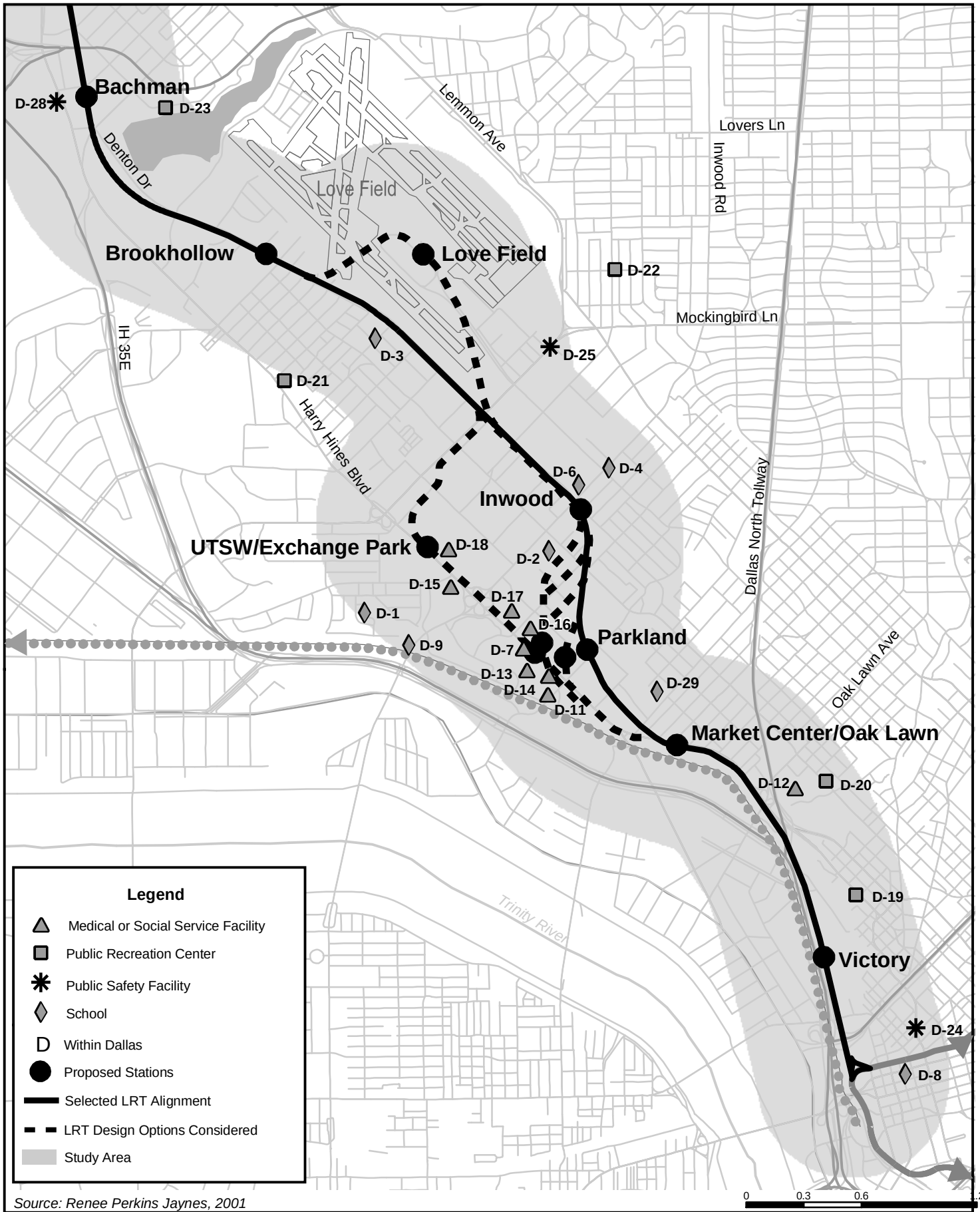
3.1.5 Schools, Community Services, Facilities, and Resources

Schools and community facilities within the project corridor are examined in this section. The majority of the residential areas lie in the eastern portion of the corridor. Most of the schools and community facilities serving the project area are also located in this area. **Table 3-2** identifies the schools and community facilities in the corridor. **Figures 3-4, 3-5 and 3-6** graphically depict their locations.

TABLE 3-2
SCHOOLS AND COMMUNITY FACILITIES

Facility	Location	Figure No.
Elementary Schools		
Arlington Park Community Learning Center, DISD	5606 Wayside Drive, Dallas	D-1
Onesimo Hernandez, DISD	5555 Maple Avenue, Dallas	D-2
Obadiah Knight, DISD	2615 Anson Road, Dallas	D-3
Maple Lawn, DISD	3120 Inwood Road, Dallas	D-4
Julian T. Saldivar, DISD	9510 Brockbank Drive, Dallas	D-5
Central Primary, CFBISD	1600 South Perry Road, Carrollton	C-1
Hope Medrano, DISD	2221 Lucas Drive, Dallas	D-29
Middle Schools		
Thomas J. Rusk, DISD	2929 Inwood Road, Dallas	D-6
Vivian Field, CFBISD	13551 Dennis Road, Farmers Branch	FB-1
Colleges and Universities		
UTSW Medical Center and School	5323 Harry Hines Boulevard, Dallas	D-7
El Centro College	801 Main Street, Dallas	D-8
TWU Dallas Parkland Campus	1810 Inwood Road, Dallas	D-9
Parker College of Chiropractic	2500 Walnut Hill Lane, Dallas	D-10
Dallas Christian College	2700 Christian Parkway, Farmers Branch	FB-2
Major Medical and Social Service Facilities		
Children's Medical Center	1935 Motor Street, Dallas	D-11
Texas Scottish Rite Hospital	2222 Welborn Street, Dallas	D-12
Parkland Memorial Hospital	5201 Harry Hines Blvd., Dallas	D-13
Zale Lipshy University Hospital	5151 Harry Hines Blvd., Dallas	D-14
St. Paul University Hospital	5909 Harry Hines Blvd., Dallas	D-15
UT Southwestern Medical Center	5323 Harry Hines Blvd., Dallas	D-7
Salvation Army Carr P. Collins Social Srvs. Ctr.	5302 Harry Hines Blvd., Dallas	D-16
Salvation Army Adult Rehab. Center	5554Harry Hines Blvd., Dallas	D-17
Salvation Army Texas Divisional Headquarters	6500 Harry Hines Blvd., Dallas	D-18
Gravley Center	1111 W. Belt Line Road, Carrollton	C-2
Public Recreation Centers		
Pike Recreation Center	2807 Harry Hines Blvd., Dallas	D-19
Reverchon Recreation Center	3505 Maple Avenue, Dallas	D-20
Grauwyler Recreation Center	7780 Harry Hines Blvd., Dallas	D-21
Polk Recreation Center (Love Field Des. Opt. Only)	6801 Roper Street, Dallas	D-22
Bachman Recreation Center	2750 Bachman Drive, Dallas	D-23
Crosby Road Recreation Center	1610 Crosby Road, Carrollton	C-3
Thomas Center	1620 Denton Drive, Carrollton	C-4
Public Safety Facilities		
DFD Station Number 18	660 N. Griffin Blvd., Dallas	D-24
DFD Station Number 42	3333 W. Mockingbird Lane, Dallas	D-25
DFD Station Number 43	2844 Lombardy Lane, Dallas	D-26
DFD Station Number 30	11381 Zodiac Lane, Dallas	D-27
FB Fire Station Number 1	2535 Valley View, Farmers Branch	FB-3
DPD Northwest Patrol Division	9801 Harry Hines Blvd., Dallas	D-28

Source: Renee Perkins Jaynes, December 2001, April 2003



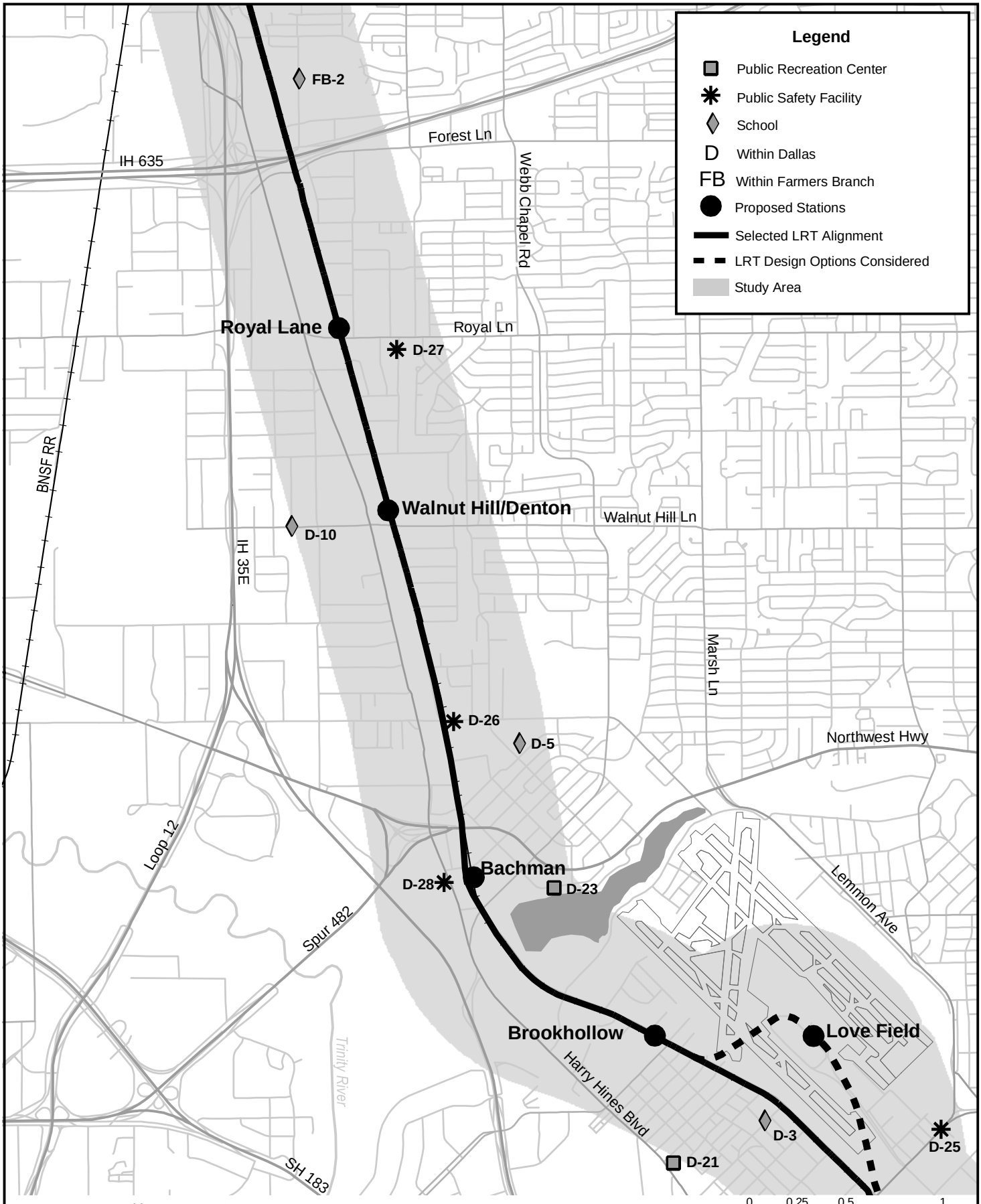
Source: Renee Perkins Jaynes, 2001

Figure 3-4

Schools and Community Facilities

South Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



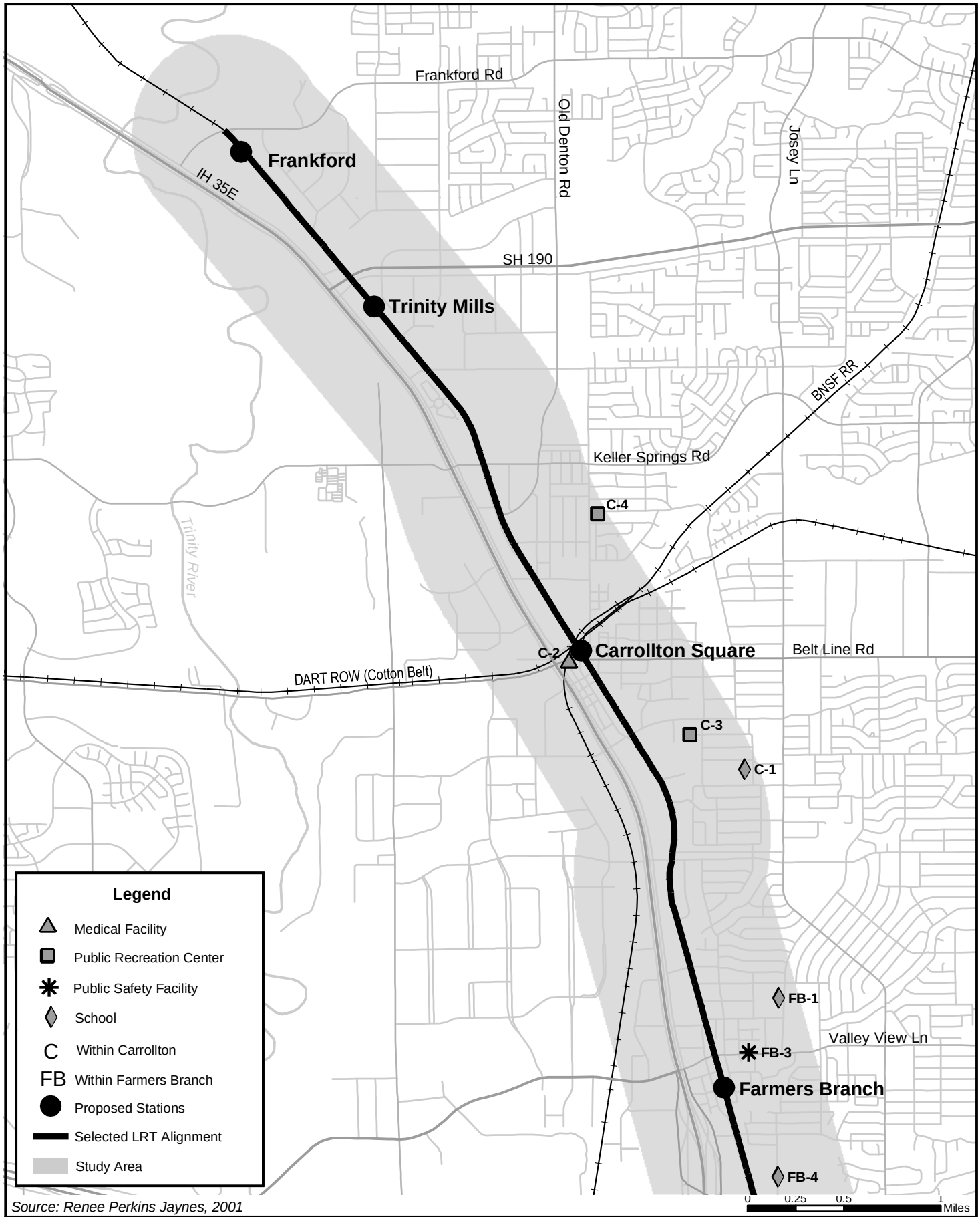
Source: Renee Perkins Jaynes, 2001

Figure 3-5

Schools and Community Facilities

Middle Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Renee Perkins Jaynes, 2001

Figure 3-6

Schools and Community Facilities

North Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

3.1.6 Major Activity Centers

A portion of the proposed project lies within the Stemmons Corridor – an area with one of the highest employment concentrations in the region. NCTCOG predicts that the Stemmons Corridor will contain 31% of total forecasted regional employment by 2010. A 1997 Transportation Management Study prepared for the corridor found a relatively low population to employment ratio in the area. Thus, the corridor has significant transportation needs due to its high employment concentration and the fact that a significant number of people travel to this destination for employment.

The project corridor contains several large employers, both commercial and institutional, surrounded by smaller supporting businesses and industries. These "activity centers" require transportation for both their employees and patrons. Three of the top five employers found within the City of Dallas are located within the corridor: Parkland Memorial Hospital, UTSW Medical Center, and Southwest Airlines.

Table 3-3 identifies the major activity centers and employers within the corridor. **Figures 3-7, 3-8 and 3-9** depict their location relative to the LRT alignment and station locations. A brief description of the largest of these centers is outlined below.

Dallas

- *Harry Hines Medical Center District (D-29 through D-36)* - This major activity center has significant transportation needs – it is the location of five major medical facilities including Dallas County's Parkland Hospital (D-30). A substantial number of patrons to Parkland, and the other facilities, rely on public transportation. The UTSW Medical Center (D-33) is a major medical facility as well as school. UTSW had the second highest level of employment within the district in January 2000 – 6,157 employees. In addition, the University's Master Plan outlines several new facilities to be constructed in the area.

- *Dallas Market Center (D-53)* - This complex is the world's largest wholesale merchandise mart covering more than 100 acres and consisting of six buildings containing 6.9 million square feet of space. The Dallas Market Center conducts 50 markets annually, attended by more than 130,000 retail buyers. Numerous hotels are located around the Market Center, including the Wyndam Anatole Hotel with approximately 1,500 employees (in January 1999).

- *Dallas Love Field (D-57)* – This major activity center is the City of Dallas' central hub for regional business and commuter air travel. This area is also the location of Southwest Airlines Corporate Headquarters and several other aviation related industries. In 2000, Southwest Airlines was the fifth largest employer in the City with 3,250 employees.

- *Other Dallas Centers* - A new arena north of downtown Dallas – the American Airlines Center (D-50) – opened in July 2001. A seventy-acre urban neighborhood is planned in the area, known as the Victory Project. A mixture of land uses is envisioned for the project – from residential to retail, hotel and office.

Farmers Branch

In Farmers Branch, there are several major employers within the project corridor. They tend to be more geographically dispersed making it difficult to identify specific activity centers in this section of the corridor. The majority of these employers are concentrated along the proposed LRT alignment and in areas just west of the LRT line. Within Farmers Branch, there are five employers in the corridor with more than 200 employees.

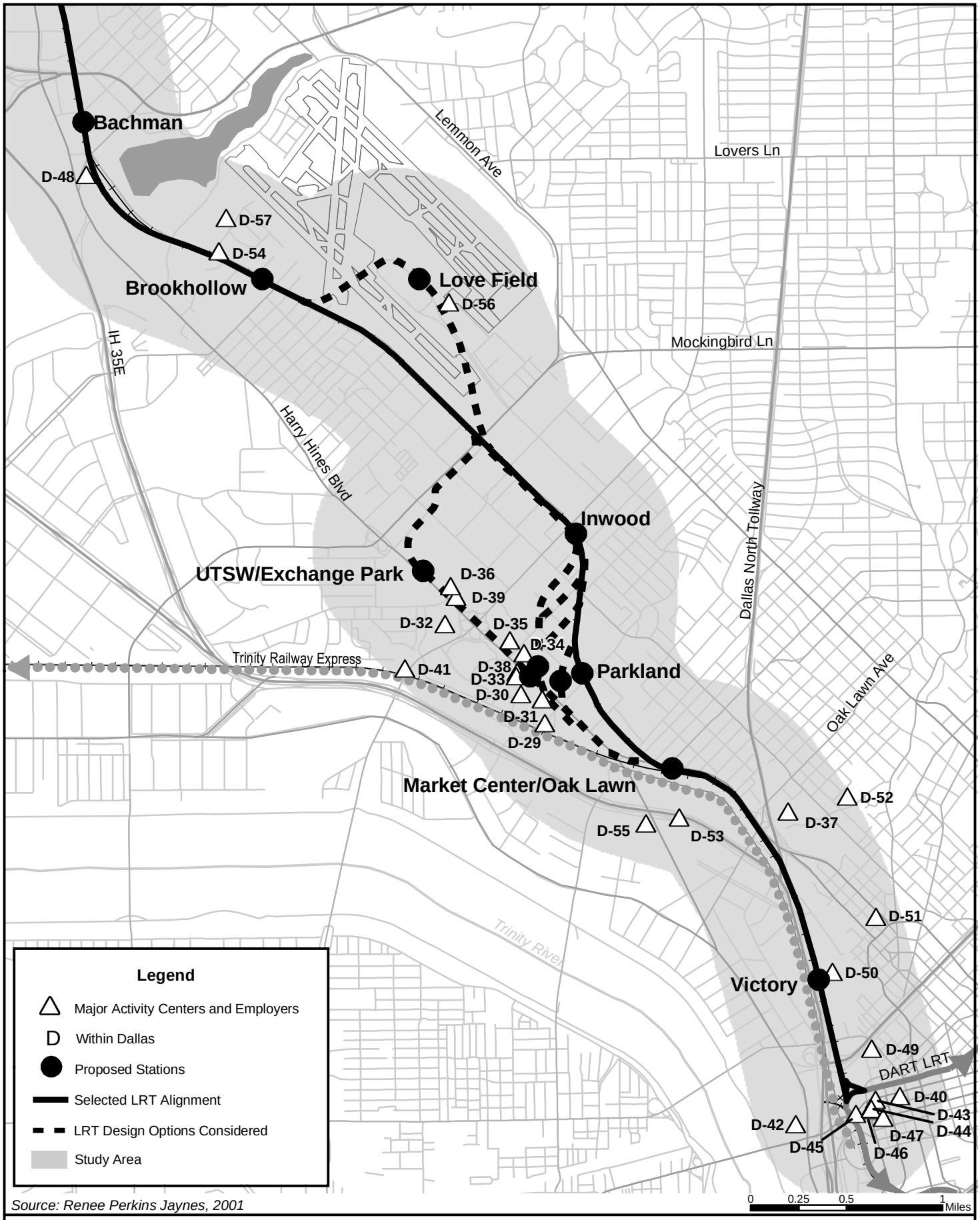
Carrollton

There are approximately 28 employers with 100 or more employees located within the City of Carrollton's portion of the project corridor. Nine of these employers have more than 200 employees. The majority of these employers, as in Farmers Branch, are concentrated along the proposed LRT alignment and in areas just west of the LRT line. One major activity center can be clearly identified – the Frankford Trade Center (C-6) at the northern end of the project corridor. It is a major industrial park and is designated as a Foreign Trade Zone.

TABLE 3-3
MAJOR ACTIVITY CENTERS AND EMPLOYERS

Name	Location	Figure No.
Harry Hines Medical District		
Children's Medical Center	1935 Motor Street, Dallas	D-29
Parkland Memorial Hospital	5201 Harry Hines Blvd, Dallas	D-30
Zale Lipshy University Hospital	5151 Harry Hines Blvd, Dallas	D-31
St. Paul University Hospital	5909 Harry Hines Blvd, Dallas	D-32
UT Southwestern Medical Center	5323 Harry Hines Blvd, Dallas	D-33
Salvation Army Carr P. Collins Social Services Center	5302 Harry Hines Blvd, Dallas	D-34
Salvation Army Adult Rehab. Center	5554Harry Hines Blvd, Dallas	D-35
Salvation Army Texas Divisional Headquarters	6500 Harry Hines Blvd, Dallas	D-36
Other Hospitals		
Texas Scottish Rite Hospital	2222 Welborn Street, Dallas	D-37
Higher Education Centers		
UT Southwestern Medical Center	5323 Harry Hines Blvd, Dallas	D-38
UT Southwestern North Campus	6000 Harry Hines Blvd, Dallas	D-39
El Centro College	801 Main Street, Dallas	D-40
Texas Women's University	1810 Inwood Road, Dallas	D-41
Dallas Christian College	2700 Christian Parkway, Farmers Branch	FB-4
Government Centers		
Dallas County Frank Crowley Courts Bldg.	133 N. Industrial Blvd, Dallas	D-42
Dallas County Administration Building	411 Elm Street, Dallas	D-43
Dallas County Records Building	500 Main Street, Dallas	D-44
Dallas County Old Criminal Courts Building	400 Main Street, Dallas	D-45
Dallas County Old Red Courthouse	100 S. Houston Street, Dallas	D-46
Dallas County George L. Allen Sr. Courts Building	600 Commerce Street, Dallas	D-47
DART, Northwest Service Center	2424 Webb Chapel Ext, Dallas	D-48
Farmers Branch City Hall	13000 William Dodson Pkwy, Farmers Branch	FB-5
Major Employers and Other Major Centers		
West End Market Place & Historic District	603 Munger Avenue, Dallas	D-49
American Airlines Center & Victory Project	2500 Victory Avenue, Dallas	D-50
Centex Corporation	2728 N. Harwood, Dallas	D-51
Republic Insurance	2727 Turtle Creek Blvd, Dallas	D-52
Dallas Market Center Complex	2100 Stemmons Freeway, Dallas	D-53
IBM Corporation	13800 Diplomat Road, Farmers Branch	FB-6
TD Industries	13850 Diplomat Road, Farmers Branch	FB-7
Stream International	1235 W. Trinity Mills Road, Carrollton	C-5
Southwest Airlines	2702 Love Field Drive, Dallas	D-54
Wyndham Anatole Hotel	2201 N. Stemmons Freeway, Dallas	D-55
K-C Aviation, Inc.	7350 Cedar Springs Road, Dallas	D-56
Dallas Love Field Airport	2702 Love Field Dr, Dallas	D-57
United Parcel Service	10155 Monroe Dr, Dallas	D-58
Frankford Trade Center	Trade Center Drive, Carrollton	C-6

Source: Renee Perkins Jaynes, December 2001



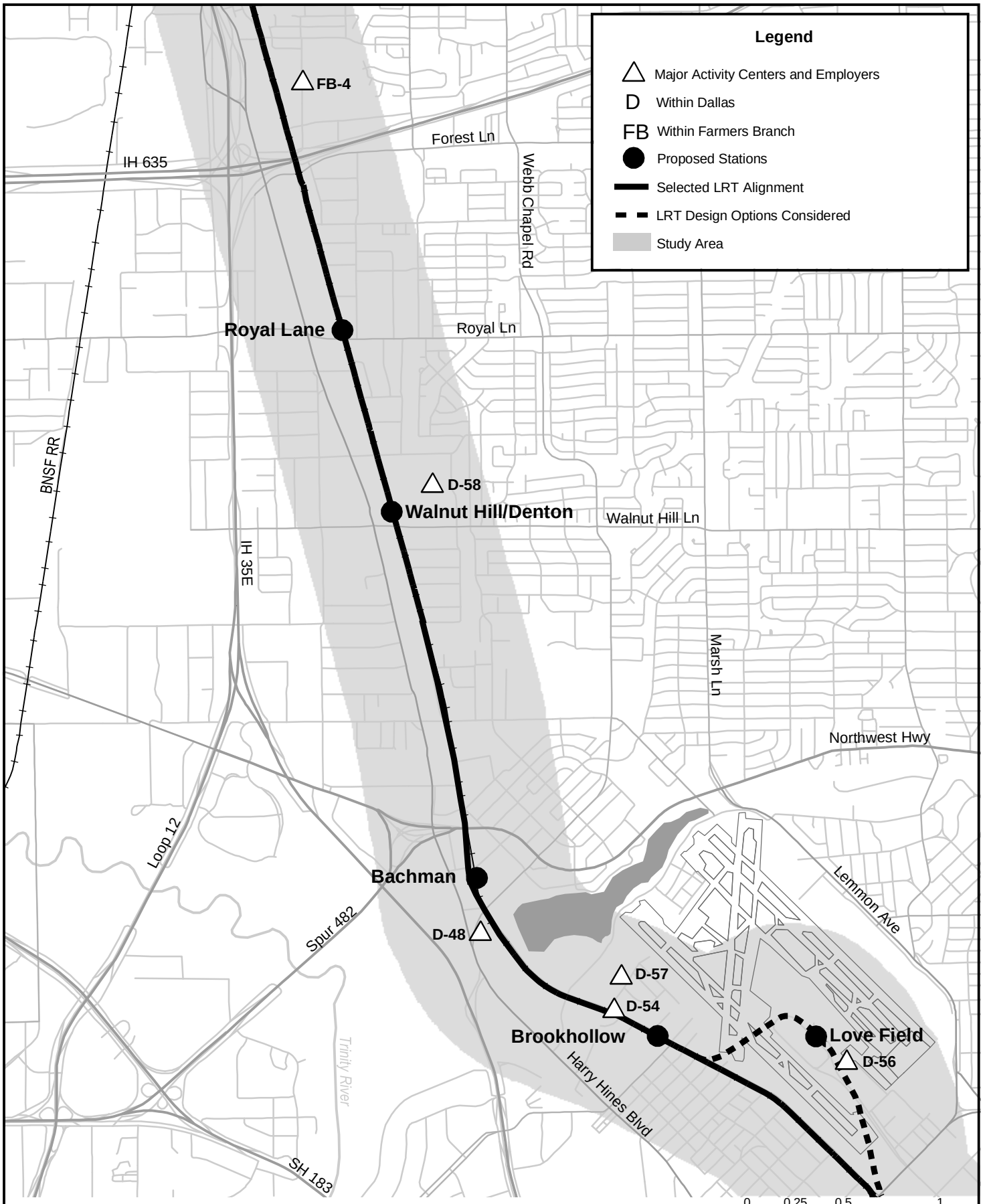
Source: Renee Perkins Jaynes, 2001

Figure 3-7

Major Activity Centers and Employers

South Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



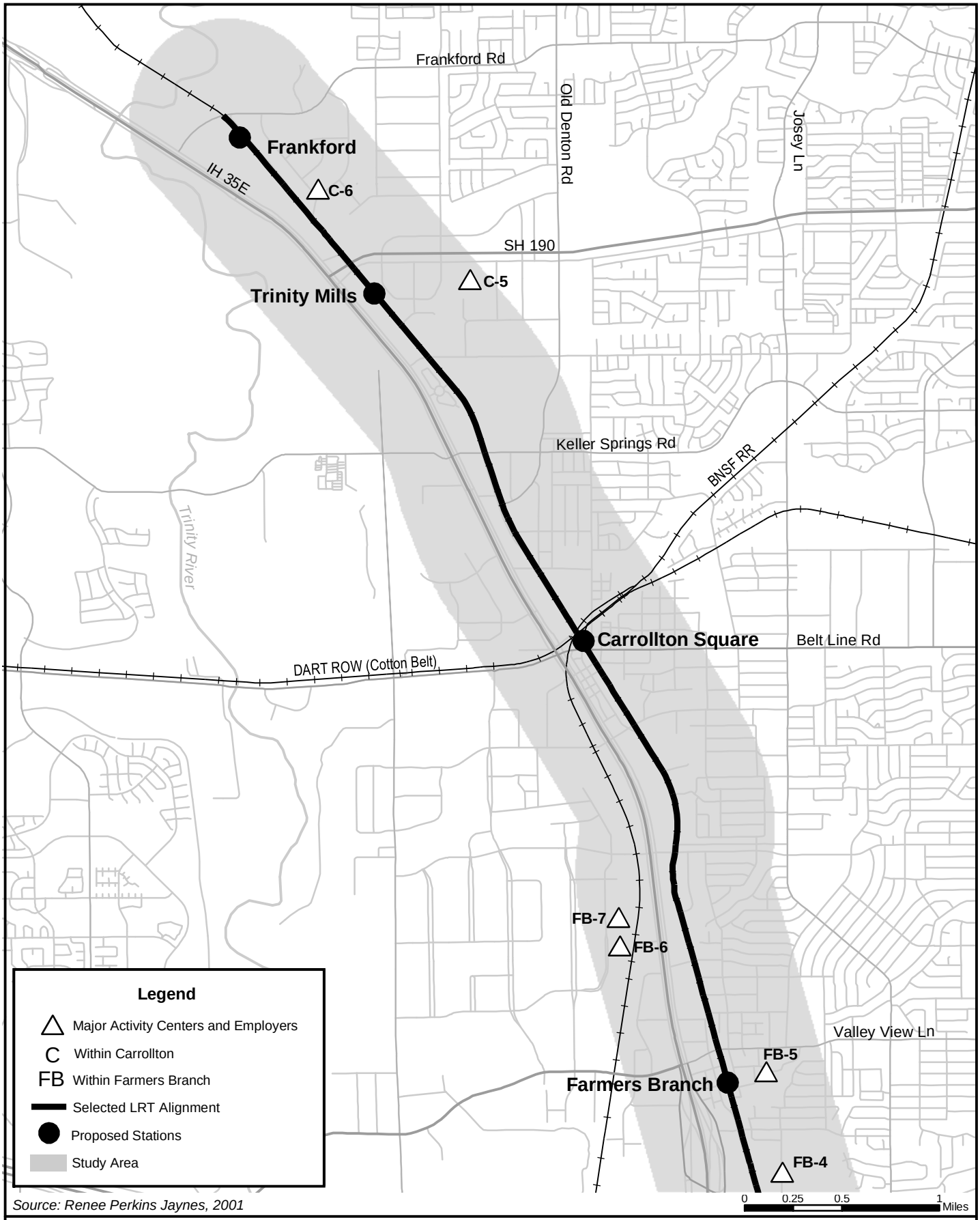
Source: Renee Perkins Jaynes, 2001

Figure 3-8

Major Activity Centers and Employers

Middle Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Renee Perkins Jaynes, 2001

Figure 3-9

Major Activity Centers and Employers

North Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

3.2 SOCIOECONOMIC CHARACTERISTICS AND NEIGHBORHOODS

This section describes the population and employment tends for the region, the project corridor (approximately one-half mile on either side of the Selected LRT Alternative) and the geographic areas impacted by the alternative alignments considered. It also outlines neighborhoods affected by the LRT project.

3.2.1 Population Dynamics

The Metroplex is the fastest growing large urban area in the nation according to the 2000 Census. The area grew by 29%, or approximately 1.2 million persons, between 1990 and 2000. The City of Dallas had an 18% increase in population from 1990 to 2000 – with a 2000 population of 1,188,580 residents. NCTCOG predicts that Dallas' population will grow by 22% between 1995 and 2025. The City of Carrollton grew by 27,407 residents, or 33%, between 1990 and 2000. This is the highest rate of population growth for all cities in the project corridor. The City's population in 2000 was 109,576. Carrollton is projected to increase its population by 41% by 2025. The City of Farmers Branch grew by 3,258 residents from 1990 to 2000. The City's population in 2000 was 27,508. Farmers Branch is projected to increase its population by 20% by 2025.

The corridor Study Area also experienced population growth between 1990 and 2000. The corridor is projected to continue adding residents. NCTCOG estimates that the corridor will increase its population by 39% between 1995 and 2025. **Table 3-4** below outlines NCTCOG's population projections for the corridor cities and Study Area.

TABLE 3-4
POPULATION PROJECTIONS (1995-2025)

Area	Population		Absolute Growth	Percentage Growth
	1995	2025	1995-2025	1995-2025
Dallas	1,034,400	1,263,550	229,150	22 %
Carrollton	90,950	128,700	37,750	42%
Farmers Branch	24,500	29,400	4,900	20%
Study Area	81,920	114,122	32,202	39%

Source: NCTCOG, April 2001

For transportation planning purposes, it is important to identify where this population growth has occurred. **Table 3-5** examines the population change from 1990 to 2000 for the corridor cities and census tracts. (See **Figures 3-10** and **3-11** for 1990 and 2000 Census Tract boundaries.) Only census tracts with a significant land area in the project corridor are included in this analysis.

The population growth rate for the corridor cities ranged from 13% to 33%. The median rate of increase for the corridor census tracts was 29%. Twenty of the twenty-three census tracts examined gained population. Seven tracts gained 1,000 or more residents. In Dallas, this includes the Stemmons Corridor (south of Northwest Highway) and areas around Dallas Love Field, north of Bachman Lake to Walnut Hill Lane, and north of Royal Lane to LBJ Freeway. In Carrollton, it includes an area north of Ryan Avenue to West Jackson Road.

The Study Area has a high percentage of racial minority residents. Approximately 42% of the project corridor's residents are members of a racial minority, compared to approximately 33% for the DART Service Area and Dallas County. The project corridor also has a high percentage of individuals of Hispanic origin, 38%, compared to approximately 16% for the County and Service Area. The 2000 Census data shows that the project corridor experienced a substantial increase in its Hispanic population during the last decade. Several areas more than doubled in the percentage of their population of Hispanic origin.

TABLE 3-5 POPULATION (1990-2000)		
City	**Change**	**%Change**
Dallas	181,703	18%
Carrollton	27,407	33%
Farmers Branch	3,258	13%
Census Tract		
4.01	337	9%
4.03	1,010	19%
4.04	726	18%
4.05	646	28%
5	920	19%
6.01	3,112	48%
19	784	73%
21	0	N/A
31.01	-930	(33%)
72.01	5,755	117%
96.1	2,113	63%
97.01	991	28%
98.03	1,002	39%
99	-61	(4%)
100	6,349	195%
137.13	754	48%
137.14	916	20%
137.17	851	40%
137.16	1,104	30%
137.19	888	35%
139.01	535	19%
140.01	281	8%
140.02	979	301%
Median	**888**	**29%**

Source: Renee Perkins Jaynes; U.S. Census Bureau, 1990 and 2000 Data

The project corridor is similar to the County and DART Service Area in the percentage of its population under the age of 18, approximately 25% to 26% of the residents.

The corridor, as a whole, has a higher percentage of elderly, approximately 22%, as compared to Dallas County and the DART Service Area, which are both under 10%. Some areas within the corridor did not follow this pattern and were below the County and Service Area average. Census Tracts 4.04 and 6.01 had a much lower percentage of elderly, only 5% and 3%, respectively.

The average median household income of the project corridor is lower than the County or the DART Service Area. The average median household income was $28,628 in 1990 compared to $42,183 for the Service Area. The percentage of persons defined as low income was also higher – 16% of the population compared to approximately 13% for the Service Area and Dallas County. In census tract 19, 67% of the residents were low income in 1990.

The project corridor population was also more transit dependent than Dallas County in 1990. Approximately 12% of the residents reported no access to an automobile compared to 8% for the County. The highest concentrations of transit dependent residents are located from Downtown Dallas to Inwood Road. In this segment of the corridor, 28% to 66% of the population stated that they had no access to an automobile.

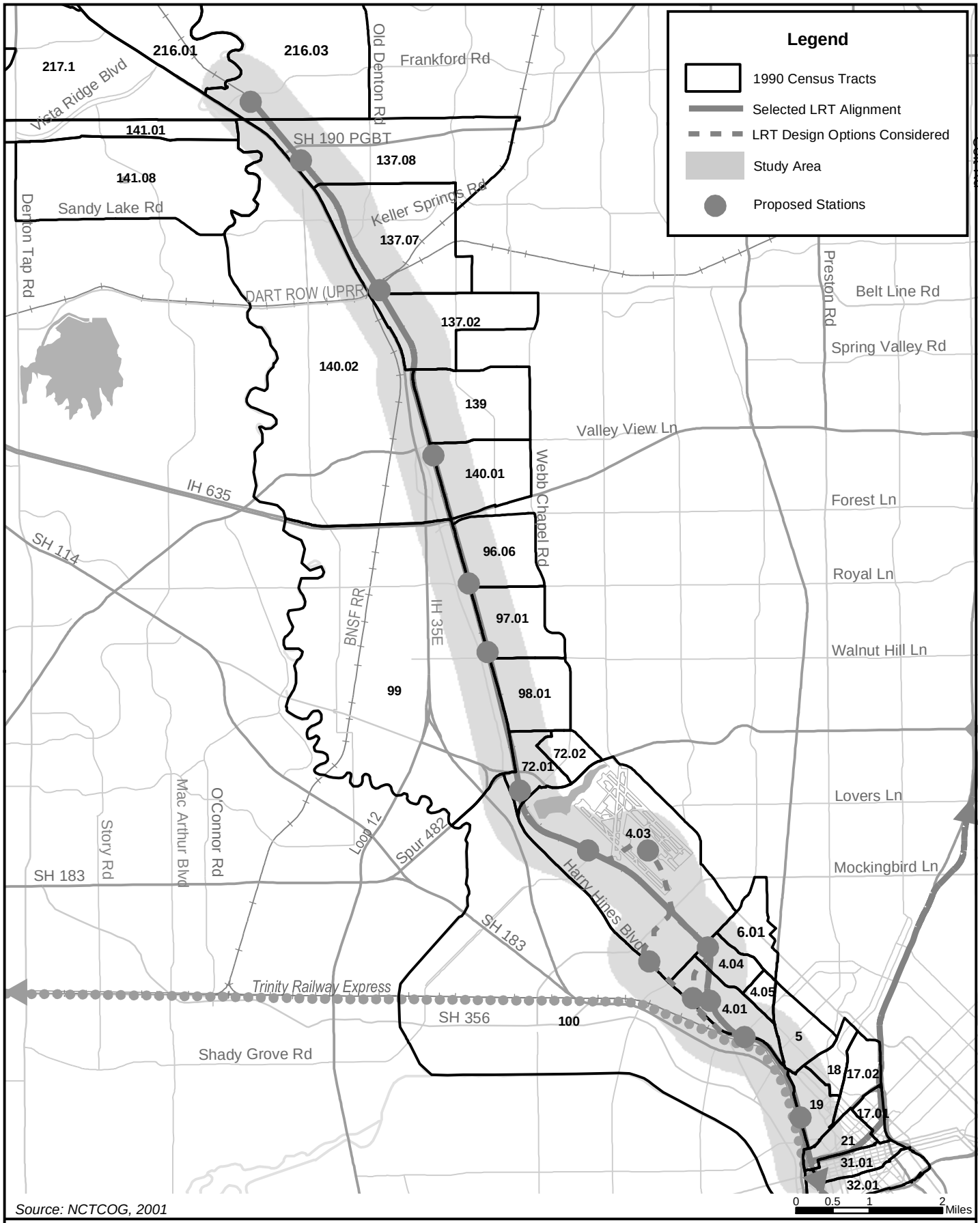
3.2.2 Labor Force and Employment Centers

This section outlines employment trends and projections for the region, Dallas County and the Study Area.

Employment Trends

The Study Area has one of the highest employment concentrations in the region. The corridor contains traditional suburb to downtown travel, but also reverse commute travel from the southern portions of Dallas County to employment centers within the corridor. The corridor has significant transportation needs due to its high employment concentration and the fact that a significant number of people travel to this area for employment.

According to NCTCOG, all census tracts within the corridor experienced employment growth between 1990 and 1998. A majority of the tracts had double-digit growth, with two tracts having an increase of over 50% (Tracts 4.05 and 17.02). Nine tracts added 1,000 jobs or more, with census tract 100 adding 15,237 jobs. Total employment for these areas in 1990 was 364,717. The estimated employment for 1998 was 420,310. This represents an increase of 55,593 jobs or 15%.



Source: NCTCOG, 2001

Figure 3-10
1990 Census Tract Boundaries

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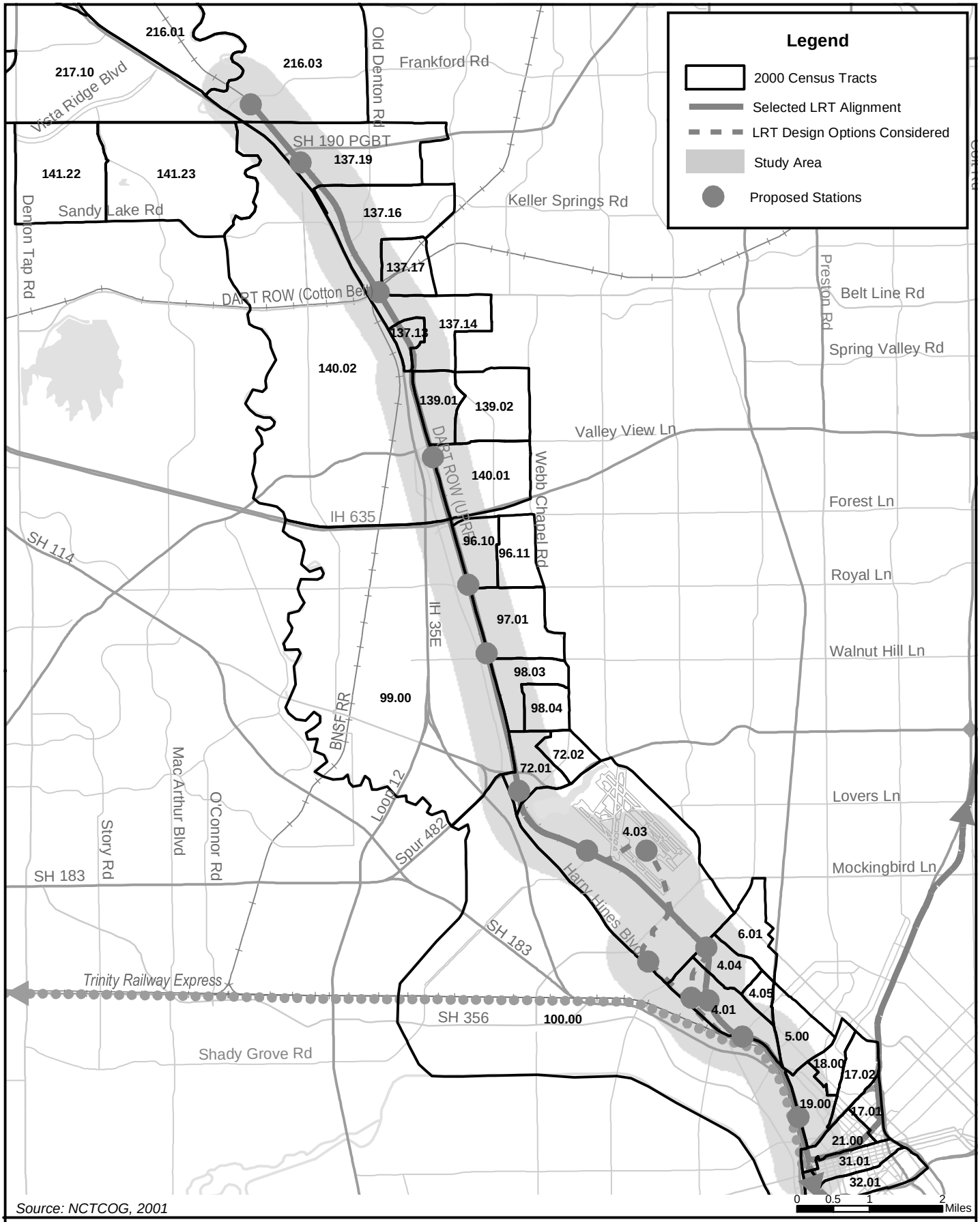

Source: NCTCOG, 2001

Figure 3-11
2000 Census Tract Boundaries

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Distribution Patterns

Downtown Dallas has the densest geographic concentration of employment within the Study Area. In 1990, downtown employment was 107,443. NCTCOG estimates that employment increased by 12% in 1998, to 120,602 jobs. Census Tract 21, with 66% of its land area residing in the project corridor, was projected to have a 21% increase in total employment from 1990 to 1998. The majority of the employment in the Study Area is located along the Stemmons Corridor (from Downtown Dallas to Northwest Highway). Employment was estimated to be 196,607 in 1998 – a 15% increase from 1990.

North of Northwest Highway and south of LBJ Freeway there are a significant number of warehouse/distribution firms. These uses tend to have lower employment per square foot of space when compared to office or manufacturing uses. Approximately 14% of total corridor employment in 1998 is found in these census tracts. This area had an estimated 59,966 jobs in 1998, representing a 15% increase from 1990.

North of LBJ Freeway, the Cities of Carrollton and Farmers Branch had 13% of total corridor employment in 1998 – an estimated 55,108 jobs. This geographic area was projected to have the highest rate of employment growth between 1990 and 1998 – 23%.

Employment Projections

A number of sources project that the North Central Texas Region will continue to have strong employment growth, continuing to outpace the national employment growth rate. NCTCOG projects total regional employment will increase from 2,296,200 in 1995 to 3,952,700 in 2025 – a 72% increase. Dallas County is projected to receive the greatest share of this growth, 42% or 700,100 jobs.

NCTCOG predicts that the City of Dallas' employment will grow by 39% from 1995 to 2025. Dallas is projected to have the highest total absolute growth among the corridor cities – employment is projected to increase by 338,100 jobs. The City of Carrollton is projected to have the highest rate of job growth in the corridor, with an increase of 55% or 26,100 jobs. Farmers Branch is also projected to increase its employment, with a 47% increase or 25,500 jobs. The project corridor had an estimated 298,449 jobs in 1995. Employment is projected to increase to 365,747 jobs by 2025. This represents an increase of 67,298 or 22%. Employment projections are shown in **Table 3-6**.

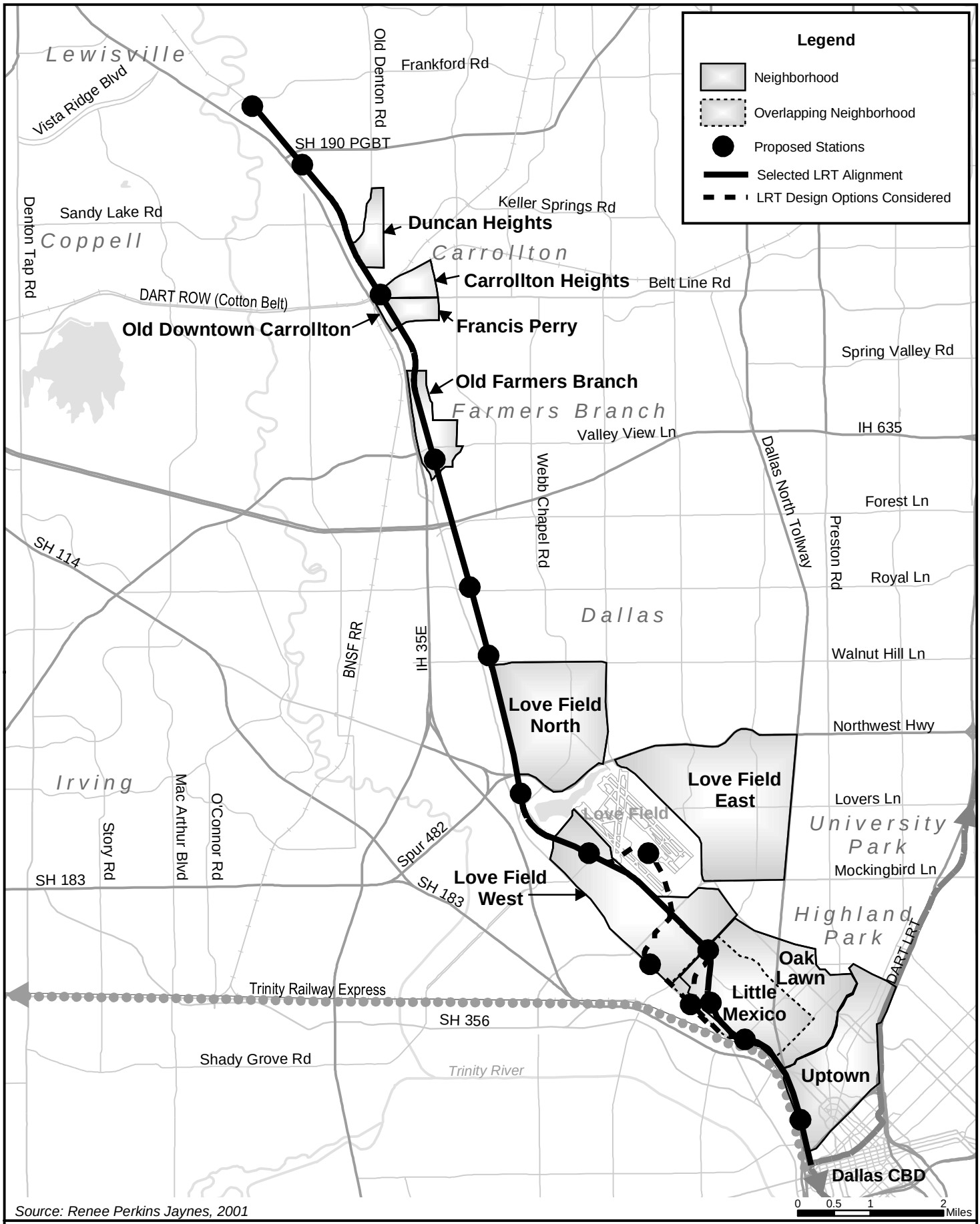
TABLE 3-6
EMPLOYMENT PROJECTIONS (1995-2025)

Area	1995 Jobs	2025 Jobs	1995-2025 Growth	1995-2025 %Growth
Study Area	298,449	365,747	67,298	22.55%
Dallas	857,150	1,195,250	338,100	39.44%
Carrollton	47,200	73,300	26,100	55.30%
Farmers Branch	53,850	79,350	25,500	47.35%

Source: Renee Perkins Jaynes; North Central Texas Council of Governments, April 2001.

3.2.3 Neighborhoods

There are numerous residential areas throughout the project corridor. Many of these do not have distinct boundaries or identities. Almost all of the residential land uses are located east of the proposed LRT Line. One exception is a neighborhood known as "Love Field West". **Figure 3-12** depicts the neighborhoods in the project corridor with defined geographic boundaries. Below is a brief description of each area.



Source: Renee Perkins Jaynes, 2001

Figure 3-12

Neighborhoods

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Uptown (Dallas)
This neighborhood is located just north of downtown Dallas and west of North Central Expressway. This mixed-use area consists of multi-family residential, a limited amount of single family residential, and a mix of hotels, commercial offices, service and retail businesses. The area is designated as a City of Dallas Public Improvement District that provides public amenities and services to the area.

Oak Lawn (Dallas)
This neighborhood is located north of Woodall Rodgers Freeway, east of Stemmons Freeway and Harry Hines Boulevard, west of North Central Expressway and south of Inwood Road. It is a mixed-use area that includes single family residential and multi-family uses. The area has a significant amount of retail, office and service businesses. It also includes a major city park and open space – Lee Park. Development within the Oak Lawn area is subject to the development standards and guidelines contained in the Oak Lawn Special Purpose District Ordinance.

Love Field West
This neighborhood is located directly west of Dallas Love Field airport in Dallas. The general boundaries are Harry Hines on the west, Bachman Lake Park on the north, Dallas Love Field airport on the east, and Inwood Road on the south. The predominant housing type in this neighborhood is single-family residential. The neighborhood does contain a limited number of duplexes, multi-family structures and mobile homes. This area was the subject of a land use planning study in 1987.

Love Field North or Bachman Area
This area is just north of Bachman Lake Park bounded by Harry Hines on the west, Marsh Lane on the east and Walnut Hill Lane on the north. A significant amount of housing in this area is multi-family. A study prepared by the City of Dallas in 1988 reported that approximately 75% of the housing units were apartments and 25% single family residential. This area has been the subject of several studies by the City including the ***Love Field North Land Use Study*** (1988) and the ***Northwest Highway Area Revitalization/Neighborhood Improvement Study*** (1992).

Love Field East
This area is located just east of Dallas Love Field airport, west of the Dallas North Tollway, north of Mockingbird Lane and south of Shorecrest/Northwest Highway. The neighborhood has both single family and multi-family uses. There are commercial and retail uses along the major thoroughfares. A land use study was adopted for this area in 1986.

Little Mexico (Dallas)
This area centers on Maple Avenue and is generally bounded by Inwood Road on the north, Harry Hines on the west, Cedar Springs on the east, and McKinney Avenue on the south. Maple Avenue is known as the “Main Street” for Little Mexico, which historically has been the focal point for the Hispanic community in Dallas. The area is served today by the Maple Avenue Economic Development Corporation (created in 1982) – a non-profit provider of affordable housing.

Old Farmers Branch Area (Farmers Branch)
This area is located just east of IH 35E, west of Rawhide Creek, north of Farmers Branch Lane and south of Spring Valley. This area contains a 22-acre historical park with homes and structures dating back to the mid-1800s. The Branch Crossing Neighborhood, located in Old Farmers Branch, is part of the City’s Renaissance Neighborhood Program. This program is designed to encourage infill housing and amenities in existing neighborhoods and encourage renovation of the existing structures while preserving a sense of history and character.

Old Downtown Carrollton (Carrollton)
This is the older commercial section of the City of Carrollton. It contains historic structures including a public square and gazebo that marks the center of downtown. The city recently studied this neighborhood. The ***Carrollton Renaissance Initiative*** recommended several public/private strategies for improving the commercial and residential areas. The Carrollton City Council approved the report and the DART LRT Station Areas, part of the Selected LRT Alternative, in June 2002.

Francis Perry and Carrollton Heights Neighborhoods (Carrollton)
These are the older residential areas adjacent to Old Downtown Carrollton. The Francis Perry Neighborhood is located just south of Belt Line Road and Carrollton Heights is located just north of Belt Line Road (see **Figure 3-12**). The ***Carrollton Renaissance Initiative*** examined station impacts in these areas and recommends standards for new development activity.

Duncan Heights (Carrollton)
This residential area is located east of the LRT ROW and north of Northside. For most of the neighborhood, commercial uses serve as a buffer between the railroad and the residences. However, a few homes in this area are in close proximity to the LRT ROW.

3.3 TRANSPORTATION

The proposed project would have to interface with the existing transportation system of roadways, highways, railroads, pedestrian/bicycle facilities, bus routes, and transit centers. This section describes the existing conditions of the transportation infrastructure within the project corridor, and lays the groundwork for determining what changes will have to be made to accommodate light rail.

3.3.1 Transit Services and Facilities

The project corridor is served by a network of 20 DART bus routes. Bus transit services operate in mixed traffic on city streets and on IH 35E south of IH 635 (**Figure 3-13**). Buses utilize high occupancy vehicle (HOV) lanes on IH 35E north of IH 635, and on IH 635 east of IH 35E. There are six local, two express, five circulator, one rail-feeder, and six cross-town routes in the corridor. The “circulator” routes operate between transit centers in outer Dallas and in the suburbs. There is also an express cross-town route that provides east-west service on IH 635 and two routes near the corridor that operate between Dallas Love Field and downtown Dallas. The corridor bus network generally is oriented in a north-south direction, radiating from downtown Dallas located at the southeast end of the Study Area. Cross-town service to the suburbs and outlying areas is limited.

There are two transit centers within the corridor providing park-and-ride facilities at major bus transfer centers. The North Carrollton Transit Center provides over 1,000 parking spaces and is served by one express bus route to downtown Dallas (Route 204) and two circulator bus routes. The Farmers Branch Park and Ride provides 240 parking spaces and is served by express bus Route 247 to downtown Dallas and two to six other circulator and cross-town bus routes depending on the time of day.

Finally, there is a commuter rail line operated by DART that travels through the southern end of the corridor. The Trinity Railway Express (TRE) rail line links downtown Dallas and downtown Fort Worth. The first ten miles of the service between downtown Dallas and South Irving opened in 1996, with stations at Union Station, the Medical/Market Center, and South Irving. The second 17 miles extended the service into Richland Hills in September 2000. Service to downtown Fort Worth opened in December 2001.

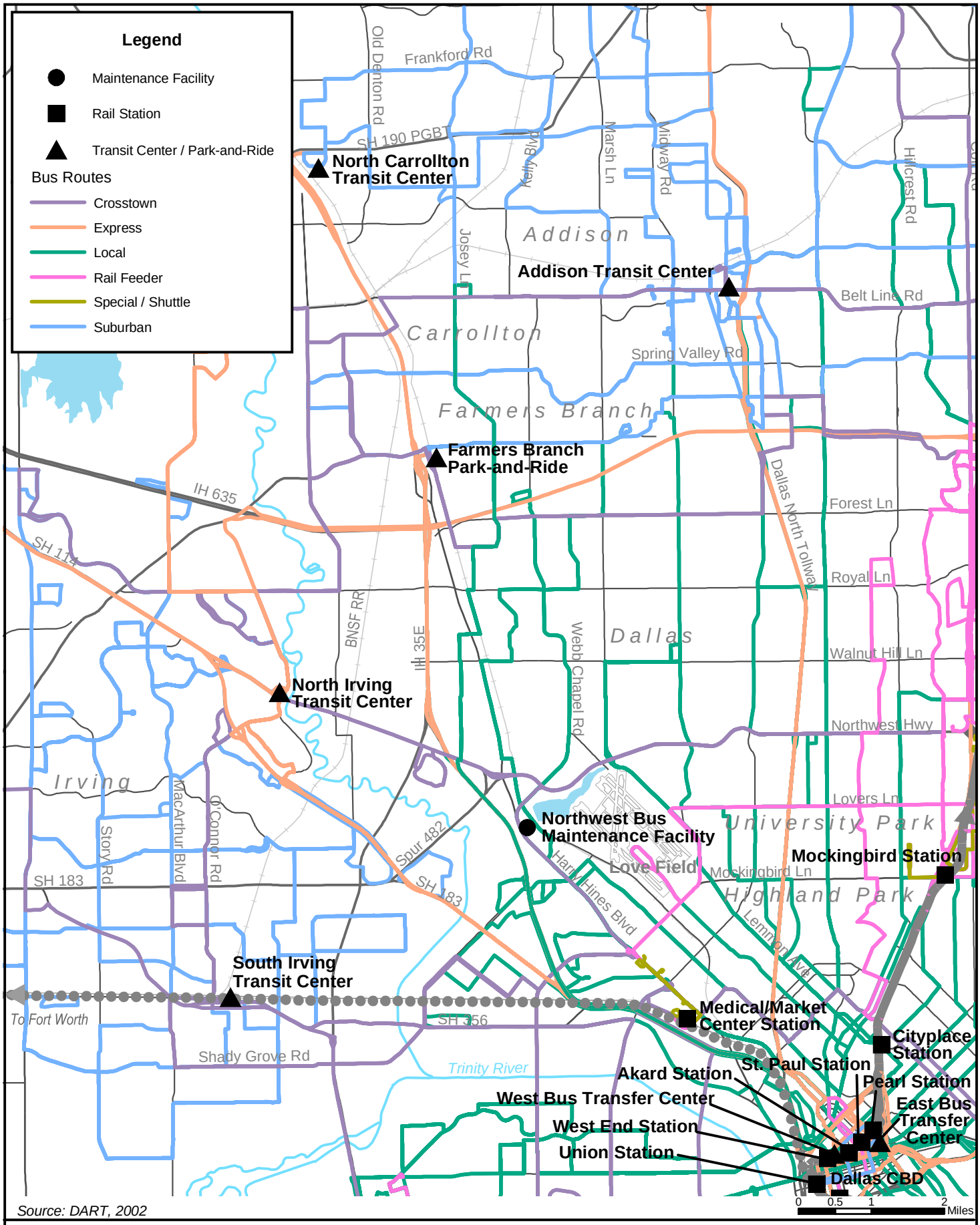

Figure 3-13
Existing Bus Routes

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Transit Operations and Ridership

Many of the 20 bus routes serving the corridor would need to be restructured when light rail service is initiated. The average ridership on the bus routes currently operating in the corridor is summarized in **Table 3-7**. Service descriptions and headways for each of the routes are summarized in **Table 3-8**. The bus routes traveling through the study corridor have a total average ridership of more than 1 million passengers each month, almost 90 percent of which use the system on weekdays. These routes account for about 27 percent of DART's total system-wide bus ridership. The highest ridership routes are found along Harry Hines Boulevard (through the Medical Center District) and Maple Avenue.

TABLE 3-7
EXISTING CORRIDOR BUS RIDERSHIP

Route	Average Weekday	Average Saturday	Average Sunday	Average Month End Passengers
Local Routes				
26	4,870	2,331	1,299	121,656
29	3,196	1,696	965	80,958
39	1,713	862	683	43,858
44	8,730	4,504	2,330	219,396
49	1,755	383	10	40,191
59	2,571	424	162	58,903
Express Routes				
204	1,517	No Service	No Service	33,370
247	107	No Service	No Service	2,350
Circulator (Suburban) Routes				
321	236	No Service	No Service	5,196
322	602	No Service	No Service	13,235
331	459	183	No Service	10,831
333	537	222	No Service	12,702
344	238	44	No Service	5,422
Cross-Town Routes				
400	1,847	643	12	43,263
405	2,533	1,441	1,072	65,780
409	4,745	2,678	1,463	120,954
428	4,040	2,175	734	100,516
453	3,459	1,698	1,130	87,404
486	2,172	954	226	52,496
Rail Feeder Routes				
539	274	20	No Service	6,100

Source: Parsons Transportation Group; DART; March 2001

Several types of transit use occur within the corridor. Some transit users drive to a park-and-ride lot and board a bus bound for downtown or destinations within the corridor. Other transit users walk to bus stops near their homes and board the bus bound for their place of employment. Depending on their destination, some of these latter transit users may use the transit centers to transfer from one bus route to another in order to reach their final destination. Finally, some transit users use the commuter rail that crosses through the south end of the corridor. These users are primarily long-haul commuters who drive to park-and-ride lots in suburban Fort Worth and Irving and ride the train into downtown Dallas. The first two types of transit users described above will be the ones most impacted by the extension of light rail into the corridor.

TABLE 3-8
CORRIDOR BUS OPERATIONS SUMMARY

Route	Description	Service Frequency (minutes)	
		Peak	Off-Peak
Local Routes			
26	King Arthur via Regal Row via Brookriver via Record Crossing to Dallas City Hall	10	20
29	Maple via Downtown Dallas via St. Augustine to Prairie Creek	15	40
39	Dallas Love Field to Downtown Dallas	15	40
44	RHD Medical Center via Brookhaven College via Downtown Dallas to Bexar Street	20	40
49	Regal Row to Downtown Dallas	10	40
59	Farmers Branch Park & Ride via Belt Line Road via Downtown Dallas via West Dallas to Tumalo Trail	20	40
Express Routes			
204	North Carrollton Transit Center to Downtown Dallas	5	40
247	Farmers Branch Park & Ride to Downtown Dallas	15	45
Circulator (Suburban) Routes			
321	Addison Transit Center to Farmers Branch Park & Ride	30	60
322	Skylane via Addison Transit Center to Farmers Branch Park & Ride	30	60
331	Trinity Medical Center to Farmers Branch Park & Ride	35	60
333	Addison Transit Center to Carrollton Transit Center	30	40
344	Downtown Dallas via Tollway to Carrollton Transit Center	30	60
Cross-Town Routes			
400	Garland Central Transit Center via Richardson Transit Center via Addison Transit Center to North Irving Transit Center	30	60
405	Parkland Medical Center to Ledbetter Station	30	40
409	Downtown Dallas to Medical/Market Center Station	16	35
428	South Garland Transit Center via Park Lane Station via Webb Chapel via Medical/Market Center to North Irving Transit Center	30	60
453	Medical Center to Southwest Center Mall	16	30
486	Garland Central Transit Center via North Central Transit Center to Farmers Branch Park & Ride	30	30
Rail Feeder Routes			
539	Medical/Market Center Station via Dallas Love Field Airport to Lovers Lane Station	30	40

Source: Parsons Transportation Group; DART; March 2001

Considering the large amount of employment and lack of residential development within the study corridor, DART's transit system is vital to the economic vitality of the corridor. It provides job opportunities for people from all areas and demographics (including those who are "transit dependent"), and it provides employers with a wider range of the labor pool. As employment opportunities increase within the corridor, the transit system will become even more important to employers and employees alike.

Transit Use Incentives

There are two transit pass programs that DART provides to promote transit usage through large employers. The FareShare program allows employers to provide their employees with monthly DART transit passes at reduced costs. The E-Pass program is an annual DART pass provided by the company to all employees. It provides unlimited transportation on all DART fixed-route bus and rail service, and free emergency taxi rides home. These programs, especially the E-Pass, become an additional company benefit and can help attract employees.

According to DART, there are 38 companies within the corridor that currently provide E-Passes to their 17,481 employees. However, it is impossible to know how many of these employees take advantage of the pass. The largest employer providing the E-Pass is Parkland Memorial Hospital with 6,400 employees. TXU, Bank of America, and Adam's Mark Hotel are the largest downtown employers providing E-Passes to their employees (about 1,500 employees each). The total number of employees with access to an E-Pass is roughly equal between the downtown area and the Medical/Market Center area.

3.3.2 Roads and Highways

The existing highway system in the corridor includes several freeways, a tollway, and a network of arterial roadways and local streets (**Figure 3-14**). Throughout the corridor, the proposed alignment runs along several arterial roadways, including Harry Hines Boulevard, Denton Drive, and Broadway Street. Harry Hines is a major six-lane divided arterial extending northwest from downtown Dallas and serving the Medical/Market Center area and commercial land uses. Denton Drive is a smaller, two-lane and four-lane arterial roadway that parallels the DART ROW (UPRR) freight line and Harry Hines Boulevard, providing access primarily to industrial areas. Denton Drive becomes a four-lane roadway within Farmers Branch serving industrial and residential areas. Finally, Denton Drive becomes Broadway Street when it enters Carrollton. Broadway Street is a minor, two-lane arterial roadway that serves a limited number of industrial and commercial areas.

In the northern half of the corridor, the proposed alignment runs closely parallel to the principal freeway in the area, IH 35E (Stemmons Freeway). IH 35E is part of a system of highways that radiates from the Dallas CBD freeway loop. IH 35E runs generally north-south. Currently there is a high occupancy vehicle (HOV) lane in each direction on IH 35E between IH 635 and Trinity Mills Road, and there are plans to extend the HOV lanes south of IH 635 to Loop 12.

Two limited-access highways cross the corridor, the largest of which is IH 635 (LBJ Freeway). LBJ Freeway is a "cross-town," outer loop freeway around the City of Dallas and currently has an HOV lane in each direction between US 75 and IH 35E. Plans are being prepared to widen the freeway and add HOV lanes, with construction slated to begin in about 2008. The President George Bush Turnpike (PGBT) is a second circumferential highway (toll facility, under construction in 2000 and now complete) near the northern end of the corridor in the City of Carrollton. The Turnpike currently is open from Garland through north Dallas and Carrollton to IH 35E. There are plans to extend the Turnpike southwest to connect to SH 161 at IH 635.

A grid-like street pattern of major arterial roadways exists for most of the corridor, though the grid is less defined west of the proposed alignment. Along most of these major arterial roadways, high traffic volumes contribute to congestion delays. The high volume-to-capacity ratios on many of these arterials result in unacceptable traffic operating conditions as defined by local and national standards. All major surface streets in the corridor, except Northwest Highway and Oak Lawn Avenue, cross the DART ROW (UPRR) tracks at-grade. The tracks cross the frontage roads of LBJ Freeway, but are grade-separated from the freeway's main lanes. Similarly, the tracks cross the frontage roads of the President George Bush Turnpike, but are grade-separated from the main lanes and the freeway-to-freeway connection ramps.

Traffic Volumes and Trends

Traffic volumes in the Dallas urbanized area are considered some of the highest in Texas. IH 35E carries an average of 160,000 to 270,000 vehicles per day within the corridor. IH 635 (LBJ Freeway) provides east-west access through the corridor and carries an average of 170,000 vehicles per day west of the corridor, and 300,000 vehicles per day east of the corridor. These volumes are the highest in the Dallas urbanized area. Traffic volumes on most of the arterial roadways in the study corridor are also high, with several carrying over 30, Selected characteristics of the streets serving the Study Area are shown in **Figure 3-14.**

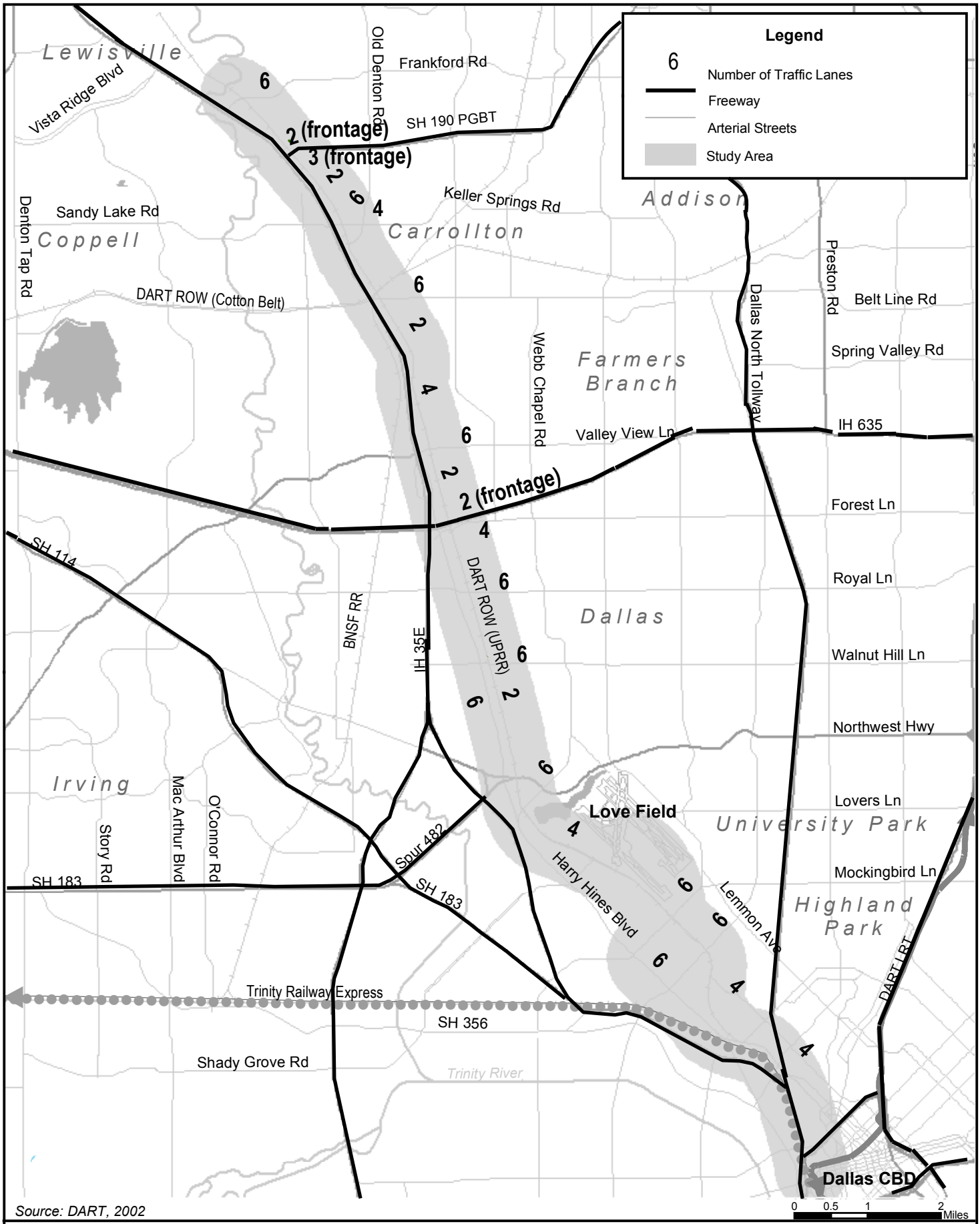

Figure 3-14

Existing Roadway Network

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Most of the major roadways crossing the study corridor are spaced about one mile apart as part of a larger grid. This grid is less defined west of IH 35E due to the Elm Fork of the Trinity River. Major roadways paralleling the corridor are on a more random pattern near the corridor because of the diagonal alignment of IH 35E and the UPRR line. The existing traffic volumes on all the freeways and arterial roadways within the study corridor are shown in **Figure 3-15**. The traffic volume information for the major roadways paralleling the corridor is listed in **Table 3-9**, and for the major roadways crossing the alignment in **Table 3-10**. These include the existing traffic volumes, existing levels of service, projected 2025 traffic volumes, and their projected 2025 levels of service. The level of service is a measure of the relative delay and congestion experienced on a roadway, with "A" the best, and "F" the worst. Levels of service "E" and "F" are considered unacceptable.

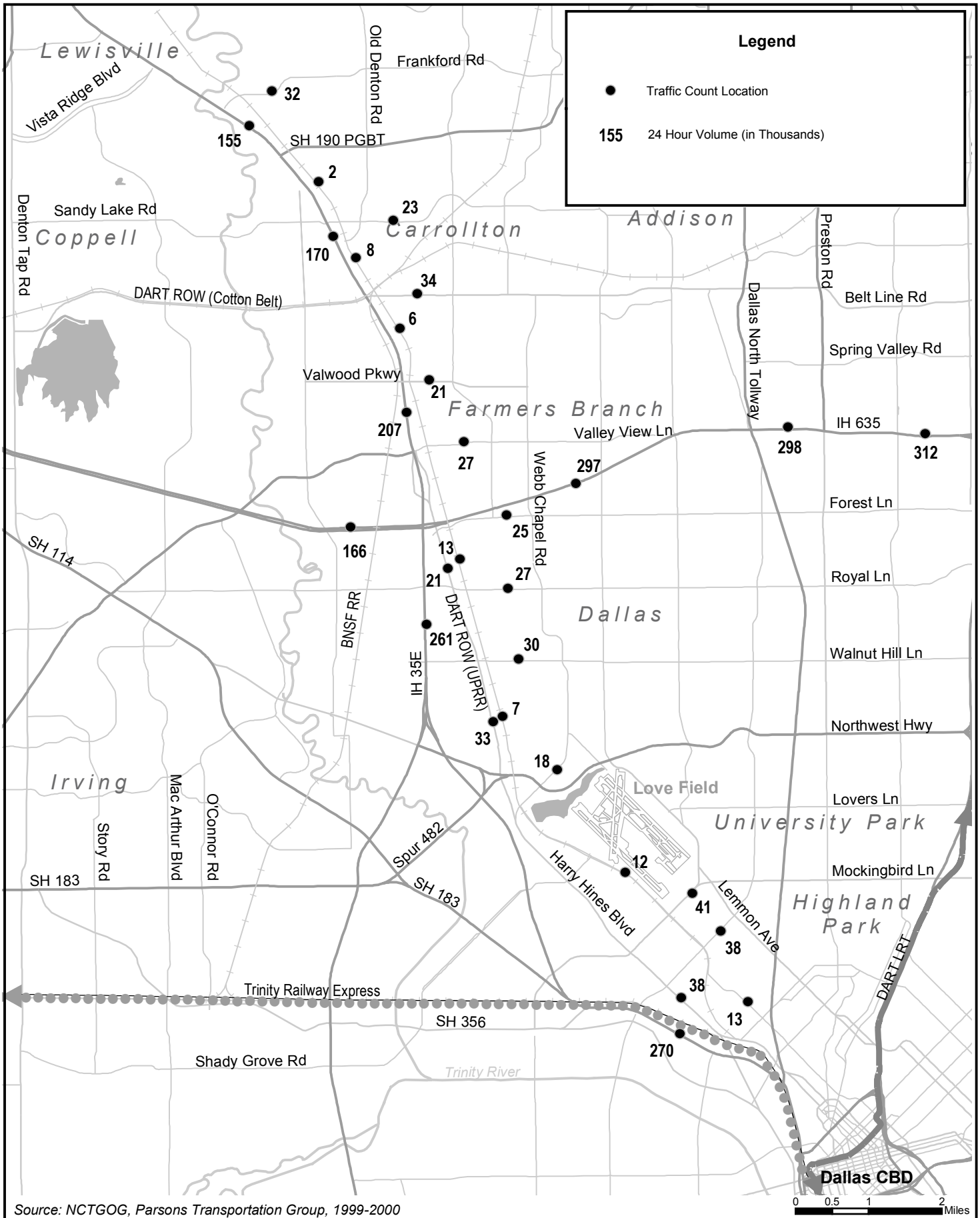
The primary flow of traffic within the corridor is east and west along the arterial thoroughfares and IH 635 toward IH 35E and then north and south along IH 35E. Heavy north-south traffic also occurs on Denton Drive and Harry Hines Boulevard. North of IH 635, IH 35E exhibits traditional commuter traffic patterns in that most traffic is traveling south towards downtown during the AM peak, and most is traveling north away from downtown during the PM peak. South of IH 635, this pattern is less defined, with heavy traffic volumes in both directions during both peak periods. In addition, IH 635 itself exhibits congestion in both directions during both peak periods in the vicinity of IH 35E. These patterns are due to the high concentration of employment within the corridor and on IH 635.

Historically, traffic volumes on Dallas freeways have increased 5 to 10% per year since 1995. Traffic volumes on major roadways approaching IH 35E and IH 635 are at or near capacity on almost all roadways. Increases in traffic volumes on these roadways have historically averaged around 3% per year with a few locations increasing as much as 10% per year.

Tables 3-9 and 3-10 show that most of the roadways within the study corridor operate with unacceptable levels of service. The tables also show projected 2025 traffic volumes and levels of service on those roadways after certain programmed improvements are made. Traffic volumes on most roadway segments are projected to increase, with a corresponding degradation in level of service. Future traffic volumes are expected to decrease on some segments of IH 35E due to future highways that will be built by 2025, including PGBT, SH 161, and the Trinity Parkway. However, congested conditions and unacceptable levels of service will continue on IH 35E.

The project corridor has one of the highest employment concentrations in the region, second only to downtown Dallas, and has relatively little residential population. Therefore, the corridor is not only a route to downtown Dallas, but also a major commute destination, attracting trips from all areas of the region. As a result, travel within the corridor is comprised of traditional suburb to downtown trips, northern suburb trips that terminate within the corridor, and reverse commute trips from the southern portions of Dallas County that terminate within the corridor. All of these traffic patterns converge within the corridor to create high traffic volumes and varying levels of congestion in both directions during each peak period, and to extend the duration of the traditional peak periods. Considering the corridor as a whole, peak period congestion is widespread on the major roadways and the length of the peak period has been increasing.

Tables 3-9 and **3-10** show that most of the freeway and roadway segments in the study corridor currently operate with unacceptable levels of service on a typical weekday. In addition, most of the roadways are at their ultimate build-out conditions, so reconstruction cannot mitigate current conditions or handle the projected traffic growth. For example, while the corridor already has the second highest concentration of employment in the region, there is land available for further development. While employment centers will continue to grow within the corridor, the already under-represented residential sector is not expected to grow significantly. As a result, there will be more jobs within the corridor, but a smaller proportion of nearby housing, which means more, longer commuter trips bound to the corridor in the future.



Source: NCTGOG, Parsons Transportation Group, 1999-2000

Figure 3-15

Existing Traffic Volumes

LRT Line to Farmers Branch and Carrollton
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TABLE 3-9
MAJOR ROADWAYS PARALLELING THE LRT LINE

Roadway	Section	2000 ADT[1]	2000 LOS[2]	2025 ADT[1]	2025 LOS[2]
IH 35E Stemmons Freeway	SH 121 to SH 190	155,000	F	226,000	F
	SH 190 to Belt Line Road	170,000	F	175,000	F
	Belt Line Road to IH 635	207,000	F	172,000	F
	IH 635 to Loop 12	261,000	F	294,000	F
	SH 183 to Downtown	270,000	F	235,000	F
Broadway	Jackson to Whitlock	2,000	B	1,000	B
	Whitlock Road to Belt Line	8,000	F	10,000	F
	Belt Line to Valwood Parkway	6,000	D	4,000	B
Denton Drive	IH 635 to Royal Lane	13,000	F	23,000	F
	Walnut Hill Lane to Loop 12	7,000	D	16,000	F
	Loop 12 to Mockingbird Lane	12,000	D	19,000	F
Maple Avenue	Inwood Road to Wycliff	13,000	D	15,000	D
Harry Hines Boulevard	IH 635 to Royal Lane	21,000	F	43,000	F
	Walnut Hill Lane to Loop 12	33,000	F	39,000	F
	Inwood Road to Wycliff	38,000	F	45,000	F

[1] – Average daily traffic in both directions. All freeway traffic counts were collected in 1999, all arterial traffic counts were collected in 2000. Future 2025 volumes estimated by NCTCOG.
[2] – Level of Service determined by NCTCOG.

Source: Parsons Transportation Group; NCTCOG; 2000-2001

TABLE 3-10
MAJOR ROADWAYS CROSSING THE LRT LINE

Roadway	Lanes at the Crossing[1]	2000 ADT[2]	2000 LOS[3]	2025 ADT[2]	2025 LOS[3]
Frankford	6	32,000	F	23,000	E
SH 190 Pres. George Bush Turnpike	Tollway	Under Construction	Under Construction	139,000	F
Trinity Mills	NA[4]	31,000[4]	F	32,000	F
Jackson	2	7,000	D	9,000	F
Whitlock	4	23,000	F	33,000	F
Old Denton	6	10,000	B	48,000	F
Belt Line	6	34,000	F	46,000	F
Crosby	4	15,000	F	12,000	F
Valwood Parkway	6	21,000	D	23,000	F
Valley View	6	27,000	F	39,000	F
LBJ WB Frontage Rd	2[5]	6,000	D	17,000	F
IH 635 LBJ Freeway	Freeway	297,000	F	252,000	F
Forest	4	25,000	F	16,000	F
Royal	6	27,000	F	39,000	F
Merrell	2	8,000	F	8,000	F
Walnut Hill	6	30,000	F	36,000	F
Lombardy	2	16,000	F	22,000	F
Webb Chapel Extension	6	18,000	B	19,000	B
Shorecrest	2	7,000	F	7,000	F
Mockingbird	6	41,000	F	43,000	F
Inwood	6	38,000	F	45,000	F
Motor	2	11,000	F	23,000	F
Maple	4	13,000	D	15,000	F

[1] – Includes lanes in both directions on two-way streets unless noted otherwise.
[2] – Average daily traffic in both directions. All traffic counts were collected in 2000. Future 2025 volumes estimated by NCTCOG.
[3] – Level of Service determined by NCTCOG.
[4] – Under construction along with SH 190. Traffic volume is from 1999.
[5] – Two WB lanes (one-way) on the WB approach; one lane in each direction on the EB approach.

Source: Parsons Transportation Group; 2000-2001

3.3.3 Railroads

There are four active rail lines traversing the project corridor as shown in **Figure 3-16**. Three of these rail lines are now owned by DART and the fourth is owned by the Burlington Northern Santa Fe Railroad (BNSF RR). Currently there are active freight operations on three of the rail lines, and active DART commuter rail with some minor freight operations on the other. The primary rail line in the corridor is the DART-owned UPRR line, along which it is proposed to construct most of the new light rail extension. The UPRR line is a single and double-track alignment that runs from north of downtown Dallas to the northwest, past Dallas Love Field, to Farmers Branch, Carrollton, and Lewisville. The line generally parallels IH 35E and has multiple sidings and spurs that serve individual customer sites on both sides of the alignment. A detailed description of the track configuration and freight operations on this line is presented in Section 3.3.4. It is proposed that separate LRT tracks be constructed along the UPRR alignment and co-exist alongside or above sections of operational freight track.

As the UPRR line enters downtown Dallas, it joins the DART-owned Trinity Railway Express (TRE) commuter rail line which connects downtown Dallas to downtown Fort Worth. This line also carries some minor freight operations, and is planned to be doubled-tracked in the near future. Separate LRT tracks are proposed in this part of the corridor.

The BNSF is another major north-south rail line in the vicinity of the corridor. The BNSF is an active freight rail line and crosses from the west side of the corridor to the east side through the busy interchange at IH 35E and Belt Line Road. In addition, the DART-owned St. Louis Southwestern Railroad (Cotton Belt) line runs east-west and crosses the corridor just north of Belt Line Road. Although active, the Cotton Belt line currently carries just one freight train a day in each direction between Carrollton and Plano.

The IH 35E and Belt Line Road interchange area has a combination of congested thoroughfares which intersect near and cross two active freight rail lines, with a nearby intersection of three rail lines. This complicated transportation interface easily becomes overloaded with rail and vehicular traffic during peak periods. For these reasons, it is proposed that the light rail service along the DART ROW be grade-separated at this location.

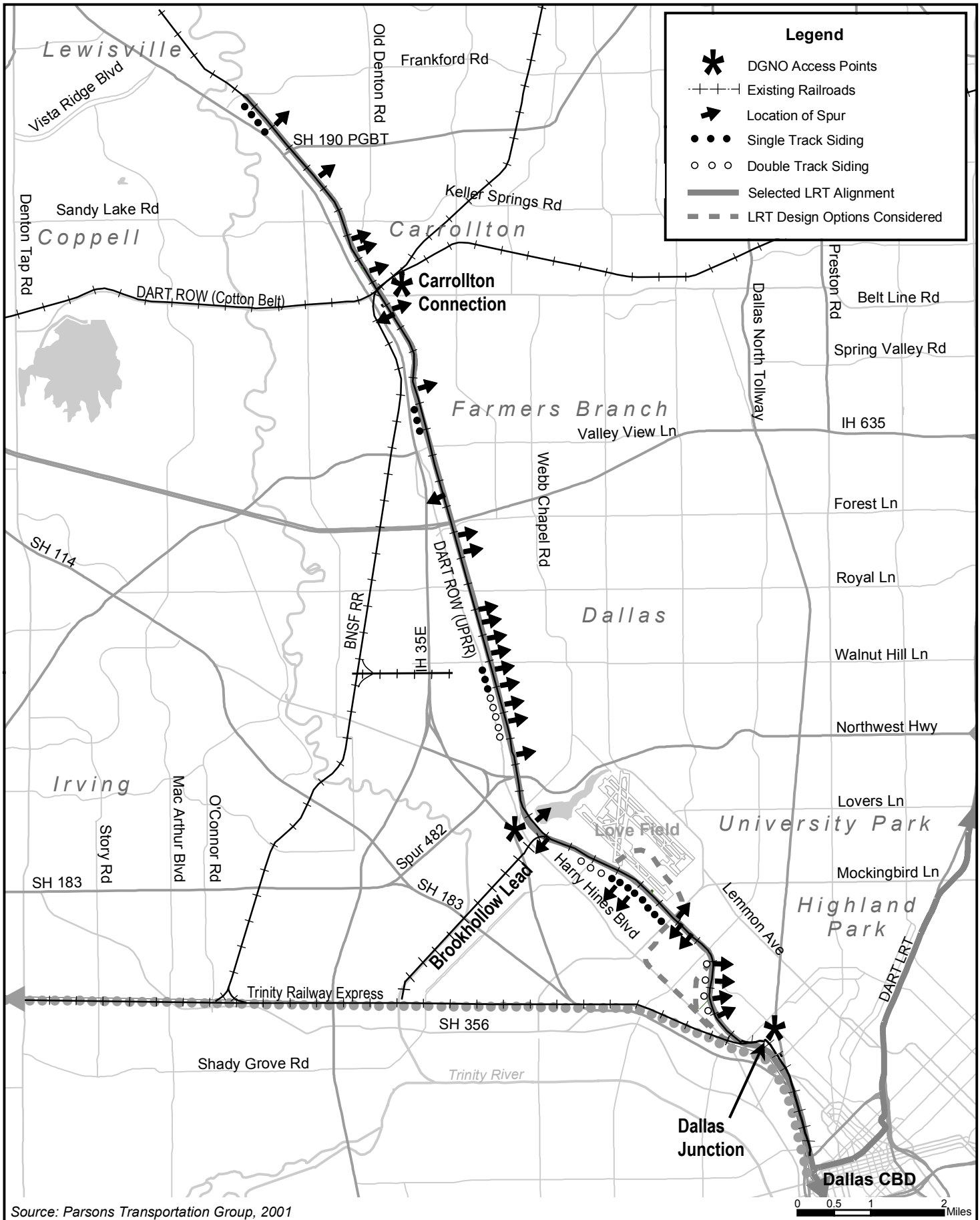
3.3.4 Movement of Freight

Due to the high concentration of manufacturers, warehouses, and large institutional employers within the corridor, the movement of freight is extremely important to the economic vitality of the corridor. Large amounts of freight are transported into, out of, and within the corridor every day by truck and by rail. In addition, IH 35E serves as a major North American Free Trade Agreement (NAFTA) trucking route between Mexico, the United States, and Canada.

Freight Transported by Truck

Most of the freight transported within the corridor is transported by truck. The primary roadway facilities for truck movements are illustrated in **Figure 3-17**. Designated truck routes are shown, as well as other thoroughfares that have heavy local truck traffic. Based on field observations and compared to Dallas as a whole, there is a higher amount of local truck traffic within the corridor due to the industrial nature of its land use. In addition, there is a higher number of trucks on IH 35E (compared to other north-south freeways) due not only to the industrial nature of the corridor, but also to its international NAFTA designation.

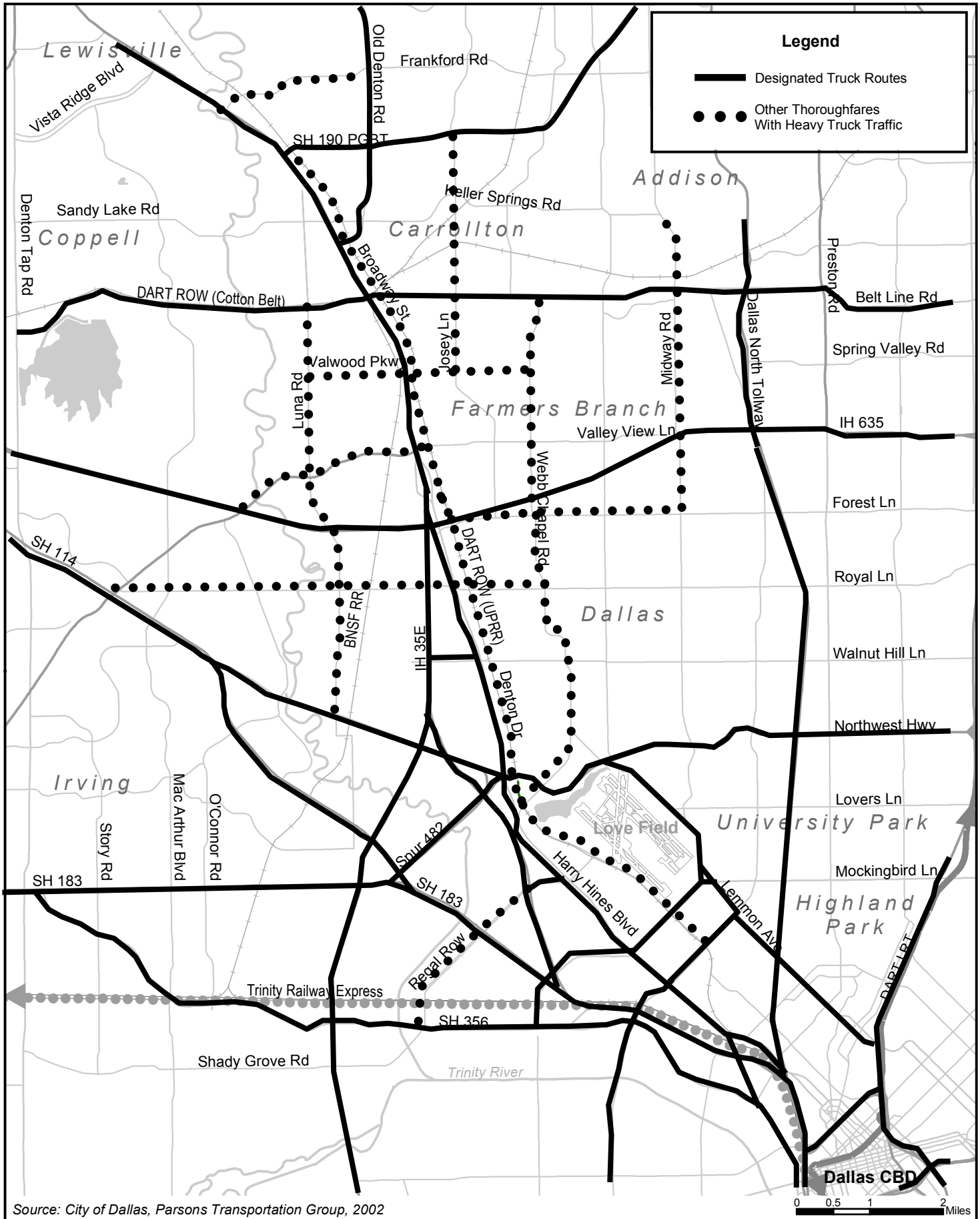
Some of the freight transported through the Dallas-Fort Worth Metroplex by truck is categorized as hazardous material, and is therefore restricted to certain routes within urbanized areas. The primary hazardous material routes in the Study Area are identified in **Figure 3-18**. Within the corridor, the transportation of hazardous material is allowed on IH 35E and the portion of IH 635 that is east of IH 35E. These regional route restrictions are extensions of ordinances adopted by the City of Dallas to control the transportation of hazardous material.



Source: Parsons Transportation Group, 2001

Figure 3-16
Existing Railroads

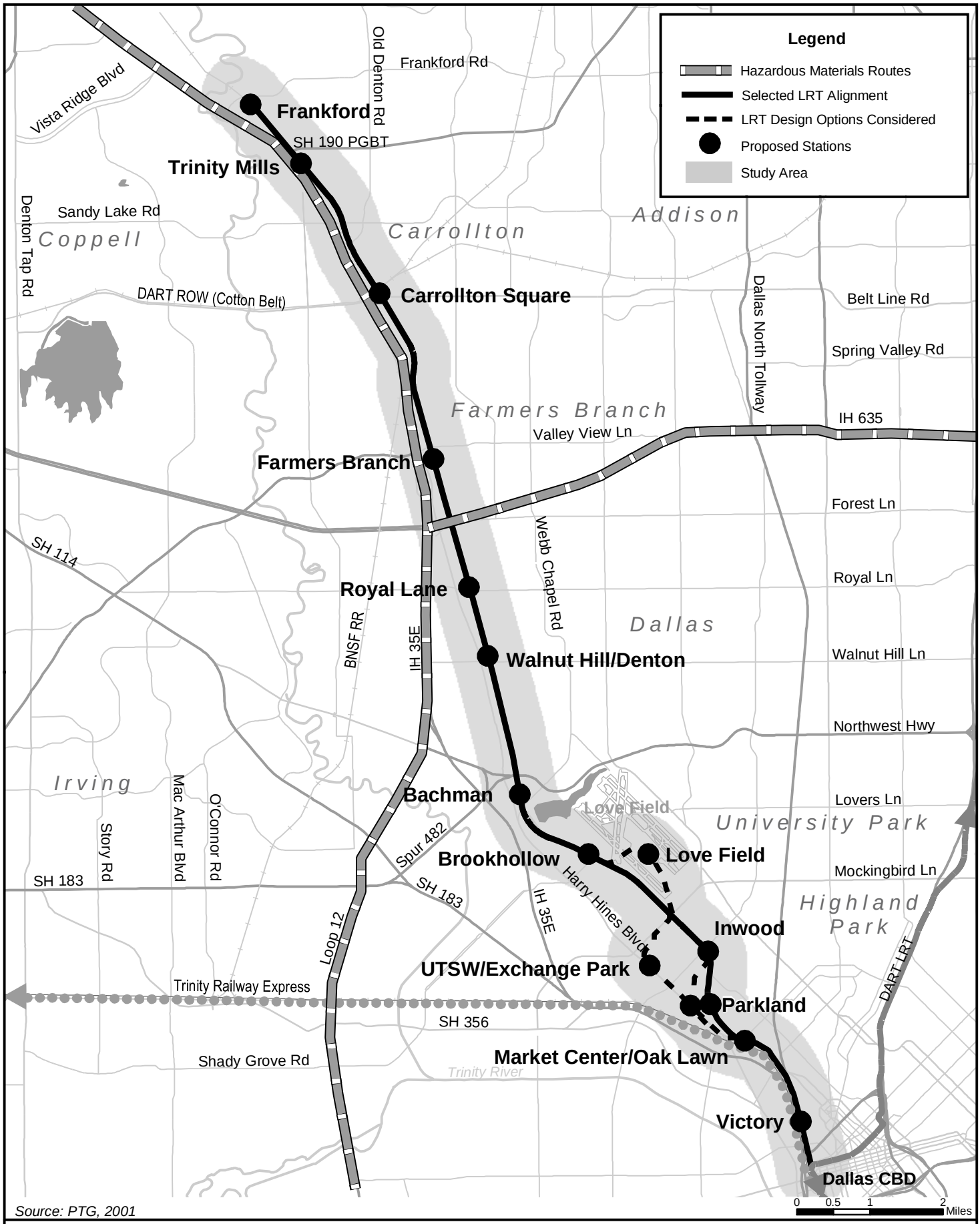
LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: City of Dallas, Parsons Transportation Group, 2002

Figure 3-17
Existing Truck Routes

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: PTG, 2001

Figure 3-18

Hazardous Material Routes

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

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Freight Transported by Rail

Although trucks transport the majority of freight, a large amount of freight is transported by rail within the corridor. There are four active freight rail lines operating within or across the corridor. As described above, several of these lines transport freight across the corridor, but the UPRR line is primarily used to pick up and deliver freight to customers within the corridor. Deliveries to customers on the UPRR line are provided by the Dallas, Garland, and Northeastern Railroad (DGNO). Approximately 6,000 to 7,000 carloads of freight originate and terminate annually at approximately 30 individual freight customer locations on the UPRR line within the corridor. The largest customer is Coca-Cola, located on a spur south of Mockingbird Lane, which shipped about 2,000 carloads of freight in both 1999 and 2000. The average number of annual carloads shipped to and from each customer along the line is 245 carloads, with most shipping less than that.

DGNO accesses the UPRR line at three junctions (see **Figure 3-16**):

- Dallas Junction, also called DFW Junction, which is located near the Oak Lawn Avenue underpass, south of the Harry Hines Boulevard grade crossing. This junction connects to the Trinity Railway Express (TRE) line.

- The Brookhollow Lead, which is located between Wyman and Burbank Streets adjacent to Dallas Love Field, and connects to Mockingbird Yard on the TRE line.

- The Carrollton Connection, which is located north of the Belt Line Road grade crossing and provides access to and from DGNO's Mercer Yard in Carrollton.

DGNO serves customers in both directions, north and south, from the Brookhollow Lead and from the Carrollton Connection. Based on a review of 1999 and 2000 statistics, approximately 32 percent of DGNO's carloads originate and terminate north of the Carrollton Connection, 40 percent between the Carrollton Connection and the Brookhollow Lead, and 28 percent between the Brookhollow Lead and Dallas Junction. Therefore, approximately 60 percent of current freight operations would be unaffected, while approximately 40 percent of current freight operations would be rerouted in some fashion. Overall, train travel time between the northern and southern segments of the line would be increased, but since these trains run only once or twice a day, the impact is not significant.

DGNO currently provides freight service to the UPRR line with three crews. One crew begins operating a train at 7:00 AM daily Monday through Friday and serves customers north of the Carrollton Connection. The other two crews cover all of the switching between Carrollton Connection and Dallas Junction. One crew begins operating a train at 8:00 AM (six days per week) and the other starts at 8:00 PM (five days per week). DGNO also operates a train, the Mockingbird Hauler, from Carrollton Connection at 8:00 PM to interchange cars with BNSF and UP at Irving and Mockingbird Yards on the TRE line, which then returns to the Carrollton Connection.

Mercer Yard in Carrollton serves as DGNO's base of operations for freight service on the UPRR line. Based on current operation, all of the cars bound for customers within the corridor move on the Mockingbird Hauler to Mercer Yard in Carrollton, and are blocked at Mercer for various destinations on the UPRR line. In addition, DGNO currently uses various side tracks and spurs along the corridor for storage of cars awaiting placement and to accumulate cars for movement to Mercer Yard. On September 7, 2000, there were 113 railcars stored on various spurs and sidings along the freight rail line within the Study Area.

The railroad storage tracks and spurs used for serving freight customers and for storing railcars were summarized on **Figure 3-16**. Details of existing spurs are shown on the plans in Appendix C. There are four single track and three double track sidings. There are 31 spurs off of the UPRR line

within the Study Area (though many of these branch off further into several sub-spurs). Most of the main spurs (24) are on the east side of the existing rail line. Less than half of the main spurs are used actively for freight deliveries, with most of the remaining spurs used to store railcars.

3.3.5 Non-Motorized Circulation

This section describes existing pedestrian and bicycle circulation in the corridor.

Pedestrian Circulation

Pedestrian circulation facilities in the Study Area are essentially provided as part of the roadway facility cross-section. This typically includes sidewalks, pedestrian crossings, and pedestrian signals. However, there are large sections along the proposed alignment where these pedestrian facilities are not provided.

Specifically, Broadway Street is largely a two-lane roadway with no curb or sidewalk (except within Old Downtown Carrollton). Likewise, Denton Drive is largely a two-lane roadway with no curb or sidewalk. Although sections of Denton Drive have been improved to four-lane sections with curbs, these sections also do not have sidewalks along most of their length. Harry Hines Boulevard has some sidewalks within the Medical District, but these sidewalks are not contiguous and are not present along most of its length. This lack of sidewalks along the proposed alignment is primarily due to the industrial nature of the land use and the lack of residential development along these roadways.

Despite this lack of sidewalks, pedestrian activity does occur along these roadways south of Belt Line Road. Specifically, some employees of the various businesses along Denton Drive ride the bus to work and therefore must walk to work from the closest bus stop. In addition, there are some small restaurants along the corridor that depend on business from nearby workers. Therefore, pedestrians are often seen walking on the edge of the roadway or in the ditch along Denton Drive. Many of these pedestrians cross Denton Drive without the benefit of a pedestrian crosswalk or signal. There are traffic signals on Denton Drive to facilitate a safe crossing, but these are spaced at about one mile increments.

Along Harry Hines Boulevard, most of the hospitals within the Medical District do not attract pedestrians from the roadway except from nearby bus stops. However, there is a lot of pedestrian activity between the Parkland Hospital Complex and the parking facilities across the street. To manage the interface of the busy roadway and the high pedestrian demand, there is a traffic signal with pedestrian buttons as well as a pedestrian bridge that crosses over Harry Hines and connects the hospital to a parking garage.

Beyond sidewalk construction, specific pedestrian circulation systems have not been developed by the three cities in the corridor. However, the City of Carrollton Park and Recreation Department has completed a Hike-and-Bike system component as part of their Park Master Plan. This plan takes into account the future locations of LRT stations. Similarly, the City of Farmers Branch plans to develop a pedestrian/bicycle path east of the LRT line between Valwood and Farmers Branch Lane that will connect the nearby neighborhoods to the new development they are planning around the Farmers Branch Station.

Bicycle Circulation

All three corridor cities maintain various pedestrian trails and bike routes as part of their park systems, and the City of Dallas has developed a plan for bicycle circulation facilities. The City of Dallas developed the ***Greater Dallas Bike Plan*** Map in 1992, and updated it in 1995 and 1997. This plan element identifies the following facilities in Dallas, Farmers Branch, and Carrollton:

- East-West Signed Routes

- North-South Signed Routes
- Unsigned and Future Routes
- Paved Paths
- Unpaved Off-Road Trails

North-south signed bicycle routes serving the study corridor are Route 23, Route 29, and Route 37. Route 23 parallels almost the entire corridor and is located on various streets along the way. From the south, it enters the corridor on Empire Central and then continues north on Denton Drive. At Northwest Highway, Route 23 begins to parallel the corridor on a combination of north-south streets (such as Timberline, Brockbank, and Dennis) and then begins to follow multiple residential streets north of IH 635 just east of the corridor. The route terminates in downtown Carrollton at Belt Line Road.

Although they are north-south routes, Routes 29 and 37 simply cross the corridor. Route 29 crosses Harry Hines Boulevard within the UTSW Medical Center area and Route 37 crosses Harry Hines near Wycliff Avenue. Two east-west signed bicycle routes also cross the corridor. Route 280 crosses Denton Drive on the north edge of Dallas Love Field and Route 290 crosses Denton Drive on Walnut Hill Lane.

Finally, there are several unsigned routes that parallel or cross the corridor. Route 19 is located on Denton Drive between Lombardy Lane and Valley View Lane. Route 300 crosses the corridor on Southwell Road, Route 330 crosses on Valwood Parkway, and Route 340 crosses on Crosby Road.

3.3.6 Parking

In general, the supply of parking in the project corridor generally meets or exceeds current demands. While parking is not permitted on principal arterials, free parking is generally allowed on most minor arterials, collectors, and local streets in the corridor. In addition, small and large activity centers within the corridor provide adequate free and fee parking in off-street facilities for patrons and employees.

On-street parking is not permitted on any of the four-lane or six-lane principal arterials in the study corridor. However, there is a limited amount of on-street parking on the two-lane sections of Broadway Street and Denton Drive. The first section of on-street parking is on Broadway Street in Old Downtown Carrollton between Belt Line Road and Roberts Street. There is parallel parking on one or both sides of the street. Old Downtown Carrollton contains small retail and office buildings on a closely-spaced grid of two-lane streets with on-street parking.

The second section of on-street parking is on Denton Drive between Forest Lane and Royal Lane. This parking occurs primarily on the shoulder between Denton Drive and the railroad tracks, an area that is not designated or regulated for parking use. The parking occurs in random patterns along the roadside and appears to be overflow parking from nearby automobile-related businesses.

The final section of on-street parking is on Denton Drive between Northwest Highway and Webb Chapel Extension. This section of Denton Drive has high-density apartment complexes on both sides of the street, which causes the high demand for parking in the area. Where on-street parking does occur, it is not delineated nor clearly regulated. Denton Drive does not have curbs or sidewalks in this area and the unmarked parallel and 90-degree parking takes place in the paved and unpaved drainage ditches on the west side of the roadway. Similar on-street parking also occurred on the east side of the roadway until the Fall 2001 when No Parking signs were placed on that side of Denton Drive.

The vast majority of parking within the corridor is off-street parking that serves specific uses (parking lots and parking garages). Most businesses and institutions along the corridor provide adequate parking capacity for their employees, customers, and suppliers with their own parking lots on their property. In addition, DART provides off-street parking for transit users at the North Carrollton Transit Center and the Farmers Branch Park-and-Ride.

As **Table 3-11** shows, the North Carrollton Transit Center parking lot is 59 percent occupied on a typical weekday with about 600 parked cars. The Farmers Branch Park-and-Ride parking lot is less utilized with a 22 percent occupancy of about 50 cars.

TABLE 3-11
PARKING UTILIZATION
AT EXISTING DART FACILITIES

Facility	Parking Spaces	Utilization Rate[1]
North Carrollton Transit Center	1,021	59%
Farmers Branch Park-and-Ride	240	22%

[1] Based on a count of occupied spaces during periods of peak parking.

Source: Parsons Transportation Group; March 2001

The largest concentration of off-street parking exists in the Market Center and Medical Center District areas. Multiple large surface lots and parking garages are located near the proposed alignment. Within the Medical Center District most of the off-street parking is for a fee, ranging from $2 to $5 per day.

Some parking garages are restricted to employees only, and others require passes or decals. There are eight large parking garages and seven surface parking lots easily accessible from Harry Hines Boulevard in the Medical Center District. Additional parking facilities are along Medical Center Drive. One parking garage (at Lofland Street) provides a pedestrian bridge over Harry Hines Boulevard that connects to Parkland Hospital.

On-street parking is generally not allowed on the side streets within the Medical District. However, there is metered on-street parking located on some side streets including City-enforced metered parking on Lofland Street and on Redfield Street.

The Market Center area also has large amounts of parking, with most located in large surface parking lots at no cost to Market users. Market Center parking has no direct access from Harry Hines Boulevard. Demand patterns for the Market Center parking is more event based as compared to the constant, daily demand experienced by the Medical Center District.

3.3.7 Regional Transportation Improvement Plans

Mobility 2025: The Metropolitan Transportation Plan is the 25-year plan to guide the implementation of roadway and transit improvements in the Dallas-Fort Worth Metropolitan Area. The original plan was developed as ***Mobility 2010*** in 1990 and was updated in 1993. In 1997 the plan was updated and renamed the ***Mobility 2020 Plan***. The ***Mobility 2025 Plan*** was developed in January 2000 and most recently updated in May 2001. Previous versions of the plan recommended the implementation of commuter rail in the Northwest (Stemmons) Corridor, but the current plan recommends an extension of DART's light rail system in the corridor, based on the results of the MIS. The plan also recommends additional transit-related improvements in the corridor including high occupancy vehicle (HOV) facilities on IH 35E and IH 635; managed HOV facilities on PGBT; express buses serving the HOV facilities; expanded cross-town bus service; circulator service in high density employment areas; and local feeder buses to serve proposed rail lines and park-and-ride lots.

The ***Mobility 2025 Plan*** also includes recommendations for Congestion Management System (CMS) strategies throughout the region. These CMS strategies are short-range, relatively non-capital intensive measures focusing on transportation system management (TSM) and travel demand management (TDM) strategies such as:

- Traffic Signal Improvements and Intersection Improvements;
- Incident Detection and Response Systems including motorist assistance patrols;
- Advanced Traffic Management Systems relaying real-time travel information;
- Employer Trip Reduction Programs at large employers; and
- Vanpool Programs.

The 2000 Transportation Improvement Plan for the Dallas-Fort Worth Metropolitan Area, the TIP, identifies all of the roadway and transit improvements programmed for construction within the next eight years. The projects presented within the 2000 TIP were chosen to implement improvements consistent with the ***Mobility 2025 Plan***. Roadway improvement plans for the corridor identified within the 2000 TIP will provide some additional traffic-carrying capability to respond to the projected population and employment growth. Despite the existing transportation infrastructure and planned improvements, significant traffic congestion is anticipated to occur in the corridor between now and the year 2025. Unacceptable volume-to-capacity ratios are expected to occur on most arterial roadways in the study corridor. In addition, increases in congestion are anticipated on many of the arterial roadways in the study corridor.

The 2000 TIP identifies extensions of DART's LRT system into the Carrollton and Irving/DFW corridors and HOV facilities on IH 35E and IH 635 as the principal transit projects for improving mobility within the Northwest Corridor. Additional transit-related programs include “Ozone Alert” fare programs, the acquisition of more transit vehicles to expand service and the CMS strategies discussed above. No other improvements directly related to transit currently are committed for implementation in the corridor. The following is a summary of key anticipated improvements in the corridor:

- Install ITS video and communications system on IH 35E and IH 635 Corridors (2001);
- Add travel lanes on Motor Street from Harry Hines Boulevard to Maple Avenue (2002);
- Add travel lanes on Oak Lawn Avenue from IH 35E to Maple Avenue (2002);
- Add travel lanes on Denton Drive from Webb Chapel Extension to Farmers Branch city limits (2003);
- Add travel lanes on Inwood Road from Lemmon Avenue to Harry Hines Boulevard (2003); and,
- Upgrade the spread spectrum radio communication system on Belt Line Road from Luna Road to Webb Chapel (2003).

The Denton Drive improvement is being closely coordinated with the LRT project as it is adjacent to the DART rail ROW.

The next version of the TIP will be the 2002 TIP, which will focus on new projects programmed for 2003 and 2004 and would include some new long-term projects programmed through 2010. Local governments and transportation agencies have compiled lists of prioritized improvement projects and have submitted them to NCTCOG for consideration of inclusion in the new 2002 TIP, which should be finalized by the end of 2002.

3.4 AIR QUALITY

This section describes the study methodology and the affected environment for the air quality analysis.

The purpose of the analysis is to determine the potential impacts of the proposed Selected LRT Alternative on the air quality in the Study Area in Collin, Dallas, Denton and Tarrant Counties. The impact analysis was performed by comparing the predicted ambient air concentrations for the various proposed alternatives to the National Ambient Air Quality Standards (NAAQS).

3.4.1 Study Methodology

For assessing the air quality impacts, a mesoscale as well as a microscale analysis was performed. A mesoscale pollutant burden analysis was performed to assess air quality impacts on a corridor level. The 2025 pollutant emissions associated with the various alternatives were calculated for carbon monoxide (CO), volatile organic compounds (VOC), and oxides of nitrogen (NOx). The latter two pollutants, precursors of ozone (O_3), serve as an indicator of the ozone impact in the area.

Total emissions for this area were estimated using the regional travel demand forecasting model maintained by the NCTCOG). This model estimates the vehicle travel resulting from the combination of land use, socioeconomic levels, and the available transportation system, including both transit and private automobiles.

The microscale analysis was performed to estimate CO concentrations at one major intersection, Valley View Lane and Denton Drive. This intersection was selected from those along the alignment and near stations and associated park-and-ride lots since it is expected to be impacted the greatest by construction of the proposed project. A number of receptors at the study site were selected to determine the "worst case" outdoor levels of CO concentrations in the vicinity.

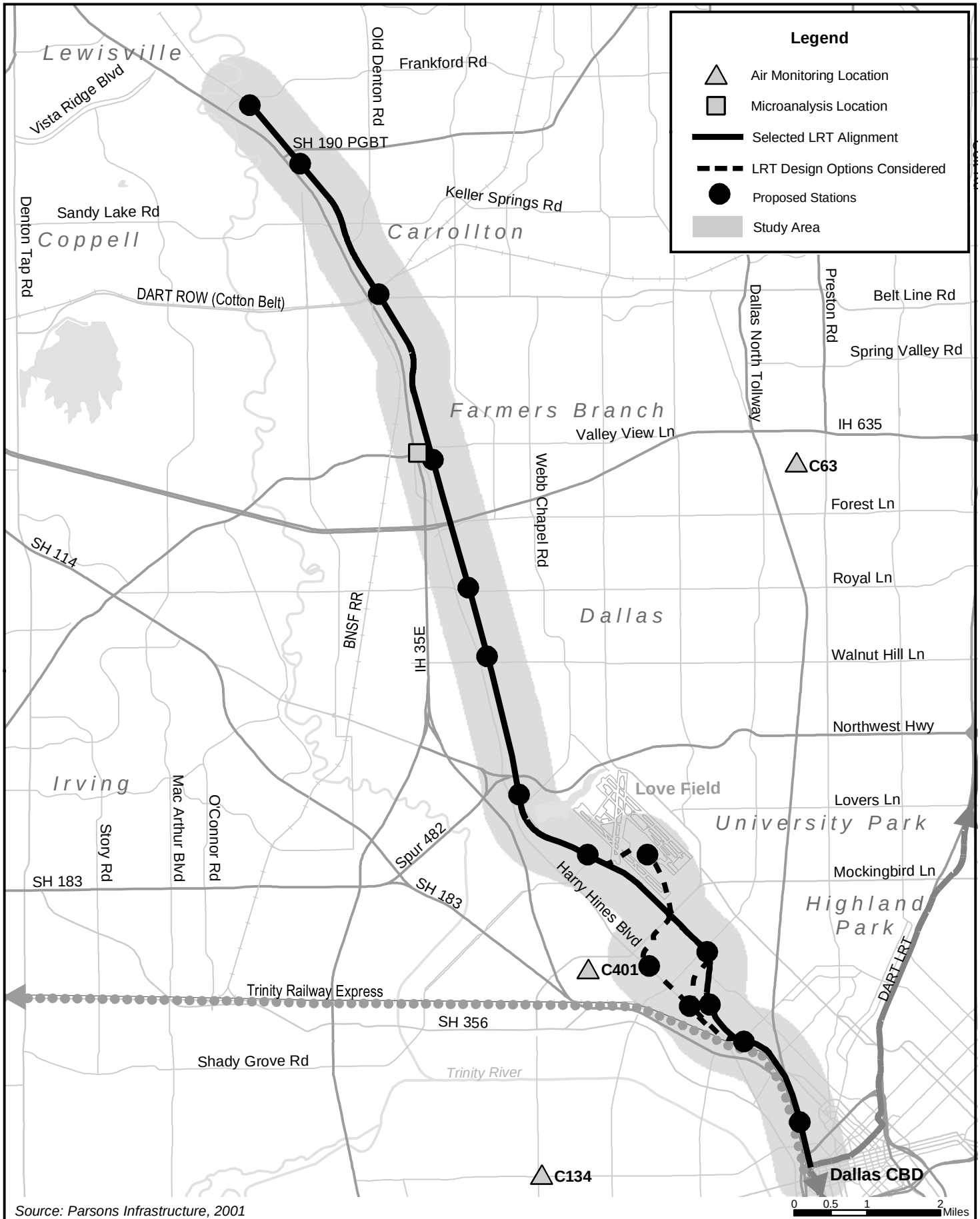
Figure 3-19 shows the location of the selected receptor. This study site was selected based on the projected traffic volumes, congestion, and proximity of sensitive receptors to the intersection.

It was assumed that if modeled CO concentration at the intersection most impacted by the full build scenario did not violate the CO standard, then no CO concentrations at other intersections would violate the CO standard.

CO emissions were estimated using emission factors provided in the document entitled "Conformity of Mobility 2025 Update: Metropolitan Transportation Plan and 2002 TIP, 2025 Mobile5b Emission Factors-Urban Counties". The final CO emission rates were calculated by multiplying the MOBILE5B emission factors by the estimated VMT by speed. The vehicle miles traveled (VMT) were also classified according to vehicle speed. **Table 3-12** presents a summary of the emission rates used.

In addition to CO emission rates, a number of other variables were also used for the micro-scale analysis. The selected variables represent worst-case assumptions regarding meteorological conditions, vehicle fleet operating characteristics, traffic, and local terrain, and are taken from the ***U.S. EPA Users' Guide CAL3QHC v2.0*** (September 1995). These variables and their value are summarized below.

- Ambient Temperature: 44 degrees Fahrenheit (average January Temperature)
- Stability Class: "D" (stable atmosphere)
- Wind Speed: 1 meter/second (minimum speed of model)
- Wind Direction: All wind directions in 10 degree increments
- Mixing Height: 1,000 meters
- Settling Velocity: 0 meters/second
- Deposition Velocity: 0 meters/second
- Background CO: 4.4 ppm (1-hour) and 2.5 (8-hour) from 1414 Hinton Street Monitoring Station
- 8-hour Persistence Factor: 0.7



Source: Parsons Infrastructure, 2001

Figure 3-19

Carbon Monoxide Monitoring Stations and Microanalysis Location

LRT Line to Farmers Branch and Carrollton
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TABLE 3-12 SUMMARY OF YEAR 2025 MOBILE5B EMISSION RATES, IN GRAMS/VEHICLE MILE TRAVELED (VMT)		
Speed (mph)	AM CO Emission Rate (grams/ VMT)	PM CO Emission Rate (grams/ VMT)
1-3	16.30	16.30
10	7.02	7.02
20	4.48	4.48
30	2.79	2.79
40	1.98	1.98
50	1.62	1.62
60	2.24	2.24
65	2.86	2.86

Source: NCTCOG, Parsons Transportation Group, August 2001

Emission and Dispersion Models: Emission rates were based on those presented above. CAL3QHC air dispersion model was used to predict CO concentrations.

Vehicle Fleet Characteristics: The vehicle mix was integrated in the emission factors provided by NCTCOG. Dallas and surrounding Counties (Collin, Denton and Tarrant) have voluntarily elected to use reformulated gasoline.

Site Characteristics: Surface roughness was selected based on standard guidelines, the particular terrain, and land use of the modeled site. Surface roughness influences the dispersion of pollutants. Surface roughness corresponding to a suburban commercial area was used. Optimum signal timing, within the constraints of reasonable cycle lengths and intersection geometrics, were assumed. Specific receptor locations were selected based upon the front door, or corner of the nearest building in each intersection quadrant, if buildings existed. The goal was to identify a location where people might be exposed to vehicle-generated pollutants between one to eight hours. The peak hour traffic volumes were used for the microscale analysis.

3.4.2 Affected Environment

The Dallas-Fort Worth metropolitan area has a continental climate with annual temperatures ranging from below 10 degrees to over 100 degrees Fahrenheit. Average monthly temperatures range from 44 degrees Fahrenheit in January to 86 degrees Fahrenheit in July. Prevailing winds are from the south, and the level to rolling terrain of the metropolitan area allows air masses to move easily over the region. As a result, long-term air pollution episodes resulting from stagnant air masses are uncommon. Ozone pollution episodes in the Dallas-Fort Worth area are usually associated with the summer months, with high temperature and intense sunlight, which is more conducive to ozone production than winter months.

Motor vehicles emit a variety of pollutants including CO, NOx, VOC, PM_{10}, and lead (Pb). O_3 is not directly emitted from automobiles, but is formed in the atmosphere by chemical reactions involving HC, NOx, and sunlight.

The EPA has established primary and secondary NAAQS for these pollutants. The primary standards were set to protect the public health. The lower secondary standards were established to prevent other adverse effects of air pollutants. These air quality standards are presented in **Table 3-13**.

Attainment Status

The Texas Commission on Environmental Quality (TCEQ) under the guidance of EPA, is the lead state agency responsible for developing plans and implementing regulations for clean air. The 1990 Federal Clean Air Act Amendments (CAAA) requires that the TCEQ and EPA designate

areas affected by these regulations. The North Central Texas area (composed of Collin, Dallas, Denton and Tarrant counties) is in "attainment" of the federally established air quality standards except for O_3, based on violations of federal standards for O_3 at air monitoring sites within the region. The TCEQ and the City of Dallas operate air-monitoring stations throughout the metropolitan area, including three in the vicinity of the proposed project. These monitoring stations were shown on **Figure 3-19**.

TABLE 3-13
NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

POLLUTANT/ AIR CONTAMINANT	PRIMARY STANDARD[1]	SECONDARY STANDARD[2]	APPLICATION OF STANDARD
Carbon Monoxide (CO)	9.5 ppm by volume	9.5 ppm by volume	Maximum 1-hour concentration not to be at or above this level more than once per calendar year.
	35.5 ppm by volume	35.5 ppm by volume	Maximum 8-hour concentration not to be at or above this level more than once per calendar year.
Ozone (O_3)	0.125 ppm[3] by volume	0.125 ppm by volume	Maximum 1-hour concentration not to be at or above this level more than 3 days over 3 calendar years.
Particulate Matter (PM_{10})	51 micrograms per cubic meter	51 micrograms per cubic meter	The 3-year average of the annual arithmetic mean concentrations at each monitor within an area is not to be at or above this level.
	155 micrograms per cubic meter	155 micrograms per cubic meter	The 3-year average of the annual 99th percentile concentration for each monitor within an area is not to be at or above this level.
Oxides of Nitrogen (NOx)	0.054 ppm by volume	0.054 ppm by volume	Maximum annual arithmetic mean not to be at or above this level.
Lead (Pb)	1.55 micrograms per cubic meter	1.55 micrograms per cubic meter	Maximum arithmetic mean averaged over a calendar quarter not to be at or above this level.
Sulfur Dioxide (SO_2)	0.035 ppm by volume	-	Maximum annual geometric mean not to be at or above this level.
	0.145 ppm by volume	-	Maximum 24-hour concentration not to be at or above this level more than once a year.
	-	0.55 ppm by volume	Maximum 3-hour concentration not to be at or above this level more than once a year.

1. The primary air quality standards are defined as the levels of air quality necessary, with an adequate margin of safety, to protect the public health.
2. Secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant on property, material, vegetation, etc.
3. ppm = parts per million.

Source: EPA, June 1997

It should be noted that after passage of the 1990 Clean Air Act Amendments (CAAA), the North Central Texas area was originally classified as a "moderate" non-attainment area, meaning it had an ozone design value between 138 and 160 parts per billion (ppb) (the fourth highest monitored 1-hour average O_3 concentration at the same monitoring site in a three-year period). In order to comply with the CAAA's 1996 deadline for moderate non-attainment areas, the Dallas/Ft. Worth region was allowed no more than three exceedances at any single monitor over a three-year period. However during 1994-1996, six of the eight monitors in the North Central Texas area recorded more than three exceedances, with two recording 12 exceedances each.

Thus, the north central Texas area was reclassified as a "serious" O_3 non-attainment area as mandated in Section 181(b)(2)(A) of the CAAA. The reclassification required the TNRCC to submit a new "demonstration of attainment" State Implementation Plan (SIP) to the EPA by the spring of 2000.

Under the new SIP, TNRCC determined that reduction in NOx emissions were also required to meet the 1-hour NAAQS for ozone of 125 ppb. Previously the north central Texas area was under a NOx waiver and only VOCs were required to be reduced. In late April 2000, TNRCC submitted the final set of recommended control measures required to attain the federal ozone standards. EPA published a proposal to approve the Dallas/Fort Worth SIP in the Federal Register on January 18, 2001 (Federal Register, Volume 66, Number 12, page 4756). Final approval is pending. The next major SIP submittal for the DFW area will be for the mid-course review in 2004.

3.5 NOISE

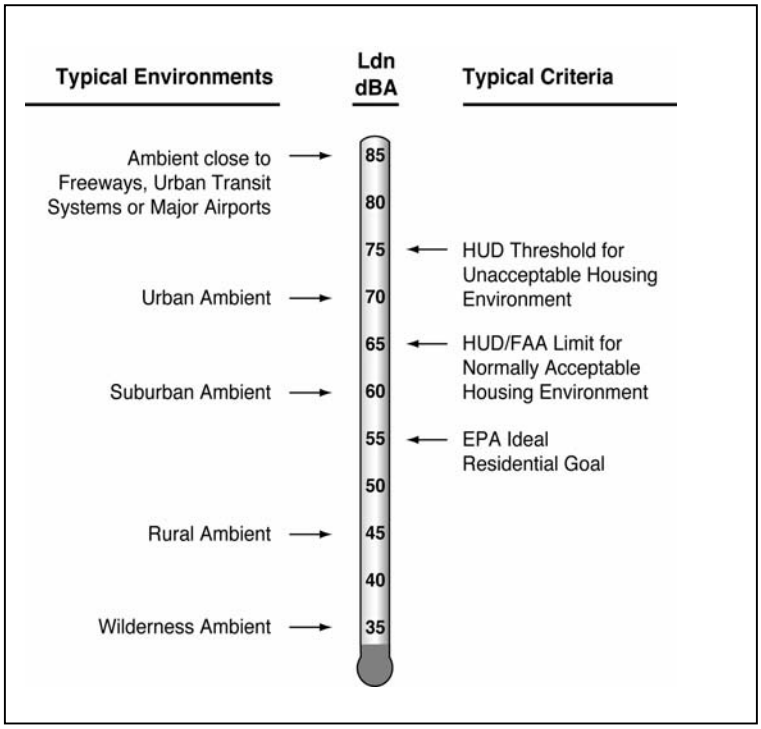
This section describes the methodology used to characterize the existing noise conditions along the corridor, and provides background information on airborne noise issues related to the proposed transit project.

Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content and (3) variation with time. The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels. By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 decibels. On a relative basis, a 3-decibel change in sound level generally represents a barely-noticeable change outside the laboratory, whereas a 10-decibel change in sound level would typically be perceived as a doubling (or halving) in the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels, and are expressed in decibel notation as "dBA." The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise.

Because environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number, called the "equivalent" sound level (Leq). Leq can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified time period (typically 1 hour or 24 hours). Often the Leq values over a 24-hour period are used to calculate cumulative noise exposure in terms of the Day-Night Sound Level (Ldn). Ldn is the A-weighed Leq for a 24-hour period with an added 10-decibel penalty imposed on noise that occurs during the nighttime hours (between 10 P.M. and 7 A.M.). Many surveys have shown that Ldn is well correlated with human annoyance, and therefore this descriptor is widely used for environmental noise impact assessment.

Figure 3-20 Examples of Typical Outdoor Noise Exposure



Source: Harris, Miller, Miller, and Hanson, 2001

Figure 3-20 provides examples of typical noise environments and criteria in terms of Ldn. While the extremes of Ldn are shown to range from 35 dBA in a wilderness environment to 85 dBA in noisy urban environments, Ldn is generally found to range between 55 dBA and 75 dBA in most communities.

As shown in **Figure 3-20**, this spans the range between an "ideal" residential environment and the threshold for an unacceptable residential environment according to U.S. Federal agency criteria.

3.5.1 Transit Noise Criteria

Noise impact for this project is based on the criteria as defined in the U. S. Federal Transit Administration (FTA) guidance manual ***Transit Noise and Vibration Impact Assessment*** (FTA Report DOT-T-95-16, April 1995). The FTA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although more transit noise is allowed in neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise.

The FTA Noise Impact Criteria group noise sensitive land uses into the following three categories:

Category 1: Buildings or parks where quiet is an essential element of their purpose.

Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.

Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and places of worship.

Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses such as parks and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility's operating period is used.

There are two levels of impact included in the FTA criteria. The interpretation of these two levels of impact are summarized below:

- Severe: Severe noise impacts are considered "significant" as this term is used in the National Environmental Policy Act (NEPA) and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical method of mitigating the noise.

- Impact: Sometimes referred to as moderate impact, in this range of noise impact, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

The noise impact criteria are summarized in **Table 3-14**. The first column shows the existing noise exposure and the remaining columns show the additional noise exposure from the transit project that would cause either moderate or severe impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the transit project.

3.5.2 Existing Noise Conditions

Noise-sensitive land use along the project corridor was first identified based on preliminary alignment drawings, aerial photographs, visual surveys and land use information from the MIS process. Based on this review, summary descriptions of noise-sensitive land use and existing noise sources along the corridor, from south to north, are as follows:

- Harry Hines Boulevard (Oak Lawn Avenue to Motor Street) - Although much of this area is commercial, there are several motels as well as a single-family residential neighborhood along the northeast side of Harry Hines Boulevard. Most of the residences are currently shielded from existing traffic noise by first-row commercial buildings. In addition to traffic on Harry Hines Boulevard, existing noise sources along this corridor segment include Dallas Love Field aircraft traffic, railroad operations on the opposite side of Harry Hines Boulevard, and miscellaneous commercial activities.

- Harry Hines Boulevard (Motor Street to Record Crossing Road) - The southernmost portion of this area is in close proximity to the Selected LRT alignment. Areas to the north are associated with the Harry Hines Base Alignment, which was considered in the Draft EIS. This segment of the corridor passes through the Medical Center District, which includes Parkland Hospital, UTSW Medical Center, Zale Lipshy University Hospital, St. Paul University Hospital and Salvation Army social service facilities, including a chapel (the Salvation Army Temple) at the corner of Harry Hines Boulevard and Mockingbird Lane. All of the hospitals are high-rise buildings located on the southwest side of Harry Hines Boulevard, and noise-sensitive outdoor land use is limited to a few scattered benches in front of the hospitals. The existing noise environment is dominated by a high volume of bus, truck and automobile traffic on Harry Hines Boulevard, Dallas Love Field aircraft traffic and hospital sources (e.g., ambulance sirens).

- Harry Hines, Maple Avenue/Denton Drive Area (Medical Center Design Options and UPRR) - This section begins in the Medical Center area, heading north from Harry Hines Boulevard, through a mostly industrial area to Maple Avenue and Denton Drive. This area covers Design Options A, B, C and D as well as the Selected LRT alignment (UPRR) in the Medical Center area. These alignments are in the vicinity of the Salvation Army Carr P. Collins Social Services Center residential buildings near Harry Hines Boulevard, O-K Paper Company, single-family residences, two schools, a medical clinic, Weichsel Park, an existing apartment complex and an apartment complex currently under construction. Video Post and Transfer, a noise and vibration sensitive business, is also located in this area. The existing noise environment is dominated by Dallas Love Field aircraft traffic, and by local automobile traffic.

TABLE 3-14
FTA NOISE IMPACT CRITERIA

Existing Noise Exposure Leq or Ldn	Project Noise Exposure Impact Thresholds, Ldn or Leq (dBA)			
	Category 1 or 2 Sites		Category 3 Sites	
	Impact	Severe Impact	Impact	Severe Impact
<43	Amb.+10	Amb.+15	Amb.+15	Amb.+20
43	52	58	57	63
44	52	59	57	64
45	52	59	57	64
46	52	59	57	64
47	52	59	58	64
48	53	59	58	64
49	53	59	58	64
50	53	60	59	65
51	54	60	59	65
52	54	60	59	65
53	54	60	60	65
54	55	61	60	66
55	55	61	61	66
56	56	62	61	67
57	56	62	62	67
58	57	62	62	67
59	57	63	63	68
60	58	63	63	68
61	58	64	64	69
62	59	64	65	69
63	60	65	65	70
64	60	66	66	71
65	61	66	66	71
66	61	67	67	72
67	62	67	68	72
68	63	68	69	73
69	64	69	69	74
70	65	69	70	74
71	65	70	70	75
72	65	71	70	76
73	65	72	70	77
74	65	72	70	77
75	65	73	70	78
76	65	74	70	79
77	65	75	70	80
>77	65	75	70	80

Note: Ldn is used for land uses where nighttime sensitivity is a factor; maximum 1 hour Leq is used for land use involving only daytime activities.

Source: Federal Transit Administration, April 1995

- Love Field Design Option - There are no sensitive land uses in the vicinity of the Love Field Design Option. Noise levels are dominated by aircraft operations.

- South of Mockingbird Lane (Harry Hines Boulevard to Denton Drive) - Although this area is primarily commercial and industrial, there are a few single-family homes that remain on Bomar Avenue and Manor Way. The existing noise environment in this area is dominated by Dallas Love Field aircraft traffic.

- Denton Drive (Empire Central to Burbank Avenue) - There is a large single-family residential area located along this segment of the corridor on the southwest side of Denton Drive, including a school and two churches. In addition to Dallas Love Field aircraft traffic, the

dominant noise source, other contributors to the noise environment in this neighborhood include traffic on Denton Drive and limited DGNO freight train movements on the existing railroad line between the houses and Denton Drive.

- Denton Drive (Webb Chapel Extension to Northwest Highway) - This short segment of the corridor includes several large apartment complexes on both sides of Denton Drive. As in the other areas adjacent to Dallas Love Field, aircraft traffic is the dominant noise source. Other contributors to the noise environment in this area include traffic on Denton Drive, limited DGNO freight train movements and local resident activities.

- Farmers Branch - Noise-sensitive land use along the corridor in Farmers Branch includes a small number of single-family residences, a church and a park, all located to the east of Denton Drive and the DGNO railroad line. There is also a motel on the west side of the corridor. Existing noise sources in this area include Denton Drive traffic and a limited number of DGNO train operations.

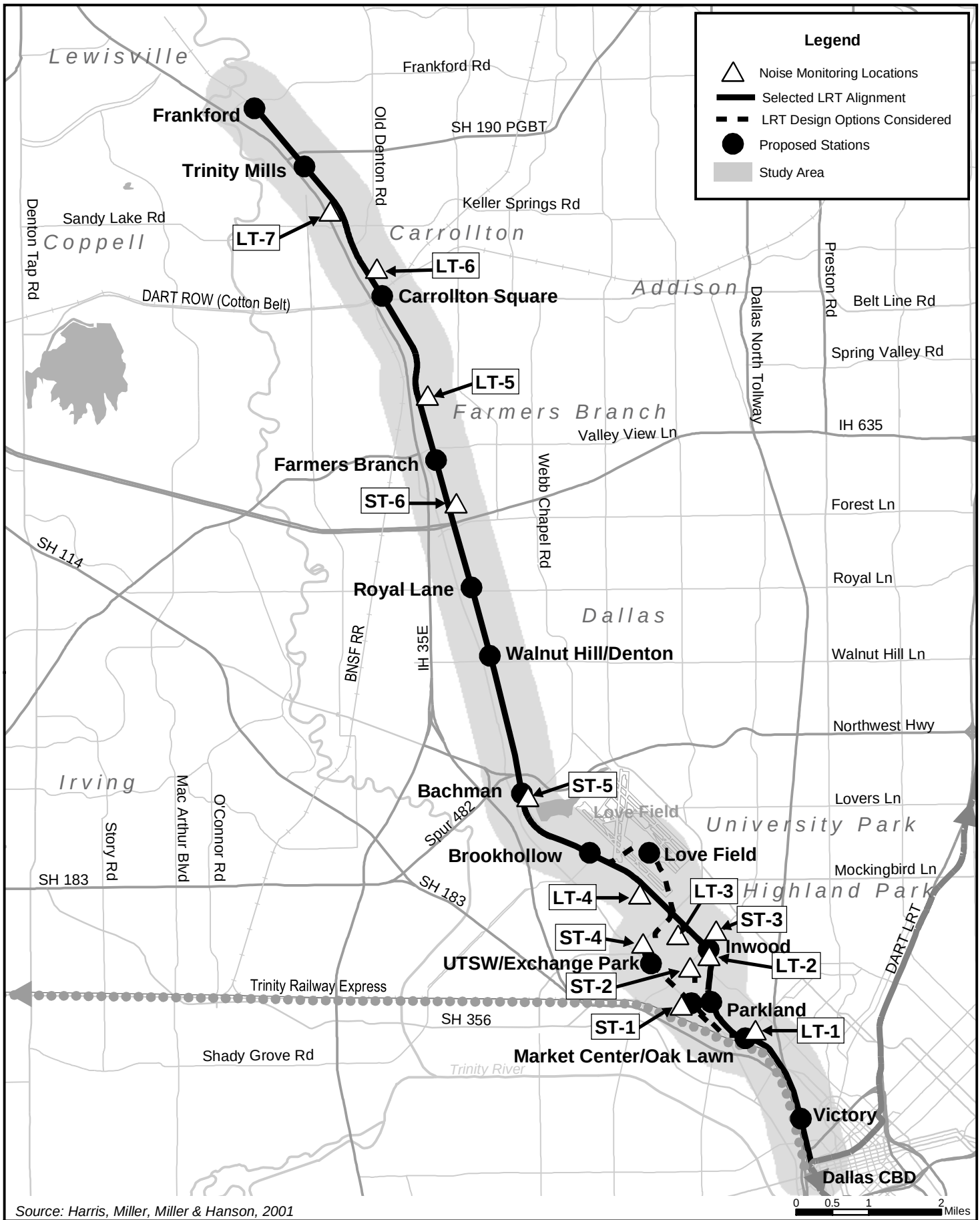
- Carrollton - Noise-sensitive land use along the corridor in Carrollton includes a small number of single-family residences, one apartment complex, a church, several motels and a trailer park. Existing noise sources include traffic on Broadway Street (an extension of Denton Drive) and a limited number of DGNO train operations.

Existing ambient noise levels in the above areas were characterized through direct measurements at selected sites along the proposed alignment during the period from March 5 through March 7, 2001 and from November 7 through November 8, 2001. Estimating existing noise exposure is an important step in the noise impact assessment since, as indicated above in Section 3.5.2, the thresholds for noise impact are based on the existing levels of noise exposure. The measurements included both long-term (24-hour) and short-term (typically one hour) monitoring of the A-weighted sound level at representative noise-sensitive locations.

All of the measurement sites were located in noise-sensitive areas, and were selected to represent a range of existing noise conditions along the corridor. **Figure 3-21** shows the general location of the seven long-term monitoring sites (LT-1 through LT-7) and six short-term monitoring sites (ST-1 through ST-6). At each site, the measurement microphone was positioned to characterize the exposure of the site to the dominant noise sources in the area. For example, microphones were located at the approximate setback lines of the receptors from adjacent roads or rail lines, and were positioned to avoid acoustic shielding by landscaping, fences or other obstructions.

The results of the existing ambient noise measurements, summarized in **Table 3-15**, were used as a basis for determining the existing noise conditions at all noise-sensitive receptors along the corridor. However, because of the variability and dominance of aircraft noise and train horn noise at certain locations, supplementary estimates and adjustments to the measured noise levels were made to generalize the results along the corridor. The resulting characterization of existing ambient noise conditions is summarized below.

- Harry Hines Boulevard (Oak Lawn Avenue to Motor Street) - The Ldn measured at the nearest residence in this area (Site LT-1) was 70 dBA, dominated by noise from traffic on Harry Hines Boulevard. This site is located at 150 feet from the center of Harry Hines Boulevard, with a partial view of the road (view angle of about 90 degrees). Thus, the Ldn at other locations in this area can be estimated by applying appropriate adjustments to the measured level for distance and shielding.



Source: Harris, Miller, Miller & Hanson, 2001

Figure 3-21
Ambient Noise Monitoring Locations

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TABLE 3-15
SUMMARY OF EXISTING AMBIENT NOISE MEASUREMENT RESULTS

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Ldn	Leq
	Selected LRT Alternative (Base Alignment with Medical Center Design Option D)					
LT-1	S.F. Res.@ 2219 Douglas Avenue – Dallas	3-6-01	14:00	24	70	--
LT-2	S. F. Res @2805 Cherrywood Avenue – Dallas	11-7-01	10:00	24	72	--
LT-3	S.F. Res.@ 2614 Bomar Avenue – Dallas	3-5-01	00:00	24	62	--
LT-4	S.F. Res. @ 7319 Denton Drive – Dallas	3-6-01	12:00	24	73	--
LT-5	S.F. Res.@ 12815 Bee St. – Farmers Branch	3-5-01	00:00	24	65	--
LT-6	M.F. Res.@ 1309 Northside Drive–Carrollton	3-5-01	00:00	24	76	--
LT-7	Trailer Home #30@2200 N. IH35E–Carrollton	3-5-01	00:00	24	67	--
ST-1	Parkland Memorial Hospital – Dallas	3-6-01	16:00	1	65*	66
		11-8-01	11:00	1		64
		11-7-01	23:00	1		59
ST-3	Rusk Middle School – Dallas	11-7-01	16:00	1	--	73
ST-5	Apt. #1014 @ Rush Creek Apts. – Dallas	3-6-01	11:00	5	63	64
		11-7-01	07:00	1		62
		11-8-01	00:01	1		56
ST-6	Farmers Branch Historic Park – Farmers Branch	3-5-01	10:00	½	--	55
	Other Alignments Considered					
ST-2	Edison Hernandez Academy – Dallas	11-7-01	15:00	1	--	67
ST-4	Salvation Army Temple – Dallas	11-8-01	15:00	1	--	61

*See text for a discussion of the estimation of the Ldn from the short-term data.

Source: Harris, Miller, Miller, & Hanson Inc., 2001

- Harry Hines Boulevard (Motor Street to Record Crossing Road) - Although no long-term noise measurements were made in this area, a short-term measurement was made at Parkland Hospital (Site ST-1). The measurement location was 150 feet from the center of Harry Hines Boulevard, and is representative of the closest hospital buildings in this area. The Leq measured during a peak traffic hour at this site was 66 dBA, the Leq measured during an off-peak hour at this site was 64 dBA, and the Leq measured during a nighttime hour at this site was 59 dBA. The Ldn was estimated to be 65 dBA based on a formula in the FTA guidance manual using the three short-term noise measurements conducted at this site.

- Harry Hines/Maple Avenue/Denton Drive Area (Medical Center Design Options and UPRR) - The Ldn measured at a residence (LT-2) in this area was 72 dBA, dominated by noise from aircraft from Dallas Love Field. Base on this measurement and on Love Field noise contours, the Ldn is estimated to range from 67 dBA to 73 dBA at residential sites in this area. In addition, short-term noise measurements were conducted at Edison Hernandez Elementary School (ST-2) and Rusk Middle School (ST-3). The Leq noise exposure level measured during peak traffic hours, was 67 dBA at the elementary school and 73 dBA at the middle school. The Leq levels at Weichsel Park and Video Post and Transfer, located near the middle school, are also taken to be 73 dBA. The Leq at the medical clinic is taken to be 70 dBA, based on typical daytime hourly Leq data from nearby measurement site LT-2.

- Love Field Design Option - No measurements were taken since no noise sensitive uses are present.

- South of Mockingbird Lane (Harry Hines Boulevard to Denton Drive) - The existing Ldn is taken to be 62 dBA at the few noise-sensitive receptors in this area, based on the

measurement results at Site LT-2. This is a conservatively low value, based on measurements during "north flow" conditions at Dallas Love Field, with arriving aircraft flying over this area. The noise contours for Dallas Love Field suggest that the Ldn is about 10 decibels higher under "south flow" conditions, when aircraft depart over this area. In addition, a short-term measurement (ST-4) was conducted at the Salvation Army Temple on the corner of Harry Hines Boulevard and Mockingbird Lane. The peak-hour Leq at this site was 61 dBA.

- Denton Drive (Empire Central to Burbank Avenue) - The Ldn measured at a home along Denton Drive in this area (Site LT-3) was 73 dBA, dominated by noise from aircraft at Dallas Love Field; without aircraft noise, the measured data suggest that the background Ldn at this location is about 61 dBA. However, because the airport noise contours show that the Ldn varies widely with location along Denton Drive in this area, the existing Ldn has been estimated based on a combination of the background noise level and the minimum aircraft noise levels predicted for either northwest or southwest aircraft flow conditions at Dallas Love Field. The resulting site-specific existing Ldn values range from 65 dBA at Burbank Avenue to 78 dBA at Empire Central.

- Denton Drive (Webb Chapel Extension to Northwest Highway) - The Leq measured during a five-hour mid-day period at an apartment complex located 125 feet east of Denton Drive (Site ST-5) was 64 dBA. The Leq measured during a peak hour was 62 dBA and the Leq measured during a nighttime hour was 56 dBA. The Ldn was estimated to be 63 dBA based on a formula in the FTA guidance manual using the three-short-term noise measurements conducted at this site. For residences in this area on the west side of Denton Drive, located only about 75 feet from the road, the existing Ldn is estimated to be 3 decibels higher based on distance, yielding an estimate of 68 dBA.

- Farmers Branch - The Ldn measured at a residence located about 200 feet east of Denton Drive in Farmers Branch was 65 dBA. This level can be used to characterize the Ldn at other receptors in Farmers Branch, by applying adjustments based on the distance to Denton Drive. At Farmers Branch Historical Park (Site ST-6), the existing noise environment is characterized by the measured short-term Leq of 55 dBA.

- Carrollton - The measurements in Carrollton indicated Ldn values of 76 dBA at a residence near the Northside Drive grade crossing (Site LT-6), and 67 dBA at a trailer park on the west side of Broadway Street (Site LT-7). However, the Ldn at Site LT-6 was dominated by extremely loud noise from DGNO train horns, with a maximum noise level of 105 dBA between 2:00 A.M. and 3:00 A.M. Without the train horn noise, the Ldn in this area is estimated to be 66 dBA. Due to the variability and intensity of this source, the latter value is used to characterize the existing noise environment at noise-sensitive locations along the corridor in Carrollton.

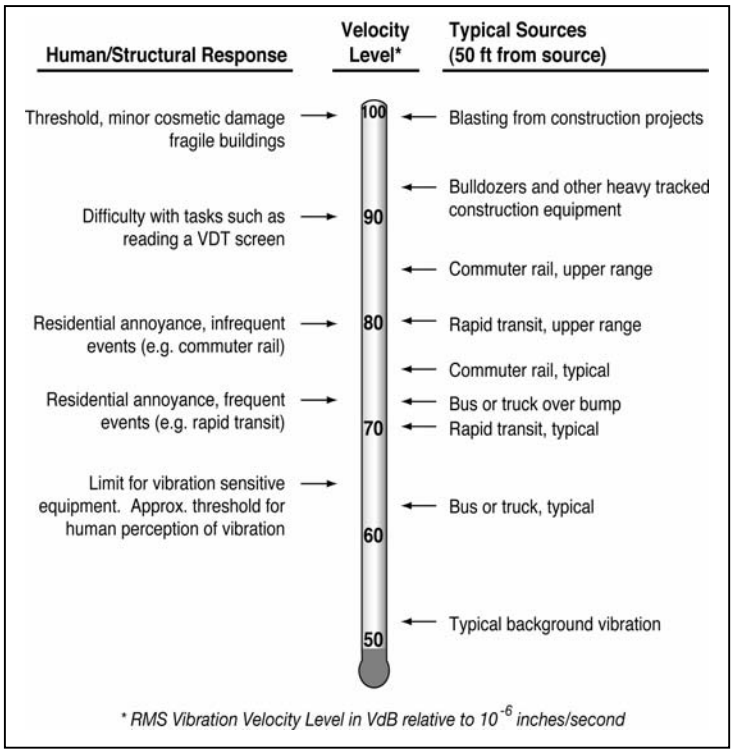
3.6 VIBRATION

This section describes the methodology used to characterize the existing vibration conditions along the corridor, and provides background information on ground-borne vibration issues related to the proposed transit project.

Ground-borne vibration is the oscillatory motion of the ground about some equilibrium position that can be described in terms of displacement, velocity or acceleration. Because sensitivity to vibration typically corresponds to the amplitude of vibration velocity within the low-frequency range of most concern for environmental vibration (roughly 5-100 Hz), velocity is the preferred measure for evaluating ground-borne vibration from transit projects.

The most common measure used to quantify vibration amplitude is the peak particle velocity (PPV), defined as the maximum instantaneous peak of the vibratory motion.

Figure 3-22
Typical Ground-Borne Vibration Levels and Criteria



Source: FTA Transit Noise & Vibration Impact Assessment, April 1995

PPV is typically used in monitoring blasting and other types of construction-generated vibration, since it is related to the stresses experienced by building components. Although PPV is appropriate for evaluating building damage, it is less suitable for evaluating human response, which is better related to the average vibration amplitude. Thus, ground-borne vibration from transit trains is usually characterized in terms of the "smoothed" root mean square (rms) vibration velocity level, in decibels (VdB), with a reference quantity of one micro-inch per second.

VdB is used in place of dB to avoid confusing vibration decibels with sound decibels. **Figure 3-22** illustrates typical ground-borne vibration levels for common sources as well as criteria for human and structural response to ground-borne vibration.

As shown, the range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human perception to vibration is 65 VdB, annoyance is usually not significant unless the vibration exceeds 70 VdB.

3.6.1 Ground-Borne Vibration Criteria

The FTA ground-borne vibration impact criteria are based on land use and train frequency, as shown in **Table 3-16**. There are some buildings, such as concert halls, recording studios and theaters that can be very sensitive to vibration but do not fit into any of the three categories listed in **Table 3-16**. Due to the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project. **Table 3-17** gives criteria for acceptable levels of ground-borne vibration for various types of special buildings. The Love Field Design Option included a tunnel alignment under Dallas Love Field property. Specifically, vibration from tunnel boring and LRT operations may have affected existing navigational aids (NAVAIDS) and associated underground or surface equipment used for aircraft operations. These facilities would have also warranted special attention during final design should the Love Field Design Option have been selected. Prior to construction, FAA would need to approve DART's plans and review and concur with the vibration analysis of the potential construction and operational impacts to airport facilities.

TABLE 3-16
GROUND-BORNE VIBRATION AND NOISE IMPACT CRITERIA

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro inch/sec)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[3]	65 VdB[3]	[4]	[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB	40 dBA	48 dBA

Notes:
1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2 "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
4. Vibration-sensitive equipment is not sensitive to ground-borne noise.

Source: Federal Transit Administration, April 1995

TABLE 3-17
GROUND-BORNE VIBRATION AND NOISE IMPACT CRITERIA FOR SPECIAL BUILDINGS

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums[3]	72 VdB	80 VdB	30 dBA	38 dBA
Theaters[3]	72 VdB	80 VdB	35 dBA	43 dBA

Notes:
1. "Frequent Events" is defined as more than 70 vibration events per day. Most transit projects fall into this category.
2. "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. If the building will rarely be occupied when the trains are operating, there is no need to consider impact. As an example consider locating a commuter rail line next to a concert hall. If no commuter trains will operate after 7 pm, it should be rare that the trains interfere with the use of the hall.

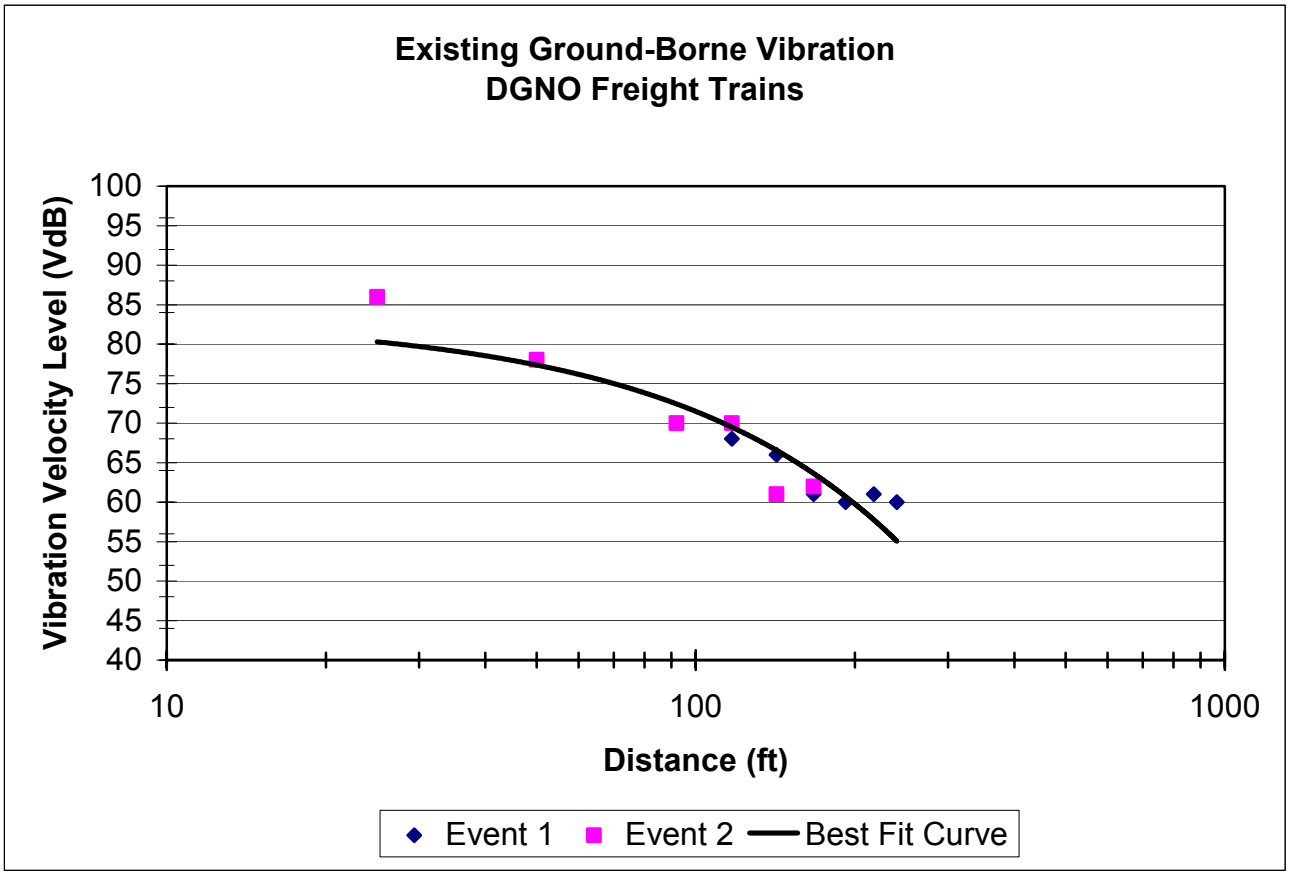
It should also be noted that **Table 3-16** and **Table 3-17** include separate FTA criteria for ground-borne noise, the "rumble" that can be radiated from the motion of room surfaces in buildings due to ground-borne vibration. Although expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are set significantly lower than for airborne noise to account for the annoying low-frequency character of ground-borne noise. Because airborne noise tends to mask ground-borne noise for above ground (i.e. at-grade or elevated) rail systems, ground-borne noise criteria are primarily applied where airborne noise is not a dominant factor. As such, ground-borne noise criteria are applied only to well-insulated interior spaces of noise-sensitive institutional buildings adjacent to the project alignment (e.g., Video Post and Transfer).

3.6.2 Existing Vibration Conditions

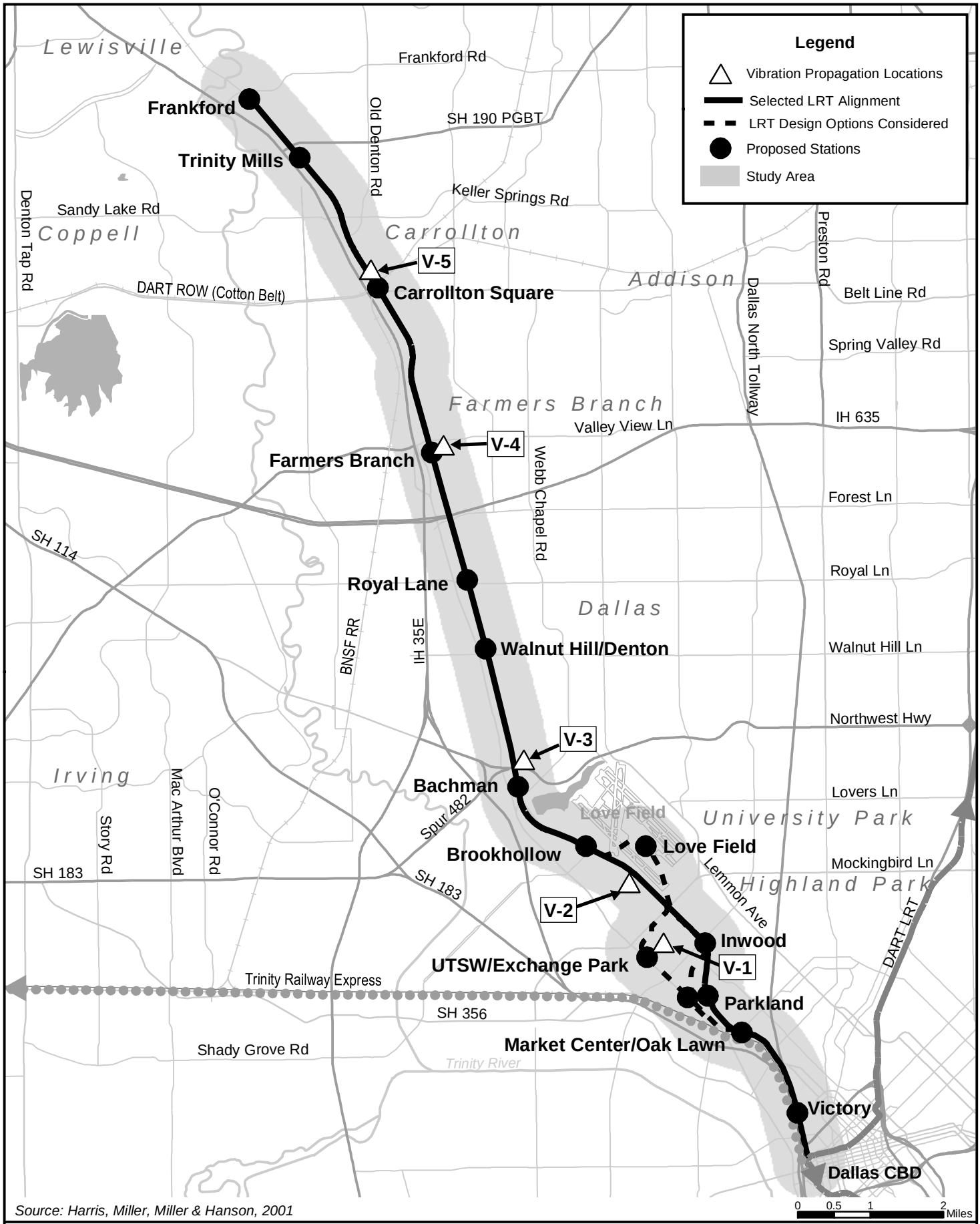
Because significant sources of existing ground-borne vibration along the Northwest Corridor are limited to infrequent, low-speed freight train movements on the DGNO railroad line north of Mockingbird Lane and aircraft activity level at Dallas Love Field, the vibration measurements for this project focused on characterizing the vibration propagation characteristics of the soil at representative locations along the corridor. Five vibration testing sites, at the locations shown in **Figure 3-23**, were selected to represent a range of soil conditions in areas along the corridor that include a significant number of vibration-sensitive receptors. At each of these sites, ground-borne vibration propagation tests were conducted by impacting the ground and measuring the input force and corresponding ground vibration response at various distances. The resulting force-response transfer function can be combined with the known input force characteristics of the DART light rail vehicle to predict future vibration levels at locations along the project corridor.

Measurements of existing ground-borne vibration were limited to two train events at Site V-2, in the residential neighborhood along Denton Drive on the west side of Dallas Love Field. The results, shown in **Figure 3-24**, suggest that the existing ground vibrations from DGNO freight train operations are perceptible within about 150 feet from the track.

Figure 3-24
Maximum Existing Ground-Borne Vibration from Freight Train Operations



Source: Harris, Miller, Miller, and Hanson, 2001



Source: Harris, Miller, Miller & Hanson, 2001

Figure 3-23
Ground-Borne Vibration Measurement Locations

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3.7 VISUAL AND AESTHETIC RESOURCES

3.7.1 Methodology

A visual inventory of the corridor was undertaken to provide an overview of the various character areas along the corridor. The purpose of this inventory is to document the visual and aesthetic resources within the corridor that may be impacted by the proposed action. The analysis of potential impacts presented in Section 5.6 addresses how the proposed action will affect the views, vistas and areas of special design character. This includes not only the character of the built environment, but of the natural environment, as well.

3.7.2 Overview of the Corridor

The project corridor begins in the urban core of downtown Dallas, as it departs from the light rail system in the West End, and then quickly transitions through an area of office parks and hospital facilities to an industrial corridor. As it approaches its terminus to the north, it reaches the downtowns of two suburban communities, Farmers Branch and Carrollton. It is typical of a railroad corridor, given its history, in that it is lined with small industrial and commercial sites that have, in their past, relied on the railroad for the delivery of goods.

Whether adjacent to Harry Hines Boulevard, Stemmons Freeway, Denton Drive, or Dallas Love Field, the alignment is fronted by the back door of many businesses and other uses due to its history as an active freight railroad corridor. The exception is those places where the alignment will depart from the railroad corridor to serve activity centers such as the Medical Center area.

3.7.3 Corridor Assessment Unit Descriptions

For the purpose of documenting the visual inventory of the corridor, the Study Area was, based on field observation, categorized into ten assessment units, shown in **Figure 3-25**. Each of these units was delineated based on its general visual character and the commonality of its land uses. **Table 3-18** provides a general rating of each unit's visual quality, sensitivity to change, primary viewers, and sensitive visual assets or receptors. **Table 3-19** provides definitions of the ratings used in evaluating each assessment unit. The ten assessment units are described below:

Unit 1 – West End/Arena

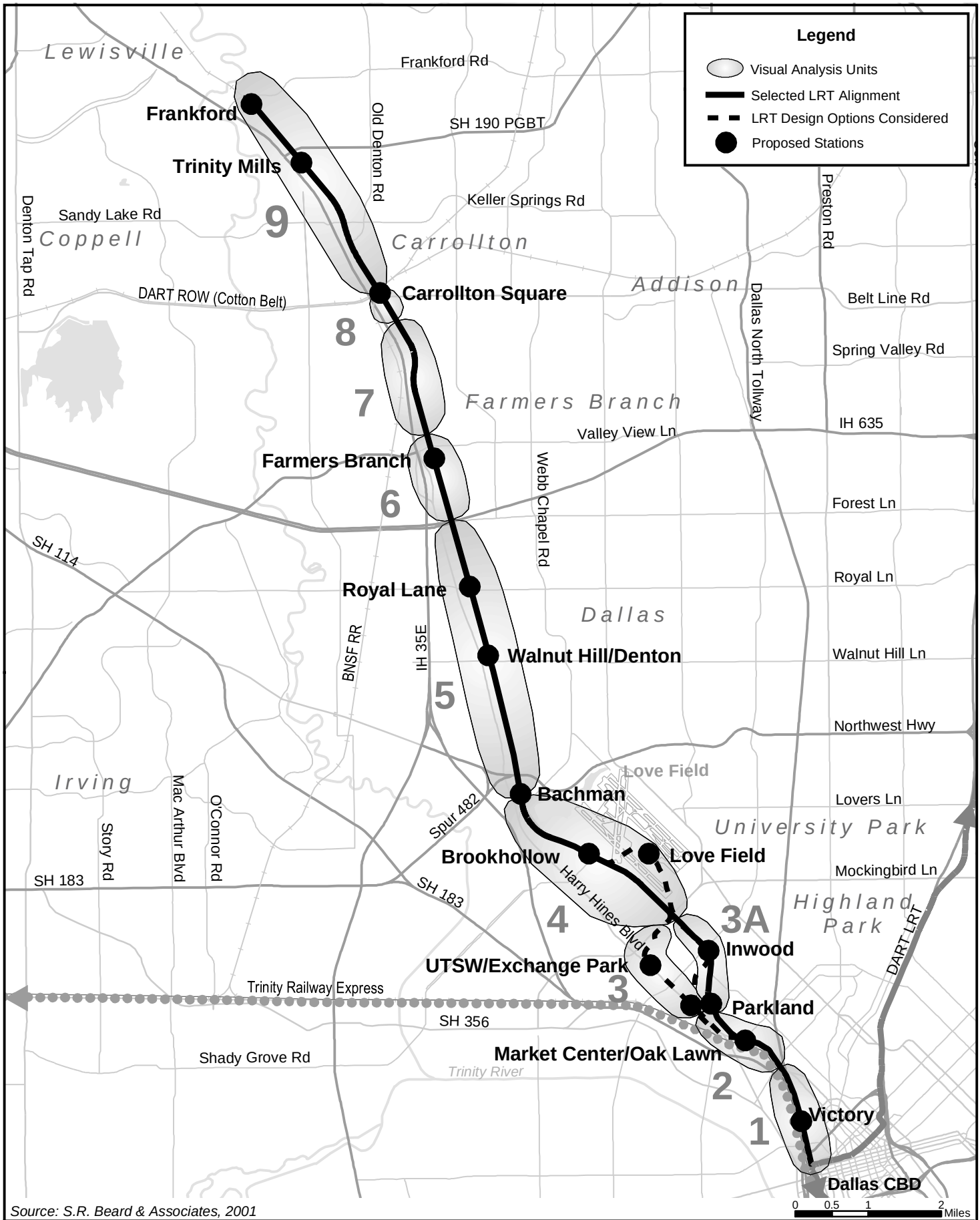
This unit is comprised of a variety of buildings and architectural styles, which begin the transition from the historic West End north towards Market Center. The red brick architecture of older buildings is carried through the design of the new American Airlines Center arena. The area has an industrial-era character, which quickly changes as the line progresses north.

Unit 2 - Market Center

The visual landscape of the Market Center unit is characterized by the landscaping and modern architecture of the low to mid-rise office, market and hotel buildings located west of the rail alignment. The area also has older commercial buildings and motels on the east side of Harry Hines Boulevard, which buffer Harry Hines Boulevard and the UPRR from an adjacent single-family residential neighborhood. Along the UPRR, the visual landscape is dominated by industrial/warehouse uses.

Unit 3 - Medical Center

The Medical Center unit is characterized by its landscaped median, and the institutional architecture of several interconnected hospitals and supporting medical buildings. Towards the southern end of the unit, a pedestrian bridge connects Parkland Hospital to its parking garage across Harry Hines. To the north, the North and South campuses of UTSW are connected by a pedestrian and bus shuttle bridge ("campus connector") crossing Harry Hines. The environment of the Medical Center is very much indoors, with minimal surface sidewalks and pedestrian ways to connect buildings to each other and to parking garages and lots.



Source: S.R. Beard & Associates, 2001

Figure 3-25
Visual Analysis Units

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TABLE 3-18
GENERAL RATING OF CORRIDOR VISUAL ASSESSMENT UNITS

Unit	Name	City	Primary Viewers	Visual Quality	Visual Sensitivity	Sensitive Receptors/Assets
1	West End / Arena	Dallas	A, E, G	Moderate-High	Moderate	West End properties, American Airlines Center
2	Market Center	Dallas	A, B, C, E	Moderate-High	Moderate	Reverchon Park, Turtle Creek Pump Station, Market Center, SF residences to east, offices, hotels
3	Medical Center	Dallas	A, C, E, H	Moderate-High	High	Hospitals, MF residences, offices, Harry Hines Blvd. landscaping
3A	Inwood	Dallas	A, B, D,E, F, H	Low-Moderate	Moderate	SF residences to the east, schools, park, low-rise industrial
4	Love Field	Dallas	A, B, C, D, F	Low	Low	SF residences to west, Knight School, Bachman Lake Park
5	Northwest Hwy. / LBJ Freeway	Dallas	A, C, E, F	Low-Moderate	Moderate-High	MF residences to east, offices
6	Farmers Branch	Farmers Branch	A, B, E, D, G	Moderate	Moderate	FB Historical Park, SF residences, municipal center
7	North Farmers Branch	Farmers Branch	A, C, F	Low	Low-Moderate	Low rise industrial uses and MF residences
8	Downtown Carrollton	Carrollton	A, E, G	Moderate-High	High	Old Downtown Carrollton, SF and MF residences, historic properties and parks
9	Carrollton / Frankford	Carrollton	A, B, C, D, F	Moderate	Moderate	SF residences, offices, Ken Good Park

Source: S.R. Beard & Associates, 2001

TABLE 3-19
EVALUATION RATING DEFINITIONS

Primary Viewers	Visual Quality	Visual Sensitivity
A = Arterial Motorists B = Single Family Residents C = Multi-Family Residents D = Recreational Users E = Commercial/Office Tenants F = Industrial Tenants G = Downtown Pedestrians H = Others	**High =** Assessment unit or portions thereof is of significant visual or aesthetic quality to the primary viewers. **Moderate =** Assessment unit or portions thereof is of average visual or aesthetic quality to the primary viewers. **Low =** Assessment unit is of little or no visual or aesthetic quality to the primary viewers.	**High =** Introduction of new elements into the assessment unit could significantly impact the quality of the visual/aesthetic resource as observed by the primary viewers. **Moderate =** Introduction of new elements into the assessment unit may impact the quality of the visual/aesthetic resource unit or a portion thereof as observed by the primary viewers. **Low =** Introduction of new elements into the assessment unit is not likely to have an impact on any visual/aesthetic resource as observed by the primary viewers.

Source: S.R. Beard & Associates, 2001

Unit 3A - Inwood
The Inwood unit is characterized by low rise light industrial and older commercial uses towards its southern end. As it extends north towards Inwood Road, it is adjacent to additional light industrial and commercial uses, as well as two schools, Weichsel Park and a single-family residential neighborhood.

Unit 4 - Dallas Love Field
The Dallas Love Field unit is a low-rise industrial area that is indicative of development adjacent to many airports. Warehouses and aviation related offices lining the east side of the railroad corridor serve air cargo, maintenance and other functions at the airport itself. The single-family residential area to the west of the corridor faces toward the alignment and Dallas Love Field Airport.

Unit 5 - Northwest Highway/LBJ Freeway
The Northwest Highway to LBJ Freeway unit is predominantly railroad-served industrial uses, with low-rise buildings that back onto the corridor. In the vicinity of the Northwest Highway station, there are two- and three-story multi-family residential developments, as well as commercial and retail uses.

Unit 6 – Farmers Branch
The Farmers Branch Unit is best characterized as the town center. Residential and civic uses to the east of the corridor have tree-lined streets, and older homes and buildings house small businesses. The unit is also characterized by the presence of public offices and their architecture, which is indicative of their importance in the community.

Unit 7 - North Farmers Branch
The North Farmers Branch Unit is a suburban industrial corridor. The buildings, most of which are fenced in, are set back farther from the railroad corridor than in the more southerly segments of the line. Towards the northern end of the unit, multi-family housing faces the alignment with a view from balconies and patios across a parking lot.

Unit 8 – Downtown Carrollton
The Downtown Carrollton unit is unique to the suburban end of the line. The original railroad depot and downtown area are indicative of a turn-of-the-century farming settlement. While the character of the buildings, both old and new, is of varying aesthetic character, most are either rehabilitated or restored to add to the quality of the pedestrian environment in downtown.

Unit 9 – Carrollton/Frankford
At the northernmost end of the line, the Carrollton/Frankford unit is the most suburban, with newer industrial and warehouse uses set back from the line, many behind security and privacy fencing. There is a public park with small lakes just south of the Trinity Mills station. The line terminates at the Frankford station just south of the Elm Fork of the Trinity River.

3.8 CULTURAL RESOURCES AND PARKLANDS

This section describes the existing cultural resources including but not limited to historic resources, archeological resources, and Section 4(f) resources potentially affected by the proposed project. First the regulatory framework governing cultural resources is presented; next historic resources are presented and analyzed, followed by archeological resources and Section 4(f) resources.

3.8.1 Applicable Legal and Regulatory Requirements

Section 106

If projects are Federally permitted, licensed, funded or partially funded with Federal money, the project must comply with Section 106 of the National Historic Preservation Act of 1966, as amended through 1992 (16 U.S.C. § 470 et seq.). Section 106 requires that every Federal agency "take into account" the effect of an undertaking on historic properties. The process begins with inventorying and evaluating historic properties. For Section 106 purposes, any property listed in or eligible for the National Register of Historic Places (NRHP) is considered to be an historic property. The NRHP is a historic resources inventory and is maintained by the Secretary of the Interior. This list includes buildings, structures, objects, sites, and districts. Furthermore, Section 106 requires Federal agencies to consult with and seek comments from the State Historic Preservation Officer (SHPO), a representative of the independent federal reviewing agency, the Advisory Council on Historic Preservation (ACHP). The ACHP has developed a process for carrying out Section 106 responsibilities, which is defined in its regulations entitled Protection of Historic Properties, 36 CFR Part 800.

Texas Antiquities Code

Cultural resources may include archeological, historical, architectural sites, and places of particular significance to traditional cultures. Cultural resources located on land owned or controlled by the State of Texas, or one of its cities or counties, or other political subdivisions are protected by the Antiquities Code of Texas. Under the Antiquities Code, any historic or prehistoric property located on state land or land controlled by a political subdivision of the State of Texas may be determined eligible as a State Archeological Landmark (SAL). Conditions for formal landmark designation are covered in Chapter 26 of the Texas Historical Commission's (THC) Rules of Practice and Procedure for the Antiquities Code of Texas. All groundbreaking activities affecting public land must be reviewed by the THC's Archeological Division under the following circumstances: (1) if the project affects a cumulative area larger than five acres or disturbs a cumulative area of more than 5,000 cubic yards, whichever measure is triggered first, or (2) if the project is inside a designated historic district or recorded archeological site. Authorization to proceed includes a formal Antiquities Permit, which stipulates the conditions under which survey, discovery, excavation, demolition, restoration, or scientific investigations will occur.

State Historic Preservation Officer Coordination

The Texas Historical Commission coordinates state participation in implementing Section 106 as the Texas SHPO. In accordance with the ACHP's guidelines, DART and the Federal Transit Administration (FTA) are consulting with the Texas SHPO on this undertaking. In accordance with Section 106 and on behalf of FTA, DART identified those properties that are already listed in, were previously determined eligible for listing in, or appear eligible for listing in the NRHP, and requested SHPO's concurrence with these findings on February 5, 2002, by submitting the ***Request for Determination of Eligibility Report***. SHPO requests for supplemental information to support the eligibility determination were sent on April 26, June 11, and August 16, 2002. In addition, a tour of the project corridor for THC Staff was provided on April 5, 2002. The SHPO concurred with the findings of the Determination of Eligibility report in a letter to DART on August 21, 2002 (See Appendix D). Based on changes in Medical Center area to follow the UPRR alignment, a Supplemental Request for Determination of Eligibility and Effects was sent to SHPO on April 4, 2003, showing the revised Area of Potential Effects (APE). The SHPO concurred with the findings in a letter to DART dated May 21, 2003.

Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303) requires that federal transportation projects consider the project's effects on certain protected resources. A Section 4 (f) resource is a publicly owned park, recreation area, wildlife/waterfowl refuge, or significant historic site. Regulations prescribing procedures for implementing the Section 4 (f) process are found in 23 CFR 771.135.

Texas Parks and Wildlife Code

Chapter 26 of the Texas Parks and Wildlife Code was established to protect parks, recreation and scientific areas, wildlife refuges, and historic sites from being used or taken by state or local agencies for public projects. Chapter 26 applies to all DART rail projects. Section 26.001 of Chapter 26 provides that:

> *(a) A[n] [agency] of this state may not approve any program or project that requires the use or taking of any public land designated and used prior to the arrangement or the program or project as a park, recreation area, scientific area, wildlife refuge, or historic site, unless the [agency], acting through its duly authorized governing body or officer, determines that:*
>
> *(1) there is no feasible and prudent alternative to the use or taking of such land; and*
>
> *(2) the ... project includes all reasonable planning to minimize harm to the land, as a park, recreation area, scientific area, wildlife refuge, or historic site, resulting from the use or taking.*

Chapter 26 is similar to Section 4(f) of the Department of Transportation Act of 1966 in its requirements, except that the Texas law requires a public hearing on any taking of public park land. Section 26.001 states that:

> *(b) A finding required by Subsection (a) of this section may be made only after notice and a hearing as required by this chapter.*
>
> *(c) The governing body or officer shall consider clearly enunciated local preferences, and the provisions of this chapter do not constitute a mandatory prohibition against the use of the area if the findings are made that justify the approval of a program or project.*

Chapter 26 excludes parks, recreation areas, or wildlife refuges in certain cases. Section 26.004 provides that a department, agency, board, or political subdivision having control of the public land is not required to comply with this chapter if:

> *(1) the land is originally obtained and designated for another public use and is temporarily used as a park, recreation area, or wildlife refuge pending its use for the originally designated purpose;*
>
> *(2) the program or project that requires the use or taking of the land being used temporarily as a park, recreation area, or wildlife refuge is the same program or project for which the land was originally obtained and designated; and*
>
> *(3) the land has not been designated by the department, agency, political subdivision, county, or municipality for use as a park, recreation area, or wildlife refuge before September 1, 1975.*

3.8.2 Cultural Resources

Survey Methodology

A field survey of all properties within the proposed project's Area of Potential Effects (APE) was undertaken according to standard Section 106 guidelines and related procedures. A qualified architectural historian[1] conducted field investigations in March 2001 and in March 2003. During

[1] This refers to a person who meets the Secretary of the Interior's Professional standards.

the field investigations, the boundaries of the preliminary APE were confirmed, and an assessment was made of all extant buildings, structures, objects and districts within the APE to determine if their age and integrity warranted application of National Register criteria. The National Register includes an age criterion of 50 years.

The field survey of historic and architectural resources included the following steps:

- A field survey consisting of a visual on-site examination of every parcel within the APE, including an assessment of integrity;
- Identification of the age of all buildings, structures, objects, and districts located within the APE;
- Photography of each district feature, major structure, building, or object within the APE constructed before 1953/4, which is 50 years prior to the proposed project construction; and,
- Field review of the findings of previous surveys and inventories of significant historic properties.

Following the field survey, site-specific research was conducted using the following:

- Dallas Public Library
- City Directories of Dallas, Texas
- City of Dallas Building Permits
- Dallas County Appraisal District
- TaxNet USA
- Sanborn Maps (City of Dallas and Carrollton)

In addition, historical information was requested from the following organizations:

- Dallas Landmarks Commission
- Dallas Historic Preservation League

The properties identified in this survey effort as being listed on or eligible for being listed on the National Register of Historic Places are outlined in the Historic Resources section below.

Definition Of The Area Of Potential Effects

As defined in the Section 106 guidelines, the Area of Potential Effects (APE) means “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking” (36 CFR §800.16(d)).

In accordance with this definition, the APE for architectural and historical resources includes the parcels within one block of the proposed project alignment and parcels containing and adjacent to stations, traction power substations, and the Northwest Rail Operating Facility (NWROF). The APE for archeological resources includes the area of ground to be disturbed by construction of the proposed project.

Records Search

A records search was undertaken within the APE to determine the proximity of previously documented historic and architectural resources to the project and to help establish a context for resource significance. National, state and local inventories of architectural/historic resources were examined in order to update this previous information, and identify significant local historical events and personages, development patterns, and unique interpretations of architectural styles. The following inventories and sources were consulted:

- The National Register of Historic Places, National Register Information System, updated through December 2001;
- Registered Texas Historical Landmarks;

- Texas Historic Engineering Site Inventory;
- County of Dallas;
- City of Dallas Landmarks;
- The Handbook of Texas Online;
- Daniel Hardy (Hardy, Heck, and Moore), Phase Two: Historic Resources Survey of the City of Dallas, Part One, 1987 survey; and,
- Ron Emrich (Urban Prospects), City of Dallas Historic Resources Survey, 1985.

Consulting and Interested Parties
The Section 106 guidelines require that a Federal agency evaluate all properties within the APE and identify historic resources by seeking information from consulting parties, and other individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area. The following organizations having interests, involvement, or concerns relating to historic preservation were contacted for the proposed project:

- City of Dallas, Planning & Development, Historic Preservation Division
- City of Dallas Landmarks Commission
- Dallas County Historical Commission
- Dallas Historical Society
- Preservation Dallas
- City of Carrollton, Department of Planning
- City of Carrollton, Public Library
- City of Farmers Branch, Department of Planning

In addition, public and agency involvement activities were held prior to the selection of the proposed project and have continued throughout the project development process. For more details, refer to Chapter 6.

Historic Resources
Four properties located within the project APE are listed in the National Register of Historic Places and are shown on **Table 3-20**.

TABLE 3-20
PROPERTIES LISTED IN THE NATIONAL REGISTER OF HISTORIC PLACES

Map No.	Address	Resource Name	Date Listed
1	Roughly bounded by Pacific Avenue, Market and Jackson Streets, and right of way of Dallas Right of Way Management Company	Dealey Plaza Historic District[1]	Listed: 04/19/1993 Listed also as a National Historical Landmark
2	Bounded by Lamar, Griffin, Wood, Market and Commerce Streets	West End Historic District[1]	Listed: 11/14/1978
3	1607 Lyte Street	Magnolia Petroleum Company City Sales and Warehouse[1]	Listed: 12/23/1994
5	3630 Harry Hines Boulevard	Turtle Creek Pump Station	Listed: 02/09/2001

[1]The Dealey Plaza and West End Historic Districts, along with the Magnolia Petroleum Company City Sales and Warehouse are located outside the APE for this undertaking but are in the vicinity.

Source: Myra L. Frank & Associates, 2001

One property within the project APE, the Letot School, was previously determined eligible for listing in the National Register of Historic Places. Then additional properties within the project APE have

been determined to be eligible for listing in the National Register of Historic Places as a result of the survey for the proposed project. These properties are shown on **Table 3-21**. The locations of these 15 resources on the proposed project alignment are illustrated in **Figures 3-26** through **3-28**.

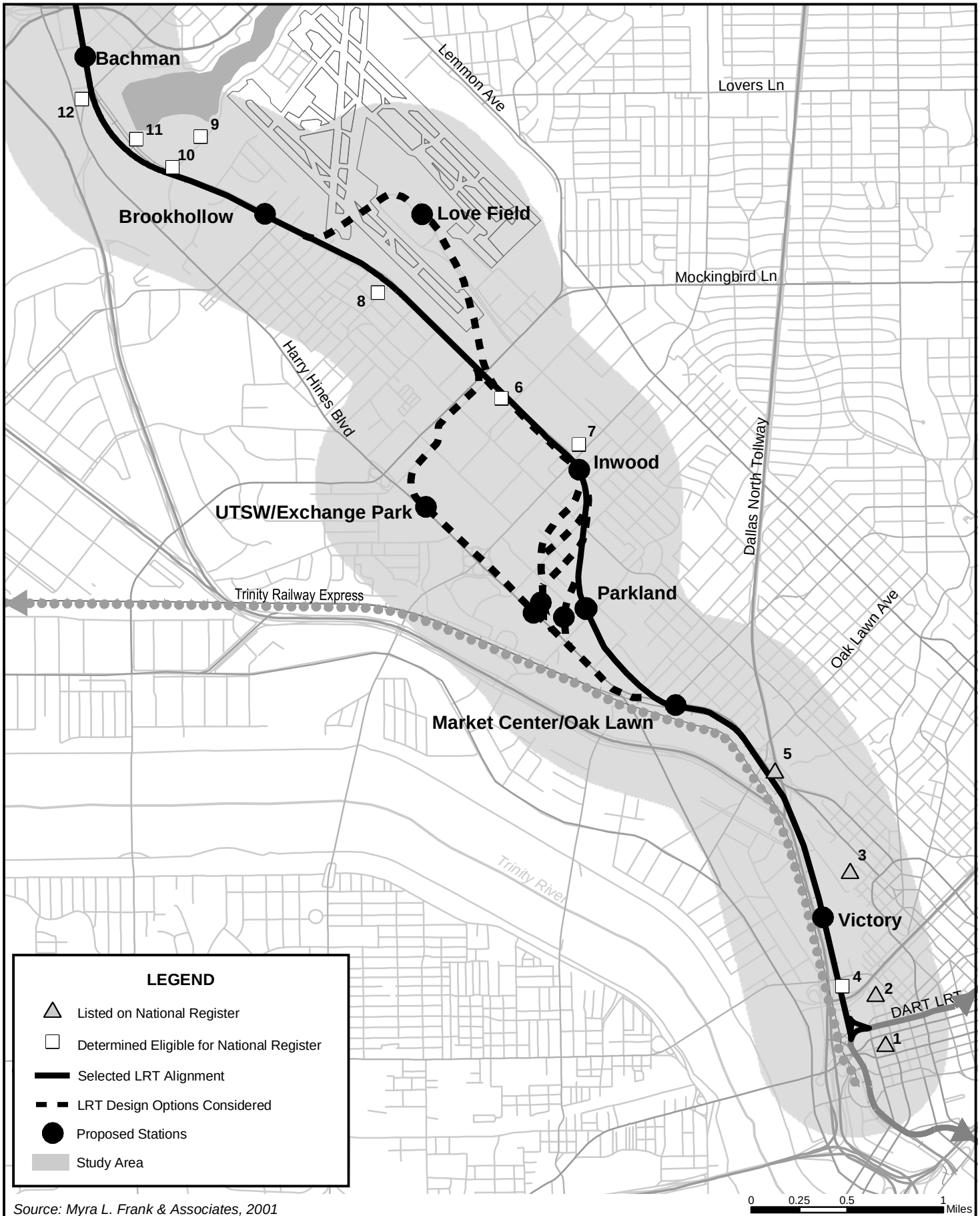
TABLE 3-21
PROPERTIES DETERMINED ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER

Map No.	Address	Resource Name	Year Built	Applicable National Register Criteria
4	Continental Avenue[3]	Continental Avenue Bridge/Lamar-McKinney Underpass	1933	A[4]: Local, state and federal significance. Contributing element of a discontinuous district associated with the Trinity River flood control measures from the 1930s.
6	6333 Denton Drive	Old Morton Food Headquarters	1951	C: Local significance. Good example of 1950s industrial architecture.
7	2929 Inwood Road	T.J. Rusk Middle School	1951	C: Local, state significance. Good early example of International style architecture used for school building.
8	2615 Anson Road	Obadiah Knight School	c. 1927	C: Local, state significance. Good example of 1920s public school architecture.
9	2605 Shorecrest Drive	Water Department Purification Plant	c. 1920	A, C[5]: Local, state and federal significance. Good example of 1920s utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
10	2525 Shorecrest Drive	Water Department Pumping Station	c. 1920	A, C: Local, state and federal significance. Good example of 1920s utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
11	9500 Denton Drive	Bachman Electric Gen. Station	c. 1930	A, C: Local, state and federal significance. Good example of 1930s utility construction. Exemplifies the usage of the railroad corridor as a utility corridor.
12	9911 Denton Drive	Club Schmitz	1930	A, B[6]: Identified as locally significant community resource. One of the few remaining 1930s commercial structures along the railroad corridor. Commercial variation of Art Deco/Moderne style.
13	2711 Storey Lane	Bingo Theater/ Circle Theater	1947	C: Local, state significance. Good example of late Moderne movie house architecture.
14	2727 Lombardy Lane	Letot School	c.1920	Identified as a locally significant educational resource.
15	1020 N. Broadway Street and MKT tracks	Carrollton Crossing Depot	c. 1925	A; Local, state and federal significance. The depot, which once served the three railroads in Carrollton, exemplifies the prominence of the railroad in the growth of the area.

[3] The Continental Avenue Bridge/Lamar-McKinney Underpass is addressed as part of the Categorical Exclusion for Line Section NW 1-A, which has independent utility.
[4] National Register Criteria A: Associated with events that have made a significant contribution to the broad patterns of our history.
[5] National Register Criteria C: Embodiment of the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
[6] National Register Criteria B: Associated with the lives of persons significant in our past.

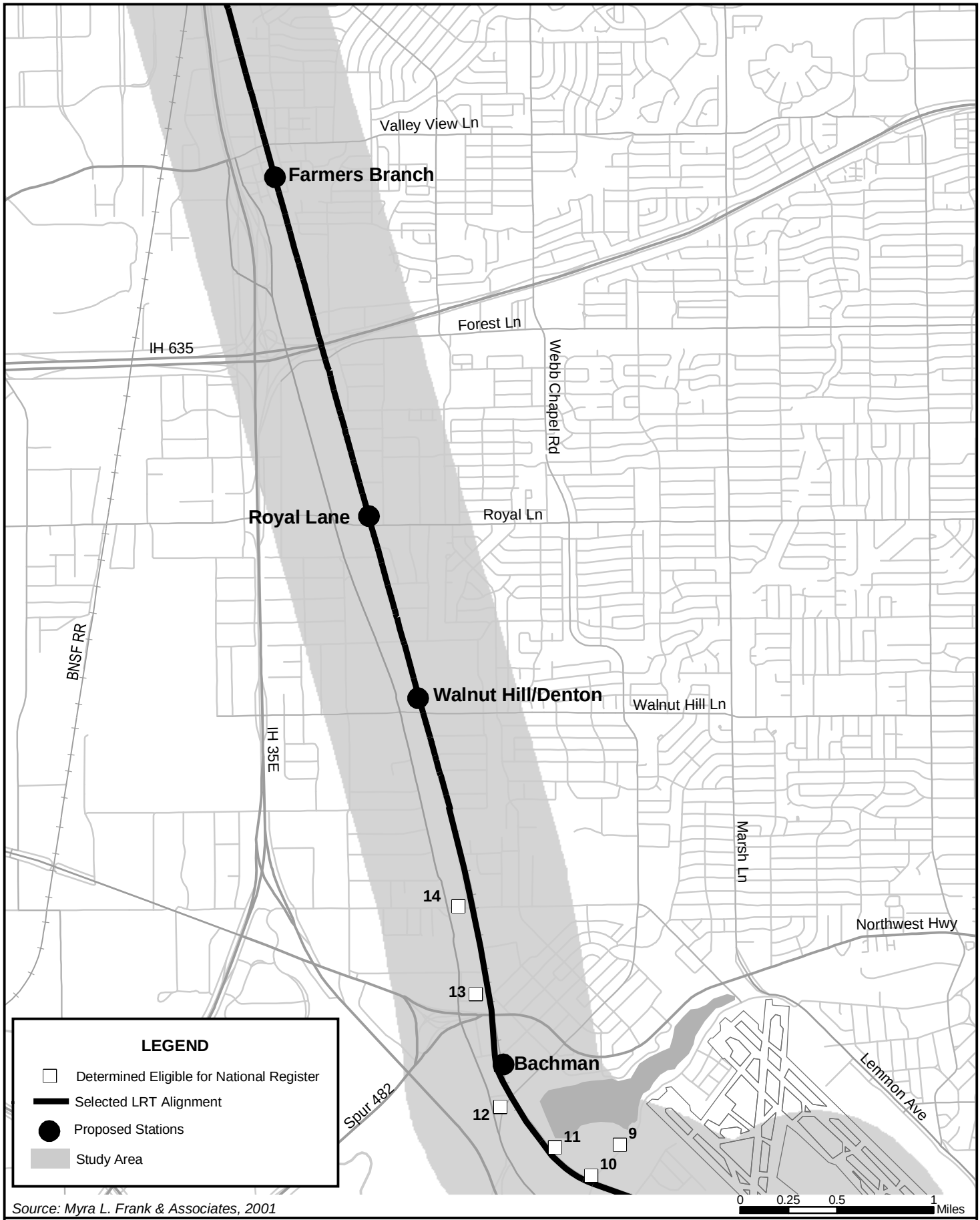
Note: Speaco Foods, Inc., 8668 Denton Drive was identified as an eligible property in the Draft EIS. The structure was demolished as part of Southwest Airlines expansion in 2002. Letot School has been added to this list of eligible properties since preparation of the Draft EIS and selection of the Northwest Rail Operating Facility site at Lombardy Lane and Denton Drive.

Source: Myra L. Frank & Associates, 2001



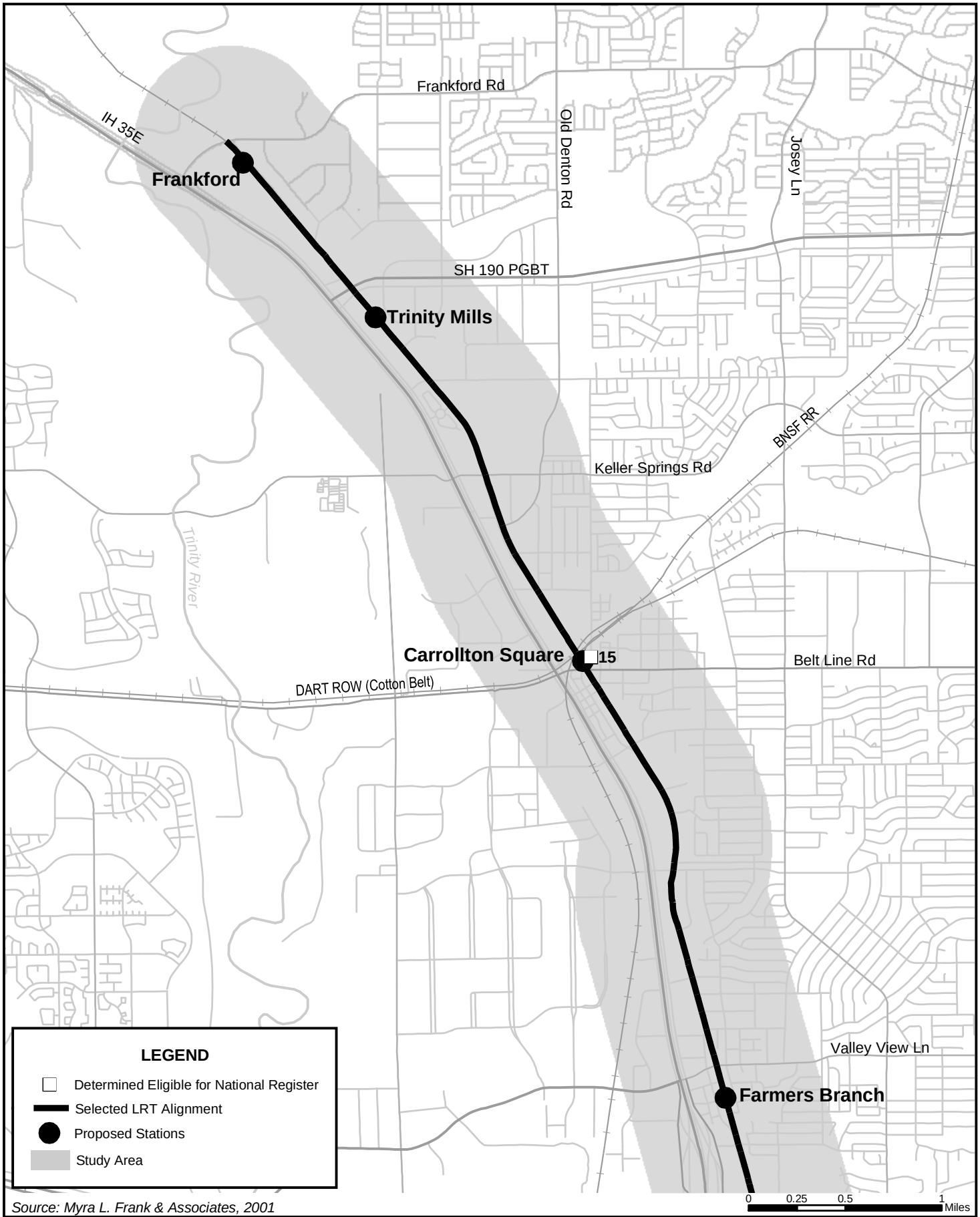
Source: Myra L. Frank & Associates, 2001

Figure 3-26
Historic Resources
South Section
LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Myra L. Frank & Associates, 2001

Figure 3-27
Historic Resources
Middle Section
LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Myra L. Frank & Associates, 2001

Figure 3-28

Historic Resources

North Section

LRT Line to Farmers Branch and Carrollton
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3.8.3 Archeological Resources

Survey Methodology

The archeological survey was conducted in accordance with the Council of Texas Archeologists (CTA), the Texas State Historic Preservation Officer (SHPO), and the State of Texas Antiquities Code. The Department of Interior's Guidelines for addressing cultural resources are also considered. All archival research also followed accepted guidelines. Details can be found in the ***Existing Conditions Technical Memorandum*** (DART, 2001).

Archeological Resources Survey Results

The two objectives to be accomplished during the survey consisted of the examination of areas with potential for either historic or prehistoric archeological deposits and the examination of previously recorded site locations along the corridor that may be impacted through rail line or station construction. The following section presents the results of those objectives.

A site files search indicated that 22 sites have been previously identified within one-half mile of the proposed project and that six sites are within 1,000 ft of the survey segment (**Figures 3-29** and **3-30).** An attempt was made to relocate or reexamine the six sites (41DL14, 41DL52, 41DL250, 41DL279, 41DL362, and 41DL363) along the corridor, particularly those that might be impacted through rail or station construction.

Sites 41DL14 and 41DL52 were identified in the 1940s as surface sites of prehistoric age. Other than the early recordation of site 41DL14 and the notation that some surface collection of materials had taken place by "local people," no known archeological investigations were ever conducted. Site 41DL14 is situated on Rawhide Creek, just west of the rail line. The area of the site nearest the creek has been impacted by drainage channelization and straightening, but how much of the remainder of the site is still intact is unknown. Site 41DL52 has been impacted by urban development and no longer exists.

Sites 41DL250, 41DL279, 41DL362, and 41DL363 are historic sites located within the Central Business District (CBD) of downtown Dallas. Site 41DL250 is the old county courthouse, known as "Old Red," and the courthouse square. This building is currently listed on the National Register (NR). Site 41DL279 was excavated during the 1980s by the Archaeology Research Program of Southern Methodist University (Jurney and Andrews 1994) prior to the construction of a parking garage and elevator associated with the Sixth Floor Exhibit at the Dallas County Administration Building (formerly the Texas School Book Depository). This site encompassed a portion of CBD Block 10/13 and yielded information from backyard deposits of several homeowners and renters. Sites 41DL362 and 41DL363 were identified during investigations conducted for the South Oak Cliff Light Rail Line. AR Consultants, Inc., identified and excavated portions of a house site (41DL362) and a dump (41DL363) in 1994 (Skinner et al. 1996). Neither of these sites was found to be eligible for inclusion in NRHP and both were ultimately destroyed during rail line construction.

Transect Results

Based on the results of the archival research, some of the areas of the corridor were categorically excluded from intensive pedestrian survey. However, a total of six transects was closely examined through subsurface shovel testing.

Only one presumed residential site, 41DL404, was identified during Transect Survey. It was found in Transect 2. Site 41DL404 is not considered eligible for inclusion in the NRHP due to its lack of archeological integrity, its low artifact density, and its rather recent age.

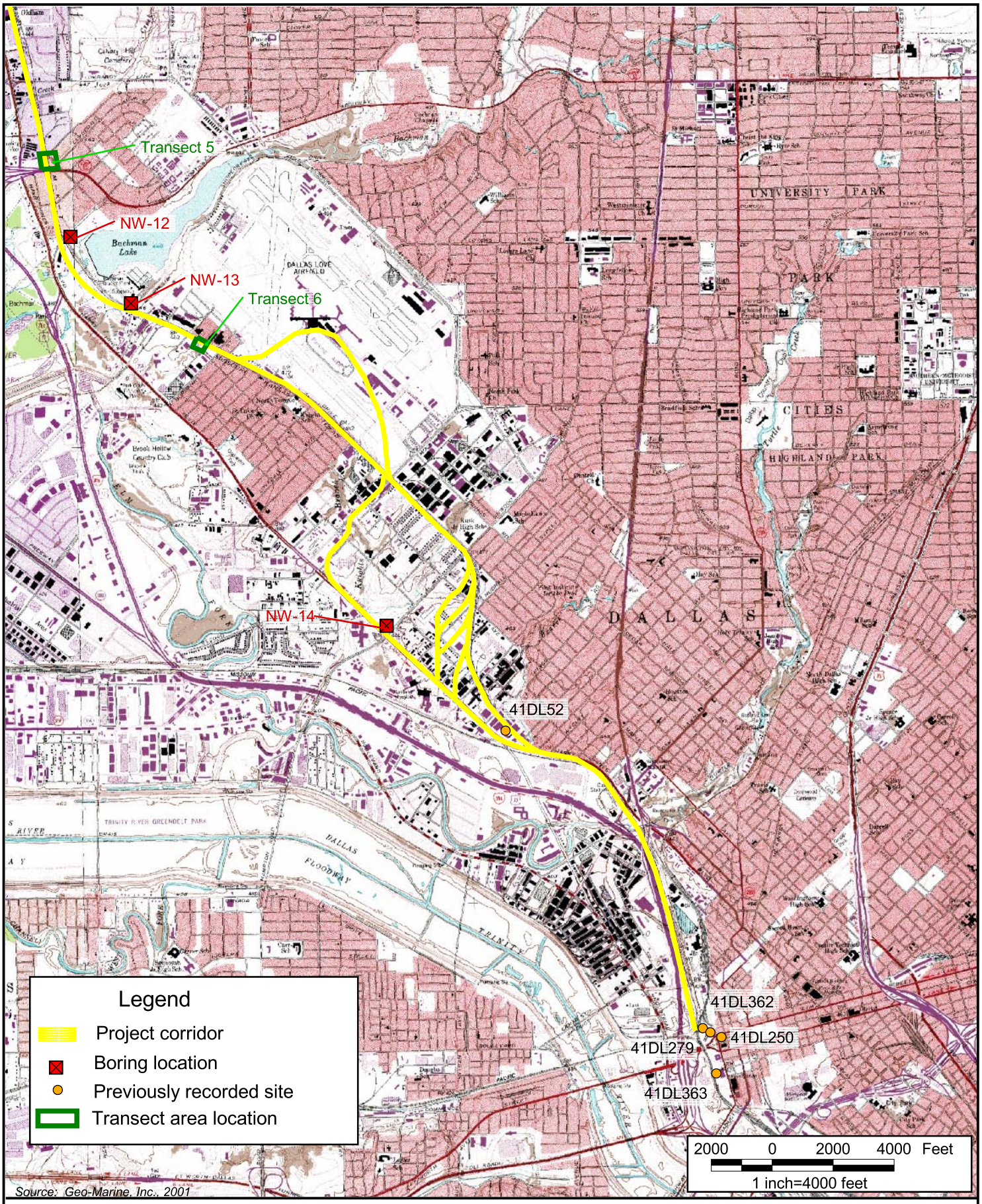

Figure 3-29

Archeological Resources
Dallas CBD to Northwest Highway

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

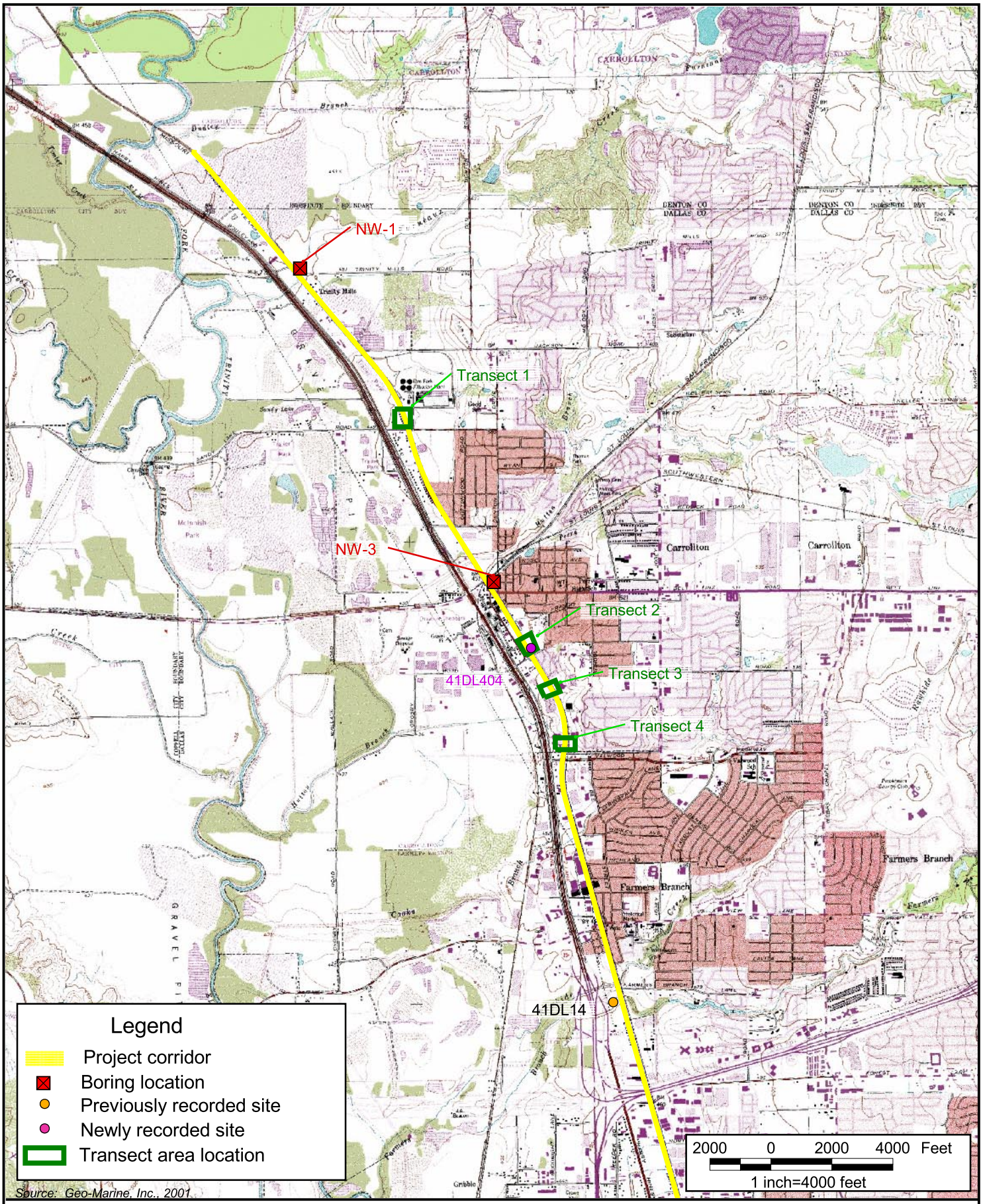

Figure 3-30

Archeological Resources
Valley View Lane to Frankford Road

LRT Line to Farmers Branch and Carrollton
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Buried Site Potential

Except at its very southern end, the proposed corridor lies east of the current and pre-1930 channels of the Elm Fork of the Trinity River. The southern end of the corridor is in proximity to the pre-1930 channel of the Trinity east and downstream of the confluence of the Elm Fork and West Fork. Over half of this southern portion of the corridor is located within the modern flood plain of the Elm Fork; the rest is located on or immediately adjacent to the uplands just east of the Trinity. North of Knights Branch most of the corridor is located on fluvial terraces of the Elm Fork of the Trinity or on the modern flood plains of tributaries (Bachman Branch, Farmers Branch, Rawhide Branch, Hutton Branch, and Furneaux Creek) to the Elm Fork. Since the highest probability areas for locating buried, stratified cultural deposits are these flood plains, bore holes at Bachman Branch, Hutton Branch, and Furneaux Creek as well as previous studies in the nearby flood plain of the Elm Fork (Cliff et al. 1999; Peter et al. 2001) provide the data for buried site potential.

Based on the data currently available from the bore holes within the corridor as well as that from other studies conducted in this same area or immediately adjacent, it is clear that there is potential for buried, stratified cultural deposits in some portions of the corridor. Only those portions of the corridor located within the current or pre-1930 flood plains of the Elm Fork of the Trinity or its tributaries or on fluvial terraces composed at least in part of terminal Pleistocene or younger sediments have potential for buried cultural materials. However, given the extensive disturbance of the upper 2 to 3 meters of the existing sediments and/or the deposition of considerable amounts of foreign material on top of the natural, preexisting surface, the chance for finding an undisturbed cultural site in the upper few meters of sediment is remote at best. Further, locating any sites that may be buried more deeply than several meters would be extremely difficult. Thus, although the potential exists, any sites that were initially shallowly buried and hence easier to find have in all likelihood already been destroyed, while those that are still intact but more deeply buried would be exceedingly difficult and expensive to locate.

Site Potential Within Proposed Station Areas

The review of Sanborn maps, the 1918 soil map for Dallas County, 1938 aerial photographs, and the Sam Street map indicates that much of the area projected for each potential station area was not well developed until the mid-twentieth century or later. The available 1938 aerial photographs for the area between Motor Street and Mañana Drive indicate that the area was relatively undeveloped except for agricultural purposes. The 1918 Dallas County soil map indicates isolated pockets of development at Dallas Love Field, Letots (intersection of Mañana Drive and Missouri Kansas and Texas Railway), Farmers Branch, Carrollton, and Trinity Mills. Even in downtown Carrollton, the 1921 Sanborn maps indicate only an iron-clad warehouse, the Leeland Hotel (Block 25), and a telephone exchange immediately adjacent to the proposed corridor. Domestic housing and the downtown square comprise the remaining buildings within the area for the Carrollton Square Station.

Most of the stations are proposed on landforms that were originally Pleistocene terrace landforms that have been extensively built upon during the latter part of the twentieth century. Therefore, the potential for significant archeological deposits with contextual integrity is extremely limited. At the southern end of the project, the proposed Victory Station is projected for an area that likely contains massive fill deposits. As part of the Categorical Exclusion for this section of the corridor, a separate effort has addressed archeological resources. Only the presently proposed location for the Carrollton Square Station (north of Belt Line Road) contains potentially undisturbed areas that could contain archeological deposits with contextual integrity.

3.8.4 Parklands

A field survey was conducted in March 2001 to inventory parklands resources. These resources include community, regional, and historical parks, greenbelts, and a municipal golf course. No wildlife or waterfowl refuges that are protected under the regulating legislation were identified in the project Study Area.

All parklands resources within approximately 500 feet of the proposed alignment were included in the inventory. In the areas where the track would be elevated, resources within approximately 700 feet of the alignment were included, due to the expanded area of potential impacts resulting from elevated structures.

A total of 12 parks and recreational resources were identified as being within 500 to 700 feet of the proposed alignment. **Table 3-22** provides a list and descriptive characteristics of the resources identified during the field survey. **Figures 3-31** through **3-33** illustrate the location of parks and recreational lands in the Study Area.

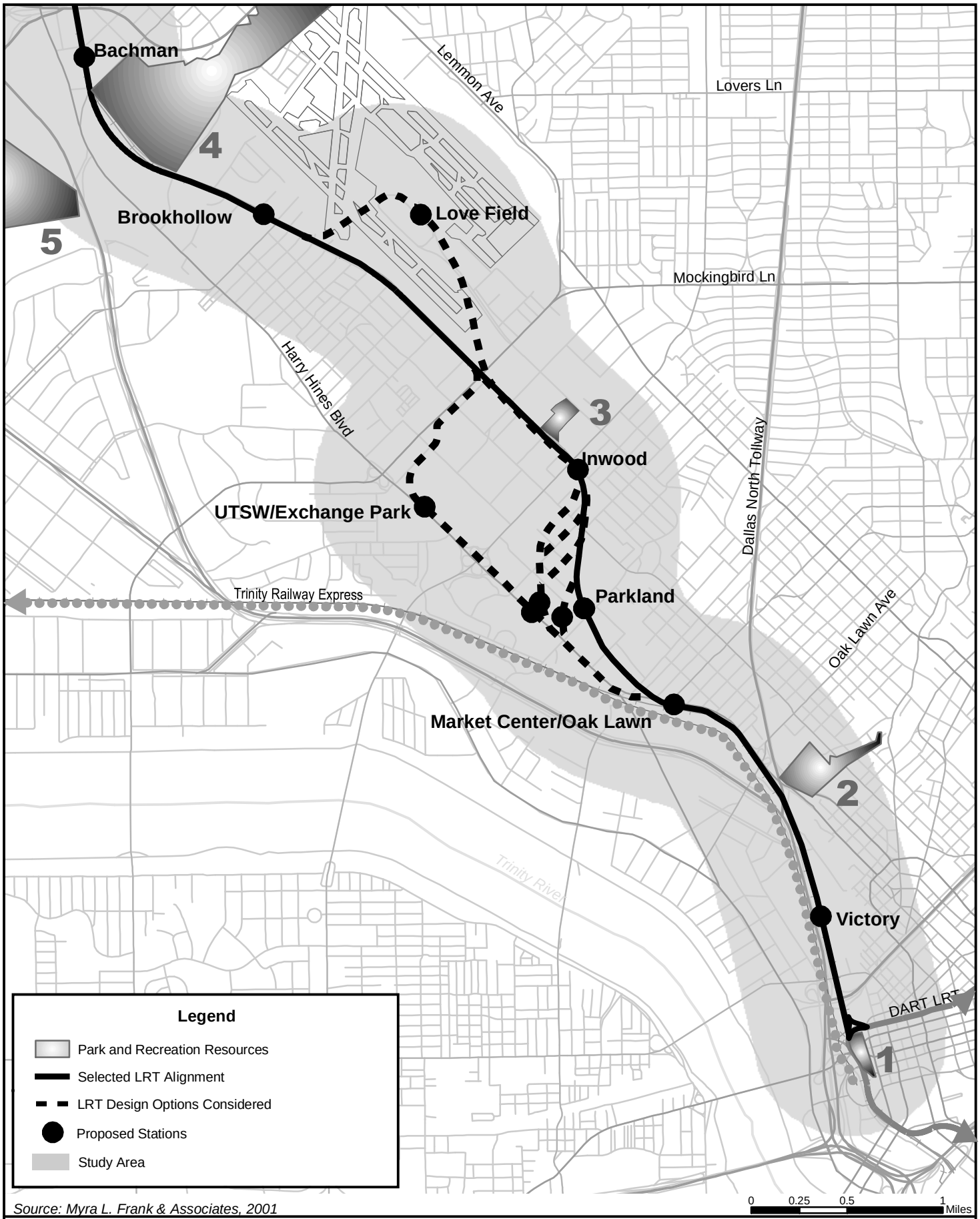
TABLE 3-22
PARKS AND RECREATIONAL RESOURCES

Map No.*	Name	Type of Park[1]	Owner	Acres	Facilities
1	Dealey Plaza Annex	Special	City of Dallas	3.1	Urban open space, historical site.
2	Reverchon Park	Community	City of Dallas	41.26	Recreation center, picnic area, amphitheater, basketball, baseball.
3	Weichsel Park	Community	City of Dallas	13.77	Picnic area.
4	Bachman Lake Park	Regional	City of Dallas	205.5	Recreation center, picnic area, playground equipment, hike/bike trail, boating, boathouse.
5	LB Houston Park (LB Houston Nature Trail)	Regional	City of Dallas	476.06	Hike/bike trails (hard surface and soft surface), picnic area.
6	Farmers Branch Historical park	Special	City of Farmers Branch	22	Historical park containing multiple historic buildings, none of which are located within Cultural Resources APE.
7	Gussie Field Watterworth Park	Neighborhood	City of Farmers Branch	22	Baseball, basketball, playground equipment, tennis, picnic area/grills, horseshoes, museum
8	Francis Perry Park	Neighborhood	City of Carrollton	3	Picnic area, playground equipment, tennis, and rental facility.
9	Pioneer Park	Special	City of Carrollton	0.5	Historical site.
10	Downtown Square Park	Special	City of Carrollton	N/A	Picnic area/gazebo.
11	Ken Good Park	Community	City of Carrollton	20	Fishing, picnic area.
12	Indian Creek Municipal Golf Course	Regional	City of Carrollton	415	36-hole golf course, clubhouse.

* See **Figures 3-31** through **3-33**.

[1]As classified by the city in which the park is located

Source: Myra L. Frank & Associates, 2001



Source: Myra L. Frank & Associates, 2001

Figure 3-31

Park and Recreation Resources

South Section

LRT Line to Farmers Branch and Carrollton
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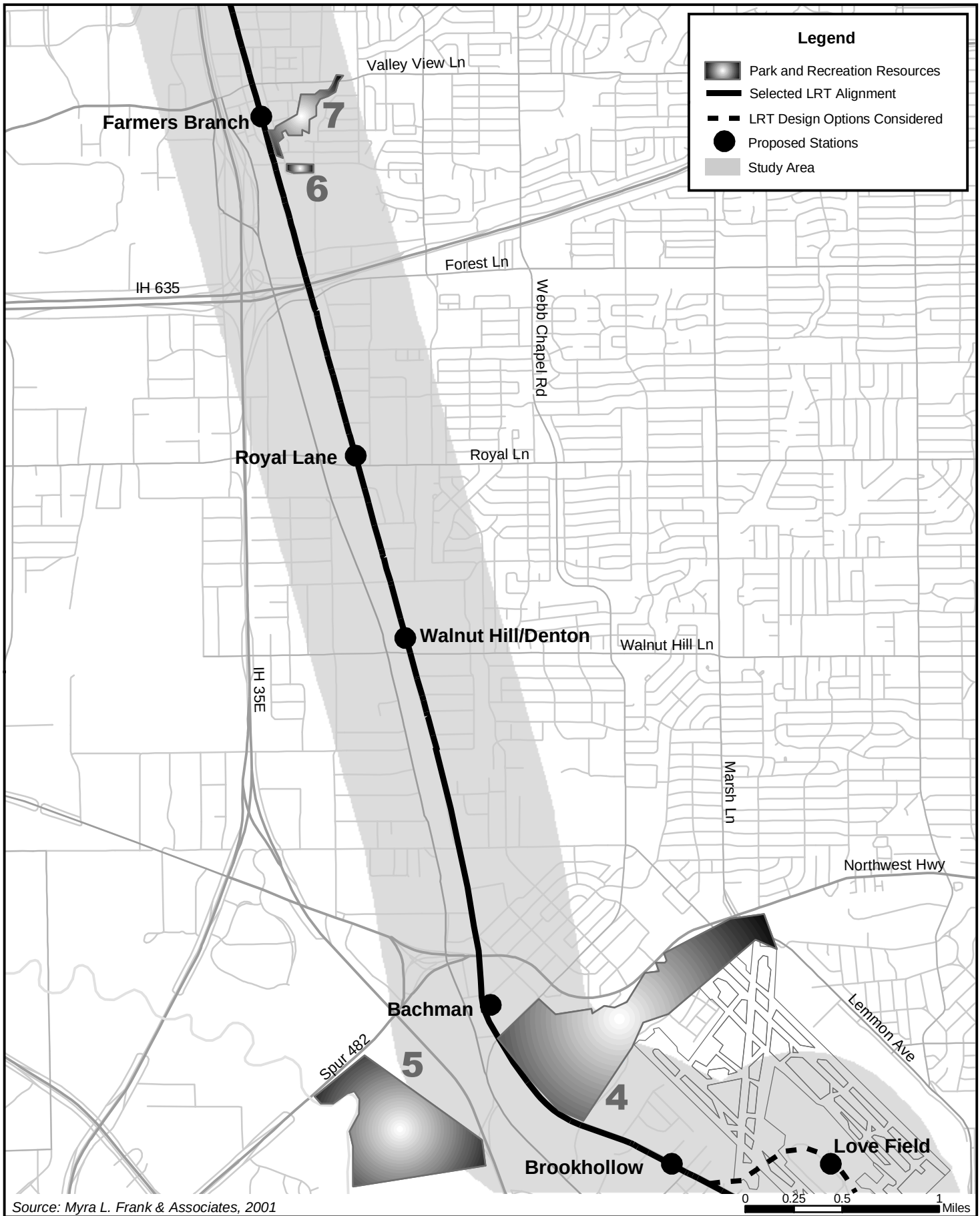


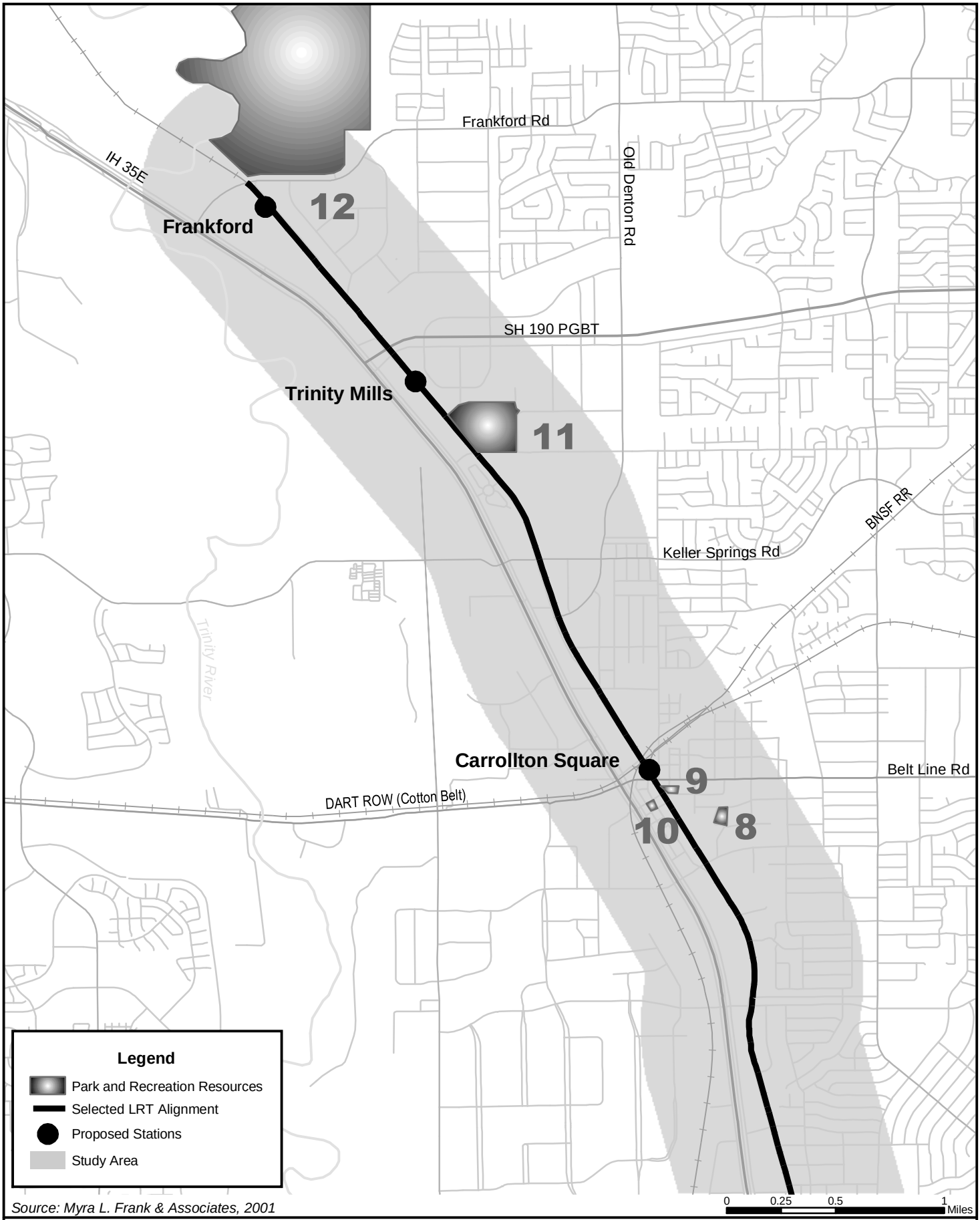
Source: Myra L. Frank & Associates, 2001

Figure 3-32

Park and Recreation Resources

Middle Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Myra L. Frank & Associates, 2001

Figure 3-33

Park and Recreation Resources

North Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

3.9 ECOSYSTEMS

Existing ecosystems are described in the following section, including terrestrial and aquatic habitats, vegetation, and fish and wildlife resources. Supplemental literature reviews, agency contacts, and reconnaissance-level site investigations in the project area were conducted to characterize the vegetation and fish and wildlife resources. A 300-foot project area corridor was established along the proposed LRT line (150 feet on each side of the proposed alignment), to inventory the ecosystem components. A 0.25-mile radius area around proposed station areas was also inventoried for all ecosystem components. The potential effects of construction across existing drainage and wetland areas are addressed in Chapter 5.

3.9.1 Wetlands Inventory

Section 404 of the Clean Water Act (CWA) of 1977 (Public Law [P.L.] 95-217) and Executive Order 11990 authorizes the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), to issue permits for the discharge of dredged or fill materials into waters of the U.S., including wetlands. Waters of the U.S. (Section 328.3[2] of the CWA) are those waters used in interstate or foreign commerce, subject to ebb and flow of tide, and all interstate waters including interstate wetlands. Jurisdictional waters of the U.S. are further defined as all other waters such as navigable waterways, intrastate lakes, rivers, streams, intermittent streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds or impoundments of water, tributaries of waters, and territorial seas.

Wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory 1987). Wetlands are transitional lands between terrestrial and deep-water habitats. At the most general level of the classification system, wetlands are grouped into three ecological systems: palustrine, estuarine, and marine. Wetlands are then classified on the basis of their hydrology, vegetation, and substrate (soil).

The ***Soil Survey of Dallas County, Texas*** (Coffee et al. 1980); 7.5 minute U.S. Geological Survey (USGS) quadrangles of Dallas, Irving, and Carrollton (1:24,000 scale; USGS 1989a, 1989b, 1989c); National Wetland Inventory (NWI) maps of Dallas, Irving, and Carrollton (1:24,000 scale; U.S. Fish and Wildlife Service [USFWS] 1989a, 1989b, 1989c); and aerial photography (2000) were utilized to identify possible waters of the U.S. and areas prone to wetland development within the project area. Only areas within existing rail lines of the project area were field checked, and the delineation of potential waters of the U.S. was performed in accordance with the ***Corps of Engineers Wetlands Delineation Manual*** (Environmental Laboratory 1987). Remaining areas that could not be field verified, due to access restrictions, were delineated utilizing the above referenced literature.

During field surveys, 38 water bodies were identified: 24 channels, six wetlands, and eight small lakes/ponds. Detailed descriptions and photographs are included in the ***Existing Conditions Technical Memorandum*** (DART 2001). The size of these water bodies within the project corridor and around station areas is presented in **Table 3-23** and shown in **Figures 3-34** through **3-44.** A 0.25-mile radius around each station was analyzed, and any potentially jurisdictional waters of the U.S. were identified based upon the USFWS classification system (Cowardin et al. 1979).

In addition to the above-listed water bodies, several bar ditches run parallel to the existing rail line throughout most of the project area. These ditches were constructed to collect and remove storm water runoff and range from dry in spots to slowly flowing water in other areas. There is no classification assigned to these bar ditches.

TABLE 3-23
AREA OF POTENTIALLY JURISDICTIONAL WATERS OF THE U.S. LOCATED WITHIN THE PROJECT AREA

Map No.*	Name	Location	Area (acres)
RAIL LINE			
Selected LRT Alternative (Base Alignment with UPRR)			
1	Turtle Creek	Between Dallas North Tollway and Oak Lawn	0.153
2	Cedar Branch	Parallel to Harry Hines at Market Center	0.250
3	Unnamed tributary of Knights Branch	Between Mockingbird Lane and Inwood Road	0.170
3B	Unnamed tributary to Elm Fork	Between Wyman and Burbank Streets	0.077
4	Bachman Creek	South of Webb Chapel Road	0.348
5	Bachman Wetland	South of Webb Chapel Road	0.227
6	Joe's Creek	Between Lombardy and Nagle Roads	0.126
7	Unnamed Tributary of Joe's Creek	Between Congressman Lane and Anode Lane	0.109
8	Unnamed Tributary of Joe's Creek	Between Congressman Lane and Anode Lane	0.093
9	Unnamed Tributary of the Elm Fork	Between Indian Trail and Walnut Hill Lane	0.080
10	Unnamed Tributary of the Elm Fork	Between Indian Trail and Walnut Hill Lane	0.091
11	Farmers Branch of the Elm Fork	South of Valley View Lane	0.251
12	Farmers Branch of the Elm Fork	South of Valley View Lane	0.402
13	Rawhide Creek	South of Valley View Lane	0.369
14	Cook's Branch	Between Valwood Parkway and Richland Ave.	0.293
17	Wetland	Between Carroll Avenue and Crosby Road	0.395
18	Wetland	Between Carroll Avenue and Crosby Road	0.191
20	Hutton Branch of the Elm Fork	Between Vinylex and Beltline Roads	0.435
21	Unnamed Tributary of the Elm Fork	South of Jackson Road	0.104
22	Ken Good Park Lakes	Between Ismail Center Circle and Jackson Road	0.754
24	Furneaux Creek	North of Trinity Mills Road	0.185
15[1]	Unnamed Open Storm Drain	Between Burning Tree Lane and Valwood Parkway	0.080
16[1]	Unnamed Open Storm Drain	Between Burning Tree Lane and Valwood Parkway	0.090
19[1]	Unnamed Open Storm Drain	Between Carroll Avenue and Crosby Road	0.110
23[2]	Ken Good Park Lakes	Between Ismaili Center Circle and Jackson Rd.	0.506
23[2]	Ken Good Park Lakes	Between Ismaili Center Circle and Jackson Rd.	0.348
Other Alignments Considered (Harry Hines Base Alignment; Medical Center Design Options A, B,C, and D; and Love Field Design Option)			
2	Cedar Branch	Parallel to Harry Hines at Market Center	1.16
3A	Unnamed tributary to Knights Branch	Between Mockingbird Lane and Inwood Road	1.20
STATIONS			
Selected LRT Alignment (Base Alignment with UPRR)			
Victory			
None	--	--	--
Market Center/Oak Lawn (South)			
2	Cedar Branch	Parallel to Harry Hines Boulevard at Market Center	0.00
Parkland (UPRR)			
None	--	--	--
Inwood (South)			
3	Unnamed tributary to Knights Branch	Between Mockingbird Lane and Inwood Road	1.20
Brookhollow			
3B	Unnamed tributary of Elm Fork	--	0.30
Bachman			
None	--	--	--
Walnut Hill/Denton			
7	Unnamed tributary to Joe's Creek	Between Congressman Lane and Anode Lane	0.20
Royal Lane			
None	--	--	--

TABLE 3-23 (CONTINUED)
AREA OF POTENTIALLY JURISDICTIONAL WATERS OF THE U.S. LOCATED WITHIN THE PROJECT AREAS

Map No.*	Name	Location	Area (acres)
Farmers Branch			
13	Rawhide Creek	South of Valley View Lane	1.60
Carrollton Square			
20	Hutton Branch of the Elm Fork	Between Vinylex and Beltline Roads	3.10
Trinity Mills			
24	Furneaux Creek	North of Trinity Mills Road	0.80
PEM1A	Wetlands adjacent to Sandy Lake	South of Trinity Mills Road, West of Interstate 35E	4.70
POWHx	Sandy Lake	South of Trinity Mills Road, West of Interstate 35E	2.30
Frankford			
L1OWHx	Lakes adjacent to Trinity River	North side of Frankford Road	0.70
R2OWH	Trinity River and tributary	North side of Frankford Road	2.60
Other Alignments Considered (Design Options A, B, C, D, and Harry Hines Base Alignment)			
Market Center/Oak Lawn (North)			
2	Cedar Branch	Parallel to Harry Hines Boulevard at Market Center	1.20
Parkland (Design Options A, B, C, D, and Harry Hines Base Alignment)			
None	--	--	--
UTSW/Exchange Park (Harry Hines Base Alignment)			
3A	Unnamed tributary to Knights Branch	South of Exchange Pkwy.	0.30

*Refers to **Figures 3-34** through **3-44**.
[1] these are not considered to be jurisdictional because they were intentionally created to drain upland areas (i.e., they are storm drains), [2] two portions of the same lake

Source: Geo-Marine, Inc., 2002

3.9.2 Vegetation Inventory

Due to the urban development within the project area, only four plant communities were identified, which include urban, grassland, shrubland, and woodland. The plant communities identified had generally uniform species composition and canopy stratification. **Figures 3-34** through **3-44** show the location and **Table 3-24** identifies the approximate size of each plant community within the project area, from south to north. The following paragraphs provide a brief description of each plant community. More detailed species composition and stratification data for these community types are presented in the ***Existing Conditions Technical Memorandum*** (DART, 2001).

3.9.3 Wildlife Inventory

Overall, urban areas would potentially provide habitat for 97 bird species, 16 mammal species, 29 snake and lizard species, six turtle species, and three amphibian species (Johnston and Short 1989). During the field surveys, 35 bird species, seven mammal species, two reptile species, and one amphibian species were seen along the project corridor. In general, more bird and wildlife species were seen in the northern portion of the corridor (north of IH 635) where these types of remnant habitats occurred as opposed to the south, where there was greater urban land use.

Numbers and types of wildlife that would potentially use emergent wetlands include 76 species of birds, 10 species of mammals, 11 species of snakes and lizards, six species of turtles, and 11 species of amphibians (Johnston and Short 1989). No species-specific surveys were performed for wetland habitat areas; however, several wading birds (great egret [*Ardea alba*] and great blue heron [*Ardea heodias*]) and mallards (*Anas platyrhynchos*) were observed using wetland habitat.

Riparian woodland sites would potentially provide habitat for 130 species of birds, 27 species of mammals, 28 species of lizards and snakes, 13 species of turtles, and 16 species of amphibians (Johnston and Short 1989). During the 2001 field surveys, biologists noted that a greater diversity and higher number of bird species were observed at the creek crossings due to better quality habitat.

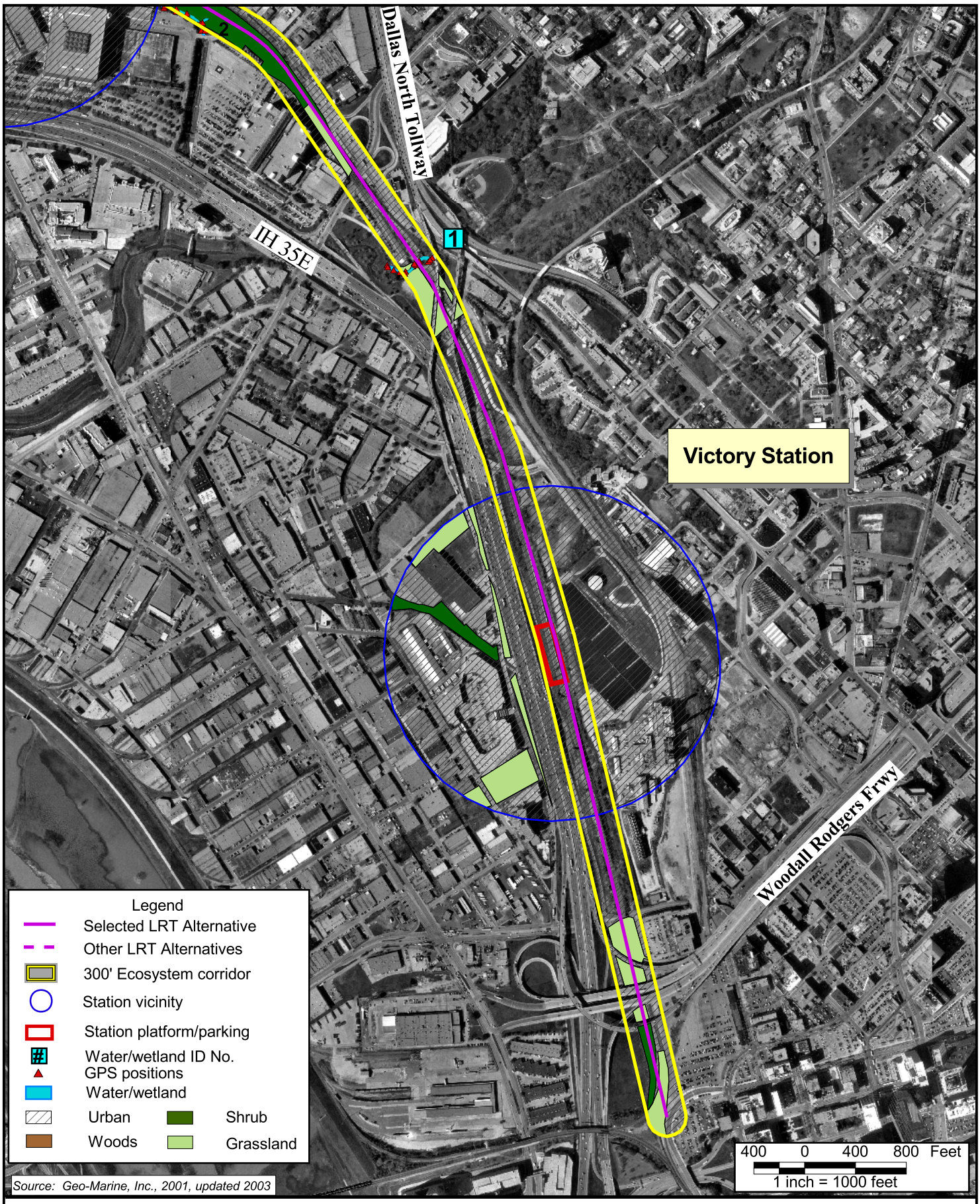


Figure 3-34

Jurisdictional Waters and Vegetation Cover

Map 1

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

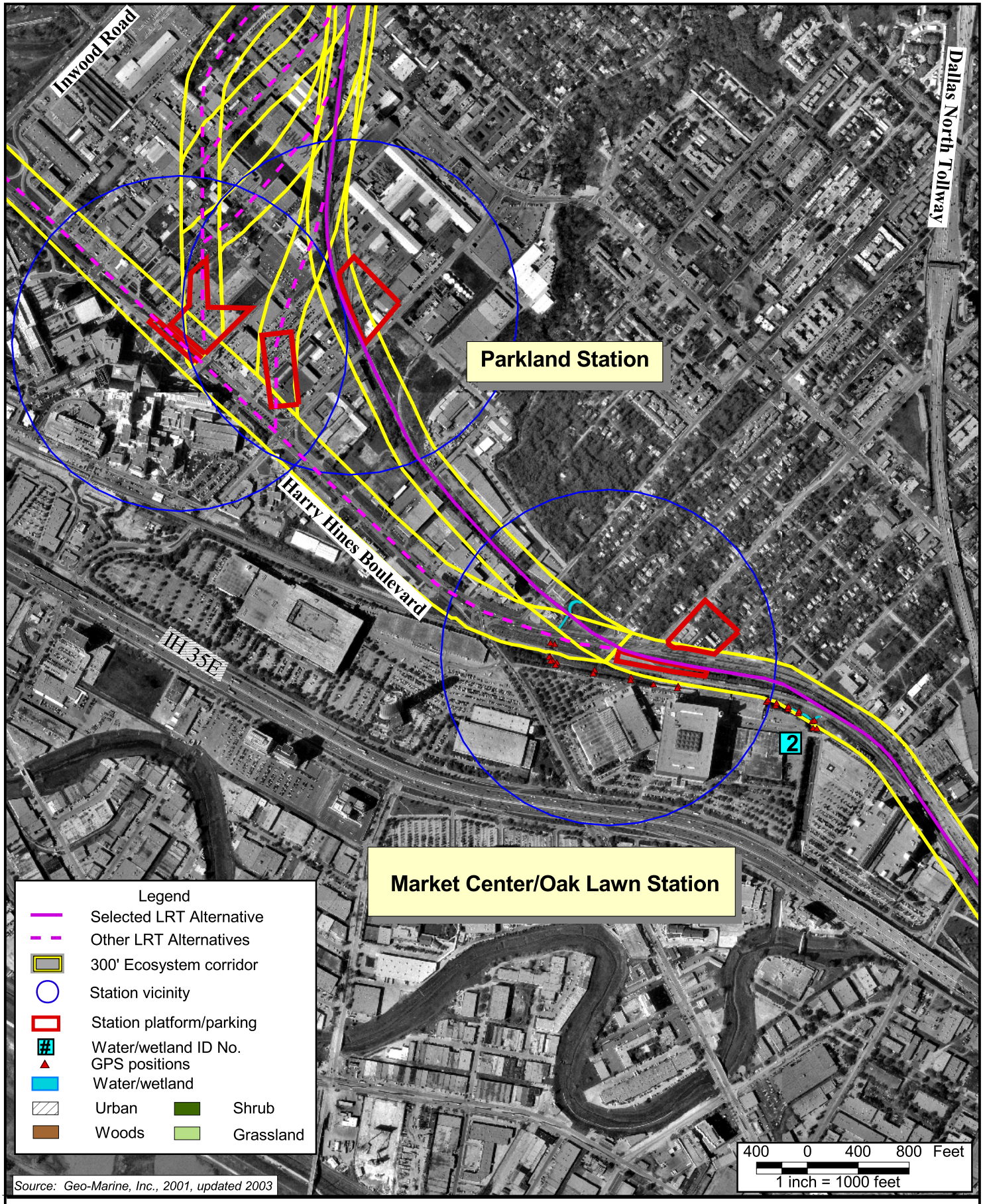


Figure 3-35

Jurisdictional Waters and Vegetation Cover

Map 2

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

Figure 3-36

Jurisdictional Waters and Vegetation Cover

Map 3

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

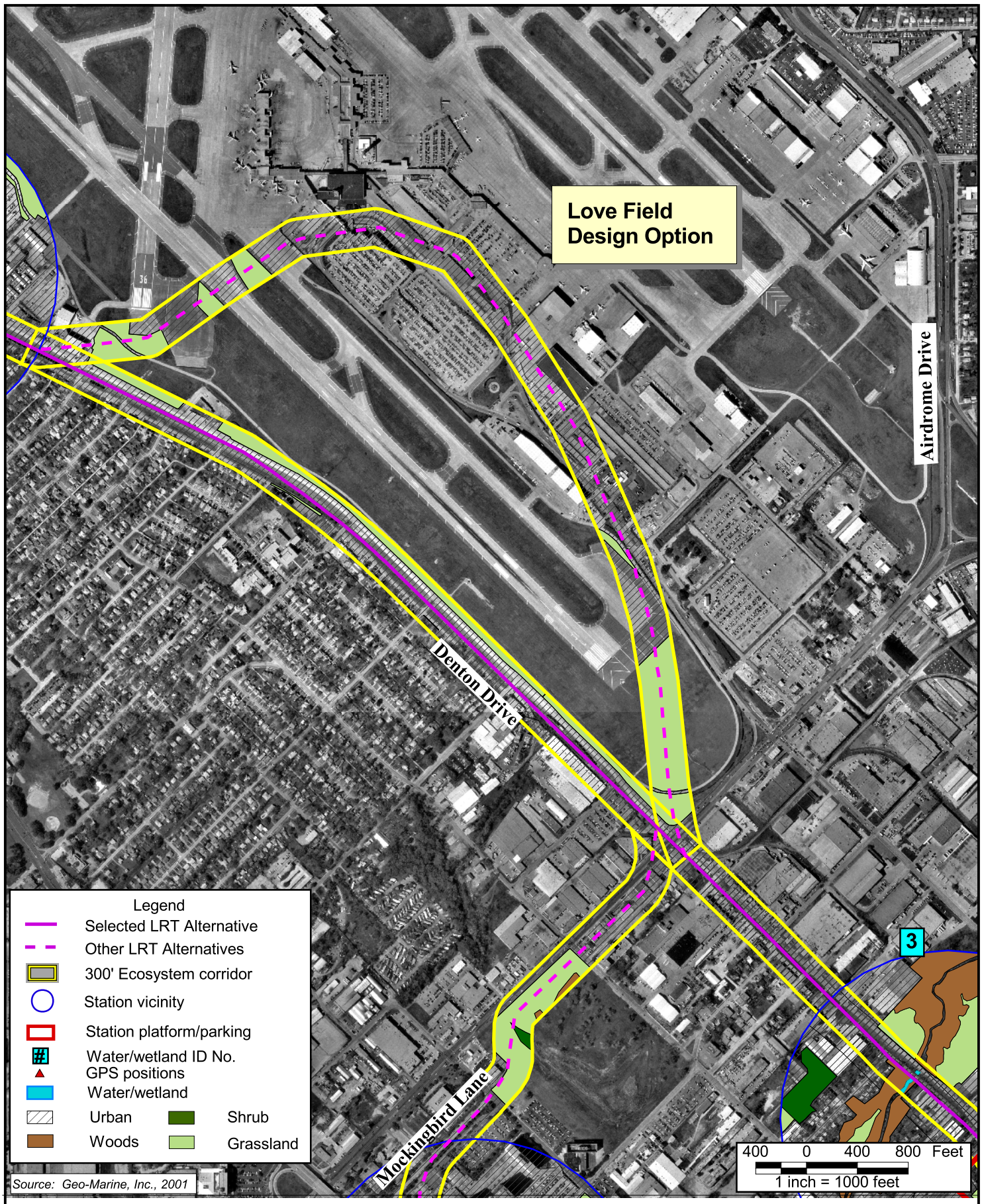


Figure 3-37

Jurisdictional Waters and Vegetation Cover

Map 4

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

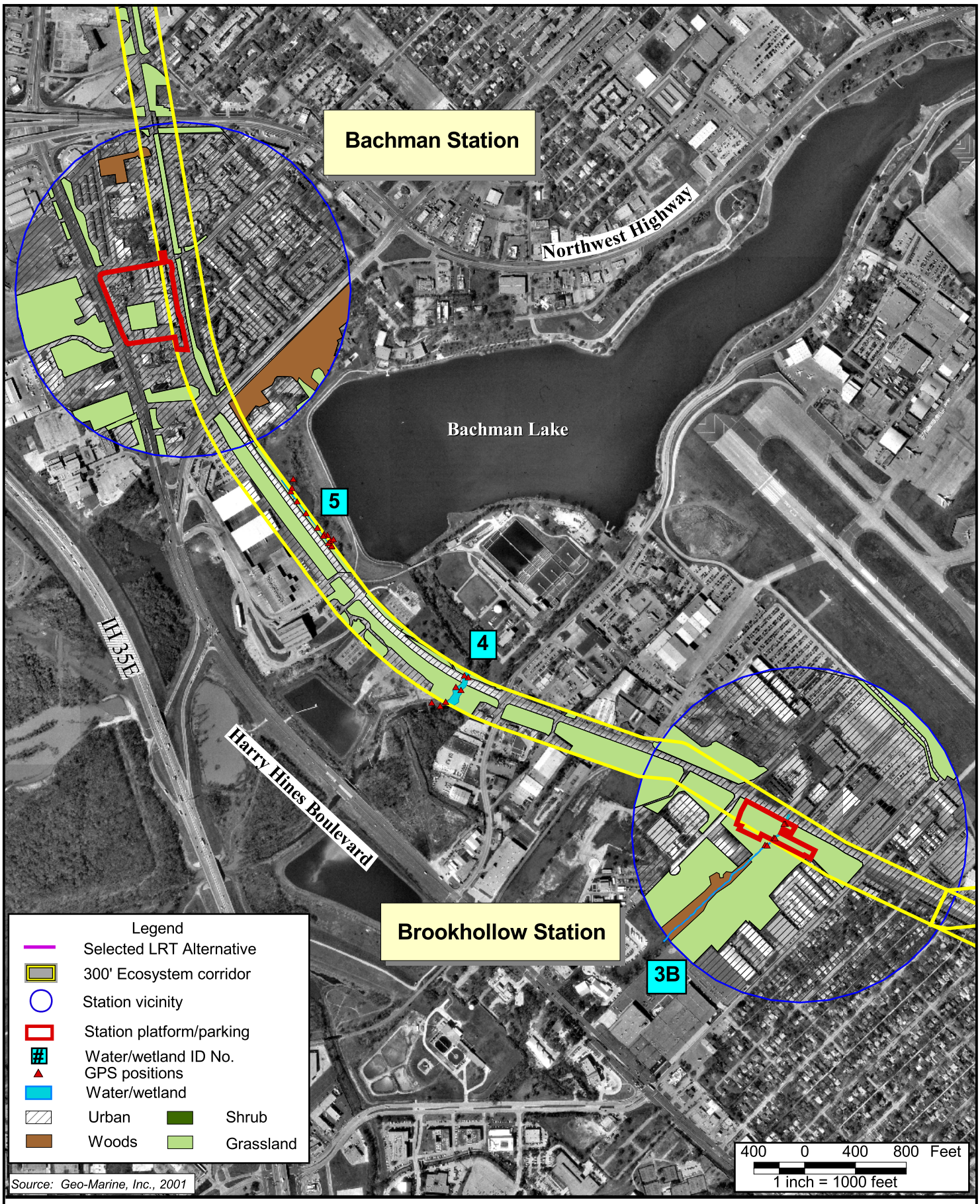


Figure 3-38

Jurisdictional Waters and Vegetation Cover

Map 5

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

Figure 3-39

Jurisdictional Waters and Vegetation Cover

Map 6

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

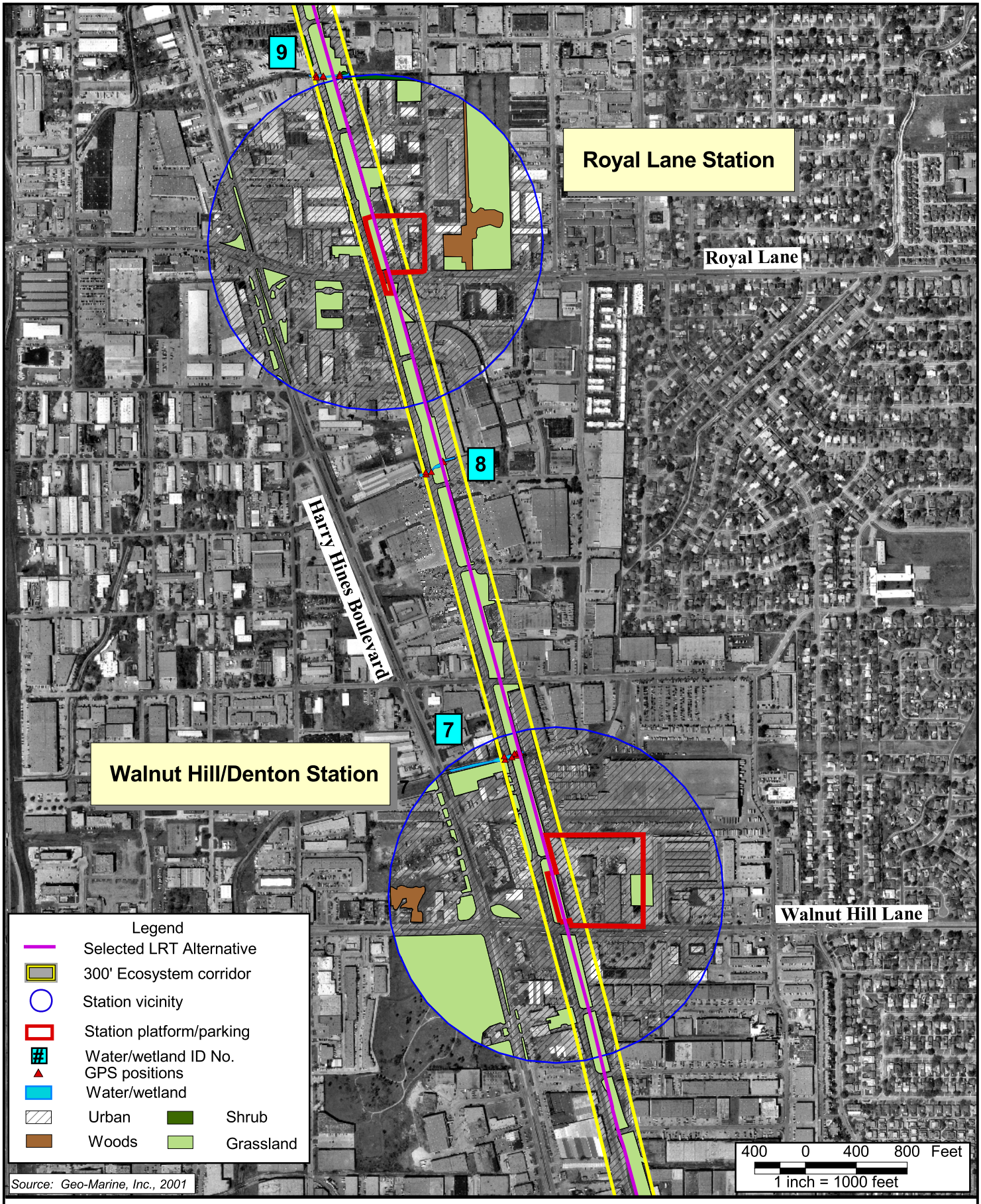


Figure 3-40

Jurisdictional Waters and Vegetation Cover

Map 7

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

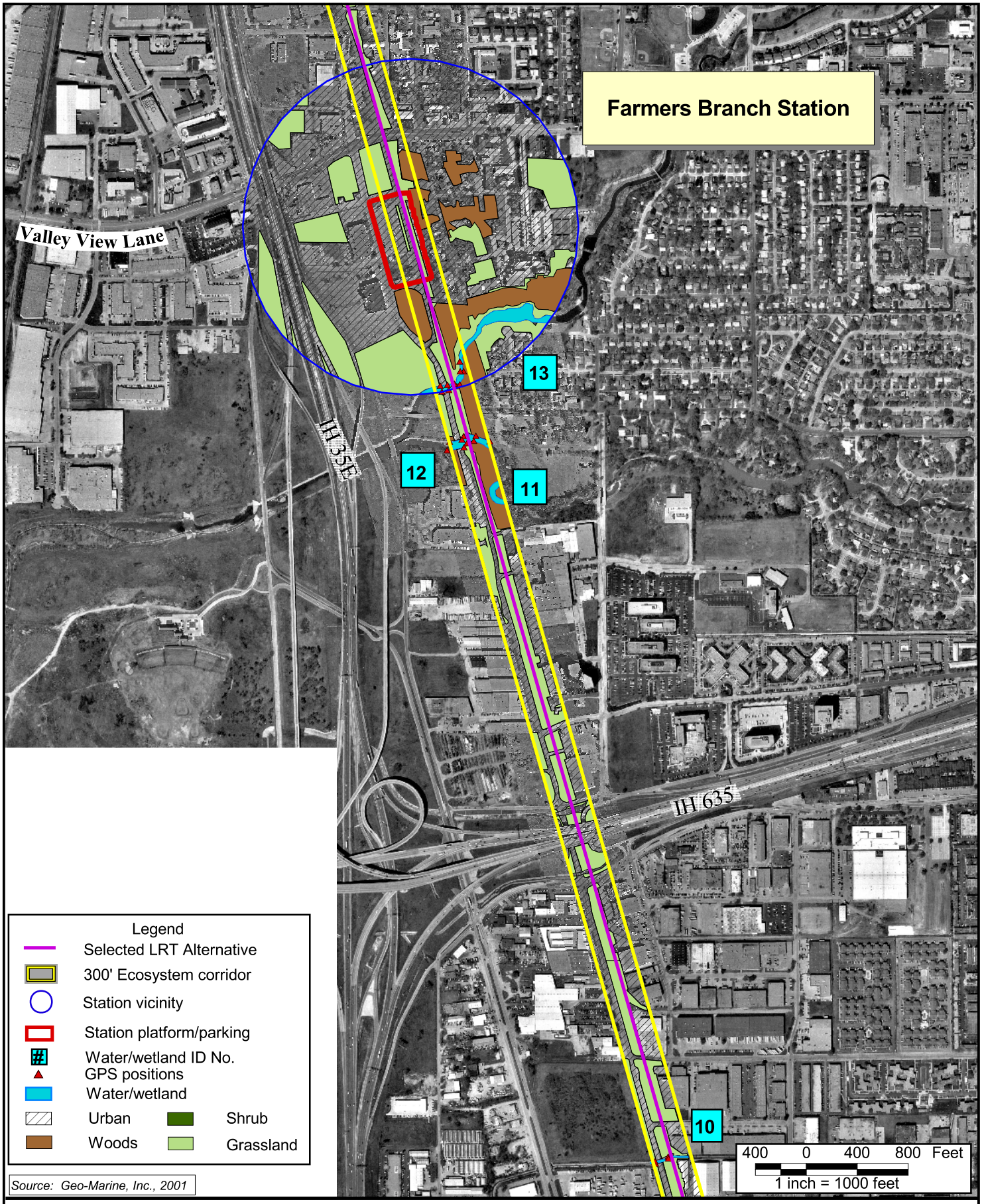


Figure 3-41

Jurisdictional Waters and Vegetation Cover

Map 8

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

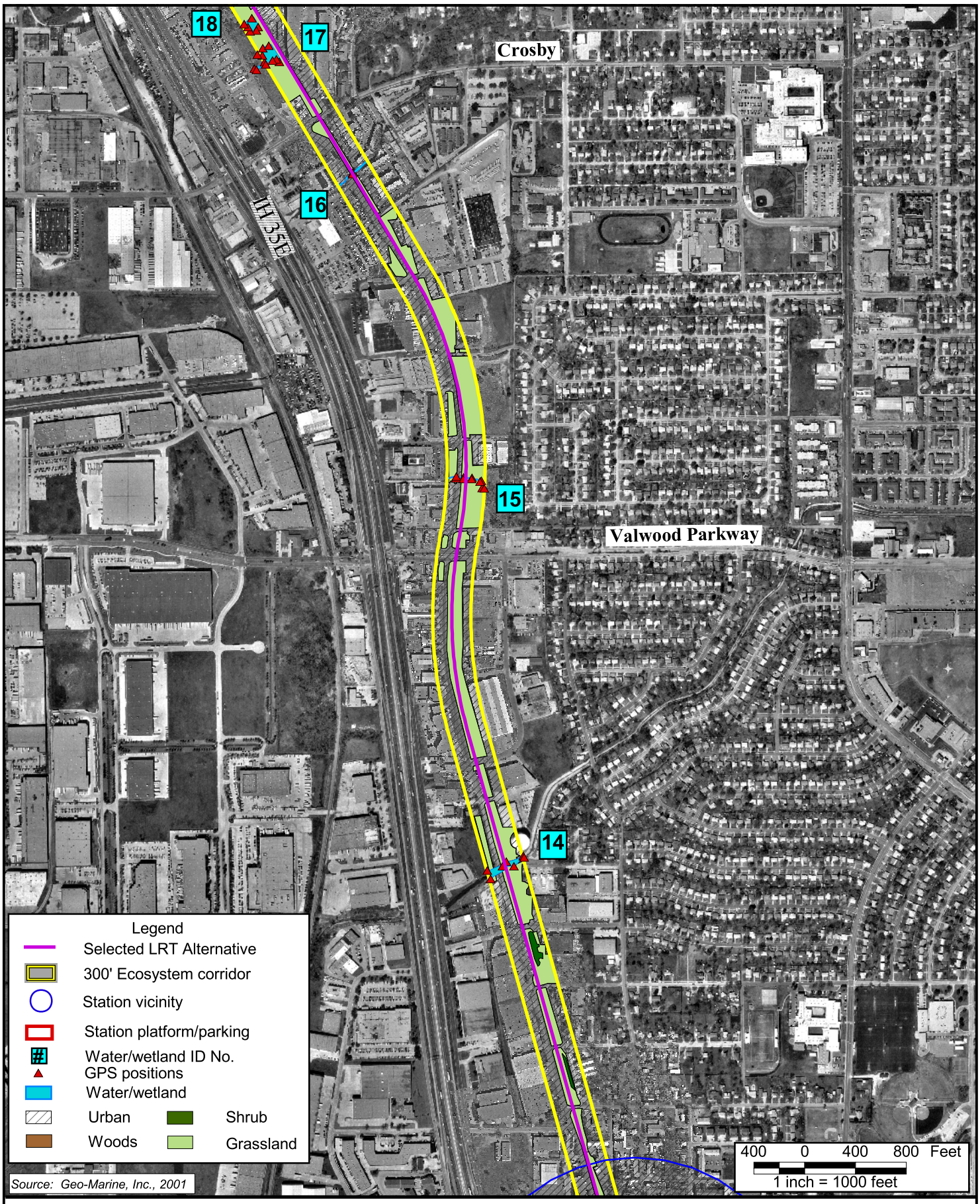


Figure 3-42

Jurisdictional Waters and Vegetation Cover

Map 9

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

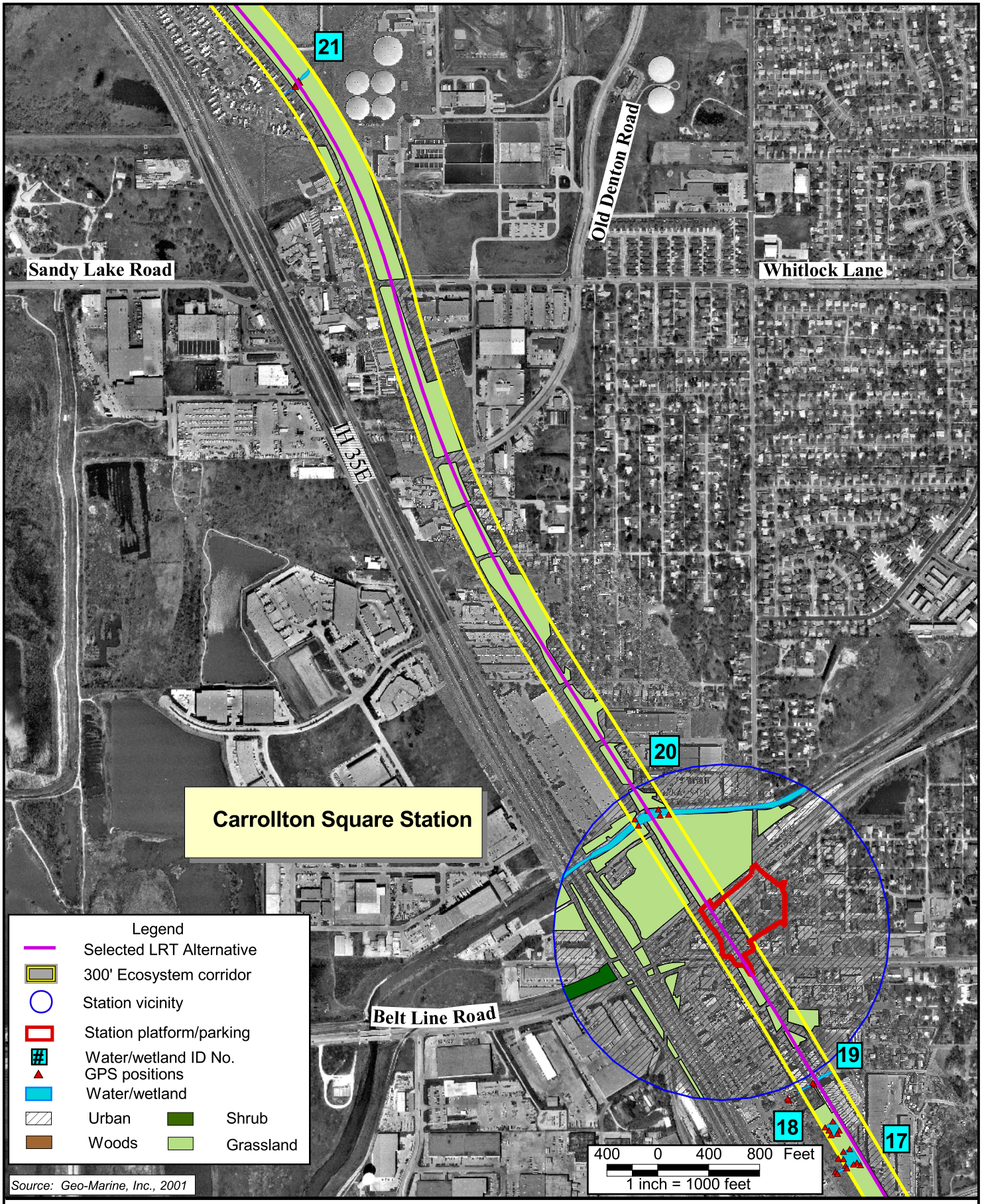


Figure 3-43

Jurisdictional Waters and Vegetation Cover

Map 10

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

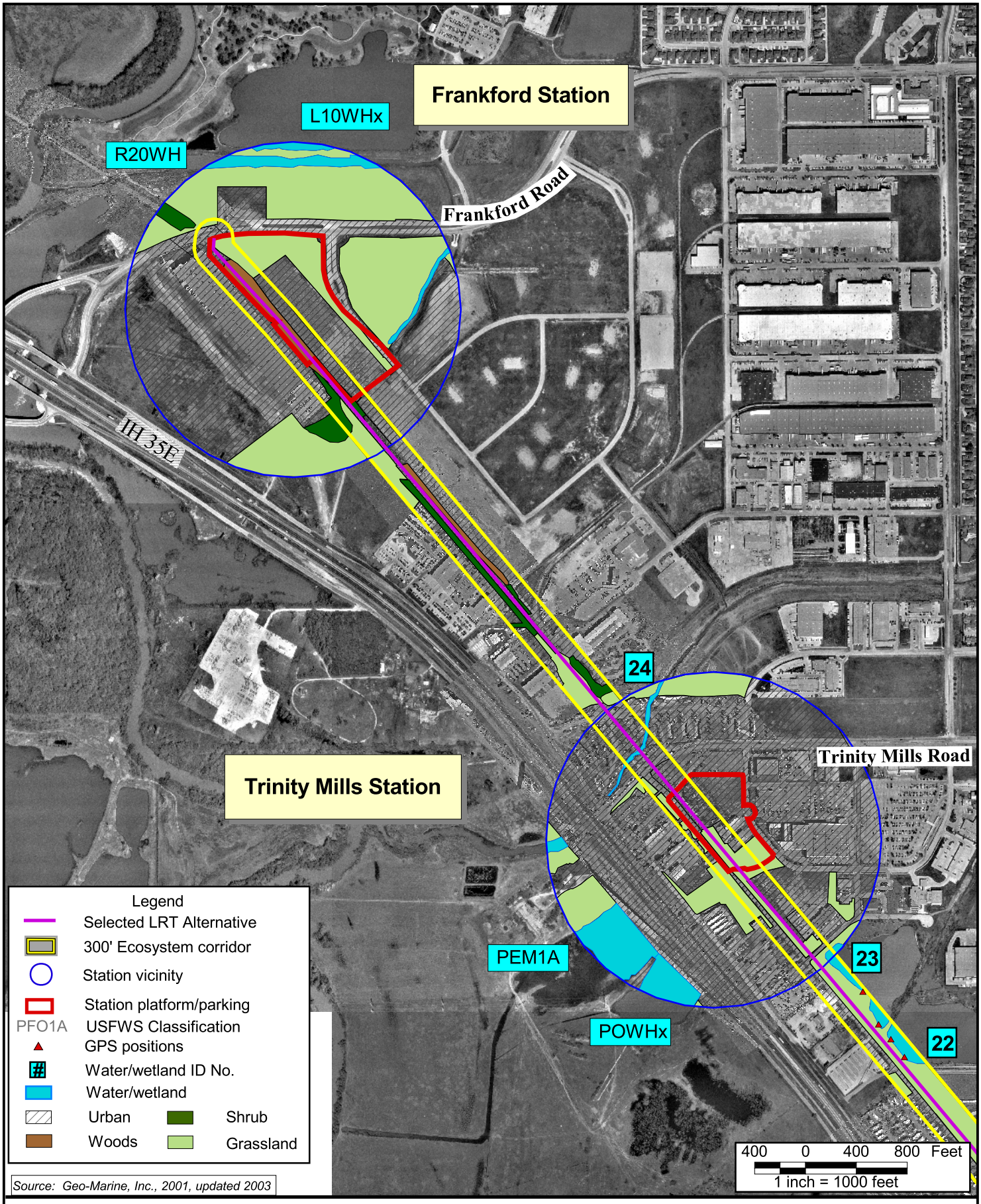


Figure 3-44

Jurisdictional Waters and Vegetation Cover

Map 11

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

TABLE 3-24
PLANT COMMUNITIES AND THEIR SIZES PRESENT WITHIN THE PROJECT AREA

Project Area	Urban (acres)	Grassland (acres)	Shrubland (acres)	Woodland (acres)	Total (acres)
RAIL LINE					
Selected LRT Alternative (Base Alignment with UPRR)	424.7	180.5	16.0	14.4	635.6
Other Alignments Considered					
Base Alignment (Harry Hines)	417.9	211.6	16.8	14.2	660.5
Base Alignment with Love Field Design Option	433.8	213.4	16.8	14.2	678.2
Base Alignment with Medical Center Design Option A	420.8	201.2	15.8	14.6	652.4
Base Alignment with Medical Center Design Option B	423.6	199.3	15.8	14.6	653.3
Base Alignment with Medical Center Design Option C	424.5	198.2	15.8	14.6	653.0
Base Alignment with Medical Center Design Option D	424.7	199.2	15.8	14.6	654.3
Base Alignment with Love Field and Medical Center Design Option A	436.6	204.1	15.8	14.6	671.1
Base Alignment with Love Field and Medical Center Design Option B	439.4	202.1	15.8	14.6	672.0
Base Alignment with Love Field and Medical Center Design Options C	440.3	201.0	15.8	14.6	671.7
Base Alignment with Love Field and Medical Center Design Option D	440.6	201.0	15.8	14.6	672.0
STATIONS					
Selected LRT Alignment (Base Alignment with UPRR)					
Victory	97.3	25.9	1.9	0.0	125.1
Market Center/Oak Lawn (South)	103.9	7.5	4.2	8.0	123.6
Parkland (UPRR)	110.4	12.1	0.0	2.7	125.2
Inwood (South)	87.3	18.1	2.6	14.6	122.6
Brookhollow	92.9	29.9	0.0	2.0	124.8
Bachman	98.9	17.9	0.0	8.1	124.9
Walnut Hill/Denton	101.6	22.0	0.0	1.1	124.7
Royal Lane	103.1	19.0	0.3	2.6	125.0
Farmers Branch	83.8	27.4	0.0	13.9	125.1
Carrollton Square	97.5	25.1	1.1	0.0	123.7
Trinity Mills	79.8	36.9	0.9	0.0	117.6
Frankford	23.6	86.7	8.5	3.2	122.0
Other Alignments Considered					
Love Field Design Option					
Love Field (Design Option)	0.0	N/A	N/A	N/A	0.0
Medical Center Design Options					
Parkland (Harry Hines Base Alignment)	118.1	7.0	0.0	0.0	125.1
Parkland (Design Options A, B, C)	118.1	7.0	0.0	0.0	125.1
Parkland (Design Option D)	119.7	5.6	0.0	0.0	125.3
Market Center/Oak Lawn (North)	103.9	7.2	3.2	9.3	123.6
Inwood (North)	85.9	19.5	2.6	14.6	122.6
UTSW/Exchange Park (Base Alignment)	96.4	25.4	3.0	0.0	124.8

Source: Geo-Marine, Inc., 2002

During field surveys conducted in 2001, signs and individuals of several wildlife species were observed within the project area, including eastern cottontail rabbit (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), opossum (*Didelphis marsupialis*), eastern fox squirrel (*Sciurus niger*), coyote (*Canis latrans*), beaver (*Castor canadensis*), and armadillo (*Dasypus nevemcinctus*). Two reptile individuals (unidentified snake and turtle species) and one amphibian individual (unidentified frog

species) were observed. Thirty-five bird species were also observed. The common and scientific names of birds observed during 2001 field surveys, as well as the number of birds observed in each transect during field surveys, are presented in Appendix 10-D of the ***Existing Conditions Technical Memorandum*** (DART, 2001).

The most common bird in the project area was the European starling (*Sturnus vulgaris*). Other common species included rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), great-tailed grackle (*Quiscalus mexicanus*), and house sparrow. Some species were only encountered in areas where water was present, such as near Ken Good Park and in or near Bachman Lake (i.e., herring gull [*Larus argentatus*] and Canada goose [*Branta canadensis*]).

Fewer birds were seen in the areas with predominant traffic noise (as observed by the biologists). More birds were seen to the north where there was slightly more habitat. The highest concentrations of birds and the most diverse species assemblages were found in the riverine and/or pond environments.

Correspondence with TPWD indicated that the Biological and Conservation Data System (BCD) data did not provide a definitive indication as to the presence, absence, or condition of special species, natural communities, or other significant features in the project area. TPWD also made note of two colonial waterbird rookeries as being documented within one mile of the proposed project route. Field verification showed the Carrollton site is more than one mile from the project, and the other is located near the UTSW Medical Center South Campus and is located more than ¾-mile from the proposed alignment.

3.9.4 Protected Species

A combined total of 19 federal and state-listed endangered, threatened, or rare species occurs or potentially occurs in the Dallas County area and project area. Information pertaining to the description and habitat requirements of the various species is presented in **Table 3-25**.

The Endangered Species Act (ESA) of 1973 (P.L. 93-205), as amended, was enacted to provide a program of preservation for federally listed endangered and threatened species and to provide protection for ecosystems upon which these species depend for their survival. An endangered species is a species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Proposed species are those that have been formally submitted to Congress for official listing as threatened or endangered.

The State of Texas has separate laws governing the listing of animals as endangered or threatened. Endangered or threatened animal species on the state list are those species so designated according to Chapters 67 and 68 of the Texas Parks and Wildlife Code and Section 65.171-65.184 of Title 31 of the Texas Administrative Code (TAC). Animals that are not currently listed by the federal government may be listed as endangered or threatened by the state. The state does not have authority, at this time, to list invertebrates. In addition to listing threatened/endangered species, the state also lists rare species that have no regulatory listing status.

Besides the ESA, migratory birds and the bald eagle *(Haliaeetus leucocephalus)* are also protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code [U.S.C.] 703-712), as amended by the Fish and Wildlife Improvement Act of 1978 (P.L. 95-6-6) and the Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668d), as amended.

Regulation 50 Code of Federal Regulations (CFR) Part 10.13 lists all migratory birds protected under the MBTA. The USFWS has a legal mandate under the Fish and Wildlife Conservation Act

of 1980, as amended (P.L. 100-653, Title VIII), to identify, monitor, and assess species, subspecies, and populations of all migratory non-game birds (USFWS 1995b).

TABLE 3-25
THREATENED, ENDANGERED, AND RARE SPECIES OCCURRING OR POTENTIALLY OCCURRING IN DALLAS AND DENTON COUNTIES

Common Name	Scientific Name	Federal Status[1]	State Status[2]	Habitat Present
Arctic peregrine falcon	*Falco peregrinus tundrius*	DL	T	**yes**
Bald eagle	*Haliaeetus leucocephalus*	LT-PDL	T	no
Black-capped vireo	*Vireo atricapillus*	LE	E	no
Black-tailed prairie dog	*Cynomys ludovicianus*	C	--	no
Golden cheeked warbler	*Dendroica chrysoparia*	LE	E	no
Henslow's sparrow	*Ammodramus henslowii*	--	R	no
Interior least tern	*Sterna antillarum*	LE	E	possible
Migrant loggerhead shrike	*Lanius ludovicianus migrans*	--	R	**yes**
Mountain plover	*Charadrius montanus*	PT	R	no
Piping plover	*Charadrius melodus*	LT	R	no
Western burrowing owl	*Athene cunicularia hypugaea*	--	R	no
White-faced Ibis	*Plegadis chihi*	--	T	no
Whooping crane	*Grus americana*	LE	E	no
Wood stork	*Mycteria americana*	--	T	no
Black lordithon rove beetle	*Lordithon niger*	--	R	no
Plains spotted skunk	*Spilogale putorius interrupta*	--	R	no
Texas garter snake	*Thamnophis sirtalis annectens*	--	R	**yes**
Texas horned lizard	*Phrynosoma cornutum*	--	T	no
Timber/canebrake rattlesnake	*Crotalus horridus*	--	T	no
Warnock's coral root	*Hexalectris warnockii*	--	R	no

[1]Federal Status
LE = Listed endangered
LT = Listed threatened
PT = Proposed threatened
DL = Delisted
PDL = Proposed delisted

[2]State Status
E = Endangered
T = Threatened
R = Rare
C = Candidate

Source: Beaudry 1995; CMI 1996; Davis et al. 1994; TPWD 2001a, 2001b, 2002; USFWS 1995a, 1995b, 1996, 1999a, 2001, 2002; Wisconsin Department of Natural Resources, 2001; Dallas Audubon Society, 2002, Bird News.
Web site: http://www.dallasaudubon.org/bird_news.htm. Accessed 19 March, 2002.

As shown in **Table 3-25**, four species would have a low to moderate potential of occurrence within the project area based on habitat availability. The Arctic peregrine falcon (*Falco peregrinus tundrius)* normally nests in the Arctic tundra with a migration range from northern Alaska, Canada, and Greenland to Central and South America during the fall months (USFWS 1999b). This species has been delisted federally; however, it is still listed as threatened in Texas. A peregrine falcon (*Falco peregrinus*), probably of the Interior West population (not the Arctic breeding population), was observed in downtown Dallas during the field surveys on 7 March 2001. The falcon was observed flying over the project area in the direction of downtown Dallas. Food resources such as rock doves (pigeons) are abundant in the area for this bird. No known nesting sites for the falcons are documented in the downtown Dallas area (TPWD 2001a).

The state and federally endangered interior least tern (*Sterna antillarum*) is a rare to common transient to the north Texas area. In Dallas County, this species has been reported as early as 3 May and as late as 22 September. In Denton County, this species has been reported as early as 14 April and as late as 25 September (Pulich 1988). In recent years, a colony of interior least terns have been confirmed as occurring in southeast Dallas County at the Southside Wastewater Treatment Plant (Dallas Audubon Society 2002). During informal consultation with the USFWS, it was discovered that a colony of interior least terns have been discovered nesting in the proximity of the project corridor. Specifically, the colony was observed at the Valwood Improvement Authority [VIA] Cell B Pond in northwest Dallas County. Additionally, the USFWS believes that this species utilizes the Trinity River as a travel and nesting corridor on its migratory route. However, this species has not been observed during any of the numerous field surveys, nor has any suitable habitat been identified. Nesting sites for the interior least turn are salt flats, broad sandbars, and barren shores along wide, shallow rivers. Important breeding habitat characteristics include bare ground or nearly bare ground and alluvial islands or sandbars for nesting, the availability of food (primarily small fish), and favorable water levels during the nesting season. They usually nest on sites without vegetation, but have been found on sites with an average of 11-30 percent vegetative cover. These sites will be composed of grasses, shrubs, and trees and will range from 15 to 37 inches in height. As nesting sites become sparse, interior least turns have used dredge islands, dikefields, fly-ash lagoons, sandpits, and gravel levee roads as nesting sites (USFWS 1995a).

The northern population of the migrant loggerhead shrike (*Lanius ludovicianus migrans)* also has potential habitat present within the project area and is listed as rare in Texas. Five loggerhead shrikes were observed along the corridor – two were observed between IH 635 and Webb Chapel Extension and three were observed between Shorecrest Drive and Seelcco Street. Without seasonal surveys, it is difficult to ascertain whether the shrikes that were observed were migratory or nonmigratory. However, if present, migratory loggerhead shrikes would be transitory in the area and feeding resources are abundant (Dobkin 1994; Hamel 1992; Hunter 1990).

A fourth species, the Texas garter snake (*Thamnophis sirtalis annectens)*, is listed as rare in Texas and depends upon habitat consisting of wet or moist areas (Beaudry 1995). This species could potentially occur along riparian areas or near wetlands.

Migrating bird species potentially use the riparian areas, wetland areas, or forest stands in the project area as stopping points on their way to and from wintering grounds. During the surveys, several species of wading birds and ducks were observed utilizing the ponds at Ken Good Park and near Bachman Lake.

3.9.5 Aquatic Habitats

Aquatic communities in the project area are diverse and fall into two types of habitat classifications: ponds and streams. There are several water bodies (Ken Good Park ponds and an overflow pond off Bachman Lake) located adjacent to the project areas. These types of water bodies, usually ranging in size from 10 to 500 acres, are more likely to maintain water throughout the year and generally have a sustained fish population. Streams are classified based on their size and flow characteristics and range from small, intermittent-flowing channels to permanent flowing drainage ways.

Eleven streams/rivers and one water body (Ken Good Park ponds) were evaluated for the aquatic habitat component. A second water body, the Bachman Lake pond overflow, is discussed in Section 3.9.1 as part of the jurisdictional waters of the U.S. inventory. Of the 11 streams evaluated, most had little cover available for aquatic species due to channelization and concrete lining.

Habitats associated with ponds in the project area include open water and shoreline. Open water habitat not only supports a variety of fish species, but it also provides benefits for many species of birds, mammals, reptiles, and amphibians. Shoreline habitats provide feeding and resting areas

for shorebirds that migrate through the project areas (Johnston and Short 1989). The ponds at Ken Good Park contained habitat for fish, turtles, and many species of aquatic birds. The overflow at Bachman Lake had good quality habitat with large trees, cover, cattails, and evidence of beaver inhabitation.

3.10 GEOLOGY

3.10.1 Geologic Setting

The Study Area lies within the physiographic region known as the Blackland Prairie. This category consists of low rolling terrain with chalk and marl bedrock tilting to the south and east. The bedrock of Dallas County and southern Denton County is of Upper Cretaceous age. Thick sedimentary beds underlie the northwestern quadrant of Dallas County and southern Denton County and are covered with Quaternary terrace deposits consisting of sand, gravel, silt and clay, but no rock outcroppings. Surface geology is composed of the Austin, Woodbine, Eagle Ford and U. Washita Groups, which are all Cretaceous soils. The Study Area is located near the boundary of the Austin formation and the underlying Eagle Ford formation, both of which outcrop just northeast of Dallas Love Field. The Austin formation is composed of clayey limestone with calcareous shale and marl. The Eagle Ford formation is composed mainly of clay shale, with minor calcareous shale and shaly limestone beds and numerous thin bentonite beds. Additional information on the geologic setting in the Dallas Love Field area is contained in the report ***DART Love Field Airport Light Rail Access: Design Review of Tunnel Alignment and Underground Structures*** (September 2001, Dr. Sauer Corporation), incorporated as Appendix F.

Fossils are common throughout Dallas County and southern Denton County and include occasional gastropods (snails), pelecypods (clams and oysters), cephalopod (ammonite and squid) shells, crayfish, and shark and skate teeth.

3.10.2 Soil Types

The project corridor traverses many distinct soil types with varying patterns of drainage and relief. According to the U.S. Department of Agriculture *Soil Survey of Dallas County* and *Soil Survey of Denton County, Texas* there are 26 soil types found within the Study Area. **Table 3-26** lists the soil types intersecting the alignment, as well as characteristics, potential and limitations of each soil type.

TABLE 3-26
SOIL TYPES IN THE STUDY AREA

Soil Type	Soil Characteristics	Soil Potentials and Limitations
Arents (loamy, gently undulating)	Areas that have been mined for gravel and sand and are lower than the surrounding landscape. Mainly consist of sandy clay loam, clay loam, loam or fine sandy loam in the upper 80 inches.	These soils have medium potential as pastures and low potential for urban development. Hazards of flooding and corrosivity to uncoated steel are limitations.
Arents (loamy, hilly)	Consists of the overburden of mining operations, which has been left in ridges and mounds in the gravel pits. Slopes range from 10% to 30%. The soil is moderately alkaline to a depth of about 80 inches and it is a light, yellowish brown sandy clay loam.	Permeability is moderate, runoff rapid, and the hazard of erosion severe. These soils have a very low potential for urban development. The limitations are the hazard of flooding, the slopes of the ridges and mounds, and corrosivity to uncoated steel.
Arents (clayey, gently undulating)	Consists of clayey soil material removed from nearby road cuts, borrow pits, or drainage ditches. The soil is typically dark brown, calcareous clay, containing many clods and bodies of very dark brown and grayish brown fragments of surface soil.	Permeability is slow to very slow, runoff is medium, and sloping areas erode easily. These soils have a very low potential for urban development. Limitations are a high content of clay, wet spots and ponding

TABLE 3-26 (continued)
SOIL TYPES IN THE STUDY AREA

Soil Type	Soil Characteristics	Soil Potentials and Limitations
Axtell-Urban land complex (1% to 5% slopes)	Made up of deep, gently sloping, moderately well drained soils and areas of Urban land on uplands. The Axtell soil makes up about 50% of this complex, and Urban land makes up about 25%. The surface layer of Axtell soil is typically slightly acid to strongly acid, dark grayish brown to pale brown fine sandy loam with brown and red mottling to about 52 inches. To 80 inches, it is moderately alkaline, grayish brown sandy clay.	Permeability is very slow, runoff is medium, and the hazard of erosion is moderate. These soils have a medium potential for urban uses. The high shrink-swell potential, low strength, and corrosivity of the soil and the hazard of erosion are limitations
Bastsil fine sandy loam (0% to 3% slopes)	Deep, well drained, nearly level to gently sloping soil. The surface layer is typically medium acid, brown fine sandy loam to yellowish red sandy loam to about 34 inches. To 68 inches, it is mottled red, yellowish red, and light gray sandy clay loam.	Runoff is medium, the hazard of erosion is moderate, permeability is moderate, and the available water capacity is high. This soil has a high potential for urban development. Corrosivity to uncoated steel, and low soil strength are the limitations.
Bastsil-Urban land complex (0% to 2% slopes)	Nearly level to gently sloping, well drained soils and areas of urban land. The Bastsil soil makes up about 40% of the complex, while Urban land makes up 35%. Surface layer is typically moderately acid, brown fine sandy loam to yellowish red to red sandy clay loam to about 34 inches deep. To 68 inches, the soil is mottled dark red, yellowish red, and light gray sandy clay loam.	Permeability is moderate, runoff is medium, and the hazard of erosion is moderate. These soils have a high potential for urban development. The only limitation is corrosivity of uncoated steel.
Frio silty clay, frequently flooded	Deep, well drained, nearly level soil on floodplains. Surface layer is moderately alkaline, dark grayish brown to brown silty clay and silty clay loam, to 74 inches.	Permeability is moderately slow, runoff is slow, and the hazard of erosion is slight. This soil has a very low potential for urban uses, due to frequent flooding and low strength and corrosivity of the soil.
Gowen loam, frequently flooded	Deep, well drained, nearly level soil on floodplains. Typically, surface layers are neutral to moderately alkaline, brown to grayish brown clay loam and sandy clay loam, with thin strata of fine sand around 53 inches. To 80 inches, the soil is moderately alkaline, dark gray and dark yellowish brown sandy clay.	Permeability is moderate, runoff is slow, and the hazard of erosion is slight. This soil has a very low potential for urban and recreational purposes. The hazard of flooding and the corrosivity of the soil are the main limitations.
Houston Black-Urban land complex (0% to 4% slopes)	Deep, moderately well drained, nearly level and gently sloping soils and areas of Urban land. The Houston Black soil makes up about 40% of the complex, while the Urban land is about 35%. Surface layer is typically moderately alkaline, very dark gray, to black, to grayish brown clay to 70 inches, with the bottom 12 inches containing light olive brown mottles.	Permeability is very slow, runoff is medium, and the hazard of erosion is moderate. The soil has low potential for urban development, due to the high shrink-swell potential, corrosivity and low strength of the soil.
Lewisville-Urban land complex (4% to 8% slopes)	Deep, well drained, gently sloping soils and areas of Urban land. The Lewisville soil makes up about 60% of the complex, and Urban land about 30%. The surface layer is typically moderately alkaline, dark grayish brown to light yellowish brown silty clay, with mottles appearing towards the bottom.	Permeability is moderate, runoff is medium, and the hazard of erosion is severe. This soil has medium potential for urban uses. The high shrink-swell potential, low strength, and corrosivity of the soil, and the hazard of erosion are the limitations.
Pits and Dumps	Areas from which limestone or shale has been removed. The pits are several feet deep, and the mounds of rubble or shale are several to many feet high. The areas are generally 8 to 75 feet below the original surface.	A few areas have been smoothed for use as building sites.
Silawa-Urban land complex (2% to 6% slopes)	Deep, well drained, gently sloping and sloping soils and areas of Urban land. The Silawa soil makes up about 50% of the complex and Urban land makes up about 25%. The surface layer of Silawa soil is typically slightly to moderately to strongly acid, grayish brown fine sandy loam, and reddish brown and yellowish red sandy clay loam to 44 inches. To 80 inches, it is strongly acid, reddish yellow loamy fine sand.	Permeability is moderate, runoff is medium, and water and wind erosion are moderate hazards. This soil has a high potential for urban development. The erosion hazards and the corrosivity and low strength of the soil are the limitations.

TABLE 3-26 (continued)
SOIL TYPES IN THE STUDY AREA

Soil Type	Soil Characteristics	Soil Potentials and Limitations
Silstid loamy fine sand (0% to 3% slopes)	Deep, well drained, nearly level to gently sloping soil on uplands. Typically, the surface layer is neutral to moderately acid, brown to yellowish brown loamy fine sand, and yellowish brown sandy clay loam, to a depth of 44 inches. To 80 inches, it is strongly acid, reddish yellow loamy fine sand.	Permeability is moderate, runoff is slow, and water erosion is a slight hazard. Wind erosion is a severe hazard if the surface is bare. This soil has a high potential for urban uses. The corrosivity of the soil is a hazard to underground installations. The sandy texture of the soil is a limitation to recreational uses.
Trinity clay, frequently flooded	Deep, nearly level, somewhat poorly drained soil on floodplains. Typically, the surface layer is moderately alkaline, dark gray, grayish brown and very dark gray clay.	Permeability is very slow, runoff is slow, and the hazard of erosion is slight. This soil has a very low potential for urban uses. The frequent flooding and the wetness, corrosivity, very high shrink-swell potential, and clayey texture of the soil are limitations.
Trinity-Urban land complex	Deep, nearly level, somewhat poorly drained soils and areas of Urban land on floodplains. The Trinity soil makes up about 60% of the complex and Urban land makes up about 20%. The surface layer of the Trinity soil is typically moderately alkaline, very dark gray, black, and dark grayish brown clay, to a depth of 80 inches.	Permeability is very slow, runoff is very slow, and the hazard of erosion is slight. The soils in this complex have very low potential for urban uses, mainly because of the hazard of flooding. Other limitations include a very high shrink-swell potential, corrosivity, low strength, and wetness of the soil.
Wilson-Urban land complex (0% to 2% slopes)	Nearly level to gently sloping, deep, somewhat poorly drained soils and areas of Urban land. The Wilson soil makes up about 60% of this complex, while Urban land makes up 30%. The surface layer of the Wilson soil is typically mildly to moderately alkaline, dark grayish brown clay loam, and dark gray and olive brown to light olive brown clay.	Permeability is very slow, runoff is slow, and the hazard of erosion is slight. The Wilson soil has medium potential for urban uses. The high shrink-swell potential, corrosivity, and low strength of the soil are the main limitations to urban uses.

Source: NRCS Soil Survey for Dallas and Denton Counties, Texas: 1980.

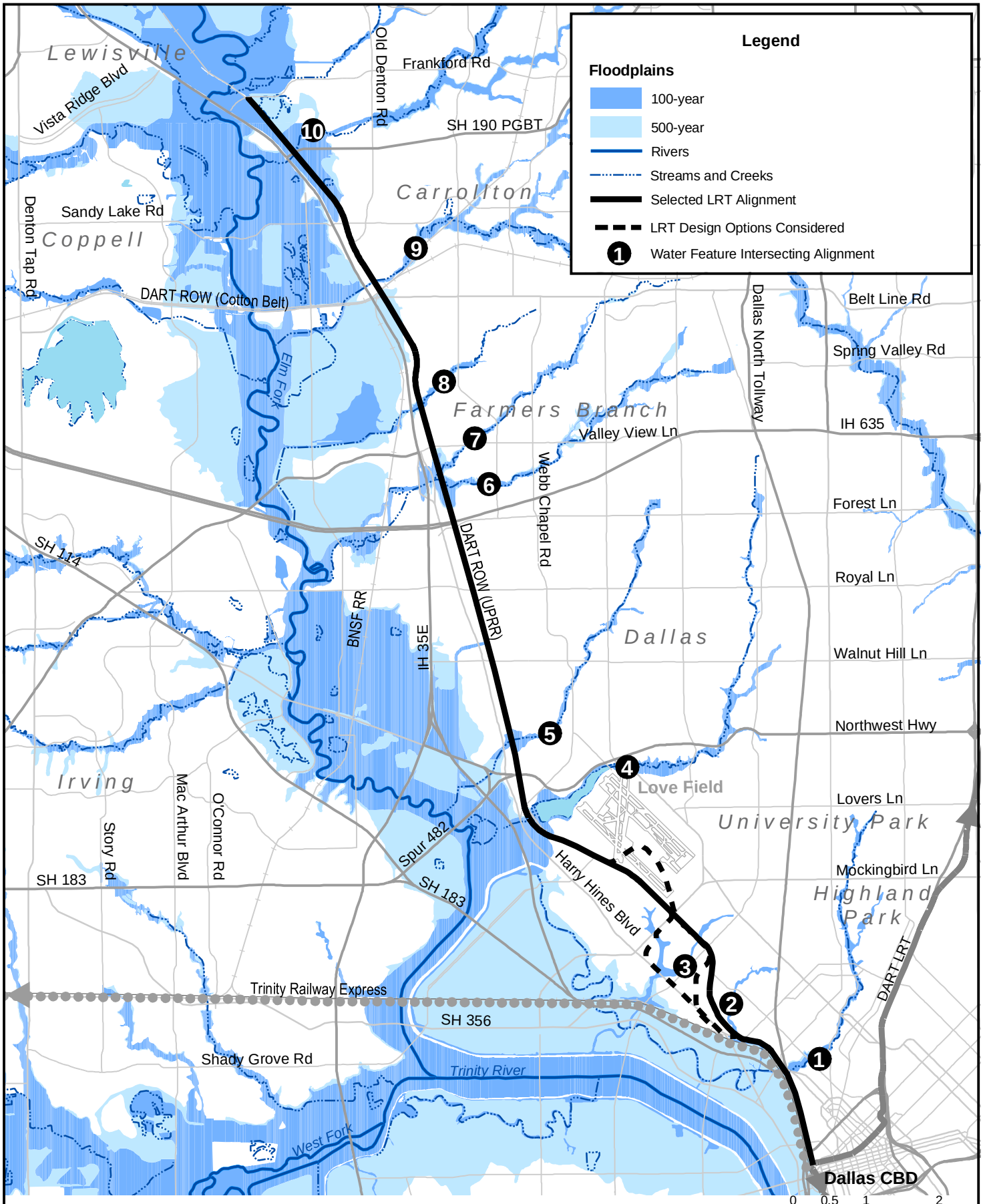
Soils are moderate in extent due to the degree of urbanization in this area, but where present, consist mainly of clay soils with low slopes. The soils immediately intersecting the existing alignment consist of varying potential for urban development. Approximately 50 percent of the soils are of high or moderate potential for urban uses, and 50 percent are of low or very low potential. The soils of high and moderate potential are the most common along the length of the alignment, covering approximately 75 percent of the alignment. Soils of low potential most commonly occur within floodplains and thus, will generally be avoided.

3.11 HYDROLOGY / WATER QUALITY

3.11.1 Surface Water Quality

The surface water resources for most of the project area drain into the Lower Elm Fork region of the Trinity River, and flow in a west/southwest direction. Bachman Lake lies within the half-mile project Study Area, however the proposed LRT project is located downstream from the lake's outlet. No major river channels cross the proposed alignment; however, there are ten streams and creeks that cross the existing alignment. These resources are listed in **Table 3-27** and illustrated in **Figure 3-45**.

According to EPA's ***Index of Watershed Indicators***, the northern half of the project area is categorized as having better water quality with low vulnerability. Approximately 1/4-mile south of Bachman Lake, the water quality changes to more serious with low vulnerability. According to the ***State of Texas 1998 303(d) Listed Stream Segments***, the Elm Fork of the Trinity River is listed as a state stream segment not meeting water quality standards as required by Section 303(d) of the Federal Clean Water Act.



Source: LOPEZGARCIA GROUP, 2002

Figure 3-45
Floodplains and Watershed

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

TABLE 3-27
WATER BODIES INTERSECTING THE STUDY CORRIDOR

Map No.	Water Feature	Description of Location
1	Turtle Creek	Flows under the intersections of the Dallas North Tollway with McKinnon Street and Harry Hines Boulevard. Flows northeast to southwest and empties into the Lower Elm Fork of the Trinity River.
2	Cedar Branch of Turtle Creek	Approximately 350 feet west of Hondo Drive. Flows from north to south and empties into Turtle Creek, which then drains into the Lower Elm Fork of the Trinity River.
3	Knights Branch of Turtle Creek	Approximately 350 feet north of Inwood Road; forks north and northeast at the center of the alignment. Flows from north to south at the westernmost fork, and from northeast to south at the easternmost fork. It eventually empties into Turtle Creek, which drains into the Elm Fork of the Trinity River.
4	Bachman Creek	Approximately 350 feet northwest of Shorecrest. Flows from northeast to southwest and empties into the Elm Fork of the Trinity River.
5	Joes Creek	Crosses the alignment approximately 675 feet north of Nagle Road. Flows in a southwesterly direction into the Elm Fork of the Trinity River.
6	Farmers Branch of Rawhide Creek	Approximately 300 feet south of Farmers Branch Road. Flows east to west into the Elm Fork of the Trinity River.
7	Rawhide Creek	Approximately 725 feet south of Sable Lane. Flows northeast to southwest into the Elm Fork of the Trinity River.
8	Cooks Branch of the Elm Fork	Approximately 675 feet north of Havenhurst Road. Flows northeast to southwest into the Elm Fork of the Trinity River.
9	Hutton Branch Creek	Approximately 900 feet north of College Road. Flows northeast to southwest and empties into the Elm Fork of the Trinity River.
10	Furneaux Creek	Approximately 120 feet northwest of Trinity Mills Road. Flows west by southwest and drains into the Elm Fork of the Trinity River.

Source: NCTCOG, 1999.

3.11.2 Groundwater Resources

The only major aquifer that supplies both Dallas and Denton counties with groundwater is the Trinity aquifer. The Woodbine aquifer is a minor aquifer that is also located within the project area. The water-bearing units in Dallas County consist primarily of the Lower Cretaceous Trinity and Paluxy sands and the Upper Cretaceous Woodbine formation.

The water quality of the Trinity Group is acceptable for most municipal and industrial purposes and ranges from fresh to slightly saline, with salinity increasing with depth. The water table is low due to overdeveloping in the Dallas/Fort Worth metropolitan area, dropping as much as 1,200 feet below the surface. Currently, water supplied to the area comes from surface reservoirs built on the Trinity River.

The Woodbine aquifer, which also produces water in the upper part of the Trinity River Basin, consists of fine-grained sand and sandstone interbedded with clay. Lignite and sandy clay layers occur in the upper part of the aquifer with 50 percent commonly consisting of sand. Useable water quality is produced to a maximum depth of about 2,000 feet; however, water quality is relatively poor, exceeding 1,500 parts per million (ppm) dissolved solids in most areas. Salinity increases with depth.

The construction of tunnel or cut-and-cover structures along the project alignment would result in contact with ground water resources and may result in contact with underground hazardous material sites. The Selected LRT Alternative contains only one below grade segment, located under Mockingbird Lane. Four USTs have been identified within 200 feet of this portion of the Selected LRT Alternative (see Section 3.12 below).

3.11.3 Floodplains

The Federal Emergency Management Agency (FEMA) requires municipalities that participate in the National Flood Insurance Program to adopt floodplain ordinances that prohibit development in the existing 100-year floodplain. These flood zones have been established by FEMA and are shown on the agency's Flood Insurance Rate Maps (FIRM).

A floodplain is defined as any land area susceptible to inundation by floodwaters from any source. The 100-year floodplain is any area that has a one percent chance of being exceeded in magnitude in any given year. Portions of the Study Area lie adjacent to or cross the 100-year floodplain of the Elm Fork of the Trinity River and its tributaries. **Table 3-28** summarizes the locations at which the Study Area crosses or abuts the 100-year floodplain. All of these crossings are to be constructed at least two feet above the 100-year floodplain. **Figure 3-45** displays the areas of potential flooding along the Study Area as established by FEMA.

In the north, the floodplain extends from the northern edge of the proposed alignment to Hutton Branch Creek on the west side of the alignment. In the central region of the alignment, the area around Bachman Creek lies within the 100-year floodplain in approximately a two-mile radius from the creek itself.

All of the sites considered for the Northwest Rail Operating Facility had some portion of their area within the Bachman Branch 100-year floodplain. Approximately 20% of the selected site at Lombardy Lane lies within the 100-year floodplain for Joe’s Creek.

For the other candidate sites that were considered, but not selected, the Webb Chapel and Northwest Highway sites have only a small area within the 100-year floodplain of Joe’s Creek.

3.12 HAZARDOUS / REGULATED MATERIALS

3.12.1 Study Methodology

Using the state and federal regulatory databases, facilities and areas of concern were identified based on their location within the Study Area, particularly their proximity to the proposed alignment and station areas, and their proximity to existing track locations.

The Study Area was visually inspected between December 5, 2000 and December 22, 2000 via vehicle and pedestrian survey. Subsequent visual inspections of the proposed Northwest Rail Operating Facility at Lombardy and Denton Drive were conducted on July 31 and September 5, 2002. The purpose of the Study Area visit was to view the facilities and properties for signs of past or current field conditions.

TABLE 3-28
FLOODPLAIN LOCATIONS ADJACENT TO OR CROSSED BY THE PROPOSED PROJECT

Map No.	Water Feature and Base Elevation	Location	Width of Floodplain at Crossing (in feet)
1	Turtle Creek (406 feet)	North of Woodrow and south of Oak Lawn Ave.	~700 feet crossed once by alignment
2	Cedar Branch (409.7 feet)	West of Hondo Drive and east of Lucas Drive	~700 feet crossed once by the Selected Alignment ~1,000 feet crossed once by other alignments
3	Knights Branch (418.8 feet)	Just north of Inwood Road; forks north and northeast at the center of the alignment	~175 feet crossed once by Selected Alignment ~1,200 feet crossed twice by Harry Hines Base Alignment
4	Bachman Branch (430.3 feet)	Northwest of Shorecrest and southeast of Chapel Hill Road	~2,600 feet crossed once by alignment
5	Joes Creek (437.2 feet)	Crosses Harry Hines Blvd. at approx. 1/8 mile north of Nagle Road	~2,000 feet crossed once by alignment
6	Farmers Branch (457.1 feet)	South of Farmers Branch and north of Christian Parkway	~3,200 feet (includes Rawhide Creek) each crossed once by alignment
7	Rawhide Creek (459.2 feet)	Just north of Farmers Branch Lane and south of Sable Lane	(Rawhide Creek floodplain width included in Farmers Branch)
8	Cooks Branch (463.8 feet)	North of Havenhurst Road and south of Branch View Road	~600 feet crossed once by alignment
9	Hutton Branch Creek (453.4 feet)	North of College Road and south of Vinylex	~150 feet crossed once by alignment
10	Furneaux Creek (445.1 feet)	Just northwest of Trinity Mills Road and southeast of Dixon Road	~7,500 feet crossed once by alignment

Source: NCTCOG, 1999.

Information from federal and state regulatory databases, visual inspections, and topographic and soils information were combined and evaluated. This information is reported in the ***Phase 1 Environmental Site Assessment for the Northwest Corridor Light Rail Expansion,*** (Wendy Lopez & Associates, April 2001). Based on this data, facilities were categorized as having high, moderate, or low concern regarding hazardous materials and the potential for environmental liability. The three categories of concern are defined below:

- High Concern - These locations are found within 200 feet of the proposed alignment and are of high concern due to their likelihood of being contaminated. Those suspect facilities between 200 and 400 feet from the property with granular or sandy soils and surface gradient elevations sloping toward the property are given a high concern ranking as well. These locations consist of: National Priority List (NPL) facilities, Leaking Underground Storage Tank (LUST) facilities, Underground Storage Tank (UST) facilities, Aboveground Storage Tank (AST) facilities, State-equivalent Comprehensive Environmental Response, Compensation, and Liability Information System [CERCLIS] List (SCL) facilities, and Corrective Actions (CORRACTS) facilities.

- Moderate Concern - These locations are also found within 200 to 400 feet of the proposed alignment but are of lesser concern due to their current regulatory status, or the likelihood of encountering contamination during construction activities. However, each of these locations

may have contamination issues that could impact construction activities. Those suspect facilities between 400 and 1,320 feet from the property with granular or sandy soils and surface gradient elevations sloping toward the property are given a moderate concern ranking as well, unless identified as having a low concern. These locations consist of: LUST facilities, UST facilities, and SCL facilities.

- Low Concern - These locations are found within 400 to 1,320 feet of the proposed alignment and are of least concern. These facilities have a lower potential of being contaminated or, due to their distance from the property or type of contamination, of having any contamination associated with them that would impact construction activities. Locations of the sites can be found in the above referenced report.

Figures 3-46 and **3-47** show the locations of all of the facilities of high and moderate concern within the Study Area. **Tables 3-29** and **3-30** contain the name, address and type of hazard for each site of high concern and each site of moderate concern identified. The numbers on the figures correspond to the numbers in the tables.

Federal Regulatory Databases
To provide information regarding the hazardous materials present in the Study Area, the following Federal databases were searched:

- National Priority List (NPL) - This database includes a listing of all US EPA National Priority List sites. These sites fall under the EPA's Superfund program established to fund cleanup of contaminated sites that pose risk to human health and the environment. This database was searched to a 1-mile radius from the proposed project. No sites were discovered.

- RCRA permitted treatment, storage, disposal facilities (RCRA-TSD) - The RCRA Facilities database is a compilation by the EPA of facilities that report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA TSDs are facilities that treat, store and/or dispose of hazardous waste. Also searched to one mile, a search of this database resulted in no RCRA-TSDs sited.

- Sites under review by US EPA (CERCLIS) - This database contains an extract of sites nationally identified as hazardous sites that have been investigated or are in the process of investigation for contamination risk. This database was searched to 1/2-mile and resulted in the finding of one site (Low Concern).

- No Further Remedial Action Planned (NFRAP) CERCLIS - These are sites that have been removed from CERCLIS. After initial investigation, either no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. This database was also searched to 1/2-mile, and 18 sites were identified.

- RCRA Corrective Actions (CORRACTS) - A "corrective action order" is issued pursuant to RCRA Section 3008 (h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. This database was also searched to a one-mile radius from the proposed project, with the result of six (6) sites found (two High Concern, four Low concern).

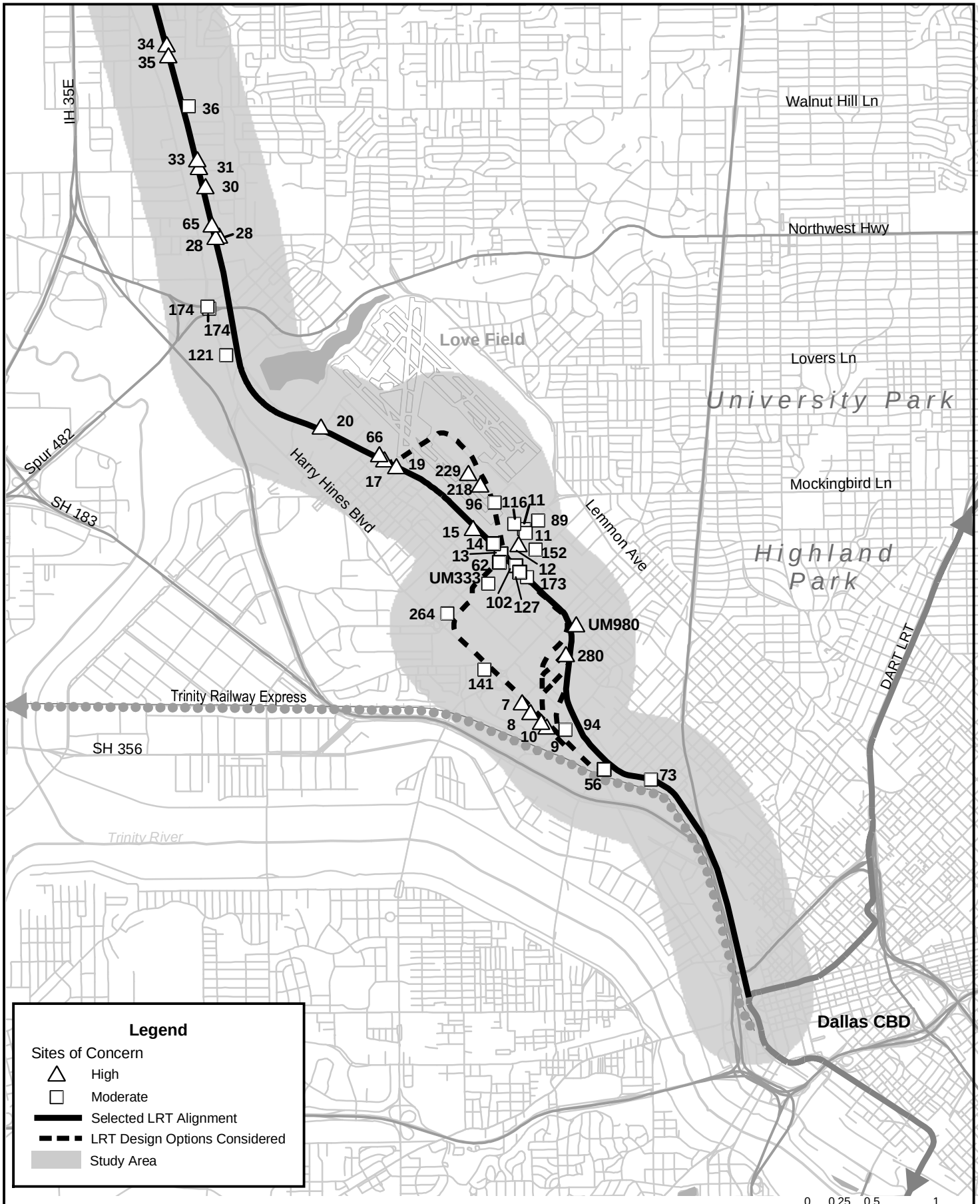


Figure 3-46

Hazardous Material Sites of Concern

Dallas CBD to Walnut Hill

LRT Line to Farmers Branch and Carrollton

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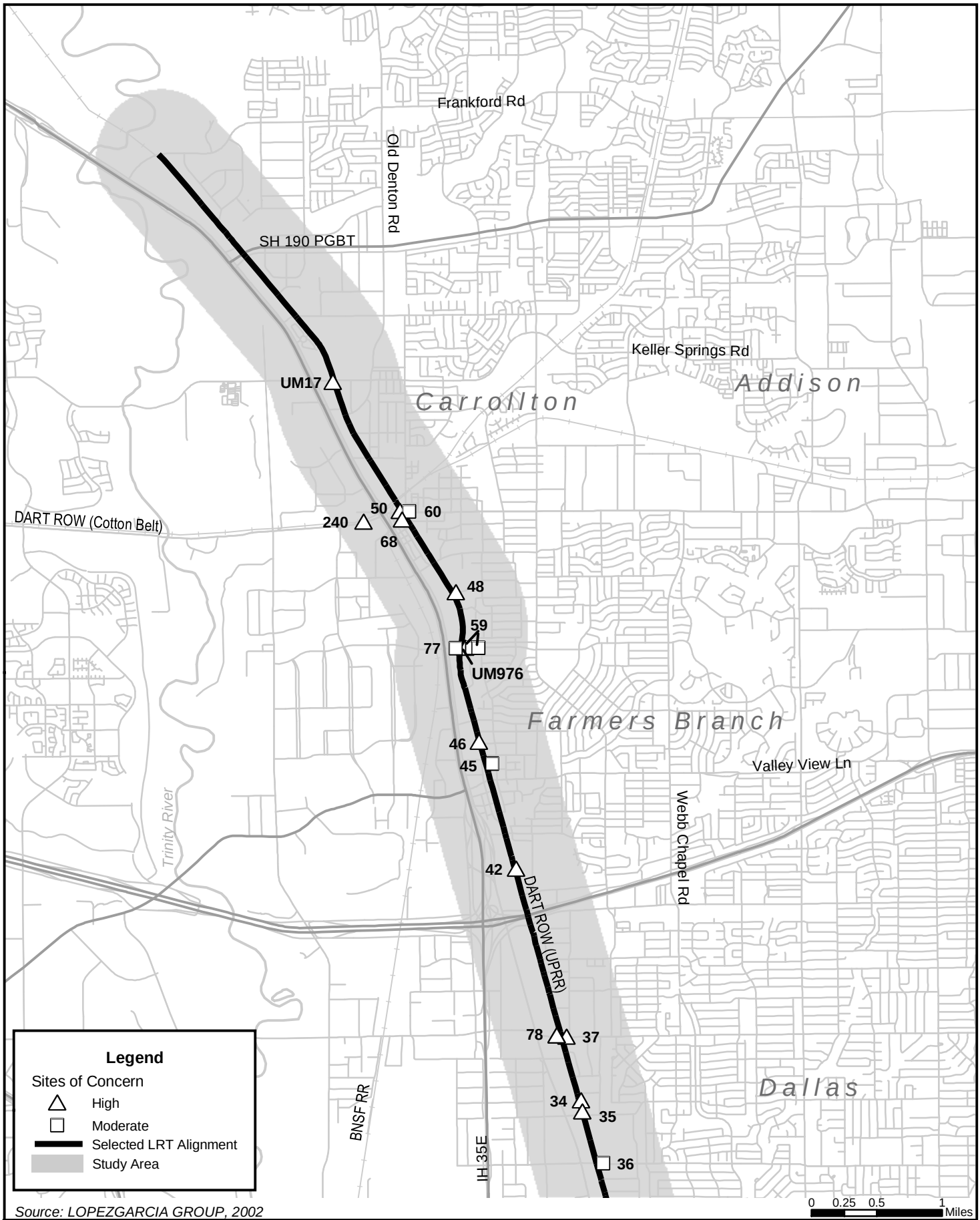

Source: LOPEZGARCIA GROUP, 2002

Figure 3-47

Hazardous Material Sites of Concern

Walnut Hill to Frankford

LRT Line to Farmers Branch and Carrollton

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TABLE 3-29
HAZARDOUS MATERIALS FACILITIES OF HIGH CONCERN WITHIN THE STUDY AREA

Map No.	Facility	Address	Type of Hazards
7*	7-Eleven Store #1611-22009	5406 Harry Hines Boulevard	LUST, UST
15	Jones Blair Paint Company	2728 Empire Central	SCL, LUST, UST, AST, RCRIS, SPILLS
33	Glass Depot	10845 Denton Drive	LUST, UST
34	Lane Container Company	11180 Denton Drive	LUST, UST, RCRIS
50	Racetrac Petroleum	1001 North Broadway	LUST
68	David E. Oldfield Property	1011 South Broadway in Carrollton	LUST
78	Sigmor #750	2655 Royal Lane	LUST
240	Diamond Shamrock #782	1300 Belt Line Road	LUST
UM976	Abandoned Valwood Gas Station	2409 Valwood Parkway	LUST, UST
8*	UT Southwestern Medical Center	5151 Harry Hines Boulevard	UST
9*	University Medical Center	5323 Harry Hines Boulevard	UST
10*	Parkland Hospital	5201 Harry Hines Boulevard	LUST, UST, RCRIS
17	1 Stop Food Store	8460 Denton Drive	UST
19	TXI Aviation	8350 Denton Drive	UST, RCRIS
20	Varel Manufacturing Company	9230 Denton Drive	UST
28	Diamond Shamrock #775	3003 Lombardy Lane	UST
28	7-Eleven Store #21764	3003 Lombardy Lane	UST
31	J's Aircraft Engines & Parts, Inc.	10819 Denton Drive	UST
37	Royal Lane FINA	2681 Royal Lane	LUST, UST, SPILLS
46	241 Co. Chaps L7	13303 Denton Drive	UST
48	Carrollton/Farmers Branch Service Center	1505 Randolph	RCRIS
65	Archer Automotive	10603 Denton Drive	UST
66	Southwest Airlines Bulk Fuels Storage Facility	2734 Brookfield	RCRIS
78	Diamond Shamrock #750	2655 Royal Lane	UST
218	Hertz Rent-A-Car	7212 Cedar Springs Road	LUST, UST
UM17	Bragg Service Company	1937 Broadway	UST
117 [1]	Sigmond Property	NWC Summer Street and Broom Street	SCL
35	A B Aluminum Brass Foundry	11165 Denton Drive	CORRACTS
42	Wellmark International	12200 Denton Drive	CORRACTS, NFRAP, RCRIS
30	Glazer's, Inc	10750 Denton Drive	AST
173	unknown	6200 Denton Road	SCL
280**	Hewitt Garage, Inc.	5505 Maple Avenue	LUST
UM980**	Triple A Oil Company	5534 Denton Drive	LUST
12***	Exxon R/S #6-4579	3040 Mockingbird Lane	LUST, UST
218***	Hertz Rent-A-Car	7212 Cedar Springs Road	LUST, UST
229***	Jet Aviation Texas, Inc.	7363 Cedar Springs Road	UST

* Site of High Concern for Harry Hines Base alignment and Medical Center Design Options A, B, C, and D only.
** Site of High Concern for the Medical Center Design Options alignments: site #280 for A only, site #UM980 for A, B, C, and D. Both are High Concern for Selected LRT Alternative (UPRR).
*** Site of High Concern for the Love Field Design Option alignment
[1] Upon further examination, Site 117 was found not to meet the lateral distance requirements for a site of high or moderate concern, as described in Section 3.12; for this reason it has not been considered as a project impact .

