

Const 8,265,100
Contingency 1,091,510
10%
Row 2,650,000
Engr 1,091,510

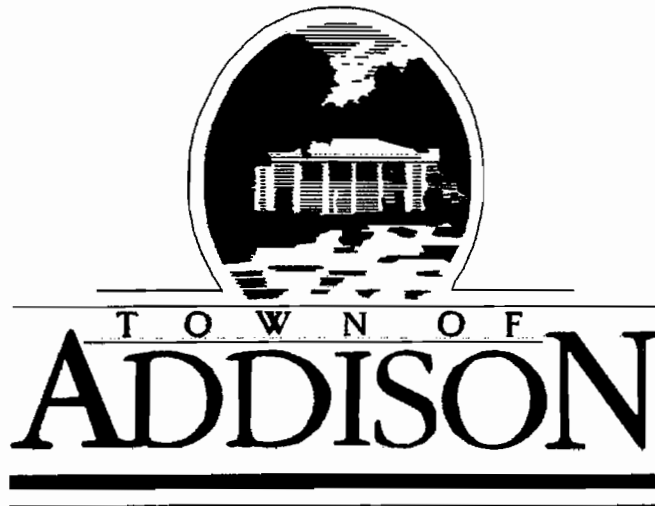
13,098,120

Const. 1,871,120
Row 1,540,000
Contingency 10% 341,112
Engr 341,112

4,093,344

ALIGNMENT STUDY REPORT
FOR
PROPOSED ARAPAHO ROAD EXTENSION

Prepared for the
TOWN OF ADDISON



Prepared By

HNTB Corporation
GBW Engineers, Inc.
Jack Hatchell & Associates

JANUARY 1999

ALIGNMENT STUDY REPORT

ARAPAHO ROAD EXTENSION

for the

TOWN OF ADDISON

Prepared by:

HNTB Corporation
GBW Engineers, Inc.
Jack Hatchell & Associates



January, 1999



Table of Contents

Alignment Study Report Arapaho Road Extension

	<u>Page</u>
EXECUTIVE SUMMARY	4
1 INTRODUCTION	8
2 ALTERNATIVE ALIGNMENTS	9
2.1 Centurion Way Alignment	9
2.2 Divided Roadway Alignment	10
2.3 DART Railroad Alignment	10
2.4 Traffic Analysis	11
2.4.1 Projected Traffic Volumes	
2.4.2 Evaluation of Traffic Volumes	
2.5 Options Studied for DART Railroad Alignment	13
2.5.1 Option 1 – Overpass at Midway Road with Entry/Exit Ramps on the North Side of Proposed Arapaho Road	
2.5.2 Option 2 – Underpass at Midway Road with Entry/Exit Ramps on the North Side of Proposed Arapaho Road	
2.5.3 Option 3 – Overpass at Midway Road Without Ramps	
2.5.4 Option 4 – Underpass at Midway Road Without Ramps	
2.5.5 Option 5 – Overpass Without Ramps, No Taking of Charter Furniture Warehouse	
2.5.6 Option 6 – Underpass Without Ramps, No Taking of Charter Furniture Warehouse	
2.6 Evaluation of DART Railroad Alignment Options	14
3 TECHNICALLY PREFERRED ALTERNATIVE	17
3.1 Coordination Issues	17
3.1.1 DWU Easement	
3.1.2 Railroad Crossing	
3.1.3 Realty Road Section	
3.1.4 Construction Sequencing	
3.1.5 Overpass Aesthetics	
3.1.6 Right-of-way and Building Acquisition	
3.2 Project Phasing	18
3.2.1 Phase 1 – Marsh Lane to Surveyor Boulevard	
3.2.2 Phase 2 – Surveyor Boulevard to Addison Road	
3.3 Cost Estimates	19

Table of Contents (cont'd)

LIST OF EXHIBITS

Exhibit A	Centurion Way Alignment
Exhibit B	Divided Roadway Alignment
Exhibit C	DART Railroad Alignment
Exhibit D	Enhanced Photograph - Midway Overpass
Exhibit E	Technically Preferred Alignment (map pocket)
Exhibit F	Right-of-way Strip Map (map pocket)

Executive Summary

In February of 1998, the Town of Addison retained a team of consultants, lead by HNTB Corporation, to study an extension of Arapaho Road as a four lane roadway from Addison Road west to Marsh Lane. The purpose of the Arapaho Road extension is to relieve traffic congestion on roadways in the project vicinity, particularly on Belt Line Road, the primary east-west thoroughfare.

The project team conducted a traffic study which showed that an Arapaho Road extension would reduce traffic volumes on Belt Line Road and Midway Road. The traffic study also indicated that the section of Arapaho Road east of Midway Road should be constructed as a four-lane divided facility based on projected traffic volumes. West of Midway Road, Arapaho Road can be constructed as a four-lane undivided roadway if no entry or exit ramps are installed.

The proposed extension, which is approximately 7,800 feet in length, includes intersections at Addison Road, Midway Road, Surveyor Boulevard, Commerce Street and Marsh Lane. Presently, the section of Arapaho Road from just west of the North Dallas Tollway to Addison Road is under construction.

From Addison Road to Marsh Lane, the project corridor must fit between Belt Line Road to the south and the Dallas Area Rapid Transit (DART) owned railroad to the north. At the east end, the roadway must be a continuation of the portion of Arapaho Road which is presently under construction, and at the west end it must align with existing Realty Road on the Farmers Branch side of Marsh Lane.

Within this corridor, the project team analyzed the following three general alignments for the Arapaho Road extension.

- Centurion Way alignment
- Divided Roadway alignment
- DART Railroad alignment

Exhibits A, B and C within Section 2 of the report show these alignments. Due to the constraints presented by the intersections at either end of the project, an electrical substation on the west side of Surveyor Boulevard, existing buildings in the project corridor and the DART railroad, there is no viable alternative to the alignment sections east of Midway Road and west of Surveyor Boulevard.

Although the Centurion Way alignment benefits from the use of an existing right-of-way, it requires the purchase of the Charter Furniture property. In addition, at the west end of Centurion Way where the street turns 90 degrees to the south and becomes Runyon Road, this alignment divides the Mini Warehouse facility in two and requires the removal of a significant portion of the buildings on that property.

Executive Summary (cont'd)

The divided roadway alignment requires the purchase of Charter Furniture and a smaller portion of the Mini Warehouse property than the Centurion Way alignment. This alignment also results in less convenient access for vehicles entering or exiting the buildings along Centurion Way, which currently carries two-way traffic. If, as part of this alignment, an underpass or overpass were constructed at Midway Road, access to the buildings closest to Midway would be severely impacted.

The DART railroad alignment allows Centurion Way to remain in place as a service road for the adjacent buildings. Furthermore, no purchase of the Charter Furniture building is required, and only a corner of the Mini Warehouse property is impacted. Given the potential access and cost benefits associated with the DART railroad alignment, a more in-depth evaluation of its viability was conducted.

The analysis of the DART railroad alignment primarily focuses on the intersection at Midway Road. Southbound traffic queues currently extend on Midway Road from Belt Line Road to north of the DART railroad during much of the day. Consequently, an at-grade crossing of Arapaho Road at Midway Road may not be feasible without providing dual-coordination of the traffic signals along Midway and Belt Line Roads.

The grade separated options, with or without ramps, all reduce traffic on Belt Line and Midway Roads with one exception. If entry/exit ramps are included at Midway Road on the south side of Arapaho Road, then traffic on Midway Road is increased between proposed Arapaho Road and Belt Line Road. As a result, the following six horizontal and vertical alignment options at the Midway Road intersection were evaluated .

- Option 1 – Overpass at Midway Road with Entry/Exit Ramps on the North Side of Proposed Arapaho Road
- Option 2 – Underpass at Midway Road with Entry/Exit Ramps on the North Side of Proposed Arapaho Road
- Option 3 – Overpass at Midway Road Without Ramps (*similar alignment to Option 2*)
- Option 4 – Underpass at Midway Road Without Ramps (*similar alignment to Option 2*)
- Option 5 – Overpass Without Ramps, No Taking of Charter Furniture Warehouse
- Option 6 – Underpass Without Ramps, No Taking of Charter Furniture Warehouse

Due to extensive utility relocations in a tight construction corridor, the viability of Option 6 is questionable at this point. If the Town wanted to pursue this option, further coordination would be necessary with DART and DWU prior to developing an Opinion of Probable Cost.

Three overpass and three underpass options were evaluated, and in each case the corresponding underpass option was more expensive. An underpass may be more visually appealing than an overpass, however, the narrowing of Midway Road to facilitate construction would increase traffic delays during the 12 months of construction. Given the increased project cost and the impact on

Executive Summary (cont'd)

Midway Road traffic during construction associated with the underpass options, an overpass is preferred.

Overpass Option 1 requires the purchase of the Charter Furniture and MNBA buildings in order to make the entry ramp onto Arapaho Road safe at the merge point. Overpass Option 3, like Option 5, has no ramps, however, it would require the purchase of the Charter Furniture building. Of the three overpass options, Option 5 is the only one which does not require the purchase of either the Charter Furniture or MNBA buildings. Option 5 places the edge of the overpass structure 10 feet from the MNBA building and 15 feet from the Charter Furniture building, with a two-and-a-half-foot sidewalk for emergency access on both sides of the overpass. In addition, it would require DWU of accept 20 feet for maintenance of their 60-inch water line.

Given the escalating cost of real estate and the traffic impacts, neither the additional construction area associated with Option 3 nor the ramps associated with Option 1 appear to justify the required property purchases. Therefore, it is our recommendation that Option 5, an overpass without ramps at Midway Road and no building takes at this location, be selected as the Technically Preferred Alternative.

The following issues will need to be resolved to facilitate construction of the Technically Preferred Alignment.

