

SEE SHEET 2 & 3 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FHWA TEXAS DIVISION	PROJECT NO. F 2021 (826)	SHEET NO. 1	
STATE	DISTRICT	COUNTY	
TEXAS	LFK	POLK	
CONTROL	SECTION	JOB	HIGHWAY NO.
0213	04	050	US 190

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT
FEDERAL PROJECT NO. F 2021 (826)

FUNCTIONAL CLASS: RURAL PRINCIPAL ARTERIAL

DESIGN SPEED = 50 MPH
ADT (2022) = 13,900
ADT (2042) = 19,200

* DESIGN SPEED APPLICABLE ONLY TO
THE DESIGN ELEMENTS AFFECTED BY
THE SCOPE OF THE HSIP PROJECT.

US 190
POLK COUNTY

NET LENGTH OF ROADWAY = 38,067.51 FT. = 7.209 MI.
NET LENGTH OF BRIDGES = 395 FT. = 0.075 MI.
NET LENGTH OF PROJECT = 38,462.51 FT. = 7.284 MI.

FINAL PLANS

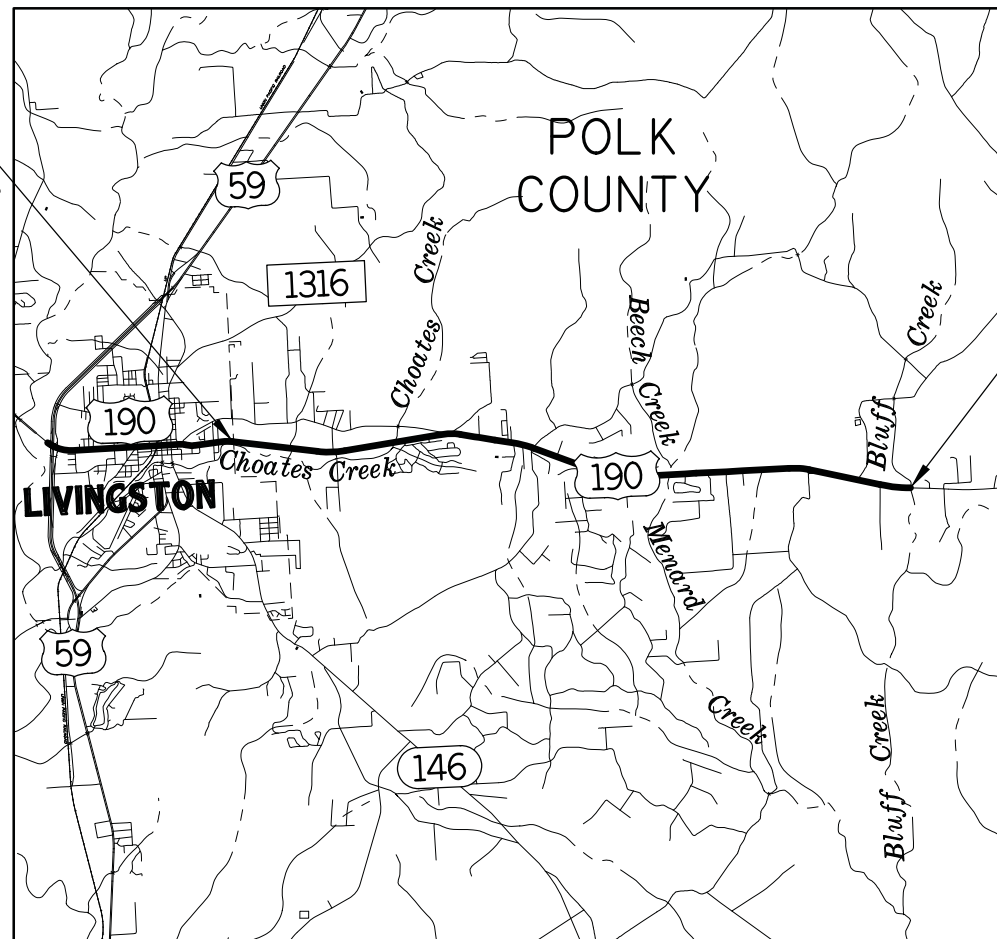
LETTING DATE: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
FINAL CONTRACT COST: \$ _____
CONTRACTOR: _____

LIMITS: LIVINGSTON CITY LIMITS TO 4.0 MI WEST OF FM 1276

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENT PROJECTS CONSISTING OF
REHABILITATE EXISTING AND ADD CONTINUOUS TWO WAY LEFT TURN LANE

CONSTRUCTION WORK ON THIS PROJECT WAS PERFORMED
IN ACCORDANCE WITH PLANS, CONTRACT AND APPROVED
CHANGE ORDERS.