Source: Wendy Lopez & Associates, 2002 & 2003

TABLE 3-30
HAZARDOUS MATERIALS FACILITIES OF MODERATE CONCERN WITHIN THE STUDY AREA

Map No.	Facility	Address	Type of Hazard
45	Dallas Area Rapid Transit ROW	13315 Elder	LUST
59	Francis Oil Company	2420 Valwood Parkway	LUST
36	Peerless Manufacturing Co.	2819 Walnut Hill Lane	UST
59	Highway Oil #751	2422 Valwood Parkway	UST
60	FINA	1013 East Belt Line Road	UST
77	Buddy's Texaco	2360 Valwood Parkway	LUST, UST
121	Healthsouth Dallas Rehab. Center	9713 Harry Hines Boulevard	UST
174	My-T-Quick Food Store	10002 Harry Hines Boulevard	UST
174	Friendly's Grocery	10025 Harry Hines Boulevard	LUST, UST
94	Exide Corporation	2040 Motor Street	SCL
173	Unknown	6200 Denton Road	SCL
73	Labor Force	4248 Harry Hines Boulevard	UST
141*	Saint Paul Medical Center	5909 Harry Hines Boulevard	UST, RCRIS
264*	Total Petroleum Station #2308	2121 West Mockingbird Lane	LUST
UM333*	SAIA Motor Freight Line, Inc.	1969 Record Crossing	UST
11**	Budget Rent-A-Car	6629 Aubrey	UST
11**	Thrifty Car Rental	3127 Mockingbird Lane	UST
89**	Sonny's Soft Touch Car Wash	3211 Mockingbird Lane	UST
96**	Avis Rent-A-Car	7020 Cedar Springs	UST
116 **	Former Dollar Rent-a-Car	3114 Hawes	UST
152**	Estate of Alyne B. Hayman	6417 Cedar Springs	SCL
13	Warehouse	6621 Denton Drive	UST
14	Williamson Printing Corp.	6700 Denton Drive	LUST, UST, RCRIS
56	Walraven Brothers Inc.	2023 Lucas	RCRIS
62	--	2703 W. Mockingbird Lane	Spill
102	Love Field Auto Service Center	6420 Denton Drive	UST
127	Southwest Snacks	6333 Denton Drive	UST

* Site of Moderate Concern only for Harry Hines Base Alignment in the Medical Center area.
** Site of Moderate Concern for the Love Field Design Option alignment only.

Source: Wendy Lopez & Associates, 2000 & 2003

- RCRA Registered small or large generators of hazardous waste (GNRTR) - The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities that report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA Large Generators are facilities which generate at least 1000 kg/month of non-acutely hazardous waste (or 1 kg/month of acutely hazardous waste). RCRA Small and Very Small generators are facilities that generate less than 1000 kg/month of non-acutely hazardous waste. These databases were searched to 1/8-mile around the proposed project, resulting in the finding of 72 sites.

- ERNS and State spills list (SPILLS) - Many states maintain a database of spills, reported under various legislative requirements. Frequently there is substantial overlap between spills reported in the State's system and spills reported in the Federal (US EPA) Emergency Response Notification System. This database was searched to 1/8-mile and resulted in 22 sites found (two High Concern, 20 Low Concern).

State of Texas Regulatory Databases

The state databases that follow were also examined to compile hazardous materials information about the Study Area. It should be noted that listing on these databases does not necessarily indicate that the sites are not in compliance with federal or state regulations. Rather, the sites are registered and are either in compliance, or are being monitored by regulatory agencies.

- State Equivalent Priority List (SPL) - Only classified as a State Priority if confirmed sites are included, and the state is involved in clean-up activities or is actively pursuing responsible parties. This database was searched to one mile; however, no sites were found.

- State Equivalent CERCLIS List (SCL) - Lists containing unconfirmed sites or sites where no further action is expected are classified as State Clean-up Lists (SCLs). Often SCLs will contain some priority sites as well. This database was searched to 1/2-mile and resulted in the finding of 47 sites.

- Leaking Underground Storage Tanks (LUST) - Leaking underground storage tanks are a major cause of soil and ground water contamination. Along with stricter regulation of USTs, most states now maintain lists of reported LUSTs. This 1/2-mile search identified 140 sites.

- Solid waste landfills, incinerators, or transfer stations (SWLF) - Depending on the state, these lists may include active landfills, inactive landfills, incinerators, transfer stations, recycling locations and other facilities where solid waste is treated or stored. Also searched to 1/2-mile, this database resulted in three sites found.

- Registered Underground Storage Tanks (UST) - Underground storage tanks regulated under Subtitle 1 of the Resource Conservation and Recovery Act (RCRA) must be registered with the state agency responsible for administering the UST Program. This database was searched to 1/4-mile, and 268 registered underground storage tanks were found.

- Registered Aboveground Storage Tanks (AST) - Some states require registration of Aboveground Storage Tanks (ASTs) as well as USTs (Underground Storage Tanks). Aboveground storage tanks serve the same function as underground storage tanks, which is to store various forms of hazardous wastes. This database was also searched to 1/4-mile, and 18 sites were found.

- State Spills List (SPILLS) - See SPILLS description under the federal regulatory database listed above, which contains all of the results of this database search.

3.12.2 Assessment of Probable Contamination Potential

The conclusions presented in this section are the result of information gathered from several sources of data, including site inspection, surrounding area visual reconnaissance, environmental regulatory databases, historical aerial photographs, and personal interviews. A total of 119 sites were found in the federal database–searches. No facilities were found on the EPA's National Priority List, nor were there any RCRA permitted treatment, storage, or disposal facilities found. A review of the state regulatory databases revealed 498 facilities of concern within the Study Area. However, no facilities were found on the state equivalent priority list. Thirty-six (36) locations are of high concern, and twenty-seven (27) locations are of moderate concern within the Study Area.

Those areas of high concern that are currently contaminated, or have the potential of being contaminated, may require a Phase II investigation before any construction activities begin in these areas in order to determine the possibility of encountering contamination, and the potential impact of this encounter. Those locations that are of moderate concern are not as likely to contribute to sources of contamination during construction as those of high concern. However, each of these areas may have associated onsite or offsite contamination that may impact construction activities.

DART has in place an on-going due diligence policy and program to assess the environmental condition of all properties contemplated for purchase as right-of-way or for the siting of transit facilities. Under this program, DART performs a separate Phase I Environmental Site Assessment (ESA) of each parcel or site under consideration for purchase in order to assess its specific probability for contamination. A Phase II ESA may also be undertaken to further identify and quantify existing hazardous/regulated material contamination so the resulting need for cleanup or mitigation (Phase III ESA) can be factored into the purchase price and/or the long-term environmental liability associated with acquiring the property.

Transportation Impacts

Chapter Four

4.0 TRANSPORTATION IMPACTS

This chapter describes the anticipated transportation impacts of the No-Build and Selected LRT Alternatives. The evaluation is based upon the anticipated travel demand, transportation capacity, transportation performance measures, and impacts to the road network, parking, and freight delivery. The analysis was developed from 2025 travel demand forecasts for the project corridor using the NCTCOG's regional travel demand model. Where possible, quantitative and qualitative data are presented to show the relative performance measures and impacts of each alternative.

For comparison, the impacts of the LRT design options that were considered but rejected (Love Field and Medical Center Design Options A, B, C, D, and the Harry Hines Base) are also provided. In some cases the impacts of the Selected LRT Alternative and all of the design options are similar and are discussed together in the same section. Where impacts substantially differ, a separate subsection is provided to discuss the impacts of the varied design options in those areas. Specific mitigation measures in response to anticipated transportation impacts of the Selected LRT Alternative are identified in this chapter, and are incorporated into the project as committed actions.

The discussion of transportation impacts is based on detailed technical reports prepared for the Draft EIS and has been updated for the Final EIS to reflect refinements in the project resulting from additional information, agency and community comments, coordination with federal, state, and local agencies and further planning and preliminary engineering efforts that have occurred since the release of the Draft EIS. Specific project changes since the Draft EIS are described in Chapter 2. The technical reports should be referred to for more detailed information on each impact of relevance to the project; however, the information in this Final EIS may supercede that in the technical reports. The technical reports are hereby incorporated by reference into this Final EIS and are available for review at DART's offices located at 1401 Pacific Avenue, Dallas, Texas 75202.

4.1 IMPACTS ON TRANSIT SERVICE AND RIDERSHIP

The proposed LRT Alternative would extend service from the existing LRT system in downtown Dallas through northwest Dallas and Farmers Branch to a terminus at Frankford Road in Carrollton (see Chapter 2 for additional detail). A DART bus network with 20 routes and two transfer stations with park-and-ride lots currently serves the corridor (**Figure 3-13**). The DART bus service includes local, express, circulator and cross-town routes. These buses operate in mixed traffic on IH 35E and on local arterials. The proposed LRT Alternative would expand fixed guideway transit from downtown Dallas and increase the reliability of transit service in the corridor, particularly for commuters to downtown Dallas. The impacts of the LRT design options in the Medical Center and Love Field areas on transit service and ridership are anticipated to be similar to that for the Selected LRT Alternative with the few exceptions as noted below.

4.1.1 Transit Levels of Service

Current bus transit service in the project corridor operates in mixed traffic on city streets and on IH 35E south of IH 635. Buses utilize high occupancy vehicle (HOV) lanes on IH 35E north of IH 635 and on IH 635 east of IH 35E. The transit service carries approximately 2.5 percent of the total travel demand in the corridor. While this is a low percentage, it is higher than many other areas in the Dallas area due to the highly concentrated industrial and institutional employment centers located in the corridor and the low percentage of residential development.

While the bus system would evolve to better accommodate future travel demand patterns in the No-Build Alternative, buses would still operate under unpredictable, mixed traffic conditions on area roadways and highways. The proposed LRT Alternative would provide an exclusive guideway that would provide increased reliability and the potential for travel time-savings. When connected to the existing DART LRT system, the proposed LRT Alternative would also provide increased transit

mobility to origins and destinations throughout the DART Service Area. As shown by the performance measures in **Table 4-1**, the DART transit system would experience increased ridership, increased passenger miles, and increased passenger hours with the LRT Alternative compared to the No-Build Alternative. These levels of service measures are commonly used to assess transit system performance.

TABLE 4-1
2025 TRANSIT SYSTEM LEVEL OF SERVICE
PERFORMANCE MEASURES (DART SYSTEM-WIDE)

Daily Performance Measure	Alternative					
	No-Build[1]	Selected LRT Alternative[2] (UPRR)	LRT Base (Harry Hines) Alignment[3]	LRT Base Alignment With Love Field Design Option[4]	LRT Base Alignment With Medical Center Design Options[5]	LRT Base Alignment With Love Field and Medical Center Design Options[6]
Unlinked Transit Trips						
1) Local Bus	194,000	192,500	192,200	193,600	191,600	192,900
2) Express Bus	11,600	7,000	7,020	7,110	7,070	7,120
3) Light Rail	74,400	114,300	113,700	115,100	114,100	115,600
4) Commuter Rail	11,400	11,500	11,400	11,500	11,400	11,500
5) Total	291,400	325,300	324,320	327,310	324,170	327,120
6) Added Trips		33,900	32,920	35,910	32,770	35,720
Linked Transit Trips						
1) Light Rail	35,200	53,400	53,100	53,900	53,500	54,200
2) Commuter Rail	6,500	6,100	6,000	6,100	6,000	6,100
3) Total	187,500	199,100	199,200	201,000	199,100	200,900
4) Added Transit Riders		11,600	11,700	13,500	11,600	13,400
Passenger Miles						
1) Total	1,655,700	1,771,200	1,774,700	1,794,700	1,774,100	1,789,800
2) Percent Change		7%	7%	8%	7%	8%
Passenger Hours						
1) Total	78,800	80,300	80,200	81,200	80,100	80,900
2) Percent Change		2%	2%	3%	2%	3%

[1] DART NPE.PENWSE.NOBLD.CMS.ARENA model run, NCTCOG, January 2002
[2] DEIS 3A UP model run, March 2003
[3] DEISBASE model run, December 2001
[4] DEISBASE model run, plus Love Field, January 2002
[5] DEIS 3A model run, December 2001
[6] DEIS 3A model run, plus Love Field, January 2002

Source: NCTCOG, DART; December 2001, January 2002, and March 2003

Table 4-1 shows that total system-wide transit ridership would increase by about 12,000 riders per day for linked trips (an increase of six percent) and increase by about 34,000 trips daily for unlinked trips (an increase of over eleven percent as compared to the No-Build Alternative). Linked trips provide an estimate of the number of people who use the transit system, while unlinked trips provide a measure of the number of persons using each route or mode of travel. **Table 4-1** also shows that total system-wide transit passenger miles are estimated to increase from 1.65 million in the No-Build Alternative to 1.77 million in the LRT Alternative (an increase of about seven percent as compared to the No-Build Alternative). Total system-wide passenger hours, on the other hand, would increase only two percent in the LRT Alternative. These trends indicate an increased system-wide efficiency of travel time savings would result from the LRT Alternative because there would be more passengers traveling longer distances with reduced travel times.

Geographic Coverage

The No-Build Alternative would not expand the geographic coverage of transit service beyond the area traversed by the 20 bus routes currently operating in the project corridor. The level of bus service would increase as the employment and/or population of the corridor increases, particularly with the addition of HOV lanes on IH 35E south of IH 635. However, anticipated increases in traffic congestion would make the bus transit service with the No-Build Alternative less reliable, regardless of capacity or route expansions.

The LRT Alternative would expand the geographic coverage of fixed guideway transit service from downtown Dallas along the former UPRR rail line, through northwest Dallas and Farmers Branch and into Carrollton. This would allow continuous, high-speed transit service along an exclusive guideway with 12 transit stations. A feeder bus system, as described in Chapter 2, would bring transit riders to the LRT stations. The feeder bus service would expand the geographic coverage of the LRT system far beyond the effective range of the No-Build Alternative through the corridor as a whole.

Hours and Frequency of Service

The LRT Alternative would have a peak-hour headway of 10 minutes and an off-peak (mid-day, evening, and weekend) headway of 20 minutes. South of the Bachman station, these would be 5-minute peak and 10 minute off-peak headways. The LRT vehicles are capable of a maximum operating speed of 65 miles per hour; however, average speeds are much lower. The vehicles would have an average low-level platform station dwell time of 20 seconds. **Table 4-2** shows the preliminary operating plan and station-to-station travel times for the Selected LRT Alternative as well as travel time summaries for each of the other alignments considered.

Generally, two-vehicle trains would operate most of the day, with three-vehicle trains operating during the peak period, and single-vehicle trains operating during evening hours of low usage. The operating hours for the LRT Alternative would be from about 5:00 AM until 12:30 AM, seven days a week. Peak hour service would be provided Monday through Friday between 6:00 AM and 9:00 AM in the morning, and between 3:00 PM and 6:00 PM in the afternoon. This schedule is the same as that for DART's existing LRT system.

The fares would be based on DART's new fare structure for the existing LRT system ($1.25 per one-way trip for light rail riders), which became effective in March 2003. Transfers to the LRT system from the feeder buses would require a second fare ($1.25 for the bus trip and $1.25 for the light rail trip). Parking in park-and-ride lots would be free. LRT service would replace the Carrollton and Farmers Branch express bus routes to downtown Dallas. Current bus riders utilizing these express routes would no longer pay express bus fares; however, LRT riders transferring to other express bus routes (i.e., premium service) would pay a one-way fare of $2.25. The fares for LRT riders within downtown Dallas would be $0.50 each way between the Convention Center Station and the Pearl Street Station. Senior citizens, the mobility impaired, and students would have reduced fares of $0.50. These fares are similar to the No-Build Alternative bus service fares. A variety of monthly passes, 11-ride packages, and day passes would also be offered for trips throughout the DART LRT and Commuter Rail system.

TABLE 4-2
PRELIMINARY OPERATING PLAN FOR THE LRT ALTERNATIVE

Selected LRT Alternative (Base Alignment with UPRR)			Other Alignments Considered		
12 Stations	**Distance from Station to Station (Miles)**	**Travel Time between Stations (Minutes)**	**Alignment**	**Total Distance (Miles)**	**Total Travel Time (Minutes)**
West End					
to	0.9	3.3	Base Alignment (Harry Hines) (12 Stations)	17.8	34.5
Victory					
to	1.4	3.1			
Market Center/Oak Lawn					
to	0.7	1.8			
Parkland					
to	0.7	1.8	Base Alignment with Love Field Design Option (13 Stations)	18.3	35.6
Inwood					
to	2.4	4.9			
Brookhollow					
to	1.3	2.4			
Bachman					
to	1.9	3.0			
Walnut Hill/Denton			Base Alignment with Love Field and Medical Center Design Options (13 Stations)	18.1	35.2
to	1.0	1.8			
Royal Lane					
to	1.8	2.9			
Farmers Branch					
to	2.4	4.0			
Carrollton Square					
to	2.1	3.3			
Trinity Mills			Base Alignment with Medical Center Design Option D (12 Stations)	17.8	34.5
to	1.0	1.8			
Frankford					
TOTAL	17.6	34.1			

Source: DART; January 2002, March 2003

Travel Times

Ideally, transit alternatives should provide reduced travel times to downtown Dallas when compared to automobile travel (the No-Build Alternative). Due to longer routes and dwell times at each stop and/or station, transit alternatives can take more time to reach their destination than passenger cars, particularly during off-peak hours. However, the benefits of ease of travel, consistent travel time due to an exclusive guideway that is not subject to incidents or accidents, and elimination of the inconvenience and expense of parking in downtown can outweigh the lack of a travel timesavings. Eliminating the inconvenience of parking in the Market Center and Medical Center Districts would also be a large benefit of the LRT Alternative. During peak periods, transit can provide considerable travel time savings, particularly when roadway incidents are present.

In addition, the LRT Alternative would provide travel time-savings to existing transit riders destined to downtown Dallas within the project corridor and from Dallas Love Field. **Table 4-3** shows the difference in average transit travel times from existing transit stops to downtown Dallas for the No-Build Alternative (bus transit) and for the Selected LRT Alternative and the other LRT alignments considered. Depending on the time of day, the Selected LRT Alternative would save up to 22

minutes for transit riders from the Trinity Mills Station, up to 28 minutes from the Walnut Hill/Denton Station, and up to 18 minutes from Dallas Love Field over the No-Build Alternative.

TABLE 4-3
TRANSIT TRAVEL TIMES FROM SELECT ORIGINS AND DESTINATIONS

To West End from:	In-Vehicle Transit Travel Time (minutes)				
	No-Build (Bus) (AM / off peak / PM)	Selected LRT Alternative (LRT) (peak and off peak)	Base Alignment (LRT) (peak and off peak)	Base Alignment with Love Field Design Option (LRT) (peak and off peak)	Base Alignment with Love Field and Medical Center Design Options (LRT) (peak and off peak)
Trinity Mills	33 / 34 / 55	33	33	34	33
Walnut Hill	39 / 49 / 49	21	21	22	21
Love Field	38 / 37 / 36	20	21	14	14

Source: Parsons Transportation Group, DART; December 2001, March 2003

Transfers

The No-Build and LRT Alternatives would both use the DART bus network to transfer riders to and from the LRT system. With the No-Build Alternative, transit patrons would use the DART bus system to transfer to other bus routes at the transit centers within the corridor, including the North Carrollton Transit Center and the Farmers Branch Park-and-Ride. A limited number of transit patrons within the corridor would also use the DART bus system to transfer to the existing LRT system at the current West CBD Transfer Center, which is close to the West End LRT Station. The No-Build Alternative would result in 97,400 transfers daily.

With the LRT Alternative, many transit riders would use the feeder bus network to transfer to the proposed LRT stations along the project corridor. For the LRT Alternative, there would actually be more transfers than the No-Build Alternative because more riders would be attracted to the system, the feeder bus network would supply a large number of the transit riders to the LRT extension, and several express bus routes to downtown would no longer exist within the corridor. The LRT Alternative would result in 109,900 transfers daily, an increase of 13 percent compared to the No-Build Alternative.

The predominant mode of access to the LRT system will vary by each LRT station; however, most of the LRT riders would transfer from the feeder bus service. Approximately 11 percent of LRT riders would transfer to the new rail line from other rail lines, 25 percent would drive to the LRT stations, 22 percent would access the system by walking, and 42 percent would use local bus service to access the LRT Alternative in 2025.

Reliability

The No-Build Alternative would use the DART bus transit system on the existing corridor roadways under mixed-traffic travel conditions. Therefore, the bus system in the No-Build Alternative would be subjected to similar travel speeds and delays resulting from peak hour congestion on the roadways within the corridor. Many of the major arterials and freeways within the corridor operate at Volume to Capacity ratios meeting or exceeding the upper limit of 0.9, an indication that traffic conditions are unacceptable during the peak hour. As a result, the buses operating in the mixed traffic environment would generally have decreased reliability and increased travel times.

The LRT Alternative would operate on an exclusive guideway and would not be subjected to traffic and traffic signal delays on the major thoroughfares within the corridor. The LRT vehicles would have preemption traffic signals at all grade crossings to insure few, if any, delays. Although the

LRT may experience longer travel times compared to the No-Build Alternative during optimal traffic conditions, the LRT Alternative would provide transit riders with a more reliable transit service than the No-Build Alternative because it would not be susceptible to the occasional congestion created by traffic incidents. This is also reflected in the increased number of system-wide transit riders after implementation of the LRT Alternative.

Comfort

The No-Build Alternative would provide few enhancements to the existing comfort and convenience of transit service in the corridor. In fact, the No-Build Alternative would be more susceptible to the inconvenience of lower service reliability due to roadway congestion and incidents.

The proposed LRT Alternative would provide enhanced comfort and convenience for transit riders on the DART system as compared to the No-Build Alternative. The LRT system would provide transit service to passengers with conveniently located stations and air-conditioned light rail vehicles. The LRT Alternative would be fully accessible for mobility-impaired patrons and would enhance regional mobility for transit dependent populations much more than the No-Build Alternative. Additionally, the LRT Alternative would operate within an exclusive guideway on continuously welded rail with fewer of the stop-and-go movements associated with conventional bus transit service. Since LRT service would replace the existing Carrollton and Farmers Branch express bus routes to downtown Dallas, bus patrons currently utilizing these routes would be required to use the LRT. Compared to the express bus routes, the LRT Alternative would provide improved service reliability to downtown Dallas, increased passenger capacity, a comparable level of comfort, and a lower fare (i.e., a $1.25 one-way LRT fare compared to a $2.25 one-way premium express bus service fare).

4.1.2 Transit Ridership

The transit ridership anticipated for each alternative was estimated in terms of both “linked” and “unlinked” passenger trips. The forecast of linked passenger trips includes all travel from the point of origin to the point of final destination as a single trip, regardless of whether or not there was a transfer from one mode to another (e.g., bus to rail). Therefore, the linked trip counts all of the individual segments of travel as one trip. The forecast of unlinked trips counts each segment of a trip on an individual mode as a separate trip, regardless of transfer (e.g., a bus ride and transfer to the rail system to reach a given destination equals two individual trips). Linked trips provide an estimate of the number of people who use the transit system, while unlinked trips provide a measure of the number of people using each route or mode of travel. Thus, for the following analysis of transit patronage, both linked and unlinked passenger trips are used to describe estimated 2025 ridership characteristics for each alternative.

Total Transit Riders

To determine the total system-wide daily transit ridership for each alternative, the forecast of unlinked transit trips in 2025 was developed using the North Central Texas Council of Governments (NCTCOG) travel demand model. These unlinked transit trips include ridership by mode including local bus, express bus, and LRT. As shown in **Table 4-1**, the total daily unlinked transit trips range from 291,400 for the No-Build Alternative to over 325,000 for the Selected LRT Alternative. Therefore, the LRT Alternative would result in an increased daily ridership of about 34,000 unlinked transit trips system-wide in 2025.

LRT Ridership by Alternative

The forecast of daily ridership for the LRT Alternative includes passengers who would access the LRT system at stations from automobiles, walking, and from bus transfers. This estimate was developed using linked trips to count only those riders using the LRT system and to prevent double counting. This is done by eliminating the effect of transfers on the total number of system riders to account for the net increase in system ridership. The resulting forecast of 2025 daily linked trips

produced by the NCTCOG model indicates that the system-wide LRT ridership would increase from 35,200 for the No-Build Alternative to over 53,400 for the Selected LRT Alternative, as shown in **Table 4-1**. This indicates that 18,200 more passengers would use the proposed LRT service daily in 2025.

Peak Hour Riders
Peak hour system-wide ridership with the LRT Alternative in 2025 is estimated to be 137,975 linked trips. Off-peak linked trips on the DART system are estimated to total 61,125 trips per day. For the No-Build Alternative, a total of 129,925 peak hour transit riders and 57,575 off-peak transit riders are expected in 2025.

Special Generator Ridership
Special generators, such as large sporting events, do not produce trips on a regular weekday basis throughout the year. For that reason, these types of special generator trips are not addressed in the NCTCOG regional travel demand model. However, understanding the potential for special generator ridership can enhance the accuracy of travel demand forecasts. The proposed LRT alignment has several of these special event venues along the corridor, including the new American Airlines Center, Market Center, and Dallas Love Field Airport. There are also many attractions and events in the West End Historic District and along the existing and planned LRT system (such as Fair Park) that would draw riders from the project corridor.

As part of the Section 5309 New Starts Submittal for the Northwest/Southeast Corridor MOS described in Chapter 1, DART estimated transit mode share for such venues and activities using FTA guidance. The MOS project was estimated to generate an additional 4.1 million annual riders based on these special events. A portion of this would be directly attributable to the enhanced access afforded by implementation of the proposed project.

Station Volumes and Boardings/Alightings
The stations proposed for the LRT Alternative were selected due to their proximity to population and employment centers, major existing transportation facilities, and ease of access by bus, car, or walking. **Table 4-4** shows the anticipated 2025 daily volumes of transit passengers at each of the stations in the Selected LRT Alternative. As shown in the table, most stations can be categorized as primarily an origin station or a destination station. A few stations serve both functions roughly equally.

Most stations in the corridor would serve as origin stations for round trips to downtown, but some stations in the corridor would serve as destinations in their own right. Specifically, the Parkland Station (and the Market Center/Oak Lawn Station on event days) would be major destination stations within the corridor due to the high-density employment in those areas and the high number of patrons and visitors that use those facilities. The Market Center/Oak Lawn Station would also be a large origin station due to the proximity of the station to residential areas and the fact that it is the closest “outer” station to downtown Dallas. The Brookhollow Station would also be a destination station due to travelers to Dallas Love Field and Southwest Airlines employees. The Bachman Station would be a major origin and destination station due to its proximity to high concentrations of residential development. The Victory Station would have the most riders and be the largest origin station as well as a large destination station due to the crowds that it would attract for special events.

As shown in **Table 4-4**, the stations anticipated to have the greatest volumes of passengers are Victory, Market Center/Oak Lawn, Parkland, Inwood, Bachman, Farmers Branch, Trinity Mills, and Frankford.

TABLE 4-4
DAILY LRT ALTERNATIVE STATION PASSENGER VOLUMES IN 2025

Station	Boardings[1]	Alightings[2]	Total Station Volume	Total Station Riders
SELECTED LRT ALTERNATIVE[4] (Base Alignment with UPRR)				
Victory	6,985	1,042	8,027	4,014
Market Center/Oak Lawn	1,552	887	2,439	1,220
Parkland	932	2,013	2,945	1,473
Inwood	1,819	733	2,552	1,276
Brookhollow	611	1,515	2,126	1,063
Bachman	1,576	1,057	2,633	1,317
Walnut Hill/Denton	1,214	451	1,665	833
Royal Lane	736	1,008	1,744	872
Farmers Branch	1,816	802	2,618	1,309
Carrollton Square	1,003	426	1,429	715
Trinity Mills	2,184	377	2,561	1,281
Frankford	2,178	116	2,294	1,147
TOTALS[3]	*22,606*	*10,427*	*33,033*	*16,520*
OTHER ALIGNMENTS CONSIDERED (Totals)				
Base Alignment[5] (Harry Hines) (12 stations)	*21,798*	*10,546*	*32,344*	*16,177*
Base Alignment with Medical Center Design Option D[6] (12 Stations)	*22,376*	*10,652*	*33,028*	*16,516*
Base Alignment with Love Field Design Option[7] (13 stations)	*22,636*	*12,154*	*34,790*	*17,398*
Base Alignment with Love Field and Medical Center Design Options[8] (13 stations)	*23,173*	*12,196*	*35,369*	*17,687*

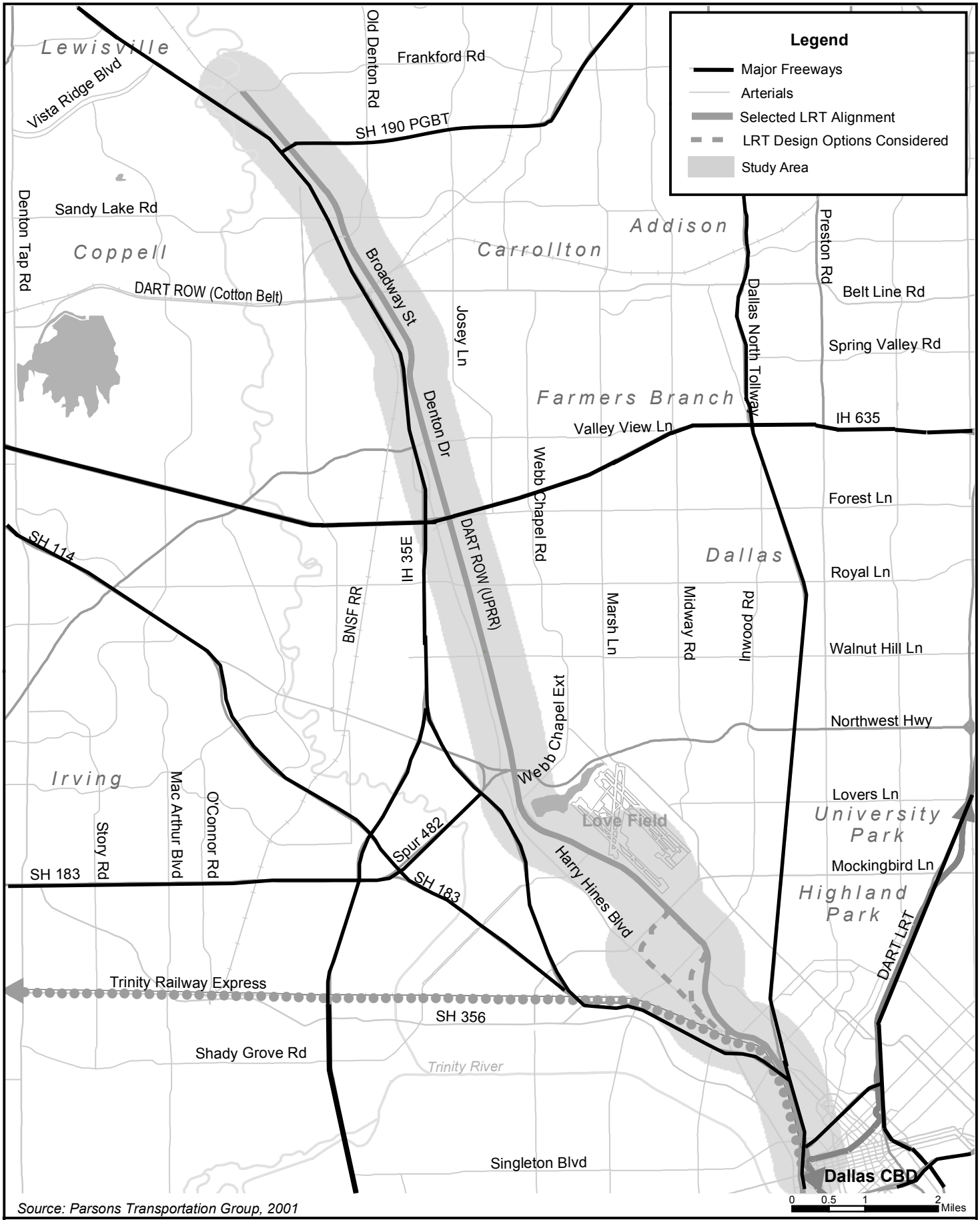
Notes: 1 – Number of trips to and from station where station is the origin of a one-way or round trip.
2 – Number of trips to and from station where station is the destination of a one-way or round trip.
3 – Total Boardings and Alightings are not equal because the entire DART LRT system is not represented in this table; many of those who board within this study corridor have destinations outside of the study corridor.
4 – DEIS 3A UP model run, March 2003
5 – DEISBASE model run, December 2001
6 – DEIS 3A model run, December 2001
7 – DEISBASE model run, plus Love Field, January 2002
8 – DEIS 3A model run, plus Love Field, January 2002

Source: Parsons Transportation Group; DART; December 2001, January 2002, and March 2003

Most stations would have park-and-ride lots (average about 300 spaces) and substantial feeder bus service. Major destination stations (Victory, Parkland, and Brookhollow) would also be served by feeder bus service, but would not have park-and-ride lots. The Frankford Station (an origin station) would be the northern terminus of the LRT Alternative and is expected to draw riders from a broad area of the northern sector of the corridor via automobile and on-call feeder bus activity. This station would have the largest park-and-ride lot with nearly 900 spaces.

4.2 HIGHWAY AND ROADWAY IMPACTS

The existing highway system in the Carrollton LRT corridor includes two freeways (IH 35E and IH 635), a tollway (the President George Bush Turnpike), and a network of arterial and local streets (**Figure 4-1**). These roads and highways are discussed in Chapter 3.



Source: Parsons Transportation Group, 2001

Figure 4-1
Major Freeways and Arterials

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Significant levels of congestion currently occur on the corridor road network. Due to an anticipated increase in commercial and industrial development in the corridor, these levels of congestion are anticipated to worsen by 2025 despite the addition of HOV lanes on IH 35E and the widening of LBJ Freeway (IH 635). Additionally, many of the existing roadways have limited potential for expansion because existing development has reduced available right-of-way. The LRT Alternative is anticipated to help reduce vehicle traffic on the corridor road network.

The discussion below focuses on the Selected LRT Alternative and anticipated regional impacts, as well as local impacts, including those on road and intersection LOS, transit station access, and pedestrian safety. The impacts of the LRT design options in the Medical Center and Dallas Love Field areas are anticipated to be similar to that for the Selected LRT Alternative with the few exceptions as noted below.

4.2.1 Regional Impacts

Regional travel patterns in the corridor were derived from the NCTCOG Travel Demand Model. In 1995, the residents of the corridor generated 605,203 home-based work (HBW) trips daily. This total number of trips includes both productions and attractions to and from sites within and outside the corridor. Of the 205,414 trip productions, 54 percent were made to locations within the corridor. This indicates that just under half of the corridor's work force travels to areas outside of the corridor for employment purposes. Another 399,789 HBW trips were attracted to locations within the corridor from areas outside the corridor. These patterns are expected to continue through 2025, but with additional traffic.

In 2025, the residents of the corridor are expected to generate 1,007,225 HBW trips daily. This total number of trips includes both productions and attractions to and from sites within and outside the corridor. Of the 353,229 trip productions, 50 percent will be made to locations within the corridor. This indicates that half of the corridor's work force is expected to travel to areas outside of the corridor for employment purposes, a slightly higher percentage than in 1995. Another 653,996 HBW trips will be attracted to locations within the corridor from areas outside the corridor.

While there is not a significant difference in the origin and destination of HBW trips between the No-Build and LRT Alternatives, there is a difference in the mode of transportation used to travel between home and work. Of the total number of HBW trips to be generated in 2025, approximately 3.5 percent would use public transit to reach their destinations, and the LRT Alternative would result in about 11,600 added riders using public transit compared to the No-Build Alternative.

The LRT Alternative is anticipated to have beneficial impacts to the regional transportation system by helping to reduce regional Vehicle Miles Traveled (VMT). It is estimated that VMT in the corridor would increase by about 622,000 miles daily from 1995 levels to 2025 levels under the No-Build Alternative. The LRT Alternative would reduce VMT in the corridor by 159,100 miles daily compared to the No-Build Alternative in 2025.

4.2.2 Local Impacts

The LRT Alternative would help reduce roadway congestion in the corridor. However, some localized areas may experience limited increases in traffic congestion due to increased rail traffic (freight and LRT traffic combined) on the DART (UPRR) line and the introduction of gates at LRT grade crossings. The gates would create brief interruptions to the flow of traffic to allow for the safe crossing of LRT vehicles. In addition, the construction of park-and-ride lots, LRT train stations, and the traffic they would attract, could have some limited impact on traffic operations near those stations. These impacts are defined in greater detail in the following sections.

Impacts on Road/Intersection LOS

Impacts on Freeways

The LRT Alternative, with its associated park-and-ride lots and feeder bus network, would provide incentive for commuters to use transit and therefore decrease automobile travel on area roadways. **Table 4-5** shows the differences in average daily traffic (ADT) between the No-Build and the LRT Alternative in 2025 on the corridor freeways. Implementation of the Design Option alignments would have yielded similar results to the Selected LRT Alternative. With the LRT Alternative fully operational in 2025, there would be decreases in ADT on several freeway segments, as shown in **Table 4-5** and **Figure 4-2**. On IH 35E, traffic is anticipated to decrease by approximately 1,000 vehicles per day on most segments, and decrease by 4,000 vehicles per day at Valley View Lane. The difference at Valley View Lane represents a 2 percent decrease from the No-Build volume.

TABLE 4-5
2025 FREEWAY ADT IN THE NORTHWEST CORRIDOR

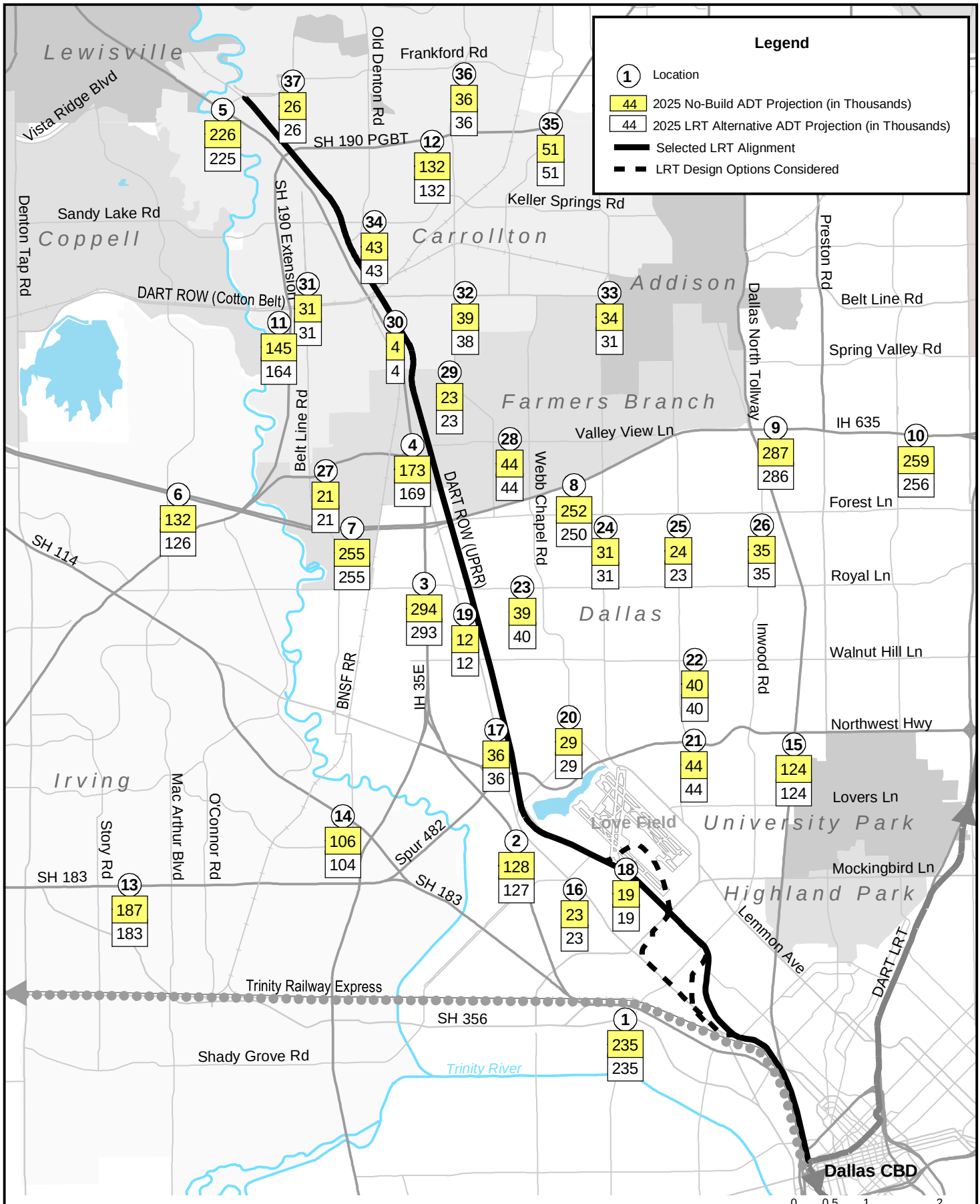
Location and Map No.		Average Daily Traffic (ADT)		
		No-Build Alternative	LRT Alternative	Increase (Decrease)
Stemmons Freeway (IH 35E)				
1	Inwood Road	235,000	235,000	0
2	Webb Chapel Extension	128,000	127,000	(1,000)
3	Royal Lane	294,000	293,000	(1,000)
4	Valley View Lane	173,000	169,000	(4,000)
5	Frankford Road	226,000	225,000	(1,000)
LBJ Freeway (IH 635)				
6	Belt Line Road	132,000	126,000	(6,000)
7	Luna Road	255,000	255,000	0
8	Webb Chapel	252000	250,000	(2,000)
9	Dallas North Tollway	287,000	286,000	(1,000)
10	Preston Road	259,000	256,000	(3,000)
President George Bush Turnpike				
11	Belt Line Road	165,000	164,000	(1,000)
12	Josey Lane	132,000	132,000	0
Airport Freeway (SH 183)				
13	MacArthur Blvd.	187,000	183,000	(4,000)
Carpenter Freeway (SH 114)				
14	Walton Walker Blvd.	106,000	104,000	(2,000)
Dallas North Tollway				
15	Northwest Highway	124,000	124,000	0

Source: NCTCOG; June 2001, February 2002

As described in Chapter 3, the level of service on a roadway is a measure of the relative delay and congestion experienced on that roadway, with level of service “A” being the best, and “F” the worst. Levels of service “E” and “F” are considered unacceptable. IH 35E currently operates at Level of Service “F.” Due to the anticipated traffic growth in the area, IH 35E would continue to operate at Level of Service “F” in 2025 in both the No-Build and LRT Alternatives, regardless of the construction of HOV lanes or any reductions in traffic due to the implementation of LRT.

Impacts on Major Arterials

Similar to the freeway system, congestion delays can be expected on many of the arterials in the study corridor by 2025, even with the LRT Alternative in place. **Table 4-6** shows the anticipated 2025 ADT on many of the local arterials in the Northwest Corridor for the No-Build and LRT Alternatives. The ADT under any of the Design Options would be similar to that of the Selected LRT Alternative.



Source: Parsons Transportation Group, 2002

Figure 4-2
2025 Average Daily Traffic Projections

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With the LRT Alternative fully operational in 2025, most arterials would experience the same daily traffic levels compared to the No-Build Alternative, and a few would experience small decreases in ADT. Comparing **Tables 4-5 and 4-6** and **Figure 4-2**, the reductions in ADT that would occur on the regional freeway network are greater than those that would occur on the arterial road network in the Northwest Corridor. The freeway reductions in ADT are due to the elimination of some of the commuter trips that would have used the freeways, but would now use the expanded transit system. The arterials experience very similar traffic levels in both alternatives because any arterial traffic eliminated by the LRT would likely be offset by increased traffic using the arterials to approach new transit station park-and-ride lots.

TABLE 4-6
2025 ARTERIAL ADT IN THE NORTHWEST CORRIDOR

Location and Map No.		Average Daily Traffic (ADT)		
		No-Build Alternative	LRT Alternative	Increase (Decrease)
16	Harry Hines at Burbank	23,000	23,000	0
17	Harry Hines at Lombardy	36,000	36,000	0
18	Denton at Burbank	19,000	19,000	0
19	Denton at Merrell	12,000	12,000	0
20	Webb Chapel at Lombardy	29,000	29,000	0
21	NW Highway at Midway	44,000	44,000	0
22	Walnut Hill at Midway	40,000	40,000	0
23	Royal at Brockbank	39,000	40,000	1,000
24	Marsh at Northaven	31,000	31,000	0
25	Midway at Northaven	24,000	23,000	(1,000)
26	Inwood at Northaven	35,000	35,000	0
27	Valley View at Hutton	21,000	21,000	0
28	Valley View at Webb Chapel	44,000	44,000	0
29	Valwood at Josey	23,000	23,000	0
30	Denton at Crosby	4,000	4,000	0
31	Belt Line at Luna	31,000	31,000	0
32	Belt Line at Josey	39,000	38,000	(1,000)
33	Belt Line at Marsh	34,000	34,000	0
34	Keller Springs at McCoy	43,000	43,000	0
35	Trinity Mills at Kelly	51,000	51,000	0
36	Josey at Frankford	36,000	36,000	0
37	Frankford at Dickerson	26,000	26,000	0

Source: NCTCOG; DART; June 2001, February 2002

LRT implementation would create some larger localized increases in traffic on some roadways that are not shown in the macroscopic analysis in **Table 4-6**. This is because some roadways would serve as primary access roads to LRT stations and park-and-ride lots and therefore would carry the station-bound traffic in addition to the commuter traffic already projected for 2025. A detailed analysis of traffic volumes shows that the largest difference would occur on Frankford Road, where traffic would increase 9% due to the location of the terminus LRT station and its very large park-and-ride lot. (This increased traffic volume on Frankford Road will be coming from IH 35E and therefore no increase is shown at the intersection of Frankford and Dickerson in **Table 4-6**.) Walnut Hill Lane, Royal Lane, and Webb Chapel would also experience modest localized increases in traffic due to the location of LRT stations. The specific traffic impacts of each LRT station are described later in this section.

Impacts on Grade Crossings and Intersections

For the most part, the LRT Alternative uses an existing railroad alignment, the former UPRR line, which crosses 102 roadways and one railroad in the corridor. The roadways range in size from two-lane local streets to six-lane major arterials. A few major arterials and freeways in the corridor, including Oak Lawn Avenue, Northwest Highway, the main lanes of LBJ Freeway, and the main lanes of President George Bush Turnpike already have grade-separated crossings with the UPRR

line. However, 98 local streets and private driveways and one railroad currently have at-grade crossings with the alignment of the Selected LRT Alternative and existing freight railroad. Traffic impacts to grade crossings and intersections focus on the impact of LRT since freight service is infrequent in many areas and consists of short trains serving customers along the corridor. In all cases freight service is less frequent than LRT and is assumed to remain the same or decrease in service as LRT is implemented.

Of the 99 existing grade crossings along the Selected LRT Alternative, 23 have been designated for closure or consolidation due to lack of significant traffic volumes or because the transition of the LRT alignment to or from an elevated section at that point would block the crossing. Whether they are public roadways or private driveways, all of the crossings designated for closure are minor crossings and therefore would not impact a significant number of vehicles. In the case of private driveways, each of the affected properties has either a second driveway or alternate access can be provided from another roadway. In some cases, access roads would be built parallel to the alignment to connect closed roadways to crossings that remain open (Havenhurst, Fruitland, and Richland would be connected to Squire Place in Farmers Branch, and Bomar Avenue would be connected to Manor Way in Dallas).

The remaining 76 grade crossings along the Selected LRT Alternative would remain open as either at-grade or grade separated crossings. Light rail vehicles would create delays at at-grade crossings because the railroad crossing gates would interrupt traffic flow, particularly during peak traffic periods. In addition, most major crossings have a traffic signal near the LRT crossing of the arterial. If the crossing were to remain at-grade, the nearby traffic signal would require preemption to ensure that all vehicle queues are cleared from the tracks before the arrival of a train. For this reason, the detailed grade separation analysis focused not simply on the gated crossing itself, but on the impact of preempting the nearby traffic signal. To assess the transportation impacts of the Selected LRT Alternative on the local street network at the grade crossings and nearby intersections, a detailed analysis of 2025 street volumes, intersection capacity, and simulation of grade crossing movements of the proposed LRT system was performed.

This analysis of the LRT grade crossings in Dallas, Farmers Branch, and Carrollton began with the identification of study areas and the development of projected 2025 peak hour traffic volumes. Projected daily traffic volumes for 2025 were obtained from the NCTCOG Mobility 2025 Plan and turning movement volumes were developed for each study intersection for the AM and PM peak hours. Existing roadway geometrics in the area of each crossing were inventoried to identify lane configurations, queue storage capacities, and distances between intersections under study. The existing geometrics were assumed to remain in place until 2025, except at locations where improvements are planned. At these locations, the planned improvements were assumed to exist for both the No-Build and LRT Alternative analyses in 2025.

Networks were then coded in Synchro (roadway network analysis computer software) for each crossing. These networks included the crossing and several nearby intersections identified as part of the study area for each crossing. All networks were assumed to operate with existing cycle lengths in 2025. Optimized signal timings were developed for each network using the existing cycle lengths and assuming no LRT vehicles would cross at the crossings. At locations with insufficient capacity for the projected 2025 traffic volumes, lanes were added, where reasonable, to accommodate the projected volumes. The final step in the analysis was the simulation of an LRT vehicle arriving at different points in the signal cycle and crossing the arterial streets at grade. The rail crossings were assumed to be closed for 42 seconds to include gate-warning time, train clearance time, and time to reopen the gates. Four simulation runs were made for each network. Each run assumed the train would arrive at 0, 25, 50, and 75 percent of the cycle length, respectively. The results of each run were averaged to arrive at an estimate of the typical impact of a train arriving at a random point in the cycle and disrupting traffic.

To analyze the anticipated conditions at intersections, the 2025 Level of Service (LOS) was determined for the 20 major grade crossings in the corridor. LOS is a qualitative measure describing the vehicle operating conditions at an intersection or segment of roadway during any given period as shown in **Table 4-7**. LOS is determined by the volume to capacity ratio (V/C ratio) of a street or intersection and corresponding average vehicle delays. LOS A, B, and C generally are considered acceptable, and LOS D often is considered acceptable in more densely populated and traveled portions of various urban areas. LOS E represents traffic volumes close to the full capacity of a street or intersection and the resulting congestion and slow traffic. LOS F generally represents stop-and-go, near breakdown traffic conditions.

TABLE 4-7
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS)	Average Total Delay (sec/veh)	Description
A	≤10	Very low delay; most vehicles do not stop at all.
B	> 10 and ≤ 20	More vehicles stop than with LOS A, increasing the average delay.
C	> 20 and ≤ 35	The number of vehicles stopping is significant; however, many still pass through the intersection without stopping.
D	> 35 and ≤ 55	Congestion is readily apparent with many vehicles stopping and individual cycle failures are noticeable (i.e., not all vehicles waiting in the intersection queue are able to get through the intersection on the first green indication).
E	> 55 and ≤ 80	Poor progression; long cycle lengths and frequent cycle failures.
F	> 80	Unacceptable operations, which include many cycle failures caused by arrival flow rates exceeding intersection capacity.

Source: Transportation Research Board, *Highway Capacity Manual*, 1997

Of the 76 grade crossings along the Selected LRT Alternative to remain open within the project corridor, the 20 major crossings were analyzed using this procedure. A Level of Service was calculated for the westbound approach and the eastbound approach to the signalized intersection adjacent to the crossing. The approach that was most impacted by the LRT preemption of the traffic signal was reported and used for determining whether grade separation would be warranted. Typically, the worst-case direction reversed by time-of-day (i.e., westbound across the tracks during the AM peak and eastbound towards the tracks during the PM peak). The AM and PM peak hour results of the grade crossing analysis are shown in **Table 4-8**.

Specifically, the conclusion that a crossing should be grade separated was made due to excessive traffic delay caused by LRT preemption or the likelihood that vehicle queues from the signalized intersection would spill back into other intersections. The crossings requiring grade separation include Motor, Maple, Inwood, Mockingbird, Webb Chapel Extension, Walnut Hill, Royal, Crosby, Belt Line, Old Denton, and Whitlock. The remaining crossings would operate adequately as at-grade intersections, though crossing gates would need to be installed at each of them. The final design of the LRT alignment designates additional crossings to be grade separated as well (Harry Hines Boulevard, Shorecrest Drive, Lombardy Lane, and Merrell Road). These are due to special considerations or physical constraints placed on the alignment that require an elevated (or tunnel) section rather than due to traffic conditions.

TABLE 4-8
LEVEL OF SERVICE AT MAJOR LRT CROSSINGS BY ALTERNATIVE

Crossing	2000 Existing Level of Service[1]		2025 No-Build Level of Service[1]		2025 LRT Alternative Level of Service[1]		Unacceptable Queues?	Recommend
	AM	PM	AM	PM	AM	PM		
Motor	A	A	A	A	F	F	Yes	Grade Sep.
Maple	C	C	C	C	D	E		Grade Sep.
Inwood	C	C	C	C	E	E		Grade Sep.
Mockingbird	D	F	E	F	F	F	Yes	Grade Sep.
Shorecrest	B	C	C	B	E	D		Gated
Webb Chapel	B	C	E	E	F	F		Grade Sep.
Lombardy	A	A	B	E	D	E		Gated
Walnut Hill	A	B	A	B	C	E	Yes	Grade Sep.
Merrell	B	B	B	B	C	B		Gated
Royal	B	B	C	B	D	F	Yes	Grade Sep.
Forest	A	B	A	B	B	D		Gated
LBJ WB Fr. Rd.	B	C	B	B	D	D		Gated
Valley View	A	C	A	C	D	D		Gated
Valwood	B	B	B	B	D	D		Gated
Crosby	C	C	C	C	F	F	Yes	Grade Sep.
Belt Line	C	C	E	E	F	F	Yes	Grade Sep.
Old Denton[2]	B	B	B	B	F	F		Grade Sep.
Whitlock	A	A	A	A	D	C	Yes	Grade Sep.
PGBT EB Fr. Rd.	N/A	N/A	A	A	A	A		Gated
PGBT WB Fr. Rd.	N/A	N/A	A	A	A	A		Gated

Notes: 1 – Level of Service is reported only for the east or west approach to the signalized intersection adjacent to the crossing, depending on which approach is most impacted by LRT preemption.
2 – Volumes are estimated assuming Old Denton/Luna connection.

Source: Parsons Transportation Group; 2001-2003

Preemption of the traffic signals at the intersections of Denton Drive at Forest Lane and the westbound LBJ Freeway Exit Ramp would be required to ensure that traffic on these streets is cleared off of the tracks in advance of the arrival of a train. (Traffic operating conditions at these intersections would be improved significantly with the reconstruction of IH 635 prior to 2025. Specifically, both roadways would become standard two-lane frontage roads instead of carrying two-way traffic as they do today. With the reconstruction, both intersections are projected to operate at LOS D or better during both peak periods in the LRT Alternative, including the necessary preemption.)

As shown in **Table 4-8**, traffic conditions would warrant the LRT tracks being grade separated from the arterial roadways at 11 crossings within the corridor. In addition, there are some other issues to consider at some of the other major crossings.

At Valley View Lane, the analysis shows that an at-grade crossing would operate adequately if the planned improvements at the IH 35E interchange were implemented. However, a proposal under consideration by the City of Farmers Branch includes narrowing Valley View Lane to a four-lane arterial in the LRT station development area. An analysis of this scenario indicates that this would result in significant increases in traffic congestion in the area. The reduced capacity at the LRT crossing would magnify the effects of LRT preemption. Valley View Lane would thus have to be grade separated if the four-lane proposal is implemented.

Another issue is the interaction of traffic with the BNSF freight rail line west of the crossing of Valwood Parkway. Future traffic volumes do not warrant an LRT grade separation at this location. However, if a freight train arrives during the peak hour, the blockage of Valwood Parkway and disruption of the traffic signal timing due to the freight rail preemption may result in gridlock

conditions that extend to the LRT crossing. If these conditions were common, a grade separation would be warranted. However, freight rail preemptions during peak hours are rare and gates would be in place to protect the LRT crossing. Therefore, a grade separation is not warranted.

In the case of Old Denton Road, a new connection with Luna Road would create a continuous north-south arterial from Irving to north Carrollton. Future traffic projections for this new arterial indicate that the Old Denton Road crossing could be one of the highest volume crossings in the corridor. Although vehicle queues could be adequately stored at this crossing, grade separation is recommended to avoid the excessive delays caused by LRT preemption.

Finally, it should be noted that while **Table 4-8** summarizes the analysis of the 20 major crossings along the alignment, data was also collected at the remaining minor crossings. Of the remaining minor crossings that will remain open, 31 had significant traffic volumes and were therefore analyzed to ensure that they would operate acceptably with the additional traffic diverted from nearby proposed closures and the LRT preemption. It was determined that all of these minor grade crossings would still operate adequately as at-grade crossings. **Table 4-9** lists all of the roadways that cross the Selected LRT Alternative and summarizes whether the crossings would be at-grade crossings, grade separated, or closed. This data is shown graphically in **Figures 4-3** through **4-5**.

It should be noted that while this discussion has been limited to LRT crossings, at-grade freight rail crossings will continue to exist at several of these intersections, regardless of whether the LRT is grade separated or not. **Table 4-9** denotes the LRT crossings that will still have an at-grade freight rail crossing in the LRT Alternative. Within segments of the corridor where the freight rail is not removed, some intersections will have both an at-grade LRT crossing and an at-grade freight rail crossing. Other intersections will have a grade separated LRT crossing but still have an at-grade freight rail crossing. Still other intersections will be closed, removing both the LRT and the freight rail crossing.

Summary of Road/Intersection LOS Impacts and Mitigation Measures

In summary, the Selected LRT Alternative has 103 existing crossings (four of which are existing grade separations). One of the at-grade crossings would be converted to an LRT station access drive (a private drive at Walnut Hill Station). In addition, seven new crossings would be created: two new at-grade street connections (Buttonwood Drive and Pike Street in Farmers Branch), four new LRT station access drives (at the Inwood, Bachman, and Royal Lane Stations), and one new grade-separated crossing (at Dickerson Parkway).

Of these 110 total crossings along the Selected LRT Alternative:

- 61 would be grade separated,
- 27 would be gated, and
- 22 would be closed.

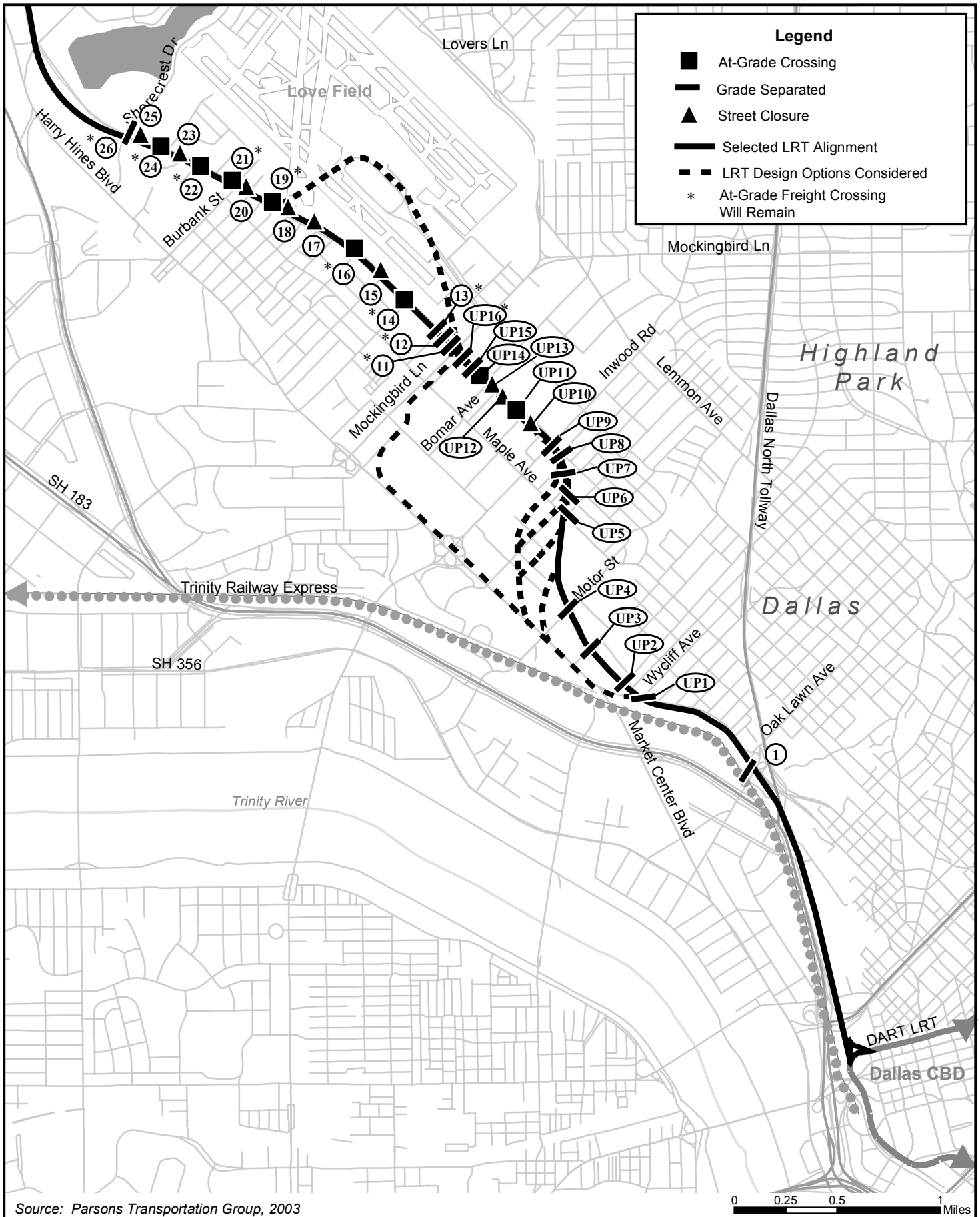
As a comparison, the Base Alignment had 103 crossings (56 grade separated, 28 gated, and 19 closed). The Base Alignment with Medical Center Design Option A had 111 crossings (57 grade separated, 31 gated, and 23 closed); the Base Alignment with Medical Center Design Option B had 101 crossings (52 grade separated, 27 gated, 22 closed); the Base Alignment with Medical Center Design Option C had 103 crossings (52 grade separated, 29 gated, and 22 closed); and the Base Alignment with Medical Center Design Option D had 109 crossings (58 grade separated, 28 gated, and 23 closed). If the Love Field Design Option was applied to any of these alternatives, it avoided three grade crossings and three street closures.

TABLE 4-9
LRT ROADWAY CROSSING CONFIGURATIONS
SELECTED LRT ALTERNATIVE (Base Alignment with UPRR)

Map No.*	Location	Roadway	Configuration*	Map No.*	Location	Roadway	Configuration*
1	Dallas	Oak Lawn Ave.	Grade Separated	49	Dallas	Dairy Milk Ln.	Grade Separated
UP1	Dallas	Harry Hines Blvd.	Grade Separated	50	Dallas	Virgo Ln	Grade Separated
UP2	Dallas	Lucas Avenue	Grade Separated	51	Dallas	Leo Ln	Grade Separated
UP3	Dallas	Kendall St/Macatee Dr	Grade Separated	52	Dallas	Royal Ln	Grade Separated
UP4	Dallas	Motor Street	Grade Separated	53	Dallas	Station Access (future)	Grade Separated
UP5	Dallas	Maple Ave	Grade Separated	54	Dallas	Zelrich Ln	Grade Separated
UP6	Dallas	Butler St	Grade Separated	55	Dallas	Rodney Ln	Grade Separated
UP7	Dallas	Station Access (future)	Grade Separated	56	Dallas	Indian Trail	Grade Separated
UP8	Dallas	Station Access (future)	Grade Separated	57	Dallas	Northaven Rd	Grade Separated
UP9	Dallas	Inwood Rd	Grade Separated	58	Dallas	Forest Ln	At-Grade Crossing
UP10	Dallas	Private Driveway	Closed	59	Dallas	LBJ IH-635	Grade Separated
UP11	Dallas	Private Driveway	At-Grade Crossing	60	Dallas	LBJ WB Frtg Rd	At-Grade Crossing
UP12	Dallas	Private Driveway	Closed	61	Dallas	Private Driveway	Closed
UP13	Dallas	Bomar Ave	Closed	62	Dallas	Villa Creek Dr	At-Grade Crossing
UP14	Dallas	Manor Way	At-Grade Crossing	63	Farmers Branch	Private Driveway	Closed
UP15	Dallas	Egan Ave	Grade Separated	64	Farmers Branch	Private Driveway	Closed
UP16*	Dallas	Fielder Ct	Grade Separated (F)	65	Farmers Branch	Private Driveway	Closed
11*	Dallas	Mockingbird Ln	Grade Separated (F)	66	Farmers Branch	Farmers Branch Ln	At-Grade Crossing
12*	Dallas	Private Driveway	Grade Separated (F)	67	Farmers Branch	Sable	Closed
13*	Dallas	Hawes Ave	Grade Separated (F)	68	Farmers Branch	Buttonwood Dr (future)	At-Grade Crossing
14*	Dallas	Empire Central Dr	At-Grade Crossing (F)	69	Farmers Branch	Pike St (future)	At-Grade Crossing
15	Dallas	Lovedale Ave	Closed	70	Farmers Branch	Valley View Ln	At-Grade Crossing
16*	Dallas	Anson Rd	At-Grade Crossing (F)	71	Farmers Branch	Havenhurst Ave	Closed
17	Dallas	Gilford St	Closed	72	Farmers Branch	Fruitland Ave	Closed
18	Dallas	Langdon Ave	Closed	73	Farmers Branch	Richland Ave	Closed
19*	Dallas	Lovers Ln	At-Grade Crossing (F)	74	Farmers Branch	Squire Pl	At-Grade Crossing
20	Dallas	Brookfield Ave	Closed	75	Farmers Branch	Private Driveway	Closed
21*	Dallas	Burbank St	At-Grade Crossing (F)	76	Farmers Branch	Distribution Way	At-Grade Crossing
22*	Dallas	Wyman St	At-Grade Crossing (F)	77	Farmers Branch	Valwood Pkwy	At-Grade Crossing
23	Dallas	Oak Downs Dr	Closed	78	Farmers Branch	Spring Valley Rd	Closed
24*	Dallas	Walters Ln	At-Grade Crossing (F)	79	Carrollton	Private Driveway	At-Grade Crossing
25	Dallas	Private Driveway	Closed	80	Carrollton	Burning Tree Ln	At-Grade Crossing
26*	Dallas	Shorecrest Dr	Grade Separated (F)	81	Carrollton	Randolph St	At-Grade Crossing
27*	Dallas	Private Driveway	Grade Separated (F)	82	Carrollton	Private Driveway	Closed
28*	Dallas	Private Driveway	Grade Separated (F)	83*	Carrollton	Private Driveway	At-Grade Crossing (F)
29*	Dallas	Webb Chapel Ext	Grade Separated (F)	84*	Carrollton	Crosby Rd	Grade Separated (F)
30	Dallas	Cullum Dr	Closed	85*	Carrollton	4th St/Main St	Grade Separated (F)
31	Dallas	Station Access (future)	At-Grade Crossing	86*	Carrollton	3rd Ave	Grade Separated (F)
32*	Dallas	Community Dr	At-Grade Crossing (F)	87	Carrollton	Denton Dr	Grade Separated
33	Dallas	Northwest Hwy	Grade Separated	88*	Carrollton	Belt Line Rd	Grade Separated (F)
34*	Dallas	Storey Ln/Starlight Rd	Grade Separated (F)	89	Carrollton	BNSF/Cotton Belt RR	Grade Separated
35*	Dallas	Nagle St	Grade Separated (F)	90*	Carrollton	Private Driveway	Grade Separated (F)
36*	Dallas	Private Driveway	Grade Separated (F)	91*	Carrollton	Vinylex Dr	Grade Separated (F)
37*	Dallas	Lombardy Ln	Grade Separated (F)	92*	Carrollton	Northside Dr	Grade Separated (F)
38*	Dallas	Century St	Grade Separated (F)	93*	Carrollton	Donald Ave	Grade Separated (F)
39*	Dallas	Private Driveway	Grade Separated (F)	94*	Carrollton	Westway Cir	Grade Separated (F)
40*	Dallas	Blystone Ln	Grade Separated (F)	95*	Carrollton	Old Denton Rd	Grade Separated (F)
41*	Dallas	Reward Ln	Grade Separated (F)	96*	Carrollton	Whitlock Ln	Grade Separated (F)
42*	Dallas	Anode Ln	Grade Separated (F)	97*	Carrollton	Jackson Rd	Grade Separated (F)
43*	Dallas	Congressman Ln	Grade Separated (F)	98*	Carrollton	Ismali Center Cir	At-Grade Crossing (F)
44*	Dallas	Ladybird Ln	Grade Separated (F)	99	Carrollton	Dickerson Pkwy (future)	Grade Separated
45*	Dallas	Walnut Hill Ln	Grade Separated (F)	100	Carrollton	Private Driveway	Closed
46*	Dallas	Private Dr/Station Access	Grade Separated (F)	101*	Carrollton	SH 190 EB Frtg Rd	At-Grade Crossing (F)
47	Dallas	Merrell Rd	Grade Separated	102	Carrollton	SH 190	Grade Separated
48	Dallas	Private Driveway	Grade Separated	103*	Carrollton	SH 190 WB Frtg Rd	At-Grade Crossing (F)

* (F) indicates that a freight rail at-grade crossing will remain, regardless of whether the LRT will be at-grade or grade separated. See **Figures 4-3** to **4-5**.

Source: Parsons Transportation Group; April 2002, October 2002, March 2003



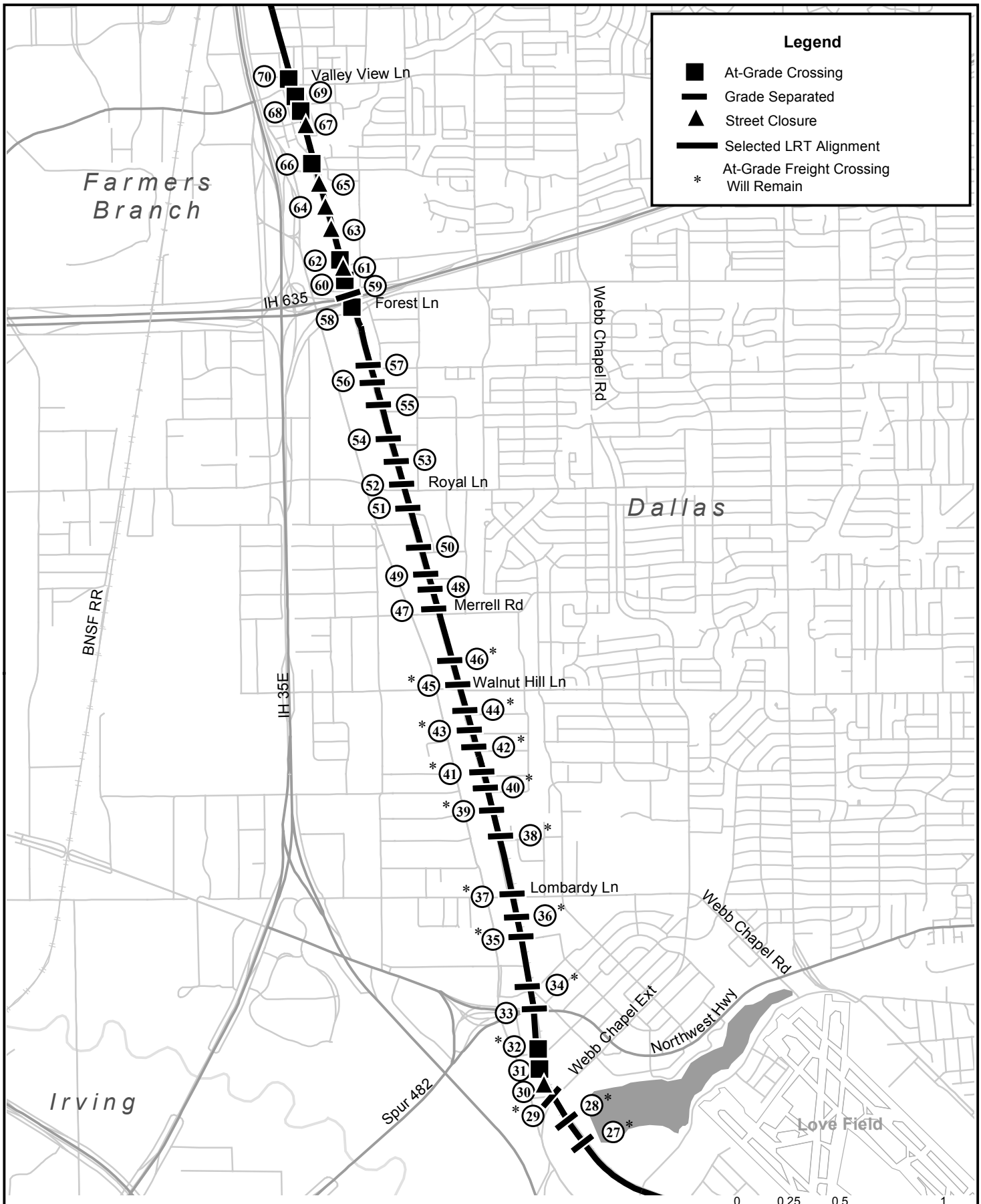
Source: Parsons Transportation Group, 2003

Figure 4-3

LRT Roadway Crossing Configurations

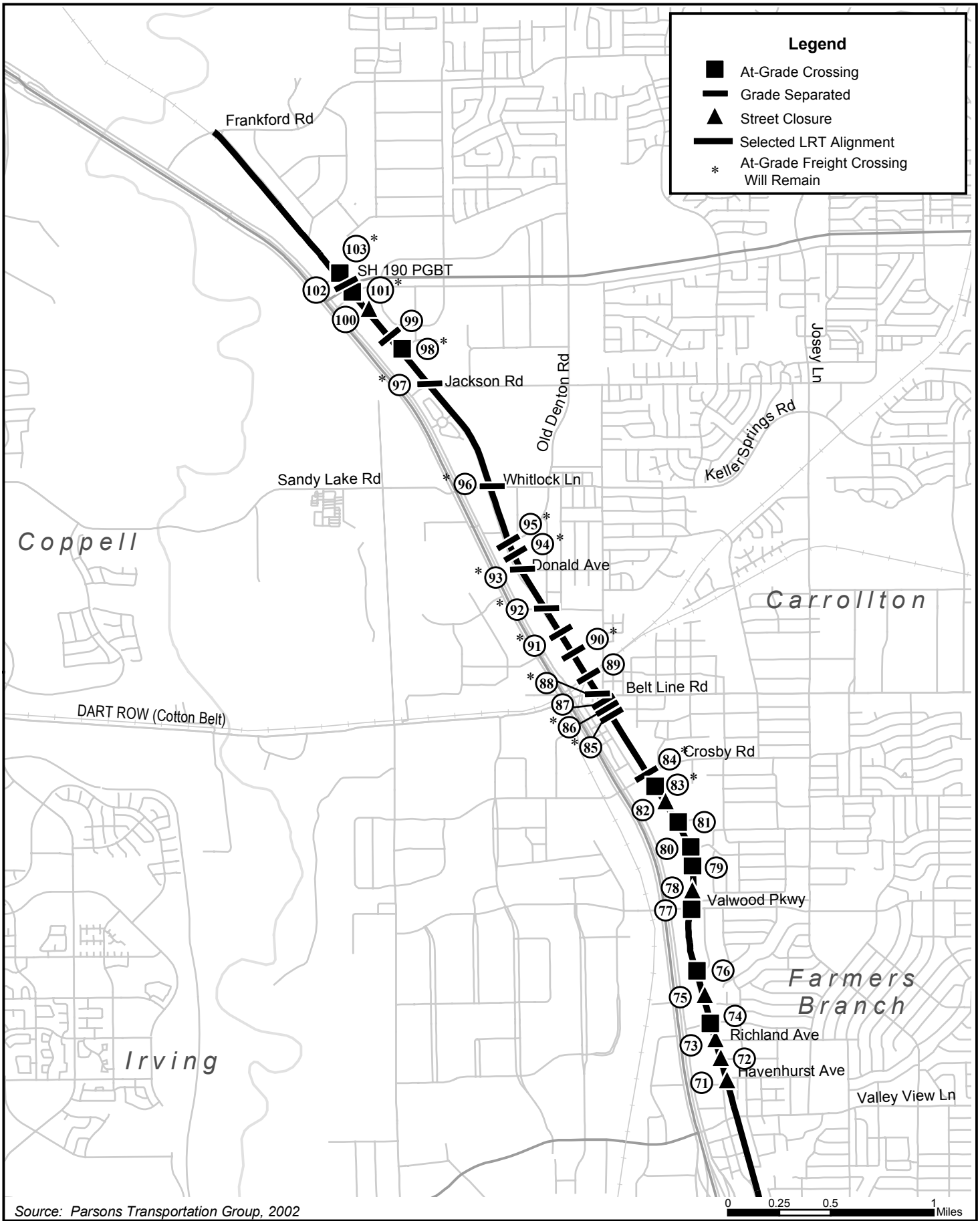
South Section

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Parsons Transportation Group, 2002

Figure 4-4
LRT Roadway Crossing Configurations
Middle Section
LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement



Source: Parsons Transportation Group, 2002

Figure 4-5
LRT Roadway Crossing Configurations
North Section
LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

The LRT Alternative will operate within an exclusive right-of-way on a fixed guideway that will, for the most part, not take any roadway right-of-way or require the removal of travel lanes. Anticipated roadway and grade crossing impacts would be minor and localized and would be mitigated using engineering improvements such as grade separation, changing signalization, and other standard traffic engineering strategies. As detailed in the following section, the addition of traffic signals will be required at some entrances to new LRT park-and-ride lots to ensure acceptable operations for traffic entering and exiting the new stations. In addition, the optimization of signal timing will be required in the densely developed areas of downtown Carrollton and the redeveloped area around the Farmers Branch Station. At grade crossings, signal preemption will be required to prevent vehicles from being queued on the tracks when trains arrive, particularly where a parallel street is present (such as Denton Drive or Broadway Street). Finally, some roadway improvements will be required such as extra turn lanes and geometric improvements at various intersections to allow buses to turn in and out of the new stations. These mitigation measures will be further refined during the final design stage of project development.

4.2.3 Transit Station Access

Most of the stations in the Selected LRT Alternative would include park-and-ride facilities. These stations include Market Center/Oak Lawn, Inwood, Bachman, Walnut Hill/Denton, Royal Lane, Farmers Branch, Carrollton Square, Trinity Mills, and Frankford Stations. The remaining stations (Victory, Parkland, and Brookhollow Stations) are located in areas of high-density employment or commercial use where parking lots are unnecessary or infeasible.

In addition to generating automobile traffic related to park-and-ride facilities, each of the park-and-ride stations would have bus traffic resulting from feeder bus service. **Table 4-10** summarizes the amount of parking that would be provided as well as the proposed number of bus routes and bus bays serving each station.

As shown in the table, Frankford Station would provide the most parking (nearly 900 spaces), but the Parkland Station would provide the most bus bays. The Frankford Station would be the northern terminus of the line and therefore would attract automobile traffic from a wide area. Conversely, the Parkland Station would be located in a high-density commercial and institutional area where more trips would be attracted by the existing and proposed transit system.

Each LRT Station would have different impacts on its neighborhood depending on the configuration of the park-and-ride and bus facilities in relationship to the surrounding transportation system. The layout and traffic impacts of each station are described below. The impacts are based on a comparison of 2025 intersection operations in the No-Build Alternative with those in the LRT Alternative.

Victory Station

The Victory Station would be an at-grade station located next to the new American Airlines Center. Since the arena is a large transit and motorist destination already, the station would not have its own bus bays or park-and-ride parking spaces. Existing on-street bus routes would provide feeder bus service.

The new arena and the surrounding area were built to accommodate large numbers of pedestrians walking to and from the arena from surrounding parking facilities, downtown retail districts, and new transit stations. As such, sidewalk and crosswalk facilities in the area are sufficient to handle the pedestrians using Victory Station. There are no existing or planned designated bicycle routes that serve the arena area; however, the pedestrian nature of the area is conducive to bicycle access to the station.

TABLE 4-10
PROPOSED PARKING AND BUS FACILITIES AT LRT STATIONS

Station	Estimated Parking Spaces	Bus Bays	Bus Routes	Maximum Buses per Hour
Victory	0	On-Street	2	12
Market Center/Oak Lawn	230	5	4	23
Parkland	0	12	10	63
Inwood	386	5	4	20
Brookhollow	0	8	3	12
Bachman	443	10	8	48
Walnut Hill/Denton	361	5	3	21
Royal Lane	235	5	2	18
Farmers Branch	179	7	7	22
Carrollton Square	253	5	4	19
Trinity Mills	495	7	3 + On-Call	10 + On-Call
Frankford	887	5 (+ 4 future)	N/A	On-Call

Source: DART; March 2003

Impacts
Due to the nature of the development and the lack of park-and-ride facilities, this station would generate no additional traffic and therefore would create no traffic impacts.

Mitigation
No mitigation is necessary.

Market Center/Oak Lawn Station (South)
At the Market Center/Oak Lawn Station, bus bays would be constructed next to the station on the west side of Harry Hines Boulevard while a parking lot with 230 spaces would be constructed on the east side of Harry Hines Boulevard. A pedestrian bridge would cross over Harry Hines Boulevard to connect the parking lot to the station. Similarly, a pedestrian tunnel would pass under the LRT and Trinity Railway Express/freight tracks to connect the station to the Market Center complex. The tunnel will be designed to be light and open. It will also be relatively short (approximately 32 feet). Safety and security measures for the tunnel are further discussed in Section 5.11. Buses would access the station off of Harry Hines Boulevard, and park-and-ride patrons would access the parking lot from Wycliff Avenue and Vagas Street, both of which intersect with Harry Hines. One northbound bus route on Harry Hines would continue to stop on the street adjacent to the station parking lot.

Pedestrian access to the station from the surrounding neighborhood would also be provided by the pedestrian bridge over Harry Hines Boulevard. Sidewalks do not currently exist along Harry Hines Boulevard and limited sidewalk facilities extend into the nearby neighborhood. Therefore DART will coordinate with the City in order to improve pedestrian connections to the station. In addition, an existing on-street, signed bicycle route (Route 37) passes within a block of the station, which could easily be altered to connect to the station.

Impacts
The impact of the Market Center/Oak Lawn Station to the surrounding intersections in 2025 was found to be minimal. All intersections, with the exception of Harry Hines Boulevard at Wycliff

Avenue, would have the same LOS in the No-Build and the LRT Alternatives, despite the additional station-generated traffic (see **Table 4-12** at the end of this section). The intersection of Harry Hines Boulevard at Wycliff Avenue would remain at LOS D in the AM peak, and degrade from LOS D to LOS E in the PM peak. There would be added station traffic on Vagas Street and potential impacts to the adjacent residential area.

Mitigation

The analysis indicates that the addition of a second left-turn lane for vehicles turning from southbound Harry Hines Boulevard to eastbound Wycliff Avenue would allow the intersection to operate at LOS D and LOS C in the AM and PM peak hours, respectively. This project is planned by the City of Dallas as a striping/signal modification. Further analysis of access to the parking lot and localized effects on neighborhood traffic, including safety, will be conducted during final design to reduce or minimize those traffic impacts. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Parkland Station (UPRR)

The Parkland Station would be located across Harry Hines Boulevard from Parkland Hospital in an aerial configuration over Motor Street, which is in the heart of Parkland expansion area. The station would have 12 bus bays, with an area for up to 6 hospital shuttle bays (by others) located north of Motor Street adjacent to the station. The current DART bus stops on Harry Hines would remain. No park-and-ride facility would be constructed for the station due to the land use density in the area. As the ***Parkland Master Plan*** is refined, station layout changes may be made to better meet both DART and Parkland objectives.

There is currently a large amount of pedestrian activity between the existing Parkland Hospital buildings and the parking facilities across the street (as well as bus stop and restaurant activity on Harry Hines Boulevard). To manage the interface of the busy roadway and the high pedestrian demand near Parkland Hospital, there is currently a traffic signal with pedestrian buttons as well as a pedestrian bridge that crosses over Harry Hines and connects the hospital to a parking garage. In the LRT Alternative, this bridge would help provide pedestrian access to the station from the other side of Harry Hines Boulevard. Pedestrians could also use the signalized crosswalk to cross Harry Hines Boulevard to access the station. As Parkland expands into new facilities on the east side of Harry Hines closer to the Parkland Station, there may be fewer pedestrians crossing Harry Hines.

Although there are sufficient existing pedestrian facilities in the Parkland Hospital area, there are no continuous sidewalks along Harry Hines Boulevard that connect Parkland to the other hospital campuses in the area. Transit patrons who use the train instead of the bus system would need improved pedestrian connections to access these other destinations. DART will work with the hospitals and the City to identify and improve pedestrian connections to existing and planned developments. In addition, an existing on-street, signed bicycle route (Route 29) passes within a block of the station, which could easily be altered to connect to the station.

Impacts

Due to the lack of a park-and-ride facility, this station would attract no additional vehicular traffic and traffic impacts would be minimal in the LRT Alternative. However, there will be additional bus and shuttle traffic to and from the transfer facility at the station. This will increase bus traffic on Motor Street and potentially within the Parkland campus depending on its new internal street network. If Redfield Street is extended to Motor Street, Parkland traffic and bus traffic could result in increased delay and queuing on Motor and Redfield Streets. There would also be impacts to parking due to property acquisition at this station, which is discussed in Section 4.5.

Mitigation

It is recommended that the existing "bus only" lane on Harry Hines Boulevard during peak traffic hours be maintained. The City of Dallas and TxDOT plan to improve Motor Street from two lanes to four lanes between Harry Hines and Maple Avenue. DART Bus Operations has requested that a traffic signal be installed at the intersection of Motor Street and the bus transfer area entrance east of the station. Other traffic signals may be necessary to accommodate the new Parkland development as well. Additional analyses of signal and turn lane needs should be performed during final design. DART will continue to coordinate with Parkland Hospital, the City of Dallas, and TxDOT during final design to assess the potential impact of both the DART LRT station and ***Parkland's Master Plan*** development. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Inwood Station (South)

The Inwood Station would be an aerial station located in the southwest quadrant of Inwood Road and Denton Drive. It would provide approximately 386 park-and-ride spaces and have five bus bays. Traffic would access the station via Denton Drive or from Inwood Road.

Sidewalks currently exist on both sides of Inwood Road, but they are not continuous across the freight railroad tracks. There are no sidewalks along Denton Road. DART would coordinate with the City of Dallas to ensure that sufficient, safe pedestrian connections would be made to the nearby school and neighborhood. In addition, an existing on-street, signed bicycle route (Route 29) passes within a block of the station, which could easily be rerouted to pass by the station.

Impacts

The additional traffic generated by the Inwood Station is not projected to change the level of service at any of the surrounding intersections. However, growth of the background traffic in the area would cause several of the intersections to operate at LOS E or F by 2025 with no geometric improvements. Because the intersection of Denton Drive and Inwood Road will already be operating at LOS F in the PM peak hour by 2025, the station-generated traffic would increase delays on the northbound approach.

Mitigation

Since LOS E and F conditions will occur without the implementation of LRT, the City of Dallas should explore improvements needed to mitigate the growth of background traffic. However, the intersection of Denton Drive and Inwood Road may require mitigation due to station-related traffic during the PM peak hour. A right-turn lane should be considered on the northbound Denton Drive approach, and protected left-turn arrow indications should be added to the north and southbound approaches. In addition, DART Bus Operations has requested that a traffic signal be installed at the intersection of Denton Drive and the south station exit. Another more in-depth analysis of these intersections will be performed during final design as part of the station zoning process to ensure that the requested traffic signal is warranted and could operate satisfactorily in conjunction with the nearby signal at the intersection of Inwood Road and Denton Drive and that the proper mitigation be incorporated at this intersection. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Brookhollow Station

The Brookhollow Station would be an at-grade station located just north of Burbank Street on the southwest corner of Denton Drive and Wyman Street. This station would have eight bus bays and no park-and-ride lot. Bus traffic would enter and exit the station from Burbank Street. Some buses would continue to operate on Denton Drive.

There is currently a sidewalk along Denton Drive on the east side of the street, but none on the side of the station. In addition, there are no existing pedestrian connections to the nearby

neighborhood. DART will coordinate with the City to ensure that sufficient pedestrian connections be made to the nearby neighborhood as well as to the businesses on the east side of Denton Drive. Finally, an existing on-street, signed bicycle route (Route 23) passes in front of the station along Denton Drive, providing easy integration with bicycle traffic.

Impacts

Due to the lack of a park-and-ride facility, the traffic impacts to surrounding intersections would be minimal. However, buses exiting the station may not be able to clear the tracks safely unless a traffic signal were to be installed at the intersection of Burbank Street and Denton Drive. (Background traffic at this intersection is likely to meet traffic signal warrants.) This signal will provide an added measure of safety for both bus and auto traffic. (The traffic signal at Seelco Street is planned to be relocated to Wyman Street as part of Southwest Airlines Headquarters expansion.)

Mitigation

A traffic signal at Burbank Street and Denton Drive operating with train preemption will be necessary to ensure that buses and vehicles are cleared off of the tracks in advance of the arrival of a train. DART will install this signal if it is not done by others. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Bachman Station

The Bachman Station would be an at-grade station located on the west side of Denton Drive just south of Community Drive. It would have ten bus bays (seven in the station and three along Denton Drive) and a park-and-ride lot with approximately 443 spaces. Buses would access the internal bus bays by entering the south end of the transit station from Harry Hines Boulevard as well as Denton Drive. Buses would depart the north side of the transit station and use Community Drive to return to either Harry Hines or Denton Drive. Park-and-ride access would be primarily off of Harry Hines Boulevard. Traffic approaching the transit station from Denton Drive would have to cross the LRT tracks, while traffic approaching from Harry Hines would not.

There are currently no sidewalks along Denton Drive in this area and there are very few pedestrian connections to the nearby neighborhoods of apartment complexes. DART will coordinate with the City of Dallas to ensure that sufficient pedestrian connections will be made to and from the new station through the City's station area planning process. Finally, an existing on-street, signed bicycle route (Route 23) passes through the intersection of Denton Drive and Community Drive, allowing easy integration with the new station.

Impacts

The analysis of No-Build and LRT Alternative traffic conditions indicated that the proposed LRT station would have limited impacts on the local traffic network. Specifically, the intersection of Webb Chapel Extension at Harry Hines would degrade from LOS E to LOS F, and the intersection of Webb Chapel Extension at Denton would degrade from LOS B to LOS C during the PM peak period. Both the intersections of Northwest Highway at Webb Chapel Extension and Community Drive would continue to operate at LOS E and LOS F during the AM peak and PM peak periods, respectively. The eastbound and westbound approaches of Community Drive at Harry Hines Boulevard would continue to operate with high vehicular delay with the stop-sign control in place.

Mitigation

A traffic signal will be installed at the intersection of Community Drive and Harry Hines Boulevard as part of the LRT project. A traffic signal will also be installed at the intersection of Community Drive and Denton Drive to facilitate both vehicular and pedestrian access to the station. The traffic signal on Denton Drive would require preemption to facilitate LRT operations.

Dallas County plans to widen Denton Drive to a four-lane roadway, and the City of Dallas Thoroughfare Plan shows that Community Drive will also eventually be widened to a four-lane roadway. Community Drive will be improved to its ultimate cross-section of four lanes with a continuous left-turn lane between Harry Hines Boulevard and Denton Drive upon station opening to provide better access to and from the station site. With the current two-lane configuration, westbound left-turns into the station may block traffic passing by the station headed for Harry Hines Boulevard. This may result in unsafe queuing conditions across the tracks. This improved cross-section will allow for more efficient traffic signal preemption at Denton Drive and will also improve access to the new Dallas Police Department Substation on the west side of Harry Hines Boulevard at Community Drive. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Walnut Hill/Denton Station

The Walnut Hill/Denton Station would be an aerial station located north of Walnut Hill Lane on the east side of Denton Drive. Five bus bays would be constructed along side the station on the east side of Denton Drive, as well as a park-and-ride lot with approximately 361 spaces. Vehicular access would be provided both off of Walnut Hill Lane and Denton Drive, with Walnut Hill Lane being the primary entrance. Traffic that would enter the station from Denton Drive would not have to cross a rail line because the freight rail line would be removed in this area and the LRT tracks would be elevated.

There are currently no sidewalks along Denton Drive. Sidewalks do currently exist on both sides of Walnut Hill Lane, but they are not continuous across the freight railroad tracks. On the west side of the rail line, these sidewalks are continuous across Harry Hines Boulevard on the north side of Walnut Hill Lane, but not on the south side. DART will coordinate with the City to ensure that sufficient pedestrian connections will be maintained in the area. Finally, two existing on-street bicycle routes pass through the intersection of Denton Drive and Walnut Hill Lane (Route 19 runs north-south and Route 290 runs east-west), allowing easy integration with the new station.

Impacts

The analysis of No-Build and LRT Alternative traffic conditions indicates that the proposed LRT station would cause only minimal impacts to the local traffic operating conditions. Vehicular delay at adjacent intersections along Walnut Hill Lane would increase slightly due to the additional traffic generated by the station activities in the LRT Alternative. However, most intersections would operate at acceptable levels of service during both peak periods with the exception of the intersection of Walnut Hill Lane and Webb Chapel Road, which would continue to operate at LOS F during the evening peak period (in both alternatives) without any improvements.

Mitigation

Assuming that the planned widening of Denton Drive to a four-lane facility prior to 2025 takes place, no mitigation will be necessary due to the implementation of LRT. If this widening has not been completed upon station opening, temporary improvements at the intersection of Denton Drive and Walnut Hill Lane will be necessary to accommodate the additional station traffic. In addition, the City of Dallas should explore improvements needed at the intersection of Walnut Hill Lane and Webb Chapel Road to mitigate the growth of background traffic (these improvements are not needed due to the implementation of LRT). DART Bus Operations has requested a traffic signal at each station entrance, one on Denton Drive and one on Walnut Hill Lane. Another analysis of these intersections will be performed during final design to ensure that the requested traffic signals are warranted and could operate satisfactorily in conjunction with the nearby signal at the intersection of Walnut Hill Lane and Denton Drive. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Royal Lane Station

The Royal Lane Station would be an elevated station located north of Royal Lane on the east side of Denton Drive. Five bus bays would be constructed along side the station on the east side of Denton Drive, as well as a park-and-ride lot with approximately 235 spaces. Vehicular access to the transit station would be provided from both Denton Drive and Royal Lane (via Grissom Lane). No rail crossing would be present because the freight rail line is planned to be removed and the LRT tracks would be elevated.

There are currently no sidewalks along Denton Drive or on the north side of Royal Lane. Sidewalks do exist on the south side of Royal Lane, but they are not continuous across the freight railroad tracks. DART will coordinate with the City to ensure that there will be sufficient pedestrian connections to nearby employment centers and the neighborhoods several blocks away. Finally, an existing on-street bicycle route (Route 19) passes by along Denton Drive, allowing easy integration with the new station.

Impacts

The analysis of No-Build and LRT Alternative traffic conditions indicated that the proposed LRT station would cause negligible impacts to the local traffic operating conditions. Although the station would attract some additional traffic, traffic-operating conditions at most intersections along Royal Lane would be unacceptable in 2025 in either alternative due to the projected increase in background traffic volume. Most study intersections along Royal Lane are projected to operate at poor levels of service (LOS E or F) in 2025 in the No-Build and LRT Alternatives with no improvements.

Mitigation

Dallas County is planning to widen Denton Drive to a four-lane facility prior to 2025 regardless of the LRT project. If the widening occurs, the intersection of Royal Lane at Denton Drive is projected to operate at a favorable LOS C during both peak periods in both the No-Build and LRT Alternatives. However, if this widening has not been completed upon station opening, temporary improvements at the intersection of Denton Drive and Royal Lane would be necessary to accommodate the additional station traffic until the road is widened. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Farmers Branch Station

The Farmers Branch Station would be an at-grade station located on the east side of Denton Drive south of Valley View Lane on the site of the existing Farmers Branch Bus Park-and-Ride Center. Seven bus bays would be constructed for the new station. The existing park-and-ride lot would provide about 179 spaces. The traffic analysis for this station takes into account recent and planned street changes.

There are currently sidewalks on the west side of Denton Drive, both sides of Pike Street, and none on Rossford Street. There are sidewalks along Valley View Lane, but they are not continuous. In addition, there are no existing pedestrian connections to the neighborhood across the tracks from the station. DART will coordinate with the City to ensure that sufficient pedestrian connections will be made to the surrounding neighborhoods. Finally, there is an existing on-street bike route (Route 19) that terminates a couple blocks south of the new station on Denton Drive. This route could easily be extended to connect to the new station. Farmers Branch is planning a new possible bike route to be located on surface streets parallel to and east of the LRT alignment to link with the station area. DART would also coordinate with the city on this proposal should the City of Farmers Branch decide to carry this proposal forward.

Impacts

Because the existing park-and-ride facility is near the station site, the traffic that would be generated by the station is very similar to the traffic generated by the existing site. Therefore, the only impact to traffic operations due to the implementation of LRT would be due to the necessary signal preemption at the at-grade crossing at Valley View Lane, which would cause the intersection of Rossford Drive and Valley View Lane to degrade to LOS D (which is still acceptable). However, the City of Farmers Branch is planning an extensive redevelopment of the station area, including office, retail, and higher-density residential uses. The additional traffic generated by this development would have a much greater impact on traffic operations in the area, most of which occurs at the diamond interchange of Valley View Lane at the IH 35E frontage roads. In the No-Build Alternative, the interchange would operate at LOS E and LOS D in the AM and PM peak hours, respectively. Adding the traffic generated by the development around the new station would cause the interchange to deteriorate to LOS E in the AM peak hour and LOS F in the PM peak hour. However, these poor levels of service are not due to the implementation of LRT.

At Valley View Lane, the analysis shows that an at-grade crossing would operate adequately if the planned improvements at the IH 35E interchange were implemented. However, a proposal under consideration by the City of Farmers Branch includes narrowing Valley View Lane to a four-lane arterial in the LRT station development area. An analysis of this scenario indicates that this would result in significant increases in traffic congestion in the area. The reduced capacity at the LRT crossing would magnify the effects of LRT preemption. Valley View Lane would thus have to be grade separated if the four-lane proposal is implemented.

Mitigation

No mitigation is necessary due to the implementation of LRT. However, if the City redevelops the area as planned, the City would need to mitigate the resultant deteriorated traffic conditions. It was found that if the City were to change the traffic signal phasing sequence at the interchange to a more efficient method it could significantly reduce vehicle delays. With improved signal timing, the intersection was shown to operate at the more acceptable LOS D in both peak periods under the LRT Alternative with the development in place.

It should be noted that these signal timing improvements are only possible if the City's scheduled CMAQ improvements are in place at the diamond interchange of Valley View Lane and the IH 35E frontage roads. These geometric improvements include the addition of a dedicated left-turn lane in each direction within the interchange. The analysis of the No-Build Alternative assumed that these CMAQ improvements would be in place. Without these improvements, at the time the station opens, background traffic levels alone would cause this interchange to operate at LOS F and mitigations would be required (but not due to the implementation of LRT).

DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Carrollton Square Station

The Carrollton Square Station would be an elevated station located on the east side of Broadway Street north of Belt Line Road. Five bus bays and a park-and-ride lot with about 253 spaces would be constructed along side the station between Broadway Street and Main Street, north of Belt Line Road. Access would be from Denton Drive, which will be realigned north of Belt Line Road to connect with Main Street at Belt Line Road. This realignment is necessary to accommodate the new LRT station, and would make it desirable to remove the short segment of Denton Drive south of Belt Line Road.

Downtown Carrollton has sidewalks throughout its grid of streets, but there are no major pedestrian connections across Belt Line Road to the new station site. In addition, the neighborhood near the new station has few sidewalks along its streets. DART will coordinate with the City to ensure that

sufficient pedestrian connections (such as the proposed pedestrian bridge over Belt Line Road) will be made to Downtown Carrollton and the surrounding neighborhood. Finally, an existing on-street bicycle route (Route 23) currently terminates on Main Street north of Belt Line Road. This bicycle route could be integrated with the new station to provide a convenient interface between bicycle and rail transit modes.

Impacts

The analysis of No-Build and LRT Alternative traffic conditions indicated slight increases in vehicular delay at several major intersections in the area surrounding the station. Levels of service would remain mostly the same for the No-Build and LRT Alternatives. A separate analysis was also conducted in the same manner for the added traffic from the proposed new developments in downtown Carrollton. No significant change in level of service was found during both peak periods.

Based on these analyses, the proposed Carrollton Square LRT Station and the future developments in the downtown area would not significantly impact the local traffic operation under existing traffic volumes. Projected background traffic growth by the year 2025, however, would place a significant demand on the area's available roadway capacities and thus lead to worsening traffic congestion.

Mitigation

Due to the implementation of LRT, DART will reconstruct Denton Drive to align with Main Street at Belt Line Road and remove that portion of Denton Drive north of Belt Line Road within the station area. During this realignment, DART will provide two southbound lanes and two northbound lanes on Main Street at Belt Line in order to accommodate future traffic levels as well as station traffic. This realignment also will require the relocation of a traffic signal from the intersection of Belt Line Road and Denton to the intersection of Belt Line Road and Main. Other improvements should be considered by the City of Carrollton to improve traffic operations throughout the area to mitigate the growth in background traffic that would occur regardless of the implementation of LRT (such as a fourth westbound lane on Belt Line Road).

It was found that the City could optimize the signal timing plans along Belt Line Road to improve the levels of service in the LRT Alternative. Specifically, the intersection of Belt Line and Broadway could be improved from LOS D and LOS E to LOS C and LOS B during the AM peak and PM peak hours, respectively. In addition, the new signalized intersection of Belt Line and Main would operate at LOS D and LOS B during the AM peak and PM peak hour, respectively. (Due to the relocation of this traffic signal being required by the LRT Alternative, the City and DART would share responsibility for the traffic signal timing project.)

DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Trinity Mills Station

The proposed Trinity Mills Station would be at-grade and located just east of Broadway Street and south of the newly constructed President George Bush Turnpike (SH 190). The station would have seven bus bays and approximately 495 park-and-ride spaces, with space available for parking expansion. Currently, there are limited pedestrian facilities in this area. DART will coordinate with the City to ensure that sufficient pedestrian facilities will be provided when this area is redeveloped to provide a new network of streets for the station and surrounding development. No designated bicycle routes currently serve this area.

Impacts

Because several proposed roadways in the proposed station area are not yet built, traffic volume counts were not available for an analysis of existing conditions. The projected 2025 traffic volumes obtained from NCTCOG were used as a basis to derive the traffic volumes on the adjacent

roadways for No-Build and LRT Alternative analyses. Future year analysis assumed that the proposed Dickerson Parkway extension would be in place and that Blanton Street would be terminated as a cul-de-sac just south of the station. The resulting levels of service from this analysis are satisfactory in both alternatives. With the additional station-related traffic, only minor increases in vehicular delay were observed. The levels of service at the study intersections remain acceptable in both alternatives.

Mitigation

No traffic mitigation is necessary due to the implementation of LRT. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996.

Frankford Station

The Frankford Station would be an at-grade station located on the south side of Frankford Road with about 887 parking spaces. Five bus bays would be provided with space available for future expansion. Vehicular access to the transit station would be provided off of Frankford Road via Trade Center Boulevard. There are currently no pedestrian or bicycle facilities in this area.

Impacts

An analysis of existing traffic conditions revealed that vehicle queues routinely fill the entire ramp that leads from the IH 35E southbound frontage road to Frankford Road (approximately 2,100 feet) during the AM peak. In addition, westbound traffic on Frankford Road occasionally spills back from the northbound frontage road into the signalized intersection with the aforementioned ramp during the PM peak. Without improvements to the roadway network in the station area, this would only worsen to LOS D by the year 2025 (No-Build Alternative) due to the growth in background traffic. The addition of station-related traffic and station-area development traffic to the No-Build Alternative would further worsen these queue spillbacks and vehicular delays to unacceptable levels. Therefore, mitigation will be required due to both the typical growth in background traffic and the addition of station traffic and station-area development traffic.

Mitigation

The ramp from the IH 35E southbound frontage road to Frankford Road should be widened to allow dual left turns onto eastbound Frankford Road. In addition, traffic signals would be installed at the T-intersection of Frankford Road and the IH 35E northbound frontage road as well as the intersection of Frankford Road and Trade Center Drive. These modifications could effectively remedy the queuing problems while accommodating both station-related traffic and projected background traffic growth in the station area. These proposed mitigation measures would cause the intersection of Frankford Road and the ramp from the IH 35E southbound frontage road to improve from an AM peak hour LOS E and PM peak hour LOS D in the No-Build Alternative (without mitigation) to LOS B in both peaks in the LRT Alternative (with mitigation). Likewise, the intersection of Frankford Road and Trade Center Drive would improve from a PM peak hour LOS F in the No-Build Alternative (without mitigation) to LOS A in the LRT Alternative (with mitigation). Similarly, the intersection of Frankford Road and the northbound frontage road would improve from LOS F in both peak hours of the LRT Alternative without mitigation to LOS B and LOS C in the AM and PM peak hours of the LRT Alternative with mitigation. Due to the nature of the existing traffic problems, future traffic growth as a result of the City's station-area development plans, and the addition of station traffic, the responsibility of these improvements should be shared by DART and the City of Carrollton.

Pedestrian Safety

The LRT Alternative would improve safety in the corridor primarily by enhancing pedestrian access. As described above, pedestrian safety to and from the LRT stations and park-and-ride lots would be enhanced by improving markings at existing signalized crosswalks at major intersections, pedestrian bridges at stations with heavy adjacent pedestrian or automobile traffic, and sidewalks

and other pedestrian facilities connecting park-and-ride lots and bus bays to the station platforms. DART will add or improve pedestrian facilities to meet the requirements stated in the DART Build-Out Phase 2 Design Criteria, Volume 1, Revision 3, 1996. In accordance with DART policy, fencing will be provided along the right-of-way where the operating speed of the LRT would exceed 45 mph or where special safety considerations are present. Locations of fencing and other safety and security elements are discussed in Section 5.11.

Summary of Station Area Impacts and Mitigation Measures
As described above, anticipated roadway and grade crossing impacts due to the new traffic generated by new LRT stations would be minor and localized and will be mitigated using standard traffic engineering strategies. These mitigation measures are summarized in **Table 4-11** and will be further refined during the final design stage of project development. The Levels of Service at intersections near the stations are summarized in **Table 4-12** and are described in detail above. The table compares the year 2025 No-Build, LRT Alternative (without mitigation), and LRT Alternative with the proposed mitigation measures in place (as described in **Table 4-11**).

At those stations where parking is not provided other than for kiss-and-ride and the mobility-impaired, patrons who desire to park-and-ride would be encouraged to use adjacent stations where on-site parking will be provided. If off-site parking demand should develop around stations, DART will work with the city and affected property owners to implement measures restricting transit patrons from parking at non-DART parking facilities during business hours or for long periods of time.

4.3 IMPACTS ON MOVEMENT OF FREIGHT

Both freight rail service and LRT service would be provided in the project corridor via DART-owned right-of-way. The LRT Alternative would operate on separate tracks through the corridor; therefore, its schedule of operations would not interface or conflict with the schedule of freight service operations. However, the construction of the LRT project would have an impact on how freight is moved within the corridor in the following ways:

- Relocation of freight tracks to accommodate LRT and freight service within the same right-of-way;
- Removal and relocation of freight storage track/sidings at several locations in the project corridor; and
- Scheduling agreement to minimize concurrent freight and LRT operations, particularly during peak-hours where freight passes between the LRT station platform and the bus transfer/parking areas.

LRT would also take advantage of planned improvements to modify freight service as recommended by the DART Commuter Rail/Railroad Management Department and the corridor's short-line freight operator, the Dallas, Garland and Northeastern Railroad (DGNO).

4.3.1 Freight Railroads

The LRT Alternative would operate primarily within an existing railroad right-of-way that currently provides rail freight service to multiple customers within the study corridor. Based on planned improvements in the corridor, freight service will be maintained in some areas and will be eliminated in others. The physical requirements of the LRT alignment and stations throughout the corridor will determine the impacts on freight operations. The degree of impact will depend on the size and location of the various freight customers within the corridor.

TABLE 4-11
STATION AREA TRAFFIC MITIGATION MEASURES

Station	Mitigation Measures	Responsibility
Victory	No mitigation necessary due to implementation of LRT.	N/A
Market Center/ Oak Lawn	Add a second southbound left-turn lane at the intersection of Harry Hines Boulevard and Wycliff Avenue. (This project is planned by the City of Dallas as a striping/signal modification).	City of Dallas
Parkland	Widen Motor Street from two lanes to four lanes between Harry Hines and Maple Avenue. If it is warranted during final design, install a traffic signal requested by DART at the intersection of Motor Street and bus transfer area entrance.	Traffic Signals: DART Widening: TxDOT, City of Dallas
Inwood	Consider a right-turn lane on northbound Denton Drive at Inwood Road, and add protected left-turn arrow indications for north and southbound Denton Drive approaches. If it is warranted during final design, install a traffic signal requested by DART at the intersection of Denton Drive and the south station exit. Intersection improvements should be analyzed during the station zoning process in conjunction with other possible improvements by the City of Dallas.	DART
Brookhollow	Install a traffic signal at the intersection of Denton Drive and Burbank Street. Preemption of the traffic signal will be required due to LRT operations.	DART
Bachman	Install a traffic signal at the intersections of Harry Hines Boulevard and Community Drive and at Denton Drive and Community Drive. The traffic signal on Denton Drive would require preemption due to LRT operations. Widen Community Drive between Harry Hines Boulevard and Denton Drive to four lane cross-section with continuous left-turn lane.	Traffic signals: DART Widening: DART, City of Dallas
Walnut Hill/ Denton	Assuming that the planned widening of Denton Drive takes place by the opening of the station, no mitigation will be necessary due to the implementation of LRT. If the widening project is not completed upon station opening, temporary improvements at the intersection of Denton Drive and Walnut Hill Lane will be necessary. In addition, if they are warranted during final design, two traffic signals requested by DART will be installed at the station entrances (one on Denton Drive and one on Walnut Hill Lane).	Widening: Dallas County Temporary Improvements: DART Traffic signals: DART
Royal Lane	Assuming that the planned widening of Denton Drive takes place by the opening of the station, no mitigation will be necessary due to the implementation of LRT. If the widening project is not completed upon station opening, temporary improvements at the intersection of Denton Drive and Royal Lane will be necessary.	Widening: Dallas County Temporary Improvements: DART
Farmers Branch	No mitigation necessary due to implementation of LRT.	N/A
Carrollton Square	Realign Denton Drive with Main Street at Belt Line Road, relocate the traffic signal at Belt Line Road and Denton Drive to Beltline Road, and Main Street and re-optimize signal timing.	DART (City to share cost of signal timing)
Trinity Mills	No mitigation necessary due to implementation of LRT. CMAQ impacts are assumed in place. Added growth in background traffic due to city's redevelopment actions may require additional improvements.	N/A
Frankford	Widen ramp from the southbound IH-35E frontage road to allow dual left-turns onto eastbound Frankford Road, and install traffic signals at the T-intersection of Frankford Road and the IH-35E northbound frontage road and the intersection of Frankford Road and Trade Center Drive.	DART and City of Carrollton

Source: Parsons Transportation Group, 2002-2003

TABLE 4-12
STATION AREA LEVELS OF SERVICE

Station	Arterial	Intersection	Unsignalized Approach	Year 2025 Peak Period					
				No-Build		LRT without Mitigation		LRT with Mitigation	
				AM	PM	AM	PM	AM	PM
Market Center/ Oak Lawn	Wycliff	Harry Hines		D	D	D	E	D	C
		Maple		C	C	C	C	C	C
		Dallas N. Tollway		B	B	B	B	B	B
		Congress		A	A	A	A	A	A
	Market Center	IH 35E SBFR		D	D	C	D	C	D
		IH 35E NBFR		C	D	C	D	C	D
		Harry Hines		B	D	B	D	B	D
Inwood	Inwood	Maple		B	D	B	D	B	D
		Denton		D	F	D	F	C	E
		Cedar Springs		D	E	D	E	D	E
		Lemmon		D	F	D	F	D	F
Bachman	Webb Chapel	Harry Hines		D	E	D	F	D	E
		Denton		D	B	D	C	D	C
		NW Highway		E	F	E	F	D	F
	Community	Harry Hines	WB	F	F	F	F	Signalized:	
			EB	F	F	F	F	A	B
		Denton	WB	B	C	B	C	Signalized:	
			EB	B	C	B	C	A	B
		NW Highway		E	F	E	F	E	F
Walnut Hill/ Denton	Walnut Hill	IH 35E SBFR		C	D	C	D	C	D
		IH 35E NBFR		B	D	B	D	B	D
		Harry Hines		C	D	C	D	C	D
		Denton		B	C	B	C	B	C
		Webb Chapel		D	F	D	F	D	F
Royal Lane	Royal	Emerald		F	F	F	F	F	F
		IH 35E NBFR		F	F	F	F	F	F
		Harry Hines		E	F	E	F	E	F
		Denton		C	C	C	C	C	C
		Grissom	SB	F	F	F	F	F	F
			EB Left turn	F	D	F	E	F	E
		Dennis		F	F	F	F	F	F
		Brockbank		F	F	F	F	F	F
		Webb Chapel		F	F	F	F	F	F
				E	D	E	F	D	D
				D	D	D	E	D	C
		Rossford		B	B	D	D	D	D
		Josey		C	C	C	D	C	C
Carrollton Square	Belt Line	IH 35E SBFR		F	F	F	F	F	E
		IH 35E NBFR		F	E	F	E	F	E
		Broadway		D	E	C	B	C	C
		Denton		Current Loc.		New Location		New Location	
				C	C	A	A	A	A
		Main	NB	C	D	Signalized:		Signalized:	
			SB	F	C	D	B	D	B
Trinity Mills	MacArthur	PGBT EBFR		B	B	B	B	B	B
		PGBT WBFR		A	A	A	A	A	A
	Dickerson	PGBT EBFR		B	B	B	B	B	B
		PGBT WBFR		B	B	B	B	B	B
Frankford	Frankford	IH 35E NBFR		C	D	F	F	B	C
		Ramp to SBFR		E	D	F	F	B	B
		Trade Center	NB	D	F	F	F	Signalized:	
								A	A

Source: Parsons Transportation Group, 2002 - 2003

When DART acquired the UPRR property, it accepted responsibility for the rail freight common carrier obligations. To discharge that obligation, DART entered into a contract with the DGNO to use the former UPRR line to serve approximately 30 active freight customers located along the project corridor. DGNO's economics are volume driven. DGNO has a commercial agreement with the UPRR for rail freight service to this and other lines in the Dallas area. Maintaining current volumes and increasing them, when possible, is in the best interest of both DART and the DGNO.

A Memorandum of Understanding (MOU) between DART and the DGNO is under development and addresses both the planned changes under the No-Build condition as well as impacts and mitigation associated with the implementation of the LRT project. Meetings were held with DGNO on May 3, 2002 and November 29, 2002 to continue to discuss the changes in the corridor and review key elements of the MOU. All major issues have been identified. Coordination between DART and DGNO will continue during final design to ensure that freight operations can continue during both construction and LRT operation with no or minimal impacts. Due to ongoing coordination and decisions related to DGNO's use of Mockingbird Yard (see #2 below) not proposed to be final until late 2003, the MOU and other agreements will not be finalized until final design, at which time all issues will have been resolved.

No-Build Alternative

As previously stated, proposed improvements to modify freight service have been informally agreed upon by the DART Commuter Rail/Railroad Management Department and the DGNO. This represents a No-Build condition that will occur with or without the implementation of the LRT Alternative. The proposed improvements are as follows:

1. Severing the corridor for freight service between Merrell Road in Dallas and Randolph Street in Carrollton. The LRT project does not require that freight be severed between these points. Rather, this action is proposed due to a lack of customers in this section (only one active customer as of January 2001), numerous street crossings and the required maintenance of those crossings, as well as changing land uses and conditions in the general area. In the year 2000, the sole active customer only shipped or received a total of 49 carloads of product or material. The LRT project would take advantage of the planned action by locating the alignment in or near the center of the ROW and designing the two affected stations without the need to accommodate freight operations. Implementation of these improvements should be treated as an action separate from the LRT project, but should be accomplished before construction of the LRT project. Agreements are in development with DGNO and the freight customer to accomplish this improvement.

2. Construction of approximately 15,000 feet of yard track on the Brookhollow Lead with a complete "Y" connection to the TRE alignment. This Brookhollow Yard may be necessary with the implementation of Item 1 above. However, the new yard would not be necessary if DGNO can use the existing Mockingbird Yard for its switching operations. Use of the Mockingbird Yard appears promising and should be resolved by late 2003. Severing the track will require that service to customers south of Merrell Road be provided via the Brookhollow Lead. Because Item 1 is not a requirement of the LRT, the Brookhollow Yard is also not a requirement of the LRT project. However, some minor replacement of storage tracks may be needed along the Brookhollow Lead. Implementation of this improvement should be accomplished prior to or concurrent with construction of the LRT project. Based on discussions with DGNO, they support this concept. TRE has the capacity to accommodate an increase in traffic.

Despite the removal of freight operations between Merrell Road in Dallas and Randolph Street in Carrollton, customers on both segments of the remaining freight line would continue to be served by DGNO operations. DGNO would use the nearby BNSF RR line under a trackage rights agreement to transfer freight between the northern and southern segments of the UPRR line.

Specifically, the northern customers would continue to be served by trains from Mercer Yard via the Carrollton Connection, while the southern customers would be served by trains from the Brookhollow Lead, which can connect to DGNO's northern operations via the BNSF RR line on the west side of IH 35E.

Based on a review of 1999 and 2000 statistics, approximately 32 percent of DGNO's carloads originate and terminate north of the Carrollton Connection, 40 percent between the Carrollton Connection and the Brookhollow Lead, and 28 percent between the Brookhollow Lead and Dallas Junction. Therefore, approximately 60 percent of current freight operations would be unaffected, while approximately 40 percent of current freight operations would be rerouted in some fashion. Overall, train travel time between the northern and southern segments of the line would be increased, but since these trains run only once or twice a day, the impact is not significant.

There is currently one active freight customer located between Merrell Road and Valwood Parkway where freight service is proposed to be removed. This customer receives relatively small amounts of freight when compared to other customers along the DART (UPRR) line. Specifically, the average number of annual carloads for each customer along the line within the corridor is 245 carloads and one customer handled over 2,000 carloads in the year 2000. In contrast, the affected customer shipped only 49 carloads in 2000. **Table 4-13** identifies the customer that would be affected by the removal of rail freight service under the planned No-Build condition. An agreement for alternative service to this customer is under development.

The above-described improvements will create several positive opportunities for the LRT project:

- Allows unobstructed utilization of the affected right-of way for LRT construction.
- Eliminates need for a more costly shared-use design for LRT and freight tracks.

TABLE 4-13
FREIGHT CUSTOMERS AFFECTED BY SEVERING THE FREIGHT RAIL LINE*

Rail Section	Side of UPRR Line	Customer
Indian Trail to Rodney Lane	East	Central Hardwood
* Severing is planned for the No-Build Alternative and is not due to the implementation of LRT.		

Source: Parsons Transportation Group; DART; DGNO; April 2001

LRT Alternative

Although the above-described improvements are not required to accommodate the LRT project, there are other modifications to freight tracks and operations that are associated with the proposed project. These adjustments and impacts to the freight tracks and operations are described in the following paragraphs.

1. Elimination of the southern section of the UPRR tracks (south of the Coca-Cola spur) and closure of Dallas Junction. This would be required by the LRT project due to right-of-way constraints in the area just north of Oak Lawn Avenue, space requirements for the Market Center/Oak Lawn Station near Wycliff Avenue, and accommodation of the LRT alignment due to the selection of the UPRR alignment in the Medical Center area. The impacts to freight operations would include:

   - Loss of a southern access connection to the TRE tracks.
   - Loss of storage track capacity used by DGNO for Coca-Cola service. This will be mitigated by providing additional tracks in alternate locations along the corridor, as well as along the Brookhollow Lead.

- Reconstruction of the Coca-cola spur. It is likely that this spur will require temporary or permanent relocation during LRT construction.
- Loss of service to freight customer Architectural Carpentry Materials (ACM) between Inwood and Mockingbird. This could be mitigated by providing an intermodal reload service to truck ACM's shipments to their facility; shipping completely by truck; maintaining the freight service using the existing or a reconfigured rail spur; or relocating ACM's facility to another location with a direct freight spur. Several of these options are cost prohibitive or would entail unacceptable property acquisitions. Shipping by rail to a railroad reload center and trucking the lumber to ACM's facility appears to be the best option for further discussion with ACM as final design is initiated.

2. Relocation of the main line and removal of some storage tracks in the Dallas Love Field area. This would be required by the LRT project due to right-of-way constraints along the Selected LRT Alternative as it passes by Dallas Love Field. Most of the removed storage track will be replaced along other sections of the LRT alignment, the specifics of which are detailed in the 10% Preliminary Engineering drawings (see Appendix C). The potential impacts to freight operations would include:

   - A decrease in the amount of storage and spur tracks available to rail customers in the area, such as Coca-Cola, which have significant delivery and shipping requirements. Loss of track storage space will be mitigated by providing additional tracks in alternate locations (such as the Brookhollow Lead) to result in no net loss of storage track overall.
   - Minor disruption to freight operations during the time that new main line and storage track connections are being constructed.

3. Relocation of the main line and spur tracks for the two customers (Foxworth-Galbraith Lumber and International Paper) located between Crosby Road and the Cotton Belt rail line. These adjustments would be required due to right-of-way constraints and would include additional storage, or "run-around" tracks, for more efficient service. The impacts to freight operations would include:

   - Minor disruption to freight operations during the time that new main line and storage track connections are being constructed.

4. Consider nighttime service to the two customers identified in Item 3 above, located between Crosby Road and the Cotton Belt rail line. This is not a requirement, but would be preferred where freight would continue to operate adjacent to or through station areas (between parking/bus bays and the station platform). Service should at a minimum be provided during off-peak time periods. The impact to freight operations would be:

   - Operations scheduled at a less cost-effective time period for both the freight operator and the rail freight customers.

5. Elimination of the connection in the southeast quadrant of the Cotton Belt rail line and UPRR in Carrollton. This is a requirement of the LRT project to eliminate the conflicts between freight operations and pedestrian and vehicle operations in the Carrollton Square Station on the north side of Belt Line Road. Mitigation for eliminating this connection will be provided through Item 6 below. The impact to freight operations would be:

   - A slightly less direct, less efficient track connection for providing service to the two active customers south of Belt Line Road.

6. Construction of a new connection in the northeast quadrant of the Cotton Belt rail line and UPRR to replace that eliminated in Item 5 above. This new connection would be constructed as mitigation for Item 5. The impact to freight operations would include:

   - A slightly less direct, less efficient track connection to providing service to the two active customers south of Belt Line Road.

   - Use of the BNSF track for a short distance.

7. Relocation of the main line and spur tracks for the six customers including Boral Brick, Vinylex, Rhodes Printing, Dallas Water Chemicals, and the Frankford Trade Center lead (two customers), located between Belt Line and Frankford Roads. This is a direct result of the LRT project in order to allow for the future potential operation of commuter rail service on the mainline freight tracks, and maintain freight service to individual customers and multiple customers located in the Frankford Trade Center development. The impact to freight operations would be:

   - Minor disruption to freight operations during the time that new main line and spur track connections are being constructed.

8. Where the LRT alignment is at-grade, DART is proposing to close minor crossings where possible to enhance safety and operations. Closure of street crossings is a direct result of the LRT project. The potential benefits to freight operations would include:

   - An improvement in the safety conditions as a result of fewer at-grade crossings.
   - Better track crossing surface as a result of crossing reconstruction.

9. All common grade crossings (i.e., at-grade crossings shared by both DGNO and DART LRT) will be equipped with four quadrant gates or two gates and non-mountable median barriers, and freight and LRT warning operations will be integrated and coordinated. Final decisions on how this will be implemented will be addressed in final design. The potential benefit to freight operations would include:

   - An improvement in the safety conditions as a result of better crossing controls.

The Federal Railroad Administration (FRA) will be involved as necessary during final design, particularly as it relates to safety and shared use of the corridor and right-of-way. The freight railroad modifications described above are quantified in **Table 4-14** and generally located on **Figure 4-6.** Details of the modifications are shown in the 10% preliminary engineering drawings contained in **Appendix C**.

4.3.2 Trucking and Deliveries

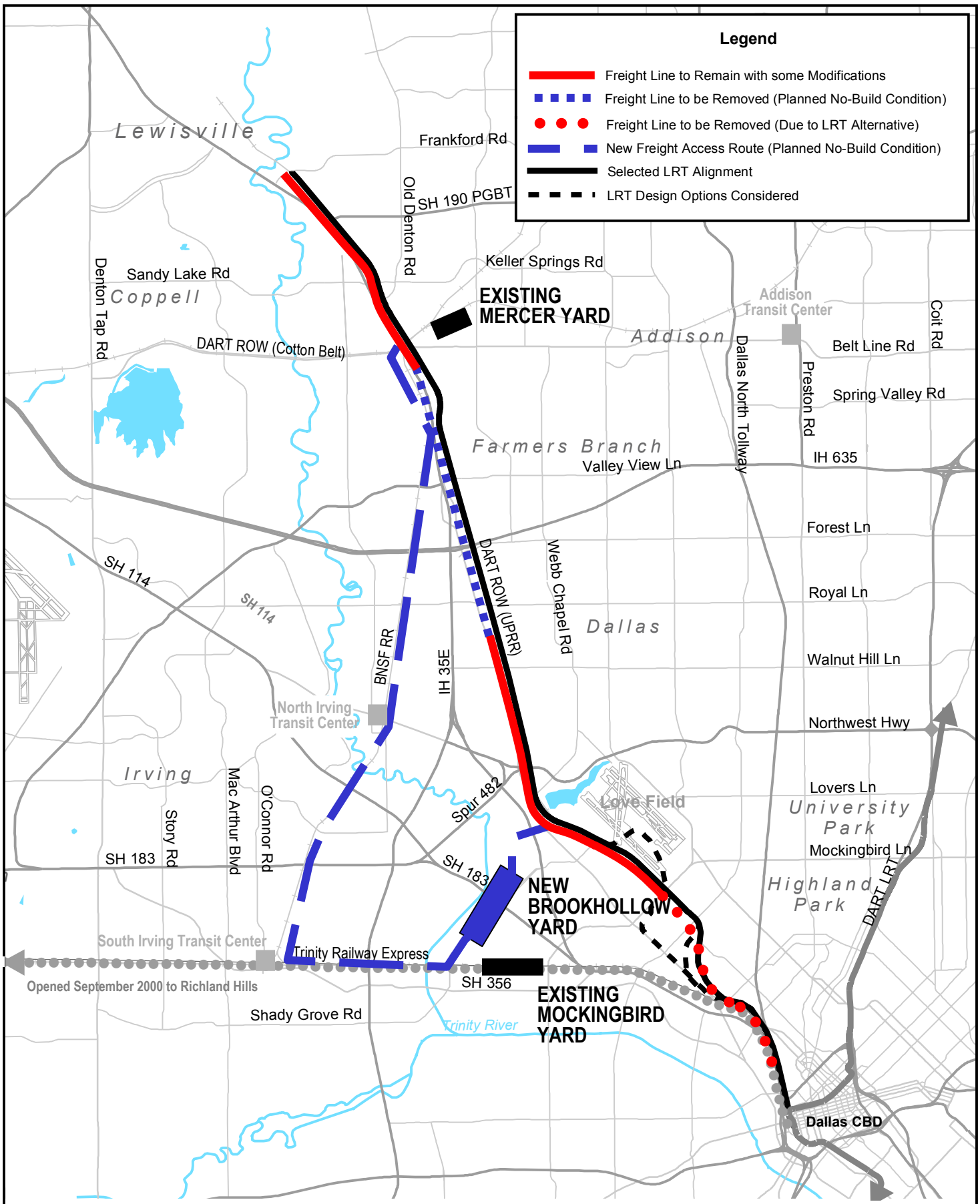
Trucking and delivery movements through the corridor would experience both positive and negative impacts from the construction of the LRT Alternative. The LRT Alternative would be on aerial structure where heavy truck traffic is present, and would in many cases need to rebuild any remaining freight crossings, which would benefit truck traffic. The LRT Alternative is also anticipated to help reduce automobile traffic on several major roadways within the corridor, which should benefit truck and delivery traffic. However, some trucking companies and delivery customers that are based within the corridor would be affected by the closure of some local streets and private driveways when the LRT is implemented. **Table 4-9** summarized those streets that would be closed.

TABLE 4-14
PROPOSED CHANGES TO EXISTING FREIGHT RAIL LINE

Track Type	Action*	Length	Net Change
Start of Project to Harry Hines Boulevard			
Mainline	Remove	-3,210 ft	-3,210 ft
Storage	Remove	-1,320 ft	-1,320 ft
Connection	Remove	-230 ft	-230 ft
Harry Hines Boulevard to Mockingbird Lane			
Mainline	Remove	-10,460 ft	-10,460 ft
Spur	Remove	-450 ft	-450 ft
Storage	Remove	-3,260 ft	-3,260 ft**
Mockingbird Lane to Northwest Highway			
Mainline	Remove	-2,000 ft	0 ft
	Add	+2,000 ft	
Spur	Remove	-375 ft	-175 ft
	Add	+200 ft	
Storage	Remove	-2,725 ft	-1,550 ft
	Add	+1,175 ft	
Northwest Highway to Merrell Road			
Mainline	Remove	-7,290 ft	0 ft
	Add	+7,290 ft	
Spur	Remove	-600 ft	-600 ft
	Add	0 ft	
Storage	Remove	-5,030 ft	+1,880 ft
	Add	+6,910 ft	
Merrell Road to Crosby Road			
Mainline	Remove*	-23,420 ft	-23,420 ft*
Spur	Remove*	-1,880 ft	-1,880 ft*
Storage	Remove*	-1,390 ft	-1,390 ft*
Crosby Road to Belt Line Road			
Mainline	Remove	-2,120 ft	+160 ft
	Add	+2,280 ft	
Spur	Remove	-200 ft	-200 ft
	Add	0 ft	
Storage	Remove	0 ft	+1,510 ft
	Add	+1,510 ft	
Belt Line Road to Frankford Road			
Mainline	Remove	-15,390 ft	0 ft
	Add	+15,390 ft	
Spur	Remove	-640 ft	+420 ft
	Add	+1,060 ft	
Storage	Remove	-980 ft	+120 ft
	Add	+1,100 ft	
Connection	Remove	-500 ft	+300 ft
	Add	+800 ft	

* All changes in this table are required by the Selected LRT Alternative except those between Merrell Road and Crosby Road, where the freight line will be severed in the No-Build Alternative.
** It is possible to replace some or all of this displaced storage at other locations along the alignment, or at the planned Brookhollow yard. Suitable locations will be discussed with DGNO.

Source: Parsons Transportation Group, October 2002



Source: Parsons Transportation Group, 2003

Figure 4-6
Proposed Freight Modifications

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

Specifically, some companies would lose some or all of their direct access to Denton Drive or Broadway Street through the closure of a local street or a driveway that currently crosses the UPRR tracks. In most cases this simply means that trucks would have to take an alternate route to reach Denton Drive or Broadway Street. In some limited cases, the trucking company would have to reconfigure their loading dock operations to adjust for the loss of one of two driveways. Overall, the largest impact to trucking and deliveries in the area would be some small added travel time required when certain access points across the tracks are eliminated. All trucking companies (or delivery customers) will continue to have access to Denton Drive or Broadway Street with the construction of the LRT Alternative.

4.4 IMPACTS ON NON-MOTORIZED CIRCULATION

Non-motorized circulation includes pedestrian and bicycle facilities. Pedestrian facilities typically include sidewalks adjacent to area streets, pedestrian crossings, pedestrian signals, and off-street pedestrian trails. Bicycle facilities consist of signed and unsigned bicycle routes on certain streets as well as off-street bicycle routes. The implementation of LRT would have both positive and negative impacts on these methods of non-motorized circulation.

4.4.1 Pedestrian Movements

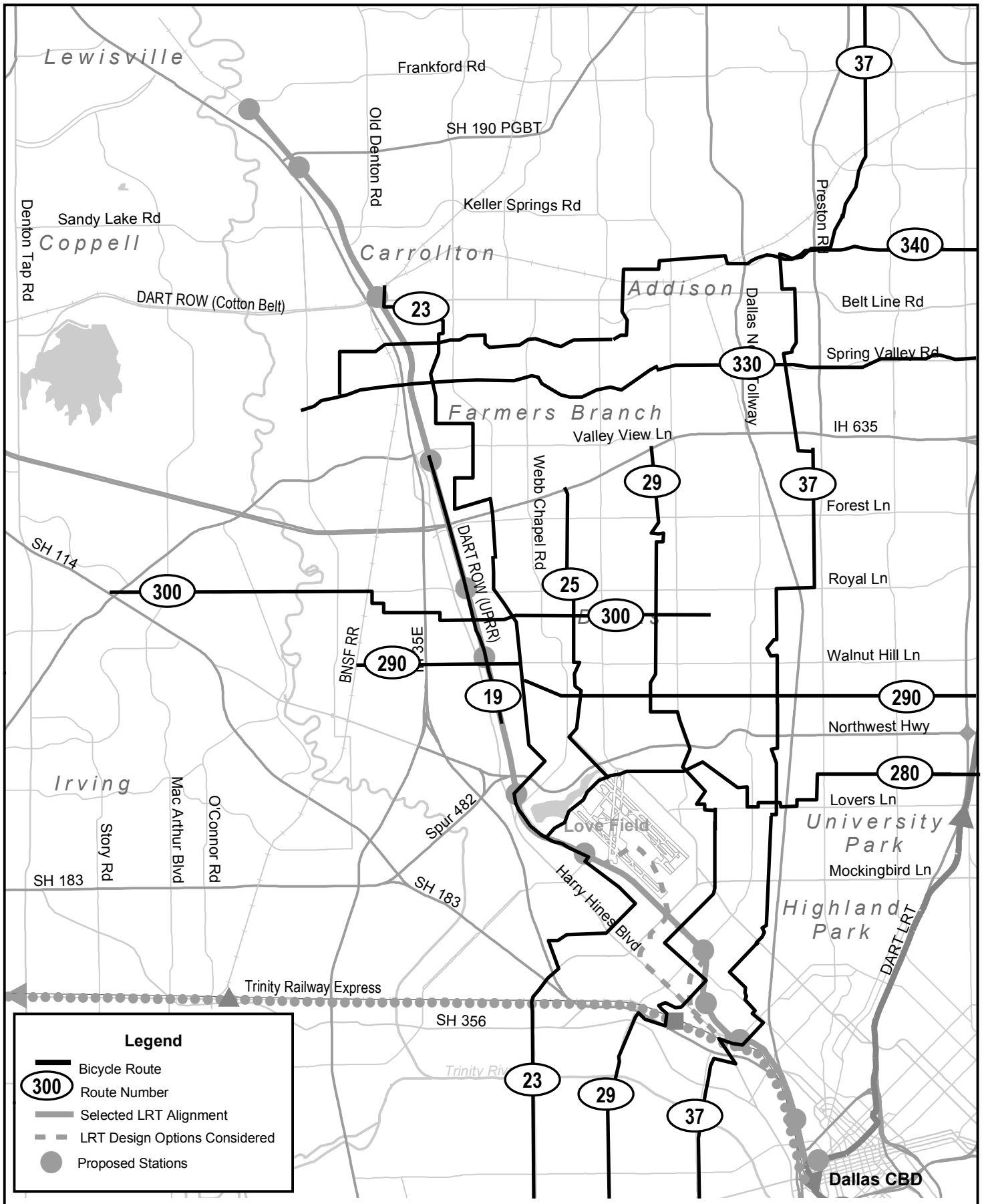
Pedestrian circulation facilities in the study area are essentially provided as part of the roadway facility cross-section. While this typically includes sidewalks, pedestrian crossings, and pedestrian signals, there are large sections along the alignment of the Selected LRT Alternative where these pedestrian facilities are not currently provided. Despite this lack of sidewalks, pedestrian activity does occur along these roadways, particularly in areas south of Belt Line Road. Some employees of the various businesses along Denton Drive must walk to work from the closest bus stop and also walk to nearby restaurants. While there are traffic signals on Denton Drive to facilitate a safe crossing, these are spaced at about one mile increments. Therefore, many pedestrians cross Denton Drive without the benefit of a pedestrian crosswalk or signal.

The Market Center/Oak Lawn and Parkland Stations are the only LRT station sites where many transit patrons would have to cross an arterial roadway on foot in order to access the station platform. In the case of the Market Center/Oak Lawn Station, the park-and-ride lot would be across Harry Hines Boulevard from the station. Therefore, a pedestrian bridge over the roadway would be provided to connect the parking lot to the station. Similarly, a pedestrian tunnel will pass under the Trinity Railway Express/freight tracks to connect the station to the Market Center complex. In the case of the Parkland Station, the aerial platform would be located on the other side of Harry Hines Boulevard from the existing Parkland Hospital and other medical facilities. DART will work with Parkland Hospital to define measures that safely control pedestrian movements across Harry Hines between the hospitals and the station using the existing pedestrian bridge and signalized crosswalks. These pedestrian needs will change as Parkland expands to the east side of Harry Hines adjacent to the station. In addition, the Selected LRT Alternative would include an aerial station at Inwood Road. Three schools are located within one-half mile of this station. Specific measures to address safety and security of school children are discussed under Safety and Security in Section 5.11.

4.4.2 Bicycles

As described in Chapter 3, the City of Dallas has developed a plan for bicycle circulation facilities which encompasses all three corridor cities. The City of Dallas developed the Greater Dallas Bike Plan Map in 1992, and updated it most recently in 1997. The existing bicycle routes in the area are shown in **Figure 4-7**. Signed bicycle routes that cross the alignment are:

- Route 29 within the UTSW Medical Center Area
- Route 37 on Lucas at Harry Hines
- Route 280 on Shorecrest Drive at Denton Drive
- Route 290 on Walnut Hill Lane at Denton Drive



Source: Parsons Transportation Group, 2002

Figure 4-7
Bicycle Routes

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

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Unsigned routes cross the alignment on Crosby Road and Valwood Parkway, but there are no paved paths or unpaved off-road trails. The City of Farmers Branch has expressed a desire to have a bicycle/pedestrian route or path, possibly within DART right-of-way or on parallel streets, from Valwood Parkway to Valley View Lane to link with the existing and planned system. The City of Carrollton has similar ideas. DART will work with both jurisdictions to determine the feasibility of these facilities.

All bicycle route crossings that are associated with streets will be given the same crossing warning devices as those streets. However, all of the signed bicycle routes that cross the alignment are on streets that do not cross the LRT alignment at grade. Overall, the LRT Alternative's only effect on bicycle circulation should be a positive one of encouraging existing bicycle facilities to be used to access the transit system. As described in Section 4.2.3, five of the proposed locations for LRT stations are currently served directly by existing on-street bicycle routes (Routes 19, 23, and 290). Four additional station locations could be served by slightly modifying existing on-street bicycle routes (Routes 29 and 37). Where appropriate, DART will provide bicycle racks or lockers at LRT stations.

4.5 IMPACTS ON PARKING

Parking within the corridor could be impacted in two ways. First, some existing parking supply could be displaced by the construction of the LRT line or the transit stations (both temporarily and permanently). Second, existing and future parking supply for residences or businesses could be utilized by transit patrons instead of the intended users. Overall, the LRT Alternative would have a minimal impact on parking within the corridor.

As described in Section 3.3.6, most of the parking in the corridor is off-street in parking lots or parking structures. In addition, there is some limited on-street parking along Denton Drive. The on-street parking near Northwest Highway is due to the residential developments on both sides of the roadway, while the on-street parking near Forest Lane is overflow parking from nearby commercial land uses (mostly automobile related). In both the No-Build and LRT Alternatives, these areas of informal on-street parking would be eliminated. Specifically, Dallas County plans to widen Denton Drive to a four-lane roadway with curbs and gutters, which will displace the on-street parking described above.

Since the loss of the on-street parking described above would occur in both the No-Build and LRT Alternatives, its impact cannot be attributed to the implementation of LRT. In addition, while the construction of the LRT stations, bus transfer platforms, and park-and-ride lots would eliminate some off-street parking, most of the residences or businesses associated with those parking areas would also be displaced. Therefore, the loss of these parking areas would not be considered a parking impact. Overall, the LRT Alternative would displace only limited amounts of existing parking that would be considered as parking impacts. As described below, most of these impacts are located in the Medical Center District, and varied depending on the design options that were considered in that area.

4.5.1 Selected LRT Alternative Impacts and Mitigation

Table 4-15 summarizes the parking impacts to existing properties under the Selected LRT Alternative. Mitigation is also indicated as appropriate. For the selected LRT Alternative, there will be a temporary loss of about 10 parking spaces at the Old Morton Foods Headquarters during construction. The spaces will be restored fully when construction is complete. In addition, the selected alignment will result in the temporary removal of 218 employee parking spaces on Parkland property during construction. After construction, many of these spaces can be restored, but approximately 150 parking spaces will be permanently displaced.

TABLE 4-15
PARKING IMPACTS AND MITIGATION
SELECTED LRT ALTERNATIVE

Location	Impact	Mitigation
Parkland Hospital Employee Parking	218 surface parking spaces will be eliminated in an employee parking lot during construction. After construction, approximately 70 spaces would be reinstated in a reconfigured parking lot.	Increased transit accessibility; market transit during construction
Old Morton Foods Headquarters, 6333 Denton Drive	Approximately 10 parking spaces temporarily eliminated during construction.	Replacement after construction

Source: Parsons Transportation Group; March 2003

Also, in order to address additional parking demand generated by the LRT system, parking will be supplied at park-and-ride lots proposed at most of the LRT stations. DART's policy of providing free parking should encourage transit patrons to use the DART park-and-ride lots rather than impacting the parking supply within a given neighborhood by parking on local streets or using nearby building-specific parking. Due to the high-density commercial and institutional land uses within the corridor, it is more likely that the DART park-and-ride lots would occasionally be used by motorists destined for other nearby land uses (especially at the Market Center/Oak Lawn, Bachman, Farmers Branch, and Carrollton Square Stations). During off-peak periods (nights and weekends), DART would be willing to develop shared parking arrangements as needed.

4.5.2 Other Alignments Considered

The Harry Hines Base Alignment would have eliminated an 896-space parking structure used by UTSW at the UTSW/Exchange Park Station. Near Treadway Street, 88 private spaces at the Bank One office building would have been lost. On Treadway Street, 47 on-street metered spaces would have been lost.

Medical Center Design Option D would have had significant parking impacts. First, all of the existing 47 on-street metered parking spaces would have been eliminated on Lofland Street in order to transform it into a bus transfer center. In addition, Lofland Street would have been widened to accommodate the new bus transfer center, which would have eliminated 53 parking spaces in the privately operated, fee-based visitor parking lots along Lofland Street. All existing 16 metered and 22 free on-street parking spaces on Redfield Street would have been displaced during construction of the LRT and bus transfer center. A smaller number of spaces could then have been reinstated on Redfield Street after construction, depending on how buses from the transfer center would use the street.

The largest impact would have occurred across Harry Hines Boulevard from Parkland Hospital where currently there are two large employee parking lots. The smaller lot has about 330 parking spaces and is located north of the intersection of Redfield Street and Lofland Street. The larger parking lot has 694 parking spaces and is located in the middle of the Parkland property surrounded by Lofland Street, Harry Hines Boulevard, and Motor Street.

Under Medical Center Design Option D, the Parkland Station would have been placed in this block of land and the alignment would have also cut through the smaller employee parking lot to the north. During construction, nearly all of the 1,024 employee parking spaces in the two lots would have been displaced. After construction, two-thirds of the parking spaces in the employee parking lot to the north can be restored while 121 spaces would have remained permanently displaced. Similarly, 215 parking spaces could have been restored in the larger employee parking lot after construction while 479 parking spaces would have been permanently displaced.

Medical Center Design Options A, B, and C would have had on-street impacts on Lofland Street and Redfield Street, similar to Design Option D. They would also have displaced private parking at several other businesses where property acquisitions were needed for alignment right-of-way. The Salvation Army Carr P. Collins Social Service Center would have lost 40 to 61 spaces. Design Option C would have impacted parking at two more businesses, eliminating 26 more spaces.

Environmental Consequences

Chapter Five

5.0 ENVIRONMENTAL CONSEQUENCES

This chapter provides a summary of the environmental consequences of implementing the Selected LRT Alternative. For comparison, impacts of the No-Build Alternative and LRT Design Options (Medical Center and Love Field areas) are provided. Specific mitigation measures in response to anticipated impacts are identified in this chapter, and are incorporated into the project as committed actions.

5.1 LAND USE AND ECONOMICS

The Northwest Corridor is a major employment destination for the Dallas region. Land use and economic activities within the corridor are strongly influenced by the availability of transportation resources. The No-Build Alternative, Selected LRT Alternative, and LRT Alignment Design Options would have significantly different impacts on each of these activities. The potential impacts, and related issues, are addressed in the sections below.

5.1.1 Land Use Impacts

Potential land use impacts would be strongly influenced by the land use plans and development policies of the governing cities within the corridor. Given this, the LRT and No-Build Alternatives are evaluated for their consistency with the land use plans and policies of Dallas, Farmers Branch and Carrollton. The alternatives are also reviewed for potential impacts on existing neighborhoods. For regional and corridor levels of analysis, the impacts of the LRT Alternative include the other alignments considered in the Draft EIS. Where applicable (such as neighborhood and station levels), differences in impacts for the Selected LRT Alternative and the other alignments considered are described. The corridor study area is defined as the area within one-half mile of the proposed LRT alignment.

Regional Land Use and Development Impacts

No-Build Alternative

This alternative represents the “status-quo”. There would be no impact on regional land use and development.

LRT Alternative

Transit studies focusing on the relationship between rail transit and land use in urban areas have found that transit systems rarely generate new regional growth.[1] However, with supportive public policies and favorable real estate market conditions, transit systems can be used as a planning tool to redistribute growth.

The proposed project would not generate new growth or development within the region; instead it is designed to serve existing residential and business centers forecast to grow in the corridor. However, the project could also be a catalyst for encouraging development to be more transit-efficient in northwest Dallas County and southeast Denton County. Whether or not this occurs would depend upon the actions of the cities governing development in the corridor and on local real estate market conditions.

Corridor-Level Land Use and Development Impacts

The project corridor experienced double-digit employment growth during the last decade and this trend is projected to continue. By the year 2010, NCTCOG projects that the Stemmons Corridor will contain 31% of total regional employment. Continued population growth is also projected for the corridor. NCTCOG forecasts a Study Area population of 114,000 by 2025 – a 39% increase from 1995. This forecast is supported by the 2000 Census figures. The median population growth

[1] Transit Cooperative Research Program, “An Evaluation of the Relationship Between Transit and Urban Form,” Research Results Digest, June 1995.

rate for census tracts within the corridor was 29% between 1990 and 2000. This growth, combined with employment increases, indicates an increasing burden on existing transportation systems unless improvements are made. There is a significant difference between the No-Build and LRT Alternative in addressing this issue.

The corridor's demographic profile indicates that the area is home to a high number of low-income households, elderly individuals, and persons without automobiles. There is a higher level of transit dependence for residents in the study area than in Dallas County as a whole. The two alternatives vary significantly in serving the needs of these residents. The differences between the No-Build and LRT Alternatives are examined further below.

No-Build Alternative

Under this alternative, current land use trends and development activity would continue. The area would maintain its status as a major employment center; however there would be no incentive for land uses to develop in a more transportation efficient pattern. There would be increased traffic congestion and the desirability of the corridor as an employment destination might decline over time. The quality of life in the residential areas would also be impacted. Increased automobile congestion would place a greater burden on streets through residential areas and increase air quality problems. In addition, the transit dependent residents within the corridor would have more limited transit options, all of which would be subject to the forecasted street and highway congestion.

LRT Alternative

The proposed project would encourage development within the corridor to be more transportation efficient by providing fixed station locations with nodal development opportunities. Transit studies have found that with supportive public policies, transit investments and services can bring about significant and long-term land-use and urban form changes.

The project would also have long-term impacts on the distribution and density of development within the corridor. This would likely be a redistribution of growth rather than new growth (given the high rates already projected for the area). Development would be attracted to property with access to one of the rail stations. Dr. Weinstein and Dr. Clower from the University of North Texas (UNT) have documented the attraction of new development and redevelopment to existing DART stations.[2] Their study concluded that properties near the existing DART LRT Stations (Mockingbird, Lovers Lane, and Park Lane) had property values approximately 25 percent higher than other areas examined. DART stations have proved to be a catalyst for several major real estate projects along the LRT system. Based upon DART's experience with investment around LRT stations over the past five years, similar development patterns may emerge at some station locations along the project corridor.

By addressing the transportation needs of the corridor, the proposed project would make the area more attractive to future real estate investment and would encourage existing uses to remain in the area. There would be incentives for infill development within the corridor as users take advantage of the availability of rail transit services. In addition, the expanded LRT system and supportive bus system would enhance opportunities for transit dependent residents throughout the DART Service Area.

Consistency With Land Use Plans

The proposed project lies within three municipal jurisdictions: Dallas, Farmers Branch and Carrollton. This section examines each of the alternatives for consistency with the plans and policies of these cities and the other plans discussed in Chapter 3.

[2] Bernard Weinstein, PhD and Terry Clower, PhD, "The Initial Economic Impacts of The Dart LRT System", University of North Texas, July 1999.

City Of Dallas

No-Build Alternative

This alternative is not consistent with the ***City of Dallas Growth Policy Plan***, a citywide policy tool for land use and development planning. The plan recognizes the use of the light rail system for serving the transportation needs of the community and for improving the transportation efficiency of land development patterns. The No-Build Alternative is also not consistent with several subarea plans for the corridor. The City's plans for the Dallas Love Field neighborhoods (***Love Field North Land Use Study*** and ***Love Field West Land Use Study****)* contain a DART LRT alignment and station in these areas. The two studies identified for the Northwest Highway area (***Northwest Highway Area Revitalization/Neighborhood Improvement Study*** and ***Northwest Highway Urban Design Study***) also include a DART LRT alignment and station in the Northwest Highway area. The studies cite the positive impact of an LRT system on land uses and transportation accessibility in the area. The No-Build Alternative is also inconsistent with the ***Stemmons/Harry Hines Corridor Implementation Study***. That study recommends infrastructure improvements to facilitate future growth and development of the business community. The LRT project would locate three stations in this area that extends from Northwest Highway to LBJ Freeway.

LRT Alternative

The proposed project is consistent with the City's ***Growth Policy Plan*** and the ***Dallas Plan***. The project would allow the City to support growth nodes in appropriate locations and to encourage more transportation-efficient land use patterns. The project is also consistent with all of the sub-area plans for the corridor. The LRT stations could be a catalyst for several of the improvement and redevelopment objectives recommended in the plans.

City Of Farmers Branch

No-Build Alternative

This alternative is not consistent with the City's ***Comprehensive Plan*** or its revitalization plan for the Old Farmers Branch Area. The City promotes public transit use in its Comprehensive Plan. The City has also undertaken extensive planning to prepare for a LRT station in Farmers Branch including the preparation of detailed studies, creation of a Tax Increment Financing District, acquisition of property in the proposed station area and adopting a station area plan.

LRT Alternative

This alternative would provide LRT service to the community, which is consistent with the City's ***Comprehensive Plan*** and the ***Farmers Branch Station Area Conceptual Master Plan*** adopted by the City Council in July 2002. Constructing the LRT project would also support the City's efforts to revitalize and redevelop the Old Farmers Branch Area. The rail station is considered a major tool for achieving the City's goals. It would be a major catalyst affecting both the viability and character of the area's redevelopment.

City Of Carrollton

No-Build Alternative

This alternative is not consistent with the City's ***Comprehensive Plan*** or plans for improving Old Downtown Carrollton. The Comprehensive Plan identifies a future DART rail line along the proposed LRT alignment and LRT service is an element of the City's ***Thoroughfare Plan***. The City's ***Old Downtown Carrollton Plan*** and ***Carrollton Renaissance Initiative*** support the development of a light rail station that serves Downtown Carrollton.

LRT Alternative

Construction of the proposed project would implement LRT, an improvement recommended in Carrollton's ***Thoroughfare Plan***. The LRT stations would support the City's redevelopment efforts for Old Downtown Carrollton as well as the Trinity Mills and Frankford Road areas. The Carrollton

City Council approved the DART LRT Station Areas, with stations as outlined in the Selected LRT Alternative, in June 2002.

Other Land Use or Master Plans

No-Build Alternative

This alternative is not consistent with any version of the ***UTSW Medical Center Master Plans*** (all three versions provide for LRT service in some location), the ***Dallas Love Field Master Plan***, or the ***Southwest Airlines Master Plan***. All of the land development plans contained LRT service provided by at least one of the alignment options under consideration.

The No-Build Alternative is also not consistent with the ***Dallas Plan***. Several of the Dallas Plan's recommendations include light rail service as part of their implementation strategy. This includes the Plan's strategies for smart growth for a sustainable community, improvements to air quality, and enhancements to the Harry Hines Medical District to support the biotechnology industry.

LRT Alternative

The Selected LRT Alternative and Medical Center Design Options A, B, C, and D are consistent with the updated UTSW Master Plans for years 2012 and 2025. The Harry Hines Base Alignment in the Medical Center area is not consistent with UTSW'S most current Master Plan given the alignment and station conflict with planned facilities, and would require purchase of land from UTSW. (The initial UTSW Master Plan reflected the Harry Hines Base Alignment, however it did not indicate the vertical profile of the light rail corridor. UTSW has since stated that their desire was for an underground LRT alignment.)

The Selected LRT Alternative is also consistent with concepts developed for Parkland Hospital's Master Plan. The Plan proposes expanding Parkland's medical facilities east towards Maple Avenue. The Hospital District has already acquired property immediately east of the UPRR Alignment and Parkland Station towards Maple Avenue and plans to acquire additional property in the vicinity of the station. The location of the Parkland Station under Medical Center Design Option D was not compatible with the hospital's plans for their property. The station's configuration conflicted with planned service tunnels and basement connections between future facilities – prompting the need to reconsider that design option.

The LRT Alternative is consistent with the ***Dallas Love Field Master Plan***. While the Love Field Design Option is not part of the Selected LRT Alternative, the proposed project allows for the opportunity to serve Dallas Love Field in the future using a separate alignment. The studies that were conducted during the Draft EIS provide valuable information on providing LRT service to the airport. In addition, ongoing coordination between DART and the City of Dallas will ensure that various options to provide direct rail service to the terminal remain available to support future expansion plans.

The LRT Alternative is consistent with the Southwest Airlines Master Plan. Southwest Airlines has incorporated the layout for the proposed Brookhollow Station into their Master Plan in order to design appropriate connections to the station area and across the LRT alignment. Southwest Airlines supported the Love Field Design Option studied during the Draft EIS because it provided a direct link between their headquarters and the terminal area. Currently, access between these locations is provided via shuttle bus service along Denton, Mockingbird and Cedar Springs. However, Southwest Airlines did not support funding mechanisms proposed by the City of Dallas that would have instituted a Passenger Facility Charge (PFC) on Dallas Love Field tickets.

The LRT Alternative is also consistent with ***The Dallas Plan***. The Harry Hines Base Alignment in the Medical Center area more strongly supported implementation of the plan's objectives compared to the Selected LRT Alternative and the other Medical Center Design Options. The

Harry Hines Base Alignment had two stations located in the Harry Hines Medical District – the designated biotech corridor. The alignment also provided a station in close proximity to UTSW's campuses. The Selected LRT Alternative provides for only one station within the Harry Hines corridor, within the Parkland Hospital expansion area. It does however, have a station at Inwood and Denton that can serve UTSW as the university facilities expand eastward along Inwood Road.

Impacts on Neighborhood Integrity and Community Cohesion
Neighborhood integrity focuses on the impact of the alternatives on the physical boundaries of neighborhoods identified in the project area. Community cohesion examines the social aspects, examining how the project might affect interactions among groups and persons in communities along the corridor.

No-Build Alternative
This alternative represents the "status-quo" relative to neighborhood integrity and community cohesion. The physical boundaries of the residential areas would remain unchanged and the social interactions of the residents would not be altered.

Selected LRT Alternative
The majority of the proposed alignment lies within the DART-owned former UPRR right-of-way. In these areas, the project would not impact neighborhood integrity. The neighborhoods have developed around the rail lines and the uses adjacent to the line tend to reflect this historical relationship. The LRT line would not introduce a new boundary but would reinforce the existing corridor.

In one area along the alignment, the Selected LRT Alternative would impact the future development of adjacent properties (even though the alignment is located in existing railroad right-of-way). North of Motor Street, the Selected LRT Alignment passes between properties owned by Parkland Hospital. While the ROW is an existing boundary through this area, the presence of the LRT line would create an additional physical division for future development on either side of the alignment. This impact, however, can be alleviated through the design of automobile and pedestrian connections underneath the aerial guideway. In addition, the LRT Alternative has been reviewed by Parkland Hospital and is compatible with the Master Plan concepts for their property in the area.

The Selected LRT Alternative (although within existing rail ROW) also divides an attendance zone for Hernandez Elementary School. In the DEIS, an at-grade crossing of Maple Avenue was proposed. Based on an updated traffic analysis, the alignment will be grade separated at Maple Avenue. This grade separation will avoid the safety issues associated with school-aged children crossing LRT at-grade since Maple Avenue is a primary walking route. The alignment will also present a physical barrier between the Kimsey Drive neighborhood and Rusk Middle School, which is currently a short-cut for school access. During final design, DART will assess ways to create a safe pathway for children to get to school, rather than requiring them to walk longer distances.

The alignment for the Selected LRT Alternative is located within existing railroad right-of-way with the exception of a line segment north of Webb Chapel Extension. In this area, the alignment and station are located on the west side of Denton Drive (and west of the RR ROW) requiring the acquisition and displacement of several households and businesses. A 170-unit apartment complex, one single-family structure and several businesses would be impacted.

The residential properties to be acquired are in very poor structural condition and are the only housing in the neighborhood located west of Denton Drive. The primary housing for this neighborhood is located east of Denton Drive. Redevelopment of the acquired properties could improve the neighborhood if the displaced residents are relocated according to DART guidelines

and the properties are developed in a manner sensitive to the residential areas to the east. (DART's relocation guidelines require replacement housing that is affordable, safe and sanitary. Most likely this would improve the living conditions of the displaced residents.) Harry Hines Boulevard, a very busy commercial corridor, is located just west of the impacted neighborhood. Redevelopment of the acquired properties could provide a land use buffer between Harry Hines and the residential areas to the east. It could also encourage new investment in the neighborhood due to the presence of the LRT station. In addition, it would provide a much-needed service to a low income, transit dependent community.

Looking at the corridor as a whole, construction of the LRT system would enhance community cohesion in the corridor. Corridor residents have a higher level of transit dependence than the average for Dallas County. The LRT system would provide access to a significant number of community services including medical services, community recreational programs and governmental centers. In addition, the LRT system would provide convenient transportation to a number of major employers in the Dallas area. The LRT system would alter the social interaction of the corridor residents by concentrating transit travel opportunities at the LRT stations. These new activity centers would increase the opportunity for community interaction.

Other Alignments Considered

Several other design options were considered for the LRT alignment – the Harry Hines Base Alignment, the Love Field Design Option and four Medical Center Design Options (A, B, C and D). All of these options would have located the LRT alignment outside of the existing UPRR right-of-way in more areas than the Selected LRT Alternative (some more so than others). Almost all of these alignment design options would have had a greater impact on private property, causing more private property acquisition and displacement than the Selected LRT Alternative. (The exception would have been the Love Field Design Option that, depending on the alignment chosen, would have primarily impacted publicly owned property.)

Assessing neighborhood integrity impacts, the most intrusive options would have been Medical Center Design Options A, B and C. Each of these alignment options would have created a new physical barrier through an old industrial area. The magnitude of the business displacements would have had an adverse impact on the economic viability of the area as a location for industrial uses. Option A would also have had a negative impact on Hernandez Elementary School, passing at-grade adjacent to the school property and creating a physical barrier between the school and its attendance zone east of Denton Drive. While the Selected LRT Alignment also divides an attendance zone for the school, the alignment would be grade separated at Maple Avenue. This avoids the safety issue of school-aged children crossing the LRT at-grade (that would have occurred under previous design options).

Station Vicinity Impacts

No-Build Alternative

The No-Build Alternative represents the "status-quo" position relative to land use and development activity. There would be no station vicinity impacts under this alternative.

Selected LRT Alternative

The LRT Alternative would have direct and indirect impacts on land use in the station vicinities. At some of the station sites, there would be a direct impact due to property acquisition for the station and related facilities. Some of these acquisitions would result in displacement of existing uses. (Acquisitions and displacements are addressed in Section 5.2) Where these impacts occur, they would alter the long-term use of the property. Indirect land use impacts generally occur within one-half mile of LRT stations.[3] The amount and scale of development near rail stations is often influenced by the presence and availability of transit services. Transit focused development can

[3]Institute of Transportation Engineers, Transportation Planning Handbook, 1999.

support revitalization and redevelopment of older neighborhoods and business centers. The University of North Texas (UNT) study found that most properties near the North Central Line Stations increased in value, particularly property with office and retail uses.[4] Given that the proposed project's station sites are primarily in nonresidential areas, property value enhancements would likely occur. An assessment of the potential impacts for each LRT station associated with the Selected LRT Alternative is provided below.

Victory Station
The proposed location of this station is the east side of the railroad right-of-way near the American Airlines Center. The station has no parking and property was acquired by DART in 2001 for a planned pedestrian plaza to connect the platform to the arena entrance. This station would serve commuter rail and light rail transit operations, significantly enhancing transit availability to a major public facility. It would also be a positive influence on the existing and planned development of adjacent property – the 70-acre mixed-use urban neighborhood known as the Victory Project.

Market Center/Oak Lawn Station (South)
The proposed location of this station is the east side of the railroad right-of-way near the Dallas Market Center. Parking facilities would be located on the east side of Harry Hines. There would be an elevated crosswalk connecting the platform to the parking area. Approximately 2.8 acres would be acquired for a parking lot. This station would provide transit access to the Dallas Market Center, a major employer and visitor destination, thereby supporting their long-term viability. The station would be designed to support a new pedestrian gateway to the Trade Mart, planned by Market Center.

The station's parking lot would impact the residential area east of Harry Hines. The lot would be located between Wycliff Avenue and Vagas Street, east of Harry Hines Boulevard. Three single-family homes on Wycliff and one on Vagas would be acquired. Two motels fronting on Harry Hines would also be displaced (see Section 5.2 for more detail). The parking lot has an entrance on Vagas Street, a two lane single-family residential street. The traffic impacts on Vagas Street could be significant with approximately 120 to 200 trips per day with up to 75 trips cutting through the neighborhood during peak hour. In addition to the traffic, this creates safety issues along the street for pedestrians and bicycles. The lot would also be adjacent to residential properties, causing potential visual impacts. DART has committed to work with the City of Dallas and the neighborhood during final design of the parking lot to determine appropriate traffic control measures to limit impacts on Vagas Street and to address visual impacts on adjacent residential properties.

Parkland Station (UPRR)
This aerial station would be located over Motor Street, providing access to development areas both north and south of Motor Street. While the station itself would be located within DART-owned ROW, the bus transfer area would require the acquisition of approximately 2.8 acres east of the ROW. Development west of the station would remain under Parkland's ownership, but could be coordinated to encourage transit supportive uses. The 2.8 acre acquisition would displace two businesses located on Motor Street, Double E. Inc. and Centex Corporation (see Section 5.2 for more detail).

This station would have positive economic impacts on adjacent properties. Parkland recently purchased 24 acres immediately east of the rail ROW for redevelopment as part of their Master Plan. Their Master Plan, coupled with the new Parkland LRT Station, would serve as a catalyst to create new market opportunities for this area. Development of this site would enhance the station vicinity and provide a convenient connection between the transit station and the medical facilities in the area. DART will continue to coordinate with Parkland to create a pedestrian-oriented

[4] Bernard Weinstein, PhD and Terry Clower, PhD.

environment that supports connections between the LRT Station and surrounding development. Ambulance operations would continue to function normally.

Inwood Station (South)
This aerial station would be located at the southwest corner of Inwood Road and Denton Drive. Approximately 7.5 acres would be acquired for the station. Most of the property to be acquired is vacant, but there would be one business displaced (Lawns of Dallas). An additional business would be displaced by the alignment just south of the station, S&A Automotive. (See Section 5.2 for more details.) The proposed station layout would provide automobile access to the site from Denton Drive and Inwood Road. The alignment and station would be across from a single-family residential area immediately east of Denton Drive. This would cause some traffic impacts to Cherrywood Avenue; however, the impact was not deemed to be significant (50 trips per day). This would also cause some additional visual impacts to the neighborhood. This issue is addressed in Section 5.6.

The station would also be in the vicinity of Rusk Middle School, but traffic and safety impacts would be minimized because the LRT would be aerial in this area. A single-family residence would be acquired on Kimsey Street due to a vibration impact from the alignment.

Brookhollow Station
This station would be located between Wyman and Burbank Streets. Southwest Airlines has indicated that the company plans to expand their corporate facilities in this area. The station would support their plans while also serving the residential area to the south and west. In addition, there is vacant land in the surrounding area that has the potential to be developed into higher density, transit-supportive uses.

Bachman Station
The LRT line would run parallel to Denton Drive through this area and the proposed station is located at the southwest corner of Denton and Community Drives. There are several direct impacts, both short term and long term, for the station vicinity. Property would be acquired for both the station and the LRT line. Most of this property is improved with existing uses and all of these would be displaced. (See Section 5.2 for more information). Once the station and line were built, any excess developable property would probably be improved with higher density transit-supportive uses. The property would eventually have access to transportation service from two light rail lines (Carrollton and Irving/DFW LRT lines) and proximity to several major thoroughfares.

The properties east of the station are developed with multi-family uses. Some of these properties are in poor structural condition, and according to City reports, several have multiple code violations. The LRT station would create market opportunities for redevelopment or renovation of these properties.

Walnut Hill/Denton Station
The proposed location for this aerial station is east of Denton Drive and the DART railroad right-of-way, and north of Walnut Hill Lane. This station would displace a manufacturing business currently located on the property. The area around the station is developed with a mixture of light industrial, retail and commercial uses. This variety of land uses would likely continue; however, the station would be a catalyst for redevelopment of some of the older more obsolescent properties.

Royal Lane Station
The location of this proposed aerial station is just east of the DART railroad right-of-way and north of Royal Lane. Several properties would be acquired for this station and a number of businesses would be displaced. The area surrounding the station is a wholesale/retail center consisting of several Korean-American and other Asian-American owned businesses. The ***Stemmons/Harry***

Hines Corridor Implementation Study contained strategies for creating an "Asian Trade District" in this area. A DART station in this location could contribute to these efforts by creating a transit gateway into the trade district.

Farmers Branch Station
This station would be located south of Valley View Lane along the DART railroad right-of-way. It would be located on property owned by DART and the City of Farmers Branch. The location is within the City of Farmers Branch Tax Increment Financing (TIF) District, which was created to attract transit-supportive development to the Old Farmers Branch Area. In July 2002, the City Council approved a ***Conceptual Master Plan*** to guide development of residential and commercial uses around the station. The station is considered an integral component of these efforts and would have a major influence on the viability and character of the development.

Carrollton Square Station
The proposed location of this aerial station is north of Belt Line Road and east of the DART railroad right-of-way. Several properties would be acquired, displacing both business and residential uses. In June 2002, the City approved the proposed station location and the ***Carrollton Renaissance Initiative*** – a plan for commercial and residential redevelopment in Old Downtown Carrollton. The plan proposes a pedestrian connection between the LRT station and Old Downtown Carrollton. The station would support the City's efforts to implement its redevelopment plan.

Trinity Mills Station
The proposed location of this station is north of the planned Dickerson Parkway Extension, south of the new President George Bush Turnpike and east of the DART railroad right-of-way. Several properties, both residential and light industrial, would be acquired for this station. The City recently approved a station area plan for the station and surrounding property. The plan provides guidelines for the appropriate mix and density of land uses for the area and outlines the street improvements that are required.

Frankford Station
This station would displace a new warehouse/distribution building. It would provide LRT access to the Frankford Trade Center employment center. Over the long term, some of the industrial properties might be redeveloped into higher density uses to take advantage of the station proximity. The City of Carrollton recently approved a station area plan for the station and surrounding properties.

Rail Operating Facility
Three sites were considered in the Draft EIS for the location of the proposed Rail Operating Facility. The selected site is located east of Denton Drive and north of Lombardy Lane. This area is dominated by industrial businesses. A portion of this site was occupied by a lumberyard that is now vacant. The proposed facility would displace as many as 16 small light industrial businesses adjacent to the former lumberyard. Indirect impacts would be minimal as the surrounding land uses are compatible with the facility.

<u>Other Alternatives Considered</u>
Market Center/Oak Lawn Station (North)
During the Draft EIS, an alternative location for parking was analyzed. A parking structure was proposed on 2.1 acres between Wycliff Avenue and Hondo Street, east of Harry Hines. There would have been four single-family residences and three businesses displaced – a similar level to the proposed location. The parking structure would have impacted the remaining residences on Hondo to a much greater degree than the Selected LRT location and would have been more intrusive into the neighborhood. It would have adversely impacted several homes that would have

been located just across the street from the structure, some of which have been recently constructed and/or improved.

Parkland Station (Harry Hines Base Alignment)
During the Draft EIS, several alternative alignments were evaluated for the Medical Center area. The Harry Hines Base Alignment contained an aerial station in the median of Harry Hines Boulevard directly across from Parkland Hospital. There was no parking planned for this station and property acquisition would have been minimal (the only real estate acquired would have been for road improvements). The proposed station would have had a direct connection to the pedestrian bridge over Harry Hines Boulevard.

Parkland Station (Medical Center Design Options A, B, and C)
The alignments for Medical Center Design Options A, B and C proposed an open-cut LRT station at the northeast corner of Lofland and Harry Hines – similar to the service provided by the Parkland Station in the Harry Hines Base Alignment. This station site would have required acquisition of approximately 4 acres of private property. Part of this property would have been acquired for construction staging. Once construction was completed, the property would have been available for joint development opportunities.

Parkland Station (Medical Center Design Option D)
Medical Center Design Option D proposed an open-cut station located east of Harry Hines Boulevard and north of Motor Street. Approximately 3 acres would have been acquired from Parkland Hospital displacing their Support Services Facilities located at 5000 Harry Hines. Ongoing coordination with Parkland revealed that a shallow tunnel and station at this location would have complicated their ability to develop adjacent properties, substantially increasing the project costs. This factor combined with the Hospital's plan to expand their facilities east towards Maple Avenue made the Selected Alternative (UPRR) location a more viable alternative.

UTSW/Exchange Park Station (Harry Hines Base Alignment)
This aerial station would have been located on the east side of Harry Hines adjacent to UTSW's North Campus. No parking was planned at this location. Approximately 4.6 acres of property would have been needed for bus and circulator needs and kiss and ride. This station would have provided LRT service to a major medical campus and employer (UTSW), an adjacent hospital (St. Paul) and the Exchange Park Office Complex. This station would have supported future UTSW expansion by providing additional transportation services to the area. The station would also have been a catalyst for new investment and renovation of Exchange Park. However, the station bus transfer area would have conflicted with recent changes to the UTSW Master Plan.

Inwood Station (North)
This alternative was considered with Medical Center Design Options A, B, C and D. It would have placed an aerial station on approximately 5 acres at the northwest corner of Inwood Road and Denton Drive. It would have displaced five businesses, including one business that would have likely had a significant hardship in relocation. In addition, the north option would have created additional traffic for the businesses remaining on Sadler Circle (an access street to the station). The location also caused potential traffic and safety issues for students attending Rusk Middle School, located at the northeast corner of Denton and Inwood.

Love Field Station (Design Option)
This station was part of the Love Field Design Option studied during the Draft EIS. It would have been located directly on Dallas Love Field property. It would have enhanced access opportunities to the airport and could have reduced parking requirements by providing an alternative mode of access. The below-grade, open-cut station would not have impacted airside facilities but would have required partial or complete demolition of a vacant ticket wing. The vacant ticket wing is the

location of a possible new ticketing and baggage wing as proposed in the Dallas Love Field Master Plan.

5.1.2 Economic Impacts

The economic impact of the No-Build versus the LRT Alternative is significant. The LRT project affects future economic development at both a corridor and regional level. It also has significant implications for labor force accessibility to employment centers. The LRT project would be an economic stimulus to the Dallas area economy while enhancing transportation options for the corridor's disadvantaged population. In addition, the project would be a catalyst for joint development at some station locations, benefiting both public transit ridership and DART revenue. These impacts and related issues are examined in the following sections.

Regional and Corridor Impacts

No-Build Alternative

The No-Build Alternative represents the "status-quo" position. There would be no change in transportation service, land use or development within the corridor and therefore no impact to economic activity.

LRT Alternative

UNT conducted a study of DART's economic impact that revealed that local commercial real estate professionals consider the light rail system a positive force for economic development in the Dallas region. DART is seen as a critical factor in Dallas' long-term growth prospects because of increasing traffic congestion and air quality problems. The transit system gives the region a competitive edge to attract new businesses and business relocations.

The proposed project would have a positive economic impact upon the region and the corridor. It would provide transit service to congested high employment centers such as the Dallas Central Business District and the Medical/Market Center areas. It would also increase accessibility and mobility for the corridor residents – increasing the job opportunities available to this population. There would be other economic benefits as well – construction and operation of the system would have positive benefits to the local economy. These impacts and related issues are examined in the following sections.

Transportation Disadvantaged Population

The corridor contains a high percentage of transportation-disadvantaged households. This includes individuals without automobiles, the elderly, the young and persons with income below the poverty level. **Table 5-1** examines these characteristics for the corridor and Dallas County.

The corridor has a higher percentage of low-income individuals, a higher number of elderly persons, and more individuals without access to an automobile than the population of Dallas County as a whole. The median household income of the project corridor is also much lower than the median for either Dallas County or the DART Service Area.

TABLE 5-1
TRANSPORTATION DISADVANTAGED POPULATION

Characteristic	Project Corridor	Dallas County
Low Income	16%	13%
Population Under 18	25%	27%
Population Over 64	22%	8%
No Automobile	12%	8%

Source: Wendy Lopez & Assoc. and Renee Perkins Jaynes/ U. S. Census Bureau, 1990

The median household income in 1990 was $28,628 compared to $42,183 for the Service Area and $31,605 for the County. There are certain portions of the study area that are more transit dependent than the corridor as a whole. In Census Tract 19, 67% of the residents were low income in 1990 and 66% of the population did not have access to an automobile. In Census Tract 4.01, 41% were low income and 32% did not have

access to an automobile. The most transit dependent portion of the corridor in 1990 was concentrated in the inner city areas – from Downtown Dallas to Inwood Road.

No-Build Alternative
The No-Build Alternative would not provide any additional transit opportunities for the transit-disadvantaged population within the corridor or the DART Service Area, nor would it be able to draw forecast Dallas area growth to the corridor.

LRT Alternative
The proposed LRT project would provide four stations accessible to the residents located between Downtown Dallas and Inwood Road. The stations could encourage corridor development and LRT service would enhance resident mobility to further increase their accessibility to employment opportunities. The corridor is projected to add 67,298 jobs by the Year 2025. LRT service could concentrate those jobs along the alignment, which would provide more efficient access to them. In addition, the project is accessible to two of Dallas's largest employers: Parkland Hospital and Southwest Airlines. This employment concentration creates opportunities for all corridor residents, but especially for those who are transportation disadvantaged.

DART's mobility impaired patrons would also benefit economically from increased accessibility. The entire DART system, including the LRT, is accessible to mobility-impaired persons. The proposed project would increase employment accessibility for these individuals as well.

Regional Accessibility
Regional accessibility examines how many people are provided the opportunity to use transit services. The project corridor has one of the highest employment concentrations in the region. It contains traditional suburb to downtown travel, but also reverse commute travel from the southern portions of Dallas County to employment centers within the corridor. According to NCTCOG, employment in all the census tracts within the corridor grew between 1990 and 1998, and the majority had double-digit growth. Employment is projected to increase to 365,747 by the year 2025. The two alternatives vary significantly in addressing regional transportation needs.

No-Build Alternative
The No-Build Alternative would provide no additional transportation services to the corridor beyond those already planned or programmed. It would contribute to increased traffic congestion and travel time delays in the corridor and the region.

LRT Alternative
Studies have been conducted that estimate the distance most people are willing to travel to reach transit stations.[5] They reveal that most patrons will walk up to 0.62 mile to reach a stop or station, will use feeder transit up to 4 miles, and will drive up to 6.2 miles to access park and ride facilities. The LRT Alternative will provide improved accessibility to residential areas and employment centers in the corridor.

Employment Impacts
No-Build Alternative
Employment within the Study Area is projected to grow from 298,449 in 1995 to 365,747 by 2025. The No-Build Alternative would not provide light rail transit to service this growth, increasing congestion in this corridor. In addition, there would be no employment generated from design and construction of the LRT project.

[5] Institute of Transportation Engineers, Transportation Planning Handbook, 1999.

LRT Alternative

Construction of the proposed project would have direct and indirect employment impacts in the local economy. Direct impacts would result from construction labor, employment related to the production of the goods and materials for the project, and design, engineering and architectural services employment. Indirect impacts would result from the "multiplier effect" of these expenditures in the local economy. The Texas State Comptroller's Office maintains an input/output model that estimates direct and indirect employment impacts based on different expenditure types, including civil construction transportation projects.[6] These multipliers were used to estimate the employment impacts from construction of the project. The employment impacts of the Selected LRT Alignment are provided in **Table 5-2**. Employment impacts for the other alignments considered would be similar, varying with the amount of the construction expenditure for each.

TABLE 5-2
LRT ALTERNATIVE EMPLOYMENT IMPACT

Alignment	Total Capital Cost[1] (millions)	Direct Jobs	Indirect Jobs	Total Jobs
Selected LRT Alternative	$715	13,278	13,157	26,435

[1] Hard construction costs and soft costs, such as professional services, have different employment multipliers. All cost estimates were based on 2002 dollars. Costs include a portion of the Rail Operating Facility to be used for Northwest Corridor but do not include real estate, LRT vehicles, or ticket vending machines.

Source: Renee Perkins Jaynes, Sunland Engineering, April 2003

In addition to new jobs from construction, there would be long-term employment impacts from the additional jobs created to operate and maintain the new LRT service. This new employment would also have a multiplier effect on the local economy resulting in additional expenditures and job creation.

The proposed Northwest Rail Operating Facility would displace a vacant lumberyard and up to 16 small industrial businesses in the Lombardy and Denton Drive area. However this job loss would be offset by the number of jobs created at the facility – estimated to be approximately 225 jobs. This could improve employment opportunities for the nearby work force. There would be a loss of property tax revenue from development of this site – approximately 34.3 acres of developable land would be removed from the tax rolls.

Joint Development Opportunities

Joint development is an opportunity for enhancing revenue and ridership. It is a public/private venture whereby a private development project is physically related to a transit station through either a direct connection from an adjacent location or air rights over the station. The transit authority's financial benefit from the project can be realized through several means. Often the transit agency receives revenue from the proceeds of the sale or leasing of land or air rights. Revenue can also be generated through connection fees. Sometimes, the private sector makes a contribution of land or offsets a portion or all of the cost of the station.

No-Build Alternative

With the No-Build Alternative, there are no joint development opportunities within the corridor.

Selected LRT Alternative

There are four stations in the Selected LRT Alternative where DART is acquiring property and would have residual land available after construction that could be used for joint development – Bachman, Walnut Hill/Denton, Carrollton Square and Frankford. There are two other station sites where DART has the opportunity to tie into adjacent planned development – Parkland and Farmers Branch. At Trinity Mills, construction of the station would create the opportunity for redevelopment

[6] Economic Outlook Group, State of Texas Comptroller, August 2002.

of the existing North Carrollton Transit Center (just east of the station). The joint development potential of all of these station sites is examined below. For the remaining station sites, they do not have excess land available – the majority of the site would be needed for parking, kiss and ride or bus access facilities. This includes the Victory, Market Center/Oak Lawn, Inwood, Brookhollow, and Royal Lane Stations. This does not preclude surrounding property owners from working with DART to create a joint development project in the future.

Parkland Station
Approximately 2.8 acres would be acquired for bus transfer areas for the station. Parkland Hospital plans on developing their property adjacent to the station on the east and west sides of the ROW. DART and Parkland will coordinate the final design of the station towards development of a pedestrian plaza or other transit oriented use on Parkland's property west of the station. In addition, there is a large vacant tract just south of Motor Street presenting a potential joint development opportunity with a possible connection of the station to future uses on the site.

Bachman Station
The joint development potential of this site would depend upon the final configuration of the property (the size of development parcels available after the line and station are built). If suitable development sites are available after development of the line, the property could have significant potential for a future joint development project. This site would have future market potential due to the station serving two lines and the high number of boardings projected at this location. On the block bound by Cullum, Community, Harry Hines and Denton, approximately 2.9 acres have been identified for development opportunities/expansion parking once construction is complete. On the block north of Community, there may also be development opportunities. The exact acreage is unknown at this time since this property would also be used for a future Irving/DFW LRT alignment.

Walnut Hill/Denton Station
Given the large size of the property to be acquired for this station site, a portion of this site would be made available for joint development. Approximately 11 acres would be acquired for the station and 3.7 acres has been identified for development/expansion parking. The excess property has frontage along Walnut Hill and is adjacent to the United Parcel Service facility (a major employer in the corridor). However, the existing market around the property is primarily industrial and heavy commercial indicating only a low to moderate potential for joint development.

Farmers Branch Station
Although DART would not be acquiring property at this location, the City of Farmers Branch has developed a station area plan for the area that could create joint development opportunities for DART. An element of their plan includes the future conversion of the surface DART park-and-ride into a parking garage with ground level and other uses to support future development.

Carrollton Square Station
Approximately 6.6 acres would be acquired just north of Belt Line Road. A small amount of that area, about 1.2 acres, has been identified for development/expansion parking. This provides for some small-scale joint development opportunities in the near term. For the future, more broad scale joint development opportunities may become available if the City's station area plan for Carrollton Square becomes a reality. That plan envisions a dynamic commercial and residential area directly adjacent to the station.

Trinity Mills Station
Construction of this station would create joint development opportunities for DART at the North Carrollton Transit Center location, located approximately ¼ mile east of the proposed LRT station. The property, located on Dickerson Parkway, would no longer be needed for transit purposes and

would be vacated once the LRT station is operational. The property is accessible to the new President George Bush Turnpike and could be redeveloped into a higher use.
Adjacent to the Trinity Mills Station site, the City has adopted a station area plan that could create future joint development opportunities for DART.

Frankford Station
This station site would be quite large – approximately 17 acres. Of that acreage, approximately 4.8 acres have been identified for development/expansion parking. The City of Carrollton has also adopted a station area plan for the Frankford Station. The vision for this area is to promote mixed-use transit oriented development around the station. If this plan becomes a reality, it could provide substantial joint development opportunities for DART on their 17 acres.

Other Alternatives Considered
Market Center/Oak Lawn Station (North)
The DEIS Station included a structured parking garage that would have been constructed at this location on approximately two acres. There would have been a small amount of residual land fronting on Harry Hines that would have been available for joint development.

Parkland Station (Medical Center Design Options A, B, and C)
Residual land after the construction of this below-grade station would have presented significant joint development opportunities adjacent to and potentially over the station through the use of air rights. Likely uses would have been Medical Center facilities.

Parkland Station (Medical Center Design Option D)
Approximately three acres would have been acquired on the block bound by Harry Hines, Motor, Lofland and Redfield. Initially, it was thought that the design would allow for the development of the air rights over the station creating a joint development opportunity with Parkland Hospital. However, subsequent design reviews with Parkland revealed that a shallow cut tunnel and station on this site would have substantially restricted their ability to develop the property (below-grade) to meet their needs.

Love Field
No joint development opportunities were available for this station.

5.1.3 Mitigation Measures
Representatives of each of the corridor cities, other public agencies and the general public will continue to be involved in the planning and design process to ensure all impacts are identified and to assist in the development of mitigation measures. This includes working with City staff and their consultants to coordinate the design process with local plans currently in place and with those still being developed. Specific mitigation for acquisitions and displacements are discussed in Section 5.2.

5.2 ACQUISITIONS AND DISPLACEMENTS
This section describes the potential acquisitions and displacements associated with the No-Build Alternative and the Selected LRT Alternative. There were a number of design options considered during the Draft EIS and the potential impacts of these options are briefly discussed (a complete outline of impacts is covered in the Draft EIS). The following assessments are based on preliminary engineering drawings representing a ten percent level of design. Because of this, the following impact assessment is not a complete list of all real estate to be acquired for the project. As final design progresses on the alignment and the station areas, there will be refinements, including additions and deletions, to the proposed right-of-way and parcel acquisitions.

5.2.1 Real Estate Acquisitions

Acquisitions of real property (land and buildings) are described in this section. Acquisitions include occupied and vacant structures. Household and business displacements are in Section 5.2.2.

No Build-Alternative

This alternative represents the status quo and there would be no acquisition of property.

Selected LRT Alternative

Most of the properties acquired would be for construction of the LRT stations and related facilities (bus bays, pedestrian areas and parking). Property would also be needed where the alignment is located outside of the railroad right-of-way or where there is insufficient right-of-way width; to construct road improvements made necessary due to the presence of the LRT system; for construction staging, and for the Northwest Rail Operating Facility.

Stations and Rail Operating Facility

Approximately 107.2 acres would be acquired for the construction of LRT stations and the Northwest Rail Operating Facility. Of this 72.9 acres would be acquired for the stations. Eleven of the twelve stations will require acquisition of private property – this includes Victory, Market Center/Oak Lawn, Parkland, Inwood, Brookhollow, Bachman, Walnut Hill/Denton, Royal Lane, Carrollton Square, Trinity Mills and Frankford. The only station that would be located entirely on DART property is the Farmers Branch Station.

The selected location of the Northwest Rail Operating Facility is at Lombardy Lane and Denton Drive. Approximately 34.3 acres would be acquired at this location. A summary of the acquisitions for the stations and the Rail Operating Facility is in **Table 5-3** (displacement information is also included).

TABLE 5-3
STATION AREA AND RAIL OPERATING FACILITY ACQUISITIONS AND DISPLACEMENTS

LOCATION	AREA TO BE ACQUIRED	LAND USE	CURRENT STRUCTURES	OCCUPANCY STATUS
Victory Station				
East of RR ROW at American Airlines Center	0.9 Acres (acquired 2001)	Institutional (Recreational)	Vacant	N/A
Market Center/Oak Lawn Station				
East of Harry Hines Between Wycliff & Vagas	2.8 Acres	Residential and Commercial	Four Single Family Residences, Two Motels	All occupied
Parkland Station				
Motor St. at UPRR	2.8 Acres	Industrial	Two Light Industrial Firms	All Occupied
Inwood Station				
South of Inwood & West of Denton Dr.	7.5 Acres	Commercial and Industrial	Two Office Buildings and Sheds for Landscaping Business	All Occupied except one office bldg.
Brookhollow Station				
Southwest corner Denton Dr. & Wyman St.	3.0 Acres	Industrial and Commercial	Vacant	N/A
Bachman Station (includes alignment and construction staging adjacent to station)				
West of Denton Drive and south of Community	10.6 Acres	Multi-family, Retail and Commercial	170 apartment units, Nightclub, Manufacturing Firm, Restaurant, Auto Sales, Auto Repair Sers. and Retail Strip Center	All occupied except for nightclub

TABLE 5-3 (Continued)
STATION AREA AND RAIL OPERATING FACILITY ACQUISITIONS AND DISPLACEMENTS

LOCATION	AREA TO BE ACQUIRED	LAND USE	CURRENT STRUCTURES	OCCUPANCY STATUS
Walnut Hill/Denton Lane Station				
North of Walnut Hill & East of Denton Dr.	11.0 Acres	Industrial	Manufacturing Business	Occupied
Royal Lane Station				
North of Royal, Between Denton and Grissom	3.4 Acres	Commercial and Industrial	Auto Sales, Carpet Store, Comm. Lawn Equipment Business, Refrigeration Co., Auto Repair	All occupied
Farmers Branch Station				
South of Pike St. & West of RR ROW	None	Park & Ride	N/A	N/A
Carrollton Square Station (includes alignment and street improvements adjacent to station)				
North of Belt Line, East of LRT Line	6.6 Acres	Residential, Commercial and Industrial	4 Single Family Residences, Strip Retail, Restaurant, Electrical Supply, Printing Service, Service Station and RR depot and yard	All occupied except for depot
Trinity Mills Station				
North Dickerson Pkwy. Extension, east of Broadway Street	7.4 Acres	Residential and Industrial	2 single Family Residences, Industrial Supply Firm, Landscape and Irrigation Firm	All occupied
Frankford Station				
South of Frankford Road & East of RR ROW	16.9 Acres	Industrial	Office/Warehouse Distribution Building (containing a business furniture company)	Occupied
Rail Operating Facility				
North of Lombardy Lane & East of Denton Dr.	34.3 Acres	Industrial	Lumber yard, 16 small light industrial businesses	All occupied except for lumber yard
Total Area to be Acquired	107.2 Acres			

Source: Renee Perkins Jaynes; Wallace Roberts & Todd; Wendy Lopez & Associates, April 2003

Alignment and Related Improvements

For engineering and design purposes, the LRT alignment has been divided into five sections. The first line section, NW-1A (Houston Street to Turtle Creek) has independent utility and began construction in 2002. The limits of each remaining line section are the following: NW-1B Turtle Creek to Bomar Avenue; NW-2 Bomar Avenue to Community Drive; NW-3 Community Drive to Valley View Lane; and NW-4 Valley View Lane to Frankford Road. The alignment requires real estate acquisition along all sections. In addition to acquisitions to accommodate the alignment, private property would be needed for street improvements made necessary by the LRT, construction staging and traction power substation locations. (Of the estimated 14 substations along the alignment, 12 are located in existing street or LRT right-of-way. Two impact private property.) Approximately 18.0 acres of private property have been identified for acquisition for these uses as of preliminary design (10 percent).

NW-1B
Approximately 0.7 acres would be acquired for NW1-B. Two properties are impacted – 2727 Kimsey and 2537 Butler. Approximately 0.18 acres would be acquired at 2727 Kimsey due to a vibration impact from the LRT alignment. Approximately 0.51 acres would be acquired at 2537 Butler due to insufficient RR right-of-way width – additional property is required to accommodate the alignment. (See Section 5.2.2 for displacement information).

NW-2
The NW-2 line section requires the acquisition of approximately 2.1 acres. The majority of these acquisitions are small pieces of property (0.25 acre or less) adjacent to existing street or railroad rights-of-way. These would be acquired for street improvements made necessary by the LRT and because of insufficient railroad right-of-way width in some locations. The exception to this is the acquisition of a block bound by Cullum, Community, Harry Hines and Denton (the location of the Bachman Station). In this section of NW-2, the LRT alignment would be located west of Denton Drive (outside of existing railroad ROW). This entire block would be acquired to accommodate the LRT alignment, a station and construction staging. The acreage for this acquisition is not included in the above total for NW-2 – it is included in the total acreage for the Bachman Station.

NW-3
Approximately 10.9 acres would be acquired for NW-3. Of that amount, 9.34 acres would be for acquisition of the block bound by Community, Northwest Highway, Jameson and Denton. This block is directly north of the block described above. Acquisition of the block would be for the Carrollton LRT alignment and to accommodate a connection to the future Irving LRT line. The proposed Irving Line would join the Carrollton Line in a Y-configuration on this property. Preliminary design also indicates that the property would be used for a traction power substation and construction staging. The remaining property to be acquired along NW-3, 1.58 acres, would be for street improvements and to provide additional right-of-way adjacent to the railroad corridor.

NW-4
The NW-4 requires the acquisition of approximately 4.3 acres. Almost half of this property is needed to widen the right-of-way just north of the Cotton Belt rail line. Approximately 0.2 acre would be acquired for a traction power substation. The remaining property acquired would be for street improvements and additional right-of-way along the LRT corridor.

Table 5-4 summarizes the acquisitions for all line sections.

TABLE 5-4
SUMMARY OF LRT ALIGNMENT ACQUISITIONS AND DISPLACEMENTS

LOCATION	AREA TO BE ACQUIRED (ACRES)
Line Section NW-1B Turtle Creek to Bomar Avenue	0.7
Line Section NW-2 Bomar Avenue to Community Drive	2.1
Line Section NW-3 Community Drive to Valley View Lane	10.9
Line Section NW-4 Valley View Lane to Frankford Road	4.3
Total for all Line Sections	18.0
Note: The land acquisition in this table is in addition to that described in **Table 5-3**.	

Source: Renee Perkins Jaynes; DART Real Estate; Chiang, Patel & Yerby, Inc; November 2002, April 2003

Other Alignments Considered and Station Areas
Alignments
Six alternative alignment options were evaluated during the Draft EIS. Five of these options focused on the Medical Center area. One of the options proposed an LRT alignment within the right-of-way of Harry Hines Boulevard until the line turned east just south of Mockingbird. This option had minimal impact on private property; most of the alignment would have been in street

right-of-way. The private property that would have been impacted included UTSW property near the North Campus and several commercial properties on the south side of Mockingbird Lane.

Three of the options considered in the Medical Center area (Medical Center Design Options A, B and C) proposed turning the alignment east from Harry Hines just north of Lofland Street. These options had a very significant impact on private property through that area; approximately 23 to 28 acres would have been required. Medical Center Design Option D, developed during the Draft EIS comment period, proposed turning the alignment east from Harry Hines just north of Motor Street, and would have avoided many of the private property impacts associated with Options A, B and C. The LRT line would have been located primarily within DART-owned railroad right-of-way at a point further south in the alignment.

Relocation of the Inwood Station and grade separation of Maple Avenue further avoids some of the property acquisitions due to alignment widening north of Inwood and street reconstruction that was previously associated with the design options.

The fifth alignment option considered during the DEIS was the Love Field Design Option. This alignment had very minimal impact on private property – less than an acre – since the majority of the property impacted was City of Dallas street right-of-way and Dallas Love Field airport property.

Stations

Seven alternative station locations were evaluated during the DEIS. The Harry Hines Base Alignment contained an aerial Parkland Station located within the right-of-way of Harry Hines Boulevard. This alignment option also proposed a station at UTSW's North Campus at Exchange Park Boulevard. The station would have required 4.6 acres of private property. Medical Center Design Options A, B and C proposed a station near Harry Hines and Lofland that would have required 4.0 acres of private property. Medical Center Design Option D proposed a station at Motor and Harry Hines, which required approximately 3.0 acres from Parkland Hospital. The Draft EIS also examined an option for the Inwood Station (north of Inwood) and Market Center/Oak Lawn Station (north of Wycliff Avenue). The Inwood Station would have acquired 5.0 acres of private property, and the Market Center/Oak Lawn Station would have acquired 2.1 acres of property. For the Love Field Option, a station would have been located on airport property, owned by the City of Dallas.

Rail Operating Facility

Two alternative locations were assessed during the DEIS for the Northwest Rail Operating Facility. One site was approximately 36 acres located at Webb Chapel and Denton Drive. This property is the location of the City of Dallas' Solid Waste Transfer Center and DART's Northwest Bus Operating Facility. The second site considered was located at Northwest Highway and Denton Drive. This site would have required the acquisition of 23 acres from private property owners.

5.2.2 Displacements and Impacts

Displacements of existing households and business uses in occupied structures are described in this section. Acquisitions of real property (land and buildings) were described in Section 5.2.1.

No Build-Alternative

This alternative represents the status quo and there would be no displacements.

Selected LRT Alternative

Most of the properties to be acquired have existing occupied structures. The uses range from single-family residential to heavy industrial. For the stations and alignments that have displacements, a brief description of the displaced uses and an assessment of potential impacts are outlined below. Displaced businesses and households are summarized in **Table 5-5**.

TABLE 5-5
SUMMARY OF BUSINESSES AND HOUSEHOLDS DISPLACED

LOCATION	Number of Households Displaced	Number of Businesses Displaced
STATIONS AND RAIL OPERATING FACILITY		
Victory	0	0
Market Center/Oak Lawn (South)	4	2
Parkland (UPRR)	0	2
Inwood (South)	0	1
Brookhollow	0	0
Bachman (including alignment and construction staging areas adjacent to station)	163	13
Walnut Hill/Denton	0	1
Royal Lane	0	5
Farmers Branch	0	0
Carrollton Square (includes LRT Alignment and Main Street Improvement)	4	9
Trinity Mills	2	2
Frankford	0	1
Rail Operating Facility	0	16
ALIGNMENT AND RELATED FACILITIES		
NW-1B Turtle Creek Blvd. to Bomar Ave.	1	1
NW-2 Bomar Ave. to Community Dr.	0	4
NW-3 Community Dr. to Valley View Lane	1	10
NW-4 Valley View Lane to Frankford Road	5	0
TOTAL DISPLACEMENTS	**180**	**67**

Source: Renee P. Jaynes; DART Real Estate; WRT; Chiang, Patel and Yerby; April 2003

Stations

Market Center/Oak Lawn Station (South)

The park-and-ride for this station would be located east of Harry Hines Boulevard between Wycliff and Vagas. There would be two businesses and four residences displaced. The businesses are the La Casita Motel located at 4300 Harry Hines Boulevard and the Park Crest Inn at 4318 Harry Hines Boulevard. Acquisition of the motels would not negatively impact room availability in this area. There are several motel and hotel facilities located in the immediate area.

Three of the single-family structures displaced are located on Wycliff Avenue. Two of the homes are tenant occupied (2214 and 2218 Wycliff) and were built in the 1950's. The 2214 Wycliff address is the residence for the Park Crest Inn Manager. The third house on the street, 2222 Wycliff, is owner occupied and was recently constructed (2002). The fourth residence impacted is 2231 Vagas Street. It is a tenant occupied structure built in the 1930's.

The values of the properties indicate that lower-income individuals occupy the households. DART Board adopted policies require that affordable, decent, safe and sanitary housing be made available to households that are relocated in accordance with Federal regulations. Section 5.16 provides additional information regarding environmental justice concerns.

Parkland Station (UPRR)

The Parkland Station and associated bus transfer area would displace two businesses north of Motor Street and east of the UPRR right-of-way. Double E, Inc., a manufacturing business, occupies four structures at 2031 and 2039 Motor. The buildings range in size from a 1,800 square foot office building to a 10,420 square foot storage/warehouse structure. The second business impacted is Centex Corporation, which is located at 2201 and 2211 Motor. There are two industrial buildings on these properties.

Inwood Station (South)
This station would displace two commercial structures located at 2722 Inwood Road, all of which are occupied by one business, Lawns of Dallas. An additional vacant commercial building at 2708 Inwood would also be impacted. Both properties impacted are owned by the same investment partnership.

Brookhollow Station
There are no displacements required for the Brookhollow Station. Acquisition of 3.0 acres of vacant property is required.

Bachman Station (including the LRT alignment and construction staging)
For the Bachman Station, the LRT alignment and construction staging area, DART would acquire a block bounded by Harry Hines on the west, Denton Drive on the east, Cullum Lane on the south, and Community Drive on the north. This would displace a number of businesses and one large apartment complex.

The largest impact would occur at the apartment complex located at the southwest corner of Community and Denton. The Willow Wood Apartments consists of 15 buildings containing 170 units. As of October 25, 2001, 163 units were occupied. From visual inspection, the apartments appear to be in poor condition. Relocating these residents according to DART relocation guidelines would likely improve their living conditions. The difficulty may be in finding replacement housing for that large a number of households if they all wish to remain in the immediate area. The relocation process would also require a very lengthy lead-time and multi-lingual relocation specialists. The Willow Wood residents that would be displaced should be able to find replacement housing within a two-mile radius of their current residence. A review of housing data recently released for the 2000 Census reveals that within a one-mile radius of Willow Wood Apartments there were 208 vacant housing units. Within a two-mile radius, there were 565 vacant units. Most of the units within these areas are available for rental occupancy. Approximately 94% of all housing units were renter occupied within the one-mile radius and 79% within two miles. Section 5.16 provides additional information regarding environmental justice concerns.

The businesses displaced on this block include a strip retail center (occupied by four tenants), a tire business, a retail structure (occupied by three tenants), ZINC Manufacturing, two automotive repair businesses (Car Quest and Dallas Alignment), a nightclub, an auto sales business, and a restaurant (BJ's Home Cooking). All properties, except the nightclub, were occupied at the time of the site inspections.

Because of the large number of businesses displaced, it would be difficult for all of them to remain in the immediate area. The project corridor, however, has several areas with vacant commercial and light industrial property available for replacement space. Both the Harry Hines and Northwest Highway corridor are nearby and might provide suitable replacement locations.

Walnut Hill/Denton Station
This station would displace one industrial firm – Peerless Manufacturing. The firm has 11 buildings at this location built between 1940 and 1970. It would be difficult for the firm to remain in this area due to their large land requirements. However the owners have expressed an interest in relocating their business.

Royal Lane Station
There are several industrial and retail businesses that would be displaced by this station. The largest of these, Longhorn Wholesale, Inc., is a commercial lawn equipment sale and service business. It consists of 3 buildings built in the 1960s and 1970s. Along Royal Lane, there is a used-car business (Royal Auto Sales) and a carpet store (Floor Mart) both built in 1970 that would be displaced. Along Grissom Lane, two smaller industrial businesses would be displaced –

Schindler Refrigeration Company and Scott's Automotive. Schindler's building was constructed in 1964 and Scott's in 1985. The smaller firms should be able to relocate in the area without any difficulty. Longhorn Wholesale should be able to remain in the corridor but might have to consider another area due to their sizable space requirements. There are numerous light industrial buildings in the corridor.

Farmers Branch Station
There are no displacements required for the Farmers Branch Station. No additional acquisition of property is required.

Carrollton Square Station (including LRT alignment and Main Street Improvements)
This station area has been approved as part of the City of Carrollton's planning study for the downtown area. The study recommends several thoroughfare changes including closing part of Denton Drive and extending Main Street. This creates a station area that requires the acquisition of several residential and non-residential structures. There are three homes on the west side of Denton Drive that would be displaced. All three structures are occupied. There is one house on the west side of Main Street that would also be displaced. It is also occupied. Two of the homes are owner-occupied according to Dallas County tax records. One of the homes was built in 1932. The others were built in the 1940s. None of these homes were found to be historically significant.

Five business properties would be acquired resulting in a total of nine displacements. At the northwest corner of Belt Line Road and Denton Drive, a strip retail center would be acquired that is occupied by five small businesses (a pawn shop, a small grocery market, a bakery, an electronics store and a hair salon). Just across the street from the strip center, a restaurant would be displaced. Both structures were built in the 1960s. On Denton Drive just north of Oak Street, two industrial businesses would be displaced – Fastway Electrical Supply and Edwards Printing Service. Fastway's building was constructed in 1987 and Edwards' in 1968. On Belt Line Road, a Conoco Service Station built in 1989 would be displaced. At the corner of the DART-owned Cotton Belt railroad ROW and Denton Drive, the vacant Carrollton Crossing Depot would be displaced and relocated in the station area (refer to **Figure 2-15**). A small portion of the Mercer freight yard would be acquired but would not affect freight operations.

The smaller retail businesses should be able to relocate in the area due to the numerous commercial properties along Belt Line Road. The two industrial firms have more specialized space needs and may have to relocate to industrial space elsewhere in the corridor. The Carrollton Crossing Depot, a historic resource, is proposed to be relocated to a more suitable location within the LRT station.

Trinity Mills Station
The proposed location of this station would displace residential and non-residential structures. There are two houses along Broadway Street that would be displaced. Both were built in the 1950s and appear to be occupied. One house was listed for sale by owner. There is a third structure on Broadway that may be an abandoned house. The building was not visible from the street and no record of the structure was found on the tax records. Two businesses would be displaced; both are located along Blanton Street. The first is a light industrial building occupied by Lesco Industrial. The second is an office/light industrial building that is occupied by Evans Landscape and Irrigation. The buildings appear to have been recently constructed or remodeled.

This area is in transition due to recent completion of the President George Bush Turnpike. It is unlikely that the residential structures would remain even if the DART station were not built. There is strong demand for higher intensity uses (such as commercial) in this area. The two businesses should be able to find replacement space in this general area. There are numerous commercial and light industrial sites available.

Frankford Station
This station would displace a new industrial building that appears to be approximately 200,000 square feet. The Herman Miller Company occupies approximately 70 percent of the space. The remaining space was vacant as of September 2001. DART is coordinating with the development company for the Frankford Trade Center to determine the appropriate timing for Herman Miller to be relocated within the Trade Center.

Rail Operating Facility
This site at the Northeast corner of Lombardy and Denton would displace a vacant lumberyard and approximately 16 small light industrial businesses.

Alignment, Street Improvements and Construction Staging
The following describes private property required for the LRT alignment, street improvements made necessary due to the presence of the LRT, construction staging, and power and traction substations. (With the exception of properties directly adjacent to the Bachman and Carrollton Square Stations; they were described in the previous section).

NW-1B Turtle Creek Boulevard to Bomar Avenue
The NW1-B alignment would be located primarily within street and DART-owned UPRR right-of-way. Two displacements would occur along this line section. The first is a business located at 2537 Butler Street, S&A Automotive. This property would be required to widen the right-of-way in this location to accommodate the LRT line. The second displacement is a single-family residence located at 2727 Kimsey. This owner-occupied structure built in the 1930's would be acquired due to a vibration impact from the LRT line.

NW-2 Bomar Avenue to Community Drive
Four businesses would be displaced along this section of the alignment – these properties are needed for the LRT alignment due to insufficient right-of-way. Two are located just north of Mockingbird and west of Denton Drive. AABCO Physical Health Equipment occupies two buildings at the northwest corner of Denton and Mockingbird. Boyer Automotive occupies one building located just north of Mockingbird on Denton Drive.

The remaining two business displacements are just south of Mockingbird and west of Denton Drive. The largest is a 4,214 square foot office building at 2728 West Mockingbird Lane. The second is a 2,424 square foot technical building at 2726 Fielder. Both buildings were occupied at the time of field inspection.

NW-3 Community Drive to Valley View Lane
Ten businesses and one single-family residence are displaced along this line section. All but one of these displacements occurs on the block just north of the Bachman Station. This property is bound by Jameson Drive on the west, Denton Drive on the east, Community Drive on the south and Northwest Highway on the north. On this block, a single-family residence is located at the corner of Denton and Community. The nine business displacements occur along Denton, Jameson, Northwest Highway and Community. These displacements include a trucking business, a nightclub, a construction firm, a motel (Circle Inn), a window tinting business (3M Distribution Window Tinting), two auto repair businesses (Perfect Auto Service and Advantage Auto Body), one furniture store (Corona Furniture Store), and two unknown nonresidential structures that appear to be for one business. All of the structures were occupied at the time of the site inspections.

The displacements are due to several needs for the property; 1) the alignment for the LRT Line; 2) construction staging; 3) a traction power substation; and 4) the junction for the future LRT alignment to Irving/DFW. The proposed Irving/DFW Line would join the proposed project in a Y-configuration on this block. The tenth business displacement occurs just north of Northwest

Highway and west of Denton Drive. The El Noa Noa Ballroom located at 10011 Denton Drive would be acquired. This structure is approximately 23,522 square feet and was occupied at time of inspection. It is a large facility, however replacement locations might be available elsewhere along Northwest Highway.

NW-4 Valley View Lane to Frankford Road
One multi-family structure and one single-family structure would be displaced along this section of the alignment. The multi-family structure is a four unit residential building located at 1309 Northside Drive just east of the LRT right-of-way. The single-family building is located at 1601 Random Road. Partial acquisitions of these properties are needed for the LRT alignment, which will likely require a full acquisition. Both buildings appeared occupied at time of inspection. It is estimated that five households would be displaced – most renter occupied.

Other Alignments Considered
The Harry Hines Base Alignment would have displaced several businesses and office structures along the south side of Mockingbird Lane between Maple and Denton. Several structures are vacant in this area. Approximately five businesses were occupying buildings at the time of inspection. The Love Field Design Option would have displaced four offices on the south side of Mockingbird, depending on the route into Dallas Love Field. All were occupied.

The Medical Center Design Options (A, B and C) would have displaced 26 to 35 structures depending on the option. Only three of these buildings were residences. The actual number of businesses displaced would likely have been much higher than the number of structures displaced because several of the buildings were multi-tenant facilities. The uses included offices, warehouses, industrial, and medical services. Option C had the highest number of total displacements – up to 80 business displacements were estimated in the Draft EIS. Option B would have displaced a major industry in the area, Olmsted-Kirk Paper, located south of Butler and west of Maple.

Option D, developed during the Draft EIS comment period, would have displaced Parkland Support Services, which would have relocated in the same general area as part of their Master Plan. Two industrial buildings on the south side of Butler Street would have been displaced due to street improvements (the proposed grade separation at Maple avoids these impacts). A single-family home on the south side of Kimsey adjacent to the right-of-way would also have been displaced because the property would have been needed for the LRT alignment.

5.2.3 Summary of Acquisitions and Displacements
The Selected LRT Alternative would require the acquisition of approximately 125.2 acres of private property at various locations along the line. The acquisitions are needed for LRT stations, the rail operating facility, LRT alignment, street improvements, construction staging, and the traction power substations. Approximately 13 single-family structures, one four-plex and one apartment complex would be displaced requiring the relocation of an estimated 180 households. Approximately 67 businesses would be displaced.

5.2.4 Mitigation Measures
All acquisition of property must adhere to the DART Board of Directors' Real Estate Policy and Procedures, adopted August 25, 1987 and modified in October 2000. These policies and procedures adhere to all Federal guidelines regarding acquisition and relocation assistance including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42USC 4601). For all real property acquired, DART compensates the property owner for the fair market value of their property and for damages to any remaining parcel(s).

Relocation benefits are provided for all businesses and residents (owner occupants and tenants) that are displaced by acquisition. Prior to the relocation, DART staff prepare a relocation analysis that determines the availability of (1) adequate, decent, safe and sanitary housing for displaced residents and (2) suitable locations or facilities for displaced businesses. The relocation benefits and services provided to those displaced are determined by eligibility guidelines based on Federal policies. For businesses, these generally include reimbursement of moving expenses and advisory assistance in locating a replacement site. For residents, this includes reimbursement of moving expenses, advisory assistance in locating replacement housing and replacement housing entitlements (if eligibility criteria are met). DART also has a "Last Resort Housing" provision that may be needed for some of the households displaced due to the high percentage of individuals with incomes below the poverty level.

5.3 AIR QUALITY

In this section, the air quality impacts of the future No-Build and LRT Alternative are presented and discussed. Supporting these results, Section 3.4.1 describes the methodology used for both the mesoscale burden analysis and the microscale CO analysis. Section 3.4.2 provides a background on the current status of air quality in the corridor and the region in general.

5.3.1 Impact Assessment

Mesoscale Burden Analysis

Table 5-6 presents the results of the pollutant burden analysis. This analysis includes vehicle emissions from the corridor study area across the four counties of the North Central Texas region (composed of Collin, Dallas, Denton and Tarrant). As **Table 5-6** shows, the LRT Alternative vehicle emissions would be similar to the future No-Build Alternative. This is due to the similar vehicle miles traveled in both alternatives. Since VOCs and NOx are known precursors to the formation of O_3, it is unlikely that O_3 levels will increase as a result of building the project.

It should be noted that the proposed Northwest Rail Operating Facility may cause a slight increase in emissions of VOCs from paints, solvents, and other chemicals utilized for maintenance activities. However, this potential is minimal as no heavy maintenance is proposed for this facility.

TABLE 5-6
2025 PROJECTED CORRIDOR POLLUTANT BURDEN
(VEHICLE EMISSIONS POLLUTANTS IN TONS/DAY)

Measure	No-Build	Build	Percent Change +/-
VMT (× 1,000)	168,601	167,334	-0.75%
CO	1,201	1,217	1.32%
HC (VOC)	149	149	0.07%
NOx	255	256	0.43%

Source: Parsons, 2001

Microscale CO Analysis

While overall CO emissions are similar between the future No-Build and the LRT Alternatives, specific intersections near stations may show an increase in localized emissions. CO is the most common pollutant of concern in localized areas, and vehicles are the primary contributor to local CO "hot spots." The CO micro-scale analysis examined receptors near the intersection of Valley View Lane and Denton Drive in Farmers Branch, which is expected to be impacted the greatest by building the project. This intersection was selected based on its grade, vehicle volume and speed, receptors, and proximity to a rail park-and-ride station. Intersections that are elevated above grade produce less ground level impacts because of higher air dispersion. Increased vehicle volumes generate more emissions. Vehicles produce less CO emissions as speed increases until approximately 50 miles per hour, at which point emissions increase as engine efficiency is reduced. In general, the closer a receptor is to the intersection the greater the exposure.

Proximity to rail park-and-ride stations will generate additional trips through nearby intersections. Receptors were placed near roadways at distances greater than the mixing zone of 3 meters above grade at the selected intersection location.

The results of the microscale CO analysis are presented in **Table 5-7**. It should be noted that this analysis was performed using the Cal3QHC model. CO concentrations are reported for a receptor with the highest concentration within 1,000 feet of the intersection selected for CO microanalysis. The maximum predicted 1-Hour concentration of 5.2 ppm is predicted to occur at the northbound onramp to the IH 35E frontage road. The maximum predicted 8-hour concentration of 3.6 ppm is also predicted to occur at the northbound onramp to the IH 35E frontage road. The results of the analysis presented in **Table 5-7** indicate that the maximum predicted CO concentrations would be well below the CO ambient air quality standards. The results in **Table 5-7** also indicate that the CO concentration predicted for the LRT Alternative would be similar to the future No-Build Alternative.

TABLE 5-7
2025 MICRO-SCALE ANALYSIS RESULTS (PPM)

Site	1-Hour		8-Hour	
	No Build	LRT	No Build	LRT
Valley View Lane and Denton Drive	5.1	5.2	3.6	3.6
Standard	35.5		9.5	

Source: Parsons, 2001

5.3.2 Mitigation Measures

Since no air quality violations are anticipated and overall build project CO emissions are expected to be similar to future No-Build alternative CO emissions, no additional mitigation measures are required.

5.3.3 Conformity Statement

This project is within the boundary of the North Central Texas Council of Governments (NCTCOG) Transportation Management Area (TMA). This area is designated as a serious non-attainment area for ozone, since the federal standard for this pollutant has been exceeded in past years. Other pollutants are predicted to remain below federal and state standards in the future.

Under the provisions of the Clean Air Act, states are required to develop and submit to the EPA a State Implementation Plan (SIP) for each non-attainment area. A SIP for the Dallas-Fort Worth Area has been submitted. This plan includes the proposed project. All projects in the Transportation Improvement Program (TIP) for the Dallas-Fort Worth Metropolitan Area that are proposed for federal funding were initiated in a manner consistent with the Statewide and Metropolitan Planning Final Rule in the federal guidelines, Section 450 of Title 23 CFR and Section 613.2000, Subpart B, of Title 49 CFR and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The ISTEA was reauthorized as the Transportation Equity Act for the 21st century (TEA-21), however the 2000 TIP was prepared under ISTEA guidelines pending publication of the TEA-21 revised planning guidelines. Energy, environmental, air quality, cost and mobility considerations are addressed in the programming of the TIP. The proposed action is consistent with the region's ***Mobility 2025***: The Metropolitan Transportation Plan Update adopted in May 2001. EPA published a proposal to approve the Dallas/Fort Worth SIP in the Federal Register on January 18, 2001 (Federal Register, volume 66, Number 12, page 4756). Final approval by the EPA is pending. The next major SIP submittal for the DFW area will be for the mid-course review in 2004.

5.4 NOISE

This section presents the analysis of potential noise impacts due to the operation of the proposed project and discusses mitigation measures to minimize adverse impacts.

5.4.1 Noise Impact Assessment

Noise Impact Assessment Methodology

Noise levels were projected based on the DART LRT vehicle noise specification, the proposed project's Operating Plan and the prediction model specified in the FTA guidance manual. Significant factors are summarized below:

- Based on the DART vehicle noise specification, the predictions assume that a single 93-foot long vehicle operating at 40 mph on ballast and tie track with continuous welded rail (CWR) generates a maximum noise level of 76 dBA at a distance of 50 feet from the track centerline. A noise assessment was not conducted for the Rail Operating Facility due to the fact that the site is not located in close proximity to any Category 2 receptors.

- The operating times of the line would be between 5:30 AM and 12:30 AM. The operating plan for LRT service specifies a peak-hour headway of ten minutes, an off-peak base period headway of 15 minutes and an evening headway of 20 minutes. Two-car trains would operate most of the day, with some three-car trains in peak periods and single-car trains in the evenings.

- Peak hour operations would occur between 6:00 AM and 9:00 AM and between 3:00 PM and 6:00 PM. Evening operations would occur between 8:30 PM and 12:30 AM, and base service would occur during all other time periods. The average number of cars per train would be 2.5 cars during peak hours, two cars during base service, and one car during evening service.

- Vehicle operating speeds are based on the Train Performance Calculation (TPC) Simulations for the project. The speed limits range from 10 mph to 65 mph along the corridor.

- The projections near grade crossings include noise from train whistles and crossing bells. Based on DART audible warning signal equipment and policy, the estimates assume that the whistles generate a noise level of 78 dBA at 50 feet from the track for a five second period as trains approach each crossing. The bells are estimated to generate a noise level of 72 dBA at 50 feet for 20 seconds prior to and ten seconds following each train. These operating parameters are consistent with current practice on the Starter System and were designed to minimize community noise exposure to the greatest extent possible within the constraints of safe operations. However, to account for the intrusive character of the whistles and bells, a 5 dBA penalty is applied to noise levels from these sources in accordance with FTA procedures.

- There will be no significant shift of freight rail operations from daytime to nighttime periods due to the implementation of the LRT Alternative. Sporadic nighttime freight service is present today and will continue in the future.

Projected Sound Levels

The No-Build Alternative is not expected to result in any noise impacts.

For the Selected LRT Alternative and other alignments considered, detailed comparisons of the existing and future noise levels are presented in **Table 5-8** and **Table 5-9**. **Table 5-8** includes results for the Category 2 receptors along the alignment with both daytime and nighttime sensitivity to noise (e.g. residences, hotels, and hospitals). **Table 5-9** is a listing of all Category 3 receptors along the alignment, consisting of institutional sites that are not sensitive to noise at night (e.g. schools, churches, parks and medical offices).

TABLE 5-8
NOISE IMPACTS FOR LAND USE
WITH BOTH DAYTIME AND NIGHTTIME SENSITIVITY (CATEGORY 2)

Location	Civil Station	Dist to Near Track (ft)	Speed (mph)	Exist. Noise Level[1]	Project Noise Level [1]			Impact Category	Total Noise Level[1]	Noise Level Increase[1]	# of Res. Impacts	
					Predicted [2] (rounded to nearest decibel)	Impact Criteria						
						Imp	Sev				Imp	Sev
Selected LRT Alternative (Base Alignment with UPRR)												
Hondo St	204	180	25	70	48	64	70	None	70	0	0	0
Lucas Ave	214	95	45	62	57	59	65	None	63	1	0	0
Maple Ave	255	95	47	67	59	62	68	None	68	1	0	0
Hudnall St	264	130	42	69	54	64	69	None	69	0	0	0
Inwood Rd	278	150	21	72	49	65	71	None	72	0	0	0
Kimsey Dr	290	85	57	73	66	65	72	Imp	74	1	1	0
Empire Central Dr	183	140	64	72	61	65	71	None	72	0	0	0
Lovedale Ave	203	140	65	73	54	65	72	None	73	0	0	0
Bombay Ave	217	140	65	73	54	65	72	None	73	0	0	0
Gilford Ave	222	140	65	73	54	65	72	None	73	0	0	0
Lovers Lane					57	65	72	None	73	0	0	0
Webb Chapel	319	176	27	63	60	60	65	Imp	65	2	52	0
Farmers Branch Lane	556	340	65	65	47	61	66	None	65	0	0	0
Sable	567	160	33	65	55	61	66	None	65	0	0	0
Fruitland	593	80	65	65	58	61	66	None	66	0	0	0
Valwood Parkway	642	168	65	65	62	61	66	Imp	67	2	1 motel	0
Crosby	662	80	65	66	65	62	67	Imp	69	1	24	0
Northside [3]												
Severe Impact [4]	718	25	65	66	68	62	67	Sev	70	4	0	4 [4]
Mod. Imp. >3dB	721	35	65	66	67	62	67	Imp	69	3	1	0
Mod. Imp. <3dB	722	55	65	66	64	62	67	Imp	68	2	1	0
Donald	730	50	62	66	65	62	67	Imp	68	2	4	0
Whitlock	757	88	63	67	62	62	68	None	68	0	0	0
Jackson	778	80	65	67	57	62	68	None	67	0	0	0
Total											**84**	**4**
Other Alignments Considered (Harry Hines Base Alignment, Medical Center Design Option A)												
Lofland (Base)	89	100	37	65	53	61	66	None	65	0	0	0
Lofland (Option A)	53	220	40	70	51	64	70	None	70	0	0	0
Mockingbird (Base)	161	64	35	70	64	69	75	None	71	1	0	0
Redfield St. (Option A)	106	64	40	62	55	59	65	None	63	0	0	0
Empire Central (Base)	196	140	65	73	54	65	72	None	73	0	0	0

[1] Noise levels are based on Ldn and are measured in dBA.
[2] Predicted levels include a 5dBA penalty applied to audible signal noise, where applicable.
[3] One property at this location was considered a noise impact in the Draft EIS, but is now identified as a real estate acquisition for alignment right-of-way. It is therefore not considered a noise impact.
[4] Four (4) multi-family residences identified with a severe noise impact have also been identified as a real estate acquisition. If acquisition if not ultimately required, then noise mitigation will be required at this location.

Source: HMMH, 2002

In addition to the civil station, distance to the near track and proposed LRT speed, each table includes the existing noise level, the projected noise level from LRT operations and the impact criteria for each receptor or receptor group. Based on a comparison of the predicted project noise level with the impact criteria, the impact category is listed, along with the predicted total noise level and projected noise increase due to the introduction of LRT service. **Table 5-8** also includes an inventory of the number of impacts and severe impacts at each sensitive receptor location.

TABLE 5-9
NOISE IMPACTS FOR INSTITUTIONAL LAND USE WITH NO NIGHTTIME SENSITIVITY (CATEGORY 1 AND 3)

Location	Civil Stn	Dist. to near track (ft)	Speed (mph)	Exist. Noise Level[1]	Project Noise Level[1]			Impact Category	Total Noise Level[1]	Noise Level Increase[1]
					Predicted[2] (rounded to nearest decibel)	Impact Criteria				
						Imp	Sev			
Selected LRT Alternative (Base Alignment with UPRR)										
Medical Clinic	273	150	25	70	49	69	75	None	70	0
School	283	180	30	73	50	70	77	None	73	0
Video Post and Transfer	283	70	30	73	56	70	77	None	73	0
Church	208	120	65	71	61	69	75	None	71	0
Church	227	140	65	65	54	66	71	None	66	1
Park	552	320	65	55	48	60	66	None	56	1
Church	586	88	65	66	57	67	72	None	67	1
Church	665	128	65	71	58	69	75	None	71	0
Church	672	320	63	71	48	69	75	None	71	0
Other Alignments Considered (Harry Hines Base Alignment and Medical Center Design Option A)										
School (Option A)	111	200	40	67	49	62	68	None	67	0
Salvation Army Chapel (Base)	139	224	30	61	48	63	69	None	61	0

[1] Noise levels are based on Peak Hour Leq and are measured in dBA.
[2] Predicted levels include a 5dBA penalty applied to audible signal noise, where applicable.

Source: HMMH, 2002

The results in **Table 5-8** identify noise impacts for a total of 88 receptors (76 apartment units, 11 single-family homes, and one motel). Four of these impacts meet severe impact levels. The FTA definition of severe impact and impact is found in Section 3.5.1. The following are brief discussions of each impacted Category 2 land use area:

Selected LRT Alternative

Kimsey Drive: Noise impact is projected at one residence, located at 2722 Kimsey Drive on the south side of the street, due to a planned crossover adjacent to this site.

Webb Chapel: The impacted apartment complexes in this area are located to the east of the tracks opposite the Bachman Station. Due to the grade crossing at Community Drive and the crossover for the Irving/DFW line, four buildings comprised of 52 units are projected to experience noise impact.

Valwood Parkway: There is a Red Roof Inn Motel located west of the alignment north of Valwood Parkway. Noise impact is due to the two grade crossings at Burning Tree Lane and at a private drive.

Crosby: The Crosby Creek Apartments are located to the east of the alignment south of Crosby Road. Due to the high speed of the LRT operations (55-65 mph) and to the change from at-grade to an aerial structure, 24 units in two buildings are projected to have noise impact.

Northside: This area includes several residences located to the east of the alignment. The noise environment is characterized by traffic on North Broadway Street and the alignment would be on an aerial structure through this area. Due to the close proximity (60 feet) and the LRT speed of 55-65 mph, one residence was projected to have noise impact in the Draft EIS. This property is now identified as a real estate acquisition for alignment right-of-way for the project, based on a minor alignment shift, and therefore is not considered a noise impact. Due to the alignment shift, impact is now projected at six other residences, with severe impact at four multi-family residences located as close as 25 feet from the near track. However, the four residences with severe impact have been identified as a real estate acquisition. If acquisition is avoided during the real estate negotiation process, mitigation will be provided by constructing a noise barrier wall. There is a moderate impact of more than 3dB at one single-family residence, and a moderate impact of 2dB at one other.

Donald: Due to the alignment shift from the location assumed in the Draft EIS, moderate noise impact is now projected at four residences in this area (two duplexes), located 50 feet instead of 112 feet from the nearest LRT track.

Similar to the Category 2 analysis, an assessment of noise impact for Category 3 receptors was also conducted. This assessment was based on a comparison of the existing ambient noise level with the predicted project noise levels in terms of the peak transit hour Leq. As indicated in **Table 5-9**, no impact is predicted at any of these locations. **Figures 5-1 and 5-2** show the locations of potential noise impact discussed above.

Other Alignments Considered
As shown in **Tables 5-8** and **5-9**, the noise impacts would be the same as for the Selected LRT Alternative. No additional sensitive uses would be affected.

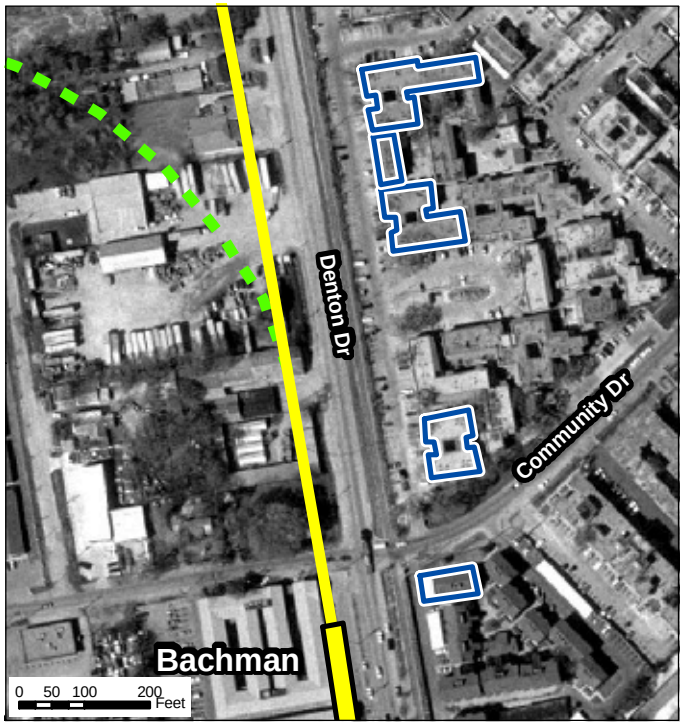
5.4.2 Noise Impact Mitigation

As discussed in Section 3.5.1, FTA states that in implementing noise impact criteria, severe impacts should be mitigated unless there are no practical means to do so. For the proposed project, there are no severe impacts (since the severe impact building is proposed to be acquired). At the moderate impact level, more discretion should be used, and other project-specific factors should be included in the consideration of mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-to-indoor sound insulation and the cost-effectiveness of mitigating noise to more acceptable levels.

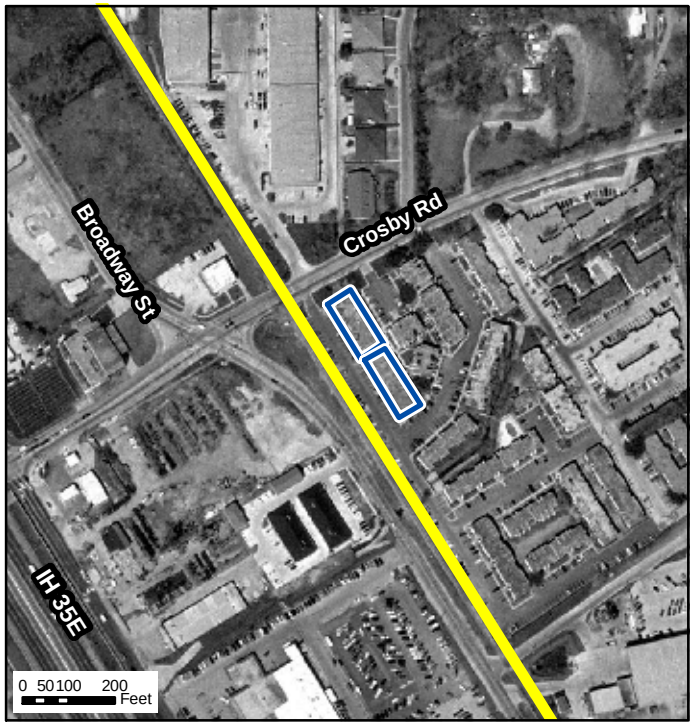
Mitigation Options
Potential mitigation measures for reducing noise impacts from LRT operation for the proposed project are described below.

Noise Barriers - This is a common approach to reducing noise impacts from surface transportation sources. The primary requirements for an effective noise barrier are that:

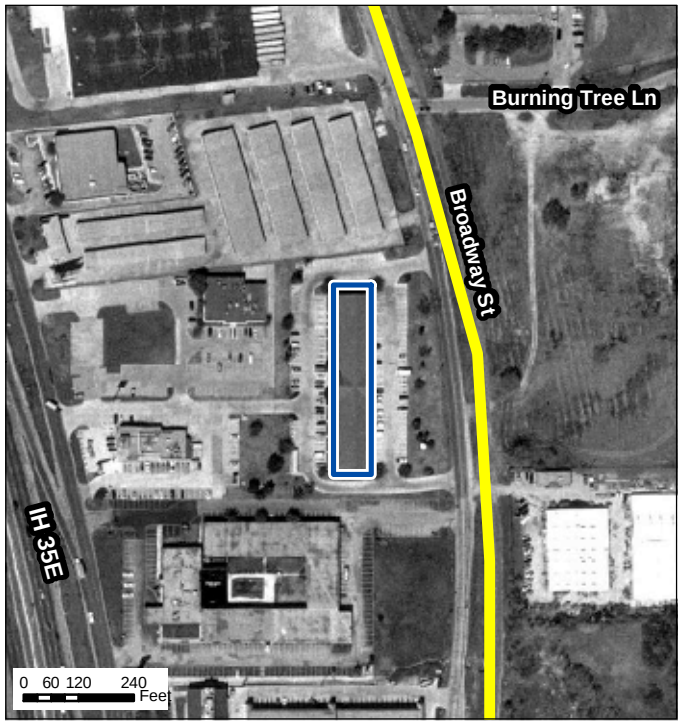
- the barrier must be high enough and long enough to break the line-of-sight between the sound source and the receiver;
- the barrier must be of an impervious material with a minimum surface density of 4 lb/sq. ft.; and
- the barrier must not have any gaps or holes between the panels or at the bottom.



Vicinity of Community Drive



Vicinity of Crosby Road



Vicinity of Valwood Parkway

Vicinity of Donald Avenue and Northside Drive

Legend

- Projected Severe Noise Impact Area
- Projected Moderate Noise Impact Area
- LRT Station Platform
- Selected LRT Alignment
- Future Irving/DFW Branch

Source: Harris, Miller, Miller & Hanson, 2001

** One property at this location (northwest corner of Random Road and Northside Drive) was considered a noise impact in the Draft EIS, but is now identified as a real estate acquisition for alignment right-of-way. It is therefore not considered a noise impact. In addition, the four multi-family residences on the south side of Northside Drive are projected to have severe noise impact, and are now also identified for acquistion for alignment right-of-way.*

Figure 5-1
Projected Noise Impact Areas

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

Source: Harris, Miller, Miller & Hanson, 2003

Figure 5-2

Projected Noise and Vibration Impact Areas

Vicinity of Kimsey Drive

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

N

Because numerous materials meet these requirements, the selection of materials for noise barriers is usually dictated by aesthetics, durability, cost and maintenance considerations. Depending on the proximity of the barrier to the tracks and on the track elevation, transit system noise barriers typically range in height from between four and eight feet.

Building Sound Insulation - Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction has been widely applied around airports and has seen limited application for transit projects. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable, and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to the windows, by sealing any holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air-conditioning so that windows do not need to be opened.

Special Trackwork at Crossovers - Because the impacts of LRT wheels over rail gaps at track crossover locations increases LRT noise by about 6 dBA, crossovers are a major source of noise impact when they are located in sensitive areas. If crossovers cannot be relocated away from residential areas, another approach is to use moveable point frogs in place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains.

LRT Speed Reductions in Sensitive Areas - Speed reductions will always lower community noise levels, but they are not often implemented for noise control because of the negative impact on the LRT operating schedule. Thus, their impact on the operating schedule would need to be evaluated with respect to their potential noise mitigation benefits.

Recommended Mitigation

Based on the results of the noise assessment, mitigation measures have been identified to address four severe and two moderate impacts at Northside Drive. The primary mitigation measure would be the construction of sound barrier walls to shield areas where impact is projected. **Table 5-10** indicates the approximate noise barrier location, length, and side of tracks as well as the number of moderate and severe impacts that would be reduced. Typical barrier height is about eight feet, and can be somewhat less on elevated structures. Exact height and configuration depend on specific conditions, and will be determined during final design. Mitigation for other moderate noise impacts is not recommended due to intervening features such as freight tracks or a street, as well as projected noise increases of less than 3 dB.

TABLE 5-10
RECOMMENDED NOISE BARRIER MITIGATION TREATMENT

SEGMENT	Side of Track	Civil Station	Length (Feet)	Impacts		Total
				Moderate	Severe	
Northside Drive						
Moderate Impact	NB	720+50 to 723+50	300	2	0	2
Severe Impact*	NB	716+50 to 720+50	400	0	4	4
* The 4 severe impacts at 1309 Northside Drive are to be acquired for right-of-way purposes. If acquisition is avoided during the real estate negotiation process, noise mitigation will be provided at this location.						

Source: HMMH, 2002

5.5 VIBRATION

5.5.1 Ground Vibration Impact Assessment

Vibration Impact Assessment Methodology

The potential vibration impact from LRT operation was assessed on an absolute basis using the FTA criteria. The same representative sensitive receptors identified in **Table 3-15** in Chapter 3 were considered for the vibration impact assessment. The following factors were used in determining potential vibration impacts along the project corridor:

- Vibration source levels were based on measurements previously conducted on vehicles operating on the existing Starter System. A vibration assessment was not conducted for the Northwest Rail Operating Facility due to the fact that the proposed site is not located within 200 feet of any sensitive receptors. The Brockbank Apartments are located approximately 550 feet from the northeast corner of the Northwest Rail Operating Facility site; however, based on the conceptual site layout, no LRT would operate within 750 feet of the apartments.

- Vibration propagation tests were conducted at five sites along the corridor near sensitive receptors. These tests measured the response of the ground to an input force. The results of these tests were combined with the vibration source level measurements to provide projections of vibration levels from vehicles operating on the project corridor.

- Vehicle operating speeds are based on the TPC Simulations for the project corridor. The speed limits range from 10 mph to 65 mph along the corridor.

Projected Vibration Levels

The No-Build Alternative is not expected to result in any ground-borne vibration impacts. Traffic, even heavy trucks and buses, rarely creates perceptible ground-borne vibration unless they are operating very close to buildings or there are irregularities, such as potholes or expansion joints, in the roadway. The pneumatic tires and suspensions systems of normal automobiles, trucks and buses are sufficient to eliminate most ground-borne vibration forces.

With regard to the LRT Alternative, the estimated root mean square (RMS) velocity levels (VdB re 1 micro-in./sec.) for sensitive receptors at representative distances are provided in **Tables 5-11** and **5-12**. These tables summarize the results of the analysis in terms of anticipated exceedances of the FTA criteria for “frequent events” (defined as more than 70 events per day). The criteria are discussed in more detail in Section 3.6.1.

Vibration levels for the Love Field Design Option are not projected at this time. Should this Design Option be reconsidered in the future, vibration testing for potential impacts to sensitive airport equipment would be conducted based on the detailed alignment and construction method.

Vibration-sensitive locations along the Selected LRT Alignment and other alternatives considered are listed in **Table 5-11** for Category 2 land use and in **Table 5-12** for Category 1 and 3 land use. Each table lists the locations, the civil station, the distance to the near track, and the projected LRT speed at each location. In addition, the predicted project vibration level and the impact criterion level are indicated along with the number of impacts projected for each receptor or receptor group.

Table 5-11 identifies one potential Category 2 vibration impact as follows.

Kimsey: This area is a single-family residential street located to the west of the tracks north of Inwood Road. Vibration impact is due to the close proximity of the residence (2727 Kimsey Drive) to the tracks (20 feet). This impact is shown in **Figure 5-2**.

TABLE 5-11
LAND USE CATEGORY 2 VIBRATION IMPACTS

Location	Civil Stn.	Distance to Near Track (ft)	Speed (mph)	Project Vibration Level[1]	Vibration Impact Criterion[1]	No. of Res. Impacts
Selected LRT Alternative (Base Alignment with UPRR)						
Hondo St	204	180	25	29	72	0
Lucas Ave	214	95	45	49	72	0
Maple Ave	255	95	47	49	72	0
Hudnall St	264	130	42	41	72	0
Inwood Rd	278	150	21	31	72	0
Kimsey Dr	290	20	57	93	72	1
Empire Central Dr	183	140	64	55	72	0
Lovedale Ave	203	140	65	56	72	0
Bombay Ave	217	140	65	56	72	0
Gilford Ave	222	140	65	56	72	0
Lovers Lane	238	136	65	54	72	0
Webb Chapel	319	176	27	49	72	0
Farmers Branch Lane	556	340	65	46	72	0
Sable	567	160	33	47	72	0
Fruitland	593	80	65	63	72	0
Valwood Parkway	642	168	65	52	72	0
Crosby	662	80	65	65	72	0
Northside	721	25	65	64	72	0
Donald	730	50	62	61	72	0
Whitlock	757	88	63	63	72	0
Jackson	778	80	65	63	72	0
Total:						**1**
Other Alignments Considered (Harry Hines Base Alignment and Medical Center Design Option A)						
Lofland (Base)	89	100	37	43	72	0
Lofland (Option A)	53	220	40	29	72	0
Mockingbird (Base)	161	64	35	70	72	0
Redfield St (Option A)	106	64	40	67	72	0
Empire Central (Base)	196	140	65	56	72	0

[1]Vibration levels are measured in VdB referenced to 1 µin/sec.

Source: HMMH, 2002

TABLE 5-12
LAND USE CATEGORY 1 AND 3 VIBRATION IMPACTS

Location	Land Use Cat.	Civil Stn.	Distance to Near Track (ft)	Speed (mph)	Project Vib. Level[2]	Vib. Impact Criterion[2]	No of Impacts
Selected LRT Alternative (Harry Hines Base with UPRR)							
Medical Clinic	3	273	150	25	33	75	0
School	3	283	180	20	30	75	0
Video Post & Transfer	1	283	70	30	52	65	0
Southwestern Gage	1	286	30	37	70	65	1
Church	3	208	120	65	60	75	0
Church	3	227	140	65	55	75	0
Church	3	586	88	65	61	75	0
Church	3	665	128	65	45	75	0
Church	3	672	320	63	41	75	0
Total:							**1**
Other Alignments Considered (Harry Hines Base and Medical Center Design Option A)							
School (Option A)	3	111	200	40	41	75	0
Salvation Army Chapel (Base)	3	139	224	30	26	75	0

[1]Assessment is for vibration-sensitive buildings only; park lands are not included.
[2]Vibration levels are measured in VdB referenced to 1 µin/sec.

Source: HMMH, 2002

Similar to the Category 2 analysis, an assessment of vibration impact for Category 1 and 3 receptors was also conducted. As shown in **Table 5-12**, one potential impact was identified as follows:

Southwestern Gage: This vibration-sensitive business is located to the west of the proposed LRT tracks north of Sadler Circle. Vibration impact is due to the close proximity of the building to the tracks (30 feet) and the nearby crossover.

5.5.2 Ground-Borne Noise Impact Assessment

As indicated in Section 3.6.1 (Ground-Borne Vibration Criteria), airborne noise tends to mask ground-borne noise for above ground (i.e. at-grade or elevated) rail systems, and therefore ground-borne noise impact was assessed only at Video Post and Transfer, a business with well-insulated, noise-sensitive interior spaces. The projected ground-borne noise level inside this building is 20 dBA, which is below the 25 dBA FTA criterion for this Category 1 receptor. Therefore, no ground-borne noise impact is anticipated.

5.5.3 Ground-Borne Vibration Mitigation

Ground-borne vibration impact has been identified at one residential receptor along the project corridor, the single-family residence at 2727 Kimsey Drive on the north side of the street. Because the projected vibration level of 93 VdB is more than 20 decibels above the FTA criterion (72 VdB) at this site, vibration isolation will not be practical and the only feasible mitigation measure is to acquire this property.

Potential vibration impact has also been identified at one vibration-sensitive business, Southwestern Gage. Possible mitigation approaches at this site include crossover relocation, alternative crossover frog designs, resilient track isolators, and vibration isolation of sensitive equipment inside the building. A detailed analysis will be conducted during final design to refine the vibration projections and to determine the most appropriate mitigation measure, if warranted.

5.6 VISUAL AND AESTHETIC RESOURCES

This section presents the visual and aesthetic impacts of implementing the proposed project. The purpose of this section is to identify changes in visual resources and the affect of such change on the experience of the primary viewers.

5.6.1 Methodology

To assess visual and aesthetic impacts, each of the Corridor Assessment Units described in Section 3.7.3 (Corridor Assessment Unit Descriptions) were analyzed. Each sensitive receptor/asset was assessed to determine which project characteristics would potentially have an impact. The characteristics of the project which could have an impact on the resource include:

- Station Areas, including platform, bus transfer, and parking areas
- Elevated Structures/Bridges
- Elevated Stations
- Other vertical elements (i.e., catenary poles, light standards, safety fencing).
- Rail Operating Facility

For each of the sensitive receptors/assets where impacts are anticipated, mitigation measures are specified. Mitigation measures are intended to be consistent with those employed for other sections of the DART LRT system, as appropriate.

5.6.2 Impact Assessment and Mitigation

The potential impact of each of the project characteristics was rated as either significant, potentially significant, or generally not significant based on the sensitive receptors/assets. It was assumed

that the design and construction of the project would be consistent with current DART design standards. The assessment for each of the Corridor Assessment Units is summarized in **Table 5-13** and the nature of those impacts which are either potentially significant or significant are described below.

TABLE 5-13
VISUAL AND AESTHETIC IMPACTS

				Characteristics				
Unit	**Name**	**Sensitive Receptors/Assets**	**Primary Viewers**	**Station Areas**	**Elevated Structures/ Bridges**	**Elevated Stations**	**Other Vert. Elements**	**Rail Operating Facility**
1	West End/Arena	West End properties, American Airlines Center	A E G	N/A	N/A	N/A	○	N/A
2	Market Center	Reverchon Park, Turtle Creek Pump Station, Market Center, offices, hotels SF residences to east,	A C E	○	○	N/A	○	N/A
			B	●	○	N/A	●	N/A
3*	Medical Center	Hospitals, MF residences, offices, Harry Hines Blvd. Landscaping	A C E H	●	●	●	●	N/A
3A	Inwood	Low rise industrial, schools, parks, SF to west SF to east	A F	○	○	○	○	N/A
			B D G	◒	◒	◒	◒	N/A
			B G	N/A	●	N/A	●	N/A
4	Love Field	SF residences to west, Knight School, Bachman Lake Park	A B C D F	○	N/A	N/A	○	N/A
5	Northwest Hwy/ LBJ Freeway	MF residences to east, offices	A E F	○	○	○	○	◒
			C	○	◒	◒	◒	N/A
6	Farmers Branch	Low rise industrial uses, park and government buildings	A B D E G	◒	◒	N/A	◒	N/A
7	North Farmers Branch	Low rise industrial uses and MF to the east	A F	○	○	○	○	N/A
			C	○	●	○	●	N/A
8	Downtown Carrollton	Old downtown Carrollton, SF and MF residences, historic properties and parks	A E G	◒	●	◒	●	N/A
9	Carrollton/ Frankford	SF residences, offices, Ken Good Park	A B C D F	○	○	○	○	N/A

Primary Viewers

A = Arterial Motorist
B = Single Family Residents
C = Multi-Family Residents
D = Recreational Users
E = Commercial/Office Tenants
F = Industrial Tenants
G = Pedestrians
H = Others

Impacts

●= Significant
◒= Potentially Significant
○= Not Significant
N/A = Not Applicable

*Visual Unit 3 is not included in the Selected LRT Alignment.

Source: S. R. Beard & Associates, 2002

The measures to be utilized for each of the affected visual and aesthetic resources are described immediately following the description of the impact. Various mitigation measures will be employed to address the adverse impacts of the Selected LRT Alternative.

All mitigation of visual impacts will conform to DART Rail Design Criteria, specifically Chapter 19.2 (Landscaping) and Chapter 26 (Lighting).

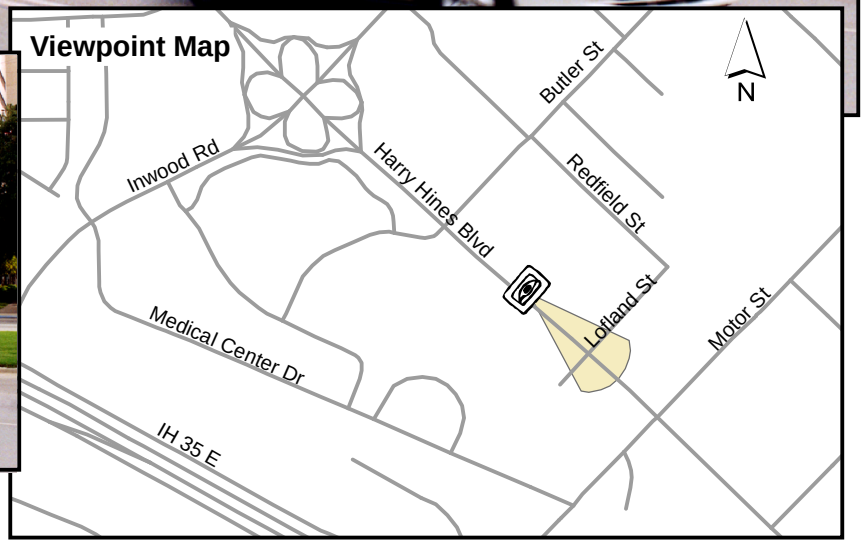
Unit 1 - West End/Arena
The visual impact of the project on the West End/Arena assessment unit is not significant. The architectural character of the West End is unique to the region and the introduction of the system elements, such as catenary poles and trackway, have been designed to complement the character of the area as seen by arterial motorists, downtown pedestrians, and office tenants. Improvements in the West End Historic District have received design review by the Dallas Landmark Commission and the West End Task Force. A Certificate of Appropriateness has been issued by the City of Dallas for the proposed improvements by DART.

Unit 2 - Market Center
The impact of the project on the Market Center assessment unit is significant, especially to the residential area adjacent to the proposed station parking lot. The removal of four residences, two motels, and introduction of a parking lot significantly alters the character and views for the remaining residences. The remaining residences, once afforded views of neighborhood residences, would have views of the Market Center/Oak Lawn Station parking lot and views of the aerial station and Market Center Complex to the west. Light standards and associated night-time lighting of the parking lot would result in a significantly changed environment for the remaining neighborhood residents.

Mitigation of these impacts will be further explored during final design and will require close coordination with adjacent property owners and residents. Features reflective of a residential setting will be incorporated on the north (Wycliff Avenue), south (Vagas Street) and east sides of the parking lot, where residences are adjacent to or face the parking lot. Lighting in the parking lot will be shielded to minimize light pollution impact to the adjacent residential areas. Landscaping will also be incorporated to soften the view of the parking lot. These impacts are less than those associated with the Draft EIS station option which included a 3-level parking structure between Hondo and Wycliff Avenue.

Unit 3 - Medical Center (not included in Selected LRT Alternative)
During the Draft EIS, consideration was given to an alignment along Harry Hines Boulevard, turning east along Treadway (Harry Hines Base Alignment). This alignment would have created significant visual impacts in the Medical Center area. As the alignment approached Parkland Hospital from the south, it would have been elevated to a vertical clearance of more than 34 feet as it passed over the pedestrian bridge connecting the hospital with the parking garage on the east side of Harry Hines Boulevard. The view of arterial motorists and pedestrians of the hospitals, their facades, landscape and major entrances would have been affected by the elevated structure in the median of the roadway, as shown in **Figure 5-3**. Much of the existing median landscaping and trees would have been removed and replaced. Some views by those inside the hospital facilities to the outside would also have been impacted by the elevated structure and station in this location.

Mitigation of the impacts at this location would have been further explored during final design and may have included the “softening” of the long, linear structure with landscaping, streamlined structural features, architectural enhancements, or the lowering of the structure to provide minimum vertical clearance, thus requiring the raising or reconstruction of the pedestrian overpass. These features were discussed with the Medical Center area stakeholders, who indicated that the visual impacts would have been unacceptable.



Source: Poitra Visual Communications, LCC, 2002

Figure 5-3

Visual Simulation - Parkland Station

Considered But Not Selected

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

Unit 3A - Inwood (Selected LRT Alternative and Medical Center Design Options A, B, C, D)
The impact of the Selected LRT Alternative (as well as Medical Center Design Options A, B, C, and D) on the Inwood unit is potentially significant. As the alignment heads north from the Market Center Station, it would be elevated to cross over Motor Street, Maple Avenue and Inwood Road with an aerial station south of Inwood Road. This could create visual impacts for residents living in the single-family residential area (particularly Cherrywood Avenue) southeast of the Inwood/Denton Drive intersection as well as for future residents of new apartments under construction between Maple Avenue and the LRT alignment. Potential visual impacts to Rusk Middle School (eligible for the NRHP) may also occur.

While the Cherrywood residences do not directly face the LRT alignment, they would see the new LRT structure and aerial station from the street and potentially from rooms that face west toward Denton Drive. The Draft EIS included a station north of Inwood Road so the residents would only view the aerial LRT guideway. With the station south of Inwood, a bus drop-off area will be provided adjacent to the station off of Denton Drive. Mitigation of the impacts to residents along Cherrywood will be further explored during final design and will include, but not be limited to, the use of vegetation in the area between Denton Drive and the bus drop-off area to soften views and to create a screen wall along Denton Drive towards the residential area.

New apartments are under construction west of Maple Avenue, adjacent to the LRT alignment. These units will be four stories high with one building facing the alignment but set back from the alignment by parking. The top of the rail will be approximately 25 feet high in this area. Potential visual impacts may occur to those apartments facing out toward the LRT structure. During final design, the use of a screening element on the structure or landscaping will be assessed as methods to address visual impacts.

Mitigation measures to avoid an adverse effect on Rusk Middle School are addressed in the Section 106 Memorandum of Agreement with the Texas State Historic Preservation Officer (SHPO), and include design review by the SHPO of the 30%, 65%, 95% and 100% final design plans (see Appendix H). The potential for visual impacts to Weichsel Park are low. Mitigation measures to minimize any impacts of the LRT project are addressed in Section 5.15.2. Neither DISD nor the City of Dallas have indicated any concerns relative to visual impacts at the school or park.

Potential impacts would also have been associated with the Draft EIS station location north of Inwood. The station and parking area would have been adjacent to single-family residences, and across the street from Rusk Middle School and an area of Weichsel Park, creating potential visual impacts related to vertical elements, lighting, and station features. However, residences immediately adjacent to the station have been converted to commercial uses so impacts to residents would have been minimal. Moving the station to the south minimizes these impacts.

Unit 4 - Love Field
The proposed project would result in LRT operations along an existing rail right-of-way west of Dallas Love Field that is actively used for freight deliveries to customers along the alignment. This alignment would not eliminate freight storage between Mockingbird and Burbank. This would have no change to the visual environment of the neighborhood to the west, which currently experiences lengthy periods of blocked views created by freight cars on these siding tracks. The LRT catenary system will be a new visual element but freight will remain to the west of the LRT and will largely block views of the LRT. No impacts are anticipated for L. B. Houston Park either, as most use occurs west of Harry Hines Boulevard, several hundred feet from the proposed project.

Unit 5 - Northwest Highway/LBJ Freeway
The impact of the project is potentially significant to the residents of multi-family housing in the vicinity of Denton and Community Drives. The introduction of system elements in this location would affect the views that apartment residents have from their residences which are located across Denton Drive, but that are parallel to and face the alignment.

Based upon public comments received during the Draft EIS public comment period, nearby residents indicated that the selected site for the Northwest Rail Operating Facility (at Lombardy and Denton) would create potentially significant visual impacts to adjacent uses and potentially hinder redevelopment opportunities in the area, particularly because Lombardy Lane is a main entrance from Denton and Harry Hines in that area of Dallas.

Mitigation will be further explored during final design and would include the use of vegetation, appropriate lighting and other design features to respond to the residential character of the adjacent areas, particularly in the vicinity of the Bachman Station.

As part of the August 13, 2002 resolution approving the Northwest Rail Operating Facility, the DART Board required visual mitigation to address community concerns. During final design, DART will develop mitigation including an enhanced retaining wall along Lombardy Lane between Denton Drive and Abernathy to incorporate landscaping and a cost-effective screening wall. Along Denton Drive, particularly further south near the Letot School, mitigation will include additional landscaping to screen both freight and LRT. The remainder of the site will be treated with appropriate landscaping and security fencing. In accordance with the Section 106 Memorandum of Agreement (see Appendix H), this area will require design review by the SHPO during final design.

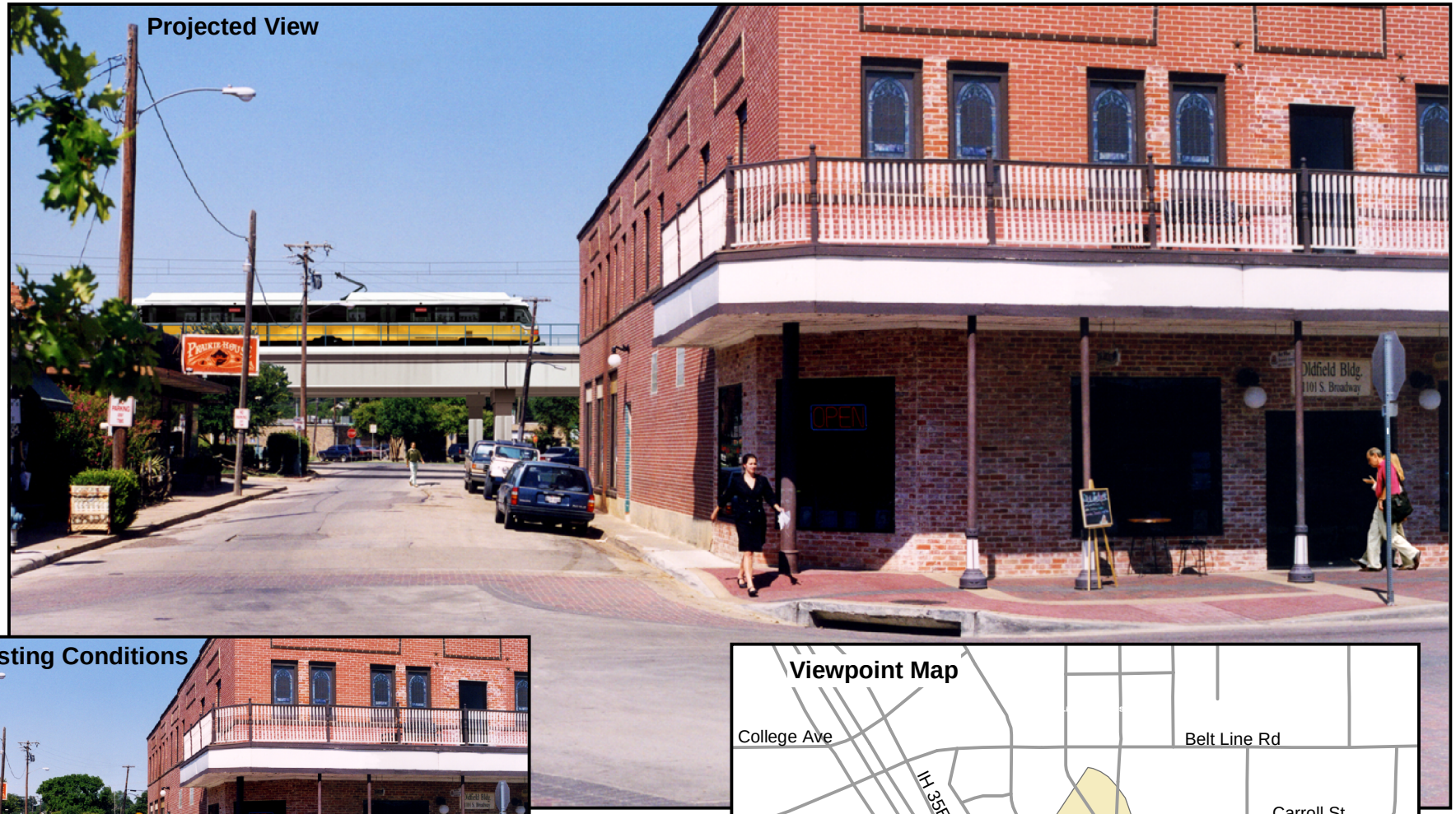
Unit 6 - Farmers Branch
The impact in the area of downtown Farmers Branch is potentially significant. The system elements to be constructed adjacent to an area of mature vegetation and historic architecture could affect the views as experienced by arterial motorists, pedestrians, residents and visitors to the city's park.

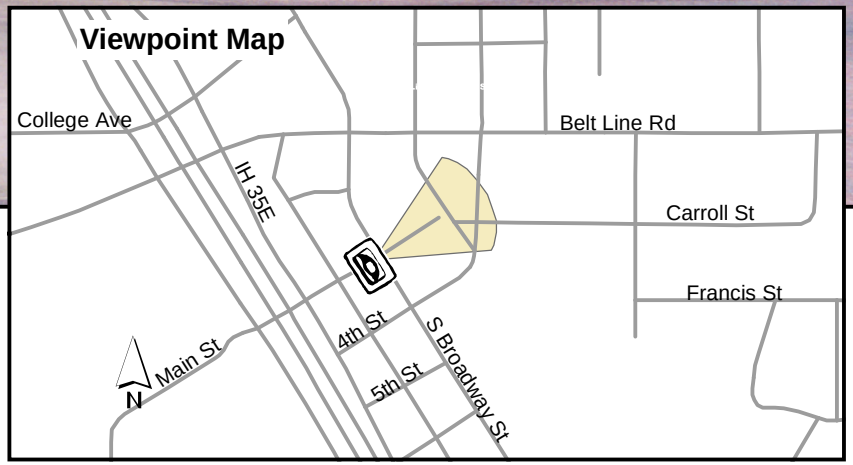
Mitigation of the impacts in Farmers Branch will include the use of vegetation along the alignment near Farmers Branch Historical Park. DART will also explore the use of architectural and design elements in the station area which are more consistent with the goals and objectives of Farmers Branch's redevelopment plans. This could include paving the platform track area and using complementary bus shelter designs.

Unit 7 - North Farmers Branch
The impact to residents at the northern end of this visual unit is significant. Residents of multi-family housing immediately adjacent to the right-of-way, south of Crosby Road, would view the elevated structure from patios and balconies facing west.

Mitigation will include, but not be limited to, design of a screening element as part of the structure as it crosses Crosby Road, and the use of vegetation to screen views of the LRT structure over the existing privacy fence of the apartments. The screening element can be designed as an integral part of the LRT guideway structure that can also address moderate noise impacts at this location. Structural features that can be used to minimize the mass and scale of the proposed bridge structure will also be explored.

Unit 8 - Downtown Carrollton
The impact of the project on this visual unit is potentially significant. The elevated structure may impede views of the historic downtown area and the pedestrian environment may be less desirable when overshadowed by the structure, as shown in **Figure 5-4.**





Source: Poitra Visual Communications, LCC, 2002

Figure 5-4
Visual Simulation - Carrollton Square Station

Mitigation of the impacts to downtown Carrollton will be further explored during final design and will include, but not be limited to, use of materials and finishes consistent with the historic character of the area. In accordance with the Section 106 Memorandum of Agreement (See Appendix H), the Carrollton Square Station will require design review by the SHPO during final design, specifically as it relates to the relocation of the Carrollton Crossing Depot.

Unit 9 - Carrollton/Frankford
The proposed project would not create any visual impacts in this assessment unit. The area is characterized by industrial warehouses, many of which are served by freight rail service. While there is a public park in this vicinity, Ken Good Park, it is surrounded by industrial warehouse uses, and by Broadway Street and IH-35E to the west. Thus, there are no nearby areas which contribute visual elements to the park. No impact is anticipated in this visual unit.

5.7 ECOSYSTEMS

This section describes the potential impacts that could result from implementation of the No-Build or LRT Alternatives. Except where noted, the impacts are the same for the other alignments considered, but not selected. The information used to analyze potential impacts included site surveys and a literature review (including a review of previous environmental documents).

5.7.1 Wetlands

All waters of the U.S. were delineated in February and March of 2001 by certified wetland biologists. Section 3.9.1 identifies the waters of the U.S. present within the project corridor. The following impact evaluation for these waters of the U.S. is quantified based on the acreage or linear distance of each water feature that could be impacted.

No-Build Alternative
The No-Build Alternative would not impact any wetlands or other waters of the U.S. because this alternative would not have any ground disturbance. The waters of the U.S. would remain as described in Section 3.9.1.

LRT Alternative
Within the project study area there are 38 bodies of water; of these, 34 are considered to be potentially jurisdictional waters of the U.S. Several of these water resources lie adjacent to the proposed construction corridor, but will be avoided. All potential jurisdictional waters of the U.S. within this alternative that cannot be avoided will be bridged to minimize filling the water resources.

Preliminary engineering designs indicate that 15 water bodies (IDs 1, 2, 3, 3B, 4, 6, 8, 9, 10, 12, 13, 14, 20, 21, and 24) would be crossed by the Selected LRT Alignment. The Medical Center Design Options A, B, C, and D or Love Field Design Option would also cross the same 15 water bodies. Potential impacts would be restricted to bridge supports and would be minimal (**Table 5-14**).

Total impacts to these water bodies would be dependent upon the size and number of support columns placed within the ordinary high water mark for each individual water body. Despite placing support columns into these water bodies, significant impacts are not expected.

The remaining water bodies lie adjacent to the proposed construction area and would not receive any direct impacts. However, indirect impacts could occur via surface water runoff, which may transport sediment into these water bodies. During construction activities, potential erosion from soil disturbance will be reduced by the implementation of standard engineering best management practices, such as silt fences and hay bales around the site perimeter. These construction and mitigation measures will minimize and/or alleviate any potential negative effects resulting from erosion and subsequent sedimentation.

TABLE 5-14
IMPACTS TO WATERS OF THE U.S.

PROJECT AREA/ID	Name	Crossing Type	Civil Station No.	Crossing Width (in feet)	Impacts[2] (sq. ft.)
RAIL LINE					
Selected LRT Alignment					
1	Turtle Creek	B	160+75	30	NA
2	Cedar Branch	B	209+00	20	NA
3	Unnamed tributary to Knights Branch	B	287+20	25	NA
3 B	Unnamed tributary to Elm Fork	B	250+70	10	NA
4	Bachman Creek	B	278+00	43	NA
6	Joe's Creek	B	356+00	37	NA
8	Unnamed Tributary of Joe's Creek	B	430+00	20	NA
9	Unnamed Tributary of the Elm Fork	B	454+00	10	NA
10	Unnamed Tributary of the Elm Fork	B	494+00	20	NA
12	Farmers Branch of the Elm Fork	B	552+00	43	NA
13	Rawhide Creek	B	556+50	25	NA
14	Cook's Branch	B	606+80	18	NA
20	Hutton Branch of the Elm Fork	B	707+00	37	NA
21	Unnamed Tributary of the Elm Fork	B	771+00	5	NA
24	Furneaux Creek	B	817+00	15	NA
STATIONS					
No impacts relative to stations.					

B = Bridge
NA = Currently Not Available at 10% design; limited to bridge pier placement
[1]See Section 3.9 for location maps and site descriptions
[2] Based on Global Positioning System survey

Source: Geo-Marine, Inc. 2001

Stations
There are no station-related impacts to jurisdictional waters of the U.S.

Rail Operating Facility
The selected site for the proposed Northwest Rail Operating Facility will not impact any jurisdictional waters of the U.S.

Wetlands Mitigation
DART and its contractors will follow the guidelines of the USACE Nationwide Permit 14, *Linear Transportation Crossings.* The guidelines stipulate that mitigation is required for any activity that impacts greater than 0.5 acre or 200 linear feet of stream channel for any single and complete project. For linear projects, the "single and complete project" (i.e., single and complete crossing) will apply to each crossing of a separate water of the U.S. (i.e., single water body) at that location, except that for linear projects crossing a single water body several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate water bodies. Additionally, a pre-construction notification must be given to the USACE under General Condition 13 of the permit if an area greater than 0.1 acre is to be impacted.

Station impacts will follow guidelines of the USACE Nationwide Permit 39, *Residential, Commercial, and Institutional Developments,* which require mitigation for any activity that impacts more than 0.5 acres of waters of the U.S. or 300 linear feet of stream bed for a single and complete project. A pre-construction notification must be given to the USACE under General Condition 13 of the permit if an area greater than 0.1 acres is to be impacted or if any open waters, including perennial or intermittent streams (below the ordinary high water mark) will be lost.

Under General Condition 13 of Nationwide Permits 14 and 39, a pre-construction notification would be given to the USACE for all bridged crossings and stations impacting stream channels that are either intermittent or perennial in nature. The notification will include a compensatory mitigation proposal to offset permanent losses of waters of the U.S. to ensure that those losses result only in minimal adverse effects to the aquatic environment and a statement describing how temporary losses of waters of the U.S. will be minimized to the maximum extent practicable. Additionally, based on the final design, any necessary mitigation plan and permit pursuant to USACE waters of the U.S. regulations will be implemented.

The USACE requires that all mitigation efforts be conducted at a minimum ratio of 1:1 (USACE 2000) to ensure that there is no net loss of functions and values. Mitigation efforts that could be implemented include stream channel/wetland enhancement and implementation of native vegetation buffers along the fringe of the water resource. Other mitigation efforts may include reducing the size of the project, establishing an upland vegetated buffer, and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed. Other mitigation options include the in-lieu fees program and mitigation banking.

Consultation with the USACE has been initiated in order to document the expected impacts, permits, and mitigation needs. This consultation is documented in Appendix D and will continue after completing the Final EIS to establish actions required in final design to conform to all USACE requirements.

5.7.2 Long-term Vegetation Impacts

The entire corridor has been previously impacted by various construction projects, and is predominantly vegetated with ornamental or disturbance species. Potential impacts to vegetation are estimated based on the number of acres of vegetation to be permanently replaced by structures.

Both the cities of Dallas and Carrollton have tree ordinances that protect certain tree species of certain sizes. The Dallas Landscape & Tree Regulations (Part II of the Dallas Development Code) generally prohibits the felling of protected trees of diameters greater than six inches without replacement. DART is exempt from the City of Dallas tree ordinance within the DART right-of-way. The Tree Preservation Ordinance for the City of Carrollton generally requires replacing protected trees greater than four inches in diameter.

No-Build Alternative

Implementation of the No-Build Alternative would result in no direct or indirect impacts to the vegetation. The plant communities would remain as described in Section 3.9.2

LRT Alternative

During field surveys, there were four distinct plant communities delineated throughout the project area. The primary direct effect of implementing the LRT Alternative would be the loss of vegetation and subsequent wildlife habitat. A maximum of 21.1 acres of habitat, including 12.9 acres of vegetation, would be permanently removed by the Selected LRT Alternative not including the stations (**Table 5-15**). The impacts of other alignments considered are shown for comparison. However, these plant communities, and those of higher quality, are abundant throughout the north-central region of Texas (McMahan et al. 1984).

TABLE 5-15
IMPACTS TO PLANT COMMUNITIES

Project Area/Option	Urban (acres)	Grassland (acres)	Shrubland (acres)	Woodland (acres)	Total (acres)
RAIL LINE					
Selected LRT Alignment (UPRR)	8.2	10.6	1.3	1.0	21.1
Other Alignments Considered					
Harry Hines Base Alignment	8.0	11.0	1.3	1.0	21.3
Base Alignment with Medical Center Design Options A, B,C, or D	3.3	10.6	1.3	1.0	21.2
Base Alignment with Love Field Design Option	3.1	11.0	1.3	1.0	16.4
Base Alignment with Love Field and Medical Center Design Options A, B, C, or D	3.4	10.6	1.3	1.0	16.3
STATIONS (Platform and Parking)					
Selected LRT Alignment					
Market Center/Oak Lawn (South)	2.9	0.0	0.0	0.0	0.0
Parkland (UPRR)	3.6	0.0	0.0	0.0	3.6
Inwood (South)	4.2	3.2	0.0	0.0	7.4
Brookhollow	0.6	5.9	0.0	0.0	6.5
Bachman	6.1	1.0	0.0	0.0	7.1
Royal Lane	3.7	0.7	0.0	0.0	4.4
Walnut Hill	10.4	1.1	0.0	0.0	11.5
Farmers Branch	4.3	0.2	0.0	0.0	4.5
Carrollton Square	6.3	0.0	0.0	0.0	6.3
Trinity Mills	2.3	6.0	0.0	0.0	8.3
Frankford	0.7	15.5	0.1	2.5	18.8
Other Alignments Considered					
Parkland (Medical Center Design Option A, B, C)	2.8	0.0	0.0	0.0	2.8
Parkland (Medical Center Design Option D)	2.9	0.0	0.0	0.0	2.9
Market Center/Oak Lawn (North)	4.8	2.1	0.0	0.2	7.1
Inwood (North)	4.7	0.0	0.0	0.0	4.7
UTSW/Exchange Park (Harry Hines Base)	3.7	0.0	0.0	0.0	3.7

Source: Geo-Marine, Inc., 2001

The selected Northwest Rail Operating Facility site has been used for retail or industrial purposes and is now devoid of natural habitat.

Vegetation Mitigation
After final grading, all plant communities would be restored to the original condition. The cities of Carrollton and Dallas tree ordinances would be followed. A survey would be conducted during the final design phase to determine whether the felling of any protected trees is necessary. Based on this survey and the final design, any necessary mitigation plan and permit pursuant to the tree regulations would be implemented. Although not bound by the City of Dallas tree ordinance within the DART right-of-way, DART would preserve existing vegetation and trees to the greatest extent possible.

5.7.3 Wildlife Impacts
Potential impacts to biological resources are estimated based on the amount and type of wildlife habitat disturbed.

No-Build Alternative
Implementation of the No-Build Alternative would result in no ground disturbance and therefore no alteration/disturbance of the landscape. As a result, wildlife and their associated habitat in the area would not be affected.

LRT Alternative

Under the LRT Alternative, there would be no significant impacts to wildlife or their associated habitat within the project areas. Wildlife communities within the project areas include the wildlife commonly associated with the floodplain areas of north-central Texas and species adapted to urbanization. Other than a few areas in the northern half of the project corridor and a small number of riparian corridors, the LRT Alternative contains very little wildlife habitat. Correspondence with TPWD indicated that the Biological and Conservation Data System (BCD) data did not provide a definitive indication as to the presence, absence, or condition of special species, natural communities, or other significant features in the project area. TPWD also made note of two colonial waterbird rookeries as being documented within one mile of the proposed project route. One of the rookeries was confirmed as being located in Carrollton more than one mile from the project area and separated from the project area by several city blocks, streets, and a large number of buildings. No direct or indirect impacts would occur to this rookery as a result of the proposed alternative. The other rookery is located near the University of Texas Southwestern Medical Center. This rookery is separated from the Selected LRT Alternative by a distance of 2,900 linear feet. No direct impacts to the rookery are expected. Minor indirect impacts such as disturbance from noise may occur to the nesting birds. However, biologists noted that the rookery was located in an area of high pedestrian and vehicle use. Therefore, the impacts to these birds would be minimal, considering the already occurring disturbances.

Wildlife Mitigation

All animals present within the project area are already subject to an environment that is regularly disturbed. Due to the animals' mobile nature, they would relocate in the event of habitat disturbance. Construction activities would temporarily disturb these animals' habitat; however, long-term impacts would be mitigated through re-vegetation. Existing vegetation or habitat would be replanted along the disturbed project areas.

5.7.4 Protected Species

Four species have a low to moderate potential of occurring within the project areas - Arctic peregrine falcon, interior least tern, migrant loggerhead shrike, and Texas garter snake. Although species-specific surveys were not performed, a peregrine falcon and several loggerhead shrike were identified within the project area. These species were unable to be identified as the protected varieties. On April 8, 2002, informal consultation was initiated with the USFWS in order to determine what, if any, effects this project may have on protected species, as well as to provide an opportunity to alleviate those affects early in the planning process. On April 23, 2002, the USFWS responded, with a "may affect" designation for the interior least tern.

No-Build Alternative

The No-Build Alternative would not result in any ground disturbance or alterations to the potential habitat for the Arctic peregrine falcon, interior least tern, migrant loggerhead shrike, or Texas garter snake within the project areas. Therefore, the No-Build Alternative would not have any impacts on protected species.

LRT Alternative

Although no impacts are anticipated with the Selected LRT Alternative, the USFWS has indicated during informal consultation that the interior least tern could potentially be affected. While preferred habitat of the interior least tern is not found within the project corridor, they are a highly opportunistic species capable of surviving in disturbed urban environments. They are also believed to utilize the Trinity River and its tributaries, some of which cross the project corridor, as a nesting/migratory route.

Protected Species Mitigation
All four protected species that would potentially utilize the project corridor are subject to an environment that is already repetitively disturbed (i.e., mowing, road construction projects, bridge maintenance, and traffic noise). Due to the animal's mobile nature, they would relocate in the event of habitat disturbance. Construction would temporarily disturb the animal's habitat; however, long-term impacts will be mitigated through re-vegetation. Existing vegetation or habitat will be replanted along the disturbed project areas. Additionally, through coordination during final design with the USFWS, preventative/mitigative measures in "sensitive areas", as determined by the USFWS, will be developed in order to lessen the effect on this species to a level that is discountable or insignificant; and, thus, will not adversely affect the interior least tern. Appropriate coordination with USFWS will be conducted during final design.

5.7.5 Aquatic Habitat Impacts
The acreage or linear distance of surface water features quantifies the potential impacts to aquatic habitat. The area of potentially affected aquatic habitats is presented below.

No-Build Alternative
This alternative would not result in any disturbance to aquatic habitats. The existing conditions identified in Section 3.9.5 would remain undisturbed.

LRT Alternative
The preliminary designs indicate all aquatic habitats would be bridged. Despite placing support beams into these aquatic habitats, no substantial impacts to these aquatic habitats are expected.

Aquatic Habitat Mitigation
Due to the poor species composition and highly disturbed nature of the existing aquatic habitats, no long-term impacts are anticipated. Potential aquatic habitat may be indirectly impacted as a result of construction-related surface water runoff. Potential construction-related erosion will be minimized by implementation of standard engineering best management practices (i.e., silt fences and hay bales around the construction limits). These construction and mitigation measures will minimize and/or alleviate any potential negative effects to the aquatic habitat resulting from erosion and subsequent sedimentation.

5.8 GEOLOGY
No-Build Alternative
The No-Build Alternative involves no additional construction or excavation. No significant geological impacts are expected with this alternative.

LRT Alternative
The majority of soils in the project area (75%) have a high to moderate potential for urban development. Those areas containing soils with a low potential for development lie mostly within floodplains. Impacts will be limited to minor amounts of fill associate with project-related retaining walls and structures (see Section 5.9.3).

Direct impacts to soils would include the removal of vegetation, exposure of the soil, mixing of soil horizons, loss of topsoil productivity in areas which are not currently paved, and short-term increased susceptibility to wind and water erosion. These construction activities can lead to an increased potential for erosion and sedimentation during the construction process.

The underlying geology in the region of Love Field and the Medical Center, where the below-grade segments of the alignment would have been located, consists primarily of Fluviatile terrace deposits. The only below-grade section of the Selected LRT Alternative is under Mockingbird Lane. The Eagle Ford group and Austin Chalk are also found in the Love Field area. These latter two

formations could contain paleontological remains. Care should be taken during trenching activities to protect archeological resources. Appendix F contains more detailed information on geological conditions in the Love Field area.

Mineral maps show that the Love Field/Medical Center area is covered in sand and gravel terraces and floodplain deposits, from the time the Trinity River flowed freely. The presence of sand and gravel deposits should be considered in the design process and in developing tunnel construction methods in this area.

Impacts for other alignments considered are similar to the Selected LRT Alternative.

Geology Mitigation
Increased runoff and erosion will be reduced with the establishment of protective vegetation and the use of best management practices (BMP's). Some relevant BMP's include silt fences, strawbale dikes, diversion ditches, rip-rap channels, water bars, and water spreaders.

Potential impacts to geological resources are not expected to be significant. Mitigation measures enacted to protect floodplain resources would also protect floodplain soils categorized as having low potential for urban development (see Section 5.9.3).

5.9 HYDROLOGY/WATER QUALITY

Section 3.11 describes several hydrologic and water quality issues that must be addressed prior to construction. These issues include surface water quality impacts, impacts to groundwater resources, and floodplain impacts. The following section provides information relating to the minimizing of impacts to these areas. Except where noted, impacts described apply to the Selected LRT Alternative and to the other alignments considered, but not selected.

5.9.1 Surface Water Quality Impacts

As mentioned in Section 3.11.1, Surface Water Quality, the Selected LRT Alignment does not cross any major river channels. The existing freight railroad alignment identified in the No-Build Alternative, however, crosses ten streams and creeks. Because the majority of the proposed alignment is within an existing transportation corridor, the proposed project would generally rehabilitate or rebuild existing bridges crossing affected water resources. Project construction has the potential to cause minor, short-term impacts to these water bodies due to runoff from grading activities, removal or additions of fill materials and incidental/accidental spills of mechanical fluids. Erosion control measures, such as gabion channel linings, would have minimal impact to water quality.

No-Build Alternative
Surface water quality has been degraded for many years due to stormwater runoff from the rail line containing minor amounts of creosote, oil and grease, hydraulic fluid and other chemicals associated with railroad activities.

Implementation of the No-Build Alternative would indirectly impact surface water quality because this alternative would fail to reduce the automobile traffic on area roadways. Automobiles generate significant amounts of non-point source contaminants (petroleum products, rubber, etc.) that are deposited on roadways. This material is washed from the roadways to local drainages during storm events via the storm sewer system where it affects surface water quality.

LRT Alternative
The impact to surface water quality from the rail line of the Selected LRT Alternative would be less than that of the No-Build Alternative. All rail bed ties will be concrete instead of wood, thereby

ensuring that no creosote runoff will occur. Additionally, the trains will be electric, thus reducing the amount of petroleum hydrocarbons required for operation of the trains.

Potential impacts to water quality could result from the impervious surfaces of station platforms and parking areas associated with the project if not adequately addressed. Stormwater run-off from platforms could contribute to erosion and sedimentation problems adjacent to station sites. Runoff from parking areas could contain anti-freeze, lubricating fluids, gasoline and other petroleum hydrocarbons associated with automobiles. Mitigation of these potential impacts through appropriate design measures is addressed below. Water quality and runoff during construction is discussed in more detail in Section 5.12.8.

Rail Operating Facility

The Northwest Rail Operating Facility has the potential to impact water quality due to incidental/accidental spills from mechanical fluids, paints, solvents and other maintenance materials. No significant increase in impervious surfaces is anticipated with the proposed site.

Surface Water Quality Mitigation

Prior to construction, coordination with the USACE will be initiated to allow the USACE to evaluate potential channel impacts and mitigation options. Additionally, DART will be required to obtain the necessary permits to proceed with construction. The issuance of storm water discharge permits under the Texas Pollutant Discharge Elimination System (TPDES) is a major part of the Environmental Protection Agency's efforts to restore and maintain the water quality of the nation. Under TPDES' General Permits for Storm Water Discharges from Construction Activities, the Texas Commission on Environmental Quality (TCEQ) requires the development and implementation of a Storm Water Pollution Prevention Plan (SW3P). The plan is designed to reduce pollution at the source before it can bring about environmental problems that cost the public and private sectors resources and the expense of environmental restoration activities. A SW3P will be prepared by DART prior to final design submittal.

Consultation with the USACE has been initiated in order to document the expected permits and mitigation needs. This consultation is documented in Appendix D and will continue after the Final EIS and during Final Design.

5.9.2 Impacts to Groundwater Resources

Potential impacts to groundwater resources are expected to be less than significant. Due to over-development in the Dallas/Fort Worth Metroplex, the water table is low in the project area, dropping at times to as much as 1,200 feet below the surface.

No-Build Alternative

The No-Build Alternative would not significantly impact groundwater quality. Minor impacts have occurred due to storm water runoff from the existing freight rail line containing minor amounts of creosote, oil and grease, hydraulic fluid and other chemicals associated with railroad activities that have leached into the ground. No significant groundwater impacts are expected under the No-Build Alternative.

LRT Alternative

Construction of the Selected LRT Alternative should reduce the amount of non-point source contaminants automobiles contribute to the groundwater by reducing the number of automobiles on the roadways. Contaminants from the existing rail alignments would also be reduced, since the LRT trains run on concrete bed ties, rather than wooden ones, and are powered by electricity, rather than petroleum hydrocarbons. After years of stormwater runoff from commercial and residential developments and transportation facilities, it is unlikely that the shallow groundwater within the project corridor will be adversely affected by the project.

Construction of the Selected LRT Alternative would not likely impact aquifer resources. The Trinity group, the primary source of groundwater for the upper Trinity River Basin, and the Woodbine Aquifer, a minor aquifer also producing water in this basin, are the two major components of the area's groundwater resources. Although both of these aquifers outcrop west of Dallas County, construction of a tunnel through the Medical Center area would have resulted in contact with groundwater resources. However, the Selected LRT Alternative has only a short cut-and-cover section under Mockingbird Lane so impacts will be minimized, relative to previous alignment alternatives. Along the selected route, four USTs and three LUSTs were identified. Although building portions of the alignment below-grade does provide an opportunity for groundwater contamination, DART's due diligence program and best management practices provide a high level of protection for groundwater resources.

Medical Center Design Options A, B, C, and D had tunnel sections in the Medical Center and would have had a higher potential for impacts. The Harry Hines Base Alignment was aerial and would have avoided such impacts. The Love Field Design Option would have had potential impacts on groundwater.

Rail Operating Facility
The construction and operation of the proposed Northwest Rail Operating Facility at the selected site, or at any of the previous candidates sites, would not impact any groundwater resources.

Mitigation of Impacts to Groundwater Resources
The mitigation measures provided in Sections 5.11, Construction Impacts, and 5.9.1, Surface Water Quality Impacts, would result in minimal impacts to shallow groundwater. Primary and secondary aquifers would not be impacted by project construction.

5.9.3 Floodplain Impacts

No-Build Alternative
The No-Build Alternative involves no additional construction, excavation or placement of fill material beyond what has been approved for existing and planned projects.

LRT Alternative
The proposed project crosses or abuts the 100-year floodplain of the Elm Fork of the Trinity River and its tributaries at ten locations, as explained in Section 3.11.3. As final design progresses, the amount of impact at these locations will be quantified. At this time, it is necessary to assume that direct impacts to floodplains would be limited to minor amounts of fill associated with retaining walls and structures associated with the proposed project. **Table 5-16** identifies the designated and suspected floodplains that would be impacted. The remaining portions of the rail line were not shown to be within designated flood zones or within suspected floodplains.

The Federal Emergency Management Agency (FEMA) has regulations governing alterations or development within floodplains shown on Flood Insurance Rate Maps. Under FEMA regulations, no alterations of flood zones can result in an increase in the 100-year base flood elevation or cause an increase in the velocity of floodwaters. In addition, the cities of Dallas, Farmers Branch and Carrollton have their own floodplain ordinances. An EIS and a complete stream rehabilitation program must be approved prior to any relocation or alteration of the natural channel. It would also be necessary to coordinate with the US Army Corps of Engineers (USACE) on the issue of fill in any of the floodplains or wetlands. While a Nationwide permit might suffice for the construction of an aerial structure above the floodplain, an Individual permit may be required if short-term construction impacts occur in more than 0.3 acres of the associated wetlands. This will be determined with the development of engineering details during final design.

TABLE 5-16
DESIGNATED AND SUSPECTED FLOODPLAINS CROSSED OR BORDERED BY ALIGNMENT

Name of Floodplain	City
Trinity River Floodplain	Dallas
Turtle Creek Branch Floodplain	Dallas
Cedar Springs Branch Floodplain	Dallas
Knights Branch Floodplain	Dallas
Bachman Branch Floodplain	Dallas
Joe's Creek Floodplain	Dallas
Farmers Branch Creek Floodplain	Farmers Branch
Rawhide Creek Floodplain	Farmers Branch
Cooks Branch Floodplain	Farmers Branch
Hutton Branch Floodplain	Carrollton
Furneaux Creek Floodplain	Carrollton

Source: Wendy Lopez & Associates, 2001

The project spans or borders the following flood zones within the City of Dallas: Trinity River, Turtle Creek Branch, Cedar Springs Branch, Knights Branch, Bachman Branch, and Joe's Creek. Farmers Branch Creek, Rawhide Creek, and Cooks Branch in the City of Farmers Branch may also be impacted, as may Hutton Branch and Furneaux Creek in the City of Carrollton. Each city has specific ordinances governing land alteration within a floodplain, as does the federal government. Federal law requires municipalities that participate in the Federal Flood Insurance Program to adopt floodplain ordinances that prohibit development in the existing 100-year floodplain. In compliance with this program, Section 51A-5.101 of the Dallas City Code, Part II of the Dallas Development Code sets forth floodplain regulations. These regulations include the uses and structures permitted, and the conditions for the development within the floodplain. The deposition or storage of fill, the placement of a structure, or excavation within a floodplain area requires a fill permit. An overview of this permit process is outlined in the *Procedures for Filling in a Floodplain under the Floodplain Management Guidelines.*

Floodplain management guidelines reflect several City of Dallas concerns, including that:

- Storm water be moved naturally rather than relying on extensive and costly channel improvements;
- Fill and development which is not unreasonably damaging to the environment should be permitted where it would not create other flood problems and where public acquisition is not required for environmental protection or recreation purposes; and
- A systematic approach to review fill requests for all floodplains not covered by specific guidelines from adopted management plans should be utilized.

Similar information on permitted uses within floodplains in the City of Farmers Branch can be found within the City's *Comprehensive Zoning Ordinances* as well as the *Code of Ordinances* Part II, Chapter 42, Article II. Any structure to be erected in an area designated as a Floodplain on the City's Zoning District Map must first be approved by the Director of Public Works.

The City of Carrollton does not allow any new construction within floodplain areas. However, construction may take place in areas reclaimed from the floodplain. A Floodplain Alteration Permit must be obtained from the City for floodplain reclamation or alteration. This permit may be granted only if certain criteria are met, including that the alteration does not create erosive water velocity on or off-site, does not significantly increase downstream discharge, and does not cause any additional expense to current or projected public improvements. The City of Carrollton's floodplain regulations can be found in their *Stormwater and Flood Protection Ordinance*, Articles 8 and 9.

Rail Operating Facility
According to the FEMA Maps, a portion of the selected NWROF site is located within the floodplain of Joe's Creek.

Mitigation of Floodplain Impacts
DART and its contractors will comply with all federal, state, and local regulations regarding construction and operation of the project within floodplains. The proposed project will be designed to be above any 100-year floodplain that the alignment will cross. Impacts to floodplains will be limited to piers located in the flood zone or minor amounts of fill associated with retaining walls and other bridge structures. Some fill will also be required at the Northwest Rail Operating Facility site. Mitigation measures may include channel improvements or design modifications to ensure that neither the 100-year base flood elevation nor floodwater velocity is increased. DART will coordinate with the USACE and the cities of Dallas, Farmers Branch and Carrollton during final design, with respect to floodplain impacts. These regulatory agencies will evaluate and approve the project design, including any mitigation measures that may be required.

Consultation with the USACE has been initiated in order to document the expected permits and mitigation needs. This consultation is documented in Appendix D and will continue after the Final EIS and during final design.

5.10 HAZARDOUS/REGULATED MATERIALS

This section summarizes potential construction and operational impacts of the No-Build and LRT Alternatives with regard to hazardous and regulated materials. Impacts of the Selected LRT Alternative and other alignments considered are described. Hazardous and regulated materials impacts are anticipated only during construction activities. Thus, additional detail regarding these potential impacts is presented in Section 5.11, Construction Impacts.

5.10.1 Impact Assessment

No-Build Alternative
The No-Build Alternative consists of existing highway and transit projects currently approved for implementation. Implementation of these projects would include the potential to uncover or disturb hazardous or toxic materials during construction activities.

LRT Alternative
Excavation activities for the LRT Alternative would be associated with the development of: LRT guideway (i.e. railbed preparation and track installation), LRT station elements (e.g. utilities, platforms, transformers, and elevators), retaining walls, support structures for aerial tracks, grade separations, and tunnel or cut-and-cover structures.

Of the 64 sites identified as a result of the database search and field survey of hazardous materials in the project area, 46 are relevant to the Selected LRT Alternative: 28 of high concern, 18 of moderate concern. The Selected LRT Alternative effectively avoids eight high and nine moderate sites that would otherwise have been encountered by the other alignments considered in the Draft EIS (Medical Center Design Options A, B, C, and D; the Harry Hines Base Alignment; and the Love Field Design Option). The sites encountered by the Selected LRT Alternative consist mainly of leaking petroleum storage tanks associated with small petroleum fuel and oil facilities. Petroleum contamination of soil is the most likely contamination problem to be encountered along the LRT alignment. All other sites found in the database search are considered to be of low risk to the project.

Of the 64 sites originally identified, eight have been identified for acquisition, and an additional 16 sites are located within existing street or railroad ROW that would be used for the project. These sites are identified in **Tables 5-17 and 5-18**.

TABLE 5-17
HAZARDOUS MATERIALS OCCURRENCES
WITHIN THE BOUNDARY OF PROPERTIES TO BE ACQUIRED

Map No.*	Facility	Address	Level of Concern	Reason for Acquisition
20	Varel Manufacturing Company	9230 Denton Drive	High	Selected Alignment
121	Healthsouth Dallas Rehab.	9713 Harry Hines	Moderate	Construction Staging
138	Bright Truck Leasing	9773 Harry Hines	Low	Bachman Station
28	Diamond Shamrock 775	3003 Lombardy Lane	High	Rail Operating Facility
65	Archer Automotive	10603 Denton Drive	High	Rail Operating Facility
37	Royal Lane FINA	2681 Royal Lane	High	Royal Lane Station
50	Racetrac Petroleum	1001 North Broadway	High	Carrollton Square Station
60	FINA	1013 E. Belt Line	Moderate	Carrollton Square Station

* See **Figures 3-46** and **3-47**

Source: Wendy Lopez & Associates, 2001

TABLE 5-18
HAZARDOUS MATERIALS OCCURRENCES
WITHIN EXISTING STREET OR RAILROAD ROW

Map No. *	Facility	Address	Level of Concern
19	TXI Aviation	8350 Denton Drive	High
28	7-Eleven Store #21764	2990 Lombardy Lane	High
30	Glazer's, Inc.	10750 Denton Drive	High
31	J's Aircraft Engines & Parts, Inc.	10819 Denton Drive	High
33	Glass Depot	10845 Denton Drive	High
35	AB Aluminum Brass Foundry	11165 Denton Drive	High
42	Wellmark International	12200 Denton Drive	High
46	241 Co. Chaps L7	13303 Denton Drive	High
65	Archer Automotive	10603 Denton Drive	High
73	Labor Force	4248 Harry Hines Boulevard	Moderate
UM17	Bragg Service Company	1937 Broadway	High
13	Warehouse	6621 Denton Drive	Moderate
14	Williamson Printing Corp.	6700 Denton Drive	Moderate
102	Love Field Auto Service Center	6420 Denton Drive	Moderate
127	Southwest Snacks	6333 Denton Drive	Moderate
173	Unknown (Spill in Street)	6200 Denton Drive	Moderate

* See **Figures 3-46** and **3-47**

Source: Wendy Lopez & Associates, 2001

Although a site is known or suspected to be contaminated, implementation of the LRT Alternative does not necessarily mean that the LRT project would affect the site. More detailed information regarding project design, to be developed during the final design phase of this project, will be used to determine the appropriate methods(s) to be developed to address hazardous/regulated material sites that will either be acquired or remain in proximity to the LRT project.

Rail Operating Facility

A database search identified three sites of high concern associated with the selected location for the Northwest Rail Operating Facility: one adjacent to the site and two within the site. The other candidate sites that were not selected were also found to have hazardous materials sites within or directly adjacent to their boundaries. The Webb Chapel site had no hazardous material facilities of high or moderate concern, but a City of Dallas Solid Waste Transfer Facility is located on the site, along with the DART Northwest Bus Operating Facility. The Northwest Highway site was adjacent to one facility of moderate concern.

5.10.2 Mitigation Measures

Further investigations will be performed during final design for at-risk areas. The investigations will focus specifically on areas where construction activities involve soil excavation and/or dewatering operations (i.e. utility relocations, LRT stations, park-and-ride facilities, and tunnel locations). In addition, any existing structures will be surveyed for the presence of asbestos-containing materials and lead-based paint prior to their demolition or modification. These investigations will provide a basis for determining construction health and safety specifications, contaminated soil and groundwater remediation and disposal procedures, and asbestos or lead-based paint management and remediation practices. The design and preparation of required monitoring and remediation plans will be coordinated with the Texas Commission on Environmental Quality (TCEQ).

The completed review of hazardous materials occurrences provides a strong basis for predicting which properties pose a risk of contamination. While the DART Environmental Compliance Section (ECS) will address known hazardous or regulated materials prior to construction, unanticipated sources of hazardous or regulated materials may be encountered during construction activities. If this occurs the construction manager or designee will immediately notify the DART ECS. Specific mitigation activities that address the type, level, and quantity of contamination encountered will be immediately implemented.

The most common case encountered would be removal of unanticipated underground storage tanks. If such an “orphan tank” is encountered, it must be addressed as an emergency removal, so as not to delay construction activities. DART ECS will immediately inform the TCEQ and issue a task order for immediate removal of the tank within a 24-hour period. If asbestos is encountered, DART will perform an asbestos survey (via environmental contracts) and abate if necessary, prior to renovation or demolition of the structure. The handling, treatment and the discharge of any wastewater suspected of containing hazardous/regulated materials is prohibited without first obtaining a TPDES Permit or a similar special permit covering the one-time discharge of wastewater containing known and specific hazardous constituents issued by the TCEQ. If will be required to ensure that the sources of any fill material are free of contamination. All ECS activities will be performed according to all applicable Federal, state, and local regulations.

5.11 SAFETY AND SECURITY

The construction and operation of public transit projects increases multi-modal traffic and the potential for conflicts with automobiles and pedestrians. The ensuing safety and security issues center around avoiding accidents between competing travel modes and ensuring the daily safety of transit patrons at and near station areas, as well as persons and automobiles who must cross the alignment. Consequently, transit projects can place additional demands on police and fire protection services in the communities they serve. The impacts on safety and security issues for the No-Build and the LRT Alternatives are described below. Except where noted, the LRT Alternative includes impacts for the Selected LRT Alternative and for other alignments considered, but not selected.

The potential safety and security impacts associated with the No-Build and LRT Alternatives address a wide range of considerations including:

- Police protection and community safety services;
- Fire protection and emergency medical services;
- Pedestrian activity; and
- Station area activity.

5.11.1 No-Build Alternative

The No-Build Alternative would expand bus services and facilities in the project corridor in accordance with the DART ***Five Year Action Plan***. DART Transit Police and the municipal police

departments of Carrollton, Dallas, and Farmers Branch would continue to provide public safety services without the need for significant additional resources beyond those already planned to keep up with growth.

5.11.2 LRT Alternative

Impacts on Police Protection and Community Safety Services

The proposed project is not expected to cause any impact to demand for municipal police protection or community services. Police protection will be required for project security during both the construction and operation of the proposed project, but DART will take responsibility for project and public security by providing both uniformed and undercover transit police on its vehicles and at station areas. Should it become necessary, DART staff will work with local police to apprehend criminals. One police department division (City of Dallas Northwest Operations) is located within the corridor north of Dallas Love Field near the proposed Bachman Station. No project-related impacts are expected to effect that division. The presence of DART Transit Police and other personnel would serve to reduce the volume of crime at stations. The project will not require increased staffing for local police within any of the affected municipalities.

Police Protection and Community Safety Services Mitigation

DART Transit Police provide frequent random patrols of the stations and trains. The LRT vehicles include an operator-controlled silent alarm to alert DART Transit Police to a security problem, radio communications between trains and the central control center and a two-way emergency communication system between the train operator and passengers.

At the Market Center/Oak Lawn Station, where an element of the station would be below-grade, special security measures have been designed. The Market Center security division has stated they will monitor the pedestrian underpass connecting the Market Center/Oak Lawn station to the Market Center by closed circuit television. Should they decide not to, DART will work with them to determine security needs. If Medical Center Design Options A, B, C, or D had been selected, the below-grade Parkland Station would have been equipped with a “panic button” that sounds an alarm and activates a two-way communication device to the DART security headquarters. If the Love Field Design Option would have been selected, similar measures would have been taken for the Love Field Station.

Before start-up, DART will host security sessions with police, fire, schools, emergency response teams, employers, and other interested parties located within the corridor. The information sessions will cover the details of LRT operations, potential security issues and agency responsibilities.

Impacts on Fire Protection and Emergency Medical Services

There are currently five fire stations located within the corridor. They are located near the West End, Love Field, Bachman Lake, Northwest Highway, Royal Lane and Valley View Lane. The Selected LRT Alternative may require fire protection services for control of fires in the vehicles and at the substations. However, it is unlikely that a fire would occur in light rail vehicles since all vehicles would be constructed of flame and shatter resistant materials, would have two fire extinguishers per car, and would have an exterior emergency door release for use by police or firefighters. Similarly, light rail stations would be constructed with fire-resistant materials. Because the potential for fire is low, it is not anticipated that the Selected LRT Alternative would necessitate the hiring of additional fire protection personnel in any of the affected communities.

The potential exists for increased demands for emergency medical services due to the concentration of passengers at the LRT stations. In addition, emergency vehicle response time could be slightly impacted by at-grade LRT crossings. These crossings will be provided with gates

that will block access across the tracks while the light rail vehicle passes. Typical gate down time ranges from 35 to 50 seconds depending on the width of the crossing.

Fire Protection and Emergency Medical Services Mitigation
DART will sponsor information sessions for police, fire, emergency response teams, schools and employers in the corridor. These information sessions will cover LRT operations and the potential emergency issues associated with operations.

Alternate routing for fire and police vehicles operating out of facilities near at-grade crossings will be evaluated as part of the final design phase of the project. Consideration will be given to whether alternate routes will create longer response time than the 35-50 second gate down time. The effects of both will be greatest during peak traffic hours. During these times of day, traffic could be a greater detriment to response time than the crossing gates. However, the Selected LRT Alternative preserves ambulance access to the Medical Center hospitals since the alignment is elevated in that area.

The final design of the guideway will be in accordance with the National Fire Protection Association NFPA-130 (Standard for Fixed Guideway Transit and Passenger Railway Systems) and the applicable fire and building codes of the local jurisdictions. Emergency egress provisions will be provided at a maximum spacing of 2,500 feet for tunnel and elevated guideway sections. Tunnel ventilation, fire suppression, lighting, and other Life Safety provisions will be incorporated in accordance with NFPA-130.

Impacts on Pedestrian and Vehicle Accidents
The addition of frequent LRT service adjacent to active freight lines will present safety and security concerns for adjacent residents and businesses. Both types of rail operations along the alignment have the potential to impact vehicular and pedestrian safety at points where the alignment crosses streets at-grade and in areas where corridor residents use informal crossings as short cuts to access neighborhood facilities. The potential for conflict at these informal crossings is especially important around schools and other community facilities. The schools within the corridor are concentrated along Denton Drive near Dallas Love Field.

Hernandez Elementary and Rusk Middle School are near the alignment and the proposed Inwood Station. In a letter dated December 5, 2001, DISD noted their opposition to the Medical Center Design Option alignments due to potential safety issues for their students, particularly those attending Hernandez Elementary School. The attendance zone for Hernandez Elementary is largely south of Inwood Road and students that walk to school primarily use Maple Avenue. While the Draft EIS included an at-grade crossing of Maple Avenue, this Final EIS includes a grade separation due to an updated traffic analysis. Furthermore, the Selected LRT Alignment follows the existing rail ROW. This coupled with the grade separation of Maple Avenue, minimizes impacts to this attendance zone. Rusk Middle School students access the school from all directions, primarily the north, east and south. This school is located adjacent to an elevated section of the alignment so potential impacts are less likely. However, public comments received in April 2003 highlighted the need for DART to consider pedestrian access between Kimsey Drive and Rusk Middle School. The Harry Hines Base Alignment would not have divided school attendance zones and DISD stated their support for this design option.

Along the Harry Hines Base Alignment, pedestrian and vehicular conflicts with the LRT system would have been minimal given the mostly aerial alignment. The highest potential for pedestrian accidents would have been where transit patrons had to cross a major street to access a station. This would be the case at most LRT stations along the Harry Hines Base Alignment and all Medical Center Design Options.

Safety concerns at the stations south of Northwest Highway are even more important because a high number of transit-dependent people live between downtown Dallas and Northwest Highway.

Pedestrian and Vehicle Accidents Mitigation

All federal, state and municipal laws regulating safety, design and operating procedures will be followed. The proposed project is designed to provide grade-separated crossings at most major arterials and railroad rights-of-way, so the potential for accidents with other vehicles or freight trains will be minimized at these major intersections. Installing special signage, providing designated street crossings, and employing crossing guards can mitigate the potential for accidents involving pedestrians. Through its public involvement process, DART will continue to identify areas with special safety needs in order to coordinate the most appropriate response for transit patrons.

To reduce the potential for pedestrian accidents near schools, DART will work with DISD to identify appropriate safety features. Where the LRT line separates residential areas from schools in their attendance zones, additional fencing will be used to control informal pedestrian crossings regardless of whether the 45 mph speed criterion is met. This may be necessary where the alignment is at-grade between Inwood Road and Mockingbird Lane. During final design DART will consider design options to provide pedestrian access between Kimsey Drive and Rusk Middle School. Furthermore, DART will construct pedestrian bridges at the Market Center/Oak Lawn and Carrollton Square Stations to enhance pedestrian safety and access.

In addition, in order to accommodate automobile traffic, all crossing approaches will be signed and standard safety and warning signs installed in order to warn drivers of a train's approach. Crossing gates will be installed at all at-grade crossings such that at the approach of any rail vehicle (light rail or freight), the gates will lower and automobile traffic will be stopped until the rail vehicles have cleared the street. Where light rail vehicle speed equals or exceeds 45 miles per hour, the alignment will be fenced to prevent access by pedestrians or automobiles who may be accustomed to "informal" track crossings. As noted above, fences can also be provided where speeds are less than 45 miles per hour, depending on adjacent land uses and pedestrian activity. This will be determined during final design.

Should an accident occur, safety features on all LRT vehicles include emergency manual door releases, a public address system inside and outside the car, an automatic feature that stops the train if operators release control, safety mirrors, sight and sound warning systems, impact resistant windows and windshields, "sensitive edges" on passenger doors to detect possible obstructions, and three brake systems per car—dynamic brakes, disc brakes and magnetic track brakes.

Station Area Safety Impacts and Mitigations

Although the addition of light rail service increases the potential for modal conflict in and around station areas, stations have been designed with safety measures such that no impact to station areas is anticipated. DART incorporates a number of safety considerations into the design of LRT stations. These include measures such as limiting pedestrian access across the tracks to dedicated track crossings, providing adequate lighting, and maintaining good visibility and sight lines throughout the station areas. Furthermore, at the Brookhollow and Walnut Hill/Denton Stations where pedestrians would have to cross a freight line to access the light rail platform, no impacts would be expected because freight operation would not occur during DART's operational hours or at a minimum not during peak hours. Furthermore, this freight service is infrequent and operates at low speeds, about one train per day near the station. Similarly, where bus service would feed light rail station areas, bus bays are designed to allow boardings and alightings from a common rail and bus platform such that pedestrian activity would be separated from buses and automobiles.

5.12 CONSTRUCTION IMPACTS

Short-term impacts and mitigations associated with constructing the project are documented in the following section. The construction scenario describes the construction process by line segment and by grade; the other sub-sections analyze short-term construction impacts by impact category.

5.12.1 Construction Scenario

It is anticipated that DART would divide the construction of the proposed project into four primary construction contracts: Facilities, Trackwork, Systems and Landscaping. Furthermore, DART would subdivide the Facilities contract into five separate Line Section contracts, enabling DART to effectively manage the construction efforts of the build-out. Facilities construction would progress from south to north with each successive Line Section Contract beginning 6 months after initiation of the preceding Line Section work. Each Facilities contract is expected to last between 2 and 2-1/2 years. An overview of the primary construction contracts follows.

Facilities Contracts

DART's implementation plan calls for dividing the corridor into five separate Line Section contracts. The first Line Section (NW-1A) is currently under construction between Houston Street in downtown Dallas and Turtle Creek. This line section has independent utility and is being implemented in advance to meet ridership demands at that location.

1. Line Section NW-1A – Houston Street to Turtle Creek
2. Line Section NW-1B – Turtle Creek to Bomar Avenue
3. Line Section NW-2 – Bomar Avenue to Community Drive
4. Line Section NW-3 – Community Drive to Valley View Lane
5. Line Section NW-4 – Valley View Lane to Frankford Road

Each Line Section would contain at-grade and aerial construction components. Line Section NW-2 would contain below grade components where the alignment crosses below Mockingbird Lane. **Table 5-19** outlines the summary of work for each type of construction by elevation.

The typical construction scenario would start with utility and storm sewer relocations, followed by construction of permanent and temporary facilities to support rerouting of vehicular and rail traffic. Once the utilities are cleared and the permanent / temporary facilities constructed, the contractors would build long duration construction items such as tunnel and bridge sections.

For tunnel construction, the contractor would first construct excavation support and ground water barrier walls at the perimeter of the open-cut areas. Tunnel construction would be staged from these areas and excavation spoil would be removed and disposed of properly. After completion of the tunnel liners, the approach structures would be completed and all disturbed surface areas restored.

Tunnel depths and excavation and mining procedures vary by tunnel location. The cut and cover tunnel beneath Mockingbird Lane would be 35-40 feet below grade. Traffic lanes would be bridged and maintained during the tunnel construction. Had Medical Center Design Option A, B, C, or D been selected shallow mined twin-bore tunnels, 30-35 feet below grade, would have served the below grade Parkland Station. These tunnels would be constructed with an earth pressure-boring machine or by the new Austrian tunneling method.

For bridge structures, the contractors would first construct the substructure / foundations, bridge piers and abutments. Once these items are complete, the contractor would place beams, pour the bridge deck and install parapet railing. Retained earth embankments can be constructed concurrently with the bridges.

TABLE 5-19
CONSTRUCTION ELEMENTS BY ELEVATION

At-Grade LRT Construction	
Clearing and grubbing	1,4,5,6
Storm water and erosion control	6,10,24
Utility and street relocation	4,6,10,11,13,16
Demolition of existing facilities	1,4,5,6,17,26
Drainage and storm water systems	6,10,11,15
Excavation, embankment and subgrade preparation	1,4,11,23
Retaining walls and ballast walls	3,10,22,25
Lime subgrade	4,11,23
Subballast	4,11
Chain link fencing	6,22,24
At-Grade Stations	
Station platform slab and Special Use Platform	3,5,8,11,22,25
Structural steel canopies and roofing systems	2,12,14,15,20
Electrical systems	3,10,11,20
Mechanical systems	3,10,6,12
Architectural finishes	3,14,18
Painting	18,19,20
Street, Driveway and Parking Lot Construction	
Street pavement and LRT street at-crossing headers	3,4,6,11,13,22
Permanent street signage and pavement markings	12,18,24,27
Aerial LRT Construction	
Drilled shaft construction	2,8,21,22
MSE wall construction at bridge approaches	5,6,11,25
Bridge pier construction	2,3,22
Bridge deck and parapet	2,3,9,20,22
Grounding system	3,6
Aerial Stations	
Station platform	2,20,9,12
Cut-and Cover Tunnel	
Street bridging	2,6,11,15,13
U-structure and Double box tunnel section	3,5,6,11,12
Backfill and final grading	4,5,11

1 Dozer	10 Ditcher/trencher	19 Paint Sprayers
2 Tracked crane	11 Compaction equipment	20 Man lift
3 Rubber tired crane	12 Air compressor	21 Water pump
4 Motor grader	13 Paving machine	22 Concrete vibrators
5 Dump trucks, haul trucks	14 Welding machine	23 Tiller (lime manipulation)
6 Loader/Backhoe	15 Rubber tired loader	24 Tractor with hole auger
7 Water truck	16 Excavator	25 Bucket grading machine
8 Drilled pier rig	17 Jackhammer, ramjack	26 Concrete saw
9 Concrete pump	18 Sand blaster	27 Street sweeper

Source: Chiang, Patel and Yerby, November 2000.

At-grade guideway construction can proceed concurrent with tunnel and bridge construction, but would be phased so as not to impede progress on the tunnel and bridge work. In several areas, construction activities would have to be coordinated with on-going commuter and freight rail operations.

All station construction would commence with subsurface utility / drainage and foundation work. This would be followed by platform, canopy and ancillary construction including architectural finishes. Subsurface stations would be constructed in a similar fashion, but would be phased with tunnel construction. Parking lots can be constructed at any time during the contract, but they usually follow the LRT station construction.

Trackwork Installation Contract
A systemwide contract for trackwork installation would follow substantial completion of the line section contracts. It would include the installation of the fixed guideway elements: ballast, ties, rail, concrete plinths on direct fixated bridges, and special trackwork. DART would provide the rails and ties to the Trackwork Installation contractor. These items would be strategically placed throughout the corridor to minimize haul distances and facilitate construction. It is anticipated that track installation would last approximately one year for each Line Section contract and overlap the Facilities and Systems contracts.

Systems Contract
A systemwide contract for Systems would follow substantial completion of trackwork installation. This contract would provide for the installation of traction electrification, wayside signals, communication, and fare collection elements. Systems construction and testing is anticipated to last one year for each of the four Line Section contracts and would commence after substantial completion of the Facilities and Trackwork elements.

Landscape Installation Contract
The Landscaping Contract would install planting materials and irrigation systems at all the station sites and at other selected locations in the corridor. This work would be performed concurrent with the Trackwork and Systems contracts. **Table 5-20** illustrates the anticipated construction schedule.

TABLE 5-20
CONSTRUCTION AND REVENUE SERVICE SCHEDULE

LINE SECTION	CONSTRUCTION START DATE	REVENUE SERVICE DATE
NW-1B	June 2004	December 2007
NW-2	December 2004	June 2008
NW-3	March 2005	September 2008
NW-4	June 2005	December 2008
Note: Working schedule subject to a 2-3 year delay with additional adjustments to be determined through the DART Financial Plan Process		

Source: DART; November 2002.

Construction Staging Areas
Several staging areas would be required for the storage of equipment and materials used for the construction of the project. Some preliminary staging areas are identified adjacent to stations. Their final size and location will be determined during final design.

Construction Staging Areas Impacts
If exposed to the weather, some construction equipment and materials have the potential to release chemicals during storm events. The storage of construction equipment and materials on the ground also has the potential to disturb the soil and kill or prevent the growth of groundcover, which causes the soil to be susceptible to wind and water erosion. Construction equipment has the potential to leak oil and grease, hydraulic fluid, brake fluid and other petroleum hydrocarbons. There is also the possibility of spillage during fueling operations.

Construction Staging Areas Mitigation
The DART General Provisions, General Requirements and Standard Specifications for Construction Projects, Section 01560 (Part 1.3 C-6 and G, Construction Facilities and Staging Areas), states that the contractor must store equipment and materials in conformance with applicable local regulations. Unnecessary materials and equipment are not allowed to be stored at the job site. No structure is allowed to be loaded with a weight that would endanger its structural integrity or the safety of persons. Materials are not allowed to be stored on private property without written authorization of the owners of the property. Staging areas cannot be located on any

property listed or eligible to be listed in The National Register of Historic Places without prior approval of the DART Contracting Officer.

