PARMER LANE AT SH 45

CSJ: 3417-02-040

TCEQ EDWARDS AQUIFER MODIFICATION ROADWAY APPLICATION

PREPARED FOR:
WILLIAMSON COUNTY

AND:
BENESCH

PREPARED BY:
EDGE ENGINEERING
FIRM NO. 20690

JANUARY 2026

Modification of a Previously Approved Plan Checklist

X **Edwards Aquifer Application Cover Page (TCEQ-20705)**

N/A **General Information Form (TCEQ-0587)** ***(N/A – information provided under TCEQ-20872)***

Attachment A - Road Map
Attachment B - USGS / Edwards Recharge Zone Map
Attachment C - Project Description

X **Geologic Assessment Form (TCEQ-0585)**

Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
Attachment B - Stratigraphic Column
Attachment C - Site Geology
Attachment D - Site Geologic Map(s)

X **Modification of a Previously Approved Plan (TCEQ-0590)**

Attachment A - Original Approval Letter and Approved Modification Letters
Attachment B - Narrative of Proposed Modification
Attachment C - Current Site Plan of the Approved Project

X **Application Form (include any applicable to the proposed modification):**

Aboveground Storage Tank Facility Plan (TCEQ-0575)
Organized Sewage Collection System Application (TCEQ-0582)
Underground Storage Tank Facility Plan (TCEQ-0583)
Water Pollution Abatement Plan Application (TCEQ-0584)
Lift Station / Force Main System Application (TCEQ-0624)
X **Edwards Aquifer Protection Program Roadway Application (TCEQ-20872)**
X Attachment A - Road Map
X Attachment B - USGS Quadrangle
X Attachment C - Project Description
X Attachment D - Factors Affecting Surface Water Quality
X Attachment E - BMPs for Upgradient (Offsite) Stormwater
X Attachment F - BMPs for On-site Stormwater
Supporting Documents
X Attachment G - Construction Plans
TCEQ Water Quality Calculations
Water Quality Site Plan
Stormwater Prevention Pollution Plan (SW3P)
X Attachment H - Inspection, Maintenance, Repair and Retrofit Plan
N/A Attachment I - Pilot-Scale Field Testing Plan
X Attachment J - Measures for Minimizing Surface Stream Contamination
X Attachment K - Volume and Character of Stormwater

X **Temporary Stormwater Section (TCEQ-0602)**

– *Review Item 37 on Roadway Application for applicability*

X Attachment A - Spill Response Actions
X Attachment B - Potential Sources of Contamination

X Attachment C - Sequence of Major Activities
X Attachment D - Temporary Best Management Practices and Measures
N/A Attachment E - Request to Temporarily Seal a Feature (if requested)
X Attachment F - Structural Practices
X Attachment G - Drainage Area Map
N/A Attachment H - Temporary Sediment Pond(s) Plans and Calculations
X Attachment I - Inspection and Maintenance for BMPs
X Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

N/A – **Permanent Stormwater Section (TCEQ-0600), if necessary** ***(N/A – information provided under TCEQ-20872)***

Attachment A - 20% or Less Impervious Cover Declaration (if requested for multi-family, school, or small business site)
Attachment B - BMPs for Upgradient Stormwater
Attachment C - BMPs for On-site Stormwater
Attachment D - BMPs for Surface Streams
Attachment E - Request to Seal Features, if sealing a feature
Attachment F - Construction Plans
Attachment G - Inspection, Maintenance, Repair and Retrofit Plan
Attachment H - Pilot-Scale Field Testing Plan (if requested)
Attachment I -Measures for Minimizing Surface Stream Contamination

X – **Agent Authorization Form (TCEQ-0599), if application submitted by agent**

X – **Application Fee Form (TCEQ-0574)**

– *Do <u>not</u> submit for TxDOT roadways*

X – **Core Data Form (TCEQ-10400)**

Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with 30 TAC 213.

Administrative Review

1. Edwards Aquifer applications must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

   To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: http://www.tceq.texas.gov/field/eapp.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.

3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.

4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

   An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.

6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.

2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.

4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a "Mid-Review Modification". Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if yo9u have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ's Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ's San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

1. Regulated Entity Name: Parmer Lane at SH 45						**2. Regulated Entity No.:**			
3. Customer Name: Williamson County						**4. Customer No.:** CN 600897888			
5. Project Type: (Please circle/check one)	New		Modification			Extension		Exception	
6. Plan Type: (Please circle/check one)	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential		Non-residential			**8. Site (acres):**		15.01	
9. Application Fee:	$6,500		**10. Permanent BMP(s):**			Extended Detention Pond			
11. SCS (Linear Ft.):	N/A		**12. AST/UST (No. Tanks):**			N/A			
13. County:	Williamson		**14. Watershed:**			Brushy Creek			

Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the "Texas Groundwater Conservation Districts within the EAPP Boundaries" map found at:

http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf

For more detailed boundaries, please contact the conservation district directly.

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	___	___	X
Region (1 req.)	___	___	X
County(ies)	___	___	X
Groundwater Conservation District(s)	__ Edwards Aquifer Authority ___ Barton Springs/ Edwards Aquifer ___ Hays Trinity ___ Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___ Austin ___ Buda ___ Dripping Springs ___ Kyle ___ Mountain City ___San Marcos ___ Wimberley ___ Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	X Austin ___Cedar Park ___Florence ___Georgetown ___Jerrell ___Leander ___Liberty Hill ___Pflugerville ___Round Rock

San Antonio Region					
County:	**Bexar**	**Comal**	**Kinney**	**Medina**	**Uvalde**
Original (1 req.)	___	___	___	___	___
Region (1 req.)	___	___	___	___	___
County(ies)	___	___	___	___	___
Groundwater Conservation District(s)	___ Edwards Aquifer Authority ___Trinity-Glen Rose	___Edwards Aquifer Authority	___Kinney	___EAA ___Medina	___EAA ___Uvalde
City(ies) Jurisdiction	___Castle Hills ___Fair Oaks Ranch ___Helotes ___Hill Country Village ___Hollywood Park ___San Antonio (SAWS) ___Shavano Park	___Bulverde ___Fair Oaks Ranch ___Garden Ridge ___New Braunfels ___Schertz	NA	___San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

Travis Kaatz

Print Name of Customer/Authorized Agent



2/9/2026

Signature of Customer/Authorized Agent | Date

FOR TCEQ INTERNAL USE ONLY				
Date(s)Reviewed:		Date Administratively Complete:		
Received From:		Correct Number of Copies:		
Received By:		Distribution Date:		
EAPP File Number:		Complex:		
Admin. Review(s) (No.):		No. AR Rounds:		
Delinquent Fees (Y/N):		Review Time Spent:		
Lat./Long. Verified:		SOS Customer Verification:		
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):	
Core Data Form Complete (Y/N):			Signed (Y/N):	
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):	

GEOLOGIC
ASSESSMENT
SECTION

Geologic Assessment for the Parmer Lane at State Highway 45 Project, Williamson County, Texas

DECEMBER 2025

PREPARED FOR

Alfred Benesch & Company

PREPARED BY

SWCA Environmental Consultants

GEOLOGIC ASSESSMENT FOR THE PARMER LANE AT STATE HIGHWAY 45 PROJECT, WILLIAMSON COUNTY, TEXAS

Prepared for

Alfred Benesch & Company
5113 Southwest Parkway, Suite 225
Austin, Texas 78735

Prepared by

SWCA Environmental Consultants
4407 Monterey Oaks Boulevard
Austin, Texas 78749
(512) 476-0891
www.swca.com



SWCA Project No. 88122

Texas Board of Professional Geoscientists, Firm Registration No. 50159

December 2, 2025

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1 INTRODUCTION

This narrative geologic assessment accompanies Texas Commission on Environmental Quality (TCEQ) Geologic Assessment Form TCEQ-0585 completed for the proposed Parmer Lane at State Highway 45 Project (project site). The project includes construction of turn lanes along Parmer Lane and the State Highway 45 frontage road from 650 feet south of Spectrum Drive to 470 feet north of Amberglen Boulevard (Figure 1).

2 METHODOLOGY

SWCA Environmental Consultants (SWCA) scientists studied records pertaining to all reputed caves in the project site and gathered information related to documented caves in the project vicinity prior to conducting field work. Relevant information sources include the following:

- Internal SWCA data;
- Unpublished data related to SWCA et al. (2008);
- Esri and ArcGIS Online Basemap Map Services;
- U.S. Geological Survey (USGS) 7.5-minute topographic digital raster graphics (USGS 2022);
- Geologic maps (Barnes 1974; Woodruff et al. 2019);
- Mapped fault lines (Barnes 1974; Woodruff et al. 2019).

A Texas Licensed Professional Geoscientist (PG) conducted field surveys on October 10, 2025. The pedestrian surveys were completed by walking parallel transects spaced approximately 30 to 50 feet apart, as directed by the TCEQ in the Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones (Rev. 10-01-04). Closer spacing was used where vegetation inhibited clear observation. SWCA scientists carefully examined all observed potential karst features, including depressions, holes, and animal burrows, for subsurface extent evidence. SWCA used several techniques for this effort, including probing with a digging implement to determine the thickness and consistency of fill material and feeling for air flow which may indicate the presence of a subsurface void space. Other techniques included recording notable features and site characteristics such as vegetation types or semi-circular burrow mounds produced by small mammal activity.

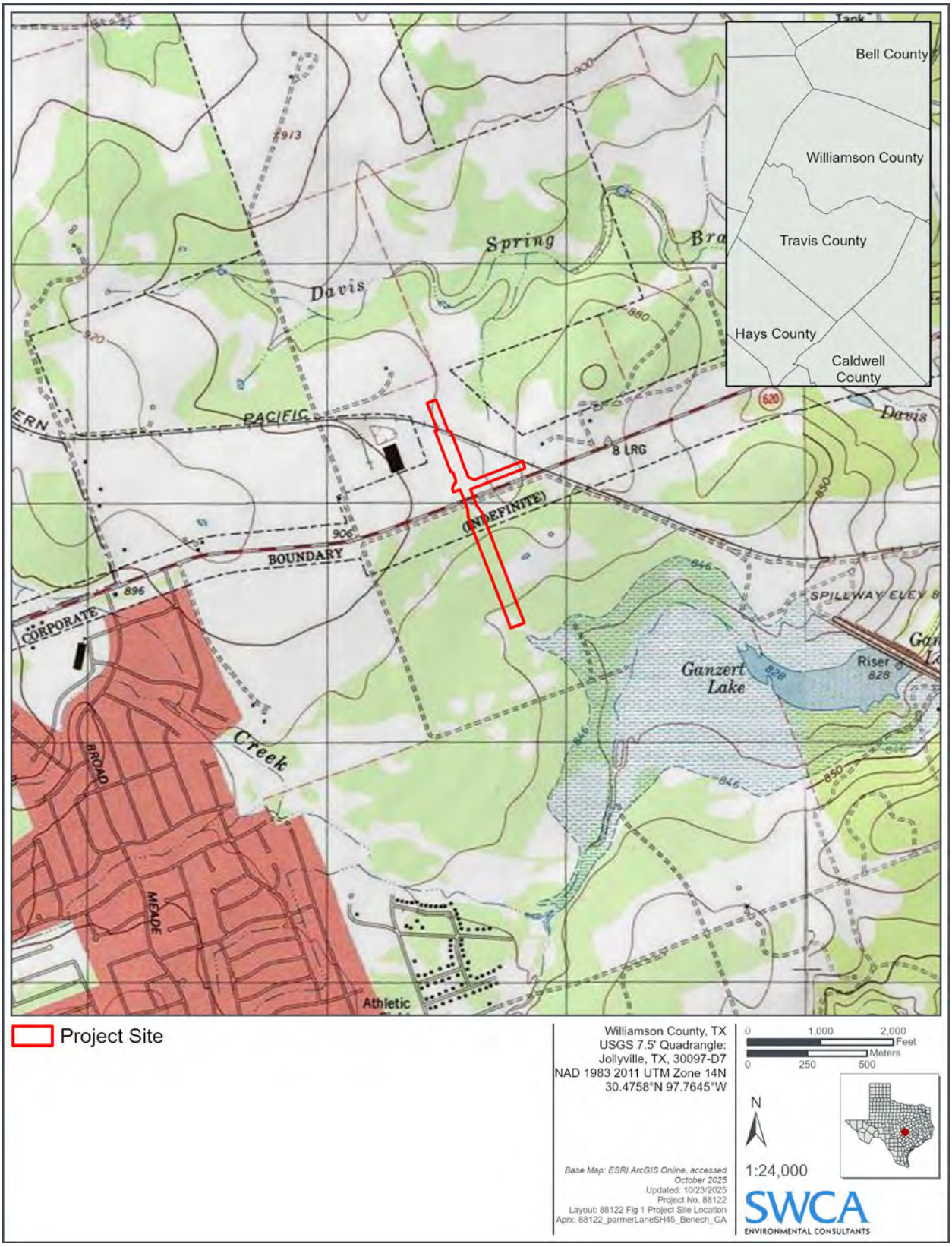


Figure 1. Project site location map.

3 RESULTS

3.1 Project Site Overview

The project site is within the Edwards Aquifer Recharge Zone (EARZ), which is in the northern segment of the Edwards Aquifer (TCEQ 2025). The USGS National Hydrography Dataset indicates that the project site is within the Brushy Creek watershed of the Brazos River basin. Surface water runoff within the project site drains toward Lake Creek, eventually culminating in Brushy Creek. Brushy Creek connects with the San Gabriel River more than 10 linear miles east of the project site. The elevation of the project site ranges from approximately 850 feet above mean sea level (amsl) to 890 feet amsl near the northern portion of the project site.

The project consists of constructing turn lanes along Parmer Lane and the U.S. Highway 45 frontage road from 650 feet south of Spectrum Drive to 470 feet north of Amberglen Boulevard (see Figure 1).

3.2 Soils

The Natural Resources Conservation Service (2025) identified three soil units within the project site (Figure 2). Table 1 provides additional details for these soil units.

Table 1. Soil Units within the Project Site

Soil Unit	Hydric	Hydrologic Soil Group*	Drainage Class	Frequency of Flooding / Ponding	Depth to Water Table (inches)
EeB: Eckrant stony clay, 0 to 3 percent slopes, stony	No	D	Well-drained	None	80+ inches
FaA: Fairlie clay, 0 to 1 percent slopes	No	D	Well-drained	None	80+ inches
FaB: Fairlie clay, 1 to 2 percent slopes	No	D	Well-drained	None	80+ inches

Source: Natural Resources Conservation Service (2025)

* Group D – Soils had very slow infiltration rates when thoroughly wetted and exhibit the highest potential for runoff.



Figure 2. Soils map.

3.3 Geology

The project site is along the Balcones Fault Zone (BFZ) within the Edwards Aquifer Contributing and Recharge Zones (TCEQ 2025). Structural down-warping occurred with the Gulf of Mexico's ancestral formation during the middle Tertiary and the BFZ formed along a zone of weakness, which currently marks the boundary between the Edwards Plateau and the Gulf Coastal Plain in Central Texas. The BFZ is characterized by a series of northeast-trending, predominantly normal, nearly vertical en echelon faults.

There are no mapped faults within the project site (Barnes 1974). The regional trend of the mapped faults within the area is approximately 20 degrees; therefore, any features within 15 degrees (5–35 degrees) would be awarded an additional 10 points on the geologic assessment table presented in Appendix A.

Woodruff et al. (2019) indicates the project site is underlain by the Edwards Limestone (Ked) (Appendix A). SWCA finds the Woodruff et al. (2019) interpretation of the geology to be generally accurate. The Stratigraphic Column is included in Appendix A.

Edwards Limestone is described by Collins (2005) as:

> …limestone, dolomitic limestone, and marl, massive to thin beds, chert, and fossiliferous; fossils include *rudists*. Shallow subtidal-flat cycles. Honeycomb textures, voids in collapse breccias, and cavern systems. Accounts for most of the Edwards Aquifer strata. Thickness is between 100 and 300 ft; thins northward.

Recharge into the Edwards Aquifer primarily occurs in areas where the Edwards Group and Georgetown Formation are exposed at the surface. A significant amount of recharge is from direct infiltration via precipitation and streamflow loss. Rapid recharge occurs predominantly along secondary porosity features such as faults, fractures, and karst features (e.g., caves, solution cavities, sinkholes, etc.). Karst features are commonly formed along joints, fractures, and within bedding plane surfaces in the Edwards Group and Georgetown Formation. In the vicinity and downgradient of the project site, water often discharges from the Edwards Aquifer through seeps and springs at or near the contact between the Edwards Limestone and underlying Comanche Peak Formation.

3.4 Hydrogeologic Assessment

The overall potential for fluid migration to the Edwards Aquifer within the project site appears low compared to background infiltration rates due to the presence of no sensitive features. SWCA did not observe any water wells within the project site; however, the depth to water within the project site has been measured between 36 and 41 feet in a nearby plugged Edwards Aquifer monitoring well (State ID No. 5834305) (Texas Water Development Board 2025).

The USGS National Hydrography Dataset indicates that the project site is within the Brushy Creek watershed of the Brazos River basin. Surface water runoff within the project site drains toward Lake Creek, eventually culminating in Brushy Creek. Brushy Creek connects with the San Gabriel River more than 10 linear miles east of the project site.

The following two features were identified within the project site:

- Feature S-1 is a sanitary sewer line that crosses Parmer Lane. The majority of the sewer line is beneath impervious surfaces; therefore, the probability of rapid infiltration is low.

- Feature S-2 is a sanitary sewer line that crosses and runs parallel to Parmer Lane. The majority of the sewer line is beneath impervious surfaces or maintained grassy parkways of Parmer Lane; therefore, the probability of rapid infiltration is low.

4 LITERATURE CITED

Barnes, V.E. 1974. Geologic Atlas of Texas, Austin Sheet. Scale 1:250,000. University of Texas at Austin, Bureau of Economic Geology.

Collins, E.W. 2005. Geologic map of the west half of the Taylor, Texas, 30 X 60 minute quadrangle: central Texas urban corridor, encompassing Round Rock, Georgetown, Salado, Briggs, Liberty Hill, and Leander, University of Texas at Austin, Bureau of Economic Geology, Miscellaneous Map 43, 1:100,000.

Natural Resources Conservation Service. 2025. United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database. Available at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed October 2025.

SWCA Environmental Consultants (SWCA), Smith, Robertson, Elliott, Glen, Klein, & Bell, LLP, Prime Strategies, Inc., Texas Perspectives, Inc. 2008. Williamson County Regional Habitat Conservation Plan. Prepared for Williamson County Conservation Foundation and The Honorable Lisa Birkman.

Texas Commission on Environmental Quality (TCEQ). 2004. *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones* (Rev. 10-01-04). Austin, Texas.

———. 2025. Edwards Aquifer Viewer Available at: https://www.tceq.texas.gov/gis/edwards-viewer.html. Accessed October 2025.

Texas Water Development Board. 2025. Groundwater data viewer. Available at: https://www2.twdb.texas.gov/apps/WaterDataInteractive/GroundwaterDataViewer/?map=sdr. Accessed October 2025.

U.S. Geological Survey (USGS). 2022. USGS 1:24000-scale Quadrangle for Jollyville, Texas.

Woodruff, C.M., Jr. and Collins, Edward W. 2019. Geologic map of the lower Lake Travis and Lake Austin vicinity, Texas, University of Texas at Austin, Bureau of Economic Geology, Miscellaneous Map 53, 1:50,000.

APPENDIX A

Texas Commission on Environmental Quality Forms

Geologic Assessment

Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: Philip Pearce, P.G. Telephone: 210-877-2847

Date: 12/2/2025 Fax: 210-877-2848

Representing: SWCA Environmental Consultants; TBPG Firm Registration No. 50159 (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: Parmer Lane at SH 45 Project

Project Information

1. Date(s) Geologic Assessment was performed: October 10, 2025
2. Type of Project:
   - ☒ WPAP
   - ☐ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

4. ☒ **Attachment A - Geologic Assessment Table**. Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.

5. ☒ Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
EeB: Eckrant stony clay, 0 to 3 percent slopes, stony	D	5
FaA: Fairlie clay, 0 to 1 percent slopes	D	4
FaB: Fairlie clay, 1 to 2 percent slopes	D	5

Soil Name	Group*	Thickness(feet)

** Soil Group Definitions (Abbreviated)*

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. Soils having a very slow infiltration rate when thoroughly wetted.

6. ☒ **Attachment B – Stratigraphic Column**. A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.

7. ☒ **Attachment C – Site Geology**. A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.

8. ☒ **Attachment D – Site Geologic Map(s)**. The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'

   Applicant's Site Plan Scale: 1" = 400'
   Site Geologic Map Scale: 1" = 400'
   Site Soils Map Scale (if more than 1 soil type): 1" = 1,000'

9. Method of collecting positional data:

   ☒ Global Positioning System (GPS) technology.
   ☐ Other method(s). Please describe method of data collection: _____

10. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.
12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

    ☐ Geologic or manmade features were not discovered on the project site during the field investigation.
13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.

    ☐ There are _____ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    - ☐ The wells are not in use and have been properly abandoned.
    - ☐ The wells are not in use and will be properly abandoned.
    - ☐ The wells are in use and comply with 16 TAC Chapter 76.

    ☒ There are no wells or test holes of any kind known to exist on the project site.

Administrative Information

15. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

ATTACHMENT A

GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME: Parmer Lane at SH-45

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
S-1	30°28'39.14"N	97°45'55.03"W	MB	30	Ked	-	200	-	-	0	-	-	F	5	35	x			x	Drainage
S-2	30°28'32.31"N	97°45'52.06"W	MB	30	Ked	-	2300	-	-	0	-	-	F	5	35	x			x	Drainage

* DATUM: NAD 83

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.

My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Philip C. Pearce

Date 12-02-2025

Sheet 1 of 1

STATE OF TEXAS
12-2-25
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST

TCEQ-0585-Table (Rev. 10-01-04)

ATTACHMENT B

STRATIGRAPHIC COLUMN

Table B-1. Stratigraphic Column

Upper Cretaceous	Upper Confining Units	Navarro and Taylor Groups, undivided; 600 feet thick
		Austin Group; 325–420 feet thick
		Eagle Ford Group; 25–65 feet thick
		Buda Limestone; 40–50 feet thick
		Del Rio Clay; 40–70 feet thick
Lower Cretaceous	Edwards Aquifer	Georgetown Formation; 30–80 feet thick
		Edwards Limestone; Up to 200 feet thick
		Comanche Peak Formation; 80 feet thick
	Lower Confining Units	Walnut Formation; Up to 120 feet thick
		Upper member of Glen Rose Limestone; 500 feet thick

Note: The shaded area represents the mapped lithology that outcrops in the project site.

ATTACHMENT C

NARRATIVE DESCRIPTION OF SITE GEOLOGY

Refer to Section 3.3 of this report for the Geologic Narrative Description.

ATTACHMENT D

SITE GEOLOGIC MAP



Project Site

Sanitary Sewer Lines

Geologic Unit Type

Ked: Edwards Limestone (Comanchean)

STATE OF TEXAS
12-2-25
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST

1 inch = 400 feet

Williamson County, TX
USGS 7.5' Quadrangle:
Jollyville, TX, 30097-D7
NAD 1983 2011 UTM Zone 14N
30.4758°N 97.7645°W

Base Map: ESRI ArcGIS Online, accessed December 2025
Updated: 12/2/2025
Project No. 88122
Layout: 88122 Fig 3 Geology Map 11 x 17
Aprx: 88122_parmerLaneSH45_Benech_GA

0 200 400 Feet
0 50 100 Meters

N

1:4,800

SWCA
ENVIRONMENTAL CONSULTANTS

APPENDIX B

Photographic Log



Photograph 1. Site overview from Parmer Lane median, facing south towards SH 45.



Photograph 2. Feature S-1, facing east.



Photograph 3. View facing north-northwest, along the alignment of feature S-2.

MODIFICATION OF A PREVIOUSLY APPROVED PLAN

Modification of a Previously Approved Plan

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Transition Zone and Relating to 30 TAC 213.4(j), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This request for a **Modification of a Previously Approved Plan** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Travis Kaatz, CFM, P.E.

Date: 12/17/2025

Signature of Customer/Agent:



Project Information

1. Current Regulated Entity Name: Parmer Lane at SH 45
   Original Regulated Entity Name: Sh 45 Section VII
   Regulated Entity Number(s) (RN): 103171484
   Edwards Aquifer Protection Program ID Number(s): 03050901
   ☐ The applicant has not changed and the Customer Number (CN) is: _____
   ☒ The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

2. ☒ **Attachment A: Original Approval Letter and Approved Modification Letters**. A copy of the original approval letter and copies of any modification approval letters are attached.

3. A modification of a previously approved plan is requested for (check all that apply):
   - ☐ Physical or operational modification of any water pollution abatement structure(s) including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
   - ☒ Change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
   - ☐ Development of land previously identified as undeveloped in the original water pollution abatement plan;
   - ☐ Physical modification of the approved organized sewage collection system;
   - ☐ Physical modification of the approved underground storage tank system;
   - ☐ Physical modification of the approved aboveground storage tank system.

4. ☒ Summary of Proposed Modifications (select plan type being modified). If the approved plan has been modified more than once, copy the appropriate table below, as necessary, and complete the information for each additional modification.

WPAP Modification Summary	***Approved Project***	***Proposed Modification***
Acres	100.52	161.10
Type of Development	Roadway Improvement	Roadway Improvement
Number of Residential Lots	0	0
Impervious Cover (acres)	63.83	64.91
Impervious Cover (%	63.5%	40.3%
Permanent BMPs		
Other		

SCS Modification Summary	***Approved Project***	***Proposed Modification***
Linear Feet		
Pipe Diameter		
Other		

AST Modification Summary	***Approved Project***	***Proposed Modification***
Number of ASTs	_____	_____
Volume of ASTs	_____	_____
Other	_____	_____

UST Modification Summary	***Approved Project***	***Proposed Modification***
Number of USTs	_____	_____
Volume of USTs	_____	_____
Other	_____	_____

5. ☒ **Attachment B: Narrative of Proposed Modification**. A detailed narrative description of the nature of the proposed modification is attached. It discusses what was approved, including any previous modifications, and how this proposed modification will change the approved plan.

6. ☒ **Attachment C: Current Site Plan of the Approved Project**. A current site plan showing the existing site development (i.e., current site layout) at the time this application for modification is attached. A site plan detailing the changes proposed in the submitted modification is required elsewhere.
   - ☒ The approved construction has not commenced. The original approval letter and any subsequent modification approval letters are included as Attachment A to document that the approval has not expired.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was constructed as approved.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was **not** constructed as approved.
   - ☐ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was constructed as approved.
   - ☐ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was **not** constructed as approved.

7. ☒ The acreage of the approved plan has increased. A Geologic Assessment has been provided for the new acreage.
   ☐ Acreage has not been added to or removed from the approved plan.

8. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

ATTACHMENT A
APPROVAL LETTERS

ATTACHMENT A
APPROVAL LETTER
PERMIT NO. 03050901

Sub Edaq - Travis County - 8-29-03
State Highway 45 Sec. VII

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*
Margaret Hoffman, *Executive Director*

COPY

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

Only approval letter received from TCEQ regarding Permit #11-0305091
No approval letter relevant to project included from TCEQ

August 29, 2003

Mr. Jon Geiselbrecht, AICP
Environmental Quality Coordinator
Texas Turnpike Authority Division
Texas Department of Transportation
1421 Wells Branch Parkway
Building 1, Suite 107
Pflugerville, Texas 78660

Re: Edwards Aquifer, Travis County
NAME OF PROJECT: State Highway 45 Section VII; Along FM 620 West of Parmer Lane to Davis Spring Branch Then Easterly to State Highway 45 Section 3; Williamson County, Texas
TYPE OF PLAN: Request for Approval to Seal Solution Cavity Encountered While Excavating the Trench for a Water Line; 30 Texas Administrative Code (TAC) Chapter 213
Edwards Aquifer Protection Program ID No. 03050901

Dear Mr. Geiselbrecht:

The Austin Regional Office of the Texas Commission on Environmental Quality (TCEQ) has reviewed the final recommendation for closure of the karst feature zone at the referenced project that was received on August 13, 2003. The feature discovery notification indicated that the a gravel formation was encountered during a SBC telephone cable relocation operation that was necessary for the construction of SH 45 (near FM 620). Additional information was received on August 28, 2003.

The information and recommendations for closure were prepared by Jeffrey S. Kessel, P.E. The proposed methods generally complied with the requirements of 30 TAC Chapter 213; therefore, a verbal approval to close the feature zone as proposed was granted on August 28, 2003. This letter is sent to provide a written approval for your records.

Thank you for your cooperation in this matter. Should you have any questions, please contact Mr. James Bice, P.E. of the Edwards Aquifer Protection Program at the Austin Regional Office at 512/339-2929.

Sincerely,

Margaret Hoffman
Executive Director
Texas Commission on Environmental Quality

MH/jeb

cc: Central Records, Information Resources Division, TCEQ, Austin, Texas

Extracted permit approval info from https://www15.tceq.texas.gov/

Central Registry

The Customer Name displayed may be different than the Customer Name associated to the Additional IDs related to the customer. This name may be different due to ownership changes, legal name changes, or other administrative changes.

Detail of: **Edwards Aquifer Permit 11-03050901**

For: **SH 45 SECTION VII (RN103171484 ...)**

FM 620 W OF PARMER LN TO DAVIS SPRING BR & E T

Permit Status: **ACTIVE**

Held by: **Texas Department of Transportation (CN600803456 ...)** View 'Issued To' History ...

OWNER Since 05/09/2003 View Compliance History ...

Mailing Address: 125 E 11TH ST AUSTIN, TX 78701 -2409

Legal	Description	Start Date	End Date	Type	Status	Status Date
11-03050901	EDWARDS AQUIFER	05/09/2003		PERMIT	APPROVED	09/12/2003

Tracking No.	Type	Value	Start Date	End Date
16312844	Plan Type	WPAP	05/09/2003	
16312845	Notice of Construction Date	11/03/2003	05/09/2003	
16312848	Distribution Date	05/14/2003	05/09/2003	

Physical	Description	Start Date	Type	Status	Status Date
SH 45 SECTION VII	SH 45 SECTION VII	05/09/2003	EDWARDS AQUIFER SITE	SEE LEGAL STATUS	05/09/2003

Tracking No.	Type	Value	Start Date	End Date
16312851	Project Area	121.53 ACRES	01/01/1800	
16312852	Watershed	DAVIS SPRING	01/01/1800	
16312849	Permanent BMP Name	MIGRATED	01/01/1800	
19041393	Permanent BMP Certification Date	02/26/2015	03/04/2015	

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Statewide Links: **Texas.gov | Texas Homeland Security | TRAIL Statewide Archive | Texas Veterans Portal**

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Last Modified 2025-04-23 - Production v2.2.1

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

Received from TCEQ regarding Permit #11-0305091 from document titled "EDWARDS AQUIFER 2003 WILLIAMSON CO STATE HIGHWAY SH45 IBC# 40061535.pdf"

I, Phillip E. Russell, P.E.,
Print Name

Director
Title - Owner/President/Other

of The Texas Turnpike Authoirty
Corporation/Partnership/Entity Name

have authorized Leticia E. Sosa, P.E.
Print Name of Agent/Engineer

of Turner Collie and Braden, Inc.
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Natural Resource Conservation Commission (TNRCC) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TNRCC's approval letter. The TNRCC is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and the forms must accompany the completed application.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TNRCC cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. For applicants who are not the property owner, but who have the right to control and possess and control the property, additional authorization is required from the owner.

Stacey B Fielding
Applicant's Signature

5/2/03
Date

THE STATE OF Texas §

County of Travis §

BEFORE ME, the undersigned authority, on this day personally appeared Stacey Benningfield known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 2nd day of May, 2003.

Betty M Hoffman
NOTARY PUBLIC

Betty M. Hoffman
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: February 9, 2005

BETTY M. HOFFMAN
NOTARY PUBLIC STATE OF TEXAS
COMMISSION EXPIRES:
FEBRUARY 9, 2005

ATTACHMENT B
NARRATIVE OF PROPOSED MODIFICATION

Williamson County (Wilco) proposes upgrades to the intersection of Parmer Lane at SH 45, including additional turn lanes and sidewalk extensions. The project is located within the City of Austin and resides in the Edwards Aquifer Recharge Zone. The project area covers three existing WPAPs as seen in Table 1. Because the hazardous material trap was built prior to the current Total Suspended Sediment (TSS) load removal requirements, it does not provide any TSS removal. Its capture requirements as a hazardous material trap are also unaffected by the proposed developments.

Table 1: Existing Permits within the Project

CSJ Number	Drainage Area	BMP Type	WPAP Permit Number
3417-02-004	A	Hazardous Material Trap	11-95050402 11-92022701
3417-02-024	B	None	
0683-01-070	C	Extended Detention Basin	11-03050901

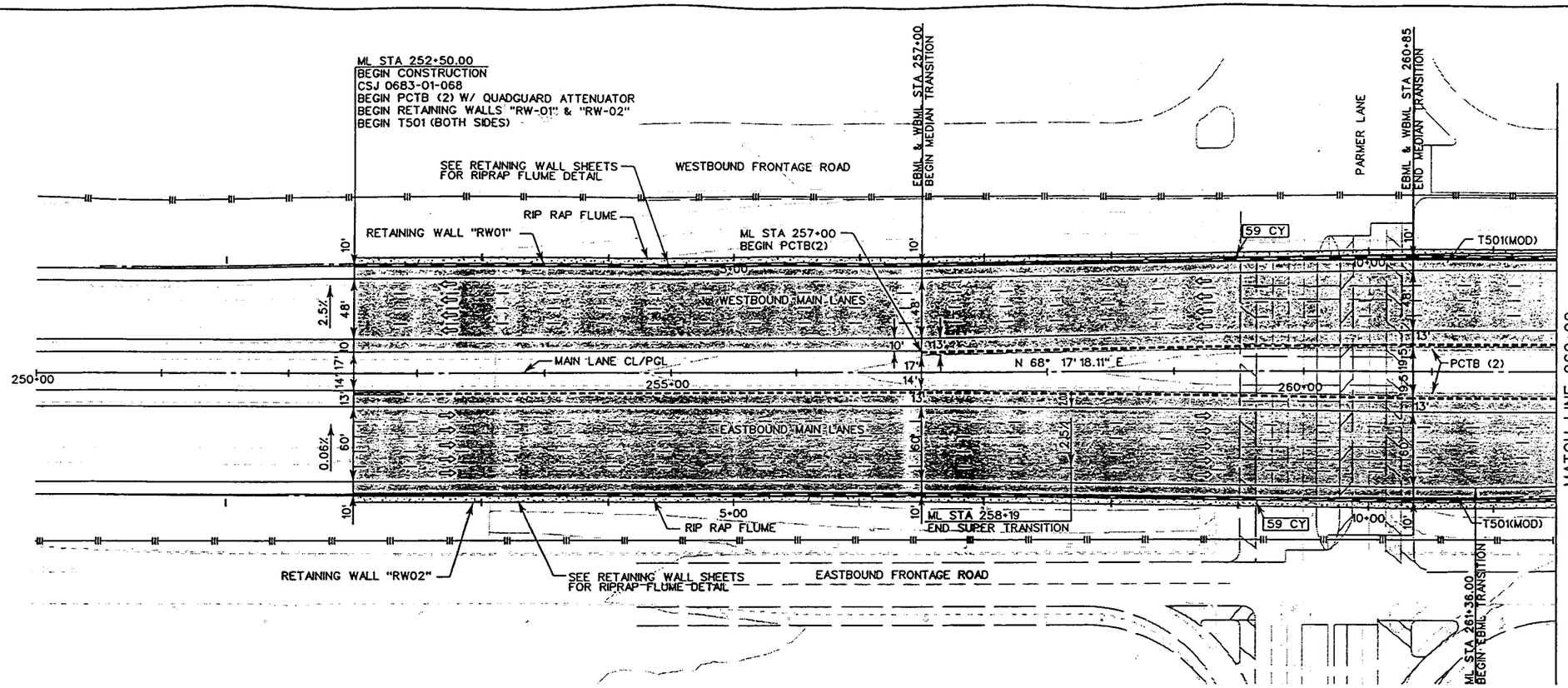
The existing extended detention pond is located west of Pearson Ranch Road on the south side of SH 45. The original design of the pond from 2003 showed that the pond would treat a drainage area of 100.52 acres with 63.5% impervious cover. Due to ongoing adjacent development and changing landcover use in the area, the present-day conditions show that the drainage area to the pond is 159.00 acres with 39.81% of it being impervious cover. The 2003 as-builts of the pond noted that this area only required a 359,657 cubic foot extended detention pond to remove 80% of the TSS load produced by its drainage area. However, the pond was designed to be 720,000 cubic feet in volume, allowing for future changes to the treatment capacity.

The proposed Parmer Lane improvements include changes to the drainage area of this existing pond. An additional 2.1 acres from Parmer Lane on the north side of SH 45 will be routed to the pond for treatment. This is a 1.3% increase in drainage area and 2.4% increase in impervious cover draining to the pond for an additional 1,209 pounds of annual TSS load removed by the pond, as described in Table 2. There will be no changes to the design of the existing BMP or its maintenance procedures.

Table 2. Treatment Provided by Extended Detention Pond.

	Existing Conditions	Proposed Conditions	Difference
Total Drainage Area (ac)	159.00	161.10	2.1
Impervious Cover (ac)	63.30	64.91	1.61
Rainfall Depth	3.40	3.33	-0.07
Fraction of Annual Runoff	0.98	0.98	-
TSS Load Removed (lbs)	52,837	54,046	1,209

ATTACHMENT C
CURRENT SITE PLAN OF THE APPROVED PROJECT

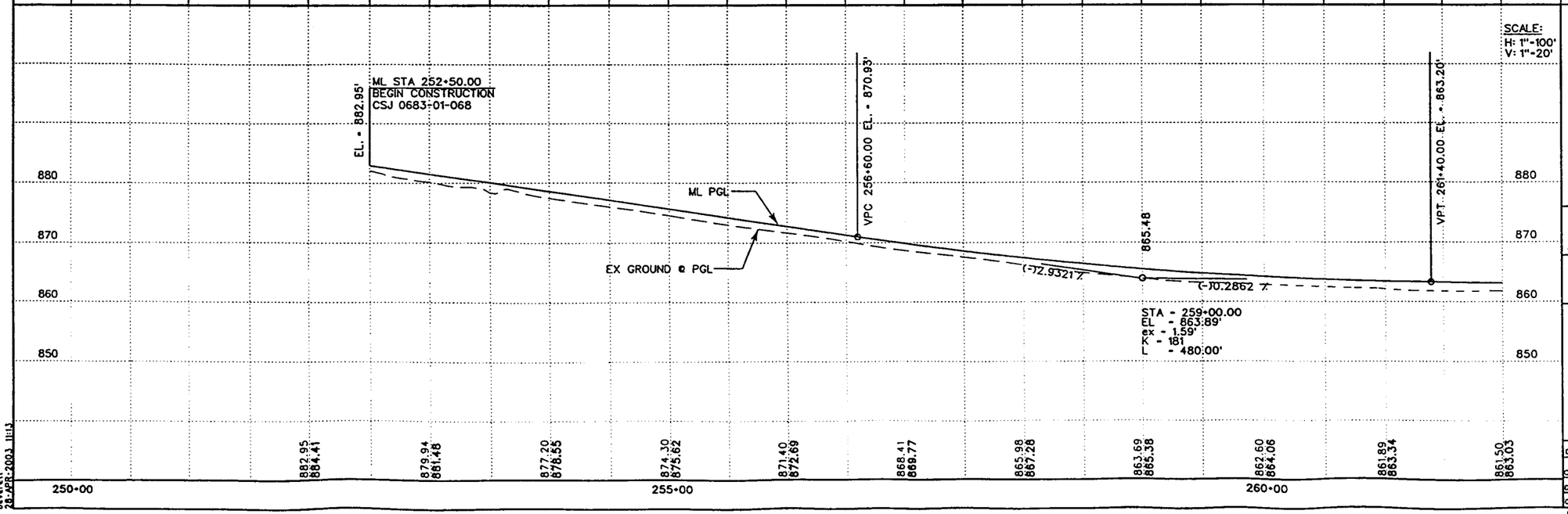


LEGEND

- 11" CRCP ON 6"HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501(MOD)
- BENCH MARK
- CONTROL OF ACCESS

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
272		CY	EMBANKMENT
31431		CY	EXCAVATION



Douglas Huneycutt, PE 3/28/03

DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by Douglas Huneycutt, P.E. 62830 on March 28, 2003

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Texas Department of Transportation
TEXAS TURNPIKE AUTHORITY DIVISION

JACOBS

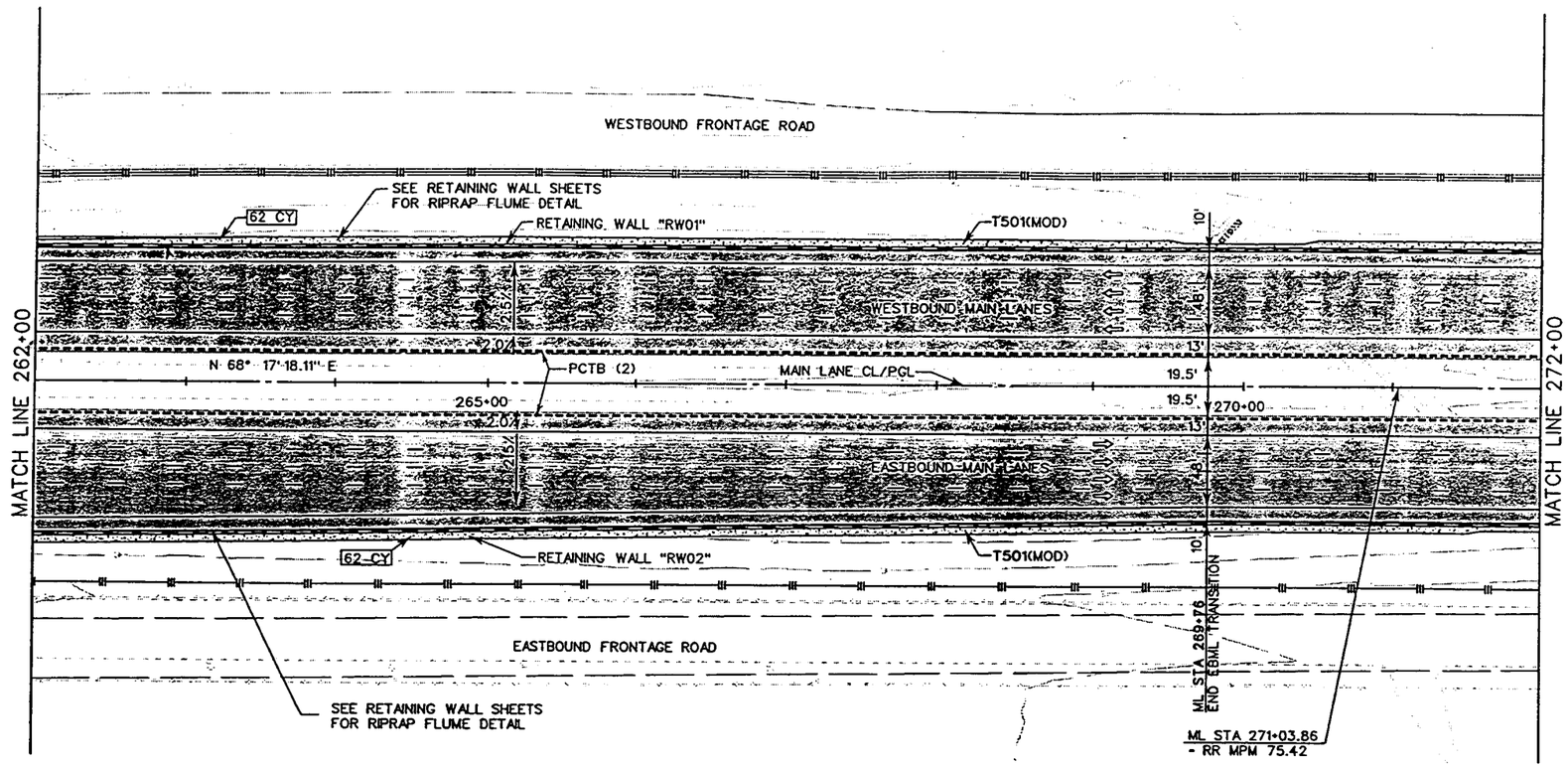
MAIN LANE PLAN & PROFILE STA. 250+50 TO 262+00 SHEET 1 OF 13

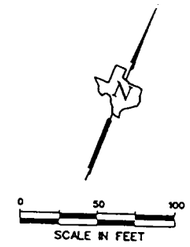
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No. / SECTION No. / JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683 / 01 / 070	153

\\WAC\H2O\1\PROJECT\C3d\30700\700cadd\V102\civil\sps070a1.dgn

baverell 28-MAR-2003 11:13





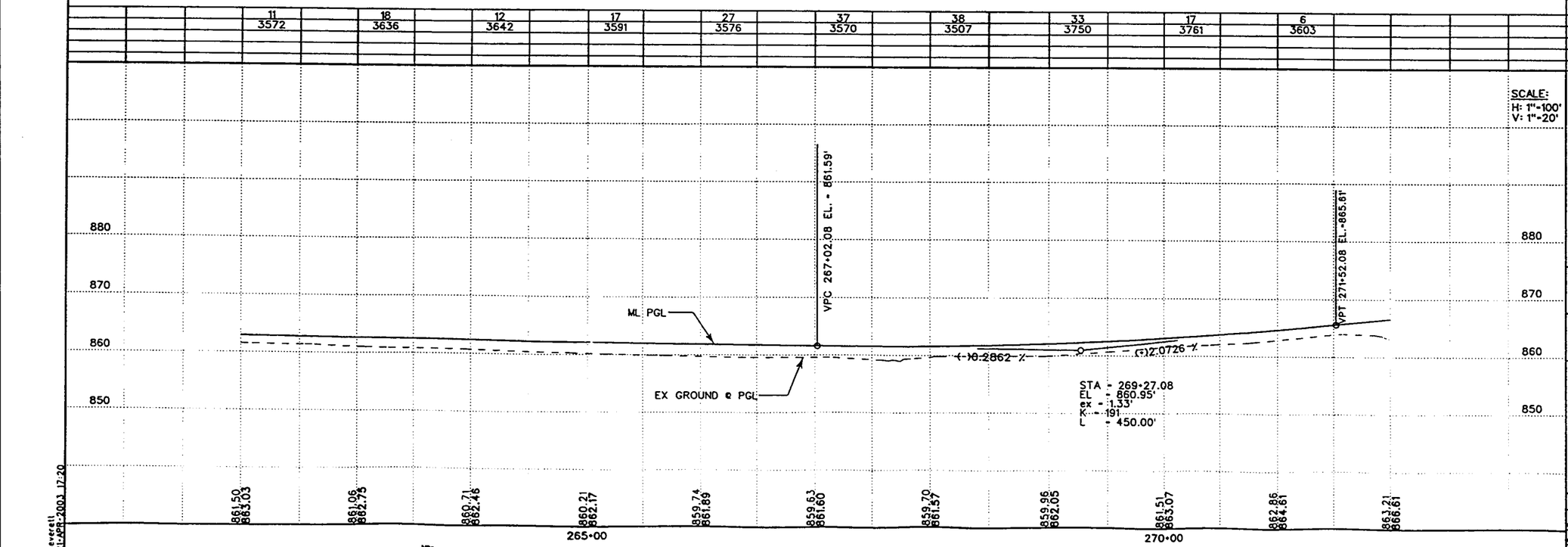
LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501(MOD)
- BENCH MARK
- CONTROL OF ACCESS

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
216		CY	EMBANKMENT
36208		CY	EXCAVATION



Douglas Huneycutt, PE 3/28/03

DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by Douglas Huneycutt, P.E. 62830 on March 28, 2003

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TEXAS TURNPIKE AUTHORITY DIVISION

JACOBS

MAIN LANE PLAN & PROFILE STA. 262+00 TO 272+00 SHEET 2 OF 13

SCALE: 1" - 100'

DESIGNED SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED GKL	6	TEXAS	NG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED GKL	14	WILLIAMSON	0683	01	070	154

beverell 21-APR-2003 17:20

\\NEW\PROJ\PROJECT\CL-130700\700cadd\V02Civil\Spp07on.dgn

END CSJ 0683-01-068 ML STA 276+00.00 | BEGIN CSJ 0683-01-070 ML STA 276+00.00

MATCH LINE 272+00

MATCH LINE 284+00

ML STA 275+25.26

ML STA 277+15.83 BEGIN WBML TRANSITION

ML STA 279+57.08 BEGIN MBGF W/ TAS

ML STA 280+57.08 END MBGF W/ SGT

ML STA 283+25.53 END WBML TRANSITION

EX ROW

UGT

WESTBOUND FRONTAGE ROAD

STA 274+60 END-PCTB (2) W/ QUADGUARD

RETAINING WALL "RW-01"

50 CY

T501(MOD)

SEE RETAINING WALL SHEETS FOR RIPRAP FLUME DETAIL

WESTBOUND MAIN LANES

MAIN LANE CL/PGL

PC 276+60.53

PT 278+19.15

100' MBGF

N 67° 34' 01" E

6 CY

275+00

280+00

EASTBOUND MAIN LANES

PCTB(2)

RE01 STA 283+00

END T501(MOD)

BEGIN T501 RAIL

RAMP RE01

RETAINING WALL "RW-02"

SEE RETAINING WALL SHEETS FOR RIPRAP FLUME DETAIL

T501(MOD) 43 CY

STA 283+00 END RW02 6 CY

RETAINING WALL "RW-18"

10 CY 2 CY RAMP RE03

RETAINING WALL "RW-17" 6 CY

CAPITAL METRO RAILROAD

ML STA 273+00.00 BEGIN EBML TRANSITION BEGIN MEDIAN

BM#1 - N BOLT METAL POLE STA 273+-- RT 196' EL 885.458

EX ROW

BM#2 - BRASS DISK STA 278+-- RT 201' EL 889.166

ML STA 282+00.00 END EBML TRANSITION

PROP ROW

EASTBOUND FRONTAGE ROAD

ML STA 281+96.68 94' RT BEGIN RAMP RE01 TRANSITION

LEGEND

- 11" CRCP ON 6"HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 6" HMAC (3"TY C) ON 10"TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- BENCH MARK
- CONTROL OF ACCESS

0 50 100 SCALE IN FEET

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. BENCH MARKS LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
2418		CY	EMBANKMENT
29002		CY	EXCAVATION

14	3453	31	2880	70	2464	91	2215	119	2096	38	2318	25	2616	16	2653	28	2521	163	2046	692	1863	1131	1877

EXCAVATION & EMBANKMENT QUANTITIES INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS

SCALE: H: 1"-100' V: 1"-20'

VPT 271+52.08 EL.=865.61'

VPC 273+56.72 EL = 869.86'

(+)2.0742 %

872.52

(+)0.8848 %

STA = 275+56.72
EL = 874.00'
ex = -0.59'
K = 336
L = 400.00'

VPT 277+56.72 EL = 875.77'

VPC 277+95.03 EL = 876.11'

ML PGL

EX GROUND @ PGL

(+)0.8848 %

(-)1.9730 %

STA = 282+34.86
EL = 880.00'
ex = -3.14'
K = 308
L = 879.67'

EX GROUND @ P.G.L.	866.70	868.63	870.50	872.02	873.19	874.35	874.89	875.37	875.41	875.00	874.45	873.25
PROPOSED P.G.L.	868.68	870.72	872.52	874.02	875.22	876.15	876.86	877.24	877.30	877.03	876.43	
	863.21											
	866.61											

870 860 850 840 830 820 810

275+00 280+00

Texas Department of Transportation

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TEXAS TURNPIKE AUTHORITY DIVISION

JACOBS

MAIN LANE PLAN & PROFILE STA. 272+00 TO 284+00 SHEET 3 OF 13

SCALE: 1" = 100'

Douglas Huneycutt, PE 3/28/03

STATE OF TEXAS DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER

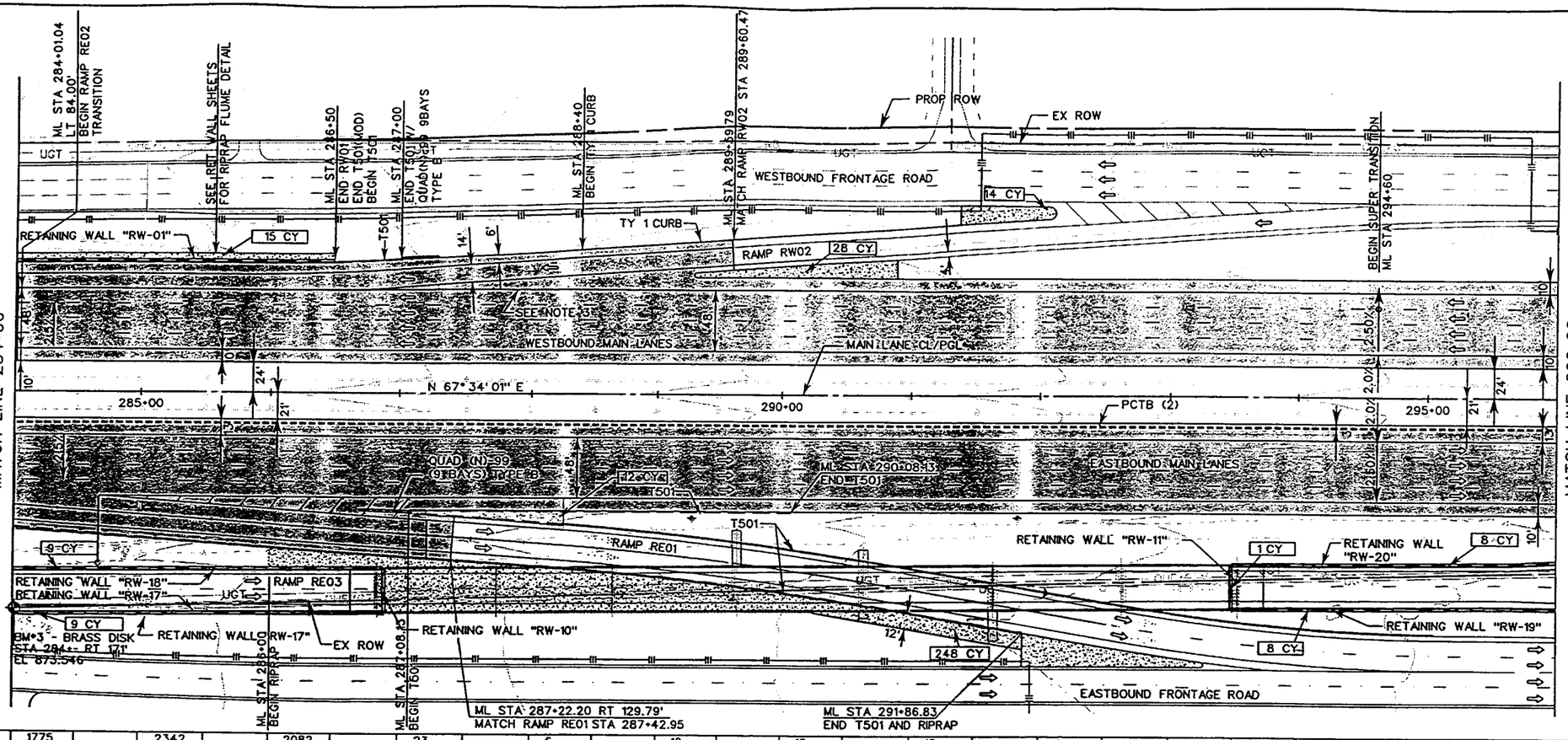
The seal appearing on this document was authorized by Douglas Huneycutt, P.E. 62830 on March 28, 2003

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	155

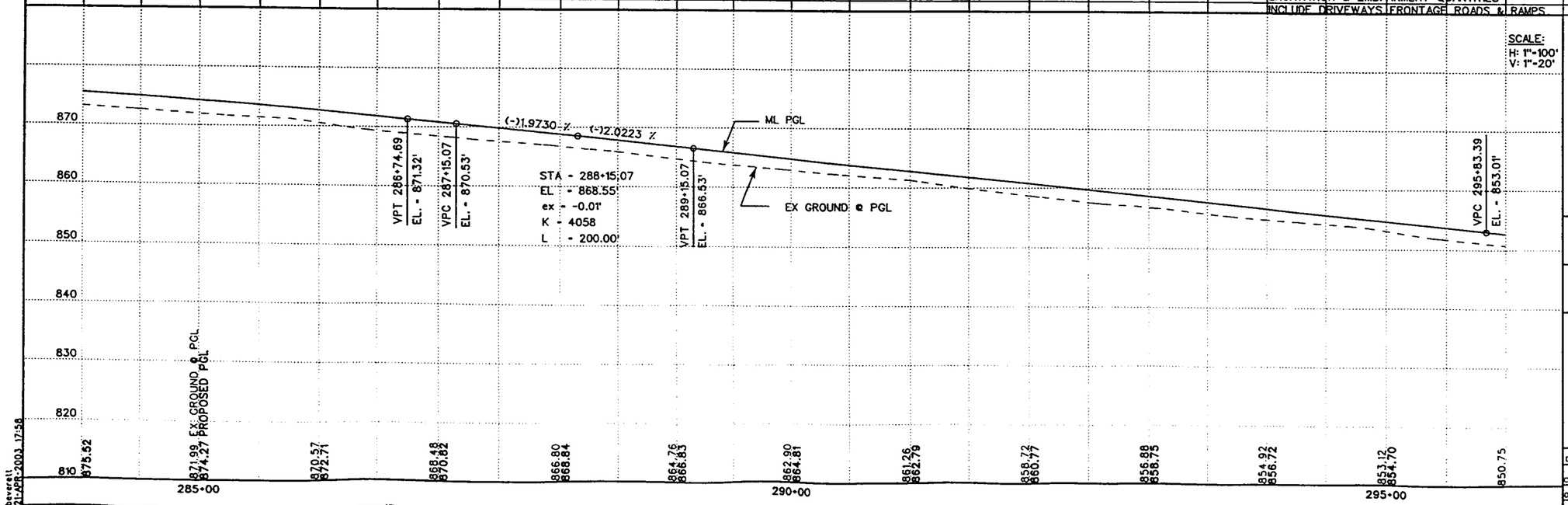
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1775 1828		2342 2065		2082 2223		23 2658		6 2790		10 2949		15 3006		15 3062		4 3546		682 3766		2655 2956		2417 2677	

EXCAVATION & EMBANKMENT QUANTITIES INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS





LEGEND

- 11" CRCP ON 6"HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 7" HMAC ON 9" TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- BENCH MARK
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. SEE RAMP DETAIL SHEETS.
4. BENCH MARKS LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
12026		CY	EMBANKMENT
33526		CY	EXCAVATION

Douglas Huneycutt, PE 3/28/03



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TEXAS TURNPIKE AUTHORITY DIVISION

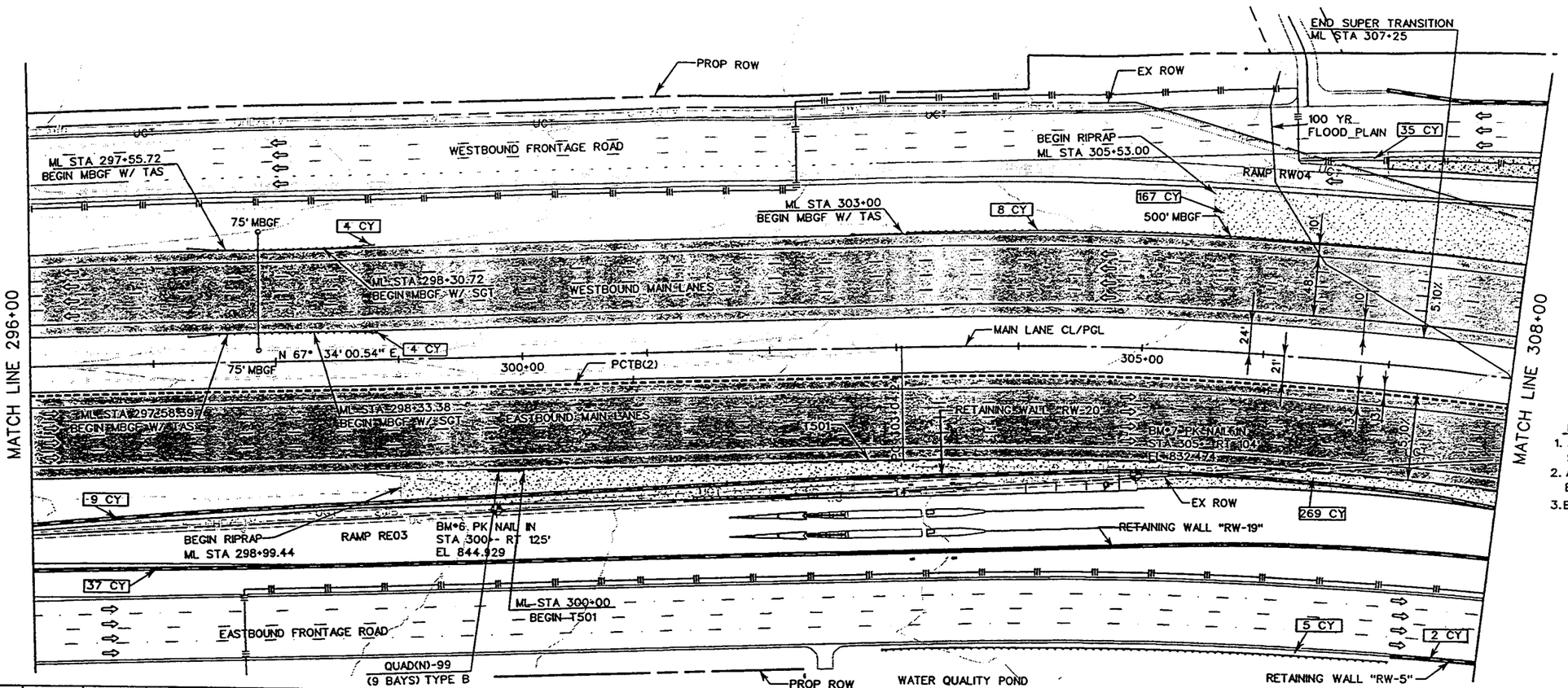
JACOBS

MAIN LANE PLAN & PROFILE STA. 284+00 TO 296+00 SHEET 4 OF 13

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	156

Beverett 21-APR-2003 17:58
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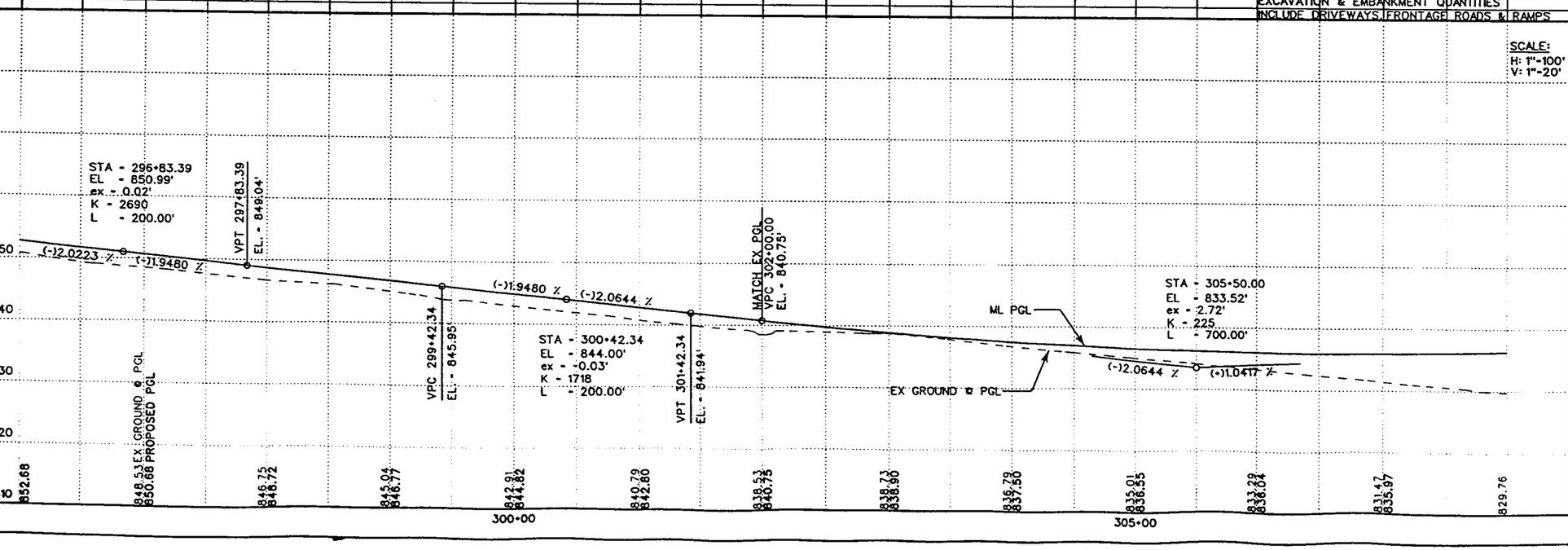


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2710		3012		3162		2733		2102		1896		1670		1131		725		347	

8588	9700
233	247

EXCAVATION & EMBANKMENT QUANTITIES
INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS

SCALE:
H: 1"=100'
V: 1"=20'



beverett
23-APR-2003 09:57

LEGEND

- 11" CRCP ON 6"HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 6" HMAC (3"TY C) ON 10"TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- BENCH MARK
- CONTROL OF ACCESS
- T4 — T4(S) MOD WITH 2-2" PVC CONDUITS

0 50 100
SCALE IN FEET

NOTES:
1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. BENCH MARKS LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
54161		CY	EMBANKMENT
19968		CY	EXCAVATION

Douglas Huneycutt, PE
3/28/03

STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED PROFESSIONAL ENGINEER

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TEXAS TURNPIKE AUTHORITY DIVISION

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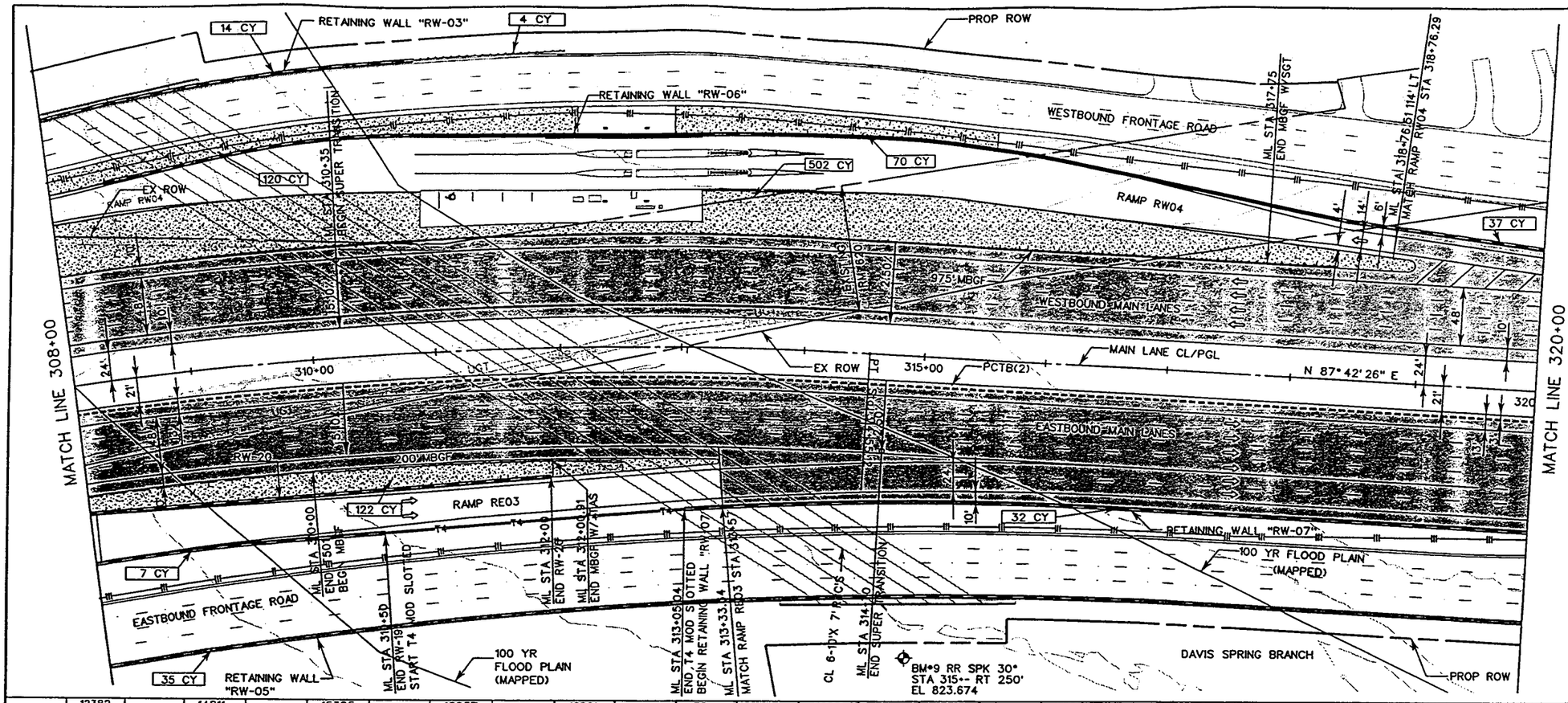
MAIN LANE PLAN & PROFILE STA. 296+00 TO 308+00 SHEET 5 OF 13

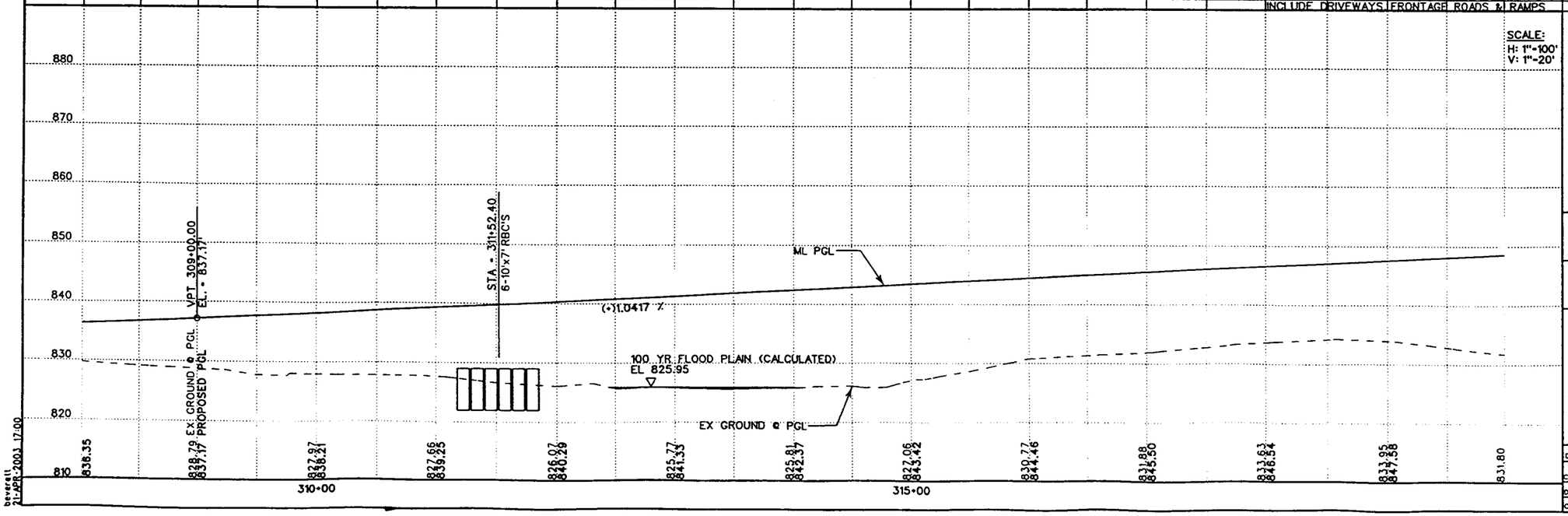
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	157

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12382	14811	15385	15957	16861	17319	17606	16265	14684	13715	12200	12714
40	0	0	39	129	272	228	105	28	2	8	71

EXCAVATION & EMBANKMENT QUANTITIES INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS

SCALE:
H: 1"=100'
V: 1"=20'

0 50 100
SCALE IN FEET

N

LEGEND

- 11" CRCP ON 6"HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 6" HMAC (3"TY C) ON 10"TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- BENCH MARK
- CONTROL OF ACCESS
- T4(S) MOD WITH 2-2" PVC CONDUITS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. SEE RAMP DETAIL SHEETS.
4. BENCH MARKS LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL

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SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
179899		CY	EMBANKMENT
922		CY	EXCAVATION

Douglas Huneycutt, P.E. 3/29/03

THE STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER

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TEXAS TURNPIKE AUTHORITY DIVISION

JACOBS

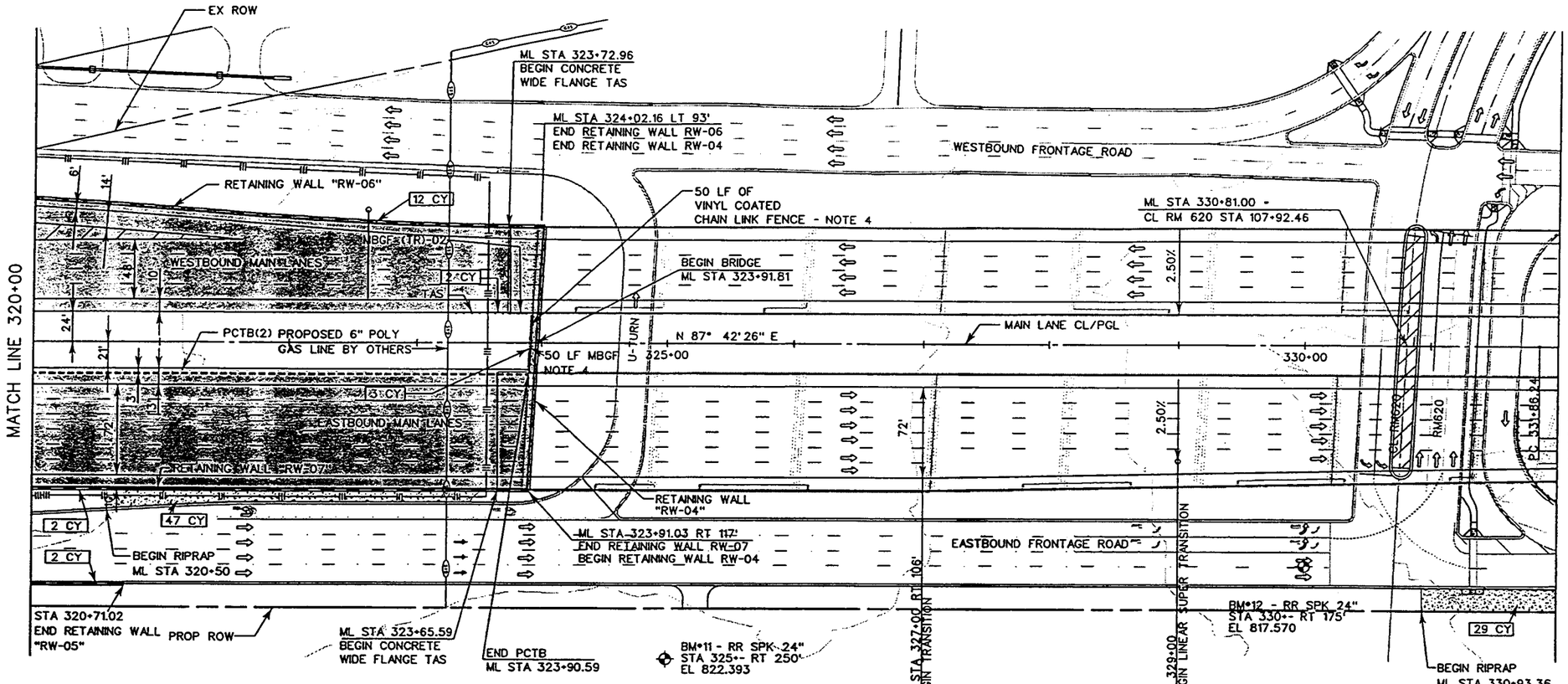
MAIN LANE PLAN & PROFILE STA. 308+00 TO 320+00 SHEET 6 OF 13

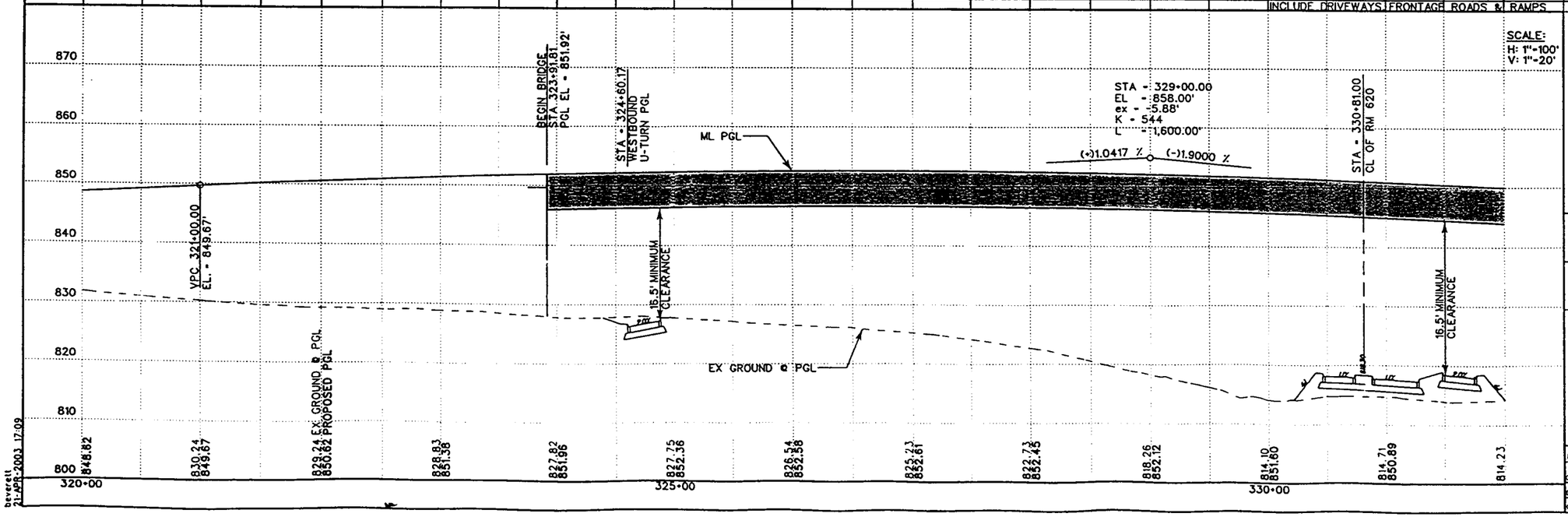
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CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	158

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21-APR-2003 17:00

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14277		15367		15848		15117		66		26		25		320		780	
127		34		67		308		798		1306		3548		3030		1209	

364		789		2101													
339		63		38													

EXCAVATION & EMBANKMENT QUANTITIES
INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS

SCALE:
H: 1"=100'
V: 1"=20'

0 50 100
SCALE IN FEET

N

LEGEND

- 11" CRCP ON 6"HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 7" HMAC ON 9" TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- BENCH MARK
- CONTROL OF ACCESS
- TXU GAS LINE

NOTES:
1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. BENCH MARKS LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL
4. REFER TO SHEET 221 FOR SAFETY FENCING DETAIL.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
65080		CY	EMBANKMENT
10867		CY	EXCAVATION

Douglas Huneycutt, PE
3/29/03

DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER

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TEXAS TURNPIKE AUTHORITY DIVISION
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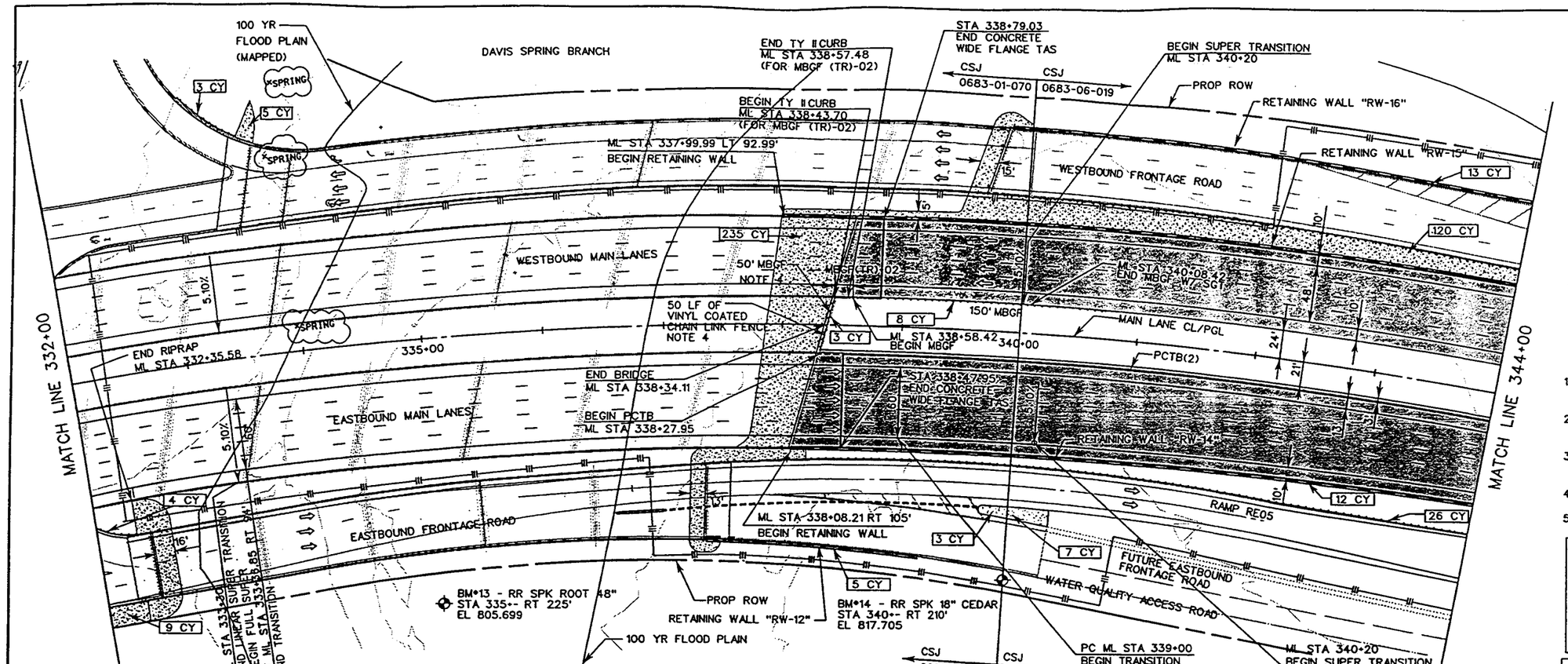
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MAIN LANE PLAN & PROFILE STA. 320+00 TO 332+00 SHEET 7 OF 13

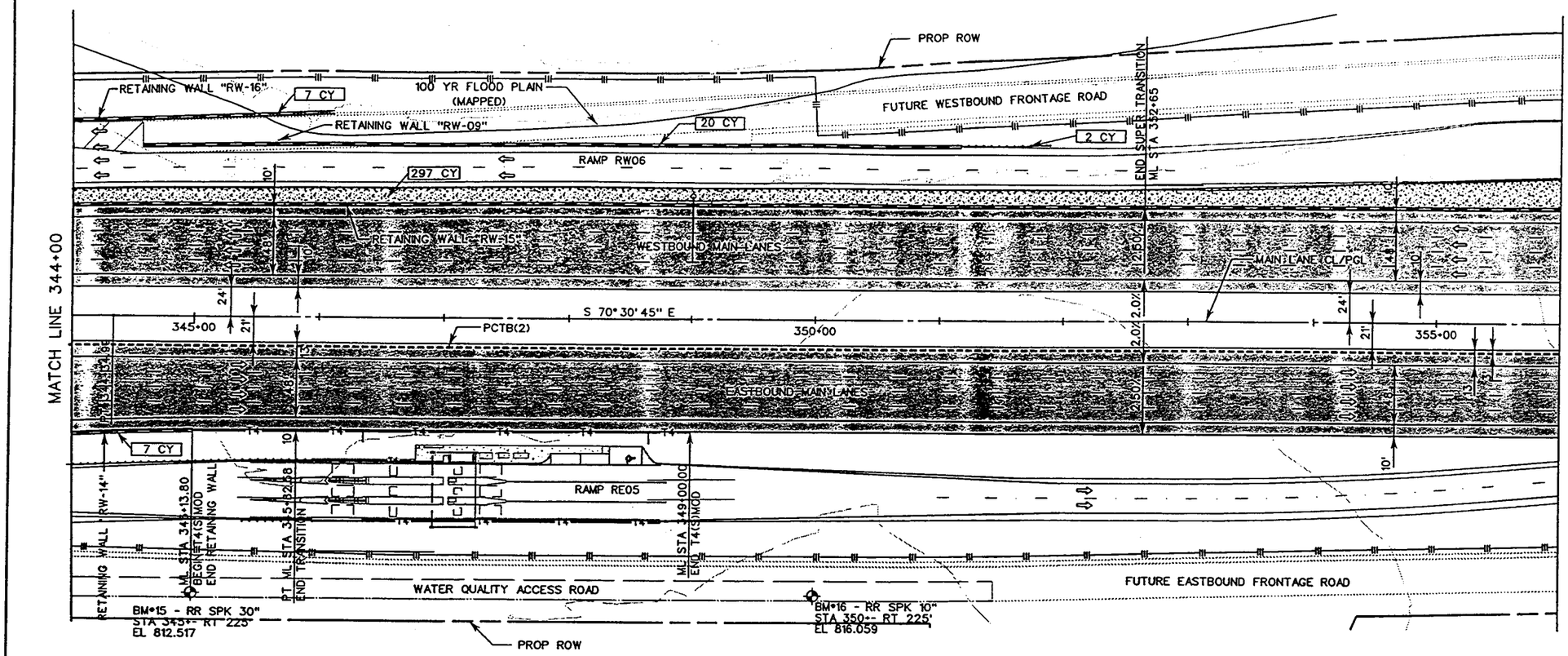
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CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No. / SECTION No.	JOB No. / SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683 / 01	070 / 159

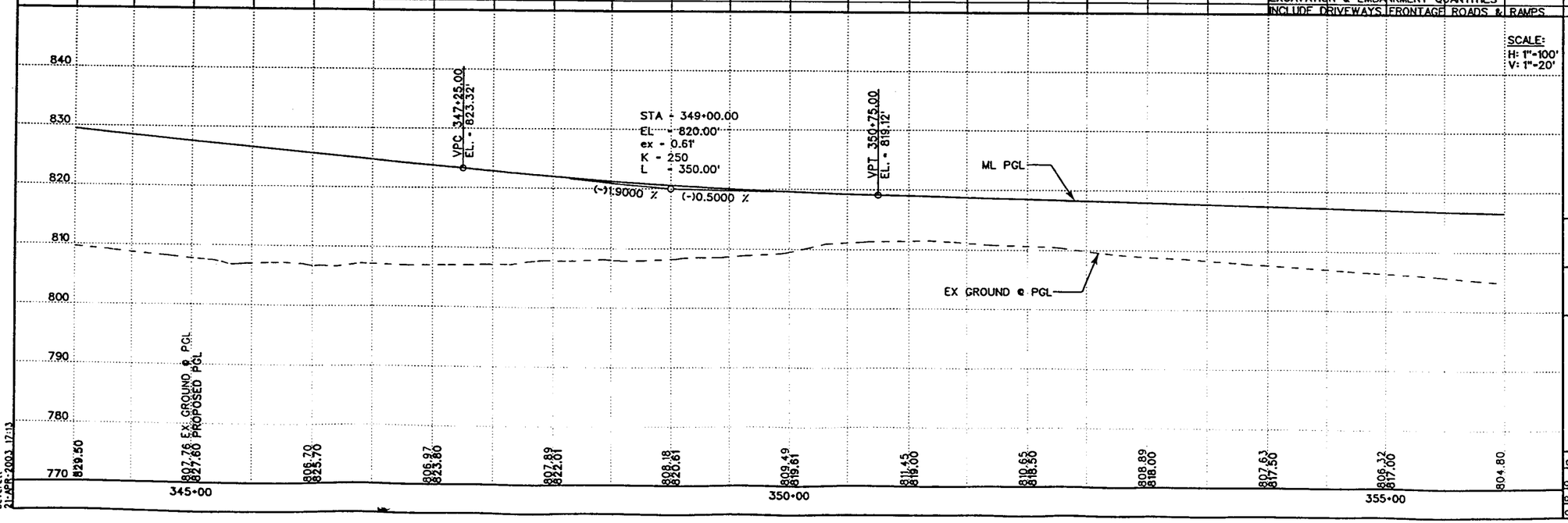
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100 YR FLOOD PLAIN (MAPPED)
DAVIS SPRING BRANCH
END TY II CURB ML STA 338+57.48 (FOR MBGF (TR)-02)
BEGIN TY II CURB ML STA 338+43.70 (FOR MBGF (TR)-02)
STA 338+79.03 END CONCRETE WIDE FLANGE TAS
CSJ 0683-01-070
CSJ 0683-06-019
BEGIN SUPER TRANSITION ML STA 340+20
PROP ROW
RETAINING WALL "RW-16"
RETAINING WALL "RW-15"
ML STA 337+99.99 LT 92.99' BEGIN RETAINING WALL
WESTBOUND FRONTAGE ROAD
WESTBOUND MAIN LANES
EASTBOUND MAIN LANES
EASTBOUND FRONTAGE ROAD
50' MBGF NOTE 4
50 LF OF VINYL COATED CHAIN LINK FENCE NOTE 4
END RIPRAP ML STA 332+35.58
END BRIDGE ML STA 338+34.11
BEGIN PCTB ML STA 338+27.95
ML STA 338+58.42 BEGIN MBGF
ML STA 340+08.42 END MBGF W/ SGT
150' MBGF
MAIN LANE CL/PGL
PCTB(2)
STA 338+47.95 END CONCRETE WIDE FLANGE TAS
RETAINING WALL "RW-14"
RAMP REQ'S
FUTURE EASTBOUND FRONTAGE ROAD
WATER QUALITY ACCESS ROAD
ML STA 338+08.21 RT 105' BEGIN RETAINING WALL
BM#13 - RR SPK ROOT 48" STA 335+- RT 225' EL 805.699
BM#14 - RR SPK 18" CEDAR STA 340+- RT 210' EL 817.705
PROP ROW
RETAINING WALL "RW-12"
100 YR FLOOD PLAIN
ML STA 333+30 END LINEAR SUPER
BEGIN FULL SUPER
PT ML STA 333+85 RT PVI
END TRANSITION
PC ML STA 339+00 BEGIN TRANSITION
ML STA 340+20 BEGIN SUPER TRANSITION END FULL SUPER
MATCH LINE 332+00
MATCH LINE 344+00
335+00
340+00
3 CY
5 CY
235 CY
8 CY
13 CY
120 CY
4 CY
9 CY
7 CY
12 CY
26 CY
5.10%
16'
24'
48'
10'
21'

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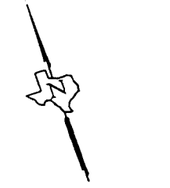




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0		0		0		0		20		249		615		804		851		844		799		614	

EXCAVATION & EMBANKMENT QUANTITIES INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS

SCALE:
H: 1"=100'
V: 1"=20'



LEGEND

- 11" CRCP ON 6"HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- BENCH MARK
- CONTROL OF ACCESS
- T4(S) MOD WITH 2-2" IN PVC CONDUITS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. BENCH MARKS LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
96200		CY	EMBANKMENT
4796		CY	EXCAVATION

Douglas Huneycutt, P.E. 3/28/03



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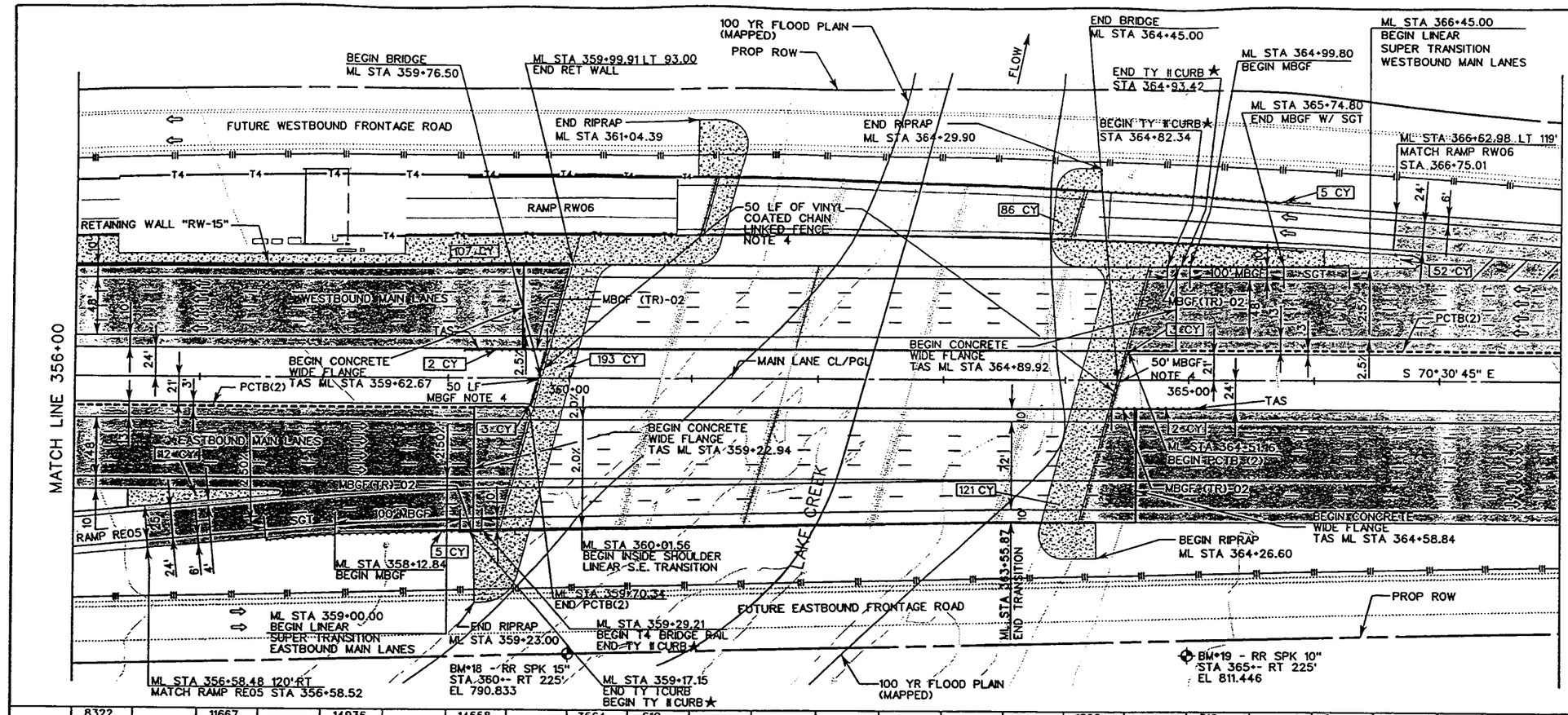
MAIN LANE PLAN & PROFILE STA. 344+00 TO 356+00 SHEET 9 OF 13

SCALE: 1" = 100'

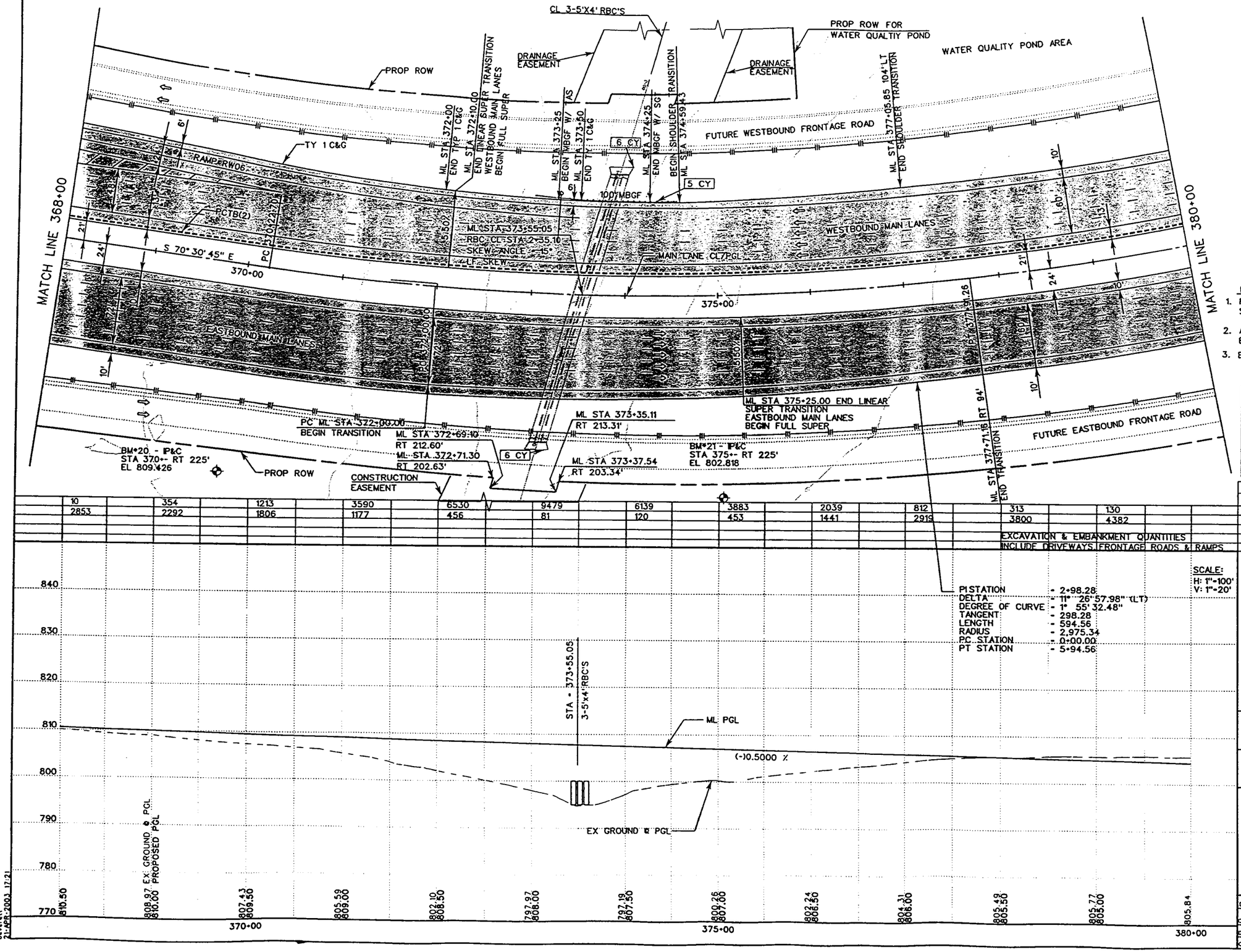
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CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No. / SECTION No.	JOB No. / SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683 / 01	070 / 61

beverett
21-APR-2003 17:13

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MATCH LINE 356+00
MATCH LINE 368+00
100 YR FLOOD PLAIN (MAPPED)
PROP ROW
FLOW
BEGIN BRIDGE ML STA 359+76.50
ML STA 359+99.91 LT 93.00 END RET WALL
END BRIDGE ML STA 364+45.00
ML STA 364+99.80 BEGIN MBGF
ML STA 366+45.00 BEGIN LINEAR SUPER TRANSITION WESTBOUND MAIN LANES
END TY II CURB ★ STA 364+93.42
BEGIN TY II CURB ★ STA 364+82.34
ML STA 365+74.80 END MBGF W/ SGT
ML STA 366+62.98 LT 119' MATCH RAMP RW06 STA 366+75.01
FUTURE WESTBOUND FRONTAGE ROAD
END RIPRAP ML STA 361+04.39
END RIPRAP ML STA 364+29.90
RAMP RW06
RETAINING WALL "RW-15"
50 LF OF VINYL COATED CHAIN LINKED FENCE NOTE 4
86 CY
107 CY
5 CY
52 CY
WESTBOUND MAIN LANES
MBGF (TR)-02
TAS
BEGIN CONCRETE WIDE FLANGE TAS ML STA 359+62.67
2 CY
193 CY
50 LF MBGF NOTE 4
MAIN LANE CL/PGL
BEGIN CONCRETE WIDE FLANGE TAS ML STA 364+89.92
100' MBGF
SGT
50' MBGF NOTE 4
S 70°30'45" E
PCTB(2)
EASTBOUND MAIN LANES
3 CY
12 CY
2 CY
ML STA 364+51.46 BEGIN PCTB(2)
121 CY
BEGIN CONCRETE WIDE FLANGE TAS ML STA 359+22.94
RAMP RE05
ML STA 358+12.84 BEGIN MBGF
ML STA 360+01.56 BEGIN INSIDE SHOULDER LINEAR S.E. TRANSITION
LAKE CREEK
BEGIN CONCRETE WIDE FLANGE TAS ML STA 364+58.84
BEGIN RIPRAP ML STA 364+26.60
ML STA 359+70.34 END PCTB(2)
ML STA 363+55.87 END TRANSITION
PROP ROW
ML STA 359+00.00 BEGIN LINEAR SUPER TRANSITION EASTBOUND MAIN LANES
END RIPRAP ML STA 359+23.00
ML STA 359+29.21 BEGIN T4 BRIDGE RAIL END TY II CURB ★
FUTURE EASTBOUND FRONTAGE ROAD
BM•19 - RR SPK 10" STA 365+- RT 225' EL 811.446
ML STA 356+58.48 120' RT MATCH RAMP RE05 STA 356+58.52
BM•18 - RR SPK 15" STA 360+- RT 225' EL 790.833
ML STA 359+17.15 END TY TCURB BEGIN TY II CURB ★
100 YR FLOOD PLAIN (MAPPED)

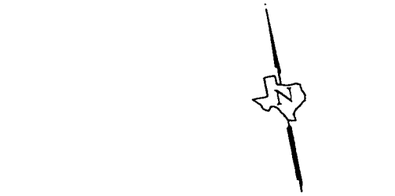
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10		354		1213		3590		6530		9479		6139		3883		2039		812		313		130	
2853		2292		1806		1177		456		81		120		453		1441		2919		3800		4382	

EXCAVATION & EMBANKMENT QUANTITIES INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS

SCALE:
H: 1"=100'
V: 1"=20'



LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 7" HMAC ON 9" TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- BENCH MARK
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
34493		CY	EMBANKMENT
21780		CY	EXCAVATION

Douglas Huneycutt, PE
3/29/03



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TEXAS TURNPIKE AUTHORITY DIVISION

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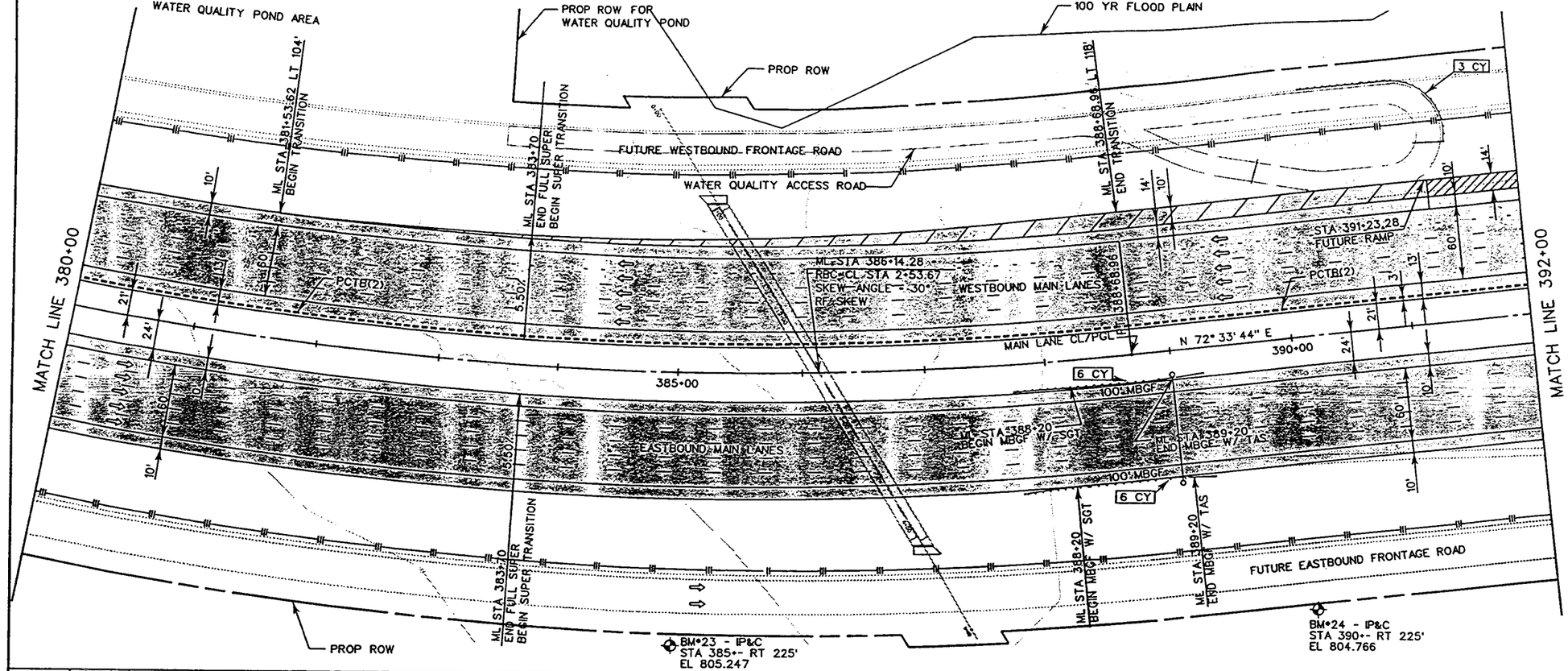
MAIN LANE PLAN & PROFILE STA. 368+00 TO 380+00 SHEET 11 OF 13

SCALE: 1" = 100'

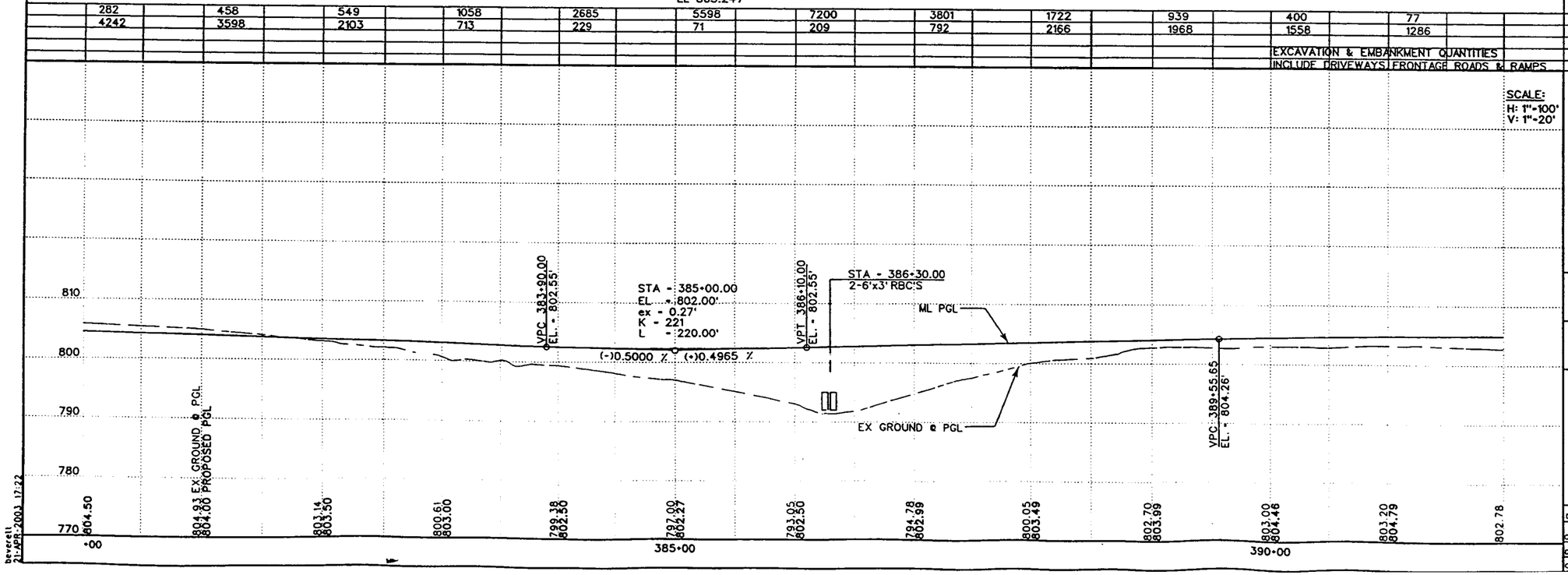
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CHECKED: GKL	6	TEXAS	NG 2002(245)			SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	163

beverett
27-MAR-2003 17:21

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282		458		549		1058		2685		5598		7200		3801		1722		939		400		77	
4242		3598		2103		713		229		71		209		792		2166		1968		1558		1286	
																				EXCAVATION & EMBANKMENT QUANTITIES			
																				INCLUDE DRIVEWAYS, FRONTAGE ROADS & RAMPS			



SCALE:
H: 1"=100'
V: 1"=20'

LEGEND

- 16" HMAC, TY A (4 EQUAL LIFTS)
- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE (ML)
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- BENCH MARK
- CONTROL OF ACCESS

0 50 100
SCALE IN FEET

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. BENCH MARK LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
24769		CY	EMBANKMENT
18935		CY	EXCAVATION

Douglas Huneycutt, PE
3/29/03



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Texas Department of Transportation
TEXAS TURNPIKE AUTHORITY DIVISION

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MAIN LANE PLAN & PROFILE STA. 380+00 TO 392+00 SHEET 12 OF 13

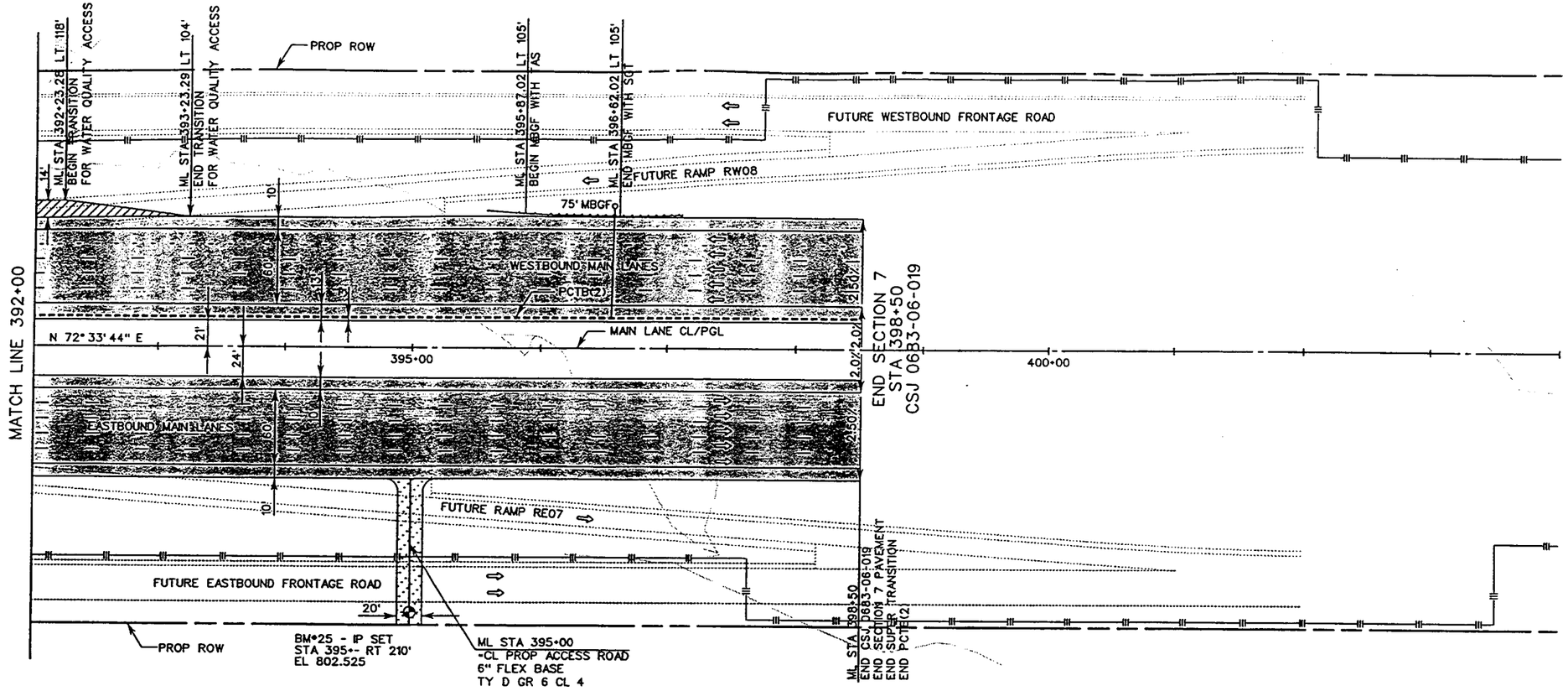
SCALE: 1" - 100'

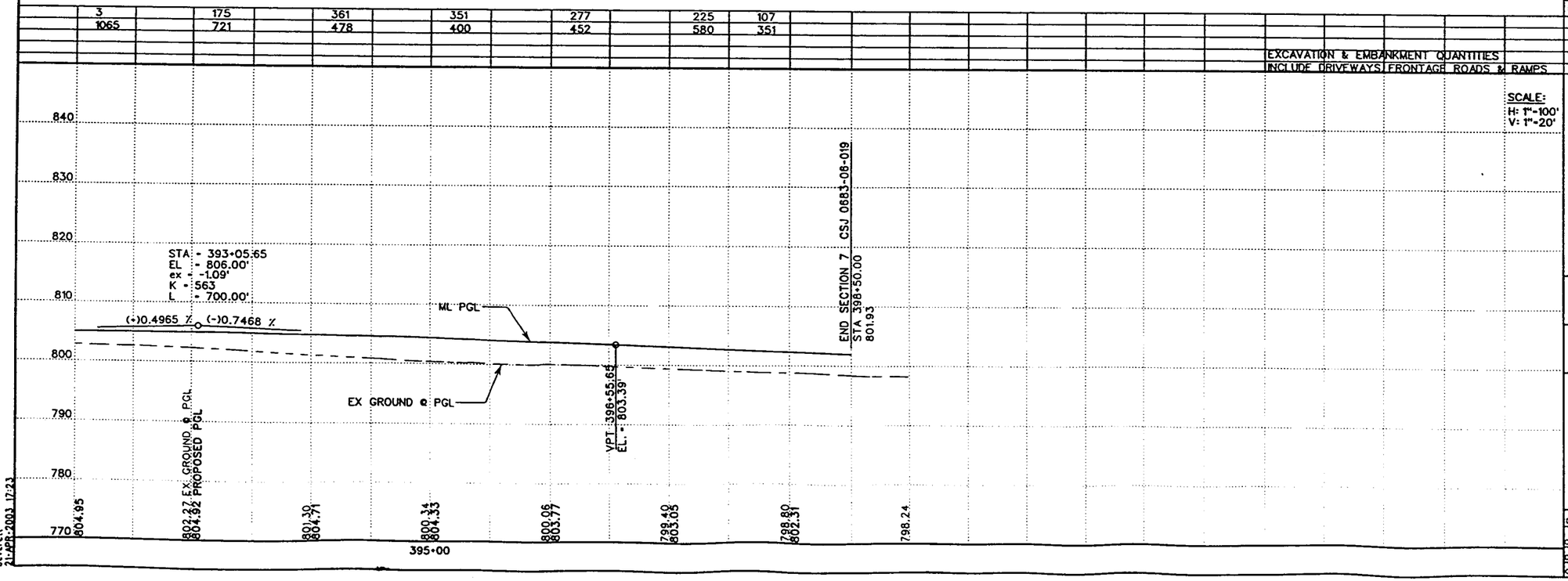
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CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

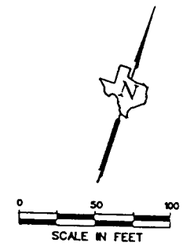
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	14

beverell
21-APR-2003 12:22

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LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE (ML)
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- BENCH MARK
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. BENCH MARKS LOCATIONS ARE APPROXIMATE AND NOT TO BE USED FOR HORIZONTAL CONTROL

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
1499		CY	EMBANKMENT
4047		CY	EXCAVATION

Douglas Huneycutt, PE 3/28/03



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TEXAS TURNPIKE AUTHORITY DIVISION

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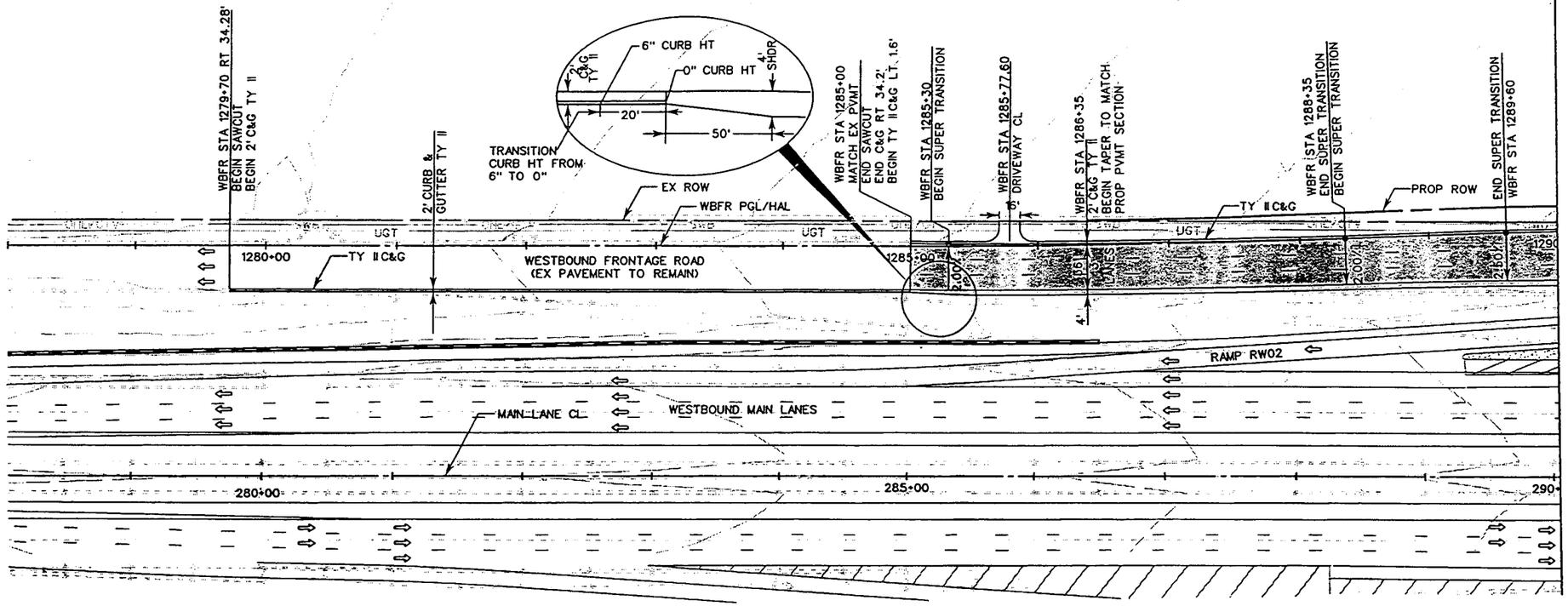
MAIN LANE PLAN & PROFILE STA. 392+00 TO 398+50 SHEET 13 OF 13

SCALE: 1" - 100'

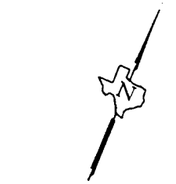
DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	165

beverett
21-APR-2003 12:23

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MATCH LINE 1290+00



LEGEND

- 7" HMAC [2"TY C (SURF),2"TY C, 3"TY B] ON 9" FLEX BASE, 6" L.T.S.G
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

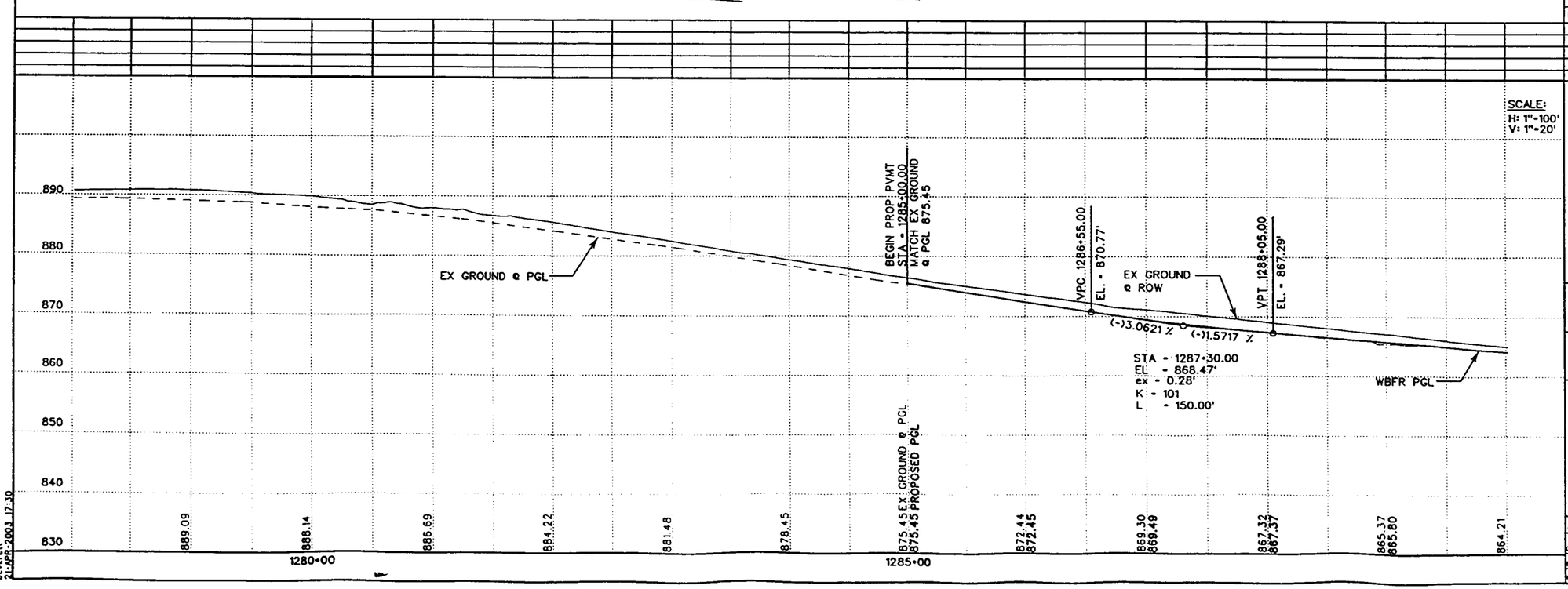
NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION



Douglas Huneycutt, PE
3/28/03

STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER

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Texas Department of Transportation
TEXAS TURNPIKE AUTHORITY DIVISION
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WESTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 1279+70 TO 1290+00 SHEET 1 OF 6

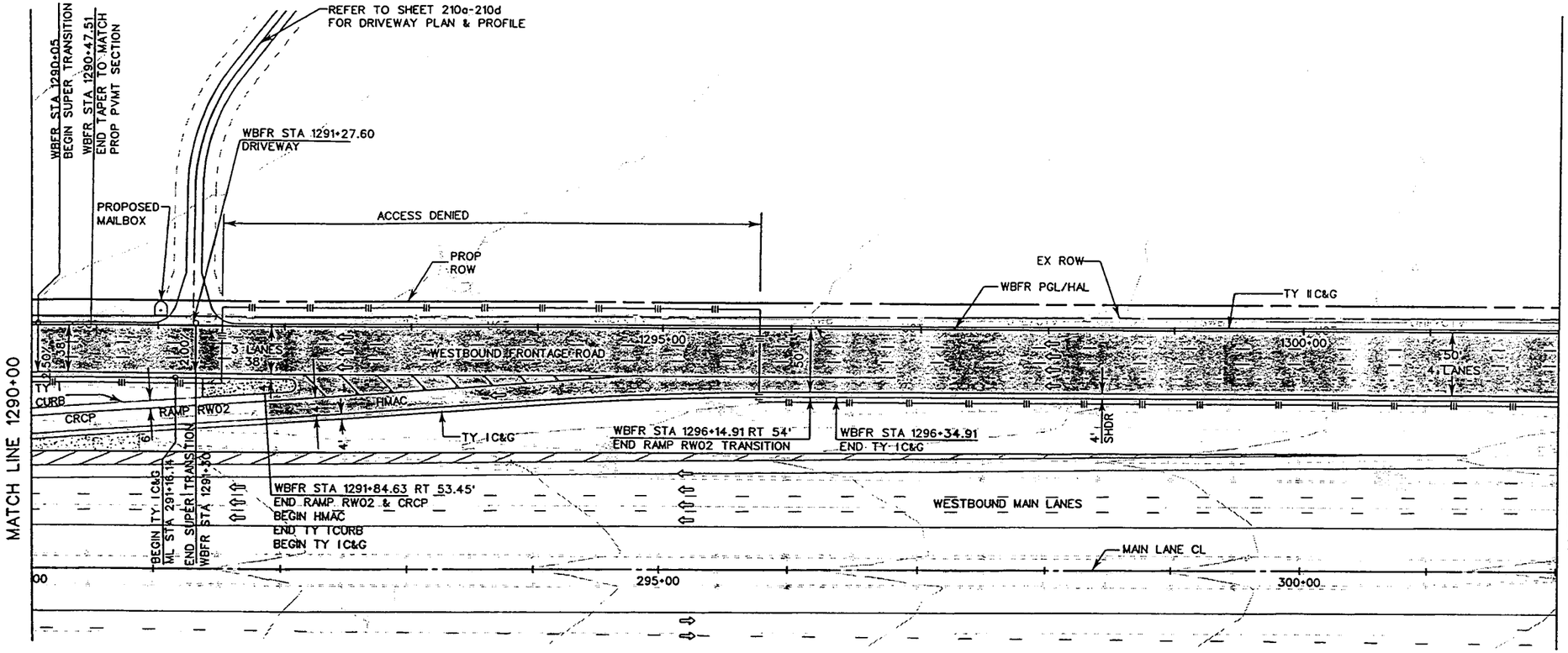
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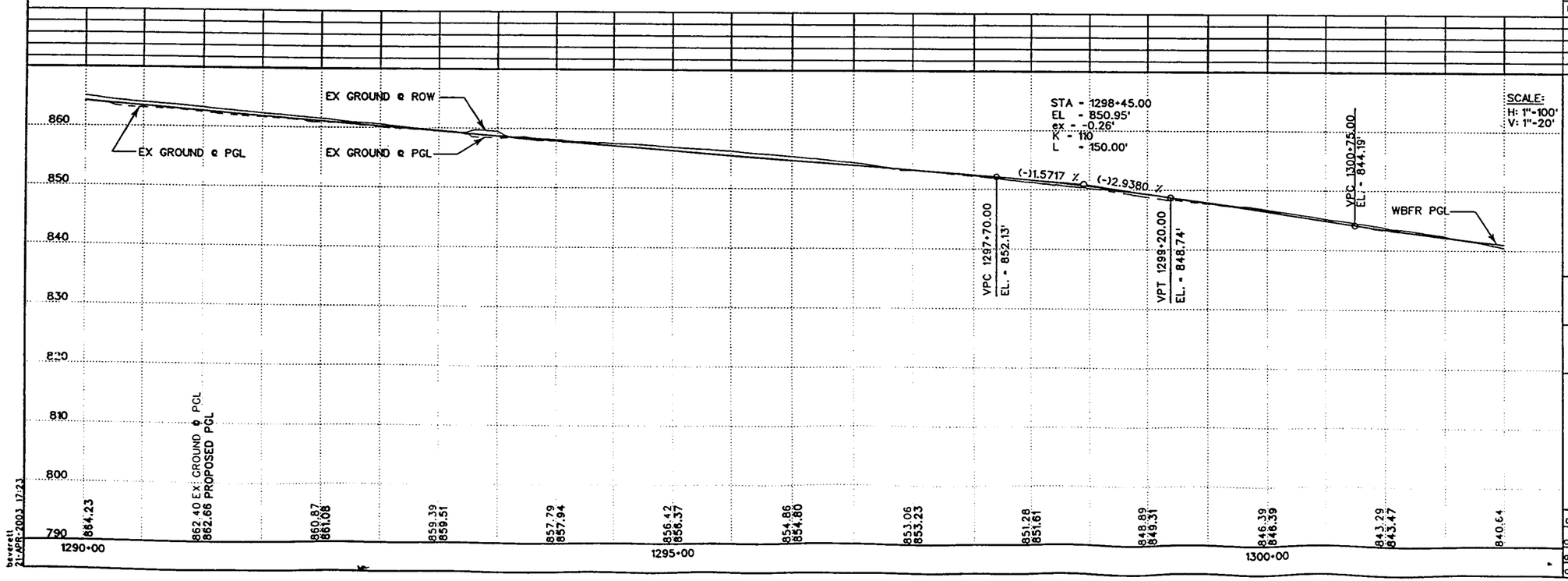
DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	166

beverett
21-APR-2003 17:30

\\WACO1\PROJECT\CJ\JOB\070\V00\cadd\702civ\sspo702.dgn







LEGEND

- 7" HMAC [2"(TYC)(SUR), 2"TY C, 3"TYB], 9" FLEX BASE, 6"L.T.S.G
- 7" HMAC [2"(TY C)(SURF), 2"TY C, 3" TYB] ON 9"TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- CONTROL OF ACCESS
- GUARD RAIL
- MAIL BOX

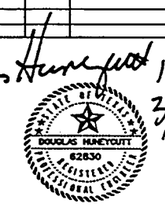
NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/20/03



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TEXAS TURNPIKE AUTHORITY DIVISION

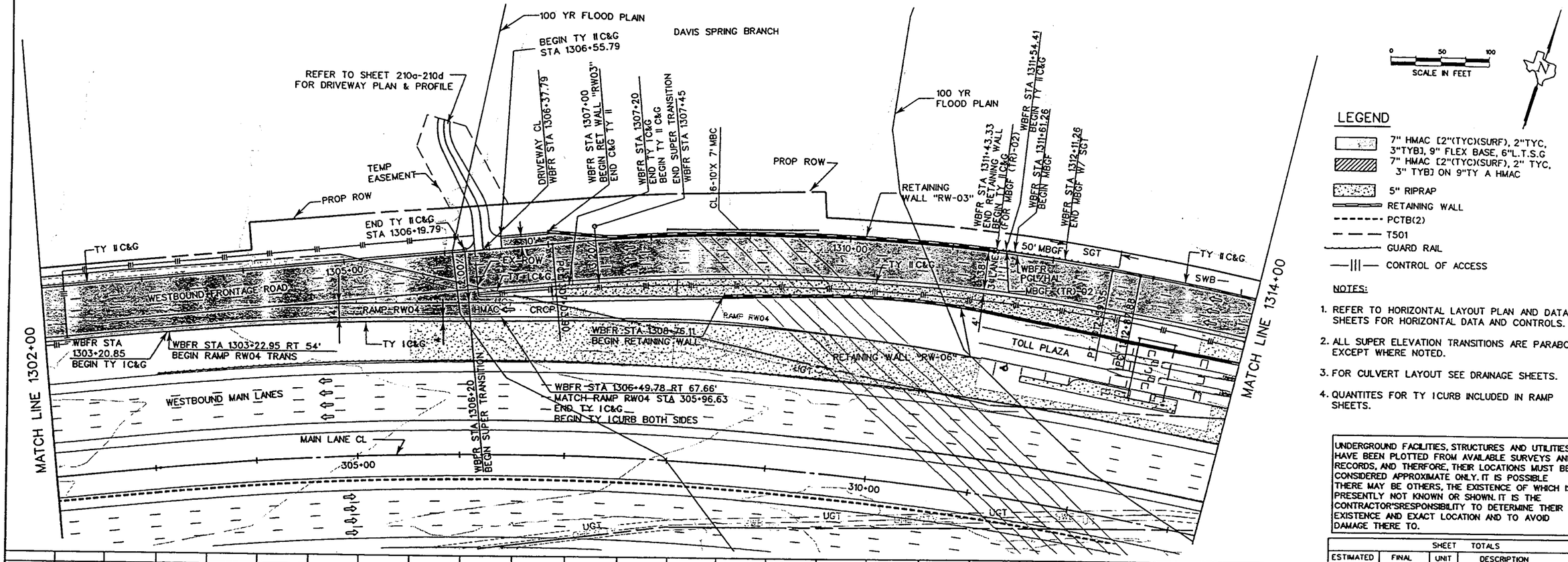
JACOBS

WESTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 1290+00 TO 1302+00 SHEET 2 OF 6

SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.			HIGHWAY No.
CHECKED: GKL	6	TEXAS	NG 2002(245)			SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	167

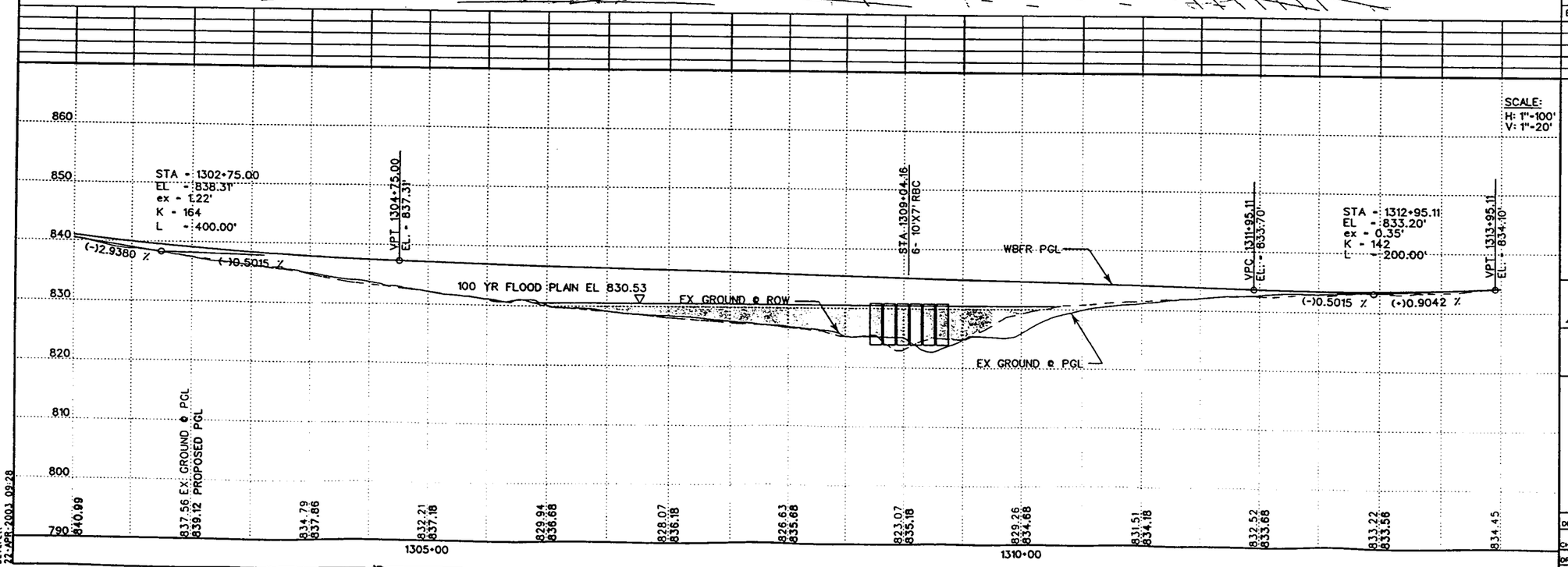
Beverell 21-APR-2003 17:23



NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.
4. QUANTITES FOR TY I CURB INCLUDED IN RAMP SHEETS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.



SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE
3/29/03

DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS

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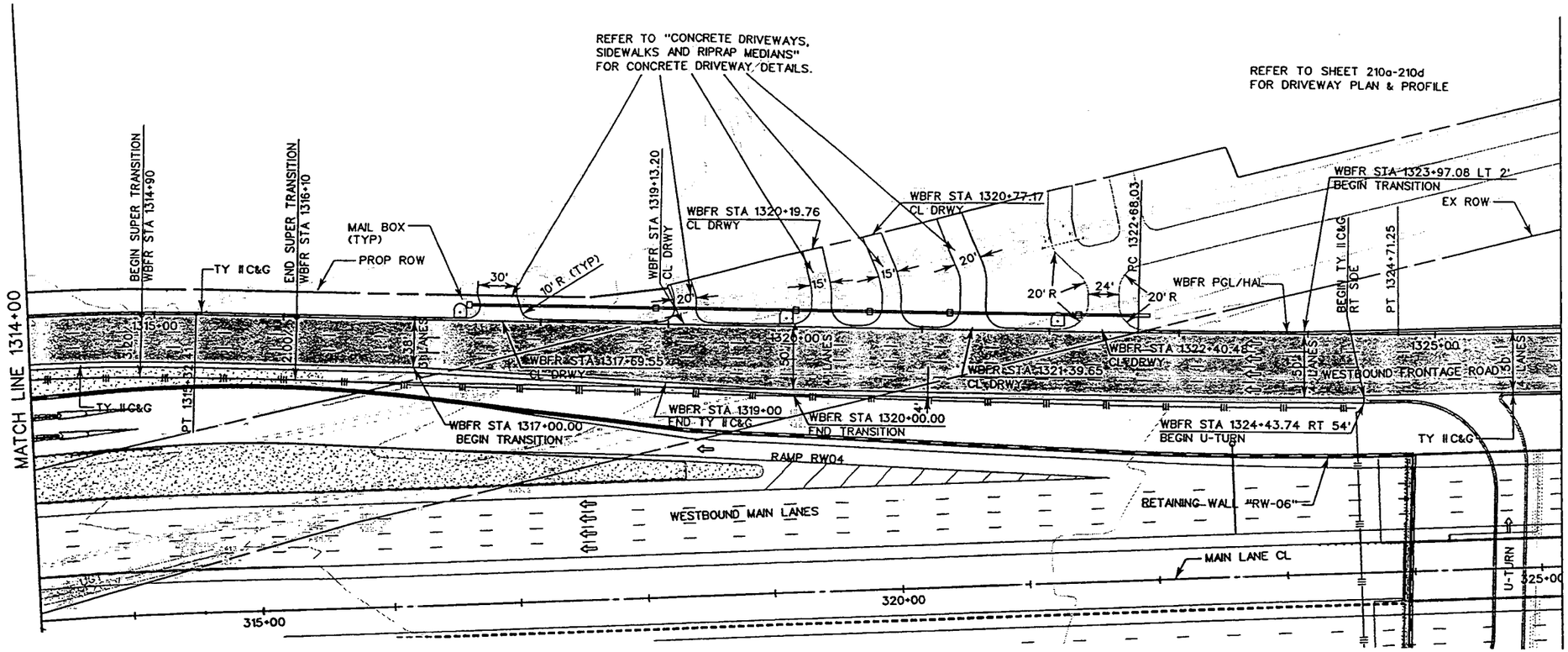
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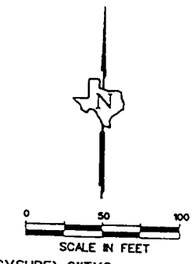
WESTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 1302+00 TO 1314+00 SHEET 3 OF 6

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.
CHECKED: GKL	6	TEXAS	NG 2002(245)		SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	168

Beverett 22-APR-2003 09:28

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LEGEND

- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3" TYBJ, 9" FLEX BASE, 6"L.T.S.G
- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3"TYBJ ON 9"TY A HMAC
- 2" HMAC OVERLAY
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, P.E. 3/28/03



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WESTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 1314+00 TO 1326+00 SHEET 4 OF 6

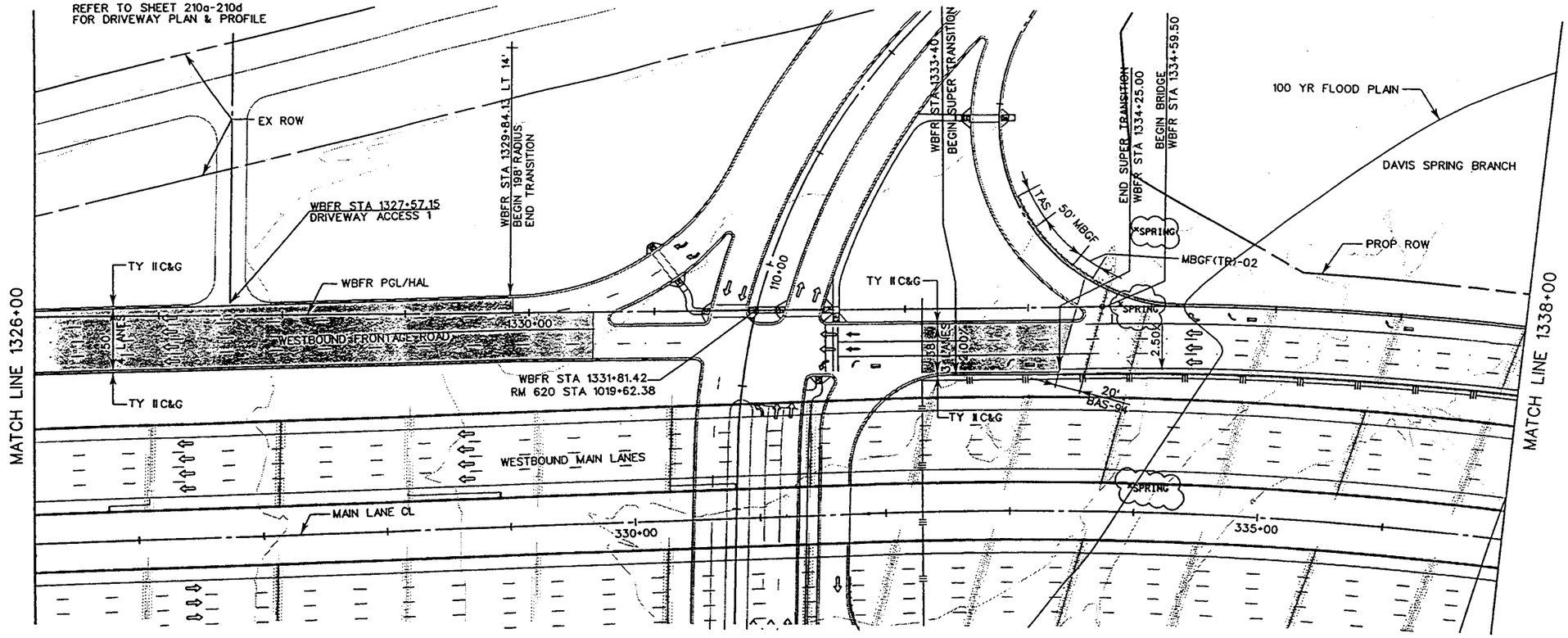
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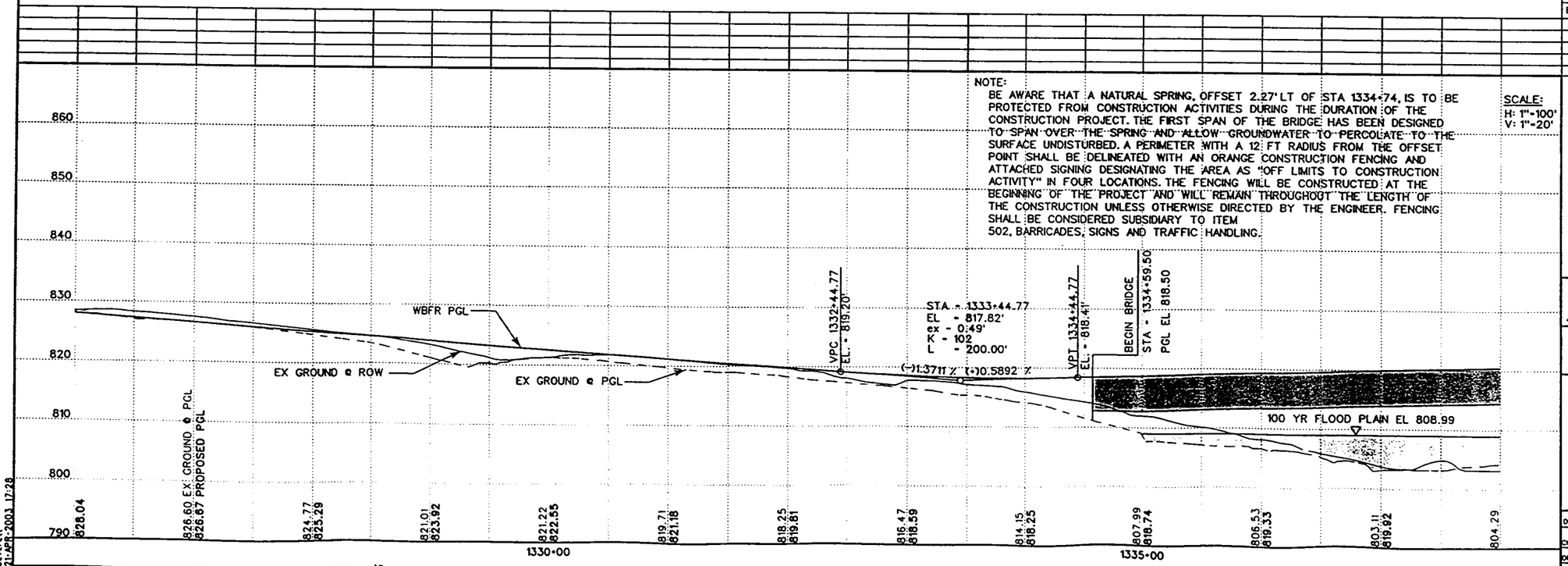
DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	124

beverett 21-APR-2003 08:11

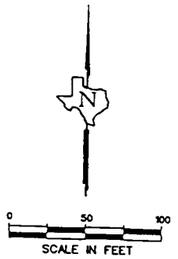
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NOTE:
BE AWARE THAT A NATURAL SPRING, OFFSET 2.27' LT OF STA 1334+74, IS TO BE PROTECTED FROM CONSTRUCTION ACTIVITIES DURING THE DURATION OF THE CONSTRUCTION PROJECT. THE FIRST SPAN OF THE BRIDGE HAS BEEN DESIGNED TO SPAN OVER THE SPRING AND ALLOW GROUNDWATER TO PERCOLATE TO THE SURFACE UNDISTURBED. A PERIMETER WITH A 12 FT RADIUS FROM THE OFFSET POINT SHALL BE DELINEATED WITH AN ORANGE CONSTRUCTION FENCING AND ATTACHED SIGNING DESIGNATING THE AREA AS "OFF LIMITS TO CONSTRUCTION ACTIVITY" IN FOUR LOCATIONS. THE FENCING WILL BE CONSTRUCTED AT THE BEGINNING OF THE PROJECT AND WILL REMAIN THROUGHOUT THE LENGTH OF THE CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE ENGINEER. FENCING SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502, BARRICADES, SIGNS AND TRAFFIC HANDLING.

SCALE:
H: 1"=100'
V: 1"=20'



LEGEND

- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3"TYB], 9" FLEX BASE, 6"L.T.S.G
- 7" HMAC [2'(TYC)(SURF), 2" TYC, 3" TYB] ON 9"TY A HMAC
- 2" HMAC OVERLAY
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
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3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, P.E. 3/29/03

STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED PROFESSIONAL ENGINEER

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TEXAS TURNPIKE AUTHORITY DIVISION

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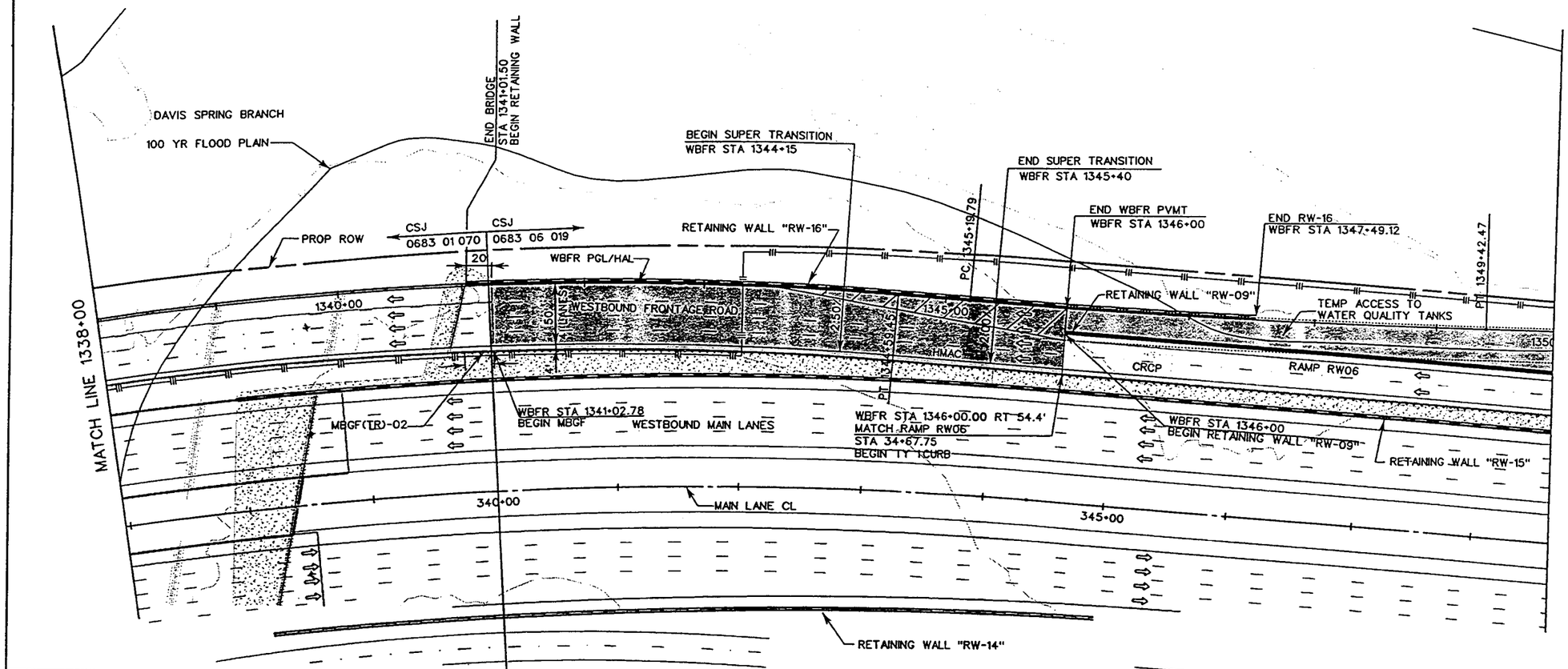
WESTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 1326+00 TO 1338+00 SHEET 5 OF 6

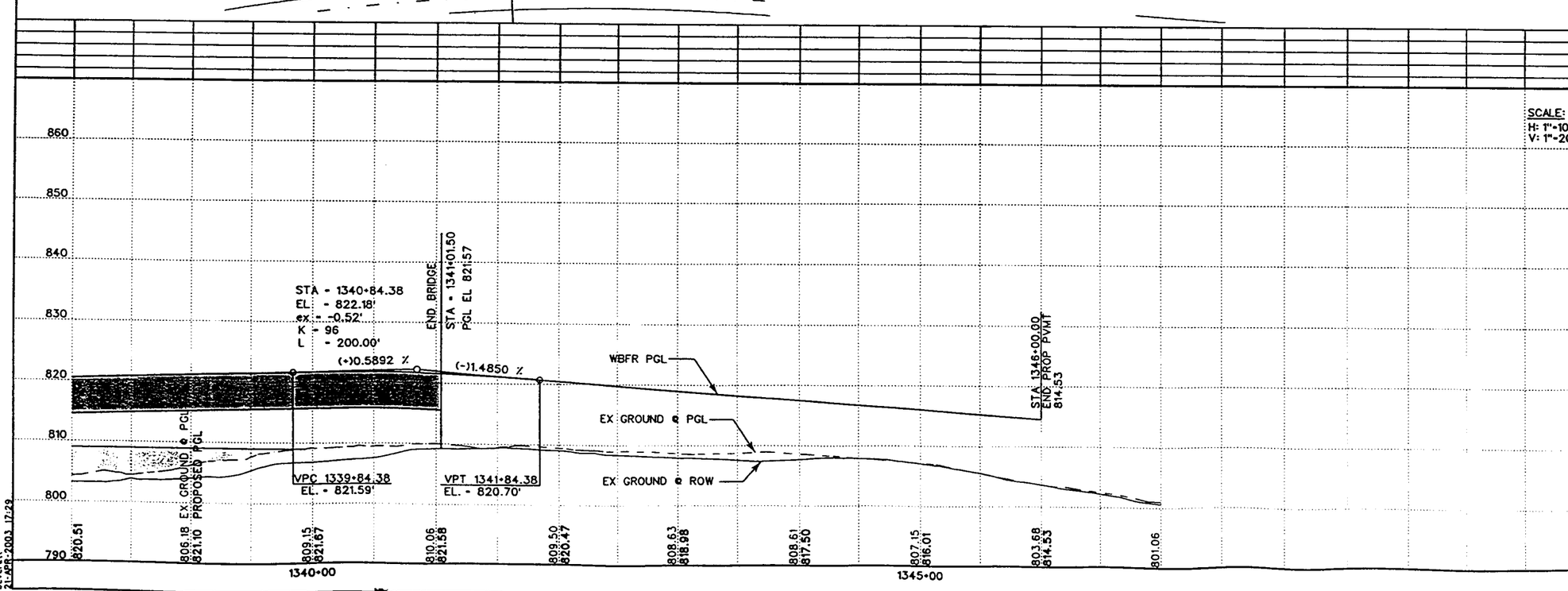
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.	
CHECKED: GKL	6	TEXAS	NHS 2002(245)		SH-45	
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	170

beverett
21-APR-2003 17:28

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Beverell
21-APR-2003 17:29

LEGEND

- 7" HMAC [2"(TY C)(SURF), 2"TYC, 3"TY B), 9" FLEX BASE, 6" L.T.S.G.
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE
3/28/03

STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER

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Texas Department of Transportation
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TEXAS TURNPIKE AUTHORITY DIVISION

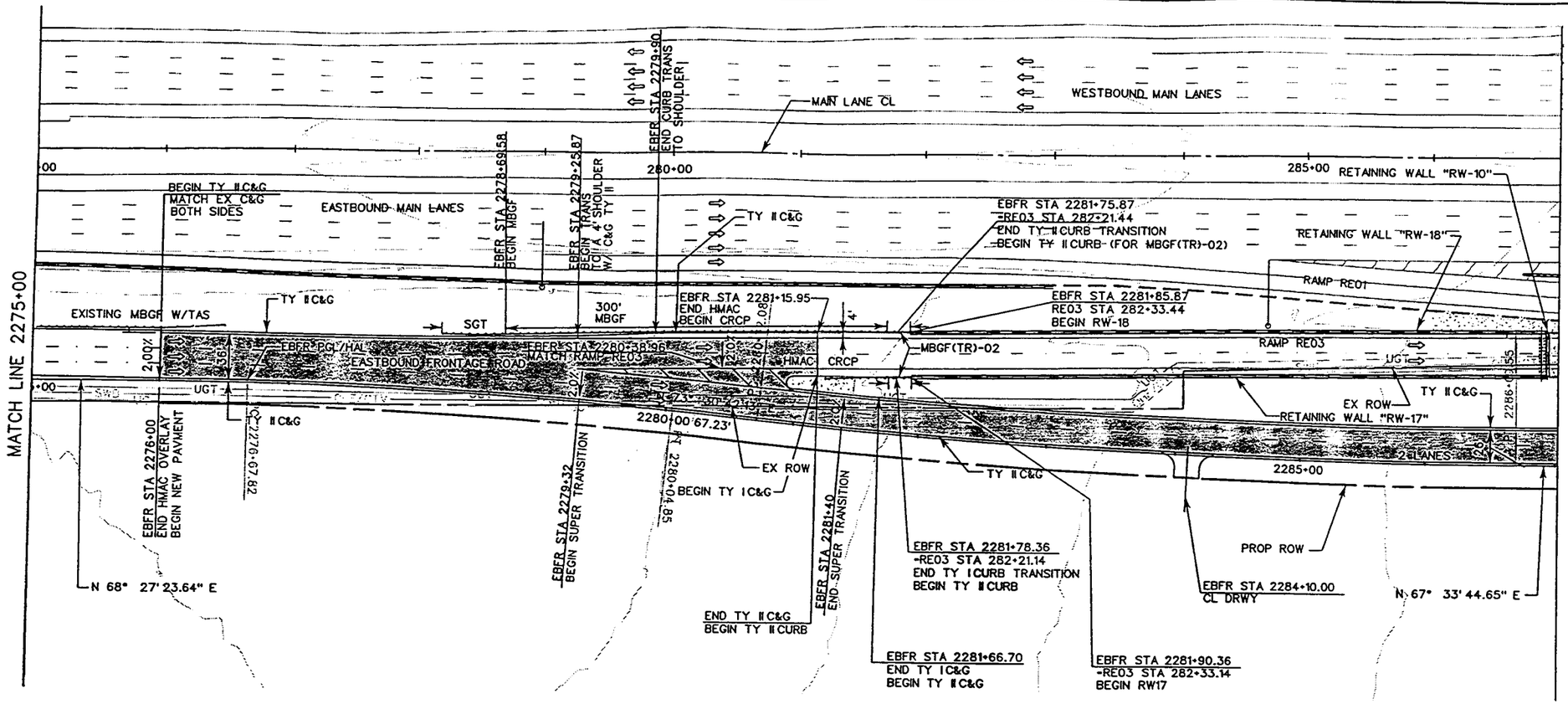
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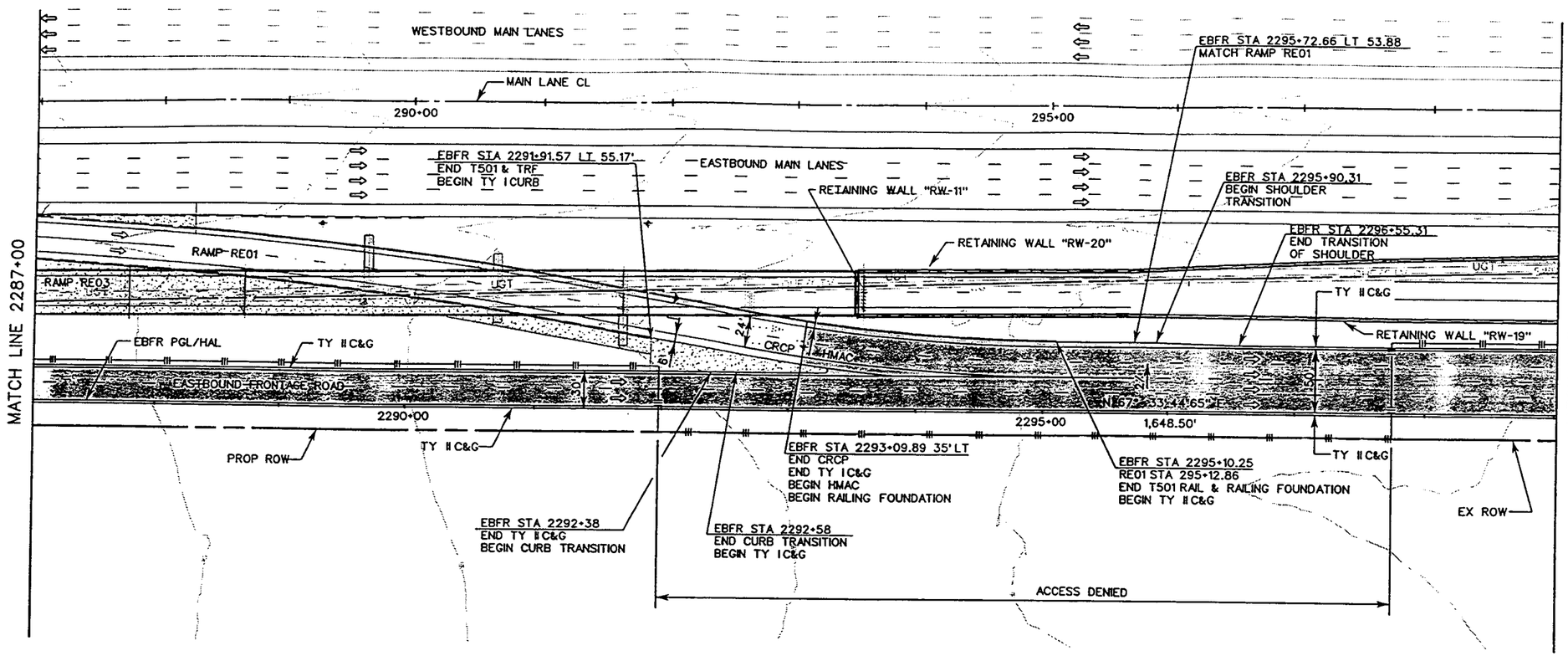
WESTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 1338+00 TO 1346+00 SHEET 6 OF 6

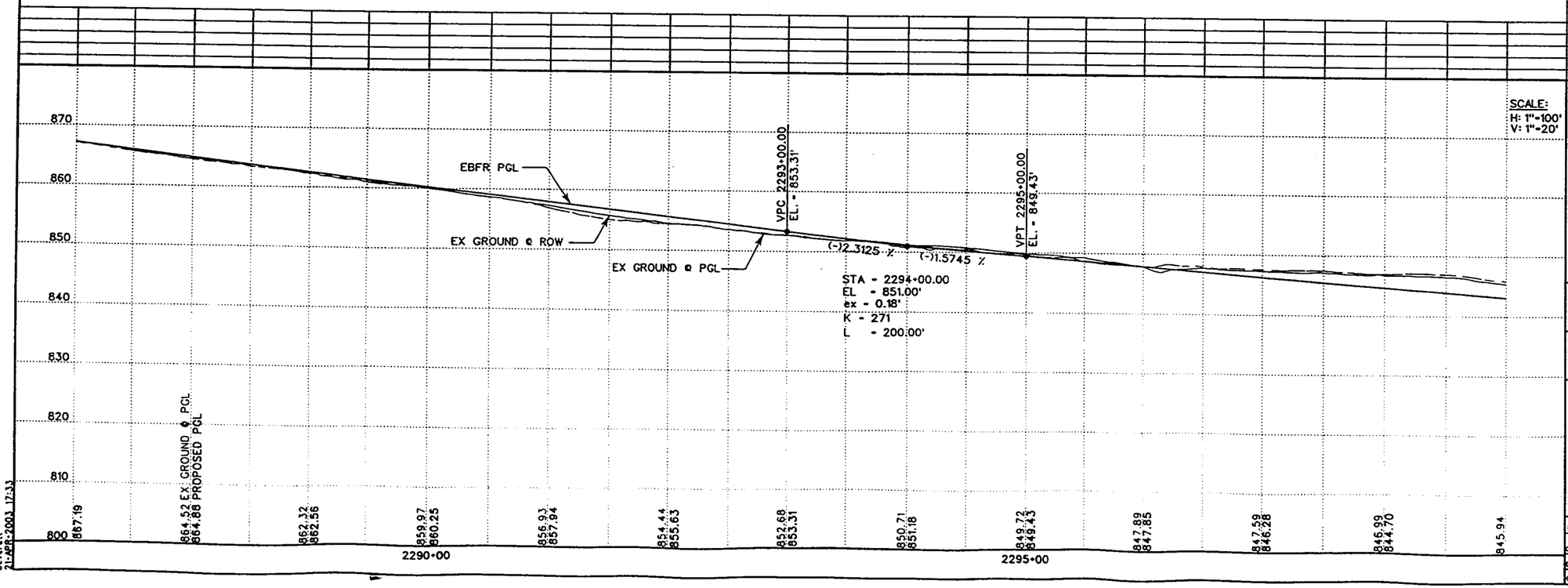
SCALE: 1" - 100

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.	
CHECKED: GKL	6	TEXAS	MG 2002(245)		SH-45	
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No
CHECKED: GKL	14	WILLIAMSON	0683	01	070	171

\\ACAD\Austin\PROJECT\C3D\070\700ccadd\702cwlx4spp071.dgn


MATCH LINE 2275+00
MATCH LINE 2287+00
MAIN LANE CL
WESTBOUND MAIN LANES
EASTBOUND MAIN LANES
EASTBOUND FRONTAGE ROAD
BEGIN TY IIC&G
MATCH EX C&G
BOTH SIDES
EBFR STA 2278+69.58
BEGIN MBGF
EBFR STA 2279+25.87
BEGIN TRANS TO 4' SHOULDER W/ C&G TY II
EBFR STA 2279+90
END CURB TRANS TO SHOULDER
TY IIC&G
EXISTING MBGF W/TAS
300' MBGF
SGT
EBFR STA 2281+15.95
END HMAC
BEGIN CRCP
EBFR STA 2281+75.87
-RE03 STA 282+21.44
END TY IICURB TRANSITION
BEGIN TY IICURB (FOR MBGF(TR)-02)
EBFR STA 2281+85.87
RE03 STA 282+33.44
BEGIN RW-18
RETAINING WALL "RW-10"
RETAINING WALL "RW-18"
RAMP RE01
RAMP RE03
MBGF(TR)-02
CRCP
HMAC
UGT
EX ROW
RETAINING WALL "RW-17"
TY IIC&G
2285+00
PROP ROW
EBFR STA 2284+10.00
CL DRWY
N 67° 33' 44.65" E
EBFR STA 2276+00
END HMAC OVERLAY
BEGIN NEW PAVMENT
2276+67.82
N 68° 27' 23.64" E
EBFR STA 2279.32
BEGIN SUPER TRANSITION
2280+04.85
EBFR STA 2281.40
END SUPER TRANSITION
2280+00 67.23'
END TY IIC&G
BEGIN TY IICURB
BEGIN TY IC&G
EX ROW
EBFR STA 2281+78.36
-RE03 STA 282+21.14
END TY ICURB TRANSITION
BEGIN TY IICURB
EBFR STA 2281+66.70
END TY IC&G
BEGIN TY IIC&G
EBFR STA 2281+90.36
-RE03 STA 282+33.14
BEGIN RW17
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SCALE IN FEET

LEGEND

- 7" HMAC [2"(TY C)(SURF), 2"TYC, 3"TY B], 9" FLEX BASE 6" L.T.S.G.
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. QUANTITIES FOR 5" RIPRAP TO BE INCLUDED IN MAINLANE SHEETS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03

DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER

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JACOBS

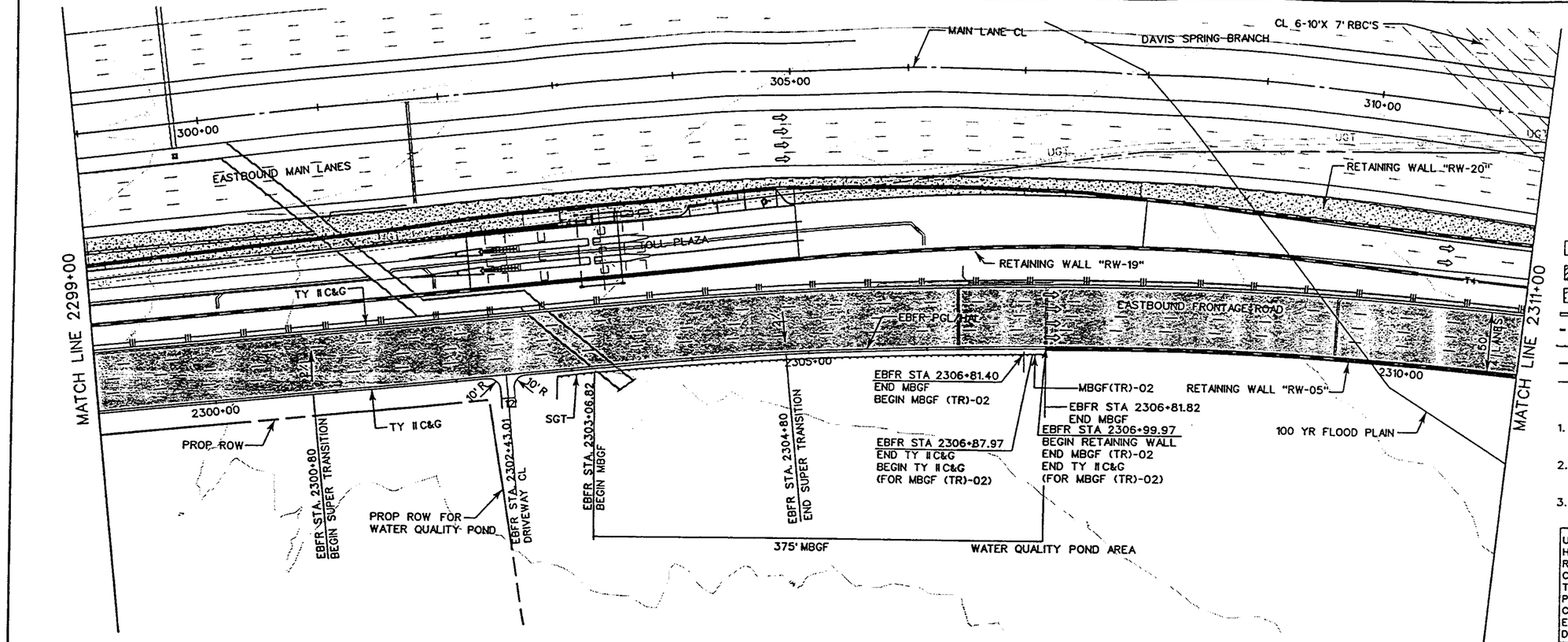
EASTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 2287+00 TO 2299+00 SHEET 2 OF 6

SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	NG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	173

\\WACO1\PROJECT\CJ\10700\700cadd\702Civil\Sheet\sp0720.dgn



LEGEND

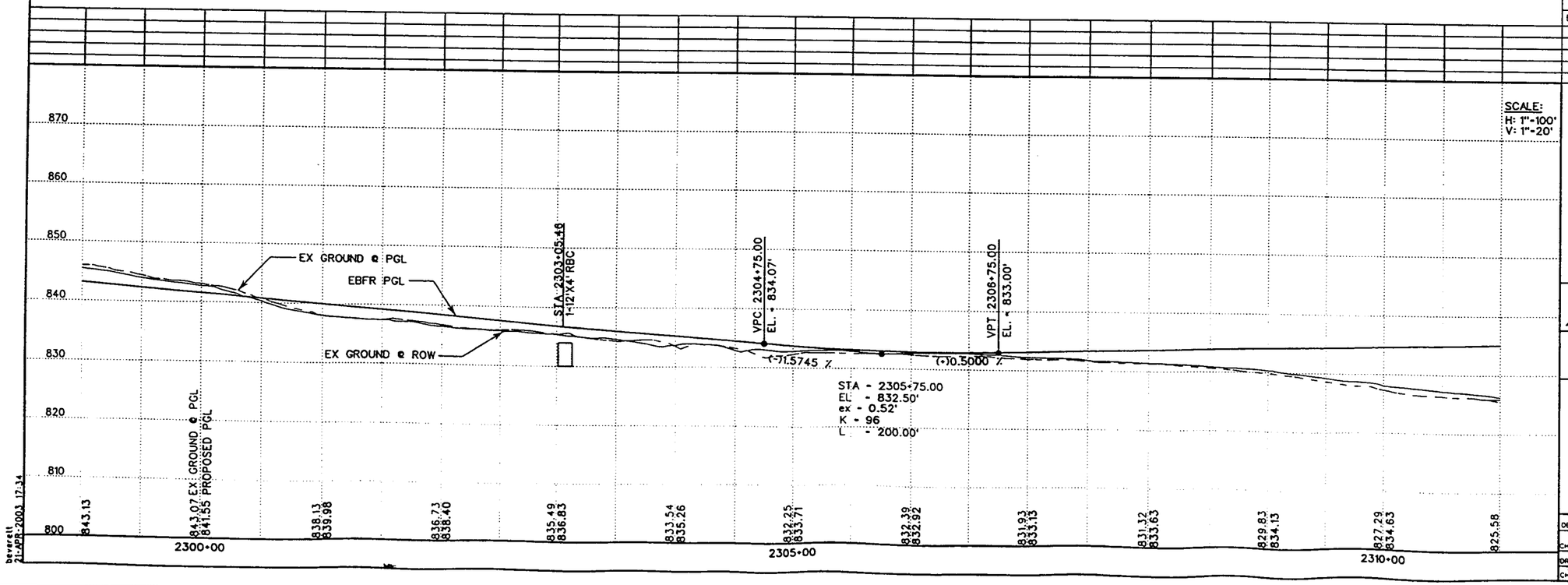
- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3"TYB], 9" FLEX BASE, 6"L.T.S.G
- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3"TYB], 9" TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION



Douglas Huneycutt, PE
3/28/03

DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER
STATE OF TEXAS

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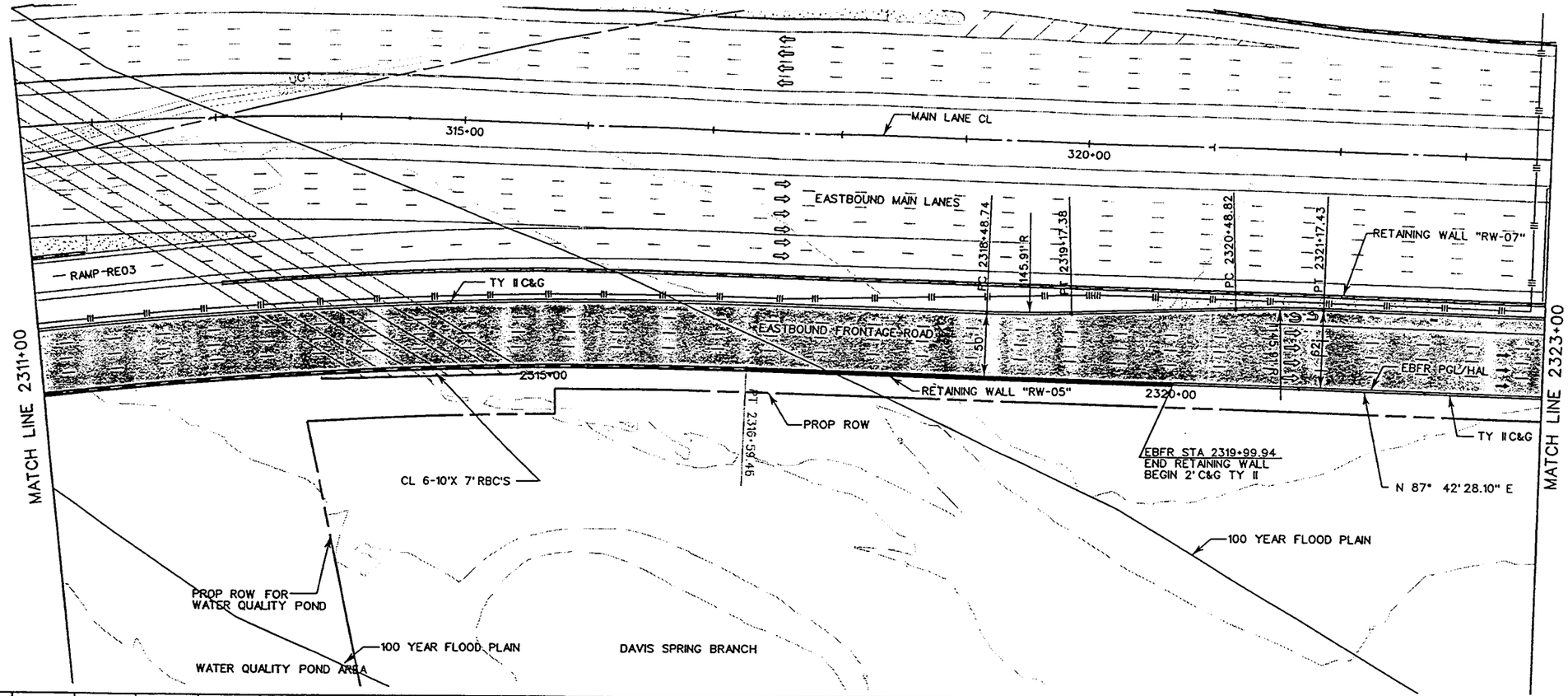
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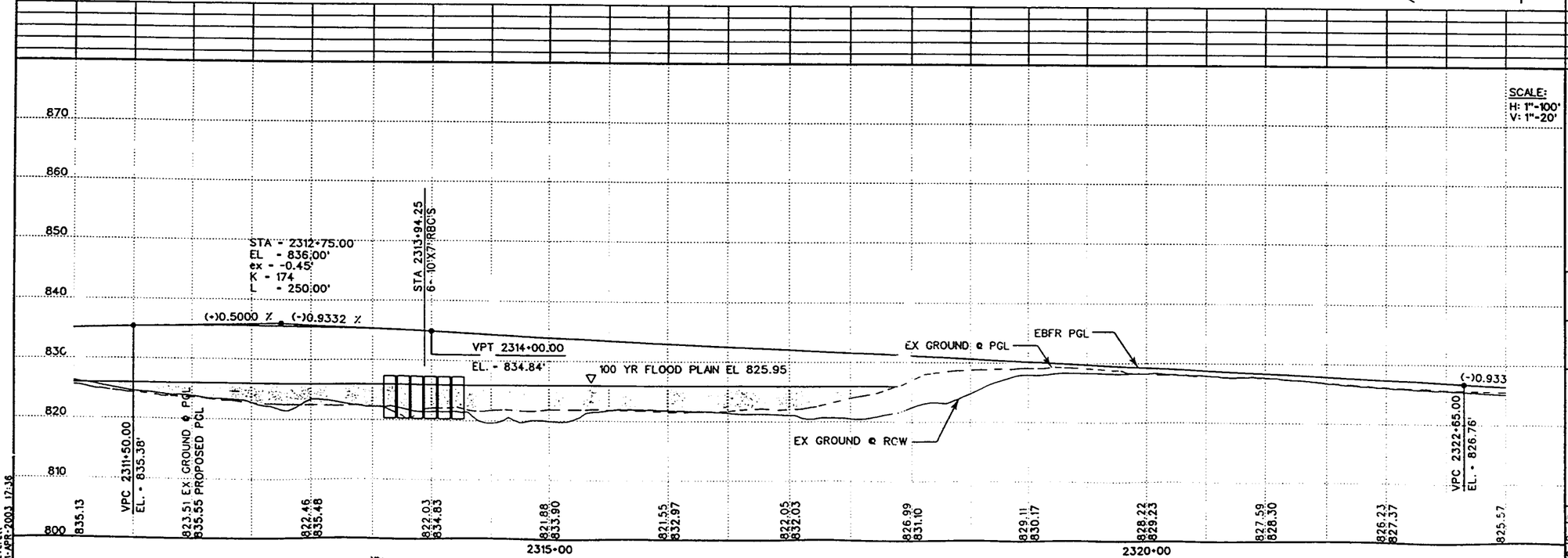
EASTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 2299+00 TO 2311+00 SHEET 3 OF 6

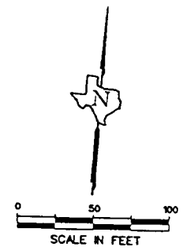
SCALE: 1" = 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.			HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)			SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	174

\\WACW2K01\PROJECT\CI\130700\700cadd\702civil\45pp072f.dgn







LEGEND

- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3"TYB], 9" FLEX BASE, 6"L.T.S.G
- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3"TYB], 9" TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE
3/28/03



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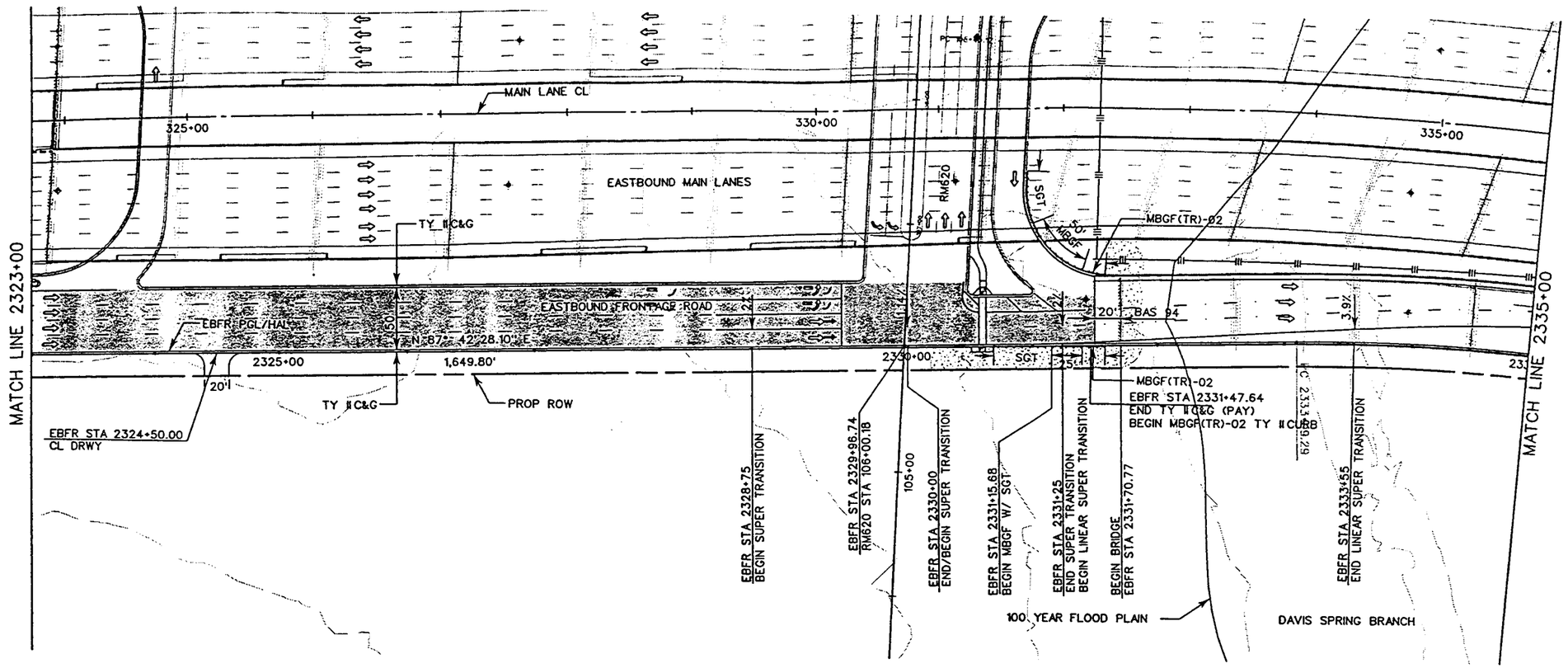
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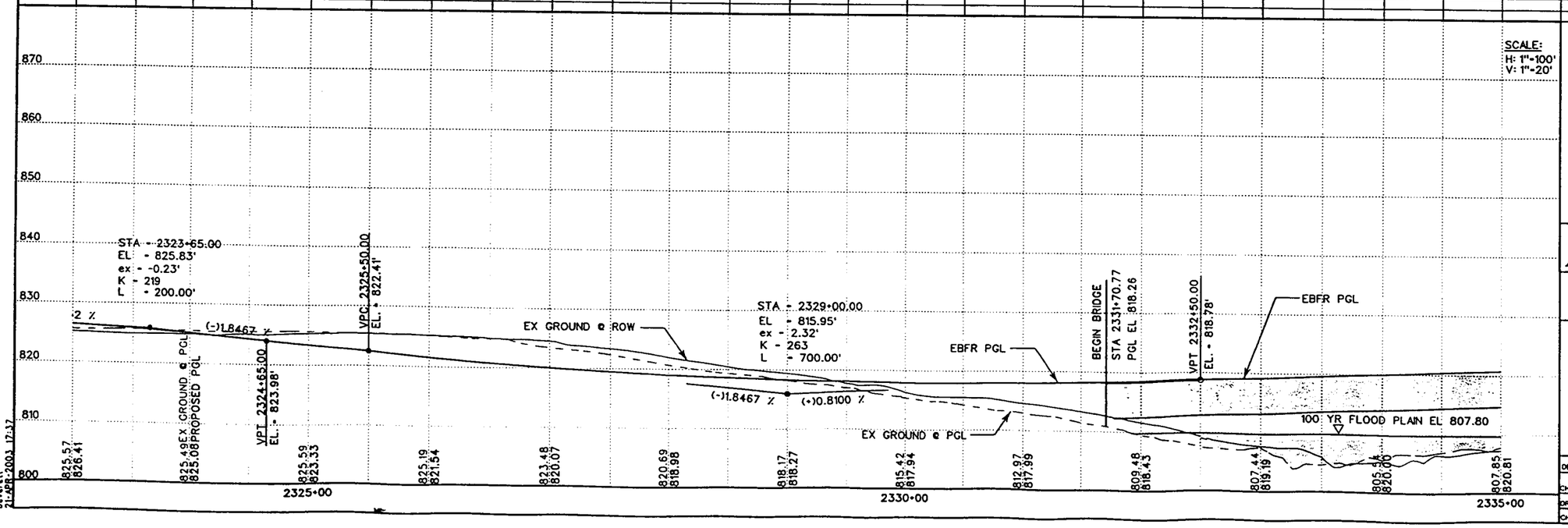
EASTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 2311+00 TO 2323+00 SHEET 4 OF 6

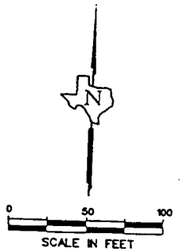
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.	
CHECKED: GKL	6	TEXAS	NG 2002(245)		SH-45	
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	175

plotted: 21-APR-2003 17:16







LEGEND

- 7" HMAC [2"(TYC)(SURF), 2"TYC, 3"TYBJ, 9" FLEX BASE, 6"L.T.S.G
- 7" HMAC [2"(TY C)(SURF), 2" TY C, 3" TY BJ ON 9" TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE
3/29/03

STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER

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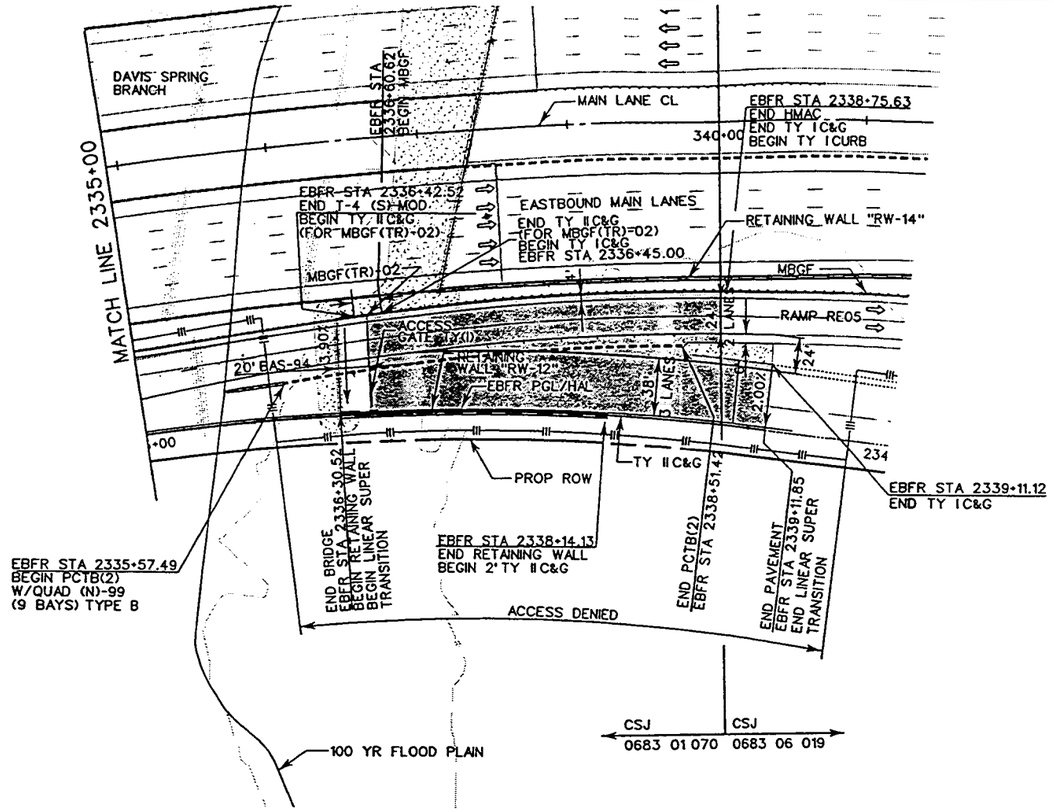
EASTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 2323+00 TO 2335+00 SHEET 5 OF 6

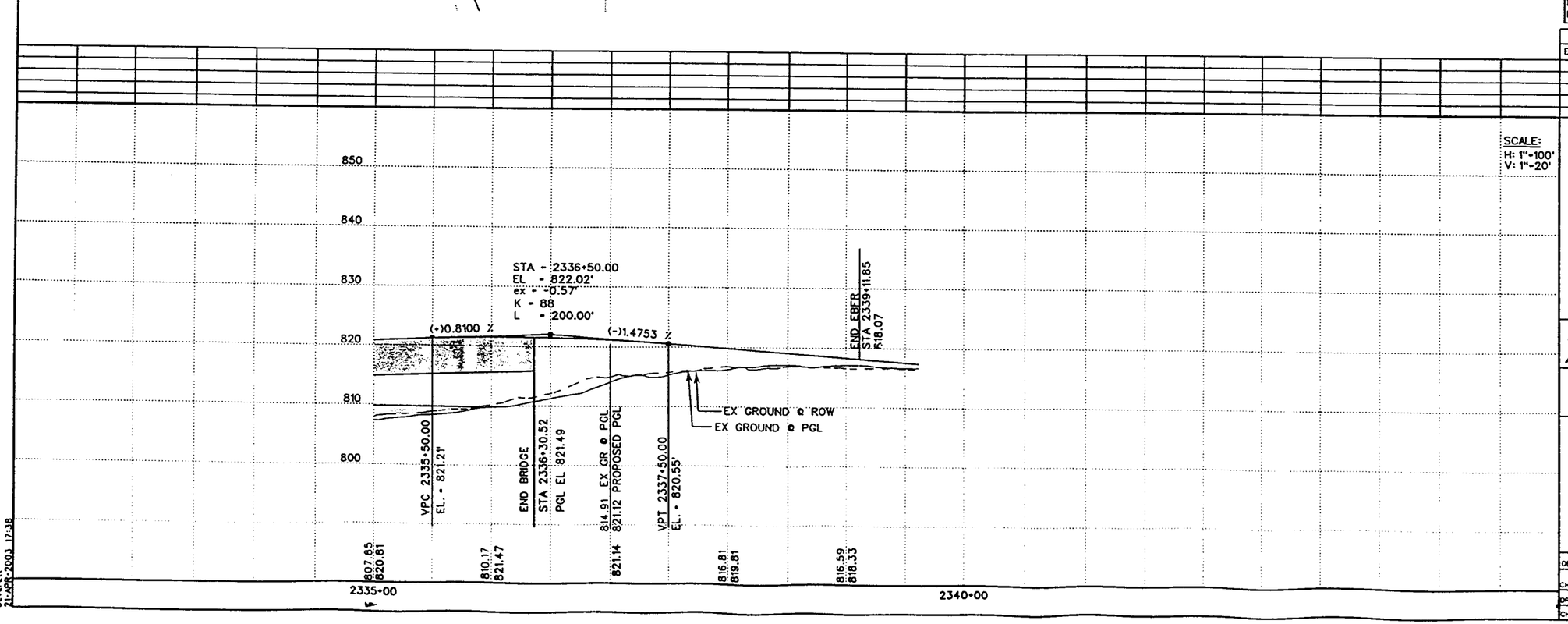
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	176

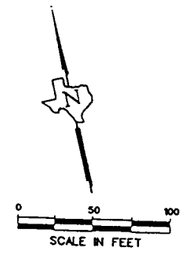
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21-APR-2003 17:38



LEGEND

- 7" HMAC (2"(TYC)(SURF), 2"TY C, 3"TY B), 9" FLEX BASE, 6"L.T.S.G.
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. FOR CULVERT LAYOUT SEE DRAINAGE SHEETS.
4. ACCESS VEHICULAR GATE (TYI) 6' H X 22' W DOUBLE REF CLF-00BLACK VINYL COATED FABRIC

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

SCALE:
H: 1"=100'
V: 1"=20'

Douglas Huneycutt, PE 3/28/03



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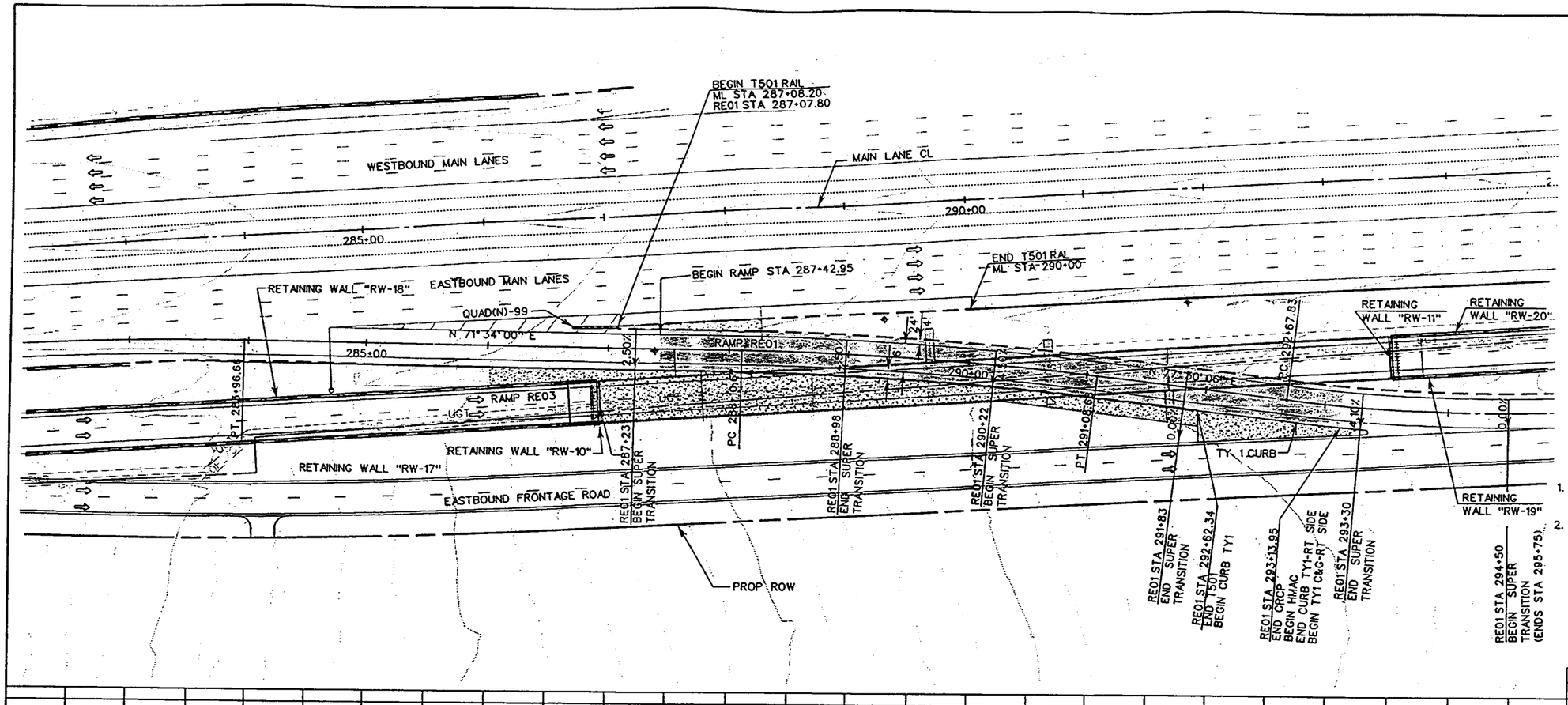
JACOBS

EASTBOUND FRONTAGE ROAD PLAN & PROFILE STA. 2335+00 TO 2339+11.85 SHEET 6 OF 6

SCALE: 1" = 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.			HIGHWAY No.
CHECKED: GKL	6	TEXAS	NG 2002(245)			SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	177

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LEGEND

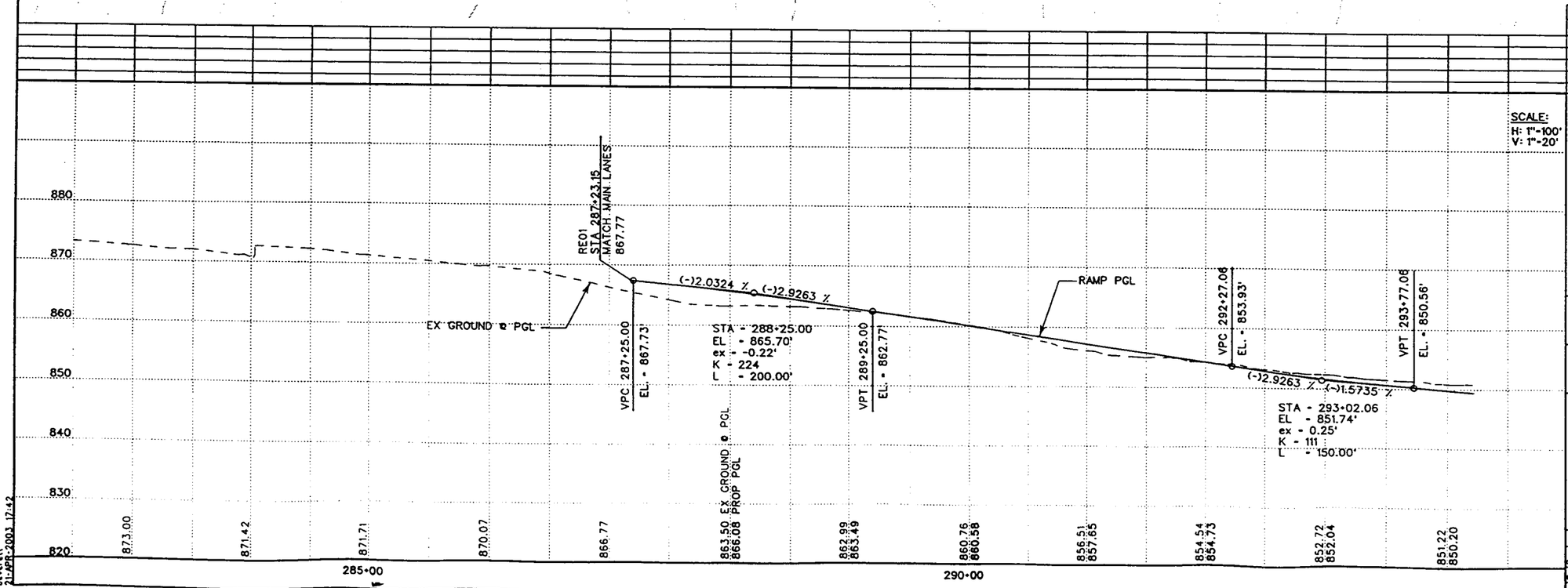
- 11" CRCP ON 6" HMAC BASE, TY A
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501

NOTES:

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION



Douglas Huneycutt, PE
3/28/03

STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED PROFESSIONAL ENGINEER

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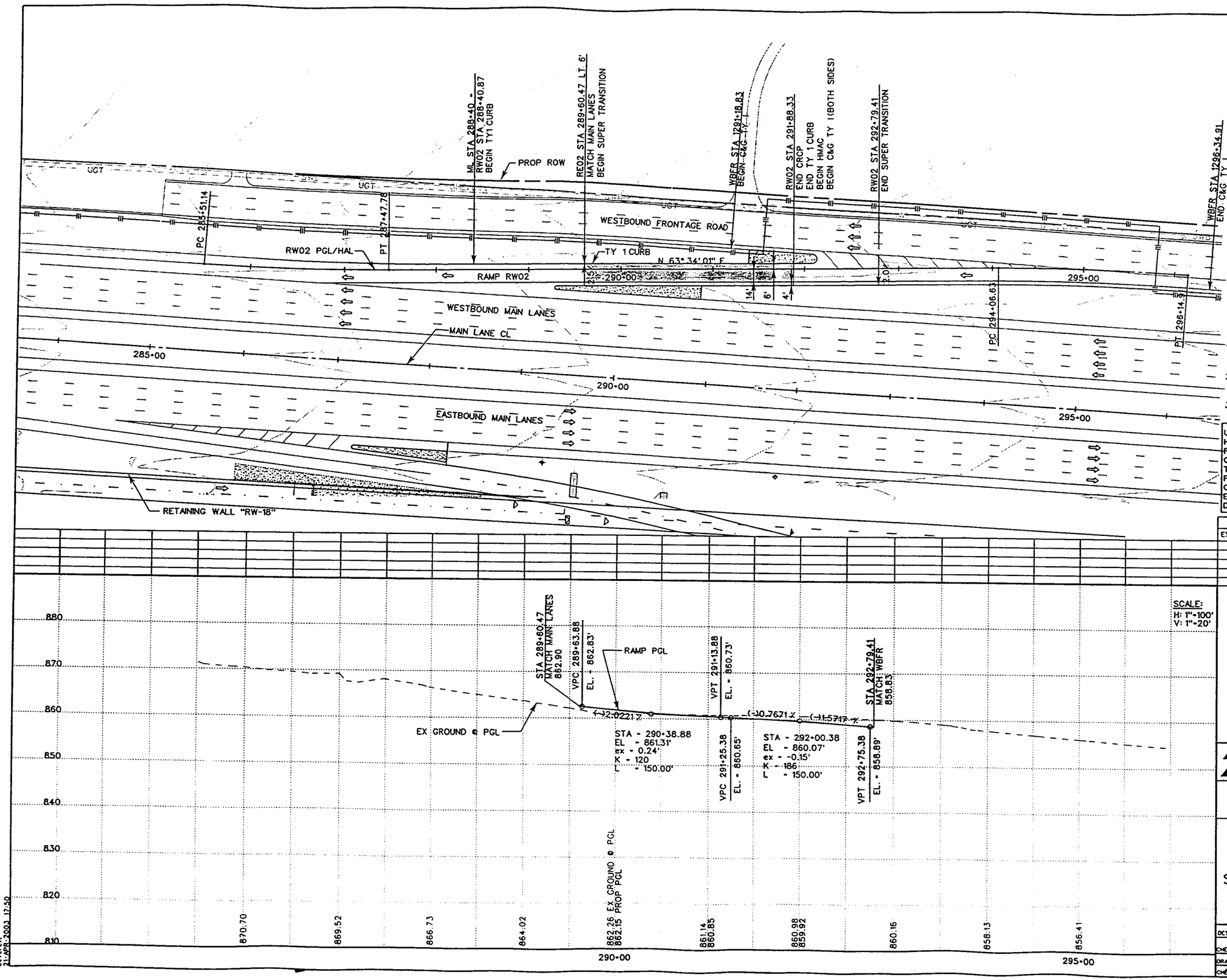
RE01
PLAN & PROFILE
STA 287+42.95 TO 293+13.95
SHEET 1 OF 1

SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No. / SECTION No.	JOB No. / SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683 / 01	070 / 178

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21-APR-2003 17:42

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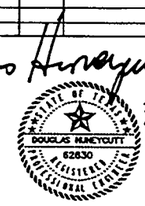
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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03



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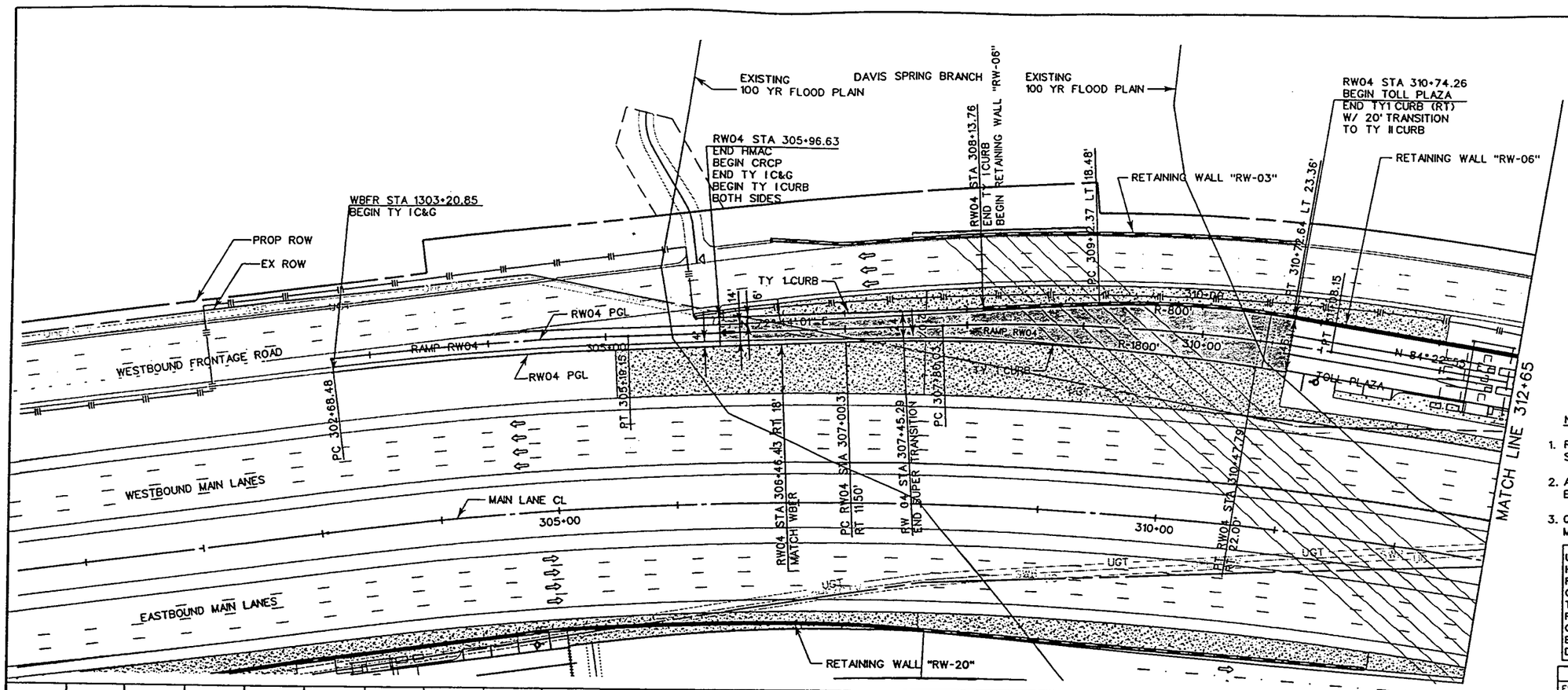
RAMP RW02 PLAN & PROFILE STA 289+60.47 TO 291+88.33 SHEET 1 OF 1

SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.	
CHECKED: GKL	6	TEXAS	NG 2002(245)		SH-45	
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	179

beverett
21-APR-2003 17:50

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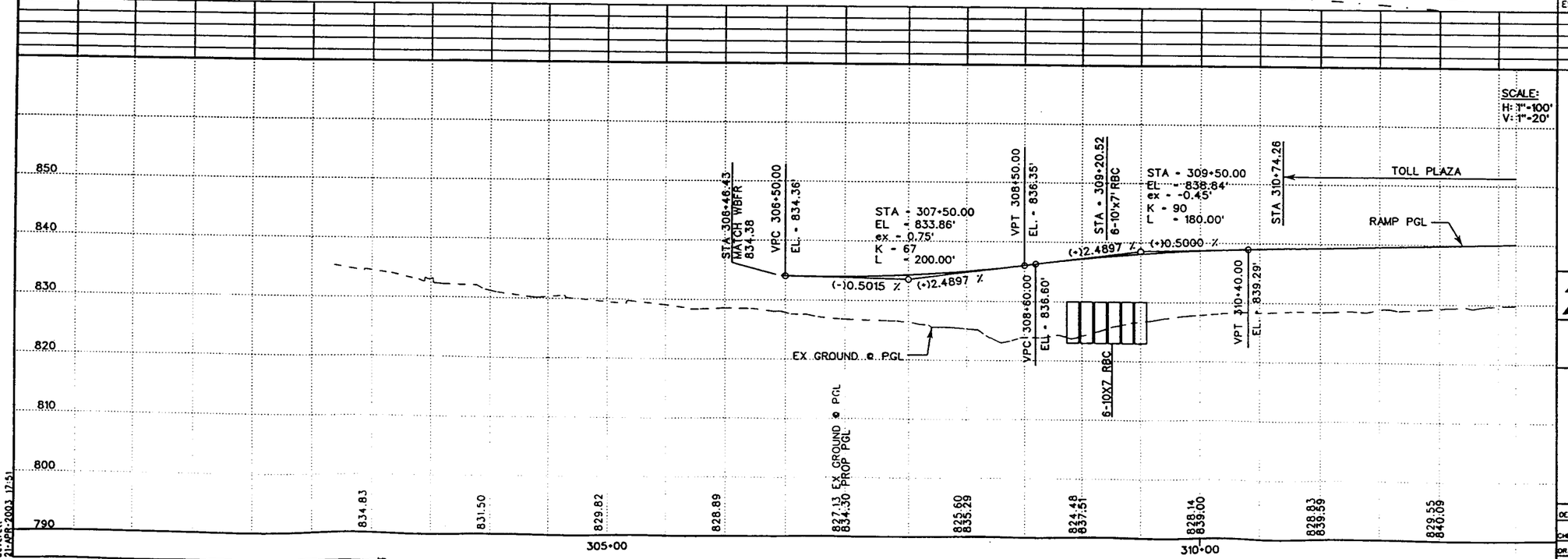
LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. QUANTITIES FOR 5" RIPRAP TO BE INCLUDED IN MAINLANE SHEETS.