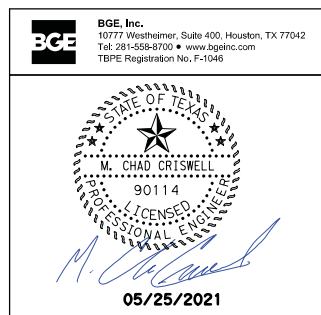
BEGIN PROJECT
STA 42+95.91
CSJ: 0213-04-050
REF MRKR 786+1.689
LAT: 30.7144127°
LONG: -94.9179705°
PREVIOUS PROJECT TIE-IN
PROJECT NO. STP 2016 (708) HES
CSJ: 0213-04-046
STA 43+06.91



END PROJECT
STA: 427+58.42
CSJ: 0213-04-050
REF MRKR 794+0.973
LAT: 30.7025662°
LONG: -94.7976937°
PREVIOUS PROJECT TIE-IN
PROJECT NO. STP 2016 (708) HES
CSJ: 0213-04-046
STA 427+69.42

BARRICADES AND WARNING SIGNS

PROVIDE AND ERECT BARRICADES AND WARNING SIGNS
IN ACCORDANCE WITH THE BARRICADE & CONSTRUCTION
STANDARDS, TCP STANDARDS, THE "TEXAS MANUAL ON
UNIFORM TRAFFIC CONTROL DEVICES" AND AS DIRECTED.



RECOMMENDED FOR LETTING: 6/1/2021
APPROVED FOR LETTING: 6/1/2021

"NO EXCEPTIONS, NO EQUATIONS"

RAILROAD CROSSINGS: STA 1199+28.85

DocuSigned by:
Elizabeth Ortega, P.E.
1B27AAE71511446...

DISTRICT DESIGN ENGINEER

DocuSigned by:
Kelly O. Morris, P.E.
F044211639424B4...

DISTRICT ENGINEER

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SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF
TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS
LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION
CONTRACTS (FORM FHWA 1273, MAY 2012).

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SHEET NO. DESCRIPTION

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- * 65 TCP(3-3)-14
- * 66 WZ(STPM)-13
- * 67 WZ(RS)-16
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- * 69 - 70 SSCB(2)-10
- * 71 SSCB(5)-10
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- * 114 RURAL DRIVEWAY DETAILS (LUFKIN DISTRICT STANDARD)
- * 115 DRIVEWAY & SIDE ROAD CUT & RESTORE PAVEMENT DETAILS (LUFKIN DISTRICT STANDARD)
- * 116 TE(HMAC)-11
- * 117 NON-MOW STRIP DETAILS (LUFKIN DISTRICT STANDARD)
- * 118 CCCG-21
- * 119 - 120 GF(31)TR TL3-20
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SHEET NO. DESCRIPTION

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- * 170 PB
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THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A * HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

M. Chad Criswell
 M. CHAD CRISWELL P.E. 6/22/2021
 DATE

INDEX OF SHEETS

SHEET 1 OF 2

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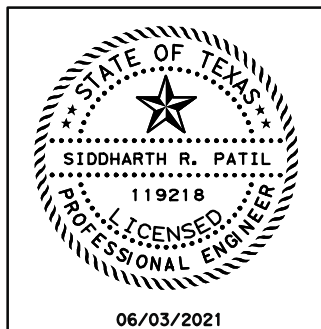
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STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONTR.	SECT.	JOB HIGHWAY NO.
0213	04	050 US 190

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SHEET NO. DESCRIPTION

V. BRIDGES

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178	BRIDGE LAYOUT (CHOATES CREEK)
179	TYPICAL BRIDGE SECTION (CHOATES CREEK)
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196	BRIDGE LAYOUT (MENARD CREEK)
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199	BRIDGE BORING LOGS (MENARD CREEK)
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210 - 211	FRAMING PLAN UNIT-1 SPAN (1-2) (MENARD CREEK)
212	FRAMING PLAN UNIT-2 SPAN (3) (MENARD CREEK)
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** 222 - 223	CSAB
** 224 - 225	FD (MOD)
** 226	PSB-4SB15
** 227	PSB-5SB15
** 228	PSBEB
** 229	PSBRA
** 230 - 231	TYPE SSTR