DART Construction Guidelines Specifications Section 01560 Part 1.4B, Storm Water Pollution Prevention Plan, states that a Storm Water Pollution Prevention Plan (SW3P) should be developed for the Selected LRT Alternative. It will state that the construction contractor will be required to use best management practices to prevent storm water runoff from construction materials and equipment by covering such materials and equipment with awnings, roofs, or tarps; storing materials on asphalt or concrete pads; surrounding material stockpiling areas with diversion dikes or curbs; and using secondary containment measures such as dikes or beams around fueling areas. The contractor should also be required to mulch and reseed disturbed areas to prevent air and water erosion on the site after termination of construction operations.

Coordination with Other Scheduled Construction Projects

The construction of the proposed project will be coordinated with Dallas County, Denton County, the City of Dallas, the City of Farmers Branch, the City of Carrollton, Texas Department of Transportation (TxDOT), North Texas Tollway Authority (NTTA), and the City of Dallas Department of Aviation. **Table 5-21** summarizes on-going projects that would influence the design and construction of the light rail project. During Preliminary Engineering, DART has communicated with these entities in order to minimize construction-related impacts to residents, property owners and corridor users. These communication and coordination efforts will continue during final design and construction activities.

TABLE 5-21
CONSTRUCTION COORDINATION

Related Project or Study	Area of Impact	Issue
Denton Drive improvements	Webb Chapel Extension to IH 635	Timing and coordination of DART reconstruction sections, with ultimate cross-section.
Dallas Water Utilities 66" water line	Carrollton	Requires relocation due to conflicts with proposed DART LRT improvements
Station Vicinity street improvements	Carrollton	Streets must be designed around DART infrastructure
Station Vicinity street improvements	Farmers Branch	Streets must be designed around DART infrastructure
Oak Lawn Avenue	North Tollway to NB IH 35E	Final designs and construction must be coordinated; traffic study completed to mitigate ramp closure from southbound Harry Hines to Oak Lawn Avenue
Double track TRE facilities	West of existing tracks	Coordinate construction activities
IH 35E and IH 635 Interchange improvements	Forest Lane and WB frontage road of IH 635	Coordination with TxDOT for construction timing and future frontage road crossings.
Harry Hines/Motor Street	Harry Hines/Motor Street Intersection	Design and timing coordination
Motor Street- Harry Hines to Maple	Harry Hines to Maple	Design and timing coordination
Inwood-Harry Hines to Lemmon	Harry to Lemmon	Design and timing coordination
Shorecrest widening	At Denton Drive Intersection	Design and timing coordination
Dickerson Parkway crossing	South of Trinity Mills Station	Coordinate allowable clearances
Broadway Street	Carrollton-Whitlock to Trinity Mills (SH190 /EBFR)	Timing and coordination of DART of reconstruction sections with ultimate cross-section.

Source: Chiang, Patel, and Yerby; November 2002

5.12.2 Construction Noise Impacts

Construction of the tracks, stations, substations, maintenance facility and the associated parking facilities would result in the generation of noise from construction equipment. Construction noise varies greatly depending on the construction process, type and condition of equipment used and the layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise.

Table 5-22 summarizes available data on noise emissions of construction equipment that may be used for this project. Impacts from construction noise depend on the sensitivity of the noise receptor, the magnitude of noise during each construction phase, the duration of the noise, the time of day the noise occurs and the distance from the construction activities.

No-Build Alternative

Impacts of the No-Build Alternative would be confined to already active and congested highway areas where residents and businesses have already adjusted to highway-related noise. No construction-related noise impacts are expected.

LRT Alternative

Using the typical sound emission characteristics given in **Table 5-22**, along with information on the equipment to be used and the utilization factors or duty cycles of the equipment, it is possible to estimate construction noise exposure in the community. Although no standardized criteria have been developed for assessing construction noise impact, guidelines are provided in the FTA Noise and Vibration Impact Assessment guidance document. These guidelines, summarized in **Table 5-23**, are based on land use and time of day and are given in terms of Leq for an 8-hour work shift.

TABLE 5-22
TYPICAL NOISE LEVELS OF CONSTRUCTION EQUIPMENT

Equipment Type	Typical Sound Level at 50 ft (dBA)
Backhoe	80
Bulldozer	85
Compactor	82
Compressor	81
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Loader	85
Pavement Breaker	88
Paver	89
Pile Driver, Impact	101
Pump	76
Roller	74
Truck	88

Source: Federal Transit Administration, April 1995

TABLE 5-23
FTA CONSTRUCTION NOISE GUIDELINES

Land Use	Noise Limit, 8-hour Leq (dBA)	
	Daytime	Nighttime
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: Federal Transit Administration, April 1995

The potential for construction noise impact varies by location and land use. Commercial and industrial land uses, which adjoin the majority of the alignment, should not be impacted by construction noise. For residential land uses, the potential for temporary noise impact from daytime construction would be limited to locations directly adjacent to the alignment. However, noise impact from nighttime construction would be much more extensive, which emphasizes the importance of avoiding nighttime construction near residential areas.

Construction Noise Mitigation

Construction activities will be carried out in compliance with all applicable local noise regulations. DART Construction Guidelines Specifications Section 01560 Part 1.9 A-G establishes maximum noise and vibration limits for construction activities. The guidelines also specify appropriate techniques to minimize and mitigate noise and vibration near sensitive land uses. In addition, specific residential property line noise limits would be developed during final design and included in the construction specifications for the project, and noise monitoring would be performed during construction to verify compliance with the limits. This approach allows the contractor flexibility to meet the noise limits in the most efficient and cost-effective manner. Noise control measures that will be applied as needed to meet the noise limits include the following:

- Avoiding nighttime construction in residential neighborhoods;
- Using specially quieted equipment with enclosed engines and/or high performance mufflers;
- Locating stationary construction equipment as far as possible from noise sensitive sites;
- Constructing noise barriers, such as temporary walls or piles of excavated material between noisy activities and noise-sensitive receivers;
- Re-routing construction-related truck traffic along roadways which will cause the least disturbance to residents; and
- Avoiding impact pile driving near noise-sensitive areas, where possible. Drilled piles or the use of other non-impact piling methods are quieter alternatives where the geological conditions permit their use. If impact pile drivers must be used, their use will be limited to periods between 8:00 a.m. and 5:00 p.m. on weekdays.

5.12.3 Construction Vibration Impacts

The most significant source of construction vibration is pile driving. Pile driving would occur in the tunnel section of the alignment under Mockingbird Lane. Other construction activities that could cause intrusive vibration include vibratory compaction, jack-hammering and the use of tracked vehicles, such as bulldozers. If the Love Field Design Option would have been selected, pile driving would also have been required in the tunnel section.

Construction Vibration Mitigation

Vibration impacts during construction will be avoided through numeric limits and monitoring requirements that will be developed during final design and included in the construction specifications for the project (DART Construction Guidelines Specifications Section 01560 Part 1.9 A-G, Construction Noise and Vibration Control). Measures that will be considered as requirements to meet the vibration limits include the use of alternative equipment or processes, such as the use of drilled piles in place of impact pile driving and avoiding the use of vibratory compactors near vibration-sensitive areas.

5.12.4 Disruption of Utilities

The various utilities within the project right-of-way include electric, natural gas, telephone, water and sanitary sewer. Utility line disruptions would likely occur during the grading, excavation and construction activities of most major roadway and rail projects.

No-Build Alternative

No utility disruptions would be anticipated under the No-Build Alternative.

LRT Alternative
The construction of the project would cause short-term impacts to area utilities due to line disruptions, relocations and general improvements. U.S. Department of Transportation guidelines for roadway construction recommend that utility disruptions should occur for a period not to exceed 24 hours for residential properties. Alternatives to utility disruptions include construction around existing utility lines and disallowing excavations, removal of fill and grading during construction. However, in order for construction contractors to build around existing utility lines, cost-prohibitive excavations and grading would have to occur.

The locations of the utility lines that would need to be relocated cannot be known until the project progresses to a higher level of design. During final design, DART staff will confirm utilities within the project corridor, and list them by line types, locations, proposed mitigation and the estimated duration of the disruption.

Disruption of Utilities Mitigation
Contractors will be directed to consider the following items in their construction specifications for mitigation of utilities:

- Prior to construction, all area utility companies and utility agencies will be contacted and requested to provide line location measures and approval of the proposed alteration of utility lines;
- Businesses and residences affected by utility disruptions should be notified of the disruptions at least two weeks in advance;
- Down periods for businesses should occur during off-business hours and never exceed a 24 hour period;
- Businesses such as restaurants, grocery stores or food preparation/manufacturing facilities should be accommodated in order to protect food preparation and storage mechanisms;
- Should utilities be identified during construction that are not identified prior to construction, work will be discontinued and appropriate utility companies and agencies will be contacted to identify the line(s). The newly identified line will not be disrupted until businesses and residences are notified and the utility owner/operator has approved the proposed alteration.
- DART will coordinate with FAA to ensure that FAA facilities are not impacted.

5.12.5 Access and Distribution of Traffic
During the construction of any roadway or rail line project, road and traffic disruption is expected on minor and major roadways. The following sections address traffic impacts due to construction of the project and mitigation measures to alleviate these problems.

No-Build Alternative
The current railroad and associated right-of-way would remain largely as it is today if the No-Build Alternative is selected. Therefore, no roadway disruptions or closures would be anticipated due to rail construction.

LRT Alternative
Construction of the LRT Alternative would affect numerous major and minor roadways in the Cities of Dallas, Farmers Branch, and Carrollton. When roadway or lane closures are required during construction of the Selected LRT Alternative, DART and its contractors will coordinate with the appropriate traffic control divisions of the Cities of Dallas, Farmers Branch, and Carrollton to maintain reasonable and safe traffic operations at affected crossings. **Table 5-24** illustrates how crossings and adjacent roadways in the corridor would be impacted by project construction. The streets are listed from south to north.

TABLE 5-24
CONSTRUCTION-RELATED TRAFFIC IMPACTS

Street	LRT Location	Lanes Blocked	Alternate Routes Available
Harry Hines Boulevard (near Lucas Street.)	Over	X	IH 35E; Maple Avenue
Lucas Street	Over	X	Wycliff Avenue
Kendall/Macatee	Over	X	Lucas; Motor
Motor Street	Over	X	Butler Street, Inwood Road
Denton Drive	Over, adjacent	X	Harry Hines; Maple; Lemmon Avenue; IH 35E
Market Center Boulevard	Over	X	Motor Street
Motor Street	Under	X	Butler St., Wycliff Ave.
Maple Avenue	Over	X	Denton Cut-off, Butler St., Cedar Springs Rd.
Inwood Road	Over	X	Motor Street; Mockingbird Lane
Mockingbird Lane	Under	X	Inwood Road, Shorecrest
Webb Chapel Extension	Over	X	Harry Hines; Walnut Hill
Northwest Highway	Over	X	Walnut Hill Lane; Webb Chapel Ext.
Lombardy Lane	Over	X	Northwest Highway; Walnut Hill Lane
Walnut Hill Lane	Over	X	Northwest Highway; Royal Lane
Merrell Road	Over	X	Walnut Hill Lane; Royal Lane
Royal Lane	Over	X	Walnut Hill Lane; Forest Lane
Northaven Road	Over	X	Royal Lane, Forest Lane
Forest Lane/IH635	At-grade	X	Royal Lane; Valley View Lane
IH 635 LBJ Freeway	Under		N/A
Valley View Lane	At-grade	X	LBJ Freeway; Forest Lane; Valwood Parkway
Valwood Parkway	At-grade	X	Valley View Lane; Belt Line Road
Crosby Road	Over	X	Belt Line Road; Valwood Parkway
Belt Line Road	Over	X	Crosby Road; Valwood Parkway
Old Denton Road	Over	X	Whitlock Road
Whitlock Road	Over	X	Jackson Street; Belt Line Road
Jackson Street	Over	X	PGBT Frontage Roads; Whitlock Road
President George Bush Turnpike	Under		N/A
SH 190 Frontage Roads	At-grade	X	Frankford Road; Jackson Street

Source: Parsons Transportation Group; March 2003

Traffic Mitigation

The Cities of Dallas, Farmers Branch, and Carrollton require notification of all construction activities within city rights-of-way. The construction contractors will identify the appropriate regulations and incorporate mitigation measures in the construction specifications (DART Construction Guidelines Specifications Section 01570, Maintenance and Control of Traffic). **Table 5-25** provides applicable local and state regulation guides for the proposed construction.

All construction specifications, traffic control plans, and mitigation measures must be approved by local traffic engineering authorities prior to initiation of construction. Barricading and flag staff should be used when appropriate. Private business parking areas and driveways will not be used for equipment maneuvering or parking. Construction specifications will include provisions for a maximum number of lanes blocked during peak traffic hours, maintenance and removal of traffic control devices, efficient traffic rerouting measures, and scheduling of construction activities within the roadways for times other than during peak traffic periods.

DART will include the American Red Cross, hospitals, and other affected property owners in traffic control plans and construction coordination efforts. Notification of roadway disruptions will be provided to affected property owners. In particular, hospital and emergency vehicle operators will be notified of planned roadway blockages and provided with descriptions of alternative routes. Alternative routes will also be provided to the American Red Cross as it relates to occasions when its emergency disaster response vehicle fleet is dispatched.

TABLE 5-25
ORDINANCES APPLICABLE TO PROJECT CONSTRUCTION IN CITY RIGHTS-OF-WAY

City	Applicable Publications
Dallas	NCTCOG-*Standard Specifications for Public Works Construction*; TxDOT-*Texas Manual on Uniform Traffic Control Devices*
Farmers Branch	Farmers Branch-*City Code Ordinance,* Section 34-284 NCTCOG-*Standard Specifications for Public Works Construction*; TxDOT-*Texas Manual on Uniform Traffic Control Devices*
Carrollton	City of Carrollton-*General Design Standards (Section 1: Standard Engineering/Construction Procedures);* NCTCOG-*Standard Specifications for Public Works Construction*; TxDOT-*Texas Manual on Uniform Traffic Control Devices*

Source: Parsons Transportation Group; October 2001

5.12.6 Air Quality Impacts

No-Build Alternative

The No-Build Alternative would indirectly cause construction-related air quality impacts from future roadway construction and expansion due to the failure of this alternative to reduce future automobile traffic on area roadways.

LRT Alternative

During the construction phase, there would be short-term impacts on air quality. Construction activities associated with excavations, grading and filling, and other operations disturb the soil, generate dust, and remove groundcover which causes the soil to be susceptible to wind and water erosion. The proposed project would also include a short-term increase in exhaust emissions from construction vehicles.

Mitigation of Air Quality Impacts

There are no federal, state, or local regulations concerning the generation of dust from construction activities except as a nuisance complaint; however, the DART General Provisions, General Requirements and Standard Specifications for Construction Projects, Section 01560 (Part1.8, Dust Control) provides dust control measures for construction activities. The regulations state that the contractor will be required to have sufficient equipment at the site to implement dust control measures. The measures will be implemented at all areas of construction at all times including non-working hours, weekends and holidays.

The control of exhaust emissions emanating from various construction equipment will be in accordance with EPA guidelines. To minimize exhaust emissions, contractors will be required to use emission control devices and limit the unnecessary idling of construction vehicles. (It should be noted that, effective October 1, 2001, proposed restrictions on the operation of diesel combustion construction equipment have been repealed from the State Implementation Plan (SIP) by the Texas Legislature.)

5.12.7 Disruption of Business Activities

Several businesses within the project corridor would be impacted during construction due to temporary disruption and blocking of nearby roadways.

No-Build Alternative

No business disruptions, displacements or inconveniences to patrons would be anticipated under the No-Build Alternative.

LRT Alternative
In most cases, construction of the project would cause a short-term impact to area businesses due to access restrictions, general inconveniences to patrons and temporary blocking of adjoining roadway intersections.

Mitigation for Disruption of Businesses
Due to availability of alternative routes and the temporary duration of construction periods, the short-term roadway disruptions will cause only minimal disruptions to the businesses along the project corridor. Provisions in project specification plans will require the construction contractors to make every reasonable effort to minimize construction activities within the roadways during peak traffic periods. Abatement measures such as work hour controls and weekend construction will be included in project contracts. Private business parking areas and driveways will not be used for equipment maneuvering or parking. In addition, all possible measures will be taken to avoid blockages and disruption of business access driveways. DART will include the American Red Cross and hospitals in traffic control plans and construction coordination efforts. As a courtesy, notification of roadway disruptions will also be provided to neighboring property owners. In cases of roadway blockages, neighboring property owners will be notified and provided with descriptions of alternative routes.

5.12.8 Water Quality and Runoff
Local, state and federal governments monitor and enforce water quality standards. Water quality and runoff issues will be addressed for the construction of the proposed project through the development of a comprehensive Storm Water Pollution Prevention Plan (SW3P). Such a plan must meet the requirements of the Texas Pollutant Discharge Elimination System (TPDES) Storm Water General Permit, as specified in DART Construction Guidelines Specifications Section 01560 1.4 A, B, and C, Storm Water Pollution Prevention.

No-Build Alternative
Water quality and surface runoff are currently impacted by rail line maintenance, operations and ground keeping activities, which cause minor overall impacts. Similar impacts are expected to continue under the No-Build Alternative.

LRT Alternative
Construction of the rail lines, stations and associated parking facilities could result in the generation of a short term impact to water quality and sediment runoff if not adequately addressed. The construction staging areas could also cause short-term impacts; however, impacts would be greatest in areas that are affected by grading and filling. Mitigation of these potential impacts is addressed below.

Mitigation of Water Quality and Runoff
In conformance with the TPDES General Permit, mitigation to protect area water quality will include measures to provide erosion controls and minimization of the introduction of sediments, wastewater and chemicals to surface and subsurface waters. According to the U.S. EPA regulations, cities with populations of 100,000 or greater must maintain and enforce the Municipal Separate Storm Sewer System (MS4) permitting program. The Cities of Dallas, Farmers Branch and Carrollton participate in this program and regulate storm water discharges with regard to various construction projects. This ordinance is enforced by the Storm Water Quality Department. In accordance with the ordinance, project specifications must be reviewed by the Storm Water Quality Department prior to initiation of construction.

Once issued, the TPDES General Permit will provide the following mitigation measures:

- Limit the areas of disruption;
- Temporarily stabilize and protect areas disturbed by construction to minimize erosion;
- Filter or impound sediment laden water from storm water runoff, soil boring/excavation operations, trenching, etc., to remove sediment prior to release of runoff;
- Provide structural erosion control methods where required to treat sentiment-laden runoff;
- Provide general housekeeping measures to prevent and contain spills of chemicals, including petroleum hydrocarbons, associated with construction;
- Implement waste management techniques to cover waste materials and minimize ground contacts; and
- Reduce wind blow waste and off-site tracking by vehicles from the construction sites.

DART will perform inspections at least once every seven days and within 24 hours of a storm event that produces ½ inch or a greater amount of rainfall to help ensure each construction contractor's compliance with the approved Storm Water Pollution Prevention Plan.

5.12.9 Excavations, Fill Material, Debris and Spoil

No-Build Alternative

The current railroad and associated right of way would remain developed and active if the No-Build Alternative were retained. Therefore, no construction-related excavations fill material or the generation of debris and spoil would be required.

LRT Alternative

Construction of the project would require grading, excavations and fill material that would result in the generation of debris and spoil. Much of the spoil generated from grading activities and excavations would be used as fill material along the project corridor to bring the rail line to above and below grade; however, additional fill material would probably be required. Debris and spoil would also be generated by the demolition of buildings that are acquired for station area development.

Mitigation of Excavations, Fill Material, Debris and Spoil

The DART General Provisions, General Requirements and Standard Specifications for Construction Projects, Section 01560 (Part 1.5 A, B and C), provides measures concerning disposal of debris and spoil. The regulations state that excess "clean" fill material can be disposed of on the site. Waste will be placed in containers, transferred off site and disposed of in a manner that complies with state and local requirements. No waste material will be burned on-site. The disposal transport areas will be left clean on completion of the project.

Debris and spoil generated during construction of the project within the City of Dallas could be disposed of at the McCommas Landfill. There are no regulations concerning the type of debris and spoil that could be disposed of at this landfill except that hazardous waste is not accepted. No hauling permits are required by the City of Dallas. Debris and spoil generated within the cities of Carrollton and Farmers Branch could be disposed of at other designated landfills.

5.13 CULTURAL RESOURCES

No impacts to cultural resources are expected with the implementation of the No-Build Alternative. This section outlines the effects of the Selected LRT Alternative. DART is in the Section 106 process that led to a Memorandum of Agreement (MOA) between DART, FTA, and the State Historic Preservation Officer (SHPO) for any adverse effects that are determined. The MOA specifies mitigation measures and otherwise resolves impacts. The signed and final MOA is presented in Appendix H.

5.13.1 Application of the Criteria of Adverse Effect

In order to comply with Section 106 of the National Historic Preservation Act, any effects of the proposed undertaking on historic properties listed in or determined eligible for inclusion in the National Register must be analyzed by applying the Criteria of Adverse Effect [36 CFR Part 800.5(a)], as follows:

> (1) An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.
>
> (2) Examples of adverse effects. Adverse effects on historic properties include, but are not limited to:
>
> (i) Physical destruction of or damage to all or part of the property; alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
>
> (ii) Removal of the property from its historic location;
>
> (iii) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
>
> (iv) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
>
> (v) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
>
> (vi) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

5.13.2 Effect Determinations and Mitigation for Selected LRT Alternative

Determination of No-Effect

Consultation with the SHPO has resulted in a consensus determination that eight of the fifteen properties within the Area of Potential Effects (APE) that are listed in or eligible for listing in the National Register would not be affected by the project. **Table 5-26** lists those properties and a brief discussion as to why the criteria of adverse effect do not apply. SHPO concurrence documentation is included in Appendix D.

In each instance the resource is at least 75 feet away from the rail line; and/or there is either an intervening building or activity (such as a street) between the rail line and the historic resource; or the resource is already adjacent to railroad activities and the proposed project would not constitute

a change in the immediate environment, e.g. no elevated guideways or platforms are proposed in the viewshed of the resource.

TABLE 5-26
DETERMINATION OF NO EFFECT

Map No.*	Common Name	Address	Distance to Track (approx.)	Basis for Determination
1	Dealey Plaza Historic District	Roughly bounded by Pacific Avenue, Market and Jackson Streets, and right of way of Dallas Right of Way Management Company	550’	Previously determined No Effect on April 4, 2001.
2	West End Historic District	Bounded by Lamar, Griffin, Wood, Market and Commerce Streets	550’	Previously determined No Effect on April 4, 2001.
3	Magnolia Petroleum Company City Sales and Warehouse	1607 Lyte Street	500’	This structure is located several parcels and some distance away from the proposed alignment and there are several intervening structures between it and the tracks.
5	Turtle Creek Pump Station	3630 Harry Hines Boulevard	75 – 80’	The Pump Station is located approximately 80 feet east of the railroad, across Harry Hines Boulevard from the rail line and has been in the proximity of noise intrusions from the major thoroughfares that surround it.
8	Obadiah Knight School	2615 Anson Road	500’	The school has at least one structure between it and the alignment and is already subject to noise intrusion due to its proximity to Dallas Love Field.
9	Water Department Purification Plant	2605 Shorecrest Drive	525’	The Purification Plant is a significant distance from the alignment and is further shielded by the mature trees between it and the tracks.
10	Water Department Pumping Station	2525 Shorecrest Drive	820’	This structure is a significant distance from the alignment and there are intervening landscape elements and a building between it and the tracks.
11	Bachman Electric Gen. Station	9500 Denton Drive	350’	This building is some distance from the alignment and is visually obstructed due to the presence of electrical equipment.

* Refers to **Figures 3-26** through **3-28** (chapter 3).

Source: Myra L. Frank & Associates, 2002

Several of these resources have previously been reviewed by the SHPO as part of other environmental clearances and are included here only for completeness. The initial line section for the proposed project, from downtown Dallas to the Victory Station at American Airlines Center, was the subject of a Categorical Exclusion issued by the FTA on May 16, 2001. As part of that analysis, consultation with the SHPO concluded that there would be No Effect on Dealey Plaza and the West End Historic District. It was determined that there would be an effect on the Continental Avenue Bridge, which required the preparation of a Memorandum of Agreement (see Determination of No Effect section below).

Determination of No Adverse Effect

Table 5-27 shows those four properties listed in or eligible for listing in the National Register of Historic Places where it has been determined that the proposed project would have no adverse effect. The basis for this determination is provided below, including mitigation measures to ensure the finding of no adverse effect. The MOA (Appendix H) provides details on mitigation measures.

TABLE 5-27
DETERMINATION OF NO ADVERSE EFFECT

Map No.*	Common Name	Address	Distance to Track (Approx.)
6	Old Morton Food Headquarters	6333 Denton Drive	80’
7	T.J. Rusk School	2929 Inwood Road	200’
13	Bingo Theater	2711 Storey Lane	250’
14	Letot School	2727 Lombardy Lane	80’

* Refers to **Figures 3-26** through **3-28** (chapter 3).
Source: Myra L. Frank & Associates, 2002

Old Morton Food Headquarters

Description

The Old Morton Food Headquarters is part of a larger complex of warehouses built in an industrial area south of the intersection of Denton Drive and Mockingbird Lane. This structure is a good, intact example of 1950s industrial architecture and exemplifies the importance of the railroad to the growth of this area as an industrial and commercial corridor.

Effects

Along this section, the alignment will be transitioning to below-grade (80’ to the east) to grade separate LRT from the intersection of Denton Drive and Mockingbird Lane. The structure will not be removed, altered or physically damaged by the proposed project. The changes in the immediate vicinity of the resource will not be significant, due to the distance to the tracks, the intervening parking lot and landscaping, and the fact that the trains will begin their descent into the tunnel south of the resource. Noise level changes are not expected to be significant. LRT noise will be diminished because all or part of the train will be below grade as it passes the Old Morton Food Headquarters. In addition, none of the current commercial uses of the building is noise sensitive. The building will continue to have a visual connection to a transportation-related corridor, and the introduction of light rail components such as catenary poles and lighting would not significantly affect the integrity of the property and are compatible with its industrial setting. The design of the U-wall structure, likely to be used for the tunnel descent, will include unknown design features, such as low barrier walls for pedestrian safety, which may have adverse effects on the visual environment. Therefore, to ensure a Finding of No Adverse Effect, the design of the project will be developed by DART in consultation with SHPO who will have the opportunity for design review and comment.

Mitigation
DART has agreed to consult with the SHPO on the design of the guideway in the vicinity of the structure in order to minimize potential visual impacts. Mitigation included in the final Memorandum of Agreement includes SHPO review of proposed design plans for the tunnel descent. With this mitigation, the project has been determined to have no adverse effect on the Old Morton Food Headquarters.

T. J. Rusk School
Description
The school sits at the northeast corner of the intersection of Denton Drive and Inwood Road, with the primary façade (the south façade) facing Inwood Road. The first story of this school is clad in concrete, while the second story and sections of the first story are clad in brick veneer. Ribbon windows of varying sizes, one-over-one, double hung metal sash are evident throughout. This is a good example of the use of the International style of architecture and represents an early school building of this type.

Effects
An elevated guideway and transit station are proposed to be constructed on the west side of Denton Drive, with the station at the southwest corner of the Denton Drive and Inwood Road intersection. The DEIS included a station in the northwest corner which was approximately 200 feet west of the western facade of the school. This Final EIS reflects a revised station location south of Inwood Road, which increases the distance of the station from 200 feet to 500 feet from the nearest corner of the school. Relocation of the station also removes it from the primary view of the school. The school will not be removed, altered or physically damaged due to the proposed project. The elevated tracks will create changes in the visual environment, both for the viewers of the school and for those within the school. This includes the LRT structure and tracks and to a lesser extent, station, catenary poles and lights. The west façade of the school is not the primary elevation. Views of the primary elevation would not be substantially changed by the project. Noise levels may improve for a number of reasons. Elevating the railroad tracks at this intersection eliminates the need for sounding train horns or warning bells at the crossing. In addition, traffic will move better through the intersection if it is grade separated from train movements.

Mitigation
DART has agreed to consult with the SHPO on the design of the aerial station and guideway in the vicinity of the school. Mitigation could include landscaping to soften the visual effects of the columns and the station, and designing the station to complement the style of the school. With this mitigation, the project has been determined to have no adverse effect on the school.

Bingo Theater
Description
The theater is rectangular in plan with a stepped parapet wall along the east façade. A tall partially engaged circular tower clad in vertically ribbed ceramic tile, rises from the southeast corner of the front facade. A blade sign with exposed neon channel letters projects from the upper portion of the tower. This is a good intact example of late Moderne movie house architecture.

Effects
This building will not be removed, altered or physically damaged due to the proposed project. The track would be elevated about 20–25 feet high at this point, approximately 240 feet to the east of the Bingo Theater. It is at this point in the alignment that the tracks transfer from the west side of Denton Drive to the east side of Denton Drive. The main views are by drivers on Denton Drive and are considered indirect impacts. Moreover, due to the distance between the theater and the proposed elevated tracks, and the fact that the primary façade faces away from the tracks, this is not considered a significant visual impact. Due to the theater's proximity to two well-used

secondary roads (Harry Hines and Denton Drive) and a highway (Northwest Highway), the introduction of noise associated with the LRT is not considered significant.

Mitigation
DART has agreed to consult with the SHPO on the design of the guideway in the vicinity of the theater in order to minimize potential visual impacts.

Letot School
Description
The Letot School is constructed of brick with a large rubblestone foundation and a flat roof. Most windows are currently boarded up and there is no active use. There are flat and Roman arched windows with keystones. Over the main facades are large ornate pediments that rise above the roofline. The school's primary façade faces south towards Lombardy Lane. Immediately across Lombardy Lane are several auto-related businesses. On the west side of the school is a store with an associated parking lot that faces Harry Hines Boulevard. To the east is two-lane Denton Drive, which is proposed to be improved to a four-lane undivided street, and a currently vacant commercial complex of buildings known as Carpenters Corner. The school is considered eligible for its significance in education at a local level.

Effects
The Letot School will not be removed, altered or physically damaged due to the proposed project. It is not currently in use. The Northwest Rail Operating Facility will be located at the northeast corner of Denton Drive and Lombardy Lane. The facility's conceptual site plan would relocate the freight tracks and lay new freight storage tracks on the parcel of land between Denton Drive and the proposed Northwest Rail Operating Facility. These new freight storage tracks would be located across Denton Drive from the northern portion of Letot School, opposite a secondary façade and will permit temporary storage of railroad cars. Existing mainline freight tracks would be located at the eastern edge of these new tracks, paralleling the LRT guideway. No additional lighting has been proposed at this time.

The Northwest Rail Operating Facility would be sited to the east of the school across Denton Drive, east of the existing parcel on which the Carpenters Corner complex stands, and east of the existing freight tracks. After grade separation at Lombardy Lane, the northbound LRT track would remain elevated and the southbound track will return to grade adjacent to the Northwest Rail Operating Facility. A pocket track to move trains from the alignment into the facility would be provided between the northbound and southbound tracks and would have the same vertical profile as the southbound track. A proposed 12 – 16 foot high retaining wall would be necessary on the west side of the tracks in order to bring the pocket track and southbound track back to grade for a distance of approximately 1,200 feet next to the facility.

The introduction of the elevated track and the retaining wall across Denton Drive and east of the school is considered a significant change in the visual environment. However, the introduction of these elements, and the associated lighting, wires and poles would not diminish the integrity of the property's significant historic features because this will occur across Denton Drive and opposite a secondary façade. The existing intersection of Lombardy Lane and Denton Drive is to be straightened and reconfigured as a separate project by the Dallas County Department of Transportation. DART is coordinating with Dallas County on the Denton Drive widening project to provide right-of-way necessary for the road project to avoid direct impact to the Letot School rock wall. The removal of the existing building complex at Carpenters Corner from the visual environment would be considered beneficial in creating a more attractive visual environment for the school.

The removal of various commercial and industrial businesses on the proposed Northwest Rail Operating Facility site would reduce the number and activity levels of trucks in the vicinity. Noise levels within the site are not expected to be substantially higher than current noise levels. Although the environment in the vicinity of the school will change, those changes are not considered adverse to the characteristics that made the school eligible for the NRHP.

Mitigation
The DART Board approved the selection of the Northwest Rail Operating Facility site on August 13, 2002 and in its resolution included additional visual mitigation as described in Section 5.6, Visual and Aesthetic Resources (also see Appendix D). The MOA (see Appendix H) provides for this visual mitigation, including screening of the freight storage tracks on the east side of Denton Drive across from the Letot School. The visual mitigation will be developed in consultation with the SHPO during final design of line section NW-3 and the Northwest Rail Operating Facility. This consultation will include design review by SHPO at the 30%, 65%, 95% and 100% intervals in final design. The mitigation supports the finding of no adverse effect.

Determination of Adverse Effect
Table 5-28 shows those properties listed in or eligible for listing in the National Register of Historic Places where it has been determined that the proposed project would have an adverse effect.

TABLE 5-28
DETERMINATION OF ADVERSE EFFECT

Map No.*	Common Name	Address	Distance to Track (Approx)
4	Continental Avenue Bridge	Continental Avenue Lamar/McKinney Railroad Underpass	0' from NB track
12	Club Schmitz	2900 Webb Chapel Road	32' from SB track
15	Carrollton Crossing Depot	1020 N Broadway Street & MKT Tracks, Carrollton	0'

* Refers to **Figures 3-26** through **3-28** (Chapter 3).

Source: Myra L. Frank & Associates, 2002

Continental Avenue Bridge
Description
The bridge has local, state, and federal significance. It was a contributing element of a discontinuous district associated with the Trinity River flood control measures from the 1930s.

Effects
The bridge is scheduled to be demolished during construction of line section NW-1A of the project. This line section has independent utility and was found to be a Categorical Exclusion by FTA in a letter to DART on May 16, 2001.

Mitigation
The bridge was photographed and documented in accordance with Historic American Engineering Record (HAER) Level III guidelines according to the stipulations of the separate MOA developed and signed in June 2002 after the FTA's finding. The SHPO concurred with DART's documentation on August 13, 2002. The information will be archived at the Dallas Public Library and displayed publicly by DART at its Monroe Shops museum facility (See Appendix D).

Club Schmitz

Description

This restaurant was constructed of concrete block with a flat roof and wide ledge and aluminum horizontal panels above the roofline. The window treatments are plate glass with canvas awnings. This structure was identified as a locally significant resource. In addition, it is one of the few remaining 1930s commercial structures located along the existing railroad corridor.

Effects

This building will not be removed, altered or physically damaged due to the proposed project. The project will, however, result in several proximity impacts to the property. First, the project will require that a 12 to 16 foot high aerial LRT guideway be located about 32 feet from the Club Schmitz building. There will be an aerial encroachment over the property at the northeast corner of the parking lot of approximately 100 square feet. Second, a guideway column will be placed in a public right-of-way that is not owned by Club Schmitz, but is utilized informally by its patrons. About two parking spaces would be lost. There would be no impaired vertical clearance that would further limit parking under and in proximity to the guideway structure. The column footprint would be approximately eight feet by six feet, or almost 50 square feet. In addition, the project would require closing Cullum Road at its intersection with Denton Drive and creating a cul-de-sac at that location. Cullum Road is currently a primary access road from the north to the Club Schmitz parking lot via Denton Drive. Access to the property from Cullum Road via Harry Hines Boulevard would not be affected by the project. Access from Webb Chapel Extension would also not be affected by the project.

The primary change in the environment would consist of the appearance of the LRT guideway and columns, the reduction in parking and access to the parking lot, and the change to the visibility of the structure both for drivers and patrons. Noise and vibration impacts are not considered significant because Club Schmitz is not a noise sensitive receptor. The nature of its operation means that club activities occur indoors, generating a great deal of internal noise.

DART has indicated that they will be willing to work with the proprietors of Club Schmitz to enhance the existing parking situation by helping them design a more functional parking lot. Other mitigation measures will include additional signage along Denton Drive in order to continue to make sure the restaurant has visual access to drivers using this roadway. This will be particularly important during the construction phase, but DART will assist with permanent signage also. DART has redesigned the guideway support structure to continue the bridge structure north to the north side of Cullum Road, in order to maintain views of Club Schmitz for drivers along Denton Drive. DART had originally planned to build an embankment and retained fill section to support the guideway from the south side of Cullum Road. Maintaining the bridge structure for this additional distance would shift the start of the embankment for the retaining wall about 200 feet north of where it was originally proposed, but it would improve the visibility of the club for drivers along Denton Drive.

Mitigation

The following mitigation measures are incorporated into the Memorandum of Agreement to minimize impacts on the Club Schmitz:

1) Continue the guideway on structure to the north side of Cullum Road, before starting the embankment.
2) Assist the Club Schmitz in redesigning their parking lot to reduce the effects of the parking loss.
3) Work with the Club Schmitz to install temporary and permanent signage to improve the visibility of the Club from Denton Drive.

4) Submit design plans for review by SHPO at the 30%, 65%, 95% and 100% intervals in final design.

The incorporation of the above-listed mitigation measures would reduce adverse effects on Club Schmitz, but the FTA and SHPO have determined that there would still be an adverse effect on this property because of the change in setting created by the project.

Carrollton Depot

Description

This depot has weathered wood siding and a hipped roof with very wide and deep overhanging eaves. There is a loading dock on the west side. The windows are boarded up to prevent vandals and pests from getting inside, but the fenestration appears to be one-over-one, double hung wood sash. This depot, which once served the three railroads whose lines intersect in Carrollton, exemplifies the prominence of the railroad in the growth of the area.

The depot currently faces the intersection of the Cotton Belt and MKT (Katy) railroad tracks. The north façade faces the Cotton Belt, while the west side faces the Katy tracks. According to available information, the depot has always resided in that immediate vicinity, although the City of Carrollton has indicated that it has been adjusted at least three times. It is believed that the depot was only moved within 100 yards of its current position. Sanborn map data indicate little more about the original orientation of the depot. A 1935 Sanborn Map shows the general location, but not sufficient detail of the building to determine its orientation. A drainage map published by the Dallas County Bureau of Engineering in 1949 shows the site of the depot as well, essentially in the same position where it is currently sited.

Effects

The proposed Carrollton Square LRT station would be constructed on the property where the historic Carrollton Depot now stands. It will be an aerial station, located partially where the existing Depot now stands. DART revised the Carrollton Square station concept to shift the location of the Depot so that it maintains a relationship to an at-grade railroad (Cotton Belt) to the north and to the railroad switching yard to the east (refer to **Figure 2-15**). The historic Carrollton Depot will be relocated to a position east of its current location, but within the station area. The proposed relocation would also have the advantage of making the station both visible and accessible, which is not currently the case.

While the Carrollton Crossing Depot currently retains integrity of design, setting, materials, workmanship, feeling, and association, the structure is currently vacant and inaccessible to the public. Although the suggestion has been made that the station had been moved some time in the past, research has not identified any other location than the one it currently occupies. The longer north façade appears to have been oriented toward the Cotton Belt tracks, at least for the last 50 years. This structure has been determined eligible for listing on the National Register of Historic Places for its association with the role of the railroad in the development of Carrollton. If the structure remains inaccessible to the public, its value to the community as an historic property is limited. While relocation of the structure would adversely affect the structure's integrity of location, the proposed relocation site would essentially maintain its setting, and association with the railroads so important to Carrollton's development. DART has agreed to rehabilitate the station in accordance with the Secretary of Interior's Standards for Rehabilitation. The proposed relocation site and rehabilitation of the structure would largely offset the adverse effect on the structure's integrity.

Mitigation
DART has incorporated the following mitigation measures (not in order of importance) into a Memorandum of Agreement to insure that the adverse effects of the proposed project are minimized:

1) Relocation of the structure to a location and in an orientation that maintains the Depot's relationship with the Cotton Belt Railroad. The proposed location will be integrated into the overall Carrollton Square Station site plan, and the Depot will be visible and accessible to the public.
2) Rehabilitation of the structure consistent with the Secretary of the Interior's Standards Rehabilitation and applicable guidelines.
3) Continued maintenance of the structure while it remains in DART's ownership.
4) Consultation with the SHPO if the structure is transferred, sold, or leased to incorporate measures to insure the continued integrity of the structure.
5) Station design review by SHPO at the 30%, 65%, 95% and 100% intervals in the final design.
6) SHPO review of the proposed new site and orientation.
7) SHPO review of proposed treatment and protection if the depot is subsequently transferred to a new owner.

The incorporation of the above-listed mitigation measures would reduce adverse effects on the Carrollton Depot, but the FTA and SHPO have determined that there would still be an adverse effect on this property because of the change in setting created by the project.

5.13.3 Differences in Potential Impacts of the Other Alignments Considered
The Harry Hines Base Alignment from Motor Street to Mockingbird Lane would have avoided impacts to the Morton Foods and Rusk Middle School sites. Medical Center Design Option alignments A, B, C, and D would have had the same effects on these properties as the Selected LRT Alternative (Base Alignment and Medical Center Design Option D). There are no differences in effects on historic properties between the Love Field Design Option and the Selected LRT Alternative.

5.14 ARCHEOLOGICAL RESOURCES

5.14.1 Definition of Formal Finding of Effect
A finding of no historic properties affected is appropriate when the agency has determined during the identification and evaluation step that there are no historic properties in the area of potential effects, or the agency has determined that there are historic properties present but the undertaking would not have any effect on them. [36CFR § 800.4(d)(1)]

An effect does not have to be negative to be an effect. If the undertaking would change the relevant characteristics of the property at all, it would have an effect. The potential alteration of the qualifying characteristics of a historic property does not have to be a certainty; as long as the undertaking may alter the relevant characteristics, it must be found to have an effect. Finally, the agency should consider not only the changes that may occur at the time of the undertaking, but also those reasonably foreseeable effects that may occur later.

5.14.2 Finding of Effect
Archeological investigations conducted thus far have resulted in the recordation of one archeological site, site 41DL404. Site 41DL404 represents the remains of a domestic homestead that likely dates to the mid-twentieth century. Low artifact densities and a general lack of contextual integrity indicate that this site is not eligible for inclusion in the NRHP or for designation as a State Archeological Landmark (SAL).

Given that much of the proposed corridor crosses portions of the current or pre-1930 flood plains of the Elm Fork of the Trinity River or its tributaries, the potential for buried archeological deposits must be considered. Those portions of the corridor located within the current or pre-1930 flood plains of the Elm Fork of the Trinity or its tributaries or on fluvial terraces composed at least in part of terminal Pleistocene or younger sediments have potential for buried cultural materials. However, given the extensive disturbance of the upper 2 to 3 meters of the existing sediments and/or the deposition of considerable amounts of foreign material on top of the natural, preexisting surface, the chance for finding an undisturbed cultural site in the upper few meters of sediment is remote at best. Further, locating any sites that may be buried more deeply than several meters would be extremely difficult.

Railroad and highway construction, the construction of Bachman Lake and Love Field, commercial development, and numerous sand and gravel operations have destroyed any near-surface contexts for archeological deposits. Consequently, the potential for archeological sites in near-surface contexts with good contextual integrity is extremely limited within the proposed project corridor.

Given that there are no archeological sites present within the corridor that are considered eligible for inclusion in the NRHP, the proposed construction would result in no historic properties being affected. The same would be true for all other alignments considered but not selected. The extremely low potential for archeological sites with contextual integrity at the proposed locations of the stations, with the exception of the Carrollton Square Station, would also result in the determination of "no historic properties affected." Given that the potential of the proposed location of the Carrollton Square Station to contain significant archeological deposits remains to be determined, additional investigations must be conducted once the locations are finalized and access is granted.

5.14.3 Determination of Adverse Effect

The present data indicate that no historic properties would be affected by the proposed construction; therefore, there is no potential for adverse effect. However, DART does not presently have access to, or ownership of, the property projected for the Carrollton Square Station. DART will conduct an archeological inventory of the proposed property for the Carrollton Square Station when right of access or ownership is accomplished.

5.14.4 Mitigation Measures

With the exception of the proposed Carrollton Square Station, there would be no need for mitigation measures. Once DART has access to, or ownership of, the property projected for the Carrollton Square Station, an archeological survey will be conducted and coordinated with the Texas SHPO. If potential historic properties are present, DART will develop and implement a plan for further assessment and mitigation in consultation with the Texas SHPO.

5.15 SECTION 4(f) EVALUATION

Section 4(f) of the Department of Transportation Act of 1966, codified at 49 USC 303, declares that "[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

Section 4(f) specifies that "[t]he Secretary [of Transportation] may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge or site) only if—

(1) there is no prudent and feasible alternative to using that land; and

(2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use."

Section 4(f) further requires consultation with the Department of Interior and, as appropriate, the involved offices of the Department of Agriculture and the Department of Housing and Urban Development, and relevant state and local officials, in developing transportation projects and programs that use lands protected by Section 4(f).

The proposed project is a transportation facility that would receive federal funding through the Federal Transit Administration (FTA); therefore, documentation of compliance with Section 4(f) is required.

This Section 4(f) evaluation has been prepared in accordance with the FTA regulations for Section 4(f) compliance codified at 23 CFR 771.135 and the *Section 4(f) Policy Paper* (1989) issued by the U.S. Department of Transportation through the Federal Highway Administration (FHWA).

This section of the FEIS concludes with a discussion of Section 6(f) 3 of the Land and Water Conservation Fund Act and the Texas Parks and Wildlife Code, Chapter 26.

5.15.1 Application of Section 4(f)

As defined in 23 CFR 771.135(p), the "use" of a protected section 4(f) resource occurs when:

(1) land is permanently incorporated into a transportation facility through partial or full acquisition (i.e., "direct use");

(2) there is a temporary occupancy of land that is adverse in terms of the preservationist purposes of Section 4(f) (i.e., "temporary use"); or

(3) there is no permanent incorporation of land, but the proximity of a transportation facility results in impacts so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired (i.e., "constructive use").

Direct Use

A direct use of a Section 4(f) resource takes place when property is permanently incorporated into a proposed transportation project. This may occur as a result of partial or full acquisition of a fee simple interest, permanent easements, or temporary easements that exceed regulatory limits noted below (*see* 23 CFR 771.135(p)(7)).

Temporary Use

A temporary use of a Section 4(f) resource occurs when there is a temporary occupancy of property that is considered adverse in terms of the preservationist purposes of the Section 4(f) statute. The FHWA regulations detail the conditions under which a temporary occupancy of property does not constitute a use of a Section 4(f) resource. The following requirements must be satisfied: (1) the occupancy must be of temporary duration (i.e., shorter than the period of construction) and not involve a change in ownership of the property; (2) the scope of work must be minor, with only minimal changes to the protected resource; (3) there are no permanent adverse physical effects on the protected resource, nor will there be temporary or permanent interference with activities or purpose of the resource; (4) the property being used must be fully restored to a condition that is at least as good as that which existed prior to the proposed project; and (5) there must be documented agreement of the appropriate officials having jurisdiction over the resource regarding the foregoing requirements.

Constructive Use
A constructive use of a Section 4(f) resource happens when a transportation project does not permanently incorporate land from the resource, but the proximity of the project results in impacts (e.g., noise, vibration, visual, access, and/or ecological impacts) so severe that the protected activities, features, or attributes that qualify the resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only if the protected activities, features, or attributes of the resource are substantially diminished. This determination is made through: (1) identification of the current activities, features, or attributes of the Section 4(f) resource that may be sensitive to proximity impacts; (2) analysis of the potential proximity impacts on the resource; and (3) consultation with the appropriate officials having jurisdiction over the resource. As outlined in 23 CFR 771.135(p)(4), a constructive use of a protected Section 4(f) resource occurs under any of the situations below:

- *The predicted noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource, where a quiet setting is generally a recognized attribute of the site's significance.*

- *The proximity of the proposed project substantially impairs the aesthetic features or attributes of a resource, where such features or attributes are considered important contributing elements to the value of the resource.*

- *The project results in a restriction on access which substantially diminishes the utility of a significant publicly-owned park, recreation area, or historic site.*

- *The vibration impact from operation of the project substantially impairs the use of a resource.*

- *The ecological intrusion of the project substantially diminishes the value of wildlife habitat in a wildlife or waterfowl refuge, or substantially interferes with the access to a wildlife or waterfowl refuge when such access is necessary for established wildlife migration or critical life cycle processes.*

The discussion below provides an anlysis of public parks and recreation areas and historic sites pursuant to Section 4(f) requirements.

5.15.2 Public Parks and Recreation Areas
A total of 12 publicly-owned parks and recreational areas protected by Section 4(f) are located in the vicinity of the proposed project. The application of Section 4(f) to these resources is described below.

Description of Public Parks and Recreation Areas
Table 5-29 provides a list and descriptive characteristics of the public parks and recreation areas identified in the vicinity of the proposed project.

Impacts to Public Parks and Recreation Areas
The No-Build Alternative would largely consist of transit service improvements that would not likely result in any use - direct, temporary, or constructive - of any public parks and recreation areas. Any physical improvements that may occur would be constructed as part of planned and programmed improvements for which separate Section 4(f) evaluations would be prepared as necessary.

TABLE 5-29
SECTION 4(F) RESOURCES - PUBLIC PARKS AND RECREATION AREAS

Map No.	Name	Type[1]	City/ Owner	Acres	Facilities
1	Dealey Plaza	Special	Dallas	3.10	Urban open space, historical site
2	Reverchon Park	Community	Dallas	41.26	Recreation center, picnic area, amphitheater, basketball, baseball
3	Weichsel Park	Community	Dallas	13.77	Picnic area
4	Bachman Lake Park	Regional	Dallas	205.50	Recreation center, picnic area, playground equipment, hike/bike trail, boating, boathouse
5	LB Houston Park – Nature Trail	Regional	Dallas	476.06	Hike/bike trails (hard surface and soft surface), picnic area
6	Farmers Branch Historical Park	Special	Farmers Branch	22.00	Historical park containing multiple historic buildings, none of which are located within Cultural Resources APE
7	Gussie Field - Watterworth Park	Neighborhood	Farmers Branch	12.00	Baseball, basketball, playground equipment, tennis, picnic area/grills, horseshoes, museum
8	Francis Perry Park	Neighborhood	Carrollton	3.67	Picnic area, playground equipment, tennis, and rental facility
9	Pioneer Park	Special	Carrollton	0.50	Historical site
10	Downtown Square Park	Special	Carrollton	0.52	Picnic area/gazebo
11	Ken Good Park	Community	Carrollton	20.00	Fishing, picnic area
12	Indian Creek Municipal Golf Course	Regional	Carrollton	415.00	36-hole golf course, clubhouse

[1] As classified by the city in which the park in located.

Source: Myra L. Frank & Associates, 2001

The potential effects of the Selected LRT Alternative on public parks and recreation areas in the Northwest Corridor study area are described below. **Table 5-30** summarizes the effects of the proposed project on public parks and recreation areas subject to Section 4(f). (Note: The application of Section 4 (f) to Dealey Plaza was evaluated as part of a Categorical Exclusion dated May 16, 2001, and is not repeated in this document.) A detailed discussion of the effects on each park follows the table.

The Harry Hines Base Alignment would have had no effect on Weichsel Park. All other alignments considered in the Draft EIS would have had the same effects as the Selected LRT Alternative.

Direct Use

None of the elements of the proposed project (i.e., trackwork, stations, parking, traction power substations, etc.) would permanently incorporate any portion of the 12 public parks and recreation areas in the vicinity. Thus, no direct use would result.

Temporary Use

As detailed in the construction scenario in Section 5.11, the construction staging and equipment laydown areas necessary to construct the proposed project are all expected to be accommodated

outside the limits of public parks and recreation areas. In addition, no temporary construction easements have been identified that would affect public parks and recreation areas. For these reasons, no temporary use would result.

Constructive Use

The potential effects of the proposed project that could result in a constructive use of public parks and recreation areas in the vicinity of the project are described below. For each affected resource, the potential effects are outlined with respect to the impact criteria defined in 23 CFR 771.135(p)(4) (i.e., visual, noise, vibration, and access impacts). This analysis includes those resources where the technical studies conducted for other portions of this document (i.e., noise/vibration, visual/aesthetics, and traffic) indicate that one or more potential proximity impacts are possible. Where the technical studies have documented that there are clearly no potential proximity impacts to certain Section 4(f) resources, then those resources have not been analyzed below. Five park resources had no proximity impacts. Those seven parks with potential proximity issues are discussed below.

TABLE 5-30
EFFECTS ON SECTION 4(F) RESOURCES
PUBLIC PARKS AND RECREATION AREAS

Map No.	Resource	Direct Use	Temporary Use	Construc-tive Use	Remarks
1	Dealey Plaza	No	No	No	See Categorical Exclusion approved May 16, 2001.
2	Reverchon Park	No	No	No	No proximity impacts identified.
3	Weichsel Park	No	No	No	No visual impacts result from proximity of elevated track.
4	Bachman Lake Park	No	No	No	No visual impacts result from proximity of elevated track.
5	L. B. Houston Park – Nature Trail	No	No	No	No visual impacts from elevated track.
6	Farmers Branch Historical Park	No	No	No	Nearby project elements have a low potential for significant visual impact for park users.
7	Gussie Field - Watterworth Park	No	No	No	No proximity impacts identified.
8	Francis Perry Park	No	No	No	No proximity impacts identified.
9	Pioneer Park	No	No	No	Nearby project elements have a low potential for significant visual impact for park users.
10	Downtown Square Park	No	No	No	Nearby project elements have a low potential for significant visual impact for park users.
11	Ken Good Park	No	No	No	Minor visual impacts from elevated track.
12	Indian Creek Municipal Golf Course	No	No	No	No proximity impacts identified.

Source: Myra L. Frank & Associates, 2002

Weichsel Park

Visual - The discussion of potential effects on visual and aesthetic resources in Section 5.6 indicates that a potentially significant impact may have resulted in the vicinity of the proposed DEIS Inwood Station location. Moving the station south of Inwood Road minimizes the impact potential.

This visual assessment unit includes the western portion of Weichsel Park located across Denton Drive and north of Rusk Middle School. The visual impact to the park would be created by the elevated track structures. Station elements and associated lighting would be located nearly 1,000 feet south of the park. This potentially significant visual impact has a low likelihood of resulting in a constructive use of a protected Section 4(f) resource. The portion of Weichsel Park in closest proximity to the project is generally not used for active park purposes and has a more urban, disturbed visual character than the remainder of the park. The active picnic area to the east, where the visual setting is less influenced by urban elements, is somewhat more distant and is shielded from the project by trees. The visual impacts of the project on this Section 4(f) resource are distant enough, and with intervening features, such that a constructive use would not occur.

Noise/Vibration – As noted in the analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

Access – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

Bachman Lake Park

Visual – The visual and aesthetic resources analysis in Section 5.6 states that no impact would result in the vicinity of Bachman Lake Park. However, because the track in this area would be elevated, it may create a change in the environment for park users. This would suggest the possibility of a constructive use of the Section 4(f) resource, since this park can be considered to derive some of its value from the relatively undisturbed greenspace in an area otherwise notable for its views of developed commercial and industrial sites. The changes in the visual environment are offset by a significant distance across the lake and the presence of intervening structures (e.g., water department facilities, power transmission lines, power transformers, the DART Northwest Bus Operating Facility, Dallas Solid Waste Transfer Facility, an active freight railroad, and an earthen dam) that would minimize the overall effect of the elevated LRT in the viewshed for most park users. Consequently a constructive use of this resource is not expected to occur.

Noise/Vibration - The noise analysis in Section 5.4 notes that the predicted noise level at Bachman Station, just north of Bachman Lake Park and the L. B. Houston Park – Nature Trail, would slightly exceed FTA impact criteria due to an at-grade crossing and crossover track for the future Irving/DFW line. Effects, if any, on the nearby parks are not likely, given the existing ambient noise conditions in this area, which include noise from overflights of jet aircraft at Dallas Love Field, auto and truck traffic on IH 35E and Northwest Highway, and existing freight rail service. Thus, the potential for a constructive use to occur is very low. In addition, the predicted noise level increase would likely be so negligible (i.e., 2dBA) as to be barely perceptible (see 23 CFR 771.135(p)(5)(iii)).

Access – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

L. B. Houston Park – Nature Trail

Visual - The visual and aesthetic resources analysis in Section 5.6 states that no impact would result in the vicinity of the L. B. Houston Park – Nature Trail. As with Bachman Lake Park, there is a possibility that the elevated track in this area may create a visual impact for park users. However, there is very little potential that such visual impacts would result in a constructive use of the Section 4(f) resource. Most park users would be in portions of the park west of Harry Hines Boulevard and IH 35E, at a distance that would be too great, and with too many intervening features, to perceive any adverse effects from the elevated LRT track.

Noise/Vibration – As noted above in the discussion of Bachman Lake Park, the noise analysis in Section 5.4 notes that the predicted noise level near the Bachman Station, just north of the L. B.

Houston Park – Nature Trail, would slightly exceed noise impact criteria. Similar to Bachman Lake Park, however, the existing ambient noise environment for park users is already characterized by other noise events. Additionally, the vast majority of the LB Houston Park – Nature Trail is even more distant from the proposed LRT alignment than Bachman Lake Park, with the IH 35E freeway located between the alignment and largest areas of the park. As a result, the likelihood of noise impacts creating a constructive use of this Section 4(f) resource is extremely low.

Access – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

Farmers Branch Historical Park

Visual - The visual and aesthetic resources analysis in Section 5.6 finds that the installation of proposed project elements in this area of mature vegetation and historic architecture could result in a potentially significant impact for park users. While this park has a high quality visual and aesthetic setting, there is a low potential for a constructive use to result from the visual intrusion of project elements, because the alignment will be at-grade within an existing railroad right-of-way. New vegetation and architecturally appropriate design features, as suggested in the visual and aesthetics analysis, would be sufficient to avoid or minimize such a constructive use of this protected Section 4(f) resource.

Noise/Vibration – As noted in the analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

Access – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

Pioneer Park

Visual - The visual and aesthetic resources analysis in Section 5.6 states that the visual impact in the area of downtown Carrollton would be potentially significant insofar as the installation of proposed project elements in this area of historic architecture could adversely affect the views experienced by visitors to city parks in the vicinity. This potentially significant visual impact results in a low potential for a constructive use of the nearby protected Section 4(f) resource, especially since the aesthetic quality of the area is currently defined by an active freight railroad and heavy traffic on nearby streets. The incorporation of new vegetation and architecturally appropriate design features, as suggested in the visual and aesthetics analysis, would be sufficient to avoid or minimize a constructive use of the protected resources.

Noise/Vibration – As detailed in the analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

Access – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

Downtown Square Park

Please see discussion of Pioneer Park above. Pioneer Park is just east of the alignment. Downtown Square Park is located west of the proposed project alignment and is separated from the alignment by existing development in the downtown Carrollton area. Thus, potential impacts to this 4(f) resource would be similar to, but less than those to Pioneer Park.

Ken Good Park

Visual - The visual and aesthetic resources analysis in Section 5.6 indicates no impact in the vicinity of Ken Good Park. This area would include a section of elevated track over Jackson Road, adjacent to the park. Because this park provides only minimal amenities (i.e., picnic area and

fishing), and appears to be patronized primarily by lunchtime visitors from neighboring light industrial facilities, the potential for a constructive use to result is very low. The views in this area are not an important contributing element to the value of this resource. Thus, no constructive use is anticipated.

Noise – As detailed in the noise analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

Access – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

Avoidance Alternatives
A discussion of the alternatives considered for the proposed project is provided in Chapter 2 of this document. Because no direct, temporary, or constructive uses of protected Section 4(f) park/recreation resources are anticipated, no additional avoidance alternatives have been considered.

Measures to Minimize Harm
Although no constructive use of park/recreation uses is expected, it is anticipated that the provision of measures to minimize harm would be sufficient to further ensure that any potential for proximity impacts that could otherwise result in a constructive use of Section 4(f) park/recreation resources is minimized.

- Minimization Effort 1 – DART will utilize landscaping to provide buffers between LRT facilities, particularly those structures that are elevated above-grade, in order to avoid or minimize adverse effects on the visual and aesthetic qualities of protected Section 4(f) resources. This landscaping will be provided as necessary to avoid or minimize negative aesthetic effects on Farmers Branch Historical Park and Pioneer Park.

- Minimization Effort 2 - DART will utilize capped lights and/or similar light shielding devices at LRT facilities, particularly at those structures that are elevated above-grade, in order to avoid or minimize adverse effects on the visual and aesthetic qualities of protected Section 4(f) resources. These lighting features would have been provided at the DEIS Inwood Station location in order to avoid or minimize negative aesthetic effects on Weichsel Park. The FEIS station location minimizes this impact potential and no mitigation would be necessary.

- Minimization Effort 3 - DART will utilize architecturally appropriate designs for LRT facilities in order to avoid or minimize adverse effects on the visual and aesthetic qualities of protected Section 4(f) resources. These design features will be provided as necessary at LRT facilities adjacent to Weichsel Park, Farmers Branch Historical Park, and Pioneer Park in order to avoid or minimize negative aesthetic effects on those resources.

Consultation and Coordination
The project development process has included consultation with the following parties with regulatory authority over the Section 4(f) resources in the Northwest Corridor study area: Texas State Historic Preservation Officer, City of Dallas Parks Board, City of Dallas Landmark Commission, City of Dallas Urban Design Advisory Commission, Preservation Dallas, City of Farmers Branch, and City of Carrollton. Additional consultation is expected through the final design and engineering phase of the project development process.

Determination
FTA has determined that there is no direct, temporary, or constructive use of Section 4(f) park/recreation uses. Even without any Section 4(f) use, consultation and coordination with local

park and recreation officials has ensured that all possible planning has been undertaken to minimize harm to public parks and recreation areas in the vicinity of the proposed Northwest Corridor LRT Line to Farmers Branch and Carrollton.

5.15.3 Historic Sites

A total of 15 significant historic sites protected by Section 4(f) are located in the Area of Potential Effects (APE) for the proposed project. Based upon the analysis of historic sites prepared in compliance with the requirements of Section 106 of the National Historic Preservation Act and 36 CFR Part 800 for proximity impacts of the proposed project, there has been a determination of "no effect" for eight significant historic sites, a determination of "no adverse effect" for four significant historic sites, and a determination of "adverse effect" for three properties. Of the three properties for which a finding of adverse effect is made, the Carrollton Depot would be directly affected because it would need to be relocated to accommodate the project. Club Schmitz would be adversely affected by the constructive use of the project. The third adverse effect associated with this project is the demolition of the Continental Avenue Bridge, which was previously addressed in a Memorandum of Agreement, dated June 2002. In accordance with 23CFR 771(p)(5)(i), there is no constructive use for the 12 historic sites for which a determination of no effect or no adverse effect has been made.

The application of Section 4(f) to these resources is described below.

Description of Historic Sites

Table 5-31 provides a list and descriptive characteristics of the 15 significant historic sites identified in the vicinity of the proposed project.

Impacts to Historic Sites

The No-Build Alternative would largely consist of transit service improvements that would not likely result in any use - direct, temporary, or constructive - of any significant historic sites. Any physical improvements that may occur would be constructed as part of planned and programmed improvements for which separate Section 4(f) evaluations would be prepared as necessary.

Direct Use

Carrollton Crossing Depot

The proposed project would permanently incorporate all of this significant historic site. This site is discussed below.

Description and Significance of the Section 4(f) Historic Resource

A description of the Carrollton Crossing Depot is provided in Section 3.8 and is summarized above in **Table 5-31**.

The Selected LRT Alternative would result in direct use of one historic resource (Carrollton Crossing Depot), the temporary use of one historic resource (Old Morton Food Headquarters), and the constructive use of another historic site (Club Schmitz). **Table 5-32** summarizes the effects of the proposed project on significant historic sites subject to Section 4(f). The last column of the table, Remarks, reports the Section 106 Effect Determinations for information purposes. *(Note: The application of Section 4(f) to Dealey Plaza and the West End Historic District was evaluated as part of a Categorical Exclusion dated May 16, 2001, and is not repeated in this document. The application of Section 4(f) to the Continental Avenue Bridge has also been assessed as part of a separate environmental process, and is not repeated here)*.

TABLE 5-31
DESCRIPTION OF SECTION 4(f) RESOURCES
SIGNIFICANT HISTORIC SITES

Map No.*	Name	Location	Significance
1	Dealey Plaza	Roughly bounded by Pacific Avenue, Market and Jackson Streets, and right-of-way of Dallas Right-of-Way Management Company	Listed: 04/19/1993 Listed also as National Historical Landmark
2	West End Historic District	Bounded by Lamar, Griffin, Wood, Market and Commerce Streets	Listed: 11/14/1978
3	Magnolia Petroleum Company City Sales and Warehouse	1607 Lyte Street	Listed: 12/23/1994
4	Continental Avenue Bridge/Lamar-McKinney Underpass	Continental Avenue	Local, state and federal significance. Contributing element of a discontinuous district associated with the Trinity River flood control measures from the 1930's.
5	Turtle Creek Pump Station	3630 Harry Hines Boulevard	Listed: 02/09/2001
6	Old Morton Food Headquarters	6333 Denton Drive	Local significance. Good example of 1950's industrial architecture.
7	T. J. Rusk Middle School	2929 Inwood Road	Local, state significance, Good example of 1920's public school architecture.
8	Obadiah Knight School	2615 Anson Road	Local, state and federal significance. Good example of 1920's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
9	Water Department Purification Plant	2605 Shorecrest Drive	Local, state and federal significance. Good example of 1920's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
10	Water Department Pumping Station	2525 Shorecrest Drive	Local, state and federal significance. Good example of 1920's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
11	Bachman Electric General Station	9500 Denton Drive	Local, state and federal significance. Good example of 1930's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
12	Club Schmitz	9911 Denton Drive	Identified as locally significance community resource. One of the few remaining 1930's commercial structures along the railroad corridor. Commercial variation of Art Deco/Moderne style.
13	Bingo Theater/Circle Theater	2711 Storey Lane	Local, state significance. Good example of the late Moderne movie house architecture.
14	Letot School	2727 Lombardy Lane	Identified as a locally significant educational resource.
15	Carrollton Crossing Depot	1020 N. Broadway Street and MKT tracks	Local, state and federal significance. The depot, which once served the three railroads in Carrollton, exemplifies the prominence of the railroad in the growth of the area.

* Refers to **Figures 3-26** through **3-28** (Chapter 3).

Source: Myra L. Frank & Associates, October 2002.

TABLE 5-32
EFFECTS ON HISTORIC SITES

Map No.*	Resource	Direct Use	Temporary Use	Constructive Use	Remarks
1	Dealey Plaza	No	No	No	No effect - See also Categorical Exclusion approved May 16, 2001.
2	West End Historic District	No	No	No	No effect - See Categorical Exclusion approved May 16, 2001.
3	Magnolia Petroleum Company City Sales and Warehouse	No	No	No	No effect
4	Continental Avenue Bridge/ Lamar-McKinney Underpass	No	No	No	Adverse effect. MOA signed June 2002. Photo and documentation done; SHPO concurrence Aug., 13, 2002.
5	Turtle Creek Pump Station	No	No	No	No effect
6	Old Morton Food Headquarters	No	Yes	No	No adverse effect
7	T.J. Rusk Middle School	No	No	No	No adverse effect
8	Obadiah Knight School	No	No	No	No effect
9	Water Department Purification Plant	No	No	No	No effect
10	Water Department Pumping Station	No	No	No	No effect
11	Bachman Electric Gen. Station	No	No	No	No effect
12	Club Schmitz	No	No	Yes	Adverse effect
13	Bingo Theater/ Circle Theater	No	No	No	No adverse effect
14	Letot School	No	No	No	No adverse effect
15	Carrollton Crossing Depot	Yes	No	No	Adverse effect

* Refers to **Figures 3-26** through **3-28** (Chapter 3).

Source: Myra L. Frank & Associates, October 2002.

Application of Section 4(f) Criteria for Use

The proposed project would involve the construction of the Carrollton Square Station on the site that the historic Carrollton Depot currently occupies. The station would be an aerial facility crossing over much of the existing Depot, constituting a direct use of this Section 4(f) resource. The Depot would be relocated within, and incorporated into the design of, the new station area. Relocation would adversely affect the integrity of location of the structure. Though consultation with historic preservation officials has suggested that the Depot may have been moved in the past, no evidence can be found to suggest any prior relocation. Tempering the adverse effects of relocating the Depot is the fact that it is presently vacant and inaccessible to the public. It would be moved in such a way that it could reused and better appreciated by the public as part of the proposed new Carrollton Square Station.

Avoidance Alternatives

An alternative that shifts the aerial guideway to the west would substantially reduce or eliminate the adverse effects on the Depot. By doing this, however, it is very likely that a large number of other

commercial structures in Old Downtown Carrollton would be displaced. Such an alignment would also have some potential to interfere with, or even eliminate use of, Broadway Street. As a result, this alternative is not considered to be feasible or prudent.

Measures to Minimize Harm
DART has agreed to relocate and rehabilitate the Carrollton Depot as part of the Carrollton Square Station. Relocation and rehabilitation would be in accordance with the Secretary of Interior's Standards for Rehabilitation. Two relocation concepts have been studied, with the current proposal being a new location for the Depot along the Cotton Belt tracks to the north, about 380 feet east of its current location. This site maintains the relationship of the Depot to the Cotton Belt tracks and the railroad switching yard to the east. Relocation to this site would also make the Depot more visible and accessible to the public, arguably increasing its value as an historic resource. DART has also agreed to the following additional measures to minimize harm to the Depot: (1) continued maintenance of the facility while it remains in DART's ownership; (2) consultation with the SHPO if the structure is transferred, sold, or leased in order to incorporate measures that will ensure the continued integrity of the structure; and (3) station design review by the SHPO at the 30, 65, 95, and 100 percent intervals in the final design.

Consultation and Coordination
DART staff and the project consultants met with SHPO staff on July 24, 2002 to discuss the effects of the proposed project on this site and the potential means available to minimize adverse impacts. The SHPO, in a letter dated September 26, 2002 has concurred in the determination of "adverse effect" for Carrollton Depot and the measures proposed to minimize harm to this historic resource.

Determination
The FTA, in consultation with the SHPO, has determined that there is no feasible or prudent alternative to the direct use of Carrollton Depot by the proposed project. All efforts to minimize harm have been taken, including a relocation and rehabilitation plan that meets the Secretary of Interior's Standards for Rehabilitation.

Temporary Use
Old Morton Food Headquarters
As detailed in the construction scenario in Section 5.12, the construction staging and equipment laydown areas necessary to construct the proposed project are all expected to be accommodated outside the limits of significant historic sites. It is possible, however, that a temporary construction easement may be necessary at the Old Morton Food Headquarters site in the parking lot along Denton Drive. The easement would be acquired in order to permit construction of a tunnel entry and associated U-walls. The easement will be up to 480 feet long and 10-15 feet wide. Aside from a temporary displacement of approximately 10 parking spaces, the easement would not otherwise interfere with other activities at this site on either a temporary or permanent basis. The easement will be needed for up to 18 months during construction. A change in the legal ownership of the easement land would not occur. When construction is completed, DART will restore the parking lot to its pre-construction condition. The Harry Hines Base alignment would have avoided this possible temporary use of this historic resource.

Constructive Use
Club Schmitz
Description and Significance of the Section 4(f) Historic Resource
A description of this site is provided in Section 3.8 and is summarized above in **Table 5-31**.

Application of Section 4(f) Criteria for Use
The proposed project will not remove, alter, or otherwise physically damage the Club Schmitz building. The project will, however, result in several proximity impacts to the property. First, the

project will require that a 24 foot high aerial LRT guideway be located about 32 feet from Club Schmitz. Second, a guideway column will be placed in a public right-of-way that is not owned by Club Schmitz, but is utilized informally by its patrons for parking. About two parking spaces would be lost. Third, the project would involve the permanent closure of Cullum Road at its intersection with Denton Drive, with a cul-de-sac remaining. Cullum Road presently provides access to the north side of Club Schmitz.

The most substantial effect on this property from the changes described above would be the alteration of the exterior visual and aesthetic setting of the Club Schmitz building. The proposed aerial guideway would partially obstruct views of this building, primarily from Denton Drive. This effect is offset to some extent by the fact that the activities associated with this building are essentially inward-directed as a nightclub and lounge.

The loss of about two parking spaces would not substantially impair access to Club Schmitz. These spaces are located on public property. More importantly, the remaining parking spaces, whether on public land or actually owned by Club Schmitz, will be sufficient to permit continued operation of this business.

Closure of Cullum Drive at Denton Drive would impair, but not eliminate, access to Club Schmitz. Patrons will be able to access Club Schmitz from Webb Chapel and Harry Hines Boulevard, as well as from Cullum Drive via Harry Hines.

Avoidance Alternatives
An alignment shifted to the east (perhaps on the east side of Denton Drive) would likely eliminate or substantially reduce the visual quality and access impacts of the project as proposed. In fact, DART considered several alternatives in this area as part of the planning process for the nearby Bachman Station (see Section 5.16.4). Two aerial alternatives on the east side of Denton Drive were considered and rejected because: (1) they would displace a large number of apartment buildings, most of which are occupied by minority and/or low-income residents; (2) they would not have satisfied freight separation requirements due to right-of-way constraints; and (3) they would have introduced a large, complex, and costly aerial structure in order to allow future connections to the proposed Irving/DFW corridor. For these reasons, these alternatives can be considered neither feasible nor prudent.

Measures to Minimize Harm
DART has taken steps in the planning process to minimize harm to Club Schmitz from the proposed project. Project engineers redesigned the aerial guideway by moving retaining walls about 200 feet further to the north and continuing the structure as a bridge north of Cullum Road, thereby improving the visibility of Club Schmitz from Denton Drive. DART has also committed to working with Club Schmitz to provide additional signage in this area, should it be desired to minimize the visual and access impacts of the proposed project.

Consultation and Coordination
DART staff and the project consultants met with SHPO staff on July 24, 2002 to discuss the effects of the proposed project on this site and the potential means available to minimize adverse impacts. The SHPO, in a letter dated September 26, 2002, has concurred in the determination of “adverse effect” for Club Schmitz and the measures proposed to minimize harm to this historic resource.

Determination
The FTA, in consultation with the SHPO, has determined that there is no feasible or prudent alternative to the constructive use of Club Schmitz by the proposed project. All efforts to minimize harm have been taken, including the design of the aerial guideway and a commitment to work with the proprietors of the site to provide additional signage.

5.15.4 Section 6(f)(3) Considerations

Section 6(f)(3) of the Land and Water Conservation Fund Act (LWCF Act) (16 USC 460l-4) contains strong provisions to protect federal investments in park and recreation resources and the quality of those assisted resources. The law is firm but flexible. It recognizes the likelihood that changes in land use or development may make some assisted areas obsolete over time, particularly in rapidly changing urban areas. At the same time, the law discourages casual "discards" of park and recreation facilities by ensuring that changes or "conversions from recreation use" will bear a cost - a cost that assures taxpayers that investments in the "national recreation estate" will not be squandered. The LWCF Act contains a clear provision to protect grant-assisted areas from conversions:

> *SEC. 6(f)(3) - No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.*

This “anti-conversion” requirement applies to all parks and other sites that have been the subject of LWCF grants of any type, whether for acquisition of parkland, development or rehabilitation of facilities. Since there is no parkland being acquired for this project, no LWCF funded property would be affected.

5.15.5 Texas Parks and Wildlife Code, Chapter 26

Chapter 26 of the Texas Parks and Wildlife Code was established to protect parks, recreation and scientific areas, wildlife refuges, and historic sites from being used or taken by state or local agencies for public projects. Chapter 26 is similar to Section 4(f) of the Department of Transportation Act of 1966 in its requirements, except that the Texas law requires a public hearing on any use or taking of protected land.

Because the project will require relocation of the Carrollton Depot, the provisions of Chapter 26 would be triggered. The discussion above outlines the reasons why there is no prudent or feasible alternative to the use of the site on which the Depot is currently located and identified the planning to minimize harm that has been incorporated into the project.

5.16 ENVIRONMENTAL JUSTICE

This section analyzes potential environmental justice concerns of the Selected LRT Alternative to determine if there are low-income or minority populations who would suffer disproportional high and adverse impacts.

5.16.1 Overview

Executive Order 12898, “Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations” was signed in February 1994. It requires Federal agencies to ensure that disproportionately high and adverse human health or environmental effects of proposed Federal projects on minority and low-income communities are identified and addressed. The general principles required under EO 12898 are as follows:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

In addition to complying with the Executive Order, the Department of Transportation is committed to Title VI of the Civil Rights Act, which provides that no person in the United States shall, on the grounds of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance.

5.16.2 Public Participation

Throughout the Draft EIS, PE/EIS and prior planning phases, DART has made every effort to notify affected residents, business owners and stakeholders in the project corridor. Special efforts were made to notify and inform the low-income, Hispanic and predominantly minority areas along the corridor.

Five rounds of general public meetings (December 2000, March 2001, September 2001, December 2001, April 2002), and a special public meeting to discuss the Medical Center Design Options (August 2001) were held in the corridor. Each round of public meetings included a meeting in Dallas, and a meeting in the Farmers Branch/Carrollton area. During July 2002, DART conducted three Draft EIS public hearings throughout the corridor to receive verbal comments on the proposed project and DART Service Plan amendments. One of the hearings was held at the Bachman Recreation Center – located in an identified EJ census tract (72.01). In addition to these meetings and hearings, DART made the Draft EIS available to members of the community and organizations for review and comment during a 45-day review period (June 14 through July 30, 2002). Given low participation from Hispanic community members, DART held a special meeting conducted in Spanish on August 22, 2002 at Saldivar Elementary School in the Bachman area. However, attendance was very limited. Due to project changes and refinements in the Medical Center area after the DEIS public hearings, DART held and additional public meeting (April 3, 2003) and a formal public hearing (April 10, 2003) to obtain public comment prior to publishing this Final EIS. Both of these meetings were held in identified Environmental Justice Census Tract 4.01. Several additional meetings and briefings were held and are documented in Chapter 6.

Several outreach methods were used to notice the above meetings, including:

- 60,000 to 75,000 brochures were printed and distributed for each meeting. All brochures included information for Spanish-speaking individuals so they could contact a DART representative for more information.

- Brochures (for the December 2001, April 2002 and July 2002 meetings) were printed in both Spanish and English. Those brochures were used for special door-hangings at the Willow Wood apartments (proposed to be acquired and displaced for the Bachman Station), and sections of the Love Field West neighborhood. Both locations have a high concentration of Hispanic residents. A door hanging in the Arlington Park Heights neighborhood (largely African-American) was also done for the December 2001 meeting.

- Brochures were also placed on corridor bus routes, area transit centers (via windshield distribution), and on LRT and TRE trains. Direct mailings to households and businesses within 600 feet of the alignment was also done. City staff and elected representatives were also provided brochures for their distribution.

- Notices on the DART web-site.

- Meeting notifications were printed in several papers, including the Spanish newspaper, *El Extra*, which has the widest circulation in the area, *Dallas Morning News*, and the *Korea News*. *Korea News* did an article on the project for their readers.

- Outreach through the Community Work Group, which includes minority Chambers of Commerce, including the Hispanic Chamber of Commerce, on the mailing list. However, participation from Chambers was limited.

In general all comments received at public meetings and neighborhood briefings were positive and support the project. In particular, the Bachman community supports the location of the Bachman Station despite the proposed displacement of the Willow Wood apartments. Many area residents view the apartments as old, substandard, and in disrepair; no apartment residents attended the meetings. However, some agencies, neighborhoods and residents representing low-income and minority interests had specific concerns related to the project, including:

- Some low-income, transit-dependent persons stated their opposition to the Medical Center Design Options at the August 2001 meeting, and prefer the Harry Hines Base Alignment as it has more direct service to hospitals and clinics in the Medical Center district.

- A briefing to members of the Love Field West Homeowners Association was held in August 2001. Residents indicated their concerns related to safety (train speed) and traffic (opposition to proposed street closures to minimize the number of at-grade crossings) should the Base Alignment along Denton Drive near Dallas Love Field be implemented. The Love Field Design Option would have potentially avoided these impacts.

- A briefing to the Arlington Park Heights community was held in September 2001. Some residents stated their support for the Harry Hines Base Alignment through the Medical Center area, stating it provides better access to medical facilities for the general community. Subsequent coordination between DART, the hospitals, and Arlington Park community members resulted in that community's support for the Medical Center Design Option D, particularly as it relates to UTSW's commitment to provide shuttle service to hospitals and adjacent neighborhoods from the Parkland LRT station. UTSW will continue to coordinate with Arlington Park regarding service to this community under the Selected LRT Alternative.

- A letter received from DISD on December 5, 2001 stated their opposition to the Medical Center Design Options as they pass adjacent to Hernandez Elementary School. About 700 of the school's students live east of the alignment and would have to cross the LRT tracks at-grade at Maple Avenue, viewed as a severe safety hazard by DISD. The residential areas to the east are predominantly Hispanic and in the area known as Little Mexico along Maple Avenue. DISD supports the Harry Hines Base Alignment through the Medical Center area, as it does not divide attendance zones. While the DEIS reflected an at-grade crossing of Maple Avenue, updated traffic analysis indicate a grade separation is necessary. This will minimize any safety issues associated with the Selected LRT Alignment. Safety and Security and proposed mitigation measures are discussed in Section 5.11.2.

DART also held tours as requested for minority groups. At the request of Korea News and area Chambers of Commerce, DART held a tour of the LRT Starter System for approximately 125 interested Asian Americans so they could get a first-hand look at what the proposed project would bring to their community. The Asian community has a significant business interest in the area surrounding the proposed Royal Lane Station and supports the project.

To supplement the above efforts, DART plans to use a special outreach service that targets Spanish-speaking households for future meeting notices and education efforts. This would ensure

that those populations are kept informed during final design and construction as the project design progresses and mitigation measures are finalized and implemented.

5.16.3 Impact Assessment Methodology

The environmental justice analysis in this document follows guidance provided by the Office of Federal Activities, "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses" dated April 1998, as well as guidance provided by other FHWA, FTA, EPA and CEQ publications. The analysis identifies minority and low-income populations within the project corridor Study Area and the potential adverse impacts to these populations if the LRT Build Alternative were implemented. The Study Area is defined as a one-mile cross-section centered on the LRT alignment that stretches the length of the project. If adverse impacts of the LRT project fall disproportionately on minority and low-income populations, mitigation measures or alternatives are identified (where possible).

For this evaluation, definitions of minority and low-income areas were established based on guidance provided by the Office of Federal Activities publication. The guidance states that, "…a minority population may be present if the minority population percentage of the affected area is "meaningfully greater" than the minority population percentage in the general population or other "appropriate unit of geographic analysis". A minority population is also present if the numeric measure is over 50 percent of the affected area. For low income population the guidance states that, "…low income populations in an affected area… should be identified with the annual statistical poverty thresholds from the Bureau of Census' Current Population Reports, Series P-60 on Income and Poverty." The reports state that the use of national decennial census data in depicting the low-income/poverty and minority statistics is one of the most prevalent methods used to define affected communities. For this analysis, Dallas County is used as the geographic unit of comparison.

The environmental justice analysis in this document utilizes U.S. 1990 Census data to identify high minority and/or low-income/poverty populations located within the Study Area. The 2000 Census data was examined but not used in this analysis due to the fact that income and poverty data was not yet available at the tract level. However, demographic changes between 1990 and 2000 were assessed for the Study Area (population, Hispanic origin and ethnicity) and are noted where pertinent to the analysis.

A Geographic Information Systems (GIS) analysis was used to determine a census tracts' population residing within the Study Area. The percentage of land area lying within the Study Area was calculated and that portion of the population was allocated to the Study Area population. Before this allocation was made, aerial photographs of the census tract's land use were examined to evaluate population distribution across each tract (such as location of housing, apartments, etc.).

Potential adverse impacts of the proposed project were identified and a GIS analysis was used to identify where these impacts affect minority and low-income populations. Possible alternatives and/or mitigation measures to avoid and mitigate disproportionate and adverse environmental impacts on affected populations were identified and assessed for feasibility. Potential benefits of the proposed LRT project on the affected populations were also identified.

5.16.4 Impact Assessment

Dallas County had a population of 1,852,810 in 1990 according to the 1990 U.S. Census. Approximately 33% of the population was minority, 17% Hispanic and 13% had incomes below poverty level. (The Minority category includes individuals identified as belonging to a racial category other than white. Hispanic refers to individuals of Hispanic origin, which includes all racial categories.)

Areas With High Minority, Hispanic and Low-Income Populations

Table 5-33 outlines demographic data for Dallas County, the Study Area and the census tracts within the Study Area. (As noted above, this usually does not represent the entire census tract, but only that portion found within the Study Area boundaries.)

TABLE 5-33
ENVIRONMENTAL JUSTICE
EVALUATION OF CENSUS TRACTS IN PROJECT CORRIDOR

	Total Population	Percent Minority	Percent Hispanic	Percent Below Poverty
Dallas County	1,852,810	33%	17%	13%
Study Area	40,692	46%	41%	20%
Study Area by Census Tracts [1]				
4.01 [2]	3,743	77%	76%	40%
4.03	4,874	53%	76%	25%
4.04 [2]	205	41%	42%	30%
4.05	475	80%	33%	52%
5 [2]	2,442	30%	40%	34%
6.01	132	51%	50%	25%
17.02	47	46%	10%	17%
18	477	15%	13%	11%
19 [2]	830	73%	30%	55%
21	0	0%	0%	0%
31.01	862	65%	7%	0%
32.01	0	64%	7%	75%
71.02	346	77%	10%	15%
72.01	4,460	62%	53%	26%
72.02	400	63%	48%	20%
96.05	0	0%	0%	0%
96.06	876	32%	34%	12%
97.01	1,069	20%	26%	4%
98.01	4,489	53%	43%	17%
99	279	52%	27%	24%
100	2,188	68%	9%	9%
137.02	4,195	32%	30%	13%
137.07	4,265	23%	21%	9%
137.08	0	0%	0%	0%
139	2,372	18%	21%	4%
140.01	1,668	16%	14%	6%
140.02	0	0%	0%	0%
141.01	0	0%	0%	0%
141.08	0	0%	0%	0%
216.01	0	0%	0%	0%
216.03	0	0%	0%	0%
217.1	0	0%	0%	0%

Note: Shaded areas represent tracts with high concentrations of minority, Hispanic or low-income populations.
[1] Only the population within the census tract that resides in the Study Area
[2] Census Tracts within a State Empowerment Zone or Enterprise Community

Source: Renee Perkins Jaynes; U.S. Census Bureau 1990 Data; January 2002

For this analysis, a "meaningfully greater" percentage has been defined as a percentage twice as high as the Dallas County percentage for low-income, minority and Hispanic. Also in adherence to the guidelines, high minority and Hispanic areas also include those tracts where over 50 percent of the tract was minority or Hispanic. The shaded areas on **Table 5-33** represent tracts with high concentrations of minority, Hispanic or low-income populations. For the Hispanic category, this represents tracts with a percentage of 34% or higher Hispanic and for the poverty category this represents tracts with a percentage of 26% or higher. (These thresholds are twice the County percentages therefore "meaningfully greater".) For minority, the threshold was set at 50% in compliance with Federal guidelines.

Table 5-34 below outlines the tracts that were examined for adverse impacts.

TABLE 5-34
ENVIRONMENTAL JUSTICE
CENSUS TRACTS WITH HIGH POVERTY, MINORITY OR HISPANIC POPULATIONS

Census Tract	Total Population	Percent Minority	Percent Hispanic	Percent Below Poverty
4.01	3743	77%	76%	40%
4.03	4874	53%	76%	25%
4.04	205	41%	42%	30%
4.05	475	80%	33%	52%
5	2442	30%	40%	34%
6.01	132	51%	50%	25%
19	830	73%	30%	55%
31.01	862	65%	7%	0%
32.01	0	64%	7%	75%
71.02	346	77%	10%	15%
72.01	4460	62%	53%	26%
72.02	400	63%	48%	20%
96.06	876	32%	34%	12%
98.01	4489	53%	43%	17%
99	279	52%	27%	24%
100	2188	68%	9%	9%

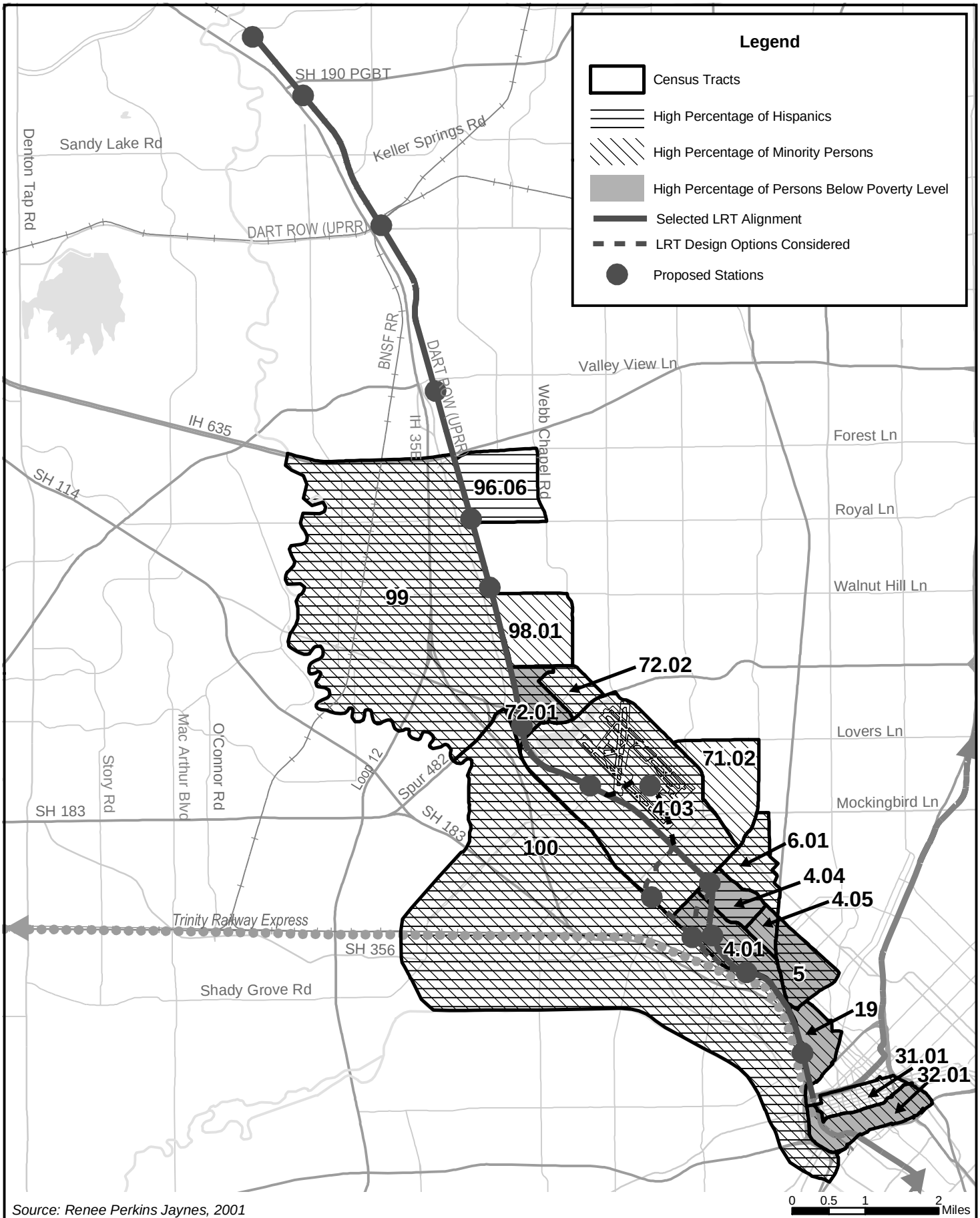
Note: Shaded areas represent tracts with high concentrations of minority, Hispanic or low-income populations.

Source: Renee Perkins Jaynes; U.S. Census Bureau 1990 Data; January 2002

The Study Area has a high percentage of Hispanics – approximately 41% of the residents. An analysis of the 2000 Census data for the Study Area reveals that the corridor has increased its Hispanic population during the last decade. Some census tracts had an increase of 76% or higher. **Figure 5-5** depicts the location of the census tracts that qualified as having a high percentage of minority, Hispanic or low-income populations. Thirteen of the tracts have a high percentage of minority persons, nine a high percentage of Hispanics and seven have a high percentage of persons below poverty level. Four of the tracts are located in a State of Texas designated Empowerment Zone or Enterprise Community.

Impacts on High Minority and Low Income Areas

All census tracts within the Study Area were analyzed for impacts related to the Selected LRT Alternative and the other alternatives considered. In order to analyze the impacts from an environmental justice perspective, five key impact categories were assessed in each tract with greater than average minority, Hispanic or low income populations: acquisitions and displacements, land use and economics, visual, safety and security, and traffic and circulation. Environmental justice impacts were identified where an environmental impact in that tract was adverse compared to the impacts in the other census tracts and the Study Area as a whole.



Source: Renee Perkins Jaynes, 2001

Figure 5-5

Enviromental Justice Assessment by Census Tract

LRT Line to Farmers Branch and Carrollton
Final Environmental Impact Statement

An examination of the sixteen census tracts with high minority, Hispanic or low-income populations concludes that adverse impacts from the Selected LRT Alternative could potentially occur in four census tracts: 4.01, 4.03, 4.04 and 72.01. A brief description of these areas and a discussion of the possible adverse impacts are outlined below. Mitigation measures for these impacts were identified during the Draft EIS. DART's commitment to specific mitigation measures is addressed for each impact identified. **Table 5-35** summarizes the type of impact attributable to the Selected LRT Alternative for each of the four census tracts.

Impacts to Census Tract 4.01

This tract is generally bounded by Inwood Road, the Dallas North Tollway, Harry Hines Boulevard and Maple Avenue. Most of the residential areas within this tract are located in the southern portion of the tract in the Oak Lawn and Little Mexico neighborhoods. Area residents met all three of the environmental justice criteria (higher than average percentage Hispanic, low income and minority populations). Residents located adjacent to the Market Center/Oak Lawn Station would be adversely impacted by the Selected LRT Alternative .

TABLE 5-35
ADVERSE IMPACTS WITHIN CENSUS TRACTS WITH HIGH POVERTY, MINORITY OR HISPANIC POPULATIONS

Category	High Minority and Low-Income Census Tracts			
	4.01	**4.03**	**4.04**	**72.01**
Acquisitions & Displacements	Yes	Yes	Yes	Yes
Land Use & Economics	Yes	No	No	Yes
Visual	Yes	No	Yes	Yes
Noise/Vibration	No	No	No	No
Safety & Security	Yes	No	No	No
Traffic & Circulation	Yes	No	Yes	No

Source: SR Beard & Associates; Renee Perkins Jaynes; January 2002

Parking for the Market Center/Oak Lawn Station would be directly adjacent to single-family homes and would have access off of Vagas, a residential street; the primary entrance would be on Wycliff. The parking would displace residential and non-residential uses and would create visual, traffic and safety issues for the adjacent residential structures.

During the Draft EIS, several other options were considered for the parking. The first site plan proposed parking north of the current site, between Wycliff Avenue and Hondo Street. This plan located a surface lot on 3.5 acres that would have displaced eight residential structures (ten households) and one motel. To reduce the number of residential displacements, an alternative plan was proposed at this location – a three-level parking garage that required 2.0 acres of property. This avoided four residential displacements including a recently constructed home at 2206 Hondo. This option still had traffic, visual and safety impacts on Hondo, a residential street.

The Selected LRT Alternative shifts the platform for this station south by approximately 400 feet to locate the alignment within DART-owned UPRR ROW. This change made it necessary to shift the parking lot for the Market Center/Oak Lawn Station south of Wycliff. The number of displacements is similar to the parking garage option – four single-family residential structures and two motels. This option minimizes the safety impacts of a parking garage, although some visual impacts remain to adjacent residential properties. There would also be traffic impacts to Vagas, which is a narrow residential street. The traffic impacts on Vagas would be significant. Approximately 120 to 200 trips per day could cut through on this street, translating into 50 to 75 trips cutting through the

neighborhood during peak hour, possibly more than one car per minute. In addition to the traffic, this creates safety issues along this street for pedestrians and bicycles.

Mitigation of these impacts will be determined during final design of the project in coordination with the City of Dallas, adjacent property owners, and residents. For the visual impacts, features reflective of a residential setting will be incorporated into the parking lot design, where residences are adjacent to or face the parking lot. Lighting in the parking lot will be shielded to minimize light pollution impact to the adjacent residential areas. Landscaping will also be incorporated to soften the views. All mitigation will conform to DART Rail Design Criteria, Chapter 19.2 (Landscaping) and 26 (Lighting). Further analysis of access to the parking garage and localized effects on neighborhood traffic, including safety, will be done during final design to reduce or minimize traffic impact.

Impacts to Census Tract 4.03

This tract is bounded by Webb Chapel Extension/Northwest Highway, Inwood Road, Harry Hines, and Lemmon Avenue and lies just north of tract 4.01. It contains the Love Field West neighborhood, the Dallas Love Field airport, the Mockingbird commercial corridor and part of the Inwood commercial corridor. The primary residential areas are located west of Dallas Love Field; however there are a few small pockets of residential uses north of Inwood Road. In 1990, the tract was 76% Hispanic and 53% minority (low income was 25%, just below the 26% threshold). By the 2000 Census, it had changed to 40% minority and 89% Hispanic.

The only impact in this tract is a vibration impact at 2727 Kimsey from the LRT alignment. The impact would be mitigated by the acquisition of this residence. This would displace one single-family household. Residents also suggested incorporation of a pathway for children to get to Rusk Middle School since the alignment will be descending to grade and will block access. Such access will be explored during final design.

Impacts to Census Tract 4.04

This tract, bounded by Inwood Road, Kings Road, Maple Avenue, and Cedar Springs, is just east of 4.01 and is primarily residential, with single family and multifamily uses. In 1990, the tract was 42% Hispanic and 30% low-income (percentage of minority was 41%, below the 50% threshold). By the 2000 Census, the Hispanic population had increased to 56%.

The aerial alignment and station in this tract would have adverse impacts to the single-family residential area just southeast of the Denton Drive/Inwood Road intersection, particularly to the residents along Cherrywood Avenue. The station site plan proposes access to the station off of Denton Drive. This creates some minor traffic impacts to Cherrywood residents from cut through traffic. A bus entrance into the station would be located immediately west of Cherrywood and this, combined with the aerial LRT alignment, creates visual impacts to the residential area. Mitigation of these impacts will be developed during final design and will include, but not be limited to, the use of vegetation in the area between Denton Drive and station/bus transfer area to soften views and create a visual screen wall along Denton Drive.

Impacts to Census Tract 72.01

This tract, located north of 4.03 and Bachman Lake, and bounded by Lombardy Lane, Webb Chapel Extension/Northwest Highway, Harry Hines/Denton Drive, and Timberline, is a mix of residential (primarily multi-family), industrial and commercial land uses. The residents of this area met all three of the environmental justice criteria. In 1990, the population was 62% minority, 53% Hispanic and 26% low-income. By the 2000 Census, the population changed to 91% Hispanic and 54% minority.

One of the largest areas of impact would be in the Bachman Station area and the block north of Community Drive, where several businesses and the Willow Wood apartment complex would be displaced. Approximately 164 households (163 apartments at Willow Wood and one single-family residence) and 23 businesses would be displaced. DART met with the manager of the Willow Wood apartments on March 12, 2002. Management indicated that the majority of residents are Spanish-speaking and low to moderate-income. A few families also live in the complex in separate apartments to maintain close proximity to one another. DART has provided door hangings in Spanish to encourage residents to attend meetings; however, it appears that no residents have attended meetings. As the project progresses and relocation efforts are initiated for the proposed project, DART will make every effort and emphasize the need to begin the relocation process early given the characteristics of the residents.

Several (23) businesses would also be displaced by the proposed project. The uses vary from industrial to service businesses. Among those displaced are a restaurant, convenience store, automotive uses, a club and a local firm, ZINC. This is a smaller commercial area in the Bachman community; the larger, more diverse commercial and retail areas are located less than ½ mile to the east along Webb Chapel Extension and Northwest Highway. These businesses would still be within easy walking distance to remaining apartments on the east side of Denton Drive. The impact of the loss of these businesses to the residents of the neighborhood would be minimal. To date, those residents and businesses that have participated in the planning process support the station and the project, and understand the need to relocate. DART will make an effort to relocate persons and businesses in the immediate area to minimize any disruption. Furthermore, as the relocation efforts begin, a resident or business owner's willingness to sell can change once they understand relocation benefits.

This area also has noise impact (all moderate, none severe) to apartment complexes located east of the tracks opposite the Bachman Station. Due to the grade crossing at Community Drive and the crossover for the Irving/DFW line, four buildings, comprised of 52 units, are projected to experience moderate noise impacts. Mitigation of these moderate noise impacts is not recommended because the projected noise increase is less than 3 dB.

Another potential impact of the LRT project is a visual impact to multi-family residences across Denton Drive that are parallel to and face the alignment in this area. Possible mitigation measures include the use of vegetation, appropriate lighting and other design features to respond to the residential character of the adjacent areas, particularly in the vicinity of the Bachman Station. Final mitigation measures will be evaluated during final design of the LRT project.

Other Alignments Considered

Six alternative alignments were considered during the Draft EIS, five options through the Medical Center District and the Love Field Design Option. The Selected LRT Alternative minimizes property acquisitions and displacements compared to the other options considered. The Medical Center Design Options A, B and C would have required a greater number of displacements (primarily non-residential), with approximately 75 business displacements under Option C. Option A also had a safety impact to Hernandez Elementary School, affecting approximately 700 students. There are some visual impacts with the Selected LRT Alternative that would have been avoided with the Harry Hines Base alignment. However, most of these impacts can be mitigated during the final design process.

Several alternative station locations were also considered during the Draft EIS. The parking garage alternative for Market Center/Oak Lawn north location would have displaced six additional single-family residences. The Inwood Station north location would also have had additional displacements (four businesses and one single-family residence). There are traffic, visual and safety impacts with the Market Center South location (as there also were with the north location). However, they are

less severe than the other design options considered. These impacts will be mitigated during final design of the station working with the adjacent property owners and residents.

5.16.5 Conclusion

The Selected LRT Alternative would potentially adversely impact environmental justice populations at the Bachman and Market Center/Oak Lawn Stations and the along the LRT alignment adjacent to Kimsey Drive and Cherrywood Avenue. These impacts are not considered disproportionately high due to DART's commitment to mitigate the impacts that have been identified. In addition, there are substantial overall benefits to environmental justice populations from the LRT project as a whole that should be considered.

The project corridor as a whole has higher percentage of minority, Hispanic, low income, and transit-dependent residents than the Service Area as a whole. These populations are even more concentrated in the EJ Census Tracts where adverse impacts have been indentified. The residents of these areas need the LRT project to improve their access to employers located within the corridor and elsewhere in the DART system. The corridor is linked to the Dallas Central Business District with its 120,000 jobs, and a variety of other employment centers. The LRT project will provide additional transit access to education, medical and governmental services (all of these uses are located within the corridor). The project will also strengthen economic conditions within the corridor, particularly at stations with joint development potential.

The most adverse impact that was identified in the EJ analysis would occur at the Bachman Station and along the LRT alignment in this area – approximately 164 households and 23 businesses would be displaced. DART considered several other alignment and station options in the Bachman Station area in order to avoid this impact and minimize acquisitions and displacements, while still attempting to design it to fit into the context of the community and be cost-effective. Several constraints in the area affected the options considered:

- DART-owned rail right-of-way is 30 feet wide and freight operations to customers north of that point would still be required. In a shared LRT/freight corridor, DART requires a 25 feet separation from freight for safety and maintenance.
- Denton Drive is planned to widen from its 2-lane configuration to a 4-lane undivided cross-section, further constraining the right-of-way.
- Multi-family apartments immediately abut both sides of the existing railroad/Denton Drive right-of-way.
- The future junction with the proposed LRT line to Irving/DFW would take place just south of Northwest Highway, north of community Drive.
- Webb Chapel Extension would need to be grade-separated and a new bridge would need to be built across Northwest Highway.

Initially, DART considered three station areas in the immediate area. One at-grade station was proposed as the currently preferred location west of Denton, and two aerial stations were proposed on the east side of Denton Drive. These two station options would be aerial because the LRT alignment would continue north in an elevated configuration from the Webb Chapel grade separation in order to cross over Denton Drive (as the existing rail alignment does) and then provide an aerial junction that would allow the alignment to continue north over Northwest Highway as well as cross back over Denton Drive to continue west into the Irving/DFW corridor. Both alternative station locations would have displaced apartment complexes east of Denton Drive for the park-and-ride facility, and the freight separation requirements would have impacted property to the west of Denton Drive due to right-of-way constraints. Furthermore, these alternatives would

have introduced a large aerial structure through the area with a complex and costly elevated junction to the Irving/DFW corridor.

Selecting the station site west of Denton Drive and south of Community would allow for the both the station platform and the Irving/DFW junction to be at-grade, thus minimizing cost and the visual and noise impacts to adjacent land uses. Based on input received at public meetings during the station location decision process, community members active in the Bachman area supported the at-grade station west of Denton Drive because it fit best into the community and had the fewest direct and indirect impacts to surrounding land uses. This option also provides for a separation of LRT and freight, as freight would remain in the existing right-of-way east of Denton Drive. By placing the alignment and the station on the west side of Denton Drive, DART could locate the station and alignment to best accommodate the Denton Drive widening while achieving a cost-effective design that fit into the Bachman community.

The Willow Wood residents that would be displaced should be able to find replacement housing within a two-mile radius of their current residence. A review of housing data recently released for the 2000 Census reveals that within a one-mile radius of Willow Wood Apartments there were 208 vacant housing units. Within a two-mile radius, there were 565 vacant units. Most of the units within these areas are available for rental occupancy. Approximately 94% of all housing units were renter occupied within the one-mile radius and 79% within two miles.

It is very likely that the displaced residents are low income and minority (this is based upon a review of Census data, discussion with Apartment Managers, and a visual inspection of the property). DART has a “Last Resort Housing” provision that may be needed for some of the households displaced due to the high percentage of individuals with incomes below the poverty level. According to DART staff, the agency’s replacement housing policies provide up to three and one-half years of rental assistance when necessary (based upon the displacees’ income and the cost of replacement housing). This ensures that the displaced residents will have decent, safe and sanitary housing that is affordable for a number of years.

The non-residential displacements, 23 businesses, may have a more difficult time in finding replacement space within the area. To mitigate this impact, DART relocation staff would provide individual assistance to each displaced business, both tenants and property owners, to assess their needs and assist in finding a suitable replacement location.

In addition, all acquisition of property will adhere to the DART Board of Directors’ Real Estate Policy and Procedures, adopted August 25, 1987 and modified in October 2000. These policies and procedures adhere to all Federal guidelines regarding acquisition and relocation assistance including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42USC 4601). For all real property acquired, DART compensates the property owner for the fair market value of their property and for damages to any remaining parcel(s). In addition, relocation benefits are provided for all businesses and residents (owner-occupants and tenants) that are displaced by acquisition.

Most of the adverse impacts identified will be mitigated using measures described in this EIS through adherence to adopted DART Board policies. In view of this and the considerable project benefits and local support for implementing the Selected LRT Alternative, the adverse impacts would not be disproportionate to the positive benefits that the project would offer low income, Hispanic and minority populations within the corridor – including increased accessibility to much needed services and employment opportunities. Public input related to the project’s benefits and impacts has been solicited throughout the study attracting many low income, Hispanic and minority community members at a number of public meetings as discussed in Section 5.16.2 and in Chapter 6.

5.17 LIST OF REQUIRED FEDERAL PERMITS

The permits and approvals shown in **Table 5-36** will be required to implement the proposed project.

TABLE 5-36
REQUIRED PERMITS AND APPROVALS

Regulatory Program or Proposed Action	Agency
Section 404 Nationwide Permit	USACOE
Texas Pollutant Discharge Elimination System (TPDES) General Permit for Storm Water Discharges Associated with Construction Activities	EPA
Development permit to perform construction activities in a flood zone	FEMA, Municipality
Storm Water Management	Municipality
Sewer Modification	Municipality
Section 4(f)	USDOT
Section 106 (Historic)	ACHP THC (SHPO)

ACHP – Advisory Council on Historic Preservation
USACOE – US Army Corps of Engineers
THC – Texas Historical Commission
SHPO – State Historic Preservation Officer
EPA – Environmental Protection Agency
FEMA – Federal Emergency Management Agency
USDOT – US Department of Transportation
TCEQ – Texas Commission on Environmental Quality

Source: S.R. Beard & Associates, Inc., 2002

5.18 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the natural, physical, and built environment would be required in order to implement the proposed project. Such uses are minimized because of the proposed use of an existing railroad right-of-way for the majority of the project. Short-term uses are also considered temporary since they are principally associated with the construction period. The tradeoff with the short-term use requirements is a long-term benefit associated with the implementation of the project. These tradeoffs are identified in the following discussion.

Short-term uses of the environment that would be required to implement the Selected LRT Alternative include the following:

- Some loss of soils during construction through erosion
- Some loss of vegetation during construction due to site clearing
- Temporary changes to visual quality due to construction activities
- Traffic disruptions during construction
- Temporary disruptions to freight rail service during construction
- Displacement of residences
- Displacement of economic activities
- Disruption of economic activities for non-displaced businesses during construction
- Temporary air quality, noise, and vibration effects during construction

Long-term productivity that would either be maintained or enhanced by the proposed project include the following:

- Alternative choice of transportation throughout the region
- Enhanced transit and traffic capacity within existing right-of-way
- Improved access to employment opportunities
- Reduced congestion at key roadway intersections
- Improved safety conditions along corridor
- Improved and alternative use of energy consumption
- Replacement of aging infrastructure

- Long-term improvements in economic conditions
- Enhanced potential for high-density, transit-oriented development

5.19 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of the Selected LRT Alternative would involve a commitment of a range of natural, physical, human, and fiscal resources. Land required for the proposed project would be considered an irreversible commitment. The majority of the land required for the project alignment is currently owned by DART and would, therefore, represent an efficient use of already committed property. Additional property requirements would be necessary at station locations and where the proposed project alignment would depart from DART-owned right-of-way.

The acquisition of property and associated displacement of residences and businesses in order to construct the proposed project and its stations would represent an irreversible commitment of real property. Owners, residents, or tenants of these properties would be afforded opportunities to relocate (as discussed in Section 5.2 Acquisitions and Displacements), but their existing properties would be converted to transit uses necessary to support the project.

Considerable amounts of fossil fuels, labor, and construction materials would be expended in the construction of the proposed project. Large amounts of labor and natural resources would also be used in the fabrication and preparation of construction materials. These materials are generally considered irretrievable. However, their availability is not limited and their use would not have an adverse impact on continued availability of these resources. The construction of the proposed project would also require substantial expenditure of local and federal funds, which once spent, would not be retrievable.

5.20 CUMULATIVE IMPACTS

Cumulative impacts are the combined effects of independent projects and the Northwest Corridor LRT Line to Farmers Branch and Carrollton on the environment. Cumulative impacts refer to those effects that "…result from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7). The anticipated cumulative impacts of the Selected LRT Alternative and all of the design options in the Medical Center and Love Field areas that were previously considered, but not selected, are anticipated to be similar. Therefore, the discussion of cumulative impacts presented below, even though referring to the Selected LRT Alternative, generally applies to all of the LRT design options.

The information presented in Chapters 3, 4, and 5 of the Final EIS provides information on the past, present, and reasonably foreseeable future anticipated actions for 2025. These projects include: 1) ongoing development of the area's transit system; 2) other planned roadway improvements; and 3) area land use plans and projects. Projects identified within the immediate vicinity of the proposed project include:

- Denton Drive/Broadway Street Widening project
- Southwest Airlines campus expansion
- Dallas Love Field improvements
- UTSW and Parkland Hospital campus expansion

5.20.1 Transportation

Several development projects planned in the corridor, such as the build-out of the Southwest Airlines headquarters near Dallas Love Field, landside and airside development at Dallas Love Field itself, UTSW and Parkland Hospital improvements in the Medical Center area, and transit-supportive land use development planned by the Cities of Farmers Branch and Carrollton will

benefit from increased transit service with a light rail system. The transit trips generated by these new development projects will contribute to the operational success of the LRT system. These impacts will be considered beneficial because they will benefit the transit system as a whole by increasing ridership.

If the Selected LRT Alternative is implemented, travel opportunities by transit would be enhanced, transit trip times would be reduced to some locations, transit mode share would be increased, and patronage would be increased. These would all be considered beneficial cumulative effects.

The recently-formed Denton County Transit Authority, responsible for transit in the area just north of the Selected LRT Alternative terminus at Frankford Road, is currently considering plans to provide rail transit service that would tie in with the proposed Frankford Station or with the planned Carrollton Square Station. If this were to occur, cumulative impacts would again be beneficial because transit access and mobility to additional portions of the region would be achieved and transit ridership would increase.

Cumulative traffic impacts associated with the Selected LRT Alternative are expected to be limited and not adverse when mitigation measures are in implemented. In general, new trips would not be generated by the transit alternatives, but would be beneficially redistributed toward transit because of the increased availability of transit improvements. In addition, the No-Build Alternative was used as the basis for the traffic forecasts for the Selected LRT Alternative. The No-Build forecast volumes were based on the NCTCOG Travel Forecasting Model, which includes projected levels of new development throughout the corridor by 2025. In this manner, all cumulative development projects are accounted for in the traffic analysis of the No-Build and Selected LRT Alternatives.

With regard to impacts on traffic during construction, several roadway improvement projects are planned in the project area as described in Section 2.3.1; however, only one is anticipated to affect or be affected by the proposed project. The widening planned along Denton Drive in Dallas and Broadway Street in Carrollton may result in cumulative impacts if that project occurs simultaneously with the construction of the LRT alignment along and adjacent to that street. The schedule for the roadway improvements has not been finalized; however, it is probable that it may occur simultaneously or just after construction of the LRT project. DART will work closely with Dallas County (the jurisdiction responsible for the road improvements) as well as with the two municipalities during final design and construction to develop and implement specific traffic control plans that will minimize impacts and will take into account the timing of both projects. As noted below in Section 5.20.2, this is a short-term impact that, upon completion, would no longer affect the community. The long-term benefits of an improved parallel street would outweigh short-term impacts that may occur.

5.20.2 Land Use and Economics

The Selected LRT Alternative has been developed in conjunction with planned public transportation and roadway improvements, and area land use plans and projects. The proposed LRT project would tend to integrate the communities in the corridor and encourage transit-oriented development and would also strongly support the area's land use plans and projects. The land uses surrounding potential LRT station locations are compatible with and would support the implementation of the proposed station development. The proposed action would not contribute to cumulative adverse local land use impacts that could result from development of the surrounding areas, but rather would benefit corridor communities by supporting more efficient land use development. Construction activities would contribute to community disruptions resulting from other development projects occurring simultaneously in the area. This may result in a longer duration of noise and dust from construction, and greater traffic delays and traffic obstructions. The combined impact may heighten the perception of disruption experienced by the local community. These impacts may be concentrated in some locations at different times during

construction but would diminish as the project concludes, and upon completion would no longer affect the community.

With regard to economic effects, the Selected LRT Alternative would have long-term benefits over the years for the communities it traverses and would further goals and policies for revitalization and investment within the study area. The fiscal benefits of operation would have a long-term impact for the communities. The loss of tax revenue would be offset by increased development near stations and along the LRT alignment. The Selected LRT Alternative would not result in a cumulative adverse impact during operation and would be economically beneficial to its surrounding communities.

As previously noted, construction activities would contribute to community disruptions resulting from other development projects in the area. This may result in temporary, short-term economic impacts on local businesses. Construction may result in overall beneficial impacts on tax revenues with increases in employment and spending that help offset any short-term economic impacts.

5.20.3 Acquisitions and Displacements

Required property acquisitions (both full and partial takings) would be relatively minor for the Selected LRT Alternative, considering its 17.8 mile length. The required takings may occur in some areas in which other related projects may also be taking property, but implementation of the LRT project would not enlarge the area of property acquisition or result in broader displacement of persons and businesses. The Selected LRT Alternative would produce a slight adverse cumulative impact in the sense that it would contribute to property acquisition.

The LRT project would contribute to the displacement of some residents and employees. It is reasonable to assume that the employees subject to relocation would be able to either relocate with the affected business or find other suitable employment in the general area. Few of the jobs to be displaced are of such a unique type that relocation would be prohibitive. This displacement would not be concentrated to threaten any one industry or economic sector. In the sense that these displacements would be additive to displacements possibly resulting from other related projects, it would contribute to an adverse cumulative impact. However, because the number of persons potentially displaced would be moderate, and it is reasonable to expect that most relocation would occur in the area, the degree of the cumulative impact would not be substantial.

5.20.4 Air Quality

The cumulative effect of the Selected LRT Alternative as well as related projects in the study area may result in modest decreases in regional emissions and have limited positive air quality impacts. However, the cumulative effect of the No-Build Alternative would also contribute to this effect since vehicle emissions of the Selected LRT Alternative and the No-Build Alternative are anticipated to be similar. The Selected LRT Alternative would not result in violations of state or federal standards for CO. For the Selected LRT Alternative, calculated CO concentrations were found to be similar to the No-Build Alternative at the one location, which is expected to be impacted the greatest by building the project. The LRT project would be supportive of the related land use plans and projects; and, to the extent that it facilitates access by transit rather than the private automobile, cumulative effects are anticipated to be beneficial.

5.20.5 Noise and Vibration

Noise levels in the corridor would be modestly increased with the Selected LRT Alternative, which would involve operating transit vehicles. The related projects would also likely increase noise, because they all result in increased travel. The Selected LRT Alternative was found to not produce significant adverse noise impacts, however, after mitigation. The level of increased noise would not be significant because it would not involve violations of FTA noise guidelines. The possible future ***Dallas Love Field Master Plan*** improvements may result in noise increases at some

locations within the DART project area. However, the Airport would adhere to FAA noise guidelines for airport noise and mitigation for significant adverse effects. There are no other known LRT project locations at which related projects may produce substantial noise increases.

5.20.6 Visual and Aesthetic Resources

The elevated portions of the Selected LRT Alternative would contribute to the number of above ground structures in the project area. That would result in limited adverse impacts since most of the project is located within an industrial/commercial setting. However, a few areas with sensitive land uses, including residential neighborhoods, will experience an adverse impact. DART will work closely with nearby residents and other property owners during final design to develop strategies to ensure that the structures will be designed to integrate, as appropriate, into the surrounding environment. There are no other known LRT project locations at which related projects would substantially contribute to the number of above ground structures.

5.20.7 Ecosystems

With regard to wetlands or other waters of the U.S., potential impacts of the Selected LRT Alternative would be restricted to bridge supports and would be minimal. Construction activities are not expected to result in significant cumulative impacts because they will be conducted in accordance with all applicable laws, statutes, and regulation. No endangered species habitats would be affected by the proposed project. The USFWS has indicated a “may affect” designation for the interior least tern, although no preferred habitat is found within the project corridor for this opportunistic species that is capable of surviving in disturbed urban environments. Coordination with the USFWS during final design and construction will result in development and implementation of preventative/mitigative measures in accordance with applicable laws and regulations to lessen the effect on this species to a level that is discountable or insignificant. In summary, no cumulative impact on ecosystems would occur.

5.20.8 Geology

The Selected LRT Alternative impact on geology and soils would occur at various locations and areas in the project corridor. However, none of the potential impacts would produce additive effects on general geology and soil conditions in the Dallas metropolitan area. As a result, it is concluded that no cumulative impacts would occur for this category.

5.20.9 Hydrology/Water Quality

The Selected LRT Alternative could produce increased runoff, which could result in additional sedimentation entering surface water resources downstream of the project. The magnitude of expected adverse effects would be small because the area is largely urbanized and also because appropriate design provisions will be incorporated, including adequate drainage facilities to handle runoff. LRT related runoff would be added to existing or potential runoff from other related projects.

The LRT route crosses floodplains only in a few places. The project would not result in the displacement or modification of floodplains to the extent that properties not currently in a floodplain would be impacted. Therefore, the cumulative impacts are anticipated to be small and localized. The project will follow all Federal, state, and local regulations with regard to construction within the floodplain to further minimize potential impacts.

5.20.10 Hazardous/Regulated Materials

The Selected LRT Alternative has the potential to affect or be affected by hazardous waste sites, both known and unknown. The related projects would also have this same potential. No adverse impacts will occur with proper mitigation in accordance with applicable hazardous waste laws, statutes, and regulations. Hazardous materials that may be encountered during construction of the

Selected LRT Alternative will be removed or treated in place, thus reducing the potential for cumulative impacts.

5.20.11 Safety and Security

The number of vehicular accidents may increase in the corridor due to the increased number of vehicles traveling to station locations due to and background growth. The potential cumulative effect of increased vehicle trips in the Corridor may be counterbalanced by a slight mode shift away from autos toward public transportation. This latter effect could be argued to reduce cumulative accident potential, rather than add to it. The addition of new LRT stations may add to the number of locations in the corridor where crimes could occur. However, the additional activity concentrated around the stations may actually reduce crime. In any case, with proper surveillance, the possible number of increased crimes occurring at such locations is expected to be small. Even with planned development in the corridor, the magnitude of additional criminal activities is not expected to be significant on a cumulative basis. The LRT Alternative could cause a slight increase in demand for additional fire or police personnel. This increase, if it occurs, would be characterized as a cumulative impact, although the magnitude is not considered significant. Given that construction of the Selected LRT Alternative would happen over a period of years and in different phases, impacts on fire and police services from this project and in conjunction with other development projects in the area may result in short-term cumulative impacts that would be less than significant due to advanced notices on traffic detours and closures.

5.20.12 Historic and Archaeological Resources

All project-related impacts on historic and archaeological resources will be mitigated through application of NEPA and Section 106 of the National Historic Preservation Act regulations. All other projects will evaluate their potential impact to historic and archeological resources separately, particularly those projects using federal funds, which require the application of NEPA and Section 106 of the National Historic Preservation Act regulations. One area where project sponsors have coordinated is near Letot School. The Dallas County Denton Drive widening project would have previously impacted the rock wall surrounding this historic resource. However, DART has designed the project such that excess DART right-of-way can be used to re-align the Denton Drive/Lombardy Lane intersection and avoid any direct impacts to the school's rock wall. The Selected LRT Alternative will not cause a cumulative impact on cultural resources.

5.20.13 Public Parks and Recreation Areas

The Selected LRT Alternative has no direct or constructive use impacts on public parks and recreation areas within the study area. Therefore, the Selected LRT Alternative will not cause any cumulative impact on these resources.

Chapter six

Public and Agency Involvement

6.0 PUBLIC AND AGENCY INVOLVEMENT

This chapter documents the dialogue between DART and interested citizens and agencies regarding issues raised by the design and construction of the proposed project. This chapter also documents the comments received on the Draft EIS and during the July 2002 and April 2003 public hearings on the project. These comments and their responses are contained in Section 6.4.

6.1 PUBLIC INVOLVEMENT PLAN

Public and agency outreach is guided by a Public and Agency Involvement Program, which was developed specifically for the proposed project. The purpose of the Public and Agency Involvement Program is to support the DART decision-making process over the course of project development. The following goals are consistent with existing practices of the DART Community Affairs Department, as well as with those strategies recommended by the Federal Transit Administration in the publication "Public Involvement Techniques for Transportation Decision-Making" (September 1996). Based on identified issues and public input from the MIS process, the goals for this Public Involvement Program are as follows:

- articulating the mission statement, goals, and objectives of the public and agency outreach activities;
- identifying the target audiences of the study;
- establishing a framework for the structure of and schedule for program activities;
- using specific methods or activities that reach target audiences while achieving desired results;
- describing how public and agency issues and concerns will be documented and addressed;
- developing evaluation and monitoring techniques to measure program effectiveness; and
- identifying methods to maintain public support through subsequent stages of project development.

Implementing the Public and Agency involvement Program has taken the form of meetings with the DART Board, City Councils, Regional Agencies, a Staff Work Group (SWG), and a Community Work Group (CWG), comprised of different neighborhood areas and property owner interests along the alignment. Outreach has also involved publishing several newsletters that are both distributed to interested stakeholders, and posted electronically on DART's website at **http://www.dart.org/mis.asp**.

The DART website also provides the community access to project information through the World Wide Web. It takes advantage of Internet capabilities to provide facts about the project, updates of project progress and activities (online Newsletter), and notice of public meetings. The web site posted the Draft EIS in order to provide another method of review for interested persons. In addition to the web page, DART maintains a customer information telephone line to provide a means for interested persons in the community to contact DART and receive information about the project. DART also keeps a directory of both SWG and CWG participants in order to keep interested participants updated with the project's progress.

6.1.1 Summary of Public and Agency Participation

The most important outreach efforts related to the proposed project were focused on engaging the participation of the general public, including both individuals and groups with an interest in the progress and outcome of the PE/EIS phase of the project. These efforts were planned by project phases. For the purposes of the Draft EIS, the Public and Agency Involvement effort concentrated on project start-up and scoping, as well as alignment and station area definition and refinement, impact assessment and development of mitigation options. This Final EIS defines the selected LRT alignment and refines the impacts and mitigation commitments.

Scoping meetings were conducted with project stakeholders and the general public in December 2000. Scoping is a study process designed to inform the public, interest groups, and involved agencies about the proposed project, and to present the proposed actions, alternatives, and issues for public and agency review. The main goal of the process is to encourage the active participation of the public, groups, and agencies early in the decision-making process. It provides the public the opportunity to communicate issues and concerns to the project team and to help develop alternatives before considerable time and effort have been put into the process.

During the scoping and planning of the proposed project, DART actively engaged agencies and interested parties along the alignment in a proactive and iterative public involvement process. **Table 6-1** documents the meetings DART staff convened in order to solicit questions and comments as the project was being planned. In addition to being especially informative to the design option alternatives that were developed in response to comments, this process was consistent with DART's commitment to its Public and Agency Involvement Plan.

A Staff Work Group (SWG) was developed to assist in the effective communication between DART and agency representatives at the federal, state, and local level. SWG members include representatives of DART, FTA, FAA, Texas Department of Transportation, and the Cities of Dallas, Farmers Branch, and Carrollton. Six rounds of SWG meetings have been conducted during the development of the preliminary engineering and the Draft EIS. An additional SWG meeting was conducted following the public review period for the Draft EIS prior to finalization of the document.

In addition to the SWG, a Community Work Group was formed. CWG members were self-nominated at the project's initial scoping meetings in December 2000, and include active members of community organizations, business representatives, residential neighborhoods, and other stakeholder groups. The original concept identified in the Public and Agency Involvement Program was to form five separate work groups, based upon geographic proximity to the proposed study area. After the first round of CWG meetings, in January 2001, the participants determined that a single CWG meeting would be most appropriate. All participants were interested in the overall aspects of the project, rather than a narrower geographic view. Five rounds of meetings have been conducted with the CWG. Members of the CWG will continue to stay informed during the next phase of project development, final design.

In addition to the CWG and SWG meetings, DART has conducted five rounds of public meetings to review progress. Each round of public meetings has included two meetings, one in the northern portion of the study area and one in the southern portion. (The initial round of scoping meetings in December 2000 included three separate meetings.) These meetings have taken place in the early evening hours and on different evenings, in order to provide options to the public. As shown in **Table 6-1**, DART held three Draft EIS public hearings to take verbal comments on the proposed project and the proposed DART Service Plan amendments. Project changes subsequent to the Draft EIS resulted in an additional public meeting on April 3, 2002 and public hearing on April 10, 2003.

TABLE 6-1
SUMMARY OF PUBLIC AND AGENCY PARTICIPATION
PRELIMINARY ENGINEERING/ ENVIRONMENTAL IMPACT STATEMENT (PE/EIS) PHASE

MEETING	Date	LOCATION
Public Meetings/Hearings		
December 2000 Scoping Meetings	December 5, 2000 December 7, 2000 December 8, 2000	Bachman Recreation Center, Dallas Farmers Branch Elementary School DART
March 2001 Public Meetings	March 28, 2001 March 29, 2001	Bachman Recreation Center, Dallas Farmers Branch Recreation Center
Frankford Station Service Plan Amendment Pre-Public Hearing	August 13, 2001	Josey/Hebron Branch Library
Frankford Station Service Plan Amendment Public Hearing	August 23, 2001	Frankford Village Branch Library
Medical Center Alternatives Public Meeting	August 27, 2001	Edison Maple Lawn Academy
September 2001 Public Meetings	September 13, 2001 September 20, 2001	Bachman Recreation Center Farmers Branch Recreation Center
December 2001 Public Meetings	December 3, 2001 December 4, 2001	Farmers Branch Recreation Center Bachman Recreation Center
April 2002 Public Meetings	April 16, 2002 April 18, 2002	Farmers Branch Recreation Center Bachman Recreation Center
Northwest Rail Operating Facility Public Hearing	April 29, 2002	Bachman Recreation Center
Draft EIS Public Hearings	July 11, 2002 July 15, 2002 July 16, 2002	Bachman Recreation Center Farmers Branch Library Carrollton Frankford Branch Library
Community Meeting (in Spanish)	August 22, 2002	Saldivar Elementary School, Dallas
Medical Center Area Project Changes – Public Meeting	April 3, 2003	Medrano Elementary School, Dallas
Medical Center Area Project Changes – Public Hearing	April 10, 2003	Medrano Elementary School, Dallas
Community Work Group (CWG) Meetings		
CWG Meeting #1a Dallas Groups	January 30, 2001	Bachman Recreation Center, Dallas
CWG Meeting #1b Farmers Branch/Carrollton	February 1, 2001	Farmers Branch Recreation Center
CWG Meeting #2 Joint Meeting	April 26, 2001	Bachman Recreation Center, Dallas
CWG Meeting #3	September 6, 2001	Farmers Branch Recreation Center
CWG Meeting #4	November 26, 2001	Grawyler Recreation Center
CWG Meeting #5	April 2, 2002	Bachman Recreation Center, Dallas
Staff Work Group (SWG) Meetings		
SWG Meeting #1	November 8, 2000	DART
SWG Meeting #2	February 15, 2001	DART
SWG Meeting #3	May 10, 2001	DART
SWG Meeting #4	September 6, 2001	DART
SWG Meeting #5	November 20, 2001	DART
SWG Meeting #6	April 4, 2002	DART
SWG Meeting #7	July 25, 2002	DART
DART Board		
DART Planning Committee	November 28, 2000	DART
DART Planning Committee	January 23, 2001	DART
DART Planning Committee	February 13, 2001	DART
DART Board Chairman Briefing – Love Field	February 27, 2001	DART
DART Planning Committee	March 27, 2001	DART
DART Planning Committee	April 24, 2001	DART
DART Planning Committee	May 22, 2001	DART
DART Planning Committee	July 2, 2001	DART
DART COTW / Board	September 25, 2001	DART – Medical Center
DART Planning Committee	October 30, 2001	DART
DART Planning Committee	November 27, 2001	DART
DART Planning Committee	December 11, 2001	DART
DART Planning Committee	January, 22, 2002	DART
DART COTW/Board	February 5, 2002	DART
DART Planning Committee	February 19, 2002	DART

TABLE 6-1
SUMMARY OF PUBLIC AND AGENCY PARTICIPATION
PRELIMINARY ENGINEERING/ ENVIRONMENTAL IMPACT STATEMENT (PE/EIS) PHASE

MEETING	Date	LOCATION
DART COTW/Board	March 5, 2002	DART
DART Planning Committee	March 19, 2002	DART
DART Planning Committee	April 23, 2002	DART
DART COTW/Board	May 14, 2002	DART
DART Planning Committee	May 28, 2002	DART
DART Planning Committee	June 18, 2002	DART
DART COTW/Board	July 9, 2002	DART
DART Planning Committee	July 30, 2002	DART
DART COTW/Board	August 13, 2002	DART – NWROF Service Plan Change
DART COTW/Board	August 27, 2002	DART
DART Planning Committee and COTW/Board	September 17, 2002	DART – Project Service Plan Change
DART Planning Committee and COTW/Board	October 22, 2002	DART
DART COTW/Board	November 12, 2002	DART
DART Planning Committee	November 26, 2002	DART
DART COTW/Board	December 19, 2002	DART
DART COTW/Board	January 14, 2003	DART
DART Planning Committee	January 28, 2003	DART
DART COTW/Board	February 11, 2003	DART
DART Planning Committee	February 28, 2003	DART
DART COTW/Board	March 11, 2003	DART
DART Planning Committee	March 25, 2003	DART
DART COTW	April 8, 2003	DART
DART Planning Committee	May 13, 2003	DART
DART COTW/Board	May 13, 2003	DART – Subsequent Project Changes Service Plan amendment
Community Meetings/Briefings		
Carrollton Economic Development Tour	September 21, 2000	Corridor Tour
St. Paul Medical Center Briefing	November 9, 2000	St. Paul Medical Center
Parkland Hospital Briefing	November 10, 2000	Parkland Hospital
UTSW Medical Center Briefing	November 10, 2000	UTSW Physical Plant Building
Children's Medical Center Briefing	November 10, 2000	Children's Medical Center
Southwestern Medical Foundation Briefing	November 15, 2000	Southwestern Medical Foundation
Zale Lipshy Hospital Briefing	November 16, 2000	Zale Lipshy Hospital
Exchange Park Briefing	November 16, 2000	Crown Exchange Partners
Medical Center Stakeholders Meeting	November 20, 2000	Parkland Hospital
Carrollton/Farmers Branch Rotary Club	January 18, 2001	Farmers Branch
Texas Tech Students Tour	January 19, 2001	DART/Northwest Corridor
UTSW Medical Center Meeting	January 29, 2001	UTSW
Medical Center Stakeholders Meeting	February 5, 2001	Parkland Hospital Boardroom
Market Center Briefing	February 8, 2001	Market Center
Korean Chamber/News Korea Texas Meeting	February 9, 2001	Korea House Restaurant
Stemmons Corridor Business Association Reps.	March 8, 2001	City Realty Offices
Leadership Farmers Branch Briefing	March 13, 2001	DART
Texas Scottish Rite Hospital Briefing	March 15, 2001	Texas Scottish Rite
Central Dallas Association Love Field Briefing	March 16, 2001	CDA
Market Center Meeting	March 28, 2001	Cityplace Tower
Northwest Dallas Community Briefing	March 29, 2001	City of Dallas
Sammons Arts Center Briefing	April 4, 2001	DART
Salvation Army Briefing	April 5, 2001	Salvation Army – Harry Hines Blvd.
Dan Burds/Real Estate Co. Briefing	April 5, 2001	DART
Zinc Business Owner Briefing	April 11, 2001	DART
Exchange Park Briefing	April 13, 2001	Crown Exchange Partners
Asian/Korean Chamber Community Tour	April 14, 2001	Starter System/Corridor Bus Tour
Medical Center CEO Meeting	April 16, 2001	UTSW McDermott Building
Texas Scottish Rite/Oak Lawn Project Meeting	April 19, 2001	Texas Scottish Rite Hospital
Leadership Metrocrest Briefing	April 20, 2001	DART
North Dallas Chamber Briefing	May 8, 2001	North Dallas Chamber of Commerce

TABLE 6-1
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PRELIMINARY ENGINEERING/ ENVIRONMENTAL IMPACT STATEMENT (PE/EIS) PHASE

MEETING	Date	LOCATION
SCBA Board	May 9, 2001	Marriott Suites
NW Dallas Improvement League Meeting	May 22, 2001	Royal Haven Baptist Church
Exchange Park Meeting	June 8, 2001	DART
Bachman/NW Hwy Assoc. Briefing	June 11, 2001	Marcus Recreation Center
Asian Chamber Meeting	June 14, 2001	NW Dallas Police Substation
NW Dallas AARP Briefing	June 21, 2001	Walnut Hill Methodist Church
Northwest Dallas Community Briefing	June 28, 2001	NW Dallas Police Substation
Texas Scottish Rite/Oak Lawn Meeting	July 12, 2001	Texas Scottish Rite
Parkland Hospital Meeting	July 17, 2001	Parkland
Medical Center Coordination Meeting	July 19, 2001	Southwest Medical Foundation offices
SW Airlines Meeting	August 9, 2001	DART
Dan Burds/Real Estate Co. Briefing	August 15, 2001	DART
Carrollton Town Hall Meeting	August 20, 2001	Carrollton City Hall
Love Field West HOA Briefing	August 30, 2001	Grawyler Recreation Center
Market Center Coordination Meeting	September 4, 2001	Market Center
SCBA/City Realty Briefing/Tour	September 5, 2001	City Realty
Salvation Army Briefing	September 5, 2001	Salvation Army
Zinc Business Owner Briefing	September 5, 2001	Zinc Offices
Parkland Hospital Meeting	September 6, 2001	Parkland
Arlington Park Heights Community Meeting	September 10, 2001	Arlington Park Church
Robert Lynn Company Briefing	September 12, 2001	Robert Lynn Offices
Dan Burds/Real Estate Co. Briefing	September 28, 2001	DART
Northwest Dallas Community Briefing	October 25, 2001	NW Dallas Police Substation
Southwest Airlines Coordination Meeting	October 25, 2001	SWA Headquarters
Parkland Hospital Coordination Meeting	November 20, 2001	Parkland
City Realty Briefing	January 3, 2002	DART
UTSW Medical Center Coordination Meeting	January 14, 2002	UTSW
DISD Meeting	January 31, 2002	DISD Offices
Argent Property Company	February 6, 2002	Argent Offices
Northwest Dallas Community Briefing	February 28, 2002	NW Dallas Police Substation
Willow Wood Apartments Manager Briefing	March 12, 2002	Willow Wood Apartments
Sammons Center for the Arts Briefing	March 20, 2002	DART
Northwest Dallas Apartment Managers Meeting	March 21, 2002	NW Dallas Police Substation
OK Paper Co. Briefing	March 21, 2002	OK Paper
Salvation Army Briefing	March 28, 2002	Salvation Army
City Realty Meeting	April 9, 2002	DART
Medical Center Representatives Meeting	April 11, 2002	UTSW McDermott Building
Leadership Metrocrest Presentation	April 12, 2002	DART
DGNO Freight Railroad Coordination Meeting	May 3, 2002	DART
Neighborhood Tour of Rail Operating Facility	May 11, 2002	Central Rail Operations/NWROF Sites
NWROF Property Owner Briefing (EMF/R&L)	May 13, 2002	NWROF Site 3
Parkland Coordination Meeting	June 6, 2002	DART
Parkland Coordination Meeting	June 19, 2002	DART
American Red Cross Briefing	June 20, 2002	American Red Cross
Walnut Hill Crime Watch Briefing	June 27, 2002	Walnut Hill Library
American Red Cross Coordination Meeting	July 8, 2002	American Red Cross
Parkland Coordination Meeting	July 8, 2002	Parkland
Northwest Dallas Community Briefing	July 11, 2002	NW Dallas Police Substation
Parkland Coordination Meeting	July 30, 2002	DART
Architectural Carpentry Materials Meeting	July 31, 2002	ACM Offices
Neighborhood Coordination/Meeting Preparation	August 20, 2002	J. Cabrera office
Southwest Airlines Coordination Meeting	August 20, 2002	Union Station
North Dallas Chamber of Commerce Briefing	September 10, 2002	NDCC Offices
Parkland Coordination Meeting	September 26, 2002	Parkland
Parkland Coordination Meeting	October 10, 2002	Parkland
Parkland Coordination Meeting	October 16, 2002	Parkland
Northwest Dallas Community Briefing	October 31, 2002	NW Dallas Police Substation

TABLE 6-1
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MEETING	Date	LOCATION
Parkland Coordination Meeting	November 22, 2002	Parkland
Parkland Coordination Meeting	November 7, 2002	Parkland
Parkland Coordination Meeting	December 20, 2002	Parkland
Dallas Market Center	January 9, 2003	Trade Mart
American Red Cross	January 23, 2003	American Red Cross
Parkland Coordination	January 31, 2003	Parkland
Parkland Coordination	February 7, 2003	Parkland
NW Dallas Planning Group	February 27, 2003	Bachman Police Substation
Maple Avenue Apartments Meeting	March 4, 2003	DART
Parkland Coordination	March 27, 2003	DART
Parkland Coordination	March 31, 2003	DART
Southwestern Gage Meeting	April 7, 2003	Southwestern Gage
Agency/City Coordination Meetings		
City of Dallas – Kick-off Coordination	June 22 or 30, 2000	City of Dallas
City of Carrollton – Kick-off Coordination	June 23, 2000	City of Carrollton
City of Dallas – SE/NW Station Areas	July 12, 2000	City of Dallas
City of Dallas - Data Collection Meeting	September 20, 2000	City of Dallas
City of Dallas Public Involvement Coordination	October 23, 2000	DART
FTA Coordination Meeting	November 7, 2000	
City of Dallas/Love Field Coordination	November 10, 2000	Love Field
City of Carrollton Coordination	November 21, 2000	City of Carrollton
City of Dallas/Love Field Coordination	November 30, 2000	Love Field
Interagency Scoping Meeting	December 6, 2000	DART
FTA Conference Call – New Starts	December 12, 2000	DART
City of Dallas – Planning Director Briefing	December 14, 2000	City of Dallas
City of Dallas/Love Field Coordination	December 19, 2000	Love Field
City of Dallas – Station Area Planning	December 27, 2000	DART
City of Dallas Coordination	January 2, 2001	DART
City of Carrollton Coordination	January 4, 2001	City of Carrollton
Love Field Master Plan Advisory Committee	January 11, 2001	Love Field
City of Carrollton Coordination	January 23, 2001	DART
Love Field Master Plan Advisory Committee	January 25, 2001	Love Field
City of Farmers Branch Coordination	January 30, 2001	DART
Love Field Master Plan Advisory Committee	February 7, 2001	Love Field
Dallas County – Denton Road Coordination	February 14, 2001	Dallas County
City of Carrollton Coordination	February 20, 2001	City of Carrollton
Love Field Master Plan Advisory Committee	February 28, 2001	Love Field – SW Airlines Headquarters
TxDOT Coordination Meeting	March 14, 2001	TxDOT Dallas District
City of Carrollton Coordination	March 20, 2001	City of Carrollton
City of Dallas Station Area Planning	March 21, 2001	DART
City of Dallas Coordination	March 23, 2001	City of Dallas
Dallas Mayor Kirk Briefing – Love Field	March 26, 2001	City of Dallas
Farmers Branch Station Area Planning	April 3, 2001	City of Farmers Branch
City of Carrollton Coordination	April 3, 2001	City of Carrollton
Love Field Staff/FAA Coordination Meeting	April 5, 2001	Love Field
Farmers Branch Coordination Meeting	April 12, 2001	City of Farmers Branch
Farmers Branch Station Area Public Meeting	April 17, 2001	City of Farmers Branch
North Texas Tollway Authority Meeting	May 3, 2001	DART
Commissioner Jackson Briefing	May 14, 2001	Commissioner's Office
Dallas County Coordination	May 30, 2001	Dallas County
FTA/FRA Shared Corridor Meeting/Tour	June 5, 2001	Union Station
Farmers Branch Coordination Meeting	June 20, 2001	Farmers Branch City Hall
Farmers Branch Coordination Meeting	July 12, 2001	Farmers Branch City Hall
Farmers Branch City Council Briefing	July 16, 2001	Farmers Branch City Hall
Carrollton Coordination Meeting	August 8, 2001	City of Carrollton
City of Dallas/NTTA Meeting	August 30, 2001	DART

TABLE 6-1
SUMMARY OF PUBLIC AND AGENCY PARTICIPATION
PRELIMINARY ENGINEERING/ ENVIRONMENTAL IMPACT STATEMENT (PE/EIS) PHASE

MEETING	Date	LOCATION
City of Dallas Station Planning Meeting	September 4, 2001	DART
City of Dallas Coordination Meeting	September 27, 2001	City of Dallas
City Managers Briefing – Love Field	October 2, 2001	City of Dallas
City of Carrollton Coordination Meeting	October 2, 2001	City of Carrollton
Dallas County – Denton Drive Coordination	October 3, 2001	Dallas County Offices
City of Dallas Trans. & Telec. Committee	October 8, 2001	City of Dallas
City of Dallas Coordination Meeting	November 5, 2001	City of Dallas
City of Dallas Plan Review Meeting	November 8, 2001	City of Dallas
City of Carrollton Plan Review Meeting	November 9, 2001	City of Carrolton
Dallas Council Transportation and Telecommunications Committee	November 12, 2001	City of Dallas
Love Field Master Plan Follow-Up Meeting	November 13, 2001	Love Field Airport
Carrollton Council Meeting	November 13, 2001	City of Carrollton
City of Dallas Planning Coordination Meeting	November 15, 2001	City of Dallas
FTA Tour	November 27, 2001	Corridor
Councilman Loza Briefing	January 9, 2002	City of Dallas
FAA/FTA Conference Call	January 23, 2002	DART
Dallas Council Transportation and Telecommunications Committee	February 4, 2002	City of Dallas
FAA/Love Field Conference Call	February 12, 2002	DART
City of Farmers Branch Coordination Meeting	February 20, 2002	City of Farmers Branch
City of Dallas Coordination Meeting	February 21, 2002	City of Dallas
City of Carrollton Coordination Meeting	February 22, 2002	City of Carrollton
Dallas County Coordination Meeting	February 25, 2002	Dallas County Offices
Dallas Council Transportation and Telecommunications Committee	February 25, 2002	City of Dallas
FTA Corridor Tour	March 6, 2002	Corridor
Farmers Branch Station Planning Public Meeting	March 7, 2002	City of Farmers Branch
City/NTTA Oak Lawn Coordination Meeting	March 13, 2002	DART
Dallas Water Utilities Coordination Meeting	March 15, 2002	DART
Congressman Sessions Briefing	March 26, 2002	DART
Dallas Aviation/Love Field Coordination Meeting	March 28, 2002	NW Project Office
Texas Historical Commission Staff	April 5, 2002	Corridor
City of Dallas Coordination Meeting	April 17, 2002	City of Dallas
Carrollton Station Area Planning Public Meeting	April 25, 2002	City of Carrollton
City of Dallas Coordination Meeting	May 6, 2002	City of Dallas
Dallas City Council Member Oakley Briefing	May 10, 2002	City of Dallas
Farmers Branch Meeting	May 13, 2002	City of Farmers Branch
City of Dallas Coordination Meeting	May 13, 2002	City of Dallas
City of Dallas Coordination Meeting	June 3, 2002	City of Dallas
City of Dallas Coordination Meeting	June 14, 2002	City of Dallas
US Representative Terri Hodge Briefing	June 25, 2002	Hodge Office
US Representative Terri Hodge Briefing	July 18, 2002	Hodge Office
State Historic Preservation Office Coordination Mtg.	July 24, 2002	DART
City of Dallas Coordination Meeting	August 6, 2002	City of Dallas
City of Dallas Coordination Meeting	August 9, 2002	City of Dallas
Dallas County Coordination Meeting	August 12, 2002	Dallas County
City of Carrollton Meeting	August 13, 2002	City of Carrollton
DART Love Field Review Team Meeting #1	September 3, 2002	DART
NTTA Coordination Meeting	September 5, 2002	DART
City of Dallas Coordination Meeting	September 6, 2002	DART
City and County of Dallas Coordination Meeting	September 9, 2002	City Oak Cliff Municipal Center
DART Love Field Review Team Meeting #2	September 10, 2002	DART
Farmers Branch Coordination Meeting	September 11, 2002	City of Farmers Branch
DART Love Field Review Team Meeting #3	September 17, 2002	DART
NTTA Coordination Meeting	September 26, 2002	DART
City of Dallas Coordination Meeting	September 30, 2002	City of Dallas

TABLE 6-1
SUMMARY OF PUBLIC AND AGENCY PARTICIPATION
PRELIMINARY ENGINEERING/ ENVIRONMENTAL IMPACT STATEMENT (PE/EIS) PHASE

MEETING	Date	LOCATION
Carrollton Historic Preservation Advisory Comm.	October 2, 2002	City of Carrollton
City and County of Dallas Coordination Meeting	October 3, 2002	DART
City of Dallas Coordination Meeting	October 7, 2002	City of Dallas
DART Love Field Review Team Meeting #4	October 18, 2002	DART
City of Dallas Coordination Meeting	October 21, 2002	City of Dallas
City of Dallas CTTC Meeting	October 28, 2002	City of Dallas
City of Dallas CTTC Meeting	November 11, 2002	City of Dallas
City of Dallas Council Briefing	November 20, 2002	City of Dallas
City of Dallas CTTC Meeting	December 9, 2002	City of Dallas
Carrollton Historic Preservation Advisory committee	February 5, 2003	City of Carrollton
Dallas CTTC	February 6, 2003	City of Dallas
City of Dallas, TxDOT, Parkland Coordination	April 16, 2003	DART

Source: DART; June 2003

6.2 AGENCY COORDINATION

In addition to the public and agency involvement meetings, DART staff conferred with municipal agencies from Dallas, Carrollton and Farmers Branch as well as with other regional agencies in order to ensure concurrence on potential environmental impacts, and to coordinate mitigation efforts with other guidance and current planning provisions. Other coordination has been conducted with:

- Federal Transit Administration (FTA)
- Federal Aviation Administration (FAA)
- Federal Railroad Administration (FRA)
- North Central Texas Council of Governments (NCTCOG)
- Texas Department of Transportation (TxDOT)
- North Texas Tollway Authority (NTTA)
- U.S. Army Corps of Engineers (USACOE)
- U.S. Fish and Wildlife Service (USFWS)
- Environmental Protection Agency (EPA)
- Texas Parks and Wildlife
- Texas Commission on Environmental Quality (TCEQ)
- State Historic Preservation Office (SHPO)
- Dallas County

Copies of the Agency Coordination letters are reproduced in Appendix D of this document. The majority of coordination with resource agencies occurred during scoping and will increase as final design is initiated. All agencies have had the opportunity to review the Draft EIS.

6.3 PUBLIC AND AGENCY INVOLVEMENT AND THE DRAFT EIS

The Draft EIS acts as a public disclosure document, in accordance with applicable state and federal regulations, by presenting the anticipated environmental consequences of the Build and No-Build Alternatives with their reasonable and feasible mitigation measures. Once the Draft EIS was approved for public circulation by the FTA, copies of the document were made available to members of the community and organizations, as well as appropriate local, state and federal agencies for their review and comment during a 45-day review period (June 14 through July 30, 2002). Its availability for comment was officially advertised in the Federal Register as well as through the local press (*Dallas Morning News*, the Spanish-language newspaper *El Extra,* and the *Korea News*). Consistent with FTA guidance, formal public hearings were held within the project corridor as described above in Section 6.1.1 in order to give interested parties the opportunity to

formally submit comments on the Draft EIS. The hearings included a technical presentation followed by time for oral testimony. Written comments were accepted at the hearings, or were mailed back to DART. Additional or subsequent written comments, including e-mail, were received at DART headquarters.

Subsequent Refinements to the Project

During preparation of this Final EIS, Parkland Hospital and DART continued coordination on the Option D alignment and station in conjunction with more detailed planning and facility concepts for the Parkland Master Plan. Due to cost and design issues, DART re-examined the DART-owned UP RR through the Medical Center area. Section 2.3 describes the project changes and issues in this area. In addition to the issues and changed conditions in the vicinity of Parkland Hospital, DART made refinements to the Inwood and Market/Center Oak Lawn Stations (see Section 2.2.2 for station refinements).

Prior to seeking DART Board approval of using the UPRR right-of-way rather than Option D through the Medical Center area, DART held an informational public meeting on April 3, 2003 and a formal public hearing on April 10, 2003 to take comments on the proposed alignment and station refinements. A summary of the changes was available at the meetings. Brochures with comment cards to send to DART were sent to all DEIS recipients as well as those that commented on the DEIS. Verbal and written comments received on the changes by April 12, 2003 are included in Section 6.4 with responses to each comment. The DART Board approved the changes on May 13, 2003. These changes are reflected in this Final EIS as the Selected LRT Alternative.

6.4 ORGANIZATION OF THE COMMENTS AND RESPONSES RECEIVED

During the Draft EIS comment period, more than 125 written or verbal comments were received. An additional 34 comments were received in April, 2003, in response to the Medical Center area adjustment change. All correspondence, including transcripts from the public meetings, was reviewed. Substantive comments have been recorded and classified by subject area. Comments subsequent to the Draft EIS public comment period on project changes in the Medical Center area are also included. All comments have been reviewed, have received complete responses, and are documented here.

The majority of comments as they appear here are verbatim from the commenter as received in written or verbal comments. While some comments have been paraphrased for brevity, every effort has been made to accurately represent the comments. Each comment has been assigned a number to identify the commenter and comments (s). this numbering system is described in Section 6.4.2. Copies of the original written comments and transcripts of the public hearings are available for review at DART headquarters.

6.4.1 Summary of Comments

The comments on the Draft EIS generally fell into 12 subject areas. Many of these subject areas addressed the outstanding issues noted in the Draft EIS and resolved in this Final EIS, such as the Medical Center and Love Field alignments, and the Northwest Rail Operating Facility site.

The summary of comments and responses (see **Tables 6-2 and 6-3**) includes a column that identifies the subject area addressed by the comment. Some comments address more than one subject area. A total of 359 distinct comments were provided by 162 commenters. A summary of the subject areas, the number of persons or agencies addressing each subject, and the abbreviation for each as noted in the tables is as follows:

- Medical Center Design Options (MC) – 93 comments
- Transportation (T) – 63 comments (transportation comments include issues related to transit ridership, bus access, travel demand, traffic, street improvements, freight access, bicycle/pedestrian issues, and parking)
- General (G) – 52 comments (general comments include those stating support for project, suggesting routes for future expansion, etc.)
- Love Field Design Option (LF) – 38 comments
- Rail Operating Facility Site Options (ROF) – 26 comments
- Real Estate Acquisition and Displacements (AD) – 21 comments
- Miscellaneous (M) – 15 comments (miscellaneous comments generally refer to typographical, grammatical or document organization issues, as well as comments not directly related to the project)
- Noise and Vibration (NV) – 14 comments
- Parklands and Historic Resources (HP) – 13 comments
- Visual and Aesthetic Issues (V) – 10 comments
- Natural Environment (NE) – 7 comments (environmental comments related to ecosystems, water quality, floodplains, and air quality)
- Safety and Security (S) – 7 comments

6.4.2 List of Comments and Responses

Tables 6-2 and **6-3** list all comments received by DART on the proposed project, and the responses to them. **Table 6-2** lists the written comments received from public agencies and officials during the Draft EIS comment period and subsequent public hearing and comment period in April 2003. Each commenter is identified by name, title (if applicable), and affiliation, and assigned a number (1, 2, 3). Where there are multiple comments, each comment is given a letter (1A, 1B, 1C). A response is provided for each comment. A reference to the relevant section of the Final EIS is noted where appropriate.

Table 6-3 lists all public comments received in writing or verbally at the public hearings. As with the agency comments, each commenter is identified by name, title or affiliation (if applicable), and city. Each commenter is identified by a number (1, 2, 3), and if there are multiple comments, each comment is given a letter (1A, 1B, 1C). To differentiate these comments from those received from agencies, written comments are identified by a “W” preceding the number of each commenter, and are listed first in the table. Verbal comments provided at each of the public hearings follow and are identified by “PH” preceding the number of each commenter. A response is provided for each comment. A reference to the relevant section of the Final EIS is noted where appropriate.

TABLE 6-2
AGENCY AND ELECTED OFFCIAL COMMENTS AND RESPONSES ON DRAFT EIS AND SUBSEQUENT PROJECT CHANGES

Subject*	Commenter	No.	Comment	Response
NE	Ray C. Telfair, II, Ph.D. Wildlife Division, Texas Parks & Wildlife	1A	Locally adapted native plants should be used for revegetation, similar to recommendations for TxDOT projects in the Dallas district.	Comment noted. Revegetation plans during final design will follow established DART construction and landscaping standards.
NE		1B	Allowance should be made for water flow in the 100-year floodplain by installing an adequate number of culverts under the rail structure.	Comment noted. Final design will meet FEMA and local floodplain standards for construction in the floodplain.
NE		1C	TPWD recommends that the entire list of rare and Threatened & Endangered species for Dallas County be reviewed for occurrence in and near the project area, and that precautions be taken to avoid adverse impacts to them.	The lists were reviewed and updated in Section 3.9.4 and Table 3-25 of the Final EIS. Mitigation measures are addressed in Section 5.7.4.
NE		1D	The colonial waterbird rookery at the UT-Southwestern Medical Center is especially important. Precautions should be taken to avoid adverse disturbance above the current vehicle and pedestrian use in the area.	The selected alignment in the Medical Center follows the existing DART-owned UP RR, which more than ½ mile from the rookery (see Sections 3.9.2 and 5.7.3).
MC	Dallas City Councilmember Ed Oakley, District 6	2A	The best alignment for long-term ridership, neighborhoods, and economic viability is the original base alignment down Harry Hines with a station north of Motor Street at Parkland Hospital, and a second station between St. Paul Hospital and UT Southwestern Medical Center south of Mockingbird.	DART has taken into consideration all the issues in an effort to balance the interests in the Medical Center corridor. After considering the comments and issues, the DART Board approved a resolution on September 17, 2002 approving Medical Center Design Option D, which was developed during the Draft EIS comment period. Subsequent coordination with Parkland Hospital uncovered significant cost and design issues with Option D, which led to the re-examination of DART-owned UP RR for the alignment. On May 13, 2003, the DART Board approved the UP RR alignment through the Medical Center district. This decision was made after holding a public meeting, a public hearing, and assessing changed conditions in the area. (Note: Mr. Oakley addressed the DART Board of Directors on September 17, 2002 to indicate his support of Option D as an appropriate alignment through the medical center area. He also voted to support use of the Option D, the Harry Hines Base, or the UP RR alignment as part of a subsequent Dallas City Council resolution on February 12, 2003). Section 2.2 of the EIS describes the selected alignment.
HP	F. Lawerence Oaks, State Historic Preservation Officer (SHPO)	3A	We are unable to concur with the determination of effect on architectural historical properties, as final agreement on the National Register-eligibility has not yet been reached and the level of design detail in the draft EIS is relatively vague. Since some aspects of the project have the potential to cause an adverse effect, and the design of new features in historic districts and adjacent to individually eligible properties needs to be reviewed regarding compatibility, we recommend that an agreement document be developed to address potential effects and a schedule for review of proposed work.	Comment noted. The DEIS was published before the Determination of Effects was complete. This issue was addressed in a meeting with the SHPO on July 24, 2002. The Determination of Eligibility and subsequent supplemental reports have now been completed and the Texas Historical Commission (SHPO) has concurred with the findings in letters dated July 15, 2002, August 21, 2002 and ---, 2003. The Request for Determination of Effects Report was sent by DART to the SHPO on August 26, 2002; SHPO concurred with the Effects Report on September 26, 2002. Supplemental information on project changes in the Medical Center area was sent to SHPO on April 4, 2003. The Final EIS reflects the findings of the SHPO relative to eligibility and effects. A Memorandum of Agreement (MOA) has been executed between FTA and SHPO outlining the mitigation measures and review schedule for the project during final design based on SHPO comments (see Appendix H).
HP		3B	Carrollton Crossing Depot: The depot retains its Natl. Register listing eligibility on its existing site, and could be adversely affected in moving it from its existing location or by construction	Comment noted. The FEIS includes the determination of Adverse Effect for the depot and outlines the mitigation measures to reduce or eliminate the adverse effect. These measures are included in the MOA. See also

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			of a raised track and station near, or above, the building.	response to Comment 3A.
HP		3C	T. J. Rusk Middle School (Medical Center Design Options): A raised Inwood Station (51 ft.) and track section would have the potential to adversely affect the T. J. Rusk Middle School.	Comment noted. The FEIS includes the determination of No Adverse Effect for the school and outlines the mitigation measures to support the finding of no adverse effect. These measures are included in the MOA. In addition, the relocation of the Inwood Station to south of Inwood Rood increases the distance from the resource and minimizes the potential for adverse effects. See also response to Comment 3A.
HP		3D	Peerless Manufacturing Plant: The raised Walnut Hill/Denton Station may have the potential to adversely affect the Peerless Manufacturing Plant, which may be eligible for listing in the National Register.	The Texas Historical Commission determined the Peerless Manufacturing Plant NOT ELIGIBLE for the National Register of Historic Places on August 21, 2002.
HP		3E	Letot School: Option 3 for the proposed Rail Operating Facility is adjacent to this school, which may be eligible for listing in the National Register. We recommend that the EIS address potential affects on this historic property.	The DART Board approved a resolution approving Site 3 (Lombardy / Denton) for the Rail Operating Facility on August 13, 2002. The FEIS includes the determination of No Adverse Effect for the school and outlines the mitigation measures to support the finding of No Adverse Effect. These measures are included in the MOA (Appendix H). See also response to Comment 3A.
HP		3F	General organization of cultural resource information in the Draft EIS. Cultural Resource information should be included in Cultural Resource sections of the document for clarity.	Comment noted. Chapter 3 of the EIS has a single Cultural Resource and Parklands Section, with subsections on Cultural Resources, Archeological Resources, and Parklands. Chapter 5 of the EIS has separate sections for Cultural Resources, Archeological Resources, and Section 4 (f) Evaluation. The Final EIS has been updated to clarify issues related to Cultural Resources. The issue of EIS organization was addressed during the July 24, 2002 meeting between DART and SHPO. The Determination of Effects report was organized per SHPO's comments; no changes have been made to the Final EIS.
HP		3G	Other sections of the document include aerial photos with superimposed project information. The maps indicating the locations of cultural resource information give only very vague location information for the properties in relation to the proposed project.	More detailed maps were provided to SHPO as part of the Request for Determination of Effects report in order to facilitate review based on the July 24, 2002 meeting discussion between DART and SHPO. This report is referenced in the FEIS. No additional maps will be included in the FEIS.
T	Robert D. Lawrence, Chief, Office of Planning and Coordination, Environmental Protection Agency Region 6	4A	**Transportation:** The DEIS does not measure or determine how the proposed project meets the stated purpose and need. It presents raw numbers of trips and riders for the LRT, however it does not compare the data against current and future trip generation to evaluate the value of LRT in the corridor.	Table 4-1 shows that the LRT Alternative would result in increased transit ridership compared to the No-Build Alternative. Various paragraphs in Section 4.1.1 discuss the benefits to existing transit riders, Section 4.2.1 details the reduction in future VMT, and Table 4-5 shows a reduction in future traffic volumes.
T		4B	**Transportation:** Transit currently accommodates 2.5% of corridor travel demand. No similar data is presented for future No-Build and LRT conditions. Section 4.1.2 has numbers of expected riders and linked and unlinked trips, but does not analyze the impact of increased ridership and trip accommodation on the future travel demand.	Section 4.2.1 states that transit will accommodate about 3.5% of future corridor travel demand. Tables 4-5 and 4-6 show the impact of increased ridership on future arterial and freeway traffic volumes. Section 4.2.3 discusses the local impacts of traffic that will reroute to the LRT stations.
T		4C	**Transportation:** Section 4.2.1 of the DEIS states that about 3.5% of daily home-based work (HBW) trips would use transit, and the LRT Alternative would result in about 12,000 more daily riders compared to No-Build. No comparison to current HBW trips is provided, but compared to the overall travel demand rate of 2.5% for transit, the LRT Alternative appears to provide	Chapter 4 is primarily a comparison of future No Build and Build conditions. Chapter 3 contains the various measures of effectiveness for the existing conditions (transit ridership, HBW trips, etc.). While the LRT Alternative does not divert a significant portion of future trips from the roadways, any diversion is beneficial and is better than the

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			minimal trip accommodation compared to future overall travel demand.	No Build Alternative. Furthermore, in addition to added capacity in the corridor, the purposes and needs of the project also relate to travel time improvements, increased transit efficiency, regional connectivity, offering of an alternative to the SOV, and increased accessibility and economic development opportunities, all of which the project helps to achieve.
T		4D	**Transportation:** The LRT Alternative does not demonstrate the project will meet the project purpose by effectively reducing peak period congestion levels. Additional information is needed to address the project's ability to meet the purpose and needs, and to provide for a segment of future travel demand to provide relief to regional and local highway corridors. Please clarify these concerns in the Final EIS.	While the diversion of some future trips from the roadways to transit will be beneficial, the total growth in trips in the corridor will be so large in the next 20 years that no reduction in congestion from current levels will be possible. There technically is a reduction in congestion levels from the No-Build Alternative, but it is minor compared to the total increase over the next 20 years. Although it is recognized that reducing peak period congestion is a critical transportation need in the Northwest Corridor, the purpose of the Selected LRT Alternative is not to reduce these congestion levels. Rather, as presented in Section 1.4.2, the proposed project is intended to increase transit effectiveness and regional connectivity, provide an alternative to single-occupancy vehicle travel, increase people-carrying capacity in the corridor, improve accessibility, and increase economic development opportunities.
M		4E	**Cumulative Effects:** A separate section should present cumulative effects information and discuss it for each alternative. The DEIS format presents cumulative effects information under each resource heading. This is difficult for the reviewer to understand context and significance of cumulative effects. Please clarify in the FEIS.	A new Section 5.20 – Cumulative Effects has been added to the FEIS.
NE		4F	**Air Quality:** Page 3-49, second paragraph, and p. 5-26, Sec. 5.3.3, second paragraph both refer to the State Implementation Plan (SIP) approval as of January 2002. Please delete and replace with "EPA published a proposal to approve the Dallas/Fort Worth SIP in the Federal Register on January 18, 2001 (Federal Register, Volume 66, Number 12, page 4756). Final approval pending".	The text has been modified in the FEIS. (See Sections 3.4.2 and 5.3.3)
M	Christopher Barton, AICP, Chief Planner, City of Carrollton Planning Dept.	5A	**Chapter 3:** Page 3-16, Table 3-3: Item C-3 (Frankford Trade Center) is not shown on map in Figure 3-9. Page 3-19, Figure 3-9: Item C-5 not found in Table 3-3.	The text has been corrected in the FEIS.
T		5B	Page 3-41, Para 5**:** "Carrollton Connection?" Does this name come from DGNO?	This term was apparently coined decades ago by the local railroad companies and authorities and is still used today by all rail operators in the Dallas area.
T		5C	Page 3-42, Para 6: Where does statement "... City of Carrollton plans to conduct a comprehensive city-wide study of future pedestrian and bicycle system needs in the year 2002" come from?	PTG spoke to Scott Whitaker of the City of Carrollton Parks & Recreation Department in October 2001. At that time, Mr. Whitaker referred to the City's planned study.
V		5D	Page 3-65, Para 3: Statement that Old Downtown Carrollton evokes "an old western town" seems slightly off. "Western" to me evokes cowboys, Indians, cattle drives, open range. I don't think this was Carrollton. Better term might be "turn-of-the-century farming settlement."	The text has been modified in the FEIS. (See Section 3.7.3)
HP		5E	Page 3-78, Table 3-22: Item 11 (Ken Good Park) states "boating" is offered. Unless model boats are meant, this is incorrect.	The text has been corrected in the FEIS.

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T		5F	**Chapter 4:** Page 4-8, Table 4-4: Table shows ridership declining with the addition of Love Field and/or Medical Center options. Why? Also, table shows fewer boardings at Frankford Station than at Trinity Mills Station, but Trinity Mills Station will be designed with fewer parking spaces. Does this mean more people area expected to ride "feeder" bus service to Trinity Mills Station?	Table 4-4 has been revised to reflect the selected LRT alternative. Your comment may refer to ridership at Carrollton Stations. Minor changes in travel time or alignment and stations can affect ridership at stations along the alignment. The differences at stations in Carrollton range from an increase in 6 riders to a decrease in 15 riders and are negligible under the regional model. The Frankford Station will be accessed primarily by automobile trips from outside DART's service area. Trinity Mills will be accessed more by feeder bus service. See also response to Comment 6H.
T		5G	Page 4-16, Table 4-8: Table shows equivalent decline in "level-of-service" (LOS) for crossings of Old Denton Road and Whitlock Lane. Whitlock Lane declines to LOS "D" (a.m.) and "C" (p.m.). It seems as if this tends to support grade-separation at Whitlock Lane to begin with, rather than coming back later and doing so.	An analysis based on updated traffic volumes was conducted after the production of the DEIS and revealed unacceptable queues at Whitlock due to congestion at the IH 35E interchange. The FEIS reflects this analysis and recommends grade separation of Whitlock (see Section 4.2.2 and Table 4-8).
T		5H	Page 4-32, Para 1: Final sentence states that constructing the Denton Drive/Main Street connector "necessitates" closing Denton Drive south of Belt Line Road. While doing so is certainly desirable and in all of our plans, I don't see the "necessity." Page 4-32, Para 2: Reference to "Bicycle Route 23." Is this established by the City of Dallas? I can find no evidence of any City of Carrollton bicycle route system or plan. Also, NCTCOG shows no existing or programmed bicycle routes anywhere in Carrollton. Page 4-32, Para 5: Statement that DART "should provide two southbound lanes." What about the northbound lanes? City of Carrollton Thoroughfare Plan calls for Denton Drive at this location to be a (C4U) four-lane undivided road. If Denton Drive is connected to Main Street in order to cross Belt Line Road, that crossing should logically be a four-lane undivided road. Page 4-32, Para 6: Statement that better signal timing could improve LOS along Belt Line Road "in the LRT altemative." Does this mean no such improvement could be made under the "no-build" alternative? Page 4-32, Para 7: Labeling the President George Bush Turnpike, as "SH 190" is incorrect. Only the frontage roads (which remain named "Trinity Mills Road) are SH 190. Compare this system to the Dallas North Tollway/Dallas Parkway.	The text in the FEIS has been revised to explain the desirability of this closure and removes the term "necessitates" (see "Carrollton Square Station" in Section 4.2.3). Bicycle Route 23 is defined in the "Greater Dallas Bike Plan Map" created by the City of Dallas. The route is signed in the city limits of Dallas, but it is shown as an unsigned extension of the route in the City of Carrollton. The text in the FEIS has been revised to describe the cross-section of the roadway that should be built by DART. This description includes a four-lane undivided roadway (see "Carrollton Square Station" in Section 4.2.3). While signal timing improvements can be made in the No-Build Alternative, the altered signal spacing in the LRT Alternative is more conducive to signal timing improvements. Comment noted. The use of "SH 190" as a designation for the entire facility is a colloquialism still used by many Dallas area professionals and laypeople alike. The use of this term does not impact the understandability of the EIS.
T		5I	Page 4-33, Para 1: Word "finally" can be read to indicate completion of a plan to eliminate bicycle routes from the area. Suggest deleting the word "finally." Page 4-33, Para 6: Statement "widening the ramp" is somewhat unclear. Which ramp? One must read the entire paragraph very carefully, and be able to visualize the overall design. Suggest substituting "widening the east ramp approach."	The text has been revised to delete the word "finally" for the text for the Trinity Mills Station, and the text for the Frankford Station has been revised to substitute another phrase for "widening the ramp" (see Section 4.2.3).
T		5J	Page 4-44, Para 4: Statement that Carrollton maintains a bicycle route ("all three corridor cities") seems wrong. Source of	The bicycle routes are associated with the Greater Dallas Bike Plan Map. The text has been clarified to note that the system is associated with the

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Subject*	Commenter	No.	Comment	Response
			this statement?	Dallas Bike Plan Map, which encompasses areas outside of the City of Dallas.
AD		5K	**Chapter 5:** Page 5-8, Para 5: Statement that residential uses would be displaced seems wrong. I will check this out. (See also next comment)	The EIS states that the Carrollton Square Station requires the acquisition of four single-family homes, two of which are owner occupied according to tax records. See comment 5 L regarding the residences.
HP		5L	Page 5-22, Para 5: Statement "none of these homes were found to be historically significant" is bothersome. Who found this? Based solely on age, all three homes would qualify for assessment, and City of Carrollton has not yet done so.	None of the aforementioned structures was identified as eligible for listing in the National Register. In the Determination of Eligibility report, each structure within the Area of Potential Effects was evaluated according to whether or not it met the criteria for National Register eligibility (Please refer to Chapter 3 and the relevant regulations). Build dates were acquired from available tax records and confirmed by qualified architectural historians in the field. Additional research was conducted when necessary and two letters were sent to the City of Carrollton Planning Department (May 1999 and December 2001) requesting assistance identifying local cultural resources. 1007 N. Main Street was built in 1932. This house is a typical example of its type of which many are extant, and lacks architectural quality and distinction; therefore it does not meet National Register Criterion C. It has no known associations with historic events, personages or movements; therefore it does not appear to be eligible for listing in the National Register under Criterion A or B. 1011 Denton Drive N was constructed in 1940. This Minimal traditional-style house is a typical example of its type of which many are extant, and lacks architectural quality and distinction; therefore it does not meet National Register Criterion C. It has no known associations with historic events, personages or movements; therefore it does not appear to be eligible for listing in the National Register under Criterion A or B. 1013 Denton Drive N was constructed in 1945. This Minimal Traditional style house is a typical example of its type of which many are extant, and lacks architectural quality and distinction therefore it does not meet National Register Criterion C. It has no known associations with historic events, personages or movements; therefore it does not appear to be eligible for listing in the National Register under Criterion A or B. 1015 Denton Drive N was constructed in 1945. This house is a typical example of its type of which many are extant, and lacks architectural quality and distinction therefore it does not meet National Register Criterion C. It has no known associations with historic events, personages or movements; therefore it does not appear to be eligible for listing in the National Register under Criterion A or B. The Texas Historical Commission concurred with the above findings on July 15, 2002.
HP		5M	Page 5-23, Para 1: Statement "both were built in the 1950' s." Source?	2516 N Broadway was shown on available tax records as having been constructed in 1953. Several visual surveys of the property revealed that the structure had been altered and lacked integrity. No other evidence indicating a different date of construction was identified.

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				2520 N Broadway was originally thought to date to 1955, but tax records show a build date of 1953. Visual inspection in the field confirmed this information and no evidence to prove otherwise was found during the lengthy research period and records search. The Texas Historical Commission concurred with the finding that these buildings were not eligible for the National Register of Historic Places on July 15, 2002.
NV		5N	Page 5-30, Figure 5-1: Image "vicinity of Crosby Road" shows outline of northern two buildings parallel to LRT track, but not southern building which seems to be at equal distance. Why? Also, image "vicinity of Northside Drive" shows only one building outlined, although several others seem nearly or as close to LRT track. Why?	Page 5-29 of the Draft EIS explained that the noise was due to the high speed and the transition of LRT from at-grade to aerial in the vicinity of the two northern buildings (due to the Crosby Road grade separation). LRT is at grade near the southern building and the analysis found no noise impact would occur. The moderate impact at Northside Dr. in the Draft EIS was only to the one building. The Final EIS has taken in to account a design change that shifted the LRT alignment to the east. This has resulted in the moderate impact at Northside Drive shown in the Draft EIS now being a property acquisition. There is also a four-plex on the south side of Northside Dr. that has severe noise impact, but is also identified for acquisition. If acquisition is not ultimately required, then noise mitigation will be required for this property. There are two single-family properties with moderate noise impact just north of Northside Dr. Noise barriers will be included to mitigate one with an increase of more than 3 dB, and an adjacent one with an increase of less than 3 dB. Other moderate impacts have increases of less than 3 dB and do not require mitigation (see Section 5.4).
HP, V		5O	Page 5-81, Para 9: Entire paragraph states that LRT will have a significant effect on Pioneer Park, but preliminary engineering (95% design) drawings show no mitigation of any kind.	The Draft EIS noted a potentially significant visual impact to Pioneer Park. The potential for this impact to create a constructive use (as defined under Section 4(f)) on the park is low (see Section 5.15.2 and Table 5-31).
HP, V		5P	Page 5-82, Para 5: Paragraph does not state that "elevated" track adjacent to Ken Good Park would be largely "retained fill," resulting in virtually "walling off" Ken Good Park from Broadway Street. This would be a major visual and access impact to the area.	The section of elevated track is for the grade separation of Jackson Road, which includes a retaining wall for approximately 400 feet along the south portion of the park. From that point north near the park, the alignment will be on retained fill (up to five feet) due to floodplain issues. The amount of retained fill may decrease during final design pending a detailed hydraulic analysis. There is currently no access off Broadway Street to the park; thus access will not be affected. Furthermore, Broadway Street itself may need to be raised when it is ultimately improved. The EIS states that the visual quality of areas near the park is not deemed an important contributing element to the park (Broadway Street, industrial uses, and IH 35E); thus, no impact is anticipated.
T	Shon Merryman, P.E. Senior Traffic Engineer, City of Carrollton	6A	**Bus Routes:** Figure 1-2 continues to show Route 400 as having a route along Crosby Road to Nix, where it tums north to connect with Belt Line Road. This portion of Route 400 is a temporary detour that was implemented to accommodate DART buses during the reconstruction of Belt Line Road. The reconstruction project is now complete and buses are in the process of returning to their normal route. Please have this routing corrected on the appropriate figures.	This figure and two others have been corrected in the FEIS to reflect the change to the normal route.
M		6B	**Station Names;** At this point, DART should be well aware of the	Station names used in the EIS are preliminary. Final station naming is a

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Subject*	Commenter	No.	Comment	Response
			City's desire regarding station names. It is simply noted here that 2 of the 3 station names used in the report are not the names endorsed by the Carrollton City Council, as per Resolution #2561. A copy of this Resolution has already been provided to DART for consideration.	matter of consideration by the DART Board in accordance with the DART Station Naming Policy. DART will work closely with the City during final design to consider station names, including those in the City of Carrollton Council resolution.
T		6C	**Chapter 2 - Alternatives Considered:** Tables 2-4 through 2-7 all show "On Call" under the Frankford station and Trinity Mills station routes. It is not clear what this means.	DART On-Call is a van-based, demand responsive feeder service, which replaces traditional fixed route feeder service in lower density residential areas, which are proximate to the rail corridor. The DART On-Call concept requires that customers directly contact a van operator via cellular phone to arrange pick-ups and drop-offs. A six to nine square mile residential zone can be accommodated with one van, making connections to a rail station or transit center. In the DART On-Call service, one trip end of all peak period trips must be at the rail station or transit center. In addition, the service is partially scheduled in that the van is required to be at the rail station or transit center twice an hour, at specified train meet times, during the peak periods and at least once per hour during base periods. (See Section 2.2.3)
M		6D	**Chapter 3 - Affected Environment:** It was previously noted that Indian Creek Golf Course and the T.C. Rice Athletic Complex were not included in Table 3-2 or Table 3-3. It is not clear why these points of interest do not qualify to be included in the tables. Table 3-3 shows 2 entries labeled as C-2 & C-3.These labels are not shown on Figure 3-9. Conversely, labels C-5 & C-6 shown in Figure 3-9 are not in the previous tables. The location for "Stream International" in Table 3-3 should list Carrollton as the address, not Dallas.	The Affected Environment data reflects an area within approximately ½ mile of the proposed project. A review of mapping shows that Indian Creek G. C. and T.C. Rice Athletic Complex were not within this distance, and thus were not included. Table 3-3 and Figure 3-9 have been corrected in the Final EIS.
T		6E	Table 3-9 and Table 3-10 shows Year 2000 and Year 2025 ADT volumes. Presumably, the volume projections were provided by NCTCOG while the existing numbers were taken from actual traffic counts. We have some serious reservations about the numbers presented, particularly with respect to the projected volumes. Some of the traffic volumes on our version of the NCTCOG 2025 map showing projected volumes do not match the projected volumes in these tables (which are theoretically from the same source). In some cases the differences are significant. For example, our NCTCOG projections do not show an ADT on any section of Broadway less than 8,500 vpd. However, Table 3-9 shows ADT's on Broadway actually *decreasing* below existing volumes to a level of 1,000 vpd. Not only do these assumptions not match the NCTCOG volume projections that we have on file, they do not appear to be warranted.	The standard version of the NCTCOG 2025 volume map assumes that all planned roadway and transit improvements will be made by 2025. For this EIS, NCTCOG created another version of the 2025 volume map that reflects the No Build Alternative (which assumes that the LRT is not built and certain roadway improvements are not made. The volumes shown in Table 3-9 are from the No Build version of NCTCOG's traffic volume model. Tables 4-5 and 4-6 compare the traffic volumes projected by NCTCOG's No Build and LRT Alternative models.
T		6F	Similarly, the NCTCOG 2025 ADT on Whitlock immediately east of IH 35E is approximately 43,500 vpd. Table 3-10 indicates the volume on Whitlock crossing the DART line is expected to be 33,000. It is not possible for Broadway north and south of Whitlock to draw 10,000 vehicles off Whitlock while at the same time decreasing in volume below the existing ADT. This discrepancy brings into question whether Whitlock should be	See the response to Comment 6E above regarding differences in NCTCOG volume projections. See response to Comment 5G regarding the Whitlock grade separation (see revisions to Section 4.2.2 and Table 4-8).

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Subject*	Commenter	No.	Comment	Response
			grade separated at the DART LRT line. It is our opinion that the decision to make Whitlock an at-grade crossing should be re-evaluated for the following reasons: 1. Volume. Based on the discrepancy in NCTCOG projections, we are not convinced that Whitlock would not qualify for a grade separation based on future volume. 2. There is a "roller coaster" effect between Whitlock and Frankford (3 grade changes), which is a relatively short distance. Is this desirable? 3. The LRT comes back to grade south of Whitlock and is at grade for about 2,000 ft. before it starts to elevate again. Is the cost savings that significant for such a relatively short section of rail? Table 3-10 shows the LOS at Trinity Mills to be LOS "F" and an ADT of 31,000. This is somewhat misleading (as the associated note touches on but does not elaborate) since the service road volume is currently much less than 31,000 vpd and is not expected to reach that level by 2025. Therefore, the LOS shown for 2025 will probably not be "F".	
T		6G	Figure 3-17 shows "Designated Truck Routes" and "Undesignated Truck Routes w/Heavy Local Truck Traffic". The second category is somewhat ambiguous. What percentage of truck traffic does a roadway need to have in order to be an "undesignated truck route"? Also, labeling a few additional roads on Fig. 3-17, such as Luna Road and Midway, would help provide some orientation with respect to the north/south roadway locations. Old Denton Road is a Designated Truck Route. There is no truck restriction on SH 190/PGBT, although it is not shown as either a designated or undesignated truck route.	The category of "Undesignated Truck Route with Heavy Local Truck Traffic" was used to describe roadways that are not officially designated as truck routes but experience heavy truck traffic. There was no specific measurement used for inclusion in this category. Instead, subjective observations of roadway operations were used. The FEIS has been revised to clarify this category as "Other Thoroughfares with Heavy Truck Traffic" (see Section 3.3.4 and Figure 3-17). The figure has also been revised to label more north-south streets. The PGBT was not observed as having heavy truck traffic. However, since PGBT most closely fits into the category of a designated truck route, Figure 3-17 has been revised to show it as such.
T		6H	**Chapter 4 - Transportation Impacts:** Table 4-4 illustrates the estimated 2025 passenger volumes under the various alignment alternatives. Under each scenario, the "Trinity Mills" and "Frankford" stations show very similar numbers across the board. In fact, the table shows more total station riders at the Trinity Mills station than at the end-of-the-line station at Frankford. This similarity in ridership brings up the question as to how these riders will be getting to the station. Does DART anticipate that more riders will come to the Trinity Mills station by bus rather than automobile? If not, then why doesn't the Trinity Mills station have a comparable number of parking spaces to the Frankford station (395 spaces vs. 920 spaces)?	DART ridership projections include estimates for mode of access to rail stations. Projections indicate that more riders will come to the Trinity Mills Station by feeder bus service, as opposed to Frankford Station, which shows a higher drive access and thus a higher demand for parking.
T		6I	Table 4-4 also shows the total number of "Boardings" and "Alightings" for the entire NW Corridor. It is not explained in the text nor intuitively clear how the number of Boardings can be roughly twice the number of Alightings for the system.	The footnotes in Table 4-4 define boardings and alightings. The boardings and alightings are not equal because many of the destinations of those who board within the Northwest Corridor are outside of the Northwest Corridor (downtown, the other rail lines, etc.). If this table included the entire DART system, the boardings and alightings would be equal. An additional note has been added to Table 4-4 to clarify this point.
T		6J	Table 4-6 shows the ADT for Frankford Road under the No-	The increased traffic volumes on Frankford will be coming from IH 35E

TABLE 6-2
AGENCY AND ELECTED OFFCIAL COMMENTS AND RESPONSES ON DRAFT EIS AND SUBSEQUENT PROJECT CHANGES

Subject*	Commenter	No.	Comment	Response
			Build and LRT Alternatives. It shows no increase in traffic on Frankford at Dickerson. On the same page (4-14), the text goes on to state that the greatest increase in traffic volumes along the entire NW Corridor is the 9% experienced at Frankford Road. Which is correct?	and therefore there is no increase shown on Frankford at Dickerson. The text in section 4.2.2 has been revised to clarify this difference.
T		6K	Table 4-8 shows the LOS of several roadways that cross the LRT. This table is confusing as it is not clear what it is intended to convey. Is it supposed to represent the LOS at the rail crossing itself? If that is the case, then it is stating the obvious: if you add an at-grade LRT crossing to a major arterial the LOS will suffer.	The LOS refers to one approach of the signalized intersection right next to the crossing. The title and footnotes of Table 4-8 have been revised for clarification.
T		6L	Under the "Carrollton Square Station" *Mitigation* section (Page 4-32), the text states that a 4th westbound lane is needed on Belt Line Road due to background traffic. It is our understanding that this 4th lane is not just due to background traffic, but is also required because of the station.	The fourth westbound lane is not required due to station related traffic. It would be needed even if the station were not built.
T		6M	It does not necessarily need to be outlined in the report, but some discussion needs to occur to clarify the extent of the City's participation expected in the projects noted in Table 4-11.	Comment noted. Discussion specific to the City's participation in improvements will occur during final design.
T		6N	Table 4-12 shows station area LOS. It is not clear why the LOS improves from "C" under the 'No-Build" condition to "A" under the "LRT without Mitigation" condition. With the Downtown station in place, Denton Drive goes away so there should not be an LOS associated with its future intersection at Belt Line Road.	Table 4-12 has been revised to reflect the Level of Service for the existing intersection location in the No-Build condition, and the new location of the intersection for the LRT condition (with and without mitigation).
T		6O	It is not clear from the Trinity Mills station analysis what surrounding roadway infrastructure was assumed to be in place.	The text has been revised to describe the roadway network and list the study intersections (See "Trinity Mills Station" in Section 4.2.3).
T		6P	In the Frankford Station discussion, signalization is mentioned as a possible option for mitigating the intersection of Frankford Road at the IH35 northbound service road. The City of Carrollton has been in discussions with the Texas Department of Transportation (TxDOT) about improvements to this intersection. TxDOT has indicated signalization is not an option. However, they are currently designing geometric improvements for this intersection, which should significantly improve traffic operations and LOS.	Comment noted. DART will continue to coordinate with TxDOT and the City during final design to ensure that the proposed improvements can accommodate station related traffic.
T		6Q	No mention is made in the mitigation discussion about the need for a new traffic signal at the intersection of Trade Center Drive and Frankford Road, primarily as the result of station traffic.	The text has been revised to include the need for the traffic signal at Trade Center (See "Frankford Station" and Table 4-11 in Section 4.2.3).
T		6R	**Chapter 5 - Environmental Consequences:** Under the City of Carrollton LRT Alternative section (page 5-3), the text states: "Construction of the LRT would implement an improvement recommended in the Carrollton Thoroughfare Plan". What improvement is this referring to?	The improvement is referring to LRT itself; which is a recommended transportation improvement. Text has been clarified to note this as the referenced improvement. (See Section 5.1.1, "City of Carrollton")
AD		6S	Table 5-4 shows land to be acquired for the LRT Construction Staging Areas. It is not clear whether the area described is a portion of the area noted in Table 5-3 or if it is an addition to the land required for station development.	Section 5.2.2 states, "A summary of potential acquisitions for stations and the Rail Operating Facility (with displacement information) is outlined below in Table 5-3**.** Acquisitions for the rail alignment and street improvements, as well as a summary of displacements, are addressed in the subsequent sections."
T		6T	It was previously pointed out that under *Traffic Mitigation* on page 5-66, the text read: "Construction specifications should	Specifications will note the maximum number of lanes that can be blocked during peak traffic hours, which translates into a minimum

TABLE 6-2
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Subject*	Commenter	No.	Comment	Response
			include provisions for a *maximum* number of lanes blocked during peak traffic hours...". Should this not read "... a *minimum* number of lanes blocked..."?	number of lanes that must remain open.
T		6U	Table 5-26 lists alternate routes available for streets affected by the DART construction. It should be pointed out that the alternate routes listed also happen to be streets that cross the DART LRT line and will be impacted by construction.	Comment noted. Construction phasing will be designed to minimize impacts to alternate routes while certain streets are being impacted by construction.
M	Nan L. Terry, Airport Environmental Specialist, Federal Aviation Administration	7A	Name of Airport – the airport, Dallas Love field is referenced in different ways throughout the DEIS. The Federal Aviation Administration (FAA) refers to this airport as Dallas Love Field. The airport should be referred to consistently throughout the DEIS as Dallas Love Field.	The name of the airport has been corrected in the FEIS.
LF, M		7B	FAA's Federal Actions – The FAA would like to include the following clarification concerning potential Federal actions. We suggest adding the following language: "if there is an approval of the Dallas Love Field Option alignment by Federal Transit Administration (FTA), the FAA may make a number of decisions pursuant to the Final Environmental Impact Statement (FEIS), including the following: 1) approval of changes to the Airport Layout Plan (ALP) indicating the LRT line and station at Dallas Love Field as shown in the FEIS; 2) consideration of possible Airport Improvement Program (AIP) funding for eligible items on Dallas Love Field that may be eligible for such funding and 3) consideration of any necessary release of Federally obligated airport property interest so as to allow concurrent use by the FAA and DART of aeronautical land on Dallas Love Field along the LRT alignment without impact to airport facilities or operation" Such language should be added, perhaps as page ES-1 (next to last paragraph), ES-6 (first paragraph, page 1-11, last sentence, and page 2-13 (sixth paragraph).	Comment noted. The DART Board did not approve the Love Field Design Option at this time due to financial constraints and potential delays to other capital projects, including LRT service to Farmers Branch and Carrollton. However, should a funding plan that minimizes or avoids delays to existing projects be developed, a direct connection to Dallas Love Field will be reconsidered during final design. Any supplemental environmental studies would be completed at that time and appropriate Federal actions would be taken.
S		7C	Construction Impacts – As we have discussed before, we are concerned about any impacts to our facilities and to Dallas Love Field during construction. Although there is a discussion on page 3-58 under "Affected Environment" concerning the need prior to construction of having FAA approve DART's plans and review and concur with the vibration analysis of the construction and impacts to airport facilities, here is no mention of this as mitigation under Chapter 5, page 5-34. Chapter 5 simply says that testing will be done. The language from page 3-58 should be included as part of the mitigation measures in Chapter 5. The FEIS should also state that any construction on Dallas Love Field must be done in accordance with FAA order SW 5200.5B, Airport Safety Standards During FAA-Funded Construction and Maintenance (2/25/96, and Advisory Circular 150/5370-2D Operational Safety on Airports During Construction (5-30-02).	The DART Board did not approve the Love Field Design Option at this time. However, a direct connection to Love Field may be reconsidered in the future. The text in Chapter 5 has been modified as requested to ensure that all mitigation is covered in the Final EIS should the decision to pursue the Love Field Design Option occur at a later date.
M, T		7D	Specific Comments – 1) Page 2-12, 1st full paragraph – change "avoid flight zone: to "avoid obstruction associated with runways at Dallas Love Field". 2) Page 2-13, Love Field Design Option, 1st paragraph,	Comments noted. Various text corrections and changes have been incorporated into the Final EIS to respond to the FAA's corrections and clarifications related to comment numbers 1 through 9, 12, 13, and 14. Responses to comments 10 and 11 with additional explanation are provided below. Any changes to the FEIS are noted as necessary.

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Subject*	Commenter	No.	Comment	Response
			last sentence – change "protective" to protection". 3) Page 2-13, 3rd paragraph under Love Field Design Option – change "main runway" to "primary runway 13R/31L". 4) Page 2-13, 4th paragraph under Love Field Design Option – there have been studies initiated, not just one. 5) Page 2-33 and Figure 2-22, change, "proposed ticket/baggage" to possible future ticket/baggage". 6) Page 3-7, in the sentence, "Love Field has four instrument Landing Systems on runways 31L, 31R, and 13L, "insert "13R". 7) Page 3-7, we suggest moving the sentence beginning "FAA uses a 'three…" to above the sentence beginning "Love Field has four…" 8) Page 3-7, paragraph beginning with Landside facilities – As of 8/2/02, Dallas Love Field has 17 air carrier gates in operation (16 gates with jet bridges and one ground loading gate). Delete "as part of Phase I of the Love Field Master Plan". Check with Dallas Love Field to verify the location of the administrative offices. There are administrative offices on the 2nd floor. 9) Page 3-11 Dallas Love Field Master Plan – Insert the demolition of the east concourse in the list of projects in Phase 1. The fourth sentence, which discusses Phase 2 of the Master Plan, states that this approach "would end with.." this should be changes to "could end with…" The last sentence states: "Phase 2 elements have yet to be committed to an implementation schedule." We recommend the following instead: "Whereas Phase 2 elements include potential projects under the Master Plan, no final decisions or plans have been made". 10) Page 5-25, Table 5-6 – Please explain why the Vehicle Miles Travel(VMT) goes up for the build as compared to the no-build. One would think VMT would go down. 11) Page 5-51, 4th paragraph and Page 3-105, 4th paragraph – The two pages appear to conflict with each other. Page 5-51 reference "four Underground Storage Tanks (USTs) in the area of potential construction near Love Field and none are leading". However, page 3-105, mentions "one LUST" (leaking UST). 12) Page 5-65, 1st full paragraph, last sentence – We prefer the original language of "to avoid any impact to airport facilities" rather than as it now reads, which is "to limit any impacts to airport facilities". 13) Page 5-65, last paragraph – Please add, "DART will	10) The Draft EIS was in error; VMT has been re-calculated and the reduction is shown in Table 5-6 in the FEIS. 11) The text has been modified to reflect this correction. (See Sections 3.11, 3.12, 5.9, and 5.10 in the Final EIS).

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Subject*	Commenter	No.	Comment	Response
			coordinate with FAA to ensure that FAA facilities are not impacted" 14) Page B-1, Federal Aviation Administration, Southwest Region. (not Office of Planning), Washington, D.C.) Dean McMath, Planning and Programming Branch, Environmental Program Manager	

***Subject Key:**
AD - Real Estate Acquisitions and Displacements,
G - General,
HP - Historic Resources and Parklands,
LF - Love Field,
M - Miscellaneous
MC - Medical Center,
NE – Natural Environment
NV - Noise/Vibration,
ROF - Rail Operating Facility,
S - Safety and Security,
T - Transportation,
V - Visual/Aesthetics,

TABLE 6-3
WRITTEN AND PUBLIC HEARING COMMENTS AND RESPONSES ON DRAFT EIS AND SUBSEQUENT PROJECT CHANGES

Subject*	Commenter	No.	Comment	Response
WRITTEN COMMENTS RECEIVED ON THE DRAFT EIS				
ROF	Jeanne M. Clark, VP of Finance, Bodycote Thermal Processing	W-1	We own four properties in the area for the referenced facility [Rail Operating Facility site # 3, Lombardy/Denton]. We no longer use these buildings for production, and are interested in leasing or selling these buildings as soon as possible. Bodycote would like DART to purchase our property as soon as possible. Could you please let us know whom to communicate with to discuss the procedures and timetable for DART's project and the corresponding property purchase? We also lease office space [in the area] and will be forced to relocate. Information about timing will be helpful to us in evaluating that situation as well.	The DART Board approved a resolution approving the Lombardy/Denton rail operating facility site on August 13, 2002. DART provided letters to BodyCote in July and August 2002 to explain the procedures and timing for property acquisition, as well as to inform BodyCote that an advance acquisition of their property has been requested through the Federal Transit Administration in order to minimize any financial hardship (see Sections 2.2 and 2.2.5).
MC	George Farr, Children's Medical Center of Dallas	W-2A	We continue to have a problem with the base alignment down the middle of Harry Hines. We believe that an at-grade or aerial alignment will create serious traffic and safety problems for our patients, visitors, employees, and emergency vehicles daily. We are supportive of a subway under Harry Hines. We feel this would be a magnificent, long-term solution for the whole community.	The DART Board approved a resolution on September 17, 2002 approving Medical Center Design Option D, which was developed during the Draft EIS comment period and supported by the medical center representatives (see Sections 2.2 and 2.3.2). Subsequent coordination with Parkland Hospital uncovered significant cost and design issues with Option D, which led to the re-examination of DART-owned UP RR for the alignment. On May 13, 2003, the DART Board approved the UP RR as the preferred route through the Medical Center district. This decision was made after holding a public meeting, a public hearing, and assessing changed conditions in the area. The Base alignment would have been aerial through the entire Medical Center district, thus minimizing any surface conflicts with automobiles, emergency vehicles, or pedestrians. Short-term construction impacts to automobile or pedestrian access or routes would be coordinated with the hospitals to avoid or minimize potential safety hazards or delays. Although a subway solution along Harry Hines was evaluated, it was found to be cost-prohibitive.
MC, NV		W-2B	We also strongly believe this alignment [Base] will create a day and night disturbance for patients and those ministering to their care.	Sections 3.5 and 5.4 in the EIS address the potential for noise disturbances in the Medical Center area under the Harry Hines Base Alignment. A noise measurement was taken near Parkland Hospital to establish the existing noise environment and to be representative of the buildings closest to the alignment. Using the Federal Transit Administration guidance manual, no noise increase beyond existing levels was projected in the hospital corridor. Thus, no disturbance to patients or to those ministering to their care would be expected.
MC		W-2C	If the DART staff continue to forecast a prohibitive cost for this highly preferable option [tunnel], we could also support the alternative alignment [Medical Center Design Option - MCDO] 3A that was approved by the DART Board on September 25, 2001. Because this option uses a below-grade alignment, our concerns regarding traffic and noise disruption could be alleviated while still providing excellent access to the medical center. We urge you to adopt the alternative 3A route when making your decision on the MCDO of the Northwest Corridor Light Rail project.	Comment noted. On May 13, 2003, the DART Board approved the UP RR as the preferred route through the Medical Center district. This alignment minimizes impacts associated with Option A while maintaining a similar level of service.
MC	Kern Wildenthal, M.D., Southwestern	W-3A	Having reviewed the DEIS, comparing the baseline elevated rail route above Harry Hines with the three alternate routes known as 3A, 3B, and 3C, we believe that appropriate research is lacking, thereby providing an incomplete analysis.	Comment noted. Medical Center Design Option D was proposed as an option

TABLE 6-3
WRITTEN AND PUBLIC HEARING COMMENTS AND RESPONSES ON DRAFT EIS AND SUBSEQUENT PROJECT CHANGES

Subject*	Commenter	No.	Comment	Response
	Medical Center		We request additional research to provide a more comprehensive view. I hope our thoughts will assist your staff in providing a more complete review in the FEIS. **Additional alternate route:** Another option in addition to 3A, 3B, and 3C, has been proposed by DART staff. We are interested in seeing the full research of the effects on Harry Hines, Motor, and Mockingbird of the four alternate and baseline routes. We suggest development of a head-to-head chart as part of the executive summary that compares the baseline route with the four alternate routes.	that addresses the public's concerns of cost and displacements associated with Options A, B and C. A comparison of the Base Alignment with the new Option D was conducted in support of the September 17, 2002 Board action selecting Option D. Subsequent coordination with Parkland Hospital uncovered significant cost and design issues with Option D, which led to the re-examination of DART-owned UP RR for the alignment. On May 13, 2003, the DART Board approved the UP RR as the preferred route through the Medical Center district. Pertinent information is included in the FEIS. See also comment W-2A.
MC, NV		W-3B	**Noise Levels:** Concerns are twofold: construction noise for the elevated rail line over Harry Hines and Mockingbird, and noise from the rail service on the elevated and surface routes. We would like to see research conducted on both construction and rail service noise, especially around our intensive care and psychiatry units near Harry Hines; we would like to see similar noise level research near our student housing [on Mockingbird].	The DEIS included a noise analysis for the Harry Hines Base Alignment. No additional analysis will be conducted for the Base alignment since it was not selected. See response to Comment W-2A.
MC, T		W-3C	**Traffic increases on Harry Hines (HH):** What impact will construction have on Harry Hines and Motor Street? Since it appears that one to two lanes on HH may forever be removed for the rail line and/or [on-street] bus bays, how will traffic be affected upon completion?	Section 5.12 of the Final EIS discusses construction impacts. Temporary construction impacts under the Base Alignment would have likely resulted in short-term lane closures on both Harry Hines and Motor Street. Harry Hines lanes would not have been removed permanently. Use of the UP RR will result in temporary construction impacts to Motor Street primarily. Construction methods and traffic control will be determined during final design and will be coordinated with the City and the hospitals.
MC, T		W-3D	**Emergency access:** What impact will construction lane closings and congestion have on patient and ambulance access? If traffic is slowed, backups will delay emergency access.	Sections 5.11 and 5.12 discuss safety and security and construction impacts associated with the project. Construction impacts to traffic would occur under any of the alternatives. The construction method and hospital/DART coordination efforts would seek to limit traffic impacts to emergency vehicles. The majority of emergency access entrances are not located off Harry Hines or Motor Street, but use Medical Center Drive. DART will work closely with the City and the hospitals to ensure that ambulance operations continue normally (see Sections 5.12.5 and 5.12.7).
MC, T		W-3E	**Future HH Blvd. improvements:** Future opportunities for planned improvement on HH (additional lanes) would be eliminated by the baseline route. What impact will the rail line have on these planned widening improvements?	The City of Dallas Thoroughfare Plan shows Harry Hines with an ultimate eight-lane configuration. No additional analysis will be conducted since the Base alignment was not selected as the preferred alignment. See response to comment W-2A.
MC, T		W-3F	**Bus and shuttle service:** We believe the level of bus and shuttle service would increase on HH to serve the new rail stops. With continuous loading and unloading, commuters would face increased traffic on an already congested Harry Hines. What actions are being planned to limit such problems?	The outside lanes of Harry Hines are currently reserved for bus or right-turn only during peak hours to reduce traffic conflicts. The number of routes operating along Harry Hines would generally remain unchanged under any of the alignment options. Under the Base Alignment, most of the bus transfer activity would have occurred at the UTSW/Exchange Park Station in an off-street facility, thus not affecting Harry Hines. Under the design options and selected UP RR alignment, most of the bus transfer activity would take place at the Parkland Station; also in off-street transfer areas so as to limit impacts to traffic flow. Smaller shuttles could operate on streets such as

TABLE 6-3
WRITTEN AND PUBLIC HEARING COMMENTS AND RESPONSES ON DRAFT EIS AND SUBSEQUENT PROJECT CHANGES

Subject*	Commenter	No.	Comment	Response
				Medical Center Drive, Redfield, and Forest Park (see Sections 2.2.4, 2.2.6, and 4.2.3).
MC, AD		W-3G	**Costs of land acquisition:** There appear to be additional costs that were not included. The Base Alignment would require use of two different areas of land owned by UTSW that are earmarked for future development. Costs for these appear to have been omitted. We would like to see research into the cost of the Base Alignment and an alternate HH/Mockingbird route without access to UTSW land. Without this, there can be no accurate cost estimate.	Costs for acquisition of UTSW property are included in the cost estimates. Modifications to the Base Alignment could have been made to minimize UTSW property acquisitions, particularly south of Exchange Park where a new potential building has been sited in the Master Plan. These modifications have been examined and the increase in capital cost is offset by the reduced costs of land acquisition; thus, the cost of a modified Harry Hines/Mockingbird route would be approximately the same. Avoidance of all UTSW property would have added approximately $5 million to the Base Alignment. However, the UP RR alignment was selected and no UTSW property is necessary for the project.
MC, AD	George C. Chapman, Thompson & Knight Attorney and Counselors (Olmsted-Kirk Paper Co.)	W-4A	Concern that Option B displaces our business and affects our workforce. Option B would displace 25 businesses, and O-K is clearly the largest business and workforce (183 employees) that would be affected.	Comment noted. Option B was not selected. The DART Board approved a resolution on May 13, 2003 approving the UP RR alignment as the route through the Medical Center district.
AD		W-4B	When eminent domain power is used to acquire property, the owner is to be paid fair market value plus damages to the remainder. [Extensive case law is cited, outlining comparable sales, costs, and income approaches to arriving at market value.] The highest and best use for the O-K property has been for headquarters, manufacturing, storage, and distribution.	Comment noted. DART follows the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended. It is DART's policy that displaced persons or businesses shall not suffer unnecessarily as a result of programs designed to benefit the public as a whole.
AD		W-4C	We have reviewed the DART brochure on displaced businesses and relocation. O-K would be considered a "small business" with less than 500 employees, and the limit is $10,000 on recoverable expenses. This would only be a small fraction of the cost to O-K to relocate. Its workforce of 183 (many minority) would also be impacted, and it is uncertain if it is feasible and affordable for them to go to a relocated facility many miles from the current location.	Comment noted. See response to W4-A.
G	Sharanda Lockett, Dallas	W-5	I think it's a good idea, because it provides more ways for people without transportation to commute all over the Dallas/Ft. Worth area.	Comment noted.
LF	James Bui, N. Richland Hills	W-6	In support of having another station and/or connection to/from Love Field Airport. I've been riding the TRE and light rail for the last 9 months and I love it.	Comment noted. The DART Board did not approve the Love Field Design Option at this time due to financial constraints and potential delays to other capital projects, including LRT service to Farmers Branch and Carrollton. However, an interlocal agreement (ILA) between the City of Dallas and DART is being developed to determine if the Love Field Design Option can be reconsidered during final design. The ILA will also include provisions for alternative rail access into Love Field, such as a separate LRT line, or rail spur, that is more financially feasible. The DART 2030 System Plan update will also examine Love Field service. If direct rail service is not provided, bus shuttle service from off-site LRT stations would link the LRT system with Love Field (see Section 2.2 and 2.3.2).
G, LF	John C. Long, Irving	W-7	DART should be expanded to include all sections of Dallas in ten years, east, west, south, north, including DFW and Love Field.	DART has 13 member cities that contribute one percent of their sales tax to build and operate DART services. The DART 2030 System Plan update is currently underway and will address

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Subject*	Commenter	No.	Comment	Response
				future expansion within the financial constraints of our sales tax revenues. Potential transit services in non-member cities is also under discussion as part of the System Plan update. See Comment W-6 regarding Love Field. A connection to DFW Airport is planned as part of the Northwest Corridor Irving/DFW LRT project, planned for implementation in 2011/2012 (date subject to change).
LF	Harry Paslay, Dallas	W-8	Please stress the need for DART rail to connect with Love Field.	Comment noted. See response to Comment W-6.
T	Bob Rapp, Carrollton	W-9	I hope that when the LRT line goes to Frankford that the bus route 204 is not eliminated.	DART's policy is to eliminate duplicative service. Thus, DART proposes to eliminate the 204 express bus route when the LRT line opens.
G	Neil Sheth, Bedford	W-10	I think this is a really great plan and I do believe we should have more public transportation in Dallas and Ft. Worth and Arlington areas. I do think we need bus service also in other cities. This will not only reduce traffic and save gas, but it will also reduce the number of accidents.	Comment noted. See response to Comment W-7.
G	Scott Trapp, Carrollton	W-11	I work in the Love Field area and would ride the train daily if it came out to Frankford. The train is a much better option than fighting traffic on I-35 daily. Please build it quickly.	Comment noted.
T	James R. Strickling, Fort Worth	W-12	Already riding on DART's 404/400 to Garland 378. Real nice. Keep route 839 to come on weekends. Support linking independent to Trinity Railway Express. Keep Forum. So keep 404/400.	Comment noted.
G	Robert Weber, Dallas	W-13	My family and I totally support DART's proposal. Thank you for your efforts to make it a reality and Dallas a better city.	Comment noted.
M	Ron Roeder, Dallas	W-14A	If the DART light rail gauge is the same as the TRE gauge, the DART light rail could run on that track.	While the track gauge is the same, light rail vehicles do not meet Federal Railroad Administration (FRA) minimum requirements to operate on shared track with heavier trains (i.e. crash worthiness). Furthermore, LRT requires an overhead catenary system for power, which is not present on the TRE tracks (TRE trains are diesel powered).
LF		W-14B	The Love Field Design Option should definitely be included in the new route. Jet flying is best followed by the faster light rail, not a slow bus.	Comment noted. See response to Comment W-6.
M	John Herndon, Dallas	W-15	I am the Environmental Service Coordinator for Trinity River Authority. We have a wastewater line at Trinity Mills and IH-35 that will be impacted by the project – coordination is necessary.	Comment noted. Contact has been made with the authority to initiate coordination. As discussed in Section 5.12.4 of the Final EIS, all utility providers will be contacted during final design and requested to provide line location measures and approval of the proposed alteration of utility lines.
G	Mary Menefee, Dallas	W-16A	As a long time resident of this area I feel the DART plans are excellent and will serve the community well.	Comment noted.
G		W-16B	Many participants at Bachman Therapeutic Recreation Center do not live near so transportation is a big problem.	Comment noted. The proposed LRT line will provide a station at Denton and Community Drive (Bachman Station), which may enhance transportation for persons going to the Bachman Recreation Center.
ROF		W-16C	The DART rail yard on Lombardy will take care of a real eye-sore in a depressed area. Go for it. Thanks!	Comment noted. The DART Board approved a resolution approving the Lombardy/Denton rail operating facility site on August 13, 2002. See response to Comment W-24.
G	Richard K. Miller, Dallas	W-17	I believe the Northwest Corridor LRT to Farmers Branch and Carrollton is highly desirable and beneficial from several aspects: needed service, environmental improvement, traffic ease, and related improved ecological effects. I will use the service frequently.	Comment noted.

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G	Eddie Miller, Dallas	W-18	Good Idea – Cross connected at Love Field [attached map shows connection along Mockingbird Lane between Love Field and Mockingbird station on North Central LRT line.]	Comment noted. There are currently no plans for a cross-town rail connector as suggested. The suggestion has been forwarded to the DART 2030 System Plan group.
G	Julia Alonzo, Dallas	W-19	Thanks for spreading bus services, especially when you get to Farmers Branch. It's a joy to be able to go visit or to get to a job in less time. Wishing you could get to Lewisville, Texas.	Comment noted. Lewisville is not a DART member city and is outside the service area. See response to Comment W-7.
G	Marilyn Smith, Dallas	W-20	Would like to know when DART was going east and west from Mockingbird to Bachman Station. Northwest Highway is very bad. Takes me 40 minutes at rush hour.	Comment noted. See response to Comment W-18.
G	Jack & Jane McNairy, Dallas	W-21	I am so glad DART is going to do something with rail on this side of town. I have friends in Plano who use the rail, but I live in Dallas and have to drive across town to use DART rail. It can't get here fast enough.	Comment noted.
G	Jim Godfrey, Arlington	W-22A	The NW Corridor light rail is excellent.	Comment noted.
G		W-22B	We also need the Cotton Belt line completed.	Comment noted. This comment is outside the scope of the Northwest Corridor EIS. The Cotton Belt line is identified as a potential corridor for future rail service in the DART System Plan and is being addressed as part of the 2030 System Plan update. See response to Comment W-18.
G		W-22C	The TRE should be completed and expanded westbound to Weatherford and eastbound to Mesquite and beyond. Expand, expand, expand. 20% of the gas tax should be for trains!	Comment noted. Weatherford and Mesquite are not DART member cities and are outside the service area. See responses to Comments W-7 and W-18.
MC, LF	Robin M. Babcock, Carrollton	W-23	I approve and can't wait for completion. Do the Medical Center Option but not the Love Field Option.	See response to Comments W-2A and W-6.
ROF, V	Sharon Boyd, Dallas	W-24	If we are to get a rail yard on Denton Road it should be enclosed with a brick wall to appear as a business building, or something comparable to sound walls along Central at M Streets. We should also have parkway trees around perimeter.	Comment noted. The DART Board approved a resolution approving the Lombardy/Denton rail operating facility site on August 13, 2002 (see Sections 2.2 and 2.2.5 of the Final EIS). The resolution included a statement that additional visual mitigation work be provided for the site. This will enhance the site and create an asset for the community. Appropriate visual mitigation has been developed and is included in the Final EIS (see Section 5.6.2).
MC	Pat Ash, Dallas	W-25	We have had our clinic at 2719 Inwood Rd. for 52 years. We are, I am, in favor of 3D location of Medical Corridor. Let's start the 3D location right away. This location will best serve the interest of the people of Dallas. I think it will improve the area.	Comment noted. See response to Comment W-2A.
ROF	Linda Neel, Dallas	W-26	I am opposed to the Denton/Lombardy location for the Rail Storage Facility. I believe the Bachman area is ready for redevelopment and that putting a rail yard at this location will have a detrimental effect on the tremendous efforts to improve this area.	Comment noted. See response to Comment W-24.
G	Frank Sinclair, Irving	W-27	Proposed LRT line needs to connect with LRT line that will go thru the Los Colinas Urban Center on out to the DFW airport.	The Irving/DFW LRT line is part of the Northwest Corridor effort. The Irving /DFW LRT line will have a junction with the proposed LRT Line to Farmers Branch and Carrollton immediately north of the Bachman Station (near Northwest Highway). Preliminary Engineering and the EIS effort for the Irving/DFW line is scheduled to begin in 2003.
LF	Loretta and John Clarkson, Dallas	W-28	I opt for the Love Field route. Love is a major transportation hub and should be connected to downtown Dallas as well as worker's neighborhoods. Put Love on the route 11.	Comment noted. See response to Comment W-6. The Route 11 suggestion has been forwarded to DART Service Planning for consideration.

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Subject*	Commenter	No.	Comment	Response
G	Greg Paskin, Lake Dallas	W-29	Rail service is much needed. Why aren't service talks being conducted to get DART into Denton and Collin County?	Comment noted. See response to Comments W-7. LRT service into Collin County (Richardson and Plano) was initiated in 2002. Cities in north Collin County are not DART member cities. The Denton County Transportation Authority was recently formed to develop transit plans for Denton County.
LF	Vernon Hock, Ft. Worth	W-30	Love Field – Yes	Comment noted. See response to Comment W-6.
G	Vanessa Byas, Dallas	W-31	I suggest that a light rail be accessible to Town East. The convenience of being able to go to the mall would be good for people without transportation.	Comment noted. See response to Comment W-7. DART is conducting a Major Investment Study for the IH-30 corridor which includes the Town East area in Mesquite. The suggestion has been forwarded to appropriate staff.
G	Devindra D. Maini, Carrollton	W-32	This seems to be a wonderful idea to connect Carrollton with other DART projects and I am 100% for it. This will save time for the commuters and solve the problem with gas. The car industry will definitely lose business. I am in favor of raising ¼% in sales tax in our city.	Comment noted.
LF	Paul Benson, Irving	W-33	Please make the Love Field line a top priority!	Comment noted. See response to Comment W-6.
LF	Stephen G. Turner, Dallas	W-34A	I support Love Field Option.	Comment noted. See response to Comment W-6.
MC		W-34B	I support the original alignment for the hospital district. Despite the objections of UTSW, I feel the original alignment serves the neighborhood better in that it allows more people to have easier access to all of the hospitals in the corridor. People will have close access to Parkland, UTSW, Children's, and St. Paul. In spite of UTSW support for option D, I feel that the Dallas populous will be better served if the light rail runs to Exchange Park. When people need access to one of these hospitals and don't have a car, being able to take a train that close to all of the hospitals is a real advantage.	Comment noted. See response to Comment W-4A. As part of their support for Option D, UTSW committed to provide a comprehensive shuttle service to medical facilities and adjacent neighborhoods to ensure a high level of service (see Appendix D in the Final EIS). DART and the hospitals will coordinate to provide the same for the selected UP RR alignment.
MC		W-34C	University of Texas Southwestern Medical Center indicated that going down Harry Hines would divide the campus. I feel that this is a bogus claim since the LRT would be above ground and they could enjoy all of the access that they now have. I feel that their objections were expressed by the very people who will not use the system and if the original alignment isn't accepted it will deny easy access for the people who need services at the hospitals. The Inwood Station would be nice but would mean that people traveling to UTSW, Children's, and St. Paul would have to wait longer for needed service by having to take another bus. On Channel 8, on July 15, 2002 they mentioned the options but did not show the original alignment, only the options. I hope that you have not already given in to their wishes. I don't feel that the people who spoke would ever use the services anyway.	Comment noted. DART has taken into consideration all the issues in an effort to balance the interests in the Medical Center corridor. After considering the comments and issues, the DART Board approved a resolution on September 17, 2002 approving Medical Center Design Option D. Subsequent coordination with Parkland Hospital uncovered significant cost and design issues with Option D, which led to the re-examination of DART-owned UP RR for the alignment. On May 13, 2003, the DART Board approved the UP RR as the preferred route through the Medical Center district. This decision was made after holding a public meeting, a public hearing, and assessing changed conditions in the area.
ROF	Lyman deCamp	W-35	If there is any substance at all to the article in Monday's 15 JUL 2002 Dallas Morning News about an emerging "Option D" for rail through the Parkland area, it occurs that DART might be able to combine that with locating the NW storage yard at the site of Trinity Industries' existing railcar manufacturing facility just east of Parkland. Rumor has it that DART has some expectations that the existing land use will cease anyway; reuse of the site for railcar storage would be a natural progression. Indeed, it might be practical to provide "covered parking" for this site, but converting the land from manufacturing to storage should "upgrade" its neighborhood impact, and thus avoid many of the issues raised about the several proposed sites near Northwest Highway.	See response to Comment W-24 regarding the rail operating facility site selection. The Trinity Industries property was recently purchased by Parkland for future development and is only 24 acres. A minimum of 30 acres is needed for the rail operating facility.
LF	Miguel	W-36	"We are senior citizens" "Excellent Presentation" THANK YOU. Please include	Comment noted. See response to Comment W-6.

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Subject*	Commenter	No.	Comment	Response
	Rodríguez, Dallas		Love Field in your plans. It can be a primary hub, and an economic potential boost! Our whole Love Field area is in need of development.	
MC	Irma S. Rodríguez, Dallas	W-37	"We are senior citizens" Please use the original Harry Hines plan and do not detour us from the hospitals, which we need convenient transportation to. A detour defeats the whole purpose of transportation convenience. Be smart and hold the line at your successes.	Comment noted. See response to Comment W-34C.
G	Juan H. Sanchez, Farmers Branch	W-38	We need less traffic on the highways. This rapid transit seems to be helping. People going to downtown Dallas is a good idea!	Comment noted.
G	Richard A. Schumacher, Dallas	W-39A	Design the line to permit skip/stop express service, with some or all of the stations accommodating five-car trains. This is in anticipation of future significant service improvements in downtown Dallas, either by the addition of a second downtown transit corridor or by enhancements of the existing transit mall.	Comment noted. Skip-stop service is not DART's present policy; the suggestion will be forwarded to the DART 2030 System Plan update staff. Station platforms are designed for future expansion to accommodate four car trains; downtown city blocks also limit the length of the trains. The DART 2030 System Plan update is examining downtown transit improvements.
ROF		W-39B	I support site option number three for the operations facility. However, if you have not already done so, please consider the area immediately to the west of that site as a possibly less-disruptive alternative.	Comment noted. See response to Comment W-16C. The area to the west of Site 3 includes the Letot School, which is eligible for the National Register of Historic Places. It was not considered as a site.
LF		W-39C	I support direct service into Love Field, but only if the city of Dallas agrees to share the additional cost. The city will most directly benefit from the Love Field option and so should share its cost.	Comment noted. See response to Comment W-6. The City of Dallas has agreed to fund 1/3 of the additional cost for the Love Field Option if it were to be implemented at a later date.
MC		W-39D	I support Option 3 D for the Medical Center segment, but only if the Medical Center agrees to assume all costs, beyond those that would have been incurred by the baseline Harry Hines alignment, of: 1) acquiring, removing, or replacing any Medical Center property of facilities required by Option 3 D, and of 2) noise, vibration, and aesthetics mitigation required for all properties adjacent to Option 3 D. Option 3 D was developed at the specific request of the Medical Center. In fairness they should assume the costs of Option 3 D design features, which would directly benefit only the Medical Center, and of mitigating the effects of Option 3 D upon the neighborhood.	Comment noted. See response to Comment W-34C. The cost of the Base Alignment and Option D are comparable. The UP RR provides a significant cost savings of approximately $40 million.
MC	Robert M. Martin, Jr., Dallas	W-40A	[Copy to DART of letter to BUILD DART Smart, dated 07-17-02] I have your letter of July 10, 2002 and the attached brochure, and I have observed the extreme claims that building an elevated rail service on Harry Hines Boulevard would: Threaten Medical Care; Jeopardize Economy; Endanger Patients and Pedestrians; Increase Traffic Congestion, all without the slightest factual data to support these claims of pending disaster. In short, if moving rail service farther away from the area it is supposed to serve prevents four disastrous events which would occur with the close-in location, please advise the names and opinions of the public transportation experts whose study of the traffic and other relevant factors support the conclusions of your brochure. None of the signatories appears to be qualified by training or experience to supply these details. Perhaps I am missing something in the analysis of this situation, and I will be glad to learn from empirical data dealing with the proposals.	Comment noted. See response to Comment W-2A. (Note: The information in the referenced brochure was not prepared by, nor endorsed by, DART. Thus, DART cannot respond to comments regarding information in the brochure).
MC		W-40B	My viewing of the proposed routes suggests that a DART elevated line would avoid an enormous amount of expense (as compared with the other suggested routes) of condemnation of a very large amount of right-of-way land. I can visualize an amount of money to the benefit of the landowners, which would go a long way in financing the elevated line.	The Base Alignment would avoid a significant amount of cost and acquisition as compared to Medical Center Design Options A, B, and C. However, Option D was developed in response to those concerns so that an option comparable in cost to the Base alignment could be considered. The selected UP RR alignment

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				has the least expense and right-of-way acquisition of all alternatives considered. See also response to Comment 34-C.
MC		W-40C	Also, the routing of the proposed alternates completely eliminates the station at the north end of the medical complex, as well as the possibility of an intermediate stop at Inwood Road. If the objective is to serve the very large medical complex, the alternate routes are absurd. If I were going [to an office at UTSW], I would have the choice (under the alternates) of getting off at a more remote Parkland station and walking north on Harry Hines Blvd., or getting off at the proposed Inwood Station, where a walk back west is impossible. If the objective is to serve the medical complex, the only change that makes sense is to create another station near St. Paul.	Comment noted. Under any of the Options, a more extensive bus circulator system would be needed to link the North Campus area to the LRT station. See response to Comment 34-B.
MC		W-40D	Moving the rails all the way over to Denton Drive will serve only to benefit the landowners by increasing enormously the value of the *remainder* of the rather unremarkable property traversed by the alternate routes, not to mention the cash received by those owners for the *condemned* portion. In the mid-19th century expansion of the railroads, landowners would give right-of-way to the railroads because of the increase in adjoining property's value. The scenario here seems to bear some resemblance, but I suspect that the landowners do not plan to give right-of-way to DART.	Option D would have only required use of Parkland property to accommodate the LRT alignment between Harry Hines and Maple Avenue. The majority of the LRT alignment would be located within the DART owned railroad right-of-way. The UP RR alignment through the Medical Center area is DART-owned right-of-way. Parkland property will be required for the Parkland Station bus transfer area.
MC	Jeffrey P. Bishop, M.D., M.A., Dallas	W-41A	I have spoken to Ruben Esquivel at the Medical Center and now understand some of their concerns. They feel that a three-year construction project along Harry Hines, even with the aerial configuration, would be too disruptive to patients, students, and employees. Mr. Esquivel states that all the Medical Center entities wanted the Base Option, but with an underground configuration, which while costly, makes good sense to me.	Comment noted. See response to Comment W-2A.
MC		W-41B	Unless DART Light Rail stations are convenient, faculty will not ride. If the faculty will not ride, students and residents will not ride. Then only the support staff will be riding. If DART does not make riding to the medical center convenient, the perception at the medical center will persist, prompting fewer people to ride. Thus, two stops serving the medical center are really necessary. For this reason, I reluctantly want to support the Base configuration. It will provide more stops and thus increase the convenience of Light Rail to the medical center.	Comment noted. See response to Comments W-2A, W34-C and W40-C.
MC		W-41C	However I fear support for the Base Alignment comes at a significant price. Harry Hines is a major corridor for ambulances and patient traffic in and out of the medical center. And God forbid, it may even be possible that patients or ambulances could get stuck in traffic due to construction. In the short run, we trade traffic problems for better service and fewer cars on the road. Perhaps this is a risk we will have to take.	Comment noted. Construction impacts to traffic would occur under any of the alignment options. The construction method and hospital/DART coordination efforts would seek to limit traffic impacts to emergency vehicles. The majority of emergency access entrances are not located off Harry Hines, but use Medical Center Drive.
MC		W-41D	This brings me to a final chastisement. I wish that DART would have considered an underground option in more detail; this option would have been viewed favorably by the medical center. We would not have our construction-induced traffic problems. Whatever the up-front costs to DART, in fifty years people would have been touting the brilliance of an underground configuration. They will still praise DART with the aerial base configuration but at what cost beyond mere cash? Hopefully, no one will pay these costs.	Comment noted. See response to Comment W-2A.
MC, V	Cheryl Sutterfield, Chief Executive Officer, Dallas	W-42A	The American Red Cross understands the benefits to be gained from the new rail line; however, the current designs will cause an undue and unnecessary hardship on us, the services we provide, and the community. The following are concerns regarding each of the proposed alignments that the American Red	Comment noted. See response to Comment W-2A. DART has received a letter from American Red Cross expressing support for use of the existing UP RR alignment. Thus, none of the impacts listed in the Comment would occur. The responses

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	American Red Cross		Cross would like DART to mitigate: Base Alignment: As currently designed, the base alignment creates no physical barriers to the American Red Cross. The elevated rail line of the base alignment would, however, have a negative visual impact on the American Red Cross.	below pertain to Option D, which was selected by the DART Board prior to changing to the UP RR alignment in April 2003.
MC, T		W-42B	Alternate Alignments A, B, C, D: As currently designed, all have significant and detrimental impacts on the American Red Cross. 1) Both Harry Hines southbound median cuts into the Red Cross will be closed. 2) Southbound access to the Red Cross will require vehicles to pass the Red Cross and perform a U-turn at a median cut north of the Market Center Blvd. intersection. 3) Southbound access leaving our site will require vehicles to turn northbound and make a U-turn at the extremely congested Harry Hines /Motor St. intersection. 4) Northbound traffic lanes and noise are being shifted 30 feet closer to our headquarters building, reducing the distance from the building to the roadway from 52 to 22 feet. The traffic noise of Harry Hines Blvd. would have a significant detrimental effect on the Disaster Operations Center and Call Center. 5) The tunnel entry will be directly in front of the main entrance to the Red Cross.	1) Both existing southbound median cuts would have been closed. Option D was modified to provide for a new median cut providing access to the north side of the American Red Cross parking lot. This median cut would provide joint access to the property immediately to the north. 2) Southbound traffic could have used the proposed median cut described above. Some vehicles currently make the u-turn given sight distance and traffic issues. Another route would be to use Motor, Bengal, Kendall/Macatee, and Harry Hines. 3) Some vehicles currently use this route given sight distance and traffic issues. Southbound traffic could have used the revised design referenced in #1, which also included additional left-turn storage for northbound Harry Hines at Motor to help facilitate this u-turn. 4) The northbound traffic lanes would have been shifted closer. The existing noise levels would not have increased significantly (approximately 1-2 dB). Furthermore, the existing windows in the American Red Cross are highly insulated and would have kept noise levels within acceptable levels. 5) Comment noted.
MC, T		W-42C	We believe that Alternative 1 [Harry Hines Base Alignment] will be less costly than the proposed "A-D" Design Options. It is essential to provision of Red Cross services in the Dallas area and nationally that at least one, or a combination of the alternatives below be implemented to mitigate impacts on the Red Cross: 1) Continue the rail line on the west side of Harry Hines from Market Center to the tunnel entrance, to be located in available right-of-way (ROW) or the parking lot. Several benefits would occur. A) The detrimental impact on Red Cross services will be eliminated. B) The usable Harry Hines Blvd. ROW will be preserved. C) Adding future lanes to Harry Hines Blvd. will remain a viable option. D) Improvement of the Harry Hines /Motor Street intersection will be simplified. E) This alternative is less costly for DART because: a) It eliminates the overhead to enter the Harry Hines Blvd. median. b) It eliminates the cost of re-routing Harry Hines Blvd. to the east to accommodate the tunnel entrance. c) The only offsetting cost is that of relocating the overhead electric transmission lines. Probably only three, and at most five, lines would have to be relocated to the fringe of the right-of-way or even next to the right-of-way of the existing rail line. Preliminary TXU estimates are that the relocation cost of each of these poles is less than $100,000, bringing the total cost of relocation to less than $500,000. Surely the additional costs of overhead rail line and street rerouting are several times greater than this. d) There is an additional benefit if the electric lines are moved to the existing rail line border between Market Center Blvd. and Motor Street since this will be the most direct route to the point of termination on the West side of Children's Hospital and the rail line. It will also be the first step of relocation of the entire electric line off of the Harry Hines right-of-way. To mitigate the impact on a critical service for the community and to ensure the least costly route is selected, it is imperative that DART design and cost out this alternative.	Cost estimates indicate the cost of the Base Alignment is about the same as Design Option D and less than Options A, B or C. Regarding possible mitigation associated with Option D: 1) The median alignment to the tunnel entrance for the Design Options makes the best use of public right-of-way, maintains access to properties, and minimizes right-of-way acquisition. Moving LRT to either side of Harry Hines would greatly reduce access and increase impacts to property. See also response to W-42B. Moving the rail line to the west side would not eliminate the overhead section, which is required to cross over Market Center Boulevard. Portions of Harry Hines would still need to be relocated to accommodate the tunnel entrance, or additional right-of-way would have to be purchased. Shifting the line to the west using the parking lot as suggested would add at least $7 million to the project, not including right-of-way costs. Relocating the overhead electric lines to the DART owned Trinity Railway Express Commuter Rail right-of-way could limit DART's ability to expand that rail service. Although the cost would be $100,000 per pole, that cost does not reflect property that would need to be acquired to relocate the poles outside of the DART right-of-way. The median alternatives were developed to make the best, most cost-effective use of public right-of-way while minimizing property acquisition and impacts.

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			2) Shift the Harry Hines roadway to the west side of the ROW. 3) The relocation of the tunnel entry further south to permit a southbound median cut and entry in to the Red Cross. This alternative will: A) Reduce, but not eliminate the impact on Red Cross operations. B) Only be slightly more expensive than Med. Ctr. Design Option "D". C) Permit a more effective design of the already congested Harry Hines/Motor St. intersection.	2) Shifting the Harry Hines roadway to the west side of the ROW would necessitate relocating the TXU overhead lines and affecting private property. The median alternative is the most cost-effective use of the public right-of-way. 3) See response to W-42B.
T		W-42D	Due to the significant impacts to the Red Cross, we would like to be an active participant in the traffic flow planning for Harry Hines Blvd. between Market Center and Motor St.	DART will include the American Red Cross in traffic control plans and construction coordination efforts. This has been incorporated into the Final EIS (see Sections 5.12.5 and 5.12.7). Impacts are minimal with the use of the UP RR as the selected alignment.
G	Harold Abbey, Dallas	W-43	DART rail must be extended to Lewisville, Lake Dallas, Corinth and Denton-UNT. I 35 is a disaster. The population will continue to explode north. Same for Hwy. 75 to McKinney.	Comment noted. See response to Comments W-7 and W-29.
G	Roderick Arthur, Irving	W-44	Anything that DART can do to reduce traffic in the Metroplex is OK with me, to include running a rail through my backyard.	Comment noted.
S	Merle Ireland, Irving	W-45	I would love to go into town from driving to the public library on Young Street. After looking at the location of the Irving DART station I knew it would not be a safe place for me or my car. I will never ride DART until there are stations in safer neighborhoods.	Comment noted. DART strives to make each station safe regardless of its location by using Transit Police to patrol stations and trains, and designing the stations to enhance security and safety. Section 5.11 of the Final EIS addresses Safety and Security.
G	Julie Morrison, Dallas	W-46	Extend the line to Carrollton as fast as possible – and then get started on the next one.	Comment noted.
ROF	Alice Jumper, Dallas	W-47A	I strongly support DART building its new operating facility at Denton Drive and Lombardy. This seems to be the only choice where there is enough area to allow for the future expansion which will be needed as Dallas grows. This area is already zoned industrial and is full of vacant properties. I believe this would be a good use for that area. I think you can make the facility more acceptable with good landscaping around it.	Comment noted. See response to Comment W-24.
LF		W-47B	I also believe you should go ahead on the route to Love Field. I look forward to having all the light rail service to this area. Thank you.	Comment noted. See response to Comment W-6.
LF	Phyllis Silver, Dallas	W-48A	It is important that Love Field service be worked on immediately. Service to and from the airport is vital to the region. Although it is an expensive piece of the rail line, costs will only go up and tabling it will make the project more expensive in the long run.	Comment noted. See response to Comment W-6.
MC		W-48B	I support the Base Alignment at the Medical Center. This alignment would serve the majority of people and it would make the transportation available to those who need mass transit the most. If there continues to be opposition to the rail alignment, my second choice would be Option D.	Comment noted. See response to Comment W-2A.
MC	Henry Ash, Dallas	W-49	I favor Plan D (Option D). It will decrease air pollution. It will vitally help transit-dependent job holders and patients for medical facilities at Parkland Hospital. It will help people going to Love Field and cut down on area traffic at peak times. My analysis of favoring Plan D has come from my experience in working in this specific area for 52 years. As a property owner Plan D will also cost a projected $22 to $25 million less than the other three plans.	Comment noted. See response to Comment W-2A.
V, NV, S	E. M. Cantrell, Farmers Branch	W-50	I'm not in favor of the DART rail coming so close to my house. The pollution is bad enough – let's not add to it. It will bring many undesirable people into our area. Besides the noise.	Chapter 5 of the Final EIS discusses the environmental consequences of the project. As designed, the LRT project would be approximately ¼ mile from your home and would not

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				impact your home. In terms of air quality, the LRT is electrically powered and will not contribute to air pollution. Localized traffic access to LRT stations could affect air quality but based on the air quality analysis in the EIS no air quality violations are expected as a result of the project. It is unlikely that the project will bring "undesirable people" into your area as you indicate. See response to Comment W-45 regarding safety and security. No noise impacts are projected in your area due to LRT.
LF	Laura Swan, Bloomfield, CT	W-51	Serve Love Field! Thousands of workers there, and all those passengers, would benefit enormously. I work for Southwest, and would love such a convenience when in Dallas.	Comment noted. See response to Comment W-6.
G	Ann Gant, Dallas	W-52	I was not able to make your public forum. Do you plan to have rail service to Carrollton? Tell me about changes to the Medical Market Center area.	Comment noted. The LRT Line will provide service to three stations in Carrollton. Chapter 2 of the Final EIS includes project information related to Carrollton as well as the proposed alignment and stations in the Medical/Market Center area.
M	Fred Reyna, Irving	W-53	Trinity Railway Express service on Sunday would be good. AM TRE is full of riders from Arlington when it gets to South Irving. No seats are available for Irving taxpayers.	Comments noted. However, they are outside the scope of the EIS for the Northwest Corridor LRT Line project and have been forwarded to DART Commuter Rail staff for consideration.
G	Isaac Cajina, Farmers Branch	W-54	Me parece muy conveniente que la línea del tren eléctrico tenga varias estaciones de parada a lo largo de su curso desde el "downtown" hasta Carrollton. Estoy seguro que esto traerá muchos beneficios a la comunidad y por supuesto al medio ambiente porque todos vamos a usarlo tan pronto comience a funcionar. Esperamos sea pronto. Gracias. [Translation: It appears to me very convenient that the LRT line has various stations the length of its route from downtown to Carrollton. I am sure that this will bring many benefits to the community and of course to the environment because we are all going to use it as soon as it begins service. We hope it will be soon. Thank you.]	Comment noted.
G	Margarita Umanzor, Irving	W-55	I think that DART is doing a good thing by putting the railroad in those locations because it will be less using my car and filling it up with gas. More DART. Thank you for your concern.	Comment noted.
M	Bill Frey, Albuquerque, NM	W-56	No rest rooms - -what the hell you people thinking?	Comment noted. DART Board policy is to include rest rooms at Transit Centers, where wait times may be longer than at LRT stations.
LF	George R. Edwin, Irving	W-57A	I am sorry that I am not able to attend any of the hearings but my comments are as follows: A) We must have a rail connection to Love Field.	Comment noted. See response to Comment W-6.
MC		W-57B	B) A UTSW is very important. I hope this alignment can be resolved for all sides. Cost is still very important.	Comment noted. See response to Comment W-34C.
M	Joyce DeHaven, Dallas	W-58	I represent the 500 families that live in the Sparkman area. It is bounded by Webb Chapel on the west, Royal on the north, Marsh on the east, and Timberview on the south. As a community we are very interested in knowing what type of retail is being planned for the Denton Dr. – Royal Lane station. As a community we would like to see retail in as much of that area (along Royal all the way to Brockbank) as possible. How do I find out what retail is being planned?	Comment noted. DART is only developing the LRT station; no additional development is planned by DART. The City of Dallas has been working to develop an Asian Trade District in that area and can provide additional information regarding zoning and possible redevelopment opportunities.
G	M. Scott Heimer, Dallas	W-59A	As with cities having sister cities, DART should have the V.O. R. in Vienna, Austria as its sister mass transit organization for the Northwest Corridor and all other rail projects and design issues. Vienna has the best mass transit system in the world and would be an invaluable resource to model our (DART, DFW,	Comment noted.

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			Texas) design, growth, and operation on. Cover DFW and Texas with rail, for us, the people. If you build it, they will come… and ride it!	
MC		W-59B	I favor the Baseline hospital extension because hospital access is the most important and it would only help their customers, we the people.	Comment noted. See response to Comment W-34C.
LF		W-59C	Love Field must be serviced, whatever the form.	Comment noted. See response to Comment W-6.
ROF		W-59D	Rail Yard # 3, Lombardy/Denton is most favorable.	Comment noted. See response to Comment W-24.
V, NV	Farmers Branch residents: Mr. And Mrs. Al Paul Mr. And Mrs. James Woods Mr. And Mrs. Rand Bennett Mr. And Mrs. Richard Chaney Mr. And Mrs. Frank Sota	W-60	These comments are related to the area between Sta. 554+50 (Farmers Branch Ln.) and Sta. 564+00 (Sable Lane) in Farmers Branch. This area of the proposed project borders the west boundary of Gussie Field Watterworth Park and the residential property to the east. Profiles and cross-sections indicate the new track will be 4-5 feet higher and some 40 feet east of the old track alignment. Most importantly, the natural screen that now exists will be removed. This "natural screen" of trees and dense brush has shielded the neighborhood from the influences of the I35E freeway. The traffic sight and sound, and to some degree the pollutants have been screened away to a significant extent. Removal of this barrier will certainly have an adverse effect on this park and the surrounding neighborhood. As a remedy for the loss of this benefit, an effective soundwall should be considered in the design of this area as well as natural cover along the wall. Several concerned neighbors all agree that removal of the screen and opening up the area to the activity and noise to the west will be detrimental to the community. Please incorporate a screenwall in to the final design along this environmentally sensitive area.	Based on preliminary floodplain information, the LRT alignment will need to be raised in this area. In order to keep streets such as Farmers Branch Lane and Buttonwood open to Denton Drive, the LRT alignment must be moved over to the east to minimize reconstruction and allow for adequate grades for the streets to be raised to the LRT profile and then brought back down to match Denton Drive. The EIS and preliminary design reflects a worst-case scenario; during Final Design, detailed hydraulic analyses will be conducted which may reduce the profile of LRT through this area. The LRT alignment and the construction of the alignment will take place within DART right-of-way. Some vegetation within the DART owned ROW would need to be removed to accommodate the LRT. DART will maintain as much vegetation as possible and will not affect vegetation outside of the ROW. If necessary, additional vegetation can be provided (see Section 5.6.2). Section 5.4 of the EIS contains the noise analysis. Based on a noise measurement at Sta. 556 near Farmers Branch Lane, there will be no noise impacts in this neighborhood and no soundwall is necessary. DART does place chain link fences along the ROW lines where train speeds exceed 45 mph, which applies in this area.
AD	S Beltran, Dallas	W-61	Is it true that you're trying to put a DART station around my property, and how come I never received anything on this? What will happen to my property? I don't want to sell it. Why did you pick this particular subdivision?	The subject property is proposed for acquisition to accommodate the Carrollton Square Station north of Belt Line Road. DART makes every effort to notify interested residents and property owners through mailings, newspaper notices and web-site information. DART follows the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (see Acquisitions, section 5.2.2 of the Final EIS). It is DART's policy that displaced persons or businesses shall not suffer unnecessarily as a result of programs designed to benefit the public as a whole.
G	Scott Heimer, Dallas	W-62	The commenter provides many ideas for improving public transit within the DART service area as a whole and indicates that a mass transit system with rail as its base and largest asset is only a WIN WIN situation for all involved.	Comments address public transit within the DART service area in general and are not specific to the scope of the EIS for the Northwest Corridor LRT Line project. Comments will be forwarded to DART 2030 System Plan staff and the marketing/communications department for their consideration.
G	Philip Dybvig, Dallas	W-63A	Map enclosed. [Suggested LRT connection shown from Bachman station on west to Plano line and to White Rock station on Garland Line. Future extension to Irving/DFW and to Grapevine also shown.]	Comments noted. However, they are outside the scope of the EIS for the Northwest Corridor LRT Line project. Comments will be forwarded to DART 2030 System Plan staff for their consideration. See response to Comment W-27.
T		W-63B	NO SIGNAL CROSSING All stations ground level. Go up Harry Hines to Bachman then up Denton Dr. on to Frankford and north.	Comment noted. DART determines the need for grade separations based on traffic warrants and based on other safety, environmental and design constraints in order to develop

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				a cost-effective design. In addition, the use of Harry Hines north of Mockingbird to Bachman was examined during the Major Investment Study (MIS) and was dropped from further consideration based on technical analysis and public and agency input.
LF		W-63C	Do not go under runways at Love Field.	Comment noted. In order to avoid conflicts with airport operations the alignment must go under the runways, or an alternate route must be used. See response to Comment W-6.
NE	Nancy Feaster, Dallas	W-64	Attached is a copy of the flood plain map dated November 1982 I received from the city of Dallas. The dark line on the map shows the inundation limits for the area of DART's proposed Inwood Station. I have marked the Sadler Circle lot addresses from 5719 to 5737. The lot at 5737 Sadler is now a parking lot, which probably has already changed the inundation limits to a small degree. On Sadler I own lots 5719-21 (our current office site) and 5731—33-35 (our proposed office and shop site). The latter lots are all on the slate to be a parking lot along with the lots facing Inwood Road. All this new impervious surface area will dramatically change the inundation limits due to new run off. This in turn will change the inundation limits on my current office site at 5719-21. According to the map, 5719 is already almost 75% in flood plain and 5721 is right on the line. The EIS seems to address the flood plain with regard to the actual rail line, but not regarding new impervious surfaces and their impact. What are DART's plans regarding the impact to the 100 year flood plain in this area? Has this been researched and taken into account and made part of the proposed budget for the Inwood Station? Maybe these issues will be addressed at the Board meeting on Tuesday.	Section 5.9 of the EIS describes impacts and mitigation related to water quality and hydrology. Section 5.9.1 specifically addresses surface water quality due to new impervious surfaces and describes the permits that must be obtained prior to construction in order to reduce or minimize any potential for pollution. DART must comply with all FEMA and City of Dallas requirements regarding development in the floodplain. This will be addressed in final design. The relocation of the Inwood Station to south of Inwood Road will minimize any impacts related to run-off or to changes in floodplain limits.
M	Nancy Feaster, Dallas	W-65	Attached is a photocopy of the surveyor's business card left with one of the neighbors. The handwriting is the surveyor's. If he wasn't working for DART, he certainly was giving a good impression that DART was his client.	Comment noted.
AD	Nancy Feaster, Dallas	W-66	I don't think I have conveyed to you in writing my plans for 5731-35 Sadler Circle. The property was bought with the express purpose of building our construction office and wood shop. The lots had a condemned house and out building which had to be removed. We have done clearing of debris, poison ivy growing up tress, removed tree suckers, and trimmed dead branches. We have had the water and sewer hooked up. We have an architect drawing plans (we have received the preliminary drawings). I know the neighborhood is commercial, but with the mature trees, birds singing and feeding you feel you are in the country.	Comment noted. Based on comments received during the Draft EIS comment period, DART re-evaluated the use of your property and other properties north of Inwood and developed a station option south of Inwood Road. This station option was presented at a public meeting on April 3, 2003, and a public hearing on April 10, 2003. The DART approved the station location change on May 13, 2003.
T	Nancy Feaster, Dallas	W-67	I have talked with several Love Field parking lot owners/managers and they express dismay that the City of Dallas is spending $70,000,000 to build a new parking garage and then allow DART to build a free to the public parking area probably less than one mile away. They feel as I do that the Inwood Station will be used by Love Field daily commuters.	Comment noted. Please see response to Comments W-2A (regarding Medical Center alignment) and W-6 (regarding Love Field). Transit riders desiring to go to destinations such as Love Field, the Medical Center or downtown Dallas can park at any of the LRT stations on the DART system at no cost and buy a ticket to ride the train. DART does sign stations that parking is for DART patrons only and no overnight parking is allowed.
LF	Richard A. Schumacher, Dallas	W-68	Is there time to consider another option for light rail service into Love Field? It could cost about half as much to build as the direct option while providing nearly the same level of service. It also uses a below-grade open-air LRT station, but sited on the existing rail ROW on the west side of Denton Drive, immediately adjacent to Love Field rather than inside the field. An underground automated people-mover would pass under Denton Drive and the runways to connect the	Appendix E to the EIS includes a summary of Love Field access alternatives examined during the PE/EIS phase of the project. One of these alternatives was a people mover option. Once systems costs and station costs are included with the tunnel construction costs, the total cost can range from $100-120 million, depending on the technology and level of service. See

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			LRT station with one or more stops at the Love Field terminal. Except for the LRT station itself the rail line would remain at-grade (as in the base alignment). The currently planned Brookhollow LRT station could remain unaffected, or possibly the two stations could be consolidated. The tunnels required for the people-mover would be about half the total length of the direct service rail tunnels, and so should cost about half as much to build. The people-mover could be a tram system similar to the ones used between terminals in Denver, or a "horizontal elevator" like the one now planned to connect the terminal and the remote parking structure at Minneapolis/St.Paul. The below-grade LRT station would provide the same look and feel of direct terminal service. This option might even be more convenient because it might be possible to place the people-mover stops closer to the terminal than the infield. (Putting the people-mover stops beneath or inside the terminal would be most convenient; that may require a security checkpoint for passengers before boarding the people-mover at the LRT station. Finally, putting the Love Field station on Denton Drive would also provide better service to the adjacent area southwest of Love Field and thus enhance development opportunities there. The city would be responsible for all the maintenance and operating costs of the people-mover, but the city would also have to bear some or all of the ongoing costs of a Love Field shuttle bus service if the direct LRT option cannot be built. A people-mover would be fast and more comfortable than a shuttle bus on the street.	response to Comment W-6 regarding alternative rail access into Love Field.
MC	Ron J. Anderson, M.D., Parkland Health and Hospital System	W-69A	As you are probably aware, DART is currently planning future rail service to the Harry Hines Medical Corridor. We are excited by its potential to provide better access to world-class medical care, promote economic growth and present nearby neighborhoods and businesses with reliable rail service. DART's initial plan called for an elevated light rail line down the middle of Harry Hines. For several years now, representatives from Parkland Hospital, Children's Medical Center, St. Paul University Hospital, UT Southwestern Medical Center and Zale Lipshy University Hospital have been unified in our concerns with this proposed elevated route and voiced our thought with DART staff. We are concerned that the elevated line would split the Medical Corridor in half, threaten our ability to provide quality medical care, and interfere with planned additions to the Medical Corridor and the creation of a bio-tech center, jeopardizing future medical research and billions of dollars in economic impact. *(Letter also signed by George D. Farr and David W. Biegler, Children's Medical Center of Dallas; Donald R. Smithburg and David W. Quinn, St.Paul and Zale Lipshy University Hospitals; Kern Wildenthal, M.D. UT-Southwestern Medical Center; Maurine Dickey, Dallas County Hospital District; W. Plack Carr, Jr., Southwestern Medical Foundation)*	See response to Comment W-2A and W-34C. DART understands the concerns of the Medical Center. Based on experience of the system in Dallas thus far, DART has not determined that LRT would threaten the ability of the Medical Center to continue to prosper and provide quality medical care.
MC, T		W-69B	There also is apprehension that construction of the elevated route will interfere with the ability of doctors and nurses to provide the best medical care possible and limit access by our patients to vital medical treatment.	See response to Comment W-2A and W-41C regarding emergency access and coordination to address potential short-term construction impacts.
MC, NV		W-69C	In addition the elevated route would pass within a dozen yards of operating rooms and intensive care units, thus disturbing gravely ill patients and their visitors.	See response to Comment W-2B regarding the noise analysis.
MC		W-69D	For several years now, representatives from each hospital in the Medical Corridor have worked with DART staff to develop the safest and most reliable rail service. As a result of our concerns, and those of other community and business leaders, DART is now considering alternate route 3D – a proactive effort by DART that should be applauded. At a cost similar to or less than the	Comments noted. See response to Comment W-2A and W-34C.

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			proposed route elevated above Harry Hines, route 3D would protect our ability to provide quality medical care and allow hospitals along the Medical Corridor to continue withy expansion plans. According to DART staff, route 3D would have higher ridership levels and would not delay rail service to Irving, Farmers Branch and Carrollton. In addition, route 3D provides our current shuttle service the opportunity to transport patients and hospital staff from the proposed 3D rail stop to facilities throughout the Medical Corridor by utilizing side streets and preventing additional congestion along Harry Hines. Based on the benefits we have detailed, we strongly believe alternate route 3D would best serve the Medical Corridor, one of the region's leading social, medical, and economic areas. As concerned physicians, hospital administrators and trustees throughout the Medical Corridor, we are writing to you as one voice. Our ultimate goal is to develop rail service that will promote economic growth, ease traffic and help physicians and nurses continue to provide the best patient care possible. DART's staff should be commended for working with us to accomplish this objective. As you ponder your impending decision on DART rail service to the Medical Corridor, we wanted you to be aware of our concerns and thoughts and welcome any questions or comments you may have.	
AD	Michael L. Geller, Dallas	W-70	I represent the owner of the above-noted location [2681 Royal Lane]. I understand that a DART rail station is proposed for the intersection of Royal and Denton. Please advise how I or my client can be assured of notice of all activity that may affect his property.	Comment noted. Your contact information has been forwarded to the DART Community Affairs Department for inclusion on the contact list for the project.
MC	J. C. Cobb, Copper Canyon, TX	W-71A	My friends and family strongly support the proposed Northwest rail project. With regard to the Medical Center options, we support Option D.	Comment noted. See response to Comment W-2A.
ROF		W-71B	With regard to the Northwest Rail Operating Facility, we support the Lombardy/Denton option.	Comment noted. See response to Comment W-16C.
G	Amber Brown, Grand Prairie	W-72	I strongly think that the DART should be traveling down by Arlington and Grand Prairie.	Comment noted. See response to Comment W-7; Arlington and Grand Prairie are not member cities of DART.
T	Dennis White, ACM	W-73	I am Dennis White, General Manager of Architectural Carpentry Materials on Denton Drive. Recently we received information about the proposed DART rail through our area. It has come to our attention that you may be intending to remove the spur on Denton Drive according to map Location 144+00. We use this spur on a regular basis for our business receiving building materials. We learned this through another business in our area. We are unable to find any notice the DART sent to use advising that they intend to remove our spur. Removing this spur would increase the cost of our materials if we have to unload the railroad cars from remote locations and haul them via truck from car location to our lumberyard. We did not receive notice of this intent to remove our spur until after all the public hearings had been held. We would appreciate your contacting us immediately as we know you have a Board meeting scheduled for July 30, explaining why we not notified and whether there is something we can do to have the Board review this decision to remove our spur.	See response to Comment W-61 regarding outreach efforts. DART has met with ACM and is discussing options to replace freight rail service. Maintaining the freight line and spur in this area would result in major impacts and/or acquisitions of additional real estate north of ACM. The selected option will be negotiated during final design.
V, NV	Susan and Richard Chaney, Farmers Branch	W-74	As homeowners in Farmers Branch, we are concerned as to the amount of trees that may be destroyed to make room for the DART rail tracks. The west side of our house borders on Bee Street, between Farmers Branch Lane and Danny Lane, just a half block outside the main entrance to the Farmers Branch Historical Park. Do you know if a tree line will be left between the rails and this short stretch of Bee Street? Also, are any barriers, such as fences, planned for noise abatement?	See response to W-60.

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MC	John Rader	W-75	I support Option D for the LRT station and alignment at Parkland Hospital. This option gives the hospital district the most room for expansion and planning.	Comment noted. See response to Comment W34-C.
MC	Homer Rader	W-76	I am in favor of Option D in the Medical Center area.	Comment noted. See response to Comment W34-C.
MC	Elizabeth Rader	W-77	I support Option D for the LRT station at Parkland Hospital. It's the least disruptive and the most economical route.	Comment noted. See response to Comment W34-C.
WRITTEN COMMENTS RECEIVED in APRIL 2003 ON SUBSEQUENT PROJECT CHANGES IN THE MEDICAL CENTER AREA.				
NV	Mr. & Mrs. Joe R. Saucedo, Sr., Dallas	W-78	Do not want or need near our house. We live ½ block (where it will cross to Inwood Rd) on 2800 block of Cherrywood Ave., its enough with the Love Field air planes passing over our house. We do not need more noise. Why can't it pass on Maple Ave to Mockingbird Lane where its business. Not so close to residential.	DART conducted a noise analysis following federal guidelines and no noise impacts were identified for any residences on Cherrywood Street. This is primarily due to the high existing noise levels in your area due to the airport, and traffic on both Denton Drive and Inwood Road. Because the station will be elevated and the train will cross over Inwood Road, the train will only use bells when entering or leaving the Inwood Station. The LRT is proposed along this area because DART owns the existing railroad right-of-way along Denton Drive. Insufficient right-of-way on Maple Avenue would require excessive property acquisitions if the LRT were to use that street.
S	Daisy Soockar, Dallas	W-79	I oppose the DART station at Inwood & Maple. It is so congested. What's going to happen at school zone time? Too close to all the schools on Inwood. I suggest you get here at that time and see for yourself. Record Crossing by Harry Hines has a large vacant land there that would be better. Park and Ride train at school zone time? Think again! Kids are going to get killed at that time, too close to all the schools.	Based on the traffic analysis completed for the Inwood Station, future traffic conditions will already be at capacity with or without the LRT station. Traffic will still be required to adhere to "school zone" speed limits. The station is diagonally across from Rusk Middle School but is not adjacent to the other two elementary schools near Maple and Cedar Springs. Furthermore, the LRT alignment will be elevated through this area to minimize safety conflicts between the train and pedestrians and automobiles. The Medical District did not support previous alternatives that included a station near the UTSW North Campus area in the area of Record Crossing and Harry Hines.
M	Veronica Lopez, Dallas	W-80	I do not think this is a good idea. This means the taxes where I live will go up. I cannot and do not agree that this is a good idea. This part of town is already crowded. Why make it more crowded? It may be convenient for others but if they were in my place they would disagree. I will protest all the way and will not agree to this railroad. The economy is bad enough and these people make it worse.	The proposed project will not result in a tax increase. When DART was established in 1983, a 1% sales tax from each of the DART member cities, including Dallas where you live, was approved to help fund DART. While the proposed park-and-ride lot at Wycliff Avenue will increase traffic, particularly during the peak hours, there will be limited effects on Hondo Street on which you live, north of Wycliff. Primary access to the parking lot will be from Wycliff Avenue, with a secondary access point off of Vagas Street.
G	Crae Hillman, Plano	W-81	I have been commuting to work since the rail opened at Parker Road in Plano. I am overwhelmed by the great job by everybody at DART and cannot wait for this next extension to open. Please approve all the proposed changes to save money and get this done as fast as possible. Denton Drive and Inwood Station is what I need.	Comments noted. See response to Comment W-92 regarding schedule.
G	Robin M. Babcock, Carrollton	W-82	The proposals are fine with me. Good Job!	Comments noted.
G, MC	T. Meisenheimer, Carrollton	W-83	Use the resources of the area. Make it friendly to the: (1) pedestrians with short bridges, short tunnels, stations close to the bus stations; (2) To the businesses (retail/restaurants) avoid obstructing their view and access, give them some free advertisement on your rails or other better locations, connect to the downtown underground? (3) Parkland, their own bus/Dart Bus?, connections to tunnel.	DART strives to make the system pedestrian friendly. A pedestrian bridge (from park-and-ride to station) and pedestrian underpass (from station to Market Center) are proposed only at the Market Center/Oak Lawn Station. All stations include adjacent bus transfer areas.

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				DART also strives to maintain good visual access to businesses, and access is maintained or modified if necessary to ensure that business access is retained. Relocation is only offered if the property must be acquired and displaced. The connection to downtown will be via the existing surface transitmall. A future underground connection will be examined in the future as a possible way to add capacity in the downtown area. The Medical Center is also considering a fixed guideway "campus connector" that could link all the medical facilities, including a stop at the Parkland LRT Station. In addition, DART plans to operate a network of 10 feeder bus routes at the station.
MC	Lynne Dees, Dallas	W-84	This will make train change between TRE, and the light rail to Carrollton/Farmers Branch fairly difficult. As it is now, you could walk from the Medical Market Station on TRE to the Motor Street Station. Access to Parkland, St. Paul/Zale will be farther away from the light rail stop.	Transfers between the TRE and the LRT can take place at a joint platform at Victory Station, just north of downtown. There will also be buses that will link the TRE Medical/Market Center station to the proposed Parkland LRT Station. The Parkland LRT station will be within ¼ mile walking distance to the existing Parkland Hospital and Zale Lipshy, and will be closer to the new Parkland facilities planned east of Harry Hines Boulevard. St. Paul is not within walking distance to the LRT station on Option D or the UP RR, so bus access would likely be required. The Medical Center is also considering a fixed guideway "campus connector" that could link all the medical facilities, including a stop at the Parkland LRT Station.
T	Chris Stanley, Carrollton	W-85	Yes, I support the changes, especially the bridge over Maple. It will help keep traffic moving.	Comments noted.
T, MC	Joseph Jacob, Carrollton	W-86	It's a matter of great concern why we have been given least priority in the construction of the light rail and other services DART provides to other communities. It didn't surprise me why Farmers Branch tried to pull out of DART last year. Several hundred people drive to Parkland everyday since there is no direct public transportation to the medical center. Hope you will consider the need before you make any final decision.	Comments noted. The proposed project changes will provide direct public transportation to Parkland hospital from Farmers Branch.
MC	Louise Edlund, Dallas	W-87	I recommend using existing DART-owned UP railroad right-of-way rather than Option D. It's also important to have a station close to the Medical Center where about 30,000 people are working. In addition DART would help transport students to and from the center. Not mentioning patients to the hospitals are also important. A station next to SMC Would help even them.	Comments noted. A station is proposed at Motor Street and the UP RR to serve the Medical Center. The Medical District did not support previous alternatives that included a station near the UTSW North Campus area.
G	Lee Skinner, Carrollton	W-88	Apparently, this is one more efforts to raise more money for DART. There is nothing about DART that I like and I never intend to use. You have spent enough money to have a state –of-the-art transportation system and you are still running empty busses and inflating your budget astronomically. I will not support such an inefficient system with such high paid executives.	Comments noted. DART does not raise money, but is funded in the most part through a 1% sales tax from its 13-member cities. Budgets are not inflated, but reflect the estimated actual cost to build the LRT system.
G	Charles Rubens, Dallas	W-89	Anything to save money. When will it get service to 635? I live at Royal Lane and Harry Hines. I hope soon.	Comments noted. The proposed station near Royal and Denton Drive in your area will likely open by 2010. This is based on a potential two-year delay to the LRT expansion, and is subject to change based on the economy and DART's sales tax receipts.
LF	Mario Gonzales, Dallas	W-90	The proposed alignment is agreeable to me. My main concerns/comment is that the NW Corridor will not be successful without a stop directly at Love Field. Without this, you would not get traffic from downtown and would lose potential revenue to taxi cabs. An off-site stop with shuttle service will a work as	Comment noted. See response to comment W-6 regarding Love Field.

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			effectively as a stop at the terminal.	
G	P. Rosemann, Dallas	W-91	I think that the use of an existing rail line is very wise – why not explore resources already in place instead of spending money on new construction.	Comment noted.
G	Fay Osborn, Carrollton	W-92	I encourage you to do all that is possible to get train service to Carrollton quickly. I feel we have been left out. Use existing UP right –of- way. Station changes ok.	Comments noted. DART is committed to providing LRT service to Carrollton as soon as possible within the financial constraints. Currently, a potential two-year delay to LRT projects means that LRT service to Carrollton would open in 2010. This is subject to change based on the economy and DART's sales tax receipts.
G	Deborah Martin, Carrollton	W-93	Please build the rail line as far north as the Carrollton Park & Ride on Trinity Mills and start going west to Las Colinas. I can't wait to see the progress. You're doing a great job so far.	The proposed project will include an LRT station at Trinity Mills, as well as one at Frankford Road. The next phase of LRT expansion is a branch from the proposed Bachman Station near Northwest Highway to Las Colinas and DFW Airport.
T	Dynasty Consolidated, Inc., Dallas	W-94	We agree with the proposed DART change to use the UP rail that is in place. We just request that the construction not interrupt our business. We use Kendall Drive regularly so we ask that the construction of the rail across Kendall Drive not shut down the entire street, especially during business hours.	The proposed LRT line would cross over Kendall Street on aerial structure. While there may be temporary construction impacts, DART will coordinate with adjacent property owners to ensure that Kendall remains open or that suitable alternative access is available.
MC	Muthu Seshadri, Carrollton	W-95	Option D alignment is welcome as it will be convenient for persons who want to visit hospital.	See response to Comment W-2A. The proposed station on the UP RR alignment will also be convenient to Parkland Hospital given their expansion plans east of Harry Hines towards the LRT line.
G	David Medeiros, Fort Worth	W-96	The Medical District stop should be as close to the hospital(s) as possible to accommodate the handicapped and the extremely ill access to medical care with the lease amount of effort. Keep expanding please. Makes the metroplex more user friendly. Public transit is never a draw back to economic growth – Remember NY, Chicago, Philly, and Washington, D.C.	Comments noted. The proposed Parkland LRT station at Motor and the UP RR will be within closely proximity to new facilities planned by Parkland. Those unable to walk to other facilities in the area may use shuttle service.
MC	Sidney F, Rowland, Jr., and Jeanette Rowland, Dallas	W-97	We believe that it would be more cost efficient to use the existing Up railroad line owned by DART. Also, we have no objection to changing the park and ride stations.	Comments noted.
MC	Stephen G. Turner, Dallas	W-98	While I still feel that the base alignment down Harry Hines to Exchange Park did a better job of serving the public for LRT, I will support the changes proposed in the April 3rd community meeting. I support the moving of the line back to the Dart owned ROW at Wycliff and moving the station south of Wycliff and making the LRT elevated until it passes the Inwood Station. I approve of the dropping of Option D and placing the elevated station above Motor Street, and moving the Inwood Station to the south side of Inwood.	Comments noted. See also response to comment W-2A.
AD, NV, M	Tom Bright, Southwestern Gage, Inc. , Dallas	W-99	Unfortunately, 3 minutes was insufficient time at last night's Public Hearing to cover all my points. So, I wish to add these comments: 1. We did not object to the initial revised proposal presented at the Public Hearing on August 27/02 because it called for the station to be built north of Inwood Road, and for our property to be expropriated. Although this required us to move, it meant we could remain in business, because we would move to a location, which would not be buffeted by trains and construction. As I mentioned in last night's meeting, our equipment measures to 1 millionth of an inch, and it cannot be vibrated during the measurements, or the readings will be invalid. Presently, we have one train per day passing our building, and we know about when, so we are careful at that time.	1.Your company will still be able to remain in business and will avoid relocation with the station located south of Inwood. We have included potential mitigation in Section 5.5 of the Final EIS for your property. A detailed analysis will be done on your property during final design to determine if mitigation is necessary based on the layout of your equipment, or if other types of mitigation are more appropriate.

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			2. Our business requires unfettered access to the back by transport trucks. I am concerned that they will not be able to use the only entrance to the back of the building. Also, the entrance onto Saddler Circle from Inwood at Denton Drive is likely to be blocked by a support pillar. We need access for these trucks onto Saddler Circle (and entering further south on Inwood makes for a near impossible turn on Saddler for these trucks). So if the station is not moved back to our property, and we must try to operate from this location, we think DART's suggestion of opening Saddler Circle up to Denton Drive is the only reasonable alternative.	2.The LRT project will be located within DART right-of-way and will not directly affect your property. Thus, access to the back will remain. You will still have access from Sadler Circle off of Inwood even if the entrance closest to Denton is closed. We will also explore the option of opening Sadler Circle to Denton Drive should Sadler Circle near Denton/Inwood need to be closed. This improvement would enhance access to your property.
			3. I am concerned about the mess that will be left under the overhead tracks, next to our property. When one looks at the Line running up Greenville Avenue my concerns seem to be valid. Also, when the tracks belonged to the Railroad company, they kept the right away clean and the weeds cut. Since DART has acquired the ownership, nothing is done, and garbage accumulates and the weeds abound. So, I would request bushes, etc. to beautify the area between our property and the tracks (really the track supports).	3. Dallas Garland Northeastern Railroad, who operates on the DART owned right-of-way is responsible for maintenance, although DART does assist at times. Once freight is removed from this area, DART will maintain the right-of-way and landscaping. DART has a “betterments” policy for residential areas only. However, during final design, DART will examine the use of climbing vines or other vegetation to soften the view of the structure next to your property and minimize the potential for graffiti.
			4. At the meeting on April 3/03 you stated that there was no cost differential between building the Inwood station on South side as opposed to the north side. That being the case, and with comments from the engineering staff that it would be preferable to put the station north of the Inwood Road, I don't understand the reason for the change.	4. At the April 3, 2003 meeting it was stated that no detailed cost comparison had been completed but that they were probably similar in cost. Since that time, we have completed a more detailed cost comparison, which indicates the north side could cost approximately $2 million more. The change was also proposed to minimize business displacements and reduce potential effects on Rusk Middle School, a National Register of Historic Places eligible resource. From an engineering and design standpoint, there are no significant differences between the two sites.
			5. Building the Inwood Station south of Inwood Road will likely drive two companies out of business because of problems with putting us next to the tracks because we do our business at this location. Building north of Inwood will not affect the business south of Inwood because it is essentially storage for them, and they do their landscaping elsewhere.	5.The proposed project should not impact the ability of any of the businesses to continue with business as usual. Placing the station on the north side would have directly impacted six businesses, rather than just one by locating the station south of Inwood.
			6. It was reported at the meetings that 4 of the 5 businesses directly affected by building the station north of Inwood objected to the proposal. It now turns out that none of those businesses are objecting to being expropriated, and that the only complaint is coming from a lady at the far end of Saddler Circle, and she is objecting about losing the wild life area. She may have a point if she considers "wild Life" to be homeless people who constantly camp our in the area, leave garbage all over the place, and have burned down one building and caused several grass fires. The police can confirm the constant battle with this problem. I hope I have covered everything. I guess I can sum it up by saying that we prefer the station to be built north of Inwood so we can survive, and since it doesn't cost DART any more money, why take the chance of driving at least two companies out of business.	6.During the Draft EIS comment period, only 1 of the 5 property owners affected voiced support for the station location north of Inwood. Opposition was received at the hearings and/or in writing from Video Post & Transfer and Nancy Feaster (see Comments PH-18, PH-32, PH-38, W-64, W-65, W-66, and W-67). These comments as well as other environmental issues and costs prompted DART to examine the south side. After further analysis, it was determined that the south side was preferable from a cost and impact point of view. We cannot base decisions on businesses now wishing to relocate.
AD	Robert P. Haasz,	W-100A	I am writing this letter in reference to the proposed relocation of the Inwood Dart	DART re-examined the south side of Inwood in part due to

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	Video Post & Transfer, Inc., Dallas		station. I would like to clear up and re-state Video Post & Transfers position regarding relocation. The last time I addressed the committee, we felt our hands were tied regarding the decision to move the station's original location. After the committee's final vote at that time to go with Option D, we immediately started communicating with real estate firms to get an idea of what was available in the market. I want to make it perfectly clear to the committee that Video Post & Transfer sees this relocation as a business opportunity. I also understand that there is no cost difference in what side of Inwood Road is used, so why change now. People working with DART and its real estate division have also informed me that from an engineering and design standpoint the north side of Inwood is preferred. The business owners on the north side of Inwood are in favor of selling and relocating. A lot of preliminary work has already been done. And we definitely support the original decision and hope the committee will feel the same way.	comments received by Video Post and Transfer during the DEIS comment period (refer to comments PH-32 and PH-38). The proposed project changes presented an opportunity to address your comments, as well as address other issues with the Inwood north option contained in the DEIS. DART does not base its station location decisions on business opportunities for potentially affected businesses. If relocating is a good business decision for Video Post and Transfer, it should be done whether DART is present or not. At the public meeting, DART staff indicated that a cost estimate had not been done but that there would not likely be a significant cost difference between the two site options. However, a more detailed cost estimate has been developed and it is estimated that the north option could cost approximately $2 million more. The south option had not been developed fully in order to assess which site would be preferred from an engineering and design standpoint. As designed, the primary benefits of the Inwood South station are that 1) it would displace only 1 as opposed to 5 businesses); 2) the 1 business displaced with the proposed south site would have been partially (or fully) acquired because the tracks would begin to widen south of Inwood to accommodate a center platform station north of Inwood 3) the north site minimizes affects on Rusk Middle School, which is eligible for the National Register of Historic Places, and 4) the south site will minimize any run-off into Knights Branch. Also, DART does not direct businesses to begin working with real estate firms to assess relocation opportunities. However, thank you for clarifying that the significant hardship for your company would be the time required to relocate due to the many miles of digital cable in your building. The relocation package provided to businesses that may be acquired indicates that a minimum of 90 days is required for a business to relocate after the sale is made. Typically, the timeframe is greater than this. At the time that Option D was approved, the focus was on the north side. However, given the real estate and environmental issues, DART re-examined the south side. This was done, in part, as a good faith effort to respond to your concerns. During final design, the potential impacts to the entrance on Sadler Circle off of Inwood will be further examined, and depends on column placements. If this entrance must be closed, then DART may propose to connect Sadler through to Denton Drive and work with you to reconfigure the entrance to your second driveway off Inwood Road as the entrance. Employees and clients could still exit from Sadler to Inwood (at the main intersection west of your business), or from Sadler to

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				Denton. Both of these exits would be safer and more convenient given that no median breaks are located on Inwood in front of your business, forcing your employees and clients to travel out of direction or make a u-turn if they wish to go east on Inwood. Construction timeframes and methods would also be coordinated with you to minimize any impacts to your business. Ultimately, having a DART station in close proximity could enhance the value of your property.
M, AD		W-100B	I would like to go on the record one more time to dispute DART's interpretation of my comments in the early stages of this proposed option. The Draft Environmental Study report states on page #8 that Video Post & Transfer, Inc. felt it would be a "significant hardship" to relocate. As I said in the public hearing last night, my comments were taken out of context and I will try to clear them up. We operate a very extensive technically oriented firm. Our business is Post Production; we are the final step for film or video projects prior to broadcast. What we do is editing, visual effects, 3D, graphic design, color correction, audio, music, film production and film laboratory work. Our main clients are advertising agencies that work on high-end commercials. Our clients for example are agencies who represent companies such as Ford, McDonalds and Zales. We are not a retail front, our customers are accustomed to a standard of service and ascetics well beyond what is normally provided by a service business. The simple reason for that is they spend an enormous amount of time (between 8 to 10 hours) with us everyday. If we go back to 2002 and look at how option D came about you will understand what position we were put in. After first receiving notice that our property would be affected by option D we reacted immediately. At that time we received a relocation package, which described the process of relocation. It also said that we would have 90 days to move after a sale agreement was made. There lies my reluctance in the original public statement. It will take at least one year for us to move after finding a location. There are many miles of digital cable, 15 operating rooms and a film laboratory to move. Then came the final DART board vote, to decide on the base-line route or option D which going into we knew was a slam dunk for the big and powerful. We left that meeting and contacted real estate firms the next day. We informed all our employees and clients of the pending move. We were told by Act 21 that there was a 98% chance that the north side would be chosen and only a 2% chance the south side would be selected. We immediately stopped making facility improvements that were ongoing and re focused on the move. If money is not an issue as you stated in the community meeting on April the 3rd, then why change? If the south side is chosen, our customer and employee entrance on Sadler Circle will be blocked. We will be forced to use a one way entrance for 53 employees and at least 30 to 35 clients per day. According to the design you presented construction would be right on top of our facility and clients, this is an inconceivable situation.	Comments noted. See response to Comment 100-A.

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NV	John W. Lodewick, Attorney for Spiros and Kathy Vergos/Market Diner, Dallas	W-101	The purpose of this letter is to address the concerns of my client in regard to their restaurant at the captioned location which is in close proximity to the extension of the LRT as presently planned (Market Diner, 4432 – 4434 Harry Hines). Of primary concern is the noise and vibration impact upon the noise and vibration sensitive business of a restaurant. Accordingly; we request copies of your tests which documents the potential impacts associated with the noise and vibration levels to be expected at this location. Please include sufficient data so that an independent expert may properly advise my clients and make a determination of what mitigation will be necessary and further, make any recommendations, which will benefit all parties concerned. Also, please accept this letter wherein you invite written comments postmarked by April 12, 2003, for inclusion in Chapter 6 of the Final EIS.	Based on Federal Transit Administration noise guidance, noise sensitive receptors are defined into 3 categories: 1) land where quiet is an essential element in their intended purpose, such as serene lands, amphitheaters, etc. 2) residences and buildings where people normally sleep, such as homes, hospitals and hotels; and 3) institutional land use with primarily daytime and evening use, such as schools, libraries and churches. Restaurants, by their very nature, are not defined as noise and vibration sensitive uses. Noise impacts were estimated at the Days Inn Hotel, immediately north of your restaurant. Based on the analysis, no noise impacts are expected. The noise analysis results are documented in Section 5.4 of the Final EIS.
T, MC	Jim Williams, Jr., Dallas Medical District Joint Planning Committee, Dallas	W-102	By letter dated March 10, 2003, the Dallas Medical District Joint Planning Committee provided to DART the Committee's position with respect to the alignment of the DART light rail track through the Dallas Medical District. In your response letter dated March 11, 2003, you indicated that DART would be considering the Committee's position at a future DART meeting, that DART has initiated studies to locate the alignment and station within the DART-owned Union Pacific Railroad right-of-way (the UPRR ROW) and that DART must hold a public hearing to receive comments on the alignment and station location change. We have been advised by DART representatives that the public hearing will be held on April 10, 2003, and that DART board action on such proposed changes could occur as early as May 13, 2003. Although most members of the Committee have not yet seen the particulars of the alignment and station location changes being proposed by DART, representatives of certain of the medical organizations comprising the Committee have met with DART's staff and/or attended the April 3, 2003 public meeting and, in turn, briefed the Committee that DART is proposing a change in the location of the Northwest Corridor LRT alignment to the UPRR ROW and a change in the station location to Motor Street, specifically straddling Motor Street along the UPRR ROW. Further, we understand that the Northwest Corridor line will be elevated from south of the Market Center/Oak Lawn Station to north of the Inwood Station. It is also our understanding that DART is proposing to acquire property along Motor Street on the north side of the proposed station for the development of a bus transfer facility. Based on the Committee's understanding of DART's proposed changes, the Committee offer the following position and comments. By way of background, the Committee's position was conceived in light of the ongoing development of the entire Dallas Medical District, and the anticipated acceleration of that process. As a result of the individual redevelopment projects of Parkland, UTSouthwestern, Children's, Zale Lipshy, St. Paul and other participants, the Dallas Medical District will be completely transformed over the next twenty years. From the outset, the Committee has been committed to preserving a high level of functionality and appearance for the future Dallas Medical District consistent with the aspirations of each participant for its individual redevelopment project. As our discussions relating to a DART light rail station within the Dallas Medical District have evolved, it has become increasingly apparent that a single DART station, regardless of its precise location, cannot on a stand-alone basis effectively integrate light rail into the Dallas Medical District and its component facilities and community and meet the potential ridership need of our estimated collective 50,000 employees, patients and visitors daily, a great number of which will need to access facilities	Comments noted. Response to key issues are as follows below:

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			beyond to well beyond DART's one quarter mile walking radius. Moreover, for hospital patients and visitors, the one quarter mile walking radius may not be practical in many situations. The sheer size of the Dallas Medical District as it exists today, and even more as contemplated in the future, the number of potential riders from our estimated 50,000 employees, patients and visitors daily from throughout the region, and the number of different facilities spread throughout the Dallas Medical District present a tremendous challenge as well as a tremendous regional opportunity for DART that in our view cannot be adequately addressed or realized throughout a well-planned and developed circulator system that interfaces with the DART light rail station and allows employees, patients and visitors to more conveniently between the DART light rail station and any major medical facility with the Dallas Medical District. The Committee fully appreciates and supports the completion of the important Northwest Corridor line that is important to the Dallas Medical District and the regional communities and thousands of riders that can be serviced by the Northwest Corridor line. At the same time, the Committee recognizes, and encourages DART to recognize, that the envisioned light rail station cannot adequately meet the regional ridership needs relating to the Dallas Medical District as a whole without the incorporation of a well-planned circular system. As a result, our position, as detailed below, attempts to strike a win-win-win DART, regional communities and Dallas Medical District balance by facilitating the prompt completion of the Northwest Corridor line to meet the need of our regional communities and potential riders to be serviced and by DART's working together with the Dallas Medical District (without delaying the necessary studies, design and development of the Northwest Corridor line) to fully study, plan and seek appropriate financing of a circulator system that interfaces with the DART light rail station and allows our 50,000 or more daily employees, patients and visitors from throughout the region to conveniently access the DART light rail system from any of the major medical facilities within the Dallas Medical District. Specifically, the Committee offers the following comments: 1. The Committee supports the proposed shift of the Northwest Corridor alignment to the UPRR ROW and the location of an elevated Dallas Medical District station along the UPRR ROW at the location to be determined following the study process described below. 2. The committee encourages DART to move forward promptly with the completion of its studies, design and the actual development of the Northwest Corridor line that is important not only to the Dallas Medical District but to the many potential regional communities and riders that can be serviced by the Northwest Corridor line. 3. The Committee requests that DART affirmatively acknowledge the importance of a well-planned elevated Dallas Medical District station and a circulator system that interfaces with the elevated Dallas Medical District station and allows employees, patients and visitors from throughout the region to move conveniently from the Dallas Medical District station to any major medical facility within the Dallas Medical District and that DART and its staff work together with us to study, plan, cost and finance an appropriate circulator system. Specifically, the Committee requests that DART's staff work together with the Committee in the following specific ways: (a) To promptly and thoroughly study the circulator needs for	1. Comment noted regarding support for alignment change. 2. Comments noted. 3. DART examined three locations for the station: south of Motor, over Motor and north of Motor. We initiated studies with the station north of Motor Street but after designing it to DART criteria, the results showed tight curves, thus increasing the noise potential, and also ROW acquisition from Parkland west of the DART ROW. South of Motor Street removes the station from the property we are trying to serve and also moves the location too close to the Market Center/Oak Lawn Station. The LRT station over Motor Street can remain within DART ROW, minimizes curves and thus minimizes any noise, and

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			the Dallas Medical District and its employees, patients and visitors to optimize the tremendous regional opportunity presented by integrating the benefits of light rail into the entire Dallas Medical District, and, as a part of such study, to identify the optimal location and engineering of the Dallas medical District station so that the station and the circulator system can interface properly; (b) To assist in the evaluation of various circulator systems and equipment options, and costs, including an elevated fixed guideway system; and (c) To assist the Dallas Medical District in identifying potential sources for funding the cost of an appropriate circulator system to realize the tremendous regional opportunity of integrating the benefits of light rail into the entire Dallas Medical District including participation to the extent possible and appropriate by DART.	provides the best opportunities for linking with development both north and south of Motor Street. Also, ridership analyses do not show that your proposed circulator system would have a significant impact on our ridership. However, we do think it is a concept that should be studied further as a way to serve as a "campus connector" for the 50,000 daily employees, patients and visitors you estimate visit the Medical Center. The link with the LRT Station would be one of many important stops on the system. DART staff can participate with the Committee in an advisory and review role, assisting the Committee with the selection and employment of a consultant that can take the time to thoroughly study the circulator needs, equipment options, costs, and funding. Working with the Committee, we can assess the benefits of the circulator to DART to determine if financial participation is appropriate for Board consideration.
			4. As it relates to the proposed bus transfer facility, the Committee requests that DART move the proposed facility from the north side of Motor Street in the heart of Parkland's planned expansion area perhaps to an alternate location on the southeast side of Motor Street or some other nearby location that is identified in the planning process which addresses the needs to be serviced by the proposed bus transfer facility without interrupting Parkland's planned expansion efforts. Also, necessary improvements to Motor Street, including widening, as necessary, should be made if the bus transfer facility is located along Motor Street. The Dallas Medical District Joint Planning Committee would welcome the opportunity to meet with DART's staff and/or board members to more fully discuss both DART's proposed changes and the Committee's comments and position. The Committee feels that the path outlined in this letter – DART's moving forward promptly with the Northwest Corridor alignment along the UPRR ROW while jointly planning and exploring funding sources for an elevated Dallas Medical District station and circulator system with the Dallas Medical District – presents the opportunity for a win-win-win result – a win for DART, a win for the communities to be served by the Northwest Corridor line, and a win for the Dallas Medical District and its employees, patients and visitors. We look forward to meeting with you and your staff.	4. The bus transfer area is an essential element of the Northwest Corridor project given the regional importance of the Medical Center. Numerous routes serve the Medical Center and terminate in the Medical Center. Many routes provide important through service along Harry Hines. These routes bring employees, visitors, and patients to the Medical Center, and also enable other patrons to transfer between routes. These operations currently occur on Harry Hines Boulevard. The bus transfer area will provide a well-designed and controlled area for the employees, visitors, and patients to safely access the Medical Center facilities, including future Parkland clinics and hospitals north of Motor Street, as well as facilitate bus-to-bus and bus-to-rail transfers. While the main reason for locating this bus transfer area north of Motor Street is access and safety, we also based it on previous Master Plan concepts presented to us that showed the bus transfer area north of Motor Street and east of the LRT station. Moving the bus transfer area to the south side of Motor would compromise the safety and access of the many people going to locations north of Motor Street, particularly the ill and the handicapped, many of whom access Parkland by public transit. Forcing these people to cross a planned 4-lane or possibly 6-lane arterial does not present a safe or desirable situation. We believe the bus transfer area can be designed to fit into the context of your master plan,

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				and could potentially grant air rights over the bus transfer facility. Because no parking will be provided at the LRT station, our contribution to traffic on Motor Street is limited to about 8 additional buses (2 already operate on Motor Street) that will operate on a 10 to 30 minute peak frequency. While a detailed traffic study has not yet been done, this bus activity does not appear to be significant enough to warrant any additional improvements to Motor Street beyond that already planned by the City and TxDOT (4-lane undivided). The exceptions will be a location for a median support for the LRT structure and possible a left-turn lane and signal at the bus transfer area entrance, both of which will generally affect a very small segment of Motor Street. Any additional improvements to Motor Street will need to be coordinated by Parkland with the City of Dallas and TxDOT. DART will work with you through your master planning efforts to enhance pedestrian connectivity in the area. This could include a potential plaza area west of the LRT station and wider sidewalks on Motor Street. We would be willing to propose potential DART design assistance and funds (subject to Board approval) toward those types of improvements.
MC, T, S	Cheryl Sutterfield-Jones, American Red Cross, Dallas	W-103	Thank you for continuing efforts to refine and enhance the alignment of the Northwest Corridor Light Rail Transit Line. This letter is written to strongly support the use of the existing DART-owned UPRR ROW for the Northwest Corridor Light Rail Transit Line between Market Center Blvd and Inwood Road. The following benefits would be realized from utilization of the existing railroad right-of-way for the Northwest Corridor Light Rail Transit Line between Market Center Blvd and Inwood Road. 1. Access to and from the American Red Cross would not be compromised. 2. Detrimental impacts of the relocation of Harry Hines traffic lanes in close proximity to the American Red Cross headquarters building would be eliminated. 3. Reduction in the project cost for this section of the railroad line would be dramatic. 4. Access for riders to transfer to and from an aerial Medical Center station over Motor Street to a circulator bus station below would be improved. 5. Negative impacts on the beauty of the Harry Hines Boulevard corridor would be mitigated. 6. Adverse impacts on Harry Hines Boulevard property owners would be virtually eliminated. 7. Future development opportunities on Harry Hines Boulevard would be enhanced. One item of concern with the use of the existing railroad right-of-way and	Comments noted. The selected UP RR alignment would avoid many of the effects noted in Comments W-42A, B, C and D. DART will coordinate with the TxDOT and the City of Dallas on their planned Motor Street improvements to ensure that pedestrian needs are met in the area. Currently, the planned improvements include the provision of 5' sidewalks on both sides of Motor Street. DART will coordinate with the Medical Center to enhance these connections.

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			the proposed Medical Center Station is that Motor Street currently has no sidewalks for pedestrians to safely walk to and from their destinations. As Motor Street is reconstructed, sidewalks must be constructed on both sides of the street and sidewalks must also be constructed from the Harry Hines Boulevard/Motor Street intersection, north and south, to connect to existing sidewalks located further down Harry Hines. I am sure after a thorough review by the transportation engineers at DART, the citizens of our community and our community leaders, the proposed alignment on the existing DART-owned UPRR ROW for the Northwest Corridor Light Rail Transit Line between Market Center and Inwood Road is the only reasonable alternative to support the positive growth, development and transportation needs of this critical area in our community. Thank you for your time and consideration. We look forward to working with you as we move forward with this project.	
T	Ronald M. Kaim, The Bee Lee Company, Dallas	W-104	My building is not too far from the Northwest rail line off of Denton Drive between Inwood and Mockingbird. I personally feel that a street level line, instead of an overhead or tunnel, from the Inwood/Denton Station all the way north to Carrollton would be more neighborhood friendly, prettier and most of all, less costly to build for DART. Also, street level all the way north, gives DART an option to add flag stops, designed areas like bus stops, where people can flag down the train in between regular stops.	DART tries to build at street-level when possible. However, overhead and tunnel sections are often necessary due to constraints. At Inwood, traffic volumes necessitate an elevated structure. At Mockingbird, runway protection zones associated with Dallas Love Field and traffic volumes on Mockingbird Lane necessitate a short tunnel. Some at-grade track will be provided in-between Inwood and Mockingbird. North of this point, elevated sections are required due to traffic and freight conflicts. Also, given the DART train operating schedule and set times for trains to pass at key junction points, no flag stops are possible. However, numerous bus routes feed the LRT stations, which are spaced on average every 1 to 1 ½ miles. Flag stops would also add significant travel time, likely resulting in a loss of ridership due to a lower competitiveness with the automobile.
MC, T, AD	Ron Anderson, Parkland Health & Hospital System	W-105	Parkland has previously provided to DART its position on alignment of the DART light rail track through the area generally referred to as the Dallas Medical District. We have recently been informed by DART's staff that DART has initiated studies to locate the alignment and station within the DART-owned Union Pacific right-of-way (UP ROW), and, in fact, that DART's staff will recommend the new alignment and station location to DART's board for consideration at its May 13, 2003 meeting. While members of Parkland's board of directors have not yet had an opportunity to meet with DART's staff and to see the full particulars of the most recent DART proposals, we understand from a meeting between DART's staff and our facilities staff that DART's proposed changes in the Northwest Corridor alignment include the following components which directly affect Parkland and Parkland's planned new campus: • a change in the location of the Northwest Corridor LRT alignment to the UP ROW; • a change in the station location to Motor Street straddling Motor Street along the UP ROW; and • acquisition of property along Motor Street on the northeast side of the proposed station (on land envisioned by Parkland as an important part of its future main campus) for the development of a bus transfer facility.	Comments noted. See response to Comment W-102 regarding Comments 1a, 1c and 1d referenced in your letter. Regarding comment 1b, the LRT alignment is planned to be elevated from Harry Hines/Wycliff to north of Inwood, including through Parkland Hospital's future campus.

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			Inasmuch as DART's staff appears to now be focused singularly on the UP alignment, we will limit our comments and position statement to DART's latest proposals. In the event that any further consideration is given to the previously proposed Option D alignment, please refer to our earlier letters for our comments and positions. For your information and to assist you in fully understanding our views relating to the latest DART proposals as they relate to Parkland's planned new campus, we thought it would be useful to describe to you in general terms our master plan for a new campus on the opposite side of Harry Hines from our present main campus. We plan to redevelop approximately 75 acres between Harry Hines and Maple Avenue, extending north from Motor Street, into a new medical campus. We also plan to redevelop the southeast corner of Harry Hines and Motor Street into administrative space to support Parkland. These areas, currently occupied by industrial facilities, will be developed in two major phases. The first phase will include a new Ambulatory Surgery Center, planned for the corner of Maple Avenue and Motor Street, and a replacement hospital for Women's and Infants Services, planned along Harry Hines. This initial phase will also include a central utilities plant, expanded parking facilities and related site development. The second major phase will include a new acute care hospital and trauma center along Harry Hines, new outpatient clinics, administrative facilities and expansion of the central utilities plant. At the appropriate time, we also plan to develop a portion of the campus to support retail and commercial occupancies that are compatible with a major medical campus. Parkland is fully committed to the development of such a new main campus. We will kick off our program with demolition of the Old Trinity Industries building this summer, followed by construction of the Ambulatory Surgery Center, scheduled to begin this fall. We expect to begin construction of the Women's & Infants Services Hospital next fall and plan to complete it and the required support facilities in the winter of 2006 or early 2007. Our complete campus construction will be an ongoing process occurring over the next eight years. As you know, Parkland is one of the largest medical facilities in the Southwest and is the primary teaching institution of the University of Texas Southwestern Medical School. It has been consistently rated among the best hospitals in the United States, and as Dallas County's only public hospital, ensures that health care is available to all are residents. Parkland's Trauma Center is the only Level I trauma center in the area and our full service Burn Center, one of the largest in the nation, serves patients from North Texas and surrounding states. Thus, while we are pleased to work with DART to facilitate the development of its Northwest Corridor alignment along the UP ROW, it is critically important to Parkland that DART's proposals relating to the alignment itself, the station location, the bus transfer facility and related infrastructure considerations such as the capacity of the Motor Street reflect a strong sensitivity to Parkland's planned future development of its new main campus. Parkland fully supports the prompt completion of the Northwest Corridor line, and it is our express desire, as reflected in our comments, to facilitate such prompt completion. As you are aware, Parkland serves a broad regional community and many of its employees, patients and visitors represent potential riders on the Northwest Corridor line. Our hope would be that our comments will facilitate your role in planning, designing and completing the Northwest Corridor	

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			line as promptly as possible while, at the same time, permitting us to proceed with the development of our new main campus which is of profound importance to our employees, patients and visitors. Indeed, the primary compelling reason for our support, as expressed below, of the newly proposed UP alignment is that it will allow us to proceed with the development of our new main campus without the interruption and disruption with the previously discussed Option D presents. With these thoughts and objectives in mind, Parkland offers the following comments: 1. Parkland supports the proposed shift of the Northwest Corridor alignment to the UP ROW, subject, however, to the following conditions: a) The relocation of the proposed bus transfer facility from the Northeast side of the proposed station (on land which as been expressly identified as an important part of our future main campus) to an alternate location on the southeast side of the proposed station (across Motor Street from its presently proposed location), a location which should be accessible without interrupting Parkland's planned new main campus. b) Assurance that the Northwest Corridor line will be elevated throughout Parkland's envisioned new main campus (we have been told by DART's staff that the line will, in fact, be elevated from the Market Center station to a point north of Maple Avenue) c) DART and the City of Dallas widen Motor Street to as many as six lanes to accommodate the additional traffic to be generated by the bus transfer station, all of which will impact ingress to and ingress from our new main campus. d) DART should plan and design the station in a fashion that will allow the proposed circulator system described in Paragraph 2 below to interface with the rail station. Until the interface of the circulation system and the rail station is reviewed, Parkland cannot support the proposed DART station location at and straddling Motor Street. 2. Parkland expressly affirms the specific suggestions of the Dallas Medical District Joint Planning Committee relating to the planning, development and financing of a circulator system that interfaces with the DART light rail station and allows employees, patients and visitors from throughout the region to move conveniently from the DART light rail station to any major medical facility not only in Parkland but in each of the other medical facilities within the Dallas Medical District. Parkland and its staff would be pleased to meet with your staff and board members to more fully discuss Parkland's comments and position. We look forward to meeting with you and your staff.	
DRAFT EIS PUBLIC HEARING, July 11, 2002 - Bachman Recreation Center, Dallas				
MC	Claude Doane, Garland	PH-1A	I speak on behalf of the base alignment at the medical center. The hospital district's purpose is to serve the community. The Harry Hines elevated alignment is preferred. The elevated structure is deemed as dividing the	See response to Comment W-2A, W-34B and W-34C. DART believes that the selected UP RR alignment will still provide a high level of service to the Medical Center area, and particularly

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			campus by UT Southwestern, but their elevated bus structure is not. They've recently changed their master plan to put a building in the proposed alignment. I feel that this is a ploy to force DART away from the base alignment. If DART goes with any of the options, they're submitting to UT Southwestern, and that equates to disenfranchising the poor people and the citizens of this community that need the access to the hospital district. The unnamed rich contributors of UT Southwestern would never ride the train anyway.	to Parkland Hospital which has the highest use of all the facilities by low-income and traditionally transit-dependent persons.
LF		PH-1B	As far as the Love Field access is concerned, I think going into Love Field now would be the cheapest option. It's only going to get more expensive if you delay it. We have the opportunity to now connect the rail with the airports, and again I think these options are preferred and need to go forward now. Thank you.	See response to Comment W-6.
MC	David Lewis, Dallas American Red Cross	PH-2	I'm David Lewis with the American Red Cross. We're located at 4800 Harry Hines Boulevard. Basically the rail alignment will be going directly in front of our facility, and we're going to be presenting a position paper with recommendations on how to mitigate some of the impact on our facility. We just wanted it on the record that we have concerns with all of the alignments currently presented.	Comments noted. See response to written comments W-42 A through D.
MC	Dr. Clyde Yancy, Dallas	PH-3A	I'm a cardiologist with UT Southwestern Medical Center and an associate dean as well at UT Southwestern. I'm here to vigorously support DART and applaud DART for having the foresight to provide access to the medical center complexes. I'm also here to vigorously support option D as we agree it provides the least amount of disruption. One thing to keep in mind about the disruption is that with construction of the base alignment, there will be a risk to four major hospitals in the area, the three major emergency rooms, the one major trauma center, and one major burn center for all of the North Texas area. These issues are very important. We have thousands of visits on a daily basis from patients that are relatively infirm. We would like to offer the fact that the option D plan allows the medical center to provide its fundamental mission, which is health care to thousands of patients on a daily basis, in an unimpeded, uninterrupted manner while still supporting the development of DART and supporting the development of mass transit.	See response to Comment W-2A.
MC, T		PH-3B	We are very sensitive to the needs of the Arlington Park area and realize that current option D puts the station at a remote location. We are committed -- I will represent this now on behalf of UT Southwestern -- to work with DART to provide sufficient, convenient, user friendly shuttle access not only to the destinations of the medical center, but also Arlington Park. We think that this represents a very useful and a very appropriate strategy that supports DART, the medical centers and the surrounding community. We want to be good neighbors and partners. We want to make the situation work for all involved. We think the offer of providing shuttle service accomplishes that. We're willing to sit down and work with all involved to make that happen.	See response to Comment W-2A, W-34B, and W-34C. UTSW has met with residents of Arlington Park and developed a shuttle service concept. As part of their support for Option D, UTSW committed to provide a comprehensive shuttle service to medical facilities and adjacent neighborhoods to ensure a high level of service. DART and the hospitals will coordinate to provide the same for the selected UP RR alignment.
MC, T	Robert Todd, Dallas Stemmons Corridor Business Association	PH-4	I speak tonight on behalf of the Stemmons Corridor Business Association as its immediate past president and chairman. We are well known as good neighbors, friends and allies to those people in the residential areas within or adjacent to our boundaries. Community leaders such as Se-Gwen Tyler can attest to our commitment to neighborhoods such as Arlington Park. Probably the most important common interest we have is the continued orderly development of UT Southwestern Medical Center which will allow thousands of well paying jobs to be created over the coming decades if the campus master plan is completed to its potential. When the leadership of UT Southwestern Medical Center, Parkland Medical Center, and Children's Medical Center say on the	See response to Comment W-2A, W-3C, W-3D, W-69A and PH-3B. DART does not plan to redevelop the intersection at Maple Avenue, the Denton Drive cut-off, and Butler. Redevelopment in the area may support future improvements by the City or private interests.

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			record as they have that the potential of the medical center district will not be realized if DART's light rail service comes up Harry Hines, I believe we need to listen carefully. Not only is this an issue about DART's mission, it is about the future of this huge economic engine known as the medical center district. To divide it down the middle with an elevated rail line and an additional station at Exchange Park will have the effect, among other things, of creating a clogged and congested rush hour traffic situation along Harry Hines reminiscent of the old Central Expressway. On the other hand, if DART takes either of the alternate number three routes, the traffic congestion associated with another major rail station will be dissipated by locating it at Inwood and Denton Road – Denton Drive. Rapid shuttle service can then take passengers to the doorsteps of the major facilities within the medical center district. A significant benefit of alternate 3-D to those using Maple Avenue will be the redevelopment of a broken down intersection at Maple Avenue, the Denton Drive cut-off, and Butler. Because the existing track along the Denton Drive cut-off and Denton Drive is owned by DART, substantial cost savings will be realized even with the required cost to relocate several businesses along the route. Of all the options, it is clear to the SCBA that alternate 3-D is the most logical and practical of all the plans that have been proposed, and we urge the DART Board to approve it. Thank you.	
MC	Dr. Lauren McDonald, Parkland Hospital	PH-5A	I'm Dr. Lauren McDonald. I'm a kidney specialist. I'm a board member of Parkland Memorial Hospital. This is my second term. I'm also past president of the St. Paul University Hospital medical staff, and I also live off Inwood Road and am a member of the Greenway Parks Homeowners Association. I'm here and I really want to applaud DART, its staff, and the board for having the foresight to think of plan D. We think it's the best for this area.	Comment noted.
MC, NV		PH-5B	My other concern would be having an at-grade or above grade line at Harry Hines is that it's closest to some of the ICU and surgical areas at Parkland. Even though there's talk about moderate noise, it could provide problems for some of the delicate instruments that are in use. There are plans to change Parkland's footprint in the future, and it will directly involve the DART D, and make it easiest for the people and the patients that are served in the area. Thank you.	See response to Comment W-2B and PH-1A.
MC	David Biegler, Chairman Children's Medical Center	PH-6	I'm the chairman of Children's Medical Center. I'd like to focus my remarks on the economic impact. One of DART's successes has been its attention to the detail of economic development surrounding its stations, and most of that effort is typically directed toward new stations. We've already heard today of wanting to mitigate economic impact around development of new stations in this corridor. Equally important as economic impact -- more important is the economic impact on existing economic engines in the region. What we do know is that the medical corridor is a vitally important economic engine in the region. DART service and access within the medical corridor are critical. I think everyone agrees with that. It's incomprehensible you would have a corridor -- or a line running in this area not serving the corridor. What we do know is that under any alternative, we need to be thinking of a circulator system. In fact, the alternatives provide equal access to a circulator service; but to achieve the service that we need, the elevated base plan is an unnecessary requirement. The elevated plan can be detrimental to the economic engine as well as to the community. We know that it can limit the economic growth by splitting this economic engine. We wouldn't do it to a neighborhood. We wouldn't do it to a	See response to Comment W-2A, W-40C, and W-69A.

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			potential new economic area. We shouldn't do it to an existing vibrant one. Alternative D can satisfy most of these concerns. We urge focusing on that to provide the most cost-effective tweaks of that in a way to mitigate the impact of alternative D. We think it by far shows the best potential for resolving these issues. Thank you.	
MC	Ruben Esquivel, VP UTSW Medical Center	PH-7	I am vice-president for community and corporate relations of the University of Texas Southwestern Medical Center. Our investment is most visible as you drive through the corridor and see the current expansion at Children's and UT Southwestern and as you learn of the plans for further growth which also include Parkland, St. Paul, and Zale Lipshy Hospitals. At UT Southwestern, we will open by the end of next year a new 830,000 square foot research building currently under construction, and more than 800 doctors, scientists, and support staff will occupy this space. Our master plan calls for the addition of four buildings on the north campus, the first one to be completed by 2008. Even the land currently available for expansion, our growth will occur on both sides of Harry Hines. However, the elevated Harry Hines route will threaten these plans. The construction and operation of rail tracks at grade or elevated through Harry Hines will devastate our efforts to bridge and connect across what is already a congested thoroughfare. The base alignment will tear right through the heart of our campus and will become a barrier forever. Tonight, I am extremely pleased that the DART staff has looked at alternate routes, particularly option 3-D. This route would protect decades of planning throughout the medical corridor, provide jobs and high paying salaries, and solidify Dallas as a world-class medical destination. I applaud DART for working with us and urge you to utilize our staff of physicians to develop a rail service that will benefit all of Dallas. Thank you.	See response to Comment W-2A and W-69A.
MC	Dawn Parker, Dallas	PH-8A	I am a student at the University of Texas Southwestern Medical Center in allied health, and I also happen to be a nurse at Parkland Hospital. I do have an interest in the DART rail line that's actually twofold, its impact on our ability to provide quality care in the medical corridor and the proximity of the rail line to current student housing. I believe that the alternate route plan 3-D would be the best. I have concerns for patient safety and increased traffic. The alternate route, particularly plan D, will serve all parties in the community.	See response to Comment W-2A.
MC, T		PH-8B	I am extremely worried about the negative impact that the construction of an elevated rail line on Harry Hines would have on ambulance access to our emergency departments. Harry Hines and Motor Street are the primary access routes for our ambulances. During construction and even after construction, the increased traffic along Harry Hines would back up Motor Street. The extra time that would be required to reach our hospital could be the difference in a life and death emergency situation. Unfortunately, every day, I see circumstances where seconds do count.	Comment noted. See response to Comment W-2A and W-41C.
MC, NV		PH-8C	My other interest or concern is similar to that of the Arlington Park residents. During the planning process, the previously considered alternate route would have sent rail service between the Harry Hines medical corridor and the families of Arlington Park much too close to their neighborhood. Approximately 200 families would experience the construction noise, the danger to pedestrians, and a lower quality of life. The Harry Hines route would eventually run along Mockingbird Lane, and it would have the same impact on student housing where I live. The line would run within a few yards of our apartments, providing noise interference to hundreds of medical and graduate students studying night and day. Like the families in Arlington Park, we also agree this is too close. I urge	Comments noted. A previously considered route did pass fairly close to Arlington Park; while this was a factor in not considering it further, the primary reason was because it provided “back door” service to the hospitals. Under the base alignment, LRT would have operated at-grade near the apartments along an existing thoroughfare and in the vicinity of Love Field airport, which are greater contributing noise factors than LRT.

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			DART to protect the medical corridor and the families of Arlington Park as well as student housing - and support plan D.	
MC, T	Jeff Frush, Architect Ellerbe Becket, Minneapolis	PH-9	I am an architect and principal with Ellerbe Becket, Incorporated, in Minneapolis. I am here to support the alignment of 3-D. We've been working with UT Southwestern for several years now in master planning for growth and planning for their future. The whole idea of using Harry Hines in that way would separate that campus. We've been working in lots of cities. Boston and Chicago have somewhat similar situations there, and they're much more concentrated in terms of use. The way they've used the rail line is a very good example, I think, with what's going on with DART here. I think DART's move toward 3-D is in alignment with those two cities. The whole idea of elevated lines in those two cities is to take care of off-the-corridor situations. Those go to the station, and at that point surface transportation does take care of the connection to the facilities. In Chicago, we work with Northwestern Hospital, and they have a station about three blocks away, and the shuttle service between that is public transportation and shuttle service. I think that's a very good way of doing that. It keeps the concentration of that station and the involvement there away from the main corridor. 3-D is an exceptional improvement from an architect's standpoint and from a planner's standpoint. I've worked on campuses in about 20 different locations, medical center campuses, including Korea, where they have a rail line that is close to the campus, and this is a very similar situation. I think it's a very protective thing to use 3-D. Thank you.	Comments noted. See response to Comment W-2A, W-40C, and W-69A.
MC	Ken Boyd, Dallas Olmsted-Kirk Paper Company	PH-10A	I'm with Olmsted-Kirk Paper Company at 2420 Butler Street. First of all, Olmsted-Kirk is over a 90-year-old family-owned company residing on Butler. I am speaking on behalf of O-K Paper Company and its 183 employees. We're excited about 3-A and 3-D. We applaud the DART rail for looking at all options. 3-A and 3-D protect the hospital and the medical corridor, and it also protects O-K Paper, the largest nonmedical employer in the area. The Harry Hines route would cause much disruption on Harry Hines and Motor Street. That's one of the primary arteries that we use to receive and deliver paper. Alternates 3-B and 3-C would disrupt many businesses, and many businesses would have to relocate, but 3-A and 3-D would better serve the entire area.	See response to Comments W-4A and W-4B.
G		PH-10B	We've looked at other successes that the DART rail has had, and they bring a lot of economic benefits to the area. There are a lot of empty buildings and old warehouses that we think would be rejuvenated by bringing in the DART rail line.	Comment noted. Chapter 5, section 5.1 of the EIS further describes land use and economic impacts expected from the project.
LF		PH-10C	The Love Field area, we think it would be a big economic boost when the DART rail lines 3-A or 3-D would be implemented.	Comment noted. See also response to Comment W-6.
AD		PH-10D	Finally, we employ a lot of minority people, and relocating our company from this area would be an increased hardship on these minority folks not only financially, but relocating them out of a district or an area that they've lived for a number of years.	Chapter 5, section 5.1 of the EIS further describes economic impacts expected from the project. Chapter 5, section 5.16 discusses Environmental Justice and the project's impacts on minority populations.
MC	Linda Harper-Brown, Irving	PH-11	I have great interest in rail service through the medical corridor. From a regional perspective, we have to protect the medical corridor while providing rail access to nearby neighborhoods, families, and small businesses. At first glance, the Harry Hines route would appear to be easier, but what is easiest is not always best for Dallas and for the region. Alternate routes 3-A and 3-D are, simply put, smarter routes. These smart routes would have a better opportunity to better serve the medical corridor area, one of Dallas's leading social, economic, and medical engines. As an advocate for improving transportation and decreasing traffic for commuters, I must commend all parties involved for their dedication in	Comments noted. See response to Comments W-2A, W-69A and PH-3B.

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			developing the best route possible. DART has most definitely earned the respect and the recent accolades for improved rail service and their efforts to look at all options in this medical corridor; and the hospitals in the medical corridor should be commended for their efforts to work with DART to provide safe, efficient, and reliable shuttle service to the Arlington Park neighborhood. Over the years, I have worked with many members on the DART Board to improve transportation throughout Dallas County; and I am confident that after reviewing the alternate routes, the board will agree these alignments, the 3-A and 3-D alignments, will provide the strongest impact for DART	
ROF	Coleman Cobb, Dallas	PH-12	I'm a business owner and a property owner in the northwest corridor. I would like to urge the board to consider rail operating facility plan number three. I spent the day reviewing the draft of the EIS, and by the way, it was very well done. But in that, I learned, and in previous hearings I've attended, that the option number three for the rail operating facility, in my mind, is the only way to go. Thank you very much.	See response to Comment W-24.
MC, NE	Stan Aten, Wynnewood Heights Neighborhood Assoc., Dallas	PH-13A	Now, the first thing I think you should know is on your EIS statement, you're talking about the population increasing to seven million by 2025. The latest estimates from the North Texas Council of Governments are it's closer to nine million. So it's an extra two million people that are going to be in this region. The reason that's critical is because more people right now means more cars. We had two days this week where the ozone levels reached what are considered unhealthy for everybody, not just the elderly, not just the children. Three days we've had to worry about everyone, again what they call level orange. Therefore, it's critical that light rail in any form and fashion be built as quickly as possible to get people out of their cars. That's why I'm for the base alignment, because if you look at the map, alignment D, A, B, or C, takes the people away from the hospital district as far as possible as they can get. I don't think they want people to use rail and use the hospital because that's why they've moved the station so far away. The base alignment actually takes people to where they'll use the train and use the hospital district. It's good for Dallas.	Comments noted. DART used the latest approved demographic projections available during the preparation of the EIS. See response to Comment W-34C. The selected alignment provides a station in the heart of Parkland's redevelopment area and will be integrated into their development. See also response to Comments PH-1A and PH-3B.
LF		PH-13B	As far as Love Field, that's a critical thing as well. We need that. We need that to get people off of Mockingbird, off of Denton Drive, out of their cars, into the trains, and using it for tourists and conventioneers.	See response to Comment W-6.
ROF		PH-13C	As far as the rail operating facility, wherever you build it, make sure it does the least impact on the neighborhood so people really don't know about it.	See response to Comment W-24.
G		PH-13D	And as far as these people who think that an aerial train is some hazard to pedestrians, all you have to do is go into the north central line, Love Field. It's really kind of nice to see the train up in the air. It's sort of reassuring. It has no impact on people. It has no impact on traffic. It's just out there gliding along quietly. You won't notice it if you're in the hospital. And looking at some of these people who are speaking, I wonder if they've even ever used the rail. I use it daily. It's a great thing. I take people to Fort Worth now by train. So want to be able to take people to Carrollton by train. I don't want to drive anymore up there. Thank you.	Comment noted. See response to Comment W-2A.
MC	Mike Perry, Dallas	PH-14	One thing I'd like to encourage is that as DART's going through this assessment of the alignment through Parkland, we need to bear in mind, Parkland and that area is already divided by a roadway, number one. That hasn't been discussed. So the campus is already divided, and I would encourage DART to consider the general public's requirements, not the rich bureaucrats that are employed there, and I -- I mean that very forcefully. I think, as Stan did, that there's a general	See response to Comments W-34C, W-40C and PH-1A.

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Subject*	Commenter	No.	Comment	Response
			impression that if we can keep the people that utilize Parkland and which make the people rich at Parkland are shoved out of the way, it would be a nicer looking campus, and I'm very much against that. We are a city that has a lot of poor people, and they need easy access to Parkland. That means they can get off the rail line and go directly into Parkland, not have to take a shuttle bus. If they're sick, the last thing they're going to want to do is have to stand out in the heat or the cold and wait on a bus to come pick them up and take them back. That's all I have to say in that regard.	
ROF	Alice Jumper, Northwest/Walnut Hill Crime Watch, Dallas	PH-15A	I represent the Northwest Walnut Hill Crime Watch, and they heard the presentation from DART about two weeks ago. Nobody seemed to object to this operating facility that you' want to build, and I am in favor of the location three, I believe it is, at Lombardy and Denton Drive. I went over to South Dallas and saw the operating facility there, and it didn't look objectionable to me. And I went to the area where you want to build this, and it's just a bunch of empty, rusty looking buildings for the most part. It's a very economically depressed area, and it's already zoned for industrial use, which would be proper for this facility, and you would have enough acreage there to do it and plus have a little room for expansion, which I think that should be considered too because with Dallas growing like it is, our mass transit's going to have to grow with it. Anyway, I don't -- I don't see anything objectionable about it, and that's the site that I would endorse.	See response to Comment W-24.
G		PH-15B	I think also this would help some of the people, the Hispanic community where I live where they rely on labor for their living. Probably a lot of them would work there at times if they want to.	Comment noted.
MC		PH-15C	As a former employee of Southwestern, I would also endorse that option D. Thank you.	Comment noted. See response to Comment W-34C.
MC	Randy Staff, Dallas	PH-16A	My wife and I own the bank, American Bank, at 2707 West Northwest Highway, and I find myself in the situation of supporting what DART has done with the medical center as well. I think it's great. I've sat down and talked to them, listened to them come up with the plans, options that meet everybody's needs. I guess I will go on to say, particularly the Stemmons corridor, I know, also coordinates its efforts to accomplish their goals, which I think is great.	Comment noted. See response to Comment W-34C.
ROF		PH-16B	The area where we are in, the northwest corridor up here, has not had the same economic development, and -- and that's because we have been the repository of things that people don't want, whether it's a solid waste station, whether it's the bus terminal for the storage of buses, which is fine. I think we should do our part. But I will tell you, every time you take 40 acres out of the heart of your area that can be redeveloped -- as Ms. Jumper pointed out, that is an area up there of prime redevelopment between the two stations. We already have 33 acres devoted to the bus station terminal, the solid waste disposal location over there, and we also have the recycling center. You talk about the jobs. We have public hearings, and these jobs are not what you call high paying, good jobs like you have at the medical center. People that work at the train are not particularly high paying jobs, and my objection to it is that we're trying to redevelop our neighborhood too. We would like to be able to talk like the Stemmons corridor does that we're 22 percent of the tax base of Dallas. I'd be surprised if -- based on the value of the apartments and the raw land and the empty buildings all around here that you've seen, I bet you we're not two percent of the value, and I think that's one of the reasons that we continue to be the repository of everything that nobody else wants. You're not going to put a train facility like that on the	Comment noted. See response to Comment W-24.

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Subject*	Commenter	No.	Comment	Response
			Garland route. You're not putting one on the Richardson route. Yet we get that train station, and we're going to keep the bus station. I will tell you, one of the common things here -- I'm always told as we try to do redevelopment activities, well, it's not as bad as all these naked bars. I've got to tell you, it's not as bad as the naked bars. I'm not trying to get better than the naked bars. I'm like the guy from the Stemmons corridor. I've got no problem. I'm a capitalist. I am not a moralist like a lot of people here. But this is -- to me; it is so disappointing to hear. The work you do, the cooperation with them, and then we sit down and we have perfunctory meetings -- and I've been to two. I've got to tell you, you've been real nice to me, but you've told me to check with the chaplain, that you're going to put that rail station here. Well, I've got to tell you, you might put that rail station here, but we are not going to have to take it easy. I want to let you know that. I do appreciate what you've done working together.	
LF	Mary Lou Montez, Dallas	PH-17A	I have lived in the northwest area of Dallas since I moved to Dallas in 1974. I want to go on record that I support having the Love Field station. As a world-class city, Dallas deserves good transportation for our only airport inside the city.	See response to Comment W-6.
ROF		PH-17B	I also want to go on record that I am very disappointed that the rail yard will be built in my neighborhood. This facility will divide our neighborhood. But unlike the medical corridor, dividing our neighborhood is not important. We are excited about DART being in our neighborhood, but I am disappointed on the location of the rail yard because we were counting on that area being redeveloped. Thank you.	See response to Comment W-24. The location of the rail operating facility is to the west of residential areas and would be located within an industrial railroad corridor. It will not divide a neighborhood but will be located in an area where there are currently no east-west road linking residential areas to commercial areas. DART will work with the City of Dallas to maximize redevelopment opportunities around the Bachman and Walnut Hill/Denton LRT stations. The rail operating facility is not expected to hinder redevelopment of other areas surrounding the facility.
AD	Nancy Feaster, Dallas	PH-18A	I am a property owner right here where the Inwood station would be. I have five lots there. I bought them. I own a construction company, and we were going to have our office and a warehouse, et cetera there, and now I find out that these lots are going -- three of the lots are going to be taken for the station, and this is the first that I've really known about it. DART has not notified me. I have five lots, and no one has sent me a letter or told me anything about this.	DART makes every effort to notify interested residents and property owners through mailings, newspaper notices and web-site information. Please see response to Comment W-61 and Section 5.2.2 of the Final EIS regarding Acquisitions.
MC, T		PH-18B	After listening to everyone else speak, I agree about Harry Hines, and I agree about D, but I don't agree about Inwood Station. It's not just because of me. I think it's too close to Love Field. People will use it as a Park-and-Ride. They won't have to pay the $5.00. Even if they're a commuter to, say, Austin during the day, they'll just park there.	See response to Comment W-67.
AD		PH-18C	Down here off Motor Street, there are numerous empty lots, and along the rail line, there are empty lots. Well, Dallas Lawn, I believe, is right in here, and this is just one lot, one business. Whereas, there are numerous businesses in here and beautiful trees. The young man over here was talking about trees. These were all residential lots. They have beautiful mature trees that would be just destroyed because of this, and I think I've said everything I want to. Thank you	The south option referred to was evaluated during the PE/EIS phase and had access and engineering issues. However, DART has reexamined the use of the Lawns of Dallas property based on comments received during the Draft EIS comment period and recent property owner interviews, and presented that station alternative to the public at meetings in April 2003. On May 13, 2003 the DART Board approved moving the station to the south side of Inwood Road. This change should address your concerns. See also response to Comment W-66.
LF	Michael FitzGerald, Dallas	PH-19	I want to voice my support for the Love Field option. I have a couple of reasons. One: It will let more stations on the rail line, for instance, like the West End, Victory convention centers. These types of stations add and encourage more non-commuter type riders, which would increase ridership. Secondly: Direct	Comments noted. See response to Comment W-6.