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, P.E. 3/29/03

DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER

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TEXAS TURNPIKE AUTHORITY DIVISION

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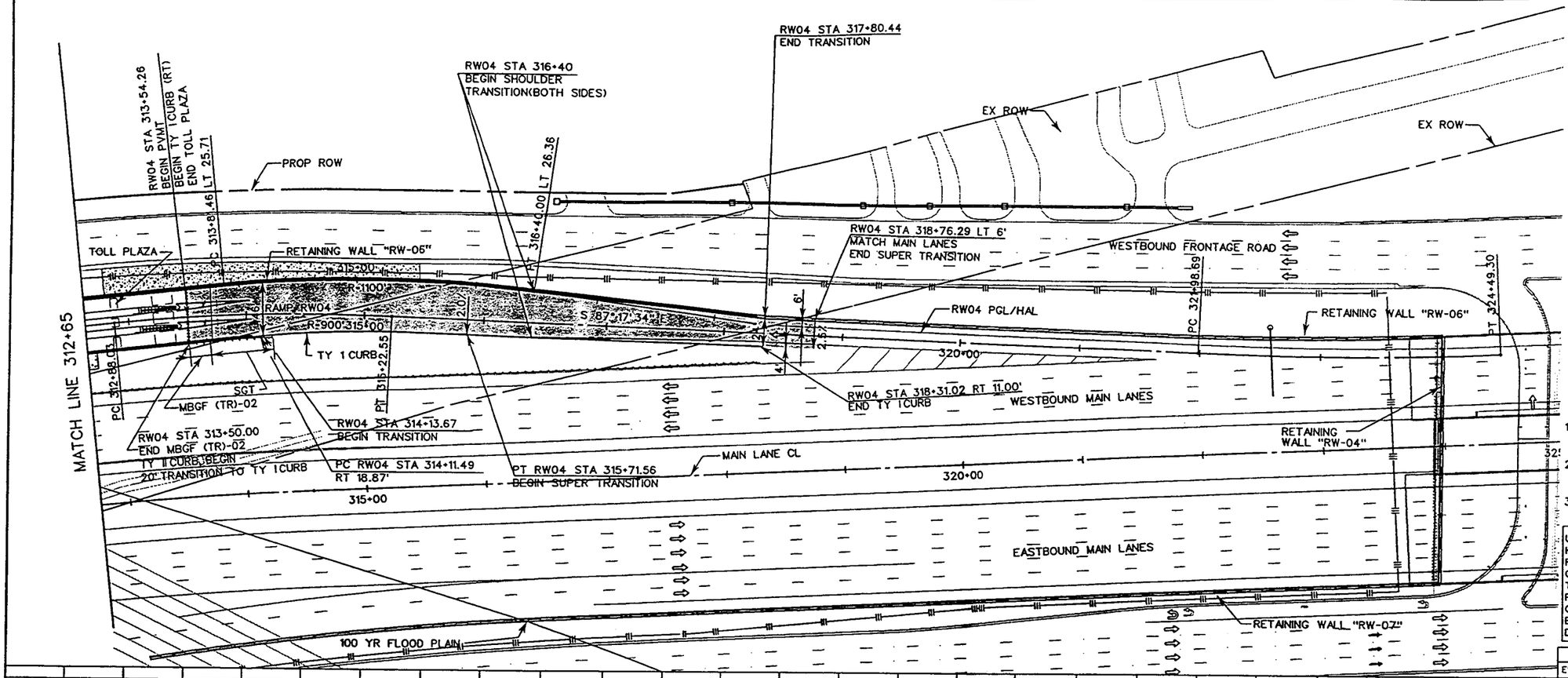
RAMP RW04
PLAN & PROFILE
STA 305+96.63 TO STA 312+65
SHEET 1 OF 2

SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	180

beverett
21-APR-2003 17:51

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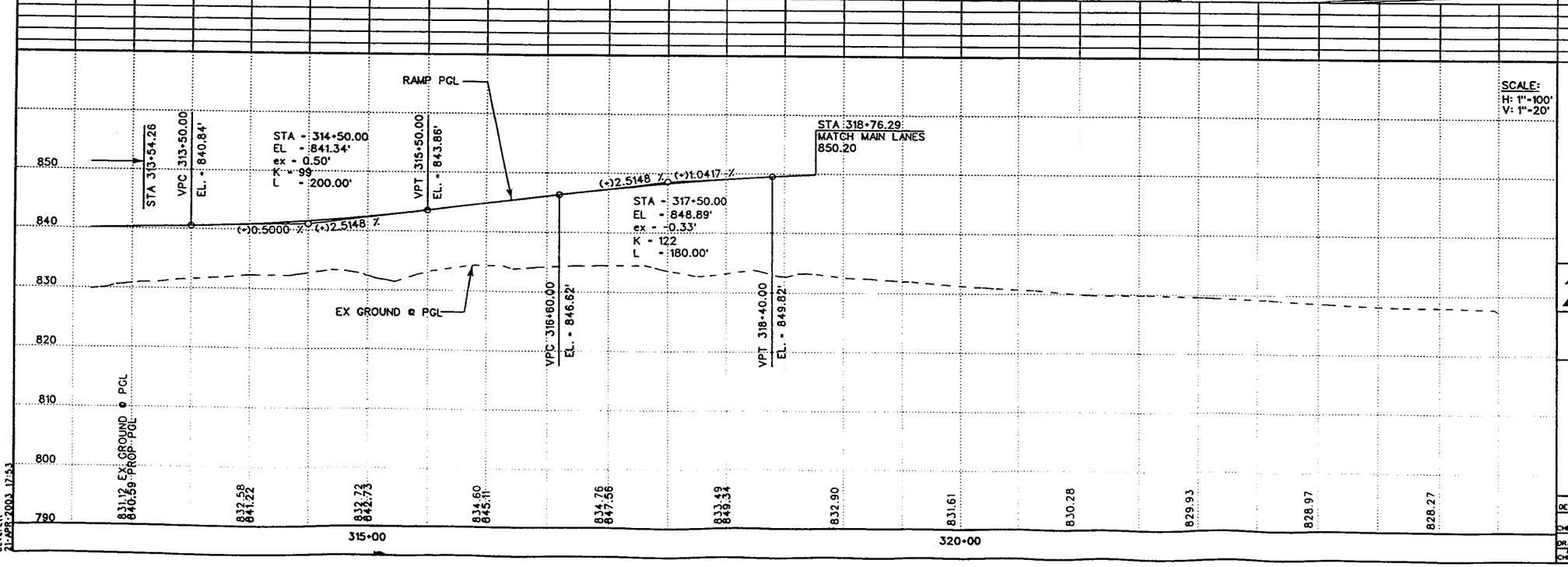
LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

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SCALE:
H: 1"=100'
V: 1"=20'

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03

DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER

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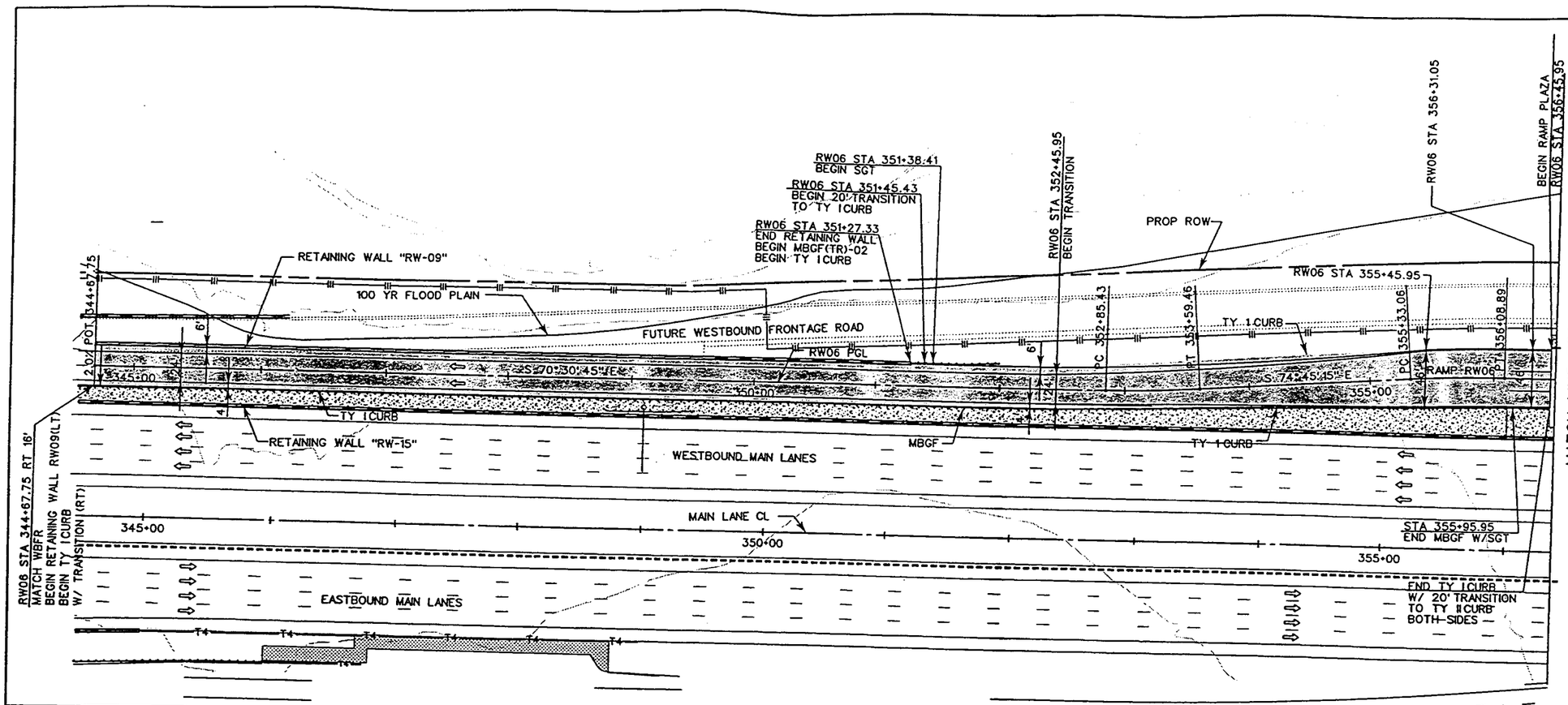
RAMP RW04
PLAN & PROFILE
STA 312+65 TO 318+76
SHEET 2 OF 2

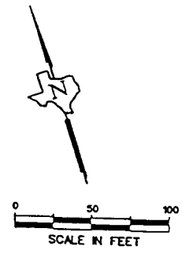
SCALE: 1" = 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	NG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	181

beverett
21-APR-2003 17:53

\\WACO1\PROJECT\C3-10700\700coad\702cwn\15pp01.15.dgn





LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03

DOUGLAS HUNEYCUTT 62830 REGISTERED PROFESSIONAL ENGINEER

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RAMP RW06 PLAN & PROFILE STA 344+67 TO STA 356+50 SHEET 1 OF 2

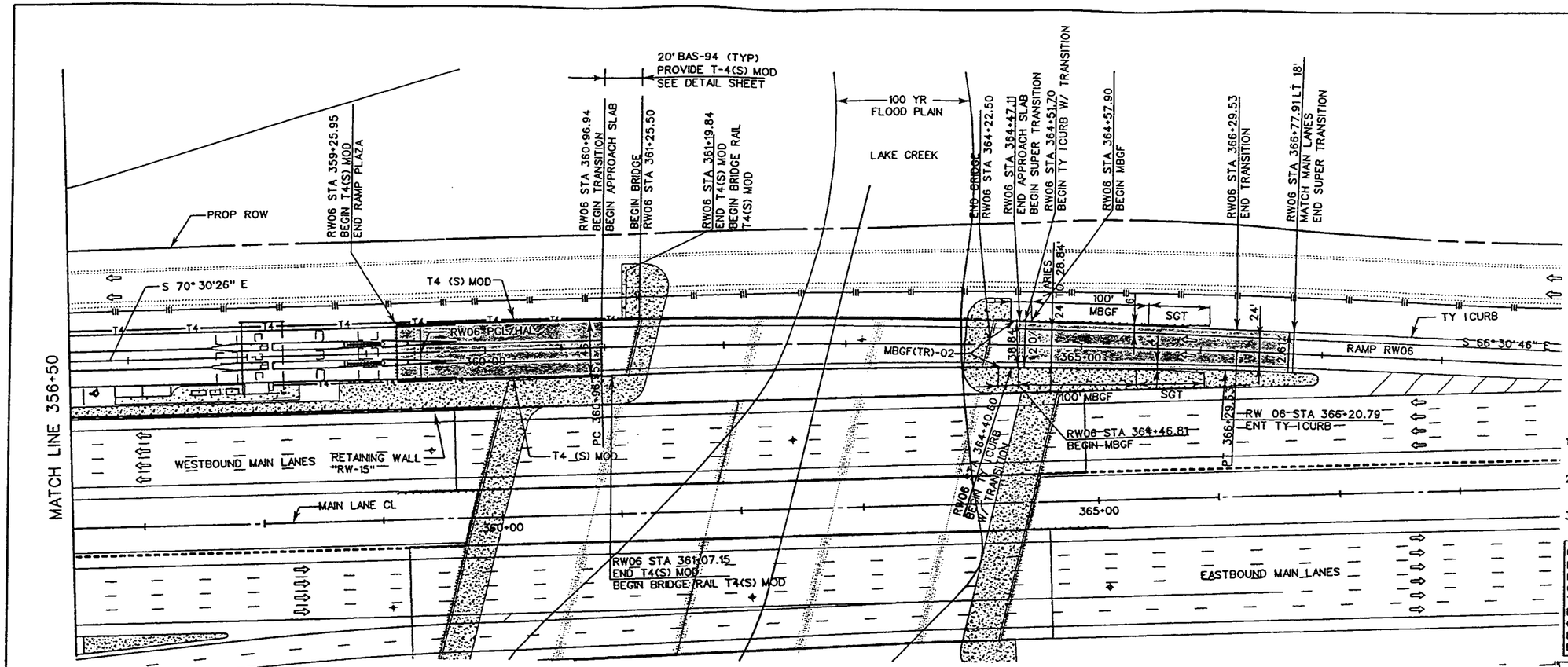
SCALE: 1" = 100'

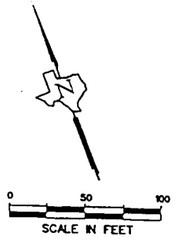
DESIGNED SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED GKL	6	TEXAS	NG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED GKL	14	WILLIAMSON	0683	01	070	192

beverell
21-APR-2003 17:54

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LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS
- T4 T4 (S) MOD WITH 2-2" PVC CONDUITS

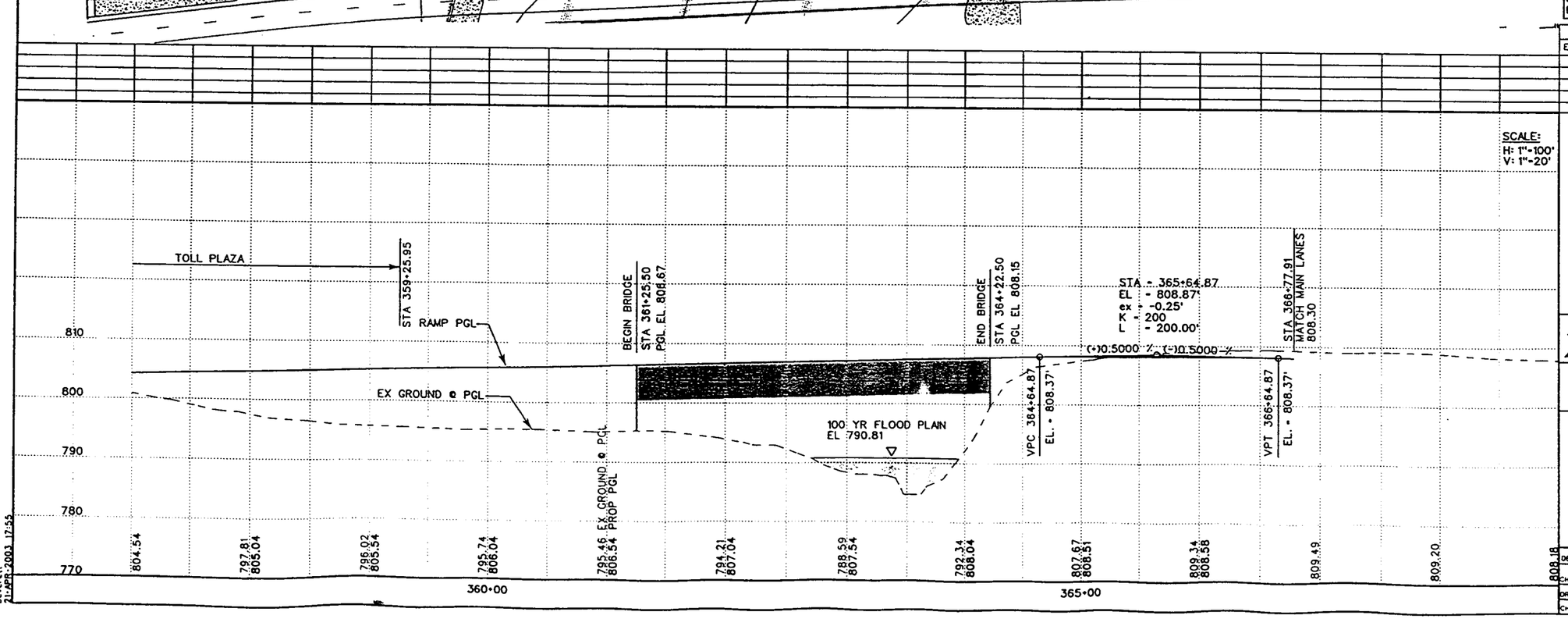
NOTES:

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SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION



Douglas Huneycutt, PE
3/28/03

DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER
STATE OF TEXAS

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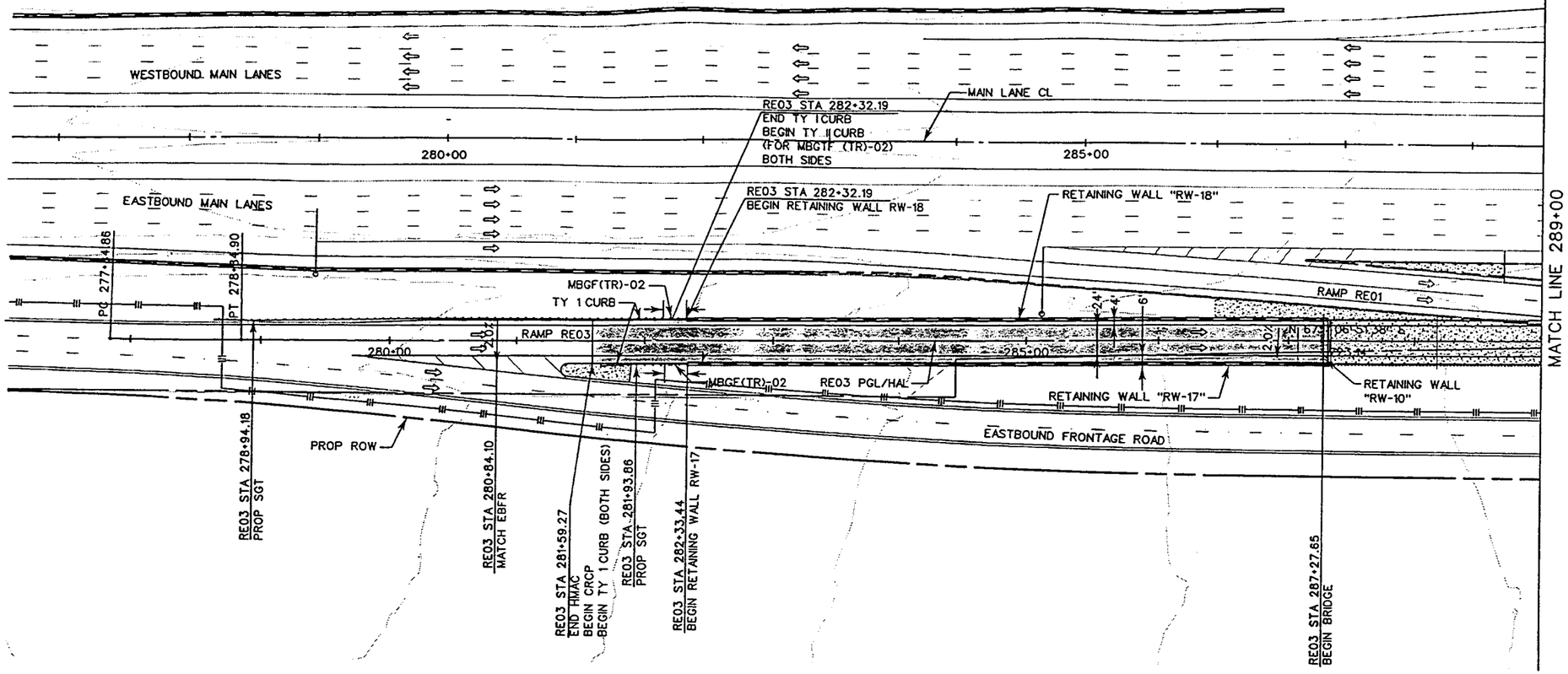
RAMP RW06
PLAN & PROFILE
STA 356+50 TO 366+78.80
SHEET 2 OF 2

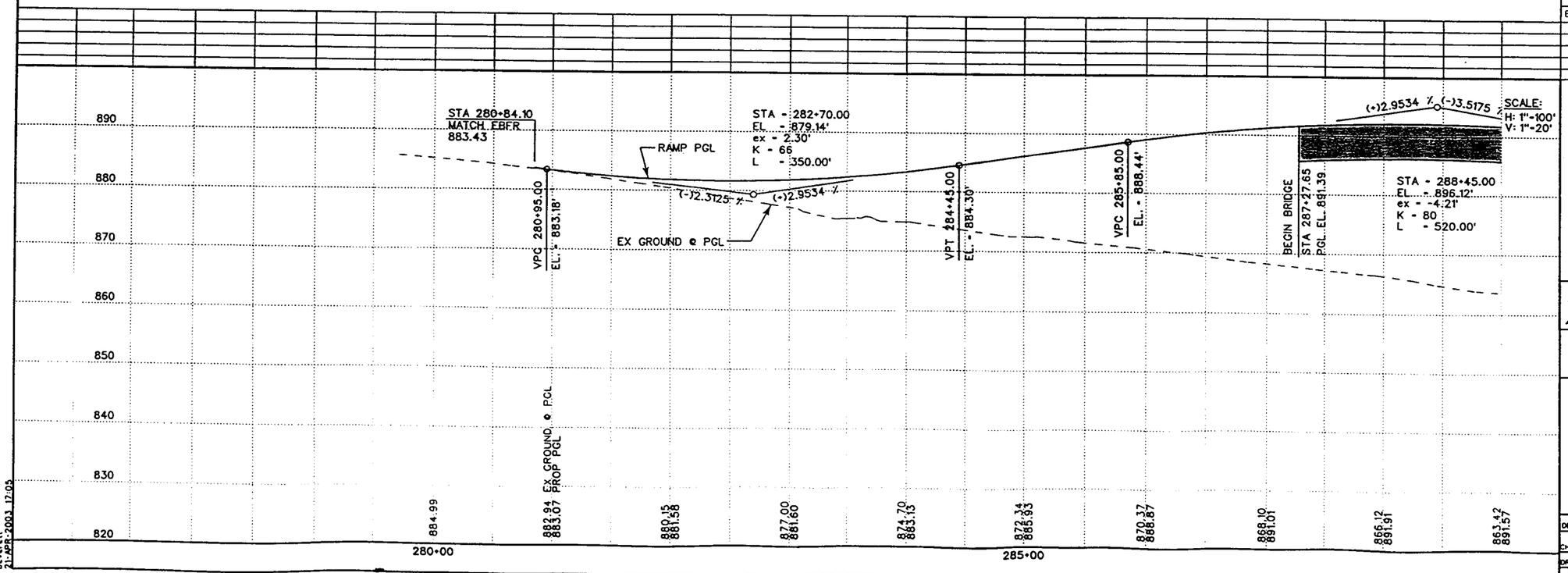
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.	
CHECKED: GKL	6	TEXAS	MG 2002(245)		SH-45	
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	193

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21-APR-2003 17:55

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beverell
21-APR-2003 17:05

0 50 100
SCALE IN FEET

LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE
3/28/03

DOUGLAS HUNEYCUTT
62830
REGISTERED
PROFESSIONAL ENGINEER

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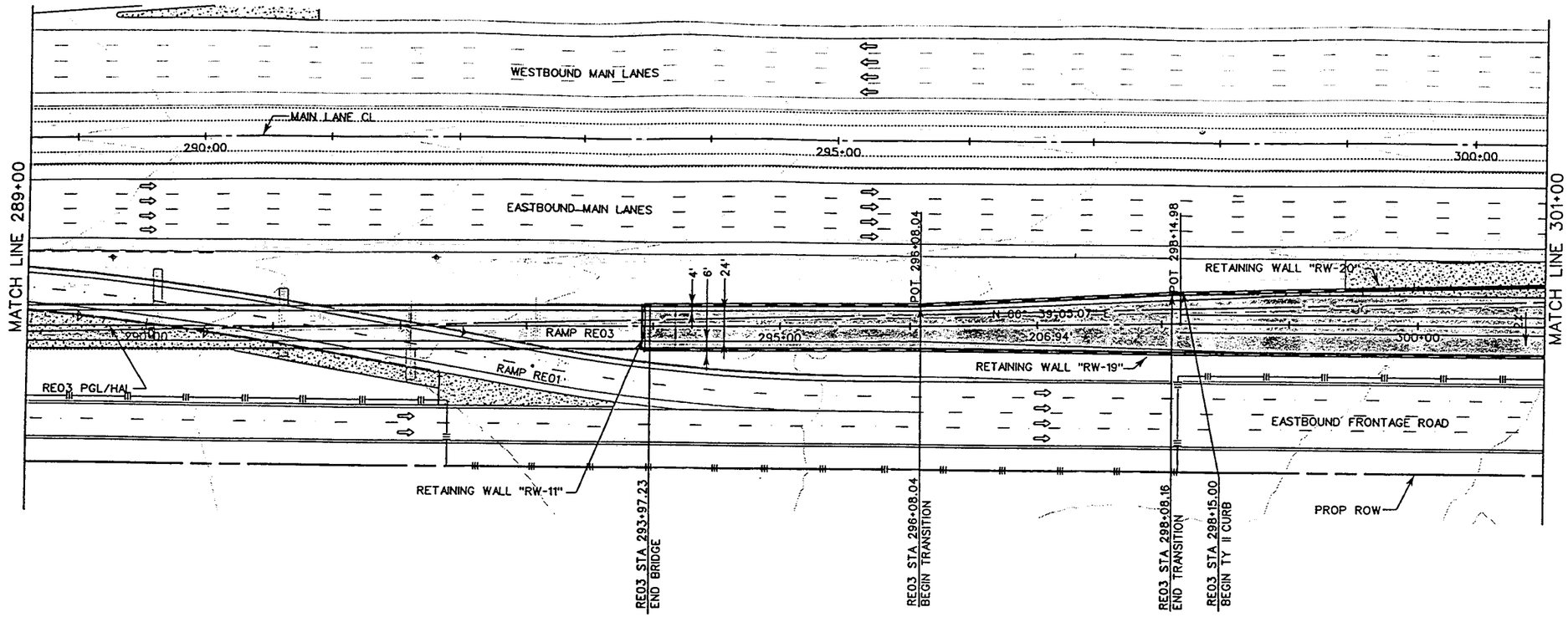
RAMP RE03
PLAN & PROFILE
STA 280+84 TO STA 289+00
SHEET 1 OF 4

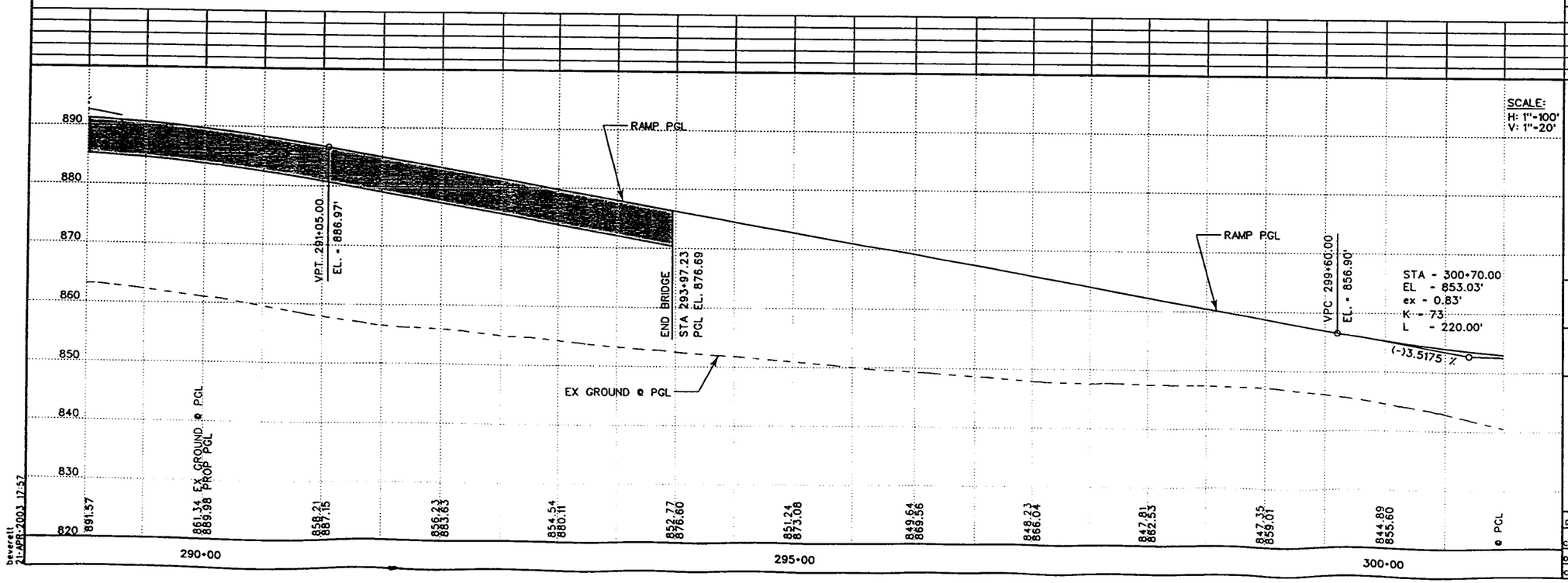
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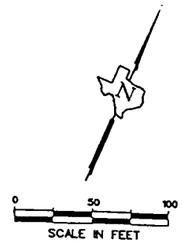
DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	154

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LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt P.E. 3/28/03

STATE OF TEXAS · DOUGLAS HUNEYCUTT · 62830 · REGISTERED PROFESSIONAL ENGINEER

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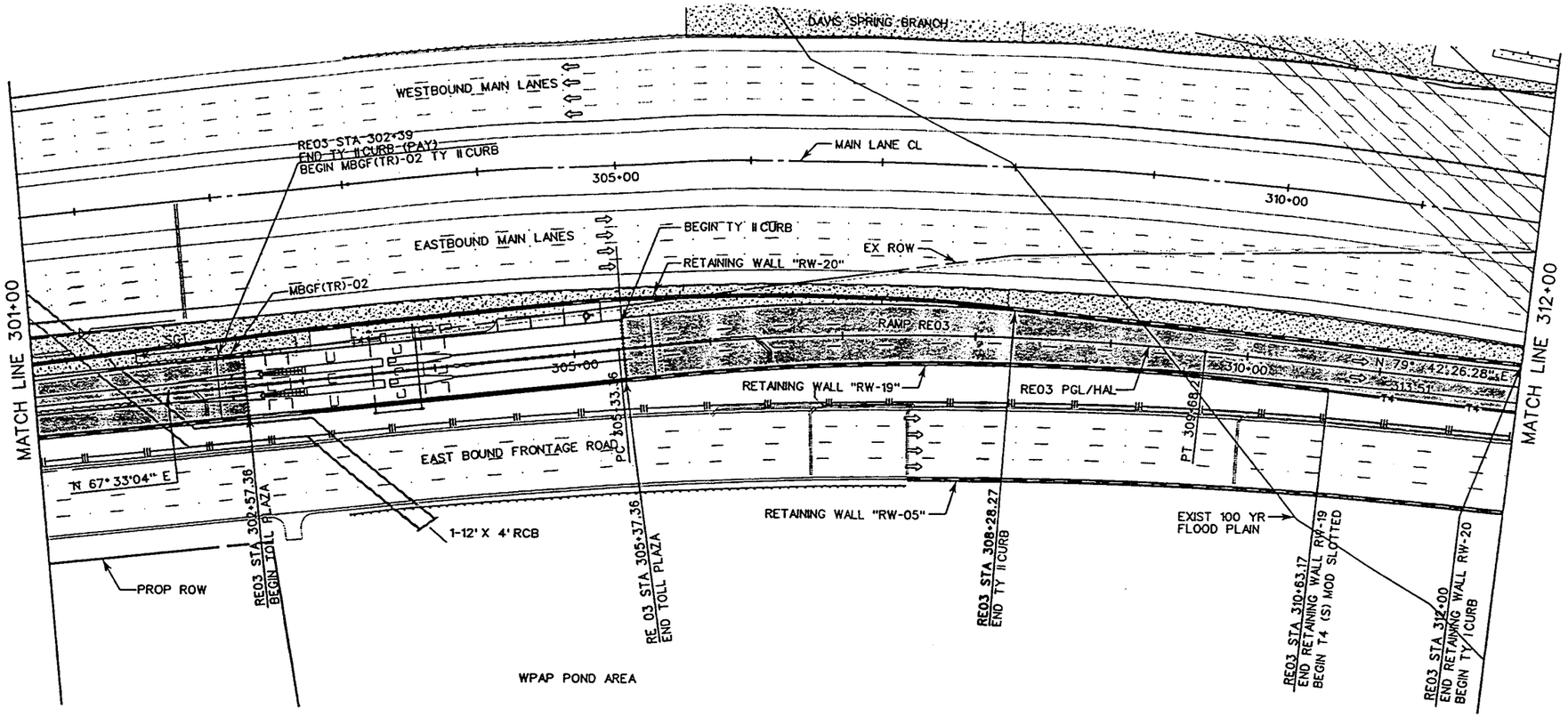
RAMP RE03 PLAN & PROFILE STA. 289+00 TO 301+00 SHEET 2 OF 4

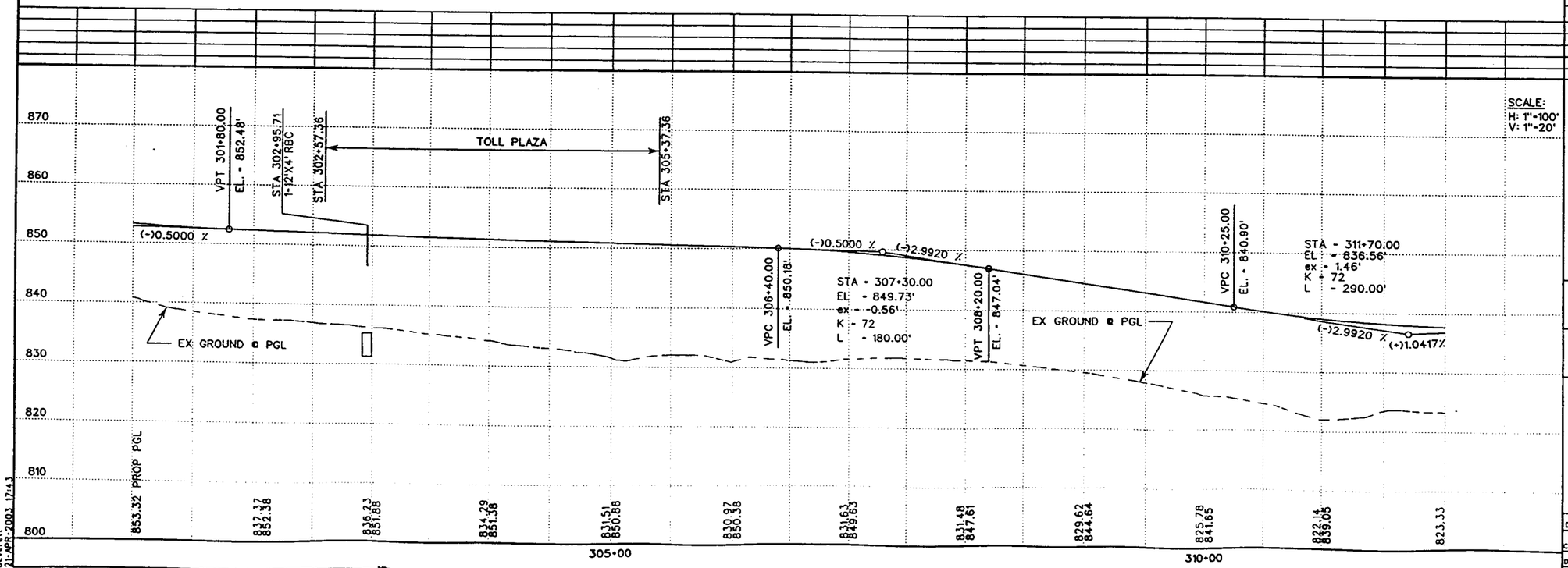
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No. / SECTION No.	JOB No. / SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683 / 01	070 / 195

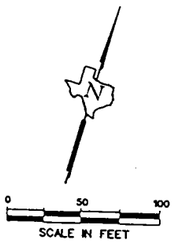
beverett
21-APR-2003 17:57

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SCALE:
H: 1"=100'
V: 1"=20'



LEGEND

0 50 100
SCALE IN FEET

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS
- T4 (S) MOD WITH 2-2" PVC CONDUITS

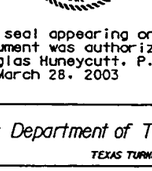
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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03



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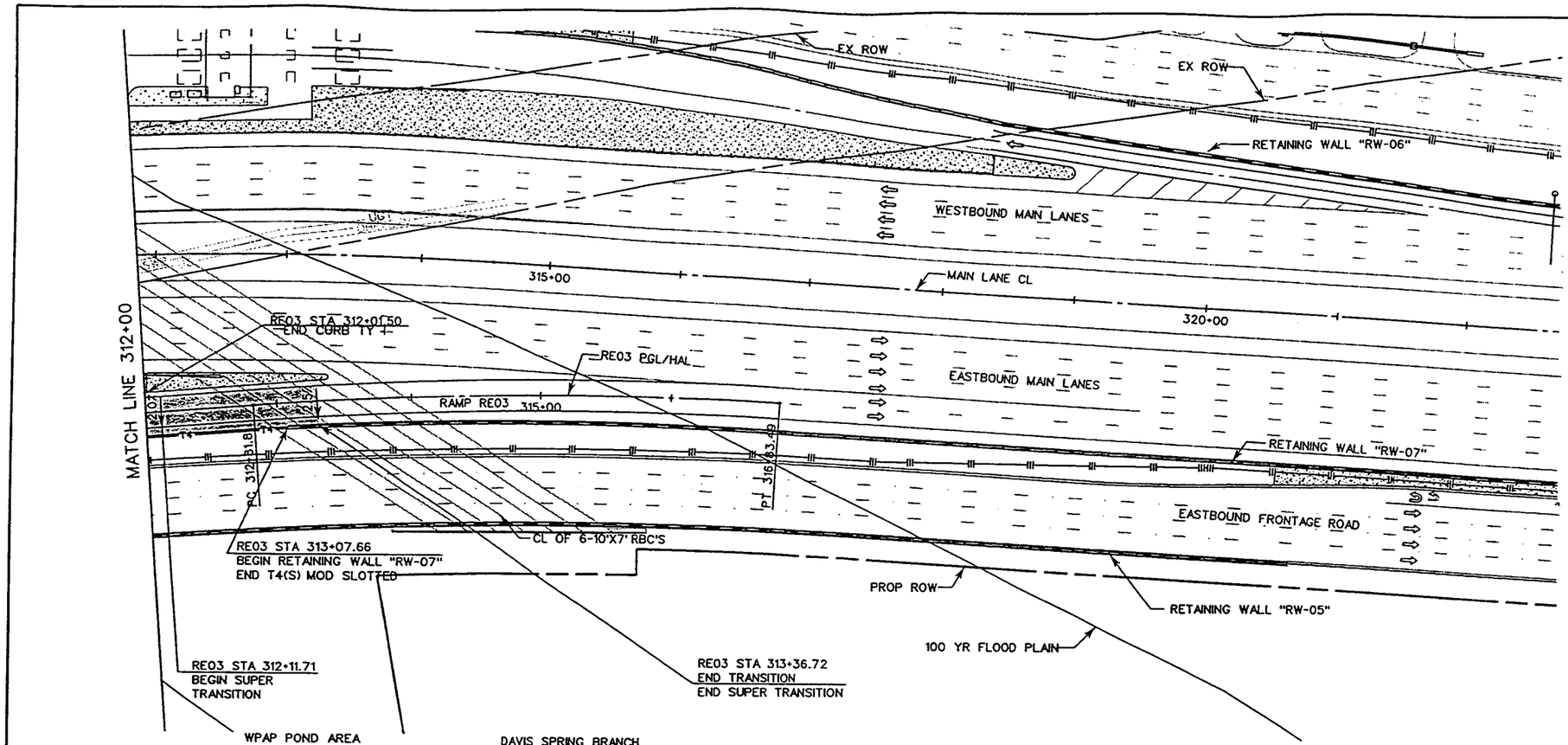
RAMP RE03
PLAN & PROFILE
STA. 301+00 TO 312+00
SHEET 3 OF 4

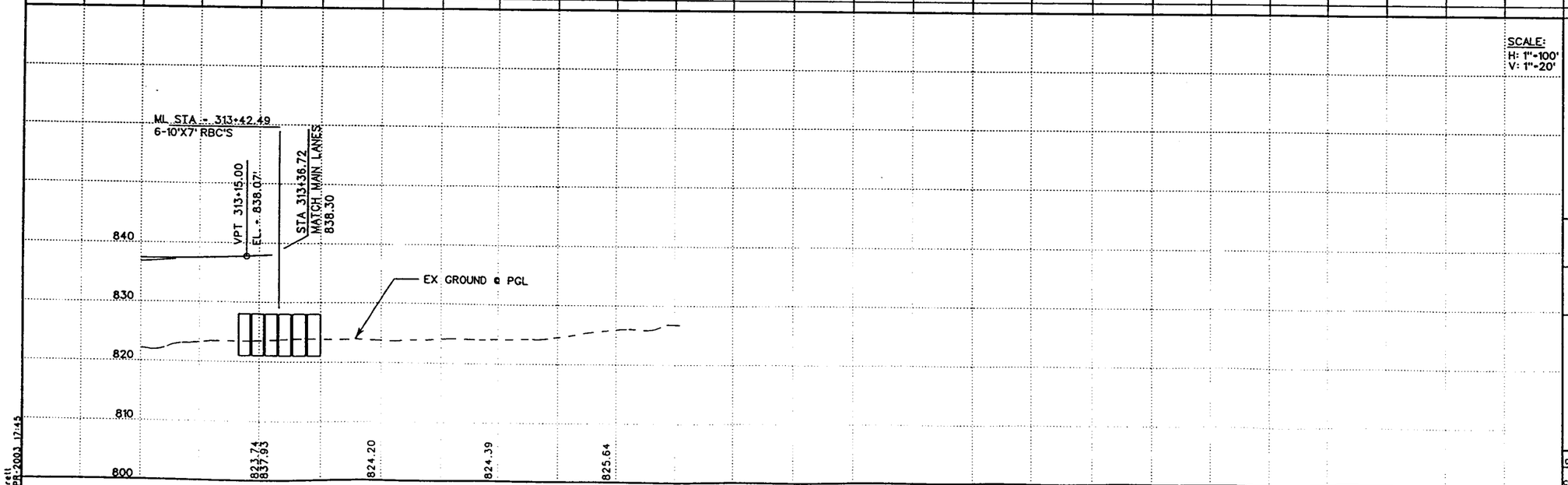
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.
CHECKED: GKL	6	TEXAS	NG 2002(245)		SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	186

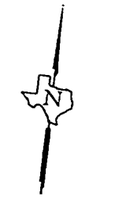
beverett
21-APR-2003 17:43

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SCALE:
H: 1"=100'
V: 1"=20'



LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS
- T4 — T4(S) MOD WITH 2-2" PVC CONDUITS

NOTES:

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03



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TEXAS TURNPIKE AUTHORITY DIVISION

JACOBS

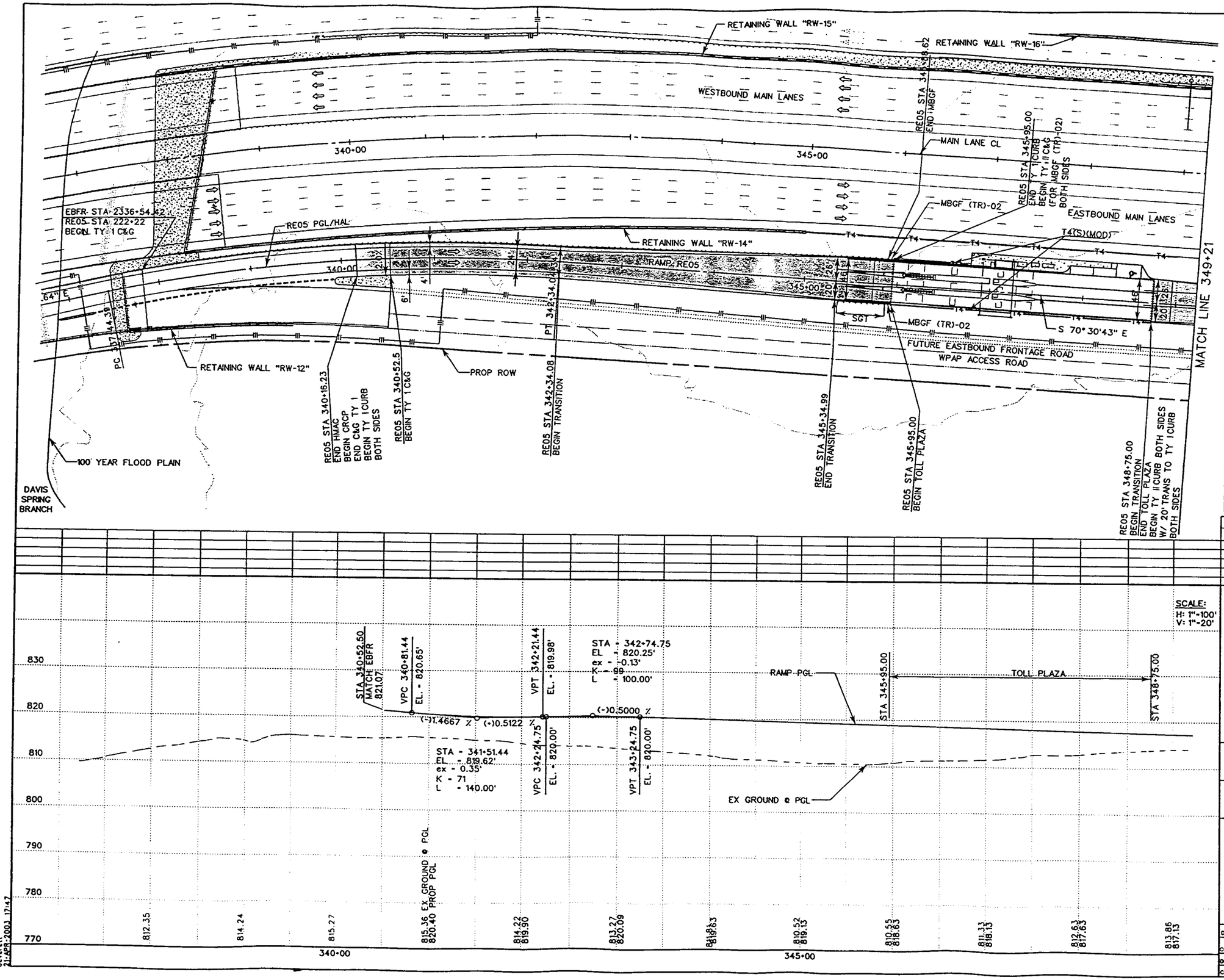
RAMP RE03
PLAN & PROFILE
STA 312+00 TO 313+36.72
SHEET 4 OF 4

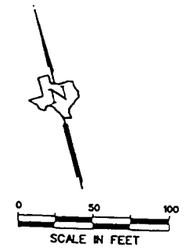
SCALE: 1" - 100'

DESIGNED: SFL	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.	
CHECKED: GKL	6	TEXAS	MG 2002(245)		SH-45	
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	147

beverett
21-APR-2003 17:45

\\WACKER01\PROJECT\CAD\MG2002\700\700code\702Cad\45ppp703.dgn





LEGEND

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS
- T4 (S) MOD WITH 2-2" PVC CONDUITS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. QUANTITIES FOR 5" RIPRAP TO BE INCLUDED IN MAINLANE SHEETS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03



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Texas Department of Transportation
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TEXAS TURNPIKE AUTHORITY DIVISION

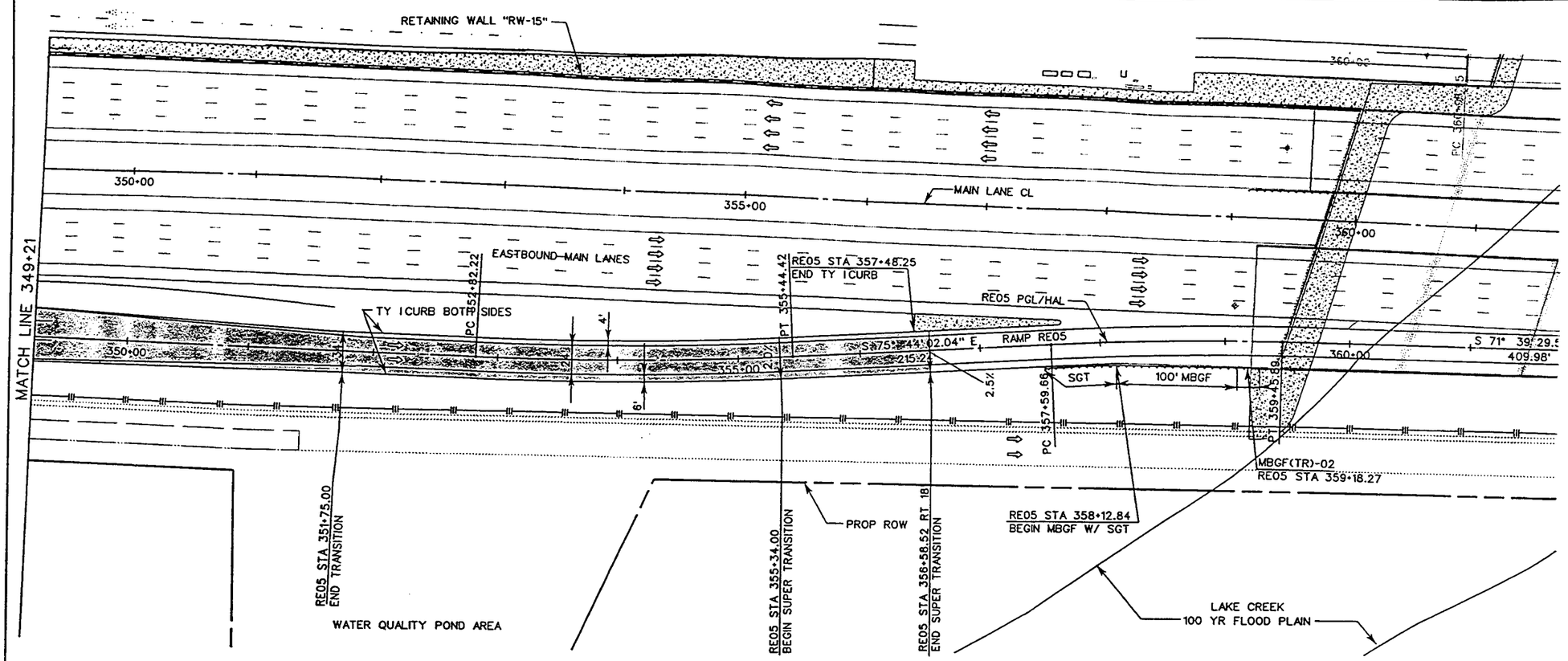
JACOBS

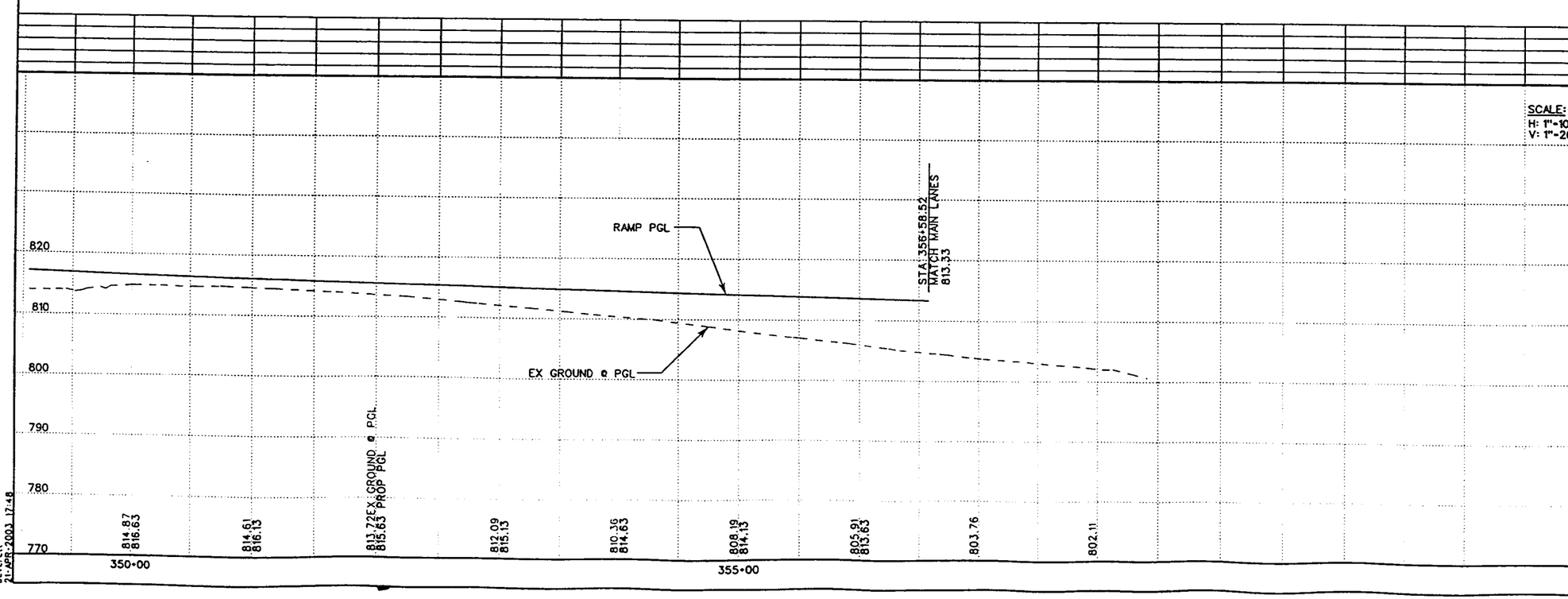
RAMP RE05
PLAN & PROFILE
STA 340+16.23 TO STA 349+21
SHEET 1 OF 2

SCALE: 1" = 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)		SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED GKL	14	WILLIAMSON	0683	01	070	148

\\WACO\GIS\PROJECTS\JOBS\700s\700ds\V02Civil\Sppo730.dgn





SCALE:
H: 1"=100'
V: 1"=20'

LEGEND

SCALE IN FEET: 0 50 100

- 11" CRCP ON 6" HMAC BASE, TY A ON 12" FLEX BASE
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. ALL SUPER ELEVATION TRANSITIONS ARE PARABOLIC EXCEPT WHERE NOTED.
3. QUANTITIES FOR 5" RIPRAP TO BE INCLUDED IN MAINLANE SHEETS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
			EMBANKMENT
			EXCAVATION

Douglas Huneycutt, PE 3/28/03

STATE OF TEXAS
DOUGLAS HUNEYCUTT
62830
REGISTERED PROFESSIONAL ENGINEER

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Texas Department of Transportation
TEXAS TURNPIKE AUTHORITY DIVISION

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JACOBS

RAMP RE05
PLAN & PROFILE
STA. 349+21 TO 356+58.52
SHEET 2 OF 2

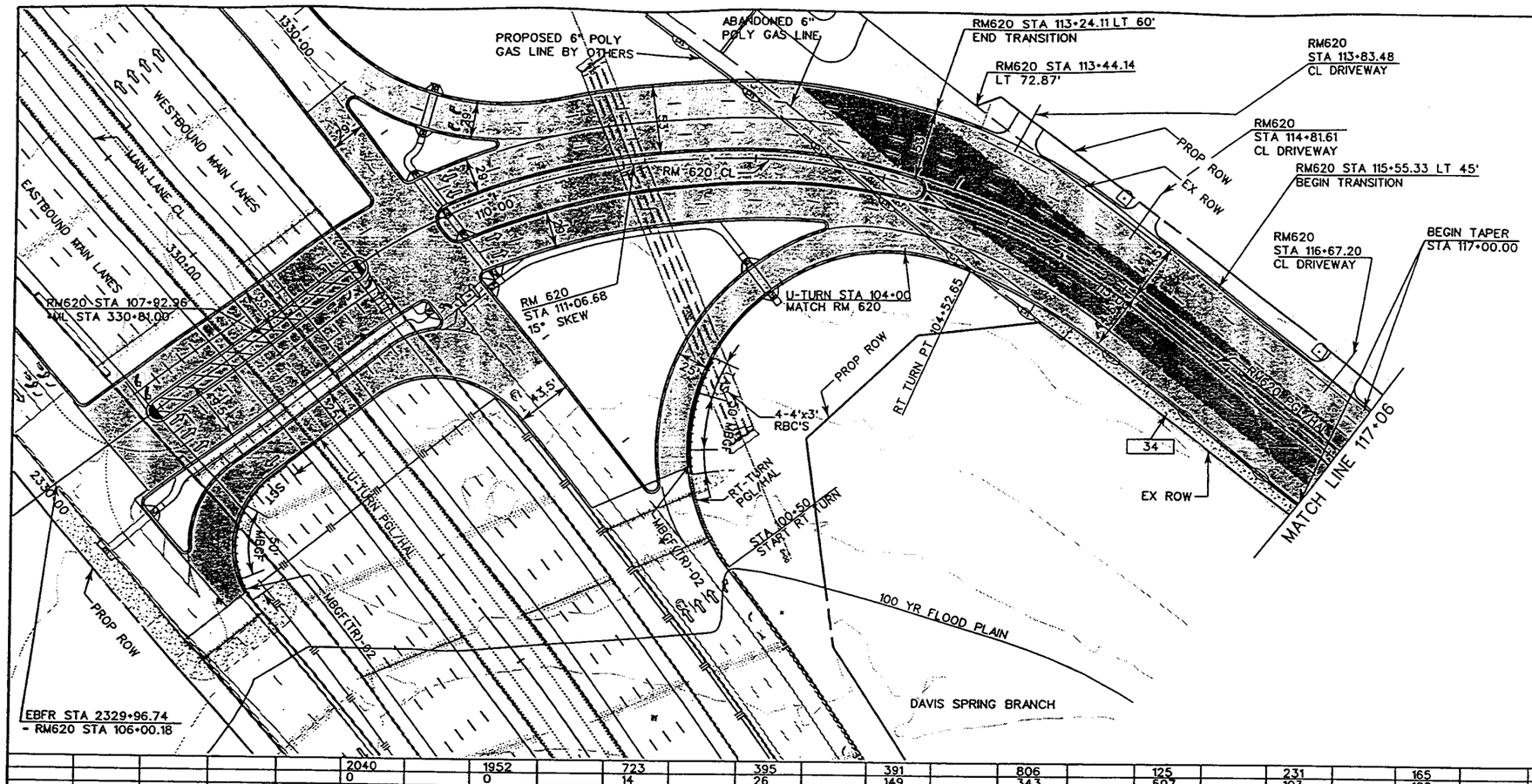
SCALE: 1" - 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	MG 2002(245)	SH-45

DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	189

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21-APR-2003 17:48

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LEGEND

SCALE IN FEET (0, 50, 100)

- 7" HMAC [2"TYC (SURF), 2"TYC, 3"TYB], 9" FLEX BASE, 6"L.T.S.C
- 2" HMAC TYC (SURF) OVERLAY
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS
- MAIL BOX

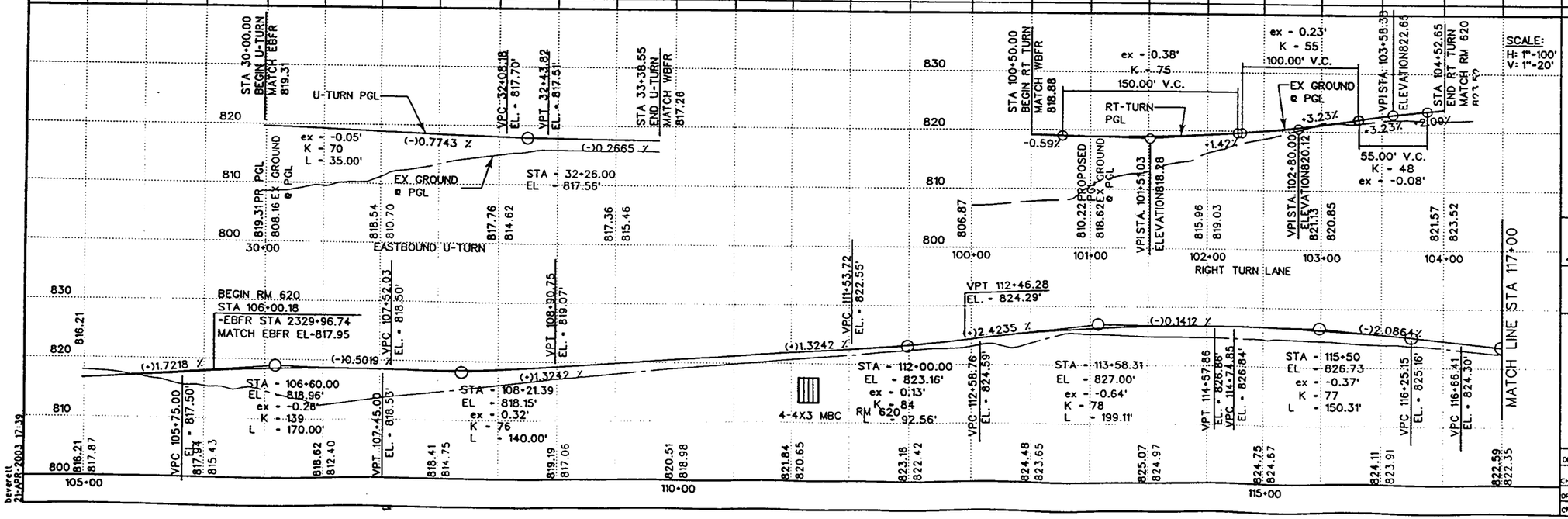
NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. REFER TO ROADWAY DETAIL SHEETS FOR CROSS SLOPE AND DRIVEWAY INFORMATION.
3. REFER TO STANDARD SHEET "CONCRETE DRIVEWAYS, SIDEWALKS AND RIPRAP MEDIANS FOR DRIVEWAY DETAILS.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THERFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'SRESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERE TO.

SHEET TOTALS

ESTIMATED	FINAL	UNIT	DESCRIPTION
6933		CY	EMBANKMENT
1523		CY	EXCAVATION



SCALE:
H: 1"=100'
V: 1"=20'

Douglas Huneycutt, PE
3/28/03

STATE OF TEXAS · DOUGLAS HUNEYCUTT · 62830 · REGISTERED · PROFESSIONAL ENGINEER

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JACOBS

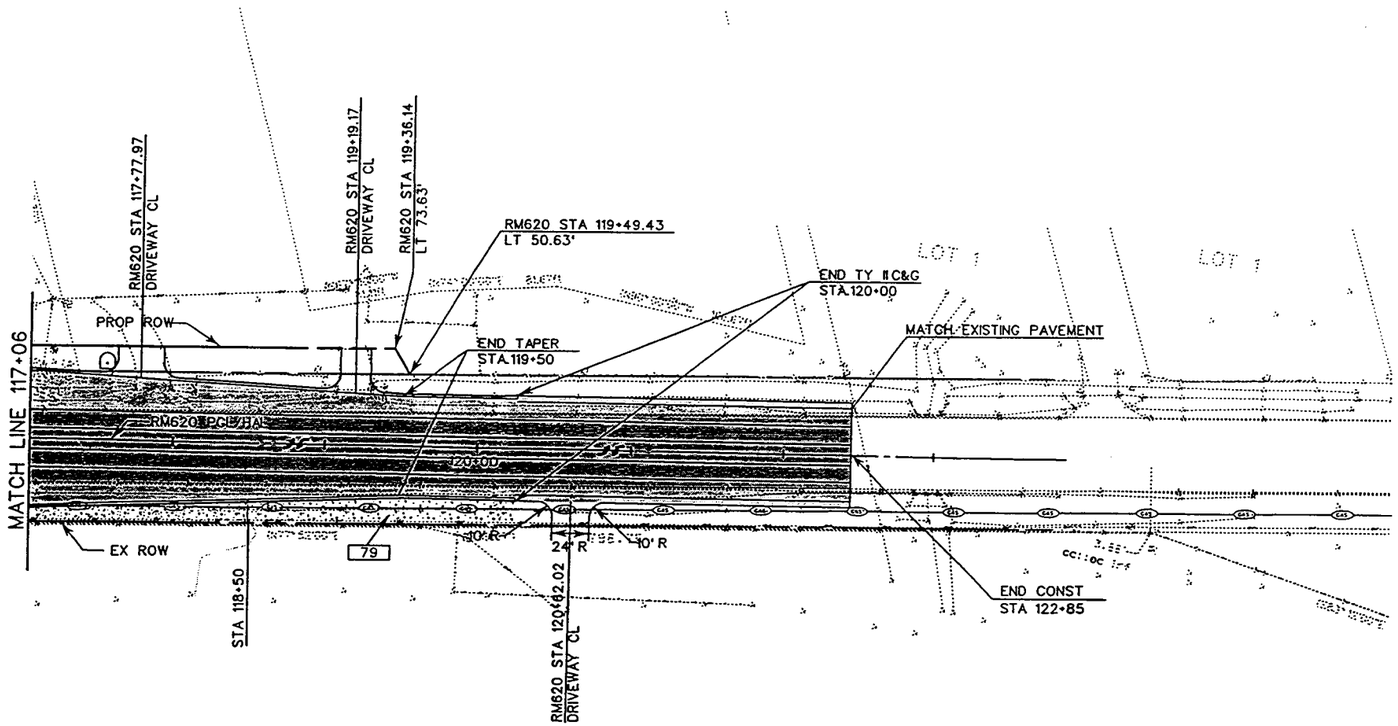
RM620
PLAN & PROFILE
STA 106+00 TO 117+06
SHEET 1 OF 2

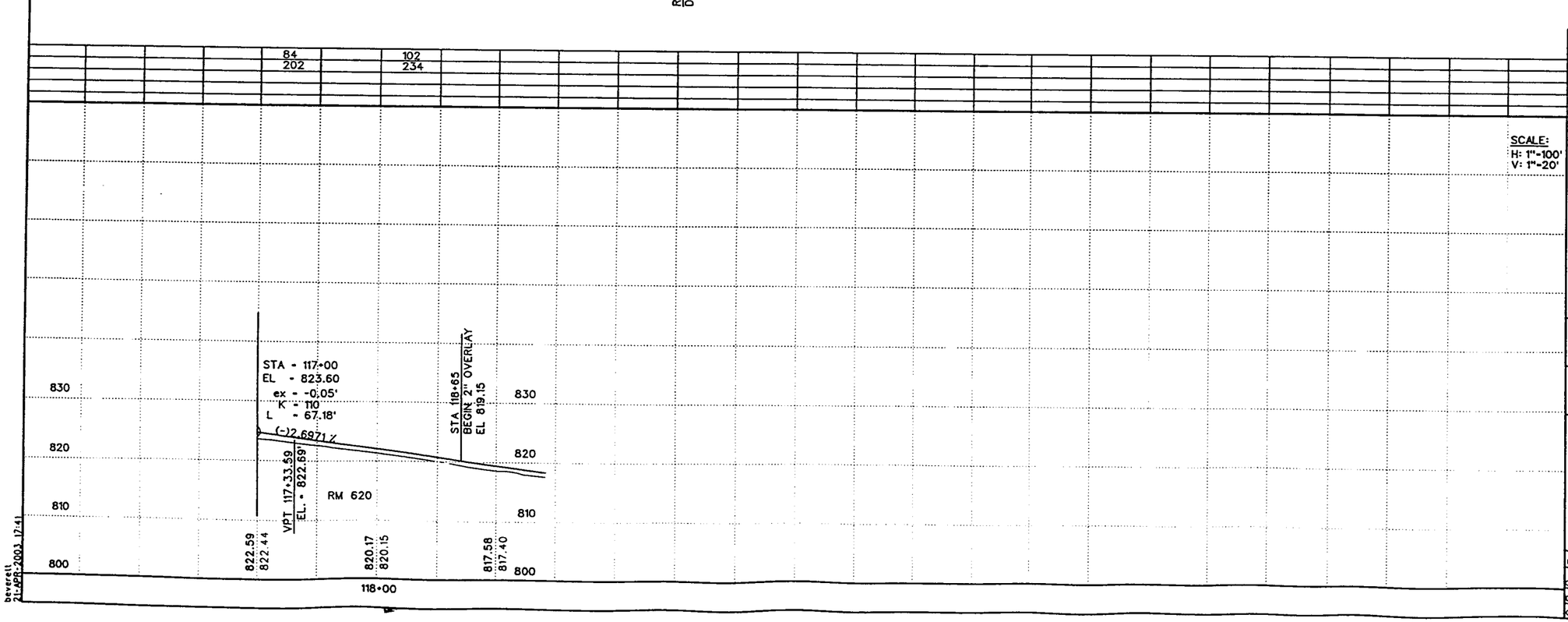
SCALE: 1" - 100'

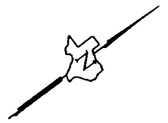
DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.	
CHECKED: GKL	6	TEXAS	MG 2002(245)		SH-45	
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	190

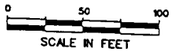
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LEGEND

- 7" HMAC, 2"(TYC)(SURF), 2"TYC, 4"TYB, 9" FLEX BASE, 6" L.T.S.C.
- 2" OVERLAY
- 6" HMAC (1.5" (TY C)(SURF), 1.5" TY C, 3" TY B) ON 10" TY A HMAC
- 5" RIPRAP
- RETAINING WALL
- PCTB(2)
- GUARD RAIL
- T501
- CONTROL OF ACCESS
- MAIL BOX

NOTES:

1. REFER TO HORIZONTAL LAYOUT PLAN AND DATA SHEETS FOR HORIZONTAL DATA AND CONTROLS.
2. REFER TO ROADWAY DETAIL SHEETS FOR CROSS SLOPE AND DRIVEWAY INFORMATION.

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SHEET TOTALS			
ESTIMATED	FINAL	UNIT	DESCRIPTION
186		CY	EMBANKMENT
436		CY	EXCAVATION

SCALE:
H: 1"=100'
V: 1"=20'

Douglas Huneycutt, PE 3/28/03



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Texas Department of Transportation

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TEXAS TURNPIKE AUTHORITY DIVISION

JACOBS

RM620
PLAN & PROFILE
STA 117+06 TO 122+85
SHEET 2 OF 2

SCALE: 1" = 100'

DESIGNED: SFI	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: GKL	6	TEXAS	NG 2002(245)	SH-45
DRAWN: DAC	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: GKL	14	WILLIAMSON	0683	01	070	19

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Thu Apr 24 11:03:35 2003
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JUNCT 4-J27
STA 252+35.00 ~ 0.00' RT. BL07
7X4 BOX FL = 873.06

JUNCT 4-J21
STA 252+38.00 ~ 0.00' RT. BL07
7X4 BOX FL = 872.91

JUNCT 4-J26
STA 253+16.36 ~ 21.00' RT. BL07
7X4 BOX FL = 868.93

JUNCT 4-J25
STA 254+81.78 ~ 21.00' RT. BL07
7X4 BOX FL = 864.83
18" FL = 866.73

TY E 4-A25 (20 FT)
STA 254+76.76 ~ 93.25' RT. BL07
LIP OF GUTTER = 873.38
18" FL = 867.38

TY E 4-A13 (15 FT)
STA 254+96.42 ~ 81.33' LT. BL07
LIP OF GUTTER = 873.10
18" FL = 867.60

JUNCT 4-J24
STA 254+96.74 ~ 21.00' RT. BL07
7X4 BOX FL = 864.46
18" FL = 866.16

JUNCT 4-J30
STA 256+50.52 ~ 21.00' RT. BL07
7X4 BOX FL = 860.65
18" FL = 861.90

TY E 4-A39 (20 FT)
STA 256+45.27 ~ 93.53' RT. BL07
LIP OF GUTTER = 869.18
18" FL = 863.68

JUNCT 4-T1
STA 258+93.93 ~ 23.83' RT. BL07
7X4 BOX FL = 855.00
8X4 BOX FL = 855.00

JUNCT 4-J23
STA 258+82.14 ~ 23.60' RT. BL07
8X4 BOX FL = 854.98
21" FL = 856.58

TY E 4-A24 (20 FT)
STA 258+77.12 ~ 95.97' RT. BL07
LIP OF GUTTER = 862.72
FL 18" = 857.42
FL 21" = 857.17

D.I. 4-A30 (TY II) (MOD)
STA 258+77.11 ~ 103.64' RT. BL07
TOP OF GRATE = 877.98
TOP OF RISER = 877.23
FL 18" = 857.45

TY E 4-A12 (20 FT)
STA 258+96.42 ~ 84.15' LT. BL07
LIP OF GUTTER = 862.69
FL 18" = 857.19

D.I. 4-A35 (TY II) (MOD) (1 GRATE)
STA 258+96.38 ~ 91.81' LT. BL07
TOP OF GRATE = 874.44
TOP OF RISER = 873.69
FL 18" = 857.22

JUNCT 4-J22
STA 259+01.93 ~ 23.89' RT. BL07
8X4 BOX FL = 854.89
18" FL = 856.22

JUNCT 4-J19
STA 260+76.61 ~ 26.38' RT. BL07
8X4 BOX FL = 854.07
18" FL = 854.39

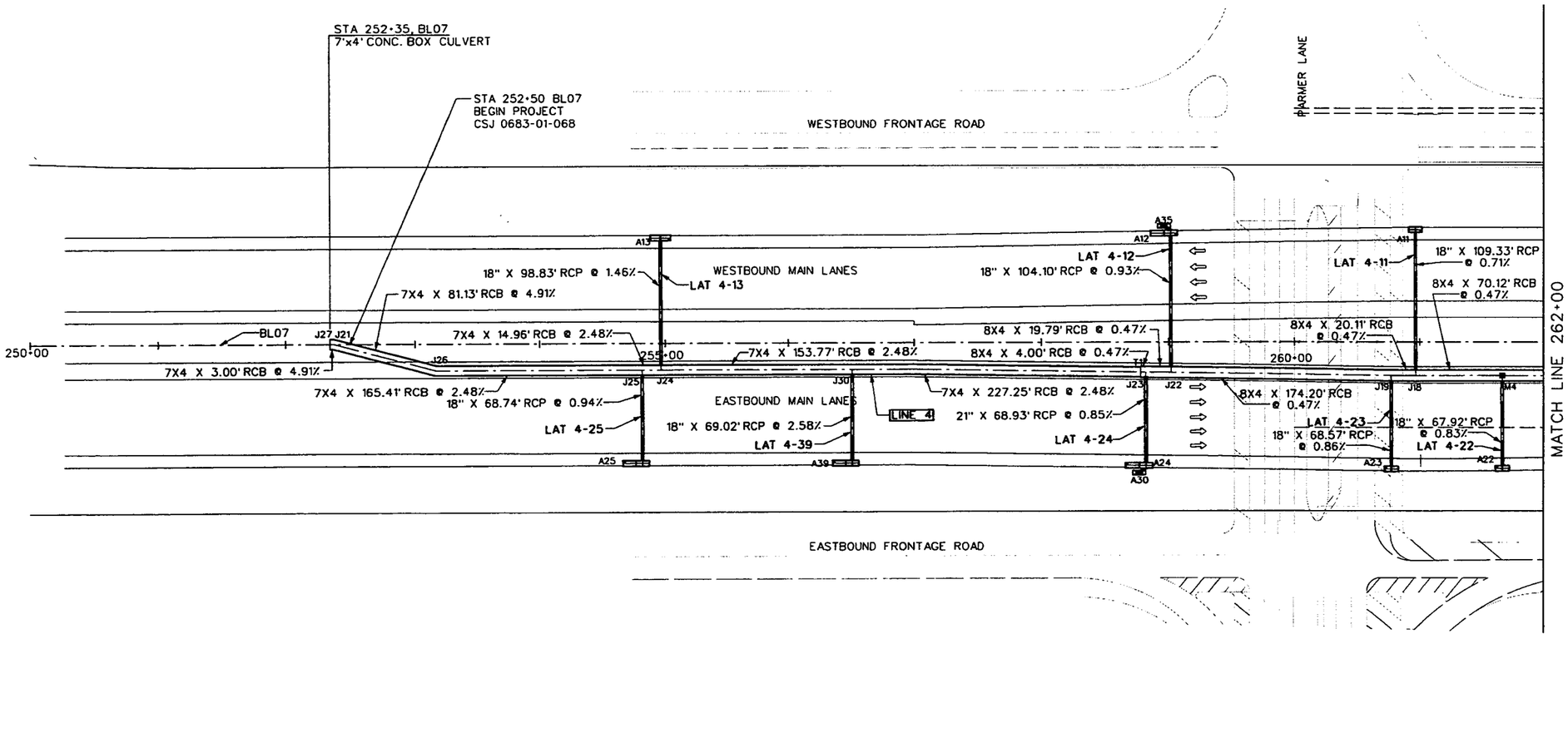
TY E 4-A23 (10 FT)
STA 260+76.84 ~ 98.94' RT. BL07
LIP OF GUTTER = 860.28
FL 18" = 854.98

TY E 4-A11 (10 FT)
STA 260+96.37 ~ 86.83' LT. BL07
LIP OF GUTTER = 860.48
FL 18" = 855.18

JUNCT 4-J18
STA 260+96.73 ~ 26.50' RT. BL07
8X4 BOX FL = 853.98
18" FL = 854.40

TY E 4-A22 (10 FT)
STA 261+66.98 ~ 98.39' RT. BL07
LIP OF GUTTER = 859.97
FL 18" = 854.67

MH 4-M4 TY M (MOD)
STA 261+66.85 ~ 26.50' RT. BL07
TOP OF RIM = 863.00
8X4 BOX FL = 853.65
18" FL = 854.11



0 50 100
SCALE IN FEET

LEGEND

←··	FLOW LINE OF DITCH
	LOCATION OF GRASSY SWALE
	RIPRAP

GENERAL NOTES

1. THE STATION AND OFFSET FOR ALL TY I, TY II, IR, IIR, IIG, IIG(MOD), AAD, AAD (MOD) AND TY E CURB INLETS ARE MEASURED TO THE INSIDE FACE, OF THE INLET, NEXT TO THE TRAVEL WAY.

2. THE STATION AND OFFSET FOR ALL DROP INLETS, MANHOLES AND JUNCTIONS STRUCTURES ARE MEASURED TO THE CENTER OF THE STRUCTURE.

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE NOTED

STATE OF TEXAS
DAVID M. HOSSEINY
65012
REGISTERED PROFESSIONAL ENGINEER
4/24/03

The seal appearing on this document was authorized by DAVID M. HOSSEINY, P.E. 65012, on April 24, 2003

Texas Department of Transportation
2003 by TxDOT
TEXAS TURNPIKE AUTHORITY DIVISION

LOPEZGARCIA GROUP
1825 Market Center Blvd., Suite 500 Dallas, Texas 75207
(214) 741-7777 (214) 741-9413 Fax
lopezgarciagroup.com

STORM DRAIN LAYOUT
250+00 TO 262+00

SHEET 1 OF 16 SCALE: 1"= 100'

DESIGNED: OJ	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: DMH	6	TEXAS	MG 2002(245)	SH-45

DRAWN: WL	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: DMH	AUSTIN	WILLIAMSON	0683	01	070	

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JUNCT 4-J15
STA 262+76.71 ~ 26.50' RT. BL07
8X4 BOX FL = 852.99
18" FL = 853.66

TY E 4-A10 (10 FT)
STA 262+76.35 ~ 86.83' LT. BL07
LIP OF GUTTER = 859.94
FL 18" = 854.44

JUNCT 4-J14
STA 263+06.78 ~ 26.50' RT. BL07
8X4 BOX FL = 852.85
18" FL = 853.49

TY E 4-A21 (10 FT)
STA 263+06.92 ~ 96.39' RT. BL07
LIP OF GUTTER = 859.62
FL 18" = 854.12

D.I. 4-A31 (TY II) (MOD) (1 GRATE)
STA 263+07.08 ~ 104.06' RT. BL07
TOP OF GRATE = 876.13
TOP OF RISER = 875.38
FL 18" = 854.14

JUNCT 4-J13
STA 264+56.78 ~ 26.50' RT. BL07
8X4 BOX FL = 852.14
18" FL = 852.93
18" FL = 852.84

TY E 4-A20 (10 FT)
STA 264+56.91 ~ 94.25' RT. BL07
LIP OF GUTTER = 859.25
FL 18" = 853.75

TY E 4-A26 (10 FT)
STA 264+56.43 ~ 86.83' LT. BL07
LIP OF GUTTER = 859.43
FL 18" = 853.93

D.I. 4-A36 (TY II) (MOD) (1 GRATE)
STA 264+56.40 ~ 94.50' LT. BL07
TOP OF GRATE = 873.93
TOP OF RISER = 873.18
FL 18" = 853.95

JUNCT 4-J12
STA 266+06.74 ~ 26.50' RT. BL07
8X4 BOX FL = 851.44
18" FL = 852.34
18" FL = 852.19

TY E 4-A19 (10 FT)
STA 266+06.87 ~ 92.11' RT. BL07
LIP OF GUTTER = 858.87
FL 18" = 853.37

TY E 4-A27 (10 FT)
STA 266+06.39 ~ 86.83' LT. BL07
LIP OF GUTTER = 859.00
FL 18" = 853.50

D.I. 4-A37 (TY II) (MOD) (1 GRATE)
STA 266+06.36 ~ 94.50' LT. BL07
TOP OF GRATE = 874.05
TOP OF RISER = 873.30
FL 18" = 853.52

JUNCT 4-T4
STA 267+52.69 ~ 26.50' RT. BL07
8X4 BOX FL = 850.79
12X4 BOX FL = 850.79

JUNCT 4-J11
STA 267+56.69 ~ 26.50' RT. BL07
12X4 BOX FL = 850.73
18" FL = 851.84
24" FL = 850.94

TY E 4-A14 (10 FT)
STA 267+56.70 ~ 89.97' RT. BL07
LIP OF GUTTER = 858.57
FL 18" = 853.07

D.I. 4-A32 (TY II) (MOD) (1 GRATE)
STA 267+56.70 ~ 97.64' RT. BL07
TOP OF GRATE = 874.19
TOP OF RISER = 873.44
FL 18" = 853.09

D.I. 4-A29 (2 GRATE) (TY I)
STA 267+56.61 ~ 0.00' RT. BL07
TOP OF GRATE = 858.50
18" FL = 851.75
24" FL = 851.25

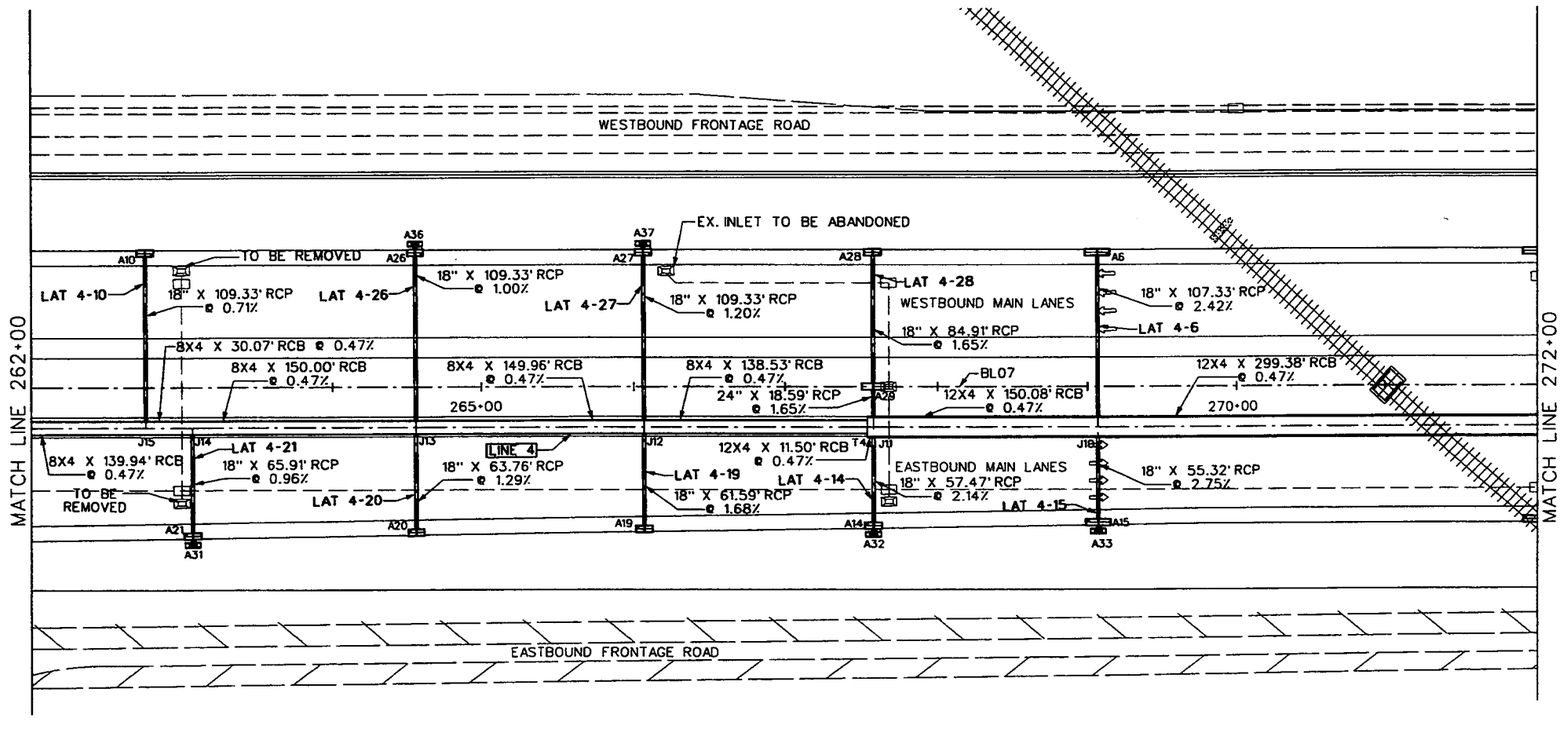
TY E 4-A28 (10 FT)
STA 267+56.41 ~ 86.83' LT. BL07
LIP OF GUTTER = 858.65
FL 18" = 853.15

JUNCT 4-J10
STA 269+06.78 ~ 26.50' RT. BL07
12X4 BOX FL = 850.03
18" FL = 852.20
18" FL = 851.13

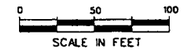
TY E 4-A15 (15 FT)
STA 269+06.99 ~ 87.82' RT. BL07
LIP OF GUTTER = 859.22
FL 18" = 853.72

D.I. 4-A33 (TY II) (MOD) (1 GRATE)
STA 269+07.00 ~ 95.49' RT. BL07
TOP OF GRATE = 874.83
TOP OF RISER = 874.08
FL 18" = 853.74

TY E 4-A6 (15 FT)
STA 269+06.42 ~ 86.83' LT. BL07
LIP OF GUTTER = 859.23
FL 18" = 853.73







LEGEND

←··	FLOW LINE OF DITCH
	LOCATION OF GRASSY SWALE
	RIPRAP

GENERAL NOTES

1. THE STATION AND OFFSET FOR ALL TY I, TY II, IR, IIR, IIG, IIG(MOD), AAD, AAD (MOD) AND TY E CURB INLETS ARE MEASURED TO THE INSIDE FACE, OF THE INLET, NEXT TO THE TRAVEL WAY.
2. THE STATION AND OFFSET FOR ALL DROP INLETS, MANHOLES AND JUNCTIONS STRUCTURES ARE MEASURED TO THE CENTER OF THE STRUCTURE.

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.

STATE OF TEXAS
DAVID M. HOSSEINY
65012
REGISTERED PROFESSIONAL ENGINEER
4/24/03

The seal appearing on this document was authorized by DAVID M. HOSSEINY, P.E. 65012, on April 24, 2003

2003 by TxDOT

Texas Department of Transportation
TEXAS TURNPIKE AUTHORITY DIVISION

LOPEZGARCIA GROUP
1825 Market Center Blvd., Suite 500 Dallas, Texas 75207
(214) 741-7777 (214) 741-9413 Fax
lopezgarciagroup.com

STORM DRAIN LAYOUT 262+00 TO 272+00

SHEET 2 OF 16 SCALE: 1"= 100'

DESIGNED: QJ	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.
CHECKED: DMH	6	TEXAS	NG 2002(245)		SH-45
DRAWN: WL	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: DMH	AUSTIN	WILLIAMSON	0683	01	070	

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TY E 4-A7 (20 FT)
STA 272+01.10 ~ 86.83' LT. BL07
LIP OF GUTTER = 863.76
FL 18" = 857.26

JUNCT 4-J5
STA 272+06.15 ~ 26.50' RT. BL07
12X4 BOX FL = 848.62
18" FL = 850.79
18" FL = 850.00

TY E 4-A16 (20 FT)
STA 272+01.21 ~ 86.82' RT. BL07
LIP OF GUTTER = 863.76
FL 18" = 855.26

TY E 4-A8 (15 FT)
STA 276+00.02 ~ 88.18' LT. BL07
LIP OF GUTTER = 871.09
FL 18" = 864.09

JUNCT 4-J4
STA 276+00.04 ~ 27.81' RT. BL07
12X4 BOX FL = 846.77
18" FL = 848.50
18" FL = 848.75

TY E 4-A17 (15 FT)
STA 276+00.26 ~ 92.88' RT. BL07
LIP OF GUTTER = 871.24
FL 18" = 859.49

TY E 4-A9 (15 FT)
STA 278+47.19 ~ 91.39' LT. BL07
LIP OF GUTTER = 873.52
FL 18" = 867.02

JUNCT 4-J28
STA 276+85.31 ~ 96.13' RT. BL07
18" FL = 859.88

JUNCT 4-J3
STA 278+46.44 ~ 27.90' RT. BL07
12X4 BOX FL = 845.29
18" FL = 847.11
18" FL = 847.00

TY E 4-A18 (15 FT)
STA 278+46.07 ~ 98.68' RT. BL07
LIP OF GUTTER = 873.38
FL 18" = 861.16

D.I. 4-A38 (TY II) (MOD) (1 GRATE)
STA 275+99.99 ~ 95.85' LT. BL07
TOP OF GRATE = 880.71
TOP OF RISER = 879.96
FL 18" = 864.11

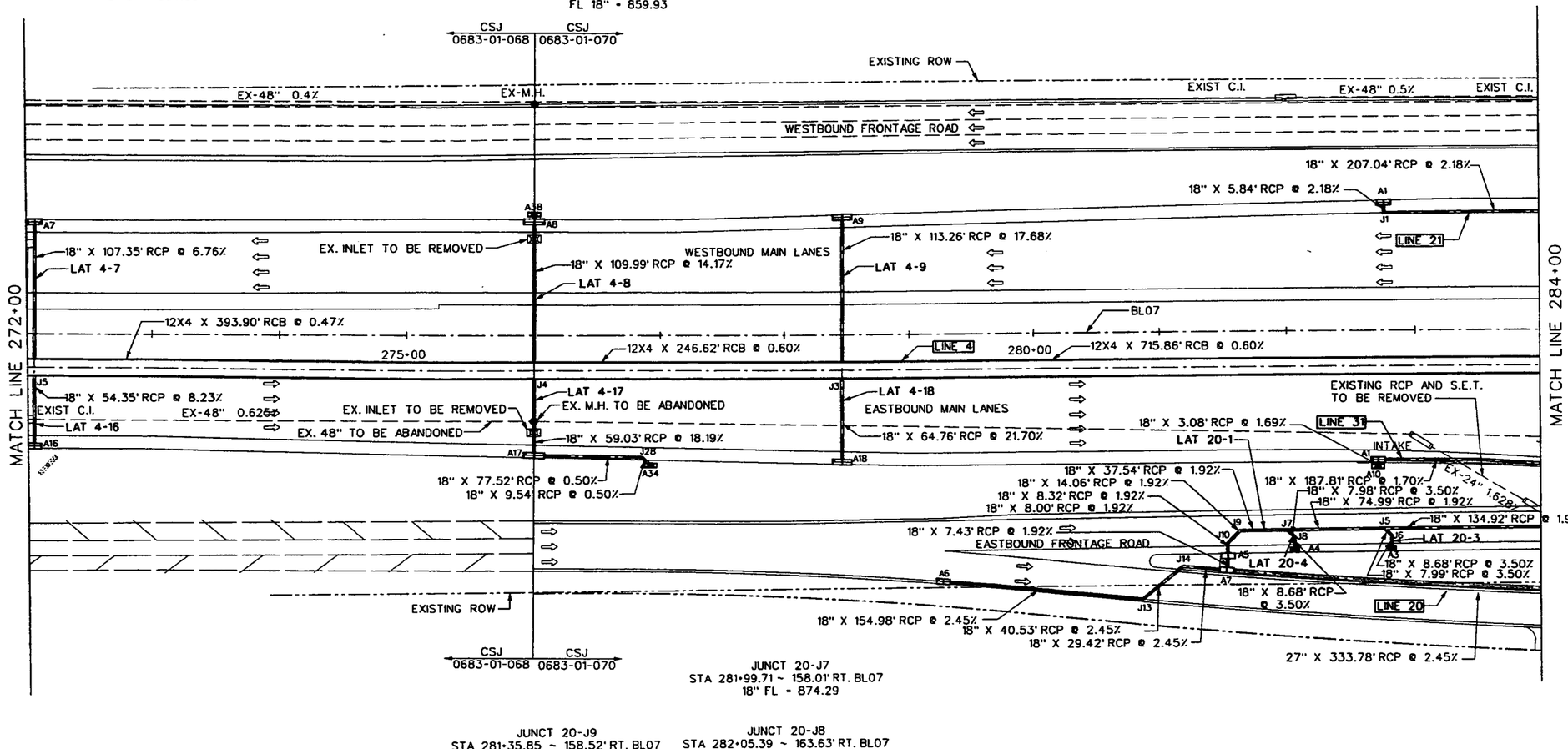
D.I. 4-A34 (TY II) (MOD) (1 GRATE)
STA 276+92.39 ~ 102.48' RT. BL07
TOP OF GRATE = 880.93
TOP OF RISER = 880.18
FL 18" = 859.93

TY E 21-A1 (10 FT)
STA 282+75.68 ~ 99.43' LT. BL07
LIP OF GUTTER = 874.25
18" FL = 869.97

JUNCT 21-J1
STA 282+75.80 ~ 93.09' LT. BL07
18" FL = 869.84

C.I. 31-A1 (10 FT) (TY E)
STA 282+69.85 ~ 100.70' RT. BL07
LIP OF GUTTER = 874.26
18" FL = 867.77

D.I. 31-A10 (TY II) (MOD) (1 GRATE)
STA 282+69.81 ~ 107.80' RT. BL07
TOP OF GRATE = 877.62
TOP OF RISER = 876.87
18" FL = 867.79







LEGEND

←··	FLOW LINE OF DITCH
	LOCATION OF GRASSY SWALE
	RIPRAP

GENERAL NOTES

1. THE STATION AND OFFSET FOR ALL TY I, TY II, IR, IIR, IIG, IIG(MOD), AAD, AAD (MOD) AND TY E CURB INLETS ARE MEASURED TO THE INSIDE FACE, OF THE INLET, NEXT TO THE TRAVEL WAY.
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ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.

C.I. 20-A6 (10 FT.) (TY IIR)
STA 279+26.40 ~ 194.43' RT. BL07
LIP OF GUTTER = 885.00
18" FL = 874.44

JUNCT 20-J13
STA 280+85.61 ~ 212.16' RT. BL07
18" FL = 874.64

JUNCT 20-J14
STA 281+16.81 ~ 186.30' RT. BL07
18" FL = 873.65

C.I. 20-A7 (10 FT.) (TY II)
STA 281+51.18 ~ 191.38' RT. BL07
LIP OF GUTTER = 880.54
18" FL = 872.80
24" FL = 872.09
LAT 20-1 18" FL = 872.96

JUNCT 20-J9
STA 281+35.85 ~ 158.52' RT. BL07
18" FL = 873.57

JUNCT 20-J10
STA 281+30.26 ~ 164.22' RT. BL07
18" FL = 873.30

C.I. 20-A5 (10 FT.) (TY I)
STA 281+52.45 ~ 176.36' RT. BL07
LIP OF GUTTER = 881.52
18" FL = 873.14

JUNCT 20-J11
STA 281+29.54 ~ 186.19' RT. BL07
18" FL = 874.92
18" FL = 874.92

JUNCT 20-J12
STA 281+34.68 ~ 192.32' RT. BL07
24" FL = 874.50
18" FL = 874.75
24" FL = 874.50

JUNCT 20-J7
STA 281+99.71 ~ 158.01' RT. BL07
18" FL = 874.29

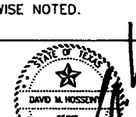
JUNCT 20-J8
STA 282+05.39 ~ 163.63' RT. BL07
18" FL = 874.57

AAD (MOD) 20-A4
STA 282+05.41 ~ 172.30' RT. BL07
TOP OF GRATE = 880.95
18" FL = 874.87

JUNCT 20-J5
STA 282+74.70 ~ 157.42' RT. BL07
18" FL = 875.74

JUNCT 20-J6
STA 282+80.38 ~ 163.03' RT. BL07
18" FL = 876.02

AAD (MOD) 20-A3
STA 282+80.41 ~ 171.71' RT. BL07
TOP OF GRATE = 881.40
18" FL = 876.32



4/24/03

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2003 by TxDOT — TEXAS TURNPIKE AUTHORITY DIVISION

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STORM DRAIN LAYOUT
STA 272+00 TO STA 284+00

SHEET 3 OF 16 SCALE: 1"= 100'

DESIGNED: QJ	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.
CHECKED: DMH	6	TEXAS	MG 2002(245)		SH-45
DRAWN: WL	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No. / SHEET No.
CHECKED: DMH	AUSTIN	WILLIAMSON	0683	01	070

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TY E 21-A2 (10 FT)
STA 284+82.83 ~ 100.52' LT. BL07
LIP OF GUTTER = 872.12
18" FL = 865.56

JUNCT 21-J2
STA 284+82.83 ~ 94.18' LT. BL07
18" FL = 865.33

DI-21-A3A (TY II) (MOD) (1 GRATE)
STA 286+41.58 ~ 108.56' LT. BL07
TOP OF RISER = 867.88
TOP OF GRATE = 868.63
18" FL = 862.14

C.I. 21-A3 (10 FT.) (TY E)
STA 286+41.70 ~ 100.90' LT. BL07
LIP OF GUTTER = 869.56
18" FL = 862.12

JUNCT 21-J3
STA 286+41.77 ~ 95.03' LT. BL07
24" FL = 861.36
18" FL = 861.61

JUNCT 21-J212
STA 286+37.70 ~ 95.00' LT. BL07
18" FL = 861.95
24" FL = 861.45

OUTFALL TO LINE 11 - J112
STA 290+00.00 ~ 92.68' LT. BL07
24" FL = 853.51
30" FL = 853.22

JUNCT 21-J211
STA 289+95.78 ~ 96.90' LT. BL07
24" FL = 853.64

MH 4-A3 (TY M) (MOD)
STA 285+62.19 ~ 28.00' RT. BL07
TOP OF RIM = 871.83
12X4 BOX FL = 840.99

MH-4-J29 (TY M) (MOD)
STA 290+00.00 ~ 28.00' RT. BL07
TOP OF RIM = 863.34
12X4 BOX FL = 838.37
30" FL = 850.33

MH 4-A2 (TY M) (MOD)
STA 293+62.19 ~ 28.00' RT. BL07
TOP OF RIM = 856.04
12X4 BOX FL = 836.19

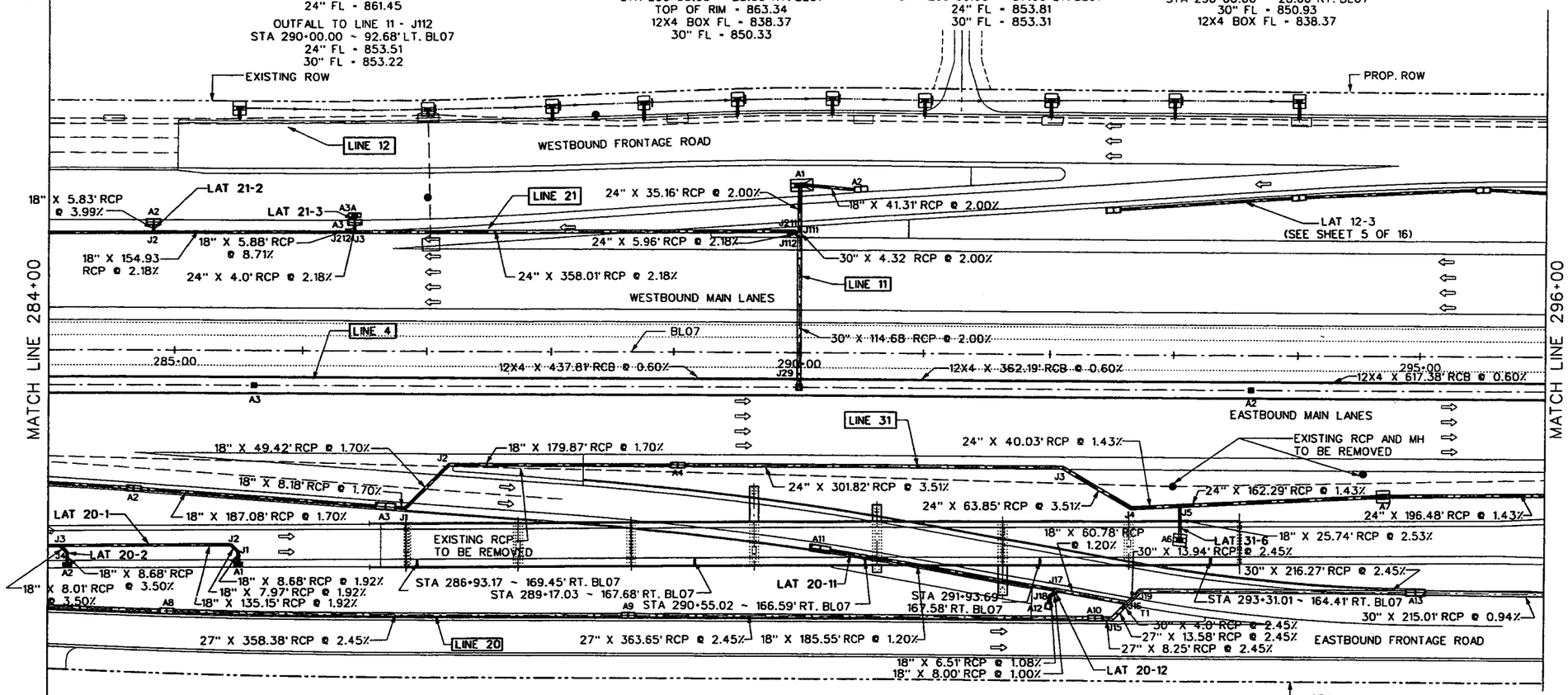
D.I. 11-A1 (2 GRATE) (TY I)
STA 290+00.59~ 133.74' LT. BL07
TOP OF GRATE = 861.39
18" FL = 855.01
24" FL = 854.51

JUNCT 11-J111
STA 290+00.00 ~ 97.00' LT. BL07
24" FL = 853.81
30" FL = 853.31

JUNCT 11-J112
STA 290+00.00 ~ 92.68' LT. BL07
24" FL = 853.51
30" FL = 853.22

C.I. 11-A2 (10 FT.) (TY I)
STA 290+49.96 ~ 128.90' LT. BL07
LIP OF GUTTER = 861.23
18" FL = 855.84

11-OUTFALL
STA 290+00.00 ~ 28.00' RT. BL07
30" FL = 850.93
12X4 BOX FL = 838.37



JUNCT 20-J3
STA 284+09.61 ~ 156.35' RT. BL07
18" FL = 878.33

JUNCT 20-J4
STA 284+15.33 ~ 161.97' RT. BL07
18" FL = 878.61

AAD (MOD) 20-A2
STA 284+15.42 ~ 170.64' RT. BL07
TOP OF GRATE = 884.24
18" FL = 878.92

C.I. 20-A8 (10 FT.) (TY II)
STA 284+94.72 ~ 210.77' RT. BL07
LIP OF GUTTER = 871.34
27" FL = 863.66

JUNCT 20-J2
STA 285+44.76 ~ 155.28' RT. BL07
18" FL = 880.93

JUNCT 20-J1
STA 285+50.42 ~ 160.90' RT. BL07
18" FL = 881.08

AAD (MOD) 20-A1
STA 285+50.42 ~ 169.58' RT. BL07
TOP OF GRATE = 888.25
18" FL = 881.25

C.I. 20-A9 (10 FT.) (TY II)
STA 288+63.53 ~ 212.75' RT. BL07
LIP OF GUTTER = 862.78
27" FL = 854.62

C.I. 20-A11 (10 FT.) (TY E)
STA 290+17.56 ~ 154.34' RT. BL07
LIP OF GUTTER = 859.18
18" FL = 848.36

JUNCT 20-J17
STA 292+07.84 ~ 188.79' RT. BL07
18" FL = 846.13

JUNCT 20-J18
STA 292+01.29 ~ 193.39' RT. BL07
18" FL = 846.21

D.I. 20-A12 (1 GRATE) (TY II)
STA 292+00.18 ~ 199.80' RT. BL07
TOP OF GRATE = 853.90
18" FL = 846.28

C.I. 20-A10 (10 FT.) (TY II)
STA 292+37.68 ~ 212.72' RT. BL07
LIP OF GUTTER = 854.13
27" FL = 845.46
27" FL = 845.42

JUNCT 20-J15
STA 291+51.17 ~ 210.98' RT. BL07
27" FL = 845.08

JUNCT 20-J16
STA 292+63.61 ~ 198.56' RT. BL07
18" FL = 845.40
30" FL = 844.40

JUNCT 20-J19
STA 292+73.47 ~ 188.71' RT. BL07
30" FL = 844.06

C.I. 20-A13 (15 FT.) (TY E)
STA 294+97.52 ~ 186.48' RT. BL07
LIP OF GUTTER = 848.34
30" FL = 838.57

C.I. 31-A2 (10 FT) (TY E)
STA 284+68.08 ~ 108.66' RT. BL07
LIP OF GUTTER = 872.12
18" FL = 864.59

C.I. 31-A3 (15 FT) (TY E)
STA 286+67.74 ~ 121.64' RT. BL07
LIP OF GUTTER = 868.52
18" FL = 861.40

JUNCT 31-J1
STA 286+83.43 ~ 125.53' RT. BL07
18" FL = 861.26

JUNCT 31-J2
STA 287+18.38 ~ 90.59' RT. BL07
18" FL = 860.41

TY E 31-A4 (10 FT)
STA 289+03.50 ~ 88.67' RT. BL07
LIP OF GUTTER = 864.67
18" FL = 857.35
24" FL = 856.85

JUNCT 31-J3
STA 292+10.56 ~ 90.50' RT. BL07
24" FL = 846.26

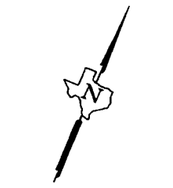
JUNCT 31-J4
STA 292+65.94 ~ 122.47' RT. BL07
24" FL = 844.02

JUNCT 31-J5
STA 293+05.92 ~ 120.45' RT. BL07
18" FL = 843.70
24" FL = 843.45

D.I. 31-A6 (1 GRATE) (TY I)
STA 293+05.92 ~ 147.69' RT. BL07
TOP OF GRATE = 847.35
18" FL = 844.35

D.I. 31-A7 (1 GRATE) (TY I)
STA 294+69.73 ~ 112.19' RT. BL07
TOP OF GRATE = 849.82
24" FL = 841.16

JCT 20 - T1
STA 292+46.92 ~ 215.23' RT. BL07
27" FL = 844.75
30" FL = 844.40



LEGEND

	FLOW LINE OF DITCH
	LOCATION OF GRASSY SWALE
	RIPRAP

GENERAL NOTES

1. THE STATION AND OFFSET FOR ALL TY I, TY II, IR, IIR, IIG, IIG(MOD), AAD, AAD (MOD) AND TY E CURB INLETS ARE MEASURED TO THE INSIDE FACE, OF THE INLET, NEXT TO THE TRAVEL WAY.
2. THE STATION AND OFFSET FOR ALL DROP INLETS, MANHOLES AND JUNCTIONS STRUCTURES ARE MEASURED TO THE CENTER OF THE STRUCTURE.

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.

STATE OF TEXAS · DAVID M. HOSSEINY · 65012 · REGISTERED PROFESSIONAL ENGINEER

4/24/03

The seal appearing on this document was authorized by DAVID M. HOSSEINY, P.E. 65012, on April 24, 2003

Texas Department of Transportation
2003 by TxDOT — TEXAS TURNPIKE AUTHORITY DIVISION

LOPEZGARCIA GROUP
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STORM DRAIN LAYOUT
STA 284+00 TO STA 296+00

SHEET 4 OF 16 SCALE: 1"= 100

DESIGNED: OJ	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.
CHECKED: DMH	6	TEXAS	MG 2002(245)		SH-45
DRAWN: WL	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: DMH	AUSTIN	WILLIAMSON	0683	01	070	

p:\dn\2000945d01da\dgn\plans\drainage\45dp0703.dgn

D.I. FM1 (TY II) W/ DB
STA 285+50.00 ~ 193.50' LT. BL07
TOP OF GRATE = 874.94
TOP OF RISER = 874.19
FL 18" = 863.44

D.I. FM2 (TY II) W/ DB
STA 287+00.00 ~ 193.25' LT. BL07
TOP OF GRATE = 869.65
TOP OF RISER = 868.90
FL 18" = 861.15

D.I. FM3 (TY II) W/ DB
STA 288+00.00 ~ 196.05' LT. BL07
TOP OF GRATE = 867.53
TOP OF RISER = 866.78
FL 18" = 859.53

D.I. FM4 (TY II) W/ DB
STA 288+75.00 ~ 198.89' LT. BL07
TOP OF GRATE = 866.34
TOP OF RISER = 865.59
FL 18" = 858.34

D.I. FM5 (TY II) W/ DB
STA 289+50.00 ~ 201.93' LT. BL07
TOP OF GRATE = 865.18
TOP OF RISER = 864.43
FL 18" = 856.68

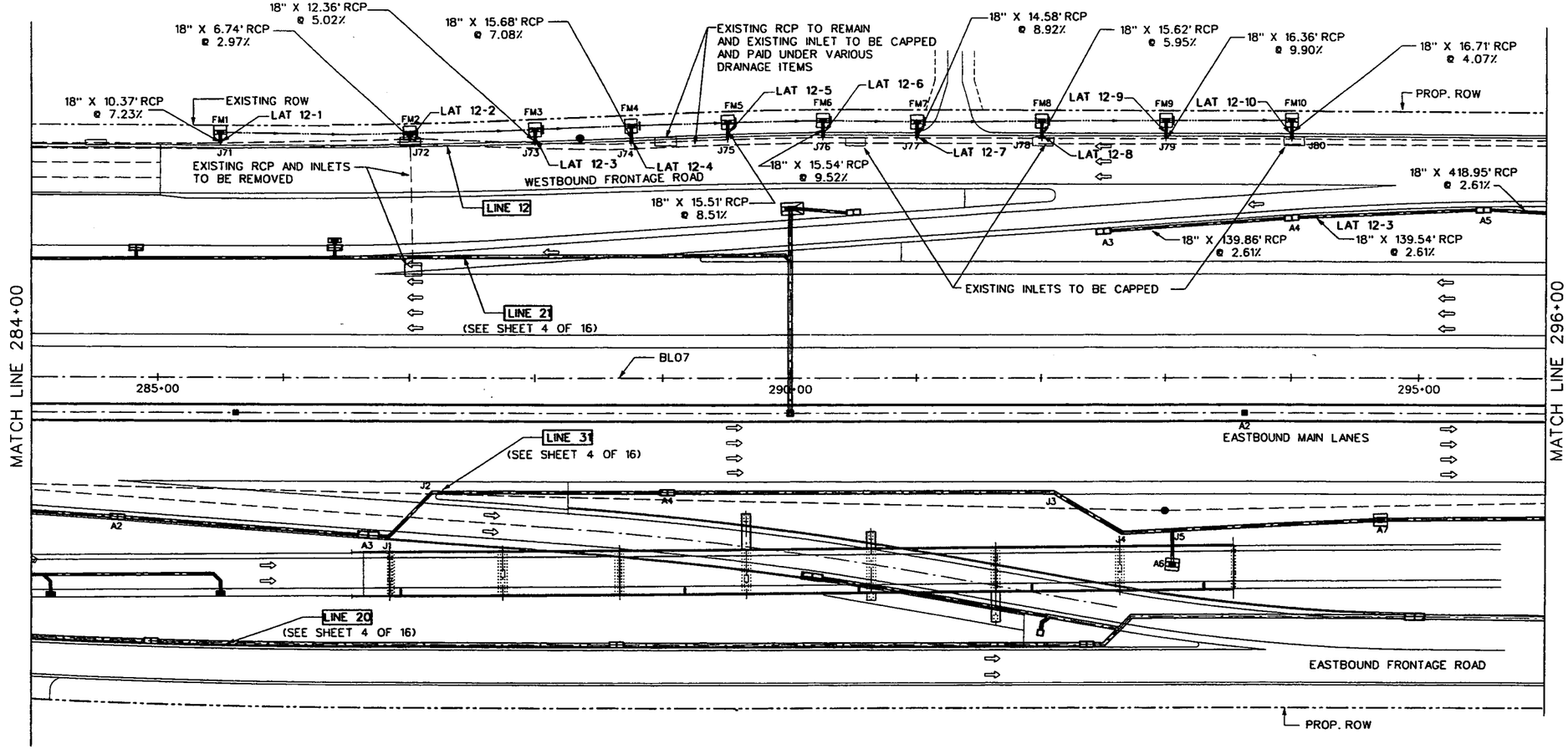
D.I. FM6 (TY II) W/ DB
STA 290+25.00 ~ 203.15' LT. BL07
TOP OF GRATE = 864.00
TOP OF RISER = 863.25
FL 18" = 857.00

D.I. FM7 (TY II) W/ DB
STA 291+00.00 ~ 202.09' LT. BL07
TOP OF GRATE = 863.01
TOP OF RISER = 862.26
FL 18" = 856.01

D.I. FM8 (TY II) W/ DB
STA 292+00.00 ~ 202.83' LT. BL07
TOP OF GRATE = 861.27
TOP OF RISER = 860.52
FL 18" = 854.27

D.I. FM9 (TY II) W/ DB
STA 293+00.00 ~ 203.28' LT. BL07
TOP OF GRATE = 859.49
TOP OF RISER = 858.74
FL 18" = 853.49

D.I. FM10 (TY II) W/ DB
STA 294+00.00 ~ 203.34' LT. BL07
TOP OF GRATE = 858.02
TOP OF RISER = 857.27
FL 18" = 851.02



JCT 12-J71
STA 285+50.00 ~ 183.23' LT. BL07
FL EX. 48" = 861.441
FL 18" = 862.69

JCT 12-J72
STA 287+00.00 ~ 186.51' LT. BL07
FL EX. 48" = 859.70
FL 18" = 860.95

JCT 12-J73
STA 288+00.00 ~ 183.69' LT. BL07
FL EX. 48" = 857.66
FL 18" = 858.91

JCT 12-J74
STA 288+75.00 ~ 183.20' LT. BL07
FL EX. 48" = 855.98
FL 18" = 857.23

JCT 12-J75
STA 289+50.00 ~ 186.20' LT. BL07
FL EX. 48" = 855.11
FL 18" = 856.36

JCT 12-J76
STA 290+25.00 ~ 188.74' LT. BL07
FL EX. 48" = 854.27
FL 18" = 855.52

JCT 12-J77
STA 291+00.00 ~ 187.50' LT. BL07
FL EX. 48" = 853.46
FL 18" = 854.71

JCT 12-J78
STA 292+00.00 ~ 187.21' LT. BL07
FL EX. 48" = 852.09
FL 18" = 853.34

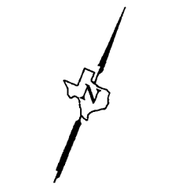
JCT 12-J79
STA 293+00.00 ~ 186.92' LT. BL07
FL EX. 48" = 850.62
FL 18" = 851.87

JCT 12-J80
STA 294+00.00 ~ 186.63 LT. BL07
FL EX. 48" = 849.09
FL 18" = 850.34

CI- 12-A3 (10 FT) (TY I)
STA 292+50.03 ~ 117.83 LT. BL07
LIP OF GUTTER = 858.92
FL 18" = 854.90

CI- 12-A4 (10 FT) (TY I)
STA 294+00.02 ~ 128.32 LT. BL07
LIP OF GUTTER = 856.71
FL 18" = 851.11

CI- 12-A5 (10 FT) (TY I)
STA 295+50.00 ~ 135.14 LT. BL07
LIP OF GUTTER = 854.51
FL 18" = 847.19



LEGEND

←··	FLOW LINE OF DITCH
	LOCATION OF GRASSY SWALE
	RIPRAP

GENERAL NOTES

1. THE STATION AND OFFSET FOR ALL TY I, TY II, IR, IIR, IIG, IIG(MOD), AAD, AAD (MOD) AND TY E CURB INLETS ARE MEASURED TO THE INSIDE FACE, OF THE INLET, NEXT TO THE TRAVEL WAY.
2. THE STATION AND OFFSET FOR ALL DROP INLETS, MANHOLES AND JUNCTIONS STRUCTURES ARE MEASURED TO THE CENTER OF THE STRUCTURE.

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.

STATE OF TEXAS
DAVID M. HOSSEINY
65012
REGISTERED
PROFESSIONAL ENGINEER
4/24/03

The seal appearing on this document was authorized by DAVID M. HOSSEINY, P.E. 65012, on April 24, 2003

Texas Department of Transportation
2003 by TxDOT
TEXAS TURNPIKE AUTHORITY DIVISION

LOPEZGARCIA GROUP
1825 Market Center Blvd., Suite 500 Dallas, Texas 75207
(214) 741-7777 (214) 741-9413 Fax
lopezgarciagroup.com

STORM DRAIN LAYOUT
STA 284+00 TO STA 296+00

SHEET 5 OF 16 SCALE: 1"= 100

DESIGNED: OJ	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.			HIGHWAY No.
CHECKED: DMH	6	TEXAS	MG 2002(245)			SH-45
DRAWN: WL	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: DMH	AUSTIN	WILLIAMSON	0683	01	070	

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30-OUTFALL
STA 301+47.14 ~ 146.57' RT. BL07
FL 18" = 832.55
12X4 BOX FL = 831.19

JUNCT 30-J3
STA 301+74.88 ~ 143.73' RT. BL07
FL 18" = 833.21

JUNCT 30-J4
STA 301+83.69 ~ 152.73' RT. BL07
FL 18" = 833.46

JUNCT 30-J5
STA 301+49.98 ~ 143.74' RT. BL07
FL 18" = 832.64

AAD (MOD) 30-A3
STA 301+83.53 ~ 163.15' RT. BL07
TOP OF GRATE = 852.49
FL 18" = 833.69

JUNCT 30-J2
STA 306+02.63 ~ 131.90' RT. BL07
FL 18" = 842.26

JUNCT 30-J1
STA 306+14.22 ~ 142.10' RT. BL07
FL 18" = 842.59

AAD (MOD) 30-A1
STA 306+14.57 ~ 150.79' RT. BL07
TOP OF GRATE = 849.59
FL 18" = 842.78

C.I. 1-A3 (10 FT)(TY I)
STA 304+99.99 ~ 133.30' LT BL07
LIP OF GUTTER = 835.94
FL 18" = 831.94

JUNCT 1-J31
STA 305+10.16 ~ 115.09' LT BL07
FL 18" = 830.88
FL 6X2 BOX = 830.38

JUNCT 1-J32
STA 304+99.87 ~ 126.30' LT BL07
FL 18" = 831.71

D.I. 1-A5 (2 GRATE) (TY I)
STA 303+58.80 ~ 122.36 LT. BL07
TOP OF GRATE = 836.40
6X2 BOX FL = 831.14

C.I. 1-A1 (10 FT.) (TY I)
STA 306+72.89 ~ 129.52' LT. BL07
LIP OF GUTTER = 834.87
FL 18" = 830.87

JUNCT 1-J3
STA 306+72.99 ~ 126.36' LT. BL07
FL 18" = 830.68

JUNCT 1-J2
STA 306+83.85 ~ 115.71' LT. BL07
FL 18" = 830.02
6X2 BOX FL = 829.52

C.I. 1-A4 (10 FT.) (TY IIG) (MOD)
STA 307+21.95 ~ 129.88' LT. BL07
LIP OF GUTTER = 834.07
FL 18" = 830.07

JUNCT 1-J5
STA 307+22.11 ~ 126.38' LT. BL07
FL 18" = 830.01

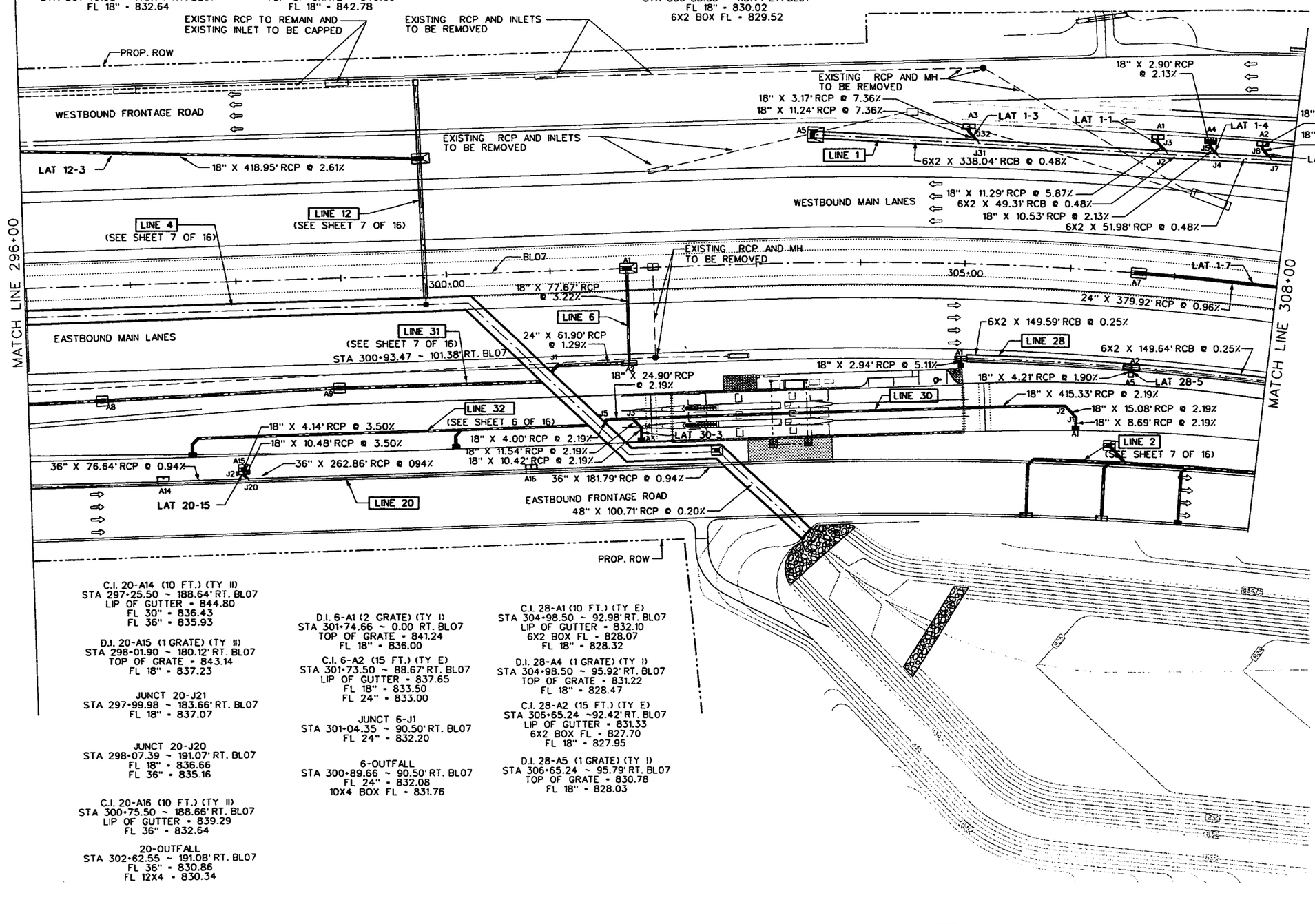
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STA 307+31.43 ~ 117.51' LT. BL07
FL 18" = 829.78
6X2 BOX FL = 829.28

C.I. 1-A2 (10 FT.) (TY I)
STA 307+70.88 ~ 133.01' LT. BL07
LIP OF GUTTER = 834.27
FL 18" = 830.27

JUNCT 1-J8
STA 307+71.01 ~ 130.11' LT. BL07
FL 18" = 830.06

JUNCT 1-J7
STA 307+81.52 ~ 120.21' LT. BL07
FL 18" = 829.53
6X2 BOX FL = 829.03

D.I. 1-A7 (2 GRATE) (TY I)
STA 306+65.03 ~ 0.01' LT. BL07
TOP OF GRATE = 834.12
FL 24" = 831.12



C.I. 20-A14 (10 FT.) (TY II)
STA 297+25.50 ~ 188.64' RT. BL07
LIP OF GUTTER = 844.80
FL 30" = 836.43
FL 36" = 835.93

D.I. 20-A15 (1 GRATE) (TY II)
STA 298+01.90 ~ 180.12' RT. BL07
TOP OF GRATE = 843.14
FL 18" = 837.23

JUNCT 20-J21
STA 297+99.98 ~ 183.66' RT. BL07
FL 18" = 837.07

JUNCT 20-J20
STA 298+07.39 ~ 191.07' RT. BL07
FL 18" = 836.66
FL 36" = 835.16

C.I. 20-A16 (10 FT.) (TY II)
STA 300+75.50 ~ 188.66' RT. BL07
LIP OF GUTTER = 839.29
FL 36" = 832.64

20-OUTFALL
STA 302+62.55 ~ 191.08' RT. BL07
FL 36" = 830.86
FL 12X4 = 830.34

D.I. 6-A1 (2 GRATE) (TY I)
STA 301+74.66 ~ 0.00 RT. BL07
TOP OF GRATE = 841.24
FL 18" = 836.00

C.I. 6-A2 (15 FT.) (TY E)
STA 301+73.50 ~ 88.67' RT. BL07
LIP OF GUTTER = 837.65
FL 18" = 833.50
FL 24" = 833.00

JUNCT 6-J1
STA 301+04.35 ~ 90.50' RT. BL07
FL 24" = 832.20

6-OUTFALL
STA 300+89.66 ~ 90.50' RT. BL07
FL 24" = 832.08
10X4 BOX FL = 831.76

C.I. 28-A1 (10 FT.) (TY E)
STA 304+98.50 ~ 92.98' RT. BL07
LIP OF GUTTER = 832.10
6X2 BOX FL = 828.07
FL 18" = 828.32

D.I. 28-A4 (1 GRATE) (TY I)
STA 304+98.50 ~ 95.92' RT. BL07
TOP OF GRATE = 831.22
FL 18" = 828.47

C.I. 28-A2 (15 FT.) (TY E)
STA 306+65.24 ~92.42' RT. BL07
LIP OF GUTTER = 831.33
6X2 BOX FL = 827.70
FL 18" = 827.95

D.I. 28-A5 (1 GRATE) (TY I)
STA 306+65.24 ~ 95.79' RT. BL07
TOP OF GRATE = 830.78
FL 18" = 828.03

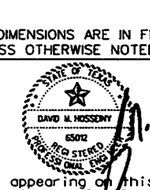
LEGEND

	FLOW LINE OF DITCH
	LOCATION OF GRASSY SWALE
	RIPRAP

GENERAL NOTES

1. THE STATION AND OFFSET FOR ALL TY I, TY II, IR, IIR, IIG, IIG(MOD), AAD, AAD (MOD) AND TY E CURB INLETS ARE MEASURED TO THE INSIDE FACE, OF THE INLET, NEXT TO THE TRAVEL WAY.
2. THE STATION AND OFFSET FOR ALL DROP INLETS, MANHOLES AND JUNCTIONS STRUCTURES ARE MEASURED TO THE CENTER OF THE STRUCTURE.
3. REFER TO SHEET MH-(MOD) FOR INLET TIE-IN DETAIL

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED



The seal appearing on this document was authorized by DAVID M. HOSSEINY, P.E. 65012, on April 24, 2003

Texas Department of Transportation
2003 by TxDOT — TEXAS TURNPIKE AUTHORITY DIVISION

LOPEZGARCIA GROUP
1825 Market Center Blvd., Suite 500 Dallas, Texas 75207
(214) 741-7777 (214) 741-9413 Fax
lopezgarciagroup.com

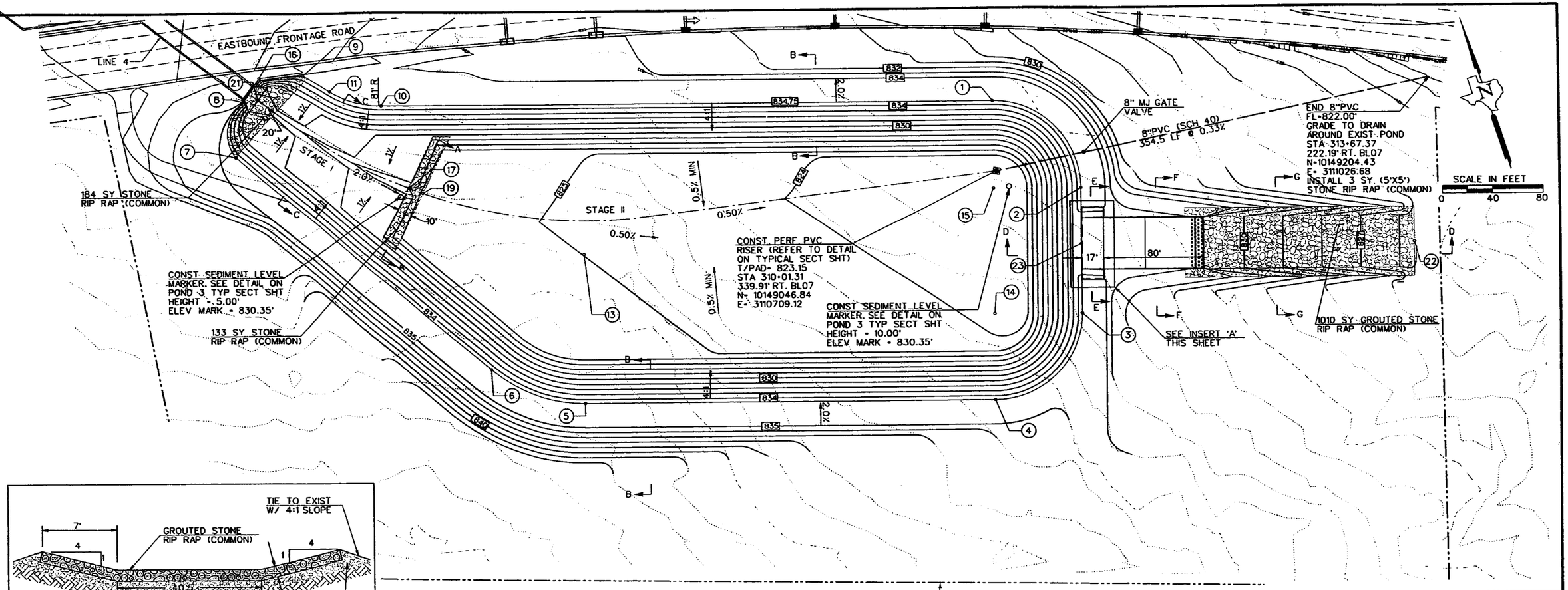
STORM DRAIN LAYOUT
STA 296+00 TO STA 308+00

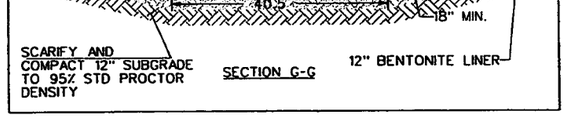
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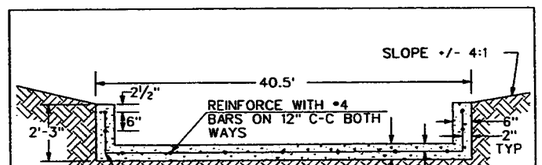
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CHECKED: DMH	6	TEXAS	MG 2002(245)		SH-45	
DRAWN: WL	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: DMH	AUSTIN	WILLIAMSON	0683	01	070	

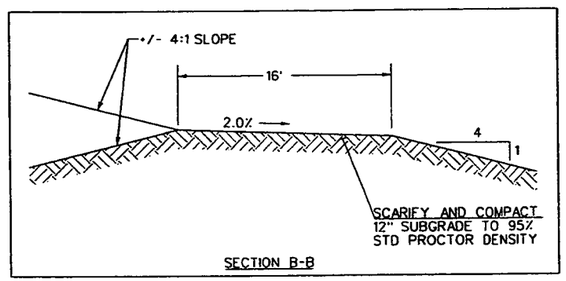
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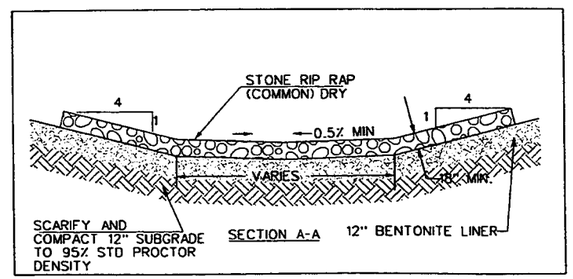
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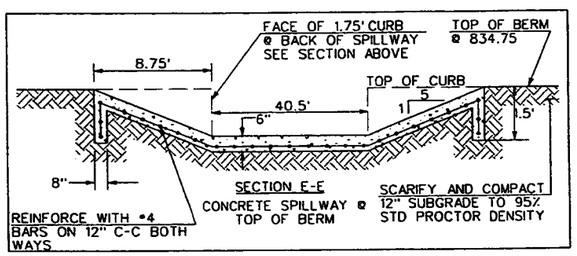


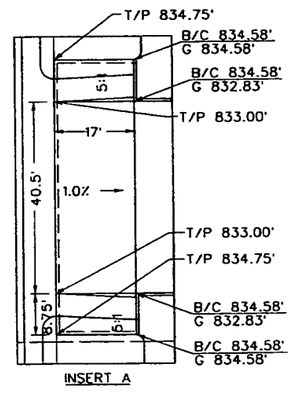












⊙	STATION AND OFFSET	ELEV
1	STA 309+94.08. 284.89' RT. BL07	PC 834.75
2	STA 310+76.91. 347.52' RT. BL07	PT 834.75
3	STA 310+88.61. 446.99' RT. BL07	PC 834.75
4	STA 310+15.55. 522.14' RT. BL07	PT 834.75
5	STA 306+22.19. 529.54' RT. BL07	PC 834.75
6	STA 305+33.27. 497.82' RT. BL07	PT 834.75
7	STA 303+24.08. 309.17' RT. BL07	PC 834.75
8	STA 303+38.54. 267.08' RT. BL07	PT 835.00
9	STA 303+90.33. 251.25' RT. BL07	PI 835.00
10	STA 304+56.00. 281.79' RT. BL07	PT 834.75
11	STA 304+11.69. 266.18' RT. BL07	PC 834.75
13	STA 306+27.31. 410.62' RT. BL07	RP 825.45
14	STA 310+08.95. 453.37' RT. BL07	RP 824.00
15	STA 309+99.95. 353.68' RT. BL07	RP 824.00
16	STA 303+53.87. 249.59' RT. BL07	PI 835.00
17	STA 304+72.52. 348.54' RT. BL07	TP 829.95
19	STA 304+84.82. 353.60' RT. BL07	TP 829.30
20	STA 305+72.94. 388.57' RT. BL07	PT 828.76
21	STA 303+50.51. 266.37' RT. BL07	TP 829.96
22	STA 313+80.07. 352.39' RT. BL07	TP 825.50
23	STA 310+82.03. 391.87' RT. BL07	TP 833.00

SHEET TOTALS

EST.	FINAL	UNIT	DESCRIPTION
48800		CY	EXCAVATION
2750		CY	EMBANKMENT (CLASS 1)
91		CY	CLASS 'A' CONCRETE (SPLWAY,DISPTRS,ETC)
135		CY	18" STONE RIPRAP (COMMON) (DRY)
505		CY	18" STONE RIPRAP (COMMON) (GROUTED)
355		LF	8" SCH 40 PVC PIPE
6		LF	8" SCH 80 PVC RISER
1		EA	8" GATE VALVE & BOX ASSEMBLY
1		EA	8" MJ ELBOW
1		EA	SEDIMENT LEVEL MARKER

STATE OF TEXAS · DAVID M. HOSSEINY · 65012 · REGISTERED PROFESSIONAL ENGINEER
4/24/03

The seal appearing on this document was authorized by DAVID M. HOSSEINY. P.E. 65012, on April 24, 2003

Texas Department of Transportation
2003 by TxDOT — TEXAS TURNPIKE AUTHORITY DIVISION

LOPEZGARCIA GROUP
1825 Market Center Blvd., Suite 500 Dallas, Texas 75207
(214) 741-7777 (214) 741-9413 Fax
lopezgarciagroup.com

TWO STAGE EXTENDED DETENTION BASIN

WATER QUALITY POND 4

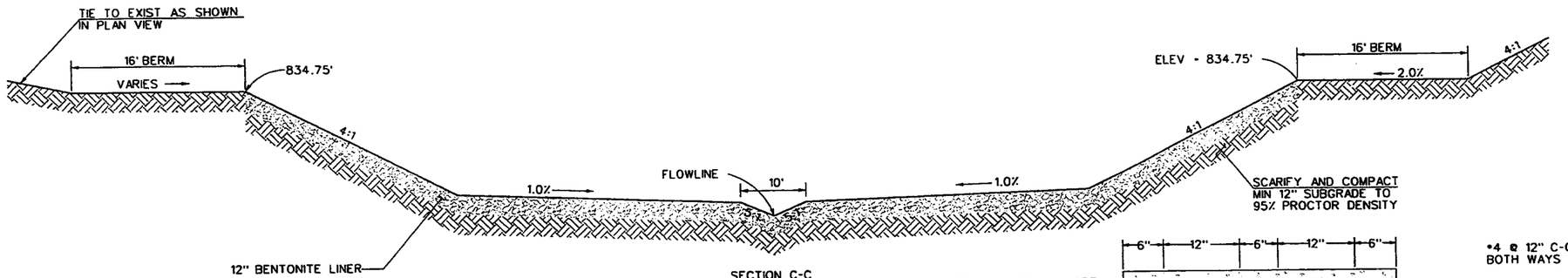
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DESIGNED: CEG SMD	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.	HIGHWAY No.
CHECKED: SMD	6	TEXAS	MG 2002(245)	SH-45
DRAWN: CEG/JM	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: SMD	AUSTIN	WILLIAMSON	0683	01	070	

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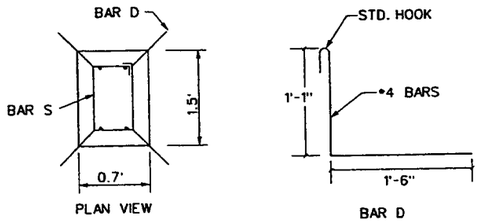
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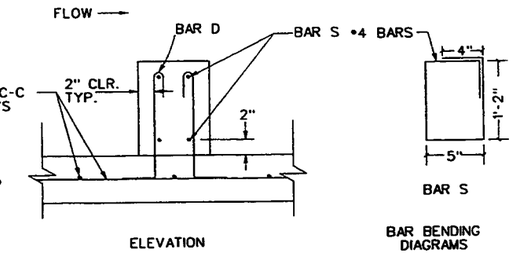
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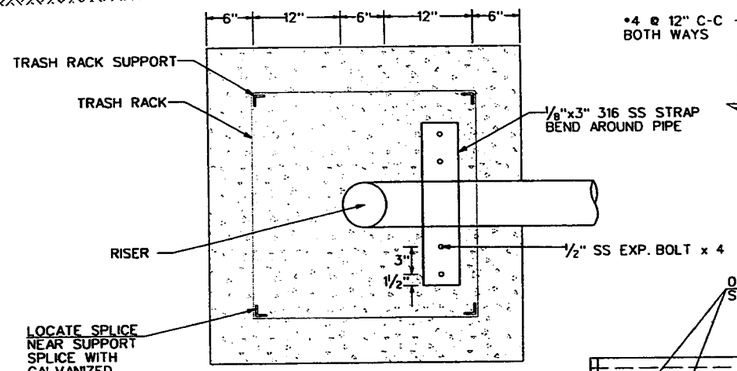
SECTION C-C
TYPICAL SECTION OF STAGE I

NTS



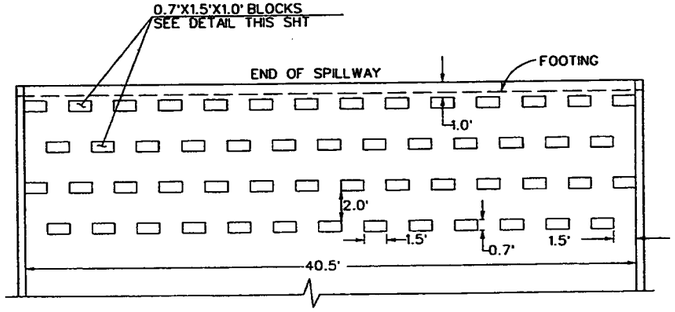


0.7'X1.5'X1.0' ENERGY DISSIPATER



TOP VIEW OF RISER (SQUARE DESIGN)

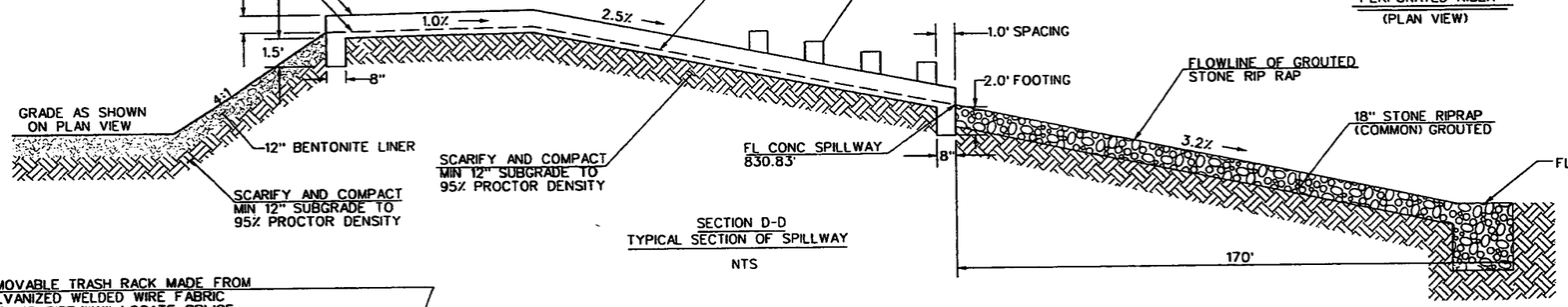
PERFORATED RISER
(PLAN VIEW)



USE 4 TOTAL ROWS OF BLOCKS AS SHOWN

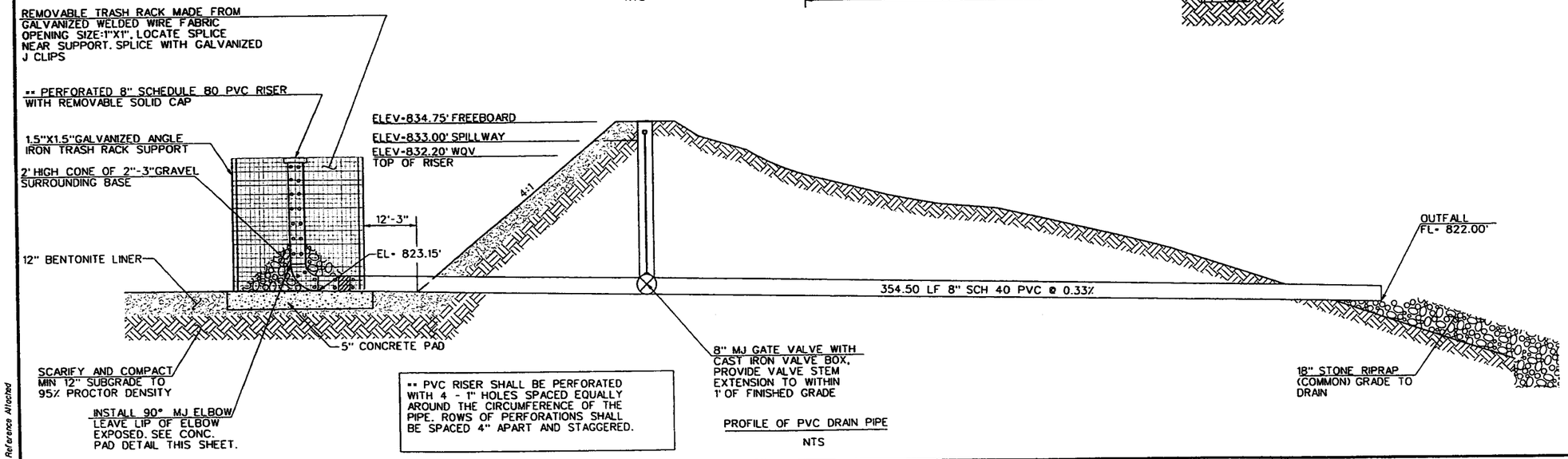
PLAN VIEW OF ENERGY DISSIPATOR
LAYOUT @ END OF SPILLWAY

NTS



SECTION D-D
TYPICAL SECTION OF SPILLWAY

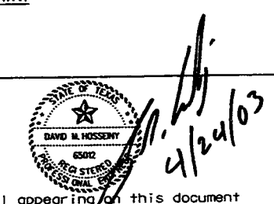
NTS



** PVC RISER SHALL BE PERFORATED WITH 4 - 1" HOLES SPACED EQUALLY AROUND THE CIRCUMFERENCE OF THE PIPE. ROWS OF PERFORATIONS SHALL BE SPACED 4" APART AND STAGGERED.

PROFILE OF PVC DRAIN PIPE

NTS



The seal appearing on this document was authorized by DAVID M. HOSSEINY, P.E. 65012, on April 24, 2003

2003 by TxDOT

Texas Department of Transportation
TEXAS TURNPIKE AUTHORITY DIVISION

LOPEZGARCIA GROUP
1825 Market Center Blvd., Suite 500 Dallas, Texas 75207
(214) 741-7777 (214) 741-9413 Fax
lopezgarciagroup.com

TYPICAL SECTIONS & DETAILS
WATER QUALITY POND 4

NTS

DESIGNED: CEG SMD	FED. RD DIV. No.	STATE	FEDERAL AID PROJECT No.			HIGHWAY No.
CHECKED: SMD	6	TEXAS	MG 2002(245)			SH-45
DRAWN: CEG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: SMD	AUSTIN	WILLIAMSON	0683	01	070	

p:\dh\200094sd01da\dgn\plans\drainage\45pond_4_ts.dgn

BORDER.p:\dh\200094sd01da\dgn\plans\WCE-REF\NCEBORDGN 13:7:19:24:40:50
No Reference Attached
No Reference Attached
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No Reference Attached
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No Reference Attached
No Reference Attached

EDWARDS AQUIFER
PROTECTION PROGRAM
ROADWAY APPLICATION

Edwards Aquifer Protection Program Roadway Application

Texas Commission on Environmental Quality

This application is intended only for projects which a major roadway is designed for construction, such as State highways, County roads, and City thoroughfares.

Designed for Regulated Activities on the Contributing Zone to the Edwards Aquifer in relation to 30 TAC §213.24, Regulated Activities on the Edwards Aquifer Recharge Zone, in relation to 30 TAC §213.5(b), Effective June 1, 1999.

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer.

The application was prepared by:

Print Name of Customer/Agent: Travis J. Kaatz, P.E.

Date: 02/06/2025

Signature of Customer/Agent:



Project Information

1. Regulated Entity (Project) Name: Parmer Lane at SH 45
2. County: Williamson
3. Stream Basin(s): Lake Creek
4. Groundwater Conservation District (if applicable): N/A
5. Customer (Applicant):

   Contact Person: Christen Eschberger
   Entity: HNTB
   Mailing Address: 101 East Old Settlers Boulevard, Suite 225
   City, State: Round Rock, TX Zip: 78664
   Telephone: (512)563-1768
   Email Address: ceschberger@hntb.com

6. Agent (Representative):

   Contact Person: Travis J Kaatz, P.E.
   Entity: EDGE Engineering, PLLC
   Mailing Address: 7000 N Mopac Expy Suite 325
   City, State: Austin, TX Zip: 78744
   Telephone: 512-766-0466
   Email Address: tkaatz@civil-edge.com

7. Landowner of R.O.W. (Right of Way)
   Person or entity responsible for maintenance of water quality Best Management Practices (BMPs), if not applicant.

   Contact Person: Omar De Leon
   Entity: TXDOT
   Mailing Address: 7901 N. I-35
   City, State: Austin, TX Zip: 78753
   Telephone: 512-832-7030
   Email Address: Omar.X.DeLeon@txdot.gov

8. ☒ **The TCEQ must be able to inspect the project site or the application will be returned**. Sufficient survey marking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of any regulated activities and the geologic or manmade features noted in the Geologic Assessment.

   ☒ Survey marking will be completed by this date: TBD

9. ☒ **Attachment A - Road Map**. A road map showing directions to and the location of the project site is attached. The map clearly shows the boundary of the project site.

10. ☒ **Attachment B - USGS Quadrangle**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') is attached. The map(s) clearly show:

    ☒ Project site boundaries
    ☒ USGS Quadrangle Name(s)
    ☒ All drainage paths from site to surface waters

11. ☒ **This project extends into (Check all that apply):**

    ☒ Recharge Zone (RZ)
    ☐ Contributing Zone (CZ)
    ☐ Transition Zone (TZ)
    ☐ Contributing Zone within Transition Zone (CZ/TZ)
    ☐ Zone not regulated by EAPP

12. ☒ **Attachment C - Project Description**. A detailed narrative description of the proposed project is attached. The project description is consistent throughout the application and contains, at a minimum, the following details:

    ☒ Complete site area [Acres]
    ☒ Offsite upgradient stormwater areas to be captured
    ☒ Impervious area [Acres]
    ☒ Permanent BMP(s)
    ☒ Proposed site use
    ☒ Existing roadway (paved and/or unpaved)
    ☐ Structures to be demolished [Include demo phase]
    ☐ Major interim phases

13. Existing project site conditions are noted below:

    ☒ Existing paved and/or unpaved roads
    ☐ Undeveloped (Cleared)
    ☐ Undeveloped (Undisturbed/Not cleared)
    ☐ Existing commercial site
    ☐ Existing industrial site
    ☐ Existing residential site
    ☐ Other: _____

14. ☒ **Attachment D - Factors Affecting Surface Water Quality**. A detailed description of all factors that could affect surface water quality is attached.

15. ☒ Only inert materials as defined by 30 TAC §330.3 will be used as fill material.

16. Type of pavement or road surface to be used:

    ☐ Concrete
    ☒ Asphaltic concrete pavement
    ☐ Permeable Friction Course (PFC)
    ☐ Other: _____

17. Right of Way (R.O.W.) and Pavement Area:

    R.O.W. for project: 15.01 (ac.)
    Length: 2,847 ft.
    Width: varies from 136 ft. to 200 ft.
    Impervious cover (IC): 10.86 (ac.)
    Total of Pavement area 10.86 (ac.) ÷ R.O.W. area 15.01 (ac.) x 100 = 72.35% IC.

    ☒ CAD program was used to determine areas.
    ☒ Number of travel lanes: proposed: 3 travel lanes with shoulders and/or curb and gutter and 3 additional left turn lanes, existing: 2-3 travel lanes with shoulders or curb & gutter
    ☒ Typical widths of lanes: 12 (ft.)

☒ Are intersections also being improved? (Y/N) Yes

Site Plan Requirements

Items 18 - 28 must be included on the Site Plan.

18. ☒ The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 100'

19. 100-year floodplain boundaries:

☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled. The 100-year floodplain boundaries are based on the following specific (including date of material) source(s): _____.

☒ No part of the project site is located within the 100-year floodplain.

20. ☒ A layout of the development with existing and finished contours at appropriate, but not greater than ten-foot contour intervals is shown. Sensitive features, lots, wells, buildings, roads, culverts, etc. are shown on the site plan.

21. ☒ A figure (map) indicating all paths of drainage from the site to surface waters.

☐ Name all stream crossings: N/A
☒ Drainage patterns and approximate slopes.
☐ There will be no discharge to surface waters.

22. ☒ Distinguish between areas of soil disturbance and areas which will not be disturbed.

23. ☒ Show locations of major structural and nonstructural controls. These are the temporary and permanent best management practices. Include the following:

☐ Show design and location of any hazardous materials traps.
☐ Show design at outfalls of major control structures and conveyances.
☒ A description of the BMPs and measures that prevent pollutants from entering surface streams.

24. Show locations of staging areas or project specific locations (PSL). Are they:

☐ Onsite, within project R.O.W.
☐ Offsite.
☒ Not yet determined. (Requires future authorization)

25. ☒ Show locations where soil stabilization practices are expected to occur.

26. ☒ Show surface waters (including wetlands).

27. Temporary aboveground storage tank facilities:

☐ Temporary aboveground storage tank facilities will be located on this site. Show on site plan.
☒ Temporary aboveground storage tank facilities will not be located on this site.

28. ☒ Plan(s) also include:

☒ Sidewalks
☒ Related turn lanes
☐ Shared-use paths
☐ Off-site improvements and staging areas

☐ Demolition plans ☐ Utility relocations
☐ Other improved areas: _____

Permanent Best Management Practices (BMPs)

Description of practices and measures that will be used after construction is completed.

29. ☐ Permanent BMPs and measures have been designed, and will be constructed, operated, and maintained to ensure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance accepted by the executive director.

    ☒ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.
    ☐ A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used: _____

30. ☒ **Attachment E - BMPs for Upgradient (Offsite) Stormwater.**

    ☐ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
    ☐ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
    ☒ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.

31. ☒ **Attachment F - BMPs for On-site Stormwater**.

    ☒ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
    ☐ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.

32. ☒ **Attachment G - Construction Plans**. Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. Construction plans for the proposed permanent BMPs and measures are attached and include all proposed structural plans and specifications, and appropriate details.

    ☒ Major bridge cross-sections, and roadway plan and profiles
    ☒ BMP plans and details ☒ Design calculations
    ☒ Erosion control ☒ TCEQ Construction Notes
    ☒ SW3P ☒ EPIC, as necessary

33. ☒ **Attachment H - Inspection, Maintenance, Repair and Retrofit Plan**. A site and BMP specific plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan fulfills all the following:

    ☒ Prepared and certified by the engineer designing the permanent BMPs and measures.
    ☒ Signed by the owner or responsible party.
    ☒ Outlines specific procedures for documenting inspections, maintenance, repairs, and, if necessary, retrofit.
    ☒ Contains a discussion of recordkeeping procedures.

34. ☐ **Attachment I - Pilot-Scale Field Testing Plan.** Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.

    ☒ N/A

35. ☒ **Attachment J - Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows, and in-stream effects caused by the regulated activity which increase erosion or may result in water quality degradation.

    ☒ Include permanent spill measures used to contain hydrocarbons or hazardous substances by way of traps, or response contingencies.

36. The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity.

    If the applicant intends to transfer responsibility, check the box below.

    ☐ Yes

    A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days.

Stormwater to be generated by the Proposed Project

Description of practices and measures that will be used during construction.

37. ☒ The site description, controls, maintenance, and inspection requirements for the Storm Water Pollution Prevention Plan (SWPPP or SW3P) developed under the Texas Pollutant Discharge Elimination System (TPDES) general permits for stormwater discharges have been submitted to fulfill paragraphs 30 TAC §213.24(1-5) & §213.5(b) of the technical report.

    ☒ The Temporary Stormwater Section (TCEQ-0602) is included with the application.
    ☐ The SWPPP (SW3P) will serve as the Temporary Stormwater Section (TCEQ-0602).

38. ☒ **Attachment K - Volume and Character of Stormwater**. A detailed description of the volume (quantity) and character (quality) of the stormwater runoff expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on area and type of impervious cover.

    ☒ Include the pre-construction runoff coefficient.
    ☒ Include the post-construction runoff coefficient.

Administrative Information

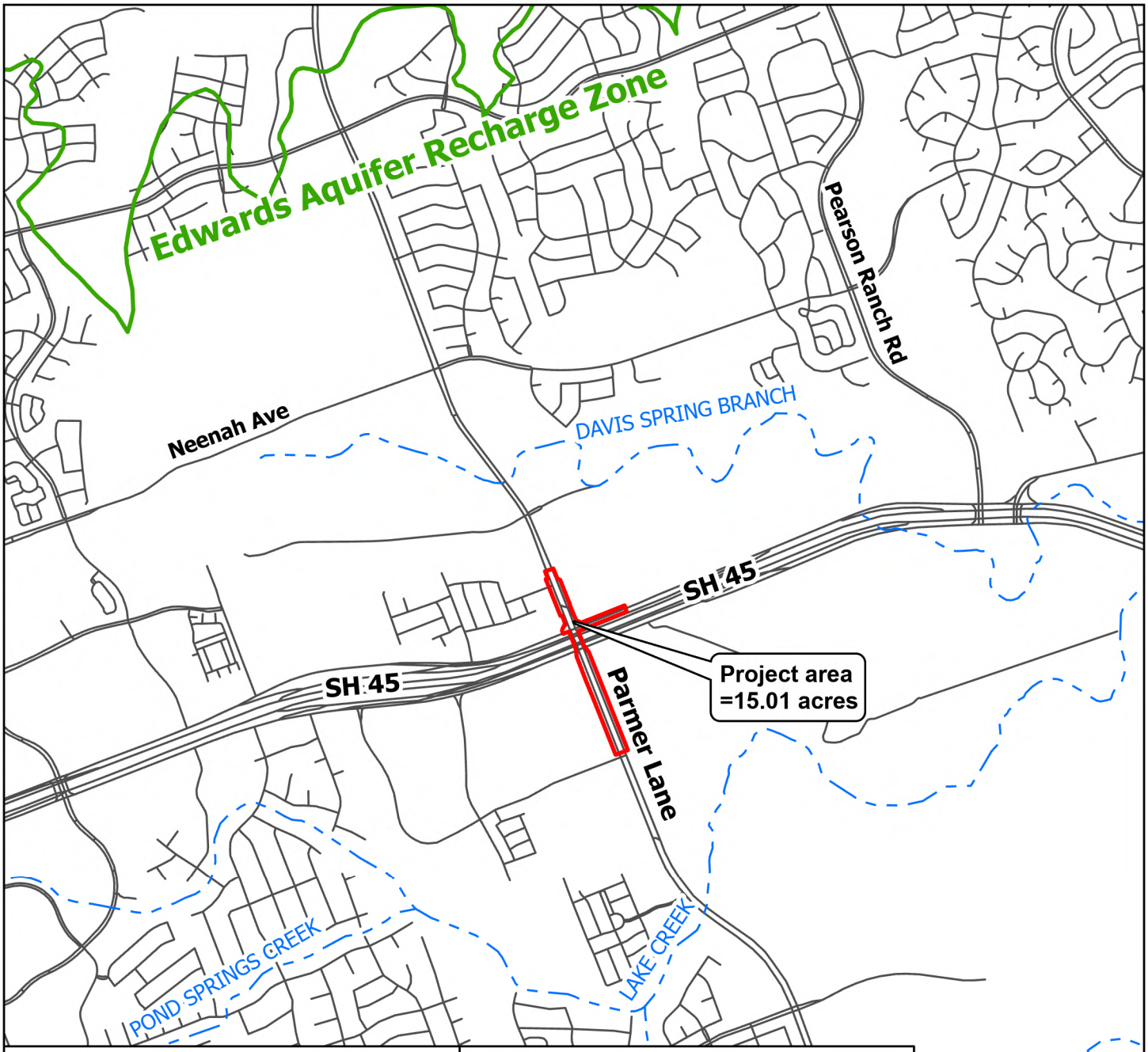
39. ☒ Submit one (1) original and one (1) copy of the application, plus one electronic copy as needed, for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ is required to distribute the additional copies to these jurisdictions.

40. The fee for the plan(s) is based on:

    ☒ The total R.O.W. (as in Item 17).

    ☐ TxDOT roadway project.