- Use the southern 10 feet of a 30-foot DWU easement which is contiguous with the DART railroad right-of-way and contains a 60-inch transmission main.
- Gain permission from Union Pacific to cross the railroad wye spur.
- Design construction sequencing plans for the affected intersections at Addison Road, Midway Road, Surveyor Boulevard, Commerce Street and Marsh Lane.
- Consider measures to improve the aesthetics of the Midway Road overpass in order to integrate the structure with the neighborhood.
- Evaluate extending the column supports from Midway Road to the west end of the MNBA building in order to maintain visibility of Charter Furniture for southbound motorists on Midway Road and to facilitate covered parking under the roadway deck for both properties.
- Proceed with the acquisition of right-of-way and the property remainders which are deemed unusable.

The Town of Addison may wish to consider phasing the construction of the Technically Preferred Alignment. This section describes two separate phases of construction.

- Phase 1 - Marsh Lane to Surveyor Boulevard

The expansion of existing Realty Road east of Marsh Lane and the extension of Realty Road

From Addison Road to Marsh Lane, the project corridor must fit between Belt Line Road to the south and the Dallas Area Rapid Transit (DART) owned railroad to the north. At the east end, the roadway must be a continuation of the portion of Arapaho Road which is presently under construction, and at the west end it must align with existing Realty Road on the Farmers Branch side of Marsh Lane.

Within this corridor, the project team analyzed three general alignments for the Arapaho Road extension.

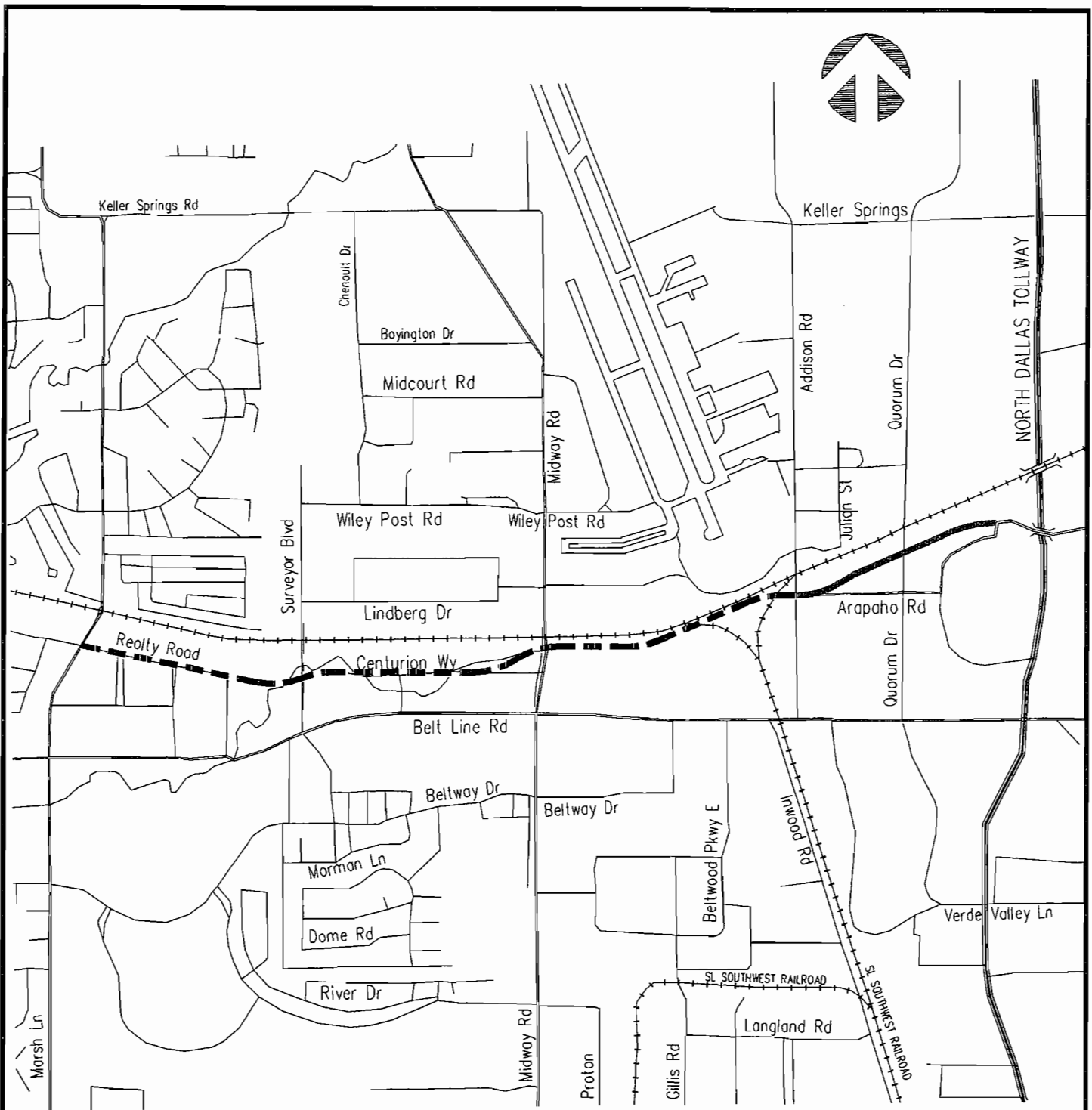
2.1 Centurion Way Alignment

The Centurion Way alignment, which had been identified at a conceptual level in a previous study, makes two at-grade crossings of a Union Pacific railroad wye spur just west of Addison Road. It then extends easterly between the DART railroad on the north side and several buildings on the south side, including Iceoplex, Motel 6, Homewood Suites and Super 6. After this alignment crosses Midway Road, it angles toward the southeast as it passes through the Charter Furniture Building before bending back to the east along the existing Centurion Way right-of-way. At the end of Centurion Way, this alignment passes through a Mini Warehouse facility on the east side of Surveyor Boulevard. On the west side of Surveyor Boulevard, it passes through a light commercial building before crossing a concrete lined channel behind Addison Bank and an open field east of Realty Road. The alignment then follows Realty Road to the Marsh Lane intersection. (See Exhibit A).

Due to the constraints presented by the intersections at either end of the project, an electrical substation on the west side of Surveyor Boulevard, existing buildings in the project corridor and the DART railroad, there are very few viable alternatives to the alignment sections east of Midway Road and west of Surveyor Boulevard. Between Midway Road and Surveyor Boulevard, this alignment uses the existing 60-foot wide Centurion Way right-of-way which currently contains a 41-foot wide pavement section measured from the back of curb.

Although this alignment benefits from the use of an existing right-of-way, it requires the purchase of the Charter Furniture property. In addition, at the west end of Centurion Way where the street turns 90 degrees to the south and becomes Runyon Road, this alignment divides the Mini Warehouse facility in two and requires the removal of a significant portion of the buildings on this property.

Both the north and south sides of Centurion Way are fully developed with building and parking improvements which extend out close to the existing right-of-way. The narrowest portion of this alignment is between the MNBA building on the north side and the ATC building on the south side where only 103 feet exists between these two buildings. There is not room for a four-lane divided roadway between these buildings.



PROPOSED ARAPAHO ROAD EXTENSION



ARAPAHO ROAD PHASE I (UNDER CONSTRUCTION)

PROPOSED ARAPAHO ROAD EXTENSION EXHIBIT 'A'

CENTURION WAY ALIGNMENT

Alternative Alignments (cont'd)

The minimum pavement width for a four lane divided roadway is 45 feet measured to the back of curb. The extra four feet of pavement widening would add to the impact on the businesses along Centurion Way which would have to gain access to and from a much busier thoroughfare.

2.2 Divided Roadway Alignment

The divided roadway varies significantly from the Centurion Way alignment between Midway Road and Surveyor Boulevard. With this alignment, the roadway splits immediately west of Midway Road into two lanes of traffic in each direction. (See Exhibit B).

The two eastbound lanes follow the Centurion Way alignment described in Section 2.1. The two westbound lanes are located next to the DART railroad from Midway Road to the Mini Warehouse facility. The westbound lanes then curve toward the southeast as they cut through a corner of the Mini Warehouses before merging with the eastbound lanes just east of Surveyor Boulevard.

