

# Lewisville Lake Toll Bridge

## Engineering Report





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Mr. Allan Rutter  
Executive Director  
North Texas Tollway Authority  
P.O. Box 260729  
Plano, Texas 75026

September 24, 2006

Dear Mr. Rutter:

We are pleased to present the attached report describing the engineering features of the Lewisville Lake Toll Bridge Project as proposed for construction by the Authority. The report also describes the Lewisville Lake Corridor Project, of which the Toll Bridge is an important part, as proposed for construction by Denton County, the City of Frisco and the Texas Department of Transportation. The report includes an estimate of the Toll Bridge Project construction costs and a layout plan of the proposed construction upon which the estimated cost is based.

The conclusions of the engineering, planning and studies indicate that the Toll Bridge Project can be constructed at an estimated cost of \$122,200,000 exclusive of interest and financing costs. It is also estimated that construction of the Toll Bridge Project can be completed in approximately 30 months and with the completion of adjacent sections of the corridor project by Denton County, it can be opened to traffic in March 2009.

We wish to acknowledge the cooperation, advice and assistance of the staff, legal counsel, traffic engineers, the financial advisors of the North Texas Tollway Authority the Texas Department of Transportation, and in particular Denton County and the City of Frisco, for their dedicated efforts in the development of the corridor project.

Respectfully Submitted,

A handwritten signature in black ink that reads "John F. Becker". The signature is written in a cursive, flowing style.

John F. Becker, P.E.  
Project Director



# Lewisville Lake Toll Bridge

## Engineering Report

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## Executive Summary

### Introduction

The North Texas Tollway Authority (NTTA) is a political subdivision of the State of Texas under Chapter 366 of the Texas Transportation Code. The NTTA is empowered to acquire, design, construct, maintain, repair and operate turnpike projects; to raise capital for construction projects through the issuance of turnpike revenue bonds; and to collect tolls to operate, maintain and pay debt service on those projects in Dallas, Collin, Denton and Tarrant counties in Texas. The NTTA has representatives from all four counties on its Board of Directors and is dedicated to fulfilling its mission, which is to improve the quality of life, mobility and the regional economy of North Texas by providing sound toll facilities.

Prior to the construction of Lewisville Lake by the US Army Corps of Engineers (USACE) the Garza Dam formed Lake Dallas on the Elm Fork of the Trinity River. Upon completion of the Lewisville Lake, the Garza Dam was breached to allow the waters of Lake Dallas to combine with those of the enlarged lake. When the dam was breached, the existing highway providing the connection between the City of Lake Dallas and Little Elm was closed. Consequently, there was no convenient direct east/west transportation spanning Lewisville Lake.

Denton County initiated studies to create an east/west transportation facility crossing the lake in 1991. As a result of these studies and continuing interest in developing the project corridor by local governmental agencies, the corridor project evolved in recognition of the need to address the increasing demand for a direct connection between IH 35E and the Dallas North Tollway.

Denton County officials contacted the NTTA with a request that the Authority explore the possibility of constructing the bridge across the lake as a toll bridge, thus making it an integral section of the corridor project. The Authority initiated preliminary traffic and engineering stud-

ies and concluded that both construction of the bridge and financing construction through the sale of revenue bonds were warranted and authorized final investment grade studies.

This report presents the location, engineering design features, project plan and profile layout, construction schedule, construction cost estimates and estimates of operation and maintenance costs of the bridge project integrated as part of the Dallas North Tollway System. The report also describes the engineering features of the Lewisville Lake Corridor Project which provides the approach roadways to the toll bridge.

### Description of the Corridor Project

The Lewisville Lake Corridor Project is approximately 13.8 miles in length and connects IH 35E at Swisher Road in Denton County with the Dallas North Tollway at FM 2934 in Collin County, Texas. To facilitate convenient design and construction, the project is comprised of eight individual sections of varying lengths. Section 2 will be constructed by the Authority. The remaining seven sections will be, or have been, constructed by either a private developer, Denton County, the City of Frisco or by the Texas Department of Transportation. When complete, the corridor project will provide a four- and six-lane facility from IH 35E to the Dallas North Tollway. One section has been completed and opened to traffic and the other sections are scheduled to open from late 2007 to late 2009.

### The Lewisville Lake Toll Bridge Project

The Lewisville Lake Toll Bridge Project is a section of the Lewisville Lake Corridor Project. The project consists of a short length of approach roadway on each shore of the lake, a toll plaza on the western shore, a flowage easement bridge and the lake bridge which crosses the main body of the lake. The project is approximately 2.04 miles in length including the lake bridge, which is 8,520 feet long, and the flowage easement bridge, 890 feet long between abutment bearings. The lake bridge provides two 30-foot-wide roadways for two lanes of traffic in each direction separated by a concrete median barrier. The superstructure consists of 68 spans, each

120 feet in length, and a water craft passage span 360 feet in length. The water craft passage span provides a vertical clearance of 52 feet above the uncontrolled spillway elevation and a 350-foot horizontal clearance between span supports.

## Toll Collection

The plaza for the collection of tolls will be located on the western terminus of the lake bridge and will provide six traffic lanes for the collection of tolls. All lanes will be equipped with electronic toll collection devices, two lanes are dedicated to non-stop "TollTag" lanes, two lanes will be equipped with automatic coin machines for motorists depositing correct coins and two lanes will be equipped for attended operation.

## Project Cost Estimates

The preparation of final construction plans and specification for the Lewisville Lake Bridge Project are essentially complete except for the toll plaza and related equipment. Quantities of the majority of construction items were developed based on the construction plan completion and include grading, drainage, paving structures and the related items of construction. Estimates of cost for the toll plaza and related toll-collection equipment were based on preliminary construction plans and equipment costs for similar installations. The estimated project cost of the Lewisville Lake Bridge Project which includes planning, engineering, construction and other agency costs is \$122,200,000.

## Introduction

The North Texas Tollway Authority (NTTA) is a regional Tollway authority and a political subdivision of the State of Texas and created in accordance with Chapter 366 of the Texas Transportation Code. It is authorized to acquire, construct, maintain, repair and operate turnpike projects in North Texas.

In 2001, Denton County officials contacted the NTTA with a request that the Authority explore the possibilities of constructing the bridge across Lewisville Lake as a toll bridge. The toll bridge is a major segment of the county's proposed Lewisville Lake Corridor Project that will provide an east/west highway facility connecting IH 35E with the Dallas North Tollway. The Authority initiated a series of preliminary traffic and revenue studies and concluded that construction of the bridge and financing through the issuance of revenue bonds was warranted and authorized further investment-grade engineering studies.

This report describes the location, engineering design features, construction cost estimates and estimates of operation and maintenance costs of the bridge as a part of the Dallas North Tollway System. This report also describes the engineering features of the corridor project which provides the approach roadways to the toll bridge.

## Background

The US Army Corps of Engineers (USACE) constructed Lewisville Lake circa 1949. Prior to the construction of Lewisville Lake, the Garza Dam forming Lake Dallas existed on the Elm Fork of the Trinity River. Upon completion of Lewisville Lake, the Garza Dam was breached to allow the waters of Lake Dallas to combine with the waters of the new and enlarged lake. When the dam was breached, the existing highway, which provided the connection between the City of Lake Dallas and Little Elm, was closed. Consequently, there was no convenient direct east/west transportation facility spanning Lewisville Lake.

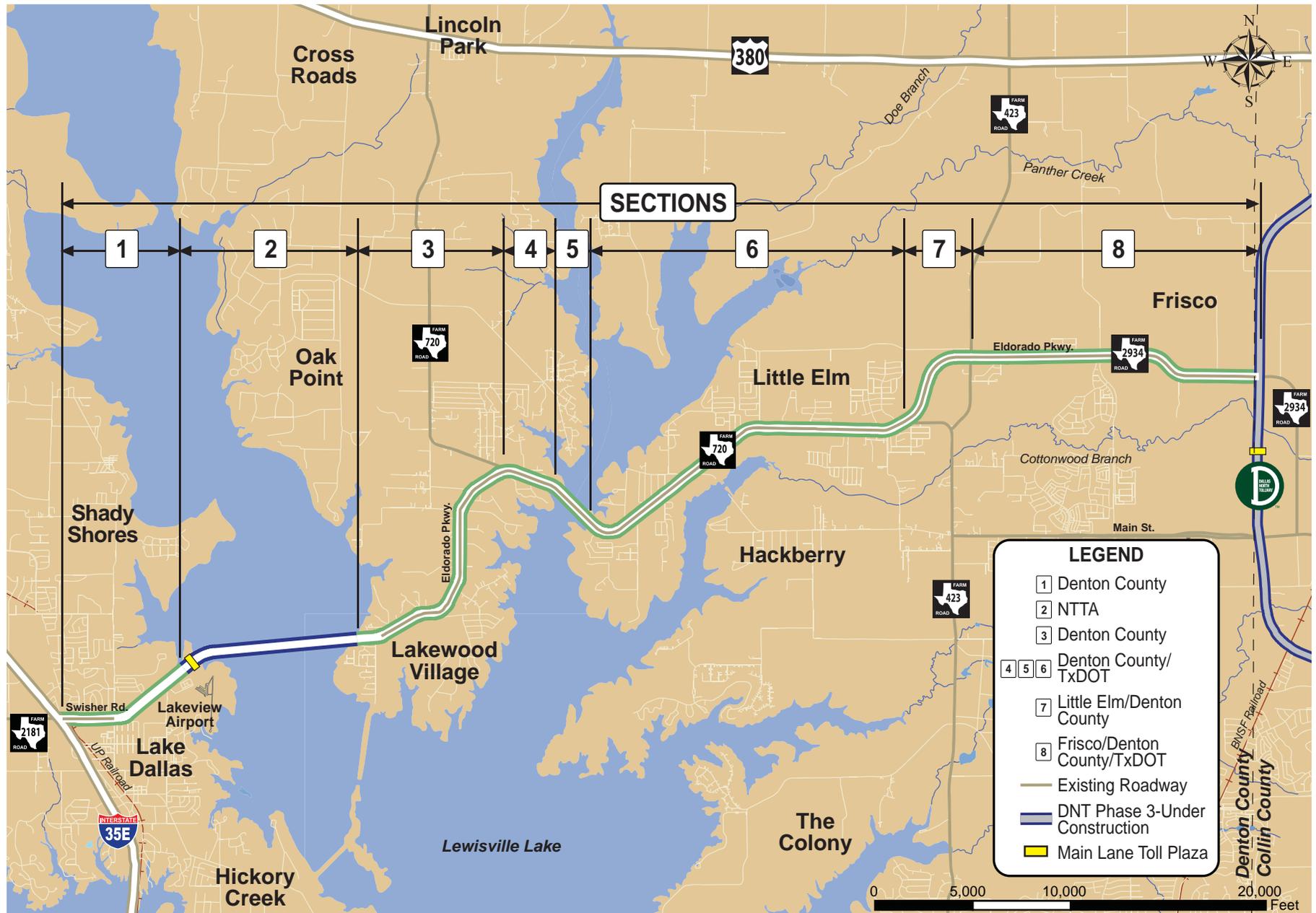
Denton County initiated actions to create an east/west transportation facility crossing the lake and received voter approval of a bond issue for route studies in 1991. As a result of these studies and continuing interest in developing the project corridor by the affected governmental agencies, the corridor project has evolved over the years in recognition of the need to address the increasing demand for a direct connection between IH 35E and the Dallas North Tollway.

Denton County continues to serve as the lead agency in coordinating the regional effort through partnerships with the Texas Department of Transportation (TxDOT), the NTTA, the City of Lake Dallas, Town of Little Elm and the City of Frisco to develop the 13.8-mile project corridor.