ATTACHMENT A
ROAD MAP



USGS QUADS:

Jollyville & Pflugerville West

Legend

- Total Project Limits
- Stream Centerline
- Roadway Centerline
- County Boundary

0 0.23 0.45 0.9 Miles

PARMER LANE AT SH 45

ROADWAY APPLICATION
(TCEQ-20872)

ATTACHMENT A
ROAD MAP

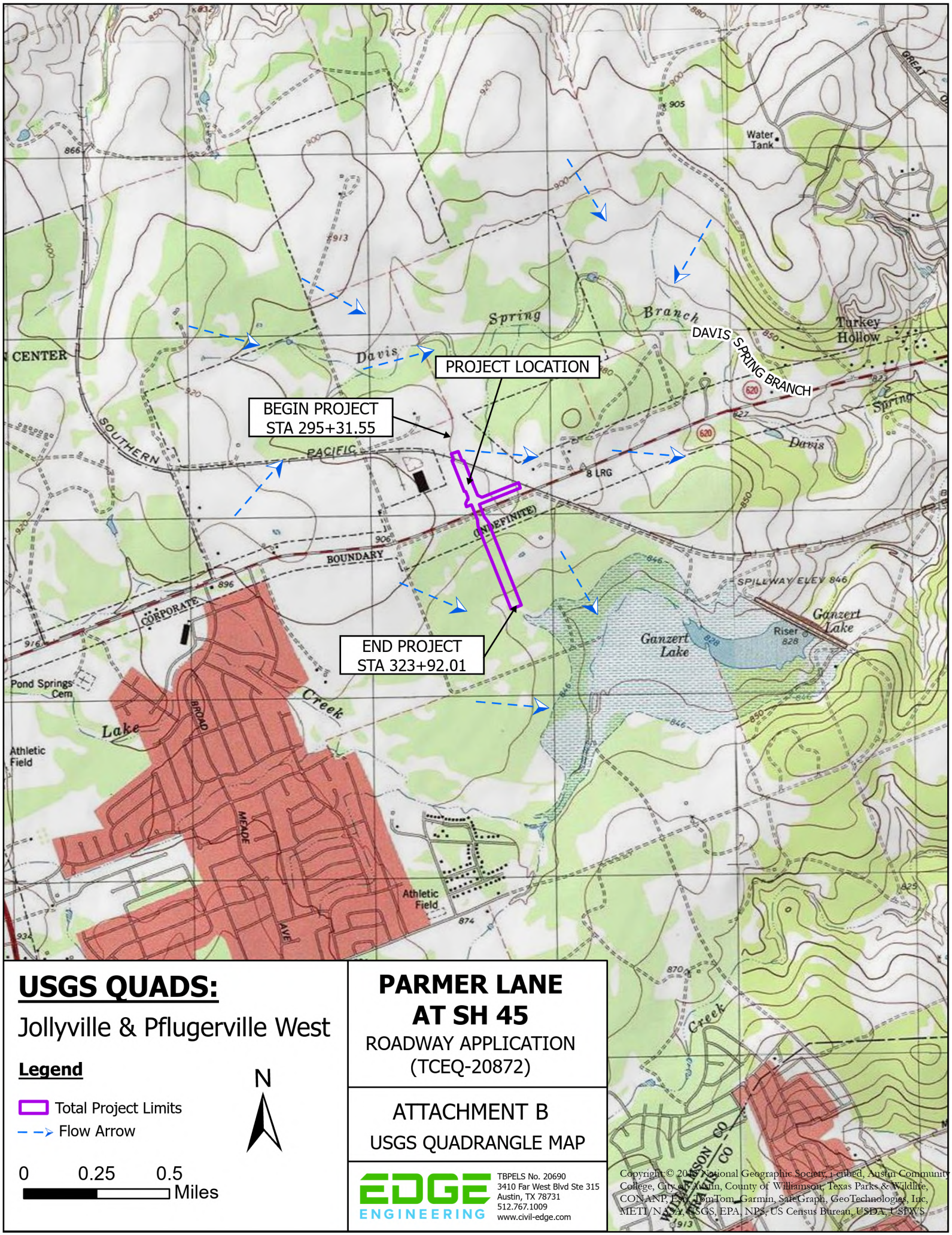
N

Williamson County

Travis County

EDGE ENGINEERING
TBPELS No. 20690
3410 Far West Blvd Ste 315
Austin, TX 78731
512.767.1009
www.civil-edge.com

ATTACHMENT B
USGS QUADRANGLE MAP



USGS QUADS:

Jollyville & Pflugerville West

Legend

- Total Project Limits
- Flow Arrow

0 0.25 0.5 Miles

PARMER LANE AT SH 45

ROADWAY APPLICATION
(TCEQ-20872)

ATTACHMENT B

USGS QUADRANGLE MAP

EDGE ENGINEERING
TBPELS No. 20690
3410 Far West Blvd Ste 315
Austin, TX 78731
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ATTACHMENT C
PROJECT DESCRIPTION

ATTACHMENT C
PROJECT DESCRIPTION

Williamson County proposes to add intersection improvements such as exclusive turn lanes to the intersection of Parmer Lane and SH 45. The existing roadway will be widened and restriped in various locations along Parmer Lane and on the westbound frontage road of SH 45. The project is located within Williamson County and the Edwards Aquifer Recharge Zone, which is regulated by the Texas Commission on Environmental Quality (TCEQ) Edwards Aquifer Protection Program.

The project is located within the Lake Creek Watershed. There are no FEMA crossings within the project limits, and there are also no cross culverts impacted by the project. The total project limits, as shown in the roadway plans, are from Station 295+31.55 to Station 323+92.01 for a total of 0.54 miles. The total area for the project is approximately 15.85 acres and is based on the right-of-way limits of the project. The project improvements will increase impervious cover by 1.36 acres, or 0.8%.

The existing Parmer Lane is a four-lane asphalt arterial roadway which maintains at least two lanes of traffic in either direction. With respect to its intersection with SH 45, Parmer Lane has curb and gutter and storm drain to the north, and roadway shoulder and open roadside ditch to the south. Along the westbound frontage road to SH 45, all onsite flow is captured in curb and gutter and storm drain. This project seeks to construct additional left turn lanes and a right turn lane at the intersection of Parmer Lane and SH 45, as well as an extension of the sidewalk along the west side of Parmer Lane. The project will add additional storm drain along Parmer Lane, connecting to the existing system running along SH 45.

On the north side of Parmer Lane, the onsite runoff is generally conveyed from the north to the east through the storm drain system. From the intersection to the south end of the project, the onsite runoff flows south through roadside ditches. The offsite and onsite flow patterns will be maintained in proposed conditions and will be conveyed by the existing and proposed, respectively, to each outfall. No offsite upgradient stormwater is proposed to be captured and treated.

In order to achieve the 80% TSS removal required by TCEQ, the runoff from the additional impervious cover is conveyed to an existing extended detention pond (WPAP Permit Number 11-03050901) east of the project, south of SH 45. The pond treats runoff from SH 45 and its frontage roads near where Amberglen Blvd intersects the frontage road to the west side of the pond, for a total of 159 acres. This existing pond outfalls to the Davis Spring Branch creek, which eventually joins Lake Creek downstream. This pond has sufficient capacity to accept and treat the additional flow from this Project.

ATTACHMENT D
FACTORS AFFECTING SURFACE WATER QUALITY

The following factors may affect water quality during both the construction and operation phases of the project.

1. The increase in impervious cover could result in an increase in runoff, potentially altering the quality and/or quantity of recharge to the aquifer.

2. Increased sediment loading in runoff due to erosion of sediment and pollutants from exposed soil due to site preparation activities such as grading, excavating, and clearing vegetation result in exposed soil. In addition to this disturbance of native soil, new soil will be brought onto the site for fill in the roadbed and other components of the project.

3. Runoff from construction product staging, storage, and waste.

4. Runoff from hazardous material spills. These may contain metals, nutrients, bacteria, herbicides, hydrocarbons, and other toxic constituents. Pesticides, de-icing salts, paint, and fertilizers introduce pollutants into the runoff. Standard vehicle use may also add pollutants through normal operations including braking and fuel combustion as well as through oil and fuel leaks. Runoff from automotive fluids, lubricants, and fuel leaks from standard vehicle use. Additionally, vehicles can transfer pollutants from source to source across the project site via vehicle tracking.

ATTACHMENT E
BMPS FOR UPGRADIENT STORMWATER

There is no surface water, groundwater, or stormwater that originate upgradient of the site and flows across the site. Parmer Lane north of the intersection with SH 45 has curb & gutter and storm drains which prevent mixing of offsite and untreated onsite runoff. Parmer Lane south of the intersection conveys runoff through roadway ditches that transport flow south, away from the site area. The surrounding topography generally drains west to east. For project drainage patterns see Attachment G – Drainage Area Map included in the Temporary Stormwater Section.

ATTACHMENT F
BMPS FOR ON-SITE STORMWATER

On-site stormwater will be treated as dictated by the TCEQ Complying with the Edwards Aquifer Rules Technical Guidance document on Best Management Practices (RG-348, dated July 2005). Per 30 Texas Administrative Code (TAC) Chapter 213, 80% of the Total Suspended Solids (TSS) generated by the increase in impervious cover due to the project must be removed.

Following the calculation methodology in RG-348, the minimum amount of TSS that must be removed due to the increase in impervious cover is 1,181 lbs of TSS. Existing and proposed impervious cover was delineated within the existing Right-Of-Way (ROW) using aerial imagery, project survey, and the proposed Parmer Lane roadway design. Detailed water quality calculations can be found in Attachment G-II – Water Quality Approach and Calculations.

Permitted Controls:

Two existing Best Management Practices (BMPs) were found to treat runoff from the project area: a Hazardous Material Trap on the east side of Parmer Lane on the north end of the project site, and an extended detention basin on the south side of SH 45 on the east end of the project site. Both are located outside the project extents. Table 1 lists these BMPs and their associated Water Pollution Abatement Plans (WPAPs).

Table 1: Existing BMPs that treat runoff from the project area.

Roadway	BMP Type	WPAP Permit Number
Parmer Lane	Hazardous Material Trap	11-95050402
		11-92022701
SH 45	Extended Detention Basin	11-03050901

There are no proposed changes to the Hazardous Material Trap. There are proposed changes to the drainage area flowing to the existing extended detention basin as part of the proposed water quality design detailed below.

Proposed Water Quality Design:

The TSS removal required for the project due to roadway widening is 1,181 lbs.

The project will utilize the existing extended detention basin to provide the required treatment for the project. To achieve this, an additional trunk line will be built along the north section of Parmer Lane with two proposed inlets to drain runoff from 1.10 acres of Parmer Lane. This trunk line will then be tied into the existing trunkline that discharges the runoff into the existing BMP.

This increase in drainage areas will allow the extended detention pond to remove 1,209 lbs of TSS per year. This removal quantity provides an approximate 2% of buffer of additional removal. Proposed TSS load removal was calculated following Equation 3.7 of TCEQ Technical Guidance RG-348. Detailed water quality calculations can be found in Attachment G-II – Water Quality Approach and Calculations.

PARMER LANE AT SH 45

CSJ: 3417-02-040

TCEQ EDWARDS AQUIFER MODIFICATION ROADWAY APPLICATION

TCEQ-20872 ATTACHMENT G-I – CONSTRUCTION PLANS

PREPARED FOR:
WILLIAMSON COUNTY

AND:
BENESCH

100% SUBMITTAL

WILLIAMSON COUNTY

PARMER LANE AT SH 45 INTERSECTION
PRECINCT NUMBER 1

WILLIAMSON COUNTY PROJECT NO. 25IFB

CSJ 3417-02-040

NET LENGTH OF ROADWAY = 2,647 FEET = 0.501 MILES
NET LENGTH OF BRIDGE = 210.00 FEET = 0.040 MILES
NET LENGTH OF PROJECT = 2,847 FEET = 0.541 MILES

LIMITS: FROM 0.27 MILE NORTH OF SH45 TO 0.29 MILE SOUTH OF SH45

FOR THE CONSTRUCTION OF INTERSECTION IMPROVEMENTS WITH RIGHT AND/OR LEFT TURN LANES

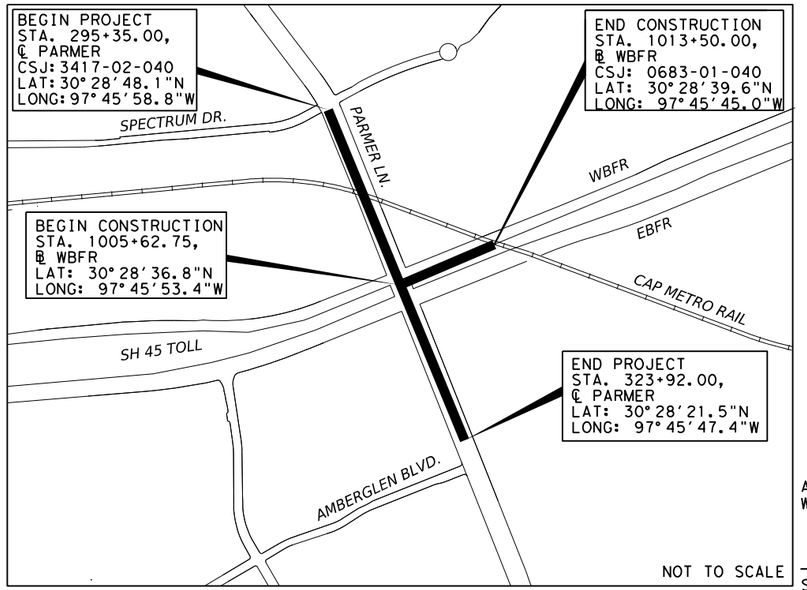
CONSISTING OF: INTERSECTION AND SIDEWALK IMPROVEMENTS

ROADWAY	CLASSIFICATION	DESIGN SPEED
FM 734 (PARMER LANE)	ARTERIAL	60 MPH
WB SH 45 FRONTAGE RD (WBFR)	FRONTAGE RD	55 MPH

ROADWAY	ADT (2026)	ADT (2046)
FM 734 (PARMER LANE)	56,105	71,795
WB SH 45 FRONTAGE RD (WBFR)	8,405	11,635
EB SH 45 FRONTAGE RD (EBFR)	9,590	13,275

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS



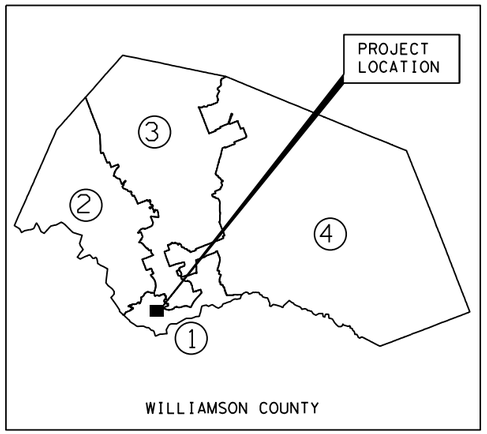
EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: CAP METRO RAIL
DOT# 914513A
STA.299+16.11, ℄ PARMER
CENTRAL SUBDIVISON
DOT#913615P
STA. 1014+00.00,℄ WBFR
CENTRAL SUBDIVISON

WATERSHED: BRUSHY CREEK
AREA OF DISTURBANCE: 2.26 AC

REGISTERED ACCESSIBILITY SPECIALIST (RAS)
INSPECTION REQUIRED TDLR NO. TABS2026005717

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED PROFESSIONAL ENGINEER
Fernando Gaytan 11/13/2025

REQUIRED SIGNS SHALL BE PLACED IN ACCORDANCE WITH STANDARD SHEETS BC(1)-21 THRU BC(12)-21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.



TxDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES ADOPTED ON SEPTEMBER 1, 2024 AND ALL APPLICABLE SPECIAL PROVISIONS AND SPECIAL SPECIFICATIONS AS INDICATED IN THE BID DOCUMENTS SHALL GOVERN ON THIS PROJECT.

100% SUBMITTAL 10/03/25

FOR 60% TXDOT REVIEW

WILCO TEXAS

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Texas Department of Transportation

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PREPARED BY:
ALFRED BENESCH & COMPANY
Fernando Gaytan 11/13/2025
FERNANDO GAYTAN, PE DATE
PROJECT MANAGER

APPROVED BY:
WILLIAMSON COUNTY

STEVEN SNELL DATE
WILLIAMSON COUNTY JUDGE

APPROVED BY:
WILLIAMSON COUNTY

TERRY COOK DATE
WILLIAMSON COUNTY COMMISSIONER
PRECINCT 1

APPROVED BY:
HNTB CORPORATION

CHRISTEN ESCHBERGER, PE DATE
ROAD BOND MANAGEMENT TEAM

RECOMMENDED FOR LETTING:

AREA ENGINEER DATE

RECOMMENDED FOR LETTING:

DISTRICT DESIGN ENGINEER DATE

APPROVED FOR LETTING:

DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT DATE

DATE: 11/13/2025 2:54:22 PM
FILE: c:\pwwordir\benesch projects\projects\d0215413100 Parmer Title 01.dgn

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STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER
11/13/2025

*THE STANDARD SHEETS IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
11/13/2025

**THE STANDARD SHEETS IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
TRAVIS J. KAATZ
124859
LICENSED
PROFESSIONAL ENGINEER
10/03/2025

***THE STANDARD SHEETS IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
GRANT R. WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER
10/3/2025

****THE STANDARD SHEETS IDENTIFIED ABOVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE
AT SH 45

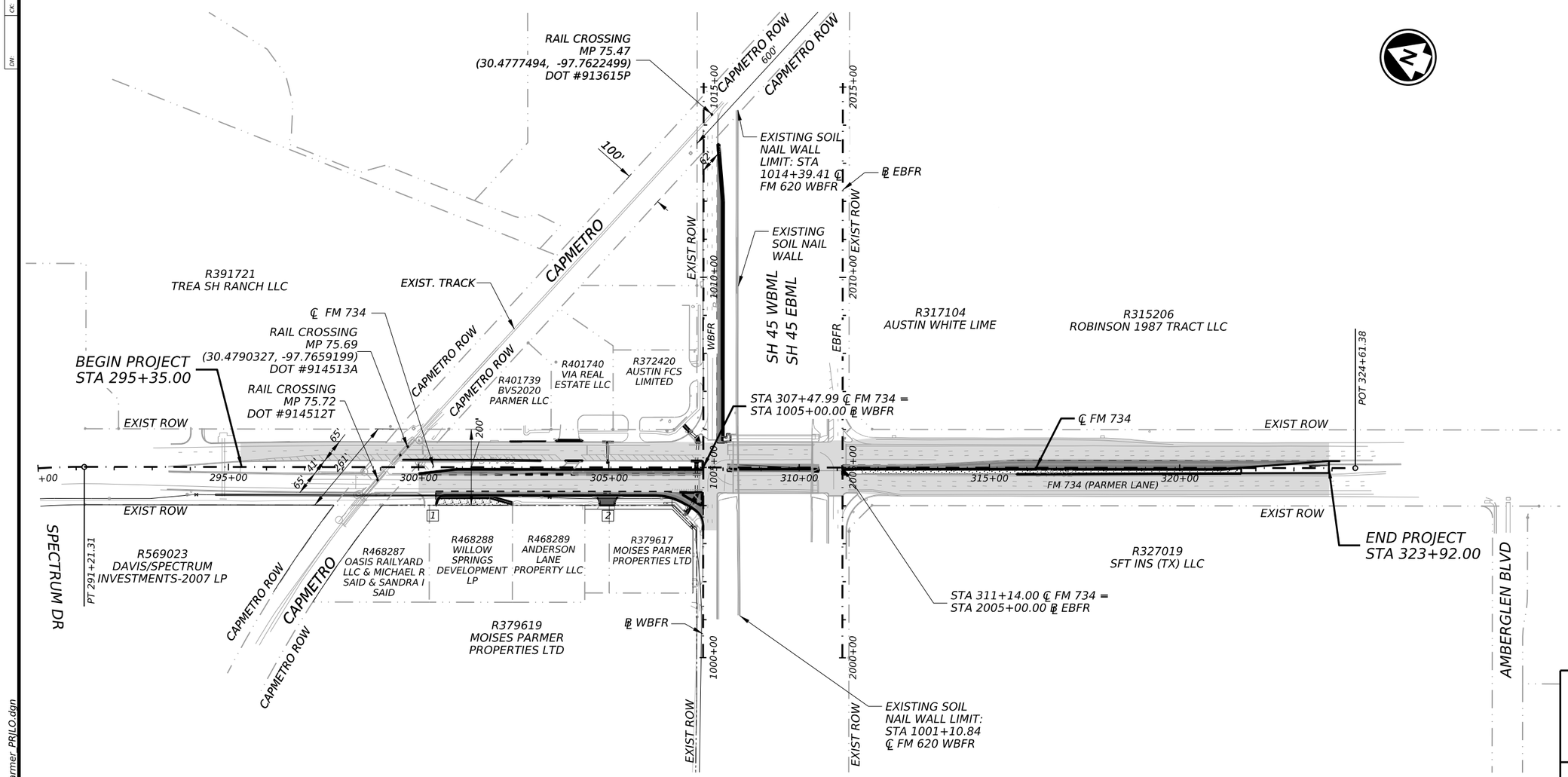
INDEX OF SHEETS

2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		2

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LEGEND

- EXISTING ROW
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- # PROPOSED DRIVEWAY NUMBER
- PROPOSED DRIVEWAY
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL INFORMATION.
3. SEE DRIVEWAY DETAIL SHEET FOR ADDITIONAL INFORMATION.
4. ALL DIMENSIONS ARE MEASURED TO THE FACE OF CURB AS INDICATED.
5. SAWCUT IS CONSIDERED INCIDENTAL TO THE ADJACENT REMOVAL ITEM AND WILL NOT BE PAID FOR SEPARATELY.

0 50 100
SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
Fernando Gaytan
11/6/2025

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PARMER LANE AT SH 45

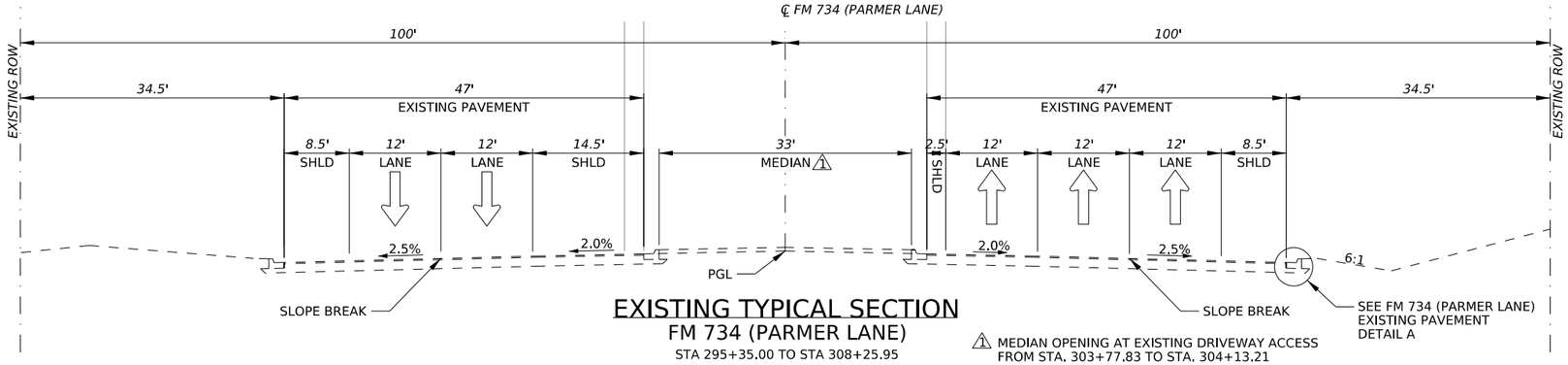
PROJECT LAYOUT

2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
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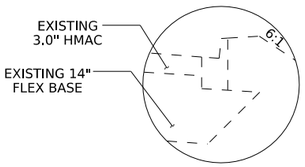
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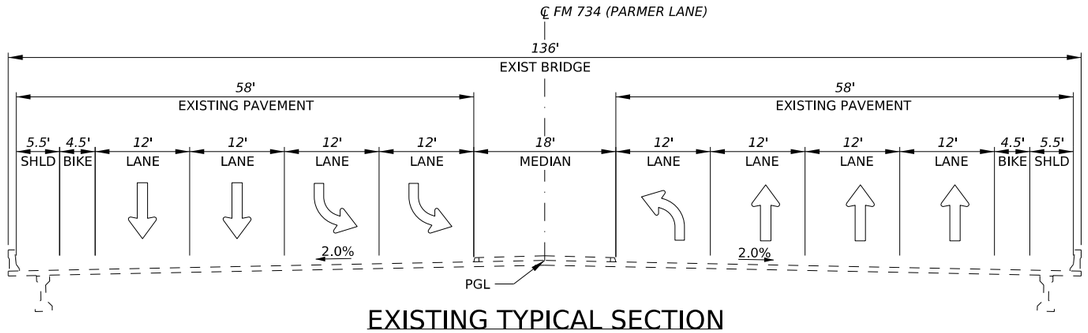


EXISTING TYPICAL SECTION
FM 734 (PARMER LANE)
STA 295+35.00 TO STA 308+25.95

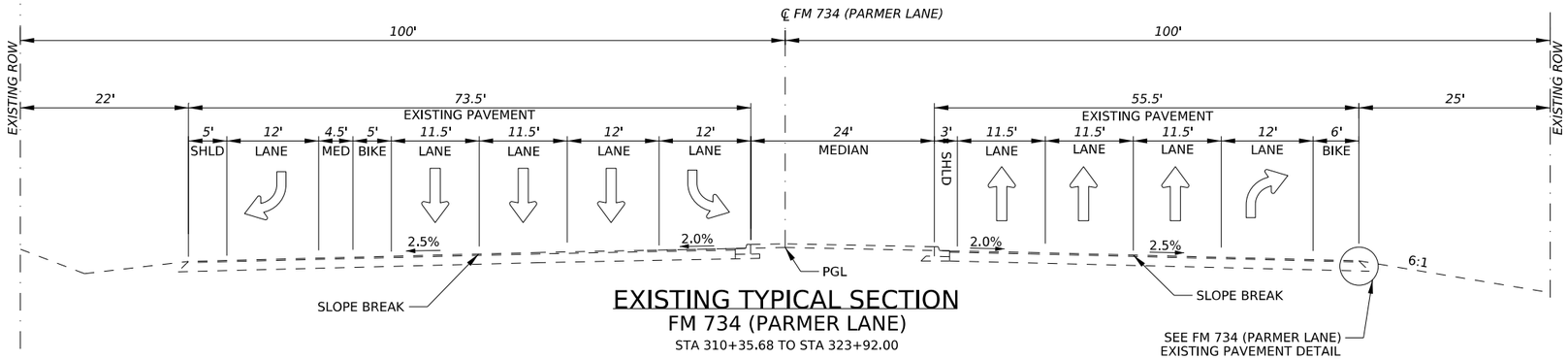
1 MEDIAN OPENING AT EXISTING DRIVEWAY ACCESS FROM STA. 303+77.83 TO STA. 304+13.21



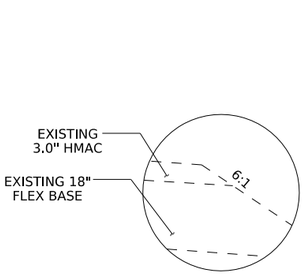
FM 734 (PARMER LANE) EXISTING PAVEMENT
DETAIL A



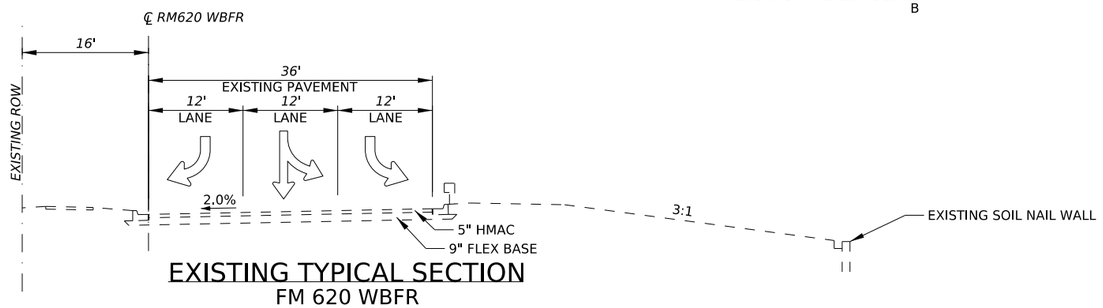
EXISTING TYPICAL SECTION
FM 734 (PARMER LANE) BRIDGE OVER SH 45
STA 308+25.95 TO STA 310+35.68



EXISTING TYPICAL SECTION
FM 734 (PARMER LANE)
STA 310+35.68 TO STA 323+92.00



FM 734 (PARMER LANE) EXISTING PAVEMENT
DETAIL B



EXISTING TYPICAL SECTION
FM 620 WBFR
STA 1003+50.00 TO STA 1013+71.00

NOTE:

1- SAWCUT IS CONSIDERED INCIDENTAL TO THE ADJACENT REMOVAL ITEM AND WILL NOT BE PAID FOR SEPARATELY.

2- TACK COAT WILL NOT BE PAID FOR DIRECTLY AND SHALL BE CONSIDERED SUBSIDIARY TO ITEM 341. IT IS SHOWN HERE FOR CONTRACTOR'S INFORMATION ONLY.

3- SAWCUT ELEVATION ARE DETAILED IN THE PROFILE VIEW OF THE PLAN AND PROFILE SHEET.

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED PROFESSIONAL ENGINEER
Fernando Gaytan
11/6/2025

WILCO TEXAS

benesch
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5113 Southwest Pkwy, Suite 255
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www.Benesch.com

PARMER LANE AT SH 45

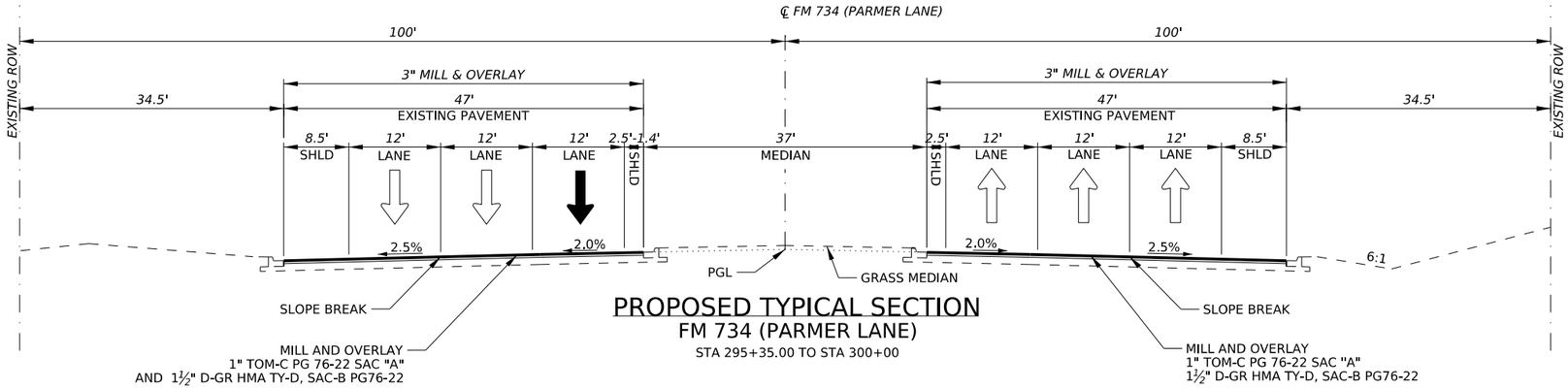
TYPICAL SECTIONS

2025 SHEET 1 OF 6

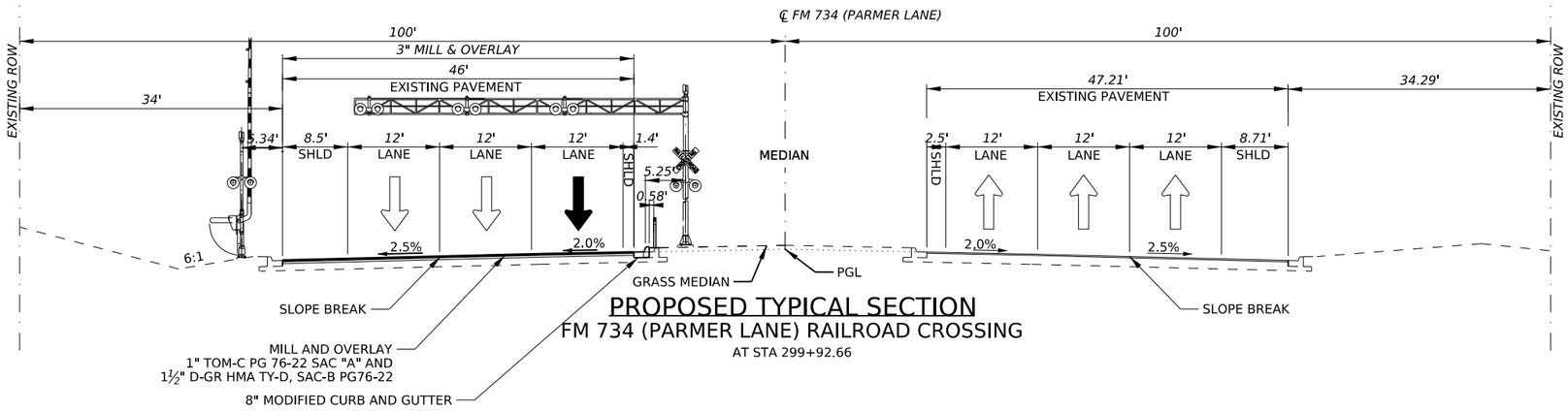
CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		4

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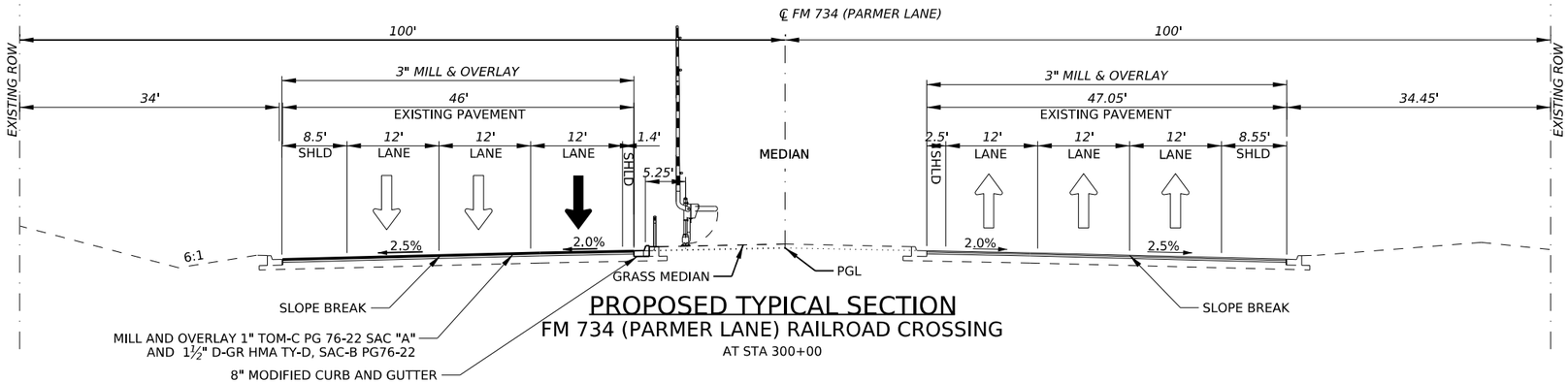
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PROPOSED TYPICAL SECTION
FM 734 (PARMER LANE)
STA 295+35.00 TO STA 300+00



PROPOSED TYPICAL SECTION
FM 734 (PARMER LANE) RAILROAD CROSSING
AT STA 299+92.66



PROPOSED TYPICAL SECTION
FM 734 (PARMER LANE) RAILROAD CROSSING
AT STA 300+00

NOTE:

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FERNANDO GAYTAN
92244
LICENSED PROFESSIONAL ENGINEER
11/6/2025

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Austin, TX 78735
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PARMER LANE AT SH 45

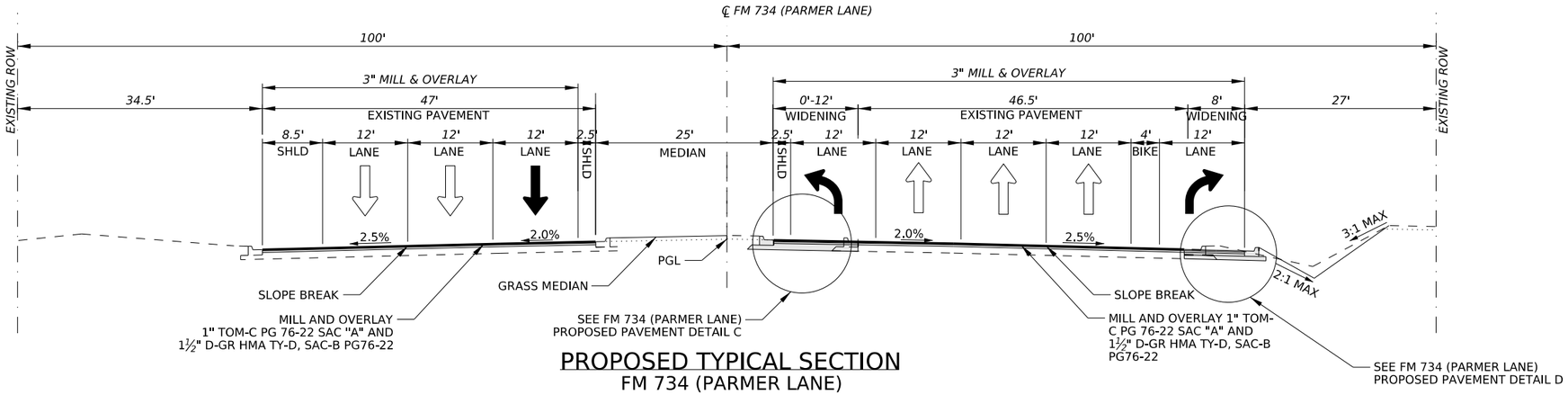
TYPICAL SECTIONS

2025 SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		5

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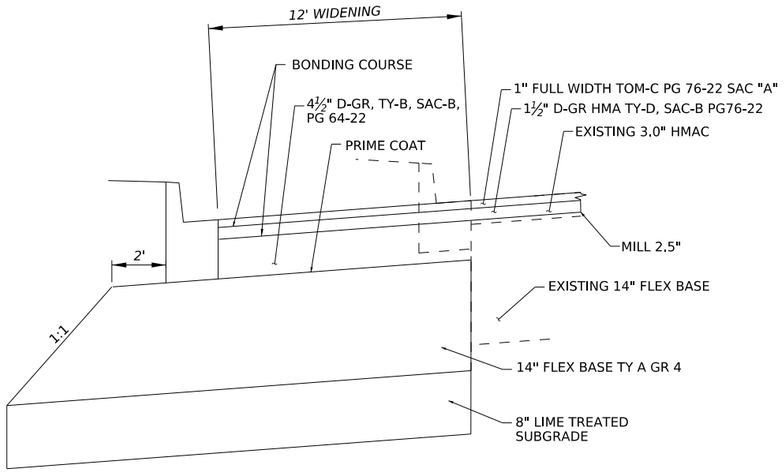
PROPOSED TYPICAL SECTION
FM 734 (PARMER LANE)
STA 300+00.00 TO STA 307+47.99

NOTE:

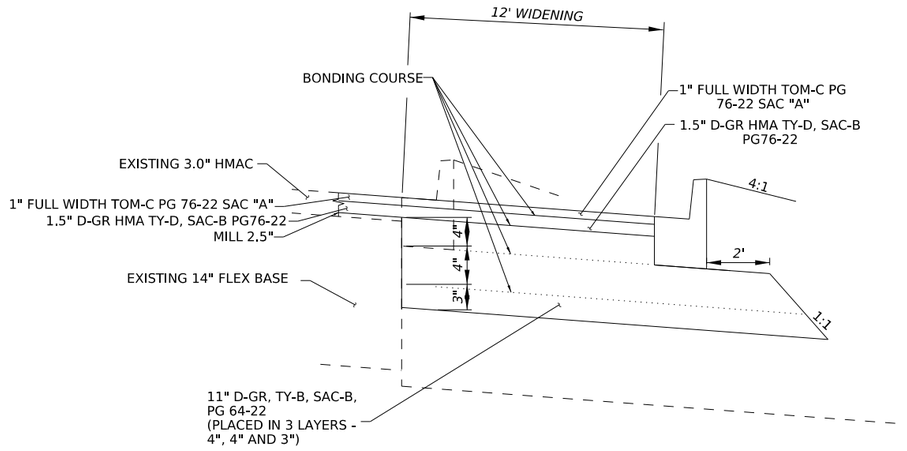
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FM 734 (PARMER LANE) PROPOSED PAVEMENT
DETAIL C



FM 734 (PARMER LANE) PROPOSED PAVEMENT
DETAIL D

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
Fernando Gaytan
11/6/2025

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
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PARMER LANE
AT SH 45

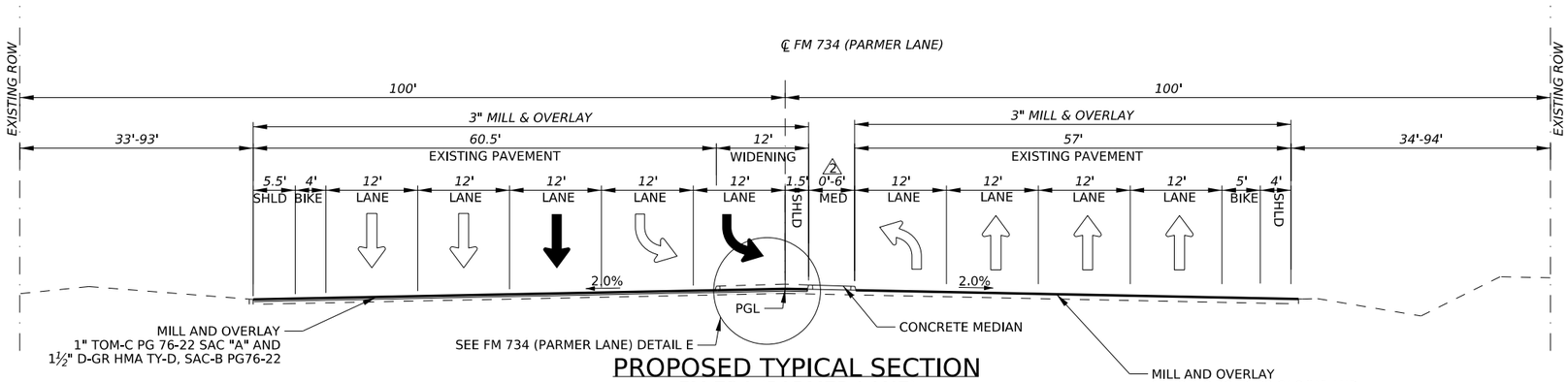
TYPICAL SECTIONS

2025 SHEET 3 OF 6

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3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		6

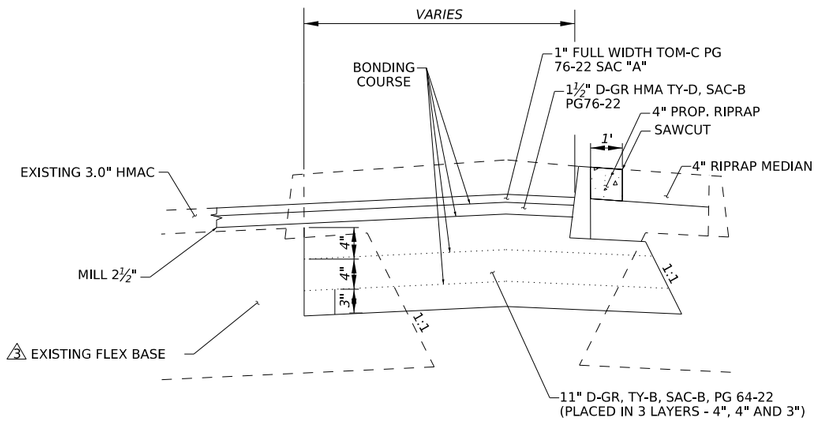
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PROPOSED TYPICAL SECTION
FM 734 (PARMER LANE)
STA 308+10.76 TO STA 308+25.95
STA 310+35.92 TO STA 310+52.70

2 STA. 307+47.99 TO STA. 308+10.76
STA. 310+52.70 TO STA. 311+14,00
IS ACROSS THE INTERSECTION AND
THERE IS NO MEDIAN



3 EXISTING 14" FLEX BASE : STA 308+10.76 TO STA 308+25.95
EXISTING 18" FLEX BASE : STA 310+35.92 TO STA 311+14.00

FM 734 PROPOSED PAVEMENT
DETAIL E

NOTE:

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STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
Fernando Gaytan
11/6/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
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Austin, TX 78735
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PARMER LANE
AT SH 45

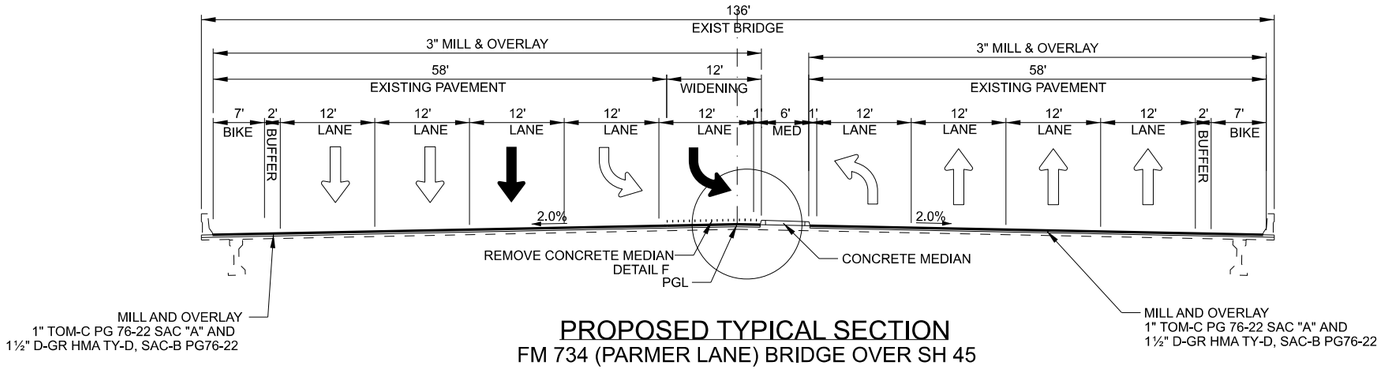
TYPICAL SECTIONS

2025 SHEET 4 OF 6

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3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		7

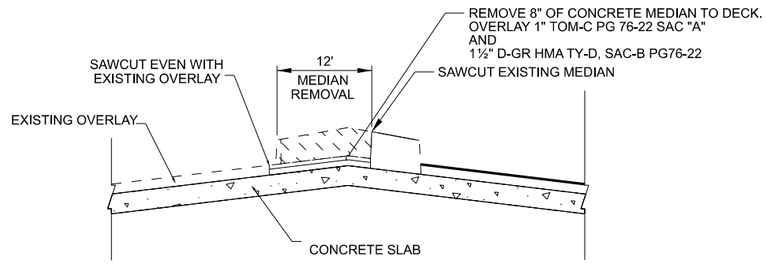
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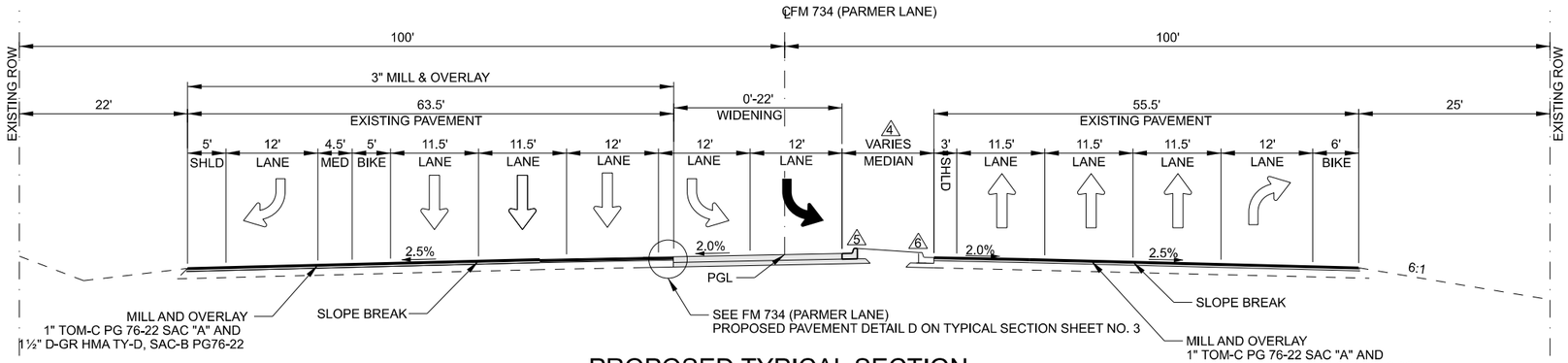


PROPOSED TYPICAL SECTION
FM 734 (PARMER LANE) BRIDGE OVER SH 45

STA 308+25.95 TO STA 310+35.92



FM 734 (PARMER LANE) BRIDGE OVER SH45
DETAIL F



PROPOSED TYPICAL SECTION
FM 734 (PARMER LANE)

STA 3 11+14.00 TO STA 323+92.00

4 15' CONCRETE MEDIAN FROM STA. 311+14.00 TO STA. 321+21.00
15' TO 18' CONCRETE MEDIAN FROM STA. 321+21.00 TO 321+61.84
18' TO 35' GRASS MEDIAN FROM STA. 321+61.84 TO STA. 323+91.99

5 PROP. CURB AND GUTTER ENDS AT STA. 321+72.00

6 EXIST. CURB AND GUTTER ENDS AT STA. 321+71.00
PROP. CURB AND GUTTER BEGINS AT STA. 321+71.00

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
Fernando Gaytan
11/6/2025

WILCO TEXAS

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PARMER LANE AT SH 45

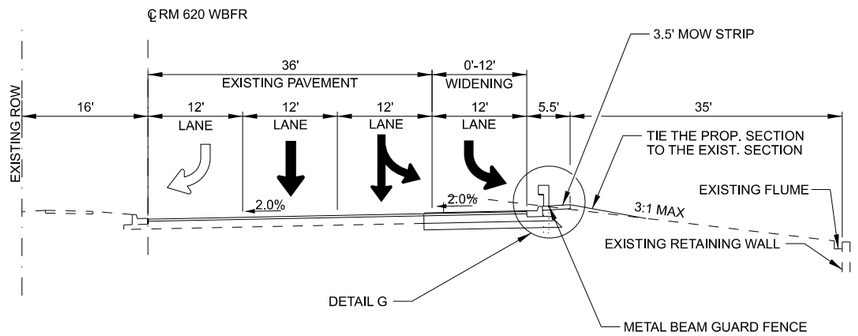
TYPICAL SECTIONS

2025 SHEET 5 OF 6

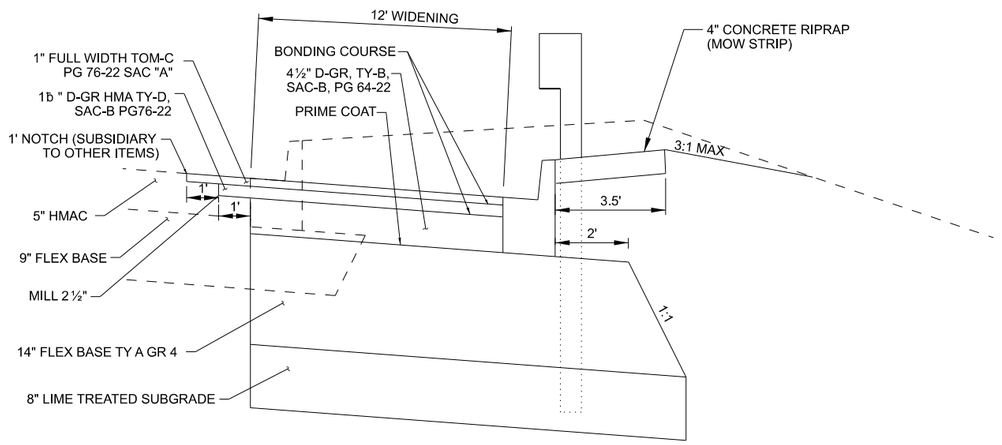
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DIST	COUNTY		SHEET NO.
4	WILLIAMSON		8

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PROPOSED TYPICAL SECTION
FM 620 WBFR
STA 1003+35.00 TO STA 1013+50.00



FM 620 WBFR PROPOSED PAVEMENT
DETAIL G

NOTE:

1- SAWCUT IS CONSIDERED INCIDENTAL TO THE ADJACENT REMOVAL ITEM AND WILL NOT BE PAID FOR SEPARATELY.

2- TACK COAT WILL NOT BE PAID FOR DIRECTLY AND SHALL BE CONSIDERED SUBSIDIARY TO ITEM 341. IT IS SHOWN HERE FOR CONTRACTOR'S INFORMATION ONLY.

3- SAWCUT ELEVATION ARE DETAILED IN THE PROFILE VIEW OF THE PLAN AND PROFILE SHEET.

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
Fernando Gaytan
11/6/2025

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benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE
AT SH 45

TYPICAL SECTIONS

2025 SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		9

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CapMetro

RAIL EMERGENCY NUMBER (844)-592-8046

SAFETY NOTES FOR DESIGN & CONSTRUCTION OF ANY INFRASTRTURE WITHIN RAILROAD RIGHT OF WAY

CAPMETRO GENERAL NOTES:

1. TO WORK WITHIN THE RAILROAD RIGHT OF WAY (ROW) YOU MUST COMPLY WITH TRACK SAFETY STANDARDS IN RAILROAD RIGHT OF WAY PER 49 CFR CHAPTER 2 PART 213. IN ADDITION, ALL INDIVIDUALS WHO REQUIRE ACCESS TO THE ROW MUST COMPLY WITH BNSF MAINTENANCE OF WAY SAFETY RULES, (EFFECTIVE JANUARY 1, 2015). THESE RULES PRESCRIBE THE ONLY ACCEPTABLE PERSONAL PROTECTIVE EQUIPMENT (PPE) THAT MAY BE USED IN THE ROW OR IN THE FOUL OF THE TRACK. INDIVIDUALS WHO ARE WEARING PPE THAT DOES NOT MEET THE REQUIREMENTS OF THESE RULES WILL NOT BE ALLOWED TO ENTER THE ROW. THE LINK TO THE SAFETY RULES IS BELOW. THE ROADWAY WORKER IN CHARGE (RWIC) WILL HAVE A COPY IN THE FIELD FOR REVIEW.

2. ALL IMPROVEMENTS SHALL BE MADE IN ACCORDANCE WITH THE APPROVED PLANS. ANY ADDITIONAL IMPROVEMENTS WILL REQUIRE PLAN REVISIONS AND APPROVAL BY CAPITAL METRO (CAPMETRO).
   THE EXISTING UTILITIES SHALL BE LOCATED PRIOR TO COMMENCING ANY EXCAVATIONS. APPROVAL OF THE PROJECT BY CAPMETRO DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OR COMPLETENESS OF LOCATION OR THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITIES OR STRUCTURES WITHIN THE LIMITS OF THIS PROJECT. THE APPROPRIATE REGIONAL NOTIFICATION CENTER [TEXAS EXCAVATION SAFETY SYSTEM SERVICE ALERT (ONE CALL) AT (8OO) 344-8377, TEXAS811.ORG], RAILWAY COMPANIES AND UTILITY COMPANIES SHALL BE NOTIFIED PRIOR TO PERFORMING ANY EXCAVATION CLOSE TO ANY UNDERGROUND PIPELINE, CONDUIT, DUCT, WIRE OR OTHER STRUCTURE. REFER TO CAPMETRO'S WEBSITE (CAPMETRO.ORG/RAIL ROW) TO ENSURE PROPER CONTACT INFORMATION AND PHONE NUMBERS. CAPMETRO IS NOT A MEMBER OF ONE CALL. IT IS THEREFORE NECESSARY TO CALL HERZOG TECHNOLOGIES (ROBBY SMITH 857-995-7622, IF NO ANSWER CALL CODY DECKER 406-550-3030) TO HAVE SIGNAL SUPPORT SERVICES MARK, AT THE

CapMetro

CONTRACTOR'S EXPENSE, SIGNAL AND COMMUNICATION CABLES AND CONDUITS IF WORKING IN THE CENTRAL SUBDIVISION. CALL AUSTIN WESTERN RAILROAD (WATCO) (TYLER GEISSEN (512) 289-6997 AND ORLANDO ORTIZ OF CDL (806) 252- 4393 TO MARK, AT THE CONTRACTOR'S EXPENSE, SIGNAL AND COMMUNICATION CABLES AND CONDUITS, IF WORKING IN THE EAST AND WEST SUBDIVISIONS. WHEN THE NEW CROSSINGS INVOLVE GATES, THE MINIMUM REQUIRED CLEARANCE FROM EXISTING OVERHEAD WIRES SHALL BE MAINTAINED, AND GATE FOUNDATIONS CHECKED FOR UTILITIES. IF UTILITIES CANNOT BE LOCATED, POTHOLING SHALL BE DONE TO LOCATE THE UTILITIES. CAPMETRO AND THE APPROPRIATE UTILITY OWNERS SHALL BE NOTIFIED IMMEDIATELY WHEN UTILITY LINES NOT KNOWN OR INDICATED ON THE DRAWINGS ARE ENCOUNTERED. NO SERVICE SHALL BE DISRUPTED UNTIL THE UTILITY OWNER AND CAPMETRO HAVE DETERMINED THE REQUIRED ACTION ON SUCH LINES.

3. THE CONTRACTOR SHALL NOTIFY CAPMETRO AT LEAST THREE (3) WEEKS PRIOR TO THE INSTALLATION OF ANY DRAINAGE FACILITY WITHIN RAILROAD RIGHT-OF-WAY.

4. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST 48 HOURS PRIOR TO STARTING ANY WORK ON CITY RIGHT-OF-WAY. THE CONTRACTOR SHALL NOTIFY TXDOT AT LEAST FOUR (4) WEEKS PRIOR TO STARTING ANY WORK ON STATE RIGHT OF WAY. A CHANGEABLE MESSAGE BOARD SHALL BE PLACED ALONG THE ROADWAY A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING THE WORK IN ORDER TO NOTIFY THE TRAVELING PUBLIC OF THE FUTURE ROAD WORK.

5. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (OSHA) (COPIES OF THESE STANDARDS MAY BE PURCHASED FROM THE U.S. GOVERNMENT PRINTING OFFICE. INFORMATION AND RELATED REFERENCE MATERIAL MAY BE PURCHASED FROM OSHA, 903 SAN JACINTO, RM. 319, AUSTIN, TEXAS 78701), AS WELL AS FRA (FEDERAL RAILROAD ADMINISTRATION) REQUIREMENTS FOR ROADWAY WORKERS.

6. TRENCH EXCAVATION PROTECTION: CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORKING AREA IN ORDER TO DEVELOP THE CONTRACTOR'S PLANS TO IMPLEMENT THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S PLANS SHALL PROVIDE FOR ADEQUATE TRENCH SAFETY EXCAVATIONS, ESPECIALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45
CAPMETRO GENERAL NOTES

CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		10

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CapMetro

OR SAFETY CONSULTANT SHALL DEVELOP AND IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS, COVERING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION. THE CONTRACTOR PLANS AND OUTLINE FOR TRENCH SAFETY PROGRAM SHALL BE FURNISHED BY THE CONTRACTOR TO THE OWNER, PRIOR TO EXECUTION OF THE CONTRACT, FOR INCLUSION AS PART OF THE CONTRACT DOCUMENTS. THE DOCUMENTS FURNISHED TO THE OWNER ARE NOT FOR THE OWNER'S REVIEW, APPROVAL OR ENDORSEMENT OF THE CONTRACTOR'S PLAN AND TRENCH SAFETY PROGRAM, BUT SOLELY FOR THE PURPOSE OF INCLUDING DETAILED TRENCH SAFETY PLANS FOR THE PROJECT IN DOCUMENTS. BORING ACTIVITIES WILL TAKE PLACE OUTSIDE OF REVENUE SERVICE, TYPICALLY AT NIGHT OR ON WEEKENDS.

7. SEE CONSTRUCTION SEQUENCING PLAN AND TRAFFIC CONTROL AND CLOSURE PLANS FOR DETAILS ON PROJECT PHASING AND DETAILS ON TRAFFIC CONTROL AND CLOSURE ITEMS. THE CITY SHALL BE CONTACTED 48 HOURS PRIOR TO THE INSTALLATION OF TRAFFIC CONTROL AND CLOSURES AS APPLICABLE FOR EACH AFFECTED ROADWAY.

8. ALL EXCESS MATERIAL WILL BE DISPOSED OF OFF SITE. CONTRACTOR SHALL NOT DISPOSE OF SURPLUS MATERIAL FROM THE SITE WITHOUT NOTIFYING CAPMETRO 48 HOURS PRIOR TO THE REMOVAL. THE NOTIFICATION SHALL INCLUDE DISPOSAL LOCATION. CONTRACTOR SHALL DISPOSE OF CONTAMINATED SOIL IN ACCORDANCE WITH FEDERAL AND STATE REQUIREMENTS FOR APPROPRIATE DISPOSAL BASED ON ENVIRONMENTAL REQUIREMENTS.

9. CONTRACTOR IS RESPONSIBLE FOR DEMOLITION AND DISPOSAL OF ANY AND ALL EXISTING STRUCTURES ON SITE AS NOTED IN THE PLANS. CONTRACTOR SHALL REMOVE ITEMS AS DETAILED IN THE PLANS. CONTRACTOR SHALL REMOVE GRADE CROSSING EQUIPMENT, CONCRETE GRADE CROSSING PANELS AND SIGNAL HOUSES AND STOCKPILE USABLE TRACK MATERIALS AT CEDAR PARK YARD AND USABLE SIGNAL MATERIALS ABBOTT YARD.

10. ALL CONCRETE WORK SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF ACI 301- 10 AND CONTRACT SPECIFICATIONS.

11. ALL EXPOSED CORNERS FOR CONCRETE WORK SHALL BE CHAMFERED 1 INCH.

12. THE INFORMATION CONTAINED ON THESE DRAWINGS IN REGARD TO EXISTING UTILITIES, TOPOGRAPHY, CONTOURS OR SUBSURFACE CONDITIONS IS FURNISHED SOLELY AS THE BEST INFORMATION AVAILABLE AT THIS TIME. ITS ACCURACY IS NOT GUARANTEED AND ITS USE IN NO WAY RELIEVES THE CONTRACTOR OF ANY RESPONSIBILITY FOR LOSSES DUE TO ANY INACCURACIES.

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13. THE CONTRACTOR SHALL NOTIFY CAPMETRO BEFORE BEGINNING ANY UTILITY CONSTRUCTION IN PUBLIC ROW OR PUBLIC EASEMENT. NO PIPE SHALL BE LAID UNTIL CAPMETRO OR ITS REPRESENTATIVE HAS MET WITH THE CONTRACTOR OR HIS REPRESENTATIVE AT THE PROJECT SITE.

14. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITIONS, INCLUDING REVEGETATION (HYDROMULCH) AND GRADING TO DRAIN AS REQUIRED BY THE CITY AT NO ADDITIONAL COST TO CAPMETRO.

15. CONTRACTORS SHALL BE RESPONSIBLE FOR ITS OWN SURVEY.

16. NO WORK SHALL BE PERMITTED WITHOUT A ROADWAY WORKER IN CHARGE (RWIC) WHEN WORK IS WITHIN CAPMETRO ROW OR EQUIPMENT HAS THE POTENTIAL TO ENTER THE ROW. WORK IMPACTING RAILROAD SERVICES MAY REQUIRE A NIGHT OR WEEKEND SCHEDULE IF A **FORM B** CANNOT BE USED. ALL CONTRACTORS MUST SUBMIT AN ONLINE APPLICATION TO CAPMETRO's REAL ESTATE DEPARTMENT FOR DEPLOYMENT OF RWIC, AT THE REQUIRED LOCATION OF THEIR WORK, WITHIN THE ROW. THE LOCATION OF WORK PERMITTED MAY NOT CHANGE UNLESS A NEW ONLINE APPLICATION HAS BEEN SUBMITTED AND APPROVED. WHEN WORKING DIRECTLY ON CAPMETRO PROJECTS RWIC FEES SHALL BE WAIVED UPON APPROVAL FROM LISTED CAPMETRO PROJECT MANAGER AND THE INTERNAL PROJECT NUMBER INCLUDED IN THE ONLINE REQUEST. FOR THIRD PARTY CONTRACTORS WORKING IN THE RAILROAD ROW, THERE WILL BE A CHARGE FOR RWIC DEPLOYMENT AT $100/HOUR.

17. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL QUANTITIES.

18. DESIGN AND CONSTRUCTION OF RAILROAD PROJECTS WITHIN THE ROW SHALL BE IN ACCORDANCE WITH THE AREMA MANUAL FOR RAILWAY ENGINEERING AND CAPMETRO GUIDELINES FOR RAILROAD GRADE SEPARATION PROJECTS (AS ANNOTATED BY TXDOT), OR KANSAS CITY SOUTHERN GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF OVERPASSES AND UNDERPASSES AND TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES.

19. SAFETY AND SECURITY CERTIFICATION (SSC) WILL BE PERFORMED ON PROJECTS THAT REHABILITATE OR MODIFY AN EXISTING SYSTEM, NEW CONSTRUCTION THAT IMPACTS THE RAIL SYSTEM OR THE REPLACEMENT OF VEHICLES OR EQUIPMENT. SSC MAY ALSO BE PERFORMED AT THE REQUEST OF CAPMETRO SENIOR LEADERSHIP. SSC HAS THREE TIERS AND DEPENDING ON THE PROJECT'S SCOPE, SIZE AND IMPACT TO THE RAIL SYSTEM, THIS WILL DETERMINE THE TIER THAT MUST BE COMPLIED WITH. CAPMETRO HAS A STANDARD SSC PROGRAM

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TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE
AT SH 45
CAPMETRO
GENERAL NOTES

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	11

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CapMetro

THAT MUST BE FOLLOWED. COMMISSIONING THE PROJECT IS CONTINGENT ON FINAL SSC. A CAPMETRO SSC REPRESENTATIVE WILL WORK WITH THE CONTRACTOR TO ENSURE THE PROCESS COMPLIES WITH THE CAPMETRO SAFETY AND SECURITY CERTIFICATION PROGRAM PLAN.

CapMetro

Grading Notes:

1. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MAKE CERTAIN THAT ALL THE REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS APPROVED BY ALL OF THE PERMITTING AUTHORITIES. PROJECTS THAT WILL REQUIRE SAFETY AND SECURITY CERTIFICATION MUST HAVE THAT PROCESS IN PLACE.

2. BARRICADING, TRAFFIC CONTROL AND PROJECT SIGNS SHALL CONFORM TO STATE AND CITY BARRICADING AND CONSTRUCTION STANDARDS AS APPLICABLE AND THE CONTRACT SPECIFICATIONS.

3. THE CONTRACTOR SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS, INCLUDING GRADES AND DIMENSIONS, BEFORE COMMENCEMENT OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES. MINOR ADJUSTMENT TO FINISH GRADE TO ACCOMPLISH SPOT DRAINAGE IS ACCEPTABLE, IF NECESSARY, UPON PRIOR APPROVAL OF THE ENGINEER. PAVING INSTALLED SHALL MATCH EXISTING PAVING AT JOINTS AND NOT CREATE PUDDLES.

4. PROPOSED SPOT ELEVATION AND DESIGNATED GRADIENT ARE TO BE USED IN THE EVENT OF ANY DISCREPANCIES.

5. SITE PREPARATION AND GRADING AND FILL COMPACTION SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT.

6. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING THE CONSTRUCTION OF THIS PROJECT.

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benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE
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CAPMETRO
GENERAL NOTES

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	12

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CapMetro

Railroad Notes:

All information associated with CapMetro ROW request ca be located at:
CAPMETRO.ORG/RAILROW

ANY WORKERS WORKING WITHIN THE RAILROAD RIGHT OF WAY MUST HAVE ROADWAY WORKER PROTECTION(RWP) TRAINING AND SUCCESFULLY RECEIVE CERTIFCATION. WORKERS MUST PRESENT A COPY OF THEIR CERTIFICATION TO THE RWIC BEFORE ACCESS TO THE RIGHT OF WAY WILL BE GRANTED, AND THEY MUST CARRY THE CERTIFICATION WITH THEM AT ALL TIMES WHILE ON THE RIGHT OF WAY. CERTIICATIONS EXPIRE AFTER ONE YEAR.

ROADWAY WORKER PROTECTION TRAINING IS PROVIDED BY HERZOG TRANSIT SERVICES. CONTACT HTSI'S ADMIN DEBRA GLEICH AT 512-770-8662 FOR INFORMATION REGARDING TRAINING.

1. CAPMETRO MUST APPROVE ALL ACCESS TO AND ACTIVITIES WITHIN THE CAPMETRO ROW PRIOR TO ENTERING INTO THE RAILROAD ROW OR THE PERFORMANCE OF ANY WORK. ALL INDIVIDUALS OR CONTRACTORS REQUIRING ACCESS TO THE RAILROAD ROW MUST HAVE AN APPROVED LICENSE AGREEMENT AND/OR WORK PERMIT PRIOR TO ANY WORK WITHIN THE RAILROAD ROW. INDIVIDUALS OR CONTRACTORS MUST FOLLOW ALL THE SAFETY REQUIREMENTS OF CAPMETRO.

2. ANY WORK WITHIN THE CAPMETRO RIGHT OF WAY CAN ONLY PROCEED WITH THE PRESENCE OF A QUALIFIED RWIC AND AFTER AN INITIAL JOB BREFIING IS HELD OFF THE SITE. AT THAT TIME RWP CERTIFICATIONS WILL BE INSPECTED. ANY WORKER WHO CANNOT PRODUCE A VALID AND IN DATE CERTIFICATION WILL NOT BE PERMITTED IN THE ROW. ANY WORK INVOLVING EQUIPMENT THAT HAS THE POTENTIAL TO ENTER THE FOUL THE ROW MAY ONLY BE PERFORMED WITH THE PROTECTION OF A QUALIFIED RWIC. THE SCHEDULING OF RWICS IS COORDINATED BY CAPMETRO RAIL OPERATIONS.

3. CONTRACTOR SHALL NOTIFY CAPMETRO AND ITS OPERATIONS & MAINTENANCE CONTRACTOR, HERZOG TRANSIT SERVICES (IF WORKING IN THE CENTRAL SUBDIVISION) OR AUSTIN WESTERN RAILROAD (IF WORKING IN EAST OR WEST SUBDIVISION), THREE WEEKS BEFORE COMMENCING WORK WITHIN THE CAPMETRO RIGHT-OF-WAY IN ORDER TO SCHEDULE ROADWAY WORKER PROTECTION TRAINING CLASS, TRACK ACCESS AND RWIC SERVICES IF NEEDED AND SCHEDULE TRACK OUTAGES.

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4. COMPLY WITH ALL CONDITIONS OF PERMIT FOR CONSTRUCTION IN RAILROAD ROW.

5. CONSTRUCTION IN RAILROAD ROW SHALL NOT PROGRESS UNTIL PROOF OF INSURANCE IS PROVIDED TO CAPMETRO.

6. THE CONTRACTOR MUST REQUEST THAT ALL RAILROAD SIGNAL GRADE CROSSING AND COMMUNICATION CABLES WITHIN THE LIMITS OF CONSTRUCTION BE LOCATED AND TAKE CARE NOT TO DAMAGE THEM. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN MARKING OF CABLES AND FOR THE REPAIR OF ANY DAMAGE TO CAPMETRO SIGNAL FACILITIES.

7. CONTRACTOR SHALL MAINTAIN A MINIMUM CONSTRUCTION CLEARANCE OF 23'-7" VERTICALLY ABOVE THE PLANE OF THE TOP OF RAIL (TOR).

8. ANY CONSTRUCTION FEATURE WILL HAVE 10' HORIZONTAL CLEARANCE FROM THE CENTER OF THE TRACK.

9. TRENCHING FOR THE UNDERGROUND CABLE OR UTILITY PIPE PARALLEL TO THE TRACK SHOULD BE PROVIDED TOWARD THE EDGE OF THE ROW.

10. BEFORE ANY EXCAVATION ON THE ROW GET DETAILS OF THE EMBEDDED PTC FIBER IN TERMS OF THE OFFSET & DEPTH OF THE FIBER OPTIC LINE IF WORKING WITHIN CENTRAL SUBDIVISION.

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE
AT SH 45
CAPMETRO
GENERAL NOTES

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	13

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CapMetro

General Shoring Requirements:

1. RAILROAD REVIEW AND APPROVAL OF SHORING, ERECTION, DEMOLITION AND FALSEWORK IS REQUIRED. ALLOW A MINIMUM OF FOUR WEEKS FOR THE REVIEW AND APPROVAL OF EACH SUBMITTAL.

2. THE PROJECT SHALL NOT INCREASE THE QUANTITY AND/OR CHARACTERISTICS OF THE FLOW IN THE RAILROAD'S DITCHES AND/OR DRAINAGE STRUCTURES. IN THE RARE EVENT THAT A GRADE SEPARATION PROJECT WILL INCREASE THE QUANTITY AND/OR CHARACTERISTICS OF FLOW IN SUCH ELEMENTS, SUCH A DESIGN MUST BE REVIEWED AND APPROVED BY THE RAILROAD.

3. VERIFY THE ELEVATION OF THE EXISTING TOR PROFILE BEFORE BEGINNING CONSTRUCTION. BRING ALL DISCREPANCIES TO THE ATTENTION OF THE RAILROAD PRIOR TO CONSTRUCTION

4. SUBMIT A PROPOSED METHOD OF EROSION AND SEDIMENT CONTROL FOR APPROVAL BY THE RAILROAD.

5. DESIGN AND CONSTRUCT ALL SHORING SYSTEMS THAT IMPACT THE RAILROAD OPERATIONS AND/OR SUPPORT THE RAILROAD'S EMBANKMENT PER CURRENT RAILROAD GUIDELINES FOR TEMPORARY SHORING.

6. COMPLY WITH RAILROAD DEMOLITION GUIDELINES FOR ALL DEMOLITIONS WITHIN THE RAILROAD ROW AND/OR DEMOLITION THAT MAY IMPACT THE RAILROAD'S TRACKS OR OPERATION.

7. DESIGN ERECTION METHODS OVER THE RAILROAD ROW TO CAUSE NO INTERUPTION TO THE RAIL OPERATIONS, ENABLING THE TRACK TO REMAIN OPEN TO TRAFFIC PER THE RAILROAD'S REQUIREMENT. COORDINATE CONSTRUCTION WORK WINDOWS WITH RAILROAD REPRESENTATIVE.

8. DESIGN ALL CONSTRUCTION PHASING THAT MAY IMPACT THE RAILROAD OPERATIONS TO CAUSE NO INTERUPTION TO THE RAILROAD OPERATION, ENABLING THE TRACK TO REMAIN OPEN TO TRAFFIC PER THE RAILROAD'S REQUIREMENT. COORDINATE CONSTRUCTION WORK WINDOWS WITH THE RAILROAD'S REPRESENTATIVE.

9. COMPLY WITH MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK OUTLINED IN THE RAILROAD GUIDELINES.

10. VERIFY ALL PERMANENT CLEARANCES BEFORE PROJECT CLOSING.

11. FOR RAILROAD COORDINATION CONSULT WITH THE RAILROAD REPRESENTATIVE.

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TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
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PARMER LANE
AT SH 45
CAPMETRO
GENERAL NOTES

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	14

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PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the Right-of-Way and/or properties of the Railroad Company and adjecent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right-of-Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right-Of-Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right-Of-Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of Railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjecent to the Contract Site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a Railroad flag person will be required. At the direction of the Railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right-of-Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right-of-Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right-of-Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 90 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right-of-Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right-of-Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the Railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on Railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, CPKC will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right-of-Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF), (UPRR) and (CPKC) horizontal from centerline of track
B. 22' (CPKC) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

SHEET 1 OF 2

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

PARMER LANE AT SH 45

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS March 2025				
	DIST	COUNTY		SHEET NO.
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DATE:
FILE:

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the Project Site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
1. Pre-construction meetings.
2. Pile driving/drilling of caissons or drilled shafts.
3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
4. Erection of precast concrete or steelbridge superstructure.
5. Placement of waterproofing (prior to placing ballast on bridge deck).
6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontaland verticalclearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events willoccur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other Railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to Railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger Railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, Railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around Railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR- https://www.up.com/aboutup/community/telecom/groups/index.htm
72 HR NOTICE REQUIRED
1-800-336-9193
24 hrs/day for emergencies

BNSF- 1-800-533-2891 and 800-832-5452
24 hour number
5 working days notice required

CPKC- Call_B4UDig@cpkcr.com
1-800-387-1833 OR 1-888-678-7272 OPTION 3

If a telecommunications system is buried anywhere on or near Railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near Railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor-assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of ¼" vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the RIGHT OF ENTRY agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor work and at least 30 working days in advance of any Contractor work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right-of-Way and leave the Right-of-Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

PARMER LANE AT SH 45

FILE:	DN: _TxDOT_	CK: TxDOT	DW: _TxDOT_	CK: TxDOT
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March 2025	DIST	COUNTY		SHEET NO.
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DATE:
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Williamson County
Project: Parmer Lane at SH 45

GENERAL NOTES: May 20, 2025 Version

Basis of Estimate

Item	Description	**Rate	Unit
160	**Furnishing and Placing Topsoil (4")**	1 CY/9 SY	SY
164	**Seed for Erosion Control** (Item 164) (Temp) (Cool) (TY 4) (Item 164) (Temp & Perm) (TY 7) (Item 164) (Temp) (Warm) (TY 10) (Item 164) (Perm) (TY 11)	 4840 SY/AC 4840 SY/AC 4840 SY/AC 4840 SY/AC	 SY SY SY SY
168	**Vegetative Watering** (Item 164) (Perm)	 20 GAL/SY	 TGL
**204	**Sprinkling** (Dust) (Item 132)	 30 GAL/CY 30 GAL/CY	 GAL GAL
**210	**Roll (Flat Wheel)** (Item 316)	 1 HR/6000 SY	 HR
**210	**Roll (Tamping)** (Item 132)	 1 HR/200 CY	 HR
**210	**Roll (Heavy Tamp)** (Item 132)	 1 HR/200 CY	 HR
**210	**Roll (Lt Pneumatic Tire)** (Item 132) (Item 316) (Seal Coat)	 1 HR/500 CY 1 HR/6000 SY	 HR HR
247	**FL BS (CMP IN PLC)** (TY A GR 4) (TY A GR 4) (TY A GR 4)	 132 LB/CF 3564 LB/CY 27 CF/CY	 TON TON CY
260	**Lime** (Hydrated Lime (Slurry))	 36 LB/SY @ 8"	 TON
310	**Prime Coat (Multi Option)**	0.20 GAL/SY	GAL
316	**Underseal:** Asphalt Aggregate (Ty D, GR 5)	<u>Total</u> 0.32 GAL/SY 1 CY/150 SY	 GAL CY
341	**Dense-Graded Hot-Mix Asphalt** TY-B__ SAC-B __ PG 64-22 TY-D SAC-B PG 76-22	 110.0 LB/SY/IN 110.0 LB/SY/IN	 TON TON
3007	**Bonding Coarse**	0.12 GAL/SY	GAL
347	**Thin Surface Mixtures (TOM)** (Aggregate) SAC B	 113.0 LB/SY/IN	 TON

** For Informational Purposes Only

Williamson County
Project: Parmer Lane at SH 45

MODIFIED STANDARDS
The following standard detail sheet or sheets have been modified:

GENERAL
References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed shall be free of organic material prior to placing any section of the pavement structure.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Provide a smooth, clean saw-cut along the existing asphalt and concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Supply litter barrels in enough numbers at locations as directed to control litter within the project. Consider subsidiary to pertinent Items.

Use a self-contained vacuum broom to sweep the roadway and keep it free of sediment as directed. The contractor will be responsible for any sweeping beyond the normal maintenance required to keep fugitive sediment off the roadway as directed by the Construction Observer. This work is subsidiary.

Protect all areas of the right of way, which are not included in the actual limits of the proposed construction areas, from disturbance. Restore any area disturbed because of the Contractor's operations to a condition as good as, or better than, before the beginning of work at no cost to the County.

Damage to existing pipes and SETs due to Contractor operations shall be repaired at Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will

not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

The Project Superintendent will be capable of speaking English and will be available ***on the project at*** all times when work is being performed, including subcontractor work. The Superintendent will be available and on-call 24 hours a day.

Coordinate and obtain approval from the Construction Observer for all bridgework over existing roadways.

Measure all minimum vertical clearances for all structures (including, but not limited to, signal mast arms, span wires, and overhead sign bridge structures) within the limits of the project for all roadway alignments in all directions of travel. Coordinate with the Construction Observer to take these measurements and obtain prior to opening roadways to traffic unless otherwise approved. The Construction Observer will report all minimum vertical clearance information on State maintained roadways to the local bridge engineer at AUS_BRG_notify@txdot.gov.

Use materials from prequalified material producers list as shown on the Texas Department of Transportation (TxDOT) – Construction Division's (CST) materials producers list. Refer to TxDOT's website for list of pre-qualified manufacturers. No substitutions will be allowed for materials found on the list. Submit list of approved suppliers/materials from TxDOT website to show items are TxDOT approved. Submit this list with request for material approval.

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with the latest version of the TxDOT details, PCA-SUP and PCA-SUB found at https://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm

When any abandoned well is encountered, cease construction operations in this area and notify the Construction Observer who will coordinate the proper plugging procedures. A water well driller licensed in the State of Texas must be used to plug a well.

Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Track all exposed soil, stockpiles, and slopes. Tracking consists of operating a tracked vehicle or equipment up and down the slope, leaving track marks perpendicular to the direction of the slope. Re-track slopes and stockpiles after each rain event or every 14 days, whichever occurs first. This work is subsidiary.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed

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until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

No above ground storage tanks will be allowed.
Project Specific Location (PSL) in Edwards Aquifer Recharge and Contributing Zone.
Obtain written approval from the Construction Observer for all on or off right of way PSLs not specifically addressed in the plans. Provide a signed sketch of the location 30 business days prior to use of the PSL. Include a list of materials, equipment and portable facilities that will be stored at the PSL. County will coordinate with the necessary agencies. Approval of the PSL is not guaranteed. Unapproved PSL is not a compensable impact.

Project Specific Location (PSL) in USACE Jurisdictional Area.
Do not initiate activities in a PSL associated with a U.S. Army Corps of Engineers (USACE) jurisdictional area that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here means materials are delivered to or from the PSL. The jurisdictional area includes all waters of the U.S. including wetlands or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. Consult with the USACE regarding activities, including PSLs that have not been previously evaluated by the USACE. Provide the Construction Observer with a copy of all USACE coordination and approvals before initiating activities.

Proceed with activities in PSLs that do not affect a USACE jurisdictional area if self-determination has been made that the PSL is non-jurisdictional or proper clearances have been obtained in USACE jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. Document any determinations that PSL activities do not affect a USACE jurisdictional area. Maintain copies of PSL determinations for review by the County or any regulatory agency. The Contractor must document and coordinate with the USACE, if required, before any excavation material hauled from or embankment material hauled into a USACE jurisdictional area by either (1) or (2) below.

1. Restricted Use of Materials for the Previously Evaluated Permit Areas. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:
    a. suitable excavation of required material in the areas shown on the plans and cross sections as specified in Standard Specification Item 110, Excavation is used for permanent or temporary fill within a USACE jurisdictional area;
    b. suitable embankment from within the USACE jurisdictional area is used as fill within a USACE evaluated area;
    c. Unsuitable excavation or excess excavation that is disposed of at an approved location within a USACE evaluated area.
2. Contractor Materials from Areas Other than Previously Evaluated Areas. Provide the Construction Observer with a copy of all USACE coordination and approvals before initiating any activities in a jurisdictional area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:

a. Standard Specification Item 132, Embankment is used for temporary or permanent fill within a USACE jurisdictional area;
b. Unsuitable excavation or excess excavation that is disposed of outside a USACE evaluated area.

Work over or near Bodies of Water (Lakes, Rivers, Ponds, Creeks, Dry Waterways, etc.).
Keep on site a universal spill kit adequate for the body of water and the work being performed. Debris is not allowed to fall into the ordinary high-water level (OHWL). Debris that falls into the OHWL must be removed at the end of each workday. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event. Install and maintain traffic control devices to maintain a navigable corridor for water traffic, except during bridge demo and beam placement. When not in use and at the end of each work shift, all material and equipment must be stored more than 100 ft. away from the ordinary high-water mark. This work is subsidiary.

Obtain written approval from the Engineer for temporary fill or crossings not specifically addressed in the plans. Provide a signed sketch of the location 60 business days prior to begin work at the location. Approval of the work is not guaranteed. Unapproved work is not a compensable impact.

DSHS Asbestos and Demolition Notification.
Complete and provide the Texas Department of State Health Services (DSHS) notification form to the Construction Observer at least 30 calendar days prior to bridge or bridge class culvert removal or renovation. Notify the Construction Observer via email of any changes to the work start date.

Migratory Birds and Bats.
Migratory birds may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16th and February 28th. Prevent migratory birds from re-nesting between March 1st and September 15th.

All methods used for the removal of unoccupied bird nests and the prevention of re-nesting must be submitted to the Construction Observer for approval thirty days prior to begin work.

In the event that any active nests are encountered on-site during construction, all construction activity within 25 feet radius of the nest must cease immediately. Contact the Construction Observer to determine how to proceed.

Bats may roost within the project limits under bridges, in culverts, in large hollow trees, in dead standing trees, and in trees with shaggy bark. Maternity colonies may occur from April 1st through August 31st. If bats are present, ensure bats are not harmed. Exclusion protocols for known colonies should be followed well in advance of commencement of construction activities. Exclusion measures by qualified individuals are used to relocate existing colonies, except from April 1st through August 31st when such measures may separate mothers and pups. Exclusion measures are also the means of preventing establishment of new colonies and re-establishment of relocated colonies.

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No extension of time or compensation payment will be granted for a delay or suspension of work caused by migratory birds or bats. This work is subsidiary.

Law Enforcement Personnel. If a law enforcement officer is required, patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. Preference will be given to Williamson County officers or officers in local jurisdiction. No payment will be made for law enforcement used for moving contractor equipment.

The sequence of work shown on the plans demonstrates a volume of work available in each phase of construction that will ensure the Contractor is not impacted by the unapproved environmental permits, outstanding inter-agency agreements, right-of-way (ROW), railroad permits and utility conflicts. Contractor is to work on simultaneous phases or deviate from the sequence of work shown on the plans, as directed by the Engineer to keep progressing the work and minimize impacts to the project schedule.

ITEM 100 – PREPARING RIGHT OF WAY
Do not burn brush, unless otherwise approved.

Trim vegetation around signs and other obstructions. Consider subsidiary to pertinent Items.

Use hand methods or other means to remove objectionable material and obstructions, if doing work by mechanical methods is impractical. Consider subsidiary to the pertinent Items.

Tree removal is subsidiary to this item. The size and quantity of trees shown are approximate and are provided for information only, if provided in project plan set.

Prep ROW limits include the entire limits of construction from ROW line to ROW line and includes all easements for construction and drainage, unless otherwise noted on the plans. No additional payment will be made for clearing of other areas necessary to complete the Work.

ITEM WC101 – SOIL RIPPING
Soil Ripping, as required for all projects in Special Specification WC101, shall be accomplished using the following values:

Spacing for slopes between 3:1 and 4:1, groves should be 16 inches on center.

For slopes flatter than 4:1, groves should be 12 inches on center.

Depth of compacted soils should be ripped to a depth of 18 inches. When embankment stabilization is a concern, ripping depth can be reduced to 12 inches.

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ITEM 110 & 132 – EXCAVATION & EMBANKMENT
At no time will the retaining wall backfill material exceed the adjacent embankment operation by more than one embankment lift. At no time will the embankment adjacent to the retaining wall backfill exceed the wall backfill by any elevation.

In sections of Excavation (cut), the removal of existing asphalt and base (Item 105 Removing Treated and Untreated Base and Asphalt Pavement) is subsidiary to Item 110 Excavation.

In Embankment sections (fill), the removal of existing asphalt pavement shall be subsidiary to Item 132 Embankment. Existing base may remain in place under embankment.

Unsuitable material encountered in a cut or fill section will be considered waste. Replacement of unsuitable material will be paid for using excavation and embankment bid items. The Construction Observer will define unsuitable material. Material, which the Contractor might deem to be unsatisfactory or unsuitable, due to moisture content, will not be considered unsuitable material, unless otherwise approved.

Obtain approval of all compaction equipment prior to all backfilling and embankment operations.

ITEM 132 – EMBANKMENT
The underlying layer or existing subgrade must be prepared and inspected prior to placement of the embankment. Proof roll the pavement area according to Item 216 prior to placement of embankment or subsequent layers. Payment for proof rolling will be subsidiary to the various bid Items of the contract.

Correct unstable material (e.g., dry, wet, loose, etc.) to a depth of six (6) inches below existing grade. This work will be considered subsidiary to pertinent bid Items. Drying required deeper than six (6) inches below existing grade will be paid for in accordance with General Condition 6.03, "Extra Work." However, there will be no payment to correct failures in the subgrade areas that were constructed under this Contract.

ITEM 132 – EMBANKMENT TY C The Construction Observer must approve the embankment material before use on the project. Do not furnish shale clays. Furnish embankment with sulfate content less than 3000 ppm if treated with calcium-based chemicals or within 5 ft. of the finished subgrade elevation. Existing material from within the project limits that meets the Type C Substitute requirements may be substituted for Type C but is not allowed to substitute for C1, C2, or density-controlled material. Offsite material may be used to blend with onsite material to achieve the Type C requirements. The Type C substitute may also be existing material in accordance with Item 132 for rock embankment.

Type C			
Percent Retained 3"	LL Max	PI Max	PI Min
0	55	20	6
Type C Substitute			
Percent Retained		PI	

Williamson County
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Type C				
Percent Retained		LL Max	PI Max	PI Min
3"				
3"	#4		Max	
Max 10	10-90		25	

Embankment Material Requirements – Item 132TY C

(TY C1 and C2 table requires Lab approval.)

TY C1 and C2

Description	Percent Retained					LL Max	PI Max	PI Min
	3"	1 3/4"	3/8"	#4	#40			
Embankment (Ordinary) (TY C1)	0	0-10	-	45-75	60-85	45	20	6
Embankment (Ordinary) (TY C2)	-	-	0	30-75	50-85	55	25	8

Embankment placed over the area of MSE backfill must meet the same backfill requirements for the type specified under Item 423 in the plans.

If abutment backfill is granular, provide weep holes in wingwalls.

Stockpile imported TY C embankment at an approved location until it meets all testing requirements. Offsite material may be used to blend with onsite material to achieve the Type C requirements. The stockpile must be between 500 CY and 5000 CY and must not exceed a height of 15 ft. It is the Contractor's responsibility to identify and notify the Construction Observer of the location of the borrow source to allow time for testing and approval to avoid delay to the project. Allow a minimum of five (5) working days for testing.

ITEMS 160, 164, & 168
Use Wilco Special Provisions for all 160 Items
ITEM 160 – TOPSOIL
No sandy loam allowed. Obtain approval of the actual depth of the topsoil sources for both on-site and off-site sources.

ITEM 164 – SEEDING FOR EROSION CONTROL
Item 164-WC11 (Type 11 seed) is to be used in eastern areas of the county for Temporary Warm and Permanent applications where use of off-site herbicides limits establishment of seasonal seeding. The quantity shown in the plans is 1.5 times the total seeding area to provide quantity for the Temporary and Permanent Warm use of the grass. Item 164-WC04 (Type 4 seed) should also be included at 0.5 of the total seeding area to provide Temporary Cool season coverage.

ITEM 204 – SPRINKLING
Apply water for dust control as directed. When dust control is not being maintained, cease operations until dust control is maintained. Consider subsidiary to the pertinent Items.

ITEM 216 – PROOF ROLLING
Correct and perform "Proof Rolling" retest at the Contractor's expense, to the satisfaction of the Construction Observer, when initial "Proof Rolling" yields a failing result. All Proof Rolling is subsidiary to pertinent items.

ITEM 247 – FLEXIBLE BASE
Furnish Type _A_ material.

Furnish flexible base meeting Grade _4_ requirements.

The layer thickness will be 4 in. to 6 in. unless shown on the plans. Placing in a single layer is allowed when total thickness of base is less than 8 in. When placed in multiple layers, compact the bottom and middle layers to at least 95% and 98% of the maximum dry density, respectively. When placed in a single layer or the final layer, compact to at least 100%. Maximum density shall not exceed 105%. Any density test result exceeding 105% requires additional sample testing and proctor.

Referee testing will be performed by a mutually agreed third party laboratory.

Table 1
Flexible Base Material Requirements

Property	Test Method	Grade 4
Master gradation sieve size	Tex-110-E	**% Retained**
2½ in.		0
1¾ in.		0
7/8 in.		10-35
3/8 in.		30-65
No. 4		45-75
No. 40		70-90
No. 200		87-95
Liquid Limit, % Max.[1]	Tex-104-E	35
Plasticity Index, Max.[1]	Tex-106-E	10
Wet ball mill, % Max.	Tex-116-E	40
Wet ball mill, % Max. increase passing the No. 40 sieve		20
Min. compressive strength, psi	Tex-117-E	
Lateral pressure 0 psi		–
Lateral pressure 3 psi		90
Lateral pressure 15 psi		175

1. Determine plastic index in accordance with Tex-107-E (linear shrinkage) when liquid limit is unattainable as defined in Tex-104-E.

Correct subgrade (e.g., unstable areas, soft spots, etc.) prior to placing Flex Base. Consider subsidiary to the pertinent Items.

Williamson County
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Complete all subgrade, ditches, slopes, and place all drainage structures to conform to required lines, grades, and cross-sections, as shown and directed, prior to the placement of Flex Base.

ITEM 260 – LIME TREATMENT (ROAD-MIXED)
Apply Commercial Lime Slurry as directed or as indicated in the plans and specifications. For embankment sections four feet thick or less, when select material is used, the existing material shall be lime treated prior to placing any embankment material. The compaction method shall be Density Control.
The Contractor is responsible for testing of materials encountered at subgrade to determine the target lime content and optimum moisture content in accordance with Tex-121-E. The test results shall be submitted to the Construction Observer for concurrence 10 days prior to application and processing of the lime into the subgrade. The Contractor may propose a mix design developed in accordance with Tex-121-E. The Engineer will use Tex-121-E to verify the Contractor's proposed mix design before acceptance. The Construction Observer will provide written confirmation of lime content prior to application. All testing should be performed according to the Guide Schedule for Sampling and Testing included in the Project Construction Manual. All testing should be performed according to the Guide Schedule for Sampling and Testing included in the Project Construction Manual. Additionally, field samples shall be tested in accordance with Tex-121-E Parts II and III and have a minimum pH of 12.4.

Measure the sulfate content, in accordance with Tex-145-E, for subgrade soil to be treated. Perform one test per 500 ft. measured along roadway centerline.

If the sulfate content is less than or equal to 3000 ppm, apply, mix, and mellow the subgrade soil with lime slurry in accordance with the standard specification. Hydrated lime or lime slurry can be used when the sulfate content is below 3000 ppm.

If the sulfate content is greater than 3000 ppm, but less than or equal to 7000 ppm, perform the following after applying and mixing lime slurry into the subgrade:

- Apply an additional 4 percentage points of moisture above optimum moisture
- Mix in the additional moisture
- Allow the mixture to mellow at least 7 days

Use lime slurry when sulfate content is greater than 3000 ppm, but less than or equal to 7000 ppm.

The Contractor is responsible for determining the roadway density and moisture content of completed sections in accordance with Tex-115-E. Compact the lime treated subgrade to at least 95% of the maximum density determine in accordance with Tex-121-E.

Before final acceptance, the Contractor shall perform tests to measure the treated depth of the lime treated material in accordance with Tex-140-E at the locations determined by the Engineer.

The Contractor must correct areas deficient by more than ½ in. in thickness or more than ½% in target lime content by adding lime as required, reshaping, recompacting, and refinishing at the Contractor's expense.

ITEM 300 – ASPHALTS, OILS, AND EMULSIONS
Asphalt season starts May 1st and ends September 15th. Emulsified Asphalt season is April 1 through October 15.

PPA and REOBs are not allowed.

Furnish a tack coat as directed by the Construction Observer. Apply tack coat at 0.08 GAL/SY (residual). Tack coat to be considered subsidiary to HMAC items.

ITEM 300 – ASPHALTS, OILS, AND EMULSIONS (NON-TRACKING TACK COAT)
Apply non-tracking tack coat at 0.08 GAL/SY (residual) or as directed by the Construction Observer.

Furnish QS-1HH or CQS-1HT tack coat for Thin Surface Overlay Mixtures meeting the following requirements:

Property	Test Procedure	Quick Setting QS-1HH	
		Min.	Max.
Viscosity, Saybolt Furol, 77ºF, sec.	T 72	15	–
Storage Stability, 1 Day, %	T 59	–	1
Settlement, 5-day, %	T 59	2	5
Sieve Test, %	T 59	–	0.30
Distillation Test:[1]			
Residue by distillation, % by wt.	T 59	50	–
Oil distillate, by volume of emulsion		–	1.0
Test on residue from distillation:			
Penetration, 77ºF, 100g, 5 sec.	T 49	–	20
Solubility in trichloroethylene, %	T 44	97.5	–
Softening point, ºF	T 53	150	–
Dynamic shear, G*/sin(d), 82ºF, 10 rad/s, kPa	T 315	1.0	–

1. Exception to AASHTO T-59: Bring the temperature on the lower thermometer slowly to 350ºF ± 10ºF. Maintain at this temperature for 20 min. Complete total distillation within 60 ± 5 min. from first application of heat.

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Property	Test Procedure	Quick Setting CQS-1HT	
		Min.	Max.
Viscosity, Saybolt Furol, 122ºF, sec	T 72	15	100
Storage stability, 1 Day, %	T 59	–	1
Sieve Test, %	T 59	–	0.10
Particle Charge Test	T 59	Positive	
Track free time[1], minutes	Test Strip	–	30
Distillation Test:[2]	T 59		
Residue by distillation, % by wt.		58	
Test on residue from distillation:			
Penetration, 77ºF, 100g, 5 sec.	T 49	40	90

1. Exception to AASHTO T-59: Bring the temperature on the lower thermometer slowly to 350ºF ± 10ºF. Maintain at this temperature for 20 min. Complete total distillation in 60 ± 5 min. from first application of heat.

Spray a test strip of tack coat at a location on or near the project as directed. Consult the manufacturer for the recommended application rate. Allow the strip to cure for the maximum time specified. Drive over the test strip with equipment to simulate the effect of paving equipment. There should be no evidence tracking or picking up of the tack coat on the wheels of the equipment.

The Construction Observer shall verify the bond strength as directed.

ITEM 302 – AGGREGATES FOR SURFACE TREATMENTS
Previously tested aggregates delivered to the project, which are found to contain excessive quantities of dust (more than 0.5% passing the No. 40 sieve) during pre-coating, stockpiling, or hauling operations, will be rejected, unless otherwise directed. Use test method Tex-200-F, Part II, for testing.

Table 3 Los Angeles Abrasion, % Max., is lowered from 35 to 30 and is applicable to all aggregates.

When TY E is allowed, furnish coarse fractionated recycled asphalt pavement (CF-RAP). CF-RAP aggregate stockpiles must be approved on a stockpile-by-stockpile basis, unless approved by the Construction Observer. Do not exceed stockpiles greater than 2000 tons.

CF-RAP shall meet the below gradation requirements or Grade 4 or finer. CF-RAP shall meet deleterious material and decantation requirements in accordance with Table 3.

Furnish CF-RAP meeting the following gradation requirements, after ignition burn-off of pre-existing asphalt, unless otherwise approved:

Sieve	Cumulative % Retained
5/8"	0
1/2"	10-25

Sieve	Cumulative % Retained
3/8”	60-80
#4	85-100
#8	90-100

ITEMS 310, & 316
Perform work during good weather, unless otherwise directed. If work is performed at Contractor’s option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

ITEM 310 – PRIME COAT
Apply blotter material to all driveways and intersections.

Use bituminous material of the type Multi-Option.

Provide Construction Observer with current Distributor Certification confirming calibration of asphalt measurement equipment.

Distribute prime coat smoothly and evenly at the rate of __0.20__ gallons per square yard.

Apply Prime to finished flex base surface at the rate shown in the plans. Hot mix can be applied to the primed surface of flex base after the prime has penetrated and cured for a minimum of 36 hours depending on weather conditions or as approved by the Construction Observer. Provide the Construction Observer with a copy of the asphalt deliver ticket prior to application.

Apply blotter material to all driveways and intersections. This work is subsidiary. When Multi Option is allowed, provide MC 30, EC 30, or AE-P.

ITEM 316 – SEAL COAT
Use ionically compatible asphalt to precoated aggregate, which is compatible with the asphalt specified for each specific Surface Treatment.

Do not apply asphalt within 1½ hours of sunset, or later, unless otherwise directed.

Grade 4 and 5 Type D or Type E is allowed as AGGR (MULTI OPTION) for an underseal.

Ensure that all underseal surface treatment operations are covered by HMACP before exposing to traffic, including construction traffic.

Apply both the first and second course of the two-course surface treatment on the same day.

Use paper or other approved material at the beginning and end of each shot so that the transverse joint is straight and prevents overlap of asphalt shots.

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Any areas with excessive asphalt or aggregate will be removed.

The Contractor is required to provide recommendations to the Construction Observer on adjusting aggregate and asphalt rates, when the road conditions, material properties or construction methods change.

Furnish medium pneumatic-tire rollers in accordance with Item 210, “Rolling.” Roll before opening to traffic.

Surface all transitions, tapers, climbing lanes and intersections to the limits as directed.

Keep all traffic, including construction traffic, off freshly placed surface treatment, as directed.

Provide Construction Observer with current Distributer Certification confirming calibration of asphalt measurement equipment.

Provide Construction Observer with a copy of the shipping ticket for the asphalt prior to application. Contractor must sample asphalt, in accordance with the applicable item. Label the sample can with date and project numbers. Samples must be stored where they are readily available to the County representative at the plant. The Contractor will be responsible for supplying storage for all samples until the project achieves substantial completion or otherwise directed.

Removal and proper disposal off the ROW of audible/profile markings, reflectorized markings, and raised markers is subsidiary.

ITEM 320 – EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT
Use of motor grader is allowed for placement of mixtures greater than 10 inches from the riding surface, when hot mix asphalt is used in lieu of flexible base, or as allowed by the Construction Observer.

ITEMS 341, & 347 (HMACP Testing)
Hot Mix Asphaltic Concrete (HMAC) Core Holes
Refill and compact all HMAC core holes to the same elevation as the adjacent roadway. Use hot mix of the type being used in the project to fill core holes. As an alternative a high-performance cold patching mix such as Rapid Cure Patching Mix meeting the requirements of DMS-9203, or Medium Cure Patching mix made with SCM meeting requirements of DMS-9202. Consider this work subsidiary to the pertinent Items.

Mill a transverse butt joint to transition from the new ACP to the existing surface tie-in. Make the transition a minimum of 50 feet H: 1-inch V slope ratio of newly placed ACP. Make the temporary joint, at the tie-in, a minimum of 10 feet longitudinally and covering the entire width. Saw-cut existing pavement as directed. Prior to milling, core the existing pavement to determine its thickness. Do not proceed with milling until directed. Consider this work subsidiary to the pertinent Items.

ITEMS 341 – DENSE-GRADED HOT-MIX ASPHALT
Contractor to submit for approval a current mix design (less than 6 months old) to the Construction Observer that meets the following requirements prior to use on the project.

PPA and REOBS are not allowed.

Lime or an approved anti-stripping agent must be used when crushed gravel is utilized to meet a SAC "A" requirement.

Aggregates used on shoulders and ramps are required to meet SAC requirements.

Target laboratory molded density is 97% for all mixtures for Texas Gyratory Compactor (TGC) mixture designs.

When using Superpave Gyratory Compactor (SGC) to design mixtures, submit the SGC mix design to the Construction Observer for approval.

When using substitute binders, mold specimens for mix design and production at the temperature required for the substitute binder used to produce the HMA.

All mixtures must meet the Hamburg requirement as stated in the table below.

High-Temperature Binder Grade	**Test Method**	**Hamburg Wheel Test Requirements [1]**		
		Minimum # of Passes	**Maximum Rut Depth (mm)[2]**	**Minimum Rut Depth (mm)[2,3]**
PG 64 or lower	Tex-242-F	7,000	12.5	3
PG 70	Tex-242-F	15,000	12.5	3
PG 76 or higher	Tex-242-F	20,000	12.5	3

1. The Construction Observer may accept Hamburg Wheel test results for production and placement if no more than 1 of the 5 most recent tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.
2. Rut depth tested @ 122°F
3. Unless approved otherwise.

Remove and dispose of off the ROW the audible/profile markings, reflectorized markings, and raised markers.

Install a butt joint with 24 in. H: 1 in. V transition from the new ACP to a driveway, pullout, or intersection. Saw cut the existing pavement at the butt joints. This work is subsidiary.

Use a device to create a maximum 3H:1V notched wedge joint on all longitudinal joints of 2 in. or greater. This work is subsidiary.

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Prior to milling, core the existing pavement to verify thickness. This work is subsidiary.

Ensure placement sequence to avoid excess distance of longitudinal joint lap back not to exceed one day's production rates.

Submit any proposed adjustments or changes to a JMF before production of the new JMF.

Tack every layer. Do not dilute tack coat. Apply it evenly through a distributor spray bar. Provide a minimum transition of 10' for intersections, 10' for commercial driveways, and 6' for residential driveways unless otherwise shown on the plans.

Irregularities will require the replacement of a full lane width using an asphalt paver. Replace the entire sublot if the irregularities are greater than 40% of the sublot area.

Lime or an approved anti-stripping agent must be used when crushed gravel is utilized to meet a SAC "A" requirement.

When using RAP and/or RAS:
Use of RAS is not allowed. When using RAP, include the management methods of processing, stockpiling, and testing of RAP in the QCP submitted for the project. Blending of RAP in one feeder bin or in a stockpile is not permitted.

RAP is not allowed for any surface mix applications.

No more than 20% RAP by weight of aggregate is allowed in any mix application.

Complete all roadways before final surface course placement, unless directed otherwise.

Ensure placement sequence to avoid excess distance of longitudinal joint lapback not to exceed one day's production rates.

The Contractor shall utilize a material transfer device per item 320 and a grade reference (such as a ski) for overlay operations. Consider subsidiary to the pertinent items.

Use a device to create a maximum 3H: 1V notched wedge joint on all hot mix joints of two (2) inches or greater. Consider subsidiary to the pertinent Items.

Taper transverse faces at ends of passes as directed.

Make transverse tapers on each end of pass using a minimum slope rate of 60H:1V. Tapers shall be removed directly before placement of final lift. Consider subsidiary to the pertinent Items.

Provide a minimum transition for all side streets of at least 12 ft. and driveways of at least six (6) feet, unless otherwise shown on the plans or otherwise approved/directed.

Tack every intermediate layer, unless otherwise directed. Do not dilute tack coat. Apply it evenly through a distributor spray bar. Provide a minimum transition of 10' for intersections, 10' for commercial driveways, and 6' for residential driveways unless otherwise shown on the plans. Submit any proposed adjustments or changes to a job mix formula to the Construction Observer before production of the new job mix formula.

For Mixture Design Verification, provide the Construction Observer with two 5-gallon buckets of each aggregate stockpile to be used on the project with three gallons of each PG binder from the plant to be used on the project. Sufficient quantities of any other additives that will be used in the HMA mixture shall also be provided.

Prior to allowing production of the trial batch, the Construction Observer will use the materials provided by the Contractor to perform the following tests to verify the HMA mixture.

1. Indirect Tensile Test in accordance with Tex-266-F
2. HAMBURG Wheel Test in accordance with Tex-242-F
3. Overlay Test in accordance with Tex-248-F
4. Cantabro Test in accordance with Tex-245-F

For mixtures designed with a Texas Gyratory Compactor (TGC), the Construction Observer may require that the target laboratory molded density be raised to no more than 97.5% or may lower the design number of gyrations to no less than 35 for mixtures designed with an SGC if any of the following conditions exist:

1. The Indirect Tensile Test results in a value greater than 200 PSI
2. The Hamburg Wheel Test results in a value less than 3.0 mm
3. The Overlay Test results in a value less than 100 cycles
4. The Cantabro Test results in a value of more than 20% loss

In lieu of or in addition to evaluating the mixture design prior to allowing a trial batch to be produced, the Construction Observer may also evaluate the mixture produced during the trial batch for compliance with the four tests listed above.

Submit thermal and segregation profiles as well as longitudinal joint densities on electronic forms provided by County to the Construction Observer.

When surface irregularities, as defined in Article 3076.4.9.3.3.5, "Irregularities," are detected or measured, the Contractor must take immediate corrective action defined as the removal and replacement of a full lane width of the defective area using a paver to place new mix, unless otherwise directed. Replace the entire sublot if the irregularities are greater than 40% of the sublot area.

Referee testing will be performed by a mutually agreed third party laboratory.

ITEM 347 – THIN OVERLAY MIXTURES (TOM)
Provide informational shear bond strength testing in accordance with Item 341.

For SAC A, blending SAC B aggregate with an RSSM greater than the SAC A rating or 10, whichever is greater, is prohibited.

Produce mixture with a Department approved WMA additive or process to facilitate compaction when the haul distance is greater than 40 miles or when the air temperature is 70°F and falling. WMA processes such as water or foaming processes are not allowed under these circumstances.

Use of pneumatic-tire rollers is prohibited.

Water flow rate should exceed 120 seconds tested in accordance with Tex-246-F. The Construction Observer will require the Contractor to perform water flow rate testing at least once per lot.

ITEM 351 – FLEXIBLE PAVEMENT STRUCTURE REPAIR
All repairs shall be made using HMA Type B PG 64-22 unless specified in the plans.

When performing repair work under this Item in conjunction with an overlay or seal coat project, perform all repair work, established by the Construction Observer, within one paving season. If repair work is not complete within this timeframe, any additional damage beyond what was originally established and identified for repair work occurs and requires repair work will be performed at the Contractor's expense, unless approved otherwise.

Perform repair work to the limits identified by the Construction Observer.

ITEM 354 – PLANING AND TEXTURING PAVEMENT
Milling machines must be able to meet the longitudinal grade and cross slope required.

Remove the loose material from the roadway before opening to traffic.

Plane a full lane width before opening to traffic at the end of a work period. Complete seal coat or overlay of planed surface within 24 hours of planing operation.

A single cut will be permitted if at most a 1¼-inch vertical offset is created against adjacent lanes when opened to traffic at the end of a work period.

Accomplish the 2-inch Planed Butt Joint only when there is at least 4 inches of existing thickness of ACP. Consider the determination of existing thickness of ACP as subsidiary to the various Items.

Taper planing at bridge ends as directed. Plane taper surfaces before placing HMACP to allow a minimum of 1-inch surface course to abut the bridge ends.

Make Transverse Tapers on each end of each pass using a minimum slope rate of 50 feet H to 1-inch V.

Retain ownership of planed materials.
Plane the designated areas and depths specified in the plans, including bridge decks, shoulders, and ramps, as required. Mill the pavement producing a final pavement surface with transverse

pattern of 0.2 inches center to center of each strike area with difference no greater than 1/16 inch between the ridge and valley (RVD) measurement of the final milled surface. Construct a uniform finish free from gouges and ridges that does not vary more than 1/8 inch in width of the cut.

Use planning machine that is power-driven, self-propelled micro-milling equipment possessing the size and shape to allow traffic safe passage through areas adjacent to the work.

Also, ensure the micro milling equipment will be:

- Equipped with a cutting mandrel with carbide or equivalent tipped cutting teeth designed for micro-milling bituminous pavement full lane width to close tolerances
- Capable of removing pavement to an accuracy of 1/16 inch (1.6 mm) with a maximum tool spacing of 5/8 inches
- Equipped with grade and slope controls operating from a string line or ski and based on mechanical or sonic operation
- Furnished with a lighting system for night work, as necessary
- Provided with conveyors capable of side, rear, or front loading to transfer the milled material from the roadway to a truck

Prior to commencement of the work, construct a test section that is 1000 ft. in length with a uniformly textured surface and cross section as approved by the Construction Observer to demonstrate compliance with the transverse pattern, cross slope, and RVD measurement requirements. Stop milling operation and submit a written plan of action detailing proposed steps to improve operations if any of these requirements are exceeded in the test section. If approved by the Construction Observer, construct another 1000 ft. test section in a different area than the initial section using the approved corrective action. The second test section is subject to the same requirements as those required in the initial test section. Continual micro-milling is prohibited until an acceptable test section is obtained.

Ensure micro-milling methods produce a uniform finished surface and maintain a constant cross slope between pavement edges in each lane. Provide positive drainage to prevent water accumulation on the micro-milled pavement, as shown on the Plans or directed by the Construction Observer. The cross slope must be uniform with no depressions or slope misalignments greater than ¼ per 12 ft. exit when the slope is tested with a straightedge placed perpendicular to the center line.

Bevel back the longitudinal vertical edges greater than two (2) inches (50 mm) produced by the removal process and left exposed to traffic. Bevel the vertical edges back at least three (3) inches for each two (2) inches (75 mm for each 50 mm) of material removed. Use an attached mold board or other approved method.

Taper the transverse edges 10 ft. (3 m) to avoid creating a traffic hazard and to produce a smooth surface when removing material at ramp areas and ends of milled sections.

Protect with a temporary asphaltic concrete tie-in (paper joint) vertical edges at other areas such as bridge approach slabs, drainage structures, and utility appurtenances greater than ½ in areas left open to transversing vehicles. Place the temporary tie-in at taper rate of at least 6 to 1 horizontal

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to vertical distance. Do not micro-mill bridge joints. Damage due to micro-milling will be repaired at the Contractor's expense and to the satisfaction of the Construction Observer.

Remove dust, residue, and loose milled material from the micro-milled surface. Do not allow traffic on the milled surface and do not place asphaltic concrete on the milled surface until removal is complete.

Measure the milled surface with a 10-foot straightedge at locations determined by the Construction Observer for quality acceptance and acceptance of test section of milling operation. Remove and replace any areas exceeding 1/8-inch RVD, as directed by the Construction Observer at no cost to the County.

ITEM 400 – EXCAVATION AND BACKFILL FOR STRUCTURES
Cut pavements with the use of a saw as directed. Consider subsidiary to pertinent Items.

Obtain approval of all compaction equipment prior to all backfilling and embankment operations.

Backfill the bridge ends with Cement Stabilized Backfill. The cost of this material will be subsidiary to embankment.

If the bridge includes an approach slab, extend the limits of the backfill to 10 ft. beyond the end of the approach slab. This work is subsidiary.

Use Class "B" sand bedding for pipe and box culvert installation unless otherwise directed.

Crusher screening fines will not be allowed.

ITEM 416 – DRILLED SHAFT FOUNDATIONS
Stake all Foundations, for approval, before beginning drilling operations, as directed. Examples of types of foundations are Bridge Supports, Traffic Signal Pole Foundation, Roadway Illumination Assembly Foundations, Sign Support Locations, etc.

Calculate the vertical signal head clearance before placing any Traffic Signal Pole Foundation.

Obtain approval before placing additional exposed Traffic Pole Foundation.

Set anchor bolts for Mast-Arm Signal Poles and Strain Poles. Set two in tension and two in compression. Obtain approval of anchor bolt placement as directed before placing concrete.

Field cut holes for anchor bolts only as directed.

Class "C" concrete will be required for drilled shaft foundations involving overhead sign structures.

Remove spoils, daily, out of flood plain, or as directed.

ITEM 432 – RIPRAP
Fibers for Concrete as defined in DMS-4550 will not be allowed.

Make five (5) inches thick unless otherwise noted or directed.
Make all mow strip riprap four (4) inches, unless otherwise directed.

Saw-cut existing riprap then epoxy 12 in. long No. 3 or No. 4 bars 6 in. deep at a maximum spacing of 18 in. in each direction to tie new riprap to existing riprap. This work is subsidiary.
Provide Type A Grade 3, 4 or 5 flexible base for cement stabilized riprap. Compressive strengths for flexible base are waived.

Additional riprap may be required, as determined by the Construction Observer, near the end of project completion, due to unanticipated erosion locations. Any additional, approved riprap will be paid under this Item.

Consider saw cutting of riprap as subsidiary.

Provide Class B Concrete for riprap.

Provide Class II Concrete for pneumatically placed concrete.

Stone Riprap may be artificial stone.

Grout is required for Stone Riprap.

Mortar is required for Stone Riprap.

Remove all loose Formwork and other Materials from the Floodplain or drainage areas, daily, which could float off in a Storm Water Event, as directed.

ITEM 450 – RAILING
Concrete railing, both on bridge and off, shall be constructed to match geometry and grades shown in the plans. Railing shall be constructed to a tolerance within a 1/4" per 10 feet, using a straight edge. Railing not within tolerance parameters is subject to removal or repair as directed by the Construction Observer. Rework is at the Contractor's expense.
Use the elliptical tube option for rails T401, T402, and C402.

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ITEM 464 – REINFORCED CONCRETE PIPE
No cross pipes or parallel pipes that are less than 24 inches, inside diameter, in Fill/Wall sections.

ITEM 465 – JUNCTION BOXES, MANHOLES AND INLETS
Provide Shop Drawings, signed and sealed by a Licensed Professional Engineer, for all precast junction boxes, manholes or inlets that are not manufactured by suppliers on TxDOT's approved MPL. Indicate the appropriate design load as shown on the plans LRFD and the maximum design depth of fill.

Contractor to use a generic manhole lid on any Williamson County owned manholes. Entity-specific lids shown in plan details are only to be used if the manhole is owned by that entity.

Curb Inlet heights (H) shown in plans are for contractor information. Curb & gutter at curb inlets should be constructed to match profile and cross slope of roadway.

Backfill shall use cohesionless material per Item 400 or flowable fill if width between structure and extent of excavation is 2 ft. or less. This work is subsidiary.

Consider excavation and backfill, frames, grates, rings, and covers subsidiary to pertinent Items.

Provide temporary drainage at each curb inlet and maintain until the final course of asphaltic concrete pavement is placed.

Remove all loose Formwork and other Materials from the Floodplain or drainage areas, daily, which could float off in a Storm Water Event, as directed.

ITEM 467 – SAFETY END TREATMENT
Cut pipe ends, in the field, to match roadway side slopes, or as directed. Apply asphalt base aluminum paint to the cut ends.

All Type II SETs shall have mitered pipe ends and cast-in-place riprap aprons.

Use Class **C** concrete.

Remove all loose Formwork and other Materials from the Floodplain or drainage areas, daily, which could float off in a Storm Water Event, as directed.

ITEM 502 – BARRICADES, SIGNS, AND TRAFFIC HANDLING

Unless otherwise approved, one (1) lane in each direction shall remain open at all times.

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No work will be allowed between 8:00 PM to 5:00 AM without approval from Construction Observer. Nighttime closures will only be allowed with approval from Construction Observer and only from 8:00 PM to 5:00 AM, unless otherwise shown on the plans.

No Daytime Lane Closures will be allowed, unless otherwise shown on the plans or as directed by the GEC.

The GEC is the authority to approve additional lane closures, prior to any work.

Maintain a written record of documentation of "The Additional Approved Lane Closures."

Submit and secure concurrence, prior to the publication of any notices or placement of any traffic control devices for implementation of the traffic control plan, hereinafter called a Lane Closure Notice (LCN).

Present to GEC, an LCN for traffic control, which is proposed for implementation, a minimum of four (4) full working days preceding any proposed implementation date. Indicate the estimated date, time, duration, and location for the proposed work. As a part of the LCN submit a written description of the lane closure(s) depicting the proposed traffic control devices used, based on the appropriate plan sheet, TxDOT or Texas Manual on Uniform Traffic Control Devices (TMUTCD) standards, and an operational description of the work to be performed.

Present to GEC, LCN's proposed to detour traffic, a minimum of ***seven (7)*** full calendar days preceding any proposed implementation date.

Present to GEC, LCN's proposed for night work, a minimum of ***seven (7)*** full calendar days preceding any proposed implementation date.

Receive concurrence prior to LCN implementation.

Submit a cancellation of any lane closures, no later than noon on the day preceding the proposed work.

Coordinate lane closures with adjacent projects.

Take immediate action to modify Closures / Traffic Control, if at any time backup (roadway queuing) becomes unreasonable (greater than 20 minutes). Have in place, a contingency plan of how this will occur.

Utilize Shadow Vehicle with Truck Mounted Attenuator for setup and removal of each lane closure.

Do not set up any Lane Closure / TCP when the pavement is wet prior to the "setup," unless otherwise directed. Revise Traffic Control, when inclement weather is imminent, as directed.

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Incorporate and maintain a 3H: 1V safety wedge into the proposed construction for any roadway edge of 2 inches or greater adjacent to a roadway under traffic.

Within the limits of the project, provide standard barricades, warning signs, delineators, lights, 28-inch cones, and flaggers in enough numbers and combinations, as directed.

For lanes use night-work and same-night remove-and-replace operations.

Temporarily relocate mailbox assemblies as shown on the plans or as directed. Maintain access to all mailboxes throughout the duration of the project. Maintenance of existing mailboxes is subsidiary to Item 502.

No closures will be allowed on the weekends, which include the following holidays: January 1st, the last Monday in May, July 4th, the first Monday in September, the fourth Thursday in November, December 25th, Easter weekend, and the working day prior to or immediately after any of the aforementioned holidays. Unless otherwise approved, no closures will be allowed on the weekends of special events that could be impacted by the construction. Ensure all equipment, vehicles, workers, etc., associated with these closures are off the roadways and all lanes re-opened, at least, by noon of the Friday before these holidays and special events.

Maintain a minimum of **2** through lane(s) in each direction, during the daylight hours, as directed.

Provide uniformed law enforcement personnel with officially marked patrol vehicles as directed.

Business access signs will be paid using safety contingency. Install as directed by the Engineer. Company logos will not be permitted on the signs. Maintenance of the signs will be subsidiary to Item 502.

ITEM 503 – PORTABLE CHANGEABLE MESSAGE SIGN

Place PCMS **07** calendar days prior to begin work stating what is to happen and dates, for example as follows. "Road Closure, Use Detour, To Begin xx/xx/2026".

Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as "RIGHT LN CLOSED XXX FT."

ITEM 505 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR

The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.
TMA/TAs used to protect damaged attenuators will be paid by the day using the force account item for the repair.

In addition to the TMA/TA required per the TCP plans and standards, provide **1** additional TMA/TA for **median construction.**

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS
If SW3P plan sheets are not provided, place the control measures as directed.
Install, maintain, remove control measures in areas of the right of way utilized by the Contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

Erosion control measures must be initiated immediately in areas where construction activities have ceased and will not resume for a period exceeding 14 calendar days. Vertical track all exposed soil, stockpiles, and slopes. Re-track after each rain event or every 14 days, whichever occurs first. Sheep foot roller is allowed for vertical tracking. This work is subsidiary.

For routine or anticipated dewatering, notify the engineer 72 hours before beginning dewatering. Notify the Engineer within 1 hour of beginning emergency or recent rainfall dewatering. Water located within the ROW that will leave the ROW must appear free of pollutants such as suspended sediment, oil sheen, floating solids, etc. Dirty water must pass thru adequate BMPs prior to leaving the ROW to prevent discharge of dirty water. Bypass pumping of water found in a navigable waterway that enters from outside the ROW and is discharged downstream of the ROW will not require the use of BMPs. Dewatering BMPs will be paid for in conformance with the applicable bid items. However, if the necessary BMP item is not included in the Contract, payment for the BMP will be in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." The act of dewatering and the equipment used to dewater will not be paid for directly but will be subsidiary to pertinent bid items.

Unless a specific pay item is provided in the plans, the installation of the 6:1 or flatter for RFD side slopes in the safety zone will be subsidiary to pertinent bid items.

Cover small waste containers (100 gallons or less) at all times. This work is subsidiary. Large waste containers (more than 100 gallons) must have a secondary discharge containment system around the container using erosion control logs. Installation of the log for each container location will be paid using existing bid items. Repair, remove, or replace of the log will not be paid. Revisions, repairs, remove or replace of the log during exchange of empty/full containers at the same location will not be paid.

Portable restrooms must be located more than 50 ft. from a waterway. Tie or stake down portable restrooms to prevent tipping due to vandalism or weather. This work is subsidiary.

Provide a designated location for disposal when excess and waste, including waste generated from cleaning of all equipment used for mixing, hauling, and transfer concrete is disposed in the ROW or PSL. Manufactured disposal containers must be metal or a plastic material with minimum 10 mil thickness. Paper, earthen berms, or pits must be lined with minimum 10 mill thickness polyethylene sheeting. Disposal locations must be located a minimum of 50 ft. from a waterway, tree, or sensitive feature. The disposal location must have a minimum height of 6 in. Maintain a minimum 4 in. of freeboard at all times. Disposal locations are not required for cleaning of small hand tools. Hardened concrete waste may be used as embankment if placed in accordance with Item 132.

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<u>Dust Control</u>
Stockpiles that will be inactive for greater than 14 days must be treated to contain dust by covering with chemical dust suppressant, soil blanket, vertical tracking, or method other than sprinkling with water. Stockpiles that are actively being used must be treated to contain dust by vertical tracking or a method determined by the Contractor. This work is subsidiary.

Provide designated construction traffic routes when feasible. Construction site traffic must be directed to use designated routes.

ITEM 512 – PORTABLE TRAFFIC BARRIER
Any increase in temporary barrier quantities that occur due to Contractor changes in the sequence of work, or the traffic control plan will not be paid.

ITEMS 529, 530, & 531– MISCELLANEOUS CONSTRUCTION
Unless shown on the plans, all concrete will be 5 in. thick and have 2 in. sand, base, or RAP bedding.

Sidewalk cross slope must not exceed 1.5%.

ITEM 529 – CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER
Fibers for concrete as defined in DMS-4550 will not be allowed.

Concrete Curb & Gutter (C&G) and combined C&G shall be constructed to match geometry and grades shown in the plans. C&G shall be constructed to a tolerance within a 1/4" per 10 feet, using a straight edge. C&G not within tolerance parameters is subject to removal or as directed by the Construction Observer. Rework is at the Contractor's expense.

ITEM 530 – INTERSECTIONS, DRIVEWAYS, AND TURNOUTS
Notify property owners a minimum of 48 hours in advance of beginning work on their driveways. Provide, to GEC, a list of each notification and contact prior to each closure.

Provide access, at all times, to adjacent property. Construct driveways one-half sections, to allow access.

Do not completely close driveways for reconstruction purposes, unless a reasonable alternate access exists to the property, as approved.

Install and maintain material across a work zone as temporary access. This work is subsidiary.

Place the Flex Base for the Driveways using Ordinary Compaction.

The following typical section notes apply to all driveways and turnouts:

For ACP or SURF TREAT, the pavement structure will match the adjacent roadway unless detailed on the plans.

For CONC, the pavement structure will be 6 in. thick and have 3 in. flexible base bedding unless detailed on the plans.
Driveways that are public (county road and city street) the pavement structure will match the adjacent roadway, unless specified in plans.

ITEM 540 – METAL BEAM GUARD FENCE (MBGF)
Before beginning the installation of the proposed Metal Beam Guard Fence (MBGF), stake the locations for approval. Adjust the limits of the MBGF to meet field conditions, as directed, before erection.

Furnish round timber posts for guard fence. Steel posts for low fill culvert applications are subsidiary including use of low fill culvert application due to other concrete structures such as inlets. Long span application at inlets may be used as an alternate to low fill culvert. Unless otherwise specified on the plans, use of low fill culvert or long span at inlets will be subsidiary to pertinent items. Install delineators before opening the road to traffic.

Adjust existing rail as per plans and in accordance with the latest TxDOT standard. Removal, replacement, or installation of mow strip block out material will be subsidiary. Constructing new or backfilling**, using class B concrete,** unused mow strip block outs will be subsidiary.

Provide Rail Elements that meet AASHTO M 180 TY I Galvanization (1.80 oz. per SY).

Rail and rail elements that are in compliance with current standards and are undamaged should stockpiled at a location, approved by the Construction Observer, within the project limits for pick up by the County.

Retain all materials. Existing materials that are structurally sound and dent free may be reused, if approved by Observer. All reused material will be from this project and in compliance with current standards. Structurally sound rust spots with the largest dimension of 4 in. may be cleaned and repaired in accordance with Section 540.3.5. Punch or field drill holes in the metal rail element to accommodate post spacing. Additional holes for splice or connections are not allowed. Space the field holes in accordance with the latest standard but no closer than the minimum spacing shown on the current standard.

Remove, replace, and install mow strip block out material. Construct new block outs and backfill unused block outs with class B concrete. This work is subsidiary.

Repair of mow strip damage, not caused by contractor negligence, and installation of new mow strip will be paid with appropriate bid items. Backfill and shoulder up of area around fence and mow strip will be paid using embankment item.

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ITEM 543 – CABLE BARRIER SYSTEM
Before installation stake end terminal locations for approval. Changes to the location may be necessary to accommodate slopes or other obstructions in the field. This work is subsidiary.

Retain all materials. Existing materials that are structurally sound may be reused. All reused material must be from this project and in compliance with current standards.

Revise cross slopes as necessary to provide a slope in compliance with the barrier standard. Reuse of excavated material from installation of the barrier and mow strip is subsidiary. Use of additional material will be paid using embankment.

Delineators must be GF2 or CAB3 style with the delineator post color that matches the color of the reflector. Install OM-3L using TWT post at the terminal end. This is subsidiary.

ITEM 545 – CRASH CUSHION ATTENUATORS (CCA)
When CCA's are Contractor supplied and they are not called to be placed in a permanent location, retain the CCA's as Contractor property, at the end of the project.

When the CCA's are supplied by the Contractor, provide crash cushions that work for the posted speed limit.

Upon removal of the CCA's provide a coring machine to remove the mounting hardware/bolts from the existing pavement. Core around the mounting hardware to at least the bottom of the HMACP/Top of base. Refill core holes with concrete or asphaltic material, as directed. Consider subsidiary to the various Items of the project.

ITEM 585 - RIDE QUALITY FOR PAVEMENT SURFACES
Use Surface Test Type B Pay Schedule 2 to evaluate ride quality of travel lanes, including service roads. This item is subsidiary to the asphalt pavement items.

ITEMS 618, 620, 621, 624, 628, 684, & 686 – ITS, TOLLING, LIGHTING, SIGNING, MARKINGS, AND SIGNALS
Meet the requirements of the NEC, Texas MUTCD, TxDOT standards, and TxDOT Standard Specifications. Notify the Engineer if existing elements to remain do not meet code or specification.

Provide all service, equipment and material required to provide a functional item and interface with existing equipment and software.

Provide a 14-day advance email notice to the Engineer to request illumination or traffic signal punch list inspection.

All items must be completed per the plans prior to traffic signal activation including deficiencies found in the punch list.

The contractor must have a qualified technician and a representative from the controller and detection supplier on the project site to place the traffic signals in operation.
For existing traffic signals, provide a 14-day advance email notice to the Engineer with Contractor signal technician contact information and signal locations prior to working or assuming operations of illumination or traffic signal.

Provide a 60-day advance email notice to the Engineer to request signal timing if timing is not provided in the plans.

Prior to relief of maintenance, a Test Period is required for signals and ITS equipment in accordance with Item 680.3.1.7. Response time to reported trouble calls shall be less than 2 hours.

Complete repairs within 24 hours. Notify the Engineer and maintain a logbook in the controller cabinet of each trouble call. Do not clear the error log in the conflict monitor without approval.

Use materials from prequalified material producers list as shown on the Texas Department of Transportation (TxDOT) – Construction Division's (CST) materials producers list. Refer to TxDOT's website for list of pre-qualified manufacturers. No substitutions will be allowed for materials found on the list.

ITEM 618 – CONDUIT

Do not use cast iron junction boxes in concrete bridge rails. Use polymer concrete junction boxes only. Mount the junction boxes flush (+ 0", - ½") with concrete surface of concrete bridge rail.

Do not use cast iron junction boxes in concrete traffic barriers and single slope traffic barriers. Use polymer concrete junction boxes shown on Standard Sheets CSB(4)-10, AND SSCB(4)-10. Mount the junction boxes flush (+ 0", - ½") with concrete surface of concrete barrier.

Shift the locations of conduit and ground boxes to accommodate field conditions. Install conduit not exceeding 2 feet in any direction from a straight line. Install conduit at a minimum depth of 2 ft. below finished grade. Installation of the conduit by jacking or boring method will be at a depth of at least 1 ft. below bottom of subgrade.

Install a high tension, non-metallic pull rope in all empty conduit runs. This work is subsidiary.
Use a coring device, not a hammer drill, when drilling holes through concrete structures.

Structurally mounted junction boxes will be as shown on the plans. When used for traffic signal installations, these boxes will be 12" x 12" x 8". This work is subsidiary.

For underground conduit, smooth wall schedule 40 equivalent HDPE can be substituted for schedule 40 PVC. For SCH 80 bore conduits, a schedule 40 equivalent HDPE carrier pipe of adequate size to carry the proposed conduits can be used as substitute. HDPE must transition to RMC/PVC per ED (11)-14.

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Use materials from prequalified material producers list as shown on the Texas Department of Transportation (TxDOT) – Construction Division's (CST) materials producers list. Category is "Roadway Illumination and Electrical Supplies."

Consider the polymer concrete barrier boxes subsidiary to Item 618, "Conduit."

Refer to plans and specifications for type of conduit. Waterproof and tighten all couplings and connections. Bring all proposed and existing conduit into a ground box and 'elbow' it unless otherwise shown on the plans. Provide a bushing to protect the wire from abrasion when a conduit run terminates.

Replace sections of conduit with the size and type shown on the plans in the event the existing conduit proves unusable due to location or damage.

Secure permission from the proper authority, as directed, before cutting into or removing any sidewalks or curbs for installation of this Item.

Saw cut and replace any riprap, which must be removed to install the conduit. Replace riprap with material and texture as directed.

The locations of conduit and ground boxes are diagrammatic and so shift, as directed, to accommodate field conditions.

Install conduit in an area not exceeding two (2) feet in any direction from a straight line with the depth of the conduit at least two (2) feet, unless otherwise shown on the plans. Installation of the conduit by jacking or boring method will be at a depth of at least one (1) foot below the bottom of the base material of the roadway. Evidence of damage to the roadway during the jacking or boring operation will be enough grounds to stop the method being used.

Install conduit on a 2-inch sand cushion and backfill with at least six (6) inches of sand. Backfill the remainder of the trench with flexible base, soil or two-sack concrete as required by the location of the conduit or as directed.

Consider all conduit elbows and rigid metal extensions required to be installed on PVC conduit systems subsidiary.

Install a high tension, non-metallic pull rope in all conduit runs. The pull ropes are for future use. Cap all empty conduit runs using standard weather tight conduit caps as directed. Consider this work subsidiary to the pertinent Item.

Install a continuous bare or green insulated copper wire No. 8 AWG or larger in every conduit throughout the electrical system including installed loop detectors and traffic signal cables which are in conformance with the Electrical Detail Standard Sheets and the latest edition of the National Electrical Code (NEC).

Placement of conduit under the existing pavement using the open trench method will not be allowed without prior approval.

Seal all conduit ends with a permanently soft, non-toxic duct seal. The dust seal must not adversely affect plastic materials or corrode metals.

Use a coring device when drilling holes through concrete structures. Do not use masonry or concrete drills, unless otherwise approved.

Structurally mounted junction boxes shall be as shown on the plans. When used for traffic signal installations, these boxes shall be 12" x 12" x 8" and shall be approved. Consider these boxes subsidiary to this Item.

Use conduit hangers for three (3) inch and larger conduit when hanging conduit from structures.

Place conduit a minimum depth of 42 inches below the bottom of ties.

Existing conduit may be proposed for reuse in this project. If the existing conduit cannot be used to place or add new electrical conductors, repair, or replace this conduit, as directed. Repair of the conduit will be paid as "Extra Work" on a "Force Account" basis. Probe the existing conduit when locating drill shafts so that the existing conduit's location will be known before it is needed.

When using existing conduit, ensure that all conduits have bushings and are cleaned of dirt, mud, grease, and other debris. Re-strap conduit that is being relocated to new timber poles as if it were a new installation. Consider this work subsidiary to this Item.

Consider all fittings, brackets, and junction boxes necessary to complete the installations subsidiary to the pertinent Items.

Abandoned underground conduit must have all conductors removed.

ITEM 619 – MULTI-DUCT CONDUIT SYSTEM
Concrete or flowable fill encasement is not required unless stated in bid item code.

In addition to PVC, HDPE approved material may be used. Blue Diamond 4 in. SIDR 11.5 casing with 4-1 in. SDR 13.5 innerducts is acceptable substitute for PVC and HDPE multi duct.

ITEM 620 – ELECTRICAL CONDUCTORS
For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder from manufacturers pre-qualified by the Traffic Operations Division. Fuse holder is shown on the producer list under Items 610 & 620.
Provide and install approved 10-amp time delay fuses.

Provide breakaway disconnects in all breakaway poles. For Flashing Beacons (Item 685) and Pedestal Poles (Item 687) within the project provide single-pole breakaway disconnects. Use Bussman HEBW, Littelfuse LEB, Ferraz-Shawmut FEB, or equal on ungrounded conductors. For

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all grounded conductors use Bussman HET, Littelfuse LET, Ferraz-Shawmut FEBN, or equal. These breakaway connectors have a white colored marking and a permanently installed solid neutral.

Clearly and permanently, mark "Illumination" on the Illumination Conductors installed in a Signal Mast-Arm Pole or Strain Pole. Make the marks easily visible from the hand hole.

Identify the conductors as shown on the Electrical Details Standard Sheets when two or more conductors are present in one conduit or enclosure. Use identification tag with two plastic straps. Each tag will indicate circuit number, letter, or other identification as shown on the plans.

Bond grounding conductors, which share the same conduit, junction box or structures, together at every accessible point, in accordance with the Electrical Detail Standard Sheets and the latest edition of the National Electrical Code (NEC).

All wiring will be in accordance with the National Electrical Code (NEC) and the appropriate TxDOT standard sheets.

ITEM 624 – GROUND BOXES
Aggregate for fill under the box will be crushed, have a maximum size of 2 in. and minimum size of ½ in.

ITEM 628 – ELECTRICAL SERVICES
Contact the utility company upon execution of contract and prior to the pre-construction meeting to make arrangements for all work and materials provided by the utility company. Contact Williamson County for account approval and information. Accounts shall be placed in the name of Williamson County.

The service enclosure provided in this contract will have provisions for pad locking the enclosure shut.

The traffic signal system will require 120/240-Volt Power Service provided by the Local Electric Utility Company. Contractor shall make all arrangements for power.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES
Fabricate all small signs not detailed on the plans in conformance with the latest edition of the "Standard Highway Sign Designs for Texas," refer to TxDOT's website.

Triangular slip base must be the clamp style to secure the post to the slip base. Set screw style slip base will not be allowed.

ITEM 658 – DELINEATOR AND OBJECT MARKER ASSEMBLIES
All delineator post and supports, excluding metal components, must be manufactured in the same color that matches the color of the reflector. Field painting is not allowed.

Flexible posts YFLX and WFLX must be tubular in shape. The "flat" flexible posts are not allowed.

Installation and maintenance of portable CTB reflectors will be subsidiary to the barrier.

CTB delineators must be placed on top of the CTB.

ITEM 662 – WORK ZONE PAVEMENT MARKINGS
Notify the Construction Observer at least 24 hours in advance of removing existing striping and placing pavement markings & markers.

Broken line markings must use solid line markings in lane shifts.

Maintain removable and short-term markings daily. Remove within 48 hours after permanent striping has been completed.

Apply markings during good weather unless otherwise directed. If markings are placed at Contractor's option, when inclement weather is impending, and the markings are damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the markings if required.

Remove work zone pavement markings within 48 hours after permanent striping has been completed.

Foil backed pavement markings will not be allowed.

Item 668 is not allowed for use as Item 662.

Roadways with existing profile pavement markings or rumble strips must supplement work zone solid lines with traffic buttons spaced at 12 in. Traffic buttons used to supplement the work zone markings will be paid by the each in addition to the work zone item

Short term removable markings designated by bid item description "SHT TERM RMV" will require the use of removable prefabricated pavement markings. Tabs will not be allowed as a substitute for prefabricated pavement markings.

ITEM 666 – RETRO-REFLECTORIZED PAVEMENT MARKINGS
Notify the Engineer at least 24 hr. before beginning work.

All projects, including resurfacing, must increase center-to-center width for center line markings to 18 in. unless the plans or existing is greater than 18 in.

Place longitudinal markings nightly for IH 35 main lanes or roadways with AADT greater than 100,000. Use of temporary flexible reflective roadway marker tabs is subsidiary and at the Contractor's option. Replace missing or damaged tabs nightly. If using tabs, place longitudinal

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markings weekly by 5 AM Friday for all weekday work and by 5 AM Monday for all weekend work. Failure to maintain tabs or place longitudinal markings by deadline will require nightly placement of longitudinal markings.

Place longitudinal markings no later than 7 calendar days after placement of the surface for roadways with AADT greater than 20,000.

When the raised portion of a profile marking is placed as a separate operation from the pavement marking, the raised portion must be placed first then covered with TY I.

When using black shadow to cover existing stripe apply a non-retroreflective angular abrasive bead drop. The marking color shall be adjusted to resemble the pavement color. If Item 677 is not used prior to placement of black shadow, scrape the top of the marking with a blade or large piece of equipment unless surface is a seal coat. The scraping of the marking is subsidiary.

ITEM 672 – RAISED PAVEMENT MARKERS
Place the bituminous adhesive at a temperature range of 380°F to 390°F. Place the pavement marker on the bituminous adhesive within approximately 20 seconds after the adhesive is placed on the pavement. Ensure the pavement marker rests solely on the adhesive and not the pavement surface. Ensure that a minimum of ⅛ inch layer of bituminous adhesive remains between the pavement marker and the pavement surface.

Place Type I-C and II-C-R markers at 40 ft. spacing for all lane lines.

ITEM 677 – ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS
Remove and dispose of, off the right of way, any existing raised pavement markings before beginning surfacing operations. Remove the existing traffic buttons and pavement markers, daily, as work progresses and as directed. Consider subsidiary to the pertinent Items.

Grinding is not an acceptable method of stripe removal on final pavement surface.

Blast cleaning is required for the removal of existing pavement markings.

Black paint will not be allowed, unless otherwise directed. Acceptable methods will be sand blasting (Blasting Method) or strip sealing (Surface Treatment Method).

Dispose of removed materials and debris at locations off the right of way.
Elimination using a pavement marking will not be allowed in lieu of methods listed in specification.

Remove pavement markings on concrete surfaces by a blasting method. Flail milling will be allowed when total quantity of removal on concrete surfaces is less than 1000 ft.

Strip seal is only method allowed on seal coat surface unless project includes placement of a new surface. If total quantity of removal on a seal coat surface is less than 2000 ft., elimination using a pavement marking is allowed if a test section is approved by the Engineer. Test section shall demonstrate the thermoplastic marking color matches the existing pavement color.

Remove pavement markings outside the limits of the new surface by a blasting method.

Use a TRAIL or a non-retroreflective paint to cover stripe remnants that remain after elimination.

The test requirements for these materials are waived. The paint color shall be adjusted to resemble the existing pavement color. Installation and maintenance is subsidiary.

ITEM 680 – HIGHWAY TRAFFIC SIGNALS
Install all materials necessary for a complete signal system as follows:

For traffic signal head installation use Austin District MAD-14 detail.

Provide equipment compatible with typical City of Austin equipment.

Furnish all other materials, tools, and labor required to provide a completed installation in accordance with the plans and specifications. Furnished materials provided by the Contractor will be new undepreciated stock.

Place the traffic signal into operation after the entire traffic signal has been completed, all required striping is complete, and all conflicting signing and sign foundations are removed. The responsible Signal Shop will be present to program the controller and assist with detection setup.

Illumination assemblies must be 250W EQ LED unless shown on the plans. Test in accordance with Item 616. This work is subsidiary.

Furnish and install all permanent signs mounted on the traffic signal wires and traffic signal poles, which include pedestal pole assemblies. Furnish all hardware for installation. Consider all costs associated with the furnishing and installation of the permanent signs and the necessary hardware subsidiary to the pertinent Items.

Use a Vulcan swinger sign mounting bracket or equivalent for all signs mounted on span wires.

Place the traffic signal into operation after the traffic signal, striping and signage has been completed. Representative from the County may be present to program the controller and assist with detection setup. Have a qualified technician and a representative from the controller supplier on the project site to place the traffic signals in operation.

After the completion of the entire signal installation (including striping), a 30-day test period begins. After it has been determined, by the County, that the field wiring and controller operation are satisfactory after this test period, and all other requirements of the project have been met, the County will relieve the Contractor of any other responsibilities for the operation of the signal.

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Use qualified personnel to respond to and diagnose all trouble calls during the thirty-day test period. Repair any malfunction to Contractor-supplied signal equipment. Provide to the Construction Observer a local telephone number, not subject to frequent changes and available on a 24-hour basis, for reporting trouble calls. Response time to reported calls must be less than 2 hours. Make appropriate repairs within 24 hours. Place a logbook in the controller cabinet and keep a record of each trouble call reported. Notify the Construction Observer of each trouble call. Do not clear the error log in the conflict monitor during the thirty-day test period without the approval of the Construction Observer.

For city operated signals, the city may assist in determining how the detector loop lead-in cables are to be connected. The city will program the controller for operation, set the video detection, connect the conflict monitor, detector units and other equipment to the controller, and turn on the controller.

Furnish and install the Emergency Response Preemption devices, as shown per plans.

ITEM 681 – TEMPORARY TRAFFIC SIGNALS
Take control and be responsible for all Signals within the Project limits as shown on the plans, to commence when the signal system or roadway capacity is affected, or within 30 days after the start of work, whichever comes first. Contact Williamson County Road and Bridge Department, at least two (2) weeks in advance, at (512) 943-3330 to arrange to take over maintenance.

The scope of this contract will include modifications of existing signal systems as required to support the traffic control plan at the following locations:

Signal Location(s):
Parmer Lane at SH45.

Provide and maintain traffic signal operation of all signalized intersections within the project limits during all phases of construction whether existing, temporary, or final. Provide all Items for temporary traffic signal including temporary controller and Video Imaging Vehicle Detection System (VIVDS) equipment. Controller will be an eight-phased NEMA controller. Controller cabinet will meet all the requirements of DMS-11170. Provide a pole-mounted controller cabinet that is 38 inches wide, 54 inches high, 26 inches deep, and that has three brackets for pole mounting. Install a 5’ x 5’ x 4” Class B concrete pad under the pole-mounted controller cabinet in accordance with Items 420 and 421. Connect all field wiring to the controller assembly. Have a qualified technician and a representative from the controller supplier on the project site to place the traffic signals in operation.

The controller cabinet assembly, including all accessories and components, and all video detection (VIVDS) cameras and processors will be salvaged and delivered to Williamson County Road and Bridge, 3151 S.E. Inner Loop, Georgetown, Texas 78626 at the end of this project. Provide a 48-hour notice to (512) 943-3330, prior to delivery of salvaged material.

Operation and maintenance of the temporary signal includes repair of Contractor-supplied equipment, provision of telephone number to the Construction Observer for trouble calls, adjustment of timing, and the generation and implementation of traffic signal timing during all phases of the project. Prepare the timing plan under the supervision of a registered Traffic Engineer and submit to the Construction Observer for approval. Load the approved timing plan into the controller and fine-tune the timing with field observations. Make timing adjustments for capacity and roadway alignment changes.

Video equipment will meet all the requirements of Item 6002. Provide signal phasing and timing plans for all construction signals throughout the entire duration of the project. These plans will match the construction sequencing or the Contractor's construction sequencing if different from what is shown in the plans. These plans will be submitted for approval and will provide operations equivalent to the existing signals.

Provide the Construction Observer the name and 24-hour telephone number of a person responsible for emergency maintenance operations. Use qualified personnel to respond to and diagnose all trouble calls during the length of the project. Repair any malfunction to signal equipment. Response time to reported trouble calls must be less than 2 hours. Make appropriate repairs within 24 hours. Place a logbook in the controller cabinet and keep a record of each trouble call reported. Notify the Construction Observer of each trouble call. Do not clear the error log in the conflict monitor without approval.

Relocate and modify signal heads as required by project phasing or other project work as directed by the Construction Observer. Relocation of signal heads for a phase change will be done during the same day. Consider subsidiary to the pertinent Items.

Be responsible for video detection changes as required by project phasing or other project work as directed by the County. Consider subsidiary to the pertinent Items.

Maintain an 18-foot minimum vertical clearance for all construction signals at all times.

Make field measurements for treated timber poles in cooperation with the Construction Observer before construction to ensure the above clearance height from the highest point of the roadway surface. Timber poles provided will meet all the requirements of Item 627. In addition, place the signal heads a minimum of 40 ft. and a maximum of 150 ft. from the stop line. If the nearest signal head must be more than 150 ft. from the stop line, place a supplemental nearside signal head. Determine the field measurements and elevations from the actual field location of the poles, considering all above and below ground utilities and existing roadway elevations.

All permanent signs mounted on the traffic signal wires, traffic signal poles, or traffic signal mast arms will be furnished and installed by the Contractor. The cost of the signs, hardware and erecting the signs will be subsidiary to the pertinent Items.

Be responsible for furnishing all other materials, tools, and labor required to maintain the signal in this project in accordance with the plans and specifications. All new materials provided by the Contractor will be new undepreciated stock.

If intersection illumination is not shown on the plans, install 2 temporary illumination fixtures (250W equivalent LED) per intersection. This work is subsidiary.

Test in accordance with Item 616. This work is subsidiary.

ITEM 682 – VEHICLE AND PEDESTRIAN SIGNAL HEADS

Install signal head attachments so the wiring to each passes from the signal pole through the attachment hardware to the signal head. Use UV rated tie wraps.

Ensure the signal heads are made of aluminum and are hooded and covered until the signal system is put into operation.

Installed traffic signal heads within the project will have backplates unless otherwise shown on the plans. Backplates will be black aluminum with reflective borders.

Provide pedestrian signal head assemblies, which have a flush "egg-crated" or "Z" pattern visor for all lamps, and a one-piece reflector assembly for incandescent lamps only.

Provide louvers, which have five (5) vanes with a black finish on inside surfaces when required within the project. Fasten a hardware cloth screen, securely, with ⅝" or smaller mesh size to the front face of each louver to prevent entry by birds.

Mount signal heads level and plumb as directed.

Replace, at Contractor's expense, all burned out or defective lamps for a period of four (4) weeks from the date of the initial turn on. At the end of this 4-week period, the Construction Observer will relieve the Contractor of any maintenance of this portion of the signal system.

Use the four-point mounting system (TY A) for signal heads, except in cases of skewed or vertical heads when (TY B) will be used.

Place LEDs at the proper angle with the ground. The wording "top" or the "up arrow" indicates the proper fixed alignment within the signal head. Hang the head parallel to the ground once attached and not angled down as with incandescent heads. Ensure the signal head to be level and within tolerances. LEDs are designed to direct the indication towards the roadway surface. Variance in head leveling will cause the LED indication to appear dim during slight movement. Ensure each LED head to be properly leveled and sight tested before final acceptance.

ITEM 684 – TRAFFIC SIGNAL CABLES

For Type A cables, cables meeting the requirements of IMSA 19-1 can be substituted for IMSA 20-1. For all types of cables, an increase of one size larger wire diameter and thickness can be substituted for plan size. For example, 12 AWG can be substituted for 14 AWG.

Leave at least two (2) feet for each cable run in each pull box and leave at least two (2) feet in each steel pole in addition to the required length for each separate cable. Provide an extra five (5) feet

of each conductor terminating in the controller cabinet. Ensure conductors are continuous without splice from terminal point to terminal point or as directed. Do not use wire nuts.

Provide a separate multi-conductor signal cable (14 AWG) inside pedestal poles and mast-arm signal poles from the terminal strip to each signal head as shown on the plans.

ITEM 686 – TRAFFIC SIGNAL POLE ASSEMBLIES (STEEL)
Provide and install damping plates on all mast arms of 40 ft. and over. For mast arms less than 40 ft., refer to SMA and DMA Vibration Notes for guidance. Consider the cost for the provision and installation of damping plates as subsidiary to the various bid Items found within this project.

Provide double nuts on top and bottom of the base plate as shown on the standards.

Provide signal pole assemblies as shown on plans. Luminaire lamps and the installation of the arms and lamps are considered subsidiary to the pertinent Items.

When luminaires are to be installed on mast arm poles, provide a separate terminal strip in the signal pole access compartment. The terminal strip shall be a 4-circuit Buchanan-Type 104SN, Kulka-Type 985-GP-4 CU, or equivalent.

Provide a 10-amp time-delay fuse for traffic signal poles onto which luminaires are to be installed. Place the fuse in the fuse block indicated within note #4 found on State standard MA-D-12.

ITEM 687 – PEDESTAL POLE ASSEMBLIES
Furnish and install pedestal pole assemblies as shown on plans. Furnish all other materials, tools, and labor required to provide a completed installation in accordance with the plans and specifications. Furnished materials provided by the Contractor will be new undepreciated stock.

Verify the required pole height prior to ordering material.

ITEM 688 – PEDESTRIAN DETECTORS AND VEHICLE LOOP DETECTORS
Test all loops in accordance with the Federal Highway Administration (FHWA) loop detector handbook.

Provide the traffic signal cable (TY C) (2 Cndr) (14 AWG) necessary to install the vehicle loop detectors.

If applicable, install vehicle loops prior to placement of roadway surface.

Stage operations such that loops at the Traffic Signals are placed to Final Paving Operations' alignments. Place loop elevations to a depth of four (4) inches below finish elevation. ***(Optional note when Wire Loops are used in the pavement for vehicle detection.)***

Pedestrian push buttons will be mounted at a height of 3'-6" (42") above the sidewalk or landing and will be of the type that have permanent-type signs within the detector unit (9" x 12" sign &

Williamson County
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push button station on Signal Poles and 5" x 7" sign & push button station on Pedestrian Poles), which explains their purpose and indicates which crosswalk signal is actuated.

Repair or replace any push button detector, which proves to be inoperable for a period of four (4) weeks from the initial flash turn on date. At the end of this 4-week period, the Construction Observer will relieve the Contractor of any maintenance of this portion of the signal system.

Pedestrian Push buttons will be of substantial tamper proof construction. The push button will be ADA and TS 2 compliant. The push button will have a powder coated aluminum bezel with stainless steel actuator. The push button will utilize a momentary contact solid-state switching mechanism. The push button will provide visual and audible feedback to the pedestrian. The low movement push button will be functional in icing conditions. All fastening hardware will be stainless steel.

Provide the traffic signal cable (TY C) (2 Cndr) (12 AWG) necessary to install the push buttons.

The audible feedback will be solely a confirmation chirp, be able to be turned on and off, and not conflict with any ADA issues.

ITEM 730 – ROADSIDE MOWING
Perform roadside mowing along the Roadway for the length of the project, as directed.

Complete spot mowing, as directed.

ITEM 734 – LITTER REMOVAL
Litter Removal, as defined below, is subsidiary to Roadside Mowing.

Complete Litter Removal Cycles along the Roadway for the length of the project, as directed.

Complete Litter Removal cycles prior to any mowing cycles.

Remove all litter on the right of way, within project limits.

ITEM 738 – CLEANING AND SWEEPING HIGHWAYS
Complete cleaning and sweeping cycles at the intervals, as directed. Complete one cycle at the end of construction and prior to final acceptance by the County.

ITEM 752 – TREE AND BRUSH REMOVAL
Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush even if Item 752 is not included as a pay item.

Flailing equipment is not allowed. Burning brush is not allowed in urban areas or on ROW. Use hand methods or other means of removal if doing work by mechanical methods is impractical.
Prior to begin tree pruning, send email confirmation to the Engineer that training and demonstration of work methods has been provided to the employees. This work is subsidiary.

Williamson County
Project: Parmer Lane at SH 45

The list of material below is for the Contractor's information only.
It is the responsibility of the Contractor to verify all items and quantities listed below.

LIST OF MATERIAL/LABOR
SUBSIDIARY TO ITEM 680

DESCRIPTION	UNIT	QUANTITY
40 FT TIMBER POLE (CLASS 2)	EA	X
8 FT LUMINAIRE ARM	EA	X
CABLE STRAPS	EA	X
⅜" ZINC-COATED STRANDED STEEL CABLE	LF	X
¼" ZINC-COATED STRANDED STEEL CABLE	LF	X
GROUND ANCHORS	EA	X
YELLOW PLASTIC GUY GUARD	EA	X
DOUBLE EYE ANCHOR ROD	EA	X
⅝" X 8' COPPERCLAD GROUND ROD W/CLAMP	EA	X
1 INCH RM CONDUIT (PHONE LINE)	LF	X
1½" WEATHERHEAD	EA	X
2 INCH WEATHERHEAD	EA	X
3 INCH WEATHERHEAD	EA	X
250W EQ LED LUMINAIRE	EA	X
8 PHASE NEMA CONTROLLER COMPLETE W/ CABINET AND ACCESSORIES	EA	X
ON-STREET ARTERIAL MASTER CONTROLLER UNIT	EA	X
2-CHANNEL DETECTOR CARDS	EA	X
INSTALL OPTICOM EQUIPMENT (INTERSECTION)	LS	X

Williamson County
Project: Parmer Lane at SH 45

INTERSECTION DISPLAY BOARD	EA	X
DIAL-UP COMMUNICATIONS MODEM/PHONE LINE	EA	X
REGULATORY SIGN PANEL (R10-12, ETC)	EA	X
SINGLE STREET NAME SIGN PANEL	EA	X
DUAL STREET NAME SIGN PANEL	EA	X
REMOVE EXISTING STOP SIGN PANEL	EA	X
CONCRETE PAD (8' X 9' X 6", Class B)	SF	72

Williamson County
Project: Parmer Lane at SH 45

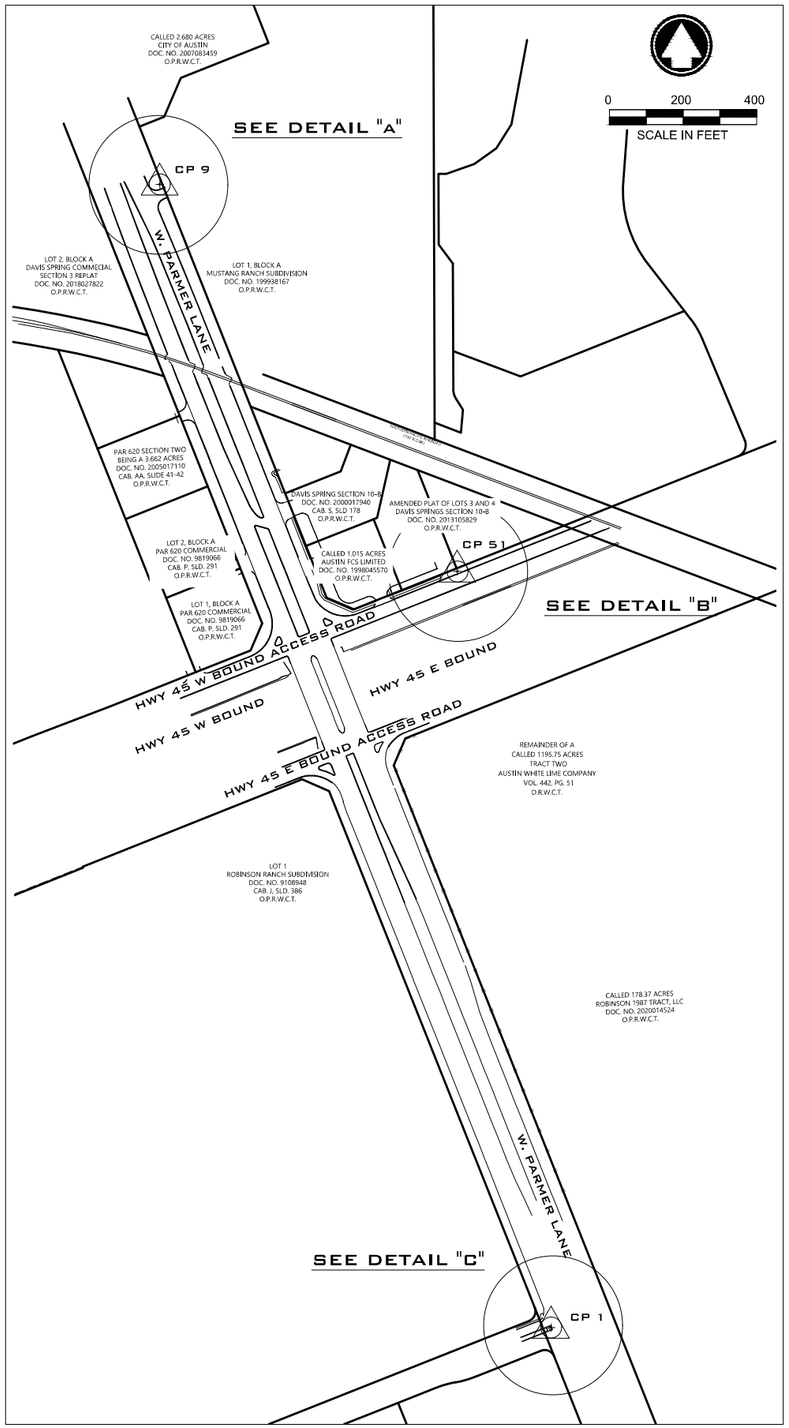
LIST OF MATERIAL
FURNISHED BY THE CITY OF ***(XXXX)*** ***or*** TEXAS DEPARTMENT OF TRANSPORTATION ***or*** WILLIAMSON COUNTY

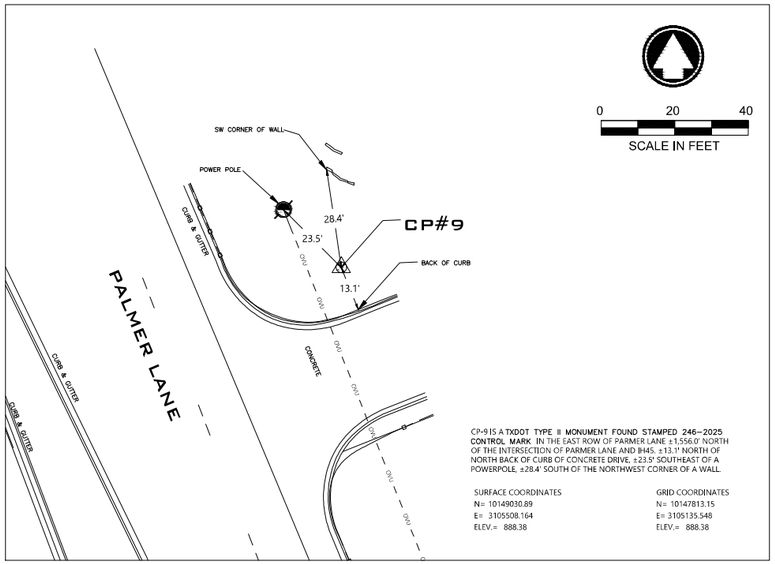
DESCRIPTION	UNIT	QUANTITY
CABINET ASSEMBLY WITH ACCESSORIES	EA	X
VIVDS CAMERA ASSEMBLIES	EA	X
VIVDS PROCESSOR CARDS (4 CHANNEL)	EA	X
VIVDS EXTENSION MODULES (4 CHANNEL)	EA	X
VIVDS MINI-HUBS (4 CHANNEL)	EA	X
VIVDS VIDEO MONITORS	EA	X
VIVDS SURGE SUPPRESSION PANELS	EA	X
DUAL BAND ETHERNET RADIO (2.4/5.8)	EA	X
MANAGED HARDENED ETHERNET SWITCH	EA	X
POWER SUPPLY (FOR ETHERNET SWITCH)	EA	X
DETECTOR, 2 CHANNEL CONTACT MATRIX CLOSURE	EA	X
3 APPROACH AC POWER PKG, W/ 3 SENSORS/BRACKETS	EA	X
4 APPROACH AC POWER PKG, W/ 4 SENSORS/BRACKETS	EA	X
ADVANCE VEHICLE DETECTION SYSTEM, 10.525 GHX	EA	X
INLINE TERMINAL STRIP JUNCTION BOX	EA	X
6/C CABLE WITH CONNECTOR (PIG-TAIL)	EA	X
6/C CABLE FOR SMARTSENSOR (1500 FT ROLL)	EA	X
4 SENSOR PREASSEMBLED BACKPLATE W/ AC POWER	EA	X
SENSOR MOUNT, 2 AXIS ALUMINUM BRACKET	EA	X
SERIAL TO ETHERNET CONVERTER	EA	X

Williamson County
Project: Parmer Lane at SH 45

LIST OF MATERIAL
FURNISHED BY THE CITY OF ***(XXXX)***

DESCRIPTION	UNIT	QUANTITY
OPTICOM CABLE	LF	X
OPTICOM DETECTOR W/MOUNTING BRACKET	EA	X
OPTICOM MODULES (2-CHANNEL)	EA	X
OPTICOM CARD RACK AND HARNESS	EA	X
OPTICOM CONTROLLER ASSEMBLY COMPLETE WITH CABINET AND ACCESSORIES	EA	X

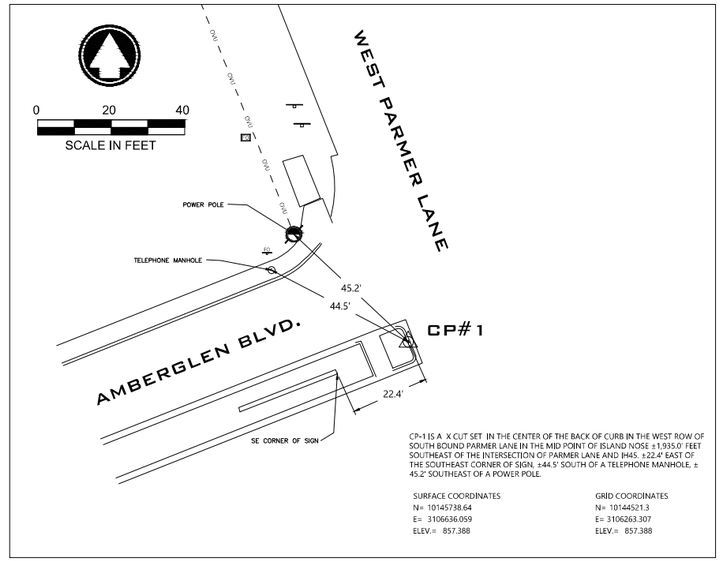




DETAIL "A"

CP-9 IS A TXDOT TYPE II MONUMENT FOUND STAMPED 246–2025 CONTROL MARK IN THE EAST ROW OF PARMER LANE ±1,556.0' NORTH OF THE INTERSECTION OF PARMER LANE AND IH45, ±13.1' NORTH OF NORTH BACK OF CURB OF CONCRETE DRIVE, ±23.5' SOUTHEAST OF A POWERPOLE, ±28.4' SOUTH OF THE NORTHWEST CORNER OF A WALL.

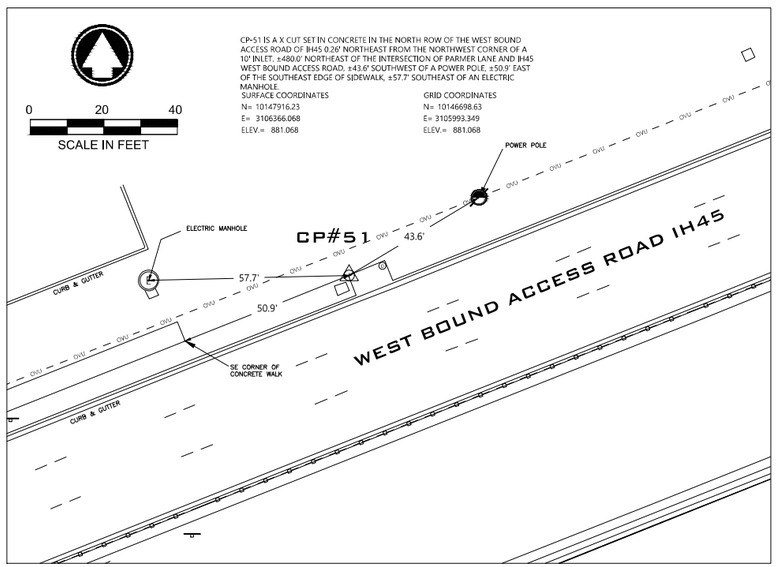
SURFACE COORDINATES	GRID COORDINATES
N= 10149030.89	N= 10147813.15
E= 3105508.164	E= 3105135.548
ELEV.= 888.38	ELEV.= 888.38



DETAIL "C"

CP-1 IS A 'X' CUT SET IN THE CENTER OF THE BACK OF CURB IN THE WEST ROW OF SOUTH BOUND PARMER LANE IN THE MID POINT OF ISLAND NOSE ±1,935.0' FEET SOUTHEAST OF THE INTERSECTION OF PARMER LANE AND IH45, ±22.4' EAST OF THE SOUTHEAST CORNER OF SIGN, ±44.5' SOUTH OF A TELEPHONE MANHOLE, ± 45.2' SOUTHEAST OF A POWER POLE.

SURFACE COORDINATES	GRID COORDINATES
N= 10145738.64	N= 10144521.3
E= 3106636.059	E= 3106263.307
ELEV.= 857.388	ELEV.= 857.388



DETAIL "B"

CP-51 IS A X CUT SET IN CONCRETE IN THE NORTH ROW OF THE WEST BOUND ACCESS ROAD OF IH45 0.26' NORTHEAST FROM THE NORTHWEST CORNER OF A 10" INLET, ±480.0' NORTHEAST OF THE INTERSECTION OF PARMER LANE AND IH45 WEST BOUND ACCESS ROAD, ±43.6' SOUTHWEST OF A POWER POLE, ±50.9' EAST OF THE SOUTHEAST EDGE OF SIDEWALK, ±57.7' SOUTHEAST OF AN ELECTRIC MANHOLE.

SURFACE COORDINATES	GRID COORDINATES
N= 10147916.23	N= 10146698.63
E= 3106366.068	E= 3105993.349
ELEV.= 881.068	ELEV.= 881.068

PRIMARY HORIZONTAL/VERTICAL CONTROL–GRID COORDINATES				
PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
1	10144521.3000	3106263.3070	857.3880	X CUT SET
9	10147813.1500	3105135.5480	888.3800	TXDOT MON FOUND 246–2025 CONTROL MARK
51	10146698.6300	3105993.3490	881.0680	X CUT SET
PRIMARY HORIZONTAL/VERTICAL CONTROL–SURFACE COORDINATES				
PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
1	10145738.6426	3106636.0586	857.3880	X CUT SET
9	10149030.8876	3105508.1643	888.3800	TXDOT MON FOUND 246–2025 CONTROL MARK
51	10147916.2338	3106366.0682	881.0680	X CUT SET

GENERAL NOTES

1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NAD 83, 2011 ADJUSTMENT (EPOCH 2010.00) / NAVD 88, GEOID 18. ALL COORDINATES SHOWN HERE ARE GRID AND MAY BE CONVERTED TO SURFACE BY MULTIPLYING A SURFACE ADJUSTMENT FACTOR OF 1.00012.
UNITS: U.S. SURVEY FEET

2. CONTROL WAS ESTABLISHED USING STATIC AND GPS OBSERVATIONS DATED JULY 2024. EPOCH 2024.

FOR PRELIMINARY REVIEW PURPOSES ONLY. THIS DOCUMENT SHALL NOT BE RECORDED FOR ANY PURPOSE

REV	DATE	DESCRIPTION	APPROVED

WILCO TEXAS
benesch
TSPE FIRM NO. 9404
5113 Southwest Pkwy, Suite 255
AUSTIN TX 78735
TEL. 720-409-1860
www.Benesch.com

SHEET 1 OF 1

DESIGN	GRAPHICS	CHECK	CHECK	SHEET NO.
				18

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DW

SUMMARY OF ROADWAY ITEMS

LOCATION	110 7001 EXCAV (ROADWAY) CY	132 7005 EMBANK (FNL)(OC)(TY C) CY	247 7178 FL BS (CMP IN PLC)(TY A GR 4)(FNAL POS) CY	260 7005 LIME (COM OR QK)(SLURRY) TON	260 7020 LIME TRT (SUBGRADE) (8") SY	310 7015 PRIME COAT (MULTIOPTION) GAL	341 7002 D-GR HMA TY-B SAC-B PG64-22 TON	341 7058 D-GR HMA TY-D SAC-B PG76-22 TON	347 7001 TOM-C PG76-22 SAC-A TON	354 7034 PLANE ASPH CONC PAV(0" TO 4") SY	420 7052 CL C CONC (RAIL FOUNDATION) CY	432 7002 RIPRAP (CONC)(5 IN) CY	450 7024 RAIL (TY SSTR) LF
PARMER LANE													
BEGIN PROJECT TO STA 303+00	462	111	289	8	442	116	305	679	349	5,584			
STA 303+00 TO 315+00	1,524	271	840	26	1,405	356	891	1,922	987	15,313		412	
STA 315+00 TO END PROJECT	451	300	813	39	2,148	367	545	1,408	724	10,964		743	
WBFR													
STA 1003+35 TO STA 1013+50	818	374	539	26	1,437	197	322	118	65		26	113	174
PROJECT TOTALS	**3,255**	**1,056**	**2481**	**99**	**5,432**	**1036**	**2,063**	**4,127**	**2,125**	**31,861**	**26**	**1,268**	**174**

SUMMARY OF ROADWAY ITEMS

LOCATION	465 6389 INLET (COMPL)(TY SIDEWALK BRIDGE)(MOD) EA	529 7002 CONC CURB (TY II) LF	529 7009 CONC CURB & GUTTER (TY II) LF	529 7011 CONCRETE GUTTER (MODIFIED) LF	530 7006 DRIVEWAY (CONC) SY	531 7002 CONC SIDEWALKS (5") SY	531 7005 CURB RAMPS (TY 1) EA	531 7012 CURB RAMPS (TY 20) EA	531 7014 CURB RAMPS (TY 22) EA	540 7001 MTL W-BEAM GD FEN (TIM POST) LF	540 7005 MTL BEAM GD FEN TRANS (THRIE-BEAM) EA	540 7015 DOWNSTREAM ANCHOR TERMINAL SECTION EA	543 7018 CABLE BARRIER TERM SEC (INSTL)(TL-4) EA	544 7001 GUARDRAIL END TREATMENT (INSTALL) EA	3007 7001 BONDING COURSE GAL
PARMER LANE															
BEGIN PROJECT TO STA 303+00		41	575	342		121				61				1	173
STA 303+00 TO 315+00	2	243	1,561	22	143	81	2	2	4	31		1			489
STA 315+00 TO END PROJECT			1,253										1		341
WBFR															
STA 1003+35 TO STA 1013+50			620							575	1			1	26
PROJECT TOTALS	**2**	**284**	**4,009**	**364**	**143**	**202**	**2**	**2**	**4**	**667**	**1**	**1**	**1**	**2**	**1,030**

SUMMARY OF REMOVAL ITEMS

LOCATION	100 7002 PREPARING ROW STA	104 7003 REMOV CONC (MOWSTRIP) SY	104 7006 REMOV CONC (RIPRAP) SY	104 7008 REMOV CONC (MEDIANS) SY	104 7011 REMOV CONC (DRIVEWAYS) SY	104 7013 REMOV CONC (SIDEWALK, RAMP OR SUP) SY	104 7016 REMOV CONC (CURB) LF	104 7017 REMOV CONC (CURB & GUTTER) LF	105 7018 RMV (18"-22") TRT/UNTRT BASE & ASPH PAV SY	542 7001 REMOVE METAL BEAM GUARD FENCE LF	542 7002 REMOVE TERMINAL ANCHOR SECTION EA	542 7003 REMOVE DOWNSTREAM ANCHOR TERMINAL EA	542 7004 RM MTL BM GD FENCE TRANS (THRIE-BEAM) EA	543 7038 CABLE BARRIER TERMINAL SECTION (REMOVE) EA	543 7037 CABLE BARRIER (REMOVE) LF
PARMER LANE															
BEGIN PROJECT TO STA 303+00	8		424				41	966	315	61	1				
STA 303+00 TO 315+00	12			409	166	19		938	634	31		1		1	188
STA 315+00 TO END PROJECT	9							74	46				1		885
WBFR															
STA 1003+35 TO STA 1013+50	10	291						788	136	750	1				
PROJECT TOTALS	**39**	**291**	**424**	**409**	**166**	**19**	**41**	**2,766**	**1,131**	**842**	**2**	**1**	**1**	**1**	**1,073**

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45

SUMMARY OF QUANTITIES ROADWAY AND REMOVAL

SHEET 1 OF 7

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		19

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EARTHWORK QUANTITY SUMMARY		
FM 734		
LOCATION	110 7001	132 7005
	EXCAV (ROADWAY)	EMBANK (FNL)(OC)(TY C)
	CY	CY
295+00	0	0
296+00	0	0
297+00	0	0
298+00	0	0
299+00	0	0
300+00	53	7
301+00	165	33
302+00	244	43
303+00	270	28
304+00	240	19
305+00	218	18
306+00	209	17
307+00	241	12
308+00	165	102
309+00	20	98
310+00	8	2
311+00	4	1
312+00	0	0
313+00	46	0
314+00	103	1
315+00	122	1
316+00	91	17
317+00	42	37
318+00	32	46
319+00	29	45
320+00	31	27
321+00	32	26
322+00	27	40
323+00	29	42
324+00	16	20
TOTAL	**2,437**	**682**

EARTHWORK QUANTITY SUMMARY		
WB FRONTAGE ROAD		
LOCATION	110 7001	132 7005
	EXCAV (ROADWAY)	EMBANK (FNL)(OC)(TY C)
	CY	CY
1003+35	0	0
1003+50	0	0
1004+00	0	0
1004+50	0	0
1005+00	0	0
1005+50	0	0
1006+00	18	26
1006+50	49	72
1007+00	50	68
1007+50	53	55
1008+00	58	22
1008+50	59	14
1009+00	61	6
1009+50	62	5
1010+00	61	6
1010+50	60	8
1011+00	59	12
1011+50	57	21
1012+00	55	33
1012+50	48	23
1013+00	35	3
1013+50	33	0
TOTAL	**818**	**374**

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE
AT SH 45
SUMMARY OF QUANTITIES
EARTHWORK

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		20

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DW

SUMMARY OF WORKZONE AND TRAFFIC CONTROL ITEMS

LOCATION	502 7001	503 7002	512 7005	512 7053	545 7004	545 7014	662 7065	662 7066
	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORTABLE CHANGEABLE MESSAGE SIGN	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	CRASH CUSH ATTEN (REMOVE)	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	WK ZN PAV MRK REMOV (W)6"(BRK)	WK ZN PAV MRK REMOV (W)6"(DOT)
	MO	EA	LF	LF	EA	EA	LF	LF
FM 734 (PARMER LANE) PH 1								
BEGIN PROJECT TO STA 303+00	3	1	500	500	1	1		
STA 303+00 TO 315+00		1	834	834	2	2	1,118	240
STA 315+00 TO END PROJECT		1	691	691	1	1	2,104	
FM 734 (PARMER LANE) PH 2								
BEGIN PROJECT TO STA 303+00	3						1,000	
STA 303+00 TO 315+00							4,210	
STA 315+00 TO END PROJECT							2,624	
FM 620 WBFR PH 1								
STA 1003+35 TO STA 1013+50		1						
FM 620 WBFR PH 2								
STA 1003+35 TO STA 1013+50			791	791	2	2	1,020	
PROJECT TOTALS	**6**	**4**	**2,816**	**2,816**	**6**	**6**	**12,076**	**240**

SUMMARY OF WORKZONE AND TRAFFIC CONTROL ITEMS

LOCATION	662 7068	662 7082	662 7083	662 7092	662 7100
	WK ZN PAV MRK REMOV (W)6"(SLD)	WKZN PAV MRK REMOV (W)(ARROW)	WKZN PAV MRK REMOV (W)(DBLARROW)	WKZN PAV MRK REMOV (W)(WORD)	WKZN PAV MRK REMOV (Y)6"(SLD)
	LF	EA	EA	EA	LF
FM 734 (PARMER LANE) PH 1					
BEGIN PROJECT TO STA 303+00	970				970
STA 303+00 TO 315+00	1,440	10	1	10	1,863
STA 315+00 TO END PROJECT					1,804
FM 734 (PARMER LANE) PH 2					
BEGIN PROJECT TO STA 303+00	3,196	1			400
STA 303+00 TO 315+00	4,566	7	3		248
STA 315+00 TO END PROJECT	1,723				
FM 620 WBFR PH 1					
STA 1003+35 TO STA 1014+25		1			
FM 620 WBFR PH 2	3,087				
STA 1003+35 TO STA 1014+25		2	1	1	
PROJECT TOTALS	***14,982***	***21***	***5***	***11***	***5,285***

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45

SUMMARY OF QUANTITIES TRAFFIC CONTROL

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		21

100% SUBMITTAL

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DW
CK
DW

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS

LOCATION	636 7002	644 7001	644 7004	644 7028	644 7031	644 7033	644 7073	658 7006	666 7009	666 7018	666 7024	666 7036
	ALUMINUM SIGNS (TY G)	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA(U)	IN SM RD SN SUP&AM TYS80(1)SA(U-2EXT)	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW)SZ 1(WFLX)SRF	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	REFL PAV MRK TY I (W)8"(DOT)(100MIL)	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)24"(SLD)(100MIL)
	SF	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF
FM 734 (PARMER LANE)												
BEGIN PROJECT TO STA 303+00	15	3					2			99	200	38
STA 303+00 TO 315+00	220	9	3	1		1	28		1,227		1926	637
STA 315+00 TO END PROJECT	6	1					1	34	204	431	1222	
FM 620 WBFR												
STA 1003+35 TO STA 1013+50	62	4	2		1		13		137	128	635	48
PROJECT TOTALS	**304**	**17**	**5**	**1**	**1**	**1**	**44**	**34**	**1,568**	**1,316**	**7,966**	**1,446**

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS

LOCATION	666 7042	666 7045	666 7081	666 7090	666 7092	666 7098	666 7117	666 7172	666 7173	666 7177	666 7179	666 7184
	REFL PAV MRK TY I (W)(ARROW)(100MIL)	REFL PAV MRK TY I(W)(DBL ARROW)(100 MIL)	REFL PAV MRK TY I (W)(RR XING)(100MIL)	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	REFL PAV MRK TY I (W)(BIKE ARW)(090MIL)	REFL PAV MRK TY I (W)(BIKE SYML)(090MIL)	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	RE PM TY II (W) 6" (BRK)	RE PM TY II (W) 6" (DOT)	RE PM TY II (W) 8" (DOT)	RE PM TY II (W) 8" (SLD)	RE PM TY II (W) 24" (SLD)
	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	LF	LF
FM 734 (PARMER LANE)												
BEGIN PROJECT TO STA 303+00			0		1	1		1,442		99	200	38
STA 303+00 TO 315+00	15	2	3	10	11	10	1237	3,701	1,227		1,926	637
STA 315+00 TO END PROJECT					4	4	1740	3,515	204	431	1,222	
FM 620 WBFR												
STA 1003+35 TO STA 1014+25	5							1,393	137	128	635	48
PROJECT TOTALS	**20**	**2**	**3**	**10**	**16**	**15**	**2,977**	**10,051**	**1,568**	**658**	**3,983**	**723**

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS

LOCATION	666 7186	666 7187	666 7198	666 7201	666 7203	666 7205	666 7215	666 7236	666 7408	666 7411
	RE PM TY II (W) (ARROW)	RE PM TY II (W) (DBL ARROW)	RE PM TY II (2) (RR XING)	RE PM TY II (W) 36" (YLD TRI)	RE PM TY II (W) (BIKE ARROW)	RE PM TY II (W) (BIKE SYMBOL)	RE PM TY II (Y) 12" (SLD)	RE PM TY II (W) 6" (SLD)	REFL PAV MRK TY I(W)6"(BRK)(100MIL)	REFL PAV MRK TY I(W)6"(SLD)(100MIL)
	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF
FM 734 (PARMER LANE)										
BEGIN PROJECT TO STA 303+00					1	1		1,899	1,442	1,899
STA 303+00 TO 315+00	15	2	3	10	11	10	1,237	5,301	3,701	5,301
STA 315+00 TO END PROJECT					4	4	1,740	3,810	3,515	3,810
FM 620 WBFR										
STA 1003+35 TO STA 1014+25	5							618	1,393	618
PROJECT TOTALS	**20**	**2**	**3**	**10**	**16**	**15**	**2,977**	**11,628**	**10,051**	**11,628**

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS

LOCATION	668 7127	672 7004	672 7006
	PREFAB PM TY C (Y)(24")(SLD)	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
	LF	EA	EA
FM 734 (PARMER LANE)			
BEGIN PROJECT TO STA 303+00		167	10
STA 303+00 TO 315+00	71	449	93
STA 315+00 TO END PROJECT		356	62
FM 620 WBFR			
STA 1003+35 TO STA 1014+25		84	48
PROJECT TOTALS	**71**	**1,056**	**213**

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TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45

SUMMARY OF QUANTITIES PAVEMENT MARKING AND SIGNING

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		22

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ITEM	0416-7042	0416-7044	0618-7054	0618-7055	0618-7060	0618-7061	0618-7090	0620-7009
INTERSECTION	DRILL SHAFT (TRF SIG POLE) (24 IN) *	DRILL SHAFT (TRF SIG POLE) (36 IN)	CONDT (PVC) (SCH 80) (2")	CONDT (PVC) (SCH 80) (2") (BORE)	CONDT (PVC) (SCH 80) (3")	CONDT (PVC) (SCH 80) (3") (BORE)	CONDUIT (PREPARE)	ELEC CONDR (NO.6) BARE
	LF	LF	LF	LF	LF	LF	LF	LF
SH 45 AT PARMER LN	24	30	130	345	135	685	805	1370
TOTALS	24	30	130	345	135	685	805	1370

ITEM	0621-7006	0624-7008	0628-7267	0680-7011	0682-7001	0682-7002	0682-7003	0682-7004
INTERSECTION	TRAY CABLE (4 CONDR) (12 AWG)	GROUND BOX TY D (162922)W/APRON	ELC SRV TY D 120/240 125(NS)GS(N)EX(O)	INSTALL HWY TRF SIG (UPGRADE)	VEH SIG SEC (12")LED(GRN)	VEH SIG SEC (12")LED(GRN ARW)	VEH SIG SEC (12")LED(YEL)	VEH SIG SEC (12")LED(YEL ARW)
	LF	EA	EA	EA	EA	EA	EA	EA
SH 45 AT PARMER LN	975	6	1	1	16	10	19	5
TOTALS	975	6	1	1	16	10	19	5

ITEM	0682-7005	0682-7006	0682-7018	0682-7042	0682-7043	0684-7010	0684-7012	0684-7079
INTERSECTION	VEH SIG SEC (12")LED(RED)	VEH SIG SEC (12")LED(RED ARW)	PED SIG SEC (LED)(COUNTDOWN)	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)
	EA	EA	EA	EA	EA	LF	LF	LF
SH 45 AT PARMER LN	19	5	4	22	2	780	4245	755
TOTALS	19	5	4	22	2	780	4245	755

ITEM	0686-7049	0686-7165	0687-7001	0688-7001	0688-7003	0690-7066	0690-7069	6008-7001
INTERSECTION	INS TRF SIG PL AM(S)1 ARM(48')	INS TRF SIG PL AM(S)2 ARM(44-36')	PED POLE ASSEMBLY	PED DETECT PUSH BUTTON (APS)	PED DETECTOR CONTROLLER UNIT	INSTALL OF LUMINAIRE HEAD	INSTALL OF LUMINAIRE MAST ARMS	RVDS (PRESENCE DETECTION ONLY)
	EA	EA	EA	EA	EA	EA	EA	EA
SH 45 AT PARMER LN	1	1	4	4	1	2	2	2
TOTALS	1	1	4	4	1	2	2	2

ITEM	6008-7003	6008-7009	6018-7004	6018-7007
INTERSECTION	RVDS (PRESENCE AND ADVANCE DETECTION)	RADAR PRESENCE DETECTOR COMM CABLE	ITS COM CBL (ETHERNET)	RELOCATE CCTV FIELD EQUIPMENT
	EA	LF	LF	EA
SH 45 AT PARMER LN	4	2735	245	1
TOTALS	4	2735	245	1

*** ITEM SUBSIDIARY TO 687-7001. SHOWN FOR CONTRACTOR PURPOSES ONLY.**

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PAPE-DAWSON ENGINEERS

2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000

Texas Engineering Firm #470 | Texas Surveying Firm #10028800

SUMMARY OF QUANTITIES TRAFFIC SIGNAL PARMER LN AT SH 45

2025 SHEET OF

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	23

DATE:
FILE:

SUMMARY OF DRAINAGE ITEMS												
	LOCATION	400	400	402	420	464	464	464	465	465	465	465
		7007	7008	7001	7009	7003	7005	7040	7002	7014	7015	7023
PLAN SHEET NUMBER	SHEET NAME/ STA TO STA	0400-7007 CUT & RESTORE CONC PAVING	0400-7008 CUT & RESTORE ASPH PAVING	0402-7001 TRENCH EXCAVATION PROTECTION	0420-7009 CL A CONC (PLUG)	0464-7003 RC PIPE (CL III) (18 IN)	0464-7005 RC PIPE (CL III) (24 IN)	0464-7040 RC PIPE (ARCH) (CL III) (DES 1)	0465-7002 MANH (COMPL) (PRM)(48IN)	0465-7014 INLET (COMPL)(PCO) (3FT)(LEFT)	0465-7015 INLET (COMPL)(PCO) (3FT)(RIGHT)	0465-7023 INLET (COMPL)(PCO) (5FT)(RIGHT)
		SY	SY	LF	EA	LF	LF	LF	EA	EA	EA	EA
DRAINAGE PLAN & PROFILE												
	PARMER LANE											
1 OF 3	BEGIN PROJECT TO STA 303+00	14		51		51	9			1	1	1
2 OF 3	STA 303+00 TO STA 315+00	30	23	428	1	246	313	75	1	1		1
3 OF 3	STA 315+00 TO STA END PROJECT											
PROJECT TOTALS:		44	23	479	1	297	322	75	1	2	1	2

SUMMARY OF DRAINAGE ITEMS								
	LOCATION	465	467	467	467	496	496	496
		7072	7308	7305	7418	7002	7004	7007
PLAN SHEET NUMBER	SHEET NAME/ STA TO STA	0465-7072 INLET (COMPL)(PSL) (RC)(3FTX5FT)	0467-7308 SET (TY II) (18 IN)(RCP) (6:1)(P)	0467-7305 SET (TY II) (18 IN)(RCP) (3:1)(C)	0467-7418 SET (TY II) (DES 1)(RCP) (6:1)(P)	0496-7002 REMOV STR (INLET)	0496-7004 REMOV STR (SET)	0496-7007 REMOV STR (PIPE)
		EA	EA	EA	EA	EA	EA	LF
DRAINAGE PLAN & PROFILE								
	PARMER LANE							
1 OF 3	BEGIN PROJECT TO STA 303+00		1	1		1	2	53
2 OF 3	STA 303+00 TO STA 315+00	1			2	2	2	130
3 OF 3	STA 315+00 TO STA END PROJECT							
PROJECT TOTALS:		1	1	1	2	3	4	183

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7000 N Mopac Expy. Ste. 325
512.767.1009 | www.civil-edge.com

PARMER LANE AT SH45

DRAINAGE QUANTITIES

2025

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		24

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SUMMARY OF SW3P ITEMS										
SW3P LAYOUT	LOCATION	160	161	164	164	164	164	166	168	506
		WC01	WC01	WC04	WC07	WC10	WC11	7002	WC01	7001
		160-WC01	161-WC01	164-WC04	164-WC07	164-WC10	164-WC11	0166-7002	0168-WC01	0506-7001
		FURNISHING AND PLACING TOP SOIL (4")	EROSION CONTROL COMPOST (3")	SEEDING FOR EROSION CONTROL (TEMP)(COOL) (TY 4)	SEEDING FOR EROSION CONTROL (TEMP & PERM) (TY 7)	SEEDING FOR EROSION CONTROL (TEMP)(WARM) (TY 10)	SEEDING FOR EROSION CONTROL (PERM) (TY 11)	FERTILIZER	VEGETATIVE WATERING	ROCK FILTER DAMS (INSTALL) (TY 1)
		SY	SY	SY	SY	SY	SY	TON	MG	LF
	PARMER LANE									
SHEET 1 OF 4	BEGIN PROJECT TO STA 303+00	993	249	497	1490	497	1490	0.07	29.80	35
SHEET 2 OF 4	STA 303+00 TO STA 315+00	1363	341	682	2045	682	2045	0.09	40.90	
SHEET 3 OF 4	STA 315+00 TO STA END PROJECT									63
	SH 45 FRONTAGE ROAD									
SHEET 4 OF 4	STA 1003+00 TO END PROJECT	3067	767	1534	4601	1534	4601	0.20	92.10	
	PROJECT TOTALS:	5423	1357	2712	8135	2712	8135	0.36	162.80	98

SUMMARY OF SW3P ITEMS						
SW3P LAYOUT	LOCATION	506	506	506	506	506
		7011	7020	7024	7044	7046
		0506-7011	0506-7020	0506-7024	0506-7044	0506-7046
		ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
		LF	SY	SY	LF	LF
	PARMER LANE					
SHEET 1 OF 4	BEGIN PROJECT TO STA 303+00	35			134	134
SHEET 2 OF 4	STA 303+00 TO STA 315+00				249	249
SHEET 3 OF 4	STA 315+00 TO STA END PROJECT	63	315	315		
	SH 45 FRONTAGE ROAD					
SHEET 4 OF 4	STA 1003+00 TO END PROJECT				59	59
	PROJECT TOTALS:	98	315	315	442	442

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7000 N Mopac Expy. Ste. 325
512.767.1009 | www.civil-edge.com

PARMER LANE AT SH45

SW3P QUANTITIES

2025

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		25

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TRAFFIC CONTROL PLAN GENERAL NOTES

1. TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC.
2. *REFER TO TXDOT TCP STANDARD BC(1)-21 THRU BC(12)-21 AND TMUTCD FOR SIGN SPACING REQUIREMENTS, SIGNS MAY BE ADJUSTED DUE TO FIELD CONDITIONS AND SAFETY TO TRAVELING PUBLIC, RELOCATE SIGNS AT INTERSECTIONS AS NEEDED TO PROVIDE BETTER VISIBLITY, TEMPORARY SIGNS SHOWN MAY BE RELOCATED ON TEMPORARY SUPPORTS DURING CONSTRUCTION. EXISTING SIGNS THAT WILL REMAIN IN PLACE BUT ARE NOT APPROPRIATE FOR CONSTRUCTION CONDITIONS SHALL BE COVERED. IN LIEU OF TEMPORARY SIGNING, THE CONTRACTOR MAY ELECT TO INSTALL FINAL PERMANENT SIGNING AS SOON A CONDITIONS ALLOW.*
3. BARRICADES AND WARNING SIGNS WILL BE PLACED AS INDICATED ON THE PLANS AND TXDOT STANDARD SHEETS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER, OR AS REQUIRED BY FIELD CONDITIONS, TO PROVIDE SAFE PASSAGE OF TRAFFIC AT ALL TIMES.
4. ALL BARRICADES, SIGNS AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING.
5. MAINTAIN BUSINESS AND PROPERTY OWNER ACCESS THROUGH WORK ZONE AT ALL TIMES. TRAFFIC BARRELS WILL BE USED TO DELINEATE INTERSECTIONS AND DRIVEWAYS, UNLESS OTHERWISE NOTED.
6. CONTRACTOR TO COORDINATE DRIVEWAY CONSTRUCTION WITH PROPERTY OWNER(S).
7. MAINTAIN POSITIVE DRAINAGE THROUGHOUT ALL PHASES OF THE PROJECT, INSTALL TEMPORARY DRAINAGE ITEMS AS NECESSARY. THIS WORK IS SUBSIDIARY.
8. EXISTING SIGNS NOT IN CONFILICT WITH THE TRAFFIC CONTROL PLAN ARE TO REMAIN DURING CONSTRUCTION.
9. REMOVE ALL CONFLICTING EXISTING AND WORK ZONE PAVEMENT MARKINGS PRIOR TO SHIFTING TRAFFIC IN A NEW PHASE OF CONSTRUCTION.
10. USE 3:1 SAFTEY WEDGES FOR ALL DROP OFFS GREATER THAN TWO (2) INCHES LEFT OVERNIGHT.
11. WHEN EXCAVATION IS REQUIRED NEXT TO TRAVEL LANE CARRYING TRAFFIC AND WIDENING IS NOT COMPLETED BY THE END OF THE DAYS OPERATION ALL EDGE OF PAVEMENT DROP OFFS NOT PROTECTED BY BARRIER SHALL BE TREATED WITH A 3:1 (OR FLATTER) SAFETY SLOPE. MATERIAL AND LABOR FOR THIS WORK WILL NOT BE PAID DIRECTLY, BUT WILL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.
12. *WHERE THERE IS EXCAVATION ADJACENT TO THE PAVEMENT EDGE, PROVIDE ADEQUATE WARNING SIGNS, VERTICAL PANELS, DRUMS, AND REFLECTORS AT THE PAVEMENT EDGE, AS DIRECTED. TREAT PAVEMENT DROP OFFS CREATED BY ACP OPERATIONS IN A SIMILAR MANNER.*
13. *AT POINTS WHERE IT IS NECESSARY FOR TRUCKS TO STOP AND UNLOAD, PROVIDE WARNING SIGNS AND FLAGGERS AS NECESSARY TO ADEQUATELY PROTECT THE TRAVELING PUBLIC.*
14. *PROTECT THE EXISTING UTILITIES THAT REMAIN IN PLACE DURING CONSTRUCTION.*
15. *NO TCP DEVICES OR SIGNAGE SHALL BE PLACED WITHIN CAPMETRO RR RIGHT-OF-WAY*
16. *REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES AS SOON AS PRACTICAL WHEN THEY ARE NO LONGER NEEDED. WHEN WORK IS SUSPENDED FOR SHORT PERIODS OF TIME, TEMPORARY TRAFFIC CONTROL DEVICES THAT ARE NO LONGER APPROPRIATE SHALL BE REMOVED OR COVERED.*
17. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED PER THE TEXAS MUTCD GUIDELINES AND MUST BE PLACED 7 DAYS PRIOR TO THE START OF CONSTRUCTION.