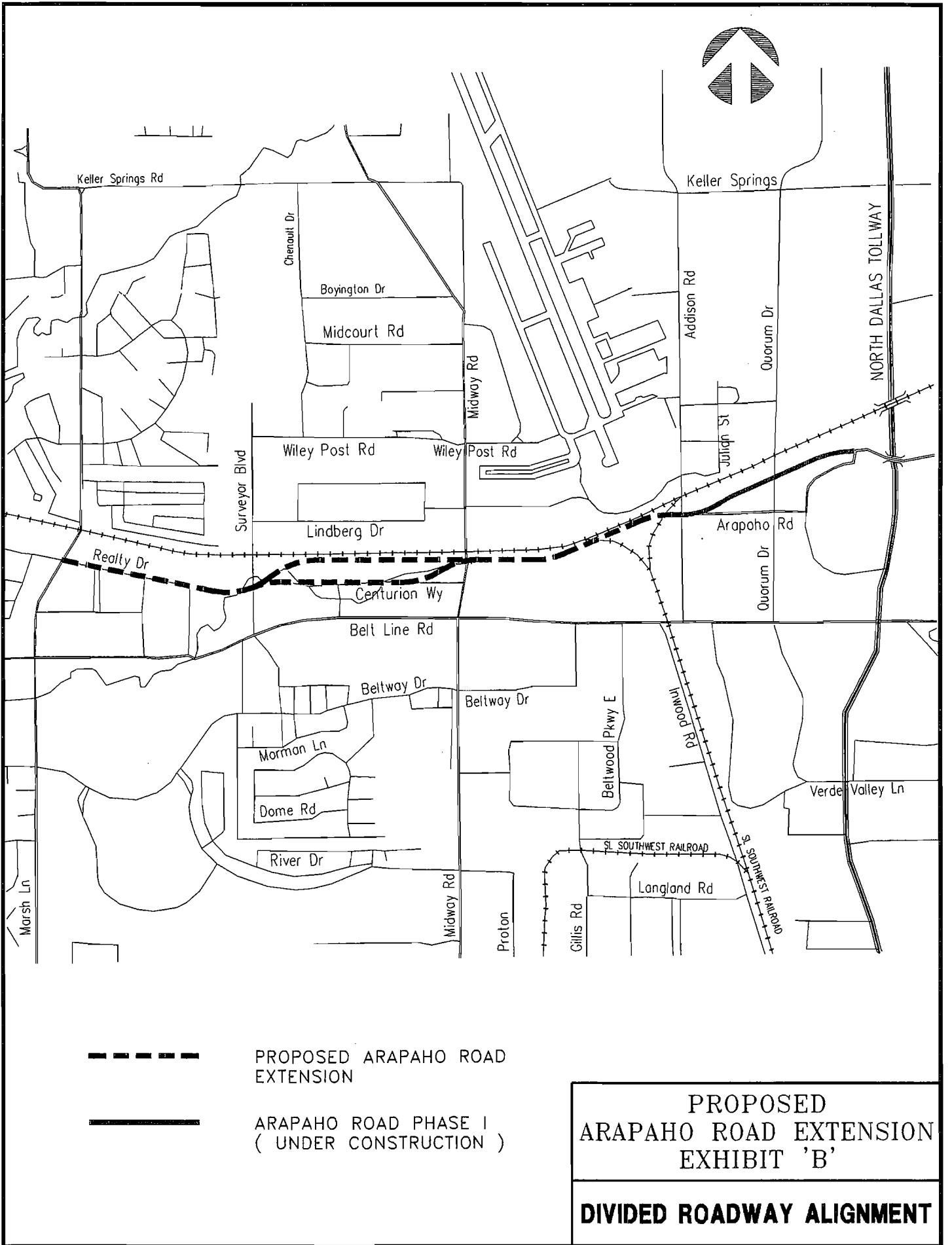
The divided roadway alignment requires the purchase of Charter Furniture and a smaller portion of the Mini Warehouse property than the Centurion Way alignment. This alignment also provides less convenient access for vehicles entering or exiting the buildings onto a one-way roadway rather than existing Centurion Way, which currently carries two-way traffic. Should access to westbound Arapaho Road be permitted along the divided roadway, motorists may attempt to cut through private parking lots to avoid circuitry of travel. If an underpass or overpass were constructed at Midway Road, access to the buildings closest to Midway would be more severely impacted.

After an evaluation of the negative impacts to the developments along Centurion Way, it was determined that this alignment was not desirable.

2.3 DART Railroad Alignment

The DART railroad alignment varies significantly from the Centurion Way alignment between Midway Road and Surveyor Boulevard. This alignment, which generally follows the westbound lanes of the divided roadway, is located next to the DART railroad from Midway Road to the Mini Warehouses where it curves toward the southeast across a corner of the Mini Warehouse property. It then crosses Surveyor Boulevard at an angle before curving back toward the east in order to match existing Realty Road. (See Exhibit C).

This alignment allows Centurion Way to remain in place as a service road for the adjacent buildings. Furthermore, the roadway can be configured such that no purchase of the Charter Furniture building is required, and only a corner of the Mini Warehouse property is impacted.



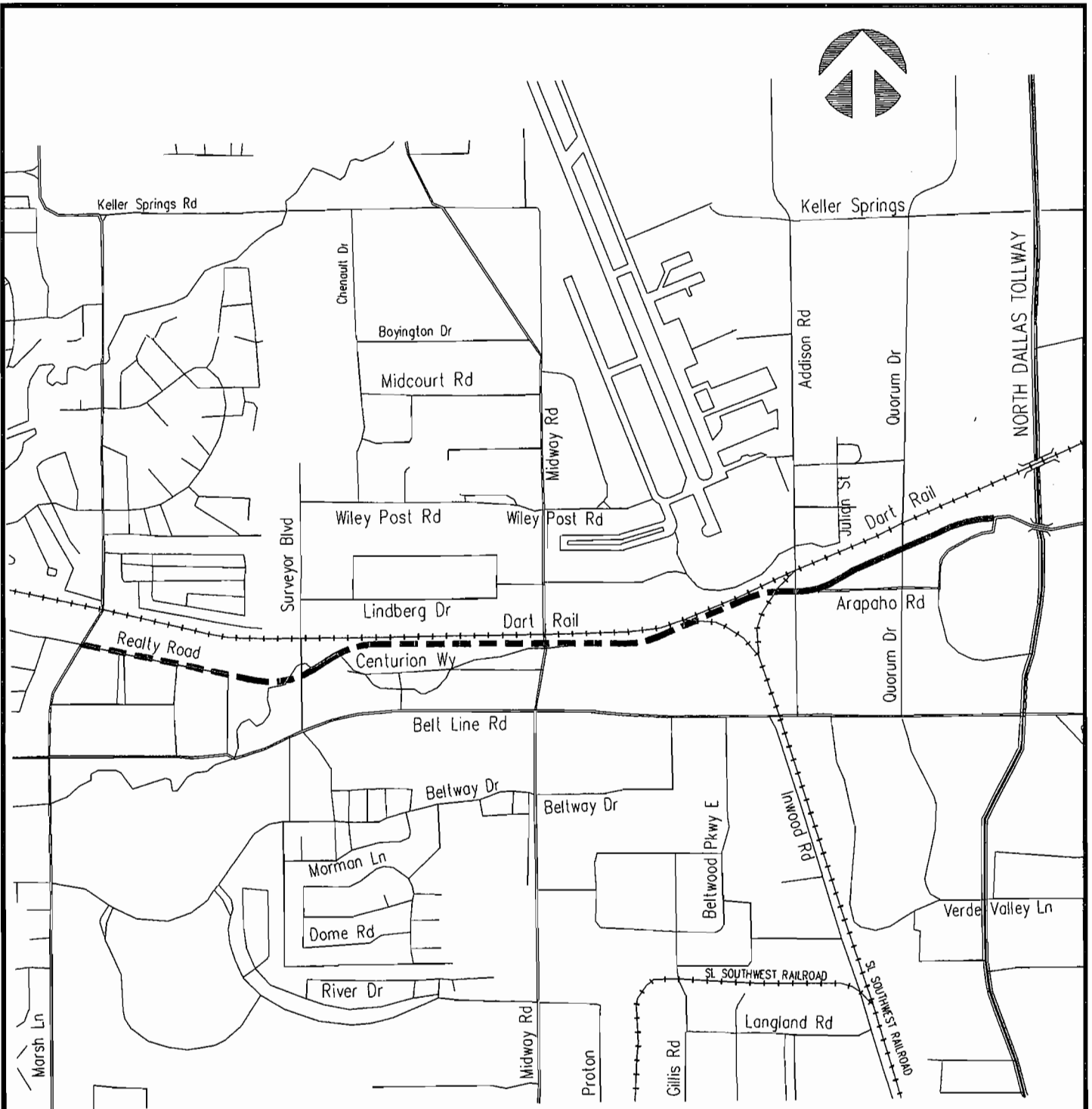
PROPOSED ARAPAHO ROAD
EXTENSION



ARAPAHO ROAD PHASE I
(UNDER CONSTRUCTION)

**PROPOSED
ARAPAHO ROAD EXTENSION
EXHIBIT 'B'**

DIVIDED ROADWAY ALIGNMENT



PROPOSED ARAPAHO ROAD
EXTENSION



ARAPAHO ROAD PHASE I
(UNDER CONSTRUCTION)

PROPOSED
ARAPAHO ROAD EXTENSION
EXHIBIT 'C'

DART RAILROAD ALIGNMENT

Alternative Alignments (cont'd)

The narrowest portion of the alignment is between the MNBA building and the DART right-of-way where 81 feet is available. Although there are no franchise utilities to contend with, a 60-inch Dallas Water Utility (DWU) transmission main is located in a 30-foot easement adjacent to the railroad. A concrete-lined channel is also located along this alignment between Midway Road and the Town of Addison water tower.

Given the potential access and cost benefits associated with the DART railroad alignment, a more in-depth evaluation of its viability was conducted.

2.4 Traffic Analysis

At this point in the study, the project team reviewed traffic assignments for the year 2020 which were prepared by the North Central Texas Council (NTCOG) of Governments for five alternatives for the Arapaho Road Extension. Two of these alternatives included entry and exit ramps at Midway Road, one with entry/exit ramps on the north side only and a second with entry/exit ramps on the south side only. These alternatives are described below.

- xviii) "No Build" Alternative – what is the impact on adjacent streets if Arapaho Road is not extended?
- ii) "At-Grade" Alternative – Arapaho Road extended with the Midway Road intersection at grade.
- iii) "Grade-Separated" Alternative – Arapaho Road extended with a grade separation at Midway Road without entry/exit ramps.
- iv) "Ramps on the North Side" Alternative – Arapaho Road extended with a grade separation at Midway Road and entry/exit ramps on the north side of Arapaho Road.
- v) "Ramps on the South Side" Alternative – Arapaho Road extended with a grade separation at Midway Road and entry/exit ramps on the south side of Arapaho Road.

2.4.1 Projected Traffic Volumes

The following table presents a summary of projected traffic impacts for the extension of Arapaho Road on Belt Line Road and Midway Road assuming that the Keller Springs tunnel is in service.