## Description of the Corridor Project

The Lewisville Lake Corridor Project is approximately 13.8 miles in length and connects IH 35E at Swisher Road in Denton County with the Dallas North Tollway at FM 2934 in Collin County, Texas. To facilitate convenient design and construction segments the project is comprised of eight individual sections of varying lengths and types of facility. (See Figure 1). On the west side of the lake (Section 1), Denton County is constructing Swisher Road to a four-lane thoroughfare with provisions for a continuous left-turn lane in the City of Lake Dallas. Section 2 consists of the Lewisville Lake Toll Bridge and is the subject of this report. On the east side of the lake, Denton County is improving Garza Lane in the Town of Little Elm (Section 3) to a four-lane thoroughfare with provisions for a continuous left-turn lane to connect with FM 720. TxDOT will improve a five-mile section of FM 720 to a four-lane thoroughfare with a raised median through the Town of Little Elm (Sections 4-6). Section 7 has been constructed by a private developer as a four-lane facility on new alignment from FM 720 to a connection with FM 2934 at FM 423 and was opened to traffic in April 2004. Plans for the construction of Section 8 as a six-lane facility are in progress and construction is scheduled to begin in the spring of 2007 by TxDOT.

Figure 1 - Project Location Map



## The Lewisville Lake Toll Bridge Project

The most important and vital section of the corridor project is the Lewisville Lake Toll Bridge Project and is referred to as Section 2 as shown in Figure 2. This project consists of a short length of approach roadway on each shore of the lake, a lake bridge that crosses the main body of water of the lake, a toll plaza located on the western terminus of the lake bridge; and a flowage easement bridge on the west side of the toll plaza. The total length of Section 2 is approximately 10,775 feet (2.04 miles) including the bridges and approach roadway.

The Lewisville Lake Toll Bridge is 8,520 feet long between abutment bearings. The bridge will provide two 30-foot-wide roadways consisting of two traffic lanes in each direction, a four-foot-wide shoulder on the right and two feet of rail offset on the left. Opposing directions of traffic will be separated by a concrete median barrier. Concrete parapet barriers located on both edges of the bridge will be continuous for the length of the bridge. The total width of the bridge including barriers measures 64 feet.

The bridge superstructure will consist of 68 spans, each 120 feet in length, and a water craft passage span of 360 feet in length; providing a horizontal clearance between piers of 350 feet and a minimum vertical clearance of 52 feet above the uncontrolled spillway elevation (532'). The bridge will be designed in accordance with the current standard specifications for highway bridges as adopted by the American Association of State Highway and Transportation Officials (AASHTO) utilizing the standard HS20 truck loading.

Each of the 120-foot superstructure spans will consist of a concrete deck supported on multiple pre-stressed concrete beams simply supported on reinforced-concrete cap beams on each sub-structure unit. The 360-foot water passage span will be a steel, tied-arch structure supporting a concrete deck on longitudinal stringers and transverse floor beams.

The steel tied arches will be inclined 10 degrees from the vertical position toward the roadway to enhance the aesthetic features of the span.

Figure 2 - Section 2 Location Map





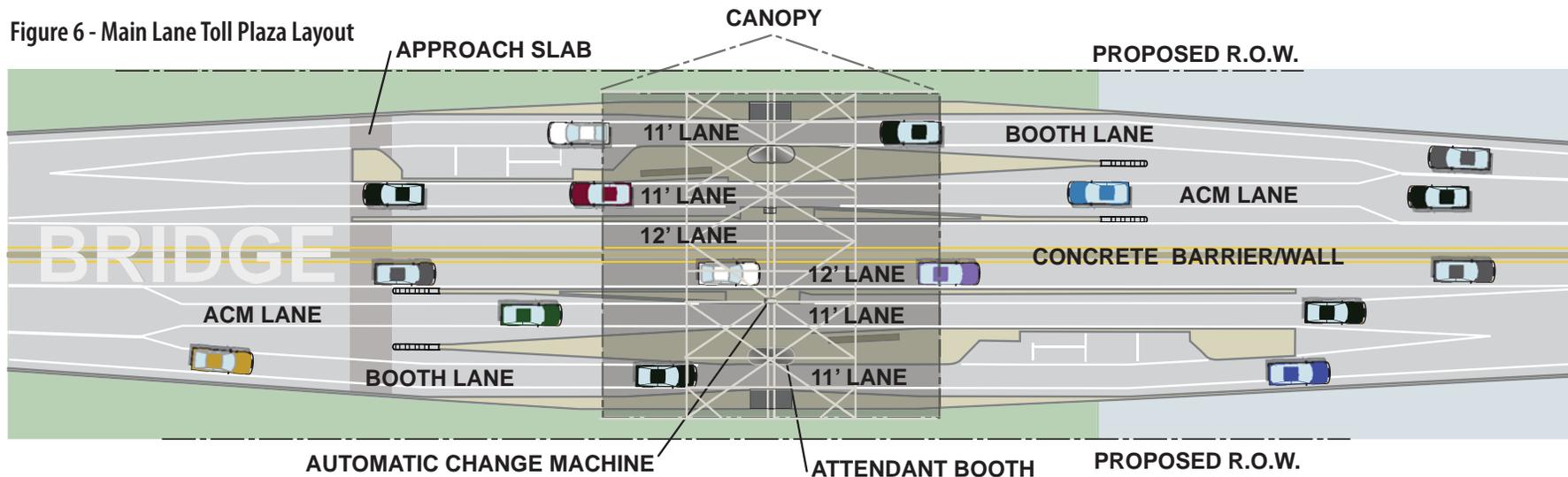
## Toll Collection

The toll plaza for collection of tolls will be located on the western approach to the Lewisville Lake Toll Bridge. The plaza will provide six collection lanes. Although all lanes will be equipped with "TollTag" collection capability, two of these lanes are dedicated, non-stop "TollTag" lanes. Two lanes will be equipped with automatic coin machines to expedite passage for motorists depositing correct coins in the automatic machines; and the other two lanes are designed for attended operation. A parking area for each travel direction will be constructed to provide employee parking facilities. A conceptual 3D rendering shows an overhead view in Figure 5, and a conceptual view of the toll plaza layout is shown in Figure 6.

Figure 5 - Main Lane Toll Plaza 3D Overhead View



Figure 6 - Main Lane Toll Plaza Layout



## Engineering Geology

A geotechnical investigation was undertaken in conjunction with the planning and design of the bridge project. Subsurface borings were made at locations along the alignment of the bridge and in the vicinity of the roadway approach and toll plaza. These investigations were performed to determine how the subsurface conditions might affect the design and construction of the roadway, toll plaza and the foundations for the bridge and retaining walls. Laboratory testing of soil samples were made to determine the nature and characteristics of the materials to be encountered.

Since construction of the lake, very soft organic sediments have collected on the lake bottom, filling depressions and channels in the original ground surface. The sediments consist primarily of very dark gray organic muck transitioning to very soft to soft dark-gray clays.

The depth of these sediments is variable and, in most cases, the transition to underlying alluvial soils is not distinct. The depth of the muck varies to as much as 25 feet but generally is about five feet thick on average. Underlying the river sediments and extending to the full penetration depths of the borings, is the Woodbine Formation. The sandstone bluffs on the eastern shoreline represent the uppermost strata of the formation. The upper member of the Woodbine Formation is the Templeton Member, which ranges in thickness from 70 to 80 feet. The Templeton Member consists primarily of gray glauconitic shale with lenses of gray to yellowish brown sand with the presence of marine fossils. The shale is capped with sandstone strata of variable thickness as evidenced by the outcropping on the eastern shore. The second member of the Woodbine Formation is the Lewisville Member, which ranges in thickness from 75 to 95 feet. This member consists primarily of sandstone and very dense silty and clayey sands (packsand), gray to yellowish brown in color with minor shale beds. The third member of the Woodbine Formation, which in this area is reportedly indistinguishable from the Lewisville Member, ranges up to 80 feet in thickness.

The Woodbine Formation in the area of the project consists primarily of four materials: very dense, lightly cemented, silty fine sand; sandstone, shale and shaley clay. These materials are variably stratified, cross-bedded, and interbedded. The key descriptor for these strata is variability: in material type, strength and stratification. However, owing to the highly over-consolidated nature of the deposits, the materials exhibit relatively high capacities with respect to carrying foundation loads. Consequently, the analysis indicates that drilled-shaft foundations will be appropriate for the project structures.

## Design Standards

The design features for the Lewisville Lake Toll Bridge Project will conform to *A Policy on Geometric Design of Highways and Streets* published by AASHTO and current standards of TxDOT.

The roadway for the project will be designed for a safe operating speed of 45 miles per hour and will provide two traffic lanes in each direction. A concrete median barrier will be placed between opposing directions of traffic over the entire length of the project to prevent crossover accidents.

The pavement lanes will be clearly marked and identify driving lanes, especially in the vicinity of the toll plaza, to aid in the safety of diverging and converging traffic entering and leaving the plaza.

Roadway pavement will consist of a 10-inch thickness of continuously reinforced concrete placed on a four-inch thickness of asphalt stabilized base. The asphalt-stabilized base will be placed over 8 inches of lime-stabilized sub-grade. In the elevated roadway section in the vicinity of the toll plaza, the asphalt-stabilized base will be placed on 24 inches of select fill material with the top eight inches stabilized by the application of lime.

Drainage and removal of storm water from the roadway in a rapid and efficient manner is an important part of the design process. Drainage of the bridge structures on the project will consist of a system of inlets and drainage pipes to intercept and collect roadway runoff. The initial runoff from rainfall on bridge structures will be collected and diverted to storm water treatment units placed at periodic intervals throughout the length of the structure. After treatment, the water will be discharged into the lake. Rainfall occurring after the initial period will be discharged directly to the lake waters.

The NTTA has implemented design guidelines and standards for structural signing, lighting, toll plaza design and landscape elements to promote visual consistency on all NTTA projects. These elements, which will be implemented on the Lewisville Lake Toll Bridge Project, are provided to enhance the NTTA customers' driving experience and help build a positive customer attitude.

Adequate illumination is essential to improve nighttime visibility and maximize safety. The design of the illumination on the structure approaches to the tied arch span will conform to the system-wide guidelines adopted by the NTTA, except where these guidelines are supplemented by additional aesthetic enhancement at eight light tower locations. At these locations, the light towers extend above the roadway and contain illuminated elements to enhance motorist driving experience.

Roadway lighting on the tied-arch span is accomplished by median-mounted lighting units containing a nautical themed light to punctuate the tied-arch span of passage.

Signage is used on highways to inform, warn and control driver actions and must be an integral part of the design process. Guide signs, which provide motorists information on routes, destinations and attractions, along with regulatory and warning signs, are included on the project and will conform to the *Texas Manual of Uniform Traffic Control Devices (MUTCD)*.

The signs will be reflectorized to enhance their visibility at night, and will be designed to withstand expected wind loads for the region. Roadside signs and overhead mounted signs will be

used as necessary to ensure that signs are clearly visible to the motorist. In addition to signs on the project, trailblazer signs will be installed on major roads in the vicinity to inform and direct motorists to the bridge project.

## Right Of Way

The USACE has jurisdiction and control of the facilities of the Lewisville Lake. The USACE has granted an easement to Denton County and NTTA to construct the Toll Bridge Project on the lake property, including the waters and area of land on each shore. Minor parcels of right of way beyond the limits of the USACE property have been acquired by Denton County and are available for bridge construction.

## Utility Adjustments

The project is located in an area where very few utilities exist. An overhead electrical line, belonging to TXU, crosses the project on the western end and has been raised to clear the bridge approach. Existing water and sewer lines crossing underneath the project on the western end have been identified. They are not in conflict with the proposed construction and will not require relocation.