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Subject*	Commenter	No.	Comment	Response
			access to the terminal would serve riders best. The Trinity Railway express type shuttle where it takes you from the station and drives you all the way over to the terminal really isn't convenient for people needing to get to the airport fast or to catch a flight due to the time sensitive situation, and next is it does attract a lot of tourism. People can come in and fly into Love Field and take the rail down to the convention centers, to the hotels, to the West End. I think it was also said before that Dallas will be one of the few cities that have direct access from the rail to the airports, and if it was built now, it would be a lot cheaper than building it in the future. I think there's a lot of demand to build it now, and just building it later on; I think people would realize we should have built this, you know, back around 2002 when we were designing it. It would really become the crown jewel, not only of the northwest rail corridor, but also the whole DART rail system. It really has that much of an impact. Thank you.	
ROF, AD	Don Argenbright, National Sheet Metal Works, Dallas	PH-20A	My concern's with the rail operating facility site, selection number three, which appears to be the favored area. I own property there, and we have a manufacturing business, National Sheet Metal Works, which has been on that site for 40 some-odd years. It has a specially designed building with a special type of pads to support our heavy equipment. We have 40 years' of worth of hand tools and hardware and stuff that we've accumulated there. It's going to be quite a project for us to move. It's going to be quite an inconvenience.	See response to Comment W-24. DART follows the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended. It is DART's policy that displaced persons or businesses shall not suffer unnecessarily as a result of programs designed to benefit the public as a whole. While DART made an effort to avoid your property, acquisition will be necessary to accommodate the facility. DART will work closely with all property owners to ensure a smooth relocation process.
ROF		PH-20B	There are some vacant warehouses which probably should be torn done or rebuilt in this area, but I don't think that's reason enough to throw this whole area out agreeing with Mr. Stan. This area is bordered on the west by Denton Drive, to the east primarily by a cemetery, to the south and north by apartments and residential areas. The warehouses that are in there are primed for redevelopment. It seems a shame to destroy this area and take it out. Site one, which has already been overlooked apparently, only has two owners, the City of Dallas and DART. It happens that they would rather displace owners like myself than have to replace their dump ground facility. Site two, I grew up watching Jack Risinger develop Circle Bowl, which is now a gutted Latin dance hall, and the Circle Theatre which also had been gutted has since been a country and western hall, now a bingo parlor, and has very little historical value left to it. There's very little other economic development in that area that would be harmed by taking that particular site. If they're determined to still take 30 or 40 acres out of this area, I think possible optional sites that should be looked at are directly west of the Lombardy site three. The city already owns the closed Lee High School building. There are the old Fridgiking and John Deere buildings, which now contain flea markets. This would be an extended north/south area for parking the rail cars, which I understand from DART, is a favored type of site, a long site, and a long narrow site as opposed to a square one. More alternatively, the Bachman strip sites, topless bars. I don't think anybody would object to having these torn down and parking rail cars in there. I just hate to see our particular area being taken. Thank you.	Appendix G of the EIS documents the alternatives considered for the rail operating facility. See response to Comment W-24. The Lombardy/Denton site was selected for several reasons. Site 1 was not selected because two major facilities would have to be relocated in the same general area of northwest Dallas and there was not enough time to complete the permitting for relocation of the solid waste transfer facility and costs to relocate both facilities would have been considerable. Site 2 has a higher redevelopment potential due to its proximity to the Bachman Station. Furthermore, the former Circle Theater has been determined to be eligible for the National Register of Historic Places. The area to the west of Site 3 includes the Letot School, which is eligible for the National Register of Historic Places. It was not considered as a site.
ROF	Linda Neel, Dallas	PH-21	I live approximately one block northeast of Northwest Highway at Denton Drive. I had a wonderful speech planned, and I've changed it somewhat after hearing so many people speak in support of option D at the medical corridor. It seems that a lot of people are very, very concerned about the visual effect of that area. I'm here to speak about the location of the rail yard in my neighborhood. If this rail yard would be put down at Harry Hines where the medical corridor is, I can	Comments noted. DART is committed to work with the community to ensure that the rail stations in northwest Dallas can assist in plans for redevelopment. See response to Comment W-24 regarding the rail operating facility.

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Subject*	Commenter	No.	Comment	Response
			assure you, all of you would be up here a lot more violently opposed to that than you are to where the rail line's going. As an activist in our neighborhood, I have worked for the past ten years in the Bachman Lake area. I've served on several committees here in the city. We've also worked with DART. We're very excited about the light rail coming through the Bachman area. We're happy to have the station stops there. All of these things are coming together now. We're getting the DART light rail. We're getting expansion at Love Field. We've got improved highway traffic flow. We've got improvements at Bachman Lake Park itself. We've got fewer nonconforming businesses, and we're continuing to work on those. We need to not exploit this area with a rail yard right when we're getting to the point of improving it. We don't need to go back. If it were in your neighborhood --	
MC	Se-Gwen Tyler, Arlington Park Association, Dallas	PH-22	Believe it or not, I do reside in the Arlington Park community, and I have lived there for over 40 years, my parents for over 50. And the ladies present here today, they have also lived there for over 50 years. I must say that being here this evening and hearing so many people speak, especially from the medical community, let me say that Arlington Park hasn't ever, ever received this much attention as what they have here today. We haven't ever seen these people before. We don't know these people. These people have not met with us. I don't know how they can make decisions on our behalf because we are definitely in support of the base alignment. So -- and this is the first time that we've ever heard or seen the 3-D map that's proposed here today. We have worked very, very hard in Arlington Park to try to revitalize the area, and I heard one person speak, and they said that the 3-D map would provide sufficient and adequate support for everyone, including Arlington Park. I don't know where he got that from. One lady spoke and said -- she even referred to the quality of life in Arlington Park, and we've never seen her before. We have been working very hard to revitalize our neighborhood. However, Mr. Todd has worked – the Stemmons Corridor Business Association is a very good -- very, very good neighborhood of ours, and we have worked together on several projects together for the senior citizens in the neighborhood, revitalizing recreation centers and schools. So they are very much involved. UT Southwestern, never see them. So -- you know. Maybe it's about time that they really stopped playing these games in coming forth and trying to speak on our behalf. We are knowledgeable enough. We know what we want. And if you all would meet with us, we would tell you what we want. We are very much in favor of the base alignment going down Harry Hines. We have several people who utilize that service. They have to walk a mile already to get to Harry Hines because the DART bus does not run frequently up and down Record Crossing. However, there are many people who utilize that service on Harry Hines, and I believe that Ed Oakley, our council representative, is also in favor of this. Our state representative is state representative Terry Hodge, and she also has been supporting the community. So I just want to say that Arlington Park definitely does support the base alignment that was proposed years ago, and it's time that we go ahead and move forward and stop interrupting this whole process. It's time to move forward. We need to utilize this service. We need it. We need it in our neighborhood. The people in our neighborhood need this service. So we ask that you all please, please approve the base alignment. We're there for you. Next time, we're bringing more people.	Comments noted. See response to Comments W-34B and W-34C. Medical Center representatives met with Arlington Park neighborhood representatives and came to an agreement in support of Option D. This support was stated at the September 17, 2002 DART Board meeting at which time Option D was approved as the preferred alignment. This shuttle service will ensure a high level of transit accessibility to the Medical Center area and adjacent neighborhoods such as Arlington Park. DART will work with the medical center representatives to ensure that agreement developed for Option D remains in place under the selected UP RR alignment, which was approved by the DART Board on May 13, 2003.
ROF	Richard	PH-23A	All of the operating service facilities would create some disruption. It looks as if	See response to Comment PH-20B.

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Subject*	Commenter	No.	Comment	Response
	Schumacher, Dallas		site three would be least disruptive. If you haven't considered it, I would urge you to consider the site immediately west.	
LF		PH-23B	For the Love Field option, I was originally very much in favor for it, and I think I still would prefer it. But spending 160 million dollars to avoid a bus ride doesn't seem like a worthwhile price to pay at this point. So if you don't do it, please preserve the option for doing it in the future. Airports in Minneapolis, Denver, and other places have very seamless and fast shuttle services between their terminals and outside transport facilities, and the same thing can be done here.	See response to Comment W-6.
MC		PH-23C	Finally, the comments from the medical center people seem bizarre. They talk about wanting to grow their facility in the area and having thousands of extra staff and students and patients in the years to come, and yet they want to push the mass transit away from it. So one has to believe they have not seen DART's recent blue line and red line expansions. The aerial stations and the aerial lines there are in no way any sort of an impediment or boundary or dividing. They're attractive, and they're easy for pedestrians to pass. The only things they interrupt are, I suppose, sight lines and building locations. I have to wonder what their real agenda is here. So if the board is more interested in serving the medical center -- the medical center doesn't recognize that at the moment -- then they should preserve the base alignment. If the DART Board is more interested in seeing redevelopment occur in the existing neighborhood, then they should pick 3-D. Thank you.	See response to Comment W-2A and PH-22. DART selected Option D in an effort to select an alignment with broad support that could provide a high level of service to the Medical Center while also providing opportunities to serve existing neighborhoods and redeveloping areas north and east of the Medical Center. Subsequent discussions led to the re-examination of the UP RR alignment. After holding a public meeting, public hearing and considering changed conditions in the area, the DART Board approved the UP RR alignment on May 13, 2003.
ROF	Sharon Boyd, Dallas	PH-24A	I am not particularly in favor of the rail yard on Denton Drive, but if we are going to get a rail yard in our area, it should be surrounded by a masonry wall so that from the street, it appears as a business complex. And we also want parkway trees around it. Again, I am not saying I'm supportive of it, but it looks very much like it's going to happen to us. And if it is, it ought to be something that adds to Denton Road, not detracts. We do not want Cox wire fence with the wire across the top like what we saw over at Fair Park. That's not acceptable. That will not encourage the redevelopment that we want on Denton Road.	See response to Comment W-24.
MC		PH-24B	I also want to speak in favor of the Harry Hines alignment for the light rail for DART. The excuses we've been hearing from the medical facilities are just that, excuses. We don't know what their real agenda is because we can't seem to follow their logic. I think most of us here are fairly bright people. We may not be as bright as doctors, but then we're not God. So I'm hoping that when you -- when push comes to shove that the DART Board is going to look to the entire community, not just one enterprise. All of us need the alignment to go down Harry Hines. Thank you.	See response to Comment W-34C and PH-23C.
MC	Steve Turner, Dallas	PH-25A	I want to support the original alignment to Parkland Hospital, because one of the things that nobody's mentioned at all is this option allows people easy access to both St. Paul and to Children's Hospital also, which is taken away if you use option A, B, C, or D. The people that need to get to the hospital need to have easy access to it with the other station at Exchange Park.	See response to Comment W-34C and W-40C.
LF		PH-25B	Also, I think that we do need the option for Love Field.	See response to Comment W-6.
ROF		PH-25C	And as far as the maintenance facility in this area, it is needed because you've got a lot of rail cars that will be going in and out of the area, and they will be needed. Where they put it, I'm not sure. But I was over at the other rail facility in the last two days, and I don't see any objection to what they have over there being in that neighborhood.	See response to Comment W-24.
MC, T	Eduardo Delacruz, Dallas	PH-26A	We talk about the base alignment, but we forget one thing. I don't know if any of these people have ever been in a hospital or ever been in an emergency.	See response to Comments W-2A, W-3C, W-3D and W-41C regarding emergency access.

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Subject*	Commenter	No.	Comment	Response
			Ambulance goes there, you know. If we go by base alignment, there's going to be a lot of traffic in and out.	
MC, V		PH-26B	Now, another thing is the trees, and I'm for the trees like I said earlier. They have beautiful trees on Motor Street all the way over to Mockingbird Lane. What's going to happen? They're going to tear down those trees, pull them up, throw them away. Of course they're going to replace them, but it's going to take 15 to 20 years to be the same way they were.	Had the Base Alignment been selected, construction would have required removal of much of the median landscaping. This would have been replaced after construction. Since the UP RR alignment was approved, no impacts to median landscaping north of Motor Street will occur.
MC		PH-26C	I go for option D. You wonder how the senior citizens are going to come down from the aerial platform down on the elevator. I've been at the Park Lane station, and when it's rush hour, the train sits a lot of people. So imagine the northwest corridor is going to be a lot of people. And remember, those people, when they try to get to the hospital, it's going to be hard for them. For a 90-year-old man, it's hard for him to go down the stairs. Even for a 62-year-old, it's a handicap. I go for the handicaps. It's hard to get downstairs on the elevator, sometimes on the platform.	See response to Comment W-2A. Any of the Medical Center alignment stations would have required vertical circulation (aerial or open-cut, below-grade stations). The selected UP RR alignment has two aerials stations in the area. However, all stations are Americans with Disabilities Act (ADA) accessible and the proposed shuttle service (see response to Comment W-34B) would help to provide door-to-door service for the elderly or handicapped.
DRAFT EIS PUBLIC HEARING, July 15, 2002 – Manske Library, Farmers Branch				
MC	Claude Doane, Garland	PH-27A	I am here to speak strongly in support of the base alignment at the medical center. And for the record, the article in today's paper was over 20 parts of byline; plus parts of it looked like they were written by the medical center staff, because it echoed the comments they made at the meeting the other night. And further for the record, they made all their comments and got up and left; thereby signifying they had no care what anybody in the community thinks.	Comments noted. See response to Comment PH-1A.
LF		PH-27B	I also support the Love Field option. If deferring stations would help get us in at Love Field, I recommend deferring the Parkland station and the Inwood/Denton station -- since medical center does not seem to want them anyway.	See response to Comment W-6 and PH-1B. Deferring the referenced stations would not be appropriate since they are projected to be two of the mostly highly utilized stations on the Northwest Corridor line.
ROF		PH-27C	As far as the maintenance facility is concerned, I prefer Option 1. I think operationally DART could do much better to be south of that junction than north.	See response to Comment PH-20B.
T		PH-27D	In the Carrollton Square station, you might want to consider moving the station so it straddles a street like Walnut Hill or -- then when they get off the train, they walk to one end and go down to the north side of the street, or on the other end, you go down to the south side of the street. You don't have to build an extra bridge -- you've already solved the problem.	The Carrollton Square platform is located north of Belt Line to be closer to bus bays, parking and a possible future station on the Cotton Belt rail line. There would be no significant cost savings to move the station to straddle Belt Line Road since both the alignment and station are on aerial structure.
T	Phyllis Silver, Dallas	PH-28A	I live in Dallas, but soon to be a resident of Addison. I have reviewed the -- a draft of the Environmental Impact Statement, and I'd like to comment in particular on Section 2 -- in particular 2.2.6, the bus operating plan. I like what it said. It talked about how the existing bus routes would be restructured and realigned. I'd like to propose that there be east-west crosstown buses linking the Northwest Corridor light rail line to the current light rail line that goes generally along Central Expressway. Also I propose that each Northwest Corridor station in the north Dallas and suburban areas have bus service along the east-west streets, such as Walnut Hill and Beltline. These would be, of course, in the north Dallas and suburban areas. And some of these buses I'm suggesting should go to the Addison Transit Center. And this way north Dallas and suburban riders who are not on the train line can also enjoy the speed and efficiency of rail service without having to go all the way downtown.	Comments noted. The bus operating plan will be refined prior to opening the LRT line; suggestions about cross-town routing for LRT feeder bus service and service to and from Addison Transit Center will be forwarded to DART Service Planning for consideration. A key element of the feeder bus plans are east-west connections linking to LRT stations on streets such as Walnut Hill and Belt Line Road.
T		PH-28B	I propose that the Carrollton Square station of course be under the road.	See response to Comment PH-27 D. The LRT line must be aerial in this area to accommodate grade-separations of streets and freight rail lines.
MC	Dave Blair,	PH-29A	I'm a citizen and the former mayor of the city of Farmers Branch, and also a	See response to Comment W-34C. The selected UP RR

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	Farmers Branch		member of the MIS committee that helped to get this alignment started in the first place. My comments are basically two -- one on the Parkland alignment. I would hope that the board would make that decision in September; a decision that would allow that alignment to proceed without delay, and certainly within some cost restraints. Hopefully the same type of costs and not increasing the costs.	alignment results in cost savings compared to the other Medical Center alignments examined. The alignment will not affect the project schedule or add to potential delays to the project. Any delays to the project would be a result of lower sales tax revenues or other funding shortfalls.
LF		PH-29B	The second comment would be the Love Field line. I would hope that the DART Board and staff would consider the Love Field as an accessory line and not delay any of the lines going north of Love Field. We've worked long and hard here on the DART situation, and we'd like to see the line into Farmers Branch no later than 2008.	See response to Comment W-6.
G	Bob Phelps, Mayor Farmers Branch	PH-30A	I wanted to congratulate DART on successfully completing the planning and environmental analysis of the Northwest Corridor light rail line. Farmers Branch is a charter member of DART and has eagerly awaited light rail service since the formation of DART in 1983. Now nearly two decades later, this public hearing represents a significant milestone on our way to our goal of bringing light rail transit to the city of Farmers Branch. DART's plan provides for the right kind of rail line in the right corridor with a station in the right place to serve our city. I encourage the federal reviewing agencies to expedite the approval of the Environmental Impact Statement. In order for the line to be in operation by or before 2008, design must be begin soon; therefore I renew my request for timely federal approval of the Environmental Impact Statement and granting of a Record of Decision as soon as possible.	Comment noted.
MC, LF		PH-30B	I urge all parties to quickly resolve any remaining issues regarding the alignment of the rail line through the medical center and the Love Field area. I think if it would slow down the original plans to come to Farmers Branch and Carrollton that it should be put off. DART must complete its work on or ahead of schedule as it has done in the past for each of its light rail projects. Light rail must be operating in the new Farmers Branch station by or before 2008.	See responses to Comments PH-29A (regarding Medical Center) and W-6 (regarding Love Field). Potential delays to the project are related to a decline in sales tax revenues.
G		PH-30C	We have developed a vision for the rail line and the station that will serve Farmers Branch. This vision includes a mix of retail, restaurants, residential, civic and office uses in a pedestrian friendly environment around a public plaza and the light rail platform. The city has long planned for the rail to be the catalyst for new development in the Northwest Corridor. Our transit oriented development would be a destination for shopping, dining, working and entertainment. This would boost DART's ridership and sales tax base while furthering the reputation of Farmers Branch as a great place to live, work and play. To realize that vision, we encourage DART to strengthen their commitment as an economic development partner. DART must recognize the importance of building a high quality station for Farmers Branch that fits the character of the urban-style mixed-use development we envision. To ensure the viability of the Farmers Branch station, part of that design should include structured parking to support not only the needs of the station, but also development opportunities adjacent to the station. DART and Farmers Branch have worked together for years to improve bus service, fund street projects and build HOV lanes. Our effective working relationship must continue to make light rail in the Northwest Corridor a reality. The city of Farmers Branch strongly supports the Northwest Corridor project.	Comment noted. DART is committed to working with the City of Farmers Branch to ensure the station and associated facilities are designed and constructed in a manner that is equitable and promotes public/private partnerships in order to enhance both ridership and redevelopment opportunities.
MC	Jim Abadie, DART Citizens	PH-31A	I'm the Carrollton representative to the DART C.A.C. First of all, the alignment through the medical center area. I think that it's very important to remember that	See response to Comment W-34C.

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Subject*	Commenter	No.	Comment	Response
	Advisory Council Representative for Carrollton		many years ago the hospital district area did sign off on the base alignment down Harry Hines. And I'm a little concerned that now during this time period, they decided that that wouldn't be good enough. The bottom line is that I think that the Harry Hines alignment is the best. We have many residents in the City of Carrollton that work at U.T. Southwestern and that would be a better option, to go down Harry Hines. But I also want to be a person who believes that we can compromise. So if that wouldn't work out and we would have some type of delay because of that, I think Option D as been presented today would be a good alternative alignment to get this thing rolling and not delay the project whatsoever.	
LF		PH-31B	The second point I'd like to address would concern also Love Field. I think it is critical that we do not delay our project into the Northwest Corridor to Farmers Branch and Carrollton by maybe having a slow down because of building a rail into Love Field. But I'd also like to make the point that it's critical that we tie in all major transportation hubs into the system, but not like us to forget that Love Field needed to be eventually tied in, but if there's any way possible that we can do this from the very beginning I think it would be very beneficial to this whole region.	See response to Comment W-6.
AD	Chris Loy, Video Post & Transfer, Dallas	PH-32	I'm employed at Video Post and Transfer located at 2727 Inwood Road in Dallas. We're on the corner of Inwood and Denton Drive. My comments tonight are that that station displaces us out of our current business. We're a full production business that does commercial television and film work for the local community in this area. And I would like to propose maybe a relocation further north of us where there's vacant property and that does not consider us in the relocation. Relocation does take a considerable amount of time in our business, because we're not just an office; we're basically a processing lab. And those details will be outlined -- our attorney will be sending you the details of our displacement if this location is decided upon. Thank you.	See responses to Comment PH-18C.
MC	Tommy Hines, Northwest Dallas Improvement League	PH-33A	My comments are my own and I'm not representing any group. With respect to the Harry Hines and Southwestern/ Parkland issue, I strongly endorse the original baseline. I feel like economically it's the best way to go. If there's any concern about elevated structures, I would remind one and all that the med school and St. Paul in conjunction with the north campuses have had an elevated concrete drive over Harry Hines for the last six or seven years.	See response to Comments W-2A and W-34.
LF		PH-33B	With respect to Love Field, I think that's an absolute yes	See response to Comment W-6.
ROF		PH-33C	With respect to the rail operations facility, I would select any location other than the one selected by the group. Go somewhere else other than Denton Drive and Lombardy.	See response to Comment W-24.
G		PH-33D	I would like to see DART completed just as soon as possible as other speakers, because we've continually heard that the relocation or reconstruction of Denton Drive depends solely on the construction of the DART line and its completion. And there are some of us that are tired of going to Midas every other week to take care of automobiles.	Comment noted. DART is continuing to coordinate with Dallas County and the City of Dallas regarding Denton Drive improvements, some areas of which are dependent on the final design of the LRT project.
G		PH-33E	With respect to some other comments relative to this project, I've heard of issues where there's going to be taking of property, just as a previous speaker noted -- however it's taken by legal means. I think they should be sensitive to people's businesses and also to the amount of the building they're taking in those locations.	Comment noted. See response to Comment W-4B.
G		PH-33F	And also just one side note in conclusion, I would like to see them be very accommodating to the people in the Asian business community that's created a	Comment noted.

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Subject*	Commenter	No.	Comment	Response
			wonderful shopping area up and down Harry Hines between Walnut Hill and LBJ Freeway. These folks are expanding each and every day. And I think we should be very attentive to what they ask of the group. And you heard those comments the other afternoon already. Thank you, ma'am.	
MC	Tim Dickey, Dallas	PH-34A	I would encourage the DART Board to support the original recommendation along Harry Hines. Southwestern Medical School has many employees that I don't believe have been listened to in this or whose opinions on liking to have mass transit as a way to get to work have been listened to. I've heard off the record people quoting doctors at Southwestern that don't like it. Comments about the aesthetics of having a split campus. These are short-term considerations. And the long-term benefit of having a major medical research facility tied into the regional mass transit I think outweighs any of the concerns. And I would encourage the DART Board and staff to solicit input from the workers at Southwestern Medical School, who I don't believe have been represented in this.	Comments noted. See response to Comment W-2A, W-34C, and PH-22 and PH-23C.
LF		PH-34B	As it relates to Love Field, I believe this entire transit corridor should be built out to maximum efficiency possible now for the next 75 years. So I would like to see the Love Field option built in at the beginning in another year or two. I understand that Farmers Branch and Carrollton have been waiting for a long time, but we're talking about a three or four or five generation impact of what we decide here today. And the short-term, a year or two, I think shouldn't outweigh the doing of a proper job. And Love Field, I believe, needs to be tied in at the beginning.	See response to Comment W-6.
ROF, V		PH-34C	My final comment is about the rail maintenance facility. The DART Board should consider doing much more at that facility to mask and screen and get more of an investment in those kinds of amenities there than they have, for example, at the current facility that we took a tour of a few weeks ago. That's just a fence. And I think that this community needs more than that in terms of screening. When the justification for that facility was made, one of the things said was that it fits the existing industrial uses. But if you go a little bit north of Walnut Hill where the new station is going to be and look at the way the city code compliance maintains the facilities along Denton Drive, like the Plaza Latina there, you can see that when it gets to the industrial areas, the city does not maintain or enforce code there, so they look run down. And that's what you're going to get in that area unless DART does extraordinary measures to make it otherwise at that rail maintenance facility.	See response to Comment W-24.
DRAFT EIS PUBLIC HEARING, July 16, 2002 - Frankford Village Branch Library, Carrollton				
ROF	Fran Brown, Carrollton	PH-35A	I've already commented on the EIS, and I will comment on the rail operating facility as being site 3.	See response to Comment W-24.
MC		PH-35B	I want to skip up to the first one, the medical center alignment. My choice has been all along the base alignment. I'm concerned about any changes on that base alignment would result in a delay to the opening of the Carrollton station -- because I'm actually opposed to anything that would cause any delay to rail getting to Farmers Branch on time or to the City of Carrollton on time. But aside from the base alignment, which quite honestly, I thought we all had agreed upon -- Farmers Branch, Carrollton, DART, citizen group, staff group as well as city leadership group. If we're going to change it, Option D would be my choice on that.	Comments noted. See response to Comment W-34C and PH-29A.
LF		PH-35C	I have always favored the Love Field access. That has never changed. And I would like to see that addressed now, so long as it does not delay DART	See response to Comment W-6.

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Subject*	Commenter	No.	Comment	Response
			opening in Farmers Branch on time and DART opening in Carrollton on time. When you're the end of the line, that seems to be the difficulty -- you have to contend with all these things that need to be in place before it gets to your city.	
G	Cissy Sylo, Indian Springs Home Owners Association, Carrollton	PH-36A	I am President of the Indian Springs Neighborhood Association. We are the closest neighborhood to the end of the Carrollton line Frankford station. We are supportive of the Frankford station being on the south side of Frankford as requested in the last public meeting we attended. We appreciate DART staff support and consultants in order to move that location to the south side of Frankford. We met as a homeowner's association last week and are supportive of moving this project as fast as possible to the end of the line -- to Carrollton. We would like to see no delays in the project.	Comments noted.
ROF		PH-36B	We are also supportive of the staff recommendation for the rail operating facility at the Lombardy site.	See response to Comment W-24.
MC	Judy Scamardo, Carrollton	PH-37A	I too am concerned about any delays in the train getting to Carrollton. We have been participants with DART in this since the beginning and have looked forward to it for many, many years. I do know that any time you make any changes; it does have a tendency to do delays. But saying that, if you could not delay the train getting to Carrollton, I think Option D at the medical center location would be the most economical way to go if it's going to save a lot of money. And we're always in favor of saving money. My biggest concern as a citizen of this community is that that train is not one day late. It needs to be here on time.	Comment noted. See response to Comment PH-29A.
LF		PH-37B	Love Field I think is very important, but if it's going to delay the train getting to Carrollton, I would say we wait for it. But I think it's necessary. And I think too if we wait that the cost will just be greater later on down the line.	See response to Comment W-6.
MC, AD	Robert Haas, Video Post and Transfer, Dallas	PH-38	I'm general manager of the business on 2727 Inwood Road called Video Post and Transfer. And it looks like a lot of the options besides the base line have an Inwood Road station at Denton Drive, and that's exactly the top of our building there. Of course we're against that. What I'd like to point out is that right behind us on Denton Drive there is a lot of vacant and abandoned property that I'm not so sure is being looked at correctly. We heard Kay talk about relocating a neighborhood, and it's a 20 million or 22 million dollar cost; I'm not so sure we realize what kind of money it's probably going to take to purchase some of the businesses over there, because we have not been contacted. And I know that we can't until a decision is made. So we definitely like the original line staying through Harry Hines. Thank you.	See response to Comment W-34C, PH-18C, and PH-32.
LF	Sid Liberman, Carrollton	PH-39	I was an original DART Board member back in '83, and I would like to make a motion that the Love Field as planned I believe will delay the northern route. The original route was on the rail right-of-way with a people mover from the terminal to the rail station. And I'd like DART to go back to that consideration. By putting the station on the east side of the terminal when all the parking and everything is developed on the west side, the luggage and everything else on their new development there, I think DART will have a problem with that station. So if they go ahead with it, I don't want the delay so that our northern stations and route will continue. I'd like DART to consider that people mover underneath the track -- underneath the west side landing strip so that it would connect up with the station on Denton -- I think it's Denton Drive where the original railroad is.	See response to Comment W-6.
LF	Joe Munoz, Dallas	PH-40A	I'm here with my wife Sherry. Thank you for the opportunity to address you all. Number one, we both strongly favor not proceeding with the Love Field option at this time. 160 million dollar cost is probably prohibitive from getting things	See response to Comment W-6.

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Subject*	Commenter	No.	Comment	Response
			launched on time. Any ideas of doing a shuttle bus service from one of the closest stations to Love Field?	
ROF		PH-40B	Second, we strongly favor the DART recommendation on rail operating facility number 3. We think it's the best one of the three presented here.	See response to Comment W-24.
MC		PH-40C	Option D on the medical center branch, we think that would be a good thing to get going. There is lot of people needing transportation to the medical city area.	See response to Comment W-34C.
HP		PH-40D	And, lastly, any thought given to incorporation of the historic Carrollton depot into the functionality of the Carrollton station? It would just be a neat touch up thing to not just put that somewhere away, but to actually become part of the station one way or the other. Thank you.	The historic Carrollton depot will be relocated and incorporated into the LRT station site. DART is working with the State Historic Preservation Officer to locate it at an appropriate site, rehabilitate the depot, and find an appropriate reuse for it. The station design currently proposes the depot be relocated to the northeast corner of the station site, adjacent to the Cotton Belt rail line. In a letter to DART dated September 26, 2002, the Texas State Historic Preservation Officer determined that the relocation of the depot from its current location would amount to an adverse effect. DART has developed a Memorandum of Agreement with FTA and SHPO that includes potential mitigation measures such as rehabilitation and continued maintenance of the structure (see Section 5.13.1 and Appendix H).
G	Randall Chrisman, DART Board member, Carrollton	PH-41	I'm also with the DART Board, and I just want to thank everyone for turning out tonight. I know as a new board member, there is a lot to consider. I think all the people's comments here are very apropos. And I think speaking up will mean a lot to getting these trains on time in Carrollton, as well as Farmers Branch, and I just want to the thank everyone that showed up tonight. Thank you.	Comment noted.
G	Shirley Denus Tarpley, Carrollton	PH-42	And I would like to say -- I'm not going to repeat all that was said tonight, but I'm in favor of anything that will get DART to Carrollton, because we've waited on this a long time. And from the very start Carrollton has supported DART in each one of our elections. We have supported DART. And I'm getting old and I'm ready to see DART come through so that I can make it to some of these other places, the medical center, Inwood, you know, and all that. So whatever gets it out to Carrollton the quickest is what I want to see.	Comment noted.
MC, LF	Dave Schlepphorst, Carrollton	PH-43	And I hope you won't mind if I sit down, but I have a bad leg and I have trouble standing. I think there's a couple of important things in this meeting we need to address. And one is the key of Love Field and medical center being great sources of revenue -- massive sources of revenue everyday that would help support the -- the cost. I think we want to investigate the deed for the property scenario, because I think it's pretty cost prohibitive and destructive to some of the area. I think that some good points were brought out on getting on the west side of the airport rather than the east side, a little closer to things, you know, cars and taxis and those things. It seems like we're getting off on the wrong side of the runway and that could be very important. But I think we've come a long way since the first meeting and this is going to work out well. And I hope that we get it here on time. That's very important to me too. Thank you.	Comment noted. See response to Comment W-34 (regarding medical center) and W-6 (regarding Love Field).
MC	Joanna Norris, Salvation Army Carr P. Collins Center Dallas	PH-44	I represent the Salvation Army, and we're located at 5302 Harry Hines Boulevard. With the options of A, B and C, my facility, which is a 512-bed facility, will be impacted. I'm very excited to hear of the plan D, because it will bring clients and residents to my facility and yet not impact my facility so drastically as A, B and C do. I am also very mindful in my job of cost cutting measures. And I think that that certainly does present an option with D as being	Comments noted. See response to Comment W-34C. The selected UP RR alignment provided comparable access to the Salvation Army facility as Option D, while providing cost savings to DART.

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Subject*	Commenter	No.	Comment	Response
			a cost cutting savings to the DART agency as they prepare for the expansion. And I too -- if I were on the end of the line, I would like for it to get there just as quickly as possible.	
PUBLIC HEARING, April 10, 2003 – Edison Medrano Elementary School, Dallas (For Subsequent Project Changes in Medical Center area)				
AD, NV	Robert Haasz, Video Post & Transfer, Dallas	PH-45	I'm writing this letter in reference to the proposed relocation of the Inwood DART Station. I would like to clear up and reset Video Post & Transfer's position regarding the relocation. The last time I addressed the committee we felt our hands were tied regarding the decision to move the station's original location. After the committee's final vote at that time to go with Option D, we immediately started communicating with real estate firms to get an idea of what was available in the market. I want to make it perfectly clear that Video Post & Transfer sees this relocation as a business opportunity. I also understand from what we've heard, there is no difference in cost of what side of Inwood Road the change really would take place, so why change now? People working with DART and its real estate division also informed me over time that from an engineering and design standpoint the north side of Inwood is preferred. The business owners on the north side of Inwood are in favor of selling and relocating. A lot of preliminary work has – has been already done for that and we definitely support the original decision and hope the committee will feel the same way. Now I looking at this handout that was given tonight on Page 8 where we're talking about the Inwood Station, there is a line item in there that says that recent interviews with property owners of Video Post and Transfer have indicated a significant hardship would occur in their relocation. That's a little bit misrepresented there – or—or miscommunicated. The hardship that we had stated at that point in time is that we have a post-production business. I have fifty-two miles of digital cable in my building and it would take me at least one full year to move from one location to another. And the hardship was in knowing what the time – the time frame is and knowing what the possibilities would be of operating two facilities, so on and so forth. So the hardship was in the time of moving, not a matter of relocating the business or not, so the statement written here is – is not what we were opposed to in the first place.	See response to comment W-100A
T, MC, S	Cheryl Sutterfield-Jones, American Red Cross, Dallas	PH-46	We strongly support the modifications as they are presented to use, the DART rail line in the owned property. It is going to truly have a more positive impact on the American Red Cross. The first impact, of course, is the access to our property will not be affected negatively. Our access to emergency vehicles coming in and out will not be affected and so we think that is very important and a benefit to us to be able to go with this proposed plan. We also think the relocation to the back of our property, which is what this plan does, moves the highway and byway in front of us. It does not affect us again going up and down the traffic line and having the DART rail directly within that twelve to fifteen feet in front of our property and the facility, so we again are strongly supportive of the modifications. We also think that the impact on the beauty of Harry Hines going away just from the impact on Harry – on our property is keeping Harry Hines open as a corridor – as a business corridor and the impact it can be strategically for our community to be able to keep Harry Hines open and keep beauty not a negative impact by having a DART rail running up and down as well. So again it's very beneficial I think for all of us to do that. We also think that the access to the new, I guess, the Motor Street DART rail station is going to be very good for the riders in the area. I know it will be good for the clients and the staff of Red Cross and eve, of course, Medical City as well. So that will be a benefit.	See response to comment W-104

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Subject*	Commenter	No.	Comment	Response
			However, I don't think that I could be the Red Cross without talking about the safety and we do encourage that we put sidewalks in that area around the DART rail. That's going to be very important for the people who are going to be walking to our facility and up and down. So we would ask that we consider to put sidewalks to protect the safety of the people using that area.	
AD, NV, T, MC	Tom Bright, Southwestern Gage, Dallas	PH-47	My company is Southwestern Gage. We are at 5819 Denton Drive. And if I seem a little nervous tonight to ya'll, it's because the impact of the change of the line from Harry Hines to where we are will effectively drive me out of business. We've been in business at that spot for fifty-two years. They're about to put a rail line that is probably at the minimum distance from the – that was mentioned, twelve feet. It's probably fifteen feet from the rail line to a concrete structure that is sixteen feet off the ground and rises up to twenty-three feet, which is right off of our building, right off of our offices. We have a factory that we must get into the back and we can only get in from the railroad track side and there is doubt of whether we will still be able to get into the factory, which would then effectively close us down. I've got to keep going, because three minutes will run out. Our property will be really difficult to use because of how it's located. Our building will be buffeted by the passing trains, which will hurt our delicate measuring equipment and that's what we sell. We have a building full of machines that measure to a millionths of an inch and all of a sudden I'm going to have traffic bouncing by twelve feet away from my building, which is going to impact it and will. I cannot imagine how I'm going to be able to continue to use it. It will be very difficult to attract our customers for this spot, because we are now in the shadow of the concrete monolith, besides the trains passing all the time. I think it will effectively destroy our business within a couple of years. So I go back to why making the change from Harry Hines? And I realize that all of a sudden a bunch of CEOs, who in 1999 said they were in favor of the line on Harry Hines have now decided, "Gee, it might split our campus up". And in spite of the fact that they have 40,000 people working and living right or working and visiting right in that area every day, not count Exchange Park which is just up the road which is a huge facility with probably another 5000 people in it, not counting the Salvation Army at Mockingbird where all the people come. I don't know whether the 40,000 includes the other Salvation Army places. So here we have all this traffic and their justification is we're making the change because there's no change in ridership. Now, can you imagine anybody walking or getting from the Inwood Station down into any parts of the northern part of that Harry Hines line? I can't. I can't imagine what we're creating is a line to move people from Carrollton to downtown and we're just putting gout anybody that's in the way and that's us and I just feel that it's very sad that we'll put a station where we probably have a hundred – or a hundred customers or a hundred workers and take it away from one that has 40,000 and justifying there's no change in ridership. It doesn't make sense to me; I'm only a poor old country boy, though.	See response to Comment W-99. In addition, ridership is estimated using the approved regional model from the North Central Texas Council of Governments (NCTCOG). Based on that model, the ridership change is not significant. That is primarily due to the fact that the stations and the feeder bus routes serving them will still provide good access into all parts of the Medical Center. In addition, the Inwood Station is projected to have strong ridership since it serves a residential area, a commercial area, and can serve as a neighborhood park-and-ride for persons coming from the north and east.
MC. T	Claude Doane, Garland	Ph-48	I want to be – I want to make sure this is in the public record that the original change to Option D was at the Medical Center's request with a promise on their part to provide shuttle service to those 40,000 people just mentioned. They are now retracting that offer of shuttle service and said they want DART to fund with twenty million dollars, half of the cost savings of this new alignment. A fixed guideway system which is an alternative to our – which will move people in the area and I – I personally think that should be dispensed with immediately. We shouldn't fund their plan because they're backing out on their offer originally.	Comments noted regarding Medical Center shuttle service; in addition to the network of DART buses feeding the stations, DART will continue to coordinate with the Medical Center on how their own supplemental system can enhance access for their employees, visitors and patients. Regarding the Market Center, there is also a new connection to the tollway planned at Oak Lawn Avenue, which may relieve some of the traffic on Wycliff. However, once operations begin, DART will monitor

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			Also I want to say that you should possible consider the parking garage at the Market Center Station, because it is at the end of the tollway and you might get a whole lot more cars there than you're thinking.	parking at the Market Center/Oak Lawn Station to determine if overflow in the neighborhood becomes a problem. If so, DART will work with the City and the neighborhood to determine appropriate parking or traffic controls, or will consider expanding the parking area.
S, T	Maria Saenz, Dallas	Ph-49	I live at 2526 Kimsey. This is a street that connects with the railroad tracks, that we have a lot of children there and they go to Rusk Junior High, the historical Rusk Junior High. And the problem is, the kids go over the railroad tracks to get to the school. It's a lot shorter way to get there and if you build the – they are telling us that there's going to be a wall that goes across there and what we're suggesting is you put some kind of safe way where the kids can go over the tracks, maybe a bridge or a sidewalk taking them to Inwood, so they don't have to go all the way around the block to get to the school. Because it's going to inconvenience the kids and it's going to be not as safe as it was for us for them to get to school that easy. You don't go all the way around the block to get to the Rusk – so if y'all could maybe put a sidewalk that directs them all the way to Inwood Road where they can cross the street safely or maybe put, like, a little bridge that goes over it or decide something to make it easier to get to the school. That's my suggestion.	Kimsey Drive does not currently cross the tracks but as mentioned, but school children do cross the existing tracks as a short-cut to access Rusk Middle School. The proposed LRT alignment will be transitioning downward to street-level at the end of Kimsey, and at that point an approximate 10-foot high retaining wall will support the LRT tracks, thus blocking access. A bridge would not be possible at this location since approximately 20 feet would be needed to clear the LRT, putting a bridge 30 feet in the air. However, during final design of the project, DART will assess ways to create a sidewalk or pathway along the LRT alignment that can get children safely to the Inwood/Denton intersection where they can cross at the signal. (See Section 5.11.2 – Impacts on Pedestrian and Vehicle Accidents)
G	Steve Jenkins, Dallas	PH-50	Kay, you had indicated before the meeting that written comments would be accepted as well if they were postmarked by the 12th and she had indicated on the record differently that the written comments needed to be provided tonight. I wondered if y'all could just clarify on the record that written comments would be accepted.	Comment noted. It was clarified at the meeting that in addition to written comments provided at the hearing, additional written comments would be included in this FEIS if postmarked by April 12, 2003.

***Subject Key:**
AD - Real Estate Acquisitions and Displacements,
G - General,
HP - Historic Resources and Parklands,
LF - Love Field,
M – Miscellaneous
MC - Medical Center,
NE – Natural Environment
NV - Noise/Vibration,
ROF - Rail Operating Facility,
S - Safety and Security,
T - Transportation,
V - Visual/Aesthetics,

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Wendy Lopez & Associates, ***DART LRT Rail Operating Facility – Phase 1 Site Selection Study***, 2002

List of Recipients

Appendix A

Appendix A – List of Recipients

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Willie Taylor, Director, Office of Environmental Policy and Compliance, Department of the Interior
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Patrick Bauer, District Engineer, Federal Highway Administration, Texas Division
David Visney, Regional Manager, Federal Railroad Administration
Leighton W. Waters, Acting Regional Administrator, General Service Administration, Region 7
Don Babers, U.S. Department of Housing and Urban Development, Dallas Office
Colonel Gordon M. Wells, Commander, U.S. Army Corps of Engineers, Fort Worth District
Wayne Lea, Chief, Regulatory Branch, U.S. Army Corps of Engineers, Fort Worth District
Rear Admiral Roy J. Casto, Commander, U.S. Coast Guard, 8th District
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Mark Denton, Archeologist, Director of State and Federal Review, Texas Historical Commission
Linda Roarke, Preservation Consultant, Texas Historical Commission
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Elvia Gonzalez, Environmental Affairs Division, Texas Department of Transportation
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John Promise, Director Environmental Resources, NCTCOG
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James McCarley, Dallas Regional Mobility Coalition

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Ramon F. Miguez, P. E., Assistant City Manager
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H. Daniel McFarland, Chief Information Officer
Madeleine B. Johnson, City Attorney

Terrell D. Bolton, Chief of Police
Steve Abraira, Chief, Fire Department
Harry Swanson, Department Director, Economic Development
Mary K. Vaughn, Department Director, Environmental and Health Services
Rosie L. Norris, Fair Housing Administrator
Sherell Cockrell, Department Director, Planning and Development
David C. Dybala, Department Director, Public Works and Transportation
Kenneth Gwynn, Department Director, Aviation
Paul D. Dyer, Department Director, Parks and Recreation
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Randy Nelson, Dallas Water Utilites
Gay DeHoff, Department Director, Office Property Management
Douglass A. Dykman, Interim Department Director, Housing
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Peer Chacko, Zoning Manager

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Beth Bormann, Assistant City Manager
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Cesar Molina, Director, Transportation
Stephen Jenkins, Director, Public Works
John Webb, Director, Planning
Shon Merryman, Transportation
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City of Farmers Branch
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Jimmy Fawcett, Police Chief
Kyle King, Fire Chief
Michael Spicer, Director of Community Services
Kaizer Rangwala, Director of Planning
Norma Nichols, Director of Economic Development
Jeff Fuller, Director of Parks and Recreation
David Davis, Engineering
Jerry Murawski, City Engineer

Dallas County
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Irvin Griffin, PE, Denton Drive Project Manager

Denton County
Kelly Zwinggi, Director of Public Works
Cathy Allcorn, Interim Planning Manager

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Senator John Cornyn, United States Senator
Senator Kay Bailey-Hutchison, United States Senator
Representative Michael C. Burgess, United States Congressman (26th District)
Representative Pete Sessions, United States Congressman (32nd District)
Representative Eddie Bernice Johnson, United States Congresswoman (30th District)

STATE ELECTED OFFICIALS

Governor Rick Perry, Texas
Senator Royce West, Texas State Senate (23rd District)
Senator Jane Nelson, Texas State Senate (12th District)
Senator Florence Shapiro, Texas State Senate (8th District)
Senator John Carona, Texas State Senate (16th District)
Senator Chris Harris, Texas State Senate (9th District)
Representative Will Hartnett, Texas House of Representatives (114th District)
Representative Terri Hodge, Texas House of Representatives (100th District)
Representative Kenny Marchant, Texas House of Representatives (115th District)
Representative Burt Solomons, Texas House of Representatives (65th District)
Representative Steve Wolens, Texas House of Representatives (103rd District)
Representative Jesse Jones, Texas House of Representatives (110th District)
Representative Dan Branch, Texas House of Representatives (108th District)
Representative Linda Harper-Brown, Texas House of Representatives (105th District)

LOCAL ELECTED OFFICIALS

Dallas County
The Honorable Margaret Keliher, County Judge
The Honorable Jim Jackson, County Commissioner, District 1
The Honorable Mike Cantrell, County Commissioner, District 2
The Honorable John Wiley Price, County Commissioner, District 3
The Honorable Kenneth Mayfield, County Commissioner, District 4

Denton County
The Honorable Mary Horn, County Judge
The Honorable Cynthia White, County Commissioner, Precinct 1
The Honorable Sandy Jacobs, County Commissioner, Precinct 2
The Honorable Bobby J. Mitchell, County Commissioner, Precinct 3
The Honorable Jim Carter, County Commissioner, Precinct 4

City of Dallas
The Honorable Mayor Laura Miller
Councilman Dr. Elba Garcia, District 1
Councilman, Mayor Pro Tem John Loza, District 2
Councilman Ed Oakley, District 3
Councilwoman Maxine Thornton-Reese, District 4
Councilman, Deputy Mayor Pro Tem Donald W. Hill, District 5
Councilman Steve Salazar, District 6
Councilman Leo V. Chaney, District 7
Councilman James L. Fantroy, District 8
Councilman Gary Griffith, District 9
Councilman Bill Blaydes, District 10
Councilwoman Lois Finkelman, District 11
Councilwoman Sandy Greyson, District 12
Councilman Mitchell Rasansky, District 13
Councilwoman Veletta Forsythe Lill, District 14

City of Carrollton
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Councilman, Mayor Pro TemTim Hayden, Place 1
Councilwoman Becky Miller, Place 2
Councilman Matthew Marchant, Place 3
Councilman Terry Simons, Place 4
Councilman Larry Williams, Place 5
Councilwoman Ronald Branson, Place 6

Councilman, Mayor Pro Tem Herb Weidinger, Place 7

City of Farmers Branch
The Honorable Mayor Bob Phelps
Councilman, Mayor Pro Tem Charlie Bird, Place 1
Councilman, Deputy Mayor Pro Tem Paul Walden, Place 2
Councilwoman Junie Smith, Place 3
Councilman Bill Moses, Place 4
Councilman Ben Robinson, Place 5

INTERESTED ORGANIZATIONS/ASSOCIATIONS/PROPERTY OWNERS

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American Red Cross, David Lewis
Arlington Park Heights Community Association, Se-Gwen Tyler
Bachman Community Association, Linda Neel
Burlington Northern Santa Fe Railroad, William Hayes
Carrollton-Farmers Branch Independent School District, Dr. Annette Griffin, Superintendent
Carr P. Collins Social Services, Jack Ewing
Central Dallas Association, Larry Fonts
Children's Medical Center, Mark Leediker
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Dallas County-Parks/Open Space Program, Administrator, Mary Phinney
Dallas Garland and Northeastern Railroad, David Eyermann
Dallas Independent School District, Glenna Taite
Dallas Market Center, David Voss
Denton County Transportation Authority, Charles Emery
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Greater Dallas Asian American Chamber of Commerce, Les Tanaka
Greater Dallas Hispanic Chamber of Commerce, Arturo Violante
Greater Dallas Korean American Chamber of Commerce, Timothy Choe
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McKaren Industries, Craig York
Metrocrest Chamber of Commerce, Ed Brady, President
North Dallas Chamber of Commerce, Carol Short
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Sammons Center for the Arts, Joanna St. Angelo
Save Open Space, Charles Allen
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Alice Jumper
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Henry Ash
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Bill Frey
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Joyce DeHaven
M. Scott Heimer
Mr. And Mrs. Al Paul
Mr. And Mrs. James Woods
Mr. And Mrs. Rand Bennett
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Mr. And Mrs. Frank Sota
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Appendix B - List of Preparers

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Plan and Profile Drawings

Appendix C

Appendix C – Plan and Profile Drawings

The Plan and Profile Drawings are provided in a separate volume. These drawings are available for review at: DART Headquarters, 1401 Pacific Avenue, Dallas, Texas 75266, and on the DART website: www.DART.org

They are also available at the following corridor libraries:

J. Erik Jonsson Central Library, 214-670-1400
1515 Young Street
Dallas, Texas

Oak Lawn, 214-670-1359
4100 Cedar Springs Road
Dallas, Texas

Park Forest, 214-670-6333
3421 Forest Lane
Dallas, Texas

Walnut Hill, 214-670-6376
9495 Marsh Lane
Dallas, Texas

Farmers Branch Manske Library, 972-247-2511
13613 Webb Chapel
Farmers Branch, Texas

Carrollton Public Library at Frankford Village, 972-466-4800
3030 N. Josey Lane, #130
Carrollton, Texas

Carrollton Public Library at Hebron & Josey, 972-466-4800
4220 N. Josey Lane
Carrollton, Texas

NORTHWEST CORRIDOR
HOUSTON STREET TO FRANKFORD ROAD
LINE SECTIONS NW1A, NW-1B, NW-2, NW-3 AND NW-4

FINAL ENVIRONMENTAL IMPACT STATEMENT APPENDIX C

PRELIMINARY ENGINEERING - 10% DESIGN

PRELIMINARY
FOR INTERIM REVIEW ONLY

By J. TIPTON P.E.# 61157

Date 25 OCT 02

CHIANG, PATEL & YERBY, INC.
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES

DWG No. GB1-0002

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NOTE:

1. RIGHT-OF-WAY PLANS, BRIDGE PLANS AND SECTIONS, STREET MODIFICATIONS AND UTILITY AND DRAINAGE IMPROVEMENTS ARE AVAILABLE AT DART HEADQUARTERS FOR REVIEW.

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DART PROJECT

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IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

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PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 2 OF 243

LIGHT RAIL TRANSIT SYSTEM
NORTHWEST CORRIDOR

INDEX OF DRAWINGS

CONTRACT C-937775-1 | DWG No. GB1-0002 | REV

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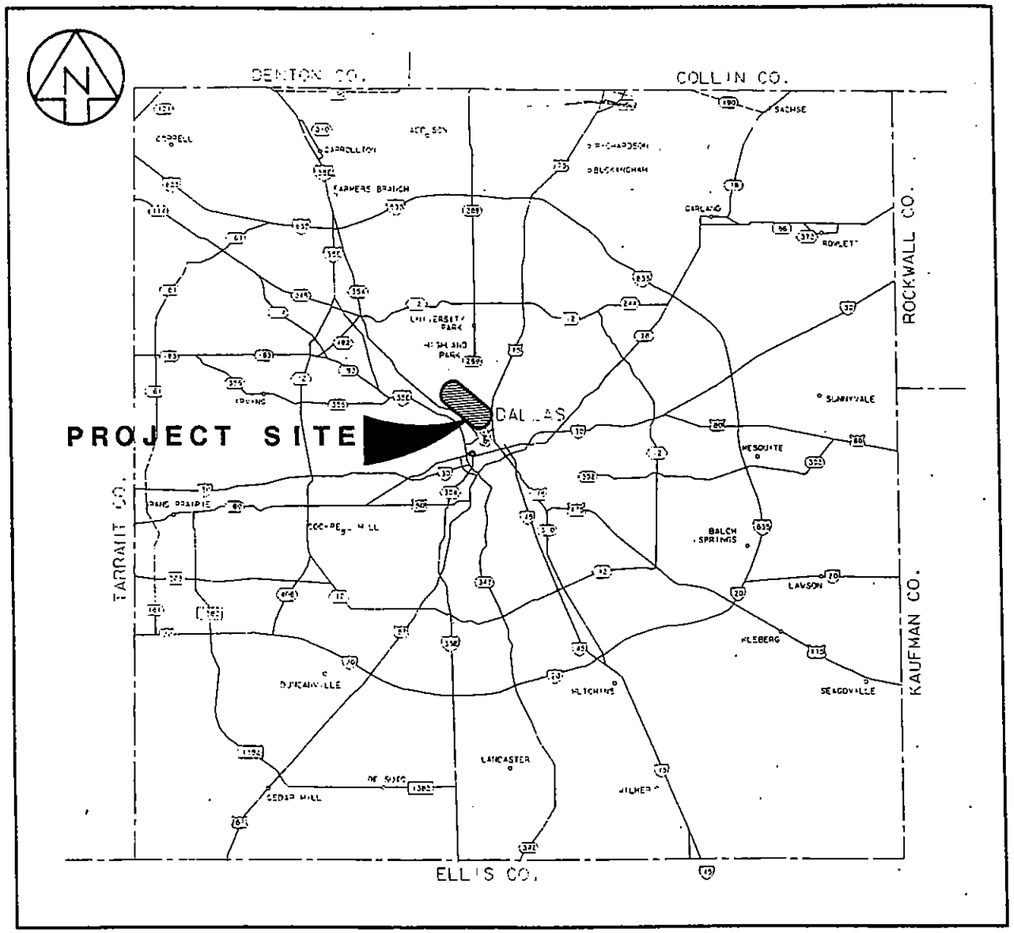

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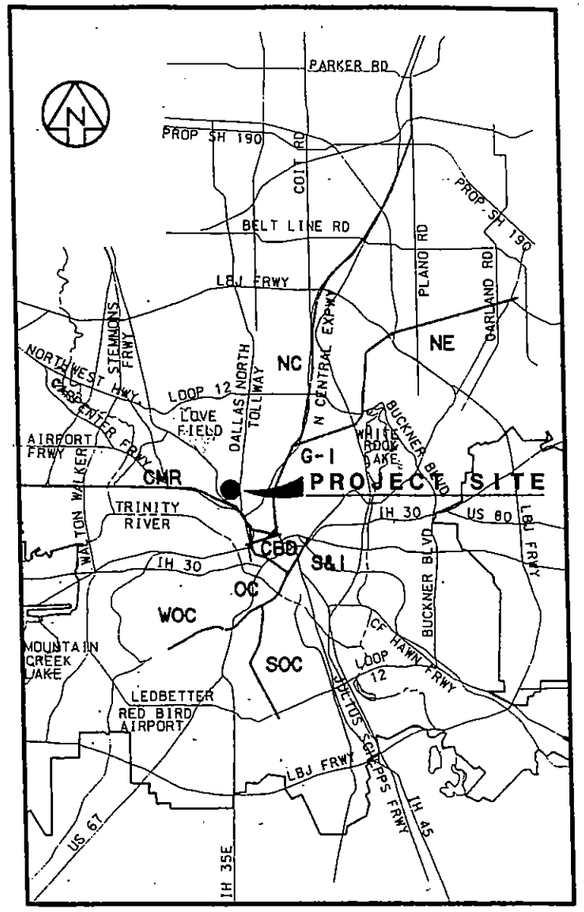

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NORTHWEST CORRIDOR
HOUSTON STREET TO TURTLE CREEK
LINE SECTION NW - 1A

REV	AMEND	CR	DATE	DESCRIPTION	BY	END	CHK	APP

STATE OF TEXAS — BRUCE HORNE — 55811 — REGISTERED PROFESSIONAL ENGINEER — 10-8-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	NO SCALE
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 3 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

TITLE SHEET

CONTRACT C-1003853-01 | DWG No. GC1-0012 | REV 0

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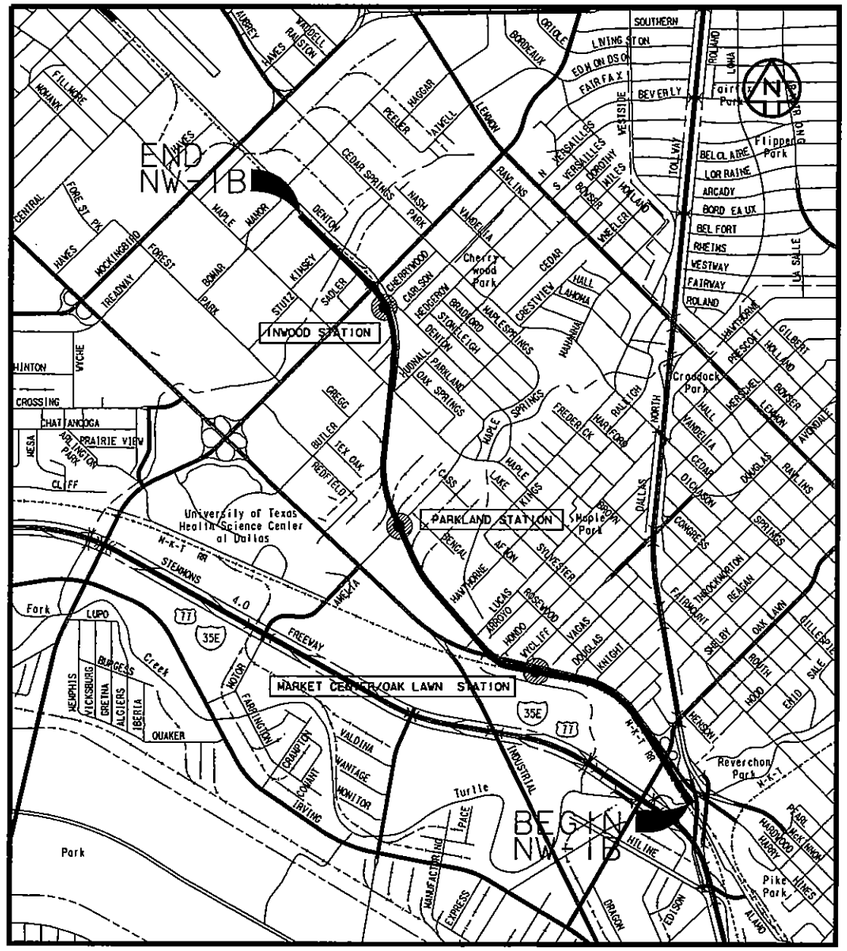

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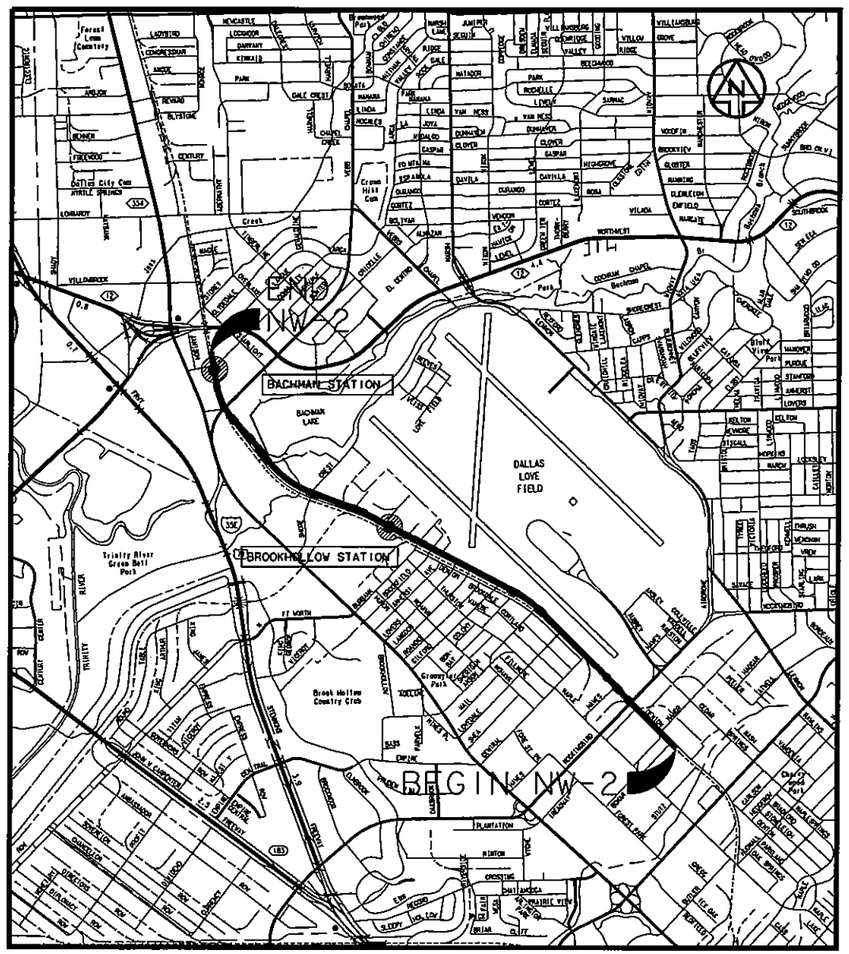
STATION VICINITY

NORTHWEST CORRIDOR
TURTLE CREEK TO BOMAR AVENUE
LINE SECTION NW-1B



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STATION VICINITY

NORTHWEST CORRIDOR
BOMAR AVENUE TO COMMUNITY DRIVE
LINE SECTION NW-2

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DART PROJECT

DART

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DESIGNED	L. MORRIS
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IN CHARGE	J. TIPTON
DATE	14 MAR 03

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LIGHT RAIL TRANSIT SYSTEM
NORTHWEST CORRIDOR

TITLE SHEET
SHEET 1 OF 2

CONTRACT C-937775-1 | DWG No. GB1-0002 | REV

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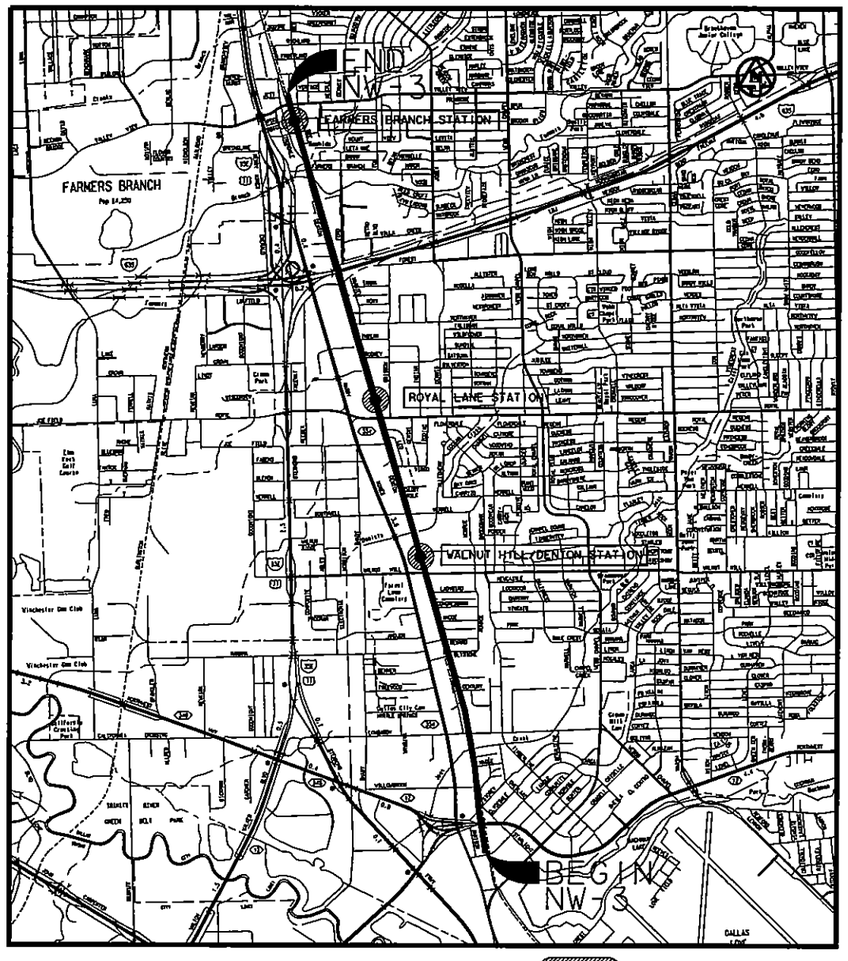

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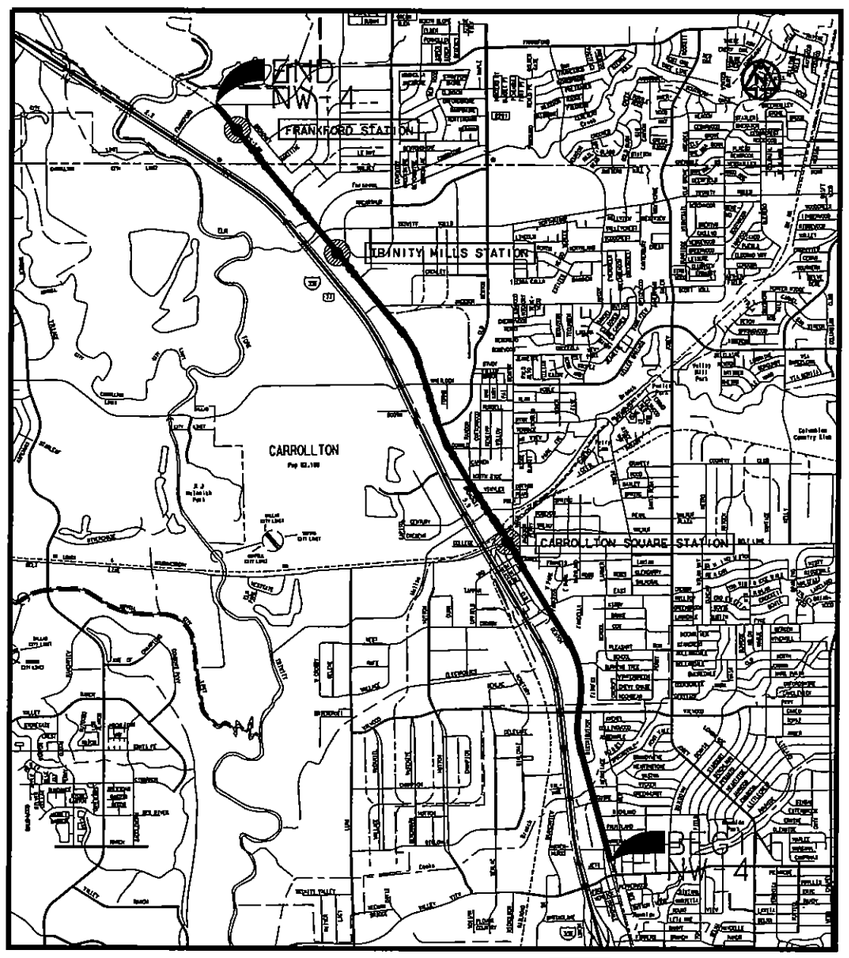
STATION VICINITY

NORTHWEST CORRIDOR

COMMUNITY DRIVE TO VALLEY VIEW LANE

LINE SECTION NW-3



VICINITY MAP
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STATION VICINITY

NORTHWEST CORRIDOR

VALLEY VIEW LANE TO FRANKFORD ROAD

LINE SECTION NW-4

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LIGHT RAIL TRANSIT SYSTEM
NORTHWEST CORRIDOR

TITLE SHEET
SHEET 2 OF 2

CONTRACT C-937775-1 | DWG No. GB1-0002 | REV

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DWG No. G86-0001

SYMBOLS

- PROFILE GRADE LINE / ELEVATION CONTROL POINT
- DIRECTION OF FLOW
- C OR B CENTERLINE OR BASELINE
- FUTURE OR NOT IN CONTRACT
- ℄ CENTERLINE
- ℄ BASELINE
- ℙ PROPERTY LINE
- DIMENSION LINE CONTINUES
- HATCH LINE
- 510 CONTOUR LINE
- TRACK (TRANSIT AND RELOCATED FREIGHT) CENTER LINE
- EXISTING FENCE LINE
- PROPOSED FENCE LINE
- STRUCTURE OUTLINE
- RAILROAD TRACKS
- TRACK (FREIGHT) REMOVAL
- CO CLEANOUT
- MH MANHOLE
- SIDEWALK AND MISC. LINES
- DROP INLET, CATCH BASIN OR DRAIN - TO SCALE
- CULVERT HEADWALLS - TO SCALE
- + 543.5 SPOT ELEVATION
- CURB LINE
- EXISTING BARRIER/RETAINING WALL
- PROPOSED RETAINING WALL
- PROPOSED BALLAST WALL
- NOISE IMPACT AREA
- GUARD RAIL
- HAND RAIL
- UNPAVED ROADS
- CONCRETE GUARD FENCE
- VEGETATION LINE
- (T) TREE
- (S) SHRUB
- POLE
- TL TRAFFIC POLE

- UTILITY POLE
- SS SANITARY (DIRECTION OF FLOW) , PLUG
- GRID OF THE STATE PLANE COORDINATE SYSTEM
- BILLBOARD
- Δ TOTAL CENTRAL ANGLE OF SPIRAL AND CIRCULAR CURVES
- Δ_{C1} SUFFIX (1) AT THE SYMBOL DENOTES DATA FOR THE FIRST CIRCULAR CURVE OF A COMPOUND CURVE
- Δ_{C2} SUFFIX (2) AT THE SYMBOL DENOTES DATA FOR THE SECOND CIRCULAR CURVE OF A COMPOUND CURVE
- Θ_S CENTRAL ANGLE OF SPIRAL OR SPIRAL ANGLE
- Θ_{SAC} CENTRAL ANGLE OF COMPOUND SPIRAL OR COMPOUND ANGLE (CS1 TO CS2)
- Θ_{SAT} TOTAL CENTRAL ANGLE OF COMPOUND SPIRAL OR TOTAL COMPOUND SPIRAL ANGLE (FROM SPO TO SC2)
- SMH SANITARY OR STORM SEWER MANHOLE
- EMH, TMH, FOCMH ELECTRICAL, TELEPHONE, OR FIBER OPTIC CABLE MANHOLE
- REDUCER
- WM WATER METER
- WV WATER VALVE
- FH FIRE HYDRANT
- CAP OR PLUG
- GV GAS VALVE
- GM GAS METER
- PB PULL BOX OR SPLICING CHAMBER
- LIGHT POLE
- FS FIRE SERVICE STAND PIPE
- FOC FIBER OPTICS CABLE
- TRAFFIC SIGN
- POLE GUY AND ANCHOR
- TRANSMISSION LINE TOWER
- TRAFFIC CONTROL GATE
- TEST BORING LOCATION
- (O/H) OVERHEAD LINES
- (O/H) E OVERHEAD ELECTRIC LINES
- UG(T) UNDERGROUND TELEPHONE LINE
- UG(E) UNDERGROUND ELECTRIC LINE
- UG(FOC) UNDERGROUND FIBER OPTICS CABLE

- AERIAL UTILITY
- UTILITY FACILITY LESS THAN 24"
- MAJOR UTILITY FACILITY 24" OR LARGER IN PLAN VIEW
- FACILITY TO BE ABANDONED
- DOUBLE CROSSOVER
- POINT OF SWITCH
- EXISTING DITCH
- PROPOSED DITCH
- DITCH PROPOSED SPECIAL DITCH
- SD STORM DRAIN
- UD UNDERDRAIN
- SS SANITARY SEWER
- W WATER LINE
- G GAS LINE
- TS TRAFFIC SIGNALIZATION LINE
- E ELECTRIC POWER LINE
- ESL ELECTRIC LINE, STREET LIGHTING
- T TELEPHONE LINE
- TV CABLEVISION LINE
- PROPOSED CASING
- PROPOSED STREET CLOSING
- PROPOSED STREET CONSTRUCTION
- EXISTING STREET/RAILROAD RIGHT-OF-WAY LINE
- EXISTING PROPERTY LINE
- DART PROPOSED RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- DART PROPOSED EASEMENT LINE
- EXIST ○ SET ● COPPER, IRON PIN, PIPE IRON ROD MARKERS OR ANY PROPERTY CORNER
- □ ■ RIGHT-OF-WAY OR CONTROL MONUMENT OR MARKERS
- EXISTING INTERSECTION OF PROPERTY LINES
- INTERSECTION OF PROPOSED DART RIGHT-OF-WAY LINES
- PROPOSED DART RIGHT-OF-WAY MONUMENT

- LEFT HAND TURNOUT
- RIGHT HAND TURNOUT
- DERAIL SWITCH
- PI/PVI/PITO
- NON-INSULATED JOINT
- (F) SWITCH NUMBERING "F" INDICATES FUTURE
- 136#/115# TRANSITION RAIL
- NW1-A CURVE NUMBER
- BLUE FLAG
- BUMPING POST
- EQUILATERAL TURNOUT

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PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 6 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
NORTHWEST CORRIDOR

SYMBOLS

CONTRACT C-937775-1 | DWG No. G86-0001 | REV

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DWG No. 684-0002

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICALS
ABUT	ABUTMENT
ADA	AMERICANS WITH DISABILITIES ACT
A/G	AT GRADE
AHD	AHEAD
ALT	ALTERNATE
AT&SF	ATCHISON, TOPEKA & SANTA FE RAILWAY CO
ASPH	ASPHALT
AVE	AVENUE
B/B	BACK TO BACK
B/C	BACK OF CURB
BD	BALLAST DRAIN
BH	BORED HOLE
BK	BACK
BLDG	BUILDING
BLVD	BOULEVARD
BN	BURLINGTON NORTHERN RAILROAD
B.M.	BENCH MARK
BOT	BOTTOM
BRG	BEARING
CB	CATCH BASIN
C	RUNOFF COEFFICIENT
CC	CENTER OF CURVE
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
CG	CONCRETE GUTTER
C&G	CURB AND GUTTER
CI	CAST IRON, CURB INLET
CIP	CAST IRON PIPE, CAST IN PLACE
CL	CLASS
C/L	CURB LINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
COC	CITY OF CARROLLTON
COD	CITY OF DALLAS
COFB	CITY OF FARMERS BRANCH
COI	CITY OF IRVING
COL	COLUMN
COMM	COMMUNICATIONS
CONC	CONCRETE
CONST	CONSTRUCT
CS	CURVE TO SPIRAL POINT
CTR	CENTER
CULV	CULVERT
CWR	CONTINUOUS WELDED RAIL
CY	CUBIC YARD
DART	DALLAS AREA RAPID TRANSIT
DBL	DOUBLE
D,DEG	DEGREE OF CURVE
D/FW	DALLAS/FORT WORTH
DI	DUCTILE IRON, DROP INLET
DGNO	DALLAS, GARLAND NORTHEASTERN RAILROAD
DIA	DIAMETER
DIP.	DUCTILE IRON PIPE
DIST	DISTANCE
DPL	DALLAS POWER & LIGHT COMPANY
DR	DRIVE
DWG	DRAWING
DWU	DALLAS WATER UTILITY
E	EAST,ELECTRIC
E-TV-T	ELECTRICAL-TELEVISION-TELEPHONE
Eo	ACTUAL SUPERELEVATION IN INCHES
EL	ELEVATION
ENCSMT	ENCASEMENT
ESMT	EASEMENT
Es	EXTERNAL DISTANCE OF SPIRAL CURVE
Eu	SUPERELEVATION UNBALANCED IN INCHES
EXIST.	EXISTING
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FIG.	FIGURE
FL	FLOW LINE
FLG	FLANGE
FOC	FIBER OPTIC CABLE
FRT	FREIGHT TRACK
F TO F	FACE TO FACE
FT	FOOT OR FEET
FWTA	FORT WORTH TRANSPORTATION AUTHORITY
FW	FORT WORTH
G	GAS
GA	GAUGE
GI	GRATE INLET
GM	GAS METER
GV	GATE VALVE
H.C.	HANDICAP
HMAC	HOT MIX ASPHALTIC CONCRETE
HR	HOUR
HORZ	HORIZONTAL
HWY	HIGHWAY
I	RAINFALL INTENSITY
IN.	INCH
INV	INVERT
ISF	INSIDE FACE
K	RATE OF VERTICAL CURVATURE
KV	KILOVOLT
L	LEFT (DEFLECTION)
L_C	TOTAL LENGTH OF CIRCULAR CURVE
LF	LINEAR FEET
LH	LEFT HAND
LN	LANE
LRT	LIGHT RAIL TRANSIT
L_S	TOTAL LENGTH OF SPIRAL
LT	LEFT
LVC	LENGTH OF VERTICAL CURVE
MKT	MISSOURI-KANSAS-TEXAS RAILROAD COMPANY
MAX	MAXIMUM
MH	MANHOLE
MIN	MINUTES OR MINIMUM
MSE	MECHANICALLY STABILIZED EARTH
N	NORTH
NB	NORTHBOUND
NCTCOG	NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NG	NATURAL GROUND
NIC	NOT IN CONTRACT
No.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTERS
OCEW	ON CENTER EACH WAY
OH	OVERHEAD
OHE	OVERHEAD ELECTRIC
ORD	ORDINATE
PC	POINT OF CHANGE FROM TANGENT TO VERTICAL CURVE
PCC	POINT OF COMPOUND CURVE
PERM	PERMANENT
PF	POINT OF FROG
PG	PROFILE GRADE
PGL	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
PITO	POINT OF INTERSECTION-TURNOUT
POB	POINT OF BEGINNING
POC	POINT ON CURVE
POE	POINT OF ENDING
POLY	POLYETHYLENE
POS	POINT ON SPIRAL
POT	POINT ON TANGENT
PS	POINT OF SWITCH
PREM	PREMOLDED
PROP	PROPOSED
PROT	PROTECTION
PT	POINT OF TANGENT
PVC	POINT OF VERTICAL CURVE, POLYVINYL CHLORIDE PIPE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVRC	POINT OF VERTICAL REVERSE CURVATURE
PVT	POINT OF VERTICAL TANGENT
Q	STORM WATER DISCHARGE
R	RADIUS
R_C	RADIUS OF CURVE
RCB	REINFORCED CONCRETE BOX CULVERT
RCP	REINFORCED CONCRETE PIPE
RD.	ROAD
REFL	REFLECTIVE
RH	RIGHT HAND
ROW	RIGHT OF WAY
RR	RAILROAD
RI	RIGHT (DEFLECTION)
RSC	RAILROAD SIGNAL CABLE
RT	RIGHT
S	SOUTH , SLOPE
SB	SOUTHBOUND
SC	SPIRAL TO CURVE POINT
SD	STORM DRAIN
SEJ	SEALED EXPANSION JOINT
S & I	SERVICE & INSPECTION
SHT	SHEET
SIG	SIGNAL
SMH	SEWER MANHOLE
SP	SOUTHERN PACIFIC TRANS. CORP.
SS	SANITARY SEWER
ST	SPIRAL TO TANGENT POINT, STREET
STA	STATION
STD	STANDARD
SURF	SURFACE
T	LENGTH OF TANGENT, TELEPHONE
T(UG)	UNDERGROUND TELEPHONE
TBM	TEMPORARY BENCH MARK
TBR	TO BE REMOVED
T^C	TIME OF CONCENTRATION
TEMP	TEMPORARY
TMH	TELEPHONE MANHOLE
TO.	TURNOUT
TPSS	TRACTION POWER SUBSTATION
T/R	TOP OF RAIL
TRA	TRINITY RIVER AUTHORITY
TRE	TRINITY RAIL EXPRESS
TS	TANGENT TO SPIRAL POINT
T_T	TOTAL TANGENT LENGTH
TXUE	TEXAS UTILITIES ELECTRIC
TXUG	TEXAS UTILITIES GAS
TxDOT	TEXAS DEPARTMENT OF TRANSPORTATION
TY	TYPE
TYP	TYPICAL
UD	UNDERDRAIN
UP	UNION PACIFIC RAILWAY
USC&GS	U.S. COAST & GEODETIC SURVEY
USGS	UNITED STATES GEOLOGICAL SURVEY
UTIL	UTILITY
V	VELOCITY
VAR	VARIES
VERT	VERTICAL
VCP	VITRIFIED CLAY PIPE
W	WEST , WATER
W/	WITH
WL	WATER LINE
WM	WATER METER
WV	WATER VALVE
WW	WASTEWATER
WWF	WELDED WIRE FABRIC
YR	YEAR

GENERAL NOTES:

1. THE CONSTRUCTION OF THE LIGHT RAIL GUIDEWAY SHALL CONFORM WITH DART STANDARD DRAWINGS AND STANDARD SPECIFICATIONS.
2. WORK INVOLVING DRAINAGE FACILITIES, AND STREET RECONSTRUCTION OR IMPROVEMENTS WITHIN THE CITY OF DALLAS PUBLIC RIGHTS-OF-WAY SHALL CONFORM WITH THE STANDARD SPECIFICATIONS AND STANDARD CONSTRUCTION DETAILS OF THE CITY OF DALLAS, THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS (NCTCOG) STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND THE CITY OF DALLAS SPECIAL PROVISIONS TO THE NCTCOG SPECIFICATIONS.
3. WORK INVOLVING WATER AND WASTEWATER (SANITARY SEWER) FACILITIES WITHIN THE CITY OF DALLAS PUBLIC RIGHTS-OF-WAY AND EASEMENTS SHALL CONFORM WITH THE CITY OF DALLAS WATER UTILITIES (DWU) DRAWINGS, DETAILS AND STANDARDS APPURTENANCES FOR WATER AND WASTEWATER PIPE CONSTRUCTION METHODS, NCTCOG STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND THE DWU ADDENDUM TO THE NCTCOG SPECIFICATIONS.
4. WORK INVOLVING DRAINAGE FACILITIES, AND STREET RECONSTRUCTION OR IMPROVEMENTS WITHIN THE CITY OF FARMERS BRANCH PUBLIC RIGHTS-OF-WAY SHALL CONFORM WITH THE CITY OF FARMERS BRANCH STANDARD DETAILS AND SPECIAL SPECIFICATIONS.
5. WORK INVOLVING WATER AND WASTEWATER (SANITARY SEWER) FACILITIES WITHIN THE SITY OF FARMERS BRANCH PUBLIC RIGHTS-OF-WAY AND EASEMENTS SHALL CONFORM WITH THE CITY OF FARMERS BRANCH STANDARD DETAILS AND SPECIAL SPECIFICATIONS.
6. WORK INVOLVING DRAINAGE FACILITIES, AND STREET RECONSTRUCTION OR IMPROVEMENTS WITHIN THE CITY OF CARROLLTON PUBLIC RIGHTS-OF-WAY SHALL CONFORM WITH CARROLLTON'S GENERAL DESIGN STANDARDS.
7. WORK INVOLVING WATER AND WASTEWATER (SANITARY SEWER) FACILITIES WITHIN THE CITY OF CARROLLTON PUBLIC RIGHTS-OF-WAY AND EASEMENTS SHALL CONFORM WITH CARROLLTON'S GENERAL DESIGN STANDARDS.
8. WORK INVOLVING OTHER UTILITIES (ELECTRIC POWER, GAS, TELEPHONE & CABLE TELEVISION), SHALL CONFORM WITH THE REQUIREMENTS OF THE OWNING/OPERATING UTILITY COMPANY.
9. THE AERIAL MAPPING IN PLAN VIEWS AND EXISTING GROUND LINES ON PROFILES AND ON CROSS SECTIONS WERE TAKEN FROM MAPPING PREPARED IN 2000/2001 BY AERIAL DATA SERVICE, AND PROVIDED BY DART/GEC.
10. THE RIGHT TRACK IS DETERMINED BY LOOKING IN THE DIRECTION OF INCREASING TRACK STATIONING. THIS TRACK IS REFERENCED AS THE (NB) NORTHBOUND TRACK AND IS ALSO THE STATIONING CONTROL TRACK.
11. THE BASIS OF DRAINAGE DESIGN FOR THE CITY OF DALLAS WAS THE CITY OF DALLAS DRAINAGE MANUAL USING A 100-YEAR STORM RECURRENCE INTERVAL.
12. THE BASIS OF DRAINAGE DESIGN FOR THE CITIES OF FARMERS BRANCH AND CARROLLTON WAS THE CITY OF FARMERS BRANCH DRAINAGE MANUAL OR THE CITY OF CARROLLTON DRAINAGE MANUAL USING A 100-YEAR STORM RECURRENCE INTERVAL.
13. ALL UTILITY LOCATIONS ARE APPROXIMATE AND MUST BE VERIFIED.
14. DRAINAGE DITCHES HAVE BEEN SHOWN ON THE CROSS SECTIONS AS TYPICAL ONLY AND WILL NEED TO BE DESIGNED FOR HYDRAULIC CAPACITY.
15. THE PROPOSED ROW/EASEMENTS SHOW THE APPROXIMATE REQUIREMENTS NEEDED TO CONSTRUCT THE LRT SYSTEM. FINAL SECTION DESIGNER SHALL VERIFY ROW NEEDS DURING FINAL DESIGN.
16. FINAL SECTION DESIGNER SHALL DESIGN THE GUIDEWAY IN ACCORDANCE WITH NFPA-130 STANDARD FOR FIXED GUIDEWAY TRANSIT AND PASSENGER RAIL SYSTEMS AND THE APPLICABLE FIRE AND BUILDING CODES OF THE LOCAL JURISDICTION.
17. SAFETY FENCING IS REQUIRED AT AT-GRADE SECTIONS WHERE LRT OPERATING SPEEDS EXCEED 45 MPH.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 7 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	ST	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 83752
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	NTS
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	J. TIPTON
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
NORTHWEST CORRIDOR

GENERAL NOTES AND ABBREVIATIONS

CONTRACT C-937775-1 | DWG No. G84-0002 | REV

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lmorris

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DWG No. CC5-0014

LINE SECTION NW-1A
HORIZONTAL ALIGNMENT SCHEMATIC

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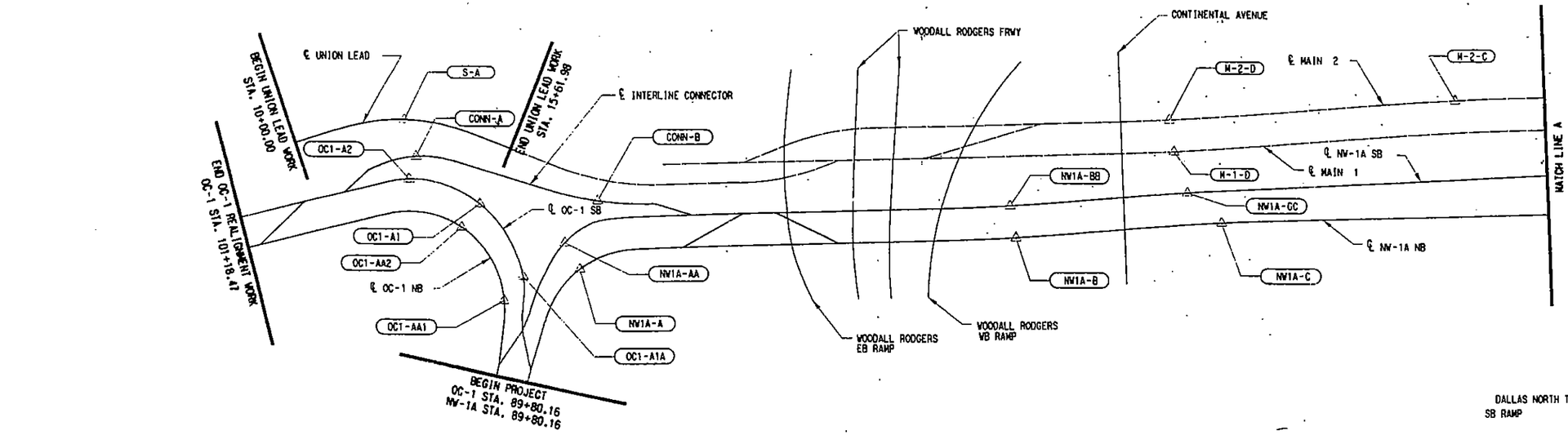

LEGEND

EXISTING

NEW

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

ROBERT DE ROSA 62652 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 10-2-01

STV Incorporated

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	N. T. S.
DRAWN	D. ELLIOTT
DESIGNED	R. DE ROSA
CHECKED	R. DE ROSA
IN CHARGE	D. HEWING
DATE	28 SEPTEMBER 01

DARTCADD

CONTRACT SHEET No. 8 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A

HORIZONTAL ALIGNMENT SCHEMATIC

CONTRACT C-1003853-01 | DWG No. CC5-0014 | REV O

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DWG No. CB5-1001

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lmorris

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HORIZONTAL ALIGNMENT SCHEMATIC
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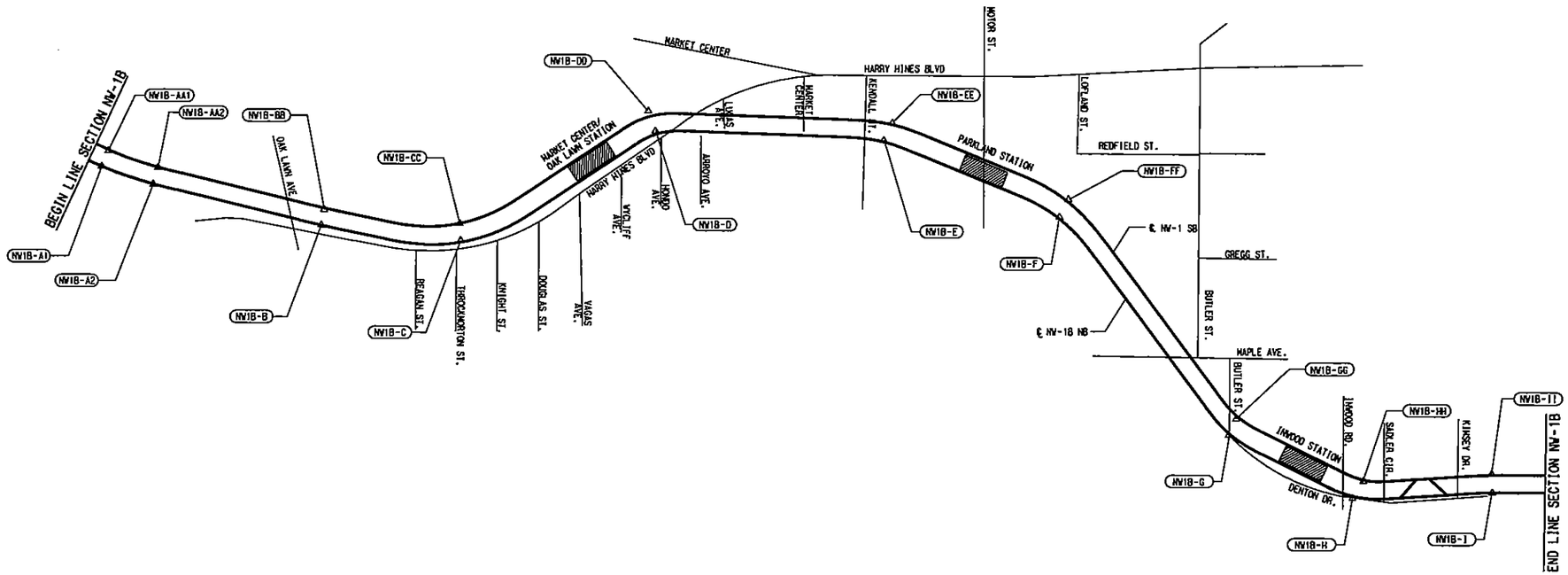

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81757
Date: 14 MAR 03

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	NTS
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 9 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

HORIZONTAL ALIGNMENT SCHEMATIC

CONTRACT	DWG No.	REV
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DWG No. C85-2001

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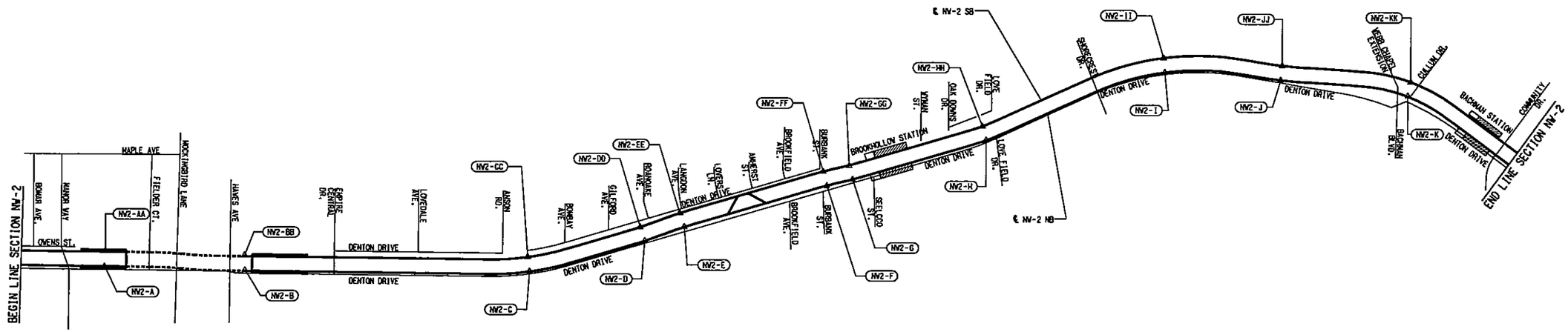

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 10 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64157 Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	NTS
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

HORIZONTAL ALIGNMENT SCHEMATIC

CONTRACT C-937775-1 | DWG No. C85-2001 | REV

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lmorris

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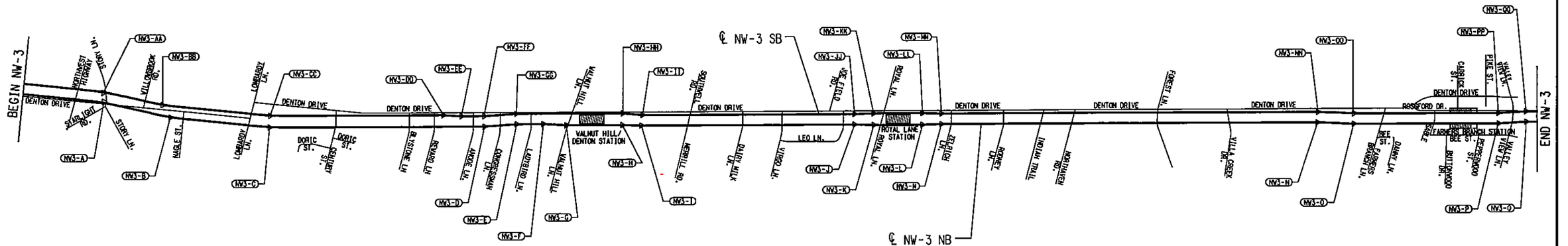

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64197
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1" = 850'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 11 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

HORIZONTAL ALIGNMENT SCHEMATIC

CONTRACT	DWG No.	REV
C-937775-1	CB5-3001	

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DWG No. C85-4001

LINE SECTION NW-4
HORIZONTAL ALIGNMENT SCHEMATIC
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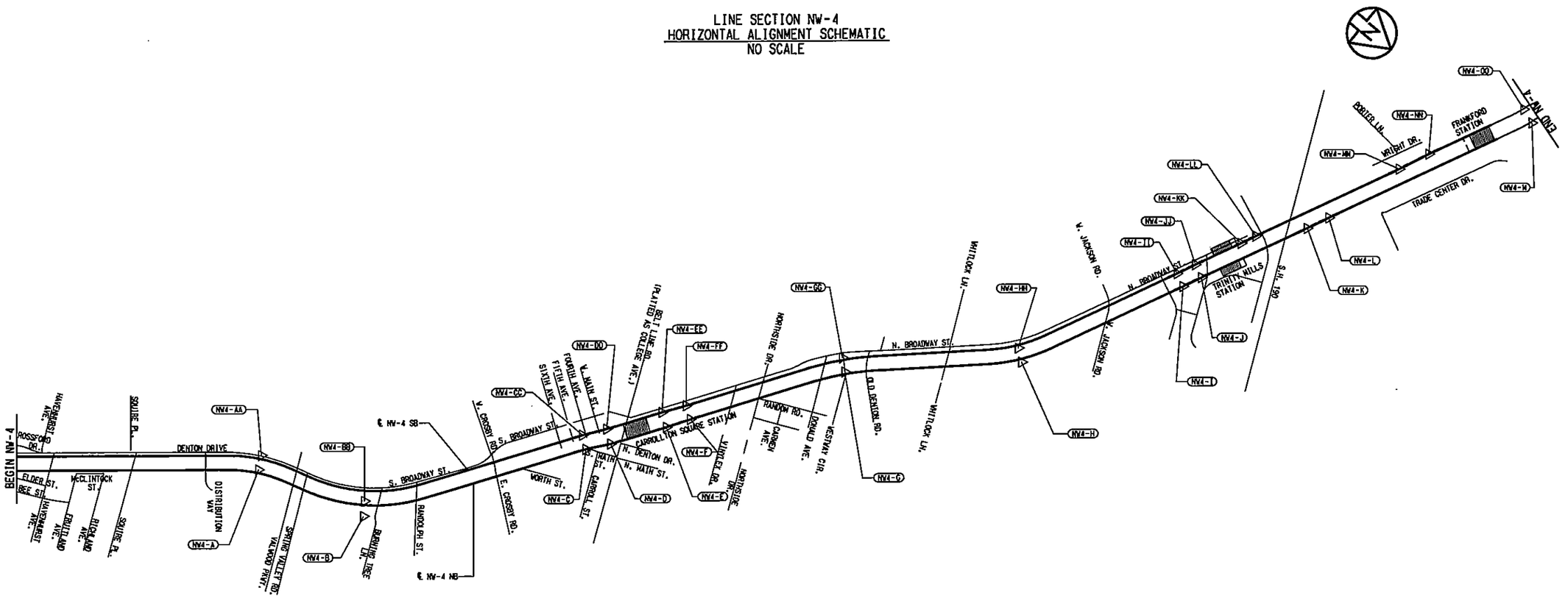

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 12 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81137
Date: 10-25-02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=1000'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

HORIZONTAL ALIGNMENT SCHEMATIC

CONTRACT C-937775-1
DWG No. C85-4001
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rthompson

DWG No. CC1-0013

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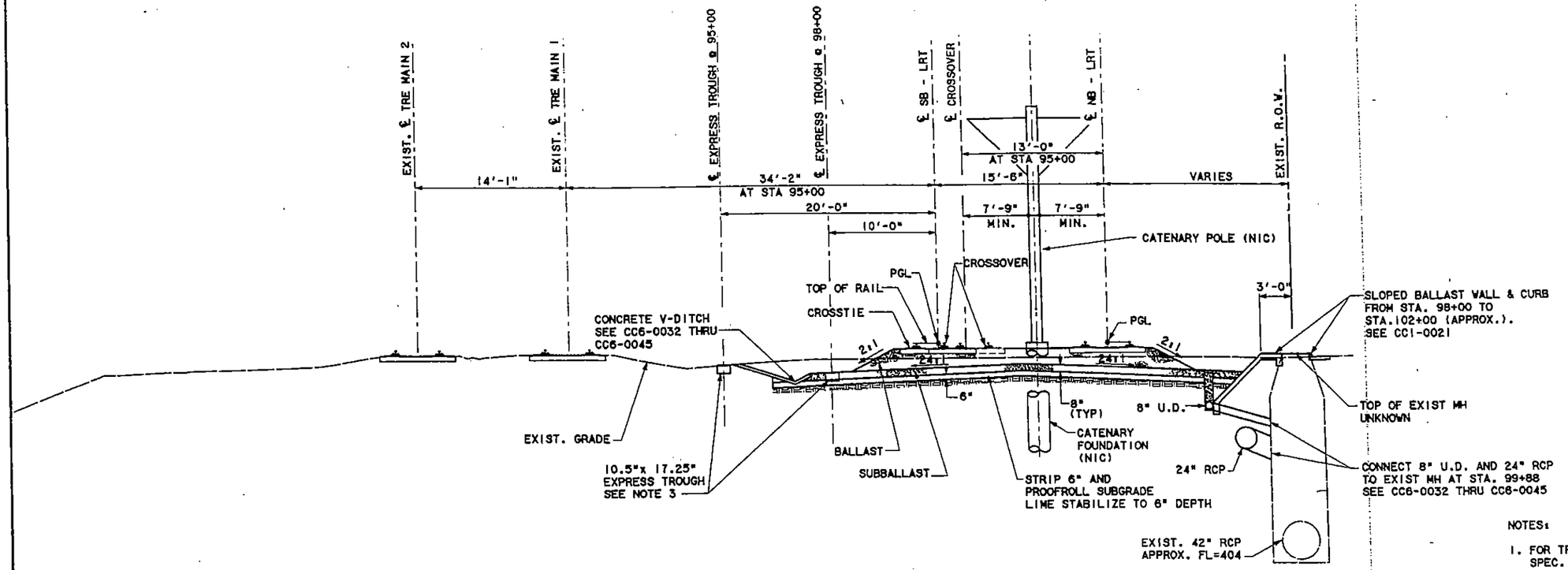


NW-1A
TYPICAL SECTION
STA. 95+00 - 102+00

NOTES:

1. FOR TRACK SUBGRADE REQUIREMENTS SEE SPEC. SEC. 02220, 02243 AND GEOTECHNICAL REPORT TMI No. DE00-153-P12 PREPARED BY TERRA-MAR INC., & DATED SEPT. 7,2001. FOR MSE WALL BACKFILL SEE SPEC. SECTION 02872.
2. ALL DISTURBED SLOPES NOT COVERED BY BALLAST OR SUBBALLAST SHALL BE SEEDED IN ACCORDANCE WITH SECTION 02930.
3. SEE DETAIL E. DWG. BC7-0007. (△1)

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
△1	4		11/28/01	REVISED NOTE	BL	RL	BH	PJ

STATE OF TEXAS · BRUCE HORNE · 85811 · REGISTERED PROFESSIONAL ENGINEER · 11-29-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	3/16" =1'-0"
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CAESS

CONTRACT SHEET No. 13 OF 243

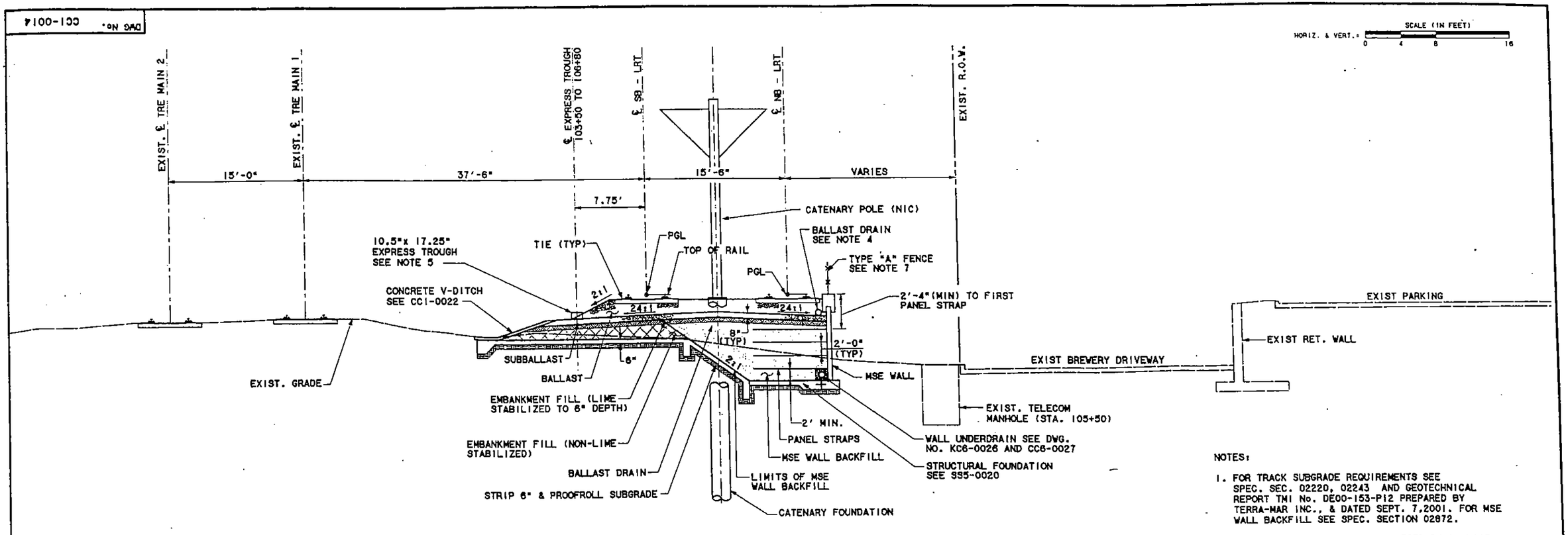
TRINITY RAIL EXPRESSWAY
RETAINING WALLS AND ROAD BED
CONTINENTAL TO HI-LINE

TYPICAL SECTION
SHEET 1 OF 7

CONTRACT C-1003274-01 | DWG No. CC1-0013 | REV 1

03:36:39 PM

DWG No. CC1-0014



NW-1A
TYPICAL SECTION

STA. 104+50 - 106+00
LOOKING NORTH

NOTES:

1. FOR TRACK SUBGRADE REQUIREMENTS SEE SPEC. SEC. 02220, 02243 AND GEOTECHNICAL REPORT TMI No. DE00-153-P12 PREPARED BY TERRA-MAR INC., & DATED SEPT. 7,2001. FOR MSE WALL BACKFILL SEE SPEC. SECTION 02872.
2. ALL DISTURBED SLOPES NOT COVERED BY BALLAST OR SUBBALLAST SHALL BE SEEDED IN ACCORDANCE WITH SECTION 02930.
3. FOR MSE WALL DETAILS, SEE DWG. S55-0018.
4. FOR BALLAST DRAIN LOCATIONS AND CONNECTIONS TO INLETS OR DRAIN PIPES SEE CC6-0032 THRU CC6-0036.
5. SEE DETAIL F, DWG. ZS1-0023.
6. TIE WALL UNDERDRAIN TO BALLAST DRAIN COLLECTOR PIPE AT DISCHARGE.
7. 6 FOOT TYPE "A" FENCE WITH TENSION WIRE TO BE INSTALLED ON TOP OF RETAINING WALLS IN AREAS WHERE WALL IS LESS THAN 6 FEET ABOVE THE ADJACENT FINISHED GRADE. FENCE CAN BE 4 FEET HIGH IF TOTAL HEIGHT OF WALL PLUS FENCE IS GREATER THAN 6 FEET.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

STATE OF TEXAS · BRUCE HORNE · 65811 · REGISTERED PROFESSIONAL ENGINEER · 10-03-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	3/16" =1'-0"
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 14 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

TYPICAL SECTION
SHEET 2 OF 7

CAES

CONTRACT C-1003853-01 | DWG No. CC1-0014 | REV 0

12:56:43 PM

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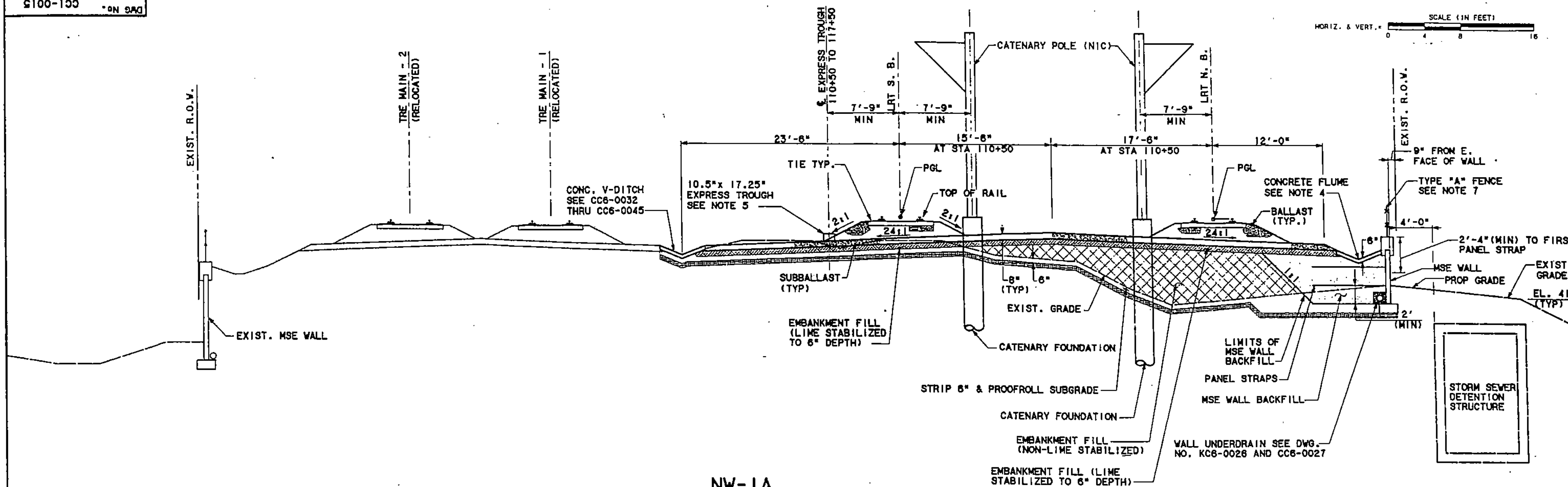

NW-1A TYPICAL SECTION

STA. 110+50 - 117+50
LOOKING NORTH

NOTES:

1. FOR TRACK SUBGRADE REQUIREMENTS SEE SPEC. SEC. 02220, 02243 AND GEOTECHNICAL REPORT TMI No. DE00-153-P12 PREPARED BY TERRA-MAR INC., & DATED SEPT. 7, 2001. FOR MSE WALL BACKFILL SEE SPEC. SECTION 02872.
2. ALL DISTURBED SLOPES NOT COVERED BY BALLAST OR SUBBALLAST SHALL BE SEEDED IN ACCORDANCE WITH SECTION 02930.
3. FOR MSE WALL DETAILS, SEE DWG. SS5-0018.
4. FOR BALLAST DRAIN LOCATIONS AND CONNECTIONS TO INLETS OR DRAIN PIPES SEE CC6-0032 THRU CC6-0045.
5. SEE DETAIL F, DWG. ZS1-0023.
6. TIE WALL UNDERDRAIN TO BALLAST DRAIN COLLECTOR PIPE AT DISCHARGE.
7. 6 FOOT TYPE "A" FENCE WITH TENSION WIRE TO BE INSTALLED ON TOP OF RETAINING WALLS IN AREAS WHERE WALL IS LESS THAN 6 FEET ABOVE THE ADJACENT FINISHED GRADE. FENCE CAN BE 4 FEET HIGH IF TOTAL HEIGHT OF WALL PLUS FENCE IS GREATER THAN 6 FEET.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

BRUCE HORNE 85811 REGISTERED PROFESSIONAL ENGINEER, STATE OF TEXAS — 10-03-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	3/16" =1'-0"
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CAES

CONTRACT SHEET No. 15 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

TYPICAL SECTION
SHEET 3 OF 7

CONTRACT C-1003853-01 | DWG No. CC1-0015 | REV 0

12:56:41 PM

DWG No. CC1-0016

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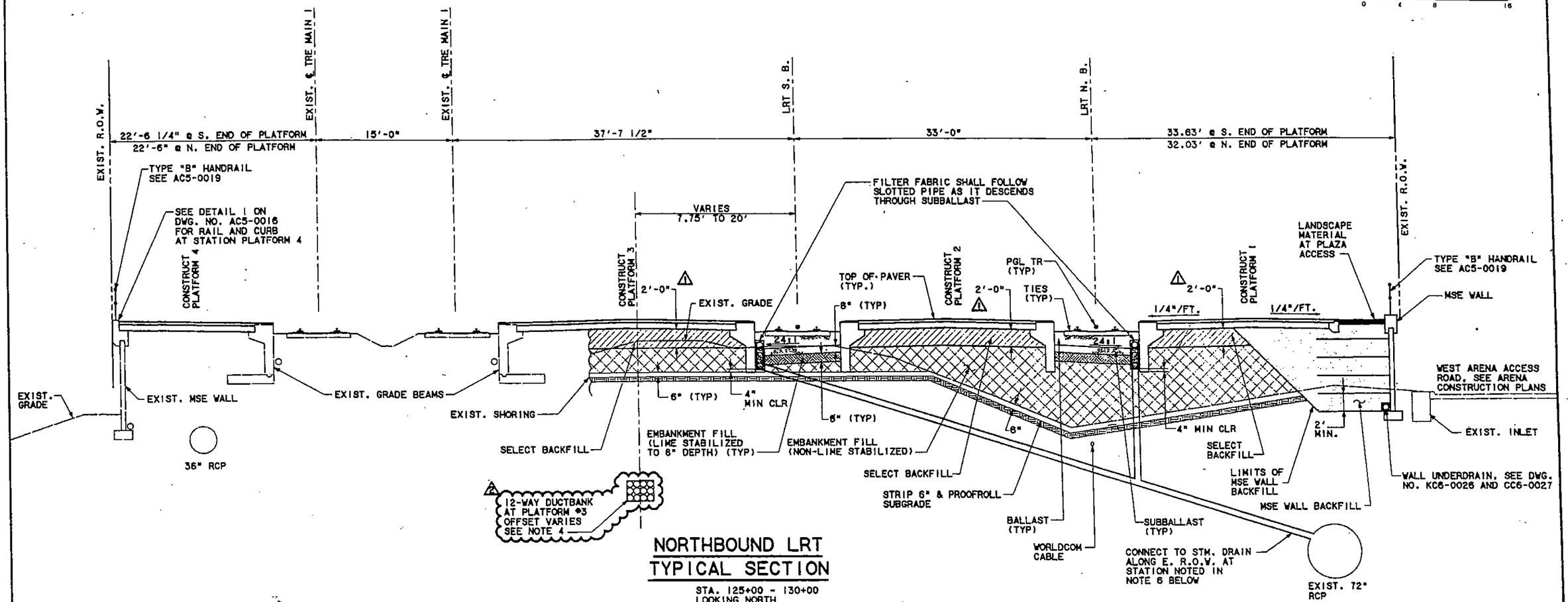


NORTHBOUND LRT
TYPICAL SECTION

STA. 125+00 - 130+00
LOOKING NORTH

NOTES:

1. FOR TRACK SUBGRADE REQUIREMENTS SEE SPEC. SEC. 02220, 02243 AND GEOTECHNICAL REPORT TMI No. DE00-153-P12 PREPARED BY TERRA-MAR INC., & DATED SEPT. 7, 2001. FOR MSE WALL BACKFILL SEE SPEC. SECTION 02872.
2. ALL DISTURBED SLOPES NOT COVERED BY BALLAST OR SUBBALLAST SHALL BE SEEDED IN ACCORDANCE WITH SECTION 02930.
3. FOR MSE WALL DETAILS, SEE DWG. SS5-0018
4. SEE DETAIL 3, DWG. ZS1-0022.
5. CONSTRUCT BALLAST DRAINS WITH A SERIES OF HIGH AND LOW POINTS AT THE STATIONS LISTED BELOW. CONNECT THE HIGH AND LOW POINTS WITH 6" PVC SLOTTED PIPE ON 1.0% GRADE. USE THE GRAVEL TRENCH SECTION SHOWN TO EMBED THE 6" PVC SLOTTED DRAIN AS IT DESCENDS THROUGH THE SUBBALLAST AND EMBANKMENT. CONNECT THE LOW POINTS OF THE 6" PVC SLOTTED DRAIN PIPE TO THE 72" RCP PIPE USING 8" SOLID PVC PIPE.

STATION	LOW POINT	HIGH POINT
124+82.75	411.04	
126+14.12		412.36
127+45.30	411.04	
128+76.87		412.36
130+08.25	411.04	

6. TIE WALL UNDER DRAIN TO BALLAST DRAIN COLLECTOR PIPE AT DISCHARGE.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
2			11/07/01	MODIFIED SELECT BACKFILL DEPTH	BL	RL	BH	PJ
4			11/28/01	ENLARGED DUCT BANK	BL	RL	BH	PJ

STATE OF TEXAS · BRUCE HORNE · 65811 · REGISTERED · PROFESSIONAL ENGINEER
12-04-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	3/16" =1'-0"
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CAES

CONTRACT SHEET No. 16 OF 243

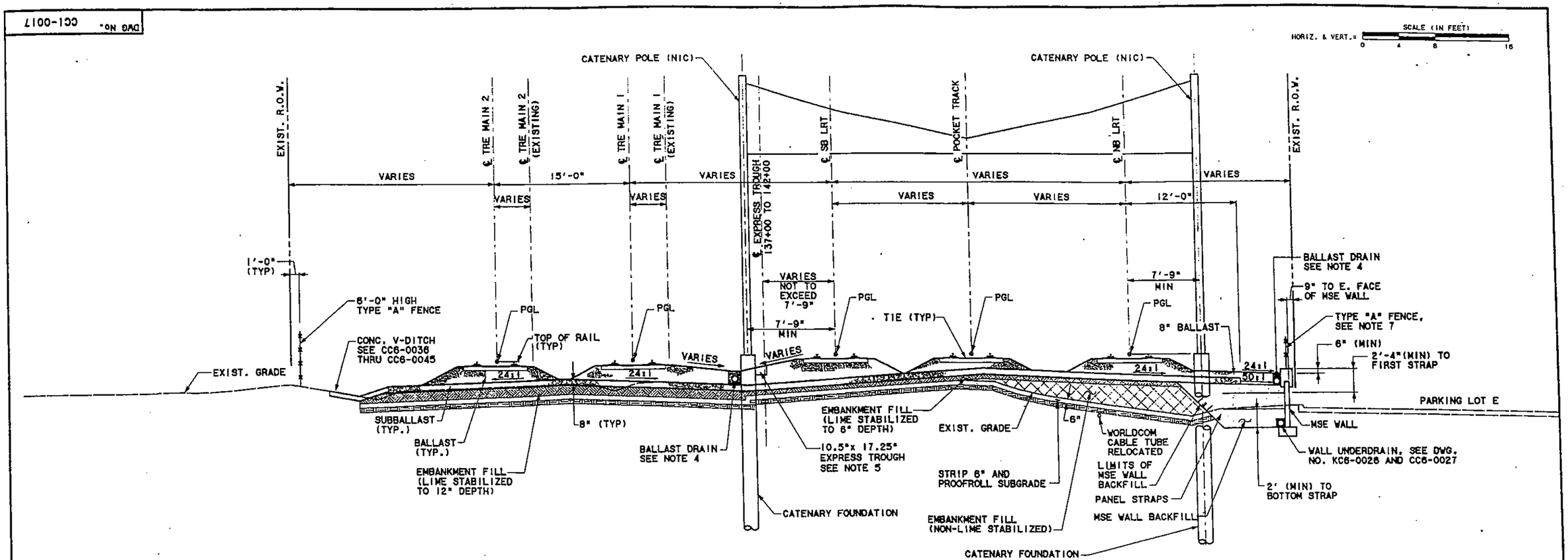
TRINITY RAIL EXPRESSWAY
RETAINING WALLS AND ROAD BED
CONTINENTAL TO HI-LINE

TYPICAL SECTION
SHEET 4 OF 7

CONTRACT	DWG No.	REV
C-1003274-01	CC1-0016	2

05:14:17 PM

DWG NO. CC1-0017



NW-1A
TYPICAL SECTION

STA. 134+00 - 142+00
LOOKING NORTH

NOTES:

1. FOR TRACK SUBGRADE REQUIREMENTS SEE SPEC. SEC. 02220, 02243 AND GEOTECHNICAL REPORT TMI No. DE00-153-P12 PREPARED BY TERRA-MAR INC., & DATED SEPT.7, 2001. FOR MSE WALL BACKFILL SEE SPEC. SECTION 02872.
2. ALL DISTURBED SLOPES NOT COVERED BY BALLAST OR SUBBALLAST SHALL BE SEEDED IN ACCORDANCE WITH SECTION 02930.
3. FOR MSE WALL DETAILS, SEE DWG. SS5-0018.
4. FOR BALLAST DRAIN LOCATIONS AND CONNECTION TO INLETS SEE CC6-0036 THRU CC6-0045.
5. SEE DETAIL F, DWG. ZS1-0023.
6. TIE WALL UNDERDRAIN TO BALLAST DRAIN COLLECTOR PIPE AT DISCHARGE.
7. 6 FOOT TYPE "A" FENCE WITH TENSION WIRE TO BE INSTALLED ON TOP OF RETAINING WALLS IN AREAS WHERE WALL IS LESS THAN 6 FEET ABOVE THE ADJACENT FINISHED GRADE. FENCE CAN BE 4 FEET HIGH IF TOTAL HEIGHT OF WALL PLUS FENCE IS GREATER THAN 6 FEET.

CONFORMED

CONTRACT SHEET No. 17 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1								

STATE OF TEXAS — BRUCE HORNE — 83811 — REGISTERED PROFESSIONAL ENGINEER — 10-03-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	3/16" =1'-0"
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CAES

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

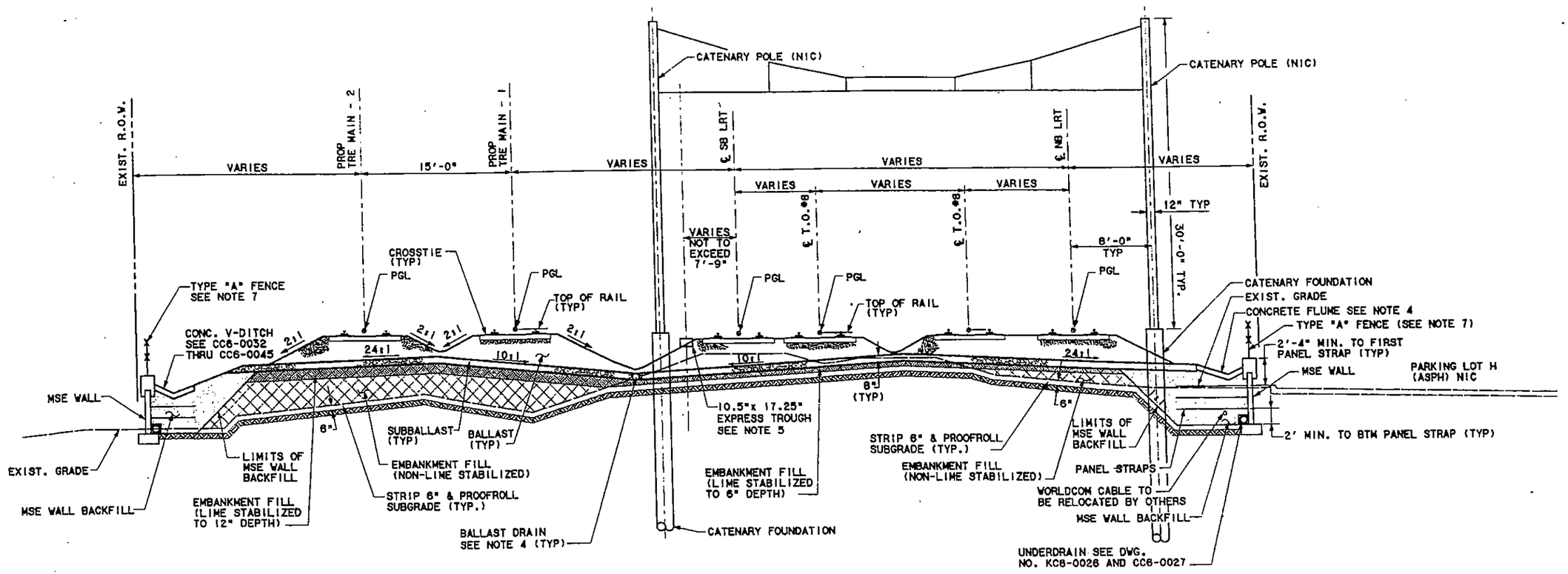
TYPICAL SECTION
SHEET 5 OF 7

CONTRACT C-1003853-01 | DWG No. CC1-0017 | REV 0

12:56:50 PM

CC1-0018 DWG NO.

SCALE (IN FEET)
HORIZ. & VERT.: 0 4 8 16



NW-1A
TYPICAL SECTION

STA. 145+50 TO 151+00
LOOKING NORTH

NOTES:

1. FOR TRACK SUBGRADE REQUIREMENTS SEE SPEC. SEC. 02220, 02243 AND GEOTECHNICAL REPORT TMI No. DE00-153-P12 PREPARED BY TERRA-MAR INC., & DATED SEPT. 7, 2001. FOR MSE WALL BACKFILL SEE SPEC. SECTION 02872.
2. ALL DISTURBED SLOPES NOT COVERED BY BALLAST OR SUBBALLAST SHALL BE SEEDED IN ACCORDANCE WITH SECTION 02930.
3. FOR MSE WALL DETAILS, SEE DWG. SS5-0018.
4. FOR BALLAST DRAIN AND WALL DRAIN LOCATION AND CONNECTION INLET OR DRAIN PIPES, SEE CC6-0032 THRU CC6-0045.
5. SEE DETAIL F, DWG. ZS1-0023.
6. TIE WALL UNDERDRAIN TO BALLAST COLLECTOR PIPE AT DISCHARGE.
7. 6 FOOT TYPE "A" FENCE WITH TENSION WIRE TO BE INSTALLED ON TOP OF RETAINING WALLS IN AREAS WHERE WALL IS LESS THAN 6 FEET ABOVE THE ADJACENT FINISHED GRADE. FENCE CAN BE 4 FEET HIGH IF TOTAL HEIGHT OF WALL PLUS FENCE IS GREATER THAN 6 FEET.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

STATE OF TEXAS — BRUCE HORNE — 85811 — REGISTERED PROFESSIONAL ENGINEER — 10.03.01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	3/16" =1'-0"
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CAES

CONTRACT SHEET No. 18 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

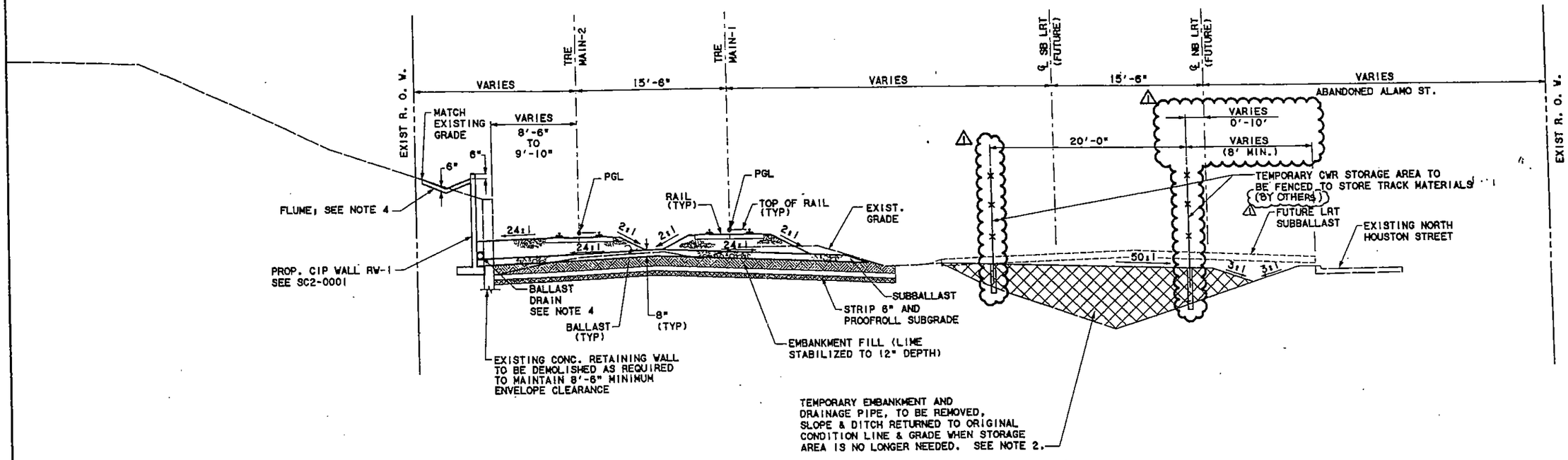
TYPICAL SECTION
SHEET 6 OF 7

CONTRACT C-1003853-01 | DWG No. CC1-0018 | REV 0

12:56:51 PM

DWG No. CC1-0019

SCALE (IN FEET)
HORIZ. & VERT.: 0 4 8 16



NORTHBOUND LRT
TYPICAL SECTION
STA. 152+50-160+00
LOOKING NORTH

NOTES:

1. FOR TRACK SUBGRADE REQUIREMENTS SEE SPEC. SEC. 02220, 02243 AND GEOTECHNICAL REPORT TMI No. DE00-153-P12 PREPARED BY TERRA-MAR INC., & DATED SEPT. 7, 2001. FOR MSE WALL BACKFILL SEE SPEC. SECTION 02872.
2. ALL DISTURBED SLOPES NOT COVERED BY BALLAST OR SUBBALLAST SHALL BE SEEDED IN ACCORDANCE WITH SECTION 02930.
3. FOR MSE WALL DETAILS, SEE DWG. SS5-0018
4. FOR BALLAST DRAINS, AND FLUME LOCATIONS AND CONNECTIONS TO INLETS OR DITCHES SEE CC6-0032 THRU CC6-0036.
5. FOR WALL UNDERDRAIN SEE KC6-0026 AND CC6-0027.
6. STRIP 6" AND PROOFROLL SUBGRADE IN ALL AREAS OF NEW CONSTRUCTION.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1	10		1/16/02	REVISED LOCATION OF CWR STORAGE FENCE	BL	RL	BH	PJ

STATE OF TEXAS · BRUCE HORNE · 85811 · REGISTERED PROFESSIONAL ENGINEER · 1-16-02

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

CAES

SCALE	3/16" =1'-0"
DRAWN	H. CRAWFORD
DESIGNED	H. CRAWFORD
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 19 OF 243

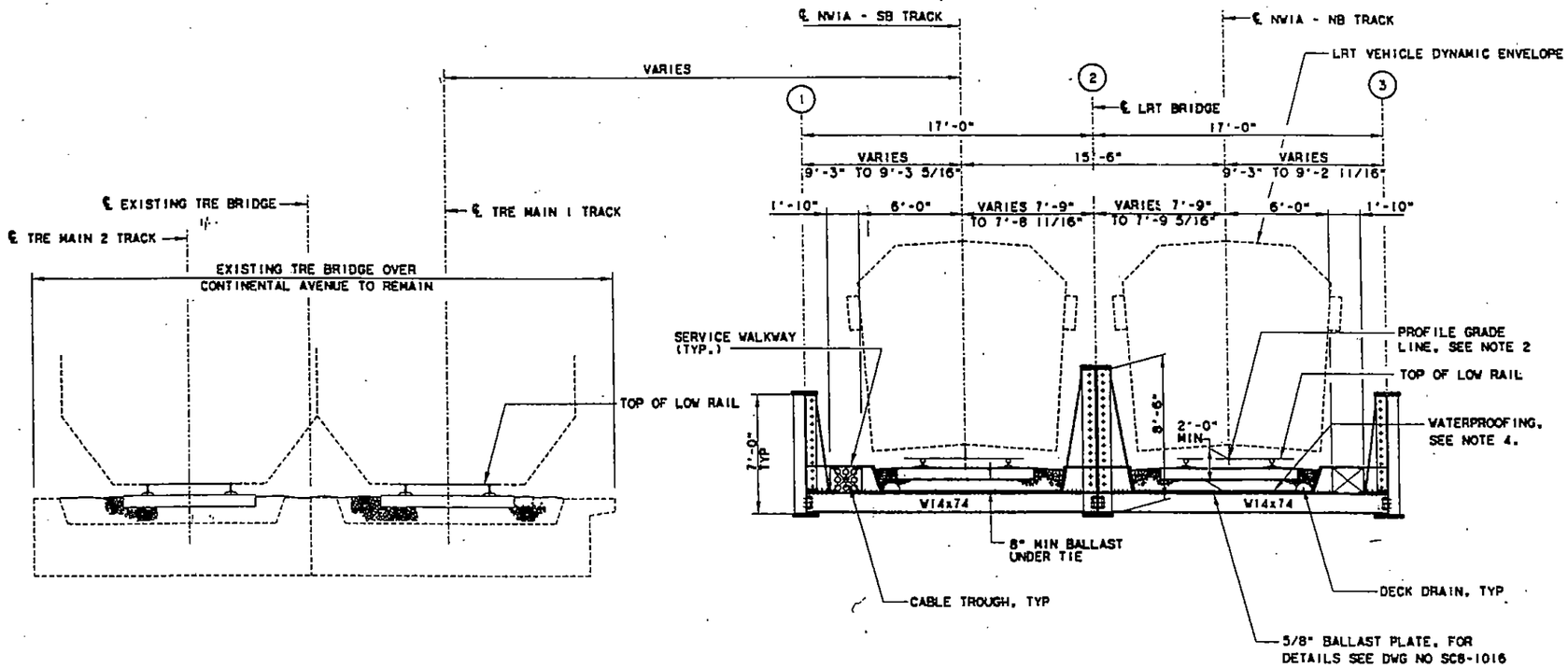
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

TYPICAL SECTION
SHEET 7 OF 7

CONTRACT C-1003852-01 | DWG No. CC1-0019 | REV 1

12:28:49 PM

9001-835 *ON DAG



NOTES:

1. SECTION SHOWN NORMAL TO ℄ BRIDGE LOOKING NORTH.
2. FOR PROFILE GRADE LINE SEE DWG. NO. KC2-0003.
3. (1) DENOTES GIRDER NUMBER.
4. FOR WATERPROOFING, SEE DWG NO. KC6-0025.

TYPICAL SECTION

SCALE: 1/4"=1'-0"

REV	AMEND	CK	DATE	DESCRIPTION	BY	CHK	CHK	APP
1			10/31/01	REVISED SHEET REFERENCE	DD	JH	CLG	GCG

STATE OF TEXAS — GEORGE C. GERETZ — 82334 — REGISTERED PROFESSIONAL ENGINEER — 10-31-01

STV Incorporated

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	1/4"=1'-0"
DRAWN	D. DONATTIA
DESIGNED	J. MCKENZIE
CHECKED	C. KILBURNP
IN CHARGE	G. GERETZ
DATE	28 SEPT 01

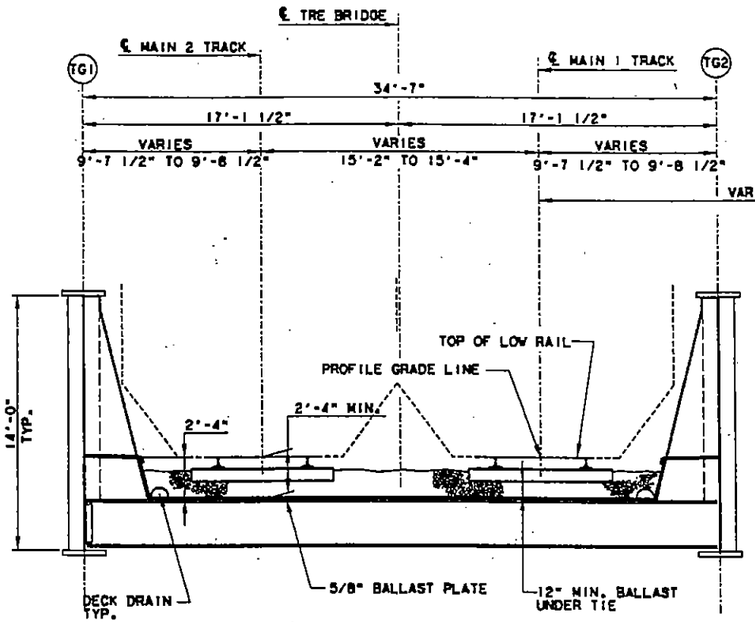
DARTCADD

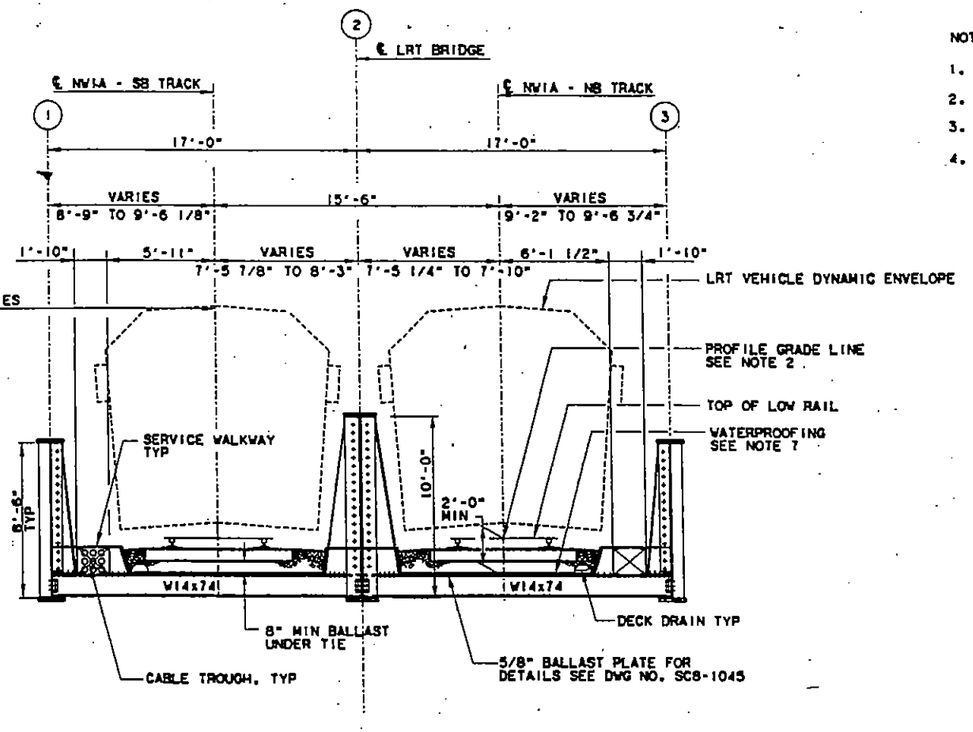
CONTRACT SHEET No. 20 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
AERIAL STRUCTURES
LRT CONTINENTAL AVENUE BRIDGE
TYPICAL SECTION

CONTRACT C-1003853-01 | DWG No. SC8-1006 | REV 1

CONFORMED





NOTES:

1. SECTION SHOWN NORMAL TO ℄ BRIDGE LOOKING NORTH.
2. FOR PROFILE GRADE LINE, SEE DWG NO. kc2-0003.
3. (1) DENOTES GIRDER NUMBER.
4. FOR WATERPROOFING, SEE DWG NO. KC6-0025.

TYPICAL SECTION

SCALE: 1/4"=1'-0"

REV	AMEND	CH	DATE	DESCRIPTION	BY	CHK	APP

STATE OF TEXAS — BRIAN C. BENETT — 76554 — REGISTERED PROFESSIONAL ENGINEER

STV Incorporated

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	
DRAWN	O. DONATTIA
DESIGNED	V. BOOT
CHECKED	C. BILDHOFF
IN CHARGE	G. BENETT
DATE	28 SEPT 01

DARTCADD

CONTRACT SHEET No. 21 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
AERIAL STRUCTURES

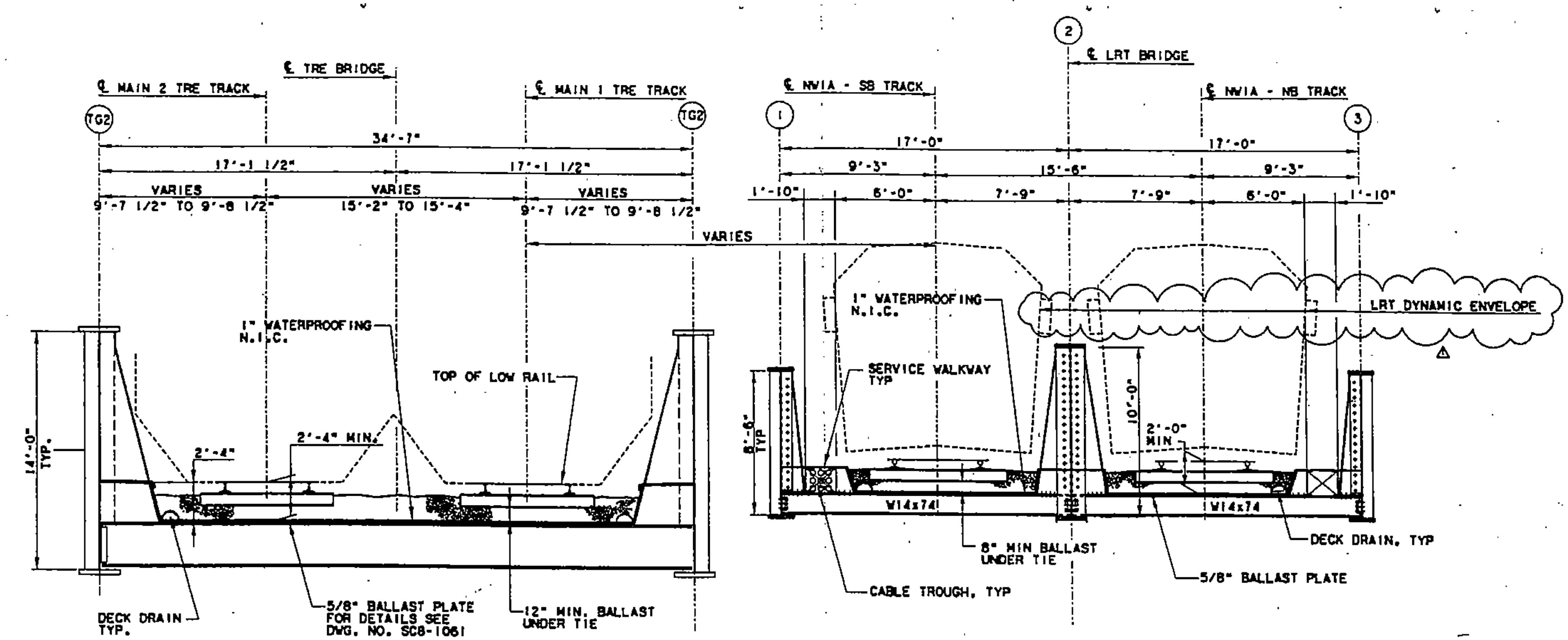
LRT LAMAR STREET BRIDGE
TYPICAL SECTION

CONTRACT C-1003653-01 | DWG No.: SC8-1035 | REV 0

CONFORMED

NOTES:

1. SECTION SHOWN NORMAL TO C BRIDGE LOOKING NORTH.
2. FOR PROFILE GRADE LINE SEE DWG. NO. KC2-0025
3. ① DENOTES GIRDER NUMBER.



TYPICAL SECTION

SCALE: 1/4"=1'-0"

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
△	2		10/31/01	LABEL ADDED				

STV Incorporated

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

DARTCADD

CONTRACT SHEET No. 22 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
AERIAL STRUCTURES
TRE LAMAR STREET BRIDGE

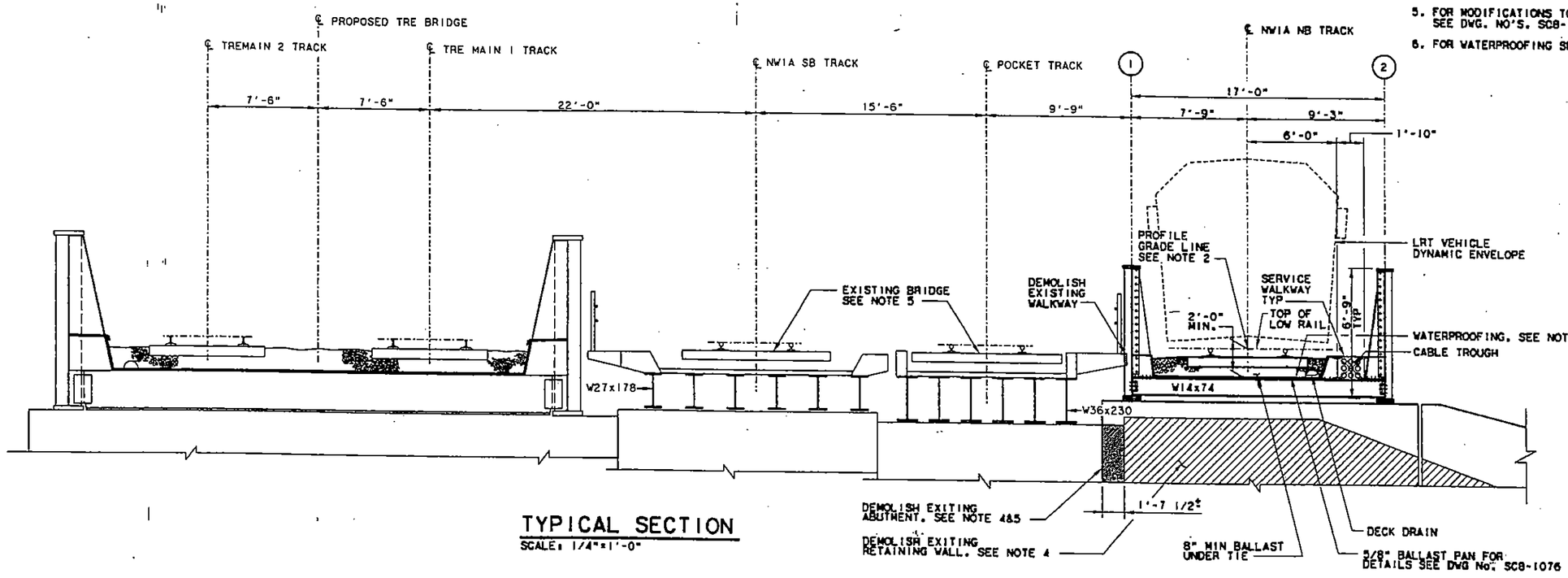
TYPICAL SECTION

CONTRACT C-1003853-01 | DWG No. SC8-1051 | REV 1

DWG NO. SC8-1066

NOTES:

1. SECTION SHOWN NORMAL TO ℄ BRIDGE LOOKING NORTH .
2. FOR PROFILE GRADE LINE SEE DWG NO. KC2-0008
3. (1) DENOTES GIRDER NUMBER.
4. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR THE PARTIAL REMOVAL OF EXISTING BRIDGE SUPERSTRUCTURE, EXISTING BRIDGE ABUTMENTS AND EXISTING RETAINING WALLS.
5. FOR MODIFICATIONS TO EXISTING BRIDGE SEE DWG. NO'S. SC8-1094 THRU SC8-1096.
6. FOR WATERPROOFING SEE DWG. NO. KC6-0025.



TYPICAL SECTION

SCALE: 1/4"=1'-0"

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

GERALD C. GERLETZ 62594 REGISTERED PROFESSIONAL ENGINEER

STV Incorporated

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	D. DEMATTIA
DESIGNED	J. MACKENZIE
CHECKED	C. WILKINSON
IN CHARGE	G. GERLETZ
DATE	28 SEPT 01

DARTCADD

CONTRACT SHEET No. 23 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
AERIAL STRUCTURES

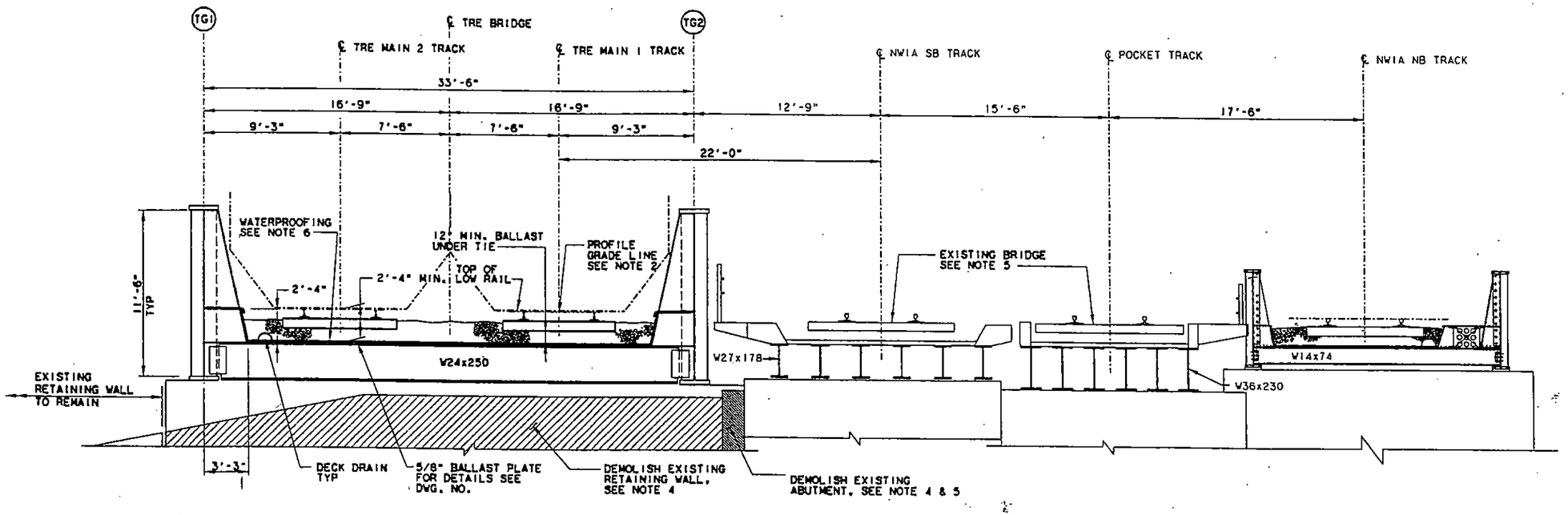
LRT HI LINE DRIVE BRIDGE
TYPICAL SECTION

CONTRACT C-1003853-01 | DWG No. SC8-1066 | REV 0

DWG No. SC8-1082

NOTES:

1. SECTION SHOWN NORMAL TO ℄ BRIDGE LOOKING NORTH.
2. FOR TRE PROFILE GRADE LINE SEE DWG. NO. KC2-0030.
3. (TG1) DENOTES GIRDER NUMBER.
4. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR THE PARTIAL REMOVAL OF EXISTING BRIDGE SUPERSTRUCTURE, EXISTING BRIDGE ABUTMENTS AND EXISTING RETAINING WALLS.
5. FOR MODIFICATIONS TO EXISTING BRIDGE SEE DWG. NO. SC8-1094 THRU SC8-1096.
6. FOR WATERPROOFING, SEE DWG. NO. KC6-0025.



TYPICAL SECTION

SCALE: 1/4"=1'-0"

REV	AMEND	CR	DATE	DESCRIPTION	BY	CHD	CHK	APP

STATE OF TEXAS — DENNIS C. GENLETZ — 62594 — REGISTERED PROFESSIONAL ENGINEER

STV Incorporated

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	D. DOHATTIA
DESIGNED	J. MACKENZIE
CHECKED	C. GILDNOW
IN CHARGE	G. NOLETZ
DATE	28 SEPT 01

DARTCADD

CONTRACT SHEET No. 24 OF 243

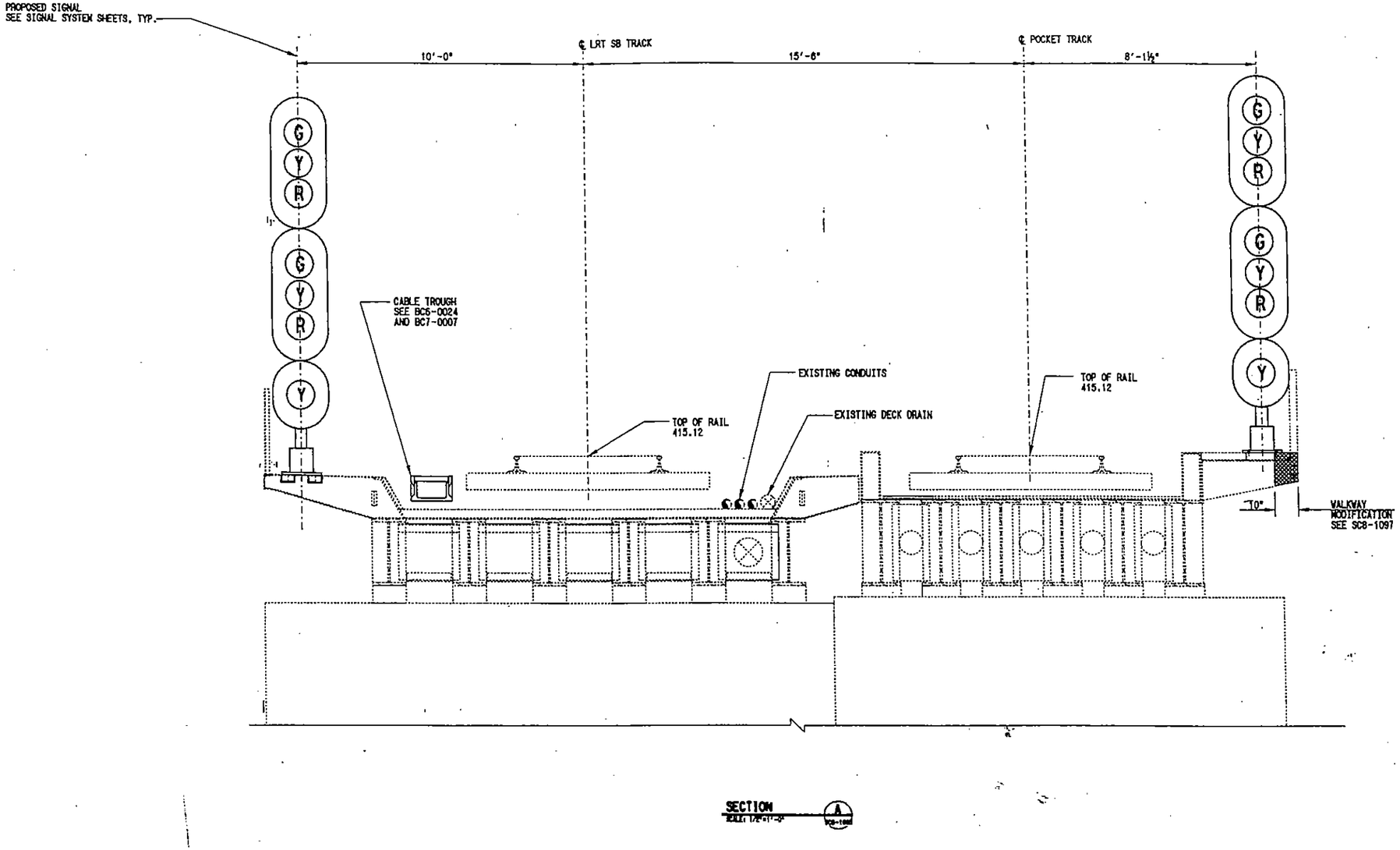
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
AERIAL STRUCTURES

TRE HI LINE DRIVE BRIDGE
TYPICAL SECTION

CONTRACT C-1003853-01 | DWG No. SC8-1082 | REV 0

CONFORMED

DWG No. SC8-1085



SECTION A
SC8-1085

WALKWAY MODIFICATION NOTES:

1. SIGNAL POLES ARE SHOWN FOR ILLUSTRATIVE PURPOSES. REFER TO SPECIFICATIONS AND SIGNAL PLANS FOR SPECIFIC SIGNAL TYPES AND VERIFICATION BOLT INSTALLATION REQUIREMENTS.

2. ALL STRUCTURAL STEEL SHAPES, BARS, PLATES AND SHEETS INDICATED ON THESE DRAWINGS SHALL CONFORM TO ASTM A-36.

3. WELDING SHALL BE SHALL CONFORM TO CURRENT A.W.S. STRUCTURAL WELDING CODE.

4. ALL MEMBERS SHOWN AS GALVANIZED SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION AND SHALL CONFORM TO ASTM A-123. TOUCH UP DAMAGED OR REPAIR AREAS WITH COLD GALVANIZING COMPOUND, ZINC OXIDE PRIMER CONFORMING TO SSPC 5 APPLIED IN TWO COATS.

5. EXISTING PLANK GRATING IS "GRIP STRUT". REPLACMENT PLANK GRATING SHALL BE OF THE SAME TREAD TYPE AS THE ORIGINAL AND OF THE SIZE INDICATED ON THE PLANS. RE-ATTACHMENT OF THE GRATING SHALL BE OF THE SAME MANNER AS THE ORIGINAL.

CONTRACT SHEET No. 25 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

STATE OF TEXAS
ERIC J. BJORKLUND
68415
REGISTERED
PROFESSIONAL ENGINEER
10/3/01

Garcia & Associates Engineering, Inc.
8989 MANHATTAN BLVD., SUITE 300
FORT WORTH, TEXAS 76120
(817) 446-1200
TRANSPORTATION • TRAFFIC • SURVEYING
TRANSIT SYSTEMS • ENVIRONMENTAL

LAN/STV
Lockwood, Andrews & Newnam, Inc.
and STV Incorporated

DART PROJECT

SCALE	1/2"=1'-0"
DRAWN	P. INTRAMANEE
DESIGNED	P. INTRAMANEE
CHECKED	E. BJORKLUND
IN CHARGE	S. OMAR
DATE	28 SEP 01

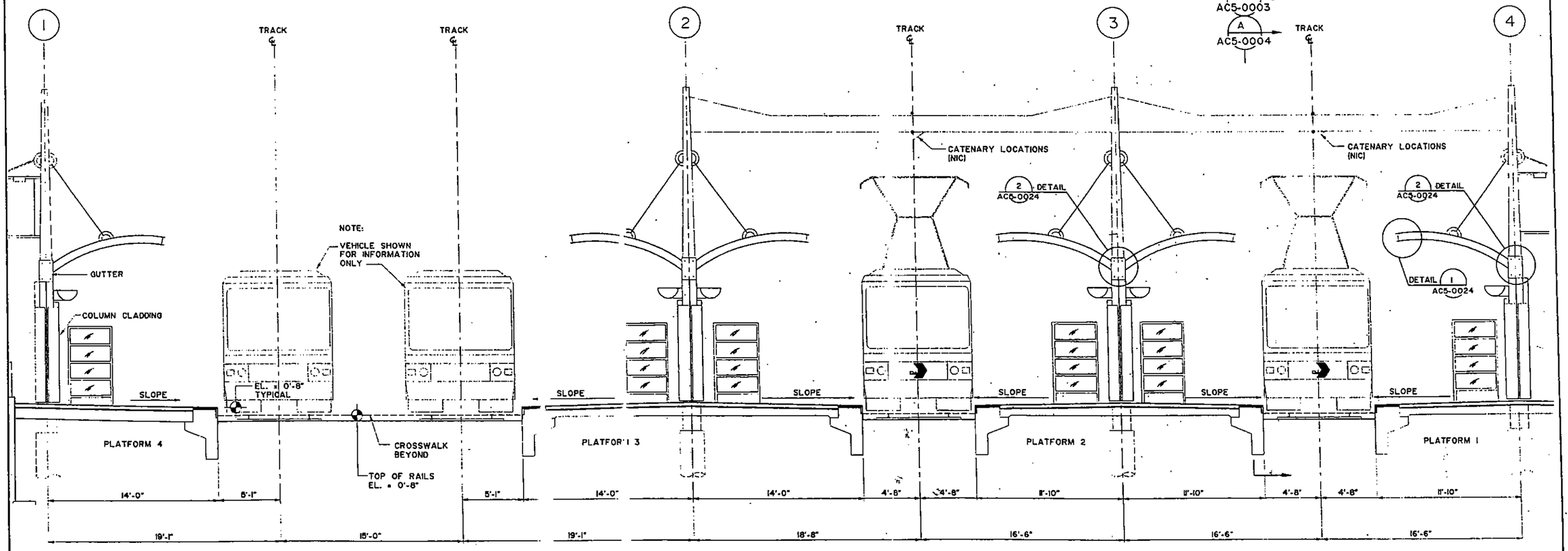
DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
AERIAL STRUCTURES
EXISTING HI LINE DRIVE BRIDGE
MODIFICATIONS
CROSS SECTION

CONTRACT C-1003855-01 | DWG No. SC8-1085 | REV O

CONFORMED

DWG No. AC5-0002



TYPICAL CROSS SECTION OF PLATFORMS & CANOPY END ELEVATIONS

SCALE: 1/4"=1'-0"

A AC5-0001

REV	AMEND	CR	DATE	DESCRIPTION
1	2		10/24/01	CHANGED DRAWING SCALE

BY	DES	CHK	APP

REGISTERED ARCHITECT STATE OF TEXAS 11/6/01

Alliance
1800 north collins blvd
suite 1000
richardson, texas 75080

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	K. SCRUGGS
DESIGNED	A. KNESHK
CHECKED	D. WESTFALL
IN CHARGE	D. WICKES
DATE	28 SEPT. 01

CAES

CONTRACT SHEET No. 26 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
VICTORY STATION
ARCHITECTURAL

STATION CROSS SECTION

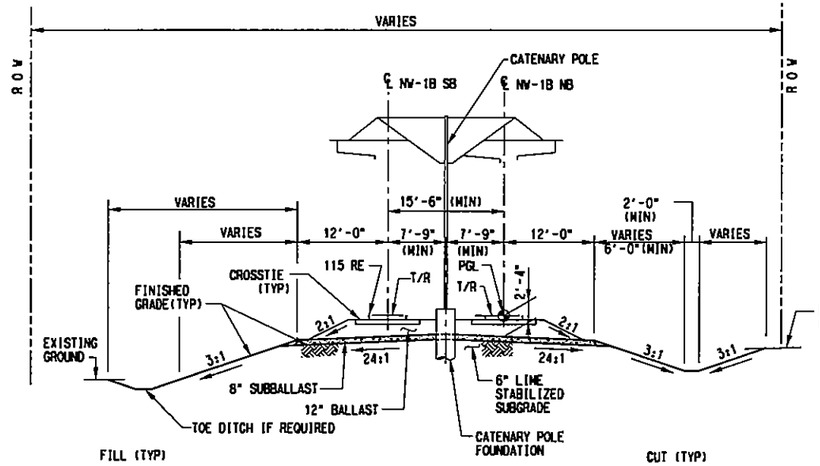
CONTRACT C-1003853-01 | DWG No. AC5-0002 | REV 1

CONFORMED

PLOTTED BY: akash
10/23/01
02:48:46 PM

n:\dgn\a-d\DART\Victory K20189\Victax02.004

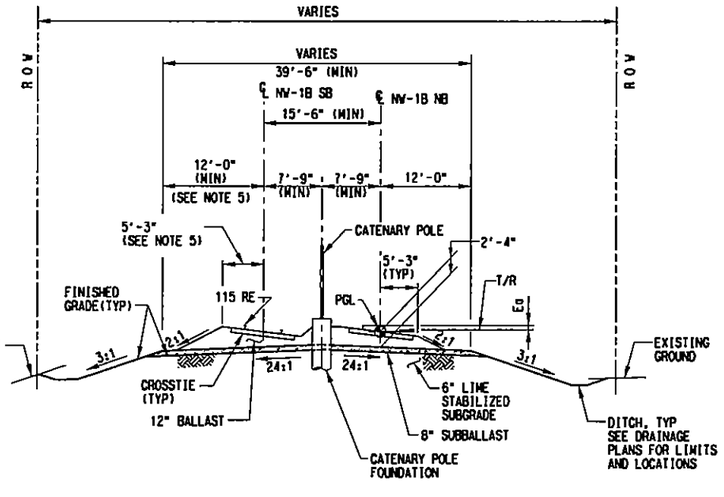
DWG No. CB1-1001



TANGENT AT-GRADE CUT AND FILL

SCALE: 1"=10'

STA 295+47.20 TO STA 297+78.14



CURVED AT-GRADE WITH CENTER POLE

SCALE: 1"=10'

STA 293+00.00 TO STA 294+58.51

STA 294+98.51 TO STA 295+47.20

NOTES:

1. ALL SECTIONS ARE LOOKING NORTH, WITH ALL STATIONING BASED ON THE CENTERLINE OF THE NORTHBOUND TRACK, UNLESS OTHERWISE NOTED.
2. CATENARY POLE LOCATION IS TYPICAL AND ONLY SHOWN AS AN ILLUSTRATION.
3. IN CURVES AND SPIRALS, THE PGL IS THE TOP OF THE LOW RAIL ON THE INSIDE OF THE CURVE OF THE NORTHBOUND TRACK.
4. SIDE SLOPES SHALL BE 3:1 UNLESS INDICATED OTHERWISE.
5. FOR SUPERELEVATED CURVES WHERE Eo IS GREATER THAN 2", INCREASE 12'-0" SHOULDER WIDTH TO 13'-6" ON HIGH SIDE OF TRACK, AND SHOULDER BALLAST TO 24". THE TRANSITION FROM THE SUBBALLAST SECTION SHOWN FOR TANGENT TRACK TO THE WIDENED SECTION FOR SUPERELEVATED TRACK SHALL BE MADE THROUGH THE LENGTH OF SPIRAL.
6. PROVIDE 6" LIME STABILIZED SUBGRADE UNDER THE 8" SUBBALLAST WHERE PI OF SUBGRADE IS 15 OR GREATER.
7. SAFETY FENCING IS REQUIRED WHERE OPERATING SPEEDS EXCEED 45 M.P.H.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 27 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64157
Date 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 1

CONTRACT	DWG No.	REV
C-937775-1	CB1-1001	

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Thu Apr 24 14:59:50 2003
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DBROWN

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no ref logical, *no ref name*, *no ref levels*

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DBROWN

PRF ROTATION=0.000000
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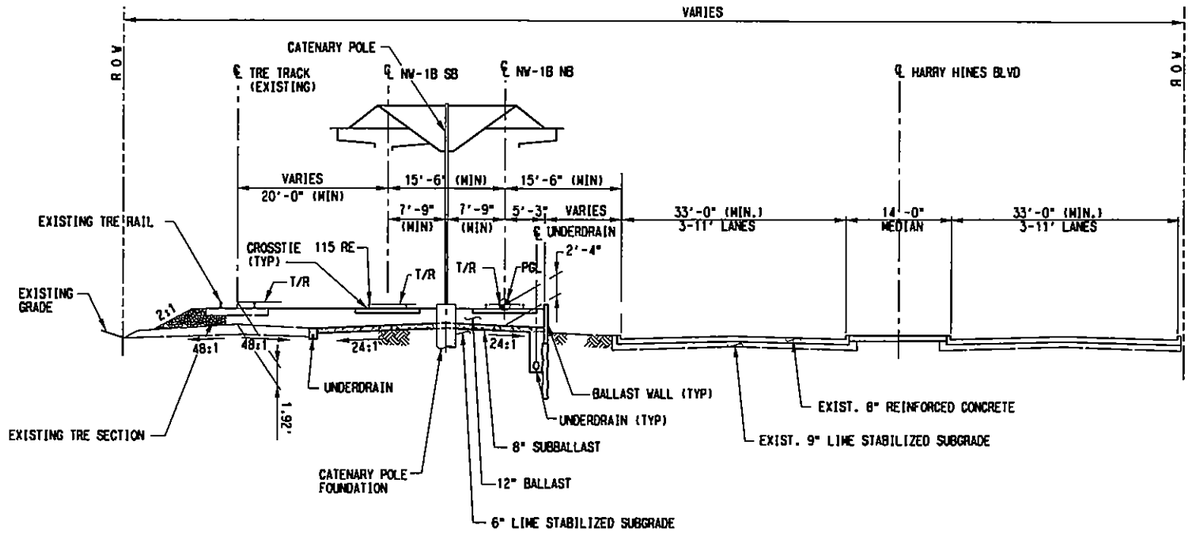
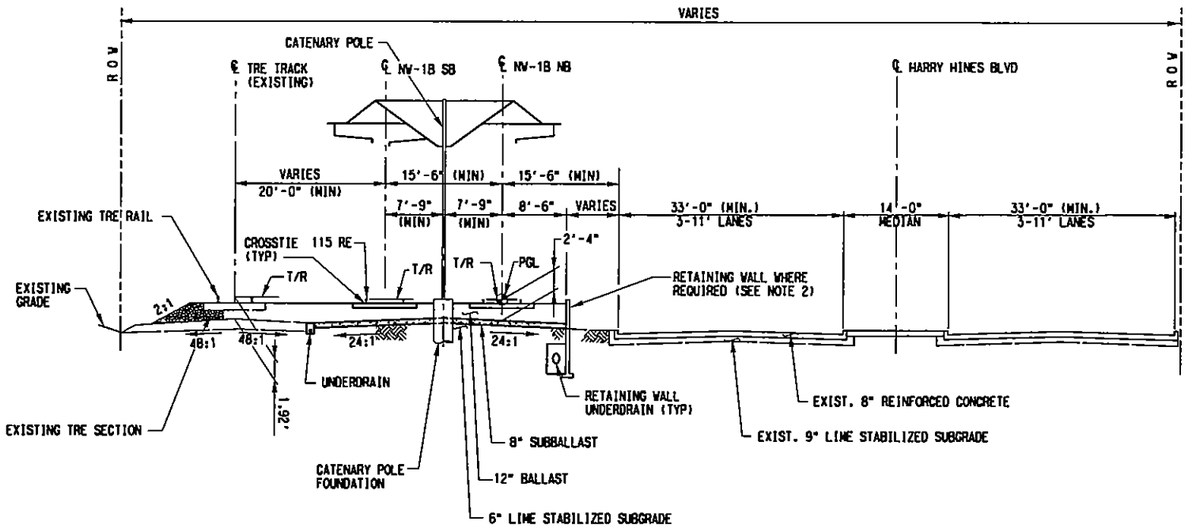
DWG No. C81-1002



AT GRADE LRT BETWEEN TRE AND HARRY HINES BOULEVARD W/BALLAST WALL

SCALE: 1"=10'

STA 164+00.00 TO STA 166+00.00



AT GRADE LRT BETWEEN TRE AND HARRY HINES BOULEVARD W/MSE WALL

SCALE: 1"=10'

STA 151+00.00 TO STA 160+00.00
STA 161+50.00 TO STA 164+00.00
STA 166+00.00 TO STA 168+50.00
STA 170+50.00 TO STA 182+00.00

NOTES:

1. SEE DWG No. C81-1001 FOR ADDITIONAL NOTES.
2. PROVIDE STRUCTURAL WALL SECTION WITH FENCE BETWEEN LRT AND HARRY HINES BLVD.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81152
Date: 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 28 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
GUIDEWAY
TYPICAL SECTIONS
SHEET 2

CONTRACT C-937775-1
DWG No. C81-1002
REV

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Thu Apr 24 14:06:15 2003
R:\NwIX\prf\nwlbar03.prf
lmorris

PRF ROTATION=0.000000
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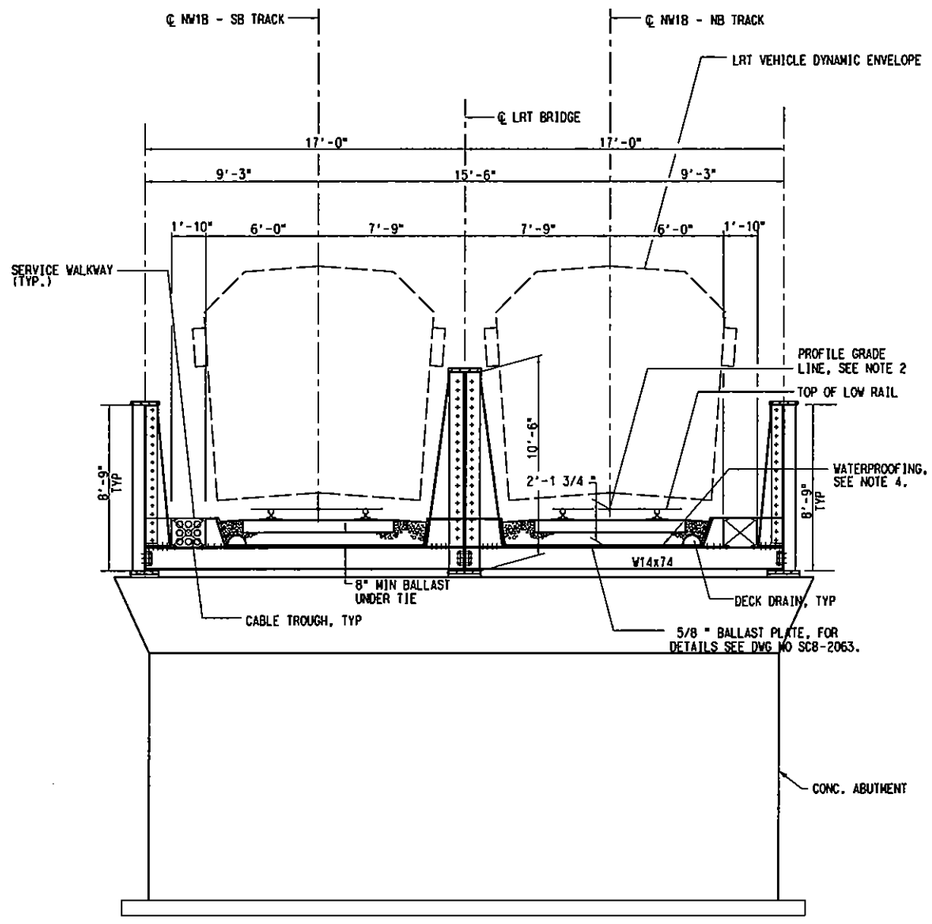
DWG No. CB1-1003



NOTES:

1. SECTION SHOWN NORMAL TO ℄ BRIDGE LOOKING NORTH.
2. FOR PROFILE GRADE LINE SEE DWG. NO. CB2-1003.

THROUGH GIRDER BRIDGE

SCALE: 1"=4'-0"

STA 160+00.00 TO STA 161+50.00 (TURTLE CREEK STRUCTURE)

STA 168+50.00 TO STA 170+50.00 (OAK LAWN STRUCTURE)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81152
Date 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	A. TIRANAPRAKIT
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 29 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 3

CONTRACT	DWG No.	REV
C-937775-1	CB1-1003	

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lmorris

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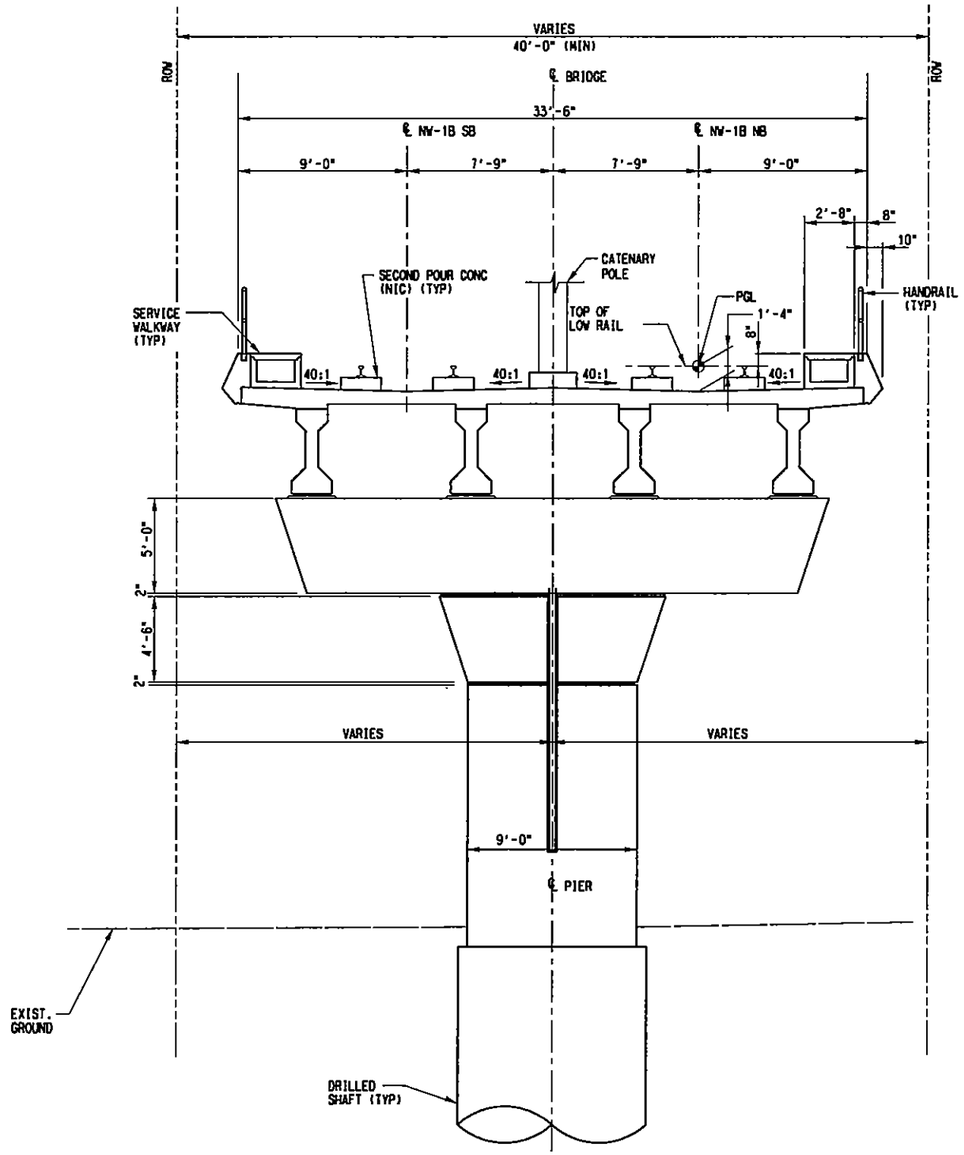
DWG No. CB1-1004



NOTES:

1. SEE DWG No. CB1-1001 FOR ADDITIONAL NOTES.
2. PROVIDE EMERGENCY EGRESS AND FIRE SUPPRESSION PROVISIONS IN ACCORDANCE WITH NFPA-130. EGRESS PROVISIONS SHALL BE PROVIDED AT A MAXIMUM SPACING OF 2,500 FEET FOR THE ELEVATED GUIDEWAY.
3. MINIMUM CLEARANCE (16'-6") SHALL BE MAINTAINED ABOVE ROADWAYS.

AERIAL LRT STRUCTURE TYPICAL

SCALE: 1"=4'-0"

STA 209+26.21 TO STA 222+16.77

STA 249+07.22 TO STA 265+38.71

STA 283+53.19 TO STA 288+36.69

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 4

CONTRACT SHEET No. 30 OF 243

CONTRACT C-937775-1

DWG No. CB1-1004

REV

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lmorris

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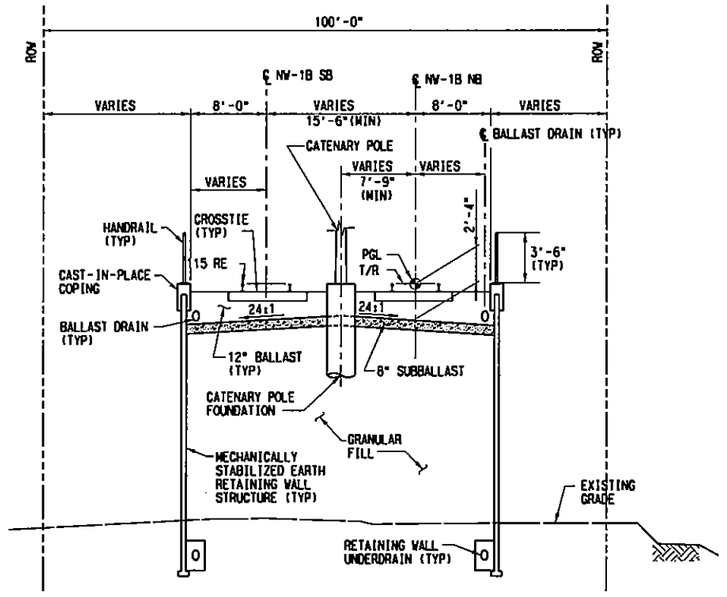
DWG No. CB1-1005

NOTES:

1. SEE DWG No. CB1-1001 FOR ADDITIONAL NOTES.



RETAINED FILL LRT - MSE WALL

SCALE: 1" = 8'=0"

STA 182+00.00 TO STA 193+00.00

STA 288+36.69 TO STA 293+00.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 851-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 31 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
GUIDEWAY
TYPICAL SECTIONS
SHEET 5

CONTRACT C-937775-1 | DWG No. CB1-1005 | REV

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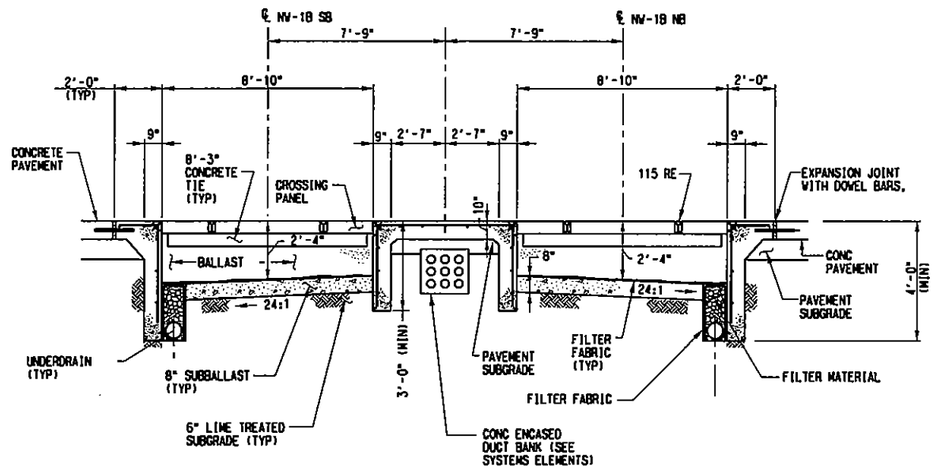
lmorris



HIGHWAY GRADE CROSSING

SCALE: NOT TO SCALE

STA 294+58.51 TO STA 294+98.51

NOTES:

1. SEE DWG. No. CB1-1001 FOR ADDITIONAL NOTES.
2. HEADER DETAIL SHOWN IS FOR A TYPICAL CONCRETE PAVEMENT INTERFACE. REFER TO DART STANDARD DRAWINGS FOR OTHER TYPES OF INTERFACE.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151 Date 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
16770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 32 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 6

CONTRACT C-937775-1 | DWG No. CB1-1006 | REV

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lmorris

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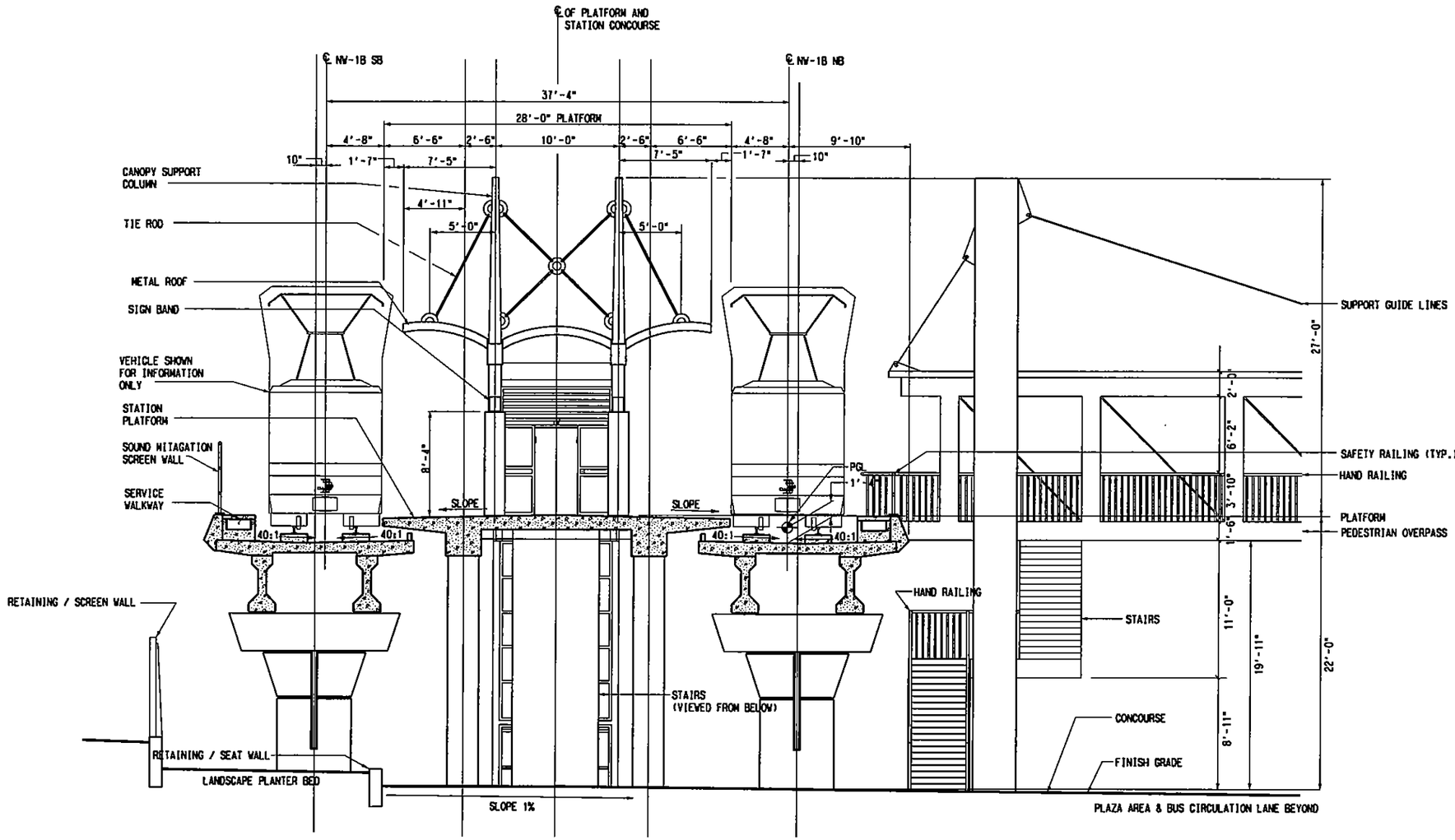
DWG No. CB1-1007



NOTES:

1. SEE DWG. No. CB1-1001 FOR ADDITIONAL NOTES.
2. TWIN BRIDGE STRUCTURES ARE PROVIDED TO TRANSITION BETWEEN 37'-4" TRACK CENTERS AT THE AERIAL STATION TO THE NORMAL 15'-6" TRACK CENTERS ON THE AERIAL STRUCTURE.

MARKET CENTER/OAK LAWN STATION

SCALE: 1"=5'-0"

STA 193+00.00 TO STA 196+81.95 (EXCLUDE STA PLATFORM, SEE NOTE #2)

STA 196+81.95 TO STA 200+92.95 (MARKET CENTER STATION)

STA 200+92.95 TO STA 209+26.21 (EXCLUDE STA PLATFORM, SEE NOTE #2)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 69757
Date 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 33 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 7

CONTRACT	DWG No.	REV
C-937775-1	CB1-1007	

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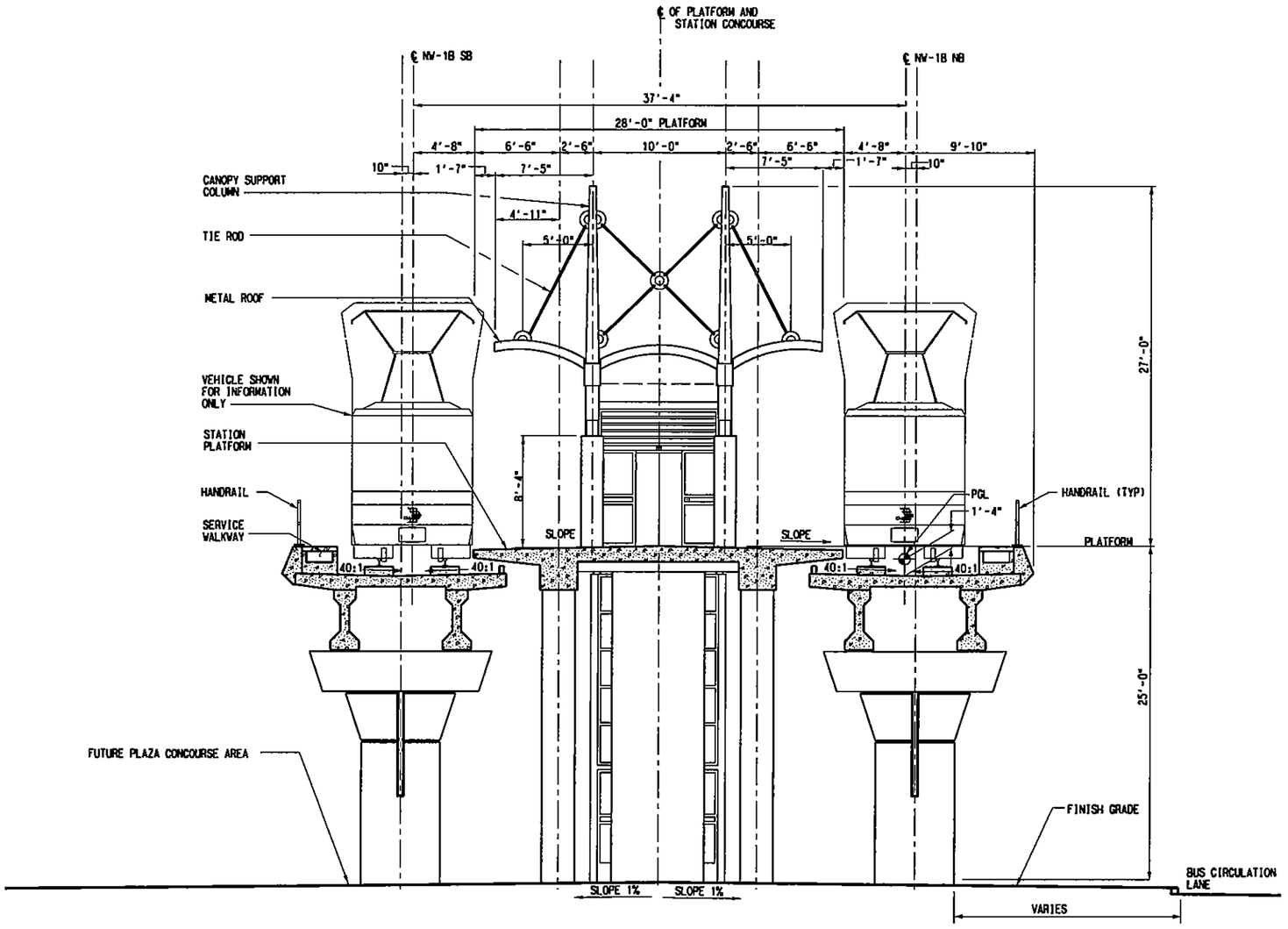
DWG No. C81-1008



NOTES:

1. SEE DWG. No. C81-1001 FOR ADDITIONAL NOTES.
2. TWIN BRIDGE STRUCTURES ARE PROVIDED TO TRANSITION BETWEEN 37'-4" TRACK CENTERS AT THE AERIAL STATION TO THE NORMAL 15'-6" TRACK CENTERS ON THE AERIAL STRUCTURE.

PARKLAND STATION

SCALE: 1"=5'-0"

STA 222+16.77 TO STA 233+52.25 (EXCLUDE STA PLATFORM, SEE NOTE #2)

STA 233+52.25 TO STA 237+63.25 (PARKLAND STATION)

STA 237+63.25 TO STA 249+07.22 (EXCLUDE STA PLATFORM, SEE NOTE #2)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. SUTTON, P.E. No. 61151
Date 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 34 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 8

CONTRACT C-937775-1 | DWG No. C81-1008 | REV

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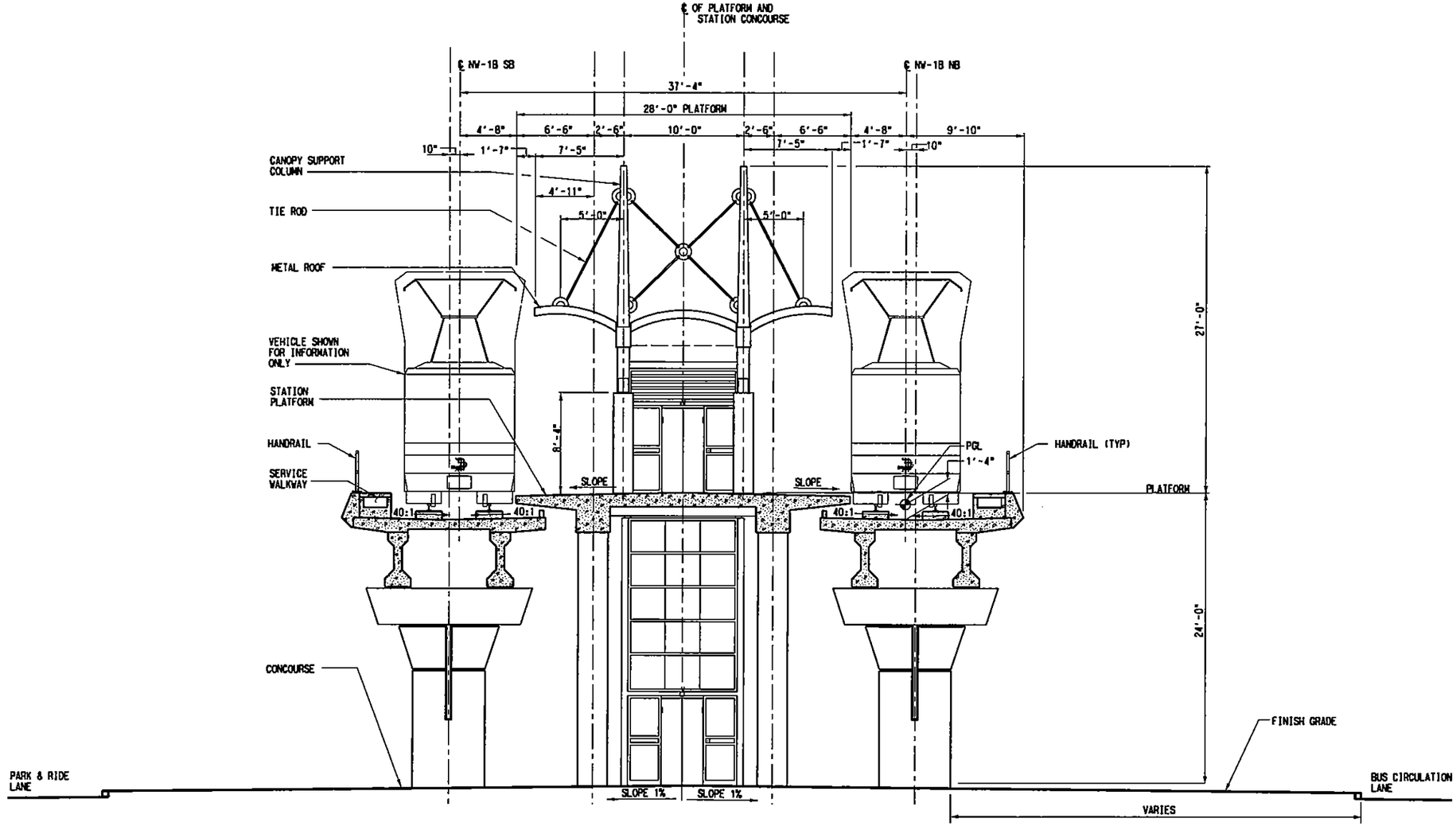
DWG No. CB1-1009



NOTES:

1. SEE DWG. No. CB1-1001 FOR ADDITIONAL NOTES.
2. TWIN BRIDGE STRUCTURES ARE PROVIDED TO TRANSITION BETWEEN 37'-4" TRACK CENTERS AT THE AERIAL STATION TO THE NORMAL 15'-6" TRACK CENTERS ON THE AERIAL STRUCTURE.

INWOOD STATION

SCALE: 1"=5'-0"

STA 265+38.71 TO STA 273+34.95 (EXCLUDE STA PLATFORM, SEE NOTE #2)
STA 273+34.95 TO STA 277+45.95 (INWOOD STATION)
STA 277+45.95 TO STA 283+53.19 (EXCLUDE STA PLATFORM, SEE NOTE #2)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84152 Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 35 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 9

CONTRACT C-937775-1 | DWG No. CB1-1009 | REV

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DWG No. CB1-1010

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NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 62137
Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 36 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 10

CONTRACT	DWG No.	REV
C-937775-1	CB1-1010	

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lmorris

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DWG No. C81-1011

SHEET INTENTIONALLY LEFT BLANK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. Tipton, P.E. No. 61152
Date 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 37 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 11

CONTRACT C-937775-1 | DWG No. C81-1011 | REV

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Thu Apr 24 14:08:16 2003
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DWG No. CB1-1012

SHEET INTENTIONALLY LEFT BLANK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64151
Date 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 38 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 12

CONTRACT	DWG No.	REV
C-937775-1	CB1-1012	

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Thu Apr 24 14:08:29 2003
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OBROWN

no ref logical, *no ref name*, *no ref levels*

SHEET INTENTIONALLY LEFT BLANK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 14 MAR 03

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT
DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 39 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 13

CONTRACT	DWG No.	REV
C-937775-1	CB1-1013	

DWG No. CB1-1013

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DBROWN

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DWG No. C81-1014

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DBROWN

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SHEET INTENTIONALLY LEFT BLANK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 40 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 14

CONTRACT	DWG No.	REV
C-937775-1	C81-1014	

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NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date 11 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT
DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 41 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 15

CONTRACT C-937775-1 | DWG No. CB1-1015 | REV

DWG No. CB1-1015

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DBROWN

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DWG No. CB1-1016

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DBROWN

PRF ROTATION=0.000000
W:\CADNET\PENTABLE\Smdarf.tbl

SHEET INTENTIONALLY LEFT BLANK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 42 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81131
Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	B. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 16

CONTRACT	DWG No.	REV
C-937775-1	CB1-1016	

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DWG No. CB1-1017

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DBROWN

PRF ROTATION=0.000000
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SHEET INTENTIONALLY LEFT BLANK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 69157
Date: 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 43 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY
TYPICAL SECTIONS
SHEET 17

CONTRACT	DWG No.	REV
C-937775-1	CB1-1017	

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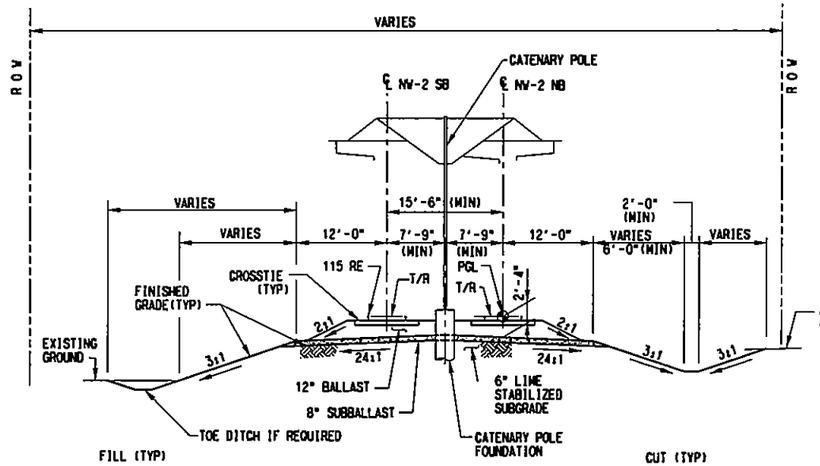


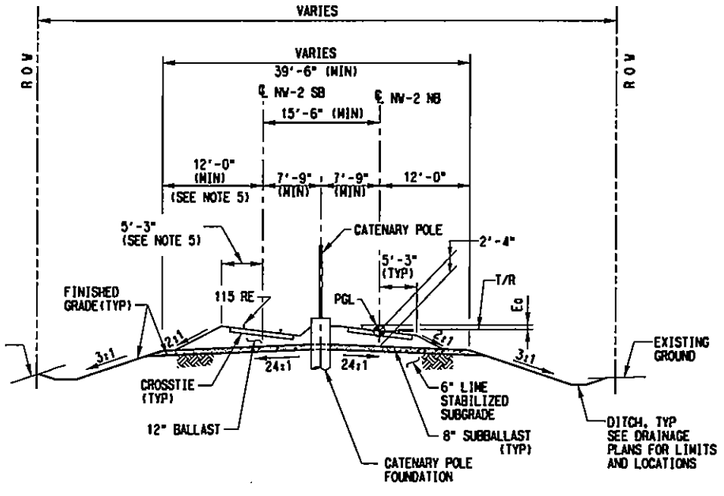
TANGENT AT-GRADE CUT AND FILL

SCALE: 1"=10'

STA 225+28.54 TO STA 226+17.37

STA 229+79.16 TO STA 231+92.50

STA 232+38.65 TO STA 242+52.14



CURVED AT-GRADE WITH CENTER POLE

SCALE: 1"=10'

STA 224+65.22 TO STA 225+28.54

STA 226+17.37 TO STA 229+79.16

STA 242+52.14 TO STA 243+25.37

NOTES:

1. ALL SECTIONS ARE LOOKING NORTH, WITH ALL STATIONING BASED ON THE CENTERLINE OF THE NORTHBOUND TRACK, UNLESS OTHERWISE NOTED.
2. CATENARY POLE LOCATION IS TYPICAL AND ONLY SHOWN AS AN ILLUSTRATION.
3. IN CURVES AND SPIRALS, THE PGL IS THE TOP OF THE LOW RAIL ON THE INSIDE OF THE CURVE OF THE NORTHBOUND TRACK.
4. SIDE SLOPES SHALL BE 3:1 UNLESS INDICATED OTHERWISE.
5. FOR SUPERELEVATED CURVES WHERE Eo IS GREATER THAN 2", INCREASE 12'-0" SHOULDER WIDTH TO 13'-6" ON HIGH SIDE OF TRACK, AND SHOULDER BALLAST TO 24". THE TRANSITION FROM THE SUBBALLAST SECTION SHOWN FOR TANGENT TRACK TO THE WIDENED SECTION FOR SUPERELEVATED TRACK SHALL BE MADE THROUGH THE LENGTH OF SPIRAL.
6. PROVIDE 6" LIME STABILIZED SUBGRADE UNDER THE 8" SUBBALLAST WHERE PI OF SUBGRADE IS 15 OR GREATER.
7. SAFETY FENCING IS REQUIRED WHERE OPERATING SPEEDS EXCEED 45 M.P.H.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 44 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 1

CONTRACT C-937775-1 | DWG No. CB1-0001 | REV

R:\NW2X\DGN\Cv1-AG\nw2xcs01.010
Fri Oct 25 10:56:55 2002
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lmorris
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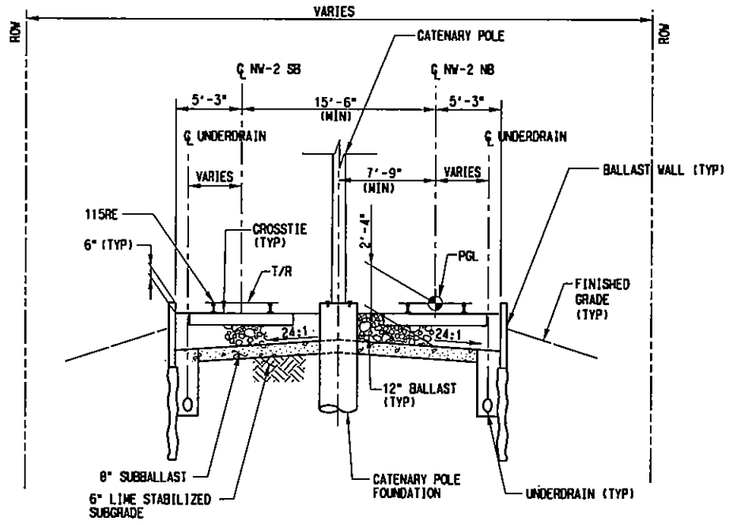
lmorris

DWG No. CB1-2002

NOTES:

1. SEE DWG No. CB1-2001 FOR ADDITIONAL NOTES.



AT-GRADE WITH BALLAST WALLS

SCALE: HORIZ. 1"=6' , VERT. 1"=4'

STA 156+18.41 TO STA 160+76.86

STA 161+30.44 TO STA 163+00.00

STA 315+11.32 TO STA 316+82.92

STA 321+10.95 TO STA 322+50.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. SUTTON, P.E. No. 81152
Date 31 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 45 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 2

CONTRACT C-937775-1 | DWG No. CB1-2002 | REV

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Thu Oct 31 07:32:22 2002
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lmorris

PRF ROTATION=0.000000
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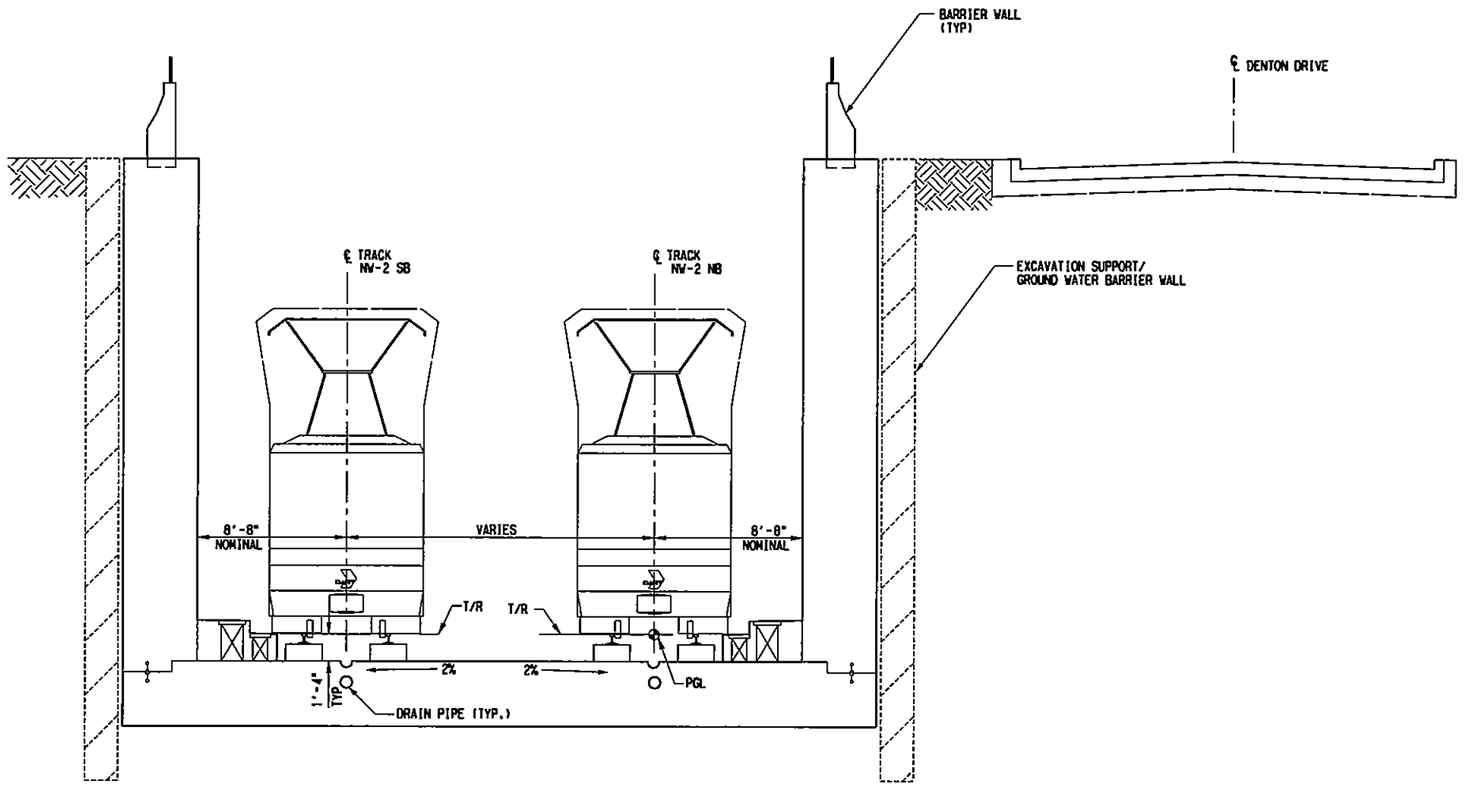
DWG No. CB1-2003



U-WALL STRUCTURE

SCALE: N.T.S.

STA 163+00.00 TO STA 167+40.00

STA 181+00.00 TO STA 186+00.00

NOTES:

1. SEE DWG. No. CB21-2001 FOR ADDITIONAL NOTES.
2. TOP OF RAIL ELEVATION VAIRES TO MAXIMUM OF 25'-0" BELOW GROUND SURFACE.
3. THE SUPPORT/GROUND WATER BARRIER USED DURING CONSTRUCTION MAY CONSIST OF EITHER A SLURRY WALL, TANGENT PILE WALL, A WALL OF SOLDIER PILE WITH TIMBER LAGGING OR ANOTHER ACCEPTABLE WALL TYPE AS DETERMINED IN FINAL DESIGN. THE WALL SYSTEM WOULD REQUIRE STABILIZATION BY THE USE OF TIE BACK ANCHORS, INTERIOR STRUTS OR ANOTHER ACCEPTABLE MEANS OF BRACING.
4. A DOUBLE L-WALL SECTION MAY PROVE TO BE MORE ECONOMICAL THAN A U-WALL SECTION FOR THE GREATER WIDTH OF THE RETAINED CUT SECTION LOCATED IMMEDIATELY NORTH AND SOUTH OF THE PARKLAND STATION. A COST EVALUATION OF THE STRUCTURES TYPES SHOULD BE MADE IN THE FINAL DESIGN.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84137
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7500

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	B. JAMES
CHECKED	L. MORRIS
IN CHARGE	B. JAMES
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 46 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 3

CONTRACT	DWG No.	REV
C-937775-1	CB1-2003	

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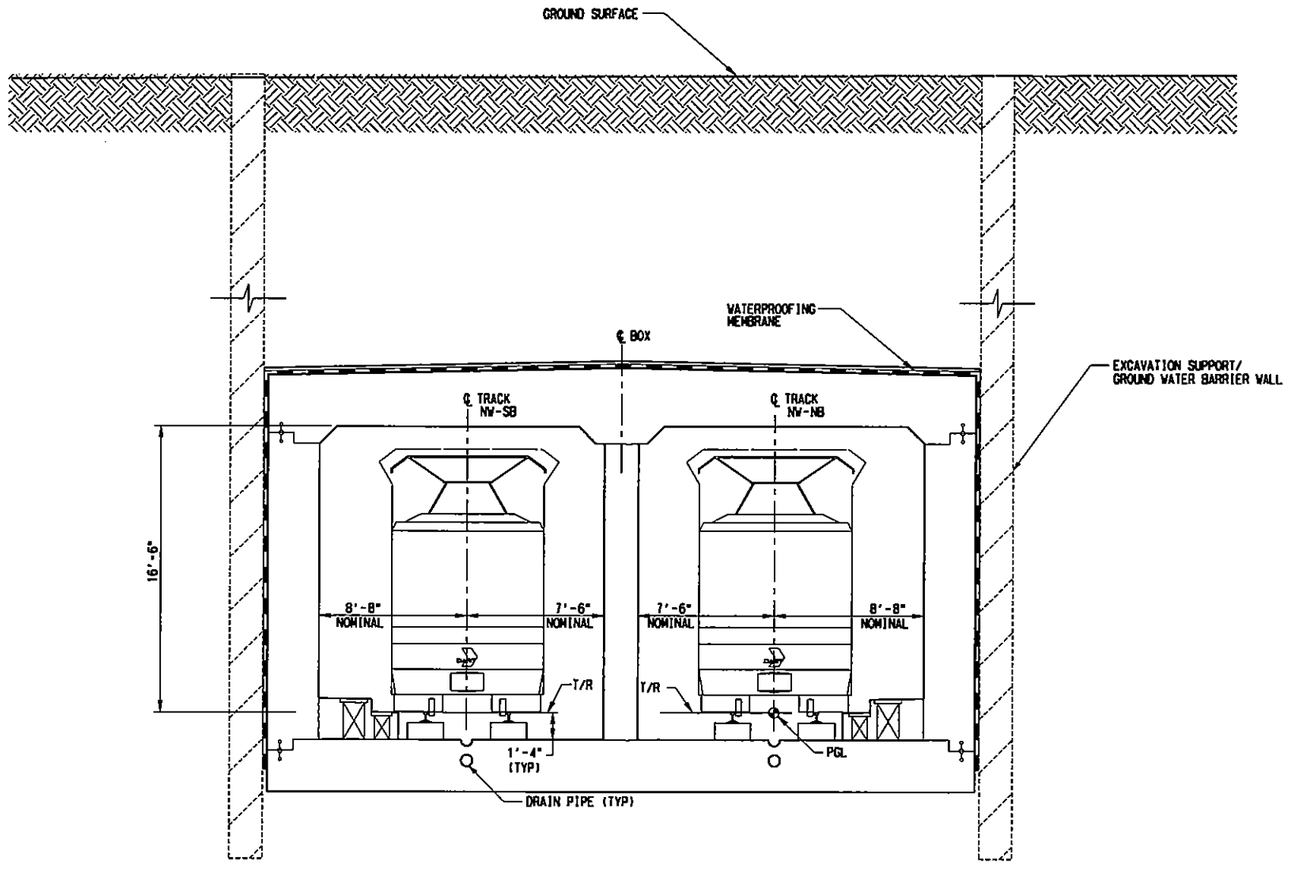
DWG No. CB1-2004



TYPICAL SECTION - CUT & COVER 2 CELL BOX

SCALE: N.T.S.

STA 167+40.00 TO STA 181+00.00

NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.
2. DIMENSION BETWEEN NB AND SB TRACK VARIES, 16'-6" MINIMUM.
3. TOP OF RAIL ELEVATION VARIES 25' TO 40' BELOW GROUND SURFACE.
4. THE SUPPORT/GROUND WATER BARRIER USED DURING CONSTRUCTION MAY CONSIST OF EITHER A SLURRY WALL, TANGENT PILE WALL, A WALL OF SOLDIER PILE WITH TIMBER LAGGING OR ANOTHER ACCECPTABLE WALL TYPE AS DETERMINED IN FINAL DESIGN. THE WALL SYSTEM WOULD REQUIRE STABILIZATION BY THE USE OF TIE BACK ANCHORS, INTERIOR STRUTS OR ANOTHER ACCEPTABLE MEANS OF BRACING.
5. EMERGENCY INGRESS/EGRESS PROVISIONS SHALL BE PROVIDED AT A MAXIMUM SPACING OF 2,500 FEET FOR TUNNEL GUIDEWAY SECTIONS. TUNNEL VENTILATION AND OTHER LIFE SAFETY PROVISIONS SHALL BE PER NFPA-130.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TUTOR, P.E. No. 81152 Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	B. JAMES
CHECKED	L. MORRIS
IN CHARGE	B. JAMES
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 47 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 4

CONTRACT C-937775-1 | DWG No. CB1-2004 | REV

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lmorris

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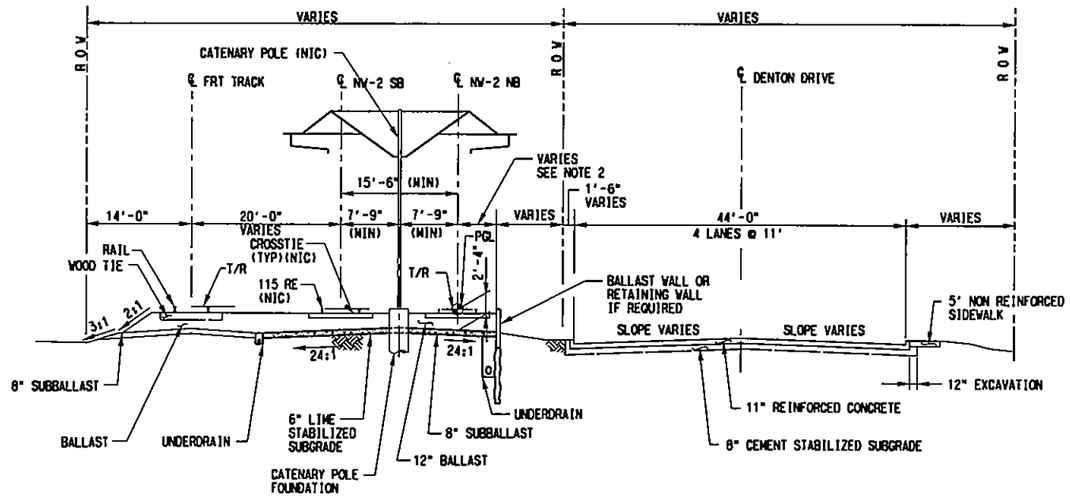
DWG No. CB1-2005



AT GRADE LRT AND FREIGHT

SCALE: 1/20"=1'-0"

STA 186+00.00 TO STA 187+00.00
STA 187+00.00 TO STA 189+00.00 (MSE WALL)
STA 189+00.00 TO STA 189+57.48
STA 190+14.93 TO STA 191+50.00
STA 191+50.00 TO STA 198+00.00 (MSE WALL)
STA 198+00.00 TO STA 204+50.00
STA 204+50.00 TO STA 207+00.00 (MSE WALL)
STA 207+00.00 TO STA 207+73.30
STA 208+19.70 TO STA 224+65.22
STA 243+81.24 TO STA 249+79.82
STA 253+39.82 TO STA 254+44.99
STA 255+21.33 TO STA 261+50.65
STA 261+50.65 TO STA 565+71.47 (MSE WALL)
STA 266+19.79 TO STA 267+58.20 (MSE WALL)
STA 312+50.00 TO STA 314+75.75

NOTES:

1. SEE DWG No. CB1-2001 FOR ADDITIONAL NOTES.
2. DIMENSION BETWEEN CENTERLINE OF NORTHBOUND TRACK AND THE FACE OF STRUCTURE VARIES AS FOLLOWS:
   BALLAST WALL = 5'-3"
   MSE WALL = 8'-0"
   CIP WALL = 8'-0"
3. STREET SECTION SHOWN IS FOR STREET MODIFICATIONS. SEE STREET MODIFICATION SHEETS FOR LIMITS OF STREET IMPROVEMENTS.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81133
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 48 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 5

CONTRACT C-937775-1 | DWG No. CB1-2005 | REV

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lmorris

PRF ROTATION=0.000000
W:\CADNET\PENTABLE\Smdarl.tbl

ORDER, R:\NW2X\nw2xbor1.001, 1-4,6,8,10,23,39,56,57,61,62

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lmorris

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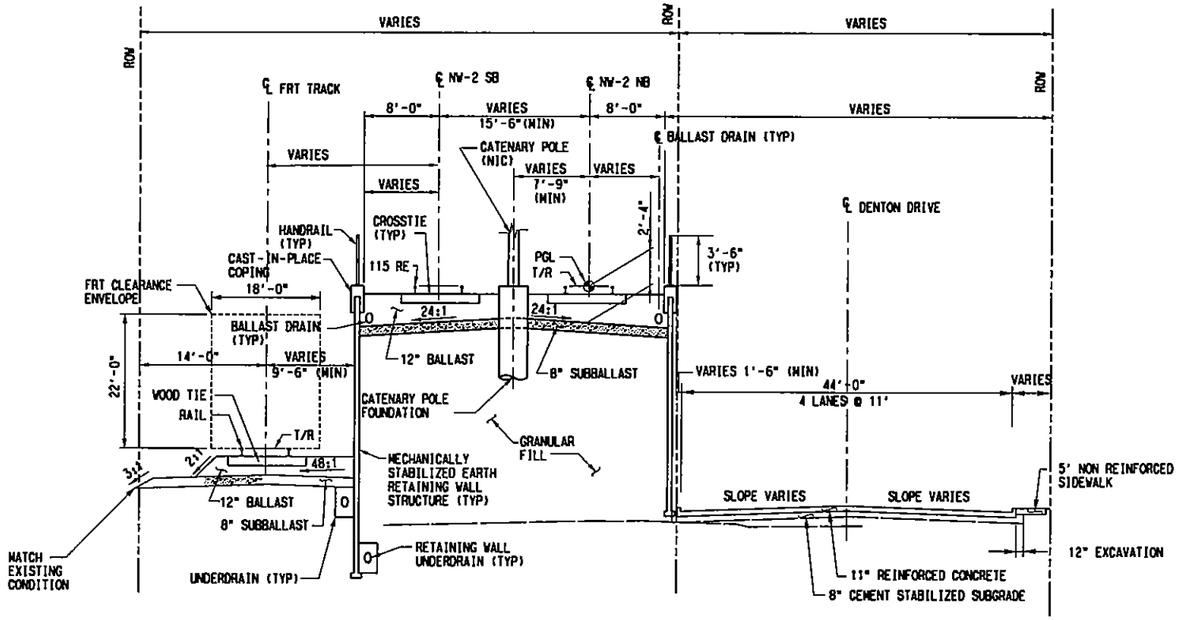
ORDER, R:\NW2X\nw2xbor1.001, 1-4,6,8,10,23,39,56,57,61,62

DWG No. CB1-2006

NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.
2. STREET SECTION SHOWN IS FOR STREET MODIFICATIONS. SEE STREET MODIFICATIONS SHEETS FOR LIMITS OF STREET IMPROVEMENTS.



RETAINED FILL LRT AND AT GRADE FREIGHT

SCALE: NTS

STA 267+58.20 TO STA 272+50.00

STA 309+83.00 TO STA 312+50.00 (NO FRT)

STA 319+93.92 TO STA 320+32.95 (NO FRT)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 49 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2
GUIDEWAY
TYPICAL SECTIONS
SHEET 6

CONTRACT	DWG No.	REV
C-937775-1	CB1-2006	

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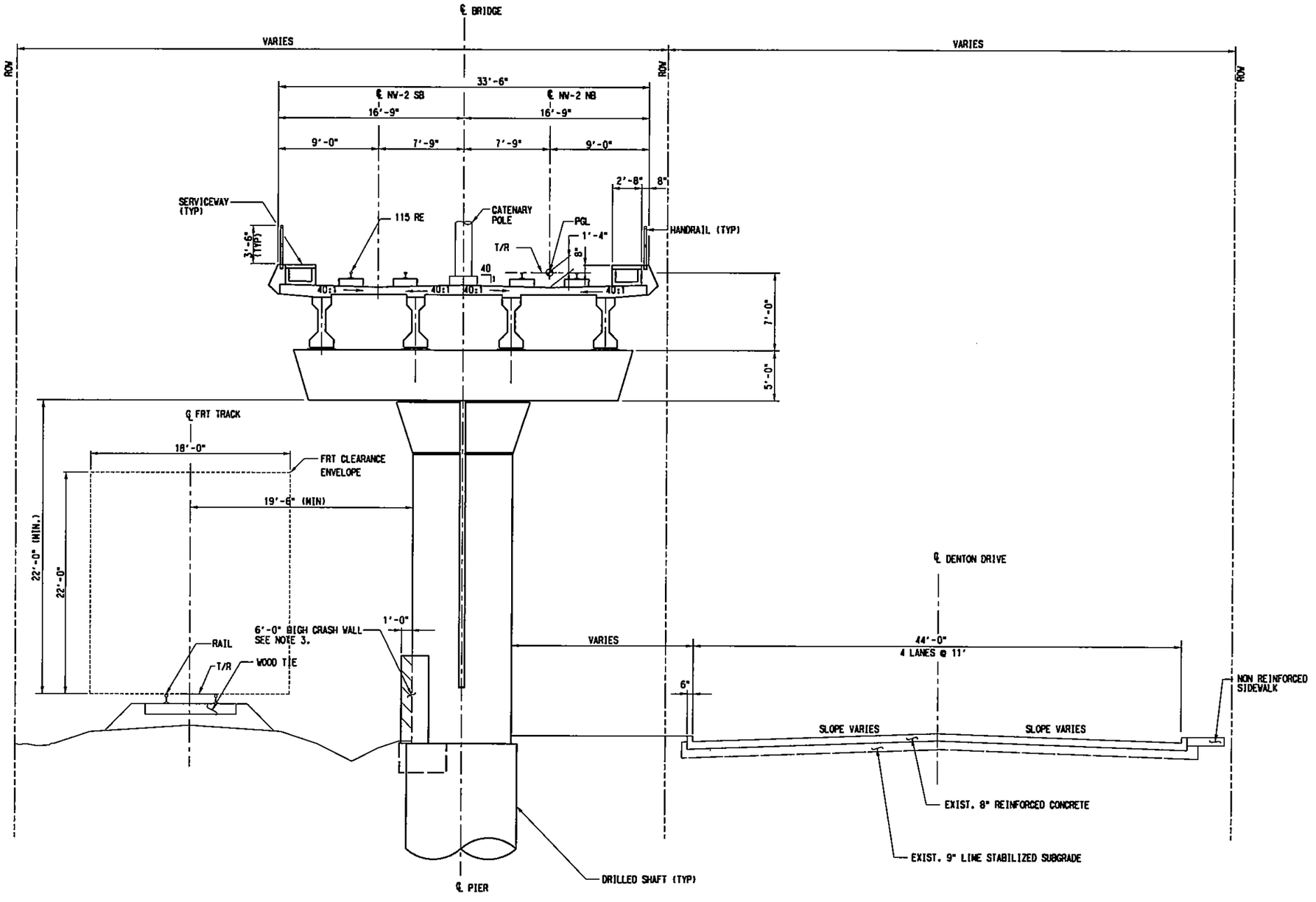
DWG No. CB1-2007



NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.
2. THE LRT ALIGNMENT MOVES WEST ACROSS THE FRT TO THE APPROACH TO BACHMAN STATION BETWEEN STATION 296+00 TO STATION 308+70.
3. PROVIDE CRASH WALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED 12' TO 25' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK.

DOUBLE TRACK LRT STRUCTURE & FREIGHT

SCALE: NTS

STA 272+50.00 TO STA 296+28.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 50 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 7

CONTRACT C-937775-1 | DWG No. CB1-2007 | REV

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Fri Oct 25 09:24:38 2002
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lmorris

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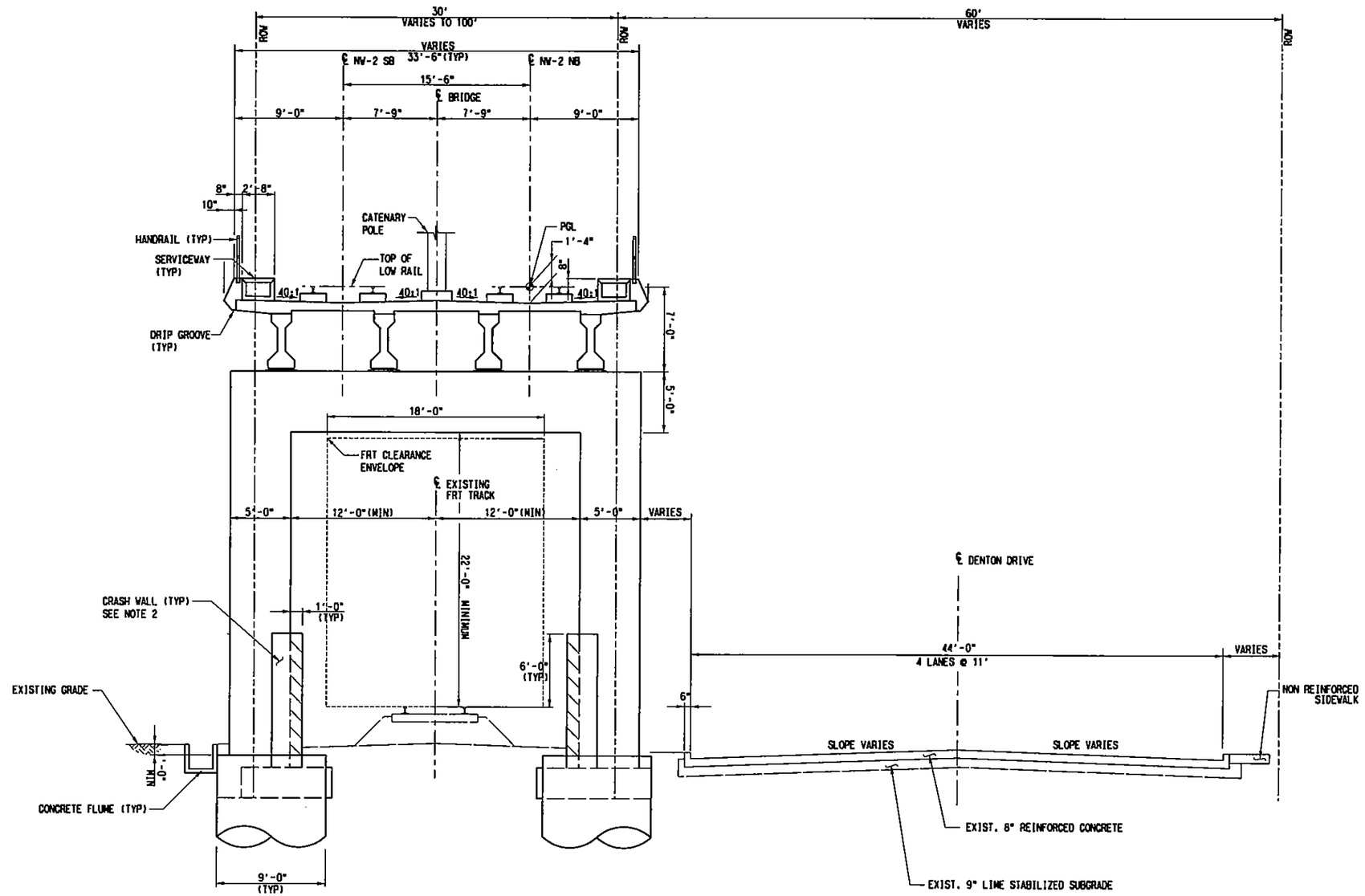
DWG No. CB1-2008



NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.
2. PROVIDE CRASHWALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED FROM 12 FT. TO 25 FT. CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12 FT. CLEAR FROM CENTERLINE OF FREIGHT TRACK.

DOUBLE TRACK LRT STRUCTURE & AT GRADE FREIGHT

SCALE: 1/4"=1'-0"

STA 296+28.00 TO STA 299+88.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
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CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

CONTRACT SHEET No. 51 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 8

CONTRACT C-937775-1 | DWG No. CB1-2008 | REV

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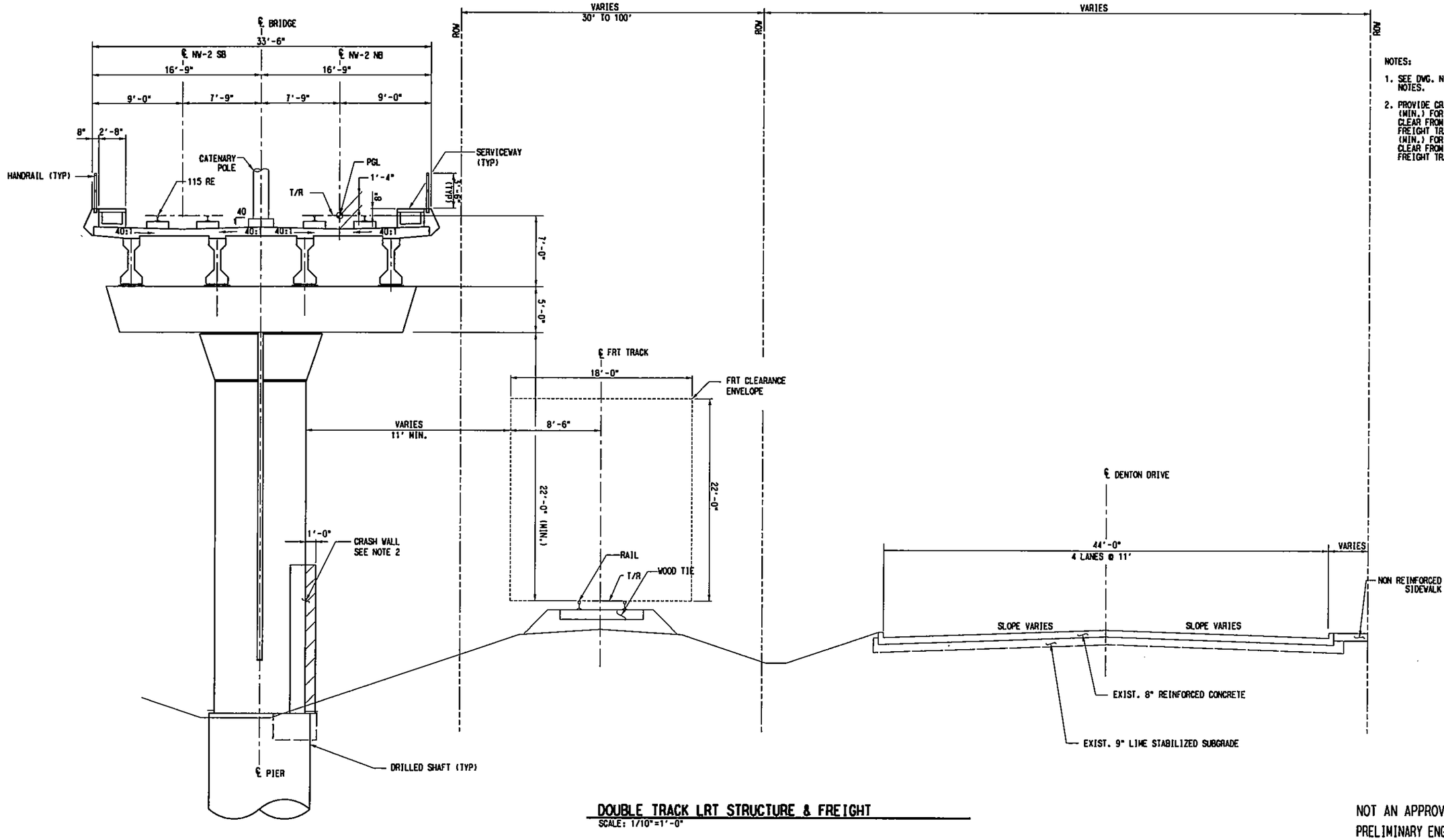
DWG No. CB1-2009



NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.
2. PROVIDE CRASH WALL 6'-0" HIGH (MIN.) FOR PIERS LOCATED 12' TO 25' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MIN.) FOR PIERS LESS THAN 12' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK.

DOUBLE TRACK LRT STRUCTURE & FREIGHT

SCALE: 1/10"=1'-0"

STA 299+88.00 TO STA 309+83.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 52 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TEXTOR, P.E. No. 84152
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 9

CONTRACT C-937775-1 | DWG No. CB1-2009 | REV

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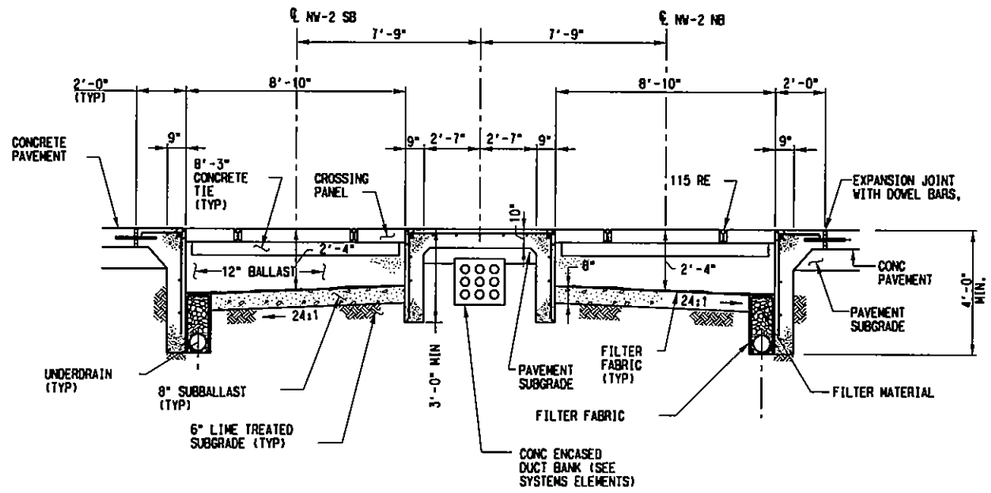
DWG No. CB1-2010



HIGHWAY GRADE CROSSING

SCALE: NOT TO SCALE

STA 160+76.86 TO STA 161+30.44 (MANOR WAY)
STA 189+57.48 TO STA 190+14.53 (EMPIRE CENTRAL)
STA 207+73.30 TO STA 208+19.70 (ANSON ROAD)
STA 231+92.50 TO STA 232+38.65 (LOVERS LANE)
STA 243+25.37 TO STA 243+81.24 (BURBANK STREET)
STA 254+44.99 TO STA 255+21.33 (WYMAN STREET)
STA 265+71.47 TO STA 266+19.79 (WALTERS LANE)
STA 314+75.75 TO STA 315+11.32 (BACHMAN STATION DRIVE)
STA 320+32.95 TO STA 321+10.95 (COMMUNITY DRIVE)

NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.
2. HEADER DETAIL SHOWN IS FOR A TYPICAL CONCRETE PAVEMENT INTERFACE. REFER TO DART STANDARD DRAWINGS FOR OTHER TYPES OF INTERFACE.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61151
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 53 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 10

CONTRACT	DWG No.	REV
C-937775-1	CB1-2010	

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lmorris

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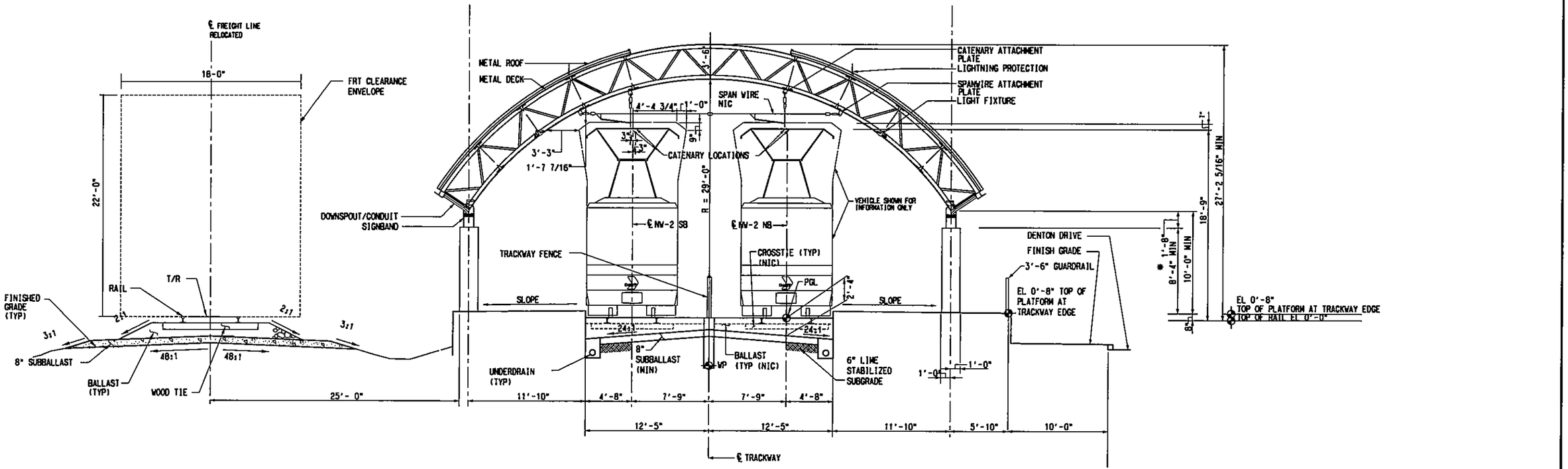
DWG No. CB1-2011

NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.



BROOKHOLLOW STATION

SCALE: 1/10" = 1'-0"

STA 249+79.82 TO STA 253+39.82

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 68152
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. BASTRY
IN CHARGE	S. BASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 54 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 11

CONTRACT	DWG No.	REV
C-937775-1	CB1-2011	

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lmorris

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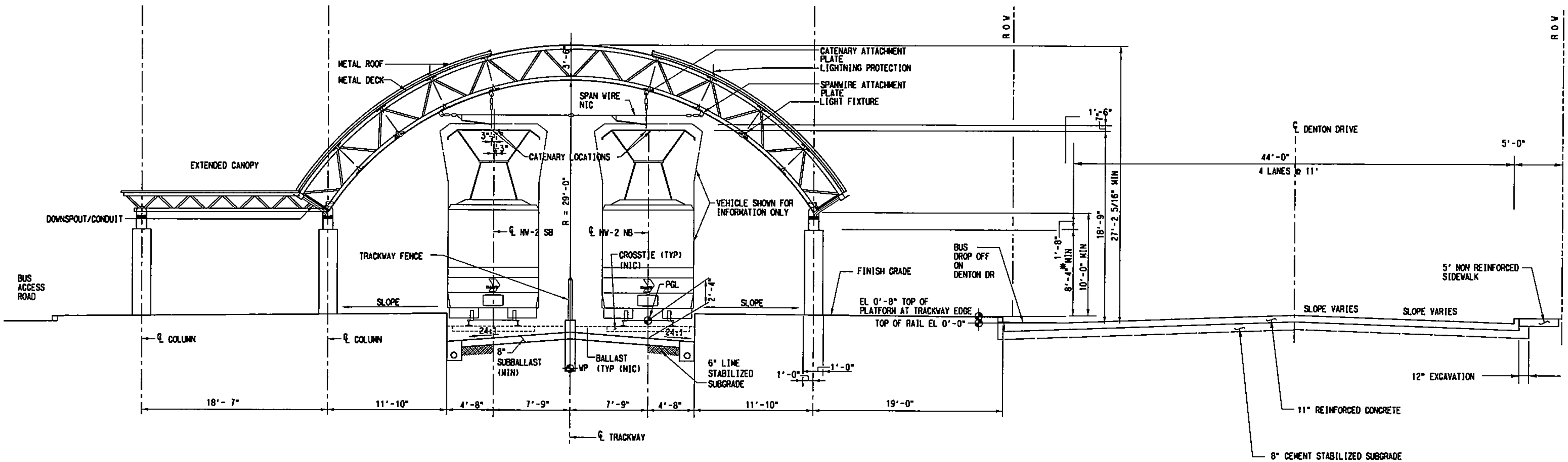
DWG No. CB1-2012

NOTES:

1. SEE DWG. No. CB1-2001 FOR ADDITIONAL NOTES.



BACHMAN STATION

SCALE: N.T.S.

STA 316+82.92 TO STA 319+93.92

NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

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CP&Y

J. TIPTON, P.E. No. 61157

Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	AS NOTED
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 55 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY
TYPICAL SECTIONS
SHEET 12

CONTRACT	DWG No.	REV
C-937775-1	CB1-2012	

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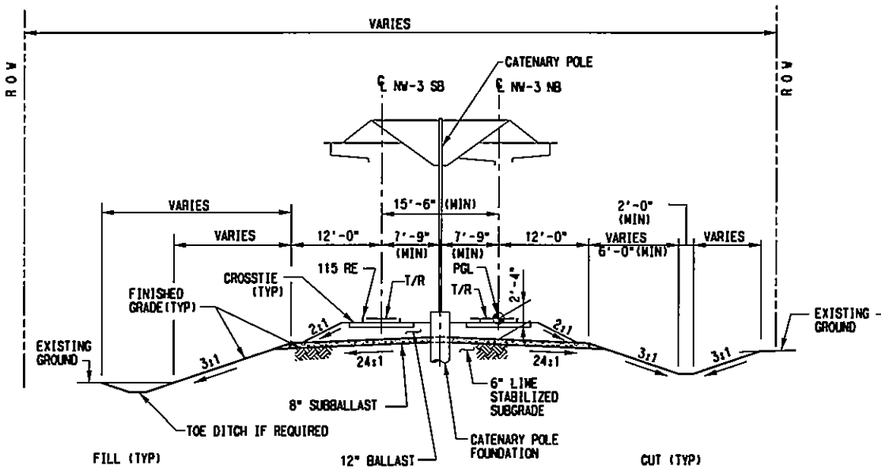
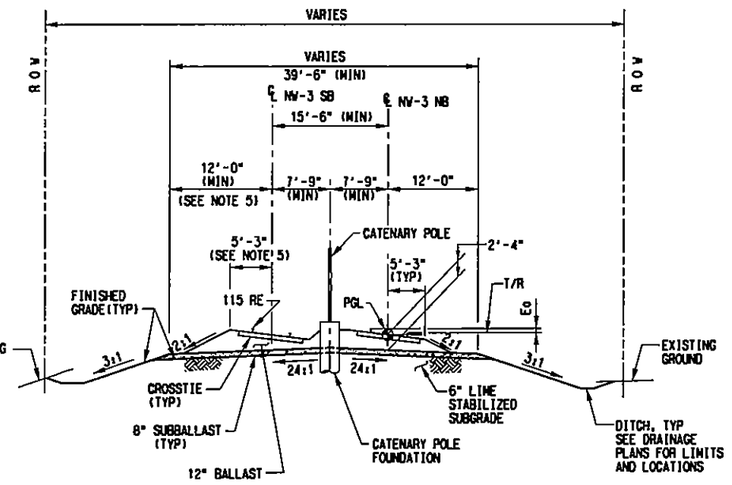
DWG No. CB1-3001





NOTES:

1. ALL SECTIONS ARE LOOKING NORTH, ALL STATIONING BASED ON THE CENTERLINE OF THE NORTHBOUND TRACK, UNLESS OTHERWISE NOTED.
2. CATENARY POLE LOCATION IS TYPICAL AND ONLY SHOWN AS AN ILLUSTRATION.
3. IN CURVES AND SPIRALS, THE PGL IS THE TOP OF THE LOW RAIL ON THE INSIDE OF THE CURVE OF THE NORTHBOUND TRACK.
4. SIDE SLOPES SHALL BE 3:1 UNLESS INDICATED OTHERWISE.
5. FOR SUPERELEVATED CURVES WHERE Eq IS GREATER THAN 2", INCREASE 12'-0" SHOULDER WIDTH TO 13'-6" ON HIGH SIDE OF TRACK, AND SHOULDER BALLAST TO 24". THE TRANSITION FROM THE SUBBALLAST SECTION SHOWN FOR TANGENT TRACK TO THE WIDENED SECTION FOR SUPERELEVATED TRACK SHALL BE MADE THROUGH THE LENGTH OF SPIRAL.
6. PROVIDE 6" LINE STABILIZED SUBGRADE UNDER THE 8" SUBBALLAST WHERE PI OF SUBGRADE IS 15 OR GREATER.
7. SAFETY FENCING IS REQUIRED WHERE OPERATING SPEEDS EXCEED 45 M.P.H.

TANGENT AT-GRADE CUT AND FILL

SCALE: 1"=10'

STA 515+75.87 TO STA 516+92.96
STA 517+46.01 TO STA 517+56.91
STA 517+84.48 TO STA 521+89.64
STA 522+80.48 TO STA 528+44.29
STA 528+92.78 TO STA 530+15.86
STA 534+05.86 TO STA 541+82.65
STA 545+90.57 TO STA 546+55.87
STA 563+55.81 TO STA 565+73.42

CURVED AT-GRADE WITH CENTER POLE

SCALE: 1"=10'

STA 541+82.65 TO STA 545+90.57
STA 572+92.43 TO STA 574+78.62 (LT. Eq)
STA 575+84.11 TO STA 576+75.63 (LT. Eq)
STA 577+58.57 TO STA 578+05.85

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 56 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 1

CONTRACT	DWG No.	REV
C-937775-1	CB1-3001	

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Fri Oct 25 11:00:14 2002
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rthompson
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Fri Oct 25 09:12:24 2002
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rthompson

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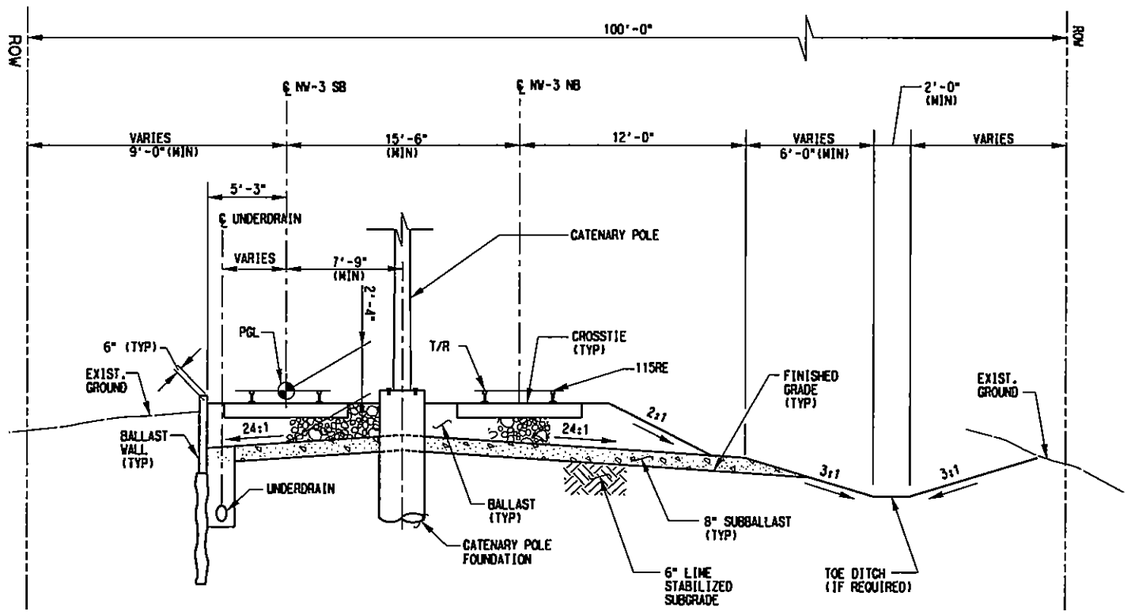
DWG No. CB1-3002

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. STATIONS LIMITS INDICATED INCLUDE CURVES. ALSO REFER "CURVED AT-GRADE" TYPICAL SECTION, DWG No. CB1-3001, FOR CURVE INFORMATION.



AT-GRADE WITH BALLAST WALL

SCALE: NOT TO SCALE

STA 322+50.00 TO STA 324+96.00 (WALL ON RT. SIDE)

STA 511+55.51 TO STA 515+75.87 (DENTON DR. ON LT. SIDE)

STA 530+15.86 TO STA 534+05.86

STA 574+78.62 TO STA 575+84.11 (WALL ON RT. SIDE)

STA 578+05.85 TO STA 581+50.00 (EOP)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 83197
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
16770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1000

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 57 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 2

CONTRACT	DWG No.	REV
C-937775-1	CB1-3002	

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Fri Oct 25 09:14:03 2002
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rthompson

PRF ROTATION=0.000000
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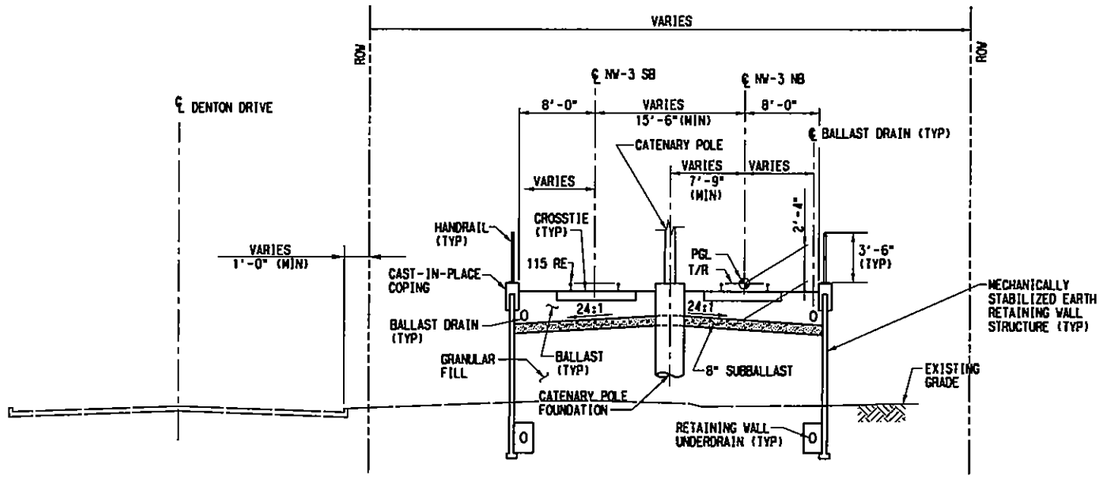
DWG No. CB1-3003



RETAINED FILL LRT

SCALE: NOT TO SCALE

STA 324+96.00 TO STA 327+30.00 (DENTON DRIVE ON NW-3 NB SIDE)

STA 505+08.72 TO STA 511+55.51

NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 58 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 3

CONTRACT C-937775-1 | DWG No. CB1-3003 | REV

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Fri Oct 25 09:14:18 2002
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r.thompson

PRF ROTATION=0.000000
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no ref logical, *no ref name*, *no ref levels*
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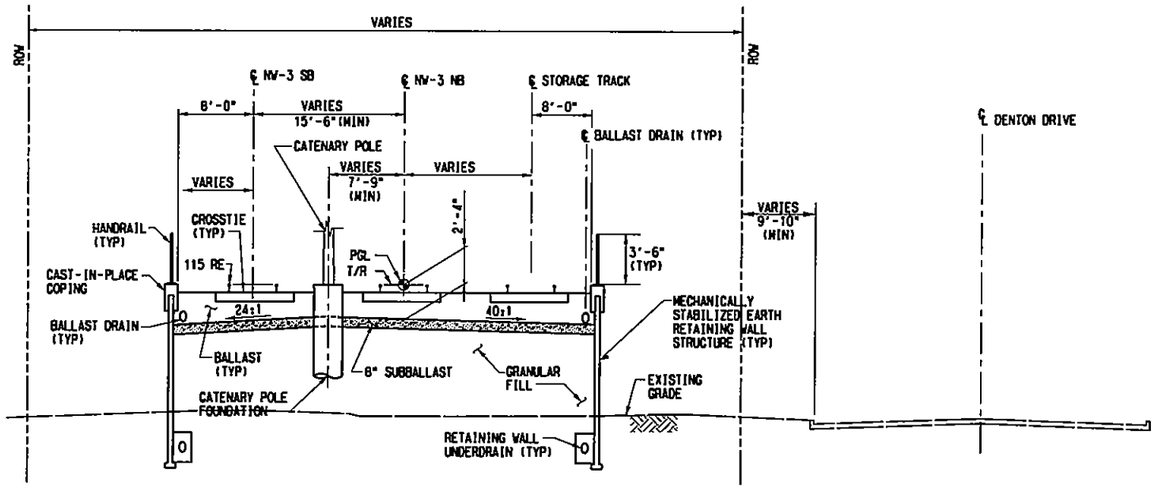
DWG No. CB1-3004

NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.



RETAINED FILL LRT WITH STORAGE TRACK

SCALE: NOT TO SCALE

STA 327+30.00 TO STA 328+85.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date 10-25-02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 59 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 4

CONTRACT C-937775-1 | DWG No. CB1-3004 | REV

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R:\NW3X\DGN\Civil-AO\nw3xcr05.dgn
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rthompson

PRF ROTATION=0.000000
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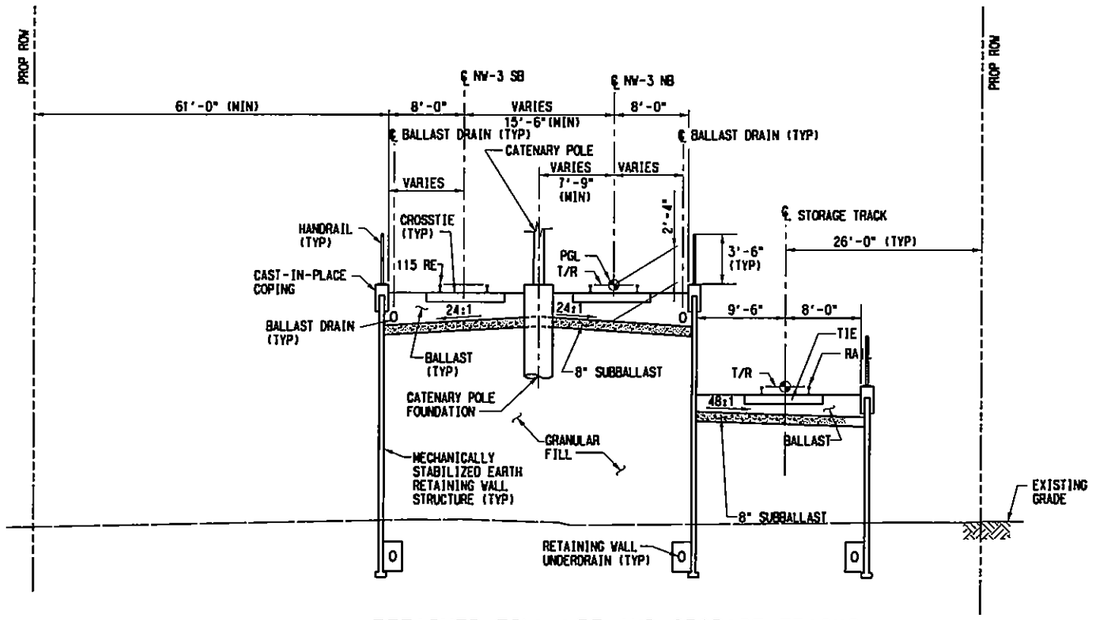
DWG No. CB1-3005

NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.



RETAINED FILL LRT AND STORAGE TRACKS

SCALE: NOT TO SCALE

STA 328+85.00 TO STA 330+66.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 60 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 83737
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 5

CONTRACT C-937775-1 | DWG No. CB1-3005 | REV

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rthompson

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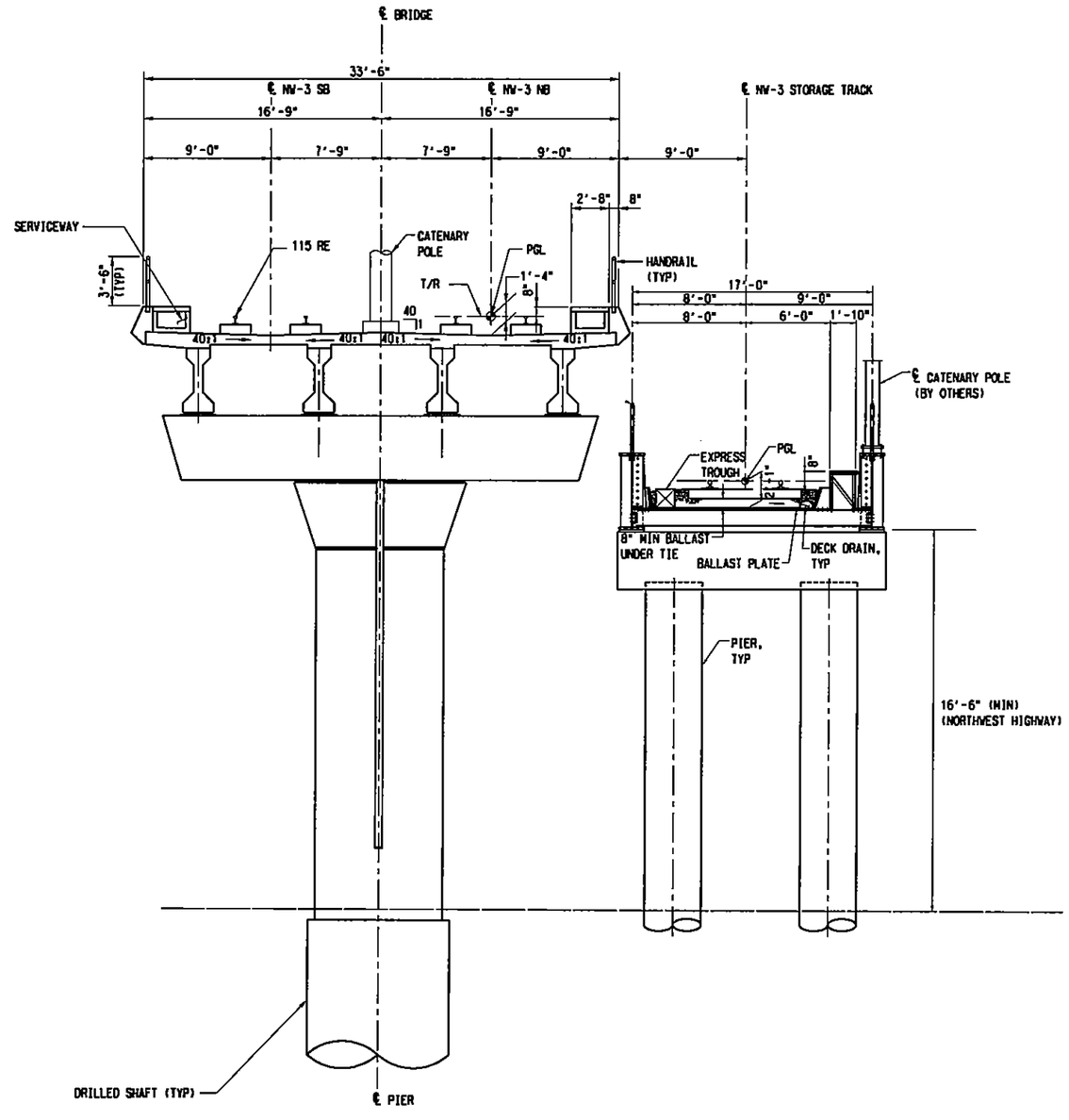
DWG No. CB1-3006



NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.

DOUBLE TRACK LRT STRUCTURE & THROUGH GIRDER STORAGE TRACK

SCALE: 1/10"=1'-0"

STA 330+66.00 TO STA 322+54.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 61 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61152
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	F. HAN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 6

CONTRACT	DWG No.	REV
C-937775-1	CB1-3006	

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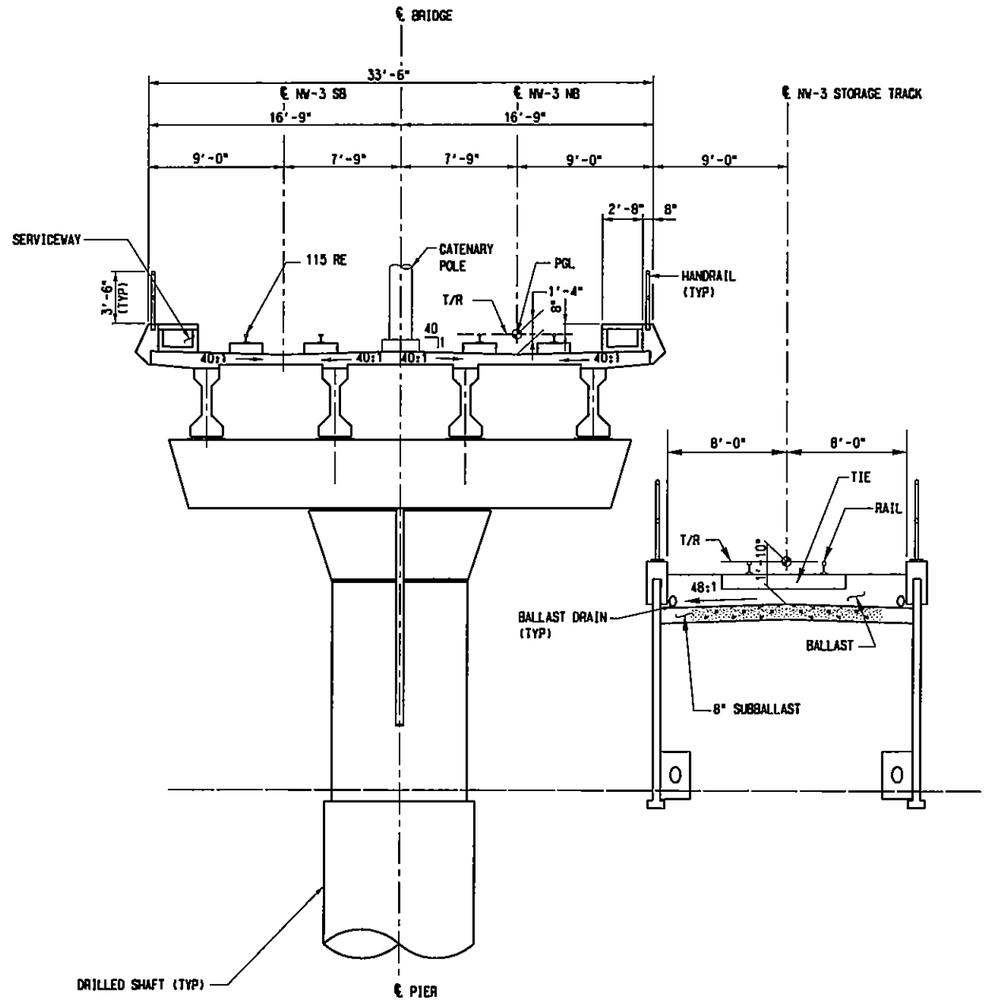
DWG No. CB1-3007



NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.

DOUBLE TRACK LRT STRUCTURE & RETAINED FILL STORAGE TRACK

SCALE: 1"=10'

STA 322+54.70 TO STA 334+92.00

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 62 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61153
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	F. HAN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 7

CONTRACT C-937775-1 | DWG No. CB1-3007 | REV

R:\NW3X\DGN\Cv1-A0\nw3xca07.dgn

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Fri Oct 25 09:16:28 2002
R:\Nw3X\prf\nw3xca07.prf
rlthompson

PRF ROTATION=0.000000
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no ref logical, *no ref name*, *no ref levels*

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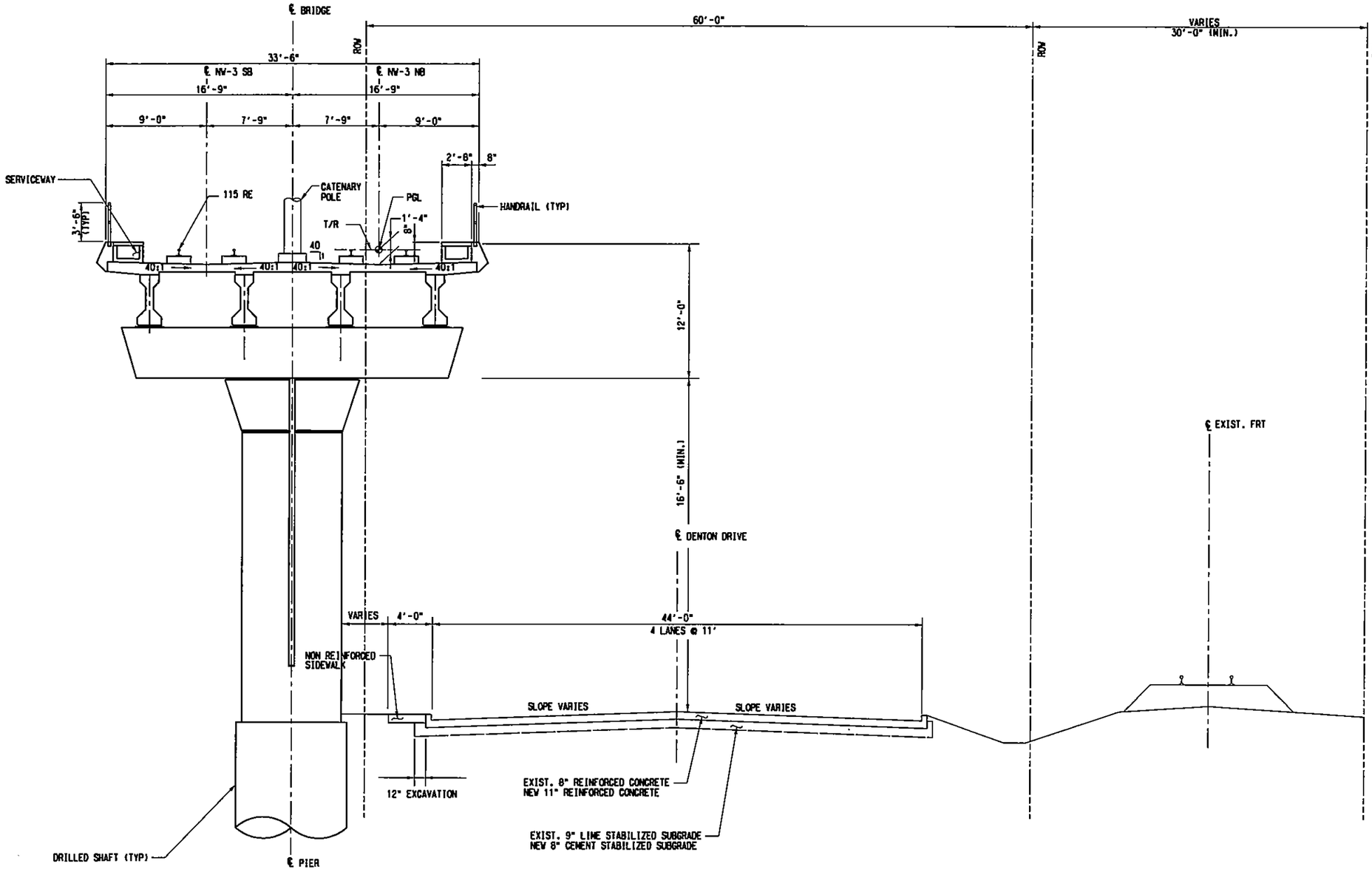
DWG No. CB1-3008



NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.

DOUBLE TRACK LRT STRUCTURE & FREIGHT

SCALE: 1"=10'

STA 334+92.00 TO STA 338+98.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 12 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	O. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 63 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 8

CONTRACT C-937775-1 | DWG No. CB1-3008 | REV

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rlthompson

PRF ROTATION=0.000000
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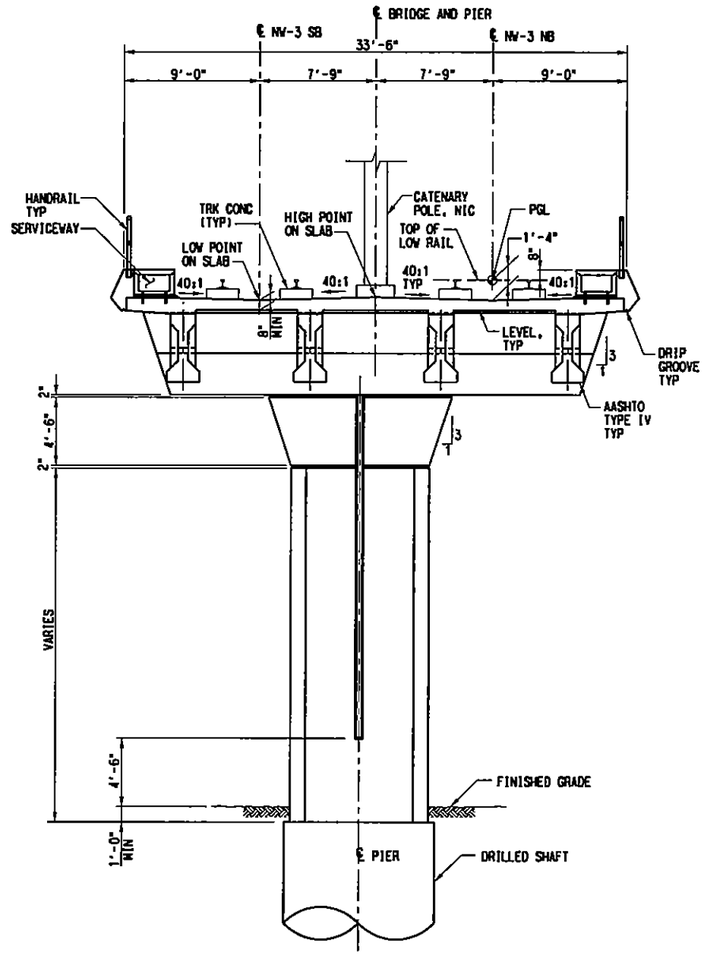
DWG No. CB1-3009



PIER TYPE B

SCALE: 1/4"=1'-0"

STA 337+17.70

STA 338+98.70

STA 342+86.70 TO STA 344+90.70

STA 403+68.70

STA 405+48.70

NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 63137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	W. XIANG
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 64 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 9

CONTRACT C-937775-1 | DWG No. CB1-3009 | REV

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rithompson
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Tue Nov 5 16:13:43 2002
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rthompson

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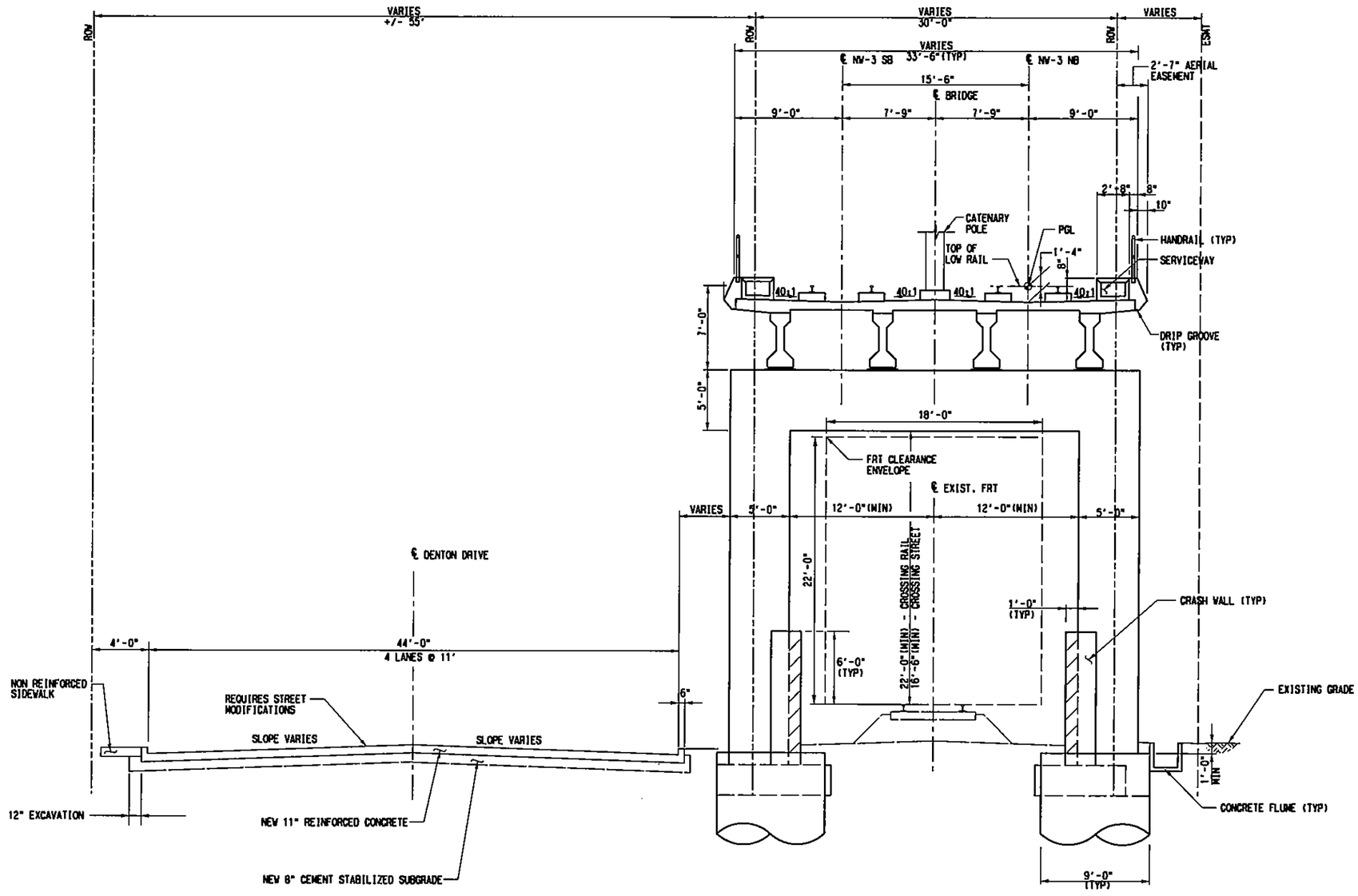
DWG No. CB1-3010



NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.
2. PROVIDE CRASHWALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED FROM 12 FT. TO 25 FT. CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12 FT. CLEAR FROM CENTERLINE OF FREIGHT TRACK.
3. PAVEMENT SECTION SHOWN IS FOR NEW PAVEMENT THAT IS REQUIRED. SEE STREET MODIFICATION PLANS FOR LOCATIONS.

DOUBLE TRACK LRT STRUCTURE & AT GRADE FREIGHT

SCALE: 1"=5'

STA 338+98.70 TO STA 342+86.70 (STRADDLE BENT IS OVER DENTON DRIVE)

STA 403+68.70 TO STA 405+48.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81137
Date: 22 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 65 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 10

CONTRACT C-937775-1 | DWG No. CB1-3010 | REV

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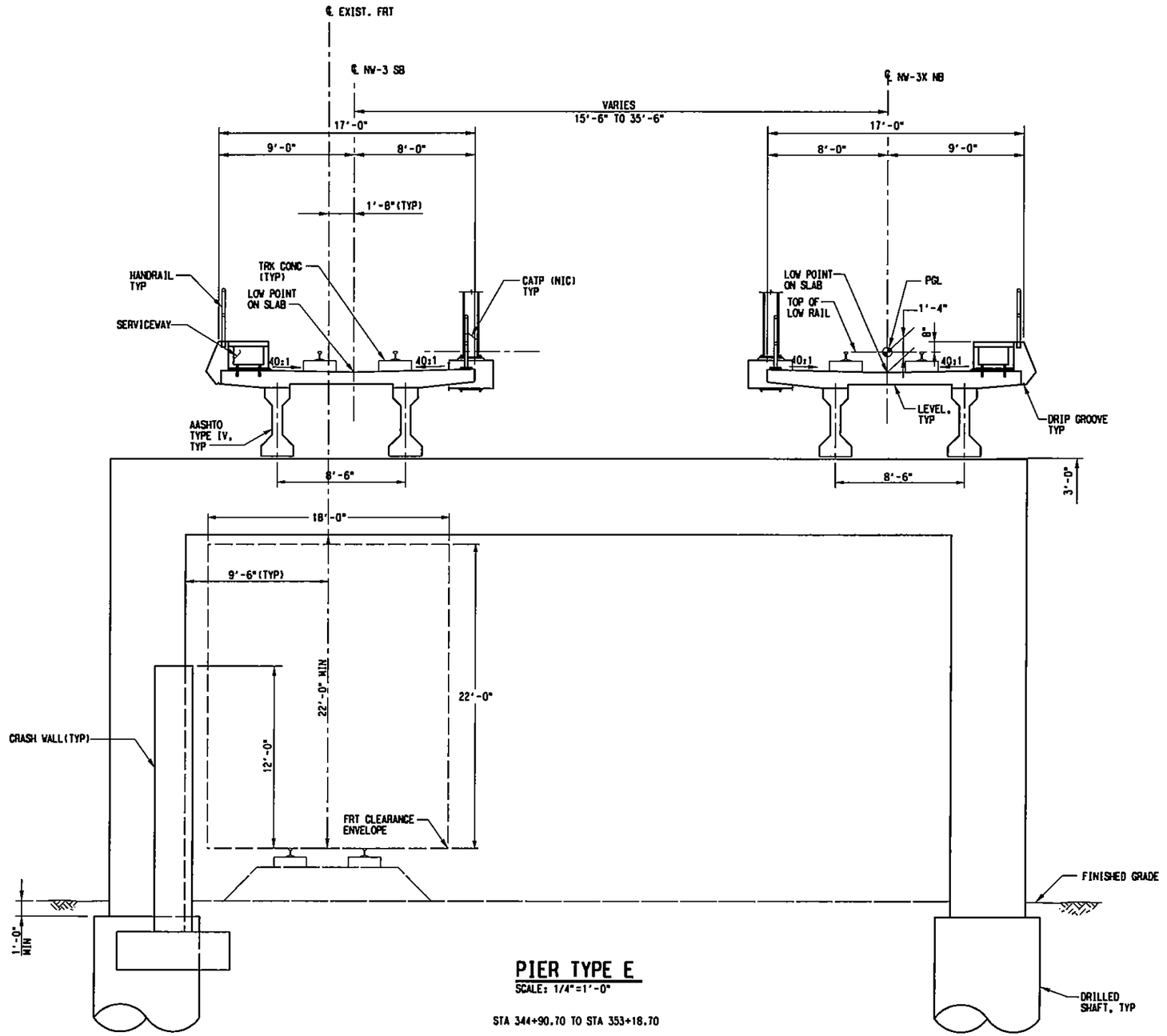
DWG No. CB1-3011



PIER TYPE E

SCALE: 1/4"=1'-0"

STA 344+90.70 TO STA 353+18.70

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. PROVIDE CRASHWALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED FROM 12 FT. TO 25 FT. CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12 FT. CLEAR FROM CENTERLINE OF FREIGHT TRACK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date 15 NOV 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=4'
DRAWN	D. BROWN
DESIGNED	V. XIANG
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 66 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 11

CONTRACT C-937775-1 | DWG No. CB1-3011 | REV

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rlhampson

PRF ROTATION=0.000000
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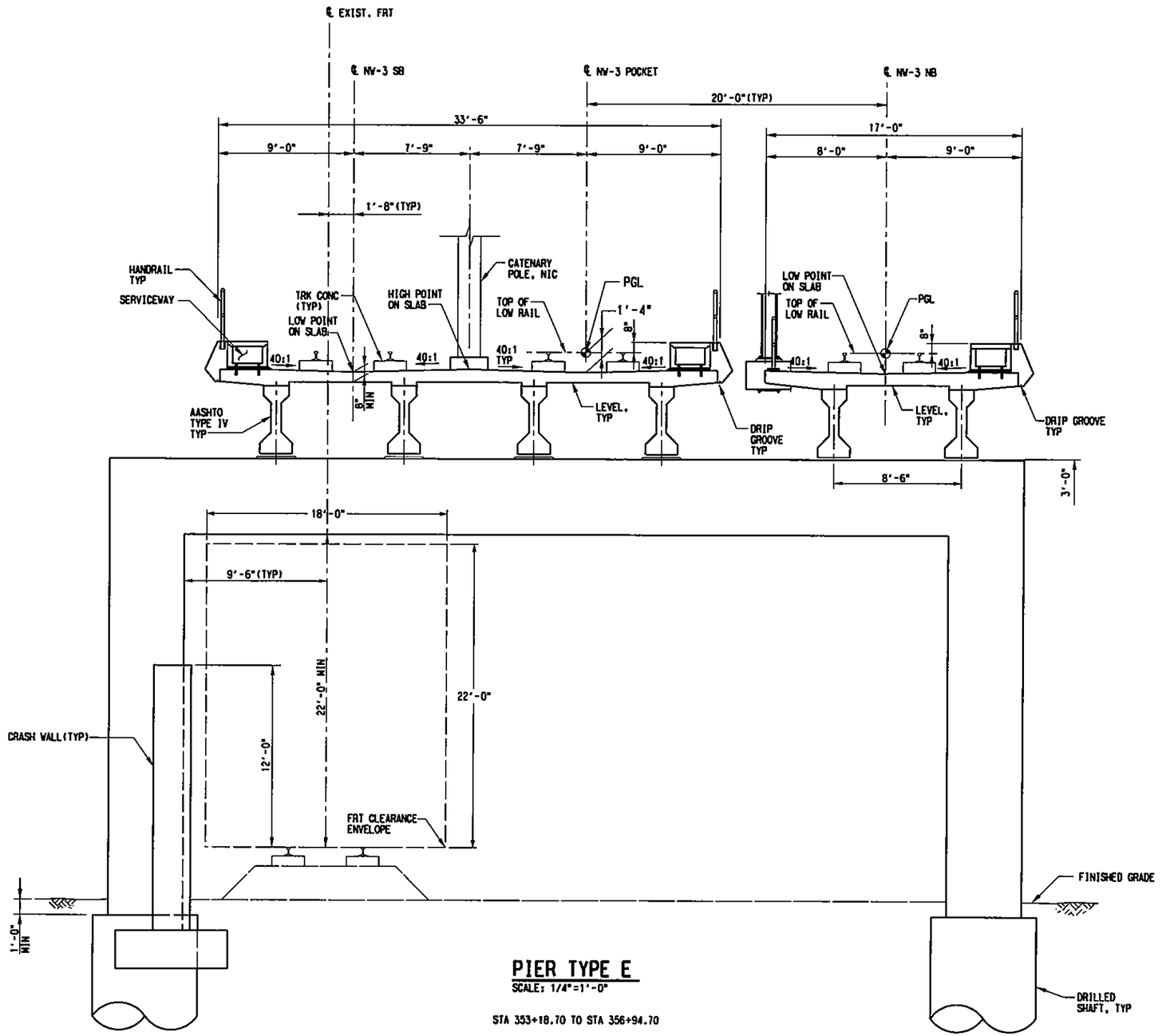
DWG No. CB1-3012



PIER TYPE E

SCALE: 1/4"=1'-0"

STA 353+18.70 TO STA 356+94.70

STA 391+06.70 TO STA 392+54.86

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. PROVIDE CRASHWALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED FROM 12 FT. TO 25 FT. CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12 FT. CLEAR FROM CENTERLINE OF FREIGHT TRACK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
J. TIPTON, P.E. No. 81151
Date: 15 NOV 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=4'
DRAWN	D. BROWN
DESIGNED	V. XIANG
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 67 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 12

CONTRACT C-937775-1 | DWG No. CB1-3012 | REV

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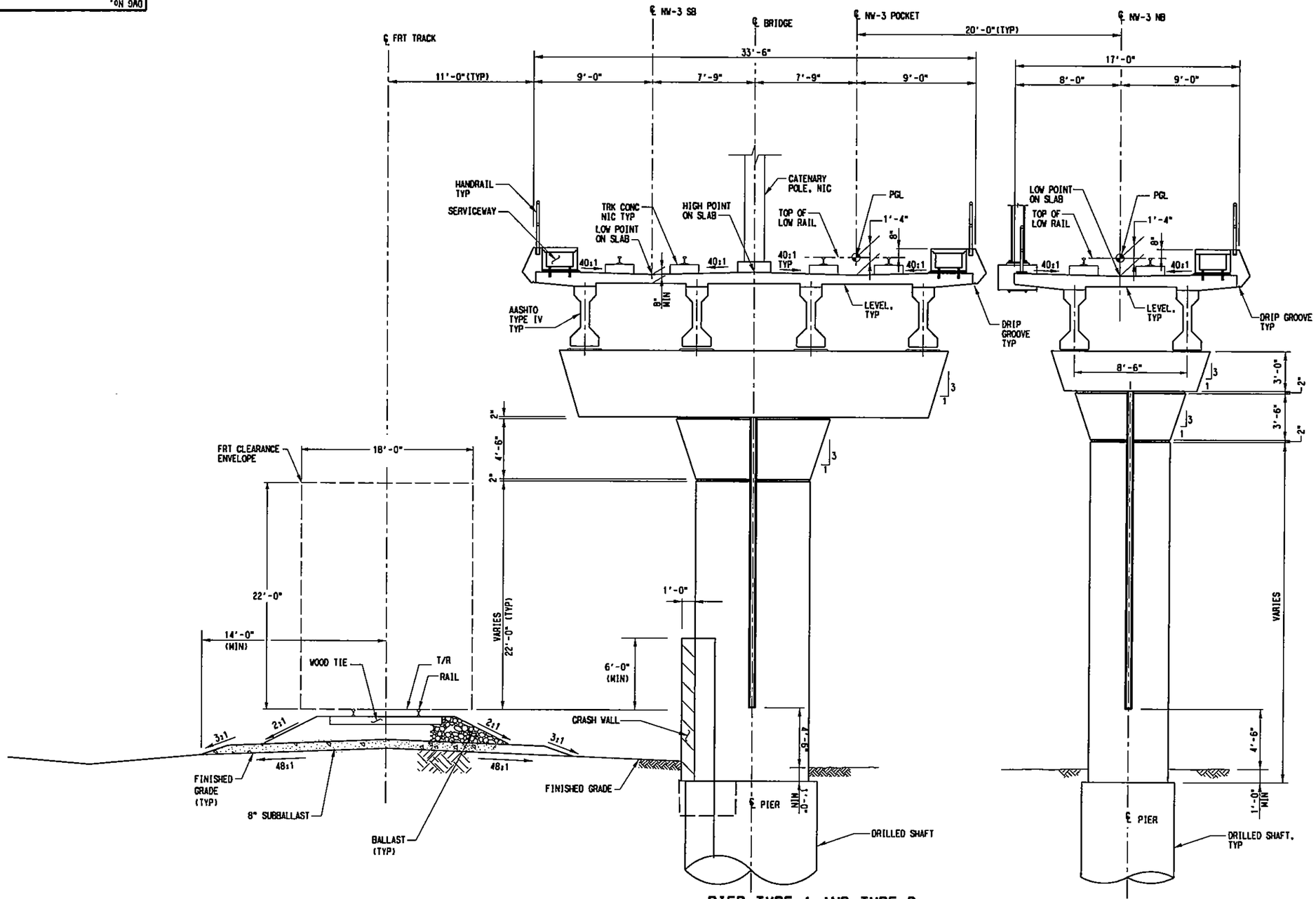
no ref logical, *no ref name*, *no ref levels*

DWG No. CB1-3013



NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. PROVIDE CRASH WALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED 12' TO 25' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK.

PIER TYPE A AND TYPE D

SCALE: 1/4"=1'-0"

STA 356+94.70 TO STA 363+30.70

STA 384+26.70 TO STA 391+06.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84159
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=4'
DRAWN	D. BROWN
DESIGNED	W. XIANG
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 68 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 13

CONTRACT C-937775-1 | DWG No. CB1-3013 | REV

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rthompson

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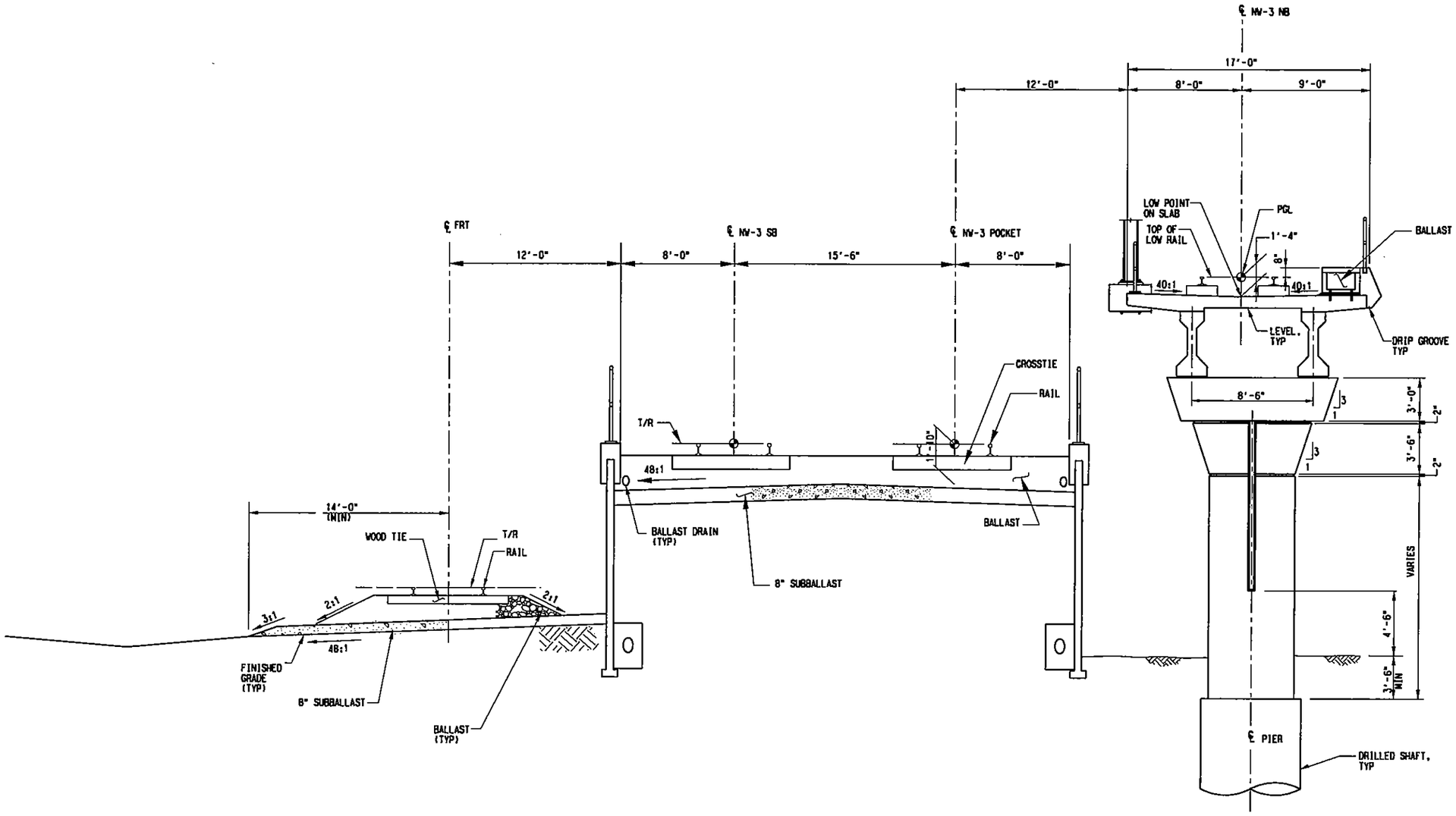
DWG No. CB1-3014



NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.

RETAINED FILL STORAGE AND PIER TYPE D

SCALE: 1/4"=1'-0"

STA 363+30.70 TO STA 370+00.00

STA 380+50.70 TO STA 384+26.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=4'
DRAWN	D. BROWN
DESIGNED	W. XIANG
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 69 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 14

CONTRACT	DWG No.	REV
C-937775-1	CB1-3014	

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Thu Oct 31 14:03:59 2002
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rthompson

PRF ROTATION=0.000000
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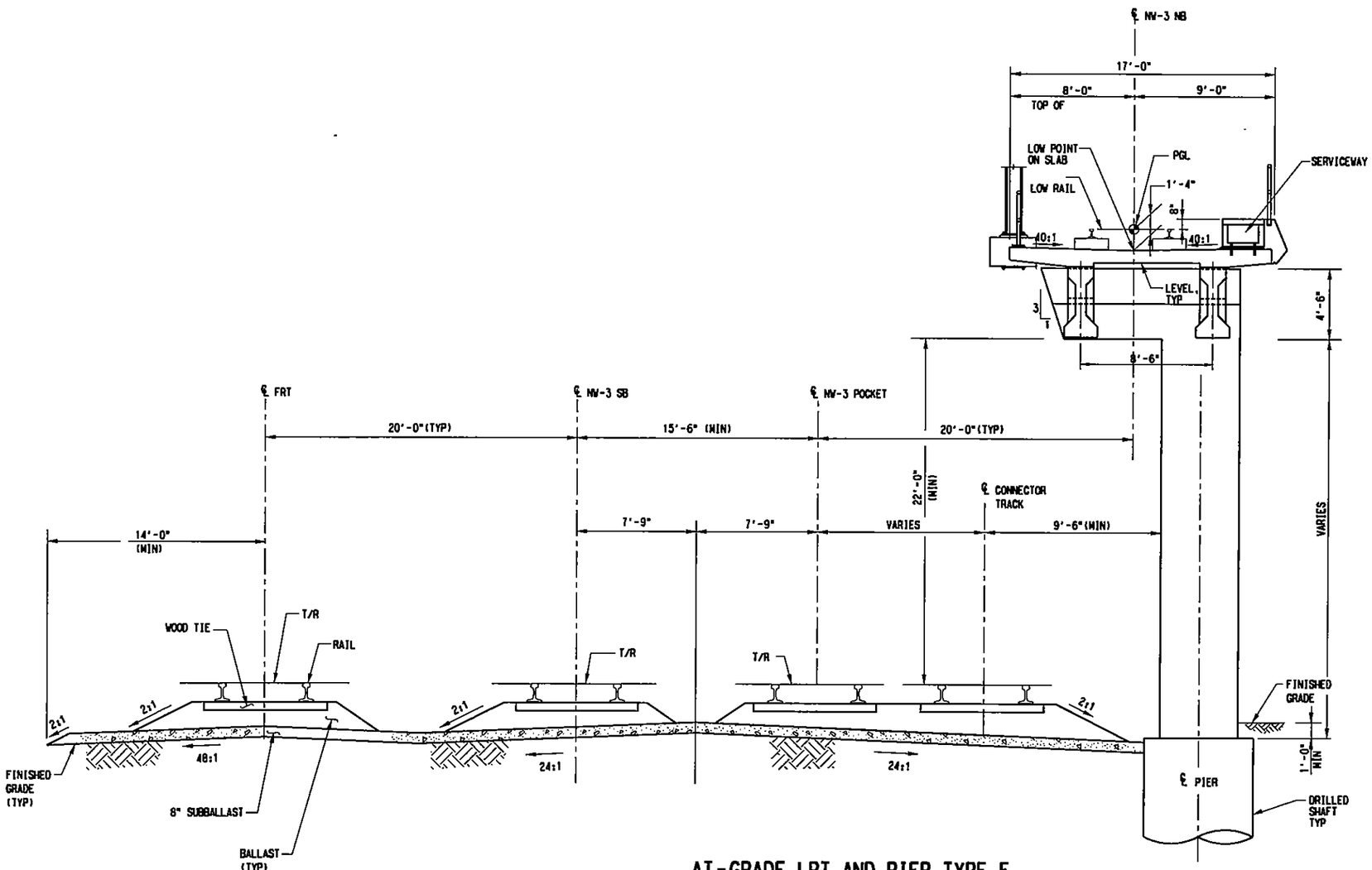
ORDER, R:\NW3X\nw3xbor1.001, 1-4,6,8,10,23,39,56,57,61,62

DWG No. CB1-3015



AT-GRADE LRT AND PIER TYPE F

SCALE: 1/4"=1'-0"

STA 368+84.45 TO STA 380+50.70

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 70 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=4'
DRAWN	D. BROWN
DESIGNED	V. XIANG
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 15

CONTRACT C-937775-1 | DWG No. CB1-3015 | REV

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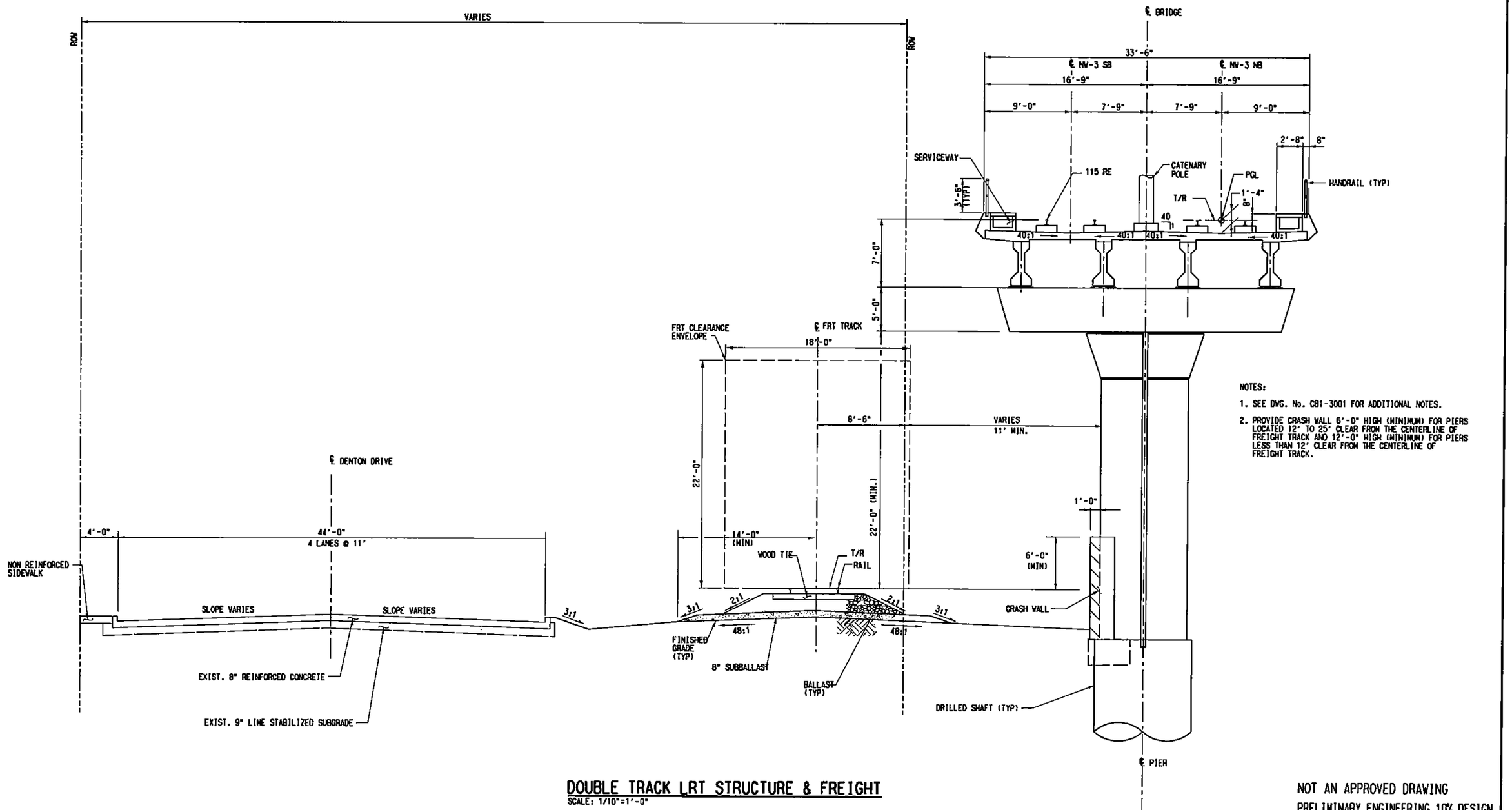
DWG No. C81-3016



NOTES:

1. SEE DWG. No. C81-3001 FOR ADDITIONAL NOTES.
2. PROVIDE CRASH WALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED 12' TO 25' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12' CLEAR FROM THE CENTERLINE OF FREIGHT TRACK.

DOUBLE TRACK LRT STRUCTURE & FREIGHT

SCALE: 1/10"=1'-0"

STA 397+36.70 TO STA 403+68.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 71 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81152
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1600

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3
GUIDEWAY
TYPICAL SECTIONS
SHEET 16

CONTRACT C-937775-1

DWG No. C81-3016

REV

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DWG No. CB1-3017

60' DENTON DRIVE ROW

100' DART ROW

ROW

ROW

ROW

℄ BRIDGE

33'-6"

℄ NW-3 SB

℄ NW-3 NB

VARIES
1'-0"(MIN.)

9'-0"

7'-9"

7'-9"

9'-0"

2'-8"

8"

10"

SECOND POUR CONC (TYP)

CATENARY POLE

PGL

HANDRAIL (TYP)

SERVICEWAY

TOP OF LOW RAIL

1'-4" 8"

40:1

40:1

40:1

40:1

5'-0"

2"

4'-6"

2"

℄ EXISTING DENTON DRIVE

18'-0"

FRT CLEARANCE ENVELOPE

℄ EXISTING FRT TRACK

22'-0"

VARIES

49'-6"

25'-0"

VARIES
13'-6"(MIN.)

VARIES
13'-3"(MIN.)

9'-0"

FINISHED GRADE

℄ PIER

EXIST. GROUND

0.5%

3:1

3:1

EXIST. GROUND

STANDARD DITCH

DRILLED SHAFT (TYP)

NOTES:

1. SEE DWG. CB1-3001 FOR ADDITIONAL NOTES.

AERIAL LRT STRUCTURE AND AT GRADE FREIGHT

SCALE: 1/4"=1'-0"

STA 405+48.70 TO STA 411+78.70

STA 428+73.86 TO STA 430+57.00 (RELOCATED FRT)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84151
Date: 15 NOV 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 72 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 17

CONTRACT	DWG No.	REV
C-937775-1	CB1-3017	

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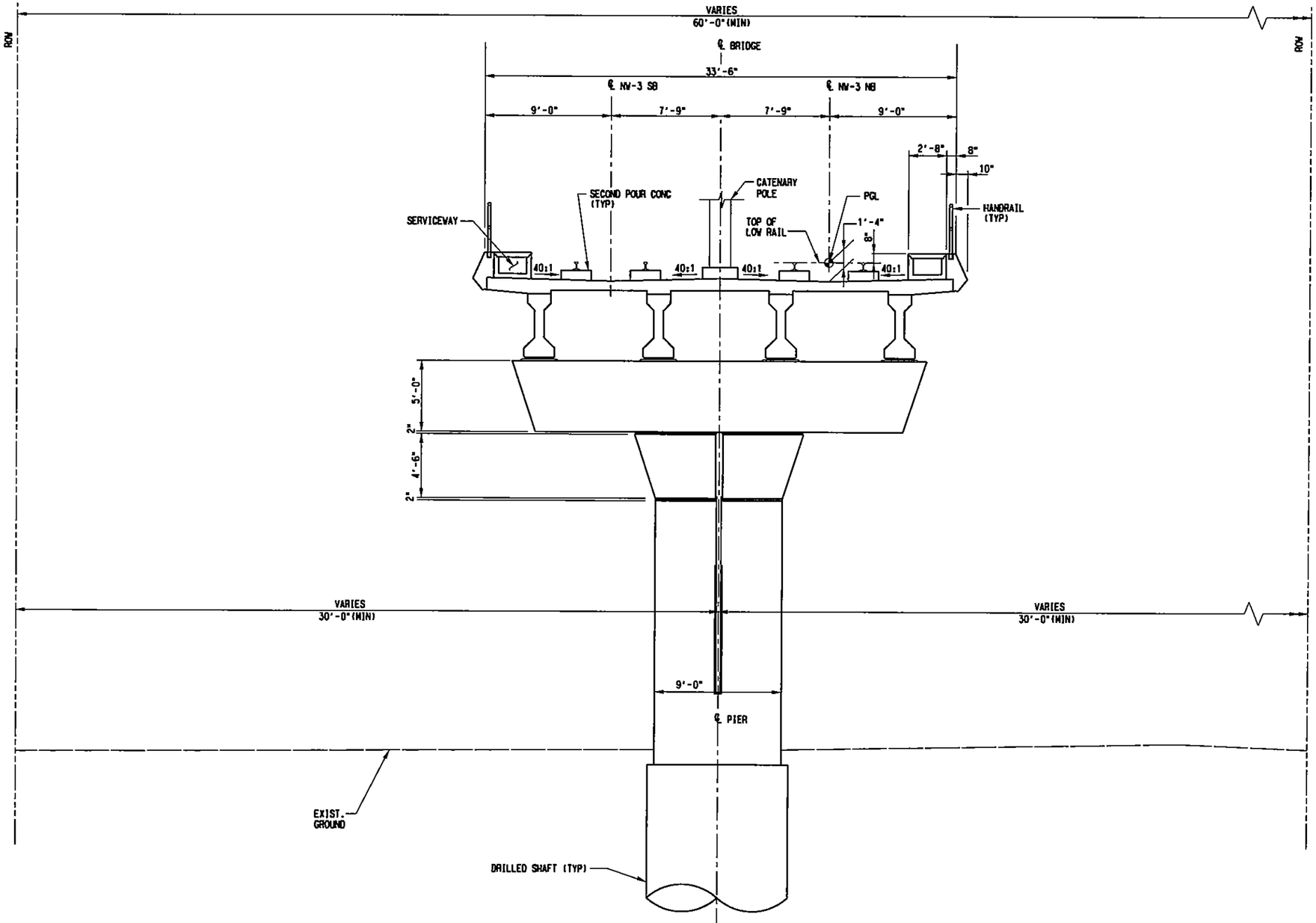
DWG No. CB1-3018



NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. PROVIDE EMERGENCY EGRESS AND FIRE SUPPRESSION PROVISIONS IN ACCORDANCE WITH NFPA-130. EGRESS PROVISIONS SHALL BE PROVIDED AT A MAXIMUM SPACING OF 2,500 FEET FOR THE ELEVATED GUIDEWAY.