Alternative Alignments (cont'd)

TRAFFIC VOLUME COMPARISON (PROJECTED DAILY TRAFFIC VOLUMES BY YEAR 2020)

SEPARATED	GRADE SEPARATED GRADE				
	NO BUILD	AT GRADE	GRADE SEPARATED	WITH RAMPS ON NORTH SIDE	WITH RAMPS ON SOUTH SIDE
ARAPAHO ROAD					
Addison to Midway	-	24,000	13,000	18,000	28,000
Midway to Surveyor	-	6,000	13,000	17,000	17,000
BELT LINE ROAD					
Addison to Midway	58,000	53,000	54,000	46,000	50,000
Midway to Surveyor	47,000	46,000	42,000	42,000	45,000
MIDWAY ROAD					
North of Arapaho	52,000	36,000	44,000	44,000	32,000
South of Arapaho	58,000	57,000	44,000	50,000	60,000
South of Belt Line	-	52,000	46,000	47,000	52,000

2.4.2 Evaluation of Traffic Volumes

The existing congestion on Belt Line Road and Midway Road supports an extension of Arapaho Road. Traffic already backs up on Midway Road from Belt Line Road to north of the DART railroad much of the day; consequently, an at-grade crossing of Arapaho Road at Midway Road may not be feasible without providing dual-coordination of the traffic signals along Midway and Belt Line Roads. The grade separated scenarios, with or without ramps, all reduce traffic on Belt Line and Midway Roads with the exception of the section of Midway Road between proposed Arapaho Road and Belt Line Road with ramps on the south side.

For the grade separated scenario without ramps, year 2020 volumes on Belt Line Road are projected to be approximately 5,000 vehicles per day (vpd) less with Arapaho Road extended. Volumes on Midway Road are projected to be reduced by 8,000 to 12,000 vpd. Arapaho Road is projected to carry 13,000 vpd from Addison Road to Marsh Lane if no entry or exit ramps are installed at Midway Road.

According to the projected traffic volumes, the extension of Arapaho Road can be constructed as a four-lane undivided roadway if no entry or exit ramps are installed at Midway Road. It should be noted that even though these traffic studies contain a large margin for error, they do serve to support the grade separated configuration with no ramps at Midway Road.

Alternative Alignments (cont'd)

2.5 Options Studied for DART Railroad Alignment

After the project team selected the DART Railroad alignment for a more detailed analysis, the following six horizontal and vertical alignment options were considered.

2.5.1 Option 1 -- Overpass at Midway Road with Entry/Exit Ramps on the North Side of Proposed Arapaho Road

Option 1 requires the purchase of the Charter Furniture and MNBA buildings in order to construct a four-lane undivided roadway and provide a safe merge length for the westbound entry ramp on the north side of proposed Arapaho Road. Permission would be required with this option to construct the entry and exit ramps within the DWU easement, however, these ramps would be constructed at grade.

2.5.2 Option 2 -- Underpass at Midway Road with Entry/Exit Ramps on the North Side of Proposed Arapaho Road

Like Option 1, Option 2 requires the purchase of the Charter Furniture and MNBA buildings, and the use of the DWU easement for the at-grade entry and exit ramps. In addition, the probable construction sequence for an underpass would require the removal of one half of Midway Road at a time. As a result, Midway Road would have to be realigned and narrowed to two lanes through the construction zone. Four lanes of traffic could be provided by installing temporary pavement on the outside of each segment. The underpass construction could affect Midway Road in this manner for up to a year.

2.5.3 Option 3 -- Overpass at Midway Road Without Ramps

Option 3 follows an alignment similar to Option 1 through the Charter Furniture building, however, without ramps, no taking of the MNBA is required. This option provides more working space between proposed Arapaho Road and the DART railroad on both sides of Midway Road. No roadway improvements would be required in the DWU easement.

2.5.4 Option 4 -- Underpass at Midway Road Without Ramps

Option 4 follows the same alignment as the overpass without ramps (Option 3) through the Charter Furniture building. It also presents the same construction sequencing challenges as the underpass option with ramps (Option 2) at Midway Road.

Alternative Alignments (cont'd)

2.5.5 Option 5 -- Overpass Without Ramps, No Taking of Charter Furniture Warehouse

Option 5 places the north right-of-way line 20-feet off the DART right-of-way from Midway Road to the Mini Warehouse property. This requires the use of the southern 10 feet of the 30-foot DWU easement but does not require taking either the Charter Furniture or the MNBA buildings. Furthermore, this option places the edge of the overpass structure approximately 10 feet from the MNBA building. The existing concrete-lined channel next to the DWU water main would need to be replaced with double 9'x5' box culverts under the overpass structure.

2.5.6 Option 6 -- Underpass Without Ramps, No Taking of Charter Furniture Warehouse

Option 6 follows the same alignment as the overpass without taking the Charter Furniture building, however, it presents the same construction sequencing challenges as the other underpass options. In addition, this option would require the installation of box culverts on the north side of the railroad to replace the concrete-lined channel presently on the south side. If a minimal separation were to be provided from the box culverts to an existing 12-inch sanitary sewer line, the edge of the boxes would be approximately five feet from several existing buildings. In addition, multiple drainage and utility relocations would be required under the railroad tracks at Midway Road, and the box culverts would need to cross back under the railroad further to the west.

2.6 Evaluation of DART Railroad Alignment Options

Horizontal and vertical alignments, along with Opinions of Probable Cost, were prepared for Options 1 through 5. These costs are included in a matrix of issues related to these options, in addition to Option 6, at the end of this section.

Due to extensive utility relocations in a tight construction corridor, the viability of Option 6 is questionable at this point. If the Town wanted to pursue this option, further coordination would be necessary with DART and DWU prior to developing an Opinion of Probable Cost.

The primary goal expressed by Town of Addison staff for this project is to relieve congestion on Belt Line Road. All the options will provide some relief to Belt Line Road.

Three overpass and three underpass options were evaluated, and in each case the corresponding underpass option was more expensive. Although no cost was prepared for Option 6, it is certain that the extensive utility relocations required would result in its cost exceeding that of Option 5. An underpass may be more visually appealing than an overpass, however, the narrowing of Midway Road would increase traffic delays during the 12 months

Alternative Alignments (cont'd)

of construction. Although an underpass would create less noise impact, only five commercial buildings are located within the overpass limits on both sides of the railroad, including Charter Furniture.

As a result of the increased project cost and the impact on Midway Road traffic during construction associated with the underpass options, an overpass is preferred.

Overpass Option 1 requires the purchase of the Charter Furniture and MNBA buildings in order to make the entry ramp onto Arapaho Road safe at the merge point. Overpass Option 3, like Option 5, has no ramps, however, it would require the purchase of the Charter Furniture building. Of the three overpass options, Option 5 is the only one which does not require the purchase of either the Charter Furniture or MNBA buildings. Option 5 places the edge of the overpass structure 10 feet from the MNBA building and 15 feet from the Charter Furniture building, with a two-and-a-half-foot sidewalk for emergency access on both sides of the overpass. In addition, it would require DWU to accept 20 feet for maintenance of their 60-inch water line.

Given the escalating cost of real estate and the traffic impacts, neither the additional construction area associated with Option 3 nor the ramps associated with Option 1 appear to justify the required property purchases. Therefore, it is our recommendation that Option 5, an overpass without ramps at Midway Road and no building takes at this location, be selected as the Technically Preferred Alternative.

ARAPAHO ROAD ALIGNMENT OPTIONS
Midway Road Section — Matrix of Issues

DESCRIPTION OF ISSUE	OPTION 1 Overpass with ramps on north side	OPTION 2 Underpass with ramps on north side	OPTION 3 Overpass without ramps	OPTION 4 Underpass without ramps	OPTION 5 Overpass without ramps; without building take	OPTION 6 Underpass without ramps; without building take
Alignment Description	Separated from railroad right-of-way	Same as 1	Same as 1	Same as 1	Adjacent to railroad right-of-way	Same as 5
Charter furniture building take	Yes	Yes	Yes	Yes	No	No
MBNA building take (for ramp safety)	Yes	Yes	No	No	No	No
Relocate DWU water line	No	No	No	No	No	Yes
Noise	Yes	No	Yes	No	Yes	No
Realign Midway for construction sequence (4 lanes)	No	Yes	No	Yes	No	Yes
Sump storm sewer	No	Yes	No	Yes	No	Yes
Move box culvert to north side of R/R; other utility relocations	No	No	No	No	No	Yes
Opinion of Probable Cost (with 20% contingency)	\$20,160,648	\$20,678,292	\$19,760,712	\$20,631,576	\$17,191,464	N/A

The Technically Preferred Alternative (TPA), as shown in the Exhibit D map pocket, follows the DART railroad alignment and Option 5 between Midway Road and Surveyor Boulevard which avoids taking either the Charter Furniture or the MNBA buildings. This section discusses some of the issues and costs associated with the TPA.

3.1 Coordination Issues**3.1.1 DWU Easement**

The TPA will require the use of the southern 10 feet of a 30-foot DWU easement which is contiguous with the DART railroad right-of-way. The DWU easement contains a 60-inch water transmission main which is located approximately six feet off the DART right-of-way to the center of the pipe. A written request has been made to DWU regarding the use of a portion of their easement, and negotiations are pending.

3.1.2 Railroad Crossing

A report has been prepared that will be submitted to Union Pacific requesting permission to cross the wye spur. This report includes a commitment to place a fully signalized gate at the crossing.

3.1.3 Realty Road Section

The traffic volumes indicate that a four-lane undivided roadway would be adequate along the existing Realty Road alignment. Omitting a median from most of this section of the project would minimize the impact on adjacent parking lots and driveways. The roadway could still be widened for turn lanes at Midway Road and Surveyor Boulevard.

3.1.4 Construction Sequencing

Construction sequencing plans will still be necessary at the intersections along the TPA, although far less extensive measures will be necessary than those required for an underpass at Midway Road. For example, some drainage and utility relocations will be necessary, particularly at Midway Road and Surveyor Boulevard.