SEQUENCE OF WORK

PLACE ADVANCED WARNING SIGNS:

PLACE ADVANCED WARNING SIGNS FOR THE ENTIRE PROJECT, IN ACCORDANCE WITH THE ADVANCED WARNING SIGN LAYOUT SHEETS AND TXDOT BARRICADE AND CONSTRUCTION STANDARDS.

PHASE I:

1. INSTALL SW3P FACILITIES AND MAINTAIN THROUGHOUT THE LENGTH OF THE PROJECT.

2. SHIFT NB & SB PARMER LANE TRAFFIC TO THE OUTSIDE OF ROADWAY PAVEMENT, MAINTAIN MINIMUM 11' LANES WITH 4' BUFFER BETWEEN CONSTRUCTION AND TRAVEL LANE. ADJUST TRAFFIC SIGNALS TO ALIGN WITH TEMPORARY LANE CONFIGURATION.

MAINTAIN EXISTING TRAFFIC PATTERNS FOR FM 620 WB & EB FRONTAGE ROADS.

3. INSTALL NEW TRAFFIC SIGNAL POLES IN MEDIAN AND REMOVE EXISTING POLES PER TRAFFIC SIGNAL LAYOUT PLANS.

4. CONSTRUCT THE PAVEMENT WIDENINGS AND MEDIAN CONSTRUCTION TO THE INSIDE OF PARMER LANE FOR BOTH THE NB AND SB LEFT TURN LANES.

CONSTRUCT THE CURB RECONSTRUCTION IN CAPMETRO RR RIGHT-OF-WAY.

5. REMOVE CHANNELIZING DEVICES.

6. OPEN NB & SB PARMER LANE LEFT TURN LANES WITH TEMPORARY PAVEMENT MARKING.

PHASE 2:

1. INSTALL SW3P FACITILIES IN ACCORDANCE WITH SW3P PLANS.

2. ADJUST THE REQUIRED ADVANCED WARNING SIGNS.

3. SHIFT SB PARMER LANE TRAFFIC TO THE INSIDE OF THE ROADWAY PAVEMENT, MAINTAIN MINIMUM 11' LANE WITH 4' BUFFER BETWEEN CONSTRUCTION AND TRAVEL LANE. CLOSE SB PARMER LANE RIGHT TURN AT FM 620 WB FRONTAGE ROAD. ADJUST TRAFFIC SIGNALS TO ALIGN WITH TEMPORARY LANE CONFIGURATION.

SHIFT WBFR TRAFFIC TO THE OUTSIDE LANES, MAINTAIN MINIMUM 11' LANE WITH 4' BUFFER BETWEEN CONSTRUCTION AND TRAVEL LANE. ADJUST TRAFFIC SIGNALS TO ALIGN WITH TEMPORARY TRAFFIC CONFIGURATION.

4. CONSTRUCT THE PAVEMENT WIDENING TO THE OUTSIDE AND SLIP LANE FOR SB PARMER LANE RIGHT TURN ONTO FM 620 WB FRONTAGE ROAD.

CONSTRUCT THE PAVEMENT WIDENING, GUARDRAIL, AND BARRIER TO THE INSIDE OF FM 620 WB FRONTAGE FOR THE LEFT TURN LANE ONTO PARMER LANE SB.

5. REMOVE CHANNELIZING DEVICES.

6. OPEN SB PARMER RIGHT TURN LANE AND FM 620 WB FRONTAGE ROAD LEFT TURN LANE WITH TEMPORARY PAVEMENT MARKING.

PHASE 3:

1. INSTALL PERMANENT SIGNS AS SHOWN IN THE PLANS

2. MILL AND THEN PLACE FINAL OVERLAY PAVEMENT SURFACE LAYER.

3. PLACE FINAL PAVEMENT MARKINGS AS SHOWN IN THE PLANS.

4. PERFORM FINAL CLEAN UP.

5. OPEN ALL LANES TO TRAFFIC.

6. REMOVE TEMPORARY EROSION CONTROL DEVICES ONCE VEGETATION IS ESTABLISHED AND APPROVED BY THE ENGINEER.

NOTE:

1. ALL CONSTRUCTION ACTIVITIES IN CAPMETRO RAIL RIGHT-OF-WAY SHALL BE COORDINATED WITH CAPMETRO, REFER TO THE APPROVED EXHIBIT A AND PERMIT FOR FURTHER INFORMATION.

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER

11/13/2025

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

FM 734 (PARMER LANE) AT SH 45

TRAFFIC CONTROL PLAN NARRATIVE

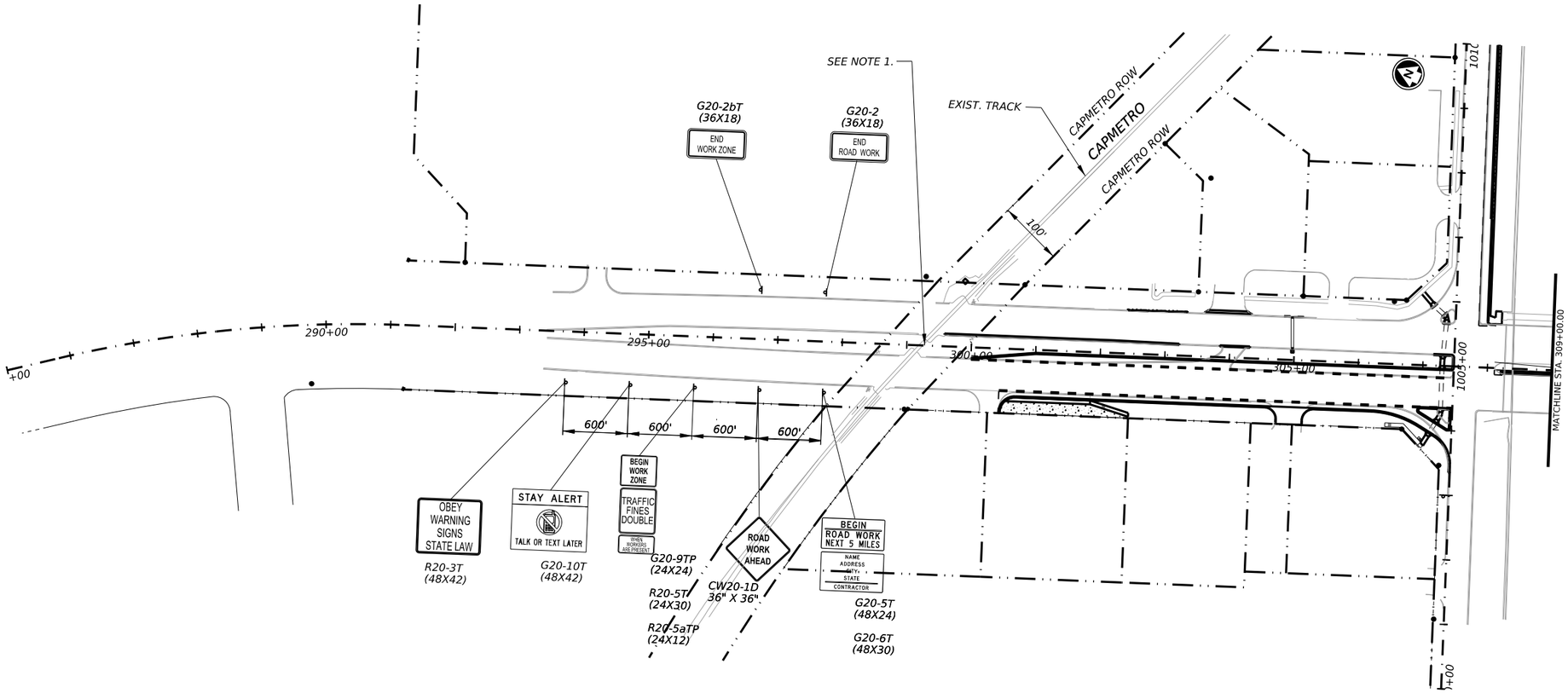
2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		26

DATE:
FILE:

100% SUBMITTAL

CK
DW
CK
DW



LEGEND

- TRAFFIC DIRECTION
- SIGN
- SIGN NUMBER

0 100 200

SCALE IN FEET
1" = 200' HORZ

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER

11/14/2025

NOTES:

1- ANY WORK WITHIN CAPMETRO ROW SHALL COMPLY WITH REQUIREMENTS SPELLED OUT ON CAPMETRO GENERAL NOTES.

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE AT SH 45
TRAFFIC CONTROL PLAN
ADVANCE WARNING SIGNS

2025 SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		27

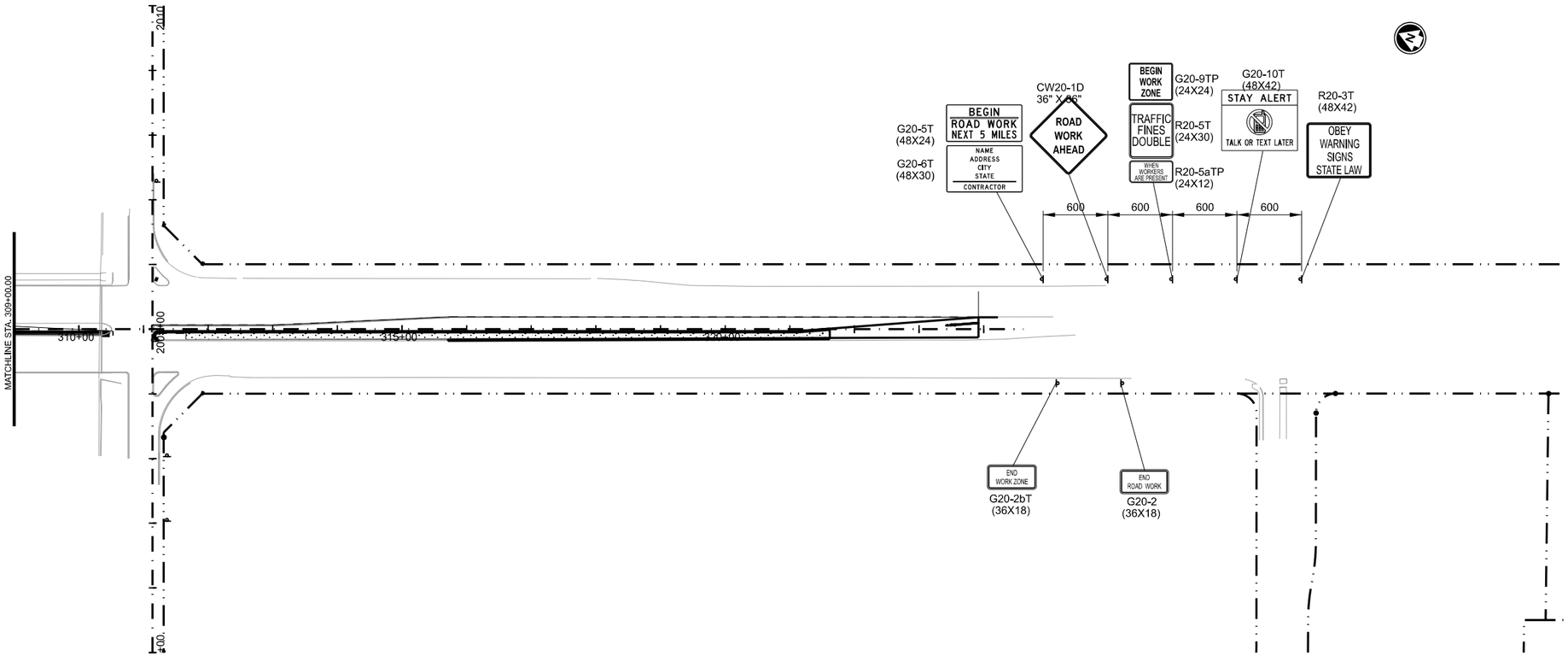
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100% SUBMITTAL

CHK
DWN
CHK
DES

LEGEND

- TRAFFIC DIRECTION
- SIGN
- SIGN NUMBER



0 100 200
SCALE IN FEET
1" = 200' HORZ

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER

11/13/2025

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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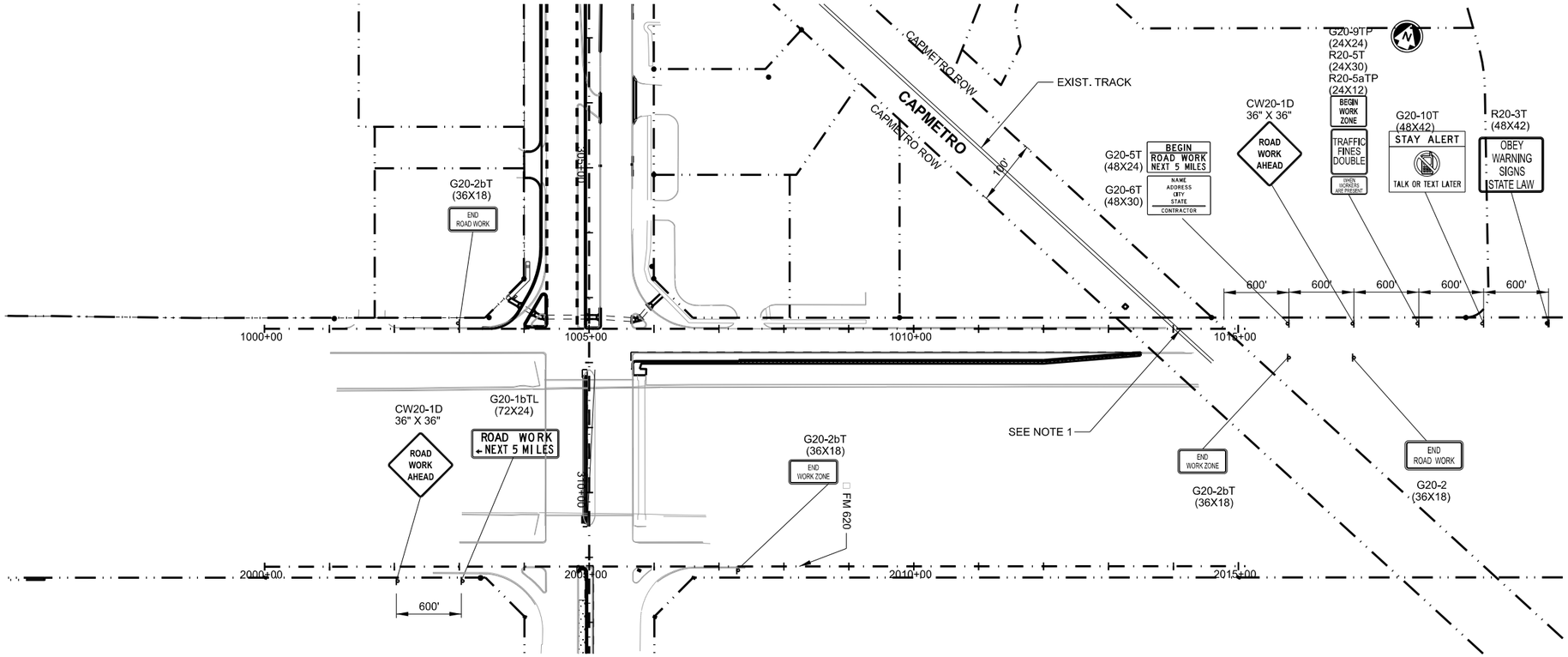
PARMER LANE AT SH 45 TRAFFIC CONTROL PLAN ADVANCE WARNING SIGNS

2025 SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		28

DATE: 11/13/2025 2:58:12 PM
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100% SUBMITTAL



LEGEND

- TRAFFIC DIRECTION
- SIGN
- SIGN NUMBER

0 100 200
SCALE IN FEET
1" = 200' HORZ

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER
David Watson
11/14/2025

NOTES:

1- ANY WORK WITHIN CAPMETRO ROW SHALL COMPLY WITH REQUIREMENTS SPELLED OUT ON CAPMETRO GENERAL NOTES.

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45
TRAFFIC CONTROL PLAN
ADVANCE WARNING SIGNS

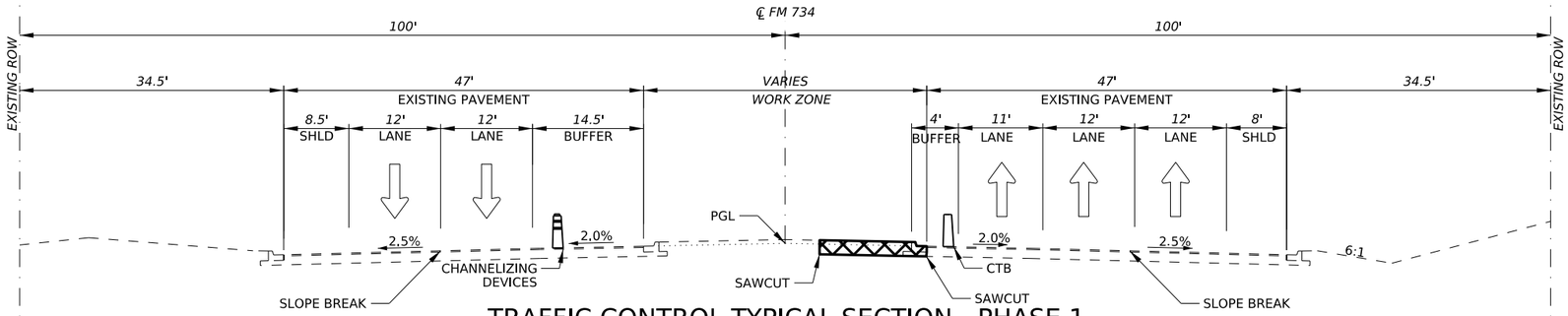
2025 SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		29

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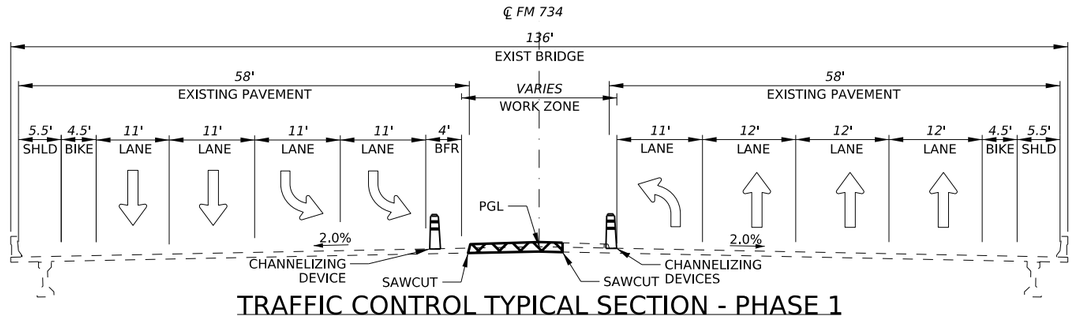
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TRAFFIC CONTROL TYPICAL SECTION - PHASE 1

FM 734 (PARMER LANE)

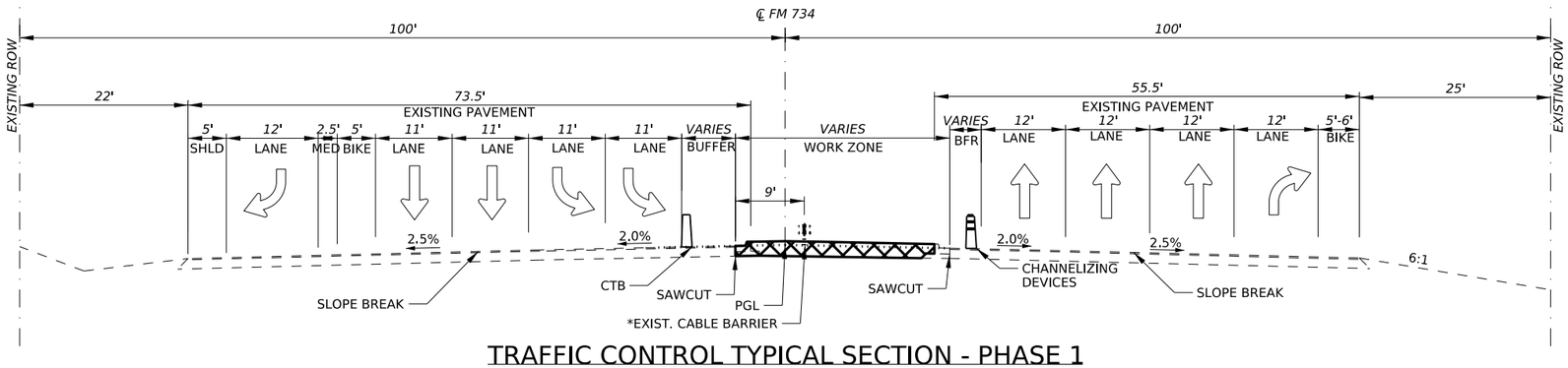
STA 300.040 TO STA 307+47.99



TRAFFIC CONTROL TYPICAL SECTION - PHASE 1

FM 734 (PARMER LANE) BRIDGE OVER SH 45

STA 308+11.32 TO STA 310+52.70



TRAFFIC CONTROL TYPICAL SECTION - PHASE 1

FM 734 (PARMER LANE)

STA 311+14.00 TO STA 323+92.00

* EXIST. CABLE BARRIER TO BE REMOVED
STA. 313+12.52 TO STA. 323+82.00

LEGEND

- EXISTING ROW
- CHANNELIZING DEVICES
- CONCRETE TRAFFIC BARRIER (CTB)
- ROADWAY CONSTRUTION
- PREVIOUS CONSUTRION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED PROFESSIONAL ENGINEER

11/13/2025

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

FM 734 (PARMER LANE) AT SH 45

TRAFFIC CONTROL PLAN TYPICAL SECTIONS PHASE 1

2024 SHEET 1 OF 2

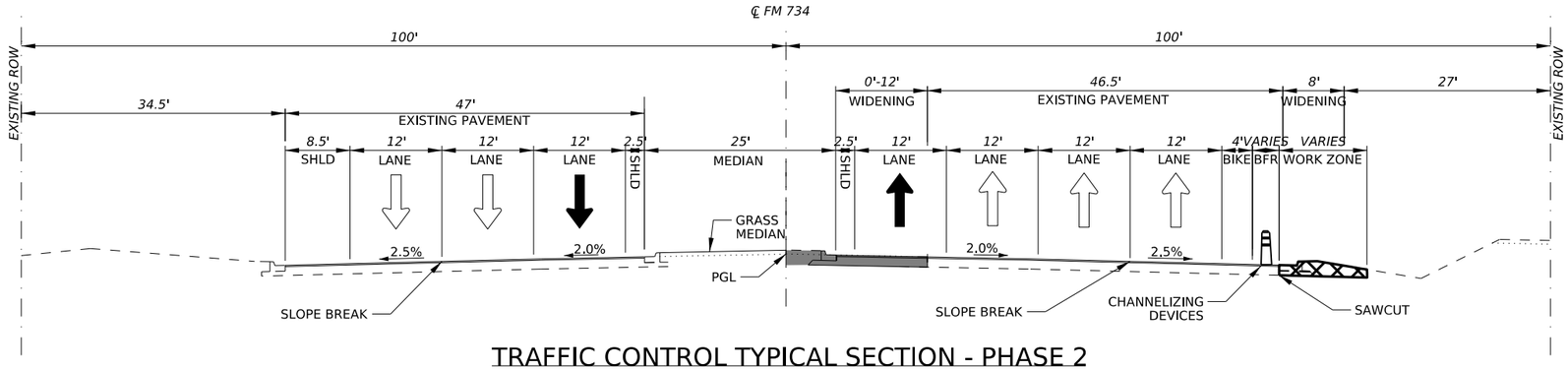
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DIST	COUNTY	SHEET NO.
4	WILLIAMSON	30

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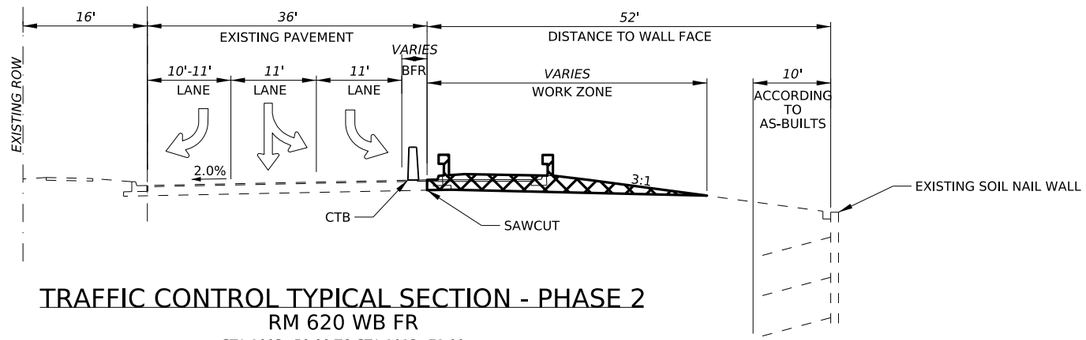
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TRAFFIC CONTROL TYPICAL SECTION - PHASE 2

FM 734 (PARMER LANE)

STA 300+00.04 TO STA 307+47.99



TRAFFIC CONTROL TYPICAL SECTION - PHASE 2

RM 620 WB FR

STA 1003+50.00 TO STA 1013+71.00

LEGEND

- EXISTING ROW
- CHANNELIZING DEVICES
- CONCRETE TRAFFIC BARRIER (CTB)
- ROADWAY CONSTRUCTION
- PREVIOUS CONSUTRION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED PROFESSIONAL ENGINEER

David Watson
11/13/2025

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

FM 734 (PARMER LANE) AT SH 45

TRAFFIC CONTROL PLAN TYPICAL SECTIONS PHASE 2

2024 SHEET 2 OF 2

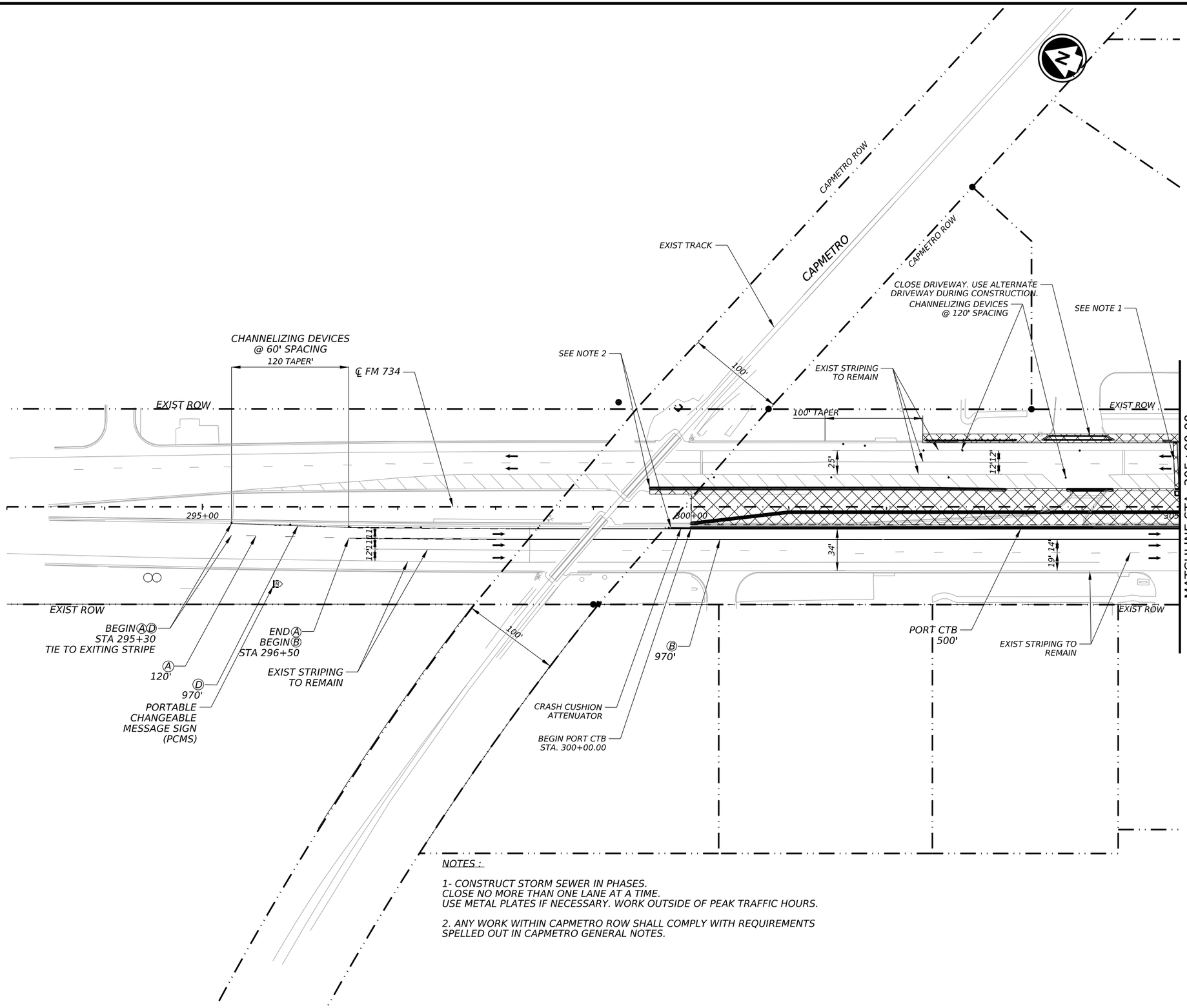
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DIST	COUNTY	SHEET NO.
4	WILLIAMSON	31

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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- Ⓐ WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- Ⓑ WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- Ⓒ WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- Ⓓ WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- Ⓔ ARROW
- Ⓕ WORD
- Ⓖ DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

0 50 100

SCALE IN FEET
1" = 100' HORZ

NOTES :

1- CONSTRUCT STORM SEWER IN PHASES.
CLOSE NO MORE THAN ONE LANE AT A TIME.
USE METAL PLATES IF NECESSARY. WORK OUTSIDE OF PEAK TRAFFIC HOURS.

2. ANY WORK WITHIN CAPMETRO ROW SHALL COMPLY WITH REQUIREMENTS SPELLED OUT IN CAPMETRO GENERAL NOTES.

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED PROFESSIONAL ENGINEER
11/14/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

FM 734 (PARMER LANE) AT SH 45
TRAFFIC CONTROL PLAN
PHASE 1

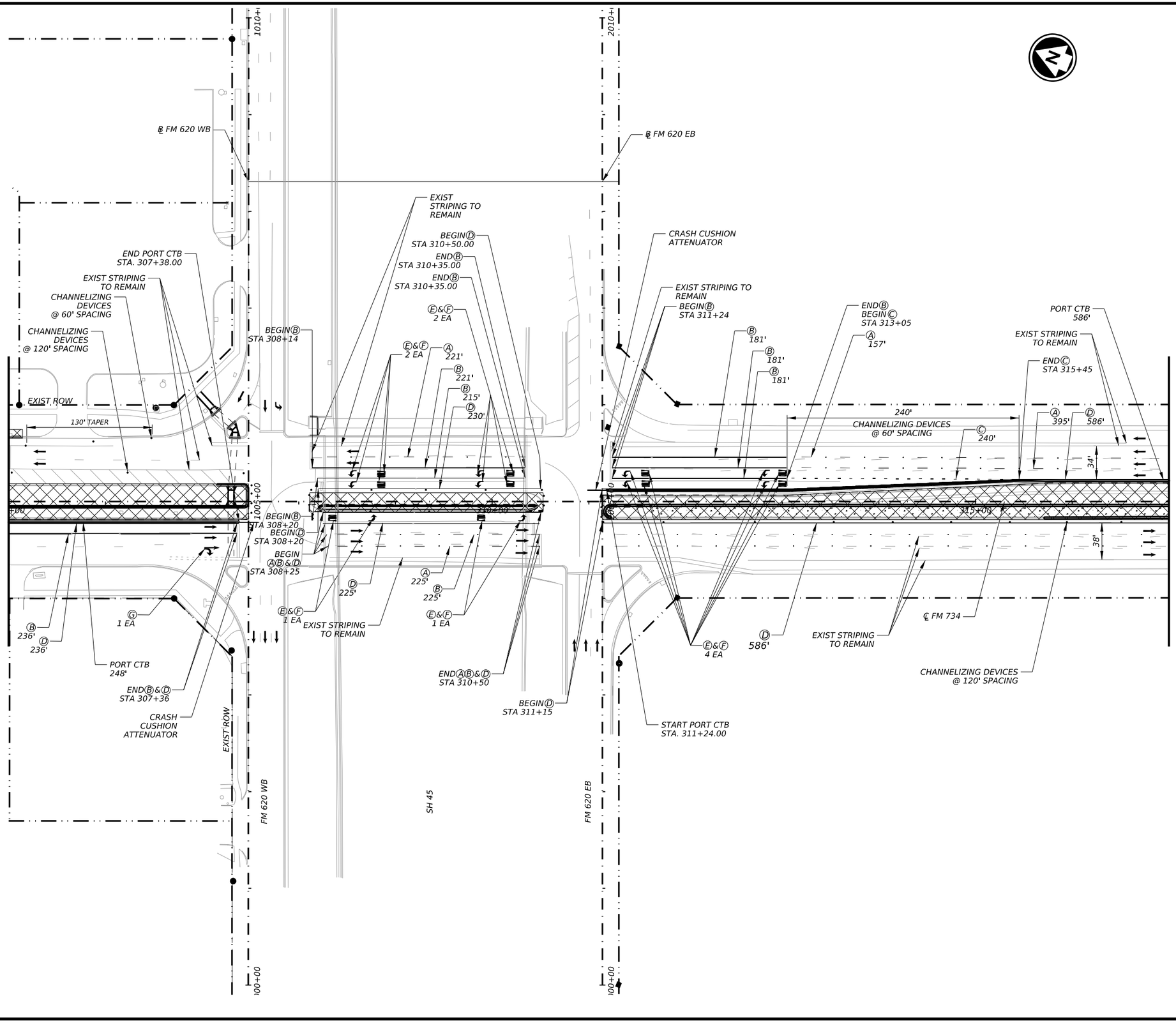
2025 SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		28

DATE: 11/14/2025 2:15:17 PM
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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- Ⓐ WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- Ⓑ WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- Ⓒ WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- Ⓓ WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- Ⓔ ARROW
- Ⓕ WORD
- Ⓖ DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

0 50 100
SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER
11/14/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

FM 734 (PARMER LANE) AT SH 45
TRAFFIC CONTROL PLAN
PHASE 1

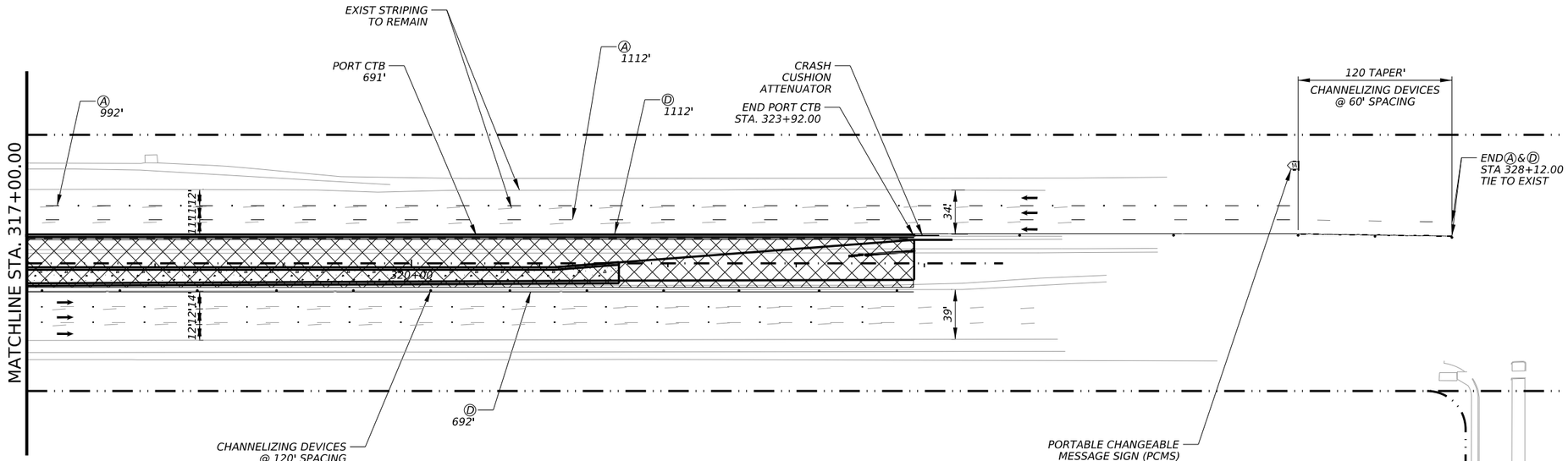
2025 SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		33

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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- Ⓐ WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- Ⓑ WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- Ⓒ WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- Ⓓ WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- Ⓔ ARROW
- Ⓕ WORD
- Ⓖ DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

0 50 100
SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER
11/14/2025

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

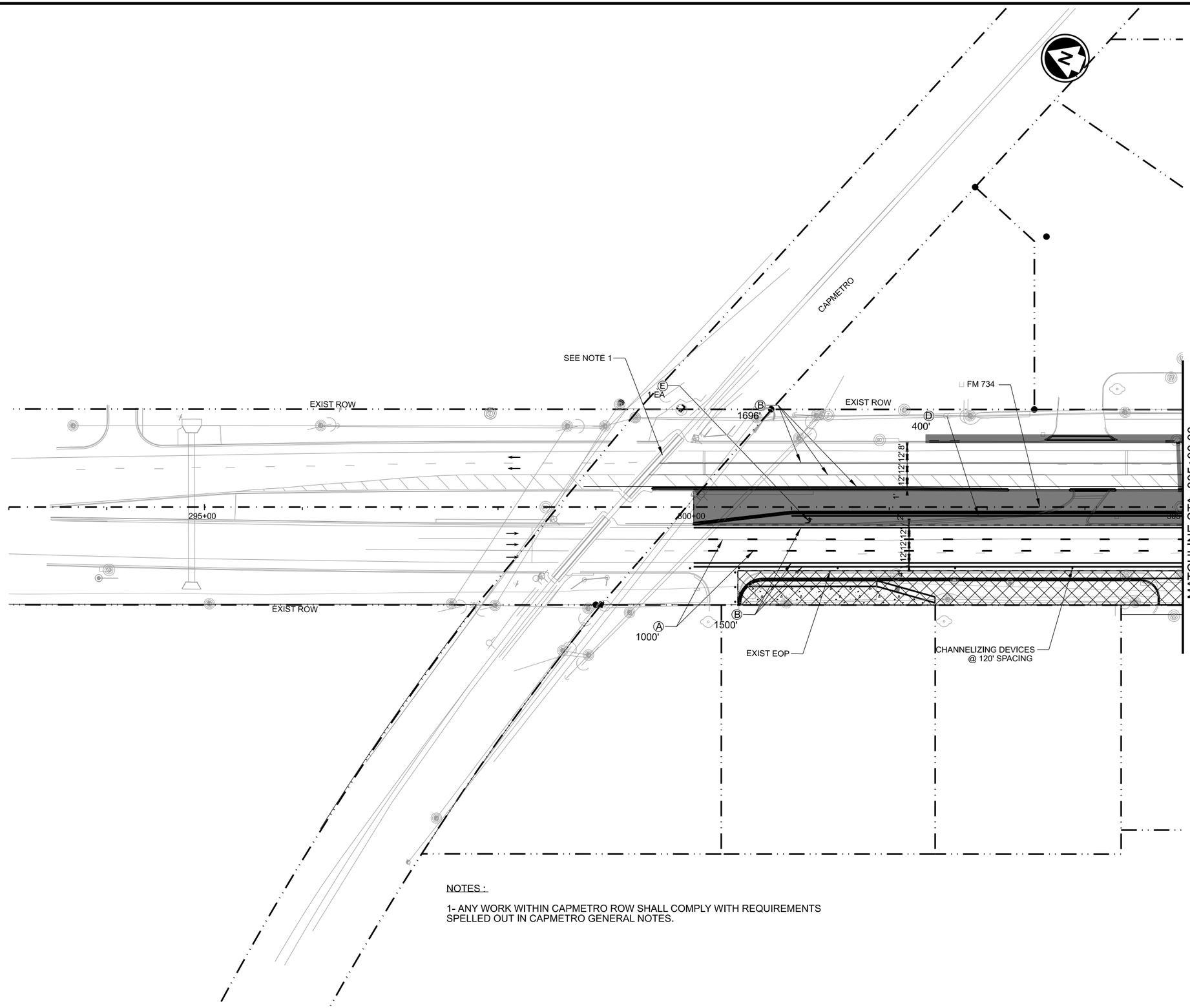
FM 734 (PARMER LANE) AT SH 45
TRAFFIC CONTROL PLAN
PHASE 1

2025 SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		30

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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- (A) WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- (B) WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- (C) WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- (D) WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- (E) ARROW
- (F) WORD
- (G) DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

0 50 100

SCALE IN FEET
1" = 100' HORZ

NOTES :

1- ANY WORK WITHIN CAPMETRO ROW SHALL COMPLY WITH REQUIREMENTS SPELLED OUT IN CAPMETRO GENERAL NOTES.

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER
David Watson
11/14/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

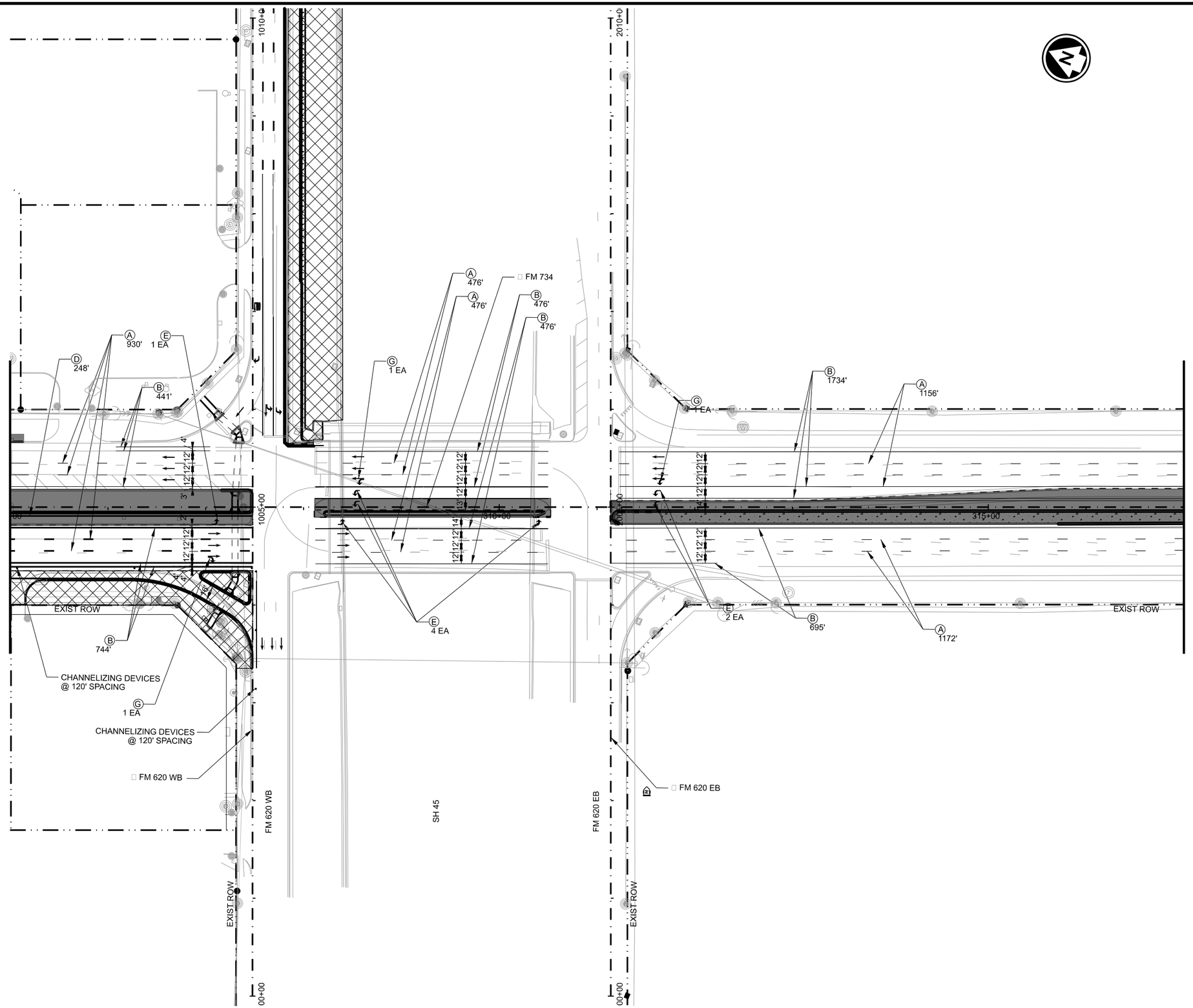
PARMER LANE AT SH 45 TRAFFIC CONTROL PLAN PHASE 2

2025 SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		35

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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- (A) WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- (B) WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- (C) WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- (D) WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- (E) ARROW
- (F) WORD
- (G) DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

0 50 100

SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER

David Watson
11/14/2025

WILCO TEXAS

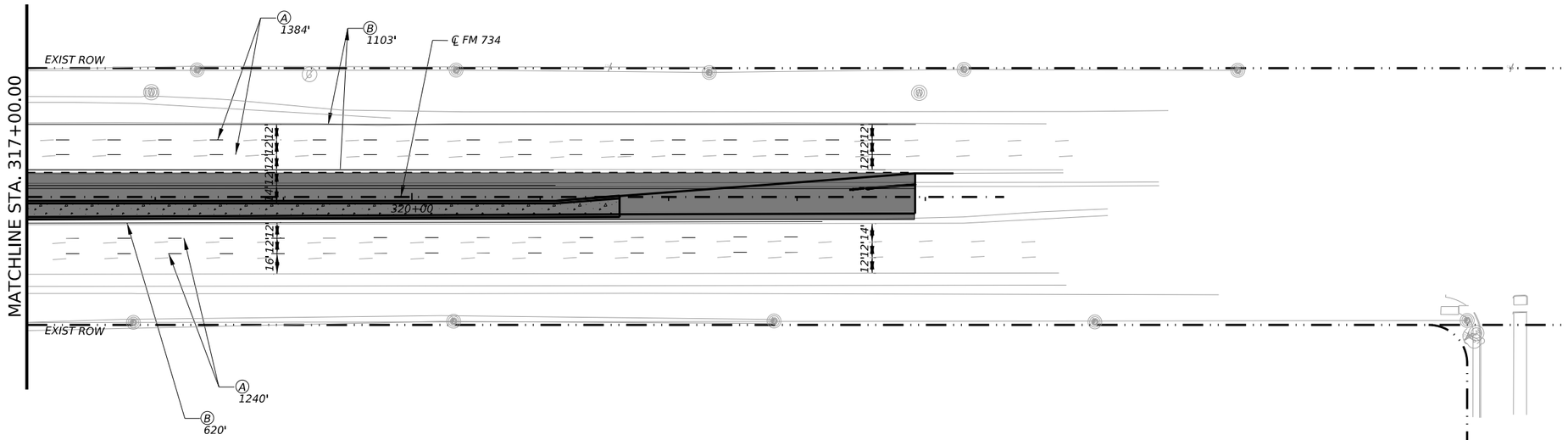
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TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE AT SH 45 TRAFFIC CONTROL PLAN PHASE 2

2025 SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		36

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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- (A) WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- (B) WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- (C) WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- (D) WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- (E) ARROW
- (F) WORD
- (G) DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

0 50 100

SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER

11/14/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45
TRAFFIC CONTROL PLAN
PHASE 2

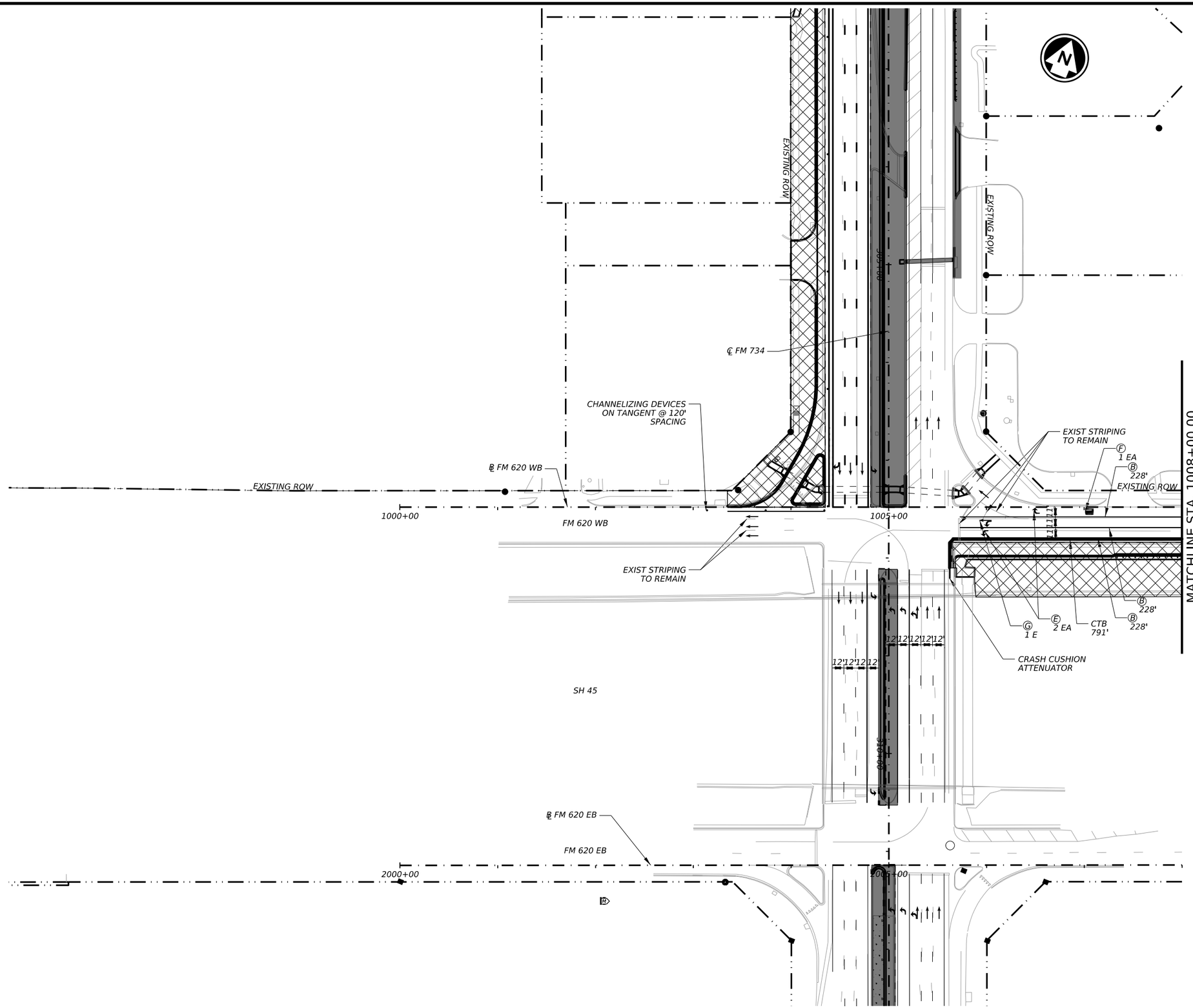
2025 SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		37

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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- (A) WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- (B) WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- (C) WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- (D) WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- (E) ARROW
- (F) WORD
- (G) DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED
PROFESSIONAL ENGINEER
David Watson
11/14/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45
TRAFFIC CONTROL PLAN
PHASE 2

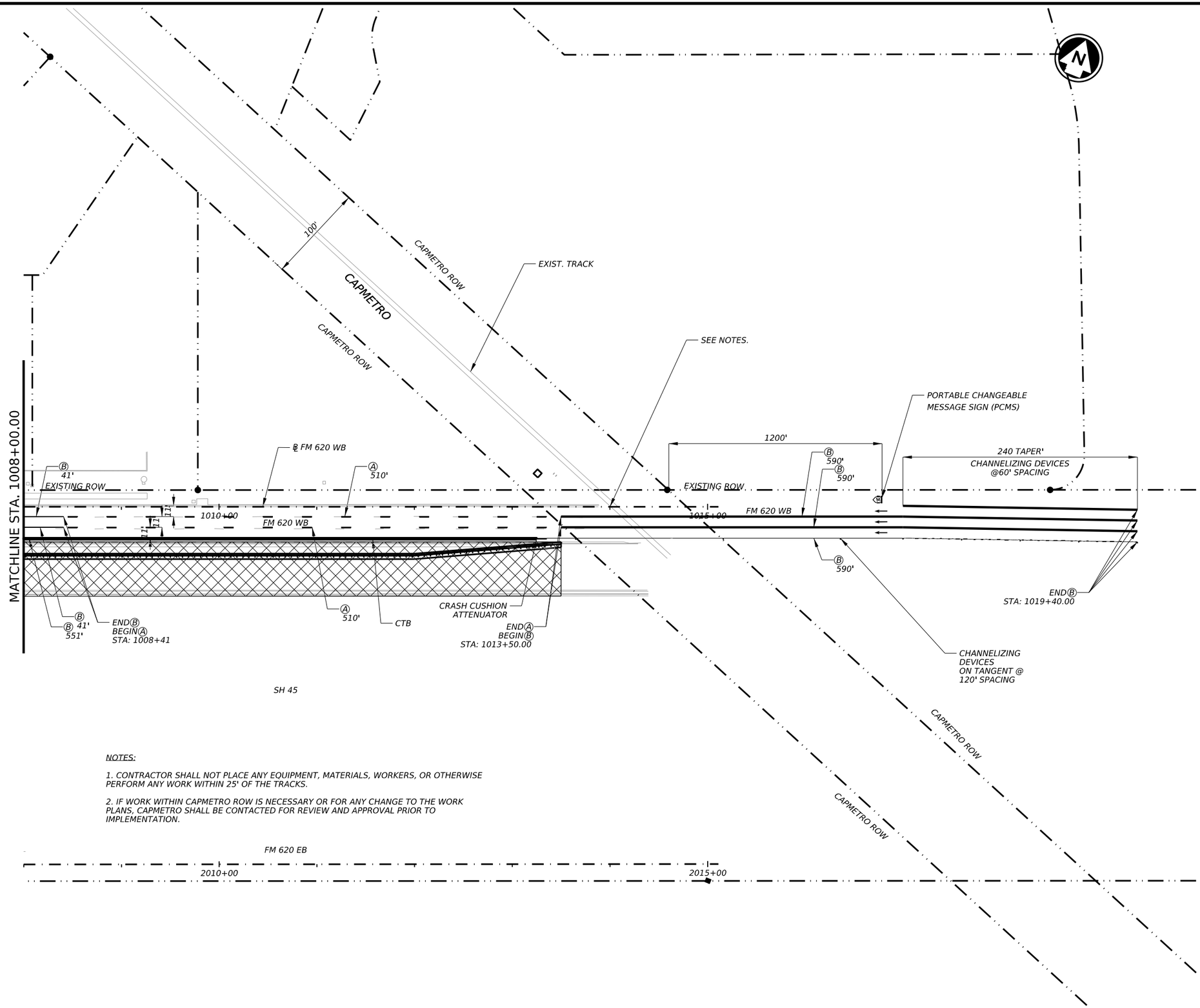
2025 SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		38

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LEGEND

- EXISTING ROW
- CONC TRAFFIC BARRIER (CTB)
- CRASH CUSHION ATTENUATOR
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- Ⓐ WRK ZN PAV MRK NON-REMOV (W)(6")(BRK)
- Ⓑ WRK ZN PAV MRK NON-REMOV (W)(6")(SLD)
- Ⓒ WRK ZN PAV MRK NON-REMOV (W)(6")(DOT)
- Ⓓ WRK ZN PAV MRK NON-REMOV (Y)(6")(SLD)
- Ⓔ ARROW
- Ⓕ WORD
- Ⓖ DOUBLE ARROW
- WORK ZONE
- PREVIOUS CONSTRUCTION
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- PROPOSED SIGN
- Ⓜ PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

NOTES:

1. CONTRACTOR SHALL NOT PLACE ANY EQUIPMENT, MATERIALS, WORKERS, OR OTHERWISE PERFORM ANY WORK WITHIN 25' OF THE TRACKS.

2. IF WORK WITHIN CAPMETRO ROW IS NECESSARY OR FOR ANY CHANGE TO THE WORK PLANS, CAPMETRO SHALL BE CONTACTED FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.

STATE OF TEXAS
DAVID C. WATSON
137353
LICENSED PROFESSIONAL ENGINEER

David Watson
11/14/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45 TRAFFIC CONTROL PLAN PHASE 2

2025 SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		39

DATE: 11/14/2025 1:51:29 PM
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

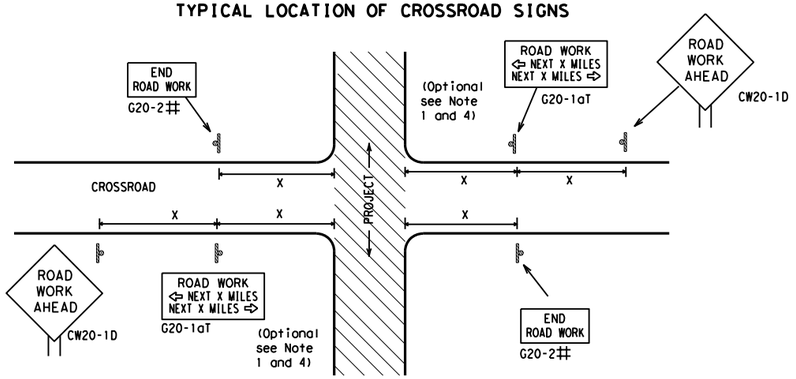
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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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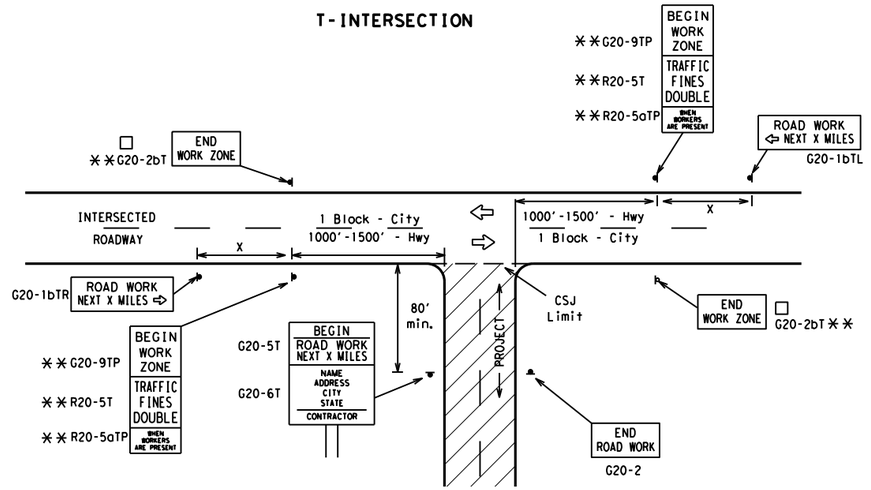
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	*[3]

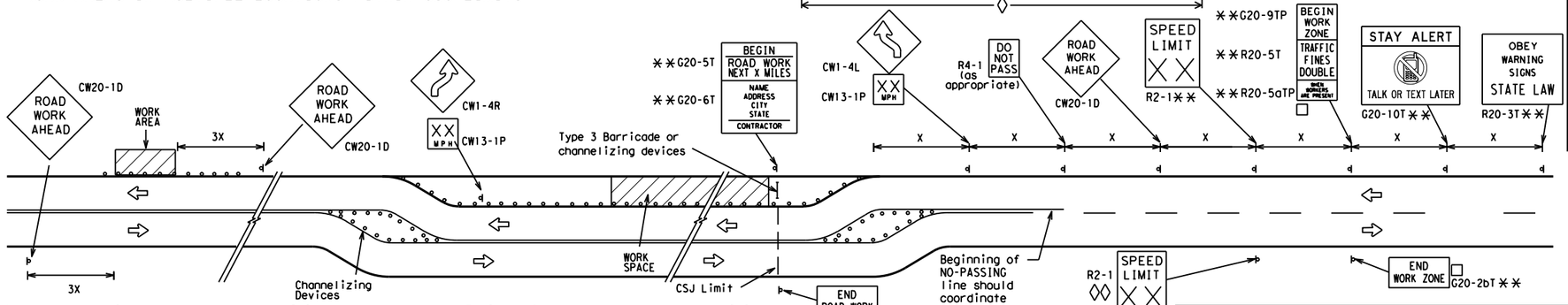
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

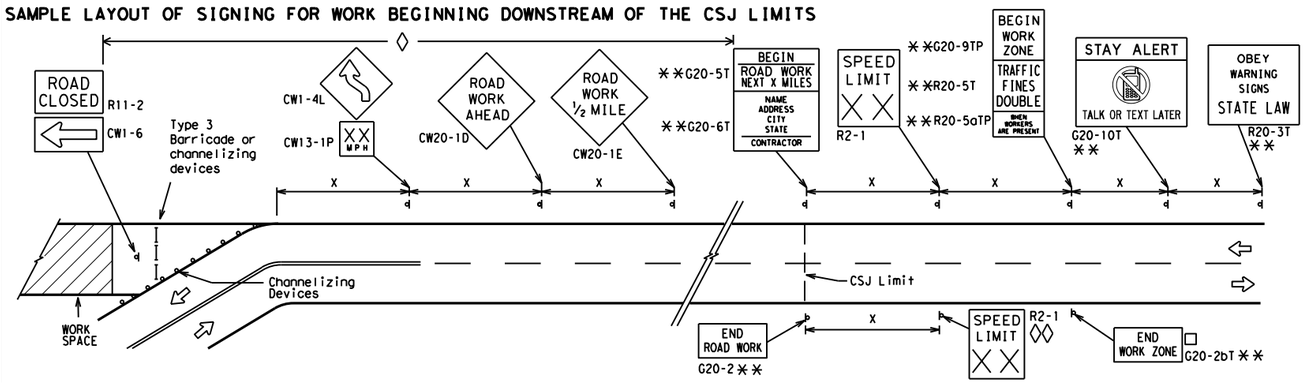
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

□ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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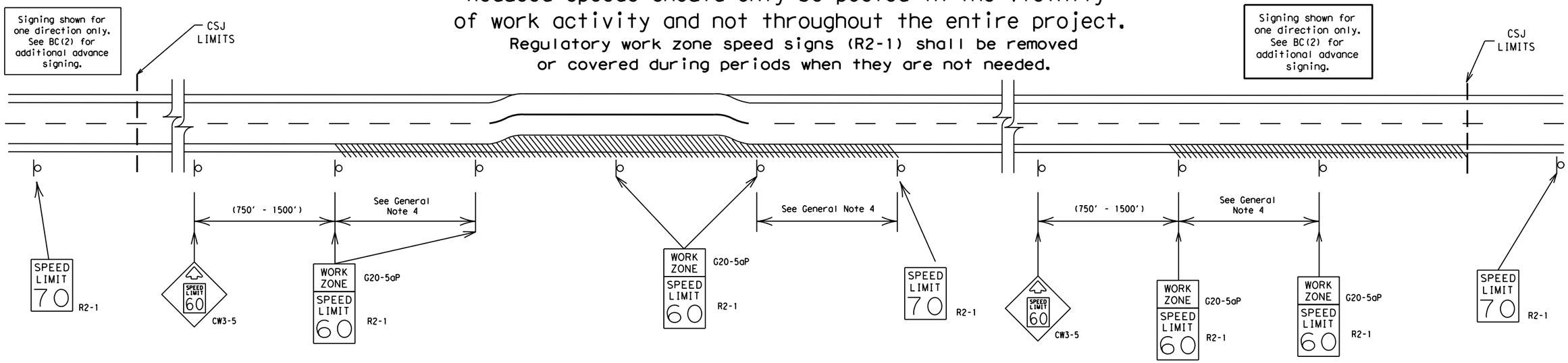
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation | Traffic Safety Division Standard

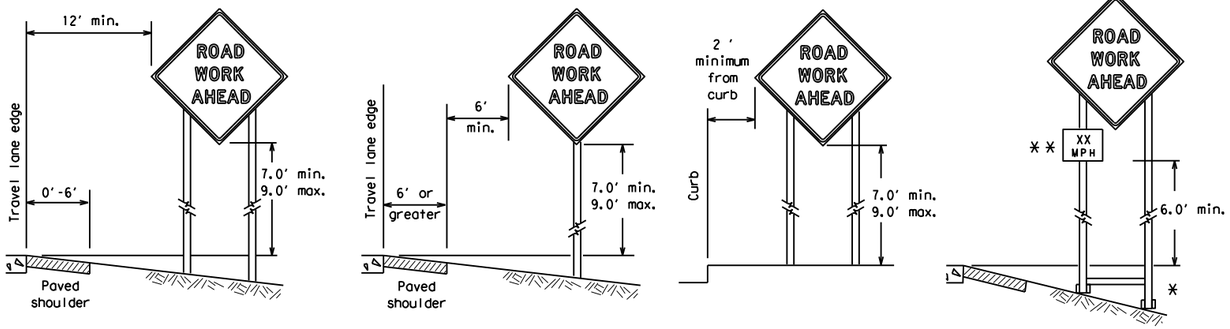
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

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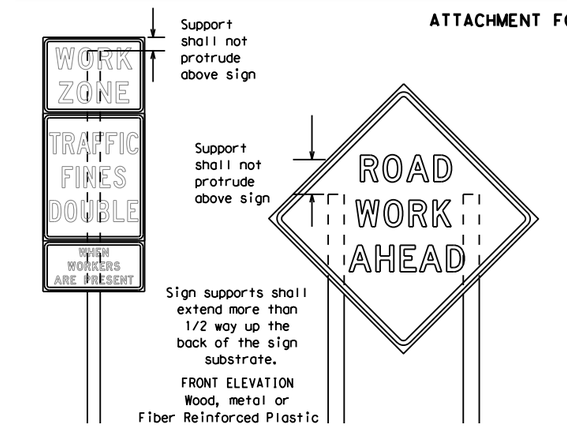
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

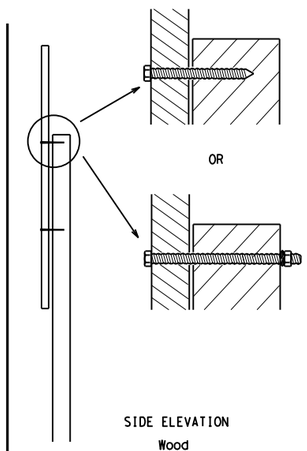


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS





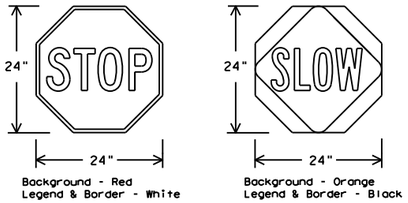
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

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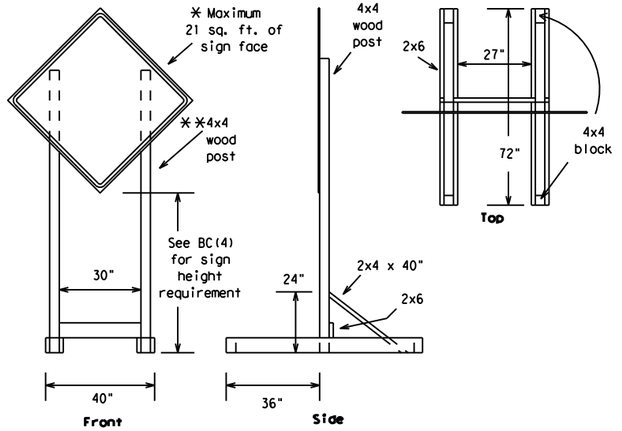
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

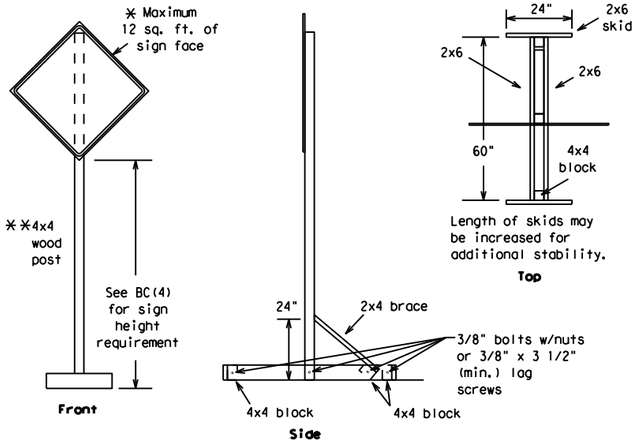
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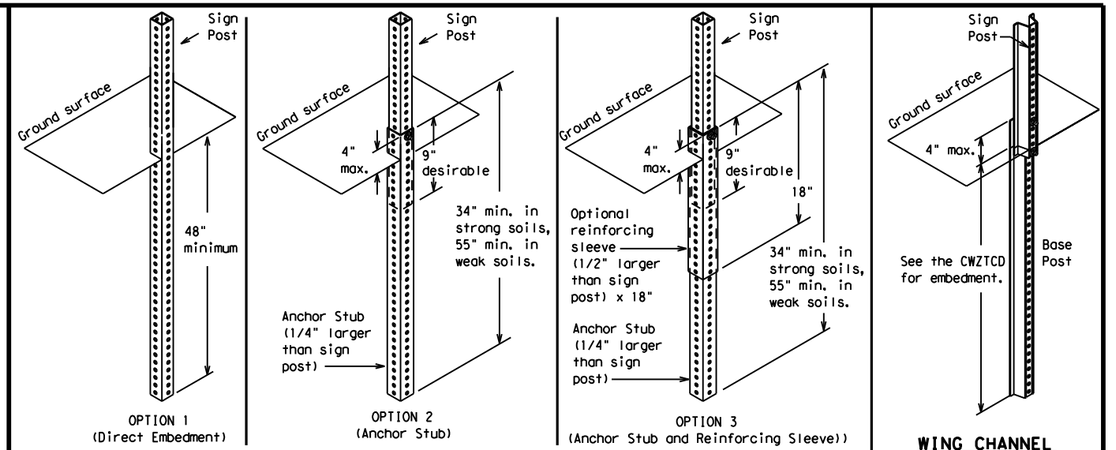
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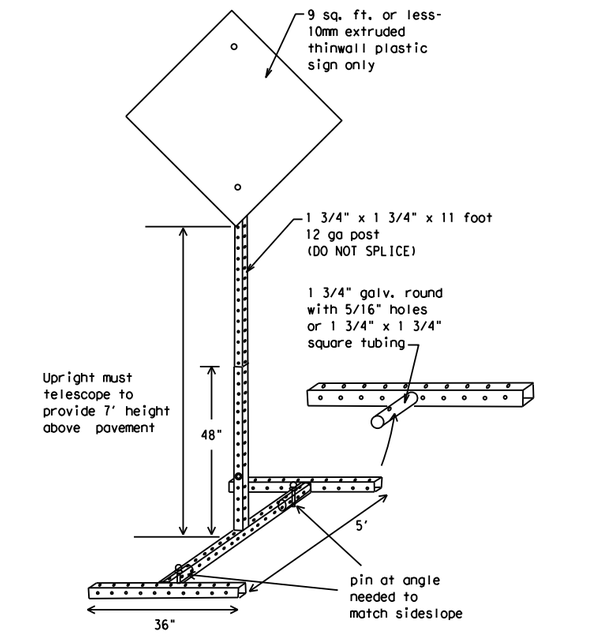
SKID MOUNTED WOOD SIGN SUPPORTS

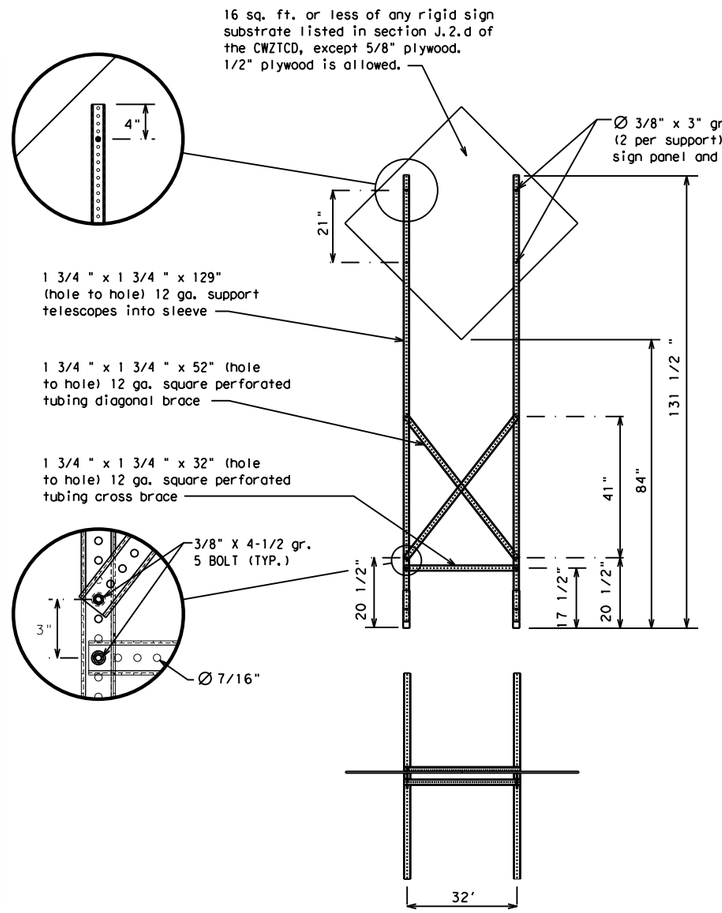
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

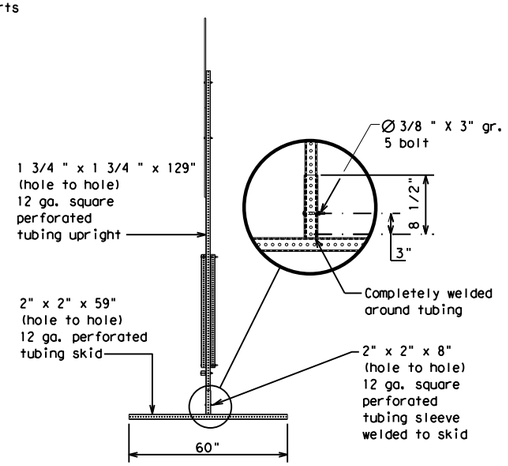


GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

* See BC(4) for definition of "Work Duration."

** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

Roadway designation * IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- FORM X LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- WATCH FOR TRUCKS
- EXPECT DELAYS
- EXPECT DELAYS
- PREPARE TO STOP
- REDUCE SPEED XXX FT
- END SHOULDER USE
- USE OTHER ROUTES
- WATCH FOR WORKERS
- STAY IN LANE *

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

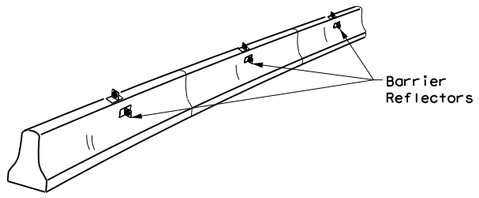
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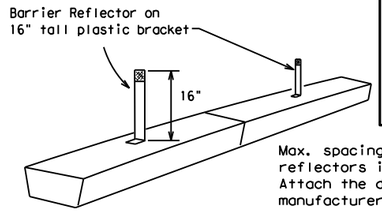
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1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

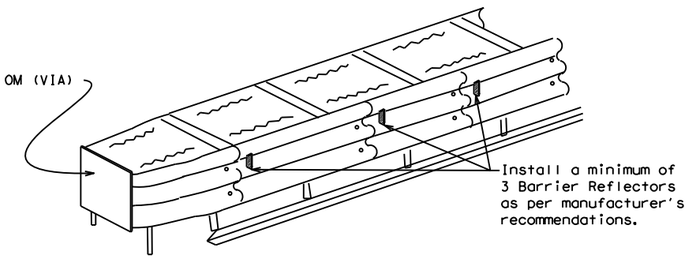


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

LOW PROFILE CONCRETE BARRIER (LPCB)

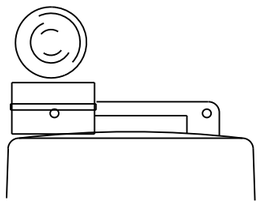


DELINEATION OF END TREATMENTS

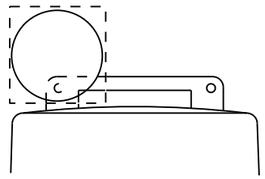
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

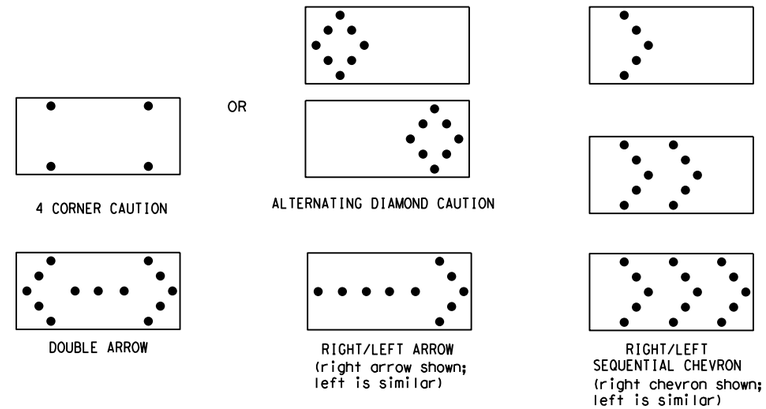
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-21

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REVISIONS	3417	02	040	FM734
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7-13 5-21	4	WILLIAMSON		46

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

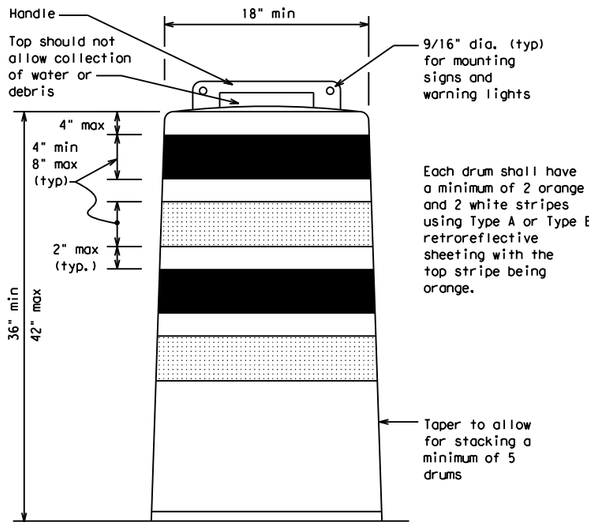
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

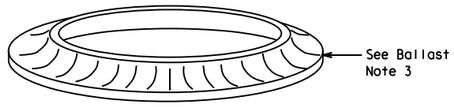
RETROREFLECTIVE SHEETING

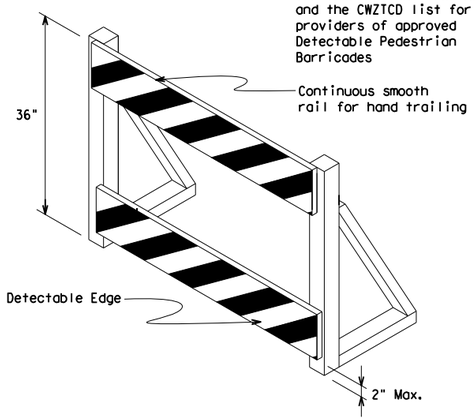
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

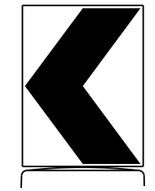




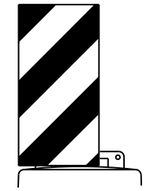


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

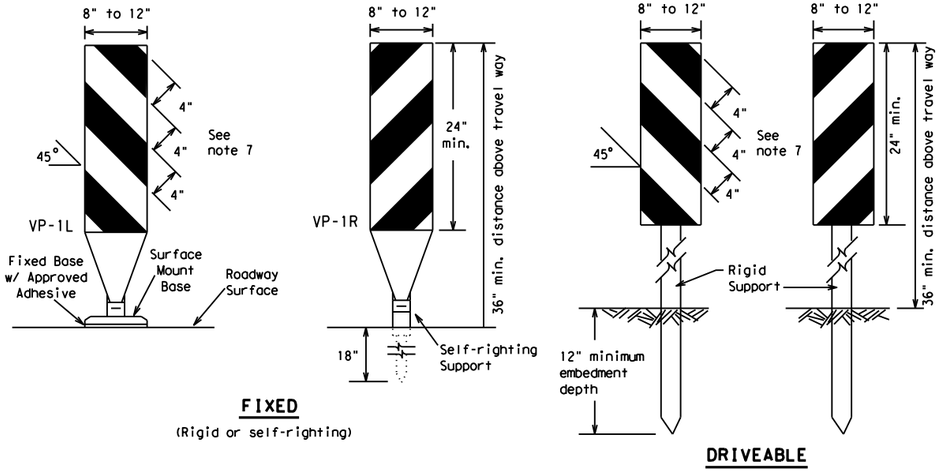
BC(8)-21

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9-07 5-21	4	WILLIAMSON		47
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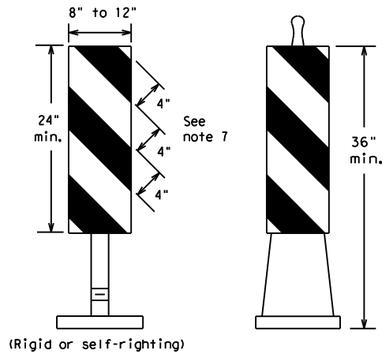
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FIXED
(Rigid or self-righting)

DRIVEABLE

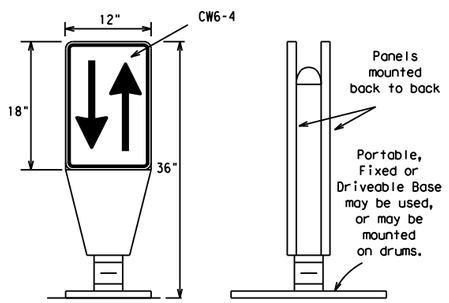


(Rigid or self-righting)

PORTABLE

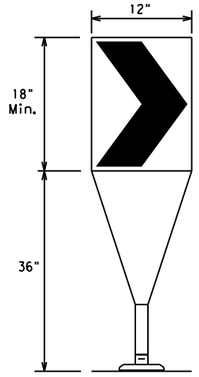
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



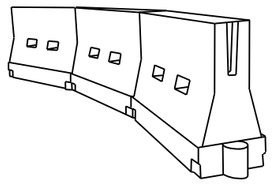
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

** Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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7-13 5-21	4	WILLIAMSON		48

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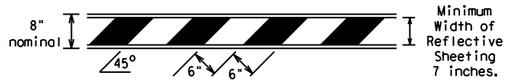
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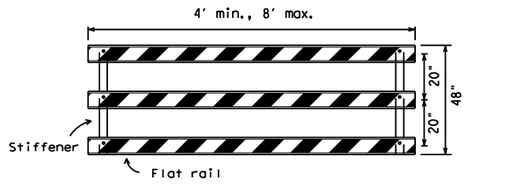
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



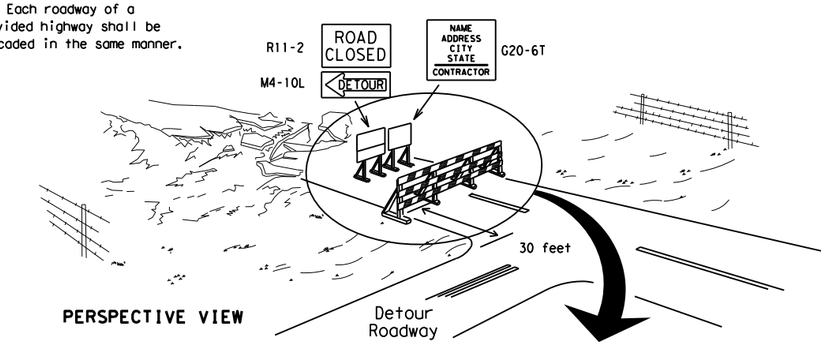
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

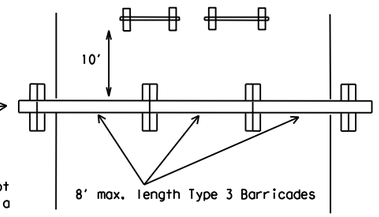
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

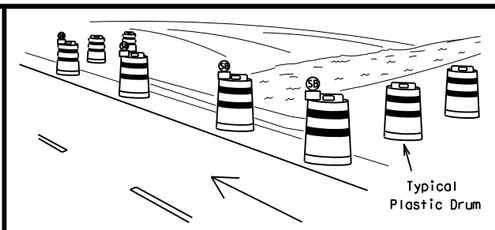
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

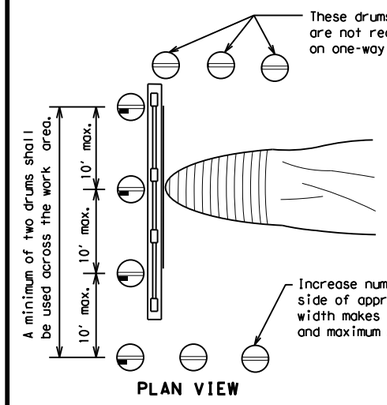
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

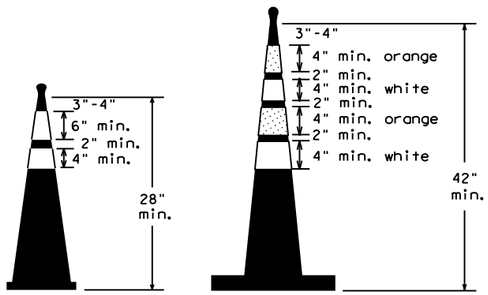
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



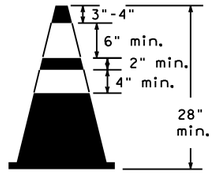
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

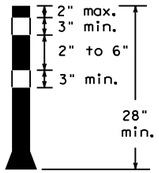
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

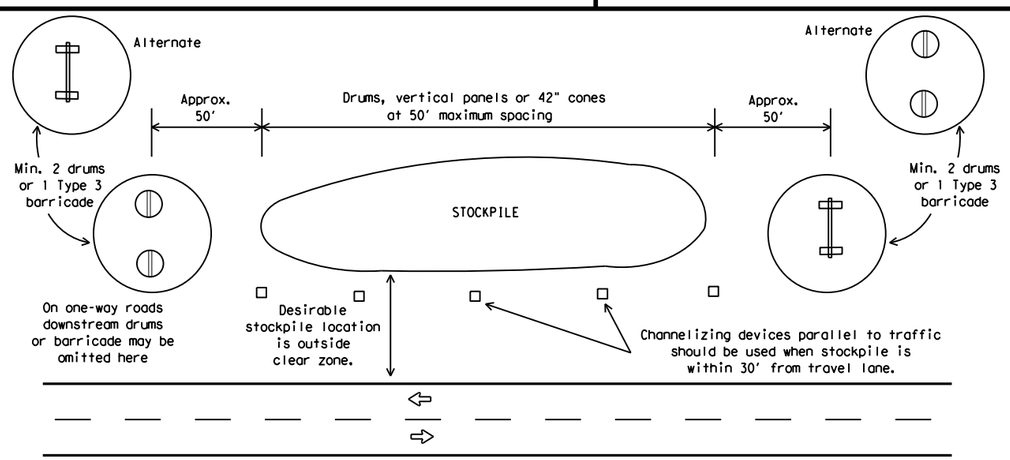


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	4	WILLIAMSON		49

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DATE: 10/3/2025 11:29:13 AM
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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

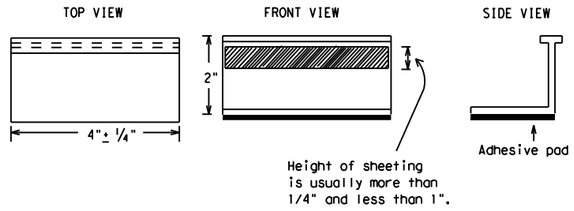
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	3417	02	040	FM734
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	4	WILLIAMSON		50
11-02 8-14				

105

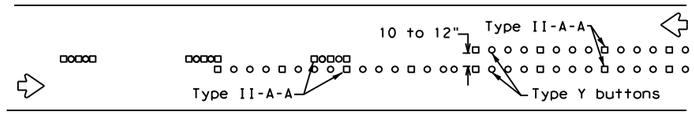
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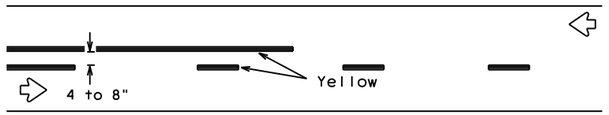
PAVEMENT MARKING PATTERNS



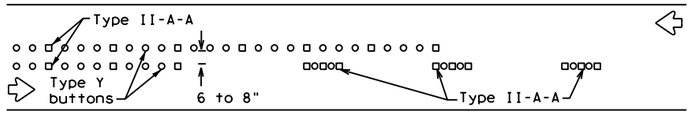
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



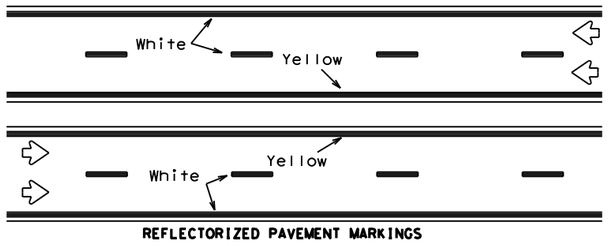
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



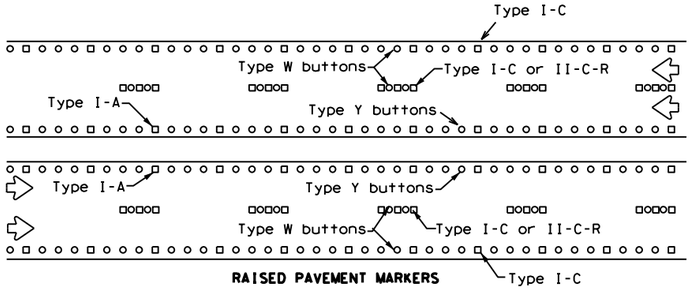
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



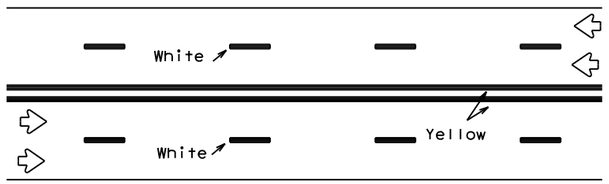
REFLECTORIZED PAVEMENT MARKINGS



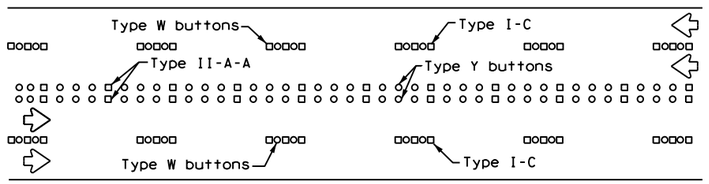
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



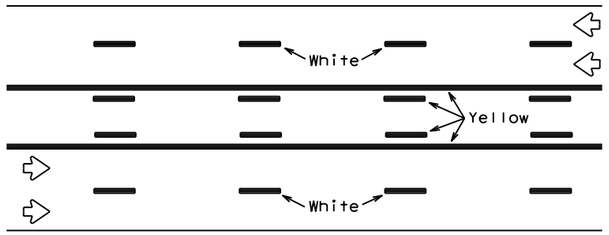
REFLECTORIZED PAVEMENT MARKINGS



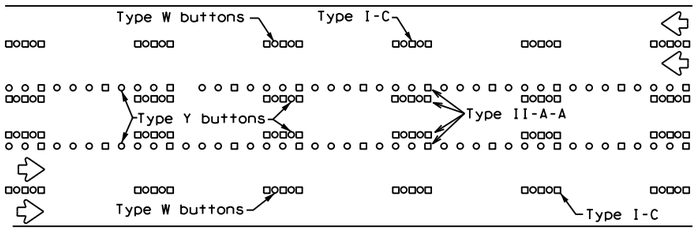
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

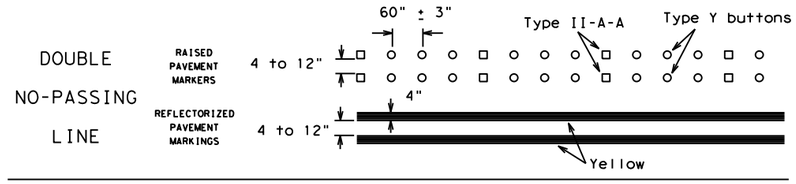
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

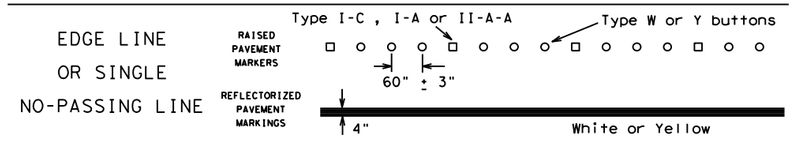
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

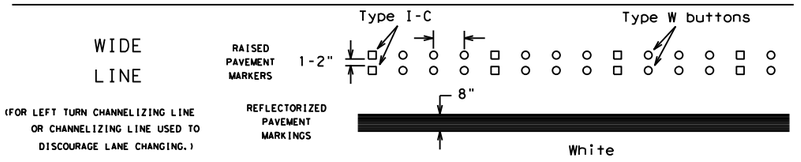


EDGE LINE OR SINGLE NO-PASSING LINE



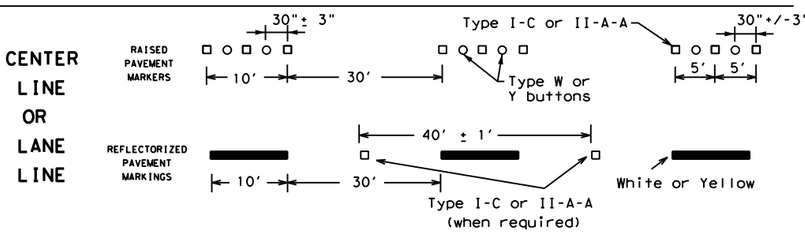
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

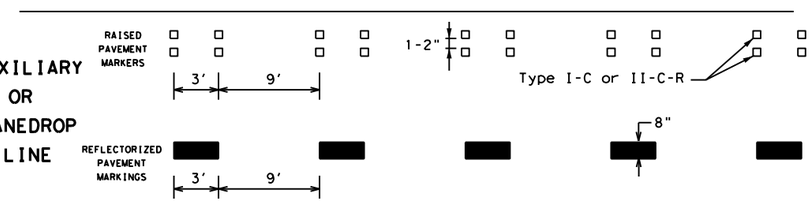


BROKEN LINES

CENTER LINE OR LANE LINE

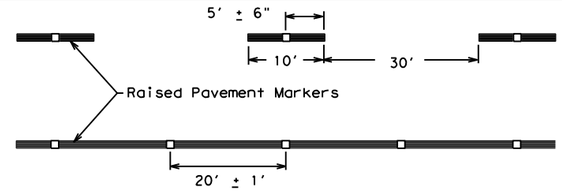


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

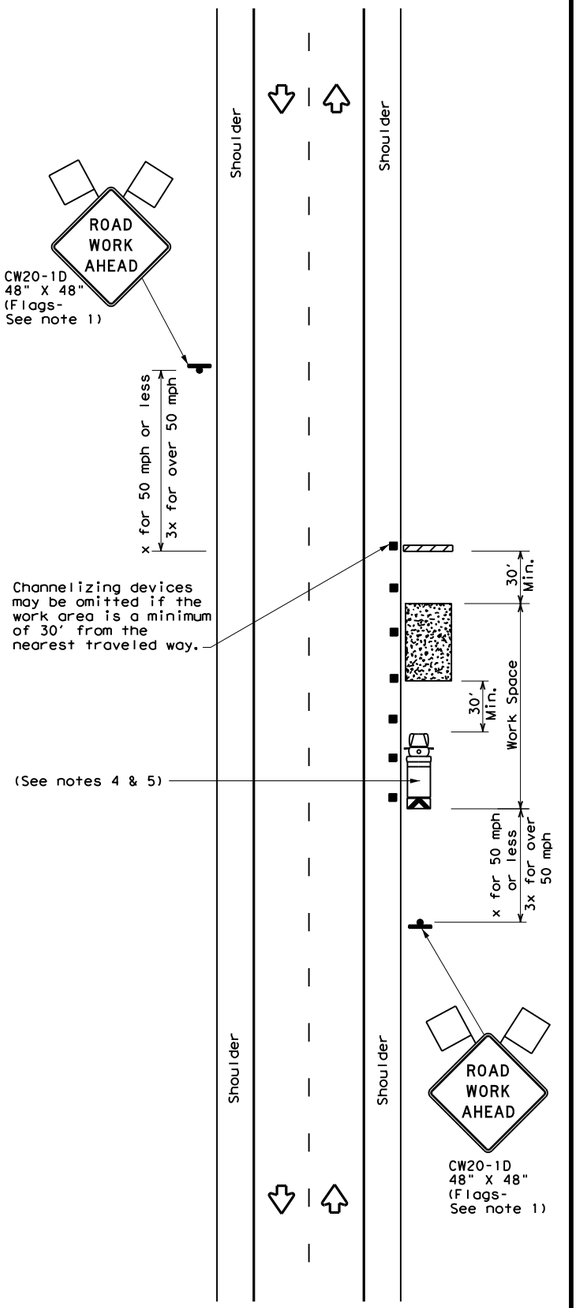
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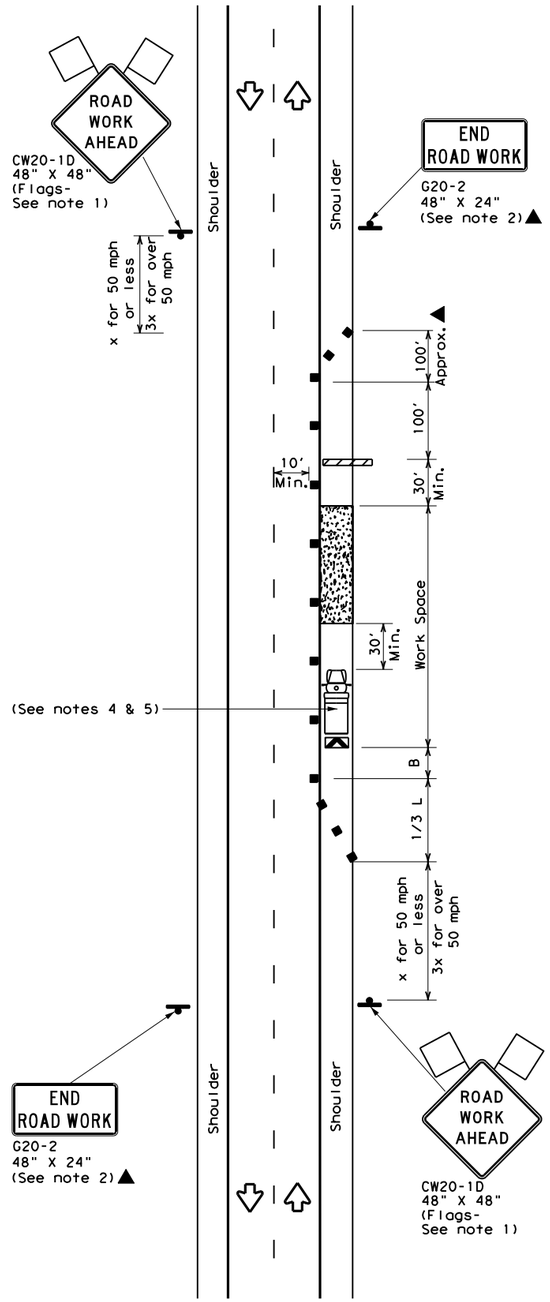
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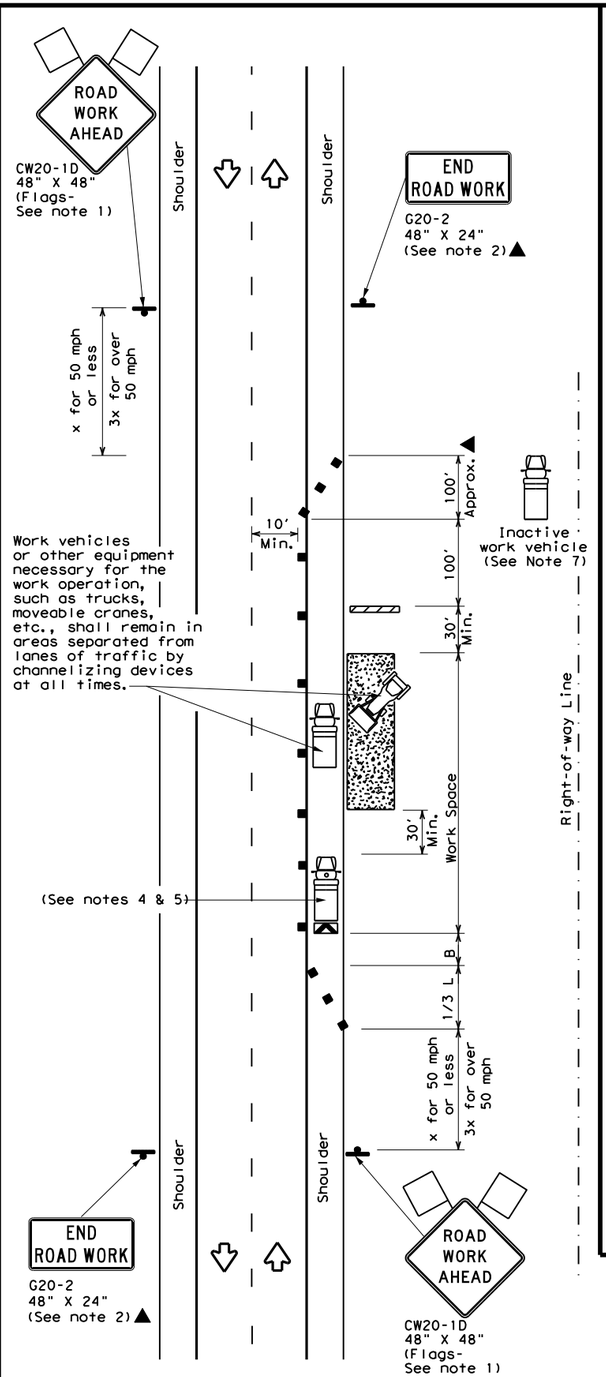
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

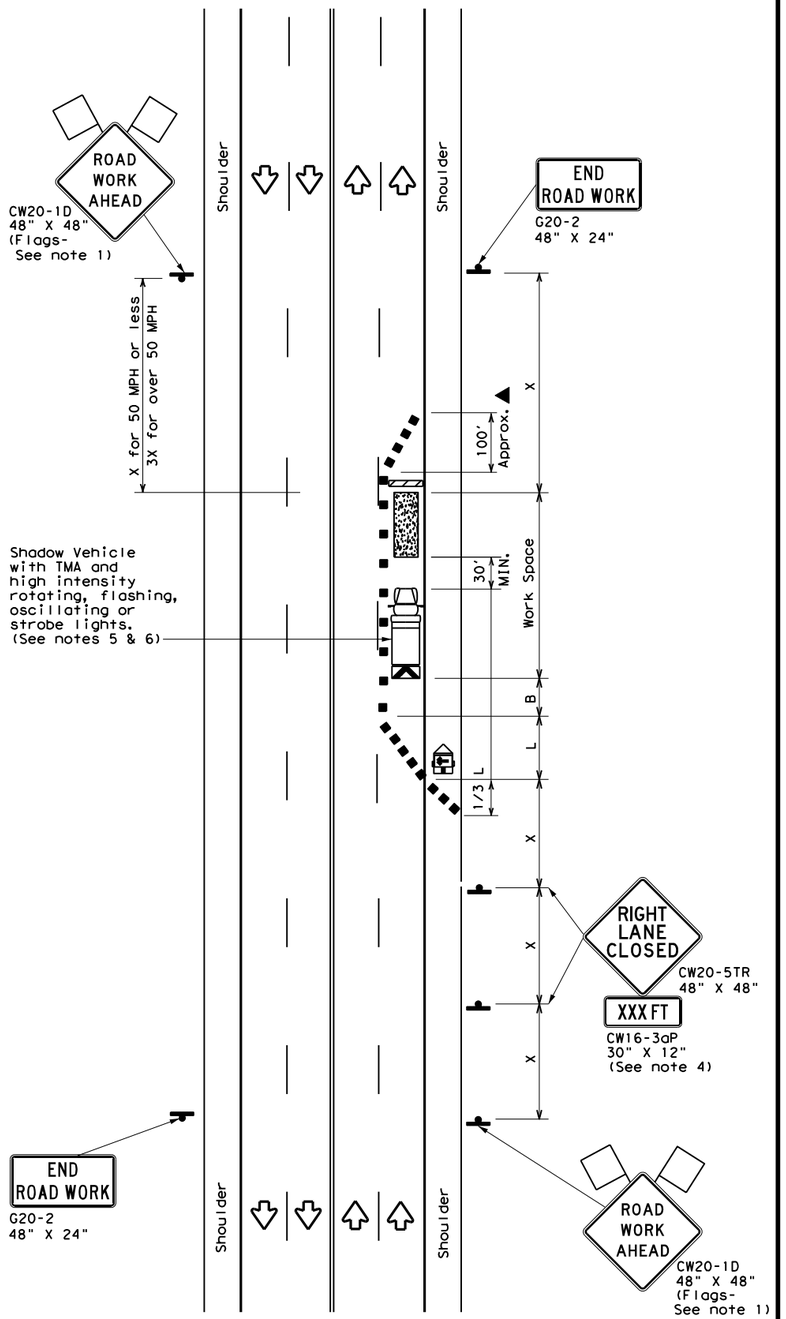
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

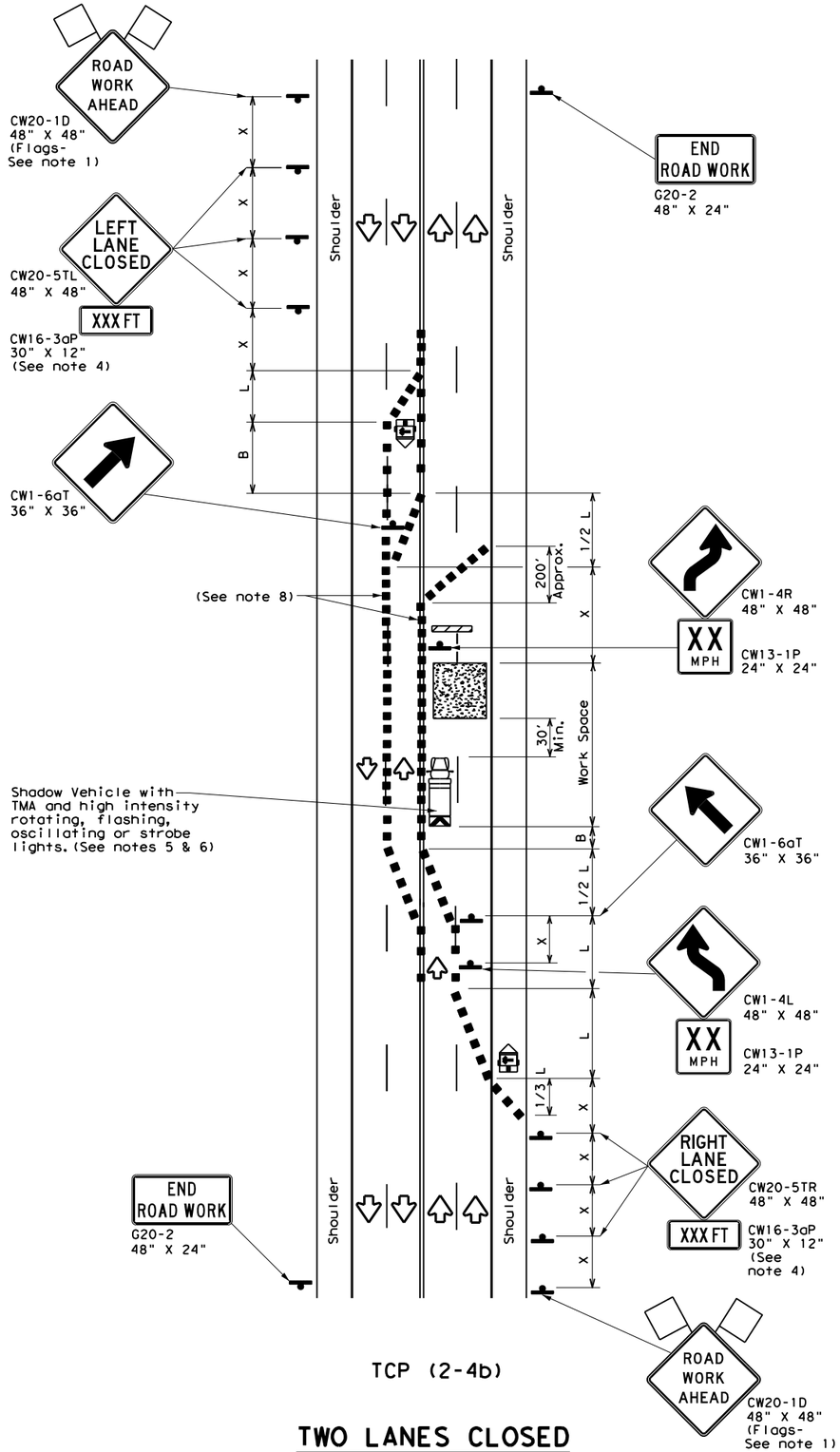
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8-95 2-12	4	WILLIAMSON		52
1-97 2-18				

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TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓	✓	

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

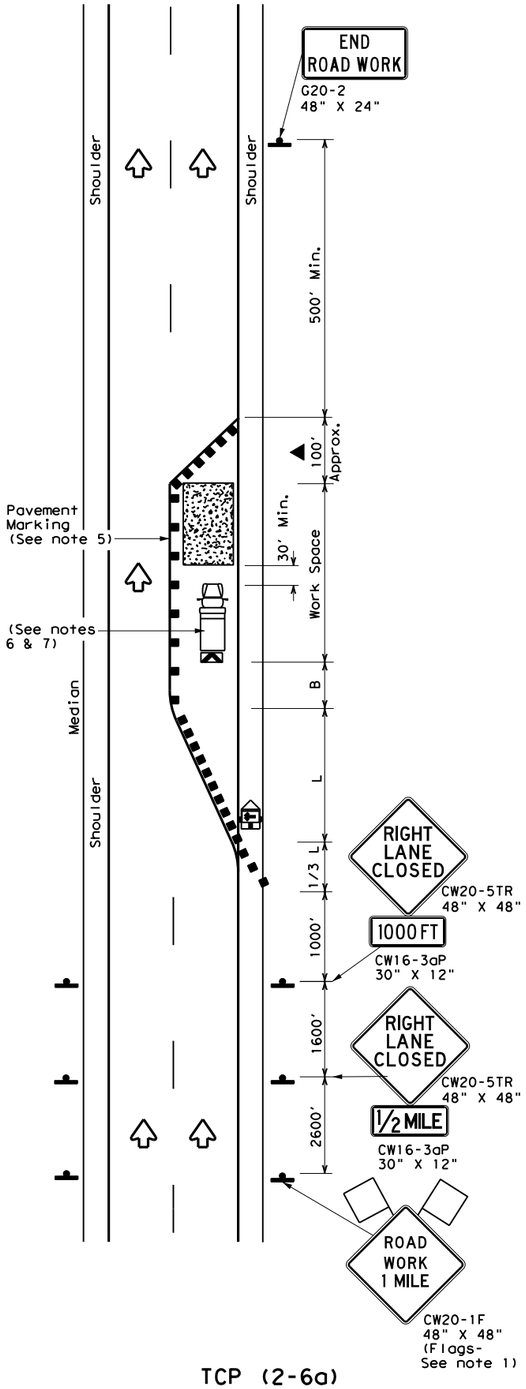
TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	3417	02	040	FM734
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	4	WILLIAMSON		53

DATE: 10/3/2025 11:29:54 AM
FILE: c:\pwwordir\benesch projects\projects\d0215502\tcp2-4-18.dgn

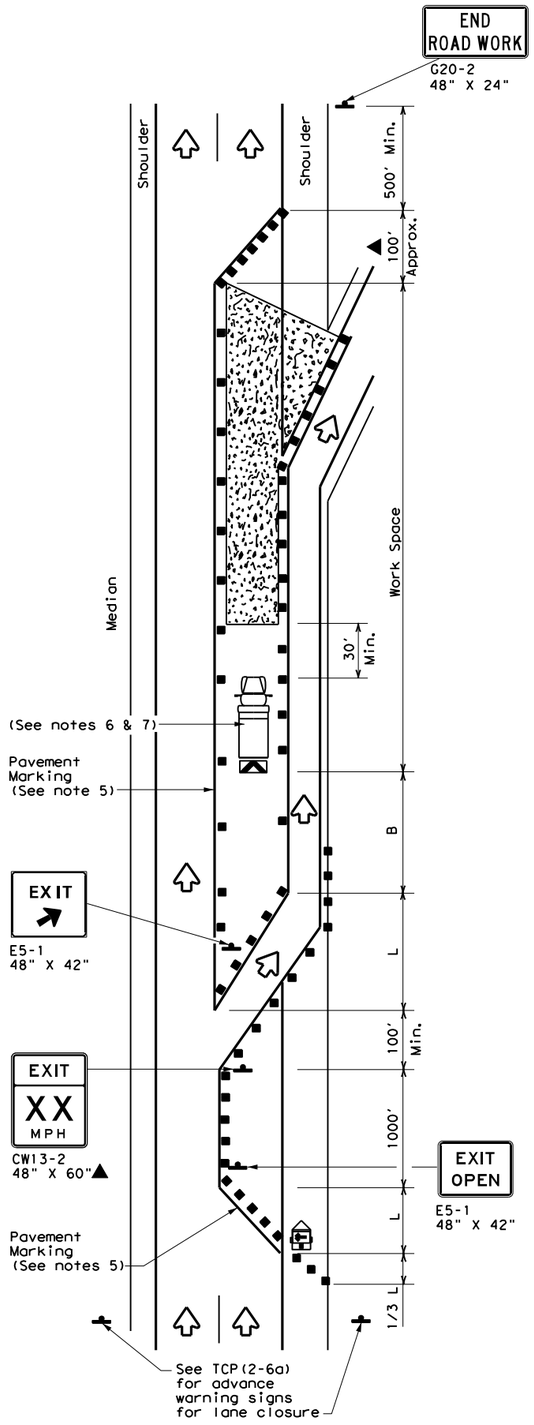
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DATE: 10/3/2025 11:29:26 AM
FILE: c:\pwworkdir\benesch projects\projects\d0223663\tcp2-6-18.dgn



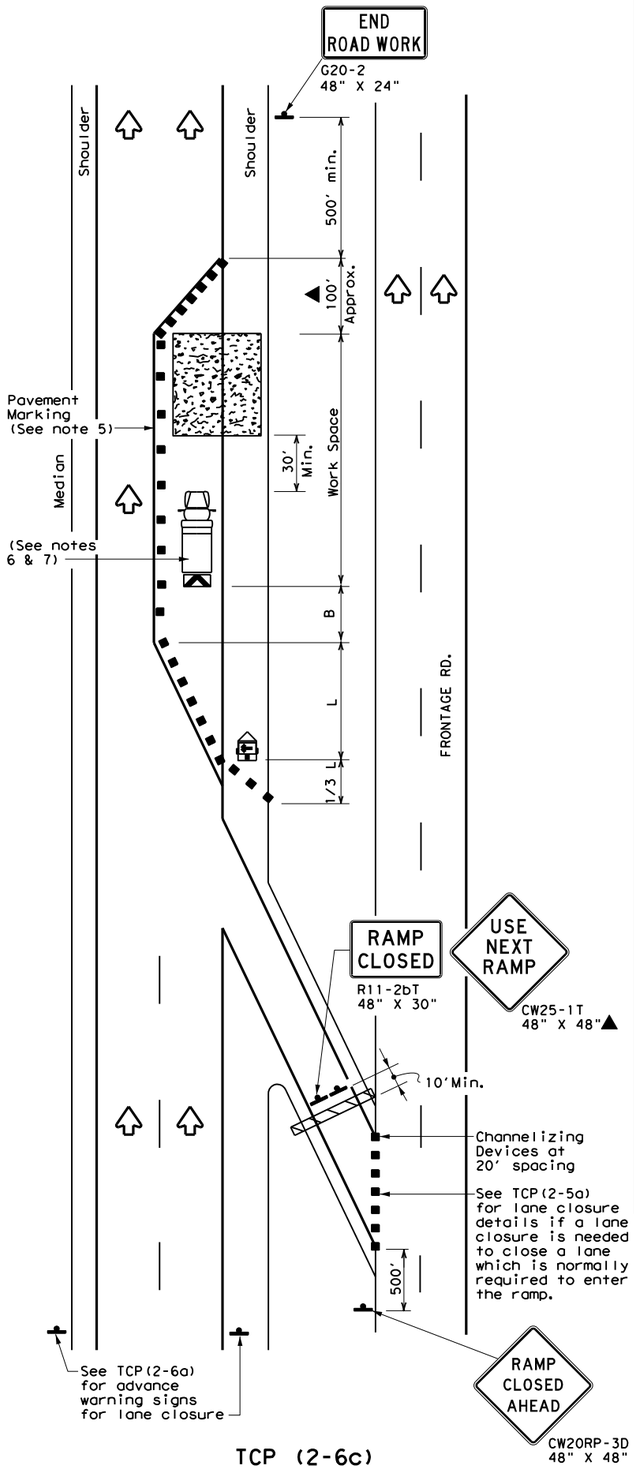
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing,oscillating or strobe lights. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

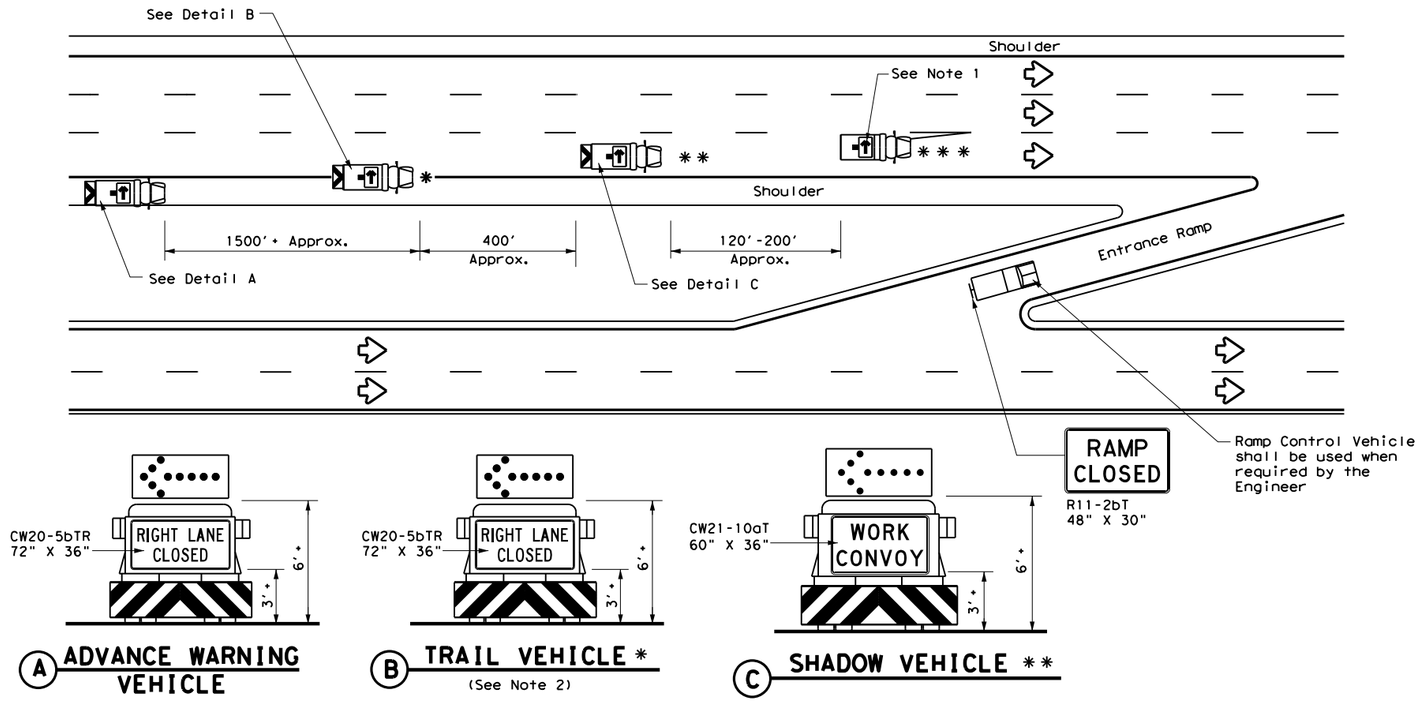
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

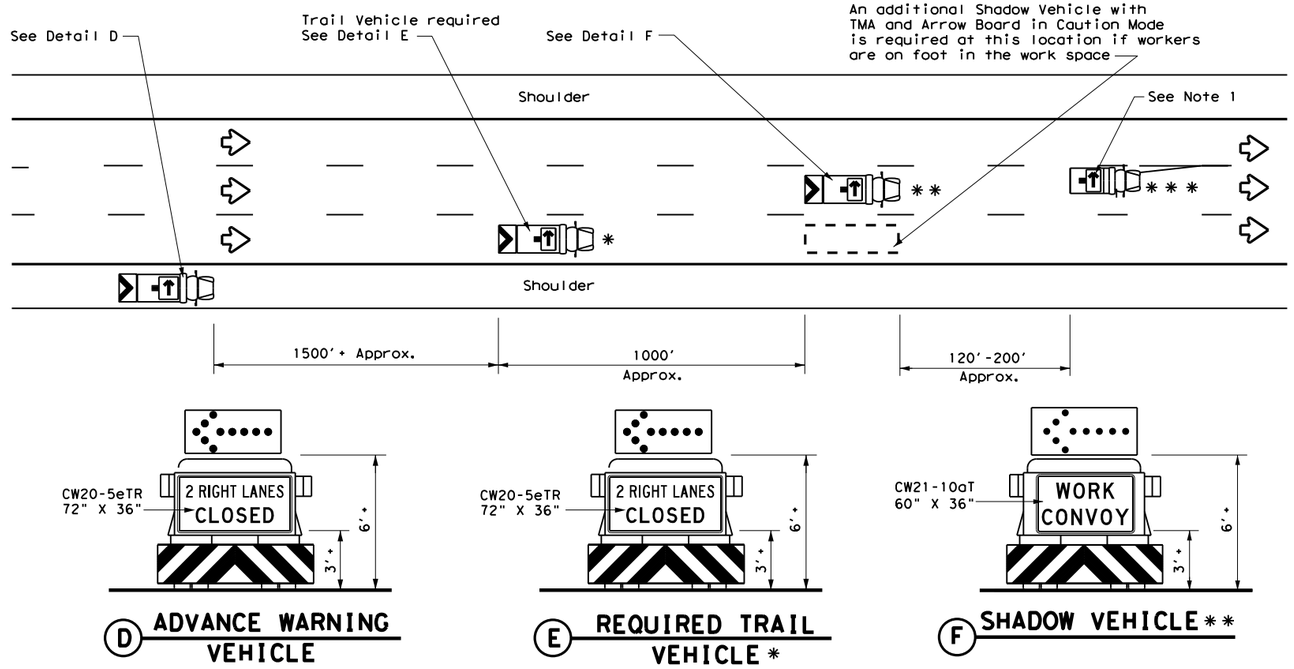
TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		54

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RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



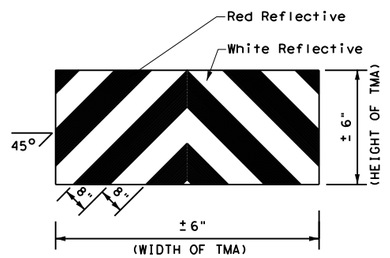
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	4	WILLIAMSON		55
1-97				

176

DATE: 10/3/2025 11:29:31 AM
FILE: c:\pwworkdir\benesch projects\projects\d0223663\tcp3-2.dgn

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CK DW CK DW

BEGIN PROJECT
STA 295+35.00

EXIST ROW

℄ FM 734

NB PARMER LANE

295+00

SB PARMER LANE

EXIST ROW

PAVEMENT REMOVAL
77 SY

CURB AND GUTTER
REMOVAL
342 LF

CAPMETRO

CAPMETRO ROW

RAIL CROSSING
MP 75.69
DOT #914513A

SEE NOTE 5.

RAIL CROSSING
MP 75.72
DOT #914512T

299+57.61

PAVEMENT REMOVAL
97 SY

METAL BEAM
GUARD FENCE
REMOVAL AND
REPLACEMENT
91 LF

EXIST ROW

MATCHLINE STA. 303+00.00

300+00

300+00.00

300+45.17

EXIST ROW

CURB AND GUTTER
REMOVAL
275 LF

PAVEMENT REMOVAL
141 SY

DRIVEWAY
REMOVAL
20 SY

RIP RAP
REMOVAL
424 SY

CURB AND
GUTTER
REMOVAL
341 LF

CAPMETRO ROW

CAPMETRO

CAPMETRO ROW

CAPMETRO

LEGEND

- REMOVE PAVEMENT
- REMOVE DRIVEWAY
- REMOVE CONCRETE
- REMOVE SIDEWALK
- SAWCUT
- CABLE BARRIER (REMOVE)

NOTES:

1. ALL ITEMS REQUIRING REMOVAL THAT ARE NOT SPECIFICALLY CALLED OUT IN PLANS SHALL BE CONSIDERED SUBSIDIARY TO PREP ROW.
2. SEE DRAINAGE PLANS FOR REMOVAL OF EXISTING DRAINAGE STRUCTURES.
3. SEE SIGNING AND PAVEMENT MARKING LAYOUT FOR REMOVAL OF EXISTING SIGNS AND PAVEMENT MARKING.
4. ALL STATIONING BASED ON ℄ FM 734 UNLESS OTHERWISE NOTED.
5. ANY WORK WITHIN CAPMETRO ROW SHALL COMPLY WITH REQUIREMENTS SPELLED OUT ON CAPMETRO GENERAL NOTES.

0 50 100

SCALE IN FEET
1" = 100' HORZ

PAVEMENT REMOVAL
5 SY

CURB AND GUTTER REMOVAL 22 LF

CURB REMOVAL 7 LF

CURB REMOVAL
34 LF

CURB AND GUTTER
REMOVAL
8 LF

CONCRETE MEDIAN
REMOVAL
14 SY

EXIST ROW

WBFR

℄ WBFR

SH 45

CURB AND GUTTER
REMOVAL
366 LF

PAVEMENT
REMOVAL
22 SY

℄ EBFR

EBFR

EXIST ROW

BEGIN CABLE BARRIER
(REMOVE) (ITEM 543-7038)
STA 313+12.52 , 2.32' RT

CABLE BARRIER
TERMINAL SECTION
(REMOVE)
1 EA

CURB AND GUTTER
REMOVAL
407 SY

EXIST ROW

MATCHLINE STA. 303+00.00

200'

℄ FM 734

305+00

308+11.38

1005+00

S21°42'13.0"E

3340.06'

NB PARMER LANE

310+52.70

310+00

1005+00

SB PARMER LANE

MATCHLINE STA. 315+00.00

EXIST ROW

CONCRETE MEDIAN
REMOVAL
364 SY

STA 311+14.00 ℄ FM 734 =
STA 2005+00.00 ℄ EBFR

STA 307+47.99 ℄ FM 734 =
STA 1005+00.00 ℄ WBFR

CONCRETE MEDIAN
REMOVAL
59 SY

CABLE BARRIER
(REMOVE)
188 LF

PAVEMENT REMOVAL
291 SY

CURB AND GUTTER
REMOVAL
143 LF

DRIVEWAY REMOVAL
166 SY

EXIST ROW

CONCRETE MEDIAN
REMOVAL
31 SY

PAVEMENT REMOVAL
257 SY

CONCRETE SIDEWALK
REMOVAL
19 SY

EXIST ROW

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER

Fernando Gaytan
11/13/2025

WILCO
TEXAS

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Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE AT SH 45

REMOVAL PLAN

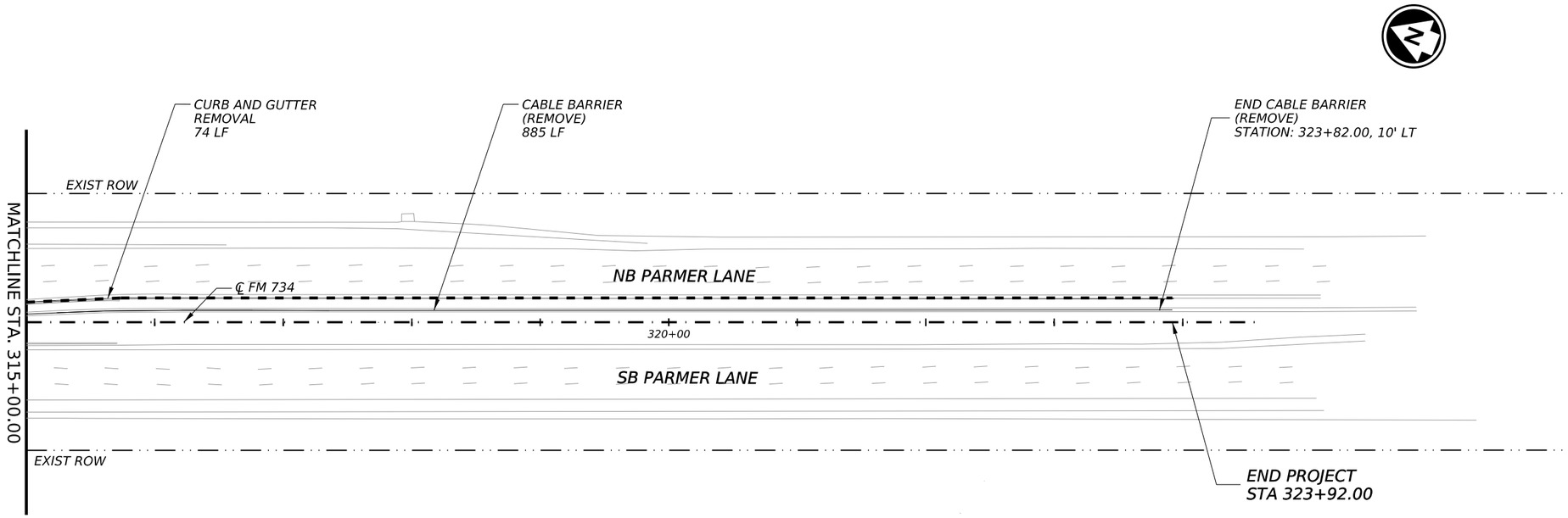
2025 SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		56

DATE: 11/13/2025 3:05:10 PM
FILE: c:\pw\world\n\benesch.projects\projects\d0215418\10 Parmer Lane_REMOVAL01.dgn

100% SUBMITTAL

CK
DW
CK
DW



LEGEND

- REMOVE PAVEMENT
- REMOVE DRIVEWAY
- REMOVE CONCRETE
- REMOVE SIDEWALK
- SAWCUT
- CABLE BARRIER (REMOVE)

NOTES:

1. ALL ITEMS REQUIRING REMOVAL THAT ARE NOT SPECIFICALLY CALLED OUT IN PLANS SHALL BE CONSIDERED SUBSIDIARY TO PREP ROW.
2. SEE DRAINAGE PLANS FOR REMOVAL OF EXISTING DRAINAGE STRUCTURES.
3. SEE SIGNING AND PAVEMENT MARKING LAYOUT FOR REMOVAL OF EXISTING SIGNS AND PAVEMENT MARKING.
4. ALL STATIONING BASED ON ℄ FM 734 UNLESS OTHERWISE NOTED.

0 50 100

SCALE IN FEET
1" = 100' HORZ

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PARMER LANE AT SH 45

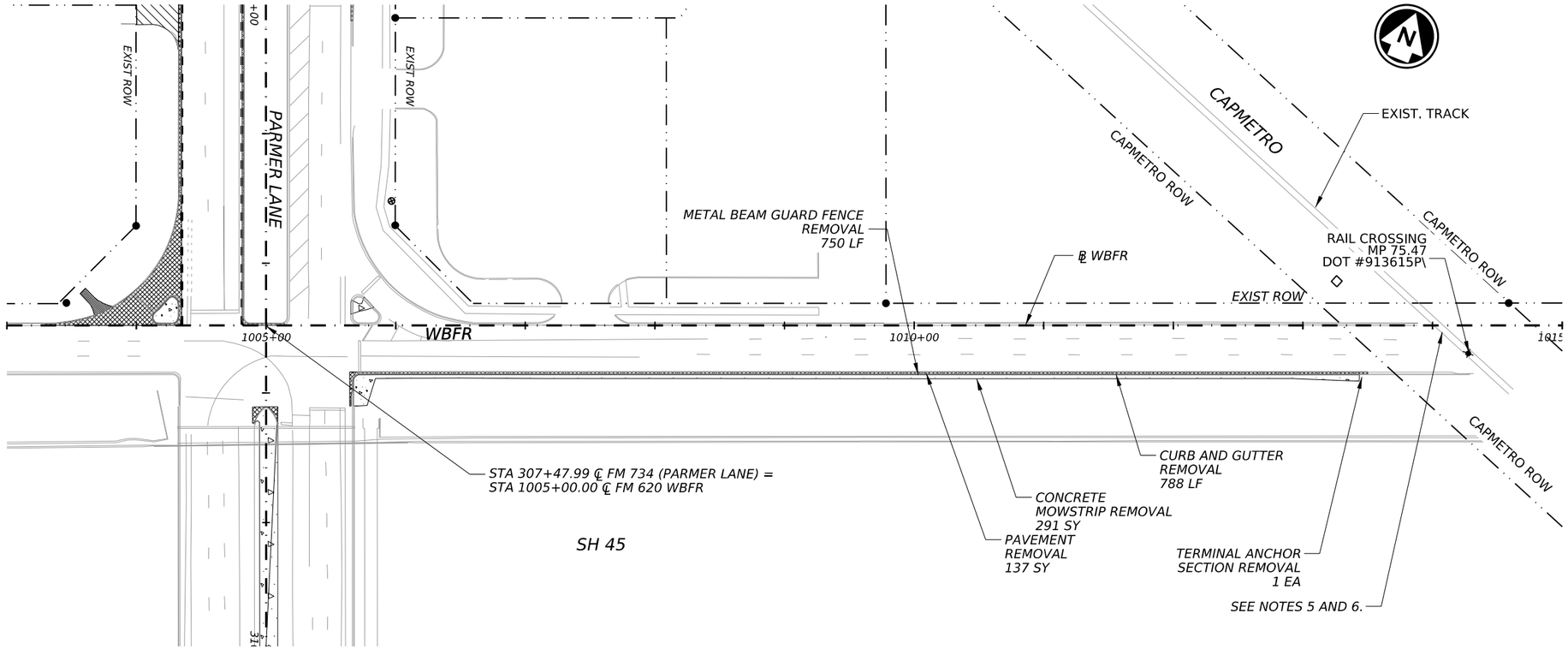
REMOVAL PLAN

2025 SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		57

DATE: 11/13/2025 3:05:23 PM
FILE: c:\pwwordir\benesch projects\projects\d0215418\10 Parmer Lane REMOVAL02.dgn

100% SUBMITTAL



LEGEND

- REMOVE PAVEMENT
- REMOVE DRIVEWAY
- REMOVE CONCRETE
- REMOVE SIDEWALK
- SAWCUT
- CABLE BARRIER (REMOVE)

NOTES:

1. ALL ITEMS REQUIRING REMOVAL THAT ARE NOT SPECIFICALLY CALLED OUT IN PLANS SHALL BE CONSIDERED SUBSIDIARY TO PREP ROW.
2. SEE DRAINAGE PLANS FOR REMOVAL OF EXISTING DRAINAGE STRUCTURES.
3. SEE SIGNING AND PAVEMENT MARKING LAYOUT FOR REMOVAL OF EXISTING SIGNS AND PAVEMENT MARKING.
4. ALL STATIONING BASED ON ℄ FM 734 UNLESS OTHERWISE NOTED.
5. CONTRACTOR SHALL NOT PLACE ANY EQUIPMENT, MATERIALS, WORKERS, OR OTHERWISE PERFORM ANY WORK WITHIN 25' OF THE TRACKS.
6. IF WORK WITHIN CAPMETRO ROW IS NECESSARY OR FOR ANY CHANGE TO THE WORK PLANS, CAPMETRO SHALL BE CONTACTED FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.

0 50 100

SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
FERNANDO GAYTAN
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Fernando Gaytán
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PARMER LANE AT SH 45

REMOVAL PLAN

2025 SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		58

DATE: 11/13/2025 3:05:36 PM
FILE: c:\pwwordin\benesch projects\projects\d021541810 Parmer Lane REMOVAL03.dgn

100% SUBMITTAL

CK
DW
CK
DW

FM 734

	STATION	X	Y
POT	273+22.37	3104298.89	10150715.92
PC	285+81.91	3105059.64	10149712.08
Tangential Direction:		142° 50' 24"	
Tangential Length:		1259.54	

PC	285+81.91	3105059.64	10149712.08
PI	288+53.26	3105223.54	10149495.82
CC		3103465.67	10148504.09
PT	291+21.32	3105323.88	10149243.71
Radius:		2000.00	
Delta:		15° 27' 10.38" (RT)	
Degree of Curvature(Arc):		2° 51' 53.24"	
Length:		539.41	
Tangent:		271.35	
Chord:		537.77	
Middle Ordinate:		18.16	
External:		18.32	
Tangent Back Direction:		142° 50' 24"	
Radial Direction:		232° 50' 24"	
Chord Direction:		150° 34' 12"	
Radial Direction:		248° 18' 00"	
Tangent Ahead Direction:		158° 18' 00"	

PT	291+21.32	3105323.88	10149243.71
POT	324+61.38	3106559.06	10146140.42
Tangential Direction:		158° 18' 00"	
Tangential Length:		3340.06	

RM 620 WB

	STATION	X	Y
POT	1000+00.00	3105460.82	10147547.60
POT	1014+32.05	3106791.54	10148076.72
Tangential Direction:		68° 19' 12"	
Tangential Length:		1432.05	

RM 620 EB

	STATION	X	Y
POT	2000+00.00	3105596.27	10147207.30
POT	2015+10.90	3106999.96	10147766.28
Tangential Direction:		68° 17' 24"	
Tangential Length:		1510.90	

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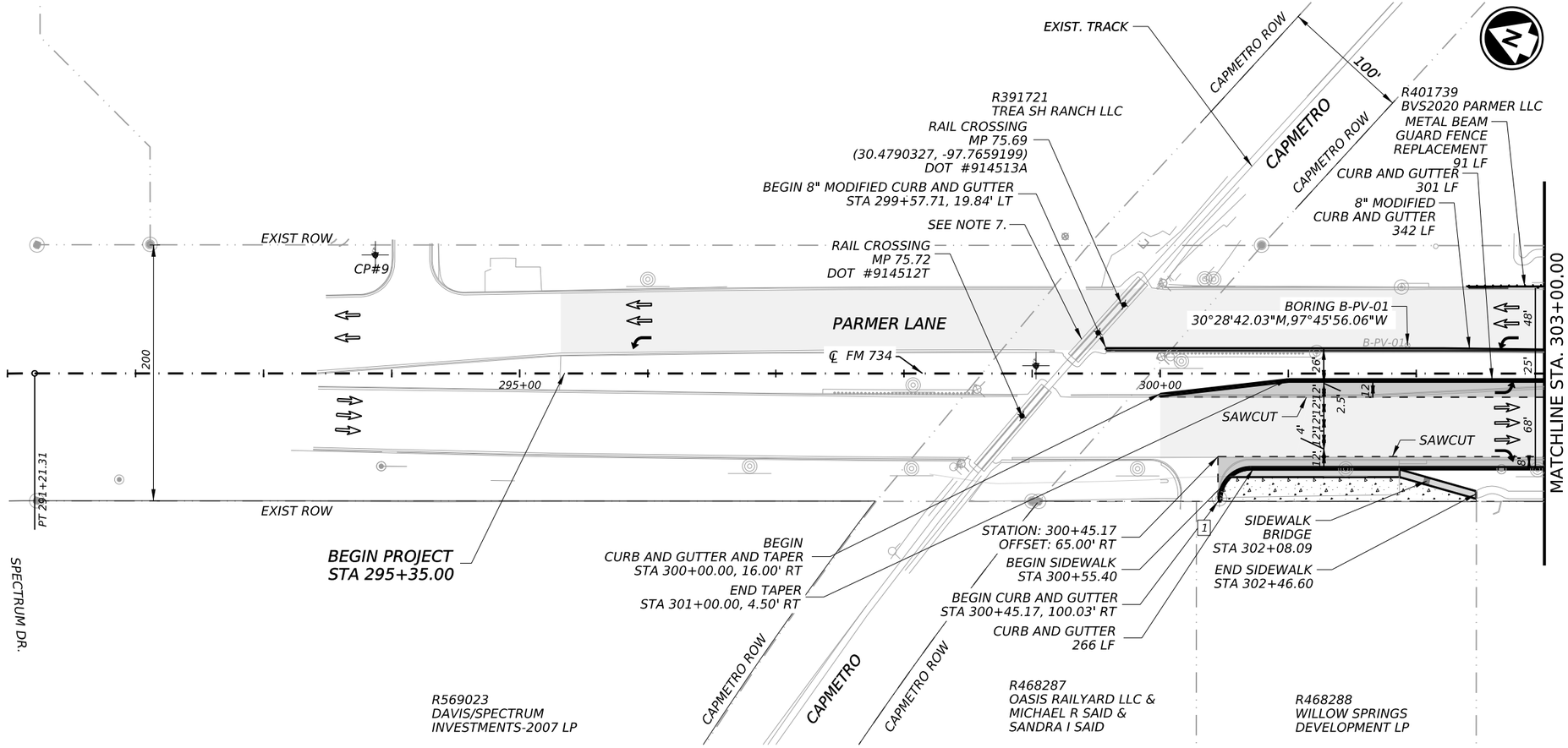
PARMER LANE AT SH 45

HORIZONTAL ALIGNMENT DATA

2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		59

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FILE: c:\pwworkl\benesch projects\projects\d0215418\20 Parmer Lane HAD 01.dgn



LEGEND

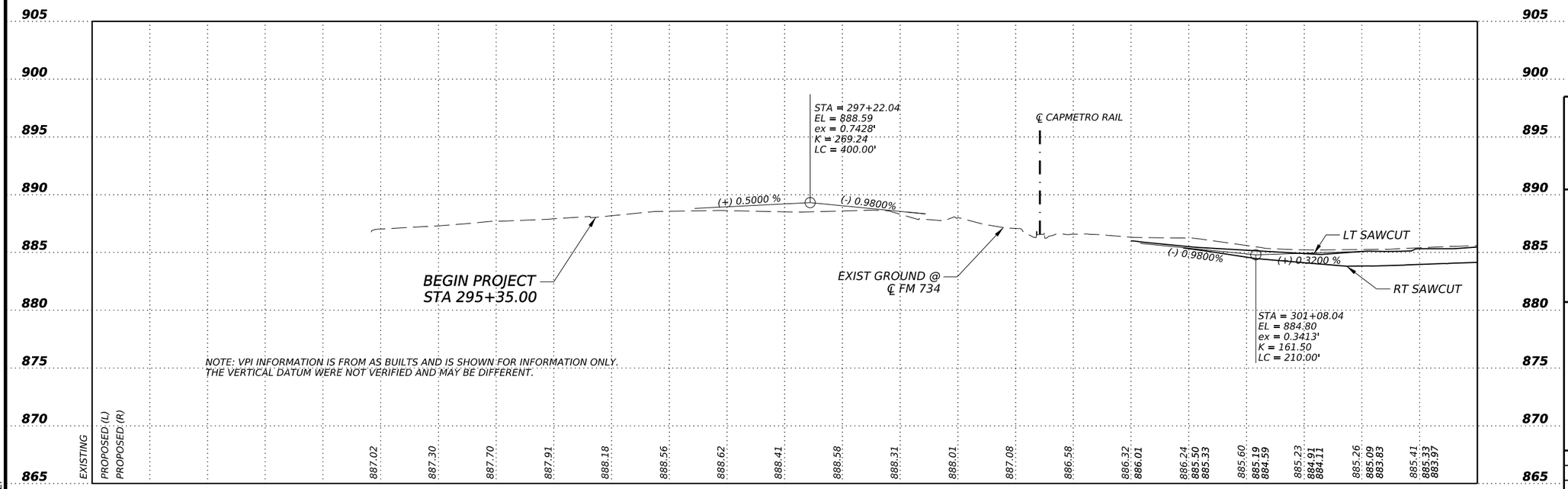
- EXISTING ROW
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- PROPOSED DRIVEWAY NUMBER
- PROPOSED DRIVEWAY
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL INFORMATION.
3. SEE DRIVEWAY DETAIL SHEET FOR ADDITIONAL INFORMATION.
4. ALL DIMENSIONS ARE MEASURED TO THE FACE OF CURB AS INDICATED.
5. SAWCUT IS CONSIDERED INCIDENTAL TO THE ADJACENT REMOVAL ITEM AND WILL NOT BE PAID FOR SEPARATELY.
6. SEE SIDEWALK BRIDGE DETAIL.
7. ANY WORK WITHIN CAPMETRO ROW SHALL COMPLY WITH REQUIREMENTS SPELLED OUT ON CAPMETRO GENERAL NOTES.

0 50 100

SCALE IN FEET
1" = 100' HORZ
1" = 10' VERT



STATE OF TEXAS
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Fernando Gaytan
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Austin, TX 78735
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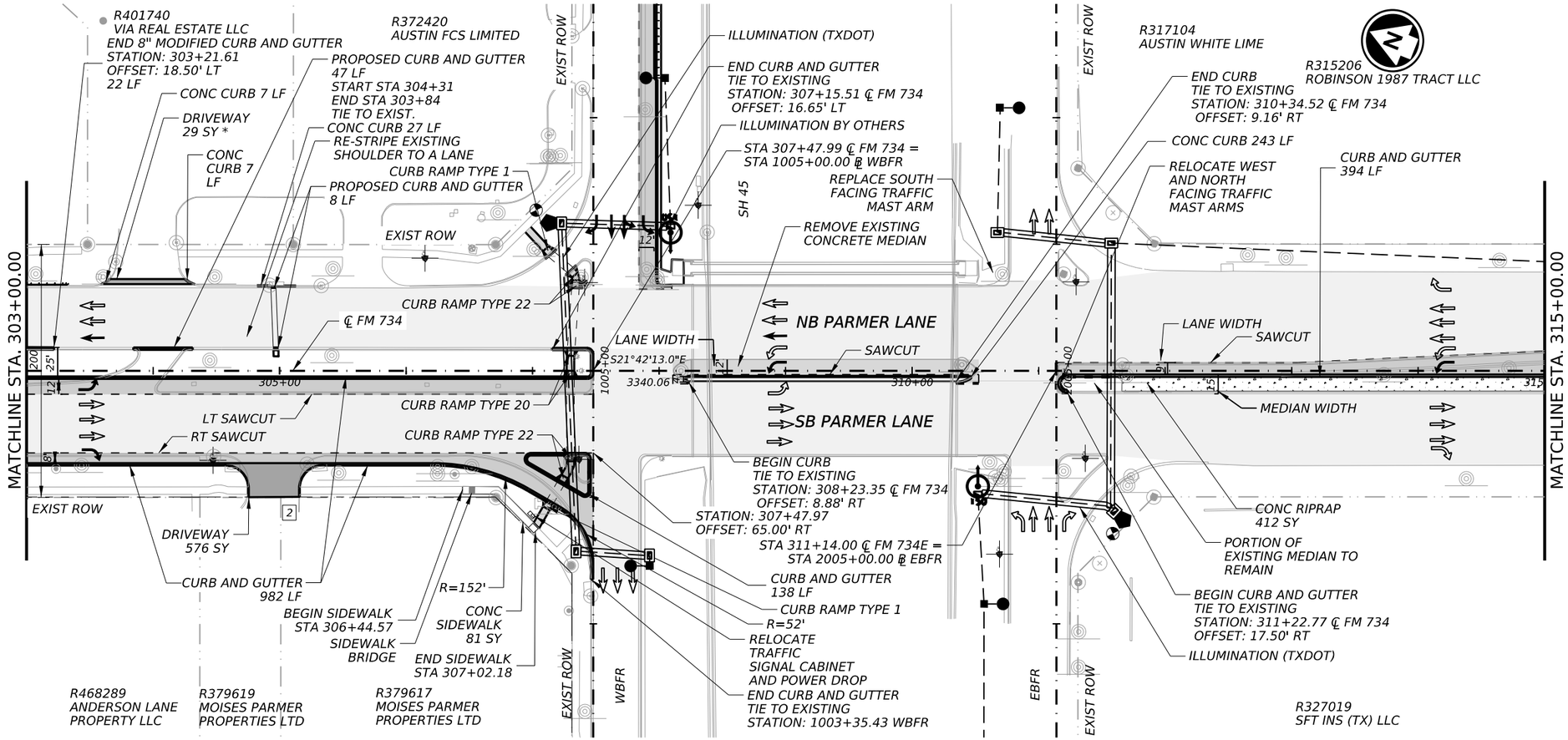
PARMER LANE AT SH 45

PLAN AND PROFILE

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		60

DATE:
FILE:



LEGEND

- EXISTING ROW
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- # PROPOSED DRIVEWAY NUMBER
- PROPOSED DRIVEWAY
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER

NOTES:

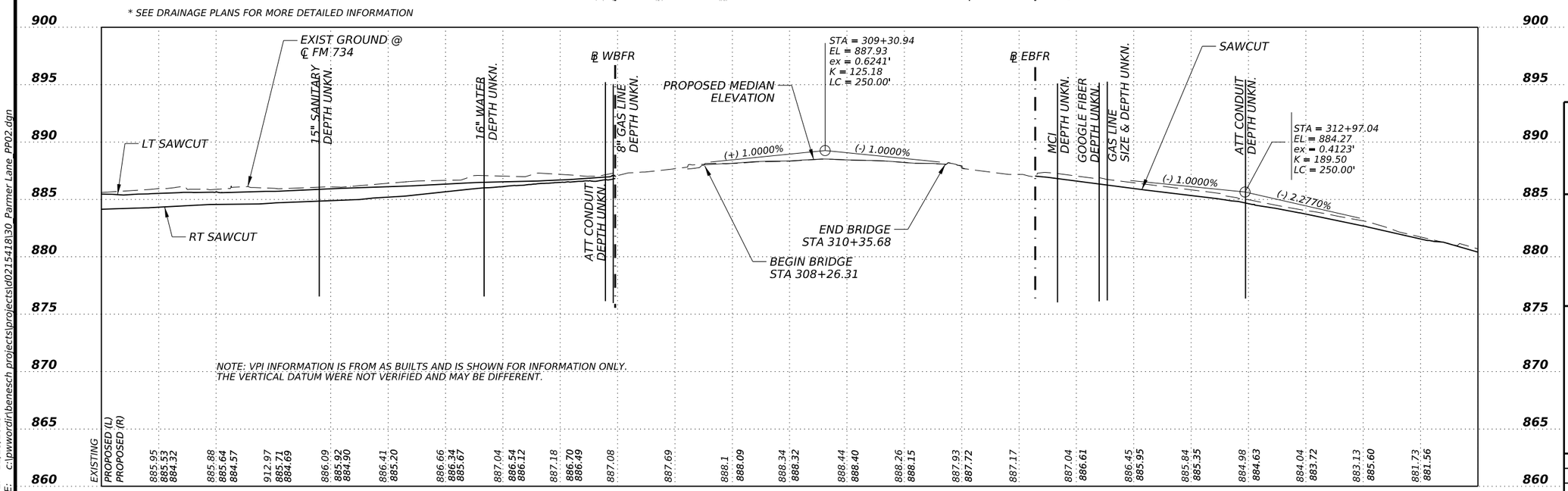
1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL INFORMATION.
3. SEE DRIVEWAY DETAIL SHEET FOR ADDITIONAL INFORMATION.
4. ALL DIMENSIONS ARE MEASURED TO THE FACE OF CURB AS INDICATED.
5. SAWCUT IS CONSIDERED INCIDENTAL TO THE ADJACENT REMOVAL ITEM AND WILL NOT BE PAID FOR SEPARATELY.

8. SEE SIDEWALK BRIDGE DETAIL.

0 50 100

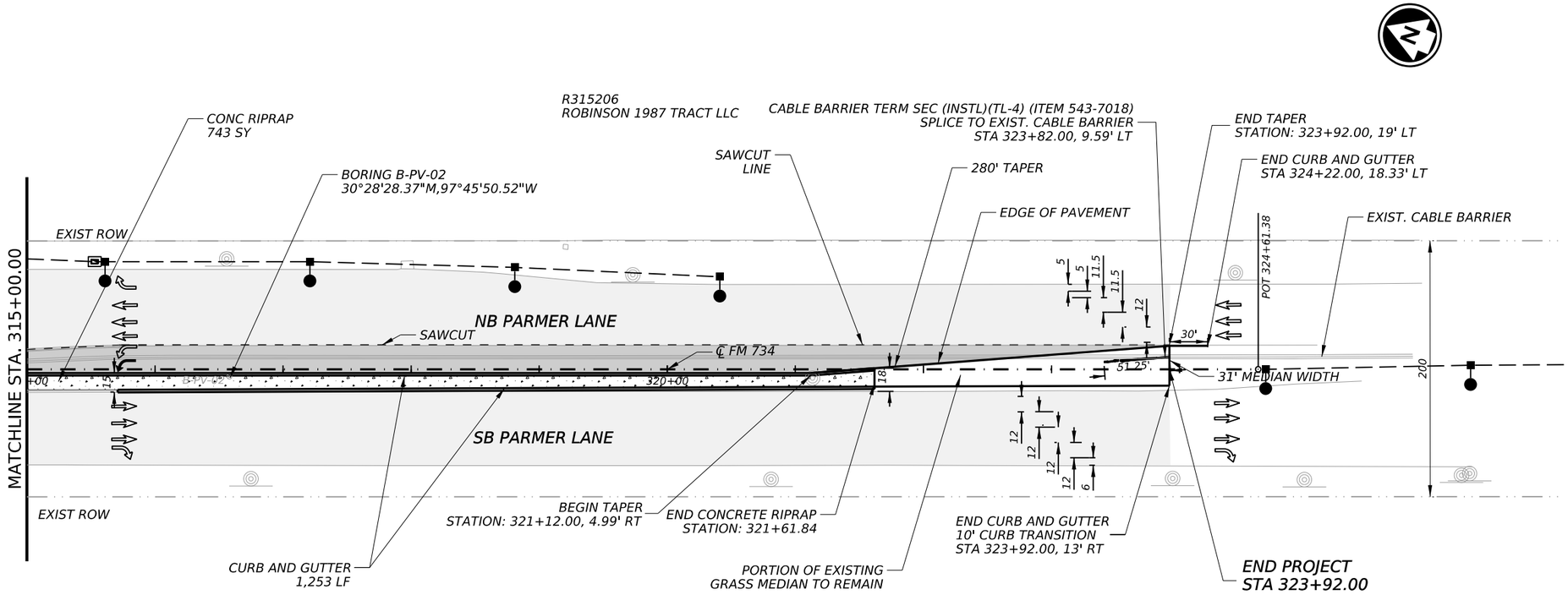
SCALE IN FEET
1" = 100' HORZ
1" = 10' VERT

* SEE DRAINAGE PLANS FOR MORE DETAILED INFORMATION



NOTE: VPI INFORMATION IS FROM AS BUILTS AND IS SHOWN FOR INFORMATION ONLY. THE VERTICAL DATUM WERE NOT VERIFIED AND MAY BE DIFFERENT.

| | | |



LEGEND

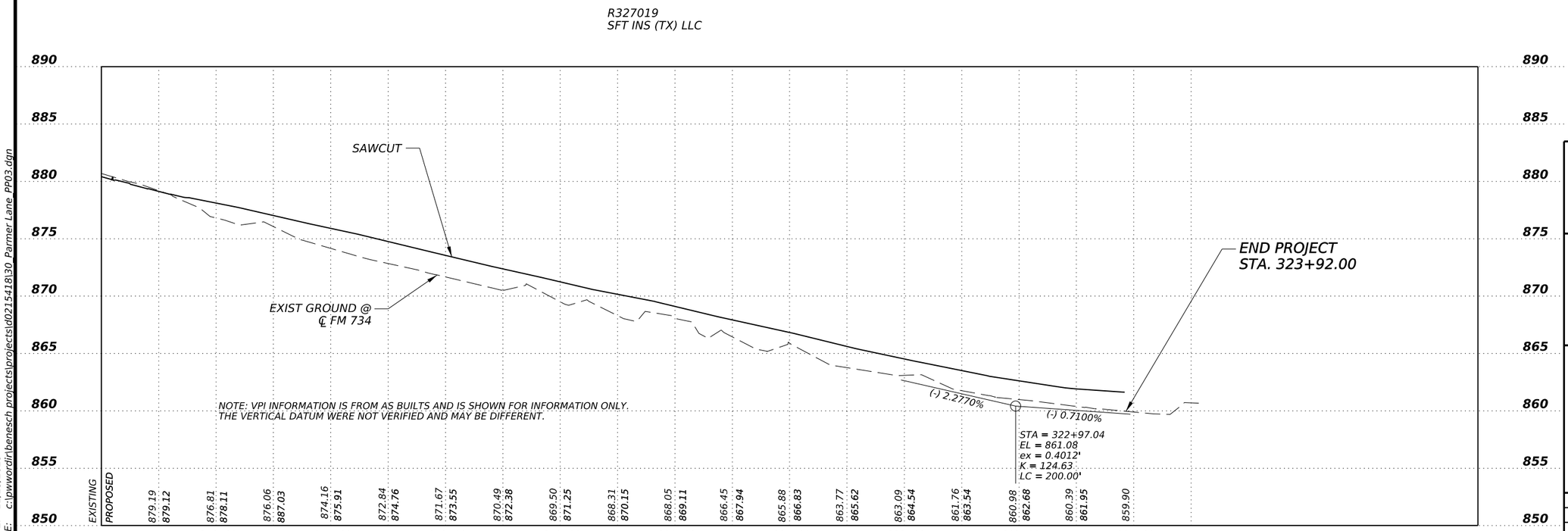
- EXISTING ROW
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- PROPOSED DRIVEWAY NUMBER
- PROPOSED DRIVEWAY
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL INFORMATION.
3. SEE DRIVEWAY DETAIL SHEET FOR ADDITIONAL INFORMATION.
4. ALL DIMENSIONS ARE MEASURED TO THE FACE OF CURB AS INDICATED.
5. SAWCUT IS CONSIDERED INCIDENTAL TO THE ADJACENT REMOVAL ITEM AND WILL NOT BE PAID FOR SEPARATELY.

0 50 100

SCALE IN FEET
1" = 100' HORZ
1" = 10' VERT



STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED PROFESSIONAL ENGINEER
Fernando Gaytan
11/13/2025

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
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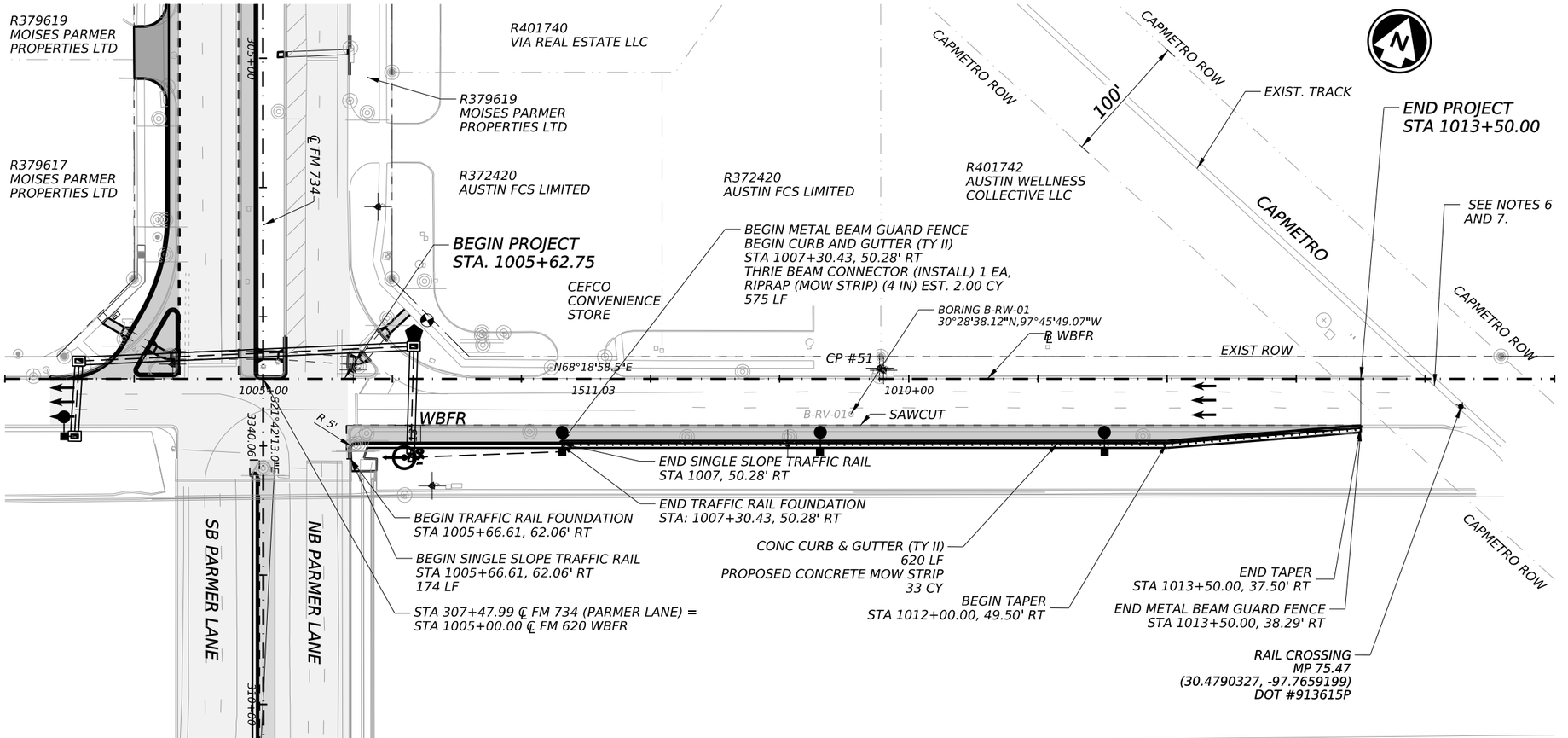
PARMER LANE AT SH 45

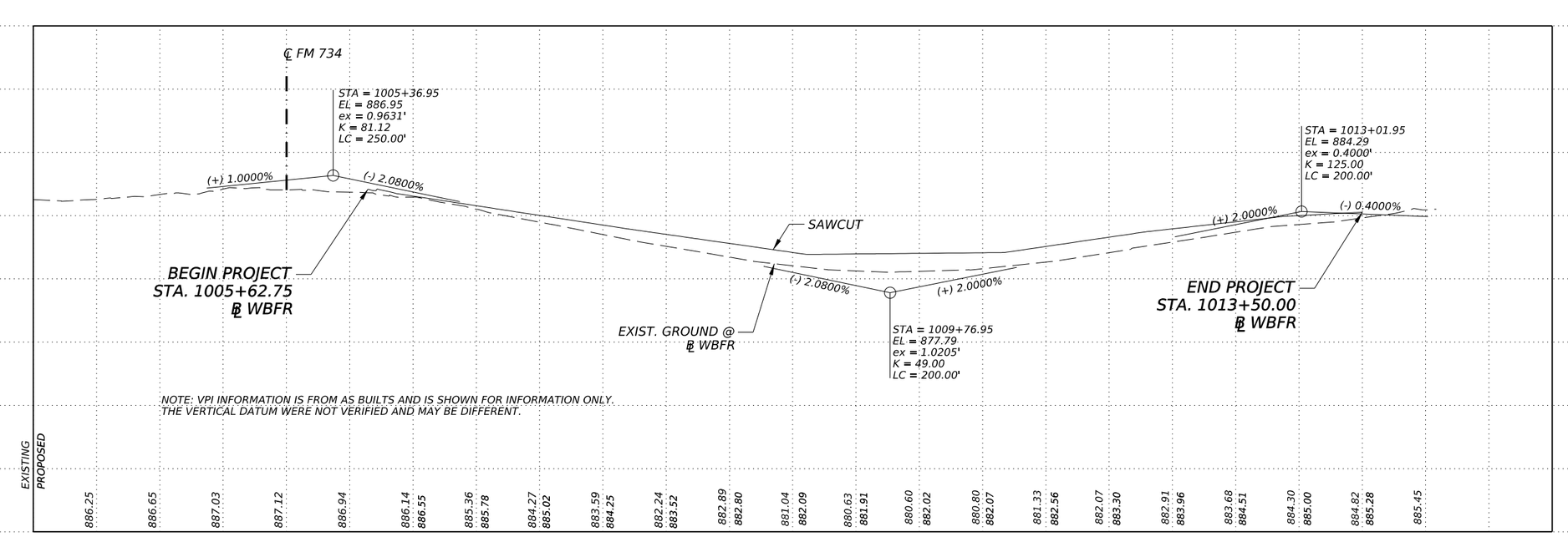
PLAN AND PROFILE

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		62

DATE: 11/13/2025 3:06:26 PM
FILE: c:\pwworkdir\benesch projects\projects\d0215418\30 Parmer Lane_PP03.dgn





LEGEND

- EXISTING ROW
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- # PROPOSED DRIVEWAY NUMBER
- PROPOSED DRIVEWAY
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ADDITIONAL INFORMATION.
3. SEE DRIVEWAY DETAIL SHEET FOR ADDITIONAL INFORMATION.
4. ALL DIMENSIONS ARE MEASURED TO THE FACE OF CURB AS INDICATED.
5. SAWCUT IS CONSIDERED INCIDENTAL TO THE ADJACENT REMOVAL ITEM AND WILL NOT BE PAID FOR SEPARATELY.
6. CONTRACTOR SHALL NOT PLACE ANY EQUIPMENT, MATERIALS, WORKERS, OR OTHERWISE PERFORM ANY WORK WITHIN 25' OF THE TRACKS.
7. IF WORK WITHIN CAPMETRO ROW IS NECESSARY OR FOR ANY CHANGE TO THE WORK PLANS, CAPMETRO SHALL BE CONTACTED FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.

0 50 100

SCALE IN FEET
1" = 100' HORZ
1" = 10' VERT

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FERNANDO GAYTAN
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LICENSED
PROFESSIONAL ENGINEER
Fernando Gaytan
11/13/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE AT SH 45

PLAN AND PROFILE

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		63

DATE: 11/13/2025 3:06:36 PM
FILE: c:\pwwordir\benesch projects\projects\d0215418130 Parmer Lane PP04.dgn

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STATION: 306+98.47
OFFSET: 113.86' LT

STATION: 306+94.07
OFFSET: 109.79' LT

EXIST ROW

CURB RAMP TYPE 1

CURB RAMP TYPE 22

WBFR

CURB RAMP TYPE 20

SAWCUT

SIDEWALK BRIDGE

EXIST ROW

BEGIN SIDEWALK RECONSTRUCTION STA 306+44.57

CURB RAMP TYPE 1

END SIDEWALK RECONSTRUCTION STA 306+98.91

CURB RAMP TYPE 22

CURB P.C.
FM 734
STA: 307+97.52
72.50' LT
ELEV: 886.78'

CURB P.T.
FM 734
STA: 308+03.02
67.00' LT
ELEV: 887.01'

STA: 308+03.02
72.50' LT

1005+00.00 (FM620_WBFR)
307+47.99 (FM 734(PARMER LANE))

STA: 307+42.99
13.15' LT

STA: 307+43.49
2.00' RT

CURB P.C.
FM620_WBFR
STA: 1004+04.73
3.50' LT
ELEV: 886.69'

CURB P.T.
FM620_WBFR
STA: 1004+02.13
8.00' LT
ELEV: 886.58'

CURB P.C.
FM620_WBFR
STA: 1003+91.02
26.77' LT
ELEV: 886.76'

CURB P.T.
FM620_WBFR
STA: 1003+50.00
1.58' LT
ELEV: 886.25'

CURB P.T.
FM 734
STA: 308+23.35
4.50' RT
ELEV: 888.08'

STA: 308+23.35
6.70' RT

CURB P.C.
FM 734
STA: 308+23.35
8.89' RT
ELEV: 887.73'

FM 734

MATCHLINE STA. 309+81.49

STA: 306+40.00 ELEV: 886.51'
STA: 306+60.00 ELEV: 886.56'
STA: 306+80.00 ELEV: 886.61'
STA: 307+00.00 ELEV: 886.70'
STA: 307+20.00 ELEV: 886.82'
STA: 307+40.00 ELEV: 886.95'
STA: 307+47.99 ELEV: 887.09'

STA: 308+10.76 ELEV: 887.66'
STA: 308+20.00 ELEV: 887.75'
STA: 308+40.00 ELEV: 888.01'
STA: 308+60.00 ELEV: 888.08'
STA: 308+80.00 ELEV: 888.18'
STA: 309+00.00 ELEV: 888.27'
STA: 309+20.00 ELEV: 888.36'
STA: 309+40.00 ELEV: 888.37'
STA: 309+60.00 ELEV: 888.36'
STA: 309+80.00 ELEV: 888.29'

LEGEND

- EXISTING ROW
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER
- FLOW DIRECTION
- SAWCUT
- EXIST. CONTOUR
- PROP. CONTOUR (MINOR)
- PROP. CONTOUR (MAJOR)

0 15 30
SCALE IN FEET
1" = 30' HORZ

STATE OF TEXAS
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LICENSED
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Fernando Gaytan
10/03/2025

WILCO TEXAS

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PARMER LANE AT SH 45

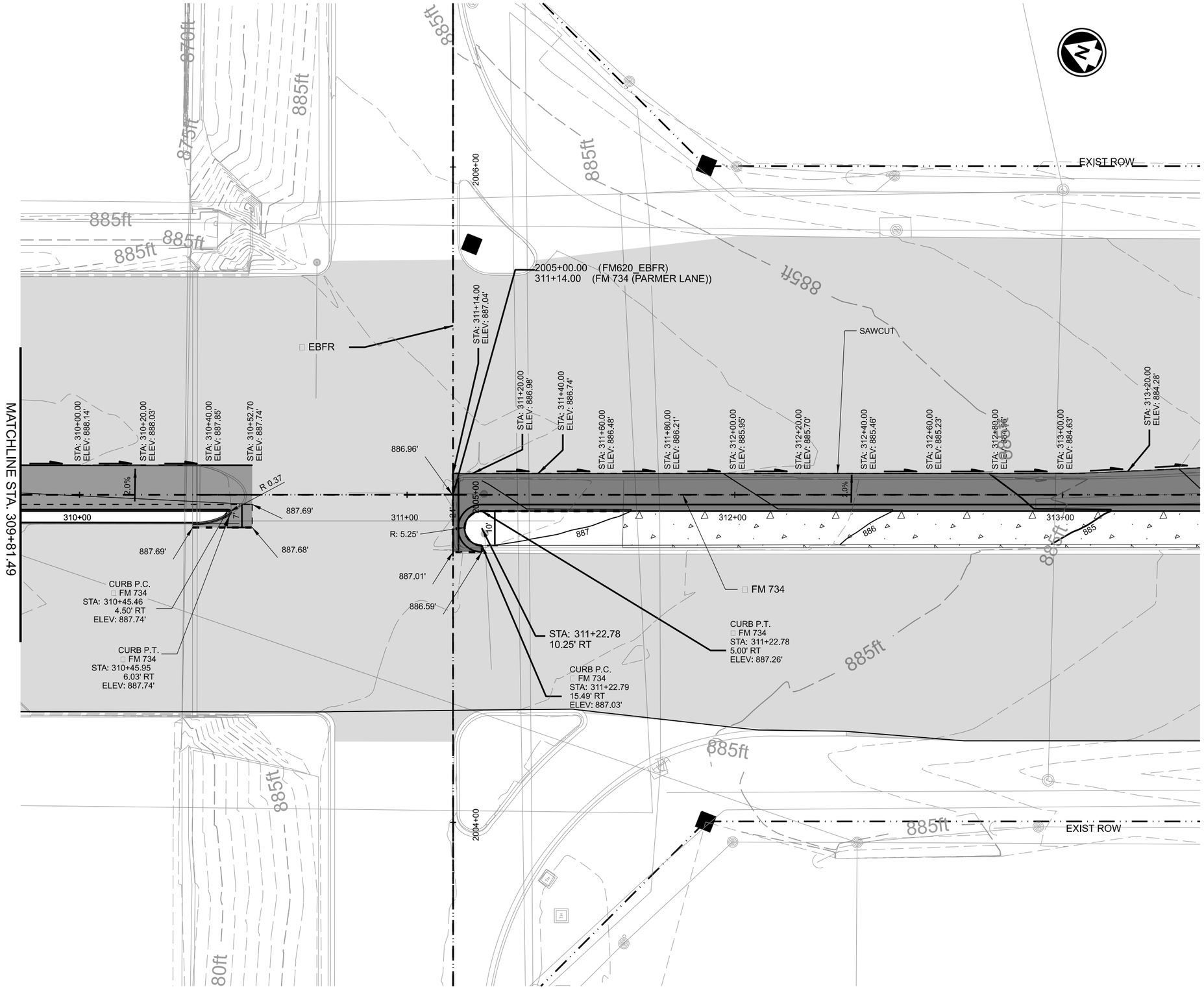
INTERSECTION LAYOUT

2025 SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		64

DATE: 10/3/2025 11:31:21 AM
FILE: c:\pwworkl\benesch projects\projects\d0215418\50_Parmer Lane_IXL01.dgn

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LEGEND

- EXISTING ROW
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER
- FLOW DIRECTION
- SAWCUT
- EXIST. CONTOUR
- PROP. CONTOUR (MINOR)
- PROP. CONTOUR (MAJOR)

0 15 30
SCALE IN FEET
1" = 30' HORZ

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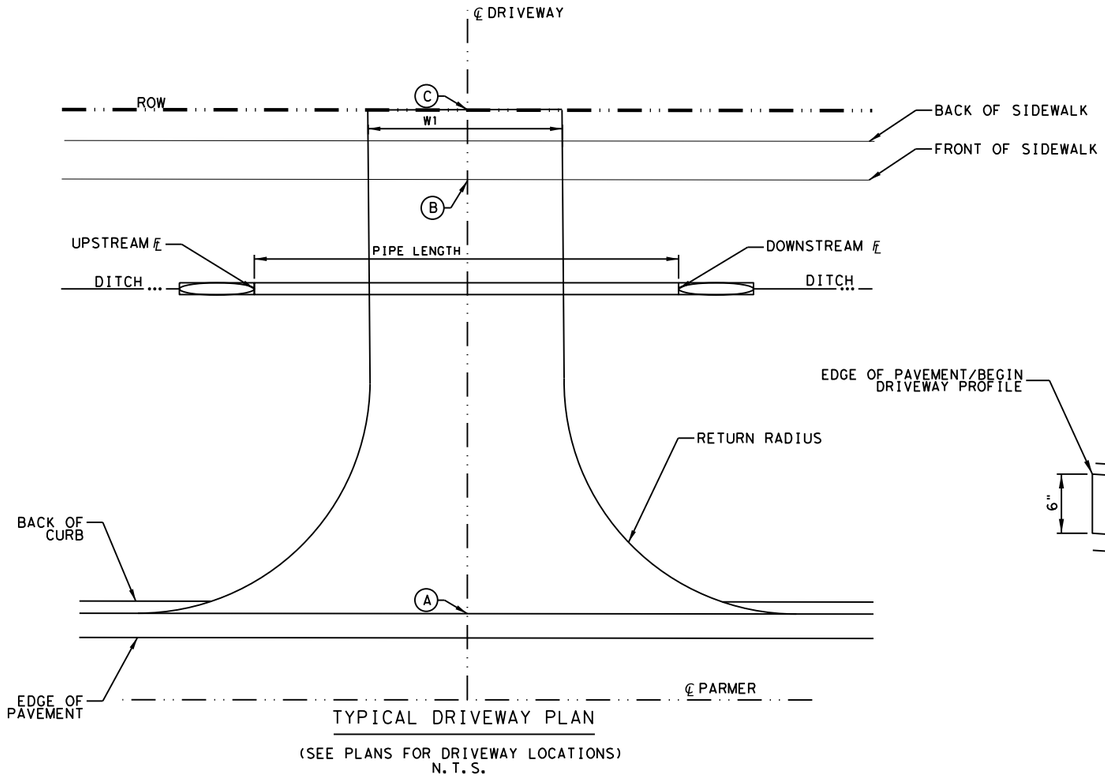
PARMER LANE AT SH 45

INTERSECTION LAYOUT

2025 SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		65

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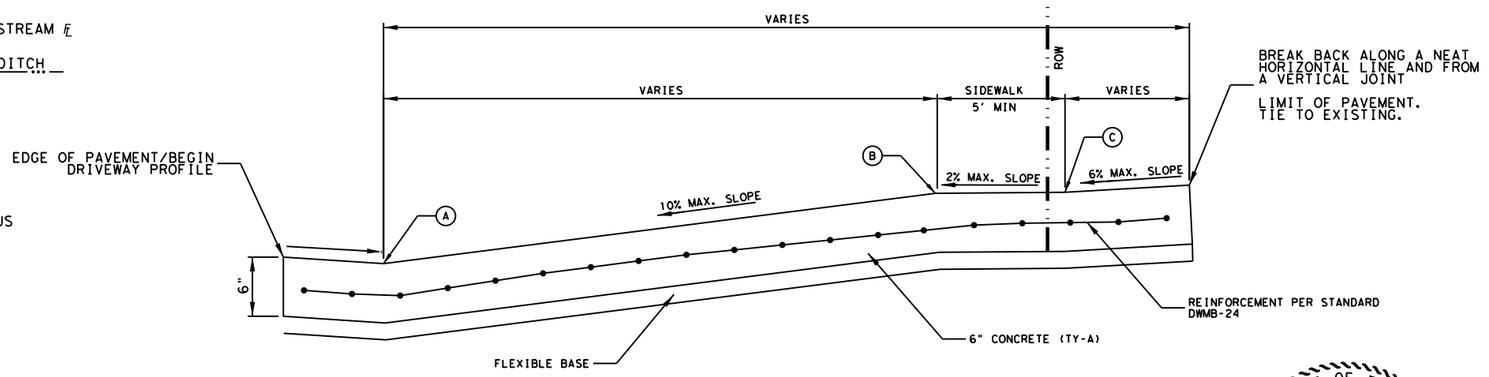


TYPICAL DRIVEWAY PLAN

(SEE PLANS FOR DRIVEWAY LOCATIONS)
N.T.S.