## Environmental Considerations

The USACE assessed potential impacts to the environment that may result from developments on USACE property at Lewisville Lake in a Programmatic Environmental Assessment (PEA). The conclusions of the PEA resulted in the Finding of No Significant Impact (FONSI) for a toll-free bridge in September 1999. The change to a toll bridge caused the USACE to further conduct a Tiered Environmental Assessment, which also resulted in the issuance of a FONSI in August 2005. A copy of the USACE FONSI is included in the Appendix.

## Schedule

The schedules for construction of the several sections of the Lewisville Lake Corridor Project are critical to the schedule for opening the toll bridge to traffic. Planning, design and preparation of construction plans is in progress on several sections of the corridor project and the current status is described in the following:

Section 1: Preparation of construction plans and acquisition of right of way is complete. Construction started in March 2006 and will be open to traffic in June 2007.

Section 2 : Preparation of construction plans and specifications is approximately 95% complete. Construction is scheduled to begin in November 2006 and will be open to traffic in April 2009.

Section 3: Preparation of construction plans and acquisition of right of way is complete. Construction started in August 2006 and will be open to traffic in August 2008.

Section 4, 5 and 6: The environmental evaluation process and the preparation of final construction plans and specifications are in progress. Construction of this five-mile section is scheduled to begin in August 2007 and is expected to open to traffic in December 2009.

Section 7 : Construction of this one-mile section was completed and opened to traffic in April 2004.

Section 8 : The environmental evaluation is currently in progress and the preparation of construction plans and specifications is nearing completion. Construction is scheduled to begin in January 2007 and is expected to be opened to traffic in July 2008.

## Project Cost Estimates

Quantities of items of construction were estimated based on construction plans and specifications that are nearly complete except for the toll plaza. The major items include grading, drainage, paving, bridges retaining walls and miscellaneous construction items. Estimates of cost for the toll plaza and related toll collection equipment were based on preliminary construction plans and estimated equipment costs.

The estimated quantities and the unit prices for construction items on similar projects in the Denton County area were used to estimate the total construction cost. The estimated unit prices expected to be received through the competitive bidding process in the second quarter of 2006 was used to establish construction costs for the major items of grading, drainage, paving and structures.

**TABLE 1: ESTIMATED COST SUMMARY**

No.	Description	Cost (\$million)
1	Section 2	\$92.9
2	Toll Plaza Structures	\$6.1
3	Equipment	\$0.5
4	Construction Management	\$5.9
Subtotal (1-4) Construction		\$105.4
5	Plans, Specifications, and Estimates (PS&E)	\$3.6
6	Other Agency Costs	\$2.1
Subtotal (5-6) Engineering		\$5.7
7	Project Contingencies	\$11.1
<b>Project Total (1-7)</b>		<b>\$122.2</b>

Table 1 shows a summary of the estimated project costs. The total project costs include engineering, legal and administration, material testing and a contingency allowance for construction variance. The estimated project cost for the Lewisville Lake Toll Bridge Project is \$122,200,000.

There are several factors, including unforeseen escalation of process and wages, labor or material shortages and changes in economic conditions, that can significantly affect (escalate or reduce) construction costs. The estimated project cost reflects our professional judgment of the current construction industry and with future adjustment for inflation; it is our belief that the project can be constructed for the estimated project cost. However, due to the nature of the construction industry, we cannot, and will not, guarantee that the actual project costs will not vary from the estimated cost.

## Operation and Maintenance Expense Estimates

Estimates of the costs of operating and maintaining the Dallas North Tollway System and the increase in costs of operating the system with the Lewisville Lake Toll Bridge in full operation have been prepared. These estimates are based on experience gained by the NTTA in the operation and maintenance of the DNT System and assume the NTTA will continue to operate under the administration and management that currently exists. The costs of administration, management, maintenance of roadways and structures, toll collection, contract maintenance activity and miscellaneous other costs associated with the operation of the system are included in the estimates.

The annual cost of operation and maintenance for 2010, the first full year of operation of the DNT System and the Lewisville Lake Toll Bridge Project is estimated to be \$79,075,000 as given in Table 2.

The estimates for operation and maintenance of the DNT System do not include deposits to a reserve maintenance fund. The reserve maintenance fund currently receives an annual deposit from System revenue and it is expected that these deposits will continue to be required to adequately maintain the System.

**TABLE 2: ESTIMATE OF ANNUAL OPERATIONS AND MAINTENANCE EXPENSE**

Year	Existing DNT System	LLTB	Proposed DNT System, Including LLTB
2006	65,206,400		65,206,400
2007	68,484,000		68,484,000
2008	73,240,000		73,240,000
2009	75,417,000	1,031,000	76,448,000
2010	77,659,000	1,416,000	79,075,000
2011	79,968,000	1,458,000	81,426,000
2012	82,345,000	1,502,000	83,847,000
2013	84,793,000	1,547,000	86,340,000
2014	87,314,000	1,593,000	88,907,000
2015	89,922,000	1,641,000	91,563,000
2016	92,607,000	1,690,000	94,297,000
2017	95,373,000	1,741,000	97,114,000
2018	98,222,000	1,793,000	100,015,000
2019	101,155,000	1,847,000	103,002,000
2020	104,176,000	1,902,000	106,078,000
2021	107,287,000	1,959,000	109,246,000
2022	110,492,000	2,018,000	112,510,000
2023	113,792,000	2,079,000	115,871,000
2024	117,190,000	2,141,000	119,331,000
2025	120,690,000	2,205,000	122,895,000
2026	124,310,000	2,271,000	126,581,000
2027	128,039,000	2,339,000	130,378,000
2028	131,880,000	2,409,000	134,289,000
2029	135,836,000	2,481,000	138,317,000
2030	139,911,000	2,555,000	142,466,000
2031	144,109,000	2,632,000	146,741,000
2032	148,432,000	2,711,000	151,143,000
2033	152,885,000	2,792,000	155,677,000
2034	157,471,000	2,876,000	160,347,000
2035	162,195,000	2,962,000	165,157,000
2036	167,061,000	3,051,000	170,112,000
2037	172,073,000	3,143,000	175,216,000
2038	177,236,000	3,237,000	180,473,000
2039	182,553,000	3,334,000	185,887,000
2040	188,030,000	3,434,000	191,464,000
2041	193,671,000	3,537,000	197,208,000
2042	199,482,000	3,643,000	203,125,000
2043	205,467,000	3,752,000	209,219,000
2044	211,631,000	3,865,000	215,496,000
2045	217,980,000	3,981,000	221,961,000

NOTE: To determine Operation and Maintenance cost for the proposed project, an estimate of the personnel and expenses required to operate each department was developed. The sum of these expenses comprises the LLTB O&M cost estimate in 2006 dollars. This estimate was then escalated by a rate of 3.0% per year.





# Appendix

Finding of No Significant Impact (FONSI)  
for Lake Lewisville Toll Bridge Project

FINDING OF NO SIGNIFICANT IMPACT  
IMPLEMENTATION OF THE LEWISVILLE LAKE TOLL BRIDGE PROJECT WITH ADDITION OF  
APPROACH ROADS AND TOLL PLAZA AT  
LEWISVILLE LAKE, DENTON COUNTY, TEXAS

**Description of Action.** The United States Army Corps of Engineers (USACE) assessed potential impacts to the environment that may result from the out granting of USACE property at Lewisville Lake, Texas. Because the proposed action involves Federal interests in property, it is considered a Federal action and as such requires compliance with the National Environmental Policy Act (NEPA) of 1969, as amended. This Tiered Environmental Assessment (TEA) and Finding of No Significant Impact (FONSI) address Denton County's need to obtain easements for construction of a new toll plaza and approach roads for the proposed Lewisville Lake Toll Bridge Project. The TEA addresses the changes to the proposed Lewisville Lake Toll Bridge Project that have come to pass since the FONSI was signed for the Lewisville Lake Programmatic Environmental Assessment (PEA). The bridge is now proposed to be a toll bridge instead of a toll-free bridge. This change would necessitate the addition of a toll plaza, which would require a small increase in the amount of Federal land to be disturbed. The most significant change would be primarily socioeconomic in that the toll bridge users would be required to pay a fee.

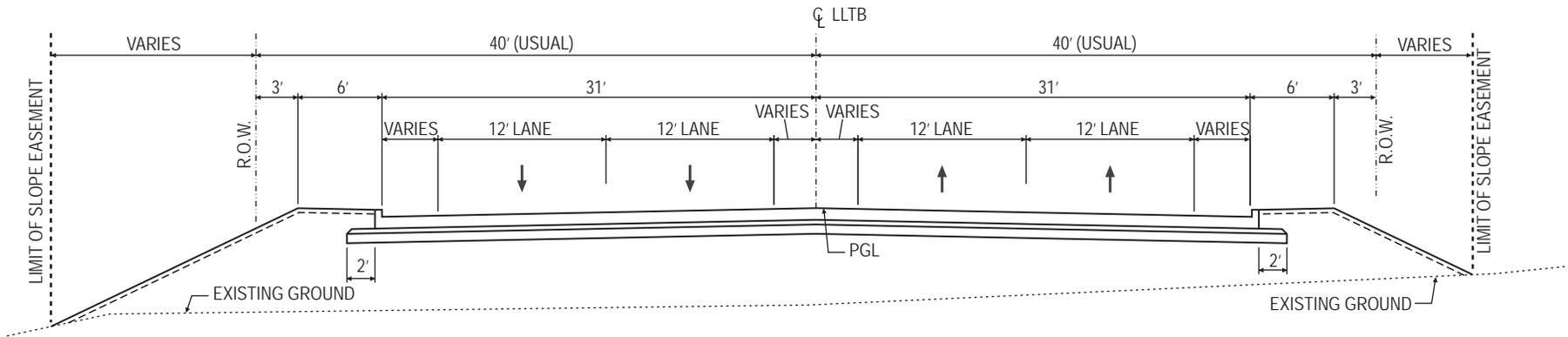
**Anticipated Environmental Effects.** The TEA evaluated three tollway bridge alternatives to address changes to the PEA that would result from conversion of the freeway bridge to a tollway bridge. Evaluation of project costs and environmental impacts indicated that Alternative 2, a tollway facility with retaining walls, was the preferred alternative. The proposed toll bridge facility would consist of four 12-foot wide travel lanes. The PEA recommended 80-foot wide ROW would be increased to 175-foot wide within the flood pool elevation and minimize impacts to USACE property. To elevate the toll bridge facility above the flood pool elevation and minimize impacts of an additional 14,000 cubic yards of flood storage. The TEA preferred alternative would result in an additional 0.53-acre of impacts to woodland habitat and a reduction of 0.10-acre of impacts to grassland habitat. The bridge structure would be consistent with the height, span, column configuration, and alignment as described in the PEA.

The TEA preferred alternative would have minor impacts to Waters of the U.S. within Lewisville Lake and along an unnamed tributary of Lewisville Lake. Short-term construction-related discharge of dredged or fill material, potential for increased erosion, and inputs of small amounts of oil and grease from construction-related equipment would be minimized during and following construction by utilizing erosion, total suspended solids, and sediment control devices as required for water quality by the Texas Pollutant Discharge Elimination System (TPDES) general permit for construction activity. The proposed project would use Nationwide Permit (NWP) #14 (Linear Transportation Crossings). The TEA preferred alternative would not have any significant negative impacts to the existing geology, soils, ground water, wetlands, socioeconomic amenities, or parklands. The TEA preferred alternative is not likely to adversely affect plant or animal species that are proposed or listed as threatened or endangered. No existing historical, archeological, or hazardous waste concerns were identified on USACE property. Impacts to existing wildlife habitat would be mitigated through 9.75 acres of woodland and 1.48 acres of grassland plantings within the Lewisville Lake Environmental Learning Area. Long-term water quality impacts to Lewisville Lake due to bridge stormwater runoff would be minimized through installation of bridge deck drains, a piping system, and oil/water/debris separators. Impacts to Lewisville Lake flood storage would be mitigated through removal of appropriate amounts of fill material from the Garza-Little Elm (Lake Dallas) Dam.