3.1.5 Overpass Aesthetics

Measures can be taken to improve the aesthetics of the Midway Road overpass to integrate the structure with the neighborhood. Discussions with the owners of Charter Furniture and the MNBA buildings have also resulted in an evaluation of extending the column supports from Midway Road to the west end of the MNBA building in

Technically Preferred Alternative (cont'd)

order to maintain visibility of Charter Furniture for southbound motorists on Midway Road and to facilitate covered parking under the roadway deck for both properties. Exhibit D is a digitally enhanced photograph of the proposed Midway Road overpass looking south.

3.1.6 Right-of-way and Building Acquisition

Building acquisitions will include the Metro Brick Company building at Addison Road, a portion of the Mini Warehouse facility on the east side of Surveyor Boulevard, and eight commercial buildings in the Addison West Industrial Park on the west side of Surveyor.

A right-of-way strip map has been included as Exhibit E in a map pocket at the back of this report. It gives estimated right-of-way takes from the properties affected by this project along with remainders of these properties which will be unusable as a result of the roadway construction.

3.2 Project Phasing

The Town of Addison may wish to consider phasing the construction of the Technically Preferred Alignment. This section describes two separate phases of construction.

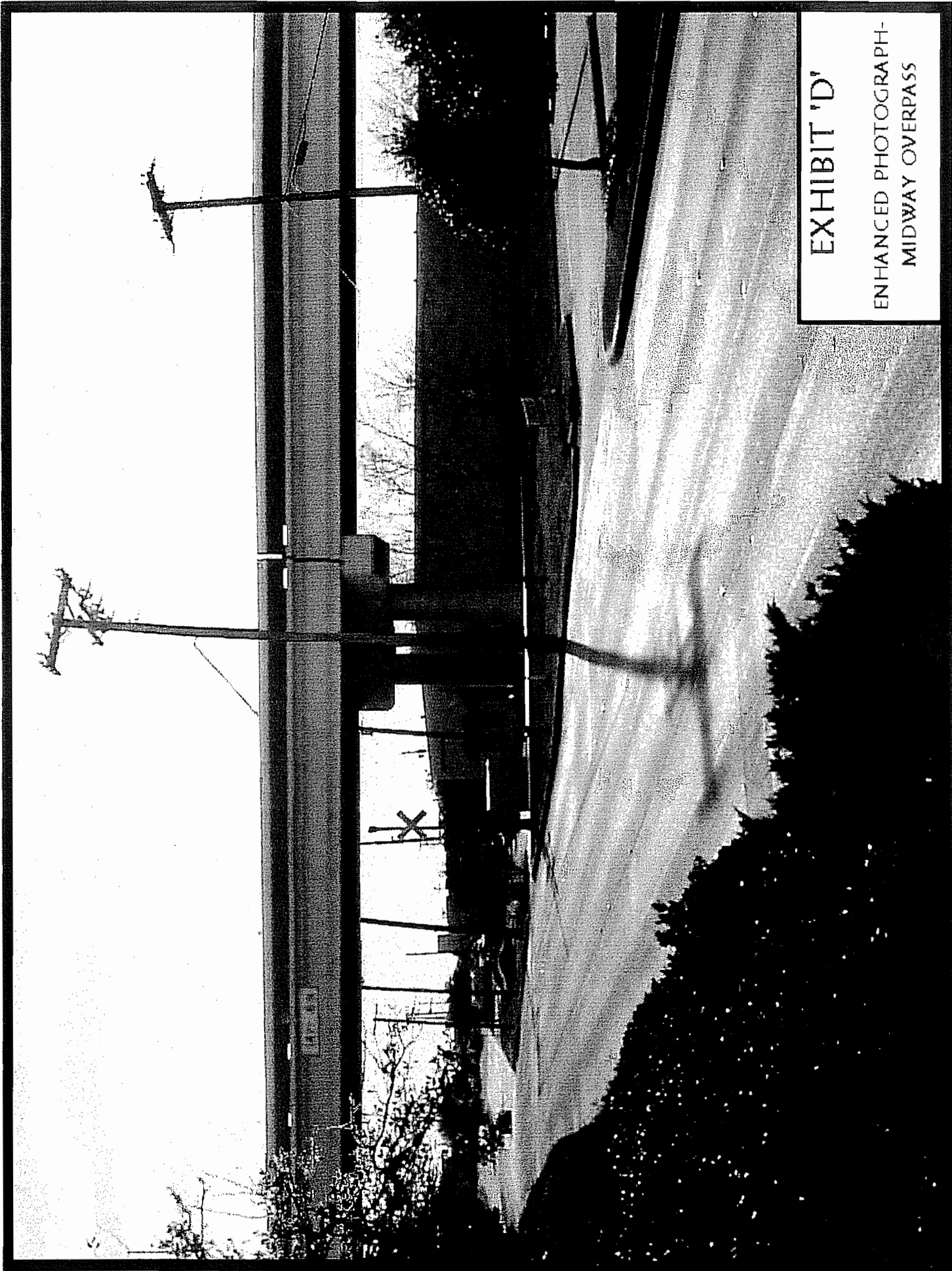
3.2.1 Phase 1 - Marsh Lane to Surveyor Boulevard

The expansion of existing Realty Road east of Marsh Lane and the extension of Realty Road from the 90° bend at Commerce Street east to Surveyor Boulevard could be constructed separately from the balance of the project. This would provide a direct four-lane connection from Marsh Lane to Surveyor Boulevard for east- and west-bound traffic. Realty Road would be widened from a 41-foot wide two-lane roadway to a 45-foot four lane undivided roadway within its existing limits. The estimated construction cost for this phase, including right-of-way, is \$ 4,093,344.00.

3.2.2 Phase 2 - Surveyor Boulevard to Addison Road

The overpass at Midway Road dictates that the roadway be constructed from Addison Road to Surveyor Boulevard as one phase. Although this is most important phase in order to relieve traffic congestion on Belt Line Road, it is also the most

EXHIBIT 'D'
ENHANCED PHOTOGRAPH-
MIDWAY OVERPASS



Technically Preferred Alternative (cont'd)

costly and time-consuming phase to complete. It includes coordination with Union Pacific to obtain a crossing of the wye spur and Dallas Water Utilities to obtain use of 10 feet of their 30-foot easement. In addition, the overpass of Midway Road is the most costly portion of this project. The estimated construction cost for this phase, including right-of-way, is \$ 13,098,120.00.

3.3 Cost Estimates

This section provides construction cost estimates for the two phases identified previously. Estimates have also been included for the right-of-way and other property takes along the project alignment. The combined estimated cost for both phases is \$ 17,191,464.00.

TOWN OF ADDISON, TEXAS

HNTB / GBW Engineers 02/16/99

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

OPTION 5 - MARSH LANE TO SURVEYOR BLVD. - Phase 1

ITEM NO	ITEM DESCRIPTION ROADWAY	UNIT	QUANTITY	ENGINEERS ESTIMATE	
				UNIT PRICE	AMOUNT
100	PREP. & MAINT. OF RIGHT-OF-WAY	STA	24.0	\$ 2,500.00	\$ 60,000.00
104	REMOVE OLD CONCRETE (PVMT.)	SY	8,440	\$ 3.00	\$ 25,320.00
110	EXCAVATION (ROADWAY)	CY	16,000	\$ 3.20	\$ 51,200.00
132	EMBANKMENT (ORDINARY COMPACTION)	CY	2,000	\$ 8.50	\$ 17,000.00
260	LIME TREATED SUBGRADE (6 in) (Mainline)	SY	15,200	\$ 3.00	\$ 45,600.00
360	CONCRETE PAVEMENT (10 in) (Mainline)	SY	15,200	\$ 31.00	\$ 471,200.00
360	MONOLITHIC CURB (TYPE A) (6 in)	LF	7,500	\$ 2.00	\$ 15,000.00
500	MOBILIZATION	LS	1	\$ 70,000.00	\$ 70,000.00
502	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	\$ 100,000.00	\$ 100,000.00
666	REFLECT PAVE MARKINGS	LF	20,000	\$ 1.50	\$ 30,000.00
*	LIGHTING	LF	3,400	\$ 35.00	\$ 119,000.00
*	TRAFFIC SIGNALS (PER INTERSECTION)	EA	2	\$ 120,000.00	\$ 240,000.00
681	TEMPORARY TRAFFIC SIGNAL	EA	2	\$ 10,000.00	\$ 20,000.00
	LANDSCAPING	LS	1	\$ 100,000.00	\$ 100,000.00
	INLETS	EA	5	\$ 2,500.00	\$ 12,500.00
	MANHOLES	EA	5	\$ 5,000.00	\$ 25,000.00
	LATERALS	LF	50	\$ 50.00	\$ 2,500.00
	24" RCP	LF	3,000	\$ 50.00	\$ 150,000.00
	30" RCP	LF	220	\$ 65.00	\$ 14,300.00
	36" RCP	LF	500	\$ 80.00	\$ 40,000.00
	2 - 10' X 7' RCBC	LF	130	\$ 850.00	\$ 110,500.00
	HEADWALL CONCRETE	CY	30	\$ 600.00	\$ 18,000.00
	REMOVE CONCRETE CHANNEL LINING	SY	700	\$ 10.00	\$ 7,000.00
	REMOVE/REPLACE CONCRETE CHANNEL LINING	SY	200	\$ 60.00	\$ 12,000.00
	OTHER UTILITY RELOCATIONS	LS	1	\$ 15,000.00	\$ 15,000.00
	RIGHT-OF-WAY	LS	1	\$ 1,540,000.00	\$ 1,540,000.00
	DEMOLITION	LS	1	\$ 100,000.00	\$ 100,000.00
	SUBTOTAL				\$ 3,411,120.00
	20% CONTINGENCY				\$ 682,224.00
TOTAL CONSTRUCTION COST					\$ 4,093,344.00