NOTES:

1. LOCATIONS LISTED ON THE TABLE ARE APPROXIMATE. EXACT LOCATIONS AND DIMENSIONS TO BE ESTABLISHED DURING CONSTRUCTION AS REQUIRED.
2. SEE CROSS SECTIONS FOR ADDITIONAL VERTICAL INFORMATION & GRADES.
3. DRIVEWAY MATERIALS SHALL CONSIST OF 6" OF CONCRETE (TY-A) AND A FLEXIBLE BASE
4. A=BEGIN DRIVEWAY
5. B=FRONT OF SIDEWALK
6. C=END DRIVEWAY
7. OFFSET MEASURED FROM PARMER CENTERLINE.
8. ROW ENCROACHMENT IS THE LIMIT OF THE PROPOSED DRIVEWAY OUTSIDE OF THE RIGHT-OF-WAY.



SECTION A-A
PROPOSED DRIVEWAY DETAIL
6" CLASS A CONCRETE AT ASPHALT ROADWAY

N.T.S.

DRIVEWAY #	STATION		TOTAL LENGTH	THROAT WIDTH, W1	RETURN RADII	DRIVEWAY GEOMETRY								ROW ENCROACHMENT	TYPE	DRIVEWAYS (CONC) 530 7006
						A		A TO B	B		B TO C	C				
						OFFSET	ELEV.	SLOPE	OFFSET	ELEV.	SLOPE	OFFSET	ELEV.			
			FT	FT	FT	FT	FT	%	FT	FT	%	FT	FT	FT		SY
1	300+31.09	RT	27.00	32.00	23.50	MATCH TO EXISTING								0.00	COMMERCIAL	26
2	304+95.39	RT	27.00	40.00	18.50	73.00	884.72	14.6	91.34	887.40	2.5	99.81	887.61	0.00	COMMERCIAL	143



Fernando Gaytan
10/03/2025

WILCO TEXAS

benesch
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PARMER LANE
AT SH 45

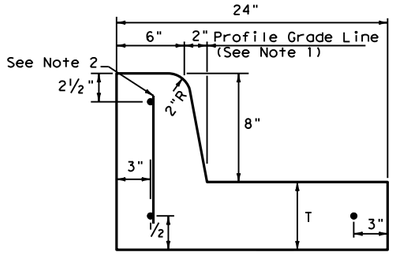
DRIVEWAY DETAILS

2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		66

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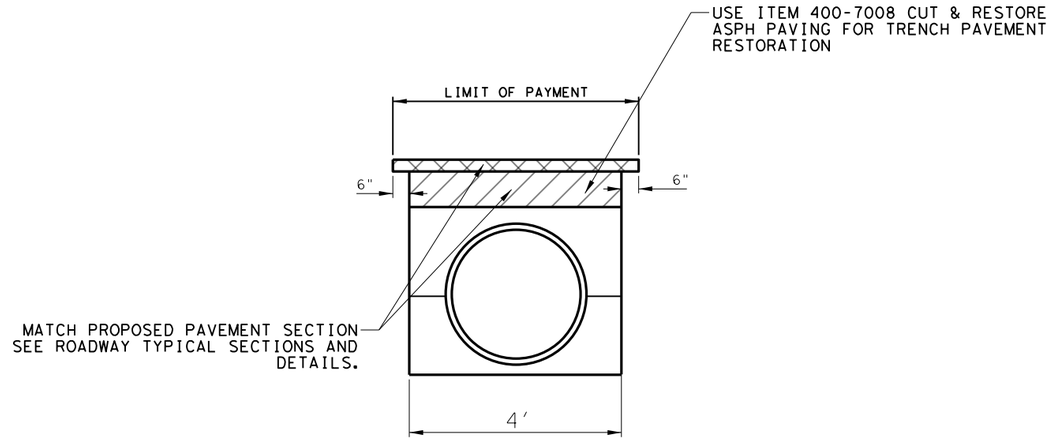




BAR B

8" HEIGHT MODIFIED CURB AND GUTTER DETAIL - PROFILE VIEW

N.T.S.



TRENCH PAVEMENT RESTORATION DETAIL

N.T.S.

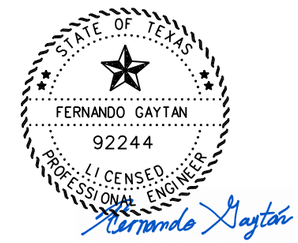
NOTES:

1. USUAL PROFILE GRADE LINE. REFER TO TYPICAL SECTIONS AND PLAN-PROFILE SHEETS FOR EXACT LOCATIONS.

2. BAR B PLACEMENT AS NEEDED (TYPICALLY AT FOUR FT. C-C) TO SUPPORT CURB REINFORCING STEEL DURING CONCRETE PLACEMENT.

3. DIMENSION 'T' SHOWN IS THE THICKNESS OF CONCRETE PAVEMENT. WHEN CURB IS INSTALLED ADJACENT TO FLEXIBLE PAVEMENT DIMENSION 'T' IS 8" MAXIMUM.

4. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER."



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PARMER LANE
AT SH 45

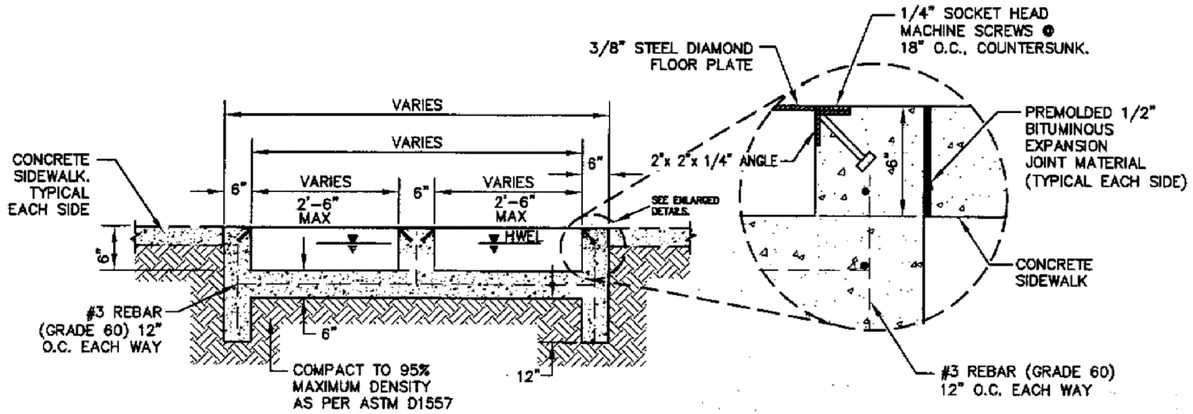
MODIFIED
CURB AND GUTTER
DETAIL

2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		67

DATE: 10/3/2025 11:31:49 AM
FILE: c:\pwwordin\benesch projects\projects\d0215418\60 Parmer Lane Mod C&G.dgn

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MULTIPLE CONCRETE FLUMES WITH STEEL PLATE COVER

APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

Provide cover plates fabricated with a product from this list.
No exceptions are permitted.

GENERAL NOTES:

Povide Class A concrete (f'c = 3000 psi).
Provide Grade 60 reinforcing steel.
Structural steel components must be Grade A36.
All exposed edges of the armored curb must receive a 1/8" bevel.
All structural steel components must be galvanized after fabrication in accordance with Item 445, "Galvanizing".
Galvanizing damaged during transport or construction must be repaired in accordance with the Specification.
The bridge plate must be hot-dip galvanized slip resistant steel (see table). Checker or diamond plate is not allowed, nor are slip resistant tapes, films, or non-metallic coatings.
Adhesive anchor system must be HIT HY 150 H.I.S. internally threaded inserts as furnished by Hilti, Inc., Tulsa, OK, or approved equivalent.
Sidewalk bridge, including all labor, armored curb, bridge plate, and other material complete and in place must be paid for under Item 465 6389, "INLET (COMP) (TY SIDEWALK BRIDGE) (MOD)" by location.

STATE OF TEXAS
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benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE
AT SH 45

SIDEWALK BRIDGE
DETAIL

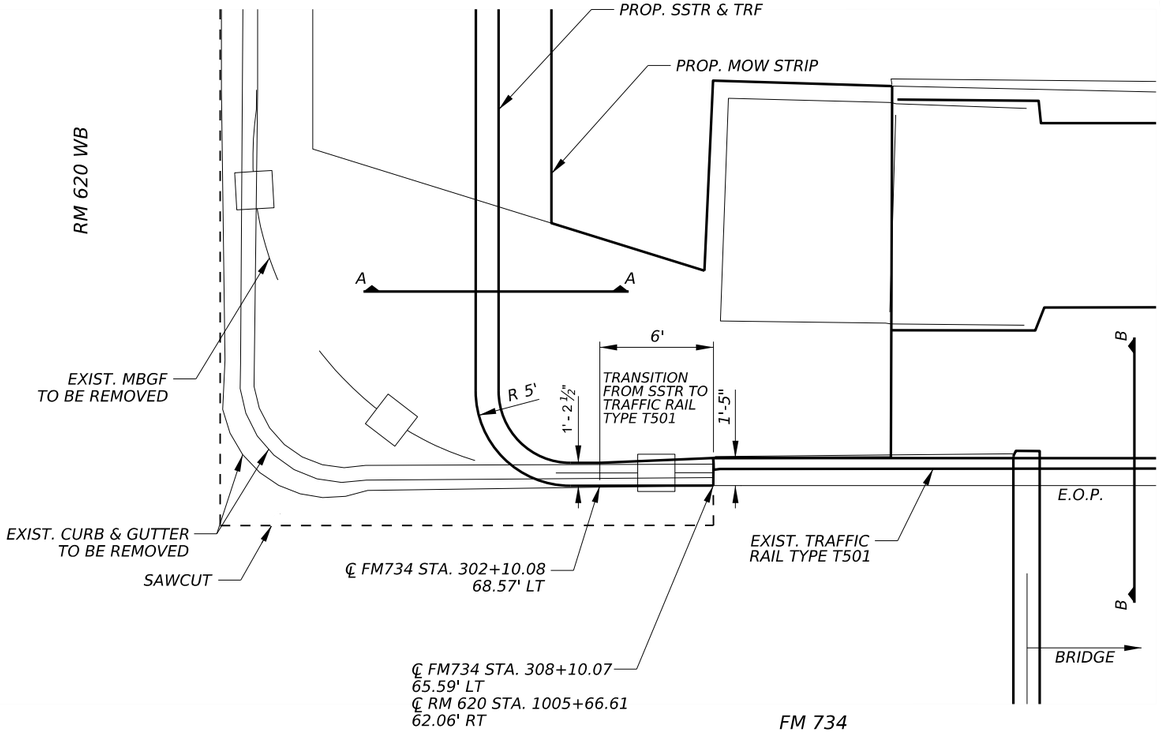
2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		68

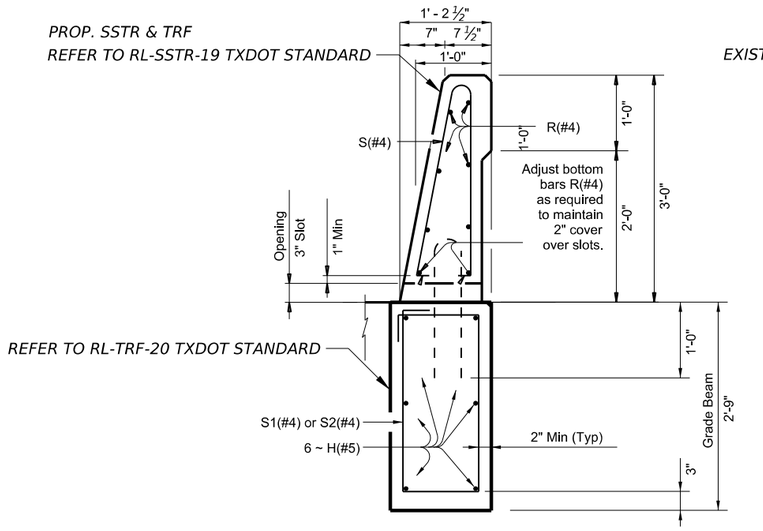
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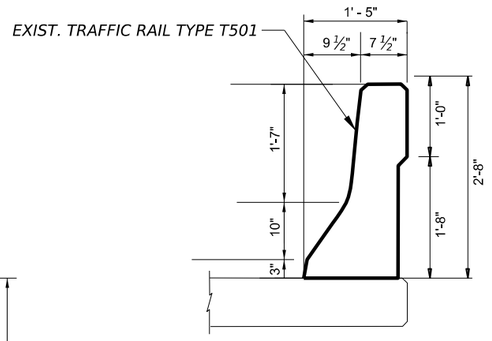
CK | DW | CK | DW



PLAN VIEW
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

LEGEND

- EXISTING ROW
- PROPOSED WIDENING
- PROPOSED MILL & OVERLAY
- RIPRAP
- CURB AND GUTTER
- FLOW DIRECTION
- SAWCUT
- EXIST. CONTOUR
- PROP. CONTOUR (MINOR)
- PROP. CONTOUR (MAJOR)

STATE OF TEXAS
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92244
LICENSED PROFESSIONAL ENGINEER
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11/14/2025

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
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PARMER LANE

CONCRETE RAIL TRANSITION DETAIL

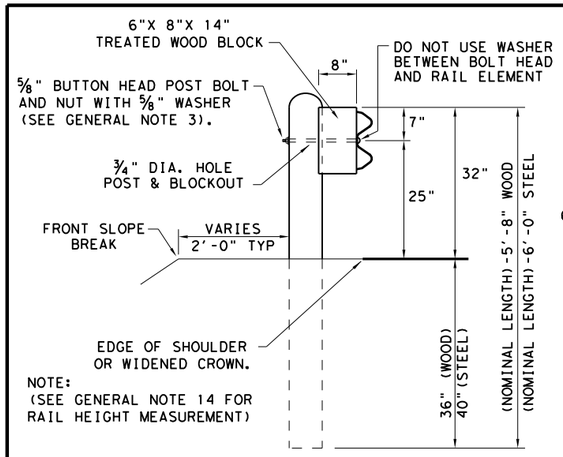
2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		69

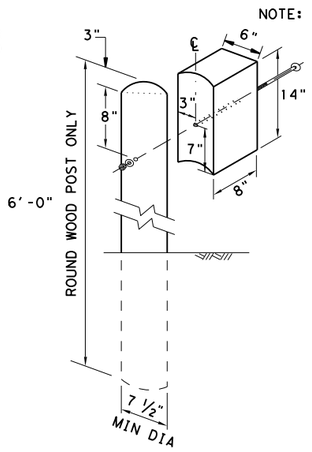
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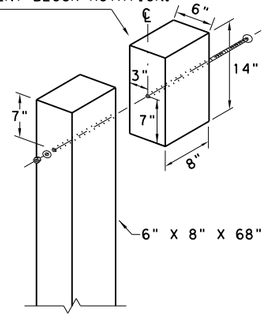


TYPICAL POST PLACEMENT

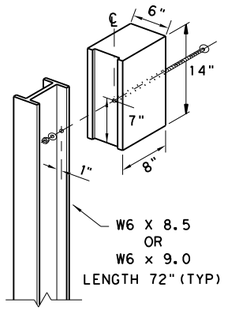


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

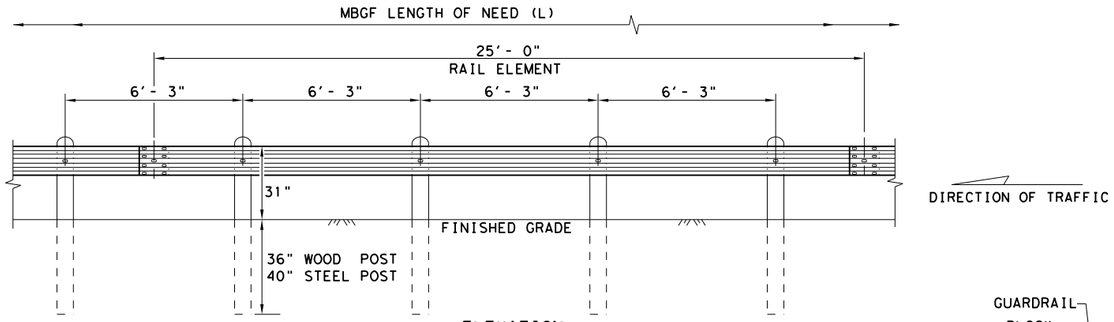


WOOD BLOCK TO RECTANGULAR WOOD POST



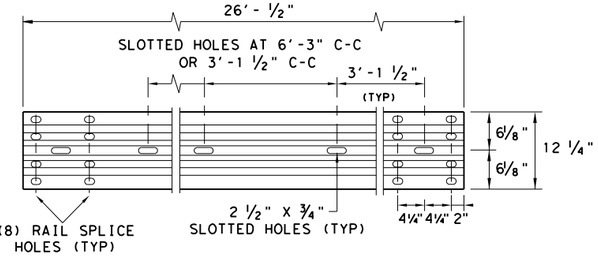
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

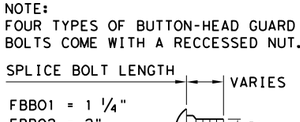
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

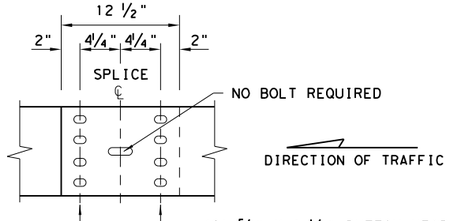
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



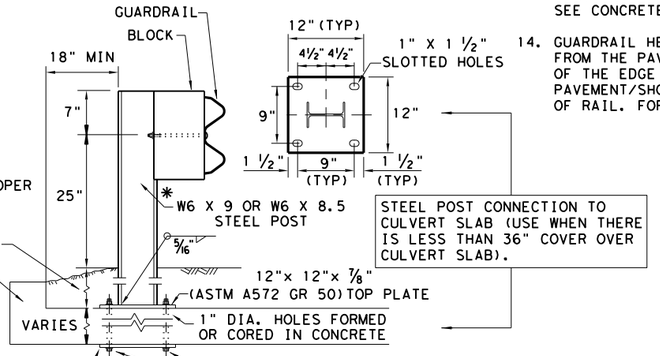
BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

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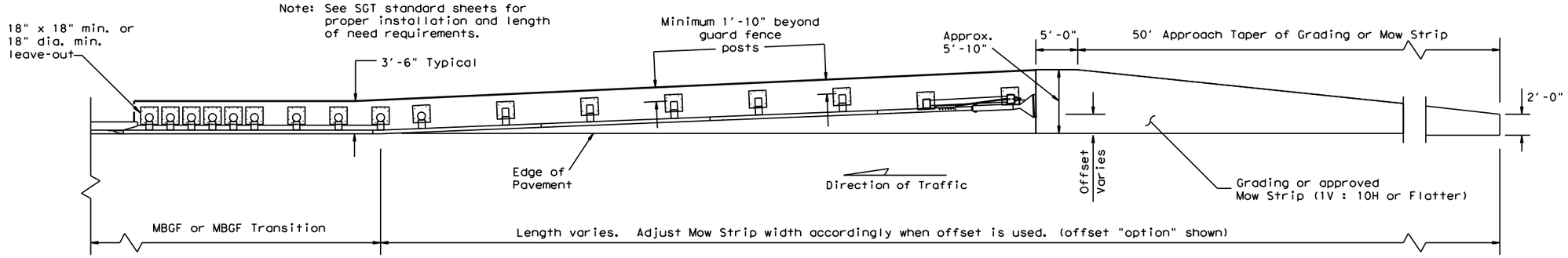
Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

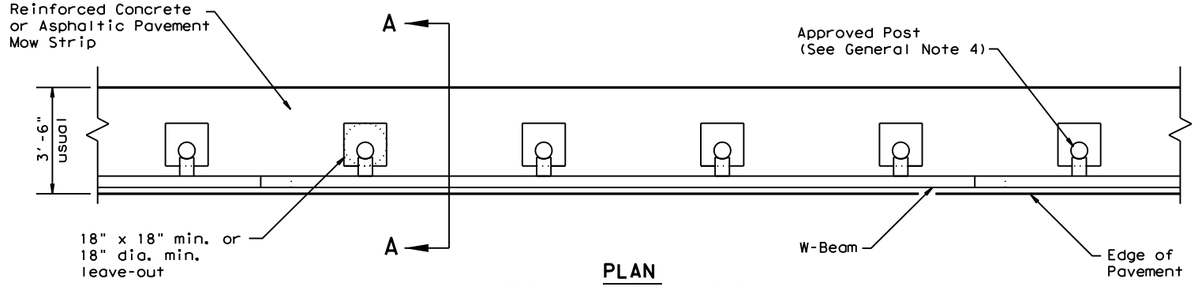
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REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		70

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DATE: 10/3/2025
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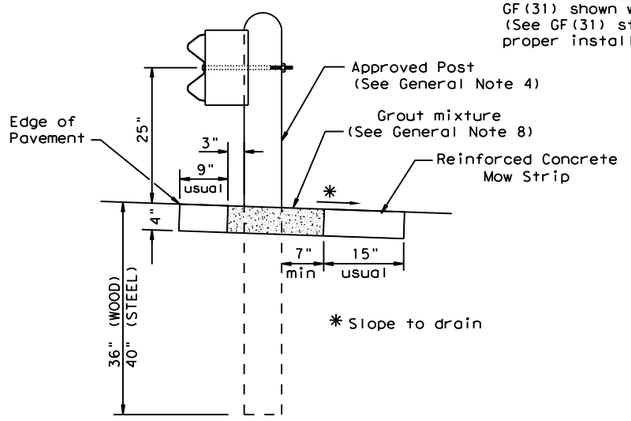


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)

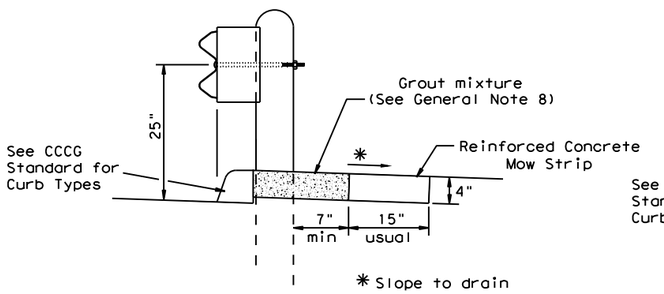


SECTION A-A

Typical

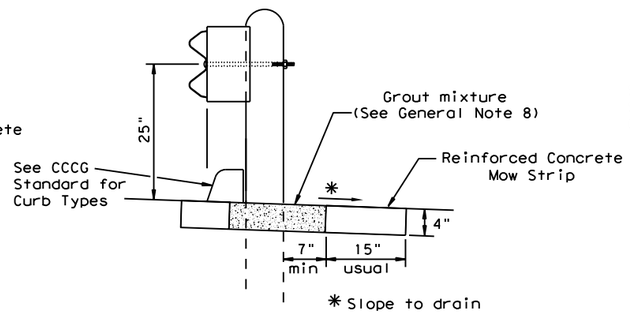
MOW STRIP DETAIL

Reinforced Concrete Mow Strip
with 18" x 18" Square or
18" Dia. minimum leave-out.



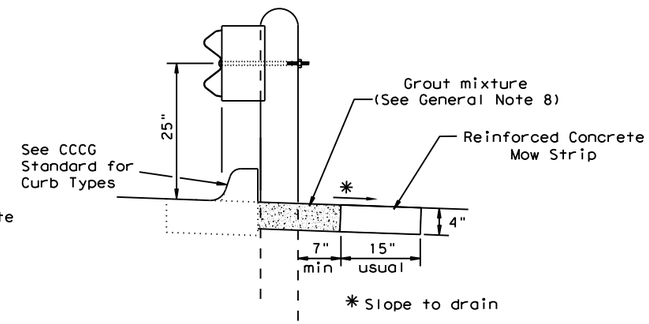
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

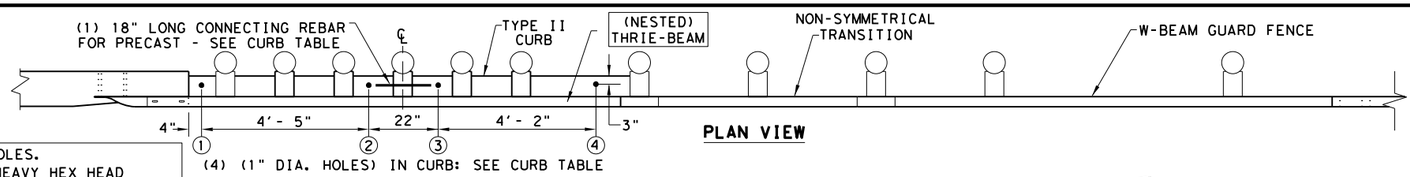
METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		71

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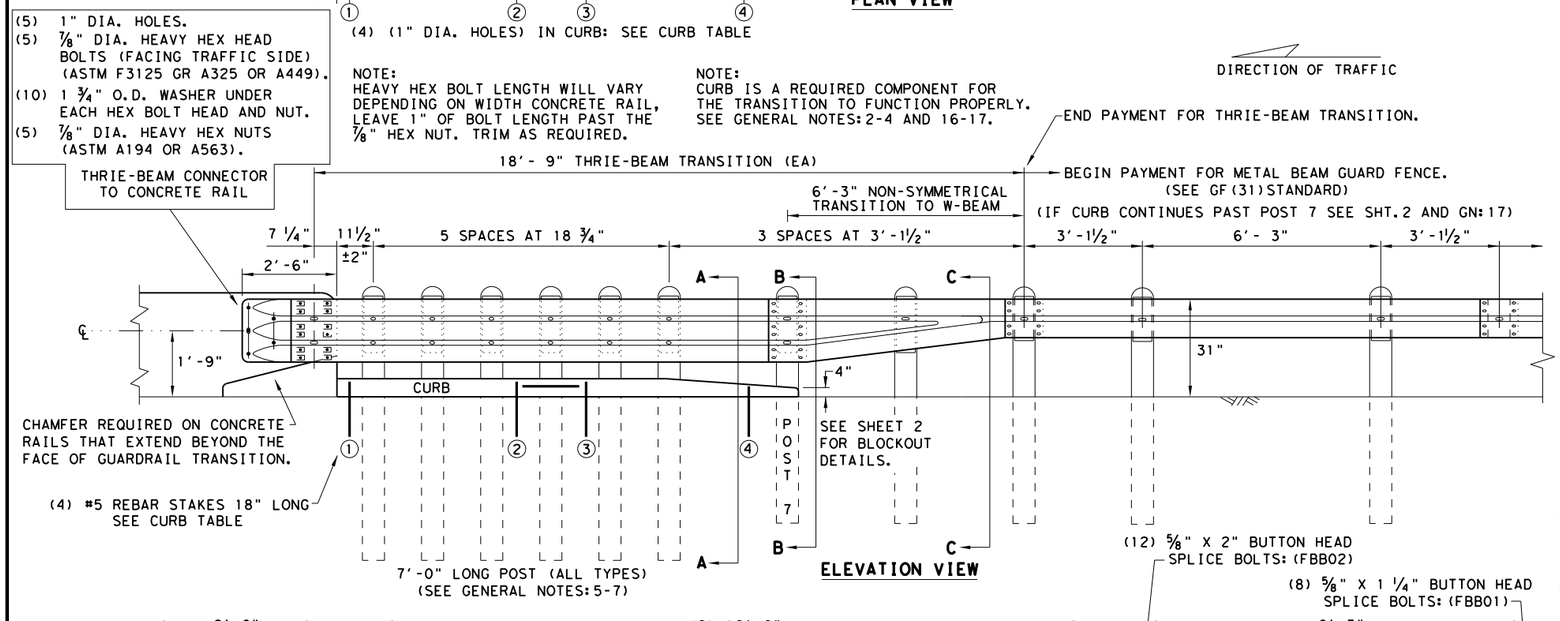


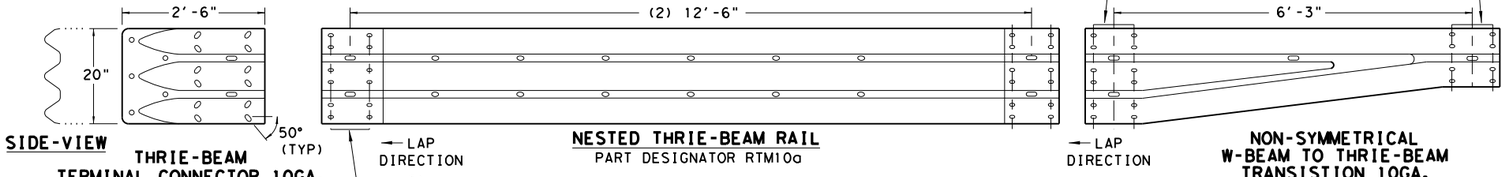
(5) 1" DIA. HOLES.
(5) ⅞" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
(10) 1 ¾" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
(5) ⅞" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

NOTE:
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE ⅞" HEX NUT. TRIM AS REQUIRED.

NOTE:
CURB IS A REQUIRED COMPONENT FOR THE TRANSITION TO FUNCTION PROPERLY. SEE GENERAL NOTES: 2-4 AND 16-17.

DIRECTION OF TRAFFIC

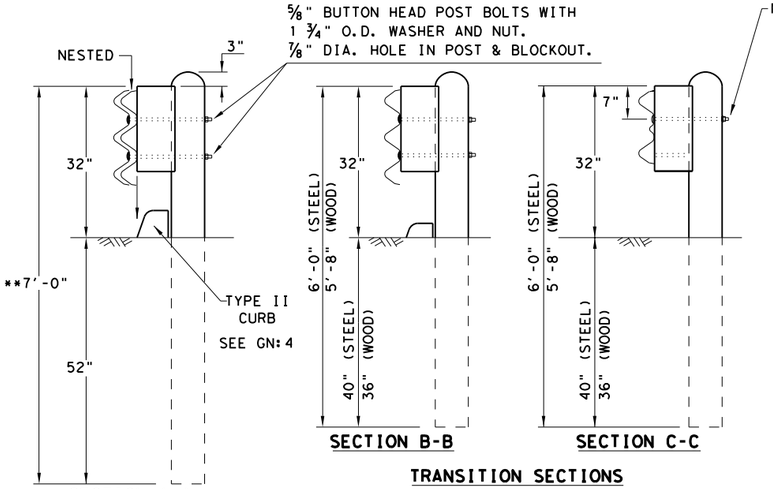




(12) ⅝" X 2" BUTTON HEAD SPLICE BOLTS WITH RECESSED NUTS: (FBB02)
(12) RECTANGULAR GUARDRAIL PLATE WASHERS: (FWR03)

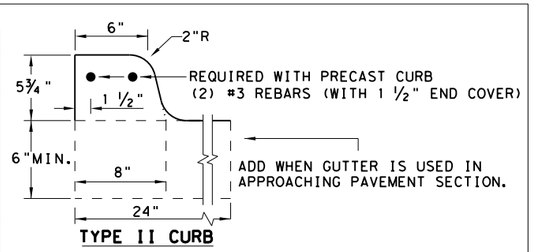
PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE NESTED RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.

THRIE-BEAM TERMINAL - CURB TABLE
PRECAST CURB FULL LENGTH EQUALS 12'- 2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.
CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7
CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.
SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.



NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

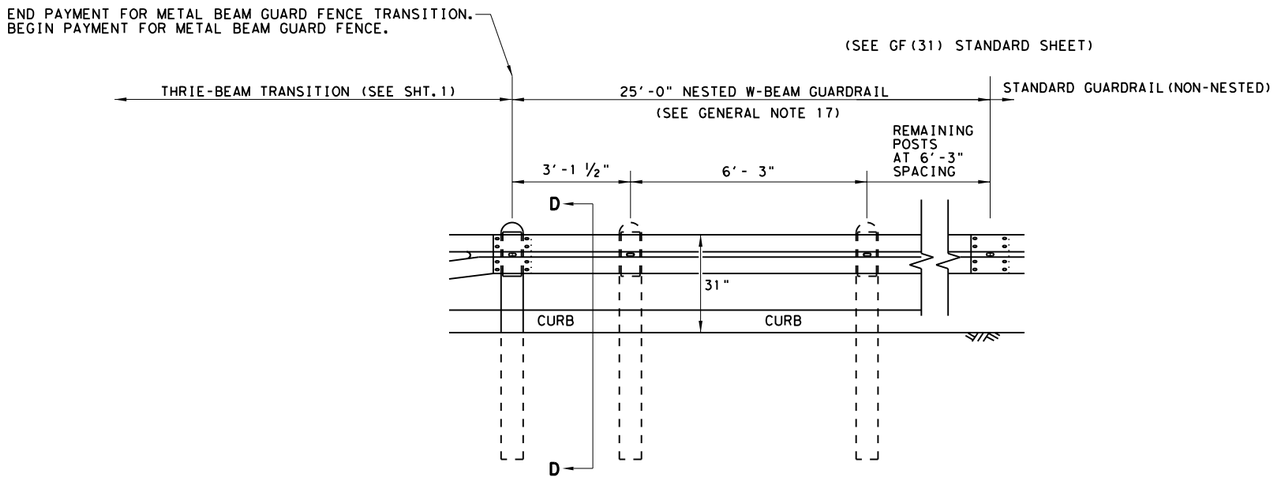
GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		72

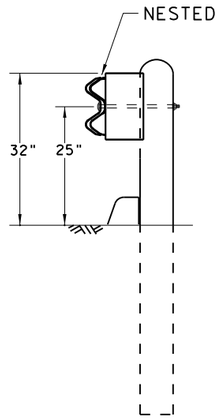
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DATE: 10/3/2025
FILE: c:\pwwordir\benesch projects\projects\d0223664\gf31trt1320.dgn

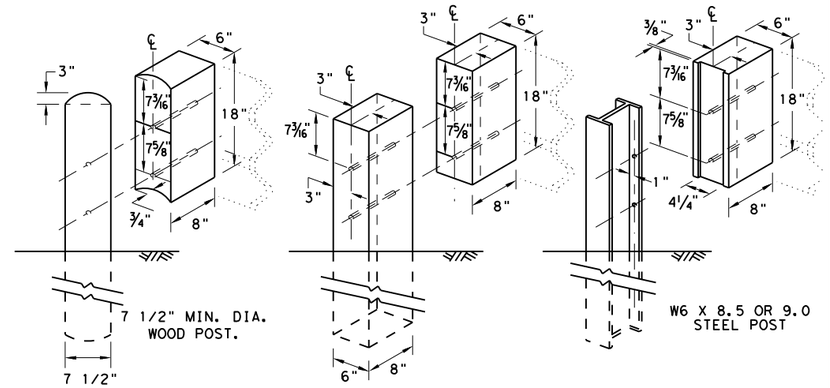
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		73

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DATE: 10/3/2025
FILE: c:\pwworkdir\benesch projects\projects\d0223664\sgt10s3116.dgn

NOTE: STEEL I-BEAM POST W6 X 8.5 (6'-0") PN: 533G
STANDARD WOOD BLOCKOUTS (6"X8"X14") PN: 4076B
AT (POSTS 2 THRU 8)

⅝" X 10" HGR BOLT PN: 3500G
⅝" HGR NUT PN: 3340G

LINE AT THE BACK OF POST #2 THRU #8

FROM THE CENTERLINE OF POST(1) & POST(0)

ANCHOR PADDLE PN: 15204A

ANGLE STRUT PN: 15202G

16"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(2) POST(1) POST(0)

PLAN VIEW

MASH TEST LEVEL 3 (TL-3) LENGTH OF SoftStop TERMINAL (50'-9 ½")

BEGIN LENGTH OF NEED

DO NOT BOLT ANCHOR RAIL TO - POST (2)

SEE DETAIL 1

TRAFFIC FLOW

50'-9 ½" STANDARD INSTALLATION LENGTH (MASH TL-3 SoftStop)

BEGIN STANDARD MBGF

END PAYMENT FOR SGT

6¼" 3'-1 ½" 6'-3" 6'-3"

ANCHOR RAIL WITH SLOTS - (THREADED THRU HEAD)
SEE SoftStop MANUAL FOR COMPLETE DETAILS

MIDDLE SLOT CUTOUT (1) 1 ¾" X 6'-10 ¼"

OUTSIDE SLOTS CUTOUT (2) 1½" X 6'-9 ⅝"

SoftStop FACE SEE GN(3) & NOTE: B

MBGF LAPPED IN DIRECTION OF TRAFFIC FLOW

25'-0" DOWNSTREAM W-BEAM GUARDRAIL PN: 61G

SoftStop ANCHOR RAIL (12GA) PN: 15215G

3'-1 ½"(+/-) 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 5'-8" 4'-7"

SEE NOTE: C

ANCHOR PADDLE PN: 15204A

END OF ANCHOR RAIL PN: 15215G

SEE NOTE: A

POST 32" HEIGHT

31" RAIL HEIGHT

RAIL 25'-0" PN: 61G

RAIL 25'-0" PN: 15215G

31" RAIL HEIGHT

DO NOT BOLT ANCHOR RAIL TO POST(2)

SEE DETAIL 2

13/16" DIA. YIELDING HOLES

13/16" DIA. YIELDING HOLES

SEE DETAIL 3

6'-1 3/8"

(8) ⅝"x 1-¼" GR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST 40" DEPTH (TYP 1-8)

(8) ⅝"x 1-¼" HGR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(2) 6'-0" (SYTP) PN: 15000G POST(1) 4'-9 ½" SYTP PN: 15203G POST(0) 6'-5 ⅜" PN: 15205A

ELEVATION VIEW

HARDWARE FOR POST(2) THRU POST(8)
(1) ⅝"x 10" HGR BOLT PN: 3500G
(1) ⅝" HGR HEX NUT PN: 3340G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

ALTERNATE BLOCKOUT SEE GENERAL NOTE: 6

4" X 7 ½" X 14" BLOCKOUT COMPOSITE PN: 6777B

6" X 8" X 14" BLOCKOUT WOOD PN: 4076B

NOTE: DO NOT BOLT ANCHOR RAIL TO POST(2)

8" 6" 14"

⅝" HGR NUT PN: 3340G

⅝" X 10" HGR POST BOLT PN: 3500G

13/16" DIAMETER YIELDING HOLES LOCATED IN FLANGES

FINISHED GRADE

(HOLES APROXIMATELY CENTERED AT FINISHED GRADE)

ISOMETRIC VIEW POST(1 & 2)

W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

(1) ⅝" x 1 ¾" HEX HD BOLT PN 3391G

ANGLE STRUT PN: 15202G

(2) ⅝" WASHERS PN 4372G

(1) ⅝" HGR HEX NUT PN 3340G

DETAIL 1

SHOWN AT POST(1) NEAR GROUND

(1) ⅝" HEX NUT

(1) ⅝" x 1-½" HEX HD BOLT-GR-5 PN: 105286

(2) ⅝" ROUND WASHERS PN: 3240G

DETAIL 2

SHOWN AT POST(1)

ANCHOR KEEPER PLATE (24 GA) PN: 15207G

ANCHOR PLATE WASHER ½" THICK PN: 15206G

1" ROUND WASHER F463 PN: 4902G

(2) ⅝" x 2 ½" HEX HD BOLT GR-5 PN: 105285G

ALTERNATE BLOCKOUT SEE GENERAL NOTE: 6

(2) ⅝" ROUND WASHER (WIDE) PN: 3240G

1" NUT PN: 3908G SHALL BE SECURELY TIGHTENED AFTER FINAL ASSEMBLY, BUT NOT DEFORMING THE KEEPER PLATE.

ANCHOR PADDLE PN: 15204A

(2) ⅝" HEX NUT A563 GR.DH PN: 3245G

W-BEAM FLATTENED (4 PLIES)

ANGLE STRUT PN: 15202G

SEE NOTE: A

(2) ¾" x 2 ½" HEX BOLT (TYP) PN: 3717G

(4) ¾" FLAT WASHER (TYP) PN: 3701G

(2) ¾" HEX NUT (TYP) PN: 3704G

6'-1 3/8" POST DEPTH

(2) ANCHOR POST ANGLE PN: 15201G

DETAIL 3 AT POST(0)

6'-5 ⅜" (W6 X 15) I-BEAM POST PN: 15205A

TRAFFIC FLOW

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

FINISHED GRADE

LINE POST (3, 4, 5, 6, 7 & 8)

SECTION VIEW B-B

6'-0" (W6 X 8.5) I-BEAM POST PN: 533G

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

FINISHED GRADE

POST(2)

SECTION VIEW A-A

6'-0" (W6 X 8.5) (SYTP) I-BEAM POST PN: 15000G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

POST 17"- ½" HEIGHT

4'-9 ½"

13/16" DIA. YIELDING HOLES

40"

POST(1)

FRONT VIEW POST(1)

4'-9 ½" (W6 X 8.5) (SYTP) I-BEAM POST PN: 15203G

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

2'-0"

STANDARD MBGF

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX. RAIL OFFSET

APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-¾" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 ⅜")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR.DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅝" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
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DATE: 10/3/2025
FILE: c:\pwworkdir\benesch projects\projects\d0223664\sgt11s3118.dgn

(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-⅝" FROM REFERENCE LINE

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2

RAIL 4 | RAIL 3 | RAIL 2 | RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

CABLES

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.

PLAN VIEW

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- ½"

49'-8 ⅝"

6'-3" | 6'-3" | 6'-3" | 6'- ¾" | 6'-3" | 6'-3" | 6'-3" | 37 ½" | 5'-3 ⅜"

RAIL HEIGHT 31"

ARROWS

RAIL HEIGHT 31"

HEAD HEIGHT

DETAIL (B)

32-¼"

ITEM (13) RAIL 4 | ITEM (13) RAIL 3 | ITEM (13) RAIL 2 | ITEM (13) RAIL 1

DETAIL (D)

FINISHED GRADE

CABLES

FINISHED GRADE

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

68-⅛"

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2 | POST 1

ITEM (4)
I-BEAM
W6 X 9

NO BLOCKOUT
AT (POST 1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

SOIL
ANCHOR POST
ITEM (1)

A

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE
DETAIL (D)

HEAD HEIGHT 32-¼"

TOP OF POST

31-⅞"

FINISHED GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

**SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9**

SECTION VIEW A-A

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 ⅝"

2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)

ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT
USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

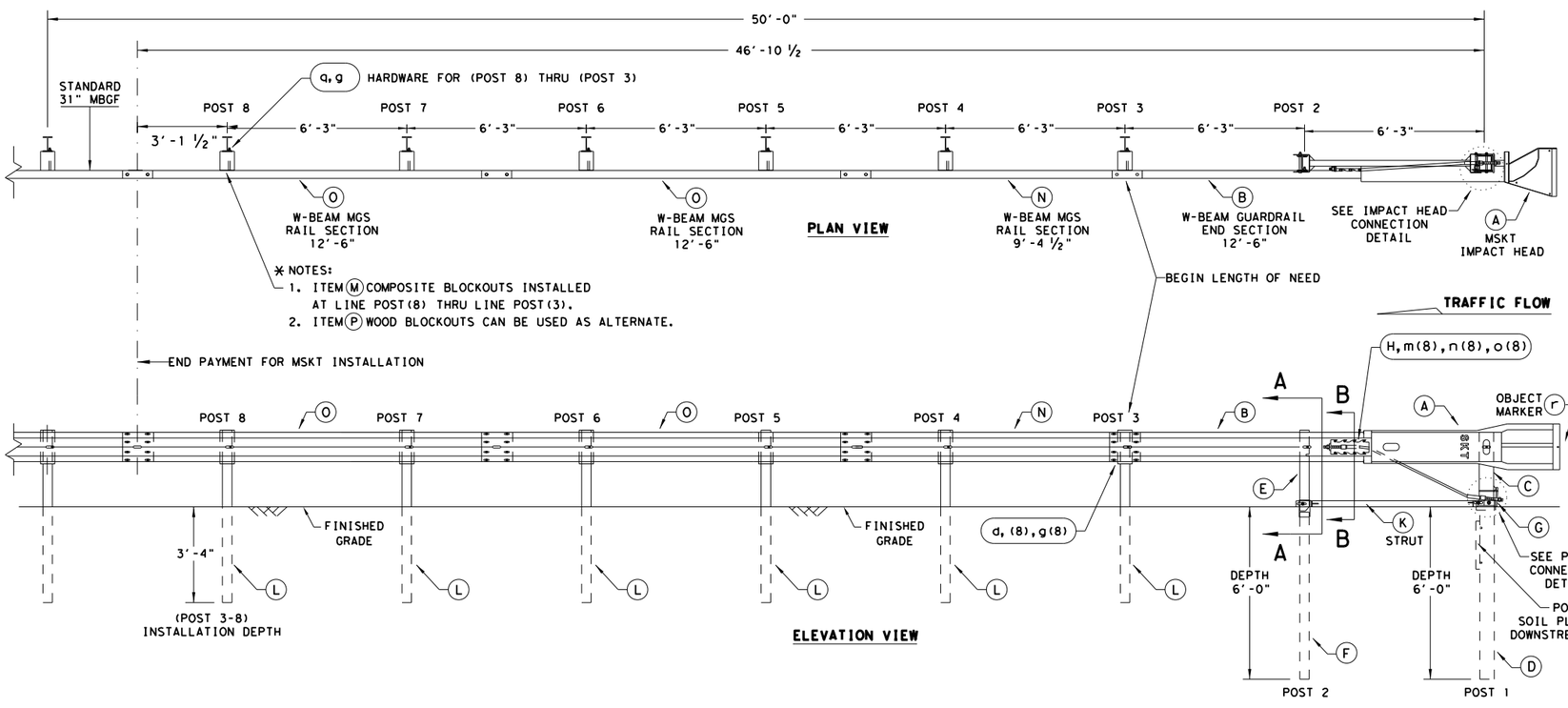
Design Division Standard

MAX-TENSION END TERMINAL
MASH - TL-3
SGT(11S)31-18

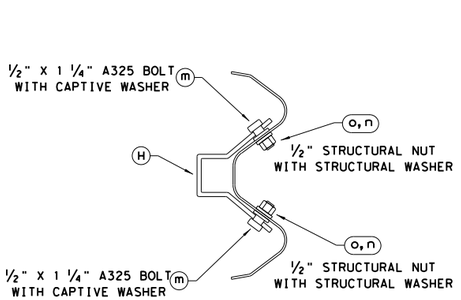
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© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		75

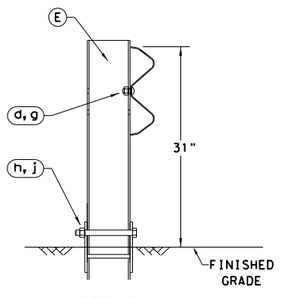
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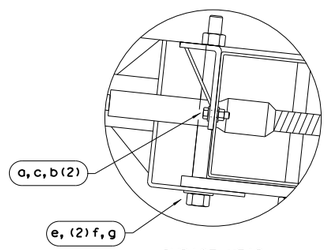
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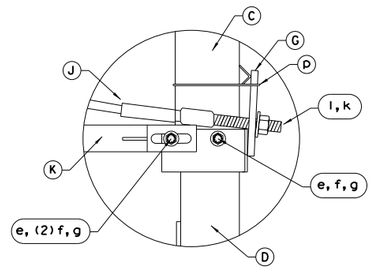


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.









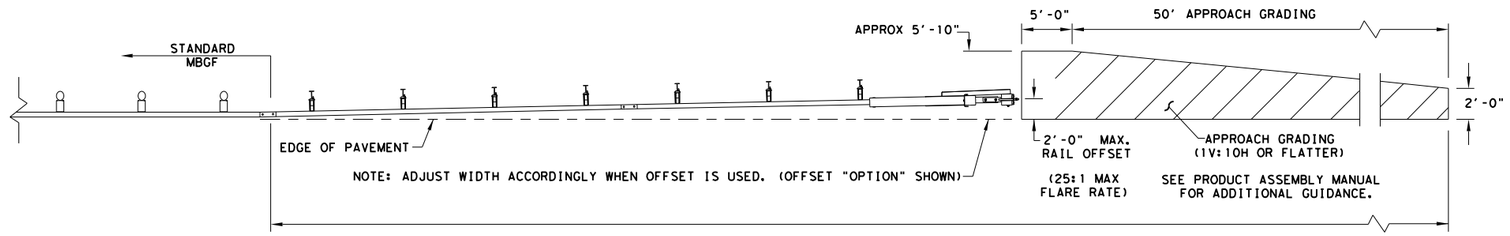
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X ⅛" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 ½")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 9/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	⅝" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

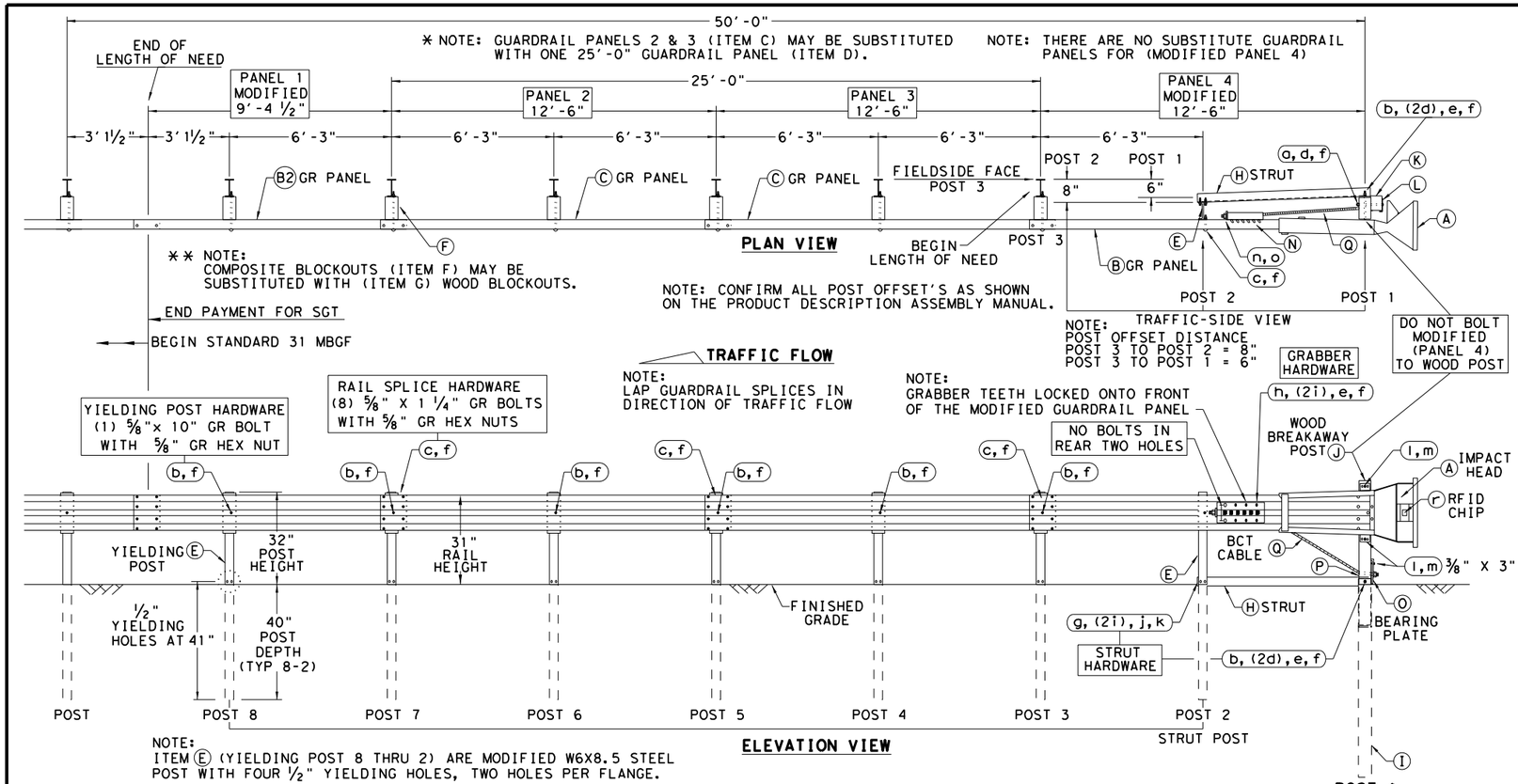
Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

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REVISIONS	3417	02	040		FM734	
	DIST	COUNTY			SHEET NO.	
	4	WILLIAMSON			76	

DISCLAIMER:
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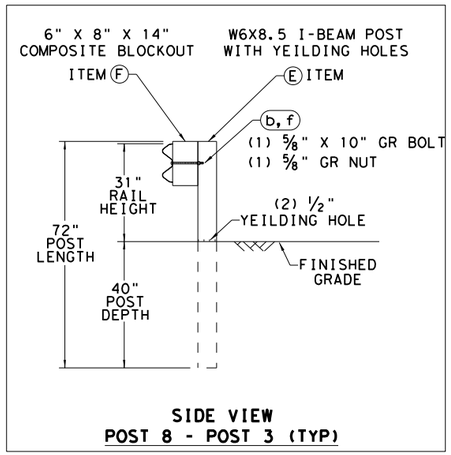


GENERAL NOTES

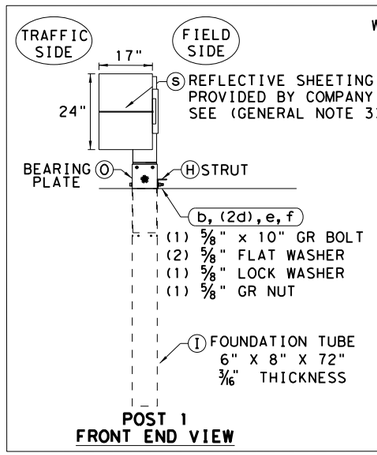
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
11. THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D *	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G **	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" x 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" x 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" x 7 1/2" x 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
		SMALL HARDWARE	
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563DH HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

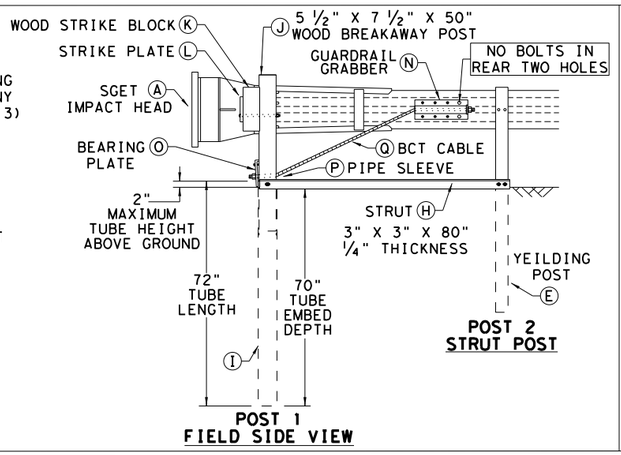
* ALTERNATIVE ITEMS
** NOTE: SEE PLAN VIEW



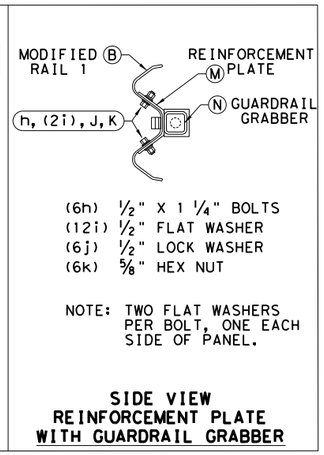
SIDE VIEW
POST 8 - POST 3 (TYP)



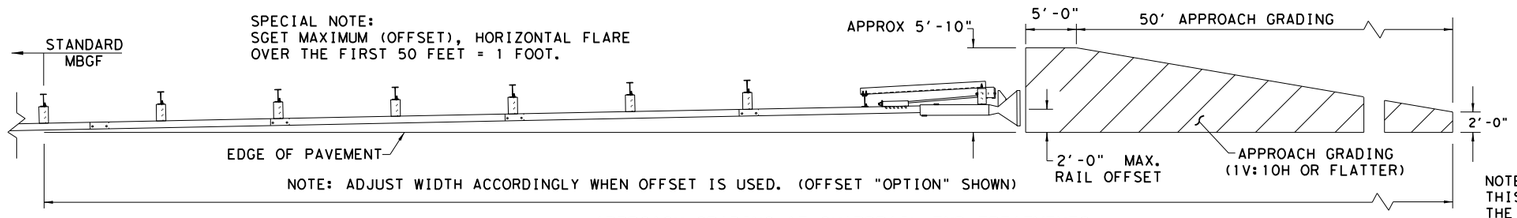
POST 1
FRONT END VIEW



POST 1
FIELD SIDE VIEW
POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

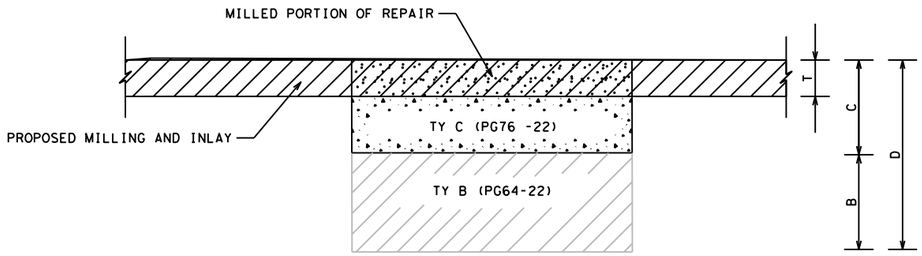
NOTE:
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Texas Department of Transportation
Design Division Standard

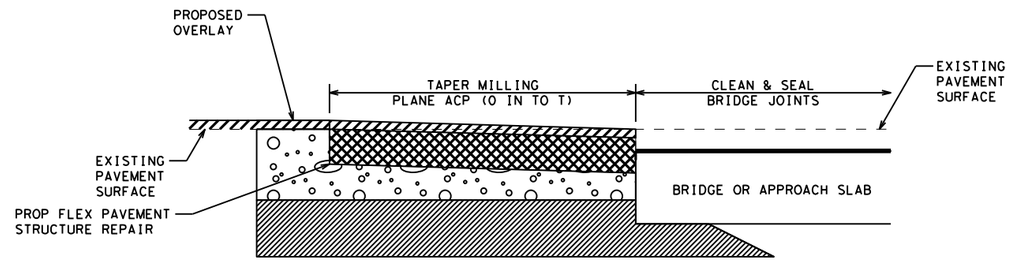
SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

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©TxDOT: APRIL 2020	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3417	02	040		FM734	
	DIST	COUNTY			SHEET NO.	
	4	WILLIAMSON			77	

REPAIR DEPTH W/ MILLING	T = 1 IN		T = 1.5 IN		T = 2 IN	
	TY C	TY B	TY C	TY B	TY C	TY B
<= 4	4	0	4	0	4	0
5	5	0	5	0	5	0
6	6	0	6	0	6	0
7	3	4	4	3	4	3
8	4	4	4	4	4	4
>= 9	4	D-4	4	D-4	4	D-4

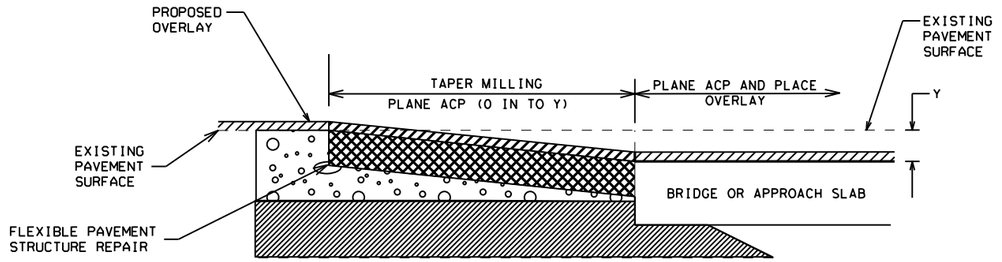


REPAIR WITH MILLING



BRIDGE APPROACH/DEPARTURE TRANSITION

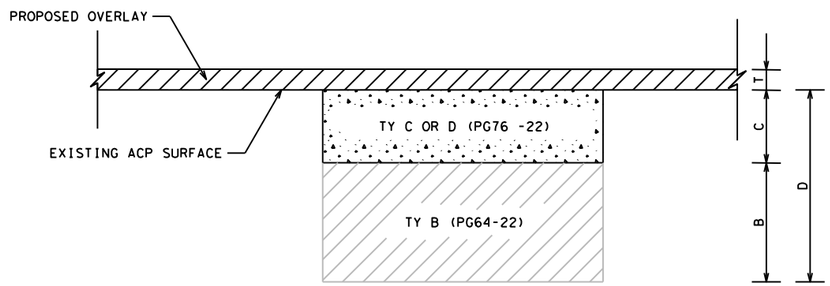
MATCHING EXISTING ACP ON BRIDGE



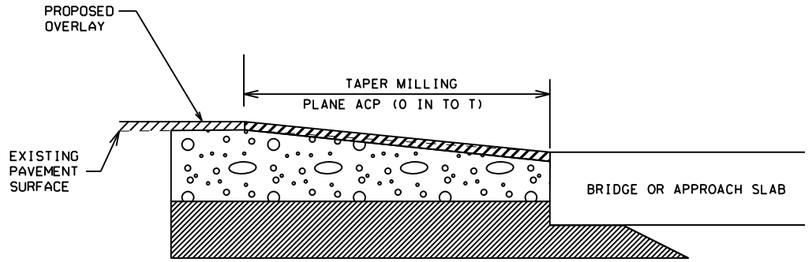
BRIDGE APPROACH/DEPARTURE TRANSITION

REMOVING EXISTING ACP ON BRIDGE

REPAIR DEPTH W/O MILLING	TY D	TY C	TY B
2	2	0	0
3	0	3	0
4	0	4	0
5	0	5	0
6	0	6	0
7	2	0	5
8	2	0	6
>= 9	2	0	D-4



REPAIR WITHOUT MILLING



BRIDGE APPROACH/DEPARTURE TRANSITION

MATCH EXISITING BRIDGE DECK

FLEX PAV REPAIR NOTES

T = OVERLAY/INLAY THICKNESS (IN)
D = REPAIR DEPTH
C = TY C/D ACP DEPTH
B = TY B ACP DEPTH

TY B MAY BE BLADE LAID.

TY C/D MUST BE PAVER LAID.

TY C/D MAX LIFT THICKNESS 3 IN

TY B MAX LIFT THICKNESS 5 IN

ALL ACP PER ITEM 3076.

FOLLOWING WORK IS SUBSIDIARY:
-SAW CUT ALL EDGES
-TACK ALL ACP SURFACES AND LAYERS

BRIDGE APPROACH MILLING NOTES

T = OVERLAY/INLAY THICKNESS (IN)
Y = DEPTH OF MILLING ON BRIDGE

TAPER LENGTH = 100 FT PER 1 IN OF T OR Y

ENGINEER SHOULD INCLUDE WORK TO ADJUST MBGF TO MEET STANDARD HEIGHT. ADJUSTMENT TO MBGF WILL BE PAID USING APPROPRIATE BID ITEMS.

ENGINEER MUST INCLUDE WORK TO ADJUST MOWSTRIP TO ELIMINATE PONDING.

NOT TO SCALE

Texas Department of Transportation | Austin District Standard

FLEXIBLE PAVEMENT DETAILS

FLEXPAVE(3)-22 (AUS)

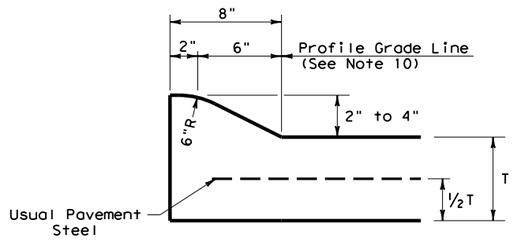
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CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		78

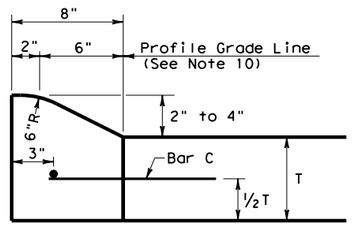
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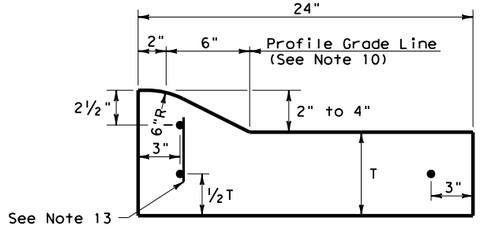
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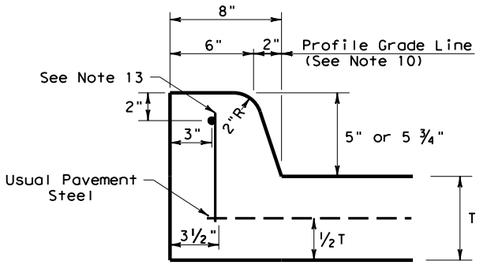
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2" - 4" HEIGHT



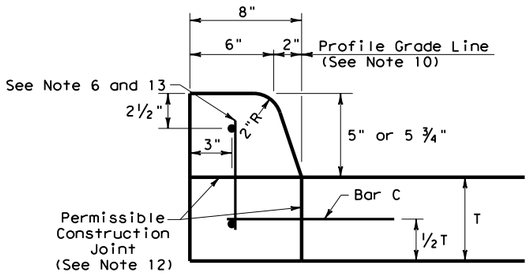
TYPE I CURB
2" - 4" HEIGHT



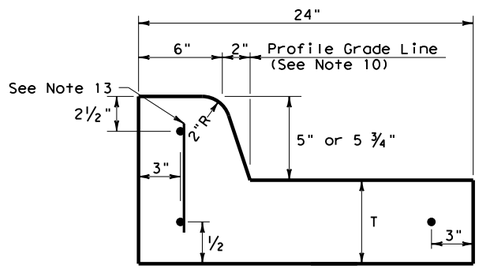
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



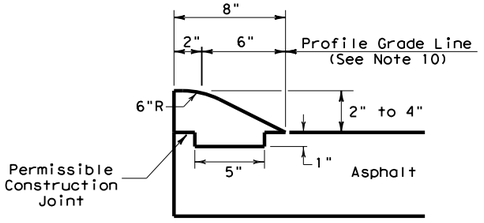
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



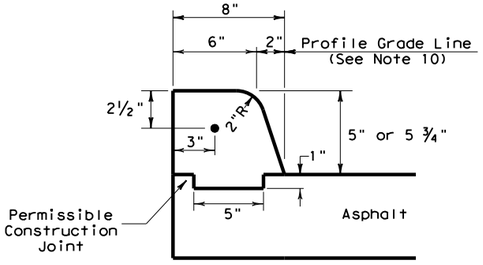
TYPE II CURB
5" - 5 ¾" HEIGHT



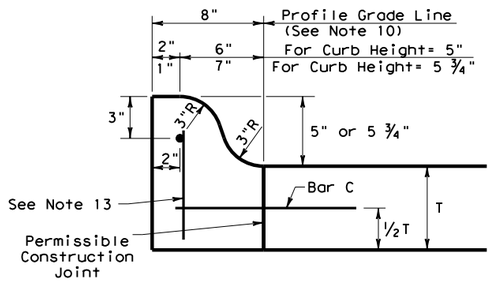
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



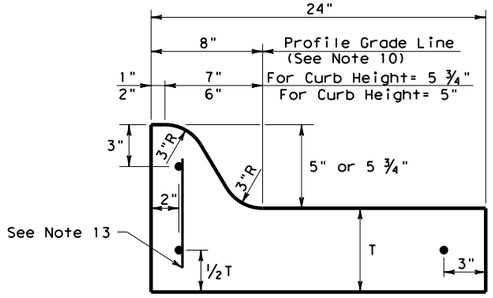
TYPE III CURB (KEYED)
2" - 4" HEIGHT



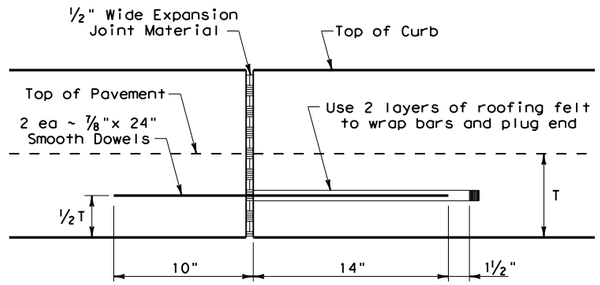
TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



TYPE IIa CURB
5" - 5 ¾" HEIGHT

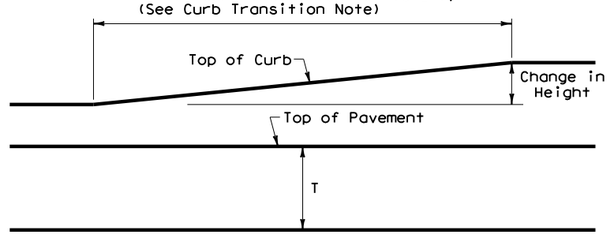


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

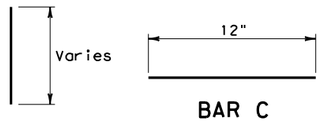
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.



BAR B

BAR C

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

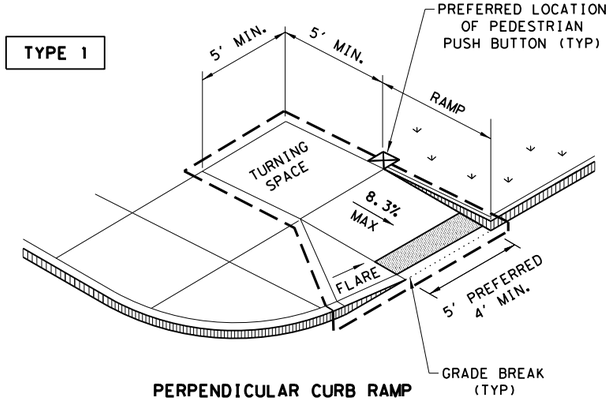
CCCG-22

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© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				79

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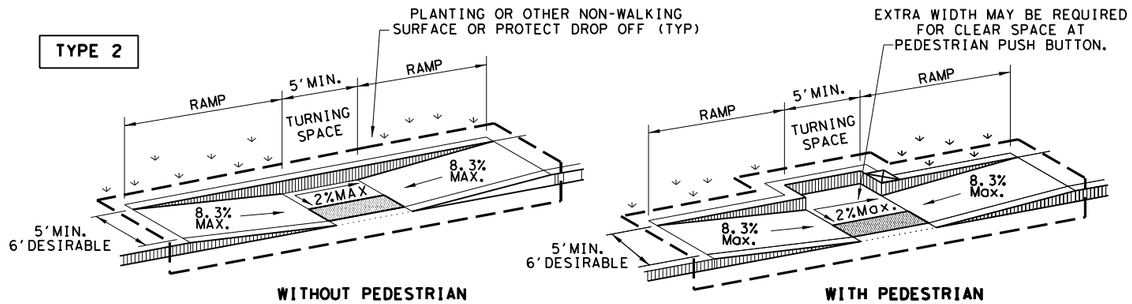
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FILE: c:\pwworkdir\benesch projects\projects\d0223664\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

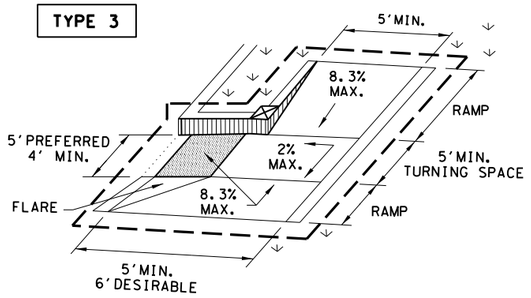


WITHOUT PEDESTRIAN PUSH BUTTON

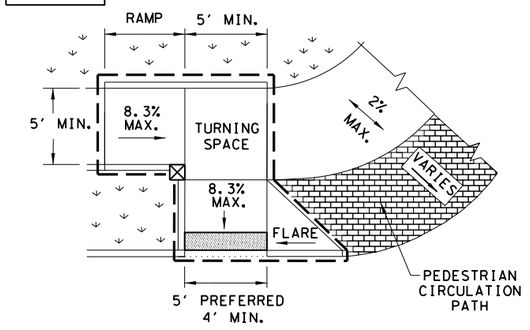
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

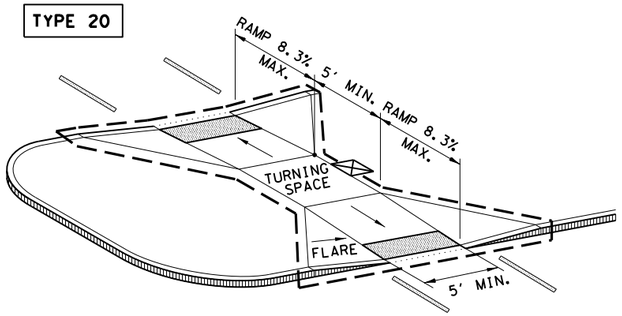


TYPE 6



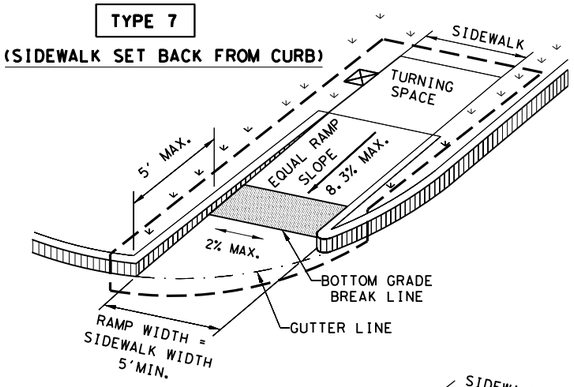
COMBINATION CURB RAMPS

TYPE 20

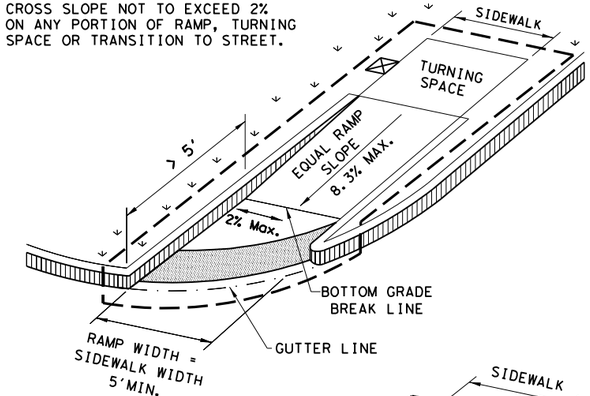


CURB RAMPS AT MEDIAN ISLANDS

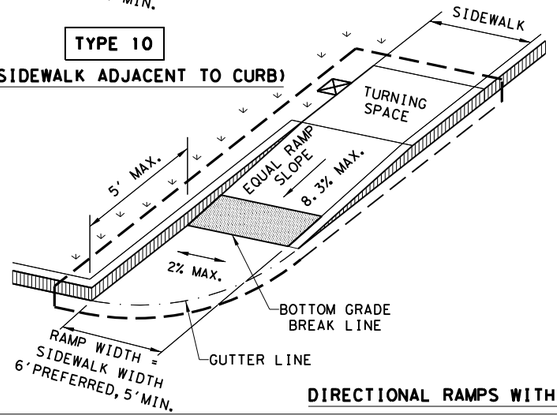
TYPE 7
(SIDEWALK SET BACK FROM CURB)



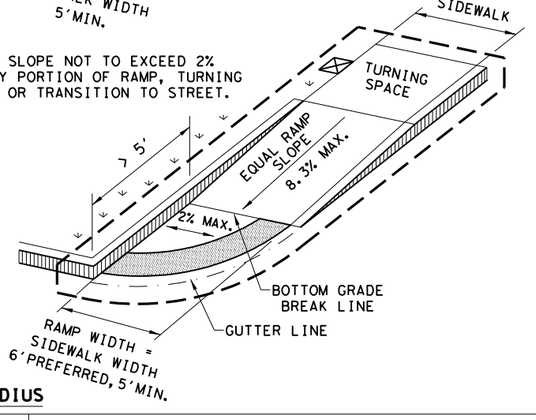
CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



TYPE 10
(SIDEWALK ADJACENT TO CURB)

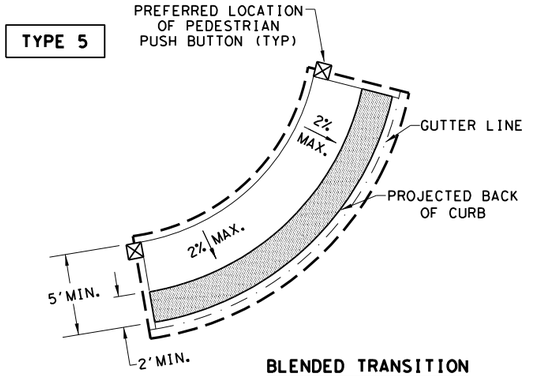


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

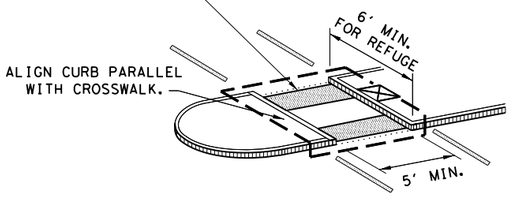
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

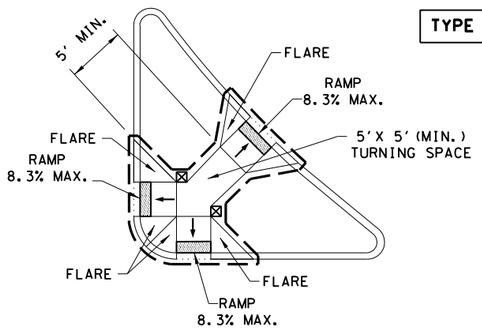
INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.

TYPE 21



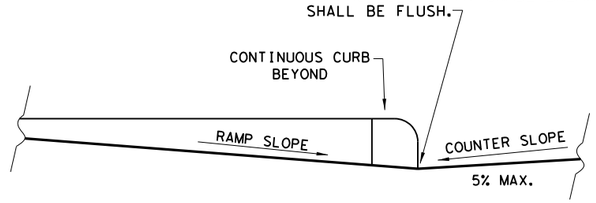
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE. ☒

GUTTER LINE

GRADE BREAK .....

RAMP LIMITS OF PAYMENT

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		80

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DATE: 10/3/2025
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GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

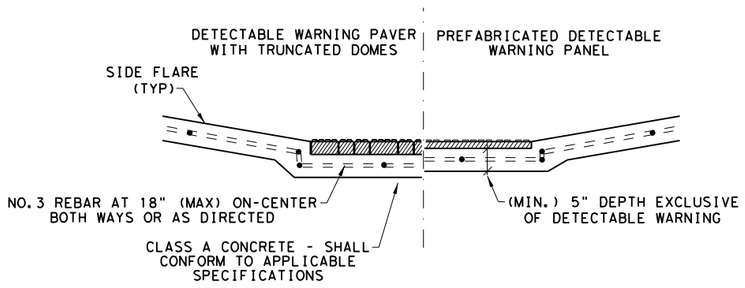
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

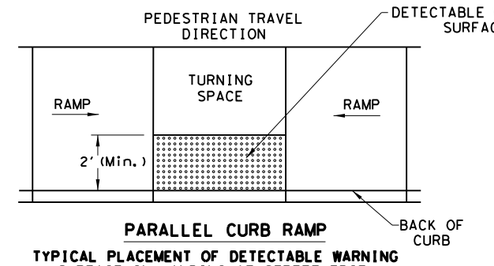
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

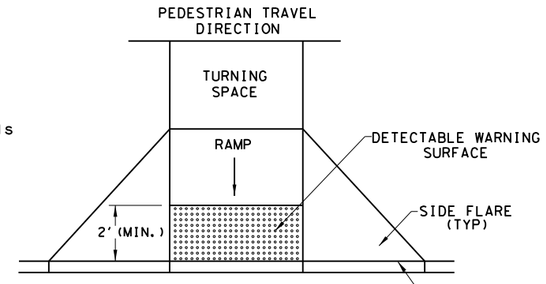


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

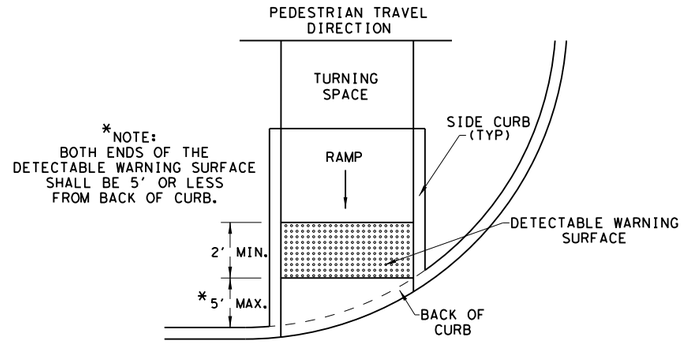
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

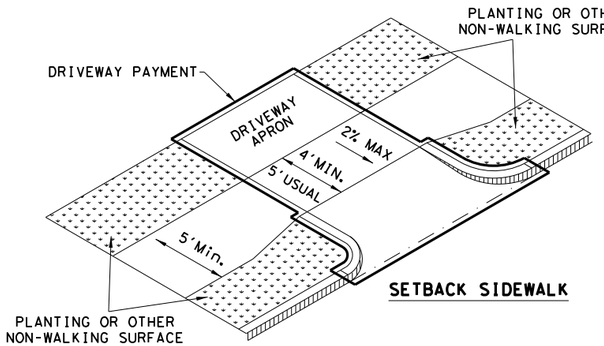
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	3417	02	040		FM734
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	4	WILLIAMSON			81

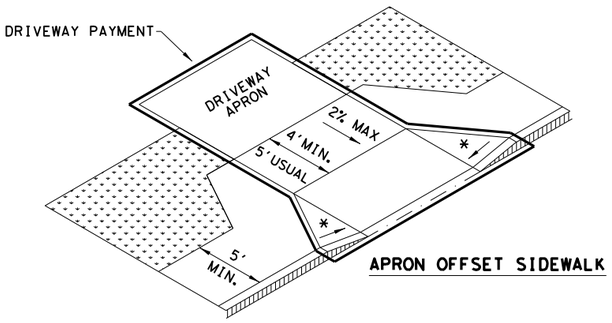
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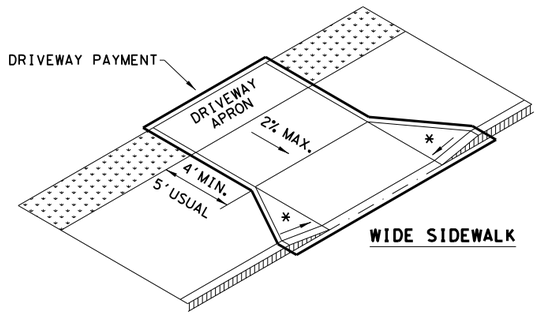
SIDEWALK TREATMENT AT DRIVEWAYS



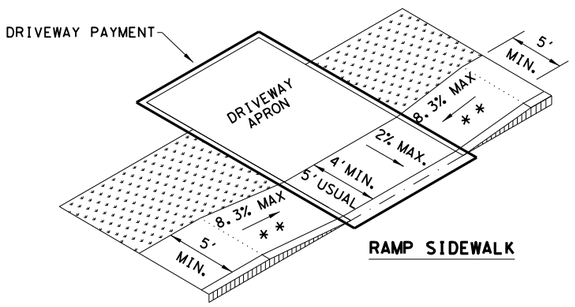
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

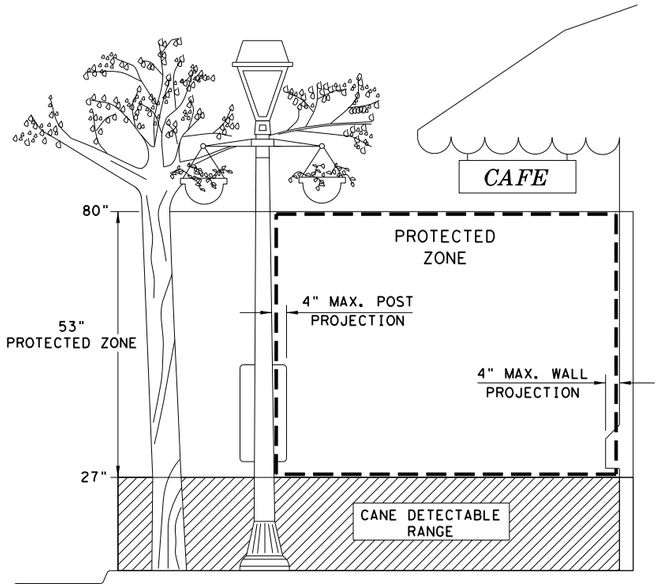


RAMP SIDEWALK

NOTES:

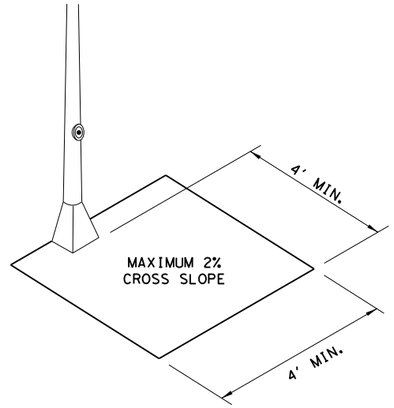
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

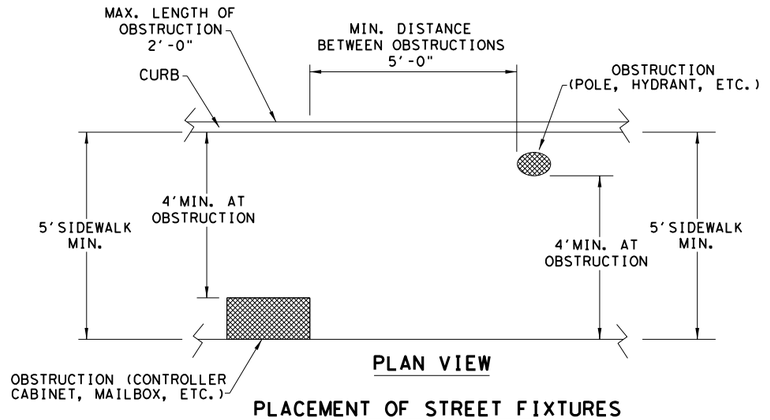


PROTECTED ZONE

NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



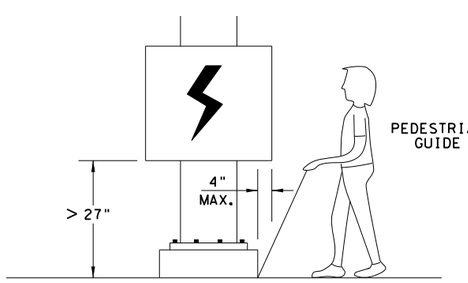
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



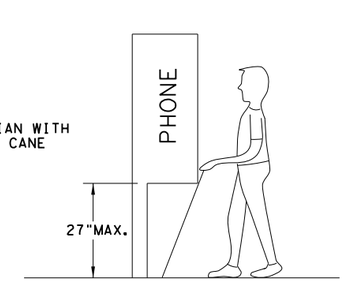
PLAN VIEW

PLACEMENT OF STREET FIXTURES

NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

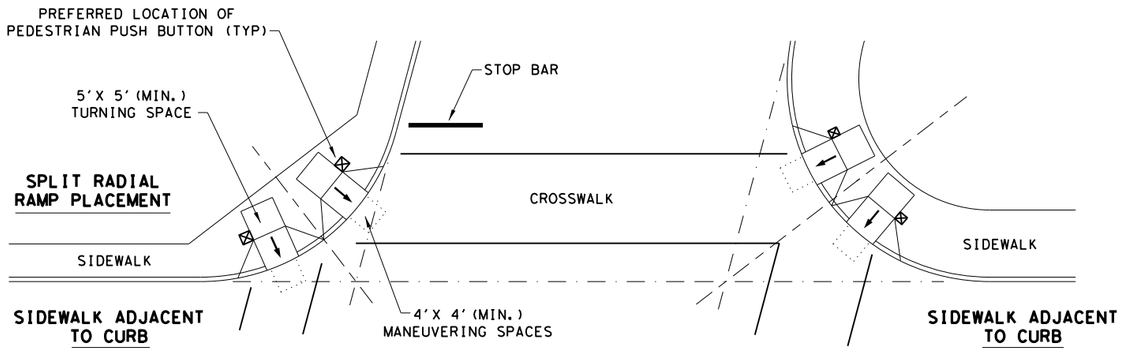
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG	
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS	3417	02	040	FM734	
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.	
	4	WILLIAMSON		82	

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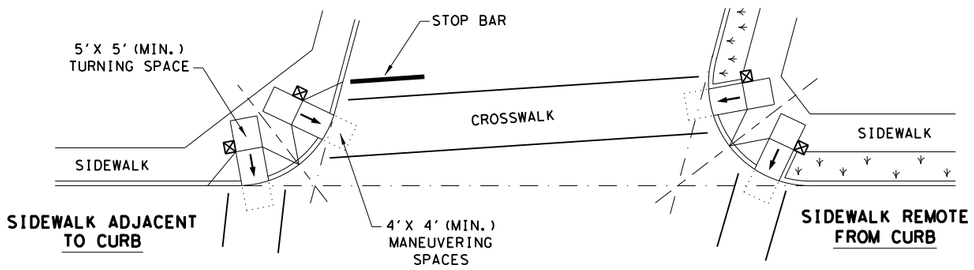
DATE: 10/3/2025
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TYPICAL CROSSING LAYOUTS

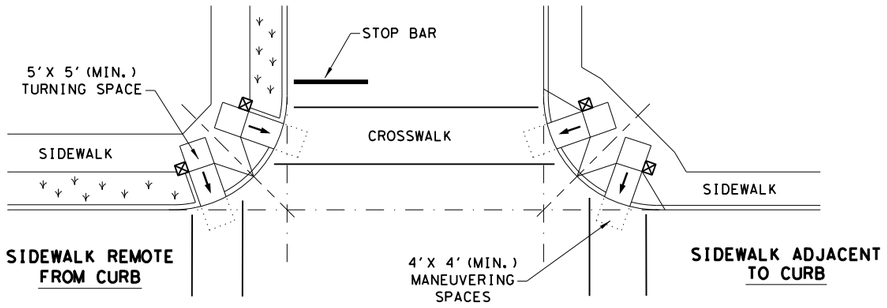
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



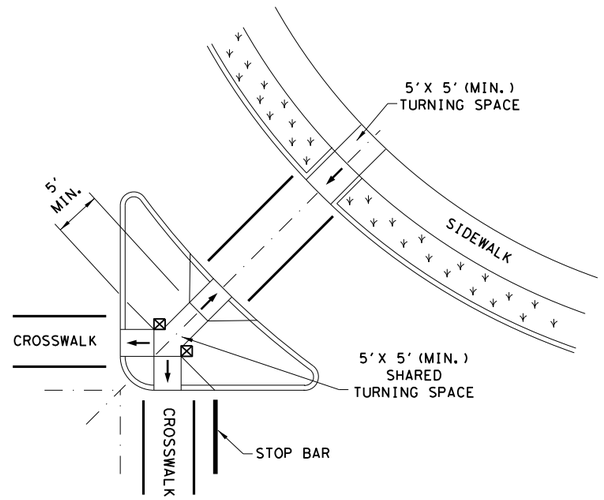
SKEWED INTERSECTION WITH "LARGE" RADIUS



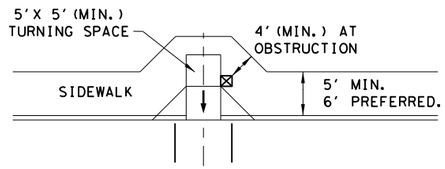
SKEWED INTERSECTION WITH "SMALL" RADIUS

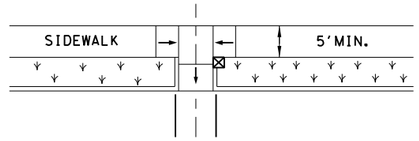


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ⊠

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

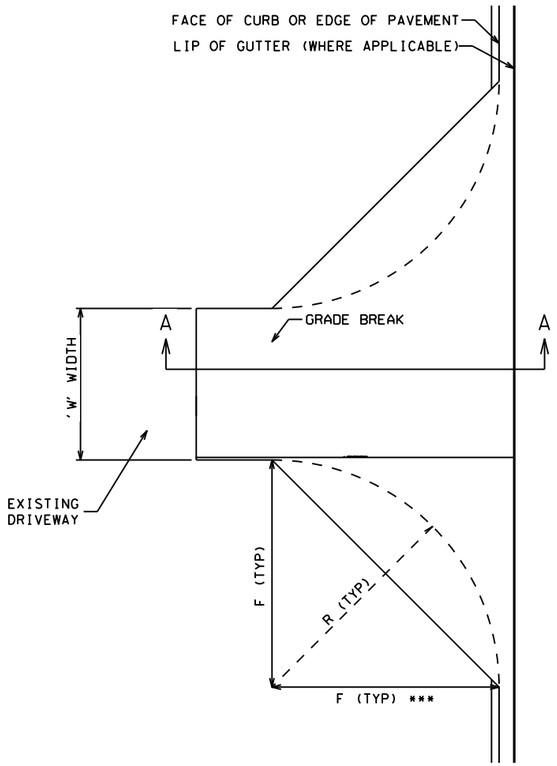
Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		83



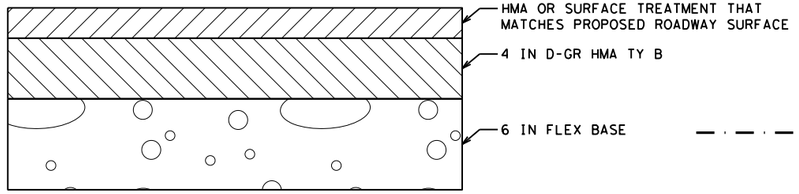
DRIVEWAY PLAN

FLARE OR RADIUS	FARM/RANCH	RESIDENTIAL	COMMERCIAL
"F" OR "R" (FT)	25	25	25

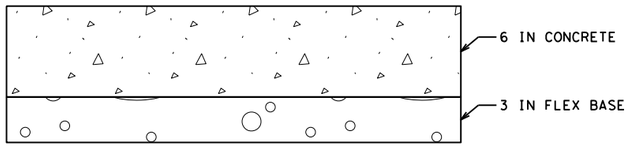
THESE ARE STANDARD DIMENSIONS UNLESS OTHERWISE SHOWN ELSEWHERE ON THE PLANS.

FLARES ARE TYPICALLY USED FOR SUBURBAN/URBAN (CURBED) ROADWAYS. RADII ARE TYPICALLY USED FOR RURAL OR UNCURBED ROADWAYS.

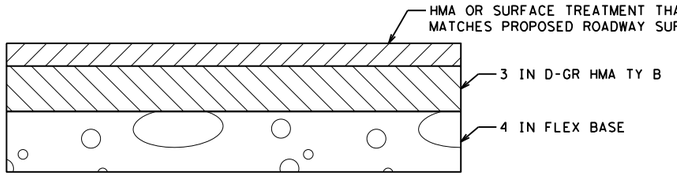
*** THIS 'F' DIMENSION MAY BE REDUCED TO KEEP WORK WITHIN THE ROW.



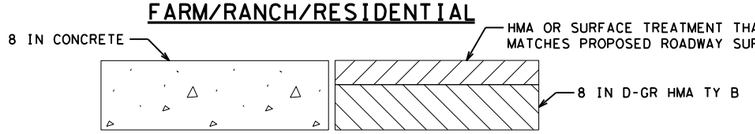
HMA OR SURFACE TREATEMENT - COMMERCIAL



CONCRETE - ALL DRIVEWAY TYPES

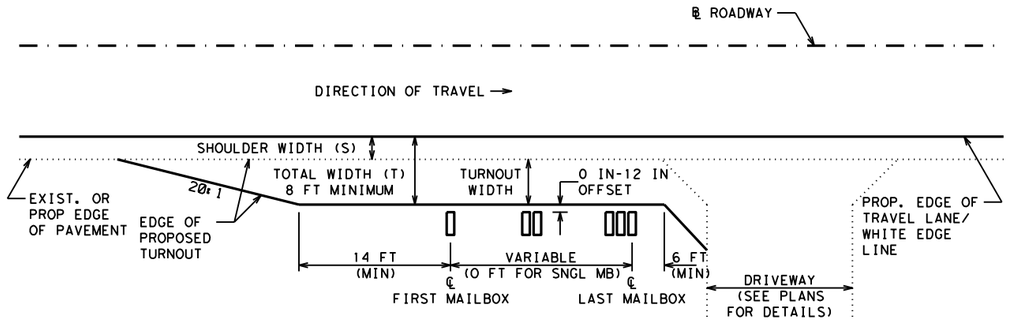


HMA OR SURFACE TREATMENT - FARM/RANCH/RESIDENTIAL

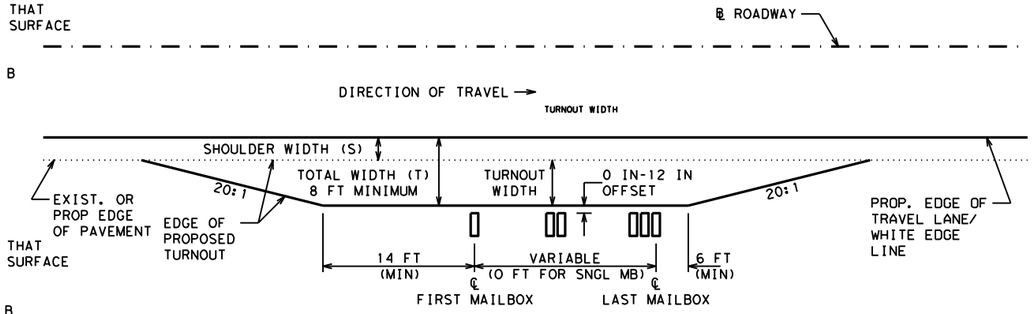


FAST TRACK ACP (TYPE 3) OR CONCRETE

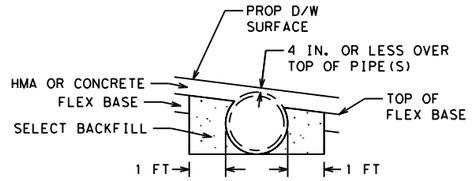
DRIVEWAY AND TURNOUT TYPICAL SECTIONS



MAILBOX TURNOUT PLAN WITH DRIVEWAY

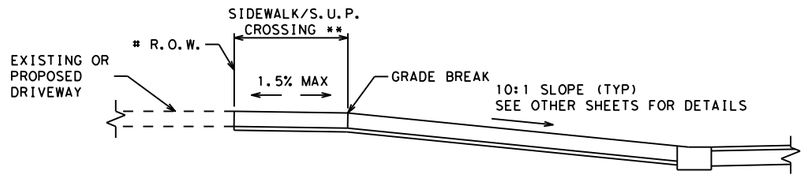


MAILBOX TURNOUT PLAN WITHOUT DRIVEWAY



THIN PIPE COVER DRIVEWAY

*FOR USE WHEN TOP OF PIPE(S) TO D/W SURFACE IS 4 IN. OR LESS
**ONLY ONE PIPE SHOWN FOR CLARITY
***SELECT BACKFILL MUST BE FLOWABLE FILL, CEMENT TREATED BASE, OR ANY CLASS OF CONCRETE AS DIRECTEDBY THE ENGINEER. TO BE PAID USING EXISTING BID ITEMS.



ACTUAL TIE-IN SHOWN ELSEWHERE IN PLANS OR AS DIRECTED

DRIVEWAY WITH GUTTER SECTION A-A

ENSURE GRADE BREAK DOES NOT EXCEED 8% UNLESS OTHERWISE DIRECTED. PROVIDE ABSOLUTE MINIMUM SIDEWALK CROSSING WIDTH OF 4' FOR DRIVEWAYS WIDTH OF 20' OR LESS

** LOCATE SIDEWALK CROSSING TO ALIGN WITH ADJACENT SIDEWALK; SIDEWALK/S.U.P. WIDTH AND LOCATION SHOWN ELSEWHERE ON THE PLANS.

GENERAL NOTES

PROVIDE EXPANSION 20 FT C-C FOR WIDTH OR LENGTH OVER 25 FT. EXPANSION JOINT PER AUS STANDARD FOR SIDEWALK (MCPSWMD).

REINFORCEMENT WILL BE IN ACCORDANCE WITH ITEM 432.3.1 USING NO. 3 OR NO. 4 BARS.

FIBER REINFORCEMENT IS NOT ALLOWED. CLASS A CONCRETE IS ALLOWED TO USE COARSE AGGREGATE GRADES 1-8.

IN LIEU OF PFC OR TOM, SURFACE MUST BE 1.5" D-GR HMA TY D. IF SURFACE IS A MULTIPLE COURSE SURFACE TREATEMENT, ALL COURSES MUST BE PLACED ON DRIVEWAY. SURFACE HMA IS PG 76-22. NON SURFACE HMA IS PG 64-22 AND MAY BE BLADE LAID.

FURNISH BASE MEETING THE REQUIREMENTS FOR ANY TYPE OR GRADE IN ACCORDANCE WITH ITEM 247. BASE COMPRESSIVE STRENGTHS ARE WAIVED.

THE BASE UNDER THE CONCRETE MAY BE REPLACED WITH CONCRETE AT A RATIO OF 3 INCHES OF BASE EQUALS 2 INCHES OF CONCRETE.

FAST TRACK DRIVEWAYS MUST BE CLOSED, CONSTRUCTED, AND REOPENED WITHIN 24 HOURS.

IF ROOTS ARE ENCOUNTERED VERIFY WITH THE ENGINEER PRIOR TO ACCOMMODATING OR REMOVING 2 IN. DIAMETER OR LARGER ROOTS. ROOT REMOVAL MUST BE IN ACCORDANCE WITH ITEM 752.4.2. ROOTS MAY REMAIN IN THE BASE. FOR IMPROVEMENTS WITHIN 6 IN. OF A ROOT, THE CONCRETE THICKNESS MAY BE REDUCED BY 1 IN. AND THE BASE INCREASED BY 1 IN. TO MINIMIZE IMPACTS TO THE ROOTS. ADJUST BASE AND SURFACE PROFILE TO PROVIDE A 1 IN. BASE CUSHION AROUND THE ROOTS. THE SURFACE PROFILE MAY BE ADJUSTED TO THE EXTENT ALLOWED BY ADA. THIS WORK IS SUBSIDIARY.

Texas Department of Transportation

Austin District Standard

DRIVEWAYS AND MAILBOX TURNOUTS

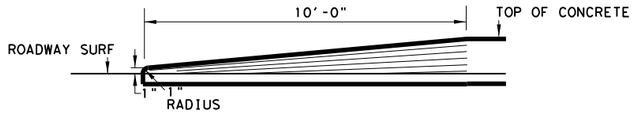
DWMB-24 (AUS)

©TxDOT 2025

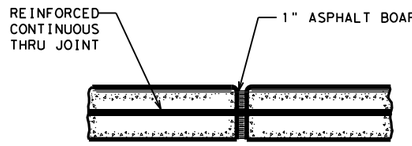
REVISIONS
01/16: SHEET CREATED
04/19: APPROVED
11/20: TABLE REVISED, GN ADDED, PLAN & PROFILE MODIFIED
01/22: ADDED TURNOUT INFO
01/24: THIN PIPE DETAIL REVISED

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		84

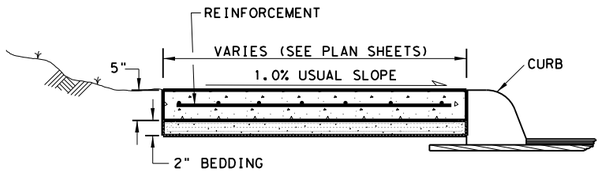
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TAPER FOR CURB AND MEDIAN ENDS

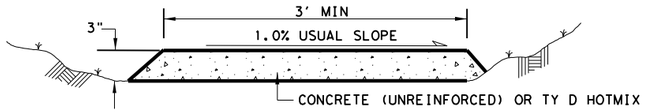


CURB, SIDEWALK, & SUP EXPANSION JOINT DETAIL



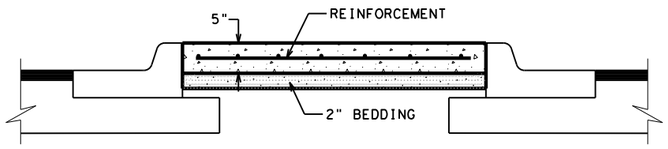
SIDEWALK & SHARED USE PATH (S.U.P.) TYP. SECT.

1. SIDEWALK OR S.U.P. EXPANSION JOINTS ARE TO BE AT A MAX. SPACING OF 40' AND COINCIDE WITH THE CURB EXPANSION JOINTS (WHEN ADJACENT TO CURB).
2. TOOLED OR SAWED CONTRACTION JOINTS ARE NOT ALLOWED



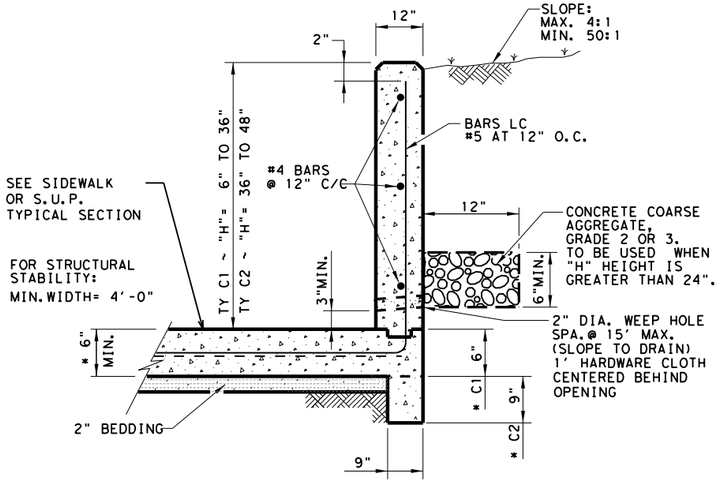
TEMPORARY SIDEWALK & SHARED USE PATH (S.U.P.)

1. EXPANSION JOINTS, BEDDING, AND TOOL JOINTS ARE NOT REQUIRED.
2. PROVIDE 5' X 5' PASSING AREA AT INTERVALS NOT TO EXCEED 200'.
3. 4' TALL ORANGE CONSTRUCTION FENCE REQUIRED IF DROP OFF GREATER THAN 6" ADJACENT TO SIDEWALK.
4. ALL MATERIAL AND TESTING REQUIREMENTS ARE WAIVED.
5. INSTALLATION, MAINTENANCE, FENCE, AND REMOVAL ARE SUBSIDIARY TO SIDEWALK ITEM.
6. EXCAVATION AND EMBANKMENT TO PROVIDE ADA COMPLIANCE WILL BE PAID USING PERTINENT BID ITEMS.
7. LOCATION AS DIRECTED BY ENGINEER.

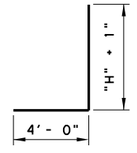


RIPRAP MEDIAN DETAIL

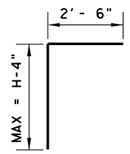
1. EXPANSION JOINTS ARE TO BE AT A MAX. SPACING OF 40' AND COINCIDE WITH THE CURB EXPANSION JOINTS (WHEN ADJACENT TO CURB)
2. EXPANSION MATERIAL BETWEEN MEDIAN AND CURB IS NOT REQUIRED.



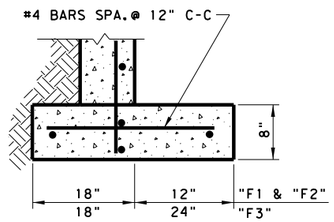
CONC CURB (TY C1) & (TY C2)



BAR LC



BAR LF



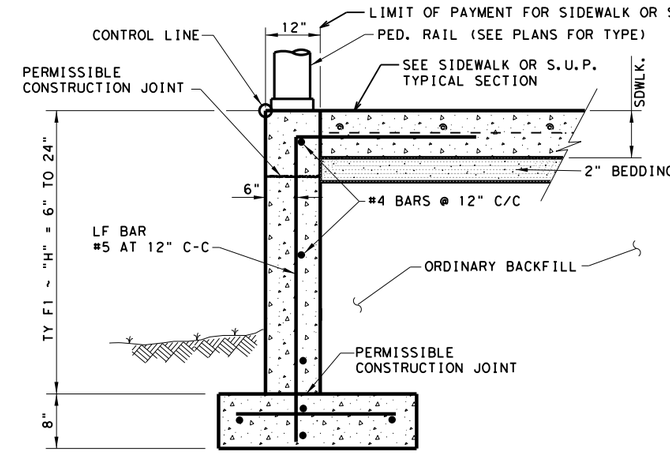
FOOTING DETAIL

SIDEWALK, SHARED USE PATH, AND MEDIAN NOTES

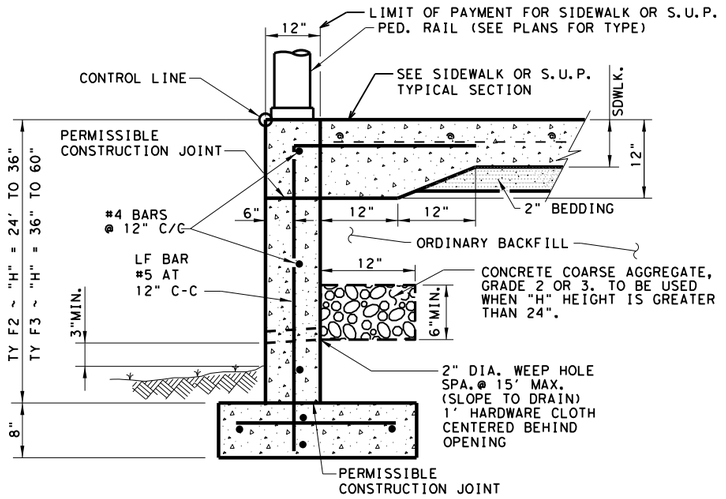
Reinforcement will be in accordance with Item 432.3.1. Fiber reinforcement is not allowed. Class A and B Concrete are allowed to use Coarse Aggregate Grades 1-8.

Bedding may be sand, base, or RAP bedding. Furnish base meeting the requirement for any type or grade in accordance with Item 247. Base compressive strengths are waived. RAP must be 100% passing a 1 in. sieve. Bedding must be placed using ordinary compaction.

If roots are encountered verify with the Engineer prior to accommodating or removing 2 in. diameter or larger roots. Root removal must be in accordance with Item 752.4.2. Roots may remain in the bedding or base. For improvements within 6 in. of a root, the concrete thickness may be reduced by 1 in. and the bedding increased by 1 in. to minimize impacts to the roots. Adjust bedding and surface profile to provide a 1 in. bedding cushion around the roots. The surface profile may be adjusted to the extent allowed by ADA. This work is subsidiary.



CONC CURB (TY F1)‡



CONC CURB (TY F2) & (TY F3)‡

CONCRETE CURB NOTES:
All Concrete, including adjacent sidewalk or S.U.P., shall be Class "C".
All Reinforcing Steel shall be Grade 60.
Minimum 4' sidewalk width for CONC CURB (TYPES C1 & C2).

‡ Until the sidewalk is complete, lateral support for the "F" curbs will be required.

ALL WORK SHOWN BEYOND TYPICAL SIDEWALK, S.U.P., AND PED RAIL IS SUBSIDIARY.

DESIGN SOIL PARAMETERS:
Soil Unit Wt. = 120 pcf
Phi = 30 Degrees
Cohesion = 50 psf
Min. PI = 15
Max. PI = 30
SURCHARGE:
TYPE F CURB q = 2' Adjacent to sidewalk
Max. slope behind TYPE C Curb = 4:1
Min. Factor of Safety against sliding is 1.5.
Designed in accordance with current AASHTO Standards and Interim Specifications.

NOT TO SCALE

Texas Department of Transportation | Austin District Standard

MISCELLANEOUS CURB, PATH, SIDEWALK, AND MEDIAN DETAILS

MCPSWMD-25 (AUS)

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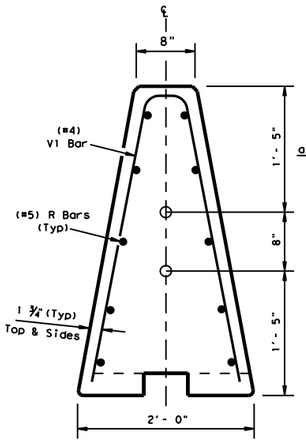
REVISIONS
04/19: APPROVED
02/23: ADDED TEMP S/W
10/24: REVISED TO 2024 SPEC

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		85

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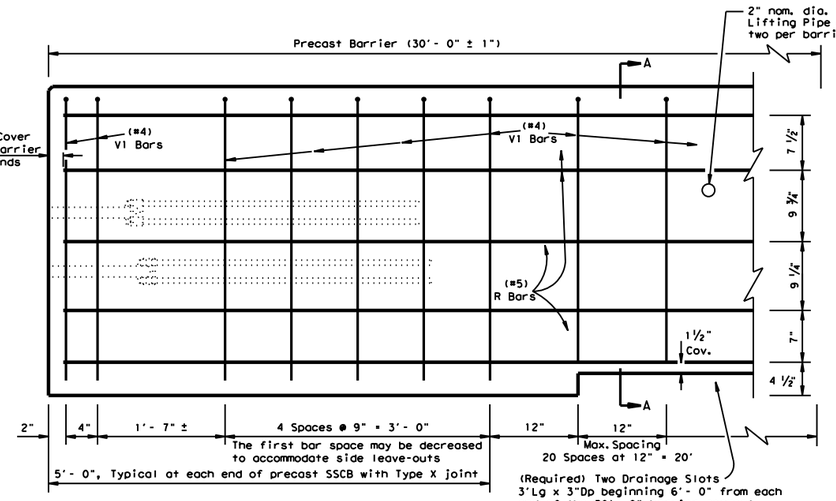
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DATE: 10/3/2025
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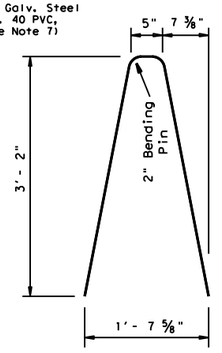
End View
Precast Barrier

Pipe locations for Joint Type X connection



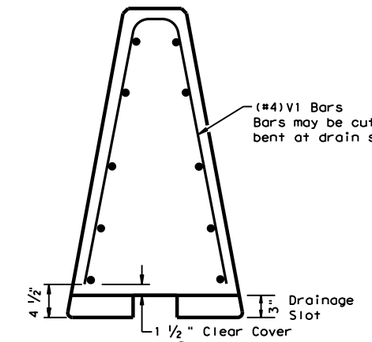
Reinforcement for Precast (SSCB)
Single Slope Concrete Barrier (Type 1)

Showing reinforcement for Joint Connection (Type X)



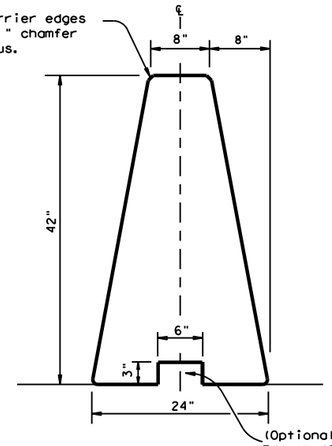
V1 Bar
#4 Rebar

Note:
V1 Bars above the drainage slots may bent to accomadate 1 ½" clear cover as directed by the Engineer.



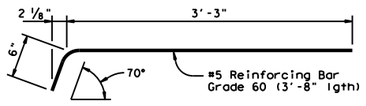
Section A-A
Steel Placement at (Required) Drainage Slots

All precast barrier edges shall have a ¾" chamfer or tooled radius.



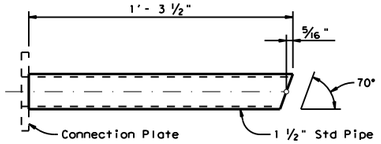
Single Slope Concrete Traffic Barrier

Precast SSCB barrier may be connected to cast-in-place SSBC. The joint connection "Types" may be used in the cast-in-place barrier, to match the precast barrier connection.



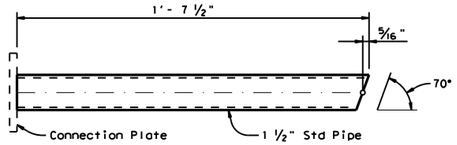
DEFORMED BAR ANCHOR DETAILS

Two (2) Bars required per assembly.
Eight (8) required per Joint.



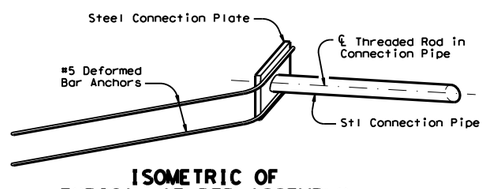
UPPER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Upper Assembly.
Two (2) required per Joint.



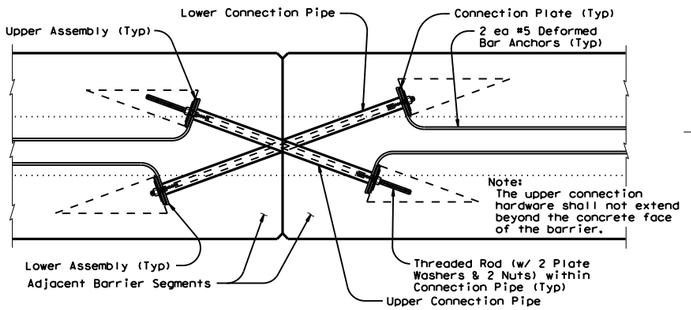
LOWER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Lower Assembly.
Two (2) required per Joint.



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) [2 Upper & 2 Lower] Assemblies required per Joint.



TYPE X JOINT INSTALLATION DETAIL

Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

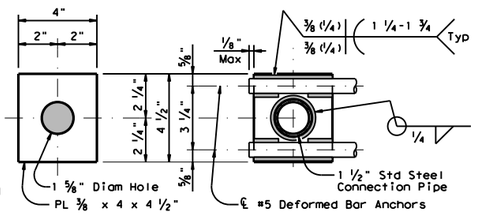
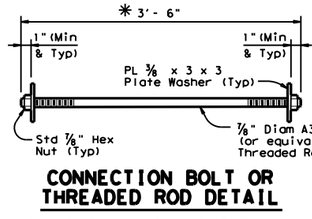


PLATE DIMENSIONS **WELDING DETAILS**

CONNECTION PLATE DETAILS

One (1) Plate required per assembly.
Four (4) required per Joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.



* The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.

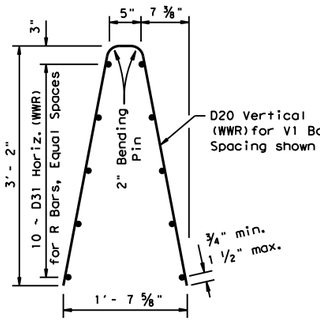
CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts)
(w/ Two (2) PL ⅜ x 3 x 3 Plate Washers & Two (2) Std Hex Nuts)
required per Joint.

Weight of one precast 30 ft. (SSCB) segment = Approx. 10.5 Tons or 717 lbs per ft.

General Notes

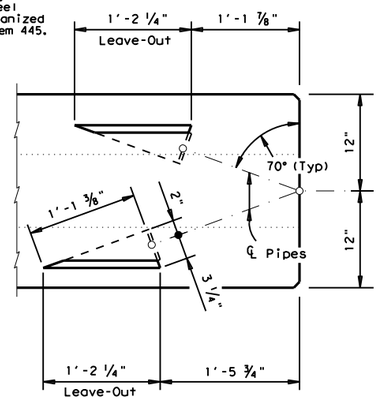
1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a ¾" chamfer or a tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items.
9. All steel assemblies shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."



Welded Wire Reinforcement (WWR) Option for Bars R and V1

(WWR) General Notes

1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".



BARRIER PLAN AT JOINT

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

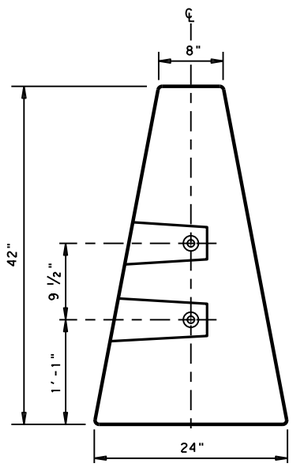
PRECAST BARRIER (TYPE 1)

SSCB(2)-10

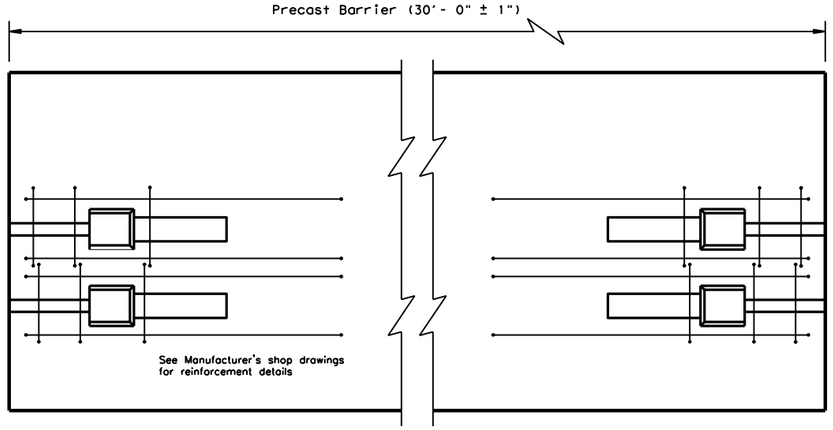
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©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		86

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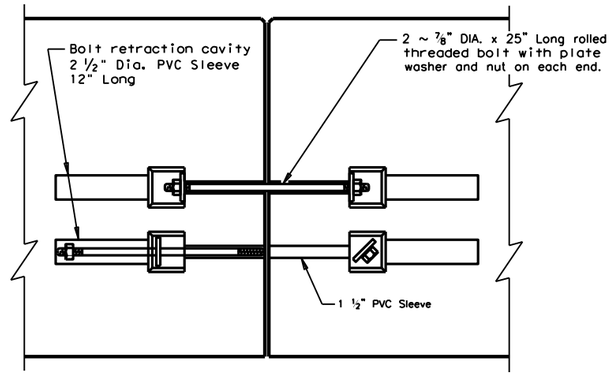
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END VIEW
"QUICK-BOLT" POCKET LOCATIONS

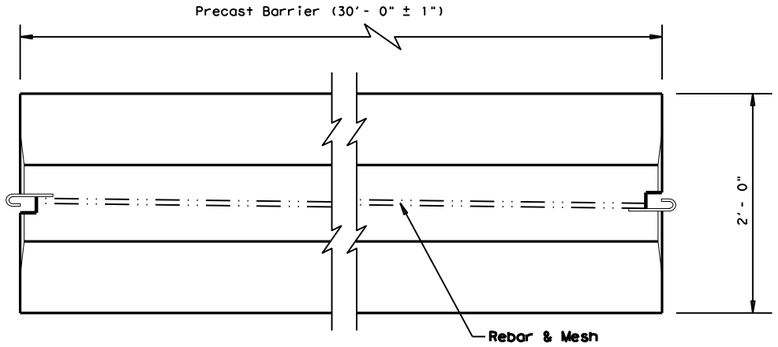


ELEVATION VIEW
"QUICK-BOLT" (SSCB)
See Manufacturer's shop drawing for additional details

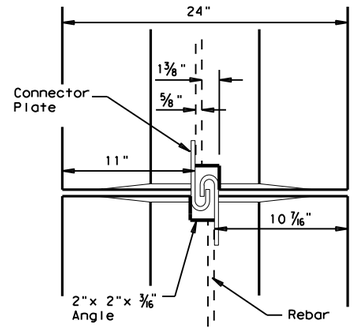


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

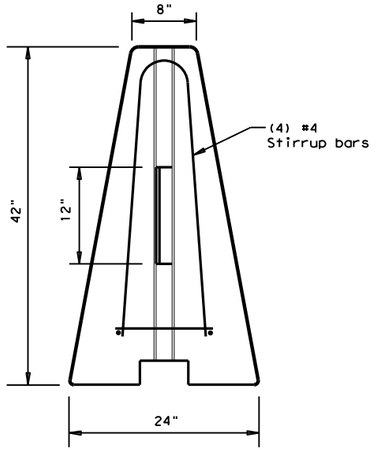
Joint Connection (Type Q)



TOP VIEW
PRECAST (SSCB) WITH J-J HOOKS
See Manufacturer's shop drawing for additional details



VIEW FROM ABOVE
J-J HOOK CONNECTION



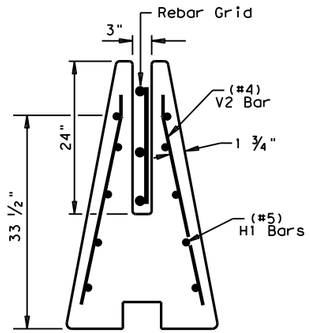
END VIEW

Proprietary Joint Connections (SSCB)

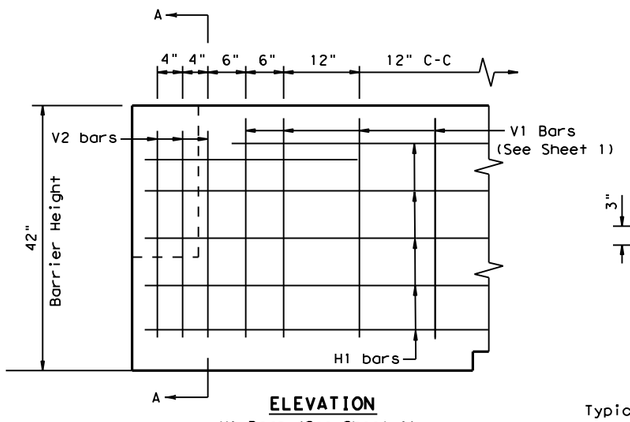
Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
Quick-Bolt by Bexar Concrete, (210)497-3773

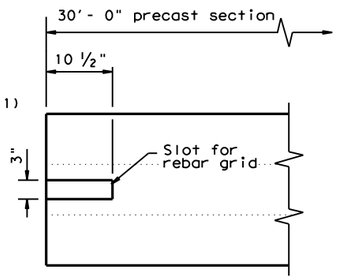
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.



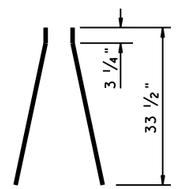
SECTION A-A
Showing (Type R) Rebar Grid



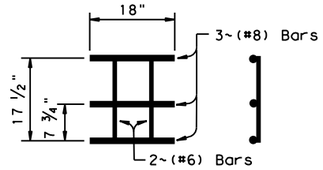
ELEVATION
V1 Bars (See Sheet 1)



TOP VIEW
JOINT CONNECTION
Typical at both ends of barrier segment



(#4) V2 BARS
6 ~ two piece bars per barrier segment



WELDED REBAR GRID

Joint Connection (Type R)

SHEET 2 OF 2

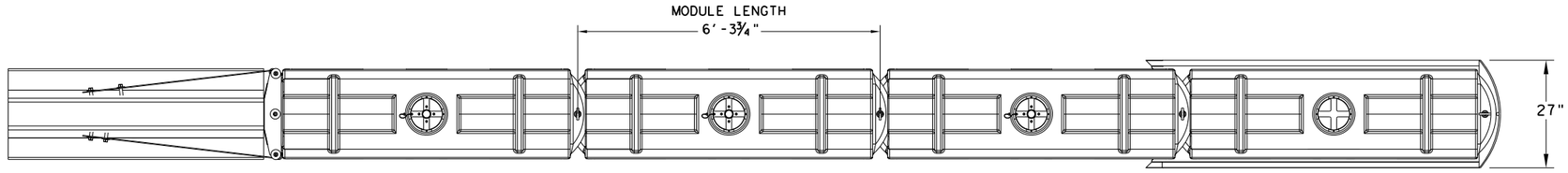
Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

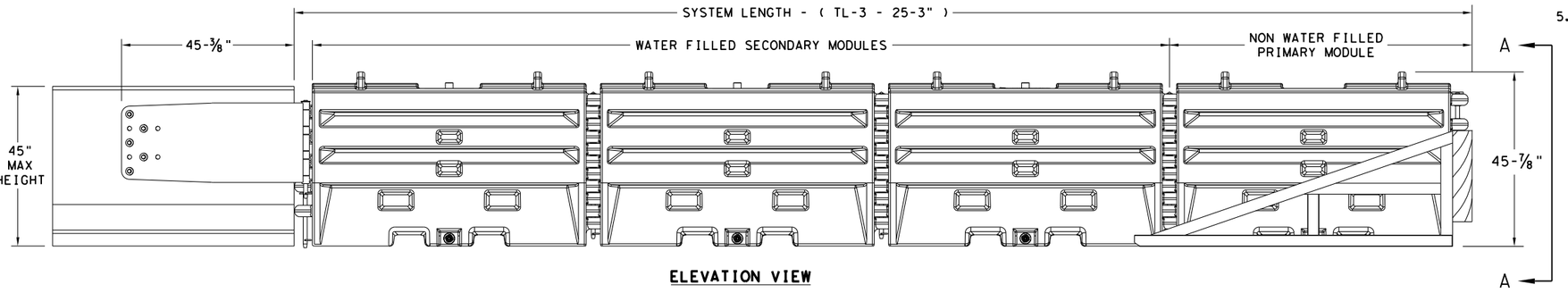
PRECAST BARRIER
(TYPE 1)

SSCB(2)-10

FILE: sscb210.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		87



PLAN VIEW



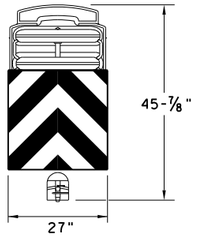
ELEVATION VIEW

GENERAL NOTES

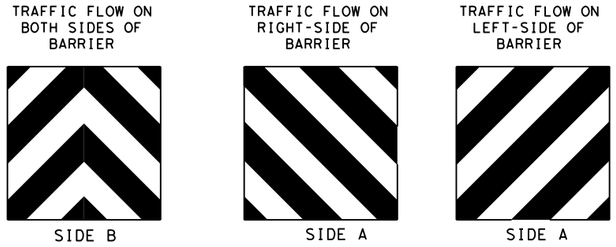
1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES) (14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:

- CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
- STEEL BARRIER
- PLASTIC BARRIER
- CONCRETE BRIDGE ABUTMENTS
- W-BEAM GUARD RAIL
- THRIE BEAM GUARD RAIL

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25' 3"



SECTION A-A

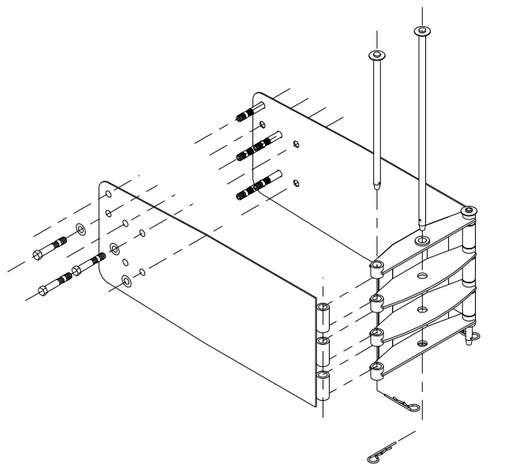


NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.

BILL OF MATERIAL

PART NUMBER	DESCRIPTION	QTY: TL-3
45131	TRANSITION FRAME, GALVANIZED	1
45150	TRANSITION PANEL, GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Texas Department of Transportation

Design Division Standard

SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
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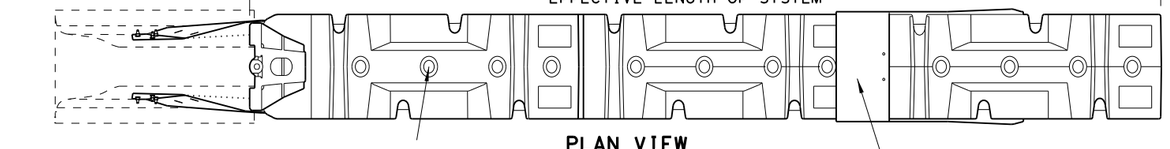
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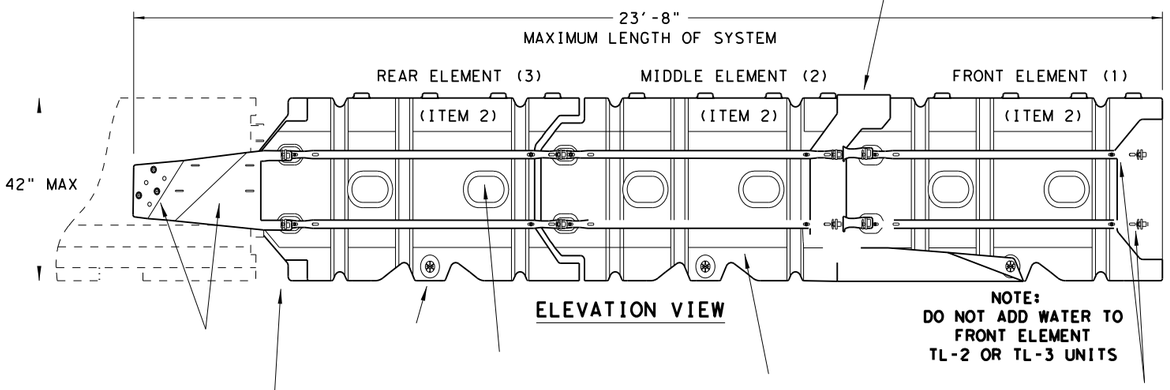
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SYSTEM SHOWN - ABSORB-M TL-3



PLAN VIEW

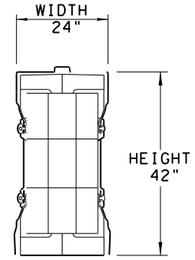
TRAFFIC FLOW



ELEVATION VIEW

NOTE:
DO NOT ADD WATER TO
FRONT ELEMENT
TL-2 OR TL-3 UNITS

TRAFFIC FLOW



SECTION A-A

TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14'- 7 3/4"	17'- 4"
TL-3	3	20'- 11 3/4"	23'- 8"

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
4. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
5. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
6. THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
7. THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
8. DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
* 2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
* 3	BSI-4004598	FILL CAPS	8	12
* 4	BSI-4004599	DRAIN PLUGS	2	3
* 5	BSI-1809053-00	TENSION STRAP-(GALV)	8	12
* 6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
* 7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE-(GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

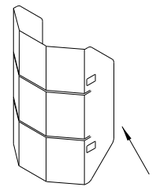
*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE



TRAFFIC FLOW LEFT-SIDE BARRIER | TRAFFIC FLOW BOTH-SIDE BARRIER | TRAFFIC FLOW RIGHT-SIDE BARRIER

**APPLY DECAL



NOSE PLATE

** NOTE: (PROVIDED BY OTHERS)
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

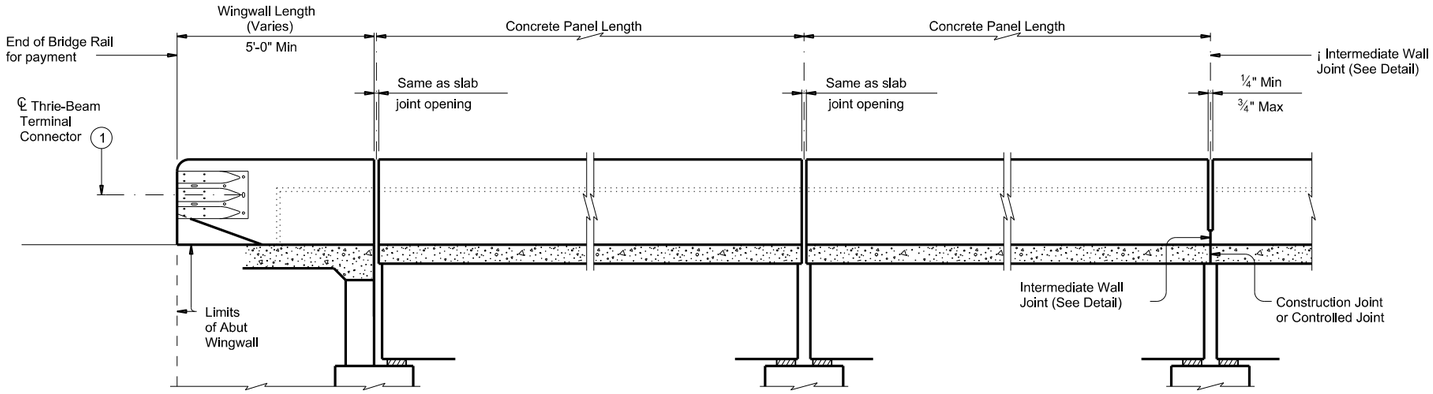
Texas Department of Transportation | Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB(M)-19

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		89

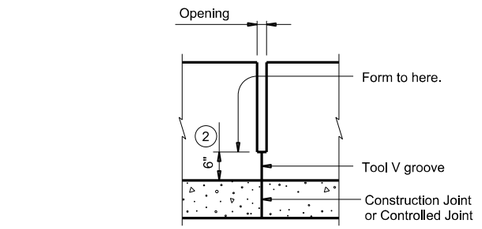
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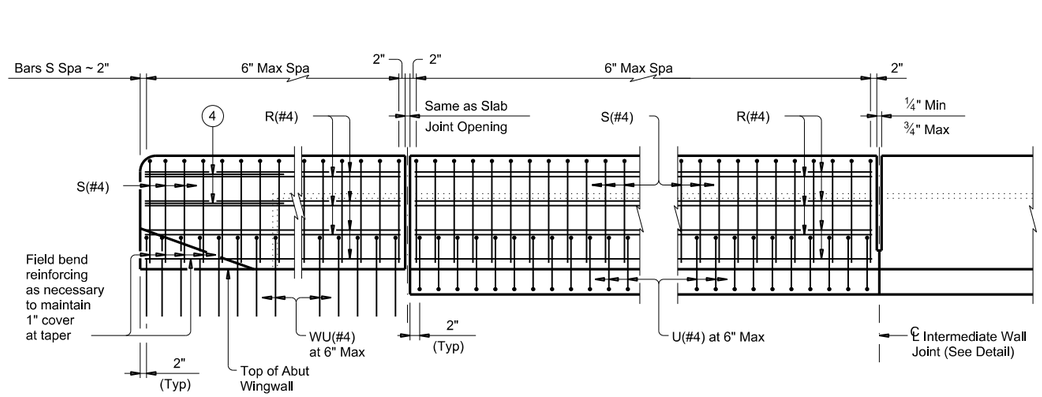
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

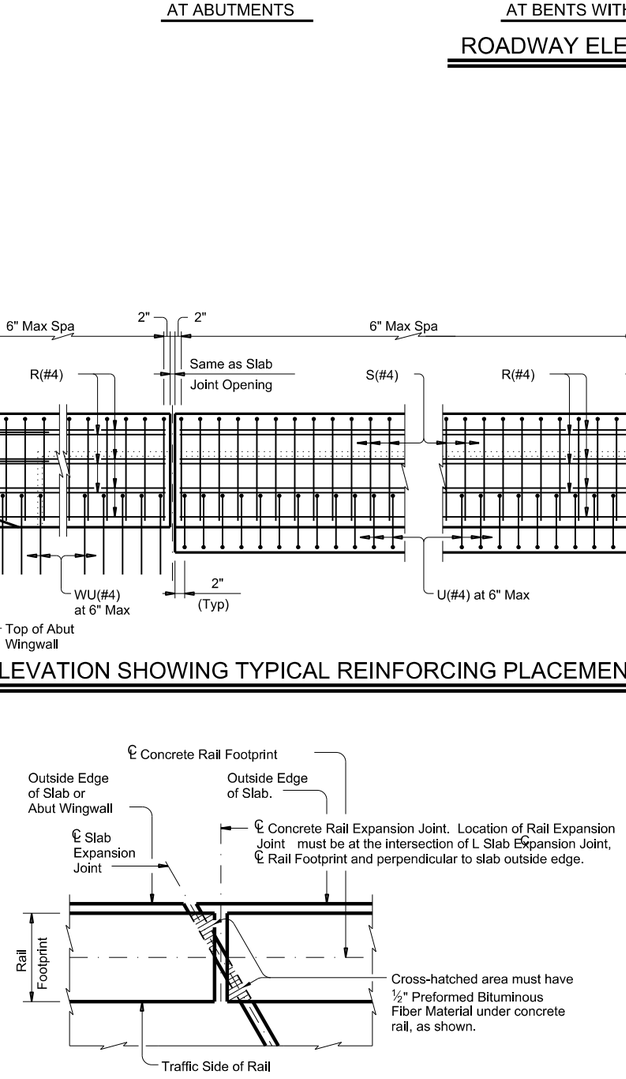


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



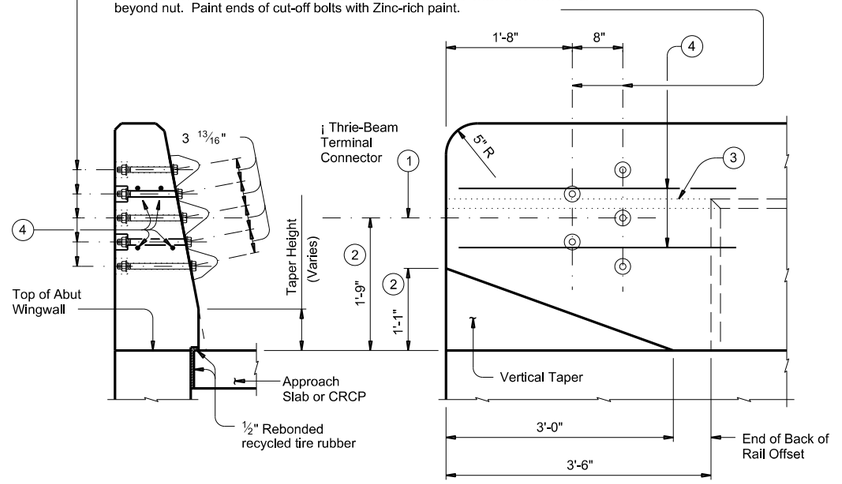
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

□ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION | ELEVATION

TERMINAL CONNECTION DETAILS

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence." Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Increase 2" for structures with Overlay.
3. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
4. Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required.

Texas Department of Transportation | Bridge Division Standard

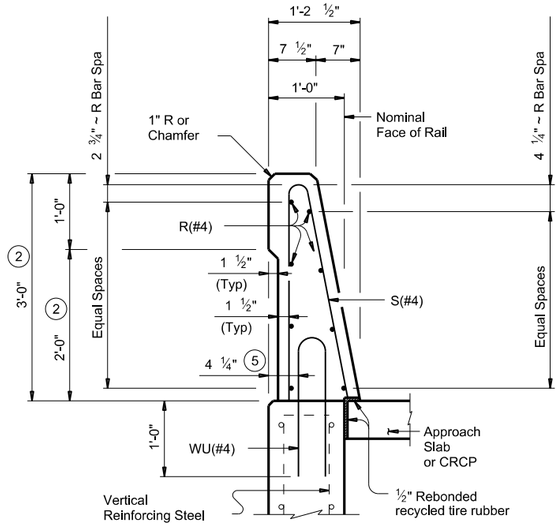
TRAFFIC RAIL
SINGLE SLOPE

TYPE SSTR

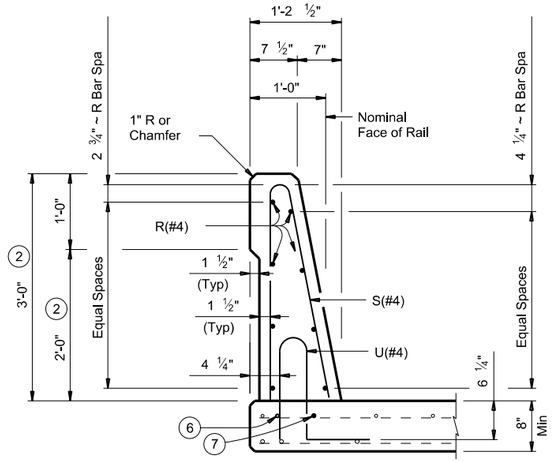
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©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		90

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ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



ON BRIDGE SLAB

SECTIONS THRU RAIL

(2) Increase 2" for structures with Overlay.

(5) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

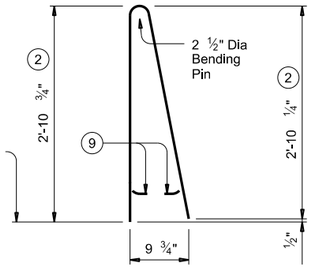
(6) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

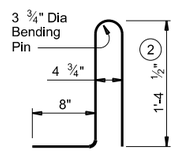
(8) No longitudinal wires may be within upper bend.

(9) Bend or cut as required to clear drain slots.

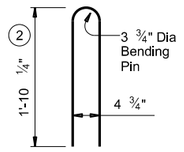
(10) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greater to side slot drain.



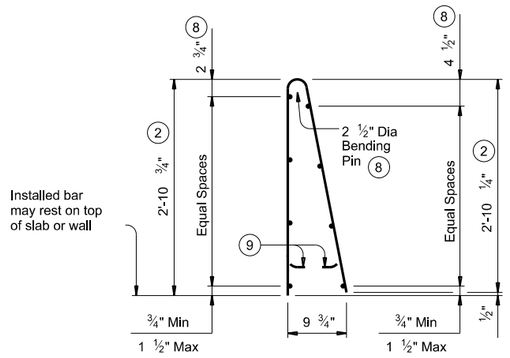
BARS S (#4)



BARS U (#4)

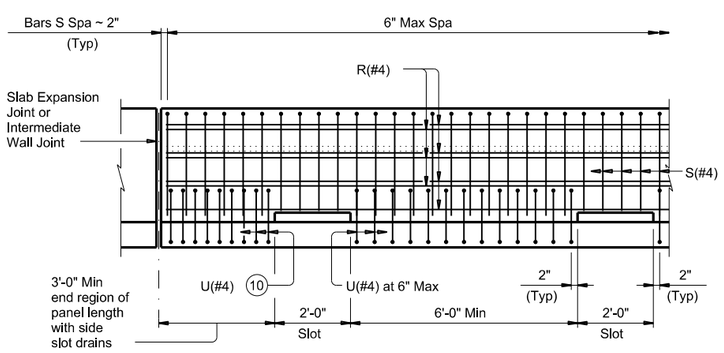


BARS WU (#4)



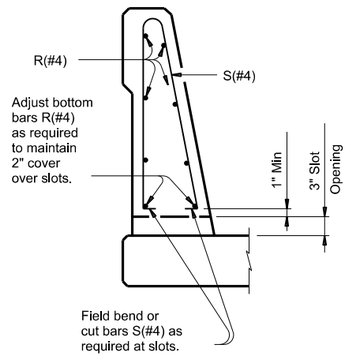
OPTIONAL WELDED WIRE
REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



SECTION THRU
OPTIONAL SIDE SLOT DRAIN

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown in the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM A1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other than shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #4 = 1'-7"
Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

Average weight of railing with no overlay is 376 plf.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

Bridge Division Standard

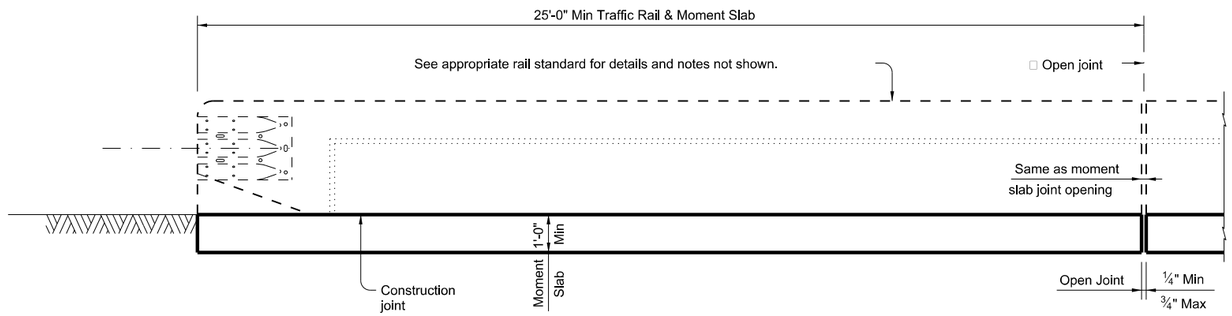
TRAFFIC RAIL
SINGLE SLOPE

TYPE SSTR

FILE: RL-SSTR-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		91

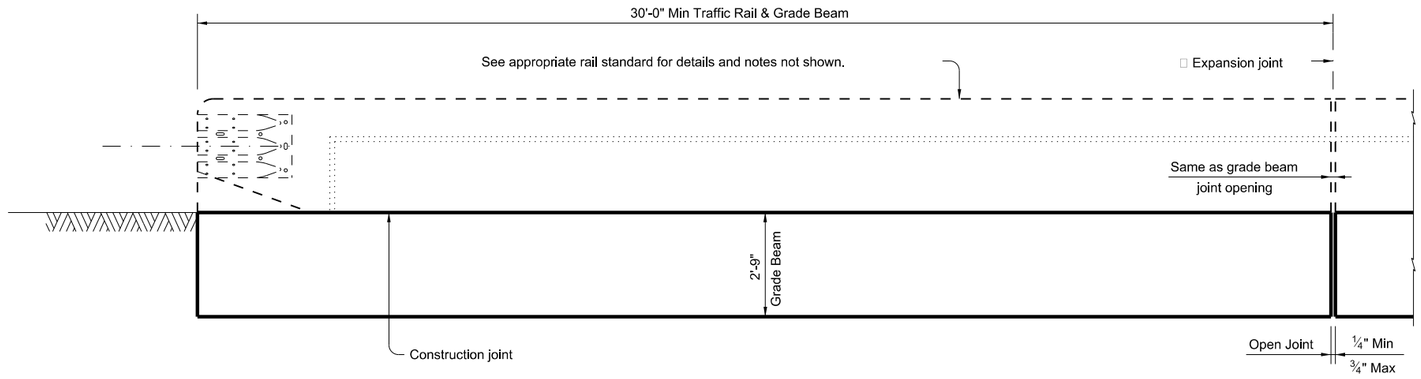
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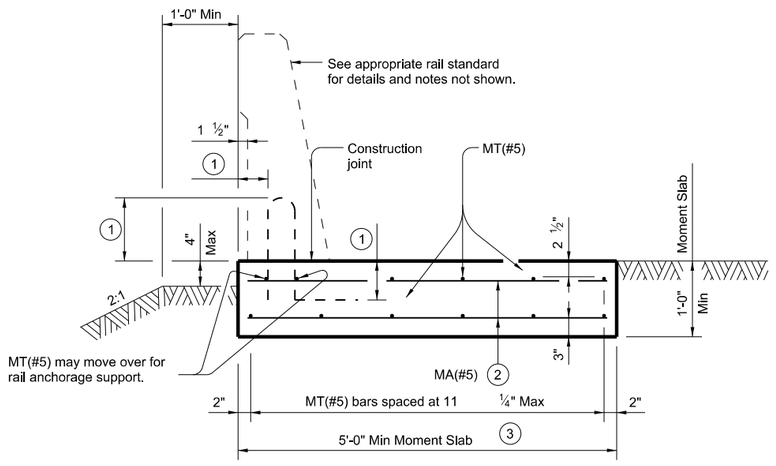
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



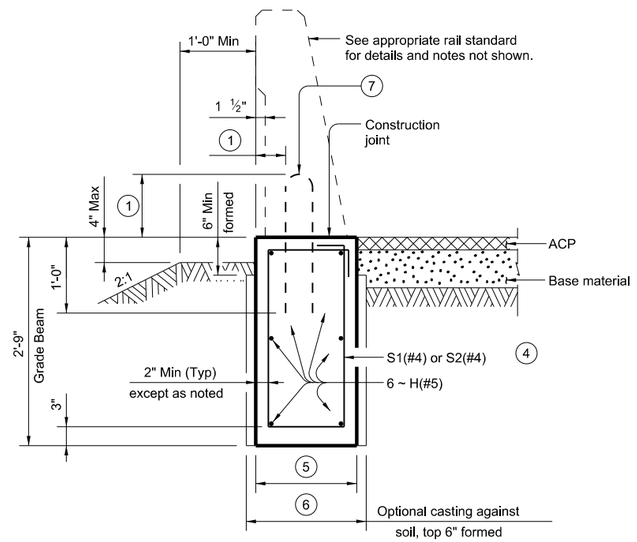
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)



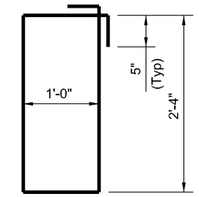
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)

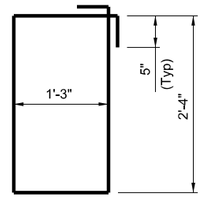
1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.
   Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66.
   Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL FOUNDATIONS
FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

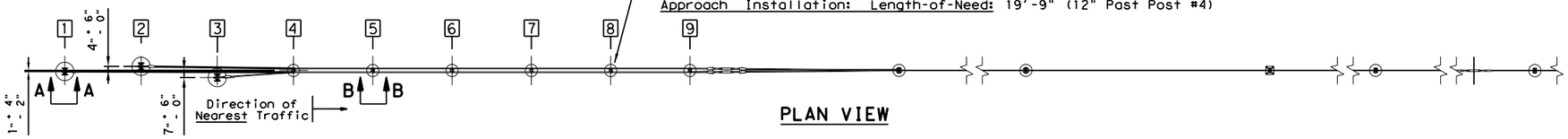
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©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
07-20: Added moment slab with rail foundation lengths.	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		92

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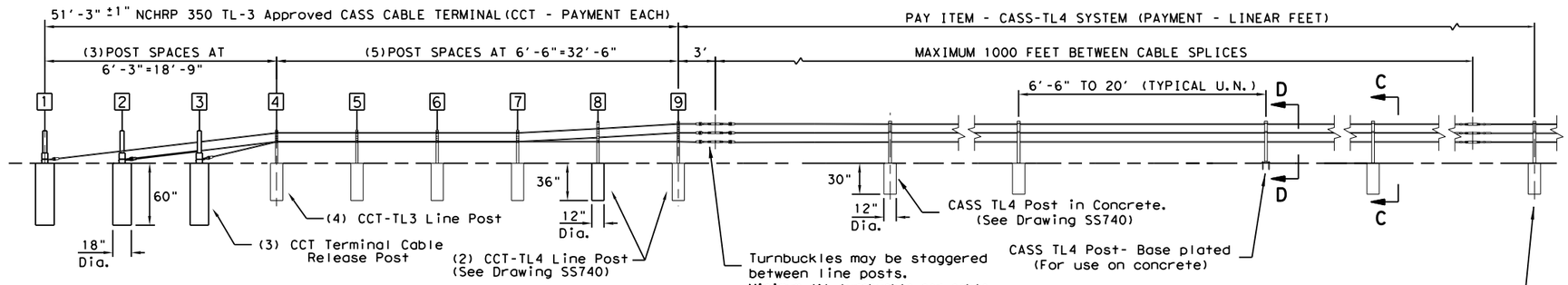
DATE:
FILE:

Preferred Installation: Locate post #2 away from nearest traffic.
System has been succesfully tested with opposite installation.

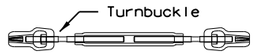
Length-of-Need Cass Cable Terminal (CCT):
Departure Installation: Length-of-Need: 44'-9" (At Post #8)
Approach Installation: Length-of-Need: 19'-9" (12" Past Post #4)



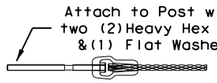
PLAN VIEW



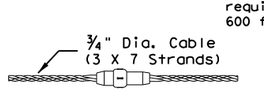
ELEVATION VIEW
(TYPICAL LAY-OUT)



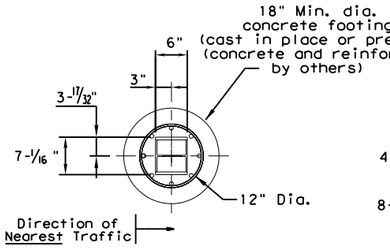
CABLE SPLICE WITH TURNBUCKLE
(OPEN BODY STYLE)



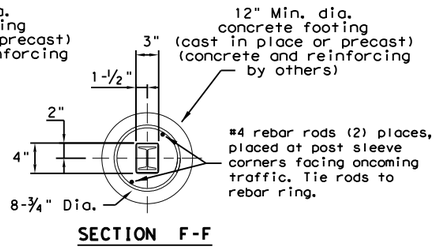
CABLE STUD ASSEMBLY



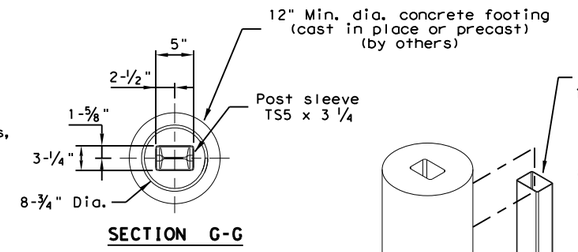
TORPEDO CABLE SPLICE



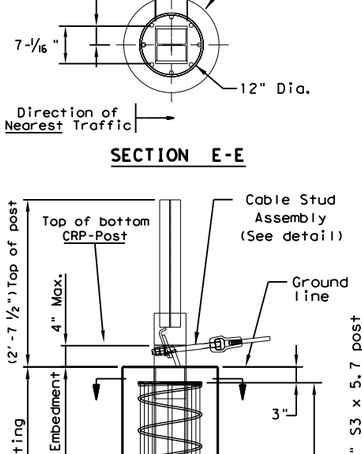
SECTION E-E



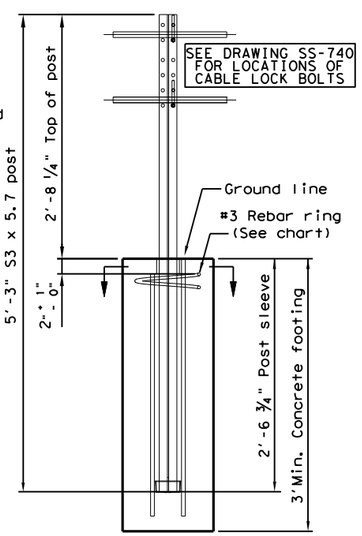
SECTION F-F



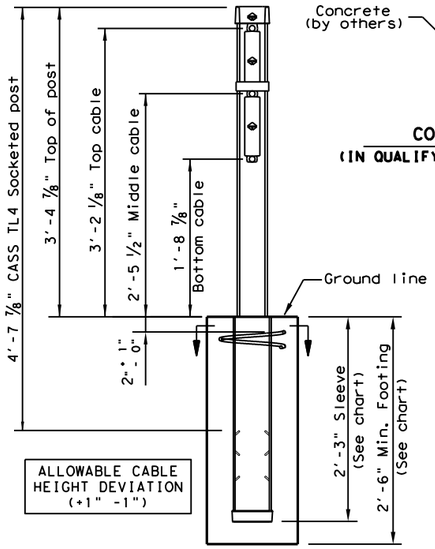
SECTION G-G



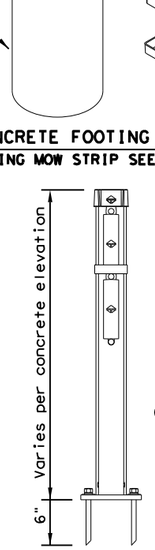
VIEW A-A
(CABLE RELEASE POST 1-3)



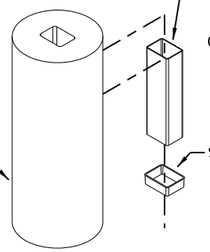
VIEW B-B
(TERMINAL LINE POST 4-7)



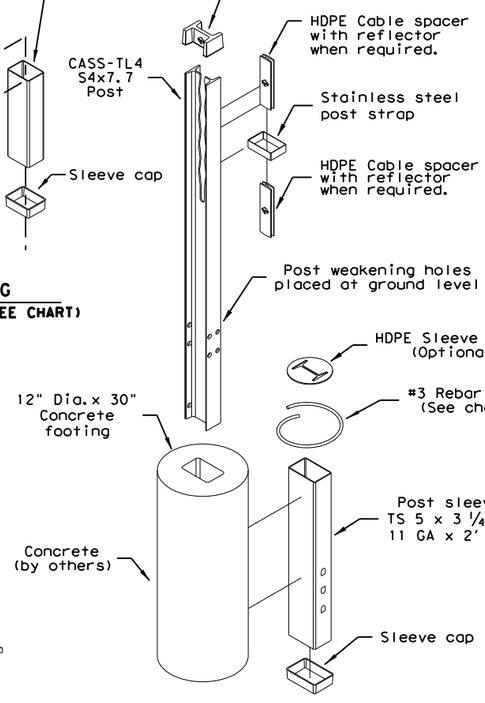
SECTION C-C
(SOCKETED POST)



SECTION D-D
(BASE PLATED POST)



CONCRETE FOOTING
(IN QUALIFYING MOW STRIP SEE CHART)



STANDARD POST & CONCRETE FOOTING
(SOCKETED POST)

GENERAL NOTES

1. This drawing is a general overview of CASS TL-4 Barrier System. See SS-740 (latest version) for specific details of CASS cable terminal (CCT) and cable safety system (CASS) requirements, proper installation, options and specification.
2. CASS is designed for bi-directional traffic flows and can be installed on either side of the median. Contact Trinity (800-527-6050) or consult the design, installation, or repair manual(s) for additional information.
3. All concrete for CASS footings shall be TxDOT class A. If class A or stronger concrete is utilized for the mowstrip, please see chart below for allowable footing depth and sleeve deviations.
4. All posts shall be socketed unless otherwise specified. All cables shall be pre-stretched unless otherwise specified.
5. For payment see Special Specification "Cable Barrier System".
6. CASS-TL4 shall be installed on shoulders or medians with slopes of 6:1 or flatter without obstructions, depressions, etc. That may significantly affect the stability of an errant vehicle. Grading of site and/or appropriate fill materials may be required. The designer/installer shall "Flatten" or "Round" various topographical inconsistencies that could interfere with the ability of the installer to consistently maintain the design height (in relation to the terrain) of the cables. Please consult manual(s) and / or TxDOT Memo(s) for installations in "Ditch Sections".
7. CASS TL-4 post spacing may be modified to avoid obstacles that conflict with the installation of cass-tl4 line posts or to reduce deflection on radiuses. No post space can exceed the maximum post TxDOT space limit of 20'. Reducing or increasing post spacing affects deflection. CASS TL-4 may be laterally transferred at a rate not to exceed 30:1.
8. Post foundations may be drilled through existing pavement. Please see line post foundation chart for minimum footing requirements in various applications.
9. For aesthetic purposes Trinity recommends all sleeves, driven posts, and lower cable release posts to be installed reasonably plumb (approximately 1/8" per foot).
10. CASS TL-4 shall be installed in well-drained, compacted, NCHRP Report 350 Standard soil. If soil does not meet this classification, if solid rock/concrete is encountered below grade or if soil is susceptable to severe freeze/thaw cycles, please contact Trinity about alternate footing design(s). Trinity suggests the use of "Mow strips" for erosion prevention and ease of maintenance / installation.
11. See the Texas MUTCD for proper "Barrier" Delineation.

MOW STRIP DETAIL*			CONCRETE FOOTING CHART		
MOW STRIP	DEPTH	WIDTH	FOOTING	TUBE SLEEVE	REBAR RING
NONE			30" Min.	27" Min.	YES
HMA	6" Min.	3' Min.	27" Min.	15" Min.	NO
HMA	8" Min.	3' Min.	24" Min.	15" Min.	NO
RC	3" Min.	3' Min.	24" Min.	15" Min.	NO

Chart does not apply to Terminal Posts 1 thru 9.
* Mow strip or pavement.
HMA = Hot Mix Asphalt (Not Recycled Asphalt Pavement).
RC = Reinforced Concrete (TxDOT Class A Minimum).

CABLE TENSION CHART	
FAHRENHEIT	PRE-STRETCHED
DEGREES	LB / FORCE
-10	7300
0	7000
10	6600
20	6300
30	6000
40	5600
50	5300
60	5000
70	4600
80	4300
90	4000
100	3600
110	3300
120	3000
130	2700
140	2500
150	2300

Allowable deviation from chart in tangent sections: +800, -200 pounds/force. Cable tension readings are typically higher in curved cable sections.

Trinity Highway Products, LLC.
2525 Stemmons Freeway
Dallas, TX 75207
Phone: (800) 644-7976

Product.INFO@TRIN.NET

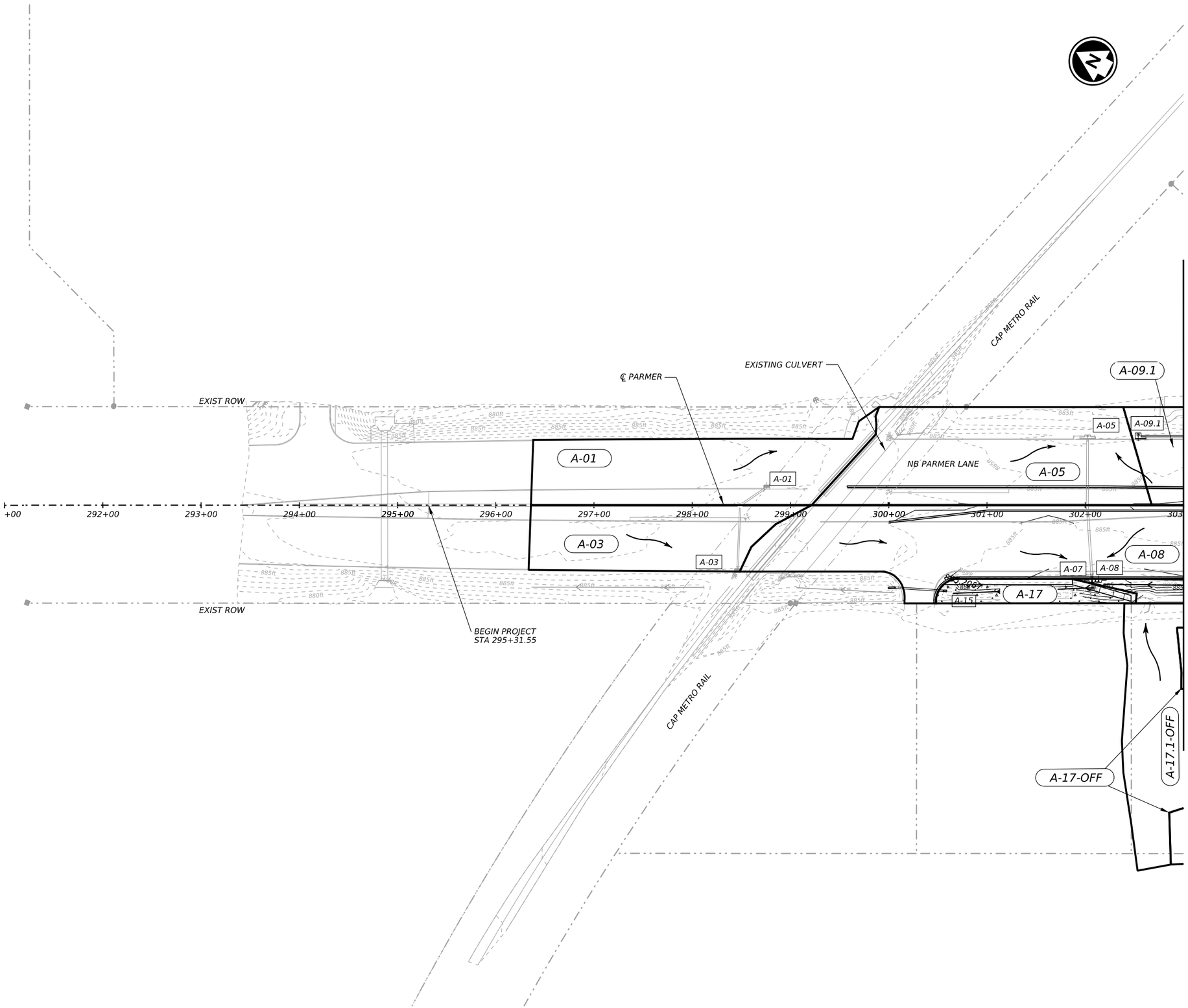
Texas Department of Transportation
Design Division Standard

TRINITY CABLE SAFETY SYSTEM (TL-4)

CASS(TL4)-14

FILE: casstl414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				93

CK
DW
CK
DW



LEGEND

- RIGHT OF WAY
- DRAINAGE BASIN
- DIRECTION OF FLOW
- SURVEY EXISTING CONTOUR
- ROADWAY CENTERLINE
- BASIN ID — A-01
- PROP DITCH CENTERLINE
- EXIST DITCH CENTERLINE
- INLET ID — A-01

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED PROFESSIONAL ENGINEER
9/30/2025

0 50 100
SCALE: H: 1"=100'

WILCO TEXAS

EDGE ENGINEERING
TBPELS Firm Number 20690
7000 N Mopac Expy. Ste. 325
512.767.1009 | www.civil-edge.com

PARMER LANE AT SH45

ONSITE DRAINAGE AREA MAP

BEGIN TO STA 303+00

2025

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		94

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MATCHLINE 303+00

MATCHLINE 315+00

CAP METRO RAIL

℄ PARMER

EXIST ROW

N68°18'58.5"E

RM 620 WBFR

SH 45 WBML

SH 45 EBML

N68°17'11.2"E

RM 620 EBFR

EXIST ROW

NB PARMER LANE

SB PARMER LANE

PARMER LANE

D-03

D-02

D-01

C-01

C-02

A-09

A-09.1

A-08

A-13

A-17

A-17.1-OFF

A-17-OFF

A-17.1-OFF

A-16

A-16-OFF

B-02

B-01

303+00 304+00 305+00 306+00 307+00 308+00 309+00 310+00 311+00 312+00 313+00 314+00 315+00

1010+00 1009+00 1008+00 1007+00 1006+00 1005+00 1004+00 1003+00 1002+00 1001+00 1000+00

2010+00 2009+00 2008+00 2007+00 2006+00 2005+00 2004+00 2003+00 2002+00 2001+00 2000+00

LEGEND

- RIGHT OF WAY
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- DIRECTION OF FLOW
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- ROADWAY CENTERLINE
- BASIN ID (A-01)
- PROP DITCH CENTERLINE
- EXIST DITCH CENTERLINE
- INLET ID (A-01)

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0 50 100
SCALE: H: 1"=100'

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PARMER LANE AT SH45

ONSITE DRAINAGE AREA MAP

STA 303+00 TO STA 315+00

2025

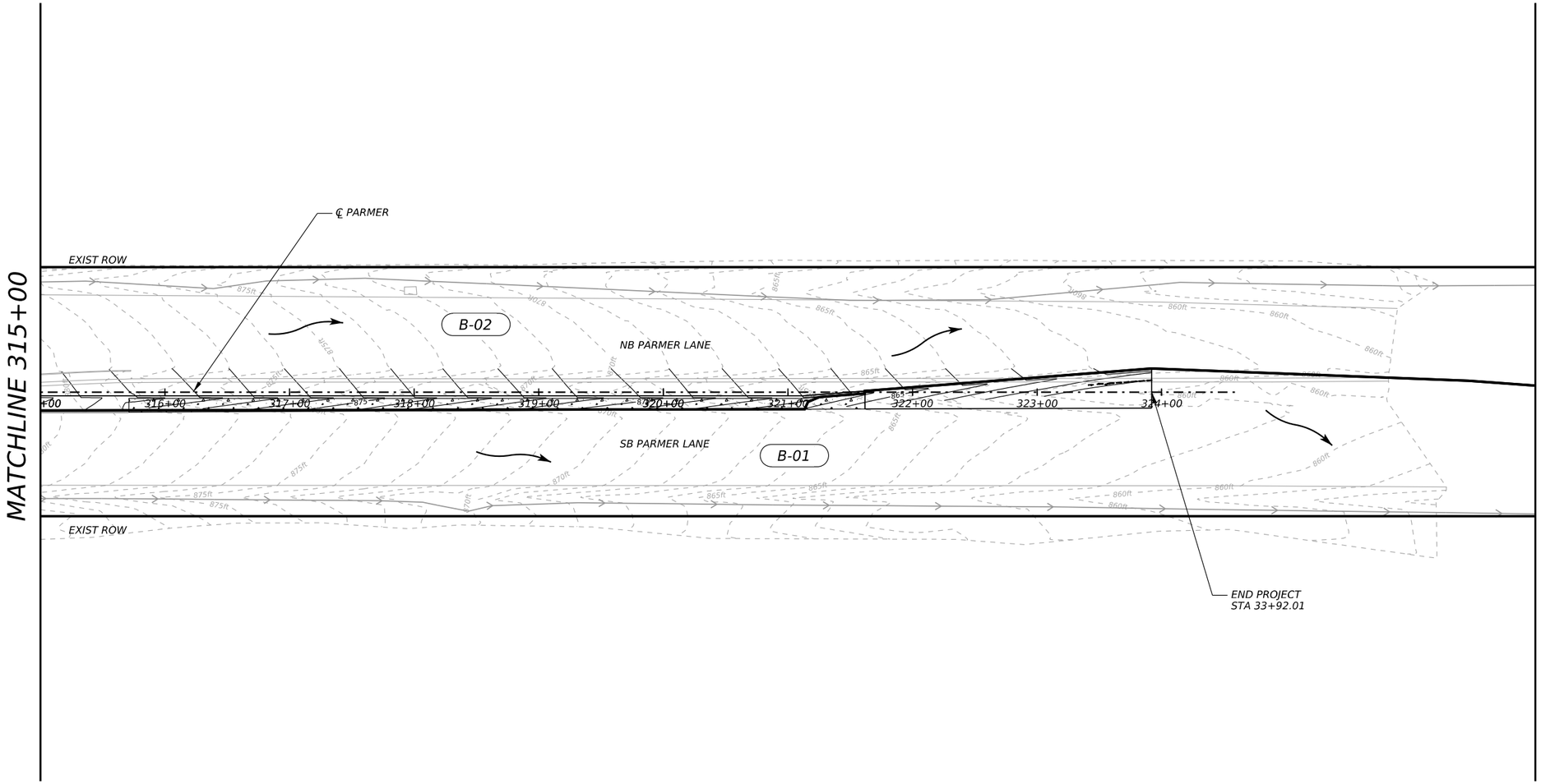
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3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		95

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CK
DW
CK
DW

LEGEND

- RIGHT OF WAY
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- DIRECTION OF FLOW
- SURVEY EXISTING CONTOUR
- ROADWAY CENTERLINE
- BASIN ID — A-01
- PROP DITCH CENTERLINE
- EXIST DITCH CENTERLINE
- INLET ID — A-01





9/30/2025

0 50 100

SCALE: H: 1"=100'

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ONSITE DRAINAGE AREA MAP

STA 315+00 TO END

2025

SHEET 3 OF 5

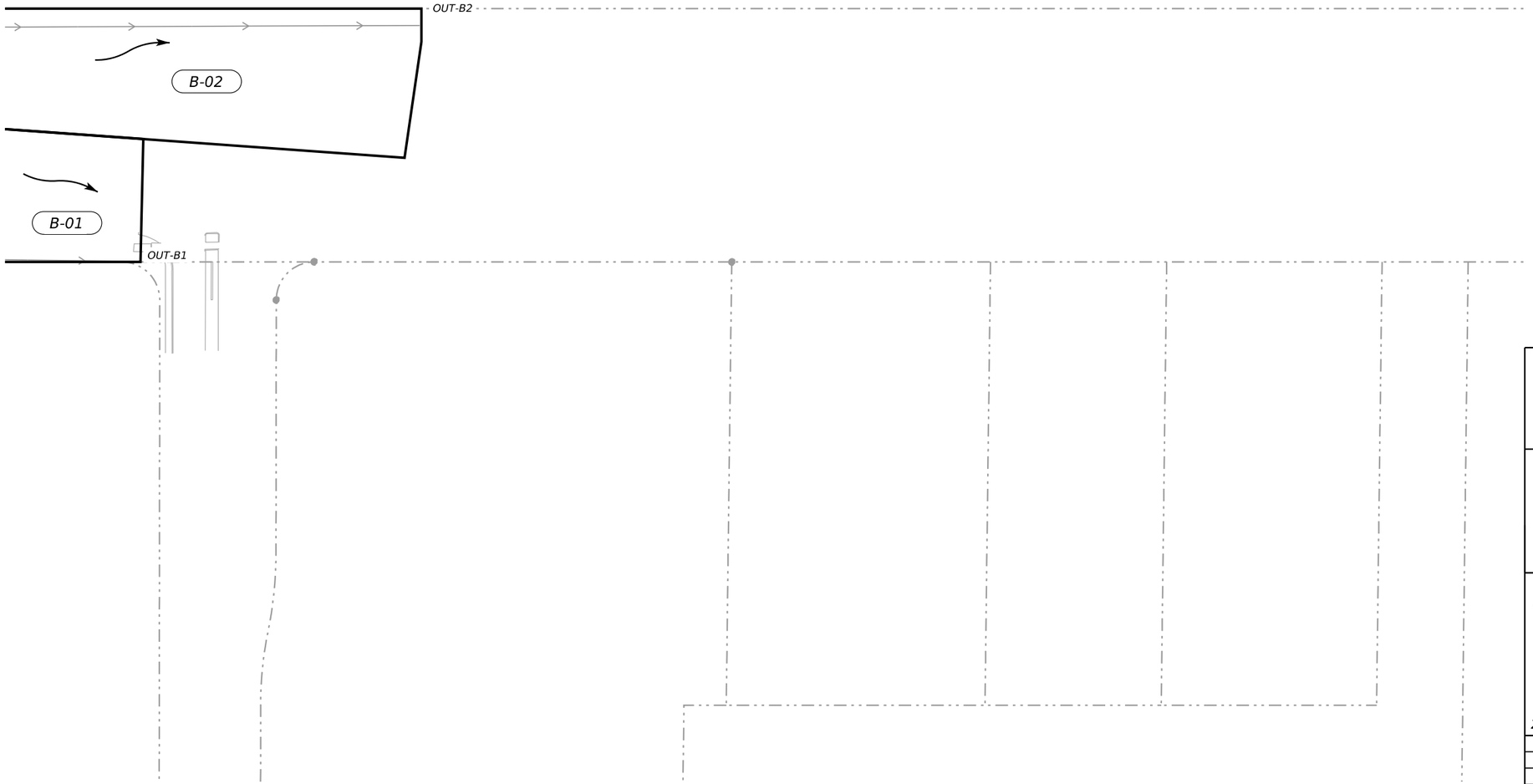
CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		96

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CK
DW
CK
DW

LEGEND

- RIGHT OF WAY
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- ROADWAY CENTERLINE
- BASIN ID — A-01
- PROP DITCH CENTERLINE
- EXIST DITCH CENTERLINE
- INLET ID — A-01





9/30/2025

0 50 100

SCALE: H: 1"=100'

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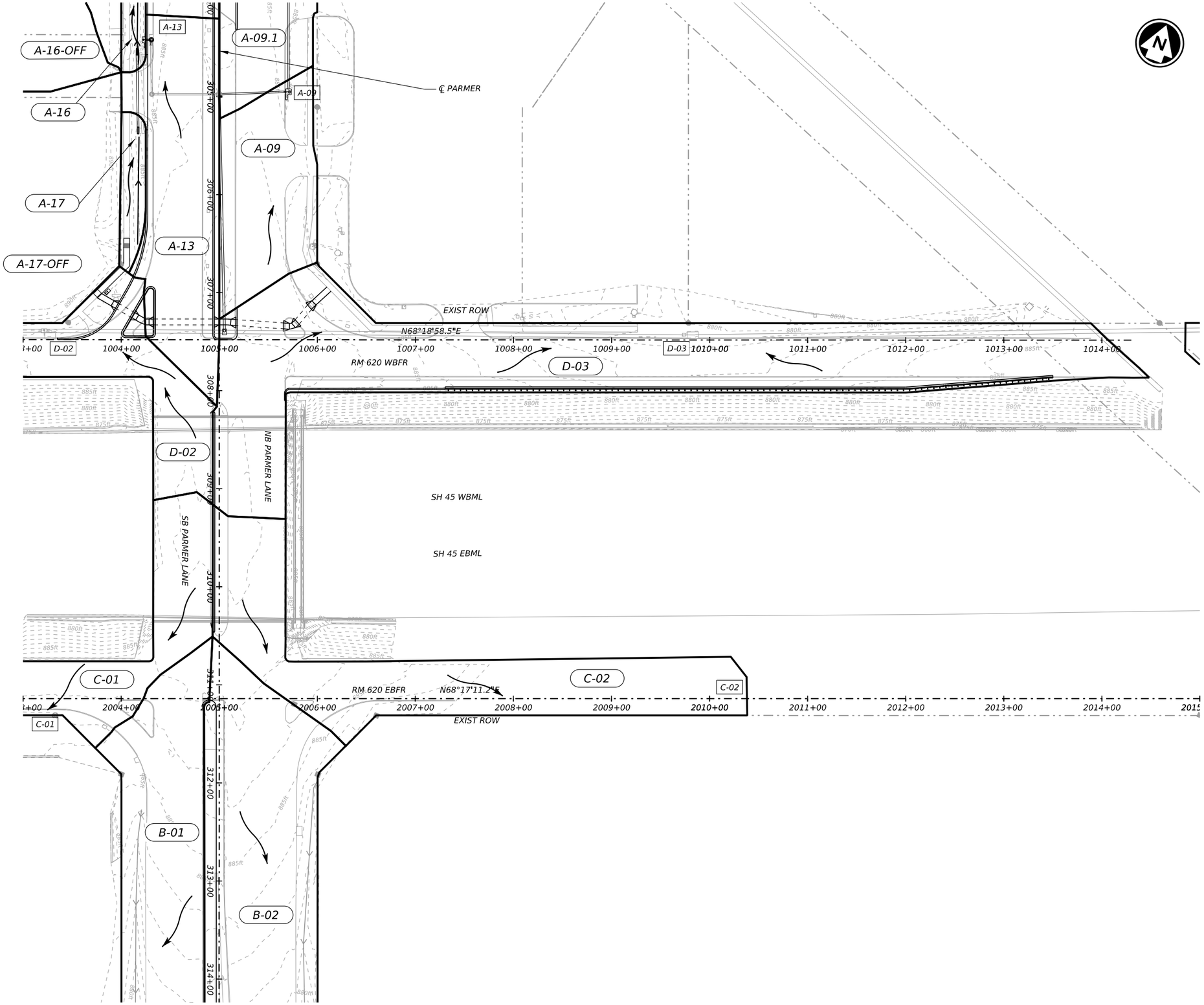
PARMER LANE AT SH45

ONSITE DRAINAGE AREA MAP

2025

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		97

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LEGEND

- RIGHT OF WAY
- DRAINAGE BASIN
- DIRECTION OF FLOW
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- INLET ID — A-01

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED PROFESSIONAL ENGINEER
9/30/2025

0 50 100
SCALE: H: 1"=100'

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PARMER LANE AT SH45

ONSITE DRAINAGE AREA MAP

2025 SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		98

DATE: 9/30/2025 9:32:39 PM
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CK
DW
CK
DW

CURB INLET HYDRAULIC DATA

INLET ID	STATION	ALIGNMENT	TYPE	INLET DESCRIPTION	PROFILE TYPE	CURB LENGTH	PROFILE SLOPE (%)	CROSS SLOPE (%)	SPREAD MANNING'S N	DESIGN STORM	DISCHARGE (CFS)	BY PASS (CFS)	BY PASS TO	ALLOWABLE PONDED WIDTH (FT)	PONDED WIDTH (FT)	ALLOWABLE PONDED DEPTH (FT)	PONDED DEPTH (FT)	NOTES
A-01	298+76	PARMER	CURB	EXIST 5-FT SLOT INLET	On Grade	4.5	3.88	2.00	0.013	10	3.99	3.06	A-05	24.00	8.69	0.50	0.17	5
A-03	298+46	PARMER	CURB	EXIST 5-FT SLOT INLET	On Grade	4.5	1.42	2.00	0.013	10	2.96	1.21	A-07	24.00	9.38	0.50	0.19	5
A-05	302+02	PARMER	CURB	EXIST 20-FT INLET	In Sag	19	0.00	2.00	0.013	10	7.94	0.00		24.00	16.61	0.75	0.58	5,6
A-07 & A-08	302+14	PARMER	CURB	2 - PCO (LT)(RT)	In Sag	19	1.00	2.00	0.013	10	7.53	3.18		24.00	12.93	0.75	0.55	6
A-09	304+95	PARMER	CURB	PCO (RT)	On Grade	9.5	0.42	2.00	0.013	10	3.61	0.41	A-05	24.00	12.67	0.50	0.25	
A-09.1	302+54	PARMER	CURB	PCO (RT)	On Grade	9.5	10.46	2.00	0.013	10	4.81	2.61	A-06	24.00	7.74	0.50	0.15	
A-13	304+42	PARMER	CURB	PCO (LT)	On Grade	9.5	0.37	2.00	0.013	10	5.60	1.25	A-07	24.00	15.36	0.50	0.31	
C-01	2003+23	RM 620 WBFR	CURB	EXIST 10-FT INLET	On Grade	9.5	4.12	2.70	0.013	10	3.99	1.39		24.00	7.13	0.50	0.19	5
C-02	2010+27	RM 620 WBFR	CURB	EXIST 10-FT INLET	On Grade	9.5	1.00	2.00	0.013	10	6.56	2.53		24.00	13.50	0.50	0.27	5,6
D-01	1000+00	RM 620 WBFR	CURB	EXIST 10-FT INLET	On Grade	9.5	0.30	2.00	0.013	10	3.99	0.41	D-02	24.00	14.04	0.50	0.28	5
D-02	1003+21	RM 620 WBFR	CURB	EXIST 10-FT INLET	On Grade	9.5	0.60	2.00	0.013	10	7.92	3.00		24.00	15.94	0.50	0.32	5
D-03	1009+85	RM 620 WBFR	CURB	EXIST 10-FT INLET	In Sag	10	0.00	2.41	0.013	10	12.98	0.00		24.00	24.55	0.75	0.84	5,6

CONDUIT HYDRAULIC DATA

LINK ID	US NODE ID	DS NODE ID	US FL ELEV (FT)	US HGL (FT)	DS FL ELEV (FT)	DS HGL (FT)	ACTUAL VELOCITY (CFS)	SIZE (## INCH RCP)	NO OF BARRELS	ACTUAL LENGTH (FT)	LINK SLOPE (%)	MANNINGS N	DESIGN STORM	DISCHARGE (CFS)	CAPACITY (CFS)	NOTES
A-01	A-01	PRM-2	883.18	883.54	876.42	877.43	0.74	24	1	30.36	20.49	0.013	10	0.93	47.54	5
A-02	PRM-2	OUT-1	875.29	876.67	871.90	874.40	3.38	18	1	446.18	0.76	0.013	10	16.59	35.65	5
A-03	A-03	PRM-2	881.86	882.36	876.42	877.41	1.41	24	1	64.17	8.19	0.013	10	1.75	30.06	5
A-05	A-05	A-06	879.30	880.30	877.39	879.67	2.53	24	1	67.32	2.76	0.013	10	7.94	37.55	5
A-06	A-06	PRM-2	877.39	878.69	875.29	877.33	3.49	30	1	348.37	0.59	0.013	10	14.93	31.62	5
A-08	A-08	EX_CMP_T	879.96	881.03	879.92	881.04	4.67	18	1	5.36	0.54	0.013	10	8.50	16.66	
A-08.1	EX_CMP_T	A-06	879.92	880.96	877.39	879.66	2.70	18	1	69.43	3.64	0.013	10	8.49	43.17	5
A-09	A-09	PRM-1	879.32	880.79	878.98	880.78	1.73	24	1	67.64	0.48	0.013	10	5.15	15.65	
A-09.1	A-09.1	A-09	880.50	881.06	879.32	880.88	1.25	18	2	236.28	0.49	0.013	10	2.20	7.35	
A-10.1	PRM-1	PSL-TRUNK	878.98	880.32	878.34	879.69	4.09	36	1	239.86	0.26	0.013	10	9.20	11.60	
A-11	PRM-3	PRM-1	880.68	881.48	879.74	880.71	3.62	18	1	64.19	1.37	0.013	10	4.35	12.29	5
A-12	PIPE_JUNCT	PRM-3	880.86	882.13	880.73	882.06	2.63	18	1	47.86	0.26	0.013	10	4.35	5.37	5
A-13	A-13	PRM-4	880.95	882.31	880.92	882.30	2.56	48	1	3.75	0.41	0.013	10	4.35	6.76	
A-13.1	PRM-4	PIPE_JUNCT	880.90	882.14	880.86	882.14	2.72	42	2	3.76	0.70	0.013	10	4.35	8.76	
A-16	A-16	A-17	883.82	885.52	883.60	884.72	5.85	13.5 x 22	1	74.09	0.30	0.013	10	9.66	5.06	
A-18	A-18	A-19	880.65	883.25	880.40	881.85	9.99	18	1	49.76	0.50	0.013	10	17.45	7.45	

DITCH DATA

DITCH LABEL	ALIGNMENT	UPSTREAM STATION (STA)	UPSTREAM OFFSET (FT)	UPSTREAM FLOWLINE (FT)	DOWNSTREAM STATION (STA)	DOWNSTREAM OFFSET (FT)	DOWNSTREAM FLOWLINE (FT)	LENGTH (FT)	LONGITUDINAL SLOPE (FT/FT)	LINING MATERIAL	ROUGHNESS COEFFICIENT (N)	BOTTOM WIDTH (FT)	ALLOWABLE DEPTH (FT)	FRONT SLOPE (_:1)	BACK SLOPE (_:1)	CAPACITY (CFS)	Q10 (CFS)	V10 (FT/S)	D10 (FT)
D-B-02	PARMER CL	310+95.00	98.0	877.38	330+26.00	101.0	850.00	1830.65	0.015	GRASS	0.035	8.00	1.00	6	4	54.1	31.06	3.54	0.75
D-B-01	PARMER CL	312+25.00	80.0	884.19	328+10.00	90.0	851.00	1578.94	0.021	GRASS	0.035	0.00	1.00	5	10	29.0	20.23	3.53	0.87
D-A-16	PARMER CL	306+50.96	83.2	884.95	305+31.00	82.8	883.82	119.96	0.009	GRASS	0.035	0.00	1.30	3	3	15.2	9.76	2.67	1.10
D-A-17	PARMER CL	304+57.00	83.9	883.60	302+40.00	86.8	881.92	217.00	0.008	CONCRETE	0.012	0.00	1.00	2	3	16.3	13.10	6.18	0.92
D-A-17.1	PARMER CL	302+40.00	86.8	881.92	300+62.00	89.3	880.50	178.00	0.008	CONCRETE	0.012	0.00	1.29	3	2.5	36.3	16.89	6.56	0.97

HYDROLOGIC DATA

AREA ID	AREA (ACRES)	C	T_c CALCULATED (MIN)	T_c USED (MIN)	I_{10} (IN/HR)	Q_{10} (CFS)
A-01	0.50	0.90	4.0	5.0	8.8	4.0
A-03	0.37	0.90	3.0	5.0	8.8	3.0
A-05	0.67	0.90	1.9	5.0	8.8	5.3
A-08	0.94	0.95	10.0	10.0	7.3	6.5
A-09	0.45	0.90	2.0	5.0	8.8	3.6
A-09.1	0.55	0.90	5.0	5.0	8.8	4.4
A-13	0.66	0.95	5.0	5.0	8.8	5.6
A-16	0.09	0.95	2.0	5.0	8.8	0.7
A-16-OFF	1.18	0.85	3.0	5.0	8.8	8.9
A-17	0.14	0.95	5.0	5.0	8.8	1.2
A-17-OFF	0.98	-	0.0	5.0	-	13.1*
A-17.1	0.10	0.95	5.0	5.0	8.8	0.9
A-17.1-OFF	0.55	-	0.0	5.0	-	1.69*
B-01	3.75	0.70	9.0	9.0	7.6	20.2
B-02	4.70	0.85	8.0	8.0	7.7	31.1
C-01	0.47	0.95	4.0	5.0	8.8	4.0
C-02	0.90	0.90	7.0	7.0	8.1	6.6
D-01	0.52	0.86	5.0	5.0	8.8	4.0
D-02	1.04	0.81	5.0	5.0	8.8	7.5
D-03	1.78	1.81	5.9	5.9	8.5	13.0

NOTE:

FLOWS MARKED WITH AN ASTERISK(*) WERE INPUT MANUALLY FROM AS-BUILTS OF ADJACENT DEVELOPMENTS

NOTES

1. *THE PEAK FLOWS FOR ONSITE DRAINAGE AREAS ARE LESS THAN 200 ACRES WERE CALCULATED USING THE RATIONAL METHOD.*
2. *MINIMUM TIME OF CONCENTRATION OF 5 MINUTES WAS USED IN ACCORDANCE TO THE WILLIAMSON COUNTY ROAD BOND PROGRAM DESIGN CRITERIA MANUAL.*
3. *RAINFALL INTENSITIES WERE TAKEN FROM THE WILLIAMSON COUNTY BOND PROGRAM DESIGN CRITERIA MANUAL FOR THE LAKE CREEK WATERSHED.*
4. *INLET AND LINK ANALYSIS PERFORMED USING OPENROADS DESIGNER 10.12 WHICH PERFORMED HYDRAULIC COMPUTATIONS IN ACCORDANCE WITH FHWA HEC-22 GUIDELINES.*
5. *EXISTING ELEMENT*
6. *DEPTH INCLUDES 3-INCH OF GUTTER DEPRESSION.*

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED PROFESSIONAL ENGINEER
9/30/2025

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PARMER LANE AT SH45

ONSITE HYDROLOGIC & HYDRAULIC DATA SHEET

2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		99

DATE: 9/30/2025 9:32:43 PM
FILE: P:\WILCO 001 Benesch_Parmer Lane\6-CAD\DGN\SHT\Parmer HYD.dgn

A-01
EXIST SLOTTED DRAIN

A-03
EXIST SLOTTED DRAIN

PRM-2
EXIST MANHOLE

A-05
EXIST 20-FT CURB INLET

A-06
EXIST JUNCTION BOX

INLET A-09.1
PROP 5-FT PCO (RIGHT)
STA 302+53.87
OFF -67.47

R391721
TREA SH RANCH LLC

NORTHWEST AUSTIN DENTISTRY

CAP METRO RAIL

R401739
BVS2020 PARMER LLC

EXISTING CULVERT (TO REMAIN)

EXIST ROW

NB PARMER LANE

PARMER LANE

SB PARMER LANE

EXIST ROW

OUT-A1

+00 | 292+00 | 293+00 | 294+00 | 295+00 | 296+00 | 297+00 | 298+00 | PRM-2 | 299+00 | 300+00 | 301+00 | 302+00 | 303

PT 291+21.31

LINE A-02
EXIST 30"RCP

LINE A-01
EXIST 18" RCP

LINE A-03
EXIST 18" RCP

EXIST 12" HDPE GAS LINE
WITH 18" STEEL ENCASEMENT

LINE A-05
EXIST 24"RCP

LINE A-06
EXIST 30"RCP

LINE A-10.2
EXIST 30"RCP

EXIST 8" GAS LINE

LINE A-18
18" RCP

A-08.1
PROP JOINT
SEE NOTE 5

LINE A-08.1
EXIST 24"RCP

LINE A-08
24"RCP

A-01 | A-05 | A-09.1 | A-06 | A-03 | A-08 | A-07 | A-19 | A-18

MATCHLINE STA. 303+00.00

EXIST DITCH

REMOVE EXIST 2 - SET
AND 53-LF OF RCP

14 SY OF CUT AND RESTORE
CONCRETE DRIVEWAY

CAUTION DURING STORM SEWER
CONSTRUCTION - EXIST GAS LINES

SIDEWALK
BRIDGE

REMOVE
EXISTING INLET

2 LF X 24" RCP
TO CONNECT INLET A-07
TO A-08

PROPOSED DITCH
D-A-17

R569023
DAVIS/SPECTRUM
INVESTMENTS-2007 LP

R468287
OASIS RAILYARD LLC &
MICHAEL R SAID &
SANDRA I SAID

R468288
WILLOW SPRINGS
DEVELOPMENT LP

CAP METRO RAIL

A-19
PROP 18" 6:1 SET
STA 300 + 05.65
OFF 84.00

A-18
PROP 18" 3:1 SET
STA 300+56.00
OFF 89.30

INLET A-08
PROP 3-FT PCO (RIGHT)
STA 302 + 06.70
OFF 75.00

INLET A-07
PROP 3-FT PCO (LEFT)
STA 302 + 14.90
OFF 75.00

LEGEND

- RIGHT OF WAY
- DIRECTION OF FLOW
- SURVEY EXISTING CONTOUR
- ROADWAY CENTERLINE
- PROP DITCH CENTERLINE
- EXIST DITCH CENTERLINE
- INLET ID — A-01

NOTES:

1. CURB INLET OFFSETS ARE TO FACE OF CURB. ELEVATIONS ARE TO TOP OF CURB.
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5. ALL PROPOSED PIPE CONNECTIONS TO EXISTING RCP SHALL INCLUDE A CONCRETE COLLAR THAT IS INCIDENTAL TO THE PIPE (SEE MISCELLANEOUS DETAILS).