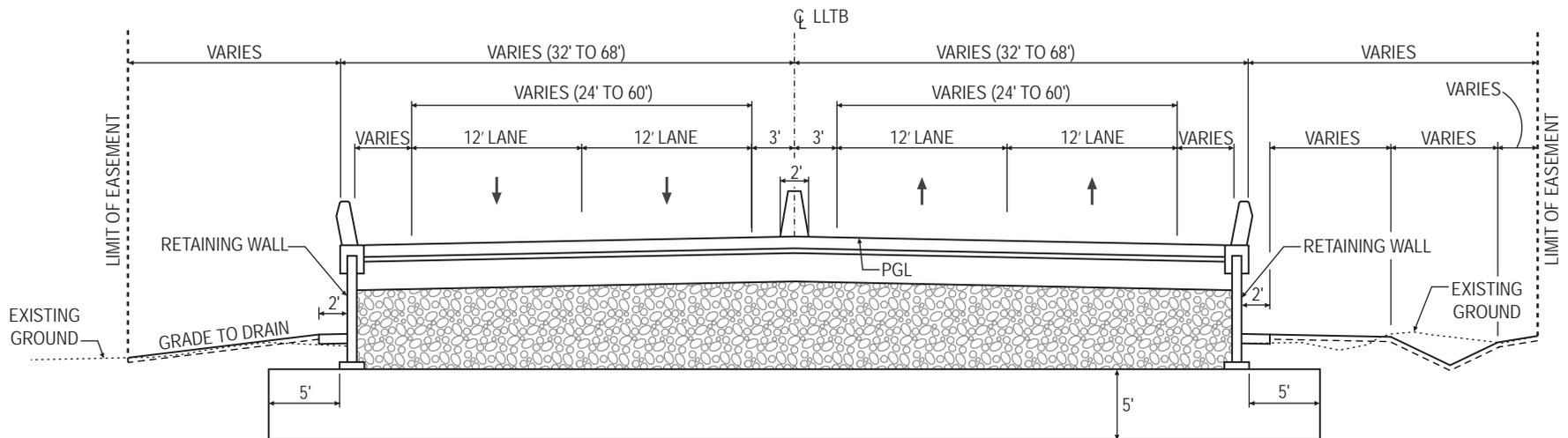
**Conclusions.** Based on review of information contained in this TEA, it is concluded that the out granting of Government lands for the construction of Lewisville Lake toll bridge facilities is not a major Federal action, which would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

  
John R. Mahan  
Colonel, Corps of Engineers  
District Engineer

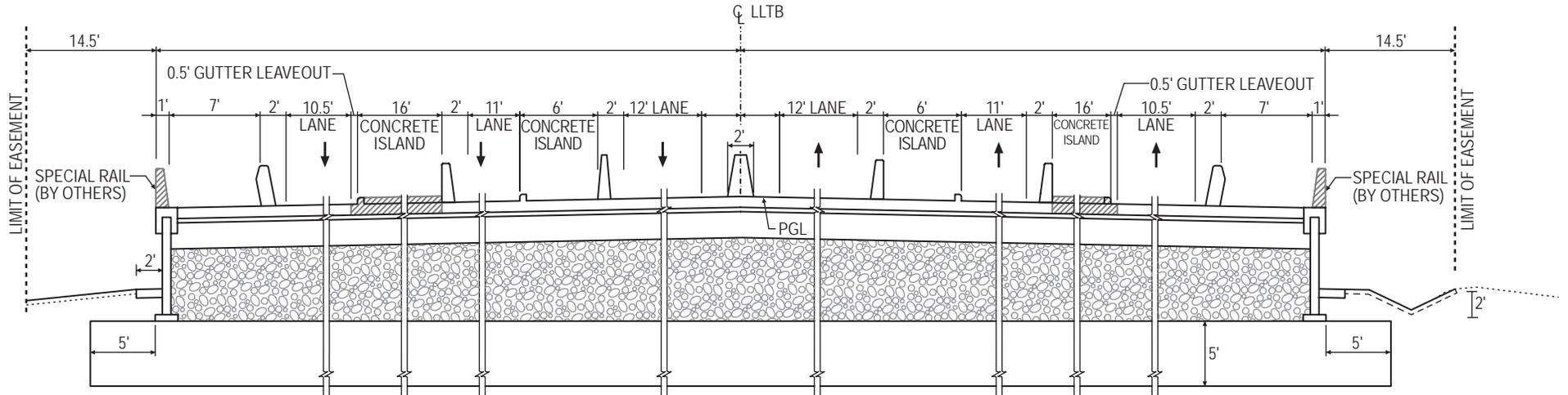
8/12/05  
Date



TYPICAL SECTION  
Station 68+00 to Station 68+90

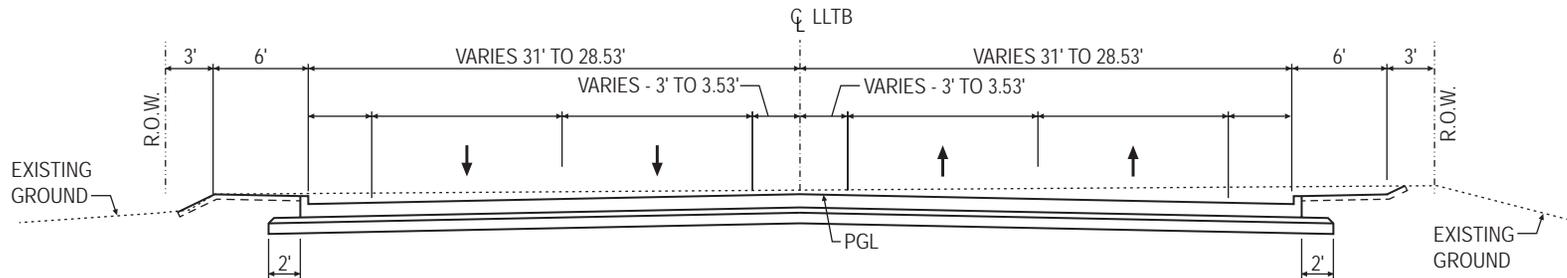


TYPICAL SECTION  
Station 78+20 to Station 80+50  
Station 81+50 to Station 89+80