TOWN OF ADDISON, TEXAS

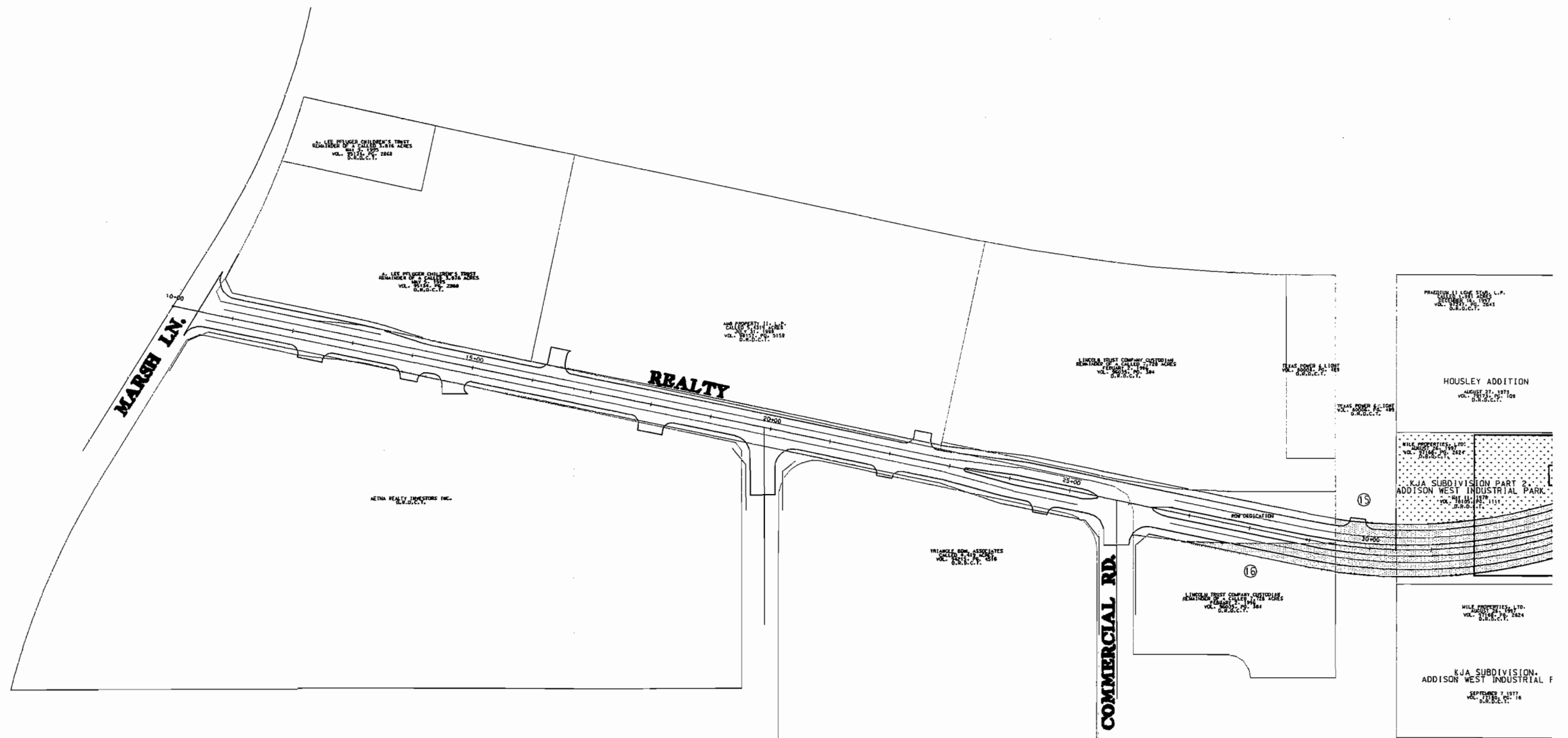
HNTB / GBW Engineers 02/16/99

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

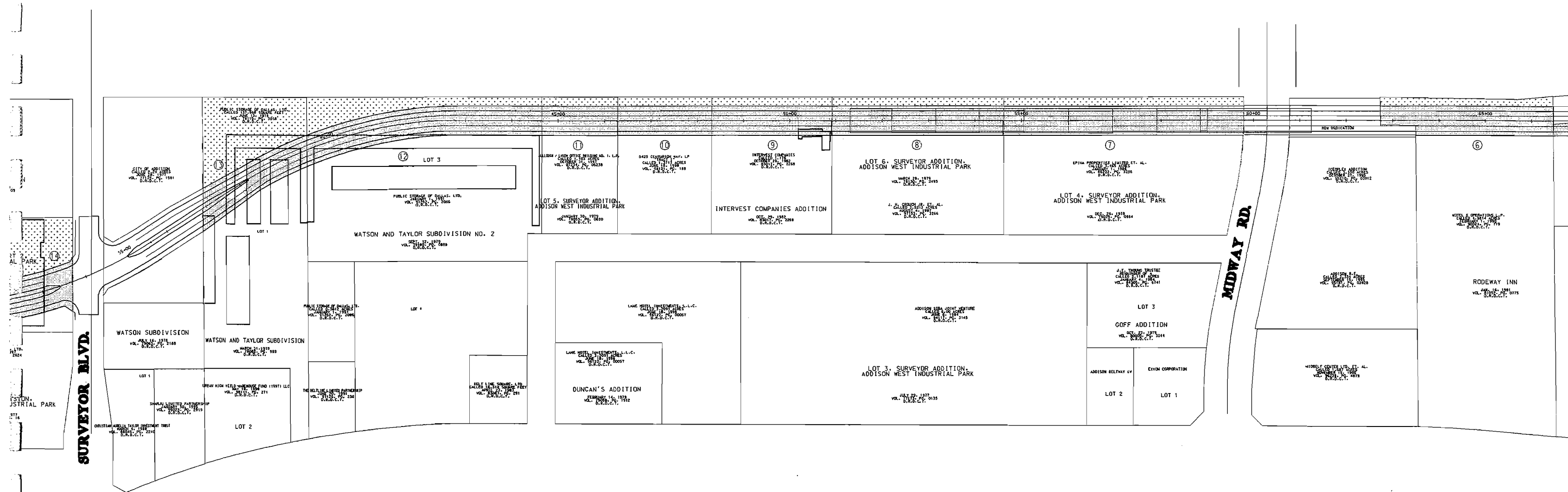
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

OPTION 5 - SURVEYOR BLVD. TO ADDISON ROAD - Phase 2

ITEM NO	ITEM DESCRIPTION ROADWAY	UNIT	QUANTITY	ENGINEERS ESTIMATE	
				UNIT PRICE	AMOUNT
100	PREP. & MAINT. OF RIGHT-OF-WAY	STA	54.0	\$ 2,500.00	\$ 135,000.00
104	REMOVE OLD CONCRETE (PVMT.)	SY	500	\$ 3.50	\$ 1,750.00
110	EXCAVATION (ROADWAY)	CY	7,000	\$ 3.20	\$ 22,400.00
132	EMBANKMENT (ORDINARY COMPACTION)	CY	34,000	\$ 8.50	\$ 289,000.00
260	LIME TREATED SUBGRADE (6 in) (Mainline)	SY	24,200	\$ 3.00	\$ 72,600.00
360	CONCRETE PAVEMENT (10 in) (Mainline)	SY	23,200	\$ 31.00	\$ 719,200.00
360	MONOLITHIC CURB (TYPE A) (6 in)	LF	11,500	\$ 2.00	\$ 23,000.00
423	RETAINING WALL (CAST IN PLACE)	SF	21,000	\$ 32.00	\$ 672,000.00
500	MOBILIZATION	LS	1	\$ 100,000.00	\$ 100,000.00
502	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	\$ 100,000.00	\$ 100,000.00
666	REFLECT PAVE MARKINGS	LF	25,000	\$ 1.50	\$ 37,500.00
*	LIGHTING	LF	5,400	\$ 35.00	\$ 189,000.00
*	TRAFFIC SIGNALS (PER INTERSECTION)	EA	1	\$ 120,000.00	\$ 120,000.00
	RAILROAD SIGNALS, CROSSING	EA	2	\$ 250,000.00	\$ 500,000.00
681	TEMPORARY TRAFFIC SIGNAL	EA	1	\$ 10,000.00	\$ 10,000.00
	LANDSCAPING	LS	1	\$ 150,000.00	\$ 150,000.00
*	STRUCTURE	SF	51,000	\$ 35.00	\$ 1,785,000.00
	INLETS	EA	25	\$ 2,500.00	\$ 62,500.00
	MANHOLES	EA	5	\$ 5,000.00	\$ 25,000.00
	LATERALS	LF	1,180	\$ 50.00	\$ 59,000.00
	24" RCP	LF	3,000	\$ 50.00	\$ 150,000.00
	30" RCP	LF	1,310	\$ 65.00	\$ 85,150.00
	36" RCP	LF	500	\$ 80.00	\$ 40,000.00
	6' X 5' RCBC	LF	260	\$ 250.00	\$ 65,000.00
	7' X 5' RCBC	LF	400	\$ 300.00	\$ 120,000.00
	9' X 5' RCBC	LF	500	\$ 350.00	\$ 175,000.00
	2 - 7' X 5' RCBC	LF	800	\$ 550.00	\$ 440,000.00
	2 - 9' X 5' RCBC	LF	1,460	\$ 700.00	\$ 1,022,000.00
	2 - 10' X 6' RCBC	LF	920	\$ 800.00	\$ 736,000.00
	HEADWALL CONCRETE	CY	30	\$ 600.00	\$ 18,000.00
	REMOVE CONCRETE CHANNEL LINING	SY	10,500	\$ 10.00	\$ 105,000.00
	REMOVE/REPLACE CONCRETE CHANNEL LINING	SY	1,100	\$ 60.00	\$ 66,000.00
	OTHER UTILITY RELOCATIONS	LS	1	\$ 70,000.00	\$ 70,000.00
	RIGHT-OF-WAY	LS	1	\$ 2,650,000.00	\$ 2,650,000.00
	DEMOLITION	LS	1	\$ 100,000.00	\$ 100,000.00
	SUBTOTAL				\$ 10,915,100.00
	20% CONTINGENCY				\$ 2,183,020.00
TOTAL CONSTRUCTION COST					\$ 13,098,120.00