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED PROFESSIONAL ENGINEER

10/1/2025

0 50 100
SCALE: H: 1"=100'
V: 1"=10'

895 | 890 | 885 | 880 | 875 | 870 | 865 | 860

-2+00 | -1+00 | 0+00 | 1+00 | 2+00 | 3+00 | 4+00 | 5+00 | 6+00 | 7+00 | 8+00 | 9+00 | 10+00

51 LF TRENCH PROTECTION

EXISTING GROUND

10-YR HGL

A-18
PSET-RP(18IN)(3:1)

A-19
PSET-RP(18IN)(6:1)

FL = 880.40'

FL = 880.65'

PROP LINE A-18
51 LF X 18" RCP
@ 0.30% SLOPE

DRIVEWAY CULVERT A-18 TO A-19

EXIST 12" HDPE GAS LINE
W/ 18" ENCASEMENT

PROPOSED GROUND

EXIST MH A-06
RIM = 885.26'

CONNECTION A-08.1
SEE NOTE 5

CI A-08
TOC = 883.97'

EXISTING GROUND

APPROXIMATE LOCATION OF
EXIST 8" GAS LINE

10-YR HGL

FL = 879.96'

LINE A-08
7 LF X 24" RCP
@ 0.16% SLOPE

FL = 877.39'

FL = 879.92'

EXIST LINE A-08.1
67 LF X 24" RCP
@ 3.78% SLOPE

EXIST 12" HDPE GAS LINE
W/ 18" ENCASEMENT

INLET A-08 TO MH A-06

WILCO TEXAS

EDGE ENGINEERING
TBPELS Firm Number 20690
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512.767.1009 | www.civil-edge.com

PARMER LANE AT SH45

DRAINAGE PLAN & PROFILE

BEGIN TO STA 303+00

2025

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		100

DATE: 10/1/2025 10:36:19 AM
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PRM-1
EXIST MANHOLE

PRM-8
EXIST MANHOLE

R401740
VIA REAL ESTATE LLC

A-09
PROP 5-FT PCO (RIGHT)
STA 304+95.08
OFF -67.51

CEFCO
CONVENIENCE
STORE

R372420
AUSTIN FCS LIMITED

30 SY OF CUT AND RESTORE
CONCRETE DRIVEWAY

R379619
MOISES PARMER
PROPERTIES LTD

EXIST ROW

REMOVE EXIST INLET

REMOVE EXIST 69 LF
OF 18" RCP

LINE A-09.1
PROP 18" RCP

A-09

23 SY OF CUT AND RESTORE
ASPHALT ROADWAY

LINE A-09
PROP 24"RCP

PLUG AND ABANDON
EXISTING 30" RCP

LINE A-10.1
PROP 24" RCP

EXIST 30"RCP
TO BE ABANDONED

PRM-1

PARMER LANE

+00 304+00 305+00 306+00 307+00

LINE A-13.1
PROP 18"RCP

LINE A-12
EXIST 18"RCP

LINE A-11
EXIST 18"RCP

REMOVE EXIST 2 - SET
AND 61-LF OF PIPE

LINE A-13
PROP 18"RCP

PRM-4

PRM-8

PROP DITCH D-A-16

A-13

A-17

A-16

EXIST ROW

REMOVE EXIST INLET

SIDEWALK
BRIDGE

R468289
ANDERSON LANE
PROPERTY LLC

R379619
MOISES PARMER
PROPERTIES LTD

R379617
MOISES PARMER
PROPERTIES LTD

PROP DITCH D-A-17

LINE A-16
PROP 13.5" X 22" ARCP

C-01

LAZEEZ
MEDITERRANEAN
FOOD

7-ELEVEN

EXIST ROW

1006+00 RM 620 WBFR 1007+00

1005+00

1004+00

1003+00

SH 45 WBML

SH 45 EBML

LINE CU-03
EX 42"RCP

PSL-TRUNK
PROP PSL(RC)(5X3)
STA 307+40.15
OFF 5.23

NB PARMER LANE

308+00 309+00 310+00 311+00

LINE CU-02
EX 42"RCP

SB PARMER LANE

LINE CU-01
EX 36"RCP

LINE CU-01
EX 36"RCP

EXIST ROW

RM 620 EBFR

2007+00

2006+00

2005+00

2004+00

2003+00

EXIST ROW

R317104
AUSTIN WHITE LIME

R315206
ROBINSON 1987 TRACT LLC

EXIST DITCH D-B-02

312+00 313+00 314+00 315

EXIST DITCH D-B-01

C-03

R327019
SFT INS (TX) LLC

C-01
EXIST 10-FT CURB INLET

C-03
EXIST 10-FT CURB INLET

PRM-4
PROP 48" MANHOLE
STA 304 + 42.00
OFF 69.50 FT

A-13
PROP 3-FT PCO (LEFT)
STA 304 + 41.70
OFF 75.15 FT

A-16
PROP DES 1 6:1 SET
STA 305 + 25.75
OFF 80.75 FT

A-17
PROP DES 1 6:1 SET
STA 304 + 61.50
OFF 82.32 FT

LEGEND

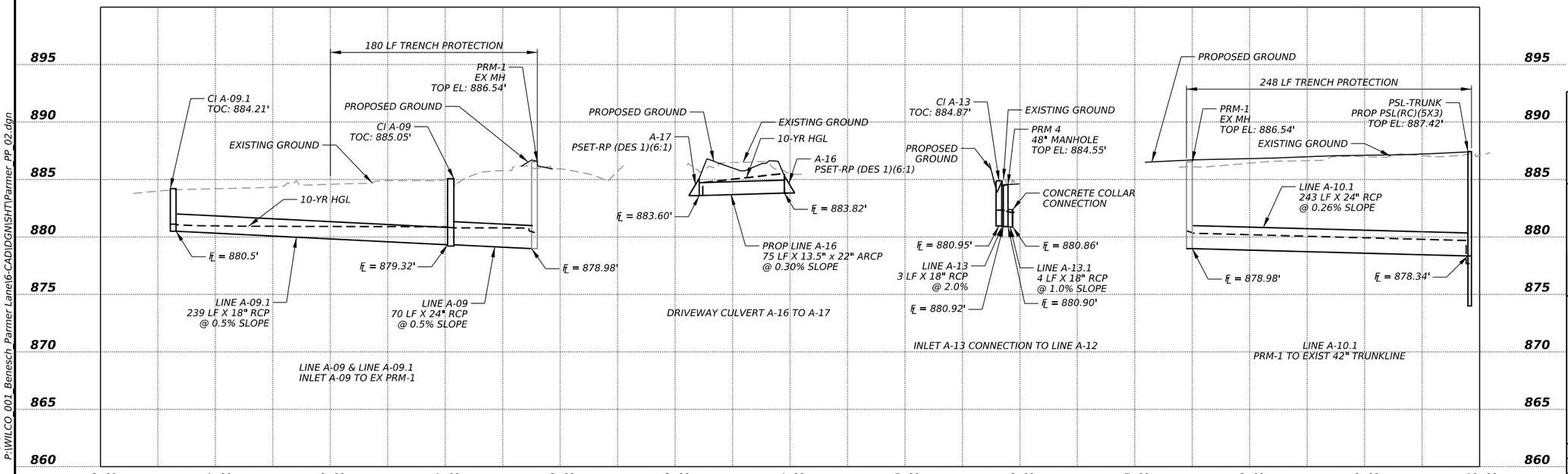
- RIGHT OF WAY
- DIRECTION OF FLOW
- SURVEY EXISTING CONTOUR
- ROADWAY CENTERLINE
- PROP DITCH CENTERLINE
- EXIST DITCH CENTERLINE
- INLET ID — A-01

NOTES:

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10/1/2025

0 50 100
SCALE: H: 1"=100'
V: 1"=10'



WILCO
TEXAS

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PARMER LANE AT SH45

DRAINAGE PLAN & PROFILE

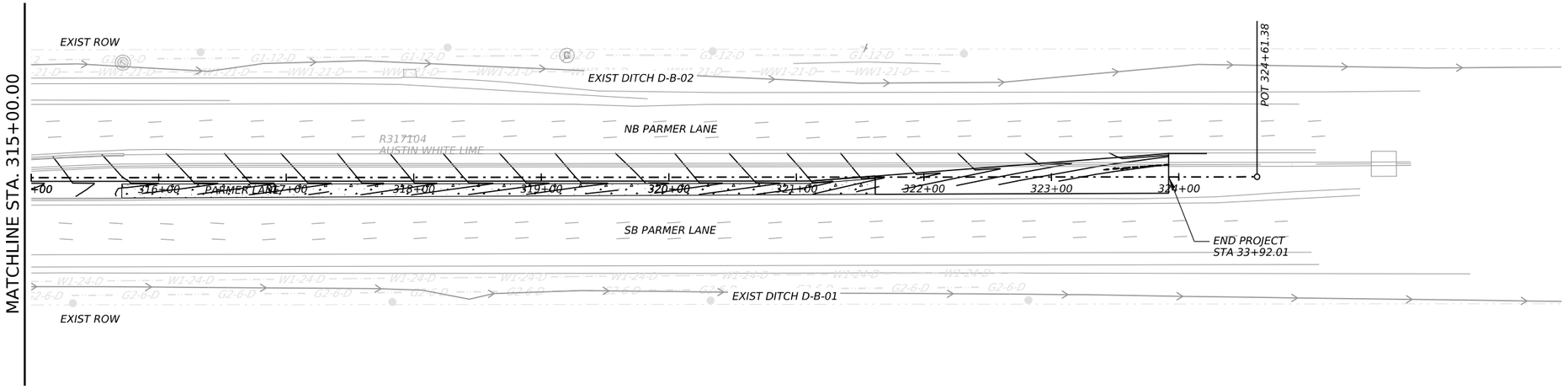
STA 303+00 TO STA 315+00

2025

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		101

DATE: 10/1/2025 10:36:39 AM
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LEGEND

RIGHT OF WAY	
DIRECTION OF FLOW	
SURVEY EXISTING CONTOUR	
ROADWAY CENTERLINE	
PROP DITCH CENTERLINE	
EXIST DITCH CENTERLINE	
INLET ID	A-01

NOTES:

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STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED PROFESSIONAL ENGINEER
9/30/2025

0 50 100
SCALE: H: 1"=100'

WILCO TEXAS

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TBPELS Firm Number 20690
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512.767.1009 | www.civil-edge.com

PARMER LANE AT SH45

DRAINAGE PLAN & PROFILE

STA 315+00 TO END

2025

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		102

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CK:
DW:
CK:
DW:

EXISTING EXTENDED DETENTION POND - EXISTING CONDITIONS

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	171.91	acres
Predevelopment impervious area within the limits of the plan * =	71.22	acres
Total post-development impervious area within the limits of the plan* =	72.58	acres
Total post-development impervious cover fraction * =	0.42	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	1181	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 3

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = C

Total drainage basin/outfall area =	159.00	acres
Predevelopment impervious area within drainage basin/outfall area =	63.30	acres
Post-development impervious area within drainage basin/outfall area =	63.30	acres
Post-development impervious fraction within drainage basin/outfall area =	0.40	
$L_{M\ THIS\ BASIN}$ =	0	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 75 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	159.00	acres
A_I =	63.30	acres
A_P =	95.70	acres
L_R =	53805	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 52837 lbs.

F = 0.98

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfal Depth =	3.40	inches
Post Development Runoff Coefficient =	0.31	
On-site Water Quality Volume =	600001	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	120000	
Total Capture Volume (required water quality volume(s) x 1.20) =	720001	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = 720001 cubic feet

EXISTING EXTENDED DETENTION POND - PROPOSED CONDITIONS

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	171.91	acres
Predevelopment impervious area within the limits of the plan * =	71.22	acres
Total post-development impervious area within the limits of the plan* =	72.58	acres
Total post-development impervious cover fraction * =	0.42	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	1181	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 3

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = C

Total drainage basin/outfall area =	161.10	acres
Predevelopment impervious area within drainage basin/outfall area =	63.30	acres
Post-development impervious area within drainage basin/outfall area =	64.91	acres
Post-development impervious fraction within drainage basin/outfall area =	0.40	
$L_{M\ THIS\ BASIN}$ =	1402	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 75 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	161.10	acres
A_I =	64.91	acres
A_P =	96.19	acres
L_R =	55149	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 54046 lbs.

F = 0.98

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfal Depth =	3.33	inches
Post Development Runoff Coefficient =	0.31	
On-site Water Quality Volume =	599999	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	120000	
Total Capture Volume (required water quality volume(s) x 1.20) =	719999	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = 719999 cubic feet

NOTES:

1. *REFER TO REPORT TITLED PARMER LANE AT SH 45 DRAINAGE & WATER QUALITY REPORT FOR DETAILED CALCULATIONS AND METHODOLOGY.*

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED PROFESSIONAL ENGINEER
9/30/2025

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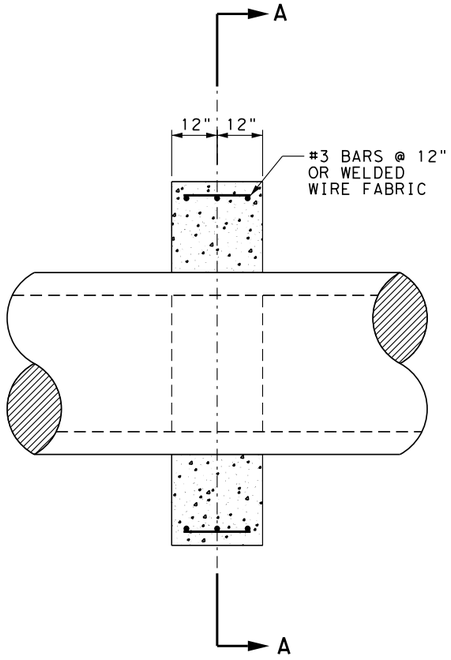
PARMER LANE AT SH45

WATER QUALITY CALCULATIONS

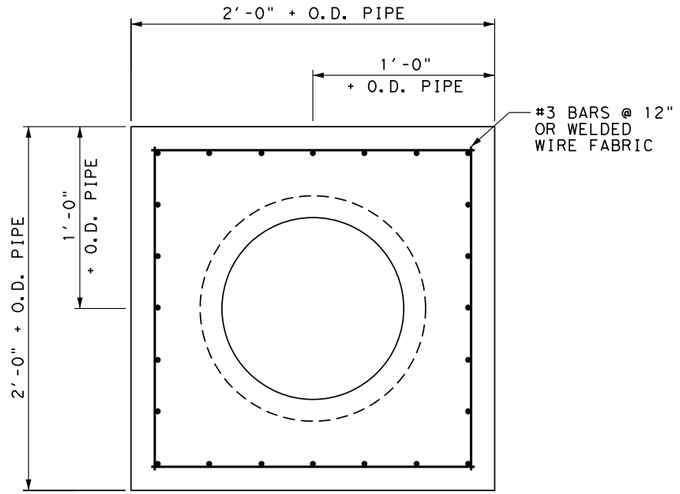
2025 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		103

DATE: 9/30/2025 9:33:43 PM
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CONNECTION TO EXISTING PIPE



SECTION A-A

* CONCRETE COLLAR IS SUBSIDIARY TO REINFORCED CONCRETE PIPE ITEM 464.

CONCRETE COLLAR DETAIL

STATE OF TEXAS
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124859
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9/30/2025

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PARMER LANE AT SH45

MISCELLANEOUS DRAINAGE DETAILS

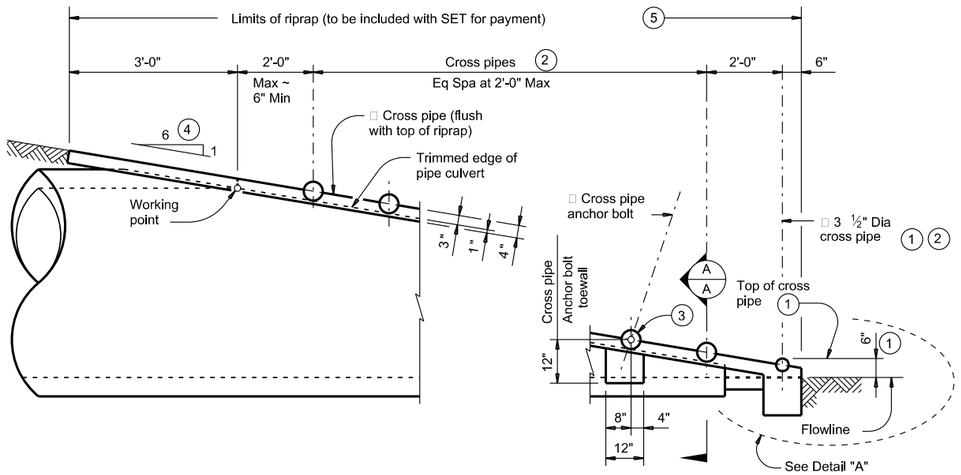
2024

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
	WILLIAMSON		104

DATE: 9/30/2025 9:33:57 PM
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SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details of corrugated metal pipe (CMP) culvert are similar. pipe runners not shown for clarity.)

CROSS PIPE LENGTHS AND REQUIRED PIPE SIZES 2

Corrugated Metal Pipe (CMP) Culverts

Design	Conc Riprap (CY) 6	Pipe Culvert Span	Pipe Culvert Rise	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
1	0.6	17"	13"	1' - 0"	N/A	2' - 8"	2' - 5"	3 or more pipe culverts	3" Std (3.500" O.D.)
2	0.7	21"	15"	1' - 2"	N/A	3' - 1"	2' - 11"		
3	0.9	28"	20"	1' - 5"	N/A	3' - 9"	3' - 9"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
4	1.0	35"	24"	1' - 8"	4' - 4"	4' - 6"	4' - 7"	All pipe culverts	4" Std (4.500" O.D.)
5	1.2	42"	29"	1' - 11"	4' - 11"	5' - 2"	5' - 5"		
6	1.4	49"	33"	2' - 2"	5' - 6"	5' - 11"	6' - 3"	All pipe culverts	5" Std (5.563" O.D.)
7	1.6	57"	38"	2' - 5"	6' - 2"	6' - 8"	7' - 2"		
8	1.8	64"	43"	2' - 10"	6' - 9"	7' - 6"	8' - 2"		
9	1.9	71"	47"	3' - 2"	7' - 4"	8' - 3"	9' - 1"		

Reinforced Concrete Pipe (RCP) Culverts

Design	Conc Riprap (CY) 6	Pipe Culvert Span	Pipe Culvert Rise	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
1	0.6	22"	13 ½"	1' - 0"	N/A	3' - 1"	2' - 10"	3 or more pipe culverts	3" Std (3.500" O.D.)
2	0.7	26"	15 ½"	1' - 2"	N/A	3' - 6"	3' - 4"		
3	0.9	28 ½"	18"	1' - 5"	N/A	3' - 10"	3' - 9 ½"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
4	1.0	36 ¼"	22 ½"	1' - 8"	4' - 5"	4' - 7"	4' - 8 ¼"	All pipe culverts	4" Std (4.500" O.D.)
5	1.2	43 ¾"	26 b"	1' - 11"	5' - 1"	5' - 4"	5' - 6 ¾"		
6	1.4	51 b"	31 Đ"	2' - 2"	5' - 8"	6' - 1"	6' - 5 ¼"	All pipe culverts	5" Std (5.563" O.D.)
7	1.6	58 ½"	36"	2' - 5"	6' - 4"	6' - 10"	7' - 3 ½"		
8	1.8	65"	40"	2' - 10"	6' - 10"	7' - 7"	8' - 3"		
9	1.9	73"	45"	3' - 2"	7' - 6"	8' - 5"	9' - 3"		

1. The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
2. Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.
3. Install the third Cross Pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
4. Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
5. Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap."
6. Quantities shown are for one end of one pipe culvert. For multiple Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

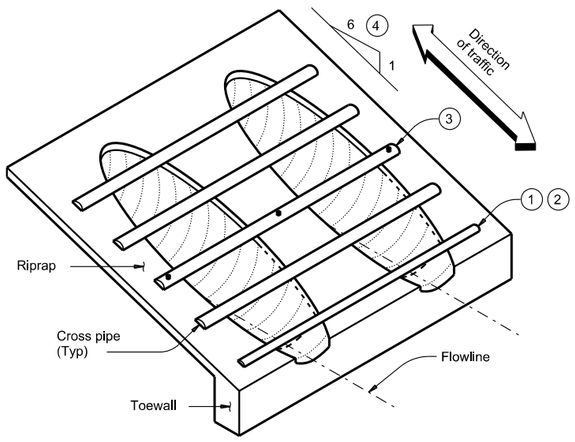
GENERAL NOTES:

Pipe runners are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

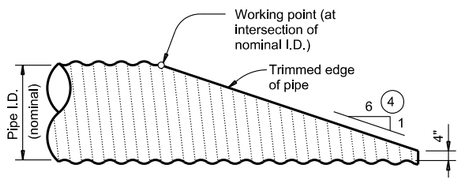
Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap."

Payment for riprap and toewall is included in the price bid for each safety end treatment.



ISOMETRIC VIEW OF TYPICAL INSTALLATION



NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT
FOR DESIGN 1 TO 9 ARCH PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

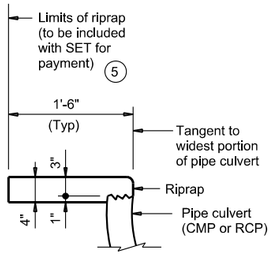
SETP-PD-A

FILE: CD-SETP-PDA-20.dgn	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		105

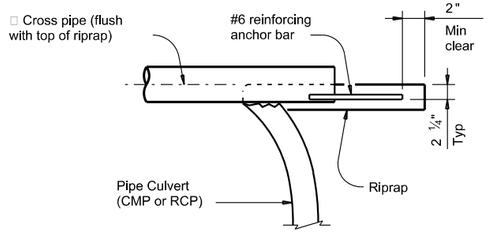
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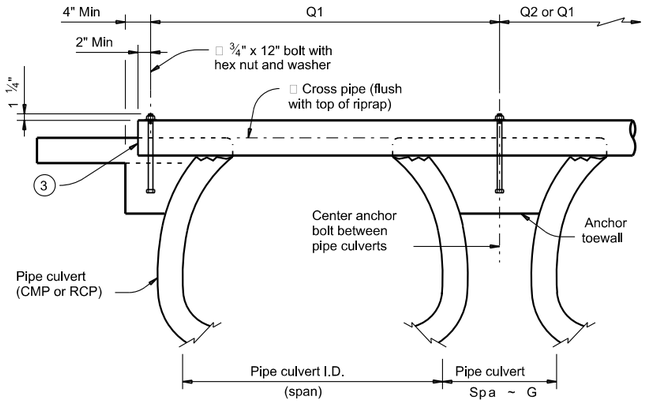
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SHOWING TYPICAL PIPE CULVERT AND RIPRAP

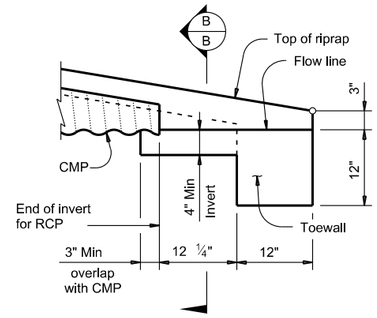


SHOWING CROSS PIPE WITH ANCHOR BAR



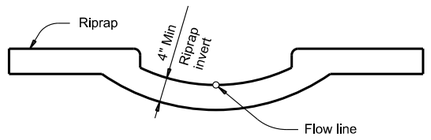
SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A



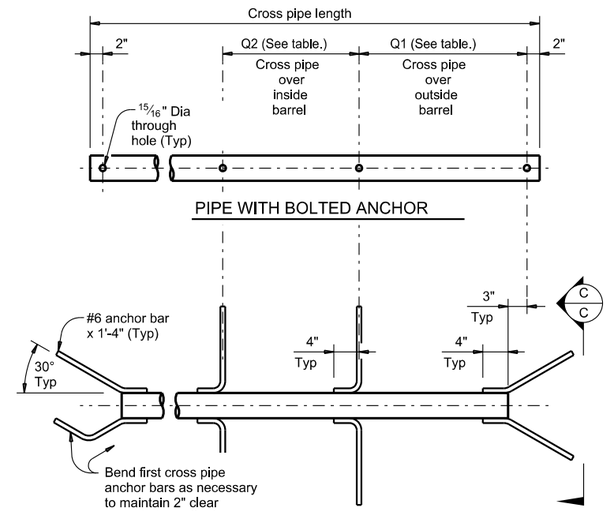
DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



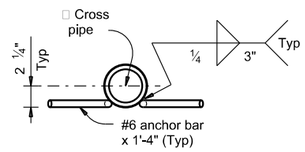
SECTION B-B

(Cross pipes not shown for clarity.)



PIPE WITH BOLTED ANCHOR

PIPE WITH ANCHOR BARS



SECTION C-C

CROSS PIPE DETAILS

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

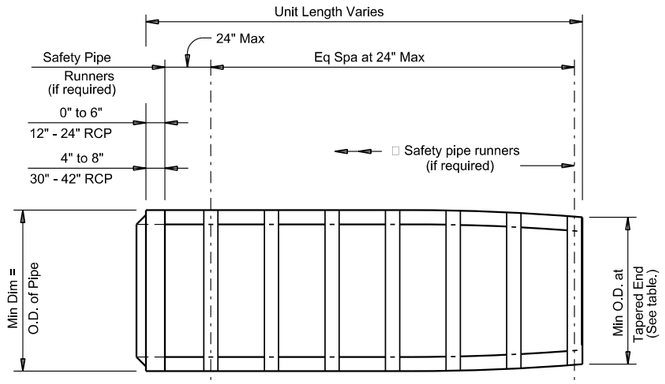
SAFETY END TREATMENT
FOR DESIGN 1 TO 9
ARCH PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD-A

FILE: CD-SETP-PDA-20.dgn	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		106

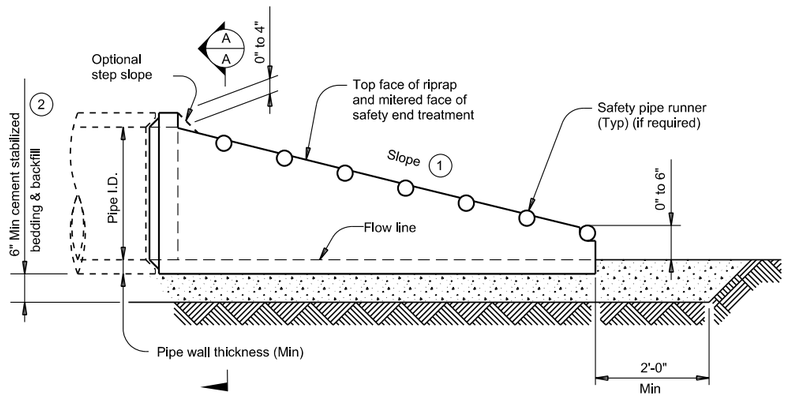
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PLAN VIEW - 12" THRU 24"

(Showing spigot end connection.)



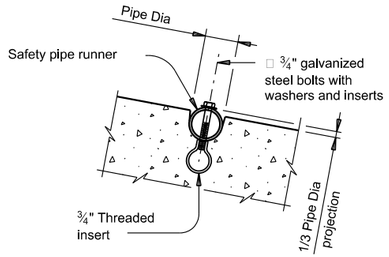
LONGITUDINAL ELEVATION - 12" THRU 24"

(Showing spigot end connection.)

1. Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.
2. Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures." Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment." When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
3. Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment."
4. Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
5. Safety pipe runners are required for multiple pipe culverts with more than two pipes.

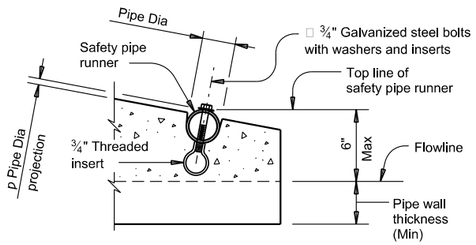
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4' - 0"	No	(5)	3" STD	3.500"	3.068"
15"	2 ¼"	19 ½"	19"	0.07 Circ.	6:1	5' - 8"	No	(5)	3" STD	3.500"	3.068"
18"	2 ½"	23"	21 ½"	0.07 Circ.	6:1	7' - 3"	No	(5)	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10' - 6"	No	(5)	3" STD	3.500"	3.068"
30"	3 ½"	37"	31"	0.18 Circ.	6:1	12' - 1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15' - 4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	51"	41 ½"	0.23 Ellip.	6:1	18' - 7"	Yes	Yes	4" STD	4.500"	4.026"

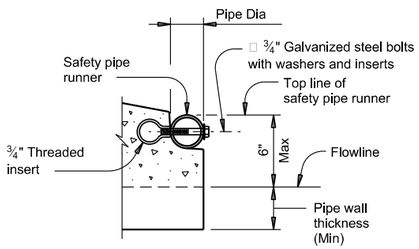


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



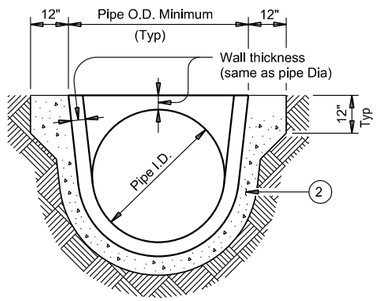
OPTION A



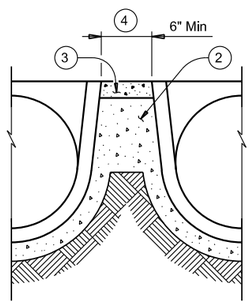
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



SECTION A-A



MULTIPLE PIPE INSTALLATION

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment."

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.

Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.

Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

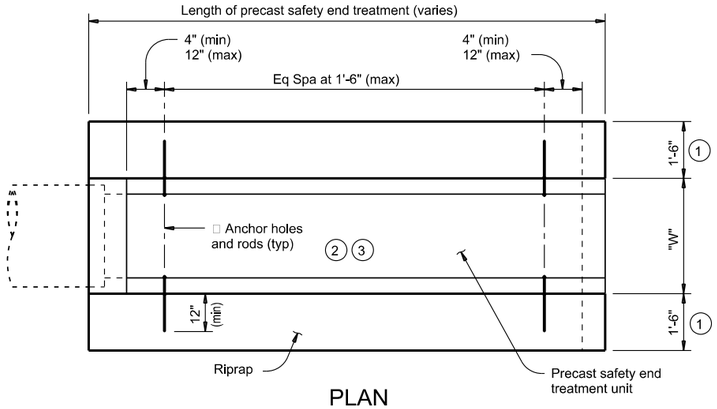
TYPE II ~ PARALLEL DRAINAGE

PSET-RP

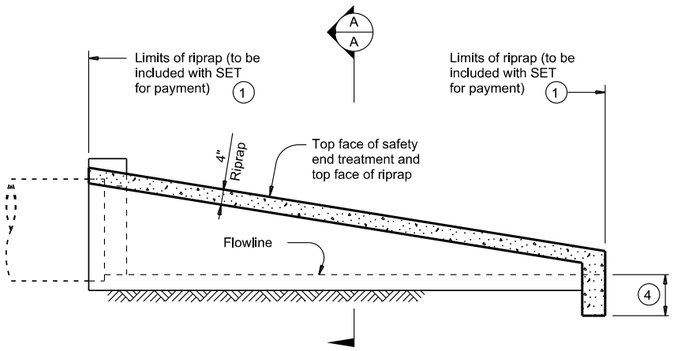
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©TxDOT February 2020		CONT	SECT	JOB		HIGHWAY	
REVISIONS		3417	02	040		PARMER LN	
		DIST	COUNTY				SHEET NO.
		AUS	WILLIAMSON				107

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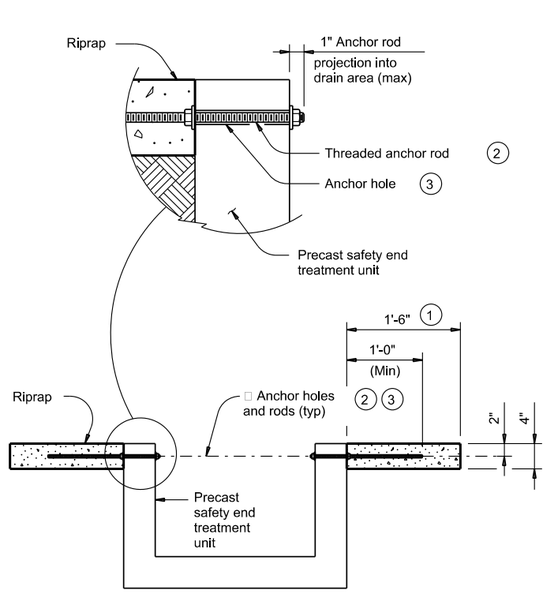
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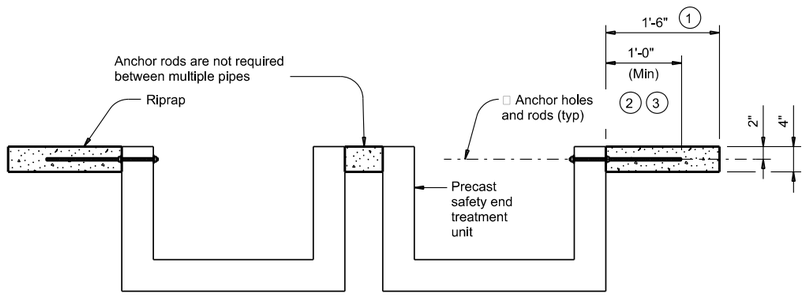


PLAN



LONGITUDINAL ELEVATION





MULTIPLE PIPE INSTALLATION

SINGLE PIPE INSTALLATION

SECTION A-A

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY)

5

Nominal Culvert (Pipe) I.D.	PSET-SC and PSET-SP Standards				PSET-RC and PSET-RP Standards			
	Unit Width "W"	Side Slope			Unit Width "W"	Side Slope		
		3:1	4:1	6:1		3:1	4:1	6:1
12"	23.0"	0.1	0.2	0.2	16.0"	0.1	0.1	0.2
15"	26.5"	0.2	0.2	0.3	19.5"	0.1	0.2	0.2
18"	30.0"	0.2	0.2	0.3	23.0"	0.2	0.2	0.3
24"	37.0"	0.3	0.3	0.5	30.0"	0.2	0.3	0.4
30"	44.5"	0.3	0.4	0.6	37.0"	0.3	0.3	0.5
36"	51.5"	0.4	0.5	0.7	44.0"	0.3	0.4	0.6
42"	58.5"	0.5	0.6	0.8	51.0"	0.4	0.5	0.7

(1) Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap." When riprap is cast integrally with the precast safety end treatment, this dimension is 1'-0" minimum.

(2) 1#2" Dia ASTM A307 Gr A threaded anchor rod with 2 nuts and 2 washers. Galvanize all components in accordance with Item 445, "Galvanizing." Repair galvanizing that is damaged during transport or construction in accordance with the specifications.

(3) 3#4" through holes in walls of safety end treatment for riprap anchor rods may be drilled with rotary (coring or masonry) type drilling equipment or may be formed. Do not use percussive (star) type drilling equipment. If holes are drilled, patch spalls in the inside face of the wall exceeding 1#2" from the holes.

(4) Provide riprap toe wall when dimension is shown elsewhere in the plans or when field conditions require a toe wall.

(5) Quantities shown are for one end of one reinforced concrete pipe culvert. For multiple pipe culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only. Quantities are based on the minimum unit lengths shown on the Precast Saftey End Treatment (SET) standard sheets.

MATERIAL NOTES:

Provide Class "B" riprap in accordance with Item 432, "Riprap." Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. The anchor rods shown are always required.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment."

Refer to PSET-SC or PSET-SP standard sheets for details of square safety end treatments not shown. Refer to PSET-RC or PSET-RP standard sheets for details of round safety end treatments not shown.

For precast units with integrally cast riprap, substitute reinforcing steel in the amount on 0.26 in./ft. minimum for the threaded anchor rods shown. When requested, submit sealed engineering drawings for approval prior to construction. Shop drawings will not be required. Note that a proprietary precast unit with integral riprap is available from L&R Precast Concrete Works, Inc. (956) 583-6293 or www.lrprecast.com.

Payment for riprap and toewalls is included in the price bid for each safety end treatment.

These riprap details are only applicable when notes that require placement of riprap with precast safety end treatments are shown elsewhere in the plans.

Precast units with integrally cast riprap are permitted unless noted otherwise on the plans.

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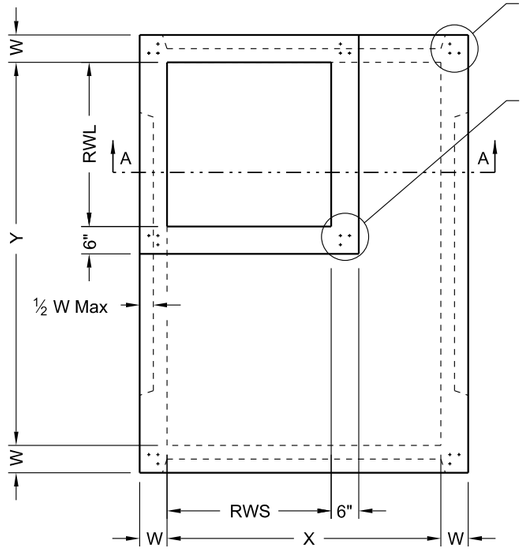
Bridge Division Standard

PRECAST SAFETY END TREATMENT
TYPE II
RIPRAP DETAILS
PSET-RR

FILE: CD-PSET-RR-20.dgn	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF	
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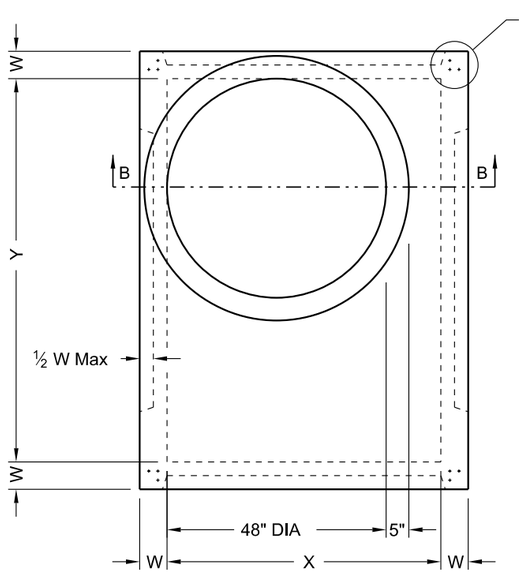
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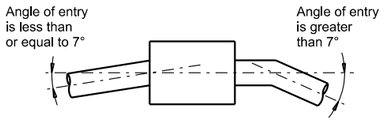
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



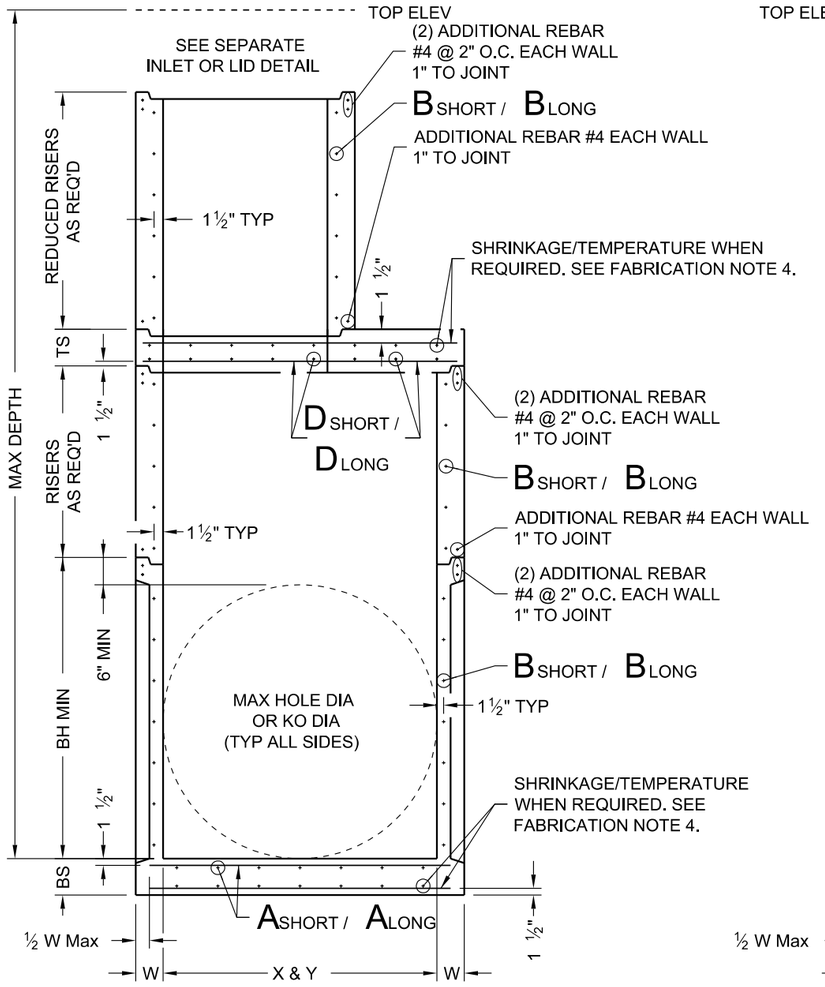
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



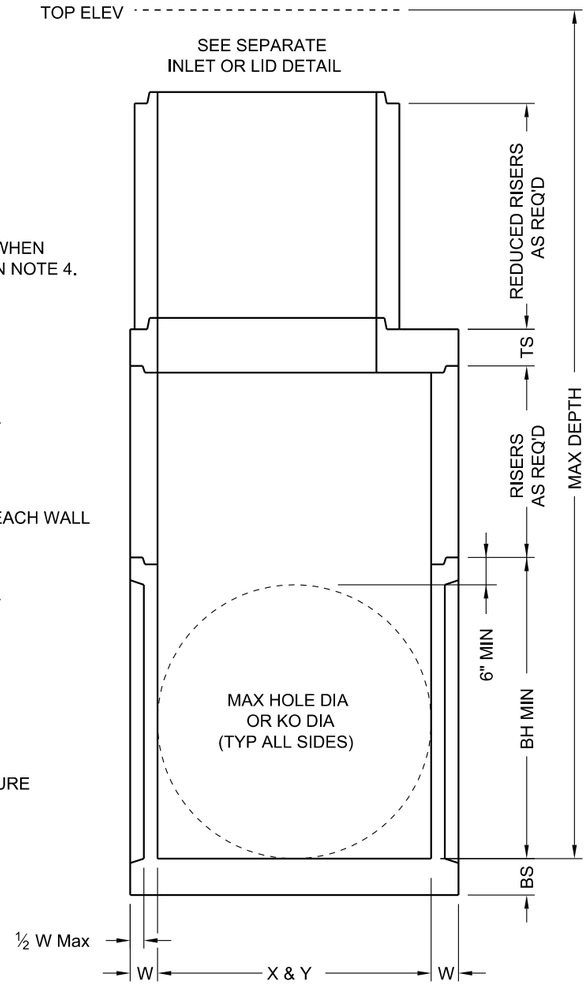
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall.
If necessary, use pipe elbow or curved approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE: CD-PB-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		109

	Size	MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB										Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)						
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

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Texas Department of Transportation

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DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

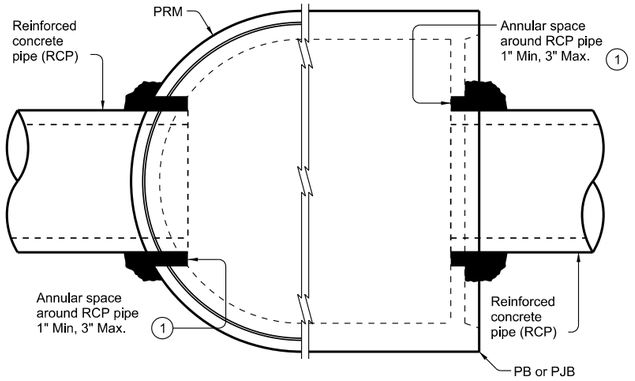
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REVISIONS	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		110

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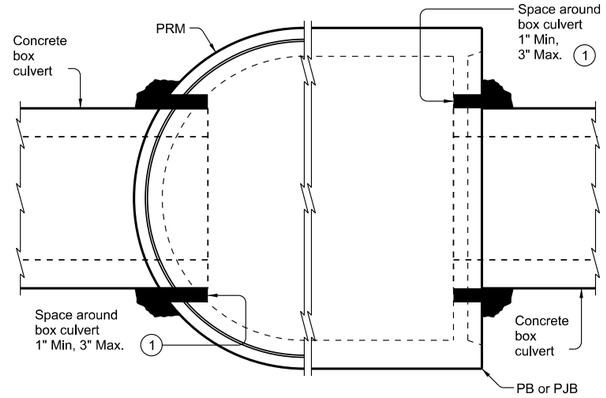
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PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

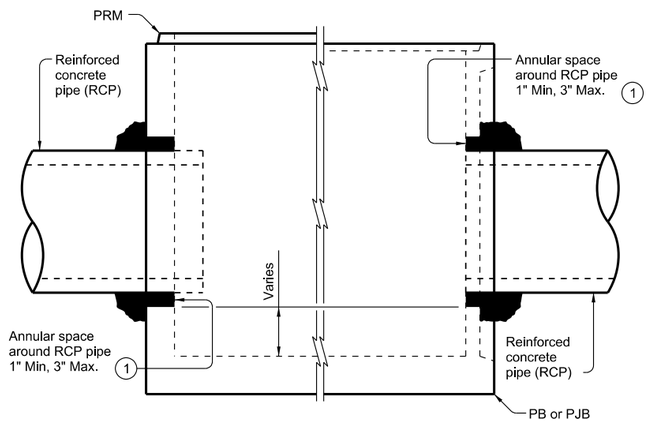
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

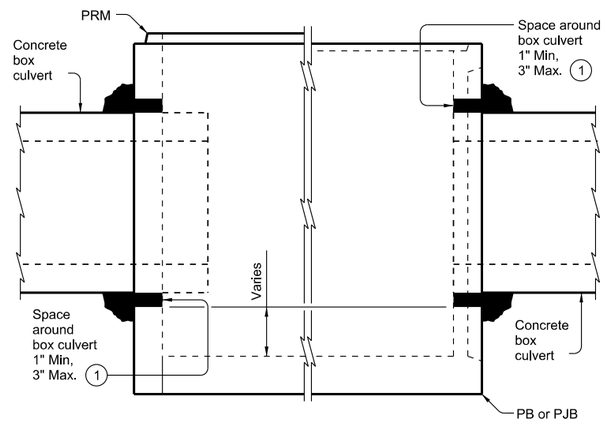
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

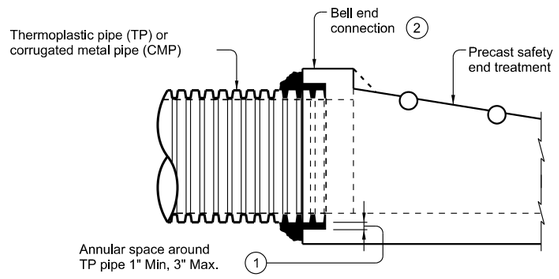
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application."

(2) For thermoplastic pipe, do not use bell or spigot for grouted connections. Remove the bell or spigot from the pipe by cutting between two exterior corrugations of the pipe before connecting and grouting the thermoplastic pipe to the structure.

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675, "Cementitious Grouts and Mortars for Miscellaneous Application."

GENERAL NOTES:

See applicable standards for notes and details not shown:
- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462, "Concrete Box Culverts and Drains."

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464, "Reinforced Concrete Pipe."

Provide Thermoplastic Pipe (TP) in accordance with Item 468, "Thermoplastic Pipe Culverts and Drains".

Payment for grouted connections is considered subsidiary to other bid items.

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Bridge Division Standard

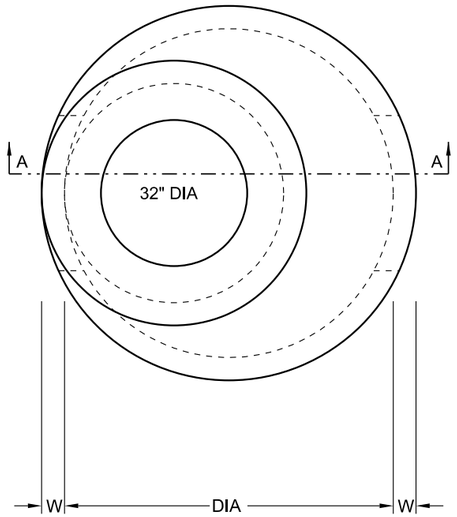
PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

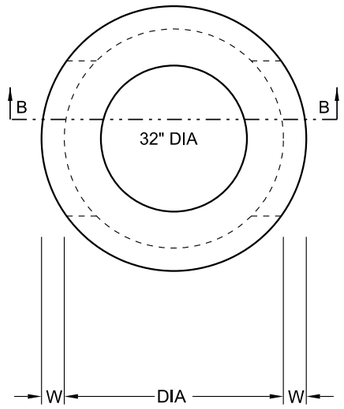
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©TxDOT February 2020	CONT	SECT	JOB		HIGHWAY		
REVISIONS	3417	02	040		PARMER LN		
06-2024: Updated notes.	DIST	COUNTY				SHEET NO.	
	AUS	WILLIAMSON				111	

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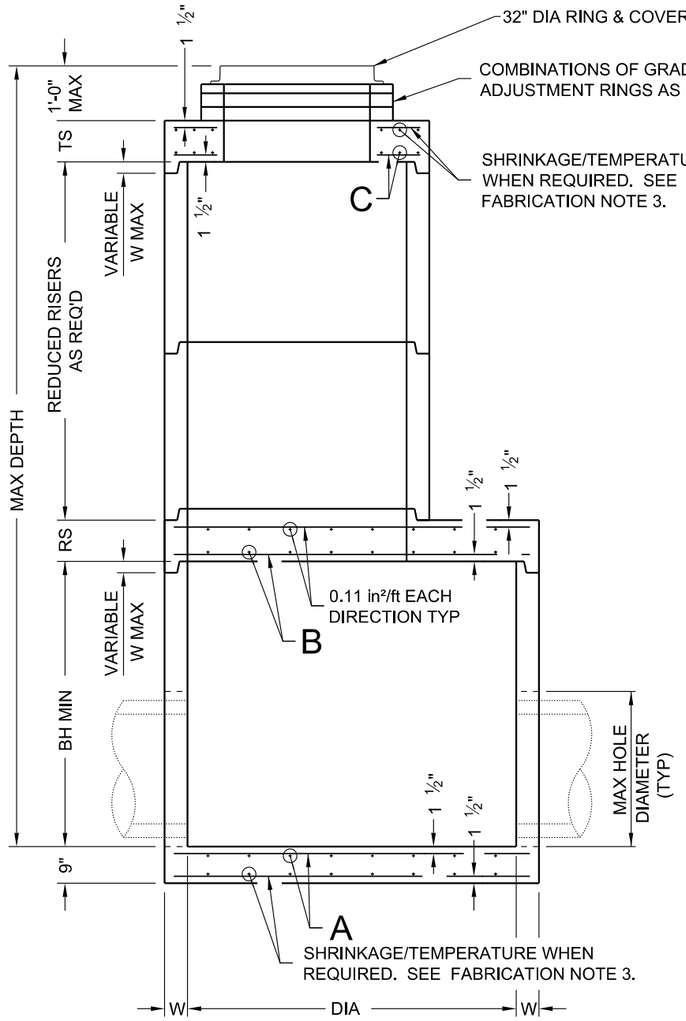
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PLAN VIEW "A"

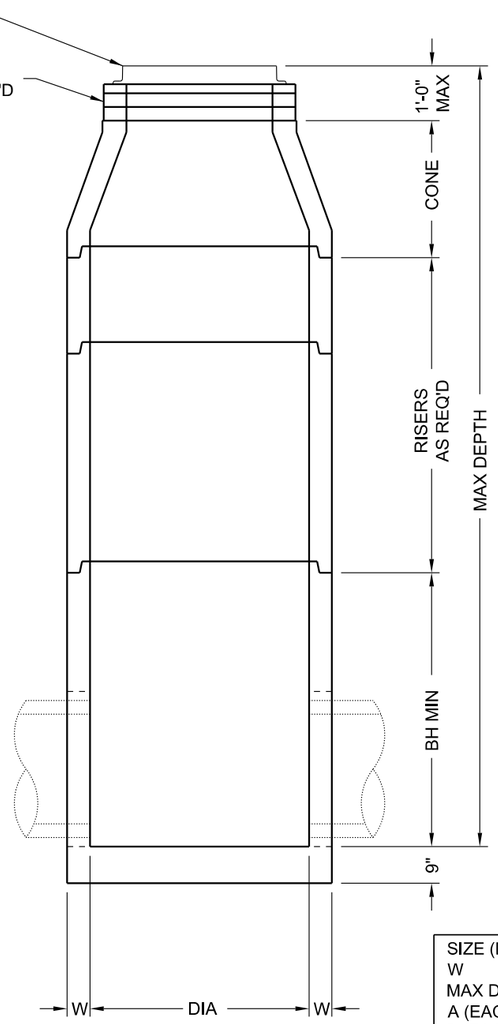


PLAN VIEW "B"



SECTION A-A

ROUND REDUCED RISER OPTION
SHOWING FLAT SLAB TOP



SECTION B-B

ROUND RISER OPTION
SHOWING CONE

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR. Provide circumferential reinforcing steel in vertical walls of base, riser and cone in accordance with ASTM C478.
3. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
4. Manufacture base and risers to nearest 3" increment.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.
7. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

INSTALLATION NOTES:

1. Cones may be concentric or eccentric. Reduction cones are acceptable. See Manufacturer for cone dimensions.
2. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to this item.
3. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
4. Do not grout rubber gasket joints without Manufacturer's recommendation.
5. Initial installation of grade adjustment rings is limited to 1'-0" Max as shown.
6. Grade adjustment rings may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments may be made up to the Max depth shown. Structure must be evaluated if Max depth will be exceeded.

GENERAL NOTES:

1. Designed according to ASTM C478.
2. Payment for manhole is per Item 465, "Junction Boxes, Manholes, and Inlets" by type and size.
3. Pipe OD + placement tolerance must be equal or less than Max hole diameter. For rigid pipe, placement tolerance is 4" Max, 2" Min. For flexible pipe, consult boot/seal manufacturer's specification for placement tolerance.

Cover dimensions are clear dimensions, unless noted otherwise.

SIZE (DIA)	48 in	60 in	72 in
W	5 in	6 in	7 in
MAX DEPTH	25 ft	25 ft	25 ft
A (EACH WAY)	0.22 in²/ft	0.30 in²/ft	0.45 in²/ft
B (EACH WAY)	N/A	0.37 in²/ft	0.62 in²/ft
C (EACH WAY)	0.24 in²/ft	0.46 in²/ft	0.46 in²/ft
BH MIN	12 in	36 in	36 in
TS	9 in	9 in	9 in
RS	N/A	9 in	12 in
REDUCED RISER DIA	N/A	48 in	48/60 in
MAX HOLE DIA	32 in	40 in	54 in

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

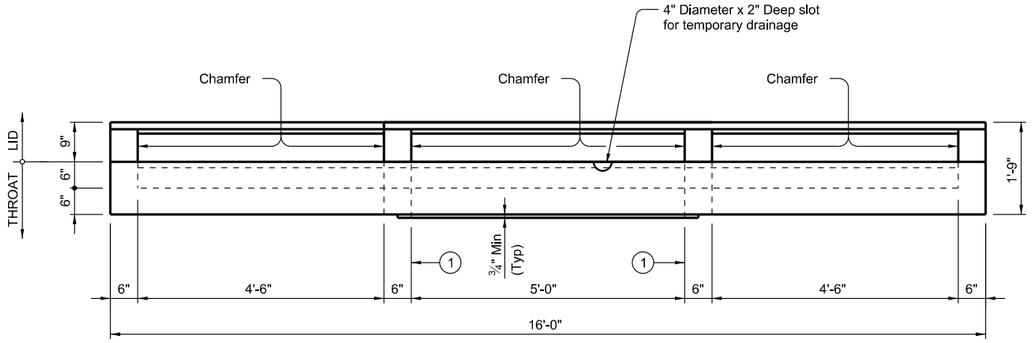
PRECAST ROUND MANHOLE

PRM

FILE: CD-PRM-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 3/2023 ~ Corrected TS and RS callout	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		112

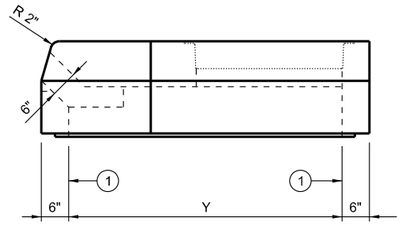
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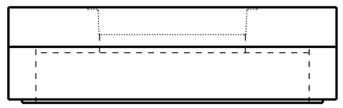


FRONT VIEW

(Showning left and right extensions)

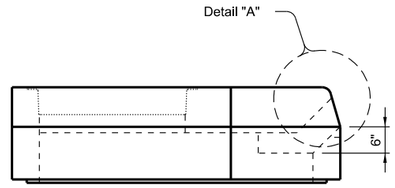


RIGHT VIEW

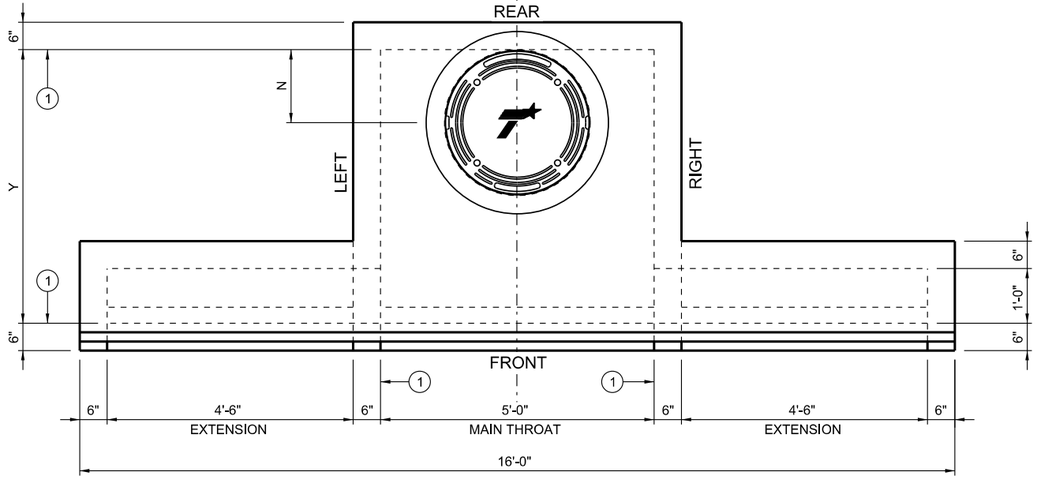


REAR VIEW

(Extensions not shown)



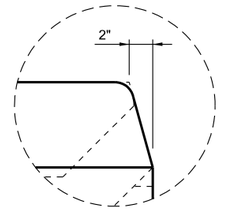
LEFT VIEW



PLAN VIEW

(Showning left and right extensions)

1. Matches inside face of wall of precast base or riser below inlet.
2. Reference point is located where the ℄ of the main throat intersects the normal gutter line. See Curb and Gutter Transition Details for PCO Inlet (CGT-PCO) standard for more information.



DETAIL "A"

HS20 LOADING

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

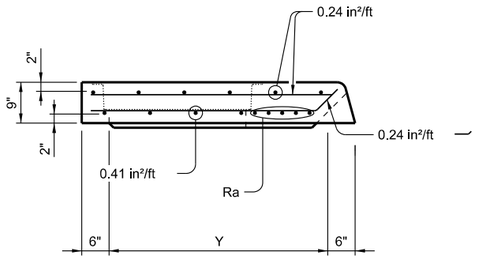
PRECAST CURB INLET OUTSIDE ROADWAY

PCO

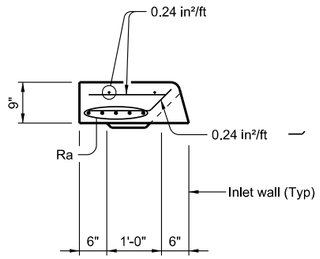
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	PARMER LN
06-2023: Added reference point.	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		113

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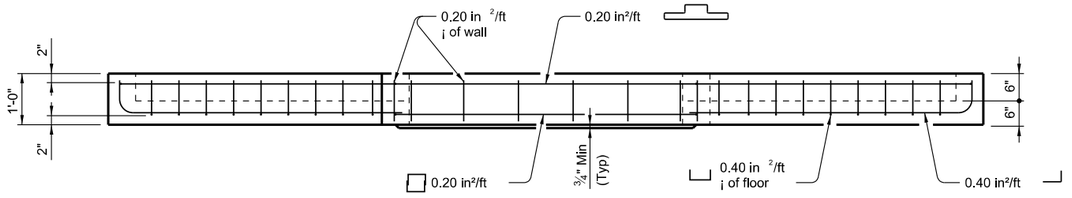
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LID SECTION A-A

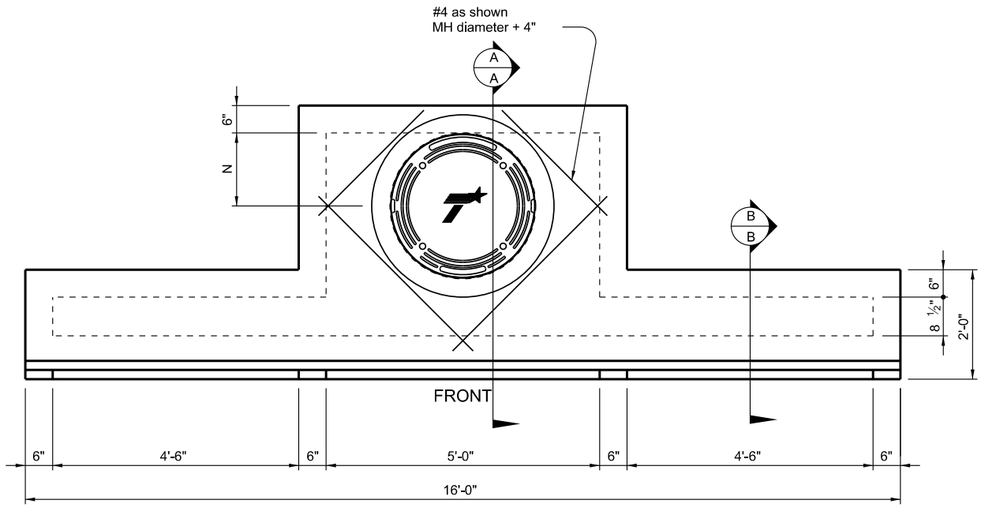


LID SECTION B-B



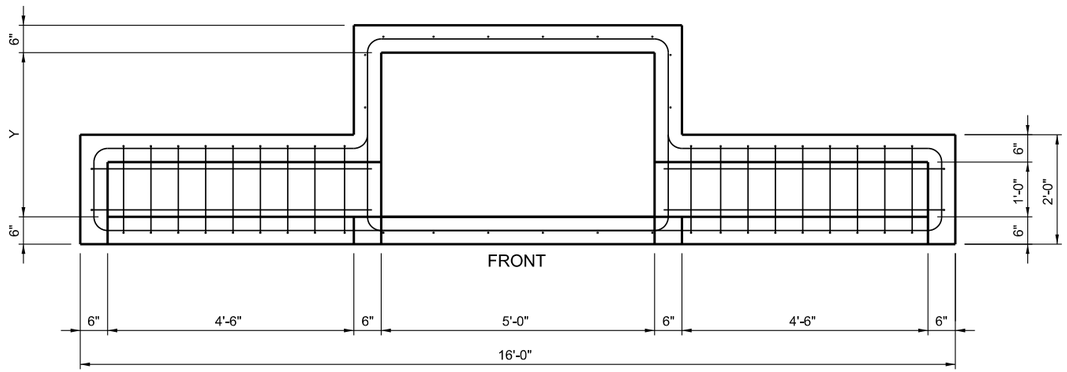
THROAT ELEVATION VIEW

(Showning left and right extensions)



LID PLAN VIEW

(Showning left and right extensions)



THROAT PLAN VIEW

(Showning left and right extensions)

Size (Y)	N	MH Dia*	Ra
3'	9"	18"	(4) #5 Additional
4'	16"	32"	(4) #5 Additional
5'	16"	32"	(4) #5 Additional
6'	16"	32"	(4) #5 Additional

*Nominal ring and cover size.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in the plans.
4. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Lid may employ a butt joint with dowels at the Contractor's option.
5. Provide lifting devices in conformance with Manufacturer's recommendations.
6. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.
7. Chamfer vertical edges of inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
2. Seal tongue and groove joints and butt joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Open area of main throat = 360 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.

Cover dimensions are clear dimensions, unless noted otherwise.

HS20 LOADING

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

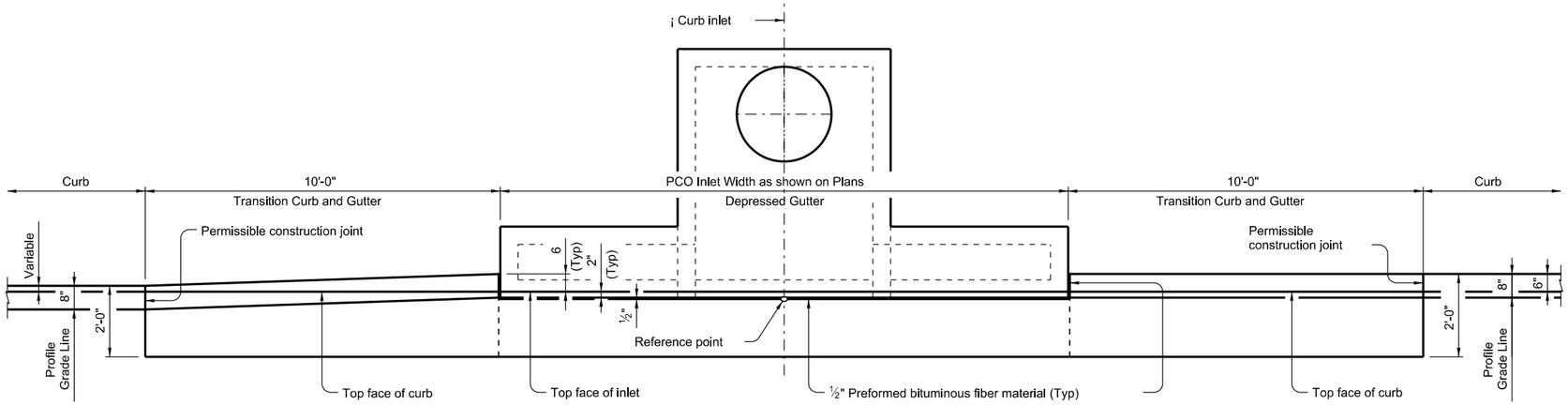
PRECAST CURB INLET OUTSIDE ROADWAY

PCO

FILE: CD-PCO-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	PARMER LN
06-2023: Added reference point.	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		114

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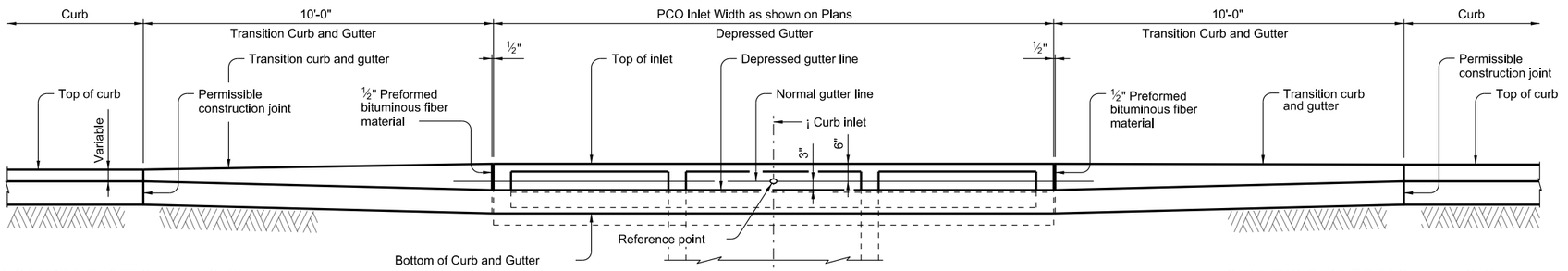
DATE:
FILE:



SHOWING TYPE **I**, IIa & III Curb and Gutter

SHOWING TYPE **II** & **IV** Curb and Gutter

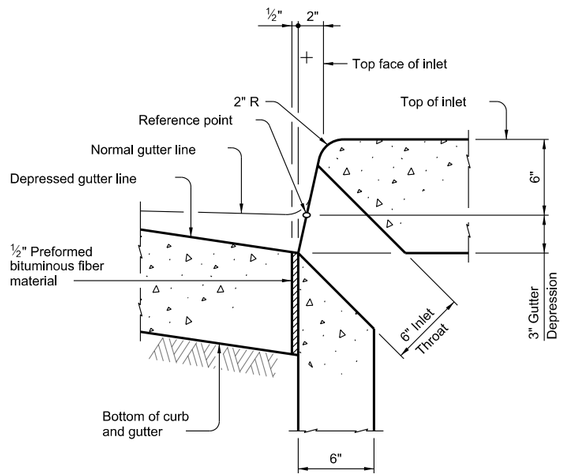
PLAN



SHOWING TYPE **I**, IIa & III Curb and Gutter

SHOWING TYPE **II** & **IV** Curb and Gutter

ELEVATION



SECTION AT GUTTER AND INLET

(Reinforcing steel not shown for clarity.)

CONSTRUCTION NOTES:
Align top face of curb with PCO Inlet as shown.

MATERIAL NOTES:
Provide ½" preformed bituminous fiber material.

GENERAL NOTES:
Reference point is located where the ¡ of the main throat intersects the normal gutter line.
See Precast Curb Inlet Outside Roadway (PCO) standard for details and notes not shown.
See Concrete Curb and Curb and Gutter (CCCG-22) standard for details and notes not shown.
Curb and Gutter Transitions is paid for and in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
Preformed bituminous fiber material is subsidiary to PCO Inlet.

Texas Department of Transportation

Bridge Division Standard

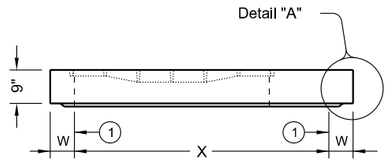
CURB AND GUTTER TRANSITION DETAILS FOR PCO INLET

CGT-PCO

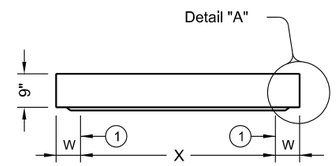
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©TxDOT February 2020	CONT	SECT	JOB		HIGHWAY		
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	AUS	WILLIAMSON			115		

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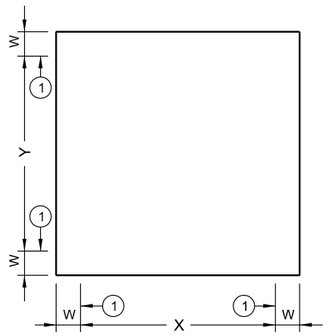
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STYLE 'FG'



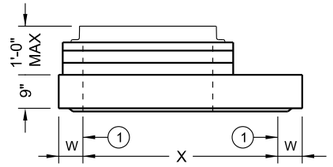
ELEVATION VIEW



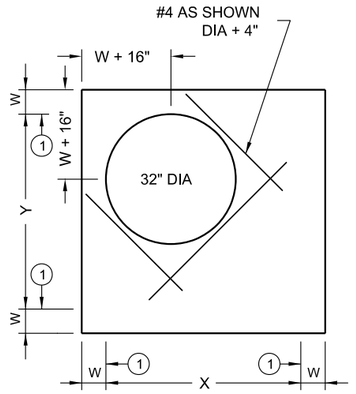
PLAN VIEW

NO OPENINGS

STYLE 'SL'



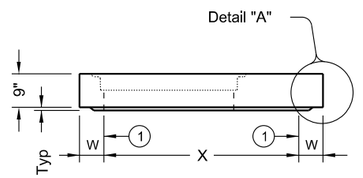
ELEVATION VIEW



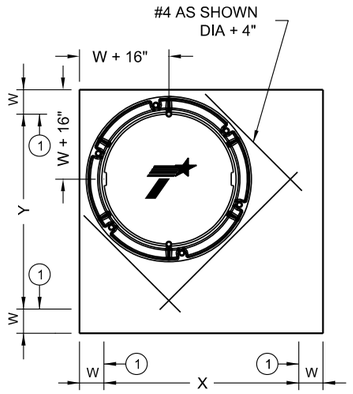
PLAN VIEW

SHIP LOOSE RING & COVER

STYLE 'RH'



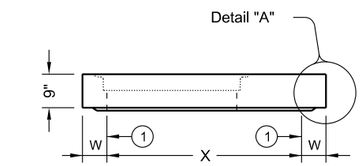
ELEVATION VIEW



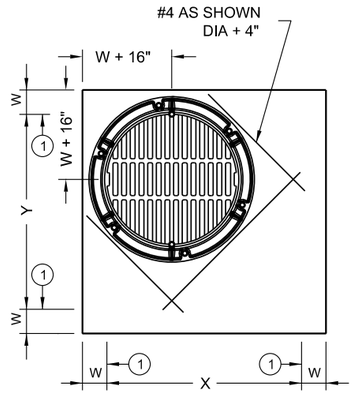
PLAN VIEW

32" DIA CAST-IN RING & COVER

STYLE 'RC'



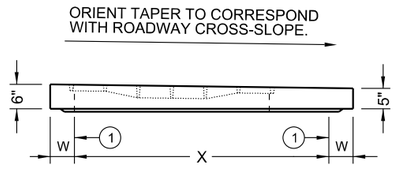
ELEVATION VIEW



PLAN VIEW

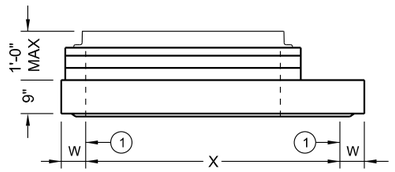
32" DIA CAST-IN RING & GRATE

STYLE 'RG'

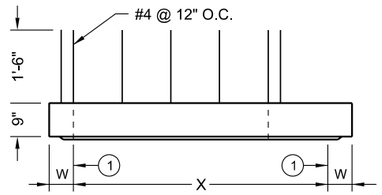


STYLE 'SFG'

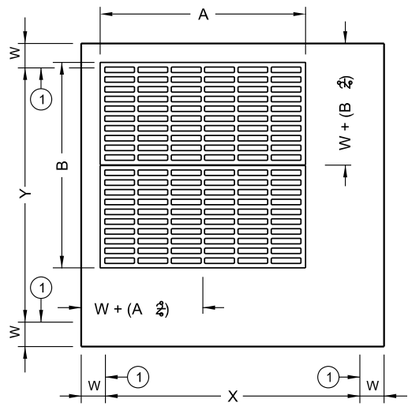
ELEVATION VIEW



ELEVATION VIEW



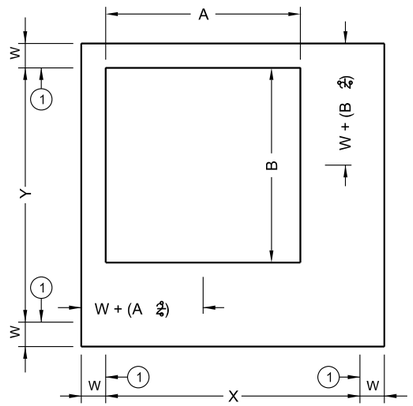
ELEVATION VIEW



PLAN VIEW

CAST-IN FRAME & GRATE

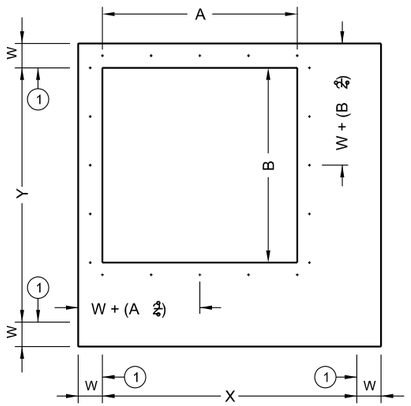
STYLES 'FG' & 'SFG'



PLAN VIEW

SHIP LOOSE FRAME & GRATE

STYLE 'SH'



PLAN VIEW

EXPOSED REBAR

STYLE 'S1'

(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

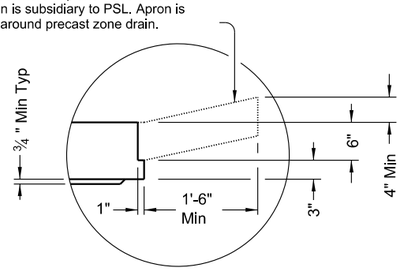
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	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		116

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Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in□/ft	0.37 in□/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in□/ft	0.37 in□/ft
SFG	3'x3'	6"	3'x3'	0.32 in□/ft	0.32 in□/ft
SL	4'x4'	6"	n/a	0.34 in□/ft	0.34 in□/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in□/ft	0.41 in□/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in□/ft	0.41 in□/ft
SFG	4'x4'	6"	4'x4'	0.32 in□/ft	0.32 in□/ft
SL	3'x5'	6"	n/a	0.39 in□/ft	0.39 in□/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in□/ft	0.48 in□/ft
SFG	3'x5'	6"	3'x5'	0.32 in□/ft	0.32 in□/ft
SL	4'x5'	6"	n/a	0.42 in□/ft	0.42 in□/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in□/ft	0.42 in□/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in□/ft	0.66 in□/ft
SL	5'x5'	6"	n/a	0.36 in□/ft	0.36 in□/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in□/ft	0.43 in□/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in□/ft	0.63 in□/ft
SL	5'x6'	6"/8"	n/a	0.48 in□/ft	0.48 in□/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in□/ft	0.60 in□/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in□/ft	0.60 in□/ft
SL	6'x6'	6"/8"	n/a	0.43 in□/ft	0.43 in□/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in□/ft	0.59 in□/ft
SL	8'x8'	8"/10"	n/a	0.45 in□/ft	0.45 in□/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in□/ft	0.45 in□/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: CD-PSL-20.dgn	DN: TxDOT		CK: TxDOT	DW: TxDOT		CK: TxDOT	
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REVISIONS	3417	02	040		PARMER LN		
	DIST	COUNTY				SHEET NO.	
	AUS	WILLIAMSON				117	

DATE:
FILE:

100% SUBMITTAL

CK
DW
CK
DW

RAIL CROSSING
MP 75.69
(30.4790327, -97.7659199)
DOT #914513A

RAIL CROSSING
MP 75.72
DOT #914512T

BEGIN PROJECT
STA 295+35.00

EXIST ROW

℄ FM 734

NB PARMER LANE

SB PARMER LANE

292+00 293+00 294+00 295+00 296+00 297+00 298+00 299+00 300+00 301+00 302+00

CAPMETRO ROW
CAPMETRO
CAPMETRO ROW
CAPMETRO ROW
CAPMETRO
CAPMETRO ROW

B-PV-01

MATCHLINE STA. 303+00.00

PROP 12" HDPE BORE
BEGIN STA 294+58.15
END STA 302+40.52

PROP 18" STEEL ENCASEMENT
BEGIN STA 294+82.26
END STA 302+36.84

PROP GAS LINE (ATMOS)

1A

1B

CONTRACTOR TO CALL 811 FOR UTILITY LOCATION SERVICES BEFORE THEY START DIGGING IN THE AREA.

CALL FOR GFIBER FIELD REPRESNTATIVE TO BE ONSIDE FOR MONITORING AND POTENTIAL EMERGENCY REPAIRS WHENEVER WORKING AROUND THE GFIBER FACILITIES.
PRIMARY = BRUCE HERNANDEZ | 512/363-2175 | HERNANDEZBRUCE@GOOGLE.COM
SECONDARY = DUSTIN NORRELL | 512-287-1431 | NORRELL@GOOGLE.COM

CONTACT THE GFIBER NETWORK OPERATIONS CENTER (NOC) BEFORE HANDLING ACTIVE FIBER CABLES, OR IN THE CASE OF DAMAGE TO THE GFIBER SYSTEM.
GFiber NOC | 866-954-1572 | GFIBER-NOC@GOOGLE.COM

LEGEND

- EXIST. ROW
- EXIST. WATER
- EXIST. WATER METER
- EXIST. WASTEWATER
- EXIST. SANITARY MANHOLE
- EXIST. 40' ILLUMINATION POLE
- EXIST. ELECTRIC
- EXIST. ELECTRIC CONDUIT BORE
- EXIST. ELECTRIC GRID BOX
- EXIST. POWER POLE
- EXIST. ELECTRIC MANHOLE
- EXIST. GAS
- PROP 12" HDPE BORE (ATMOS)
- PROP 18" STEEL ENCASEMENT (ATMOS)
- 6' ABAND PIPE (ATMOS)
- PROP 12" VALVE (ATMOS)
- PROP 12" PIPE (ATMOS)
- EXIST. GAS ENCASEMENT
- EXIST. TELEPHONE
- EXIST. FIBER OPTICS
- EXIST. UTILITY POLE
- EXIST. TELEPHONE MANHOLE

NOTE:
1- EXISTING UTILITIES ARE BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS PRIOR TO BEGINNING CONSTRUCTION.

2- THE UTILITIES SHOWN ARE FOR INFORMATION ONLY AND HAVE BEEN COLLECTED FROM AVAILABLE SURVEY RESOURCES, COBB FENDLEY AND ATMOS UTILITIES.

0 50 100
SCALE IN FEET
1" = 100' HORZ

MATCHLINE STA. 303+00.00

EXIST ROW

POWER SOURCE (AE)

℄ FM 734

℄ WBFR

℄ EBFR

SH 45

NB PARMER LANE

SB PARMER LANE

S21°42'13.0"E

304+00 305+00 306+00 307+00 308+00 309+00 310+00 311+00 312+00 313+00 314+00

1007+00 1006+00 1005+00 1004+00 1003+00

2007+00 2006+00 2005+00 2004+00 2003+00

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

PROP 12" HDPE BORE
BEGIN STA 303+83.79
END STA 305+98.39

PROP GAS LINE (ATMOS)

EBFR

WBFR

MATCHLINE STA. 315+00.00

WILCO TEXAS

benesch

TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
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PARMER LANE

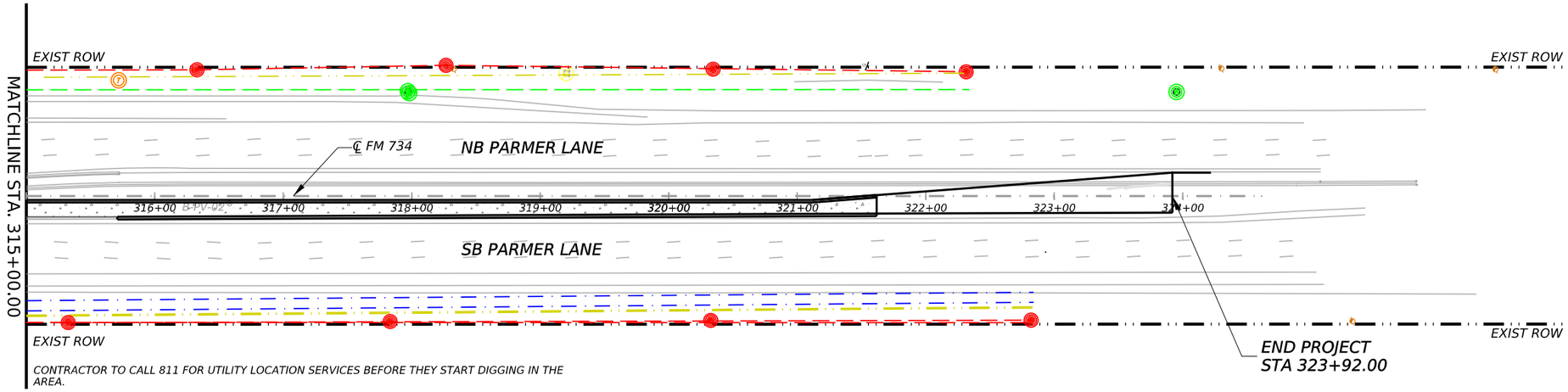
UTILITY PLAN

2025 SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		118

DATE: 11/6/2025 10:55:26 AM
FILE: c:\pwworkdir\benesch projects\projects\d0215421110 Parmer Lane UTILITY01.dgn

100% SUBMITTAL



CONTRACTOR TO CALL 811 FOR UTILITY LOCATION SERVICES BEFORE THEY START DIGGING IN THE AREA.

CALL FOR GFIBER FIELD REPRESNTATIVE TO BE ONSIDE FOR MONITORING AND POTENTIAL EMERGENCY REPAIRS WHENEVER WORKING AROUND THE GFIBER FACILITIES.
PRIMARY = BRUCE HERNANDEZ | 512/363-2175 | HERNANDEZBRUCE@GOOGLE.COM
SECONDARY = DUSTIN NORRELL | 512-287-1431 | NORRELL@GOOGLE.COM

CONTACT THE GFIBER NETWORK OPERATIONS CENTER (NOC) BEFORE HANDLING ACTIVE FIBER CABLES, OR IN THE CASE OF DAMAGE TO THE GFIBER SYSTEM.
GFiber NOC | 866-954-1572 | GFIBER-NOC@GOOGLE.COM

LEGEND

- EXIST. ROW
- EXIST. WATER
- EXIST. WATER METER
- EXIST. WASTEWATER
- EXIST. SANITARY MANHOLE
- EXIST. 40' ILLUMINATION POLE
- EXIST. ELECTRIC
- EXIST. ELECTRIC CONDUIT BORE
- EXIST. ELECTRIC GRID BOX
- EXIST. POWER POLE
- EXIST. ELECTRIC MANHOLE
- EXIST. GAS
- PROP 12" HDPE BORE (ATMOS)
- PROP 18" STEEL ENCASEMENT (ATMOS)
- 6' ABAND PIPE (ATMOS)
- PROP 12" VALVE (ATMOS)
- PROP 12" PIPE (ATMOS)
- EXIST. GAS ENCASEMENT
- EXIST. TELEPHONE
- EXIST. FIBER OPTICS
- EXIST. UTILITY POLE
- EXIST. TELEPHONE MANHOLE

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0 50 100
SCALE IN FEET
1" = 100' HORZ

CONFLICT ID	UTILITY NAME	UTILITY OWNER	UTILITY TYPE	START STATION	END STATION	CONFLICT DESCRIPTION
1A	EXIST. 8" GAS LINE	ATMOS	GAS	STA 302+05.39, 86.19'RT	STA 302+26.02, 86.10' RT	Gas line in conflict with SUP.
1B	EXIST. GAS LINE - UNKNOWN SIZE	TEXAS GAS SERVICES	GAS	STA 302+12.25, 88.16' RT	STA 302+33.16, 88.07' RT	Gas line in conflict with SUP.
2	EXIST. FIRE HYDRANT	CITY OF AUSTIN	RECLAIMED WATER	STA 304+41.35, 98.77' RT	-	Fire hydrant in conflict with sidewalk.
3	EXIST. TELEPHONE MANHOLE	CITY OF AUSTIN	COMMUNICATIONS	STA 304+51.13, 97.70' RT	-	Telephone manhole in conflict with sidewalk.
4	EXIST. STORM MANHOLE	CITY OF AUSTIN	STORM SEWER	STA 304+97.12, 00.00' LT	-	Storm manhole in conflict with pavement widening.
5	EXIST. GAS MARKER	TEXAS GAS SERVICES	GAS	STA 306+86.79, 86.83' RT	-	Gas marker post in conflict with sidewalk.
6	EXIST. TRAFFIC CONTROL BOX	CITY OF AUSTIN	ELECTRIC	STA 307+04.44, 105.43' RT	-	Traffic control box in conflict with sidewalk.
7	EXIST. ELECTRIC MANHOLE	AUSTIN ENERGY	ELECTRIC	STA 307+06.96, 105.47' RT	-	Electric manhole in conflict with sidewalk.
8	EXIST. TRAFFIC HANDHOLE AND POLE	CITY OF AUSTIN	ELECTRIC	STA 307+13.97, 116.66' RT	-	Traffic handhole and pole in conflict with median.
9	EXIST. TRAFFIC HANDHOLE	CITY OF AUSTIN	ELECTRIC	STA 307+28.57, 00+00' LT	-	Traffic handhole in conflict with median.
10	EXIST. TRAFFIC SIGNAL POLE	CITY OF AUSTIN	ELECTRIC	STA 307+39.34, 1.26' RT	-	Signal pole in conflict with median.
11	EXIST. TRAFFIC SIGNAL POLE	CITY OF AUSTIN	ELECTRIC	STA 307+34.73, 10.43' LT	-	Signal pole in conflict with median.
12	EXIST. TRAFFIC HANDHOLE	CITY OF AUSTIN	ELECTRIC	STA 307+39.95, 77.08' LT	-	Traffichand hole in conflict with median.
13	EXIST. TRAFFIC HANDHOLE	CITY OF AUSTIN	ELECTRIC	STA 307+41.47, 78.65' RT	-	Traffic handhole in conflict with median.
14	EXIST. TRAFFIC HANDHOLE	CITY OF AUSTIN	ELECTRIC	STA 307+03.65, 77.28' LT	-	Traffic handhole in conflict with road widening.
15	EXIST. TRAFFIC SIGNAL POLE	CITY OF AUSTIN	ELECTRIC	STA 311+19.39, 3.18' LT	-	Signal pole in conflict with median.
16	EXIST. TRAFFIC SIGNAL POLE	CITY OF AUSTIN	ELECTRIC	STA 311+19.60, 8.00' RT	-	Signal pole in conflict with median.
17	EXIST. TRAFFIC HANDHOLE	CITY OF AUSTIN	ELECTRIC	STA 311+26.07, 2.93' LT	-	Traffic handhole in conflict with median.

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benesch
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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE

UTILITY PLAN

2025 SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		119

DATE: 11/6/2025 10:55:36 AM
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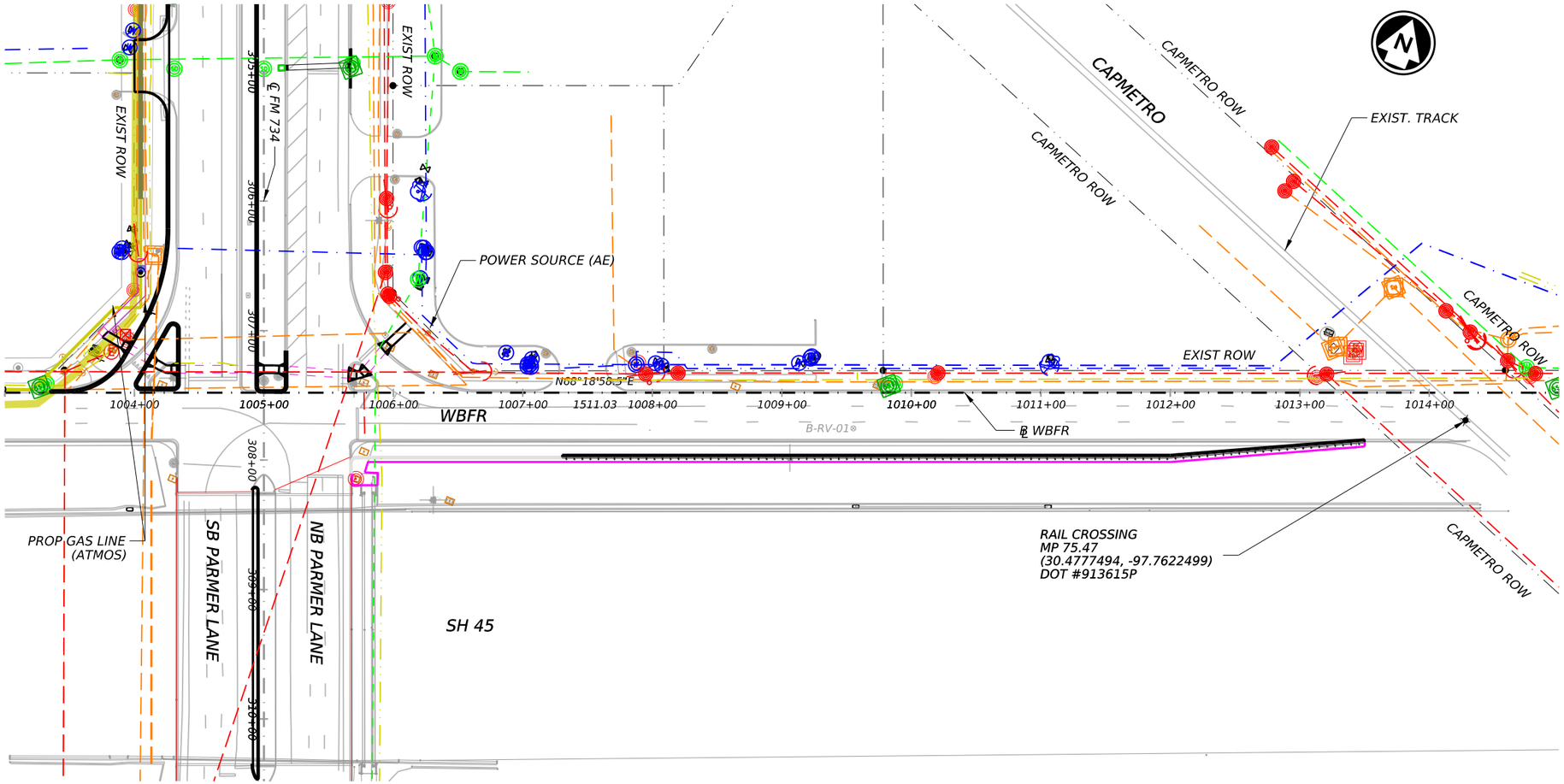
100% SUBMITTAL

CK
DW
CK
DW

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GFiber NOC | 866-954-1572 | GFIBER-NOC@GOOGLE.COM



LEGEND

- *EXIST. ROW*
- *EXIST. WATER*
- *EXIST. WATER METER*
- *EXIST. WASTEWATER*
- *EXIST. SANITARY MANHOLE*
- *EXIST. 40' ILLUMINATION POLE*
- *EXIST. ELECTRIC*
- *EXIST. ELECTRIC CONDUIT BORE*
- *EXIST. ELECTRIC GRID BOX*
- *EXIST. POWER POLE*
- *EXIST. ELECTRIC MANHOLE*
- *EXIST. GAS*
- *PROP 12" HDPE BORE (ATMOS)*
- *PROP 18" STEEL ENCASEMENT (ATMOS)*
- *6' ABAND PIPE (ATMOS)*
- *PROP 12" VALVE (ATMOS)*
- *PROP 12" PIPE (ATMOS)*
- *EXIST. GAS ENCASEMENT*
- *EXIST. TELEPHONE*
- *EXIST. FIBER OPTICS*
- *EXIST. UTILITY POLE*
- *EXIST. TELEPHONE MANHOLE*

NOTE:
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0 50 100
SCALE IN FEET
1" = 100' HORZ

WILCO TEXAS

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TEL. 720-409-1860
www.Benesch.com

PARMER LANE

UTILITY PLAN

2025 *SHEET 3 OF 3*

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		120

DATE: 11/6/2025 10:55:45 AM
FILE: c:\pwworkdir\benesch projects\projects\d0215421\10 Parmer Lane UTILITY03.dgn

LEGEND

- TRAFFIC SIGNAL POLE
- VEHICLE SIGNAL HEAD
- MAST ARM SIGN
- STREET NAME SIGN
- GROUND MOUNTED SIGN
- ELECTRIC SERVICE
- CCTV CAMERA
- CABLE RUN (TRENCH)
- CABLE RUN (BORE)
- CONTROLLER, SLAB, AND FOUNDATION
- GROUND BOX (TYPE D)
- TRAFFIC FLOW
- APPARENT RIGHT-OF-WAY

EXISTING SIGNS

N FM 620 RD	EXISTING D3-1G	S1
W PARMER LN	EXISTING D3-1G	S2
N FM 620 RD	EXISTING D3-1G	S3
LEFT TURN SIGNAL	R10-10L (24" x 30")	S4

EXISTING TRAFFIC SIGNAL HEADS

12" LED SIGNAL SECTIONS WITH BACKPLATES

SIGNAL FACES	R Y G	R Y G	R Y G
KEY	1	2	3
QTY	7	1	1

SH 45 WBFR
POSTED SPEED 55 MPH

PARMER LN
POSTED SPEED 60 MPH

Ø4

ØOLA

Ø1

Ø2

REMOVE AND SALVAGE EXISTING SIGNAL HEADS

RELOCATE CCTV CAMERA

REMOVE AND SALVAGE EXISTING GROUND BOX

REMOVE AND SALVAGE EXISTING POLE AND EQUIPMENT

REMOVE AND SALVAGE EXISTING SIGNAL HEADS

REMOVE AND SALVAGE EXISTING GROUND BOX

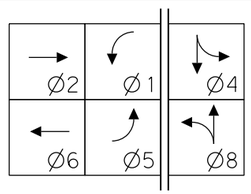
RETAIN EXISTING CABINET AND CONTROLLER

UPGRADE EXISTING POWER SERVICE

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

CAUTION:
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

PHASE DIAGRAM



OLA = 1 + 2

CONFLICT FLASH: RED ALL PHASES

NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. CONTRACTOR SHALL COORDINATE ALL REMOVAL OF TRAFFIC RELATED EQUIPMENT AND SIGNS WITH THE TXDOT/CITY OF AUSTIN.
3. EXISTING PAVEMENT MARKINGS TO BE REMOVED SHALL BE GROUND OFF AND SEALED PRIOR TO APPLICATION OF NEW PAVEMENT MARKINGS.
4. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
5. ALL ITEMS NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN. GRAYED BACK ITEMS ARE EXISTING AND TO REMAIN. BLACK ITEMS REQUIRE MODIFICATIONS.

MATCHLINE STA. 309+51.78

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

0 15 30 45
SCALE: 1" = 30'

WILCO TEXAS

PAPE-DAWSON ENGINEERS
2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

EXISTING CONDITONS PARMER LN AT SH 45 WBFR

2025

SHEET 1 OF 10

CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		121

DATE: 9/26/2025 10:27:03 AM
FILE: H:\Projects\5149300\ORD\4-Design\Traffic\4-Signals\5149300_EXST.dgn

LEGEND

- TRAFFIC SIGNAL POLE
- VEHICLE SIGNAL HEAD
- MAST ARM SIGN
- STREET NAME SIGN
- GROUND MOUNTED SIGN
- ELECTRIC SERVICE
- CCTV CAMERA
- CABLE RUN (TRENCH)
- CABLE RUN (BORE)
- CONTROLLER, SLAB, AND FOUNDATION
- GROUND BOX (TYPE D)
- TRAFFIC FLOW
- APPARENT RIGHT-OF-WAY

EXISTING SIGNS

W PARMER LN 9100	EXISTING D3-1G	S1
N FM 620 RD 14500	EXISTING D3-1G	S2
N FM 620 RD 14200	EXISTING D3-1G	S3
LEFT TURN SIGNAL	R10-10L (24" x 30")	S4

EXISTING TRAFFIC SIGNAL HEADS

12" LED SIGNAL SECTIONS WITH BACKPLATES

SIGNAL FACES	R Y G	R Y G (arrow)	R Y G (arrow)
KEY	1	2	3
QTY	6	2	1

SH 45 EBFR
POSTED SPEED 60 MPH

PARMER LN
POSTED SPEED 60 MPH

SH 45 EBFR
POSTED SPEED 55 MPH

MATCHLINE STA. 309+51.78

REMOVE AND SALVAGE EXISTING GROUND BOX

REMOVE AND SALVAGE EXISTING SIGNAL HEADS

REMOVE AND SALVAGE EXISTING POLE AND EQUIPMENT

REMOVE AND SALVAGE EXISTING GROUND BOX

REMOVE AND SALVAGE EXISTING POLE AND EQUIPMENT

REMOVE AND SALVAGE EXISTING GROUND BOX

Ø6

Ø5

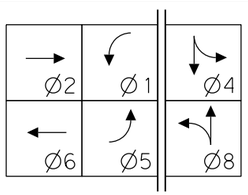
ØOLB

Ø8

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

CAUTION:
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PHASE DIAGRAM



OLB = 5 + 6

CONFLICT FLASH: RED ALL PHASES

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DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

0 15 30 45
SCALE: 1" = 30'

WILCO TEXAS

PAPE-DAWSON ENGINEERS
2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

EXISTING CONDITIONS PARMER LN AT SH 45 EBFR

2025 *SHEET 2 OF 10*

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	122

DATE: 9/26/2025 10:19:14 AM
FILE: H:\Projects\5149300\ORD\4-Design\Traffic\4-Signals\5149300_EXST.dgn

LEGEND

- TRAFFIC SIGNAL POLE
- VEHICLE SIGNAL HEAD
- MAST ARM SIGN
- STREET NAME SIGN
- GROUND MOUNTED SIGN
- ELECTRIC SERVICE
- CABLE RUN (TRENCH)
- CABLE RUN (BORE)
- CONTROLLER, SLAB, AND FOUNDATION
- GROUND BOX (TYPE D)
- LUMINAIRE
- CCTV CAMERA
- PEDESTAL POLE
- PEDESTRIAN SIGNAL
- ITERIS VECTOR (RPDD+RADD)
- ITERIS RADIUS (RPDD)
- TRAFFIC FLOW
- APPARENT RIGHT-OF-WAY

EXISTING SIGNS

FM 620 RD 14200	D3-1G	S1
FM 620 RD 14200	D3-1G	S2
LEFT TURN SIGNAL	R10-10L (24" x 30")	S3

PROPOSED SIGNS

PARMER LN 9200	D3-1G SEE SIGN DETAILS	S4
	R10-3L (9" x 15")	PB1
	R10-3R (9" x 15")	PB2

PROPOSED TRAFFIC SIGNAL HEADS

	12" LED SIGNAL SECTIONS WITH BACKPLATES					16" x 18" LED COUNTDOWN PEDESTRIAN SIGNALS
SIGNAL FACES	R Y G	R Y G	R Y G	G Y G G	G R Y G	18
KEY	1	2	3	4	5	W1 THRU W4
QTY	7	1	2	1	1	4

SH 45 WBFR
POSTED SPEED 55 MPH

PARMER LN
POSTED SPEED 60 MPH

RELOCATED CCTV CAMERA

ØOLA

Ø1

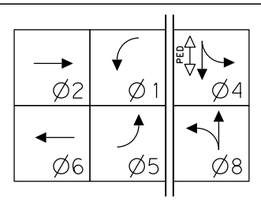
Ø2

Ø4

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

CAUTION:
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PHASE DIAGRAM



OLA = 1 + 2

CONFLICT FLASH: RED ALL PHASES

NOTES:
1. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS SPECIFIED OTHERWISE. (ALL EXISTING FEATURES ARE SHOWN SCREENED BACK i.e. FADED).
2. CONTRACTOR SHALL POTHOLE SIGNAL POLE FOUNDATION LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATION.
3. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
4. LOCATION OF TRAFFIC SIGNAL POLES, CABINET AND ELECTRICAL SERVICE SHALL BE VERIFIED AND APPROVED BY TXDOT PRIOR TO CONSTRUCTION.
5. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NOT EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.
6. CONTRACTOR SHALL CONNECT FIELD WIRING TO CONTROLLER.
7. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET OF CLEARANCE ABOVE THE ROADWAY SURFACE. ALL SIGNAL HEADS SHALL HAVE RETRO-REFLECTIVE BACK PLATES.
8. TRAY CABLE SHALL BE RUN IN 2" CONDUIT SEPARATE FROM SIGNAL CABLE.
9. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY; ORIENT THEM AS DIRECTED BY THE ENGINEER.
10. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ADDRESS IN PERMANENT NUMBERS AND LETTERS TO THE STREET SIDE OF THE SERVICE ENCLOSURE. SAID ADDRESS SHALL ALSO BE RECORDED AND GIVEN TO THE TXDOT INSPECTOR FOR THEIR RECORDS.
11. NEATLY CAP/COIL ALL WIRES AND CABLES IN GROUND BOX OR AT TERMINATION.

MATCHLINE STA. 309+51.78

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

0 15 30 45
SCALE: 1"= 30'

WILCO TEXAS

PAPE-DAWSON ENGINEERS
2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

TRAFFIC SIGNAL LAYOUT PARMER LN AT SH 45 WBFR

2025

SHEET 3 OF 10

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	123

DATE: 9/26/2025 10:31:28 AM
FILE: H:\Projects\5149300\ORD\4-Design\Traffic\4-Signals\5149300_PROP.dgn

LEGEND

- TRAFFIC SIGNAL POLE
- VEHICLE SIGNAL HEAD
- MAST ARM SIGN
- STREET NAME SIGN
- GROUND MOUNTED SIGN
- ELECTRIC SERVICE
- CABLE RUN (TRENCH)
- CABLE RUN (BORE)
- CONTROLLER, SLAB, AND FOUNDATION
- GROUND BOX (TYPE D)
- LUMINAIRE
- CCTV CAMERA
- PEDESTAL POLE
- PEDESTRIAN SIGNAL
- ITERIS VECTOR (RPDD+RADD)
- ITERIS RADIUS (RPDD)
- TRAFFIC FLOW
- APPARENT RIGHT-OF-WAY

EXISTING SIGNS			PROPOSED SIGNS		
N FM 620	D3-1G	S1	N PARMER	D3-1G SEE SIGN DETIALS	S2
			N FM 620	D3-1G SEE SIGN DETIALS	S3
			LEFT TURN SIGNAL	R10-10L (24" × 30")	S4

PROPOSED TRAFFIC SIGNAL HEADS

12" LED SIGNAL SECTIONS WITH BACKPLATES

SIGNAL FACES	R Y G	R Y G	R Y G	G R Y G	G R Y ↑
KEY	1	2	3	4	5
QTY	7	2	0	1	2

SH 45 EBFR
POSTED SPEED 60 MPH

PARMER LN
POSTED SPEED 60 MPH

SH 45 EBFR
POSTED SPEED 55 MPH

MATCHLINE STA. 309+51.78

REMOVE AND REPLACE EXISTING GROUND BOX

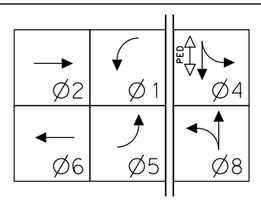
REMOVE AND REPLACE EXISTING GROUND BOX

Ø6 Ø5 ØOLB Ø8

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

CAUTION:
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

PHASE DIAGRAM



OLB = 5 + 6

CONFLICT FLASH: RED ALL PHASES

NOTES:
1. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS SPECIFIED OTHERWISE. (ALL EXISTING FEATURES ARE SHOWN SCREENED BACK i.e. FADED).
2. CONTRACTOR SHALL POTHOLE SIGNAL POLE FOUNDATION LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATION.
3. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
4. LOCATION OF TRAFFIC SIGNAL POLES, CABINET AND ELECTRICAL SERVICE SHALL BE VERIFIED AND APPROVED BY TXDOT PRIOR TO CONSTRUCTION.
5. CONTRACTOR SHALL CONNECT FIELD WIRING TO CONTROLLER.
6. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET OF CLEARANCE ABOVE THE ROADWAY SURFACE. ALL SIGNAL HEADS SHALL HAVE RETRO-REFLECTIVE BACK PLATES.
7. TRAY CABLE SHALL BE RUN IN 2" CONDUIT SEPARATE FROM SIGNAL CABLE.
8. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY; ORIENT THEM AS DIRECTED BY THE ENGINEER.
9. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ADDRESS IN PERMANENT NUMBERS AND LETTERS TO THE STREET SIDE OF THE SERVICE ENCLOSURE. SAID ADDRESS SHALL ALSO BE RECORDED AND GIVEN TO THE TXDOT INSPECTOR FOR THEIR RECORDS.
10. NEATLY CAP/COIL ALL WIRES AND CABLES IN GROUND BOX OR AT TERMINATION.

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

0 15 30 45
SCALE: 1"= 30'

WILCO TEXAS

PAPE-DAWSON ENGINEERS
2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

TRAFFIC SIGNAL LAYOUT PARMER LN AT SH 45 EBFR

2025 SHEET 4 OF 10

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	124

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CABLE TERMINATION CHART

CNDR, COLOR	CABLE 1	CABLE 2	CABLE 3	CABLE 4	CABLE 5	CABLE 6	CABLE 7	CABLE 8	CABLE 9	CABLE 10	CABLE 11	CABLE 12	CABLE 13	CABLE 14	CABLE 15	CABLE 16	CABLE 17	CABLE 18	CABLE 19	CABLE 20	CABLE 21	CABLE 22	CABLE 23
	POLE C	POLE E	POLE E	POLE E	POLE H	POLE H	POLE J	POLE J	POLE K	POLE K	POLE K	POLE K	POLE L	POLE L	POLE M	POLE M	POLE N	POLE N	POLE P	POLE P	POLE P	POLE P	POLE P
	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL	TO CNTRL
	7 CONDR	7 CONDR	7 CONDR	7 CONDR	7 CONDR	7 CONDR	2 CONDR	5 CONDR	7 CONDR	7 CONDR	7 CONDR	7 CONDR	2 CONDR	5 CONDR	2 CONDR	5 CONDR	2 CONDR	5 CONDR	7 CONDR	7 CONDR	7 CONDR	7 CONDR	7 CONDR
BLACK	SH 1 - Y PHASE 02	SH 3 - YA PHASE 01	SH 4 - Y PHASE 01	SH 1 - Y PHASE 10	SH 2 - Y PHASE 06	SH 1 - Y PHASE 06	PED CALL PHASE 04	SPARE	SH 3 - YA PHASE 01	SH 1 - Y PHASE 04	SH 4 - Y PHASE 04	SH 2 - YA PHASE 04	PED CALL PHASE 04	SPARE	PED CALL PHASE 04	SPARE	PED CALL PHASE 04	SPARE	SH 3 - YA PHASE 08	SH 4 - Y PHASE 08	SH 1 - Y PHASE 08	SH 3 - YA PHASE 05	SH 1 - Y PHASE 14
WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
RED	SH 1 - R PHASE 02	SH 3 - RA PHASE 01	SH 4 - R PHASE 01	SH 1 - R PHASE 10	SH 2 - R PHASE 06	SH 1 - R PHASE 06	-	P1 DW PHASE 04	SH 3 - RA PHASE 01	SH 1 - R PHASE 04	SH 4 - R PHASE 04	SH 2 - RA PHASE 04	-	P2 DW PHASE 04	-	P3 DW PHASE 04	-	P4 DW PHASE 04	SH 3 - RA PHASE 08	SH 4 - R PHASE 08	SH 1 - R PHASE 08	SH 3 - RA PHASE 05	SH 1 - R PHASE 14
GREEN	SH 1 - G PHASE 02	SH 3 - GA PHASE 01	SH 4 - G PHASE 01	SH 1 - G PHASE 10	SH 2 - GA PHASE 06	SH 1 - G PHASE 06	-	P1 W PHASE 04	SH 3 - GA PHASE 01	SH 1 - G PHASE 04	SH 4 - G PHASE 04	SH 2 - GA PHASE 04	-	P2 W PHASE 04	-	P3 W PHASE 04	-	P4 W PHASE 04	SH 3 - GA PHASE 08	SH 4 - G PHASE 08	SH 1 - G PHASE 08	SH 3 - GA PHASE 05	SH 1 - G PHASE 14
ORANGE	SPARE	SPARE	SH 4 - GA PHASE 01	SPARE	SPARE	SPARE	-	SPARE	SPARE	SPARE	SH 4 - GA PHASE 04	SPARE	-	SPARE	-	SPARE	-	SPARE	SPARE	SH 4 - GA PHASE 08	SPARE	SPARE	SPARE
BLUE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	-	-	SPARE	SPARE	SPARE	SPARE	-	-	-	-	-	-	SPARE	SPARE	SPARE	SPARE	SPARE
WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	-	-	SPARE	SPARE	SPARE	SPARE	-	-	-	-	-	-	SPARE	SPARE	SPARE	SPARE	SPARE

POLE SCHEDULE

POLE	(C)	(E)	(H)	(I)	(K)	(L)	(M)	(N)	(P)
POLE TYPE (SMA/LMA/DMA/PED)	SMA	SMA	LMA	PED	SMA	PED	PED	PED	DMA
POLE HEIGHT (FEET)	30	19	30	10	19	10	10	10	19
MAST ARM LENGTH (FEET)	44	36	60	N/A	48	N/A	N/A	N/A	44x36
LUMINAIRE (YES/NO)	YES	NO	YES	N/A	NO	N/A	N/A	N/A	NO
ILSN (YES/NO)	NO	NO	NO	N/A	NO	N/A	N/A	N/A	NO
ILSN ARM LENGTH (FEET)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FOUNDATION TYPE	EX	EX	EX	24-A	36-A	24-A	24-A	24-A	36-B
FOUNDATION DEPTH (FEET)	EX	EX	EX	6	14	6	6	6	16

CONDUITS AND CABLES

		TYPE								ELEC SERV		#6 BARE		GROUND		APS		PED SIG		VEH SIG		LUM		CCTV		ITERIS RADIUS (RPDD)		ITERIS VECTOR (RPDD+RADD)	
RUN		2" TRENCH		3" TRENCH		2" BORE		3" BORE		#6 XHHW				#6 BARE		2 COND. #12 AWG TYPE "C"		5 COND. #14 AWG TYPE "A"		7 COND. #12 AWG TYPE "A"		4 COND. #12 AWG TRAY		ETHERNET		ETHERNET		ETHERNET	
ID	LENGTH	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY
(01)	150	EXISTING								PULLED BY ELECTRIC COMPANY																			
(02)	20	EXISTING																											
(03)	10	EXISTING																				2	20						
(04)	15	EXISTING														4	60	4	60	8	120			1	15	2	30	4	60
(05)	50	EXISTING														4	200	4	200	8	400	2	100	1	50	2	100	3	150
(09)	55	EXISTING																		5	275	2	110			1	55	3	165
(10)	15	EXISTING																		1	15	1	15					1	15
(11)	25	EXISTING																		4	100	1	25			1	25	2	50
(12)	245	EXISTING																		4	980	1	245			1	245	2	490
(13)	20	EXISTING																		4	80	1	20			1	20	2	40
(14)	55	EXISTING																		4	220	1	55			1	55	2	110
(19)	60	EXISTING																		1	60	1	60					1	60
(20)	10	EXISTING																		1	10	1	10					1	10
(21)	15	1	15											1	15	1	15	1	15										
(22)	95					1	95	2	190					3	285	3	285	3	285	2	190			1	95	1	95	1	95
(23)	30	1	30	2	60									3	90					1	30			1	30	1	30	1	30
(24)	20	1	20											1	20	1	20	1	20										
(25)	20	1	20	2	40									3	60					1	20								
(26)	10	1	10											1	10	1	10	1	10										
(27)	65					1	65	2	130					3	195	1	65	1	65										
(28)	10	1	10											1	10	1	10	1	10										
(29)	65					1	65	2	130					3	195					4	260	1	65			1	65	2	130
(30)	10	1	10	2	20									3	30					3	30					1	10	1	10
(31)	85					1	85	2	170					3	255					1	85	1	85					1	85
CNDT SUBTOTAL		115		120		310		620						1165		665		665		2875		810		190		730		1500	
POLE SUBTOTAL														78		20		40		300		60		19		38		76	
ARM SUBTOTAL																				684		16		10		40		98	
TOTAL		115		120		310		620						1243		685		705		3859		886		219		808		1674	
10% CONTING.		11.5		12		31		62						124.3		68.5		70.5		385.9		88.6		21.9		80.8		167.4	
TOTAL W/ CONT.		130		135		345		685						1370		755		780		4245		975		245		890		1845	

LUMINAIRE AND ILSN CABLES, IF PRESENT, SHALL BE RUN IN 2" CONDUIT SEPARATE FROM ALL OTHER CABLES
EXISTING CONDUIT SHALL BE PREPARED

POLE & EQUIPMENT INFORMATION

ID	DESCRIPTION/ATTACHMENTS	NORTHING	EASTING	FND. ELEV
(A)	UPDATE EXISITNG ELECTRICAL SERVICE.		EXISTING	
(B)	EXISTING CABINET AND CONTROLLER TO REMAIN.		EXISTING	
(C)	EXISTING MAST ARM POLE TO REMAIN. REPLACE AND INSTALL FOUR (4) SIGNAL HEADS. INSTALL ONE (1) LUMINAIRE, AND ONE (1) ITERIS VECTOR AS ILLUSTRATED.		EXISTING	
(E)	EXISTING MAST ARM POLE TO REMAIN. REPLACE AND INSTALL FOUR (4) SIGNAL HEADS. INSTALL ONE (1) ITERIS RADIUS AS ILLUSTRATED.		EXISTING	
(H)	EXISTING MAST ARM POLE TO REMAIN. REPLACE AND INSTALL FIVE (5) SIGNAL HEADS. INSTALL ONE (1) LUMINAIRE, AND ONE (1) ITERIS VECTOR AS ILLUSTRATED.		EXISTING	
(I)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND. (24-A) WITH ONE (1) LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, AND ONE (1) APS PUSH BUTTON WITH R10-3eL SIGN.	10146500.7	3105479.2	FLUSH W/ LANDING
(K)	INSTALL 19 FT SMA-80 ON 14 FT DRILLED SHAFT FOUNDATION (36-A) WITH 48 FT MAST ARM, ONE (1) ASTRO-BRAC WIND DAMPER ASSEMBLY, ONE (1) RELOCATED CCTV, ONE (1) ITERIS VECTOR, ONE (1) STREET NAME SIGN AND FOUR (4) VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10146524.4	3105546.0	LEVEL W/ ROADWAY CROWN
(L)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND. (24-A) WITH ONE (1) LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, AND ONE (1) APS PUSH BUTTON WITH R10-3eR SIGN.	10146528.5	3105549.6	FLUSH W/ LANDING
(M)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND. (24-A) WITH ONE (1) LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, AND ONE (1) APS PUSH BUTTON WITH R10-3eR SIGN.	10146539.0	3105554.0	FLUSH W/ LANDING
(N)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND. (24-A) WITH ONE (1) LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, AND ONE (1) APS PUSH BUTTON WITH R10-3eR SIGN.	10146554.0	3105619.5	FLUSH W/ LANDING
(P)	INSTALL 19 FT DMA-80 ON 16 FT DRILLED SHAFT FND. (36-B) WITH 44 FT MAST ARM AND 36 FT CLAMP ON ARM, ONE (1) ASTRO-BRAC WIND DAMPER ASSEMBLY, ONE (1) ITERIS VECTOR, ONE (1) ITERIS RADIUS, TWO (2) D3-1G SIGNS, ONE (1) R10-10L SIGN AND SEVEN (7) VEHICLE SIGNAL HEADS.	10146164.9	3105684.5	LEVEL W/ ROADWAY CROWN

INSIDE POLES

POLE			FOUNDATION		GROUND		APS		PED SIG		VEH SIG		LUM		CCTV		ITERIS RADIUS (RPDD)		ITERIS VECTOR (RPDD+RADD)	
					#6 BARE		2 COND. #12 AWG TYPE "C"		5 COND. #14 AWG TYPE "A"		7 COND. #12 AWG TYPE "A"		4 COND. #12 AWG TRAY		ETHERNET		ETHERNET		ETHERNET	
ID	TYPE	HEIGHT	TYPE	DEPTH	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY
(C)	SMA	30	EX	EX							1	20	1	30					1	19
(E)	SMA	19	EX	EX							3	60					1	19		
(H)	LMA	30	EX	EX							2	40	1	30					1	19
(I)	PED	10	24-A	6	1	10	1	5	1	10										
(K)	SMA	19	36-A	14	1	19					4	80			1	19			1	19
(L)	PED	10	24-A	6	1	10	1	5	1	10										
(M)	PED	10	24-A	6	1	10	1	5	1	10										
(N)	PED	10	24-A	6	1	10	1	5	1	10										
(P)	DMA	19	36-B	16	1	19					5	100					1	19	1	19
SUBTOTAL					78		20		40		300		60		19		38		76	

INSIDE ARMS

POLE	MAST ARM	LUM ARM	ILSN ARM	VEH SIG		LUM		CCTV		ITERIS RADIUS (RPDD)		ITERIS VECTOR (RPDD+RADD)	
				7 COND. #12 AWG TYPE "A"		4 COND. #12 AWG TRAY		ETHERNET		ETHERNET		ETHERNET	
ID	LENGTH	LENGTH	LENGTH	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY	NO.	QTY
(C)	44	8	N/A	1	44	1	8					1	22
(E)	36	N/A	N/A	3	108					1	18		
(H)	60	8	N/A	2	120	1	8					1	30
(K)	48	N/A	N/A	4	192			1	10			1	24
(P)	44	N/A	N/A	5	220					1	22	1	22
SUBTOTAL				684		16		10		40		98	

PROPOSED ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/ AMP	TWO - POLE CONTACTOR AMPS	PANELBD/ LOAD CENTER AMP RATING	CIRCUIT NO.	BRANCH CKT. BKR. POLE/ AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
TL-1	ELEC SERV TY D(120/240)125(NS)GS(L)EX(O)	3"	3/#0	N/A	2P/125	N/A	125	A (SIGNAL) B (LUM) C (ITS)	1P/50 1P/15 1P/50	40 10 40	10.8

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

WILCO TEXAS

PAPE-DAWSON ENGINEERS
2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

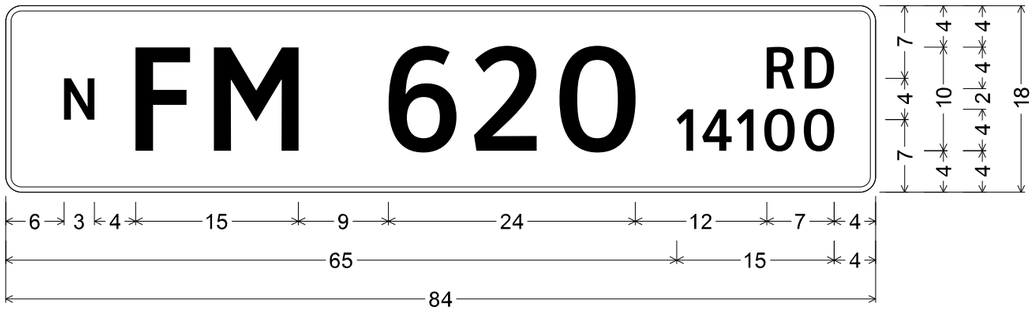
CONDUIT AND CONDUCTOR SCHEDULE
PARMER LN AT SH 45

2025 — SHEET 5 OF 10

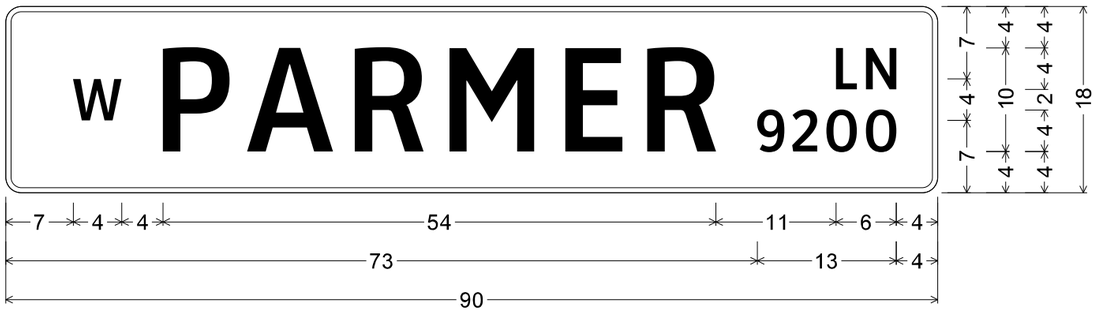
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DIST	COUNTY	SHEET NO.
4	WILLIAMSON	125

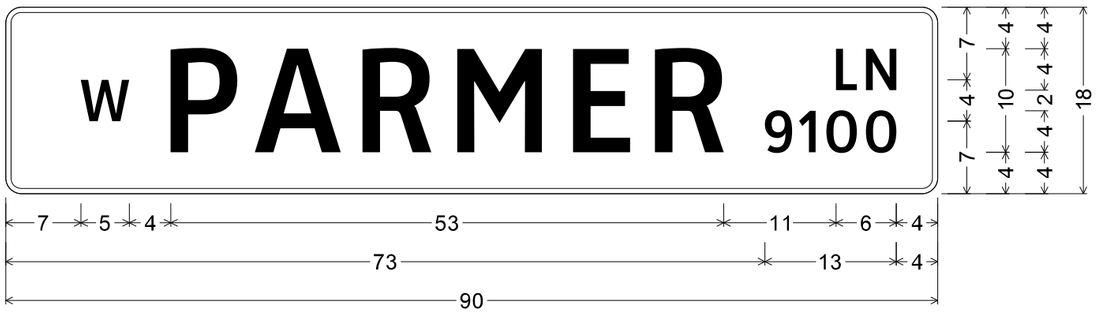
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D3-1G(6) 10in;
2" Radius, 1" Border, White on Green;
"N", ClearviewHwy-3-W; "FM 620", ClearviewHwy-3-W; "RD", ClearviewHwy-3-W;
"14100", ClearviewHwy-3-W;



D3-1G(6) 10in;
2" Radius, 1" Border, White on Green;
"W", ClearviewHwy-3-W; "PARMER", ClearviewHwy-3-W; "LN", ClearviewHwy-3-W;
"9200", ClearviewHwy-3-W;



D3-1G(6) 10in;
2" Radius, 1" Border, White on Green;
"W", ClearviewHwy-3-W; "PARMER", ClearviewHwy-3-W; "LN", ClearviewHwy-3-W;
"9100", ClearviewHwy-3-W;

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

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STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

0 15 30 45

SCALE: 1" = 30'

WILCO TEXAS

PAPE-DAWSON ENGINEERS

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Texas Engineering Firm #470 | Texas Surveying Firm #10028800

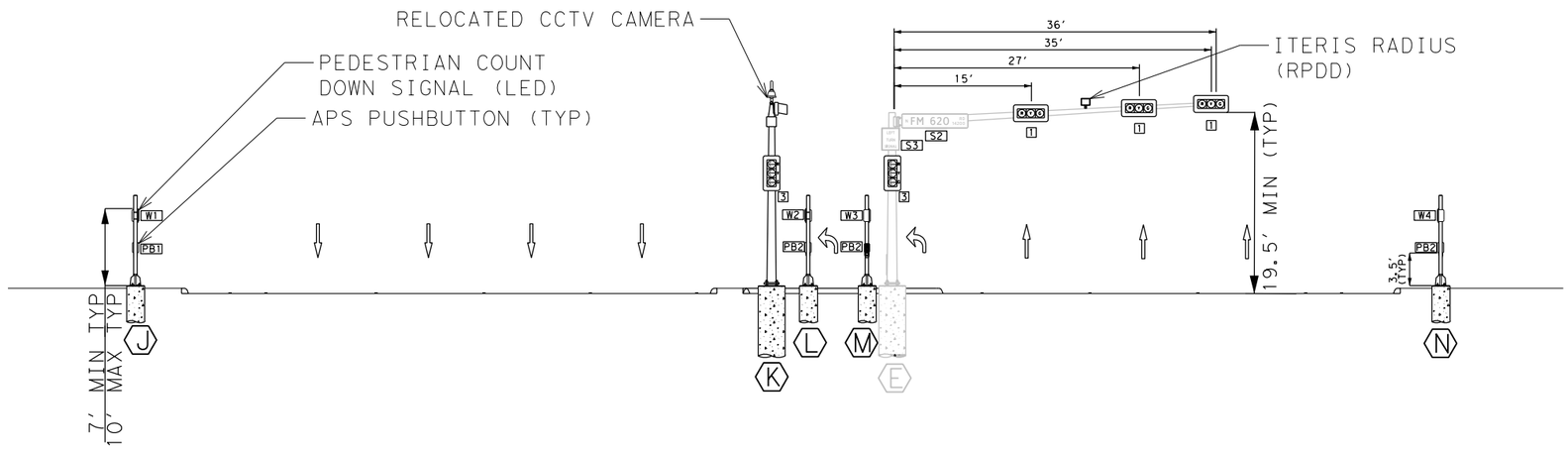
TRAFFIC SIGNAL SIGN DETAILS
PARMER LN AT SH 45

2025 SHEET 6 OF 10

CONT	SECT	JOB	HIGHWAY

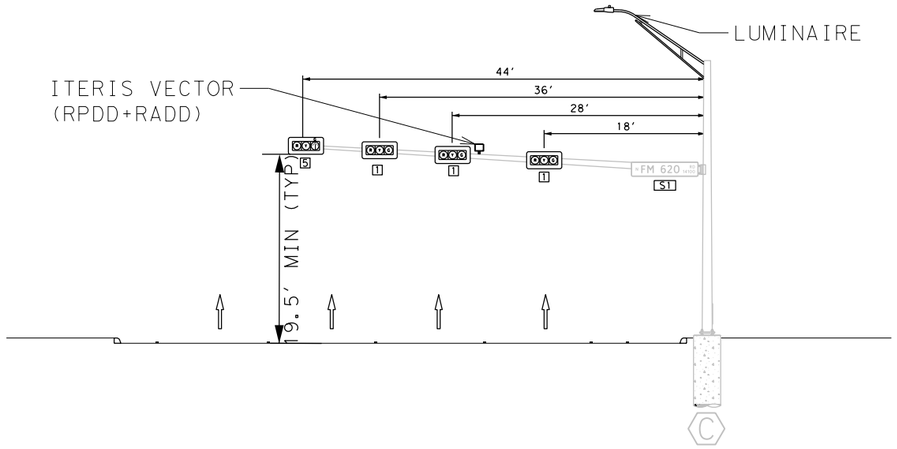
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4	WILLIAMSON	126

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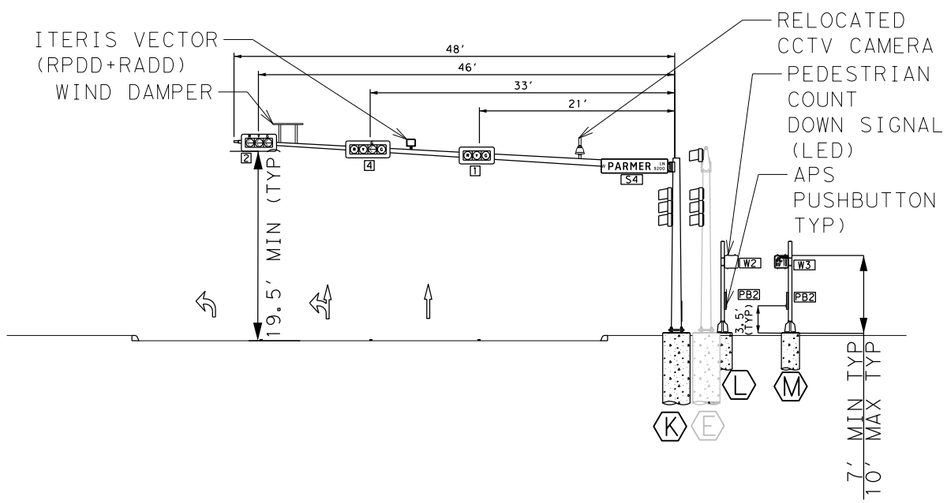
NORTHBOUND PARMER LN

NTS



SOUTHBOUND PARMER LN

NTS



WESTBOUND SH 45 FR

NTS

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

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JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

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2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
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ELEVATION VIEWS

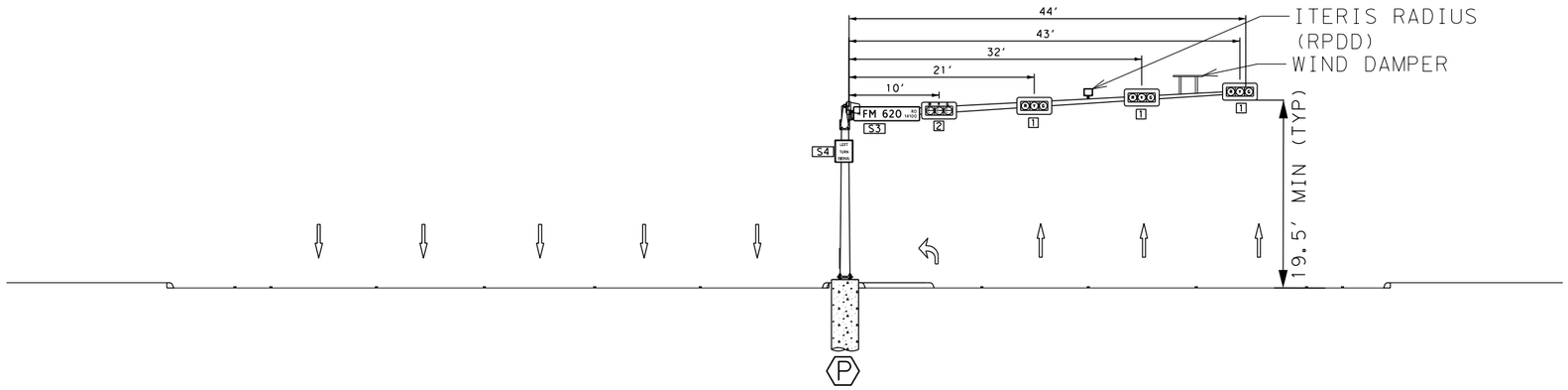
PARMER LN AT SH 45 WBFR

2025 SHEET 7 OF 10

CONT	SECT	JOB	HIGHWAY

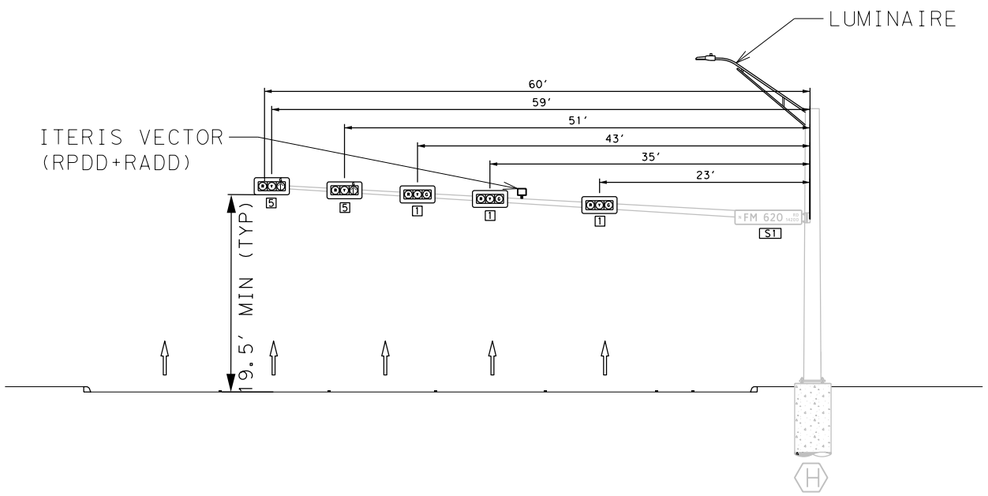
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4	WILLIAMSON	127

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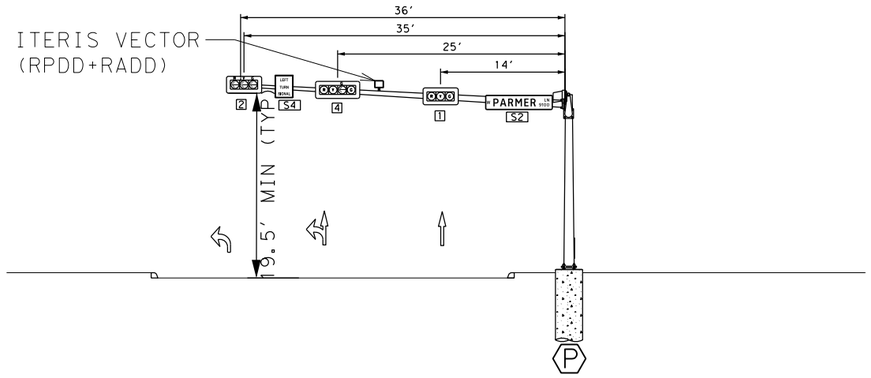
SOUTHBOUND PARMER LN

NTS



NORTHBOUND PARMER LN

NTS



EASTBOUND PARMER LN

NTS

DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

WILCO TEXAS

PAPE-DAWSON ENGINEERS

2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

ELEVATION VIEWS

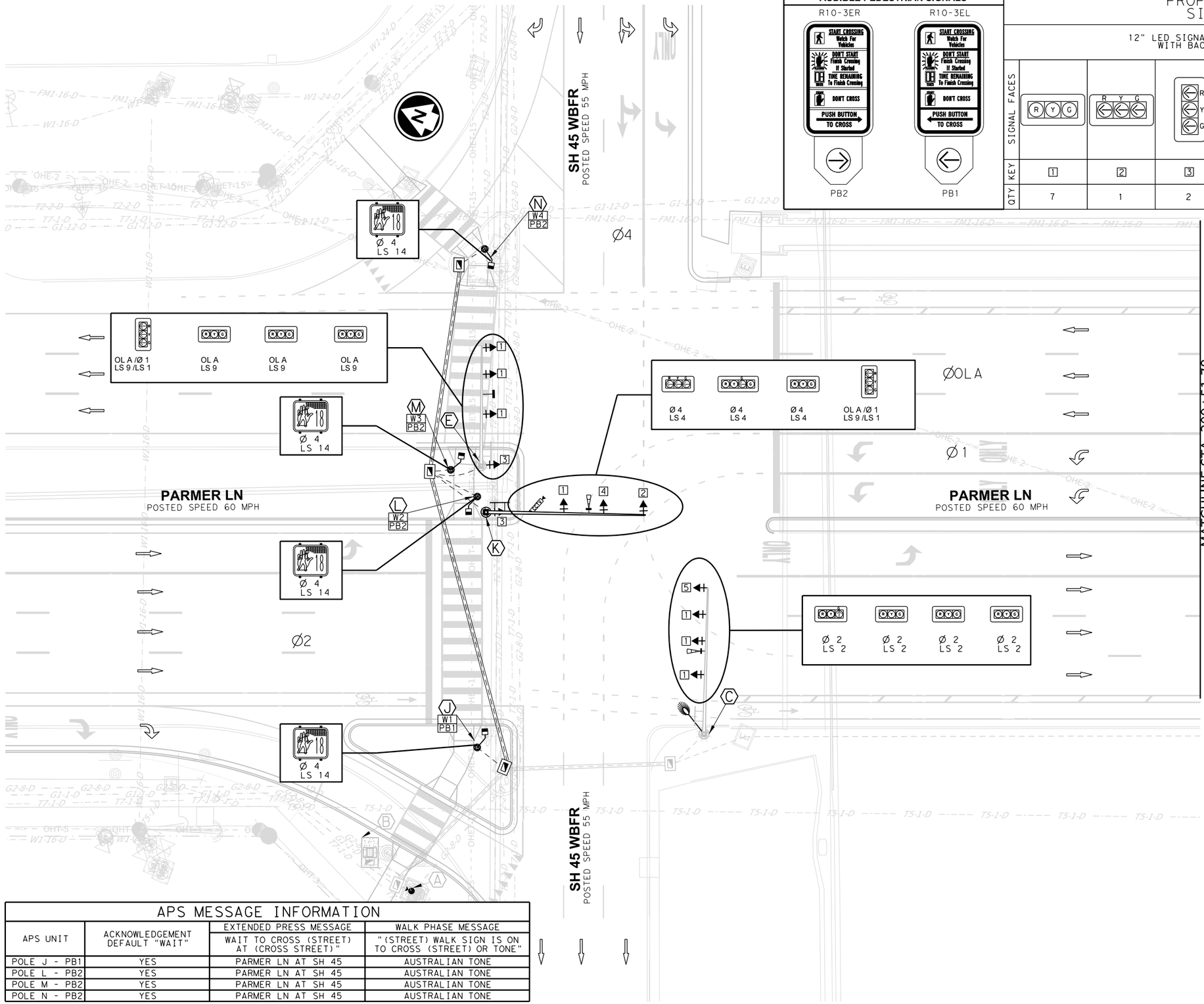
PARMER LN AT
SH 45 EBFR

2025 SHEET 8 OF 10

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	128

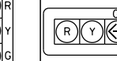
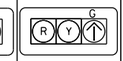
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AUDIBLE PEDESTRIAN SIGNALS

R10-3ER	R10-3EL
PB2	PB1

PROPOSED TRAFFIC SIGNAL HEADS

	12" LED SIGNAL SECTIONS WITH BACKPLATES					16" x 18" LED COUNTDOWN PEDESTRIAN SIGNALS
SIGNAL FACES						
KEY	1	2	3	4	5	W1 THRU W4
QTY	7	1	2	1	1	4

APS MESSAGE INFORMATION

APS UNIT	ACKNOWLEDGEMENT DEFAULT "WAIT"	EXTENDED PRESS MESSAGE	WALK PHASE MESSAGE
		WAIT TO CROSS (STREET) AT (CROSS STREET)"	"(STREET) WALK SIGN IS ON TO CROSS (STREET) OR TONE"
POLE J - PB1	YES	PARMER LN AT SH 45	AUSTRALIAN TONE
POLE L - PB2	YES	PARMER LN AT SH 45	AUSTRALIAN TONE
POLE M - PB2	YES	PARMER LN AT SH 45	AUSTRALIAN TONE
POLE N - PB2	YES	PARMER LN AT SH 45	AUSTRALIAN TONE

MATCHLINE STA. 309+51.78

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

0 15 30 45

SCALE: 1"= 30'

WILCO TEXAS

PAPE-DAWSON ENGINEERS
2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

APS/ LOAD SWITCH INFORMATION PARMER LN AT SH 45 WBFR

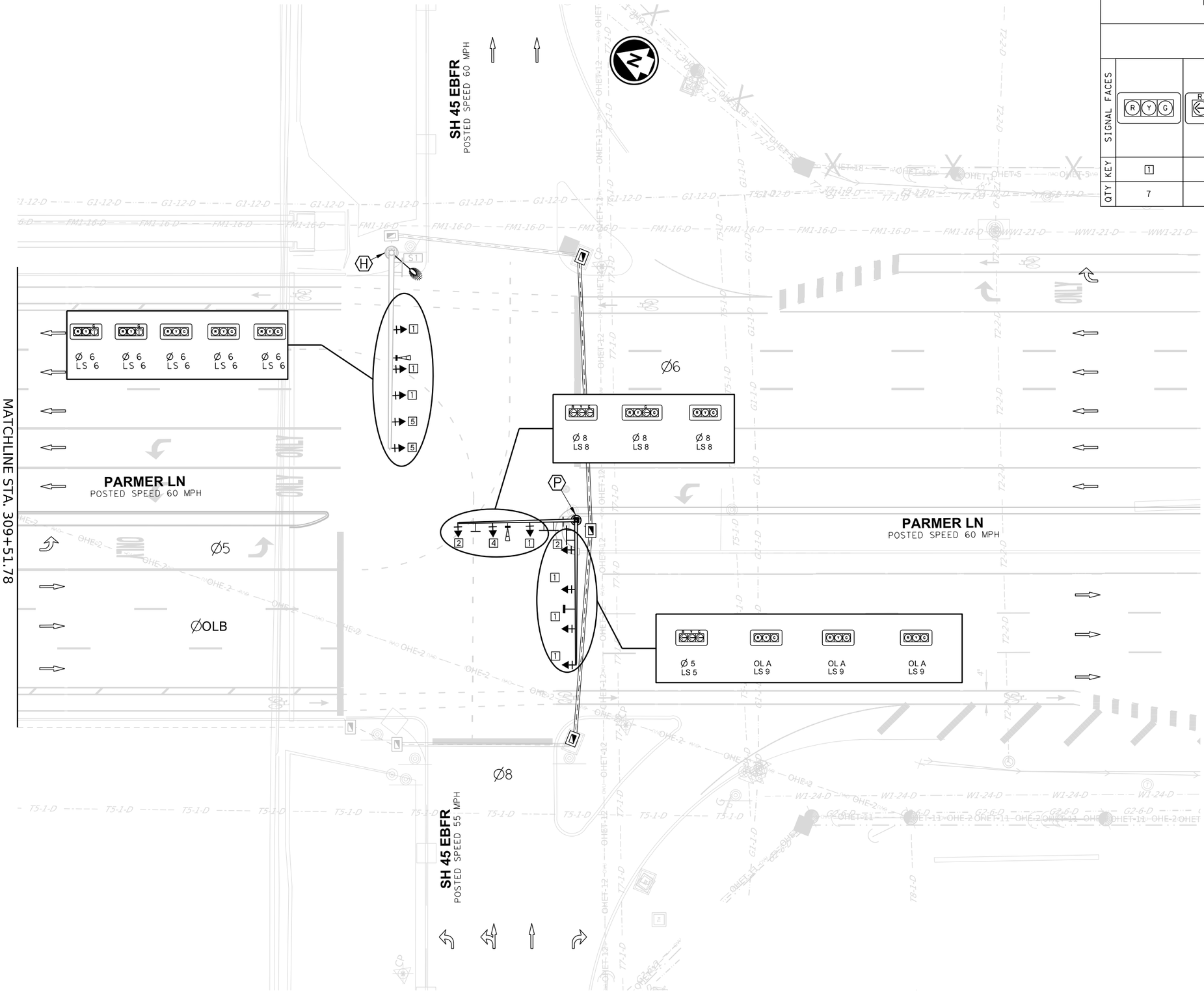
2025 — SHEET 9 OF 10

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	129

DATE: 9/26/2025 9:52:49 AM
FILE: H:\Projects\5149300\ORD\4-Design\Traffic\4-Signals\5149300_APS.dgn

CK
DW
CK
DW



PROPOSED TRAFFIC SIGNAL HEADS

12" LED SIGNAL SECTIONS WITH BACKPLATES

SIGNAL FACES					
KEY	1	2	3	4	5
QTY	7	2	0	1	2

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/26/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/26/2025 DATE

0 15 30 45

SCALE: 1" = 30'

WILCO TEXAS

PAPE-DAWSON ENGINEERS
2000 NW Loop 410 | San Antonio, TX 78213 | 210.375.9000
Texas Engineering Firm #470 | Texas Surveying Firm #10028800

APS/ LOAD SWITCH INFORMATION PARMER LN AT SH 45 EBFR

2025

SHEET 10 OF 10

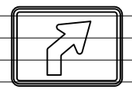
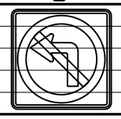
CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	130

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SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
1 of 4	1	R3-7R		36 X 36		X	10BWG	1	SA	P		
1 of 4	2	M2-1		21 x 15		X	10BWG	1	SA	P		
1 of 4	2	M1-6R		24 x 24		X	10BWG	1	SA	P		
2 of 4	3	W 10-1		36 X 36		X	10BWG	1	SA	P		
2 of 4	3	W 10-9P		30 X 24		X						
2 of 4	4	M3-4		24 x 12		X	10BWG	1	SA	P		
2 of 4	4	M1-6R		24 x 24		X						
2 of 4	4	M5-2R		21 x 15		X						
2 of 4	5	R5- 1		36 X 36		X	10BWG	1	SA	P		
2 of 4	5	D10-7aT		10 X 3		X						
2 of 4	6	R3-2		36 X 36		X	10BWG	1	SA	P		
2 of 4	7	D11-1		24 X 18		X	10BWG	1	SA	P		
2 of 4	7	R3-17a		24 x 8		X						
2 of 4	8	M3-2B		24 X 12		X	S80	1	SA	U	2EXT	
2 of 4	8	M90-1T		24 x 24		X						
2 of 4	8	M6-3B		21 x 15		X						
2 of 4	8	M3-2		24 x 12		X						

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
4-16 8-16	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		131

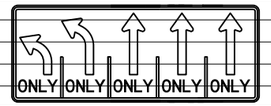
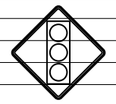
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DATE: 10/3/2025 11:38:00 AM
FILE: c:\pwwordir\benesch projects\projects\d0215423\00_Parmer_SOSS_01.dgn

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
2 of 4	8	M1 - 6T		24 X 24		X						
2 of 4	8	M6-3		21 X 15		X						
2 of 4	8	M3-2		24 X 12		X						
2 of 4	8	M1-6F		24 x 24		X						
2 of 4	8	M3-2		24 X 12		X						
2 of 4	8	M1-6R		24 X 24		X						
2 of 4	8	M6-3		21 X 15		X						
2 of 4	9	R5-1		36 X 36		X	10BWG	1	SA	P		
2 of 4	10	R1-2		48 X 48 X 48		X	10BWG	1	SA	T		
2 of 4	11	R3-8 LLK		77 X 30		X	S80	1	SA	T		
2 of 4	12	R6 - 1L		54 x 18		X	10BWG	1	SA	T		
2 of 4	13 & 14			120 x 48		X	10BWG	1	SA	T		
2 of 4	15	W8- 13A		36 x 36		X	10BWG	1	SA	P		
3 of 4	16	W3-3		30 x 30		X	10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

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NOTE:

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

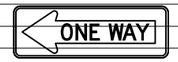
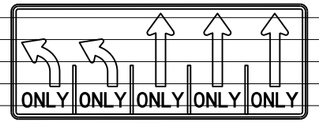
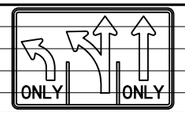
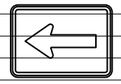
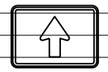
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REVISIONS		3417	02	040	FM734
4-16		DIST	COUNTY		SHEET NO.
8-16		4	WILLIAMSON		132

TB

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DATE: 10/17/2025 4:58:58 PM
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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
4 of 4	17	R6 -1L		54 X 18			10BWG	1	SA	T		
4 of 4	18 & 19	R3-4		36 X 36			10BWG	1	SA	P		
4 of 4	20	R5-1		36 X 36			10BWG	1	SA	P		
4 of 4	21	R3-8 LMS										
4 of 4	22	R3-8 LMS		48 X 30			10BWG	1	SA	T		
4 of 4	23	M3-3		24 X 12			S80	1	SA	U		
4 of 4	23	M1-6F		24 x 24								
4 of 4	23	M6-1		21 X 15								
4 of 4	23	M3-4B		24 X 12								
4 of 4	23	M90-1T		24 X 24								
4 of 4	23	M6-3B		21 X 15								
4 of 4	24	R3-7L		36 X 36			10BWG	1	SA	P		
4 of 4	25	M2-1		21 X 15			10BWG	1	SA	P		
4 of 4	25	M1-6F		24 X 24								

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

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NOTE:

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
4-16	DIST	COUNTY		SHEET NO.
8-16	4	WILLIAMSON		133

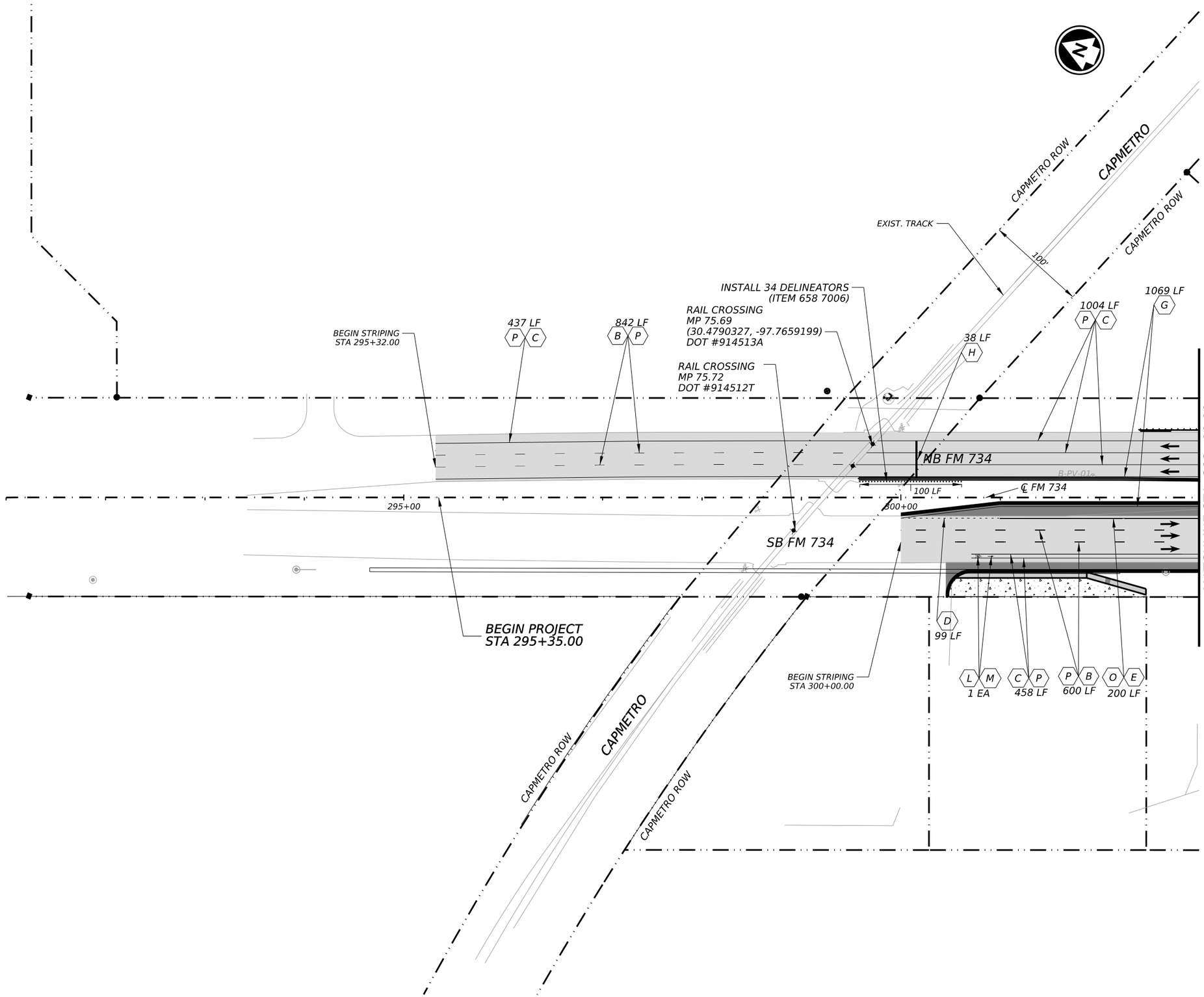
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FILE: c:\pwworkdir\benesch projects\projects\d0215423\00_Parmer_SOSS_03.dgn

100% SUBMITTAL

CK:
DW:
CK:
DW:



SUMMARY OF PAVEMENT MARKING

ITEM 666	REFL PAV MRKS TY I&II	A	6" WHITE DOT	-
		B	6" WHITE BRK	1,442 LF
		C	6" WHITE SLD	1,899 LF
		D	8" WHITE DOT	99 LF
		E	8" WHITE SLD	200 LF
		F	12" WHITE SLD	-
		G	12" YELLOW SLD	-
		H	24" WHITE SLD	38 LF
		I	ARROW	-
		J	WORD	-
		K	YIELD TRI	-
		L	BIKE ARROW	1 EA
		M	BIKE SYMBOL	1 EA
		N	RR XING	-
ITEM 668	PREFAB PM	Q	24" YELLOW SLD (See note below)	-
ITEM 672	RAISED MRKS	O	TY I-C	200 LF
		P	TY II-A-A	3,341 LF

Note: Item 668-7127 Pavement Marking (Q) (24" Yellow Solid) shall be furnished and installed in green instead of yellow.

0 50 100
SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
11/6/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45

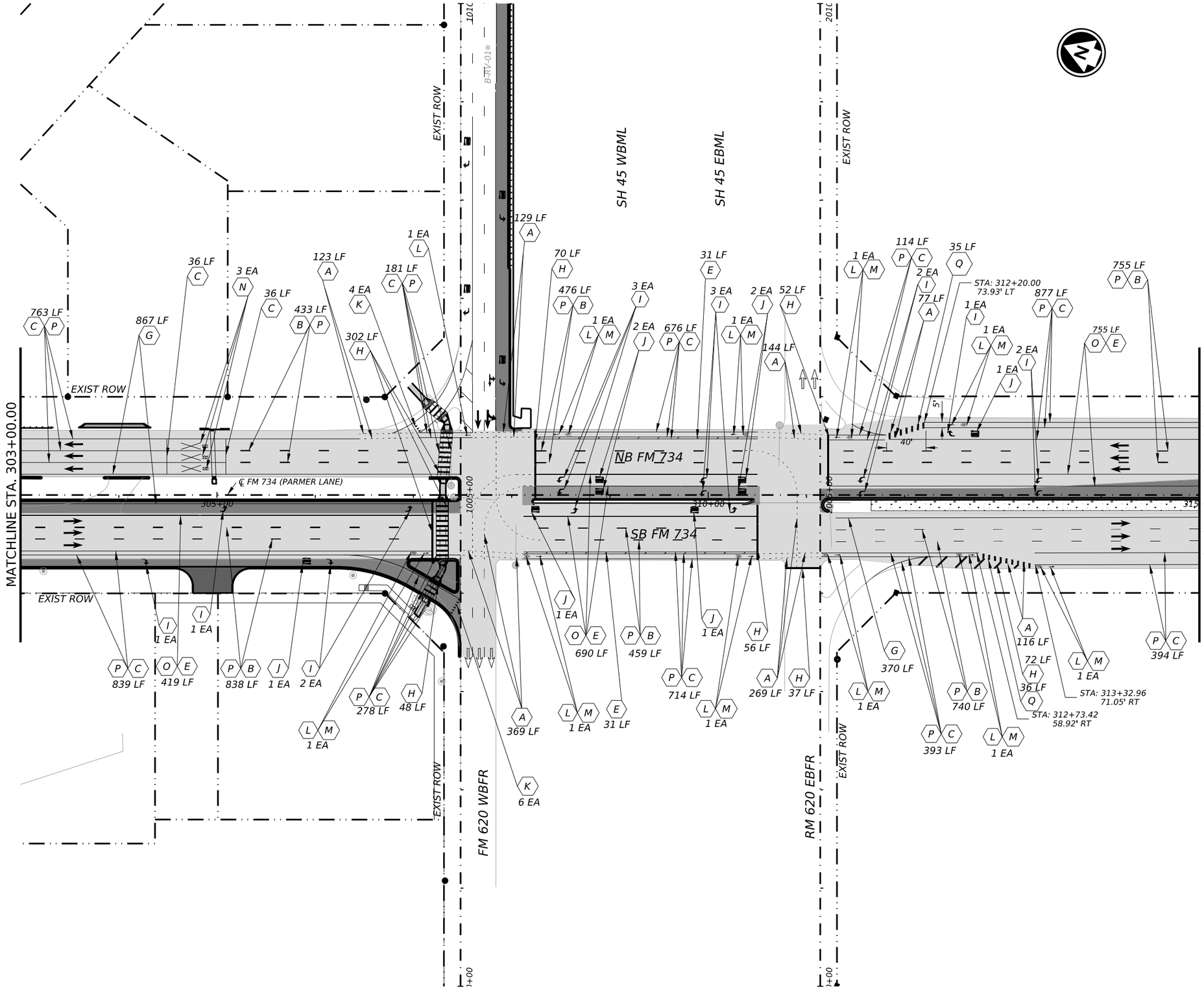
PAVEMENT MARKINGS

2025 SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		134

DATE: 11/6/2025 11:50:23 AM
FILE: c:\pwworkdir\benesch projects\projects\d0215423\00_Parmer_PM_01.dgn

100% SUBMITTAL



SUMMARY OF PAVEMENT MARKING				
ITEM 666	REFL PAV MRKS TYI&II	A	6" WHITE DOT	1,227 LF
		B	6" WHITE BRK	3,701 LF
		C	6" WHITE SLD	5,301 LF
		D	8" WHITE DOT	-
		E	8" WHITE SLD	1,926 LF
		F	12" WHITE SLD	-
		G	12" YELLOW SLD	1,237 LF
		H	24" WHITE SLD	637 LF
		I	ARROW	15 EA
		J	WORD	6 EA
		K	YIELD TRI	10 EA
		L	BIKE ARROW	11 EA
		M	BIKE SYMBOL	10 EA
		N	RR XING	3 EA
ITEM 668	PREFAB PM	Q	24" YELLOW SLD (See note below)	71 LF
ITEM 672	RAISED MRKS	O	TY I-C	1,864 LF
		P	TY II-A-A	8,930 LF

Note: Item 668-7127 Pavement Marking (Q) (24" Yellow Solid) shall be furnished and installed in green instead of yellow.

0 50 100
SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
10/17/2025

WILCO TEXAS

benesch
TBPELS Registration No. F-4452
5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45

PAVEMENT MARKINGS

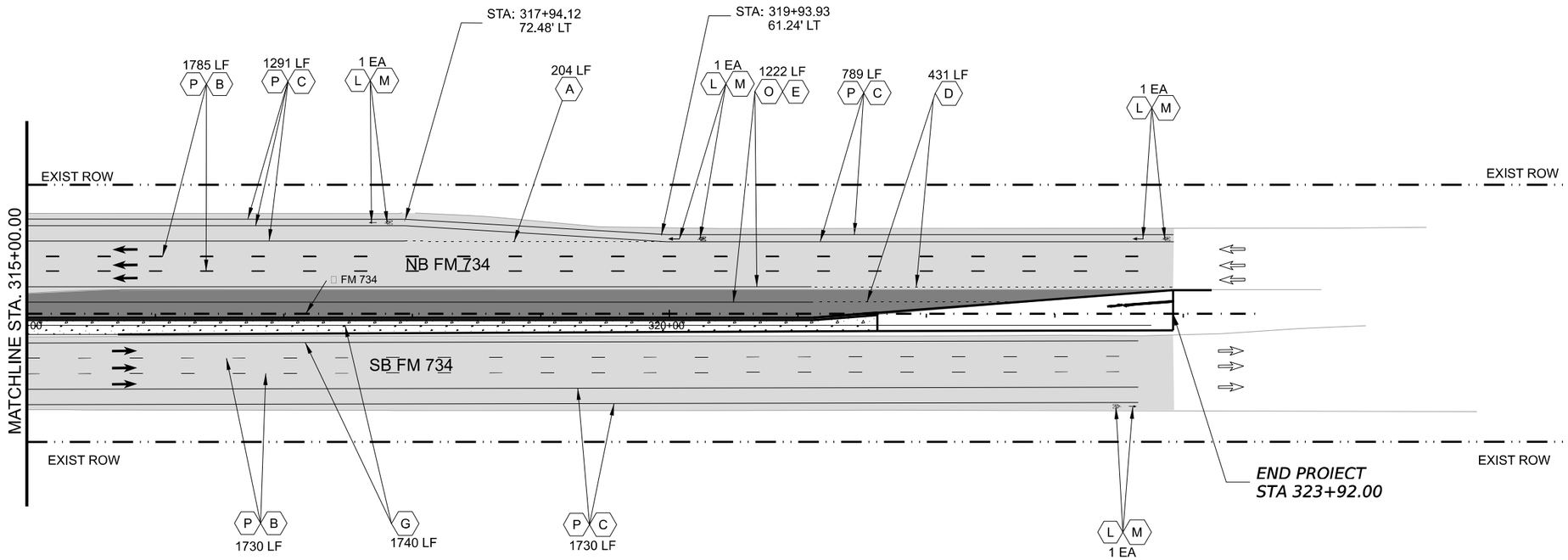
2025 SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		135

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100% SUBMITTAL

CK1
DW1
CK2
DN1



SUMMARY OF PAVEMENT MARKING				
ITEM 666	REFL PAV MRKS TYI&II	A	6" WHITE DOT	204 LF
		B	6" WHITE BRK	3,515 LF
		C	6" WHITE SLD	3,810 LF
		D	8" WHITE DOT	431 LF
		E	8" WHITE SLD	1,222 LF
		F	12" WHITE SLD	-
		G	12" YELLOW SLD	1,740 LF
		H	24" WHITE SLD	-
		I	ARROW	-
		J	WORD	-
		K	YIELD TRI	-
		L	BIKE ARROW	4 EA
		M	BIKE SYMBOL	4 EA
		N	RR XING	-
ITEM 668	PREFAB PM	Q	24" YELLOW SLD (See note below)	-
ITEM 672	RAISED MRKS	O	TY I-C	1,222 LF
		P	TY II-A-A	7,325 LF

Note: Item 668-7127 Pavement Marking (Q) (24" Yellow Solid) shall be furnished and installed in green instead of yellow.

0 50 100
SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
FERNANDO GAYTAN
92244
LICENSED
PROFESSIONAL ENGINEER
Fernando Gaytan
10/03/2025

WILCO TEXAS

benesch

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5113 Southwest Pkwy, Suite 255
Austin, TX 78735
TEL. 720-409-1860
www.Benesch.com

PARMER LANE AT SH 45

PAVEMENT MARKINGS

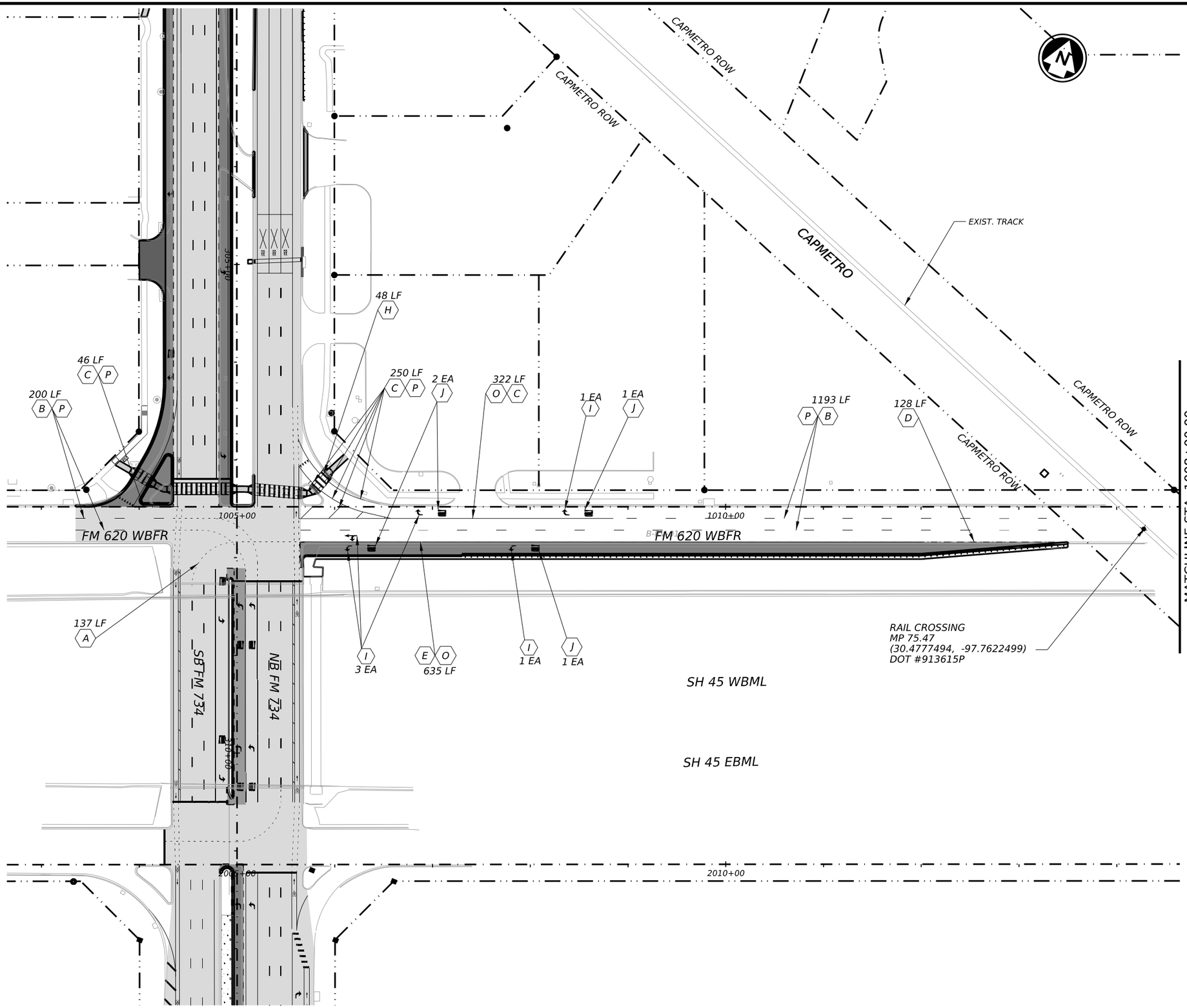
2025 SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		136

DATE: 10/3/2025 11:38:26 AM
FILE: c:\pwworkl\benesch projects\projects\d0215423\00_Parmer_PM_03.dgn

100% SUBMITTAL

CK
DW
CK
DW



SUMMARY OF PAVEMENT MARKING				
ITEM 666	REFL PAV MRKS TYI&II	A	6" WHITE DOT	137 LF
		B	6" WHITE BRK	1,393 LF
		C	6" WHITE SLD	618 LF
		D	8" WHITE DOT	128 LF
		E	8" WHITE SLD	635 LF
		F	12" WHITE SLD	-
		G	12" YELLOW SLD	-
		H	24" WHITE SLD	48 LF
		I	ARROW	5 EA
		J	WORD	4 EA
		K	YIELD TRI	-
		L	BIKE ARROW	-
		M	BIKE SYMBOL	-
		N	RR XING	-
ITEM 668	PREFAB PM	Q	24" YELLOW SLD (See note below)	-
ITEM 672	RAISED MRKS	O	TY I-C	957 LF
		P	TY II-A-A	1,689 LF

Note: Item 668-7127 Pavement Marking (Q) (24" Yellow Solid) shall be furnished and installed in green instead of yellow.