AERIAL LRT STRUCTURE

SCALE: 1"=4'

STA 430+57.00 TO STA 464+20.72

STA 479+88.72 TO STA 505+08.72

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
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CP&Y
J. TIPTON, P.E. No. 61131
Date: 15 NOV 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 73 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 18

CONTRACT	DWG No.	REV
C-937775-1	CB1-3018	

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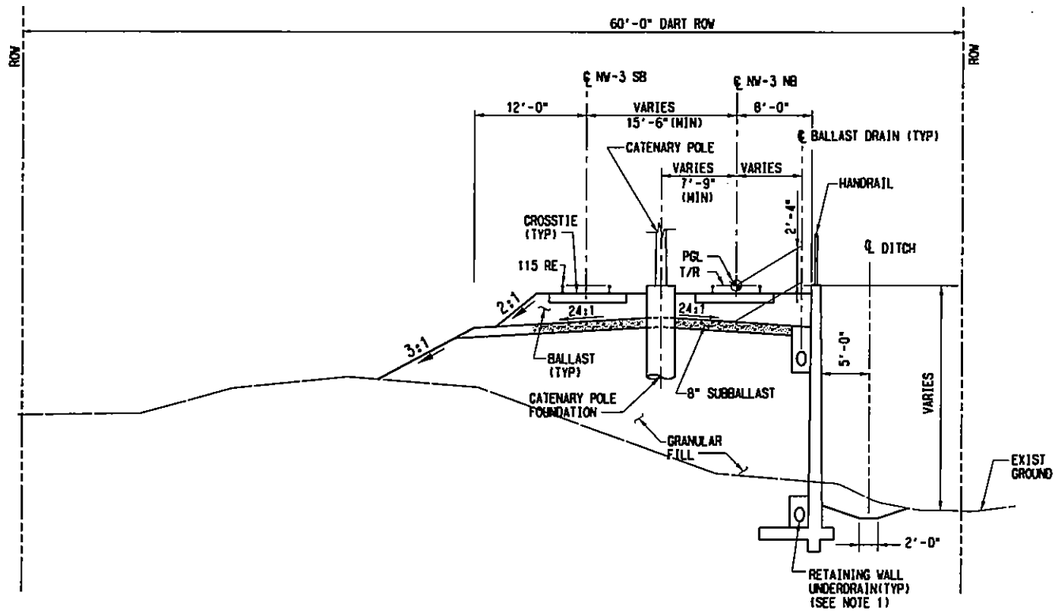
DWG No. CB1-3019



CIP WALL IN FLOOD PLAIN AND AT-GRADE FILL LRT

SCALE: NOT TO SCALE

STA 546+55.87 TO STA 551+28.87

STA 553+48.87 TO STA 554+55.49

STA 554+79.67 TO STA 556+45.87

STA 557+55.87 TO STA 563+55.81

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 74 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 19

CONTRACT C-937775-1 | DWG No. CB1-3019 | REV

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DWG No. CB1-3020

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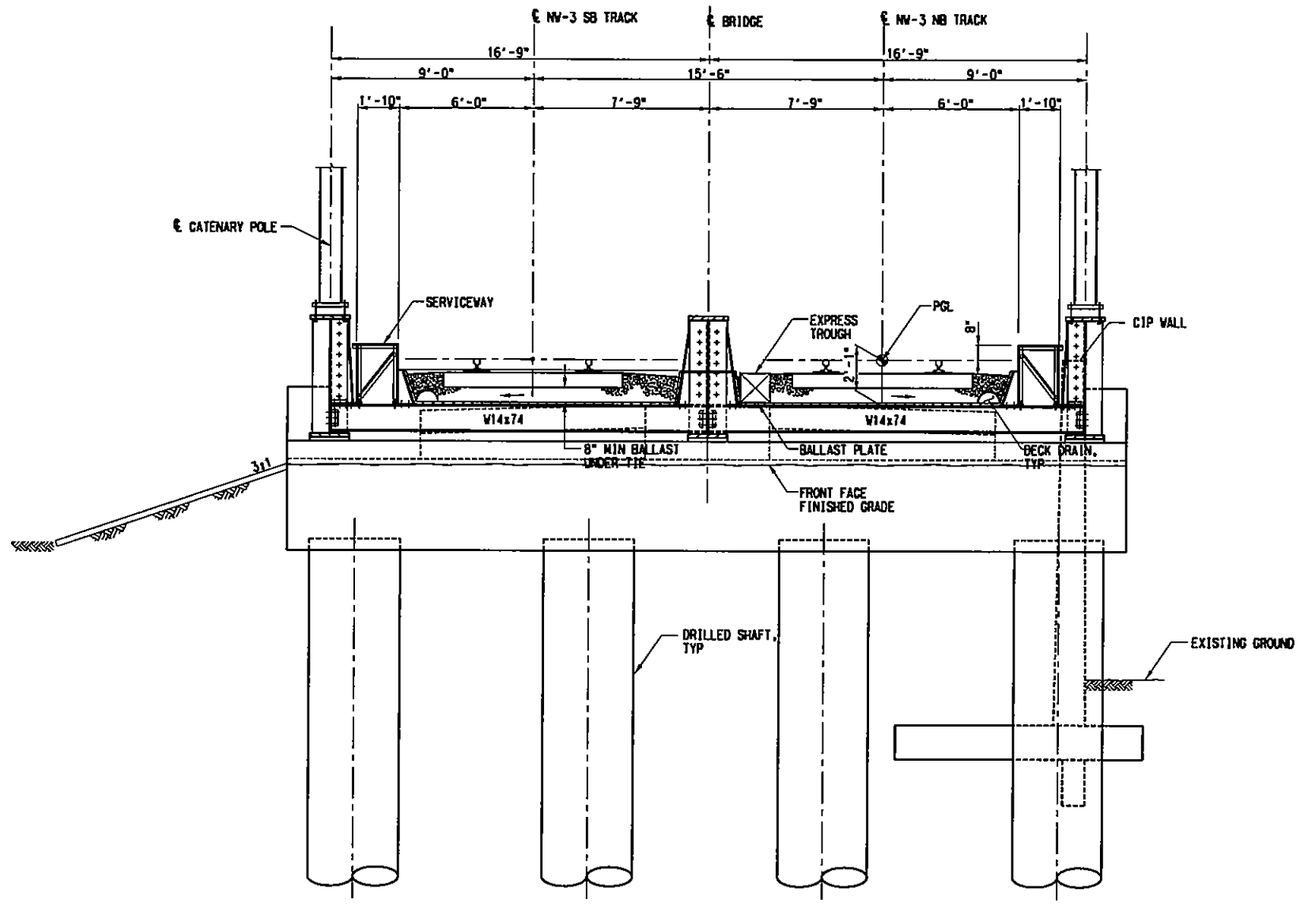

THROUGH GIRDER BRIDGE

SCALE: 3/8"=1'-0"

STA 551+28.87 TO STA 553+48.87

STA 556+45.87 TO STA 557+55.87

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. SECTION SHOWN NORMAL TO ℄ BRIDGE LOOKING AHEAD ON STATIONING.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
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CP&Y
J. TIPTON, P.E. No. 61137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	F. HAN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 75 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 20

CONTRACT C-937775-1 | DWG No. CB1-3020 | REV

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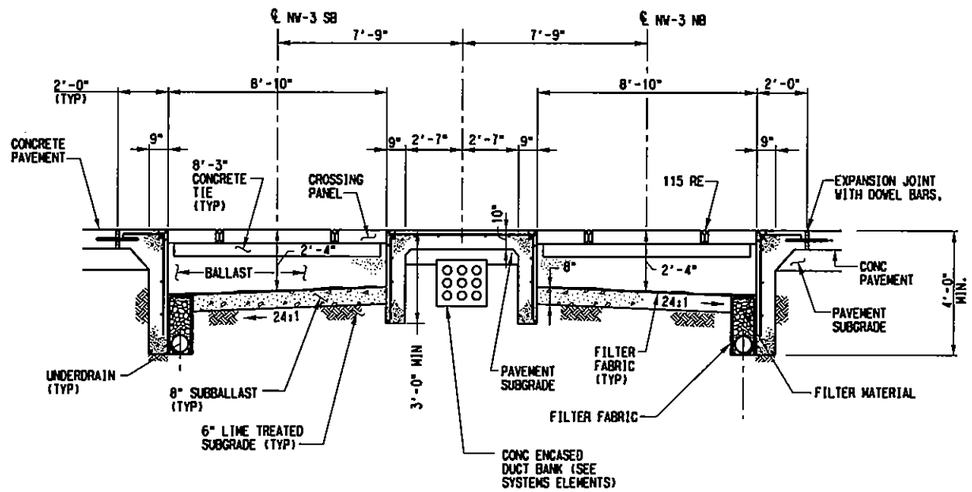

HIGHWAY GRADE CROSSING

SCALE: NOT TO SCALE

STA 517+56.91 TO STA 517+84.48 (LBJ-EBFR)

STA 522+52.92 TO STA 522+80.48 (LBJ-WBFR)

STA 528+44.29 TO STA 528+92.78 (VILLA CREEK DRIVE)

STA 554+55.49 TO STA 554+79.67 (FARMERS BRANCH LANE)

STA 565+73.42 TO STA 566+13.92 (BUTTONWOOD DRIVE)

STA 572+47.44 TO STA 572+92.43 (PIKE STREET)

STA 576+75.63 TO STA 577+58.57 (VALLEY VIEW LANE)

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. HEADER DETAIL SHOWN IS FOR A TYPICAL CONCRETE PAVEMENT INTERFACE. FOR OTHER TYPES OF INTERFACE, REFER TO DART STANDARD DRAWINGS.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
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CP&Y
J. TIPTON, P.E. No. 68757 Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. HORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 76 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 21

CONTRACT	DWG No.	REV
C-937775-1	CB1-3021	

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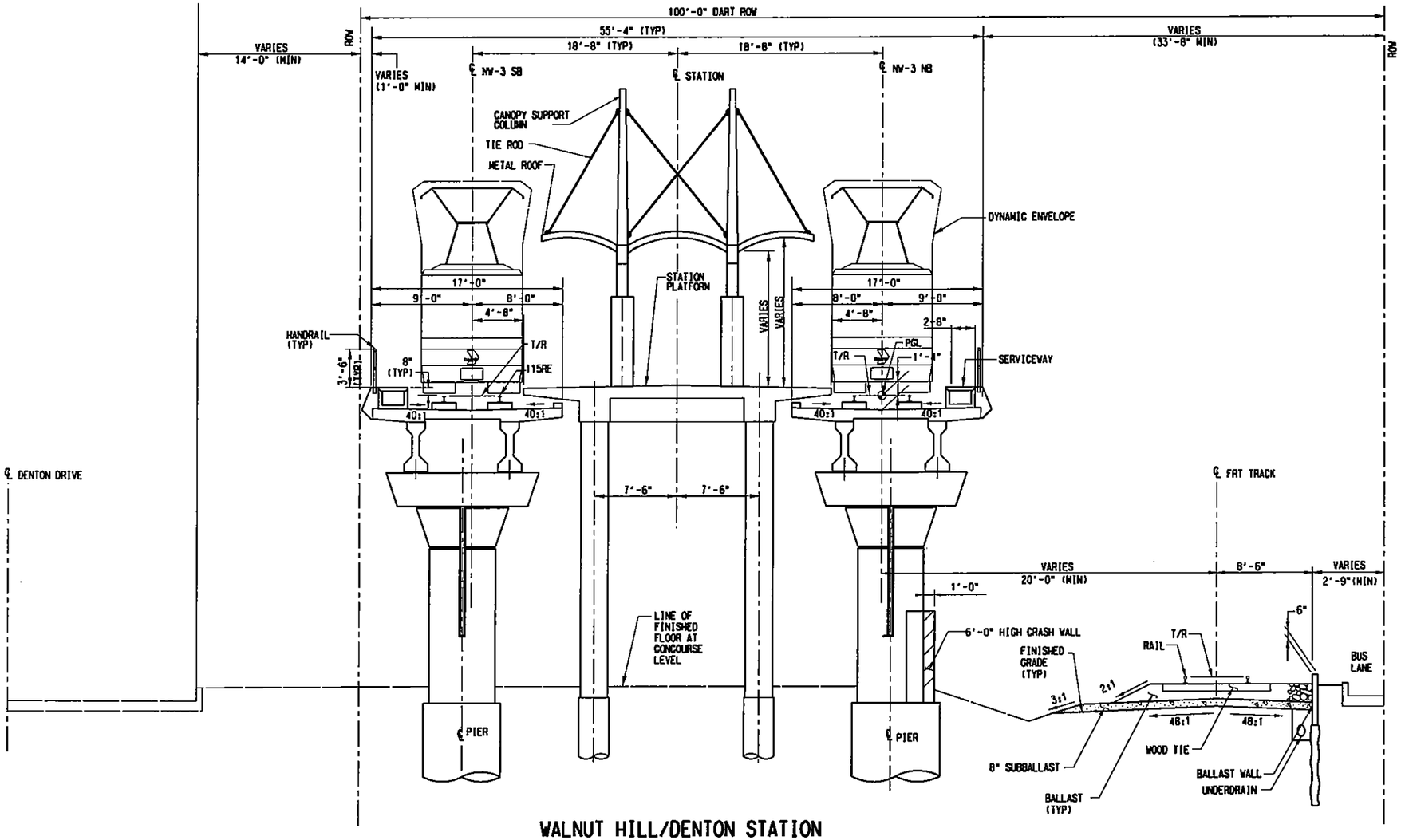
DWG No. CB1-3022



WALNUT HILL/DENTON STATION

SCALE: 3/16"=1'-0"

STA 392+54.86 TO STA 397+36.70 (FRT ON LT. SIDE, POCKET TRACK TRANSITION)

STA 411+78.70 TO STA 417+91.20 (EXCLUDE STATION PLATFORM, SEE NOTE 2)

STA 417+91.20 TO STA 422+02.20 (WALNUT HILL/DENTON STATION)

STA 422+02.20 TO STA 428+73.86 (EXCLUDE STATION PLATFORM, SEE NOTE 2)

NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. TWIN BRIDGE STRUCTURES ARE PROVIDED TO TRANSITION BETWEEN 37'-4" TRACK CENTERS AT THE AERIAL STATION TO THE NORMAL 15'-6" TRACK CENTERS ON THE AERIAL STRUCTURE.
3. PROVIDE CRASHWALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED FROM 12 FT TO 25 FT CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12 FT CLEAR FROM CENTERLINE OF FREIGHT TRACK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 77 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
△								

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81153
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 22

CONTRACT C-937775-1 | DWG No. CB1-3022 | REV

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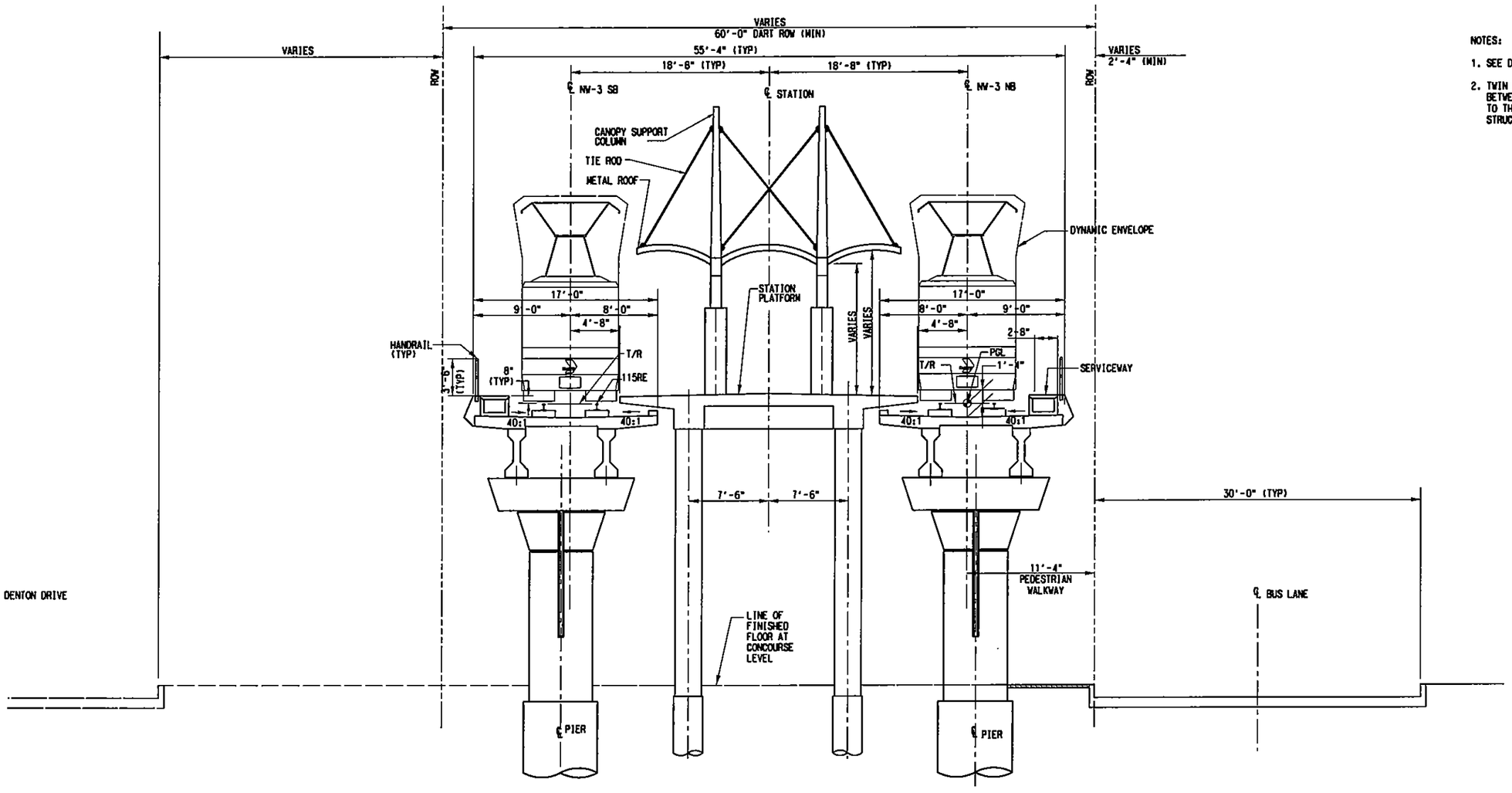
DWG No. CB1-3023



NOTES:

1. SEE DWG. No. CB1-3001 FOR ADDITIONAL NOTES.
2. TWIN BRIDGE STRUCTURES ARE PROVIDED TO TRANSITION BETWEEN 37'-4" TRACK CENTERS AT THE AERIAL STATION TO THE NORMAL 15'-6" TRACK CENTERS ON THE AERIAL STRUCTURE.

ROYAL LANE STATION

SCALE: 3/16"=1'-0"

STA 464+20.72 TO STA 470+17.90 (EXCLUDE STATION PLATFORM, SEE NOTE 2)

STA 470+17.90 TO STA 474+28.90 (ROYAL LANE STATION)

STA 474+28.90 TO STA 479+88.72 (EXCLUDE STATION PLATFORM, SEE NOTE 2)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 78 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81557
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 23

CONTRACT C-937775-1 | DWG No. CB1-3023 | REV

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DWG No. C81-3024

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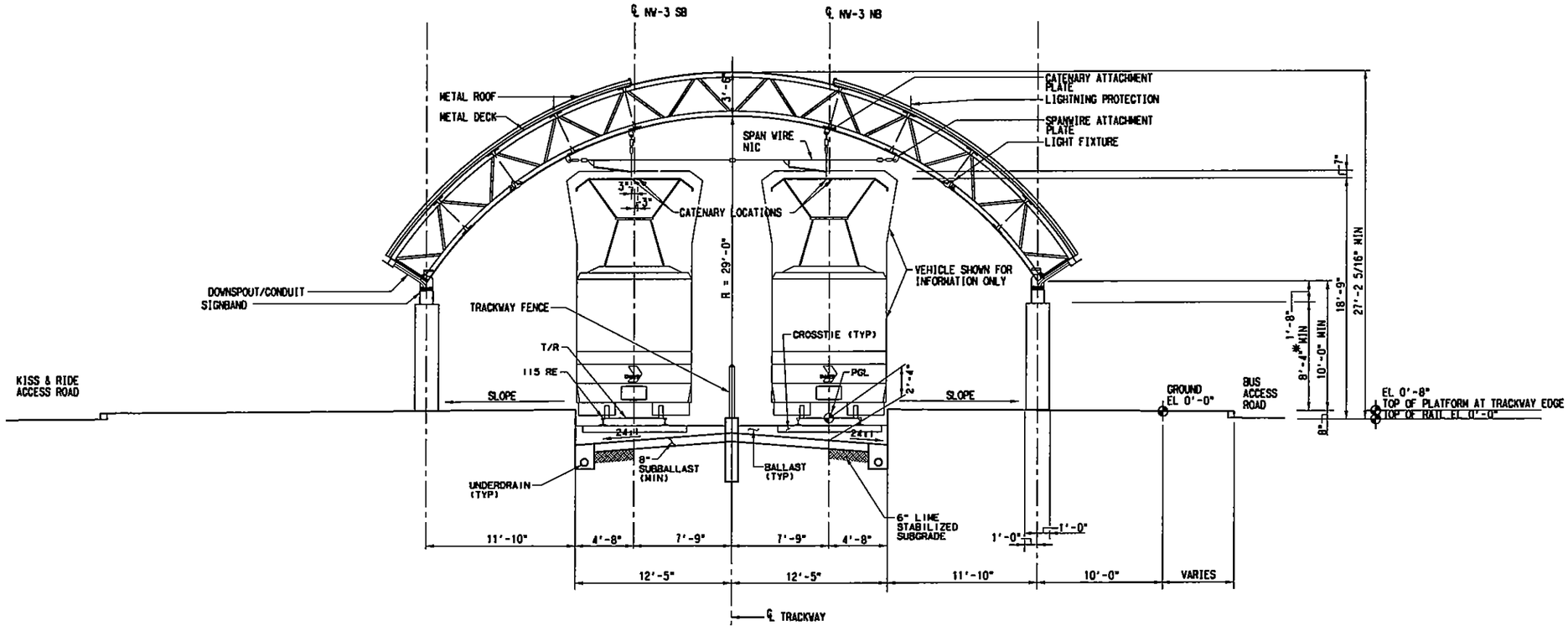

NOTES:

1. SEE DWG. No. C81-3001 FOR ADDITIONAL NOTES.

FARMERS BRANCH STATION

SCALE: 1/8"=1'-0"

STA 566+13.92 TO STA 572+47.44

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 79 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61151
Date: 10-25-02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. RATHES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY
TYPICAL SECTIONS
SHEET 24

CONTRACT C-937775-1 | DWG No. C81-3024 | REV

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rthompson

PRF ROTATION=0.000000
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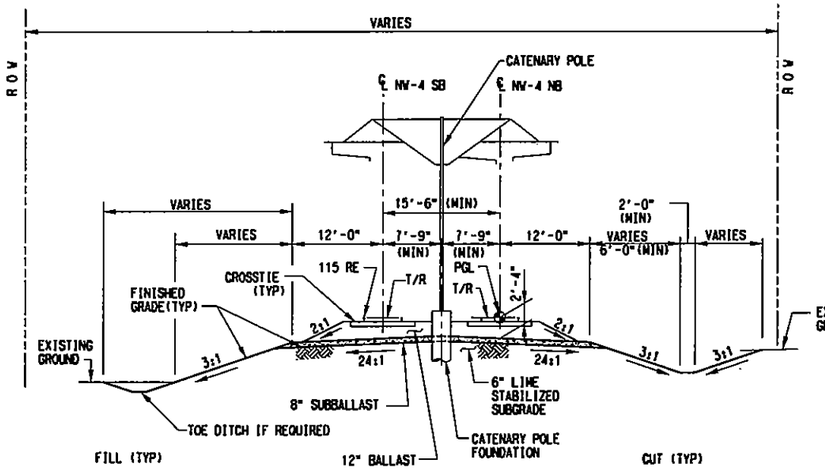
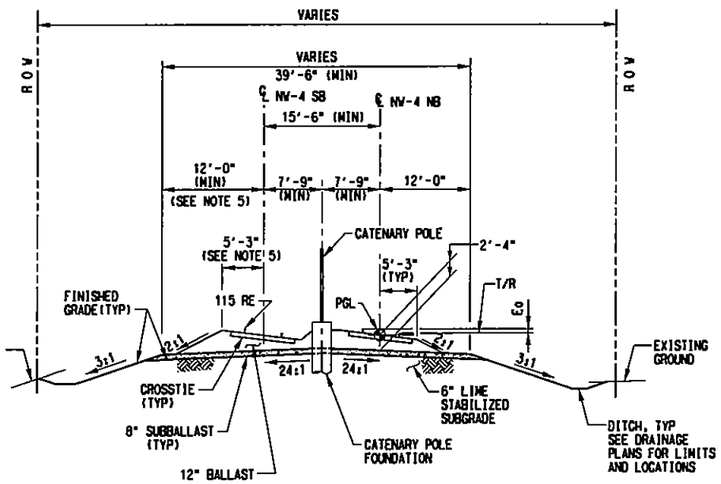
DWG No. CB1-4001





NOTES:

1. ALL SECTIONS ARE LOOKING NORTH. ALL STATIONING BASED ON THE CENTERLINE OF THE NORTHBOUND TRACK, UNLESS OTHERWISE NOTED.
2. CATENARY POLE LOCATION IS TYPICAL AND ONLY SHOWN AS AN ILLUSTRATION.
3. IN CURVES AND SPIRALS, THE PGL IS THE TOP OF THE LOW RAIL ON THE INSIDE OF THE CURVE OF THE NORTHBOUND TRACK.
4. SIDE SLOPES SHALL BE 3:1 UNLESS INDICATED OTHERWISE.
5. FOR SUPERELEVATED CURVES WHERE Eo IS GREATER THAN 2", INCREASE 12'-0" SHOULDER WIDTH TO 13'-6" ON HIGH SIDE OF TRACK, AND SHOULDER BALLAST TO 24". THE TRANSITION FROM THE SUBBALLAST SECTION SHOWN FOR TANGENT TRACK TO THE WIDENED SECTION FOR SUPERELEVATED TRACK SHALL BE MADE THROUGH THE LENGTH OF SPIRAL.
6. PROVIDE 6" LIME STABILIZED SUBGRADE UNDER THE 8" SUBBALLAST WHERE PI OF SUBGRADE IS 15 OR GREATER.
7. SAFETY FENCING IS REQUIRED WHERE OPERATING SPEEDS EXCEED 45 M.P.H.

TANGENT AT-GRADE CUT AND FILL

SCALE: 1"=10'

STA 585+65.24 TO STA 587+36.68
STA 592+56.70 TO STA 601+99.27
STA 612+31.70 TO STA 615+51.37
STA 616+10.85 TO STA 619+45.63
STA 814+81.33 TO STA 816+45.77 (FRT ON LT. SIDE)
STA 818+65.77 TO STA 821+22.97 (FRT ON LT. SIDE)
STA 821+59.26 TO STA 821+79.59 (FRT ON LT. SIDE)

CURVED AT-GRADE WITH CENTER POLE

SCALE: 1"=10'

STA 619+45.63 TO STA 631+86.65
STA 634+49.43 TO STA 636+09.85 (LT Eo)
STA 821+79.59 TO STA 824+09.43

CONTRACT SHEET No. 80 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
GUIDEWAY
TYPICAL SECTIONS
SHEET 1

CONTRACT	DWG No.	REV
C-937775-1	CB1-4001	

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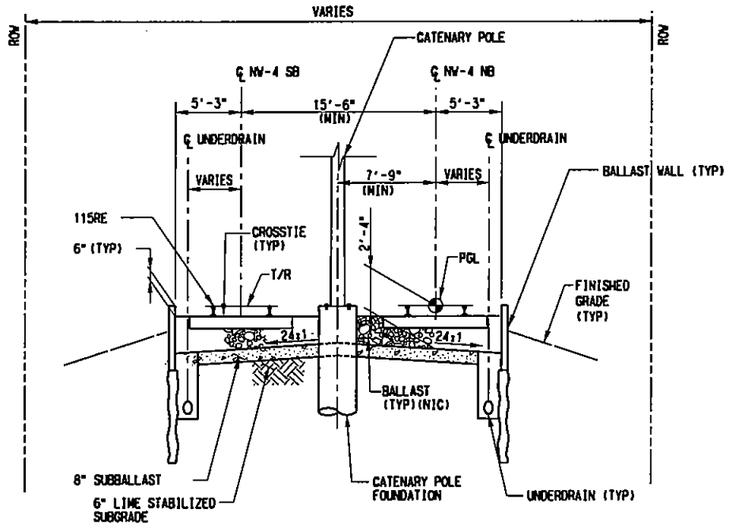


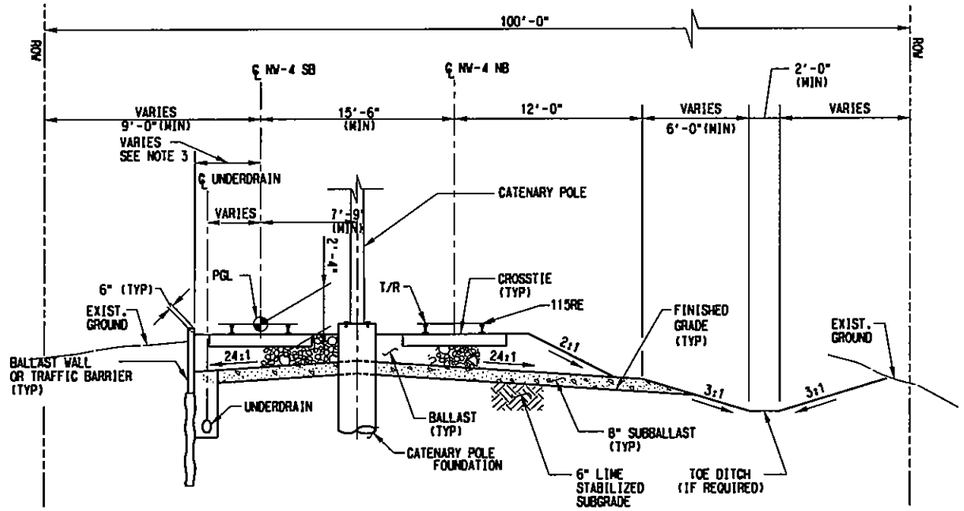
AT-GRADE WITH BALLAST WALLS

SCALE: HORIZ. 1"=6' , VERT. 1"=4'

STA 648+45.52 TO STA 654+70.89(LT Eq)

STA 655+22.53 TO STA 660+34.99

STA 660+81.05 TO STA 662+09.39



AT-GRADE WITH BALLAST WALL OR TRAFFIC BARRIER

SCALE: NOT TO SCALE

STA 581+50.00 TO STA 585+65.24

STA 587+36.68 TO STA 587+60.92 (MIRRORED SECTION)

STA 587+60.92 TO STA 591+77.17 (MIRRORED SECTION W/TRAFFIC BARRIER)

STA 591+77.17 TO STA 592+56.70 (MIRRORED SECTION)

STA 632+78.98 TO STA 634+49.43 (MIRRORED SECTION)

STA 641+57.56 TO STA 647+97.97(LT Eq)

NOTES:

1. SEE DWG No. CB1-4001 FOR ADDITIONAL NOTES.
2. STATIONS LIMITS INDICATED INCLUDE CURVES. ALSO REFER "CURVED AT-GRADE" TYPICAL SECTION, DWG No. CB1-4001, FOR CURVE INFORMATION.
3. DIMENSION BETWEEN CENTERLINE OF NORTHBOUND TRACK AND THE FACE OF STRUCTURE VARIES AS FOLLOWS:
   BALLAST WALL = 5'-3"
   TRAFFIC BARRIER = 8'-6"

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81457
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
16770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 81 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 2

CONTRACT	DWG No.	REV
C-937775-1	CB1-4002	

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DWG No. CB1-4003

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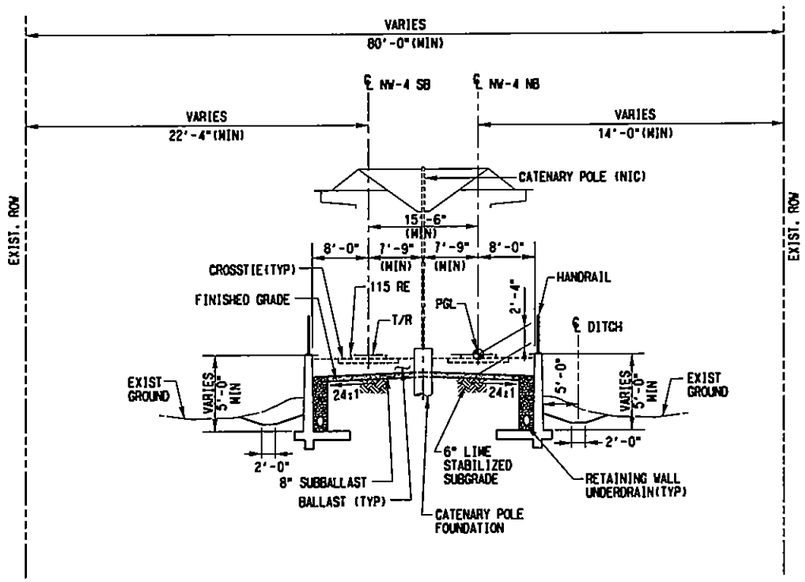
NOTES:

1. SEE DWG No. CB1-4001 FOR ADDITIONAL NOTES.
2. STATIONS LIMITS INDICATED INCLUDE CURVES, ALSO REFER "CURVED AT-GRADE" TYPICAL SECTION, DWG No. CB1-4001, FOR CURVE INFORMATION.



CAST-IN-PLACE WALL IN FLOOD PLAIN WITH HEIGHT < 8 FT

SCALE: NOT TO SCALE

STA 602+53.37 TO STA 606+41.70

STA 608+51.70 TO STA 612+31.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
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CP&Y
J. THOMPSON, P.E. No. 61137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 097-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 82 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 3

CONTRACT	DWG No.	REV
C-937775-1	CB1-4003	

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rthompson

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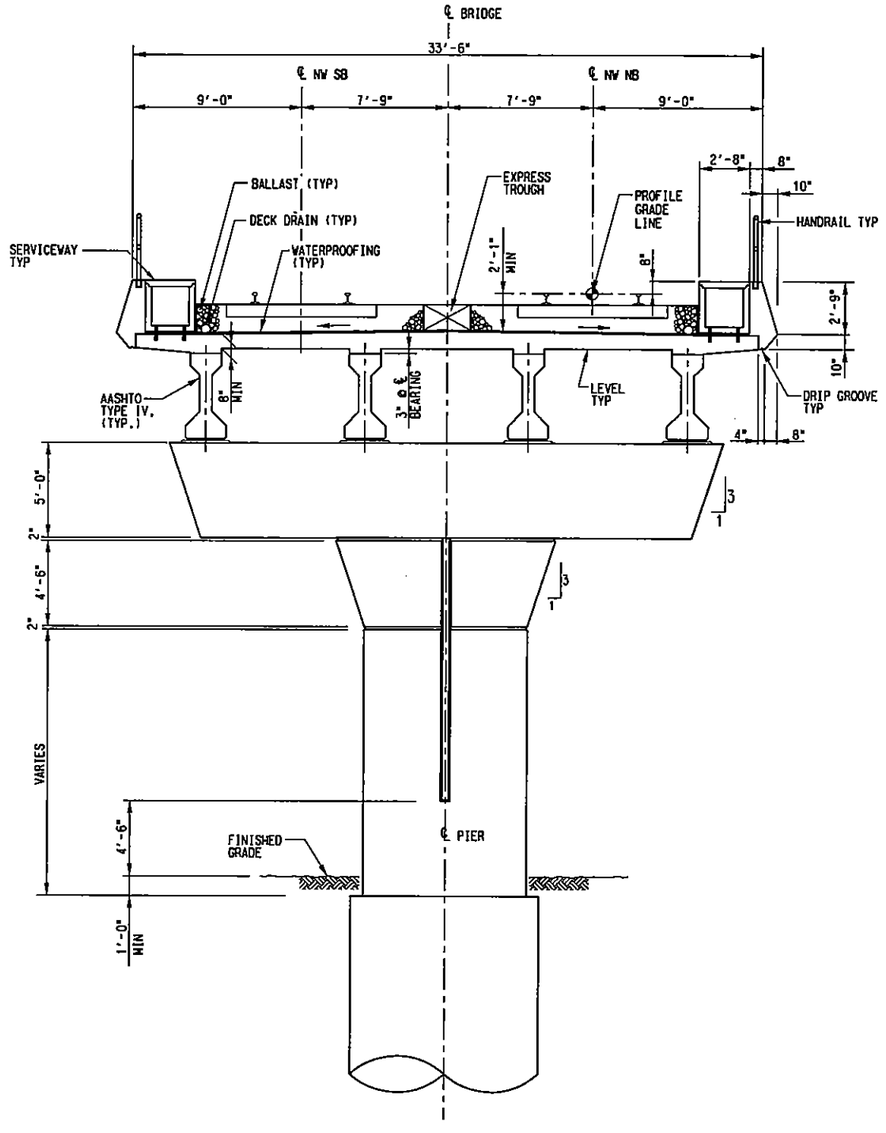
DWG No. CB1-4004



COOKS BRANCH BRIDGE

SCALE: NO SCALE

STA 606+41.70 TO STA 608+51.70

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TOTH, P.E. No. 81157
Date: 10/31/02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. PELLETIER
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 83 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 4

CONTRACT C-937775-1 | DWG No. CB1-4004 | REV

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rthompson

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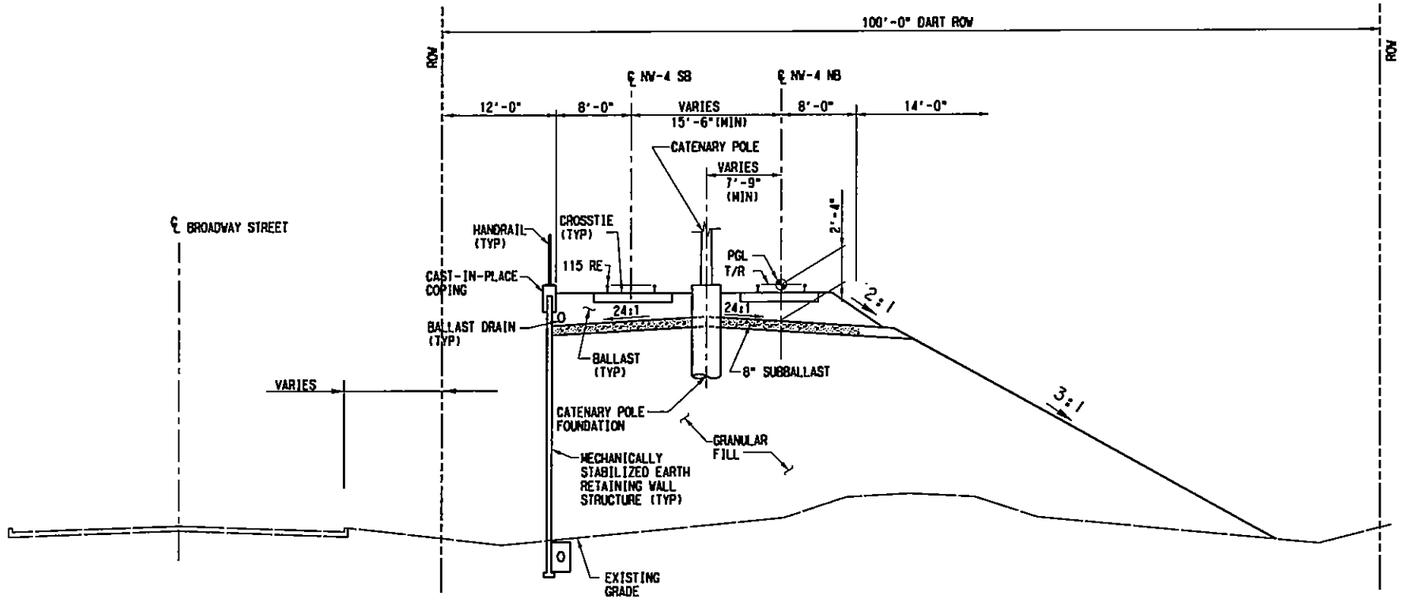

RETAINED FILL LRT - MSE WALL

SCALE: NOT TO SCALE

STA 636+09.85 TO STA 641+11.50

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 84 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 5

CONTRACT	DWG No.	REV
C-937775-1	CB1-4005	

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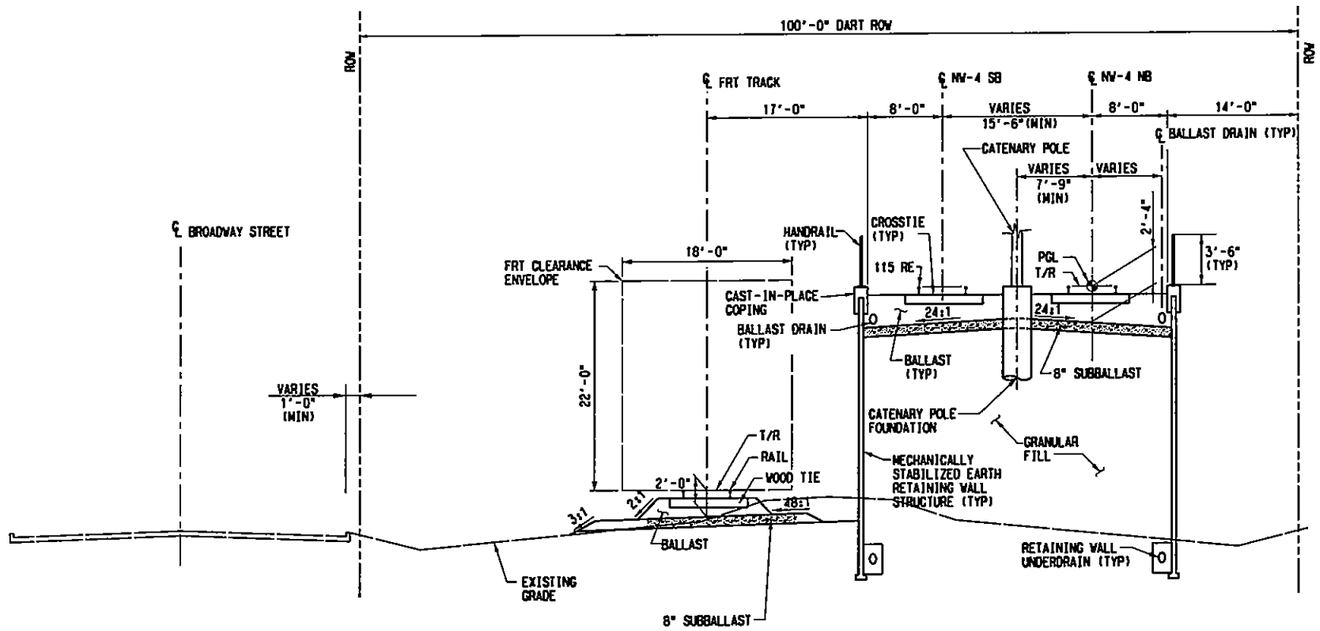
DWG No. CB1-4006



RETAINED FILL LRT - MSE WALL

SCALE: NOT TO SCALE

STA 662+09.39 TO STA 668+19.43

STA 757+37.43 TO STA 764+09.43

STA 770+09.43 TO STA 776+11.43

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 85 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
GUIDEWAY
TYPICAL SECTIONS
SHEET 6

CONTRACT C-937775-1 | DWG No. CB1-4006 | REV

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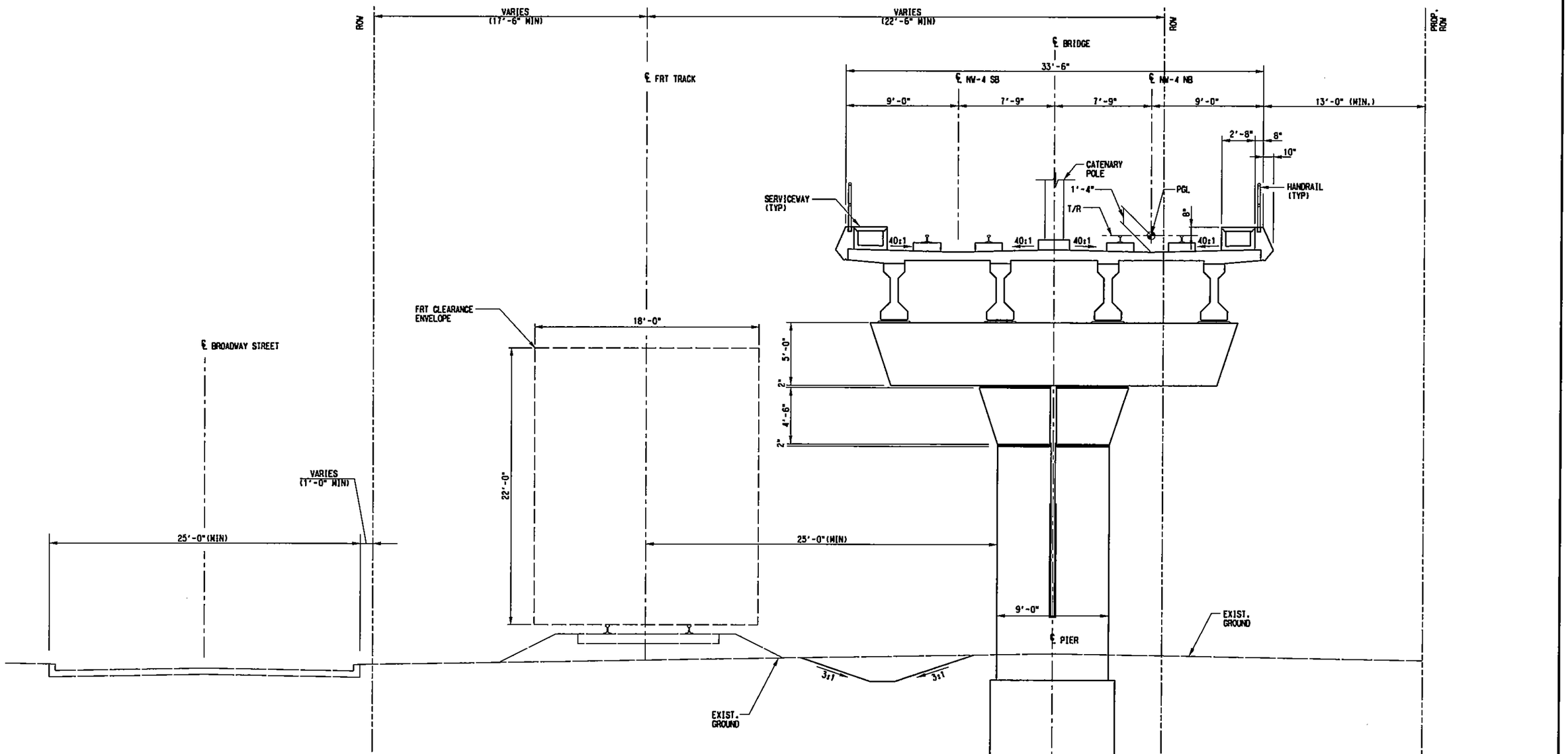

AERIAL LRT STRUCTURE AND AT-GRADE FREIGHT

SCALE: NO SCALE

STA 668+19.43 TO STA 672+59.43 (RELOCATED FRT)
STA 684+31.43 TO STA 686+05.43 (RELOCATED FRT)
STA 705+65.43 TO STA 709+32.43 (EXISTING FRT)
STA 710+22.43 TO STA 727+40.74 (EXISTING FRT)
STA 727+40.74 TO STA 742+69.36 (RELOCATED FRT)
STA 743+59.43 TO STA 757+37.43 (RELOCATED FRT)
STA 776+11.43 TO STA 783+96.43 (RELOCATED FRT)
STA 785+81.43 TO STA 787+61.43 (RELOCATED FRT)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
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CP&Y
J. TIPTON, P.E. No. 81152
Date: 15 NOV 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 86 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 7

CONTRACT C-937775-1 | DWG No. CB1-4007 | REV

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rthompson

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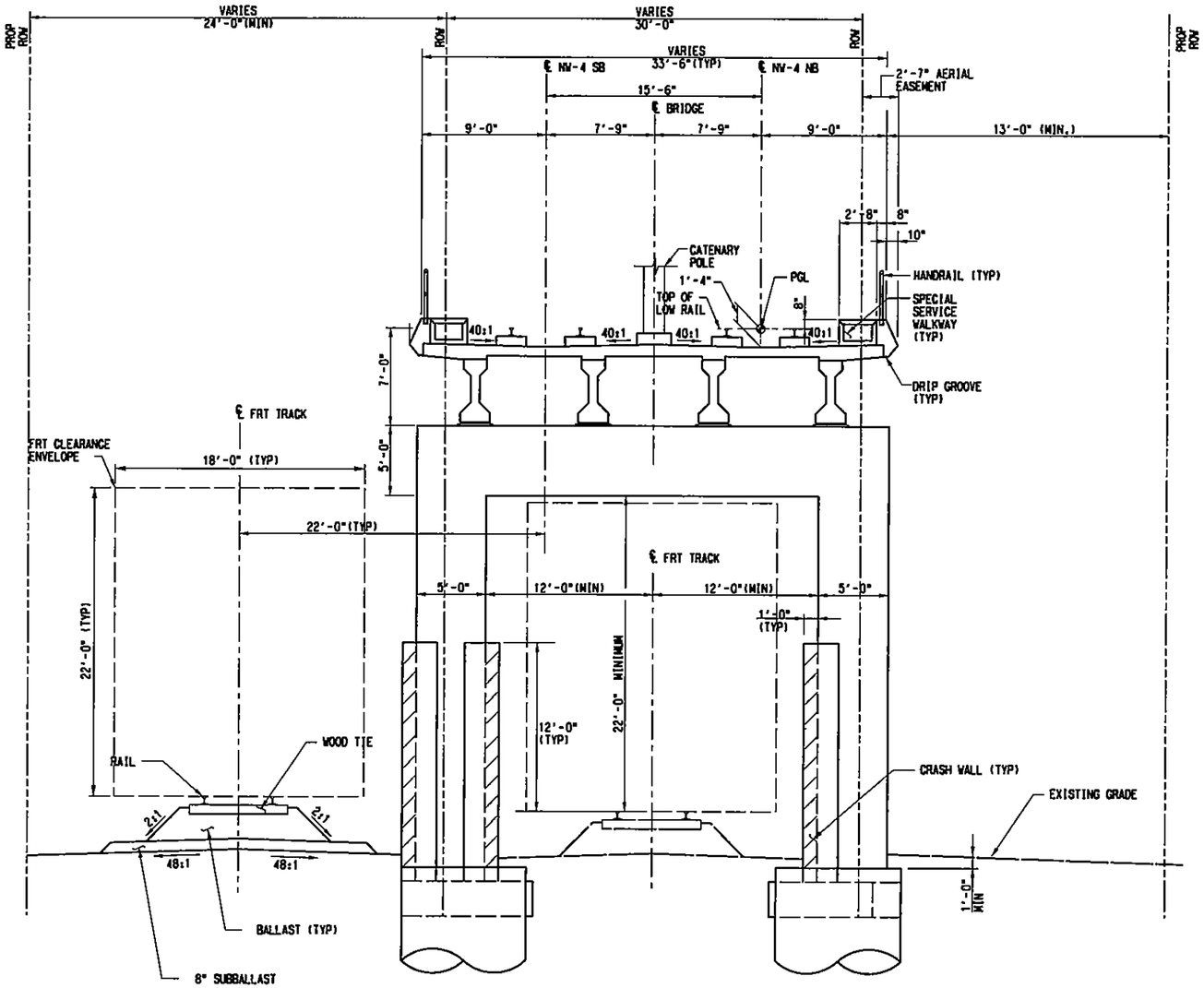
DWG No. CB1-4008



NOTES:

1. PROVIDE CRASHWALL 6'-0" HIGH (MINIMUM) FOR PIERS LOCATED FROM 12 FT. TO 25 FT. CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH (MINIMUM) FOR PIERS LESS THAN 12 FT. CLEAR FROM CENTERLINE OF FREIGHT TRACK.

DOUBLE TRACK LRT STRUCTURE & AT GRADE FREIGHT

SCALE: 1/4"=1'-0"

STA 672+59.43 TO STA 684+31.43 (EXISTING FRT IS STORAGE TRACK UNDER STRUCTURE)
STA 709+32.43 TO STA 710+22.43
STA 742+69.36 TO STA 743+59.43
STA 783+96.43 TO STA 785+81.43
STA 837+19.43 TO STA 838+99.43

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. SUTTON, P.E. No. 81157
Date: 11 NOV 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 87 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 8

CONTRACT	DWG No.	REV
C-937775-1	CB1-4008	

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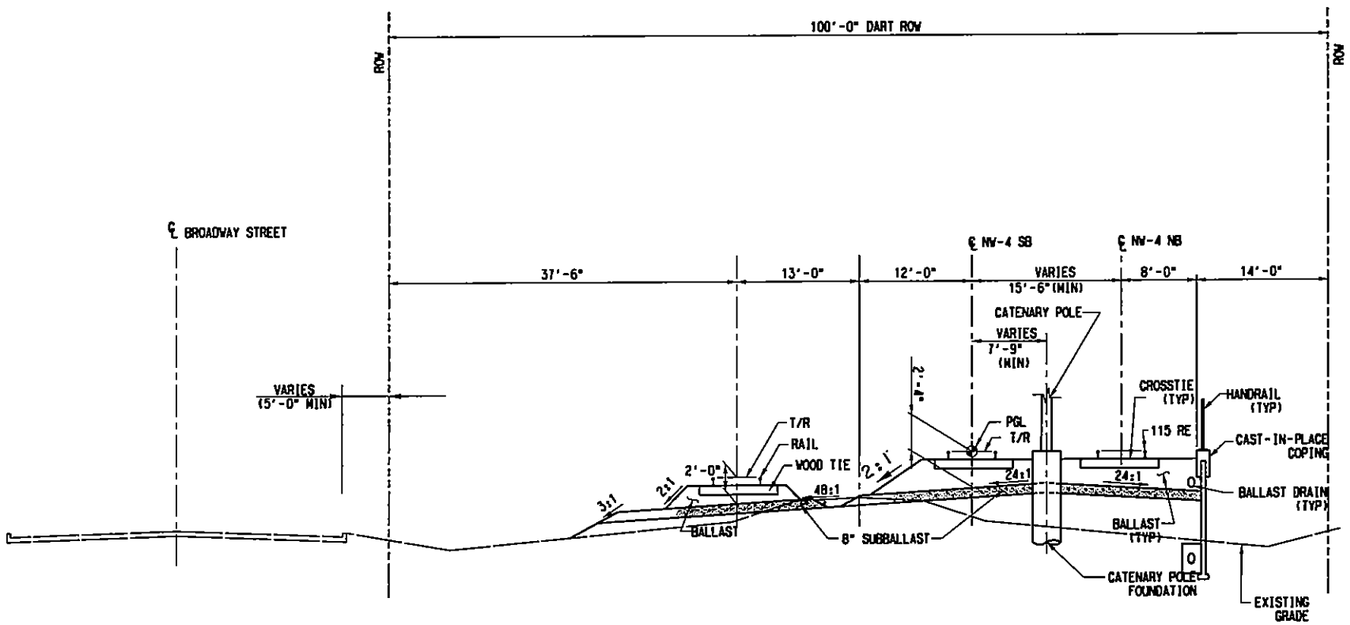
DWG No. CB1-4009



RETAINED FILL LRT WITH AT-GRADE FREIGHT - MSE WALL

SCALE: NOT TO SCALE

STA 764+09.43 TO STA 770+09.43

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 88 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
J. TIPTON, P.E. No. 61153
Date: 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 9

CONTRACT C-937775-1

DWG No. CB1-4009

REV

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rlthompson

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DWG No. CB1-4010

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rlthompson

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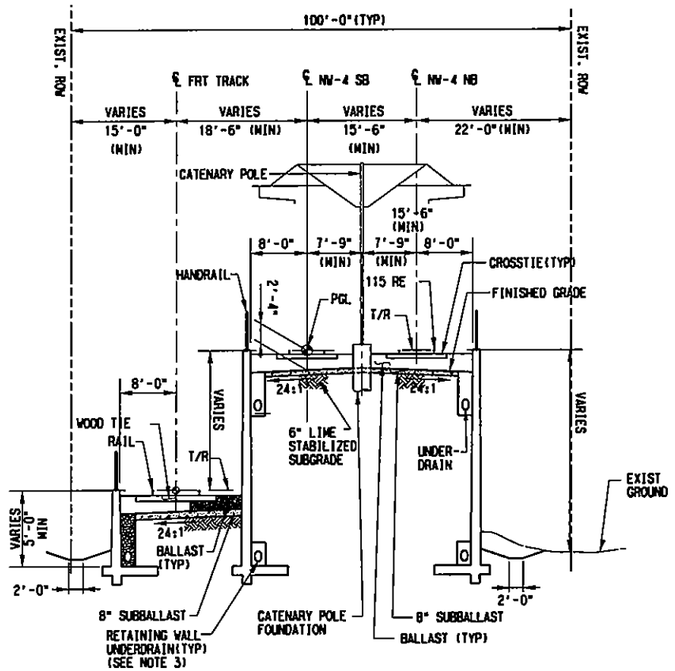

CAST-IN-PLACE WALL (LRT & FREIGHT) WITH WALL HEIGHTS 8 FT TO 24 FT

SCALE: NOT TO SCALE

STA 787+61.43 TO STA 791+09.43 (NO FRT WALL)

STA 791+09.43 TO STA 792+62.45

STA 824+09.43 TO STA 830+89.43 (NO FRT WALL)

STA 846+19.43 TO STA 851+59.22

NOTES:

1. SEE DWG No. CB1-4001 FOR ADDITIONAL NOTES.
2. STATIONS LIMITS INDICATED INCLUDE CURVES. ALSO REFER "CURVED AT-GRADE" TYPICAL SECTION, DWG No. CB1-4001, FOR CURVE INFORMATION.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 89 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 10

CONTRACT	DWG No.	REV
C-937775-1	CB1-4010	

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DWG No. CBI-4011

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Tue Nov 5 16:06:21 2002
R:\NW4X\prf\nw4xcsll.prf
rthompson

PRF ROTATION=0.000000
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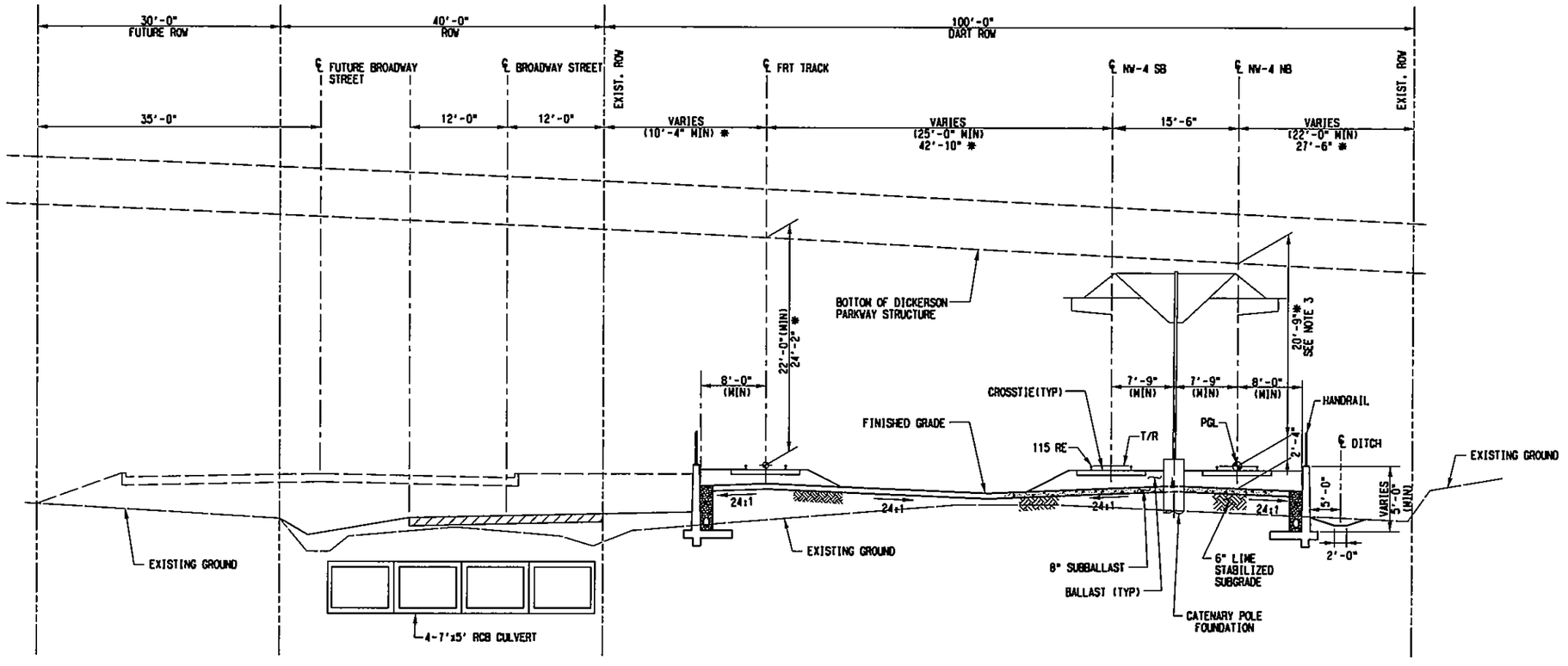
NOTES:

1. PIERS PLACED CLOSER THAN 25 FEET TO EITHER FREIGHT TRACK OR LRT TRACK WILL REQUIRE CRASH WALLS.
2. LOCATION OF FUTURE BROADWAY STREET SHALL BE COORDINATED WITH THE CITY OF CARROLLTON.
3. VERTICAL CLEARANCES OVER THE LRT THAT ARE LESS THAN 27 FEET WILL REQUIRE A DESIGN EXCEPTION FROM SYSTEMS.



CAST-IN-PLACE WALL IN FLOOD PLAIN (WITH HEIGHT < 8 FT)

SCALE: NOT TO SCALE

* DENOTES ACTUAL DISTANCES AT DICKERSON PARKWAY

STA 792+62.45 TO STA 795+94.07
STA 796+48.11TO STA 803+98.00
STA 803+98.00 TO STA 804+76.00 (DICKERSON PARKWAY)
STA 804+76.00 TO STA 806+41.39
STA 810+02.14 TO STA 812+09.43
STA 812+09.43 TO STA 814+35.05 (NO WALL ON RT. SIDE OF LRT)
STA 851+59.22 TO STA 853+34.43 (WITHOUT BROADWAY STREET)
STA 853+34.43 TO STA 857+12.71 (WITHOUT BROADWAY STREET & LRT WALL)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 90 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151
Date: 10 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	S. SASTRY
DATE	15 NOV 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 11

CONTRACT C-937775-1 | DWG No. CBI-4011 | REV

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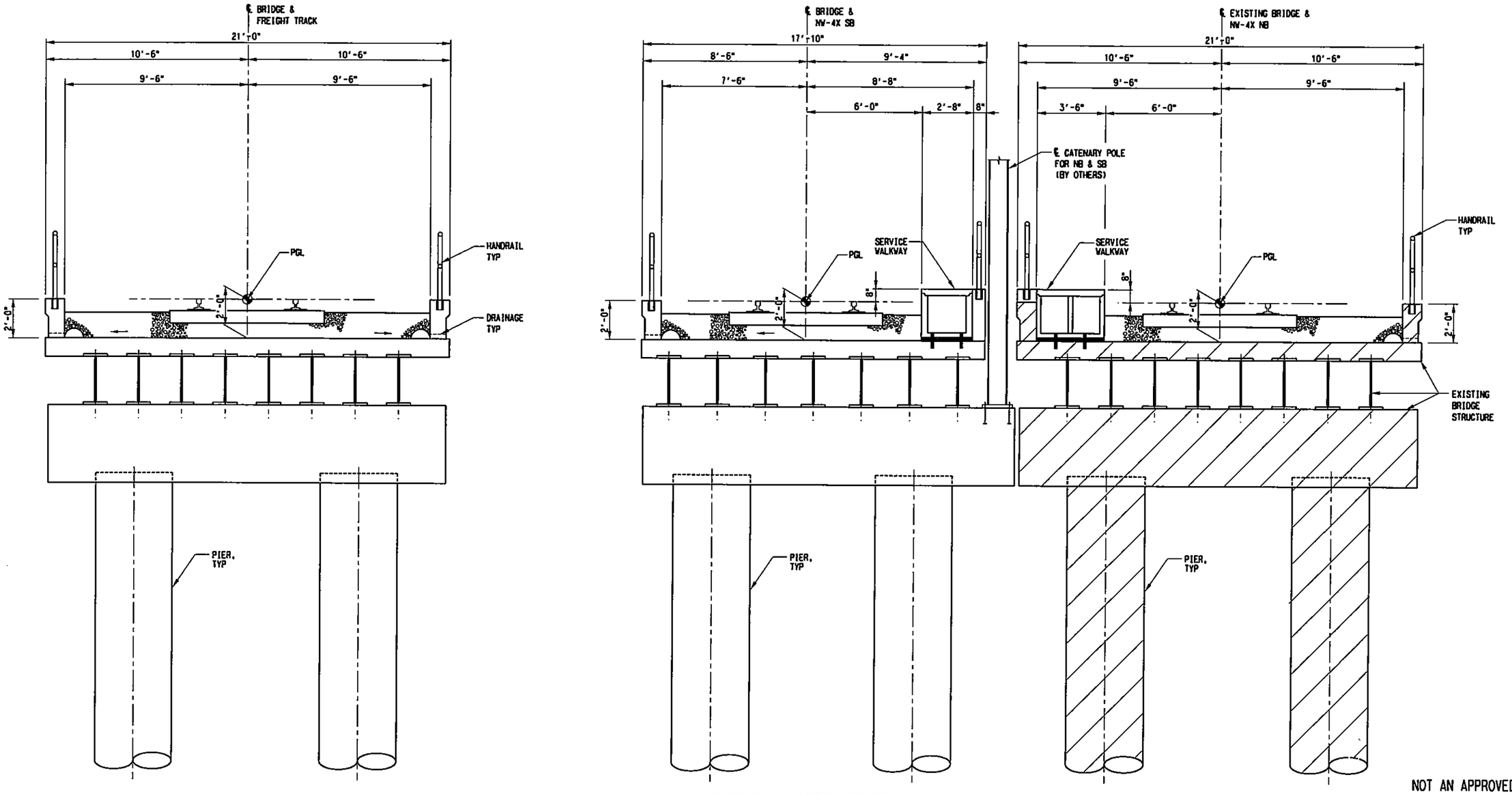
DWG No. CB1-4012



FURNEAUX CREEK BRIDGE

SCALE: 3/8"=1'-0"

STA 816+45.77 TO STA 818+65.77

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 12 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	O. BROWN
DESIGNED	F. HAN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 91 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 12

CONTRACT	DWG No.	REV
C-937775-1	CB1-4012	

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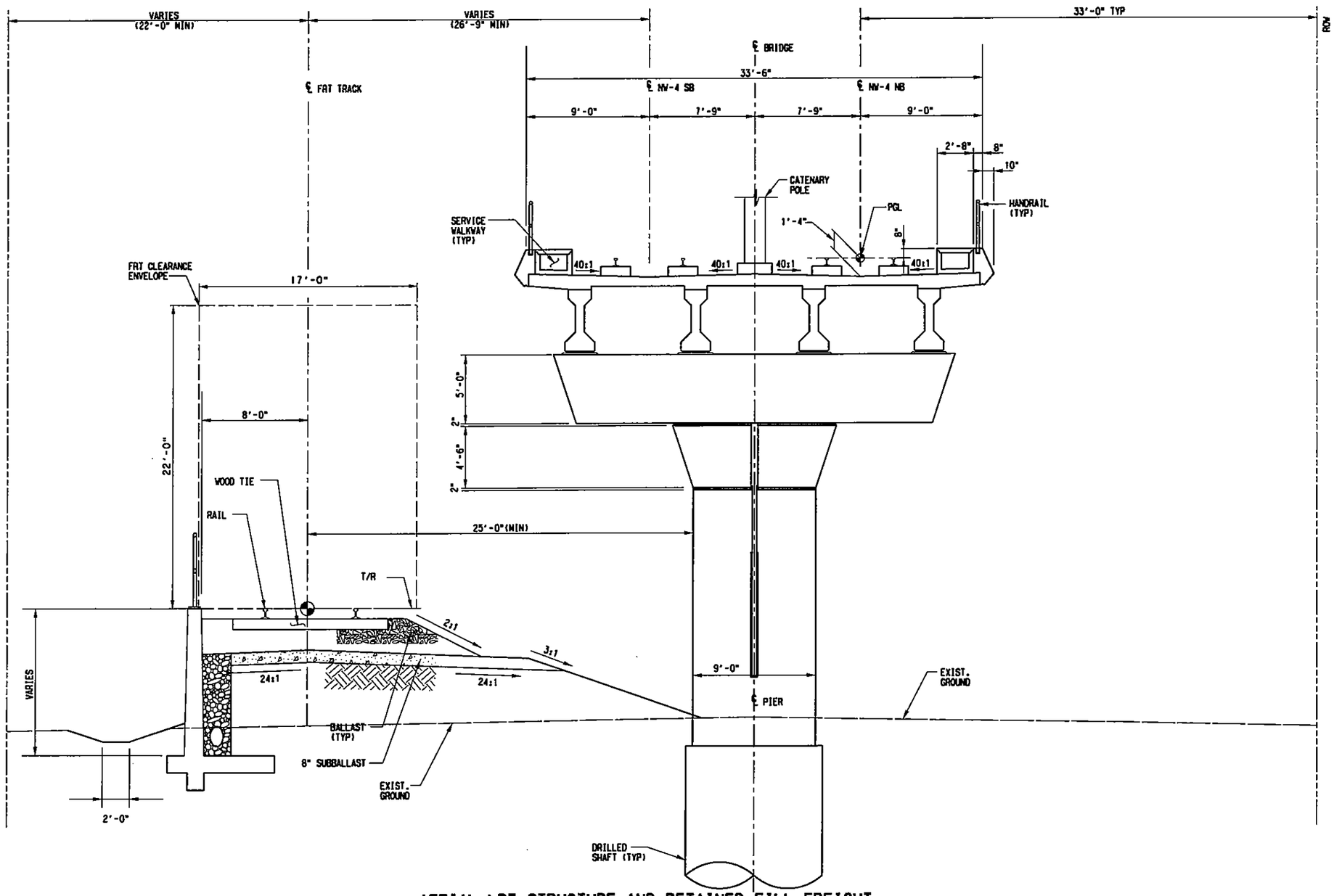

AERIAL LRT STRUCTURE AND RETAINED FILL FREIGHT

SCALE: NO SCALE

STA 830+89.43 TO STA 837+19.43 (NO FRT WALL)
STA 838+99.43 TO STA 841+09.43 (NO FRT WALL)
STA 841+09.43 TO STA 846+19.43

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 83757
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 92 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 13

CONTRACT C-937775-1 | DWG No. CB1-4013 | REV

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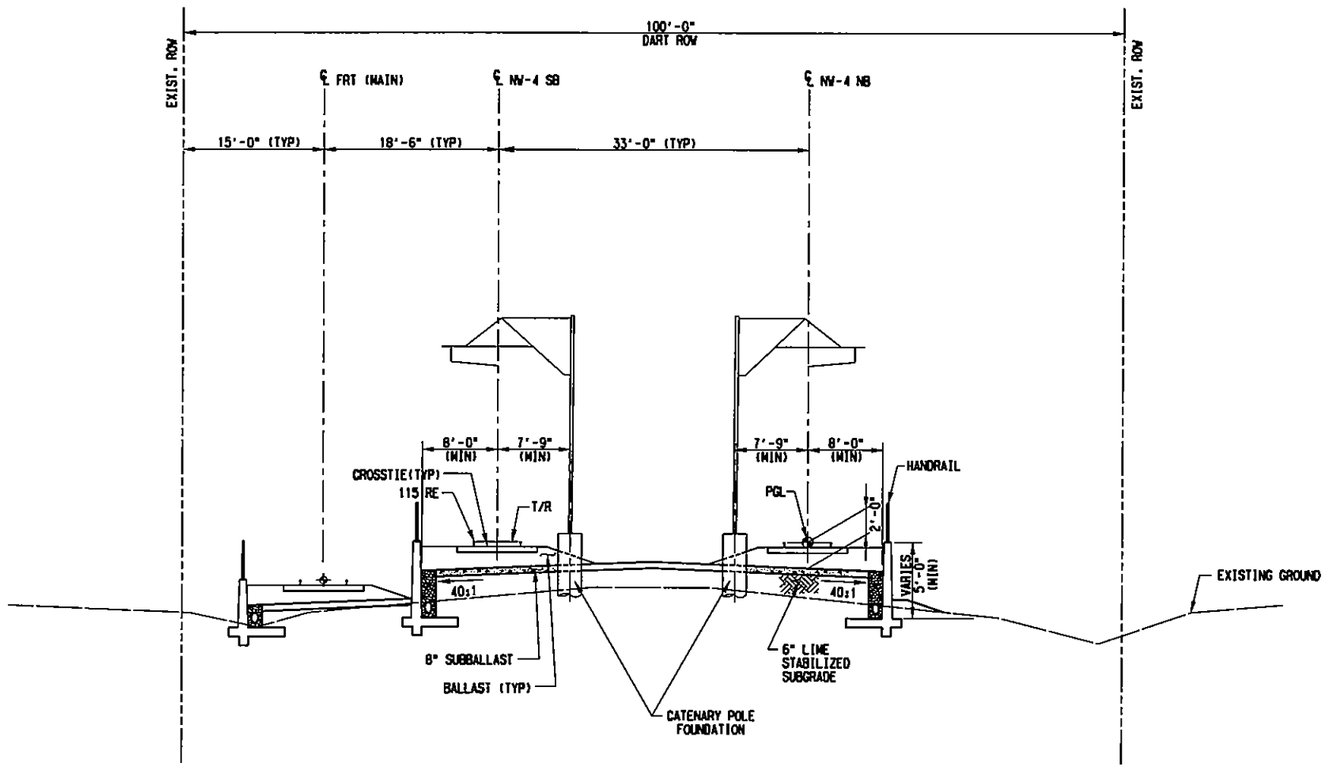

CAST-IN-PLACE WALL IN FLOOD PLAIN (WITH HEIGHT < 8 FT) AND AT-GRADE FREIGHT (MAIN & SIDING)

SCALE: NOT TO SCALE

STA 861+21.69 TO STA 869+89.07 (STORAGE TRACKS)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 11/07/02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	15 NOV 02

DARTCADD

CONTRACT SHEET No. 93 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 14

CONTRACT	DWG No.	REV
C-937775-1	C81-4014	

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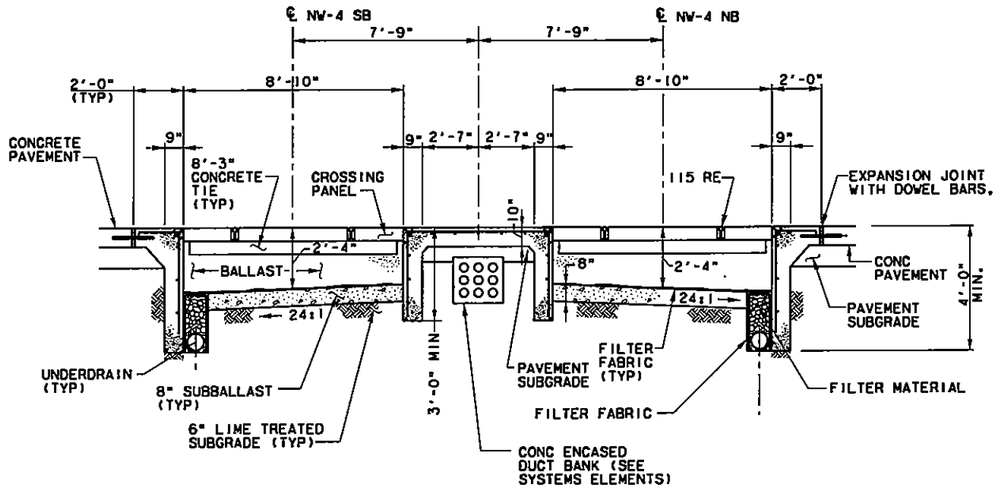
DWG No. CB1-4015



HIGHWAY GRADE CROSSING

SCALE: NOT TO SCALE

STA 601+99.27 TO STA 602+53.37 (SQUIRE PLACE)

STA 615+51.37 TO STA 616+10.85 (DISTRIBUTION WAY)

STA 631+86.65 TO STA 632+78.98 (VALWOOD PARKWAY)

STA 641+11.50 TO STA 641+57.56 (PRIVATE DRIVE)

STA 647+97.97 TO STA 648+45.52 (BURNING TREE LANE)

STA 654+70.89 TO STA 655+22.53 (RANDOLPH STREET)

STA 660+34.99 TO STA 660+81.05 (DRIVEWAY F)

STA 795+94.07 TO STA 796+48.11 (ISMAIL) CENTER CIRCLE)

STA 814+35.05 TO STA 814+81.33 (PGBT-EBFR)

STA 821+22.97 TO STA 821+59.26 (PGBT-WBFR)

NOTES:

1. SEE DWG. No. CB1-4001 FOR ADDITIONAL NOTES.
2. HEADER DETAIL SHOWN IS FOR A TYPICAL CONCRETE PAVEMENT INTERFACE. REFER TO DART STANDARD DRAWINGS FOR OTHER TYPES OF INTERFACE.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 43153
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 94 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 15

CONTRACT	DWG No.	REV
C-937775-1	CB1-4015	

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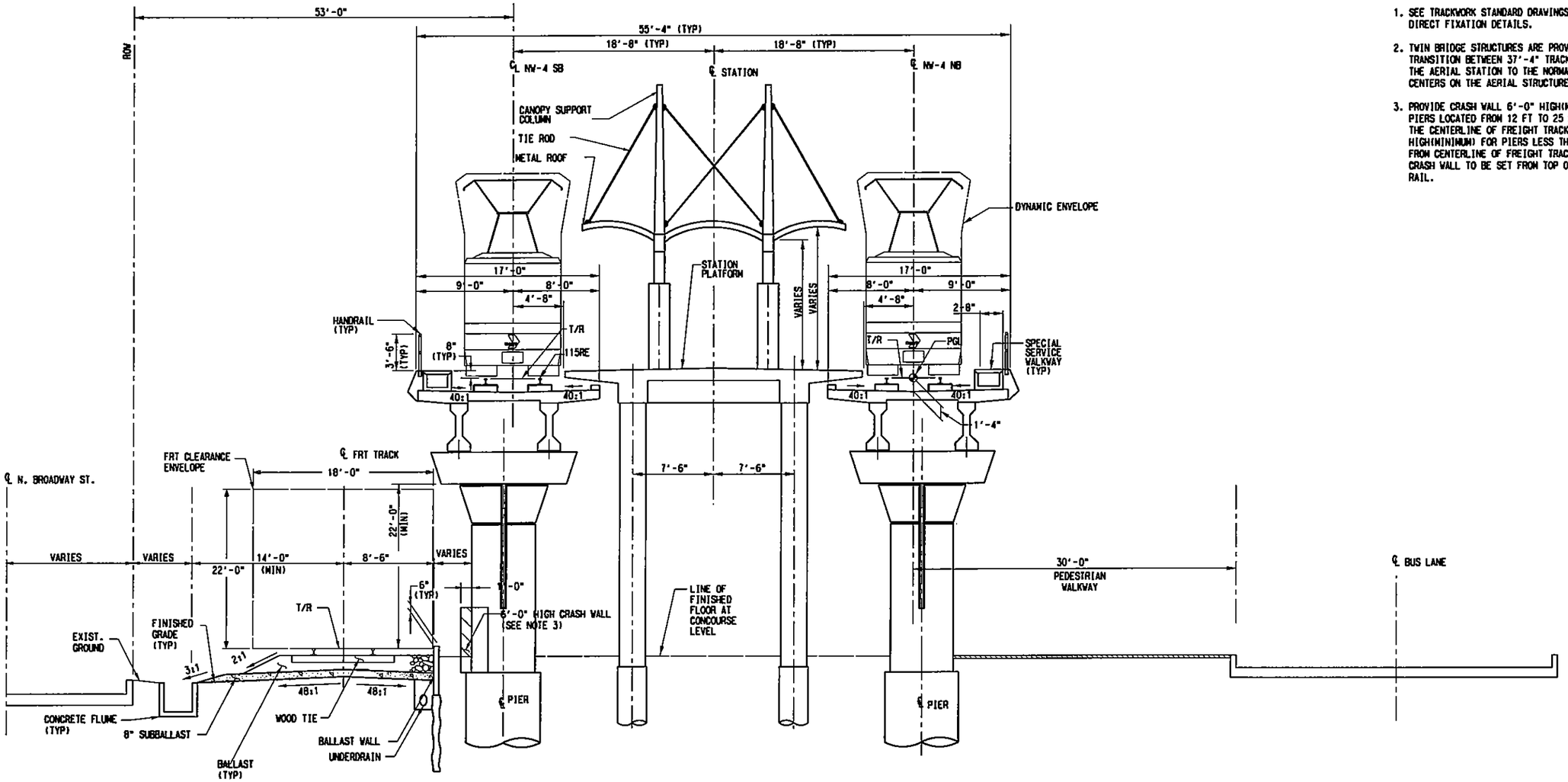

NOTES:

1. SEE TRACKWORK STANDARD DRAWINGS FOR DIRECT FIXATION DETAILS.
2. TWIN BRIDGE STRUCTURES ARE PROVIDED TO TRANSITION BETWEEN 37'-4" TRACK CENTERS AT THE AERIAL STATION TO THE NORMAL 15'-6" TRACK CENTERS ON THE AERIAL STRUCTURE.
3. PROVIDE CRASH WALL 6'-0" HIGH(MINIMUM) FOR PIERS LOCATED FROM 12 FT TO 25 FT CLEAR FROM THE CENTERLINE OF FREIGHT TRACK AND 12'-0" HIGH(MINIMUM) FOR PIERS LESS THAN 12 FT CLEAR FROM CENTERLINE OF FREIGHT TRACK. HEIGHT OF CRASH WALL TO BE SET FROM TOP OF FREIGHT RAIL.

CARROLLTON SQUARE STATION

SCALE: 3/16"=1'-0"

STA 686+05.43 TO STA 694+21.27 (EXCLUDE STATION PLATFORM AND STRUCTURE, SEE NOTE 2)

STA 694+21.27 TO STA 698+42.27 (CARROLLTON SQUARE STATION)

STA 698+42.27 TO STA 705+65.43 (EXCLUDE STATION PLATFORM AND STRUCTURE, SEE NOTE 2)

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 66157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 95 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 16

CONTRACT C-937775-1
DWG No. CB1-4016
REV

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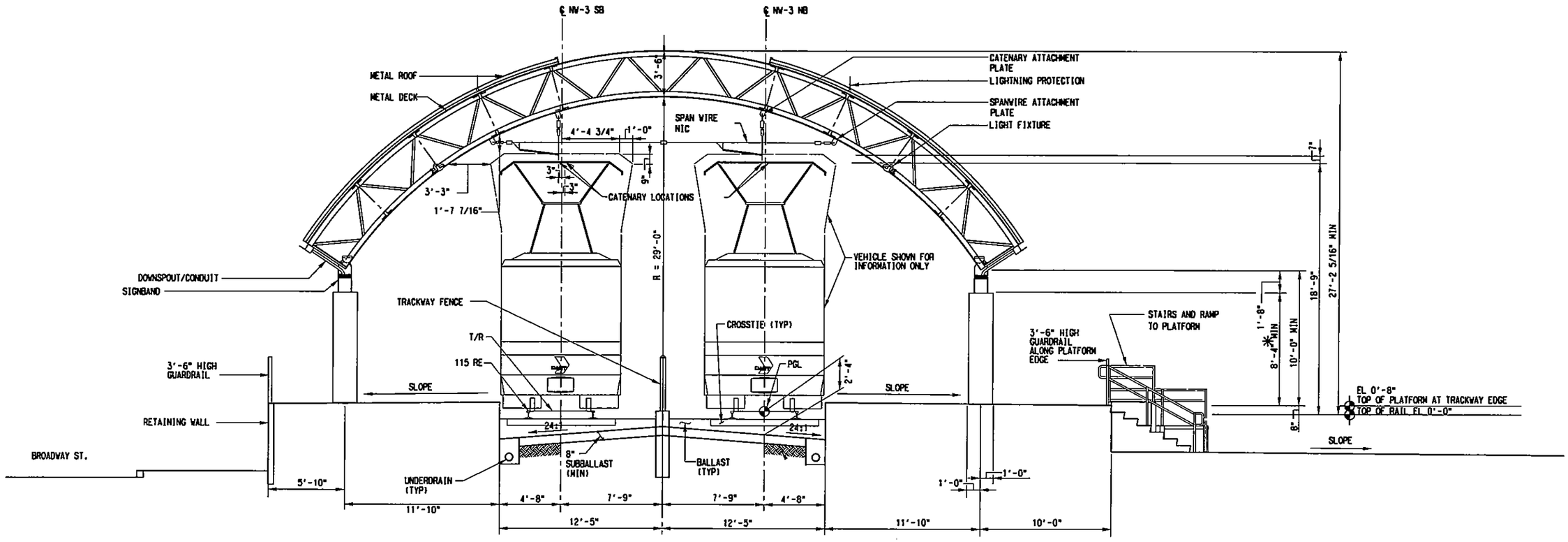

TRINITY MILLS STATION

SCALE: 1/4" = 1'-0"

STA 806+41.39 TO STA 809+02.14

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 96 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 17

CONTRACT C-937775-1 | DWG No. CB1-4017 | REV

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DWG No. CB1-4018

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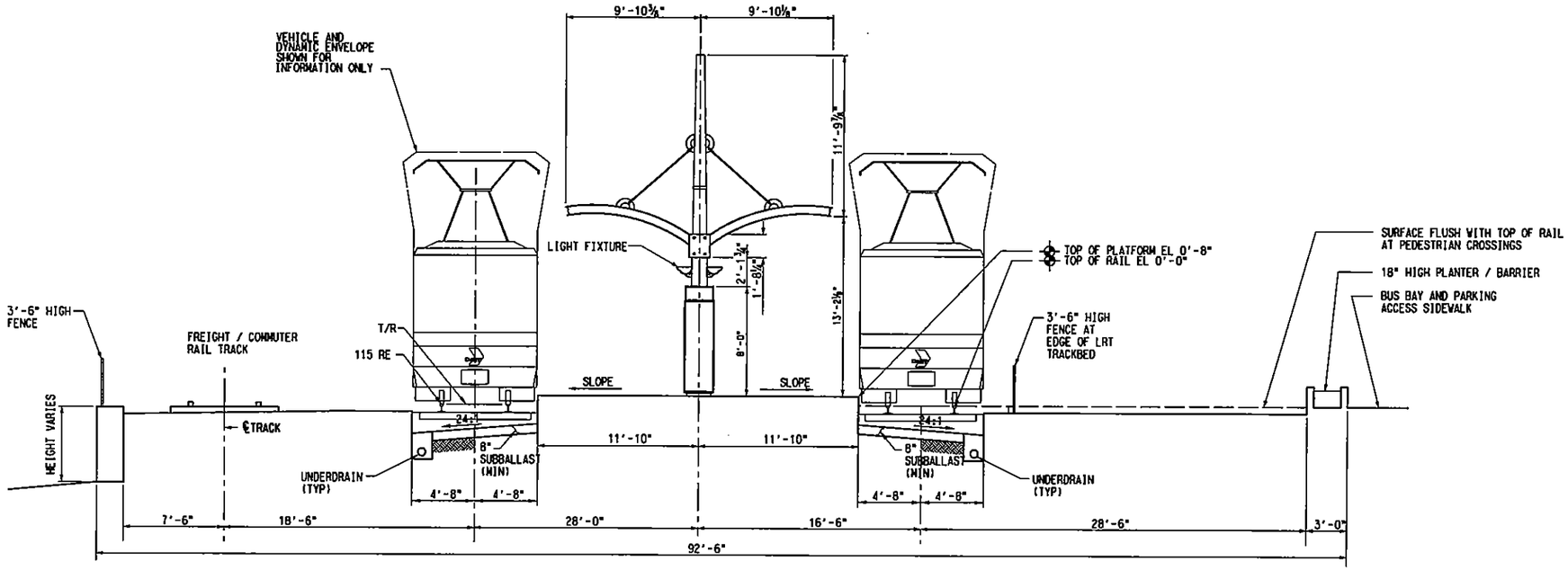
GENERAL NOTES:

1. THE DIMENSION FROM THE PGL TO THE TOP OF THE SUBBALLAST AT THE CENTERLINE OF THE TRACK IS 2'-4".



FRANKFORD STATION

SCALE: 1/5"=1'-0"

STA 857+12.71 TO STA 861+21.69

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 10/31/02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. RAINES
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 97 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY
TYPICAL SECTIONS
SHEET 18

CONTRACT	DWG No.	REV
C-937775-1	CB1-4018	

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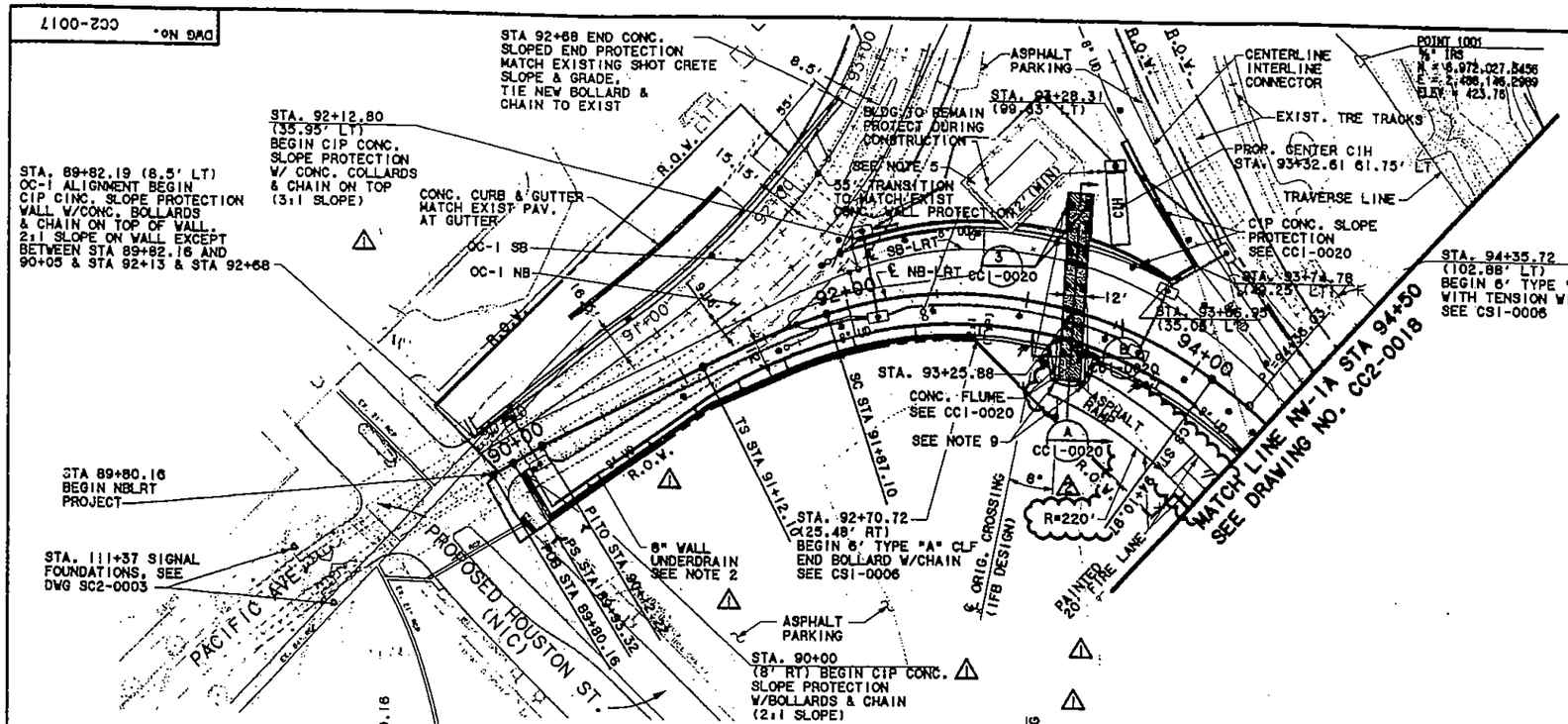
DWG No. CC2-0017



CAUTION !!!

TXU GAS FACILITIES IN AREA. CALL 1-800-344-8377 3 WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA. CALL 1-800-545-6005 EXT. (4589) 2 WORKING DAYS PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.

NOTES:

1. CONTRACTOR SHALL NOT DISTURB EXISTING TRACK SUB GRADE, SUB BALLAST, BALLAST, TIE OR RAIL WITHIN 8 FEET OF C/L OF EXISTING OC-1.
2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC6-0036 THROUGH CC6-0045 FOR DETAILED INFORMATION.
3. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. SEE SHEET CC7-0001 FOR LIMITS OF DEMOLITION.
5. FIRE LANE OR ADDITIONAL FIRE PROTECTION FOR SIGNAL HOUSE STRUCTURE IS NOT SHOWN ON THIS DRAWING, BUT SHALL FOLLOW BY AMENDED DRAWINGS AT A LATER DATE
6. FOR WALL UNDERDRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES. SEE CC6-0032 THROUGH CC6-0045.
7. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBLAST.
8. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.
9. STEEL POST SET IN ASPHALT (3' MIN DEEP) WITH A CHAIN BETWEEN THEM WITH ABLOY LOCK. SEE SPEC. SECTION 02830.
10. CONCRETE BOLLARD WITH CHAIN PEDESTRIAN BERRIER. SEE CCI-0021

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
7			11/28/01	MODIFIED VEHICLE CROSSING, CIP SLOPED BALLAST WALL PROTECTION, ADDED 6' CLF & MOVED FIRE LANE, DELETE WALL PROFILE, ADDED CURB & GUTTER, CONC. WALL PROTECTION, & CONC. BOLLARDS W/ CHAINS ON THE 8TH FLOOR MUSEUM SIDE IF THE OC-1 ALIGNMENT	RL	RL	BH	PJ
10			1/16/02	EXTEND PAINTED FIRE LANE	RL	RL	BH	PJ

STATE OF TEXAS BRUCE HORNE 65811 REGISTERED PROFESSIONAL ENGINEER 1-16-02

Lockwood, Andrews & Newnam, Inc.

LAN/STV Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	19 OCTOBER 01

CONTRACT SHEET No. 98 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 89+80.16 STA 94+50

CAES | CONTRACT C-1003853-01 | DWG No. CC2-0017 | REV 2

CONFORMED

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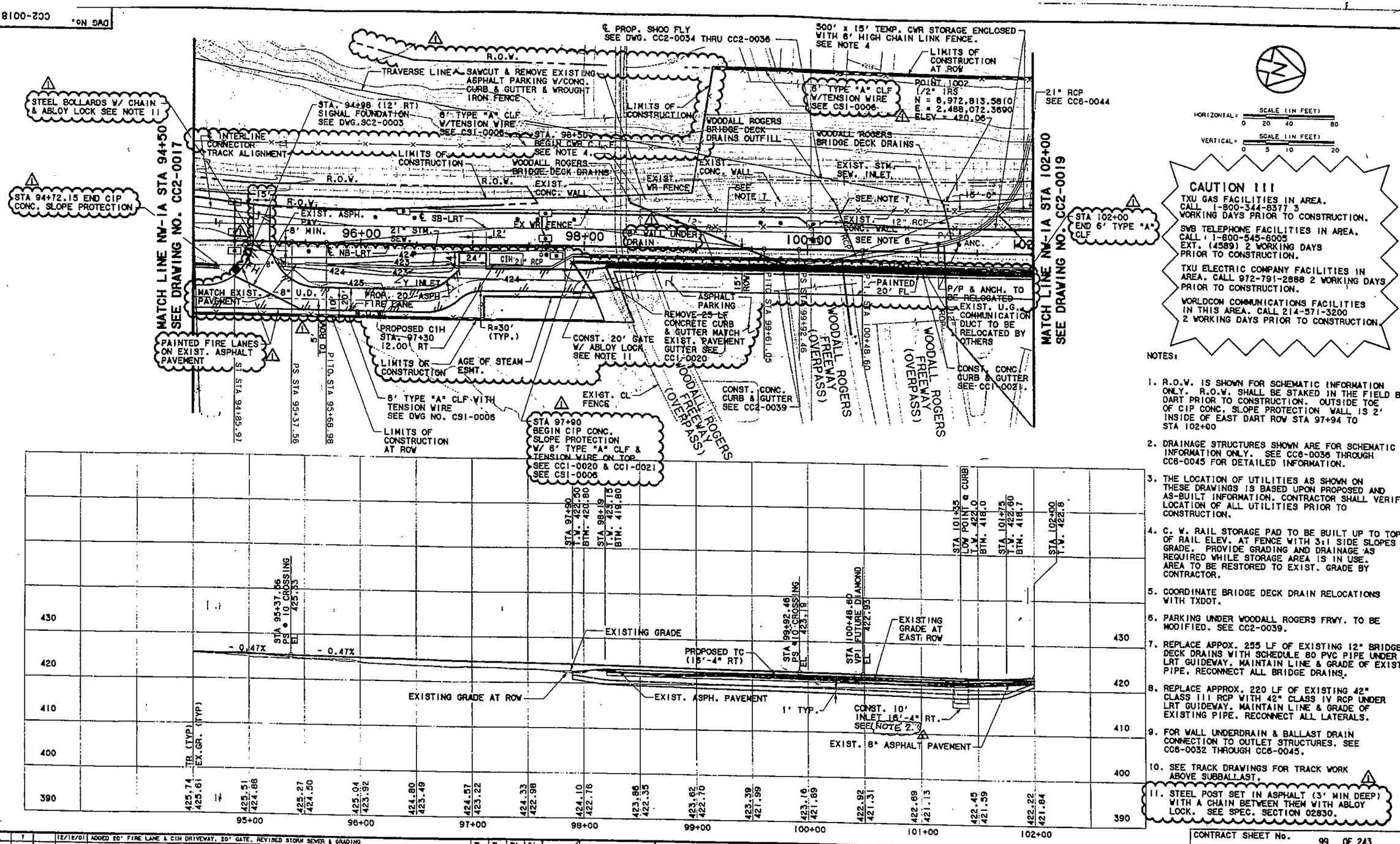
DWG No. CC2-0018



HORIZONTAL = SCALE (IN FEET) 0 20 40 80

VERTICAL = SCALE (IN FEET) 0 5 10 20

CAUTION !!!

TXU GAS FACILITIES IN AREA. CALL 1-800-344-8377 3 WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA. CALL 1-800-545-6005 EXT. (4589) 2 WORKING DAYS PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.

NOTES:

1. R.O.W. IS SHOWN FOR SCHEMATIC INFORMATION ONLY. R.O.W. SHALL BE STAKED IN THE FIELD BY DART PRIOR TO CONSTRUCTION. OUTSIDE TOE OF CIP CONC. SLOPE PROTECTION WALL IS 2' INSIDE OF EAST DART ROW STA 97+94 TO STA 102+00
2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC6-0036 THROUGH CC6-0045 FOR DETAILED INFORMATION.
3. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. C. W. RAIL STORAGE PAD TO BE BUILT UP TO TOP OF RAIL ELEV. AT FENCE WITH 3:1 SIDE SLOPES TO GRADE. PROVIDE GRADING AND DRAINAGE AS REQUIRED WHILE STORAGE AREA IS IN USE. AREA TO BE RESTORED TO EXIST. GRADE BY CONTRACTOR.
5. COORDINATE BRIDGE DECK DRAIN RELOCATIONS WITH TXDOT.
6. PARKING UNDER WOODALL ROGERS FRWY. TO BE MODIFIED. SEE CC2-0039.
7. REPLACE APPOX. 255 LF OF EXISTING 12" BRIDGE DECK DRAINS WITH SCHEDULE 80 PVC PIPE UNDER LRT GUIDEWAY. MAINTAIN LINE & GRADE OF EXIST. PIPE. RECONNECT ALL BRIDGE DRAINS.
8. REPLACE APPROX. 220 LF OF EXISTING 42" CLASS III RCP WITH 42" CLASS IV RCP UNDER LRT GUIDEWAY. MAINTAIN LINE & GRADE OF EXISTING PIPE. RECONNECT ALL LATERALS.
9. FOR WALL UNDERDRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES. SEE CC6-0032 THROUGH CC6-0045.
10. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.
11. STEEL POST SET IN ASPHALT (3' MIN DEEP) WITH A CHAIN BETWEEN THEM WITH ABLOY LOCK. SEE SPEC. SECTION 02830.

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1			12/18/01	ADDED 20' FIRE LANE & CIH DRIVEWAY, 20' GATE, REVISED STORM SEWER & GRADING	BL	RL	BK	PJ

STATE OF TEXAS BRUCE HORNE 85811 REGISTERED PROFESSIONAL ENGINEER 12-17-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV

Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

DAES

CONTRACT SHEET No. 99 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 94+50 STA 102+00

CONTRACT C-1003853-01 | DWG No. CC2-0018 | REV 1

CONFORMED

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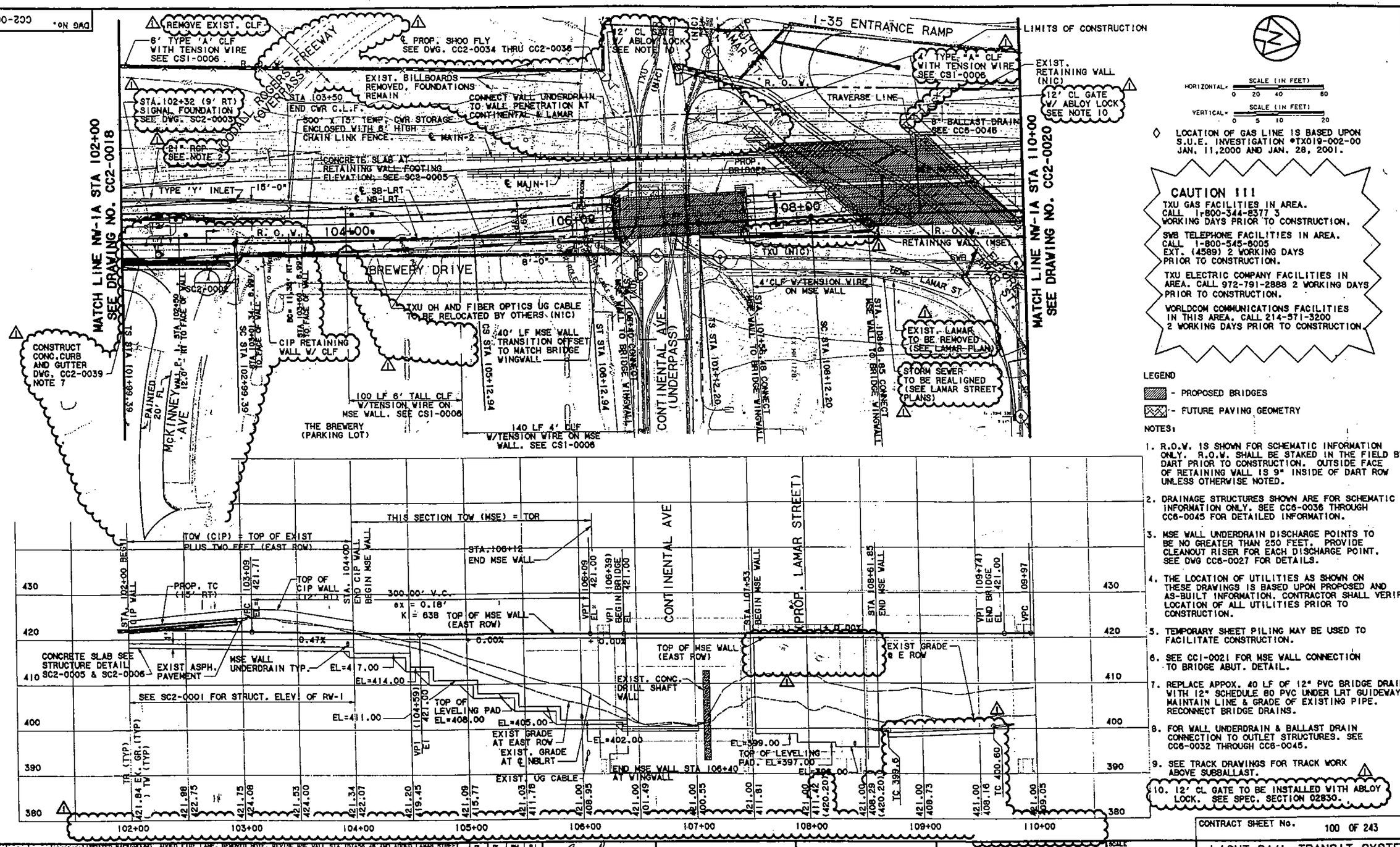

HORIZONTAL: SCALE (IN FEET) 0 20 40 80

VERTICAL: SCALE (IN FEET) 0 5 10 20

◇ LOCATION OF GAS LINE IS BASED UPON S.U.E. INVESTIGATION #TX019-002-00 JAN. 11,2000 AND JAN. 28, 2001.

CAUTION !!!

TXU GAS FACILITIES IN AREA. CALL 1-800-344-8377 3 WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA. CALL 1-800-545-6005 EXT. (4589) 2 WORKING DAYS PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION

LEGEND

- PROPOSED BRIDGES
- FUTURE PAVING GEOMETRY

NOTES:

1. R.O.W. IS SHOWN FOR SCHEMATIC INFORMATION ONLY. R.O.W. SHALL BE STAKED IN THE FIELD BY DART PRIOR TO CONSTRUCTION. OUTSIDE FACE OF RETAINING WALL IS 9" INSIDE OF DART ROW UNLESS OTHERWISE NOTED.
2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC6-0036 THROUGH CC6-0045 FOR DETAILED INFORMATION.
3. MSE WALL UNDERDRAIN DISCHARGE POINTS TO BE NO GREATER THAN 250 FEET. PROVIDE CLEANOUT RISER FOR EACH DISCHARGE POINT. SEE DWG CC6-0027 FOR DETAILS.
4. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
5. TEMPORARY SHEET PILING MAY BE USED TO FACILITATE CONSTRUCTION.
6. SEE CC1-0021 FOR MSE WALL CONNECTION TO BRIDGE ABUT. DETAIL.
7. REPLACE APPOX. 40 LF OF 12" PVC BRIDGE DRAIN WITH 12" SCHEDULE 80 PVC UNDER LRT GUIDEWAY. MAINTAIN LINE & GRADE OF EXISTING PIPE. RECONNECT BRIDGE DRAINS.
8. FOR WALL UNDERDRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES. SEE CC6-0032 THROUGH CC6-0045.
9. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.
10. 12' CL GATE TO BE INSTALLED WITH ABLOY LOCK. SEE SPEC. SECTION 02830.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1			12/17/01	UPDATED BACKGROUND, ADDED FIRE LANE, REMOVED NOTE, REVISE MSE WALL STA 107+56.48 AND ADDED LAMAR STREET IMPROVEMENTS TO BACKGROUND, REVISED INTRUSION FENCE ALONG WEST SIDE, DELETED REFERENCE TO CSI-0021 ADDED MISSING PROFILE STATIONING, REVISED MSE WALL TOP IN PROFILE	BL	RL	BH	PJ

STATE OF TEXAS — BRUCE HORNE — 85811 — REGISTERED PROFESSIONAL ENGINEER — 12.19.01

Lockwood, Andrews & Newnam, Inc.

LAN/STV

Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

CAES

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 100 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 102+00 STA 110+00

CONTRACT C-1003853-01 | DWG No. CC2-0019 | REV 1

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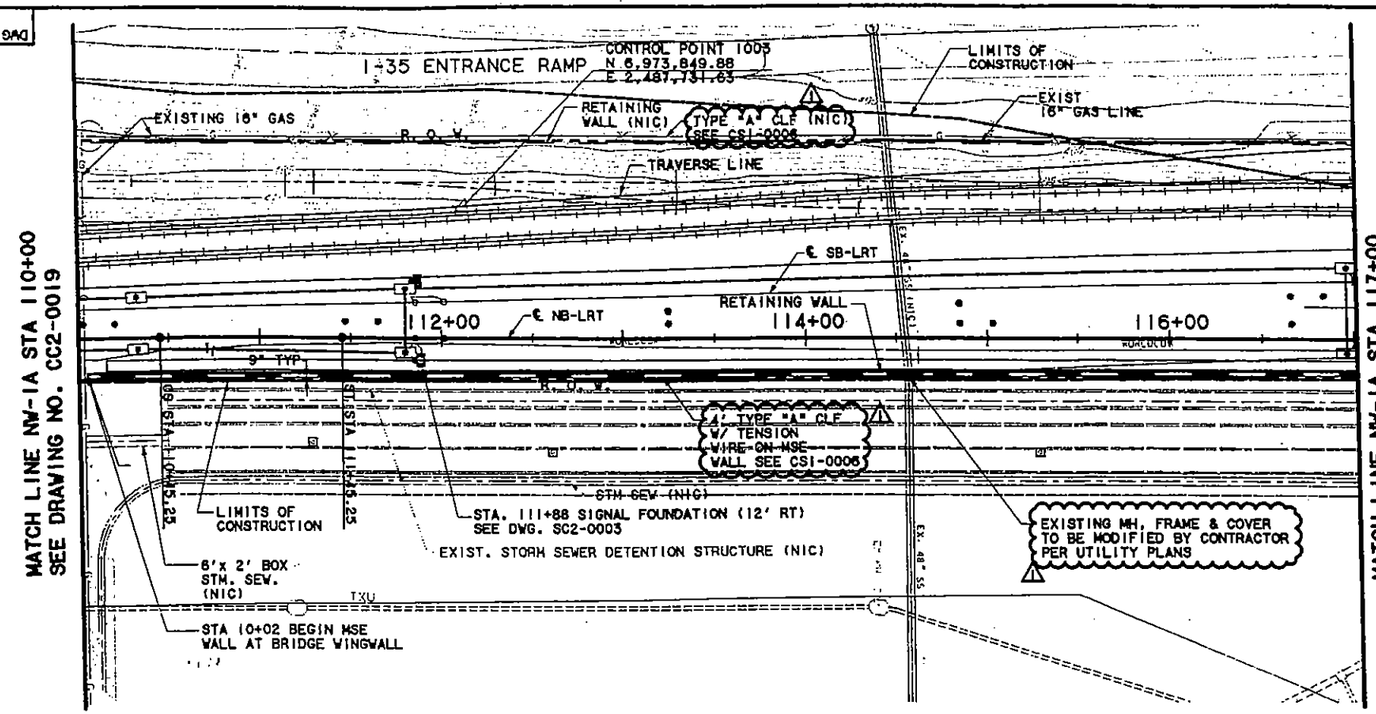

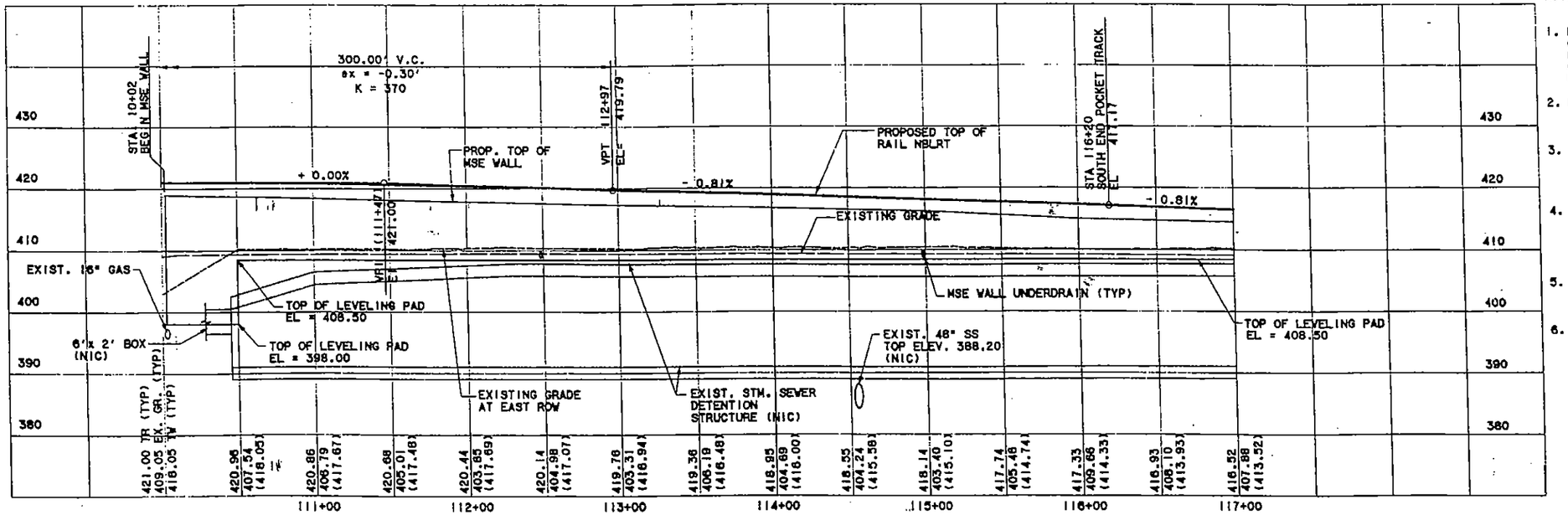

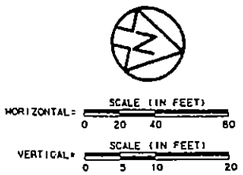

◊ LOCATION OF GAS LINE IS BASED UPON S.U.E. INVESTIGATION #TX019-002-00 JAN. 11,2000 AND JAN. 28, 2001.

CAUTION !!!

TXU GAS FACILITIES IN AREA. CALL 1-800-344-8377 3 WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA. CALL 1-800-545-6005 EXT. (4589) 2 WORKING DAYS PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.

NOTES:

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2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC6-0036 THROUGH CC6-0045 FOR DETAILED INFORMATION.
3. MSE WALL UNDERDRAIN DISCHARGE POINTS TO BE NO GREATER THAN 250 FEET. PROVIDE CLEANOUT RISER FOR EACH DISCHARGE POINT. SEE DWG CC6-0027 FOR DETAILS.
4. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
5. FOR WALL UNDERDRAIN AND BALLAST DRAIN CONNECTION TO OUTFALL STRUCTURES OR PIPE SEE CC6-0032 THROUGH CC6-0045.
6. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1			12/17/01	ADDED FENCE CALLOUTS ON TOP OF MSE WALLS, MODIFY EXISTING MANHOLE MODIFICATION NOTE STA 114+55	BL	RL	BH	PJ

STATE OF TEXAS BRUCE HORNE 85811 REGISTERED PROFESSIONAL ENGINEER 12-17-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 101 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 110+00 STA 117+00

CAES | CONTRACT C-1003853-01 | DWG No. CC2-0020 | REV 1

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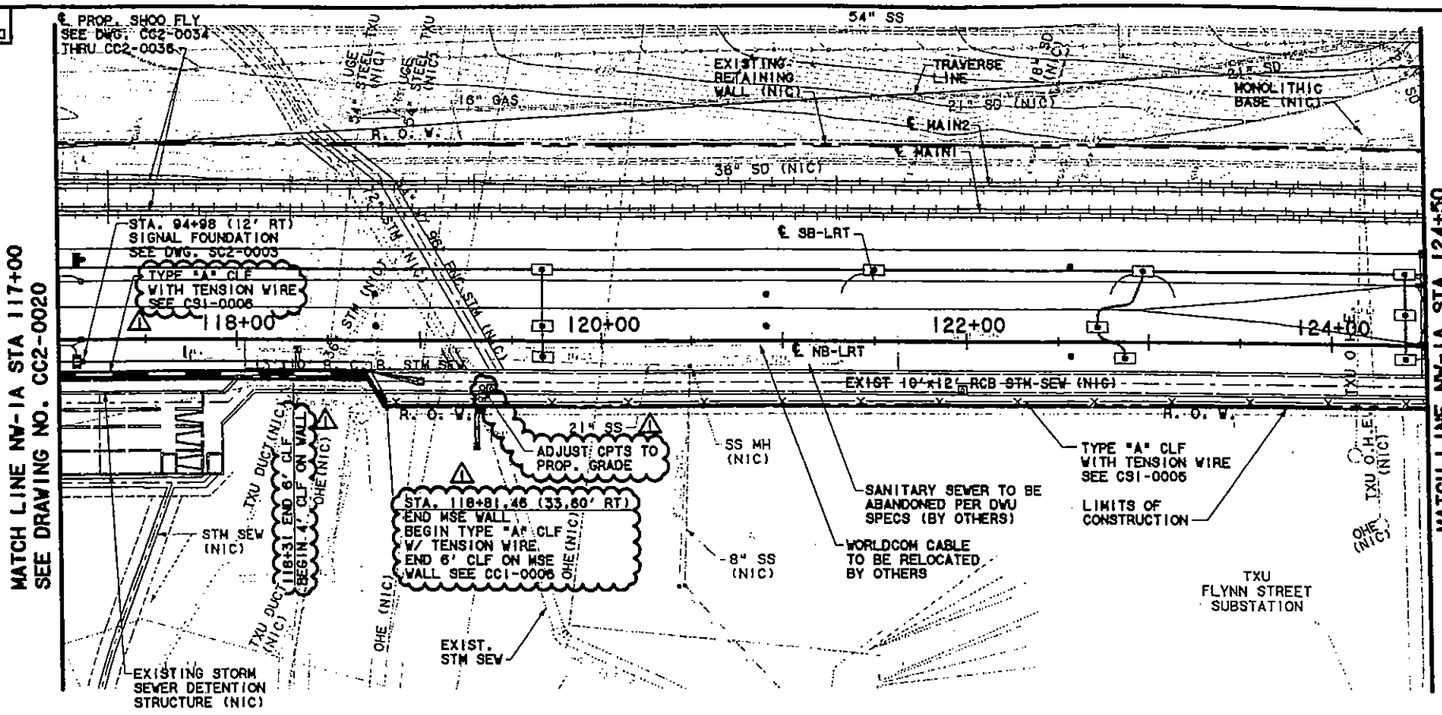


HORIZONTAL: SCALE (IN FEET) 0 20 40 80

VERTICAL: SCALE (IN FEET) 0 5 10 20

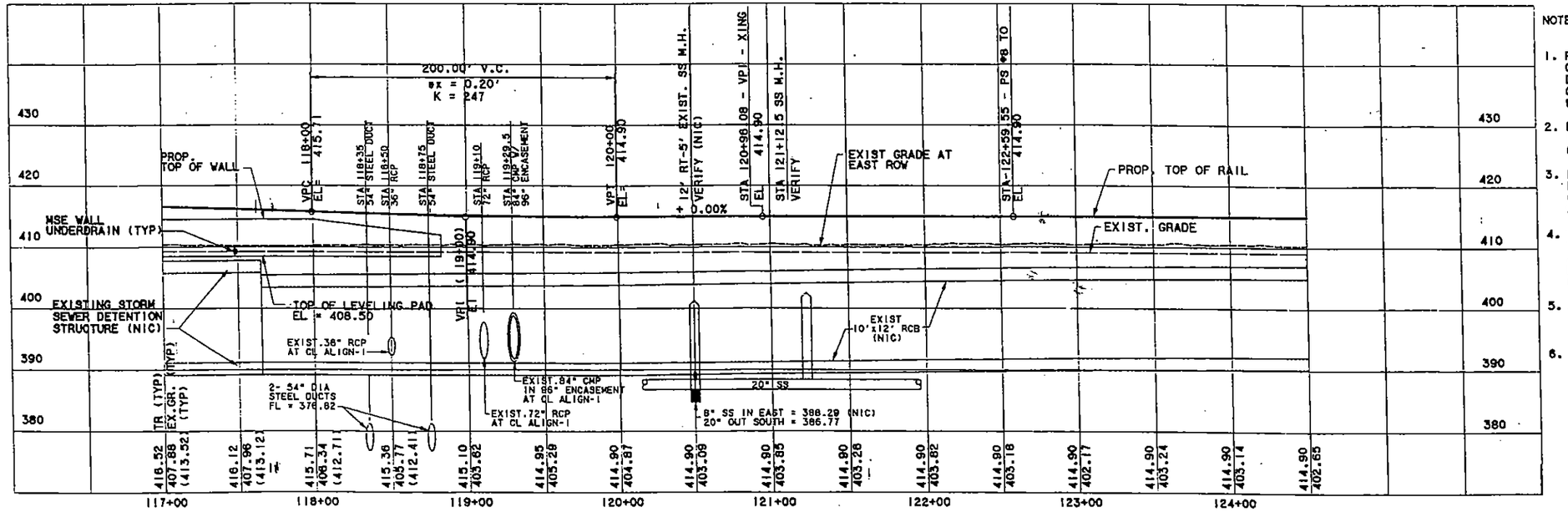
CAUTION !!!

TXU GAS FACILITIES IN AREA.
CALL 1-800-344-8377 3
WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA.
CALL 1-800-545-6005
EXT. (4569) 2 WORKING DAYS
PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.



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4. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
5. FOR WALL UNDERDRAIN AND BALLAST DRAIN CONNECTION TO OUTFALL STRUCTURES OR PIPE SEE CC6-0032 THROUGH CC6-0045.
6. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1			12/17/01	ADJUSTED CPTS TO GRADE	BL	RL	BH	PJ

STATE OF TEXAS BRUCE HORNE 85811 REGISTERED PROFESSIONAL ENGINEER 12-17-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	D. HERRERA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

DAES

CONTRACT SHEET No. 102 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 117+00 STA 124+50

CONTRACT C-1003853-01 | DWG No. CC2-0021 | REV 1

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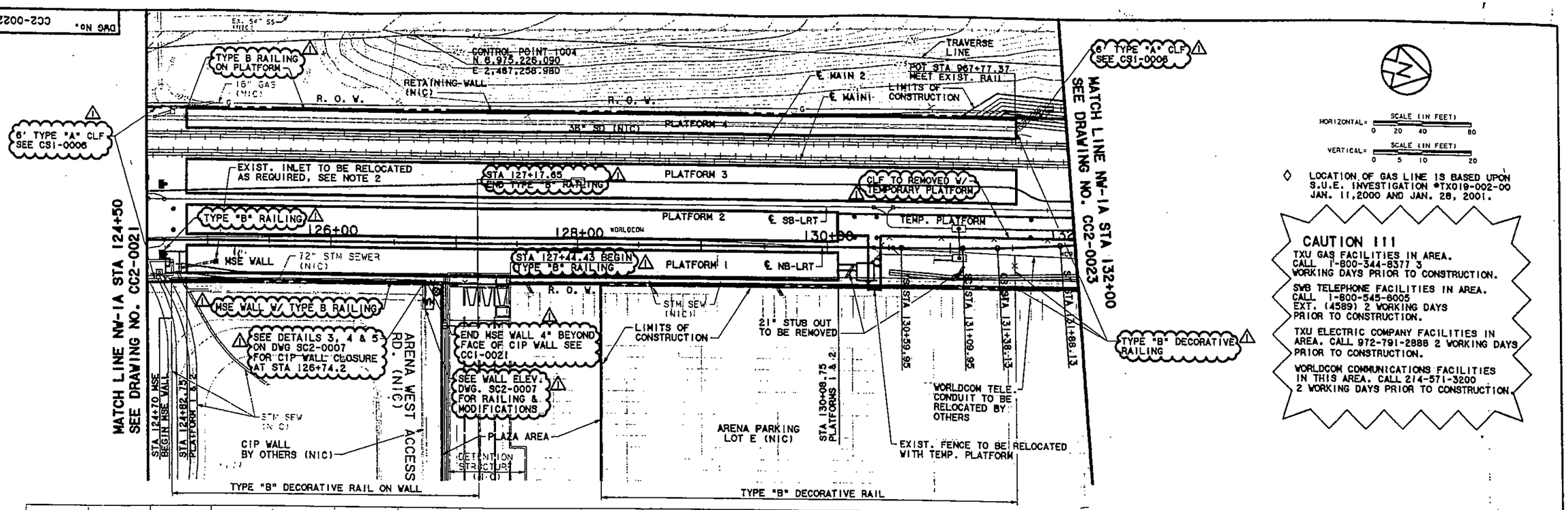
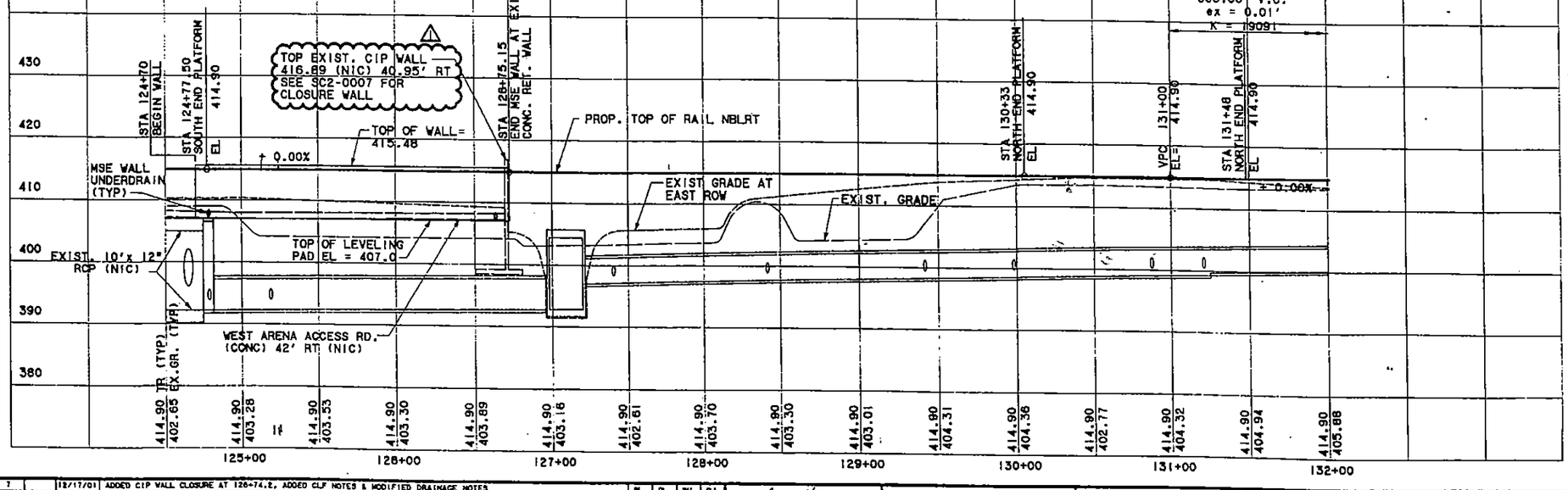
DRG No. CC2-0022





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3. MSE WALL UNDERDRAIN DISCHARGE POINTS TO BE NO GREATER THAN 250 FEET. PROVIDE CLEANOUT RISER FOR EACH DISCHARGE POINT. SEE DWG CC6-0027 FOR DETAILS.
4. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
5. FOR BALLAST DRAIN & UNDER DRAIN CONNECTIONS TO OUTLET STRUCTURES SEE CC6-0032 THROUGH CC6-0045. FOR BALLAST DRAIN THROUGH PLATFORMS SEE CC1-0016.
6. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
7			12/17/01	ADDED CIP WALL CLOSURE AT 126+74.2, ADDED CLF NOTES & MODIFIED DRAINAGE NOTES	BL	RL	BH	PJ

BRUCE HORNE 83511 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 12-17-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CAES

CONTRACT SHEET No. 103 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 124+50 STA 132+00

CONTRACT C-1003853-01 | DWG No. CC2-0022 | REV 1

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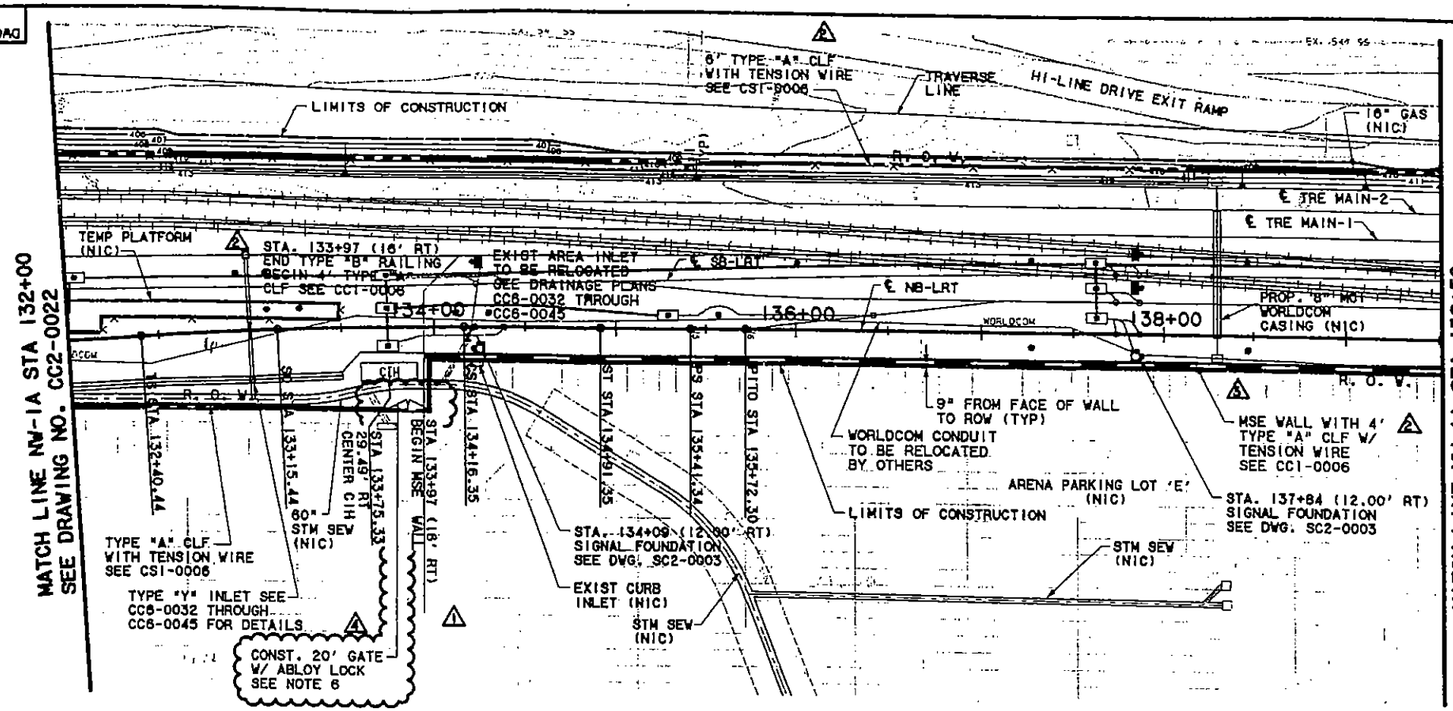


HORIZONTAL = SCALE (IN FEET) 0 20 40 80

VERTICAL = SCALE (IN FEET) 0 5 10 20

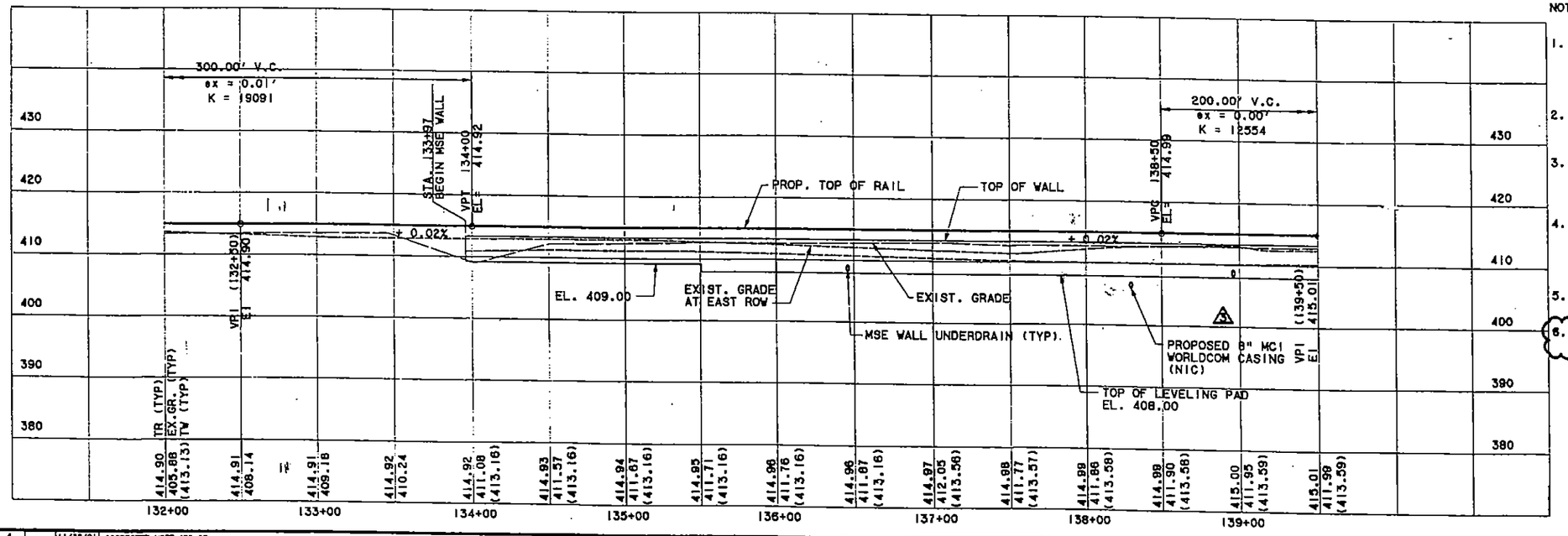
CAUTION !!!

TXU GAS FACILITIES IN AREA.
CALL 1-800-344-8377 3
WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA.
CALL 1-800-545-6005
EXT. (4589) 2 WORKING DAYS
PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.



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4. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
5. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.
6. INTRUSION FENCE GATES SHALL HAVE ABLOY LOCKS SEE SPEC. SECTION 02830.

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
4			11/28/01	CORRECTED NOTE 133+97	RL	RL	BH	PJ
7			12/17/01	ADDED FENCE TYPE & LOCATIONS	RL	RL	BH	PJ
9			1/07/02	ADDED PROPOSED 8" MCI WORLDCOM CASING (NIC)	RL	RL	BH	PJ
10			1/16/02	ADDED 20' GATE AND NOTE 6	RL	RL	BH	PJ

STATE OF TEXAS — BRUCE HORNE 85817 — REGISTERED PROFESSIONAL ENGINEER — 1-16-02

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 104 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 132+00 STA 139+50

CAES

CONTRACT C-1003853-01 | DWG No. CC2-0023 | REV 4

CONFORMED

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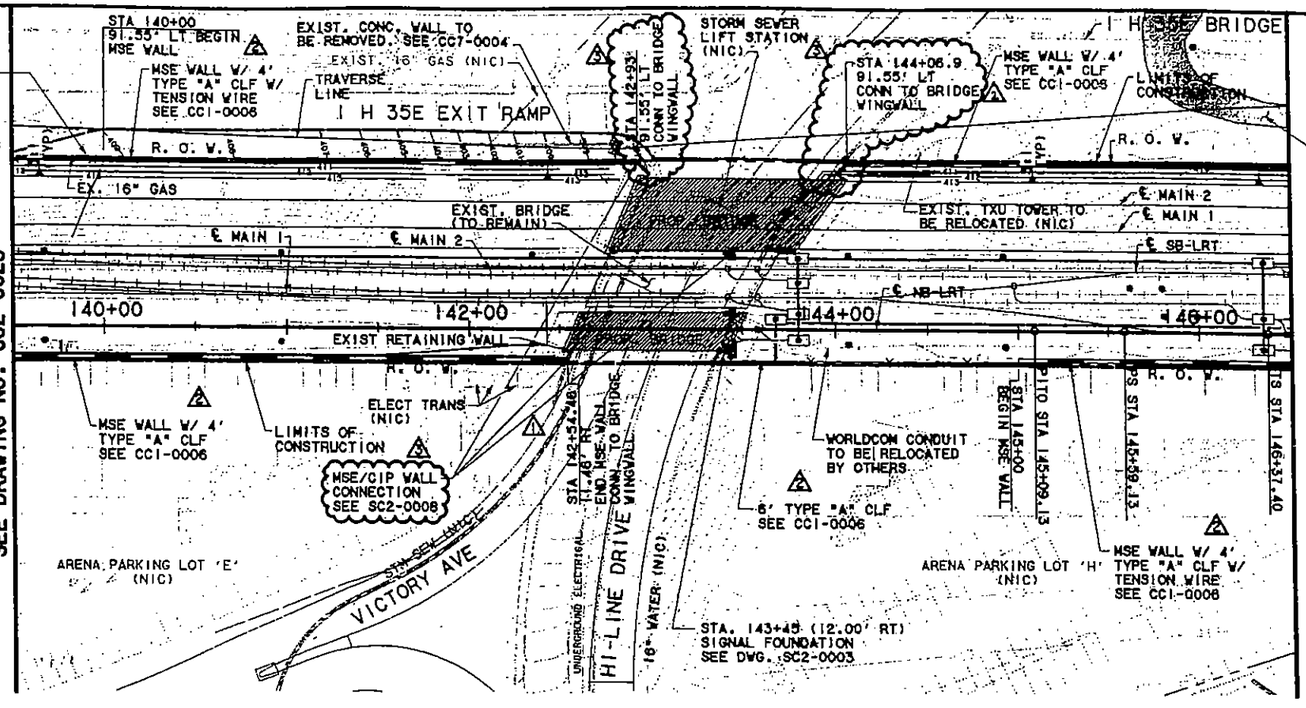
DWG NO. CC2-0024

LOCATION OF 16"GAS LINE AS SHOWN ON THESE DRAWINGS IS BASED UPON S.U.E. INVESTIGATION #TX019-002-00 PERFORMED BY TBE GROUP, INC. ON JAN. 11, 2001 & JAN. 28, 2001, AS WELL AS ASSUMED DEPTHS FROM EXISTING GRADE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF GAS LINE PRIOR TO CONSTRUCTION.



LEGEND

▨ - PROPOSED BRIDGES

⚠2 CONTRACTOR ACCESS ROAD

HORIZONTAL = SCALE (IN FEET) 0 20 40 80

VERTICAL = SCALE (IN FEET) 0 5 10 20

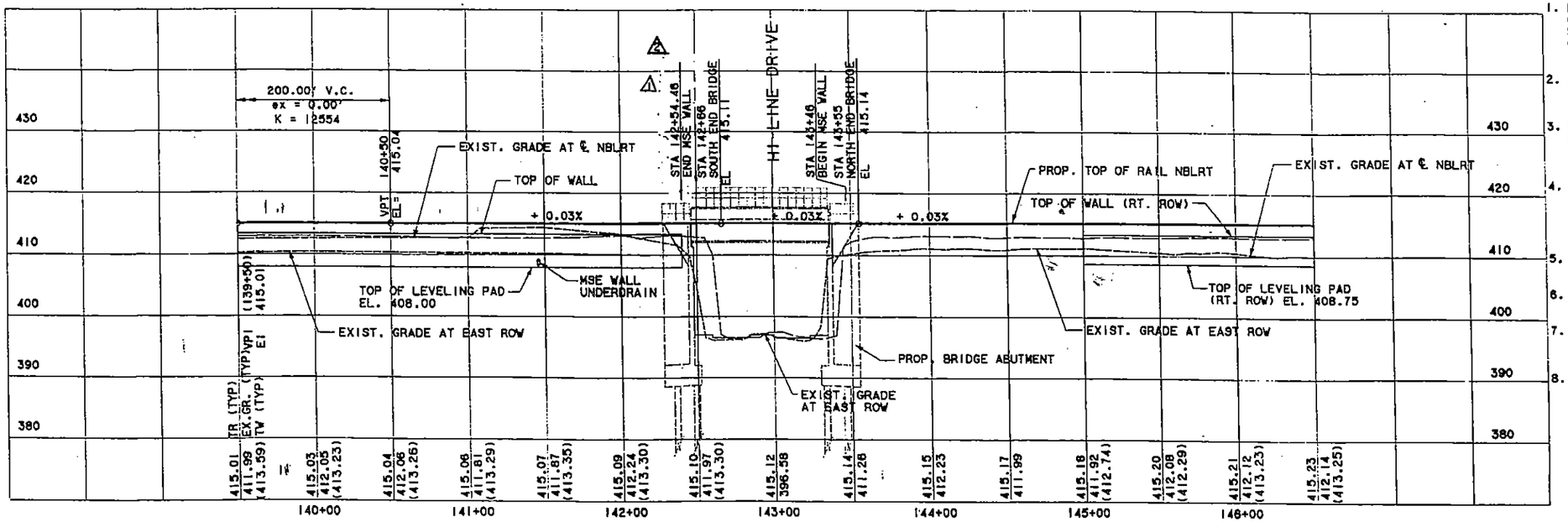
CAUTION !!!

TXU GAS FACILITIES IN AREA. CALL 1-800-344-8377 3 WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA. CALL 1-800-545-6005 EXT. (4589) 2 WORKING DAYS PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2868 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCON COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.



NOTES:

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5. SEE DEMOLITION SHEET CC7-0003 FOR RETAINING WALL REMOVAL PLAN.
6. SEE CC2-0038 FOR TRE (WEST ROW) MSE WALL PROFILES.
7. FOR WALL UNDER DRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES SEE CC6-0032 THROUGH CC6-0045.
8. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	END	CHK	APP
4			11/28/01	CORRECTED END OF WALL STATION, ADDED FENCE LIMITS AND ADDED NOTE	HC	RL	BH	PJ
7			12/17/01	ADDED FENCE LIMITS AND ADDED NOTE. CORRECTED END OF MSE WALL IN PROFILE	HC	RL	BH	PJ
10			1/18/02	REVISED END OF MSE WALLS (STATIONS) PER WINGWALL LOCATIONS	RL	RL	BH	PJ

BRUCE HORNE 85511 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 1-18-02

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CAES

CONTRACT SHEET No. 105 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 139+50 STA 146+50

CONTRACT C-1003853-01 | DWG No. CC2-0024 | REV 3

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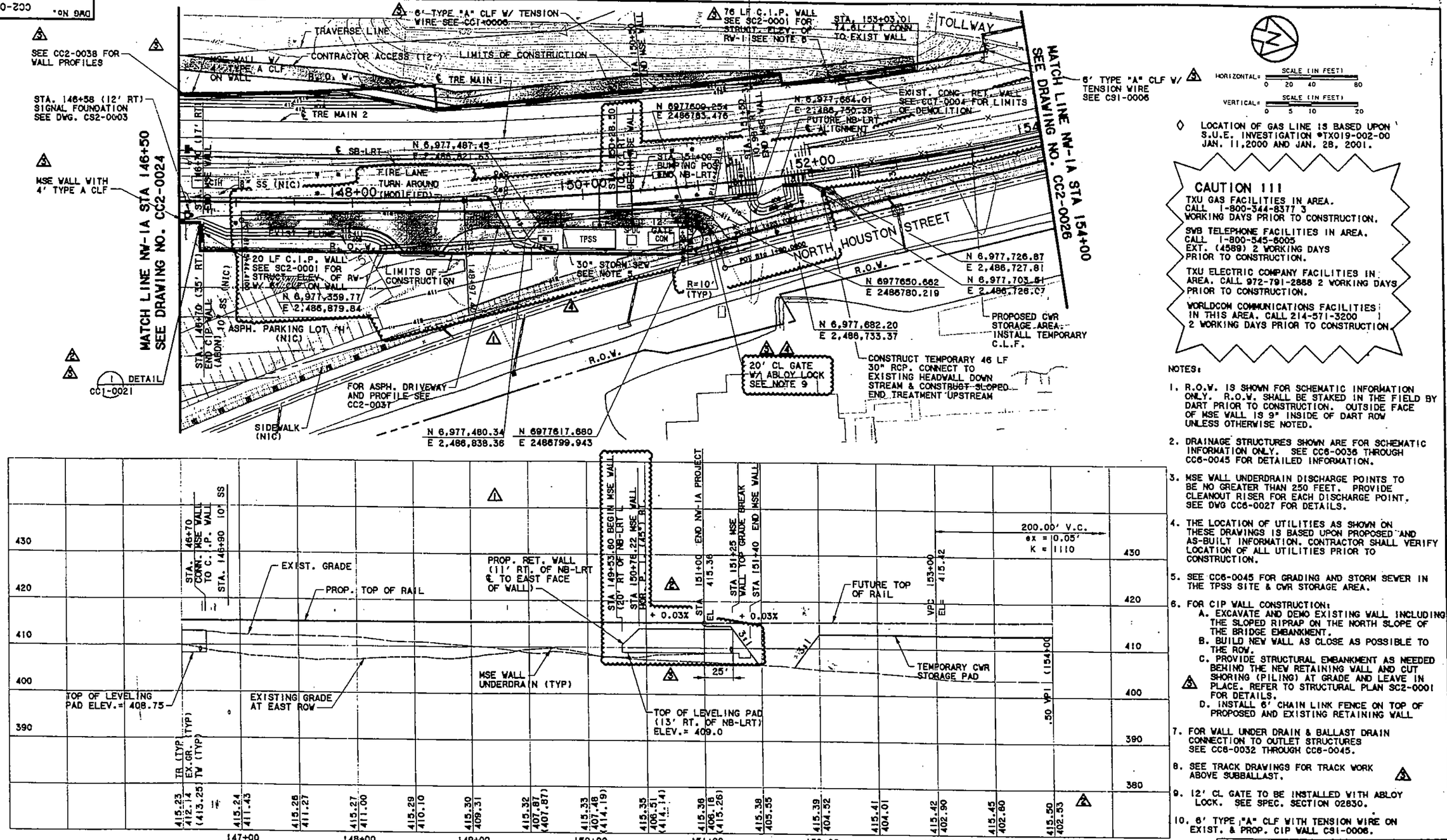
DWG NO. CC2-0025



NOTES:

1. R.O.W. IS SHOWN FOR SCHEMATIC INFORMATION ONLY. R.O.W. SHALL BE STAKED IN THE FIELD BY DART PRIOR TO CONSTRUCTION. OUTSIDE FACE OF MSE WALL IS 9" INSIDE OF DART ROW UNLESS OTHERWISE NOTED.
2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC6-0036 THROUGH CC6-0045 FOR DETAILED INFORMATION.
3. MSE WALL UNDERDRAIN DISCHARGE POINTS TO BE NO GREATER THAN 250 FEET. PROVIDE CLEANOUT RISER FOR EACH DISCHARGE POINT. SEE DWG CC6-0027 FOR DETAILS.
4. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
5. SEE CC6-0045 FOR GRADING AND STORM SEWER IN THE TPSS SITE & CWR STORAGE AREA.
6. FOR CIP WALL CONSTRUCTION:
   A. EXCAVATE AND DEMO EXISTING WALL INCLUDING THE SLOPED RIPRAP ON THE NORTH SLOPE OF THE BRIDGE EMBANKMENT.
   B. BUILD NEW WALL AS CLOSE AS POSSIBLE TO THE ROW.
   C. PROVIDE STRUCTURAL EMBANKMENT AS NEEDED BEHIND THE NEW RETAINING WALL AND CUT SHORING (PILING) AT GRADE AND LEAVE IN PLACE. REFER TO STRUCTURAL PLAN SC2-0001 FOR DETAILS.
   D. INSTALL 6' CHAIN LINK FENCE ON TOP OF PROPOSED AND EXISTING RETAINING WALL
7. FOR WALL UNDER DRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES SEE CC6-0032 THROUGH CC6-0045.
8. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.
9. 12' CL GATE TO BE INSTALLED WITH ABLOY LOCK. SEE SPEC. SECTION 02830.
10. 6' TYPE "A" CLF WITH TENSION WIRE ON EXIST. & PROP. CIP WALL CS1-0006.

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
2			10/24/01	MODIFIED PAVING, GRADING, WALL & FENCE, ADDED SIDEWALK	HC	RL	BH	PJ
4			11/28/01	REVISED DRIVE & TPSS, SPOC, CON PADS, CONTINUE STATIONING	BL	RL	BH	PJ
7			12/17/01	REVISED DRIVE & TPSS, SPOC, CON PADS, CORRECTED PROFILE STATIONING ADDED CONTRACTOR ACCESS ROAD TO TTA WALL ADDED FENCE LIMITS	BL	RL	BH	PJ
10			1/16/02	MODIFIED PAVING, GRADING, WALL & CRV FENCE MODIFIED GATE SIZE & MSE WALL PROFILE.	HC	RL	BH	PJ

STATE OF TEXAS BRUCE HORNE 83811 REGISTERED PROFESSIONAL ENGINEER 1-16-02

LAN Lockwood, Andrews & Newnam, Inc.

LAN/STV Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	24 OCTOBER 01

CAES

CONTRACT SHEET No. 106 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

GUIDEWAY PLAN & PROFILE
STA 146+50 STA 154+00

CONTRACT C-1003853-01 | DWG No. CC2-0025 | REV 4

CONFORMED

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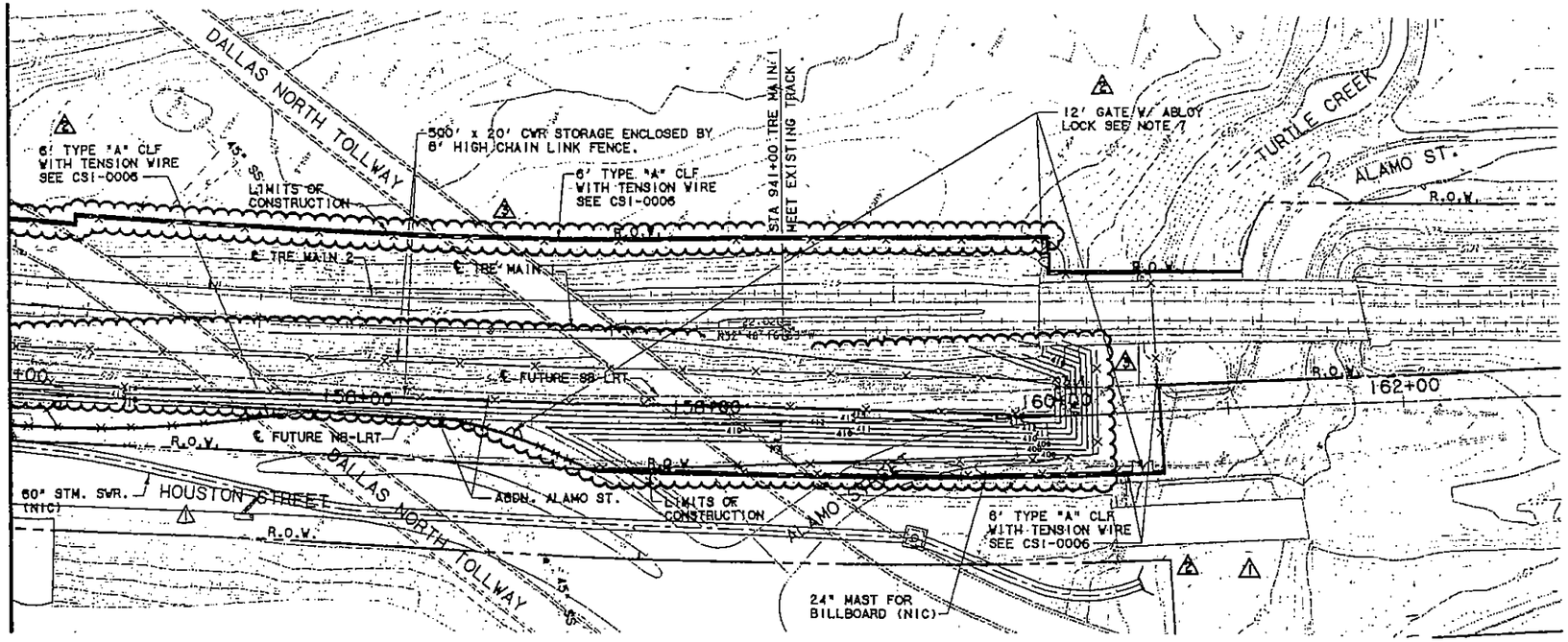
DWG No. CC2-0026



HORIZONTAL: SCALE (IN FEET) 0 20 40 80

VERTICAL: SCALE (IN FEET) 0 5 10 20

◇ LOCATION OF GAS LINE IS BASED UPON S.U.E. INVESTIGATION #TX019-002-00 JAN. 11,2000 AND JAN. 28, 2001.

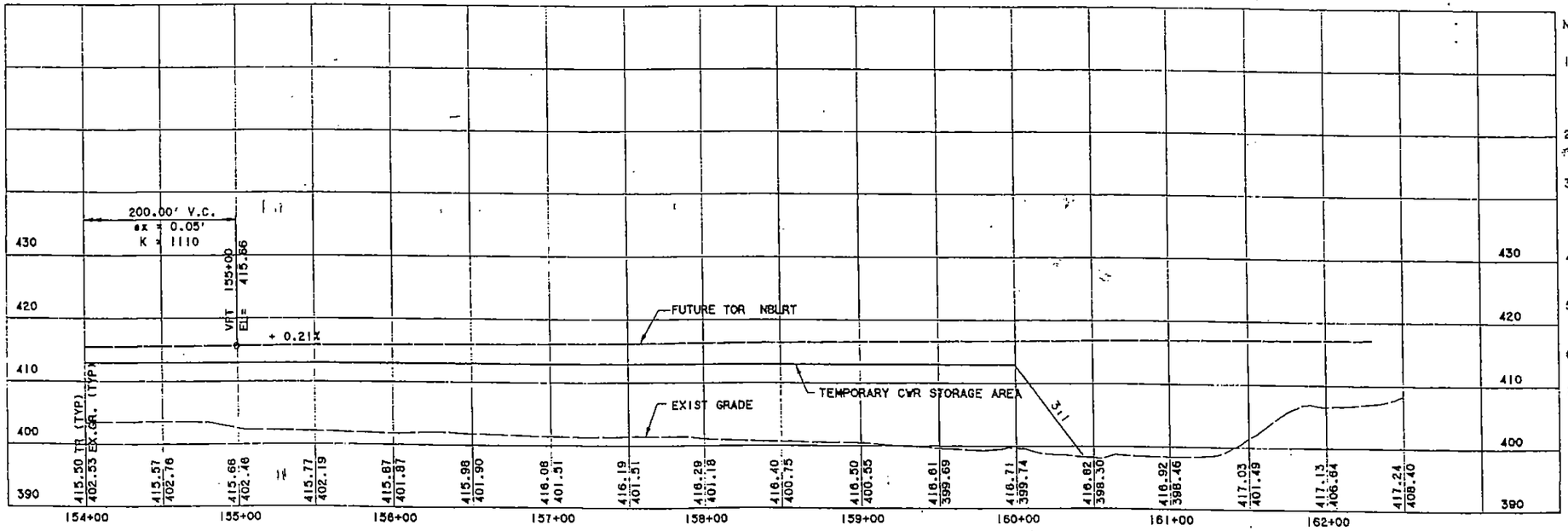
CAUTION !!!

TXU GAS FACILITIES IN AREA. CALL 1-800-344-8377 3 WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA. CALL 1-800-545-6005 EXT. (45891 2 WORKING DAYS PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION



NOTES:

1. R.O.W. IS SHOWN FOR SCHEMATIC INFORMATION ONLY. R.O.W. SHALL BE STAKED IN THE FIELD BY DART PRIOR TO CONSTRUCTION. OUTSIDE FACE OF RETAINING WALL IS 9" INSIDE OF DART ROW UNLESS OTHERWISE NOTED.
2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC6-0036 THROUGH CC6-0045 FOR DETAILED INFORMATION.
3. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. TEMPORARY CWR FENCING IS TO BE REMOVED AND STORAGE PAD IS TO BE RETURNED TO LINE AND GRADE PRIOR TO START OF CONSTRUCTION.
5. FOR WALL UNDERDRAIN AND BALLAST DRAIN CONNECTION TO OUTFALL STRUCTURES OR PIPE SEE CC6-0032 THROUGH CC6-0045.
6. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.
7. 12' CL GATE TO BE INSTALLED WITH ABLOY LOCK. SEE SPEC. SECTION 02830.

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
4			11/28/01	REMOVED TEMP 16' ASPHALT DRIVE ADDED NOTE, DASHED TOR IN PROFILE, REVISED GRADING & FENCE	BL	RL	BH	PJ
7			12/17/01	ADDED NOTE 7 AND ADDED LIMITS OF INTRUSION FENCE GATES W/ LOCKS	BL	RL	BH	PJ
10			1/16/02	MODIFIED GRADING & CWR FENCE - REMOVED SECOND FENCE & WEST ROW	BL	RL	BH	PJ

BRUCE HORNE 85811 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS
1-16-02

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	05 OCTOBER 01

CONTRACT SHEET No. 107 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A
NW-1A
GUIDEWAY PLAN & PROFILE
STA 154+00 TO STA EOP

DAES

CONTRACT C-1003853-01 | DWG No. CC2-0026 | REV 3

CONFORMED

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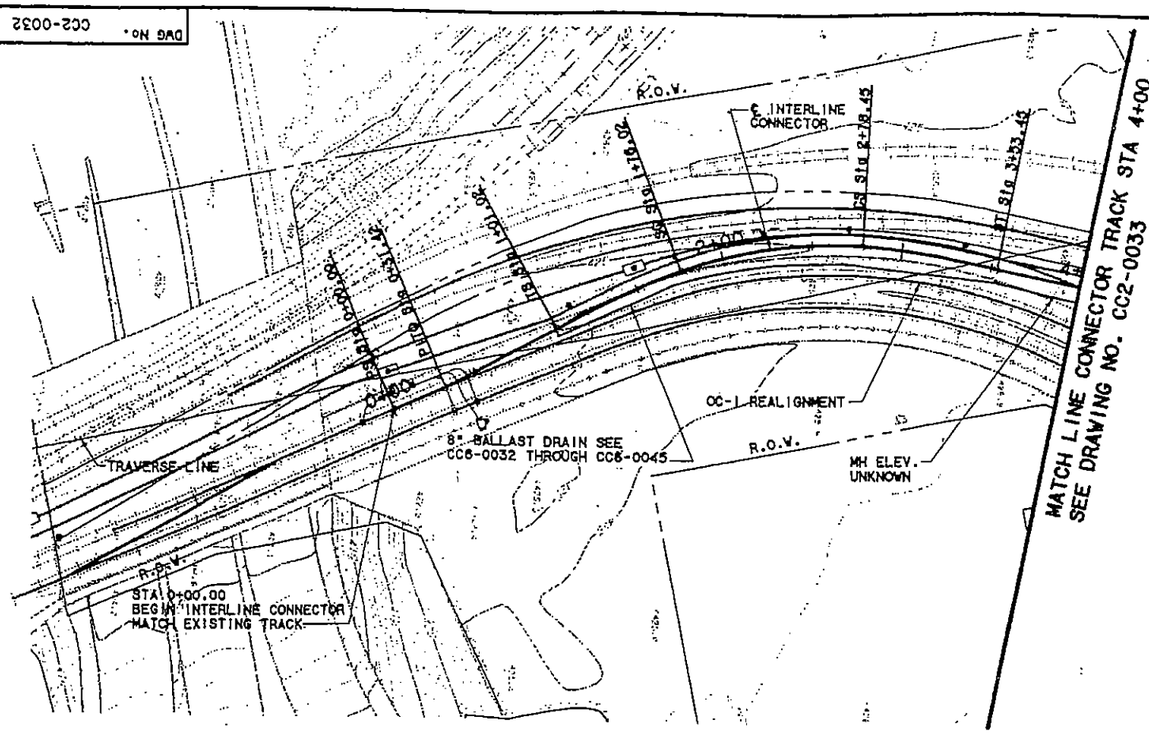

HORIZONTAL = SCALE (IN FEET) 0 20 40 80

VERTICAL = SCALE (IN FEET) 0 5 10 20

CAUTION !!!

TXU GAS FACILITIES IN AREA.
CALL 1-800-344-8377 3
WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA.
CALL 1-800-545-6005
EXT. (4589) 2 WORKING DAYS
PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.

NOTES:

1. CONTRACTOR SHALL NOT DISTURB EXISTING TRACK SUB GRADE, SUBBALLAST, BALLAST, TIE OR RAIL WITHIN 8 FEET OF C/L OF EXISTING OC-1.
2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC8-0036 THROUGH CC8-0045 FOR DETAILED INFORMATION.
3. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. FOR BALLAST DRAIN & UNDERDRAIN CONNECTION TO OUTLET STRUCTURES. SEE CC8-0032 THROUGH CC8-0045.
5. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

BRUCE HORNE 83611 REGISTERED PROFESSIONAL ENGINEER 10-03-01

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 108 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A
INTERLINE CONNECTOR
GUIDEWAY PLAN & PROFILE
STA 0+00 TO STA 4+00

CONTRACT C-1003853-01 | DWG No. CC2-0032 | REV 0

CONFORMED

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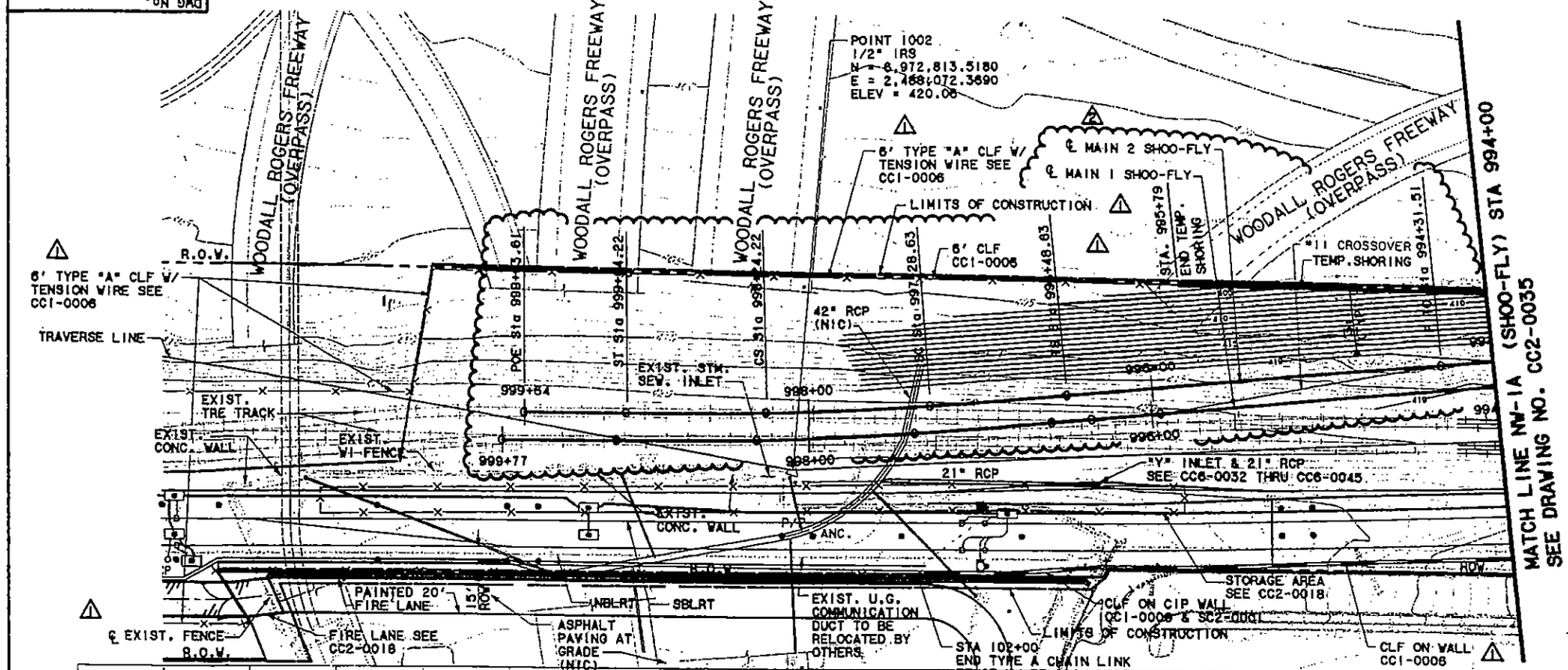

HORIZONTAL = SCALE (IN FEET) 0 20 40 80

VERTICAL = SCALE (IN FEET) 0 5 10 20

CAUTION !!!

TXU GAS FACILITIES IN AREA.
CALL 1-800-344-8377 3
WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA.
CALL 1-800-545-6005
EXT. (4589) 2 WORKING DAYS
PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.

NOTES:

1. R.O.W. IS SHOWN FOR SCHEMATIC INFORMATION ONLY. R.O.W. SHALL BE STAKED IN THE FIELD BY DART PRIOR TO CONSTRUCTION.
2. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
3. FOR WALL UNDERDRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES, SEE CC6-0032 THROUGH CC6-0045.
4. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
7			12/17/01	ADDED FIRE LANE, REVISED CIP WALL ALIGNMEN, UPDATED BACKGROUND. ADDED INTRUSION FENCE LIMITS	BL	RL	BH	PJ
9			01/07/02	ADJUSTED SHOO-FLY ALIGNMENT & GRADING	HC	RL	BH	PJ

BRUCE HORNE 85911 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS

1702

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 109 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

CONTINENTAL SHOO-FLY
GUIDEWAY PLAN & PROFILE
EOP TO STA 994+00

CONTRACT C-1003853-01 | DWG No. CC2-0034 | REV 2

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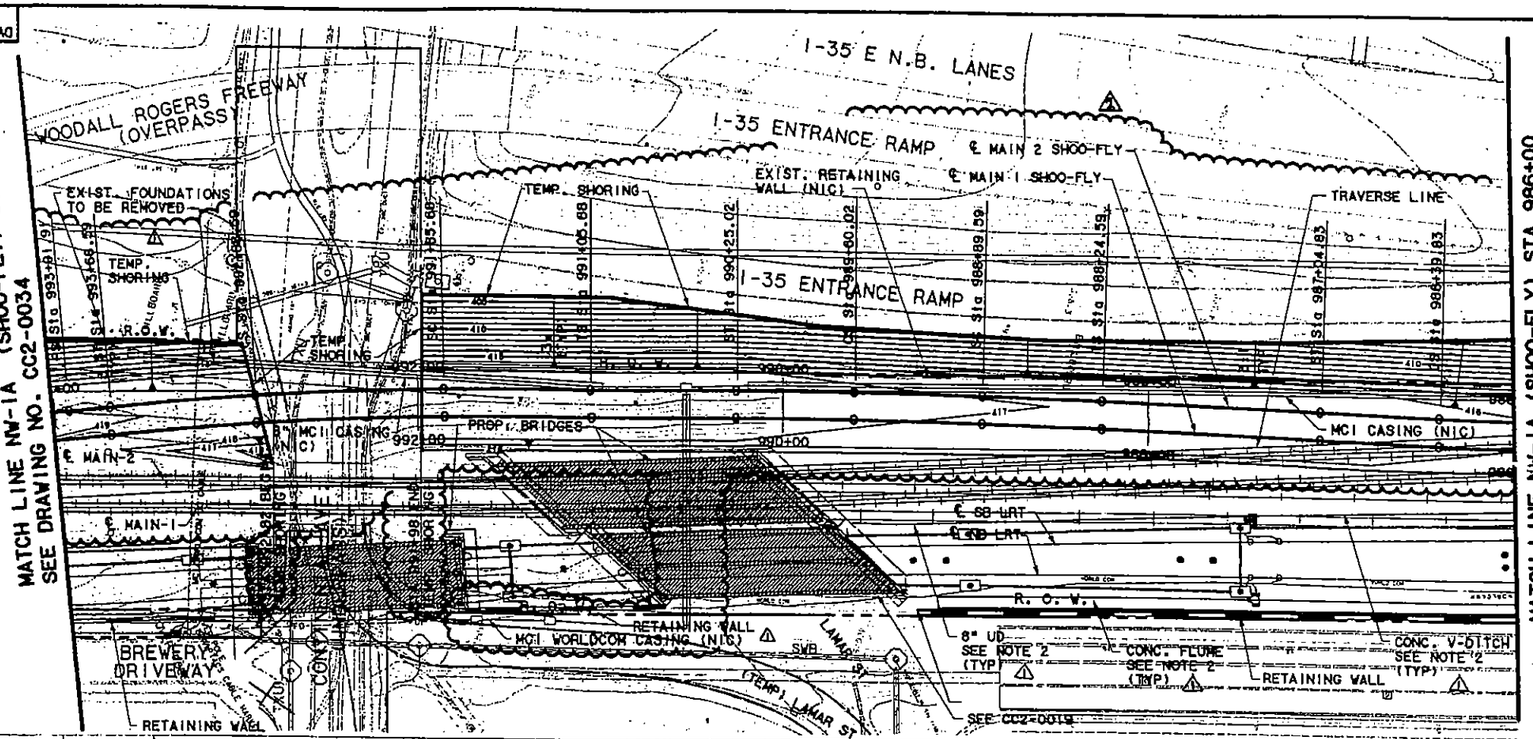

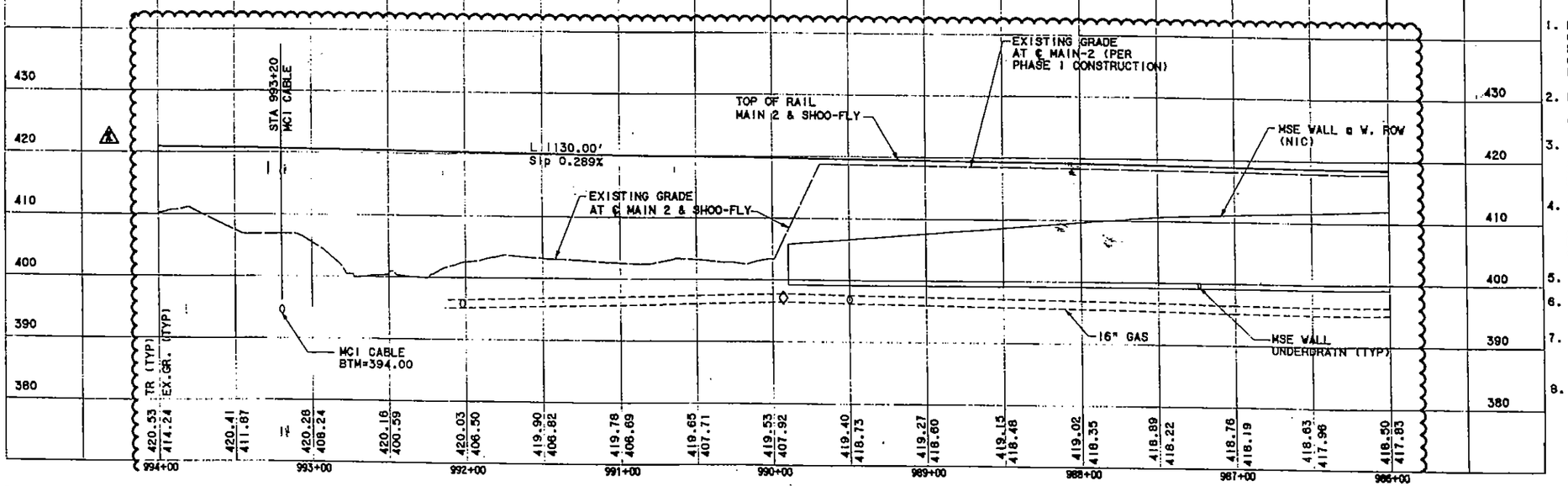

◇ LOCATION OF GAS LINE IS BASED UPON S.U.E. INVESTIGATION #TX019-002-00 JAN. 11,2000 AND JAN. 28, 2001.

CAUTION !!!

TXU GAS FACILITIES IN AREA.
CALL 1-800-344-8377 3
WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA.
CALL 1-800-545-6005
EXT. (4589) 2 WORKING DAYS
PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION

HORIZONTAL: SCALE (IN FEET) 0 20 40 80
VERTICAL: SCALE (IN FEET) 0 5 10 20

LEGEND
- PROPOSED BRIDGES
- FUTURE PAVING GEOMETRY

NOTES:

1. R.O.W. IS SHOWN FOR SCHEMATIC INFORMATION ONLY. R.O.W. SHALL BE STAKED IN THE FIELD BY DART PRIOR TO CONSTRUCTION. OUTSIDE FACE OF RETAINING WALL IS 9" INSIDE OF DART ROW UNLESS OTHERWISE NOTED.
2. DRAINAGE STRUCTURES SHOWN ARE FOR SCHEMATIC INFORMATION ONLY. SEE CC6-0036 THROUGH CC6-0045 FOR DETAILED INFORMATION.
3. MSE WALL UNDERDRAIN DISCHARGE POINTS TO BE NO GREATER THAN 250 FEET. PROVIDE CLEANOUT RISER FOR EACH DISCHARGE POINT. SEE DWG CC6-0027 FOR DETAILS.
4. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
5. SEE CC2-0019 FOR RETAINING WALL CONSTRUCTION.
6. SEE SC8-004 THRU SC8-1067 FOR CONTINENTAL/LAMAR BRIDGE PLANS.
7. FOR WALL UNDERDRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES, SEE CC6-0032 THROUGH CC6-0045.
8. SEE TRACKWORK DRAWINGS FOR TRACKWORK ABOVE SUBBALLAST.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
3	B		01/07/02	ADJUSTED SHOO-FLY ALIGNMENT & GRADING, PROPOSED 8" MCI WORLDCOM CASING LOCATION (NIC)	HC	RL	BH	PJ
4			11/28/01	UPDATED BACKGROUND, REVISED MSE WALL, ADDED NOTES	HC	RJL	BW	PJ

BRUCE HORNE 83811 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS
1-7-02

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	03 OCTOBER 01

CONTRACT SHEET No. 110 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

CONTINENTAL SHOO-FLY
GUIDEWAY PLAN & PROFILE
STA 994+00 TO STA 986+00

CAES | CONTRACT C-1003853-01 | DWG No. CC2-0035 | REV 2

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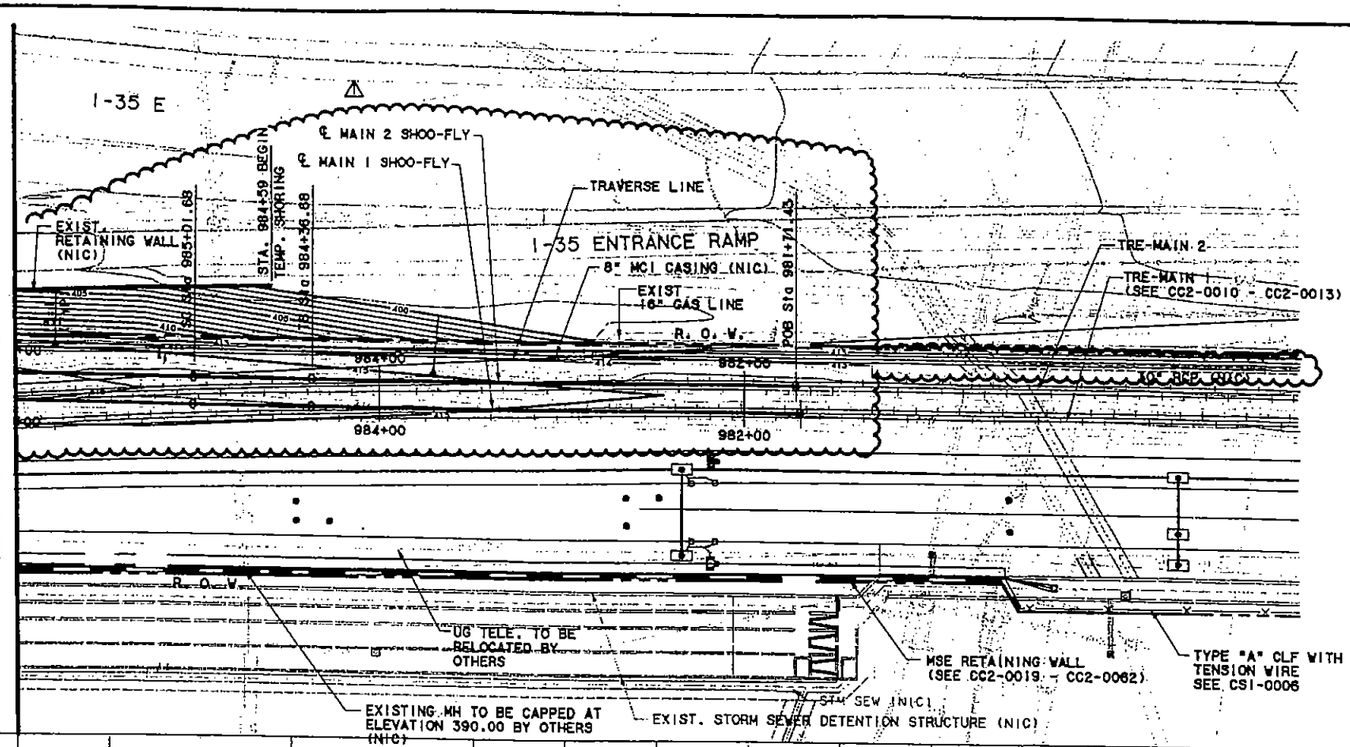
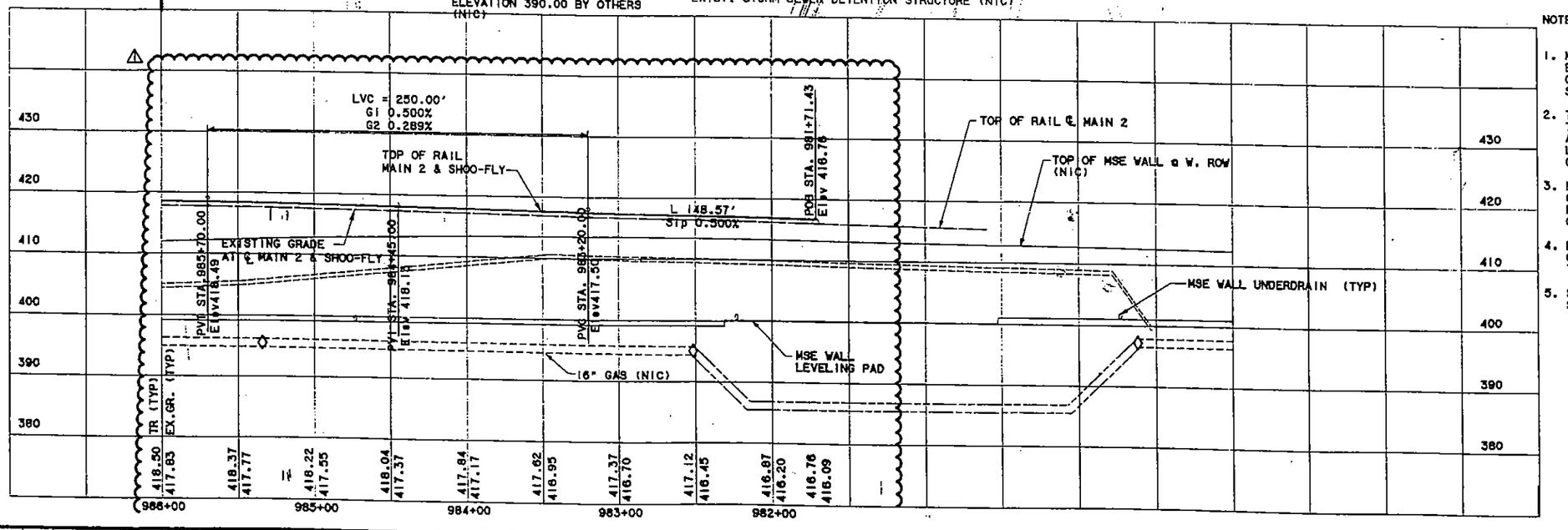
DWG No. CC2-0036

MATCH LINE NW-1A (SHOO-FLY) STA 986+00
SEE DRAWING NO. CC2-0035





◇ LOCATION OF GAS LINE IS BASED UPON S.U.E. INVESTIGATION #TX019-002-00 JAN. 11,2000 AND JAN. 28, 2001.

CAUTION !!!

TXU GAS FACILITIES IN AREA. CALL 1-800-344-8377 3 WORKING DAYS PRIOR TO CONSTRUCTION.

SWB TELEPHONE FACILITIES IN AREA. CALL 1-800-545-6005 EXT. (4589) 2 WORKING DAYS PRIOR TO CONSTRUCTION.

TXU ELECTRIC COMPANY FACILITIES IN AREA. CALL 972-791-2888 2 WORKING DAYS PRIOR TO CONSTRUCTION.

WORLDCOM COMMUNICATIONS FACILITIES IN THIS AREA. CALL 214-571-3200 2 WORKING DAYS PRIOR TO CONSTRUCTION.

NOTES:

1. MSE WALL UNDERDRAIN DISCHARGE POINTS TO BE NO GREATER THAN 250 FEET. PROVIDE CLEANOUT RISER FOR EACH DISCHARGE POINT. SEE DWG CC6-0027 FOR DETAILS.
2. THE LOCATION OF UTILITIES AS SHOWN ON THESE DRAWINGS IS BASED UPON PROPOSED AND AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
3. MSE WALL UNDERDRAIN DISCHARGE POINTS TO BE NO GREATER THAN 250 FEET. PROVIDE CLEANOUT RISER FOR EACH DISCHARGE POINT. SEE DWG CC6-0027 FOR DETAILS.
4. FOR WALL UNDERDRAIN & BALLAST DRAIN CONNECTION TO OUTLET STRUCTURES, SEE CC6-0032 THROUGH CC6-0045.
5. SEE TRACK DRAWINGS FOR TRACK WORK ABOVE SUBBALLAST.

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	CHG	CHK	APP
B			01/07/02	ADJUSTED SHOO-FLY ALIGNMENT & GRADING. ADDED PROPOSED 8" MCI WORLDCOM CASING (NIC)	HC	RL	BH	PJ

STATE OF TEXAS BRUCE HORNE 83611 REGISTERED PROFESSIONAL ENGINEER 1-7-02

Lockwood, Andrews & Newnam, Inc.

LAN/STV
Lockwood, Andrews & Newnam, Inc. and STV Incorporated

DART PROJECT

SCALE	AS NOTED
DRAWN	R. LARA
DESIGNED	R. LARA
CHECKED	B. HORNE
IN CHARGE	P. JOLLY
DATE	05 OCTOBER 01

CONTRACT SHEET No. 111 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW - 1A

CONTINENTAL SHOO-FLY
GUIDEWAY PLAN & PROFILE
STA 986+00 TO BOP

DAES

CONTRACT C-1003853-01 | DWG No. CC2-0036 | REV 1

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DWG No. CB2-1001

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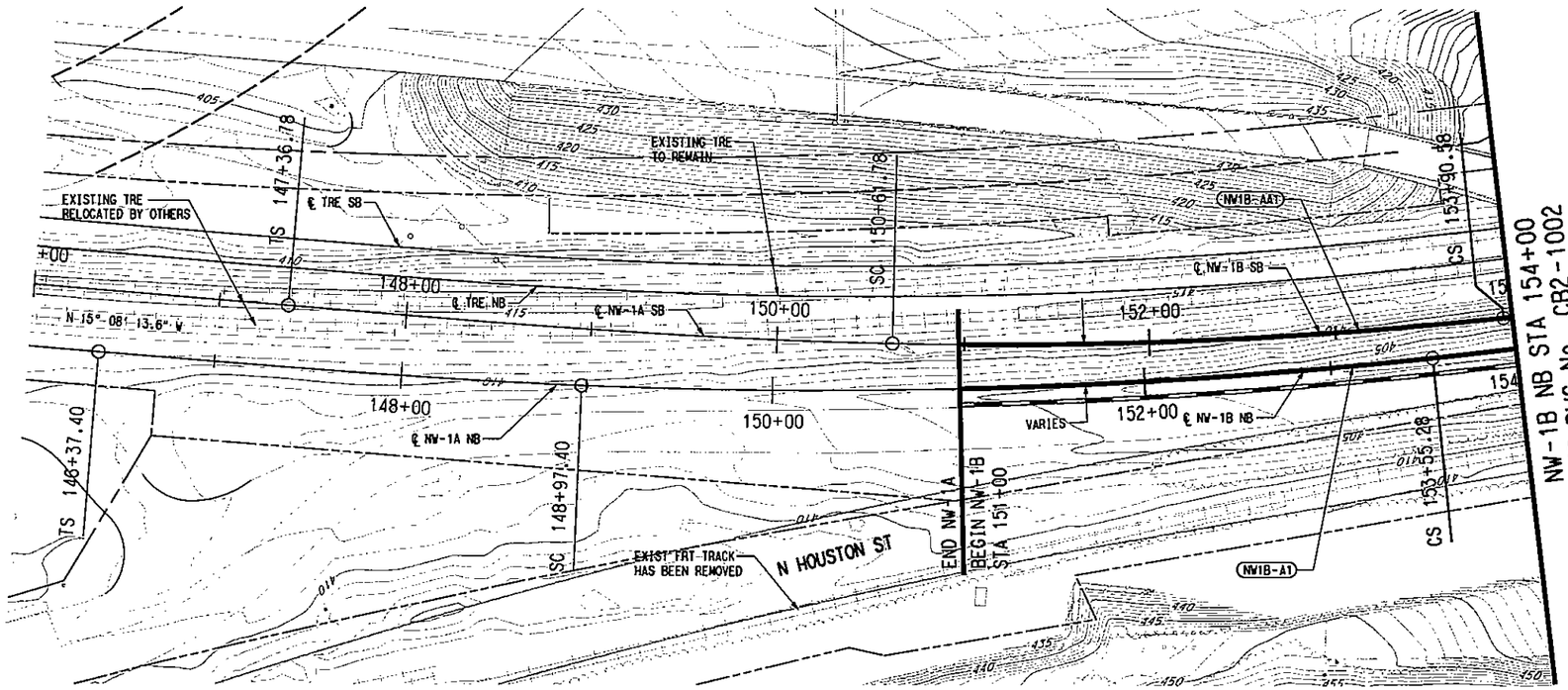
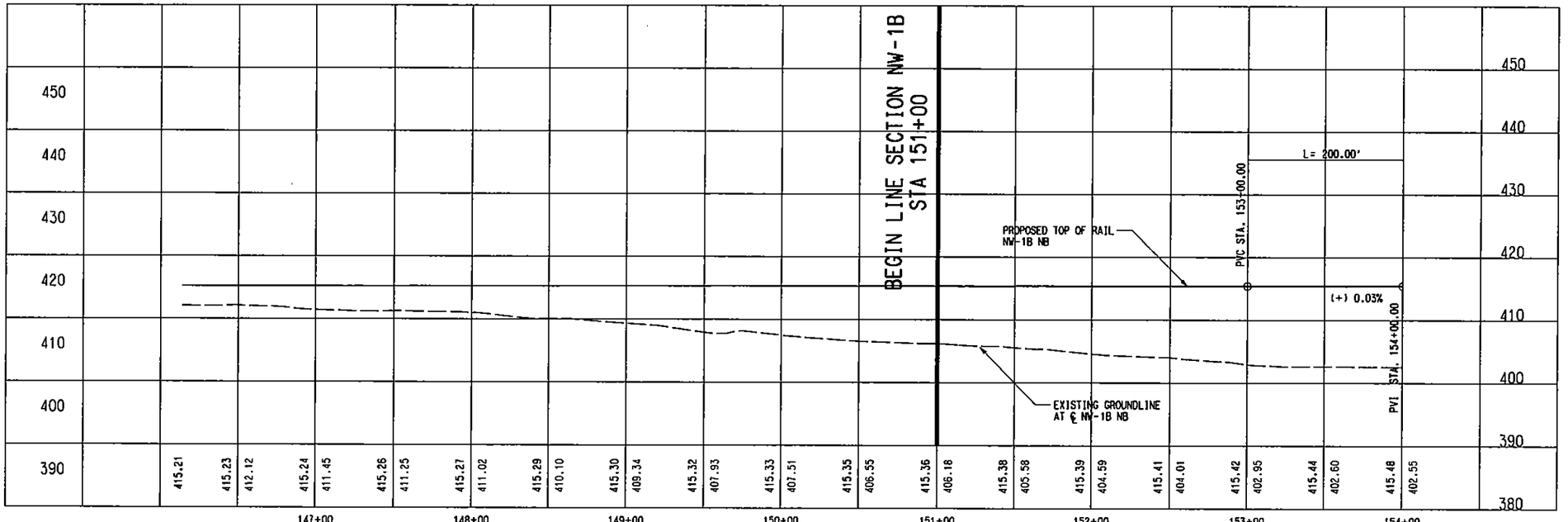


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-A1 (NB)		NW1B-AA1 (SB)	
Rc =	3100.00'	Rc =	2600.00'
Ls =	260.00' (ENT)	Ls =	325.00' (ENT)
Ls =	100.00' (EXIT)	Ls =	150.00' (EXIT
Lc =	457.88'	Lc =	328.80'
Eo =	4.00"	Eo =	5.00"
Eu =	1.45"	Eu =	1.50"
V =	65 MPH	V =	65 MPH



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 112 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE STA 151+00 TO STA 154+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-1001	

R:\NW1X\dgn\CVL-A01NW1bALI.040
R:\NW1X\dgn\CVL-A01NW1bALI.prf
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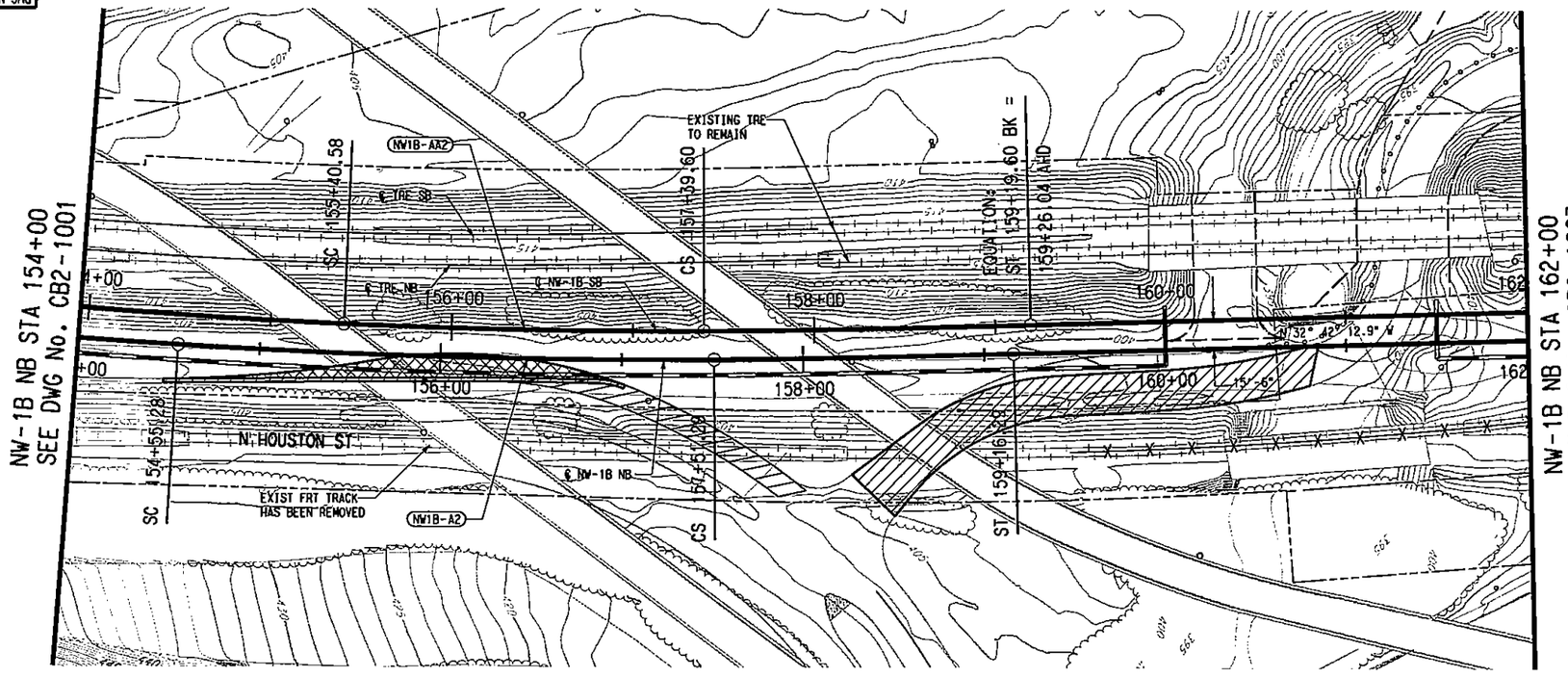
Wed Apr 23 13:54:31 2003
DBROWN

DWG No. CB2-1002

P0002



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-A1 (NB)		NW1B-AA1 (SB)	
Rc =	3100.00'	Rc =	2600.00'
Ls =	260.00' (ENT)	Ls =	325.00' (ENT)
Ls =	100.00' (EXIT)	Ls =	150.00' (EXIT)
Lc =	457.82'	Lc =	328.80'
Ea =	4.00"	Ea =	5.00"
Eu =	1.50"	Eu =	1.50"
V =	65 MPH	V =	65 MPH

NW1B-A2 (NB)		NW1B-AA2 (SB)	
Rc =	4250.00'	Rc =	4100.00'
Ls =	100.00' (ENT)	Ls =	150.00' (ENT)
Ls =	165.00' (EXIT)	Ls =	180.00' (EXIT)
Lc =	296.00'	Lc =	199.02'
Ea =	2.50"	Ea =	2.75"
Eu =	1.48"	Eu =	1.37"
V =	65 MPH	V =	65 MPH

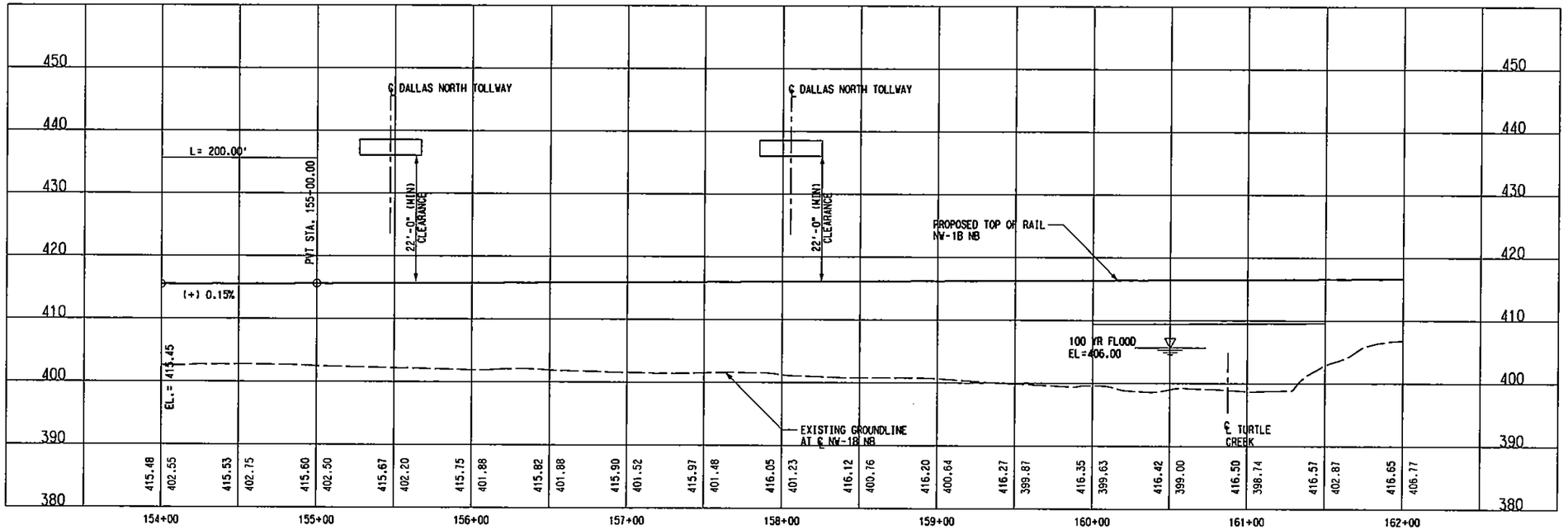
LEGEND

STREET/ALLEY/ DRIVE CLOSURE

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTES:

1. FLOOD ELEVATION TAKEN FROM FLOOD INSURANCE STUDY, CITY OF DALLAS, VOL. 3, DATED JULY 2, 1991 BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).
2. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 113 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 154+00 TO STA 162+00

CONTRACT C-937775-1
DWG No. CB2-1002
REV

R:\NW1X\ac121 mar 7 2003\DGN\CVL-AQ\NW1BAL2.prf
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R:\NW1X\prf\NW1BAL2.prf
DBROWN

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ROW, R:\NW1X\ac121 mar 7 2003\NW1Blpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
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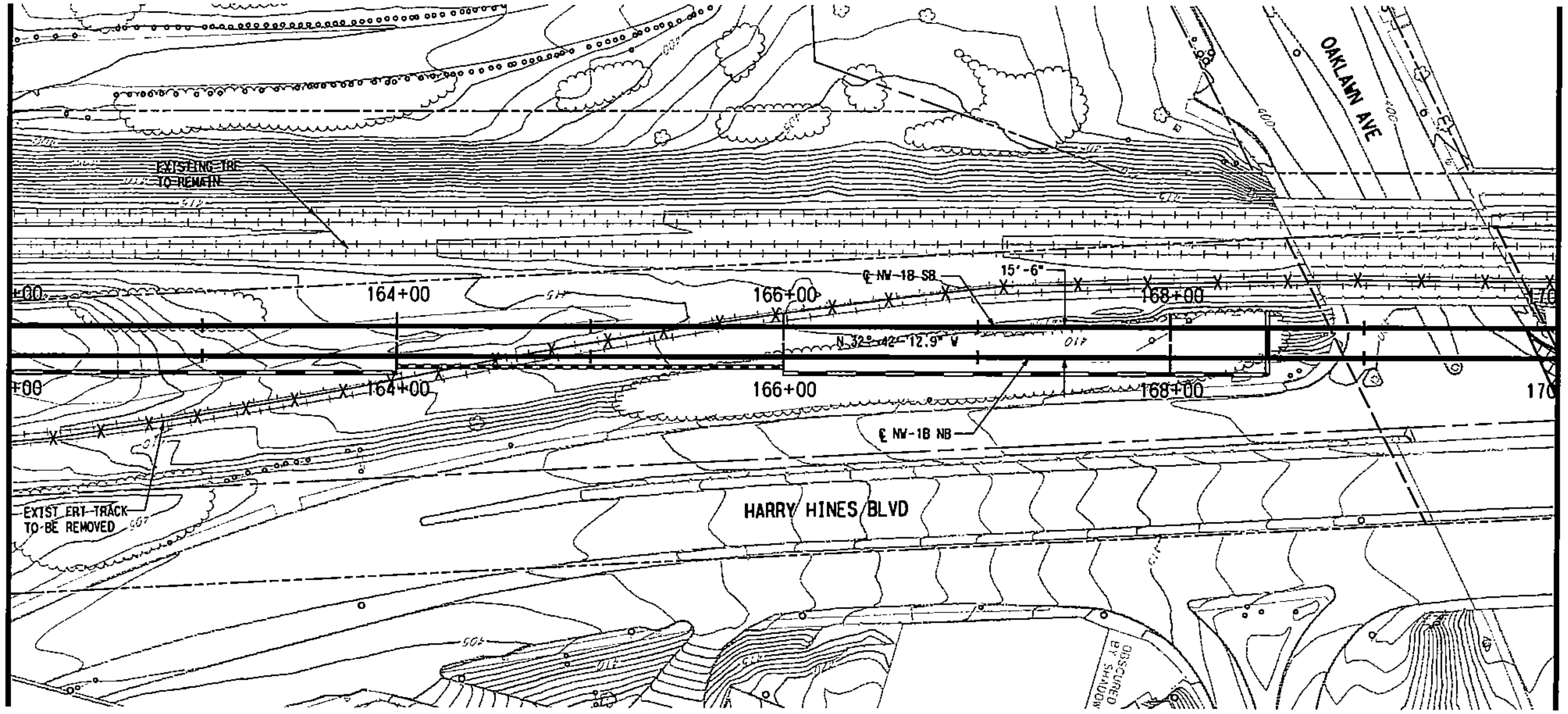
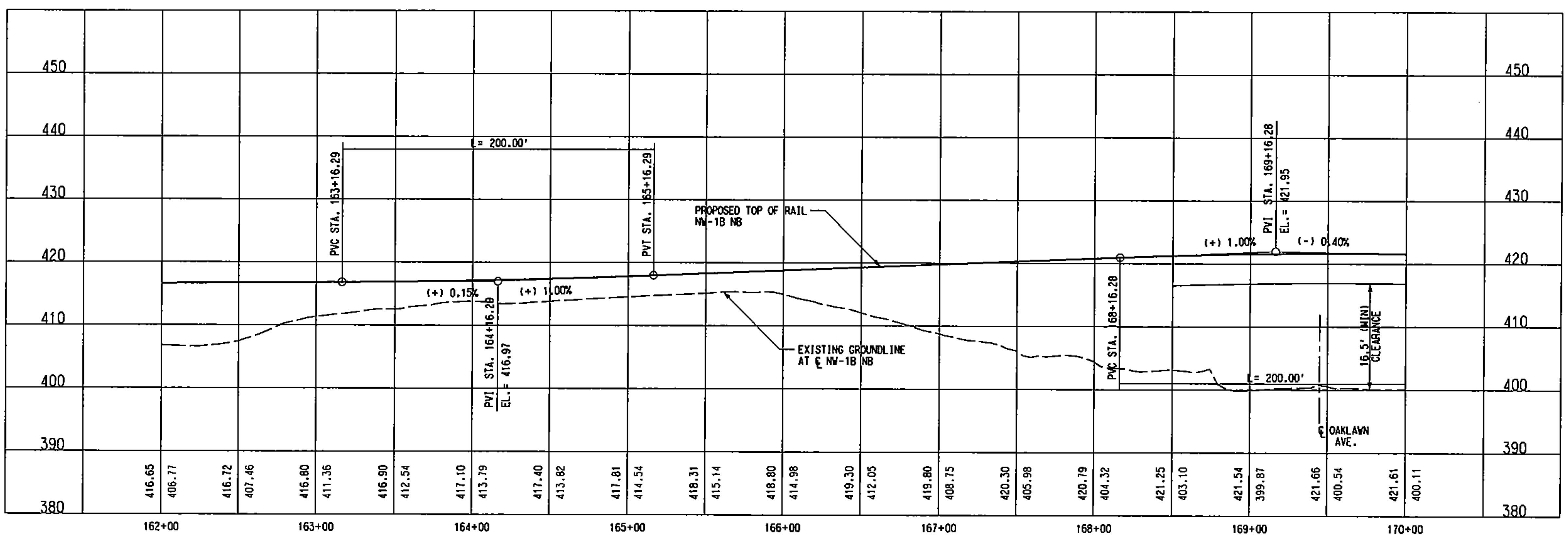
DWG No. CB2-1003

P0003



SCALE (IN FEET) HORIZ 0 20 40 80

SCALE (IN FEET) VERT 0 5 10 15 20



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 891-7800

DART PROJECT

DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 114 OF 243

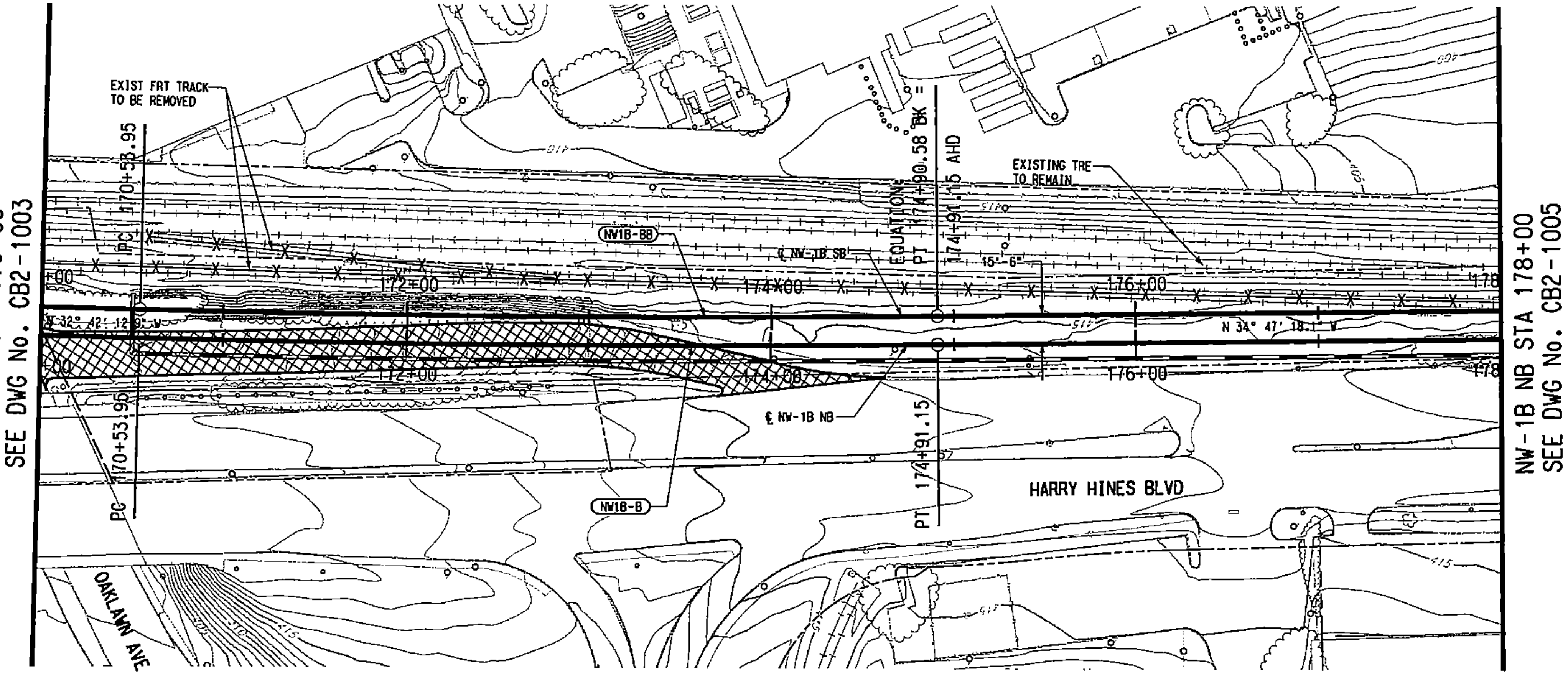
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 162+00 TO STA 170+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-1003	

DWG No. CB2-1004

P0004



HORIZ SCALE (IN FEET) 0 20 40 80

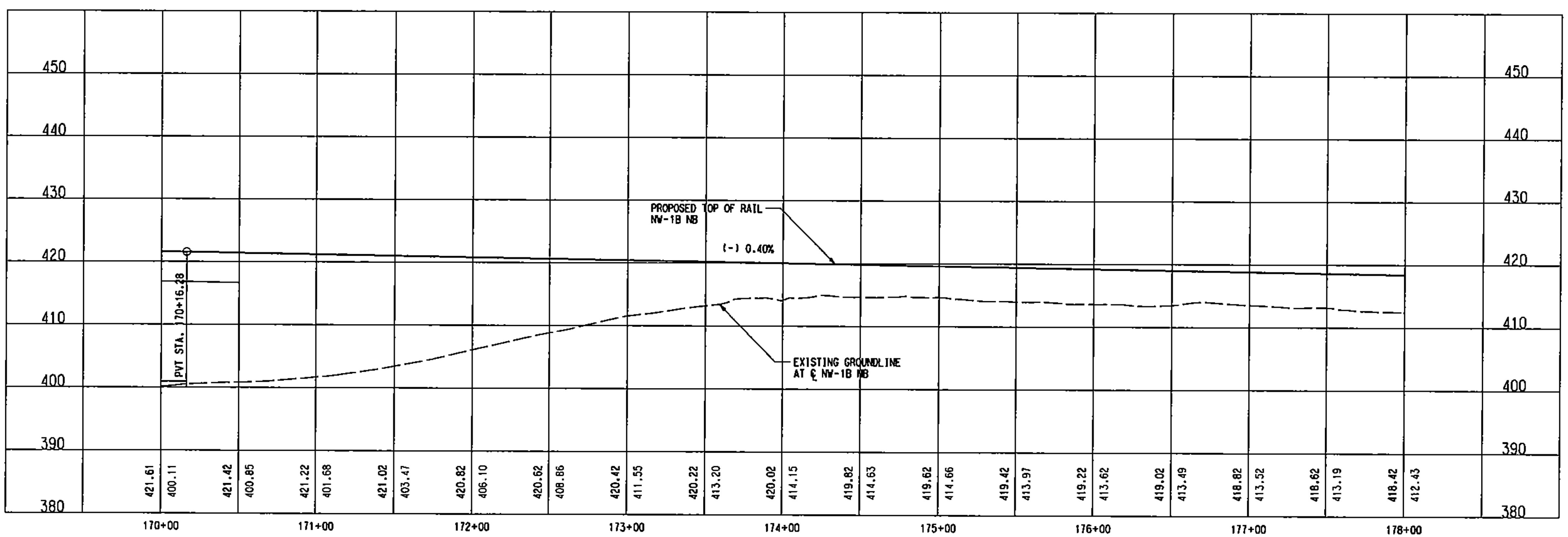
VERT SCALE (IN FEET) 0 5 10 15 20

NW1B-B (NB)	
Rc =	12015.50'
Ls =	0.00'
Lc =	437.20'
Ea =	0.00"
Eu =	1.41"
V =	65 MPH

NW1B-BB (SB)	
Rc =	12000.00'
Ls =	0.00'
Lc =	436.64'
Ea =	0.00"
Eu =	1.41"
V =	65 MPH

LEGEND

STREET/ALLEY/ DRIVE CLOSURE



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 115 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

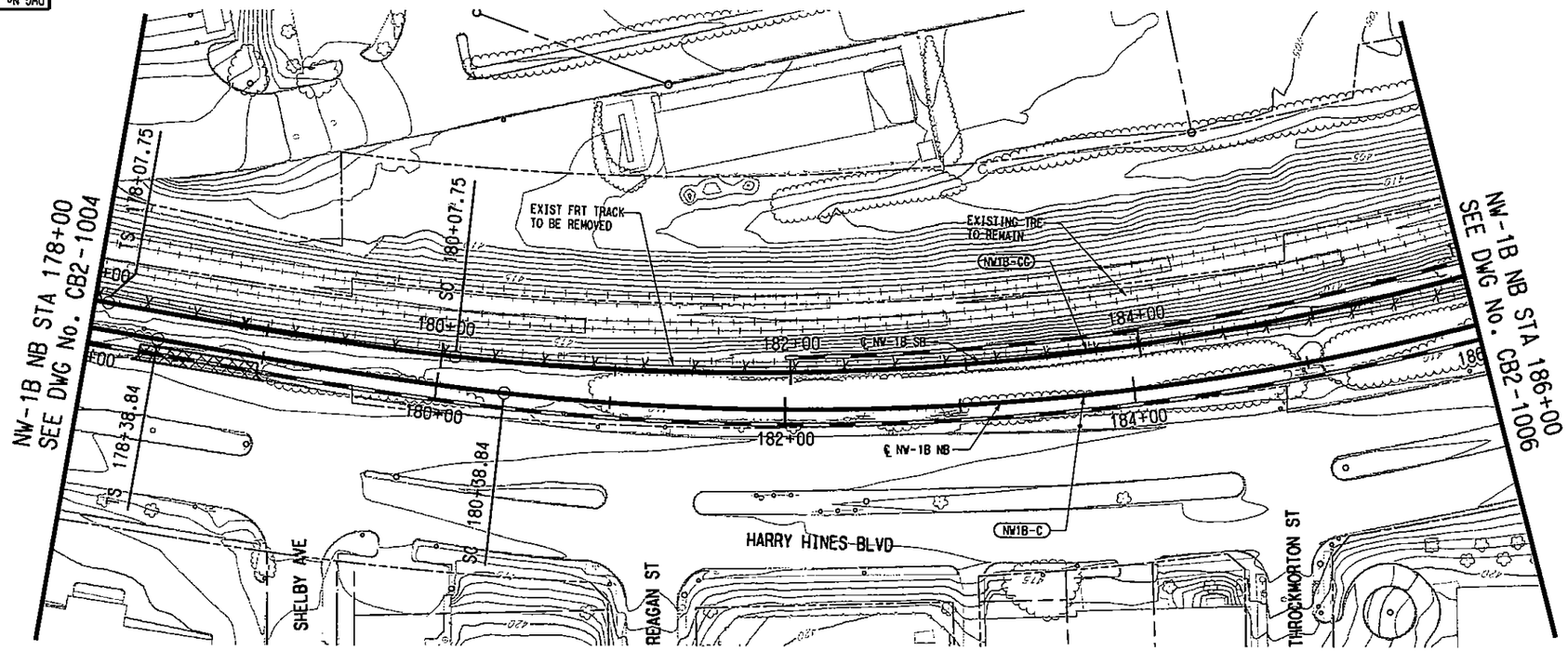
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 170+00 TO STA 178+00

CONTRACT C-937775-1 | DWG No. CB2-1004 | REV

DWG No. CB2-1005

P0005

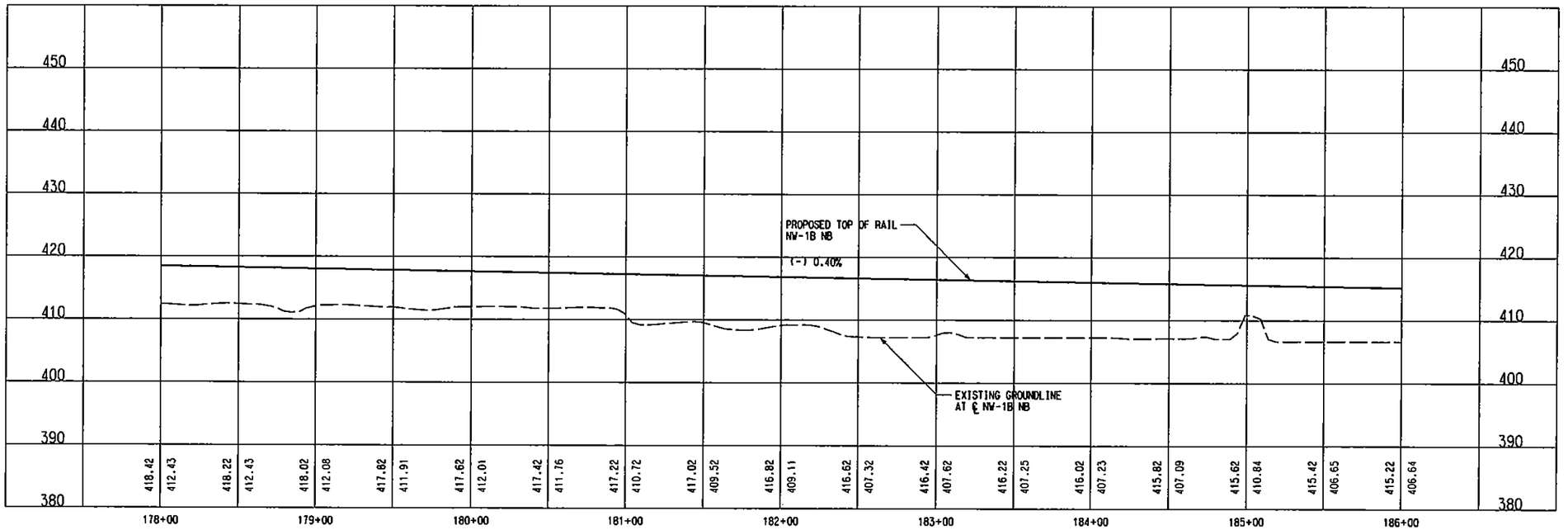


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-C (NB)		NW1B-CC (SB)	
Rc =	1555.50'	Rc =	1540.00'
Ls =	200.00'	Ls =	200.00'
Lc =	1011.16'	Lc =	999.09'
Ea =	4.00"	Ea =	4.00"
Eu =	2.43"	Eu =	2.49"
V =	50 MPH	V =	50 MPH

LEGEND

STREET/ALLEY/ DRIVE CLOSURE



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81751
Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 116 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 178+00 TO STA 186+00

CONTRACT C-937775-1 | DWG No. CB2-1005 | REV

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DBROWN
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r:\Nw1X\ac121 mar 7 2003\NW1BCPR1.040, 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234,4236,4238,4240,4242,4244,4246,4248,4250,4252,4254,4256,4258,4260,4262,4264,4266,4268,4270,4272,4274,4276,4278,4280,4282,4284,4286,4288,4290,4292,4294,4296,4298,4300,4302,4304,4306,4308,4310,4312,4314,4316,4318,4320,4322,4324,4326,4328,4330,4332,4334,4336,4338,4340,4342,4344,4346,4348,4350,4352,4354,4356,4358,4360,4362,4364,4366,4368,4370,4372,4374,4376,4378,4380,4382,4384,4386,4388,4390,4392,4394,4396,4398,4400,4402,4404,4406,4408,4410,4412,4414,4416,4418,4420,4422,4424,4426,4428,4430,4432,4434,4436,4438,4440,4442,4444,4446,4448,4450,4452,4454,4456,4458,4460,4462,4464,4466,4468,4470,4472,4474,4476,4478,4480,4482,4484,4486,4488,4490,4492,4494,4496,4498,4500,4502,4504,4506,4508,4510,4512,4514,4516,4518,4520,4522,4524,4526,4528,4530,4532,4534,4536,4538,4540,4542,4544,4546,4548,4550,4552,4554,4556,4558,4560,4562,4564,4566,4568,4570,4572,4574,4576,4578,4580,4582,4584,4586,4588,4590,4592,4594,4596,4598,4600,4602,4604,4606,4608,4610,4612,4614,4616,4618,4620,4622,4624,4626,4628,4630,4632,4634,4636,4638,4640,4642,4644,4646,4648,4650,4652,4654,4656,4658,4660,4662,4664,4666,4668,4670,4672,4674,4676,4678,4680,4682,4684,4686,4688,4690,4692,4694,4696,4698,4700,4702,4704,4706,4708,4710,4712,4714,4716,4718,4720,4722,4724,4726,4728,4730,4732,4734,4736,4738,4740,4742,4744,4746,4748,4750,4752,4754,4756,4758,4760,4762,4764,4766,4768,4770,4772,4774,4776,4778,4780,4782,4784,4786,4788,4790,4792,4794,4796,4798,4800,4802,4804,4806,4808,4810,4812,4814,4816,4818,4820,4822,4824,4826,4828,4830,4832,4834,4836,4838,4840,4842,4844,4846,4848,4850,4852,4854,4856,4858,4860,4862,4864,4866,4868,4870,4872,4874,4876,4878,4880,4882,4884,4886,4888,4890,4892,4894,4896,4898,4900,4902,4904,4906,4908,4910,4912,4914,4916,4918,4920,4922,4924,4926,4928,4930,4932,4934,4936,4938,4940,4942,4944,4946,4948,4950,4952,4954,4956,4958,4960,4962,4964,4966,4968,4970,4972,4974,4976,4978,4980,4982,4984,4986,4988,4990,4992,4994,4996,4998,5000,5002,5004,5006,5008,5010,5012,5014,5016,5018,5020,5022,5024,5026,5028,5030,5032,5034,5036,5038,5040,5042,5044,5046,5048,5050,5052,5054,5056,5058,5060,5062,5064,5066,5068,5070,5072,5074,5076,5078,5080,5082,5084,5086,5088,5090,5092,5094,5096,5098,5100,5102,5104,5106,5108,5110,5112,5114,5116,5118,5120,5122,5124,5126,5128,5130,5132,5134,5136,5138,5140,5142,5144,5146,5148,5150,5152,5154,5156,5158,5160,5162,5164,5166,5168,5170,5172,5174,5176,5178,5180,5182,5184,5186,5188,5190,5192,5194,5196,5198,5200,5202,5204,5206,5208,5210,5212,5214,5216,5218,5220,5222,5224,5226,5228,5230,5232,5234,5236,5238,5240,5242,5244,5246,5248,5250,5252,5254,5256,5258,5260,5262,5264,5266,5268,5270,5272,5274,5276,5278,5280,5282,5284,5286,5288,5290,5292,5294,5296,5298,5300,5302,5304,5306,5308,5310,5312,5314,5316,5318,5320,5322,5324,5326,5328,5330,5332,5334,5336,5338,5340,5342,5344,5346,5348,5350,5352,5354,5356,5358,5360,5362,5364,5366,5368,5370,5372,5374,5376,5378,5380,5382,5384,5386,5388,5390,5392,5394,5396,5398,5400,5402,5404,5406,5408,5410,5412,5414,5416,5418,5420,5422,5424,5426,5428,5430,5432,5434,5436,5438,5440,5442,5444,5446,5448,5450,5452,5454,5456,5458,5460,5462,5464,5466,5468,5470,5472,5474,5476,5478,5480,5482,5484,5486,5488,5490,5492,5494,5496,5498,5500,5502,5504,5506,5508,5510,5512,5514,5516,5518,5520,5522,5524,5526,5528,5530,5532,5534,5536,5538,5540,5542,5544,5546,5548,5550,5552,5554,5556,5558,5560,5562,5564,5566,5568,5570,5572,5574,5576,5578,5580,5582,5584,5586,5588,5590,5592,5594,5596,5598,5600,5602,5604,5606,5608,5610,5612,5614,5616,5618,5620,5622,5624,5626,5628,5630,5632,5634,5636,5638,5640,5642,5644,5646,5648,5650,5652,5654,5656,5658,5660,5662,5664,5666,5668,5670,5672,5674,5676,5678,5680,5682,5684,5686,5688,5690,5692,5694,5696,5698,5700,5702,5704,5706,5708,5710,5712,5714,5716,5718,5720,5722,5724,5726,5728,5730,5732,5734,5736,5738,5740,5742,5744,5746,5748,5750,5752,5754,5756,5758,5760,5762,5764,5766,5768,5770,5772,5774,5776,5778,5780,5782,5784,5786,5788,5790,5792,5794,5796,5798,5800,5802,5804,5806,5808,5810,5812,5814,5816,5818,5820,5822,5824,5826,5828,5830,5832,5834,5836,5838,5840,5842,5844,5846,5848,5850,5852,5854,5856,5858,5860,5862,5864,5866,5868,5870,5872,5874,5876,5878,5880,5882,5884,5886,5888,5890,5892,5894,5896,5898,5900,5902,5904,5906,5908,5910,5912,5914,5916,5918,5920,5922,5924,5926,5928,5930,5932,5934,5936,5938,5940,5942,5944,5946,5948,5950,5952,5954,5956,5958,5960,5962,5964,5966,5968,5970,5972,5974,5976,5978,5980,5982,5984,5986,5988,5990,5992,5994,5996,5998,6000,6002,6004,6006,6008,6010,6012,6014,6016,6018,6020,6022,6024,6026,6028,6030,6032,6034,6036,6038,6040,6042,6044,6046,6048,6050,6052,6054,6056,6058,6060,6062,6064,6066,6068,6070,6072,6074,6076,6078,6080,6082,6084,6086,6088,6090,6092,6094,6096,6098,6100,6102,6104,6106,6108,6110,6112,6114,6116,6118,6120,6122,6124,6126,6128,6130,6132,6134,6136,6138,6140,6142,6144,6146,6148,6150,6152,6154,6156,6158,6160,6162,6164,6166,6168,6170,6172,6174,6176,6178,6180,6182,6184,6186,6188,6190,6192,6194,6196,6198,6200,6202,6204,6206,6208,6210,6212,6214,6216,6218,6220,6222,6224,6226,6228,6230,6232,6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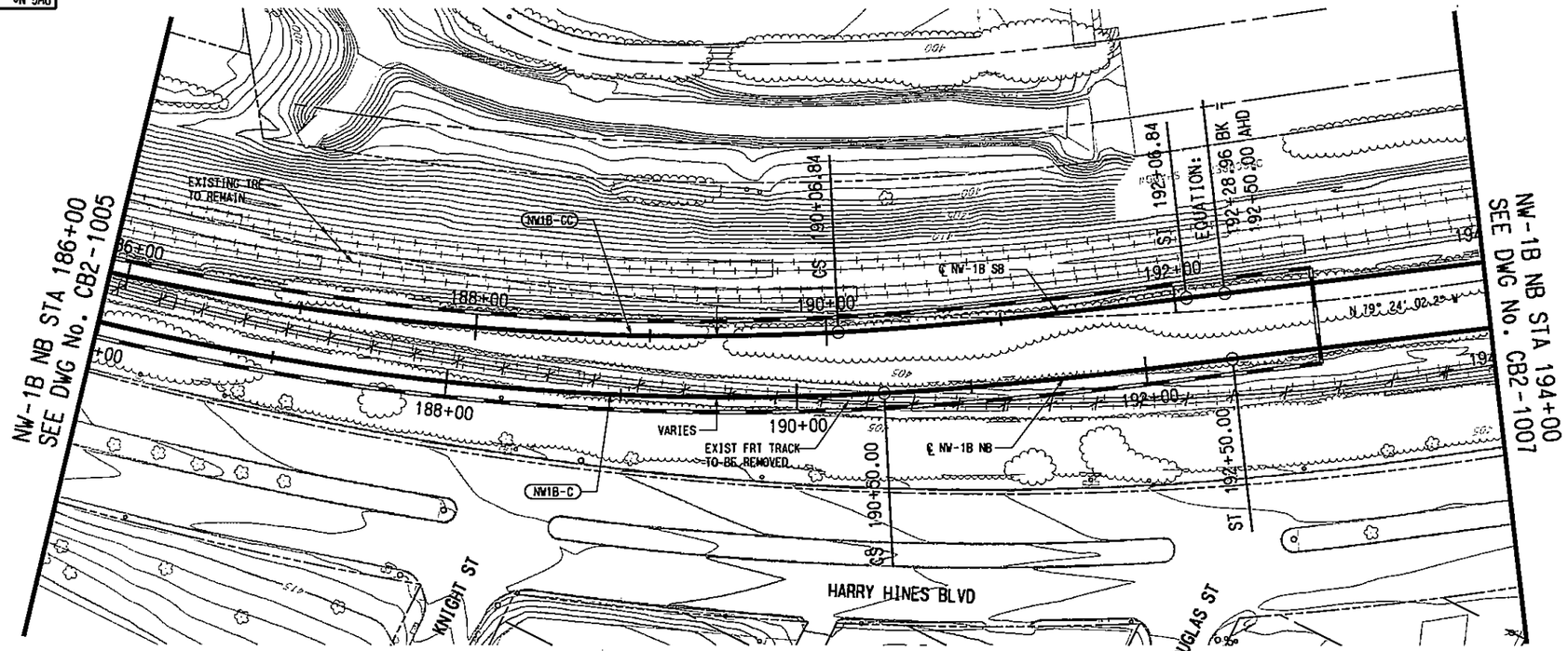
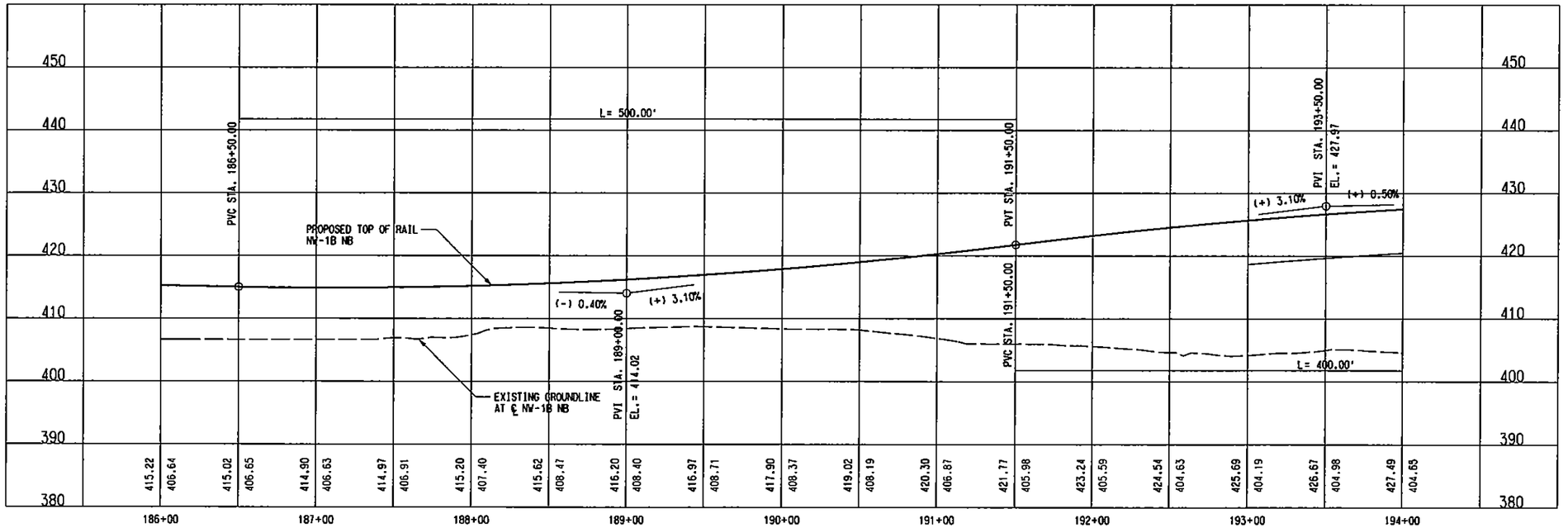
DWG No. C82-1006

P0006



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-C (NB)		NW1B-CC (SB)	
Rc =	1555.50'	Rc =	1540.00'
Ls =	200.00'	Ls =	200.00'
Lc =	1011.16'	Lc =	999.09'
Eq =	4.00"	Eq =	4.00"
Eu =	2.43"	Eu =	2.49"
V =	50 MPH	V =	50 MPH



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61151
Date: 14 MAR 03

CP&Y Chilang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 117 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 186+00 TO STA 194+00

CONTRACT C-937775-1 | DWG No. C82-1006 | REV

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DBROWN
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003\nw1bplr1.040, 1-62
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2003\nw1xbpl.001, 1-13,16-32,39,49-63
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003\NW1Bprw1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47,48,51,54,55,57,60
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PROFILE, r:\NW1X\oc121 mar 7 2003\DGN\CVL-AO\NW1BAL6.040
BORDER, R:\NW1X\oc121 mar 7 2003\DGN\CVL-AO\NW1BAL6.040
TOPO, r:\NW1X\oc121 mar 7 2003\nw1bstr1.040, 2-30,32,33,35-63
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SITE, r:\NW1X\oc121 mar 7 2003\NW1BCPR1.040, 1,7,8,13,15,17,20,25-32,37,38,41-45,47-50,52,53,56,58,59,61-63
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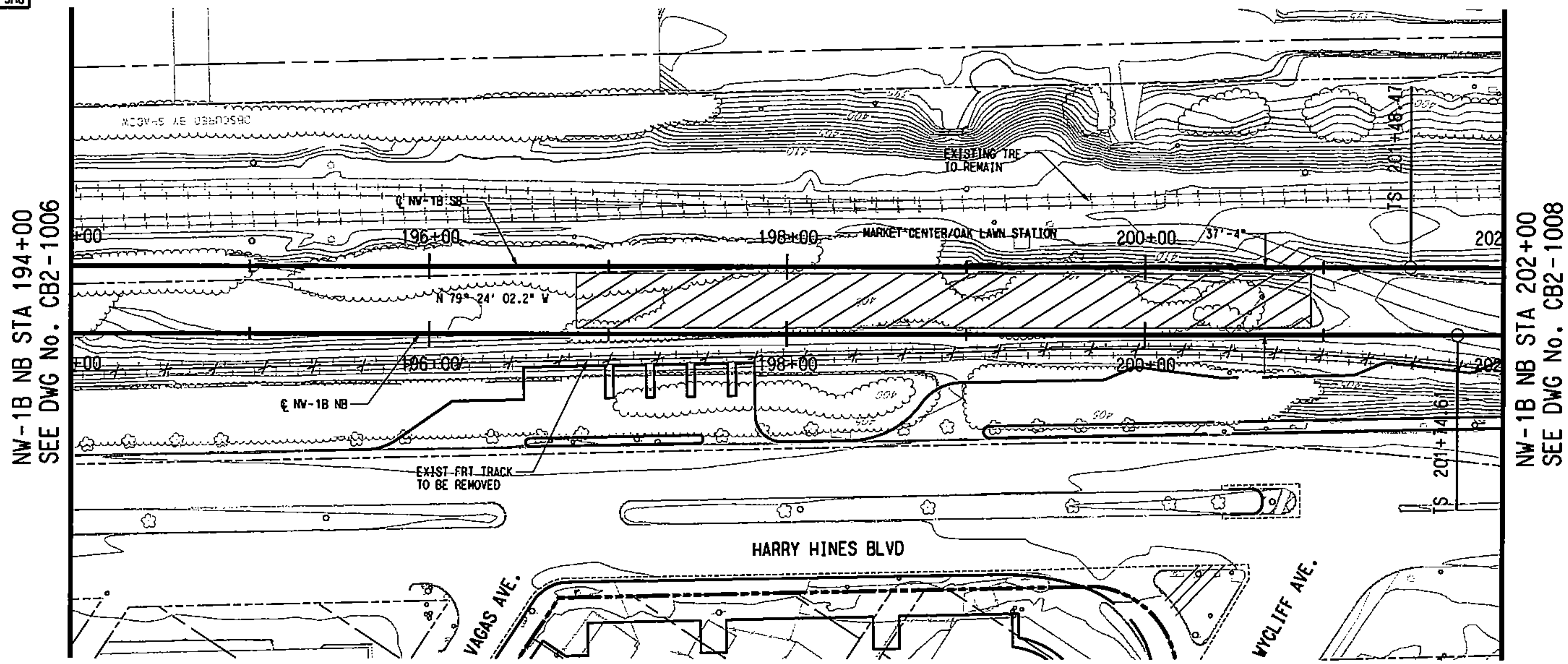
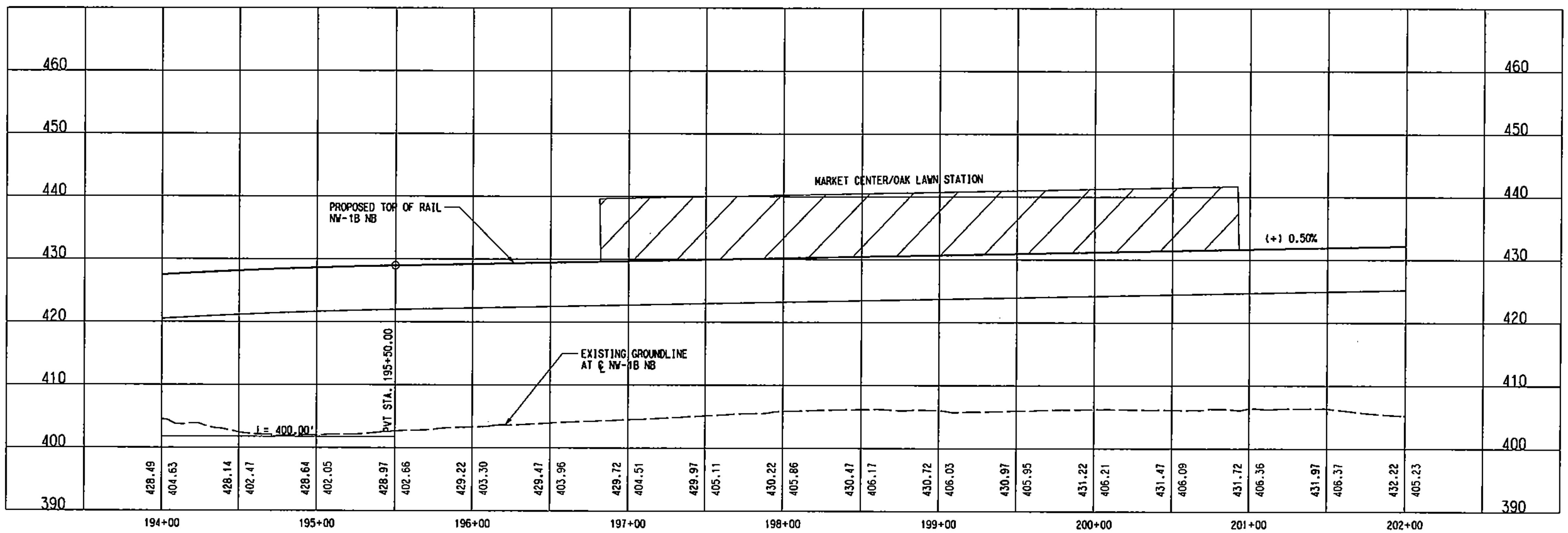


SCALE (IN FEET)
HORIZ 0 20 40 80
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOTE:

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2. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.

NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 118 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 600 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

DART

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	B. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 194+00 TO STA 202+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-1007	

R:\NWIX\ac121 mar 7 2003\DGN\CVL-AQ\
Thu Apr 24 11:23:03 2003
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lmorris
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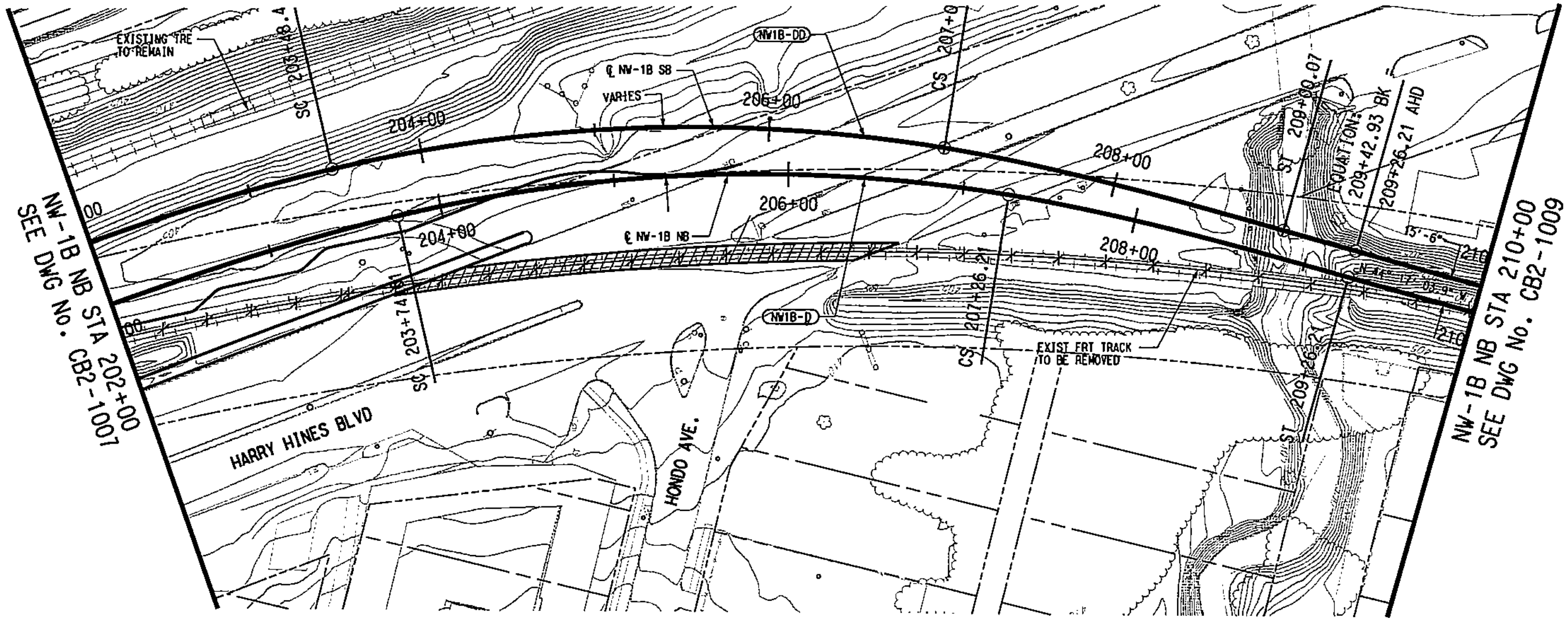


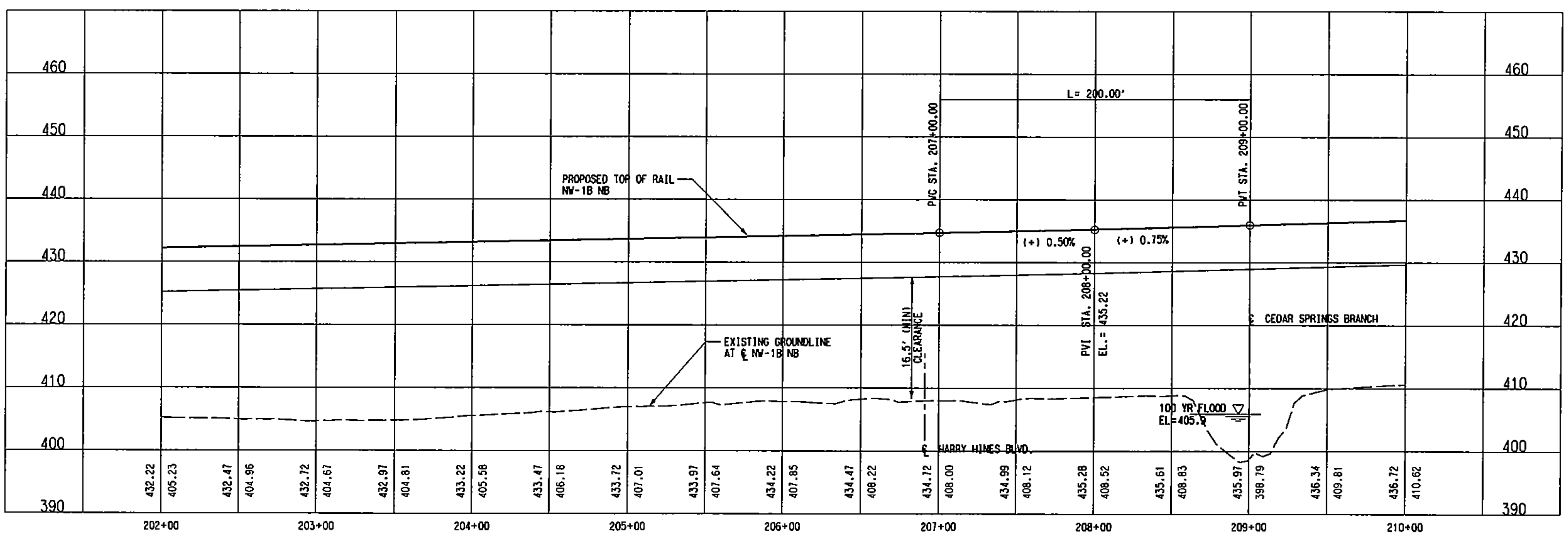
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-D (NB)	
Rc =	900.00'
Ls =	200.00'
Lc =	351.60'
Ea =	4.00"
Eu =	1.44"
V =	35 MPH

NW1B-DD (SB)	
Rc =	900.00'
Ls =	200.00'
Lc =	351.60'
Ea =	4.00"
Eu =	1.44"
V =	35 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOTES:

1. FLOOD ELEVATION TAKEN FROM KNIGHTS BRANCH AND CEDAR SPRINGS BRANCH FLOOD PLAIN MANAGEMENT REPORT DTD NOV 1982 BY RAYMOND L. GOODSON, JR INC. CONSULTING ENGINEERS.
2. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.
3. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.

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PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61153
Date: 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 119 OF 243

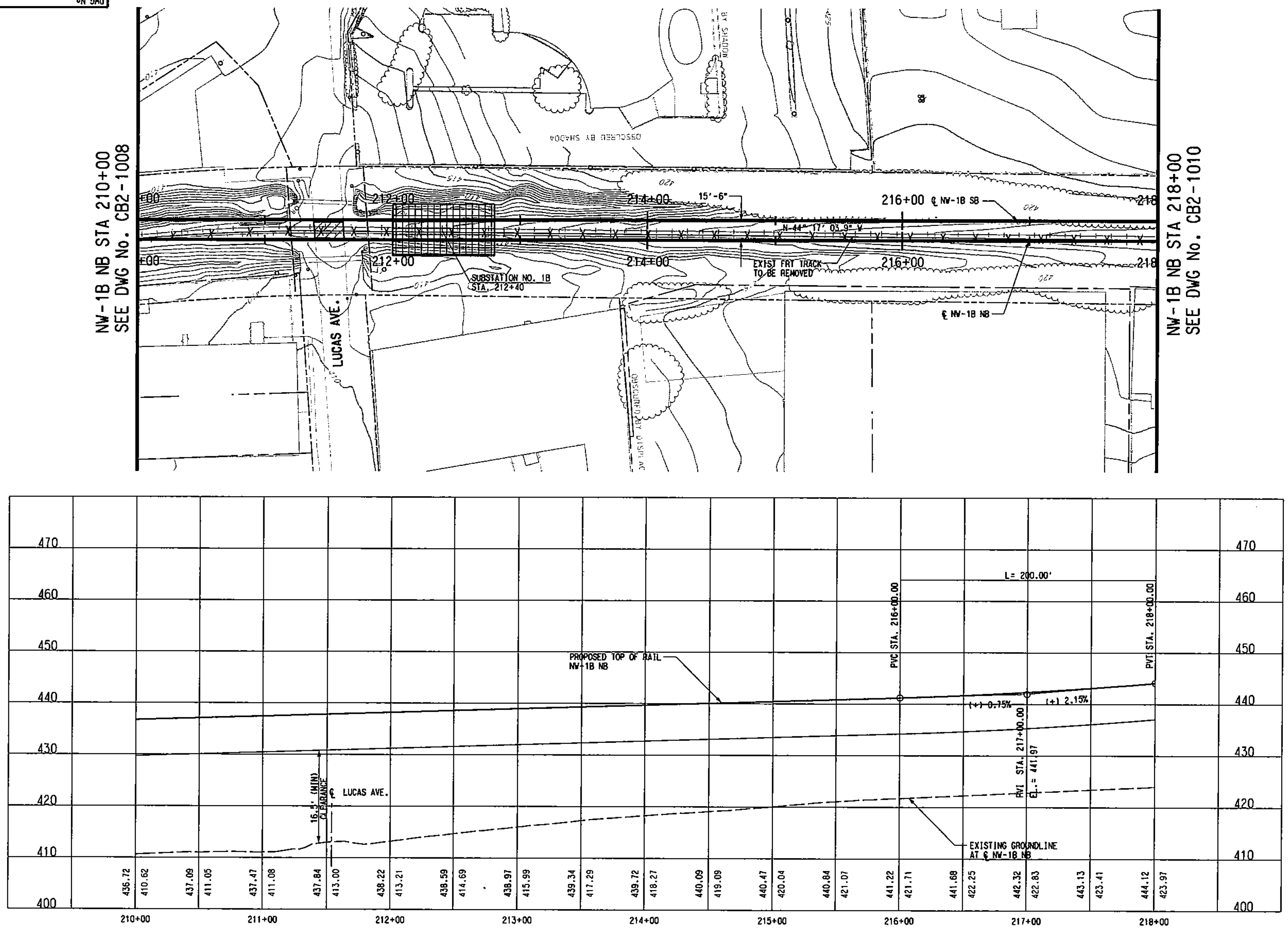
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 202+00 TO STA 210+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-1008	

R:\NWIX\ac121 mar 7 2003\DGN\CVL-AQ\NW1bAL8.040

SCALE (IN FEET)
HORIZ 0 20 40 60
VERT 0 5 10 15 20



LEGEND

GRADING FOR SYSTEM ELEMENTS

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.
2. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.
3. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.

NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 120 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CPY
J. TIPTON, P.E. No. 61757
Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

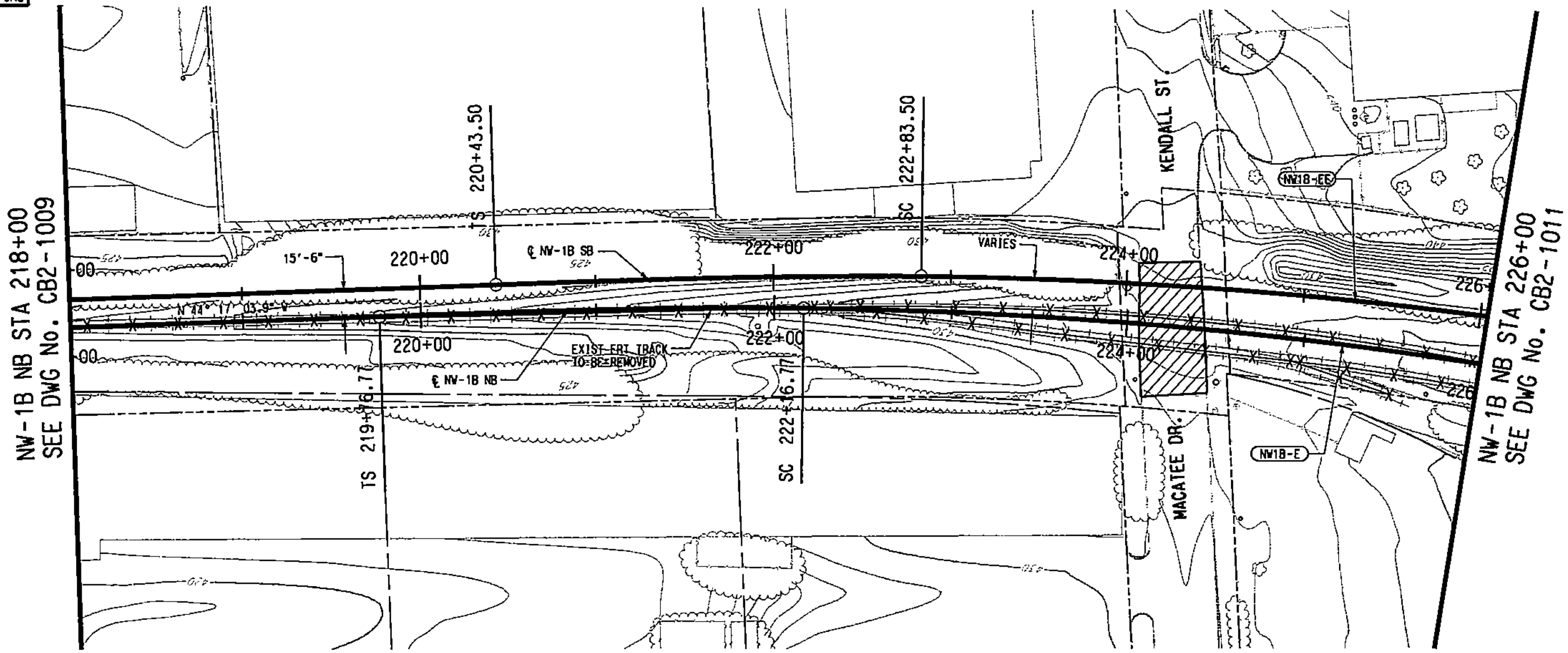
DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 210+00 TO STA 218+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-1009	



SCALE (IN FEET) HORIZ 0 20 40 80

SCALE (IN FEET) VERT 0 5 10 15 20

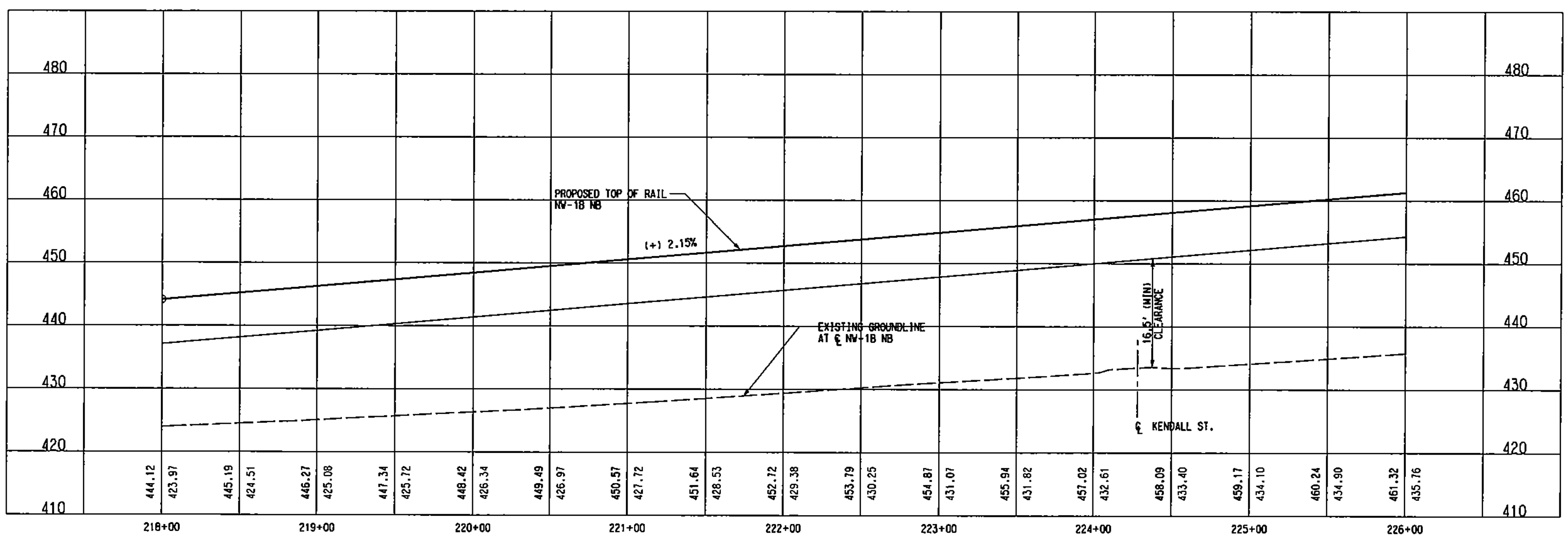
NW1B-E (NB)		NW1B-EE (SB)	
Rc =	2690.00'	Rc =	2690.00'
Ls =	240.00'	Ls =	240.00'
Lc =	696.44'	Lc =	696.44'
Ea =	3.00"	Ea =	3.00"
Eu =	1.50"	Eu =	1.50"
V =	55 MPH	V =	55 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.
2. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.



NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS 15770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

DART

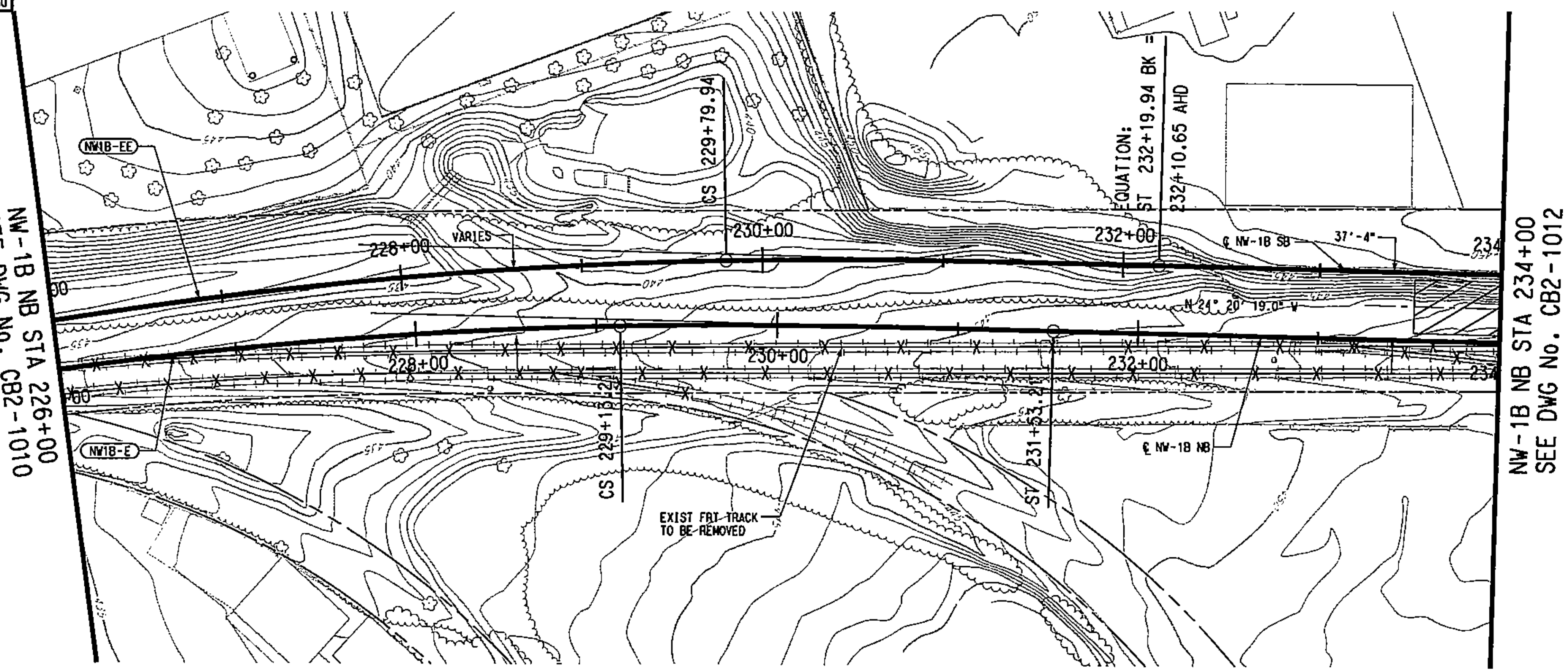
SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 218+00 TO STA 226+00

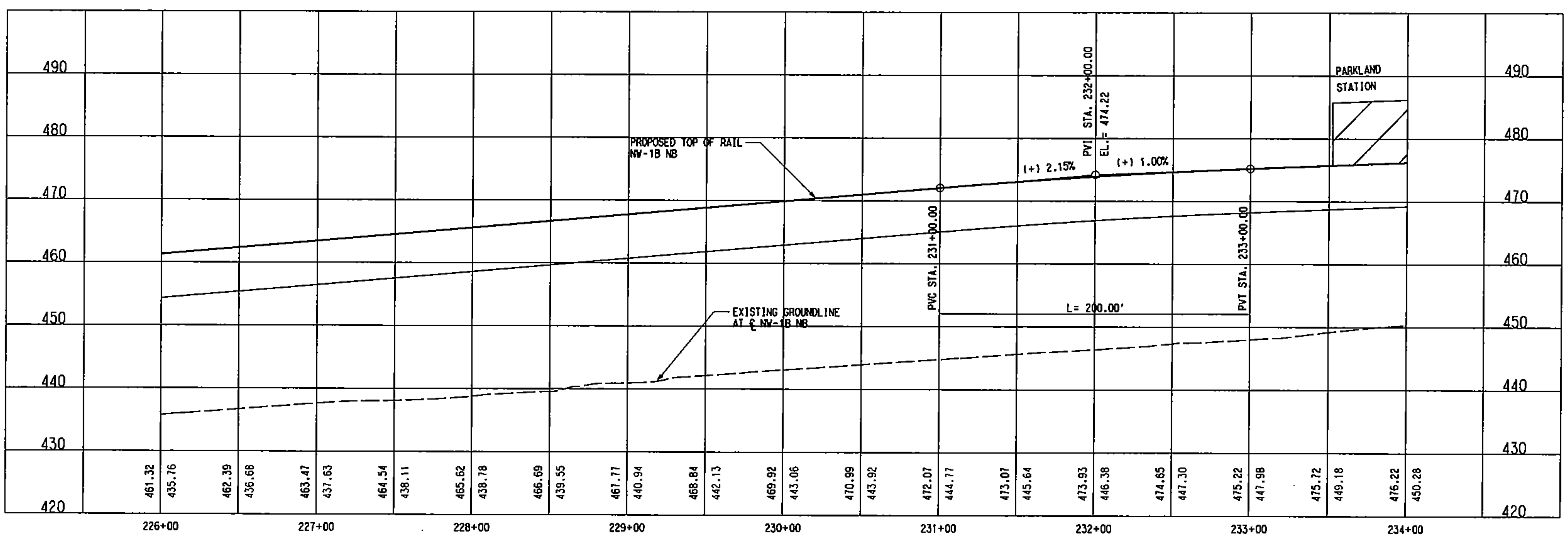
CONTRACT	DWG No.	REV
C-937775-1	CB2-1010	



SCALE (IN FEET) HORIZ 0 20 40 80

SCALE (IN FEET) VERT 0 5 10 15 20

NW1B-E (NB)		NW1B-EE (SB)	
Rc =	2690.00'	Rc =	2690.00'
Ls =	240.00'	Ls =	240.00'
Lc =	696.44'	Lc =	696.44'
Eo =	3.00"	Eo =	3.00"
Eu =	1.50"	Eu =	1.50"
V =	55 MPH	V =	55 MPH



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 122 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 226+00 TO STA 234+00

CONTRACT C-937775-1 | DWG No. CB2-1011 | REV

DWG No. CB2-1011

R:\NW1X\ac121 mar 7 2003\DGN\CVL-AO\
Thu Apr 24 11:33:57 2003
R:\NW1X\prf\NW1bAL11.prf
DBROWN
PRF ROTATION=0.000000
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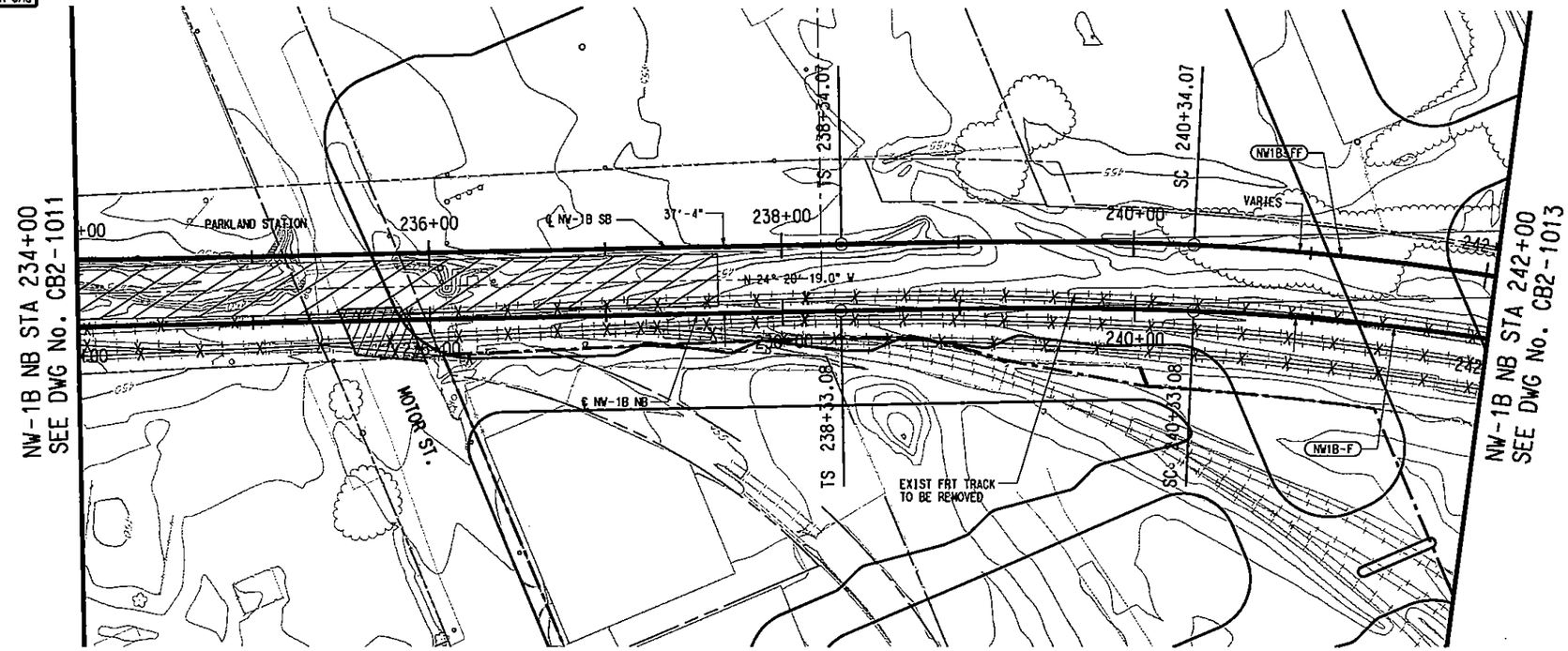
DWG No. CB2-1012

P0012

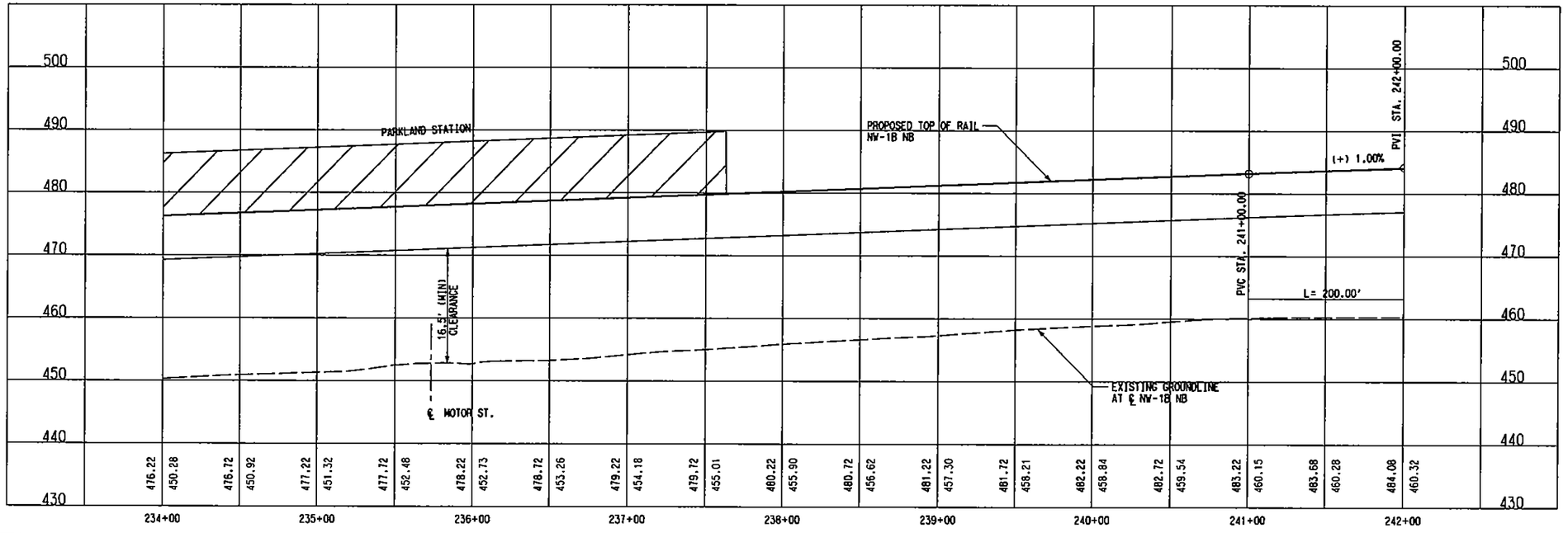


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-F (NB)		NW1B-FF (SB)	
Rc =	1620.00'	Rc =	1500.00'
Ls =	200.00'	Ls =	200.00'
Lc =	674.14'	Lc =	609.39'
Ea =	3.00"	Ea =	4.00"
Eu =	2.00"	Eu =	1.40"
V =	45 MPH	V =	45 MPH

LEGEND

STREET/ALLEY/
DRIVE RECONSTRUCTION



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.
2. IMPROVEMENTS TO MOTOR STREET ARE TO BE COORDINATED WITH TXDOT, CITY OF DALLAS AND PARKLAND HOSPITAL IN FINAL DESIGN.
3. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61153
Date: 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 123 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 234+00 TO STA 242+00

CONTRACT C-937775-1 | DWG No. CB2-1012 | REV

R:\NW1X\dgn\CIVIL-AO\NW1BAL12.040
R:\NW1X\dgn\CIVIL-AO\NW1BCVRI.040, I-61.63
R:\NW1X\dgn\NW1BPRWI.040, 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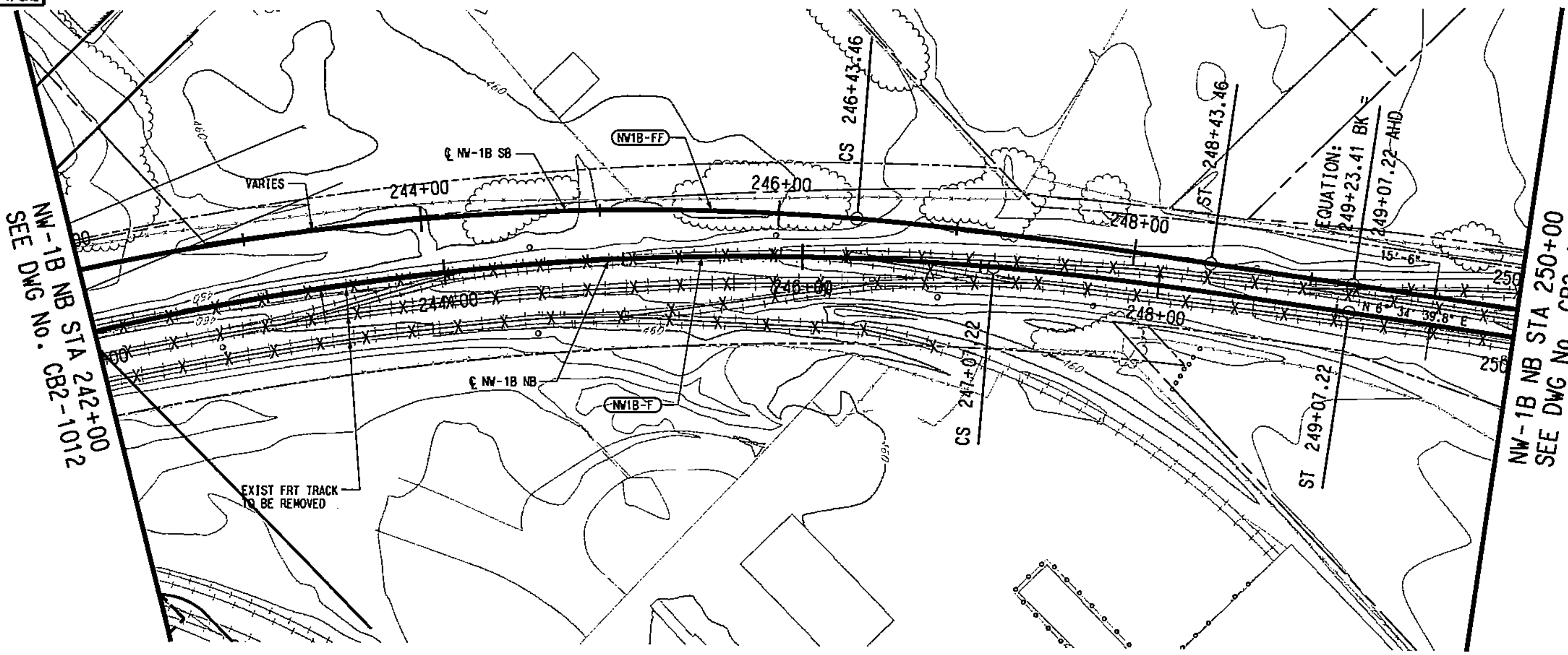

SCALE (IN FEET) HORIZ 0 20 40 80

SCALE (IN FEET) VERT 0 5 10 15 20

NW1B-F (NB)	
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Ls =	200.00'
Lc =	674.14'
Eo =	3.00"
Eu =	2.00"
V =	45 MPH

NW1B-FF (SB)	
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Lc =	609.39'
Eo =	4.00"
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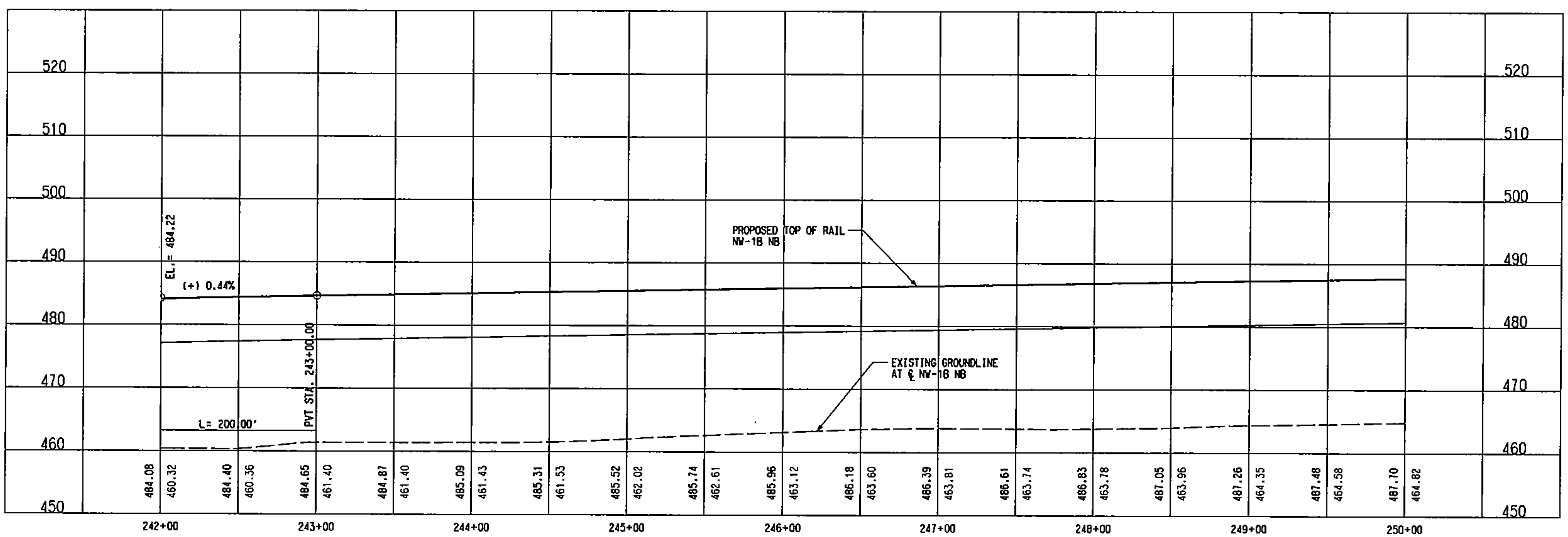
V =	45 MPH



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS

15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 124 OF 243

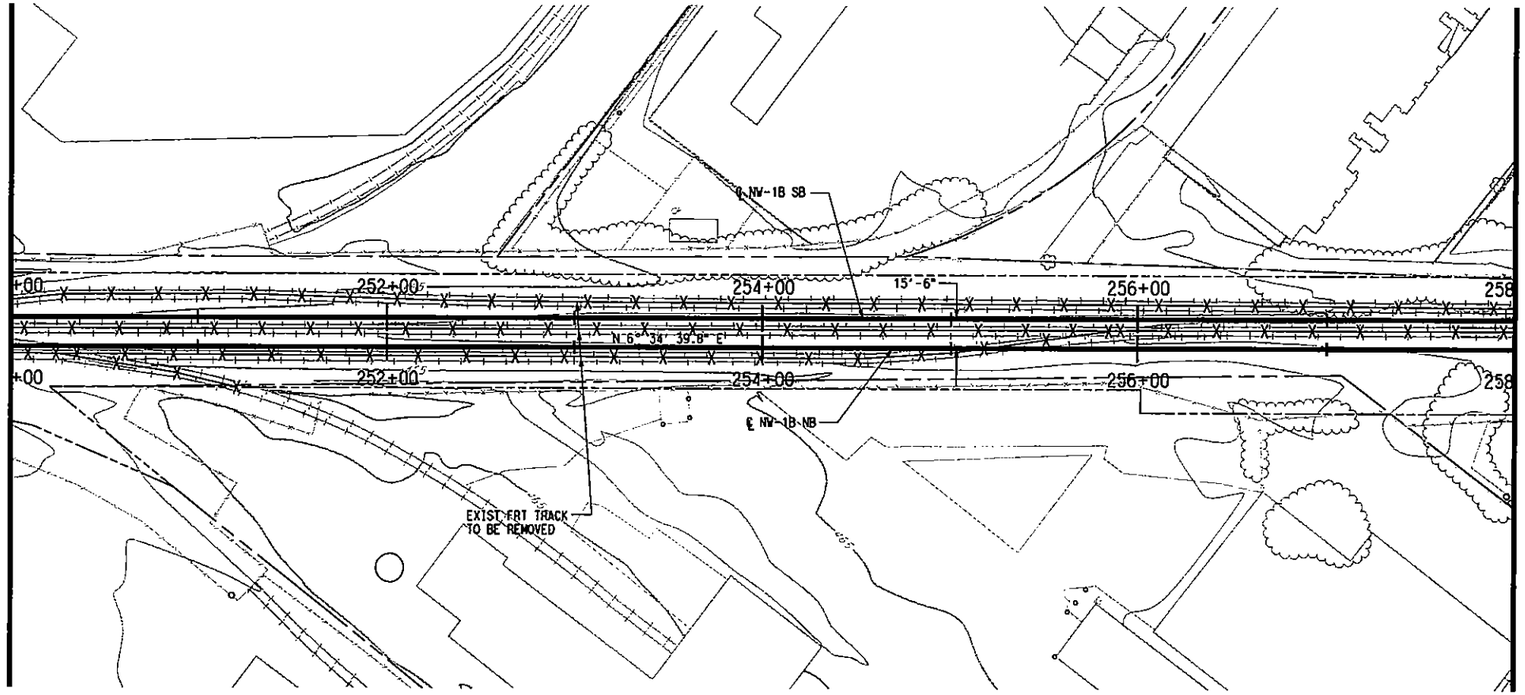
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 242+00 TO STA 250+00

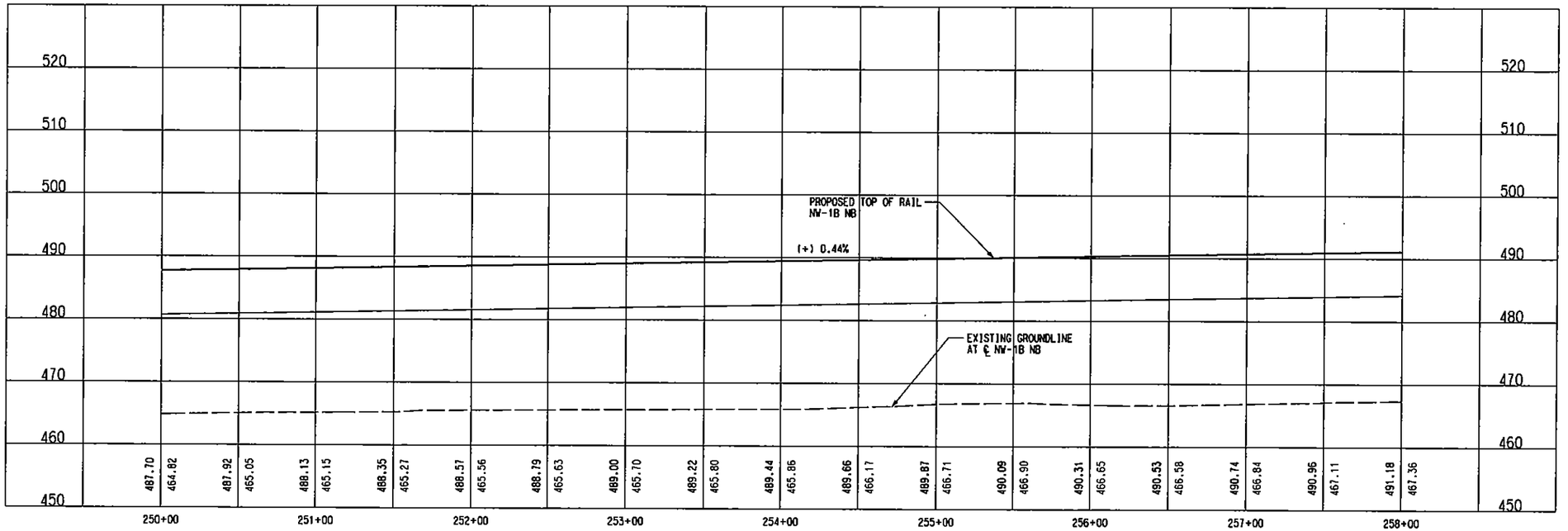
CONTRACT	DWG No.	REV
C-937775-1	CB2-1013	

DWG No. CB2-1014

P0014



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61457
Date: 14 MAR 03

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT
DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 125 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 250+00 TO STA 258+00

CONTRACT C-937775-1 | DWG No. CB2-1014 | REV

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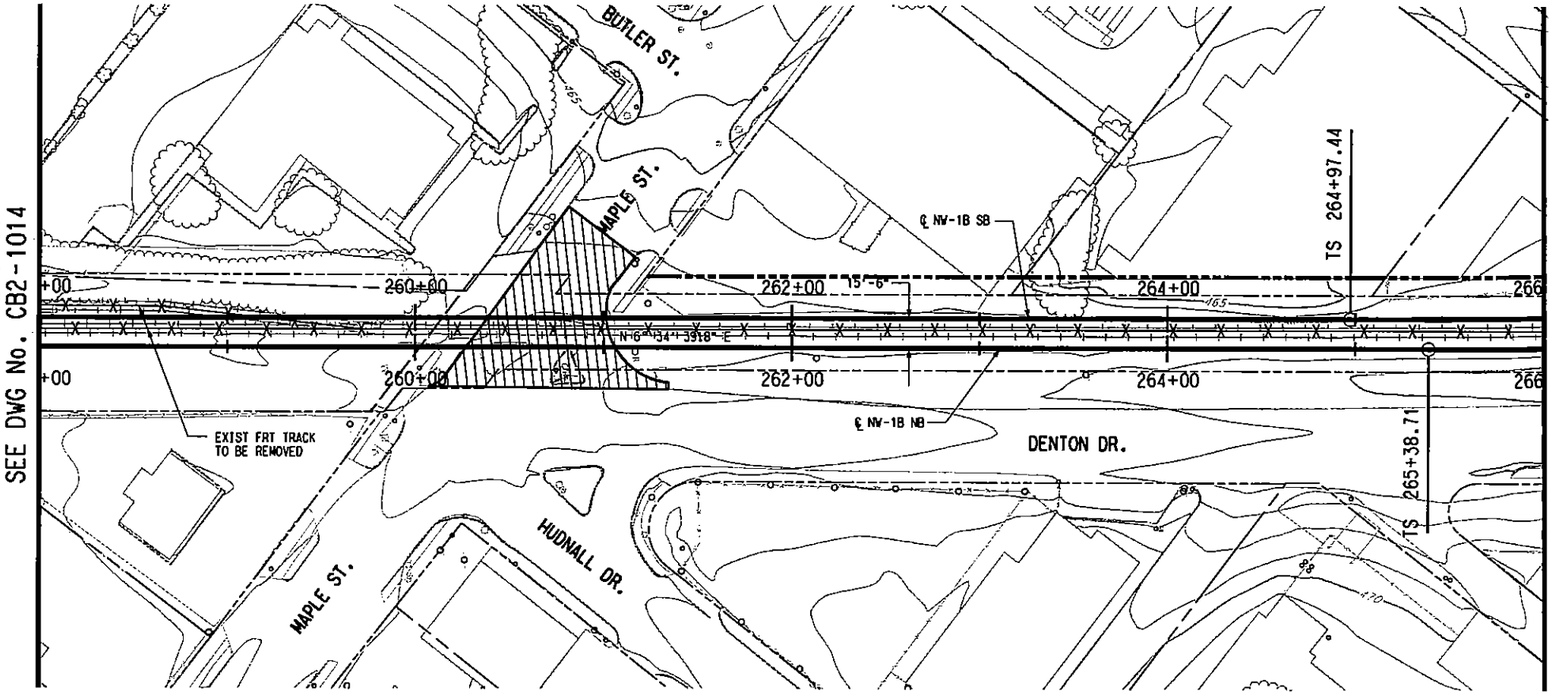
R:\NW1X\dgn\2003\NW1BTOPO, R:\NW1X\dgn\2003\NW1BWR2.040, 1-4,6-22,24-62
R:\NW1X\dgn\2003\NW1BTOPO.DWG, R:\NW1X\dgn\2003\NW1BBR1.001, 1-13,16-32,39,49-62
MODIFY, r:\NW1X\dgn\2003\NW1BCVR1.040, 1-61,63
PRF ROTATION=0.000000
R:\NW1X\prf\NW1BALIGN.prf
R:\NW1X\prf\NW1BALIGN.prf
lmorris
Thu Apr 24 11:49:53 2003
R:\NW1X\dgn\2003\NW1BCVL-ALIGN.dgn
mar 7 2003

DWG No. C82-1015

P0015

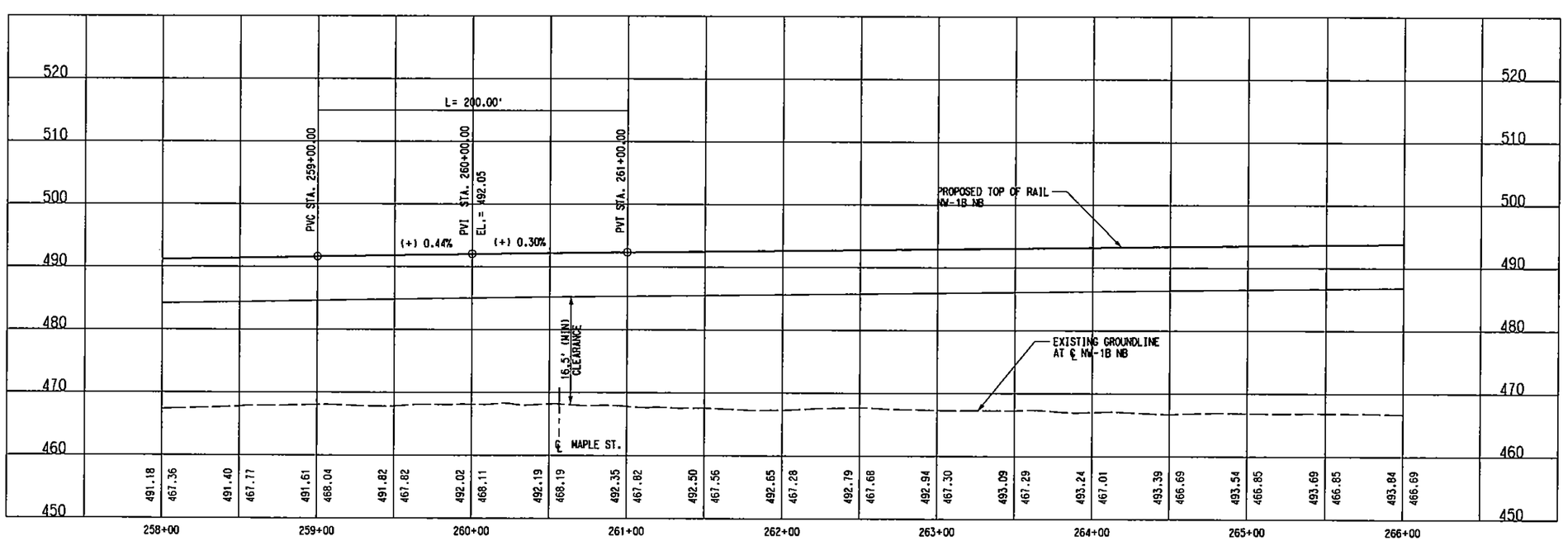


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-G (NB)		NW1B-GG (SB)	
Rc =	1000.00'	Rc =	900.00'
Ls =	175.00'	Ls =	200.00'
Lc =	290.23'	Lc =	218.70'
Ea =	3.50"	Ea =	4.00"
Eu =	1.40"	Eu =	1.44"
V =	35 MPH	V =	35 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.
2. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 63157 Date 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 126 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 258+00 TO STA 266+00

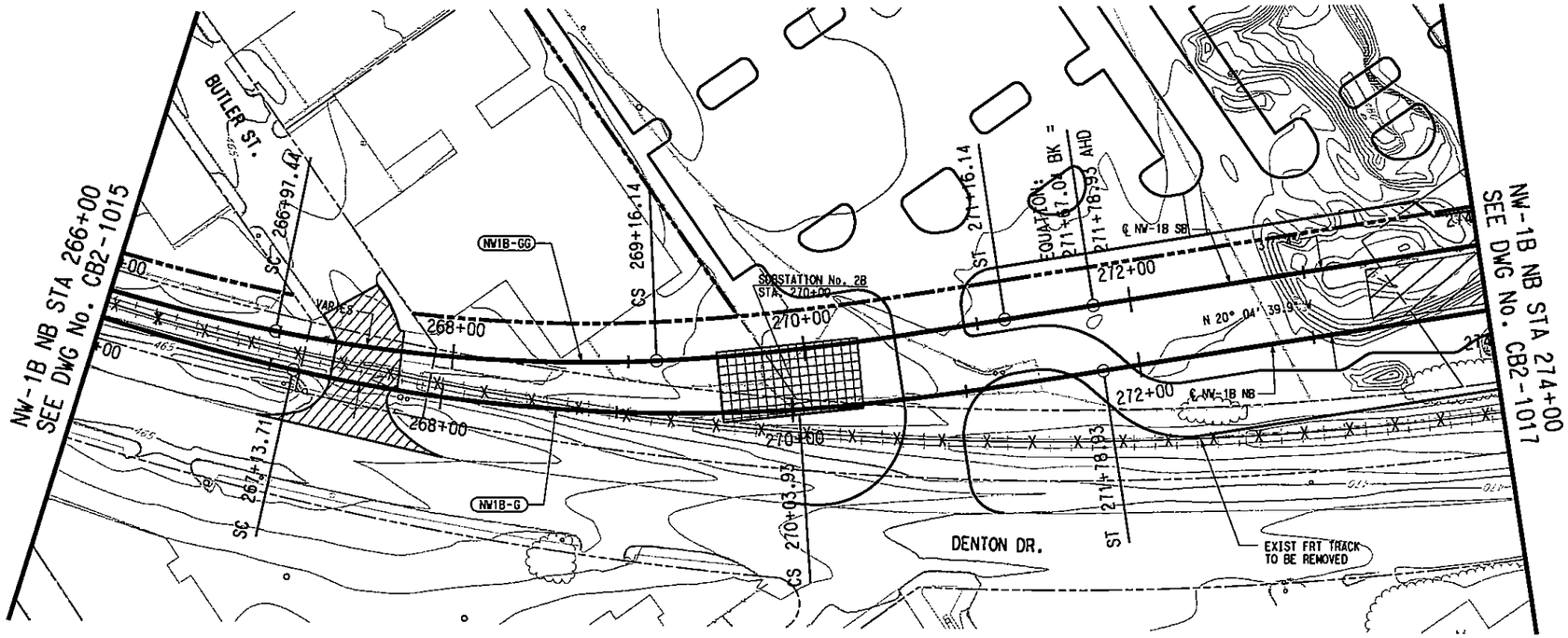
CONTRACT	DWG No.	REV
C-937775-1	C82-1015	

R:\NW1X\dgn\2003\DGN\CVL-ALIGN\NW1BALIGN.040 mar 7 2003

R:\NW1X\dgn\CVL-A0\NW1bALI6.prf
lmorris
Thu Apr 24 12:02:06 2003
R:\NW1X\dgn\CVL-A0\NW1bCVRI.040, 1-63
R:\NW1X\dgn\CVL-A0\NW1bCPRI.040, 1,7,8,13,15,17,20,25-32,37,38,41-45,47,48,50,52,53,55-58,60,61-63
R:\NW1X\dgn\NW1BPRI.040, 2-5,8-11,13-18,20,21,23-28,30-35,37-39,41,42,44,45,47,48,50,52,53,55-58,60,61-63
R:\NW1X\dgn\NW1BALI6.040, 1-62
R:\NW1X\dgn\NW1BALI6PRF.040, 1-4,6-22,24-62
R:\NW1X\dgn\NW1BALI6PRF.001, 1-13,16-32,39,49-62
MODIFY, r:\NW1X\ac121 mar 7 2003\NW1BCVRI.040, 1-61,63
PROFILE, r:\NW1X\ac121 mar 7 2003\NW1BPRI.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50,52,53,55-58,60,61-63
BORDER, R:\NW1X\ac121 mar 7 2003\NW1BALI6.040

DWG No. CB2-1016

P0016



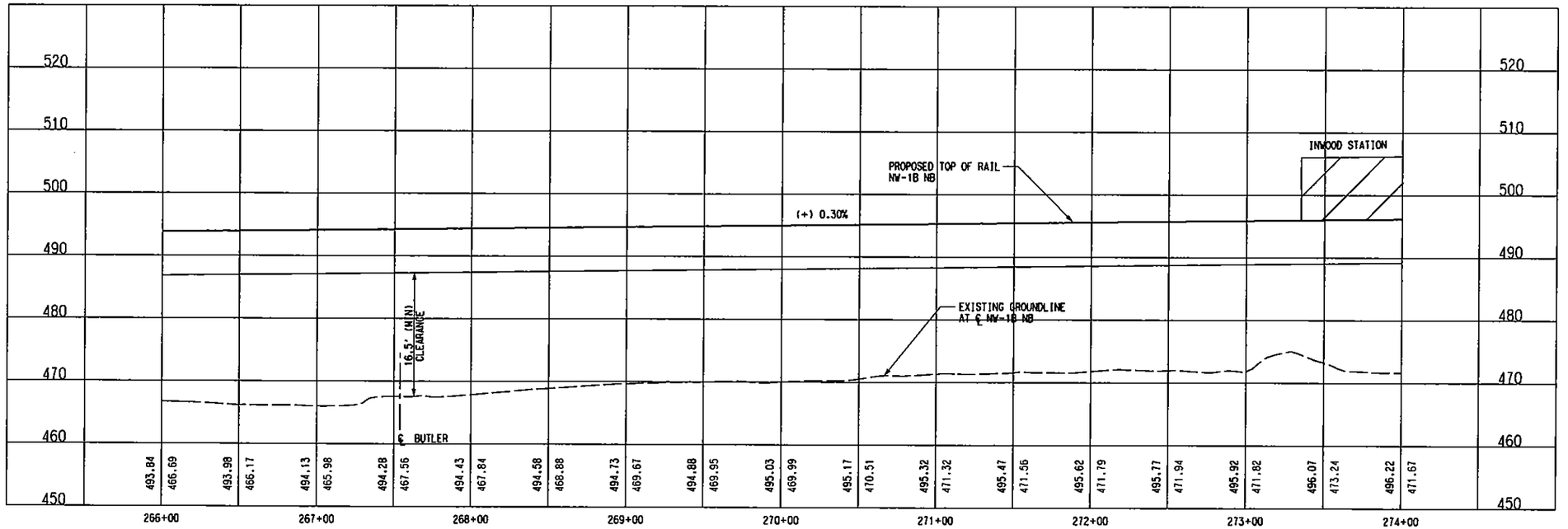
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-G (NB)		NW1B-GG (SB)	
Rc =	1000.00'	Rc =	900.00'
Ls =	175.00'	Ls =	200.00'
Lc =	290.23'	Lc =	218.70'
Eq =	3.50"	Eq =	4.00"
Eu =	1.40"	Eu =	1.44"
V =	35 MPH	V =	35 MPH

LEGEND

GRADING FOR SYSTEM ELEMENTS

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.
2. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPOC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.
3. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61151
Date: 14 MAR 03

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 127 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

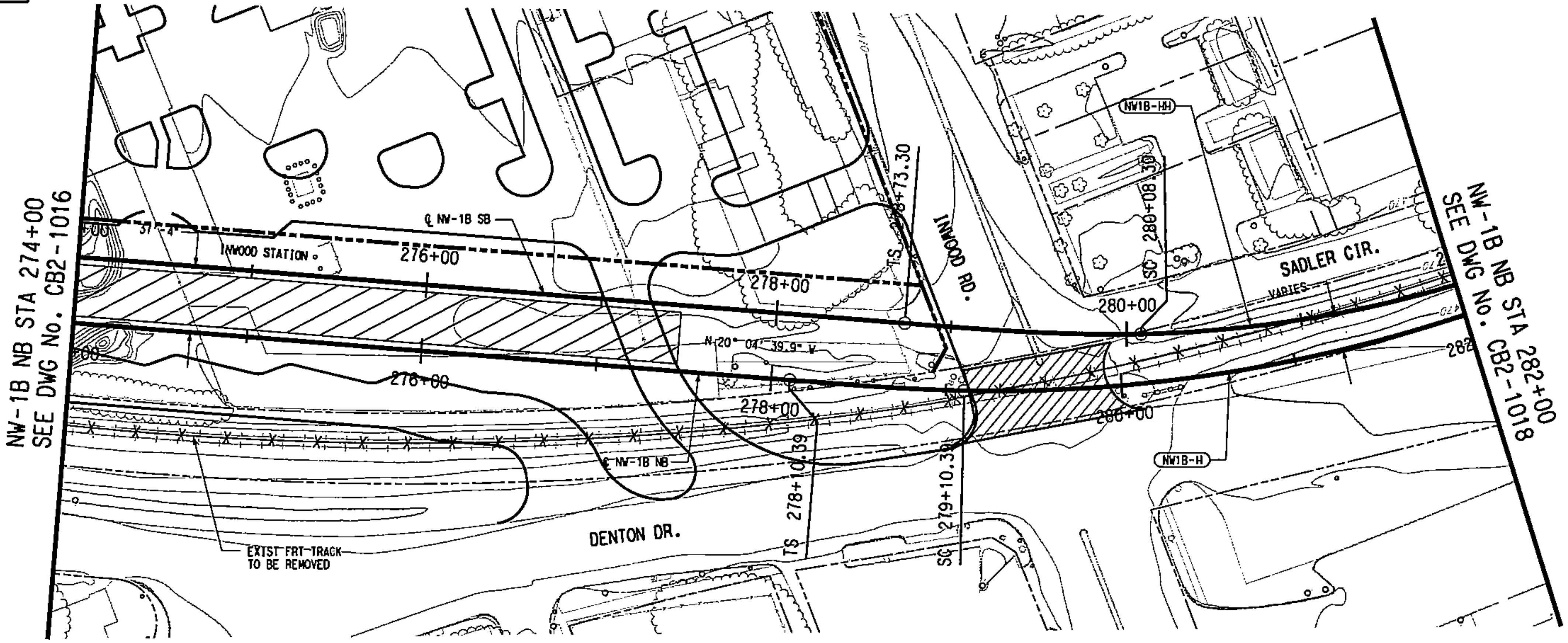
GUIDEWAY PLAN AND PROFILE
STA 266+00 TO STA 274+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-1016	

R:\NW1X\ac121 mar 7 2003\dgn\CVL-A0\NW1bALI6.040

R:\NWIX\act21 mar 7 2003\DGN\CVL-AQ\
Thu Apr 24 11:55:19 2003
R:\Nwlx\prf\NWIBAL17.prf
lmorris
PRF ROTATION=0.000000

DWG No. CB2-1017



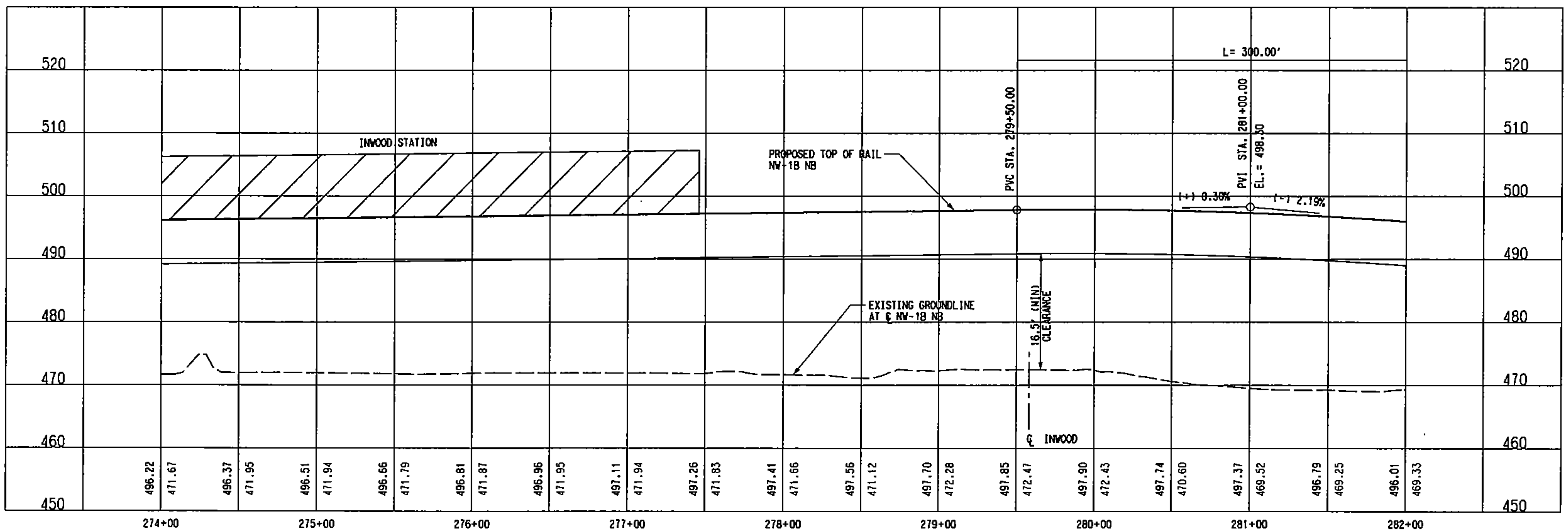
SCALE (IN FEET)
HORIZ 0 20 40 60
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-H (NB)	
Rc =	850.00'
Ls =	100.00'
Lc =	342.80'
Ea =	2.75"
Eu =	1.49"
V =	30 MPH

NW1B-HH (SB)	
Rc =	675.00'
Ls =	135.00'
Lc =	216.64'
Ea =	4.00"
Eu =	1.33"
V =	30 MPH

LEGEND

STREET/ALLEY/ DRIVE CONSTRUCTION



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

2. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED.

NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

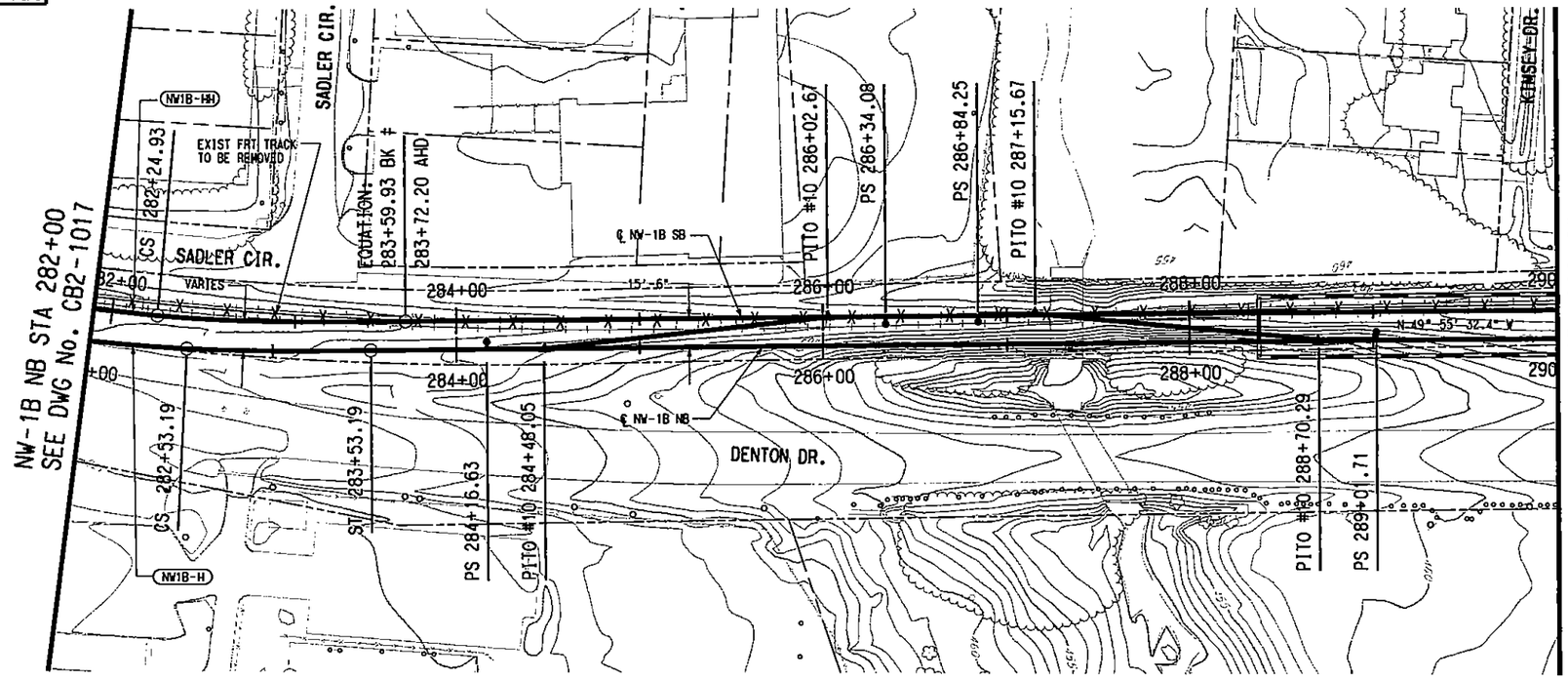
SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

CONTRACT SHEET No. 128 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 274+00 TO STA 282+00

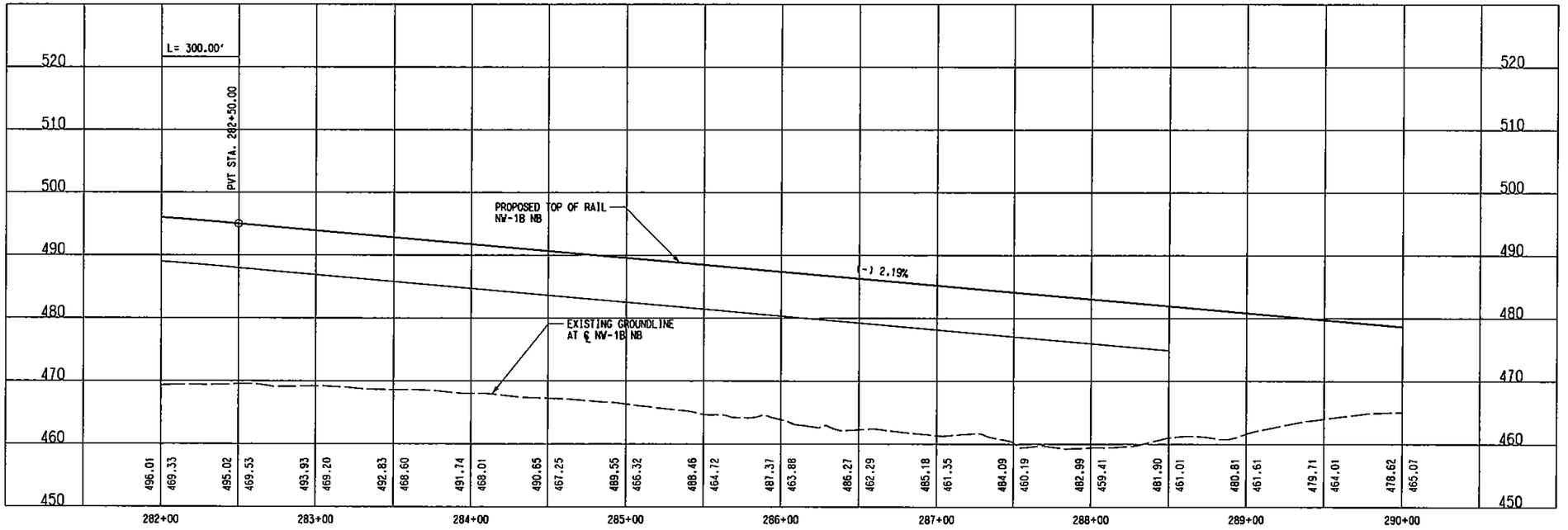
CONTRACT C-937775-1 | DWG No. CB2-1017 | REV



NW1B-H (NB)	
Rc =	850.00'
Ls =	100.00'
Lc =	342.80'
Es =	2.75"
Eu =	1.49"
V =	30 MPH

NW1B-HH (SB)	
Rc =	675.00'
Ls =	135.00'
Lc =	216.64'
Es =	4.00"
Eu =	1.33"
V =	30 MPH

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61153 Date 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASSRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 129 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

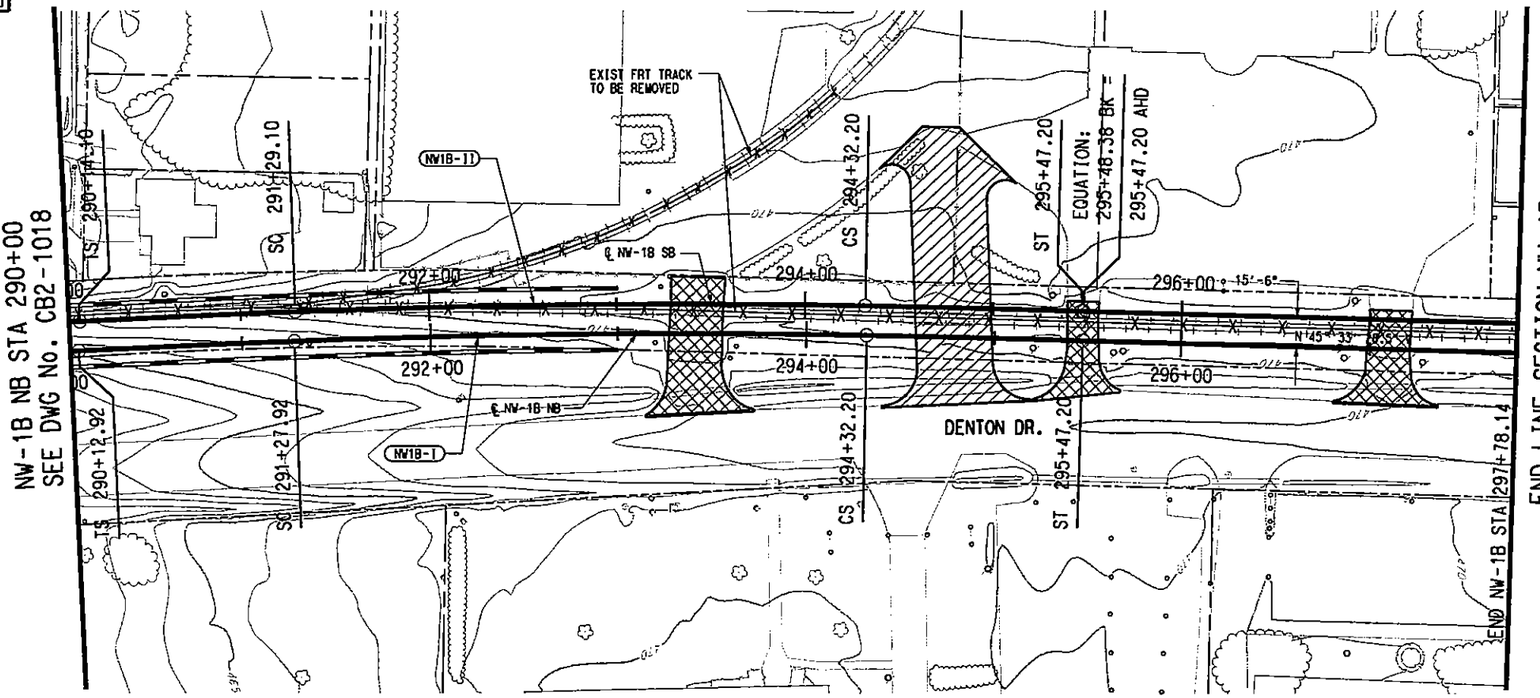
GUIDEWAY PLAN AND PROFILE
STA 282+00 TO STA 290+00

CONTRACT C-937775-1 | DWG No. C82-1018 | REV

R:\NW1X\dgn\CVL-AGNW1BAL18.040
R:\NW1X\ac121 mar 7 2003\DGN\CVL-AGNW1BAL18.040
MODIFY, r:\NW1X\ac121 mar 7 2003\NW1BCVRI.040, 1-61,63
PROFILE, r:\NW1X\ac121 mar 7 2003\NW1BPRFI.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,63
BORDER, R:\NW1X\ac121 mar 7 2003\NW1BCPRI.040, 1,7,8,13,15,17,20,25-32,37,38,41-45,47-50,52,60,63
ROW, r:\NW1X\ac121 mar 7 2003\NW1Bprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47,48,50,61-63
OW, r:\NW1X\ac121 mar 7 2003\nw1Bprwr.040, 15,18,19,26,27,31,40,46
TOPO, r:\NW1X\ac121 mar 7 2003\nw1bpir1.040, 1-13,16-32,39,49-63
ITE, r:\NW1X\ac121 mar 7 2003\NW1BCPRI.040, 1,7,8,13,15,17,20,25-32,37,38,41-45,47-50,52,60,63
IVIL, r:\NW1X\ac121 mar 7 2003\NW1BCVRI.040, 1-61,63
PRF ROTATION=0.000000
r:\NW1X\prf\NW1bAL18.prf
lmorris
Thu Apr 24 12:00:53 2003
R:\NW1X\prf\NW1bAL18.prf

DWG No. CB2-1019

P0019



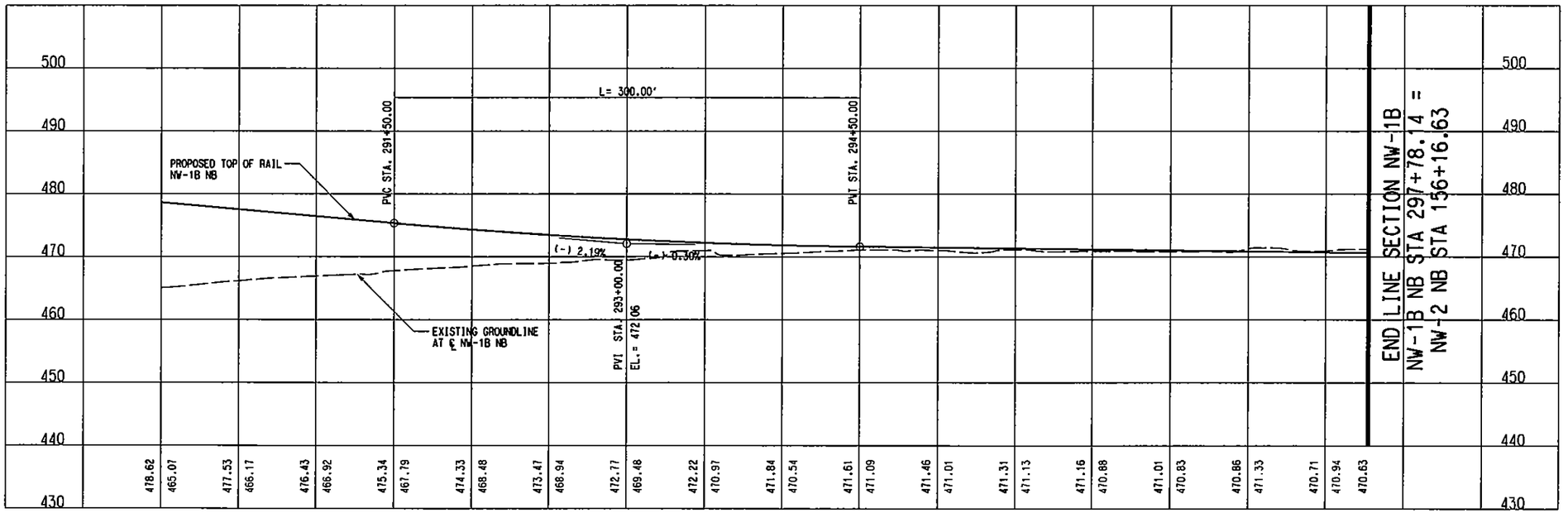
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW1B-I (NB)		NW1B-II (SB)	
Rc =	5500.00'	Rc =	5515.50'
Ls =	115.00'	Ls =	115.00'
Lc =	304.28'	Lc =	303.09'
Ea =	1.75"	Ea =	1.75"
Eu =	1.32"	Eu =	1.33"
V =	65 MPH	V =	65 MPH

LEGEND

STREET/ALLEY/ DRIVE CLOSURE

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOTE:

1. THIS ALIGNMENT ASSUMES THAT FREIGHT SERVICE CAN BE TERMINATED SOUTH OF THE "COCA-COLA" SPUR NEAR DENTON DRIVE AT MOCKINGBIRD LANE. IF FREIGHT SERVICE CANNOT BE TERMINATED, ADDITIONAL ROW WILL BE REQUIRED.
2. STREET MODIFICATIONS WILL BE FURTHER DEVELOPED IN FINAL DESIGN, IF NEEDED

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 63132
Date: 14 MAR 03

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY. SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

CONTRACT SHEET No. 130 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE
STA 290+00 TO STA 297+78.14

CONTRACT	DWG No.	REV
C-937775-1	CB2-1019	

R:\NW1X\dc121 mar 7 2003\DGN\CVL-AGNW1bAL19.040

R:\NW1X\dc121 mar 7 2003\NW1bCVR1.040, I-61,63
R:\NW1X\dc121 mar 7 2003\NW1bCPR1.040, I-7,8,13,15,17,20,25-32,37,38,41-45,49-52,60,63,65,67,68,70,71,73,74,76,77,79,80,82,83,85,86,88,89,91,92,94,95,97,98,100,101,103,104,106,107,109,110,112,113,115,116,118,119,121,122,124,125,127,128,130,131,133,134,136,137,139,140,142,143,145,146,148,149,151,152,154,155,157,158,160,161,163,164,166,167,169,170,172,173,175,176,178,179,181,182,184,185,187,188,190,191,193,194,196,197,199,200,202,203,205,206,208,209,211,212,214,215,217,218,220,221,223,224,226,227,229,230,232,233,235,236,238,239,241,242,244,245,247,248,250,251,253,254,256,257,259,260,262,263,265,266,268,269,271,272,274,275,277,278,280,281,283,284,286,287,289,290,292,293,295,296,298,299,301,302,304,305,307,308,310,311,313,314,316,317,319,320,322,323,325,326,328,329,331,332,334,335,337,338,340,341,343,344,346,347,349,350,352,353,355,356,358,359,361,362,364,365,367,368,370,371,373,374,376,377,379,380,382,383,385,386,388,389,391,392,394,395,397,398,400,401,403,404,406,407,409,410,412,413,415,416,418,419,421,422,424,425,427,428,430,431,433,434,436,437,439,440,442,443,445,446,448,449,451,452,454,455,457,458,460,461,463,464,466,467,469,470,472,473,475,476,478,479,481,482,484,485,487,488,490,491,493,494,496,497,499,500,502,503,505,506,508,509,511,512,514,515,517,518,520,521,523,524,526,527,529,530,532,533,535,536,538,539,541,542,544,545,547,548,550,551,553,554,556,557,559,560,562,563,565,566,568,569,571,572,574,575,577,578,580,581,583,584,586,587,589,590,592,593,595,596,598,599,601,602,604,605,607,608,610,611,613,614,616,617,619,620,622,623,625,626,628,629,631,632,634,635,637,638,640,641,643,644,646,647,649,650,652,653,655,656,658,659,661,662,664,665,667,668,670,671,673,674,676,677,679,680,682,683,685,686,688,689,691,692,694,695,697,698,700,701,703,704,706,707,709,710,712,713,715,716,718,719,721,722,724,725,727,728,730,731,733,734,736,737,739,740,742,743,745,746,748,749,751,752,754,755,757,758,760,761,763,764,766,767,769,770,772,773,775,776,778,779,781,782,784,785,787,788,790,791,793,794,796,797,799,800,802,803,805,806,808,809,811,812,814,815,817,818,820,821,823,824,826,827,829,830,832,833,835,836,838,839,841,842,844,845,847,848,850,851,853,854,856,857,859,860,862,863,865,866,868,869,871,872,874,875,877,878,880,881,883,884,886,887,889,890,892,893,895,896,898,899,901,902,904,905,907,908,910,911,913,914,916,917,919,920,922,923,925,926,928,929,931,932,934,935,937,938,940,941,943,944,946,947,949,950,952,953,955,956,958,959,961,962,964,965,967,968,970,971,973,974,976,977,979,980,982,983,985,986,988,989,991,992,994,995,997,998,1000,1001,1003,1004,1006,1007,1009,1010,1012,1013,1015,1016,1018,1019,1021,1022,1024,1025,1027,1028,1030,1031,1033,1034,1036,1037,1039,1040,1042,1043,1045,1046,1048,1049,1051,1052,1054,1055,1057,1058,1060,1061,1063
PRF ROTATION=0.000000
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lmorris
MODIFY, r:\NW1X\dc121 mar 7 2003\DGN\CVL-AGNW1bAL19.040
PROFILE, r:\NW1X\dc121 mar 7 2003\NW1bAL19.040
BORDER, R:\NW1X\dc121 mar 7 2003\NW1bBORDER.001, I-13,16-32,39,49-63
CVIL, r:\NW1X\dc121 mar 7 2003\NW1bCVR1.040, I-61,63
SITE, r:\NW1X\dc121 mar 7 2003\NW1bCPR1.040, I-7,8,13,15,17,20,25-32,37,38,41-45,49-52,60,63,65,67,68,70,71,73,74,76,77,79,80,82,83,85,86,88,89,91,92,94,95,97,98,100,101,103,104,106,107,109,110,112,113,115,116,118,119,121,122,124,125,127,128,130,131,133,134,136,137,139,140,142,143,145,146,148,149,151,152,154,155,157,158,160,161,163,164,166,167,169,170,172,173,175,176,178,179,181,182,184,185,187,188,190,191,193,194,196,197,199,200,202,203,205,206,208,209,211,212,214,215,217,218,220,221,223,224,226,227,229,230,232,233,235,236,238,239,241,242,244,245,247,248,250,251,253,254,256,257,259,260,262,263,265,266,268,269,271,272,274,275,277,278,280,281,283,284,286,287,289,290,292,293,295,296,298,299,301,302,304,305,307,308,310,311,313,314,316,317,319,320,322,323,325,326,328,329,331,332,334,335,337,338,340,341,343,344,346,347,349,350,352,353,355,356,358,359,361,362,364,365,367,368,370,371,373,374,376,377,379,380,382,383,385,386,388,389,391,392,394,395,397,398,400,401,403,404,406,407,409,410,412,413,415,416,418,419,421,422,424,425,427,428,430,431,433,434,436,437,439,440,442,443,445,446,448,449,451,452,454,455,457,458,460,461,463,464,466,467,469,470,472,473,475,476,478,479,481,482,484,485,487,488,490,491,493,494,496,497,499,500,502,503,505,506,508,509,511,512,514,515,517,518,520,521,523,524,526,527,529,530,532,533,535,536,538,539,541,542,544,545,547,548,550,551,553,554,556,557,559,560,562,563,565,566,568,569,571,572,574,575,577,578,580,581,583,584,586,587,589,590,592,593,595,596,598,599,601,602,604,605,607,608,610,611,613,614,616,617,619,620,622,623,625,626,628,629,631,632,634,635,637,638,640,641,643,644,646,647,649,650,652,653,655,656,658,659,661,662,664,665,667,668,670,671,673,674,676,677,679,680,682,683,685,686,688,689,691,692,694,695,697,698,700,701,703,704,706,707,709,710,712,713,715,716,718,719,721,722,724,725,727,728,730,731,733,734,736,737,739,740,742,743,745,746,748,749,751,752,754,755,757,758,760,761,763,764,766,767,769,770,772,773,775,776,778,779,781,782,784,785,787,788,790,791,793,794,796,797,799,800,802,803,805,806,808,809,811,812,814,815,817,818,820,821,823,824,826,827,829,830,832,833,835,836,838,839,841,842,844,845,847,848,850,851,853,854,856,857,859,860,862,863,865,866,868,869,871,872,874,875,877,878,880,881,883,884,886,887,889,890,892,893,895,896,898,899,901,902,904,905,907,908,910,911,913,914,916,917,919,920,922,923,925,926,928,929,931,932,934,935,937,938,940,941,943,944,946,947,949,950,952,953,955,956,958,959,961,962,964,965,967,968,970,971,973,974,976,977,979,980,982,983,985,986,988,989,991,992,994,995,997,998,1000,1001,1003,1004,1006,1007,1009,1010,1012,1013,1015,1016,1018,1019,1021,1022,1024,1025,1027,1028,1030,1031,1033,1034,1036,1037,1039,1040,1042,1043,1045,1046,1048,1049,1051,1052,1054,1055,1057,1058,1060,1061,1063
TOPO, r:\NW1X\dc121 mar 7 2003\NW1bPTR1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50

DWG No. CB2-1020

P0020

SHEET INTENTIONALLY LEFT BLANK.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 131 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
******
CP&Y
J. TIPTON, P.E. No. 61137
Date: 14 MAR 03

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B

GUIDEWAY PLAN AND PROFILE

CONTRACT C-937775-1 | DWG No. CB2-1020 | REV

r:\NwIX\dc121 mar 7 2003\DGN\CVL-AQ\NWIbAL20.040

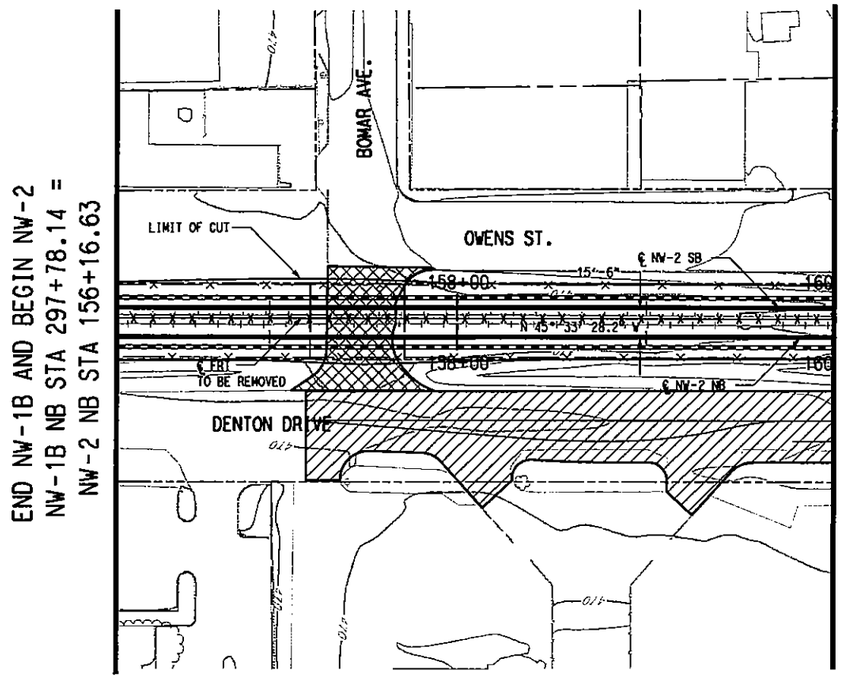
r:\NwIX\dc121 mar 7 2003\DGN\CVL-AQ\
Wed Apr 23 15:00:58 2003
R:\NwIX\prf\NWIbAL20.prf
lmorris

PRF ROTATION=0.000000
W:\CADNET\PENTABLE\Smdarf.tbl

ORDER, R:\NWIX\dc121 mar 7 2003\nwixborl.001, 1-12,16-32,39,49-63
no ref logical*, *no ref name*, *no ref levels*

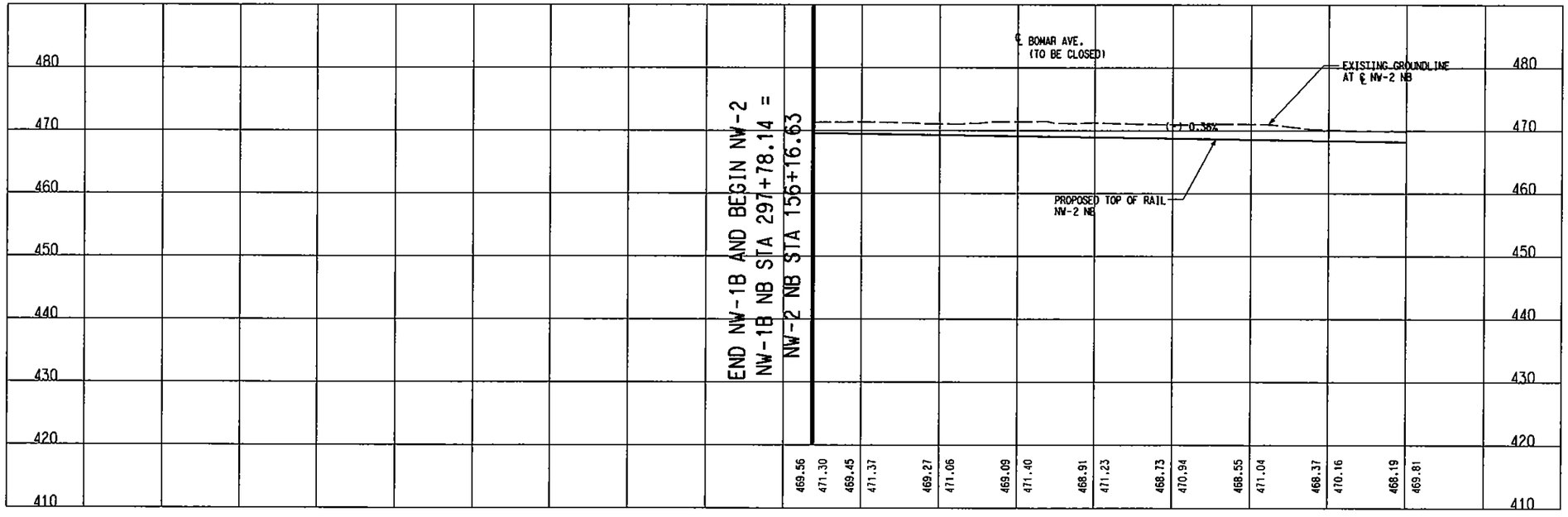
DWG No. CB2-2001

P0001



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND
- STREET/ALLEY/ DRIVE CLOSURE
- STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 132 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	R. THOMPSON
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	14 MAR 03

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 156+16.63 TO STA 160+00

CONTRACT C-937775-1 | DWG No. CB2-2001 | REV

PROV, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47-49,51-63
PTOPO, R:\NW2X\NW2xptr1.040, 2-5,8-11,13-18,20,25,29,31,35,49
ROW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46
MODIFY, R:\NW2X\NW2xstr1.040, 2-30,35-61,63
TOPOI, R:\NW2X\nw2xtpr1.040, 2-5,8-11,13-18,20,25,29,31,35,49,52
STH, R:\NW2X\nw2xudr1.040, 1-14,16-63
LIGN, R:\NW2X\nw2xalr1.040, 1-61
ORDER, R:\NWIX\ac121 mar 7 2003\nwlxbor1.001, 1-3,6,10,13,20,23,39,56,57
RPL, R:\NW2X\NW2XBRR1.040, 6-10,15-17
IVIL, R:\NW2X\nw2xCVR1.040, 1-61,63

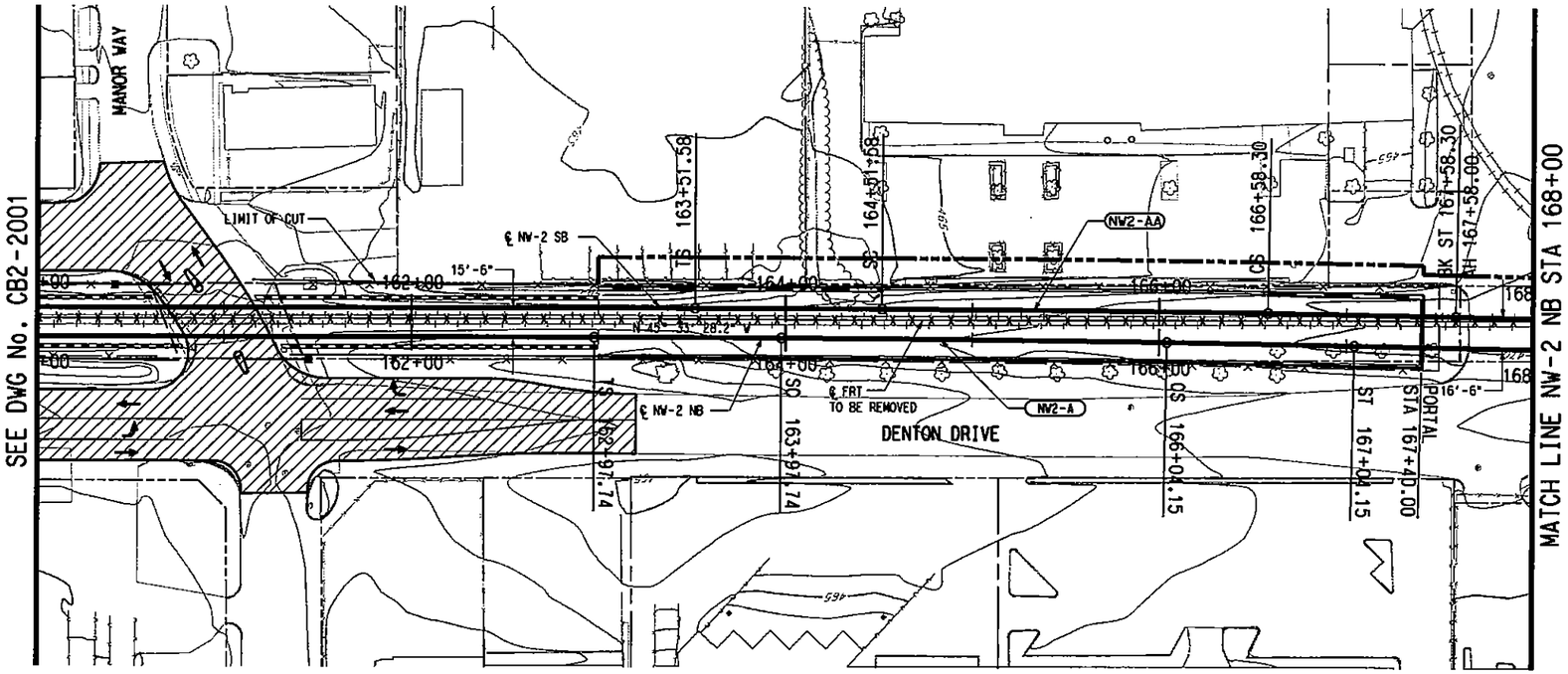
R:\NWIX\ac121 mar 7 2003\DGN\CVL-A0\
Thu Apr 24 13:33:24 2003
R:\NWIX\prf\nw2xal01.prf
lmorris

W:\CADNET\PENTABLE\Smdarf.tbl
PSW ROTATION=0.000000

R:\NWIX\ac121 mar 7 2003\DGN\CVL-A0\nw2xal01.040

DWG No. CB2-2002

P0002



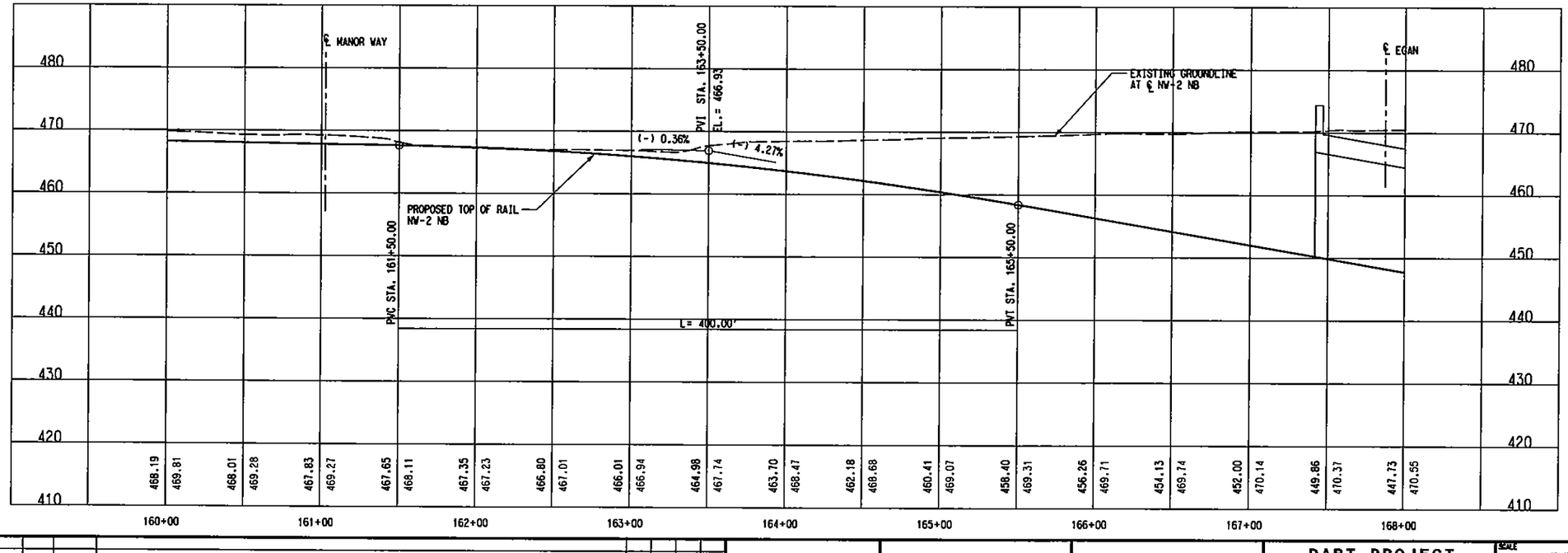
HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

NW2-A (NB)		NW2-AA (SB)	
Rc =	16500.00'	Rc =	16516.50'
Ls =	100'	Ls =	100'
Lc =	206.42'	Lc =	206.72'
Eo =	0.00"	Eo =	0.00"
Eu =	1.02"	Eu =	1.03"
V =	* 45 MPH	V =	* 45 MPH

* VERTICAL CURVE CONTROLS SPEED.