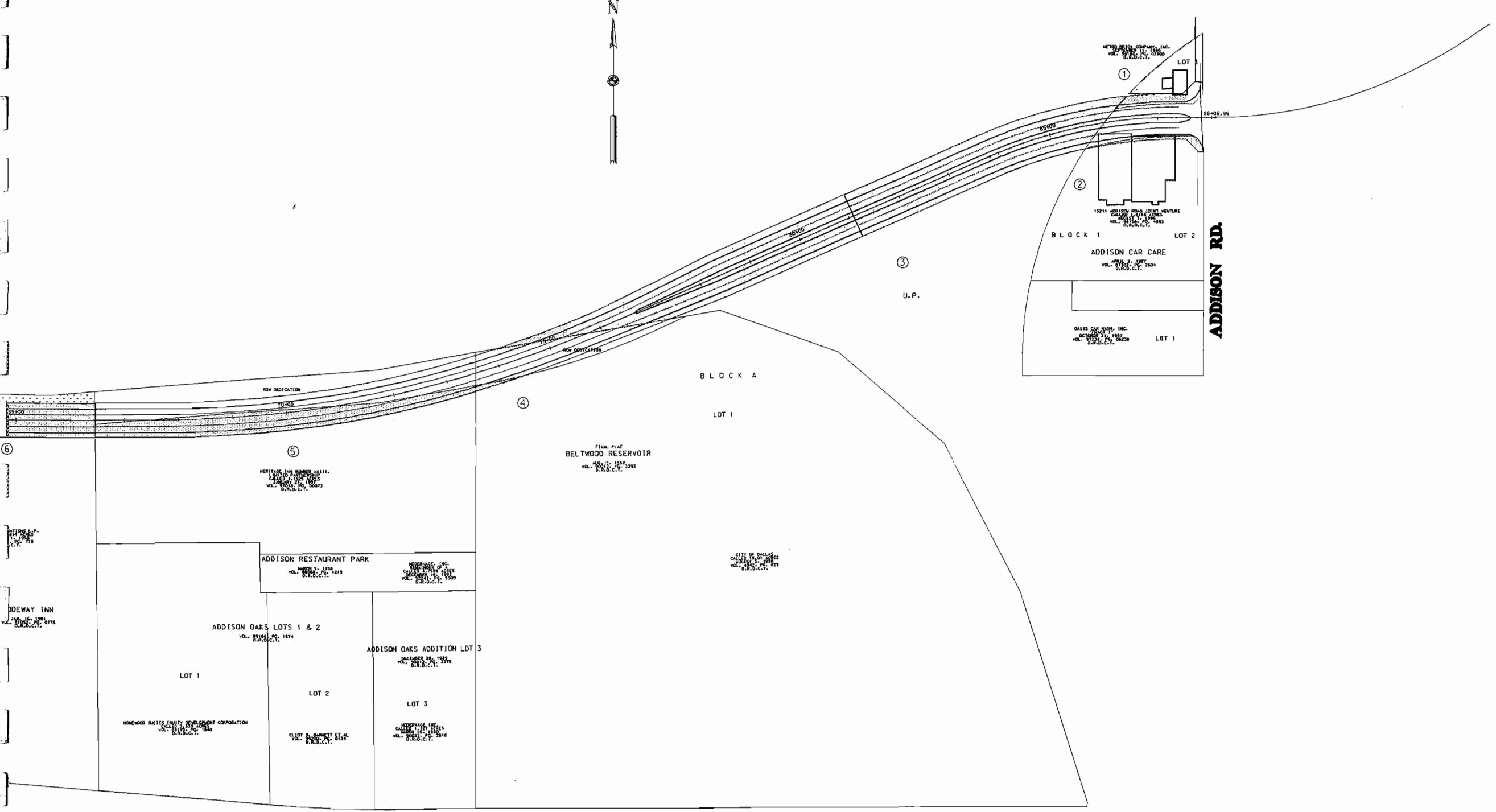


NO.	OWNER	AREA(SQ/FT)	REMAINDER AREA(SQ/FT)
1	METRO BRICK COMPANY INC.	3,200.08	
2	15211 ADDISON ROAD JOINT VENTURE	1,255.40	
3	U.P.	83,520.40	
4	BELTWOOD RESERVOIR	469.70	
5	HERITAGE INN NUMBER XXIII, L.P.	20,857.50	
6	MOTEL 6 OPERATIONS L.P.	21,911.97	6,177.96
7	EPINA PROPERTIES LTD. ET. AL.	32,680.32	9,617.88
8	J.H. CROUCH JR. ET. AL.	23,350.43	6,870.53
9	INTERVEST COMPANIES	16,487.29	4,851.15
10	5425 CENTURION WAY, L.P.	12,755.02	3,753.03
11	BULLDOG/LYKOW OFFICE BUILDING NO. 1, L.P.	10,276.70	3,023.91
12	PUBLIC STORAGE OF DALLAS, LTD.	32,504.04	16,046.64
13	PUBLIC STORAGE OF DALLAS, LTD.	17,350.90	3,0513.43
14	NILE PROPERTIES, LTD.	28,344.37	42,078.66
15	TEXAS POWER & LIGHT	8,604.30	
16	LINCOLN TRUST COMPANY CUSTODIAN	5,618.00	



SURVEYOR BLVD.

MIDWAY RD.



NO.	DATE	REVISION	APPROV.