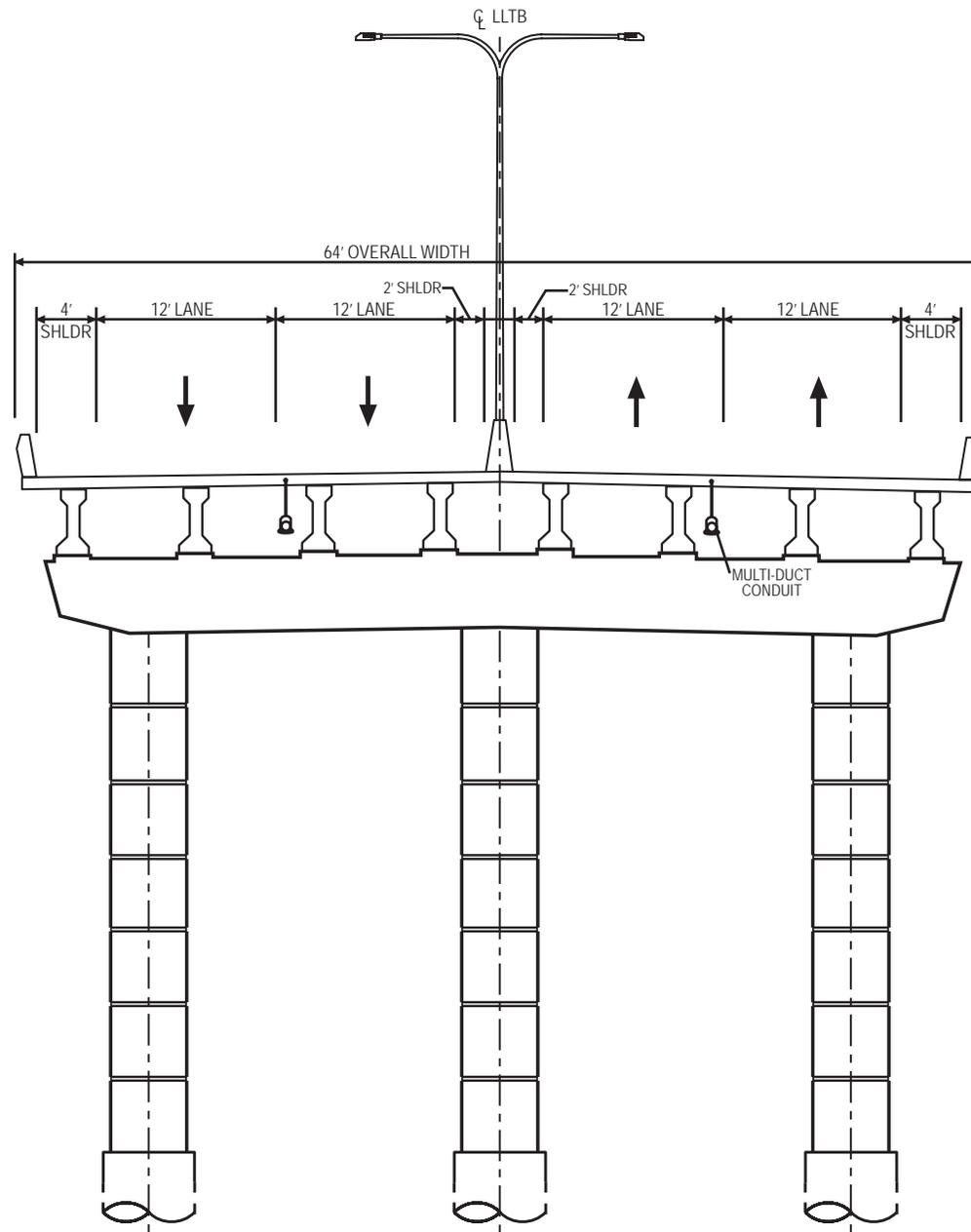


SECTION AT TOLL PLAZA  
CL Station 81+00

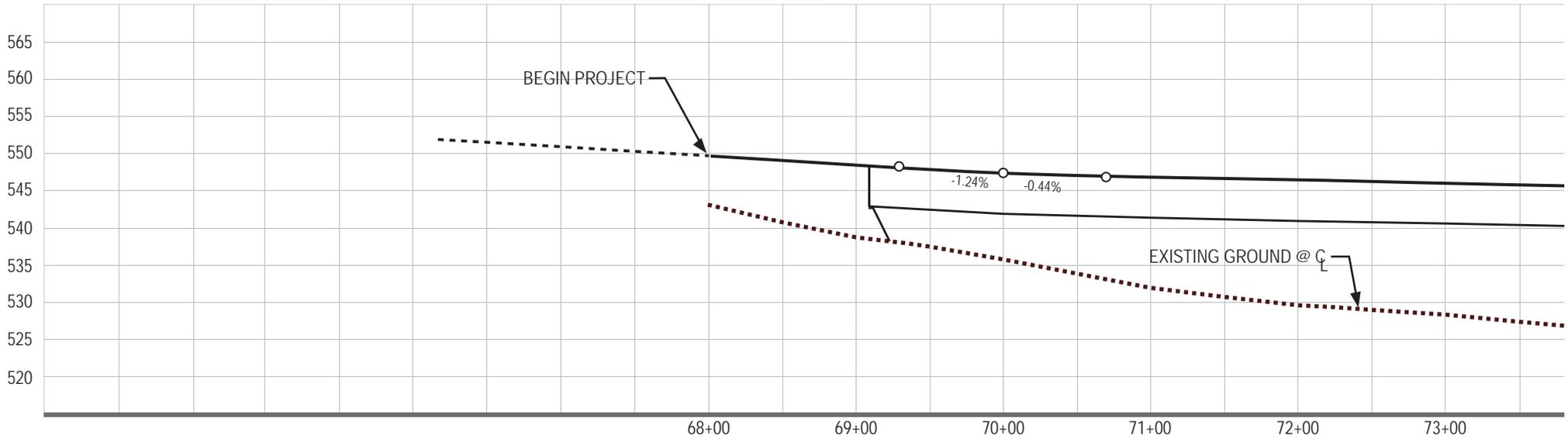
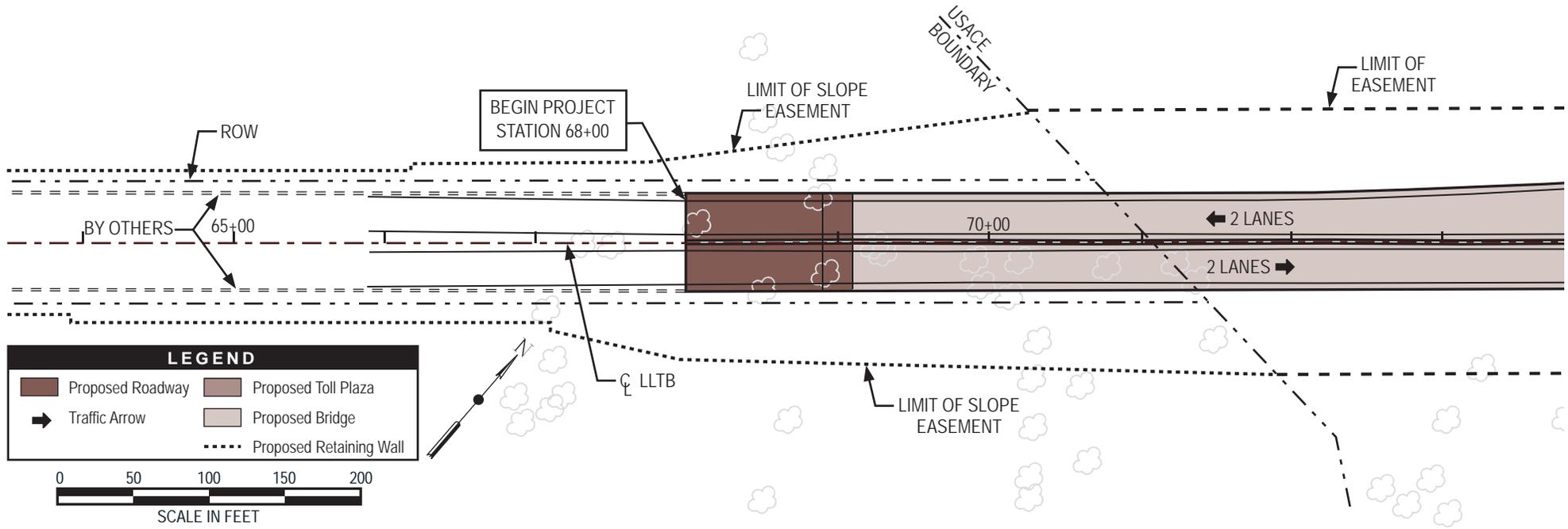
 CURB AND PAVEMENT TO BE  
CONSTRUCTED BY OTHERS

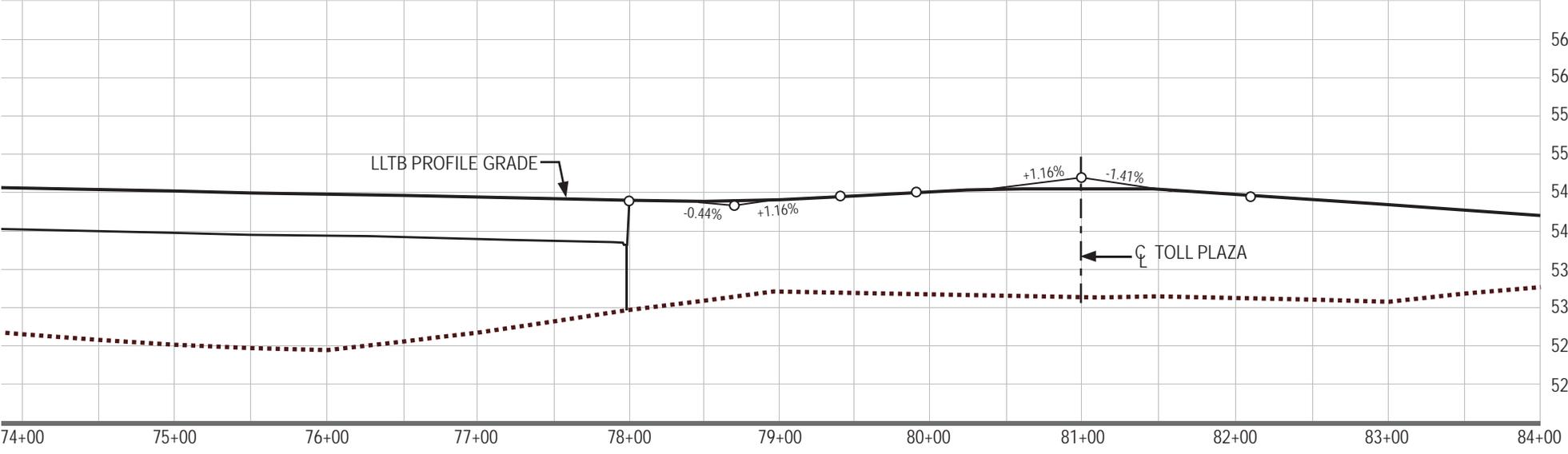
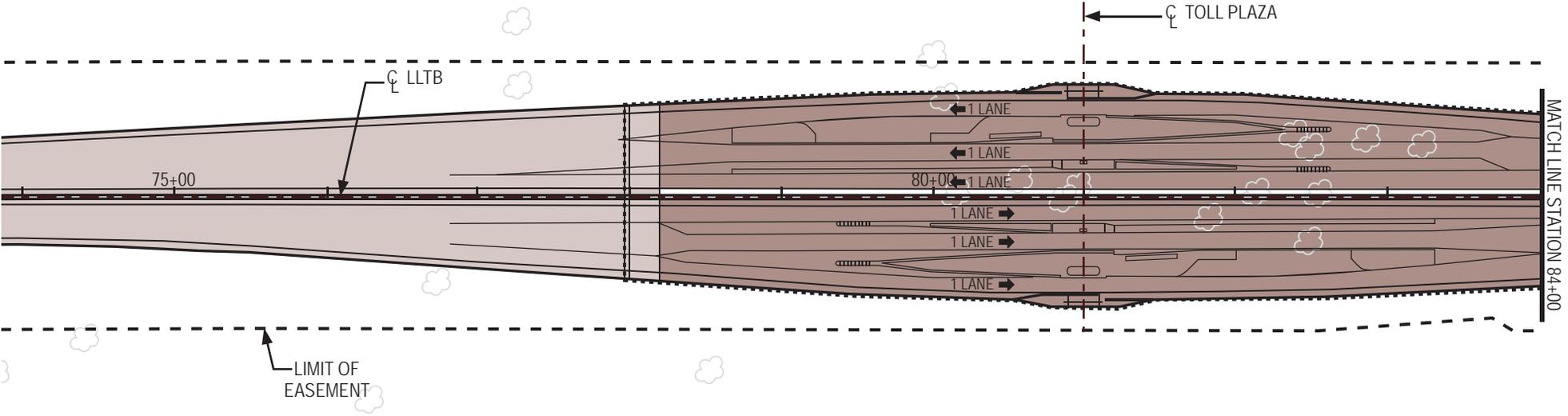


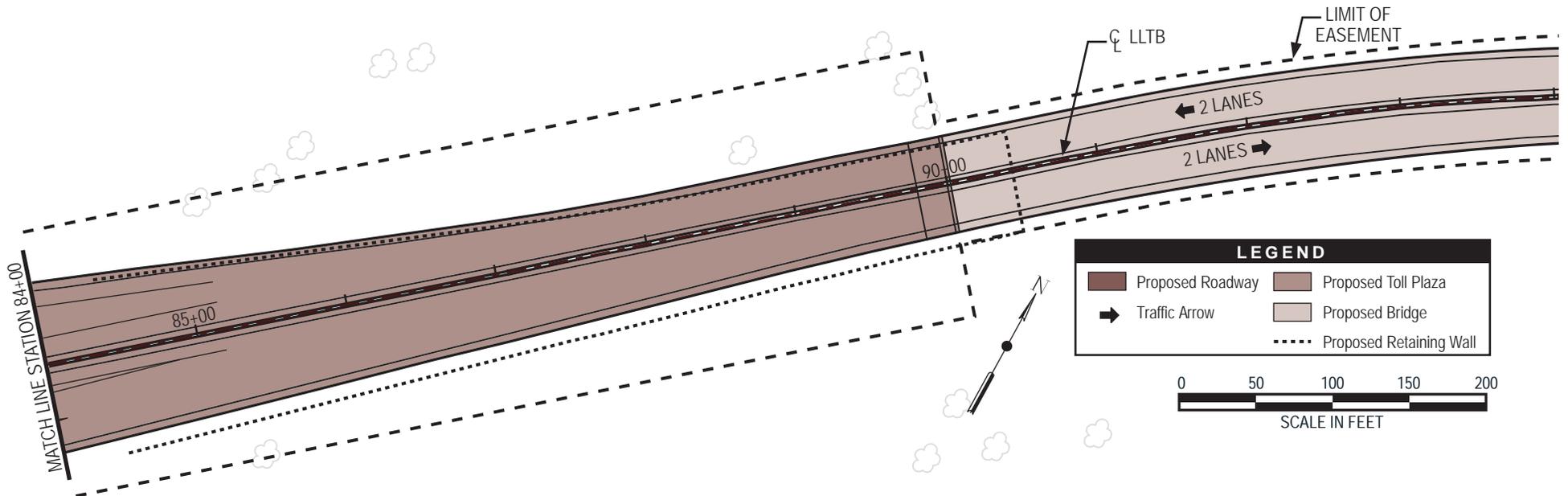
TYPICAL SECTION  
Station 175+40 to Station 175+75