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 133 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81357
Date 10.07.02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1600

DART PROJECT

SCALE	1"=40'
DRAWN	R. THOMPSON
DESIGNED	L. MORRIS
CHECKED	S. BASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 160+00 TO STA 168+00

CONTRACT C-937775-1 | DWG No. CB2-2002 | REV

R:\NW2X\DGN\Civil-AO\nw2xsl02.040
Fri Nov 15 10:47:26 2002
R:\NW2X\prf\nw2xsl02.prf
lmorris

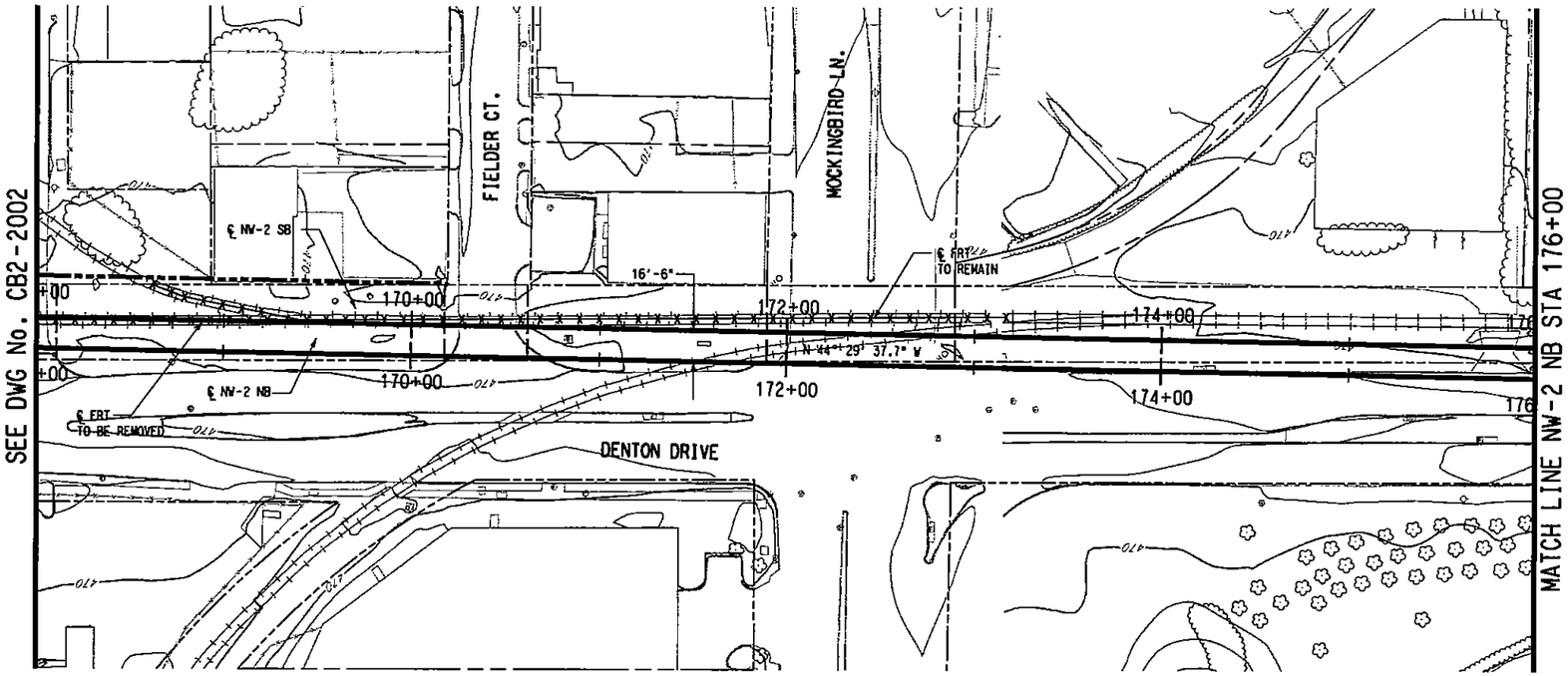
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47-49,51-63
PTOPO, R:\NW2X\NW2xptr1.040, 2-5,8-11,13-18,20,25,29,31,35,49 USE ROTATION=0.000000
ROW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46 W:\CADNET\PENTABLE\Smdarl.tbl
MODIFY, R:\NW2X\NW2xstr1.040, 1-30,35-61,63
TOPOI, R:\NW2X\nw2xtpr1.040, 2-5,8-11,13-18,20,25,29,31,35,49,52

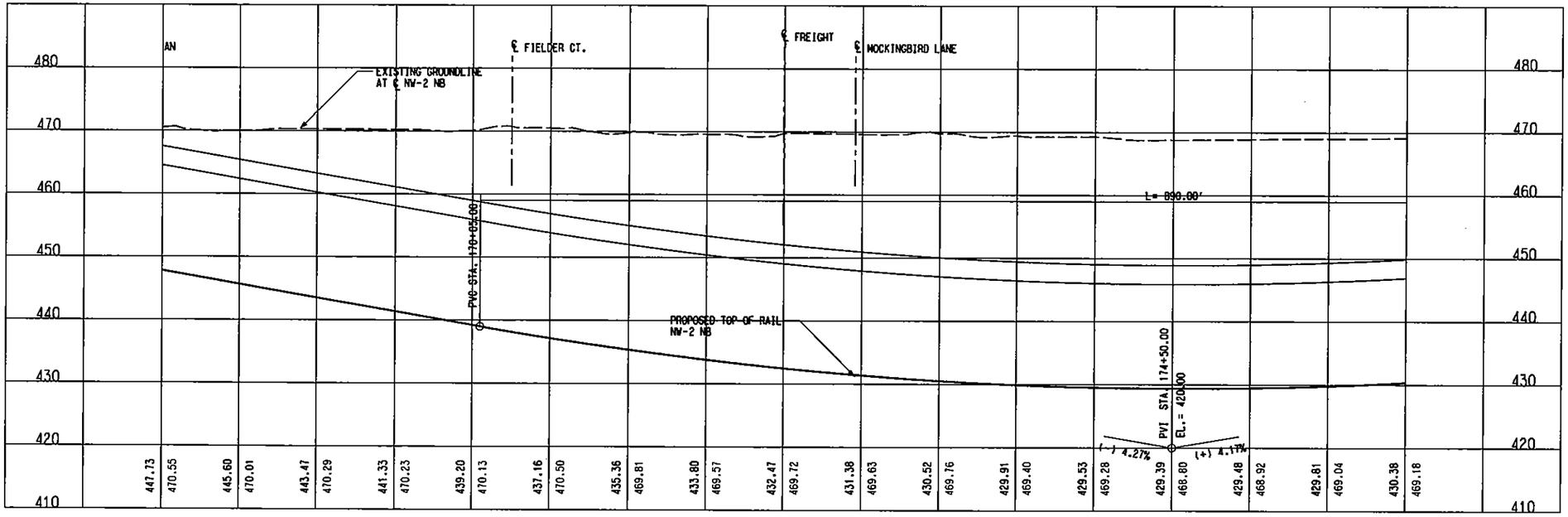
STM, R:\NW2X\nw2xudr1.040, 1-14,16-63
LIGN, R:\NW2X\nw2xelr1.040, 1-61
ORDER, R:\NW2X\nw2xbor1.001, 1-3,6,10,13,20,23,39,56,57
RPL, R:\NW2X\NW2XBRR1.040, 6-10,15-17
IVIL, R:\NW2X\nw2xCVR1.040, 1-61,63

R:\NW2X\DGN\Civil-AO\nw2xsl02.040

DWG No. CB2-2003

P0003





NOTES:

1. EXISTING FREIGHT TRACKS SHALL BE KEPT OPERATIONAL THROUGHOUT THE UNDERGROUND CONSTRUCTION BE MEANS SUCH AS BRIDGING OR TEMPORARY SHOO-FLY. FREIGHT TRACKS SHALL BE RESTORED AFTER COMPLETION OF THE RELATED UNDERGROUND CONSTRUCTION.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137 Date: 10 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	R. THOMPSON
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 134 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 168+00 TO STA 176+00

CONTRACT C-937775-1 | DWG No. CB2-2003 | REV

R:\NW2X\DGN\Civil-AG\nw2sa103.040
Fri Nov 15 10:48:21 2002
R:\NW2X\prf\nw2sa103.prf
lmorris

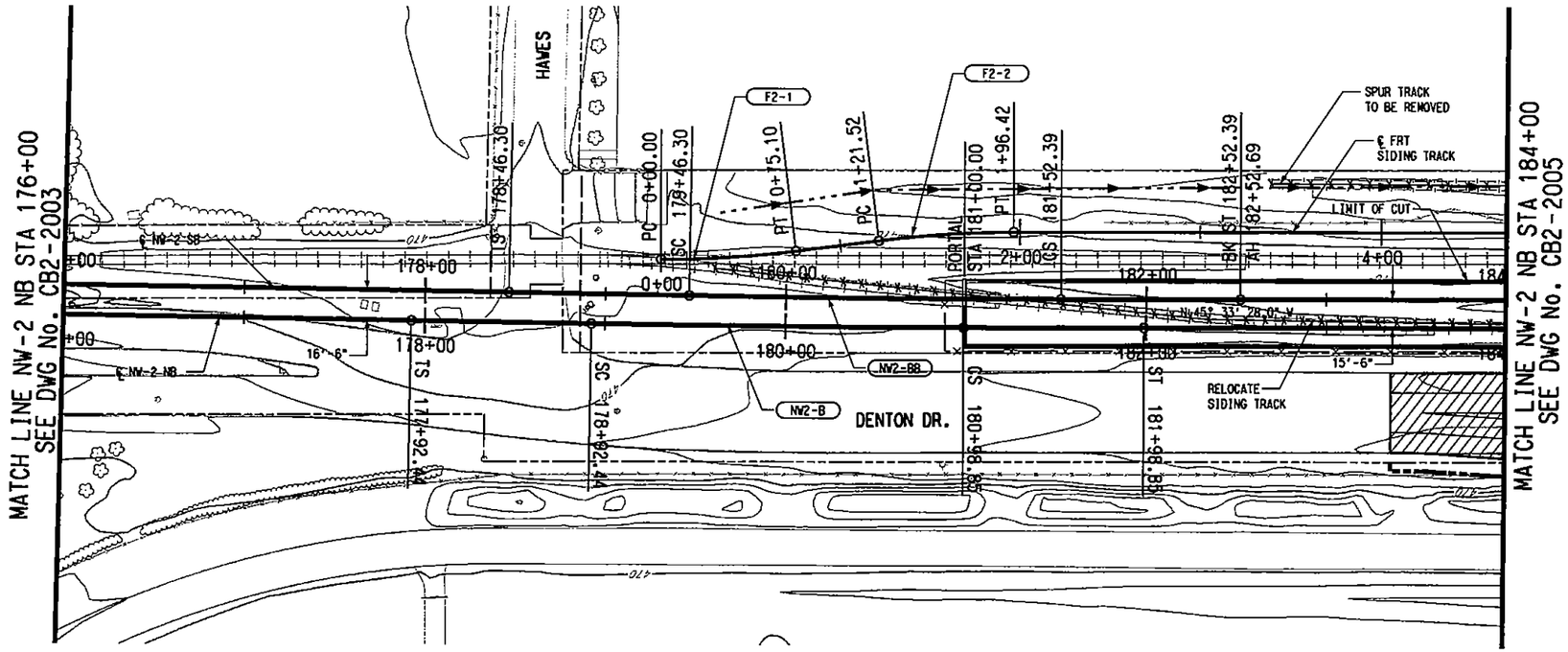
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47-49,51-63
PTOPO, R:\NW2X\NW2xptr1.040, 2-5,8-11,13-18,20,25,29,31,35,49,56,57
ROW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46
MODIFY, R:\NW2X\NW2xstr1.040, 6-10,15-17
SITE, R:\NW2X\NW2XGPR1.040, 1-61,63
V:\CADNET\PENTABLE\Smdorr1.tbl
PSF ROTATION=0.000000

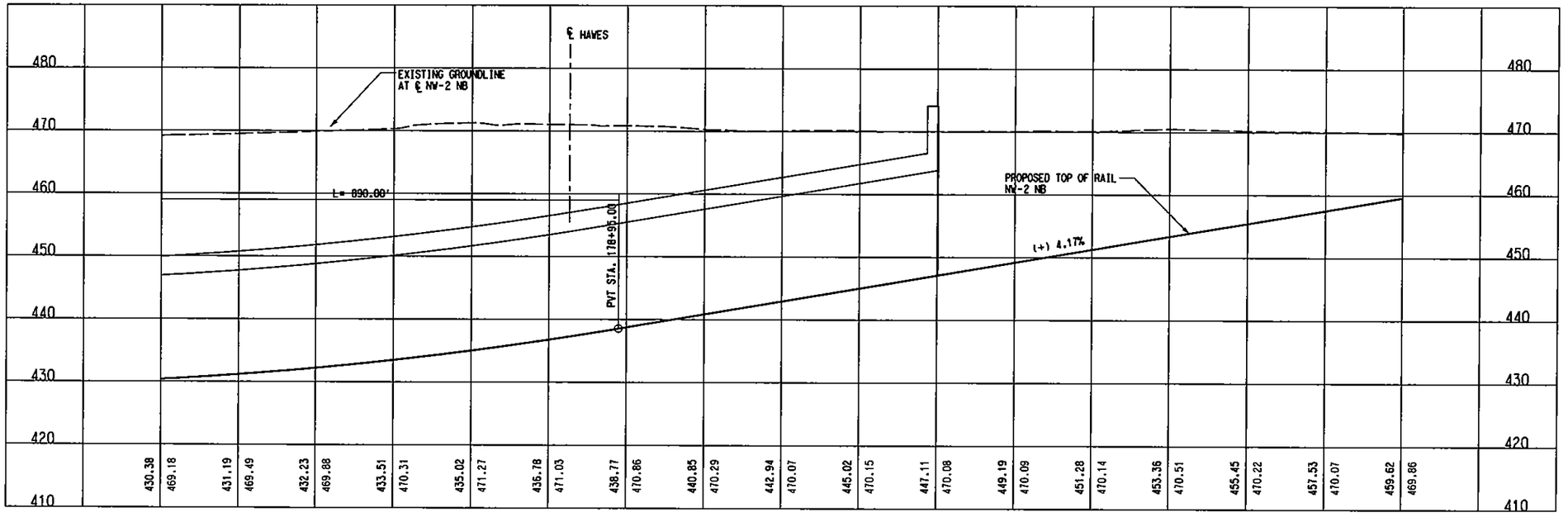
STM, R:\NW2X\nw2xudr1.040, 1-14,16-63
LIGN, R:\NW2X\nw2xstr1.040, 1-61
ORDER, R:\NW2X\nw2xbor1.001, 1-3,8,10,13,20,23,39,56,57
RPL, R:\NW2X\NW2XBRR1.040, 6-10,15-17
IVIL, R:\NW2X\nw2xCVR1.040, 1-61,63

R:\NW2X\DGN\Civil-40\nw2sa103.040

DWG No. CB2-2004

P0004





NW2-B (NB)	
Rc =	16500.00'
Ls =	100.00'
Lc =	206.40'
Eq =	0.00"
Eu =	1.02"
V =	65 MPH

NW2-BB (SB)	
Rc =	16483.50'
Ls =	100.00'
Lc =	206.10'
Eq =	0.00"
Eu =	1.02"
V =	65 MPH

F2-1	
Dc =	11°30'
Ls =	0.00'
Lc =	94.71'
Eq =	1.75"
Eu =	1.50"
V =	20 MPH

F2-2	
Dc =	11°30'
Ls =	0.00'
Lc =	94.92'
Eq =	1.75"
Eu =	1.50"
V =	20 MPH

LEGEND

STREET/ALLEY/
DRIVE RECONSTRUCTION

NOTES:

1. EXISTING FREIGHT TRACKS SHALL BE KEPT OPERATIONAL THROUGHOUT THE UNDERGROUND CONSTRUCTION BE MEANS SUCH AS BRIDGING OR TEMPORARY SHOO-FLY. FREIGHT TRACKS SHALL BE RESTORED AFTER COMPLETION OF THE RELATED UNDERGROUND CONSTRUCTION.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84157
Date: 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	R. THOMPSON
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 135 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 176+00 TO STA 184+00

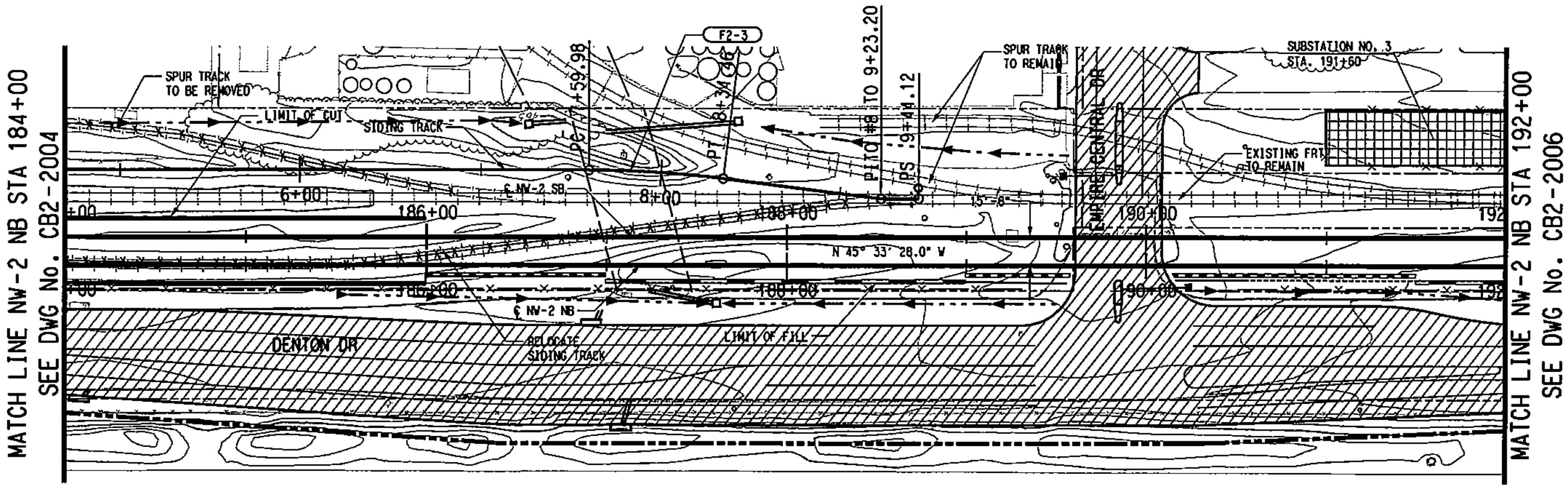
CONTRACT	DWG No.	REV
C-937775-1	CB2-2004	

STM, R:\NW2X\nw2xudr1.040, 1-14,16-63
LIGN, R:\NW2X\nw2xalr1.040, 1-61
ORDER, R:\NW2X\nw2xbor1.001, 1-3,6,10,13,20,23,39,56,57
RPL, R:\NW2X\NW2XBRR1.040, 6-10,15-17
IVIL, R:\NW2X\nw2xCVR1.040, 1-61,63

PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47-49,51-63
PTOPO, R:\NW2X\NW2xptr1.040, 2-5,8-11,13-18,20,25,29,31,35,49,52
ROW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46
MODIFY, R:\NW2X\Nw2xstr1.040, 1-30,35-61,63
TOPO1, R:\NW2X\nw2xtpr1.040, 2-5,8-11,13-18,20,25,29,31,35,49,52

R:\NW2X\DGN\Civil-AO\nw2xal04.040
Fri Nov 15 10:50:01 2002
R:\NW2X\prf\nw2xal04.prf
jmorris

R:\NW2X\DGN\Civil-AO\nw2xal04.040



SCALE (IN FEET) HORIZ 0 20 40 80

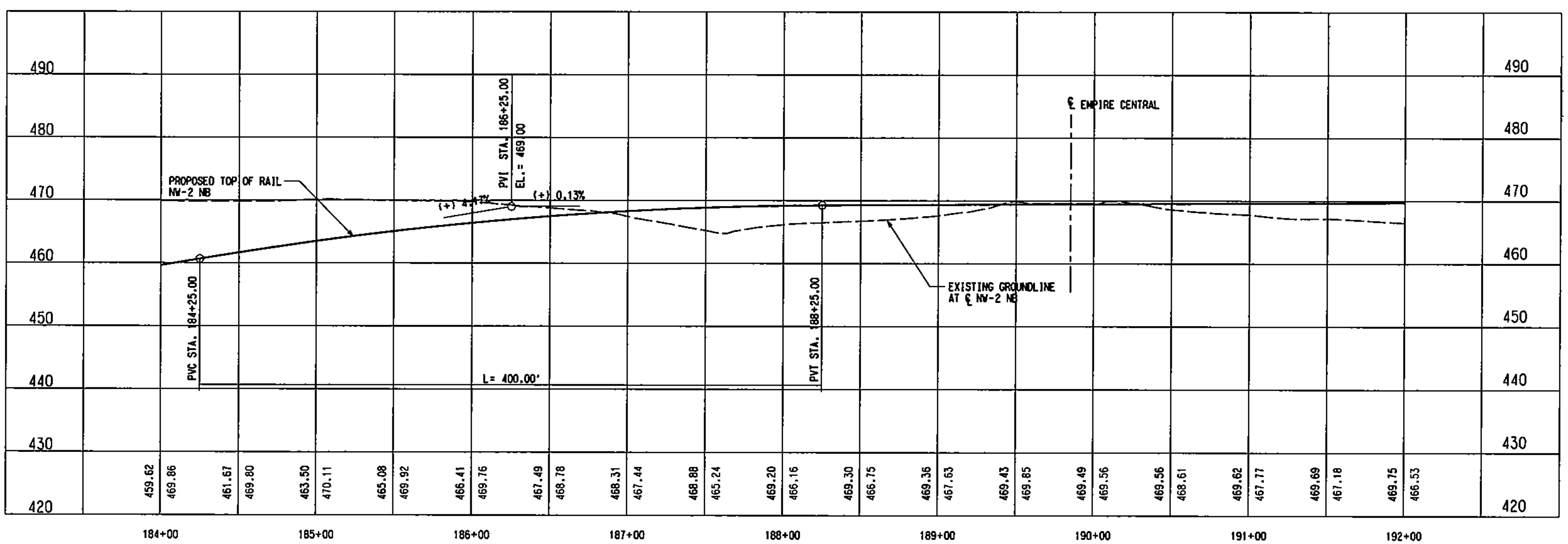
SCALE (IN FEET) VERT 0 5 10 15 20

F2-3	
Dc =	9°30'
Ls =	0.00'
Lc =	74.49'
Ea =	1.50"
Eu =	1.50"
V =	20 MPH

LEGEND

GRADING FOR SYSTEM ELEMENTS

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOTE:

1. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 136 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

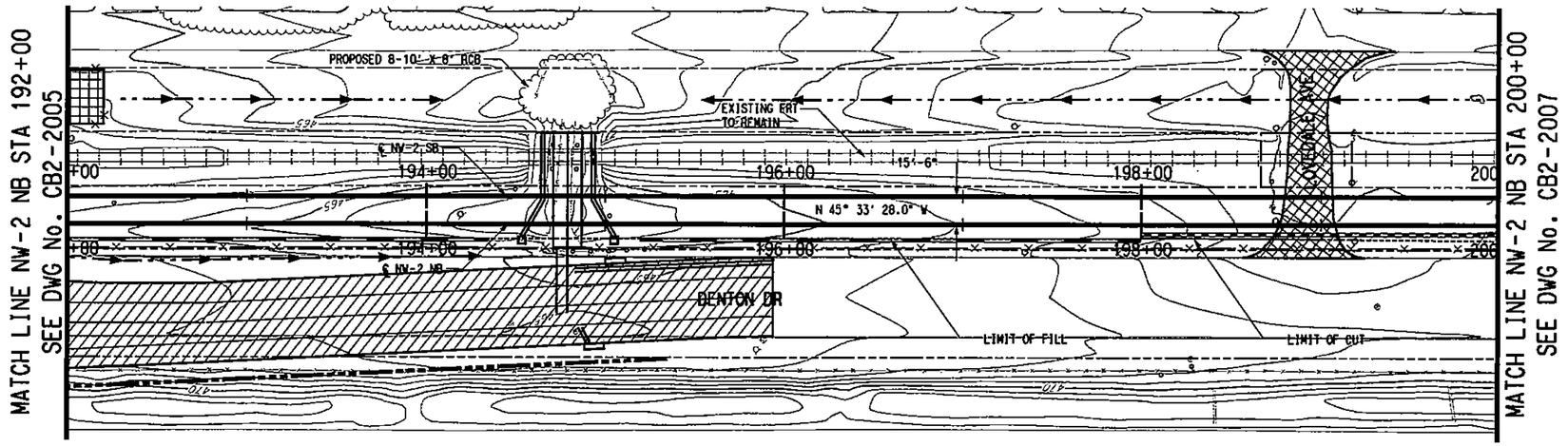
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

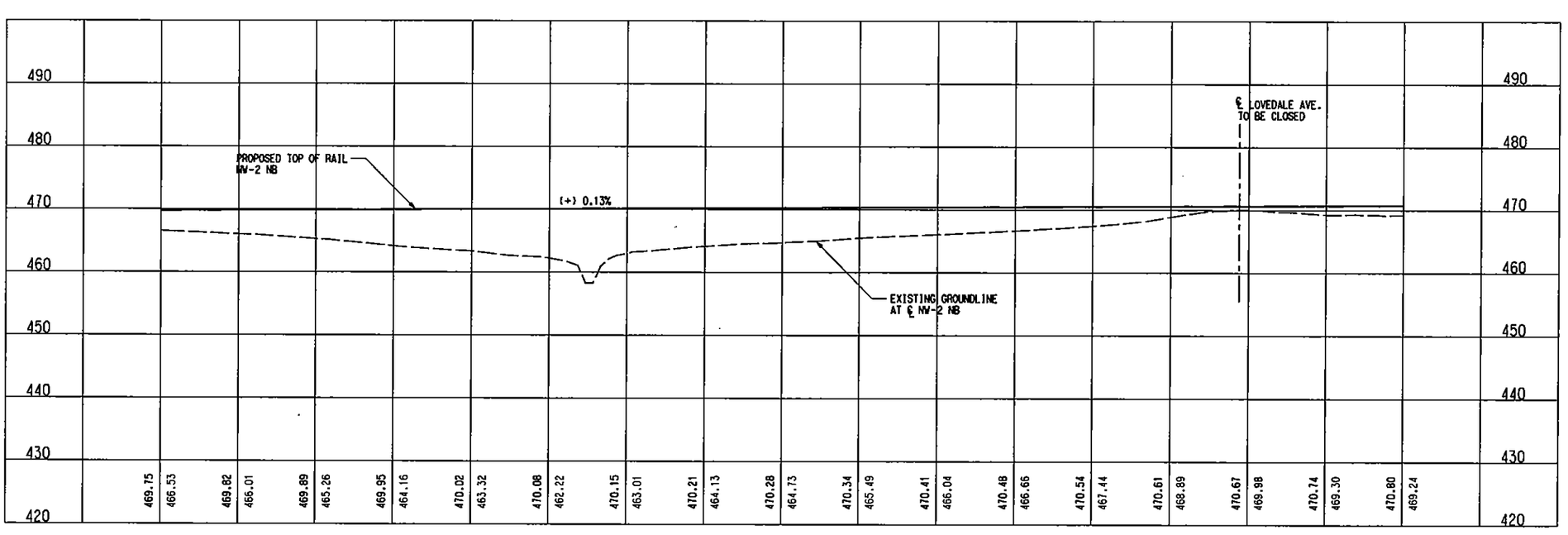
GUIDEWAY PLAN AND PROFILE
STA 184+00 TO STA 192+00

CONTRACT C-937775-1 | DWG No. CB2-2005 | REV

DWG No. CB2-2006

P0006





LEGEND

- GRADING FOR SYSTEM ELEMENTS
- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE

HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64157 Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600 DALLAS, TEXAS 75248 (972) 991-1600

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 137 OF 243

LIGHT RAIL TRANSIT SYSTEM LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE STA 192+00 TO STA 200+00

CONTRACT C-937775-1 | DWG No. CB2-2006 | REV

R:\NW2X\DGN\Cvl-AO\nw2xsl06.040
Fri Nov 15 10:53:06 2002
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lmorris

PRF ROTATION=0.000000
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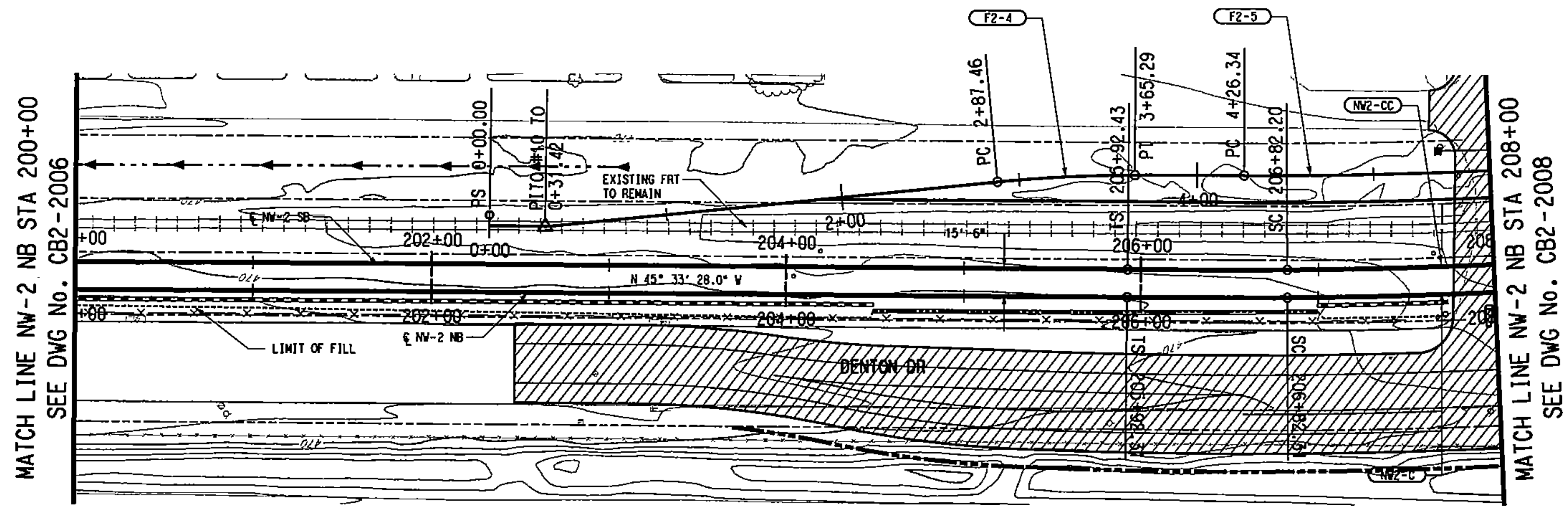
OPOI, R:\NW2X\nw2xlprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
T.IL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2xpirl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LTGN, R:\NW2X\nw2xsalrl.040, 1-61
Ow, R:\NW2X\nw2xrwrl.040, 15,18,19,26,27,31,40,46

BORDER, R:\NW2X\nw2xborl.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwrl.040, 1-21,23-28,30-35,37-39,41,42,44,
SITE, R:\NW2X\nw2xcprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbrrl.040, 6-10,15-17

R:\NW2X\DGN\Cvl-AO\nw2xsl06.040

P0007



SCALE (IN FEET)

HORIZ 0 20 40 80

VERT 0 5 10 15 20

NW2-C (NB)	
Rc =	3000.00'
Ls =	90.00'
Lc =	790.52'
Ea =	1.25"
Eu =	1.45"
V =	45 MPH

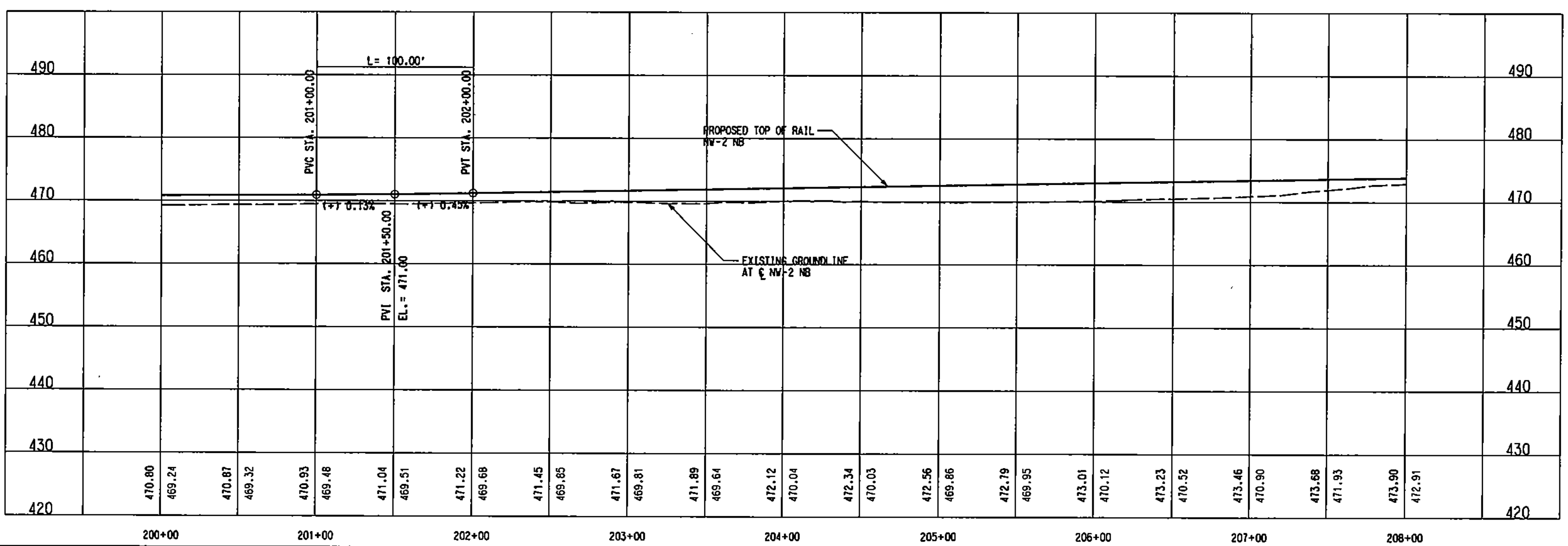
NW2-CC (SB)	
Rc =	2984.50'
Ls =	89.77'
Lc =	786.20'
Ea =	1.25"
Eu =	1.46"
V =	45 MPH

F2-4	
Dc =	1°20'
Ls =	0.00'
Lc =	77.83'
Ea =	1.00"
Eu =	1.00"
V =	20 MPH

F2-5	
Dc =	2°0'
Ls =	0.00'
Lc =	847.17'
Ea =	1.50"
Eu =	1.50"
V =	45 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 138 OF 243

REV	AMDO	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 200+00 TO STA 208+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-2007	

DWG No. CB2-2007

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Fri Nov 15 10:55:37 2002
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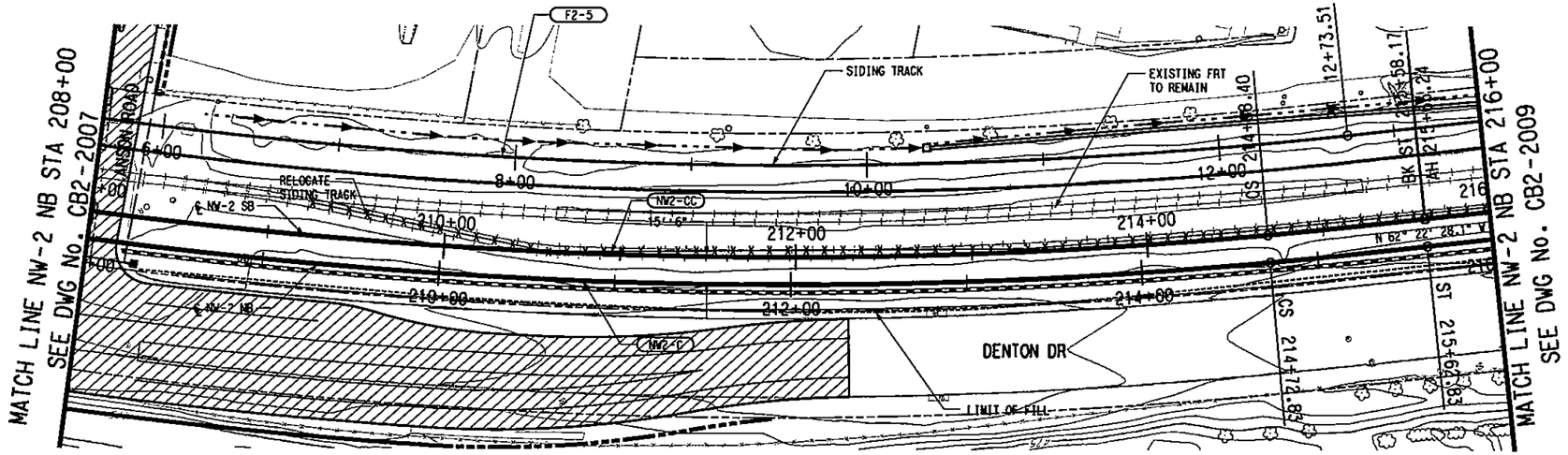
lmorris



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

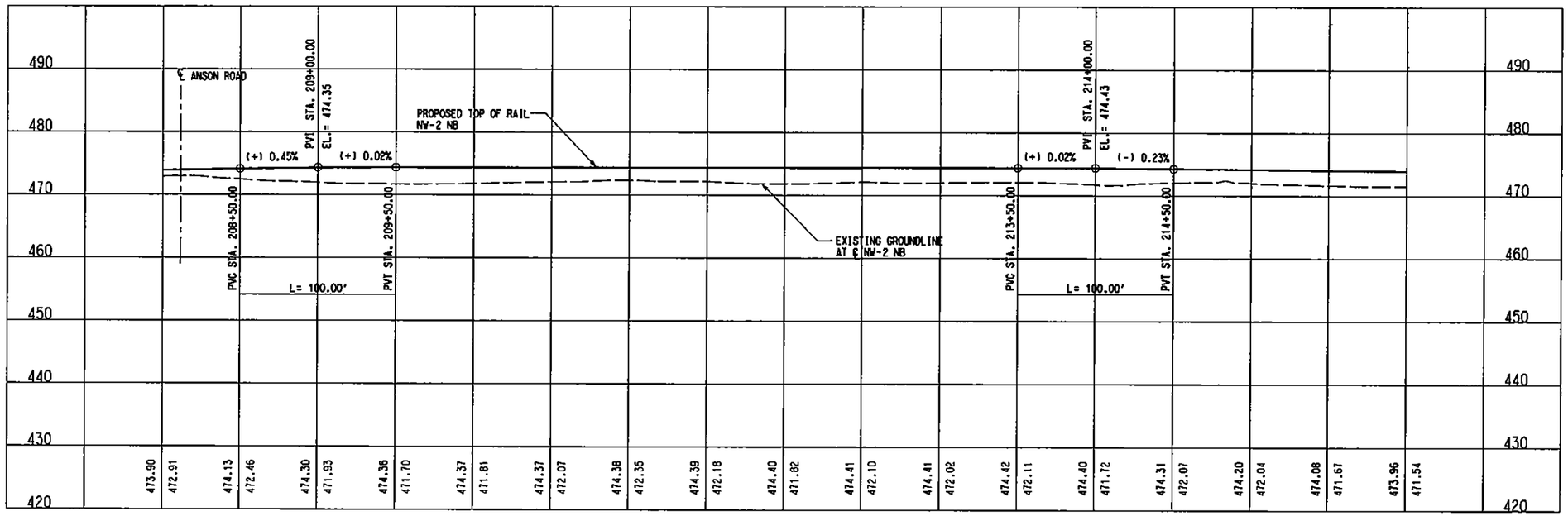
NW2-C (NB)	
Rc =	3000.00'
Ls =	90.00'
Lc =	790.52'
Ea =	1.25"
Eu =	1.45"
V =	45 MPH

NW2-CC (SB)	
Rc =	2984.50'
Ls =	89.77'
Lc =	786.20'
Ea =	1.25"
Eu =	1.46"
V =	45 MPH

F2-5	
Dc =	2°0'
Ls =	0.00'
Lc =	847.17'
Ea =	1.50"
Eu =	1.50"
V =	45 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84157
Date: 10-25-02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 139 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 208+00 TO STA 216+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-2008	

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Fri Nov 15 10:56:27 2002
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lmorris

BORDER, R:\NW2X\nw2xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,48
SITE, R:\NW2X\nw2xexpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbrr1.040, 6-10,15-17

OPOI, R:\NW2X\nw2xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2xptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xalr1.040, 1-61
OW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46

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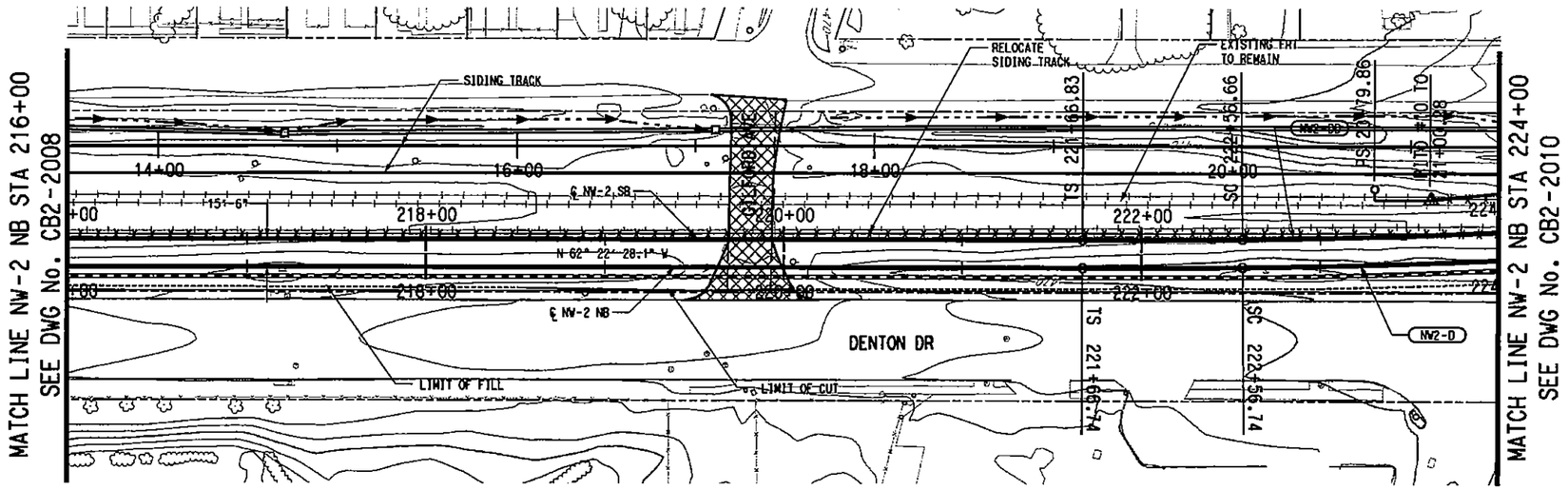
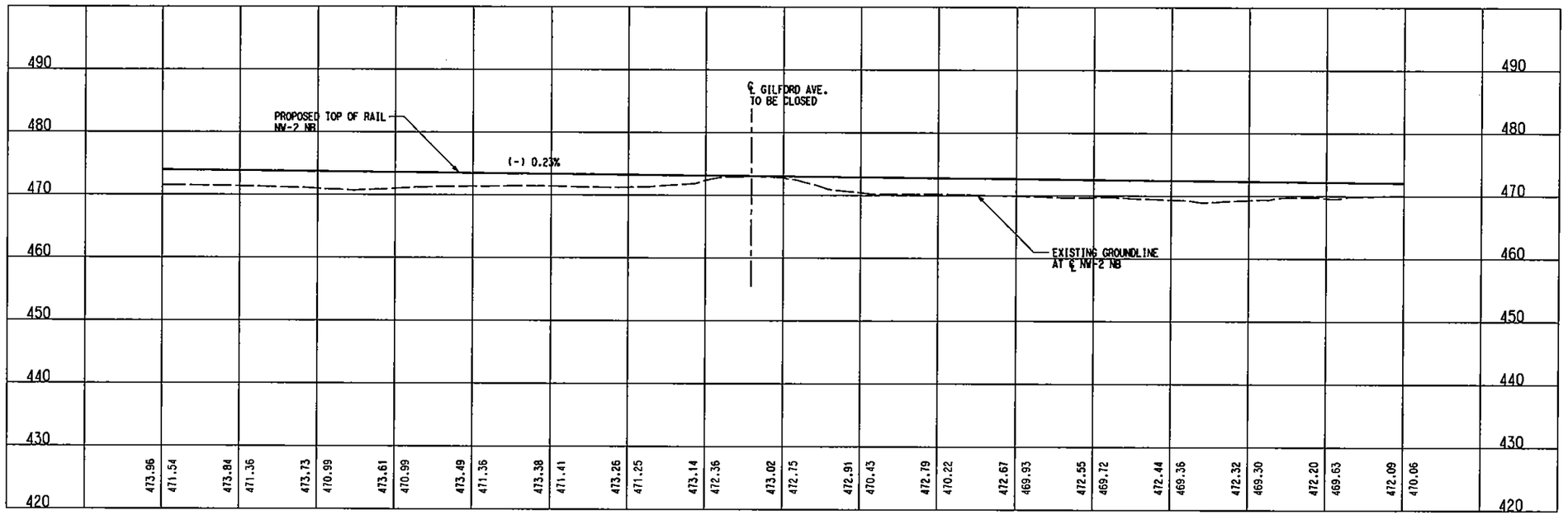
R:\NW2X\DGN\Cvl-AQ\nw2xa108.040

DWG No. CB2-2009

P0009





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW2-D (NB)		NW2-DD (SB)	
Rc =	4000.00'	Rc =	3984.50'
Ls =	90.00'	Ls =	89.83'
Lc =	181.79'	Lc =	180.91'
Ea =	1.00"	Ea =	1.00"
Eu =	1.50"	Eu =	1.51"
V =	50 MPH	V =	50 MPH

LEGEND

STREET/ALLEY/ DRIVE CLOSURE

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 140 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 216+00 TO STA 224+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-2009	

BORDER, R:\NW2X\nw2bor1.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2prwr1.040, 1-28,30-35,37-39,41,42,44,45,47-49,51,52
SITE, R:\NW2X\nw2xeprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbrr1.040, 6-10,15-17
OPOI, R:\NW2X\nw2xpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2spir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xsir1.040, 1-61
DW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46

R:\NW2X\DGN\Civil-AQ\nw2xs109.040
Fri Nov 15 10:59:00 2002
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lmorris
PRF ROTATION=0.000000
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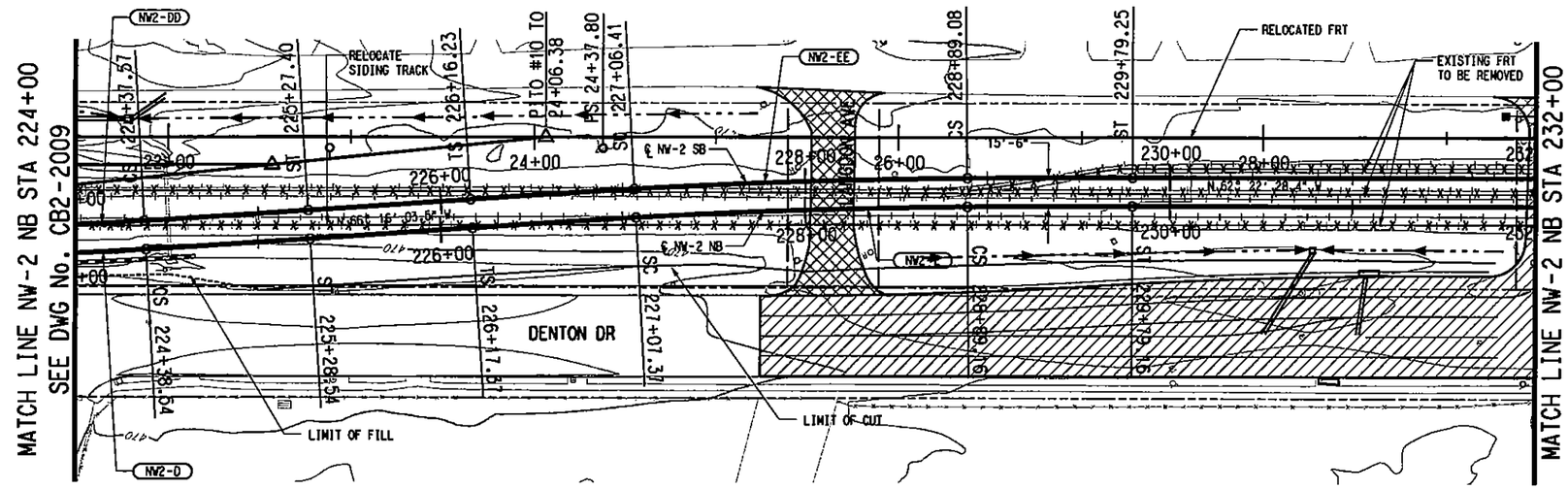
DWG No. CB2-2010

P0010



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

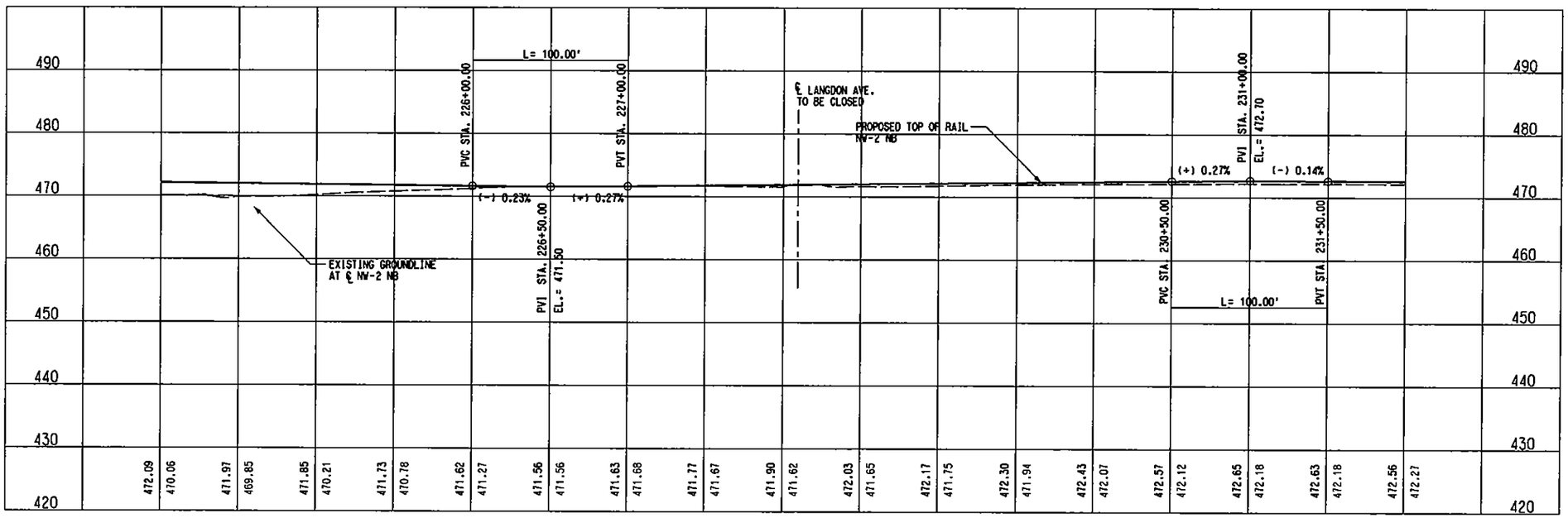
NW2-D (NB)		NW2-DD (SB)	
Rc =	4000.00'	Rc =	3984.50'
Ls =	90.00'	Ls =	89.83'
Lc =	181.79'	Lc =	180.91'
Ea =	1.00"	Ea =	1.00"
Eu =	1.50"	Eu =	1.51"
V =	50 MPH	V =	50 MPH

NW2-E (NB)		NW2-EE (SB)	
Rc =	4000.00'	Rc =	4015.50'
Ls =	90.00'	Ls =	90.17'
Lc =	181.79'	Lc =	182.67'
Ea =	1.00"	Ea =	1.00"
Eu =	1.50"	Eu =	1.49"
V =	50 MPH	V =	50 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81557
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. NORRIS
DESIGNED	L. NORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 141 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 224+00 TO STA 232+00

CONTRACT C-937775-1 | DWG No. CB2-2010 | REV

R:\NW2X\DGN\cv1-AQ\nw2sol10.040
Fri Nov 15 11:02:09 2002
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lmorris

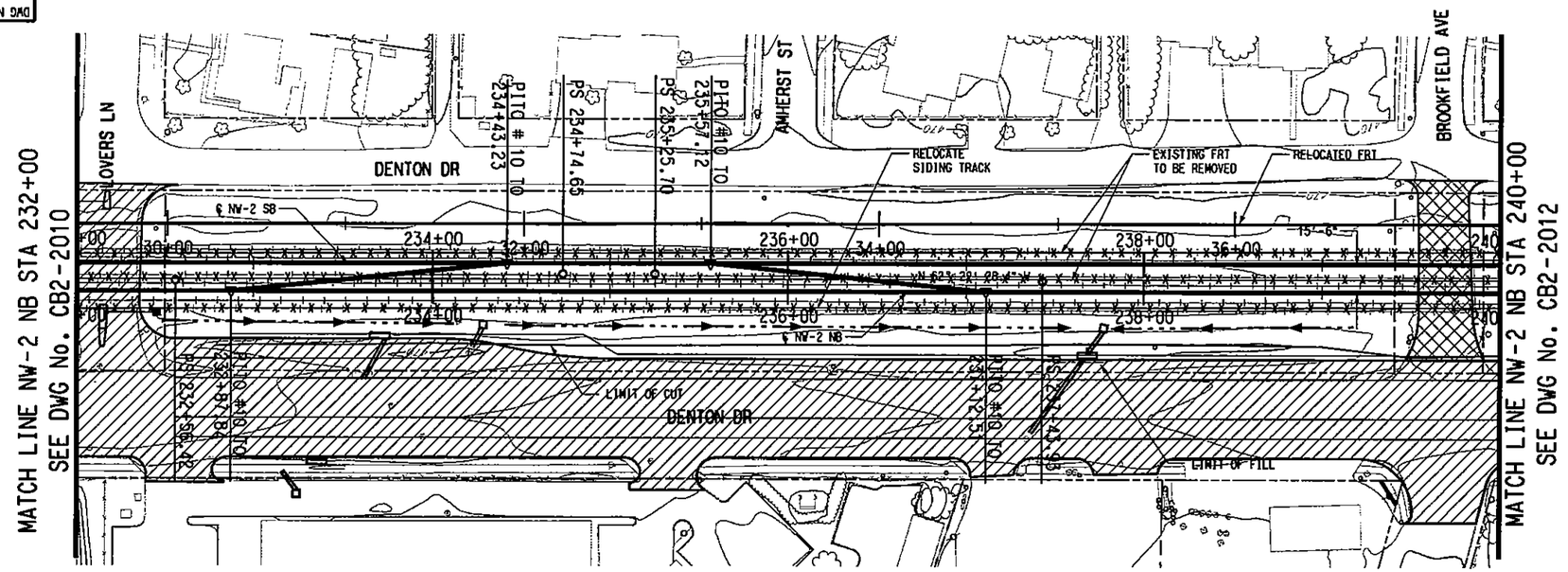
BORDER, R:\NW2X\nw2xbor1.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,
SITE, R:\NW2X\nw2xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbrr1.040, 6-10,15-17

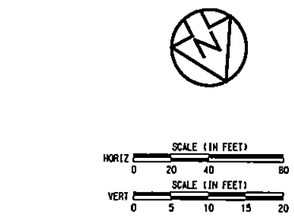
OPOI, R:\NW2X\nw2xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTR1.040, 12
TOPO, R:\NW2X\NW2xptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xalr1.040, 1-61
Ow, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46

R:\NW2X\DGN\cv1-AQ\nw2sol10.040

DWG No. CB2-2011

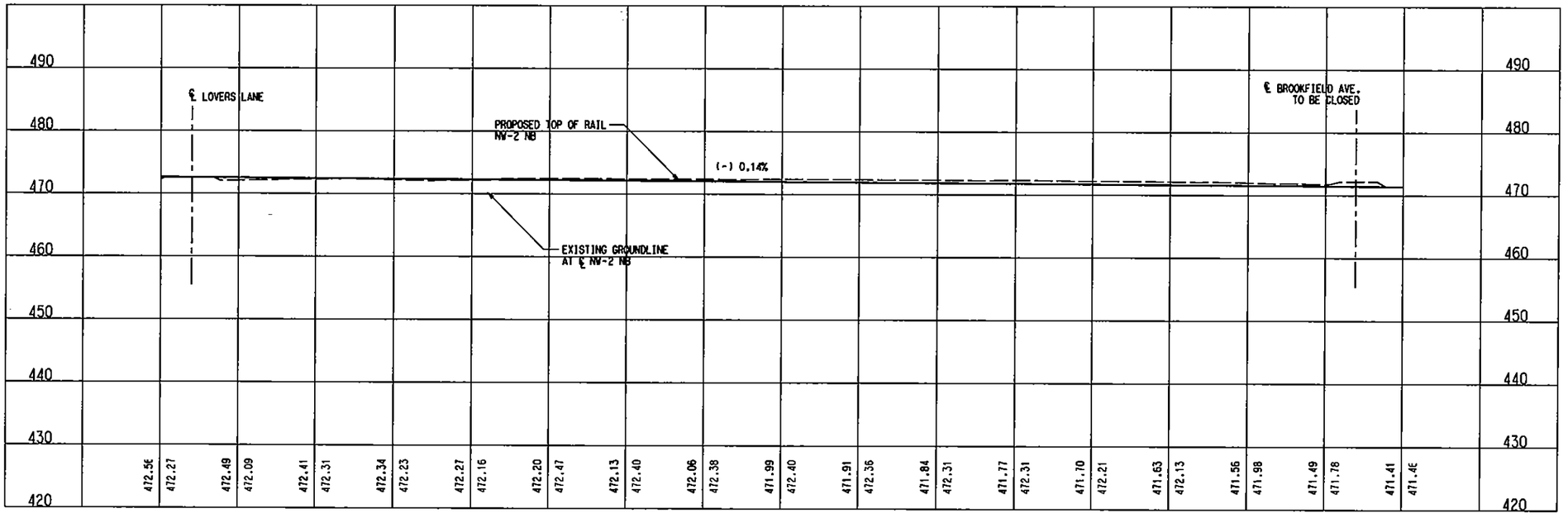
P0011





LEGEND

- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	END	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 661-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 142 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 232+00 TO STA 240+00

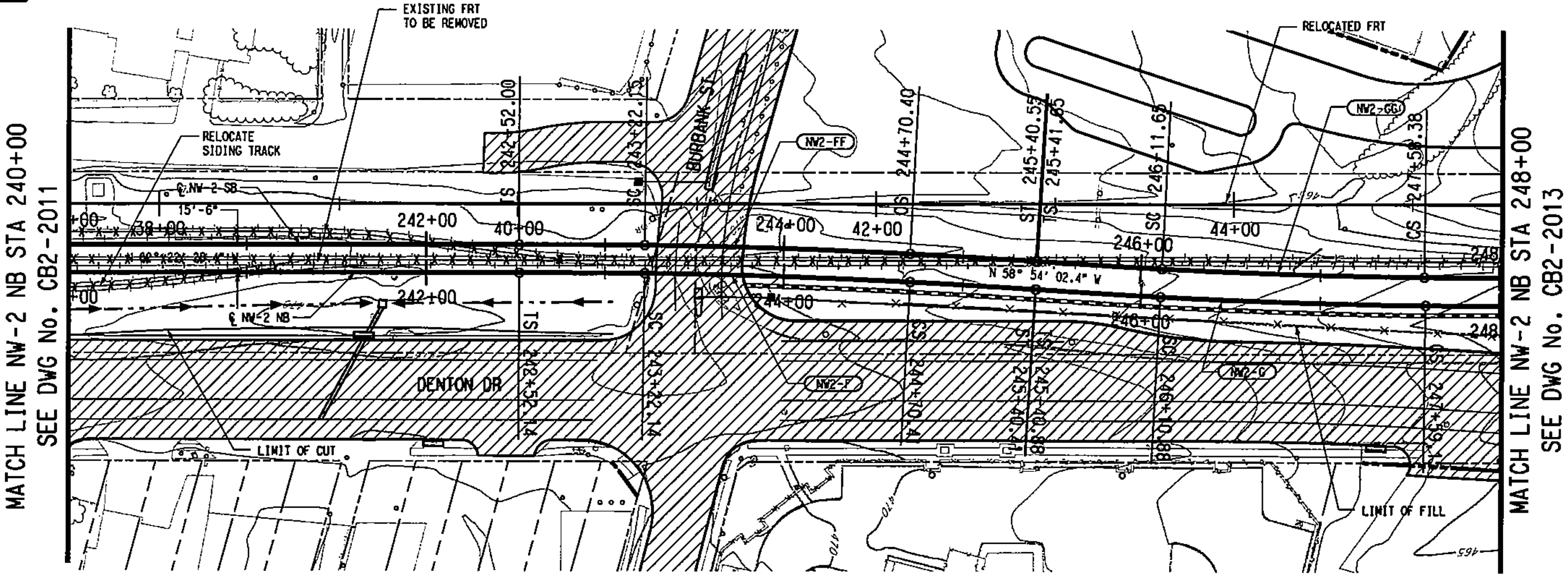
CONTRACT C-937775-1 | DWG No. CB2-2011 | REV

BORDER, R:\NW2X\nw2sbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2sprw1.040, 1-21,23-28,30-35,37-39,41,42,44,45,46
SITE, R:\NW2X\nw2sepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2sbrr1.040, 6-10,15-17
OPOI, R:\NW2X\nw2sipr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTR1.040, 12
TOPO, R:\NW2X\NW2spir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2salr1.040, 1-61
ROW, R:\NW2X\nw2srwr1.040, 15,18,19,26,27,31,40,46

R:\NW2X\DGN\Cvl-AO\nw2sall1.040
Fri Nov 15 11:03:01 2002
R:\NW2X\prf\nw2sall1.prf
lmorris

PRF ROTATION=0.000000
XS\RADWAY\PENTABLE\Smdarr1.tbl

R:\NW2X\nw2sall1.040



HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

NW2-F (NB)	
Rc =	3600.00'
Ls =	70.00'
Lc =	148.27'
Ea =	0.75"
Eu =	1.50"
V =	45 MPH

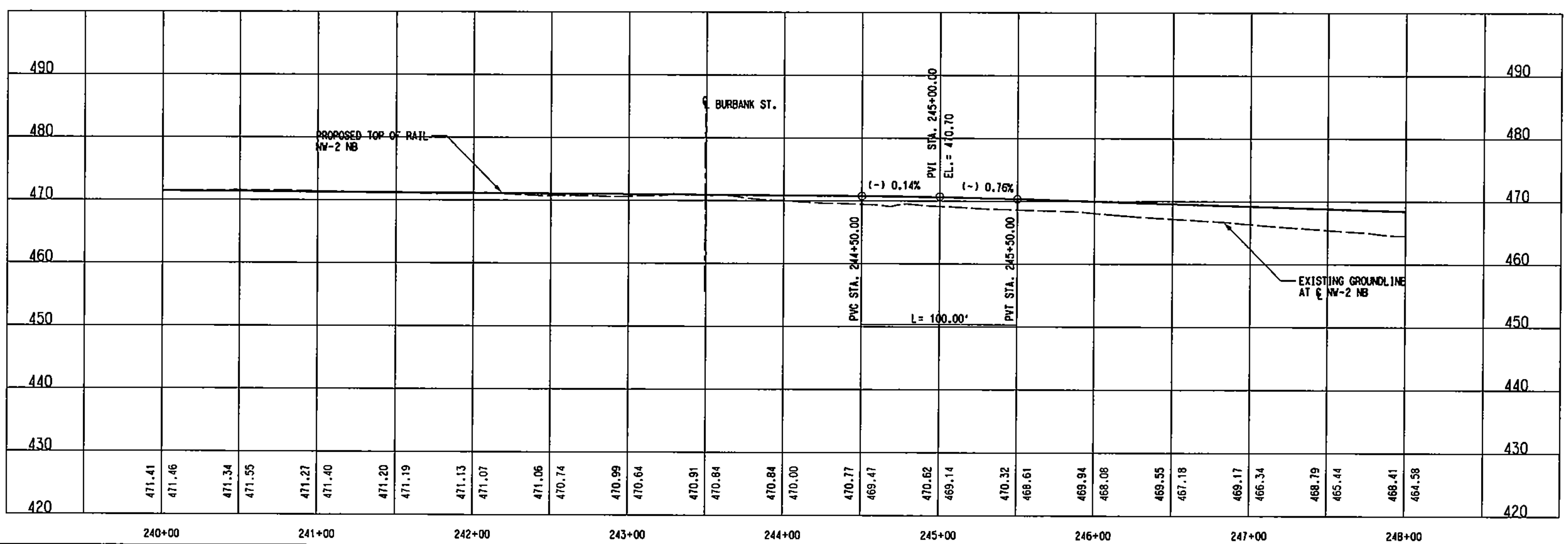
NW2-FF (SB)	
Rc =	3615.50'
Ls =	70.15'
Lc =	148.26'
Ea =	0.75"
Eu =	1.49"
V =	45 MPH

NW2-G (NB)	
Rc =	3600.00'
Ls =	70.00'
Lc =	148.27'
Ea =	0.75"
Eu =	1.50"
V =	45 MPH

NW2-GG (SB)	
Rc =	3584.50'
Ls =	70.00'
Lc =	146.73'
Ea =	0.75"
Eu =	1.51"
V =	45 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 143 OF 243

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. NORRIS
DESIGNED	L. NORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

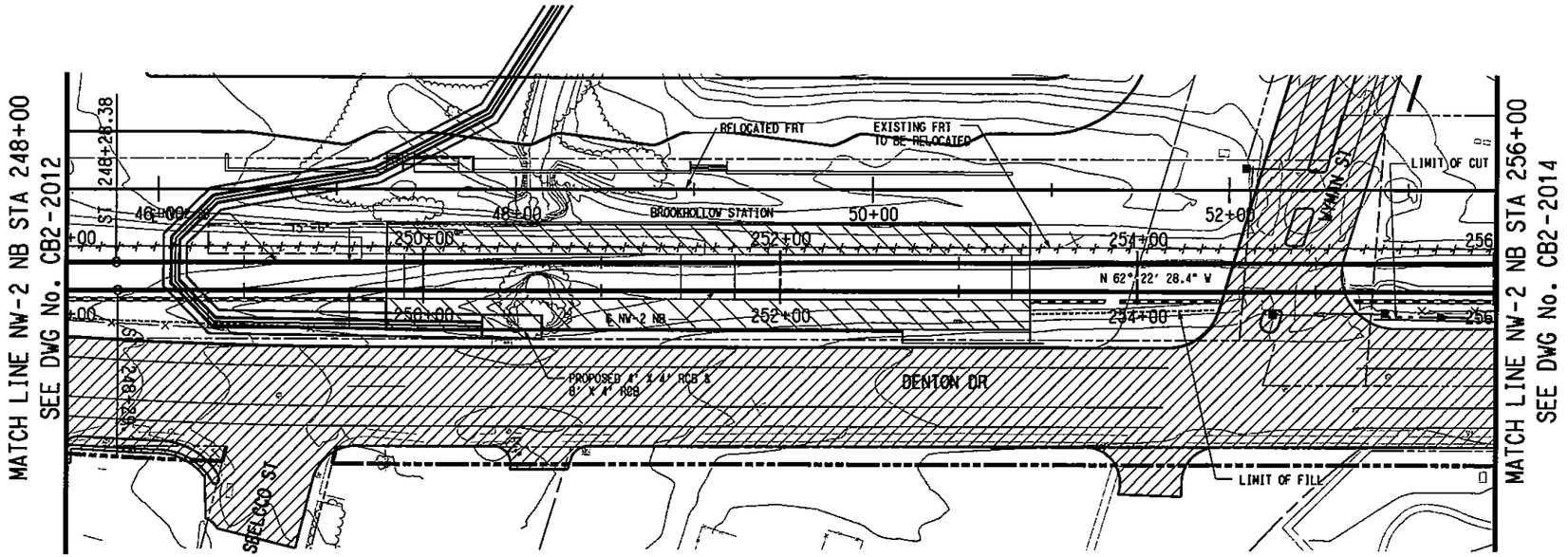
GUIDEWAY PLAN AND PROFILE
STA 240+00 TO STA 248+00

CONTRACT C-937775-1 | DWG No. CB2-2012 | REV

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

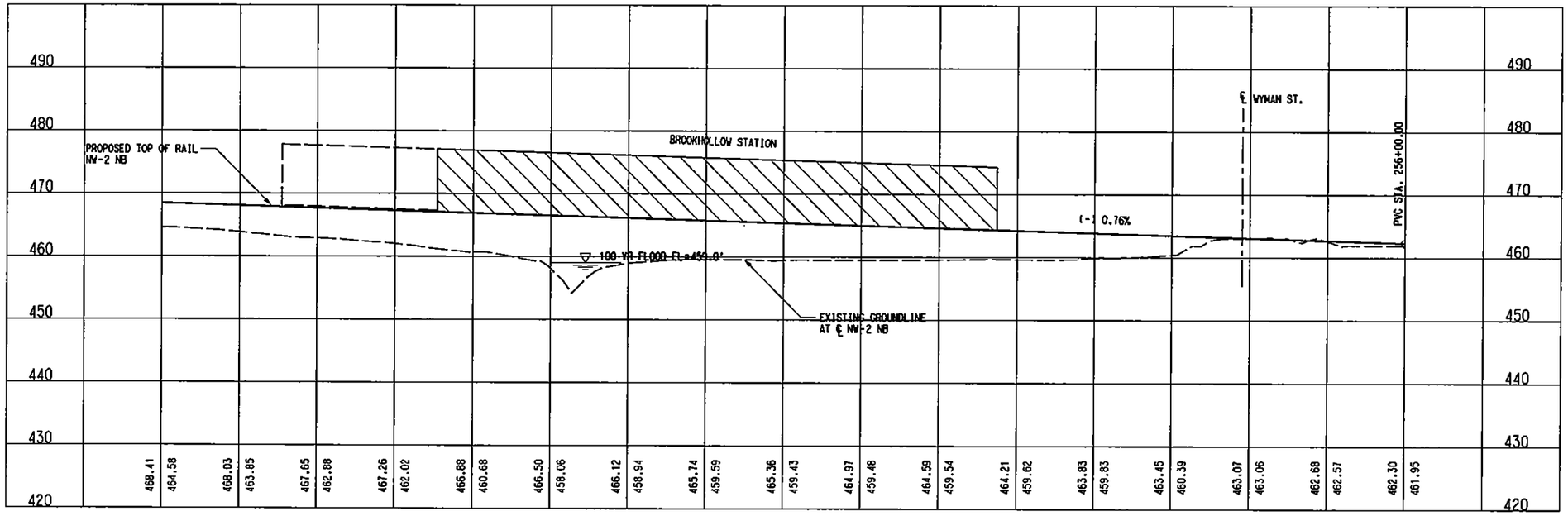
DWG No. CB2-2013

P0013



SCALE (IN FEET)
HORIZ 0 20 40 60
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND
- STATION CONCOURSE/ PLATFORM
- STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81153
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
13770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 144 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 248+00 TO STA 256+00

CONTRACT C-937775-1 | DWG No. CB2-2013 | REV

R:\NW2X\DGN\Civil-AQ\nw2xal13.040
Fri Nov 15 11:06:16 2002
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lmorris

PRF ROTATION=0.000000
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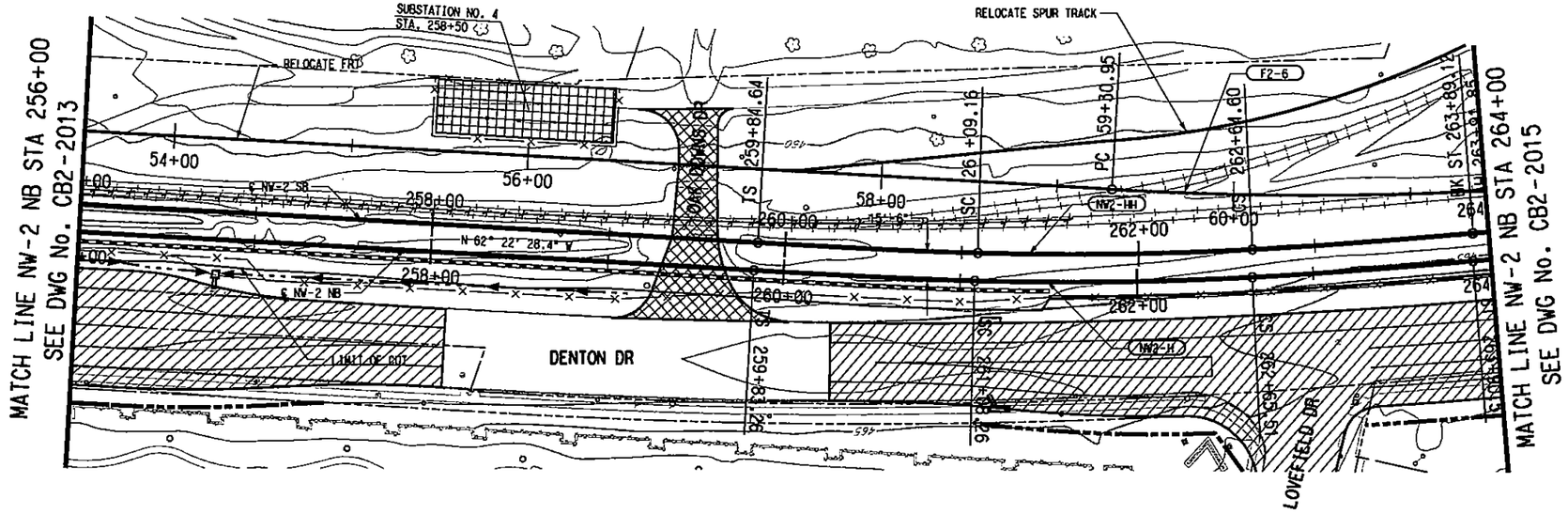
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,48,49,52
SITE, R:\NW2X\nw2xsepr1.040, 1,4,6-8,13-17,20,25-32,34,37,38,40-45,47-50,52,54,55,57-63
BRPL, R:\NW2X\nw2xbrri.040, 6-10,13-17
OPOI, R:\NW2X\nw2xtpri.040, 1,4,6-8,13-17,20,22,25-32,34,37,38,40-45,47-50,52,54,55,57,58
TIL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2zpri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xalri.040, 1-61
OW, R:\NW2X\nw2xrwri.040, 15,18,19,26,27,31,40,46

R:\NW2X\DGN\Civil-AQ\nw2xal13.040

DWG No. C82-2014

P0014



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW2-H (NB)	
Rc =	2000.00'
Ls =	125.00'
Lc =	157.25'
Eq =	2.50"
Eu =	1.55"
V =	45 MPH

NW2-HH (SB)	
Rc =	1984.50'
Ls =	124.52'
Lc =	155.44'
Eq =	2.50"
Eu =	1.58"
V =	45 MPH

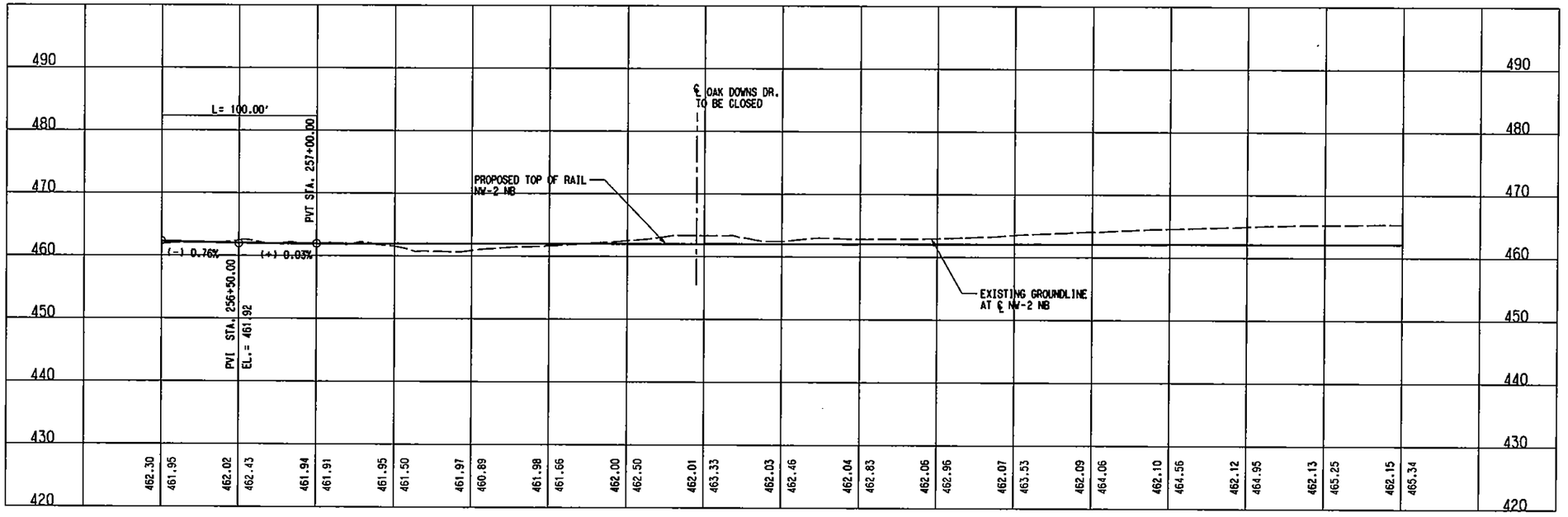
F2-6	
Dc =	3°0'
Ls =	0.00'
Lc =	286.30'
Eq =	2.75"
Eu =	1.50"
V =	45 MPH

LEGEND

- GRADING FOR SYSTEM ELEMENTS
- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE

NOTE:

1. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 145 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	B. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 256+00 TO STA 264+00

CONTRACT C-937775-1 | DWG No. C82-2014 | REV

R:\NW2X\DGN\Cvil-AO\nw2xalI4.040
Fri Nov 15 11:08:03 2002
R:\NW2X\prf\nw2xalI4.prf
lmorris

PRF ROTATION=0.000000
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R:\NW2X\prf\nw2xalI4.prf
R:\NW2X\DGN\TABLES\mdart.tbl

, 1-4,8,10,13,20,23,39,56,57
0, 1-4,6-12,14-22,24-62
1-21,23-28,30-35,37-39,41,42,44,45,46
15,17,18,33,34,45,46
6-10,15-17

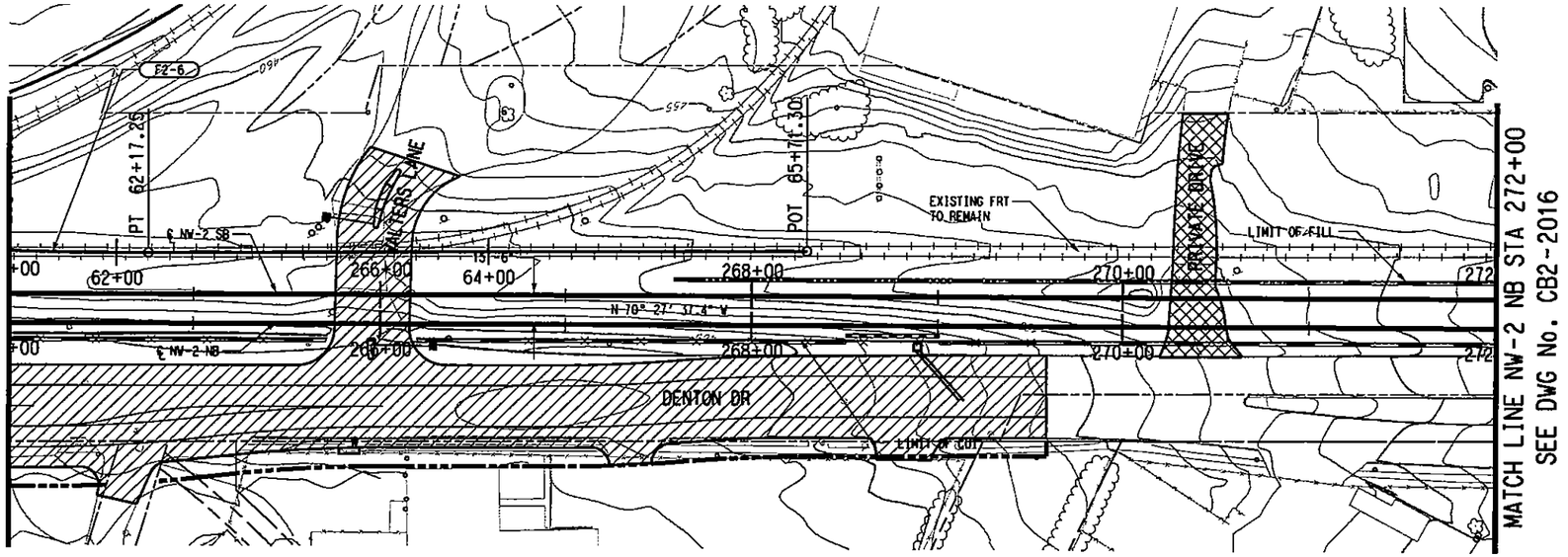
BORDER, R:\NW2X\nw2tbor1.001, 1-4,8,
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23
SITE, R:\NW2X\nw2xcpr1.040, 15,17,18
BRPL, R:\NW2X\nw2xbrr1.040, 6-10,15-

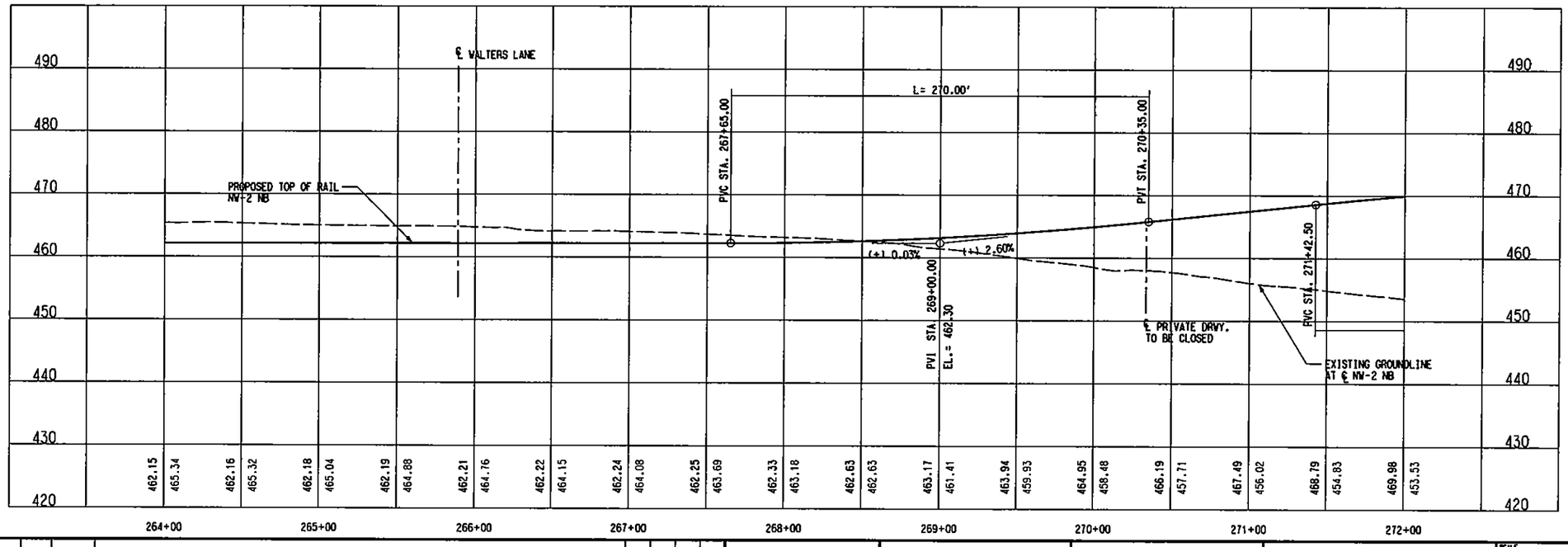
OPOI, R:\NW2X\nw2xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTR1.040, 12
TOPO, R:\NW2X\NW2xptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xalr1.040, 1-61
OW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46

R:\NW2X\DGN\Cvil-AO\nw2xalI4.040

DAG No. CB2-2015

P0015





F2-6

Dc =	3°0'
Ls =	0.00'
Lc =	286.30'
Eq =	2.75"
Eu =	1.50"
V =	45 MPH

HORIZ SCALE (IN FEET) 0 20 40 80

VERT SCALE (IN FEET) 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STREET/ALLEY/ DRIVE CLOSURE

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 146 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 264+00 TO STA 272+00

CONTRACT C-937775-1

DWG No. CB2-2015

REV

R:\NW2X\DGN\Civil-AG\nw2xall5.040

BORDER, R:\NW2X\nw2xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,49,52
SITE, R:\NW2X\nw2xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbrr1.040, 6-10,15-17

OPOI, R:\NW2X\nw2xipr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTR1.040, 12
TOPO, R:\NW2X\NW2xpir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xalr1.040, 1-61
DW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46

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lmorris
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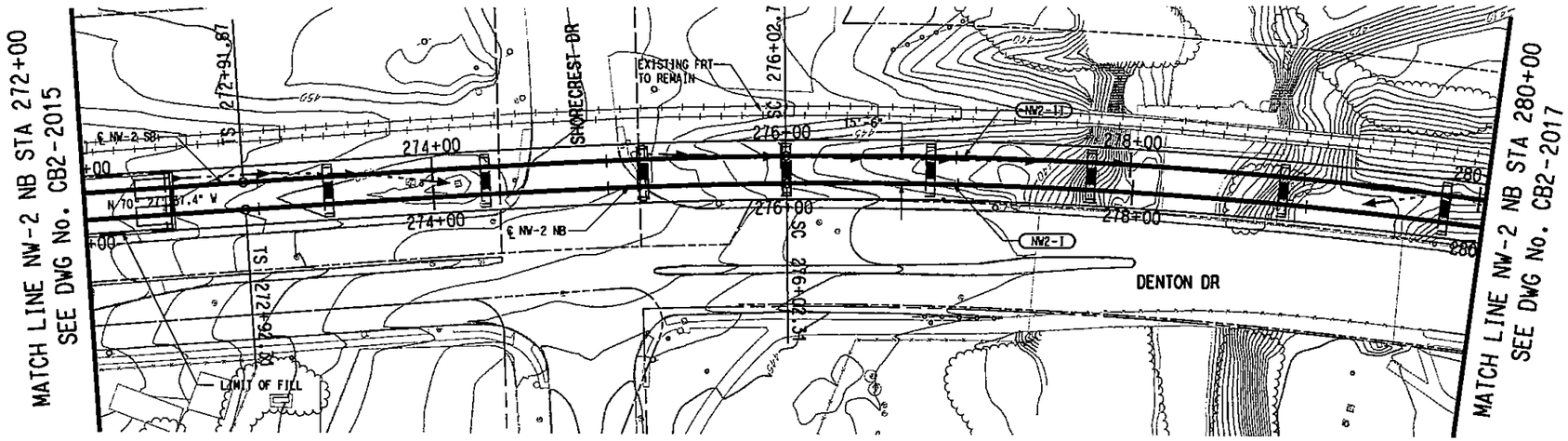
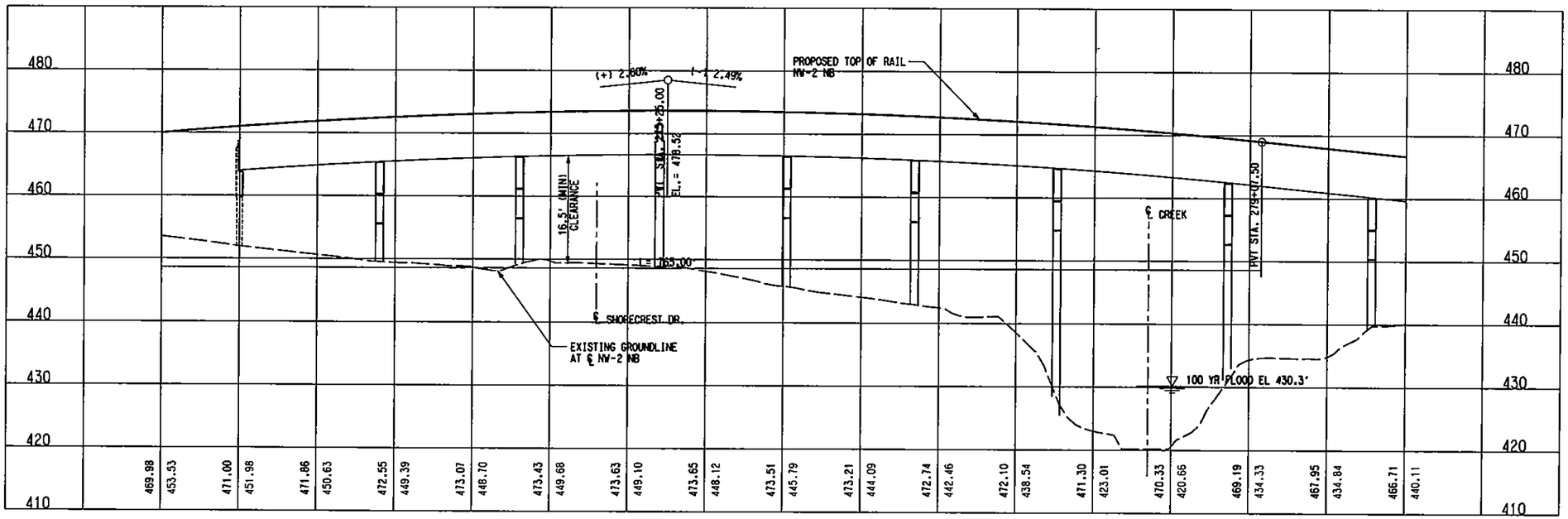
Fri Nov 15 11:09:46 2002





NW2-I (NB)		NW2-II (SB)	
Rc =	2750.00'	Rc =	2765.50'
Ls =	310.00'	Ls =	310.87'
Lc =	1304.15'	Lc =	1312.37'
Eo =	4.50"	Eo =	4.50"
Eu =	1.65"	Eu =	1.61"
V =	65 MPH	V =	65 MPH

HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

NOTE:

1. FLOOD ELEVATION TAKEN FROM FLOOD INSURANCE STUDY, CITY OF DALLAS VOL 3 DTD JULY 2, 1991 BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81152
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 147 OF 243

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 272+00 TO STA 280+00

DARTCADD | CONTRACT C-937775-1 | DWG No. CB2-2016 | REV

BORDER, R:\NW2X\nw2abrl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW2X\NW2aprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,48,49,52
SITE, R:\NW2X\nw2xepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2abrr1.040, 6-10,15-17
OPOI, R:\NW2X\nw2atpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2aptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xalr1.040, 1-6
DW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46
R:\NW2X\DGN\Cyl-AQ\nw2xalI16.040
Fri Nov 15 11:12:13 2002
R:\NW2X\prf\nw2xalI6.prf
lmorris
PRF ROTATION=0.000000
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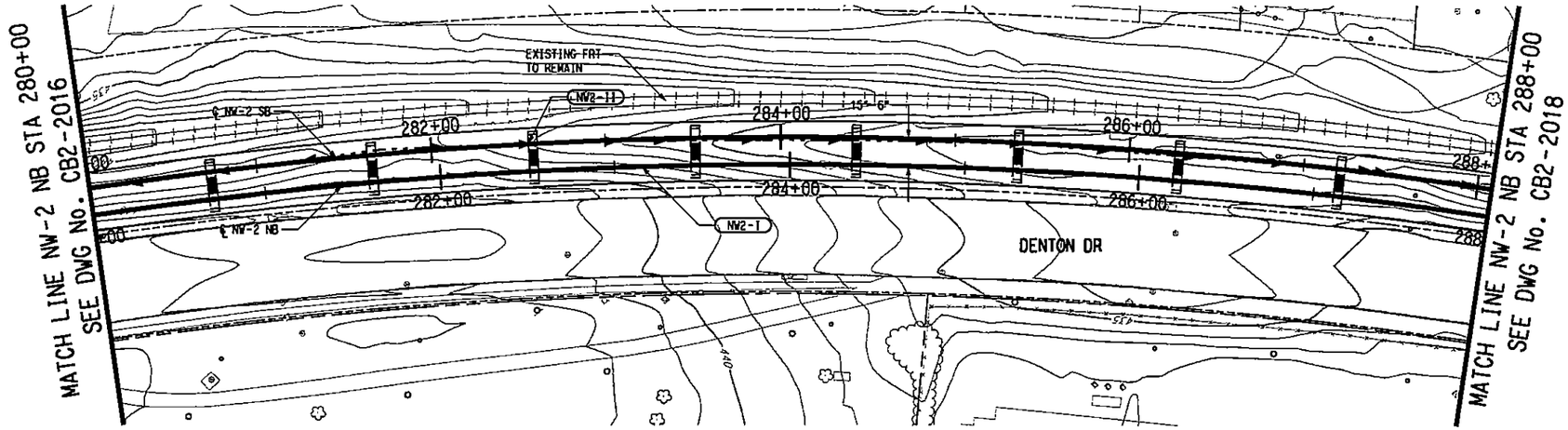
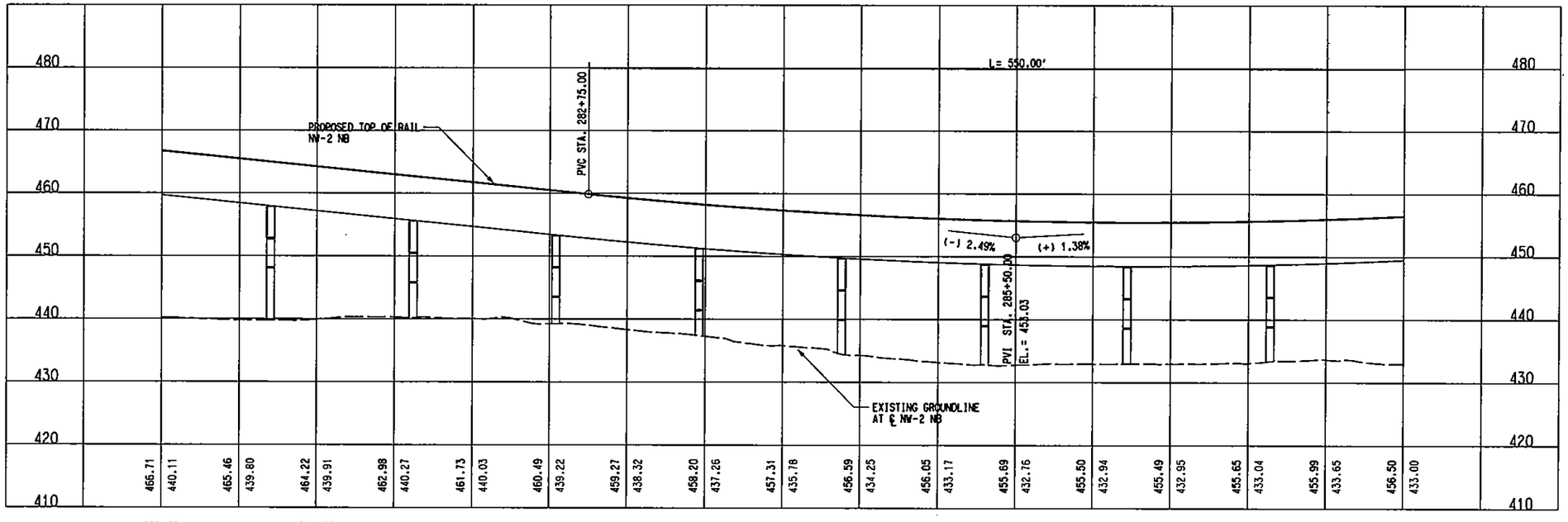
DWG No. CB2-2017

P0017



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW2-I (NB)		NW2-II (SB)	
Rc =	2750.00'	Rc =	2765.50'
Ls =	310.00'	Ls =	310.87'
Lc =	1304.15'	Lc =	1312.39'
Eq =	4.50"	Eq =	4.50"
Eu =	1.65"	Eu =	1.61"
V =	65 MPH	V =	65 MPH



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81131
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 148 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 280+00 TO STA 288+00

CONTRACT C-937775-1 | DWG No. CB2-2017 | REV

BORDER, R:\NW2X\nw2xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwr1.040, 1-28,30-35,37-39,41,42,44,45,47-49,52
SITE, R:\NW2X\nw2xspr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbrr1.040, 6-10,15-17
OPOI, R:\NW2X\nw2xipr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTR1.040, 12
TOPO, R:\NW2X\NW2xspr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xal1.040, 1-61
OV, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46

PRF ROTATION=0.000000
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Fri Nov 15 11:14:02 2002
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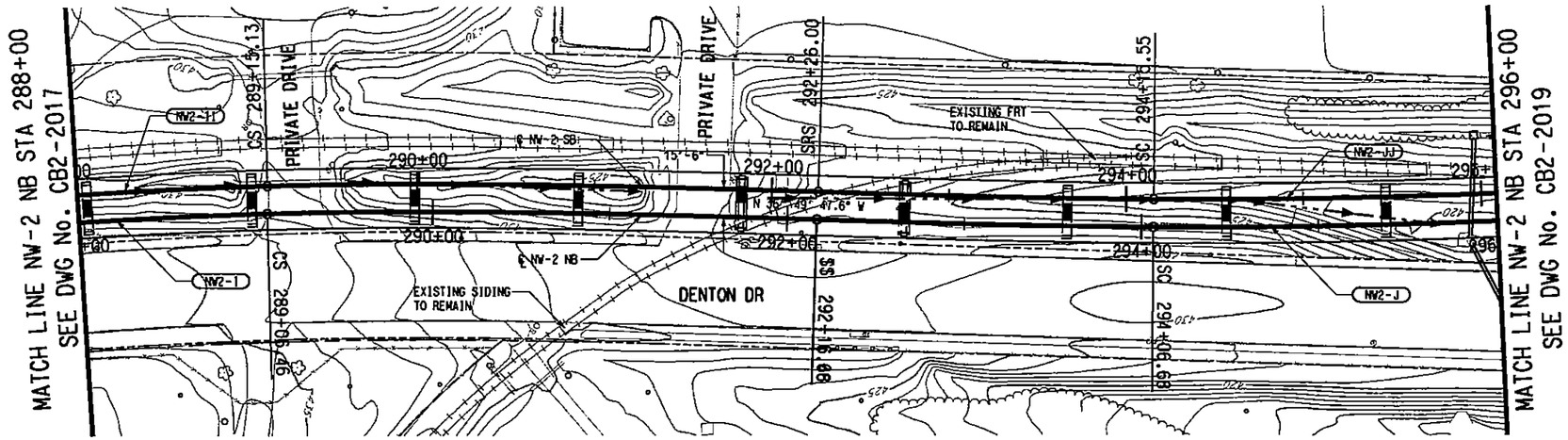
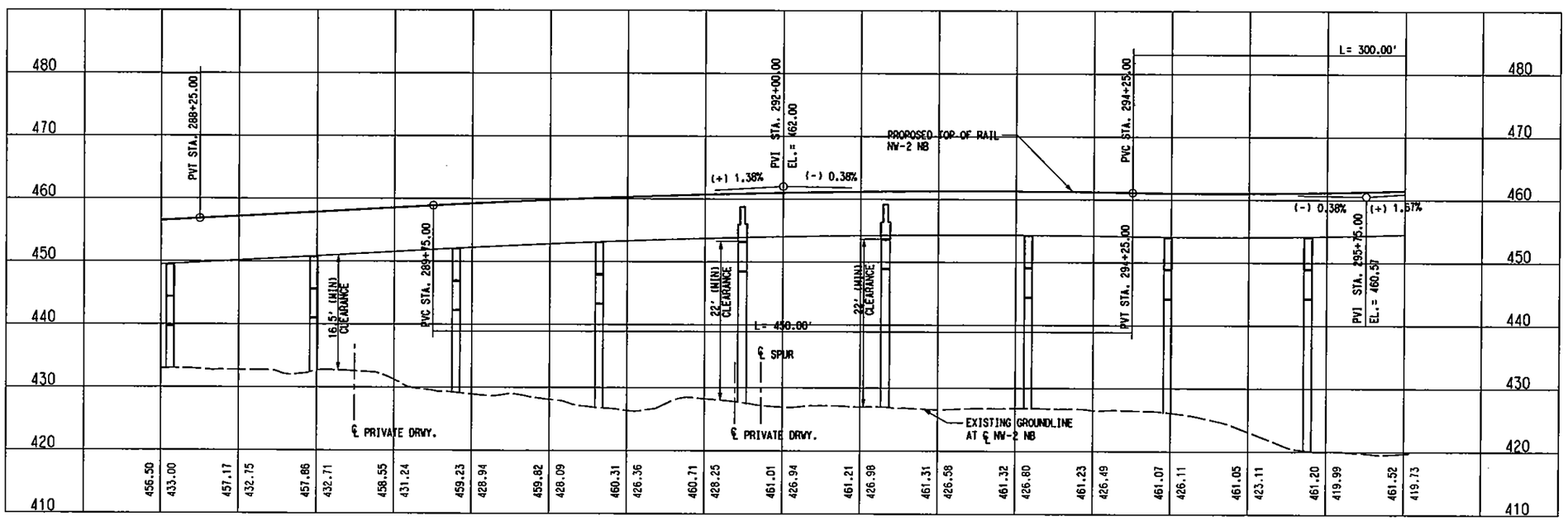
lmorris

R:\NW2X\DGN\Cv1-A0\nw2xal17.040

DWG No. CB2-2018

P0018





NW2-I (NB)	
Rc =	2750.00'
Ls =	310.00'
Lc =	1304.15'
Ea =	4.50"
Eu =	1.65"
V =	65 MPH

NW2-I (SB)	
Rc =	2765.50'
Ls =	310.87'
Lc =	1312.39'
Ea =	4.50"
Eu =	1.61"
V =	65 MPH

NW2-J (NB)	
Rc =	4000.00'
Ls =	190.00'
Lc =	204.36'
Ea =	2.75"
Eu =	1.48"
V =	65 MPH

NW2-JJ (SB)	
Rc =	3984.50'
Ls =	189.55'
Lc =	203.28'
Ea =	2.75"
Eu =	1.49"
V =	65 MPH

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84137
Date 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 149 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 288+00 TO STA 296+00

CONTRACT C-937775-1

DWG No. CB2-2018

REV

R:\NW2X\DGN\Civil-AO\nw2sall8.040
Fri Nov 15 11:15:26 2002
R:\NW2X\prf\nw2sall8.prf
lmorris

OPOI, R:\NW2X\nw2xlpri.040, 2-5,8-11,13-16,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2xpltri.040, 2-5,8-11,13-16,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xroli.040, 1-22,24-61
OW, R:\NW2X\nw2xrwri.040, 15,16,19,26,27,31,40,46
BORDER, R:\NW2X\nw2xbori.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwr1.040, 1-28,30-35,37-39,41,42,44,45,47-49,51,52
SITE, R:\NW2X\nw2xeprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbrri.040, 6-10,15-17
PRF ROTATION=0.000000
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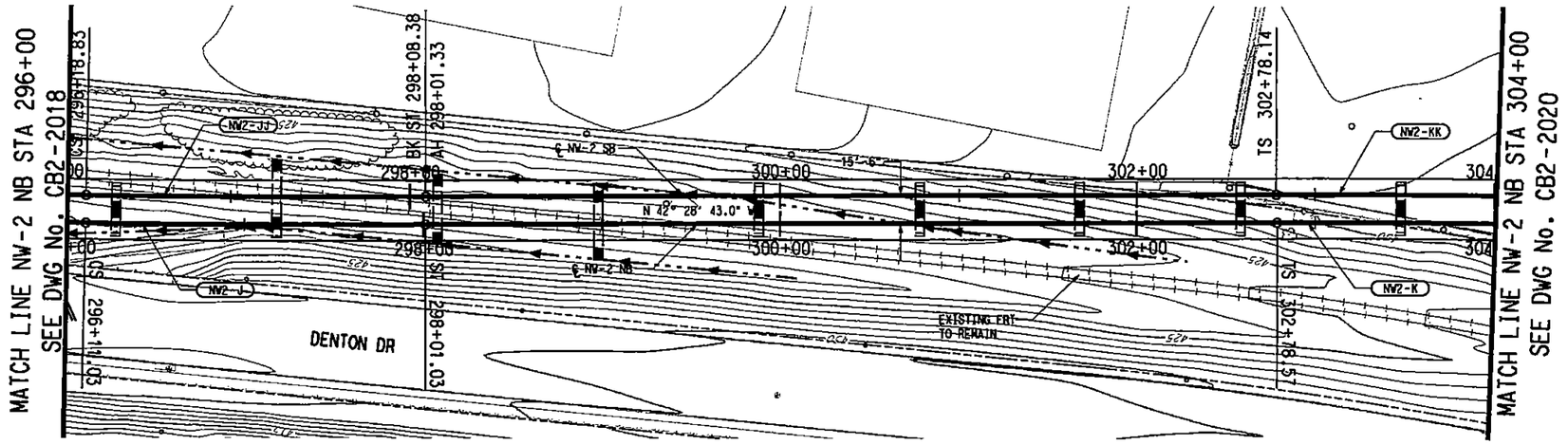
DWG No. C82-2019

P0019



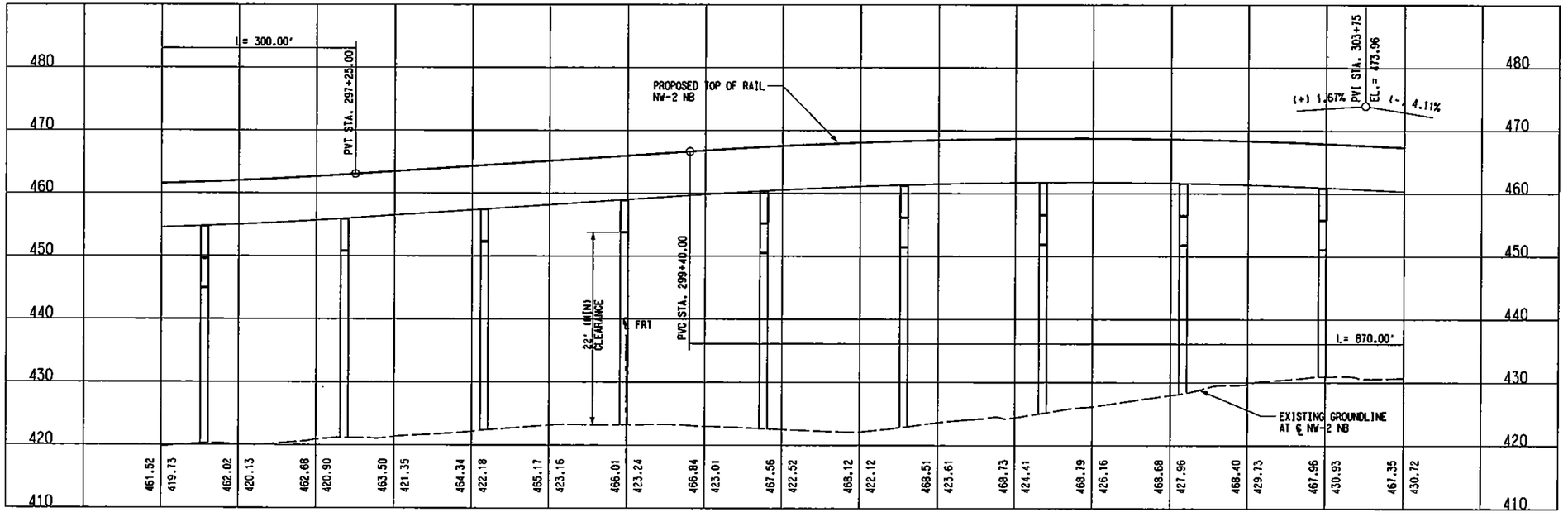
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW2-J (NB)	
Rc =	4000.00'
Ls =	190.00'
Lc =	204.36'
Eq =	2.75"
Eu =	1.48"
V =	65 MPH

NW2-JJ (SB)	
Rc =	3984.50'
Ls =	189.55'
Lc =	203.28'
Eq =	2.75"
Eu =	1.49"
V =	65 MPH

NW2-K (NB)	
Rc =	1800.00'
Ls =	200.00'
Lc =	827.84'
Eq =	4.00"
Eu =	1.55"
V =	50 MPH

NW2-KK (SB)	
Rc =	1815.50'
Ls =	200.86'
Lc =	835.83'
Eq =	4.00"
Eu =	1.51"
V =	50 MPH



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 150 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 296+00 TO STA 304+00

CONTRACT C-937775-1 | DWG No. C82-2019 | REV

BORDER, R:\NW2X\nw2xbrl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwr1.040, 1-28,30-35,37-39,41,42,44,45,47-49,52
SITE, R:\NW2X\nw2xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2xbr1.040, 6-10,15-17
OPOI, R:\NW2X\nw2xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2xpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xalr1.040, 1-61
DW, R:\NW2X\nw2xrwr1.040, 15,18,19,26,27,31,40,46

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Fri Nov 15 11:16:50 2002
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lmorris
PRF ROTATION=0.000000
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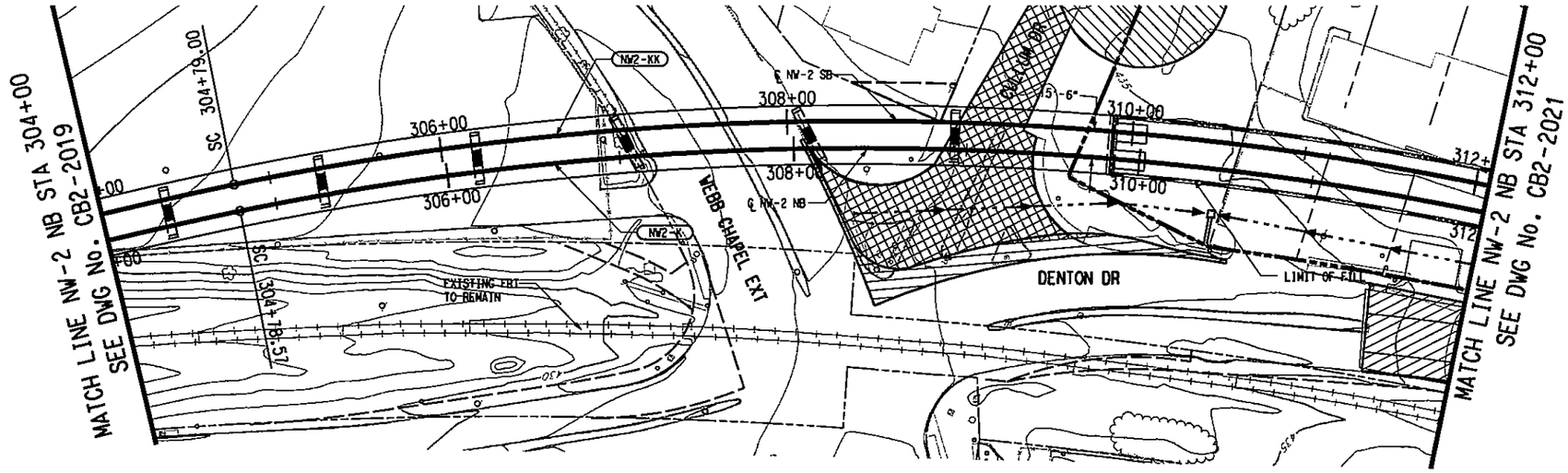
R:\NW2X\DGN\Civil-AO\nw2xall9.040

DWG No. CB2-2020

P0020



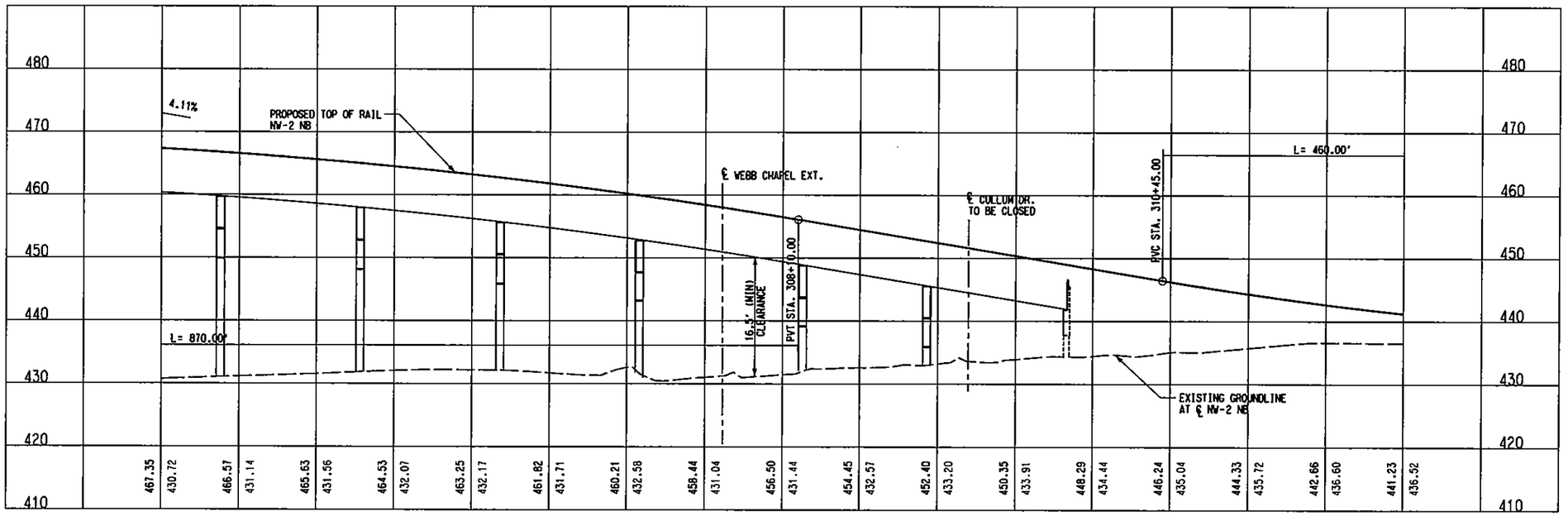
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW2-K (NB)		NW2-KK (SB)	
Rc =	1800.00'	Rc =	1815.50'
Ls =	200.00'	Ls =	200.86'
Lc =	827.84'	Lc =	835.63'
Ea =	4.00"	Ea =	4.00"
Eu =	1.55"	Eu =	1.51"
V =	50 MPH	V =	50 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 151 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
A. TIPTON, P.E. No. 81157
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 304+00 TO STA 312+00

CONTRACT C-937775-1 | DWG No. CB2-2020 | REV

R:\NW2X\DGN\Civil-AO\nw2sa120.040
Fri Nov 15 11:18:14 2002
R:\NW2X\prf\nw2sa120.prf
morris

PRF ROTATION=0.000000
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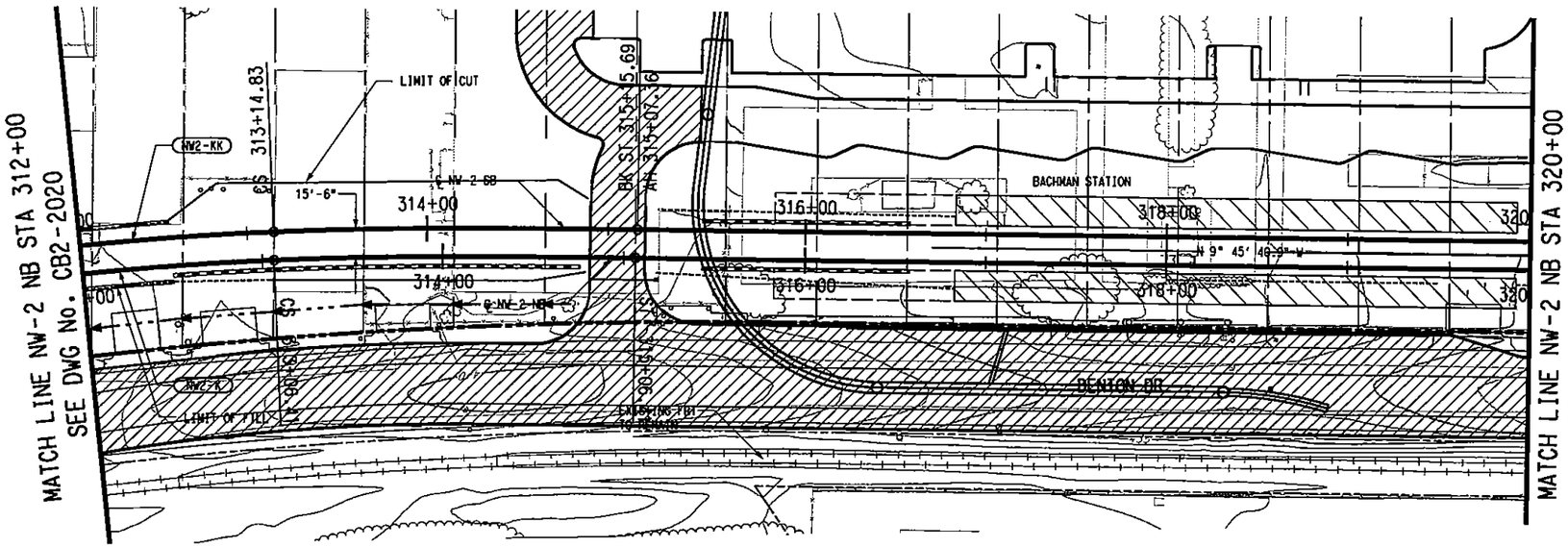
BORDER, R:\NW2X\nw2sbor1.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2sprwr1.040, 1-21,23-63
SITE, R:\NW2X\nw2sepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW2X\nw2sbrr1.040, 6-10,15-17

OPOI, R:\NW2X\nw2stpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTR1.040, 12
TOPO, R:\NW2X\NW2spsr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2salr1.040, 1-61
CW, R:\NW2X\nw2srwr1.040, 15,18,19,26,27,31,40,46

R:\NW2X\DGN\Civil-AO\nw2sa120.040

DWG No. CB2-2021

P0021



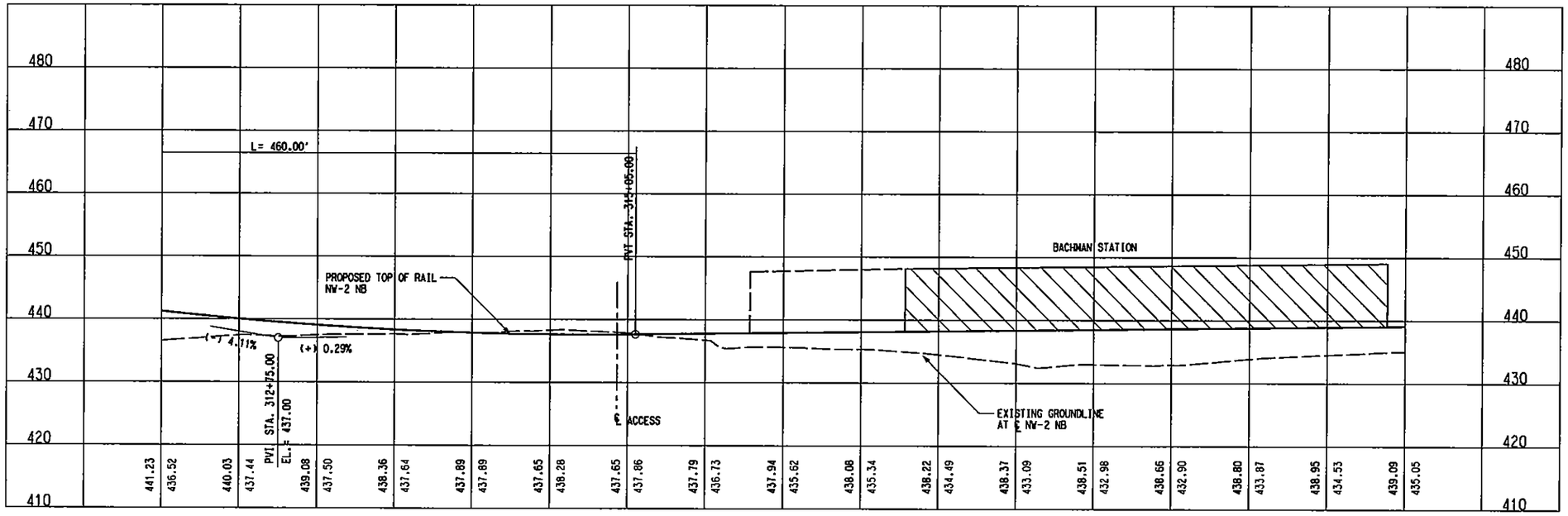
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW2-K (NB)		NW2-KK (SB)	
Rc =	1800.00'	Rc =	1815.50'
Ls =	200.00'	Ls =	200.86'
Lc =	827.84'	Lc =	835.83'
Ea =	4.00"	Ea =	4.00"
Eu =	1.55"	Eu =	1.51"
V =	50 MPH	V =	50 MPH

LEGEND

STATION CONCOURSE/ PLATFORM

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 152 OF 243

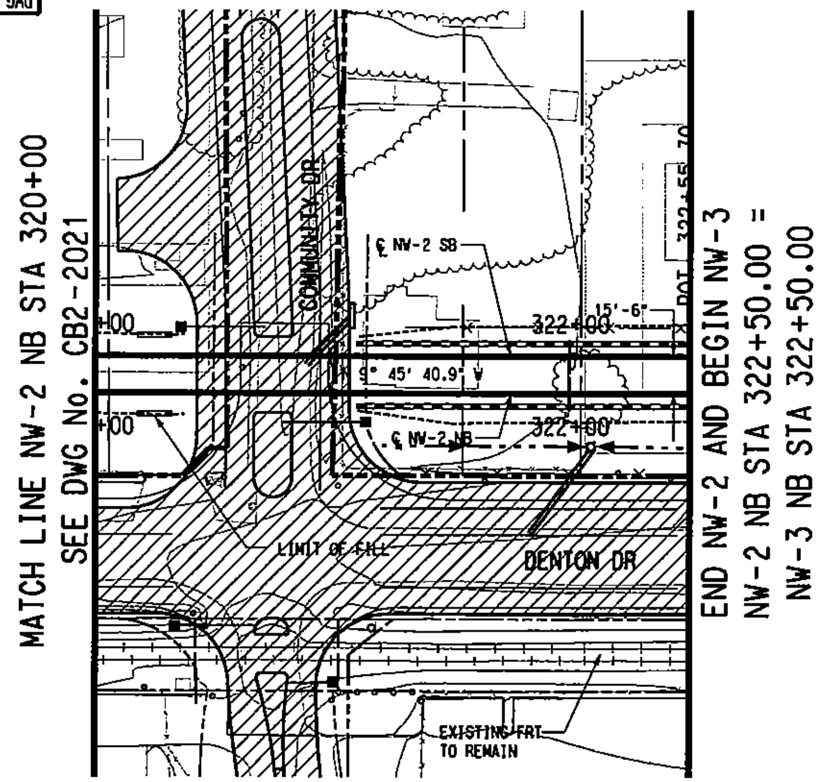
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

GUIDEWAY PLAN AND PROFILE
STA 312+00 TO STA 320+00

CONTRACT C-937775-1 | DWG No. CB2-2021 | REV

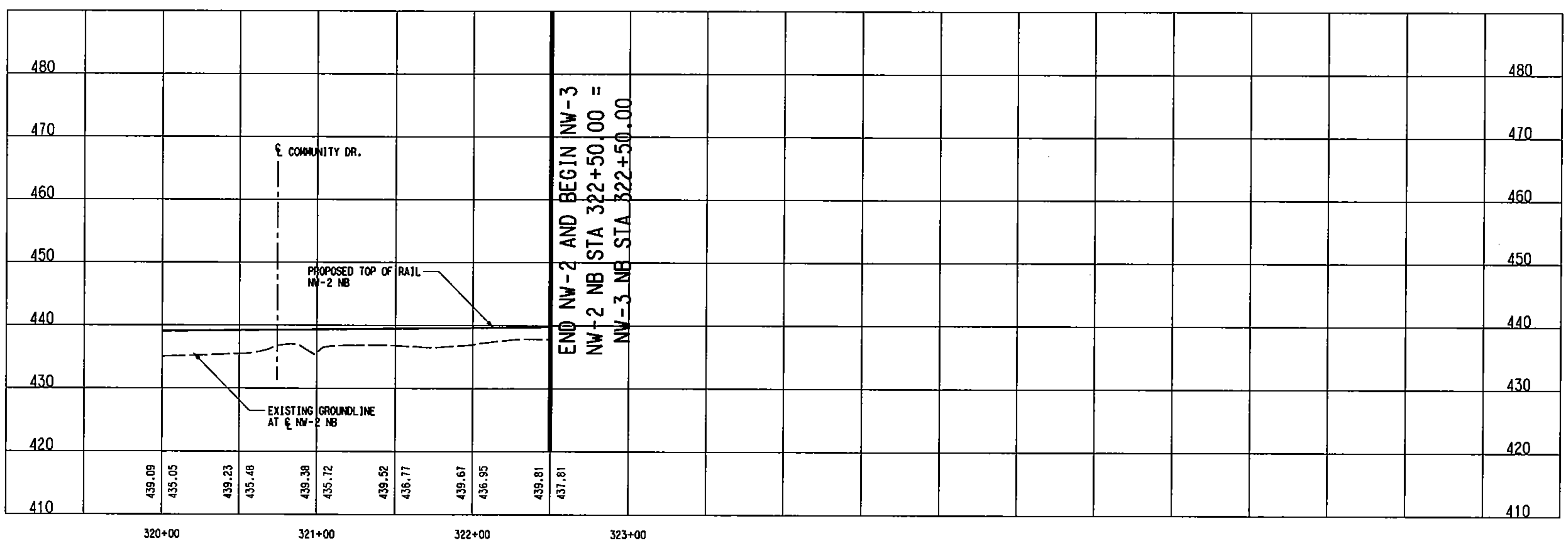
OPOI, R:\NW2X\nw2xtprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW2X\NW2XUTRI.040, 12
TOPO, R:\NW2X\NW2xptrl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW2X\nw2xrolrl.040, 1-61
OW, R:\NW2X\nw2xrwrl.040, 15,18,19,26,27,31,40,46
BORDER, R:\NW2X\nw2xborl.001, 1-4,6,10,13,20,23,39,56,57
PROFILE, R:\NW2X\NW2XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW2X\NW2xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,48,53
SITE, R:\NW2X\nw2xsprl.040, 1,7,8,13,15-17,20,25,27-32,37,40-45,47-50,52,54,55,57-63
BRPL, R:\NW2X\nw2xbrrl.040, 6-10,15-17

PRF ROTATION=0.000000
R:\NW2X\DGN\Cv1-A0\nw2xa121.040
Fri Nov 15 11:19:42 2002
R:\NW2X\prf\nw2xa121.prf
lmorris



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND
STREET/ALLEY/
DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 153 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

DARTCADD

SCALE	1"=40'
DRAWN	L. MORRIS
DESIGNED	L. MORRIS
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2

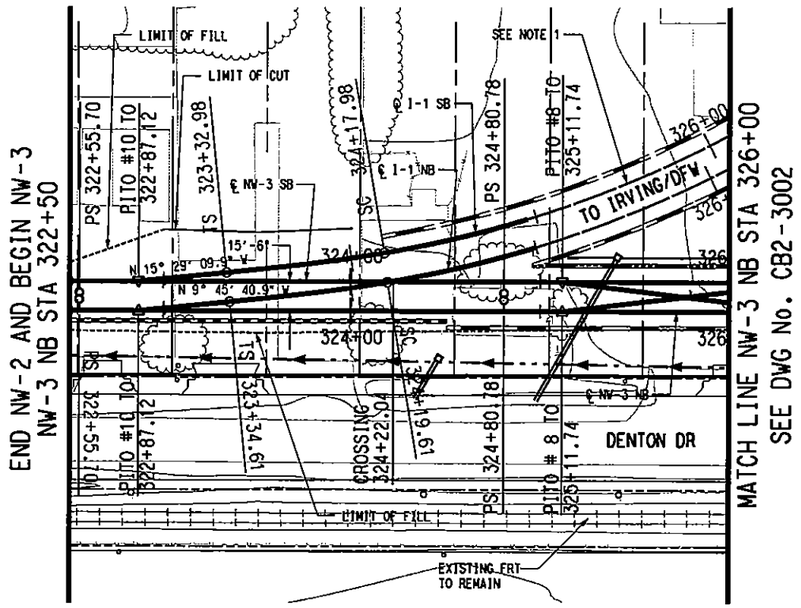
GUIDEWAY PLAN AND PROFILE
STA 320+00 TO STA 322+50

CONTRACT C-937775-1
DWG No. CB2-2022
REV

DWG No. CB2-2022

DWG No. C82-3001

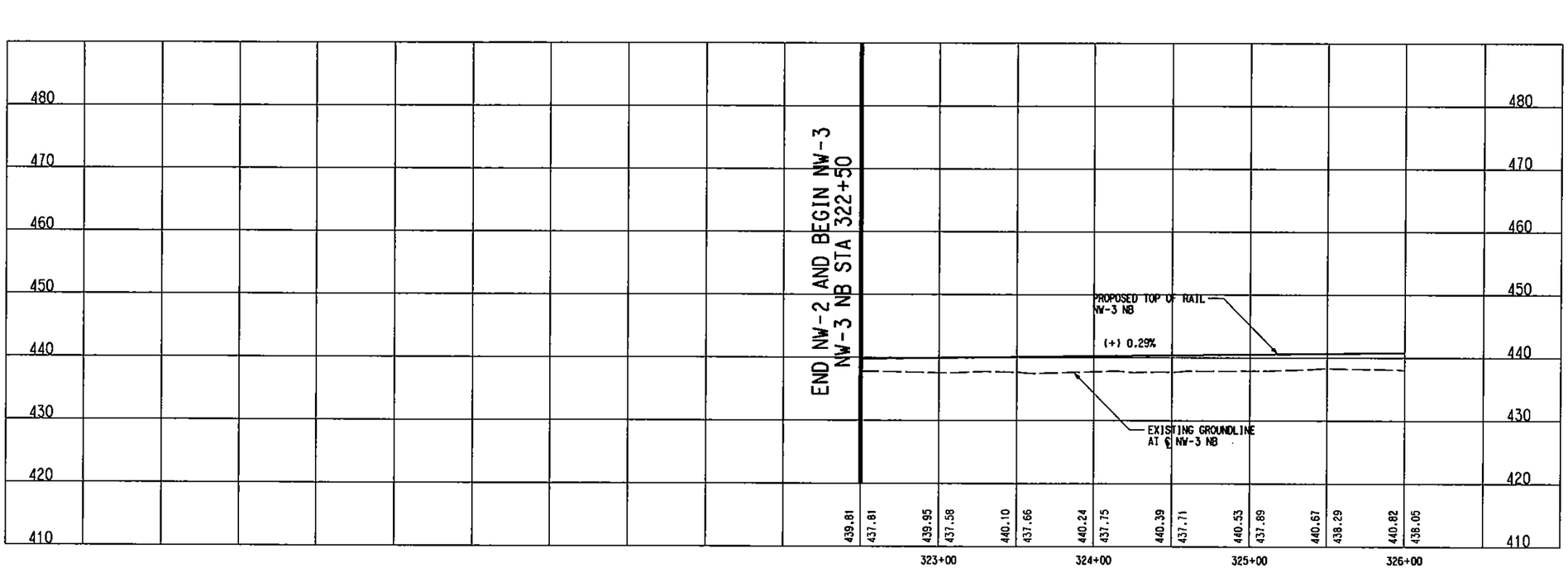
P0001



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NOTES:

1. FINAL SECTION DESIGNER TO COORDINATE WYE GEOMETRICS WITH LINE SECTION I-1 DESIGNER.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61152
Date: 10 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 154 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 322+50 TO STA 326+00

CONTRACT C-937775-1 | DWG No. C82-3001 | REV

BORDER, R:\NW3X\nw3xborl.001, 1-4,6,10,13,20,23,39,46,56,57
PROFILE, R:\NW3X\NW3XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 2-21,23-28,30-35,37-39,41,42,44,
SITE, R:\NW3X\nw3xcepr1.040, 1,7,8,13,15,17,20,22,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW3X\nw3xbrr1.040, 6-10,15-17

QPOI, R:\NW3X\nw3xipr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW3X\NW3XUTR1.040, 12
TOPO, R:\NW3X\NW3xpfr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW3X\nw3xalr1.040, 1-61
ROW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46

R:\NW3X\DGN\Cvl-AQ\nw3xq101.040
Mon Nov 25 08:06:04 2002
R:\Nw3X\prf\nw3xq101.prf
DBROWN

PRF ROTATION=0.000000
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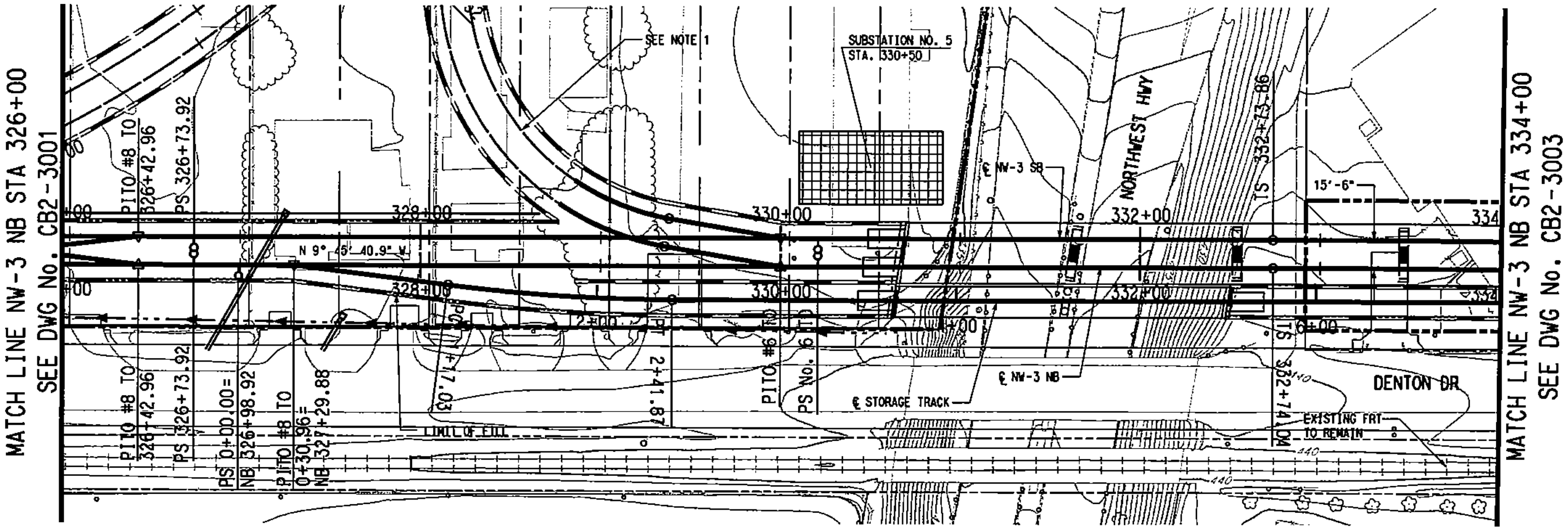
R:\NW3X\DGN\r1-40\nw3xq101.040



HORIZ SCALE (IN FEET) 0 20 40 80

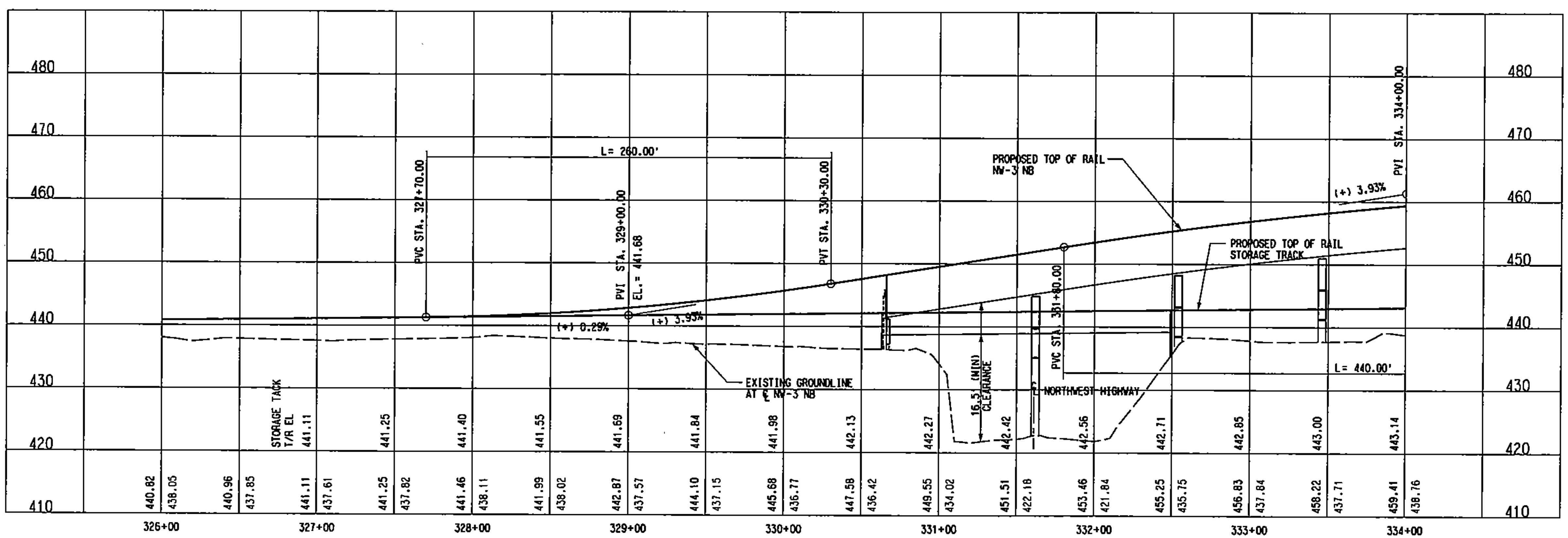
VERT SCALE (IN FEET) 0 5 10 15 20

LEGEND

GRADING FOR SYSTEM ELEMENTS

NOTE:

1. FINAL SECTION DESIGNER TO COORDINATE WYE GEOMETRICS WITH LINE SECTION I-1 DESIGNER.
2. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.



NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

DART

DARTCADD

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

CONTRACT SHEET No. 155 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

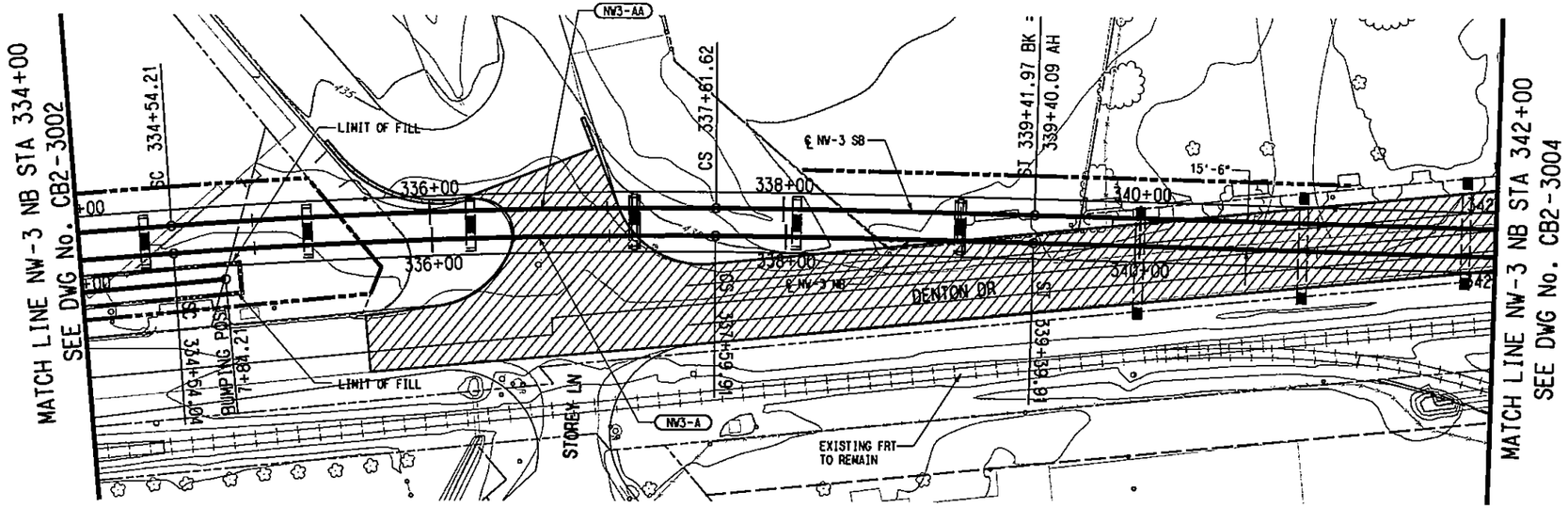
GUIDEWAY PLAN AND PROFILE
STA 326+00 TO STA 334+00

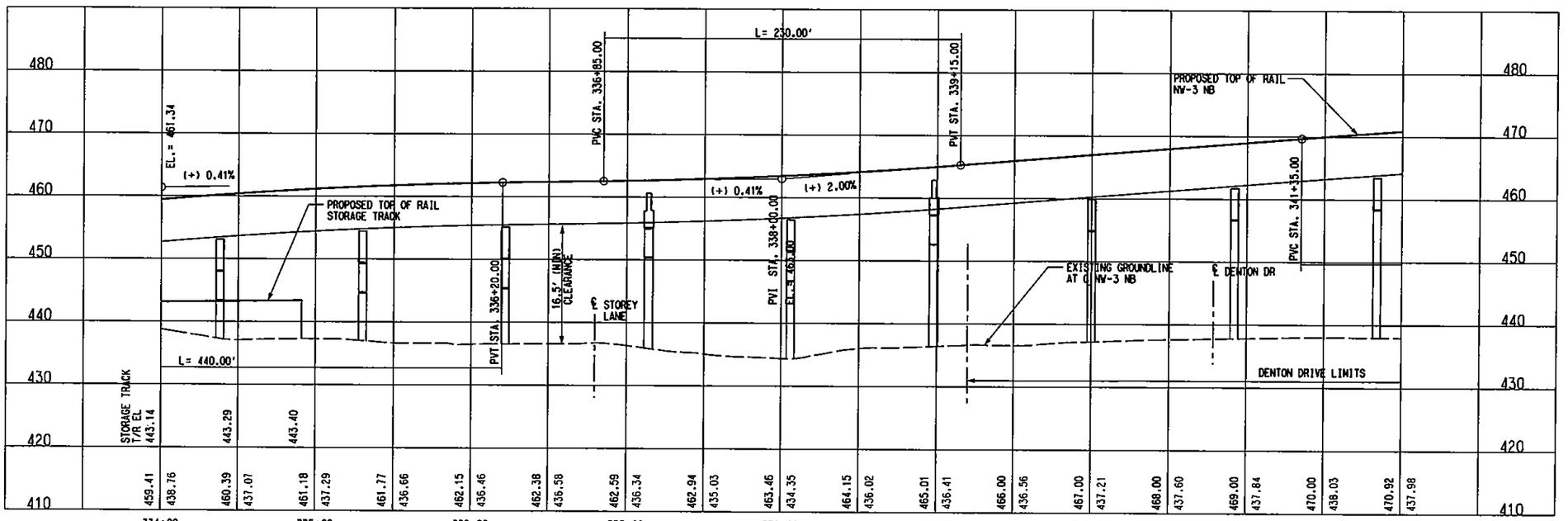
CONTRACT	DWG No.	REV
C-937775-1	CB2-3002	

R:\NW3X\DGN\CVI-AO\nw3xa102.040
Mon Nov 25 08:07:03 2002
R:\NW3X\prf\nw3xa102.prf
DBROWN

DWG No. CB2-3003

P0003





NW3-A (NB)		NW3-AA (SB)	
Rc =	4000.00'	Rc =	4015.50'
Ls =	180.00'	Ls =	180.34'
Lc =	305.88'	Lc =	307.41'
Eq =	2.75"	Eq =	2.75"
Eu =	1.48"	Eu =	1.46"
V =	65 MPH	V =	65 MPH

HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 156 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 334+00 TO STA 342+00

CONTRACT C-937775-1 | DWG No. CB2-3003 | REV

OPOI, R:\NW3X\nw3xlprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW3X\NW3XUTRI.040, 12
TOPO, R:\NW3X\NW3xpprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW3X\nw3xalrl.040, 1-61
Ov, R:\NW3X\nw3xrwrl.040, 15,18,19,26,27,31,40,46
BORDER, R:\NW3X\nw3xborl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\NW3XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwrl.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,45
SITE, R:\NW3X\nw3xeprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\nw3xbrrl.040, 6-10,15-17
PRF ROTATION=0.000000
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Fri Nov 15 11:54:16 2002
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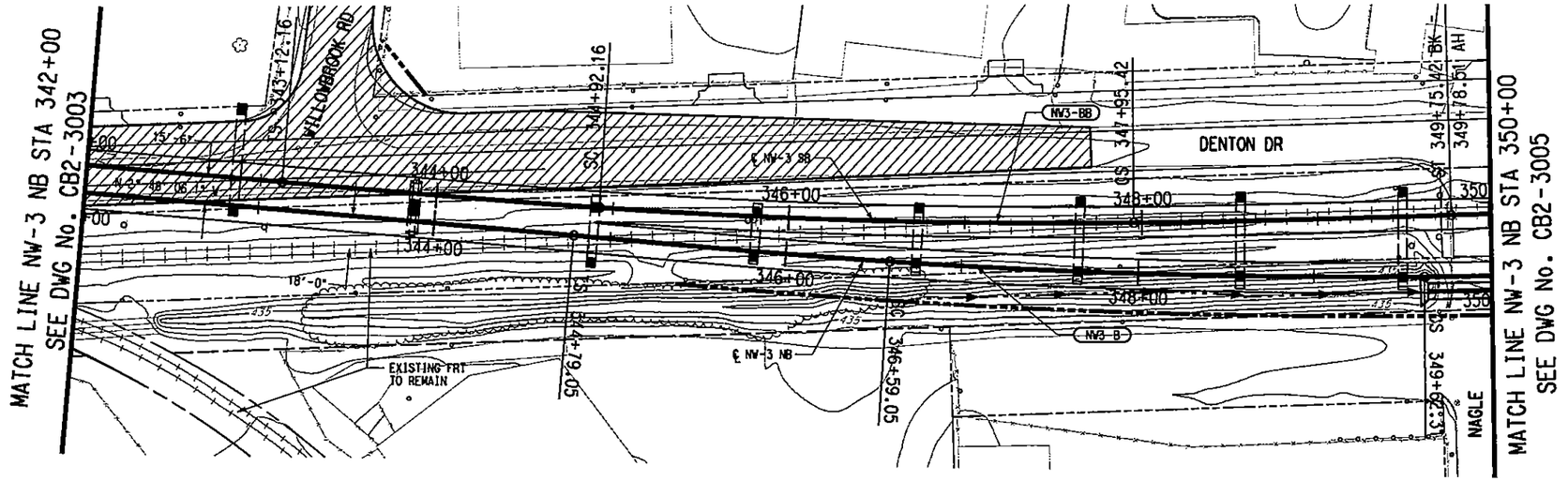
DBROWN
R:\NW3X\DGN\Cyl-AO\nw3xal03.040

DWG No. CB2-3004

P0004

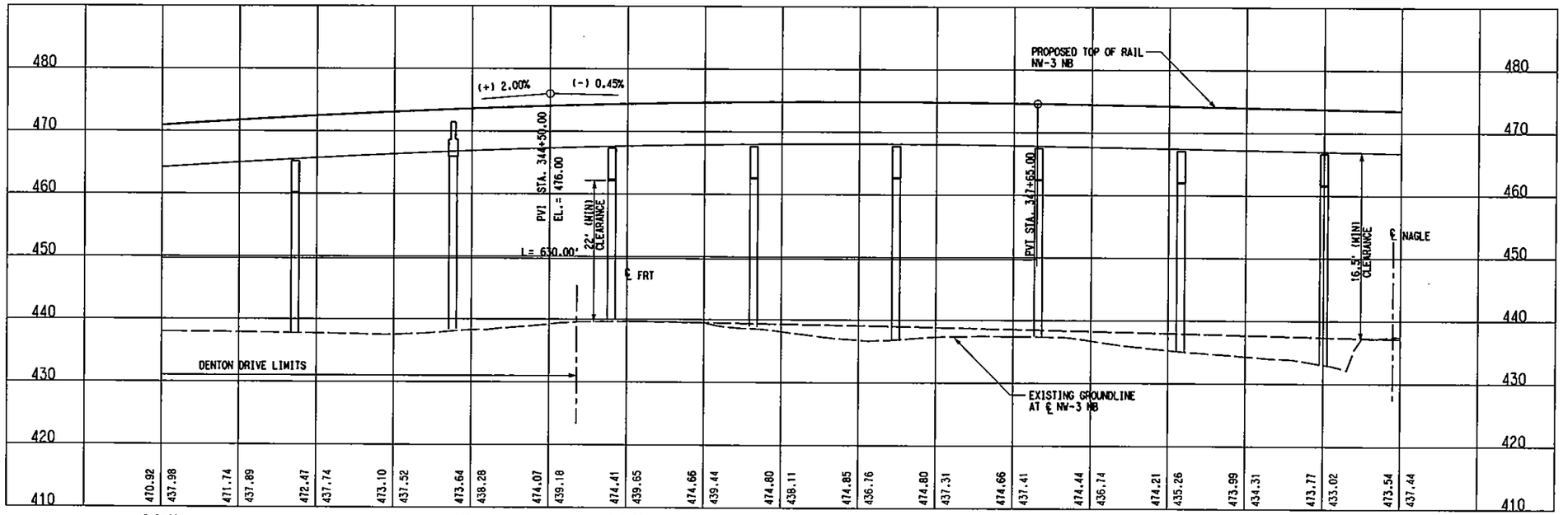


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW3-B (NB)		NW3-BB (SB)	
Rc =	4000.00'	Rc =	4000.00'
Ls =	180.00'	Ls =	180.00'
Lc =	303.26'	Lc =	303.26'
Ea =	2.75"	Ea =	2.75"
Eu =	1.48"	Eu =	1.48"
V =	65 MPH	V =	65 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 42152
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	B. BASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 157 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 342+00 TO STA 350+00

CONTRACT C-937775-1 | DWG No. CB2-3004 | REV

OPOI, R:\NW3X\nw3xtprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW3X\NW3XUTRI.040, 12
TOPO, R:\NW3X\NW3xpfrl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW3X\nw3xolrl.040, 1-61
OW, R:\NW3X\nw3xrwrl.040, 15,18,19,26,27,31,40,46
BORDER, R:\NW3X\nw3xborl.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW3X\NW3XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-42,44,45,48
SITE, R:\NW3X\nw3xeprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\nw3xbrrl.040, 6-10,15-17

PRF ROTATION=0.000000
R:\NW3X\DGN\Cvl-AO\nw3xa104.040
Fri Nov 15 11:55:19 2002
R:\NW3X\prf\nw3xa104.prf
DBROWN
R:\NW3X\ADMIN\SPECS\ABLE\Gmdorl.tbl

R:\NW3X\DGN\Cvl-AO\nw3xa104.040

R:\NW3X\DGN\Civil-AQ\nw3xa105.040
Fri Nov 15 11:56:57 2002
R:\NW3X\prf\nw3xa105.prf
DBROWN

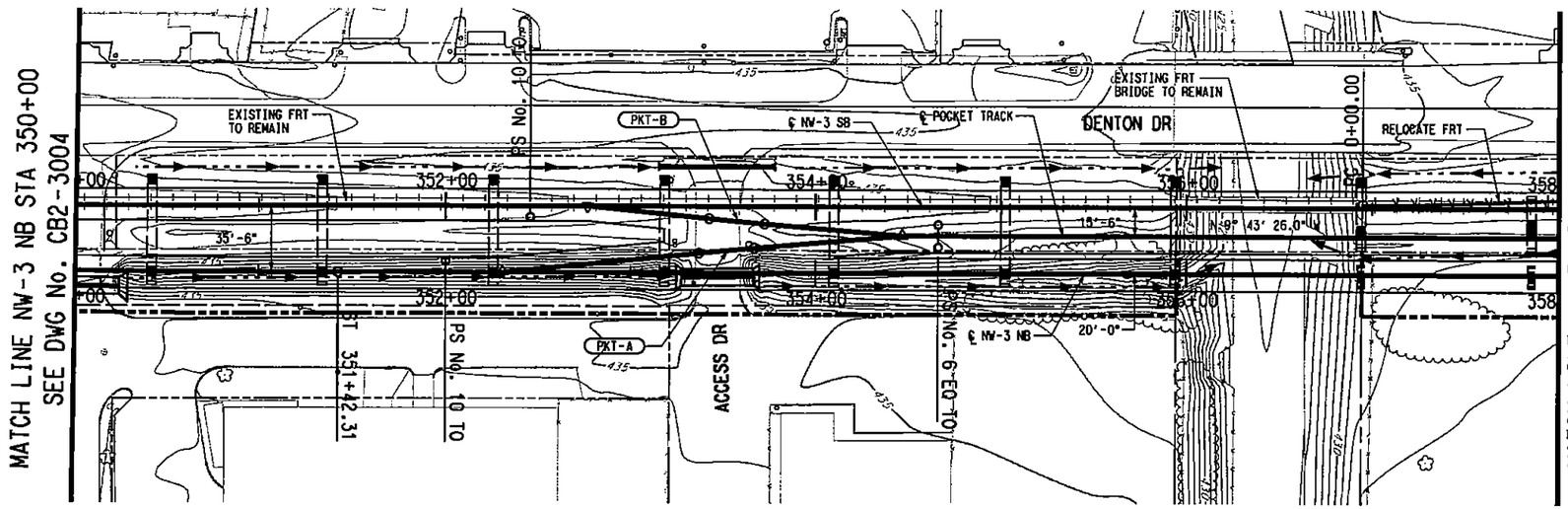
PRF ROTATION=0.000000
R:\NW3X\PRF\nw3xprr1.040, 1-3,6,10,13,20,23,39,56,57
R:\NW3X\PRF\nw3xprr2.040, 1-4,6-12,14-22,24-62
R:\NW3X\PRF\nw3xprr3.040, 1-21,24,25,27,28,30-35,37-39,41,
R:\NW3X\PRF\nw3xprr4.040, 15,17,18,33,34,45,46
R:\NW3X\PRF\nw3xprr5.040, 6-10,15-17

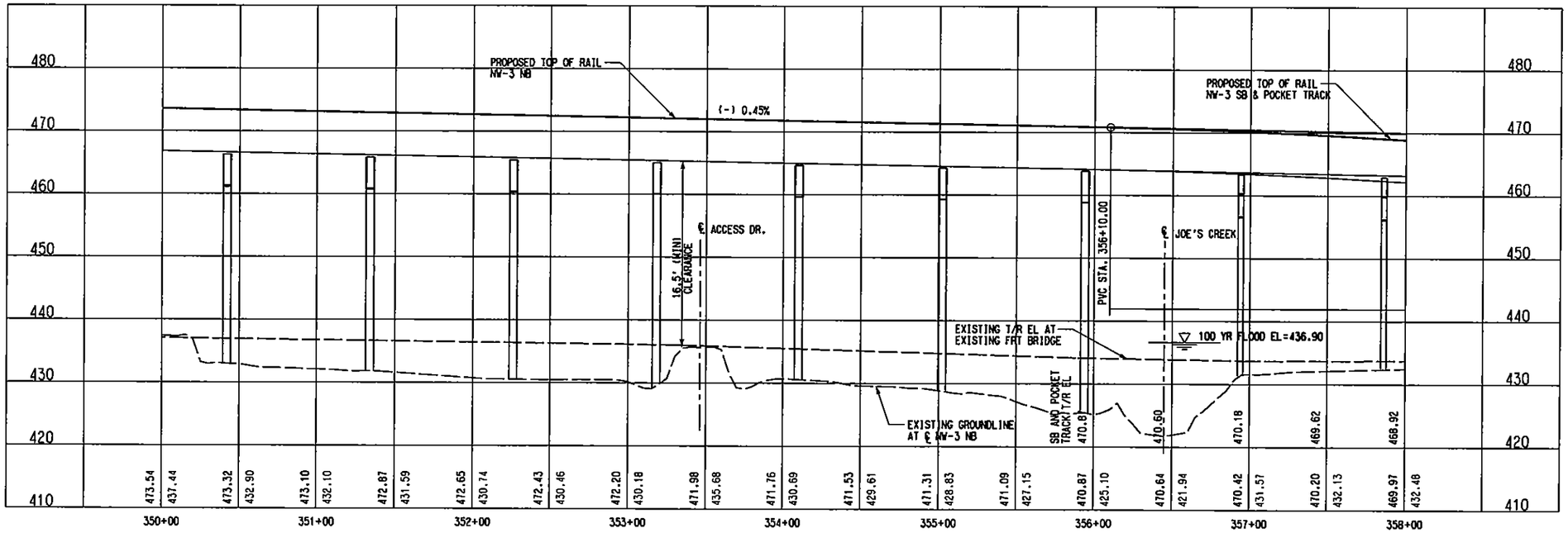
BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\NW3XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,
SITE, R:\NW3X\nw3xepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\nw3xbrr1.040, 6-10,15-17

OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW3X\NW3XUTR1.040, 12
TOPO, R:\NW3X\NW3xpir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW3X\nw3xalr1.040, 1-61
DW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46

DWG No. CB2-3005

P0005





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

PKT-A	
△ =	0°57'40"
Rc =	1800.00'
T =	15.08'
Lc =	30.19'

PKT-B	
△ =	0°57'40"
Rc =	1800.00'
T =	15.08'
Lc =	30.19'

NOTE:

1. FLOOD ELEVATION TAKEN FROM FLOOD INSURANCE STUDY, CITY OF DALLAS VOL 3 DTD JULY2, 1991 BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 12 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 158 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

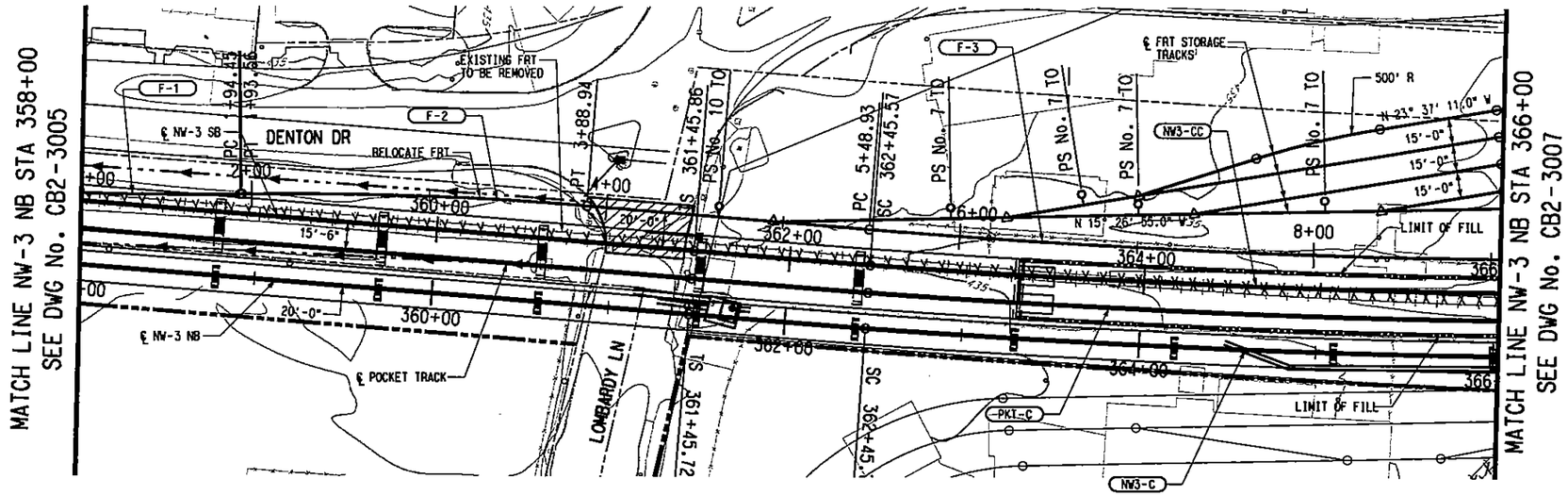
GUIDEWAY PLAN AND PROFILE
STA 350+00 TO STA 358+00

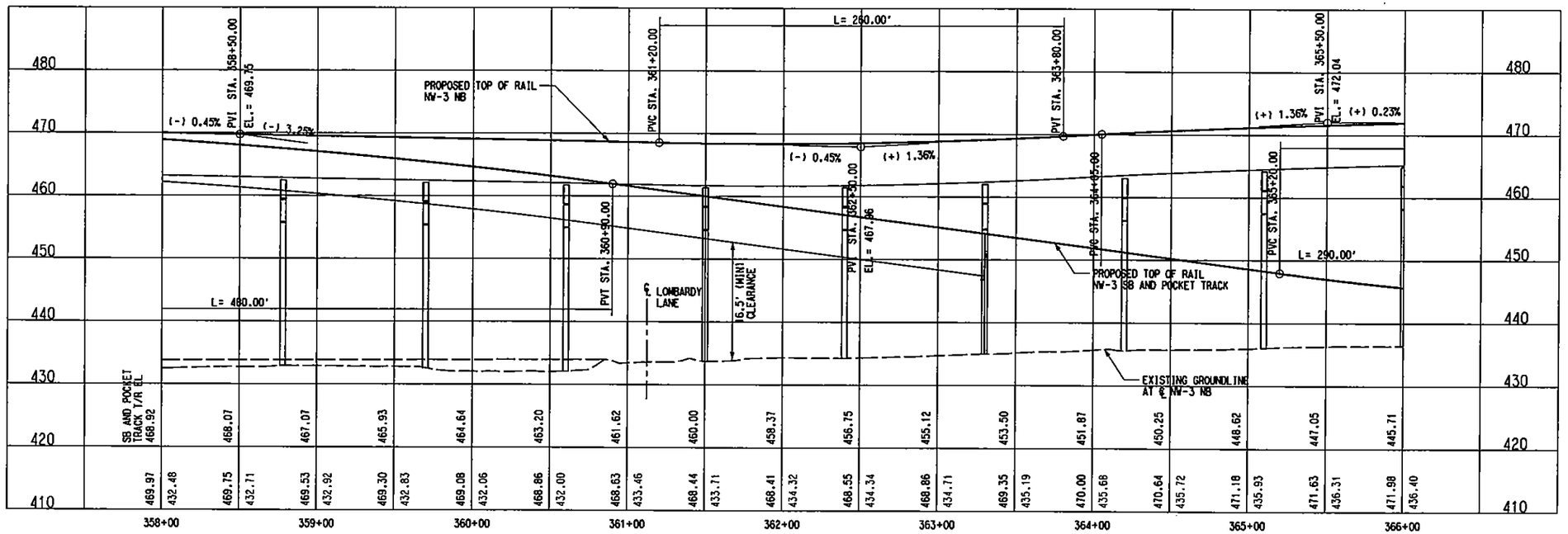
CONTRACT	DWG No.	REV
C-937775-1	CB2-3005	

R:\NW3X\DGN\Civil-AQ\nw3xa105.040

DWG No. CB2-3006

P0006





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW3-C (NB)		NW3-CC (SB)	
Rc =	6000.00'	Rc =	5964.50'
Ls =	100.00'	Ls =	99.71'
Lc =	504.27'	Lc =	500.98'
Eq =	1.50"	Eq =	1.50"
Eu =	1.32"	Eu =	1.33"
V =	65 MPH	V =	65 MPH

PKT-C		F-1	
Rc =	5980.00'	Dc =	2°45'
Ls =	99.84'	Ls =	0.00'
Lc =	502.59'	Lc =	193.56'
Eq =	1.50"	Eq =	1.00"
Eu =	1.33"	Eu =	0.72"
V =	65 MPH	V =	30 MPH

F-2		F-3	
Dc =	2°45'	Dc =	1°10'
Ls =	0.00'	Ls =	0.00'
Lc =	194.49'	Lc =	503.56'
Eq =	1.00"	Eq =	1.00"
Eu =	0.72"	Eu =	1.03"
V =	30 MPH	V =	50 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 159 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 358+00 TO STA 366+00

CONTRACT C-937775-1 | DWG No. CB2-3006 | REV

BORDER, R:\NW3X\nw3xbrl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\NW3XALR2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\nw3xbrr1.040, 6-10,15-17

OPOI, R:\NW3X\nw3xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW3X\NW3XUTR1.040, 12
TOPO, R:\NW3X\NW3xptr1.040, 2-5,8-11,13,15-18,21,25,29,31,49,52
LIGN, R:\NW3X\nw3xalr1.040, 1-61
DW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46

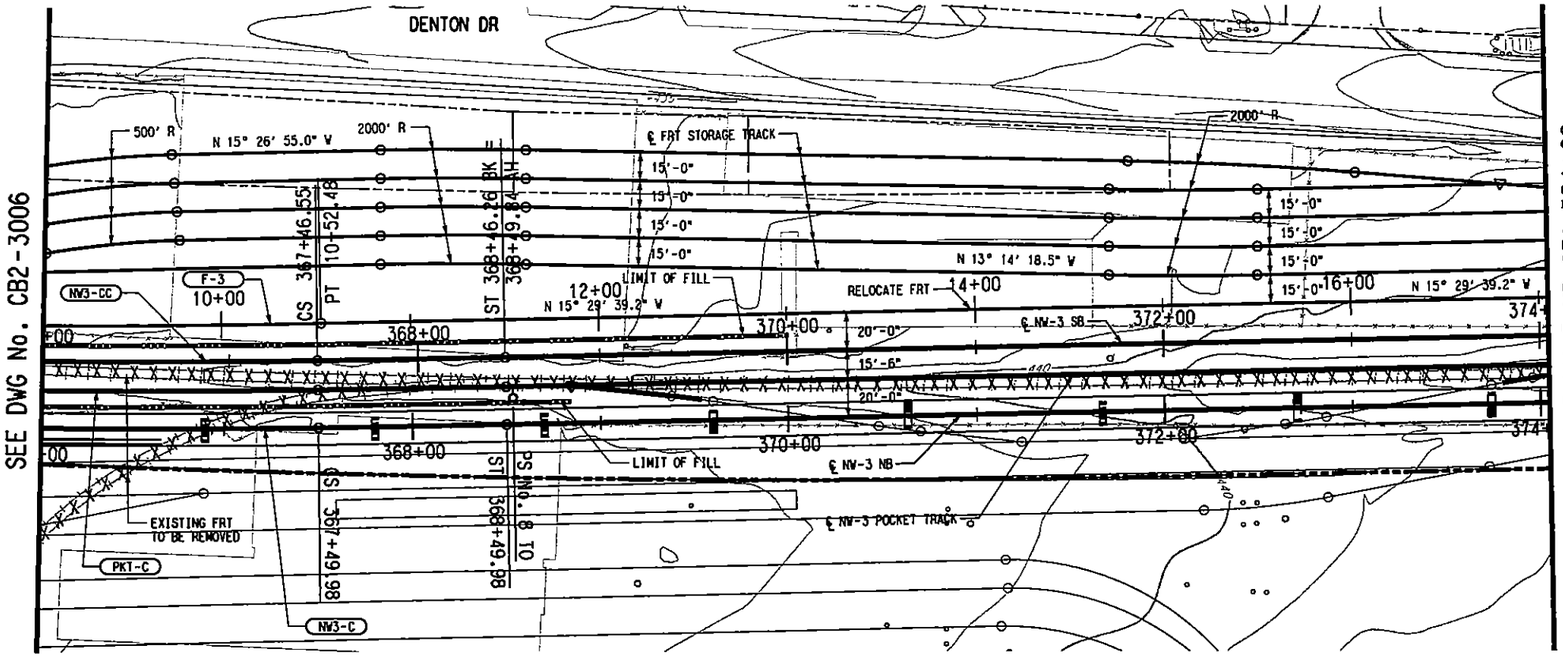
R:\NW3X\DGN\Civil-AO\nw3xal06.040
Fri Nov 15 11:58:42 2002
R:\Nw3X\prf\nw3xal06.prf
DBROWN

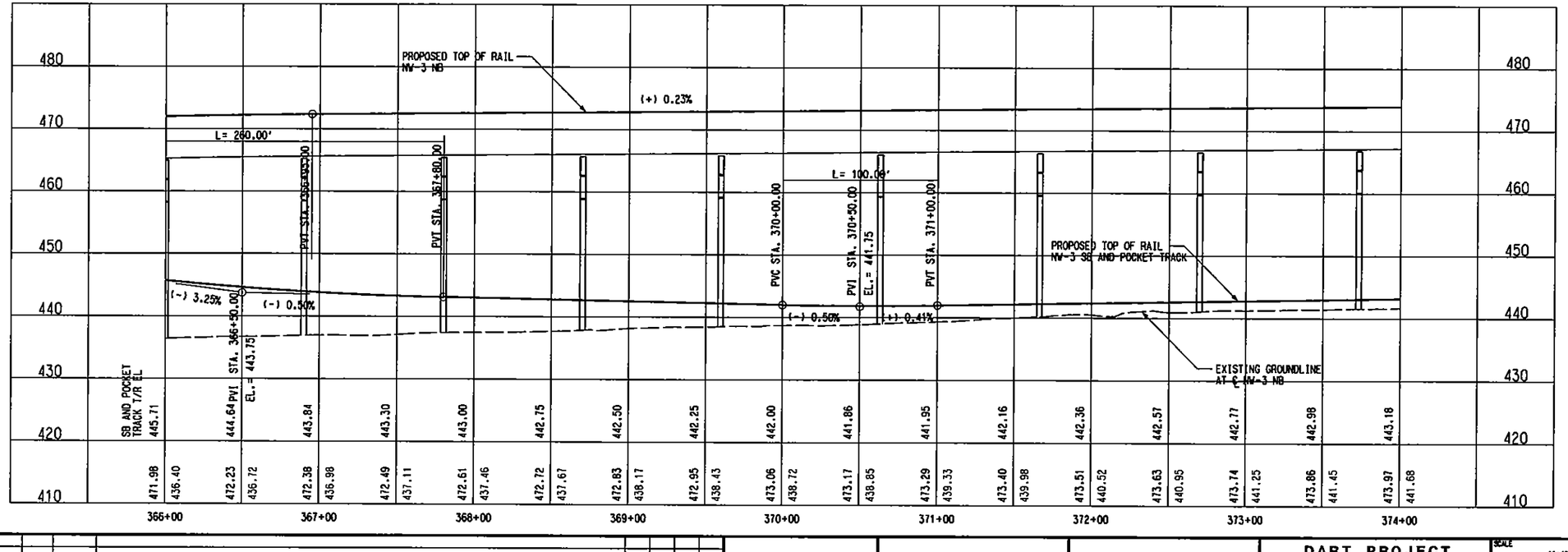
PRF ROTATION=0.000000

R:\NW3X\DGN\Civil-AO\nw3xal06.040

DWG No. C82-3007

P0007





HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

NW3-C (NB)		NW3-CC (SB)	
Rc =	6000.00'	Rc =	5964.50'
Ls =	100.00'	Ls =	99.71'
Lc =	504.27'	Lc =	500.98'
Ea =	1.50"	Ea =	1.50"
Eu =	1.32"	Eu =	1.33"
V =	65 MPH	V =	65 MPH

PKT-C		F-3	
Rc =	5980.00'	Dc =	1°10'
Ls =	99.84'	Ls =	0.00'
Lc =	502.59'	Lc =	503.56'
Ea =	1.50"	Ea =	1.00"
Eu =	1.33"	Eu =	1.03"
V =	65 MPH	V =	50 MPH

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84157
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 160 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 366+00 TO STA 374+00

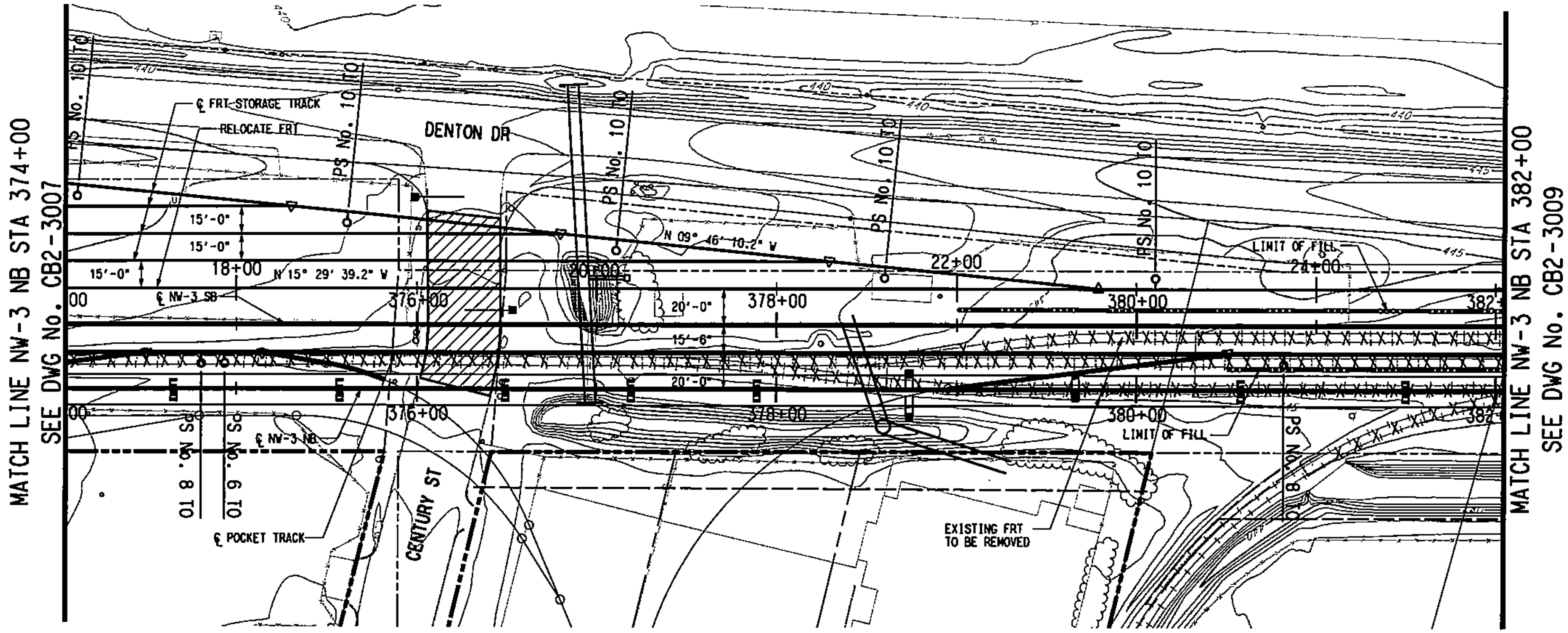
CONTRACT C-937775-1 | DWG No. C82-3007 | REV

LIGN, R:\NW3X\nw3xalr1.040, 1-61
DV, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8,10,11,13-18,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3XBPR1.040, 2-5,8-11,13-16,21,25,29,31,35,49,52

BORDER, R:\NW3X\nw3xbor1.001, 1-3,5,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\nw3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,
SITE, R:\NW3X\nw3xspr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17

R:\NW3X\DGN\Cv1-AO\nw3xa107.040
Fri Nov 15 12:00:21 2002
R:\NW3X\prf\nw3xa107.prf
DBROWN

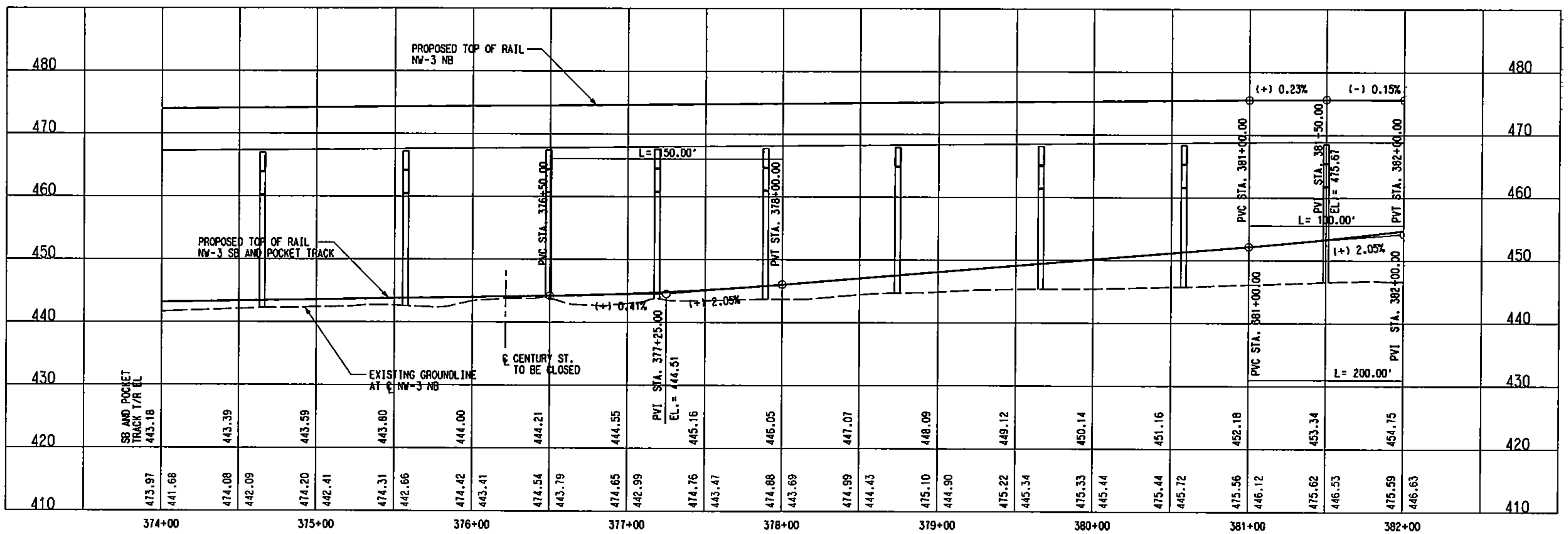
R:\NW3X\DGN\Cv1-AO\nw3xa107.040



SCALE (IN FEET)
HORIZ 0 20 40 80
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 161 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

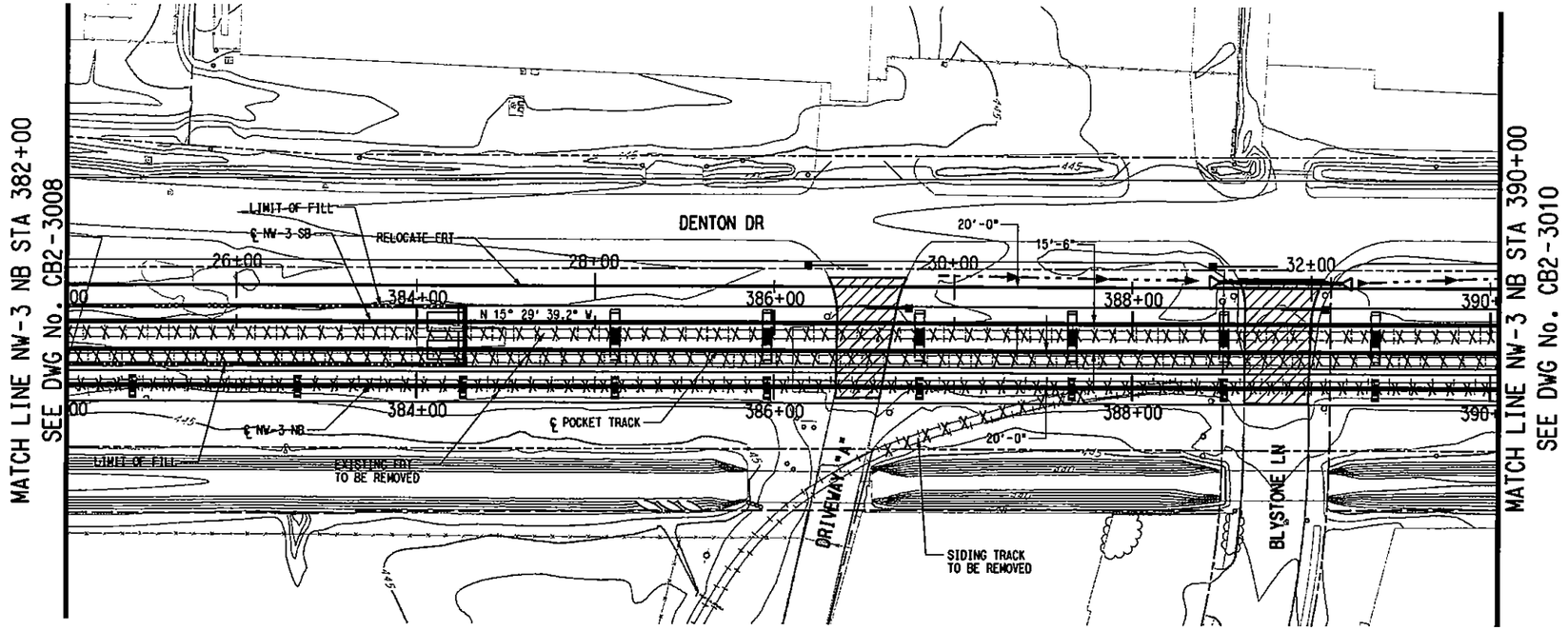
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

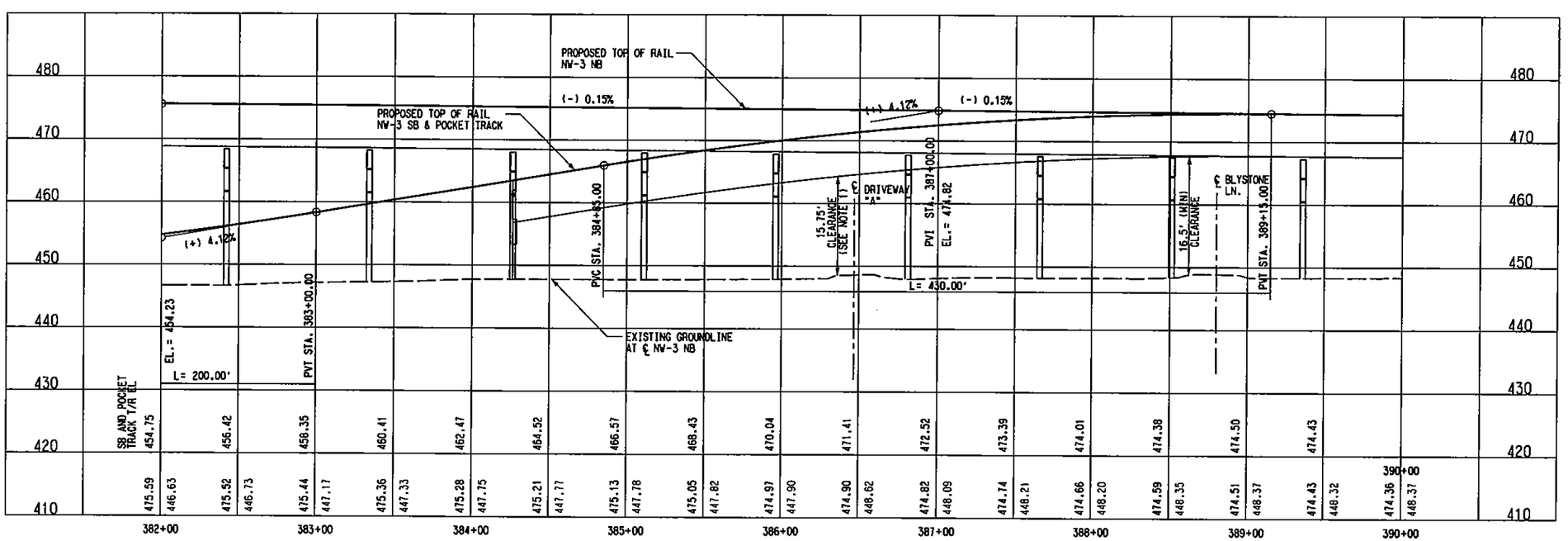
GUIDEWAY PLAN AND PROFILE
STA 374+00 TO STA 382+00

CONTRACT C-937775-1 | DWG No. CB2-3008 | REV

DWG No. C82-3009

P0009





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTE:

1. REGRADE DRIVEWAY "A" TO INCREASE VERTICAL CLEARANCE TO 16.5' (MIN).

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 162 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 382+00 TO STA 390+00

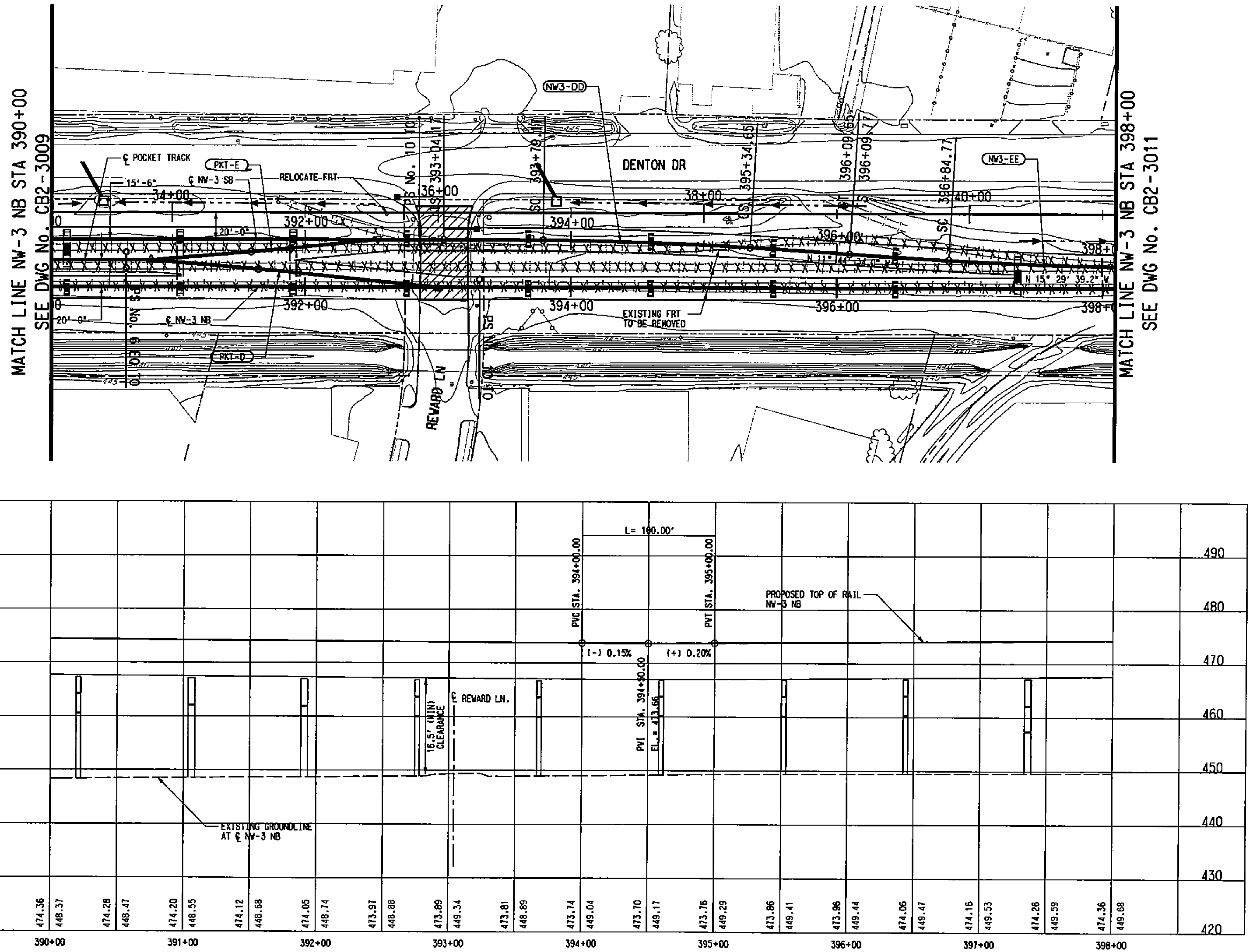
CONTRACT C-937775-1 | DWG No. C82-3009 | REV

PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42
SITE, R:\NW3X\nw3xepr1.040, 2-5,8-11,13-18,20,21,29,31,35,49,52
BRPL, R:\NW3X\NW3XBRR1.040, 2-5,8-11,13-18,21,29,31,35,49,52
LIGN, R:\NW3X\nw3xalr1.040, 1-81
OW, R:\NW3X\nw3xrwr1.040, 15,16,19,26,27,31,40,46
TIL, R:\NW3X\nw3xuti1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,29,31,35,49,52
TOPO, R:\NW3X\NW3xptr1.040, 2-5,8-11,13-18,21,29,31,35,49,52

R:\NW3X\DGN\Civil-AG\nw3xal09.040
Fri Nov 15 12:08:41 2002
R:\NW3X\prf\nw3xal09.prf
DBROWN
PRF ROTATION=0.000000
R:\$(DWG)\$(PE)\$(USER)\$(mdrl.tb)

R:\NW3X\DGN\Civil-AG\nw3xal09.040

CB2-3010 DWG No.



SCALE (IN FEET)
HORIZ 0 20 40 80
VERT 0 5 10 15 20

NW3-DD (SB)	
Rc =	3520.00'
Ls =	75.00'
Lc =	155.47'
Eo =	1.50"
Eu =	1.34"
V =	50 MPH

NW3-EE (SB)	
Rc =	3520.00'
Ls =	75.00'
Lc =	155.47'
Eo =	1.50"
Eu =	1.34"
V =	50 MPH

PKT-D	
Δ =	0°57'40"
Rc =	1800.00'
T =	15.08'
Lc =	30.19'

PKT-E	
Δ =	0°57'40"
Rc =	1800.00'
T =	15.08'
Lc =	30.19'

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 163 OF 243

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

SCALE 1"=40'
DRAWN D. BROWN
DESIGNED D. BROWN
CHECKED S. SASTRY
IN CHARGE J. TIPTON
DATE 25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 390+00 TO STA 398+00

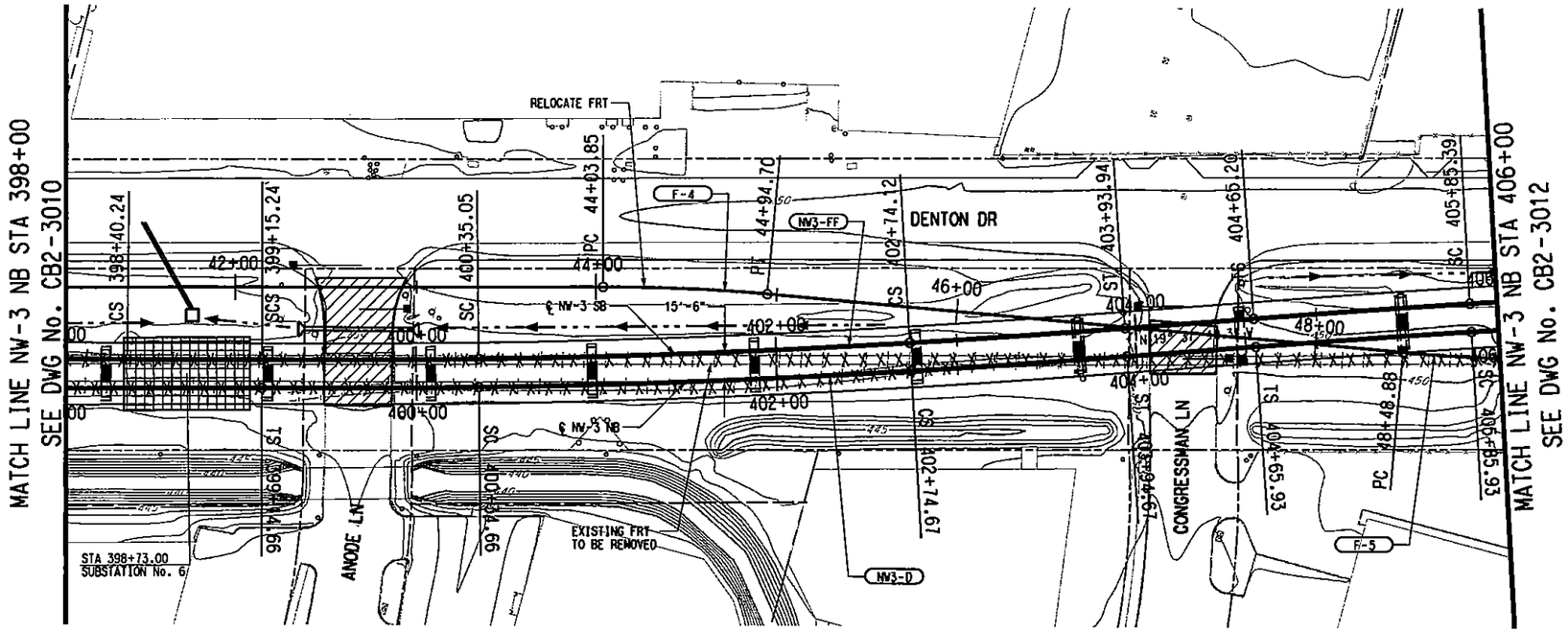
CONTRACT C-937775-1 | DWG No. CB2-3010 | REV

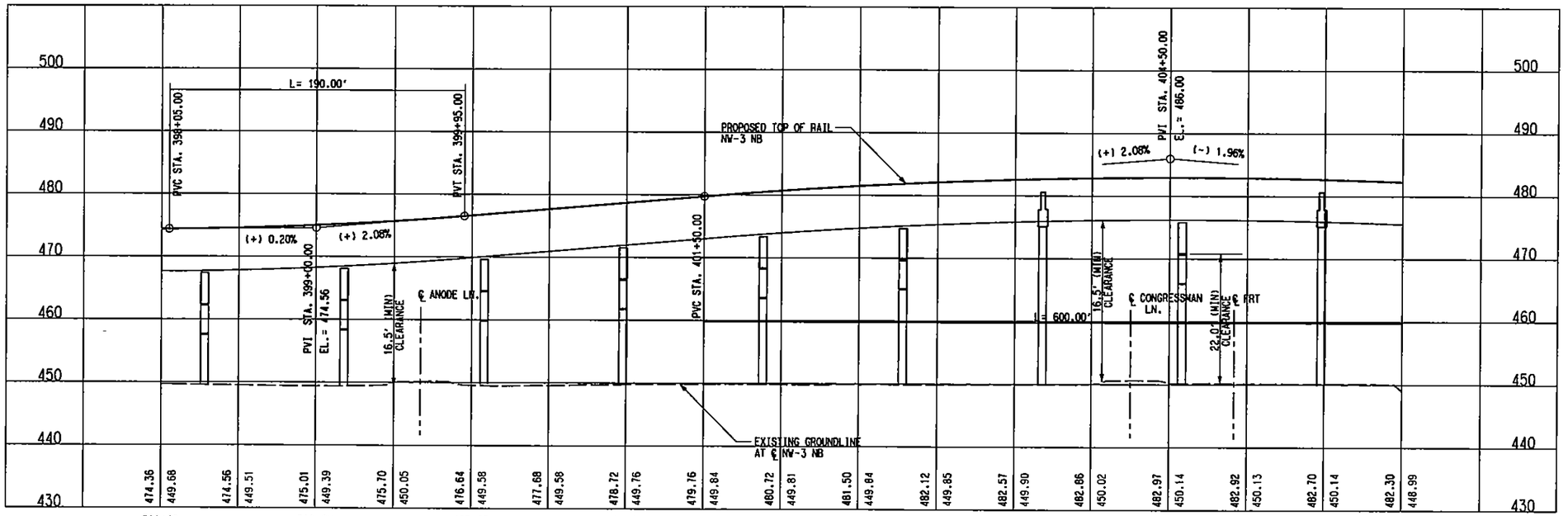
REV | AMEND | CR | DATE | DESCRIPTION | BY | ENG | CHK | APP

R:\NW3X\DGN\Cvl-AO\nw3xall0.040
Fri Nov 15 12:10:24 2002
R:\NW3X\prf\nw3xall0.prf
DBROWN

DWG No. CB2-3011

P0011





NW3-D (NB)		NW3-FF (SB)	
Rc =	5000.00'	Rc =	4984.50'
Ls =	120.00'	Ls =	119.82'
Lc =	240.00'	Lc =	239.07'
Ea =	1.00"	Ea =	1.00"
Eu =	1.42"	Eu =	1.43"
V =	55 MPH	V =	55 MPH

F-4		F-5	
Dc =	3°0'	Dc =	3°0'
Ls =	0.00'	Ls =	0.00'
Lc =	176.25'	Lc =	176.25'
Ea =	1.00"	Ea =	1.00"
Eu =	0.32"	Eu =	0.32"
V =	25 MPH	V =	25 MPH

SCALE (IN FEET)
HORIZ 0 20 40 60
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

GRADING FOR SYSTEM ELEMENTS

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTE:

1. SUBSTATION SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64157
Date: 23 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	B. SASTRY
IN CHARGE	J. TIPTON
DATE	23 OCT 02

DARTCADD

CONTRACT SHEET No. 164 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

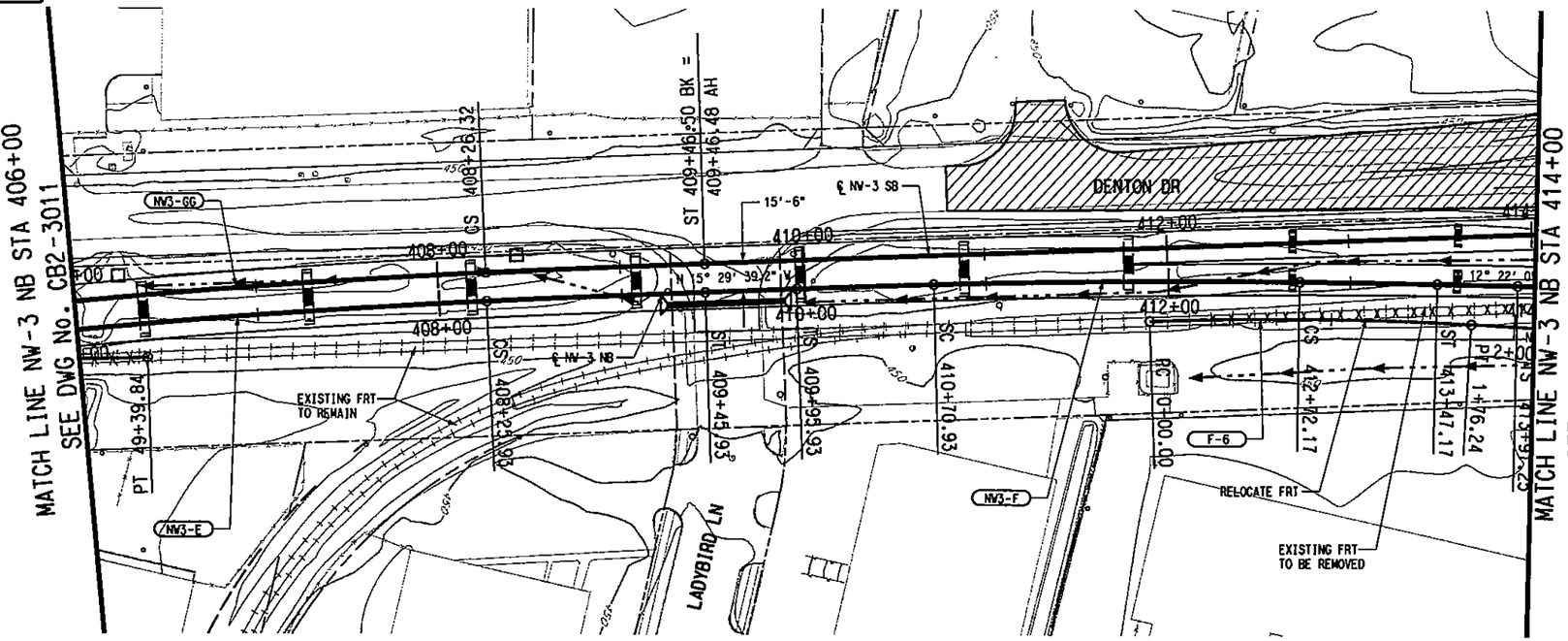
GUIDEWAY PLAN AND PROFILE
STA 398+00 TO STA 406+00

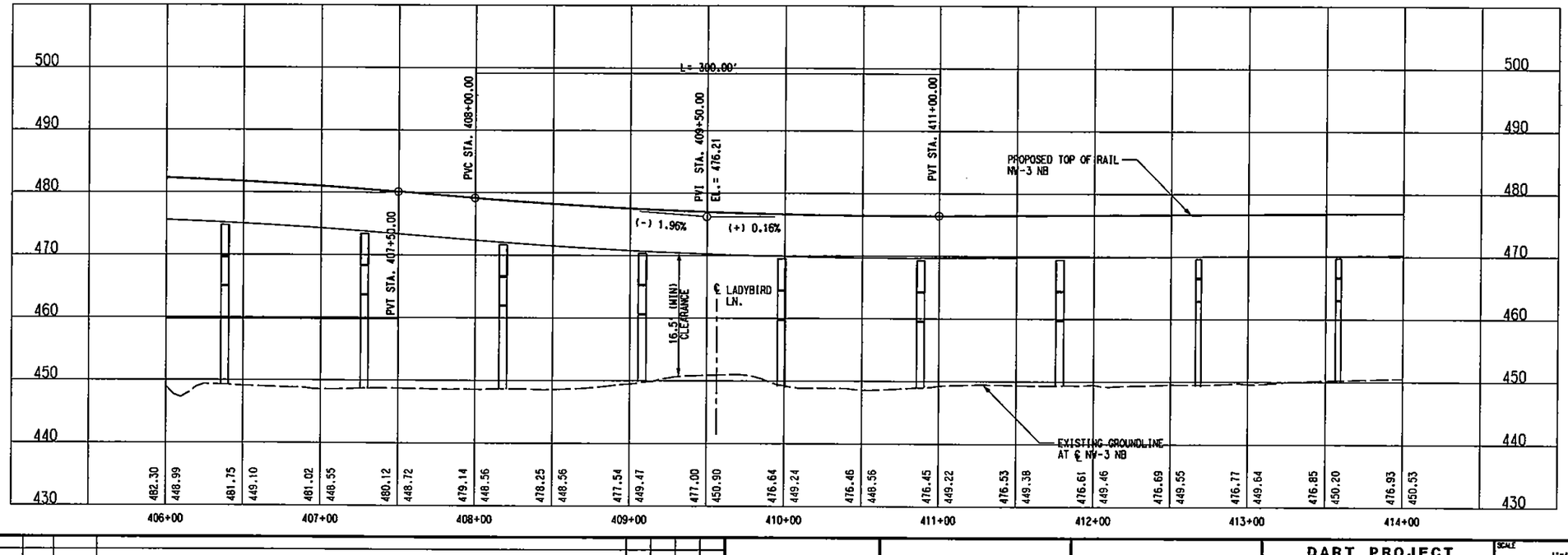
CONTRACT C-937775-1 | DWG No. CB2-3011 | REV

LIGN, R:\NW3X\nw3xalrl.040, 1-61
OV, R:\NW3X\nw3xrwrl.040, 15,16,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutrl.040, 12
OPOI, R:\NW3X\nw3xipri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xpiri.040, 2-5,8-11,13-18,21,25,29,31,35,49,52
BORDER, R:\NW3X\nw3xborl.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwrl.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,45,47,48,50,51,53,54
SITE, R:\NW3X\nw3xcprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3xBRRl.040, 6-10,15-17
PRF ROTATION=0.000000
R:\NW3X\DGN\Cvl-AO\nw3xall.040
Fri Nov 15 12:13:56 2002
R:\NW3X\prf\nw3xall.prf
DBROWN
R:\NW3X\DGN\Cvl-40\nw3xall.040

DWG No. C82-3012

P0012





NW3-E (NB)	
Rc =	5000.00'
Ls =	120.00'
Lc =	240.00'
Eq =	1.00"
Eu =	1.42"
V =	55 MPH

NW3-F (NB)	
Rc =	5000.00'
Ls =	75.00'
Lc =	201.24'
Eq =	1.00"
Eu =	1.42"
V =	55 MPH

NW3-GG (SB)	
Rc =	5015.50'
Ls =	120.18'
Lc =	240.93'
Eq =	1.00"
Eu =	1.41"
V =	55 MPH

F-6	
Dc =	3°0'
Ls =	0.00'
Lc =	176.24'
Eq =	1.00"
Eu =	0.32"
V =	25 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 165 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	END	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 69157
Date: 10/01/02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 406+00 TO STA 414+00

CONTRACT C-937775-1 | DWG No. C82-3012 | REV

R:\NW3X\DGN\Cyl-AQ\nw3xal12.040
Fri Nov 15 12:15:34 2002
R:\NW3X\prf\nw3xal12.prf
OBROWN

PRF ROTATION=0.000000
R:\NW3X\ADMIN\PENMAP\Endor1.tbl

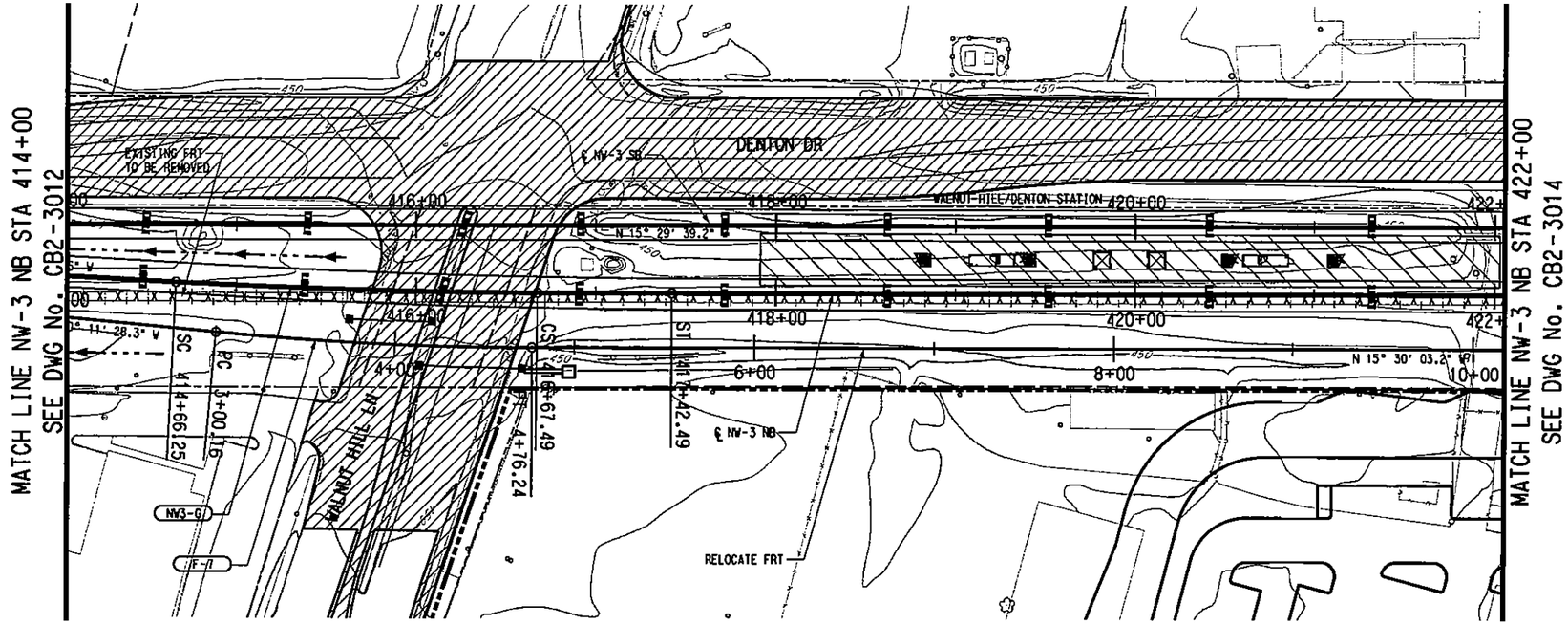
BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xal2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprw1.040, 1-21,24,25,27,28,30-35,37-39,41,
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17

ALIGN, R:\NW3X\nw3xal1.040, 1-61
ROW, R:\NW3X\nw3xrw1.040, 15,18,19,26,27,31,40,46
UTIL, R:\NW3X\nw3xut1.040, 12
TOPOI, R:\NW3X\nw3xtp1.040, 2-5,8-11,13-18,20,21,29,31,35,49,51
TOPO, R:\NW3X\NW3xtp1.040, 2-5,8-11,13-18,21,29,31,35,49,51

R:\NW3X\DGN\Cyl-AQ\nw3xal12.040

DWG No. CB2-3013

P0013



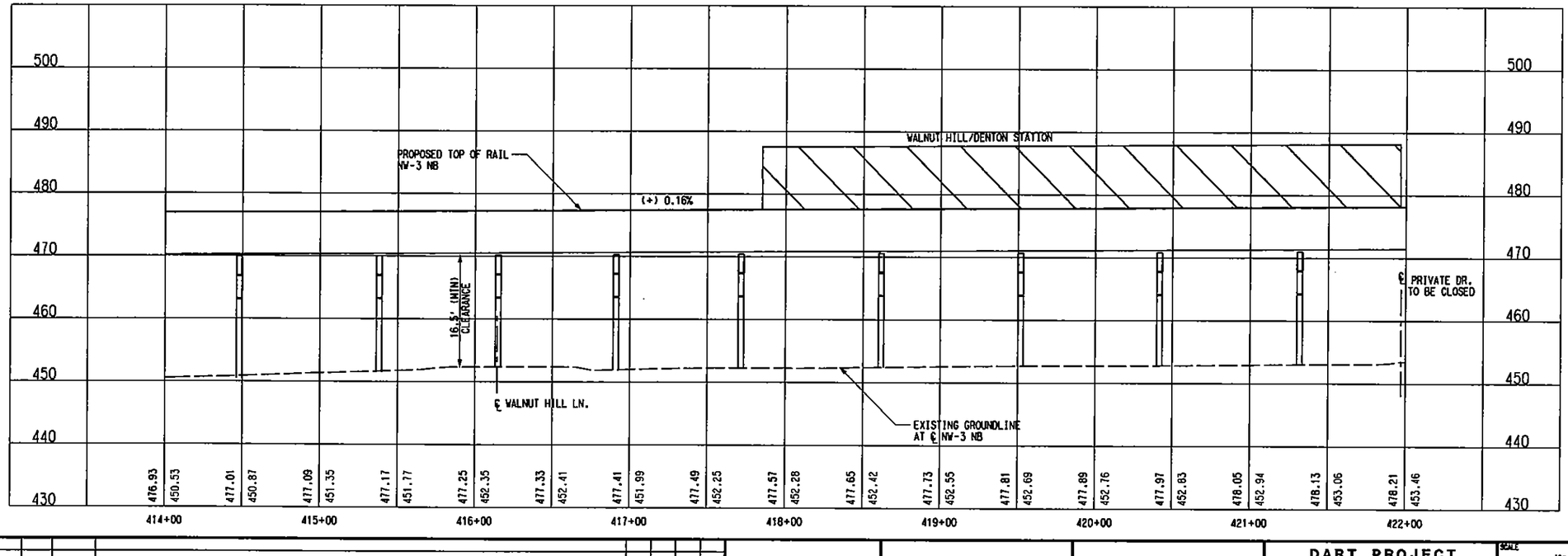
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW3-G (NB)		F-7	
Rc =	5000.00'	Dc =	3°0'
Ls =	75.00'	Ls =	0.00'
Lc =	201.24'	Lc =	176.08'
Eo =	1.00"	Eo =	1.00"
Eu =	1.42"	Eu =	0.32"
V =	55 MPH	V =	25 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STATION CONCOURSE/ PLATFORM



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 166 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 414+00 TO STA 422+00

CONTRACT C-937775-1 | DWG No. CB2-3013 | REV

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Fri Nov 15 12:21:48 2002
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DBROWN

BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,47-50,52,54,55,57-63
SITE, R:\NW3X\nw3xcpr1.040, 1,7,8,13,15-17,20,25-32,37-39,41-44,47-50,52,54,55,57-63
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17

LIGN, R:\NW3X\nw3xalr1.040, 1-6
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xptr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

PRF ROTATION=0.000000
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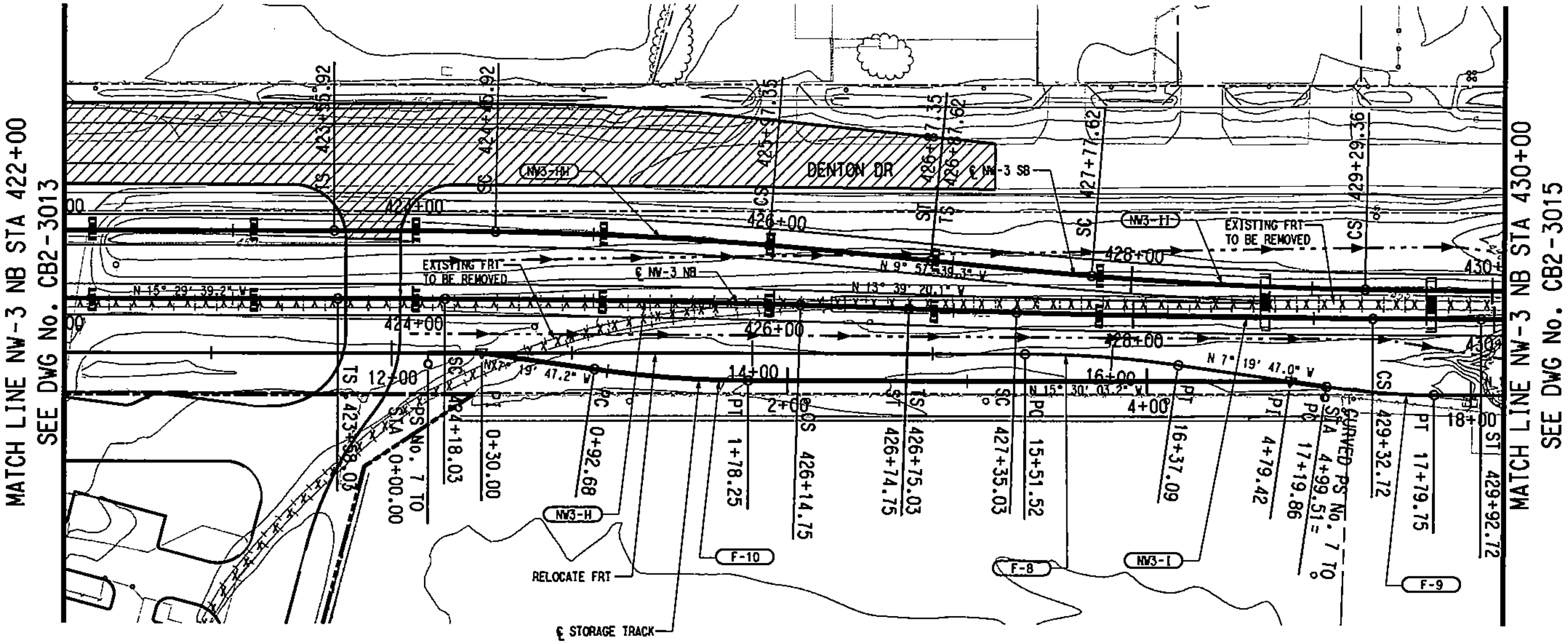
mdar1.tbl

R:\NW3X\DGN\Cvl-A0\nw3xal13.040

P0014



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW3-H (NB)	
Rc =	8000.00'
Ls =	60.00'
Lc =	196.72'
Ea =	0.50"
Eu =	1.01"
V =	55 MPH

NW3-HH (SB)	
Rc =	2500.00'
Ls =	90.00'
Lc =	151.44'
Ea =	1.75"
Eu =	1.49"
V =	45 MPH

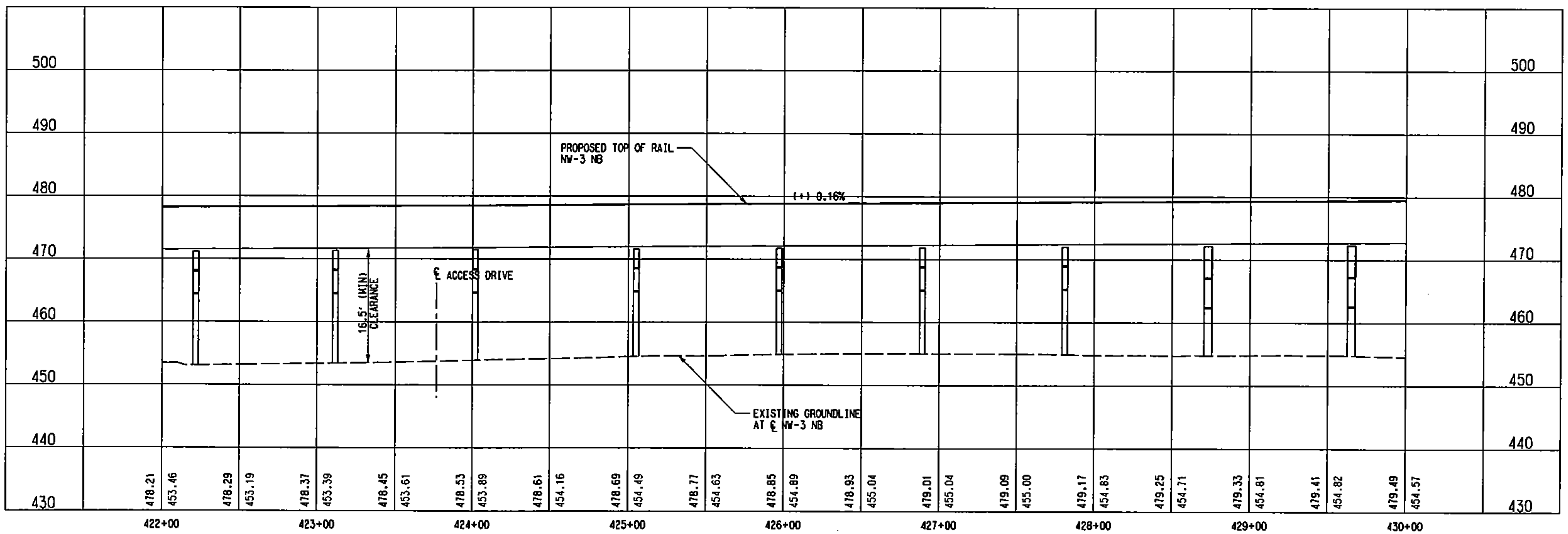
NW3-I (NB)	
Rc =	8000.00'
Ls =	60.00'
Lc =	197.69'
Ea =	0.50"
Eu =	1.01"
V =	55 MPH

NW3-II (SB)	
Rc =	2500.00'
Ls =	90.00'
Lc =	151.74'
Ea =	1.75"
Eu =	1.49"
V =	45 MPH

F-8	
Dc =	9°30'
Ls =	0.00'
Lc =	85.57'
Ea =	1.00"
Eu =	0.50"
V =	15 MPH

F-9	
Dc =	13°40'
Ls =	0.00'
Lc =	59.90'
Ea =	1.00"
Eu =	1.15"
V =	15 MPH

F-10	
Dc =	9°30'
Ls =	0.00'
Lc =	85.57'
Ea =	1.00"
Eu =	0.50"
V =	15 MPH



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 167 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. [illegible]
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 422+00 TO STA 430+00

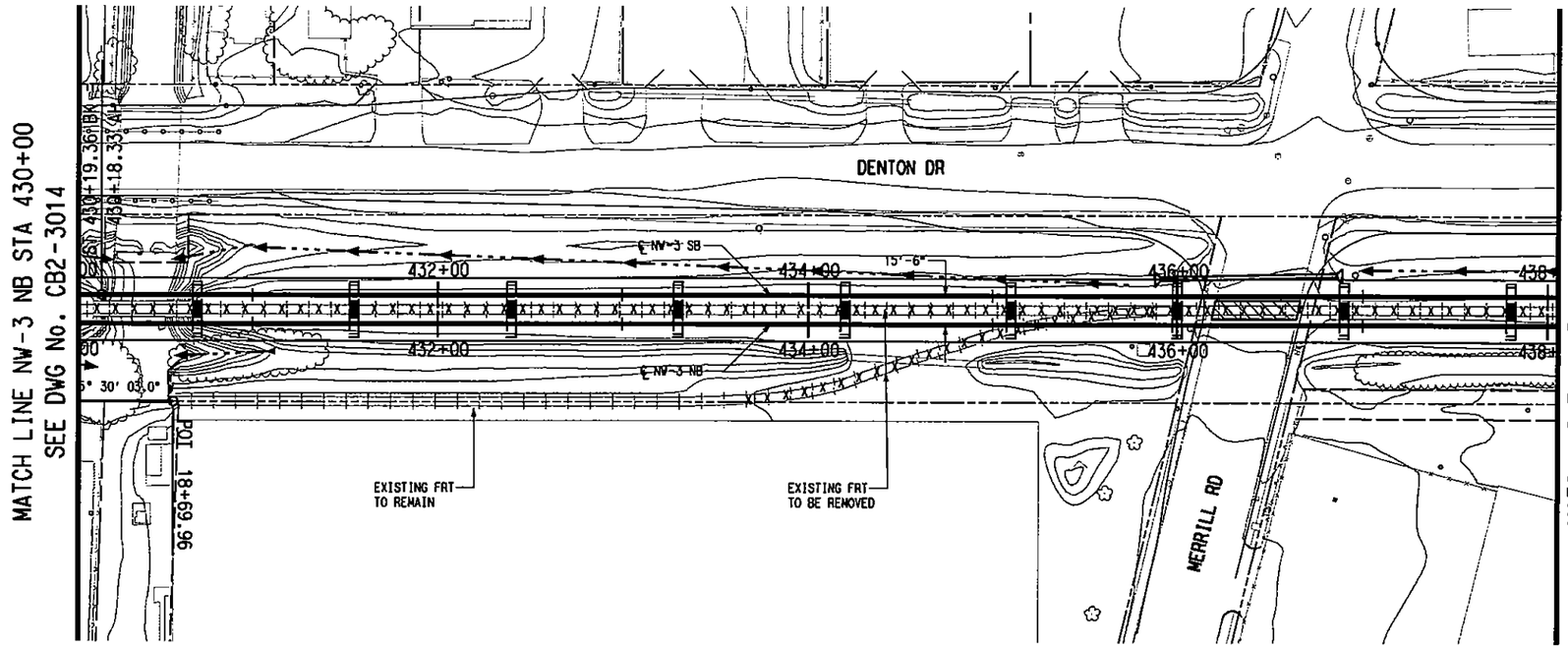
CONTRACT C-937775-1 | DWG No. CB2-3014 | REV

DWG No. CB2-3014

R:\NW3X\DGN\Cvl-AQ\nw3xal14.040
Fri Nov 15 12:23:28 2002
R:\Nw3X\prf\nw3xal14.prf
DBROWN
PRF ROTATION=0.000000

DWG No. C82-3015

P0015

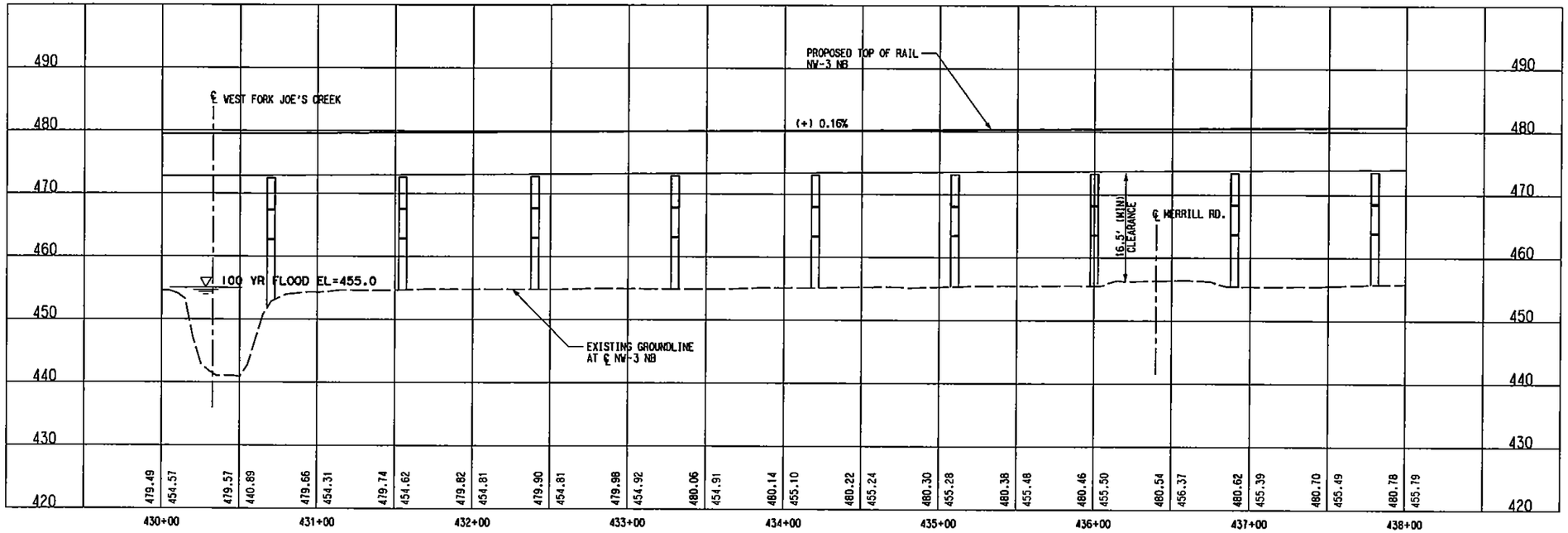


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTE:
1. FLOOD ELEVATION TAKEN FROM FLOOD INSURANCE STUDY, CITY OF DALLAS VOL 3 DTD JULY 2, 1991 BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CPSY
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	B. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 168 OF 243

LIGHT RAIL TRANSIT SYSTEM LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE STA 430+00 TO STA 438+00

CONTRACT C-937775-1 | DWG No. C82-3015 | REV

BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\nw3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,45,47,48,50,51,53-55
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17
ALIGN, R:\NW3X\nw3xalr1.040, 1-61
ROW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
TOPO1, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,49,52
TOPO, R:\NW3X\NW3XTPR1.040, 2-5,8-11,13-18,21,25,29,31,49,52

PRF ROTATION=0.000000
Fri Nov 15 12:26:56 2002
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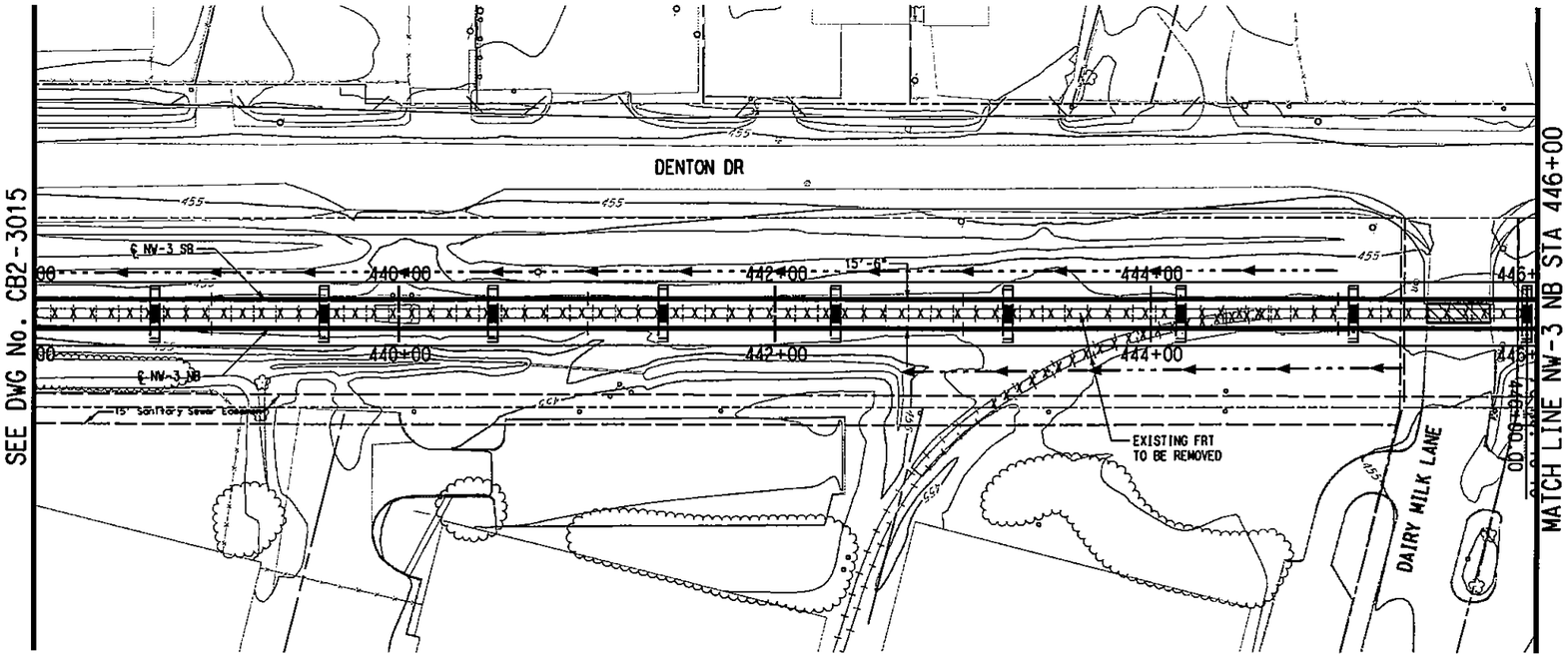
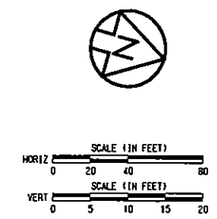
DBROWN

R:\NW3X\DGN\Cvl-AQ\nw3xalr15.040

DWG No. C82-3016

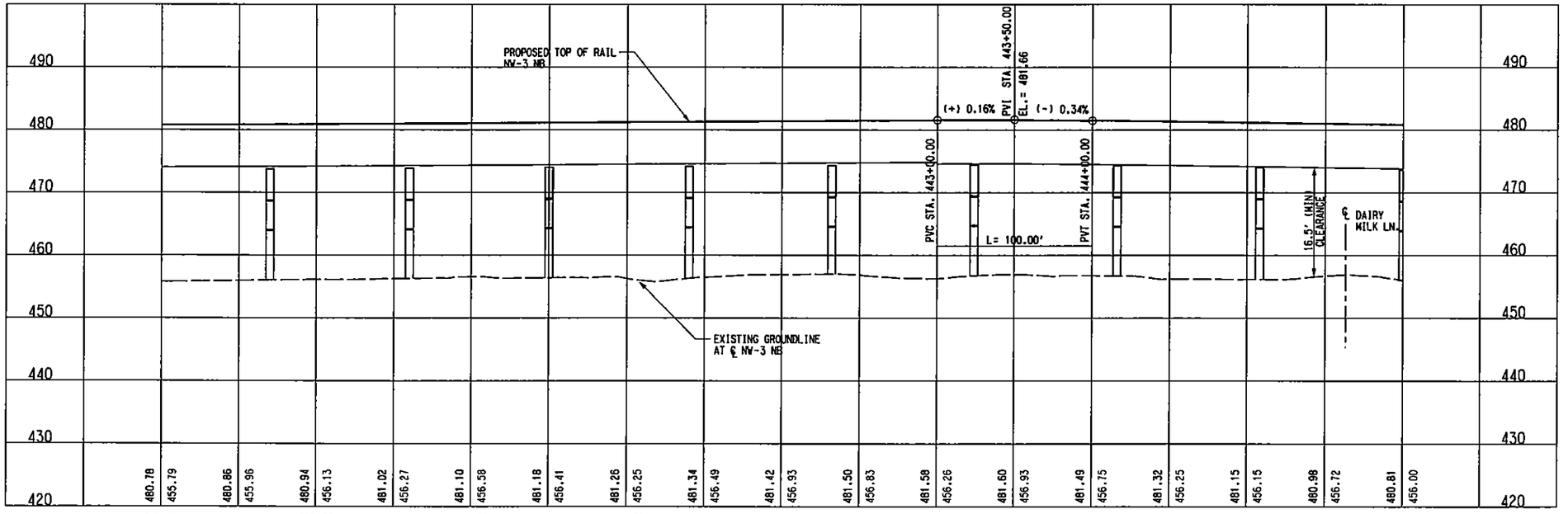
P0016





LEGEND

STREET/ALLEY/
DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 169 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64153
Date: 10/25/02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 438+00 TO STA 446+00

CONTRACT	DWG No.	REV
C-937775-1	C82-3016	

LIGN, R:\NW3X\nw3salr1.040, 1-81
OW, R:\NW3X\nw3srwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3spir1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52
BORDER, R:\NW3X\nw3sbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3sprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,13-17

PRF ROTATION=0.000000
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DBROWN
Fri Nov 15 12:28:35 2002
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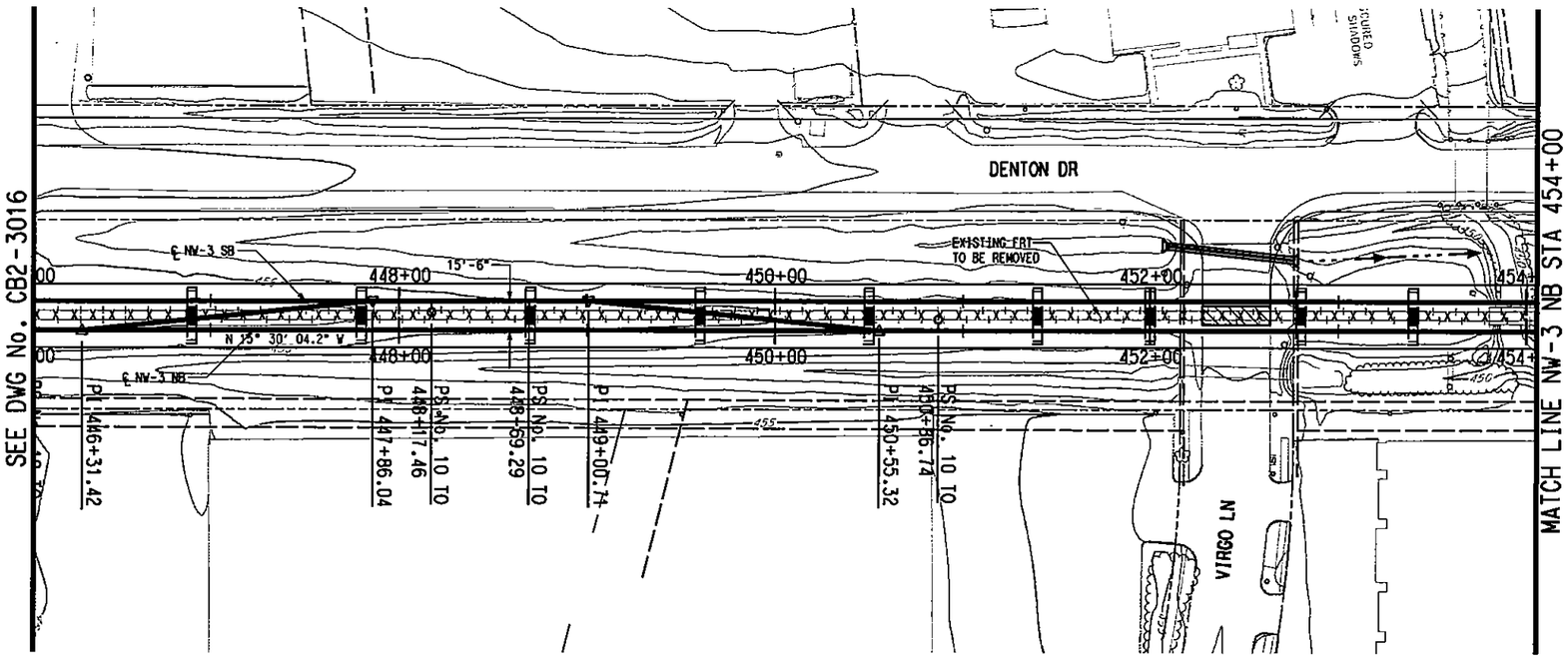
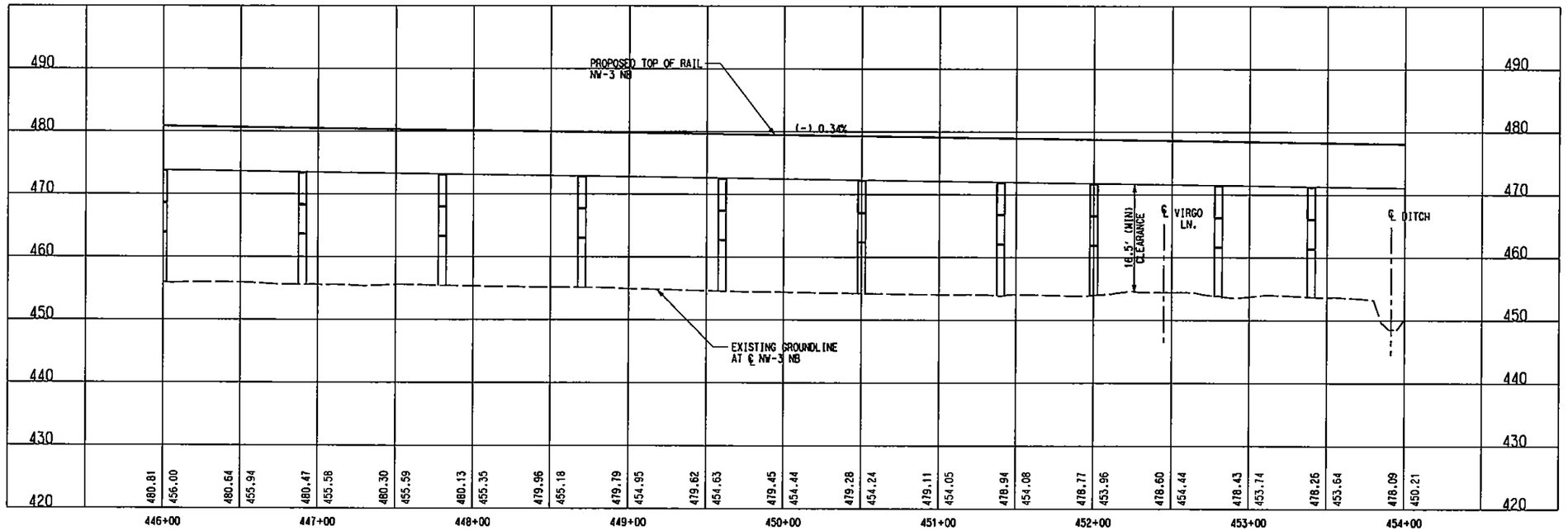
R:\NW3X\DGN\Cvil-AO\nw3salr16.040

DWG No. CB2-3017

P0017





LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81132
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
16770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 170 OF 243

LIGHT RAIL TRANSIT SYSTEM LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE STA 446+00 TO STA 454+00

CONTRACT C-937775-1 | DWG No. CB2-3017 | REV

LIGN, R:\NW3X\nw3xalr1.040, 1-81
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
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OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3spfr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROW, R:\NW3X\NW3sprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,47,48,50,51,53,54,58-62
SITE, R:\NW3X\nw3xepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17
R:\NW3X\DGN\C01-A01nw3xal17.040
Fri Nov 15 12:30:19 2002
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DBROWN
PRF ROTATION=0.000000
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R:\NW3X\DGN\Cvl-AO\nw3xal18.040
Fri Nov 15 12:31:57 2002
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DBROWN

BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xelr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,
SITE, R:\NW3X\nw3xeprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRRI.040, 6-10,15-17

LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,48
TIL, R:\NW3X\nw3xulr1.040, 12
OPOI, R:\NW3X\nw3xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xplr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

PRF ROTATION=0.000000
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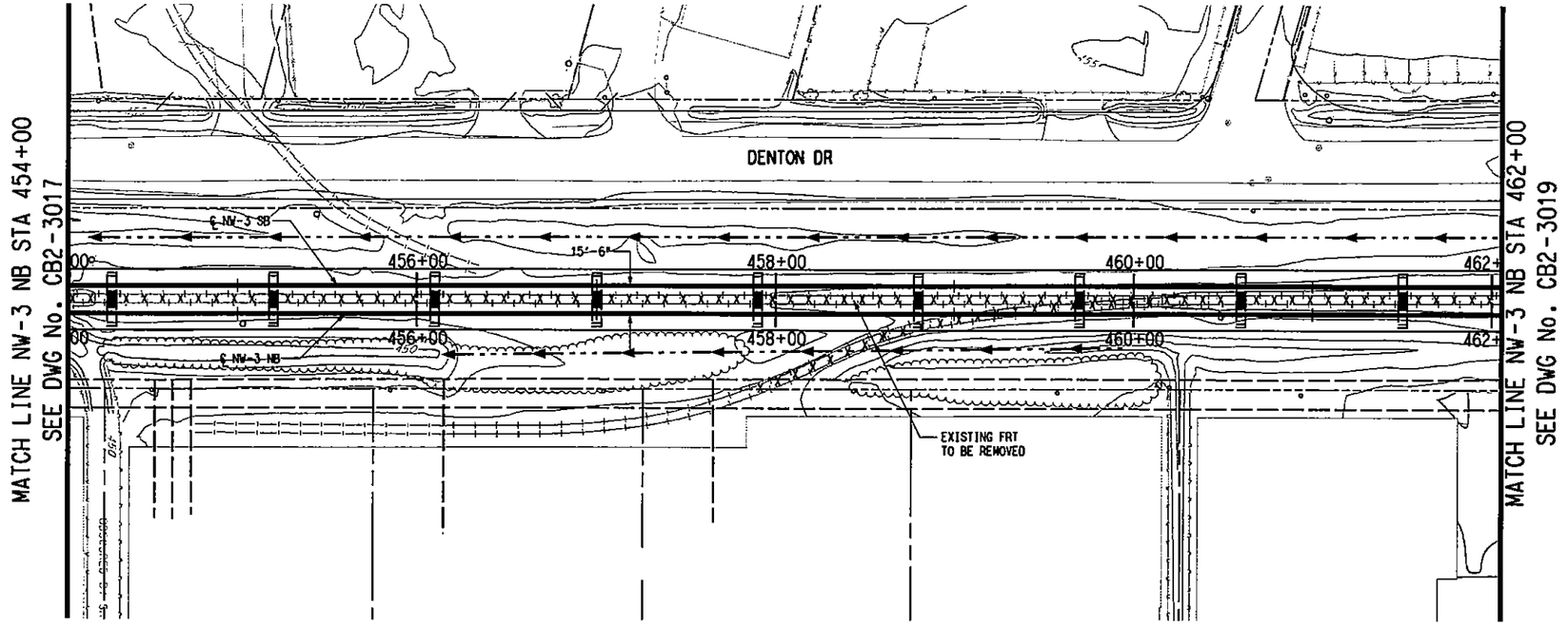
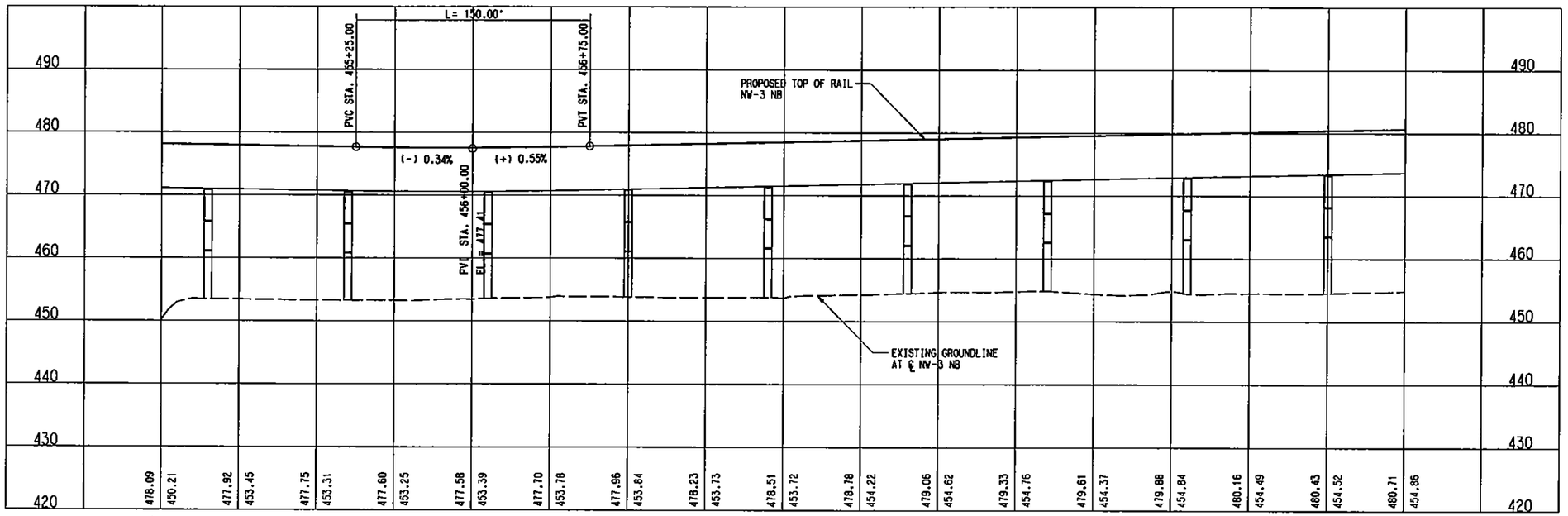
DWG No. CB2-3018

P0018



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
A. TIPTON, P.E. No. 64157
Date 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT
DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 171 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

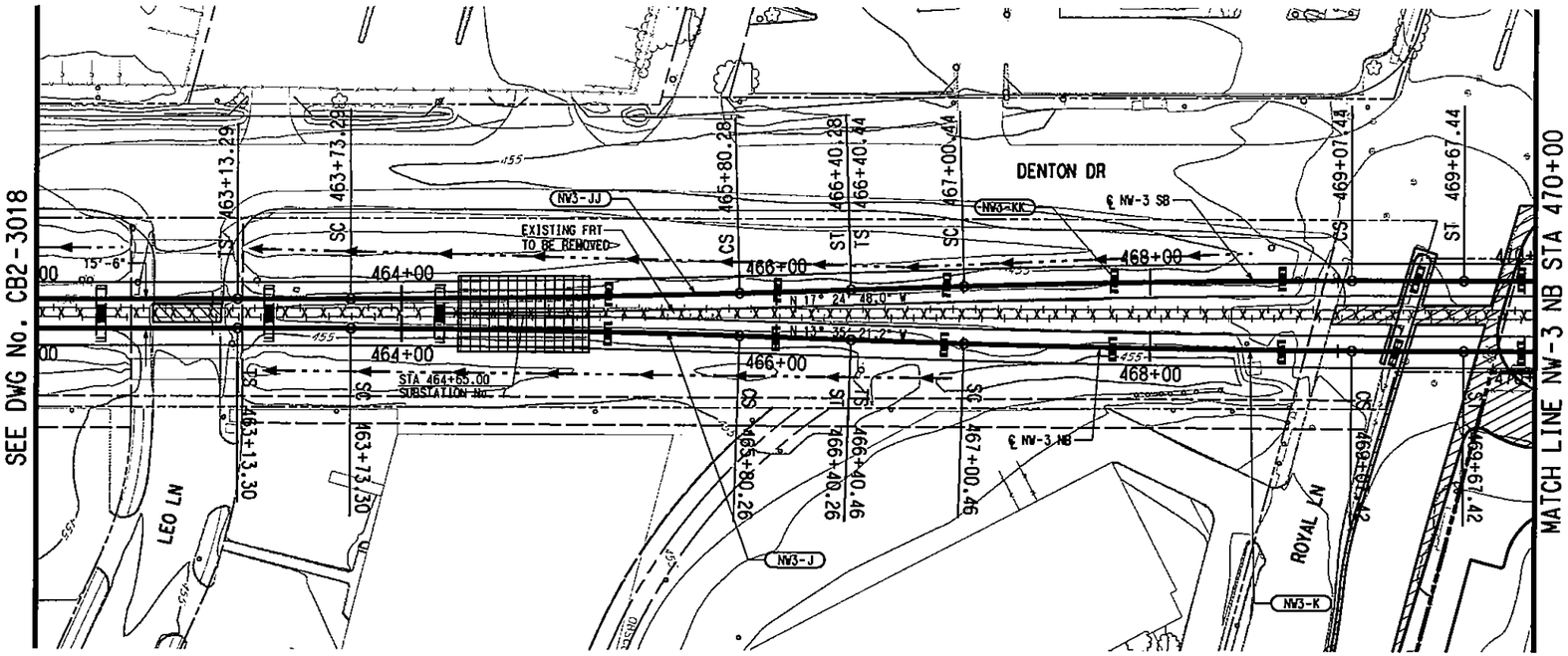
GUIDEWAY PLAN AND PROFILE
STA 454+00 TO STA 462+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-3018	

R:\NW3X\DGN\Cvl-AO\nw3xal18.040

DWG No. CB2-3019

P0019



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW3-J (NB)		NW3-JJ (SB)	
Rc =	8000.00'	Rc =	8000.00'
Ls =	60.00'	Ls =	60.00'
Lc =	206.95'	Lc =	206.99'
Ea =	0.50"	Ea =	0.50"
Eu =	1.01"	Eu =	1.01"
V =	55 MPH	V =	55 MPH

NW3-K (NB)		NW3-KK (SB)	
Rc =	8000.00'	Rc =	8000.00'
Ls =	60.00'	Ls =	60.00'
Lc =	206.96'	Lc =	206.99'
Ea =	0.50"	Ea =	0.50"
Eu =	1.01"	Eu =	1.01"
V =	55 MPH	V =	55 MPH

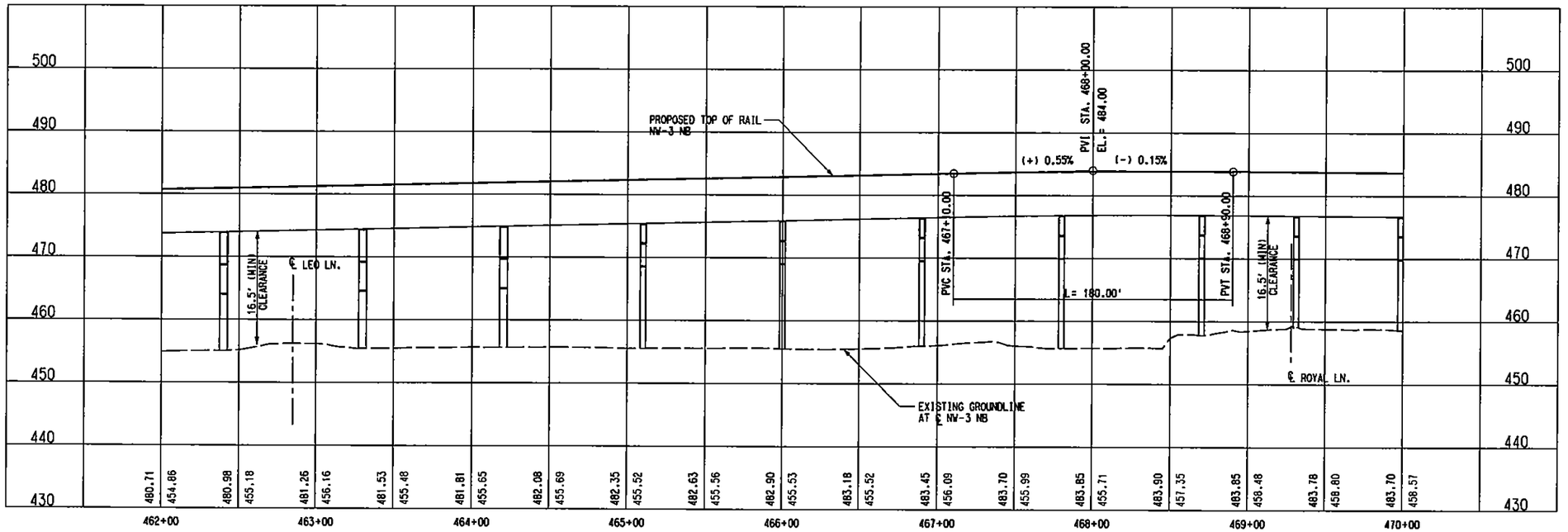
LEGEND

GRADING FOR SYSTEM ELEMENTS

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTE:

1. SUBSTATION SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPOC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 172 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

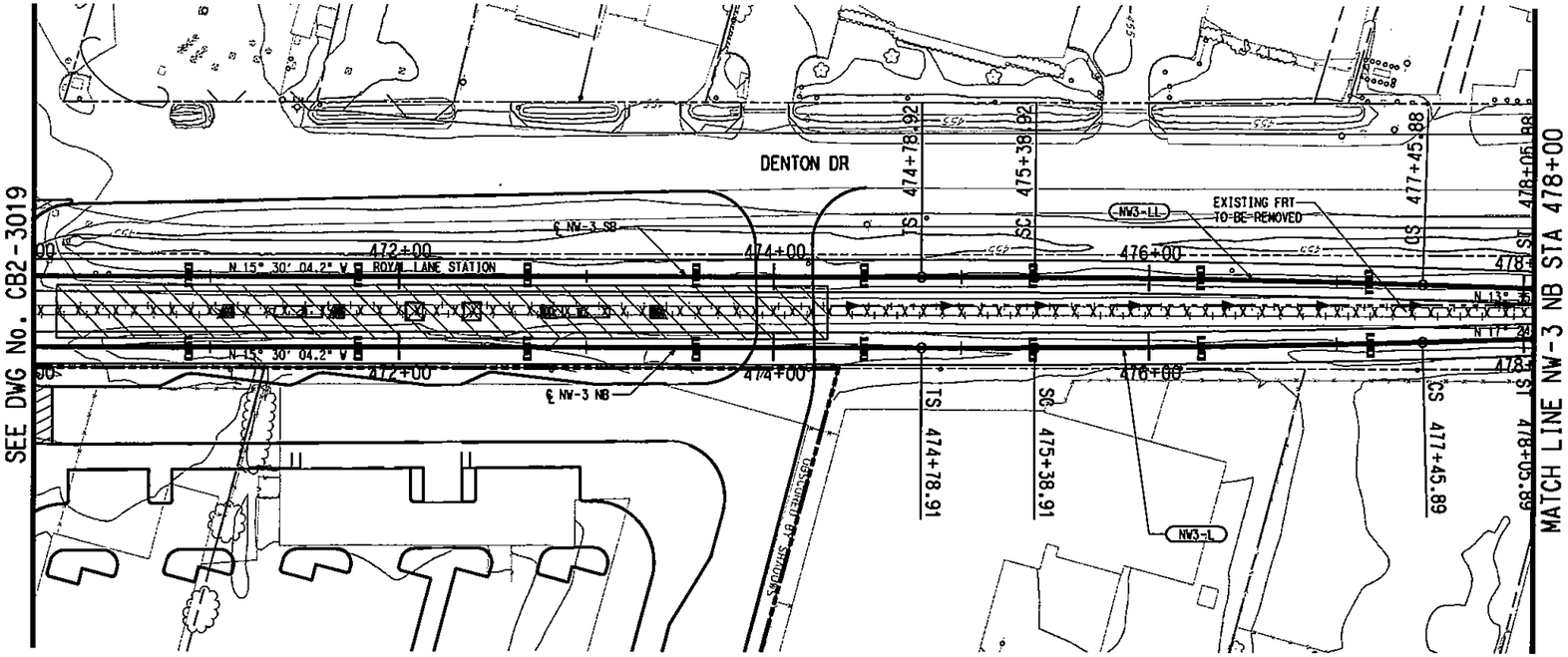
GUIDEWAY PLAN AND PROFILE
STA 462+00 TO STA 470+00

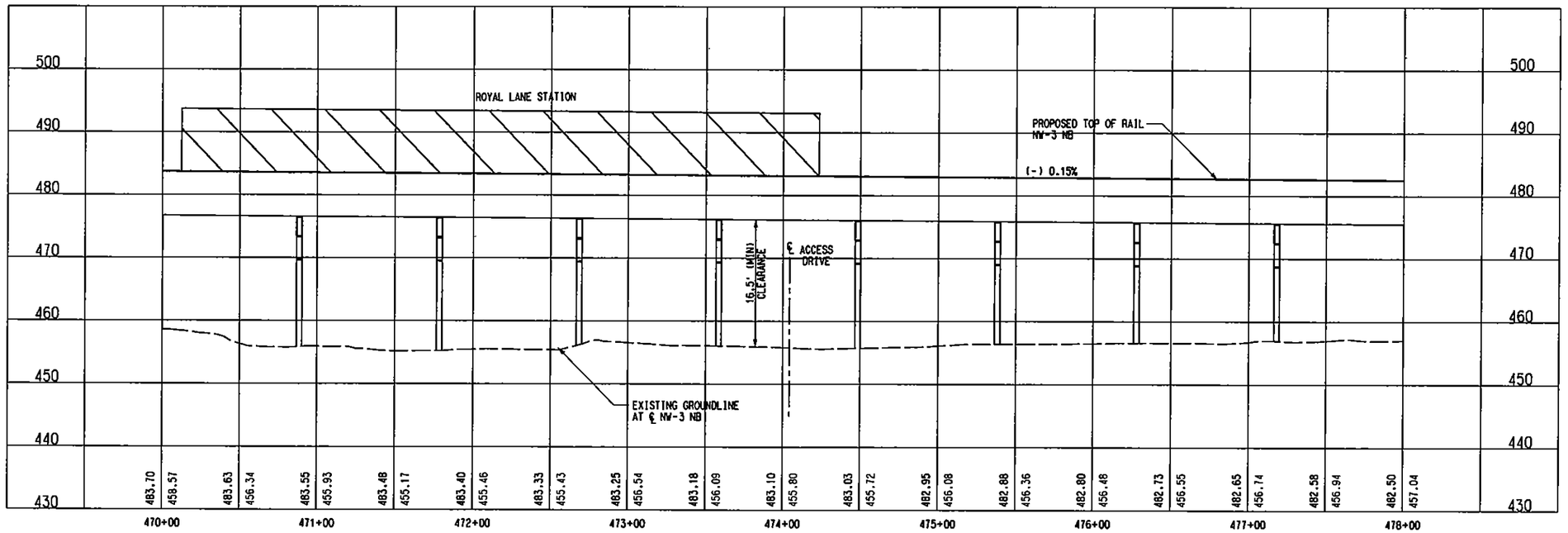
CONTRACT C-937775-1 | DWG No. CB2-3019 | REV

LIGN, R:\NW3X\nw3xalr1.040, 1-81
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutl1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xspt1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24
SITE, R:\NW3X\nw3xepr1.040, 1,7,8,13
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-
PRF ROTATION=0.000000
R:\NW3X\DGN\Cvil-AO\nw3xalr1.prf
Fri Nov 15 12:33:38 2002
R:\Nw3X\prf\nw3xalr1.prf
DBROWN
R:\NW3X\DGN\Cvil-AO\nw3xalr1.tbl
R:\NW3X\DGN\Cvil-AO\nw3xalr1.dgn
R:\NW3X\DGN\Cvil-AO\nw3xalr19.040

DWG No. CB2-3020

P0020





NW3-L (NB)		NW3-LL (SB)	
Rc =	8000.00'	Rc =	8000.00'
Ls =	60.00'	Ls =	60.00'
Lc =	206.99'	Lc =	206.96'
Ea =	0.50"	Ea =	0.50"
Eu =	1.01"	Eu =	1.01"
V =	55 MPH	V =	55 MPH

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STATION CONCOURSE/ PLATFORM

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64151
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 173 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 470+00 TO STA 478+00

CONTRACT C-937775-1 | DWG No. CB2-3020 | REV

R:\NW3X\DGN\Civil-AO\nw3xal20.040
Fri Nov 15 12:37:11 2002
R:\Nw3X\prf\nw3xal20.prf
DBROWN

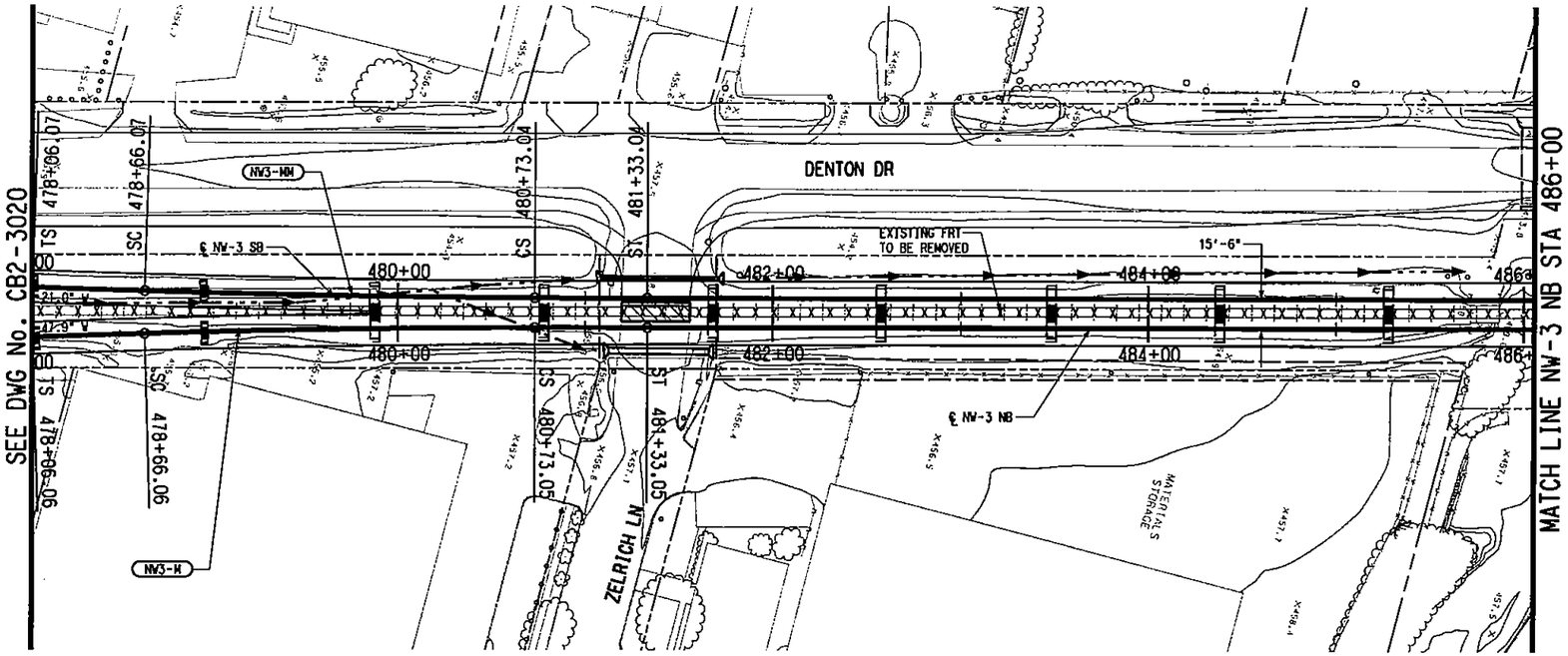
BORDER, R:\NW3X\nw3xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW3X\nw3xelr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,45,47-50,52,54,55,57-63
SITE, R:\NW3X\nw3xcpr1.040, 1,7,8,13,15-17,20,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17

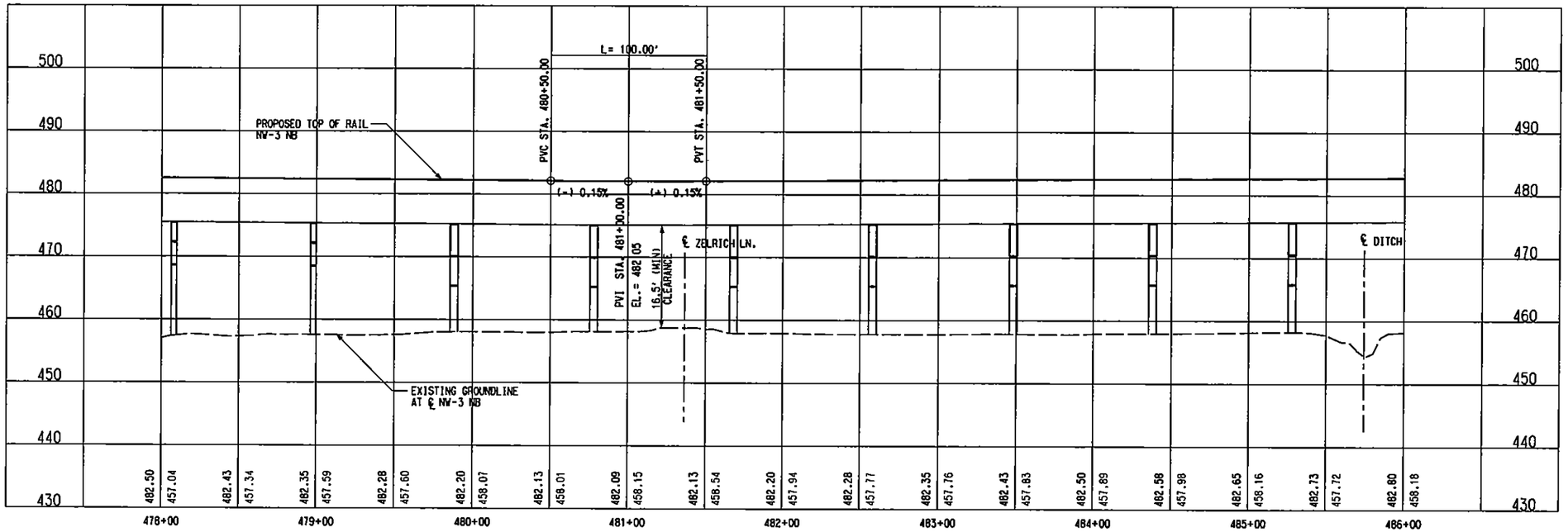
LIGN, R:\NW3X\nw3xalr1.040, 1-61
DW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xpr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

R:\NW3X\DGN\Civil-AO\nw3xal20.040

DWG No. CB2-3021

P0021





HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

NW3-M (NB)		NW3-MM (SB)	
Rc =	8000.00'	Rc =	8000.00'
Ls =	60.00'	Ls =	60.00'
Lc =	206.99'	Lc =	206.96'
Ea =	0.50"	Ea =	0.50"
Eu =	1.01"	Eu =	1.01"
V =	55 MPH	V =	55 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61151 Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 174 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 478+00 TO STA 486+00

CONTRACT C-937775-1 | DWG No. CB2-3021 | REV

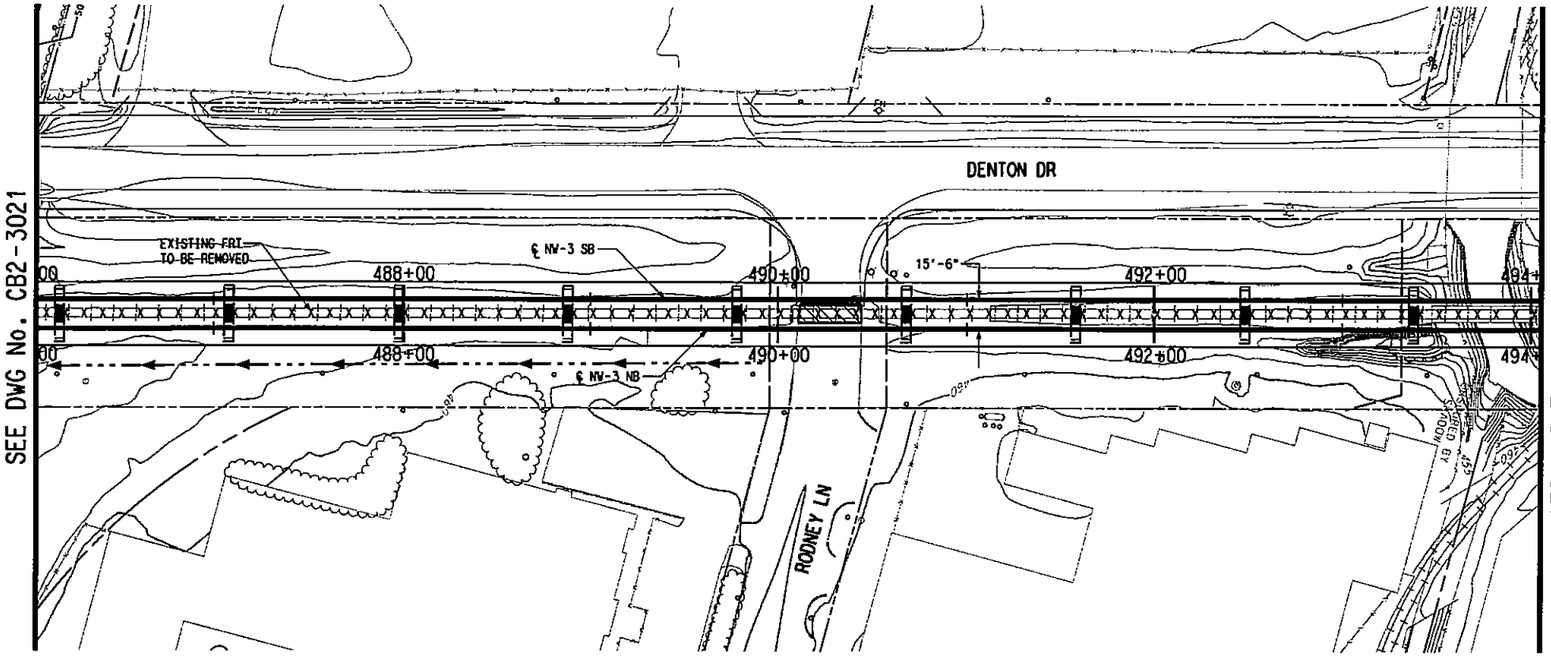
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,10,13,20,23,39,46,56,57
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17
LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,16,19,26,27,31,40,46
TIL, R:\NW3X\nw3xtlr1.040, 12
OPOI, R:\NW3X\nw3xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,36,49,52
TOPO, R:\NW3X\NW3xptr1.040, 2-5,8-11,13-18,21,25,29,31,36,49,52

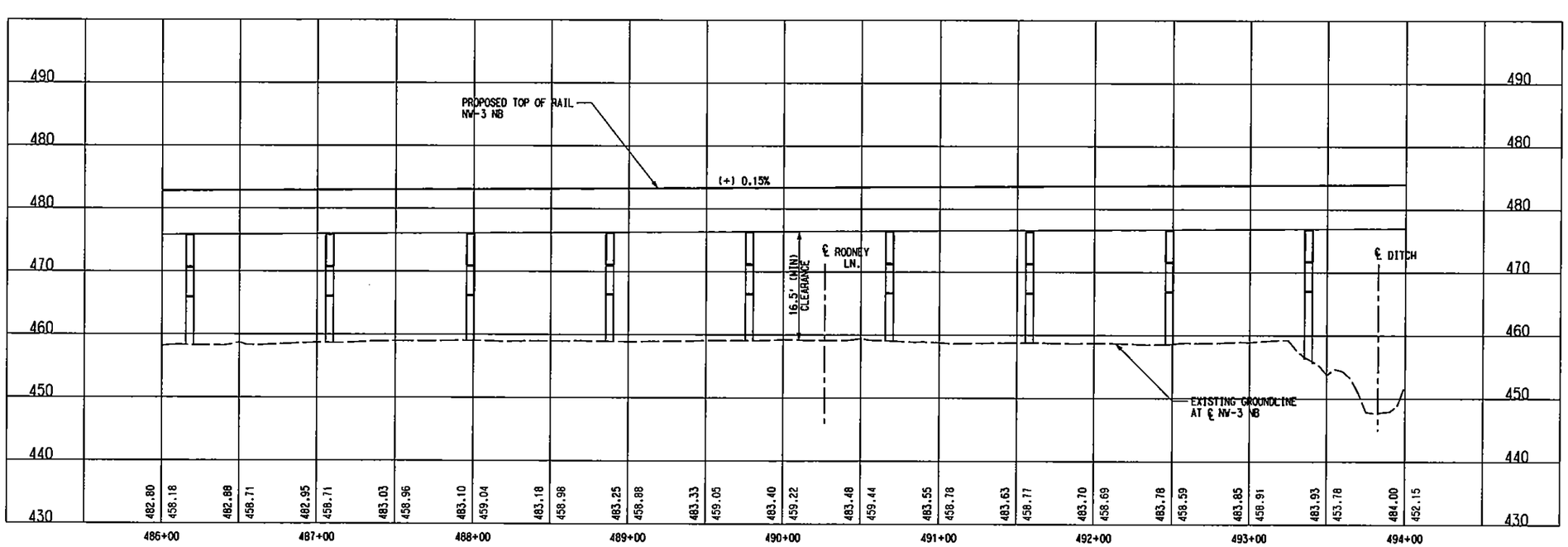
R:\NW3X\DGN\Civil-AG\nw3xal21.040
Fri Nov 15 12:38:54 2002
R:\NW3X\prf\nw3xal21.prf
DBROWN

R:\NW3X\DGN\Civil-AG\nw3xal21.040

DWG No. CB2-3022

P0022





NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 175 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 486+00 TO STA 494+00

CONTRACT C-937775-1 | DWG No. CB2-3022 | REV

BORDER, R:\NW3X\nw3xborl.001, 1-4,6,10,13,20,23,39,46,56,57 PRF ROTATION=0.000000
PROFILE, R:\NW3X\nw3xsoir2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\nw3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,
SITE, R:\NW3X\nw3xcepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17
LIGN, R:\NW3X\nw3xolr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xptr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

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Fri Nov 15 12:39:45 2002
R:\Nw3X\prf\nw3xal22.prf
DBROWN

R:\NW3X\DGN\Cv1-40\nw3xal22.040

R:\NW3X\DGN\Civil-AO\nw3xal23.040
Fri Nov 15 12:41:31 2002
R:\NW3X\prf\nw3xal23.prf
DBROWN

PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,
PROW, R:\NW3X\NW3xprw1.040, 1-21,24
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-

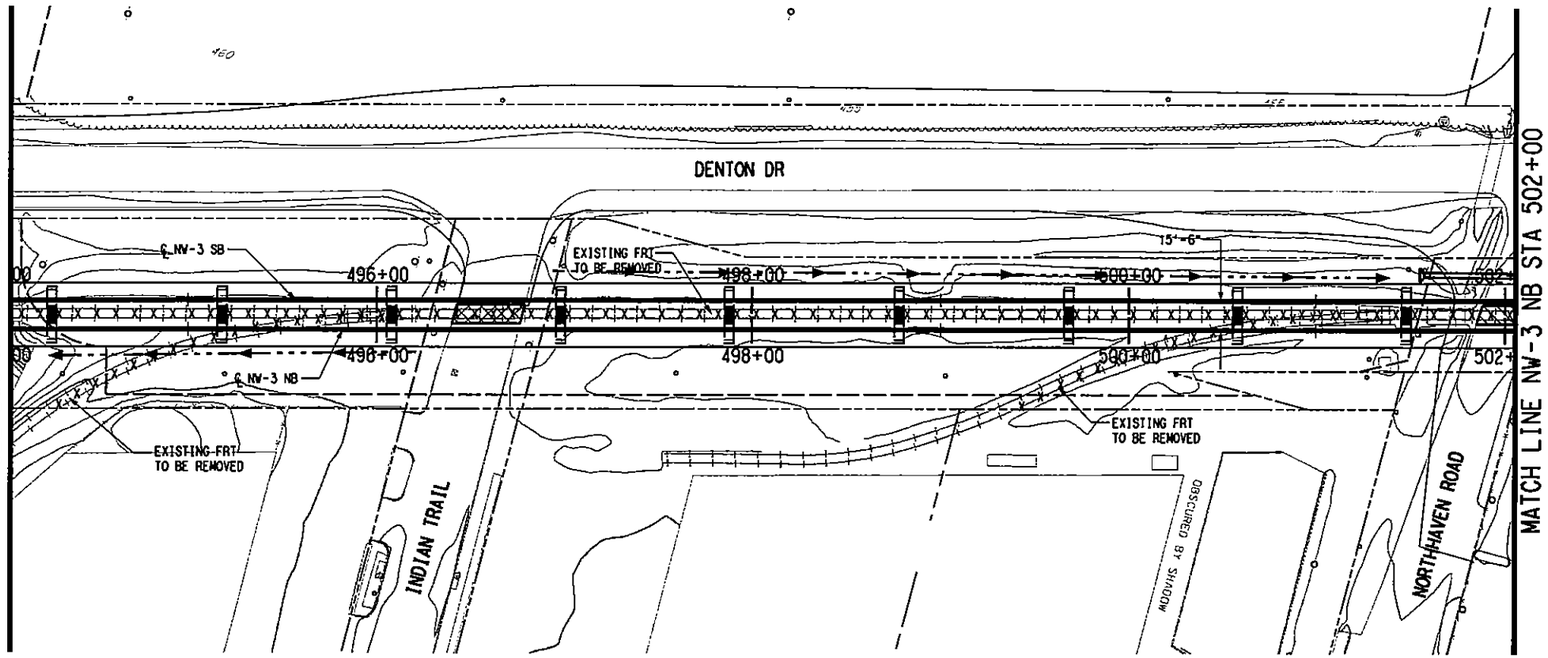
LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3spr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

R:\NW3X\DGN\Civil-AO\nw3xal23.040, 1-4,6-12,14-22,24-62
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3spr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

R:\NW3X\DGN\Civil-AO\nw3xal23.040

DWG No. CB2-3023

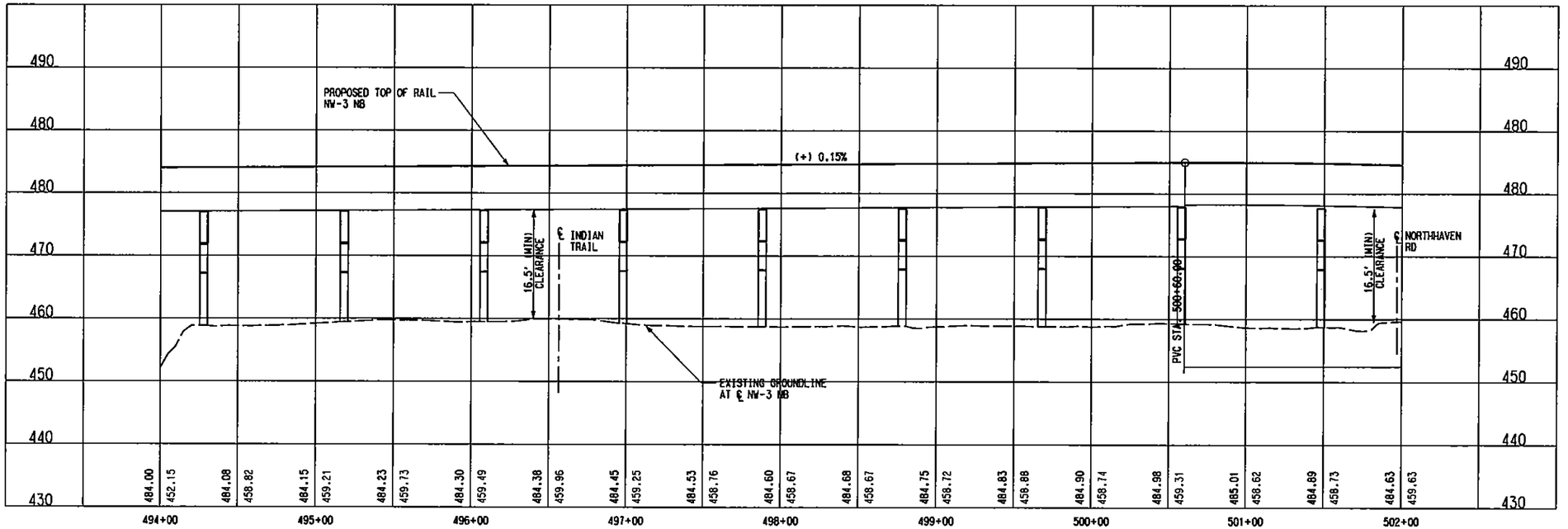
P0023



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/
DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-7900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 176 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

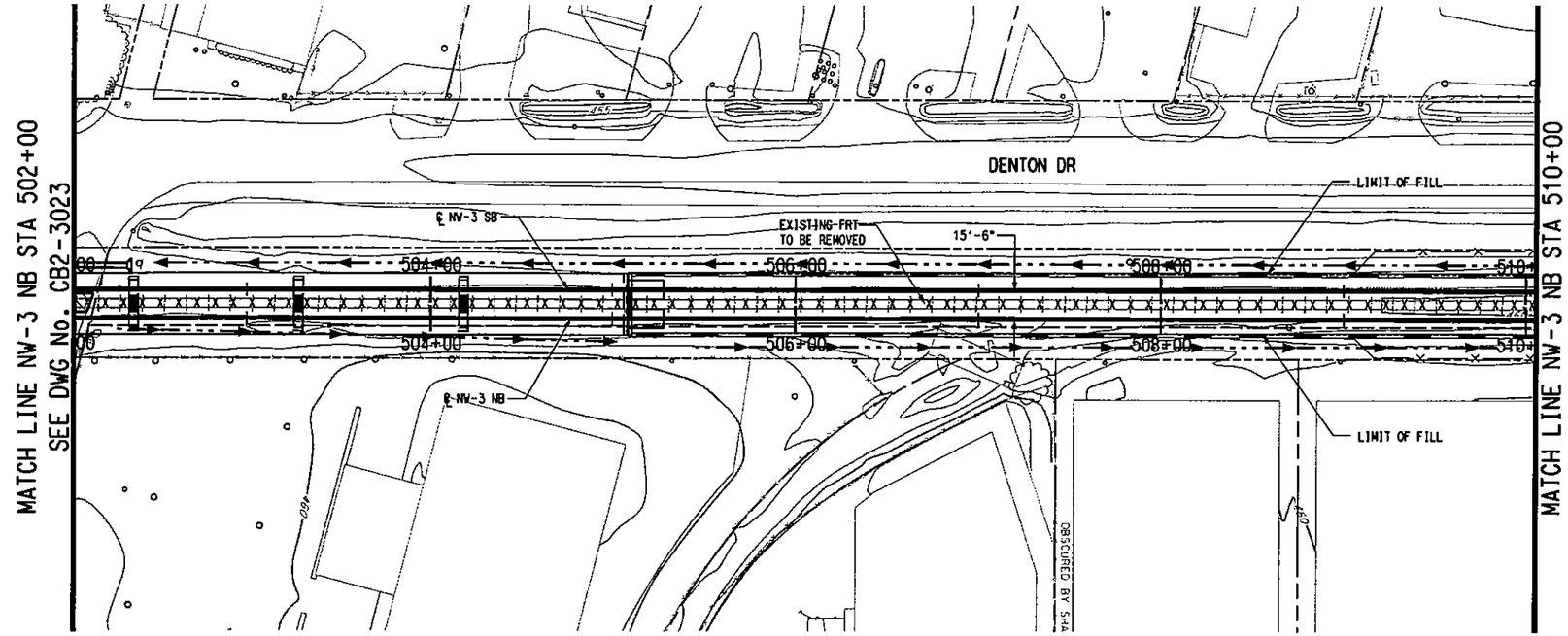
GUIDEWAY PLAN AND PROFILE
STA 494+00 TO STA 502+00

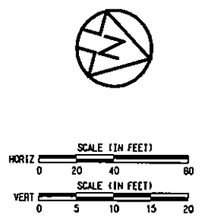
CONTRACT	DWG No.	REV
C-937775-1	CB2-3023	

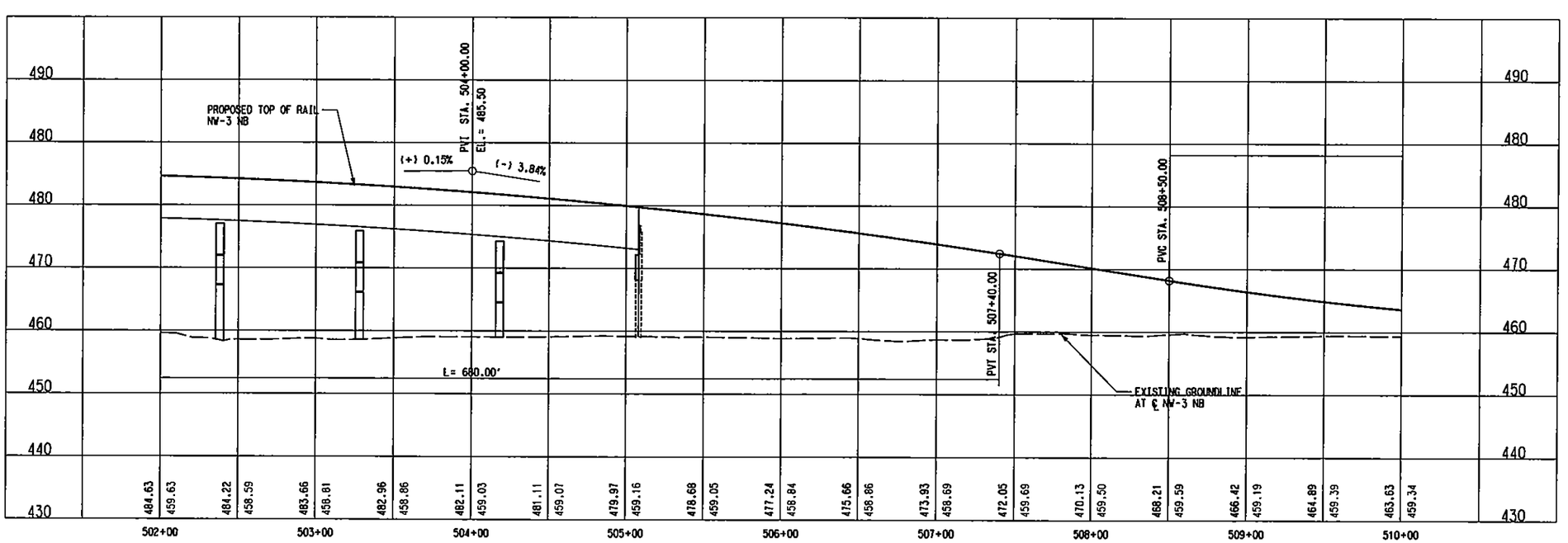
R:\NW3X\DGN\Civil-AO\nw3xal23.040

DWG No. CB2-3024

P0024







NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
A. TIPTON, P.E. No. 84137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 661-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

CONTRACT SHEET No. 177 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 502+00 TO STA 510+00

CONTRACT C-937775-1 | DWG No. CB2-3024 | REV

LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,16,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xspr1.040, 3-5,8-11,13,15-18,21,25,29,31,35,49,52
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,
PROFILE, R:\NW3X\nw3xelr2.040, 1-4,6
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,13-
R:\NW3X\DGN\Civil-AO\nw3xal24.040
Fri Nov 15 12:43:12 2002
R:\Nw3X\prf\nw3xal24.prf
DBROWN
PRF ROTATION=0.000000
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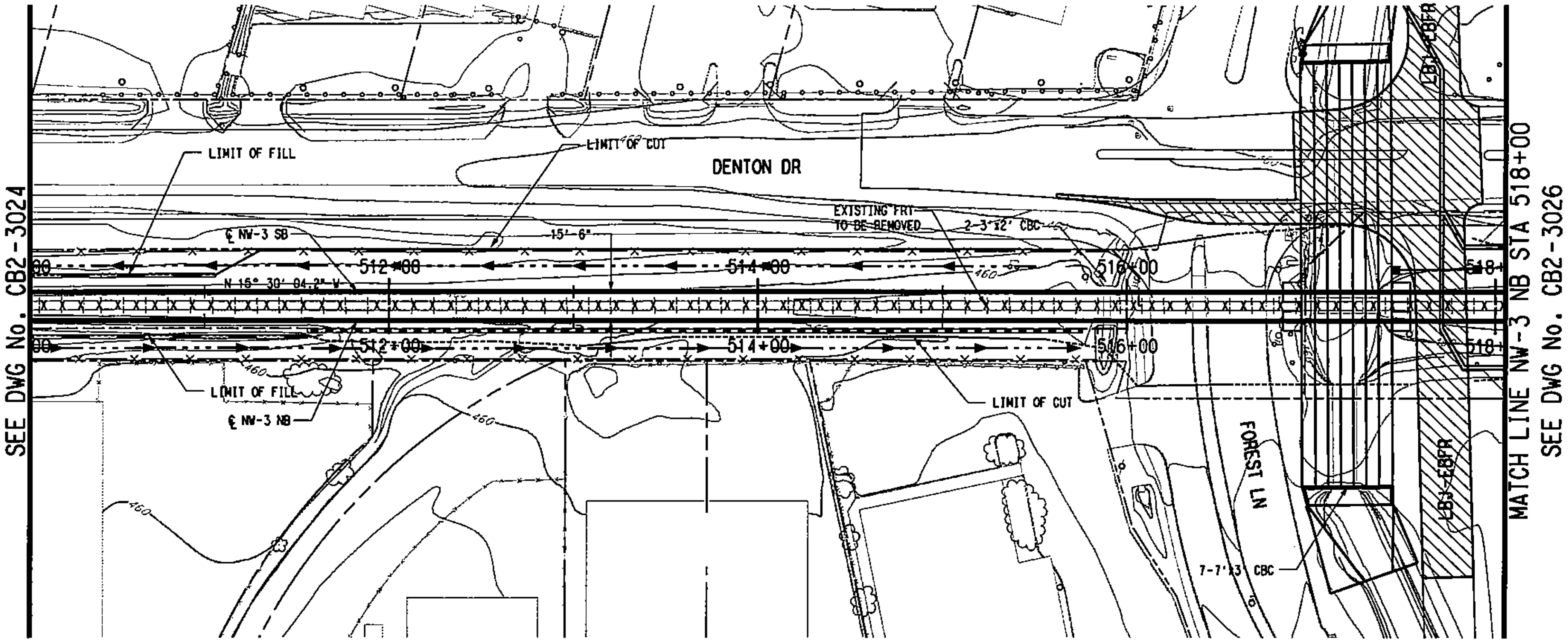


HORIZ SCALE (IN FEET) 0 20 40 80

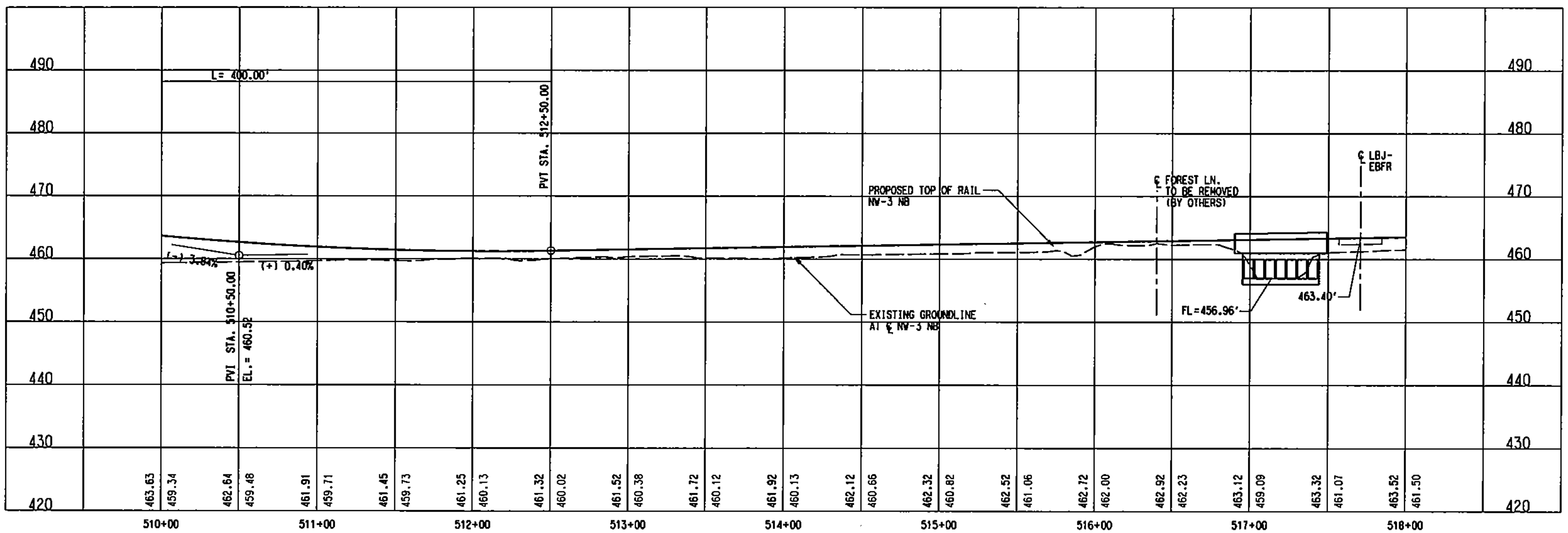
VERT SCALE (IN FEET) 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTES:

1. FINAL SECTION DESIGNER SHALL COORDINATE GRADE CROSSING CONSTRUCTION WITH TXDOT. TEMPORARY CROSSING AT FOREST LANE MAY BE NECESSARY.
2. FINAL SECTION DESIGNER SHALL DESIGN A TRANSITIONAL APPROACH AT EACH SIDE OF THE MULTI-BOX STRUCTURE. REFER TO THE TRACKWORK STANDARD DRAWINGS. SOME MODIFICATION OF THE STANDARD DETAIL MAY BE REQUIRED.



NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 600 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	B. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

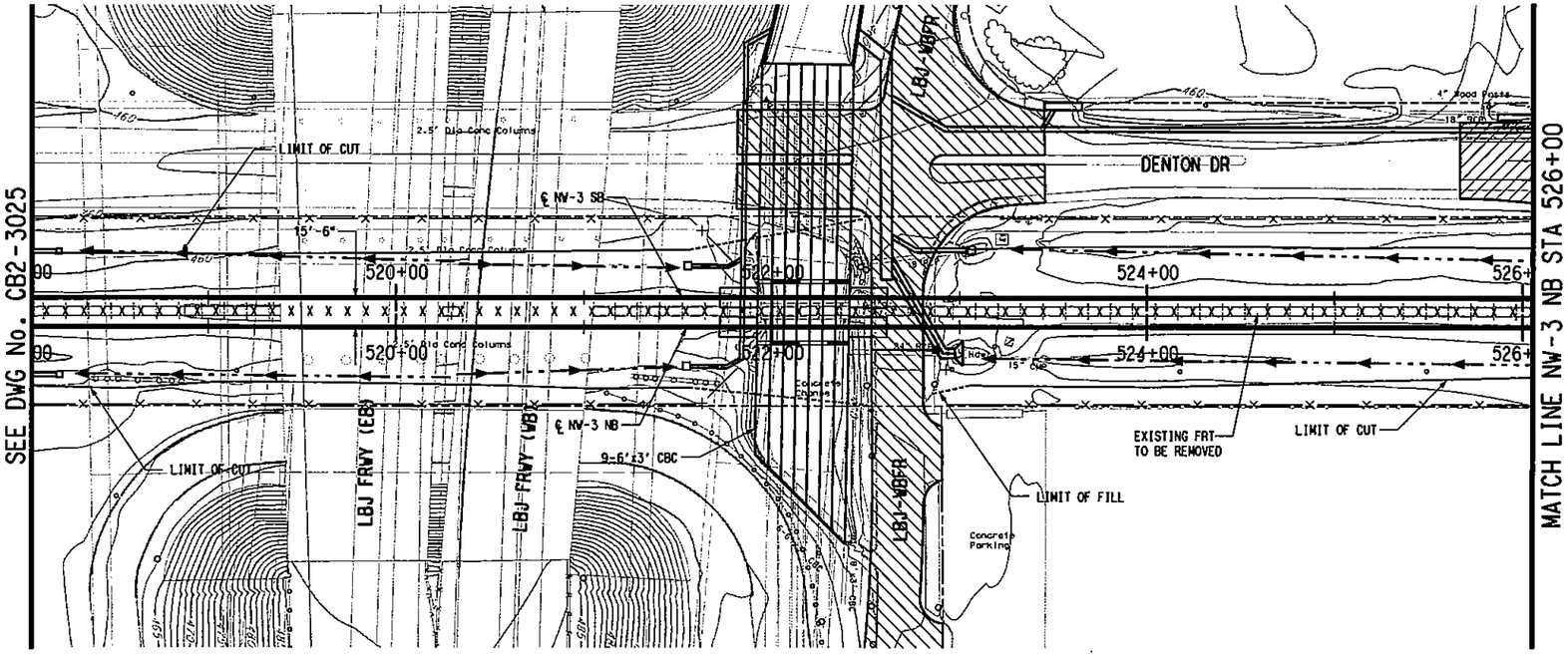
CONTRACT SHEET No. 178 OF 243

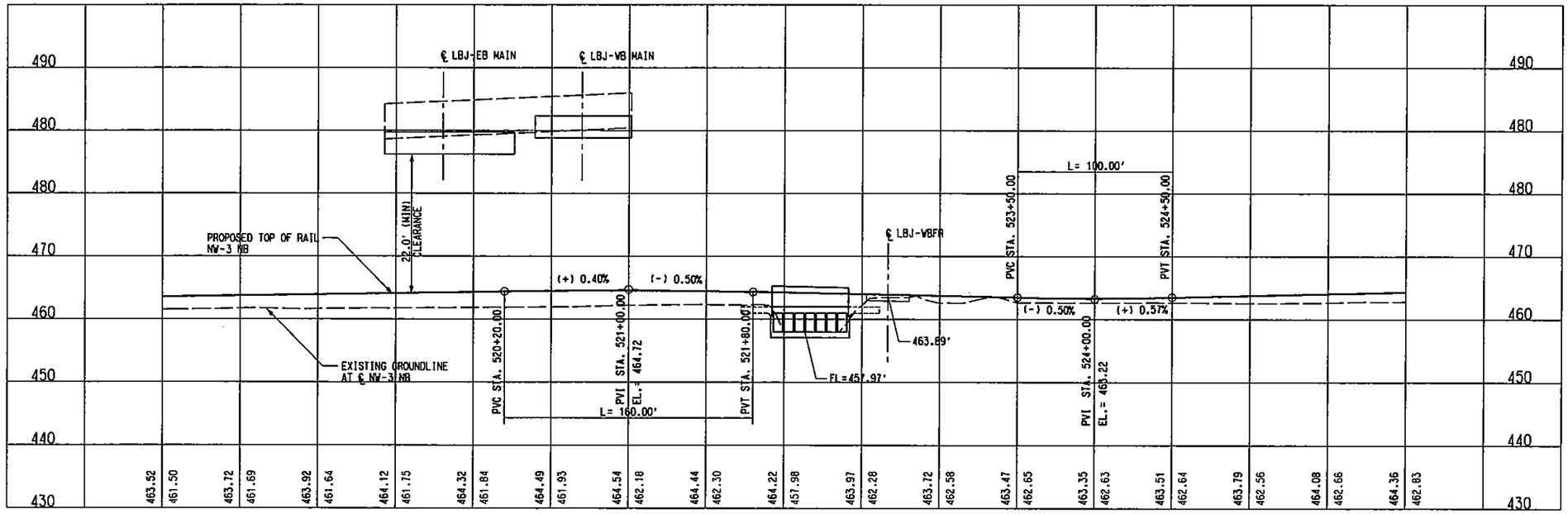
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 510+00 TO STA 518+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-3025	

R:\NW3X\DGN\Cvl-AO\nw3xol25.040
Fri Nov 15 12:44:48 2002
R:\NW3X\prf\nw3xol25.prf
DBROWN





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTES:

1. FINAL SECTION DESIGNER SHALL VERIFY ALL CLEARANCES AND COORDINATE GRADE CROSSING CONSTRUCTION WITH TXDOT.
2. FINAL SECTION DESIGNER SHALL DESIGN A TRANSITIONAL APPROACH AT EACH SIDE OF THE MULTI-BOX STRUCTURE. REFER TO THE TRACK-WORK STANDARD DRAWINGS. SOME MODIFICATION OF THE STANDARD DETAIL MAY BE REQUIRED.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 661-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 179 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 518+00 TO STA 526+00

CONTRACT C-937775-1 | DWG No. CB2-3026 | REV

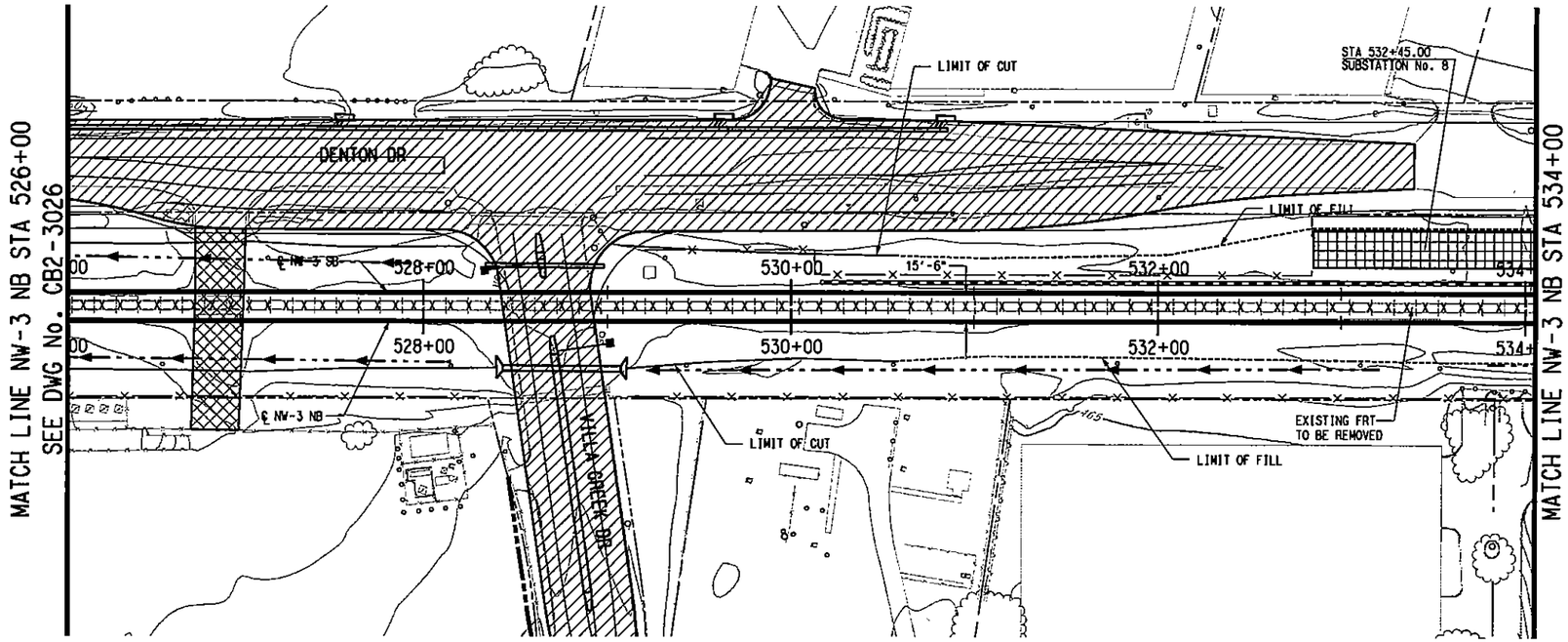
LIGN, R:\NW3X\nw3salr1.040, 1-61
OW, R:\NW3X\nw3crwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3tpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
XPTOPO, R:\NW3X\NW3spr1.040, 2-5,8-11,13-18,20,21,25,29,49,52
PROW, R:\NW3X\NW3sprwr1.040, 1,3-21,24,25,27,28,30-35,37-39,41,42,44,45,47-49,51-60,62,63
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,10,13,20,23,39,46,56,57
PROFILE, R:\NW3X\nw3xsol2.040, 1-4,6-12,14,16-62
SITE, R:\NW3X\nw3xsepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17

R:\NW3X\prf\nw3xsol2.040 2002
Wed Nov 27 07:29:40
R:\NW3X\prf\nw3xsol26.prf
DBROWN
PRF ROTATION=0.000000
V:\CADNET\PENTABLE\Smdar1.tbl

R:\NW3X\DGN\Civil-AQ\nw3xsol26.040

DWG No. CB2-3027

P0027



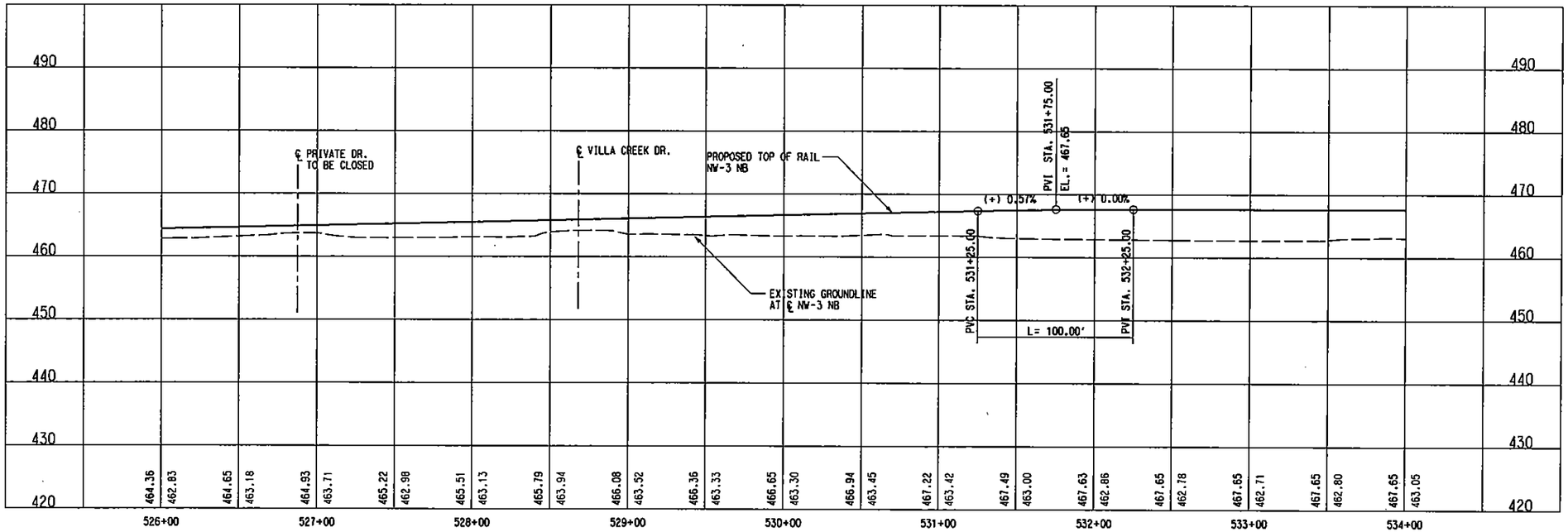
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

- GRADING FOR SYSTEM ELEMENTS
- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE

NOTE:

1. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 180 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

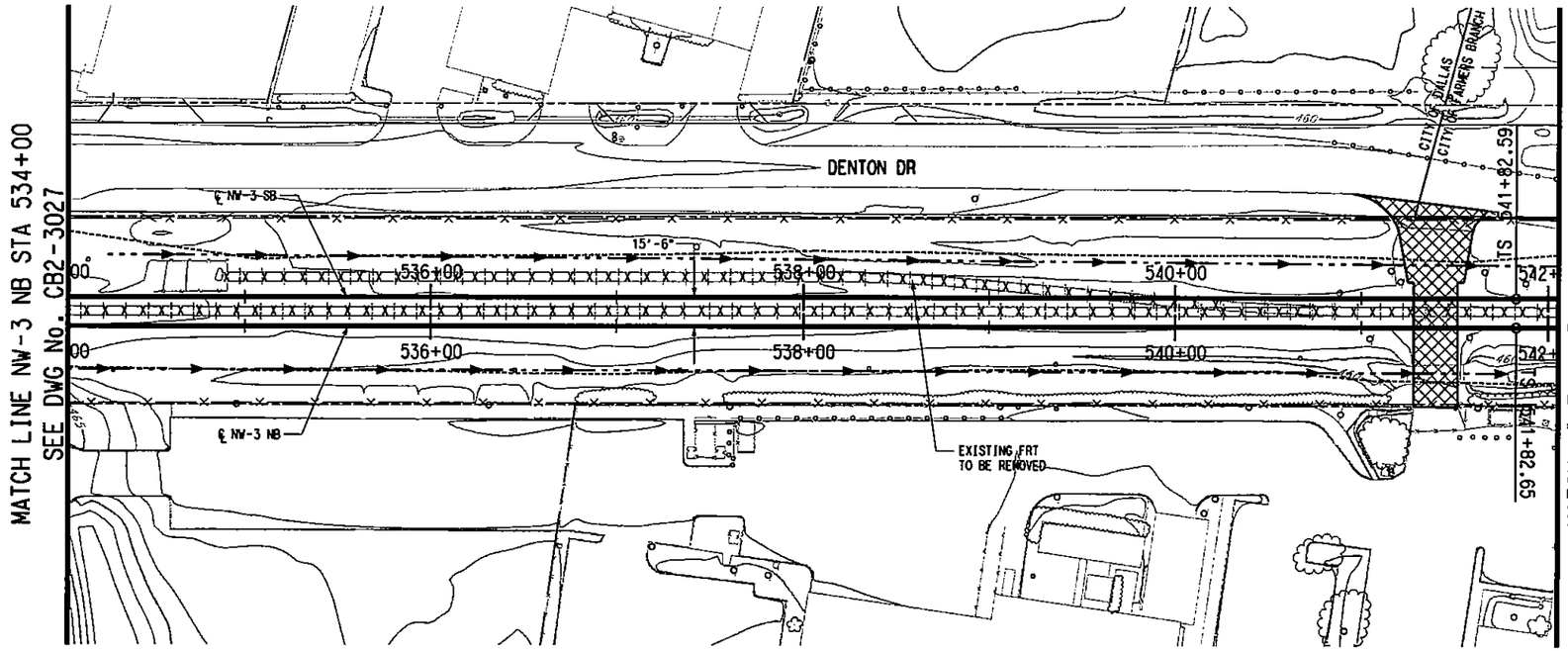
GUIDEWAY PLAN AND PROFILE
STA 526+00 TO STA 534+00

CONTRACT C-937775-1 | DWG No. CB2-3027 | REV

LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3XPIR1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xtbor1.001, 1-4,6
PROW, R:\NW3X\NW3xprwr1.040, 1-21,2
SITE, R:\NW3X\nw3xcpr1.040, 15,17,1
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15
R:\NW3X\DGN\Cyl-AO\nw3xal27.040
Wed Nov 27 07:30:29 2002
R:\NW3X\prf\nw3xal27.prf
OBROWN
R:\NW3X\DGN\Cyl-40\nw3xal27.040

DWG No. CB2-3028

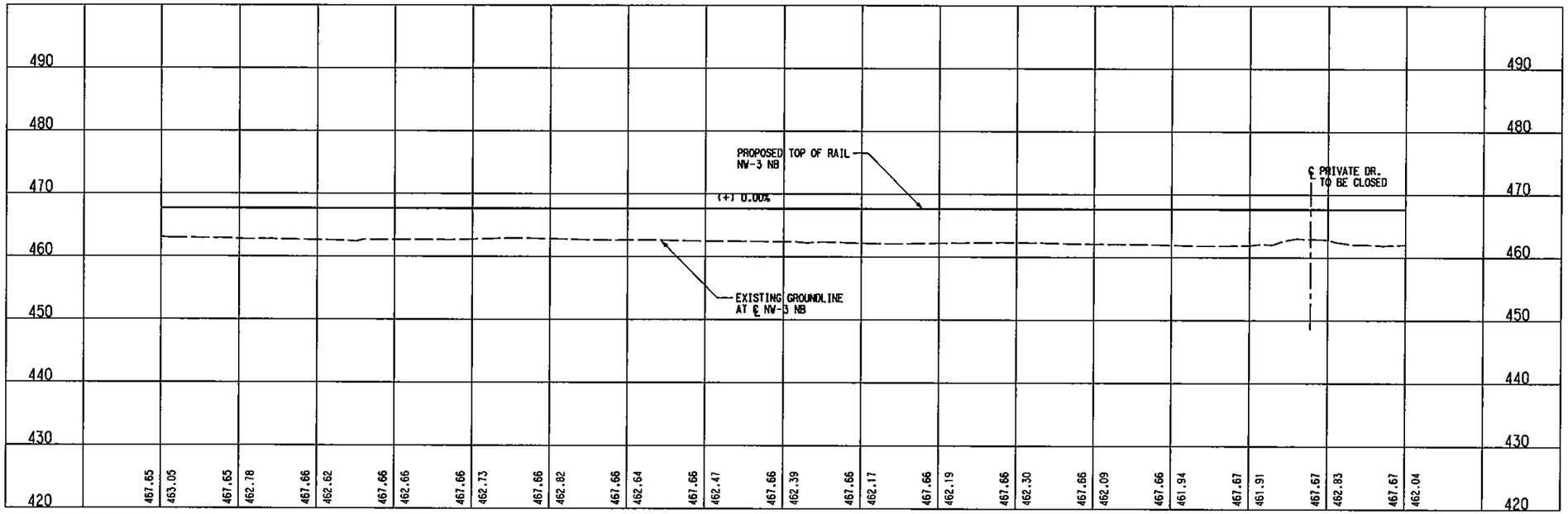
P0028



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/
DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 181 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date 10/25/02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 534+00 TO STA 542+00

CONTRACT C-937775-1 | DWG No. CB2-3028 | REV

R:\NW3X\DGN\Cvl-A01nw3xl28.040
Fri Nov 15 12:54:21 2002
R:\NW3X\prf\nw3xl28.prf
OBROWN

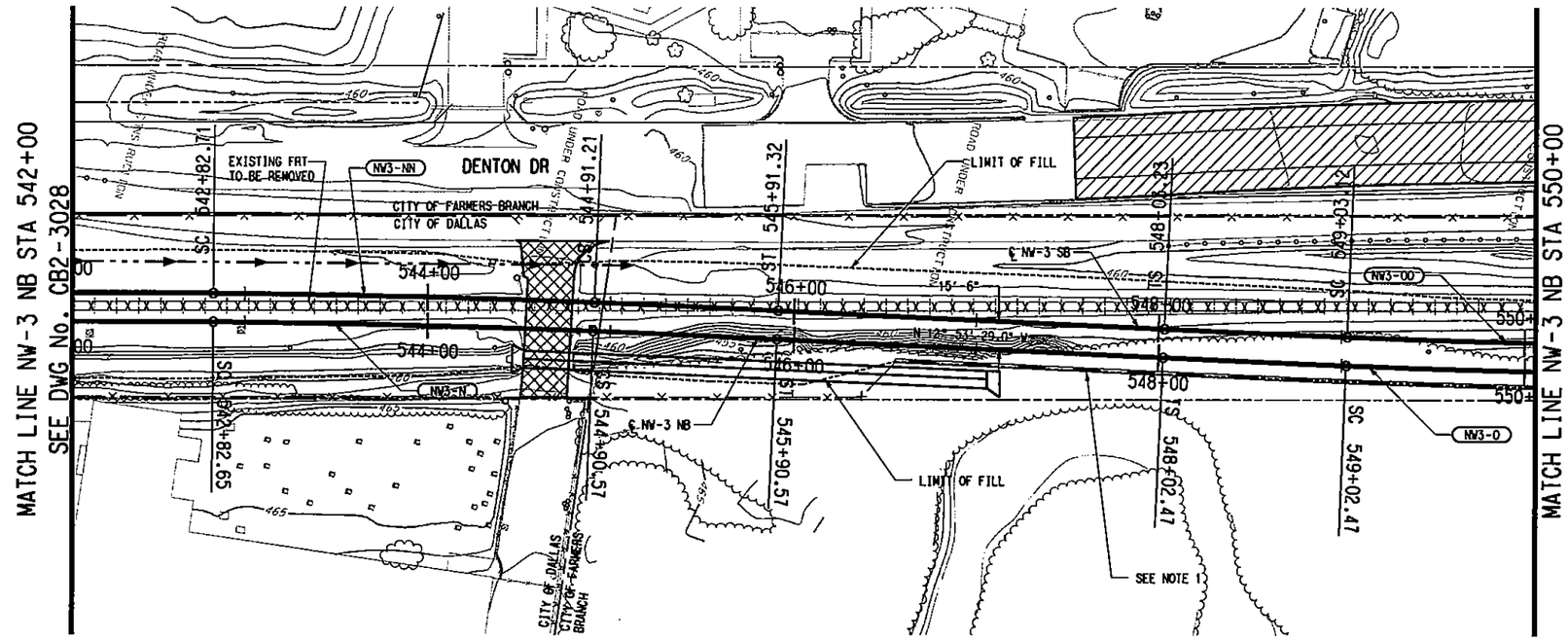
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,10,13,20,23,39,46,56,57
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,45,47,48,50,51
SITE, R:\NW3X\nw3xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,13-17

LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,16,19,26,27,31,40,46,48
TIL, R:\NW3X\nw3xtir1.040, 12
OPOI, R:\NW3X\nw3xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,48,49,52
TOPO, R:\NW3X\NW3xplr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

R:\NW3X\DGN\Cvl-A01nw3xl28.040

DWG No. CB2-3029

P0029



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW3-N (NB)		NW3-NN (SB)	
Rc =	6760.00'	Rc =	6775.50'
Ls =	100.00'	Ls =	100.11'
Lc =	207.92'	Lc =	208.50'
Ea =	1.00"	Ea =	1.00"
Eu =	1.50"	Eu =	1.49"
V =	65 MPH	V =	65 MPH

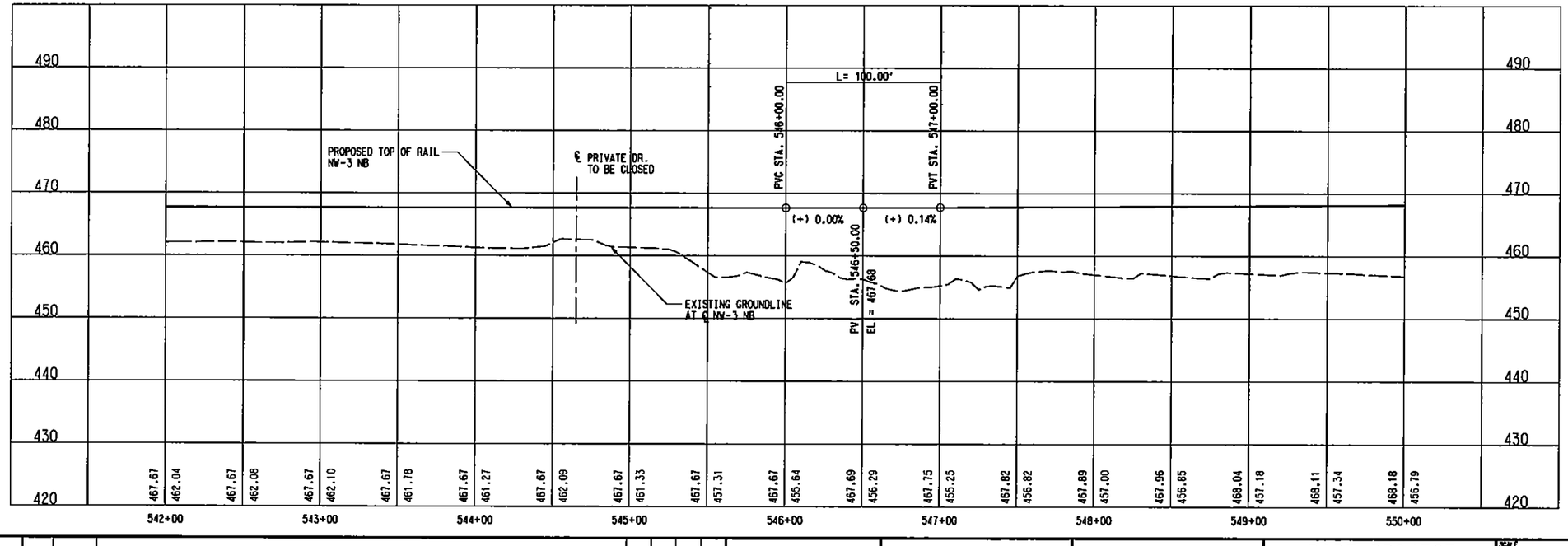
NW3-0 (NB)		NW3-00 (SB)	
Rc =	6760.00'	Rc =	6744.50'
Ls =	100.00'	Ls =	99.89'
Lc =	207.92'	Lc =	207.31'
Ea =	1.00"	Ea =	1.00"
Eu =	1.50"	Eu =	1.51"
V =	65 MPH	V =	65 MPH

LEGEND

STREET/ALLEY/ DRIVE CLOSURE

NOTES:

1. FINAL SECTION DESIGNER SHALL DESIGN THE RETAINING WALL SYSTEM TO AVOID TEMPORARY AND PERMANENT PROPERTY IMPACTS TO PARK PROPERTY, EAST OF DART'S RIGHT-OF-WAY.
2. FINAL SECTION DESIGNER SHALL PERFORM HYDRAULIC STUDY OF RAWHIDE AND FARMERS BRANCH CREEKS AND ADJUST THE LRT PROFILE GRADE TO PROVIDE MINIMUM CLEARANCE ABOVE THE 100-YEAR WATER SURFACE ELEVATION(S).



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 182 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

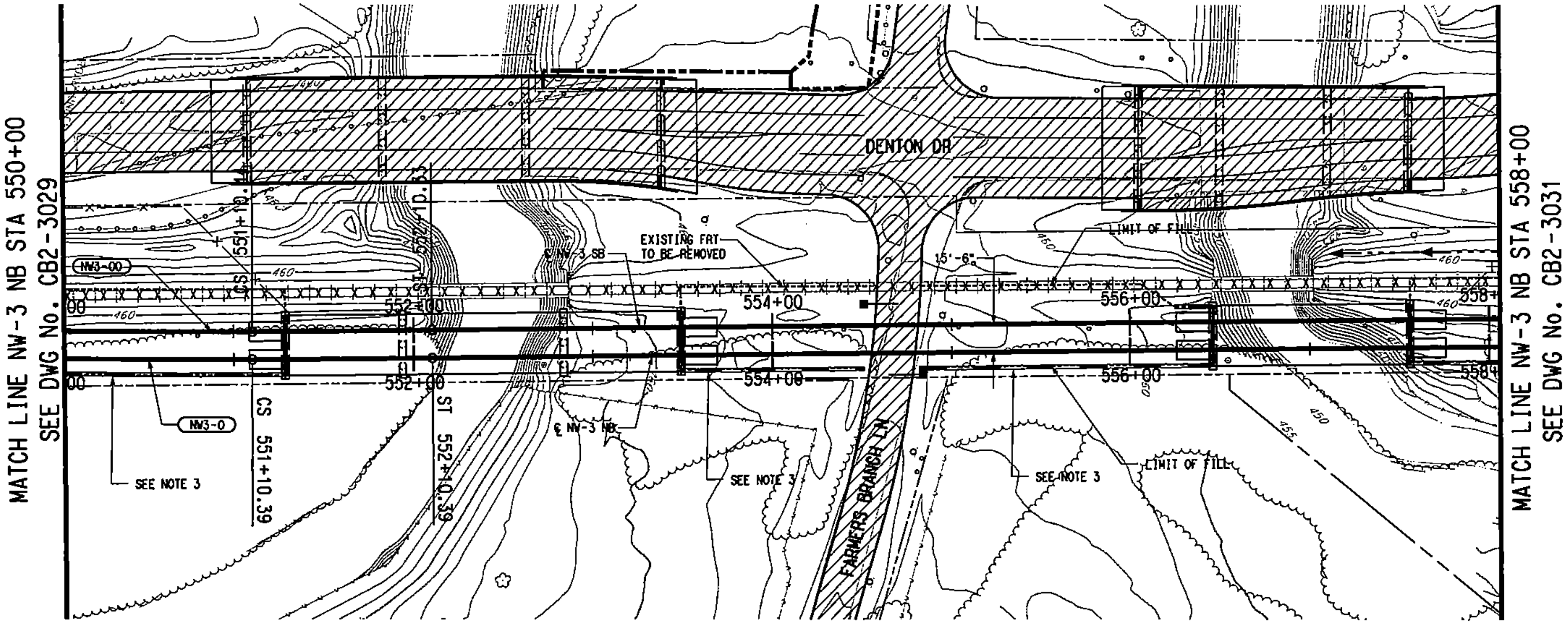
GUIDEWAY PLAN AND PROFILE
STA 542+00 TO STA 550+00

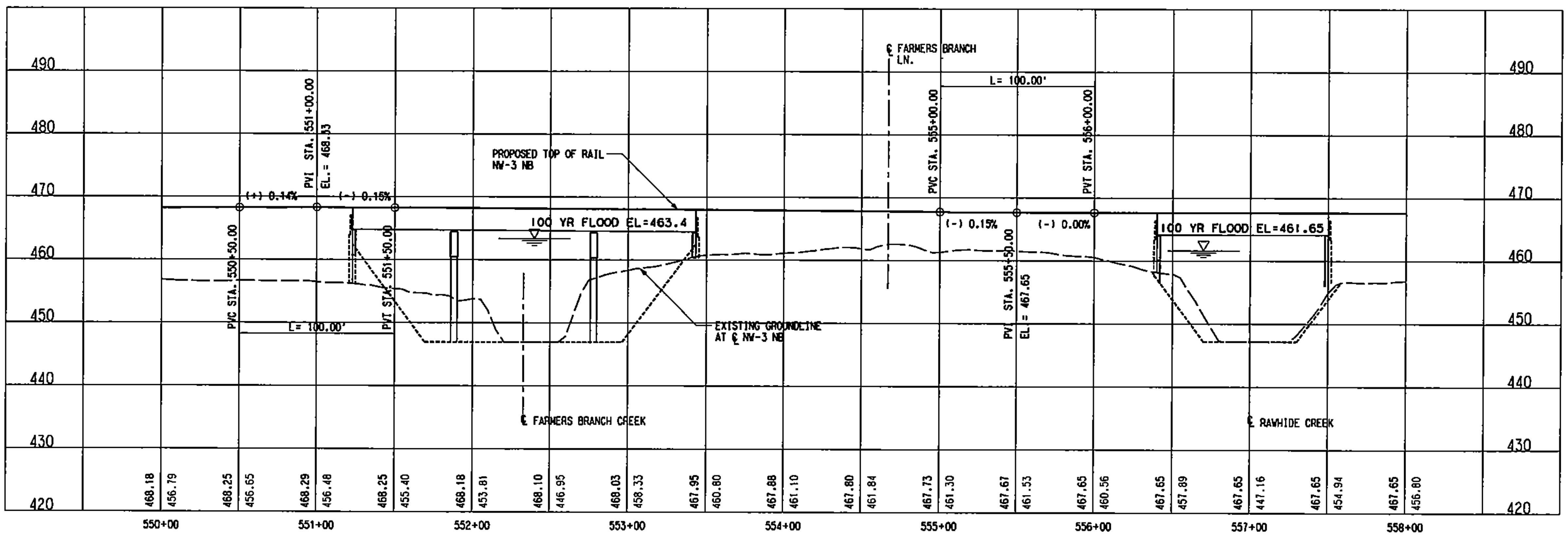
CONTRACT C-937775-1 | DWG No. CB2-3029 | REV

PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xborl.001, 1-4,6,10,13,20,23,39,46,56,57
PROW, R:\NW3X\NW3xprwrl.040, 1-21,24,25,27,28,30-35,37-39,41,42
SITE, R:\NW3X\nw3xsitr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
BRPL, R:\NW3X\NW3XBRRl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwrl.040, 15,18,19,26,27,31,40,46,48
TIL, R:\NW3X\nw3xutrl.040, 12
OPO1, R:\NW3X\nw3xtprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xptrl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52

R:\NW3X\DGN\Civil-AG\nw3xalr29.040
Fri Nov 15 12:56:04 2002
R:\NW3X\prf\nw3xalr29.prf
DBROWN

R:\NW3X\DGN\Civil-AG\nw3xalr29.040





SCALE (IN FEET) HORIZ 0 20 40 80

SCALE (IN FEET) VERT 0 5 10 15 20

NW3-0 (NB)		NW3-00 (SB)	
Rc =	6760.00'	Rc =	6744.50'
Ls =	100.00'	Ls =	99.89'
Lc =	207.92'	Lc =	207.31'
Ea =	1.00"	Ea =	1.00"
Eu =	1.50"	Eu =	1.51"
V =	65 MPH	V =	65 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTES:

1. FLOOD ELEVATION FOR FARMERS BRANCH CREEK BASED ON "HYDROLOGIC AND HYDRAULIC STUDY FARMERS BRANCH CREEK" BY TURNER, COLLIE AND BRADEN, JULY 1987.
2. FLOOD ELEVATION FOR RAWHIDE CREEK BASED ON "GUSSIE FIELD WATER WORTH PARK IMPROVEMENT PROJECT" BY GRAHMAN ASSOCIATES, MARCH 1998.
3. FINAL SECTION DESIGNER SHALL DESIGN THE RETAINING WALL SYSTEM TO AVOID TEMPORARY AND PERMANENT PROPERTY IMPACTS TO PARK PROPERTY, EAST OF DART'S RIGHT-OF-WAY.
4. FINAL SECTION DESIGNER SHALL PERFORM HYDRAULIC STUDY OF RAWHIDE AND FARMERS BRANCH CREEKS AND ADJUST THE LRT PROFILE GRADE TO PROVIDE MINIMUM CLEARANCE ABOVE THE 100-YEAR WATER SURFACE ELEVATION(S).

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 183 OF 243

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 550+00 TO STA 558+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-3030	

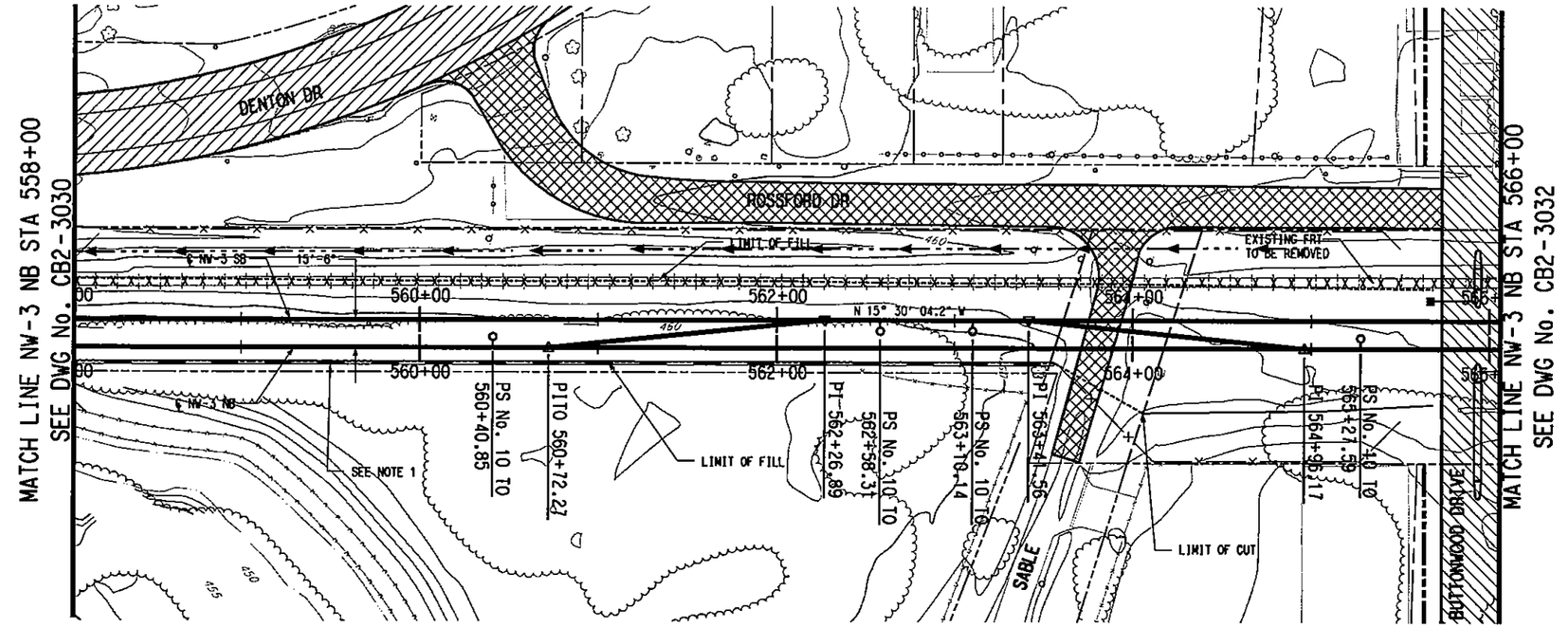
REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

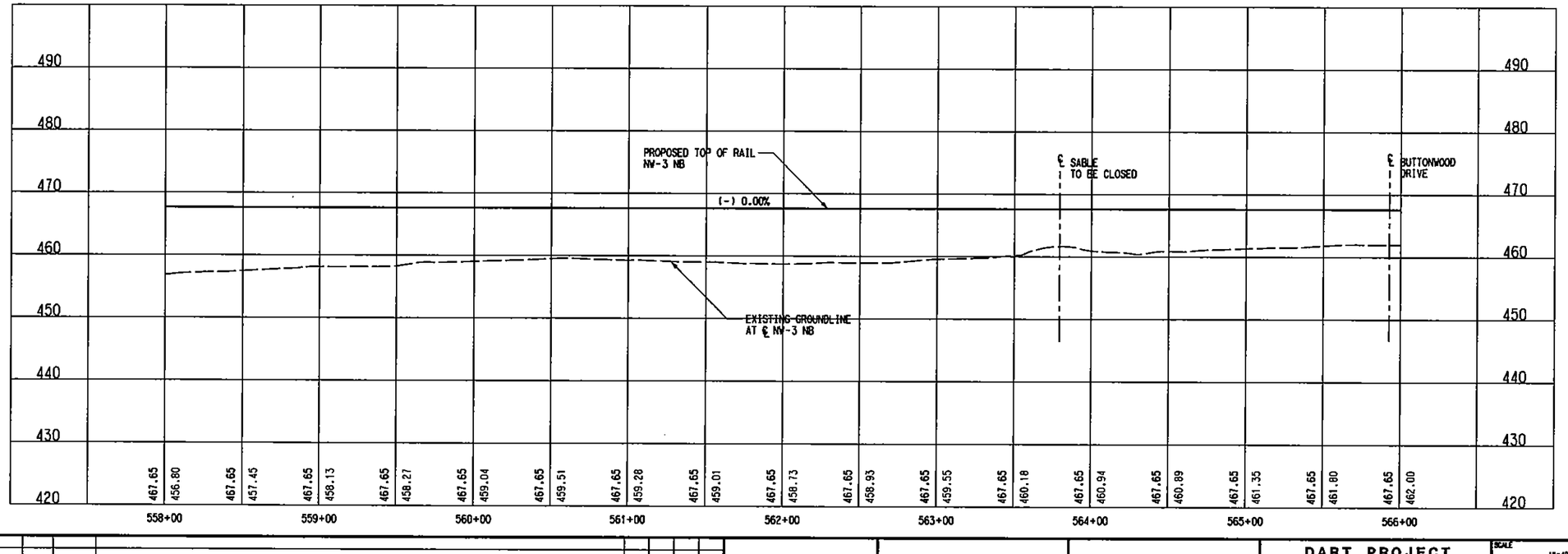
DARTCADD

DWG No. CB2-3030

DWG No. CB2-3031

P0031





LEGEND

- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE

NOTES:

1. FINAL SECTION DESIGNER SHALL DESIGN THE RETAINING WALL SYSTEM TO AVOID TEMPORARY AND PERMANENT PROPERTY IMPACTS TO PARK PROPERTY, EAST OF DART'S RIGHT-OF-WAY.
2. FINAL SECTION DESIGNER SHALL PERFORM HYDRAULIC STUDY OF RAWHIDE AND FARMERS BRANCH CREEKS AND ADJUST THE LRT PROFILE GRADE TO PROVIDE MINIMUM CLEARANCE ABOVE THE 100-YEAR WATER SURFACE ELEVATION(S).

HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 184 OF 243

REV	AMEND	CH	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157 Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 558+00 TO STA 566+00

CONTRACT C-937775-1 | DWG No. CB2-3031 | REV

PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,10,13,20,23,39,46,56,57 PRF ROTATION=0.000000
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42,45,47-50,52,54,55,57-63
SITE, R:\NW3X\nw3xcpr1.040, 1,7,8,13,15,17,20,22,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,15-17

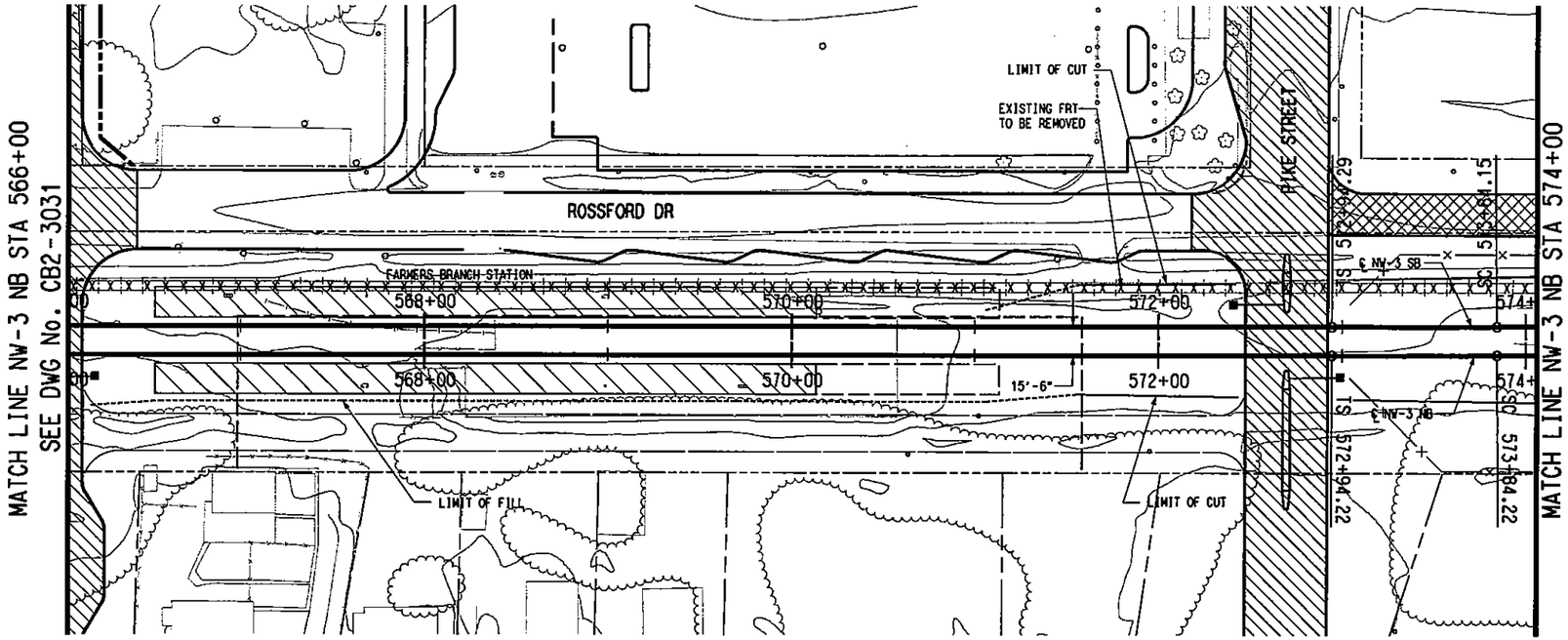
LIGN, R:\NW3X\nw3xalr1.040, 1-6
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52

R:\NW3X\DGN\Civil-AO\nw3xal31.040
Fri Nov 15 13:04:57 2002
R:\Nw3X\prf\nw3xal31.prf
DBROWN

R:\NW3X\DGN\Civil-AO\nw3xal31.040

DWG No. CB2-3032

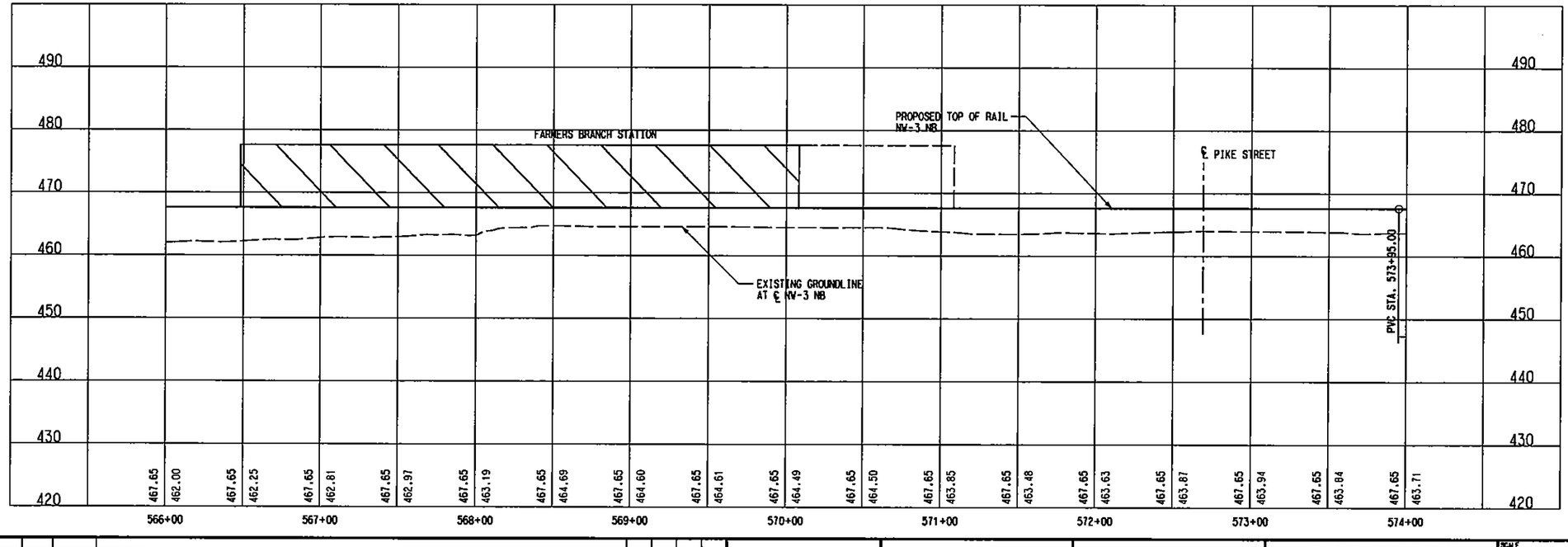
P0032



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STATION CONCOURSE/ PLATFORM
- STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 185 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 566+00 TO STA 574+00

CONTRACT C-937775-1 | DWG No. CB2-3032 | REV

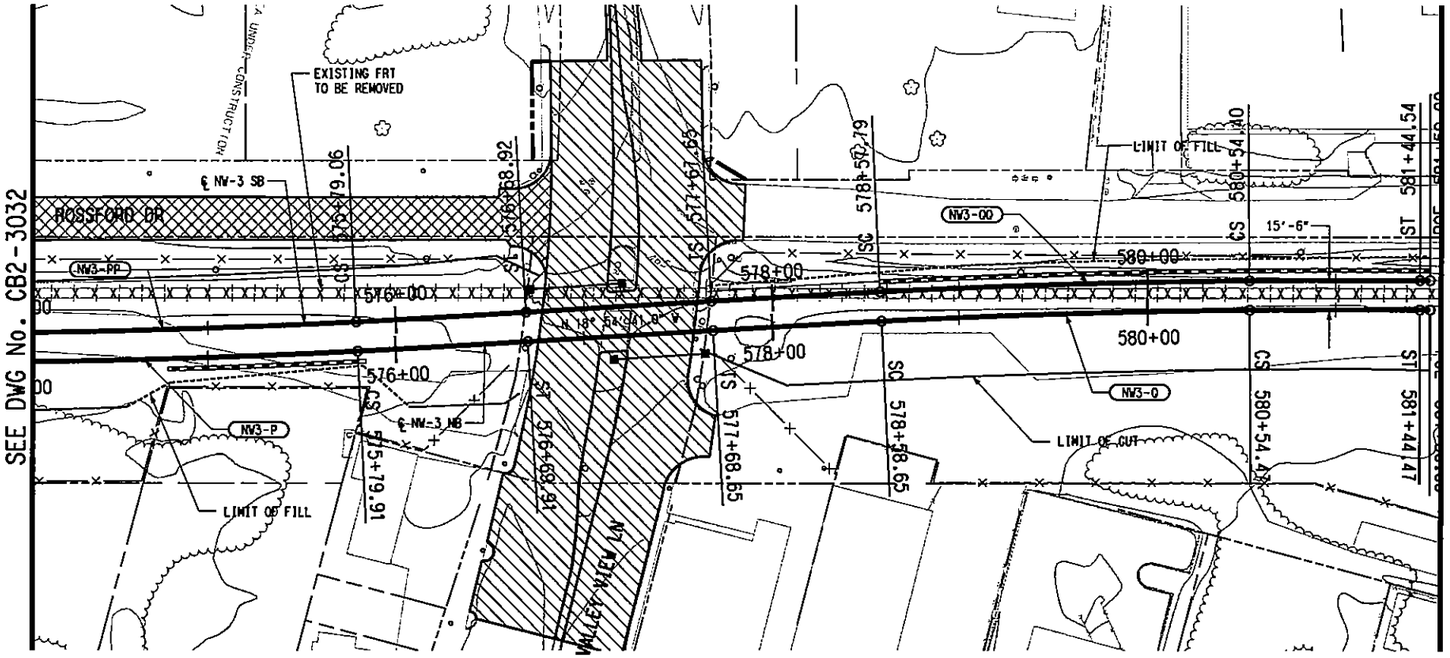
BORDER, R:\NW3X\nw3xbori.001, 1-4,6,10,13,20,23,39,46,56,57 PRF ROTATION=0.000000
PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
PROV, R:\NW3X\NW3xprwri.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,45,47-50,52,54,55,57-63
SITE, R:\NW3X\nw3xcpri.040, 1,7,8,13,15,17,20,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW3X\NW3XBRRI.040, 6-10,15-17

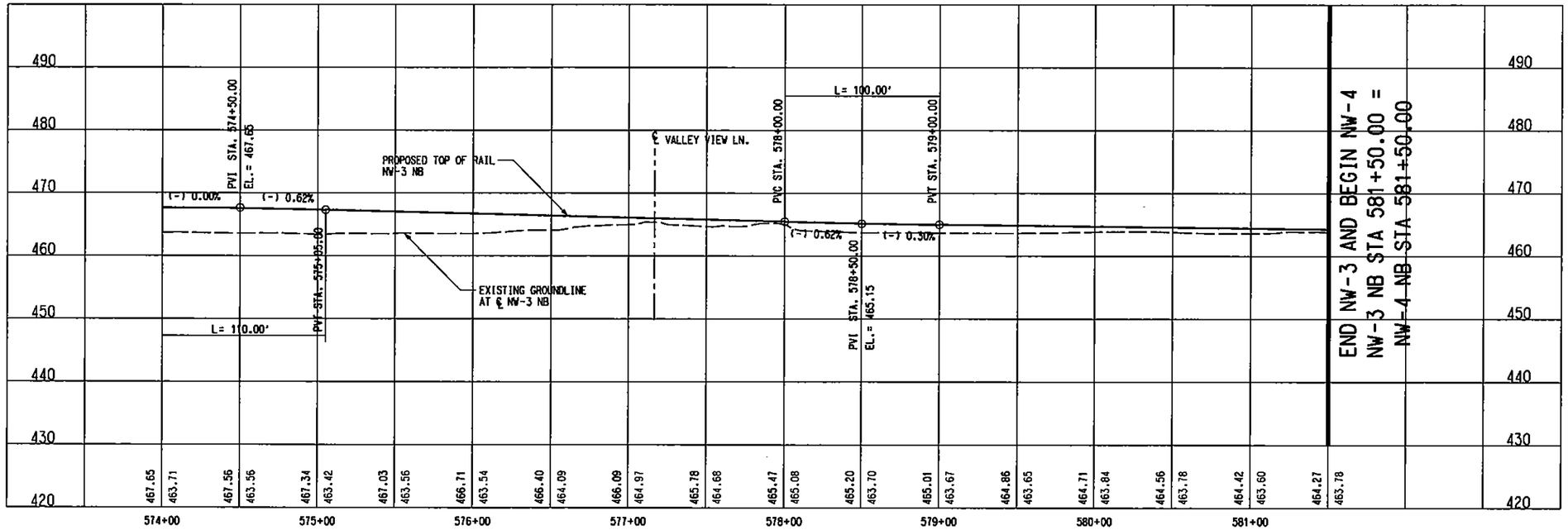
ALIGN, R:\NW3X\nw3xalri.040, 1-61
PROV, R:\NW3X\nw3xrwri.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xtiri.040, 12
TOPOI, R:\NW3X\nw3xtpri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xptri.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

R:\NW3X\DGN\Cyl-AO\nw3xol32.040
Fri Nov 15 13:08:51 2002
R:\NW3X\prf\nw3xol32.prf
DBROWN
R:\NW3X\DGN\Cyl-AO\nw3xol32.040

DWG No. CB2-3033

P0033





SCALE (IN FEET)
HORIZ 0 20 40 60
SCALE (IN FEET)
VERT 0 5 10 15 20

NW3-P (NB)		NW3-PP (SB)	
Rc =	4800.00'	Rc =	4784.50'
Ls =	90.00'	Ls =	89.85'
Lc =	195.69'	Lc =	194.92'
Ea =	1.50"	Ea =	1.50"
Eu =	1.50"	Eu =	1.51"
V =	60 MPH	V =	60 MPH

NW3-Q (NB)		NW3-QQ (SB)	
Rc =	4800.00'	Rc =	4815.50'
Ls =	90.00'	Ls =	90.15'
Lc =	195.82'	Lc =	196.61'
Ea =	1.50"	Ea =	1.50"
Eu =	1.50"	Eu =	1.49"
V =	60 MPH	V =	60 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STREET/ALLEY/ DRIVE CLOSURE

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date 10.25.02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 186 OF 243

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3

GUIDEWAY PLAN AND PROFILE
STA 574+00 TO STA 581+50

DARTCADD

CONTRACT C-937775-1 | DWG No. CB2-3033 | REV

PROFILE, R:\NW3X\nw3xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW3X\nw3xbor1.001, 1-4,6,10,13,20,23,39,46,56,57
PROW, R:\NW3X\NW3xprwr1.040, 1-21,24,25,27,28,30-35,37-39,41,42,44,45,47-50,52,54,55,57-63
SITE, R:\NW3X\nw3xepr1.040, 1,7,8,13,15,17,20,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW3X\NW3XBRR1.040, 6-10,13-17

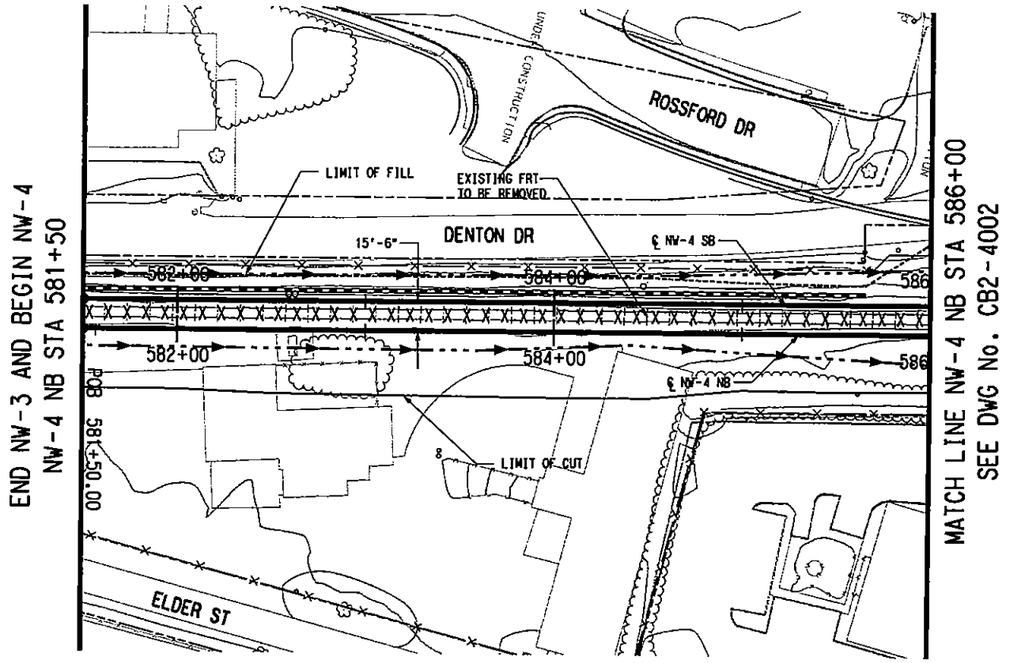
LIGN, R:\NW3X\nw3xalr1.040, 1-61
OW, R:\NW3X\nw3xrwr1.040, 15,18,19,26,27,31,40,46
TIL, R:\NW3X\nw3xutr1.040, 12
OPOI, R:\NW3X\nw3xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TOPO, R:\NW3X\NW3xtpr1.040, 2-5,8-11,13-18,21,25,29,31,35,49,52

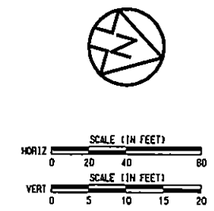
R:\NW3X\DGN\Cvl-AO\nw3xa133.040
Fri Nov 15 13:21:04 2002
R:\Nw3X\prf\nw3xa133.prf
DBROWN

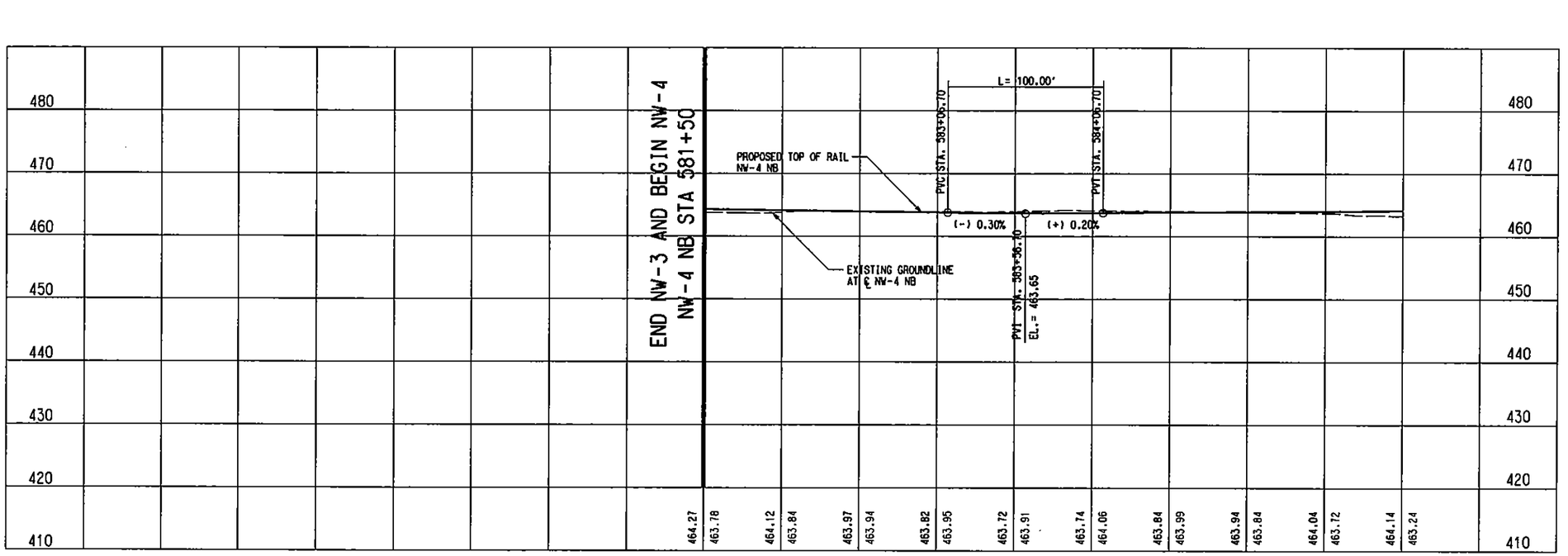
R:\NW3X\DGN\Cvl-AO\nw3xa133.040

DWG No. CB2-4001

P0001







NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 187 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

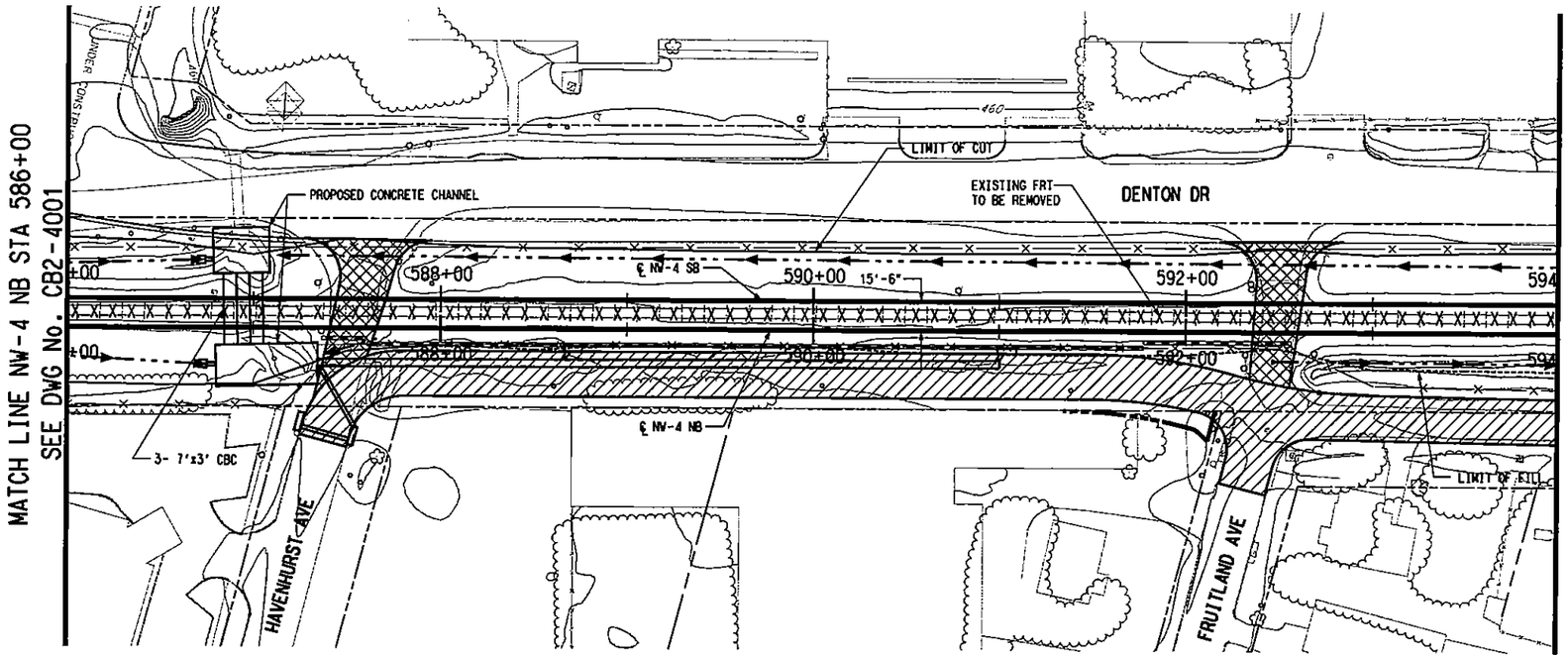
GUIDEWAY PLAN AND PROFILE
STA 581+50 TO STA 586+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4001	

TIL, R:\NW4X\NW4XUTRI.040, 12
xPTOPO, R:\NW4X\nw4xpltri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50
OPOI, R:\NW4X\nw4tpri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW4X\nw4xalri.040, 1-6|
OV, R:\NW4X\nw4xrwri.040, 15,18,19,26,27,31,40,46
BORDER, R:\NW4X\nw4xbori.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW4X\NW4xprwri.040, 1-21,23-28,30-35,37-39,41,42,44,
SITE, R:\NW4X\nw4xcpri.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrri.040, 6-10,15-17
PRF ROTATION=0.000000
R:\NW4X\DGN\Cvl-AO\nw4xal01.040
Fri Nov 15 08:34:36 2002
R:\NW4X\prf\nw4xal01.prf
DBROWN
R:\NW4X\DGN\CV1-AO\nw4xal01.040

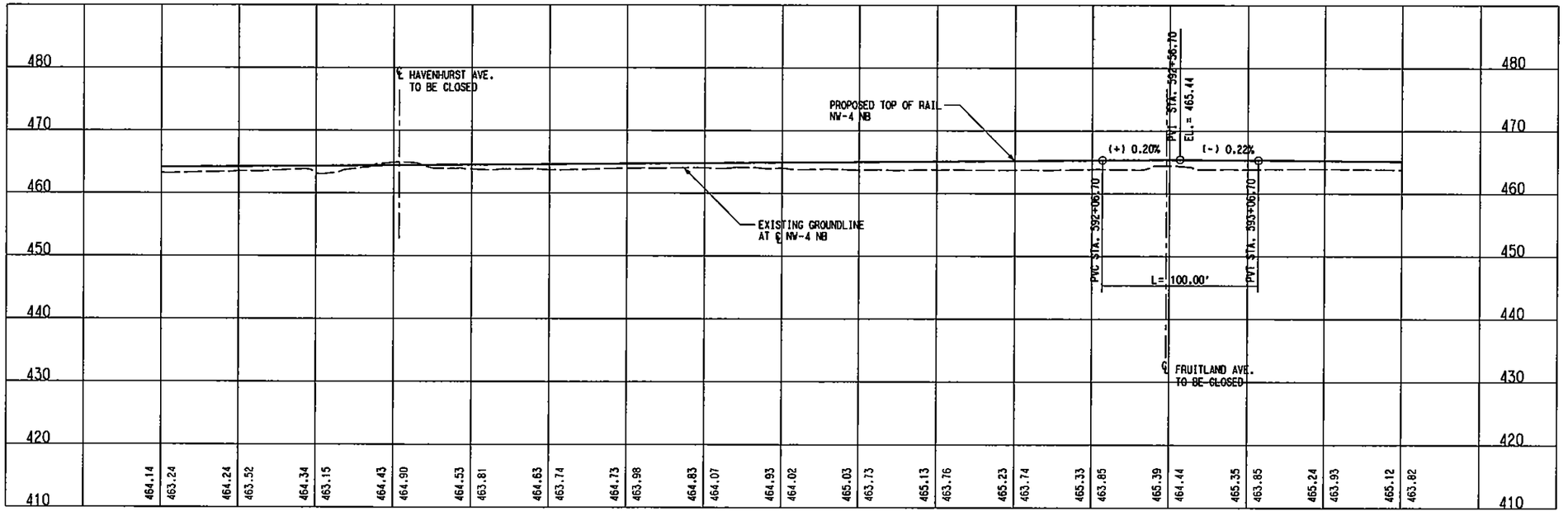
DWG No. CB2-4002

P0002



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND
- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64157
Date: 25 OCT 02

CP&Y Chilang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 188 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 586+00 TO STA 594+00

CONTRACT C-937775-1 | DWG No. CB2-4002 | REV

R:\NW4X\DGN\Cvl-AO\nw4xa102.040
Fri Nov 15 08:35:15 2002
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DBROWN

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BORDER, R:\NW4X\nw4xborl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xprfl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50
PROW, R:\NW4X\NW4xprwrl.040, 1-21,23-28,30-35,37-39,41,42,44,45,47
SITE, R:\NW4X\nw4xcprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrrl.040, 6-10,15-17

TIL, R:\NW4X\NW4XUTRl.040, 12
xPTOPO, R:\NW4X\nw4xplrl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50
OPOl, R:\NW4X\nw4xtprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW4X\nw4xalrl.040, 1-8
DW, R:\NW4X\nw4xrwrl.040, 15,18,19,26,27,31,40,46

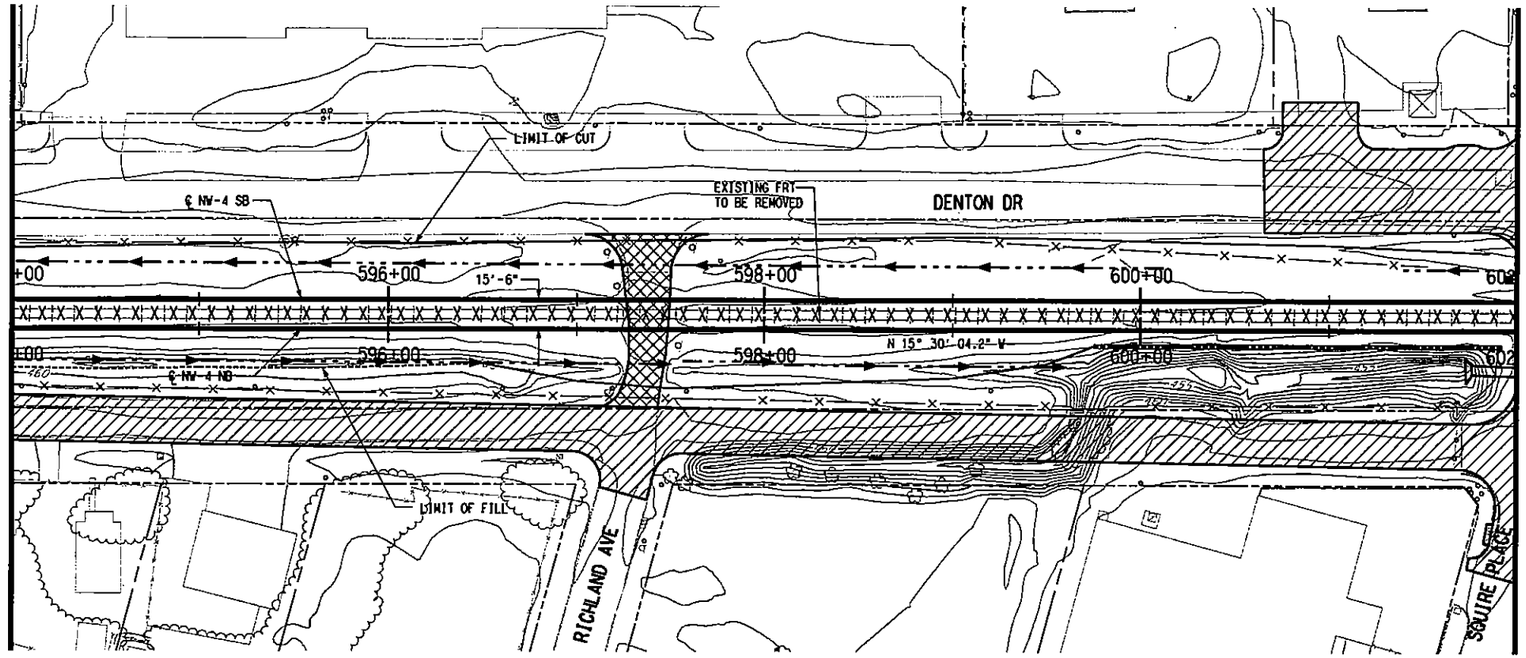
R:\NW4X\DGN\Cvl-AO\nw4xa102.040

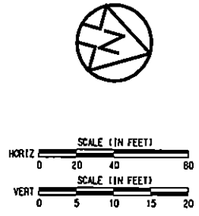
DWG No. CB2-4003

P0003

MATCH LINE NW-4 NB STA 594+00
SEE DWG No. CB2-4002

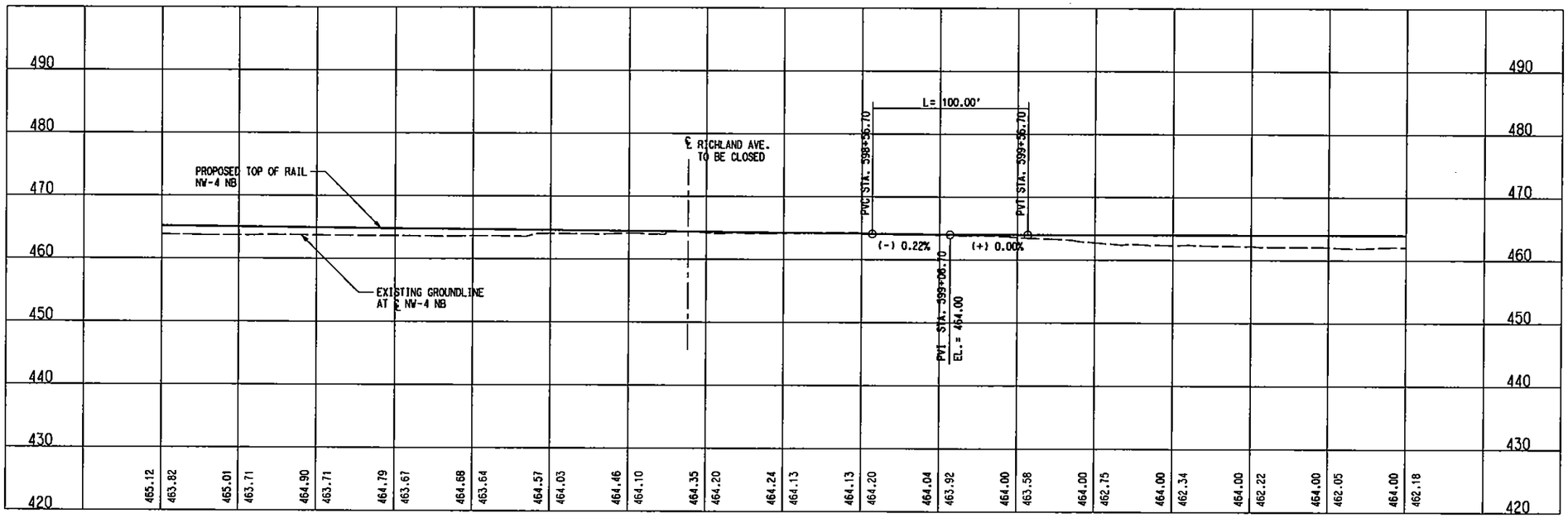
MATCH LINE NW-4 NB STA 602+00
SEE DWG No. CB2-4004





LEGEND

- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date: 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT
DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 189 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 594+00 TO 602+00

CONTRACT C-937775-1 | DWG No. CB2-4003 | REV

PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, 1-4,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17
TIL, R:\NW4X\NW4XUTR1.040, 12
xPTOPO, R:\NW4X\nw4xpir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46

R:\NW4X\DGN\Civil-AG\nw4xal03.040
Fri Nov 15 08:37:02 2002
R:\NW4X\prf\nw4xal03.prf
DBROWN

PRF ROTATION=0.000000
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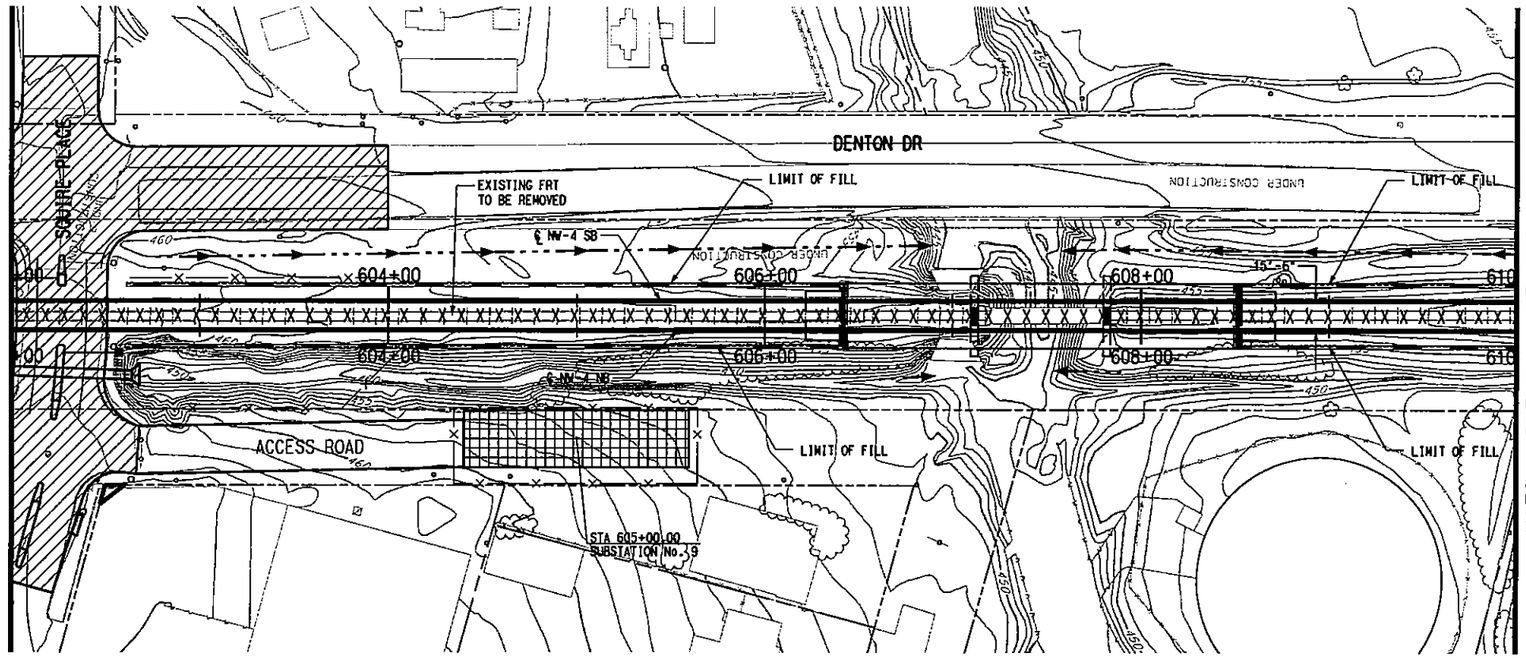
R:\NW4X\DGN\Civil-AG\nw4xal03.040

DWG No. C82-4004

P0004



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

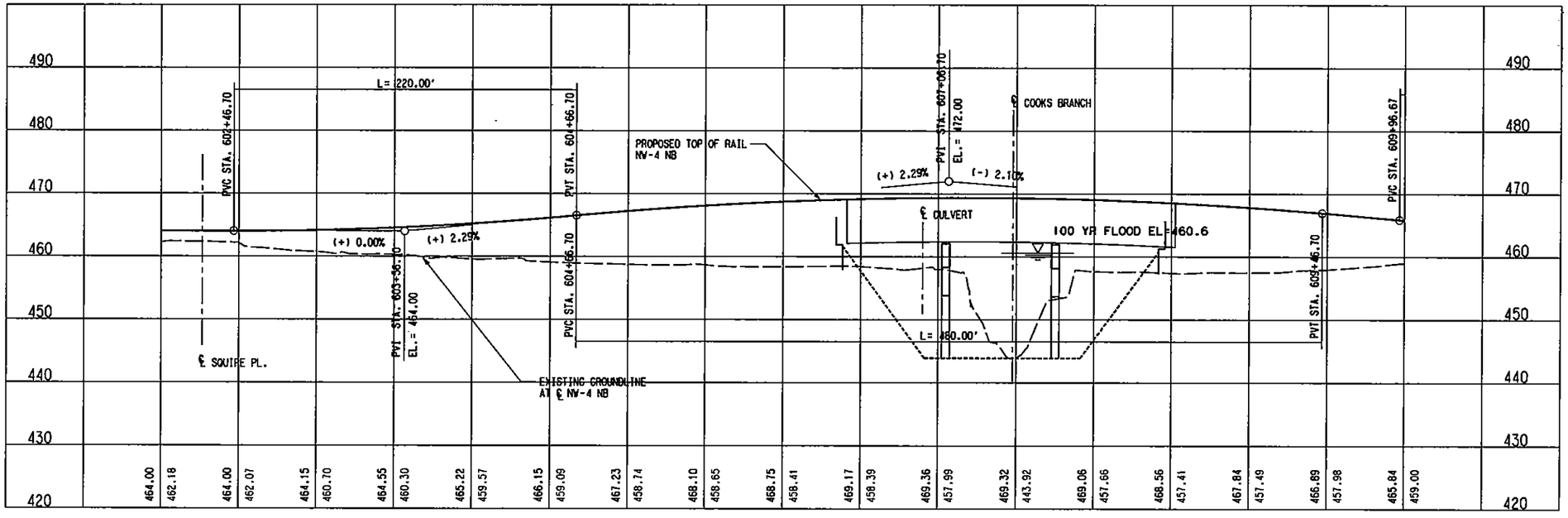
LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

GRADING FOR SYSTEM ELEMENTS

NOTES:

1. FLOOD ELEVATION TAKEN FROM FLOOD INSURANCE STUDY, CITY OF FARMERS BRANCH DTD AUG 2, 1990 BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).
2. SUBSTATION SITE SHALL ACCOMODATE TRACTION POWER SUBSTATION, SPOC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81757
Date: 10/31/02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
13770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 190 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE STA 602+00 TO 610+00

CONTRACT	DWG No.	REV
C-937775-1	C82-4004	

R:\NW4X\DGN\Cvl-AO\nw4xa104.040
Fri Nov 15 08:38:12 2002
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DBROWN

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PROFILE, R:\NW4X\nw4xa1r2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,46
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,13-17

TIL, R:\NW4X\NW4XUTR1.040, 12
xPTOPO, R:\NW4X\nw4xpir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
LIGN, R:\NW4X\nw4xa1r1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46

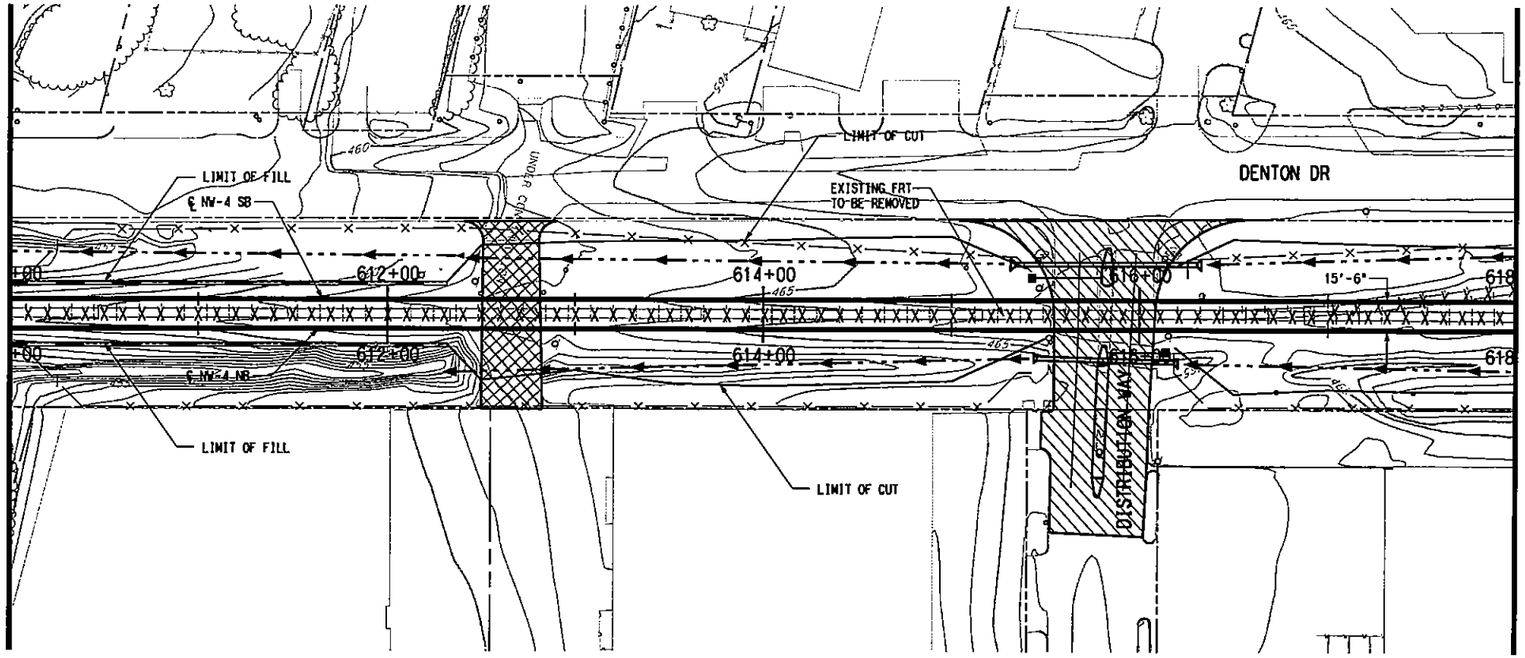
R:\NW4X\DGN\Cvl-AO\nw4xa104.040

DWG No. CB2-4005

P0005

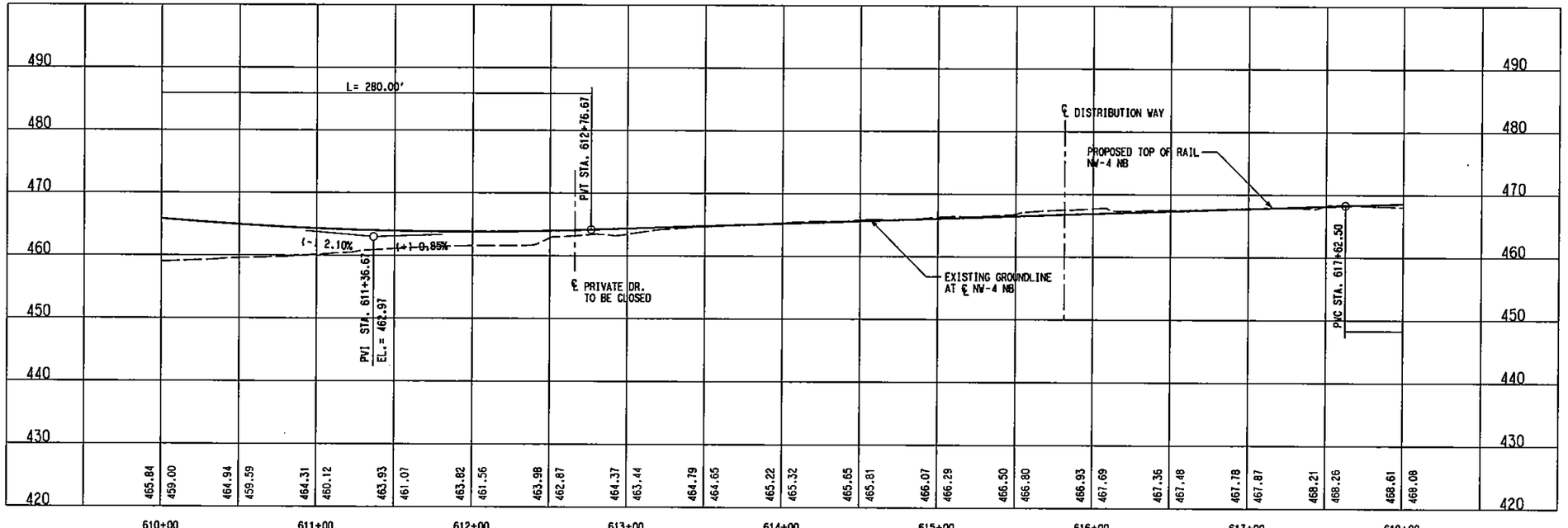
MATCH LINE NW-4 NB STA 610+00
SEE DWG No. CB2-4004

MATCH LINE NW-4 NB STA 618+00
SEE DWG No. CB2-4006



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND
- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIFTON, P.E. No. 81151
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIFTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 191 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 610+00 TO 618+00

CONTRACT C-937775-1 | DWG No. CB2-4005 | REV

PROFILE, R:\NW4X\nw4xplr2.040, 1-4,6-11,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, 2-5,8-11,13-16,20,21,25,29,31,35,49,50
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17
LIGN, R:\NW4X\nw4xlr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
xPTOPO, R:\NW4X\nw4xptr1.040, 2-5,8-11,13-16,20,21,25,29,31,35,49,50
QPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

R:\NW4X\DGN\Cvl-AO\nw4xplr2.040
Fri Nov 15 08:39:24 2002
R:\NW4X\prf\nw4xplr05.prf
DBROWN
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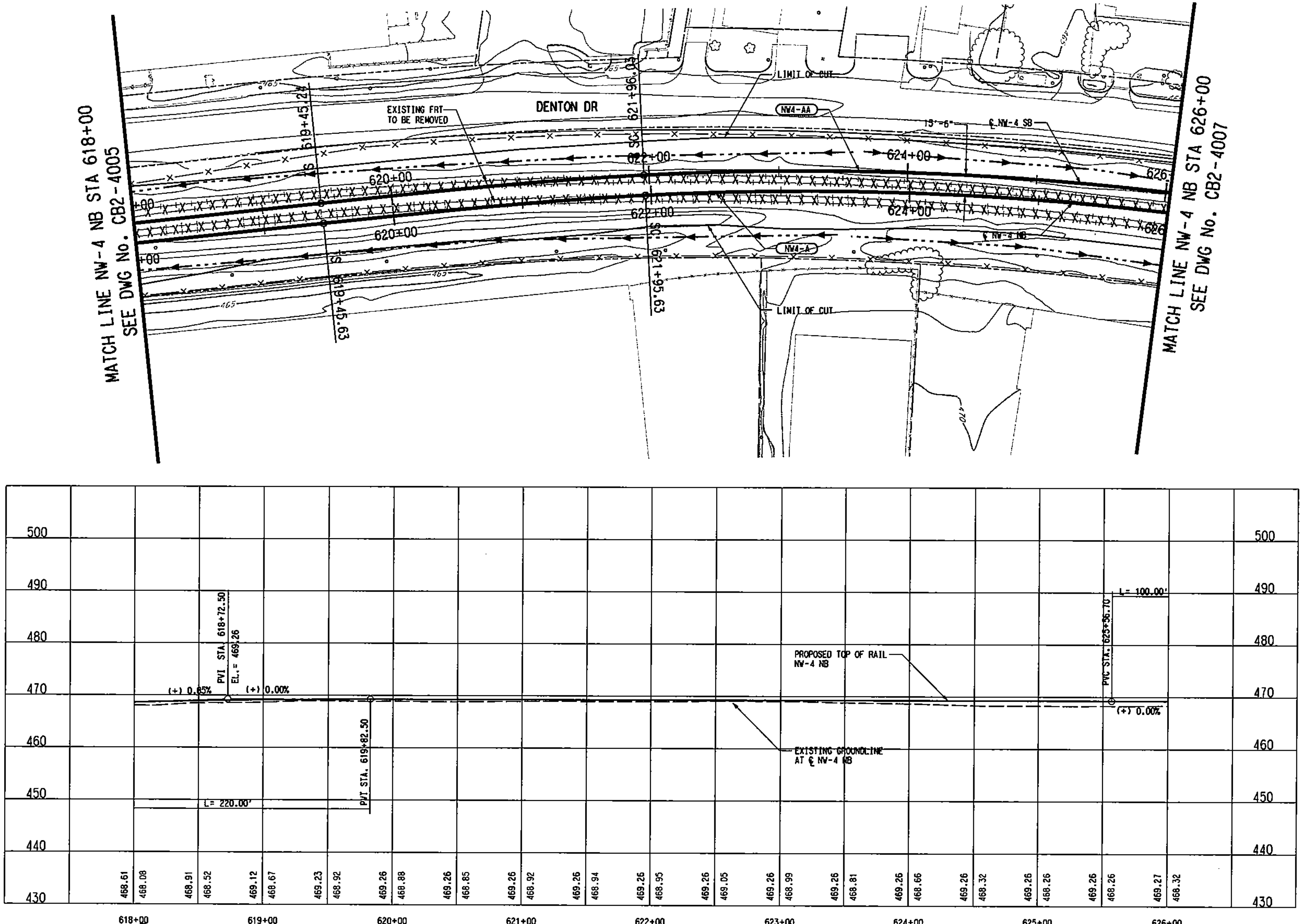


SCALE (IN FEET)
HORIZ 0 20 40 80
VERT 0 5 10 15 20

NW4-A (NB)		NW4-AA (SB)	
Rc =	2400.00'	Rc =	2415.50'
Ls =	250.00'	Ls =	250.80'
Lc =	751.14'	Lc =	756.80'
Eo =	4.00"	Eo =	4.00"
Eu =	2.00"	Eu =	1.96"
V =	60 MPH	V =	60 MPH

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 192 OF 243

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 618+00 TO STA 626+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4006	

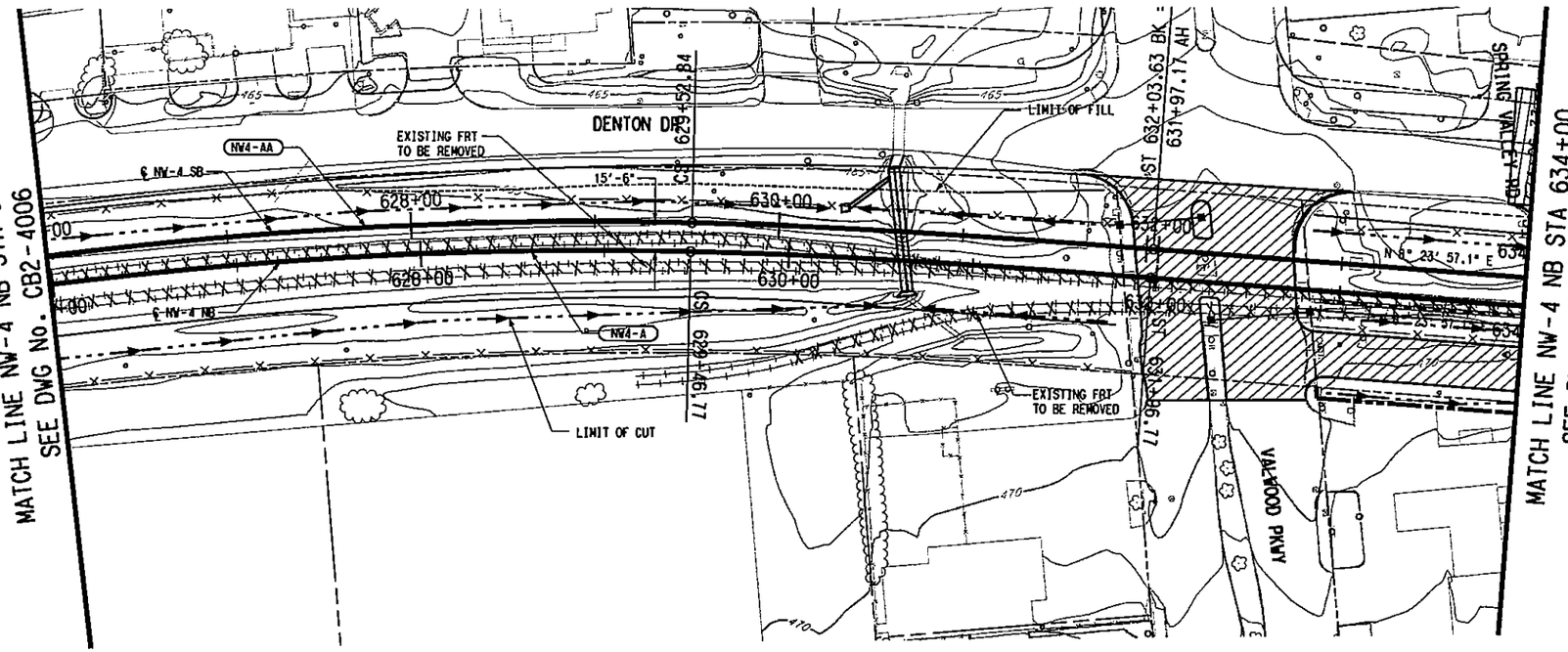
REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

DWG No. CB2-4006

R:\NW4X\DGN\Cvl-AO\nw4xol06.040
Fri Nov 15 08:40:32 2002
DBROWN

DWG No. CB2-4007

P0007

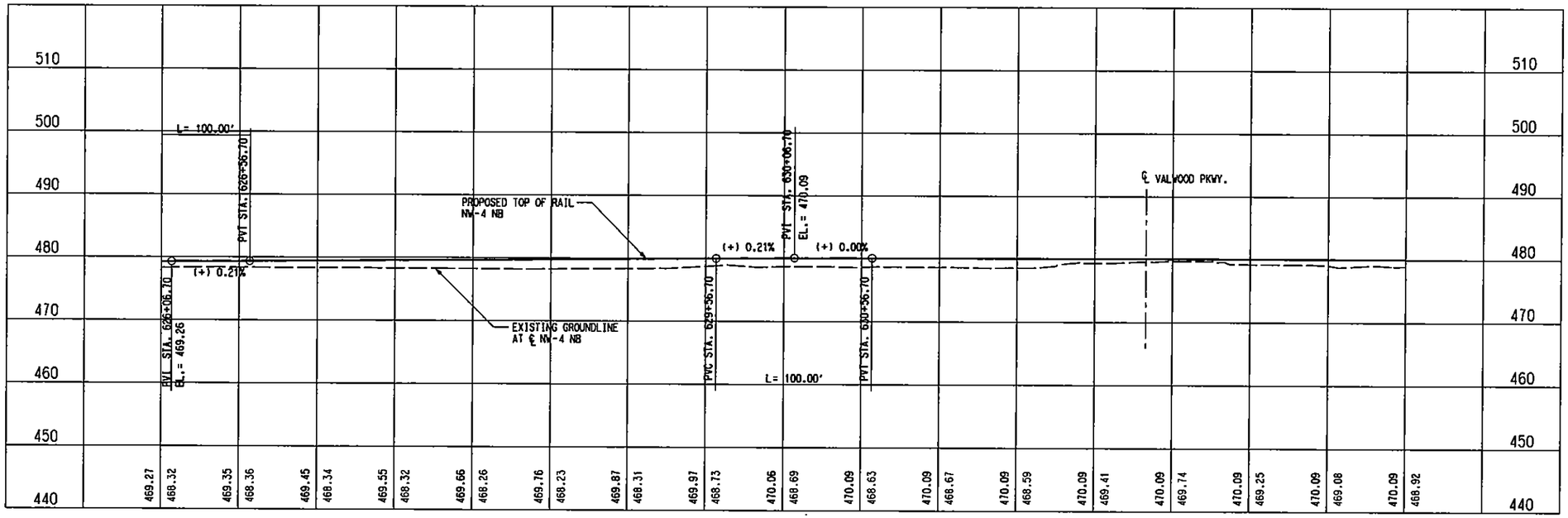


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-A (NB)		NW4-AA (SB)	
Rc =	2400.00'	Rc =	2415.50'
Ls =	250.00'	Ls =	250.80'
Lc =	751.14'	Lc =	756.80'
Es =	4.00"	Es =	4.00"
Eu =	2.00"	Eu =	1.96"
V =	60 MPH	V =	60 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81152
Date: 10 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	29 OCT 02

DARTCADD

CONTRACT SHEET No. 193 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 626+00 TO STA 634+00

CONTRACT C-937775-1 | DWG No. CB2-4007 | REV

LIGN, R:\NW4X\nw4xlor1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46,48
xPTOPO, R:\NW4X\nw4xpfr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50
OPOI, R:\NW4X\nw4xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50,52
TIL, R:\NW4X\nw4xtir1.040, 12

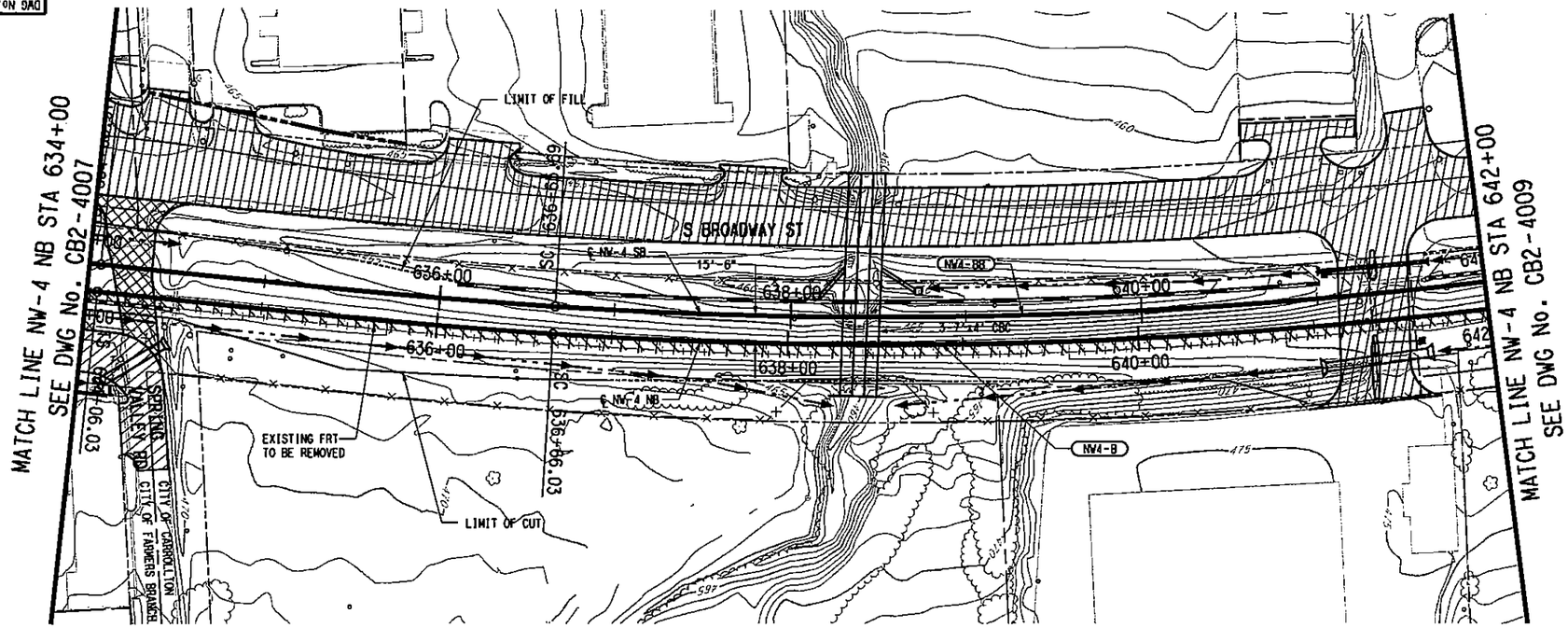
BORDER, R:\NW4X\nw4xbor1.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xor2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47
SITE, R:\NW4X\nw4xsepr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

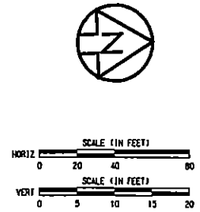
R:\NW4X\DGN\Civil-AO\nw4xsi07.040
Fri Nov 15 08:41:45 2002
R:\NW4X\prf\nw4xsi07.prf
DBROWN

PRF ROTATION=0.000000
R:\NW4X\prf\nw4xsmdor1.161

DWG No. CB2-4008

P0008



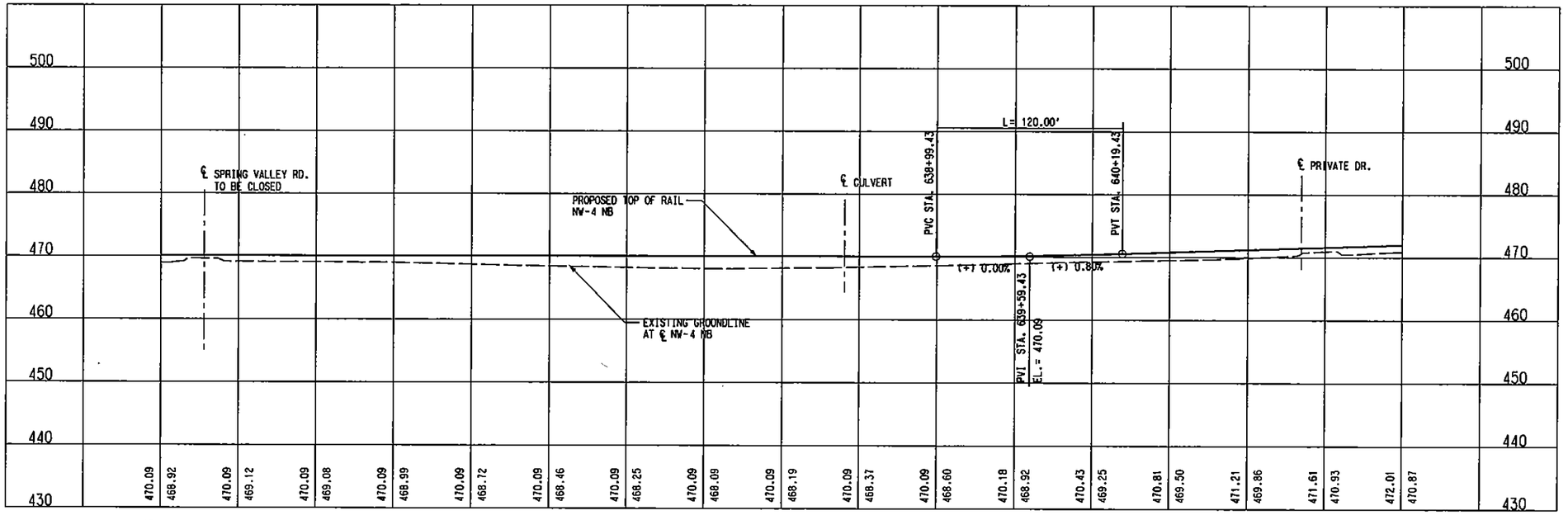


NW4-B (NB)		NW4-BB (SB)	
Rc =	2950.00'	Rc =	2934.50'
Ls =	260.00'	Ls =	259.33'
Lc =	1810.70'	Lc =	1800.49'
Eu =	2.00"	Eu =	2.00"
Ed =	2.10"	Ed =	2.10"
V =	55 MPH	V =	55 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81757
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 194 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 634+00 TO STA 642+00

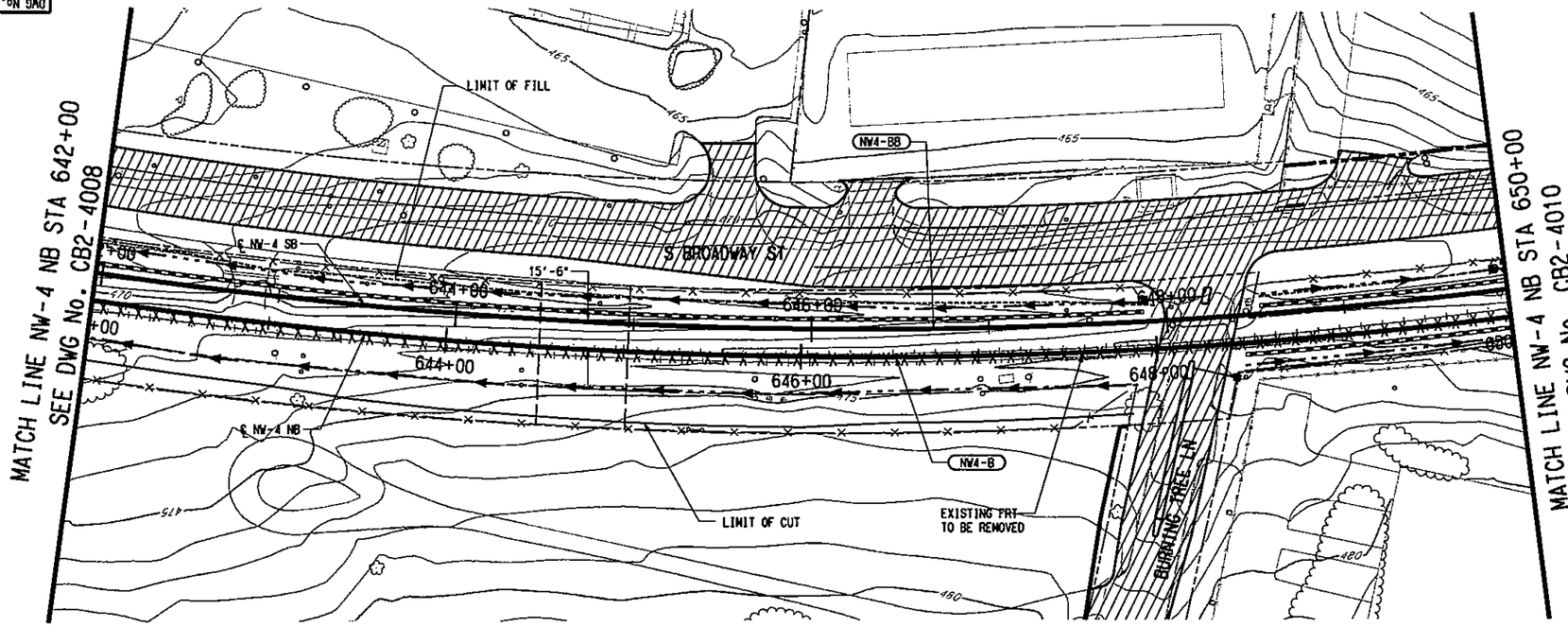
CONTRACT C-937775-1 | DWG No. CB2-4008 | REV

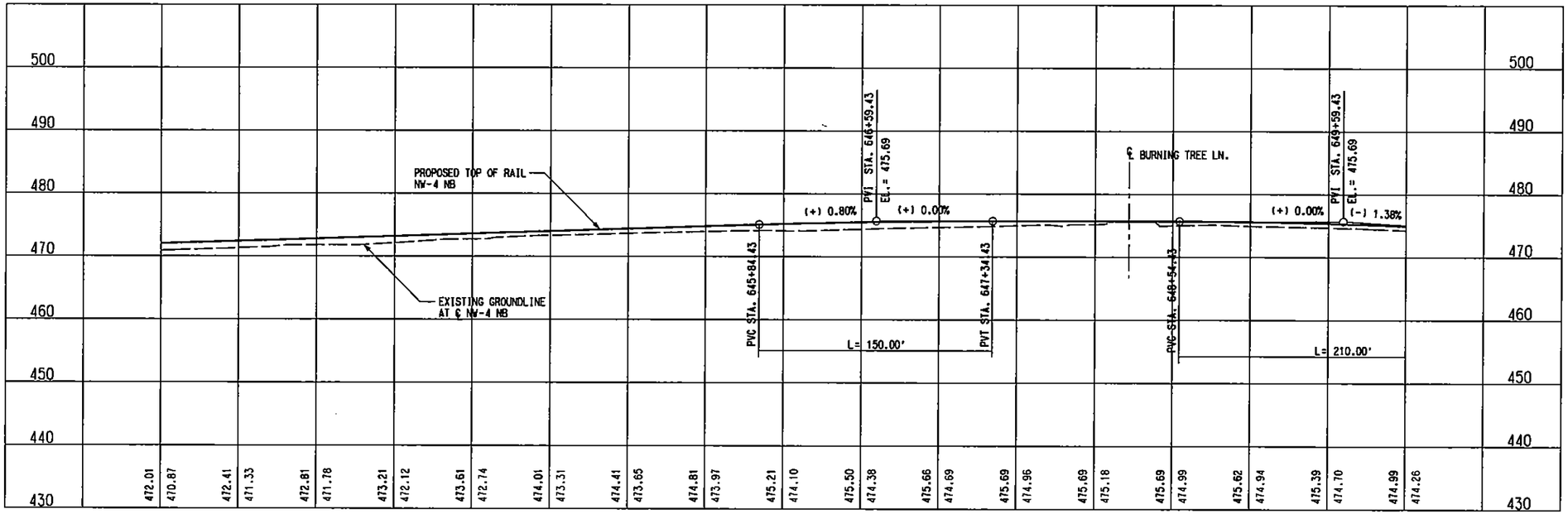
PROFILE, R:\NW4X\nw4xolr2.040, 1-4,6-11,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,55,57
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,48
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17
LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46,48
xPTOPO, R:\NW4X\nw4xplr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,50
OPOI, R:\NW4X\nw4xtplr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

R:\NW4X\DGN\Cvl-AO\nw4xalr08.040
Wed Nov 27 08:04:46 2002
R:\NW4X\prf\nw4xalr08.prf
DBROWN
PRF ROTATION=0.000000
R:\NW4X\DGN\TABLES\tmdorl.tbl

DWG No. CB2-4009

P0009





NW4-B (NB)		NW4-BB (SB)	
Rc =	2950.00'	Rc =	2934.50'
Ls =	260.00'	Ls =	259.33'
Lc =	1810.70'	Lc =	1800.49'
Eq =	2.00"	Eq =	2.00"
Eu =	2.10"	Eu =	2.10"
V =	55 MPH	V =	55 MPH

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81451
Date: 10 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT
DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 195 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 642+00 TO STA 650+00

CONTRACT C-937775-1 | DWG No. CB2-4009 | REV

LIGN, R:\NW4X\nw4slr1.040, 1-81
DW, R:\NW4X\nw4srw1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4sptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
DPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

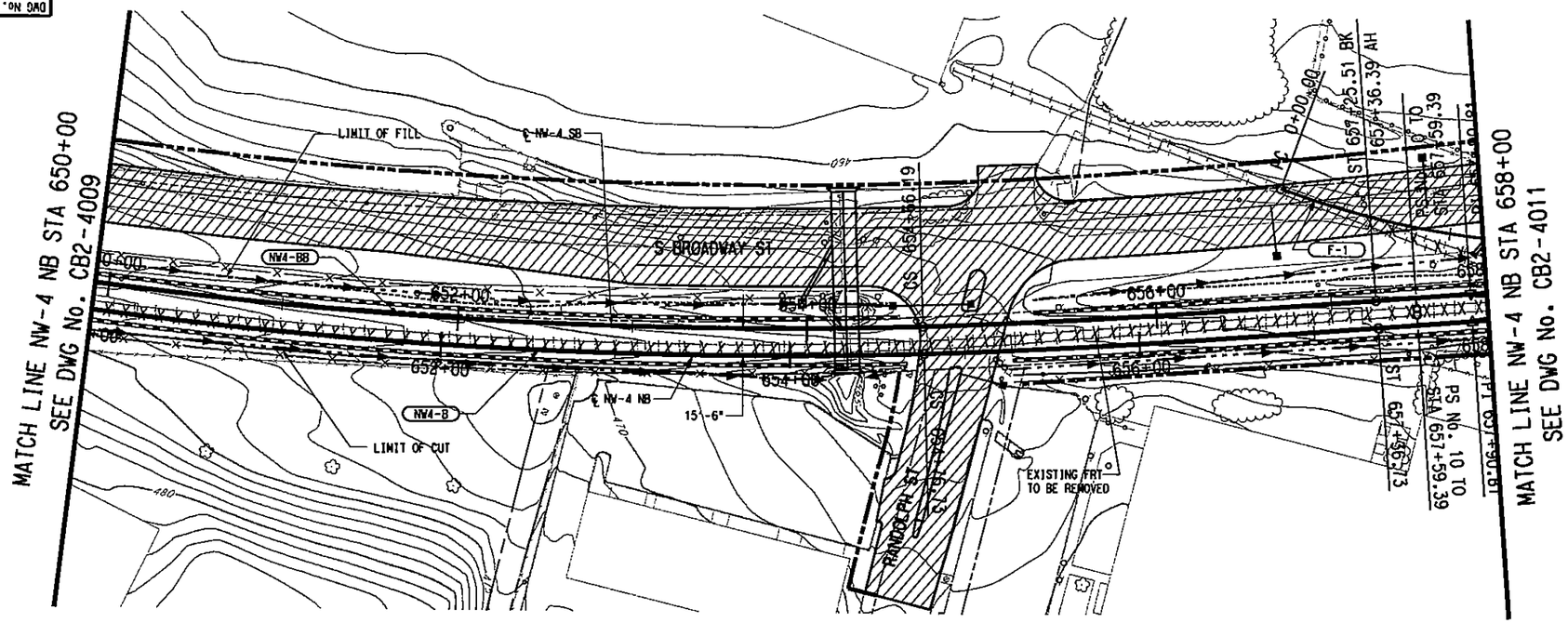
BORDER, R:\NW4X\nw4sbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4sprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,46
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

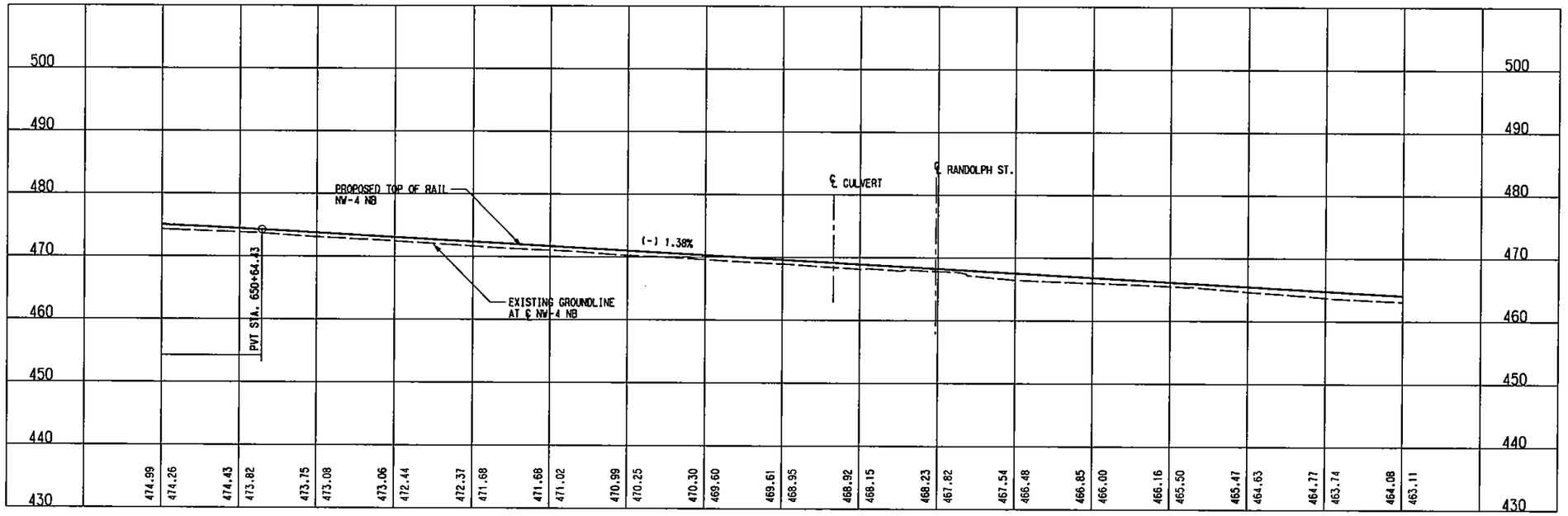
PRF ROTATION=0.000000
R:\NW4X\DGN\Cvl-AQ\nw4xa109.040
Fri Nov 15 08:44:05 2002
R:\NW4X\prf\nw4xa109.prf
DBROWN

R:\NW4X\DGN\CVI-AQ\nwxe109.040

DWG No. CB2-4010

P0010





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-B (NB)	
Rc =	2950.00'
Ls =	260.00'
Lc =	1810.70'
Eo =	2.00"
Eu =	2.10"
V =	55 MPH

NW4-BB (SB)	
Rc =	2934.50'
Ls =	259.33'
Lc =	1800.49'
Eo =	2.00"
Eu =	2.10"
V =	55 MPH

F-1	
Dc =	11°30'
Ls =	0.00'
Lc =	213.43'
Eo =	0.50"
Eu =	0.30"
V =	10 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 196 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 650+00 TO 658+00

CONTRACT C-937775-1 | DWG No. CB2-4010 | REV

R:\NW4X\DGN\Cvl-AO\nw4sol10.040
Fri Nov 15 08:45:16 2002
R:\NW4X\prf\nw4sol10.prf
DBROWN

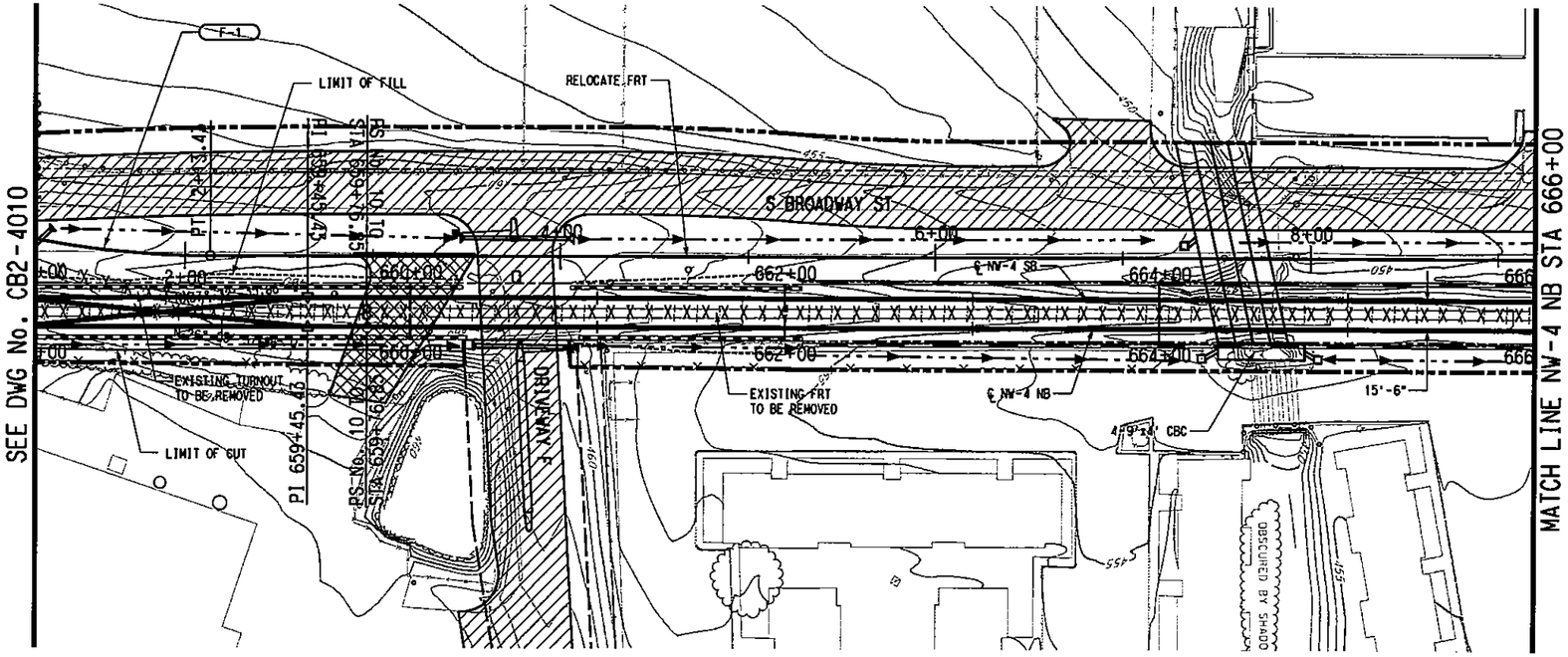
PRF ROTATION=0.000000
R:\NW4X\DGN\Cvl-AO\nw4sol2.040, l-4,6-11,14-22,24-62
PROFILE, R:\NW4X\nw4xolr1.040, l-61
BORDER, R:\NW4X\nw4xbor1.001, l-3,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, l-21,23-28,30-35,37-39,41,42,44,45,46
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17
LIGN, R:\NW4X\nw4xolr1.040, l-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

R:\NW4X\DGN\Cvl-AO\nw4sol10.040

DWG No. CB2-4011

P0011

MATCH LINE NW-4 NB STA 658+00
SEE DWG No. CB2-4010

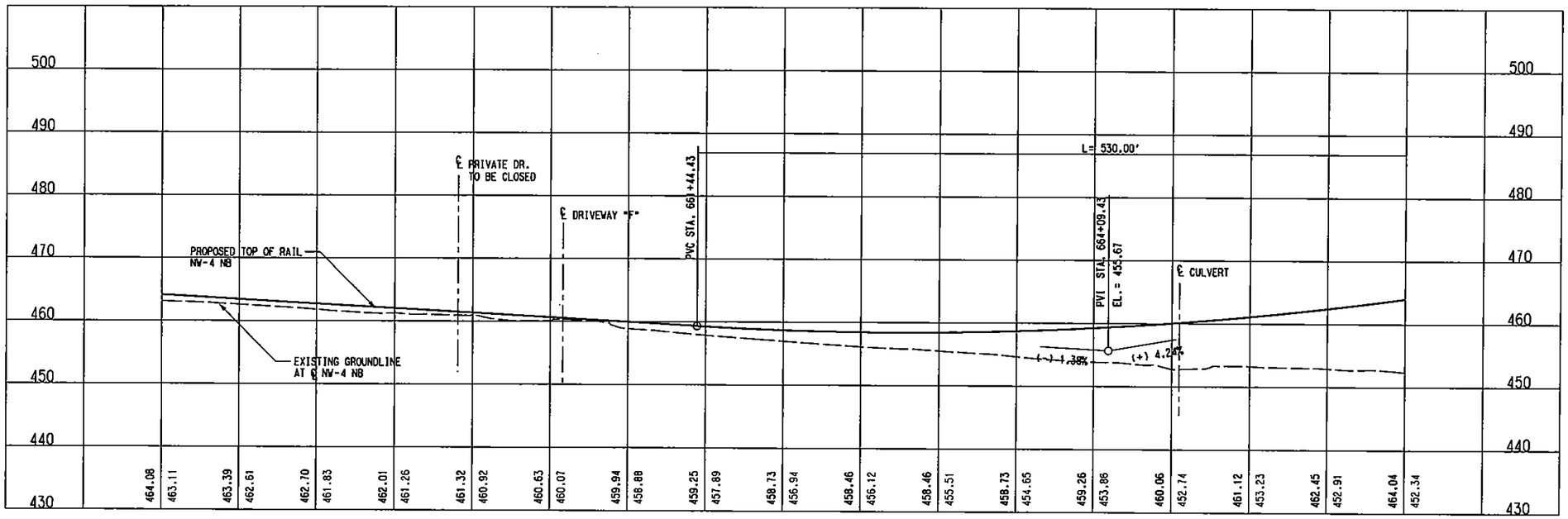


MATCH LINE NW-4 NB STA 666+00
SEE DWG No. CB2-4012

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

F-1
Dc = 11°30'
Ls = 0.00'
Lc = 213.43'
Eq = 0.50'
Eu = 0.30'
V = 10 MPH

LEGEND
STREET/ALLEY/ DRIVE RECONSTRUCTION
STREET/ALLEY/ DRIVE CLOSURE



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 43153
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 197 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 658+00 TO 666+00

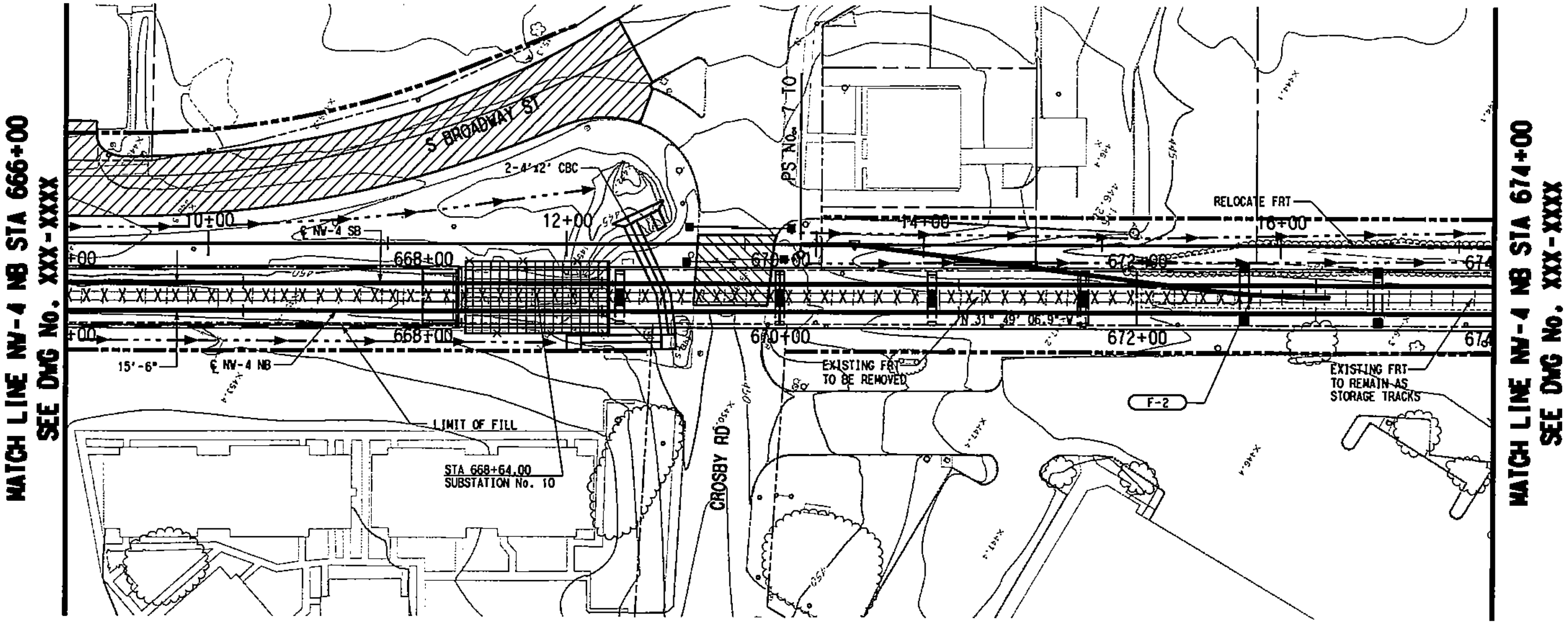
CONTRACT	DWG No.	REV
C-937775-1	CB2-4011	

LIGN, R:\NW4X\nw4xlr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xplr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xplr2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,46
SITE, R:\NW4X\nw4xspr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

PRF ROTATION=0.000000
R:\NW4X\DGN\Cvl-AO\nw4xalll.040
Wed Nov 27 08:05:57 2002
R:\NW4X\prf\nw4xalll.prf
DBROWN
R:\NW4X\DGN\CV1-AO\nw4xalll.040

P0012



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

F-2

Dc =	9°15'
Ls =	0.00'
Lc =	77.40'
Ea =	0.50"
Eu =	0.15"
V =	10 MPH

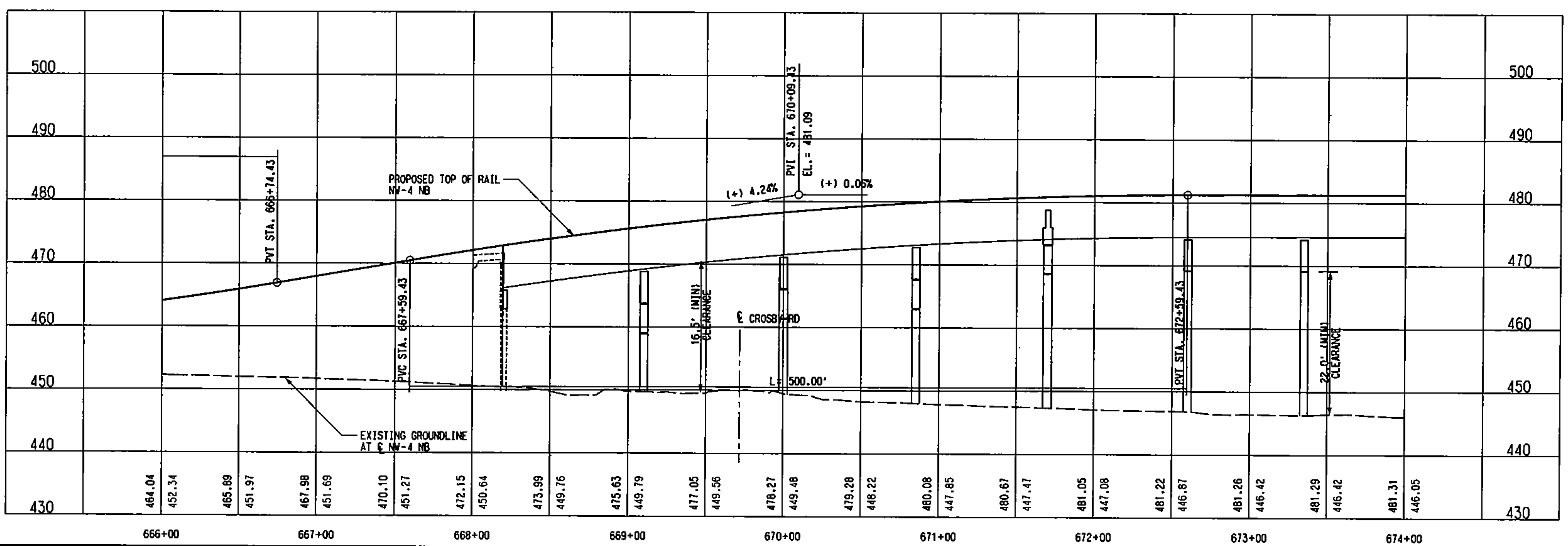
LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

GRADING FOR SYSTEM ELEMENTS

NOTE:

1. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 198 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

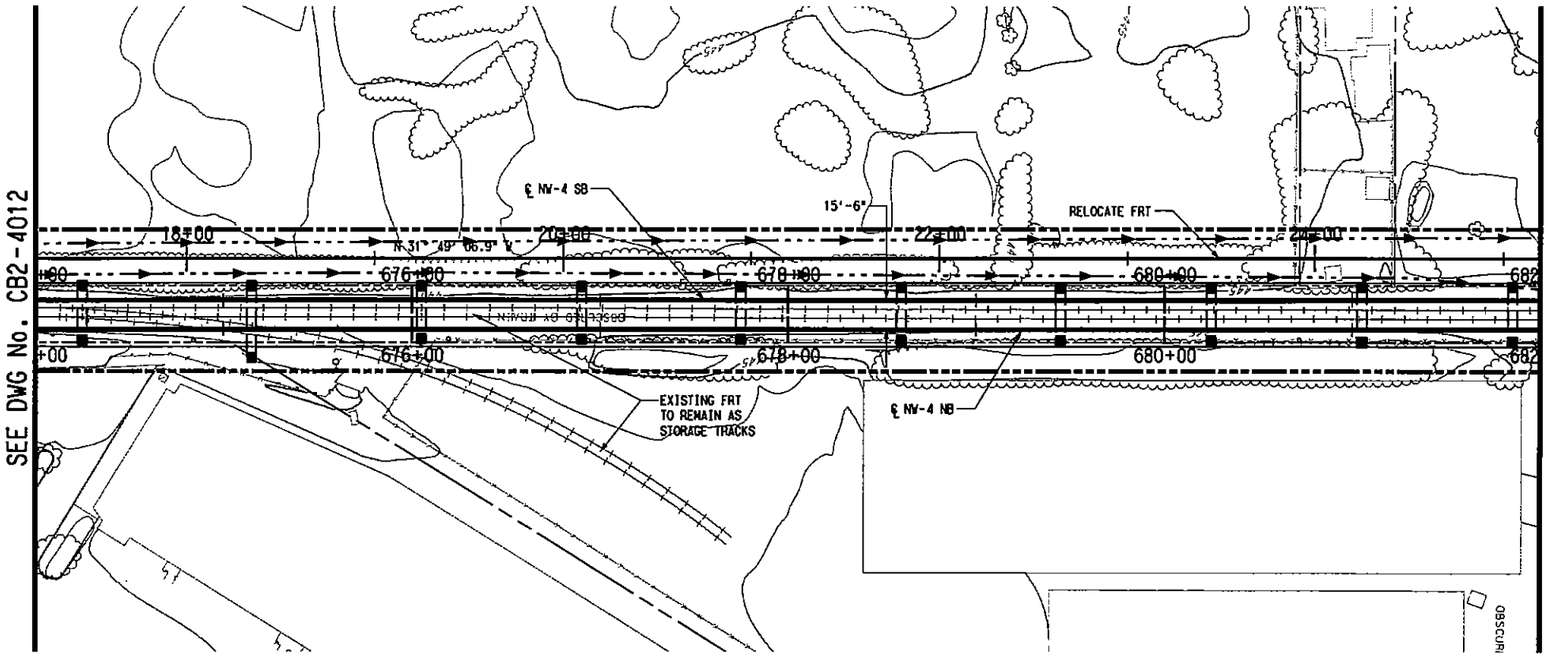
GUIDEWAY PLAN AND PROFILE
STA 666+00 TO STA 674+00

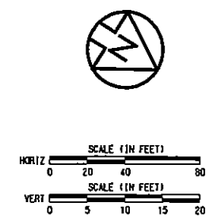
CONTRACT C-937775-1
DWG No. CB2-4012
REV

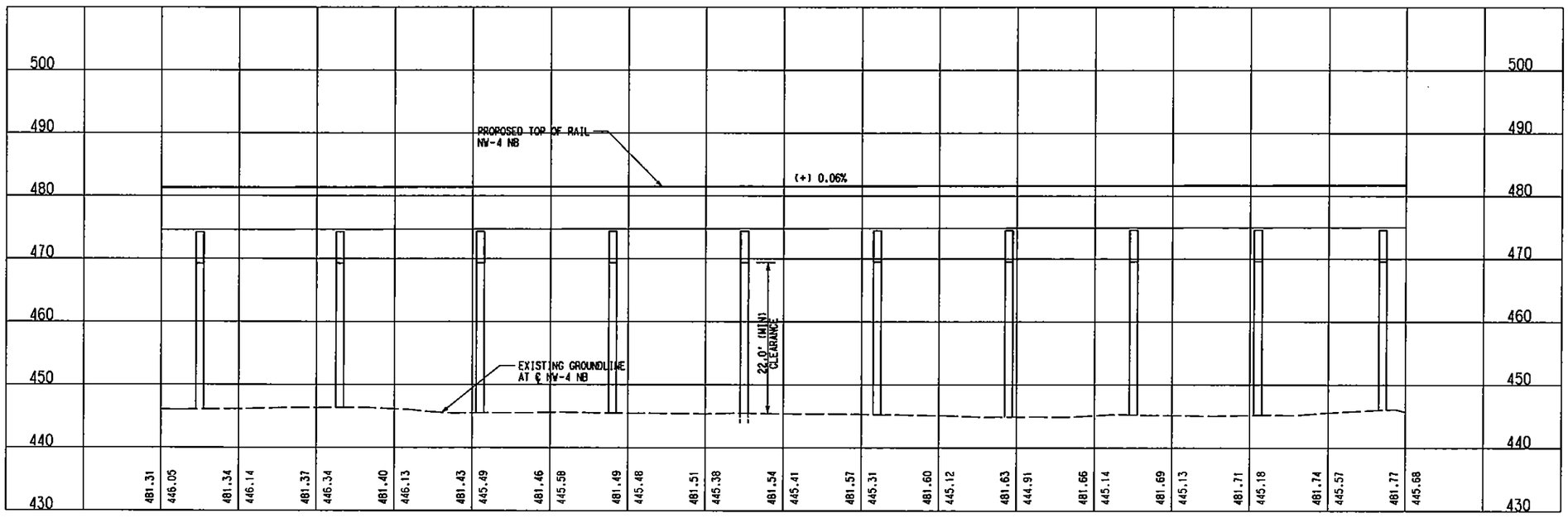
R:\NW4X\DGN\Cvl-AG\nw4xal12.040
Fri Nov 15 08:48:07 2002
R:\NW4X\prf\nw4xal12.prf
DBROWN

DWG No. CB2-4013

P0013







NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
A. TIPTON, P.E. No. 84157
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 199 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 674+00 TO STA 682+00

CONTRACT C-937775-1 | DWG No. C82-4013 | REV

LIGN, R:\NW4X\nw4xlorl.040, 1-61
DW, R:\NW4X\nw4xrwrl.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xptrl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xtitrl.040, 12

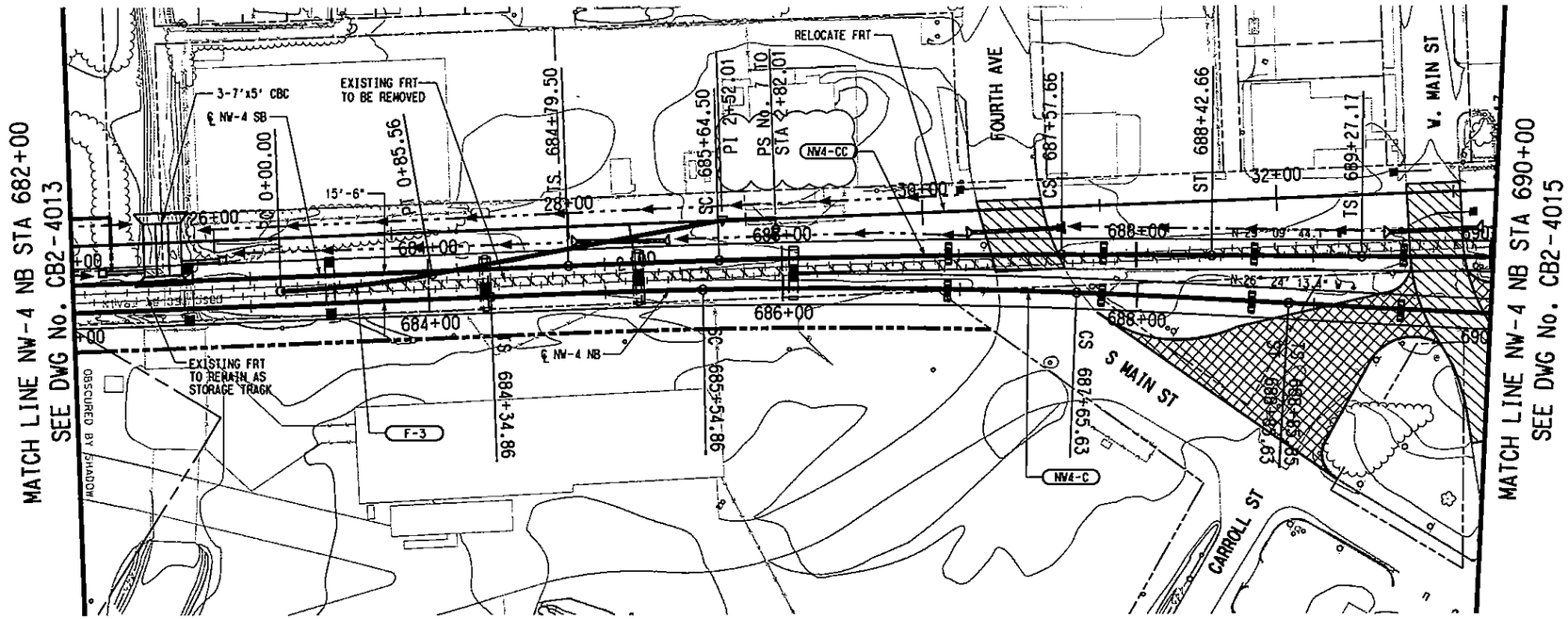
BORDER, R:\NW4X\nw4xborl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW4X\NW4xprwrl.040, 1-21,23-28,30-35,37-39,41,42,44,45,47
SITE, R:\NW4X\nw4xcprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrrl.040, 6-10,15-17

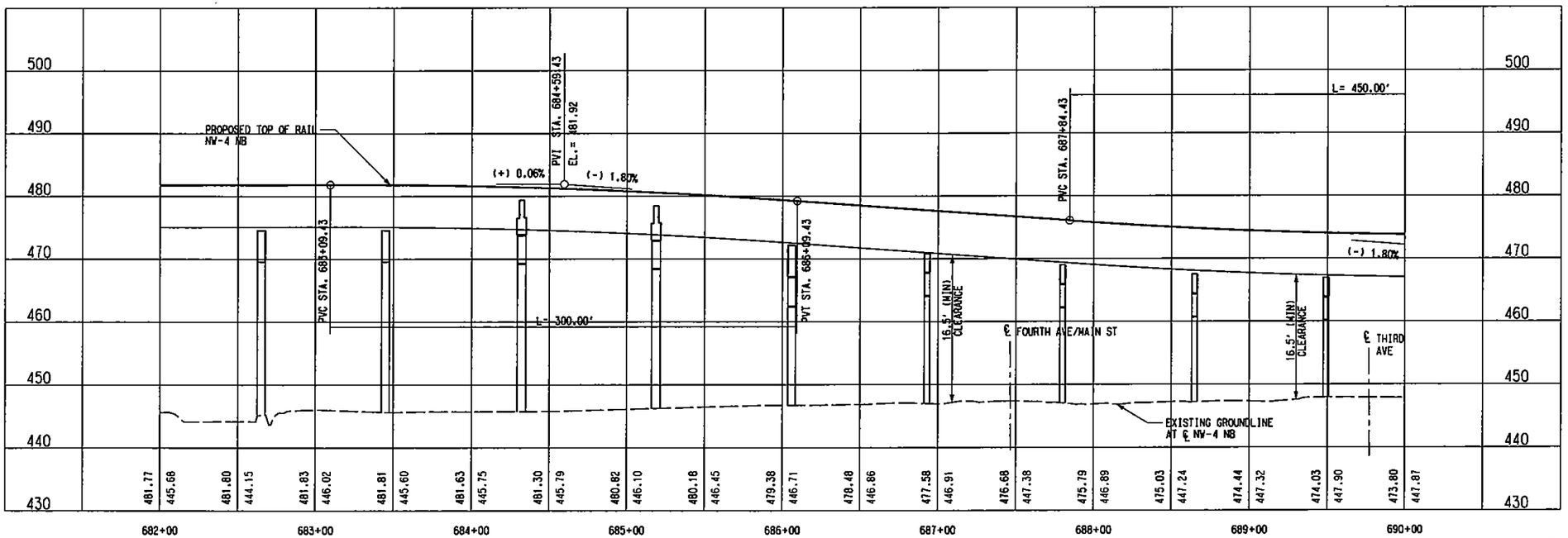
PRF ROTATION=0.000000
M:\CADD\STANDARDS\PENTABLES\3mdarl.tbl
R:\NW4X\DGN\Cyl-AQ\nw4xal13.040
Fri Nov 15 08:49:13 2002
R:\Nw4X\prf\nw4xal13.prf
DBROWN

R:\NW4X\DGN\Cyl-AQ\nw4xal13.040

DWG No. CB2-4014

P0014





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-C (NB)	
Rc =	3500.00'
Ls =	120.00'
Lc =	210.77'
Eq =	2.00"
Eu =	1.46"
V =	55 MPH

NW4-CC (SB)	
Rc =	6000.00'
Ls =	85.00'
Lc =	193.17'
Eq =	0.50"
Eu =	1.52"
V =	55 MPH

F-3	
Dc =	9°15'
Ls =	0.00'
Lc =	77.39'
Eq =	0.50"
Eu =	0.15"
V =	10 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STREET/ALLEY/ DRIVE CLOSURE

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 200 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 682+00 TO STA 690+00

CONTRACT C-937775-1

DWG No. CB2-4014

REV

LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xplr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
QPOI, R:\NW4X\nw4xlplr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xtilr1.040, 12

PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
BORDER, R:\NW4X\nw4xborl.001, 1-4,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,
SITE, R:\NW4X\nw4xcplr1.040, 15,17,18,33,34,45
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

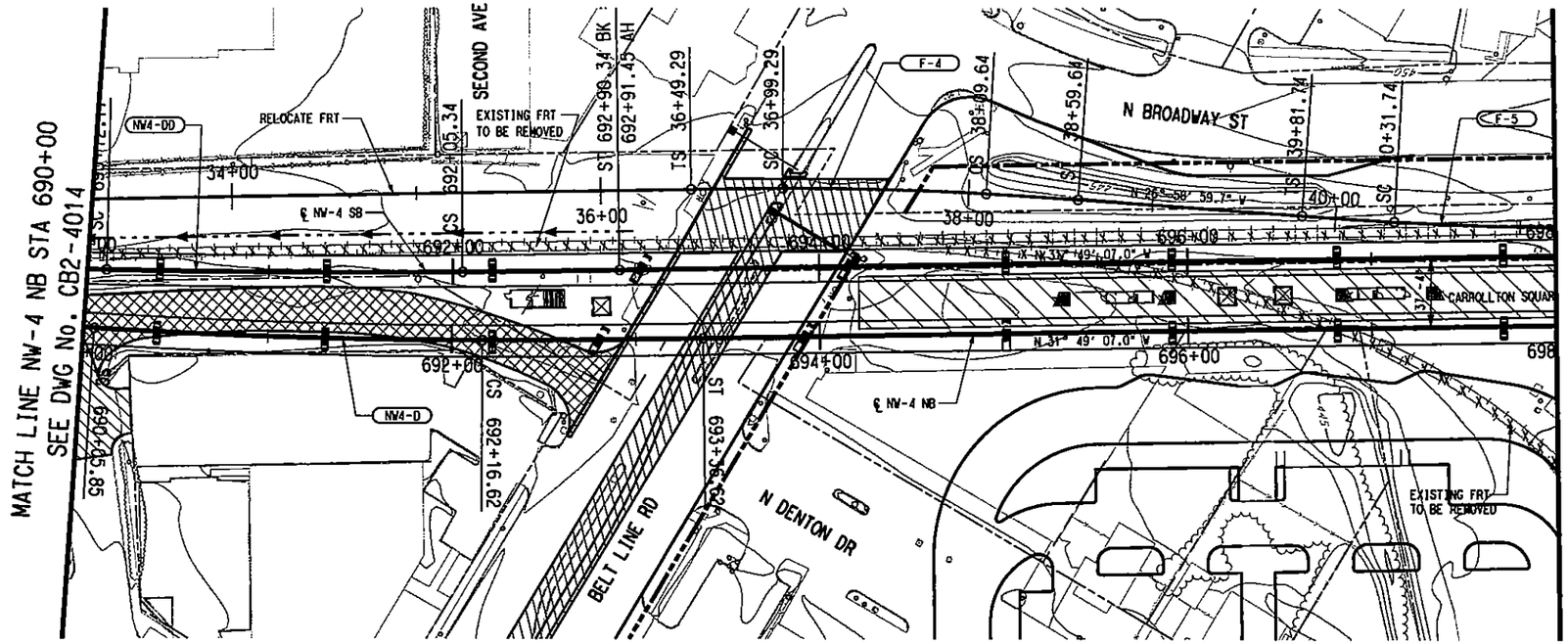
R:\NW4X\DGN\Civil-AO\nw4xal14.040
Tue Nov 19 09:54:26 2002
R:\Nw4X\pr\nw4xal14.prf
DBROWN

PRF ROTATION=0.000000
R:\NW4X\DGN\SHEETABLE\Smdarl.tbl

R:\NW4X\DGN\Civil-AO\nw4xal14.040

DWG No. CB2-4015

P0015



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-D (NB)	
Rc =	3500.00'
Ls =	120.00'
Lc =	210.78'
Eq =	2.00"
Eu =	1.46"
V =	55 MPH

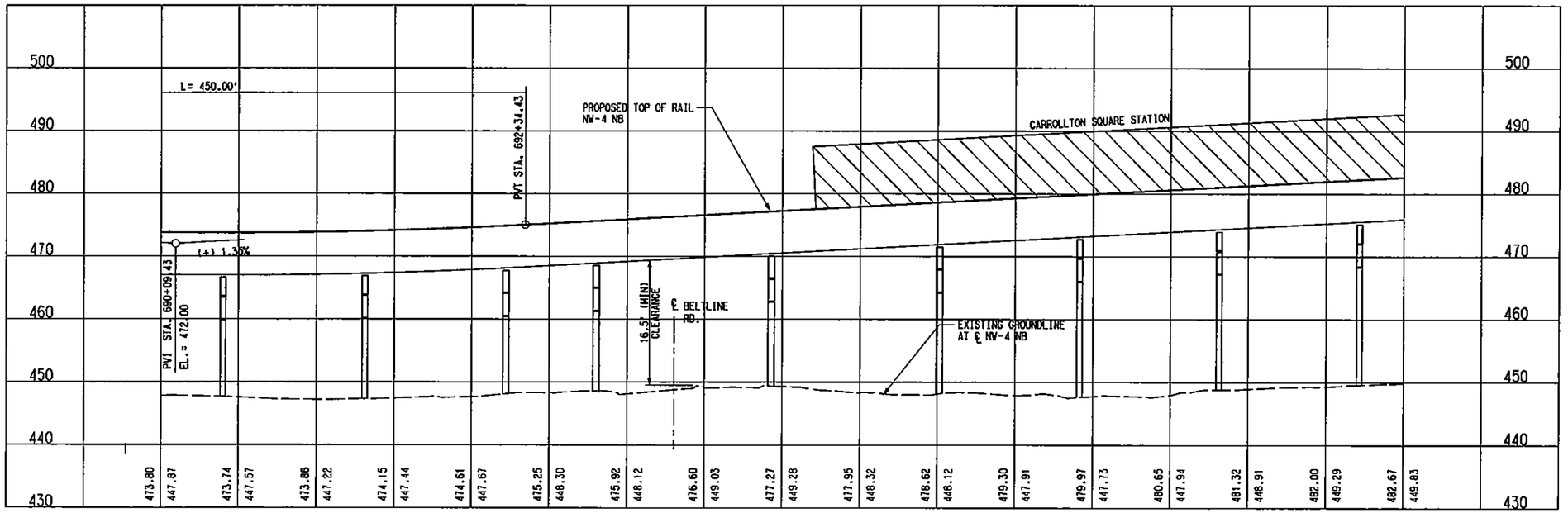
NW4-DD (SB)	
Rc =	6000.00'
Ls =	85.00'
Lc =	193.17'
Eq =	0.50"
Eu =	1.52"
V =	55 MPH

F-4	
Dc =	3°0'
Ls =	50.00'
Lc =	110.35'
Eq =	1.50"
Eu =	1.07"
V =	35 MPH

F-5	
Dc =	3°0'
Ls =	50.00'
Lc =	108.72'
Eq =	1.50"
Eu =	1.07"
V =	35 MPH

LEGEND

- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE
- STATION CONCOURSE/ PLATFORM



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151 Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 201 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 690+00 TO STA 698+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4015	

LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xpir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xtulr1.040, 12
BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47-50,52,54,55,57-63
SITE, R:\NW4X\NW4XCPRI.040, 1,7,8,13,15-17,20,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

PRF ROTATION=0.000000
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Fri Nov 15 08:51:27 2002
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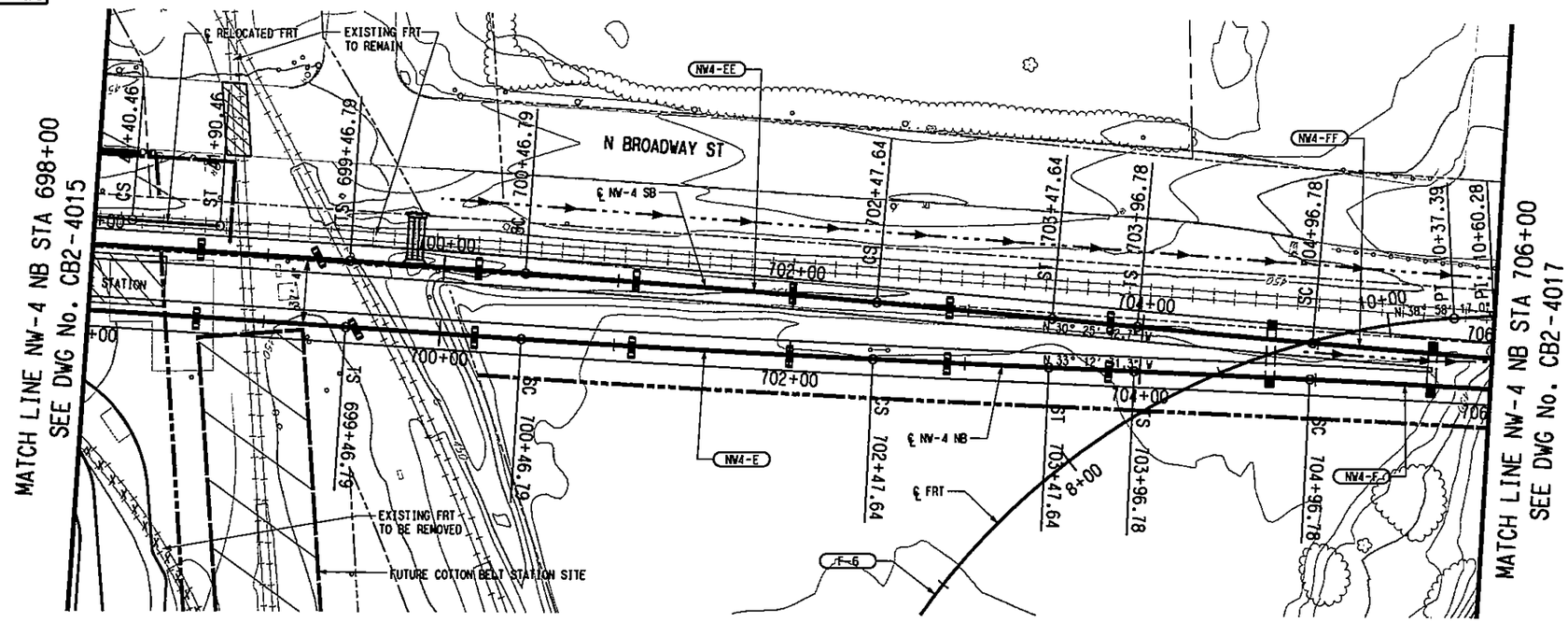
DBROWN

DWG No. CB2-4016

P0016



SCALE (IN FEET)
HORIZ 0 20 40 80
VERT 0 5 10 15 20

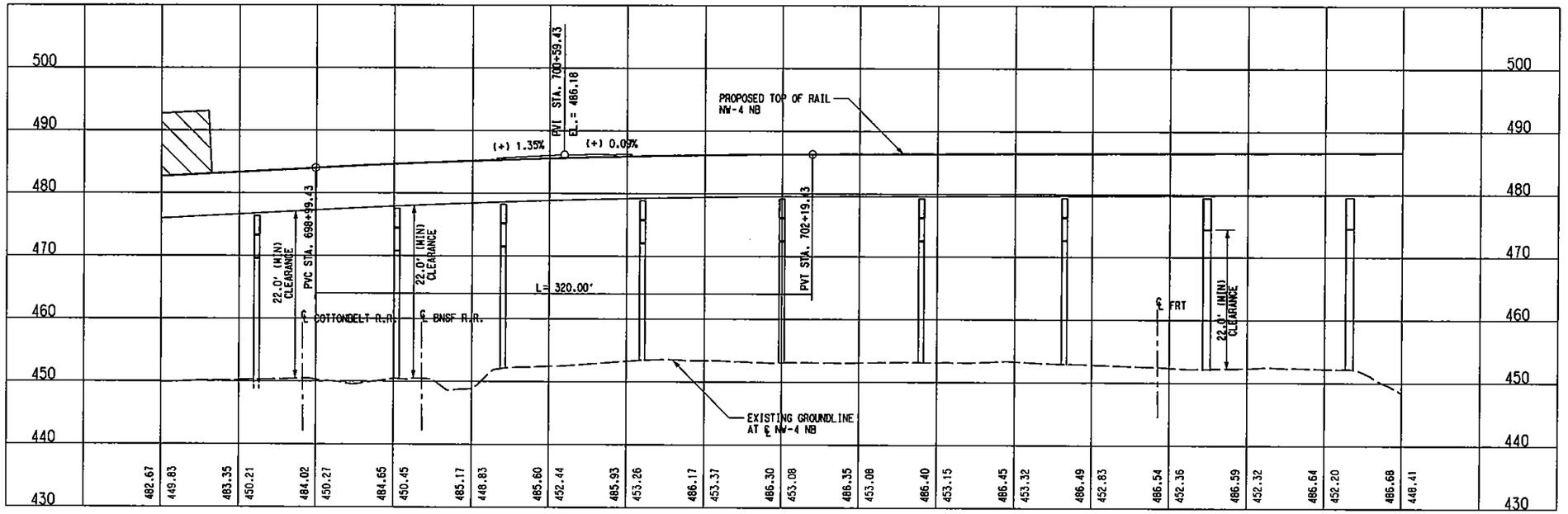
NW4-E (NB)	
Rc =	12400.00'
Ls =	100.00'
Lc =	200.84'
Ea =	0.50"
Eu =	0.86"
V =	65 MPH

NW4-EE (SB)	
Rc =	12400.00'
Ls =	100.00'
Lc =	200.84'
Ea =	0.50"
Eu =	0.86"
V =	65 MPH

NW4-F (NB)	
Rc =	12400.00'
Ls =	100.00'
Lc =	200.84'
Ea =	0.50"
Eu =	0.86"
V =	65 MPH

NW4-FF (SB)	
Rc =	12400.00'
Ls =	100.00'
Lc =	200.84'
Ea =	0.50"
Eu =	0.86"
V =	65 MPH

F-6	
Dc =	14°20'
Ls =	0.00'
Lc =	537.87'
Ea =	0.50"
Eu =	0.50"
V =	10 MPH



LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STATION CONCOURSE/ PLATFORM

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 202 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 698+00 TO STA 706+00

CONTRACT C-937775-1 | DWG No. CB2-4016 | REV

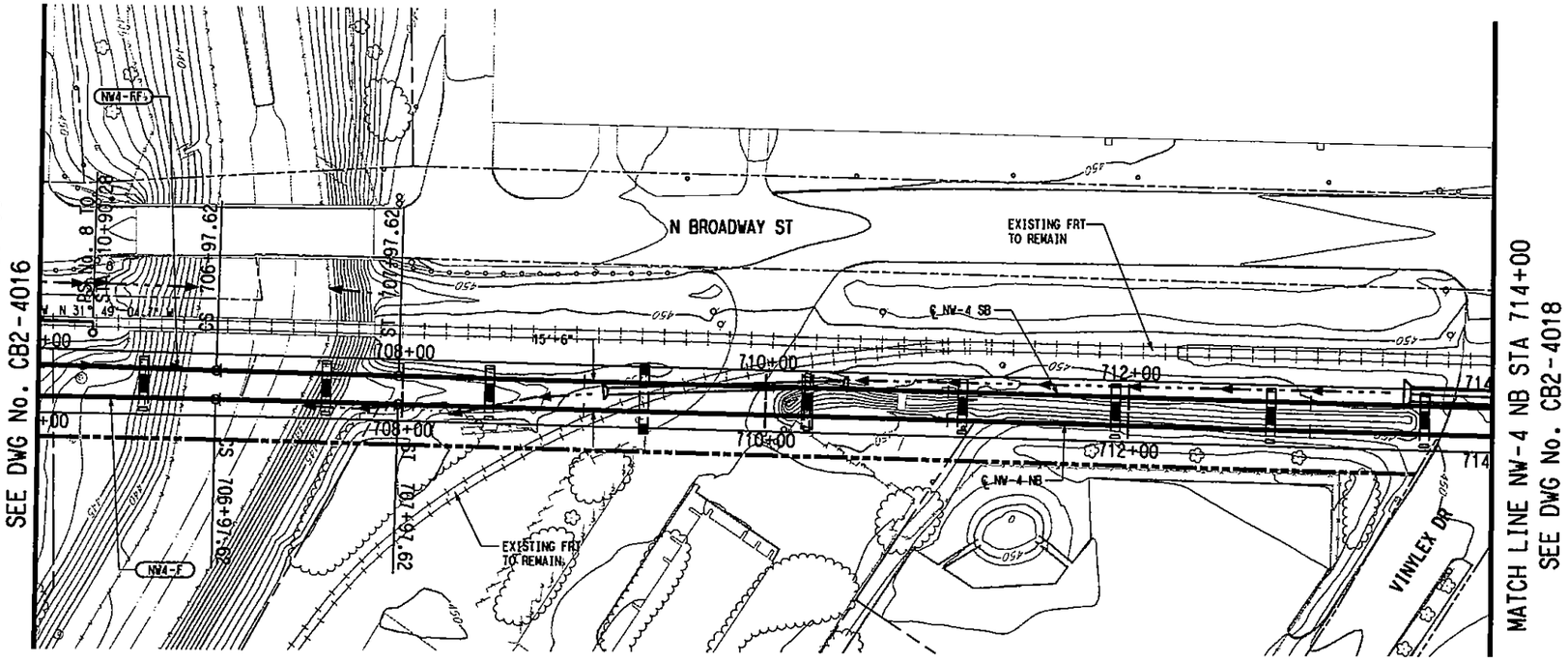
LIGN, R:\NW4X\nw4xalr1.040, 1-35,37-61
DW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xptr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xipr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45
SITE, R:\NW4X\nw4xspr1.040, 15-18,33,34,45
BRPL, R:\NW4X\NW4XBRR1.040, 6-10,15-17

PRF ROTATION=0.000000
R:\NW4X\DGN\Civil-AQ\nw4xalr2.040
Fri Nov 15 08:52:33 2002
R:\NW4X\prf\nw4xalr2.prf
DBROWN

DWG No. CB2-4017

P0017

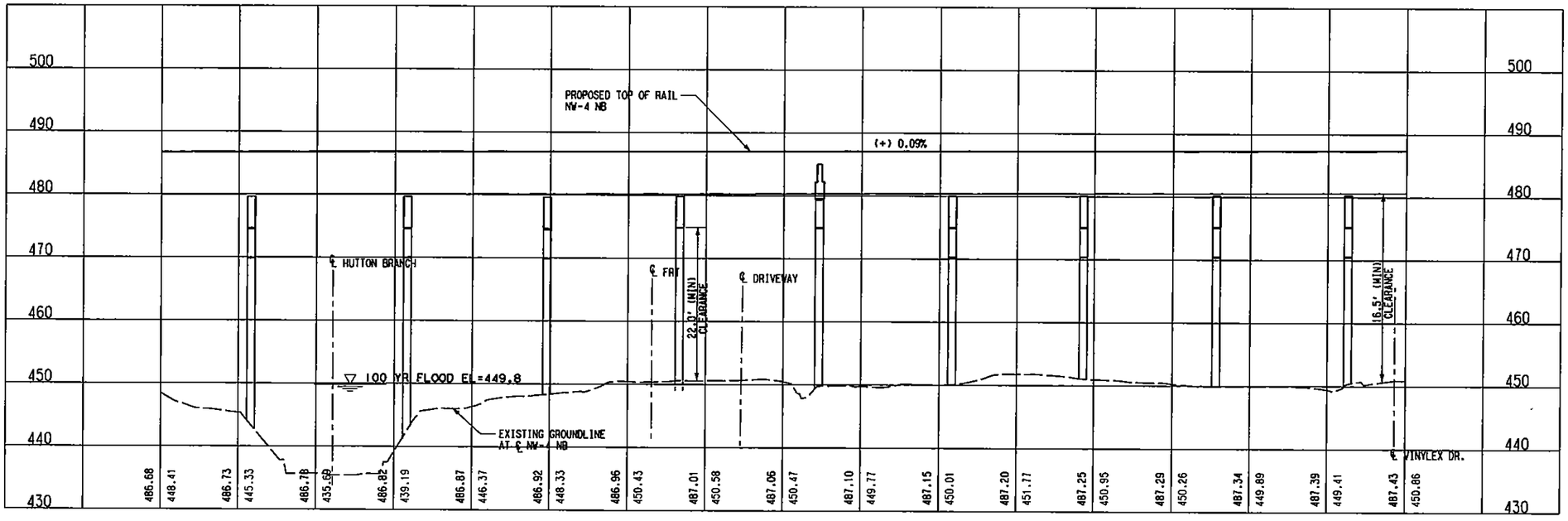


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-F (NB)		NW4-FF (SB)	
Rc =	12400.00'	Rc =	12400.00'
Ls =	100.00'	Ls =	100.00'
Lc =	200.84'	Lc =	200.84'
Eq =	0.50"	Eq =	0.50"
Eu =	0.86"	Eu =	0.86"
V =	65 MPH	V =	65 MPH

NOTE:

1. FLOOD ELEVATION TAKEN FROM CARROLLTON MASTER DRAINAGE STUDY FOR THE CITY OF CARROLLTON, TEXAS BY NATHAN D. MAIER CONSULTING ENGINEERS, INC., AUGUST 1988.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84737 Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 203 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 706+00 TO STA 714+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4017	

R:\NW4X\DGN\Civil-AQ\nw4xsoil7.040

BORDER, R:\NW4X\nw4xbor1.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
PROW, R:\NW4X\nw4xpiri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
SITE, R:\NW4X\nw4xpri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
BRPL, R:\NW4X\nw4xutri.040, 12
LIGN, R:\NW4X\nw4xsoir1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xpiri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPDI, R:\NW4X\nw4xtpri.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutri.040, 12

R:\NW4X\DGN\Civil-AQ\nw4xsoil7.040
Fri Nov 15 08:53:41 2002
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DBROWN

PRF ROTATION=0.000000
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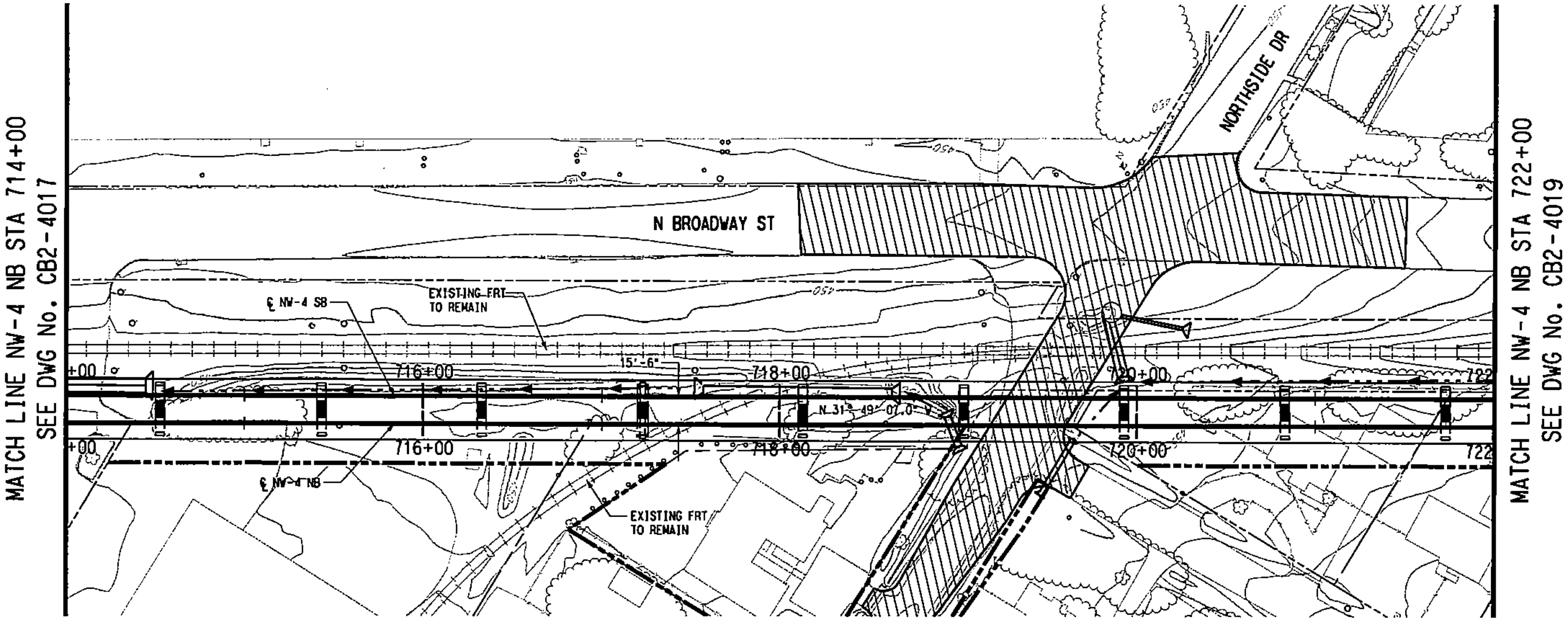
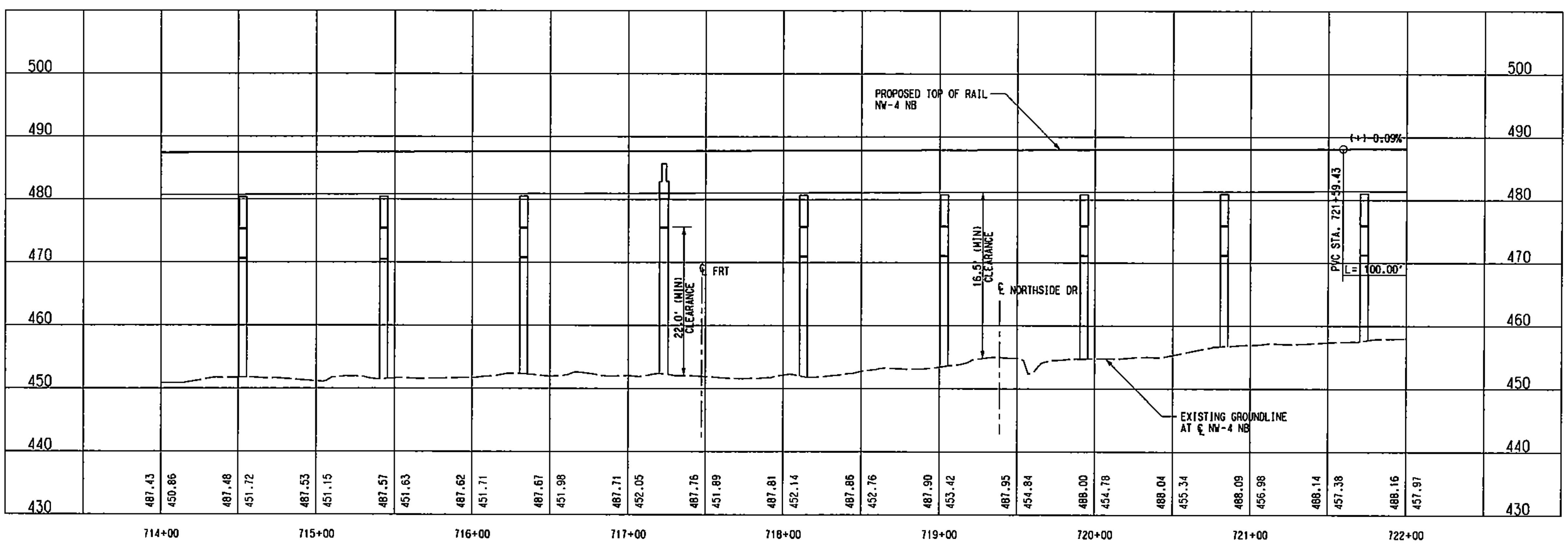


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 204 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

DARTCADD

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

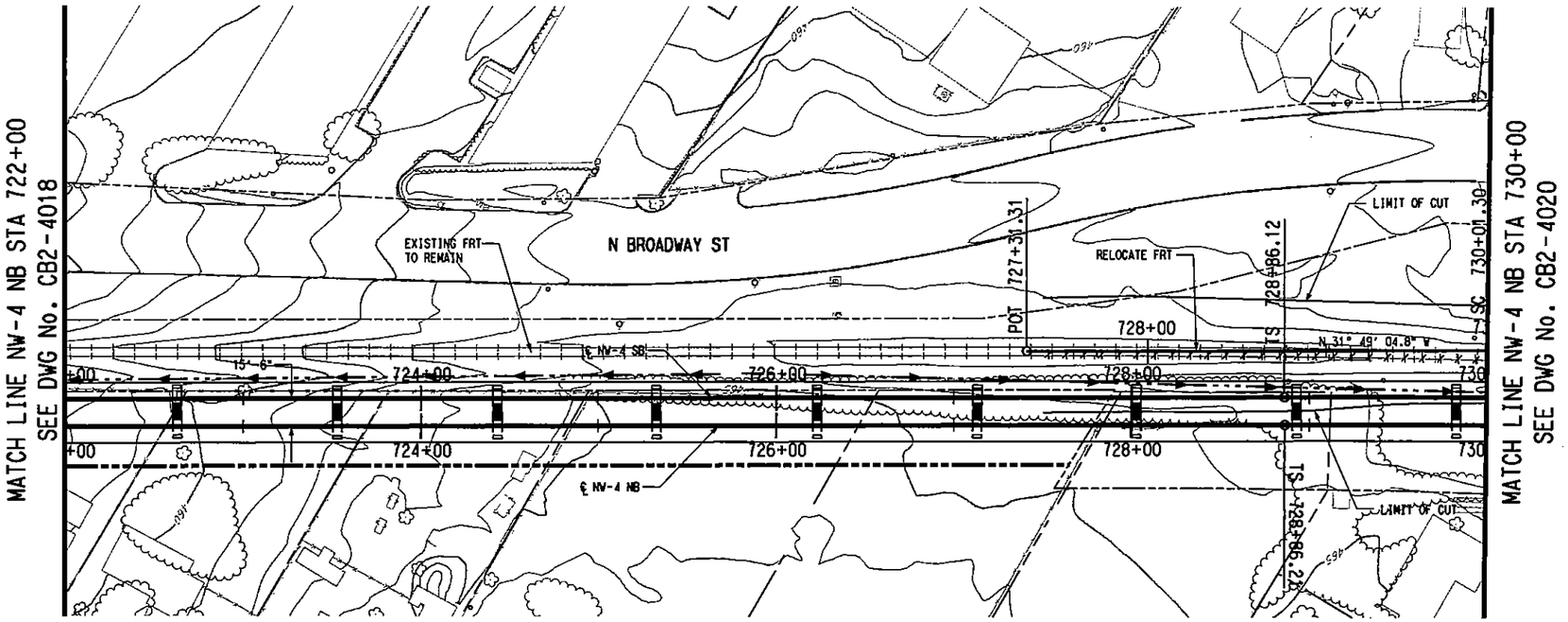
GUIDEWAY PLAN AND PROFILE
STA 714+00 TO STA 722+00

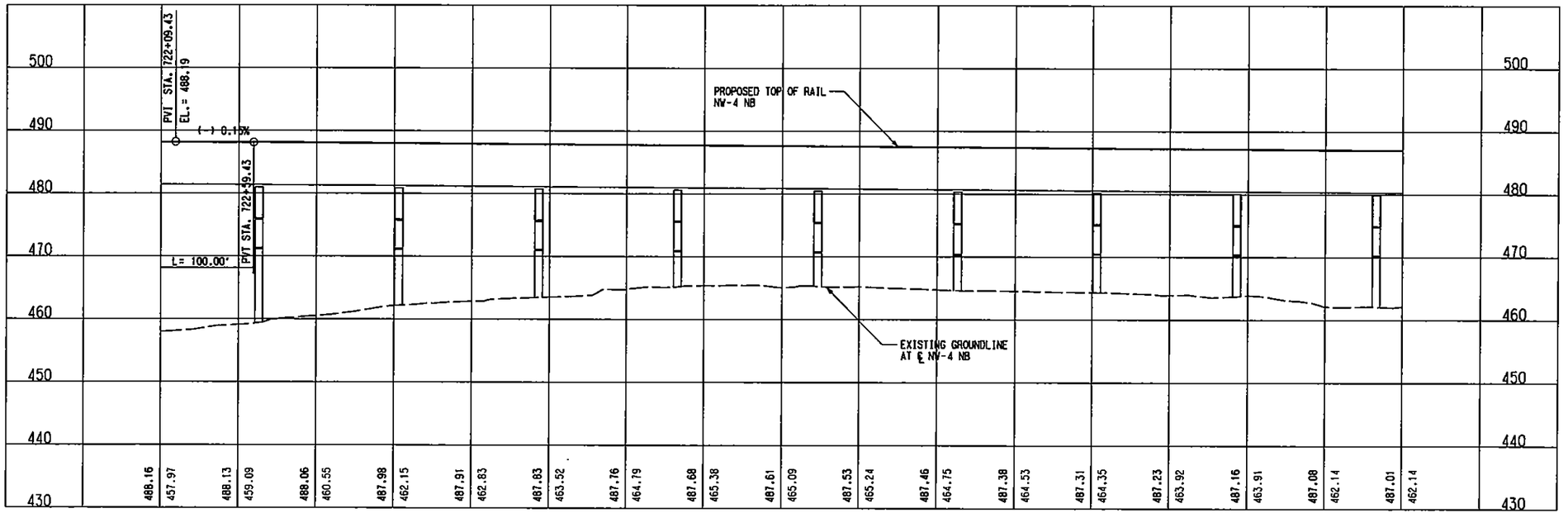
CONTRACT C-937775-1 | DWG No. CB2-4018 | REV

R:\NW4X\DGN\Cvl-AG\nw4xal18.040
Wed Jan 8 11:53:46 2003
DBROWN

DWG No. CB2-4019

P0019





NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64137
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1000

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 205 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

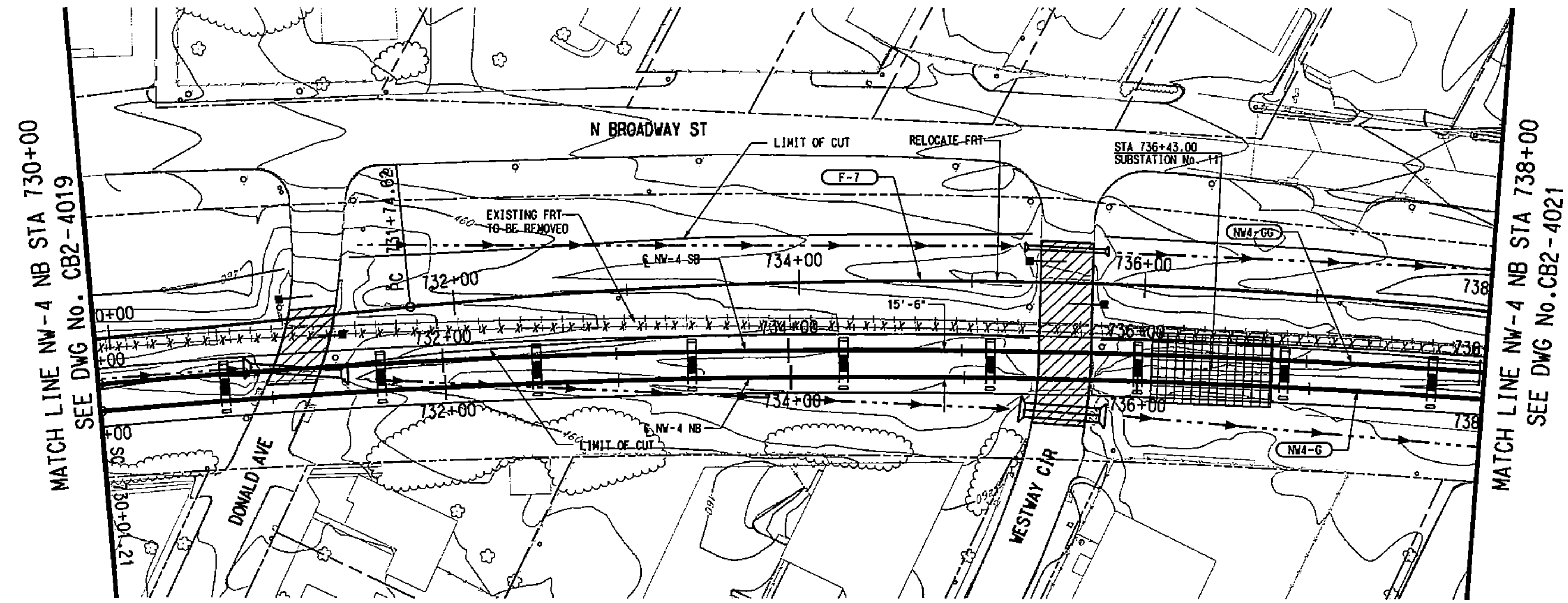
GUIDEWAY PLAN AND PROFILE
STA 722+00 TO STA 730+00

CONTRACT C-937775-1 | DWG No. CB2-4019 | REV

LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xpltr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\NW4XBRR1.040, 6-10,15-17

PRF ROTATION=0.000000
R:\NW4X\DGN\Cvl-AO\nw4xal19.040
Fri Nov 15 08:55:45 2002
R:\Nw4X\prf\nw4xal19.prf
OBROWN
R:\NW4X\DGN\Cvl-AO\nw4xal19.040



NW4-G (NB)	
Rc =	5000.00'
Ls =	115.00'
Lc =	1075.47'
Ea =	2.00"
Eu =	1.38"
V =	65 MPH

NW4-GG (SB)	
Rc =	5015.50'
Ls =	115.18'
Lc =	1078.98'
Ea =	2.00"
Eu =	1.37"
V =	65 MPH

F-7	
Dc =	1°55'
Ls =	0.00'
Lc =	714.25'
Ea =	1.50"
Eu =	1.22"
V =	45 MPH

SCALE (IN FEET) HORIZ 0 20 40 80
SCALE (IN FEET) VERT 0 5 10 15 20

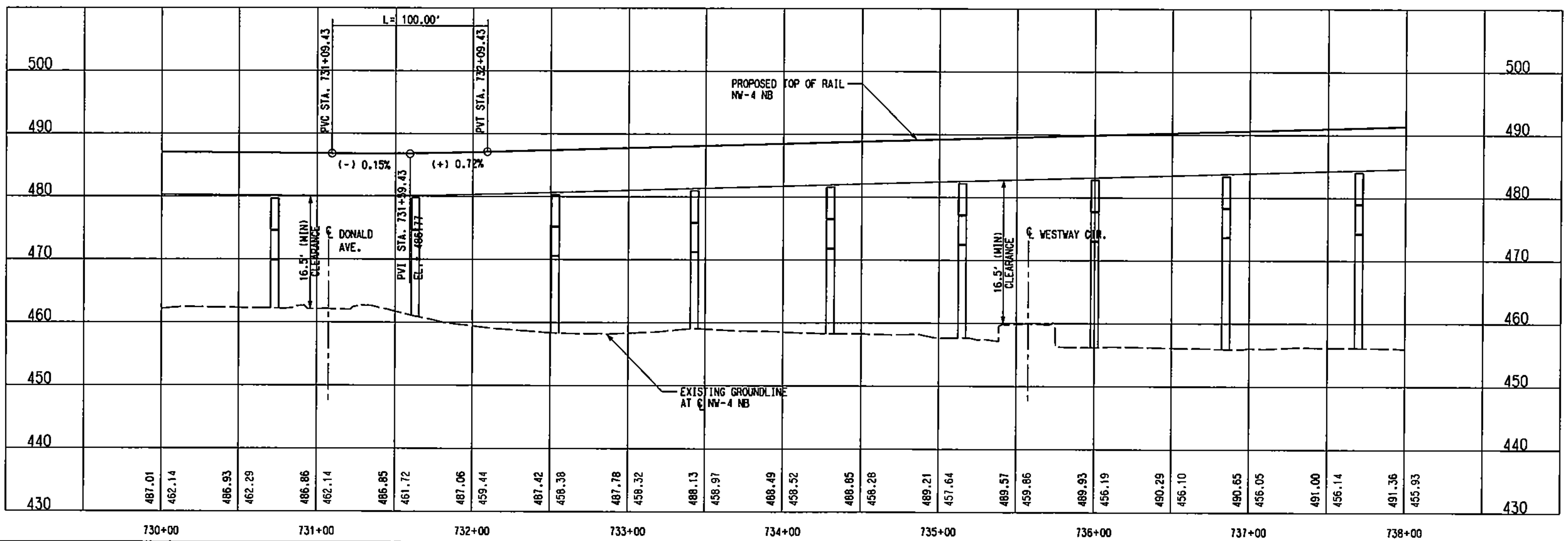
LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

GRADING FOR SYSTEM ELEMENTS

NOTE:

1. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 206 OF 243

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

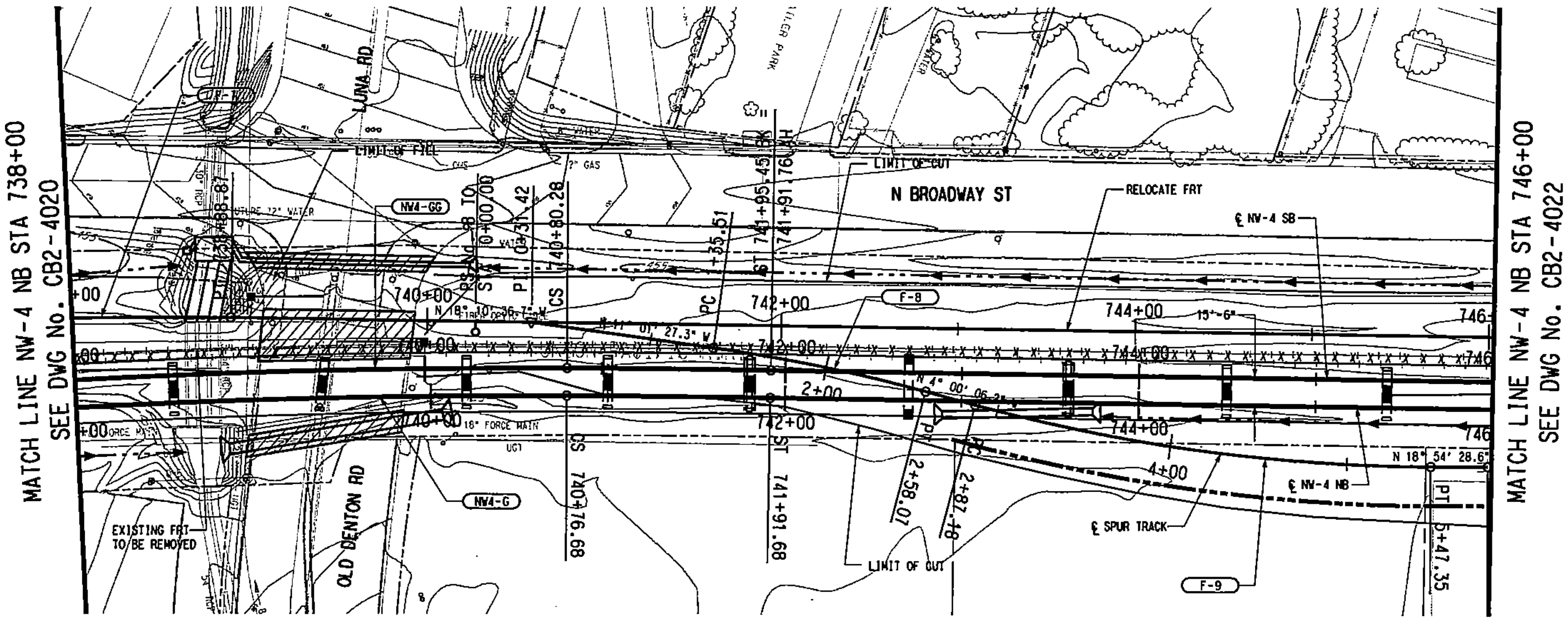
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

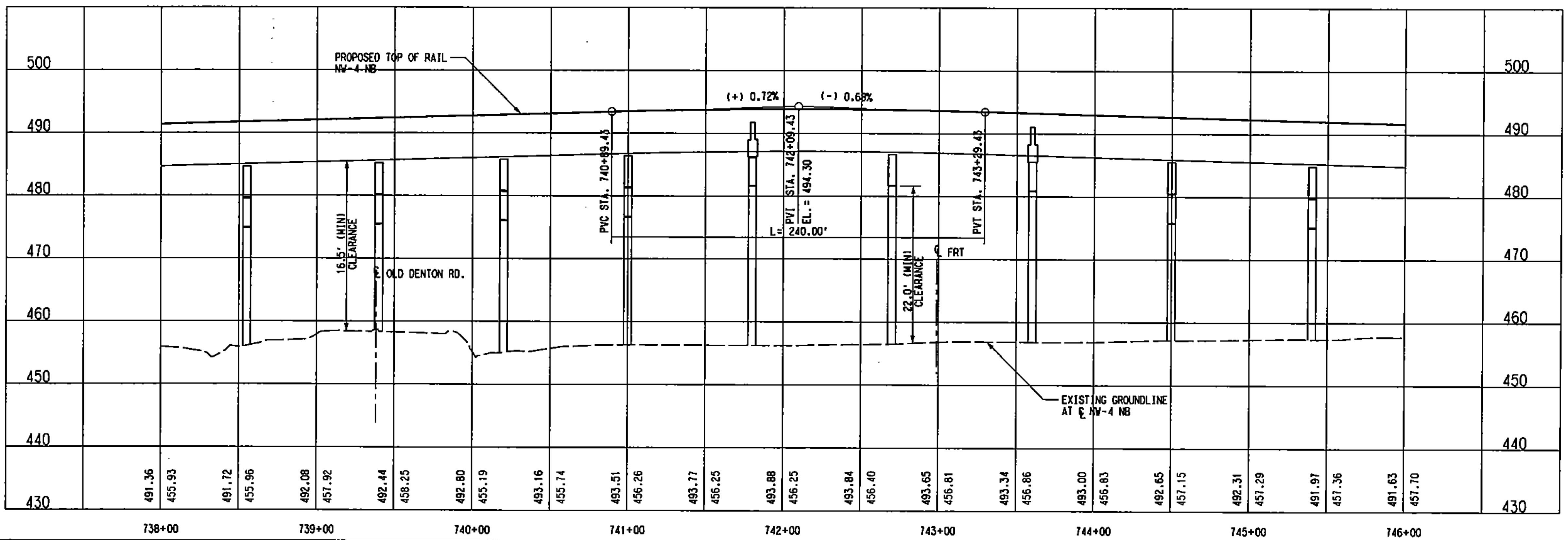
GUIDEWAY PLAN AND PROFILE
STA 730+00 TO 738+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4020	

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

R:\NW4X\DGN\Cvl-AQ\nw4xal20.040
Tue Nov 26 09:29:08 2002
R:\NW4X\prf\nw4xal20.prf
DBROWN





	NW4-G (NB)	NW4-GG (SB)
Rc =	5000.00'	5015.50'
Ls =	115.00'	115.18'
Lc =	1075.47'	1078.98'
Ea =	2.00"	2.00"
Eu =	1.38"	1.37"
V =	65 MPH	65 MPH

	F-7	F-8	F-9
Dc =	2°00'	5°45'	5°45'
Ls =	0'	0'	0'
Lc =	714.25'	122.57'	260.16'
Ea =	1.50"	2.00"	2.00"
Eu =	1.22"	1.61"	1.61"
V =	45 MPH	30 MPH	30 MPH

SCALE (IN FEET) HORIZ 0 20 40 80
SCALE (IN FEET) VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 207 OF 243

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1000

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 738+00 TO STA 746+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4021	

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

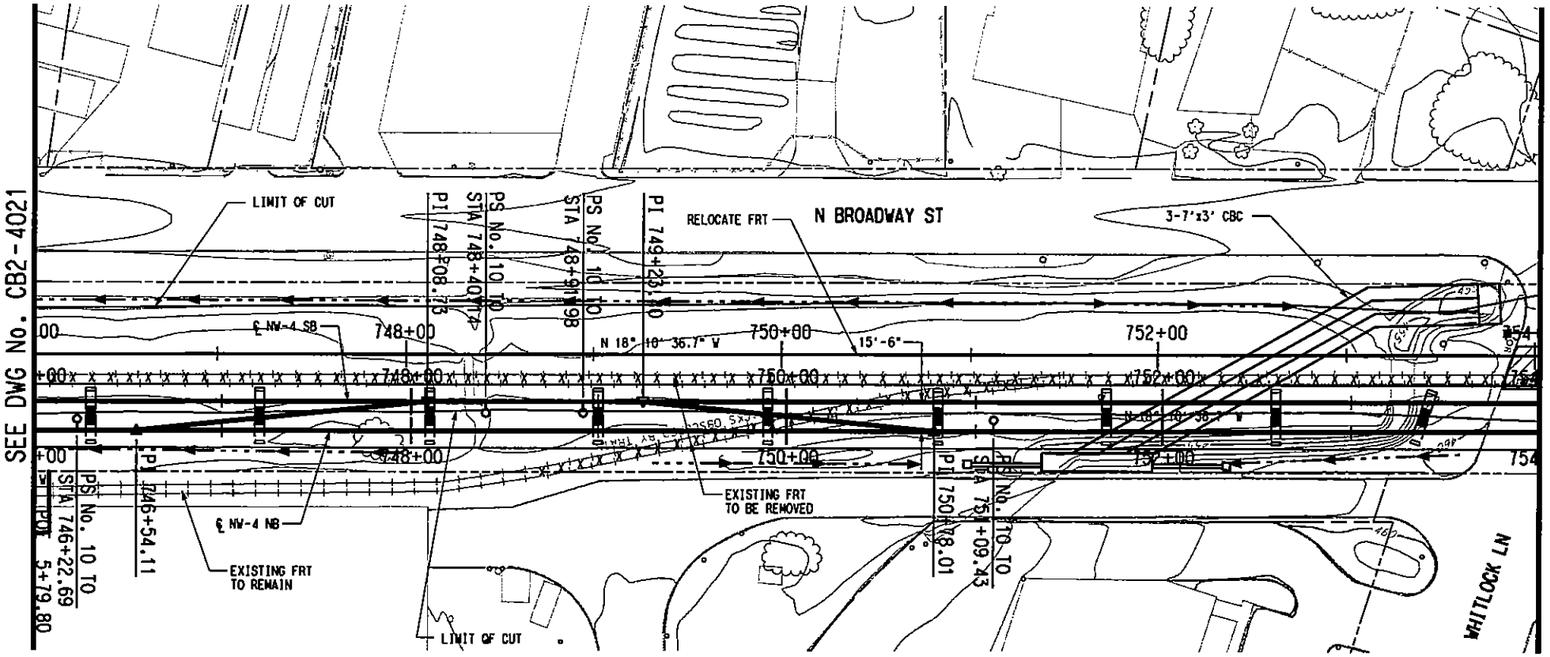
DWG No. CB2-4021

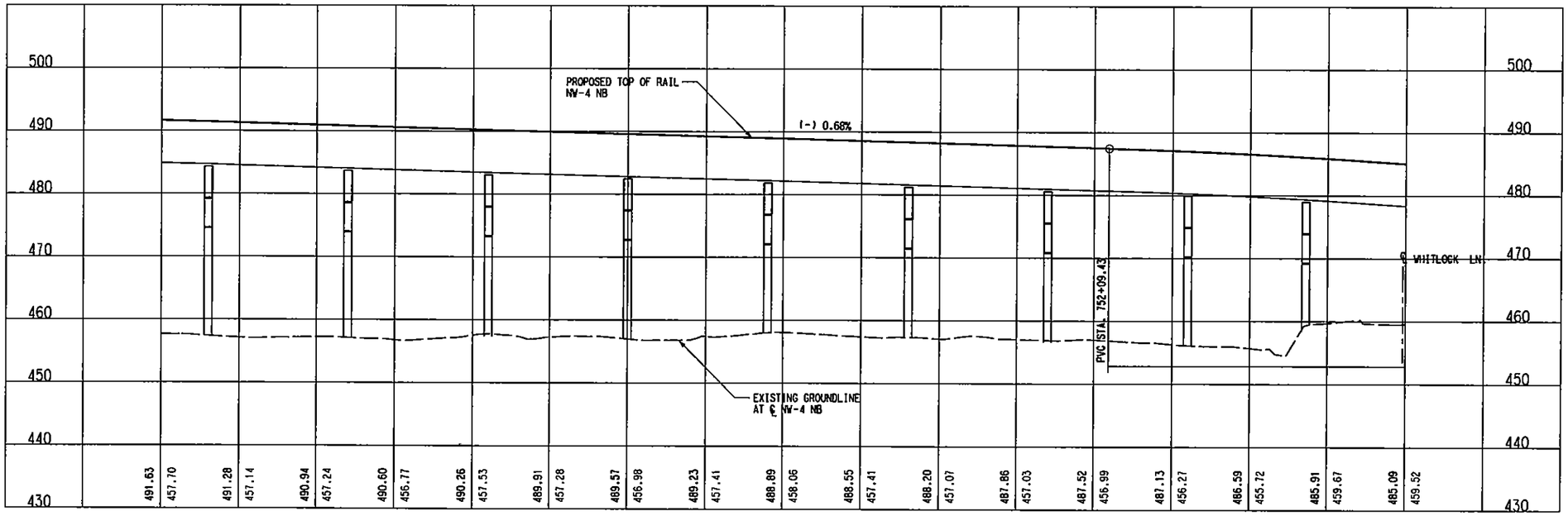
DWG No. CB2-4022

P0022

MATCH LINE NW-4 NB STA 746+00
SEE DWG No. CB2-4021

MATCH LINE NW-4 NB STA 754+00
SEE DWG No. CB2-4023





LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 208 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 746+00 TO 754+00

CONTRACT C-937775-1 | DWG No. CB2-4022 | REV

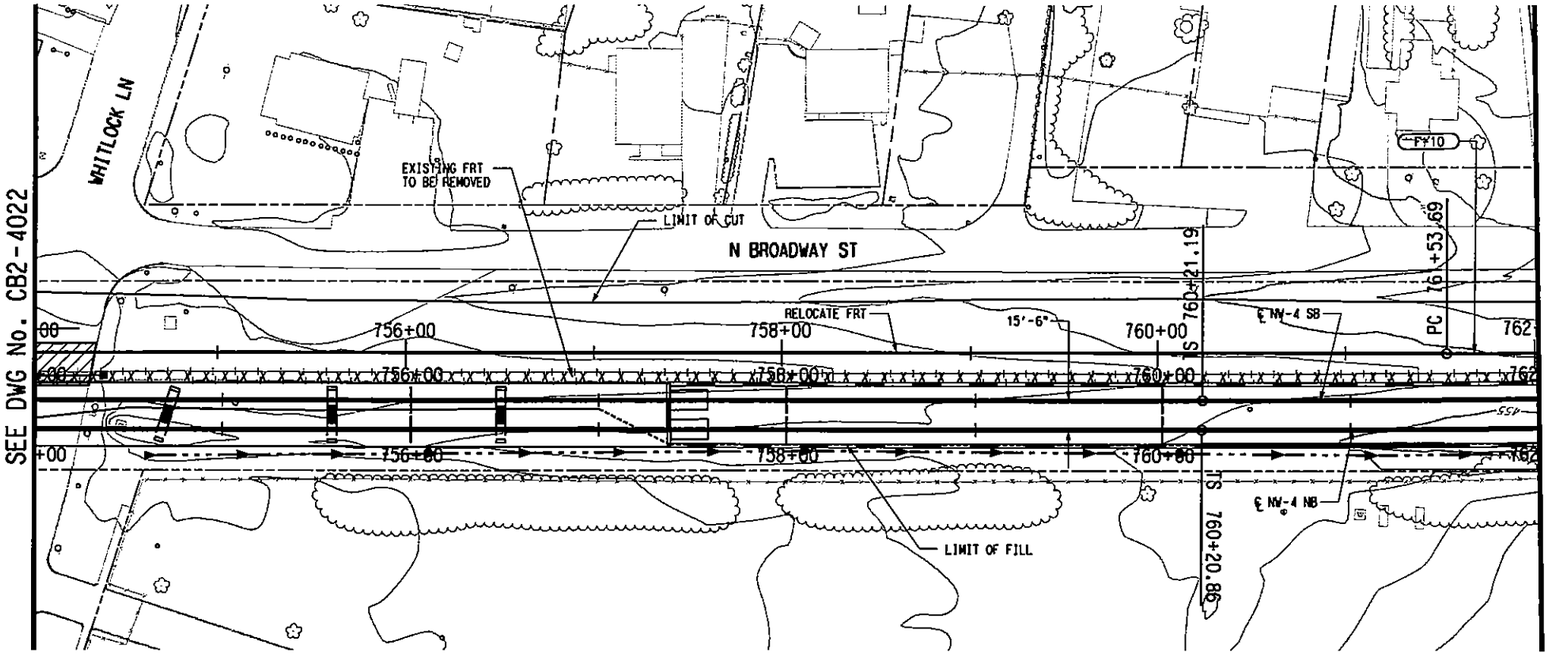
LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xptr1.040, 2-5,7-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,7-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-12,14-22,24-62
BORDER, R:\NW4X\nw4xborl.001, 1-3,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,46
SITE, R:\NW4X\nw4xcprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\NW4XBRRI.040, 6-10,13-17

R:\NW4X\DGN\Cvl-AO\nw4xal22.040
Fri Nov 15 08:58:49 2002
R:\Nw4X\prf\nw4xal22.prf
DBROWN

PRF ROTATION=0.000000
R:\NW4X\DGN\Cvl-AO\nw4xal22.040

P0023



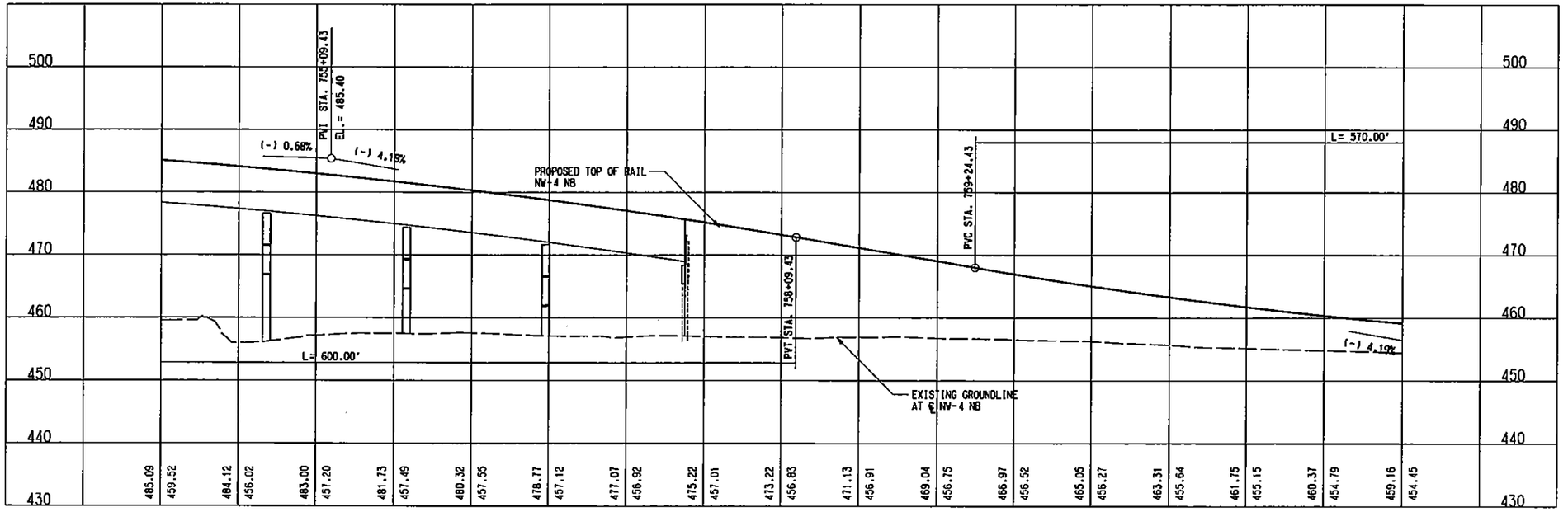
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

F-10

Dc =	2°00'
Ls =	0.00'
Lc =	1129.49'
Eo =	2.50"
Eu =	2.37"
V =	60 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 68153
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1000

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 209 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 754+00 TO STA 762+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4023	

LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xpir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtpir1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xsuir1.040, 12

BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47
SITE, R:\NW4X\nw4xcpir1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

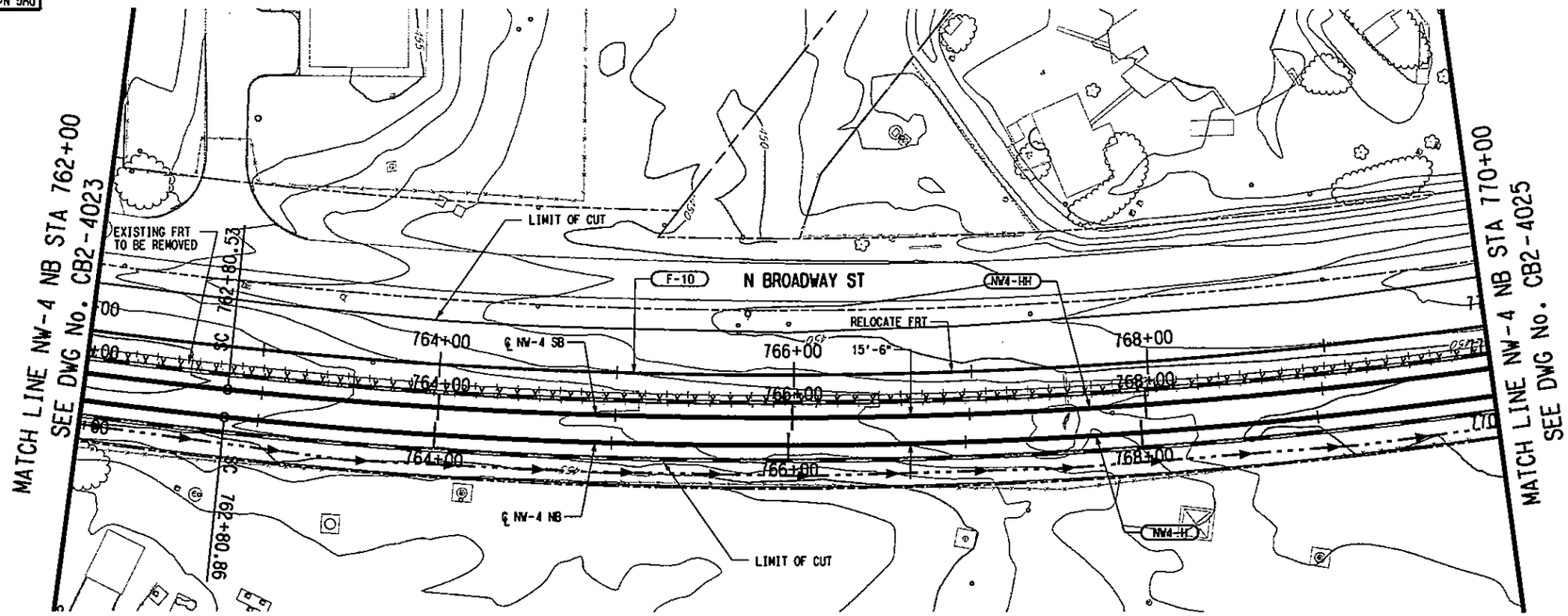
R:\NW4X\DGN\Cvl-AO\nw4xal23.040
Fri Nov 15 08:59:46 2002
R:\NW4X\prf\nw4xal23.prf
DBROWN

PRF ROTATION=0.000000
R:\NW4X\DGN\75PEOPLE\SMDARLE\Smdarl.tbl

R:\NW4X\DGN\Cvl-AO\nw4xal23.040

DWG No. CB2-4024

P0024

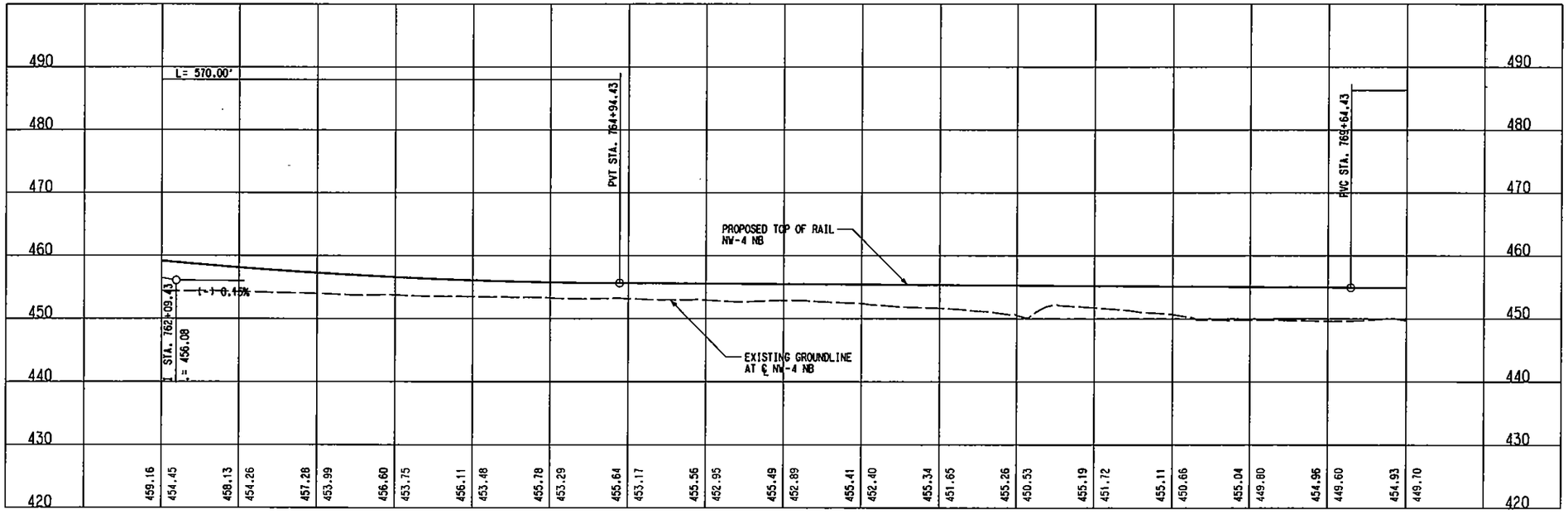


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-H (NB)	
Rc =	3000.00'
Ls =	260.00'
Lc =	884.95'
Eo =	4.00"
Eu =	1.63"
V =	65 MPH

NW4-HH (SB)	
Rc =	2984.50'
Ls =	259.34'
Lc =	879.70'
Eo =	4.00"
Eu =	1.66"
V =	65 MPH

F-10	
Dc =	2°00'
Ls =	0.00'
Lc =	1129.49'
Eo =	2.50"
Eu =	2.37"
V =	60 MPH



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 210 OF 243

REV	AMEND	CH	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 64151 Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 762+00 TO STA 770+00

CONTRACT C-937775-1 | DWG No. CB2-4024 | REV

R:\NW4X\DGN\Cvl-AO\nw4xa124.040
Fri Nov 15 09:00:45 2002
R:\Nw4X\prf\nw4xa124.prf
DBROWN

PRF ROTATION=0.000000
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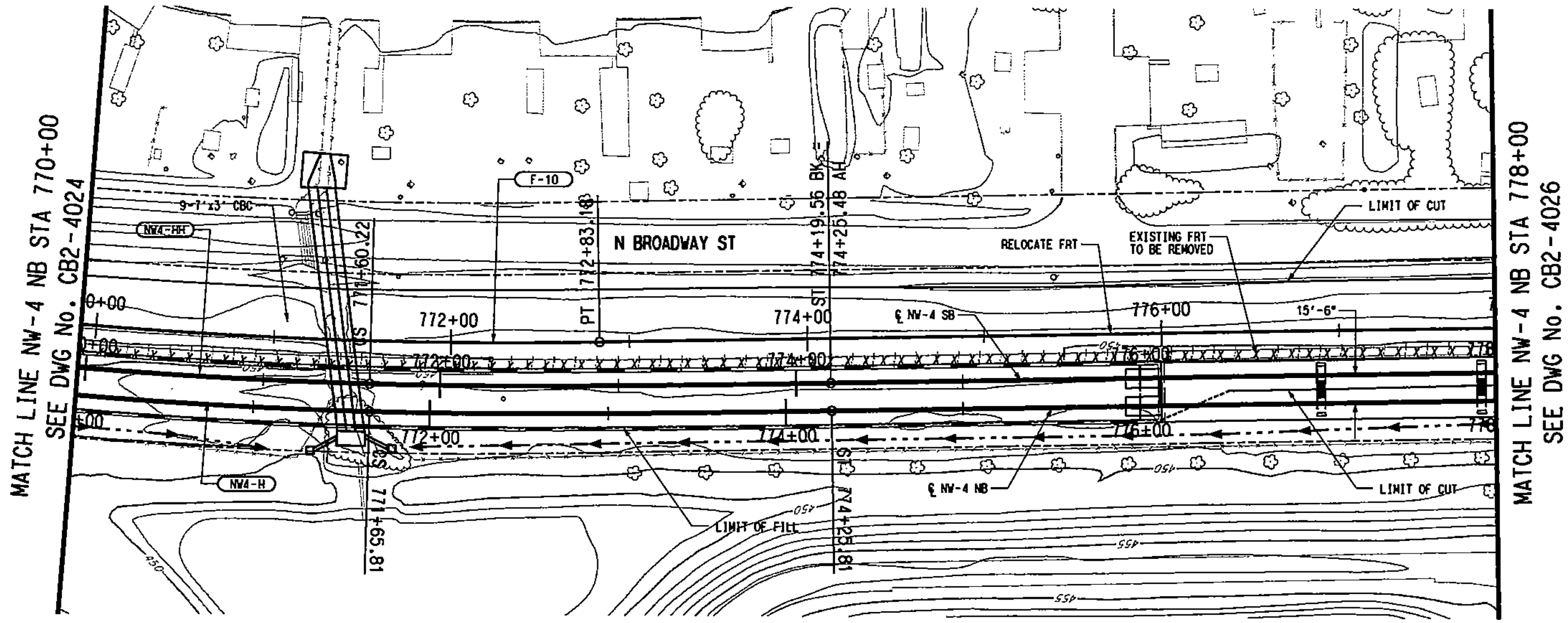
LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xplr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xulr1.040, 12

PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,13-17

R:\NW4X\DGN\Cvl-AO\nw4xa124.040

DWG No. CB2-4025

P0025



SCALE (IN FEET)

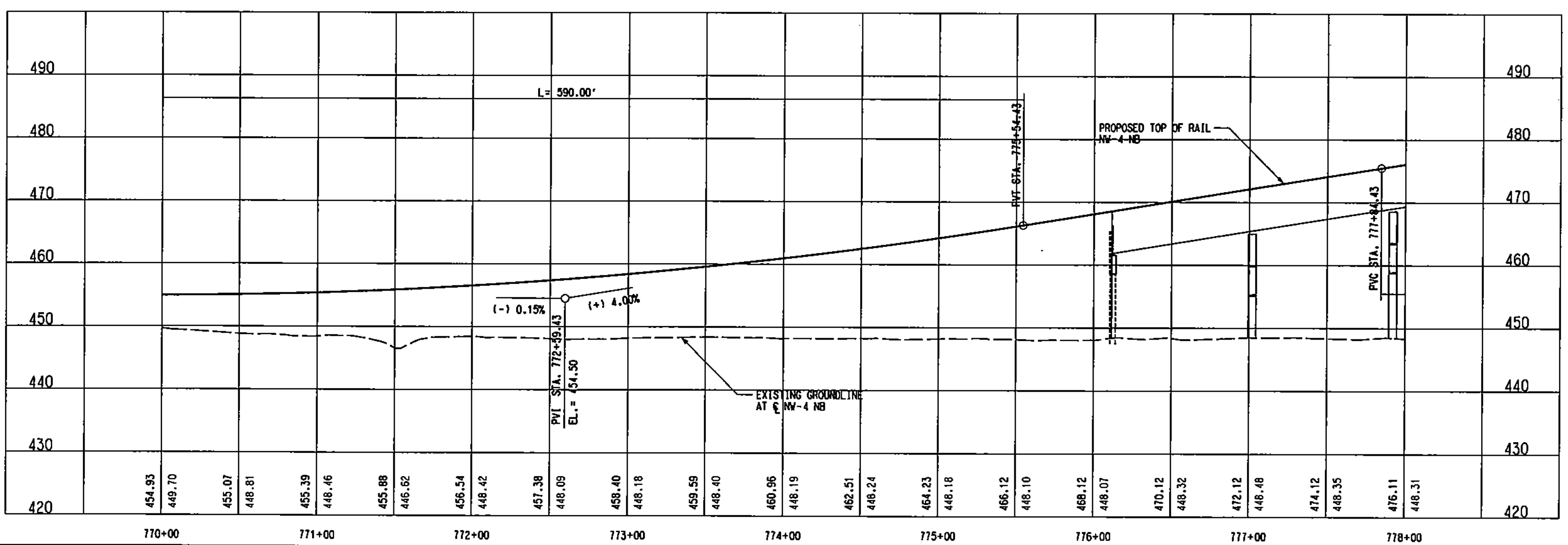
HORIZ 0 20 40 80

VERT 0 5 10 15 20

NW4-H (NB)	
Rc =	3000.00'
Ls =	260.00'
Lc =	884.95'
Ea =	4.00"
Eu =	1.63"
V =	65 MPH

NW4-HH (SB)	
Rc =	2984.50'
Ls =	259.34'
Lc =	879.70'
Ea =	4.00"
Eu =	1.66"
V =	65 MPH

F-10	
Dc =	2°00'
Ls =	0.00'
Lc =	1129.49'
Ea =	2.50"
Eu =	2.37"
V =	60 MPH



NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS

18770 N. DALLAS PKWY, SUITE 500 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 211 OF 243

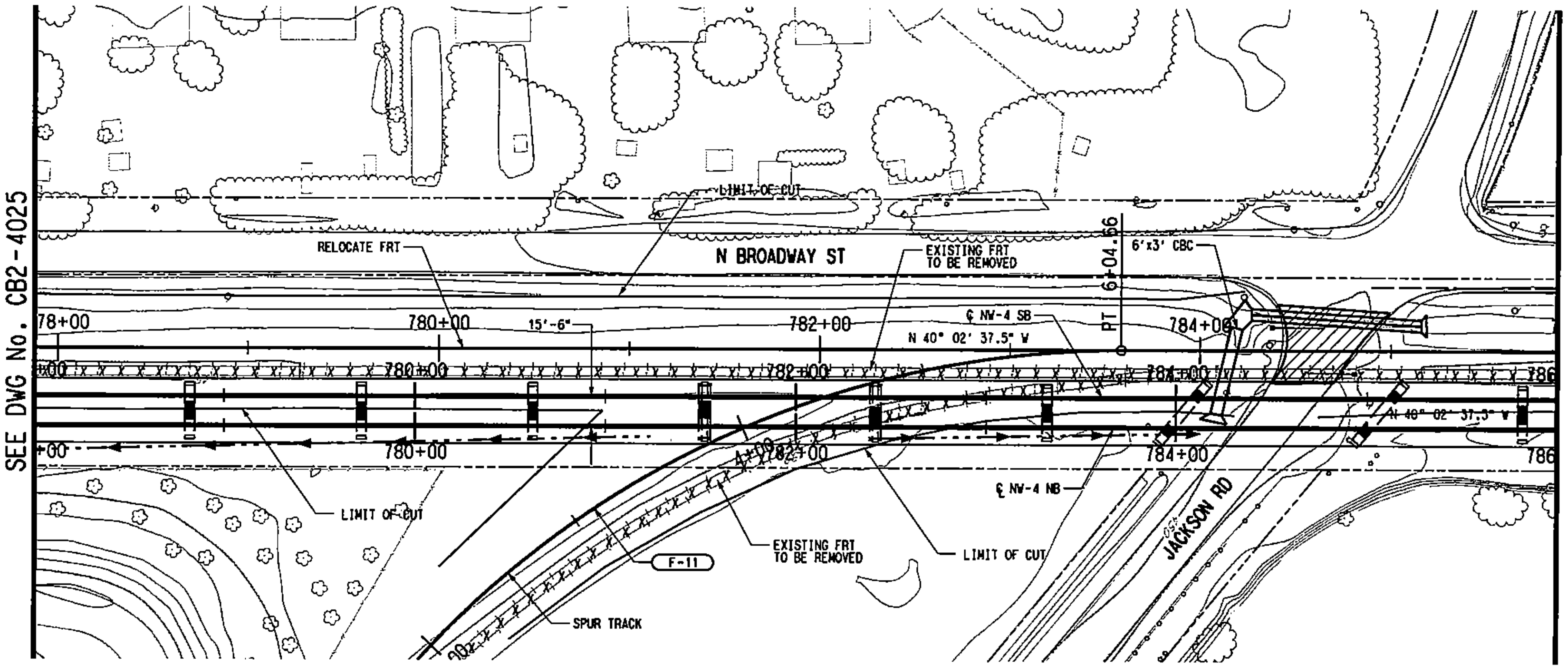
LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 770+00 TO 778+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4025	

DWG No. CB2-4026

P0026



HORIZ SCALE (IN FEET) 0 20 40 80

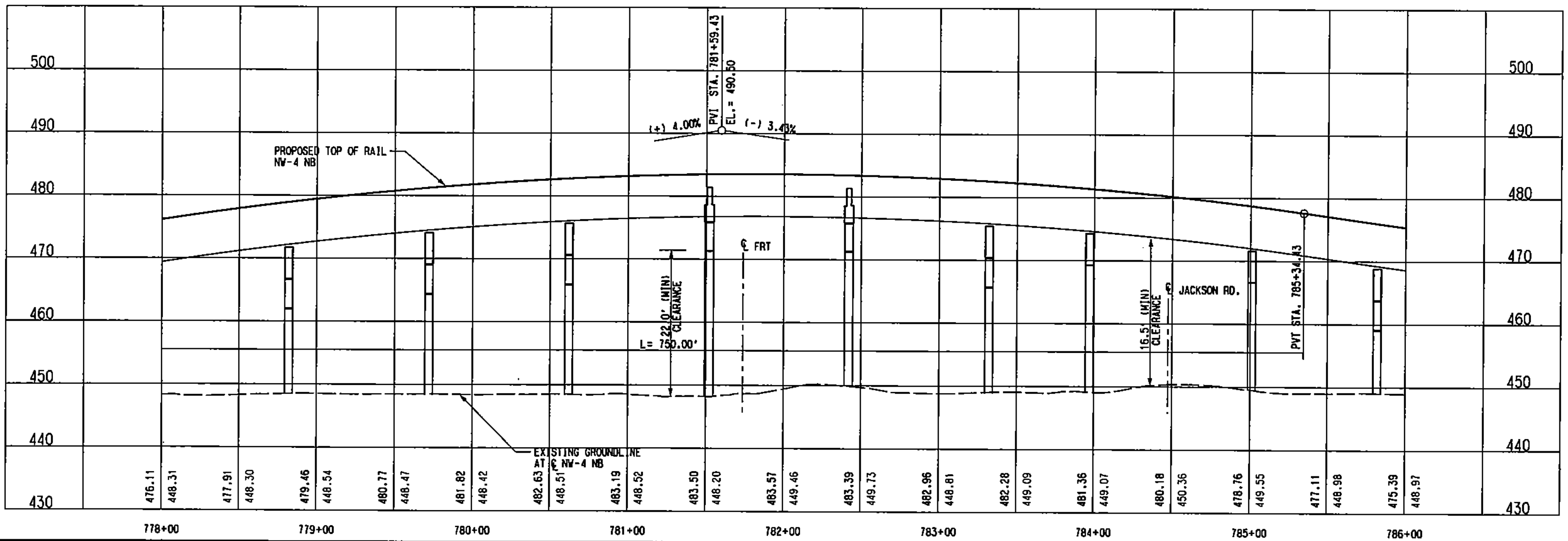
VERT SCALE (IN FEET) 0 5 10 15 20

F-11

Dc	=	11°30'
Ls	=	0.00'
Lc	=	516.36'
Ea	=	0.50"
Eu	=	0.30"
V	=	10 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING

PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 212 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS

NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y

Chiang, Patel & Yerby, Inc.

PARSONS

15770 N. DALLAS PKWY, SUITE 600 DALLAS, TEXAS 75248 (972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	B. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE STA 778+00 TO STA 786+00

CONTRACT C-937775-1

DWG No. CB2-4026

REV

R:\NW4X\DGN\Cvl-AG\nw4xal27.040
Fri Nov 15 09:03:39 2002
R:\NW4X\prf\nw4xal27.prf
DBROWN

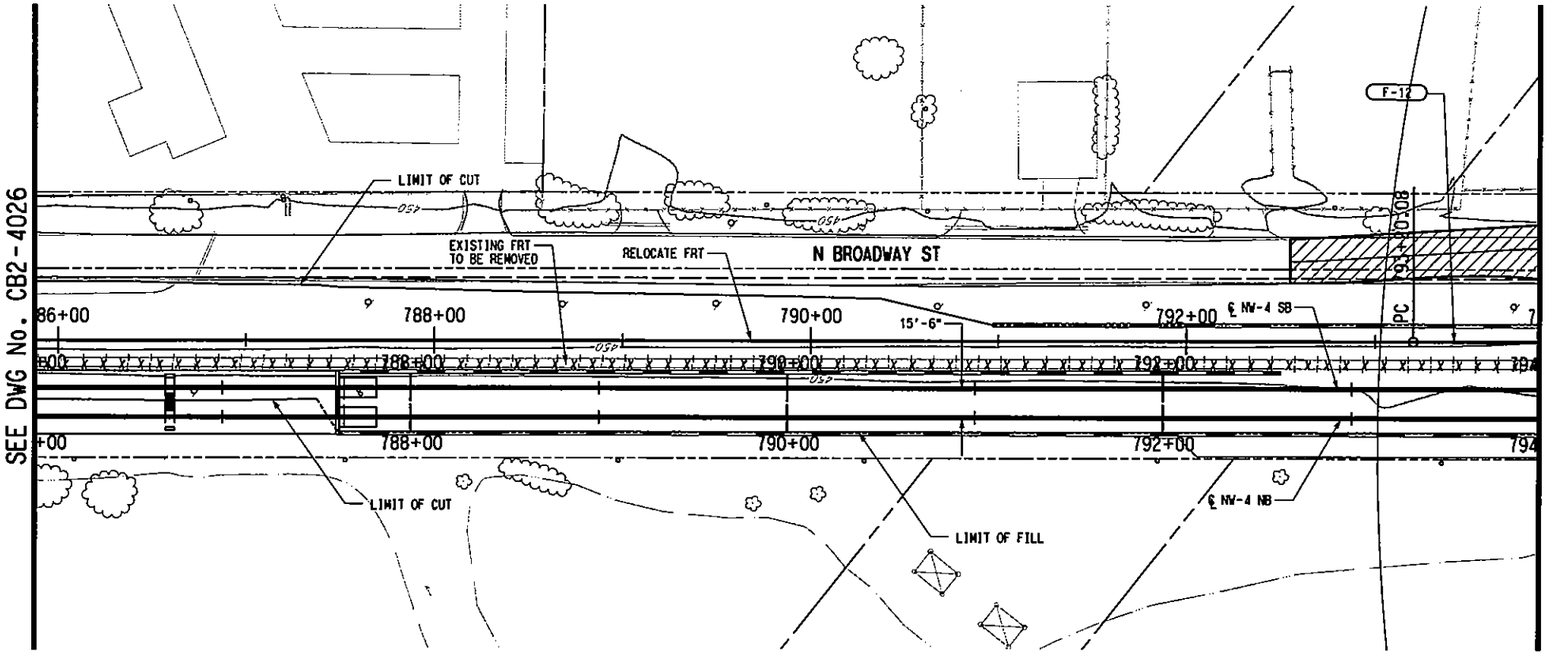
PRF ROTATION=0.000000
M:\ADOT\TYPEB\ABLE\Gmdorl.tbl

BORDER, R:\NW4X\nw4xbor1.001, 1-3,8,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xal2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

LIGN, R:\NW4X\nw4xal1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xpir1.040, 2-5,8,9,11,13-18,20,21,25,29,35,49,52
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

DWG No. C82-4027

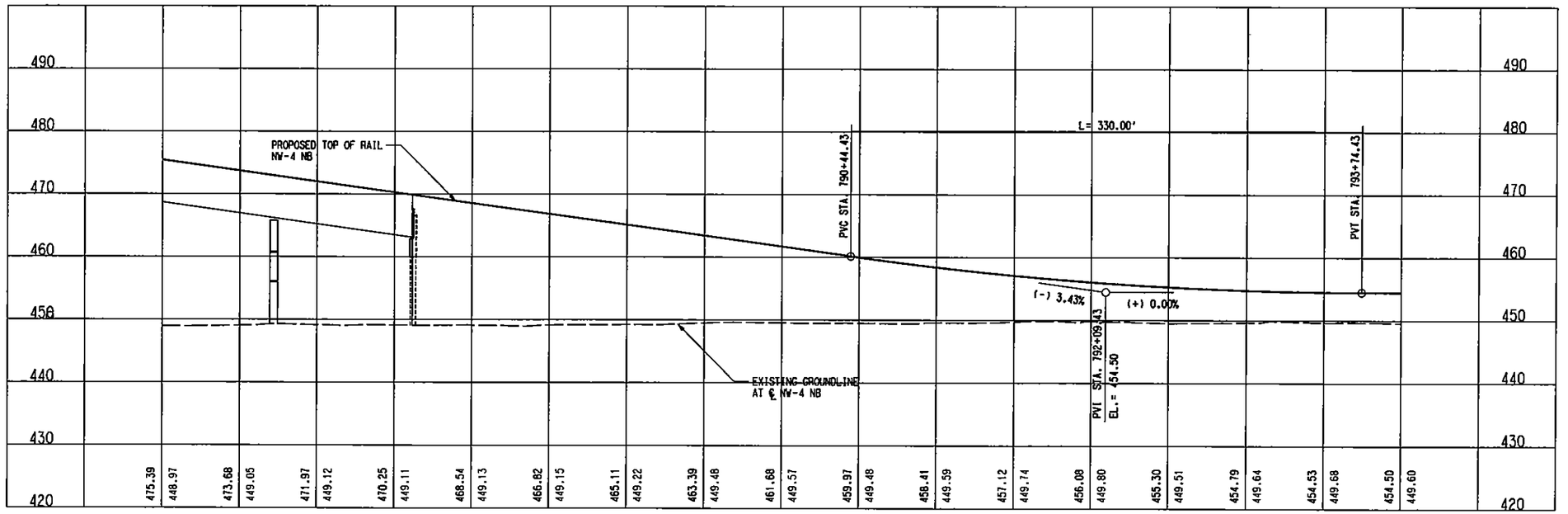
P0027



F-12	
Dc =	0°30'
Ls =	0.00'
Lc =	105.50'
Eq =	0.50"
Eu =	0.50"
V =	55 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81431
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

CONTRACT SHEET No. 213 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

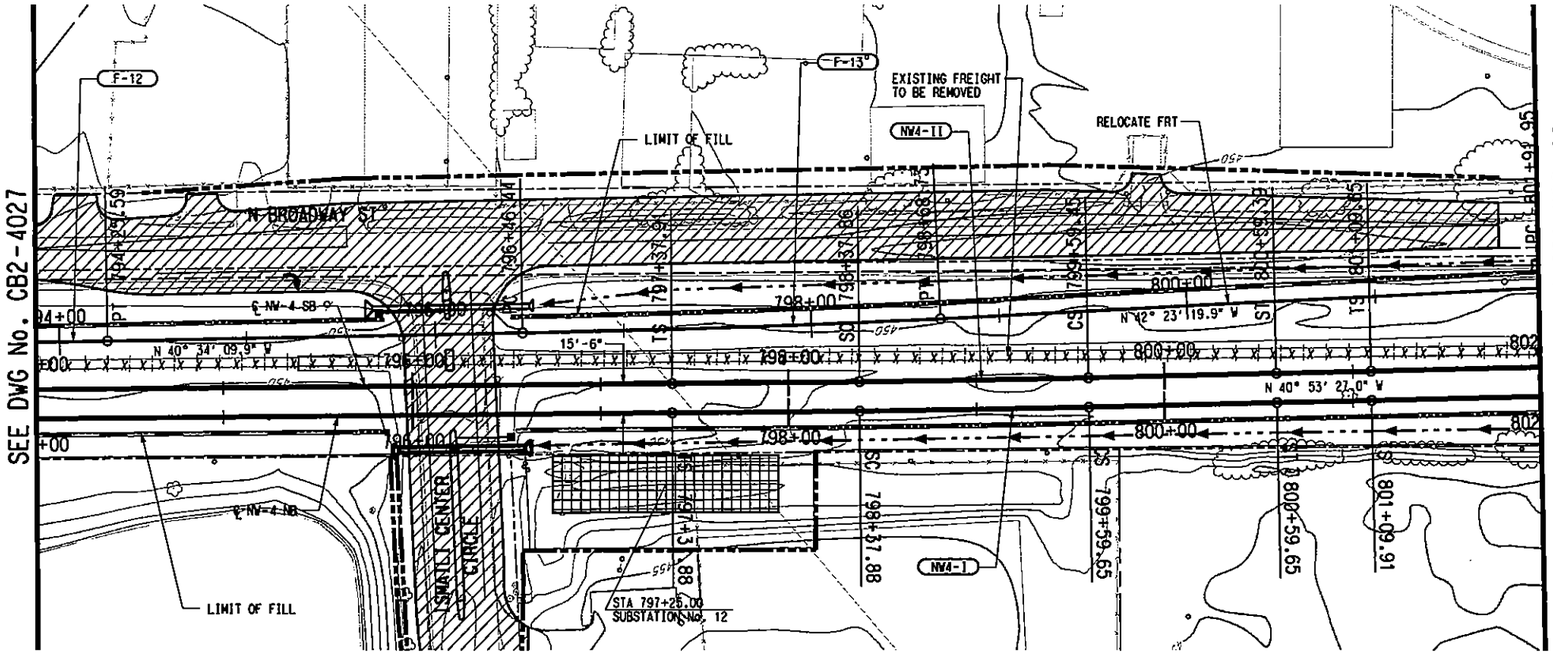
GUIDEWAY PLAN AND PROFILE
STA 786+00 TO STA 794+00

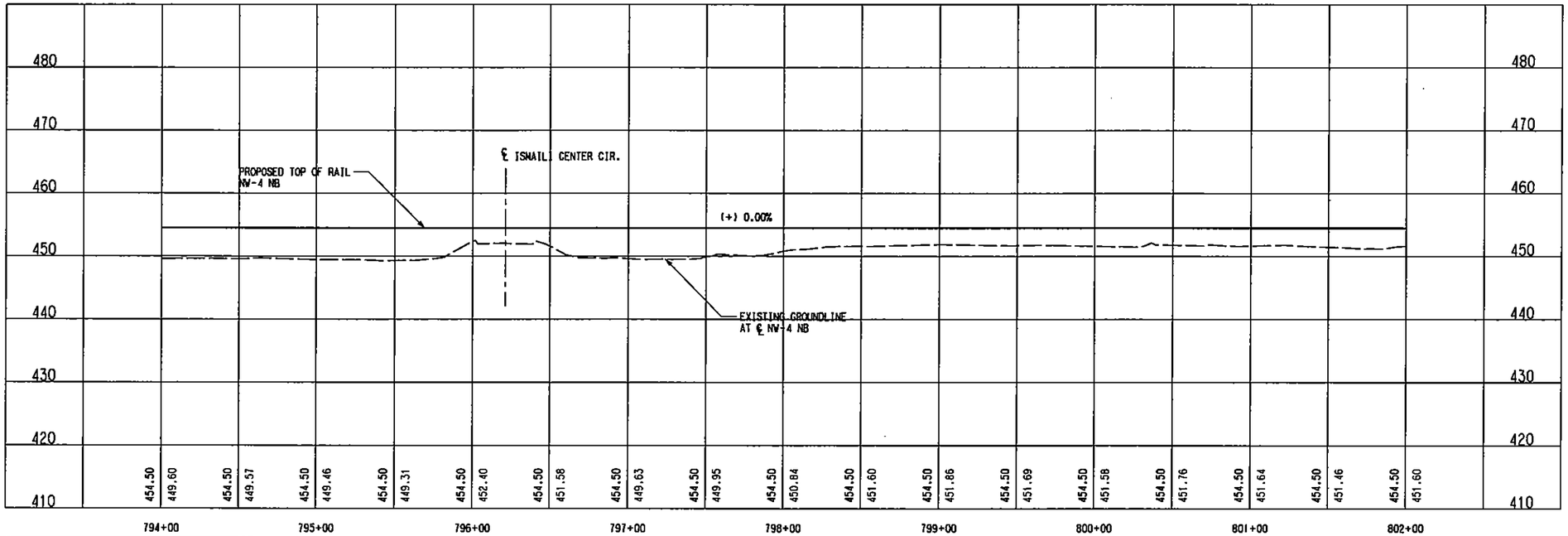
CONTRACT	DWG No.	REV
C-937775-1	CB2-4027	

R:\NW4X\DGN\Cvl-AG\nw4xal27.040

DWG No. C82-4028

P0028





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-I (NB)	
Rc =	15000.00'
Ls =	100.00'
Lc =	121.76'
Eo =	0.50"
Eu =	0.63"
V =	65 MPH

NW4-II (SB)	
Rc =	14984.50'
Ls =	99.95'
Lc =	121.59'
Eo =	0.50"
Eu =	0.63"
V =	65 MPH

F-12	
Dc =	0°30'
Ls =	0.00'
Lc =	105.50'
Eo =	0.50"
Eu =	0.50"
V =	55 MPH

F-13	
Dc =	0°50'
Ls =	0.00'
Lc =	222.29'
Eo =	1.00"
Eu =	1.00"
V =	55 MPH

LEGEND

GRADING FOR SYSTEM ELEMENTS

STREET/ALLEY/ DRIVE RECONSTRUCTION

NOTE:

1. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 214 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 794+00 TO STA 802+00

CONTRACT C-937775-1 | DWG No. C82-4028 | REV

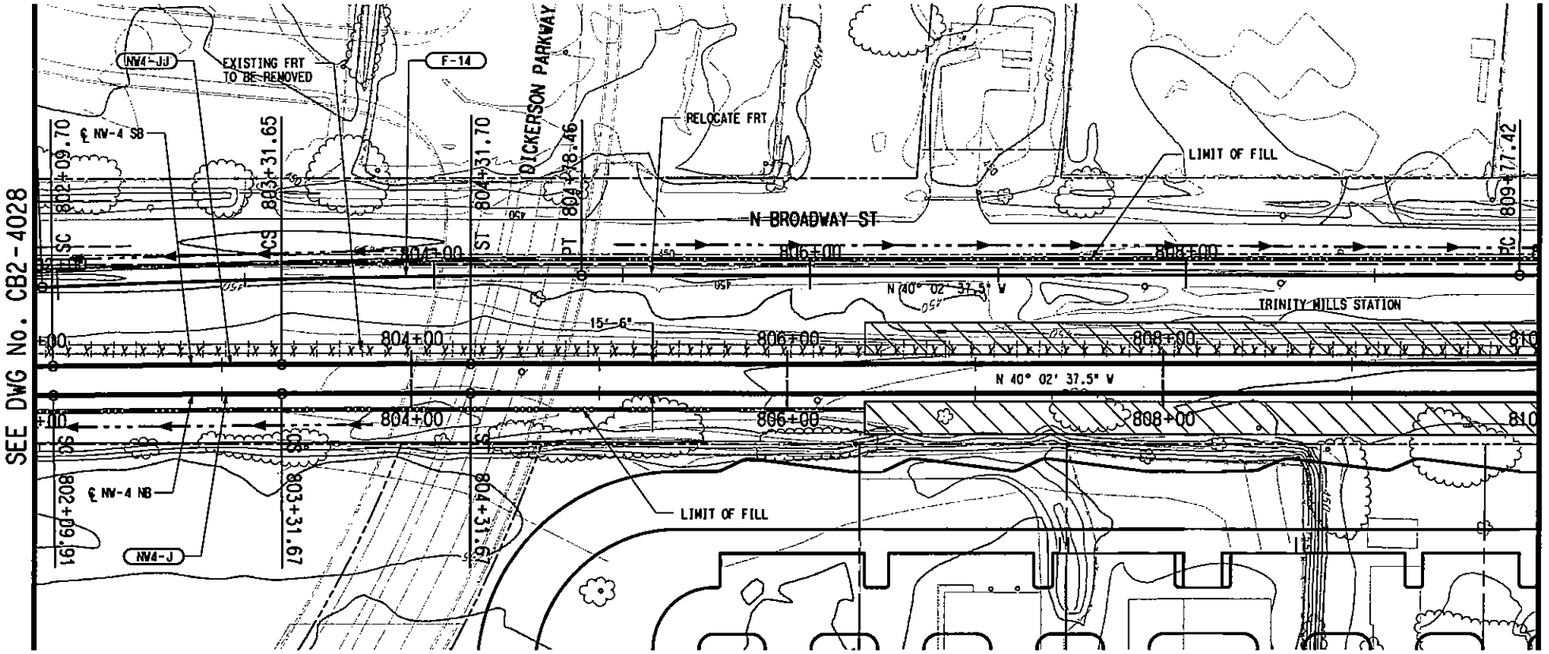
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROV, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,45,47,48,50,52
SITE, R:\NW4X\nw4xcpr1.040, 2-5,8,9,11,13-18,20,21,25,29,31,35,49,52
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,13-17
LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
XPTOPO, R:\NW4X\nw4xplr1.040, 2-5,8,9,11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xipr1.040, 2,3,5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

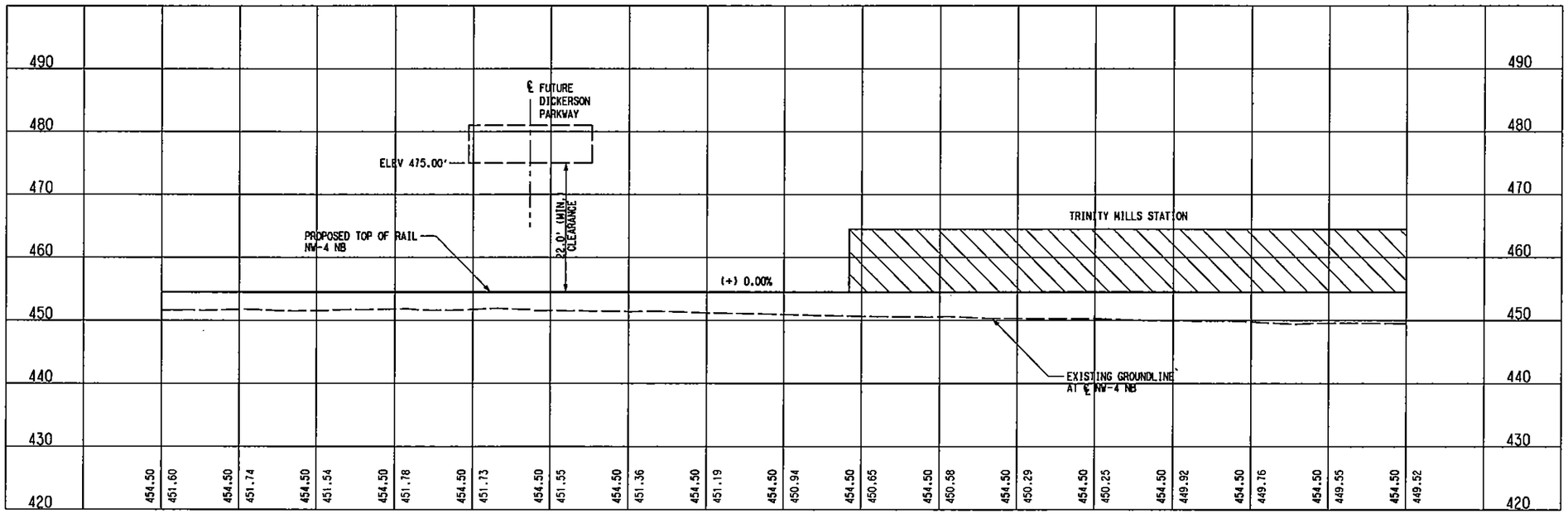
R:\NW4X\DGN\Cvl-AO\nw4xal28.040
Fri Nov 15 09:04:41 2002
R:\NW4X\prf\nw4xal28.prf
DBROWN
PRF ROTATION=0.000000
R:\ADWS75.PE93ABLE\Smderr1.tbl

R:\NW4X\DGN\Cvl-AO\nw4xal28.040

DWG No. CB2-4029

P0029





NW4-J (NB)	
Rc =	15000.00'
Ls =	100.00'
Lc =	121.77'
Eo =	0.50'
Eu =	0.63'
V =	65 MPH

NW4-JJ (SB)	
Rc =	15015.50'
Ls =	100.05'
Lc =	121.95'
Eo =	0.50'
Eu =	0.63'
V =	65 MPH

F-14	
Dc =	0°30'
Ls =	0.00'
Lc =	286.51'
Eo =	1.00"
Eu =	1.00"
V =	55 MPH

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION

STATION CONCOURSE/ PLATFORM

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	CHG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81157
Date: 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 215 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 802+00 TO STA 810+00

CONTRACT C-937775-1 | DWG No. CB2-4029 | REV

LIGN, R:\NW4X\nw4xalr1.040, 1-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
XPTOPO, R:\NW4X\nw4xplr1.040, 2-5,8,9,11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xlpr1.040, 2-5,8-11,13-16,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1,3-9,11,13-21,23-28,30,32-34,37,39,40,42,43,48,50,51,53,54,58-63
SITE, R:\NW4X\nw4xepr1.040, 1,7,8,13,15-17,20,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

R:\NW4X\DGN\Cv1-AQ\nw4xal29.040
Fri Nov 15 09:05:37 2002
R:\Nw4X\prr\nw4xal29.prf
DBROWN

R:\NW4X\DGN\civil-AO\nw4xplr2.040, l-4,6-12,14-22,24-62
PRF ROTATION=0.000000
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l,3-9,11,13-17,19-21,23-28,30,33
R:\NW4X\prf\nw4xplr1.040, l-63
l,7,8,13,15,17-20,22,25-32,37,38,41-45,47-50,52,54,55,57-63
6-10,15-17

PROFILE, R:\NW4X\nw4xalr2.040, l-4,6-12,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, l-3,6,10,13,20,23,39,56,57
PROW, R:\NW4X\NW4xprwr1.040, l,3-9,11,13-17,19-21,23-28,30,33
SITE, R:\NW4X\nw4xcpr1.040, l,7,8,13,15,17-20,22,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

LIGN, R:\NW4X\nw4xalr1.040, l-61
OW, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
XPTOPO, R:\NW4X\nw4xplr1.040, l-63
OPOI, R:\NW4X\nw4xtpr1.040, 3-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xtur1.040, 12

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Fri Nov 15 09:06:33 2002
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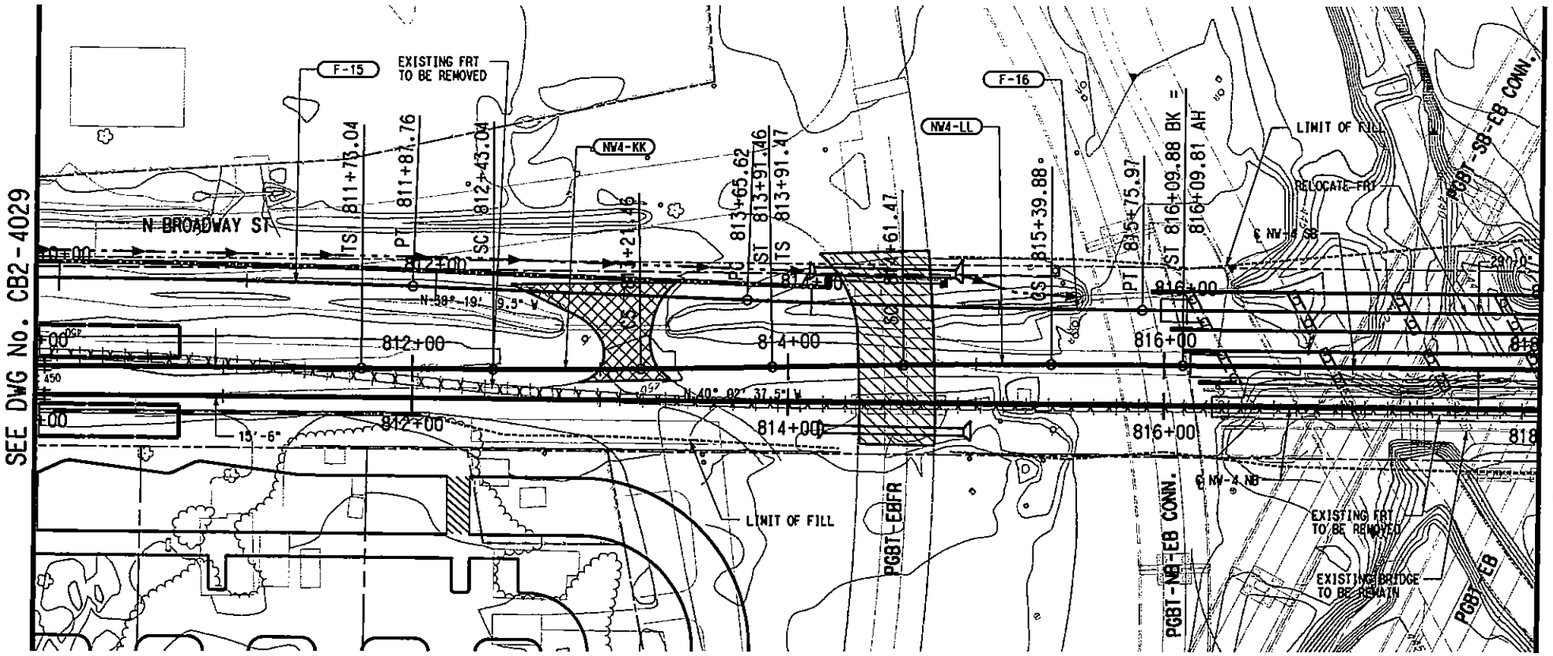
DBROWN



NW4-KK (SB)		NW4-LL (SB)	
Rc =	5400.00'	Rc =	5400.00'
Ls =	70.00'	Ls =	70.00'
Lc =	78.41'	Lc =	78.41'
Ea =	0.00"	Ea =	0.00"
Eu =	1.50"	Eu =	1.50"
V =	45 MPH	V =	45 MPH

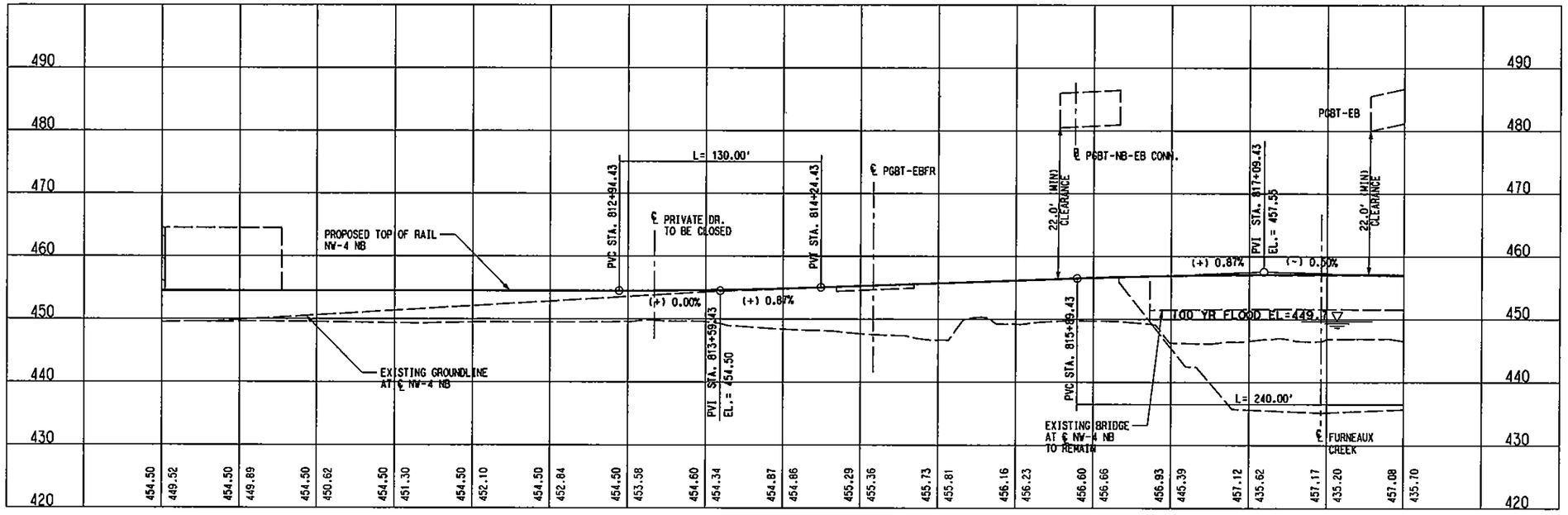
F-15		F-16	
Dc =	0°50'	Dc =	0°50'
Ls =	0.00'	Ls =	0.00'
Lc =	210.34'	Lc =	210.35'
Ea =	1.00"	Ea =	1.00"
Eu =	1.00"	Eu =	1.00"
V =	55 MPH	V =	55 MPH

LEGEND

- STREET/ALLEY/ DRIVE RECONSTRUCTION
- STREET/ALLEY/ DRIVE CLOSURE
- STATION CONCOURSE/ PLATFORM

NOTE:

1. FLOOD ELEVATION TAKEN FROM HYDRAULIC REPORT FOR FURNEAUX CREEK AND THE ELM FORK OF THE TRINITY RIVER AT THE IH35E/190T INTERCHANGE (INCLUDING PHASE 1 AND PHASE 2 IMPROVEMENTS) DTD JUNE 1998 (REV).



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 216 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

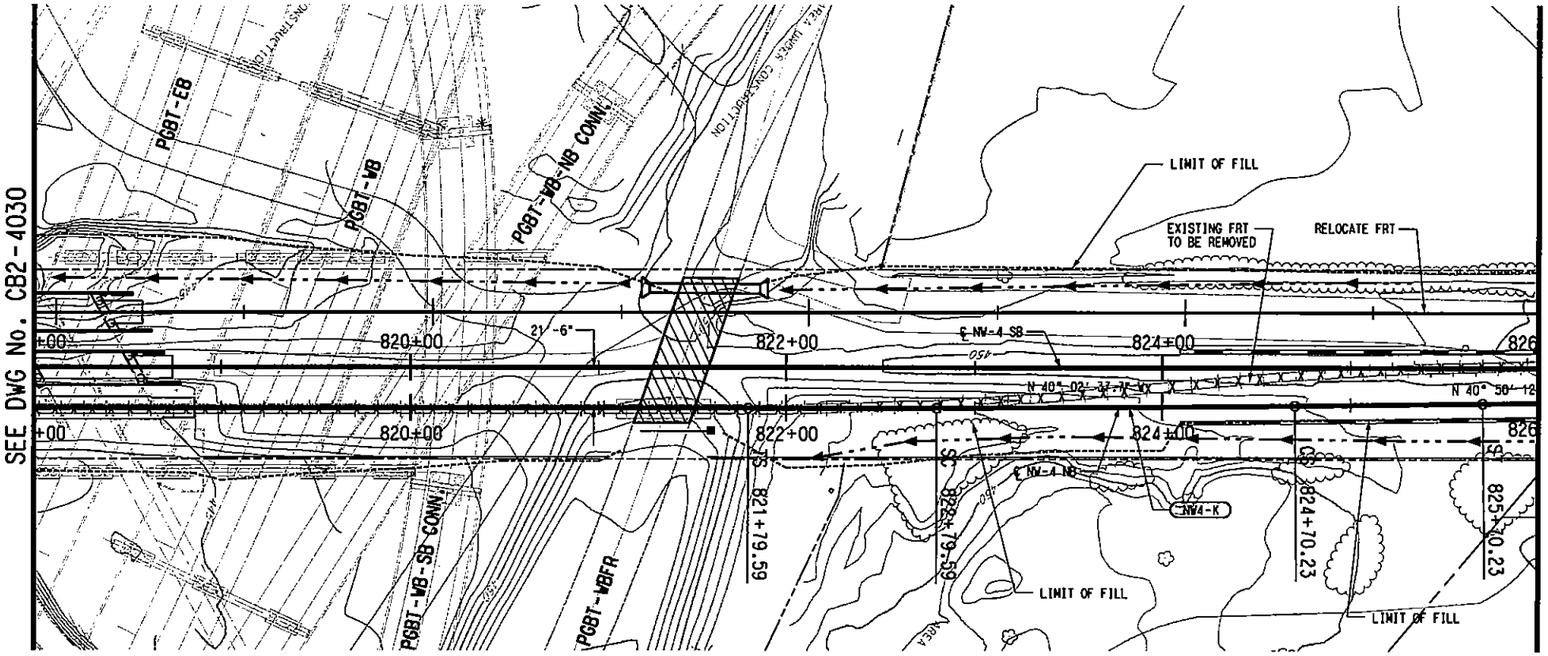
GUIDEWAY PLAN AND PROFILE
STA 810+00 TO STA 818+00

CONTRACT	DWG No.	REV
C-937775-1	CB2-4030	

R:\NW4X\DGN\civil-AO\nw4xplr130.040

DWG No. CB2-4031

P0031



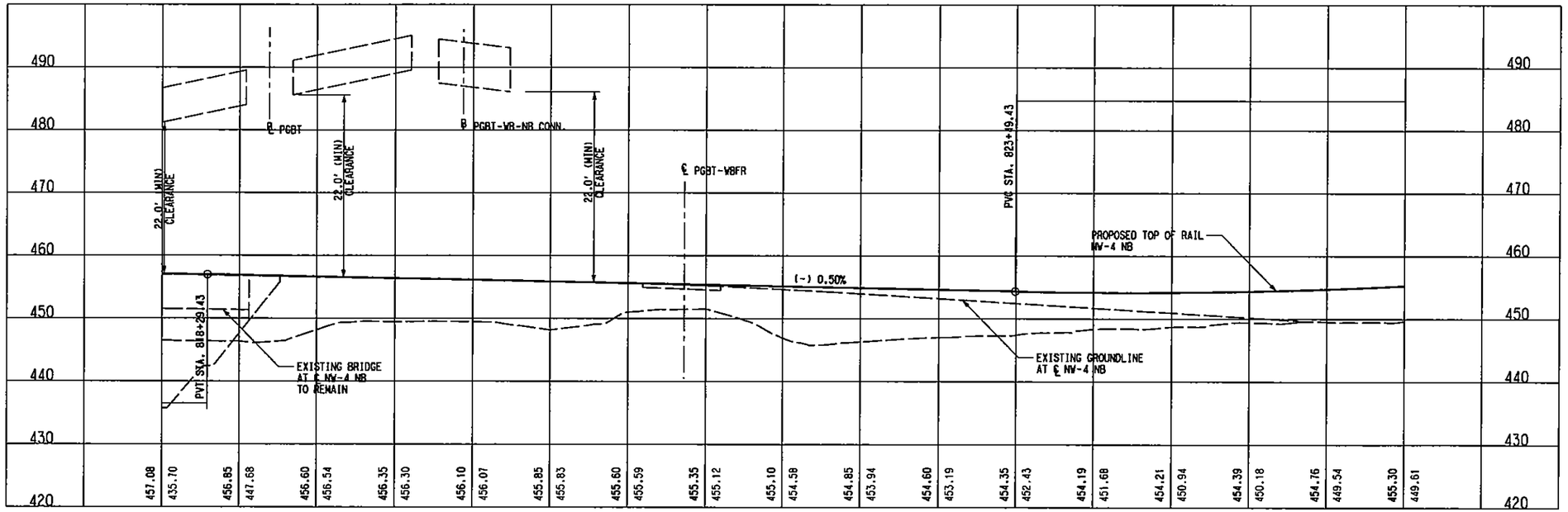
SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-K (NB)

Rc =	21000.00'
Ls =	100.00'
Lc =	190.63'
Ea =	0.50"
Eu =	0.30"
V =	65 MPH

LEGEND

STREET/ALLEY/ DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 217 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1								

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81151
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

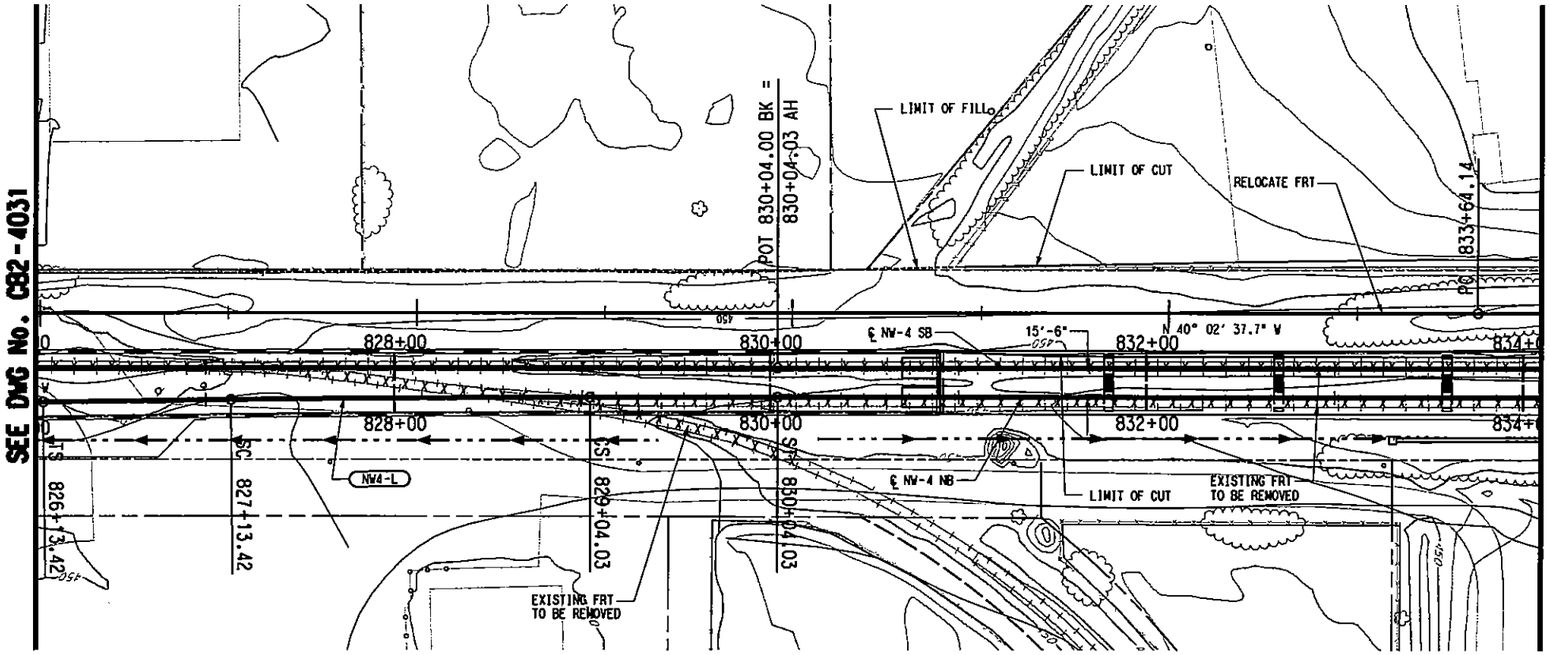
GUIDEWAY PLAN AND PROFILE
STA 818+00 TO STA 826+00

CONTRACT C-937775-1 | DWG No. CB2-4031 | REV

LIGN, R:\NW4X\nw4xalrl.040, 1-56,58-61
OW, R:\NW4X\nw4xrwrl.040, 15,18,19,26,27,31,40,46
XPTOPO, R:\NW4X\nw4xplrl.040, 2-5,8,9,11,13-17,20,21,25,29,49,52
OPOI, R:\NW4X\nw4xlprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutrl.040, 12
BORDER, R:\NW4X\nw4xborl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,40, 1-4,6-12,14-22,24-62
PROW, R:\NW4X\NW4xprwrl.040, 1,3-9,11,13-17,19-21,23-28,30,33
SITE, R:\NW4X\nw4xsprl.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrrl.040, 6-10,15-17
PRF ROTATION=0.000000
Tue Nov 26 09:30:59 2002
R:\NW4X\prf\nw4xal31.prf
DBROWN
R:\NW4X\DGN\Cvl-AQ\nw4xal31.040

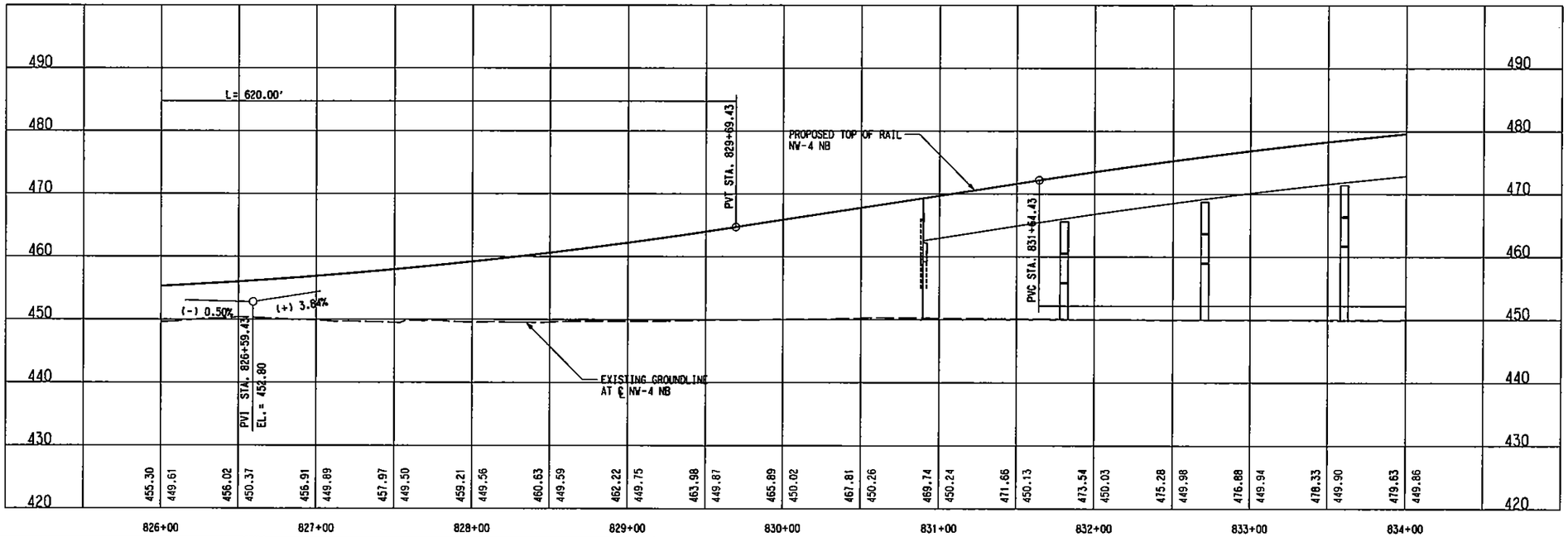
DWG No. C82-4032

P0032



NW4-L (NB)
Rc = 21000.00'
Ls = 100.00'
Lc = 190.61'
Eq = 0.50"
Eu = 0.30"
V = 65 MPH

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	END	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61157
Date: 10-31-02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	AS NOTED
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	23 OCT 02

DARTCADD

CONTRACT SHEET No. 218 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 826+00 TO STA 834+00

CONTRACT C-937775-1 | DWG No. CB2-4032 | REV

PROFILE, R:\NW4X\nw4xolr2.040, l-4,6-12,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, l-3,6,10,13,20,23,39,56,57
PROV, R:\NW4X\NW4xprwr1.040, l-9,11-21,23-28,30-35,37-39,41,
SITE, R:\NW4X\nw4xcpr1.040, 15,17,18,33,34,45,46
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

ALIGN, R:\NW4X\nw4xolr1.040, l-56,58-61
OV, R:\NW4X\nw4xrwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xplr1.040, 2-5,8,9,11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xplr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

R:\NW4X\DGN\Cvl-AO\nw4xol32.040
Fri Nov 15 09:08:20 2002
R:\Nw4X\prf\nw4xol32.prf
DBROWN
PRF ROTATION=0.000000
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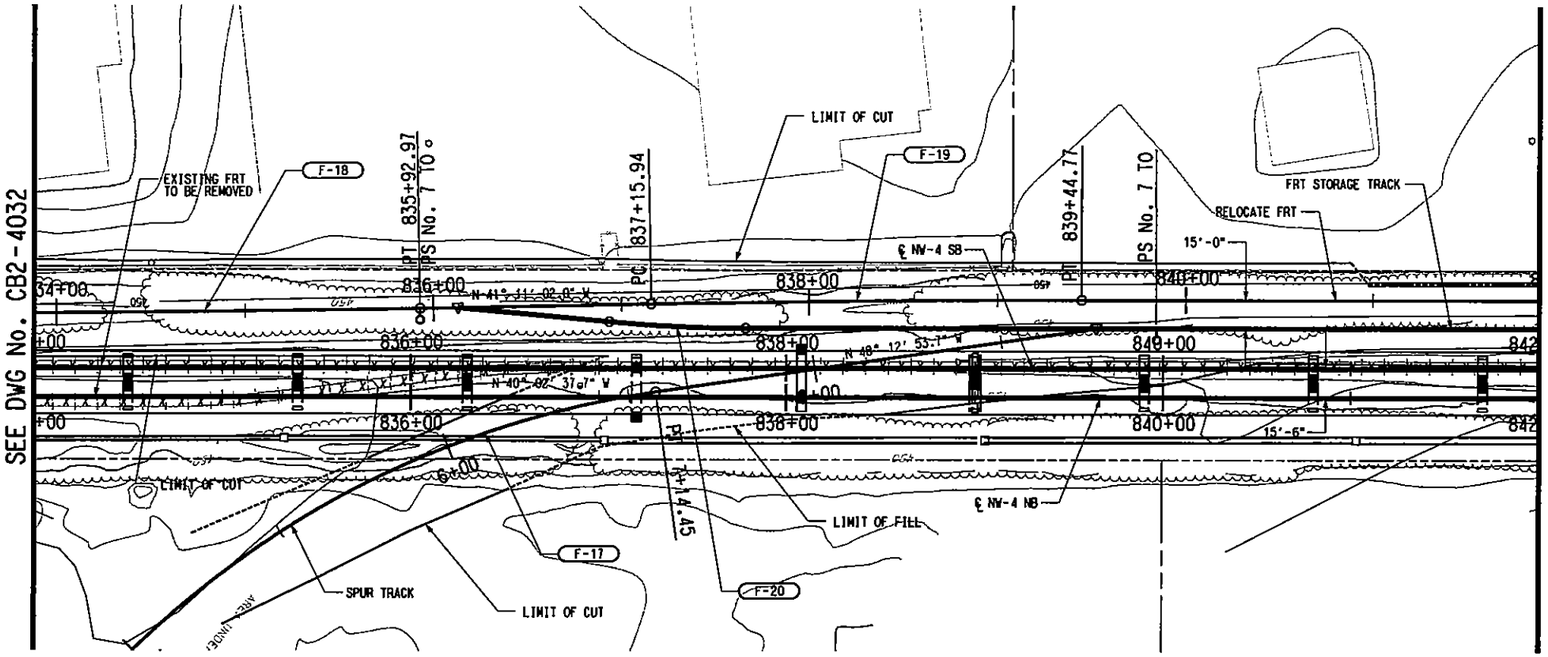
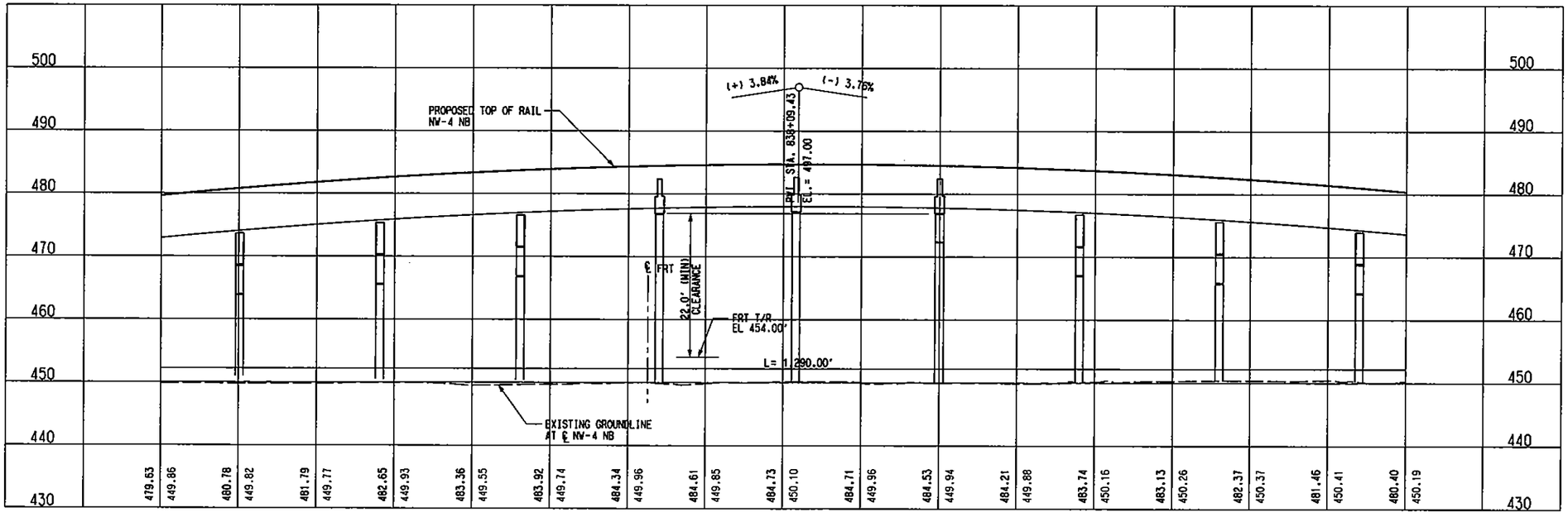
R:\NW4X\DGN\Cvl-AO\nw4xol32.040

DWG No. CB2-4033

P0033





HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

F-17	
Dc =	11°30'
Ls =	0.00'
Lc =	723.34'
Ea =	0.50"
Eu =	0.30"
V =	10 MPH

F-18	
Dc =	0°30'
Ls =	0.00'
Lc =	228.83'
Ea =	0.00"
Eu =	0.00"
V =	20 MPH

F-19	
Dc =	0°30'
Ls =	0.00'
Lc =	228.83'
Ea =	0.00"
Eu =	0.00"
V =	20 MPH

F-20	
Dc =	7°10'
Ls =	0.00'
Lc =	72.88'
Ea =	1.00"
Eu =	1.00"
V =	20 MPH

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 61137
Date: 25 OCT 02

Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-7000

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 219 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 834+00 TO STA 842+00

CONTRACT C-937775-1 | DWG No. CB2-4033 | REV

R:\NW4X\DGN\Cvl-A0\nw4xa133.040
Fri Nov 15 09:09:12 2002
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DBROWN

PRF ROTATION=0.000000
PRF DISABLE\Smdorl.tbl

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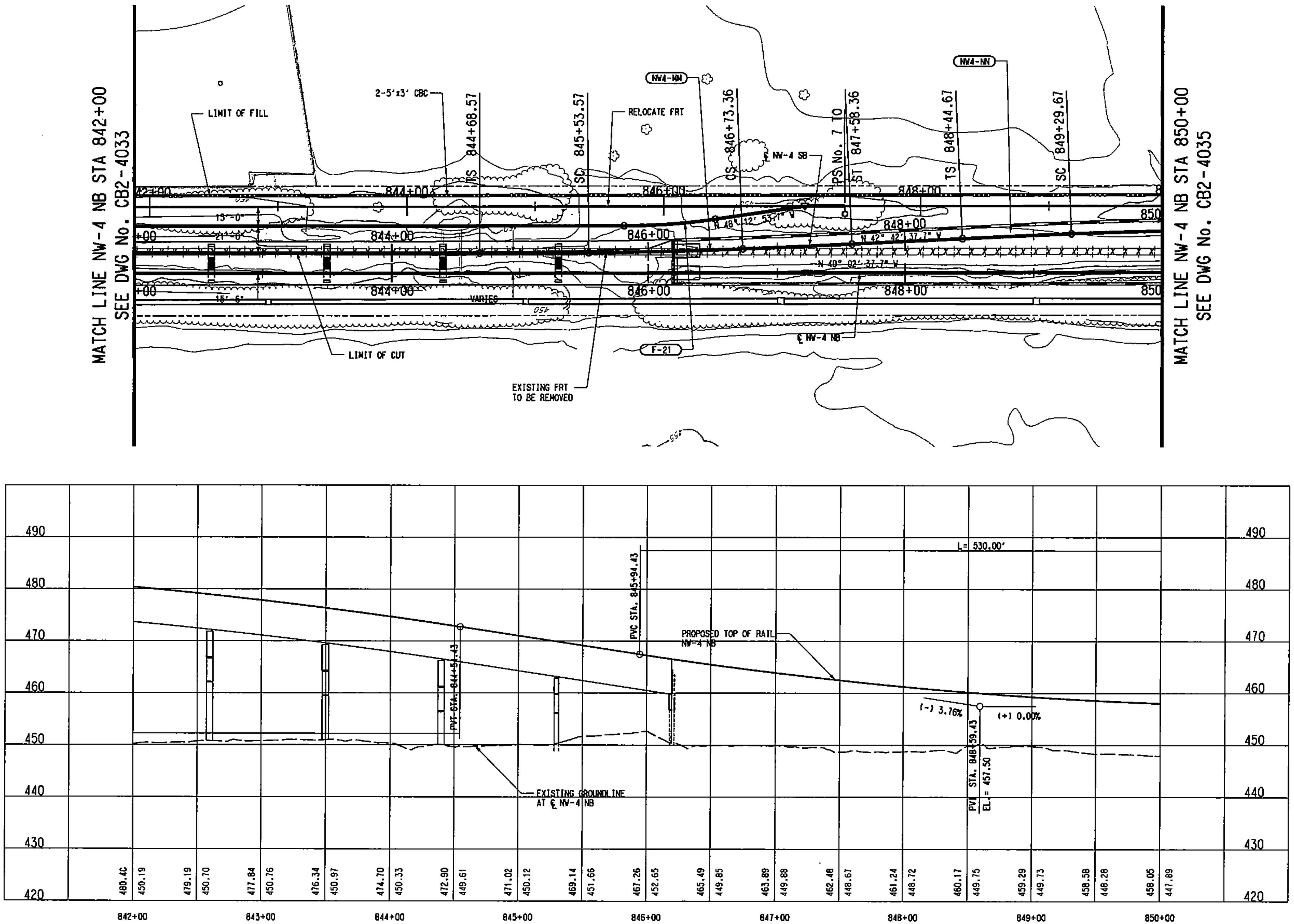
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6
PROW, R:\NW4X\nw4xprwrl.040, 1-21,23
SITE, R:\NW4X\nw4xcprl.040, 15,17,18
BRPL, R:\NW4X\nw4xbrrl.040, 6-10,15-

LIGN, R:\NW4X\nw4xalrl.040, 1-61
OW, R:\NW4X\nw4xrwrl.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xplrl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xiprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xuirl.040, 12

R:\NW4X\DGN\Cvl-A0\nw4xa133.040

P0034



SCALE (IN FEET)
HORIZ 0 20 40 80
VERT 0 5 10 15 20

NW4-MM (SB)	
Rc =	10300.00'
Ls =	100.00'
Lc =	200.07'
Ea =	0.50"
Eu =	1.14"
V =	65 MPH

NW4-NN (SB)	
Rc =	10300.00'
Ls =	100.00'
Lc =	200.07'
Ea =	0.50"
Eu =	1.14"
V =	65 MPH

F-21	
Dc =	11°30'
Ls =	0.00'
Lc =	71.31'
Ea =	1.75"
Eu =	1.46"
V =	20 MPH

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 220 OF 243

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. BASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 842+00 TO STA 850+00

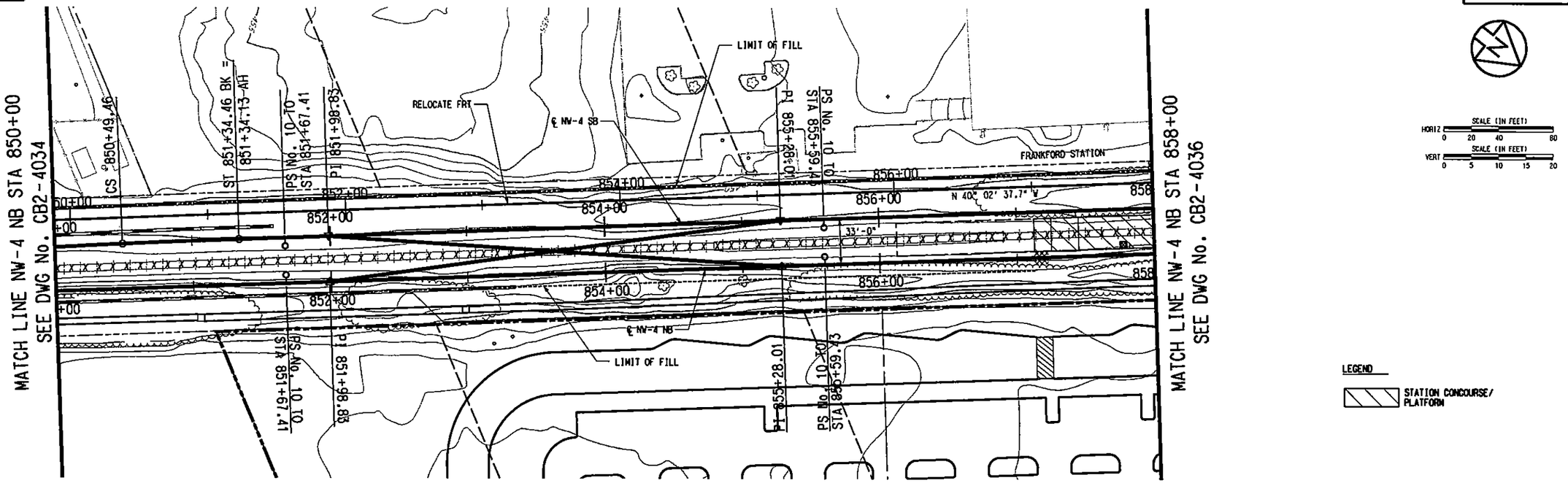
CONTRACT C-937775-1 | DWG No. CB2-4034 | REV

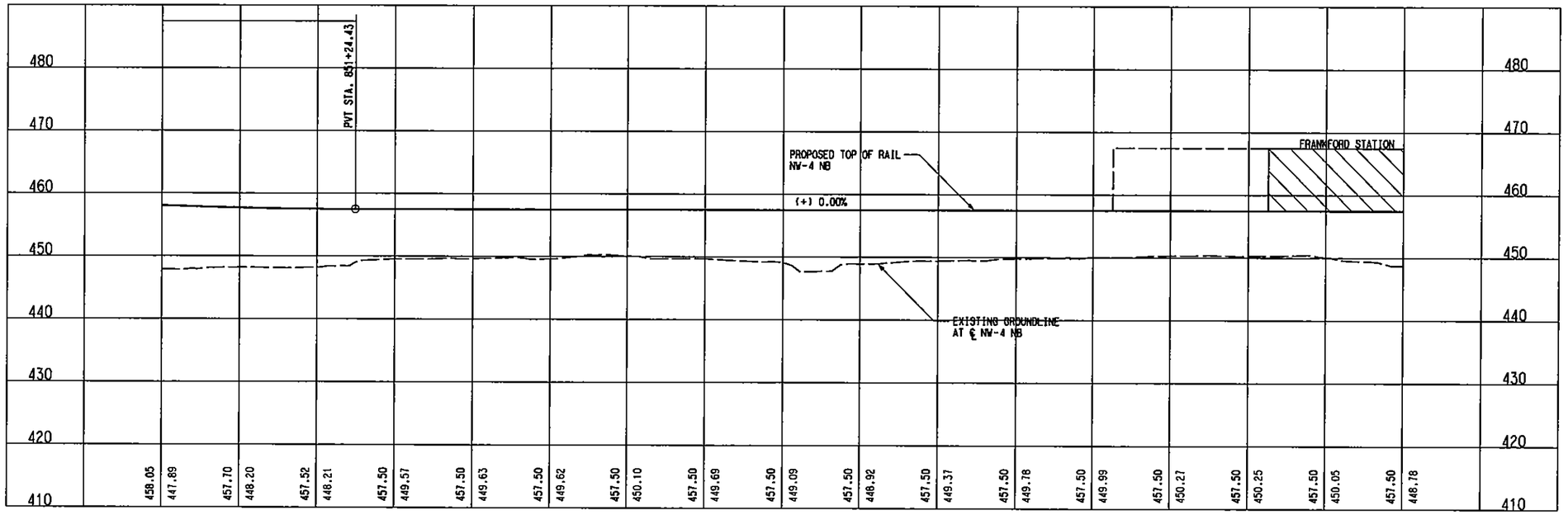
REV | AMEND | CR | DATE | DESCRIPTION | BY | ENG | CHK | APP

DWG No. CB2-4034

DWG No. CB2-4035

P0035





LEGEND

STATION CONCOURSE/ PLATFORM

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

CP&Y
J. TIPTON, P.E. No. 81551
Date: 25 OCT 02

CP&Y
Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

CONTRACT SHEET No. 221 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 850+00 TO STA 858+00

CONTRACT C-937775-1 | DWG No. CB2-4035 | REV

R:\NW4X\DGN\cv1-A0\nw4xal35.040
Fri Nov 15 09:10:58 2002
R:\NW4X\prf\nw4xal35.prf
DBROWN

PRF ROTATION=0.000000
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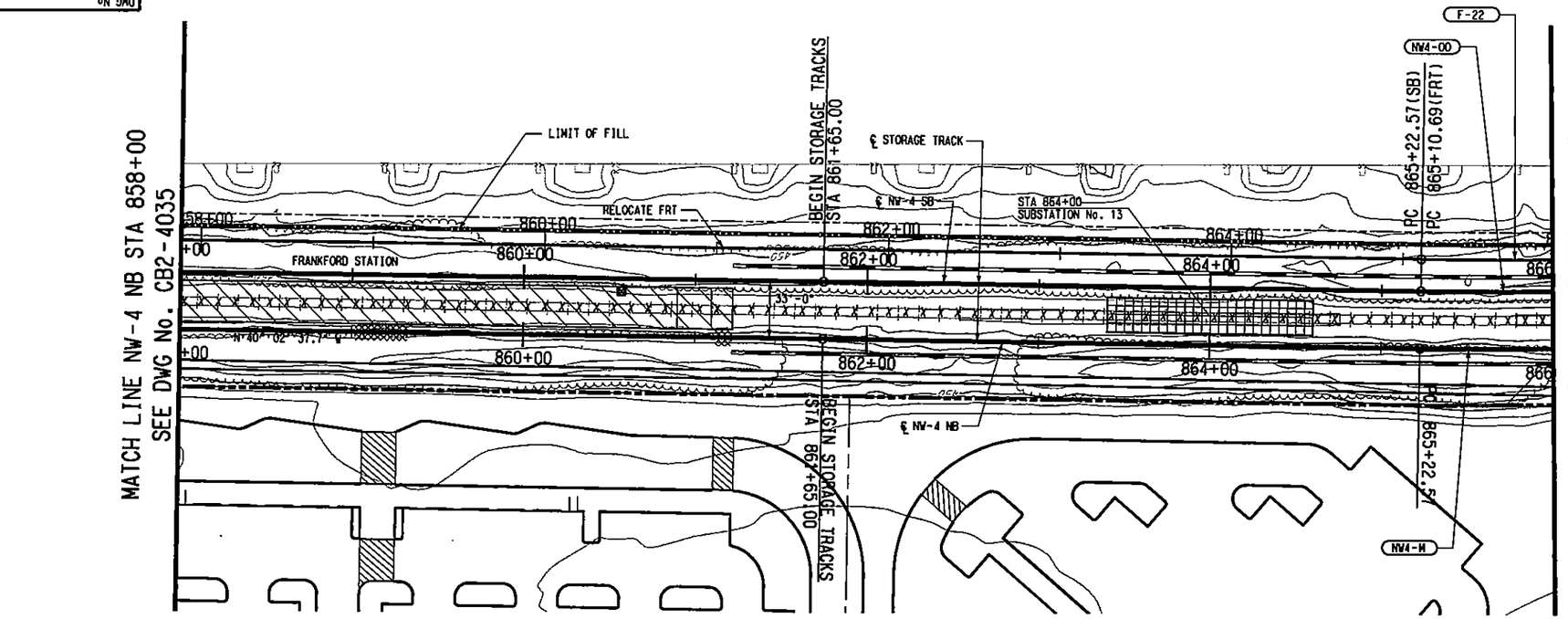
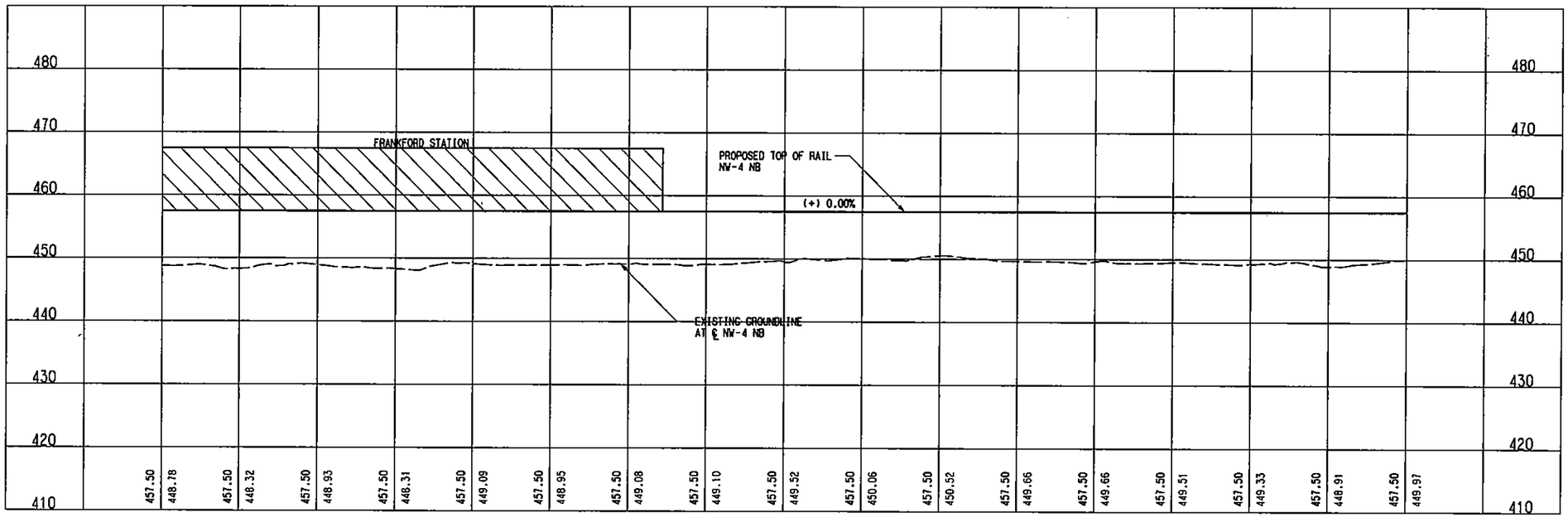
TOPO, R:\NW4X\nw4xptr1.040, 2-5,8,9,11,14-16,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,14-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12
BORDER, R:\NW4X\nw4xbor1.001, 1-61
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1-21,23-28,30-35,37-39,41,42,44,
SITE, R:\NW4X\nw4xsepr1.040, 1,7,8,13,15-17,20,22,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

DWG No. C82-4036

P0036





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

NW4-M (NB)	
Rc =	2915.50'
Ls =	0.00'
Lc =	892.88'
Eo =	0.00"
Eu =	0.14"
V =	10 MPH

NW4-00 (SB)	
Rc =	2882.50'
Ls =	0.00'
Lc =	882.78'
Eo =	0.00"
Eu =	0.14"
V =	10 MPH

F-22	
Dc =	2°00'
Ls =	0.00'
Lc =	877.11'
Eo =	2.00"
Eu =	2.50"
V =	55 MPH

LEGEND

GRADING FOR SYSTEM ELEMENTS

STATION CONCOURSE/ PLATFORM

NOTE:

1. SUBSTATION SITE SHALL ACCOMMODATE TRACTION POWER SUBSTATION, SPDC AND COMMUNICATION BUNGALOW. ACCESS ROAD TO SITE SHALL BE DETERMINED DURING THE FINAL DESIGN PHASE.

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DNS	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 84137
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 222 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 858+00 TO STA 866+00

CONTRACT C-937775-1

DWG No. C82-4036

REV

LIGN, R:\NW4X\nw4xalr1.040, 1-61
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OPOI, R:\NW4X\nw4xtpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12
PROFILE, R:\NW4X\nw4xalr2.040, 1-4,6-11,14-22,24-62
BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10
PROW, R:\NW4X\NW4xprwr1.040, 1-9,11-21
SITE, R:\NW4X\nw4xcpr1.040, 1,7,8,13,15-17,20,22,25-32,37,38,41-45,47-50,52,54,55,57-63
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Fri Nov 15 09:11:49 2002
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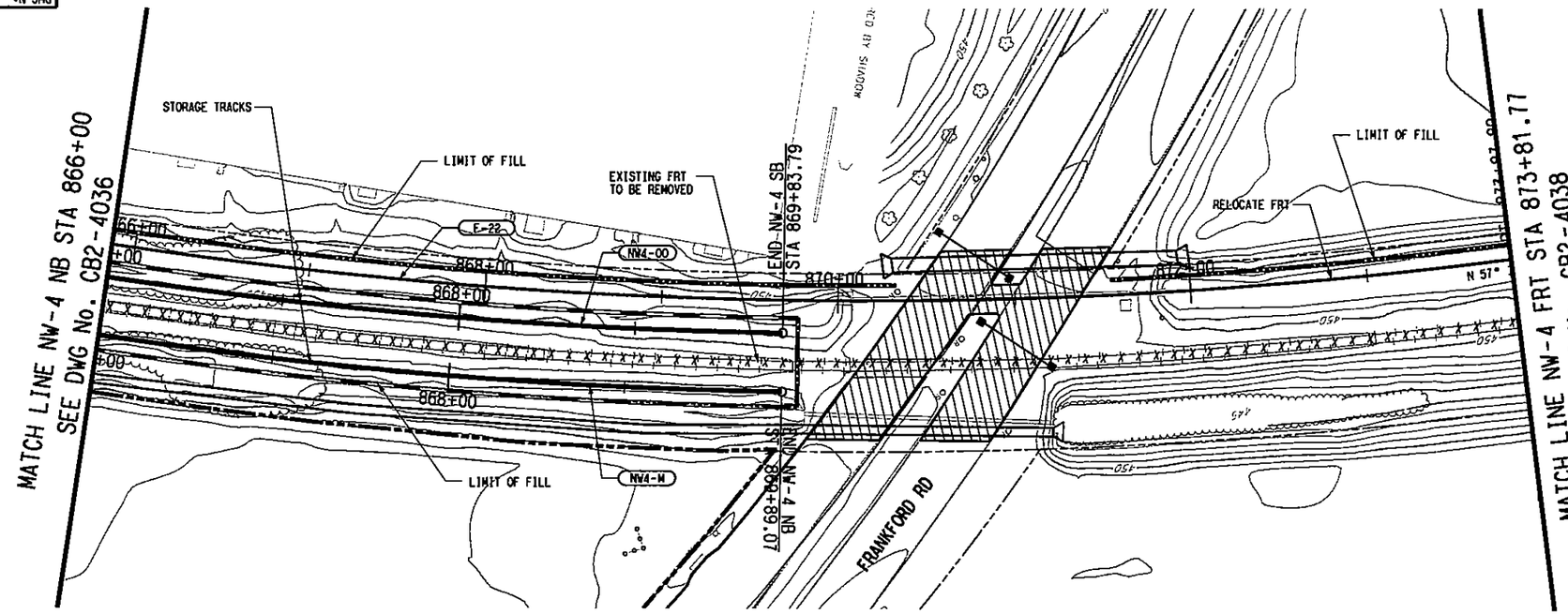
DBROWN
R:\NW4X\DGN\Cvil-AO\nw4xal36.040

DWG No. CB2-4037

P0037



SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

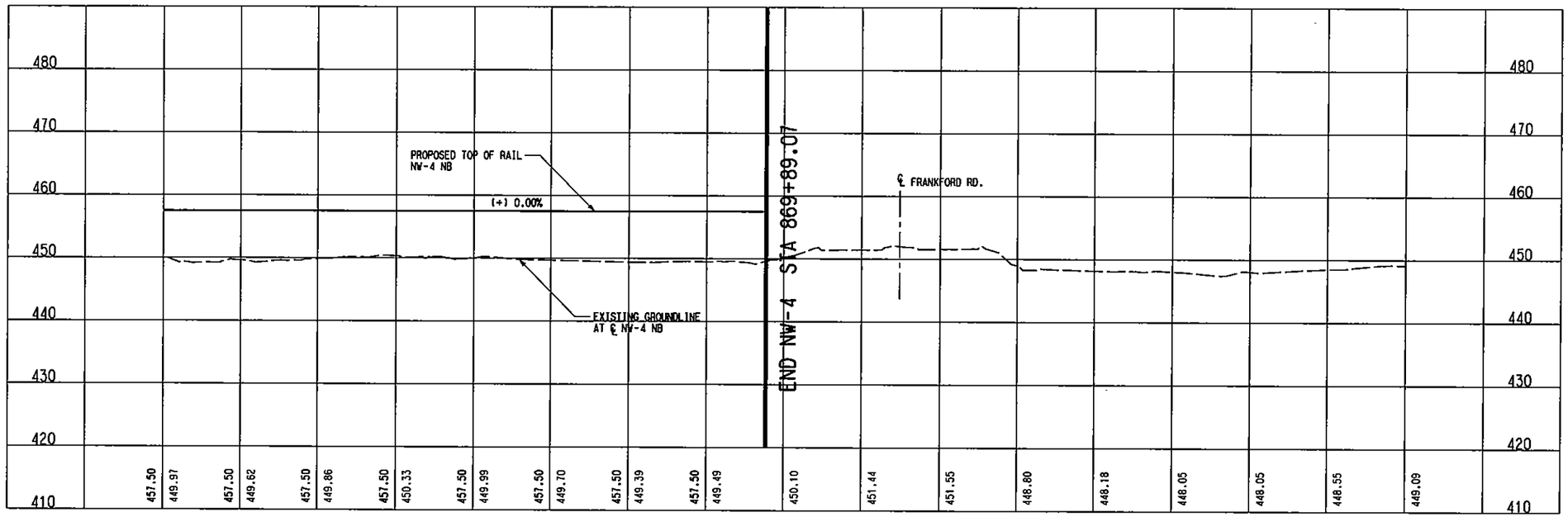
NW4-M (NB)	
Rc =	2915.50'
Ls =	0.00'
Lc =	892.88'
Eo =	0.00"
Eu =	0.14"
V =	10 MPH

NW4-00 (SB)	
Rc =	2882.50'
Ls =	0.00'
Lc =	882.78'
Eo =	0.00"
Eu =	0.14"
V =	10 MPH

F-22	
Dc =	2°00'
Ls =	0.00'
Lc =	877.11'
Eo =	2.00"
Eu =	2.50"
V =	55 MPH

LEGEND

STREET/ALLEY/
DRIVE RECONSTRUCTION



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. TIPTON, P.E. No. 81457
Date: 12/07/02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N. DALLAS PKWY, SUITE 800
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	S. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 223 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
STA 866+00 TO STA 869+79.64

CONTRACT	DWG No.	REV
C-937775-1	CB2-4037	

LIGN, R:\NW4X\nw4slr1.040, 1-61
OW, R:\NW4X\nw4srwr1.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xptr1.040, 2-5,8,9,11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xlpr1.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TIL, R:\NW4X\nw4xutr1.040, 12

BORDER, R:\NW4X\nw4xbor1.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xplr2.040, 1-4,6-12,14-22,24-62
PROW, R:\NW4X\NW4xprwr1.040, 1,3-21,23-28,30-35,37-39,41,42,44
SITE, R:\NW4X\nw4xepr1.040, 1,7,8,13,15,17,20,22,25-32,37,38,41-45,47-50,52,54,55,57-63
BRPL, R:\NW4X\nw4xbrr1.040, 6-10,15-17

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Tue Nov 26 11:28:21 2002
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DBROWN

PRF ROTATION=0.000000
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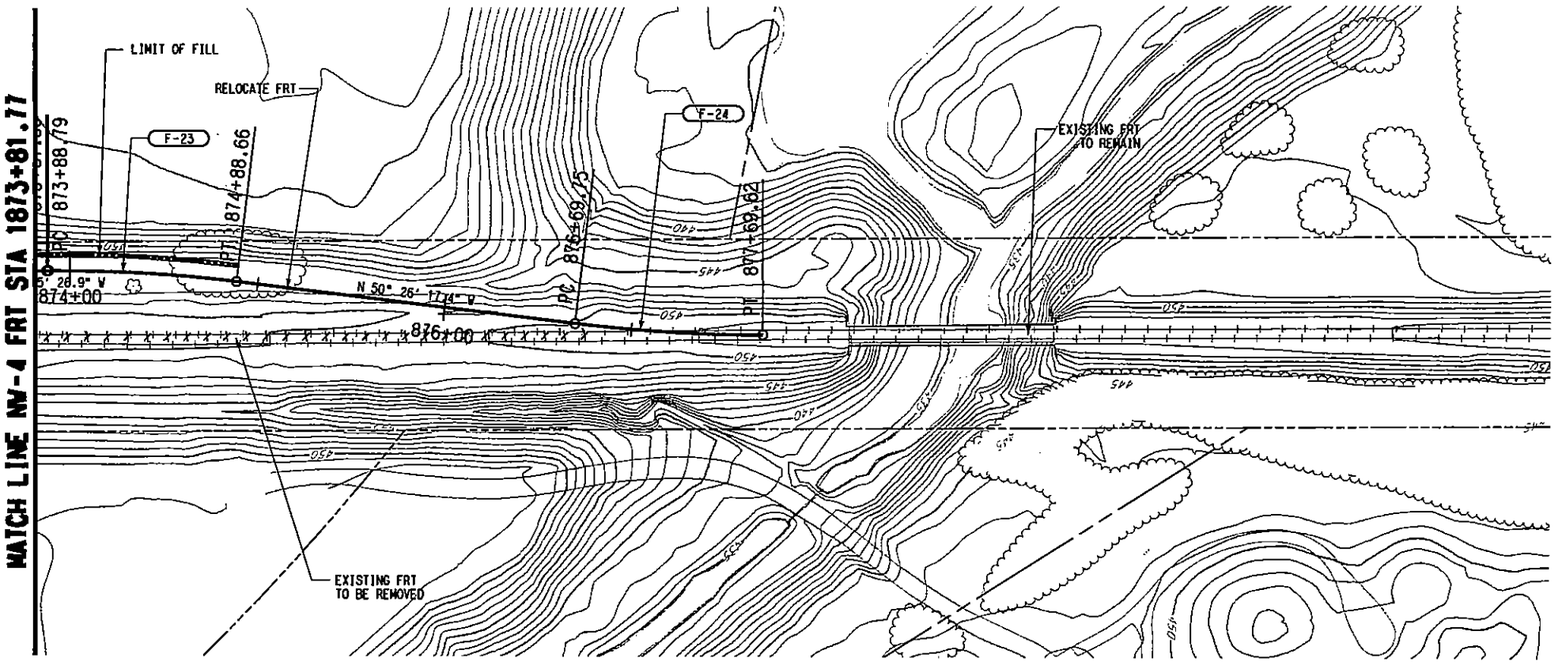
DWG No. CB2-4038

P0038

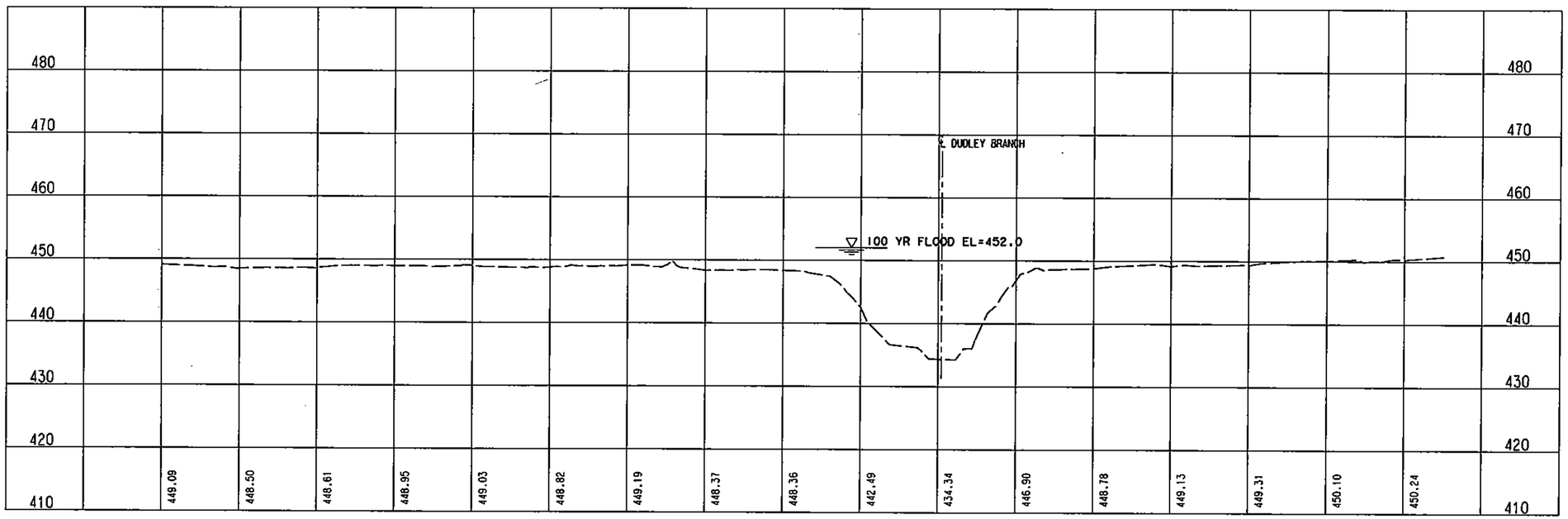


SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

F-23		F-24	
Dc =	7°10'	Dc =	7°10'
Ls =	0.00'	Ls =	0.00'
Lc =	99.87'	Lc =	99.87'
Ea =	2.00"	Ea =	2.00"
Eu =	2.41"	Eu =	2.41"
V =	30 MPH	V =	30 MPH

NOTE:

1. FLOOD ELEVATION TAKEN FROM CARROLLTON MASTER DRAINAGE STUDY FOR THE CITY OF CARROLLTON, TEXAS BY NATHAN D. MAIER CONSULTING ENGINEERS, INC., AUGUST 1988.



NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
CP&Y
J. Tipton, P.E. No. 61157
Date 25 OCT 02

CP&Y Chiang, Patel & Yerby, Inc.

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'
DRAWN	D. BROWN
DESIGNED	D. BROWN
CHECKED	B. SASTRY
IN CHARGE	J. TIPTON
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 224 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4

GUIDEWAY PLAN AND PROFILE
FRT STA 873+81.77 TO
FRT STA 877+69.62

CONTRACT C-937775-1 | DWG No. CB2-4038 | REV

LIGN, R:\NW4X\nw4xlrl.040, 1-61
OW, R:\NW4X\nw4xrwrl.040, 15,18,19,26,27,31,40,46
TOPO, R:\NW4X\nw4xptrl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
OPOI, R:\NW4X\nw4xtprl.040, 2-5,8-11,13-18,20,21,25,29,31,35,49,52
TL, R:\NW4X\nw4xtlrl.040, 12
BORDER, R:\NW4X\nw4xborl.001, 1-3,6,10,13,20,23,39,56,57
PROFILE, R:\NW4X\nw4xprwrl.040, 1-4,6-12,14-22,24-62
PROW, R:\NW4X\NW4xprwrl.040, 1-21,23-28,30-35,37-39,41,42,44,45,46
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Tue Nov 26 11:29:46 2002
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DBROWN
R:\NW4X\DGN\Cvl-AO\nw4xal38.040

DWG No. AC2-0001

I-35E (STEMMONS FRWY)

R.O.W LINE

R.O.W LINE

WORK IN CONTRACT

TYPE "B" RAILING REF. AC5-0019

WORK NOT IN CONTRACT

WICHITA ST.

R.O.W LINE

WORK IN CONTRACT

TYPE "B" RAILING REF. AC5-0019

R.O.W LINE

WORK NOT IN CONTRACT

WORK NOT IN CONTRACT

VICTORY

WICHITA ST.

ALL-STAR

AMERICAN AIRLINES CENTER

SITE PLAN

SCALE: 1"=50'-0"

A

SCALE IN FEET

0 50 100

CONFORMED

REV	AMEND	CR	DATE	DESCRIPTION	BY	DES	CHK	APP

REGISTERED ARCHITECT STATE OF TEXAS 9/29/01

Alliance
1900 north collins blvd
suite 1000
richardson, texas 75080

LAN/STV
Lockwood, Andrews & Newnam, Inc.
and STV Incorporated

DART PROJECT

SCALE	1" = 50'-0"
DRAWN	M. SCHUBERT
DESIGNED	A. KHESHK
CHECKED	D. WESTFALL
IN CHARGE	D. WICKES
DATE	28 SEPT. 01

CAES

CONTRACT SHEET No. 225 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1A
VICTORY STATION
ARCHITECTURAL

SITE PLAN

CONTRACT C-1003853-01

DWG No. AC2-0001

REV 0

PLOTTED BY: desk
09/28/01
01:28:39 PM

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Thu Apr 24 13:23:10 2003
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imorris

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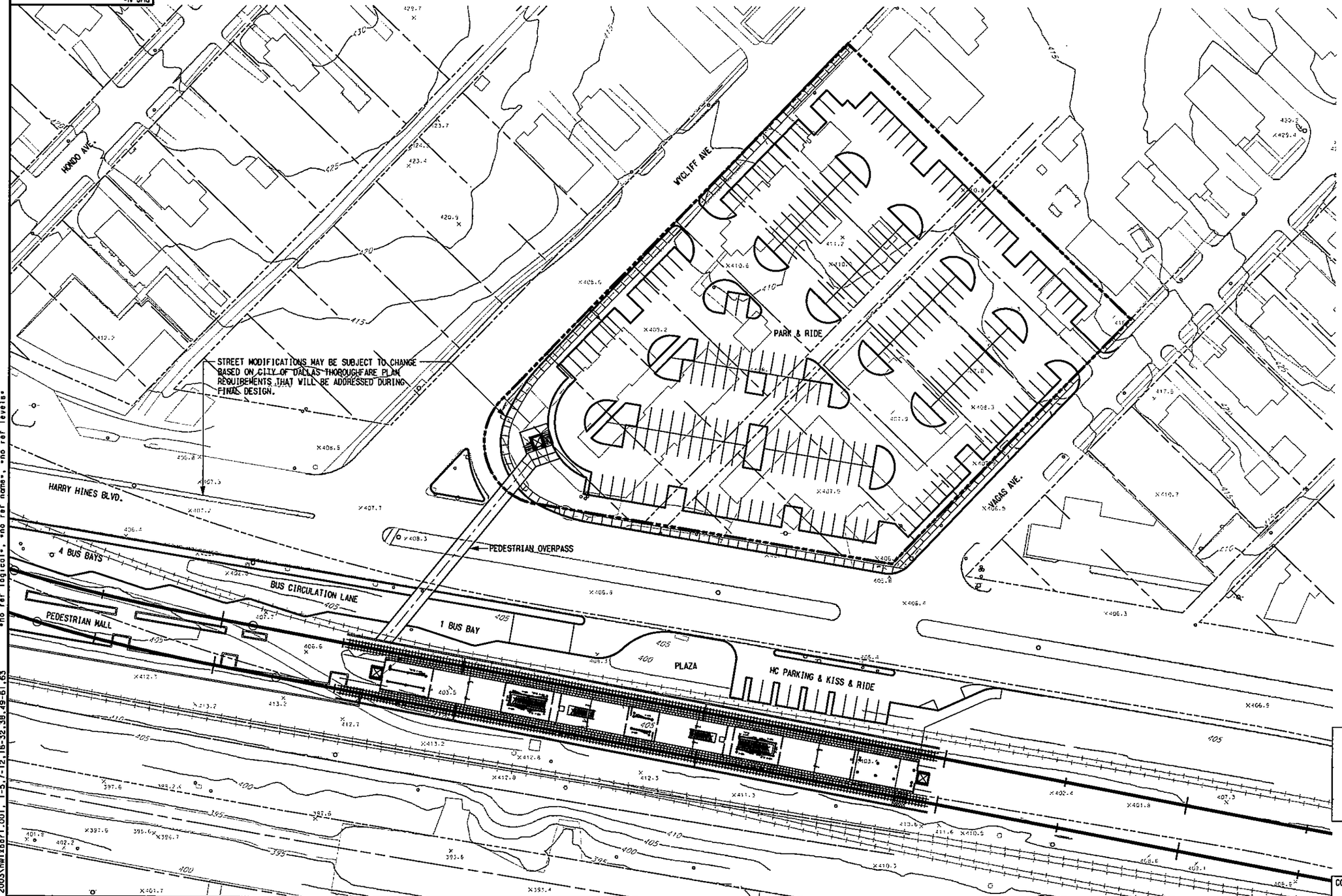
DWG No.



SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	230
KISS & RIDE SPACES:	4
BUS BAYS:	5
ZONING:	MF-2 - MULTI-FAMILY 2
	TH-3 - TOWNHOUSE 3
SITE AREA:	121,909 SF / 2.80 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 226 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto- 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

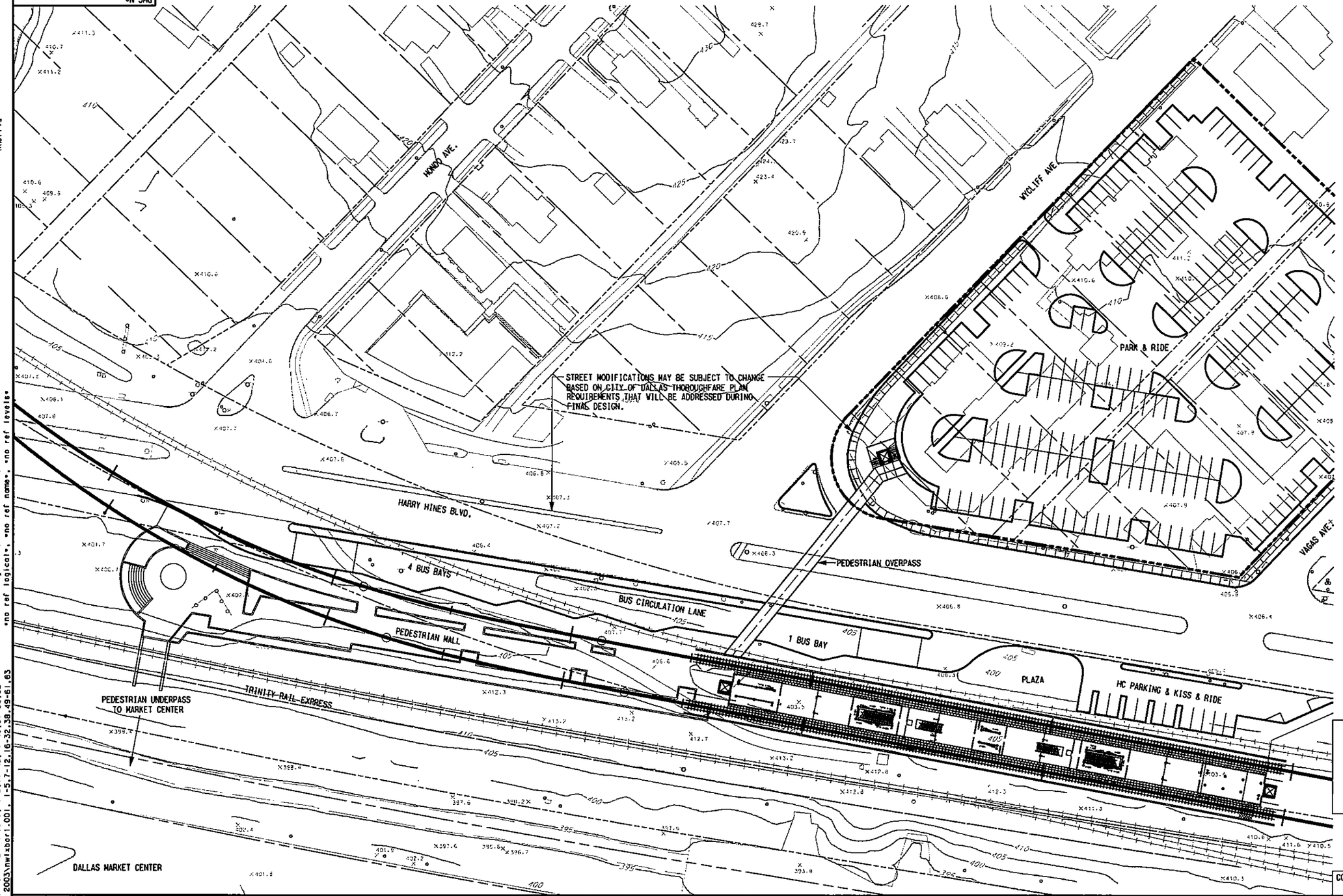
SCALE	1"=40'-0"
DRAWN	ACT 21 CAD
DESIGNED	Y. SADR
CHECKED	G. CRAMER
IN CHARGE	A. ZIRET
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
ARCHITECTURAL SITE PLAN
MARKET CENTER / OAK LAWN STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT	DWG No.	REV
C-937775-1		

DWG No.



SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	230
KISS & RIDE SPACES:	4
BUS BAYS:	5
ZONING:	MF-2 - MULTI-FAMILY 2
	TH-3 - TOWNHOUSE 3
SITE AREA:	121,909 SF / 2.80 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	DAS	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

A. ZIRZOW, A.I.A.
Date: 14 MAR 03

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2026 fax 214.220.2921

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'-0"
DRAWN	ACT 21 CAD
DESIGNED	V. BAOR
CHECKED	G. CRAMER
IN CHARGE	A. ZIRZOW
DATE	14 MAR 03

CONTRACT SHEET No. 227 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
ARCHITECTURAL SITE PLAN
MARKET CENTER / OAK LAWN STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT C-937775-1 | DWG No. | REV

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lmorris
PROPERTY ASSIGNMENTS
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Thu Apr 24 12:05:43 2003
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lmorris
W:\CADNET\PENTABLE\Smdarf.tbl

DWG No.

PROPOSED STREET (BY OTHERS)

REDFIELD ST. EXTENSION (BY OTHERS)

POSSIBLE FUTURE PLAZA & JOINT DEVELOPMENT AREA

2 SHUTTLE BAYS

2 SHUTTLE BAYS

2 SHUTTLE BAYS

2 BUS BAYS

2 BUS BAYS

3 BUS BAYS

5 BUS BAYS

BENGAL STREET

MOTOR STREET

OBSCURED BY SHADOW

N

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES: N/A
KISS & RIDE SPACES: N/A
BUS BAYS, INC. SHUTTLE: 18

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 121,968 SF / 2.80 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES, FOR REVIEW ONLY.