RIGHT-OF-WAY STRIP MAP

ARAPAHO ROAD EXTENSION

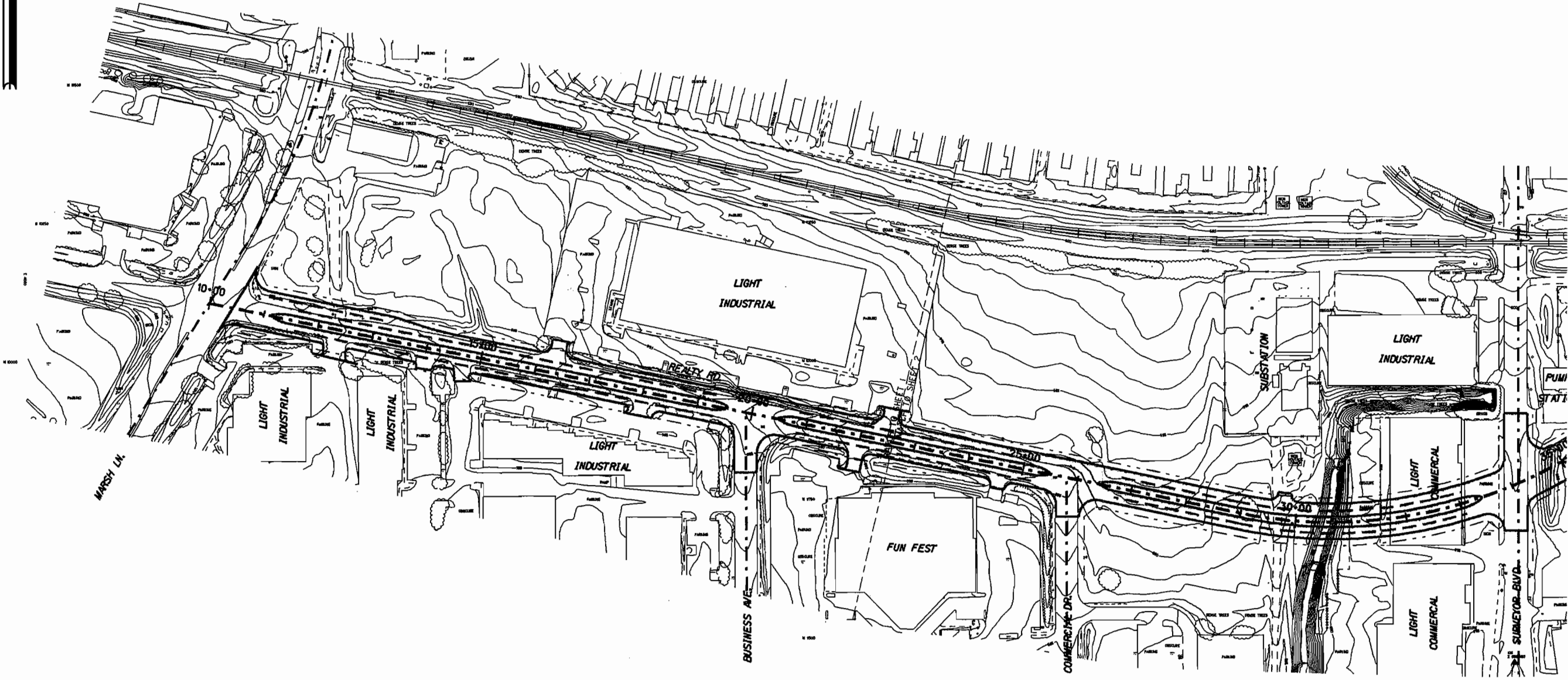
MARSH LAKE TO ADDISON ROAD

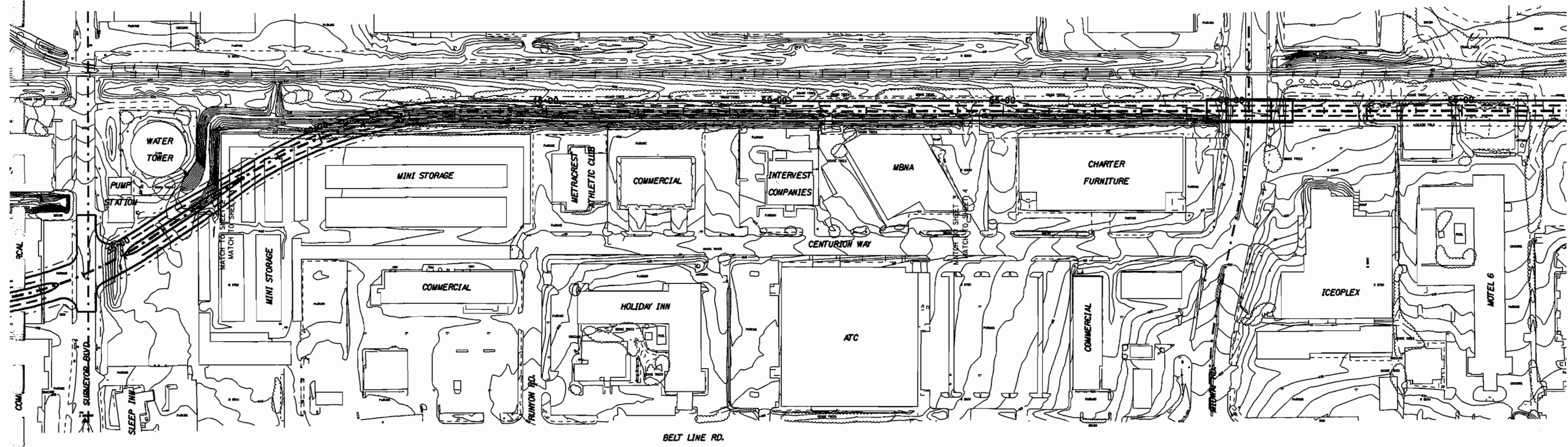
TOWN OF ADDISON, TEXAS

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

DESIGN	DRAWN	APPR.	SCALE	DATE	PROJECT NO.	SHEET NO.
CTD	CTD	DSB	1"=200'	09/18/98	25768	\$PHQ\$

ALTERNATE 5 OVERPASS WITHOUT RAMPS





ADDISON AIRPORT (ADS)
DALLAS COUNTY, TX

USPS

38-16

ADDISON RD

CITY OF DALLAS
WATER RESERVOIR

SUPER 8

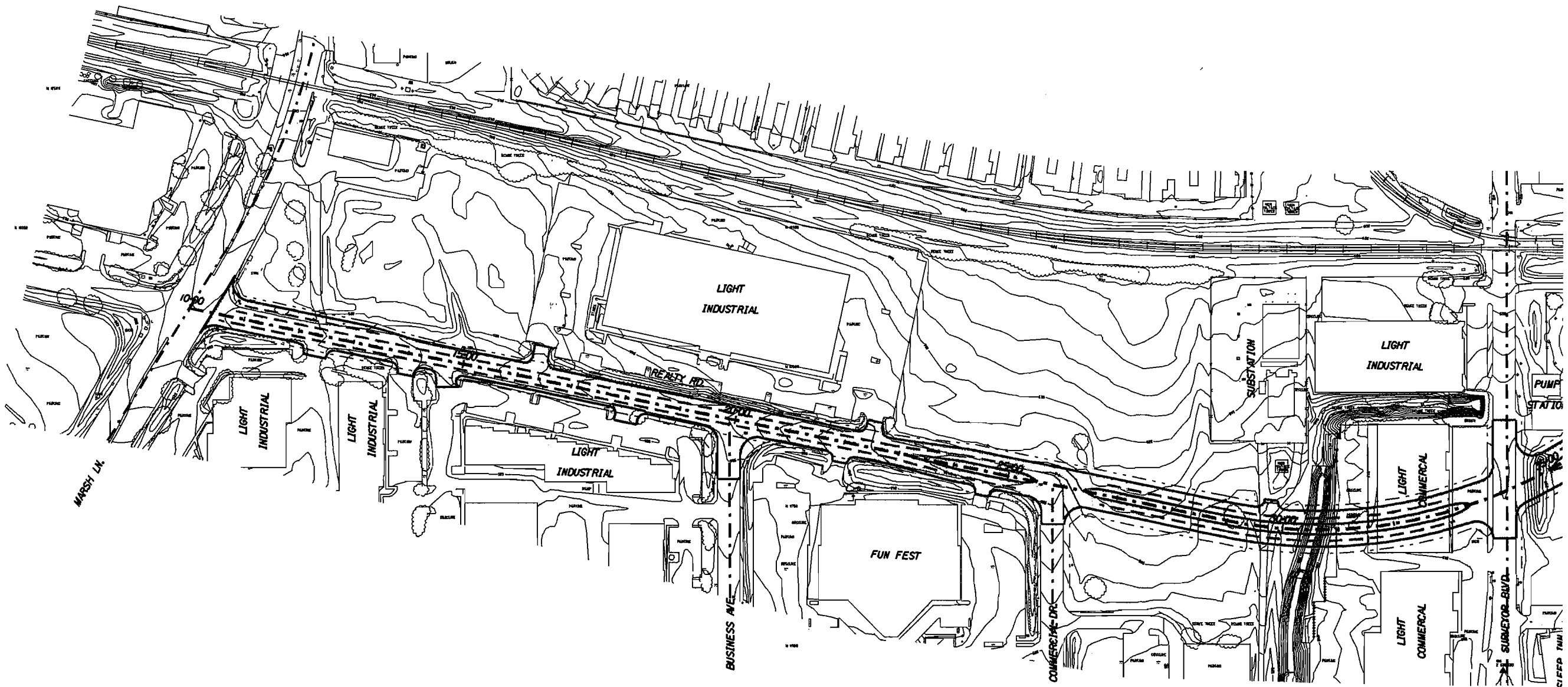
HOMewood SUITES

MOTEL 6

WATCH TO SHEET 4
MATCH TO SHEET 5

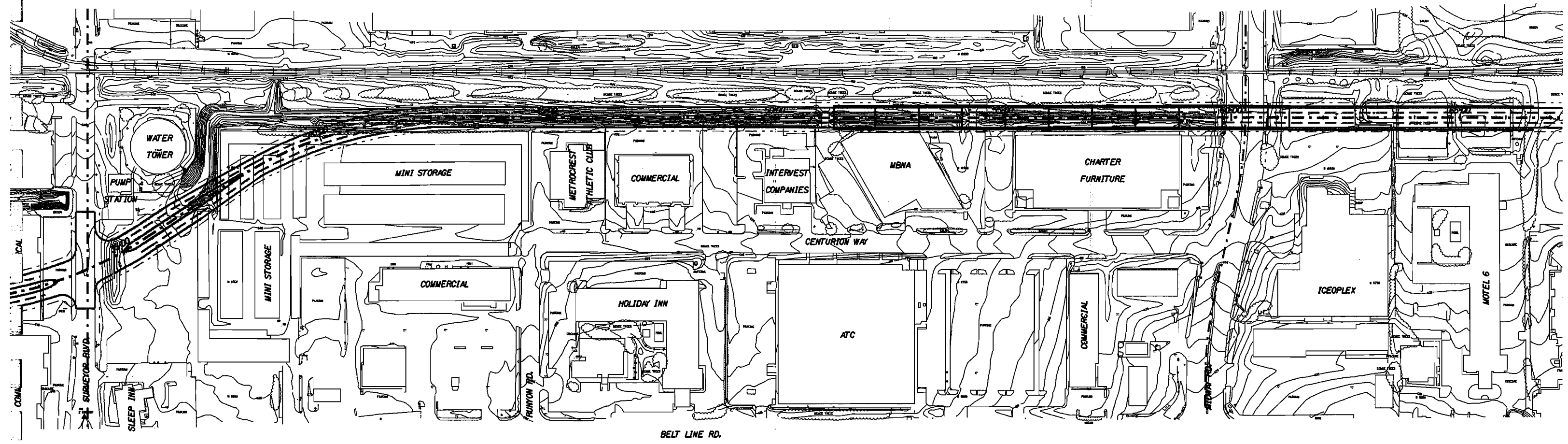
MATCH WATCH TO SHEET 5

NO.	DATE	REVISION	APPROV.			
CONCEPTUAL ALIGNMENT STUDIES						
ARAPAHO ROAD EXTENSION						
MARSH ROAD TO ADDISON ROAD						
TOWN OF ADDISON, TEXAS						
<small>ARCHITECTS ENGINEERS PLANNERS The JETZ Group</small>						
DESIGN	DRAWN	APPR.	SCALE	DATE	PROJECT NO.	SHEET NO.
CTD	CTD	DSB	1"=200'	09/18/98	25768	\$PNO\$



50750

50750



ADDISON AIRPORT (ADS)
DALLAS COUNTY, TX

USPS

88-07

ADDISON RD.

SUPER 8

CITY OF DALLAS
WATER RESERVOIR

MOTEL 6

HOMWOOD SUITES

NO.	DATE	REVISION	APPROV.			
CONCEPTUAL ALIGNMENT STUDIES						
ARAPAHO ROAD EXTENSION						
MARSH ROAD TO ADDISON ROAD						
TOWN OF ADDISON, TEXAS						
HNTB ARCHITECTS ENGINEERS PLANNERS <small>The ECHS Company</small>						
DESIGN	DRAWN	APPR.	SCALE	DATE	PROJECT NO.	SHEET NO.
CTD	CTD	DSB	1"=200'	09/18/98	25188	\$PNO\$