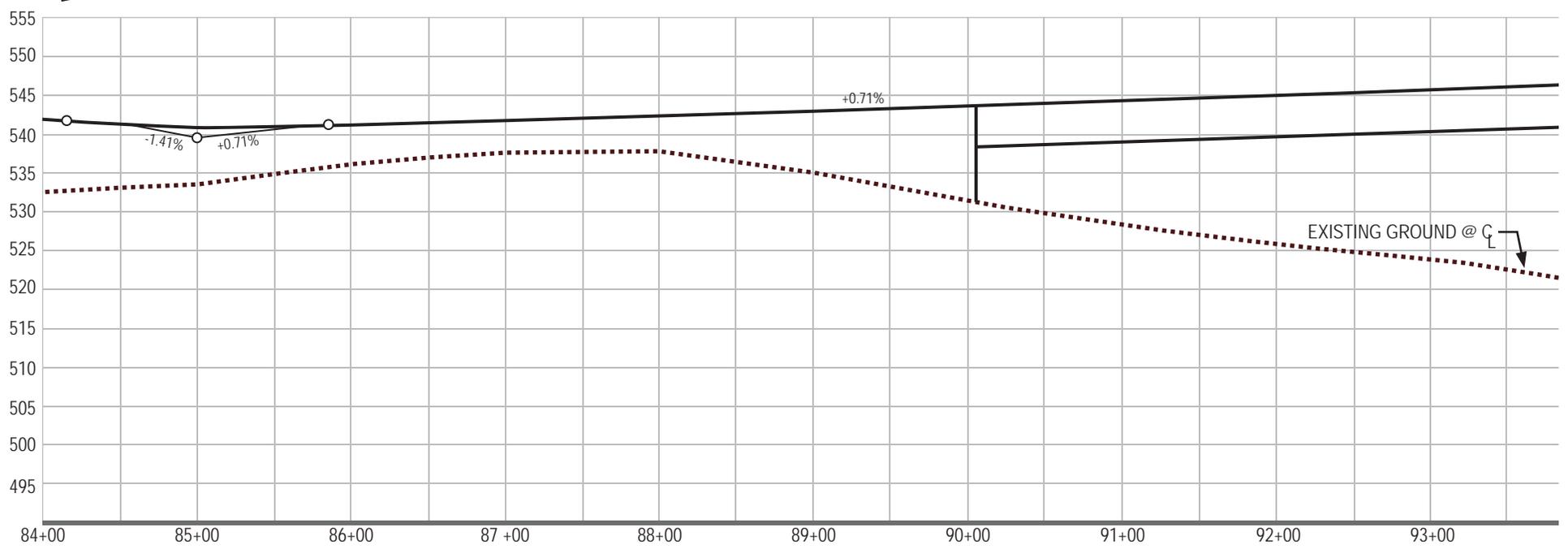
TYPICAL SECTION  
Toll Bridge

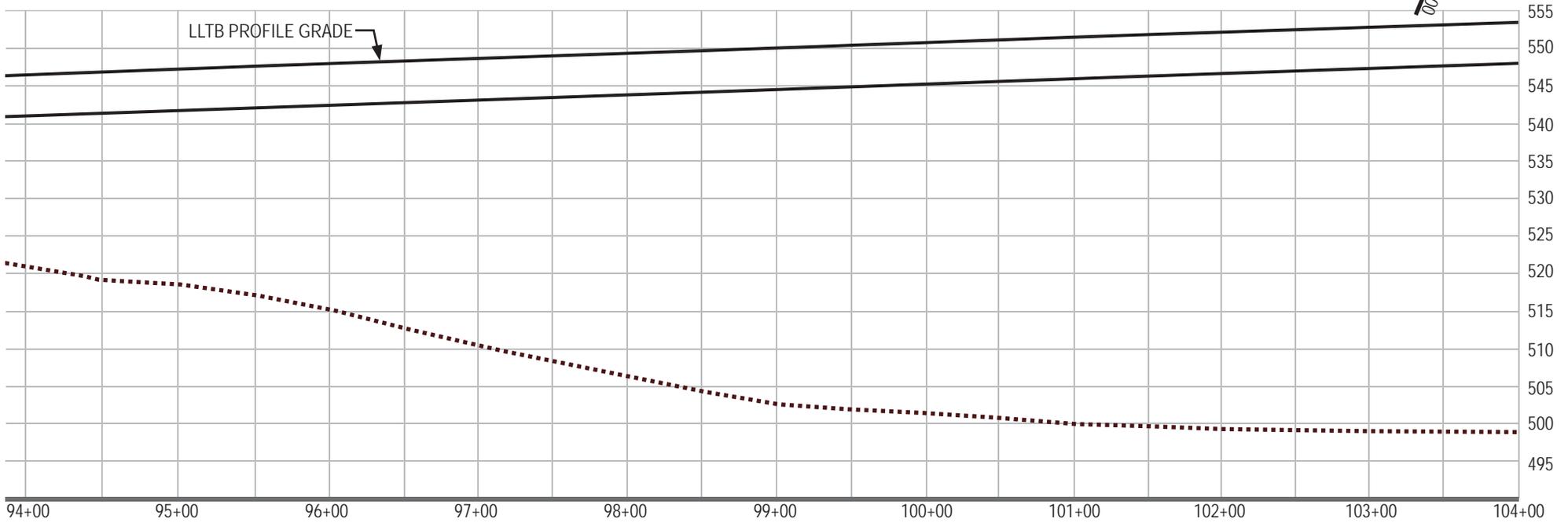
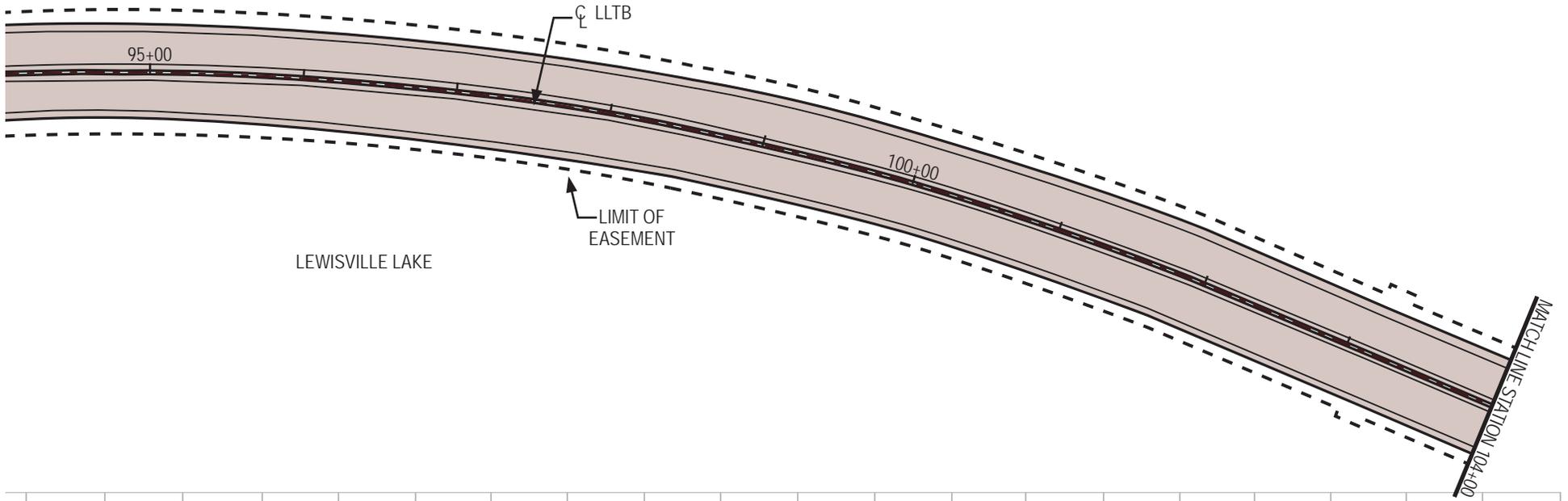


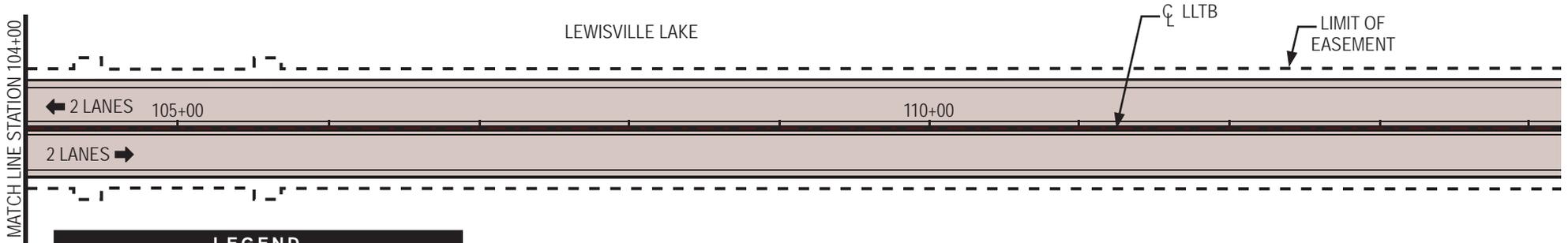




LEGEND	
	Proposed Roadway
	Proposed Toll Plaza
	Traffic Arrow
	Proposed Bridge
	Proposed Retaining Wall