R. ZECCI, A.I.A.
TX Reg No. 18130
Date 14 MAR 03

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'-0"
DRAWN	ACT 21 CAD
DESIGNED	R. GUNDINEDA
CHECKED	R. HARDIS
IN CHARGE	D. WIREWORTH
DATE	14 MAR 03

CONTRACT SHEET No. 228 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
ARCHITECTURAL SITE PLAN
PARKLAND STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT C-937775-1 | DWG No. | REV

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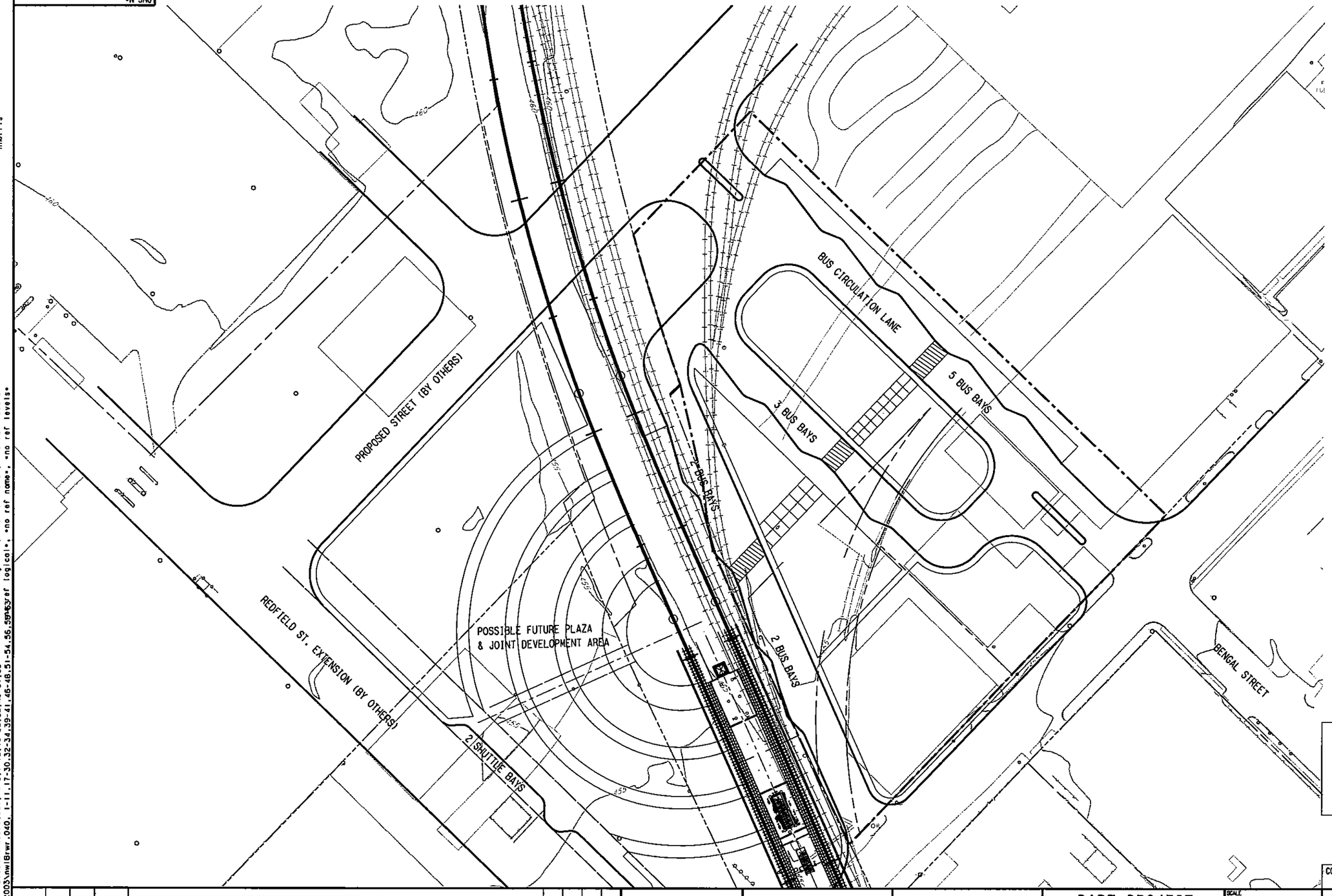
DWG No.



SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES: N/A
KISS & RIDE SPACES: N/A
BUS BAYS, INC. SHUTTLE: 18

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 121,968 SF / 2.80 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 229 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1800

DART PROJECT

SCALE	1"=40'-0"
DRAWN	ACT 21 CAD
DESIGNED	R. GUMIMEDA
CHECKED	R. MAROIS
IN CHARGE	D. NIKEWORTH
DATE	14 MAR 03

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
ARCHITECTURAL SITE PLAN
PARKLAND STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT C-937775-1 | DWG No. | REV

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lmorris

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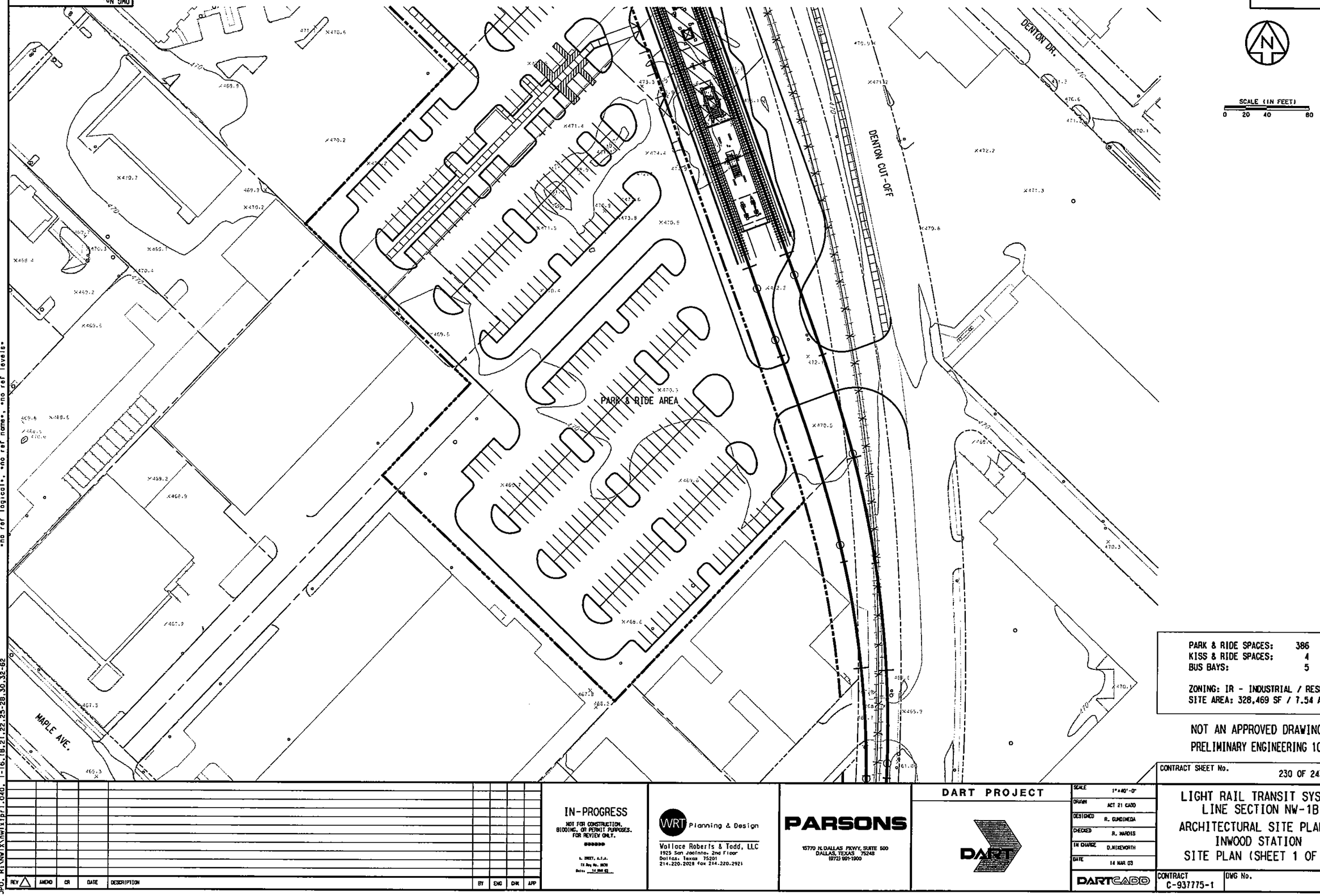

PARK & RIDE SPACES:	386
KISS & RIDE SPACES:	4
BUS BAYS:	5

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 328,469 SF / 7.54 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'-0"
DRAWN	ACT 21 CADD
DESIGNED	R. CUADRADA
CHECKED	R. HARDIS
IN CHARGE	D.MIKEWORTH
DATE	14 MAR 03

CONTRACT SHEET No. 230 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
ARCHITECTURAL SITE PLAN
INWOOD STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT C-937775-1 | DWG No. | REV

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R:\NWIX\prf\NWIBAP3A.prf
lmorris

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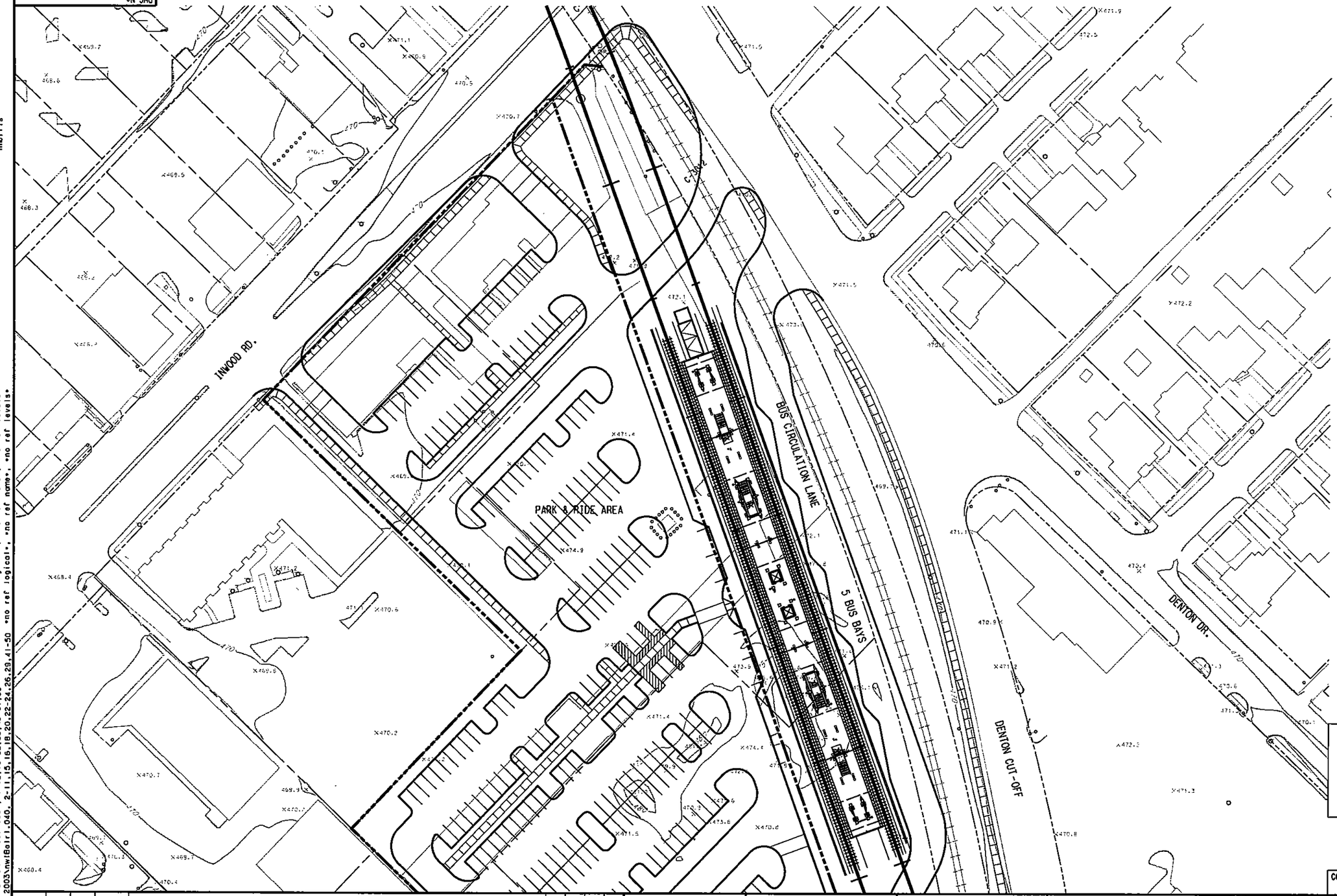
DWG No.



N

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	386
KISS & RIDE SPACES:	4
BUS BAYS:	5

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 328,469 SF / 7.54 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

A. SMITH, A.I.A.
TX Reg No. 9630
Date: 14 MAR 03

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'-0"
DRAWN	ACT 21 CADD
DESIGNED	R. GUADIMEDA
CHECKED	R. MARDIS
IN CHARGE	D.NIEWORTH
DATE	14 MAR 03

CONTRACT SHEET No. 230A OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-1B
ARCHITECTURAL SITE PLAN
INWOOD STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT C-937775-1 | DWG No. | REV

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lmorris

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DWG No. CB1-2013

SIGNAL REQUESTED BY DART PLANNING FOR (PEDESTRIAN SAFETY), TRAFFIC SIGNAL INSTALLATION TO BE DETERMINED PENDING SIGNAL WARRANT ANALYSIS

SWA HEADQUARTERS

WYMAN STREET

SEELOCO ST.

DENTON DRIVE

BUS CIRCULATION LANE

PARA TRANSIT

FUTURE RE-ALIGNMENT LOCATION OF WYMAN STREET IS NOT DETERMINED AT THIS TIME. FURTHER COORDINATION WILL BE NEEDED WITH SOUTHWEST AIRLINES MASTER PLAN.

DRAINAGE CULVERT

PROPOSED PROPERTY LINE

BUS SHELTER (TYP.)

RETAINING WALL (HT. VARIES)

PROPOSED SWA TRAINING CENTER CAMPUS

PROPOSED SWA TRAINING CENTER CAMPUS

STORM DRAINAGE EASEMENT

KISS & RIDE (3)

BURBANK / DENTON SIGNAL REQUESTED BY DART BUS OPERATIONS, TRAFFIC SIGNAL INSTALLATION TO BE DETERMINED PENDING SIGNAL WARRANT ANALYSIS

JOINT ACCESS ROAD

BURBANK ST.

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	N/A
KISS & RIDE SPACES:	3
BUS BAYS:	8

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 130,287 SF / 2.99 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 231 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
A. ZREET, A.I.A.
Texas No. 9830
Date: 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2
ARCHITECTURAL SITE PLAN
BROOKHOLLOW STATION

CONTRACT C-937775-1 | DWG No. CB1-2013 | REV

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lmorris

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DWG No. CB1-2014

SIGNAL REQUESTED BY DART BUS OPERATIONS, TRAFFIC SIGNAL INSTALLATION TO BE DETERMINED PENDING SIGNAL WARRANT ANALYSIS

COMMUNITY DR.

SIGNAL REQUESTED BY DART BUS OPERATIONS, TRAFFIC SIGNAL INSTALLATION TO BE DETERMINED PENDING SIGNAL WARRANT ANALYSIS

PARK TRANSIT

DENTON DR.

BUS BAYS (3)

K & R (5) HC (2)

24'

BUS CIRCULATION LANE

HC (8)

HARRY HINES BLVD.

BUS SHELTER (TYP.)

30'

RIGHT TURN LANE (BUSES ONLY)

JOINT ACCESS ROAD

430

435

440

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	443
KISS & RIDE SPACES:	5
BUS BAYS:	10

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 460,528 SF/ 10.57 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 232 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
A. ZREET, A.I.A.
Reg No. 9820
Date: 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2020 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2
ARCHITECTURAL SITE PLAN
BACHMAN STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT C-937775-1 | DWG No. CB1-2014 | REV

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morris

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R:\NW2X\DGN\ARC\NW2XAP2A.040

DWG No. CB1-2015

PARK & RIDE SPACES: 443
KISS & RIDE SPACES: 5
BUS BAYS: 10

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 460,528 SF/ 10.57 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DART

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

CONTRACT SHEET No. 233 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-2
ARCHITECTURAL SITE PLAN
BACHMAN STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT	DWG No.	REV
C-937775-1	CB1-2015	

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lmorris

DWG No. CB1-3025

TO UNITED PARCEL SERVICE

SIGNAL REQUESTED BY DART BUS OPERATIONS. TRAFFIC SIGNAL INSTALLATION TO BE DETERMINED PENDING SIGNAL WARRANT ANALYSIS

PLTG. AREA

K.A.R. (3) HC-(12)

30'

BUS CIRCULATION LANE

PLANTING AREA

PARA TRANSIT

HC (6)

DENTON DR.

PLTG. AREA

PLTG. AREA

PLTG. AREA

BUS CIRCULATION LANE

PLTG. AREA

ADJACENT DEVELOPMENT ACCESS

RAIL FREIGHT SPUR

PLANTING AREA

FUTURE PARKING /JOINT DEVELOPMENT SITE

SIGNAL REQUESTED BY DART BUS OPERATIONS. TRAFFIC SIGNAL INSTALLATION TO BE DETERMINED PENDING SIGNAL WARRANT ANALYSIS

WALNUT HILL LN.

450

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	361
KISS & RIDE SPACES:	3
BUS BAYS:	5

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 478,091 SF /10.98 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 234 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

A. ZREET, A.I.A.
TX Reg No. 19370
Date: 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3
ARCHITECTURAL SITE PLAN
WALNUT HILL / DENTON STATION

CONTRACT C-937775-1 | DWG No. CB1-3025 | REV

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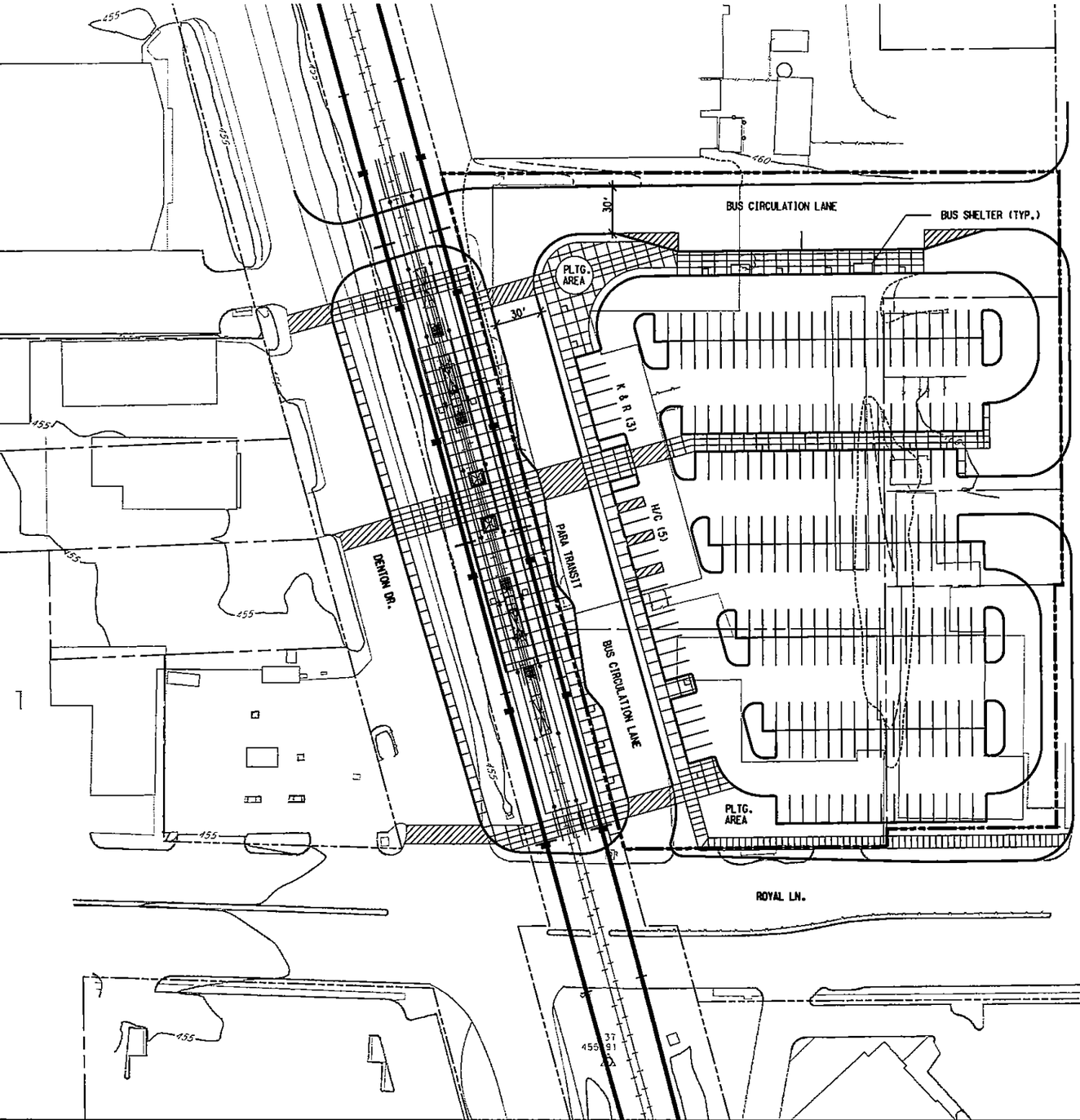
DWG No. CB1-3026



SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	235
KISS & RIDE SPACES:	3
BUS BAYS:	5

ZONING: IR - INDUSTRIAL / RESEARCH
SITE AREA: 147,802 SF/3.39 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 235 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

A. ZWEIT, A.I.A.
TX Reg No. 19331
Date 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZWEIT
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3
ARCHITECTURAL SITE PLAN
ROYAL LANE STATION

CONTRACT C-937775-1
DWG No. CB1-3026
REV

R:\NW3X\DGN\ARC\NW3XAP02.040

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lmorris

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DWG No. CB1-3027

RETAINING WALL (HT. VARIES)

EXISTING BUS SHELTER TO BE REMOVED ONCE BUS TRANSFER AREA IS COMPLETED

BUS BAY (1)

30'

PLANTING AREA

PLANTING AREA

BUS SHELTER (TYP.)

TREE GRATES (TYP.)

PEPPERWOOD ST.

SCALE (IN FEET)
0 20 40 80

PIKE ST.

EXISTING SURFACE PARKING (TO BE MODIFIED IN PHASE2)

DENTON DR.

FUTURE JOINT DEV. STRUCTURE PARKING

BUS CIRCULATION LANE (BUSES ONLY)

BEE ST.

460'

K & R (4)

HC (6)

PLANTING AREA

PLANTING AREA

TRAFFIC SIGNAGE

CARRICK ST. EXT. (AUTOMOBILES ONLY)

12'

30'

SHARED ACCESS LANE

42'

DOWNTOWN PLAZA (BY OTHERS)

PARATRANSIT

CARRICK ST.

460'

BUTTONWOOD DR.

PS No. 10 TO
565+27.59

PI 564+96.17

PARK & RIDE SPACES:	179
KISS & RIDE SPACES:	4
BUS BAYS:	7

ZONING: PD 35 EAST OF ROW
PD 31 WEST OF ROW
SITE AREA: 197,516 SF / 4.53 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 236 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	DWG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

A. ZREET, A.I.A.
TX Reg No. 19230
Date: 12/01/02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 661-1900

DART PROJECT

DART

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3
ARCHITECTURAL SITE PLAN
FARMERS BRANCH STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT C-937775-1

DWG No. CB1-3027

REV

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Mon Nov 25 08:07:54 2002
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lmorris

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OW, R:\NW3X\nw3xrwr1.040, 2-12,17-34,38-41,47,48,51-61,63
LIGN, R:\NW3X\nw3xalr1.040, 1-11,13,15,16,18,20-39,41-56,60-62

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PRF ROTATION=0.000000
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DWG No. CB1-3028

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Thu Nov 14 13:53:24 2002
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imorris

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VALLEY VIEW LANE

BEE ST.

DENTON DR.

PIKE ST.

PIKE ST.

PEPPERWOOD ST.

RETAINING WALL (HT. VARIES)

EXISTING BUS SHELTER TO BE REMOVED ONCE BUS TRANSFER AREA IS COMPLETED

BUS BAY (1)

30'

PLANTING AREA

PLANTING AREA

BUS SHELTER (TYP.)

TREE GRATES (TYP.)

EXISTING SURFACE PARKING TO BE MODIFIED IN PHASES

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	179
KISS & RIDE SPACES:	4
BUS BAYS:	7

ZONING: PD 35 - EAST OF ROW
PD 31 - WEST OF ROW
SITE AREA: 197,516 SF /4.53 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 237 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
1								

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
A. ZWEIT, A.I.A.
TX Reg No. 9620
Date: 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 Fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 800
DALLAS, TEXAS 75248
(972) 991-1000

DART PROJECT

DART

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZWEIT
IN CHARGE	R. KELLY
DATE	25 OCT 02

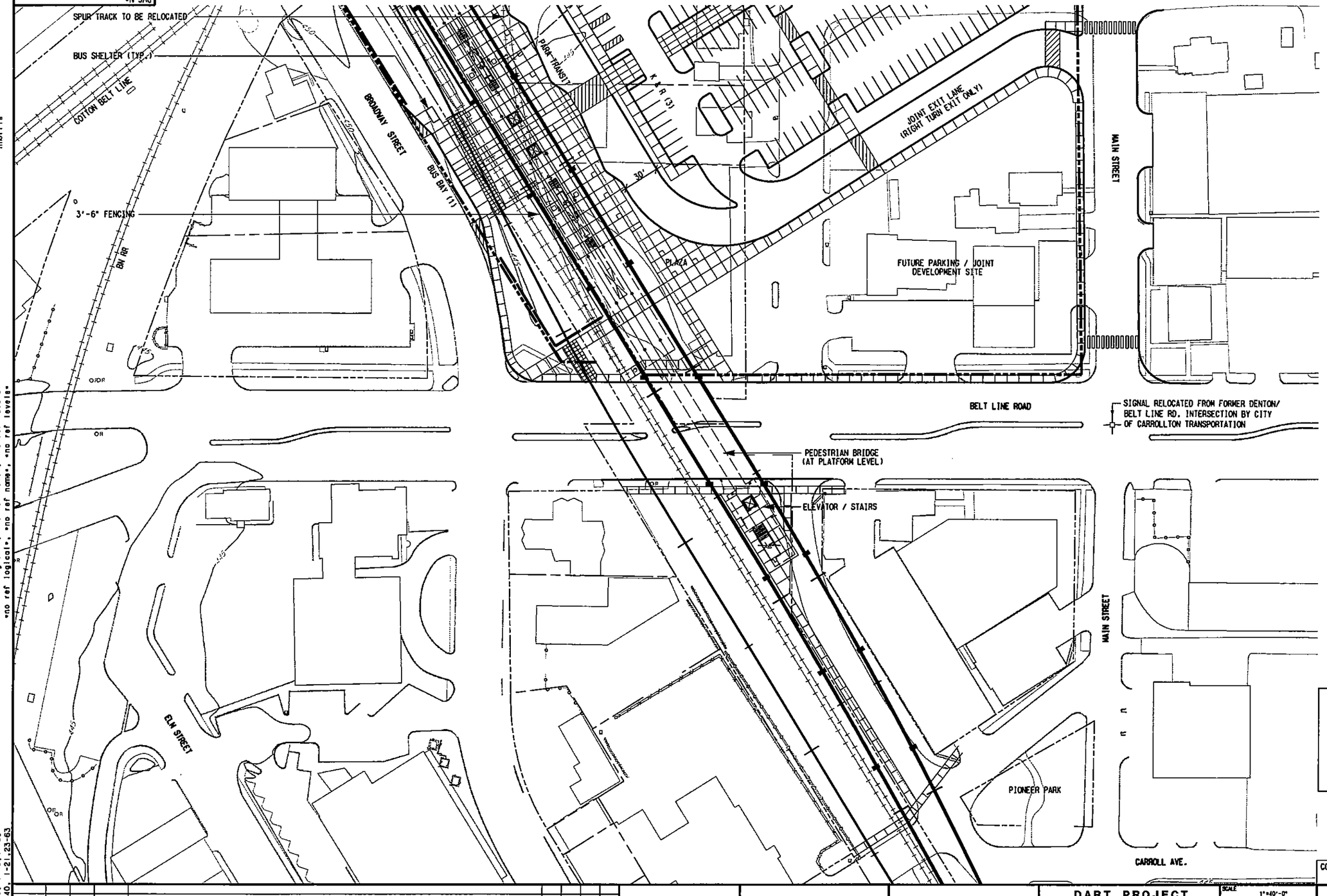
DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-3
ARCHITECTURAL SITE PLAN
FARMERS BRANCH STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT	DWG No.	REV
C-937775-1	CB1-3028	

R:\NW3X\DGN\ARC\NW3XAP3B.040

DWG No. CB1-4019



PARK & RIDE SPACES:	253
KISS & RIDE SPACES:	3
BUS BAYS:	5

ZONING: HC - HEAVY COMMERCIAL
PD 36 - (LR-2)
FRW - FREEWAY
SITE AREA: 289,026 SF/ 6.64 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 238 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.

A. ZEET, A.I.A.
TX Reg No. 19820
Date 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZEET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
ARCHITECTURAL SITE PLAN
CARROLLTON SQUARE STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT C-937775-1 | DWG No. CB1-4019 | REV

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lmorris

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DWG No. CB1-4020

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lmarris

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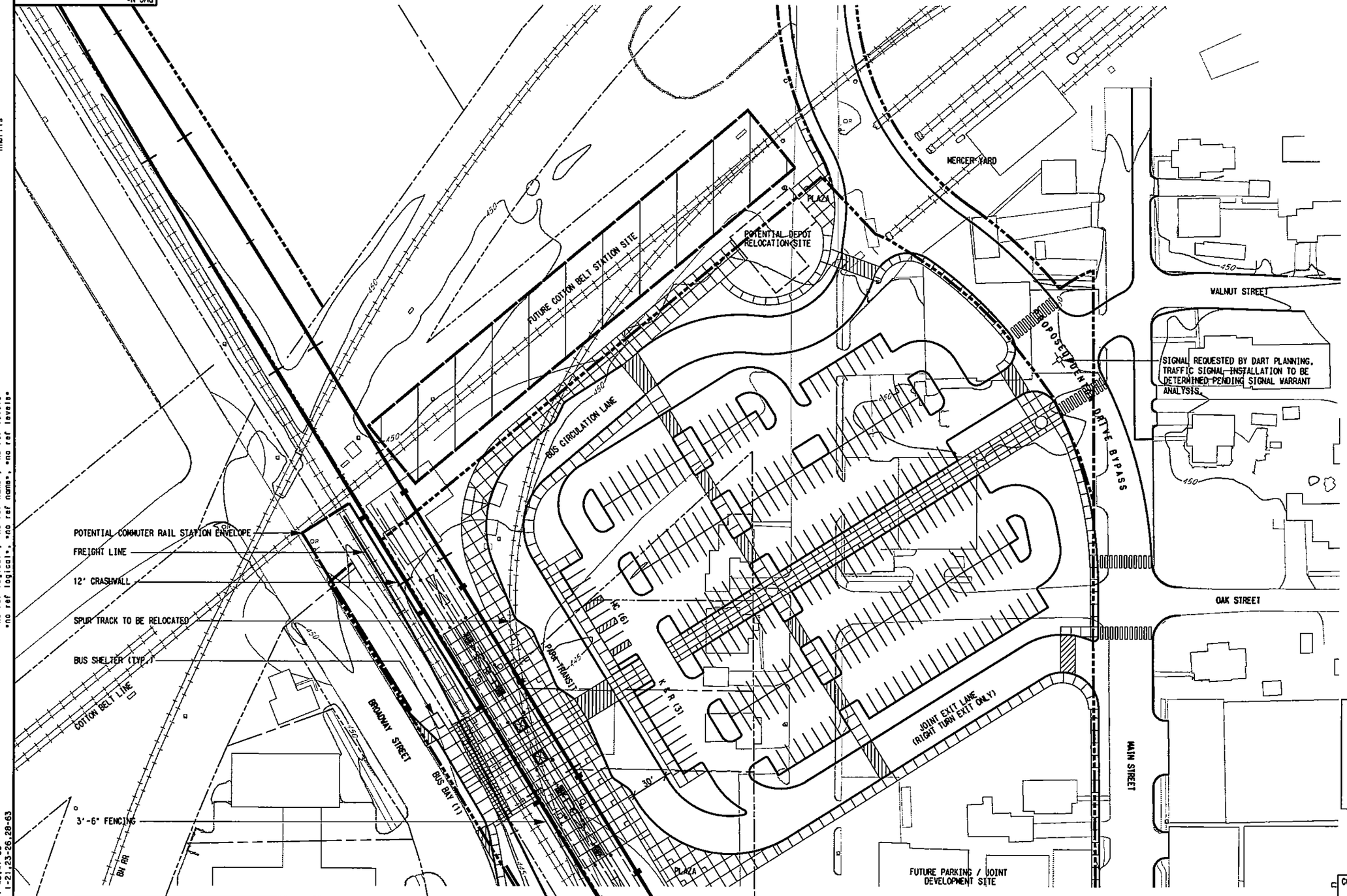

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	253
KISS & RIDE SPACES:	3
BUS BAYS:	5

ZONING: HC - HEAVY COMMERCIAL
PD 36 - (LR-2)
FRW - FREEWAY
SITE AREA: 289,026 SF/ 6.64 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 239 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
A. ZREET, R.P.E.
Date: 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
ARCHITECTURAL SITE PLAN
CARROLLTON SQUARE STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT C-937775-1
DWG No. CB1-4020
REV

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DWG No. CB1-4021

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lmorris

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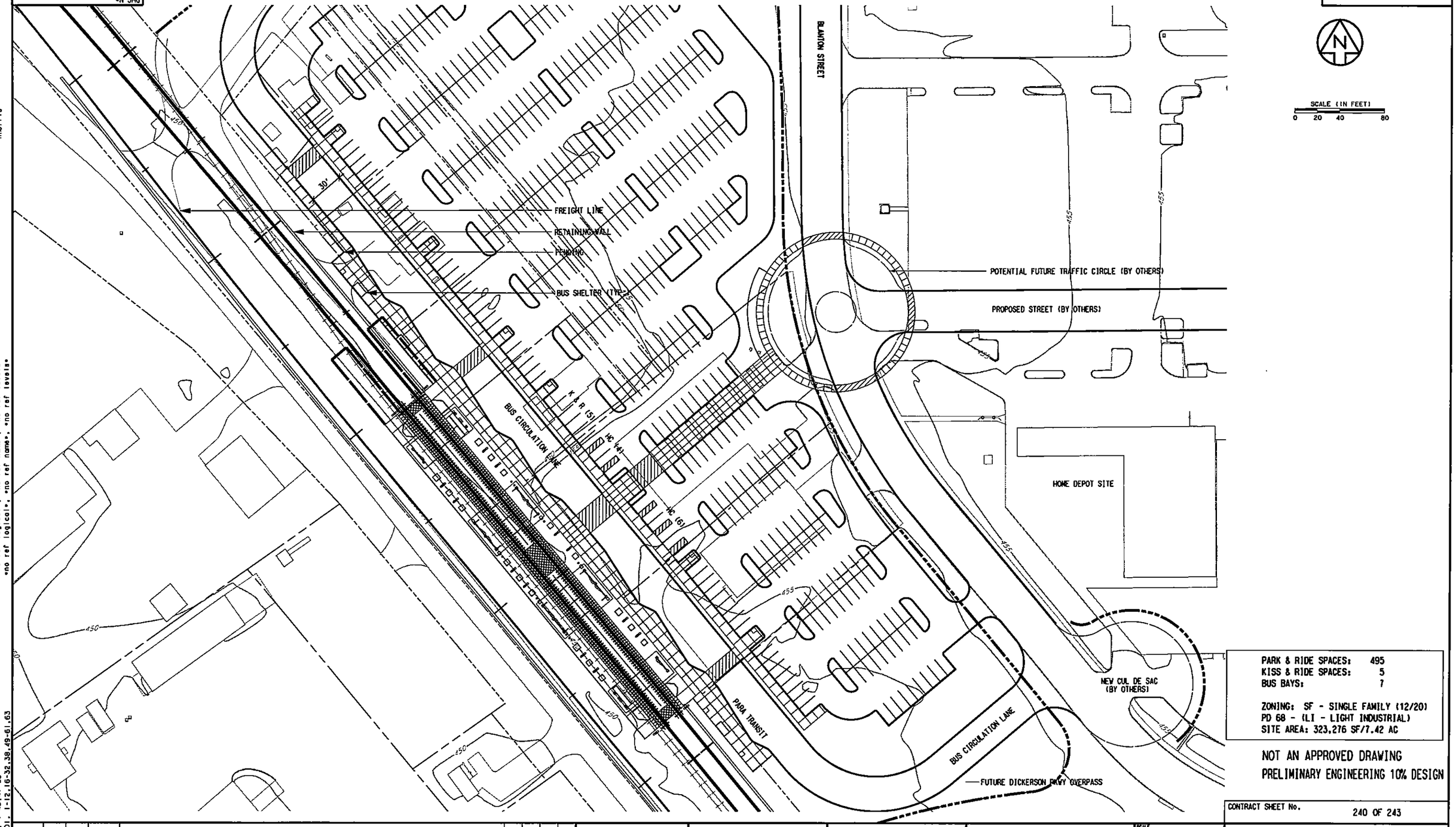

PARK & RIDE SPACES:	495
KISS & RIDE SPACES:	5
BUS BAYS:	7

ZONING: SF - SINGLE FAMILY (12/20)
PD 68 - (LI - LIGHT INDUSTRIAL)
SITE AREA: 323,276 SF/7.42 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
A. ZHEIT, A.I.A.
TX Reg No. 8820
Date: 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZHEIT
IN CHARGE	R. KELLY
DATE	25 OCT 02

CONTRACT SHEET No. 240 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
ARCHITECTURAL SITE PLAN
TRINITY MILLS STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT	DWG No.	REV
C-937775-1	CB1-4021	

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DWG No. CB1-4022

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lmorris

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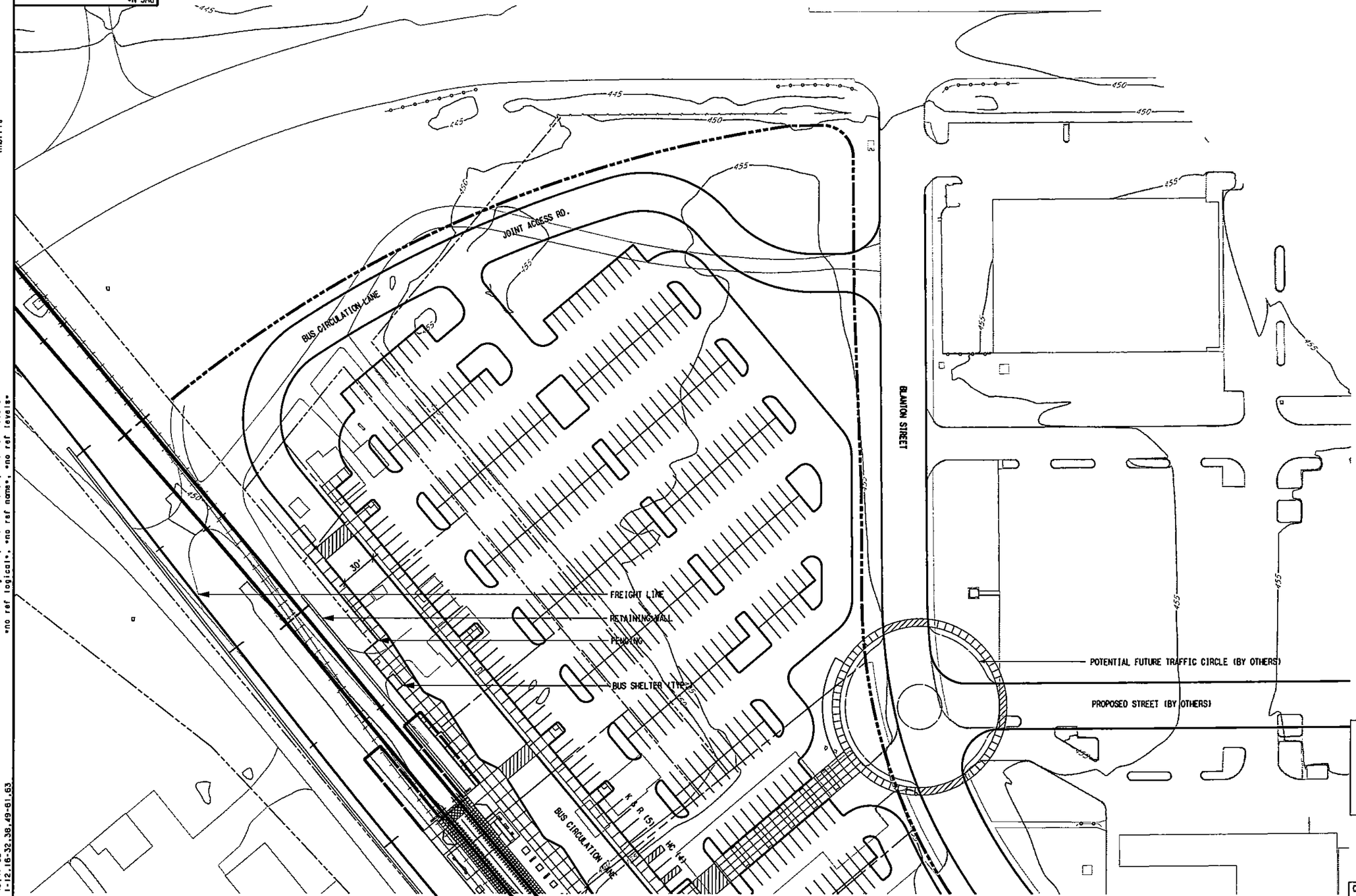

N

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	495
KISS & RIDE SPACES:	5
BUS BAYS:	7

ZONING: SF - SINGLE FAMILY (12/20)
PD 68 - (LI - LIGHT INDUSTRIAL)
SITE AREA: 323,276 SF/ 7.42 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 241 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
A. ZREET, A.I.A.
Date 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2020 fax 214.220.2021

PARSONS
15770 N.DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	H. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
ARCHITECTURAL SITE PLAN
TRINITY MILLS STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT	DWG No.	REV
C-937775-1	CB1-4022	

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DWG No. CB1-4023

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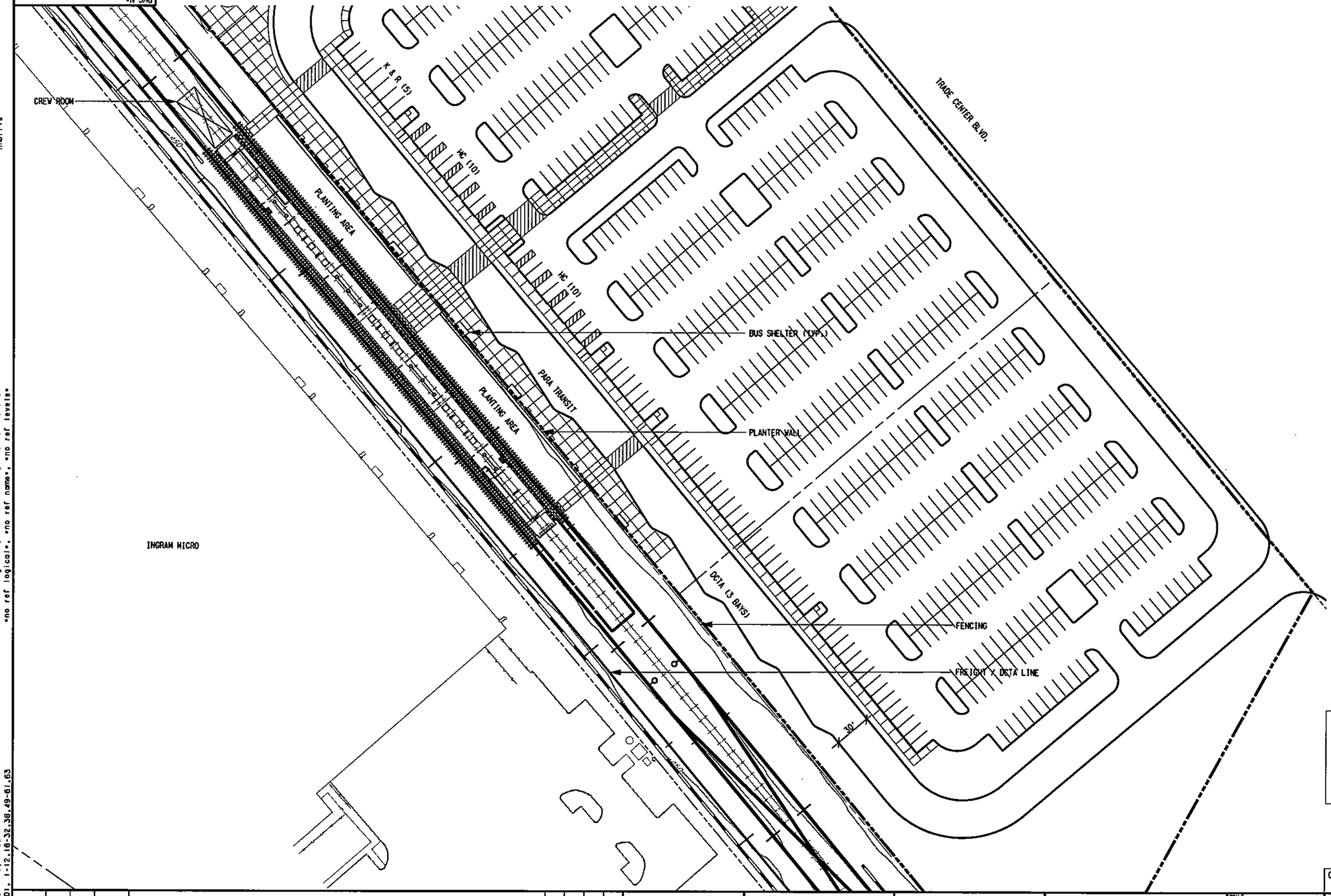

N

SCALE (IN FEET)
0 20 40 80

PARK & RIDE SPACES:	887
KISS & RIDE SPACES:	5
BUS BAYS:	5

ZONING: LI - LIGHT INDUSTRIAL
SITE AREA: 736,119 SF /16.90 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES. FOR REVIEW ONLY.
******
A. SHEET, A.I.A.
Texas reg. no. 00000
Date: 25 OCT 02

WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N.DALLAS PKWY, SUITE 600
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT

DARTCADD

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. SHEET
IN CHARGE	R. KELLY
DATE	25 OCT 02

CONTRACT SHEET No. 242 OF 243

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
ARCHITECTURAL SITE PLAN
FRANKFORD STATION
SITE PLAN (SHEET 1 OF 2)

CONTRACT C-937775-1
DWG No. CB1-4023
REV

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lmorris
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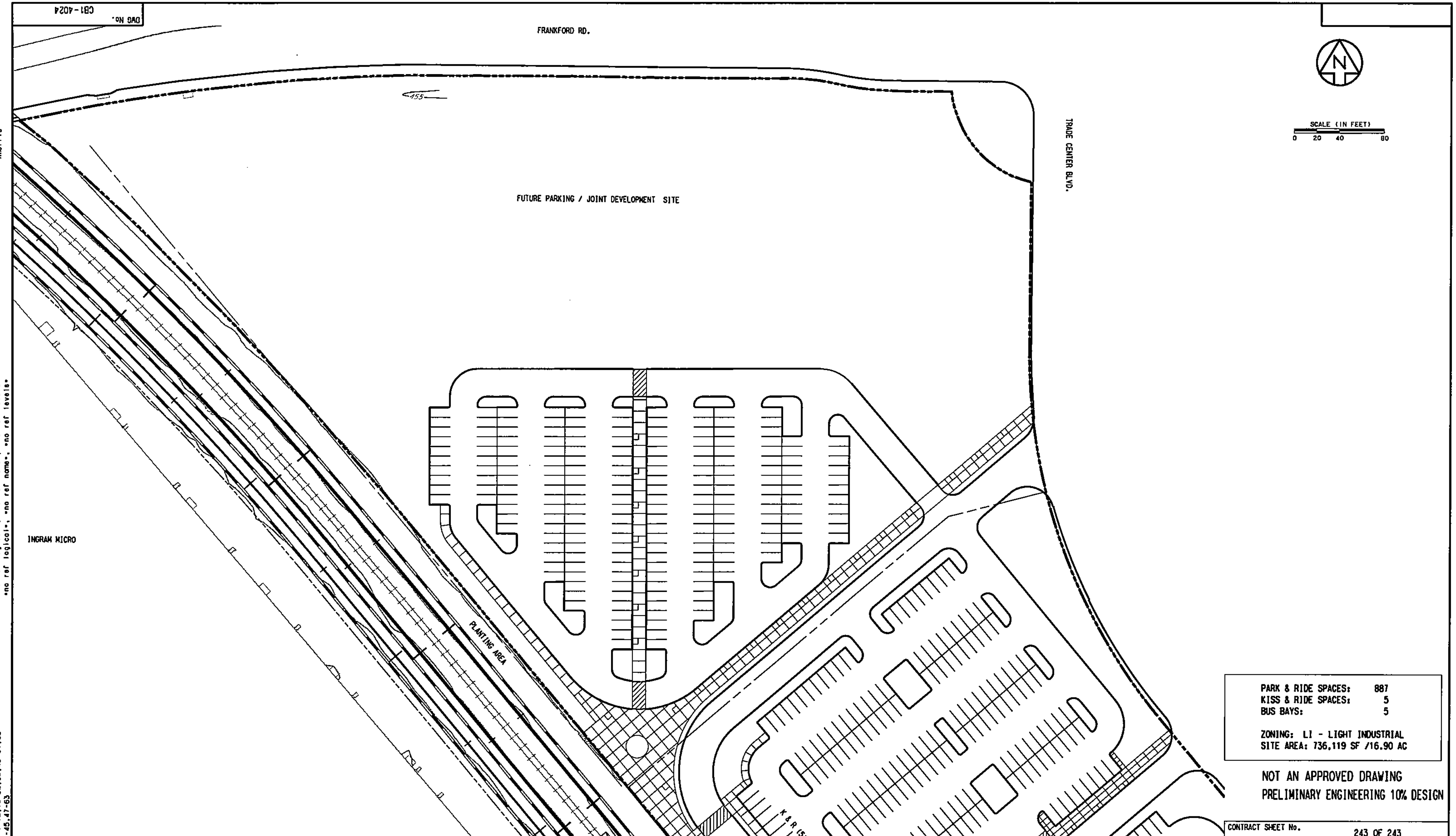
CB1-4024
DWG No.



PARK & RIDE SPACES: 887
KISS & RIDE SPACES: 5
BUS BAYS: 5

ZONING: LI - LIGHT INDUSTRIAL
SITE AREA: 736,119 SF /16.90 AC

NOT AN APPROVED DRAWING
PRELIMINARY ENGINEERING 10% DESIGN

CONTRACT SHEET No. 243 OF 243

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS
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WRT Planning & Design
Wallace Roberts & Todd, LLC
1925 San Jacinto, 2nd Floor
Dallas, Texas 75201
214.220.2028 fax 214.220.2921

PARSONS
15770 N. DALLAS PKWY, SUITE 500
DALLAS, TEXAS 75248
(972) 991-1900

DART PROJECT
DART

SCALE	1"=40'-0"
DRAWN	D.RAINES
DESIGNED	D.RAINES
CHECKED	A. ZREET
IN CHARGE	R. KELLY
DATE	25 OCT 02

DARTCADD

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION NW-4
ARCHITECTURAL SITE PLAN
FRANKFORD STATION
SITE PLAN (SHEET 2 OF 2)

CONTRACT	DWG No.	REV
C-937775-1	CB1-4024	

R:\NW4X\DGN\ARC\NW4XAP3B.040

Letters of Coordination

Appendix D

Dallas Area Rapid Transit
P.O. Box 660163
DART Dallas, Texas 75266-0163
214/749-3278

November 17, 2000

Reference: DART Northwest Line to Carrollton EIS
DART Southeast Corridor EIS

Dear Agency Representatives:

Dallas Area Rapid Transit (DART) has recently initiated efforts to prepare an Environment Impact Statement (EIS) for both of the above-referenced projects. Both projects have completed Major Investment Studies (MIS), arriving at a Locally Preferred Investment Strategy featuring Light Rail Transit (LRT) recommendations. The Federal Transit Administration (FTA) has authorized DART to commence this phase of project development, issuing a Notice of Intent to Prepare an EIS in the Federal Register on Friday, November 3, 2000.

Public Scoping Meetings for these two projects have been announced for late November (Southeast Corridor) and early December (Northwest Corridor). These meetings are detailed in the accompanying Notices of Intent.

For the purposes of initiating interagency coordination with federal, state, and local agencies, DART is conducting an Interagency Coordination Meeting during the Scoping period. You are invited to attend this meeting, scheduled for the following time and location:

DART Interagency Scoping Meetings
December 6, 2000
DART Board Conference Room 1C, First Floor
1401 Pacific Avenue
Dallas, Texas 75201
10:00 a.m. - 12 noon -- Southeast Corridor EIS
12 noon - 1:00 p.m. – Lunch (provided by DART)
1:00 p.m. - 3:00 p.m. -- Northwest Line to Carrollton EIS

You will note from this schedule that we are planning for a full day of activities in order to kick off these two important regional transportation projects. Lunch will be provided. It is our hope that you will make the time to attend these meetings so that we can initiate these projects with the fullest information possible.

In order to provide you with background prior to these meetings, we are including with this letter ***Scoping Information Reports*** for both projects. These documents highlight the potential environmental, land use and transportation issues associated with each

project. Where applicable, information from the preliminary ***Environmental Baseline Reports*** prepared during the MIS phase is attached to provide additional information for each corridor. Your early input on these issues, as well as your assistance with identifying other issues not included, would be greatly appreciated.

If you are not able to attend the meeting, but have information or comments that will be useful for the environmental process, please forward the information to the respective Project Manager at your earliest convenience.

If you have any questions, please contact either of us. We look forward to seeing you at the meetings.

Sincerely,

John Hoppie
Southeast Corridor Project Manager
214/749-2525
jhoppie@dart.org

Kay Shelton, AICP
Northwest Corridor Project Manager
214/749-2841
kshelton@dart.org

Attachments - Notice of Intent (SE and NW)
- Scoping Information Report (SE and NW)

Dallas Area Rapid Transit
P.O. Box 660163
DART Dallas, Texas 75266-0163
214/749-3278

Texas Parks & Wildlife Dept.
NOV 20 2000
Wildlife Habitat Assessment Program

November 17, 2000

Reference: DART Northwest Line to Carrollton EIS
DART Southeast Corridor EIS

Dear Agency Representatives:

Dallas Area Rapid Transit (DART) has recently initiated efforts to prepare an Environment Impact Statement (EIS) for both of the above-referenced projects. Both projects have completed Major Investment Studies (MIS), arriving at a Locally Preferred Investment Strategy featuring Light Rail Transit (LRT) recommendations. The Federal Transit Administration (FTA) has authorized DART to commence this phase of project development, issuing a Notice of Intent to Prepare an EIS in the Federal Register on Friday, November 3, 2000.

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December 6, 2000
DART Board Conference Room 1C, First Floor
1401 Pacific Avenue
Dallas, Texas 75201
10:00 a.m. - 12 noon -- Southeast Corridor EIS
12 noon - 1:00 p.m. – Lunch (provided by DART)
1:00 p.m. - 3:00 p.m. – Northwest Line to Carrollton EIS

(43)
8273
562
1

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project. Where applicable, information from the preliminary ***Environmental Baseline Reports*** prepared during the MIS phase is attached to provide additional information for each corridor. Your early input on these issues, as well as your assistance with identifying other issues not included, would be greatly appreciated.

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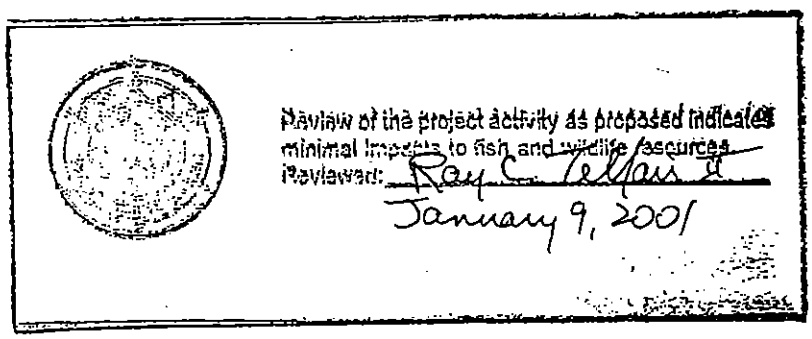
If you have any questions, please contact either of us. We look forward to seeing you at the meetings.

Sincerely,

John Hoppie
Southeast Corridor Project Manager
214/749-2525
jhoppie@dart.org

Kay Shelton, AICP
Northwest Corridor Project Manager
214/749-2841
kshelton@dart.org

Attachments - Notice of Intent (SE and NW)
- Scoping Information Report (SE and NW)



U.S. Department
of Transportation
**Federal Transit
Administration**

REGION VI
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

819 Taylor St. Suite 8A36
Fort Worth, TX 76102
817-978-0550
817-978-0575 (fax)

DALLAS AREA RAPID TRANSIT
RECEIVED
MAY 2 1 2001
CAPITAL PLANNING & DEVELOPMENT

May 16, 2001

Mr. Tom K. Ryden P.E.
Assistant Vice President
Capital Planning & Development
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

Re: DART Northwest Corridor
Interim Service to Victory Station

Dear Mr. Ryden:

The Federal Transit Administration (FTA) has reviewed the environmental study submitted for the Northwest Corridor Interim Service to Victory Station dated April 27, 2001. The FTA finds that the project is a Categorical Exclusion in accordance with 23 CFR 771.117(c)(18), and does not warrant additional environmental analysis beyond that recommended in the environmental study.

Should you have any questions regarding this finding, please contact Jesse Balleza, Community Planner, at (817) 978-0559.

Sincerely,

Robert C. Patrick
Regional Administrator

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

June 25, 2001

COPY

Stephen L. Salin, AICP
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

RE: Project review under Section 106 of the National Historic Preservation Act of 1966,
Improvements to Continental Avenue and replacement of bridge structures: City of Dallas, Dallas Co., Texas

Dear Mr. Salin:

Thank you for your May 15, 2001 correspondence and June 25 clarification concerning the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The Section 106 review process (National Historic Preservation Act of 1966, 16 USC 470, as amended) requires all federal agencies and their designated representatives to take into account the effects of their undertakings on historic properties. Federal agencies, or their designated representatives, must request the comments of the Texas State Historic Preservation Officer (SHPO) if they are considering an action or if they are assisting, permitting, or licensing an action that will affect archaeological sites or properties (buildings, structures or sites) built in 1956 or prior.

We understand that as part of the new sports arena project and associated mixed-use development, the City of Dallas finds it necessary to improve the surrounding area's traffic infrastructure. The proposed undertaking reviewed by our staff at this time involves only the action proposed by the Dallas Area Rapid Transit: the replacement of the Lamar-McKinney Underpass (also called the Continental Avenue Underpass). The History Programs review staff has evaluated your narrative report and we concur that the Lamar-McKinney Underpass is **ELIGIBLE** for the National Register of Historic Places under Criterion A in the area of Community Development.

After consultation with the Division of Architecture staff, we have determined that demolition of this National Register eligible bridge would constitute an adverse effect. Federal regulations require that agencies must seek methods to avoid, minimize, or mitigate adverse effects. We request further information regarding any alternatives that were considered that would have avoided or minimized the effect to the historic bridge, and the rationale for eliminating these alternatives. Should we agree that demolition cannot be avoided, we will need to develop a formal Memorandum of Agreement (MOA). Please contact Linda Roark at 512/463-9122 regarding any further consultation for the adverse effect.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Monica Penick at 512/463-5942.**

Sincerely,

Monica Penick, Historian
for F. Lawerence Oaks, SHPO

U.S. Department
of Transportation
**Federal Aviation
Administration**

Southwest Region
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

Fort Worth, Texas 76193-0000

MAR 0 8 2001

Mr. Robert C. Patrick
Regional Administrator
Federal Transit Administration, Region VI
819 Taylor Street
Room Number 8A36
Fort Worth, TX 76102

Dear Mr. Patrick:

We are in receipt of your letter dated February 20, 2001.

We agree to be a cooperating agency with the Federal Transit Administration (FTA), and work with the Dallas Area Rapid Transit (DART) on an Environmental Impact Statement (EIS) for the proposed Northwest Corridor Light Rail Transit Line to Carrollton, in Dallas County, Texas. In addition, we look forward to working with the FTA on complying with the Clean Air Act, specifically Transportation Conformity.

The role of the Federal Aviation Administration (FAA) is limited by the FAA's federal actions associated with the proposed projects. Specifically, FAA's federal action will be limited to those locations contained within the Love Field Airport Layout Plan. Within the EIS, we need to examine the alternative station locations with the impact on airside and landside development at Love Field.

We appreciate your interest in aviation and the environmental process and trust that this letter is responsive to your request. Ms. Nan L. Terry, Texas Airport Development Office, has attended two meetings and given the FTA and DART staff copies of the FAA Order 5050.4A, Airport Environmental Handbook and FAA Order 1050.1D, Change 4, Policies and Procedures for Considering Environmental Impacts.

These orders govern the FAA's compliance with environmental rules and regulations. If you have any questions regarding FAA's participation in the EIS, please contact Ms. Terry at 817-222-5607.

Sincerely,

Original Signed by:
Ruth Leverenz

Ruth Leverenz
Regional Administrator,
Southwest Region

cc:
Mr. Jesse Balleza
Community Planner
Federal Transit Administration Region VI
819 Taylor Street
Room 8A36
Fort Worth, TX 76102

Ms. Kay Shelton
Dallas Area Rapid Transit
1401 Pacific Avenue
Dallas, TX 75266-7213

Mr. Terry Mitchell
Assistant Director of Aviation
City of Dallas
LB16 Love Field Terminal
8008 Cedar Springs
Dallas, TX 75235

U.S. Department
of Transportation
**Federal Aviation
Administration**

Southwest Region
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

Fort Worth, Texas 76193-0000

April 27, 2001

Ms. Kay Shelton
Project Manager
Dallas Area Rapid Transit (DART)
Post Office Box 660163
Dallas, TX 75266-7248

Dear Ms. Shelton:

As discussed at our last meeting, the Federal Aviation Administration (FAA) has some concerns about Alignment Option No. 3 for the Love Field Station for the proposed DART light rail line. These are only general concerns. The FAA will have official comments after an airspace study is conducted.

- The FAA cannot approve any obstruction located within the runway safety area.
- Nothing can penetrate the light plane of the MALSR.
- During construction, no equipment can interfere with the NAVAIDs. (For example, vehicles cannot park in front of the localizer.)
- The FAA is concerned about vibrations from both the operations of the light rail and the tunnel boring affecting existing NAVAIDs.
- FAA is concerned about any change in grade on the south end of RW31L because of the Glide Slope.
- What emergency measures can be implemented in the case of an interruption to an electrical cable serving the NAVAIDs.
- A Memorandum of Agreement must be entered into between DART and FAA if our NAVAIDs are to be relocated.
- If additional investigations are required to determine the potential impacts of the operation of light rail or the construction of the light rail on FAA's equipment, DART will be required to conduct such investigations.

In order for the FAA to determine the validity of these concerns and to make an airspace determination on this proposal, DART should submit a Notice of Proposed Alteration or Construction (7460-1 Form) for this proposal. Before construction can begin, an additional airspace determination for the impacts during construction must be conducted. If I can be of any assistance in this matter, please do not hesitate to contact me at (817) 222-5607.

Sincerely,

Nan L. Terry
Airport Environmental Specialist
Texas Airports Development Office

cc:
Mr. Kenneth Gwynn
Airport Manager
Dallas Love Field
LB16 Love Field Terminal Bldg
Dallas, TX 75235

Mr. Jesse Balleza
Federal Transit Administration
819 Taylor Street
Room 8A36
Fort Worth, TX 76102

U.S. Department
of Transportation
**Federal Aviation
Administration**

Southwest Region
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

Fort Worth, Texas 76193-0000

November 5, 2001

Mr. Terry Mitchell
Assistant Director
Department of Aviation
Administration LB-16 Love Field Terminal Building
Dallas, TX 75235

Dear Mr. Mitchell:

The Federal Aviation Administration (FAA) has completed the airspace utilization study (Study No. 01-ASW-5168-NRA) of the construction on the proposed Dallas Area Rapid Transit (DART) underground light rail, a portion of which is located at the Dallas Love Field Airport, in Dallas, Texas. There is no objection to the proposal from an airspace utilization standpoint.

Environmental considerations for the light rail proposal are being studied under the Dart Environmental Impact Statement (EIS).

If I can be of further assistance, I may be reached at (817) 222-5658.

Sincerely,

Ralph B. Christian III
Program Manager, Texas Airport
Development Office

11-08-01 A10:

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

November 13, 2001

Mr. Terry Mitchell
Assistant Director of Aviation
City of Dallas
LB 16, Love Field Terminal Building
Dallas, Texas 75235

RE: Form 7460-1 – DART Northwest Corridor Love Field Alignment Option

Dear Mr. Mitchell,

Please find enclosed Federal Aviation Administration *Form 7460-1, Notice of Proposed Construction or Alteration* for another DART Northwest Corridor Love Field Alignment option for your review and distribution to appropriate City and FAA staff. Also enclosed are six (6) copies of the alignment on a USGS map and six (6) copies of the horizontal alignment on a larger-scale color map.

Based on previous discussions with the City and FAA, we anticipate you will require a 45-60 day review period. Given that a portion of this alignment is the same as that previously reviewed under FAA Aeronautical Study No.01-ASW-5168-NRA, I ask that this review be expedited and completed in 30 days if possible. This will allow us to incorporate this alignment into our Draft Environmental Impact Statement (EIS) document, which is currently being prepared.

It is DART's intention to evaluate one Love Field design option as well as our "base" alignment within the existing rail corridor in our Draft EIS. Our Final EIS will identify one option as the preferred route. Timely review comments will assist us in addressing the full range of issues in the Draft EIS.

Should you have any questions or require any additional information please feel free to contact me at 214/749-2841. Thank you.

Sincerely,

Kay M. Shelton
Dallas Area Rapid Transit
Northwest Corridor Project Manager

C: Doug Allen, Vice President, Planning and Development
Tom Ryden, Assistant Vice President, Capital Planning and Development
Nan Terry, Federal Aviation Administration, Southwest Region

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

December 5, 2001

Mr. Terry Mitchell
Assistant Director of Aviation
City of Dallas
LB 16, Love Field Terminal Building
Dallas, Texas 75235

RE: Form 7460-1 – DART Northwest Corridor Love Field Alignment Option

Dear Mr. Mitchell,

Please find enclosed Federal Aviation Administration *Form 7460-1, Notice of Proposed Construction or Alteration* for the two off-airport alternatives under consideration in the DART Northwest Corridor LRT project. As discussed with Nan Terry and Bernie Christian with FAA, an air space study must also be completed for these alternatives. If the Love Field alignment option is not selected, one of these two options will be reflected in the Final EIS.

The first option, the "Base Alignment", follows Harry Hines Boulevard through the Medical Center, and transitions back to the UP RR corridor along the south side of Treadway Street and Mockingbird Lane. The second option, the "Base Alignment with Medical Center Design Option" transitions to the UP RR corridor south of Inwood Road and provides an aerial station at Inwood Road. Portions of the alignment immediately west of the airport and the Inwood Station penetrate the 100:1 slope as noted on the maps. Both alignment options include tunnel section under Mockingbird Lane so this section does not penetrate the 100:1 slope.

These two options are for your review and distribution to appropriate City and FAA staff. Also enclosed are six (6) copies of the alignment on a USGS map and six (6) copies of the plan and profile sheets for each alternative.

Based on previous discussions with the City and FAA, we anticipate you will require a 45-60 day review period. I ask that this review be expedited and completed in 30 days if possible. This will allow us to incorporate your review comments into our Draft Environmental Impact Statement (EIS) document, which is currently being prepared for FTA and FAA review in mid-January.

It is DART's intention to evaluate both of these off-airport options in our Draft EIS. Our Final EIS will identify one option as the preferred route. Timely review comments will assist us in addressing the full range of issues in the Draft EIS.

Should you have any questions or require any additional information please feel free to contact me at 214/749-2841. Thank you.

Sincerely,

Kay M. Shelton
Dallas Area Rapid Transit
Northwest Corridor Project Manager

C: Doug Allen, Vice President, Planning and Development
Tom Ryden, Assistant Vice President, Capital Planning and Development
Nan Terry, Federal Aviation Administration, Southwest Region
Bernie Christian, Federal Aviation Administration, Southwest Region

GEO-MARINE, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES
Since 1972

12 March 2001

Ms. LaRue Parker, Chairwoman
Caddo Indian Tribe of Oklahoma
P.O. Box 487
Binger, OK 73009

Dear Ms. Parker:

Geo-Marine, Inc., has been contracted by the Dallas Area Rapid Transit (DART) to conduct historical and archeological investigations to identify both prehistoric and historic sites within the construction boundaries of a proposed light rail corridor in Dallas and Denton counties, Texas. This work is being conducted as part of a larger Environmental Impact Statement for DART. This light rail line is being constructed on an existing rail bed located between Frankford Road in Carrollton and just north of the Central Business District in Dallas. Please find enclosed a map showing the route highlighted in yellow.

We respectfully ask that your review the enclosed map and inform us if you have any concerns regarding traditional cultural properties or sacred sites as part of this project. Should you have any concerns regarding this project, please contact me within 15 days of receipt of this letter so that we might notify DART as soon as possible. I may be reached by letter or phone (see address and phone number below) or by e-mail. My e-mail address is: mgreen@geo-marine.com.

Thank you for your time and attention to this matter. If I can be of assistance, please let me know.

Sincerely,

Melissa M. Green

Melissa M. Green
Principal Investigator
Geo-Marine, Inc.

enclosure

GMI Ref#: 3600-A03

cc: Kay Shelton, DART
Kyle Keahey, S.R. Beard

GEO-MARINE, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES
Since 1972

12 March 2001

Mr. Donald Patterson, President
Tonkawa Tribe of Oklahoma
P.O. Box 70
Tonkawa, OK 74653

Dear Mr. Patterson:

Geo-Marine, Inc., has been contracted by the Dallas Area Rapid Transit (DART) to conduct historical and archeological investigations to identify both prehistoric and historic sites within the construction boundaries of a proposed light rail corridor in Dallas and Denton counties, Texas. This work is being conducted as part of a larger Environmental Impact Statement for DART. This light rail line is being constructed on an existing rail bed located between Frankford Road in Carrollton and just north of the Central Business District in Dallas. Please find enclosed a map showing the route highlighted in yellow.

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Thank you for your time and attention to this matter. If I can be of assistance, please let me know.

Sincerely,

Melissa M. Green
Principal Investigator
Geo-Marine, Inc.

enclosure

GMI Ref#: 3600-A03

cc: Kay Shelton, DART
Kyle Keahey, S.R. Beard

550 East 15th Street • Plano, Texas 75074 • Tel: (972) 423-5480 • Fax:(972) 422-2736
Dallas-Ft. Worth, TX • El Paso, TX • San Antonio, TX • Fajardo, Puerto Rico • Oak Ridge, TN • Newport News, VA • Panama City, FL
E-Mail: gmi@geo-marine.com • website: www.geo-marine.com

GEO-MARINE, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES
Since 1972

12 March 2001

Mr. Gary McAdams, President
Wichita and Affiliated Tribes
P.O. Box 729
Anadarko, OK 73005

Dear Mr. McAdams:

Geo-Marine, Inc., has been contracted by the Dallas Area Rapid Transit (DART) to conduct historical and archeological investigations to identify both prehistoric and historic sites within the construction boundaries of a proposed light rail corridor in Dallas and Denton counties, Texas. This work is being conducted as part of a larger Environmental Impact Statement for DART. This light rail line is being constructed on an existing rail bed located between Frankford Road in Carrollton and just north of the Central Business District in Dallas. Please find enclosed a map showing the route highlighted in yellow.

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Thank you for your time and attention to this matter. If I can be of assistance, please let me know.

Sincerely,

Melissa M. Green
Principal Investigator
Geo-Marine, Inc.

enclosure

GMI Ref#: 3600-A03

cc: Kay Shelton, DART
Kyle Keahey, S.R. Beard

550 East 15th Street • Plano, Texas 75074 • Tel: (972) 423-5480 • Fax:(972) 422-2736
Dallas-Ft. Worth, TX • El Paso, TX • San Antonio, TX • Fajardo, Puerto Rico • Oak Ridge, TN • Newport News, VA • Panama City, FL
E-Mail: gmi@geo-marine.com • website: www.geo-marine.com

GEO-MARINE, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES
Since 1972

30 March 2001

Ms. Celeste Brancel-Brown
Environmental Review Coordinator
Wildlife Diversity Program
3000 S. IH-35, Suite 100
Austin, TX 78704

RE: Proposed DART Northwest Corridor

Dear Ms. Brancel-Brown,

The purpose of this letter is to seek the services of Texas Parks and Wildlife. The Dallas Area Rapid Transit (DART) has proposed to extend its Light Rail Tranist servies into northwest Dallas County. DART would appreciate your review and opinion on any potential impacts to threatened/endangered species within the proposed project corridor. The enclosed documentation includes the following sections, per the *Request for Threatened/Endangered Species Review* form:

1. Scope of the project;
2. Current condition and/or historic use of the site;
3. Natural/physical features of the site;
4. T&E surveys performed;
5. Description of potential negative impacts and mitigation measures;
6. Description of planned beneficial enhancements or restoration efforts;
7. Photocopies of relevant portions of topographic maps; and
8. Photocopies of aerial photographs.

Based on the letter from you, dated August 4, 2000, a charge will be assessed for these services. Upon your review, please send an invoice for your services. For any additional question or comments please contact Mr. Rudi Reinecke, Geo-Marine, Inc. Point of Contact, at 972/423-5480.

Sincerely,

Rudi K. Reinecke
Project Manager

Enclosure

xc: Kay Shelton – DART (one copy, no attachments)
Tom Marking – S. R. Beard & Associates (one copy, no attachments)

550 East 15th Street • Plano, Texas 75074 • Tel: (972) 423-5480 • Fax (972) 422-2736
Dallas - Ft. Worth, TX • El Paso, TX • San Antonio, TX • Fajardo, Puerto Rico • Oak Ridge, TN • Newport News, VA • Panama City, FL
E-Mail: gmi@geo-marine.com • website: www.geo-marine.com

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

April 3, 2001

Ms. Melissa Green
Geo-Marine, Inc.
550 E. 15th Street
Plano, TX 75074

Re: Project review under the Antiquities Code of Texas
DART NW Light Rail Corridor, Dallas and Denton Counties
Permit Application #2552

Dear Colleague:

Thank you for your Antiquities Permit Application for the above referenced project. This letter presents the final copy of the permit application from the Executive Director of the Texas Historical Commission, the state agency responsible for administering the Antiquities Code of Texas.

Please keep this copy for your records. Additionally, please note that the Antiquities Permit investigations require production of 20 copies of the final report and verification that any artifacts recovered and records produced during the investigations are curated at the repository listed in the permit.

If you have any questions concerning this permit or if we can be of further assistance, please contact Lillie Thompson at 512/463-1858. The reviewer for this project is Mark Denton.

Sincerely,

William A. Martin

for
F. Lawerence Oaks, State Historic Preservation Officer

FLO/lft

Enclosure

cc: Dallas Area Rapid Transit, Kay Shelton

MFA Myra L. Frank & Associates, Inc.

(213) 627-5376

Fax: (213) 627-6853

"Celebrating 20 years"

Environmental Impact Reports and Statements

Architectural History

Mr. Jim Anderson
Historic Preservation Planner
City of Dallas
Planning and Development
1500 Mariella Street
Dallas TX 75201

December 17, 2001

RE: Dallas Area Rapid Transit (DART) Northwest Corridor LRT Line to Carrollton

Dear Mr. Anderson:

DART, in cooperation with the Federal Transit Adminisitration (FTA) and the Federal Aviation Administration (FAA) is preparing a Draft Environmental Impact Statement (DEIS) for the DART Northwest Corridor LRT Line to Carrollton (Carrollton LRT Line). Myra L. Frank & Associates, Inc. (MFA), under contract with DART, is preparing the historic and cultural resources documentation.

The Carrollton LRT Line was selected at the conclusion of the NW corridor MIS. It includes approximately 17 miles of double-tracked LRT from downtown Dallas through the cities of Dallas and Farmers Branch to Frankford Road in Carrollton. Two alignment design options are being carried forward into the Draft EIS. The first is for tunnel access and an underground station on the Love Field airport property. The second is for an alternative alignment and two stations in the Medical Center area between the Market Center station and Mockingbird Lane. A final decision on these design options will be made following the circulation of and public comment on the Draft EIS.

MFA contacted your agency in 1999 to request your assistance in identifying any historic buildings, districts, sites, structures, landscapes, or archaeological sites located within the proposed project area. At this time, we would like to again ask your assistance in reviewing your records to ascertain whether any additional resources have been identified since 1999.

Sincerely,

Jessica B. Feldman
Architectural Historian

MFA Myra L. Frank & Associates, Inc.

(213) 627-5376

Fax: (213) 627-6853

"Celebrating 20 years"

Environmental Impact Reports and Statements

Architectural History

Christopher Barton
Chief Planner
City of Carrollton
P.O. Box 110535
Carrollton, TX 75011-0535

December 17, 2001

RE: Dallas Area Rapid Transit (DART) Northwest Corridor LRT Line to Carrollton

Dear Mr. Barton:

DART, in cooperation with the Federal Transit Adminisitration (FTA) and the Federal Aviation Administration (FAA) is preparing a Draft Environmental Impact Statement (DEIS) for the DART Northwest Corridor LRT Line to Carrollton (Carrollton LRT Line). Myra L. Frank & Associates, Inc. (MFA), under contract with DART, is preparing the historic and cultural resources documentation.

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Sincerely,

Jessica B. Feldman
Architectural Historian

MFA Myra L. Frank & Associates, Inc.

(213) 627-5376

Fax: (213) 627-6853

"Celebrating 20 years"

Environmental Impact Reports and Statements

Architectural History

Catherine Horsey
Executive Director
Preservation Dallas
2922 Swiss Avenue
Dallas, TX 75204

December 17, 2001

RE: Dallas Area Rapid Transit (DART) Northwest Corridor LRT Line to Carrollton

Dear Ms. Horsey:

DART, in cooperation with the Federal Transit Adminisitration (FTA) and the Federal Aviation Administration (FAA) is preparing a Draft Environmental Impact Statement (DEIS) for the DART Northwest Corridor LRT Line to Carrollton (Carrollton LRT Line). Myra L. Frank & Associates, Inc. (MFA), under contract with DART, is preparing the historic and cultural resources documentation.

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Sincerely,

Jessica B. Feldman
Architectural Historian

MFA Myra L. Frank & Associates, Inc.

(213) 627-5376

Fax: (213) 627-6853

"Celebrating 20 years"

Environmental Impact Reports and Statements

Architectural History

Gaylon Polatti
Archivist
Dallas Historical Society
P.O. Box 150038
Dallas, TX 75315

December 17, 2001

RE: Dallas Area Rapid Transit (DART) Northwest Corridor LRT Line to Carrollton

Dear Mr. Polatti

DART, in cooperation with the Federal Transit Adminisitration (FTA) and the Federal Aviation Administration (FAA) is preparing a Draft Environmental Impact Statement (DEIS) for the DART Northwest Corridor LRT Line to Carrollton (Carrollton LRT Line). Myra L. Frank & Associates, Inc. (MFA), under contract with DART, is preparing the historic and cultural resources documentation.

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MFA contacted your agency in 1999 to request your assistance in identifying any historic buildings, districts, sites, structures, landscapes, or archaeological sites located within the proposed project area. At this time, we would like to again ask your assistance in reviewing your records to ascertain whether any additional resources have been identified since 1999.

Sincerely,

Jessica B. Feldman
Architectural Historian

MFA Myra L. Frank & Associates, Inc.

(213) 627-5376

Fax: (213) 627-6853

"Celebrating 20 years"

Environmental Impact Reports and Statements

Architectural History

Rick Loessberg
Coordinator for Planning and Development
Dallas County
Administration Building
411 Elm Street, 3rd Floor
Dallas, TX 75202

December 17, 2001

RE: Dallas Area Rapid Transit (DART) Northwest Corridor LRT Line to Carrollton

Dear Mr. Loessberg

DART, in cooperation with the Federal Transit Adminisitration (FTA) and the Federal Aviation Administration (FAA) is preparing a Draft Environmental Impact Statement (DEIS) for the DART Northwest Corridor LRT Line to Carrollton (Carrollton LRT Line). Myra L. Frank & Associates, Inc. (MFA), under contract with DART, is preparing the historic and cultural resources documentation.

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MFA contacted your agency in 1999 to request your assistance in identifying any historic buildings, districts, sites, structures, landscapes, or archaeological sites located within the proposed project area. At this time, we would like to again ask your assistance in reviewing your records to ascertain whether any additional resources have been identified since 1999.

Sincerely,

Jessica B. Feldman
Architectural Historian

MFA Myra L. Frank & Associates, Inc.

(213) 627-5376

Fax: (213) 627-6853

"Celebrating 20 years"

Environmental Impact Reports and Statements

Architectural History

Michael Spicer
Community Services Director
City of Farmers Branch
Community Services Department
P.O. Box 819010
Farmers Branch, TX 75381-9010

December 17, 2001

RE: Dallas Area Rapid Transit (DART) Northwest Corridor LRT Line to Carrollton

Dear Mr. Spicer:

DART, in cooperation with the Federal Transit Adminisitration (FTA) and the Federal Aviation Administration (FAA) is preparing a Draft Environmental Impact Statement (DEIS) for the DART Northwest Corridor LRT Line to Carrollton (Carrollton LRT Line). Myra L. Frank & Associates, Inc. (MFA), under contract with DART, is preparing the historic and cultural resources documentation.

The Carrollton LRT Line was selected at the conclusion of the NW corridor MIS. It includes approximately 17 miles of double-tracked LRT from downtown Dallas through the cities of Dallas and Farmers Branch to Frankford Road in Carrollton. Two alignment design options are being carried forward into the Draft EIS. The first is for tunnel access and an underground station on the Love Field airport property. The second is for an alternative alignment and two stations in the Medical Center area between the Market Center station and Mockingbird Lane. A final decision on these design options will be made following the circulation of and public comment on the Draft EIS.

MFA contacted your agency in 1999 to request your assistance in identifying any historic buildings, districts, sites, structures, landscapes, or archaeological sites located within the proposed project area. At this time, we would like to again ask your assistance in reviewing your records to ascertain whether any additional resources have been identified since 1999.

Sincerely,

Jessica B. Feldman
Architectural Historian

THE UNIVERSITY OF TEXAS
SOUTHWESTERN MEDICAL CENTER
AT DALLAS

Office of the President

March 12, 2001

Mr. Roger Snoble
President/Executive Director
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0463

Dear Mr. Snoble:

As per Tom Ryden's request, we are writing to provide a letter representing a consensus among the leaders of the medical institutions along Harry Hines Boulevard. As you know, these institutions are an important health care resource for this region as well as a major employment and economic development center.

First, we want to express our sincere thanks to you and your colleagues at DART for your continued willingness to work with our representatives to address the concerns and priorities of our area. Your staff has been consistent in their overall responsiveness to our needs. We appreciate the excellent partnership and open dialogue we have experienced to date and look forward to maintaining this relationship as we move ahead.

There is one important issue, however, upon which our institutions have reached consensus that has met with little support from your staff and consultants. Throughout our conversations with DART representatives, we have repeatedly and consistently made it clear that it is our strongest desire to have the new DART light rail line be located below-grade/underground Harry Hines Boulevard. As we have reviewed the various alignment options with your staff and consulting team and discussed how the actual rail system would operate, it has become clear to us that a below-grade alignment is by far the best choice. In our opinion, it would be the most advantageous alignment for our patients, students, faculty and constituents, and for the long-term economic development of the Harry Hines corridor, including its development as a destination site for patients coming to Dallas for health care from other areas and other counties.

During our last meeting with your staff and consultants, they indicated that implementing a below-grade option would cost an additional $75,000,000. While we recognize that this is a substantial increase in cost over the currently proposed aerial/above-grade alignment, we believe it is critical to take a long-term view of this investment. By long-term, we mean 50-100 years. Once installed, the new light rail system would be unlikely to undergo much change and therefore would become a permanent part of the landscape and infrastructure in the area.

We cannot imagine the Mayo Clinic, the Cleveland Clinic, the Massachusetts General Hospital, etc., willingly choosing to have an elevated train-line bifurcate their medical campuses. At the same time that The Dallas Morning News is highlighting the need to rectify previous infrastructure decisions that caused the functional splitting of major districts (e.g., Woodall Rogers), it seems especially detrimental to build a structure that will impede the visual and functional unification of the major medical campus we are in the process of building for Dallas and our region on Harry Hines.

Consequently, we feel that it would be penny-wise and pound-foolish to make a decision based primarily on the cost of implementation rather than the long-term benefit to the area. Simply put, we feel that implementing any alignment other than below-grade would be very shortsighted.

Because this issue is of such critical importance to us, we recommend holding another face-to-face meeting with you and your staff to discuss openly and honestly our concerns before moving forward. If you are amenable to this idea, we ask that you contact Michael Meadows at Southwestern Medical Foundation to coordinate a time that we could meet. Michael can be reached at 214-351-6143.

Again, thank you for your continued partnership. We look forward to meeting with you again soon to resolve this matter.

Sincerely yours,

Kern Wildenthal, M.D., Ph.D., President
UT Southwestern Medical Center

George D. Farr, President & CEO
Children's Medical Center of Dallas

Ron J. Anderson, M.D., President & CEO
Parkland Health & Hospital System

Frank Tiedemann, President
St. Paul Medical Center

Donald R. Smithburg, President
Zale Lipshy University Hospital

J.C. Montgomery, Jr., President
Texas Scottish Rite Hospital for Children

W. Plack Carr, Jr., President
Southwestern Medical Foundation

Michael A. Laman, Ph.D.
Associate Vice President
Institute of Health Sciences-Dallas Center
Texas Woman's University

cc: Michael L. Meadows, Southwestern Medical Foundation
Tom Ryden, Dallas Area Rapid Transit

THE UNIVERSITY OF TEXAS
SOUTHWESTERN MEDICAL CENTER
AT DALLAS

Office of the President

DALLAS AREA RAPID TRANSIT
RECEIVED
JUN 18 2001
CAPITAL PLANNING & DEVELOPMENT

June 13, 2001

Mr. Roger Snoble
President/Executive Director
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0463

Dear Mr. Snoble:

Thank you for your recent visit to our campus to review the proposed light rail options along Harry Hines Boulevard. We appreciated the presentation by Tom Ryden and the input from the DART board members present, and hope that the discussion clarified our position as well.

We are all in agreement that a below-grade alignment would be the best choice for the patients, students, faculty, employees and other constituents of our medical institutions. In our opinion, a below-grade alignment would be the safest and most accessible choice for our customers and would be in the best long-term economic and programmatic development interests of the Harry Hines corridor.

We understand DART's preference for the elevated track from a cost standpoint. Clearly, it is less expensive than the below-grade option we unanimously support. However, UT Southwestern, Southwestern Medical Foundation, St Paul Medical Center and Zale Lipshy University Hospital cannot accept this option because of the severely negative impact it would have on the visual and functional unification of their facilities and the medical school's north campus. In addition, we all agree that the construction of an elevated or at-grade alignment would be highly disruptive and detrimental to pedestrian and vehicular traffic along Harry Hines for an extended period of time. We feel as strongly about not having an elevated or at-grade alignment as you feel about going below-grade.

Given these considerations, we feel compelled to examine once again the feasibility of routing the service on either the Union Pacific rail line or the Santa Fe line. We understand the challenges presented by these options are significant, and that a sophisticated circulator system would surely be required to adequately serve all of our institutions without sacrifice to ridership, convenience and efficiency. However, the significant cost savings of going at grade along an alternative route would presumably allow some funds to be devoted to a circulator system. We would welcome further discussion with your staff regarding how these or other options could be pursued in such a way as to equitably serve the interests of the ridership as well as the medical community.

5323 Harry Hines Blvd. / Dallas, Texas 75390-9009 / (214)648-2508 Telefax (214)648-8600

Again, we extend our thanks to you and your staff for the time and consideration you have given us in trying to meet the needs of all the members of our medical community.

Sincerely yours,

Kern Wildenthal, M.D., Ph.D., President
UT Southwestern Medical Center

George D. Farr, President and CEO
Children's Medical Center of Dallas

Ron J. Anderson, M.D., President and CEO
Parkland Health & Hospital System

J.C. Montgomery, Jr., President
Texas Scottish Rite Hospital for Children

Donald R. Smithburg, President and CEO
Zale Lipshy University Hospital and
St. Paul Medical Center

W. Plack Carr Jr., President
Southwestern Medical Foundation

Michael A. Laman, Ph.D.
Associate Vice President
Institute of Health Sciences-Dallas Center
Texas Women's University

Cc: Michael L. Meadows, Southwestern Medical Foundation
Tom Ryden, Dallas Area Rapid Transit

FJR / 16m

Dallas Independent School District

December 5, 2001

Mrs. Kay Shelton
Dallas Area Rapid Transit
P. O. Box 660163
Dallas, Texas 75266-7213

RE: Proposed Light Rail for DART Northwest Corridor

Dear Mrs. Shelton:

The district has reviewed the proposed light rail line for the DART Northwest Corridor. We support the Refined Alternative #10, as shown on the map on Attachment 1, "Northwest Corridor Major Investment Study". The colored dots on the map are the geo-coded residence addresses of DISD students in the area. The colored polygons on the map are the elementary school zones. As indicated on the map, elementary students can reach their school buildings from home without having to cross DART tracks. This alternative was endorsed by the DART Community Work Group in November 1999.

The plans were recently updated as shown on Attachment 2, "DART Light Rail Base Option 1". This map indicates aerial rail, grade level rail, and, for the Love Field option, tunnel rail. The School District supports DART Light Rail Base Option 1, with or without the Love Field tunnel.

However, an additional option has been included for consideration by the DART Board that is not agreeable to DISD. Attachments 3 and 4 indicate Design Option 2 according to the elementary and middle school zones, respectively. According to Attachment 3, "Design Option 2", the rail rises to grade level next to the Hernandez Elementary School property line (Land Parcel Account Number 002372000A0010000). Our records indicate that 700 of the Hernandez students live on the east side of the UP RR tracks. The proposed DART rail poses a severe safety hazard to those students. The district has no choice but to oppose this option.

If you have questions, please contact me.

Sincerely,

Larry Groppel

Larry D. Groppel, Ed.D.
Deputy Superintendent
Business Services

/db

Enclosures

cc: William Webster
Glenna Taite

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

February 5, 2002

Mr. F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
108 West 16th
Austin, Texas 78711-2276

Attn: *Ms. Linda Roark*

Re: Northwest Corridor LRT Line to Carrollton
Request For Determination of Eligibility Report

Dear Mr. Oaks:

I am pleased to transmit for your review and concurrence two copies of the Request for Determination of Eligibility Report for the referenced project. The Federal Transit Administration (FTA) has determined that the proposed DART Northwest Corridor LRT Line to Carrollton in Dallas, Texas, is an undertaking as defined in 36 CFR 800.16(y) because it has the potential to cause effects on historic properties and, therefore, requires compliance with Section 106 of the National Historic Preservation Act as amended (Section 106, 16 U.S.C. 470f) and its implementing regulations (36 CFR Part 800).

This Request for Determination of Eligibility Report provides a description of the project, identifies the Area of Potential Effects (APE), reviews the identification efforts, describes the historical context of the corridor, and provides DART's determination of eligibility.

In accordance with 36 CFR 800.4(c)(2), DART is seeking SHPO concurrence with its determination of eligibility for listing in the National Register of Historic Places of properties within the Northwest Corridor APE. Following your concurrence, the report will be incorporated into this project's Draft and Final Environmental Impact Statement. All comments provided by the SHPO will be included.

Please provide comments to me within 30 days of receipt of this letter. Thank you for your timely attention to this matter. Please call me at (214) 749-2828 or Kay Shelton, Northwest Corridor Project Manager, at (214) 749-2841, if you have any questions.

Sincerely,

Stephen L. Salin, AICP
Senior Manager
Corridor and Environmental Planning

C: Jesse Balleza, Community Planner, FTA Region VI
John Sweek, Community Planner, FTA Region VI (one copy)
Jim Anderson, City of Dallas, Historic Preservation (one copy)
Tom Ryden, AVP, DART Capital Planning and Development

enclosures

Federal Aviation Administration
Southwest Region
Air Traffic Division, ASW-520
Fort Worth, TX 76193-0520

AERONAUTICAL STUDY
No: 02-ASW-1608-OE

ISSUED DATE: 03/28/02

KAY SHELTON
DALLAS AREA RAPID TRANSIT
1401 PACIFIC AVE
DALLAS TX 75201

** THIS IS NOT A DETERMINATION **

The Federal Aviation Administration has received your notice concerning:

Description:	DART RAIL SYSTEM BROOKHOLLOW STATION
Location:	DALLAS TX
Latitude:	32-50-36.87 NAD 83
Longitude:	096-51-46.25
Heights:	25 feet above ground level (AGL) 493 feet above mean sea level (AMSL)

NOTE: If the coordinates of your notice were submitted in NAD 27 datum, they have been converted to NAD 83 datum as shown above. NAD 83 datum will be referenced on all future correspondence and will be used for the purpose of this study.

Your notice has been assigned Aeronautical Study Number 02-ASW-1608-OE and we are in the process of conducting an aeronautical study to determine the effect on air navigation. A determination or response will be forthcoming.

Please inform involved consultants of this correspondence.

If you have any questions, please contact LINDA E. STEELE at 817-222-5539. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 02-ASW-1608-OE.

(REC)

Federal Aviation Administration
Southwest Region
Air Traffic Division, ASW-520
Fort Worth, TX 76193-0520

AERONAUTICAL STUDY
No: 02-ASW-1607-OE

ISSUED DATE: 03/28/02

KAY SHELTON
DALLAS AREA RAPID TRANSIT
1401 PACIFIC AVE
DALLAS TX 75201

** THIS IS NOT A DETERMINATION **

The Federal Aviation Administration has received your notice concerning:

Description:	DART RAIL SYSTEM INWOOD STATION
Location:	DALLAS TX
Latitude:	32-49-27.52 NAD 83
Longitude:	096-50-07.36
Heights:	25 feet above ground level (AGL) 523 feet above mean sea level (AMSL)

NOTE: If the coordinates of your notice were submitted in NAD 27 datum, they have been converted to NAD 83 datum as shown above. NAD 83 datum will be referenced on all future correspondence and will be used for the purpose of this study.

Your notice has been assigned Aeronautical Study Number 02-ASW-1607-OE and we are in the process of conducting an aeronautical study to determine the effect on air navigation. A determination or response will be forthcoming.

Please inform involved consultants of this correspondence.

If you have any questions, please contact LINDA E. STEELE at 817-222-5539. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 02-ASW-1607-OE.

(REC)

RECEIVED
APR 19 2002

CITY OF DALLAS

COPY

April 16, 2002

Tom K. Ryden, P.E.
Dallas Area Rapid Transit (DART)
1401 Pacific Avenue
Dallas, Texas 75266-7213

Dear Mr. Ryden:

The purpose of this letter is to follow-up from our meeting of February 20, 2002, at the Northwest Transfer facility. My staff and I met with you and Steve Salin to consider the question of using some or all of the Northwest Transfer Station property located at 9500 Harry Hines Boulevard for future DART rail development, primarily as a maintenance and storage yard for the rail service. You stated that you were examining several properties in the general vicinity and recognized the advantages that the transfer station property has with regard to proximity to both the rail line and the existing DART bus facility adjacent to the transfer station property.

As I mentioned in our meeting, the transfer station is a key component in the City's solid waste operation, consolidating waste collection routes from the northern part of the city and allowing for efficient transfer to the City's landfill in the southern sector. We would expect it to remain in operation indefinitely.

You asked if it would be possible to relocate the station. We responded that the 1970's cost to design, permit, and build the station was approximately $5M. We would expect that today's cost would be about two to four times that figure, possibly more. It would be wise to get a detailed and professional estimate to better determine the cost. The timeframe for site selection of a solid waste facility within an urban setting, real estate purchase, permitting, and design/construction also varies widely, but would likely fall in the 5 to 10-year time-frame.

Since we have not heard from you since the meeting, we were wondering if you are still considering this property. Please contact me to let me know how your prospects are developing.

Sincerely,

Mary Nix, P.E., Assistant Director
Department of Sanitation Services

c: Ramon F. Miguez, P.E., Assistant City Manager
Jo M. Puckett, P.E., Director, Sanitation Services
Gay DeHoff, Director, Property Management
Steve Salin, DART

GEO-MARINE, INC.

550 East 15th Street
Plano, Texas 75074

phone: 972.423.5480
email: gmi@geo-marine.com

fax: 972.422.2736
website: geo-marine.com

8 April 2002

Field Supervisor
U.S. Fish and Wildlife Service
Arlington Field Office
Stadium Centre Building
711 Stadium Drive East, Suite 252
Arlington, Texas 76011

RE: Request for Informal Consultation – Expansion of the Dallas Area Rapid Transit, Northwest Corridor Light Rail Transit Line

Attn: Field Supervisor:

Geo-Marine, Inc. (GMI) has been contracted by the Dallas Area Rapid Transit (DART) system to prepare portions of an environmental impact statement (EIS), as required by the National Environmental Policy Act (NEPA), for actions related to expansion of the DART, Northwest Corridor Light Rail Transit line in Dallas and Denton counties, which is primarily funded by the Federal Transit Administration (FTA). The purpose of this letter is to seek the services of the United States Fish and Wildlife Service (USFWS) and to initiate an informal consultation, as provided under Section 7 of the Endangered Species Act (ESA). GMI is requesting a review of your information for the proposed action area for any protected species occurrences, as well as a concurrence/non-concurrence regarding our opinion that there will be no adverse impacts to proposed, threatened, or endangered species and/or proposed/designated critical habitat as a result of a major construction activity in the subject area. The enclosed documentation includes the following information, based on the best commercial and scientific data available, which provides support to our conclusion of "no adverse impacts":

1. A complete project description, including definition and scope of proposed activities, amount of disturbance, and other anticipated environmental impacts;
2. A list of the counties in which the project is proposed;
3. A United States Geological Survey (USGS) 7.5 minute quadrangle map with the project boundaries clearly delineated;
4. Descriptions of the habitat within the proposed project area and areas adjacent to it, including vegetation surveys, wetland delineations, and any other sensitive areas;
5. Photographs of the proposed project area;
6. A summary of direct and indirect effects to listed species, critical habitat, and/or associated habitat areas for these listed species; and
7. A description of the methods and techniques used to arrive at the conclusions, along with the supporting documentation.

If, upon analysis of information related to this project, the USFWS does not concur with our opinion, it would be greatly appreciated if you would suggest any reasonable and prudent measures that may minimize/avoid adverse impacts and, if possible, avoid a situation whereby a formal consultation will be necessary.

I look forward to receiving your agency's comments. If you have any questions concerning this request, please contact me at (972) 423-5480 or via e-mail at kbaird@geo-marine.com.

Sincerely,

Geo-Marine, Inc.

Keith A. Baird
Wildlife Ecologist, Plano Environmental Resources

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
WinSystems Center Building
711 Stadium Drive, Suite 252
Arlington, Texas 76011

RECEIVED
APR 24 2002

2-12-02-I-324

April 23, 2002

Mr. Keith A. Baird
Geo-Marine, Inc.
550 East 15th Street
Plano, Texas 75074

Dear Mr. Baird:

This responds to your April 10, 2002, letter requesting comments on the proposed Dallas Area Rapid Transit (DART) Northwest Corridor Light Rail Transit System. As described, the proposed project is mostly confined within existing and highly urbanized right-of-ways (ROW). Although we agree with most of your document, we found several areas of concern that were not addressed.

The species list for the project area does not address the black-tailed prairie dog (*Cynomys ludovicianus*), a candidate species known to occur in Denton County. Although this project is not likely to affect this species, we do recommend that you include it in your final document preparation. Also, the interior least tern (*Sterna antillarum*) has been documented along the Trinity River in Dallas County. This species is probably following the river corridor seeking suitable nesting sites as evidenced by terns nesting, for the past two years, at the Valwood Improvement Authority (VIA) Cell B Pond. Since their nesting area is near the proposed DART Northwest Corridor, the possibility to affect this listed species may exist. We suggest that methods and measures to avoid a "may affect" be addressed in your final documentation. If you encounter this or any listed species during construction activities, we recommend that you contact this office for further project evaluation.

Wetlands and wetland areas were mentioned in your document; however, management practices to be used to protect these important natural resources were not included. Wetland and riparian habitats in urban areas have significantly diminished over the past few years due to large-scale development. Their loss not only impacts the wildlife dependent upon these pockets of suitable habitat but also the quality of life for residents in adjacent areas. If unavoidable impacts are anticipated, we recommend that mitigation measures be implemented to replace the habitat values of the wetland area. Mitigative measures to offset the possibility of greater volumes of natural, storm, and contaminant runoff are also recommended. If requested, we would be willing to provide assistance in the development of an appropriate mitigation plan. We also recommend that

you contact the Fort Worth District Corps of Engineers, Regulatory Branch, CESWF-EV-R, P.O. Box 17300, Fort Worth, Texas 76102-0300, to determine if a permit is required by that Agency prior to commencement of construction activities.

Thank you for the opportunity to provide information on the proposed project. If you have any questions, please contact Cindy Gabrielsen of my staff at (817) 277-1100.

Sincerely,

Tom Cloud

Thomas J. Cloud, Jr.
Field Supervisor

Dallas Area Rapid Transit
P.O. Box 660163
DART Dallas, Texas 75266-0163
214/749-3278

April 26, 2002

Mr. F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

Attn: Mr. Peter Ketter

Re: Northwest Corridor LRT Line to Carrollton
Request For Additional Information Relating to Determination of Eligibility Report

Dear Mr. Oaks:

I am pleased to transmit for your review and concurrence updated and additional information as per your request. The Federal Transit Administration (FTA) has determined that the proposed DART Northwest Corridor LRT Line to Carrollton in Dallas, Texas, is an undertaking as defined in 36 CFR 800.16(y) because it has the potential to cause effects on historic properties and, therefore, requires compliance with Section 106 of the National Historic Preservation Act as amended (Section 106, 16 U.S.C. 470f) and its implementing regulations (36 CFR Part 800).

This transmittal supplements our previously submitted Request for Determination of Eligibility Report (dated February 5, 2002) and provides additional information requested by your office as stated in your letter of February 26, 2002. The following is a summary of information enclosed with this letter:

1. More detailed, large-scale map(s) showing the proposed LRT alignment in relation to existing streets and properties within the APE.
2. Photographs of representative examples of MKT trestle bridges along the existing alignment and information related to their eligibility status.
3. Identification of potential National Register Historic Districts wholly or partially within the APE and information related to their eligibility status.

In addition to the above information, several Texas Sites Inventory Forms have been included for the trestle bridges and culverts. You will also find enclosed with this letter

several forms that were previously submitted without photographs that are now being re-submitted with photographs.

In accordance with 36 CFR 800.4(c)(2), FTA and DART are seeking SHPO concurrence with its determination of eligibility for listing in the National Register of Historic Places of properties within the referenced project's APE. Following your concurrence, the report will be referenced in this project's Environmental Impact Statement.

Thank you for your timely attention to this matter. We appreciated the opportunity to provide Peter Ketter with a tour of the Northwest Corridor on April 5, 2002 and hope the information will assist him in completing his eligibility review. Please call me at (214) 749-2828 or Kay Shelton, Northwest Corridor Project Manager, at (214) 749-2841, if you have any questions.

Sincerely,

Stephen L. Salin, AICP
Interim Assistant Vice President
Capital Planning and Development

enclosures

Dallas Area Rapid Transit
P.O. Box 660163
DART Dallas, Texas 75266-0163
214/749-3278

May 14, 2002

U.S. Army Corps of Engineers
c/o Regulatory Branch Chief
819 Taylor Street
Fort Worth, TX 76102-0300
ATTN: Mr. Wayne Lea

Re: *Request for a Project Number and Manager for the DART Northwest Corridor LRT Line to Farmers Branch and Carrollton project*

Dear Mr. Lea,

Dallas Area Rapid Transit (DART) prepared a Major Investment Study (MIS) to evaluate the Northwest Corridor study area in 1998. During this MIS process, the Northwest Corridor was split into two rail lines: the Farmers Branch/Carrollton Line and the Irving Line. After completion of the MIS, DART initiated the Preliminary Engineering and Environmental Impact Statement (PE/EIS) phase for only the LRT Line to Farmers Branch and Carrollton (see attached location map). The Notice of Intent to prepare the EIS was published on November 3, 2000. An Interagency Scoping meeting for local, regional, state and federal agencies was held on December 6, 2000; the USACOE was an invited participant.

The Draft EIS is scheduled for publication in June 2002. Among a variety of components that are being studied in the EIS, waters of the United States, including wetlands, have been and will continue to be evaluated. The purpose of this letter is to initiate coordination between DART and the U.S. Army Corps of Engineers, provide a delineation of potential jurisdictional waters of the United States, and potential impacts (by alternative) to these potential jurisdictional waters of the United States.

Waters of the United States Delineated in the Project Corridor

The *Soil Survey of Dallas County, Texas* (Coffee et al. 1980); 7.5 minute U.S. Geological Survey (USGS) quadrangles of Dallas, Irving, and Carrollton (1:24,000 scale; USGS 1989a, 1989b, 1989c); National Wetland Inventory (NWI) maps of Dallas, Irving, and Carrollton (1:24,000 scale; U.S. Fish and Wildlife Service [USFWS] 1989a, 1989b, 1989c); and aerial photography (2000) were utilized to identify possible waters of the U.S. and areas prone to wetland development within the project area. Only areas within existing rail lines of the project area were field checked, and the delineation of potential waters of the U.S. was performed in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Remaining areas that could not be field verified, due to access restrictions, were delineated utilizing the above referenced literature.

During field surveys conducted on various dates by wetland biologists, 38 water bodies were identified: 24 channels, six wetlands, and eight small lakes/ponds. The size of these water bodies within the project corridor and around station areas is presented in Table 1 and shown in the attached figures (copied from the Draft EIS). A 0.25-mile radius around each station was analyzed, and any potentially jurisdictional waters of the U.S. were identified based upon the USFWS classification system (Cowardin et al. 1979).

TABLE 1
AREA OF POTENTIALLY JURISDICTIONAL WATERS OF THE U.S. LOCATED WITHIN THE PROJECT AREA

Map No.	Name	Location	Area (acres)
RAIL LINE			
Base Alignment			
1	Turtle Creek	Between Dallas North Tollway and Oak Lawn	0.153
2	Cedar Branch	Parallel to Harry Hines at Market Center	1.160
3	Unnamed Tributary of Knights Branch	Between Wyman and Burbank Streets	0.077
4	Bachman Creek	South of Webb Chapel Road	0.348
5	Bachman Wetland	South of Webb Chapel Road	0.227
6	Joe's Creek	Between Lombardy and Nagle Roads	0.126
7	Unnamed Tributary of Joe's Creek	Between Congressman Lane and Anode Lane	0.109
8	Unnamed Tributary of Joe's Creek	Between Congressman Lane and Anode Lane	0.093
9	Unnamed Tributary of the Elm Fork	Between Indian Trail and Walnut Hill Lane	0.080
10	Unnamed Tributary of the Elm Fork	Between Indian Trail and Walnut Hill Lane	0.091
11	Farmers Branch of the Elm Fork	South of Valley View Lane	0.251
12	Farmers Branch of the Elm Fork	South of Valley View Lane	0.402
13	Rawhide Creek	South of Valley View Lane	0.369
14	Cook's Branch	Between Valwood Parkway and Richland Avenue	0.293
17	Wetland	Between Carroll Avenue and Crosby Road	0.395
18	Wetland	Between Carroll Avenue and Crosby Road	0.191
20	Hutton Branch of the Elm Fork	Between Vinylex and Beltline Roads	0.435
21	Unnamed Tributary of the Elm Fork	South of Jackson Road	0.104
22	Ken Good Park Lakes	Between Ismail Center Circle and Jackson Road	0.754
24	Furneaux Creek	North of Trinity Mills Road	0.185
15[1]	Unnamed Open Storm Drain	Between Burning Tree Lane and Valwood Parkway	0.080
16[1]	Unnamed Open Storm Drain	Between Burning Tree Lane and Valwood Parkway	0.090
19[1]	Unnamed Open Storm Drain	Between Carroll Avenue and Crosby Road	0.110
23[2]	Ken Good Park Lakes	Between Ismail Center Circle and Jackson Road	0.506
23[2]	Ken Good Park Lakes	Between Ismail Center Circle and Jackson Road	0.348
Love Field Design Option			
3	Unnamed tributary to Knights Branch	Between Love Field Drive and Seeloco Street	0.08
PEM1C	Wetland	East of Aviation Place	0.1
R4SBC	Unnamed tributary to Knights Branch	Between Mockingbird Lane and Inwood Road	0.5
R4SBCx	Unnamed tributary to Knights Branch	Between Mockingbird Lane and Inwood Road	1.2
R4UBJx	Excavated Storm Drains	East side of Love Field Airport	0.4
Medical Center Design Option			
R4SBC	Unnamed tributary to Knights Branch	Between Mockingbird Lane and Inwood Road	0.17
STATIONS			
Base Alignment			
Victory			
None	--	--	--
Market Center/Oak Lawn			
R2OWH	Cedar Branch	Parallel to Harry Hines Boulevard at Market Center	1.2
Parkland			
None	--	--	--
UTSW/Exchange Park			
R4SBC	Unnamed tributary to Knights Branch	South of Exchange Pkwy.	0.3
Brookhollow			
R4SBC	Unnamed tributary of Knights Branch	--	0.3

TABLE 1 (CONTINUED)
AREA OF POTENTIALLY JURISDICTIONAL WATERS OF THE U.S. LOCATED WITHIN THE PROJECT AREAS

Map No.	Name	Location	Area (acres)
Bachman			
None	–	–	--
Walnut Hill/Denton			
R4SBCx	Unnamed tributary to Joe's Creek	Between Congressman Lane and Anode Lane	0.2
Royal Lane			
None	–	–	--
Farmers Branch			
R2OWH	Rawhide Creek	South of Valley View Lane	1.6
Carrollton Square			
PFO1C	Hutton Branch of the Elm Fork	Between Vinylex and Beltline Roads	3.1
Trinity Mills			
R2OWH	Furneaux Creek	North of Trinity Mills Road	0.8
PEM1A	Wetlands adjacent to Sandy Lake	South of Trinity Mills Road, West of Interstate 35E	4.7
POWHx	Sandy Lake	South of Trinity Mills Road, West of Interstate 35E	2.3
Frankford			
L1OWHx	Lakes adjacent to Trinity River	North side of Frankford Road	0.7
R2OWH	Trinity River and tributary	North side of Frankford Road	2.6
Medical Center Design Option			
Parkland (Design Option)			
None	–	–	--
Inwood (Design Option)			
R4SBC	Unnamed tributary to Knights Branch	Between Mockingbird Lane and Inwood Road	1.2

[1] these are not considered to be jurisdictional because they were intentionally created to drain upland areas (i.e., they are storm drains)
[2] two portions of the same lake

Source: Geo-Marine, Inc., 2001

In addition to the above-listed water bodies, several bar ditches run parallel to the existing rail line throughout most of the project area. These ditches were constructed to collect and remove storm water runoff and range from dry in spots to slowly flowing water in other areas. There is no classification assigned to these bar ditches, because they were not considered to be waters of the United States.

Potential Impacts by Design Option

Within the project study area there are 38 bodies of water; of these, 34 are considered to be potentially jurisdictional waters of the U.S. Several of these water resources lie adjacent to the proposed construction corridor, but could be avoided. All potential jurisdictional waters of the U.S. within this corridor that cannot be avoided would be bridged to minimize filling the water resources.

Preliminary engineering designs indicate that 13 water bodies (IDs 1, 5, 6, 12, 13, 14, 16, 17, 18, 20, 22, 23, and 25) would be crossed by the Base Alignment and Love Field Design Options. Implementation of the Medical Center Design Option or Love Field and Medical Center Design Options would also cross 13 water bodies (IDs 1, 5, 6, 12, 13, 14, 16, 17, 18, 20, 22, R4SBC, and 25). Potential impacts would be restricted to bridge supports and would be minimal (Table 2). Total impacts to these 13 water bodies would be dependent upon the size and number of support columns placed within the ordinary high water mark for each individual water body. Despite placing support columns into these water bodies, significant impacts are not expected.

One proposed station could have minor impacts to potential jurisdictional waters of the U.S. Based on reconnaissance level surveys, the Market Center/Oak Lawn Station would impact 20 linear feet (628 feet^2/0.01 acres) of Cedar Branch.

TABLE 2
IMPACTS TO WATERS OF THE U.S.

PROJECT AREA/ID	Name[1]	Crossing Type	Civil Station Number	Width of Crossing (in feet)	Impacts[2] (square feet)
RAIL LINE					
Base Alignment					
1	Furneaux Creek	B	817+00	15	NA
5	Unnamed Tributary of the Elm Fork	B	771+00	5	NA
6	Hutton Branch of the Elm Fork	B	707+00	37	NA
12	Cook's Branch	B	606+80	18	NA
13	Rawhide Creek	B	556+50	25	NA
14	Farmers Branch of the Elm Fork	B	552+00	43	NA
16	Unnamed Tributary of the Elm Fork	B	494+00	20	NA
17	Unnamed Tributary of the Elm Fork	B	454+00	10	NA
18	Unnamed Tributary of Joe's Creek	B	430+00	20	NA
20	Joe's Creek	B	356+00	37	NA
22	Bachman Creek	B	278+00	43	NA
23	Knights Branch	B	250+70	10	NA
25	Turtle Creek	B	0+00	30	NA
Medical Center Design Option					
R4SBC	Unnamed tributary to Knights Branch	B	1395+00	25	NA
STATIONS					
Market Center/Oak Lawn					
R2OWH	Cedar Branch	B	--	28	628

B = Bridge
NA = Currently Not Available
[1] See Section 3 for location maps and site descriptions
[2] Based on Global Positioning System survey
IDs 7, 10, 11, and R4SB3Ax are not jurisdictional waters of the U.S.

Source: Geo-Marine, Inc. 2001

The above information includes all impacts to the potential jurisdictional waters of the United States for all design options. However, the Final EIS will identify only one design option. This selection will occur after the Draft EIS 45-day public and agency comment period, scheduled to begin in June 2002. During preparation of the Final EIS, a finalized impacts assessment will be provided to your office for final review for a Nationwide Permit 14, *Linear Transportation Crossings*.

Through this project, DART is providing for enhanced mobility while being a good steward to the environment. Should you have any questions, please feel free to call me at 214-749-2841.

Sincerely,

Kay Shelton

Kay Shelton
DART Project Manager

C: Steve Salin, Interim AVP, Capital Planning and Development

attachment

Federal Aviation Administration
Southwest Region
Air Traffic Division, ASW-520
Fort Worth, TX 76193-0520

AERONAUTICAL STUDY
No: 02-ASW-1607-OE

ISSUED DATE: 06/04/02

KAY SHELTON
DALLAS AREA RAPID TRANSIT
1401 PACIFIC AVE
DALLAS TX 75201

** DETERMINATION OF NO HAZARD TO AIR NAVIGATION **

The Federal Aviation Administration has completed an aeronautical study under the provisions of 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerning:

Description: DART RAIL SYSTEM
INWOOD STATION
Location: DALLAS TX
Latitude: 32-49-27.52 NAD 83
Longitude: 096-50-07.36
Heights: 25 feet above ground level (AGL)
523 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking and/or lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory Circular 70/7460-1K Change 1.

This determination expires on 12/04/03 unless:

(a) extended, revised or terminated by the issuing office or
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case the determination expires on the date prescribed by the FCC for completion of construction or on the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, frequency(ies) or use of greater power will void this determination. Any future construction or alteration,

including increase in heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than th studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communicati Commission if the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at 817-222-5534. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 02-ASW-1607-OE.

Bruce C. Beard

Bruce C. Beard
Specialist, Airspace Branch

(DNE)

Federal Aviation Administration
Southwest Region
Air Traffic Division, ASW-520
Fort Worth, TX 76193-0520

AERONAUTICAL STUDY
No: 02-ASW-1608-OE

ISSUED DATE: 06/04/02

KAY SHELTON
DALLAS AREA RAPID TRANSIT
1401 PACIFIC AVE
DALLAS TX 75201

** DETERMINATION OF NO HAZARD TO AIR NAVIGATION **

The Federal Aviation Administration has completed an aeronautical study under the provisions of 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerning:

Description: DART RAIL SYSTEM
BROOKHOLLOW STATION
Location: DALLAS TX
Latitude: 32-50-36.87 NAD 83
Longitude: 096-51-46.25
Heights: 25 feet above ground level (AGL)
493 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking and/or lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory Circular 70/7460-1K Change 1.

This determination expires on 12/04/03 unless:

(a) extended, revised or terminated by the issuing office or
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC within 6 months of the date of this determination. In such case the determination expires on the date prescribed by the FCC for completion of construction or on the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, frequency(ies) or use of greater power will void this determination. Any future construction or alteration,

including increase in heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communication Commission if the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at 817-222-5534. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 02-ASW-1608-OE.

Bruce C Beard

Bruce C. Beard
Specialist, Airspace Branch

(DNE)

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

June 5, 2002

Dear Northwest Corridor DEIS Recipient:

We are pleased to transmit the Draft Environmental Impact Statement (DEIS) for the Northwest Corridor Light Rail Transit (LRT) Line, which extends through northwest Dallas, into the cities of Farmers Branch and Carrollton. The DEIS has been approved for circulation and comment by the Federal Transit Administration. Your review and comments on the DEIS document are welcomed.

The DEIS is being distributed to all appropriate governmental agencies, legislative bodies and interested organizations and individuals. Additional copies of the DEIS are available for public viewing at libraries in the Northwest Corridor as noted in the attachment to this letter. You may also contact DART Community Affairs staff at (214) 749-2522 to receive more information on the availability of the document.

The formal public comment period begins on June 14, 2002 and ends July 30, 2002. Public Hearings have been scheduled for July 11, 15, and 16, 2002. The time and location for these hearings is also noted in the attachment to this letter.

We appreciate your input on the DEIS, and look forward to your continued participation in the public hearing and review process.

Sincerely,

Gary C. Thomas
President/Executive Director

U.S. Department
of Transportation

**Federal Aviation
Administration**

Southwest Region
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

Fort Worth, Texas 76193-0000

June 26, 2002

Mr. Terry Mitchell
Assistant Director
Department of Aviation
Administration LB-16 Love Field Terminal Building
Dallas, TX 75235

Dear Mr. Mitchell:

The Federal Aviation Administration (FAA) has reviewed the airspace utilization study (Study No. 02-ASW-5023-NRA) of the proposed construction of the Dallas Area Rapid Transit (DART) underground rail system, to be located at the Dallas Love Field Airport, in Dallas, Texas. As a result of our review, we have determined that the textual and graphical data provided with your request are insufficient to determine the potential impact on the approach surfaces for the ILS Rwy 31L, and Rwy 36. Our understanding is that a tunnel system will be used in the runway vicinity; however, we need more detailed information than what was provided or can be culled from the large scale graphic.

Please provide us with a scaled drawing that clearly shows the project as it affects the airport and especially Runway 36 and ILS 31L threshold areas; or, data showing: a) how far from the runway the tunnel will be, b) whether the tunnel will be perpendicular to the centerline, terrestrial or cartesian coordinates where the tunnel edges and entrances are located as well as the elevations of the track. It has been stated that the car height is 14 feet; it would be equally helpful to have the tunnel dimensions.

Once we have the requested additional information, we will make every effort to complete our review and make a determination on the proposed project in a timely manner.

If I can be of further assistance, I may be reached at (817) 222-5658.

Sincerely,

ORIGINAL SIGNED By:

Ralph B. Christian III
Program Manager, Texas Airports
Development Office

cc:
Ms. Kay Shelton
Dallas Area Rapid Transit
Northwest Corridor Project Manager
P.O. Box 660163
Dallas, Texas 75266-0163

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

July 8, 2002

Ms. Kay Shelton
Project Manager
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

Re: Project review under Section 106 of the National Historic Preservation Act of 1966
DART Northwest Corridor draft Environmental Impact Statement, Dallas, Dallas County
(FTA/106)

Dear Ms. Shelton:

Thank you for providing the Texas Historical Commission (THC) with a copy of the draft Environmental Impact Statement regarding the subject project. This letter serves as initial comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the THC.

The review staff, led by Linda Roark, has completed its review of the information provided. We are unable to concur with the determinations of effect on historic architectural properties, as final agreement on the National Register-eligibility of historic properties has not been reached and the level of design information included in the draft EIS is relatively vague. Statements to the effect that the "proposed project would not introduce elements that would harm the integrity of the resource" do not provide enough information about the nature of the proposed work to make a comprehensive evaluation of the determination of effect. Since some aspects of the project have the potential to cause an adverse effect, and the design of new features in historic districts and adjacent to individually eligible and listed historic properties needs to be reviewed regarding compatibility, we recommend that an agreement document be developed to address potential effects and a schedule for review of proposed work.

We have the following comments in regard to specific historic properties given the information provided at this time:

- Carrollton Crossing Depot: Although the building has apparently been previously moved, it reportedly is currently sited adjacent to the railroad tracks within 100 feet of its original location. The Depot retains its eligibility for listing in the National Register on its existing site, and retains integrity of setting, feeling and association that could be adversely affected in moving it from its existing location or by construction of a raised track and station near or, above the building.
- T. J. Rusk Middle School: A raised Inwood Station (51 feet) and track section would have the potential to adversely affect the T. J. Rusk Middle School.

- Peerless Manufacturing Plant: The raised Walnut Hill/Denton Station may have the potential to adversely affect the Peerless Manufacturing Plant, which may be eligible for listing in the National Register.
- Letot School on Lombardy Lane: Option 3 for the proposed Northwest Rail Operating Facility is adjacent to this school, which may be eligible for listing in the National Register. We recommend that the EIS address potential effects on this historic property.

We are concerned about the general organization of cultural resource information in the draft EIS. Information that should be concentrated in the cultural resource sections is sometimes given in other areas of the document, making review difficult. We recommend that for clarity all information relative to cultural resources be included in cultural resource sections of the document. We also note that other sections of the document, such as the "Jurisdictional Waters and Vegetation Cover" include good quality aerial photographs with superimposed project information. It is unfortunate that the maps indicating the locations of historic properties give only very vague location information for the properties in relation to the proposed project.

We look forward to receiving additional information on this proposed undertaking and to further consultation with your office. The THC hopes to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have questions concerning our comments please contact Linda Roark at 512/463-9122.

Yours truly,

F. Lawerence Oaks, State Historic Preservation Officer

cc: Stephen Salin, Dallas Area Rapid Transit
Jesse Balleza, Federal Transit Administration
Jeff Bunn, Dallas County Historical Commission
Jim Anderson, Dallas CLG
Mark Denton, THC Archeology Division
Peter Ketter, THC History Programs Division
FLO/LR

Kay,
Let's get our folks together to agree on a format which will speed up review.

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

July 15, 2002

Stephen L. Salin, AICP
Senior Manager
Corridor and Environmental Planning
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

Re: Project review under Section 106 of the National Historic Preservation Act of 1966,
DART Northwest Cooridor, Dallas, Dallas County, Texas

Dear Mr. Salin:

Thank you for your initial correspondence describing the above referenced project, and for sending the additional information we have requested. This letter serves as comment from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC). Section 106 of the National Historic Preservation Act (as amended) requires federal agencies, or their designated representatives, to take into account the effects of their undertakings on historic properties. Federal agencies, or their designated representatives, must request the comments of this office when they are considering an action, or if they are assisting, permitting, or licensing an action that may affect archeological sites or historic buildings built prior to 1956.

The THC review staff, led by Peter Keller, has reviewed the "Request for Determination of Eligibility" dated January 2002, and the supplemental information received in April and June 2002, and would like to provide the following comments.

We acknowledge that the follwing properties in the APE are LISTED in the National Register:

- Dealey Plaza Historic District (NR 1993, NHL)
- West End Historic District (NR 1978)
- 1607 Lyte Street, Magnolia Petroleum Co. City Sales and Warehouse (NR 1994)
- 3630 Harry Hines Blvd., Turtle Creek Pump Station (NR 2001)

We CONCUR that the following properties are ELIGIBLE for listing in the National Register:

- Continental Avenue Bridge/Lamar-McKinney Underpass
- 6333 Denton Drive, Old Morton Food Headquarters
- 2929 Inwood Road, T.J. Rusk Middle School
- 2615 Anson Road, Obadiah Knight School
- 8668 Denton Drive, Speaco Foods, Inc.
- 2605 Shorecrest Drive, Water Department Purification Plant
- 2625 Shorecrest Drive, Water Department Pumping Station
- 9500 Denton Drive, Bachman Electric Gen. Station
- 9911 Denton Drive, Club Schmitz
- 2711 Storey Lane, Bingo Theater
- 1020 N. Broadway, Carrollton Crossing Depot

Although not included in the APE, it is noted that the Letot School, at Denton Drive and Lombardy Lane, and its perimeter wall have previously been determined ELIGIBLE for listing in the National Register. Should the site at Denton and Lombardy be chosen for the "Rail Operating Facility," potential effects to the school must be considered.

Based on the information you have submitted, the Peerless Manufacturing Plant, 2819 Walnut Hill Lane, may be historically significant. As the first company to patent and manufacture a successful gas odorizer, Peerless made a significant contribution to the history of engineering. The invention itself has been designated a National Historic Engineering Landmark by the American Society of Mechanical Engineers. The information you have provided to date does not adequately dispute the association of the plant with this important invention. Peerless has occupied their current site since at least the 1940s, and the building described on the company's website as the "First Peerless manufacturing facility at the current Dallas location" is clearly evident in the current photos. The company (founded in 1933) may have had another, earlier manufacturing facility, but there has been no evidence presented to support that claim. We cannot definitively determine the association of the existing building with the production of the first gas odorizers. We therefore need ADDITIONAL INFORMATION to determine if the Peerless plant is eligible for the National Register.

We CONCUR that the remaining 131 properties listed in Table 3 of the January 2002 "Request for Determination of Eligibility" are NOT ELIGIBLE for listing in the National Register. No further review is required regarding those properties.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review, please contact Peter Ketter at (512) 463-5942.

Sincerely,

Peter Ketter, Historian
for F. Lawrence Oaks, SHPO

DRAFT

RESOLUTION

of the

DALLAS AREA RAPID TRANSIT
(Executive Committee)

Northwest Corridor Rail Operating Facility Service Plan Amendment

WHEREAS, the Northwest Corridor Rail Operating Facility was identified as a need in the Transit System Plan; and

WHEREAS, this facility is necessary to serve the expansion of DART's light rail system to Farmers Branch and Carrollton, as well as the LRT expansion to Irving/DFW Airport; and

WHEREAS, three locations that meet DART's requirements have been identified; and

WHEREAS, public hearings were held on April 29, and July 11, 15 and 16, 2002; and

WHEREAS, the preferred location has been recommended after the public hearing process; and

WHEREAS, the preferred location requires visual mitigation work; and

WHEREAS, funding for the Northwest Corridor is included in the Twenty-year Financial Plan.

NOW, THEREFORE, BE IT RESOLVED by the Dallas Area Rapid Transit Board of Directors that the Service Plan be amended to locate the Northwest Rail Operating Facility in the northeast quadrant of Lombardy Lane and Denton Drive in Dallas, as shown in Exhibit 1, and that the project preferred location requires visual mitigation work.

Prepared by:

Doug Allen
Executive Vice President
Program Development

Approved as to form:

Office of General Counsel

Approved by:

Gary C. Thomas
President/Executive Director

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

August 21, 2002

Stephen L. Salin, AICP
Senior Manager
Corridor and Environmental Planning
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

Re: Project review under Section 106 of the National Historic Preservation Act of 1966,
DART Northwest Coorider, Dallas, Dallas County, Texas

Dear Mr. Salin:

Thank you for your correspondence, dated August 16, containing the additional information that we requested. This letter serves as comment from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC).

The THC review staff, led by Peter Ketter, has reviewed the supplemental information and would like to provide the following comments.

We CONCUR that the Peerless Manufacturing Plant is NOT ELIGIBLE for listing in the National Register. Constructed in 1946, the building has no direct association with Donald A. Sillers's 1937 invention of the gas odorizer or its initial production.

We also CONCUR that the three additional properties within the revised Area of Potential Effects, 9710, 9712 and 9740 Abernathy Avenue, are NOT ELIGIBLE for listing in the National Register.

Please note that this letter applies solely to the supplemental information most recently submitted. For all other comments relating to Determinations of Eligibility, please see the THC's July 15 correspondence.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review, please contact Peter Ketter at (512) 463-5942.

Sincerely,

Peter Ketter, Historian
for F. Lawrence Oaks, SHPO

P.O. BOX 12276 · AUSTIN, TX 78711-2276 · 512/463-6100 · FAX 512/475-4872 · TDD 1-800/735-2989
www.thc.state.tx.us

PLANNING p 2/2

THE UNIVERSITY OF TEXAS
SOUTHWESTERN MEDICAL CENTER
AT DALLAS

...TIVE OFFICE
02 AUG 26 PM 2:20

Kern Wildenthal, M.D., Ph.D.
President

August 26, 2002

Mr. Gary C. Thomas
President/Executive Director
Dallas Area Rapid Transit
P. O. Box 660163
Dallas, Texas 75266-0163

Dear Gary:

Our recent meeting was useful in clarifying further the issues regarding the best way for DART to serve the Harry Hines medical institutions and their patients, students and employees. As we discussed, I am writing to record UT Southwestern's thoughts and commitments regarding the bus shuttle services which, whatever location is adopted for the route and stops, will be a necessary and integral supplement to the planned light rail system in order to provide adequate service to our patients, students, and employees.

As you know, all of the medical institutions (as well as the Stemmons Corridor Business Association) are unanimously committed to "Option 3D" as the best solution. For either "Option 3D" or the "Baseline Option," a supplemental bus shuttle system will be required; Parkland and Zale Lipshy are adequately served without shuttles by both options, but UT Southwestern, St. Paul, and Children's will require shuttle services because of excessive distances from any of the proposed stops on either route.

A shuttle system connecting with the "Baseline Option" would require connecting/turn-around sites on Harry Hines, and the shuttle routes would have to be up and down Harry Hines; this would increase congestion on Harry Hines, to the detriment of the institutions and all motorists. On the other hand, "Option 3D" allows the connecting/turn-around site not to impinge on Harry Hines and the shuttle routes to use side streets rather than Harry Hines, which is a great advantage.

Realizing that costs are very important to DART, and wanting to provide tangible assistance in ways that will benefit both DART and the medical institutions, UT Southwestern is willing to assume responsibility (financial and functional) for providing the shuttle services that will link with the Medical Center stop on "Option 3D." We will provide these shuttle services to all parts of UT Southwestern, St. Paul and Children's (and Parkland and Zale Lipshy, if needed in the future) at no cost to DART. The "3D" shuttle routes UT Southwestern will operate will include service

to the distant parts of St. Paul and UT Southwestern that are off Harry Hines (for example, along Record Crossing and Lee Hall/Medical Center Drive), which will allow us to provide service to the Ronald McDonald House and to the residents of Arlington Park as well as to the medical center's patients, students and employees.

In summary, I am writing to record UT Southwestern's commitment to provide the bus shuttle services that will be required to supplement light rail service to the Harry Hines medical institutions, if "Option 3D" is the selected route. Provision of this service will be at no cost to DART, and it will assure service to the residents of Arlington Park as well as to the patients, students and employees of the medical institutions.

Sincerely yours,

Kern Wildenthal, M.D., Ph.D.

KW:rk

U.S. Department
of Transportation
**Federal Aviation
Administration**

Southwest Region
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

Fort Worth, Texas 76193-0000

September 23, 2002

Mr. Terry Mitchell
Assistant Director
Department of Aviation
Administration LB-16 Love Field Terminal Building
Dallas, TX 75235

Dear Mr. Mitchell:

The Federal Aviation Administration (FAA) has reviewed the airspace utilization study (Study No. 02-ASW-5023-NRA) of the proposed construction of the Dallas Area Rapid Transit (DART) underground rail system, to be located at the Dallas Love Field Airport, in Dallas, Texas. We have no objection to the proposal, providing the plans and specifications that we have reviewed do not change.

The FAA is a cooperating agency with the Federal Transit Administration and DART on the Environmental Impact Statement "Northwest Corridor Light Rail Line to Farmers Branch and Carrollton." This proposed project is contained within that study and any environmental impacts associated with this project will be reviewed and analyzed prior to construction.

If I can be of further assistance, I may be reached at (817) 222-5658.

Sincerely,

ORIGINAL SIGNED By:

Ralph B. Christian III
Program Manager
Texas Airports Development Office

cc:
Ms. Kay Shelton
Dallas Area Rapid Transit
Northwest Corridor Project Manager
P.O. Box 660163
Dallas, Texas 75266-0163

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

September 26, 2002

Mr. Stephen Salin
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163

TRANSMITTED VIA FAX
214/749-3670

Re: *Project review under Section 106 of the National Historic Preservation Act of 1966*
DART Northwest Corridor, Determination of Effects Report, Dallas, Dallas County (FTA106)

Dear Mr. Salin:

Thank you for sending the "Determination of Effects Report" regarding the subject project and for having project representatives meet with our staff to discuss this undertaking. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Linda Roark, has completed its review of the information provided and has the following comments and recommendations:

Old Monon Food Headquarters: The Medical Center Design Option is 80 feet from this National Register-eligible property and is transitioning to below-grade adjacent to it. Given the proximity of the line to this property, and the construction that will be necessary to transition from at-grade to below-grade, there is a potential for an adverse effect on the historic property in the Medical Center Design Option. We recommend that this property be included with the group of properties for which an adverse effect is possible, but for which mitigation will be developed and included in a Memorandum of Agreement (MOA) in order that the project will result in no adverse effect on the property. Appropriate mitigation in this case would include SHPO review of the design development.

T. J. Rusk Middle School: We recommend that proposed design work developed under the Art & Design Program be included in SHPO review of the project as part of the design review mitigation intended to achieve no adverse effect on the property.

Lenot School: The design work associated with the proposed Rail Operating Facility, retaining wall and intended visual mitigation near the school site has the potential to

affect the historic property. SHPO design review should be included in the mitigation to be developed and included in the MOA in order to achieve a no adverse effect determination for the project related to this property.

Carrollton Crossing Depot: According to our architectural historian Peter Ketter, and your contractor, Jessica Feldman, it appears that the Depot is on its historic site (at the track crossing) despite statements from local citizens regarding its having been moved. Because the building is apparently on its historic site, moving the building would have an adverse effect. The extent of the adverse effect can be partially mitigated by the measures that you propose. SHPO review of work related to this historic property should also include review of the proposed new site and orientation, and there should be appropriate protection for the building if it is subsequently transferred to a new owner.

Club Schnitz: We concur with the determination of adverse effect and proposed mitigation for this historic property.

Other properties: We concur with your determinations of effect for the remaining identified historic properties in the Determination of Effects Report.

We look forward to receiving and reviewing a draft MOA for this undertaking, and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions concerning our review or if we can be of further assistance, please contact Linda Roark at 512/463-9122.

Yours truly,

for: F. Lawerence Oaks, State Historic Preservation Officer

cc: Jesse Balleza, Federal Transit Administration
Jeff Dunn, Dallas County Historical Commission
Jim Anderson, Dallas CLG
FLO/LR

Dallas Area Rapid Transit

OCT 07 2002

020163

RESOLUTION

RESOLUTION

of the

DALLAS AREA RAPID TRANSIT
(Executive Committee)

Service Plan Amendment for the Northwest Corridor Light Rail Transit (LRT) Project – Alignment, Station Locations, and Grade Separations

WHEREAS, on February 22, 2000 (Resolution No. 000034), the Board adopted the Locally Preferred Investment Strategy (LPIS), including the Northwest Corridor LRT alignment, and amended the Transit System Plan to reflect this action. This is referred to as the base alignment; and

WHEREAS, on September 25, 2001 (Resolution No. 010137), the Board adopted an additional alignment alternative through the Medical Center for inclusion in the Draft EIS in addition to the base alignment; and

WHEREAS, alternative sites for Northwest Corridor to Farmers Branch and Carrollton LRT stations have been considered and evaluated; and

WHEREAS, the physical geography, Love Field air space restrictions and traffic analyses in the Northwest Corridor have identified the need for grade separations; and

WHEREAS, DART's enabling legislation requires that a public hearing be held to establish or amend the location of transit facilities, new alignments, and grade separations; and

WHEREAS, public hearings were held on July 11, 15, and 16, 2002; and

WHEREAS, funding for the Northwest Corridor Base Alignment, Medical Center Design Option D, stations, and grade separations are within current Budget and Twenty-Year Financial Plan allocations; and

NOW, THEREFORE, BE IT RESOLVED by the Dallas Area Rapid Transit Board of Directors that the President/Executive Director or his designee is hereby authorized to:

Section 1: Amend the Service Plan to specify the Base Alignment using Medical Center Design Option D (see Exhibits 1 and 2), subject to City of Dallas approval (for Medical Center Option D.

Section 2: Amend the Service Plan for addition of alignment from Belt Line Road to Frankford Road, subject to City of Carrollton approval.

Section 3: Amend the Service Plan to specify station locations at Market Center/Oak Lawn, Parkland (Design Option), Inwood (Design Option), Brookhollow, Bachman, Walnut Hill/Denton, Royal Lane, Farmers Branch, Carrollton Square, and Trinity Mills (see Exhibit 3).

Section 4: Amend the Service Plan to specify grade separations as illustrated on Exhibit 4.

Mark C. Enoch
Secretary

Robert W. Pope
Chairman

APPROVED AS TO FORM:

DART Counsel

ATTEST:

Gary C. Thomas
President/Executive Director

September 17, 2002
Date

Dallas Area Rapid Transit
P.O. Box 660163
DART Dallas, Texas 75266-0163
214/749-3278

October 23, 2002

Mr. F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

Attn: Ms. Linda Roark

Re: Northwest Corridor LRT Line to Farmers Branch and Carrollton
Draft Memorandum of Agreement for Review and Comment

Dear Mr. Oaks:

I am pleased to transmit for your review and comment the Draft Memorandum of Agreement (MOA) for the Northwest Corridor LRT Line to Farmers Branch and Carrollton. The Federal Transit Administration (FTA) has determined that the proposed DART Northwest Corridor LRT Line to Farmers Branch and Carrollton in Dallas, Texas, is an undertaking as defined in 36 CFR 800.16(y) because it has the potential to cause effects on historic properties and, therefore, requires compliance with Section 106 of the National Historic Preservation Act as amended (Section 106, 16 U.S.C. 470f) and its implementing regulations (36 CFR Part 800).

The Draft MOA has been developed to outline the conditions for supporting the determinations of No Adverse Effect and for reducing or mitigating the determinations of Adverse Effect as found by SHPO in a letter to DART dated September 26, 2002. The MOA incorporates the proposed mitigation as highlighted in the previously submitted Request for Determination of Effects Report and agreed upon and/or suggested by you in your September 26, 2002 letter. Any additional comments you have relative to the proposed mitigation would be helpful in finalizing the MOA.

As preliminary engineering continues, there is no change from the Determination of Effects Report for the following properties:

- Continental Avenue Bridge
- Magnolia Petroleum Station City Sales and Warehouse
- Turtle Creek Pumping Station
- Obadiah Knight School

- Water Department Purification Plant
- Water Department Pumping Station
- Bachman Electric Generation Station
- T.J. Rusk Middle School
- Bingo Theater
- Carrollton Crossing Depot
- Club Schmitz

However, we would like to bring to your attention minor changes and recent decisions in the project in the vicinity of the Letot School and the Old Morton Food Headquarters. They are described below and also referenced in the attached Draft MOA.

- Letot School – On September 25, 2002, DART completed a conceptual site plan for the Northwest Rail Operating Facility (ROF), located at the northeast corner of Denton Drive and Lombardy Lane. At the time the Effects Report was prepared, all changes to the site were to occur on the east side of the existing freight tracks, and would be somewhat obscured by the elevated LRT guideway columns and a retaining wall for the pocket tracks. The conceptual site plan includes replacement freight storage tracks to the west of the relocated freight tracks and LRT alignment. The freight track and these storage tracks would be located on the parcel of land between Denton Drive and the proposed ROF (please see site plan attached, with the location of the Letot School identified). These new tracks will be located across Denton Drive from the Letot School, facing a secondary façade and will permit temporary storage of railroad cars. The existing mainline freight tracks will be located at the eastern edge of these new tracks, paralleling the LRT guideway. No additional lighting has been proposed at this time. The DART Board resolution approving the ROF site requires visual mitigation around the site. This visual mitigation will also screen the freight storage tracks. This visual mitigation work is included in the MOA to allow SHPO to review and comment on the design of the ROF project to ensure a Finding of No Adverse Effect is reached. Please see the Draft MOA for further details.

- Old Morton Food Headquarters – On September 17, 2002, the DART Board approved Medical Center Design Option "D" as the preferred alignment. This alignment follows the existing tracks along the west side of Denton Drive, past the Old Morton Food Headquarters. As was described in the Request for Determination of Effects Report, the tracks are located approximately 80' to the east of the property. The LRT will begin its descent into a tunnel to avoid the intersection of Mockingbird Lane and Denton Drive approximately 200 feet south of the building and the top of rail will be approximately 6 feet below ground when it approaches the southern end of the Old Morton Food Headquarters. It will be 18 feet below ground level at the north end of the resource, at which point the LRT will enter a tunnel portal.

  The changes in the immediate vicinity of the resource will not be significant, due to the distance to the tracks, the intervening parking lot and landscaping, and the fact that the trains will begin their descent into the tunnel south of the resource. Noise level changes are not expected to be significant. LRT noise will be diminished because all or part of the train will be below grade as it passes the Old Morton Food Headquarters. In addition,

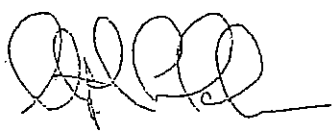
none of the current commercial uses of the building is noise sensitive. The building will continue to have a visual connection to a transportation-related corridor, and the introduction of light rail components such as catenary poles and lighting would not significantly affect the integrity of the property and are compatible with its industrial setting. The design of the u-wall structure, likely to be used for the tunnel descent, will include unknown design features, such as low barrier walls for pedestrian safety, which could affect the visual environment. Therefore, to ensure a Finding of No Adverse Effect, the design of the project will be developed by DART in consultation with SHPO who will have the opportunity for design review and comment. Please see the Draft MOA for further details.

There is also the possibility that a portion of the parking lot for Old Morton Food Headquarters would need to be used during construction for access to the tunnel. If it is necessary to displace parking spaces temporarily during the construction period, DART will consult with the property owner and tenants to provide replacement parking or compensation for parking displacements. Please see the Draft MOA for further details.

FTA has reviewed the attached Draft MOA and has agreed with its content and format. They have asked that we forward the Draft MOA to you for your review and comment. Once we receive your comments, DART and FTA will sign the MOA and forward to you for your signature.

Thank you for your timely attention to this matter and we look forward to finalizing the MOA so that the integrity of the resources in the Northwest Corridor can be maintained to their greatest potential. Please feel free to contact me at 214/749-2828, or Kay Shelton, Northwest Corridor Project Manager, at (214) 749-2841, if you have any questions.

Sincerely,



Stephen L. Salin, AICP
Interim AVP, Capital Planning and Development

enclosures

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

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CHIANG, PATEL & YERBY, INC.-DA

October 29, 2002

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OCT 31 2002

Melissa M. Green
Geo-Marine, Inc.
550 East 15th Street
Plano, TX 75074

Re: Project review under the Antiquities Code of Texas, Antiquities Permit #2552, Carrollton NW Corridor Survey, Draft Report (DART)

Dear Ms. Green:

Thank you for your correspondence concerning the above referenced project. This letter presents the comments of the Executive Director of the Texas Historical Commission , the state agency responsible for administering the Antiquities Code of Texas. We are in receipt of the draft report for Antiquities Permit # 2552, and the report is acceptable. Additionally, we concur with your conclusions and recommendations, and therefore, with the exception of the area that Geo-Marine did not have access to survey, no further archeological investigations are warranted. The area that still needs to be surveyed may be surveyed under a new and separate Antiquities Permit once access is achieved or DART and Geo-Marine can include this additional documentation as a part of Permit #2552 if you want to hold final production of this report until that data can be added.

If DART and Geo-Marine prefer completing Permit #2552 at this time, please forward the twenty final copies of the report and a completed copy of the THC Abstract in Texas Archeology Form to the THC.

Thank you for your cooperation in this state review process, and for your efforts to preserve the irreplaceable heritage of Texas. If you have any questions please contact Mark H. Denton, of our staff at (512) 463-5711.

Sincerely yours,

for
F. Lawerence Oaks
Executive Director

Enclosures: Abstract Form

GEO-MARINE, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES

Since 1972

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DEC 0 2 2002
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27 November 2002

Mr. Steve Salin
Dallas Area Rapid Transit
P.O. Box 660163
1401 Pacific Avenue
Dallas, TX 75266-7213

Dear Mr. Salin:

Please find enclosed ten (10) copies of the final report entitled *Cultural Resources Survey of the Carrollton Northwest Corridor, Dallas Area Rapid Transit Light Rail System, Dallas County, Texas* for your files and distribution. All copies contain maps showing site locations which is considered sensitive information and is not distributed to the public. Should you require copies that do not contain this sensitive information, please contact me. This work was conducted for Parsons Transportation Group and Dallas Area Rapid Transit under Antiquities Permit # 2552.

We look forward to working with you again.

Sincerely,

Melissa M. Green, RPA
Department Manager
Cultural Resources

DALLAS AREA RAPID TRANSIT
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CAPITAL PLANNING & DEVELOPMENT

Enclosure

GMI Ref: 3600-A03/30318.00.01

550 E. 15th St., • Plano, TX 75074 • Tel: (972) 423-5480 • Fax: (972) 422-2736
Dallas - Ft. Worth, TX • El Paso, TX • San Antonio, TX • Knoxville, TN • Newport News, VA • Panama City, FL • Fajardo, Puerto Rico
E-Mail: gmi@geo-marine.com • website: www.geo-marine.com

Dallas Area Rapid Transit
P.O. Box 660163
DART Dallas, Texas 75266-0163
214/749-3278

December 20, 2002

Ms. Nan Terry
Airport Environmental Specialist
Texas Airport Development Office
2601 Meacham Blvd.
Fort Worth, TX 76137-4298
ATTN: ASW-652B

Dear Ms. Terry,

On behalf of DART and FTA, I would like to thank you and your colleagues at FAA for your efforts as a cooperating agency on the Northwest Corridor Light Rail project. Your assistance was invaluable in helping to define options to serve Dallas Love Field with light rail.

As you may know, DART has been increasingly faced with budget constraints due to lower sales tax revenues over the last year. These financial constraints have resulted in our decision to submit the Final Environmental Impact Statement (FEIS) without the Love Field Design Option. Our Selected LRT Alternative reflects the use of our "base" alignment outside of Dallas Love Field airport property. This base alignment does not affect the airport layout plan and thus does not require any Federal action from FAA. A copy of the FEIS will be provided to you once it becomes available.

As we continue our work in the Northwest Corridor, we may examine other options to serve Love Field given the public and agency support for this service. If we do decide to pursue direct rail service to Dallas Love Field in the future, we will be sure to ask you for your cooperation and guidance.

Again, thank you for all of your assistance. A response letter from FAA regarding this decision would be appreciated. Please feel free to call me at 214/749-2841 should you have any questions.

Sincerely,

Kay M. Shelton, AICP
Project Manager, Northwest Corridor

C: John Sweek, FTA Region VI
Steve Salin, Interim AVP, DART Capital Planning and Development

U.S. Department
of Transportation
**Federal Aviation
Administration**

Southwest Region
Arkansas, Louisiana,
New Mexico Oklahoma,
Texas

Fort Worth, Texas 76193-0000

December 30, 2002

Ms. Kay Shelton
Project Manager
Dallas Area Rapid Transit
Post Office Box 660163
Dallas, TX 75266-7248

Dear Ms. Shelton: Kay

Thank you for your letter dated December 20, 2002, providing an update on the status of the Love Field Design Option. Since Dallas Area Rapid Transit (DART) has decided to pursue the Northwest Corridor Light Rail project without the Love Field Design Option, the Federal Aviation Administration (FAA) does not have a Federal action in this project. If at any time, DART chooses to pursue an option requiring a Federal action by the FAA, we will join DART and the Federal Transit Administration in complying with our requirements under the National Environmental Policy Act.

If I can be of any assistance in this matter, please do not hesitate to contact me at (817) 222-5607.

Sincerely,

Nan L. Terry
Airport Environmental Specialist
Texas Airports Development Office

cc: Mr. Kenneth Gwynn, Dallas Love Field, Director of Aviation, LB 16 Love Field Terminal Building, Dallas, TX 75235

Mr. John Sweek, Federal Transit Administration, Region VI, 819 Taylor Street, Room 8A36, Fort Worth, TX 76102

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

December 31, 2002

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SSalin

Mr. Stephen Salin
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163

Re: *Project review under Section 106 of the National Historic Preservation Act of 1966*
DART Northwest Corridor draft Memorandum of Agreement, Dallas, Dallas County (FTA106)

Dear Mr. Salin:

Thank you for providing our office with a draft Memorandum of Agreement (MOA) regarding the subject project. This letter serves as comment on the draft MOA from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC).

The review staff, led by Linda Roark, has completed its review of the draft MOA for DART's proposed Northwest Corridor and has the following comments and recommendations:

Stipulation I.A., Old Morton Foods Headquarters: We are concerned about the stipulation of the specific design in this area of the undertaking. The design may change, and the purpose of the MOA and SHPO review is to consult regarding the design. We recommend a more general description.

I.A.1: We are concerned about the intent of the term "final design" here, and its use throughout the draft MOA, since the object of stipulating 30%, 65%, 95% and 100% design development review is to avoid beginning the review at "final design". We recommend that the stipulation for SHPO design review (III) be referenced and substituted for the term "final design" in each stipulation where "final design" currently occurs.

I.A.2, Old Morton Foods Headquarters: We recommend that this stipulation also include that DART will work with the owners and tenants of the building to provide acceptable permanent access to the site, so that continued use of the building will not be adversely affected by diminished access.

Stipulation I.C, T. J. Rusk Middle School: The wording of the stipulation, including the previously discussed use of the term "final design" and the last sentence, which begins "Specifically, the Art & Design Program. . ." confuses the nature of the required SHPO design review. In regard to the entire undertaking, the MOA should be clear that the complete design of each station or other project construction near one or more historic properties (properties with "adverse effect" and conditional "no adverse effect" determinations) needs to be provided for review, including but not limited to the "Art & Design Program" design elements.

Stipulation I.D.1, Letot School:

- General design information for the Northwest Rail Operating Facility (to be constructed under a separate contract) should be provided to the SHPO with the proposed visual mitigation design information for the Facility, if design review for the Facility is to be coordinated at a later time.
- The relocation of the existing freight railroad tracks, closer to the historic property, is a result of the undertaking and increases the potential for the undertaking to have an adverse effect. Have potential effects been assessed for this work? The stipulation should include SHPO review of proposed mitigation for potential visual and noise effects on the historic property.

Stipulation II.A, Club Schmitz: If DART is involved in the design and/or placement of temporary and/or permanent signage to be attached to the building, the SHPO should be provided with design review in accordance with Stipulation III, including proposed design, materials and method of attachment to the building.

Stipulation II.B, Carrollton Crossing Depot:

c) This section of the stipulation, regarding rehabilitation of the depot, should refer to Stipulation III.

f) If the building is transferred or sold from DART ownership, DART should consult with the SHPO to develop an appropriate preservation easement to be placed on the property prior to transfer. If the property will be leased, DART should consult with the SHPO to develop appropriate preservation and review clauses to be included in the lease agreement.

Stipulation III, SHPO design review: We recommend the following language to stipulate review of the undertaking that has the potential to affect historic properties:

> DART will make every effort to ensure that the design of light rail structures and all other construction undertaken or funded by DART related to this undertaking, including but not limited to station platforms and canopies, artwork and community art design programs, signage, tracks, catenary poles, overhead traction and power systems, traction power substations, communications bungalows, and sound insulation fences or other construction that may have an effect on historic properties will be designed to be compatible with affected historic properties and conform to the guidance contained in the Secretary of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (U. S. Department of the Interior, National Park Service, 1983 or as most recently amended). Dart will further ensure that all such designs are developed in consultation with the SHPO and submitted to the SHPO for approval. Proposed designs will be provided to the SHPO for review at the 30%, 65% and 95% design stages.
>
> All design information provided to the SHPO for review will have pages relevant to the review marked/tabbed, and the transmittal letter from DART will include a brief synopsis of design changes/additions since the previous review.

Stipulation IV, SHPO review period: We recommend the following language:
DART shall afford the SHPO thirty (30) days to review and respond to any reports, plans, specifications or other documentation provided for review pursuant to this MOA. Should the SHPO object, DART shall consult further with the SHPO to resolve the objection. If DART determines that the objection cannot be resolved, DART shall notify the FTA, which will follow MOA Stipulation (V.E) for "Resolving objections".

Stipulation V.E, Resolving objections: Enclosed with our letter, please find a copy of a model MOA by the Advisory Council on Historic Preservation. There are three concepts in the dispute resolution stipulation (VII) of the model MOA that we recommend for inclusion in the MOA for this undertaking:

1. When an objection or dispute cannot be resolved, and the FTA forwards all documentation relevant to the dispute to the Council for comment, the FTA will take into account the comment provided by the Council, and all comments from the parties to the MOA, in reaching a final decision regarding the dispute.
2. If the Council does not provide comments regarding the dispute within 30 days after receipt of adequate documentation, the FTA may render a decision regarding the dispute. In reaching its decision, FTA will take into account all comments regarding the dispute from the parties to the MOA.
3. The FTA will notify all parties to the MOA of its decision regarding a dispute in writing before implementing that portion of the Undertaking subject to dispute.

Stipulation V.F, Amendments: The enclosed model MOA amendment stipulation (VIII) includes language we recommend for inclusion in this project's MOA:

1. The amendment will be effective on the date a copy signed by all of the original signatories is filed with the Council.
2. If the signatories cannot agree to appropriate terms to amend the MOA, any signatory may terminate the agreement in accordance with the termination stipulation.

Stipulation V.I, Termination: We recommend the following concepts from the enclosed model MOA termination stipulation be included:
"Within 30 days following termination, the FTA shall notify the signatories if it will initiate consultation to execute an MOA with the signatories under 36 CFR §800.6(c)(1) or request the comments of the Council under 36 CFR §800.7(a) and proceed accordingly."

Page 8, conclusion: We recommend the following wording as suggested in the model MOA:
Execution of this Memorandum of Agreement by the FTA, the Texas SHPO and DART, the submission of documentation and filing of this Memorandum of Agreement with the Council pursuant to 36 CFR Section 800.6(b)(1)(iv) prior to FTA's approval of this undertaking, and implementation of its terms evidence that FTA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment.

We look forward to reviewing a revised draft MOA. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have questions concerning these comments please contact me at 512/463-9122.**

Yours truly,

Linda Roark, Preservation Specialist
for: F. Lawerence Oaks, State Historic Preservation Officer

Enclosure: ACHP Model MOA
cc: Jesse Balleza, Federal Transit Administration
Jeff Dunn, Dallas County Historical Commission
Jim Anderson, Dallas CLG
FLO/LR

Dallas Area Rapid Transit
P. O. Box 660163
Dallas, Texas 75266-0163
DART 214/749-3278

August 16, 2002

Mr. F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

Attn: Mr. Peter Ketter

Re: Northwest Corridor LRT Line to Carrollton
Request For Additional Information Relating to Determination of Eligibility Report

Dear Mr. Oaks:

I am pleased to transmit for your review and concurrence updated and additional information as per your request. The Federal Transit Administration (FTA) has determined that the proposed DART Northwest Corridor LRT Line to Farmers Branch and Carrollton in Dallas, Texas, is an undertaking as defined in 36 CFR 800.16(y) because it has the potential to cause effects on historic properties and, therefore, requires compliance with Section 106 of the National Historic Preservation Act as amended (Section 106, 16 U.S.C. 470f) and its implementing regulations (36 CFR Part 800).

This transmittal supplements our previously submitted Request for Determination of Eligibility Report (dated February 5, 2002) and provides additional information requested by your office during a meeting at our offices on July 24, 2002. The following is a summary of information enclosed with this letter:

1) Carrollton Crossing Depot: Jessica B. Feldman, architectural historian with Myra L. Frank & Associates, Inc., reviewed the 1921 and 1935 Sanborn Maps for Carrollton, TX. The Carrollton Crossing Depot was constructed circa 1925. At issue was the request to determine, if possible, the original site or orientation of the depot to the railroad tracks it served. Per this request, the following information was obtained:
   a) The exact location of the depot at the site in 1921 is unclear and only identified in a large-scale map by the use of the word "depot" situated near the intersection of the St. Louis & Southwestern (Cotton Belt) Railroad and the Missouri, Kansas & Texas (MKT or Katy) Railroad. The additional maps that show street details and building footprints omit this section of the town.

b) The exact location of the depot at the site in 1935 is slightly clearer. On the large-scale map, there a written identification, "station", and a rectangular structure is delineated, with the long end facing the Cotton Belt tracks and the short end facing the MKT tracks. The additional maps that show street details and building footprints omit this section of the town.
c) The 1949 Drainage Improvement map for Hutton Branch, prepared by the Dallas County Engineering Office, shows the Depot with equal sides; the north façade still faces the Cotton Belt tracks, and the west façade faces the MKT tracks and Denton Road (also known as N. Broadway and formerly old US 77).
d) According to photographs from 1962 and 1978, the depot is in roughly the same spot as identified in the 1949 Drainage map, giving further evidence that the depot has historically faced the Cotton Belt along the north façade and the MKT along the west façade.

To supplement this information, please find the 1921 and 1935 Sanborn maps enclosed with this letter, as well as the 1949 Drainage Improvement map, as well as the later photographs. These appear to answer the question of the depot's orientation as it historically correlated to the railroads. Although the City of Carrollton indicates the structure has been moved in the past, it appears that the Carrollton Depot is still positioned in its historic orientation.

2) Peerless Manufacturing Plant: Kay Shelton spoke with Sherrill Stone, Chairman of Peerless Manufacturing on Monday, July 29, 2002. Per their conversation the following information was obtained:
   a) The first gas odorizer was invented in downtown Dallas, TX 1937.
   b) Mr. Donald A. Sillers, Sr. worked for Lone Star Gas at the time he invented the gas odorizer.
   c) The Peerless facility on Walnut Hill Lane at Denton Drive was built in 1946.
   d) The construction of the Peerless facility in 1946 was part of a business expansion.
   e) The Peerless facility manufactured a variety of industrial parts and machines including the gas odorizer, but was not built specifically for the production of the gas odorizer.

   Therefore, it is the opinion of this office that the Peerless Manufacturing Plant is not associated with the invention of the gas odorizer, was built following the invention of the gas odorizer, and was not built specifically to produce the gas odorizer. Therefore, it is not eligible for the National Register of Historic Place under Criterion A or B. This structure has already been determined to be ineligible for the National Register of Historic Places under Criterion C or D.

3) Proposed Rail Operating Facility (ROF) at Lombardy Lane and Denton Drive
   a) The proposed site of the ROF would require the acquisition of 20 parcels, all of which include structures built post-1954.
   b) Adjacent to the ROF, the northbound LRT track would remain elevated. The southbound track and pocket tracks providing access into the ROF site would transition to at-grade north of the Lombardy Lane grade separation and remain at-grade for approximately 1,200 feet adjacent to the site.
   c) An expansion of the APE defined in the FEIS will include the site of the proposed ROF and one parcel to the east, north and south of the proposed site (The site to the west, across Denton Drive, is the Letot School, to be discussed further in the EIS and the

Finding of Effects Report). The revised APE includes properties on the east side of Abernathy Avenue and the south side of Lombardy Lane, as well as property north of the proposed ROF which includes structures already evaluated and determined ineligible in the Request for Determination of Eligibility, submitted to you February 5, 2002. The attached map shows the revised APE around the ROF site.

d) Three structures in the area of the revised APE boundaries were identified as having been built prior to 1954: 9710, 9712 and 9740 Abernathy Avenue. None of these structures has been determined eligible for listing in the National Register.
e) Texas Historic Site Inventory forms for the three pre-1954 structures have been enclosed with the letter for your review.

4) Medical Center Alignment Option D
   a) Option D, a potential refinement of the three existing choices for the Medical Center Alignment would shift the curve of the alignment east towards the existing DART owned railroad corridor at a point just north of the intersection of Motor and Harry Hines, below-grade. A below-grade, open-cut station would be provided on the northeast quadrant of Motor Street and Harry Hines on Parkland Hospital property. This alignment will transfer to at-grade after it passes under a potential extension of Redfield Street, and would be at-grade within the existing railroad corridor until it rejoins the alignments of Option B as contained in the Draft EIS, including the grade separation of Inwood Road and aerial Inwood Station.
   b) The structures that are within the APE for this proposed option have previously been evaluated and determined ineligible. There are no new structures to evaluate and therefore, no corresponding Texas Historic Site Inventory forms.
   c) A copy of the map showing the proposed Option D in relation to Options A-C has been enclosed with this letter for your review

In accordance with 36 CFR 800.4(c)(2), FTA and DART are seeking SHPO concurrence with its determination of eligibility for listing in the National Register of Historic Places of properties within the referenced project's APE. Following your concurrence, the report and supplemental documentation will be referenced in this project's Final Environmental Impact Statement.

Thank you for your timely attention to this matter. We appreciated the attendance of Linda Roark and Peter Ketter during the July 24, 2002 meeting held in our offices. Please feel free to call Kay Shelton, Northwest Corridor Project Manager, at (214) 749-2841, if you have any questions.

Sincerely,

Kay Shelton for

Stephen L. Salin, AICP
Senior Manager, Corridor and Environmental Planning

enclosures

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

March 21, 2003

Mr. Stephen Salin
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163

Re: *Project review under Section 106 of the National Historic Preservation Act of 1966*
DART Northwest Corridor draft Memorandum of Agreement, Dallas, Dallas County (FTA106)

Dear Mr. Salin:

Thank you for providing our office with the revised and final draft Memorandum of Agreement (MOA) regarding the subject project. This letter serves as comment on the draft MOA from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC).

The review staff, led by Linda Roark, has completed its review of the draft MOA for DART's proposed Southeast Corridor. We concur that it is ready for signature and look forward to receiving the signature copies.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have questions concerning these comments please contact me at 512/463-9122.**

Yours truly,

Linda Roark, Preservation Specialist
for: F. Lawerence Oaks, State Historic Preservation Officer

cc: Jesse Balleza, Federal Transit Administration
Jeff Dunn, Dallas County Historical Commission
Jim Anderson, Dallas CLG
FLO/LR

DART
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

March 31, 2003

Mr. Terry Mitchell
Assistant Director of Aviation
City of Dallas
LB 16, Love Field Terminal Building
Dallas, Texas 75235

RE: Form 7460-1 – DART Northwest Corridor Inwood South Station Option

Dear Mr. Mitchell,

Please find enclosed Federal Aviation Administration *Form 7460-1, Notice of Proposed Construction or Alteration* for the proposed relocation of the Inwood Station of the Dallas Area Rapid Transit (DART) Northwest Corridor LRT project. While the DART Board approved Medical Center Option D and a station on the northwest quadrant of Inwood and Denton, recent discussions have led DART to propose the use of the UP RR right-of-way south of Inwood and relocate the Inwood Station to the southwest quadrant of Inwood and Denton. Public meetings are being held for the changes on April 3 and April 10 with DART Board approval anticipated on April 22. Ms. Nan Terry of the FAA indicated an airspace study would be needed for the proposed station relocation. Portions of the Inwood Station penetrate the 100:1 slope as noted on the maps.

The attached information is for your review and distribution to appropriate City and FAA staff. Also enclosed is a copy of the alignment on a USGS map and a copy of the plan and profile sheets for the area in the station vicinity.

Given our schedule for DART Board approval and tentative circulation of the Final EIS in May, an expedited review would be greatly appreciated.

Should you have any questions or require any additional information please feel free to contact me at 214/749-2841. Thank you.

Sincerely,

Kay M. Shelton
Dallas Area Rapid Transit
Northwest Corridor Project Manager

C: Doug Allen, Executive Vice President, Program Development
Steve Salin, Interim Assistant Vice President, Capital Planning and Development
Nan Terry, Federal Aviation Administration, Southwest Region (with enclosures)
Bernie Christian, Federal Aviation Administration, Southwest Region (with enclosures)
Bruce Beard, Federal Aviation Administration, Southwest Region – Air Traffic (with enclosures)

CARROLLTON

April 1, 2003

Ms. Kay Shelton
Project Manager
Dallas Area Rapid Transit
1401 Pacific Avenue
Dallas, TX 75202

Dear Ms. Shelton,

On behalf of the City of Carrollton Historic Preservation Advisory Committee (HPAC), I'd like to thank you for sharing information on the Northwest Corridor light rail project and its effects on the Carrollton Crossing Depot.

Members of HPAC, as well as City staff, look forward to working with DART during the final design and construction phases of the project to ensure that the depot is relocated in a manner that will preserve its historic integrity. We further support a future reuse of the depot that can enhance its value to the surrounding community, and will work with DART to ensure that the measures outlined in the Memorandum of Agreement between the Federal Transit Administration (FTA) and the State Historic Preservation Officer (SHPO) are fulfilled.

If we can be of any further assistance, please feel free to contact me.

Sincerely,

Susan Shuttleworth

Susan Shuttleworth
Chair, Carrollton Historic Preservation Advisory Committee

Christopher Barton

Christopher Barton, AICP
Chief Planner, City of Carrollton

PLANNING
•
1945 E. Jackson Road • P.O. Box 110535 • Carrollton, Texas 75011-0535
972/466-3040 • Fax: 972/466-3193 • Email: Planning@ci.carrollton.tx.us

CITY OF DALLAS

April 3, 2003

Ralph B. Christian, Program Manager
Texas Airport Development Office
Federal aviation Administration
Southwest Region
Fort worth, Texas 76193-0650

Dear Mr. Christian:

Enclosed is a Notice of Proposed Construction, FAA Form 7460-1, for the proposed relocation of the Inwood Station of the Dallas Area Rapid Transit (DART) Northwest Corridor LRT Project. The Department of Aviation has no objections to this proposal providing that DART complies with all federal, state and municipal regulations and that Dallas Love Field is in no way adversely impacted by its implementation. Thank you for your attention to this matter.

Should you require additional information, contact Kay M. Shelton, DART Northwest Corridor Project Manager, at 214/794-2841, or me at 214/670-6086.

Sincerely,

Terry Mitchell
Assistant Director of Aviation

c: Kay M. Shelton, DART Northwest Corridor Project Manager

DART

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

RECEIVED
APR 07 2003
TEXAS HISTORICAL COMMISSION

106

April 4, 2003

CONCUR
by
for F. Lawerence Oaks
State Historic Preservation Officer
Date 5.21.03

Mr. F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

Attn: Mr. Peter Ketter and Ms. Linda Roark

Re: Northwest Corridor LRT Line to Farmers Branch and Carrollton
Supplemental Request for Determination of Eligibility and Effects

Dear Mr. Oaks:

I am pleased to transmit for your review and concurrence additional information related to proposed alignment and station changes in the area of the Medical Center District within the Northwest Corridor since the publication of the Draft EIS in June 2002. These changes are detailed on the next page and in the attached *Draft Environmental Study*, which will provide the basis for completion of the Final EIS. The Federal Transit Administration (FTA) has determined that the proposed DART Northwest Corridor LRT Line to Farmers Branch and Carrollton in Dallas, Texas, is an undertaking as defined in 36 CFR 800.16(y) because it has the potential to cause effects on historic properties and, therefore, requires compliance with Section 106 of the National Historic Preservation Act as amended (Section 106, 16 U.S.C. 470f) and its implementing regulations (36 CFR Part 800).

This transmittal supplements our previously submitted Request for Determination of Eligibility Report (dated February 5, 2002) and SHPO requests for additional information to support the eligibility determination (dated April 26, June 11 and August 16, 2002). SHPO concurred with the findings of the Determination of Eligibility Report in a letter to DART dated August 21, 2002.

This transmittal also supplements our previously submitted Request for Determination of Effects Report (dated August 26, 2002). Your office completed a review of these determinations by letter on September 26, 2002. A Memorandum of Agreement (MOA) has been developed for this undertaking based on the determination of effects. The MOA was transmitted to Linda Roark on January 30, 2003 for final review. A letter was received from SHPO on March 21, 2003 that the MOA is ready for signature. Execution of the MOA will be sought prior to publication of the Final EIS.

Proposed Project Changes

Based on continuing discussions with Medical Center area representatives in the southern portion of the corridor, DART has been requested to re-examine use of the existing DART-owned Union Pacific Railroad (UP RR) right-of-way to the east of the approved alignment Option D in this area. A summary of potential changes to the project is as follows:

1. Moving the Medical Center alignment back to the DART owned UP RR right-of-way to address cost and design issues associated with Option D. This shifts a section of the alignment (about 4,000 feet in length) to the east by a maximum of 1,000 feet. The affected areas are primarily industrial and largely vacant along the existing railroad right-of-way (refer to Figures 1-2, 2-1 and 2-2 in *Draft Environmental Study*);

2. Grade separation of Maple Avenue at the UP RR due to an updated traffic analysis (refer to Figure 2-1 for location);

3. Moving the Market Center/Oak Lawn Station platform south approximately 400 feet to accommodate the alignment change described above (see Figure 2-3 in *Draft Environmental Study*). This platform shift supports movement of the station park-and-ride area to south of Wycliff Avenue in order to be directly across from the platform;

4. Relocating the Inwood Station platform and parking from the northwest quadrant of Inwood and Denton to the southwest quadrant (see Figure 2-4 in *Draft Environmental Study*). While this is not related to the UP alignment change, this change would respond to both comments received on the Draft EIS and new information obtained during tenant and property owner interviews at these two locations.

Expanded Area of Potential Effects (APE) and Determination of Eligibility

The Area of Potential Effects (APE) has been expanded to include the possible project changes described above (see attached APE maps 1 through 5). The APE maps call out each of structures for which a new site inventory form is being submitted. Many of the structures within the APE for this proposed option have previously been evaluated and determined ineligible or do not meet age criteria (see attached tables that accompany the APE maps). However, twenty-six (26) structures in the area of the revised APE boundaries were identified as having been built prior to 1954 that were not previously evaluated for National Register eligibility:

APE Map No. 1 – Market Center/Oak Lawn Station

- 2118 Hondo Avenue
- 2224-26 Vagas Street
- 2228-30 Vagas Street
- 2231Vagas Street

- 2234 Vagas Street
- 2235 Vagas Street
- 2238 Vagas Street
- 2239 Vagas Street
- 2242 Vagas Street
- 2243 Vagas Street
- 2247 Vagas Street
- 2218 Wycliff Avenue
- 2223 Wycliff Avenue
- 2224-2226 Wycliff Avenue
- 2227 Wycliff Avenue
- 2228-30 Wycliff Avenue
- 2231 Wycliff Avenue

APE Map No. 2
- None

APE Map No. 3 – Parkland Station
- 4703 Bengal Street
- 2031 Motor Street
- 2039 Motor Street

APE Map No. 4
- 5101 Maple Avenue (to be demolished by Parkland Hospital in Spring 2003 for their campus expansion)
- 5211-5219 Maple Avenue

APE Map No. 5 – Inwood Station

- 2531 Butler Street
- 2708 Inwood Road
- 2722 Inwood Road
- 5454 Maple Avenue

None of these structures appears to meet the criteria for listing in the National Register. Texas Historic Site Inventory forms for the above pre-1954 structures have been enclosed with this letter for your review.

Determination of Effects

The DEIS identified one historic property (TJ Rusk Middle School) near the Inwood Station as eligible for the National Register. A determination of no adverse effect was provided for this resource based on the location of the Inwood Station and alignment directly across Denton Drive and approximately 200 feet from the west façade the resource. Mitigation to ensure a finding of no adverse effect included design review by SHPO of the project during final design as stipulated in the Memorandum of Agreement (MOA).

The proposed station change to an area south of Inwood Road and west of Denton Drive increases the distance of the station platform from 200 feet under the DEIS station option to 500 feet from the nearest southwest corner of the school. The alignment remains approximately 200 feet from the west façade. Relocation of the station to an area southwest of the primary south façade of the school also removes the station from the primary view of the school. These changes continue to support a finding of no adverse effect. This change would not affect the conditions in the MOA recently developed with SHPO and FTA. As outlined in the MOA, the proposed design work for the alignment and station near TJ Rusk Middle School will still be included in SHPO design review to achieve no adverse effect on the property.

Pending your concurrence, because there are no additional eligible properties, there are no additional effects. The finding of No Adverse Effect for TJ Rusk Middle School is proposed to remain the same with the conditions of the MOA remaining the same to achieve no adverse effect on the property.

Summary

In accordance with 36 CFR 800.4(c)(2), FTA and DART are seeking SHPO concurrence with its determination of eligibility for properties within the referenced project's APE. We are also requesting your expedited review in accordance with 36 CFR 800.3(g). Following your concurrence, the report and supplemental documentation will be referenced in this project's Final EIS. We will also initiate execution of the MOA so that it can be included as an appendix to the Final EIS.

Thank you for your timely attention to this matter. Please feel free to call Kay Shelton, Northwest Corridor Project Manager, at (214) 749-2841, if you have any questions.

Sincerely,

Kay M Shelton for

Stephen L. Salin, AICP
Interim AVP, Corridor and Environmental Planning

Enclosures: Draft Environmental Study for project changes, APE Maps, tables and inventory forms

C: John Sweek, FTA

Federal Aviation Administration
Southwest Regional Office
ASW-520
Fort Worth, TX 76137-0520

Aeronautical Study No.
2003-ASW-2157-OE
Prior Study No.
2002-ASW-1607-OE

Issued Date: 5/16/2003

KAY SHELTON
DALLAS AREA RAPID TRANSIT
1401 PACIFIC AVE
DALLAS, TX 75201

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has completed an aeronautical study under the provisions of 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure Type:	DART RAIL SYSTEM
Location:	DALLAS, TX
Latitude:	32-49-20.74 NAD 83
Longitude:	96-50-0.42
Heights:	46 feet above ground level (AGL) 521 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking and/or lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory Circular 70/7460-1 K.

This determination expires on 11/16/2004 unless:

(a) extended, revised or terminated by the issuing office.
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed , as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure.

However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission if the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (817)222-5536. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2003-ASW-2157-OE.

Linda Steele

(DNE) 176977

for Bruce C Beard
Specialist

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION VI
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

819 Taylor St. Suite 8A36
Fort Worth, TX 76102
817-978-0550
817-978-0575 (fax)

June 4, 2003

Mr. F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Attn: Linda Roark

Re: Memorandum of Agreement (MOA)
DART Northwest Corridor Light Rail
Project Dallas, Texas

Dear Mr. Oaks:

In accordance with Section 106 of the National Historic Preservation Act and 36 CFR PART 8 00, we are transmitting four copies of the subject MOA for your signature. After signing, please return them to this office for transmittal to the Advisory Council on Historic Preservation. Following their acceptance, we will distribute the fully executed copies to the signatories.

We appreciate your attention to this project and look forward to continued consultation with your office in our collaborative effort to protect historic resources. Should you have any questions, please contact John Sweek at (817) 978-0550.

Sincerely,

Robert C. Patrick
Regional Administrator

cc: Ms. Kay Shelton, DART

Dallas Area Rapid Transit
P.O. Box 660163
DART Dallas, Texas 75266-0163
214/749-3278

June 13, 2003

Ms. Ethel Smith
Environmental Protection Specialist
Office of Environmental Policy and Compliance
Main Interior Building, MS-2342
1849 C Street, NW
Washington, DC 202040

RE: DART Northwest Corridor Section 4(f) Evaluation
DART Southeast Corridor Section 4(f) Evaluation

Dear Ms. Smith,

Please find enclosed eleven (11) CD's with information related to the Section 4(f) Evaluations for two Dallas Area Rapid Transit (DART) projects: 1) the Northwest Corridor LRT Line to Farmers Branch and Carrollton; and 2) the DART Southeast Corridor LRT Line. These 11 CD's are support for the originals sent to you by John Sweek from the Region VI Office of the Federal Transit Administration (FTA). Both projects are in the process of completing final reviews prior to publishing each project's Final Environmental Impact Statement (FEIS).

Each CD contains a folder for the NW Corridor, which includes:

- Section 4(f) Evaluation from the Northwest Corridor Final Environmental Impact Statement (FEIS) (anticipated to be published this summer)
- Final Memorandum of Agreement (MOA) in the process of being signed by the parties to the MOA (DART, FTA, SHPO and ACHP)
- FEIS Executive Summary (for information only)

The remaining three files on the CD are for the SE Corridor and include:

- Section 4(f) Evaluation, prepared as an appendix to the Southeast Corridor FEIS (anticipated to be published this summer)
- Responses to comments on the Section 4(f) Evaluation, to be included in the FEIS
- Final MOA in the process of being signed by the parties to the MOA (DART, FTA, SHPO and ACHP)

Per a phone conversation with you on May 24, 2002, one hard copy of the DEIS and 11 CD's of the DEIS were requested by DOI for their review and distribution. According to our information, twelve (12) copies of the Northwest Corridor Draft EIS were mailed to the attention of Willie Taylor at the DOI Office of Environmental Policy and Compliance on June 5, 2002. One additional copy was mailed to Gale Norton, Secretary of the Interior. The DEIS comment period was June 14 through July 30, 2002. At the time the DEIS was published, DART was involved in

the consultation process with the Texas SHPO regarding eligibility and did not identify any 4(f) impacts to parklands or historic resources. Subsequent coordination with the Texas SHPO on the determination of effects resulted in the identification of adverse effect on two historic properties. Thus, the Section 4(f) Evaluation in the proposed Final EIS discusses these two adverse effects (one direct use and one constructive use), as well as a temporary use of a third historic resource.

The DOI recently informed DART that no information for the Northwest Corridor was in the DOI database. Thus, we are resending one hard copy and 11 CD's of the Northwest Corridor DEIS for your files. No review is necessary since the information has been updated substantially for the enclosed Section 4(f) Evaluation and future Final EIS, which will also be sent to your office.

The Southeast Corridor Draft EIS was mailed to the attention of Willie Taylor in February 2002. Because only one DEIS/4(f) document was provided for DOI review, a confirmation that one copy was received and that an additional nine copies were needed was provided to FTA and DART on March 1, 2002. The additional copies were sent on March 1. The DEIS comment period was February 22 to April 8, 2002. Comments from the DOI on the DEIS were provided to DART on May 2, 2002, and are being included in the FEIS. Based on subsequent coordination with the Texas SHPO and local agencies, a revised Section 4(f) Evaluation was prepared in December 2002 and four copies were sent to the DOI.

We hope this information will help in your review of the Section 4(f) Evaluation for each project. If you need any additional information, please feel free to contact either me at 214/749-2828, or John Sweek with FTA at 817/978-0550.

Sincerely,

Stephen L. Salin, AICP
DART Interim AVP Capital Planning and Development

cc: John Sweek, FTA Region VI

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION VI
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

819 Taylor St. Suite 8A36
Fort Worth, TX 76102
817-978-0550
817-978-0575 (fax)

July 24, 2003

Don L. Klima, Director
Office of Federal Agency Programs
Advisory Council on Historic Preservation
12136 West Bayaud Avenue, Suite 330
Lakewood, CO 80228

Attn: Lee Keatinge

Section 106 of the National Historic Preservation Act of 1966: DART Northwest Corridor, Dallas, Texas

Dear Mr. Klima:

The Dallas Area Rapid Transit Authority (DART) in consultation with the Federal Transit Administration (FTA) is proposing construction of the Northwest Corridor Light Rail Transit Project in Dallas, Texas. FTA has determined that construction of the Northwest Corridor Light Rail Transit Line to Farmers Branch and Carrollton in Dallas, Farmers Branch and Carrollton, Texas, will have an effect upon Club Schmitz and the Carrollton Crossing Depot, which are two properties that have been determined to be eligible for inclusion in the *National Register of Historic Places*, and has consulted with the Texas State Historical Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act, (16 U.S.C. Section 470(f)).

In consultation with the State Historic Preservation Officer the subject Memorandum of Agreement has been prepared and executed and is submitted for concurrence by the Advisory Council. After your review and signature please return three copies to this office for distribution to the other signatories. Should you have any questions regarding the project, please contact John Sweek, Community Planner, at (817) 978-0571. Thank you for your cooperation in this matter.

Sincerely,

Robert C. Patrick
Regional Administrator

cc: Ms. Kay Shelton, DART

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

AUG 7 2003

ER 03/534

RECEIVED
PLANNING
AUG 12 2003

SLS

Stephen L. Salin, AICP
DART Interim AVP Capital Planning and Development
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163

Dear Mr. Salin:

We appreciate the opportunity to review the interim information provided regarding the Section 4(f) Evaluations for **the DART Northwest and Southeast Corridors Light Rail Transit Projects** in Dallas County, Texas.

Following our reviews of the Draft Section 4(f) Evaluations provided to us over the last two years, we initially had concerns that the documents did not contain sufficient information to adequately determine the effects or "use" of recreation properties and cultural resources. Without this information, it was difficult to understand if the appropriate level of mitigation had been addressed or if some resources could have been avoided altogether. We were also initially concerned that the appropriate level of Section 106 compliance had not been conducted.

From the information provided to us for this review, including the comment responses to the Section 4(f) Evaluation and the Memorandum of Agreement with the Texas State Historic Preservation Officer and the Advisory Council on Historic Preservation, we recognize that a more thorough effort has been conducted on the part of the Federal Transit Administration and the Dallas Area Rapid Transit to more adequately analyze the effects to historic and recreation resources and consult with the Texas State Historic Preservation Officer. We appreciate and support this additional effort.

Thank you again for the opportunity to provide these comments, and we look forward to reviewing the Final EIS and Section 4(f) Evaluation for approval.

Sincerely,

Willie R. Taylor
Director, Office of Environmental Policy
and Compliance

cc:
Mr. John Sweek
Federal Transit Administration
819 Taylor Street, Suite 8A36
Fort Worth, Texas 76102

Section 4(f) Finding
Dallas Area Rapid Transit (DART) Northwest Corridor
Light Rail Project

The Dallas Area Rapid Transit Authority (DART) in consultation with the Federal Transit Administration (FTA) is proposing construction of the Northwest Corridor Light Rail Transit Project (the Project) in Dallas, Texas. FTA has determined that said construction will not involve direct, temporary, or constructive use of Section 4(f) park/recreation lands. The Project will directly impact several historic sites as described below.

The Project involves the construction of the Carrollton Square Station on the site of the historic Carrollton Depot. The Depot will be relocated and incorporated into the Station area such that it could be reused and accessible to the public.

The Project involves the potential temporary use of the Old Morton Food headquarters site for a temporary construction easement. This affects only the temporary displacement of approximately 10 parking spaces. When construction is completed the parking lot will be restored.

The Project involves a constructive use of the historic Club Schmitz. The aerial Guideway will be located about 32 feet from the Club altering the exterior visual and aesthetic setting of the Club building. Additionally, two parking places will be lost. Finally, the permanent closure of Cullum Road will impair but not eliminate, access to the Club.

Detailed discussion of these sites and the measures proposed to minimize harm is contained in Sections 5.15 of the Northwest Corridor LRT Line to Farmers branch and Carrollton Environmental Impact Statement.

The Federal Transit Administration has consulted with the State Historic Preservation Officer, the Advisory Council on Historic Preservation and the United States Department of the Interior. Based on this consultation and the "Section 4(f) Evaluation", prepared as Section 5.15 of the Northwest Corridor LRT Line to Farmers branch and Carrollton Environmental Impact Statement, the Federal Transit Administration has determined that there is no feasible and prudent alternative to the uses of the land described above and that the proposed action includes all possible planning to minimize impacts resulting from such use.

By: _____
Robert C. Patrick
Regional Administrator

Date: 9/25/03

Love Field Access Alternative Summary

Appendix E

:am Members

Parsons Transportation Group

Chiang, Patel & Yerby

Wallace, oberts & Todd

S.R. Beard & Associates

Aerial Data Service

APM & Associates

Clark-Geogram

Frank & sociates

Garcia & Associates

Geo-Marine

HMMH

light Research

Renee Perkins Jaynes

KC Consulting

Wendy Lopez & Associates

PBS&J

PR/Texas

Sunland Engineering Company

Terra-Mar

Wizards

Memorandum

To: Kay Shelton, Project Manager

From: Allan Zreet, AIA

Date: October 29, 2001

Re: DART LRT Love Field Access
Summary of Alternatives

PURPOSE

The purpose of this memorandum is to support the Draft Environmental Impact Statement (EIS) for the Northwest Corridor LRT Line to Carrollton by summarizing the range of alternatives developed to serve Love Field Airport. A description of alternatives as well as their status and/or reason for elimination is also provided.

BACKGROUND

The Northwest Corridor Major Investment Study (MIS), completed in February 2000, recommended that an option for direct LRT service to Love Field be examined during the Preliminary Engineering/Environmental Impact Statement (PE/EIS) phase. Concurrent with the PE/EIS phase, the City of Dallas initiated efforts to develop a Love Field Master Plan. DART served on the Master Plan Advisory Committee (MPAC) to ensure that coordination and consistency between the projects.

Several alternative alignments for light rail transit service to Love Field were developed and evaluated during the PE/EIS phase. Initially 11 alignment alternatives to the base alignment were developed and evaluated focusing on cost comparisons, level of service, property impacts and travel time. Several of the initial alternatives were either combined or eliminated due to fatal flaws after the preliminary analysis. This preliminary analysis was conducted in coordination with the City of Dallas and their consultant team for the *Dallas Love Field Master Plan.* Nine (9) alternatives to the Base Alignment were further evaluated and presented to the City of Dallas, FAA and the community. One of these nine alternatives is included in the Draft EIS as the Love Field Design Option.

ALTERNATIVES

A description of each of the Base Alignment and the Love Field alignment alternatives is provided below. The alternatives are categorized with A, B and C prefixes, dependant on the station location relative to the Love Field terminal building. The "A" prefix indicates a station location at or near the terminal building (five alternatives), the "B" prefix indicates

a station location southwest of the proposed parking structure (three alternatives), and "C" provides an off airport location with a people mover connection to the terminal (one alternative). Cost estimates provided are preliminary based on a conceptual alignment and are in year 2000 dollars. Subsequent cost refinements have been made to the preferred Love Field Design Option.

Base Alignment

The Base Alignment for the Northwest Corridor LRT Line to Carrollton project follows the Union Pacific Railroad (UPRR) ROW on the southwest side of Love Field adjacent to Denton Drive. No direct access is provided to the airport under the Base Alignment. Love Field access would be provided via shuttle/bus service from the UTSW/Exchange Park Station (or the Inwood Station with the Medical Center Design Option alignment), which is located approximately 1 ½ to 2 miles from the Love Field Terminal. In the vicinity of Love Field, the Base Alignment is at-grade with the exception of short tunnel section under Mockingbird Lane. Grade separation of Mockingbird with an aerial structure is not possible due to violation of the Runway Protection Zone (RPZ) air space envelope as determined by the FAA.

Cost:	$92 million
Added Corridor Travel Time:	0 minutes

Terminal Station Alternatives (A)

Alternative A1 enters airport property from the east on an aerial structure providing grade separation at Denton Drive, Cedar Springs and Mockingbird Lane. The alignment follows the perimeter of the Love Field Runway Protection Zone (RPZ) to allow for an aerial structure. After crossing Mockingbird Lane the aerial guideway structure follows the Ralston Street ROW, returns to grade within private property (rental car agency) then follows Aviation Place entering a portal into a tunnel section. The tunnel section proceeds under the east terminal building to the station location then follows under the enplaning roadway back to the airfield and crosses under the airfield and runway 31L to return to the Union Pacific ROW where it returns to grade.

The tunnel section is assumed to be a shallow bore tunnel with the station depth approximately 50' below grade. The station construction is assumed to be cut & cover construction with staging areas within the area of the east terminal building and related ramp area. The proposed station location is directly below the Old East Ticket Wing, or east terminal building, which is planned for demolition as part of the Airport Master Plan. A new east ticket lobby and baggage claim is planned for this area in the future allowing the station access to be integrated with the new terminal construction.

Cost:	$254 million ($162 million delta from base)
Added Corridor Travel Time:	2 to 2.5 minutes

Status: Alternative A1 was eliminated during the evaluation phase due to the extensive real estate acquisition and relocation requirements east of Mockingbird Lane and disruption/displacement of rental car agencies north of Cedar Springs Road. This alternative was only possible also with the initial Base Alignment that used Bomar Street to return from Harry Hines to the UP RR. Subsequent refinements to the Base

Alignment put the LRT alignment on Treadway/Mockingbird, which would have precluded use of this alignment.

Alternative A2 provides a shallow tunnel profile that enters airport property under the airfield. The tunnel section provides grade separation of Mockingbird Lane at the Union Pacific ROW and then continues west below the UP ROW then entering the airfield property approximately 2500' west of Mockingbird. The alignment then proceeds around the proposed parking garage expansion and under the Old East Ticket Wing with a station below the east terminal building as in Alternative A1. The alignment then returns to the UP ROW under the airfield as in Alternative A1.

Cost:	$300 million ($208 million delta from base)
Added Corridor Travel Time:	2 to 2.5 minutes

Status: Alternative A2 was eliminated during the evaluation phase due concerns by FAA and the City of Dallas of potential impacts to landing instruments on the east of runway 31L and concerns over shallow tunneling under the runway.

Alternative A3 provides cut & cover access by a route following the perimeter of the airfield in order to avoid tunneling under the east end of the runway. The cut & cover section proceeds under Mockingbird at Denton Drive and parallels the northwest side of Mockingbird on airport property then proceeds along the south side of Cedar Springs Road under the Jet East hanger then into a tunnel section under Cedar Springs and to the terminal building. The station would be located under the Old East Ticket Wing as in Alternatives A1 and A2. This alternative was based on the removal of the Jet East hanger on the south side of Cedar Springs.

Cost:	$248 million ($156 million delta from base)
Added Corridor Travel Time:	2 to 2.5 minutes

Status: Alternative A3 was eliminated during the evaluation phase due to the required displacement of Jet East and the determination in the Love Field Airport Master Plan that Jet East is to remain in its current location. The FAA and the City of Dallas also had concerns with the use of cut & cover construction on the southeastern end of the airport property.

Alternative A4 attempts to avoid Love Field Airport property to the extent possible through use of a cut & cover alignment on the southeast side of Mockingbird and northeast of Cedar Springs Road. The alignment crosses under Denton Drive and parallels the east side of Mockingbird Lane then passes under Mockingbird at the Cedar Springs intersection to the north side of Cedar Springs. The alignment then follows the Cedar Springs ROW to Tom Braniff Lane at which point it enters airport property along the frontage of several rental car agencies. The alignment then enters a tunnel section on approach to the station location under the Old East Ticket Wing as in the previous alternatives. Construction of this alternative would be disruptive to numerous businesses located east of Mockingbird as well as the rental car companies north of Cedar Springs. For this reason this alternative was later modified to follow the same general alignment utilizing a shallow bore tunnel located within the Cedar Springs ROW.

Cost Range	$250 to 280 million ($158 to $188 million delta)
Added Corridor Travel Time:	2 to 2.5 minutes

Status: Alternative A4 was identified as the most promising alignment as it minimized impacts to Love Field property while providing a station near the terminal area. An airspace study (Form 7460-1) was submitted to the City and FAA for their review. Based on their findings, there would be no objections from an airspace utilization standpoint.

Alternative A5 follows generally the same alignment as Alternative A2 utilizing a deep bore tunnel below the airfield, but adjusting the alignment to clear the east end of runway 31L. This alignment has been developed with further input on soil conditions and tunneling techniques and is proposed to be a deep bore tunnel 70 to 90 feet below the surface. This tunneling method reduces concerns of soil settling in the airfield area. This alignment was developed as an alternative to A4 in order to provide a shorter route and larger curve radius for optimal travel time given that the majority of users will be through passengers. The station location would be in the vicinity of the Old East Ticket Wing.

Cost Range:	$250 to 280 million ($158 to $188 million delta)
Added Corridor Travel Time:	2 .0 minutes

Status: Alternative A5 is currently under review by the FAA and City of Dallas. A Form 7460-1 was submitted on November 13, 2001. Although airspace comments are pending, this alternative is the preferred option for the Love Field Design Option since it provides optimal operating conditions while minimizing potential airport property impacts and providing a high level of service to the airport terminal area.

Parking Structure Location Station Alternatives (B)

Alternative B1 enters airport property from the east on an aerial structure to provide grade separation at Denton Drive, Cedar Springs and Mockingbird Lane. The alignment follows the perimeter of the Love Field Runway Protection Zone (RPZ) to allow for an aerial structure. After crossing Mockingbird Lane, the aerial guideway structure enters the Ralston Street ROW then proceeds southwest crossing over Cedar Springs. The alignment then returns to grade at the Jet East property then descends into an open cut southwest of the proposed parking structure. The station location would be approximately 50' below grade immediately south of the existing parking structure. The alignment then proceeds under the airfield returning back to grade in the Union Pacific ROW similar to the alternative A alignments.

The station is proposed as on open-cut configuration with a mezzanine level at each end connecting to two underground pedestrian tunnels leading to vertical circulation at each parking structure. The vertical circulation would then provide access to the pedestrian bridges from the parking structures to the terminal building.

Cost:	$191 million ($99 million delta from base)
Added Corridor Travel Time:	2 to 2.5 minutes

Status: Alternative B1 was eliminated during the evaluation phase due to the required displacement of Jet East and the determination in the Airport Master Plan that Jet East is to remain in its current location. All "B" alternatives were also eliminated due to the remote location of the station relative to the terminal building and the low level of service it would provide to transit and airport patrons. This alternative was only possible also with the initial Base Alignment that used Bomar Street to return from Harry Hines to the

UP RR. Subsequent refinements to the Base Alignment put the LRT alignment on Treadway/Mockingbird, which would have precluded use of this alignment.

Alternative B2 provides a tunnel profile that enters airport property under the airfield and proceeds to the station location southwest of the existing parking garage. The tunnel section provides grade separation of Mockingbird Lane at the UP RR ROW then continues northwest on the UPRR ROW until entering the airfield approximately 3,200' northwest of Mockingbird Lane. After crossing under the runway the alignment enters the open-cut station area. The alignment then proceeds under the airfield returning back to grade in the UP RR ROW similar to the alternative A alignments.

The station location would be approximately 50' below grade immediately south of the existing parking structure. Two underground pedestrian tunnels, similar to Alternative B1 would provide pedestrian access.

Cost:	$226 million ($134 million delta to base)
Added Corridor Travel Time:	2.0 minutes

Status: Alternative B2 was eliminated during the evaluation phase due concerns by FAA and the City of Dallas over potential landing instrument impacts on the east of runway 31L and concerns over shallow tunneling under the runway. All "B" alternatives were also eliminated due to the remote location of the station relative to the terminal building.

Alternative B3 provides an open cut alignment accessed by a route following the perimeter of the airfield in order to avoid tunneling under the east end of the runway. The open-cut section proceeds from a cut & cover section under Mockingbird at Denton Drive and parallels the northwest side of Mockingbird on airport property then proceeds along the south side of Cedar Springs through Jet East property the to the station location southwest of the existing parking structure. The alignment then proceeds under the airfield returning back to grade in the UPRR ROW similar to the alternative A alignments.

As in alternatives B1 and B2, the station location would be approximately 50' below grade immediately south of the existing parking structure. Two underground pedestrian tunnels similar to Alternative B1 would provide pedestrian access.

Cost:	$185 million ($93 million delta from base)
Added Corridor Travel Time:	2.0 - 2.5 minutes

Status: Alternative B3 was eliminated during the evaluation phase due to the required displacement of Jet East and the determination in the Airport Master Plan that Jet East is to remain in its current location. FAA and the City also had concerns related to use of an open-cut alignment on airport property. All "B" alternatives were also eliminated due to the remote location of the station relative to the terminal building

Off - Airport Alternatives (C)

Alternative C1 was developed to provide a station along the Base Alignment (known as the Brookhollow Station) with a second mode of access (Automated People Mover, LRT or other technology) to another station at the terminal building. The at-grade station on the Base Alignment would interface with an underground people mover system providing

a direct linkage under the airfield to an underground transfer station below the east terminal building. The technology for the people mover system was not determined during this phase of development.

Cost:	$198 million ($106 million delta from base)
Added Corridor Travel Time:	1 minute plus 2 to 3 minutes for people mover.

Alternative C1 was eliminated during the evaluation phase for technical and service reasons. This alternative would provide a level of service similar to an off-airport bus shuttle connection, although more direct. This mode transfer time and cost of the people mover system was not favored by DART or the City of Dallas. However, should direct LRT access Love Field not be feasible initially, this alternative would allow for a people mover system to be implemented at a later date (by DART and/or another agency) without impacting DART operations in the corridor.

SUMMARY

Alternative A5 is the preferred alternative for LRT access to Love Field for the following reasons:

- Minimal or no displacements on or off airport, with the exception of isolated areas for vent shafts and exiting.
- Alignment would be constructed as a deep bore tunnel at the end of Runway 31L to minimize potential impacts to sensitive ground equipment.
- Provides a high level of service by allowing direct access to future terminal expansion in the area of the existing Old East Ticket Wing while minimizing travel time for through passengers.
- Provides opportunity to coordinate demolition of airport facilities with construction of the station area.

The Final EIS will reflect a final decision for Love Field LRT access. Should the Love Field Design Option be selected as the preferred LRT alignment, DART would continue to work closely with the FAA and the City of Dallas Aviation Department during final design to refine the alignment and construction technique in an effort to minimize or avoid impacts to airport property. Extensive coordination would also need to take place relative to the timing of station construction, demolition and construction associated with implementation of the Dallas Love Field Master Plan, and appropriate pedestrian circulation to existing and planned airport facilities. The DART/City of Dallas Master Interlocal Agreement would likely be amended, or a new agreement created, to document required actions of both agencies.

Love Field Tunnel Alignment Study

Appendix F

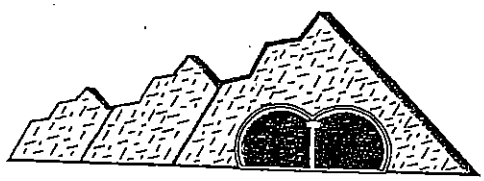
NOTE

Appendix F contains a report entitled ***Dallas Area Rapid Transit Love Field Airport Light Rail Access – Design Review of Tunnel Alignment and Underground Structures*** (Dr. Sauer Corporation, September 2001). This report was prepared as a third party review of the initial alignments under consideration by DART to provide direct LRT access to Love Field. Based on the report findings, DART made modifications to the Love Field Design Option. Not all suggestions made in the Dr. Sauer Corporation report were incorporated into the preliminary design for the Love Field Design Option. Thus, for a complete description of the Love Field Design Option, reference Chapter 2 of this Draft EIS and Appendix C, Plan and Profile Drawings, provided under separate cover and available at DART Headquarters and corridor libraries for review.

DALLAS AREA RAPID TRANSIT
LOVE FIELD AIRPORT LIGHT RAIL ACCESS

DESIGN REVIEW OF TUNNEL ALIGNMENT &
UNDERGROUND STRUCTURES

14 September 2001



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DESIGN REVIEW OF TUNNEL ALIGNMENT AND UNDERGROUND STRUCTURES FOR THE LOVE FIELD AIRPORT LIGHT RAIL ACCESS DART NORTHWEST LINE - SECTION NW-2

1. INTRODUCTION

1.1 PROJECT

Dallas Love Field Airport (DAL) is located in an urbanized area within the Dallas, Texas City limits approximately seven miles north of the city's central business district (CBD). The airport encompasses 1,300 acres and is owned and operated by the City of Dallas.

Regional freeway access to DAL is provided by the Dallas North Tollway, the Stemmons Freeway, and the John Carpenter Freeway. Regional arterial access is provided by Mockingbird Lane, Lemmon Drive, Harry Hines Boulevard, and the Northwest Highway. Other arterial roads in the vicinity of DAL include Inwood Road, Denton Drive, Lovers Lane and Midway Road.

As part of the Northwest Corridor Dallas Area Rapid Transit (DART) is planning a Light Rail access to DAL. Chiang, Patel & Yerby, Inc. (CP&Y) is providing preliminary design services for the Northwest Line - Section NW-2. The design currently shows a preferred alignment that leads along the south side of the Mockingbird Lane, then crosses Denton Drive below grade and stays below grade along the south side of Mockingbird Lane. It crosses the Mockingbird Lane below grade diagonally from the southwest to the northeast, west of the Mockingbird Lane / Cedar Springs intersection. It continues northeast underpassing Cedar Springs Road towards a future station location and then turns west below the apron, taxiways and runway. The transition back to an at-grade alignment takes place at the Denton Drive / Lovers Lane intersection. The alignment includes cut & cover tunnels, mined tunnels and a station at DAL.

1.2 SCOPE OF WORK

The purpose of this report is to review the proposed alignment of the Light Rail access to DAL and provide recommendations for reducing potential impacts on airport operations and vehicular traffic during the construction period.

Based on the geological and geotechnical conditions in Dallas County and specifically in the DAL area this report evaluates the design assumptions, construction methods, and cost and schedule estimates for the proposed Love Field Light Rail alignment. Disruptions are analyzed that will impact operations at DAL during construction. Furthermore, planned DAL improvement projects along the alignment are analyzed in regard to potential impacts or restrictions on the construction of the Light Rail structures on the proposed alignment and any potential alternative alignment options.

Based on the findings recommendations for improvements are provided with the purpose of minimizing impacts on airport operations, and reducing construction cost and schedule.

1.3 COMMISSION

The Dr. G. Sauer Corporation (DSC) was asked by CP&Y on May 24, 2001, to review the proposed design for the Love Field Light Rail Access and make recommendations for improvement. This report is prepared in coordination with CP&Y for DART in accordance with the DSC proposal dated June 14, 2001.

2. REFERENCES

The following references have been reviewed for the preparation of this report:

2.1 REPORTS

- Airport Impact Analysis / Master Plan, DMJM Aviation, prepared for the City of Dallas, March 2001.

2.2 BORINGS

- Ten borings drilled by Mason-Johnston & Associates (MJA), at the site of existing parking structure during 1962 studies for the City of Dallas Love Field Parking Garage.
- Six borings drilled by Rone Engineers Inc. (REI), along the passenger loading and unloading area during 1983 studies for the City of Dallas Love Field Parking Garage.

- Four borings drilled by MAS-TEK Engineering and Associates, Inc. (MEI) for HNTB at the planned parking structure south of existing facilities, dated Nov. and Dec. 1999.
- Twelve borings drilled by Terra-Mar Inc. (TMI) at the site of planned future parking garage for the City of Dallas, dated Aug. and Sept. 2000.
- One boring drilled by Terra-Mar Inc., for DART alignment studies, near intersection of Mockingbird lane and Denton drive, dated April 2001.
- Other borings drilled at various hanger areas obtained from search of the City of Dallas microfilms were used for general information.

2.3 DRAWINGS

- CP&Y has provided DSC with drawings (5% design) featuring the proposed vertical and horizontal alignment as well as area maps and horizontal alignment alternatives, which had been presented to DART.
- Generalized Regional Geology of Dallas County, adopted from Taylor, 1976 (Sheet 1), Limits of Surface Geology at DAL (Sheet 2) and Generalized Subsurface Profile at DAL (Sheet 3 & 4) (see Appendix A).

2.4 MEETINGS

An initial "Kick-Off" meeting took place on 23 May 2001, where John Tipton, P.E., Sury Sastry, P.E. (CP&Y) presented the proposed alignment to DSC. Subsequent conversations with John Tipton, P.E., Sury Sastry, P.E. (CP&Y), Steven Salin and Richard Brown (DART) continued throughout the project to request additional information about the alignment at the Mockingbird Lane Denton Drive Intersection.

2.5 SITE VISITS

Site visits along the proposed alignment were conducted throughout the project to verify the locations of recent borings, view possible staging areas and ongoing construction and to gain a hands-on impression of the area and the traffic situation.

2.6 OTHER

- DART Design Review Procedures, June 24, 1988.

- DART Light Rail System Design Criteria, 4/12/96, rv1.
- NFPA 502, 1998 Edition, Standard for Road Tunnels, Bridges, and other Limited Access Highways.
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- Shuler, E. W., 1918, *The geology of Dallas County*, University of Texas Bulletin, No. 1818, University of Texas, Austin, TX.
- Kim K., and Schmidt, B., 1992, *Characteristics of the state of In-Situ stresses for the design of the SSC interaction halls*, Proceedings of the ISRM Symposium on rock mechanics characterization, Dec. 1992.
- R. A. Robinson, M. S. Kucker, and R. P. Brouilette, 1993, *Construction Behavior of the First Underground opening of the Super conducting Super Collider Project*, Waxahachie, TX,. RETC proceedings.
- Font, R. G., 1979, *Geotechnical properties of unstable clay shale in North-Central Texas*, Texas journal of Science, Vol. 31, and No. 2, pp119-124.
- Airport Diagram AL – 106, Federal Aviation Administration
- Cost Estimate for cut & cover tunnel prices, Sunland Engineering Company, dated November 2000, received 7 July 2001.

3. EXISTING & FUTURE CONDITIONS ALONG THE PROPOSED ALIGNMENT

3.1 OVERVIEW

Existing underground structures, expansions of existing structures and new construction by the airport and DART's Light Rail system will impact each other and cause disruptions to traffic and airfield operations. Close coordination of the various activities is therefore of great importance.

The following sections describe the topography and geology in the Love Field area, which are important for the selection of alignment, construction methods and support elements of the underground structures. Furthermore all existing and proposed structures in the zone of influence are described and analyzed for their effect on the Light Rail tunnel construction.

3.2 TOPOGRAPHY

The Dallas County lies in the area of Black Prairie. Grand Prairie, which is in the western portions of the county, forms the edge of the landward margin of Gulf Coastal Plains in Texas. The topography of the county is primarily dominated by the rock formations found in the county. In general the underlying rocks dip at a low angle in southeasterly direction, the exposed lower resistance rocks found in the western portion of the county have been subjected to erosion. This unsymmetrical erosion has created hills generally referred to as "white rock cuesta". Near the center of the county fairly broad valleys of the Trinity River interrupt the topography. Two branches of the river called West Fork which runs east-west and Elm Fork which runs north-south join together just west of the Love Field Area. The ground surface in the Love field property is fairly flat with two low height berms, one near southwest of the airfield area and another north of this area, west of runway 31L and east of Patrol Road.

3.3 GEOLOGY

As shown on Sheet 1 (see Appendix A), there are three major rock formations outcropping in the Dallas County. However two are predominant: The Austin Chalk (AC) and Eagle Ford Shale (EFS). At DAL the Austin Chalk has eroded entirely. In addition, the top portion of the Eagle Ford Shale has eroded and been replaced with fluvial terrace deposits. Sheet 2 (see Appendix A) shows the limits of the above-mentioned formations.

Terrace soils: The fluvial terrace deposits have been mapped along the edges of old Trinity River. They occupy approximately 18% of Dallas County. These materials are of Quarterary age and consist of clays, silts, sands and occasionally gravel. They can vary laterally within a short distance, and various depositional processes and wide boring spacing make correlations difficult. The sand are generally water bearing.

Eagle Ford Shale: This formation is a fairly weak (on the rock scale) marine deposit. Locally it has been divided in two separate units; the upper part or Arcadia Park unit, and the lower part or Britton unit. The Arcadia Park unit below the AC can range from 100 to 120 ft., and consist of dark laminated shale with calcareous lenses and occasional limestone, argillaceous sandstone and arenaceous shale seams. Generally a thin concretionary layer occurs approximately 40 to 60 ft. below the top of the layer. In addition a thin layer (1 to 3 ft.) of detrital limestone has been mapped at the base of Arcadia Park. This material is often referred to as Kamp Ranch limestone. Varied irregula. shaped concretions have been found embedded in the shale along some exposures in the county.

The Britton unit of the EFS can be subdivided in two layers. The upper Britton is approximately 125 ft. thick and contains thin layers of limestone as well as concretions of claystone. The lower Britton is approximately 85 ft. thick, very calcareous, and fairly hard. Twenty-one bentonite seams have been reported in this layer including two fairly thick layers (approximately 6 to 12 inches) at top of the unit. Above these two-bentonite seams a 15 ft. layer of moderately hard marl is present.

The EFS is Montmorillonitic, but contains Kaolinite, Illite, calcite, quartz as well as other minerals. Occasional joints and fractures are expected throughout the units.

3.3.1 Geotechnical Condition along CP&Y's Alignment

The subsurface materials along the proposed alignment will consist of terrace soils overlying EFS. The depth of the terrace soils in the DAL area ranges from 34 to 49 ft.. A generalized subsurface profile has been superimposed along the vertical alignment (Sheet 3 & 4, Appendix A).

Overall the upper portions of the terrace soils are cohesive clays and sandy clays, while the lower portion mainly consists of sands with occasional cohesive soils interceded within the formation. The lower materials are water bearing and therefore unstable during open excavation. The upper portion of shale below the overburden soils appears softer than the lower portion.

The following geotechnical stratification exists along the alignment:

- Intersection Mockingbird Lane / Denton Drive:
  - 0 to 25 feet – Cohesive clays and sandy clays
  - 25 to 34 feet – Medium dense fine sand, with gravel below 33 feet.
  - 34 to 50 feet – Dark gray shale with fossil seams and slickensided
  - 50 to 85 feet – Dark gray shale with fossil seams
- Cedar Springs Road (remote surface parking):
  - 0 to 15 feet feet – Cohesive clays and sandy clays
  - 15 to 30 feet – Medium dense fine sand, with gravel.
  - 30 to 40 feet – Dark gray shale with fossil seams and slickensided
  - 40 to 85 feet – Dark gray shale with fossil seams
- Intersection Denton Drive / Lovers Lane:
  - 0 to 30 feet – Cohesive clays and sandy clays

30 to 40 feet – Medium dense fine sand, with gravel.
40 to 50 feet – Dark gray shale with fossil seams and slickensided
50 to 85 feet – Dark gray shale with fossil seams

The ground surface elevation is at approximately 470 ft. The ground water table is approximately 20 ft. below the surface elevation at 450 ft.

Along the proposed alignment the geological conditions are in general as follows:

- Ground elevation: +/- 470 ft.
- Bottom of clay elevation: +/- 445 ft.
- Bottom of sand elevation: +/- 436 ft.
- Slickensided shale elevation: 436 – 420 ft.
- Dark gray shale elevation: < 420 ft.
- Ground Water elevation: +/- 450 ft.

3.3.2 Geotechnical Summary

Terrace Soils: In general the upper 15 to 25 ft. of these soils are cohesive with strength ranging from 0.5 to 3.1 TSF. The lower 5 feet of the cohesive soils are sandy. The liquid limits of the upper clays range from 51% to 65% and their plasticity indices range from 35 to 45. The pre-consolidation ratio ranges from 4 to 6 or higher. These soils can exhibit a fairly good stand-up time, but are greatly affected by the material directly beneath them. Their at-rest lateral pressures are expected to be fairly large.

The coarse soils directly below the upper clays and sandy clays consist of fine sands and clayey sands. Their gradation appears to vary along the proposed alignment, and their relative density is estimated to be medium dense. Several borings showed clayey sand layers on top of sands and several gravel layers at the bottom of this stratum. Occasionally a clay layer is sandwiched within the sand layers. These soils will not exhibit any stand-up time and in fact they would run in an open cut due to lack of cohesion and presence of groundwater, which is generally found between 15 and 20 ft. below ground level. The effects of groundwater must be considered. The groundwater will fluctuate with the seasons as the Trinity River fluctuates. Permeability tests from other sources suggest larger horizontal than vertical permeability coefficients. The above mentioned gravel layers are likely to have much larger permeability coefficients.

Eagle Ford Shale: The EFS is a low strength material on the rock scale. It will be dark gray in color, with thin seams of calcareous shale as well as pyrite nodules and concretions. The top layer is expected to be slightly weathered. A concretion layer is expected about 40 to 60 ft. below the contact to limestone. Considering the thickness of the Terrace Soils (34 to 49 ft.) and dip of formation (estimated 20 to 30 ft.), the concretion layer may have been eroded. This indicates that between 40 to 60 ft. of Arcadia Park overlies the Britton formation.

The Trinity River is expected to have an effect on the joint system of the upper shale. It is expected the top portions shall be slickensided, but this should reduce substantially with depth. No joints or fractures have been in any of the borings; yet their orientation should be similar to the Austin Chalk. Some faulting with small offset and planar joints with limited extent are expected. In general the dip angles are expected to be 30 to 65 degrees. The projected permeability coefficient will be very low. Additional water may be present at joints or bedding planes.

No risk from seismic activity is expected in the DAL area.

The proposed vertical alignment is located entirely in the water bearing sands; the invert will lie on the upper layer of the Eagle Ford Shale. At the proposed station location, the vertical alignment reaches down to the top layer of the Eagle Ford Shale.

3.4 EXISTING AIRPORT FACILITIES, PLANNED IMPROVEMENTS AND THEIR IMPACT ON THE PROPOSED ALIGNMENT

Airport facilities are divided into two categories, referred to the airside and the landside. The airside is typically defined as the runway, taxiway and any other airfield component associated with the movement of aircraft in and out of the airport. The landside includes the remaining airport facilities needed to support the operation of the airport and any other related businesses. Both categories are equally important and any disruption caused by construction will impact the entire airport operations. The existing structures and airport amenities at DAL are currently being operated at a high level of service. Any unforeseeable or foreseeable change in traffic and/or traffic pattern will affect airport operations.

Recently DMJM Aviation has completed an Airport Impact and Analysis/Master Plan for Dallas Love Field. This study describes a recommended development plan containing airside and landside improvements. This Capital Improvement Plan includes two Phases (refer to Appendix B):

Terminal Area Plan—Phase One:

1. Open three East Concourse gates
2. Demolish remainder of East Concourse
3. Construct new cargo building
4. Demolish existing cargo building
5. Develop Commercial Vehicle Lot
6. Begin curb frontage and terminal roadway improvements

Terminal Area Plan—Future Phase:

1. Relocate/replace Southwest Airlines Training Facility
2. Redevelop North Concourse for seven gates
3. Demolish existing vacant ticket wing
4. Construct new ticketing and bag claim wing
5. Continue with terminal roadway improvements
6. Construct new pedestrian walkway from parking garage to new ticketing/bag claim
7. Begin improvements to Cedar Springs/Mockingbird intersection

Airside Plan:

1. Dual taxiway entrances to Runways 13R, 31L, 13L and 31R
2. Extend Taxiway "L" to meet "D1"
3. Expansion of the Runway 31L holding apron to accommodate two B737-700's
4. Extension of Taxiway "K" to meet extended Taxiway "B5" and construction of Taxiway "M" between "B1" to "B3"
5. Construction of Taxiway "M" between "B5" and Runway 18-36
6. Provide a designated road for aircraft service vehicles
7. Provide a remote apron and deicing area located west of Taxiway "K" and north of Taxiway "C"

The Capital Improvement Plan as well as the existing structures will impact the following areas along the proposed alignment:

Denton Drive Underpass and tunneling along Mockingbird Lane

Mockingbird Lane is a major east – west connector and carries nearly 40,000 vehicles per day. It intersects with Denton Dive at the southwest corner of DAL.

The proposed alignment layout commences with a retained cut section transforming to a cut & cover tunnel approximately 600 ft. west of the Mockingbird Lane / Denton Drive Intersection. It proceeds along the south side of Mockingbird Lane, underpasses Denton Drive and continues east towards the southwest corner of the Mockingbird Lane / Cedar Springs Road Intersection.

Cut & cover construction along the proposed alignment will disrupt east – west traffic on Mockingbird Lane, Denton Drive and the Mockingbird Lane / Cedar Springs Road Intersection. In addition a change in traffic pattern due to construction and construction related traffic, increases the risk of accidents, which will cause additional delays in traffic and construction.

Most utility lines that connect from below or along side Mockingbird Lane to businesses on the south side of Mockingbird Lane will require to be temporarily or permanently relocated.

Mockingbird Lane / Cedar Springs Road Intersection and Improvement

All public airport traffic enters and exits DAL through this intersection, which amounts to approximately 50,000 vehicles per day. The alignment proposed by CP&Y underpasses Cedar Springs Road beginning southwest of the intersection and continuing northeast below grade from the west side to the east of Cedar Springs Road.

An expanded intersection with below grade left-turn ramps into and out of the airport is proposed in the Airport Impact and Analysis/Master Plan. These ramps would have a below-grade signalized intersection, while the other movements of the intersection would be signalized at the current grade level. This will require relocation of various underground utilities and impact the vertical and horizontal alignment of the proposed cut & cover tunnels.

CPY's proposed alignment from the southwest to the northeast corner of the intersection will directly impact traffic at the intersection. Traffic resulting from construction will cause significant delay. A change in traffic pattern, as the construction area moves northeast will increase the risk of accidents.

The intersection improvement, described in the Capital Improvement Plan, may coincide with the proposed construction of the cut & cover tunnels in this area. Conflicts in traffic coordination are predetermined. In addition the space for staging areas is very scarce. However, a possible construction staging area could be located at the northeast corner of the intersection.

Cedar Springs Road

Cedar Springs Road is the main feeder road to and from DAL. It provides access to the major rental car facilities, staff parking, passenger pick-up and drop-off and airport facility buildings. South of the Spirit of Flight Monument the road splits into the terminal loop road, which encompasses the covered short-term parking garage and the remote surface parking.
Cedar Springs Road is located west and parallel to the proposed tunnel alignment. The proposed station is located under the south end of the vacant ticket wing east of Cedar Springs Road.

The terminal curbside roadway is envisioned to consist of two laterally separated roadways. The roadway adjacent to the terminal building (hereinafter referred to as the Private Vehicle Roadway) and the roadway adjacent to the parking garage (hereinafter referred to as the Commercial Vehicle Roadway).

The Commercial Vehicle Roadway would consist of a 20 ft. curb lane and two 12 ft. through lanes. A 30 ft. median island would separate the Private Car Roadway and the Commercial Vehicle Roadway. The median island would serve as a passenger loading and unloading area for commercial vehicles, providing approximately 1,450 ft. of curb frontage.

A second at-grade recirculation road will be provided to allow vehicles recirculating from the curb to the parking garage, as well as for commercial vehicle recirculation. To provide sufficient weaving distances and satisfy minimum curve radii, both recirculation roadways would be aligned south of the Spirit of Flight Monument. The proposed configuration would eliminate the existing recirculation road and the exit road from Aviation Place. It would also eliminate the existing roadways on Howard Megredy Circle.

The section of Cedar Springs Road north of Tom Branniff Lane will be widened to four lanes in each direction. The terminal approach roadway would split at approximately the existing intersection with Aviation Place, with the right lanes signed for Arrivals and Departures, and the left lanes signed fc Parking Garage and Commercial Vehicles.

Approximately 500 ft. beyond the existing recirculation road, the Parking Garage access roadway will diverge to the left from the Commercial Vehicle Roadway. This roadway would provide separate access for the existing garage and the proposed parking structure.

The Private Vehicle Roadway and Commercial Vehicle Roadway would merge into a three-lane roadway beyond the existing terminal building. The reconfigured Parking Exit Plaza will provide two lanes for vehicles exiting the parking garage. Thus, the terminal exit roadway will consist of five lanes from the Parking Exit Plaza to the recirculation roadways.

These extensive developments paired with the proposed construction of a cut & cover tunnel, a mined tunnel and a station would require a great amount of coordination and scheduling.

Cut & cover construction along the east side of Cedar Springs Road will significantly impact traffic and existing airport facilities. Traffic rerouting measures and staging plans need to be developed to minimize disruption to the incoming and outgoing traffic on Cedar Springs Road.

Mined tunnel construction would begin south of the sheltered parking lot at the Hertz rental car facility, after completing the final cut & cover section east of Cedar Springs Road. The mined tunnel under shallow overburden (10 to 20 ft. below the surface) would continue north along the east side of Cedar Springs Road and lead into the proposed station. The existing cargo building and vacant ticket wing are scheduled to be demolished in the near future.

A construction staging area could be located east of Cedar Springs Road at a rental car parking area.

The expansion concept at Cedar Springs Road will pose the same problems and conflicts as the Mockingbird Lane / Cedar Springs Road intersection improvement. The proposed alignment is east and parallel to Cedar Springs Road, cut & cover construction will require access to Cedar Springs Road for construction site traffic. This will disrupt proposed construction on Cedar Springs Road as well as the regular airport traffic.

Rental Car Facilities

The rental car facilities and their parking areas are located along the east side of Cedar Springs Road. Cut & cover construction operations along the east side of Cedar Springs Road will disrupt their day-

to-day operations, and will influence their parking, pick-up and drop-off facilities. Temporary relocation may be necessary.

New Ticket / Baggage Claim Area

The new ticket / baggage claim area is located directly above the proposed station location. Excavation of the station may take place from top down or from bottom up. Constructing the station from top down would make it part of the ticket / baggage claim building and would coincide with its construction.

Construction from the bottom up is an option should the ticket / baggage claim building be completed and in operation before the Light Rail station is built.

Baggage Claim Expansion

The planned baggage claim expansion is located at the northwest corner of Cedar Springs recirculating loop. The baggage claim building will be enlarged to the west.

The expansion of the baggage claim area would not affect any underground facilities, as the foundations of this structure do not reach down to the depth of the proposed tunnel structure. However, if the expansion is constructed earlier than the Light Rail tunnel structures it will be in the zone of influence during dewatering and settlements are likely.

Pedestrian Tunnel between Parking Garage and Baggage Claim:

A pedestrian tunnel, at a depth of approximately 15 ft. connects the existing parking garage with the baggage claim area. It will require structural consideration as well as instrumentation and monitoring during the construction of the tunnel to avoid disruption of the pedestrian flow during and after construction.

Taxiway C

Taxiway C is part of the apron and carries planes from Runway 13R-31L to the gates.
The construction of a mined tunnel below the taxiway must not allow disruptive settlements and withstand the ongoing airside traffic.

Runway 13R-31L

Runway 13R-31L is the southern northwest-southeast runway that is 8,800 ft. long and 150 ft. wide. An expansion of the Runway 31L holding apron is currently being planned.
The construction of a mined tunnel below the runway must not allow disruptive settlements and withstand the ongoing airside traffic.

TXI Aviation Building

The TXI Aviation Building is located at the western perimeter of the airfield.
The mined tunnel will not immediately affect the TXI Aviation Building as only the adjacent parking lot is in the zone of influence of the tunnel.

Denton Drive

Denton Drive runs along the west side of DAL.

Cut & cover construction will impact traffic along Denton Drive and the adjacent three freight rail lines. Modifications to the rail lines, support, and monitoring will be required, so not to interrupt freight traffic during construction.

Construction and construction sequencing of the proposed Light Rail alignment will coincide with landside and airside expansion projects at DAL. Close coordination can reduce the impact on the project and therefore be beneficial to cost and schedule.

4. REVIEW OF PROPOSED CP&Y ALIGNMENT

CP&Y has proposed a near surface Light Rail alignment at Dallas Love Field Airport, including cut & cover tunnels, a station and a shallow mined tunnel section. The cut & cover alignment leads along the south side of the Mockingbird Lane / Denton Drive Intersection, crosses Denton Drive below grade and continues along the south side of Mockingbird Lane. It proceeds from the southwest corner of the Mockingbird Lane / Cedar Springs Road intersection, underpasses Mockingbird Lane and Cedar Springs Road below grade from the southwest to the northeast of the intersection. It continues along the east side of Cedar Springs Road to access the future station location. The transition from cut & cover to the mined tunnel takes place south of the station at the Hertz rental car facility. The shallow mined tunnel then continues north and turns west below the apron, taxiways

and runway. Transition back to the at-grade alignment from mined to open cut construction takes place at the Denton Drive / Lovers Lane intersection.

4.1 REVIEW OF CONSTRUCTION METHOD BASED ON EXISTING GEOTECHNICAL CONDITIONS ALONG THE PROPOSED ALIGNMENT

CP&Y has proposed cut & cover construction for tunnels for a length of approximately 4,450 ft. The top of rail in the tunnels is between 30 and 50 ft. below the surface (surface elevation ± 470 ft.). Single and double box structures were evaluated. Double boxes are divided with a center wall supporting the roof slab, creating two individual tubes in one structure; alternatively two single boxes can be constructed. It is obvious that double box structures have an advantage over the single box structures, due to reduced surface disruption, lower cost and reduced construction duration.

Cut & cover is a conventional open cut method where the excavation is supported by sheet piles, soldier piles and lagging, SPTC or slurry walls before the tunnel structure is built in the excavated area. After waterproofing is applied to the structure the trench is backfilled and the surface can b restored. In case of SPTC or slurry walls the support of excavation can be used as the final structure, whereby special consideration has to be given to waterproofing issues. The advantage of the cut & cover method is a rather straightforward construction of the tunnel. Major disadvantages are the surface disruption for an extended period of time and the required utility relocations.

Mined tunneling is foreseen for approximately 5000 ft. and includes a 500 ft. long station. Excavation can either be achieved by means of road header with multiple face drifts ("hand mining") or by tunnel boring machine (TBM). Mined tunneling has been chosen in the terminal area to omit surface disruption to ongoing airport traffic and operations. The proposed alignment sets the crown at elevation 453 ft. and the invert at 434 ft. (approximately 36 ft. below the surface elevation of ± 470 ft.). Geologically the invert will be in shale. Water bearing sands are expected to be encountered along the wall sections. Special consideration has to be given to dewatering issues and related impacts on the surroundings.

Cut & Cover Construction at the Denton Drive Underpass

The coarse soils directly below the cohesive and sandy clays in this area will not provide any stand-up time, and in fact they would flow into an open cut due to the lack of cohesion and presence of groundwater. Due to the high permeability of the soil extensive dewatering with a well system

outside the SOE will be necessary to avoid groundwater inflow. Groundwater control, detailed instrumentation, and monitoring will be necessary to control settlements at the intersection. During construction the open cut section will provide disruption to the airport access traffic and the adjacent freight rail lines.

Cut & Cover Alignment from Denton Drive to the northeast corner of the Mockingbrid Lane / Cedar Springs Road intersection

Throughout the proposed cut & cover alignment temporary support of the open cut section will be necessary. Groundwater control is essential to minimize settlements along the flight path lighting north of Mockingbird Lane. The invert of the cut & cover section will require the exposure of the Eagle Ford Shale (EFS). The EFS is highly preconsolidated (precompression ratio of 10 or more). This feature along with its Montmorillonic clay contents can result in fairly large rebound and swelling pressures. In addition, its exposure to the atmosphere causes it to deteriorate rapidly. This requires a quick application of protection to the exposed invert. The EFS will generate large horizontal pressures against the initial support of excavation and produce uplift pressure at the invert. Groundwater control is as essential as in the previous section. Special considerations are necessary to control surface water drainage from the intersection and possible temporary roads.

Mined Tunnel Alignment from the Hertz rental car parking lot to the future Station location

The geological conditions in this area are similar to those along the cut & cover alignment and pose the same difficulties for a mined tunneling operation. Dewatering will be necessary in advance of the excavation face. The tunnel crown is shown at elevation 460 ft. (10 ft. below surface) within the cohesive and sandy clays. The invert is shown at elevation 430 ft. (40 ft. below surface) at the transition of the water bearing sand to the EFS. The tunnel invert roughly follows the top of the EFS. Excavation will therefore cut through these three formations with different properties. The design currently does not specify a specific excavation and support method. A TBM-type excavation or the utilization of a roadheader have been suggested and are therefore explained below.

This mixed face tunnel excavation imposes a challenge for TBM or shield type machines due to the limited flexibility of excavation procedures. The earth pressure combined with potential hydrostatic pressure at the face has to be compensated. Earth pressure balance shields (EPBM) or slurry shields seem to be appropriate in the given ground conditions. Open shields or "digger shields" are not recommended.

The alternative to the highly mechanized TBMs is the conventional mining of the tunnel sections using pre-support measures, shotcrete as immediate initial support and cast-in-place concrete as final lining. To minimize settlements at the surface and to stabilize the excavation face soil treatments will be required from the surface as well as from the tunnel face. Excavation can be achieved with roadheaders and/or backhoes. This method is very flexible and can be adjusted to suit various ground conditions and schedule requirements.

The open cut section at the portal of the mined tunnel would serve as a staging area to accommodate tunnel-excavating equipment and materials. To accelerate construction multiple faces can be excavated at the same time. The question of a single cross section compared to separate single-track running tunnels requires additional analysis and has not been considered in this report.

Light Rail Station

The station is located beneath the now vacant ticketing wing, which is scheduled to be demolished in the near future. Coordination of construction of the new ticket and baggage claim area with the station would benefit the overall construction cost and schedule.

In the case of a joint construction of the terminal building and the Light Rail station the station excavation would most likely advance from the top down using cut & cover techniques. Prior to the station excavation the mined tunnels shall be driven through the station area.

Alternatively, the station excavation can proceed from the running tunnels and access shafts below grade as a mining operation if the terminal building is already in place or other restrictions on the surface do not allow an open cut construction. Locations for access shafts for the mined station excavation are available at the commercial parking lot east of the now vacant ticket wing.

Soil conditions are slightly different from the previous mined section. The thickness of the water bearing sands is expected to extend from elevation 460 ft. to 425 ft. (10 to 45 ft. below surface), which is 5 ft. greater than the previous section and the invert is now fully in EFS. A detailed analysis for potential ground improvement measures in this area has to be performed during the design stage.

Mined Tunnel Alignment from Station to Denton Drive

This section continues in the same mixed face conditions as described in the station are Approximately 300 ft. north of the station the coarse sand layer decreases to 10 ft. thickness and the

invert remains deeper in the EFS. Hence, higher horizontal pressure and potential uplift pressure will affect tunnel design and construction. The EFS then gradually dips towards the west and mining continues through the coarse sands and terrace soils.

Dewatering will be necessary along the proposed alignment, as the tunnel crown is planned in the water bearing terrace soils. The Taxiway and Runway 31L – 13R are sensitive areas in terms of settlements and ground movements. Special consideration during the design and construction in this area should minimize potential impacts.

Statements about construction methods for mined tunnels from the previous sections also apply to this section.

4.2 REVIEW OF CONSTRUCTION SCHEDULE

There was no schedule provided for the DART Light Rail Love Field Access project for our review. However, in order to provide a schedule estimate for the construction of the tunnel and station structures, previous experience in the Dallas area and elsewhere has been applied.

Based on the construction methods proposed by CP&Y the following individual construction segments have been selected to estimate the duration of the project.

Denton Drive Underpass

The below grade crossing of Denton Drive and the existing freight rail lines south of the intersection is approximately 100 feet long. The proposed construction method is cut & cover. For mobilization and demobilization we estimate a duration of two months. Groundwater control, traffic staging and rerouting will prolong the construction process for one additional month. Excavation, excavation support, construction, waterproofing and refill can be completed in 4 months (approximately 1.5 ft. per day). We estimate the construction period to extend to 7 months. Not included are the finishing works including electrical and mechanical installations and test operations, which should be carried out in a separate contract system wide.

Cut & Cover Alignment

The total length of the cut & cover alignment is approximately 4,350 ft. and excludes the length of the Denton Drive underpass. To accelerate construction, excavation could start from various

locations. We do not recommend, however, starting from more than 2 locations at a time. Two months for mobilization and demobilization and at least 4 additional months for traffic rerouting at the Mockingbird Lane / Cedar Springs intersection are considered necessary. Assuming a staging area on the southeast corner of Mockingbird Lane / Denton Drive and another in the vicinity of the Hertz rental car facility parking lot the duration of cut & cover construction to the entrance of the mined tunnel would take approximately 36 months, given and advance rate of 3 ft. per day on each phase. Not included are the electrical and mechanical installations.

Mined Tunnel Alignment to Station

The length of the mined tunnel from the transition to the station is approximately 1,400 ft. Assuming a staging area in the open cut section and utilizing mined tunneling with roadheaders this section could be completed within 14 months. Advance rates of 5 to 8 ft. per day are reasonable for the existing ground conditions.

Mechanized (TBM/EPBM) tunneling will require 6 – 8 months of mobilization and must continue through the station. TBM mobilization will only be required once throughout the project whe awarded in one contract. Advance rates of 30 to 40 ft. per day can be achieved after the run in period of approximately one month and finalized soil improvement from the surface. Mechanized tunneling may be completed in 12 - 14 months.

Station Location

Tunneling shall continue through the station (length approximately 500 ft.) and proceed further towards Denton Drive. Excavation of cross adits, regular and emergency exits, and ventilation structures can commence from the running tunnels. Construction could be completed within 14 to 16 months depending on layout, structural interfaces and other details. More information is required to determine more detailed construction durations.

Excavation of the station from the top down is possible as a joint operation with the construction of the new ticket and baggage claim building. This task can be completed within 12 months.

Not included in both estimates are the finishing works including electrical and mechanical installations.

Mined Tunnel Alignment from Station to Denton Drive

The overall length of the mined tunnel from the station to Denton Drive is approximately 3,100 feet. Ground treatment from the surface as well as from the tunnel is necessary to minimize settlements and will reduce advance rates. Mechanized (TBM/EPBM) tunneling with advance rates of 30 to 40 ft. per day and tunnel a duration of two months for turning around and other inefficiencies of the TBM will make completion of the two running tunnels possible in approximately 15 months.

Excavation with roadheaders or backhoe can proceed from both portals. The average advance rate for the single twin-track cross section is approximately 4 - 6 ft. per day. The tunnel structures could be completed in 24 months. Additional access shafts can reduce the construction duration. The optimal duration will depend on the restrictions of the overall construction schedule.

4.3 REVIEW OF CONSTRUCTION COST ESTIMATE

A cost estimate for this project was provided to DSC by Sunland Engineering Company. The cost estimate is dated November 2000 and includes estimates for cut & cover tunnel construction depending on depth of the tunnel structure, excavation material (soft ground or rock) and structure type (single box vs. double box). Sunland provided linear foot prices for these various conditions without computing the overall cost for the project. The cost ranges between $6,148 per linear foot of tunnel for a double box in a depth of 20 feet below surface, to $15,277 per linear foot for a double box structure in rock in 50 feet below the surface. Single box tunnels are generally more expensive and range from $8,136 to $18,128 per linear foot for two tunnels depending on ground conditions and depth.

These estimates include the excavation, support of excavation (SOE), backfill, concrete invert, walls and roof, reinforcement and waterproofing as well as mobilization/demobilization and a factor for utilities and traffic. A contingency of 20% was added to the total cost.

This cost estimate does not explicitly include groundwater control (dewatering), monitoring, surface restoration, transition structures, and does only partially address the difficulties of construction in congested areas. Waterproofing costs are considered insufficiently. The cost for a reliable state of the art waterproofing system is about $5.5 per sf of structure surface compared to $2.5 in the estimate. Also not included are escalation, design fees and construction management fees or any cost related to real estate.

Considering these factors and the depth of the cut & cover tunnels the average cost per linear foot of cut & cover tunnel is estimated to be $9,760. This estimate is also in line with other available historic and local data about cut & cover tunnels where linear foot prices range between $8,000 and $10,000.

In the following the overall cost for the tunnel structures will be determined based on the outlined assumptions and the contract sectioning as described before.

Denton Drive Underpass

The underpass beneath Denton Drive and the existing freight rail lines can be completed in 7 months. With a length of 100 feet and the cost of $9,760 per linear foot this section cost amounts to $976,000.

Cut & Cover Alignment

The remaining cut & cover tunnel can be completed in 36 months. In this section, excluding the Mockingbird Lane / Cedar Springs intersection, the complexity is less severe than in the intersection area. The unit price is therefore reduced to $8,880. With a length of 3,750 ft. this amounts $33,300,000. The high complexity and traffic volume of the Mockingbird Lane / Cedar Springs intersection demands a higher unit price of $12,500 per linear foot. With approximately 600 ft. this results to $7,500,000. The total cut & cover alignment amounts to $40,500,000.

Mined Tunnel Alignment to Station

The mined tunnel to the station shall be complete in 8 months. According to historic data cost for a mined tunnel is comparable to the cost for a cut & cover construction. Due to the expected pre-support and ground improvement the higher unit cost of $9,760 per linear foot (including a 20%) applies. With a length of 1,400 feet the estimated construction cost for this section is $13,664,000.

Station Location

There is insufficient information available about the station structure. Based on the completed station at CityPlace on the DART North Central Corridor and on other Light Rail stations the excavation and support cost is approximated with $30,000,000. Finish out work is not included.

Mined Tunnel Alignment from Station to Denton Drive

The mined tunnel from the station to Denton Drive can be completed in 15 to 24 months. Based on the same assumptions as above and a unit price of $9,760 per linear foot (including a 20%)

contingency) the 3,100 feet long section is estimated to cost $30,256,000.

4.4 OVERALL SCHEDULE AND COST

Based on the assumptions outlined in 4.3 the overall construction cost for the proposed alignment and construction methods when adding a 15% contingency is estimated at $132,705,000. The contingency will cover items not considered in the cost estimate as well as unforeseen changes in ground conditions. The construction schedule will depend on the contract packaging and other working conditions and restrictions at the airport. Assuming that the sections will be constructed in consecutive order a conservative schedule will have construction duration of approximately 51 months. By alternative packaging and maximizing the overlapping a minimum duration of 36 months could be achieved for the construction of the tunnel sections.

5. RECOMMENDATIONS FOR IMPROVEMENT

CP&Y's proposed alignment was selected in cooperation with DART's planning & developing department. Its main objective was to minimize impact to airside and landside activities. This goal was achieved by choosing an alignment and construction method to pass by airside structures, traffic and other activities.

Today construction methods are available that allow underpassing of runways and surface structures without impacting the structures or the operation at the surface at all! Therefore, rather than avoiding the landside and airside structures and staying surface near with the tunnel an alternative alignment (DSC Alignment) as shown in Appendix B seems feasible.

Recommendations for improvement will therefore be based on the existing alignment and also on the alternative DSC alignment.

5.1 RECOMMENDATIONS FOR IMPROVEMENT OF CONSTRUCTION METHOD

5.1.1 Existing Alignment

State of the art and innovative construction methods are available to reduce the level of surface disruption and minimize cost and construction time. The recommendations for improvement will concentrate on reducing surface disruption and thereby reducing cost and schedule by applying

alternative construction methods. In particular a semi cut & cover method and an alternative mining method will be introduced when applicable along the alignment.

Denton Drive Underpass

At this intersection a high volume of cars and trucks pass by every day. Disrupting this flow will impact airport and freight rail operations as well as cause delay to individuals travelling to and from the airport. Minimizing this impact is one of the areas for improvement in this section. While the cut & cover method will generate an open cut at Denton Drive for an extended period of time a semi cut & cover method could be applied to reduce this impact.

The Doorframe Slab Method is a semi cut & cover construction method for shallow tunnels. It substantially limits the impact at the surface to a matter of weeks. Opening of a shallow trench, concreting of the roof slab, installation of the sidewall pile support and backfilling the trench to reinstate the surface are the only construction sequences seen by the public. The majority of the work is carried out as a subsequent mining operation using the elements of the New Austrian Tunneling Method (NATM) below the protecting concrete slab (see Appendix E for a typical cross section).

In order to entirely omit impact on traffic due to construction the Barrel Vault Method could be applied. This construction method creates a barrel vault made up of horizontal drilled perforated steel pipes filled with concrete, which form a structural umbrella under which the mining according to NATM principles takes place (see Appendix E for a typical layout).

The so-called "top-down" cut & cover method is another alternative for this section. This construction method sequences the construction of slurry walls prior to the installation of the roof slab. Disruption at the surface occurs during construction of the slurry walls and during the installation of the roof slab and is substantially reduced compared to the conventional cut & cover construction. This method is considered as not efficient for this application due to the high cost of slurry walls. Slurry walls would otherwise not be required in this location.

Cut & Cover Alignment

The Doorframe Slab Method can be continued along the entire cut & cover alignment, or at least in sections (Mockingbird Lane / Cedar Springs intersection) where the opening of the surface creates a major disruption to traffic or airport operations. Also, a deep mined tunnel, with the invert at a dep of approximately 80 - 100 ft. below surface (elevation ± 470 ft.) would entirely omit any surface

disruption. The mined tunnel will then be located entirely in the EFS layer, which substantially increases the efficiency of the mining operation due to reduced pre-support and ground improvement.

Mined Tunnel Alignment to Station

Here again either the Doorframe Slab Method or the Barrel Vault Method could be applied to reduce negative traffic impact. These methods will only apply, if the proposed deep mined tunnel is not selected over the shallow tunneling options. In contrast the above mentioned deep mined tunnel option would not require an additional staging area at this location as mining would continue to the station.

Station Location

The station is currently planned at elevation 427 ft. (top of rail at a surface elevation of ± 478 ft.) at the transition layer (elevation ± 430 ft.) of EFS to the water bearing sands and an average groundwater level at 452 ft.. This station could be excavated from top down or from the tunnel and access shafts. Given these mixed soil conditions and groundwater elevations a deeper station, entirely in the EFS, excavated from the tunnel, is the preferred alternative. In addition, construction is entirely independent from the proposed surface developments. Yet project coordination of DART and the City of Dallas may offer to incorporate the station construction with the development of the new ticket wing. Further studies are necessary to determine the exact elevation requirements of the station. The final location of the station and the construction staging will determine the most efficient excavation method.

Mined Tunnel Alignment from Station to Denton Drive

A shallow mined tunnel at the proposed elevations may cause large settlements. The tunnel crown is shown at elevation 450 ft. to 460 ft. (surface elevation ranges 470 ft. to 480 ft.), which is within the water bearing sand. These unfavorable soil conditions would require extensive ground treatments from within the tunnel as well as from the surface. A deep mined tunnel would omit the above mentioned cost intensive soil improvements and dewatering and reduce the risk of settlements.

5.1.2 Alternative Alignment

In contrast to the proposed alignment an alternative alignment to access DAL is a deep mined tunnel commencing as a cut & cover or semi cut & cover alignment, which will cross the Mockingbird Lane / Denton Drive intersection diagonally and terminate at the transition to the mined tunnel just east of the intersection as soon as sufficient overburden can be achieved. The tunnel would cross under the

existing and proposed airside facilities to the station location beneath the existing vacant ticketing wing. From the station location it would follow the alignment proposed by CP&Y at a deeper level and emerge on the existing right of way near the Denton Drive / Lovers Lane intersection.

This alternative alignment proposed by the DSC consists of a deep mined tunnel at an average depth of the invert of approximately 80 - 100 feet below surface. The soil at this depth is a far more favorable tunneling media. The alternative alignment provides savings due to a shorter tunnel length of between 400 and 600 feet.

The EFS is not water bearing and can be excavated with roadheaders and/or backhoes. In accordance with available information ongoing or future construction will not impact this alignment. The below grade expansions planned for the Mockingbird Lane / Cedar Springs Intersection are also not effected by this alignment, let alone disruptions to businesses along Mockingbird Lane or Cedar Springs Road. Environmental dangers arising from possible fuel storage tanks and pipelines are highly unlikely at this depth. Groundwater control is reduced to the portal areas and dewatering from within the tunnel.

5.2 RECOMMENDATIONS FOR IMPROVEMENT OF CONSTRUCTION SCHEDULE

The above noted construction method improvements will significantly reduce construction time. No or only minimal traffic re-routing will be necessary.

Denton Drive Underpass

By applying the Doorframe Slab Method for this approximately 100 ft. long section the duration of traffic disruption can be reduced to 1 to 2 months compared to almost 7 months for the cut & cover construction. Overall construction time is estimated to be 4 - 5 months as the advance rate is slightly higher at approximately 3 to 4 ft. per day.

Cut & Cover / Deep Tunnel Alignment

The Doorframe Slab Method applied at this 4,350 ft. long section can reduce the construction period to between 24 and 30 months. Traffic re-routing will be limited to weeks at time in contrast to the entire construction period. A deep mined tunnel, utilizing mechanized or hand mining excavation equipment, along this section could reduce construction time to 18 to 20 months as advance rat (including mobilization and demobilization) are higher at approximately 8-10 ft. per day. In addition

traffic re-routing at the intersection could be omitted entirely. The proposed cut & cover construction is estimated at 36 months. A combination of cut & cover construction with the Door Frame Slab Method can be applied. Cut & cover will be more suitable in areas with fewer surface activities, where as the Door Frame Slab Method should be considered for the Mockingbird Lane / Cedar Springs intersection crossing.

Mined Tunnel Alignment to Station

The Doorframe Slab Method or the Barrel Vault Method at this 1,400 ft. long section will not significantly reduce construction time. Continuing a deep mined tunnel to the station location will cut down construction time to 7 months. The proposed shallow mined tunnel construction is estimated at 14 months.

Station Location

The excavation of the station should coincide with the development of the new ticketing and baggage claim area. The station should be closely coordinated with the design and operational system of this area. No quantifiable recommendations can be made at this point until further information becomes available.

Mined Tunnel Alignment from Station to Denton Drive

Given a staging area at the new ticketing and baggage claim and a second at the parking lot of the TXI building the overall construction duration of this 3,100 ft. long section for a deep mined tunnel with TBM could be reduced to approximately 12 months. Measures for groundwater control and soil improvements are omitted with this option. Hand mined tunneling with roadheader will have higher advance rates of approximately 7 ft. per day. This results in a hand mined construction duration of approximately 14 months.

5.3 CHANGES IN CONSTRUCTION COST

The above-described changes will reduce the disruption at the surface substantially and also reduce construction cost. Moving the alignment in more favorable ground conditions reduces the cost for groundwater control and ground improvement and increases the advance rate. Excavation sequences will also change from a multiple drift excavation to a full-face excavation, which again increases the advance rate.

Denton Drive Underpass

The construction cost of the Doorframe Slab Method is comparable to the cost of cut & cover construction. The excavation volume from the surface is greatly reduced; the amount of utilized concrete and reinforcement is smaller, yet additions are made for the Doorframe Slab supporting piles and the NATM excavation. DSC estimates an average construction cost of $9,500 per linear foot in a congested area based on previous experience. This cost includes contingencies of 20% as assumed for the cut & cover construction. With a length of 100 feet this amounts to $950,000. Yet the traffic re-routing will be reduced to small sections of two weeks at a time, amounting to one month overall, compared with close to 6 months with conventional cut & cover. In addition construction time will be reduced by 1 –2 months, which provides an additional advantage of the Doorframe Slab Method. Overall it can be said that the Doorframe Slab Method provides significantly less disruption and shorter construction duration for only a marginally smaller price compared to the cut & cover construction.

Cut & Cover / Deep Mined Tunnel Alignment

The same applies to the entire cut & cover alignment from Mockingbird Lane to the proposed static
Total cost for the 4,350 ft. long section applying the Doorframe Slab Method is estimated at $34,800,000 ($8,000 per linear foot including 20% contingencies). Here again improvements in schedule, less surface disruption and fixed route construction traffic will provide benefits in comparison to the cut & cover construction. The linear foot price for the deep mined tunnel is estimated at $6,500 (including 20% contingencies) in the prevailing soil conditions. This is due to optimized, full-face excavation, reduced excavation volume, less water controlling actions and fewer pre-supporting procedures compared to the shallow mined tunnel. The estimate for the deep mined section therefore amounts to $28,275,000.

Mined Tunnel Alignment to Station

Mined tunneling in the EFS will, due to the reduced pre-support and ground improvement measures averages $6,500 per linear foot (see above). With a length of 1,400 feet the estimated construction cost for this section is $9,100,000.
This 1,400 ft. long section constructed with the Doorframe Slab Method is estimated at $13,300,000 ($9,500 per linear foot including 20% contingencies).

Station Location

Further studies and exact dates for the completion of the proposed airport improvements are required

to optimize construction scheduling and cost. The estimated cost remains at $30,000,000.

Mined Tunnel Alignment from Station to Denton Drive

A shallow mined tunnel in the prevailing soil conditions (water bearing sands) can only be constructed by improving the soil characteristics. Improving the soil conditions from the surface is not an option as the alignment passes under the apron, taxiways and runway. A substantial effort in labor, material and time is necessary. DSC estimates $9,760 per linear foot of shallow mined tunnel. This section (3,100 ft.) amounts to $30,260,000. A deep mined tunnel, which has the same conditions as mentioned before with an estimated price of $6,500 per linear foot would amount to $20,150,000.

5.4 OVERALL POTENTIAL COST SAVINGS AND SCHEDULE IMPROVEMENTS

The recommendations listed above provide potential cost savings and schedule improvements. The overall construction schedule depends on the number of headings excavated at the same time. In case of the deep alignment the schedule can be reduced to 23 months, for the shallow alignment 30 months are feasible. The alternative deep alignment will reduce the schedule further due to the decrease in length of the tunnel. Overall cost, when adding a 15% contingency for unforeseen ground conditions and changes, for construction applying the Doorframe Slab Method and mined tunneling (shallow option) amounts to approximately $125,710,000. A deep mined tunnel along the CP&Y alignment will significantly reduce the overall cost. The deep mined tunnel along the proposed alignment amounts to approximately $101,750,000. At the alternative (DSC) deep alignment the construction costs will be approximately $98,000,000. All calculated costs are based on 2001 prices and do not include escalation, design and construction management fees.

The soil conditions along the east side of Denton Drive allow a shorter cut and cover section prior to reaching the necessary depth for mining operations. The deep mined tunnel shall commence at the northwest corner of the Mockingbird Lane / Denton Drive intersection. It will continue between Denton Drive and the airport Patrol Road and turn east to cross below the runway, taxiway and apron. Just north of the Jet Aviation Building the alignment shall turn north towards the Station. The future station location is planned below the now vacant ticketing wing. A mined tunnel at a deeper elevation would require a lower station elevation. The exact location has to be determined in additional evaluations. The proposed alignment improvement shall not change the horizontal alignment from the station to Denton Drive. The tunnel invert for the deep mined tunnel shall be

approximately 100 feet below the surface to assure that the tunnel is located entirely in shale.

The overall length of the alternative (DSC) alignment is approximately 400 to 600 ft. shorter than the alignment proposed by CP&Y, which further reduces cost and the impact on future developments at the airport. Implementing the proposed alternative alignment can further reduce the overall cost by $3,000,000 - $4,500,000.

6. SUMMARY

This report reviews the design for the DART's Northwest Line, Section NW-2, the Light Rail access to the Dallas Love Field Airport. The area is highly congested by either vehicular traffic or landside or airside structures and airport operations. Planned future developments will further increase the density of construction. These are the reasons why the only way for a Light Rail line to access the airport is underground. DART and the design team of CP&Y have developed a preferred alignment for the proposed Light Rail access. The design is currently at the outline level. The cost has been estimated with $132,700,000 and the construction duration is expected to be between 36 and 51 months. By implying the improvements listed in chapter 5 savings between $7,000,000 and $34,700,000 can be achieved. Costs for all options include additional contingencies of 15% for unforeseen ground conditions and changes but do not include escalation (costs are based on 2001 prices), design fees and construction management fees. For a table comparing the improvement options refer to Appendix C.

DSC has reviewed the alignment and the proposed construction methods. Based on the findings recommendations for improvement have been suggested which focus on reducing the impact on airport operations and traffic flow during construction and reducing construction risk, cost and schedule. The current design proposes a combination of cut & cover construction and mined tunneling.

Recommendations include modifications of vertical and horizontal alignment as well as the utilization of alternative construction methods. The proposed alternatives also consider future construction in accordance with the Capital Investment Plan of the airport.

Modifications are suggested for the proposed vertical alignment. At the intersection Mockingbird Lane / Denton Drive a semi cut & cover method, the Doorframe Slab Method has been suggested, which would substantially reduce the impact of construction on the traffic in the area. While holding the alignment at the south side of Mockingbird Lane we suggest to lower the following sections in order to locate the tunnel structure in the more favorable shale formation. The tunnel can then be constructed by mining utilizing NATM principles. Based on the available information the cost for this alternative is comparable to the conventional cut & cover construction yet the construction duration is expected to be shorter. For the mined section between the Mockingbird Lane / Cedar Springs intersection and the proposed station location we also anticipate that cost will be lower than cut & cover construction, but all surface disruption during construction will be eliminated. Moving the alignment into the shale layer will also minimize the impact on adjacent structures due to settlements caused by dewatering and will avoid contamination mitigation issues at potential airport fuel locations.

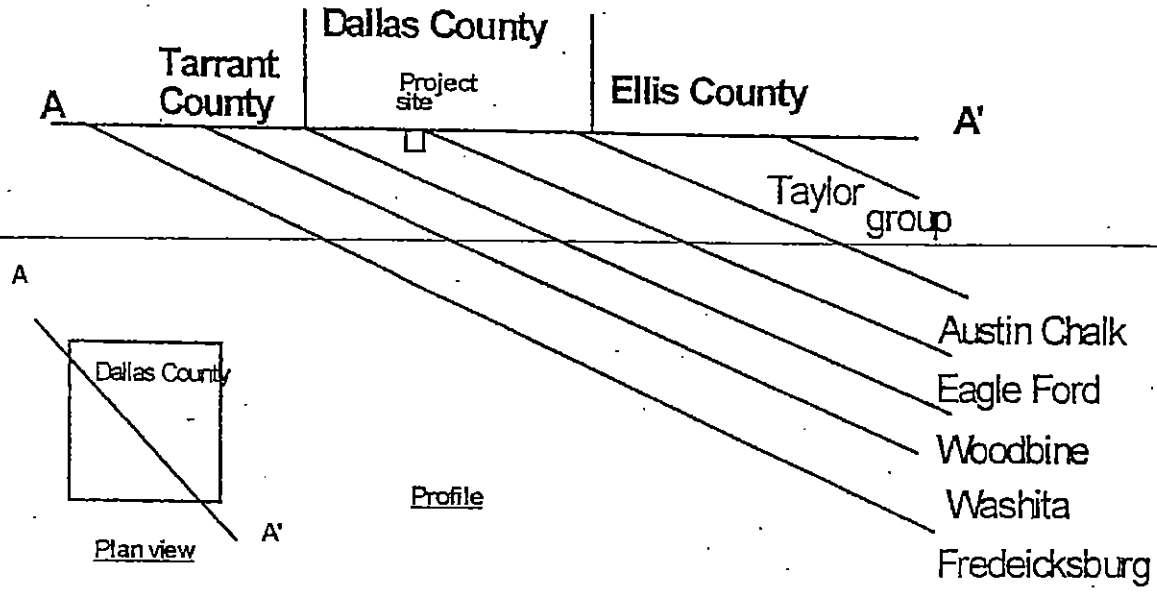
For the station construction the method will depend on the coordination with the airport. The station can be constructed underground from the running tunnels and from access shafts when the new airport facility is already in place or if disruption on the surface should be minimized. If a combined construction can be negotiated the station will be constructed from the top down, using cut & cover techniques. More information and further studies are required to determine the impact on cost and schedule of these alternatives.

For the section from the station to Denton Drive the same principles apply as mentioned in the previous mined tunnel section. Lowering the profile will ease construction due to the much more favorable conditions in the shale compared to the saturated clays and sands. Costs will be lower due to this factor and the lack of ground improvement and groundwater control.

An alternative alignment between the Mockingbird Lane / Denton Drive intersection and the station has been proposed. The alignment will also be a deep alignment favorable to tunneling. For a most economic solution tunneling is proposed to be carried out with roadheader and following NATM principles. The overall length is shorter than the proposed alignment and it eliminates the interface with future construction at the airport. The cost savings of this alternative compared to the proposed cut & cover construction are approximately $34,700,000.

A preferred layout based on a horizontal and vertical alignment should be defined and will finally determine the most economic construction methods. This report provides the framework for these decisions with descriptions and analysis of advantages and disadvantages of various options. The selection will also depend on the coordination with the airport construction activities and the acceptance of surface disruption in certain areas.

APPENDIX A



(not to scale)

Generalized Regional Geology of Dallas county, adopted from Taylor, 1976

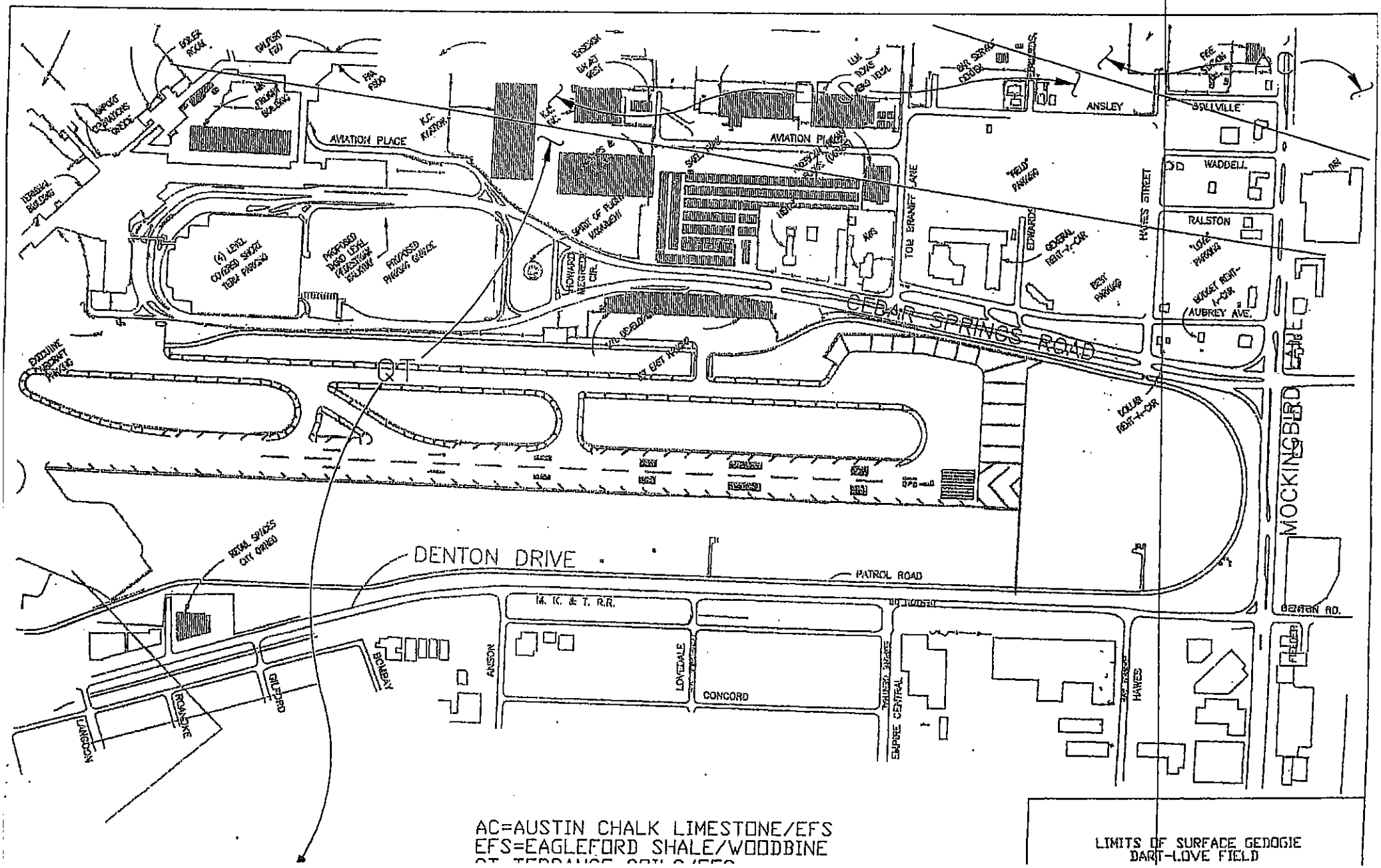
Correlation Chart	Relative Thickness (Ft.)	Lithology
Taylor Marl		Calcareous Shale
Upper Chalk	160 - 170	Chalk interbeded with calcarecus shale
Middle Marl	220 +/-	Calacreous shale interbeded with chalk
Lower Chalk	200+/-	Chalk interbeded with calcarecus shale
Upper Eagle Ford	100	Non calcareous shale (Arcadia Park)
	1 - 3	Detrital Limestone
Lower Eagle Ford	210+/-	Shale with concretions (Britton)
		Calcareous shale with bentonite seams
Woodbine		

Not to Scale

Correlation chart of Mesozoic of Dallas county, adopted from Foster, 1965

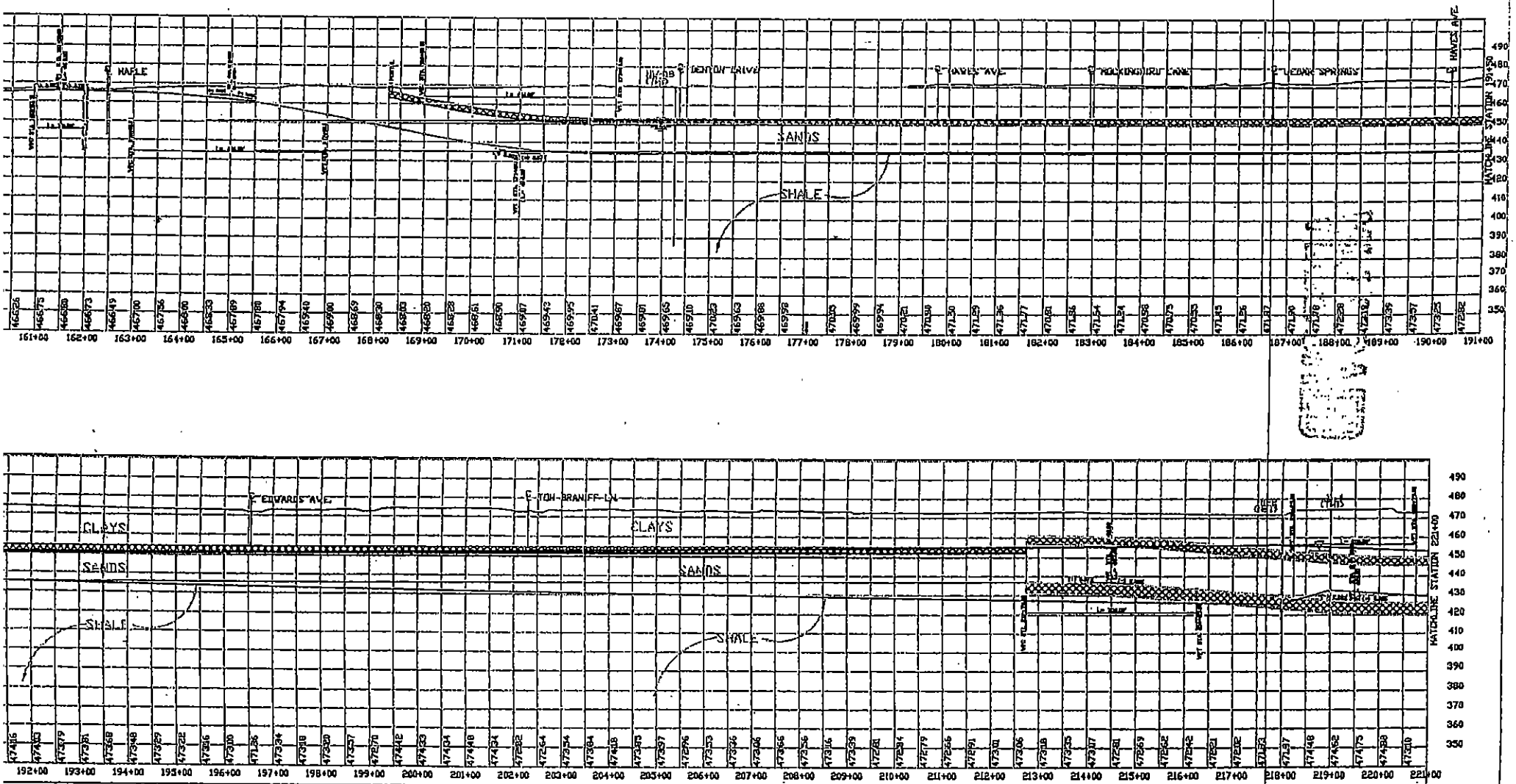
General Note: The information shown herein is schematic and show the rock formations only Not all information is shown. Division between formations are not generally straight lines and can vary based on location.

HCE Horizon Consulting Engineer	Project: DART Love Field Access	By: Ali Mohtasheni Date: 06/21/01	Sheet 1



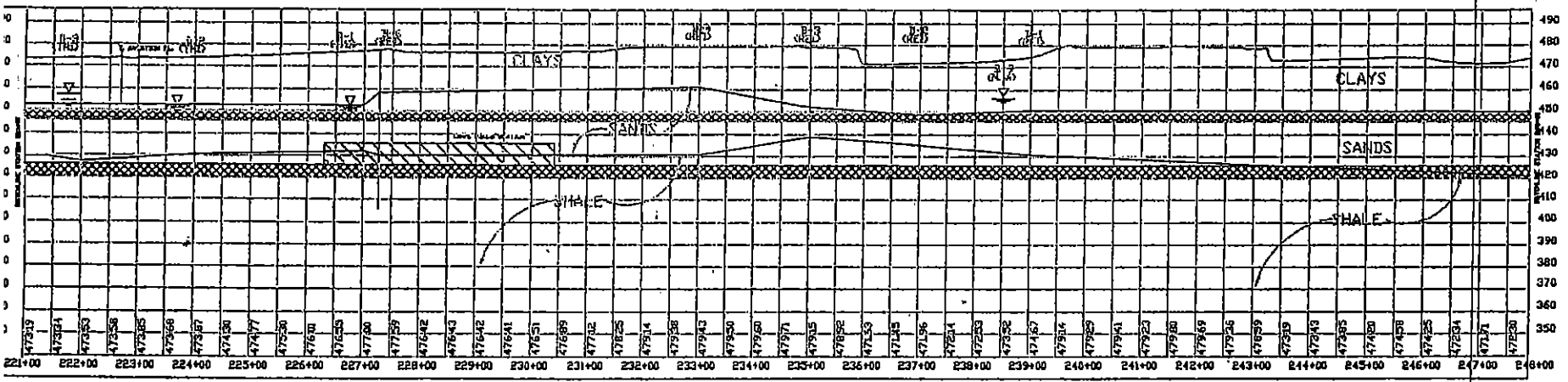
AC=AUSTIN CHALK LIMESTONE/EFS
EFS=EAGLEFORD SHALE/WOODBINE

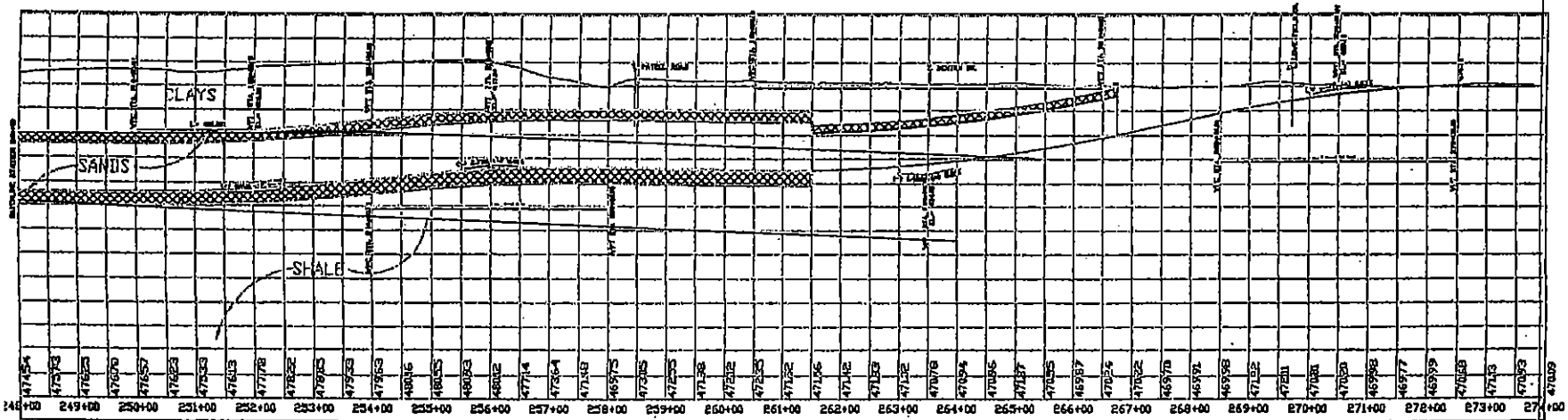
LIMITS OF SURFACE GEOLOGIC
DART-LOVE FIELD



NOTE: INFORMATION BETWEEN BORING LOCATIO RE EXTRAPOLATED. SEE TEXT FOR MORE DE...L.

GENERALIZED SUB ACE PROFILE
DART-LL FIELD





GENERALIZED SUBSURFACE PROFILE
DART-LOVE FIELD

SHEET 4

Executive Summary, DART LRT Rail Operating Facility - Phase 1 Site Selection Study

Appendix G

DART LRT Rail Operating Facility
Phase I Site Selection Study

DRAFT

Executive Summary

May 2002

DART General Planning Consultant

EXECUTIVE SUMMARY

Purpose of Report

The purpose of this Northwest Rail Operating Facility – Phase 1 Site Selection Study is to determine the most viable location for a new rail operating facility to serve Phase III expansion of the DART light rail system. Phase III includes the Northwest Corridor Light Rail Transit (LRT) Line to Farmers Branch and Carrollton, the future LRT branch to Irving/DFW, expansion along the existing blue and red lines, and possibly other LRT projects that may result from the current DART Transit System Plan update. Phase 2 of this effort will be Project Definition and Facility Layout for the Northwest Rail Operating Facility at the preferred site.

Overview of Existing Facility

DART's current light rail operating facility is located at the Central Rail Operations division immediately southeast of the Dallas CBD. The Central Rail Operating Facility performs light rail vehicle maintenance functions such as cleaning, washing, sanding, light and heavy repairs, and painting. DART also has an associated facility, the Facilities Maintenance Building (FMB) that is responsible for wayside maintenance—signals, traction electrification, track, and station.

Need for Facility

The current DART fleet consists of 95 vehicles. The fleet size reached 95 vehicles in late 2000 and includes those vehicles necessary for the build-out, including the North Central line to Richardson and Plano and the Garland line. The vehicle fleet will expand to 160 with the addition of the Southeast and Northwest Corridor lines in 2007-2008. The vehicle fleet will then expand to 195 with the addition of the Irving and Rowlett lines in 2010. An additional five to ten vehicles will be added for the SOC Phase III (2010), bringing the fleet size to 200 to 205.

The existing S&I facility is able to maintain and store 95 vehicles, and will be expanded to maintain and store 125 vehicles. This leaves approximately 80 vehicles to be maintained (and potentially stored) at the future rail operating facility, with the desired plan being for 100 vehicles to allow for growth. The project that will trigger the need for this new facility is operation of LRT in the Northwest Corridor to Farmers Branch and Carrollton.

DART has determined that for maximum operational efficiency, the new facility should be located along the Northwest Corridor. The new facility would have all the functions as the existing facility, with the exception that major repairs and overhauls and the system operations and controls would still be done at the Central facility.

Site Requirements

Site requirements for the maintenance facility that were used for this analysis include:

- Close proximity to the main LRT line and the future Irving/DFW branch just south of Northwest Highway;
- Level topography;
- Appropriate geometry;
- Access at both ends of the facility;
- Compatible with local land use and existing zoning;
- Good street access; and,
- Minimal capital investment and demolition costs.

Size Requirements

A survey of transit systems and their light rail maintenance facilities nationwide showed a ratio of 0.2 acres per light rail vehicle. DART's existing facility is approximately 40 acres and will ultimately support 125 vehicles, a ratio of 0.3 acres per vehicle. This results in a new facility (for 80 vehicles) target size of 24 acres, with approximately 30 acres minimum desired to accommodate 100 vehicles. Additional acreage beyond the 30 acres will allow for flexibility and maximum efficiency in the facility layout and design.

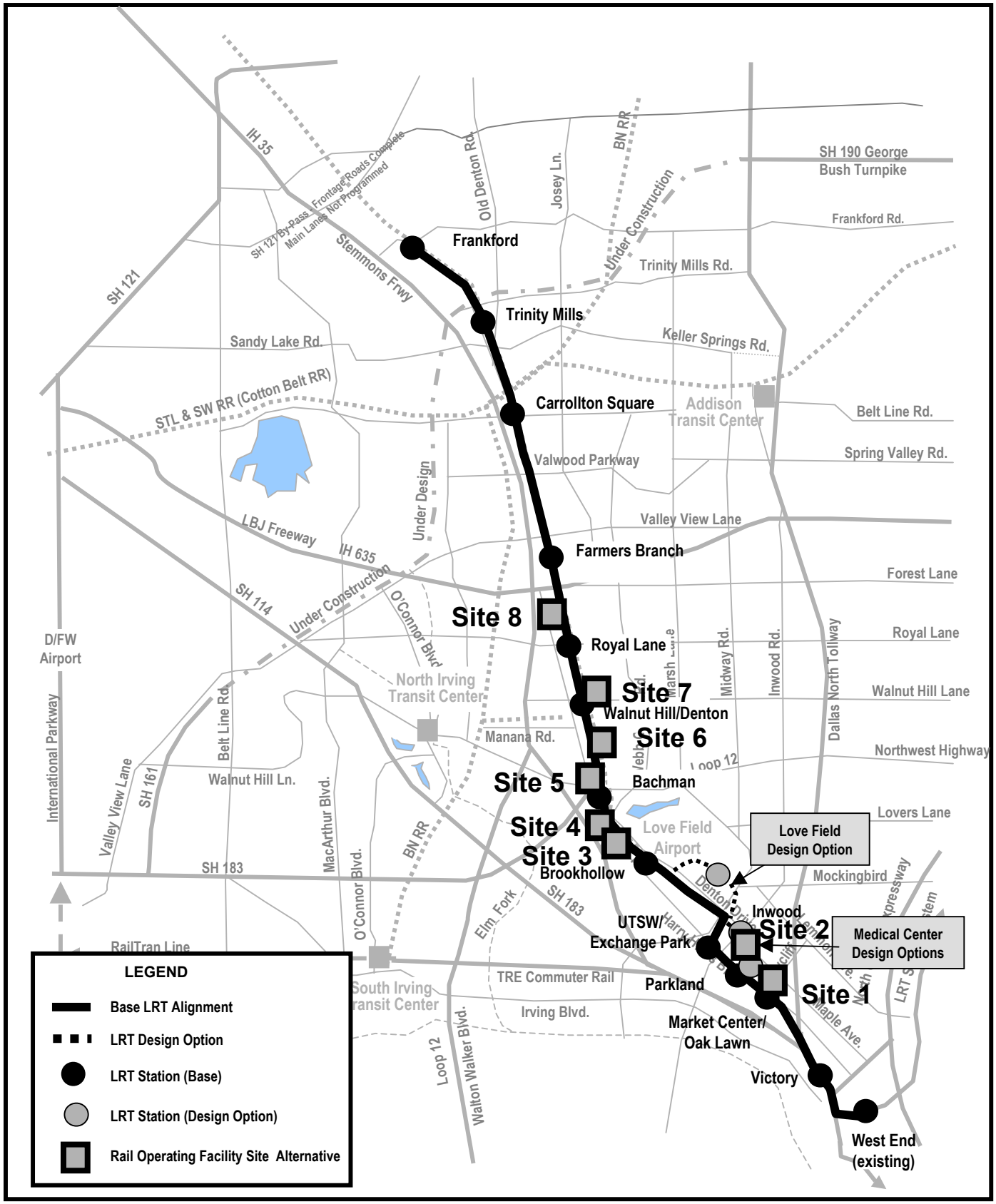
Long List of Candidate Sites

Eight areas along the Northwest Corridor alignment were initially examined as to their suitability for the new facility:

- Motor Street/Harry Hines;
- Inwood Road/Denton Drive;
- Webb Chapel Extension/Denton Drive;
- Cullum Lane/Denton Drive;
- Northwest Highway/Denton Drive;
- Lombardy Lane/Denton Drive;
- Walnut Hill/Denton Drive; and
- Northaven Road/Denton Drive.

Several sites were also considered to the west of the Stemmons Freeway, including two sites considered in an earlier DART evaluation (one on Manana Spur west of IH 35E, and one in Farmers Branch north of IH 635). While some of those sites offered considerable available acreage, DART determined that the new facility should remain adjacent to the Northwest Corridor LRT mainline to minimize deadheading travel times and minimize the expense of constructing structures for stub tracks through developed areas. In addition, DART determined that it was important to locate the new facility as close as possible to the Irving/DFW branch near Northwest Highway to promote operational efficiencies and, again, to minimize deadhead travel time for LRT vehicles.

Figure 1 shows the relative location of the eight sites. A discussion of each site is provided on the following pages.



Northwest Rail Operating Facility

Sites Considered

Figure 1

SOURCE: DART, PTG
DATE: March 2002

NW CORRIDOR PE / EIS

DART

Site 1: Motor Street/Harry Hines

This site is approximately 7.5 acres in size and would be located along the Northwest Corridor LRT line between the Market Center/Oak Lawn and Parkland LRT stations. The site runs roughly southwest to northeast between the LRT line and Denton Drive cut-off. This is the current site of Ferguson Industries, which is an active industrial site. It is directly across from Parkland Prescription Center and Amelia Court Professional Building (4917 Harry Hines), Parkland Support Services. This site is located near the high-traffic intersections of Motor/Harry Hines and Market Center/Harry Hines. The existing DART rail right-of-way travels behind the property. With the Medical Center design options, access to the site would be difficult since a tunnel section is in this area. Furthermore, freight access to the south would be removed. Given changing land uses in the area (most notably Trinity Industries proposal to be redeveloped as a mixed-use development) freight access from the north is not needed as is proposed to also be removed in this area as part of the Northwest Corridor LRT project. There is also a vacant lot that lies east of the railroad tracks. Owners of this vacant site have indicated to DART their desire to develop this site as mixed-use or medical center support type uses. Thus, expansion capabilities of this site to meet the 30-acre minimum desired size is unlikely.

Site 2: Inwood Road/Denton Drive

This site is approximately 3.2 acres in size and would be needed for one of the Northwest Corridor Medical Center Design Options (Option A). Options B and C would only require a partial acquisition of this site adjacent to Denton Drive. The site is located just south of the proposed Inwood station at the northwest corner of Denton Drive. The Lawns of Dallas business owner immediately to the north owns this vacant property. There is a dilapidated warehouse south of the property and brick buildings to the north and northeast of the building that are associated with Lawns of Dallas. Denton Drive bounds the property to the south and southeast. Expansion capabilities in this area are limited given adjacent schools, residential and planned medical center expansion.

Site 3: Webb Chapel Extension/Denton Drive

This site is approximately 36 acres in size and is located along the Northwest Corridor alignment immediately south of Webb Chapel Extension, about ½ mile south of the proposed Bachman LRT station. The rail line would be located along the west side of Denton Drive adjacent to the freight line. This site would require displacement and relocation of both the DART Northwest Bus Operating Facility, and the City of Dallas Solid Waste Transfer Facility. Surrounding land uses are parkland to the east and west and industrial to the south.

Site 4: Cullum Lane/Denton Drive

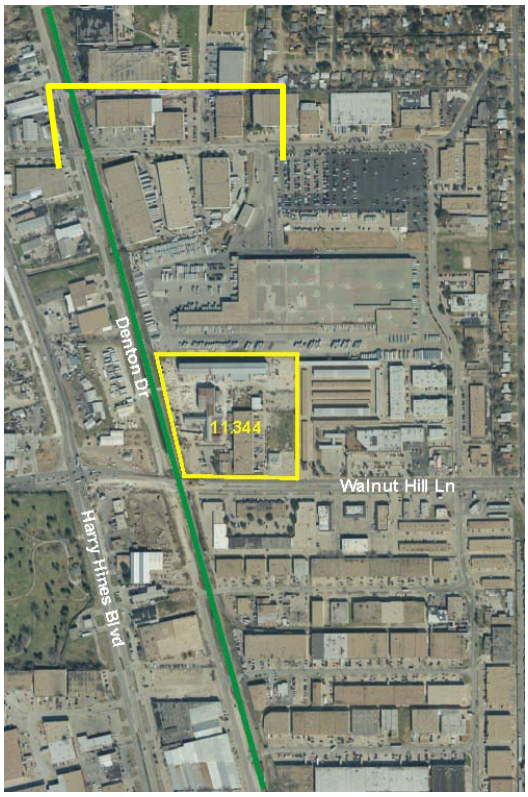
This site is approximately 4.0 acres in size and is located along the Northwest Corridor alignment just south of the proposed Bachman LRT station. The rail line would be located along the west side of Denton Drive; freight would remain on the east side of Denton Drive. There is a busy intersection west of the property on Harry Hines (which is six lanes in this area) at Webb Chapel Extension. Surrounding land uses are residential (mostly apartments to the east) and public (northwest operations division for police to the west). The junction to the Irving/DFW Line would take place just north of Community Drive, south of Northwest Highway. Expansion of this site to meet the desired 30-acre minimum size is very limited and would require re-siting of the proposed Bachman Station and likely closure of both Cullum Lane and Community Drive.

Site 5: Northwest Highway/Denton Drive

This site is approximately 17.3 acres in size and is located along the Northwest Corridor LRT line just north of the Bachman LRT station. This site is an active commercial site containing a bingo Parlor (2711 Story), which is housed in an historic structure (movie theatre) that is eligible for the National Register of Historic Places. There is also a fairly new two-story building. The parking lot is mostly paved on this site. The LRT rail line would be on the west side of Denton Drive and would begin transitioning back to the existing freight rail corridor east of Denton Drive just north of this site. An additional 5.7 acres is located immediately to the north of the primary site that would accommodate expansion, bringing the total potential area to 23 acres. Land uses along Denton Drive begin to transition from residential to more industrial uses at this point. Expansion to the 30-acre size would be fairly constrained give the location of Joe's Creek to the north and Northwest Highway to the south.

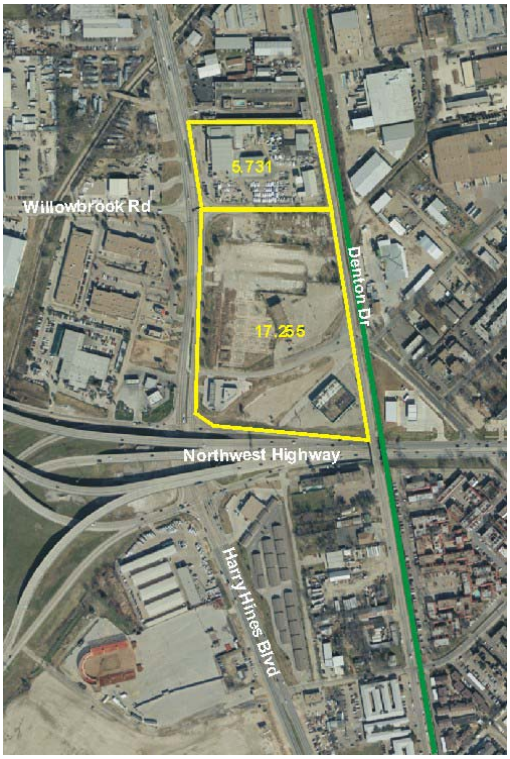
Site 6: Lombardy Lane/Denton Drive

This initial site identified at this location is approximately 22 acres in size and is located along the Northwest Corridor LRT line equidistant between the Northwest Highway and Walnut Hill Lane LRT stations. There is a recently vacated lumberyard (2801 Lombardy) that is fenced and contains several two-story corrugated metal buildings. A stone company also operates on the site. Much of the area is soft-paved. The at-grade freight line runs through the west side of the property allowing for easy freight rail access. The LRT Line would be elevated to the west of the freight line; thus, LRT access would come off the structure, over freight and drop into the site. There is also a parcel of an additional 10.5 acres adjacent to this property that could be considered for future expansion, bringing the total potential land area to 33 acres. Because the facility layout will likely need more length than width, and additional approximately 10 acres was identified to the north for possible expansion. Thus, 43 acres is available but all of this area would likely not be required.



Site 7: Walnut Hill/Denton Drive

This site is approximately 11.3 acres in size and is located along the Northwest Corridor LRT line at the site of the proposed Walnut Hill Lane LRT station. This is an active industrial site, home to Peerless Manufacturing (11010 Denton Drive). The site is fenced and the lot is mostly paved. It contains three or four corrugated metal buildings and is located directly adjacent to the rail line. United Parcel Service is located to the north of the site. Use of this site would require resiting the proposed Station to the south, and expansion to the east toward residential areas in order to avoid displacing UPS to the north.



Site 8: Northaven Road/Denton Drive

This site is approximately 32 acres in size and is located along the Northwest Corridor LRT line between the proposed Royal Lane LRT station and IH 635. There is an additional parcel of land on the east side of Denton Drive and the rail line, which is approximately 14 acres. This expansion area would be better if it were adjacent to the larger site and not separated by Denton Drive. There are significant hazardous materials issues involved with this location and this land has recently been targeted for new and redevelopment, since it is located in the Asian Trade District area. This area is also significantly further from the future junction with the Irving/DFW Line than the other sites.

Evaluation Criteria for the Site Location Analysis

The evaluation criteria for the site selection analysis were selected to focus on several important characteristics of a prototypical rail operating facility. The characteristics include attributes in four general categories:

- Site Characteristics
- Facility Operations
- System Operations
- Relative Costs

Within each of these categories, specific evaluation criteria were defined to facilitate a qualitative but objective assessment of the candidate sites.

Site Characteristics

The site should possess characteristics that minimize potential short- and long-term impacts to the surrounding area, and should not require significant modifications to accommodate the proposed facility. Specific evaluation criteria pertaining to site characteristics include the following:

- **Terrain**
  The site should have level terrain to simplify the storage and maintenance of vehicles, to minimize the potential for uncontrolled vehicle movement within the site or onto the mainline tracks, and to minimize the need for grading and earth retention structures.

- **Adjacent Land Use**
  The yard and shop site should have adjacent land uses that are generally compatible with anticipated operations and maintenance activities. It is likely that vehicle cleaning and/or maintenance will be conducted 24 hours a day, and varying levels of site lighting will be used at night. In addition, the frequent movement of vehicles through constrained trackwork on the site could result in adverse noise impacts.

- **Environmental Impacts**
  The site should minimize the potential for adverse impacts to the natural and built environments.

- **Expansion**
  The site should be large enough to accommodate future expansion of the facility with limited additional impacts to the surrounding area. If possible, the site should be configured to support the initial vehicle fleet and provide for construction of added capacity when the need arises.

Facility Operations

The site should efficiently accommodate the multiple functions associated with such facilities, including vehicle storage, cleaning, and maintenance; system operations and administration; and maintenance of way storage and operations. Specific evaluation criteria pertaining to facility operations include the following:

- **Runaround Loop**
  The site should ideally accommodate a full runaround loop, bypassing but allowing access to both the storage yard and the shop facility. In addition to providing operational

flexibility on the site, a continuous runaround loop minimizes the impact of vehicle testing on revenue operations. However, a runaround requires added space, and thus can reduce the overall capacity of a given site.

- **Redundancy**
  The site should accommodate a redundant configuration that precludes entrapment of vehicles in the storage yard and/or maintenance facility during routine operations. Typically, this is accomplished by providing double-ended access to both the storage and maintenance tracks, and by limiting each maintenance bay to two vehicle positions. However, a redundant configuration requires added space, and thus can reduce the overall capacity of a given site.

- **Reverse Operation**
  The site should accommodate the ability to turn vehicles end-for-end within the yard or through a combination yard and mainline movements. Typically, this is accomplished by providing a wye or loop track on the site. Light rail vehicles have operator cabs at both ends, and regularly alternating the travel direction of the vehicles can balance wear on vehicle components and maximize the interval between routine maintenance needs.

- **Functional Efficiency**
  The site should accommodate an efficient configuration that provides direct access between the mainline and either the storage yard or the vehicle maintenance facility. In addition, the site should be configured so that other elements can be efficiently located, including maintenance-of-way operations and storage, a traction power substation, the system administration and operations center, internal roadways, parking, and loading docks.

- **Existing Utilities**
  The availability of utilities at the site should be typical as to the type of utilities required to run and maintain a large operation.

System Operations

The site should be located and sized in a manner that supports efficient operations for the initial corridor and for potential system expansions. Specific evaluation criteria pertaining to system operations include the following:

- **System Connectivity**
  The site should be in close proximity to and easily accessible from the mainline tracks and should be compatible with all initial and ultimate operating segment alternatives.

- **Railroad Connectivity**
  The site should include a potential connection to an active freight railroad line to facilitate transport of materials, equipment, and vehicles to and from the system.

- **System Efficiency**
  The site should be located to minimize the need for non-revenue operation (deadheading) on the mainline tracks. On a single radial line, the most efficient location for the yard and shop facility is generally at the end of the line. However, if the yard and shop facility is intended to serve multiple lines (current or future), then the most efficient location may be closer to the junction of two lines.

Relative Costs

The site should result in the lowest capital investment possible to obtain the necessary property and construct the proposed facility, and the lowest system-wide operating and maintenance costs. Specific evaluation criteria pertaining to relative costs include the following:

- **Acquisition Costs**
  The site should result in the lowest capital investment possible for property acquisition, relocation, and demolition. Relative acquisition cost is primarily a function of the existing uses of the site and the potential market value of the property.

- **Capital Costs**
  The site should result in the lowest capital investment possible to construct the proposed facility. Relative capital cost is primarily a function of the civil work necessary to provide a sufficiently level site for the yard and shop facility.

- **O&M Costs**
  The site should result in the lowest system-wide operating and maintenance costs. Relative operating and maintenance cost is a function of the efficiency of both the site configuration and its location on the system.

Summary Evaluation

Each of the candidate areas was assessed preliminarily for potential environmental impacts. Table 1 shows the results of that screening.

TABLE 1

CRITERION	SITE 1 Motor/ Harry Hines	2 Inwood/ Denton	3 Webb Chapel/ Denton	4 Cullum/ Denton	5 Northwest/ Denton	6 Lombardy/ Denton	7 Walnut Hill/ Denton	8 Northaven/ Denton
Site Characteristics								
Terrain	+	+	+	+	+	+	+	+
Adjacent Land Use	+	-	+	-	+	+	+	+
Environmental Impacts	-	-	-	-	-	-	-	-
Expansion	-	-	+	-	+	+	-	+
Facility Operations								
Runaround Loop	-	-	+	-	+	+	-	+
Redundancy	-	-	+	-	+	+	-	+
Reverse Operation	-	-	+	-	+	+	-	+
Functional Efficiency	-	+	+	+	+	+	+	+
Utilities	+	+	+	+	+	+	+	+
System Operations								
System Connectivity	+	+	+	+	+	+	-	-
Railroad Connectivity	+	+	+	-	+	+	-	-
System Efficiency	-	+	+	+	+	+	-	-
Relative Costs								
Acquisition Costs	+	+	-	+	+	+	-	-
Capital Costs	-	+	+	+	+	+	+	+
O & M Costs	+	+	+	+	+	+	-	-
Rating Summary								
TOTAL "+" ratings	7	9	13	8	14	14	5	9
TOTAL "-" ratings	8	6	2	7	1	1	10	6

SOURCE: URS/BRW; Wendy Lopez & Associates; DART; March 2002.

Short List of Candidate Sites

After initial analysis related to size, suitability, and proximity to the Northwest/Irving line junction, three sites were identified as the most promising and were subject to additional analysis:

1. Webb Chapel/Denton Drive;
2. Northwest Highway/Denton Drive; and
3. Lombardy Lane/Denton Drive.

Table 2 provides a summary of the pros and cons associated with the three remaining sites. Based on the evaluation, Site 3 at Lombardy/Denton is the preferred site.

TABLE 2

Site	Pros	Cons
1 – Webb Chapel/Denton	▪ Size: 30+ acres ▪ Adjacent rail access ▪ 2 property owners (City/DART) ▪ South of Irving/DFW junction	▪ DART would have to relocate Northwest Bus Facility in area ▪ City of Dallas does not support; City would need 5-10 years to relocate solid waste facility at high cost - need DART facility by 2007
2 – Northwest Highway/Denton	▪ Proximity to Irving/DFW junction	▪ Historic resource on site ▪ Freight rail not adjacent (across Denton Dr) ▪ Multiple property owners ▪ Proximity to Bachman station – land has high likelihood for redevelopment
3 – Lombardy/Denton	▪ Size: 30+ acres ▪ Property owners willing to work with DART ▪ Freight rail through site ▪ Zoning allows rail yard uses ▪ City supports site ▪ Surrounded by industrial uses ▪ ¾ mile from Bachman and Walnut Hill/Denton stations	▪ Multiple property owners ▪ Small portion of site (to south) is in 100-year floodplain of Joe's Creek

Next Steps

In order to advance the recommended site into further design, DART is processing a Service Plan Amendment to locate the site at Lombardy/Denton. DART held public meetings on April 16 and 18, 2002 presenting the three candidate sites, and held a public hearing for the proposed Service Plan Amendment on April 29, 2002. Due to some community concerns related to the recommendation of Site 3 at Lombardy/ Denton, DART held a tour with interested community members on May 11, 2002 to view the existing Central Rail Operating Facility and visit the Lombardy/Denton Site. All three sites are included in the Draft EIS, with the recommendation noted for Site 3. The Final EIS will include Site 3 as the recommended site, subject to approval of the Service Plan Amendment by the DART Board. The DART Board action is scheduled for July 9, 2002.

Following the Service Plan Amendment, a more detailed project definition and facility layout will be developed for the recommended site to more accurately determine the exact amount of land and property needed. The layout will include locations for tracks, offices, employee parking, maintenance facilities and other associated facilities. The layout will consider the most efficient methods for site access and interface with both the mainline and the active freight line. After completion of project definition, DART would initiate final design for a period of 1-2 years, followed by construction. The facility would be in operation by early 2007.

Section 106 Memorandum of Agreement

Appendix H

MEMORANDUM OF AGREEMENT
BETWEEN THE FEDERAL TRANSIT ADMINISTRATION AND
THE TEXAS STATE HISTORIC PRESERVATION OFFICER
SUBMITTED TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE NORTHWEST CORRIDOR LIGHT RAIL PROJECT
IN DALLAS, TEXAS

WHEREAS, the U.S. Department of Transportation, Federal Transit Administration (FTA), is considering a grant application for financial assistance to Dallas Area Rapid Transit (DART), a regional transit authority organized and existing under the laws of the State of Texas, for the construction of a light rail transit (LRT) project in a northwest corridor of Dallas, Texas, that extends through portions of the cities of Dallas, Farmers Branch, and Carrollton, Texas; and

WHEREAS, the FTA has determined that construction of the Northwest Corridor Light Rail Transit Line (the Project) in Dallas, Farmers Branch and Carrollton, Texas, will have an effect upon Club Schmitz and the Carrollton Crossing Depot, as hereinafter described, which are two properties that have been determined to be eligible for inclusion in the *National Register of Historic Places*, and has consulted with the Texas State Historical Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act, (16 U.S.C. Section 470(f)); and

WHEREAS, the SHPO is authorized to enter into this Agreement in order to fulfill its role of advising and assisting Federal agencies in carrying out their Section 106 responsibilities under the following federal statutes: Section 101 and 106 of the National Historic Preservation Act of 1966, as amended, 16 U.S.C. § 470f, and pursuant to 36 CFR Part 800, regulations implementing Section 106 at §§ 800.2(c)(1)(i) and 800.6(b); and

WHEREAS, the Project consists of the construction of a two-track light rail line that will begin at the existing West End Station located in the central business district in Dallas, Texas, and will extend northwestward along the existing Trinity Railway Express (TRE) corridor to the Victory Station (which has independent utility and is under early implementation), and will continue at grade, aerial or cut-and-cover on a northwesterly alignment for approximately 17 miles and terminate at a station south of Frankford Road in Carrollton, Texas. A more detailed description of the Project's alignment is set forth in Attachment A to this Agreement; and

WHEREAS, the preferred alternative for the Project, as described above, has been determined through a public process that included a major investment study, the preparation of the Northwest Corridor Draft Environmental Impact Statement, public hearings, and coordination with major stakeholders; and

WHEREAS, project stations will be located at Victory (under early implementation); Market Center/Oak Lawn (near Harry Hines and Wycliff); Parkland (northeast of Harry Hines and Motor Street); Inwood (southwest of Denton Drive and Inwood Road); Brookhollow (north of Burbank Street near Denton Drive); Bachman (southwest of Community Drive and Denton Drive); Walnut Hill/Denton (northeast of Walnut Hill and Denton Drive); Royal Lane (northeast of Royal Lane and Denton Drive); Farmers Branch (south of Valley View near the existing

DART park-and-ride); Carrollton Square (northeast of Belt Line Road and Broadway Street); Trinity Mills (southeast of SH 190 at Broadway Street); and Frankford (south of Frankford Road at the rail terminus); and

WHEREAS, the FTA has determined that the "area of potential effects", as that term is defined at 36 CFR §800.16(d), for the Project will include the 16 properties that are listed or eligible for listing in the National Register of Historic Places together with all significant architectural, engineering and historical elements, as identified in a Request for Determination of Eligibility Report submitted to the SHPO on February 5, 2002, supplemental Request for Determination of Eligibility information submitted on April 26, 2002, June 11, 2002, August 16, 2002, and April 4, 2003, and concurrence letters dated July 15, 2002, August 21, 2002, and May 21, 2003 from the SHPO; and

WHEREAS, the FTA has determined, in consultation with the SHPO and the Advisory Council on Historic Preservation (the Council) that the construction of the Project on the alignment set out in Attachment A will have no effect on the following historic properties: Dealey Plaza Historic District (NR 1993, NHL); West End Historic District (NR 1978); Magnolia Petroleum Co. City Sales and Warehouse (NR 1994); Turtle Creek Pump Station (NR 2001); Obadiah Knight School (2615 Anson Road); Speaco Foods, Inc. (8668 Denton Drive; this structure has been demolished as part of Southwest Airlines expansion); Water Department Purification Plant (2605 Shorecrest Drive); Water Department Pumping Station (2625 Shorecrest Drive); and Bachman Electric Gen. Station (9500 Denton Drive); and

WHEREAS, the FTA has determined, in consultation with the SHPO and the Council, that the construction of Project on the alignment set out in Attachment A will have no adverse affect on Old Morton Food Headquarters (6333 Denton Drive); TJ Rusk Middle School (2929 Inwood Road); Bingo Theater (2711 Storey Lane); and Letot School (2727 Lombardy Lane); provided that certain conditions outlined in the Stipulation below are fulfilled; and

WHEREAS, the FTA has determined, in consultation with the SHPO and the Council, that the construction of the Project on the alignment set out in Attachment A will have an adverse affect on Club Schmitz and the Carrollton Crossing Depot, and further, whereas, the parties have developed the measures outlined in the Stipulations below to reduce or mitigate the identified adverse effects of the Project; and

WHEREAS, the FTA, in collaboration with DART, has demonstrated that there is no prudent and feasible alternative to the use of these two protected resources; and

WHEREAS, DART has participated with the FTA in the consultation with the SHPO and has been invited to concur in the Memorandum of Agreement to reflect its commitment to the measures described in this agreement and to its obligations in a grant that will fund the construction of this Project;

NOW, THEREFORE, the FTA and the SHPO agree that the following measures and stipulations shall be implemented in order to take into account the effects of the undertaking on historic properties:

Stipulations

The FTA shall ensure that the following stipulations are implemented:

I. FTA has determined in consultation with the SHPO that the construction of the Project on the alignment as set out in Attachment A will have no adverse affect on the following historic properties provided that certain conditions outlined below are fulfilled:

A. **Old Morton Food Headquarters**: The Project will be located within DART railroad right-of-way approximately 80 feet from this resource. The LRT will begin its descent into a tunnel to cross under Mockingbird Lane adjacent to this resource. It may be necessary to acquire a temporary construction easement in the parking lot of Old Morton Food Headquarters in order to facilitate construction of the tunnel entry and associated u-walls.

1. Condition for Determination of No Adverse Effect: The design of the project adjacent to this resource will be developed by DART in consultation with the SHPO. Plans will be provided to the SHPO for review and comment in accordance with Stipulation III below.
2. Condition for Determination of No Adverse Effect: DART will work with the owners and tenants of the Old Morton Food Headquarters Building to develop replacement parking or appropriate compensation for temporary parking impacts. When construction is completed, DART will restore the parking lot to its pre-construction condition. Furthermore, DART will work with the owners and tenants of the building to maintain permanent and acceptable access to the site, so that continued use of the building will not be adversely affected by diminished access.

B. **Bingo Theater:** The aerial guideway will be elevated about 20 to 25 feet high at this point, approximately 240 feet to the east of the structure. It is at this point in the alignment that the tracks transfer from the west side of Denton Drive to the east side of Denton Drive, transitioning away from the resource.

1. Condition for Determination of No Adverse Effect: The design of the project adjacent to this resource will be developed by DART in consultation with the SHPO. Plans will be provided to the SHPO for review and comment in accordance with Stipulation III below.

C. **TJ Rusk Middle School**: The Project alignment and aerial Inwood Station will be located across Denton Drive from this resource.

1. Condition for Determination of No Adverse Effect: The design of the project adjacent to this resource will be developed by DART in consultation with the SHPO. Plans will be provided to the SHPO for review and comment in accordance with Stipulation III below.

D. **Letot School**: The Project will be located within DART railroad right-of-way to the east and across Denton Drive from this resource. The existing freight railroad tracks will be relocated between the LRT alignment and Denton Drive with additional storage tracks. The LRT alignment will be elevated over Lombardy Lane. As the Project proceeds north, the southbound track will transition to at-grade while the

northbound track will remain elevated to facilitate movements in and out of the facility. The Northwest Rail Operating Facility will be located to the east of the LRT alignment and retaining walls necessary for the vertical alignment changes. The Northwest Rail Operating Facility will be constructed under a separate contract than that for Line Section NW-3 (Community Drive to Valley View Lane).

1. Condition for Determination of No Adverse Effect: The design of the Project adjacent to this resource will be developed by DART in consultation with the SHPO. Plans for both Line Section NW-3 and the Northwest Rail Operating Facility will be provided to the SHPO for review and comment in accordance with Stipulation III below. Proposed mitigation for potential visual and/or noise effects will be reflected in the plans for SHPO review and comment.

II. FTA has determined in consultation with the SHPO that the construction of the Project on the alignment as set out in Attachment A will have an adverse affect on Club Schmitz and the Carrollton Crossing Depot. The parties have developed the following mitigation measures to reduce or mitigate the identified adverse effects on the properties:

A. **Club Schmitz**: The building will not be removed, altered or physically damaged due to the project. However, the Project will require construction of an aerial alignment that will be located approximately 32' from the nearest corner of this local historic resource and will change the setting of the resource.

1. The following mitigation measures will be implemented to reduce or eliminate the adverse effect:
    a) The design of the project adjacent to this resource will be developed by DART in consultation with the SHPO. Plans, including those for signage to be attached to the building, if any, will be provided to the SHPO for review and comment in accordance with Stipulation III below.
    b) The vertical profile has been modified to extend the LRT alignment on structure to the north side of Cullum Road, thus eliminating the retaining wall to the east of Club Schmitz and maintaining sight lines from Denton Drive. This modification extends the bridge by two spans, or about 200 feet.
    c) DART will assist Club Schmitz in redesigning their parking lot to reduce the effects of any parking loss.
    d) DART will work with Club Schmitz to install temporary and/or permanent signage to improve the visibility of the resource from Denton Drive.

B. **Carrollton Crossing Depot**: The Project will be located on the property where this resource is currently located. The aerial Carrollton Square LRT station will be partially built over the current depot location thus requiring relocation of the depot.

1. The following mitigation measures will be implemented to reduce or eliminate the adverse effect:
    a) The design of the project adjacent to this resource will be developed by DART in consultation with the SHPO. Plans will be provided to the SHPO for review and comment in accordance with Stipulation III below.

b) The station site plan has been modified to relocate the depot to a more appropriate location that would maintain its setting and orientation toward an at-grade freight alignment (the Cotton Belt Railroad). As the station plans are further developed, DART will consult with the SHPO to ensure the proper orientation and site location. Plans will be provided to the SHPO for review and comment in accordance with Stipulation III below.
c) DART, in consultation with the SHPO, will rehabilitate the structure in accordance with Stipulation III below, in order to support an adaptive reuse of the resource.
d) DART will work with the City of Carrollton and the City's Historic Preservation Advisory Committee (HPAC) to seek an appropriate reuse of the Depot that makes the depot visible and accessible to the public. The HPAC advises and makes recommendations to the City Council to preserve the City's landmarks and built environment and to protect architecturally and/or culturally significant resources.
e) DART will maintain the structure while it remains in DART's ownership.
f) If the building is transferred or sold from DART ownership, DART will consult with the SHPO to develop an appropriate preservation easement to be placed on the property prior to the transfer. If the property will be leased, DART will consult with the SHPO to develop appropriate preservation and review clauses to be included in the lease agreement.

III. DART will make every effort to ensure that the design of light rail structures and all other construction undertaken or funded by DART related to this undertaking, including but not limited to station platforms and canopies, artwork and community art design programs, signage, tracks, catenary poles, overhead traction and power systems, traction power substations, communications bungalows, and sound insulation fences or other construction that may have an effect on historic properties will be designed to be compatible with affected historic properties and conform to the guidance contained in the Secretary of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (U.S. Department of the Interior, National Park Service, 1983 or as most recently amended). DART will further ensure that all such designs are developed in consultation with the SHPO and submitted to SHPO for review and comment. Proposed designs will be provided to the SHPO for review at the 30%, 65%, 95% and 100% design intervals. All design information provided to the SHPO for review will have pages relevant to the review marked/tabbed, and the transmittal letter from DART will include a brief synopsis of design changes/additions since the previous review.

IV. DART shall afford the SHPO thirty (30) days to review and respond to any reports, plans, specifications or other documentation provided for review pursuant to this MOA. Should the SHPO object, DART shall consult further with the SHPO to resolve the objection. If DART determines that the objection cannot be resolved, DART shall notify the FTA, which will follow MOA Stipulation (V.E) for "Resolving objections".

V. Administrative Stipulations.

A. Definition of Parties. For the purposes of this MOA the terms "party" or "parties means the FTA and the SHPO, each of which has authority under 36 CFR § 800.7 to terminate the consultant process.

B. Professional supervision. The FTA shall ensure that all activities carried out pursuant to this MOA are carried out by or under the direct supervision of a person or persons meeting at a minimum the Professional Qualifications Standards set forth in the Secretary of the Interior's Standards and Guidelines for Rehabilitation of Historic Buildings. However, nothing in this stipulation may be interpreted to bar the FTA or any agent or contractor of the FTA from utilizing the properly supervised services of employees and volunteers who do not meet the above standards.

C. Alterations to project documents. Neither the FTA nor DART shall alter any plan, scope of services, or other document that has been reviewed and commented on pursuant to this MOA, except to finalize documents commented on in draft, without first affording the parties to this MOA the opportunity to review the proposed change and determine whether it shall require that this MOA be amended. If one or more such party determines that an amendment is needed, the parties to this MOA shall consult in accordance with 36 CFR § 800.6 to consider such an amendment.

D. Annual report and review.

1. On or before 31 December of each year until the FTA and the SHPO agree in writing that the terms of this MOA have been fulfilled, DART, on behalf of FTA, shall prepare and provide an annual report to the SHPO addressing the following topics:
    a) Any problems or unexpected issues encountered during the year; and
    b) Any changes that the FTA or DART believe should be made in the implementation of this MOA.
2. DART shall ensure that its annual report is made available for public inspection, that potentially interested members of the public are made aware of its availability, and that interested members of the public are invited to provide comments to the SHPO, DART, and to the FTA.
3. The SHPO shall review the annual report and provide comments to the FTA.
4. At the request of any party to this MOA, a meeting or meetings shall be held to facilitate review and comment, to resolve questions, or to resolve adverse comments.
5. Based on this review, the FTA, DART, and the SHPO shall determine whether this MOA shall continue in force, be amended, or be terminated.

E. Resolving Objections.

1. Should any party or concurring party to this agreement or a member of the public object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, the FTA and DART shall take the objection into account. If the FTA determines, within 30 days, that such objection(s) cannot be resolved, the FTA will:
    a) Forward all documentation relevant to the dispute to the Council in accordance with 36 CFR § 800.2(b)(2). Upon receipt of adequate documentation, the Council shall review and advise FTA on the

resolution of the objection within 30 days. Any comment provided by the Council, and all comments from parties to the MOA, will be taken into account by FTA in reaching a final decision regarding the dispute.

b) If the Council does not provide comments regarding the dispute within 30 days after receipt of adequate documentation, FTA may render a decision regarding the dispute. In reaching its decision, FTA will take into account all comments regarding the dispute from the parties to the MOA.

c) FTA's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged. FTA will notify all parties of its decision in writing before implementing that portion of the Undertaking subject to dispute under this stipulation. FTA's decision will be final.

F. Amendments and Noncompliance. Any party to this MOA (exclusive of the concurring parties), may request an amendment to its terms or to the provisions of any attachment to the MOA. The party wishing to amend the MOA shall immediately consult with the other party to develop an amendment pursuant to 36 CFR §§ 800.6(c)(7) and 800.6(c)(8). The amendment will be effective on the date a copy signed by all the original signatories is filed with the Council. If the parties cannot agree to appropriate terms to amend the MOA, any party may terminate the agreement in accordance with Stipulation V.I, below.

G. Unanticipated Discoveries or Effects. In the event that the Project will affect a previously unidentified property that may be eligible for inclusion in the National Register or affect a known historic property in an unanticipated manner, DART shall require work in the area of the discovery to cease until actions that will take into account the effects of the undertaking on the property can be implemented. DART shall immediately notify FTA of the discovery and provide FTA with the information required to request the SHPO's and Council's comments pursuant to 36 CFR § 800.13(b).

H. Substantial Changes to the Project. FTA shall immediately notify the SHPO and Council of any substantial changes to the Project as described in the Final Environmental Impact Statement. FTA will provide the SHPO and Council with copies of reports developed pursuant to this agreement. FTA will also provide these reports to interested parties upon request.

I. Termination. If the MOA is not amended following the consultation set out in Stipulation V.F, it may be terminated by any signatory or invited signatory. Within 30 days following the termination, the FTA shall notify the signatories if it will initiate consultation to execute an MOA with the signatories under 36 CFR § 800.6(c)(1) or request the comments of the Council under 36 CFR § 800.7(a) and proceed accordingly.

Execution of this MOA by the FTA, the Texas SHPO, and DART, the submission of documentation and filing of this Memorandum of Agreement with the Council pursuant to 36 CFR § 800.6(b)(1)(iv) prior to FTA's approval of this undertaking, and implementation of its terms evidence that the FTA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment.

FEDERAL TRANSIT ADMINISTRATION, REGION VI

By: _____ Date: 6/4/03
Robert C. Patrick, Regional Administrator

TEXAS STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 7/18/03
F. Lawerence Oaks, Texas State Historic Preservation Officer

CONCUR:

DALLAS AREA RAPID TRANSIT

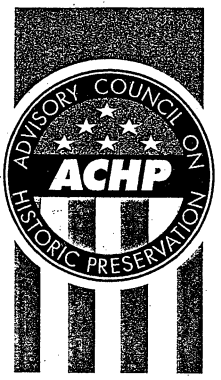
By: _____ Date: 6/2/03
Gary C. Thomas, President/Executive Director

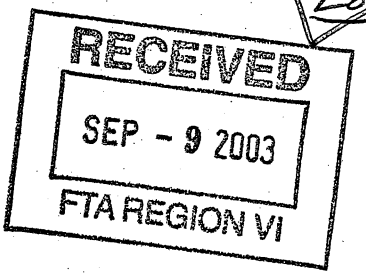
ACCEPTED:

ADVISORY COUNCIL ON HISTORIC PRESERVATION

See attached ACHP letter dated 8/26/03
By: _____ Date: _____
Executive Director

PC
~~JB~~
Log JS





August 26, 2003

Robert C. Patrick
Regional Administrator
Federal Transit Administration
Region VI
819 Taylor St., Suite 8A36
Fort Worth, TX 0550

REF: *Light Rail, Northwest Corridor, Dallas, TX.*

Dear Mr. Patrick:

On July 25, 2003, we received your notification of adverse effect for the referenced project, in accordance with Section 800.6(a)(1) of the ACHP's regulations, "Protection of Historic Properties" (36 CFR Part 800). Included with your notification was a signed Memorandum of Agreement (MOA) for the project and background documentation. The ACHP's regulations require that the Agency Official notify the ACHP of an adverse effect finding and provide the ACHP with an opportunity to participate in consultation if we so choose. We have no record of being notified by you of your finding of adverse effect prior to the receipt of the signed MOA and, thus, we were precluded from participating in consultation. Your failure to follow this procedural requirement may render the outcome of the consultation process subject to challenge by parties with an interest in the project.

However, we have reviewed the documentation provided and have decided to not reopen consultation at this time. We will, therefore, consider the MOA as having been filed with us in accordance with §800.6(b)(1)(iv). In the future, please be sure to provide us with sufficient advanced notice of any adverse effect determination prior to the execution of the Memorandum of Agreement.

Should you have any questions, please contact me at (303) 969-5110 or by e-mail at lkeatinge@achp.gov.

Sincerely,

Lee Keatinge

Lee Keatinge
Program Analyst
Western Office of Federal
Agency Programs

ATTACHMENT A

The Northwest Corridor LRT Line to Farmers Branch and Carrollton (the Project) will include approximately 17.8 miles of double-tracked LRT from downtown Dallas through the cities of Dallas and Farmers Branch to Frankford Road in Carrollton. The project will be served by twelve new stations: Victory, Market Center/Oak Lawn, Parkland, Inwood, Brookhollow, Bachman, Walnut Hill/Denton, Royal Lane, Farmers Branch, Carrollton Square, Trinity Mills, and Frankford.

The alignment will begin in downtown Dallas at the west end of the existing LRT transitway mall near Houston Street and Pacific Avenue. It will extend west and north to join the Trinity Railway Express (TRE) corridor and continue north to an at-grade station at Victory. The initial segment of the project, from downtown Dallas to the Victory Station at American Airlines Center, has independent utility and is being implemented in advance. This initial segment was found to be a Categorical Exclusion in accordance with 23 CFR 771.117(c)(18). FTA issued their finding on this subject in a letter to DART dated May 16, 2001.

The alignment will continue north within the TRE corridor to an aerial station at Market Center near Wycliff Avenue and Harry Hines Boulevard. North of the Market Center/Oak Lawn Station, the alignment will transition over Harry Hines Boulevard to continue within the DART-owned UP RR right-of-way (ROW) on elevated structure, crossing over Lucas Street, Kendall/Macatee, and Motor Street. An aerial station, Parkland Station, will be provided over Motor Street.

North of the Parkland Station, the alignment will continue on elevated structure within the UP RR ROW, crossing over Maple Avenue, Butler Street, Inwood Road, and Knight's Branch. An aerial station will be provided in the southwest quadrant of Inwood Road and Denton Drive (Inwood Station). The alignment will continue north, descending to grade north of Knight's Branch. It will pass Bomar Avenue, which will be closed, and will cross Manor Way at grade. The alignment will enter a cut-and-cover tunnel portal and cross under several minor streets and Mockingbird Lane. It will then return to grade at Empire Central and continue north in the UP RR ROW at-grade on the east side of the existing freight track. An at-grade station will be provided north of Burbank Street (Brookhollow Station). The alignment will continue north and become elevated to cross over Shorecrest Drive and past DART's Northwest Bus Operating Facility. The line will continue over a freight spur and Webb Chapel Extension, then leave the UP RR ROW and descend to the west side of Denton Drive to provide an at-grade station south of Community Drive. An at-grade junction with the future Irving/DFW LRT Line will be provided just north of the Bachman Station.

The alignment will continue north at-grade from Northwest Highway then rise to pass over Storey Lane and Denton Drive to transition back into the UP RR ROW on the east side of Denton Drive. The line will continue north on an aerial alignment crossing Lombardy Lane and several additional streets up to Walnut Hill Lane. North of Lombardy Lane the southbound track, as well as pocket tracks, will descend to at-grade for approximately 1,200 feet adjacent to the Northwest Rail Operating Facility site. The northbound track will remain aerial, allowing access from the pocket tracks into the facility without crossing the mainline. Continuing north, an aerial station will be provided on the north side of Walnut Hill Lane. The line will continue

north on aerial structure to pass over Royal Lane and adjacent streets. An aerial station will be provided on the north side of Royal Lane.

The line will continue north on aerial structure until north of Northaven Lane, then descend to grade. At-grade crossings will be provided at Forest Lane and at the eastbound and westbound service roads of LBJ Freeway. With planned IH 35E/IH 635 interchange improvements, Forest Lane will be reconfigured as the eastbound frontage road. The line will stay at-grade to pass under the main lanes of the LBJ Freeway. An at-grade station (Farmers Branch Station) south of Valley View Lane will be provided in the City of Farmers Branch.

The alignment will cross Valley View Lane and Valwood Parkway at grade, continuing to just south of Crosby Road where it will become aerial to cross Crosby Road and the major Belt Line Road / BNSF RR / Cotton Belt RR crossing. An aerial station (Carrollton Square Station) will be provided just north of Belt Line Road. The alignment will stay aerial to the north and pass over Old Denton Road. The alignment will be grade-separated at Whitlock Road, Jackson Road, and cross Ismaili Center Circle at-grade. The Trinity Mills Station will be located at-grade just south of SH 190 (President George Bush Turnpike). The Trinity Mills Station will replace the existing North Carrollton Transit Center, which will be closed when the LRT project is opened for service. The line will cross the SH 190 eastbound and westbound service roads at-grade (under the main lanes), and continue north at-grade to the last station just south of Frankford Road.