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Siddharth R. Patil
 SIDDHARTH R. PATIL P. E. 06/03/2021
 DATE

SHEET NO. DESCRIPTION

VI. TRAFFIC ITEMS

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**** 245B	ITS(3)-16
**** 245C	ITS(4)-15
**** 245D	ITS(6)-15
**** 245E	ITS(14)-15
**** 245F	ITS(17)-15
**** 245G	ITS(19)-17
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** 253	ED(10)-14
** 254	ED(12)-14
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* 280	D & OM(6)-20
* 281	D & OM(VIA)-20
* 282	RS(4)-13

VII. RAILROAD

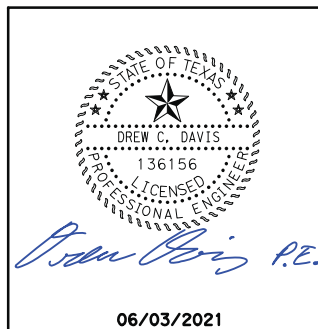
283 - 284	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS
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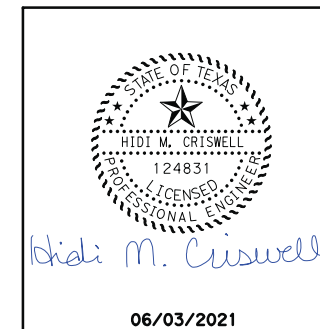
IX. MISCELLANEOUS

* 310 - 313	MB-15(1)
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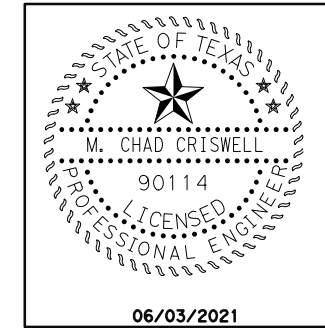
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Drew C. Davis P.E.
 DREW C. DAVIS P. E. 06/03/2021
 DATE



THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A **** HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

Hidi M. Criswell
 HIDI M. CRISWELL P. E. 06/03/2021
 DATE



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M. Chad Criswell
 M. CHAD CRISWELL P. E. 06/03/2021
 DATE

INDEX OF SHEETS

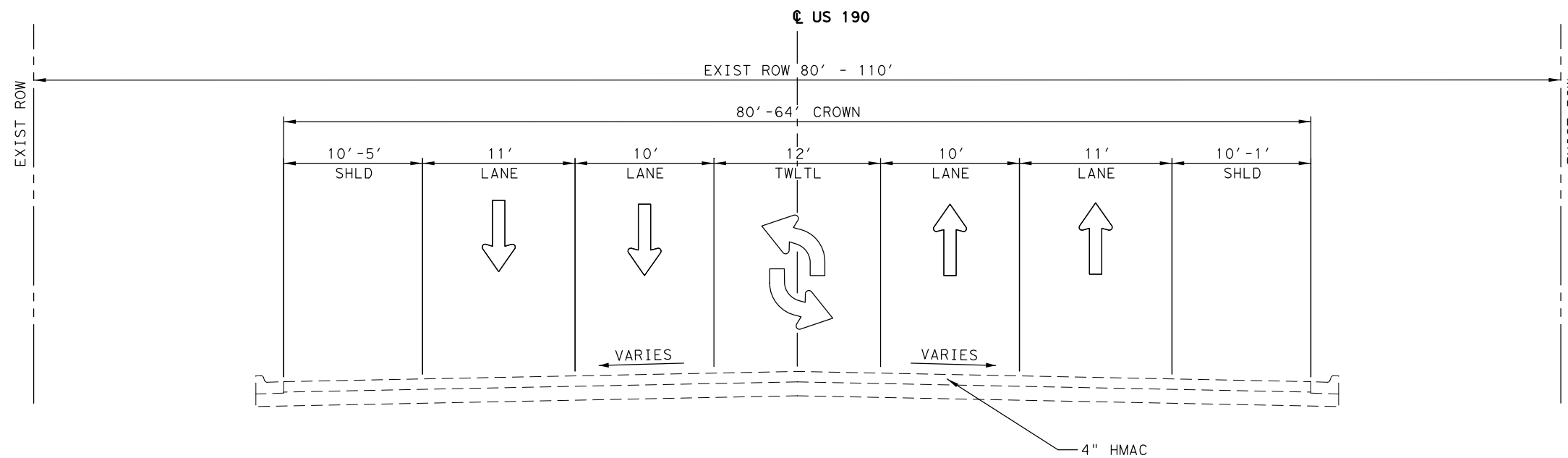
SHEET 2 OF 2



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FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.	
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STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