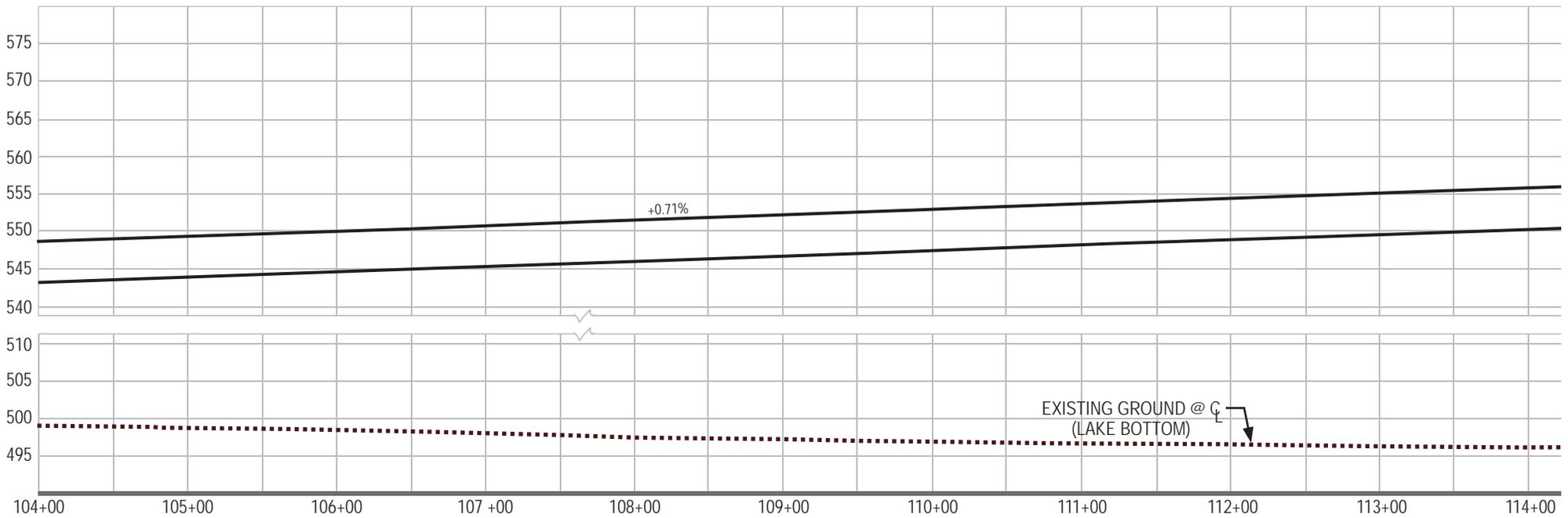


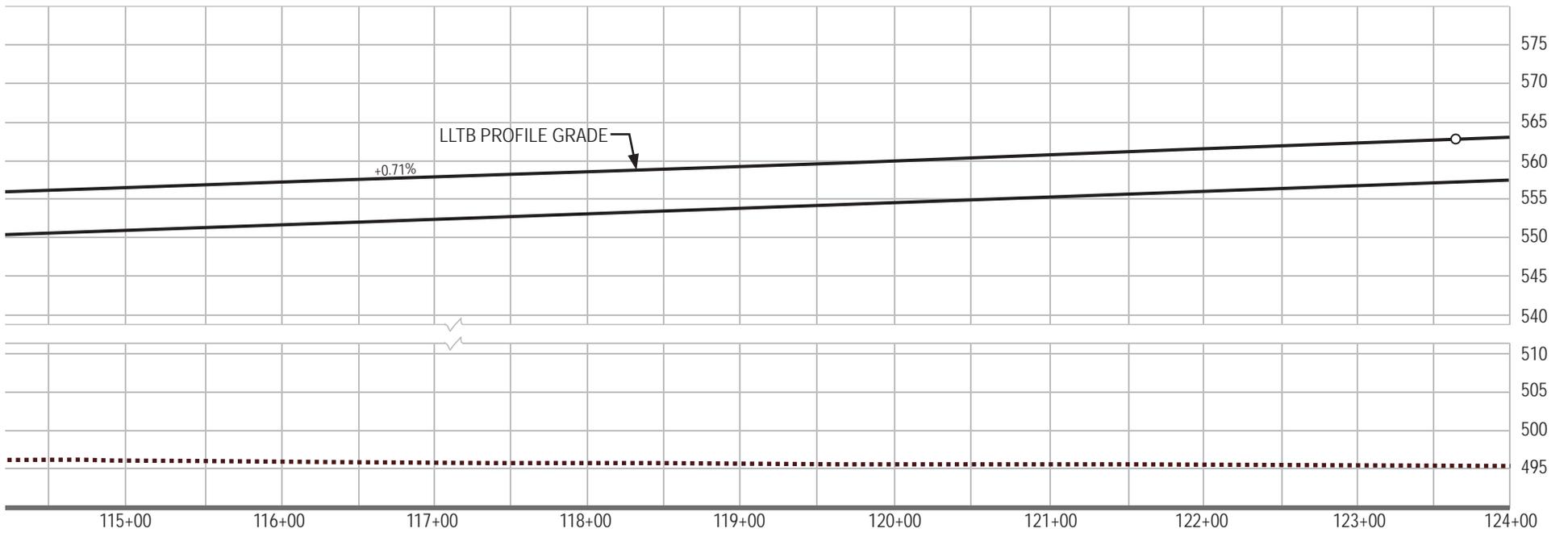
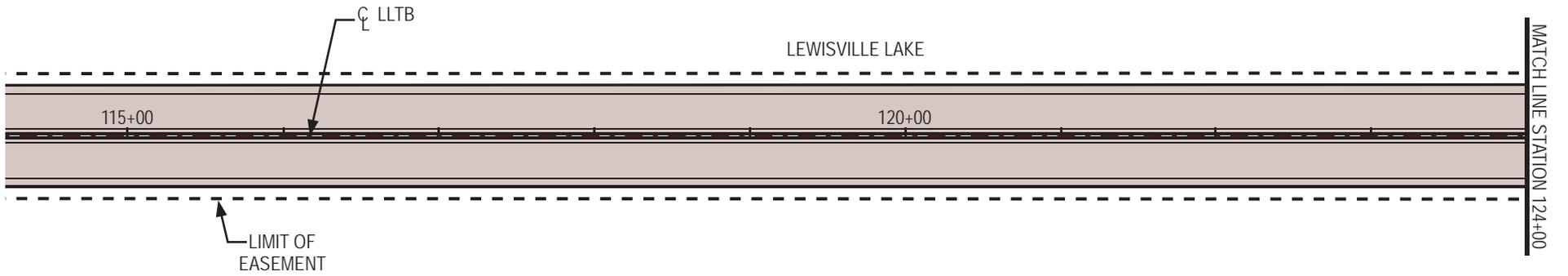




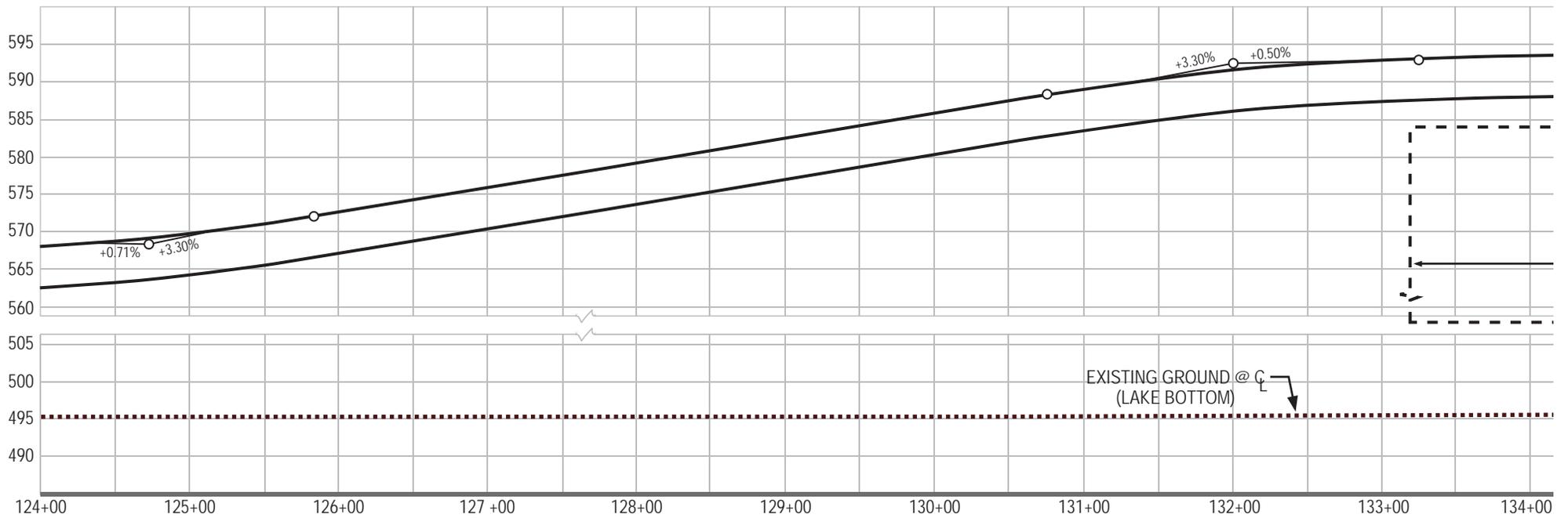
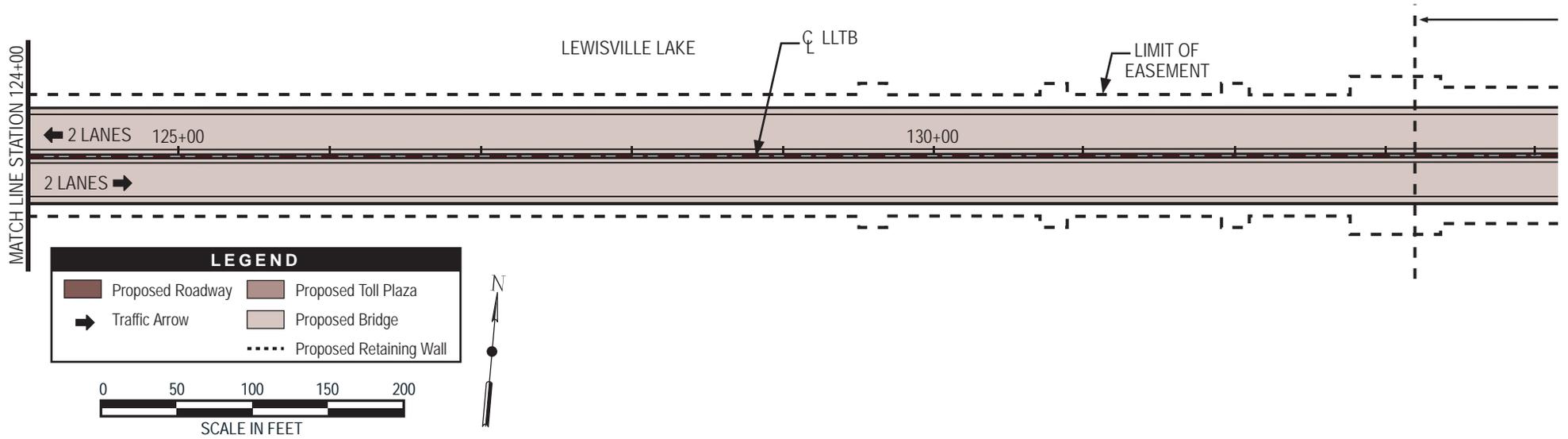
**LEGEND**

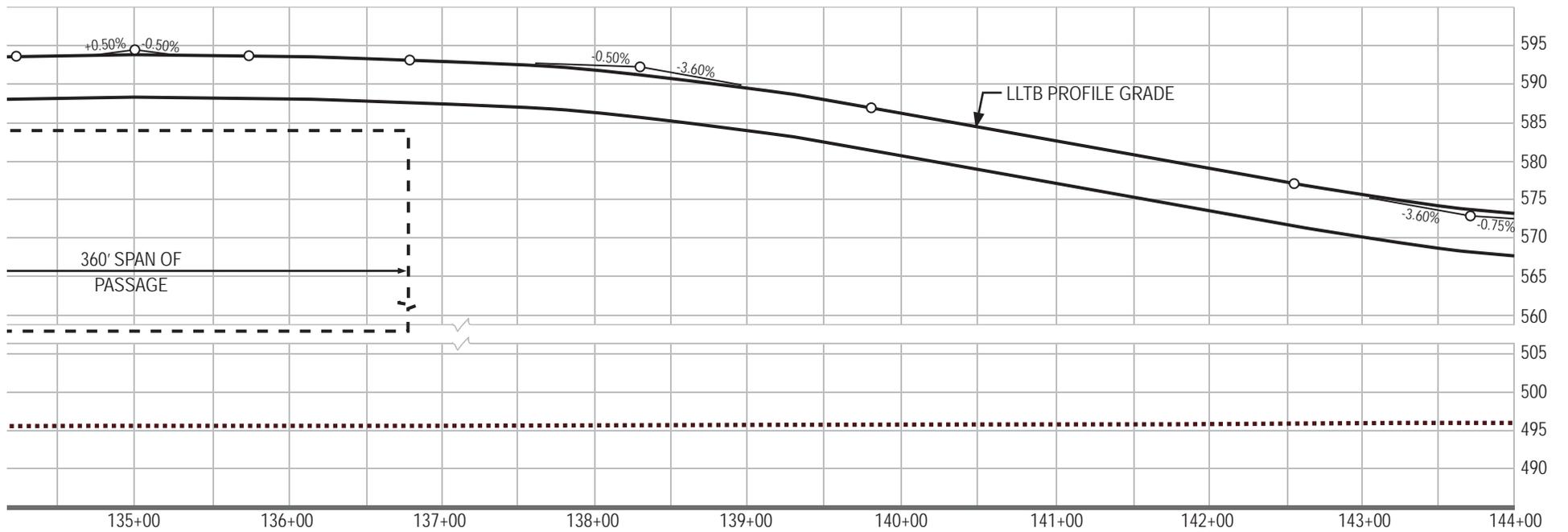
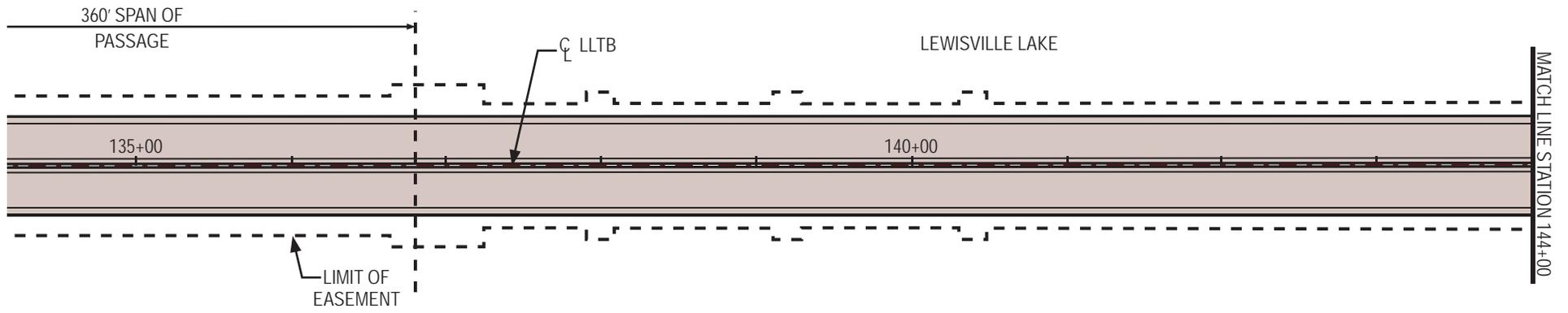
- Proposed Roadway
- Proposed Toll Plaza
- Proposed Bridge
- Proposed Retaining Wall
- Traffic Arrow