0 50 100
SCALE IN FEET
1" = 100' HORZ

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11/6/2025

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PARMER LANE AT SH 45

PAVEMENT MARKINGS

2025 SHEET 4 OF 4

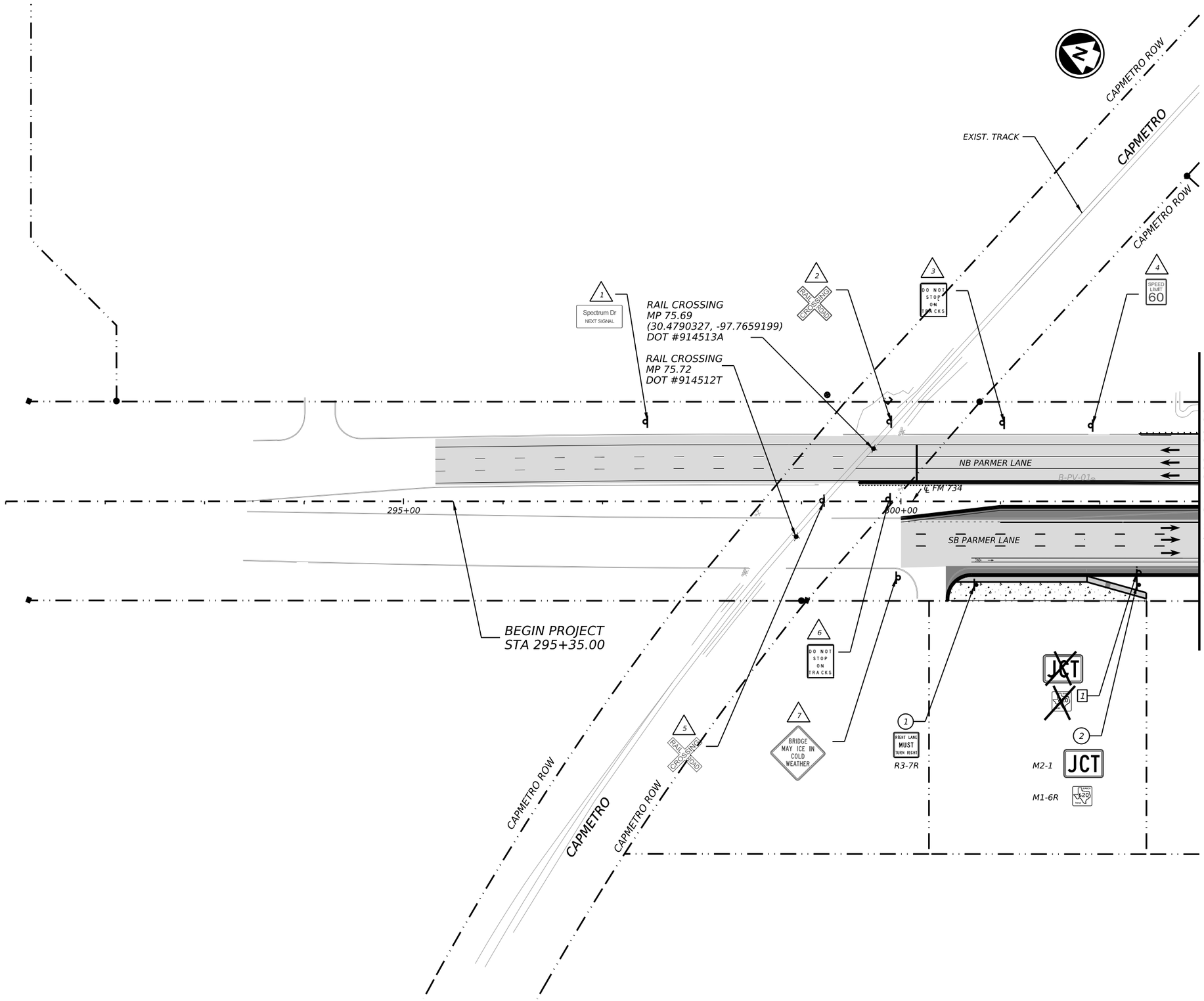
CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		137

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CK	DW

SUMMARY OF SIGNING			
ITEM 644	SIGN	(#)	IN SM RD SN SUP & AM
		△ #	EXIST. SIGN TO REMAIN
		[#]	REMOVE SIGN SUP & AM



0 50 100

SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
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92244
LICENSED PROFESSIONAL ENGINEER
Fernando Gaytan
11/6/2025

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PARMER LANE AT SH 45

SIGNING LAYOUT

2025 SHEET 1 OF 4

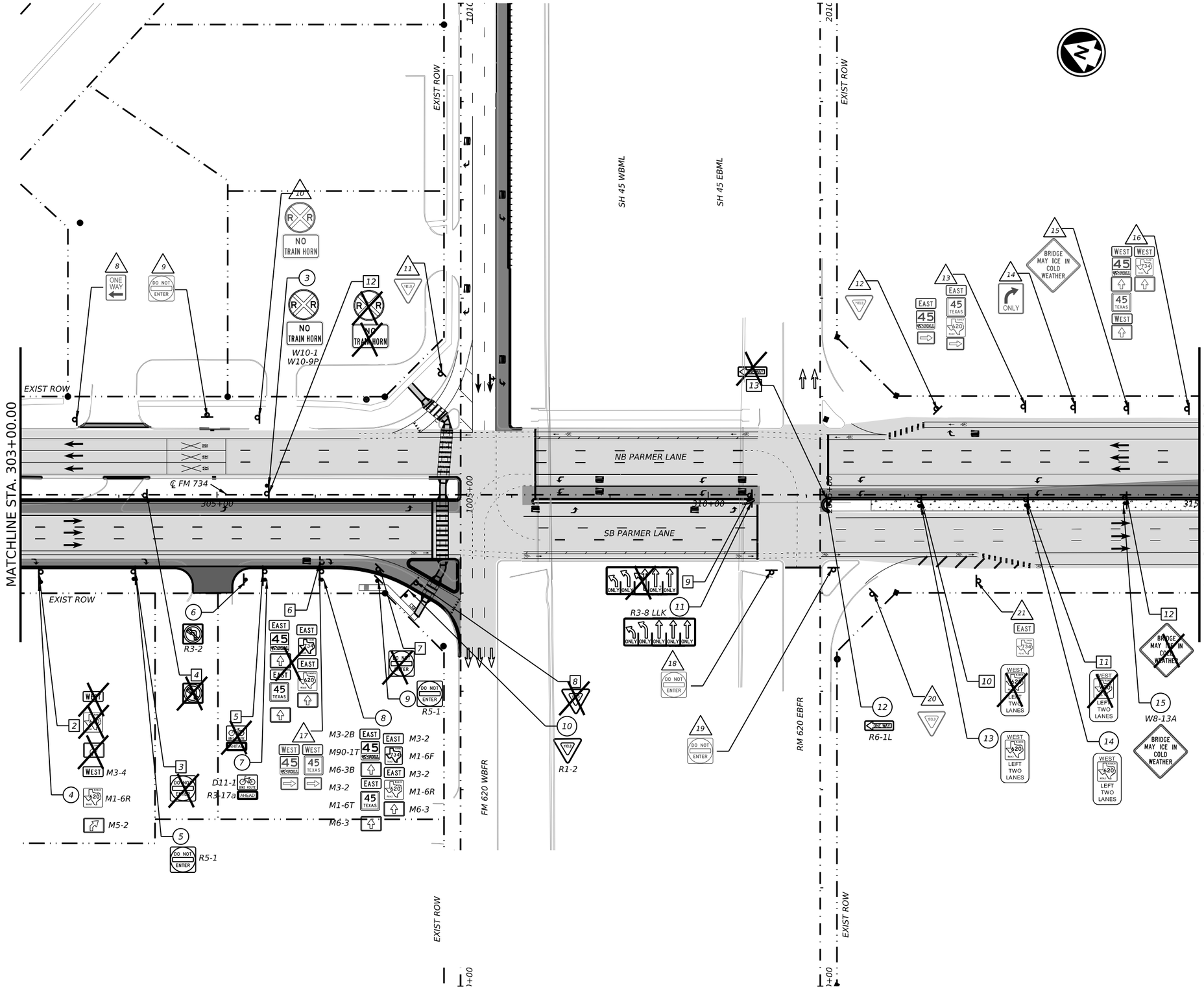
CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		138

DATE: 11/6/2025 11:04:49 AM
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100% SUBMITTAL

CK	DW	CK	DW

SUMMARY OF SIGNING			
ITEM 644	SIGN	(#)	IN SM RD SN SUP & AM
		△ #	EXIST. SIGN TO REMAIN
		#	REMOVE SIGN SUP & AM



0 50 100
SCALE IN FEET
1" = 100' HORZ

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11/6/2025

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PARMER LANE AT SH 45

SIGNING LAYOUT

2025 SHEET 2 OF 4

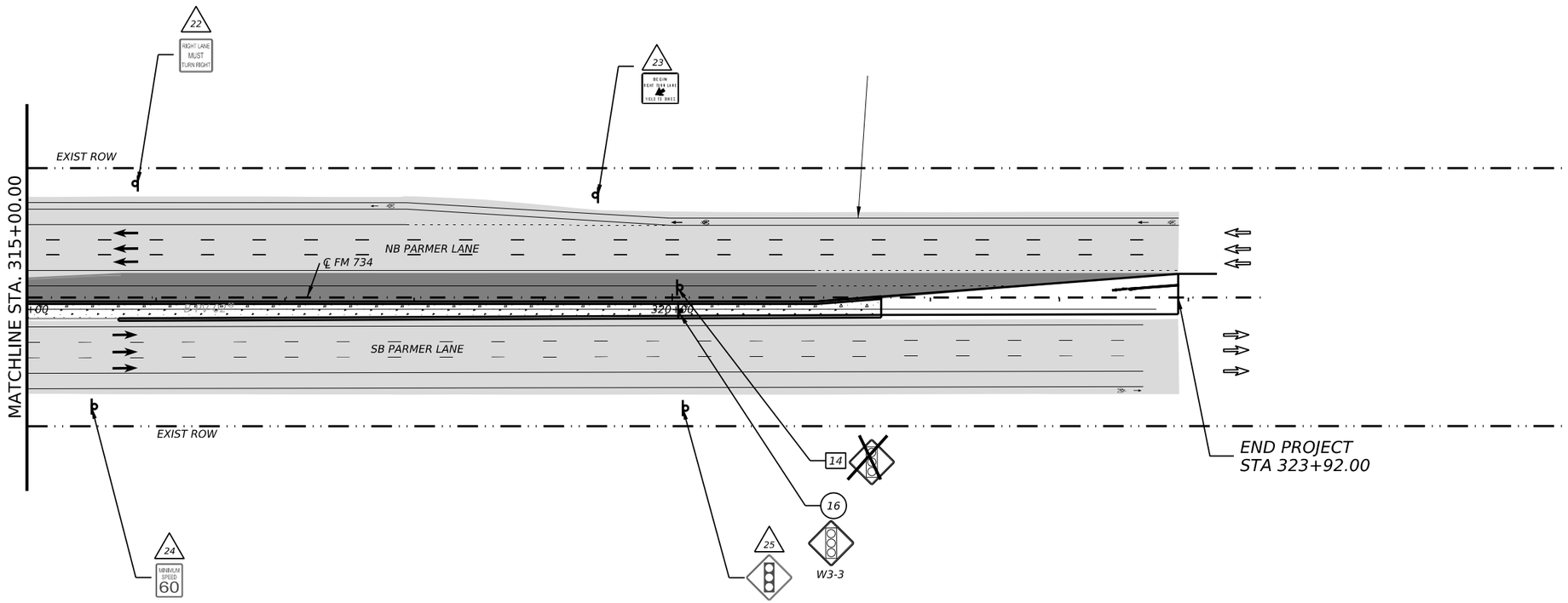
CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		139

DATE: 11/6/2025 11:05:02 AM
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CK
DW
CK
DW

SUMMARY OF SIGNING			
ITEM 644	SIGN	(#)	IN SM RD SN SUP & AM
		△ #	EXIST. SIGN TO REMAIN
		#	REMOVE SIGN SUP & AM



0 50 100

SCALE IN FEET
1" = 100' HORZ

STATE OF TEXAS
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Fernando Gaytan
11/6/2025

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PARMER LANE AT SH 45

SIGNING LAYOUT

2025 SHEET 3 OF 4

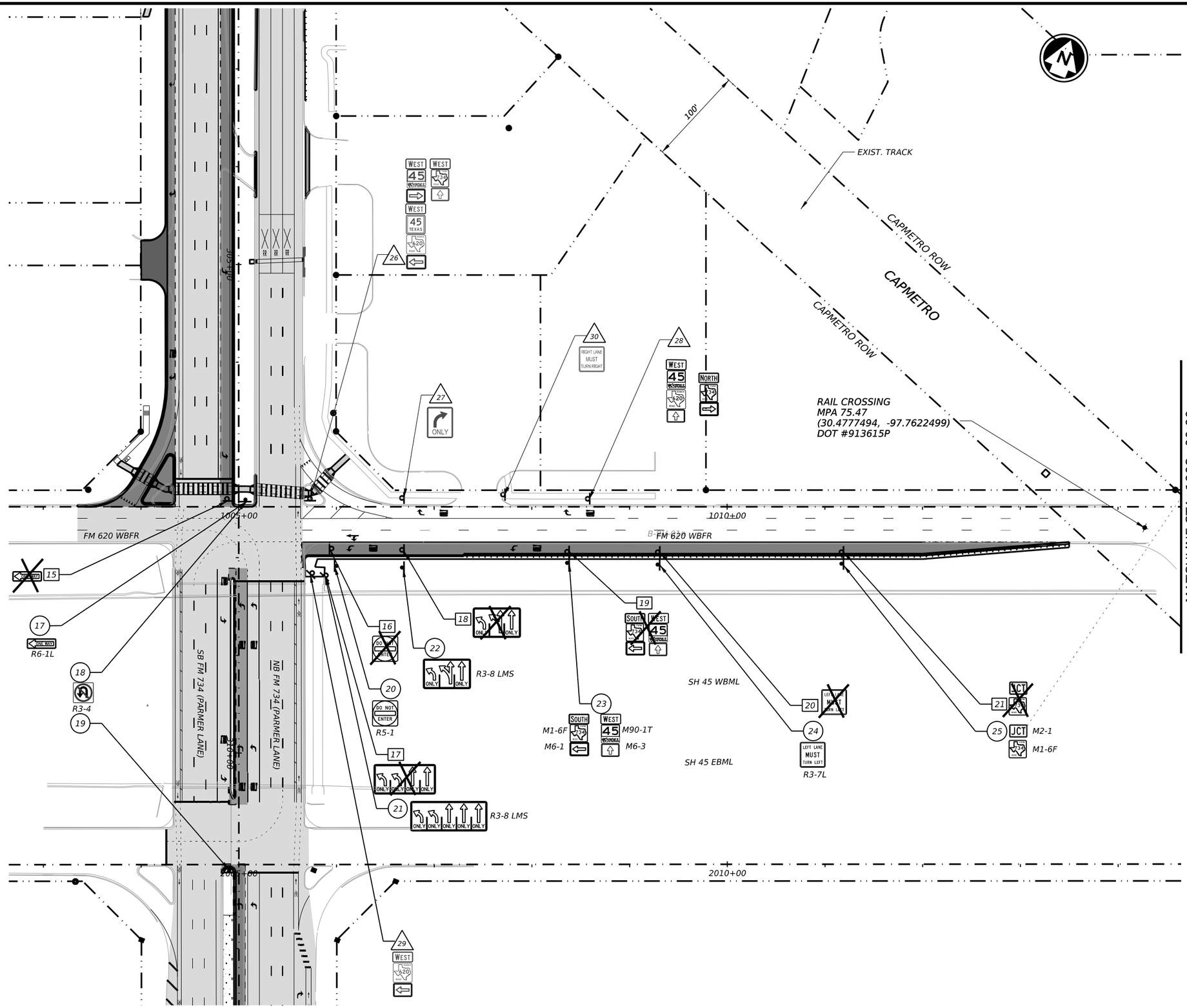
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DIST	COUNTY		SHEET NO.
4	WILLIAMSON		140

DATE: 11/6/2025 11:05:11 AM
FILE: c:\pw\wordlin\benesch projects\projects\d0215423\00 Parmer SIGN 03.dgn

100% SUBMITTAL

CK	DW	CK	DW

SUMMARY OF SIGNING			
ITEM 644	SIGN	(#)	IN SM RD SN SUP & AM
		△ #	EXIST. SIGN TO REMAIN
		#	REMOVE SIGN SUP & AM



STATE OF TEXAS
FERNANDO GAYTAN
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Fernando Gaytan
11/6/2025

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PARMER LANE AT SH 45

SIGNING LAYOUT

2025 SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		141

DATE: 11/6/2025 11:05:20 AM
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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

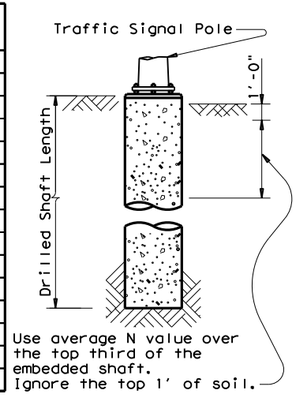
FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET)				
				24-A	30-A	36-A	36-B	42-A
POLE J	10	24-A	1	6				
POLE K	10	36-A	1			13		
POLE L	10	24-A	1	6				
POLE M	10	24-A	1	6				
POLE N	10	24-A	1	6				
POLE P	10	24-A	1	6				
POLE Q	10	24-A	1	6				
POLE R	10	36-B	1				15	
POLE S	10	24-A	1	6				
TOTAL DRILLED SHAFT LENGTHS				42*		13	15	

* FOUNDATION SUBSIDIARY TO ITEM 0687-7001.

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'



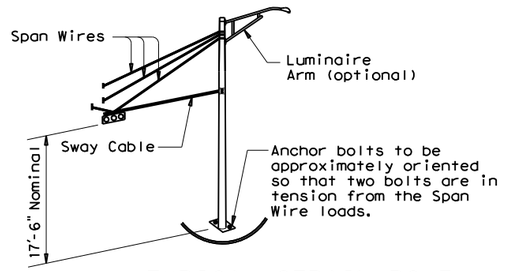
Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

ANCHOR BOLT & TEMPLATE SIZES

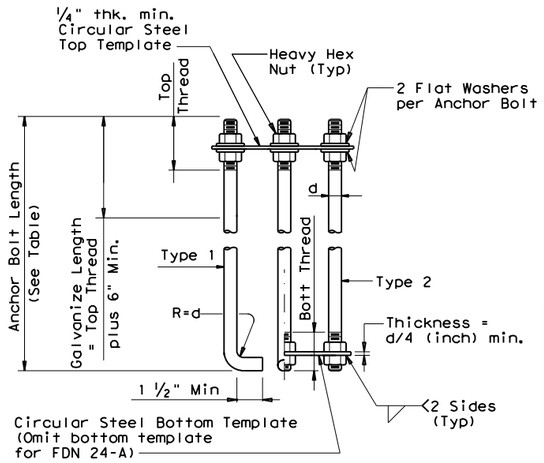
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.

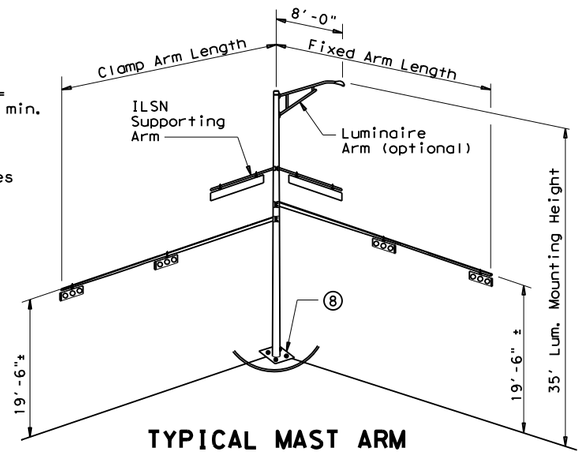


TYPICAL STRAIN POLE ASSEMBLY



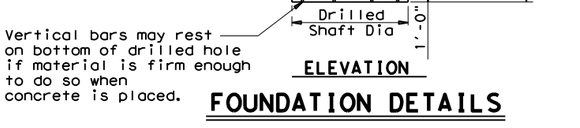
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

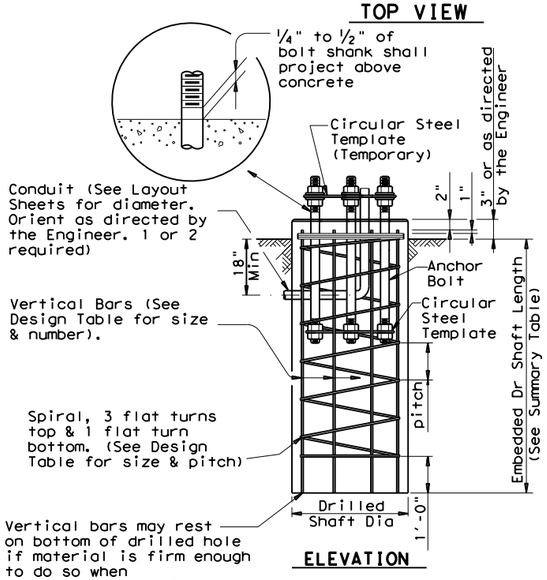


TYPICAL MAST ARM ASSEMBLY

⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TOP VIEW



ELEVATION

FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

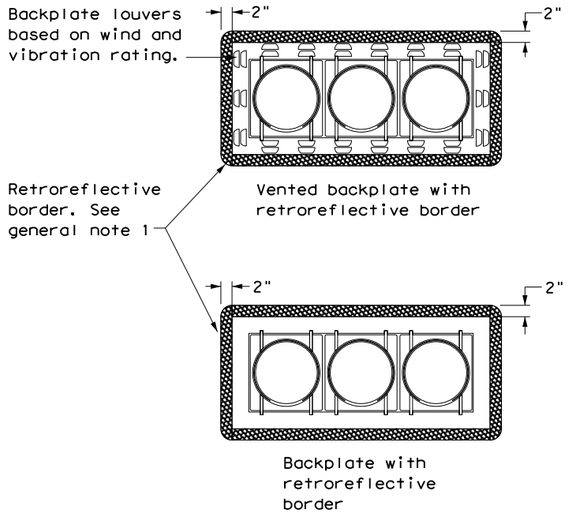
©TxDOT August 1995

REVISIONS	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96 11-99 1-12	CONT	SECT	JOB	HIGHWAY
	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		142

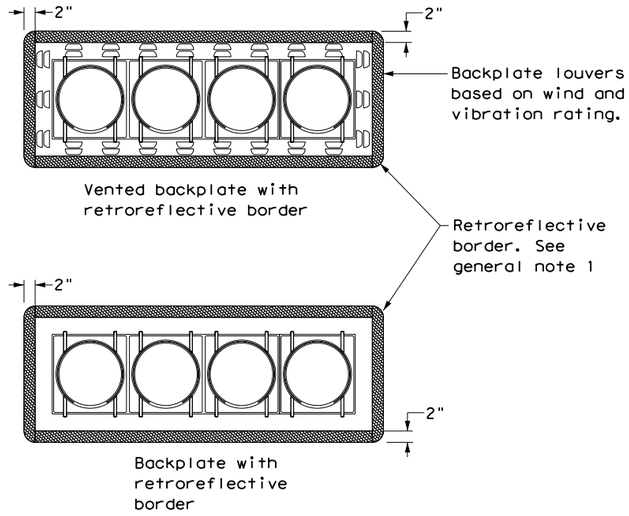
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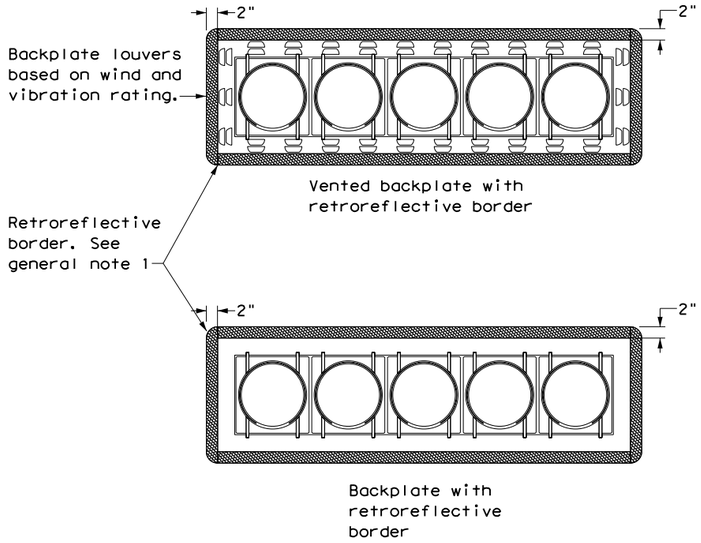
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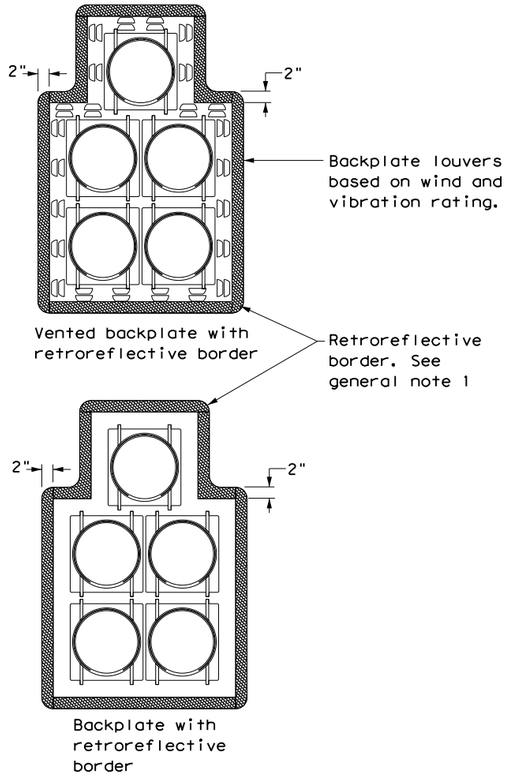
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



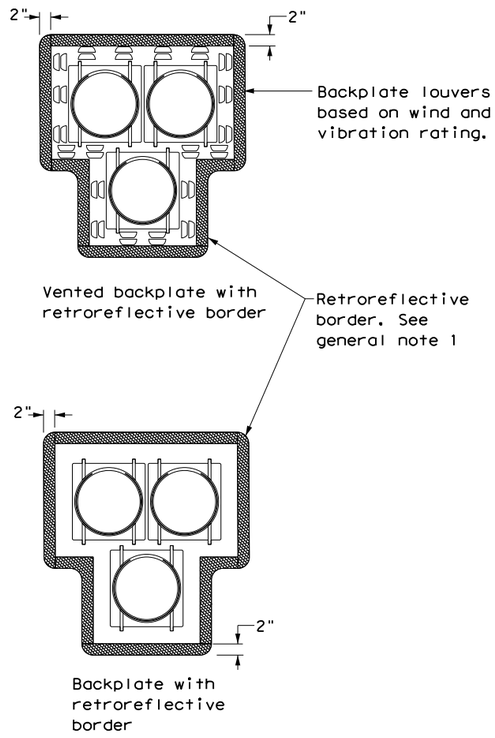
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		143

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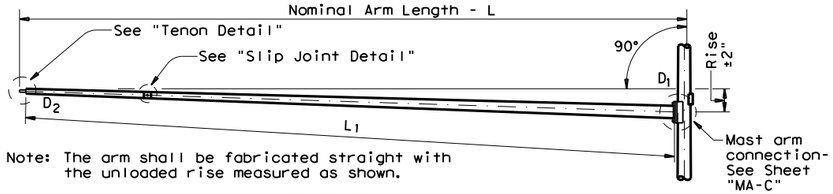
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)

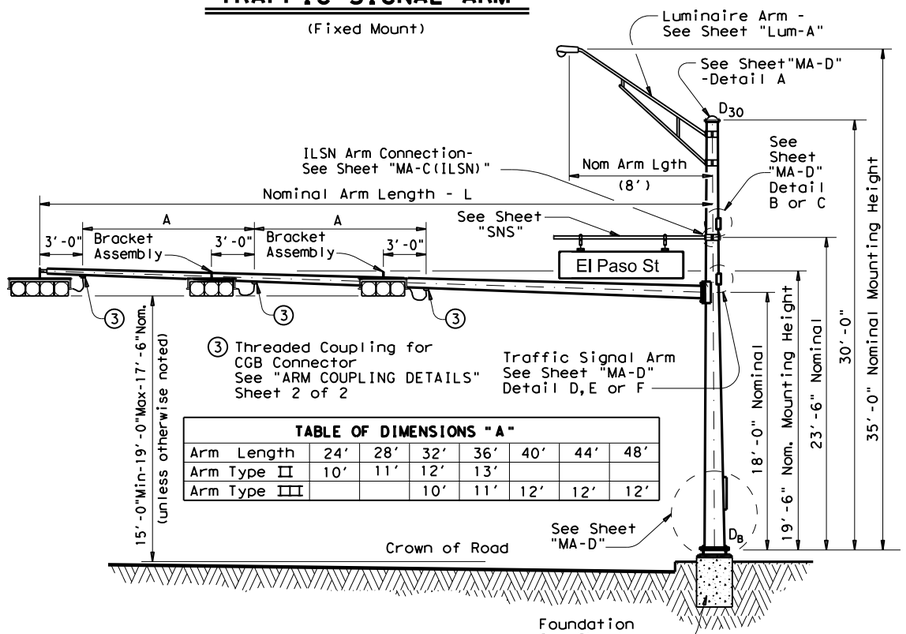


TABLE OF DIMENSIONS "A"

Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	1

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal) 1 CGB connector		Type II Arm (2 Signals) 1 Bracket Assembly and 2 CGB Connectors		Type III Arm (3 Signals) 2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	
48					48III-80	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3'-4"	
1 ¾"	3'-10"	1

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12

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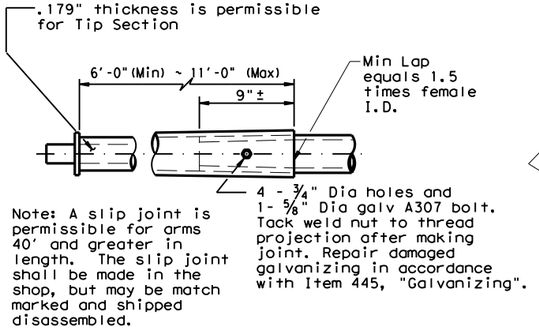
REVISIONS
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DN: MS	CK: JSY	DW: MWF	CK: JSY
CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		144

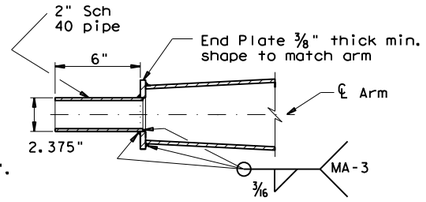
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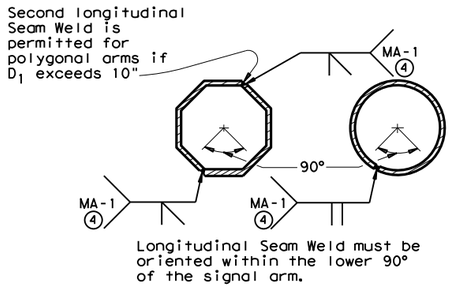
SLIP JOINT DETAIL



TENON DETAIL

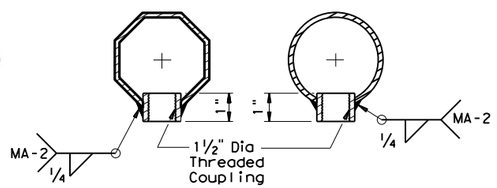
Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

④ 60% Min. penetration 100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(2)-12

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DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
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1-12

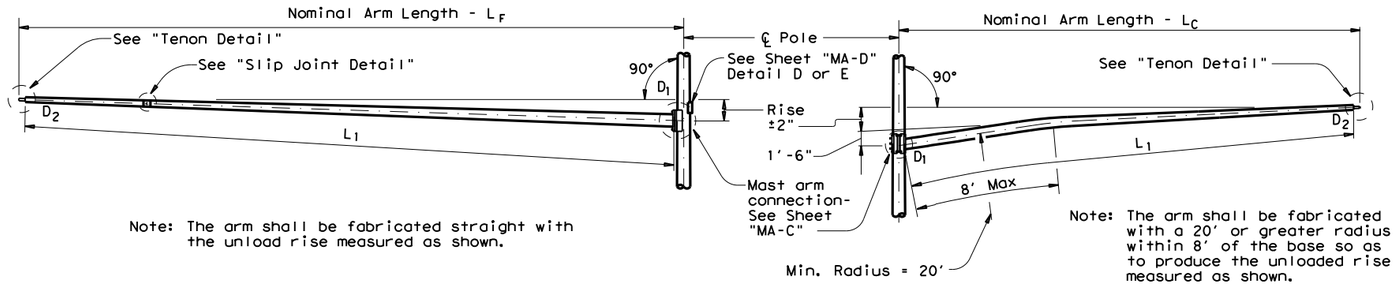
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3417	02	040	FM734
DIST	COUNTY		SHEET NO.
4	WILLIAMSON		145

122B

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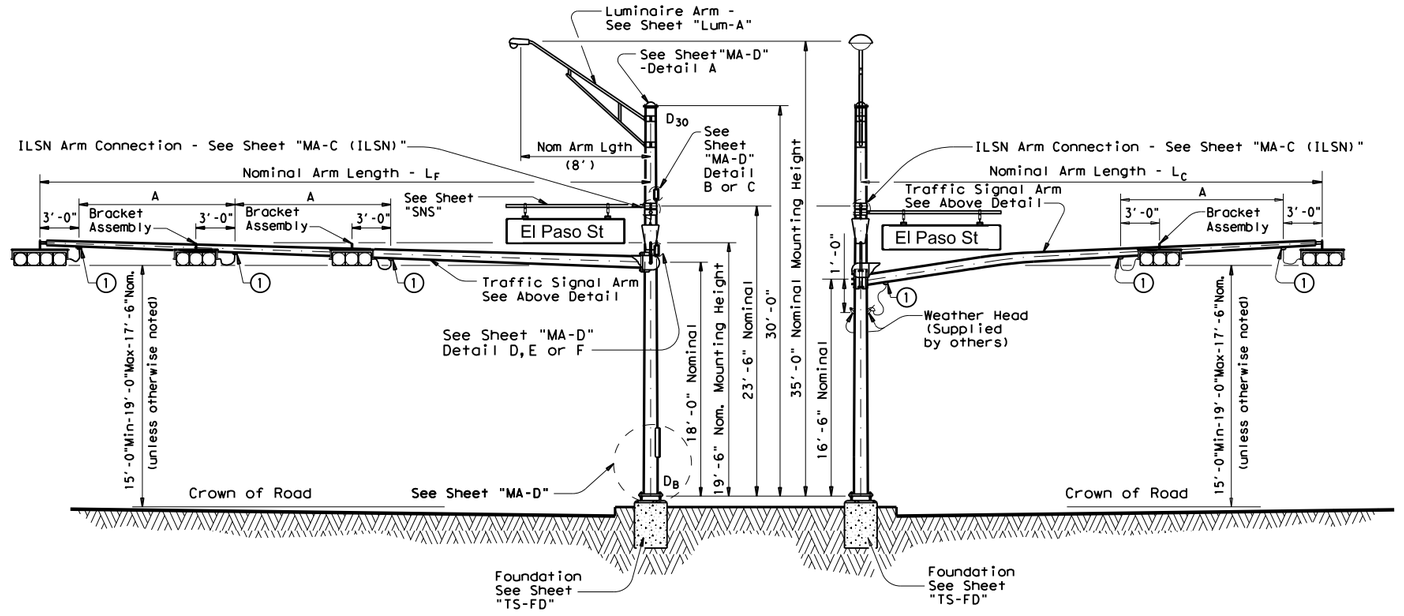


Note: The arm shall be fabricated straight with the unload rise measured as shown.

Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

CLAMP-ON TRAFFIC SIGNAL ARM



ELEVATION

(Showing fixed mount arm)

STRUCTURE ASSEMBLY

① Threaded Coupling for CGB Connector See "ARM COUPLING DETAILS" Sheet 2 of 3

ELEVATION

(Showing clamp mount arm)

TABLE OF DIMENSIONS "A"						
Arm Length	24'	28'	32'	36'	40'	44'
Arm Type II	10'	11'	12'	13'		
Arm Type III			10'	11'	12'	12'

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name signs and two traffic signal arms with length combinations as tabulated. The specified luminaire load applied at the end of luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign applied 4'-6" from the centerline of the pole equals 85 lbs vertical dead load plus the horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (1)-12

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DN: MS	CK: JSY	DW: MMF	CK: JSY

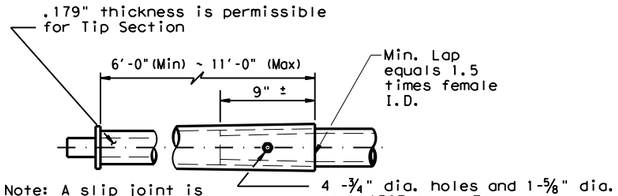
REVISIONS
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CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734

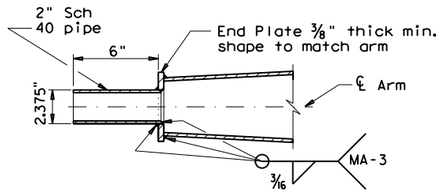
DIST	COUNTY	SHEET NO.
4	WILLIAMSON	146

124A

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SLIP JOINT DETAIL



TENON DETAIL

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY

VIBRATION WARNING

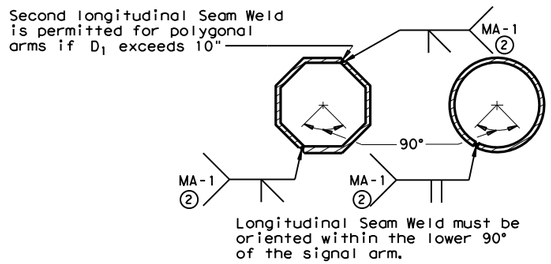
Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

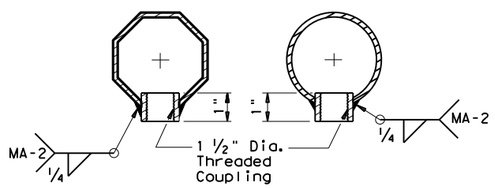
The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.



ARM WELD DETAIL

②60% Min. penetration
100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

SHEET 2 OF 3

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (2)-12

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REVISIONS	CONT	SECT	JOB	HIGHWAY	
5-96 1-12	3417	02	040	FM734	
	DIST	COUNTY		SHEET NO.	
	4	WILLIAMSON		147	

124B

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DATE:
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SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length		30' Poles With Luminaire		24' Poles With ILSN		19' Poles With no Luminaire and no ILSN	
		See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		See note above plus one small hand hole		See note above	
LF	Lc						
ft.	ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20	2020L-80		2020S-80		2020-80	
24	20	2420L-80		2420S-80		2420-80	
	24	2424L-80		2424S-80		2424-80	
28	20	2820L-80		2820S-80		2820-80	
	24	2824L-80		2824S-80		2824-80	
	28	2828L-80		2828S-80		2828-80	
32	20	3220L-80		3220S-80		3220-80	
	24	3224L-80		3224S-80		3224-80	
	28	3228L-80		3228S-80		3228-80	
	32	3232L-80		3232S-80		3232-80	
36	20	3620L-80		3620S-80		3620-80	
	24	3624L-80		3624S-80		3624-80	
	28	3628L-80		3628S-80		3628-80	
	32	3632L-80		3632S-80		3632-80	
	36	3636L-80		3636S-80		3636-80	
40	20	4020L-80		4020S-80		4020-80	
	24	4024L-80		4024S-80		4024-80	
	28	4028L-80		4028S-80		4028-80	
	32	4032L-80		4032S-80		4032-80	
	36	4036L-80		4036S-80		4036-80	
44	20	4420L-80		4420S-80		4420-80	
	24	4424L-80		4424S-80		4424-80	
	28	4428L-80		4428S-80		4428-80	
	32	4432L-80		4432S-80		4432-80	
	36	4436L-80		4436S-80		4436-80	1

Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm w/ the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	1

Traffic Signal Arms (Clamp-On Mount) (1 per pole) Ship each arm w/ the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	2 CGB connector and 1 clamp w/bolts and washers		1 Bracket Assembly, 3 CGB Connectors, and 1 clamp w/bolts and washers		2 Bracket Assemblies, 4 CGB Connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (1 or 2 per pole) ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	
1 3/4"	3'-10"	
2"	4'-3"	1

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

ARMS		ROUND POLES					POLYGONAL POLES					Foundation Type
LF	Lc	D_B	D_{19}	D_{24}	D_{30}	③ thk	D_B	D_{19}	D_{24}	D_{30}	③ thk	
ft.	ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	20	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
24	20	12.0	9.3	8.6	7.8	.179	13.0	10.0	9.2	8.3	.179	30-A
	24	12.0	9.3	8.6	7.8	.179	13.0	10.0	9.2	8.3	.239	30-A
28	20	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
	24	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
	28	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
32	20	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
	24	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
	28	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	30-A
	32	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
36	20	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
	24	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
	28	12.5	9.8	9.1	8.3	.239	13.5	10.5	9.7	8.8	.239	36-A
	32	12.5	9.8	9.1	8.3	.239	13.5	10.5	9.7	8.8	.239	36-A
	36	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
40	20	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
	24	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
	28	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
	32	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A
	36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
44	20	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	24	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	28	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	32	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B
	36	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B

Arm L_F or L_C	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	③ thk	Rise	L_1	D_1	④ D_2	③ thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire

D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length
L_C = Clamp-on Arm Length (36' Max)

③ Thickness shown are minimums, thicker materials may be used.

④ D_2 may be increased by up to 1.0" for polygonal arms.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (3)-12

© TxDOT August 1995

DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734

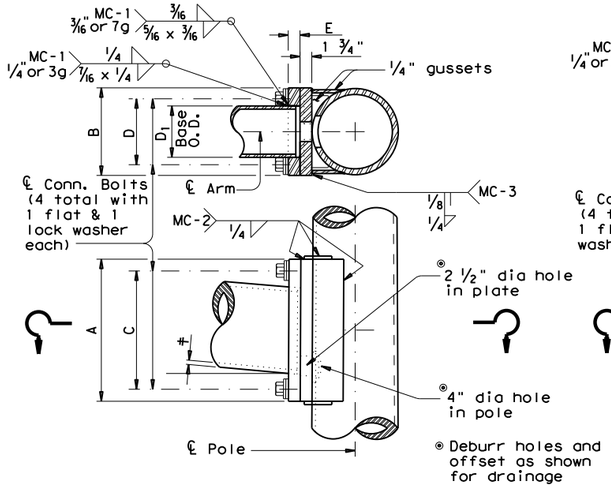
DIST	COUNTY	SHEET NO.
4	WILLIAMSON	148

124C

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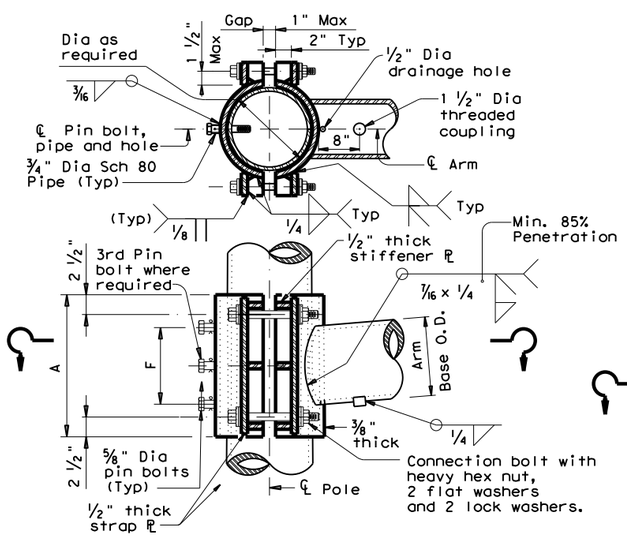
DATE:
FILE:

ARM SIZE D_1	ARM SIZE ǂ	A	B	C	D	E	CONN BOLT DIA
in.	in.	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15	9	2	1 1/4
10.5	.239	18	13	15	10	3	1 1/2
11.0	.239	18	13	15	10	3	1 1/2



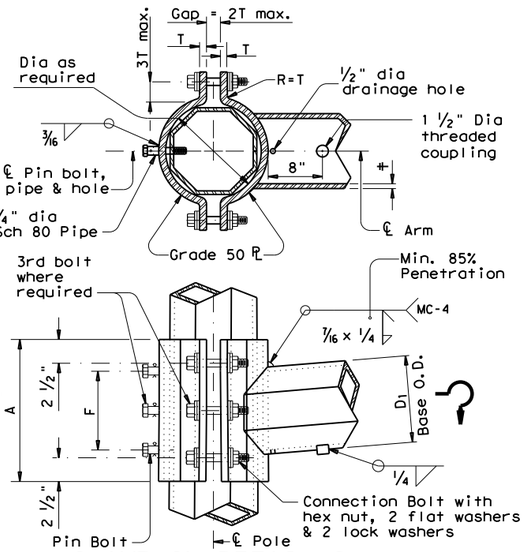
FIXED MOUNT DETAIL 1

ARM SIZE D_1	ARM SIZE ǂ	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8

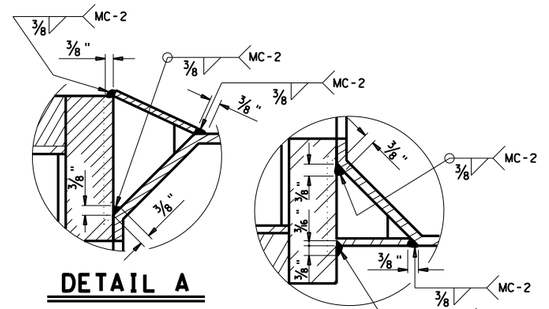


CLAMP-ON DETAIL 1

ARM SIZE D_1	ARM SIZE ǂ	A	F	T	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	in.	ea.	in.	ea.	in.
7.0	.179	12	6	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8

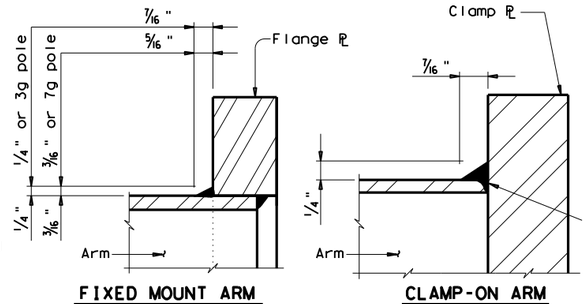


CLAMP-ON DETAIL 2



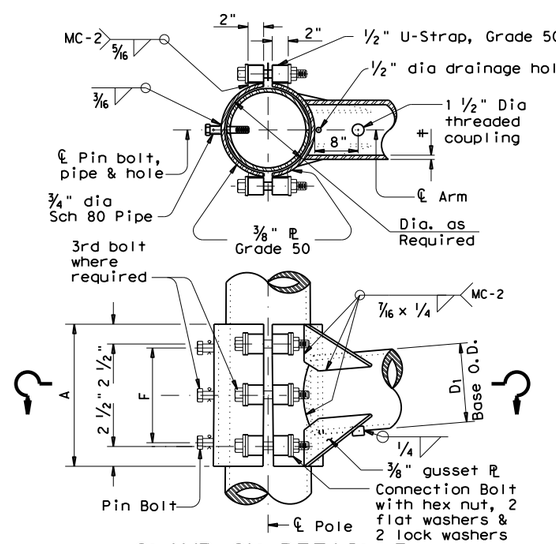
DETAIL A

DETAIL B



ARM BASE WELD DETAILS

ARM SIZE D_1	ARM SIZE ǂ	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8



CLAMP-ON DETAIL 3

MATERIALS	
Round Shafts or Polygonal Shafts ①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ②
Plates ①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 9/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

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DN: MS	CK: JSY	DW: MMF	CK: JSY
REVISIONS	CONT	SECT	JOB	HIGHWAY
5-96	3417	02	040	FM734
5-09	DIST	COUNTY		SHEET NO.
1-12	4	WILLIAMSON		514

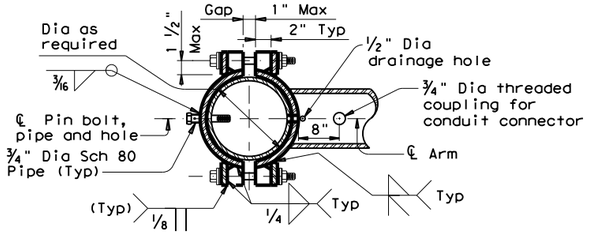
126A

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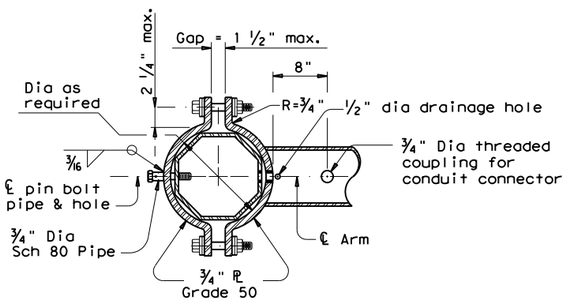
DATE:
FILE:

TABLE OF DIMENSIONS
for ILSN Support Arm Clamp-on
Details 1, 2 and 3

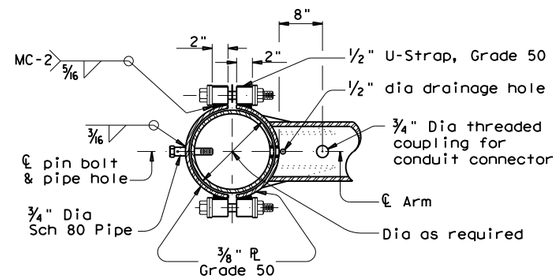
ILSN ARM SIZE	A	F	CONN. BOLTS		PIN BOLTS	
			No.	Dia	No.	Dia
	in.	in.	ea.	in.	ea.	in.
3 in. dia Schedule 40 Pipe	10	4	4	¾	2	⅝



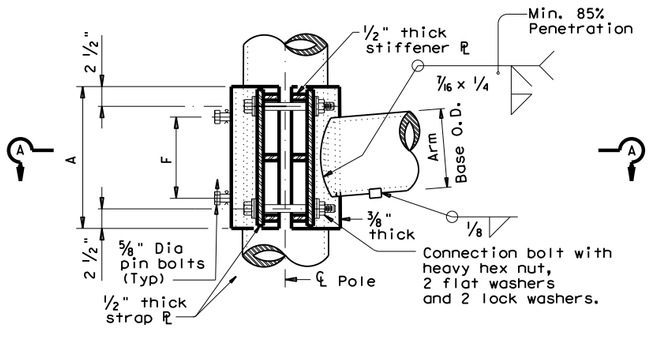
SECTION A-A



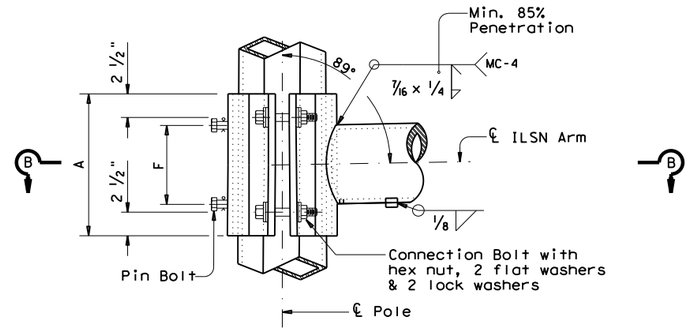
SECTION B-B



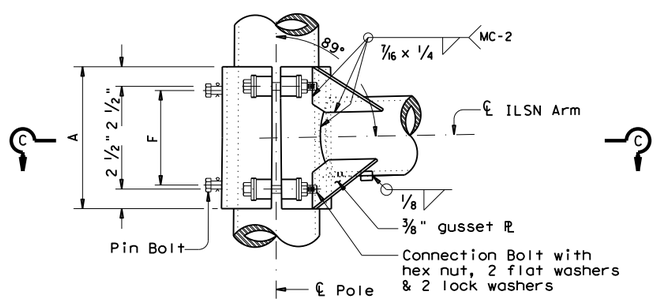
SECTION C-C



ILSN CLAMP-ON DETAIL 1



ILSN CLAMP-ON DETAIL 2



ILSN CLAMP-ON DETAIL 3

GENERAL NOTES:

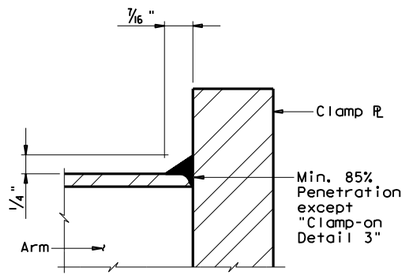
Clamp-on details shall be used for ILSN support arm assemblies. A 1 ½" inch diameter hole shall be cut in the front clamp plate for wiring access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the details.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

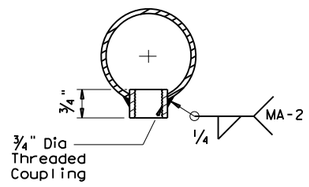
NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and ¾" dia pipe shall have 7/16" dia holes for a ⅛" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.



CLAMP-ON ARM

ARM BASE WELD DETAILS



ILSN ARM COUPLING DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST-ARM CONNECTIONS

MA-C(ILSN)-12

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DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
1-12

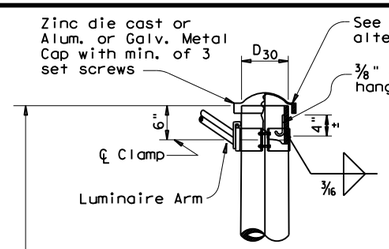
CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	150

126B

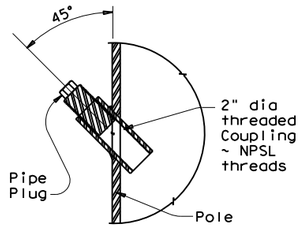
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DATE:
FILE:

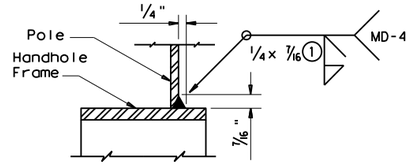


DETAIL A

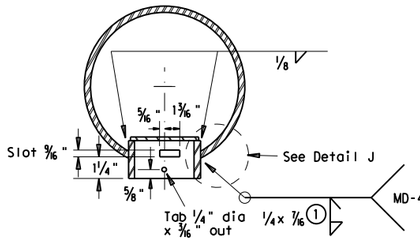
(for pole with luminaire)



POLE COUPLING DETAIL

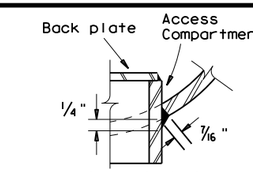


DETAIL G

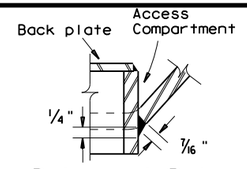


SECTION X-X

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

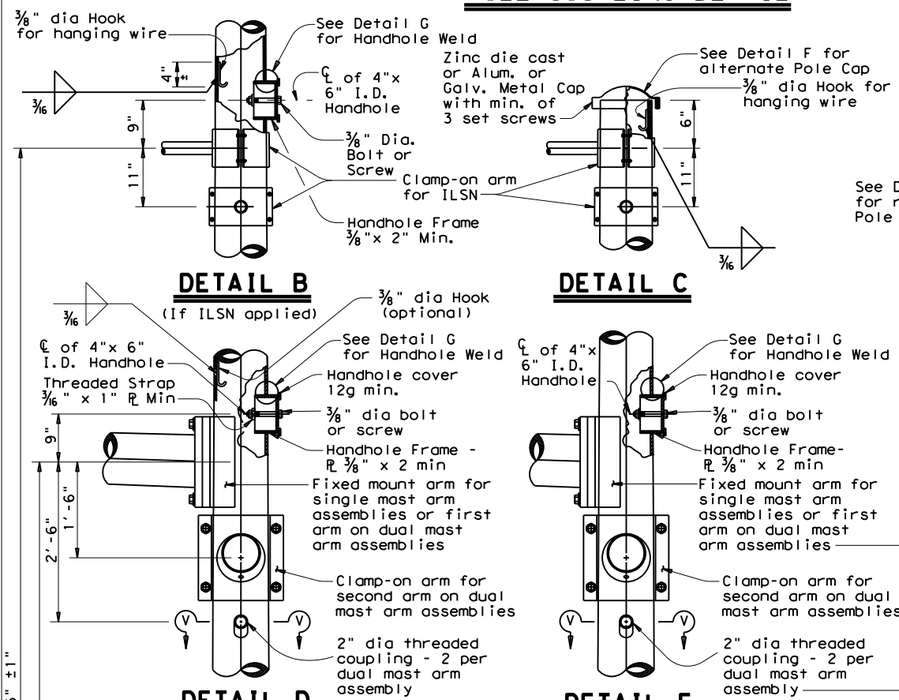


Round Pole



Polygonal Pole

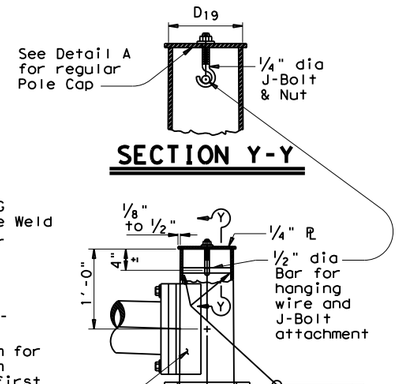
DETAIL J



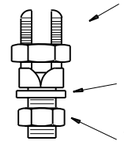
DETAIL B

(If ILSN applied)

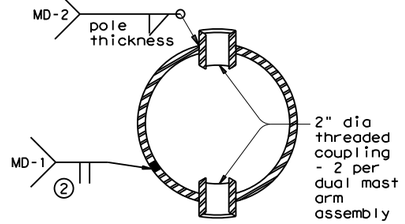
DETAIL C



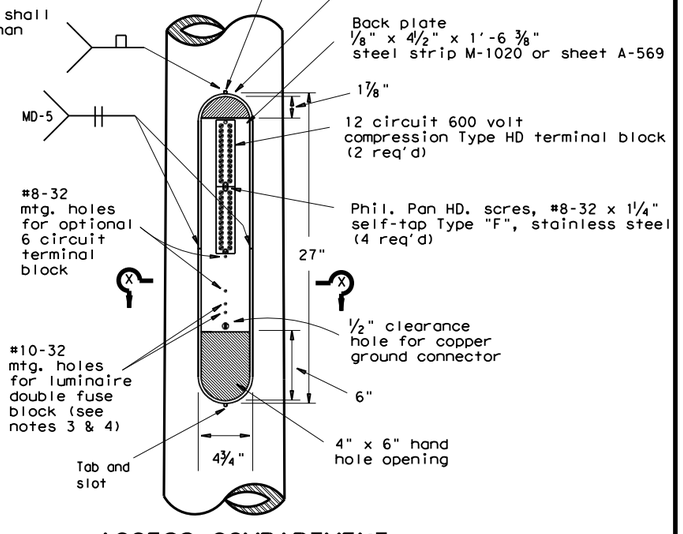
SECTION Y-Y



COPPER GROUND CONNECTOR



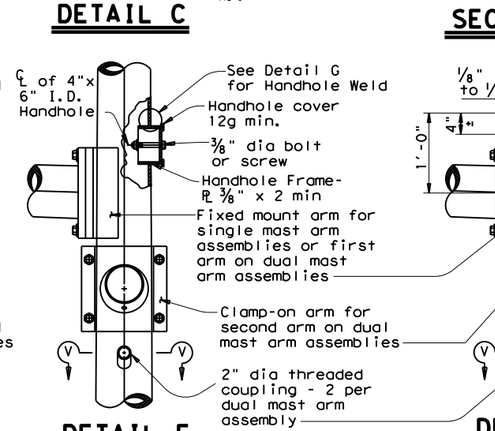
SECTION V-V



ACCESS COMPARTMENT

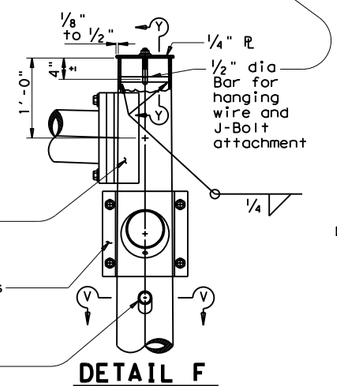
DETAIL D

(for 30' pole with luminaire and ILSN sign)



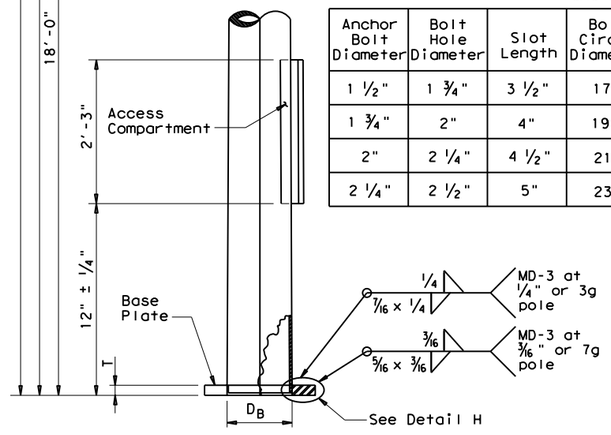
DETAIL E

(for 24' pole with ILSN sign and no luminaire)



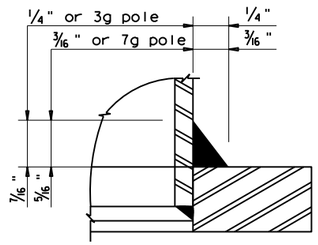
DETAIL F

(for 19' pole with no ILSN sign and no luminaire)

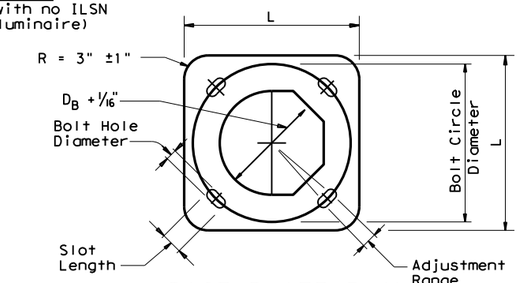


POLE ELEVATION

Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base ℞ Dim. L x T	Adjust. Range
1 1/2"	1 3/4"	3 1/2"	17"	18" x 1 1/2"	13.4°
1 3/4"	2"	4"	19"	20" x 1 3/4"	13.5°
2"	2 1/4"	4 1/2"	21"	22" x 2"	13.6°
2 1/4"	2 1/2"	5"	23"	24" x 2 1/4"	13.7°



DETAIL H



BASE PLATE PLAN

(1) 85% Min. penetration

(2) 60% Min. penetration 100% pemetration within 6" of circumferential base welds.

NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12

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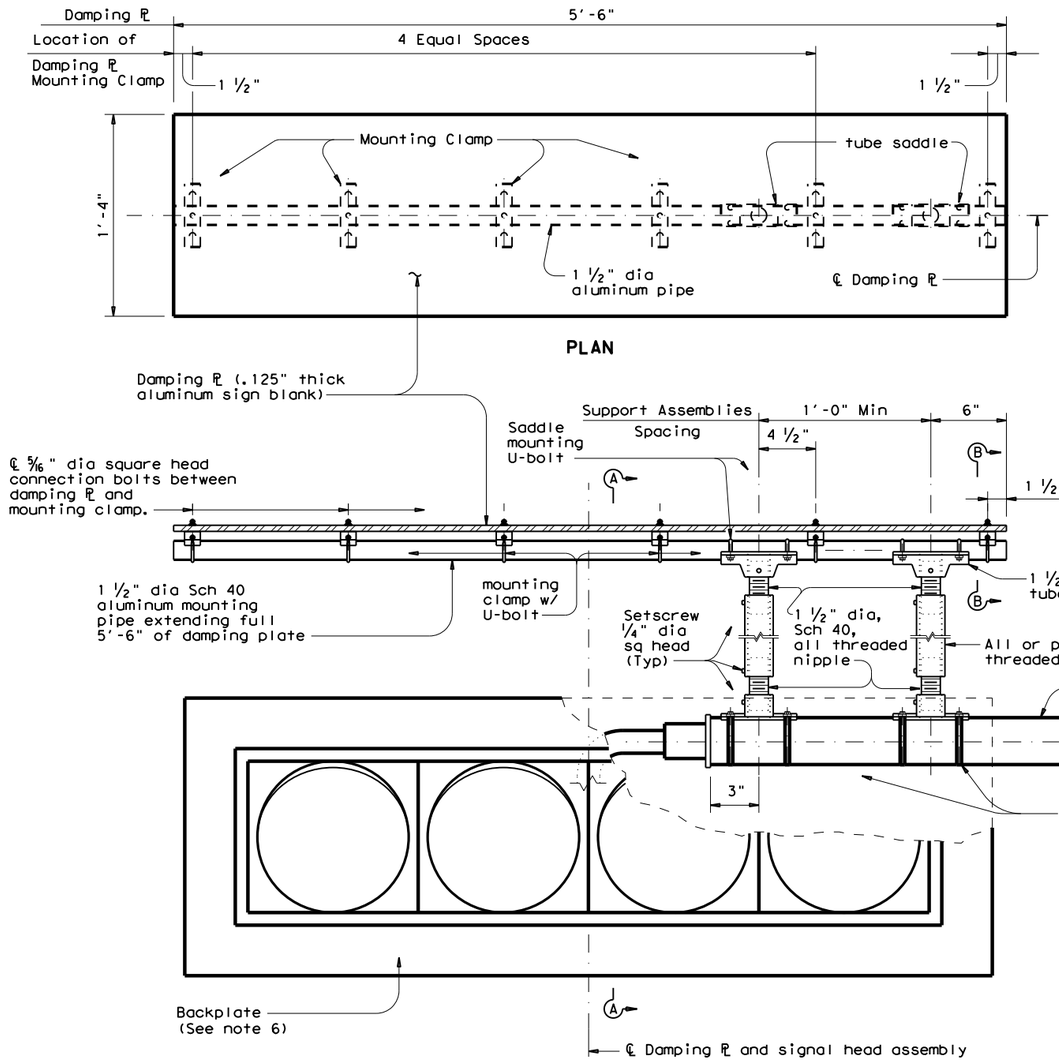
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DIST	COUNTY		SHEET NO.
4	WILLIAMSON		151

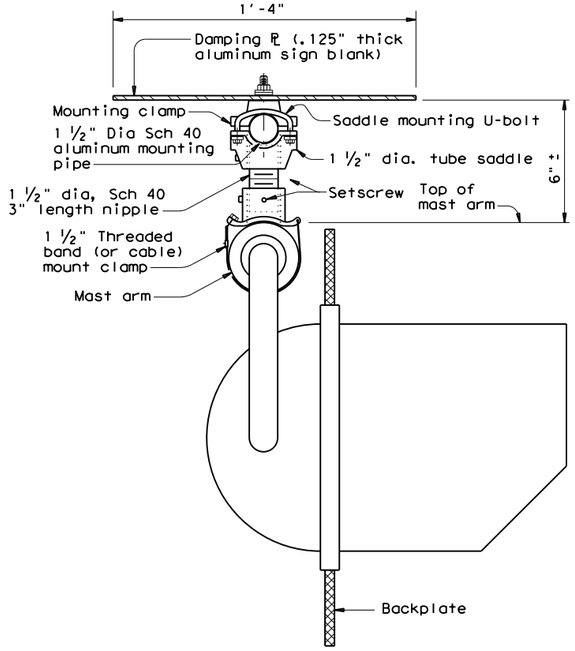
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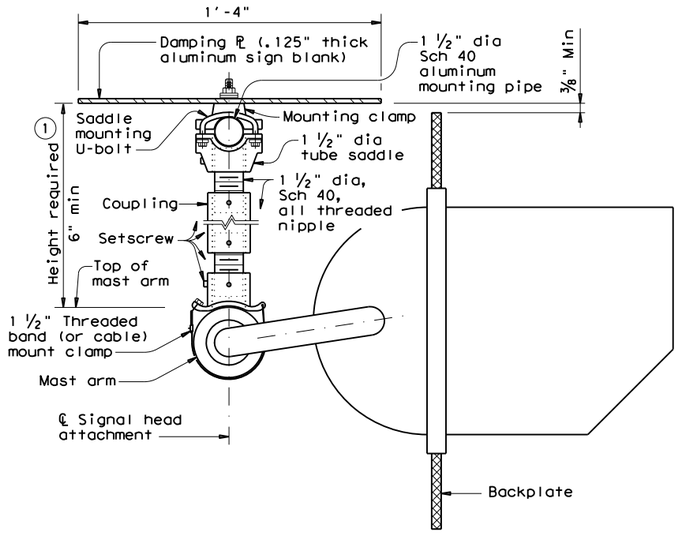
DAMPING PLATE MOUNTING DETAILS

(Showing alternate placement of signal head)



SECTION A-A

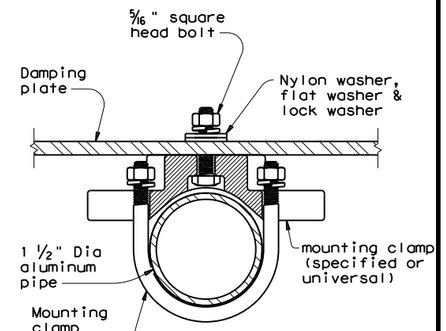
(Showing standard placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A

(Showing alternate placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)

① Recommended supporting assemblies to achieve required height for horizontal section heads			
Height required	One nipple each length	Two nipples each length plus	One coupling each length
6"-6 ¾"	3"	-	-
7"-8 ½"	4"	-	-
9"-10 ½"	6"	-	-
11"-15 ½"	-	4"	5"
16"-24"	-	6"	10"



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.
2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.
3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate)and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.
4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
5. Contractor will verify applicable field dimensions before the installation.
6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

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GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

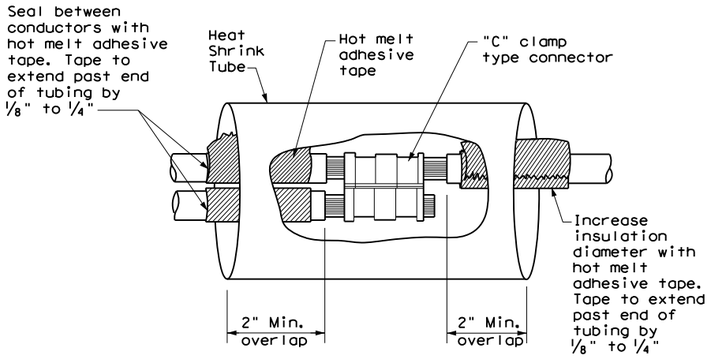
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

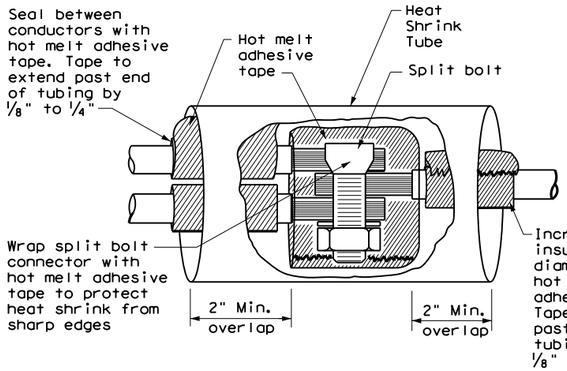
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

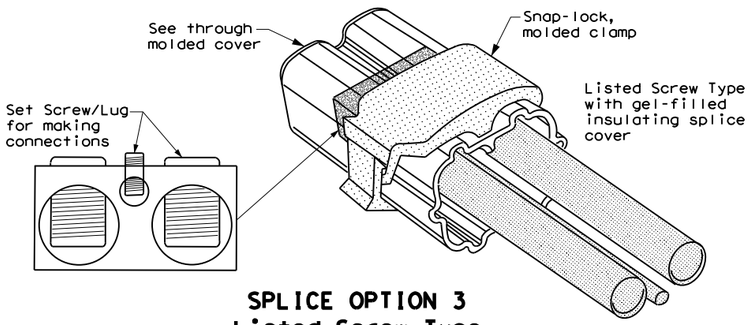
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

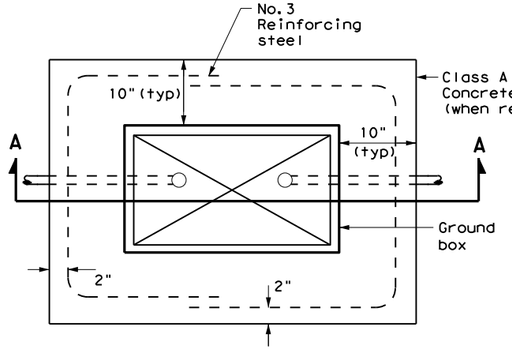
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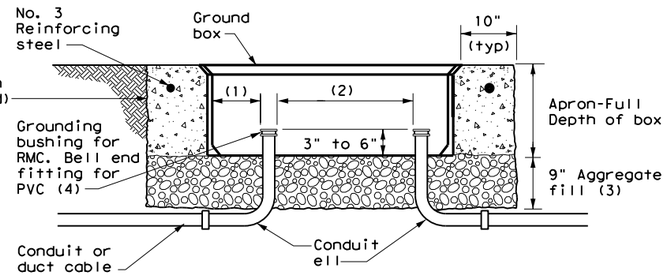
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PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

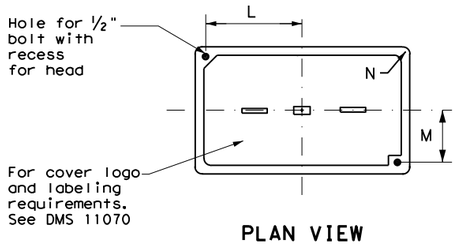
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

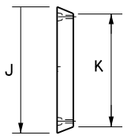
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

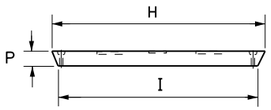
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



END



SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

*ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

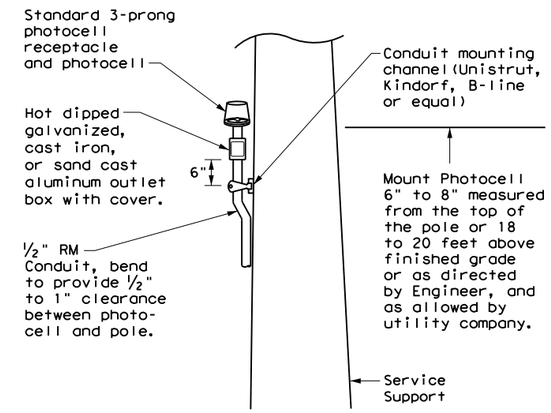
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

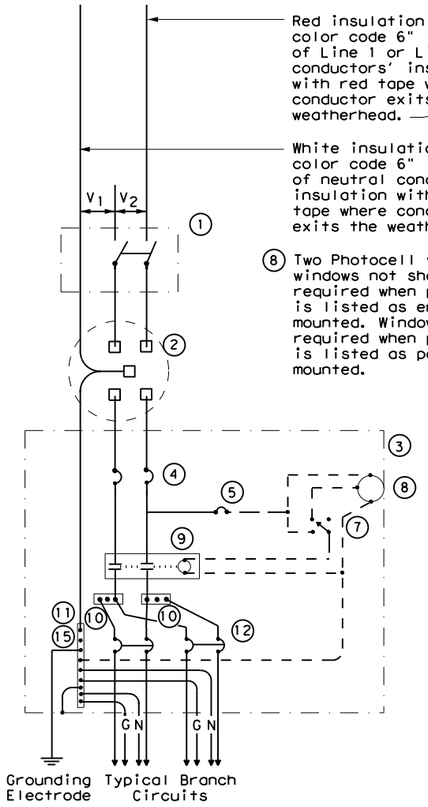
ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

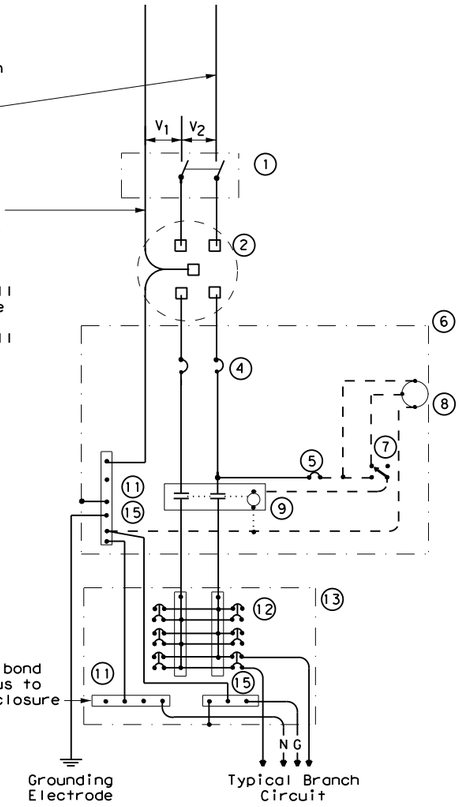
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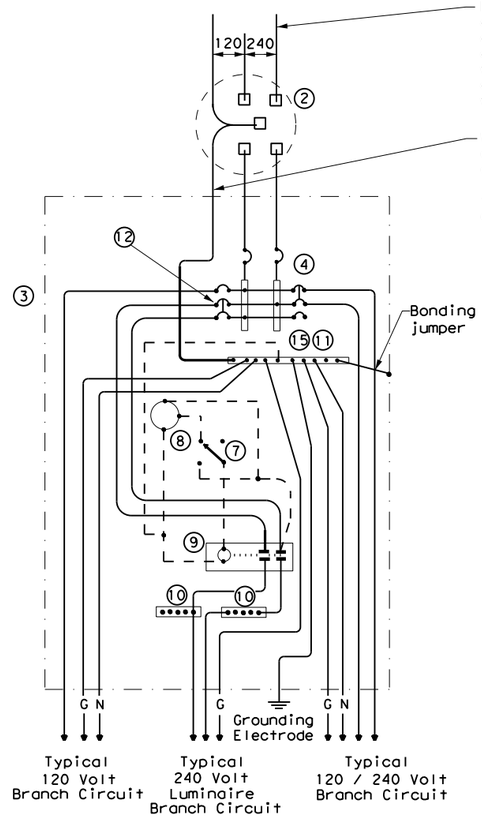
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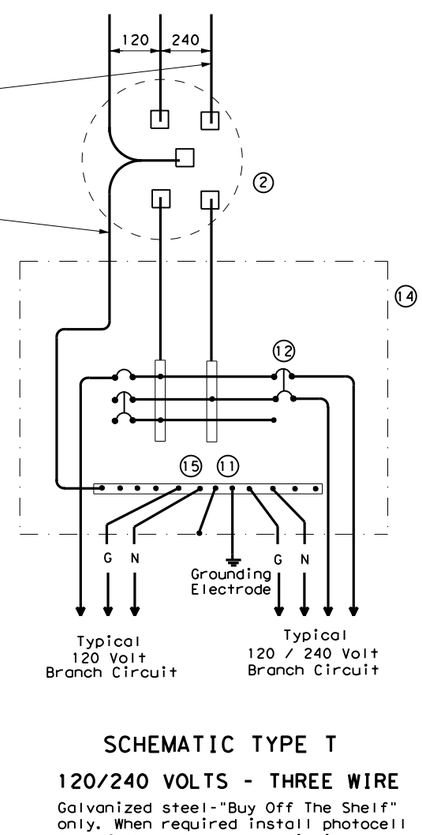
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

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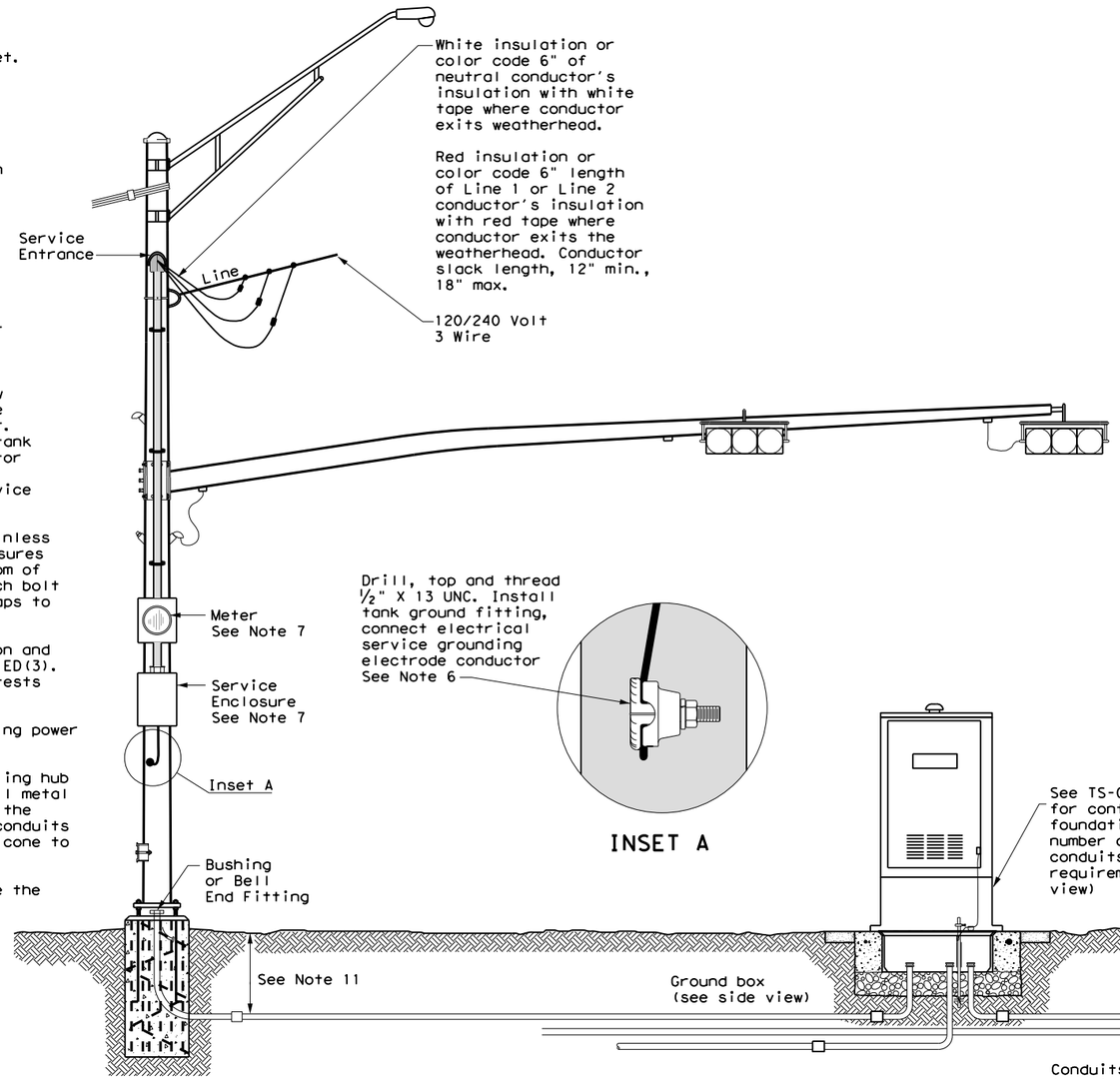
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TRAFFIC SIGNAL NOTES

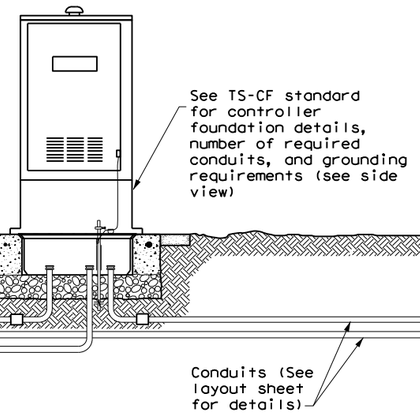
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



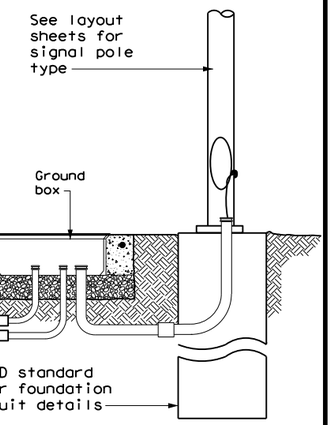
SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

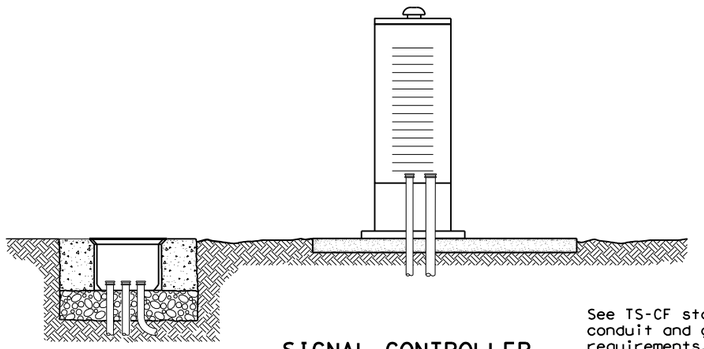
INSET A



SIGNAL CONTROLLER FRONT VIEW



SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

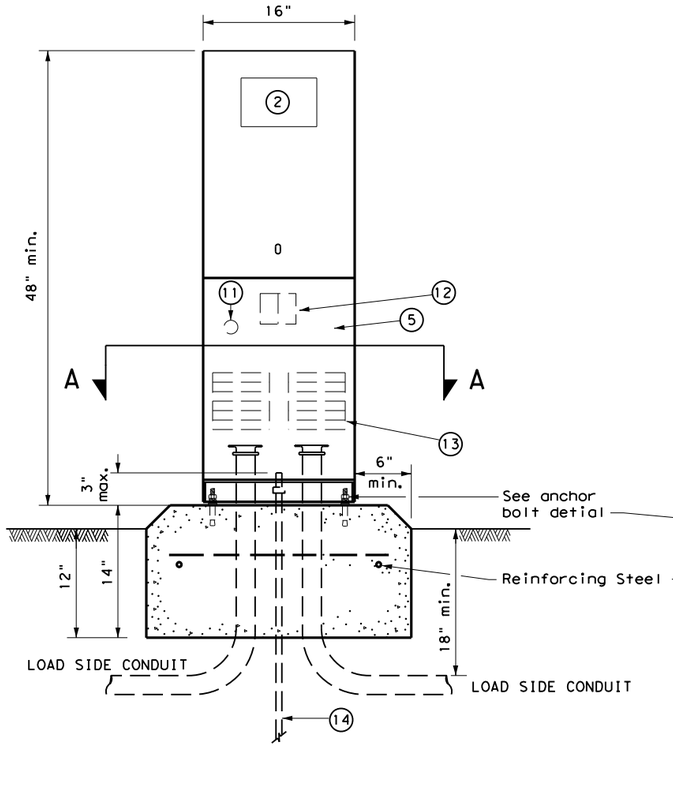
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

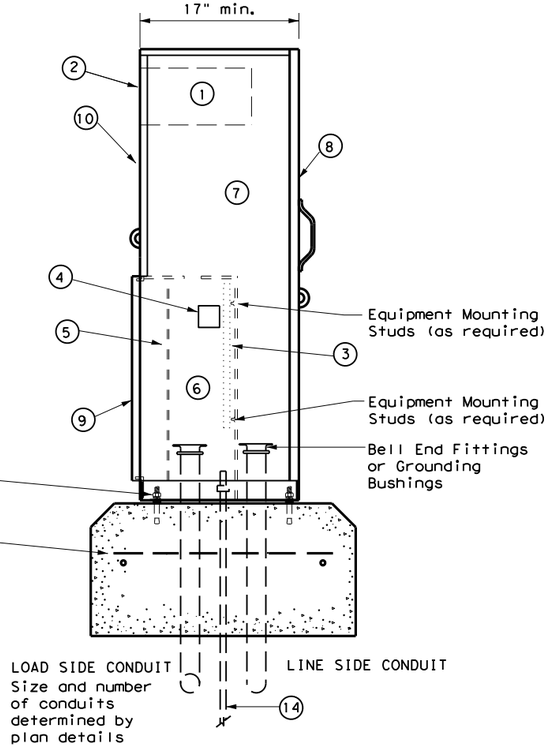
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

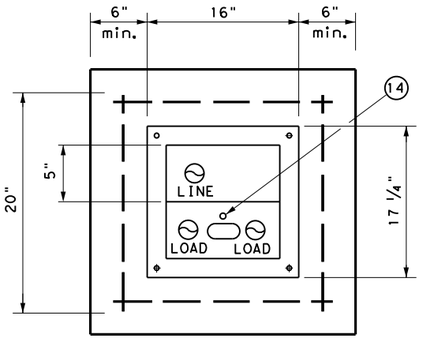


FRONT VIEW

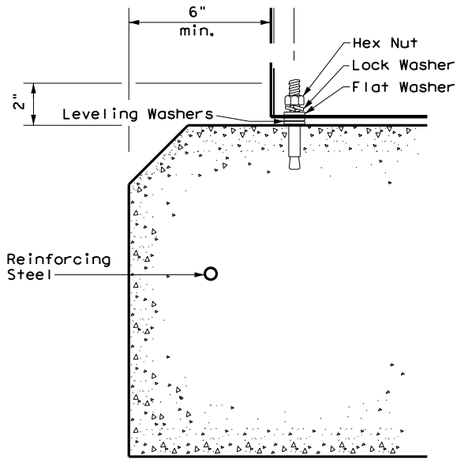


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(9)-14

FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1 1/2 in. to 1 5/8 in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, 1/4 in. minimum diameter by 1 1/2 in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in 1/2 in. PVC to ground rod - extend 1/2 in. PVC 6 in. underground.

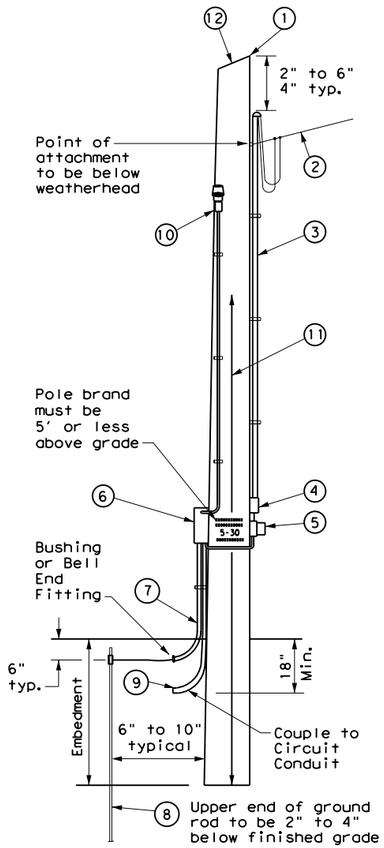
(8) 5/8 in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(11) When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

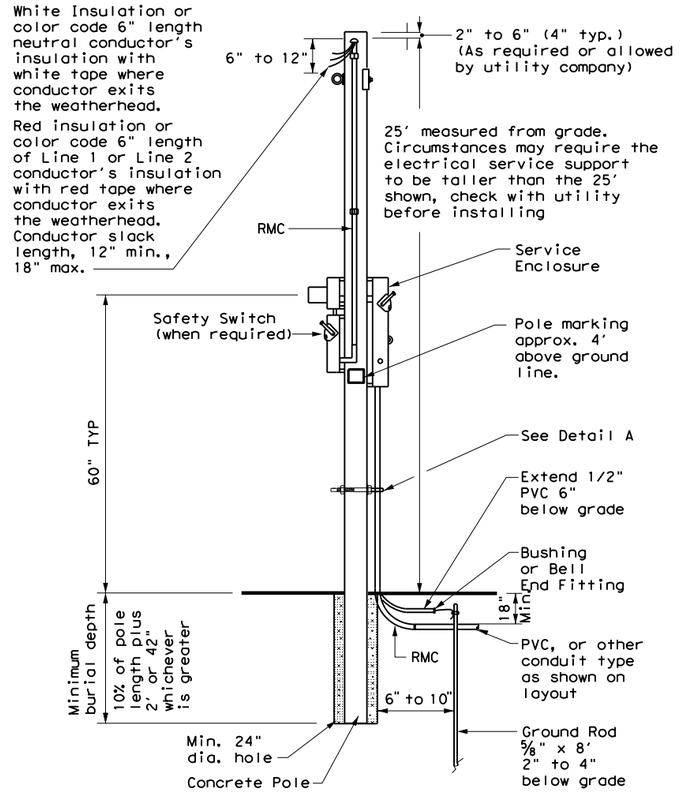


SERVICE SUPPORT TYPE TP (O)

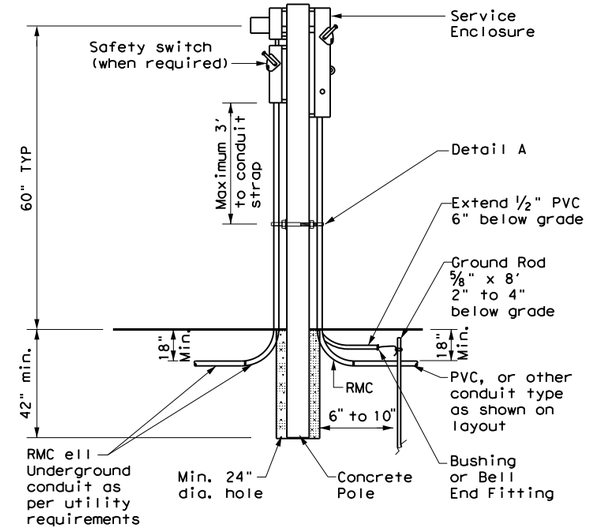
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

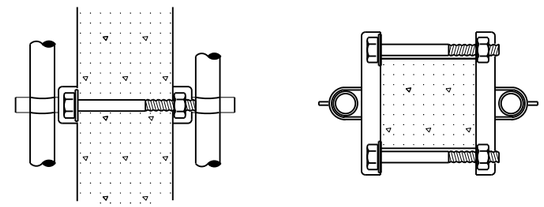
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 1/2 in. or 1 5/8 in. wide by 1 in. up to 3 3/4 in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.



CONCRETE SERVICE SUPPORT
Overhead (O)



CONCRETE SERVICE SUPPORT
Underground (U)



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-14

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DUCT CABLE & HDPE CONDUIT NOTES

1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.

2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.

3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.

4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.

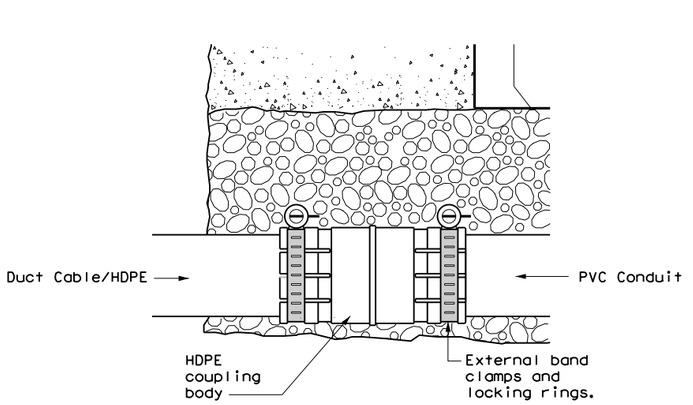
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."

6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.

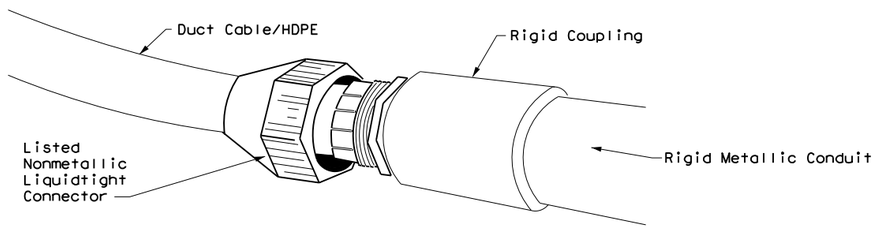
7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.

8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.

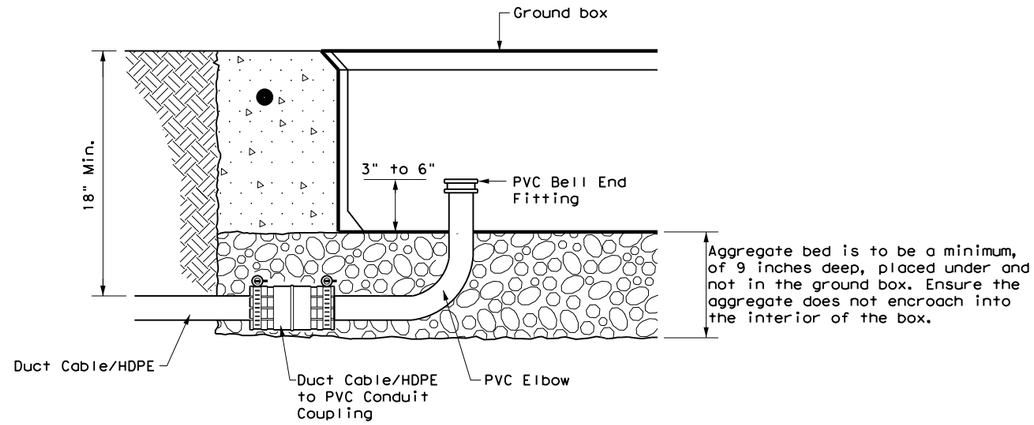
9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.



DUCT CABLE/HDPE TO PVC



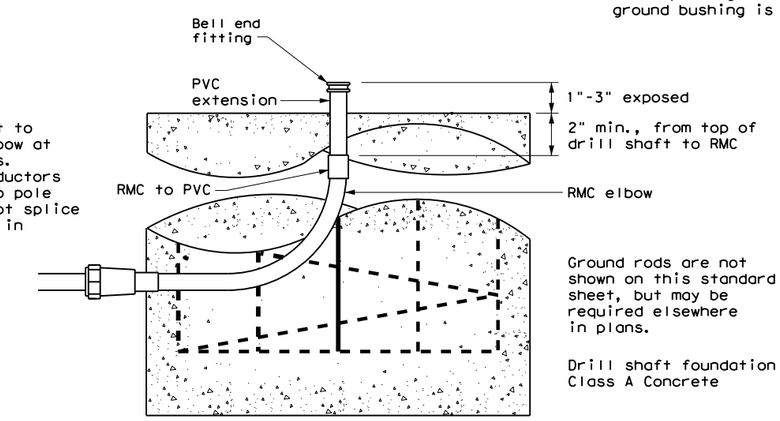
DUCT CABLE/HDPE TO RMC



DUCT CABLE/HDPE AT GROUND BOX

When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

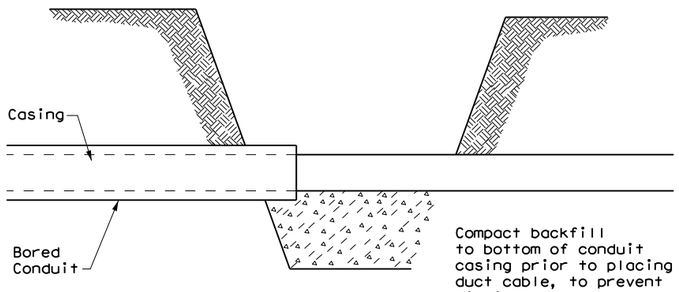
Couple duct to conduit elbow at foundations. Ensure conductors extend into pole base. Do not splice conductors in conduit.



Ground rods are not shown on this standard sheet, but may be required elsewhere in plans.

Drill shaft foundation Class A Concrete

DUCT CABLE / HDPE AT FOUNDATION



BORE PIT DETAIL

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
DUCT CABLE/ HDPE CONDUIT

ED(11)-14

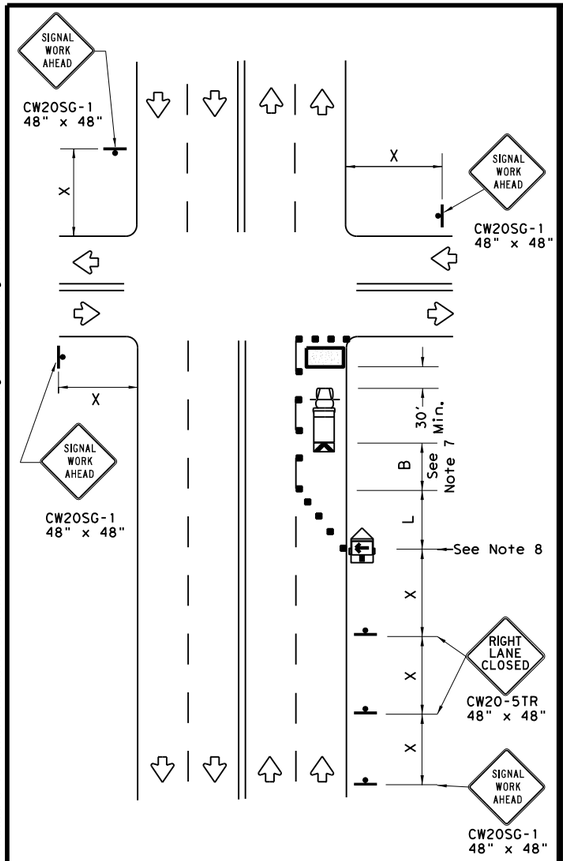
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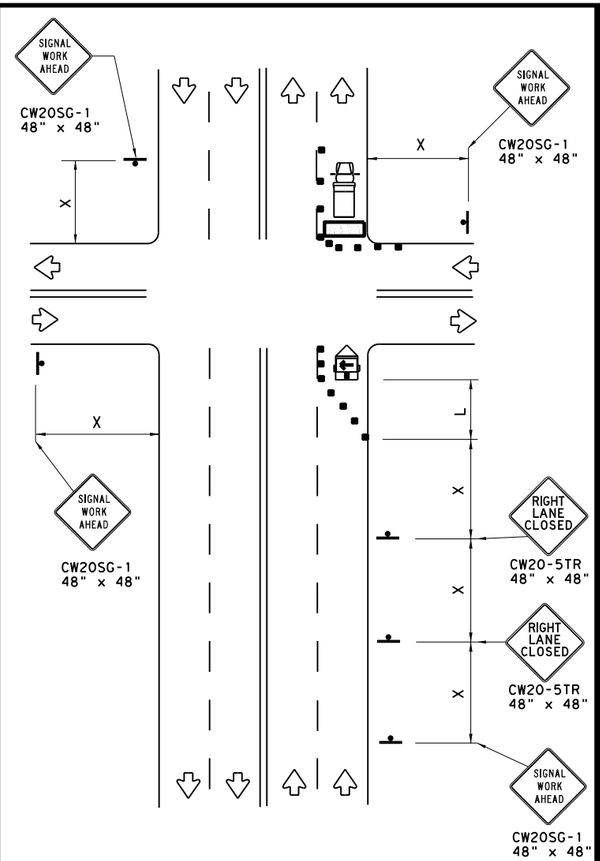
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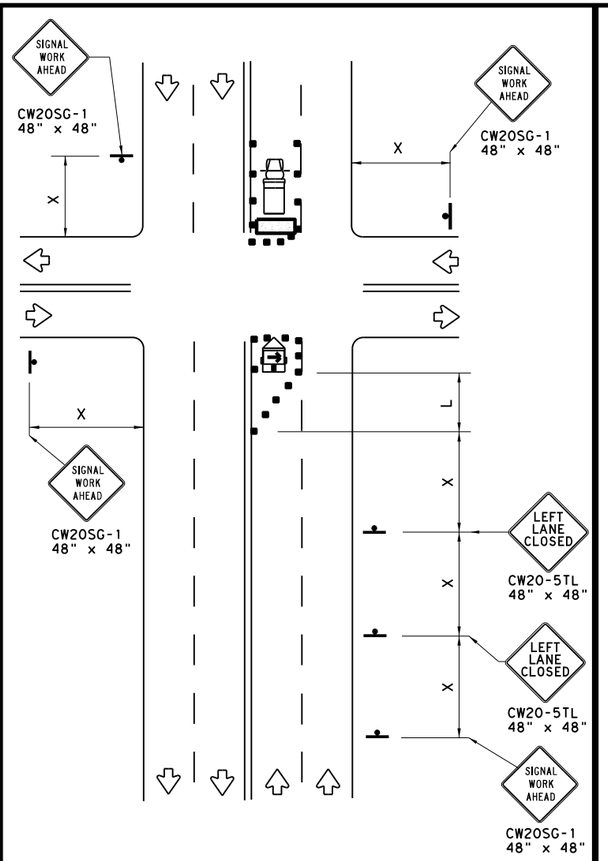
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



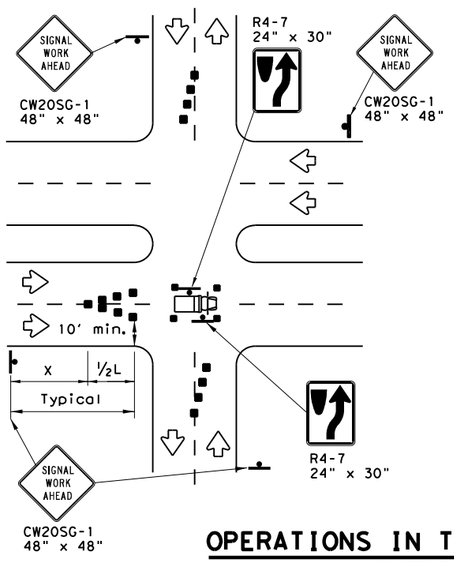
FAR SIDE RIGHT LANE CLOSURE

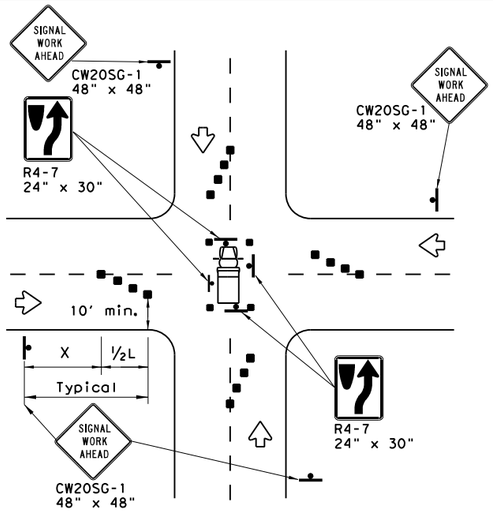
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

LEGEND

	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L = WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

SHEET 1 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

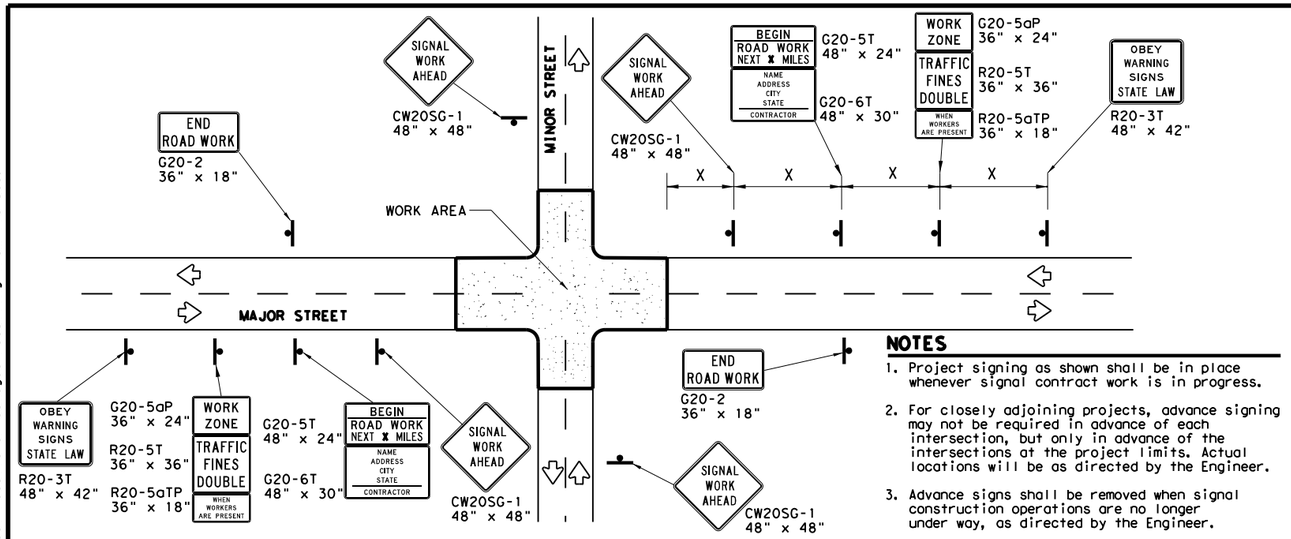
TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

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TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

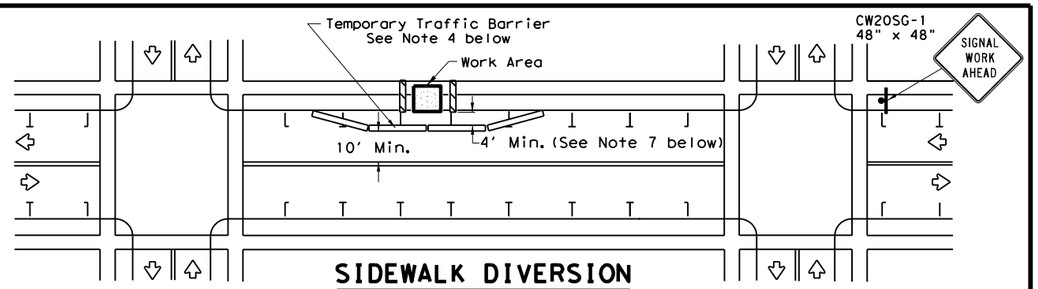
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber, such as tire inner tubes, shall not be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fastners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

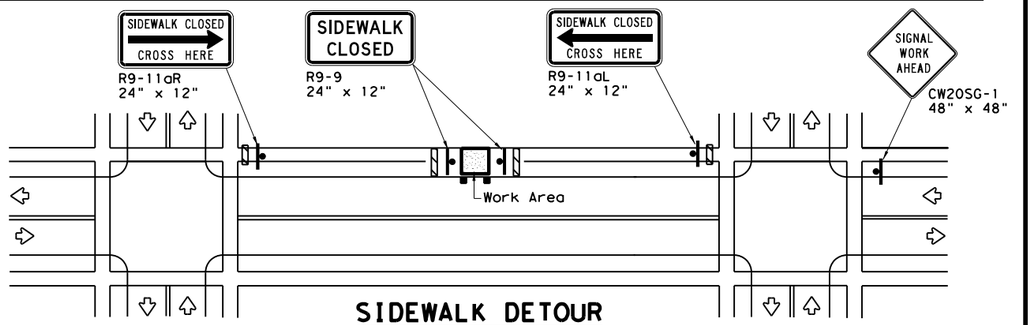
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

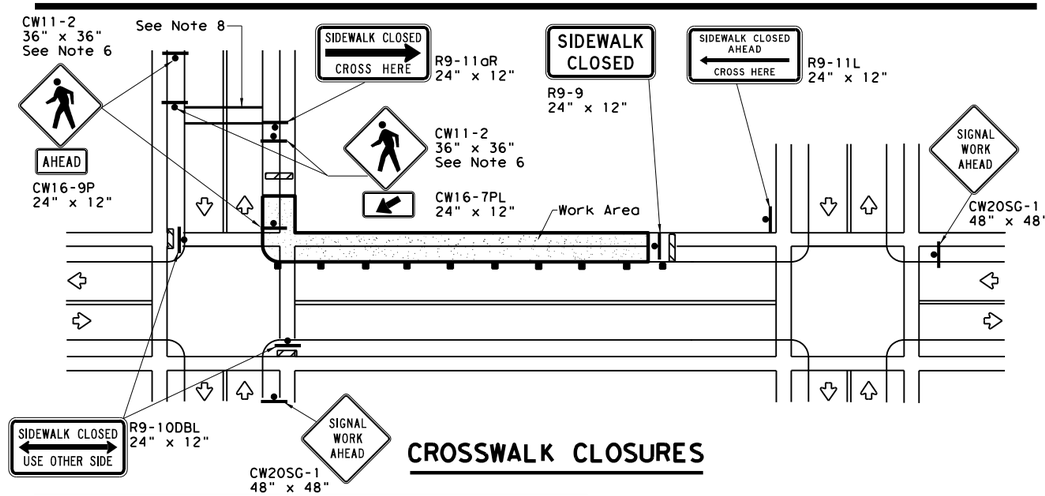
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

DATE: 10/3/2025 11:41:42 AM
FILE: c:\pwwordir\benesch projects\projects\d0224701\wzbts-13.dgn

SHEET 2 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	4	WILLIAMSON		163

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DATE: 10/3/2025 11:42:05 AM
FILE: c:\pwworkdir\benesch projects\projects\d0231471\windice.dgn

NOTE: Structures north of ice line to be designed for ice.

ZONE 2
(90 MPH WIND)

ZONE 3
(80 MPH WIND)

ZONE 4
(70 MPH WIND)

ICE LINE

ZONE 4
(70 MPH WIND)

ICE LINE

ZONE 3
(80 MPH WIND)

ZONE 1
(100 MPH WIND)

LEGEND

ZONE 1 - = (100 MPH WIND)
ZONE 2 - = (90 MPH WIND)
ZONE 3 - = (80 MPH WIND)
ZONE 4 - = (70 MPH WIND)
= (ICE LINE)
= (DISTRICT LINES)

APPLICABLE STANDARDS SHEETS

OVERHEAD SIGN BRIDGE STANDARDS:

OSB-SE
OSB-Z#
OSB-Z#1
HOSB-Z#
HOSB-Z1L
HOSB-Z#1
OSBT
OSBC
OSBC-SC-Z#
OSBS-SC
OSB-FD
OSB-FD-SC

CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:

COSS-SE
COSS-Z#-10
HCOSS-Z#-10
COSS-Z21-10
COSS-Z#&Z#1-10
COSSD
COSSF
COSS-FD

Note: # = Wind Zone number 1, 2, 3 or 4

HIGH MAST ILLUMINATION POLE STANDARDS:

HMIP-98
HMIF-98

WALKWAYS AND BRACKETS STANDARDS:

SWW
SB(SWL-1)

TRAFFIC SIGNAL POLE STANDARDS:

SP-80
SP-100
SMA-80
SMA-100
DMA-80
DMA-100
MA-C
MAC(ILSN)
MAD-D
TS-FD
LUM-A
CFA
LMA
TS-C
MA-DPD

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
Zone line is just North of SH 616.

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

Texas Department of Transportation

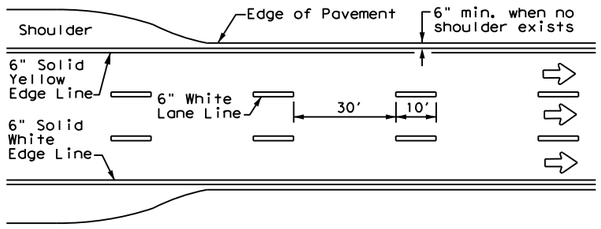
Traffic Operations Division Standard

WIND VELOCITY AND ICE ZONES

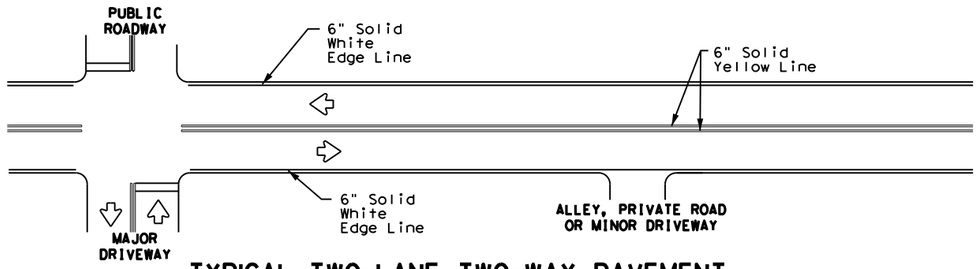
WV & IZ-14

FILE: windice.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1996	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
8-14-Added list of applicable standards, restricting use to structures designed for Fastest Mile wind speeds.	DIST	COUNTY		SHEET NO.
	4	WILLIAMSON		164

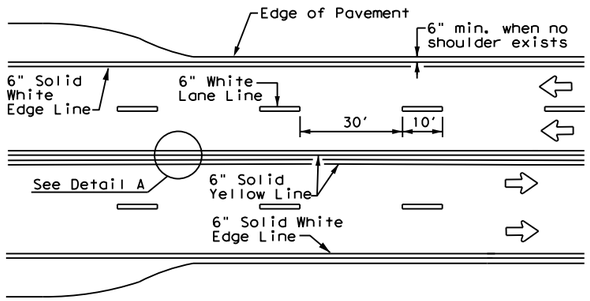
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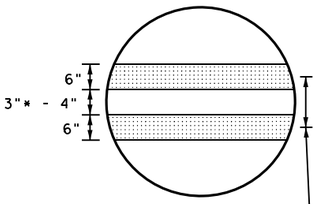


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

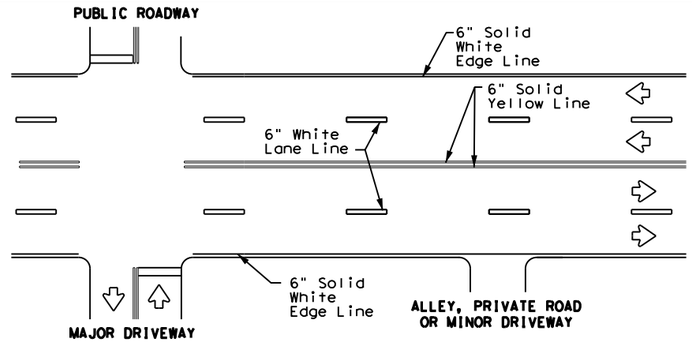




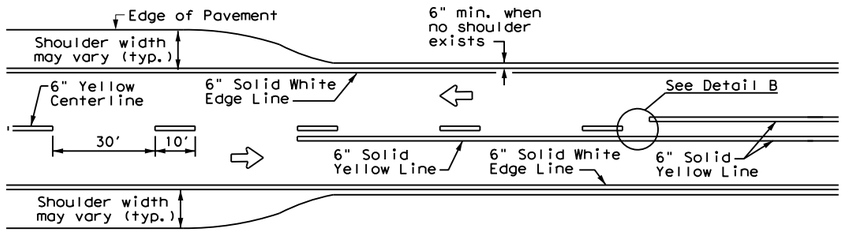
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

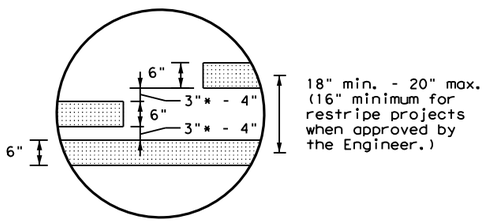
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

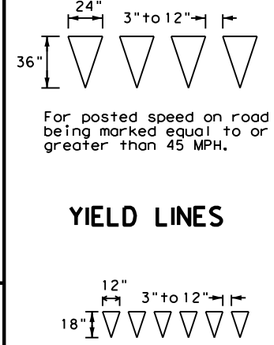


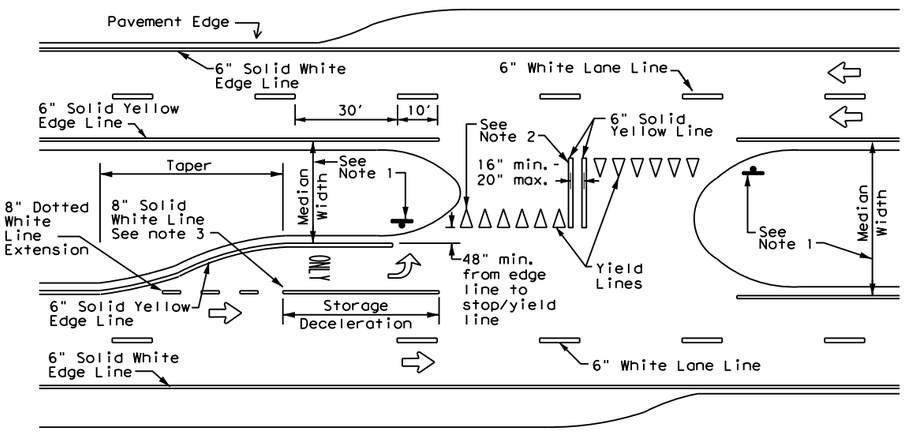
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

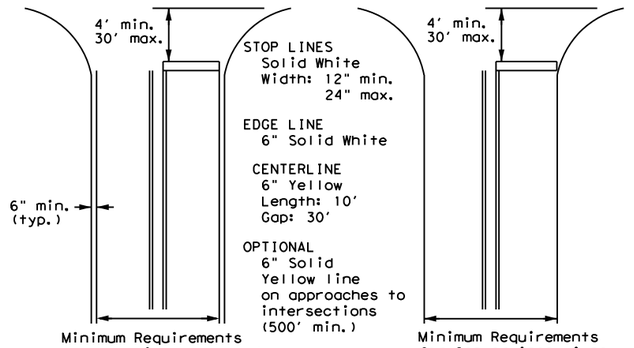
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

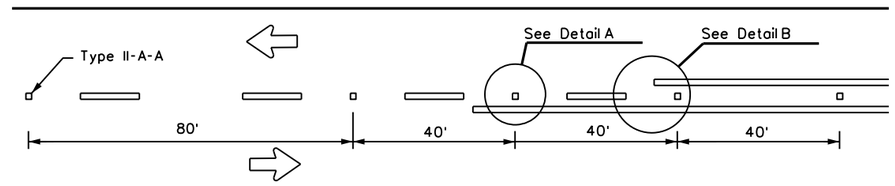
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	4	WILLIAMSON		165
5-00 2-12				

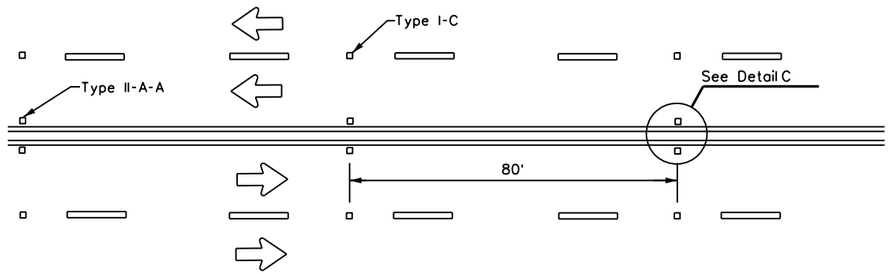
22A

DATE: 10/3/2025 11:42:29 AM
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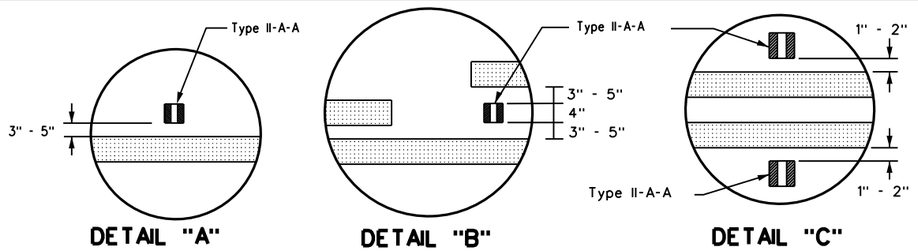
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

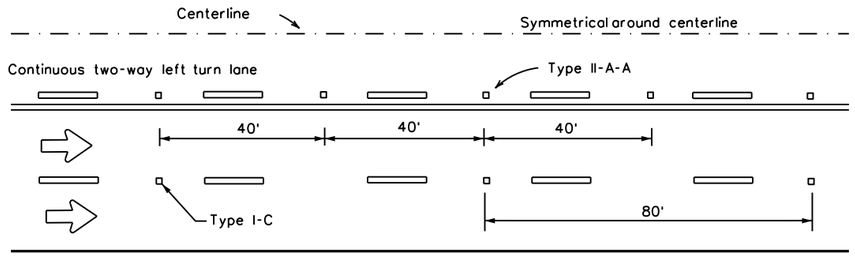


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

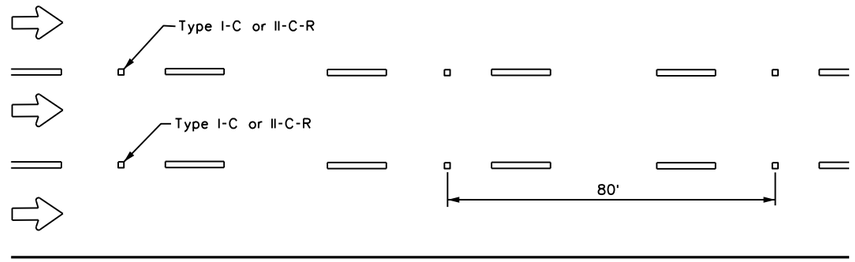


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



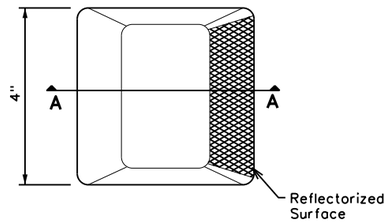
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

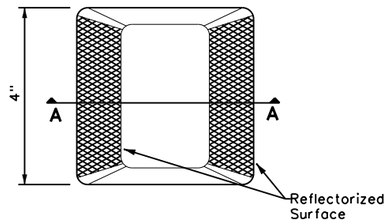
See Note 3.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

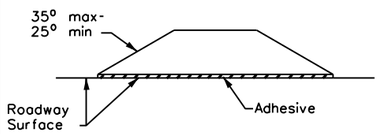
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

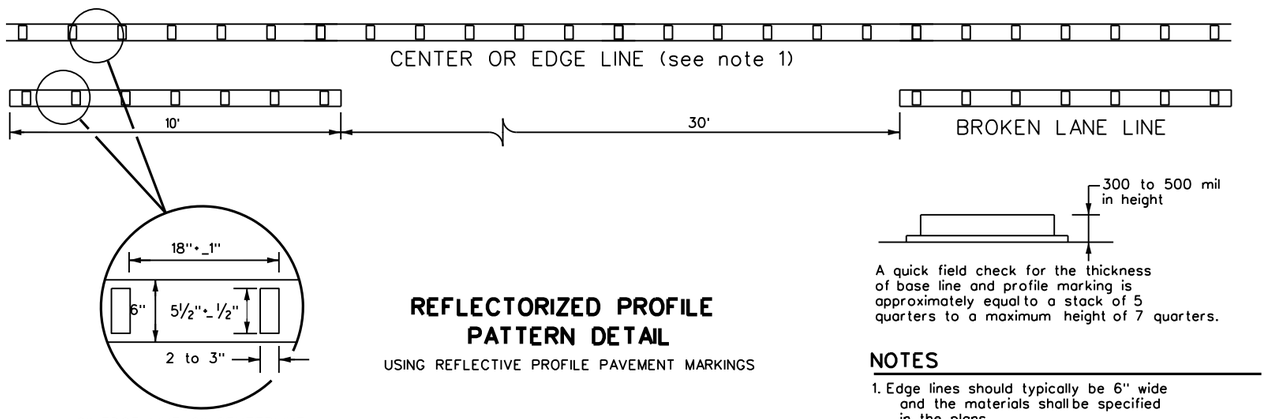


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians, and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-22

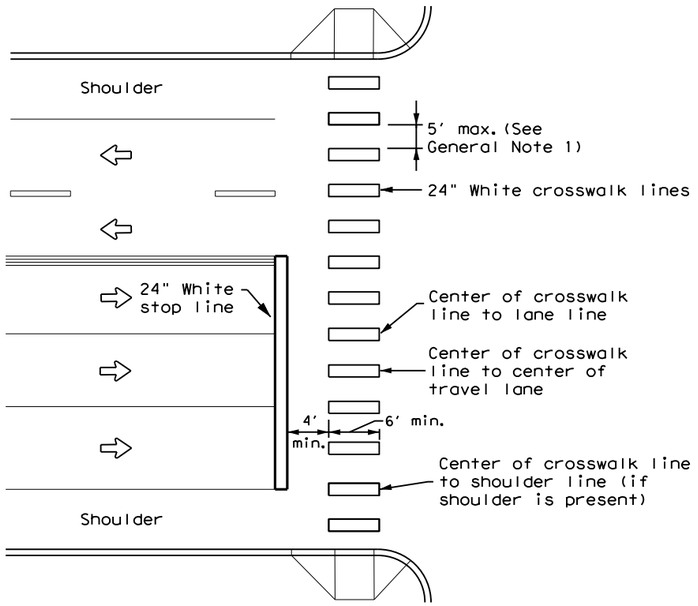
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©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	4	WILLIAMSON		166
5-00 2-12				

22B

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DATE: 10/3/2025 11:42:41 AM
FILE: c:\pwordir\benesch projects\projects\d0224701\pm2-22.dgn

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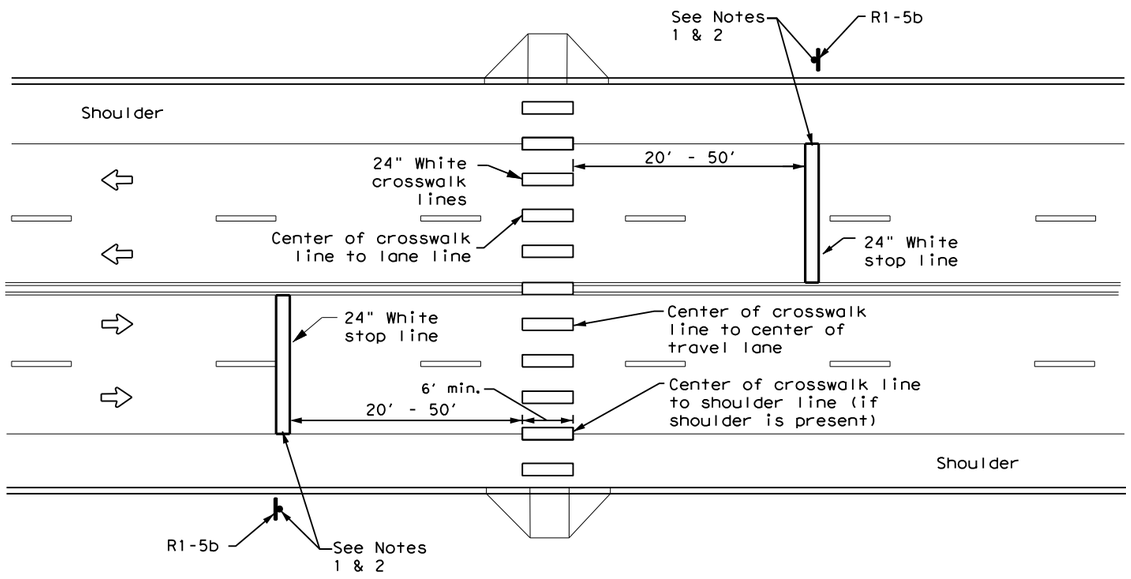
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	FM734
6-20	DIST	COUNTY		SHEET NO.
6-22	4	WILLIAMSON		167
12-22				

22D

DATE: 10/3/2025 11:42:58 AM
FILE: c:\pwworkdir\benesch projects\projects\d0224701\pm4-22a.dgn

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

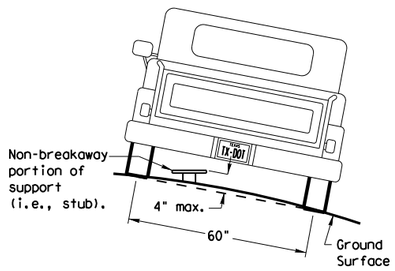
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

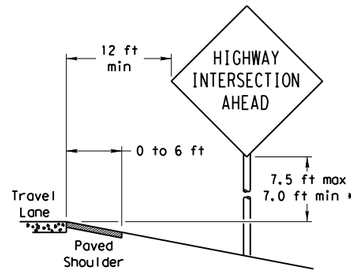
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

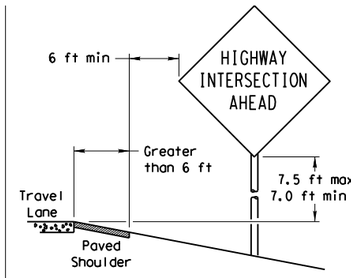
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

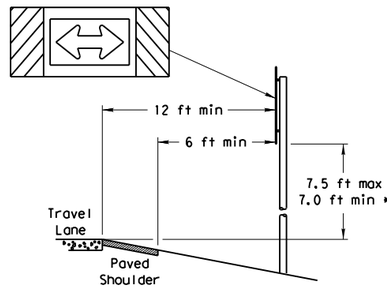
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



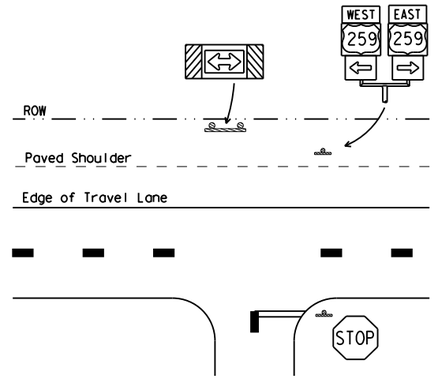
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

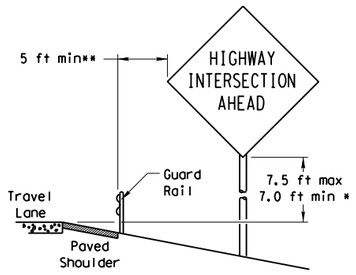
T-INTERSECTION



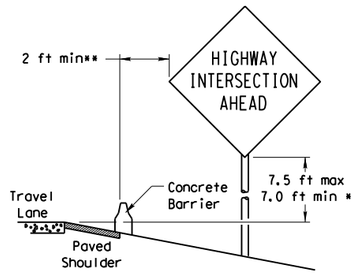
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

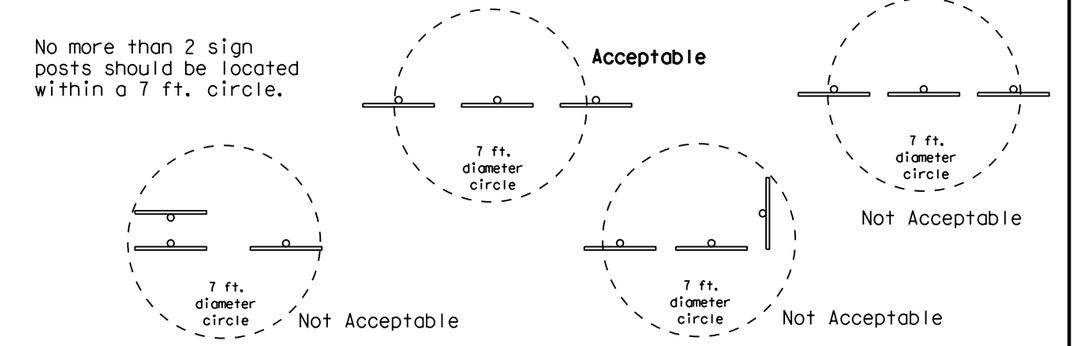
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

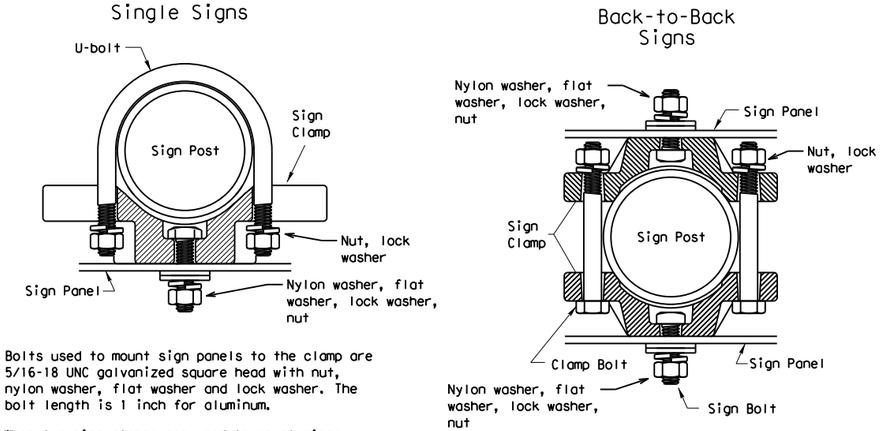
The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm



TYPICAL SIGN ATTACHMENT DETAIL



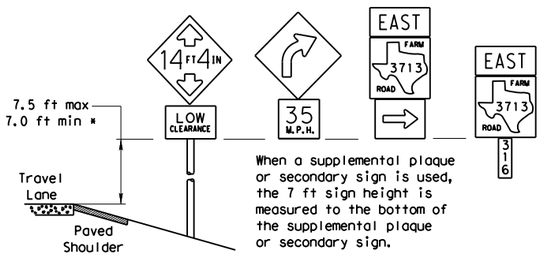
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

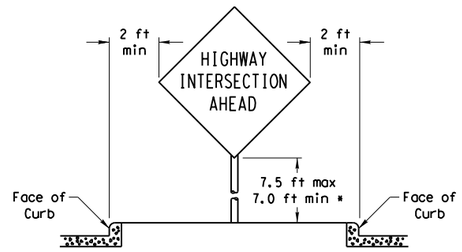
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



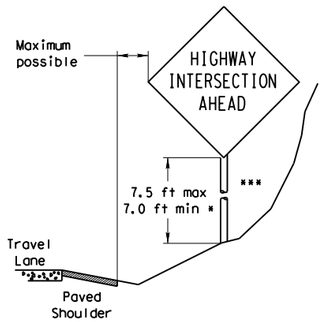
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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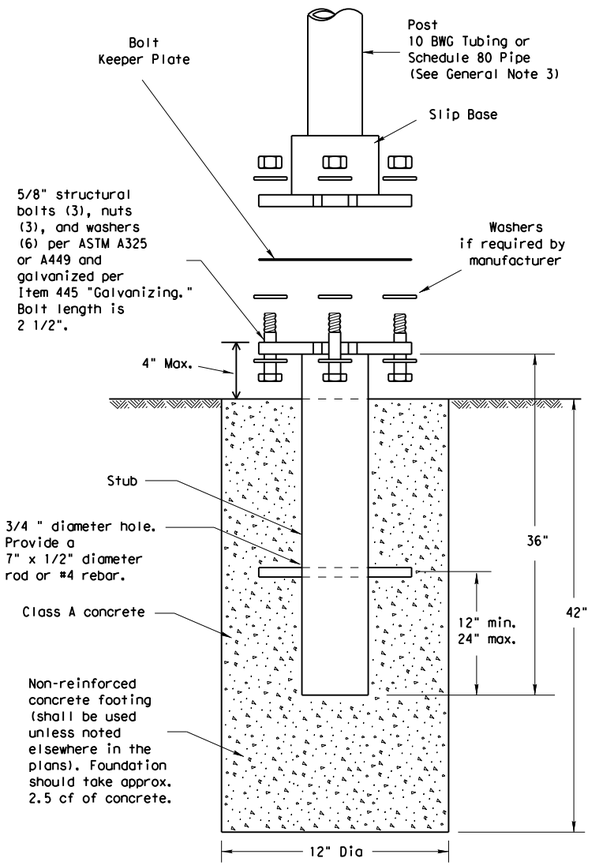
CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	168

DATE:
FILE:

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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

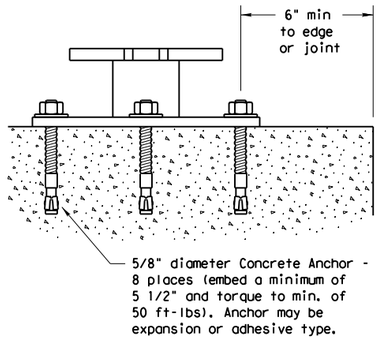
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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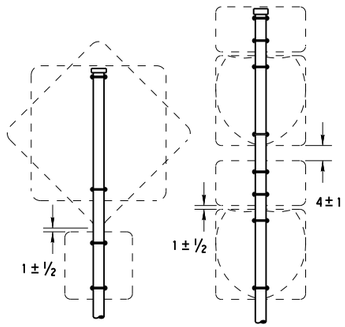
REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734

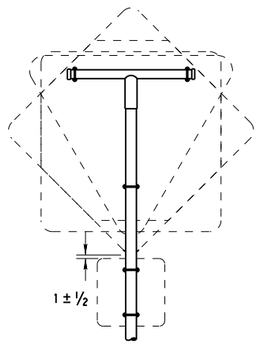
DIST	COUNTY	SHEET NO.
4	WILLIAMSON	169

DATE:
FILE:

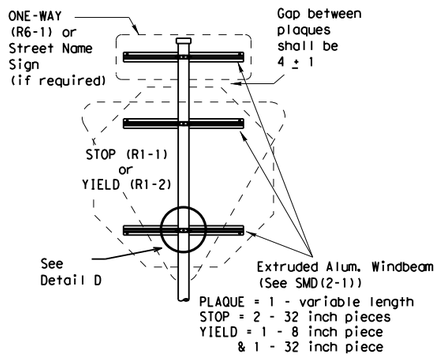
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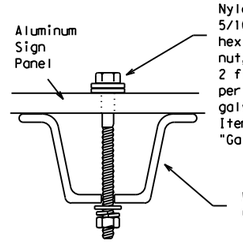
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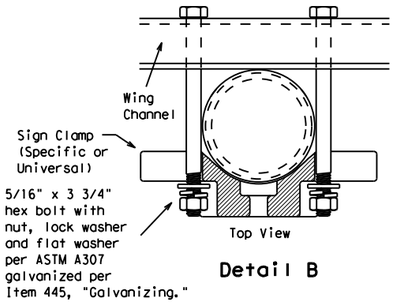
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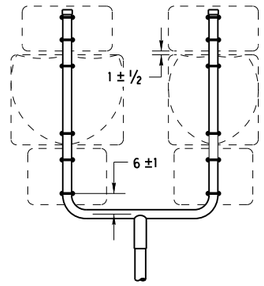
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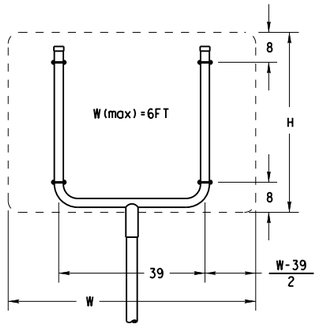
Detail A



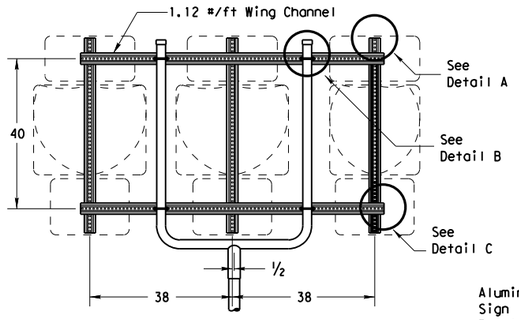
Detail B



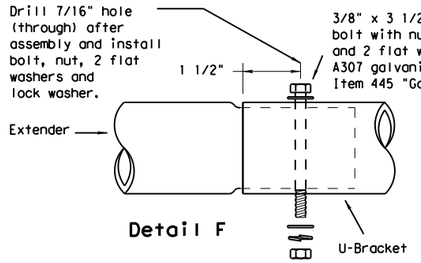
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SM RD SGN ASSM TY XXXXX(1)XX(U)

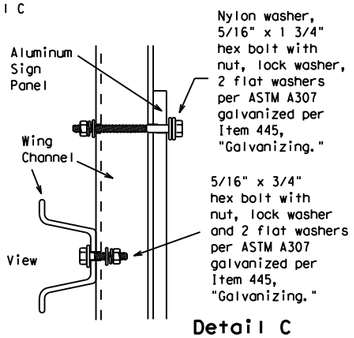


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

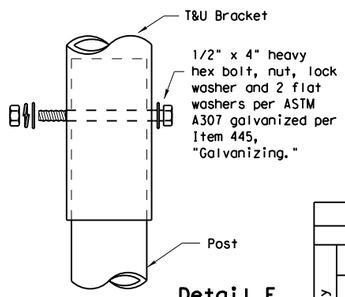


Detail F

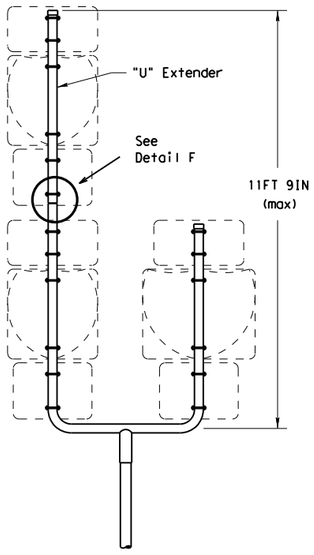
Splices shall only be allowed behind the sign substrate.



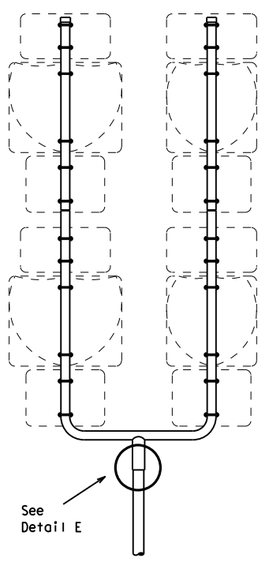
Detail C



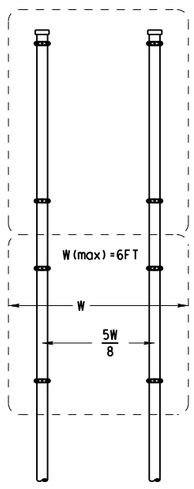
Detail E



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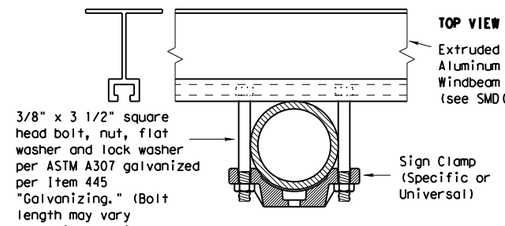


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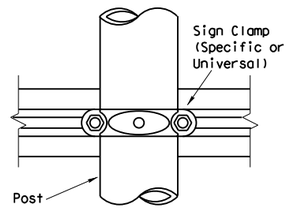


SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D



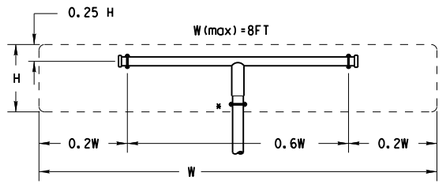
GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

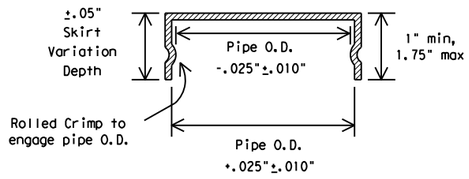
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

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Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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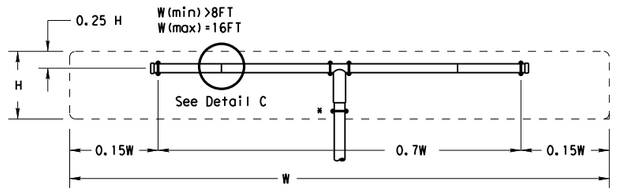
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DIST	COUNTY		SHEET NO.
4	WILLIAMSON		170

9-08 REVISIONS

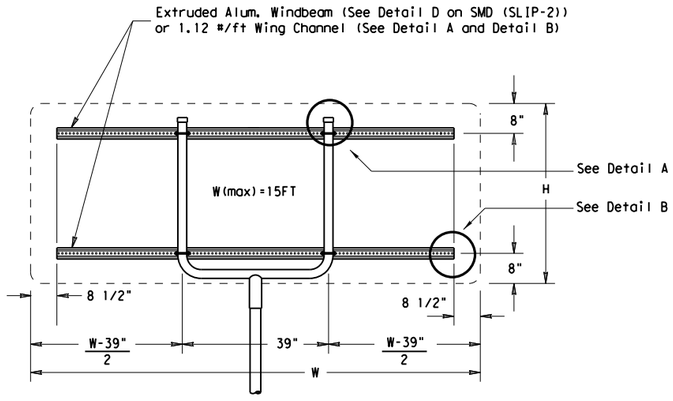
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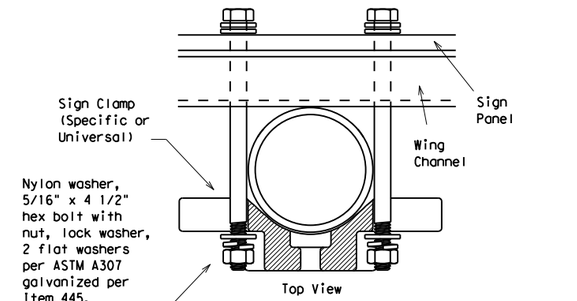
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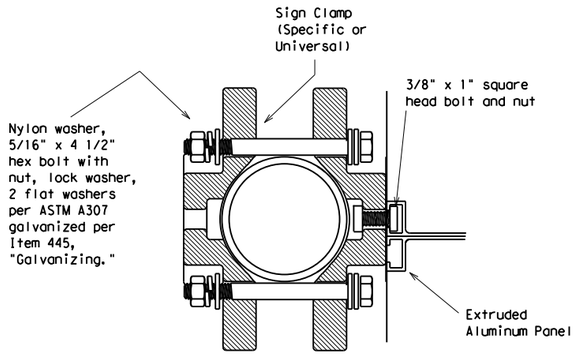
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



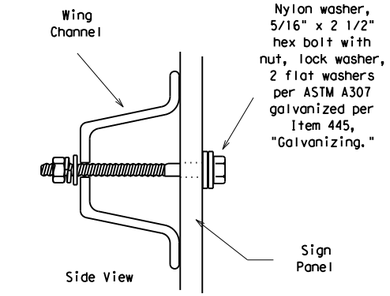
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



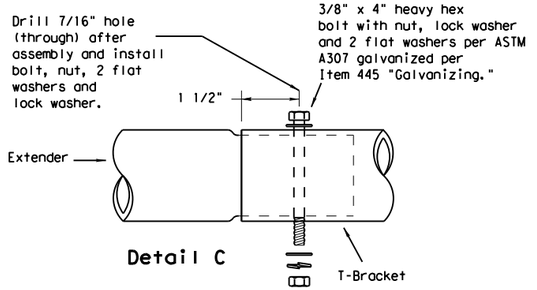
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

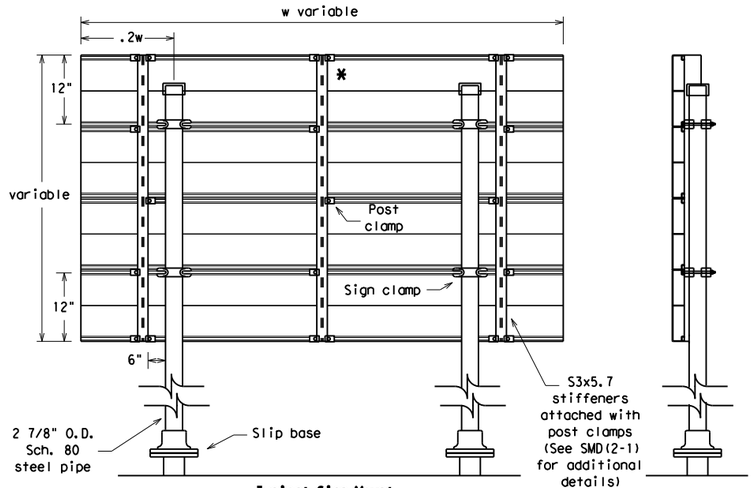


Detail B



Detail C

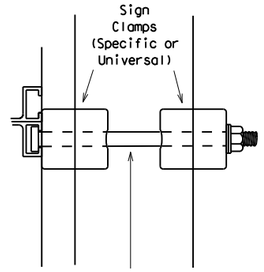
Splices shall only be allowed behind the sign substrate.



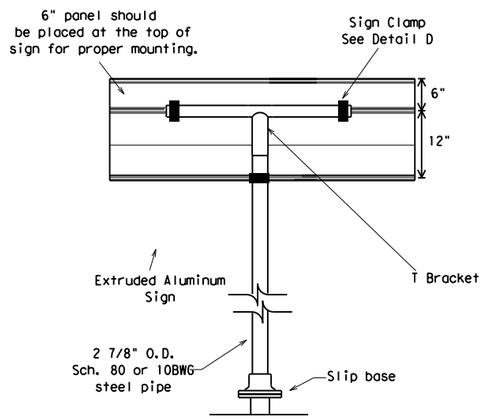
Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

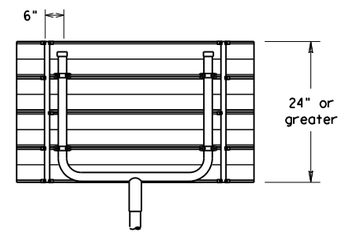
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

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REVISIONS
9-08

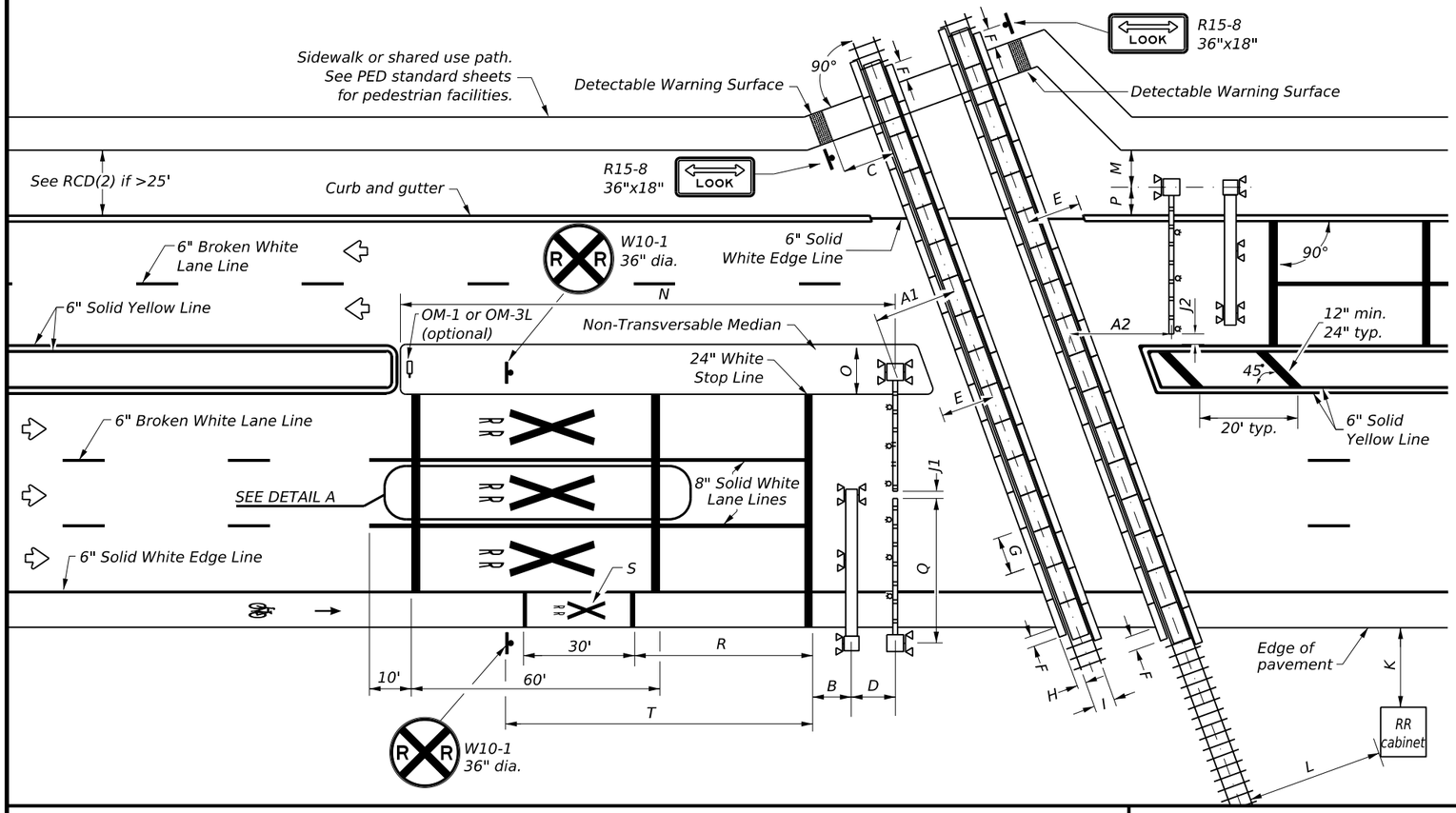
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
3417	02	040	FM734

DIST	COUNTY	SHEET NO.
4	WILLIAMSON	171

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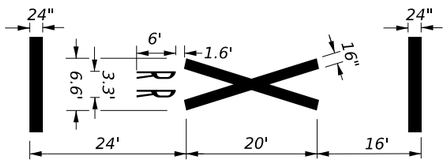
TWO-WAY, MULTIPLE LANES EACH DIRECTION



CALLOUTS:

A1: Center of RR mast to center of rail: 12 ft. minimum, 15 ft. typical.
A2: Tip of gate to center of rail: 12 ft. minimum, 15 ft. typical.
B: Center of nearest active traffic control device (cantilever, gate, or mast flasher) to stop line: 8 ft. (NOTE: Stop line may be moved as needed, but should be at least 8 ft. back from nearest active traffic control device, if present).
C: Near edge of detectable warning surface to nearest rail: 12 ft. minimum and 2 ft. upstream of railroad flashing light signals (if present).
D: Center of gate mast to center of cantilever mast: 6 ft. typical. NOTE: Cantilever may be located in front or behind gates.
E: Edge of median or curb to center of track: 10 ft. typical. NOTE: Design median edge to be parallel with rail.
F: Edge of planking panel from edge of pavement or sidewalk: 3 ft. minimum. NOTE: Field panels need not be in line with gauge panels.
G: Length of panels along rail: 8 ft. typical.
H: Width of field panel: 2 ft. typical (check with railroad company).
I: Distance between rails: 4 ft. 8½ in.
J1: Tip of gate to tip of gate: 2 ft. maximum.
J2: Tip of gate to edge of traveled way: 1 ft. maximum.
K: Nearest edge of RR cabinet from edge of pavement: 30 ft. typical. NOTE: Cabinet not required to be parallel to edge of pavement.
L: Nearest edge of RR cabinet from nearest rail: 25 ft. typical.
M: Center of RR mast to edge of sidewalk: 6 ft. minimum.
N: Center of gate mast to leading edge of non-traversable median: 100 ft. minimum to qualify as a Quiet Zone SSM. NOTE: 60 ft. will suffice if there is a street intersection within the 100 ft. and all street intersections within 60 ft. are closed.
O: Width of median for RR gate assembly: 11 ft. typical (face of curb to face of curb) when using median gates. NOTE: Center of gate mast 5 ft. 3 in. minimum from face of curb.
P: Center of RR mast to face of curb: 5 ft. 3 in. minimum. Center of RR mast to edge of pavement (with shoulder): 7 ft. minimum. Center of RR mast to edge of pavement (no shoulder): 9 ft. 3 in. minimum. NOTE: Final location determined by the railroad company.
Q: Gate length: 28 ft. or less typical, but railroad company may allow up to 32 ft. under special circumstances.
R: Stop line to first RR Crossing transverse line (bicycle lane): 50 ft. typical.
S: See the SHSD for bicycle lane railroad crossing symbol details.
T: Stop line to Grade Crossing Advance Warning (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.

DETAIL A



TWO LANES, TWO-WAY

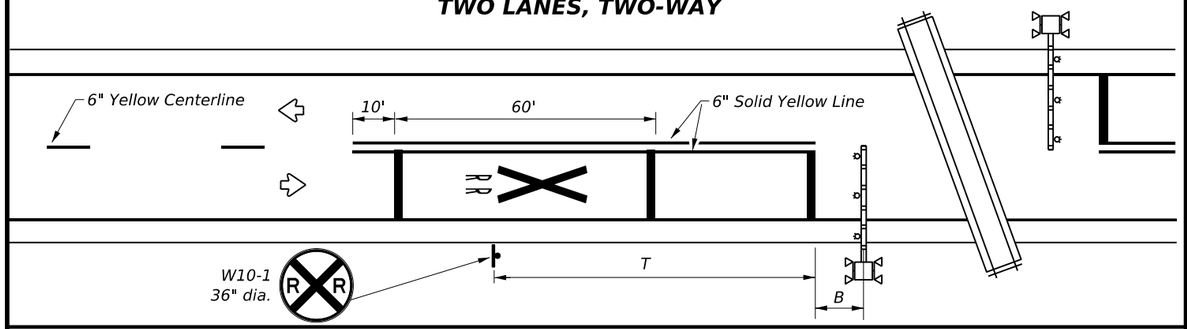


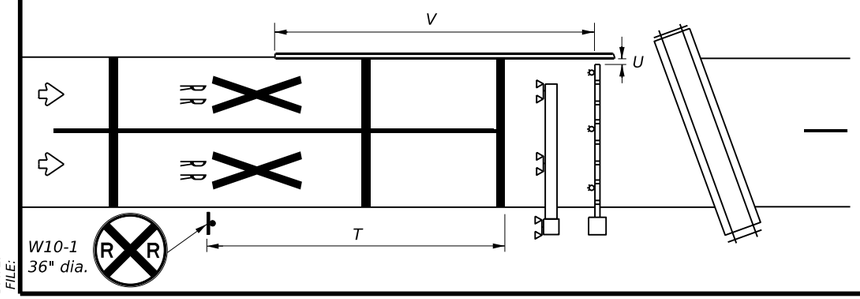
TABLE 1	
Approach Speed (MPH)	Desirable Placement (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

LEGEND	
	Cantilever
	Gate Assembly
	Mast Flasher Pair
	Object Marker
	Sign
	Traffic Flow

GENERAL NOTES:

1. *Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6 in. tall minimum and used on roadways where speed does not exceed 40 mph.*
2. *Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.*
3. *Medians preferred whenever possible to prevent vehicles from driving around gates.*
4. *Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.*
5. *See SMD standard sheets for sign mounting details.*
6. *See the Standard Highway Sign Designs for Texas (SHSD) for sign details.*
7. *Transverse lines for a railroad crossing symbol are not paid for directly, but are subisdiary to the bid item for the symbol marking.*

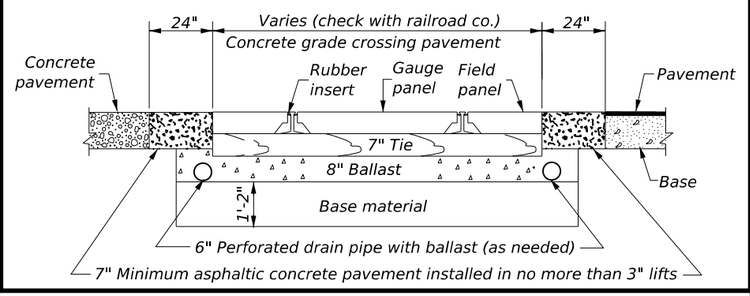
ONE-WAY STREET WITH CURB



CALLOUTS:

T: Stop line to Grade Crossing Advance Warning (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.
U: Tip of gate to edge of curb: 1 ft. maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.
V: Non-traversable curb length from gate: 100 ft. minimum for a Quiet Zone SSM, 10 ft. minimum for all other locations.

CROSSING SURFACE CROSS SECTION



Texas Department of Transportation

Traffic Safety Division Standard

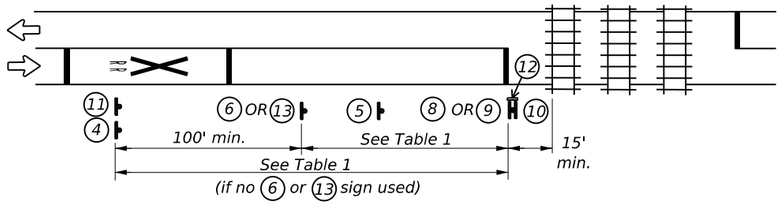
RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-25

FILE: rcd1-25.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2025	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-16 4-25 11-22	DIST	COUNTY		SHEET NO. 172

DATE:
FILE:

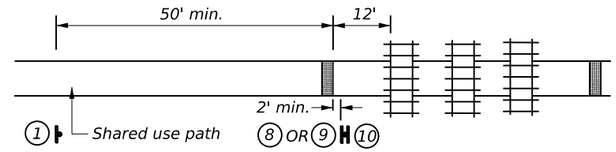
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PASSIVE CROSSING



1. A STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2 in. white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for details about sign mounting arrangements.

PATHWAY CROSSING



1. A shared use path is considered a separate pathway crossing when more than 25 ft. from traveled way of adjacent roadway.
2. Stop bar used at detectable warning surface.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

TABLE 1

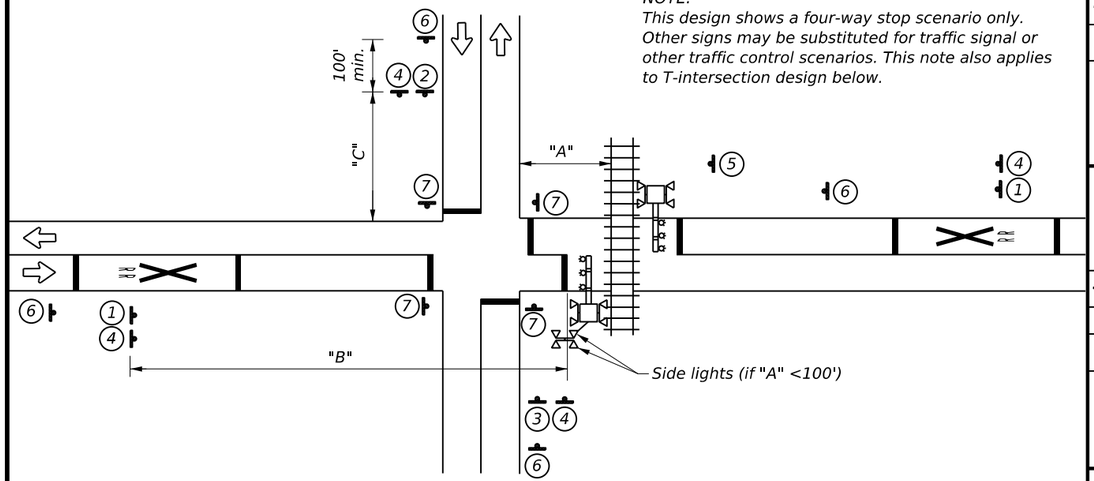
Approach Speed (MPH)	Desirable Placement (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

GENERAL NOTES:

1. Railroad company to provide active traffic control devices, Grade Crossing (Crossbuck) (R15-1), Number of Tracks (R15-2P) plaque (if more than 1 track), and Emergency Notification (I13-1) signs.
2. Low Ground Clearance Grade Crossing (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. Grade Crossing and Intersection Advance Warning (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
5. See Table 1 to determine placement of Stop Ahead (W3-1) and Yield Ahead (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs are installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Designs for Texas (SHSD) for sign and pavement marking details.

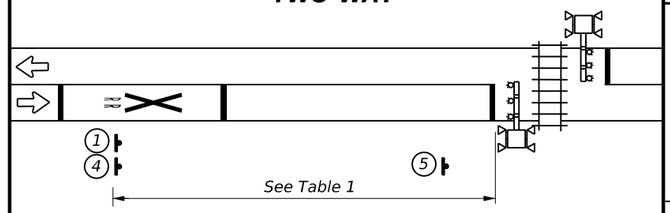
GRADE CROSSING NEAR A PARALLEL STREET

NOTE:
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-intersection design below.

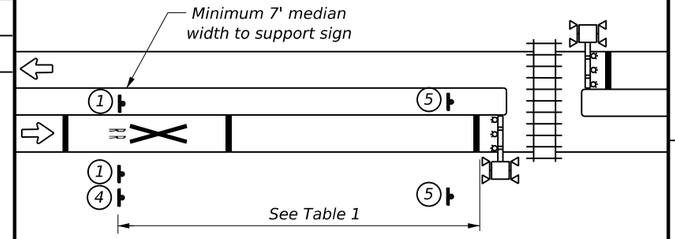


	"A" <100'	"A" ≥ 100'
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	Grade Crossing and Intersection Advance Warning (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

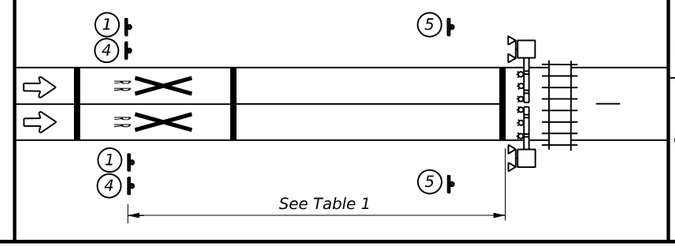
TWO-WAY



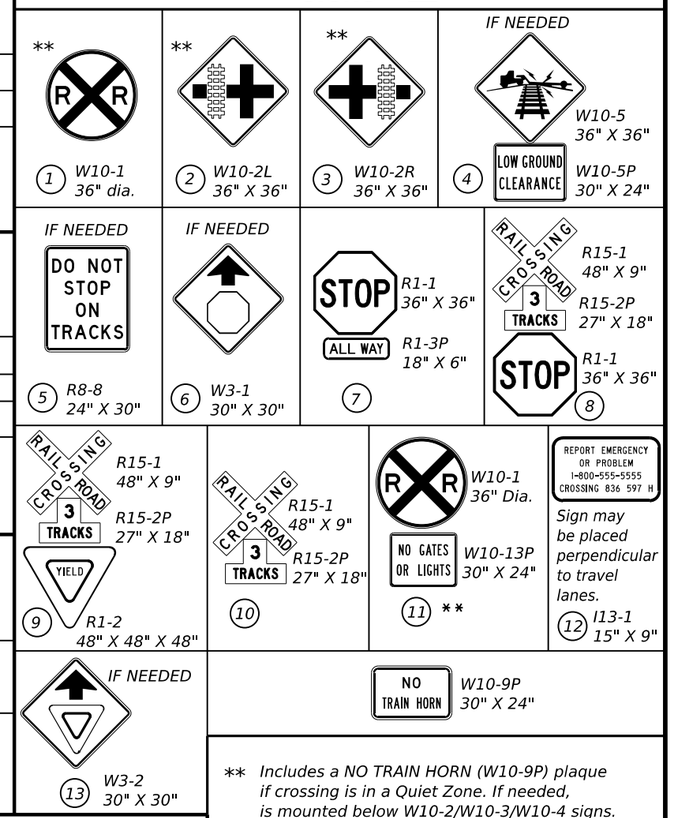
TWO-WAY WITH MEDIAN



ONE-WAY

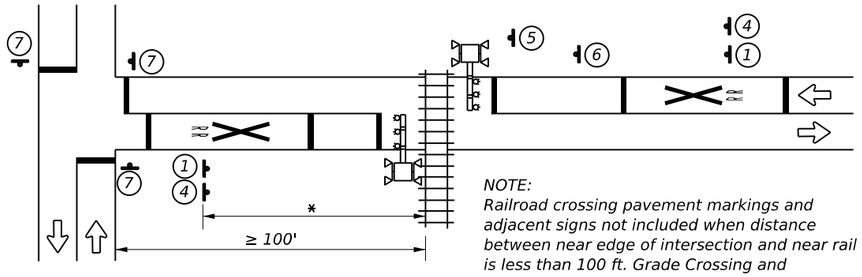


SIGNS



** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

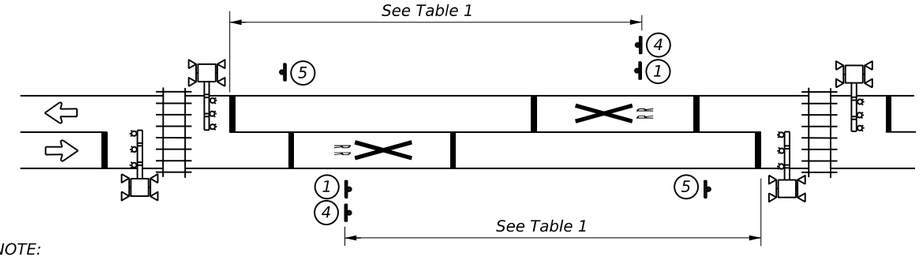
T-INTERSECTION



*Use Table 1 if sufficient space exists.

NOTE:
Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100 ft. Grade Crossing and Intersection Advance Warning (W10-3) signs installed on roadway parallel with rail in this case.

TWO ADJACENT CROSSINGS



NOTE:
Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100 ft. apart.

Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-25

FILE: rcd2-25.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 2-16 4-25 11-22	DIST	COUNTY		SHEET NO. 173

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DELINEATOR - BID ITEM DESCRIPTIONS

XXXXX DEL ASSM (D-XX)SZ X (XXXX)XXXXX(XX)

PAYMENT
- INSTL = Installation
- REPLC = Replacement

NUMBER OF REFLECTORS
- S = Single
- D = Double

COLOR OF REFLECTORS
- W = White
- Y = Yellow
- R = Red

REFLECTOR UNIT SIZE
- SZ 1 or SZ 2 or SZ 5 or SZ 6

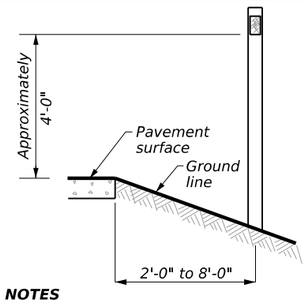
TYPE OF POST OR DELINEATOR
- WC = Wing Channel Post
- YFLX = Yellow Flexible Post
- WFLX = White Flexible Post
- BRF = Barrier Reflector

TYPE OF MOUNT
- GND = Ground Embedded (drivable or set in concrete)
- CAB1 or CAB2 or CAB3 = Cable Barrier
- CTB = Concrete Traffic Barrier
- GF1 or GF2 = Guard Fence
- SRF = Surface Mount

IDENTIFICATION
- LL= Low Speed, Low Impact
- HH = High Speed, High Impact

DIRECTION [if required]
- BI = Bi-Directional
- BR = Bi-Directional with red on back

DELINEATOR - TYPICAL INSTALLATION



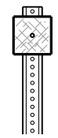
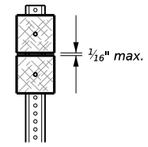
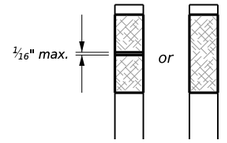
GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. When delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the delineator as close to the desired height as possible.
3. Install all delineators and barrier reflectors in accordance with the manufacturer's recommendation.
4. GF1, GF2, and CTB barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
5. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.
6. Delineator substrates and sign substrates shall be 0.080" aluminum sign blank and confrom to ASTM B-209 Alloy 6061-T6 or an approved alternative.

DELINEATOR DEFINITION

Retroreflective devices mounted on the roadway surface or at the side of the roadway in a series to indicate the alignment of the roadway, especially at night or in adverse weather. (See TMUTCD - Part 3, DELINEATORS.)

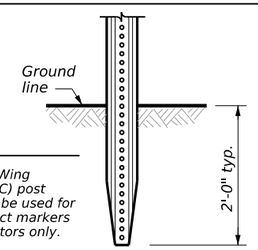
SINGLE AND DOUBLE MOUNTED DELINEATORS

	SINGLE		DOUBLE	
DEVICE	 1-Size 2 reflector unit	 1-Size 1 reflector unit	 2-Size 2 reflector units	 2-Size 1 reflector units or 1-Size 5 reflector unit
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GNDLL	GNDLL, GNDHH, SRFLL, SRFHH	GNDLL	GNDLL, GNDHH, SRFLL, SRFHH

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

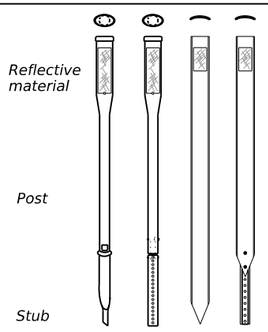


NOTES

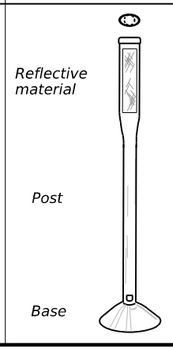
1. Embedded Wing Channel (WC) post option may be used for Type 2 object markers and delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr.50, or ASTM A499.

FLEXIBLE POSTS (YFLX, WFLX)

GND



SRF



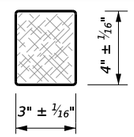
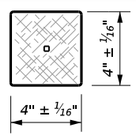
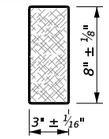
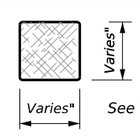
NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.

DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

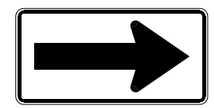
REFLECTOR UNIT DIMENSIONS FOR DELINEATORS

	SIZE 1	SIZE 2	SIZE 5	SIZE 6
DEVICE				 See Note 3
SHEETING	Yellow, White, or Red Type B or C reflective sheeting			
NOTES	1. Size 1 and 5 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 - For use on wing channel (wc) post only. Use approved metal, plastic, or fiberglass backplate with 17/64" mounting holes. 3. Size 6 - For use on cable barrier systems only. Direct applied reflective sheeting. Various dimensions as specified elsewhere in the plans or as defined by the manufacturer.			

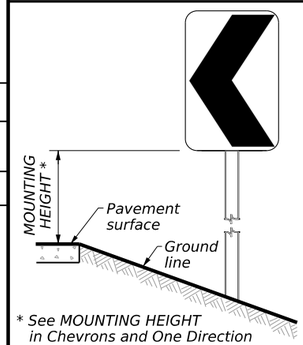
CHEVRONS

DEVICE				
	W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" to 4'-6" or 7'-0" to 7'-6"		7'-0" to 7'-6"	

ONE DIRECTION LARGE ARROW

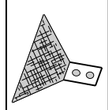
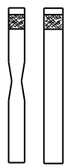
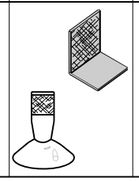
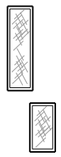
DEVICE		
	W1-6	
SIZE (W x L)	48"x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0" to 7'-6"	
NOTES	1. Chevron Alignment (W1-8) signs and One-Direction Large Arrow (W1-6) signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, a larger One-Direction Large Arrow (W1-9T) sign may be used in lieu of the typical W1-6 sign.	

CHEVRONS AND ONE DIRECTION LARGE ARROW SIGNS TYPICAL INSTALLATION



* See MOUNTING HEIGHT in Chevrons and One Direction Large Arrow tables.

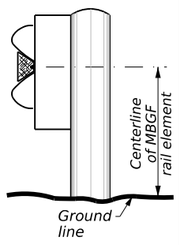
BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB	CAB1	CAB2	CAB3
DEVICE						
	1. Barrier reflectors shall meet the requirements of DMS-8600. 2. Approved barrier reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov. 3. GF2 and CAB3 are coded as "YFLX" or "WFLX" instead of "BRF". 4. CAB1, CAB2, and CAB3 are only to be used as replacements. Per Item 543, original installation is to be considered subsidiary to the Cable Barrier System.					
SHEETING	Yellow, White, Red					
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches by 3 inches and minimum surface area of 9 square inches.					

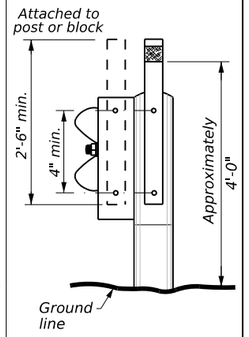
BARRIER MOUNT TYPES

GUARD FENCE

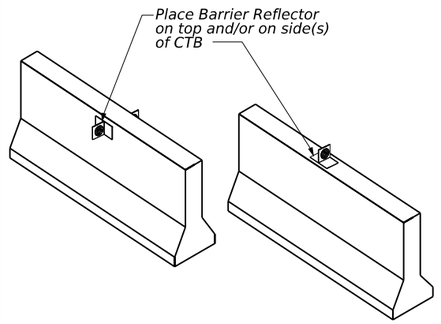
GF1



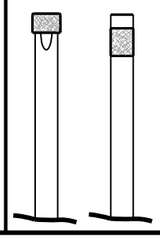
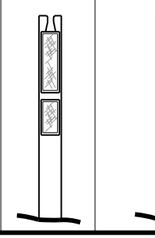
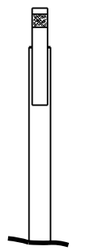
GF2



CONCRETE TRAFFIC BARRIER (CTB)



CABLE BARRIER

CAB1	CAB2	CAB3
		

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR MATERIAL DESCRIPTION & INSTALLATION

D & OM(1)-25

FILE: dom1-25.dgn		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
© TxDOT May 2025	CONT	SECT	JOB		HIGHWAY		
REVISIONS							
8-04 3-15 10-09 7-20 4-10 5-25	DIST	COUNTY				SHEET NO.	
						174	

20A

DATE:
FILE:

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OBJECT MARKER - BID ITEM DESCRIPTIONS

XXXXX OM ASSM (OM-XX)(XXXX)XXXXX(XX)

PAYMENT
- INSTL = Installation
- REPLC = Replacement

TYPE OF OBJECT MARKER
- 1, 2, 3, or 4

NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker only)

TYPE OF POST
- WC = Wing Channel Post
- WFLX = White Flexible Post
- YFLX = Yellow Flexible Post
- TWT = Thin Walled Tubing

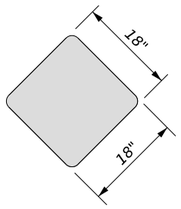
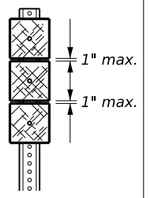
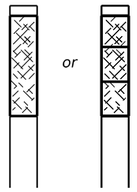
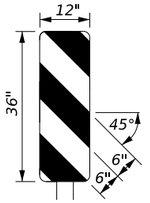
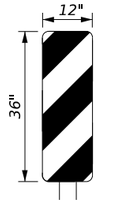
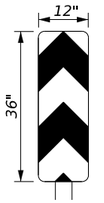
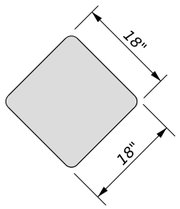
TYPE OF MOUNT
- GND = Ground Embedded (drivable or set in concrete)
- SRF = Surface Mount
- WAS = Wedge Anchor Steel
- WAP = Wedge Anchor Plastic

IDENTIFICATION
- LL = Low Speed, Low Impact
- HH = High Speed, High Impact

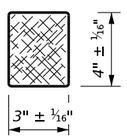
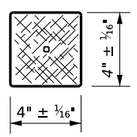
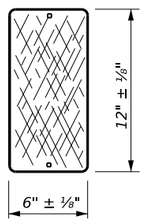
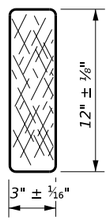
DIRECTION [if required]
- BI = Bi-Directional

OBJECT MARKER DEFINITION

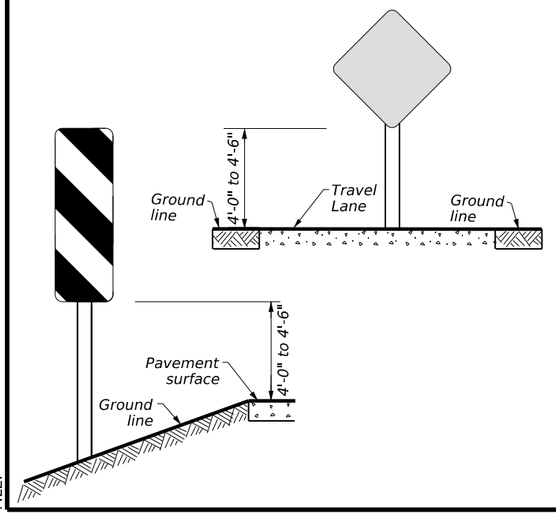
Devices used to mark obstructions within or adjacent to the roadway. (See TMUTCD - Chapter 2C, WARNING SIGNS AND OBJECT MARKERS.)

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		 3-Size 2 reflector units	 1-Size 3 reflector unit	 1-Size 4 reflector unit or 3-Size 1 reflector units				
SHEETING	Yellow - Type B_{FL} or C_{FL} sheeting	White and Yellow - Type B or C sheeting			Alternating Acrylic Black and Retroflective Yellow - Type B_{FL} or C_{FL} sheeting			Red - Type B_{FL} or C_{FL} sheeting
POST TYPE	TWT	WC	WC	WFLX, YFLX	TWT, WFLX			TWT
MOUNT TYPE	WAS, WAP	GNDLL	GNDLL	GNDLL, GNDHH, SRFLL, SRFHH	WAS, WAP, GNDLL, GNDHH, SRFLL, SRFHH			WAS, WAP

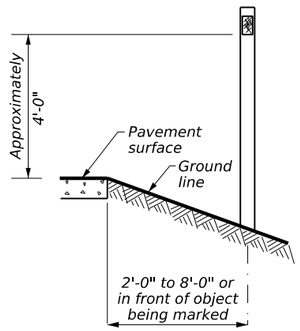
REFLECTOR UNIT DIMENSIONS FOR OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic, or fiberglass backplate with 17/64" mounting holes.			

TYPES 1, 3, AND 4 OBJECT MARKERS TYPICAL INSTALLATION



TYPE 2 OBJECT MARKERS TYPICAL INSTALLATION

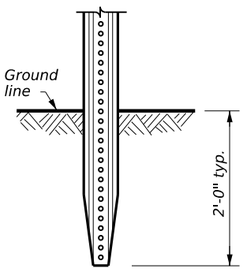


See General Notes 1, 2, and 3

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

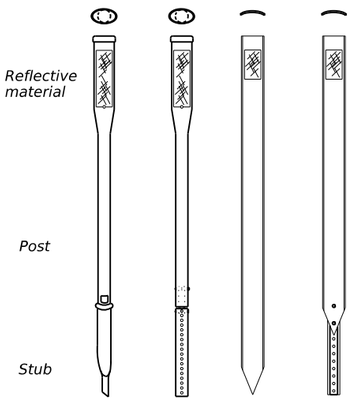
GND



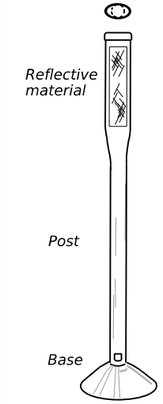
NOTES
1. Embedded Wing Channel (WC) post option may be used for Type 2 object markers and delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

FLEXIBLE POSTS (YFLX, WFLX)

GND



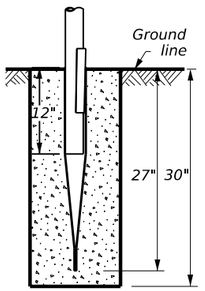
SRF



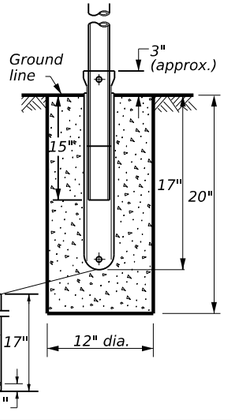
NOTES
1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.

WEDGE ANCHOR SYSTEMS

WAS



WAP



NOTE
1. Install per manufacturer's recommendations.

GENERAL NOTES
1. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
2. When Type 2 object markers are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker as close to the recommended height as possible.
3. Install all object markers in accordance with the manufacturer's recommendation.
4. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.
5. Object marker substrates shall be 0.080" aluminum sign blank and conform to ASTM B-209 Alloy 6061-T6 or an approved alternative.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

Texas Department of Transportation

Traffic Safety Division Standard

OBJECT MARKER MATERIAL DESCRIPTION & INSTALLATION

D & OM(2)-25

FILE: dom2-25.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 2025	CONT	SECT	JOB	HIGHWAY
REVISIONS				
8-04 5-25	DIST	COUNTY		SHEET NO.
3-15				175
7-20				

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FILE:

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DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Fwy./Exp. Tangent	RPMs	See PM and FPM standard sheets
Fwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Fwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 4a on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/ Deceleration Lane	Double delineators (see Detail 4a on D&OM(4))	100 feet (See Detail 4a on D & OM(4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete) and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line Bi-Directional Delineators when within clearzone	Every 5th cable barrier post (up to 100'max)
Cable Barrier Terminus / Impact Head	Object marker on end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM(6)
Guard Rail Terminus / Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM(5) and D & OM(6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM(VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM(5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM(4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

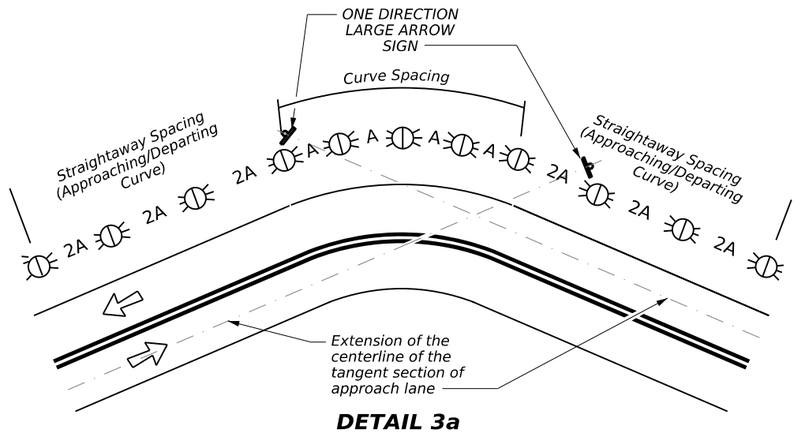
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Turn/Curve Advisory Speed: Turn (30 MPH or less)	Turn/Curve Advisory Speed: Curve (35 MPH or more)
5 MPH	• RPMs and Pavement Markings	
10 MPH	• Advance Horizontal Alignment Warning Sign with Advisory Speed Plaque; and • RPMs and Pavement Markings	
15 MPH	• Advance Horizontal Alignment Warning Sign with Advisory Speed Plaque; and • RPMs, Pavement Markings, and Delineators; or • RPMs, Pavement Markings, and One Direction Large Arrow sign(s)	• Advance Horizontal Alignment Warning Sign with Advisory Speed Plaque; and • RPMs, Pavement Markings, and Chevrons; or • RPMs, Pavement Markings, and One Direction Large Arrow sign(s) where geometric conditions or roadside obstacles prevent the installation of chevrons
20 MPH	• Advance Horizontal Alignment Warning Sign with Advisory Speed Plaque; and • RPMs, Pavement Markings, and Chevrons; or • RPMs, Pavement Markings, and One Direction Large Arrow sign(s) where geometric conditions or roadside obstacles prevent the installation of chevrons	
25 MPH or more	• Advance Horizontal Alignment Warning Sign with Advisory Speed Plaque; and • RPMs, Pavement Markings, and Chevrons; or • RPMs, Pavement Markings, and One Direction Large Arrow sign(s) where geometric conditions or roadside obstacles prevent the installation of chevrons	• Advance Horizontal Alignment Warning Sign with Advisory Speed Plaque; and • RPMs, Pavement Markings, and Chevrons

NOTE

A roadway is considered to have pavement markings when either a center line, edge lines, or both are present. A roadway is considered to have RPMs when they are used to supplement centerline pavement markings.

SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



DETAIL 3a

NOTE

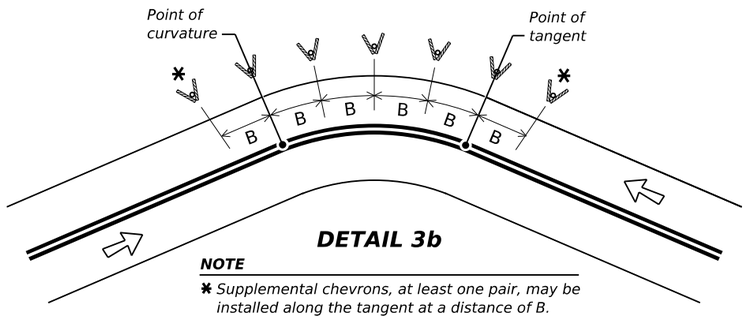
ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

LEGEND	
	Delineator
	Bi-directional Delineator
	Sign

GENERAL NOTES

1. Unless otherwise indicated, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



DETAIL 3b

NOTE

✱ Supplemental chevrons, at least one pair, may be installed along the tangent at a distance of B. Adverse curve aligment is a factor in determining if supplemental chevrons are needed.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET: Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	FEET: Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2A	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS APPLICATION & SPACING D & OM(3)-25

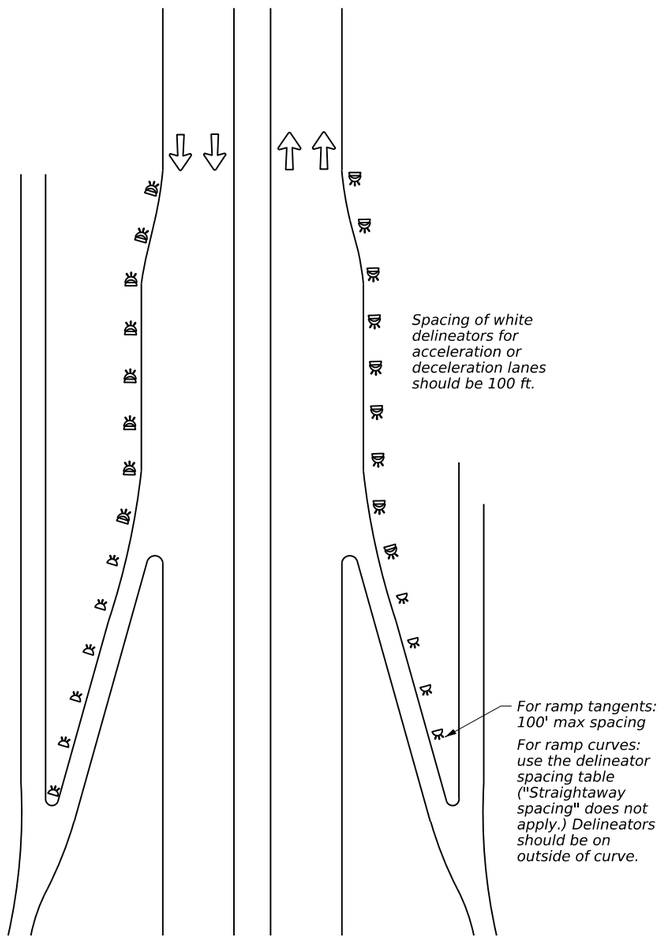
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© TxDOT	May 2025	CONT	SECT	JOB	HIGHWAY
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20C

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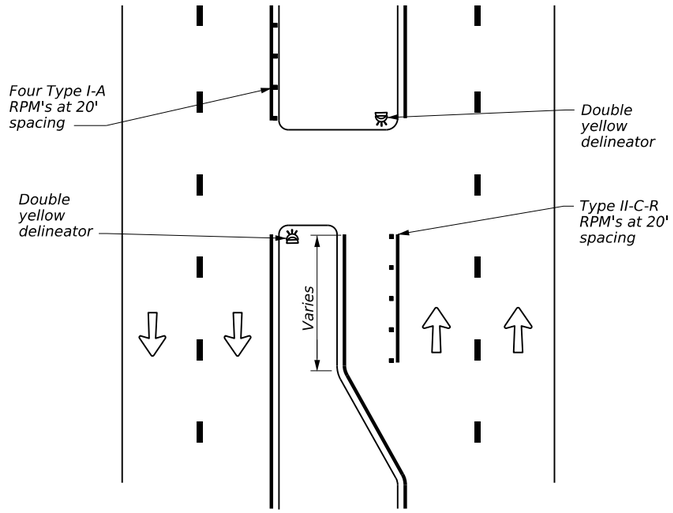
DATE:
FILE:

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION / DECELERATION LANES



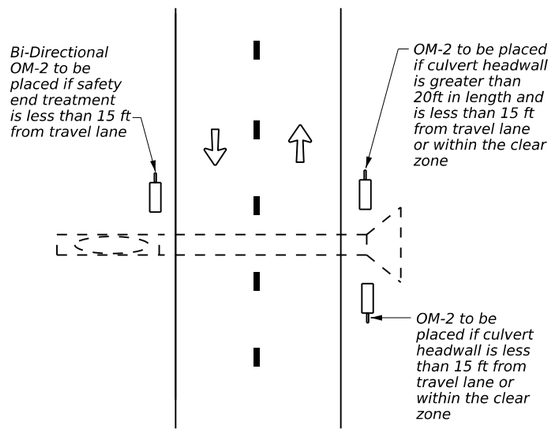
DETAIL 4a

CROSSOVERS



DETAIL 4b

FOR CULVERTS WITHOUT METAL BEAM GUARD FENCE (MBGF)

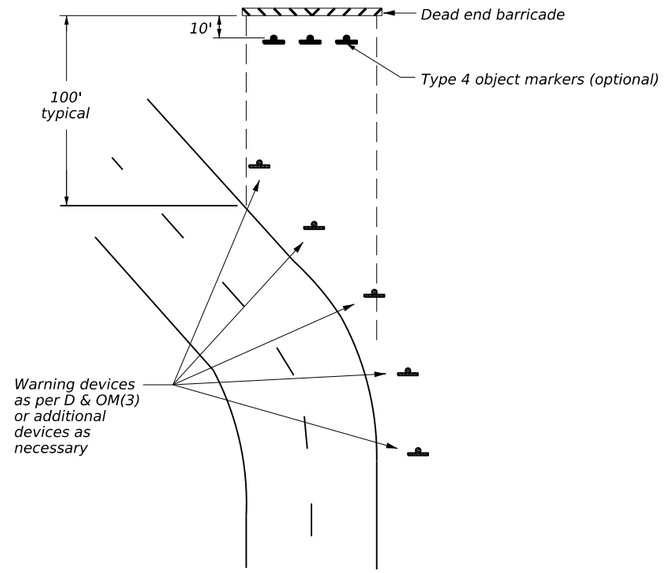


DETAIL 4c

NOTES

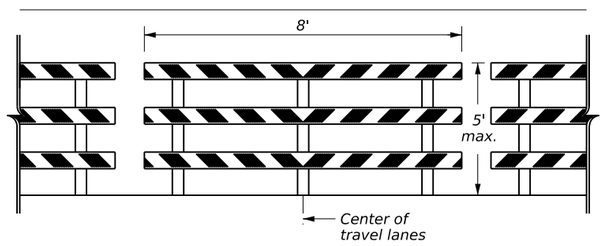
1. This detail applies for all existing culverts without MBGF, for application of OMs. New bridge-class culverts require safety end treatments, MBGF, or bridge railing. See the TxDOT Bridge Railing Manual.
2. For culverts with MBGF, see Sheet 5.

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4d

TYPICAL DEAD END BARRICADE INSTALLATION



DETAIL 4e

NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in the Compliant Work Zone Traffic Control Devices list (CWZTCD).

LEGEND

	Delineator
	Double delineator
	OM-2
	Sign
	Raised Pavement Marker (RPM)
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

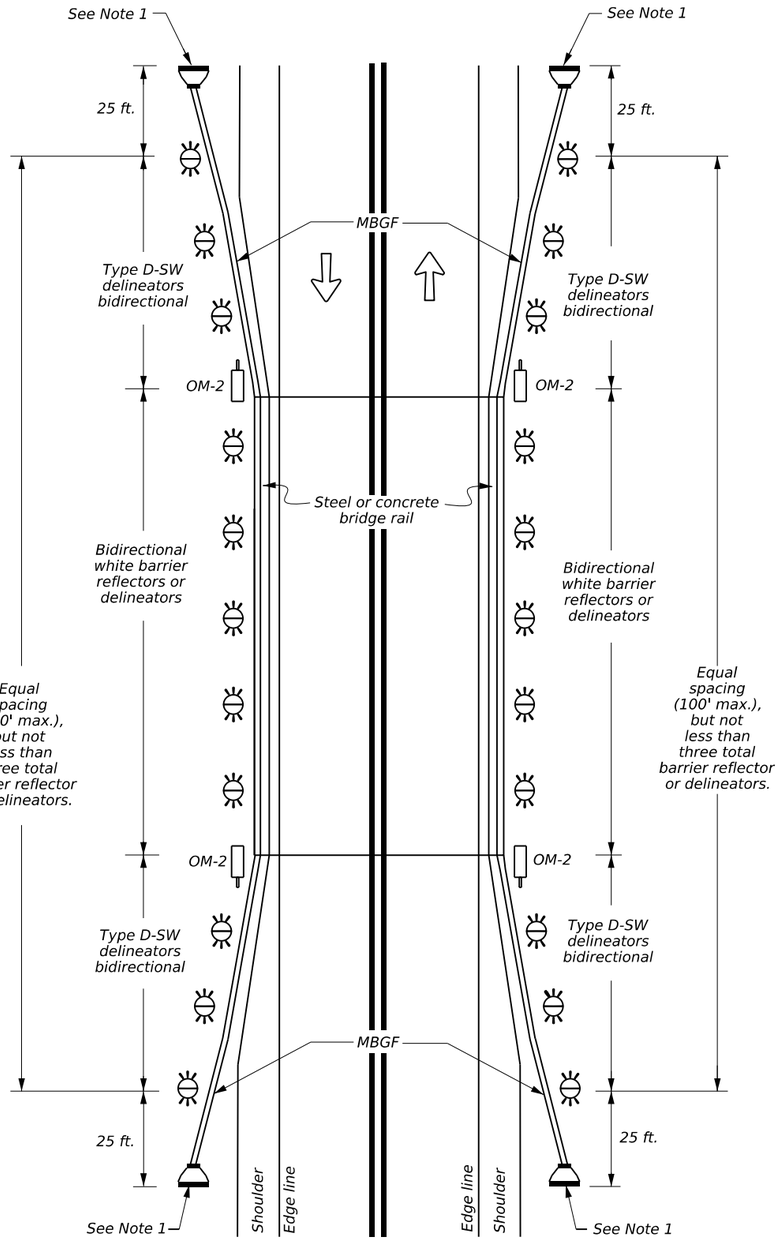
D & OM(4)-25

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©TxDOT May 2025	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-04 5-25 3-15 7-20	DIST	COUNTY		SHEET NO. 177

20D

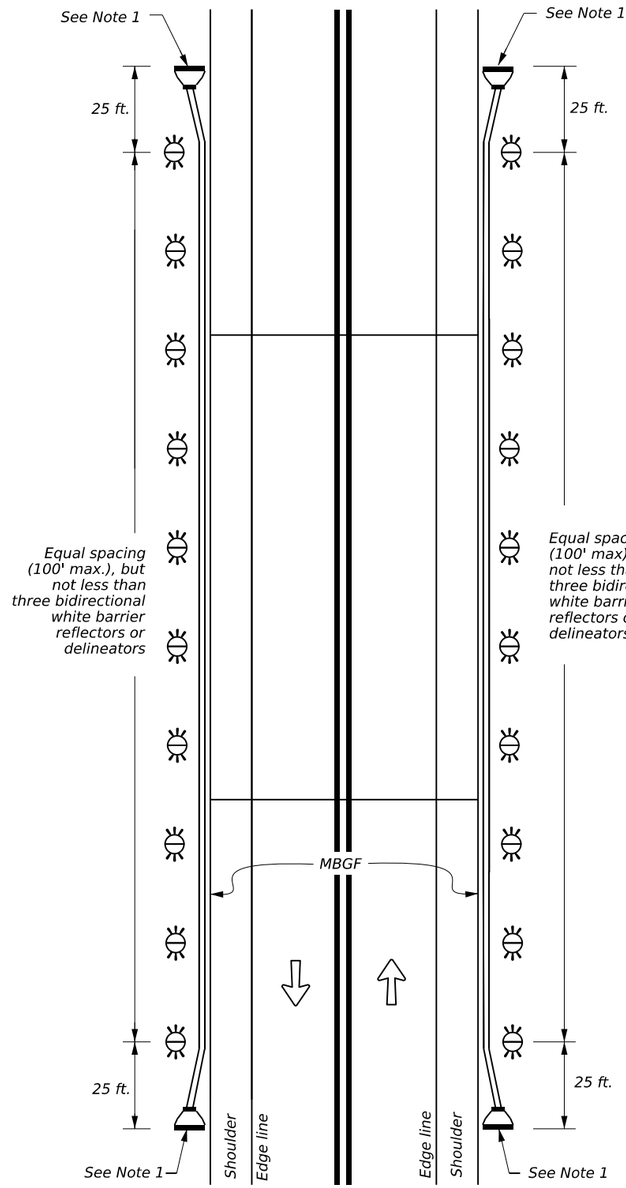
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TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



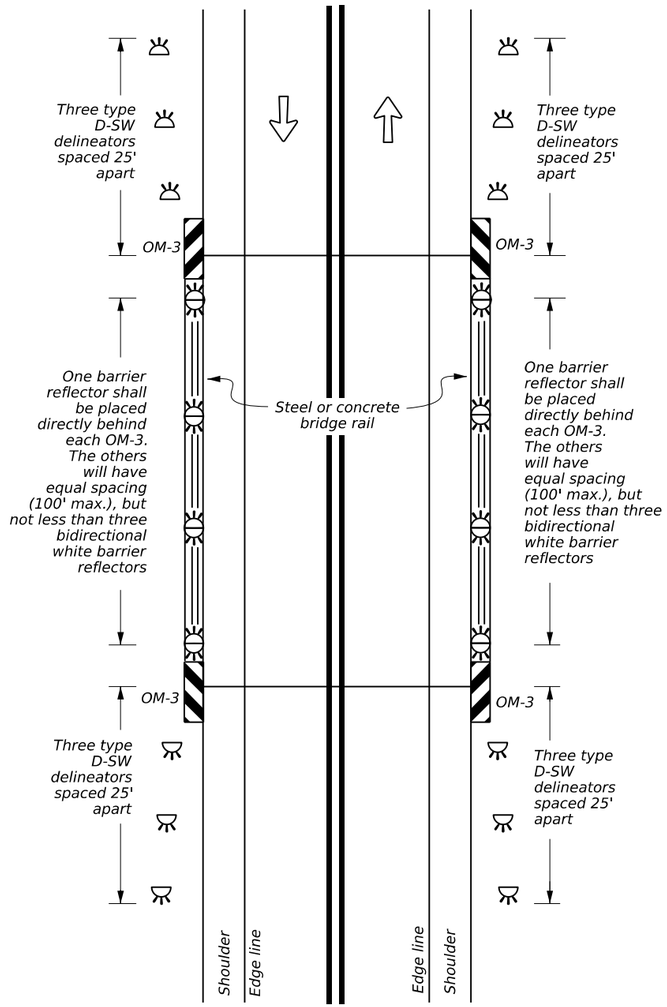
DETAIL 5a

TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DETAIL 5b

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



DETAIL 5c

NOTES

1. Terminal ends require reflective sheeting provided by manufacturer per D&OM(VIA) or a Type 3 object marker (OM-3) in front of the terminal end.
2. Bridge-class culverts may require OMs on or in advance of culvert headwalls. Refer to the TxDOT Roadway Design Manual and the TMUTCD.

GENERAL NOTE

Delineators (D) indicate roadway alignment. Object Markers (OM) identify obstructions. See D and OM definitions on D&OM(1) and D&OM(2), respectively.

LEGEND

	Delineator
	Bidirectional Delineator
	OM-2
	OM-3
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS
(BRIDGE & BRIDGE-CLASS CULVERTS)

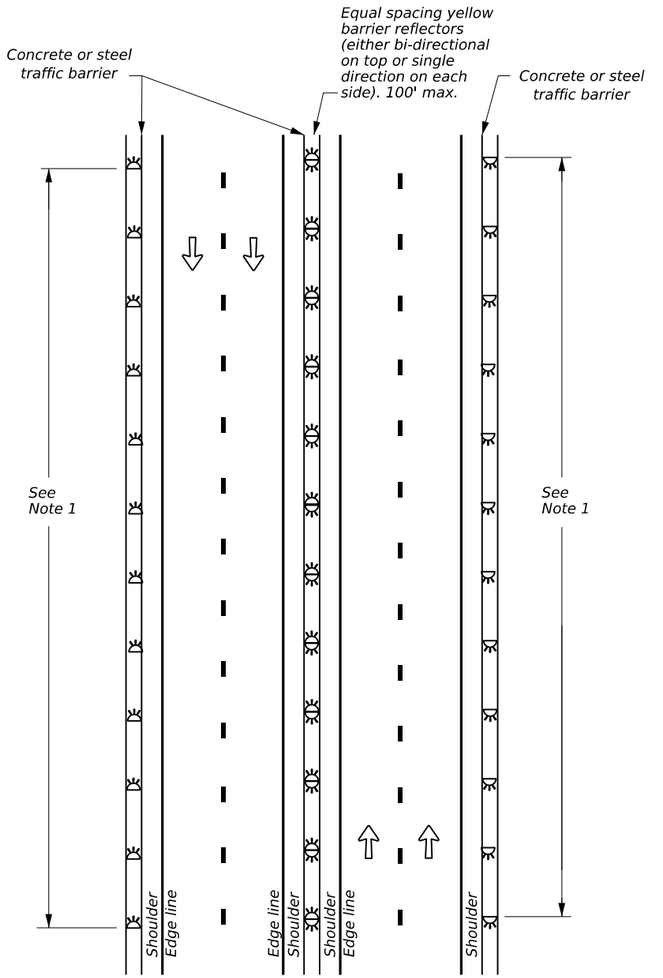
D & OM(5)-25

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5-25				
20E				

DATE:
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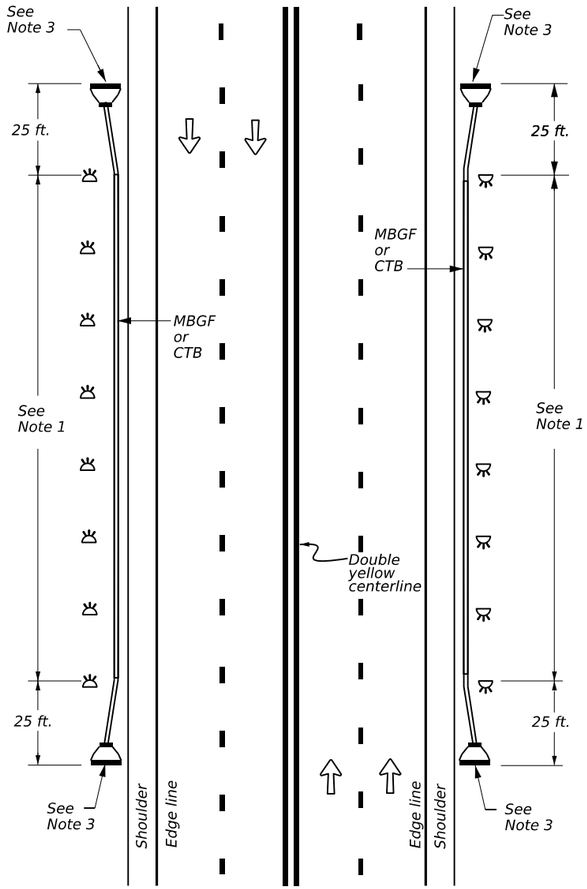
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CONTINUOUS CONCRETE OR STEEL BARRIER



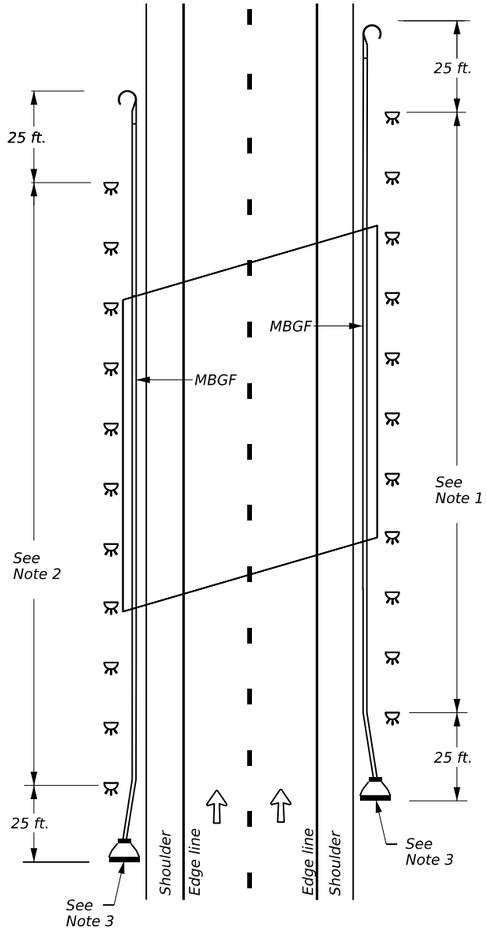
DETAIL 6a

MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



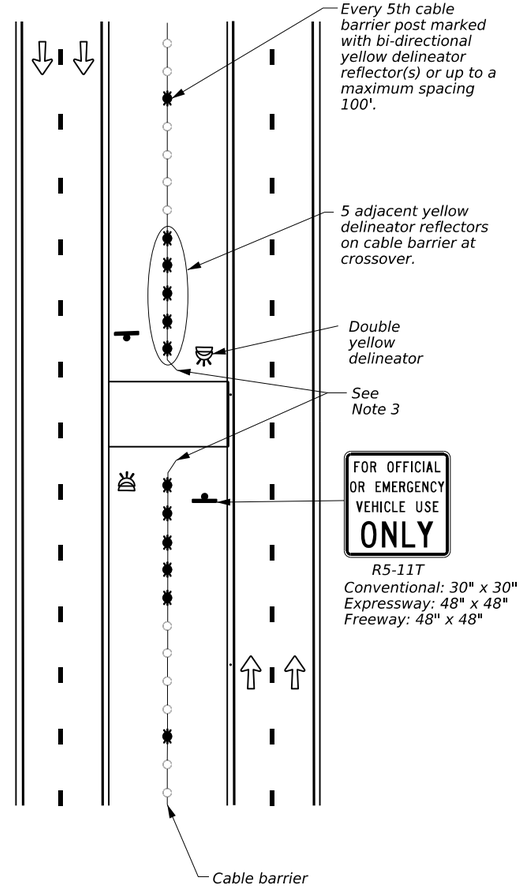
DETAIL 6b

DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DETAIL 6c

EMERGENCY CROSSOVER WITH CABLE BARRIER



DETAIL 6d

NOTES

1. Equal spacing (100' max), but not less than three single directional white barrier reflectors or delineators. On Continuous Barrier, equal spacing (100' max.)
2. Equal spacing (100' max), but not less than three single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D&OM(VIA) or a Type 3 object marker (OM-3) in front of the terminal end.
4. Optional bi-directional delineators may be placed on divided roadways to indicate wrong way direction of travel. White or yellow reflector toward normal traffic and red reflector toward wrong way traffic.

GENERAL NOTE

Delineators (D) indicate roadway alignment. Object Markers (OM) identify obstructions. See D and OM definitions on D&OM(1) and D&OM(2), respectively.

LEGEND

	Traffic Flow
	Terminal End
	Downstream Anchor Terminal End
	Delineator
	Bidirectional Delineator
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

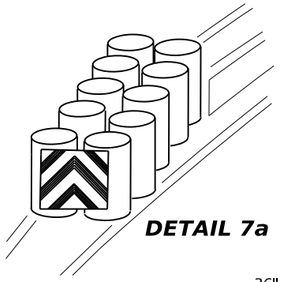
D & OM(6)-25

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5-25				

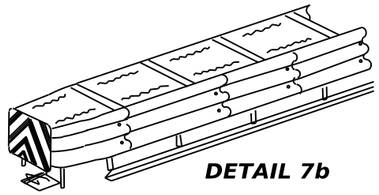
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DATE:
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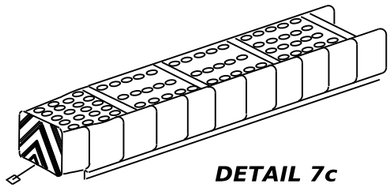
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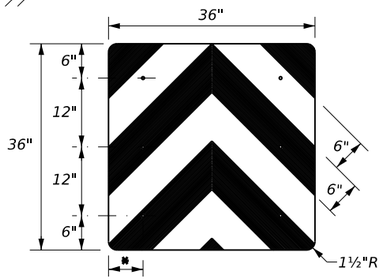
DETAIL 7a

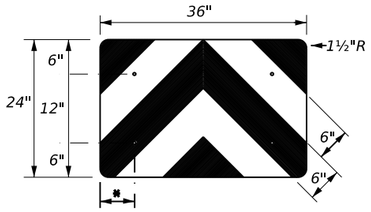


DETAIL 7b



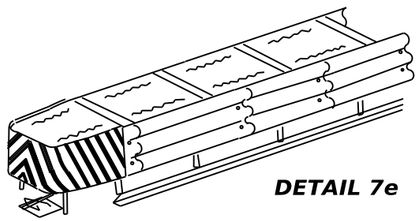
DETAIL 7c



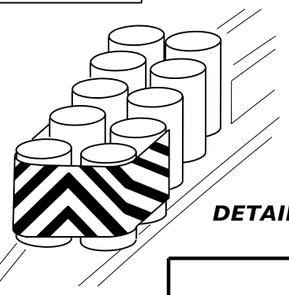


* *Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer*

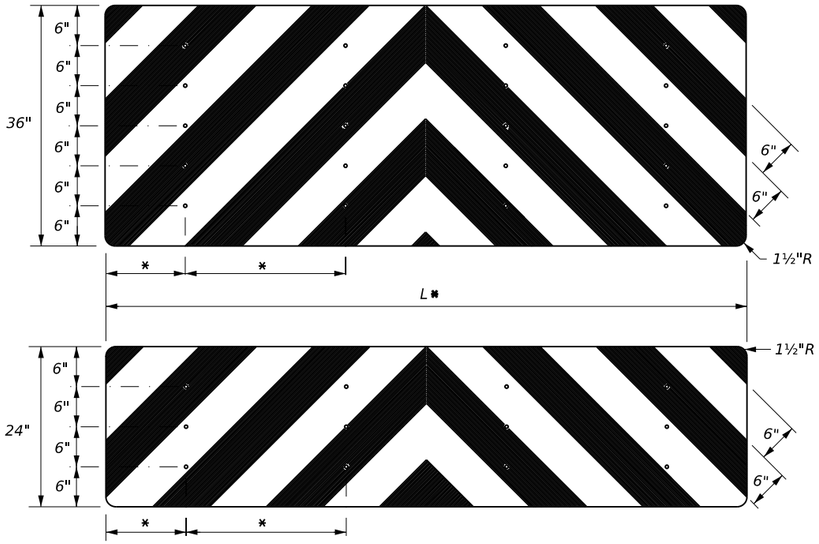
TYPICAL ATTENUATOR INSTALLATION



DETAIL 7e



DETAIL 7f

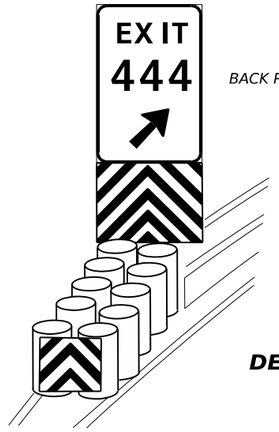


NOTES

*1. *Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.*

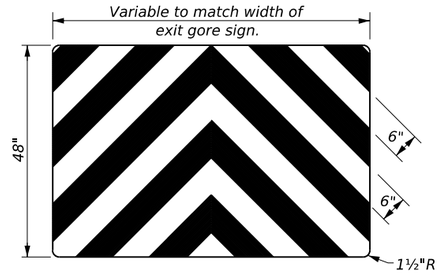
2. *Mounting should be flush with top of attenuator. Minimum size 96" x 24".*

TYPICAL APPLICATION OF OPTIONAL BACK PANEL

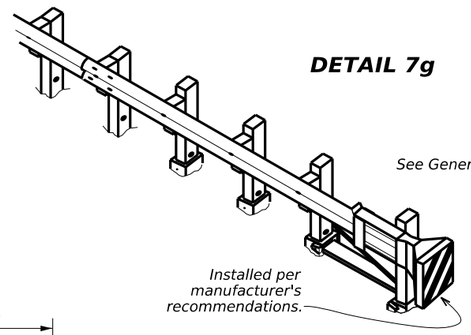


BACK PANEL (OPTIONAL)

DETAIL 7d



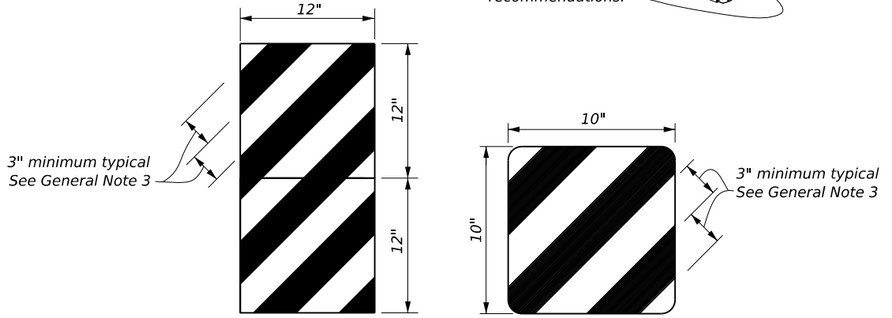
GUARDRAIL END TREATMENT



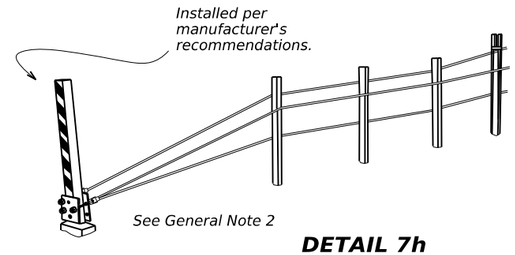
DETAIL 7g

See General Note 2

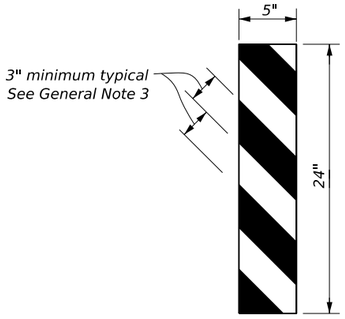
Installed per manufacturer's recommendations.



CABLE BARRIER END TREATMENT



DETAIL 7h



GENERAL NOTES

1. *Markers [with the appearance of a Type 3 object marker (OM-3)] shall conform to the TMUTCD and meet the color and reflectivity requirement of the Departmental Material Specification (DMS-8300). Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.*

2. *Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail and cable barrier end treatments, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts, or tears. A radius at the corners is not required for direct applied sheeting.*

3. *The combined width of alternating black and yellow stripes is typically 6". Marker size may be reduced to fit smaller devices. Markers smaller than 3ft² may have reduced width stripes of a minimum of 2¼" (combined 4½" width).*

4. *Pop rivets, screws, or nuts and bolts may be used to attach markers and reflectors. Holes, slots, or other openings may be cut or drilled through markers to allow cable or other attachments.*

5. *Marker or object marker placed on or at nose of attenuator is subsidiary to the attenuator.*

6. *See D & OM (1-4) for required barrier reflectors.*

Texas Department of Transportation

Traffic Safety Division Standard

OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-25

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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 913615P
Crossing Type: AT GRADE
RR Company Operating Track at Crossing: CMTA
RR Company Owning Track at Crossing: CMTA
RR MP: 75.470
RR Subdivision: CENTRAL
City: AUSTIN
County: WILLIAMSON
CSJ at this Crossing: 3417-02-040
Latitude: 30.4777494
Longitude: -97.7622499

Scope of Work, including any TCP, to be performed by State Contractor:

TCP

Scope of Work to be performed by Railroad Company:

FLAGGING

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 2

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) TxDOT will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☑ OTHERS:

CAP METRO: WESLEY BROWN
(737) 354-1625
WESLEY.BROWN@CAPMETRO.ORG

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☐ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☑ Other: $5,000,000/ $5,000,000	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☑ Required: Contractor to obtain
- ☐ BNSF: https://bnsf.railpermitting.com
- ☐ CPKCR https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☑ Other Railroads: https://www.capmetro.org/railrow

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency

Call: CAPITAL METRO
Railroad Emergency Line at: 844.592.8046
Location: DOT 913615P
RR Milepost: 75.470
Subdivision: CENTRAL

RRD Review Only
Initials: _____
Date: 10/07/2025

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf	DN: TxDOT	CK:	DW:	CK:	
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS 4/2024	3417	02	040	FM 734	
	DIST	COUNTY		SHEET NO.	
	AUS	WILLIAMSON		181	

Docusign Envelope ID: DC477215-8085-402B-8F04-435665EC1303

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 914513A
Crossing Type: AT GRADE
RR Company Operating Track at Crossing: CMTA
RR Company Owning Track at Crossing: CMTA
RR MP: 75.690
RR Subdivision: CENTRAL
City: AUSTIN
County: WILLIAMSON
CSJ at this Crossing: 3417-02-040
Latitude: 30.4790327
Longitude: -97.7659199

Scope of Work, including any TCP, to be performed by State Contractor:

MODIFY CURB & GUTTER, CANDLE STICK CHANNELIXING DEVICES, MILL, OVERLAY AND TCP

Scope of Work to be performed by Railroad Company:

FLAGGING

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 10

On this project, night or weekend flagging is:

☐ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) TxDOT will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

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☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☑ OTHERS:

CAP METRO: WESLEY BROWN
(737) 354-1625
WESLEY.BROWN@CAPMETRO.ORG

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

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Escalated Limits

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Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☐ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☑ Other: $5,000,000/ $5,000,000	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☑ Required: Contractor to obtain
- ☐ BNSF: https://bnsf.railpermitting.com
- ☐ CPKCR https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☑ Other Railroads: https://www.capmetro.org/railrow

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Approved CROE templates are not to be modified by the Contractor.

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IX. EMERGENCY NOTIFICATION

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Call: CAPITAL METRO
Railroad Emergency Line at: 914513A
Location: DOT 914513A
RR Milepost: 75.690
Subdivision: CENTRAL

RRD Review Only
Initials: _____
Date: 10/07/2025

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS	4/2024	3417	02	040		FM 734	
		DIST	COUNTY			SHEET NO.	
		AUS	WILLIAMSON			182	

ATTACHMENT G-II
WATER QUALITY APPROACH AND CALCULATIONS

(1) WATER QUALITY APPROACH SUMMARY

(2) WATER QUALITY CALCULATIONS SUMMARY

(3) TCEQ WATER QUALITY CALCULATIONS



2/9/2026

ATTACHMENT G-II (1)
WATER QUALITY APPROACH SUMMARY

Water Quality Calculations Summary – Key Inputs

1. Total Project Area

   The Total Project Area used for the existing and proposed water quality calculations was the extents of the project that included increase in impervious cover due to the proposed roadway improvements. The Project Area was delineated using the entire width of the right-of-way (ROW).

2. Required TSS Removal

   The Required TSS Removal for the project was calculated as 80% of the difference between the proposed impervious cover and the existing impervious cover.

Existing Water Quality Calculations

1. Existing permitted removal
   a. The existing WPAP's within the project limits were obtained from TCEQ. They were used to delineate what areas of the project area are treated by the existing BMPs.
   b. Drainage areas were delineated for the present-day conditions for the existing BMP.
   c. Using the size of the existing BMP and the present-day conditions, the current TSS load removed by the existing BMP was calculated in accordance with TCEQ RG-348.

Proposed Water Quality Calculations

1. Required TSS Removal

   The Required TSS Removal was calculated as 80% of the difference between the proposed impervious cover and the existing impervious cover.

2. Average Annual Precipitation: 32 in

   The average annual precipitation value for Williamson County from RG-348 was used as the project area is completely within Williamson County.

3. Types of BMP's Used: Existing Extended Detention Pond
4. Water Quality Drainage Areas:
   a. Drainage areas were delineated for the existing BMP in the proposed conditions.
   b. Using the size of the existing BMP and the proposed conditions, the proposed TSS load removed by the existing BMP was calculated in accordance with TCEQ RG-348.
   c. The required TSS load removal was found by subtracting the present-day TSS load removed from the proposed TSS load removed.

ATTACHMENT G-II (2)
WATER QUALITY CALCULATIONS SUMMARY

Changes to Drainage Areas Resulting in Changes to TSS Load Produced					
Outfall	Existing Onsite Drainage Areas ac	Existing Onsite Impervious Cover ac	Proposed Onsite Drainage Areas ac	Proposed Onsite Impervious Cover ac	Increase in Impervious Cover ac
A	4.39	2.71	2.29	1.73	-0.98
B	8.51	5.21	8.51	5.94	0.73
C	159.00	63.30	161.10	64.91	1.61
Total Project	**171.91**	**71.22**	**171.91**	**72.58**	**1.36**

TSS Removal Required for the Project			
Outfall	Existing Annual TSS Load Produced lbs	Proposed Annual TSS Load Produced lbs	Annual TSS Load Removal Required lbs
A	2,951	1,882	(856)
B	5,666	6,459	634
C	68,871	70,624	1,402
Total Project	**77,489**	**78,965**	**1,181**

TSS Removal Provided by Existing BMP			
	Drainage Area ac	Impervious Cover ac	Annual TSS Load Removed lbs
Existing Conditions	159.00	63.30	52,837
Proposed Conditions	161.10	64.91	54,046
Difference	**2.10**	**1.61**	**1,210**

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wilco_PARMER
Date Prepared: 9/29/2025

Existing Extended Detention Pond - Existing Conditions

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	171.91	acres
Predevelopment impervious area within the limits of the plan * =	71.22	acres
Total post-development impervious area within the limits of the plan* =	72.58	acres
Total post-development impervious cover fraction * =	0.42	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	1181	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 3

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = C

Total drainage basin/outfall area =	159.00	acres
Predevelopment impervious area within drainage basin/outfall area =	63.30	acres
Post-development impervious area within drainage basin/outfall area =	63.30	acres
Post-development impervious fraction within drainage basin/outfall area =	0.40	
$L_{M\ THIS\ BASIN}$ =	0	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 75 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	159.00	acres
A_I =	63.30	acres
A_P =	95.70	acres
L_R =	53805	lbs



5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **52837** lbs.

F = **0.98**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth = **3.40** inches
Post Development Runoff Coefficient = **0.31**
On-site Water Quality Volume = **600001** cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = **0.00** acres
Off-site Impervious cover draining to BMP = **0.00** acres
Impervious fraction of off-site area = **0**
Off-site Runoff Coefficient = **0.00**
Off-site Water Quality Volume = **0** cubic feet

Storage for Sediment = **120000**
Total Capture Volume (required water quality volume(s) x 1.20) = **720001** cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = **720001** cubic feet



Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wilco_PARMER
Date Prepared: 9/29/2025

Existing Extended Detention Pond - Proposed Conditions

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	171.91	acres
Predevelopment impervious area within the limits of the plan * =	71.22	acres
Total post-development impervious area within the limits of the plan* =	72.58	acres
Total post-development impervious cover fraction * =	0.42	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	1181	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 3

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = C

Total drainage basin/outfall area =	161.10	acres
Predevelopment impervious area within drainage basin/outfall area =	63.30	acres
Post-development impervious area within drainage basin/outfall area =	64.91	acres
Post-development impervious fraction within drainage basin/outfall area =	0.40	
$L_{M\ THIS\ BASIN}$ =	1402	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 75 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	161.10	acres
A_I =	64.91	acres
A_P =	96.19	acres
L_R =	55149	lbs



5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**54046**	lbs.
F =	**0.98**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**3.33**	inches
Post Development Runoff Coefficient =	**0.31**	
On-site Water Quality Volume =	**599999**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**120000**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**719999**	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

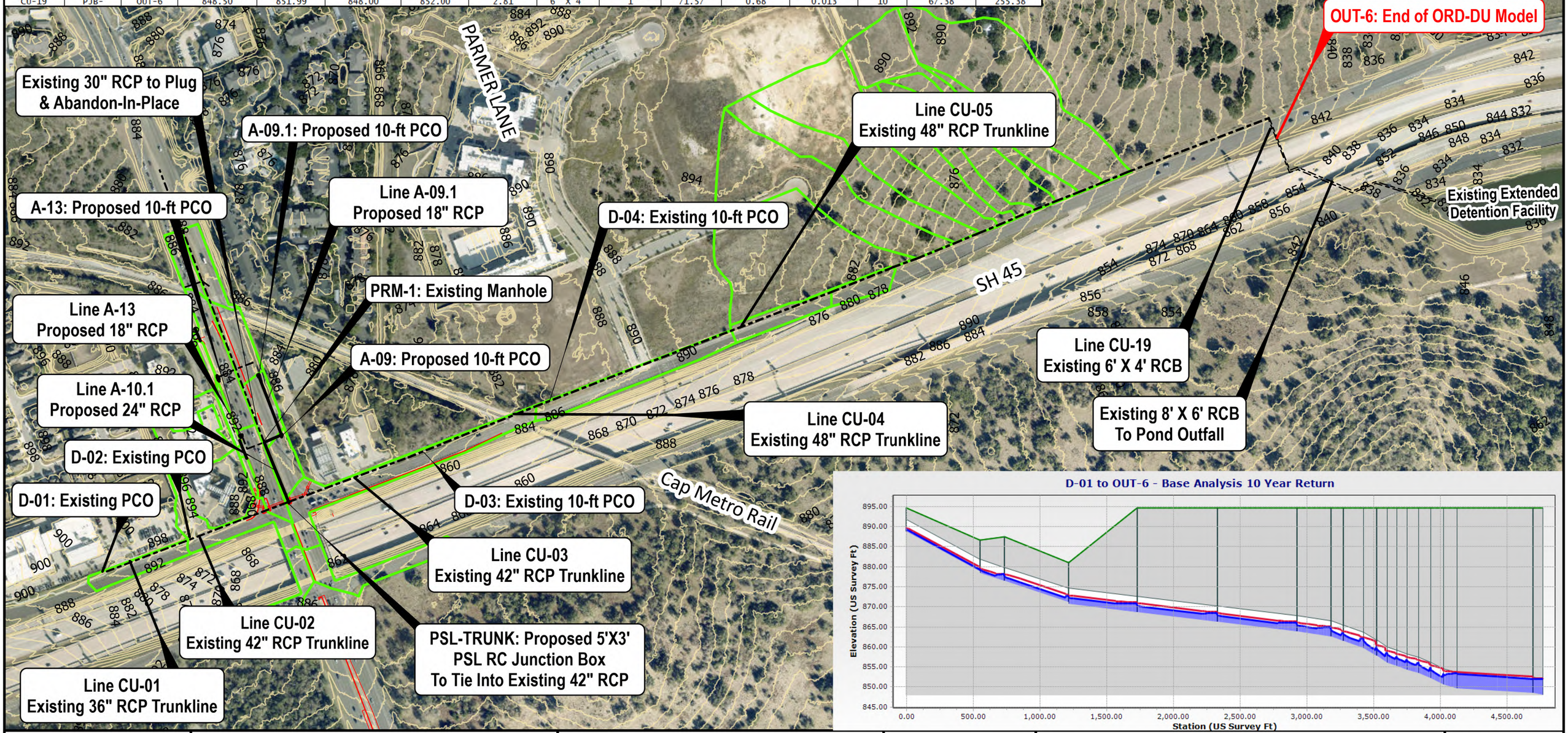
8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin =	**719999**	cubic feet



ATTACHMENT G-III
WATER QUALITY SITE PLAN

LINK ID	US NODE ID	DS NODE ID	US FL ELEV (FT)	US HGL (FT)	DS FL ELEV (FT)	DS HGL (FT)	ACTUAL VELOCITY (CFS)	SIZE (## INCH RCP)	NO OF BARRELS	ACTUAL LENGTH (FT)	LINK SLOPE (%)	MANNINGS N	DESIGN STORM	DISCHARGE (CFS)	CAPACITY (CFS)
A-09	A-09	PRM-1	879.32	880.79	878.98	880.78	1.73	24	1	67.64	0.48	0.013	10	5.15	15.65
A-09.1	A-09.1	A-09	880.50	881.06	879.32	880.88	1.25	18	2	236.28	0.49	0.013	10	2.20	7.35
A-10.1	PRM-1	PSL-TRUNK	878.98	880.32	878.34	879.69	4.09	36	1	239.86	0.26	0.013	10	9.20	11.60
A-13	A-13	PRM-4	880.95	882.31	880.92	882.30	2.56	48	1	3.75	0.41	0.013	10	4.35	6.76
CU-01	D-01	D-02	888.78	889.37	878.87	879.48	3.44	18	1	549.29	1.80	0.013	10	3.58	89.39
CU-02	D-02	PSL-TRUNK	878.35	879.20	876.35	878.11	1.64	24	1	182.40	1.09	0.013	10	7.96	104.99
CU-03	PSL-TRUNK	D-03	876.35	877.59	871.18	872.82	3.72	42	1	478.53	1.08	0.013	10	16.53	104.42
CU-04	D-03	D-04	870.68	872.24	868.60	870.88	3.74	18	1	512.87	0.41	0.013	10	27.66	91.47
CU-05	D-04	PRM-	868.60	870.25	866.20	868.37	4.43	48	1	596.34	0.40	0.013	10	30.90	90.78
CU-19	PJB-	OUT-6	848.50	851.99	848.00	852.00	2.81	6' X 4'	1	71.57	0.68	0.013	10	67.38	255.38



0 250 500
US Feet

EDGE ENGINEERING
7000 N Mopac Expy STE 325
Austin, TX 78731
United States
512.767.1009
TBPE Firm No. F-20690

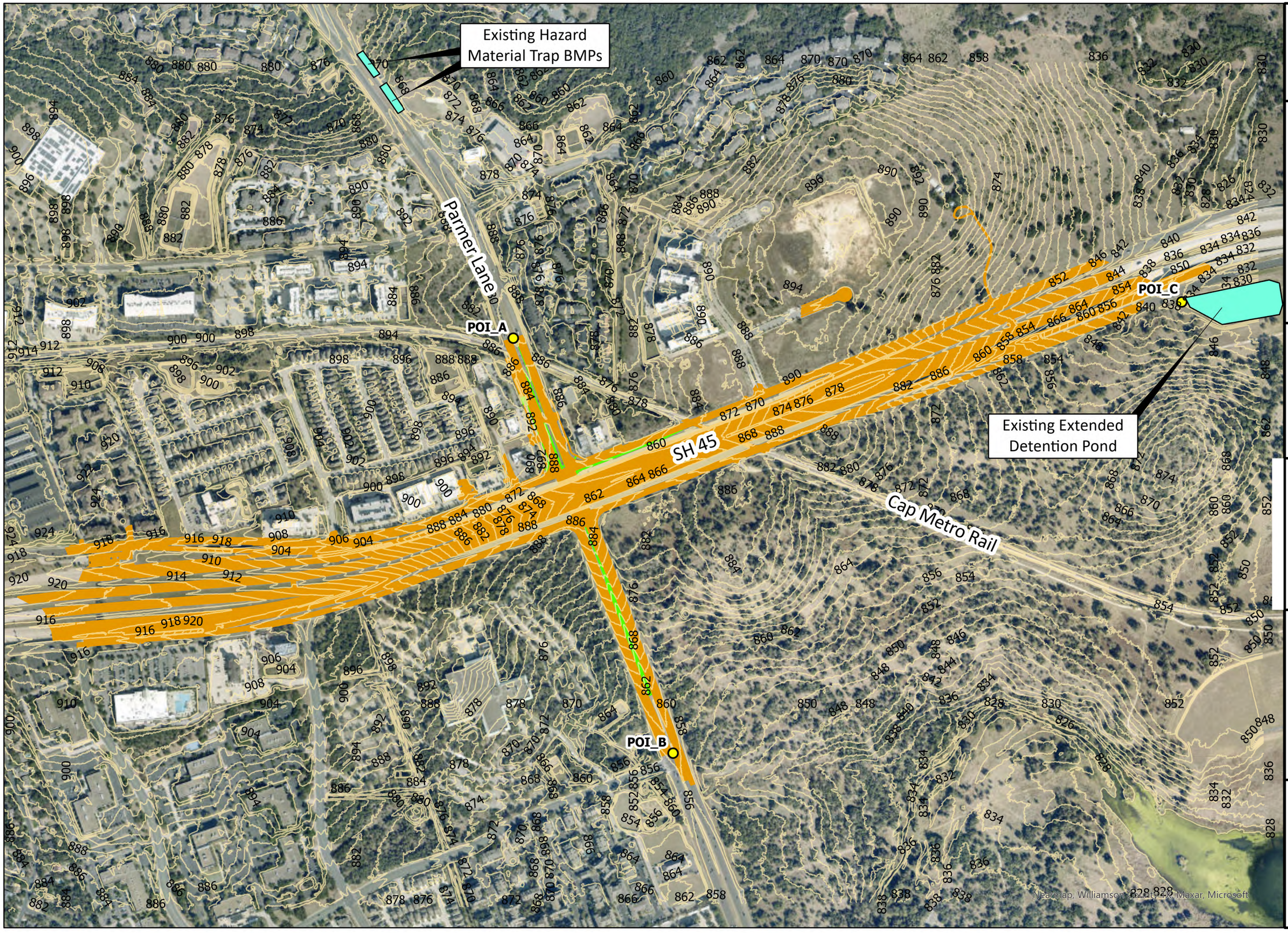
POST-PROJECT CONDITIONS PROPOSED STORM SEWER TO EXISTING WQ POND

WILCO TEXAS

Legend

- Drainage Areas to 42" RCP
- Roadway Improvements
- Existing Storm Sewer
- Proposed Storm Sewer
- 2-Ft Contours

N



N

Legend

- POI Outfalls
- 2-Ft Contours
- Post-Project IC
- Pre-Project IC

EXISTING WATER QUALITY BMP EXHIBIT

WILCO TEXAS

EDGE ENGINEERING

7000 N Mopac Expy STE 325
Austin, TX 78731
United States
512.767.1009
TBPE Firm No. F-20690

0 400 800

US Feet

ATTACHMENT G-IV
STORMWATER POLLUTION PREVENTION PLAN (SW3P)

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

1.2 PROJECT LIMITS:

From: 650' SOUTH OF SPECTRUM DR

To: 470' NORTH OF AMBERGLEN BLVD

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 30°28'48.05"N ,(Long) 97°45'58.87"W

END: (Lat) 30°28'21.48"N ,(Long) 97°45'47.51"W

1.4 TOTAL PROJECT AREA (Acres): 2.26

1.5 TOTAL AREA TO BE DISTURBED (Acres): 2.26

1.6 NATURE OF CONSTRUCTION ACTIVITY:

ADDITIONAL TURN LANES ON FM 734 (PARMER LN) AND SH45 WB FRONTAGE ROADS CONSISTING OF GRADING, DRAINAGE STRUCTURES, EROSION CONTROL, SIGNING AND STRIPING.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
CRAWFORD CLAY, 1-3 % SLOPES	WELL DRAINED, VERY HIGH RUNOFF
ECKRANT STONY CLAY, 0-3% SLOPES	STONY SURFACE AREA, WELL DRAINED, MEDIUM RUNOFF.
FAIRLIE CLAY, 0-2% SLOPES	MODERATELY WELL DRAINED, HIGH TO VERY HIGH RUNOFF
GEORGETOWN STONY CLAY LOAM, 1-3% SLOPES	STONY SURFACE AREA, WELL DRAINED, VERY HIGH RUNOFF

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- ☐ PSLs determined during preconstruction meeting
- ☐ PSLs determined during construction
- ☒ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

- ☒ Mobilization
- ☒ Install sediment and erosion controls
- ☒ Blade existing topsoil into windrows, prep ROW, clear and grub
- ☒ Remove existing pavement
- ☒ Grading operations, excavation, and embankment
- ☒ Excavate and prepare subgrade for proposed pavement widening
- ☒ Remove existing culverts, safety end treatments (SETs)
- ☒ Remove existing metal beam guard fence (MBGF), bridge rail
- ☒ Install proposed pavement per plans
- ☒ Install culverts, culvert extensions, SETs
- ☒ Install mow strip, MBGF, bridge rail
- ☒ Place flex base
- ☒ Rework slopes, grade ditches
- ☐ Blade windrowed material back across slopes
- ☒ Revegetation of unpaved areas
- ☒ Achieve site stabilization and remove sediment and erosion control measures
- ☒ Other: SIDEWALK CONSTRUCTION PER PLANS
- ☐ Other:
- ☐ Other:

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- ☒ Sediment laden stormwater from stormwater conveyance over disturbed area
- ☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- ☒ Solvents, paints, adhesives, etc. from various construction activities
- ☒ Transported soils from offsite vehicle tracking
- ☒ Construction debris and waste from various construction activities
- ☒ Contaminated water from excavation or dewatering pump-out water
- ☒ Sanitary waste from onsite restroom facilities
- ☒ Trash from various construction activities/receptacles
- ☒ Long-term stockpiles of material and waste
- ☒ Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities.
- ☐ Other:
- ☐ Other:
- ☐ Other:

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
LAKE CREEK	LAKE CREEK (1244B), UNCLASSIFIED, NOT IMPAIRED, JUST DOWNSTREAM OF PROJECT LIMITS.
BRUSHY CREEK	BRUSHY CREEK (1244), IMPAIRED, RECEIVES WATER FROM LAKE CREEK
NO TMDLS OR I-PLANS WERE IDENTIFIED	

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- ☒ Development of plans and specifications
- ☐ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- ☒ Post Construction Site Notice
- ☒ Submit NOI/CSN to local MS4
- ☒ Perform SWP3 inspections
- ☒ Maintain SWP3 records and update to reflect daily operations
- ☒ Complete and submit Notice of Termination to TCEQ
- ☒ Maintain SWP3 records for 3 years
- ☐ Other:
- ☐ Other:
- ☐ Other:

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- ☒ Day To Day Operational Control
- ☐ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- ☒ Post Construction Site Notice
- ☐ Submit NOI/CSN to local MS4
- ☒ Maintain schedule of major construction activities
- ☒ Install, maintain and modify BMPs
- ☒ Complete and submit Notice of Termination to TCEQ
- ☒ Maintain SWP3 records for 3 years
- ☐ Other:
- ☐ Other:
- ☐ Other:

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity
NO MS4s RECEIVE STORMWATER DISCHARGE FROM THIS SITE.

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
STATE	STATE DIST.	COUNTY	
TEXAS	AUS	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
3417	02	040	PARMER LN

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- X ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☐ ☐ Temporary Seeding
- ☐ X Permanent Planting, Sodding or Seeding
- X ☐ Biodegradable Erosion Control Logs
- X ☐ Rock Filter Dams/ Rock Check Dams
- X ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ X Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ X Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- X ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- X ☐ Inlet Protection
- X ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☐ ☐ Sediment Control Fence
- X ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- ☐ ☐ Sedimentation Basin
  - X Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - ☐ Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
CONCRETE RIPRAP ALONG DITCH D-A-17	STA 304+57.00	STA 300+62.00

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- X Excess dirt/mud on road removed daily
- X Haul roads dampened for dust control
- X Loaded haul trucks to be covered with tarpaulin
- X Stabilized construction exit
- X Daily street sweeping
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- X Chemical Management
- X Concrete and Materials Waste Management
- X Debris and Trash Management
- X Dust Control
- X Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
N/A		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- X Fire hydrant flushings
- X Irrigation drainage
- X Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- X Potable water sources
- X Springs
- X Uncontaminated groundwater
- X Water used to wash vehicles or control dust
- X Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
STATE	STATE DIST.	COUNTY	
TEXAS	AUS	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
3417	02	040	PARMER LN

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DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

1. ☐ It is not anticipated that any erosion, sedimentation, or environmental control devices will be needed on this project. The Contractor must still implement appropriate practices to prevent pollution from construction activities from reaching waters of the state. If it becomes necessary to implement control devices, payment for that work must be in accordance with Item 506 Article 4.4, "Change in the Work".

2. ☐ The project will disturb less than 1 acre of soil and has EPICs that require the implementation of erosion, sedimentation, or environmental control devices. The SWP3 summary sheet and associated plan information has been developed and included in the plans. Additional documentation must be maintained during construction in accordance with Department policy.

3. ☒ The project will disturb 1 acres or more of soil therefore requires the implementation of erosion, sedimentation, or environmental control devices. The SWP3 summary sheet and associated plan information has been developed and included in the plans. Additional documentation must be maintained during construction in accordance with Department policy and Texas Commission on Environmental Quality Construction General Permit (TXR150000) requirements.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

1. ☒ No Permit Required

2. ☐ USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas. The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

   - ☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
   - ☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
   - ☐ Other Nationwide Permit Required: NWP#
   - ☐ Individual Standard Permit Required

The SWP3 describes the BMPs planned to control erosion, sedimentation and post-project TSS.

The following lists the impacted water, its stationing, planned disturbed acreage,and additional notes:

1. N/A
2.
3.
4.
5.
6.
7.
8.
9.

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☐ Additional Required Actions:

1. N/A
2.
3.
4.

IV. VEGETATION RESOURCES

The Contractor must preserve native vegetation to the extent practical. Follow vegetative buffers defined in the SWP3 for work adjacent to water bodies. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ Additional Required Actions:

1. During construction, the Contractor should avoid impacts to woody vegetation. Tree and brush trimming, cutting, and removal will be kept to a minimum and implemented only when necessary to complete project work.
2. Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable.
3. The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.

V. PROTECTED SPECIES AND MIGRATORY BIRDS

The work must not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately. Do not disturb or handle bats found under bridges and other structures. Do not harm or kill wildlife that enters the project area, including rattlesnakes. Implement measures to avoid infesting water bodies with zebra mussels, including inspecting equipment prior to placing in water and clean, drain, dry practices.

If any listed species are observed, cease work in the immediate area, do not disturb the species or habitat, and contact the Engineer immediately.

☒ Additional Required Actions:

1. Migratory birds may be nesting in any woody vegetation or existing structures within the project limits. The contractor shall remove all old migratory bird nests from any woody vegetation or structures between September 16 and February 28 while the nests are not occupied by a bird. In addition, the contractor must be prepared to prevent migratory birds from re-nesting between March 1 and September 15. All methods must be approved by the Austin District Biologist well in advance of planned use.
2. Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season. If unoccupied, inactive nests will be removed, ensure that nests are not protected under the Endangered Species Act (ESA), MBTA, or BGEPA. Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
3. See Void Mitigation Details if voids are encountered during construction.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP: Best Management Practice
CGP: Construction General Permit
DSHS: Texas Department of State Health Services
FHWA: Federal Highway Administration
MBTA: Migratory Bird Treaty Act
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
OHWM: Ordinary High Water Mark
OSHA: Occupational Safety and Health Administration
PCN: Pre-Construction Notification
PSL: Project Specific Location
SDS: Safety Data Sheet
SPCC: Spill Prevention Control and Countermeasure
SW3P: Stormwater Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
TSS: Total Suspended Solids
USACE: U.S. Army Corps of Engineers
USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN:	CK: KM	DW: CES	CK:
© TxDOT: October 2025	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		

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VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

For all projects the Contractor will comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Safety Data Sheets (SDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bareground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Pollutant housekeeping is also required in accordance with items listed in Section I of this EPIC sheet.

Maintain an adequate supply of on-site spill response materials, as indicated in the SDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Responsibility for Hazardous Materials: Except in cases where the generation of hazardous materials are introduced by the Contractor on any work done by the Contractor on State-owned or controlled sites, the Contractor is not the generator of hazardous materials indentified in the ROW as shown in the plans or as discovered during construction.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

The following list identifies non-asbestos/lead contamination or waste issues (location, contamination/waste type, if a soil and groundwater management plan applies, and any additional notes)

1. N/A

2.

3.

Demolition Activities - Does the project involve the demolition of any bridge class structure (not including buried culverts) for the purpose of replacement or permanent removal?

1. ☒ No - no further action required for demolition activities
2. ☐ Yes - the Contractor must provide the dates for demolition to the Engineer at least 30 days in advance, to allow the Department sufficient time to prepare and submit the pre-demolition notification to the DSHS at least 10 working days prior to the scheduled demolition.

Asbestos Concerns:

1. ☒ The project does not involve any bridge rehabilitation or replacements. No further action required for bridge asbestos concerns.
2. ☐ The project involves bridge rehabilitation or replacements. The asbestos inspection results are negative. No abatement action is required.
3. ☐ The project involves bridge rehabilitation or replacements. The asbestos inspection results are positive and asbestos abatement is required.
   The asbestos is located at the following (structure ID and station):

   Location 1.

   Location 2.

   Location 3.

   For positive asbestos results, the following action will apply: N/A

   ☐ The Department has retained a DSHS licensed asbestos abatement contractor under a separate contract to perform the abatement, provide DSHS abatement notification, and perform asbestos management activities. This work must occur prior to the Contractor commencing any work that might disturb asbestos.

   ☐ The Department has included the work to perform the abatement, provide DSHS abatement notification, and perform asbestos management activities in this contract under Item 6.10 and related Special Provision and Special Specification. The Contractor must perform abatement work prior to commencing any work that might disturb asbestos.

Lead Paint Concerns - The project involves demolition or repair work that could require cutting, torch cutting, welding, or abrasive blasting of painted steel.

1. ☒ No - no further action required for lead paint concerns
2. ☐ Yes - the lead paint inspection results are negative. No action required for lead paint concerns.
3. ☐ Yes - the lead paint inspection results are positive. Lead is at the following locations and concentrations:

   Location (location/structure ID) Concentration (ppm)

   Location 1.

   Location 2.

   Location 3.

For positive lead results, the following action will apply: N/A

☐ The work is under Item 446 (Field Cleaning & Painting Steel), management of hazardous materials is addressed in the specification and additional mitigation is not required.

☐ The lead concentration of the coating is known to be less than 90 ppm (Consumer Product Safety Commission threshold for paint to be designated as lead-containing), additional mitigation is not required.

☐ Mitigation for lead hazards is required in accordance with OSHA. The Contractor must provide mitigation as part of this contract. Mitigation may include stripping back of paint from steel at cut points or other areas where paint will be disturbed. The Contractor may select other OSHA-compliant controls or work practices instead of paint stripping to mitigate lead hazards. Manage painted steel in accordance with Standard Specification Item 6.10, Painted Steel Requirements.

☐ Mitigation for lead hazards is required in accordance with OSHA. The Department will provide lead paint removal. The Contractor must notify the Engineer of locations where paint-disturbing activities will occur at least 90 days prior to the work, to allow sufficient time for the Department to remove the paint. Manage painted steel in accordance with Standard Specification Item 6.10, Painted Steel Requirements.

VII. OTHER ENVIRONMENTAL ISSUES

(includes program areas such as Air, Noise, Edwards Aquifer Protection Program, etc.)

☒ Additional Required Actions:

1. The project is located on the Edwards Aquifer Recharge Zone.

2. A TCEQ approved Water Pollution Abatement Plan (WPAP) is required before the start of construction. Comply with the WPAP and WPAP Approval Letter.

3. Maintain copies of the WPAP and WPAP Approval Letter onsite or immeidately available during construction.

LIST OF ABBREVIATIONS

BMP: Best Management Practice
CGP: Construction General Permit
DSHS: Texas Department of State Health Services
FHWA: Federal Highway Administration
MBTA: Migratory Bird Treaty Act
MOA: Memorandum of Agreement
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TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
TSS: Total Suspended Solids
USACE: U.S. Army Corps of Engineers
USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation — Design Division Standard

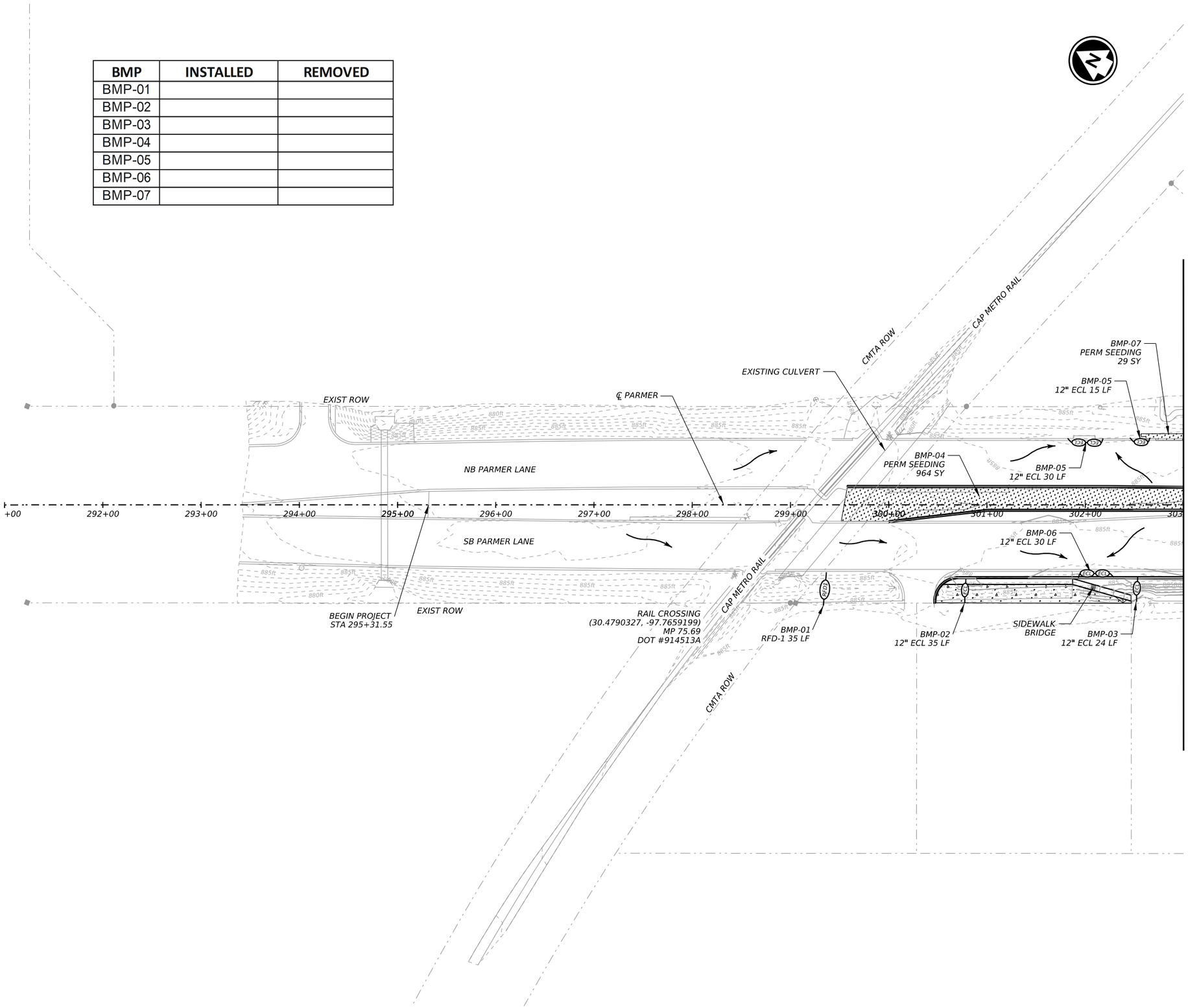
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN:	CK: KM	DW: CES	CK:
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REVISIONS	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		

DATE:
FILE:

BMP	INSTALLED	REMOVED
BMP-01		
BMP-02		
BMP-03		
BMP-04		
BMP-05		
BMP-06		
BMP-07		



LEGEND

- *RIGHT OF WAY*
- *DIRECTION OF FLOW*
- *SURVEY EXISTING CONTOUR*
- *ROADWAY CENTERLINE*
- *EROSION CONTROL LOG (12")* — ECL
- *SILT FENCE* — SCF
- *ROCK FILTER DAM TYPE 1* — RFD1
- *PROPOSED DITCH*

NOTES:

1. *SEE DETAIL SHEET FOR ROCK FILTER DAM TYPE I.*
2. *FOR DRAINAGE PATTERNS AND APPROXIMATE SLOPES, SEE DRAINAGE AREA MAPS.*
3. *CONTROL MEASURE LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS WILL BE DETERMINED IN THE FIELD BY ENGINEER.*
4. *TEMPORARY CONSTRUCTION EXIT AND ACCESS ROAD LOCATIONS TO BE DETERMINED IN THE FIELD BY TXDOT AND THE CONTRACTOR.*

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED
PROFESSIONAL ENGINEER
9/30/2025

0 50 100
SCALE: H: 1"=100'

WILCO TEXAS

EDGE ENGINEERING
TBPELS Firm Number 20690
7000 N Mopac Expy, Ste. 325
512.767.1009 | www.civil-edge.com

PARMER LANE AT SH45

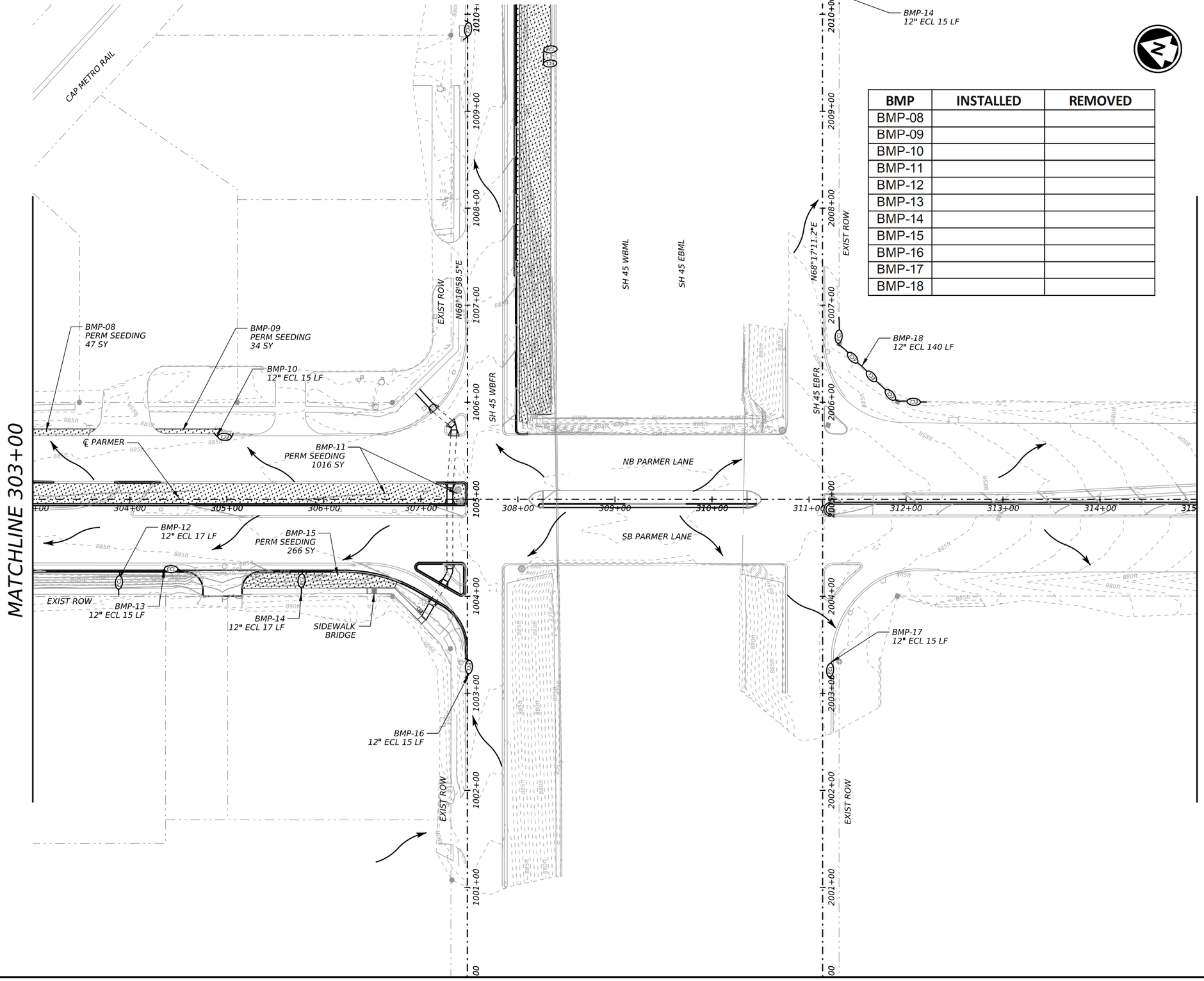
SW3P LAYOUT

BEGIN TO STA 303+00

2025 *SHEET 1 OF 4*

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

DATE: 9/30/2025 9:41:21 PM
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BMP-09		
BMP-10		
BMP-11		
BMP-12		
BMP-13		
BMP-14		
BMP-15		
BMP-16		
BMP-17		
BMP-18		

LEGEND

- RIGHT OF WAY
- DIRECTION OF FLOW
- SURVEY EXISTING CONTOUR
- ROADWAY CENTERLINE
- EROSION CONTROL LOG (12") (ECL) (ECL)
- SILT FENCE (SCF) (SCF)
- ROCK FILTER DAM TYPE 1 (RFD1) (RFD1)
- PROPOSED DITCH

NOTES:

1. SEE DETAIL SHEET FOR ROCK FILTER DAM TYPE I.
2. FOR DRAINAGE PATTERNS AND APPROXIMATE SLOPES, SEE DRAINAGE AREA MAPS.
3. CONTROL MEASURE LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS WILL BE DETERMINED IN THE FIELD BY ENGINEER.
4. TEMPORARY CONSTRUCTION EXIT AND ACCESS ROAD LOCATIONS TO BE DETERMINED IN THE FIELD BY TXDOT AND THE CONTRACTOR.

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED
PROFESSIONAL ENGINEER
9/30/2025

0 50 100
SCALE: H: 1"=100'

WILCO TEXAS

EDGE ENGINEERING
TBPELS Firm Number 20690
7000 N Mopac Expy. Ste. 325
512.767.1009 | www.civil-edge.com

PARMER LANE AT SH45

SW3P LAYOUT

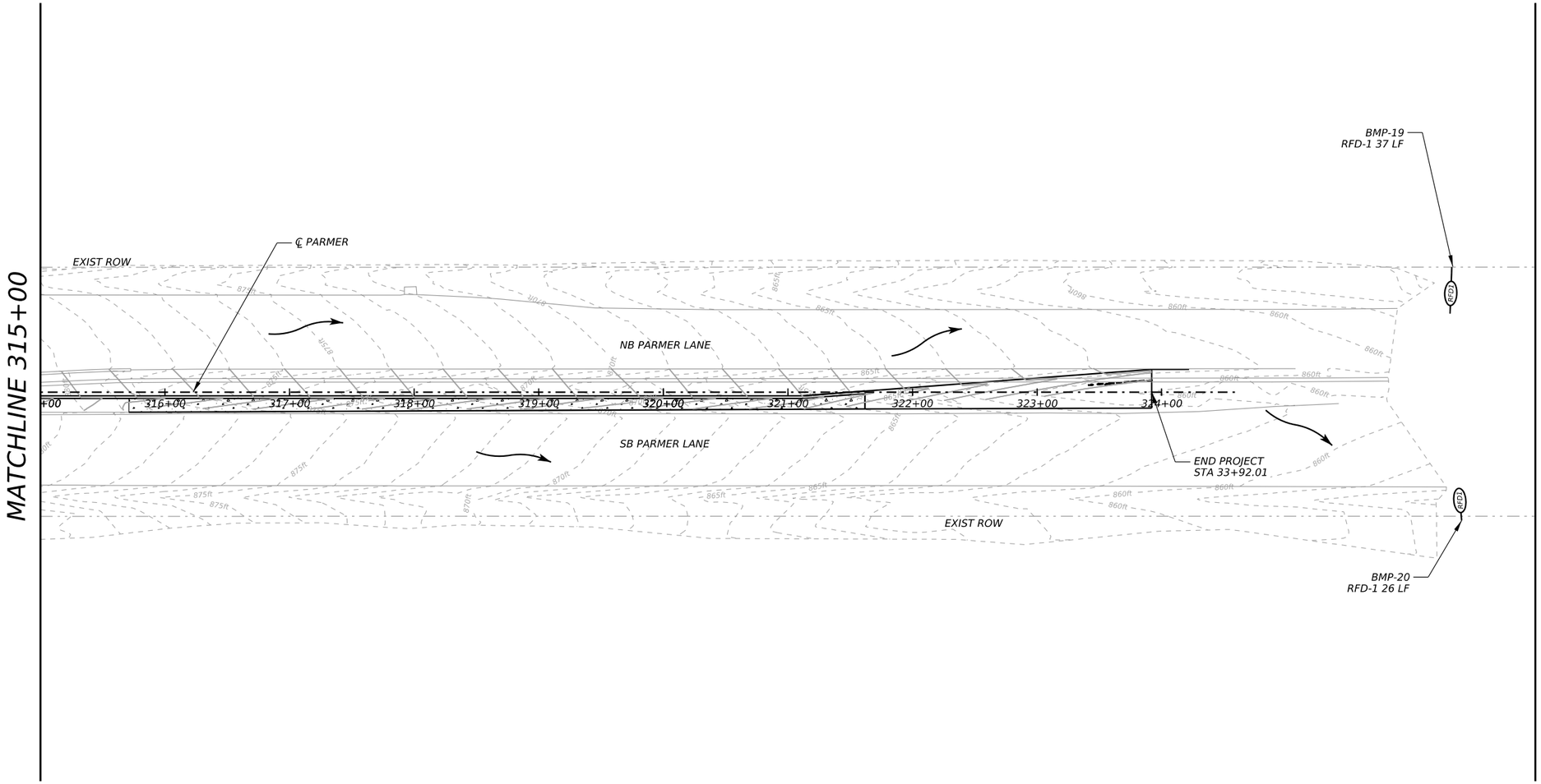
STA 303+00 TO STA 315+00

2025 SHEET 2 OF 4

CONT.	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

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BMP-20		



LEGEND

- RIGHT OF WAY
- DIRECTION OF FLOW
- SURVEY EXISTING CONTOUR
- ROADWAY CENTERLINE
- EROSION CONTROL LOG (12") (ECL)
- SILT FENCE (SCF)
- ROCK FILTER DAM TYPE 1 (RFD1)
- PROPOSED DITCH

NOTES:

1. SEE DETAIL SHEET FOR ROCK FILTER DAM TYPE I.
2. FOR DRAINAGE PATTERNS AND APPROXIMATE SLOPES, SEE DRAINAGE AREA MAPS.
3. CONTROL MEASURE LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS WILL BE DETERMINED IN THE FIELD BY ENGINEER.
4. TEMPORARY CONSTRUCTION EXIT AND ACCESS ROAD LOCATIONS TO BE DETERMINED IN THE FIELD BY TXDOT AND THE CONTRACTOR.

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED
PROFESSIONAL ENGINEER
9/30/2025

0 50 100
SCALE: H: 1"=100'

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PARMER LANE AT SH45

SW3P LAYOUT

STA 315+00 TO END

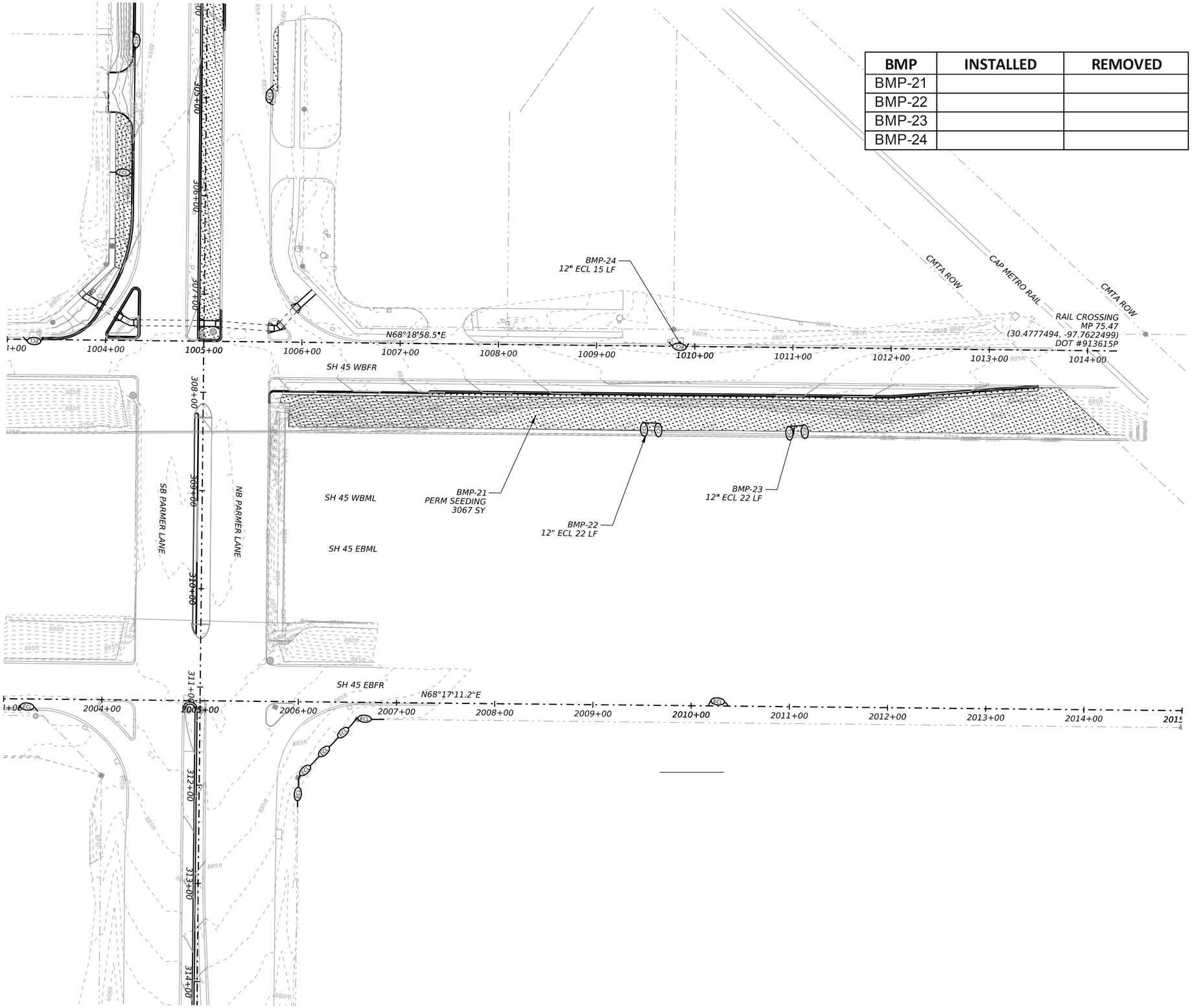
2025 SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

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BMP-22		
BMP-23		
BMP-24		

RIGHT OF WAY
DIRECTION OF FLOW
SURVEY EXISTING CONTOUR
ROADWAY CENTERLINE
EROSION CONTROL LOG (12") ECL ECL
SILT FENCE SCF SCF
ROCK FILTER DAM TYPE 1 RFD1 RFD1
PROPOSED DITCH



NOTES:

1. SEE DETAIL SHEET FOR ROCK FILTER DAM TYPE I.
2. FOR DRAINAGE PATTERNS AND APPROXIMATE SLOPES, SEE DRAINAGE AREA MAPS.
3. CONTROL MEASURE LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS WILL BE DETERMINED IN THE FIELD BY ENGINEER.
4. TEMPORARY CONSTRUCTION EXIT AND ACCESS ROAD LOCATIONS TO BE DETERMINED IN THE FIELD BY TXDOT AND THE CONTRACTOR.

STATE OF TEXAS
TRAVIS J KAATZ
124859
LICENSED PROFESSIONAL ENGINEER
9/30/2025

0 50 100
SCALE: H: 1"=100'

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PARMER LANE AT SH45

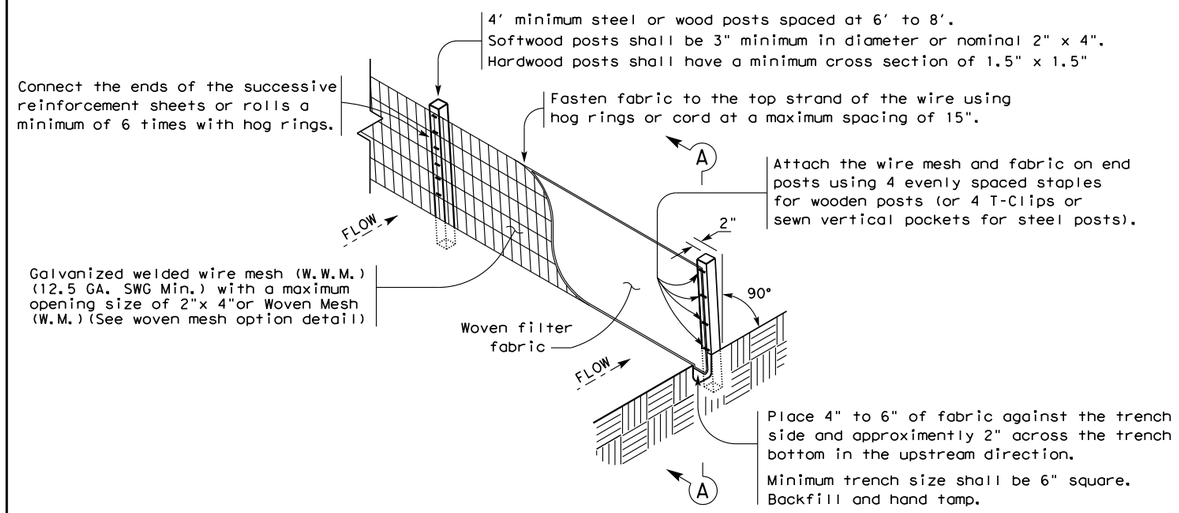
SW3P LAYOUT

2025 SHEET 4 OF 4

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DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

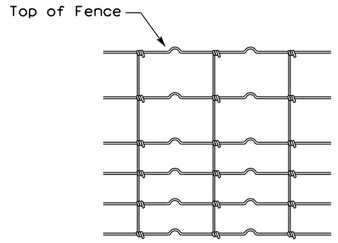
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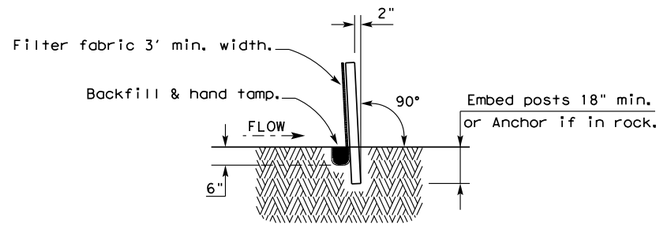
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TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

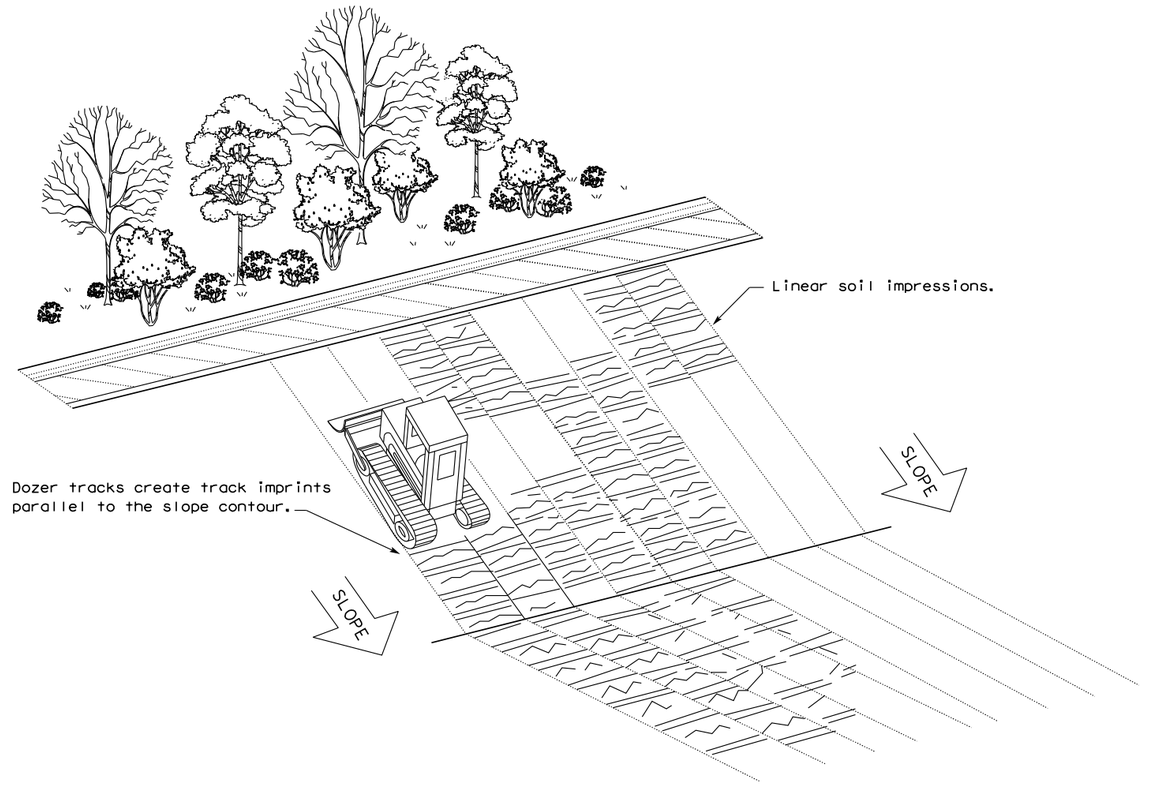
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

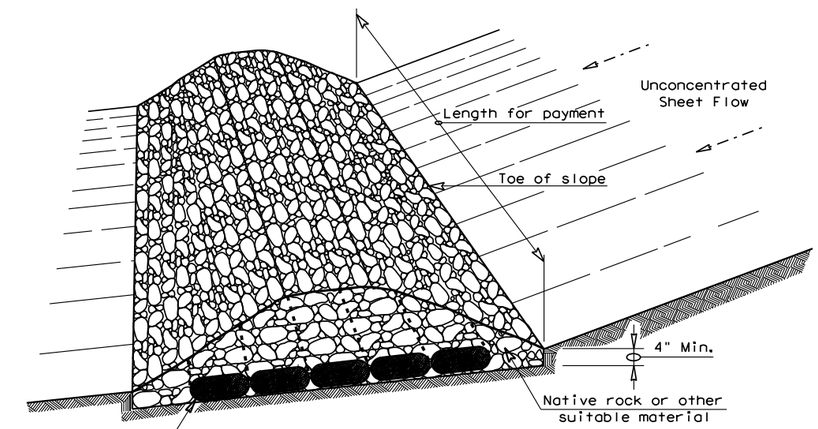
EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3417	02	040		PARMER LN	
	DIST	COUNTY			SHEET NO.	
	AUS	WILLIAMSON				

DATE
FILE

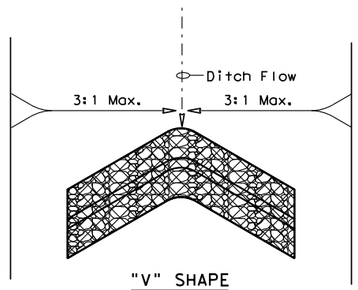
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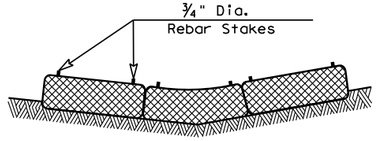
FILTER DAM AT TOE OF SLOPE

RFD1

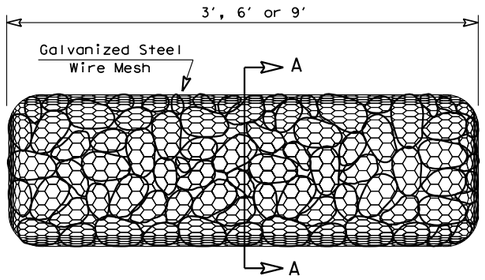


"V" SHAPE
PLAN VIEW

PLAN VIEW

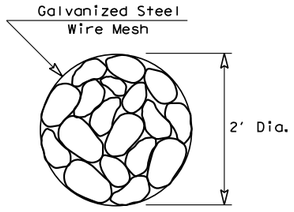


SECTION B-B

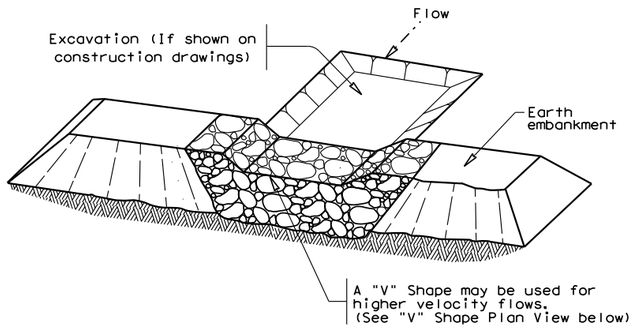


TYPE 4 (SACK GABIONS)

RFD4

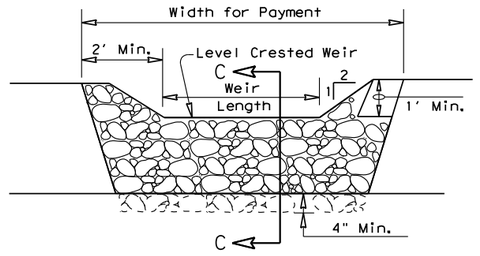


SECTION A-A

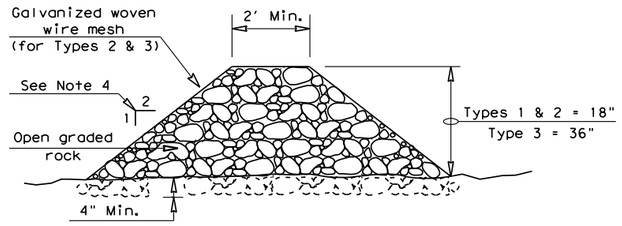


FILTER DAM AT SEDIMENT TRAP

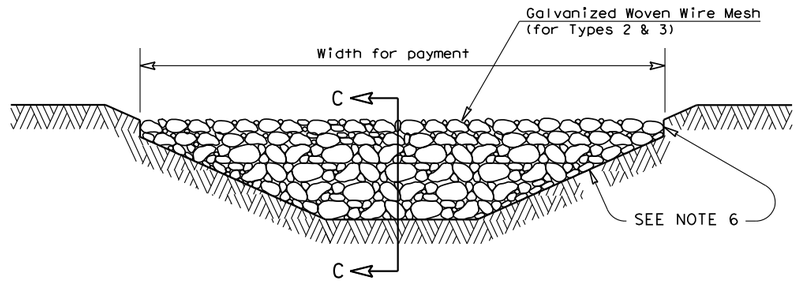
RFD1 OR RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

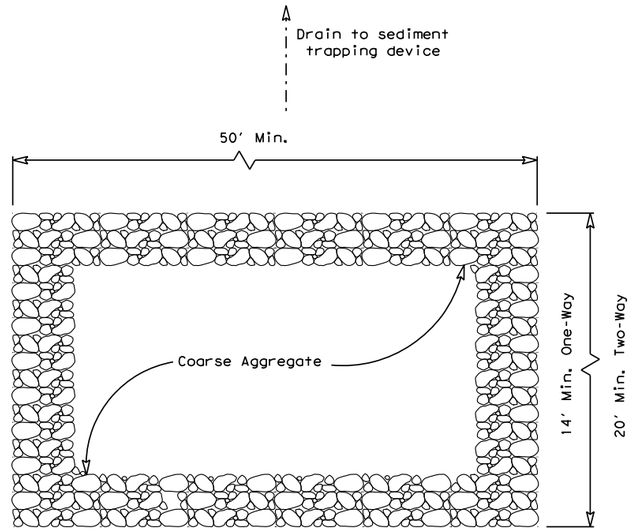
ROCK FILTER DAMS

EC(2)-16

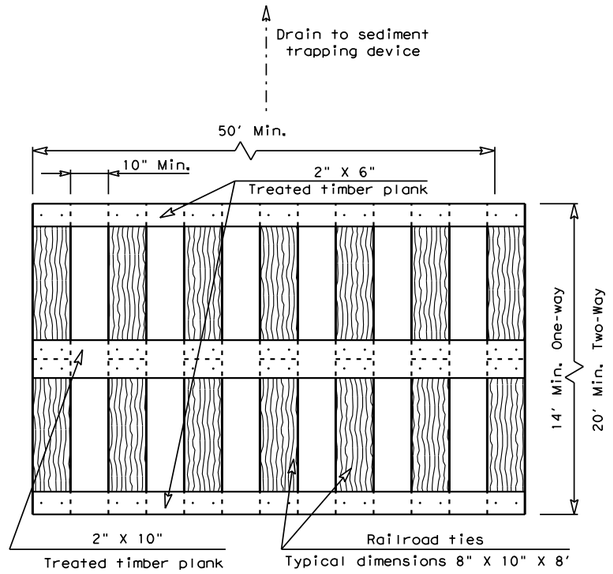
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© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY
REVISIONS	3417	02	040		PARMER LN
	DIST	COUNTY			SHEET NO.
	AUS	WILLIAMSON			

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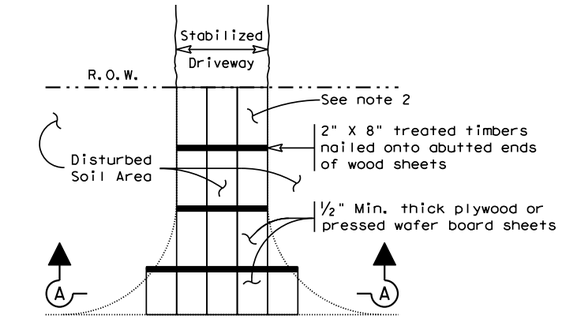
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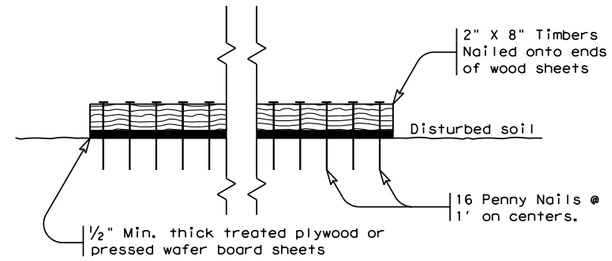
PLAN VIEW



PLAN VIEW



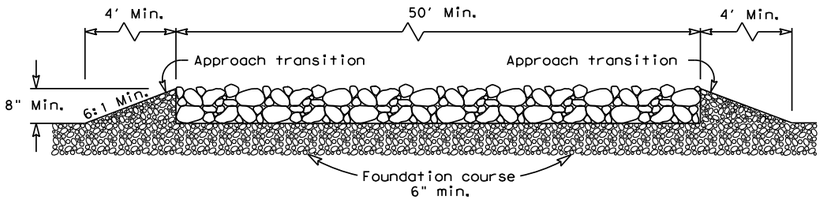
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

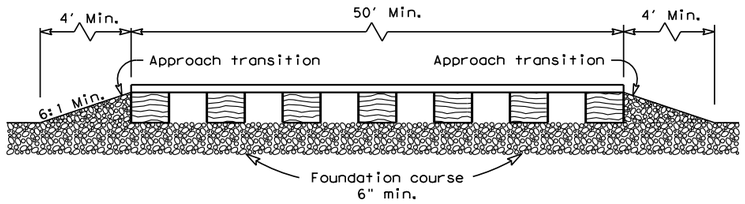
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

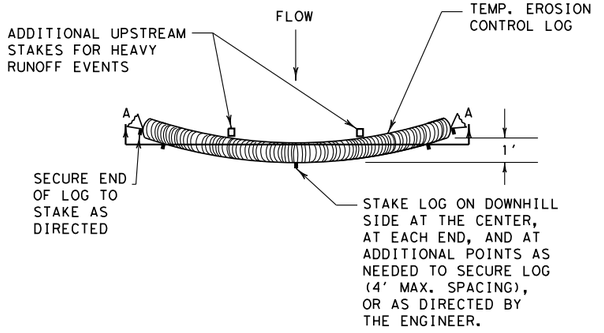
CONSTRUCTION EXITS

EC(3)-16

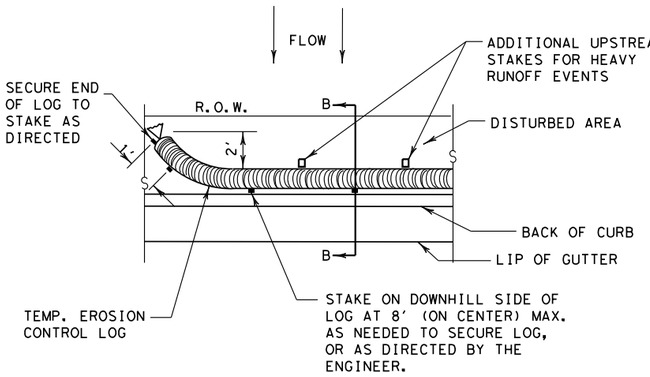
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REVISIONS	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		

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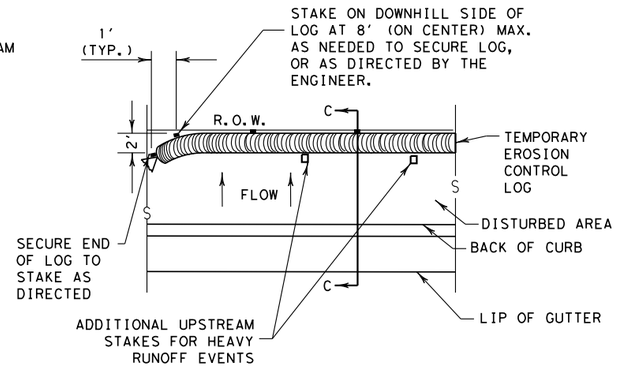
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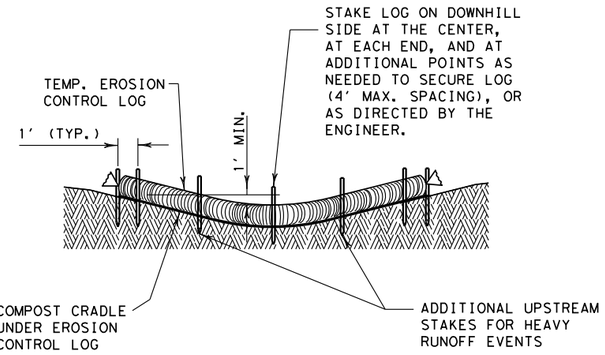
PLAN VIEW



PLAN VIEW



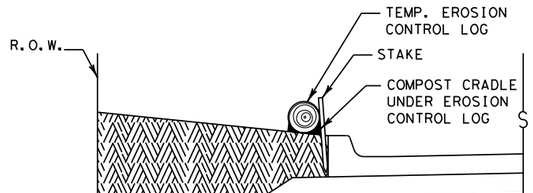
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

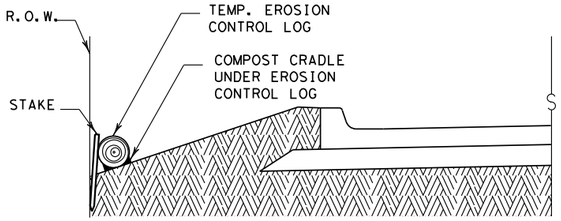
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

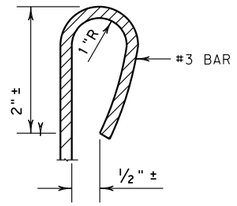
CL-BOC



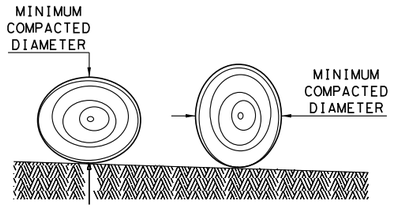
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

SHEET 1 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

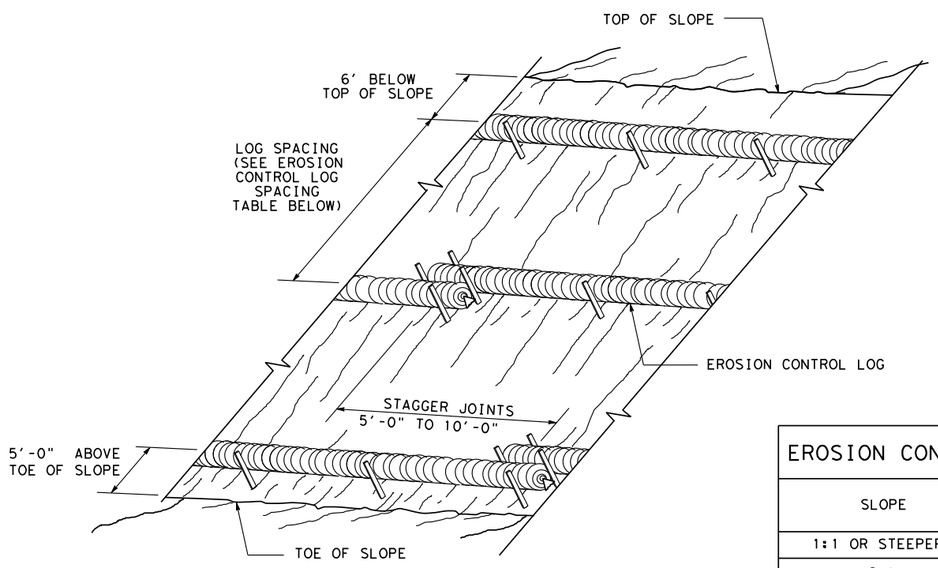
EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	3417	02	040	PARMER LN	
	DIST	COUNTY		SHEET NO.	
	AUS	WILLIAMSON			

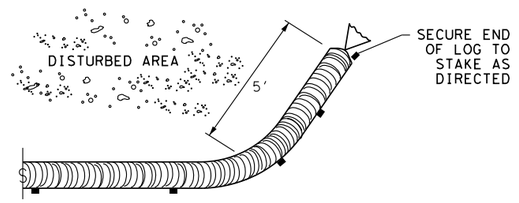
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EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

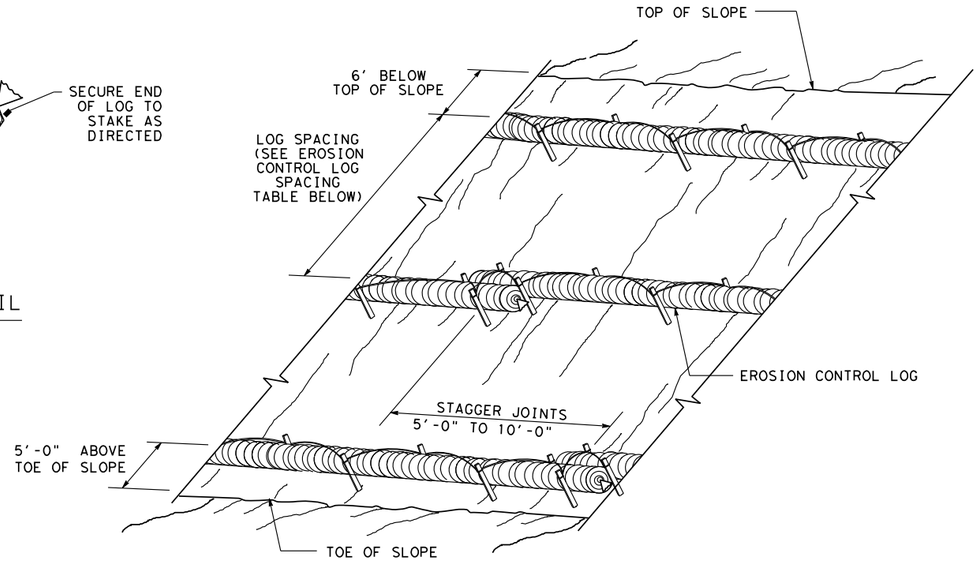
CL-SST



END SECTION RAP DETAIL

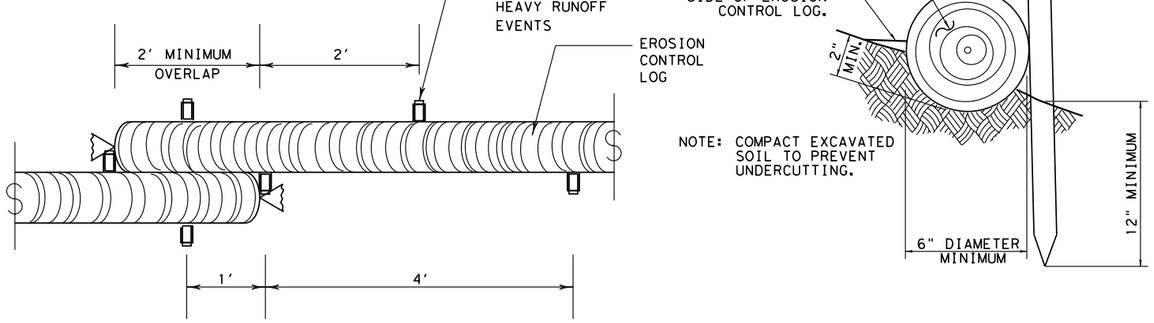
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

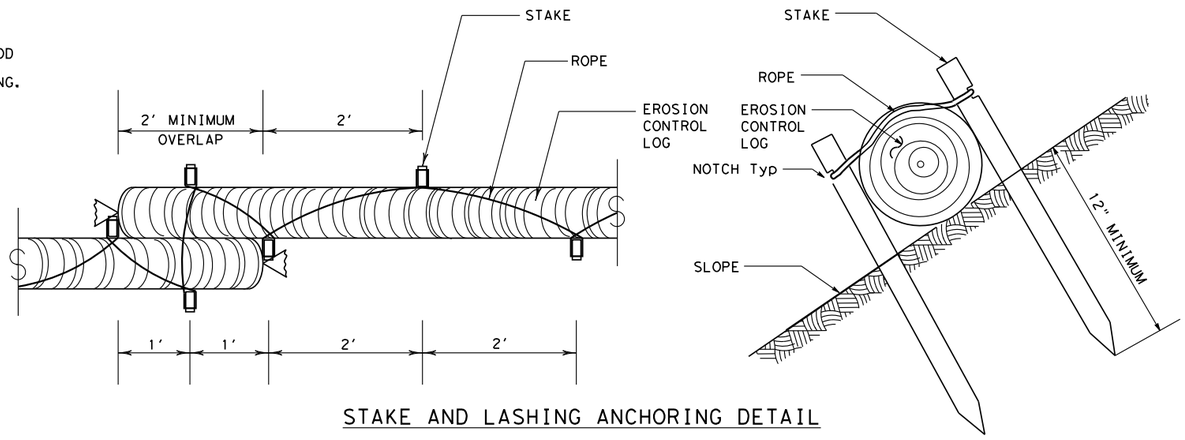
CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

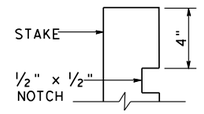
CL-SST

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

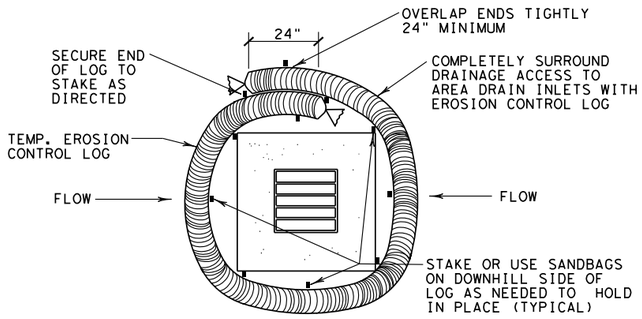
EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	3417	02	040	PARMER LN
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		

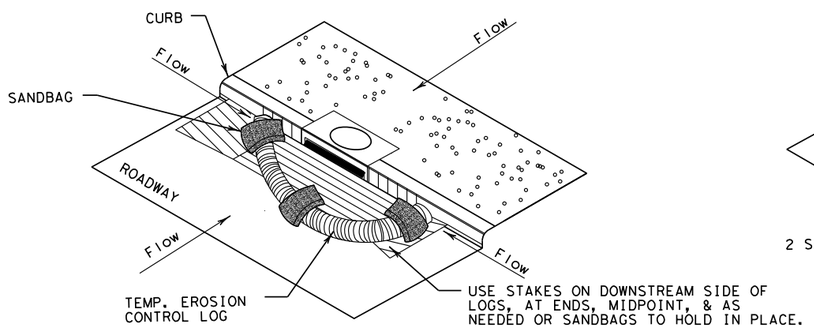
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FILE:



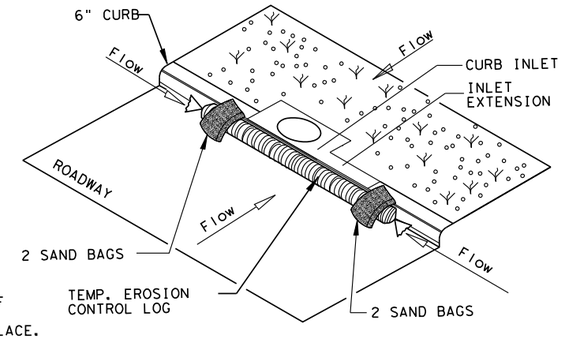
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

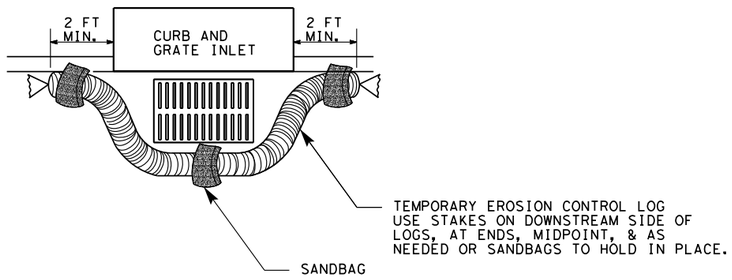
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

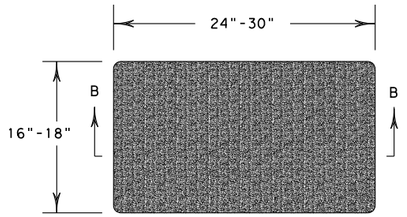


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	3417	02	040		PARMER LN		
	DIST	COUNTY				SHEET NO.	
	AUS	WILLIAMSON					

The following TCEQ requirements (Form TCEQ-0592, Rev. 7/15/15) are applicable to all work in the recharge zone of the Edwards Aquifer in Hays, Travis and/or Williamson Counties and must be adhered to by the Contractor and all Subcontractors:

1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
   - the name of the approved project;
   - the activity start date; and
   - the contact information of the prime contractor.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.

3. If any sensitive feature(s) (caves, solution cavity, sink hole, etc.) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.

4. No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

7. Sediment must be removed from the sediment traps or sedimentation basins not later thanwhen it occupies 50% of the basin's design capacity.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

11. The following records shall be maintained and made available to the TCEQ upon request:
   - the dates when major grading activities occur;
   - the dates when construction activities temporarily or permanently cease on a portion of the site; and
   - the dates when stabilization measures are initiated.

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

   A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
   B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
   C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

TCEQ REGIONAL OFFICE

Austin Regional Office
12100 Park 35 Circle
Bldg A, Room 179
Austin, Texas 78753
Phone: (512) 339-2929
Fax: (512) 339-3795

Texas Department of Transportation | Austin District Standard

TCEQ REQUIREMENTS FOR THE RECHARGE ZONE OF THE EDWARDS AQUIFER

TCEQ-RZ-19(AUS)

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REVISIONS
01/10/14: REQUIREMENTS AND ADDRESS UPDATED
01/21/16: REQUIREMENTS UPDATED
09/24/19: UPDATED RELEASE YEAR

CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

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VOIDS DEFINITION

- VOID GREATER THAN SIX INCHES ACROSS IN ANY DIRECTION AND/OR
- VOID IS GREATER THAN ONE SQUARE FOOT ALONG ANY PLANE AND/OR
- VOID BLOWS AIR AND/OR
- VOID CONTINUALLY RECEIVES WATER DURING A RAIN EVENT AND/OR
- VOID HAS WATER FLOWING THROUGH OR OUT OF IT AND/OR

GENERAL NOTES

1. USING EXPLOSIVES IS NOT ALLOWED.
2. THE PROJECT AREA IS A KNOWN KARST AREA. FRACTURED MATERIAL, BOULDERS,UNDERGROUND VOIDS, GROUNDWATER, UNSTABLE MATERIAL, AND DRASTICALLY VARYING STRATA CAN BE EXPECTED. THE CONTRACTOR SHALL WORK WITH TXDOT AND TXDOT'S PARTNERS TO ALLOW ACCESS AND ON-SITE MONITORING OF EXCAVATION.
3. THE VOID MITIGATION DETAILS ARE EXAMPLES. IMPLEMENTATION OF THE APPROVED MITIGATION PLAN SHOULD USE THE REFERENCED BID ITEMS.
4. CONCRETE USED FOR VOID MITIGATION SHALL BE 3,000 PSI IN ACCORDANCE WITH ITEM 420 CLASS A CONC (MISC). QUANTITIES UNDER 4 CY MAY BE HAND MIXED ON SITE USING 5,000 PSI RATED BAG MIX CONCRETE.
5. 3 IN. x 5 IN. ROCK SHALL BE IN ACCORDANCE WITH ITEM 506. LARGE ROCK > 1 FT. SHALL BE IN ACCORDANCE WITH 12 IN. ROCK PER ITEM 432.
6. FILTER FABRIC AND EROSION LOGS WILL BE IN ACCORDANCE WITH ITEM 506.
7. IMPERMEABLE LINER WILL BE IN ACCORDANCE WITH ITEM 5056. THE EDGE OF THE LINER SHALL BE ANCHORED IN A 6 IN. WIDE BY 18 IN. DEEP TRENCH.
8. STEEL CASING, USED FOR DRILL SHAFT CONSTRUCTION, SHALL BE IN ACCORDANCE WITH ITEM 416.
9. AGGREGATE OR OTHER BACKFILL WILL BE PAID FOR BY OVERRUN OF EXISTING EMBANKMENT ITEM. FILTER FABRIC OVER THE AGGREGATE IS SUBSIDIARY. SANDBAGS SHALL BE PAID USING SANDBAGS FOR EROSION CONTROL. THE SANDBAGS SHALL BE POLYPROPYLENE AND FILLED WITH PEA GRAVEL. CONNECTOR PIPE SHALL BE PAID USING PIPE(PVC)(SCH 80)(6 IN).
10. IF A SINGLE VOID IMPACT CAUSES DELAYS BY MORE THAN 20 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE INITIAL 20 DAYS. IF THE ACCUMULATION OF VOID IMPACTS CAUSE DELAYS BY MORE 40 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE 40 DAYS . OVERHEAD, BARRICADES AND DELAYS WILL BE EVALUATED AND PAID IN ACCORDANCE WITH THE CONTRACT. IMPACTS WILL NOT BE CONSIDERED IMPACT AFTER A RESPONSE PROCEDURE IS PROVIDED. ALL DELAYS CAUSED BY A VOID AND THE DURATION FOR IMPLEMENTATION OF A RESPONSE ARE NON-COMPENSABLE FOR LABOR, EQUIPMENT, STANDBY, MOBILIZATIONS, AND COST ESCALATIONS.

VOID MITIGATION AND PROTECTION MEASURES

REFER TO VOID MITIGATION DETAILS FOR ADDITIONAL INFORMATION. VOID MITIGATION DETAILS ARE TO BE APPROVED BY GEOSCIENTIST AND THE TCEQ (IF APPLICABLE) PRIOR TO IMPLEMENTATION.

1. IN THE EVENT THAT UNKNOWN KARST VOIDS ARE ENCOUNTERED, WORK AT THAT LOCATION WILL BE HALTED IMMEDIATELY AND THE FEATURE WILL BE INSPECTED PROMPTLY BY TXDOT.
2. WHEN REQUIRED, TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE POTENTIAL OF THE FEATURES TO PROVIDE SUITABLE HABITAT FOR ENDANGERED KARST INVERTEBRATES. WORK AT THAT LOCATION WILL NOT RESUME UNTIL AUTHORIZATION TO DISTURB THE FEATURE HAS BEEN OBTAINED. REFER TO THE EPIC SHEET FOR ADDITIONAL INFORMATION FOR THREATENED OR ENDANGERED SPECIES.

   TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE APPROPRIATE VOID MITIGATION PLAN.
3. ADDITIONAL EXCAVATION OF THE VOID MAY BE REQUIRED BY TXDOT OR THE GEOSCIENTIST TO FULLY EVALUATE THE VOID AND/OR MITIGATION PLAN PREPERATION. TXDOT APPROVAL IS REQUIRED PRIOR THE EXCAVATION. THIS WORK IS SUBSIDIARY.

VOID DISCOVERY PROTOCOL

IF A VOID IS DISCOVERED, THE FOLLOWING PROTOCOL WILL BE FOLLOWED:

1. ALL VOIDS REQUIRE AN EMAIL NOTIFICATION TO TXDOT DESIGNATED REPRESENTATIVE WITHIN 2 HOURS OF DISCOVERY. THE EMAIL WILL REQUIRE LOCATION INFORMATION (STATION, LATITUDE & LONGITUDE), DATES OF DISCOVERY, VIDEO/PICTURE DOCUMENTATION, SIZE, ETC. CONTRACTOR SHALL SUPPLY A CAMERA AND DIGITAL PICTURE/VIDEO DOCUMENTATION OF ALL VOIDS AND PROVIDE A MEASUREMENT OF THE SIZE OF THE VOID. FOR VOIDS THAT CANNOT BE SAFELY EXPLORED, ANOTHER DEVICE SHALL BE PROVIDED TO DOCUMENT THE VOID. CONTACT THE DISTRICT CONSTRUCTION OFFICE FOR AN EXAMPLE EMAIL THAT SHALL BE FOLLOWED. THIS WORK IS SUBSIDIARY.
2. ALL ACTIVITY WITHIN A 50-FOOT RADIUS OF THE VOID SHALL STOP. BLOCK TRAFFIC FROM DRIVING NEAR THE VOID AND PREVENT CONSTRUCTION EQUIPMENT FROM OPERATING IN THE VICINITY OF THE VOID USING BARRELS, ORANGE CONSTRUCTION FENCE OR OTHER APPROVED HIGHLY VISIBLE BARRIER.
3. A DRY VOID THAT IS LESS THAN 1 CF IN VOLUME OR LESS THAN 6 IN. IN ALL DIRECTIONS WILL NOT REQUIRE ACTION BEYOND NOTIFICATION. TXDOT SHALL BE NOTIFIED IMMEDIATELY VIA EMAIL AND PHONE WHEN A VOID IS FOUND THAT REQUIRES ACTION. TXDOT WILL RESPOND WITHIN 6 BUSINESS DAYS FROM TIME OF EMAIL NOTIFICATION TO PROVIDE GUIDANCE TO THE CONTRACTOR.
4. COVER THE VOID TO PREVENT CONTAMINATION AND CHANGES IN AMBIENT CONDITIONS (TARPS AND PLYWOOD, OR SIMILAR MATERIALS ARE APPROPRIATE AS AVAILABLE). WHERE COVERING THE VOID IS NOT FEASIBLE, CONTRACTOR SHALL OBTAIN APPROVAL FROM TXDOT OF ALTERNATE TEMPORARY PROTECTION MEASURES. BIODEGRADABLE EROSION CONTROL LOG (BECL) SHOULD WRAP THE SURFACE PERIMETER OF THE VOID. TEMPORARY PROTECTIONS SHOULD REMAIN IN PLACE UNTIL FINAL MITIGATION AND PROTECTION MEASURES ARE APPROVED AND IN PLACE. AN EARTHEN BERM WILL BE MAINTAINED ON THE UP-GRADIENT SIDE OF VOID TO PREVENT ANY CONSTRUCTION RUNOFF FROM ENTERING ANY PART OF THE FEATURE WHICH MAY REMAIN. THIS WORK IS SUBSIDIARY.
5. WHEN REQUIRED TXDOT SHALL IMMEDIATELY NOTIFY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) AUSTIN REGIONAL OFFICE.
6. TXDOT WILL PROVIDE FOR THE EVALUATION OF THE VOID A QUALIFIED GEOSCIENTIST LICENSED BY THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS OR BY A PROFESSIONAL ENGINEER WHO QUALIFIES TO PRACTICE GEOSCIENCE ACCORDING TO THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS.
7. WHEN REQUIRED TXDOT WILL SUBMIT AND OBTAIN APPROVAL OF AN ENCOUNTERED FEATURE MITIGATION PLAN TO THE TCEQ AUSTIN REGION OFFICE.
8. WORK SHOULD CEASE IN THE AREA UNTIL ASSESSMENT OF THE VOID CAN BE COMPLETED, TCEQ APPROVES THE ENCOUNTERED FEATURE MITIGATION PLAN AND MITIGATION IS COMPLETED. WHEN THE VOID IS OUTSIDE TCEQ JURISDICTION, TXDOT WILL APPROVE THE ENCOUNTERED FEATURE MITIGATION PLAN.

VOIDS RELATED TO DRILLED SHAFTS, SOIL NAILS, ROCK NAILS AND OTHER SIMILAR FUNCTIONS

1. SUBMIT INSTALLATION PLAN FOR REVIEW NO LATER THAN 2 MONTHS BEFORE CONSTRUCTION.
2. THE USE OF DRILLING FLUIDS, UNDERWATER PLACEMENT, OR SLURRY METHOD WILL NOT BE ALLOWED IF A VOID IS EXPOSED DURING DRILLING OF SHAFTS OR NAILS. THE CONTRACTOR SHALL USE APPROPRIATE INDUSTRY APPROVED METHODS TO PROVIDE A PRODUCT IN COMPLIANCE WITH THE SPECIFICATIONS. ADDITIONAL TIME OR COMPENSATION WILL NOT BE ALLOWED FOR USE OF ALTERNATE METHODS OR CASING INSTALLATION.
3. DURING NON-WORK HOURS OPEN HOLES SHALL BE PROTECTED FOR SAFETY AND COVERED. SHAFTS SHALL BE SURROUNDED BY EROSION CONTROL LOGS AT AN OFFSET OF 10' FROM THE EDGE OF THE OPENING. THIS WORK IS SUBSIDIARY
4. VIDEO DOCUMENTATION SHALL BE CONDUCTED OF A DRILL SHAFT ONCE EXCAVATION IS COMPLETE AND PRIOR TO PLACING REINFORCEMENT. SUFFICIENT LIGHTING SHALL ACCOMPANY THE VIDEO CAMERA TO ENSURE THE SHAFT AND VOIDS ARE VISIBLE. THIS WORK IS SUBSIDIARY.
5. CONCRETE USED TO FILL THE VOIDS WILL BE PAID USING CLASS A CONC (MISC) ITEM BUT WILL USE THE CLASS OF CONCRETE AS REQUIRED BY THE SPECIFICATION. QUANTITY OF CONCRETE WILL BE BASED ON VISUAL INSPECTION PROVIDED BY THE CONTRACTOR. IF VISUAL INSPECTION IS UNABLE TO DETERMINE THE SIZE OF THE VOID THE CONCRETE FOR PAYMENT WILL BE MEASURED AS THE ADDITIONAL CONCRETE BEYOND THE AMOUNT REQUIRED TO PLACE A CLEAN SHAFT PLUS 10 PERCENT WASTE.
6. THE USE OF PERMANENT CASING SHALL BE IN ACCORDANCE WITH ITEM 416. MATERIAL COST FOR CASING THAT REMAINS WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. ADDITIONAL LABOR, EQUIPMENT, TIME, ETC. FOR INSTALLATION OF THE CASING WILL NOT BE COMPENSABLE.
7. ADDITIONAL NAIL LENGTH WILL BE PAID BY OVERRUN OF EXISTING BID ITEM. ALTERNATE NAIL TYPE COST WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. LABOR, EQUIPMENT, ADDITIONAL TIME, ETC. WILL NOT BE COMPENSABLE.
8. CORE HOLES ARE REQUIRED FOR ALL DRILLED SHAFTS.

PLEASE REFER TO VOID MITIGATION INFO FOUND IN THE APPENDIX OF THE AUSTIN DESIGNERS GUIDE. PLEASE DELETE THIS NOTE.

PLEASE CONTACT ZACH LANFEEAR AND ANDY BLAIR AT TXDOT AUS ENV OFFICE PRIOR TO USING THESE DETAILS. PLEASE DELETE THIS NOTE PRIOR TO PLACING THESE DETAILS IN THE PLANS.

Texas Department of Transportation | Austin District Standard

VOID MITIGATION NOTES

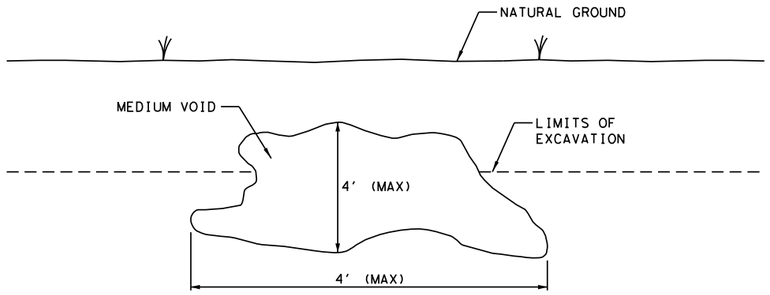
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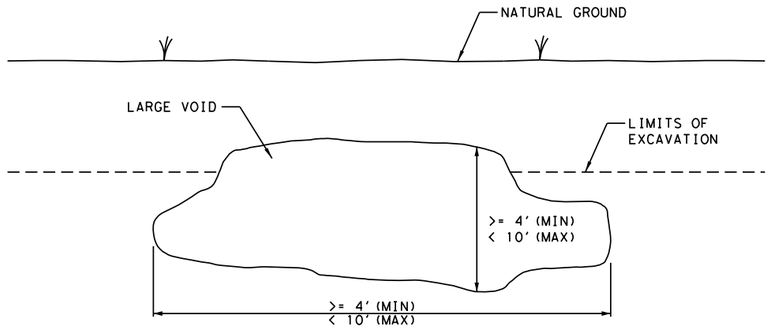
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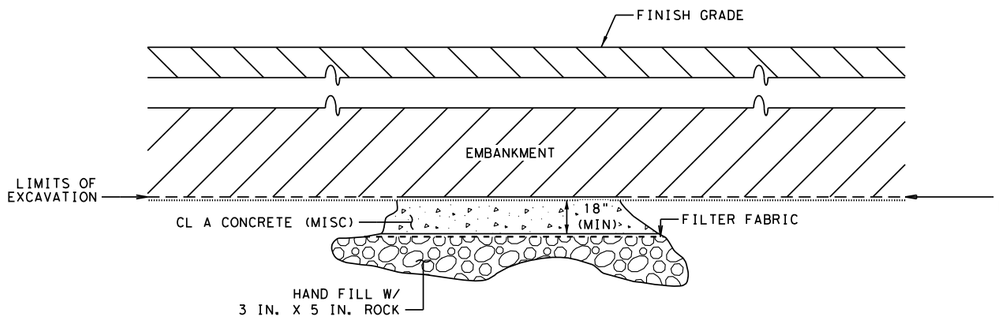
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3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

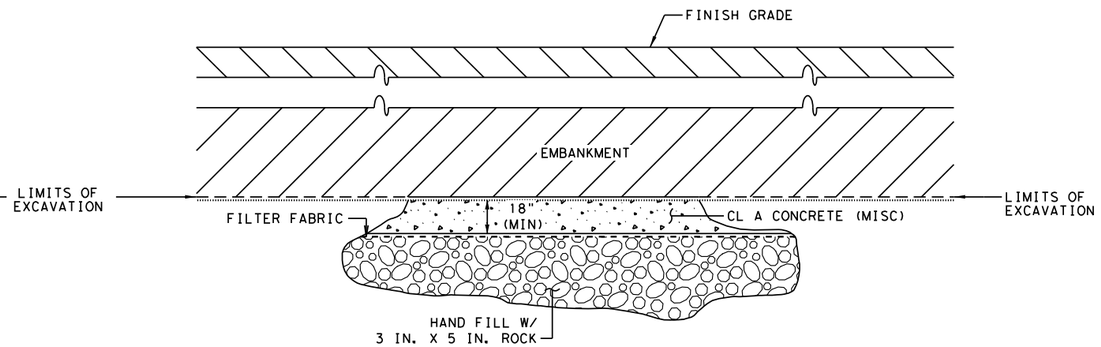
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ROADWAY/S.U.P. GRADING OPERATIONS
MEDIUM (DRY VOID)
(<4' IN ANY DIRECTION)
(1 CF < 64 CF)



ROADWAY/S.U.P. GRADING OPERATIONS
LARGE (DRY VOID)
(>=4' <10' ANY DIRECTION)
(64 CF < 1000 CF)

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VOID MITIGATION DETAILS

VMD-18(AUS)

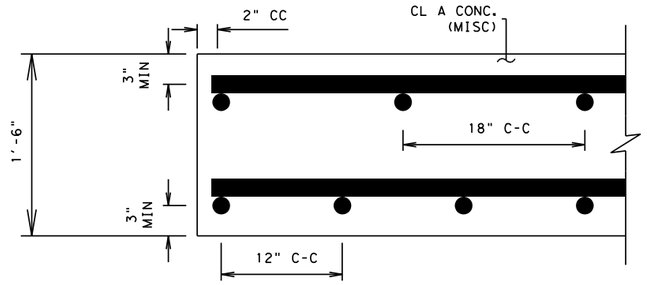
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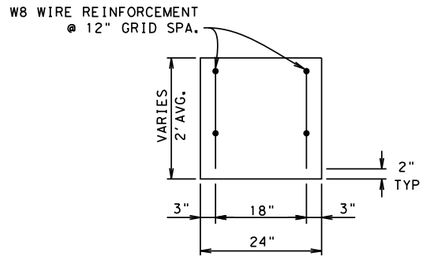
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3417	02	040	PARMER LN

DIST	COUNTY	SHEET NO.
AUS	WILLIAMSON	

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REINFORCING DETAIL



VARIABLE DEPTH CONCRETE WALL

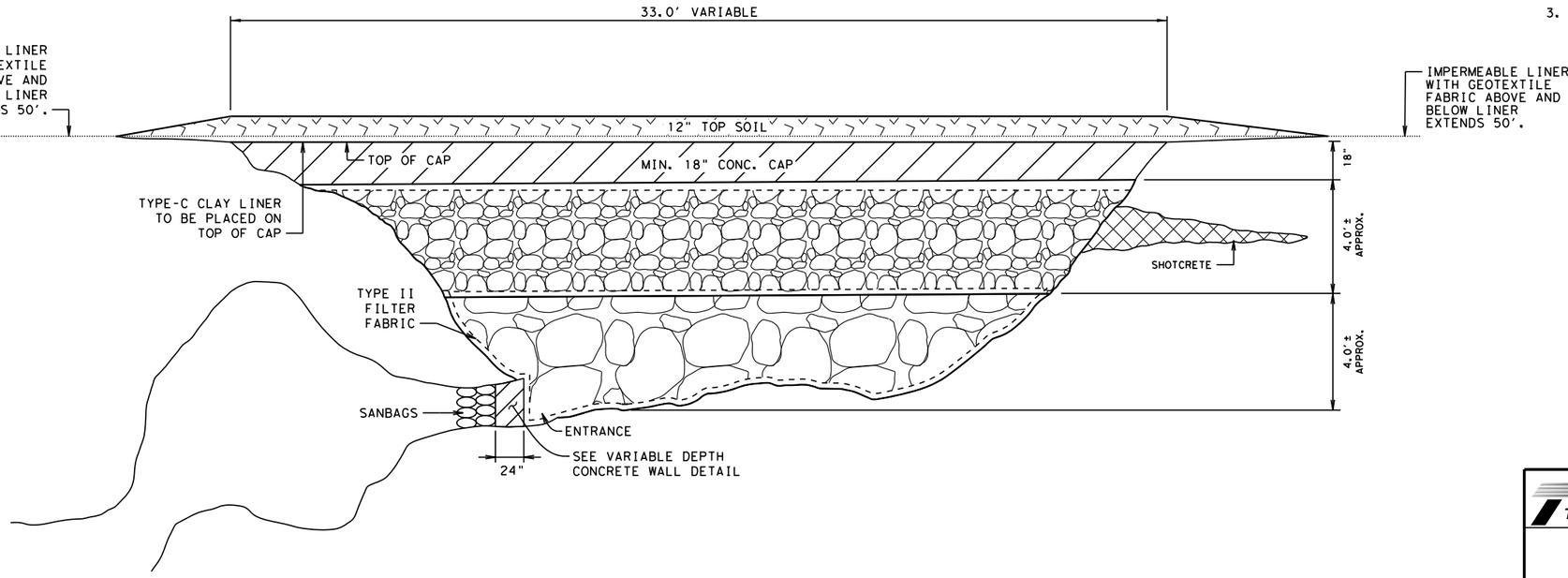
SCALE (IN FEET):
0 5

LEGEND

- CLASS A CONC. (MISC)
- 3 IN. x 5 IN. ROCK
- LARGE ROCK (≥ 1 FT)
- SHOTCRETE

NOTE:

1. CONCRETE WALL AND CONCRETE CAP SHALL BE PAID USING CLASS A CONC. (MISC).
2. SHOTCRETE WILL BE PAID USING CLASS A CONC. (MISC).
3. THE 12 IN. TOPSOIL AND LINER MAY NOT BE APPLICABLE IF THE VOID IS NOT IN A POND.



ELEVATION OF VOID IN A POND

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VOID MITIGATION DETAILS

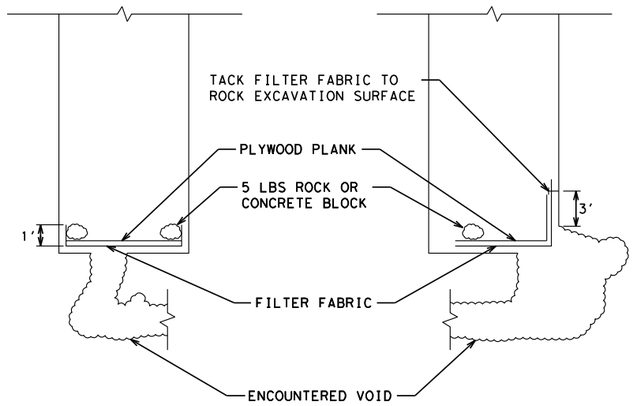
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SHEET 3 OF 7

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CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

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TEMPORARY PROTECTION
VOID AT BOTTOM OF TRENCH

NOTES:

1. PLACE TEMPORARY PROTECTION WITHIN TRENCH TO COVER VOID AS INDICATED. FABRIC SHALL EXTEND A MINIMUM OF 3 IN. BEYOND EDGE OF VOID. PLACE A PLYWOOD PLANK (MINIMUM 0.75 IN. THICK) OVER FABRIC. PLANK AND FABRIC SHALL BE WEIGHTED AS REQUIRED BY 5 LBS ROCK OR CONCRETE BLOCK TO SECURE FILTER FABRIC.

2. TEMPORARY PROTECTION SHALL BE IN PLACE AT ALL TIMES THAT CONSTRUCTION OPERATIONS ARE NOT IN ACTUAL PROGRESS.

3. CONSTRUCTION OPERATIONS WITHIN 50' SHALL NOT PROGRESS DURING OCCURRENCE OF RAIN TO ALLOW FOR PROTECTION OF VOID DURING A RAIN EVENT.

4. LOCALIZED EROSION MEASURES (SILT FENCE, EROSION CONTROL LOG OR TRIANGULAR FILTER DIKES) SHALL BE INSTALLED ALONG THE TRENCH TO ENSURE THAT LOOSE SPOILS OR RUNOFF DO NOT ENTER THE TRENCH OR AFFECT PERFORMANCE OF TEMPORARY PROTECTION. USE EARTHEN BERN TO DIVERT WATER AWAY FROM THE TRENCH.

5. SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT EROSION CONTROL MEASURES REQUIRED ALONG THE TRENCH ARE MAINTAINED, CLEANED AND FULLY FUNCTIONAL.

6. FILTER FABRIC AND ROCK OR CONCRETE BLOCKS AND PLYWOOD PLANK SHALL BE REMOVED FROM THE TRENCH WHEN PERMANENT VOID MITIGATION MEASURES ARE INSTALLED.

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VOID MITIGATION DETAILS

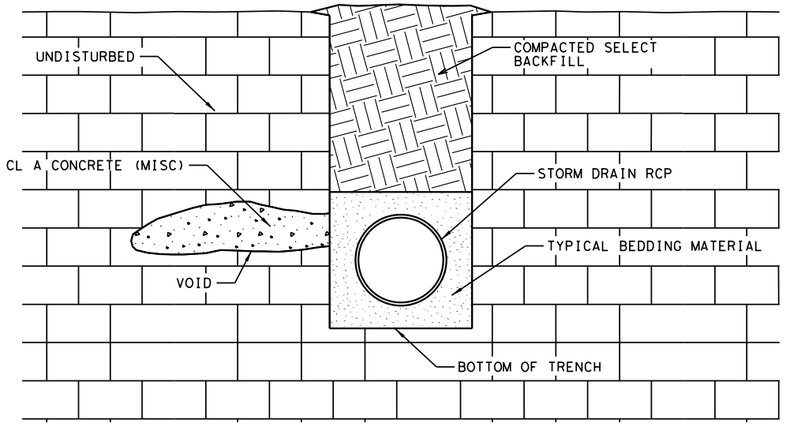
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SHEET 4 OF 7

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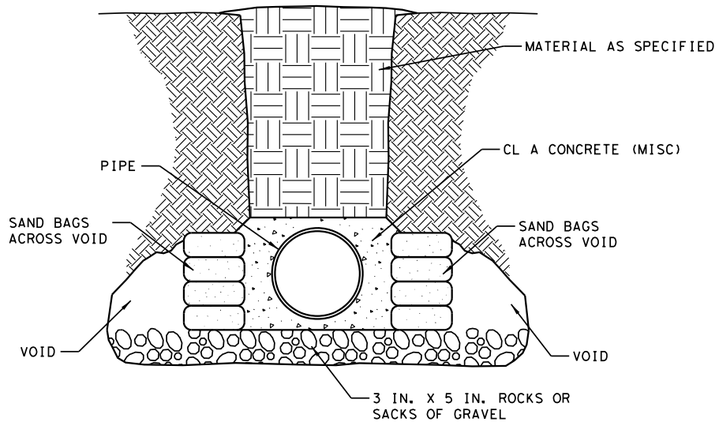
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3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

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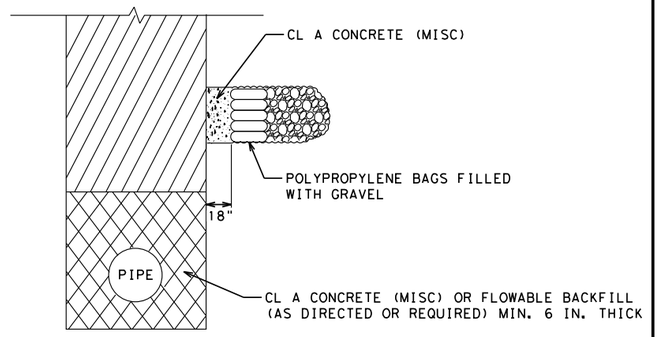
TRENCHING OPERATIONS
SMALL/MEDIUM (DRY VOID)
(<64 CF)

VOID IS EITHER LARGER THAN SIX (6) INCHES IN AT LEAST ONE DIRECTION OR IS LOCATED WITHIN THE LEVEL OF THE PIPE EMBEDMENT. ALL ROCK WITHIN AND SURROUNDING THE VOID IS SOUND.



TRENCHING OPERATIONS
LARGE (DRY VOID)
(64 CF < 1,000 CF)

VOID INTERSECTS THE PLANE OF THE TRENCH FLOOR AND ANY OPENING IN TRENCH FLOOR IS GREATER THAN FOUR (4) FEET IN ANY DIRECTION, OR THE TRENCH FLOOR IS UNSTABLE.

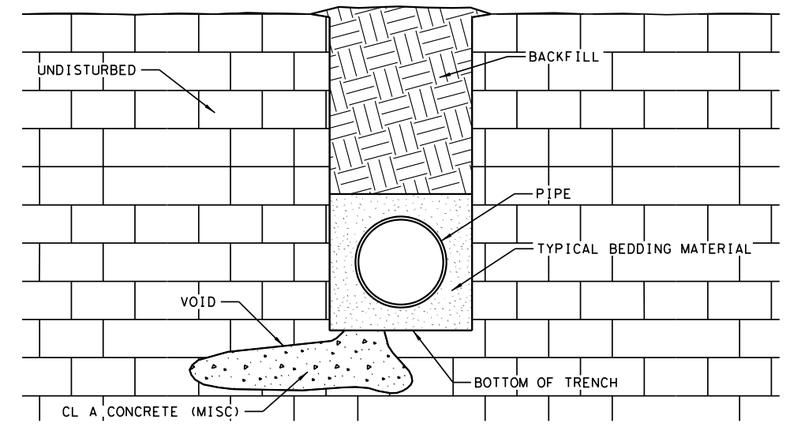


TRENCHING OPERATIONS
LARGE (DRY VOID)
(64 CF < 1,000 CF)

VOID IS ABOVE THE PLANE OF THE TRENCH FLOOR

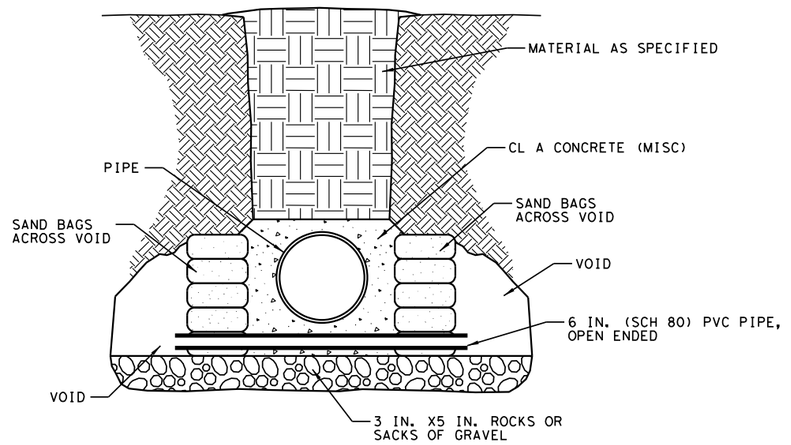
GENERAL NOTE:

1. ALL PIPES SHALL BE ENCASED WITH CLASS A CONCRETE THAT EXTENDS 5' BEYOND THE EDGE OF THE VOIDIN ALL DIRECTIONS. THE CONCRETE SHALL PROVIDE 6 IN. COVER AROUND THE PIPE.



TRENCHING OPERATIONS
SMALL/MEDIUM (DRY VOID)
(<64 CF)

VOID INTERSECTS THE PLANE OF THE TRENCH FLOOR AND IS LESS THAN FOUR (4) FEET IN ANY DIRECTION. ALL ROCK WITHIN AND SURROUNDING THE VOID IS SOUND.



TRENCHING OPERATIONS
LARGE (WET VOID)
(64 CF < 1,000 CF)

VOID INTERSECTS THE PLANE OF THE TRENCH FLOOR AND ANY OPENING IN TRENCH FLOOR IS GREATER THAN FOUR (4) FEET IN ANY DIRECTION, OR THE TRENCH FLOOR IS UNSTABLE.

Texas Department of Transportation | Austin District Standard

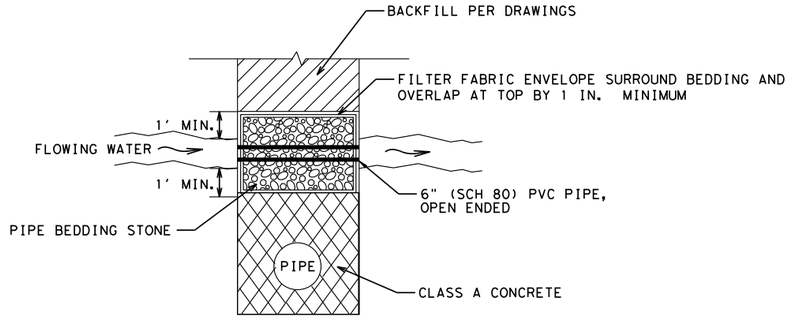
VOID MITIGATION DETAILS

VMD-18(AUS)

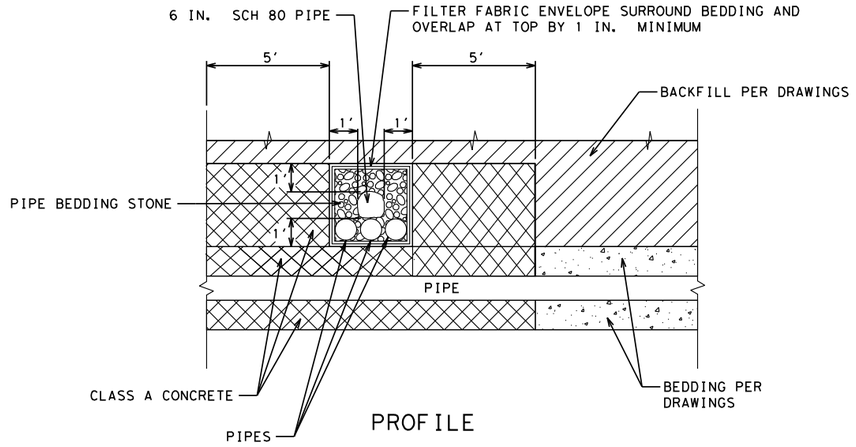
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CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

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CROSS SECTION



PROFILE

TRENCHING OPERATIONS
GROUNDWATER ABOVE
BEDDING MATERIAL

GENERAL NOTE:

1. ALL PIPES SHALL BE ENCASED WITH CLASS A CONCRETE THAT EXTENDS 5' BEYOND THE EDGE OF THE VOID IN ALL DIRECTIONS. THE CONCRETE SHALL PROVIDE 6 IN. COVER AROUND THE PIPE.

Texas Department of Transportation

Austin District Standard

VOID MITIGATION DETAILS

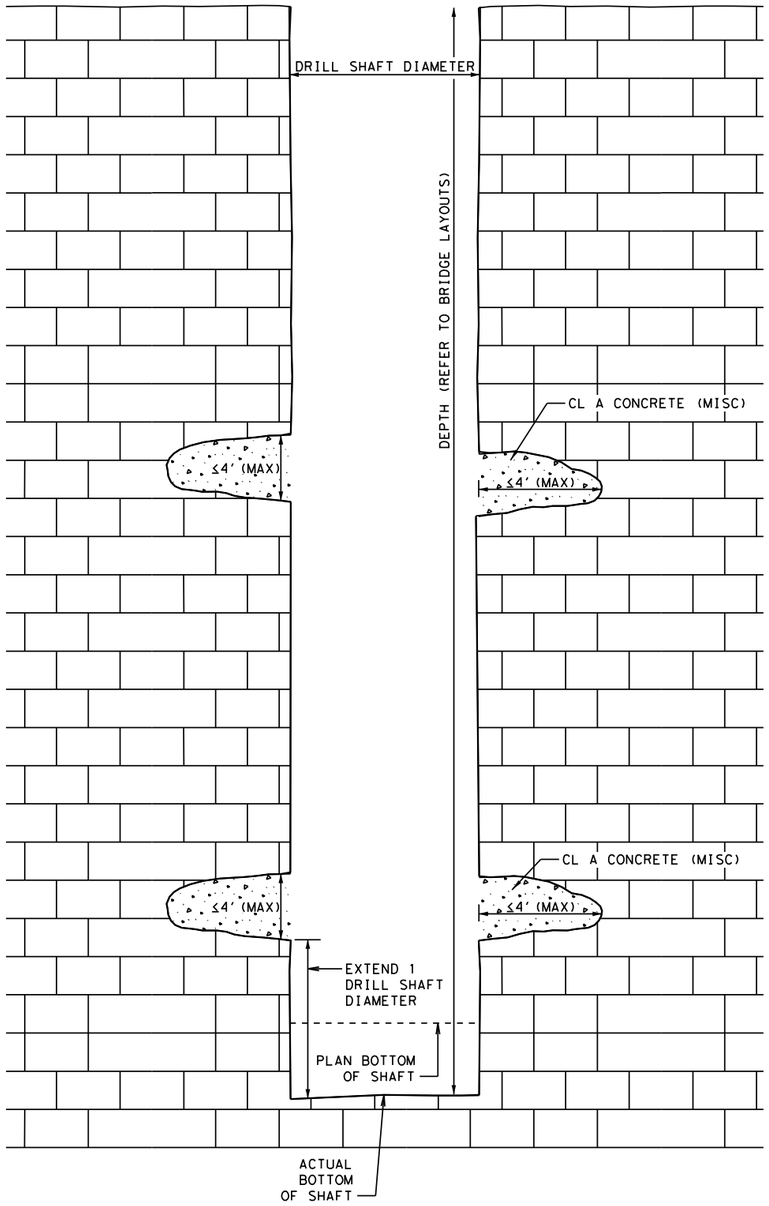
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SHEET 6 OF 7

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DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

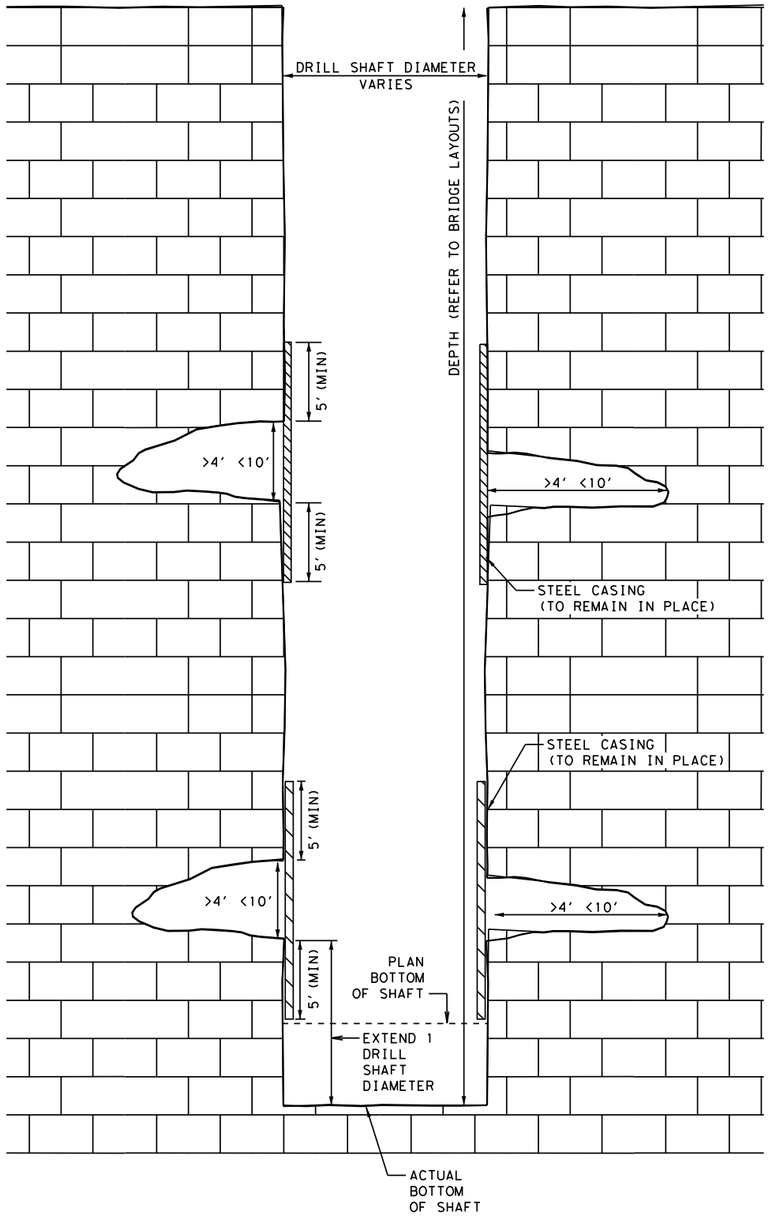
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DRILL SHAFT OPERATIONS
SMALL/MEDIUM (DRY VOID)
(≤4' IN ANY DIRECTION)

CONCRETE FOR THE VOID SHALL BE PLACED CONTINUOUSLY WITH THE SHAFT

WHERE VOIDS ARE ENCOUNTERED, DRILL SHAFT LENGTHS MAY NEED TO BE INCREASED. APPROVAL FROM THE ENGINEER OF RECORD IS REQUIRED TO COMPLETE CONSTRUCTION OF THE DRILLED SHAFT.



DRILL SHAFT OPERATIONS
LARGE (DRY VOID)
(>4' <10' IN ANY DIRECTION)

WHERE VOIDS ARE ENCOUNTERED, DRILL SHAFT LENGTHS MAY NEED TO BE INCREASED. APPROVAL FROM THE ENGINEER OF RECORD IS REQUIRED TO COMPLETE CONSTRUCTION OF THE DRILL SHAFT.

NOTES:

1. STEEL CASING WILL BE USED FOR DRILL SHAFT CONSTRUCTION THAT ENCOUNTERS LARGE VOIDS, SO AS TO ALLOW A MINIMUM AMOUNT OF CONCRETE TO ENTER THE VOID.
2. STEEL CASING SHOULD EXTEND A MINIMUM OF FIVE FEET FROM THE EDGE OF THE VOID.
3. AS PART OF THE DRILL SHAFT INSTALLATION PLAN, CONTRACTOR SHALL PROVIDE MEANS AND METHODS FOR ANCHORING THE CASING.
4. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. STEEL CASING MAYBE EXTENDED TO THE TOP OF THE SHAFT. THE ENTIRE LENGTH OF CASING INSTALLED IN A SHAFT WILL BE COMPENSATED IN ACCORDANCE WITH THE VOID MITIGATION NOTES.

Texas Department of Transportation

Austin District Standard

VOID MITIGATION DETAILS

VMD-18(AUS)

SHEET 7 OF 7

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CONT	SECT	JOB	HIGHWAY
3417	02	040	PARMER LN
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		

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ATTACHMENT H
INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN

ATTACHMENT H:

INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN

PROJECT : SH-45 SECTION 7
COUNTY : WILLIAMSON

Extended Detention Pond 4 :

Monthly; Quarterly; Annually:

Inspection:

1. The basin shall be inspected a minimum of twice a year, once immediately following or during wet weather. The pond shall be inspected during wet weather conditions to confirm the detention time.
2. The perforated riser pipe, trash cage, gravel media, weir, spillway and energy dissipaters shall be inspected for litter, debris and sediment accumulations.
3. The extended detention basin shall be inspected for litter, debris and sediment accumulations.
4. The inflow pipes, outfall pipe, weir, spillway, rock riprap divider and basin shall be inspected for structural damage, erosion and distress. Any identified damage or erosion will be repaired immediately.

Maintenance:

1. If the draw down times are longer than the 72 hrs. for total draw down or quicker than 24 hrs. for 50% of the basins water quality volume, then a retrofit or corrective measures will be required to adjust the basins performance to come into compliance with the TNRCC and Edward Aquifer guidelines, as prescribed by a Texas Registered Professional Engineer.
2. If litter is present it shall be collected and processed by a collection system*. If sediment is present it shall be removed and disposed of properly. When the sediment is 1.20 ft deep or deeper at the perforated pipe riser, the sediment shall be removed and disposed of properly.
3. If litter is found during the inspection, it shall be collected and processed by a collection system.
4. If litter is present it shall be collected and processed by a collection system. If sediment is present, it shall be removed and disposed of properly. If erosion is present, the area shall be re-sodded and/or stabilized in a manner prescribed by a Texas Registered Professional Engineer. If the outflow pipes are more than 10% clogged they shall be cleaned to original capacity. If distress is discovered it shall be repaired as soon as possible (see "Repair", Item 1, below).

Repair:

1. If structural repairs are required, a Texas Registered Professional structural engineer shall give written instructions on how and to what extent the repairs shall be completed. If repairs are erosion related, they shall be stabilized in a manner prescribed by a Texas Registered Professional Engineer.

Retrofit:

Any retrofit to the detention basin shall be sealed by a Texas Registered Professional Engineer. The updated WPAP shall be sent to the TNRCC for their approval.

Sediment Removal:

- Every year the sediment surrounding the inlet structure shall be removed and disposed of properly.

Nuisance Control:

- When the water becomes stagnant or cause soggy conditions at the lower stage then maintenance shall be performed immediately (See "Maintenance" Item 1 for details).

Mowing:

- The grass surrounding the pond shall be mowed as necessary to maintain the aesthetic appearance of the area. Care shall be exercised so that grass clippings do not accumulate in the sediment basin. This can be accomplished through mulching or removing clippings.
- If grass appears in the basin, it shall be cut as necessary (at least twice annually) to maintain a maximum height of eighteen (18) inches.

After Rainfall:

- After every 0.5 inch rainfall, the pond shall be inspected for litter, debris, and sedimentation. If accumulations warrant (see above section "Maintenance") remove and dispose of properly. The draw down time of the basin should be observed to insure compliance with the 72 hr. draw down time requirement.

"Proper" disposal of collected sediment shall be performed according to the rules and regulations of the TNRCC and other pertinent local laws and regulations

If these guidelines for the monthly inspection are altered or revised, a copy of the revisions shall be sent to the TNRCC within 30 days of their revision.

* - See Texas Administrative Code title 30, Part 1, Chapter 330, Subchapter A, Rule §330.2 for the definition of terms.

RESPONSIBLE PARTY FOR MAINTENANCE : **Phillip E. Russell, P.E.**
Director of the Texas Turnpike Authority

Address : **125 E 11th Street**
City, State, Zip : **Austin, Texas 78701-2433**
Telephone Number : **512-936-0903**

SIGNATURE OF RESPONSIBLE PARTY : _____
Phillip E. Russell, P.E.

ATTACHMENT K
VOLUME AND CHARACTER OF STORMWATER

The project site is located within the Lake Creek Watershed, which contributes to Brushy Creek. The project area generally flows from west to east.

The following stormwater runoff estimates included in **Table 1** were calculated using the rational method for drainage areas less than 200 acres. Time of concentration, runoff coefficients, and impervious cover were calculated following standard engineering practices outlined in the Williamson County Design Manual. Atlas 14 rainfall intensities were used to compute the 10-year peak runoff rates. The drainage basins included in the table below encompass the onsite drainage areas as well as three offsite drainage areas that come onsite within the proposed right-of-way to characterize the stormwater within the project limits.

Table 1: Summary of 10-Year Runoff Calculations

Drainage Area ID	Drainage Area (acres)	Runoff Coefficient (C)	T_c CALCULATED (MIN)	T_c USED (MIN)	Catchment Intensity (IN/HR)	Catchment Runoff Flow (CFS)
A-01	0.50	0.90	4.0	5.0	8.8	4.0
A-03	0.37	0.90	3.0	5.0	8.8	3.0
A-05	0.67	0.90	1.9	5.0	8.8	5.3
A-08	0.94	0.95	10.0	10.0	7.3	6.5
A-09	0.45	0.90	2.0	5.0	8.8	3.6
A-09.1	0.55	0.90	5.0	5.0	8.8	4.4
A-13	0.66	0.95	5.0	5.0	8.8	5.6
A-16	0.09	0.95	2.0	5.0	8.8	0.7
A-16-OFF	1.18	0.85	3.0	5.0	8.8	8.9
A-17	0.14	0.95	5.0	5.0	8.8	1.2
A-17-OFF	0.98	-	0.0	5.0	-	13.1*
A-17.1	0.10	0.95	5.0	5.0	8.8	0.9
A-17.1-OFF	0.55	-	0.0	5.0	-	1.69*
B-01	3.75	0.70	9.0	9.0	7.6	20.2
B-02	4.70	0.85	8.0	8.0	7.7	31.1
C-01	0.47	0.95	4.0	5.0	8.8	4.0
C-02	0.90	0.90	7.0	7.0	8.1	6.6
D-01	0.52	0.86	5.0	5.0	8.8	4.0
D-02	1.04	0.81	5.0	5.0	8.8	7.5
D-03	1.78	1.81	5.9	5.9	8.5	13.0

*Flow values extracted from development as-builts and design plans

Table 2: Summary of 10-Year Runoff Calculations for Impact Analysis at each POI

Rational Method Flows										
Node Name	Pre-Project Conditions Runoff				Post-Project Conditions Runoff				100-yr Diff (cfs)	100-yr Diff (%)
	2-yr (cfs)	10-yr (cfs)	25-yr (cfs)	100-yr (cfs)	2-yr (cfs)	10-yr (cfs)	25-yr (cfs)	100-yr (cfs)		
POI A	15.52	23.17	28.19	36.36	11.53	17.07	20.61	26.22	-10.14	-27.89%
POI B	26.74	40.12	49.02	63.70	30.48	45.74	55.88	72.62	8.91	13.99%
POI C	192.08	294.00	365.01	488.41	197.07	301.64	374.49	501.10	12.69	2.60%

Table 3: Area Comparison – Onsite vs. Total Drainage Area to Downstream POI

Outfall Location	Onsite Area (ac)	Offsite Area (ac)	Onsite vs. Total Area (%)
POI A	2.29	396.77	0.58%
POI B	8.53	76.94	11.09%
POI C	161.43	1377.09	11.72%

The project will increase impervious cover by 1.36 acres within the project extents. Runoff from the proposed project will be conveyed through roadside ditch or storm sewer before discharging to either the existing culvert north of the project or the existing extended detention pond south of SH 45. All added impervious cover is proposed to outfall at this pond to be treated. After that, the pond outfalls to Davis Spring Branch, a tributary of Lake Creek. Within the widening extents, the increase in impervious cover will lead to additional runoff volume and increases in peak flows as shown in **Table 2** for POI B and C. Although **Table 2** shows an increase in peak flows, this analysis only includes the onsite drainage areas. All three outfall have substantial offsite contributing flows that are not included. **Table 3** above outlines the total offsite area contributing to each outfall compared to the onsite area. Based on this comparison, it is determined that the onsite increase in impervious cover and onsite peak flow increase will not adversely increase peak flows downstream.

The character of the stormwater is not expected to change significantly from pre-project to post-project conditions. Since all proposed impervious cover is sent to the existing extended detention pond, there will be no additional pollutants over the recharge zone. All disturbed areas will be re-vegetated at the completion of the project; therefore, no significant degradation of stormwater quality is anticipated due to construction activities. For project drainage patterns see Attachment G – Drainage Area Map included the Temporary Stormwater Section.

TEMPORARY STORMWATER SECTION

Temporary Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

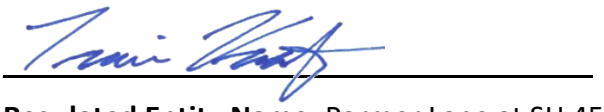
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Temporary Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Travis Kaatz, CFM, P.E.

Date: 12/17/2025

Signature of Customer/Agent:



Regulated Entity Name: Parmer Lane at SH 45

Project Information

Potential Sources of Contamination

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   ☐ The following fuels and/or hazardous substances will be stored on the site: _____

   These fuels and/or hazardous substances will be stored in:

   ☐ Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

☒ Fuels and hazardous substances will not be stored on the site.

2. ☒ **Attachment A - Spill Response Actions**. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.

3. ☐ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. ☒ **Attachment B - Potential Sources of Contamination**. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

5. ☒ **Attachment C - Sequence of Major Activities**. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.

☒ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.

☒ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Lake Creek Watershed

Temporary Best Management Practices (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.

7. ☒ **Attachment D – Temporary Best Management Practices and Measures**. TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:

☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

☒ A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. ☐ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

   ☐ **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

   ☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. ☒ **Attachment F - Structural Practices**. A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.

10. ☒ **Attachment G - Drainage Area Map**. A drainage area map supporting the following requirements is attached:

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

    ☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

☒ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.

11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations**. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.

    ☒ N/A

12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.

13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

17. ☒ **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices**. A schedule of the interim and permanent soil stabilization practices for the site is attached.

18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. ☒ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

ATTACHMENT A
SPILL RESPONSE ACTIONS

Spill prevention, control, clean-up and reporting shall comply with TCEQ regulations 30 TAC, Chapter 327 – Spill prevention and control, attached, as well as any local regulations. Above ground storage tanks are not allowed within the right of way. The contractor will implement proper spill prevention measures and maintain appropriate spill response equipment on site in the event of a spill. In the event of a hazardous materials spill, the safety of on-site personnel is the most important consideration. Once the safety of personnel is secured, the second priority becomes stopping the source of the spill. If it is safe to do so, the source of the spill will be stopped and the spill will be contained using items such as sand bags, berms or absorbent rolls. Once the spill is stopped and contained, the crew will commence proper cleanup and disposal based on the type, location and amount of material spilled. The contaminated water will be collected and properly disposed of.

If during the construction of the project, a hazardous substance or hydrocarbon (oil) spill of greater than 250 gallons occurs within the project limits, the contractor will try to stop the spill from continuing, contact the local fire department, and the Engineer. If the spill is caused by the roadway contactor, the roadway contactor will be responsible for the proper clean-up of the spill as well as notifying the TCEQ Spill Reporting Hotline (1-800-832-8224) and the EPA National Response Center Hotline (1-800-424-8802). If a spill occurs within the project limits, but is caused by a third party (someone from the traveling public driving through the project), the contractor and/or the Engineer shall immediately contact local law enforcement, the fire department, the TCEQ Spill Reporting Hotline, and the EPA National Response Center Hotline. The local fire department will immediately respond to the spill and secure the scene (stop the spill and prevent it from spreading). TxDOT will work with the responsible party to facilitate the clean-up of the spill within the right of way.

ATTACHMENT B
POTENTIAL SOURCES OF CONTAMINATION

The potential sources of storm water pollution due to the roadway improvements include displaced soil, wastewater, dust, and miscellaneous construction waste. The potential pollution sources are detailed below.

There is the potential for soil to be displaced from the construction site from activities such as grading, clearing/grubbing, excavating, and filling. Other potential sources of stormwater pollution include wastewater from portable bathrooms and de-watering operations (if required) during excavation, litter generated during the construction process, additional dust and soils tracked onto roads by construction vehicles, miscellaneous construction products and waste, and imported soils.

There are also hazardous construction materials including fuel, chemicals such as automotive fluids and lubricants, use of asphaltic products, and petroleum products from the operation of equipment on the site, all of which are potential sources of contamination. The clean-up and containment of any fuels, hydraulic fluids, hydrocarbons, or other hazardous substances released on site will be the responsibility of the contractor. In the case that a spill occurs on site the contractor must respond immediately following Attachment A Spill Response Actions.

The primary storm water contaminant expected to be generated during the construction project is the entrained solids (soil particles) which will affect the turbidity of the runoff. From this project, disturbed soils will result from:

1. Clearing, grubbing, and grading within the right-of-way
2. Removal of existing roadway
3. Removal of metal beam guard rail fence and culvert inlet/outlet structures.
4. Roadway embankment grading
5. Driveway embankment grading
6. Ditch excavation and embankment grading
7. Roadway construction
8. Sidewalk contruction
9. Culvert extension construction
10. Metal beam guard rail fence construction
11. Placement and Removal of Temporary Erosion and Sediment Controls
12. Placement of Topsoil and Seeding

Increased sediment loading in stormwater can be attributed to: a) direct impingement of rain onto disturbed soil areas, sand, gravel and rock areas where rains dislodge or entrain particles; b) erosion of disturbed soil areas; and c) the transfer of soils and particulate matter via equipment or vehicle tires onto non-disturbed areas.

All storm water will be treated by BMP's such as silt fence and rock filter dams before leaving the project site and discharging to receiving waters. BMP's are placed at the project perimeter and key outfall locations as shown in the Stormwater Prevention Pollution Plan (SW3P) included as Attachment G-IV.

ATTACHMENT C
SEQUENCE OF MAJOR ACTIVITIES

The general order of soil disturbing construction activities is detailed below. Approximate disturbed acreage is also provided for each activity. The detailed construction sequence (Phase I – III) is included in Attachment G-I Roadway Construction Plans under a separate cover. Before any soil is disturbed within the project limits, a notice of intent (NOI) must be provided to the TCEQ regional office 48 hours prior to the start of regulated activities.

Temporary erosion and sediment control measures include silt fence, erosion control logs and rock filter dams which will be placed before commencing any construction activities and remain in place during all phases of construction. Temporary controls will be removed once sufficient vegetation is established.

Installation of Temporary Erosion and Sediment Controls – Phase I and Phase II (12.4 ac)

1. Installation of Erosion and Sediment Controls in accordance with the SW3P.

Parmer Lane Roadway Widening and Median Construction – Phase I (10.2 ac)

1. Clearing, grubbing, and grading at locations of roadway widening.
2. Removal of curb, gutter, ditch, SET headwalls, and metal beam guard rail fence where applicable.
3. Construction of sidewalk on west side of Parmer Lane.
4. Installation of proposed storm drain, connecting to existing storm drain, and plugging and abandoning 30” RCP storm drain under median.
5. Construction of widened pavement.
6. Placement of topsoil for final planting and seeding in adjacent ditch and median locations.

FM 620 Roadway Widening Construction – Phase II (2.2 ac)

1. Clearing, grubbing, and grading at locations of proposed widened pavement.
2. Construction of proposed widened pavement, guardrail, and barrier for FM 620 westbound frontage road.
3. Placement of topsoil for final planting and seeding.

Final Roadway Improvements – Phase III (10.1 ac)

1. Mill and overlay
2. Final clean up.

Removal of Temporary Erosion and Sediment Controls – Phase III (10.1 ac)

1. Removal of Erosion and Sediment Controls in accordance with the SW3P.

ATTACHMENT D
TEMPORARY BMPs AND MEASURES

Temporary BMPs such as erosion control logs and rock filter dams will be installed to prevent onsite sediment and debris from entering surface streams during construction. Temporary BMPs will be placed before commencing any construction activities and will remain in place during all phases of construction.

Type 1 rock filter dams (RFD-1) will be installed at the both ends of the project as a perimeter control to filter onsite stormwater runoff before leaving the project site. This occurs both at the south end in each roadside ditch as well as the north side ditch before it enters the cross culvert under Parmer Lane. Erosion control logs are also placed before SET headwalls to intercept sediment from overland and/or concentrated flow upstream of driveway culvert locations in the sections along Parmer Lane that have roadside ditches. Erosion control logs were also utilized at a few locations where surface flow could go offsite—including at all curb inlets within the project area—and these will provide filtration before exiting the project site.

All disturbed areas shall be covered with temporary seeding as a means of dust control and to reduce wind erosion. After construction, the project limits will be re-vegetated to prevent pollution of surface streams. Temporary BMPs will be removed once sufficient vegetation is established.

Temporary BMP placement and quantities, and additional measures are provided in the SW3P included as Attachment G-IV.

ATTACHMENT F
STRUCTURAL PRACTICES

Temporary structural practices used to limit transport of pollutants include erosion control logs and Type 1 rock filter dams. These temporary BMP's are proposed to be placed along the perimeter of the project and at key outfall locations.

The TCEQ guidelines included in Section 1.2 through Section 1.4 of RG-348 must be followed for installation and maintenance of temporary structural erosion and sediment control BMP's. Additional details on temporary structural practices can be found in the SW3P included as Attachment G-IV.

ATTACHMENT G:
DRAINAGE AREA MAPS

Please reference F20872 (Roadway Application) Attachment G – Construction Plans for Drainage Area Maps.

ATTACHMENT I
INSPECTION AND MAINTENANCE FOR BMPs

All erosion and sediment control measures will be maintained in effective operating condition by following the Project maintenance procedures. The general maintenance and inspection requirements are provided in the SW3P included as Attachment G-IV. The maintenance plan for temporary BMPs meets the maintenance guidance provided in RG- 348.

The Contractor shall install and maintain the integrity of temporary erosion and sediment control devices to accumulate silt and debris until soil disturbing activities are complete, permanent erosion control features are in place, and sufficient vegetation has been established in accordance with contract documents including Standard TxDOT Specification 506, and Part II, Section F.6 of TPDES General Permit No. TXR150000.

Maintenance, repairs or retrofits will adhere to the project standards and details for the BMP. Damaged portions of BMPs shall be removed and replaced as needed to adhere to the contract documents. BMPs that cannot be adequately repaired or retrofitted to meet project requirements, shall be removed and replaced in entirely in accordance with the contract documents.

The maintenance documentation procedures and recordkeeping practices to be followed are summarized in the TCEQ Edwards Aquifer General Construction Notes, which are provided in the Roadway Application included as Attachment G-III – Water Quality Site Plan.

ATTACHMENT J
SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

The general order of soil disturbing construction activities is detailed below. Approximate disturbed acreage is also provided for each activity. The detailed construction sequence (Phase I – III) is included in Attachment G-I Roadway Construction Plans under a separate cover. Before any soil is disturbed within the project limits, a notice of intent (NOI) must be provided to the TCEQ regional office 48 hours prior to the start of regulated activities.

Temporary erosion and sediment control measures include silt fence, erosion control logs and rock filter dams which will be placed before commencing any construction activities and remain in place during all phases of construction. Temporary controls will be removed once sufficient vegetation is established.

Installation of Temporary Erosion and Sediment Controls – Phase I and Phase II (12.4 ac)

1. Installation of Erosion and Sediment Controls in accordance with the SW3P.

Parmer Lane Roadway Widening and Median Construction – Phase I (10.2 ac)

1. Clearing, grubbing, and grading at locations of roadway widening.
2. Removal of curb, gutter, ditch, SET headwalls, and metal beam guard rail fence where applicable.
3. Construction of sidewalk on west side of Parmer Lane.
4. Installation of proposed storm drain, connecting to existing storm drain, and plugging and abandoning 30” RCP storm drain under median.
5. Construction of widened pavement.
6. Placement of topsoil for final planting and seeding in adjacent ditch and median locations.

FM 620 Roadway Widening Construction – Phase II (2.2 ac)

1. Clearing, grubbing, and grading at locations of proposed widened pavement.
2. Construction of proposed widened pavement, guardrail, and barrier for FM 620 westbound frontage road.
3. Placement of topsoil for final planting and seeding.

Final Roadway Improvements – Phase III (10.1 ac)

1. Mill and overlay
2. Final clean up.

Removal of Temporary Erosion and Sediment Controls – Phase III (10.1 ac)

1. Removal of Erosion and Sediment Controls in accordance with the SW3P.

Where construction activity temporarily ceases for more than 21 days, these areas will be stabilized by the contractor with temporary seeding within 14 days of the last disturbance.

Records will be kept at the site to document dated when:

- major grading activities occur;
- construction activities temporarily cease;
- construction activities permanently cease; and
- stabilization measures are initiated.

AGENT AUTHORIZATION SECTION

ATTACHMENT A
AGENT AUTHORIZATION LETTERS

ATTACHMENT A

AGENT AUTHORIZATION LETTER (TxDOT)

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I Shane Rotter,
Print Name

Edward Aquifer & Water Quality SME,
Title - Owner/President/Other

of Texas Department of Transportation – Austin District,
Corporation/Partnership/Entity Name

have authorized Steven Snell
Print Name of Agent/Engineer

of Williamson County
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

S/R

Applicant's Signature

11/4/25

Date

THE STATE OF _____ §

County of _____ §

BEFORE ME, the undersigned authority, on this day personally appeared _____known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this ____ day of _____,_____.

S/N

NOTARY PUBLIC

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: _____

ATTACHMENT A

AGENT AUTHORIZATION LETTER (Wilco)

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I Steven Snell,
Print Name

Williamson County Judge,
Title - Owner/President/Other

of Williamson County,
Corporation/Partnership/Entity Name

have authorized Travis Kaatz, P.E.
Print Name of Agent/Engineer

of EDGE Engineering, PLLC
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

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5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Steve Snell (Oct 29, 2025 09:26:27 CDT)
Applicant's Signature

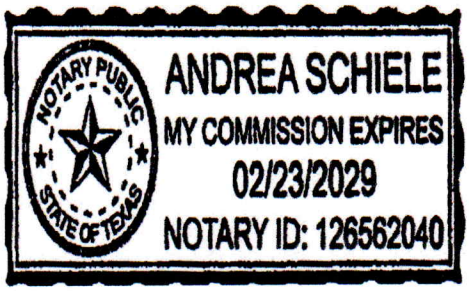
10/29/2025
Date

THE STATE OF TEXAS §

County of Williamson §

BEFORE ME, the undersigned authority, on this day personally appeared Steve Snell known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 29 day of October, 2025.



Andrea L. Schiele (Oct 29, 2025 09:41:29 CDT)
NOTARY PUBLIC

Andrea L. Schiele
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 02/23/2029

ATTACHMENT B
MAINTENANCE
AGREEMENT

Docusign Envelope ID: EA12DCAB-179B-403C-96E6-D25D0A06F88B

EDGE ENGINEERING

TBPELS FIRM No. 20690 | 7000 North Mopac, Suite 325, Austin, TX 78731 | 512.767.1009

TO: Omar De Leon (CTTS) and Shane Rotter (TxDOT)

FROM: Travis Kaatz, PE, CFM | EDGE Engineering, PLLC

PROJECT: Parmer Lane at SH 45

DATE: November 13, 2025

RE: CTTS Pond CSJ 0683-01-070

Williamson County has contracted a roadway improvement project for Parmer Lane (FM 734) at its intersection with SH 45. The stormwater runoff from this area of SH 45 and its frontage road (RM 620) are treated by an existing water quality (WQ) pond under CSJ 0683-01-070 and WPAP Permit Number 11-03050901. The proposed improvements would affect the total drainage area to the WQ pond. This letter has been produced to provide confirmation that changes to the treatment capacity of the existing WQ pond are agreed upon by all entities responsible for its function and maintenance.

The existing WQ pond is an extended detention pond located west of Pearson Ranch Road on the south side of SH 45, as seen in **Figure 1** and **Figure 2** below. The original design of the pond from 2003 showed that the pond would treat a drainage area of 100.52 acres with 63.5% impervious cover. Due to ongoing adjacent development and changing landcover use in the area, the present-day conditions show that the drainage area to the pond is 159.00 acres with 39.81% of it being impervious cover.

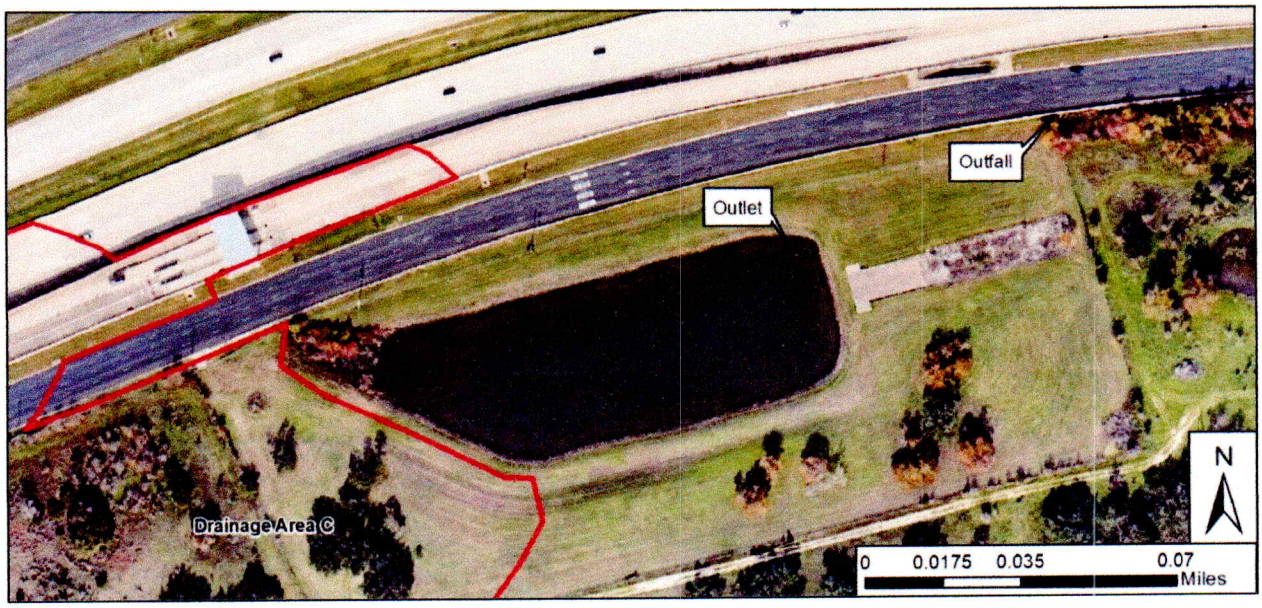


Figure 1. Extended Detention Pond.

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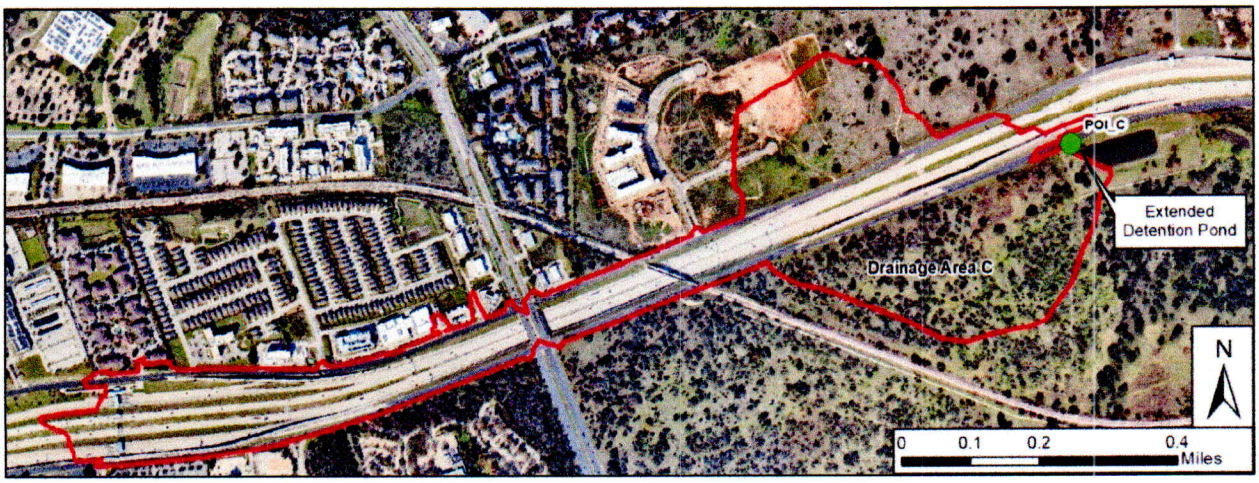


Figure 2. Extended Detention Pond Drainage Area.

The 2003 as-builts of the pond noted that this area only required a 359,657 cubic foot extended detention pond to remove 80% of the TSS load produced by its drainage area. However, the pond was designed to be 720,000 cubic feet in volume, allowing for future changes to the treatment capacity.

The proposed Parmer Lane improvements include changes to the drainage area of this pond. An additional 2.1 acres from Parmer Lane on the north side of SH 45 will be routed to the pond for treatment. This is a 1.3% increase in drainage area and 2.4% increase in impervious cover draining to the pond for an additional 1,209 pounds of annual TSS load removed by the pond, as described in **Table 1** below.

Table 1. Treatment Provided by Extended Detention Pond.

	Existing Conditions	Proposed Conditions	Difference
Total Drainage Area (ac)	159.00	161.10	2.1
Impervious Cover (ac)	63.30	64.91	1.61
Rainfall Depth	3.40	3.33	-0.07
Fraction of Annual Runoff	0.98	0.98	-
TSS Load Removed (lbs)	52,837	54,046	1,209

There will be no changes to the design of the existing BMP or its maintenance procedures. This document is provided as verification that all entities responsible for the pond understand the changes that are being made to the BMP. By signing below, you agree that you understand the changes and will continue to provide maintenance to the pond in accordance with its original procedure.

Docusign Envelope ID: EA12DCAB-179B-403C-96E6-D25D0A06F88B

EDGE ENGINEERING

TBPELS FIRM No. 20690 | 3410 Far West Blvd. Suite 315, Austin, TX 78731 | 512.767.1009

X Signed by: Omar X. De Leon, P.E. D18DBE2B94AF4FA...

Representative of CTTS

X DocuSigned by: Shane Rotter 5472579056984E5...

Representative of TxDOT

If you have any questions about this document, please do not hesitate to contact me directly at (512)766-0463 or tkaatz@civil-edge.com with comments or questions.

Sincerely,

Travis Kaatz, PE, CFM
Project Manager
EDGE Engineering, PLLC

TCEQ-0574
Application Fee Form

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Parmer Lane at SH 45
Regulated Entity Location: Intersection of Parmer Lane and SH 45
Name of Customer: Williamson County
Contact Person: Christen Eschberger (HNTB) Phone: (512) 563-1768
Customer Reference Number (if issued):CN 600897888
Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment**. This payment is being submitted to:

☒ Austin Regional Office
☒ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ San Antonio Regional Office
☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	15.01 Acres	$ 6,500
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 03/04/2026

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ
CORE DATA
FORM

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal (*Core Data Form should be submitted with the renewal form*) ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 600887888		RN

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☐ Update to Customer Information ☒ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (*If an individual, print last name first: eg: Doe, John*) *If new Customer, enter previous Customer below:*

Williamson County

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☐ City ☒ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher

13. Independently Owned and Operated?
☐ **Yes** ☒ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☐ Owner & Operator
☐ Occupational Licensee ☒ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:

City		State		ZIP		ZIP + 4	

16. Country Mailing Information *(if outside USA)*	17. E-Mail Address *(if applicable)*

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
( ) -		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (*If 'New Regulated Entity" is selected below this form should be accompanied by a permit application*)

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name (*Enter name of the site where the regulated action is taking place.*)

Parmer Lane at SH 45

23. Street Address of the Regulated Entity: *(No PO Boxes)*	N/A						
	City		**State**		**ZIP**		**ZIP + 4**
24. County	Williamson						

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	From Spectrum Drive to Amberglen Boulevard

26. Nearest City	**State**	**Nearest ZIP Code**
Austin	TX	78717

27. Latitude (N) In Decimal:			**28. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	28	36	97	45	54

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
1611		237310	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Roadway

34. Mailing Address:							
	City		**State**		**ZIP**		**ZIP + 4**
35. E-Mail Address:							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
( ) -		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Travis Kaatz, CFM, P.E.	**41. Title:**	Project Manager

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 766-0463		( ) -	tkaatz@civil-edge.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	EDGE Engineering, PLLC	**Job Title:**	Project Manager
Name *(In Print):*	Travis Kaatz, CFM, P.E.	**Phone:**	(512) 766- **0463**
Signature:		**Date:**	12/17/2025