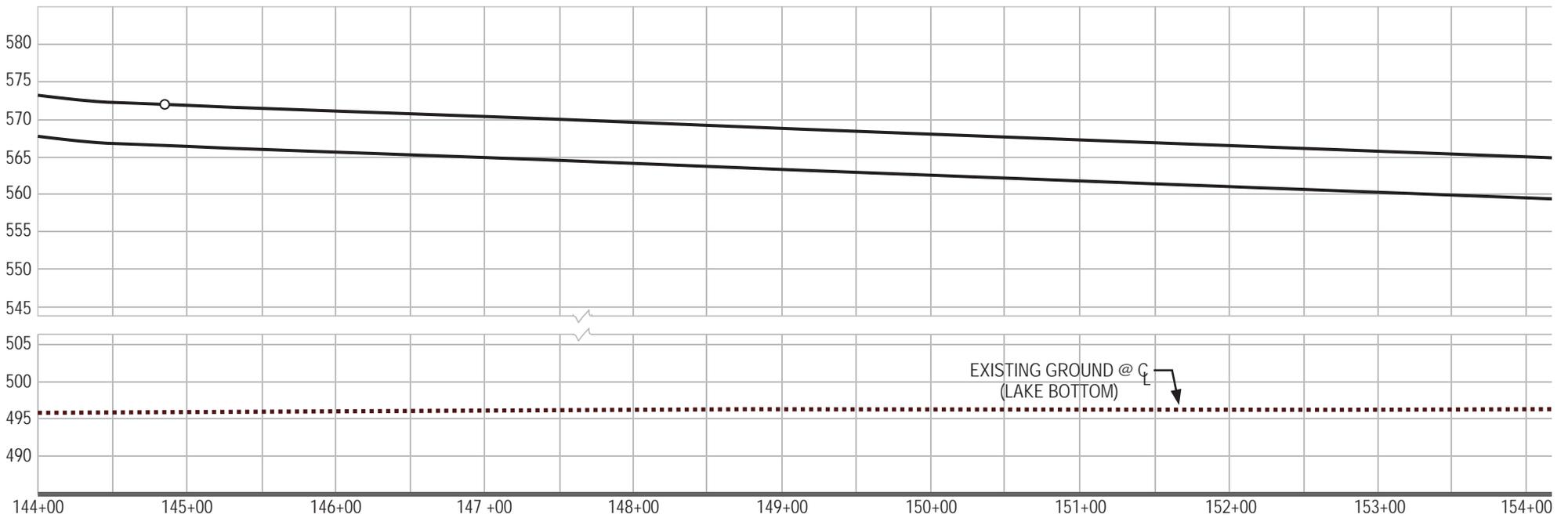
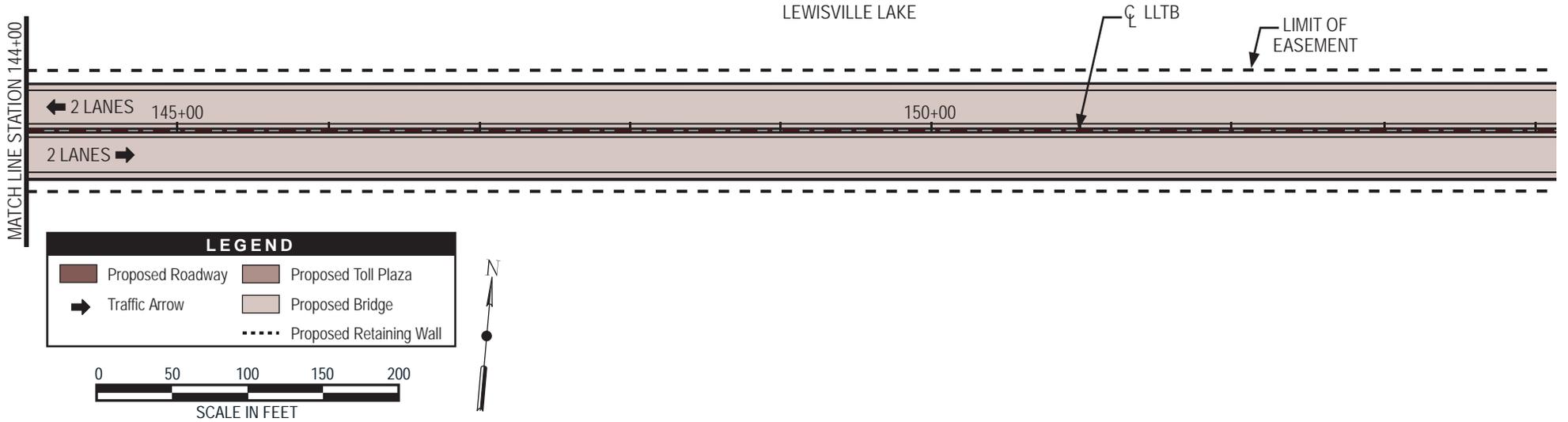


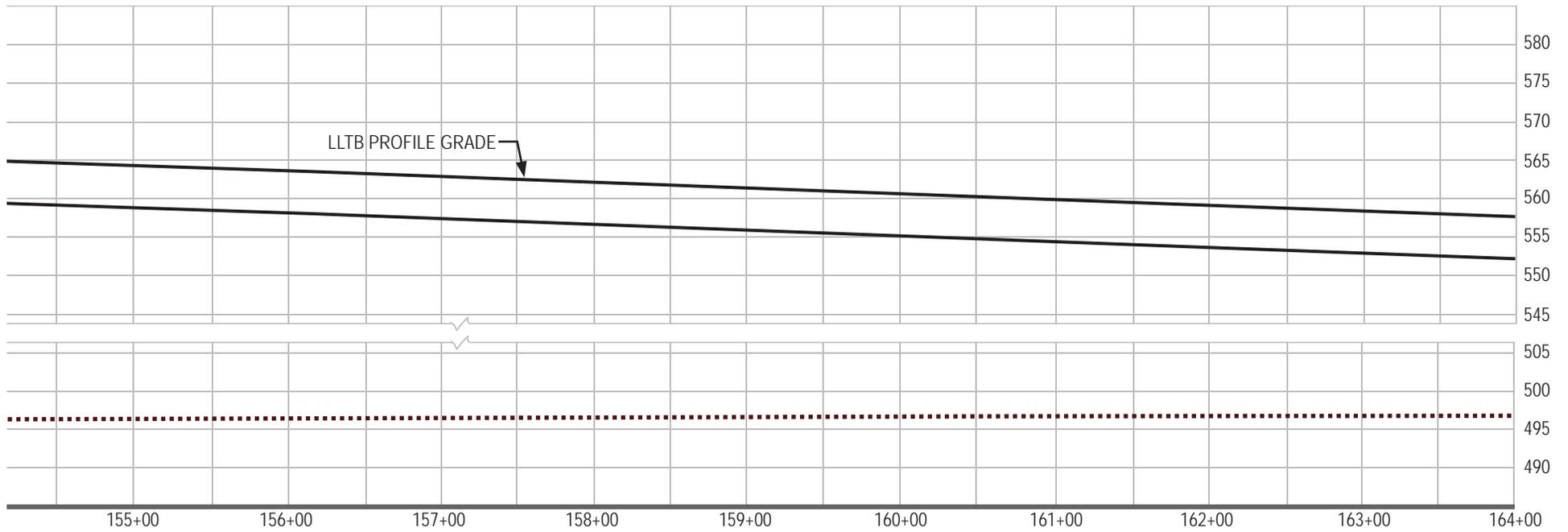
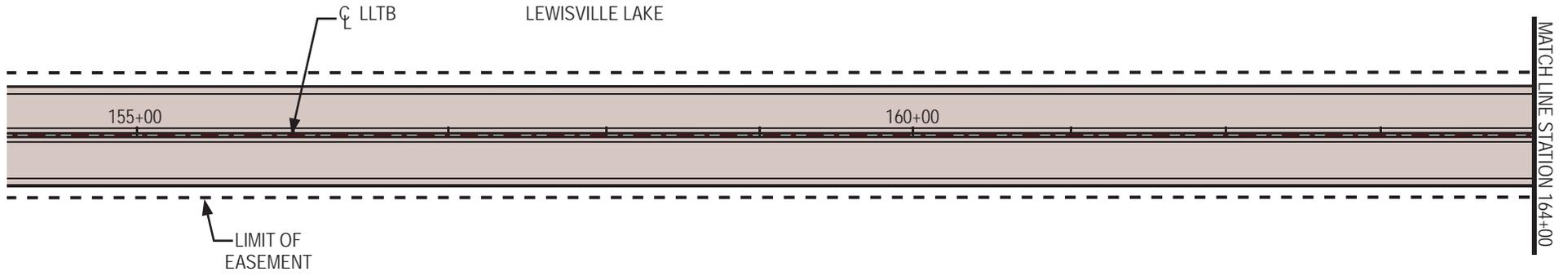


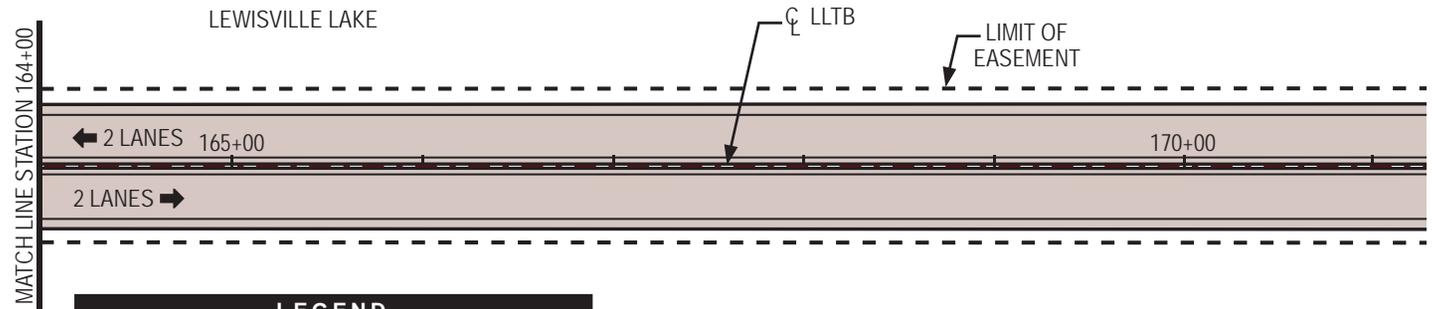
# Lewisville Lake Toll Bridge Engineering Report











**LEGEND**

- Proposed Roadway
- Proposed Toll Plaza
- Proposed Bridge
- Proposed Retaining Wall
- Traffic Arrow