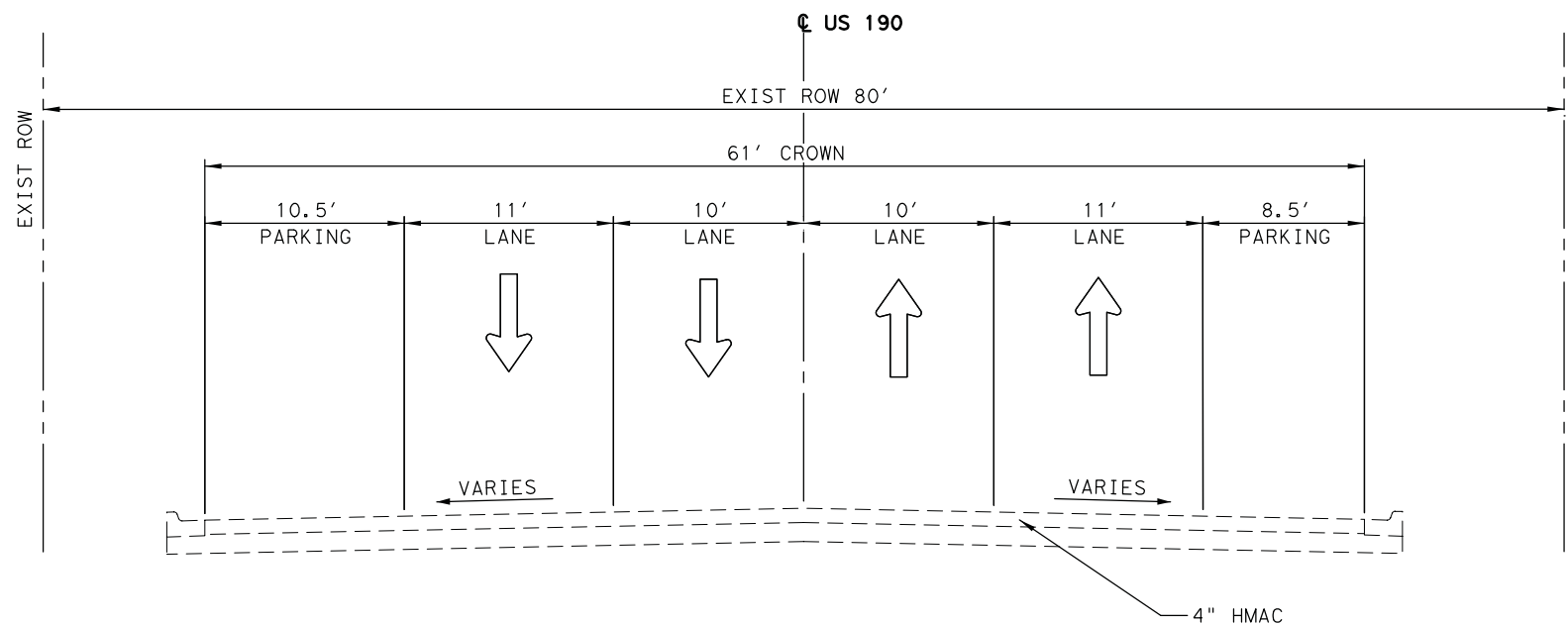
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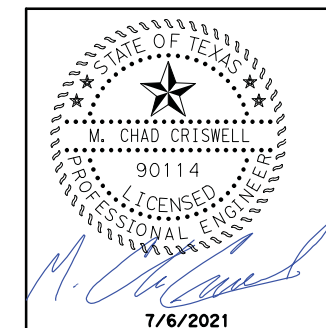
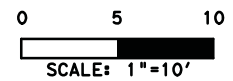
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STA 1152+34.00 - STA 1191+29.00
 STA 12+87.00 - STA 42+95.91



INCIDENTAL EXISTING TYPICAL SECTION

STA 1191+29.00 - STA 1201+73.27
 STA 0+00.00 - STA 12+87.00
 EQUATION: STA 1201+73.27 (BK) = STA 0+00.00 (AH)



**EXISTING
 TYPICAL
 SECTIONS**

SHEET 1 OF 4

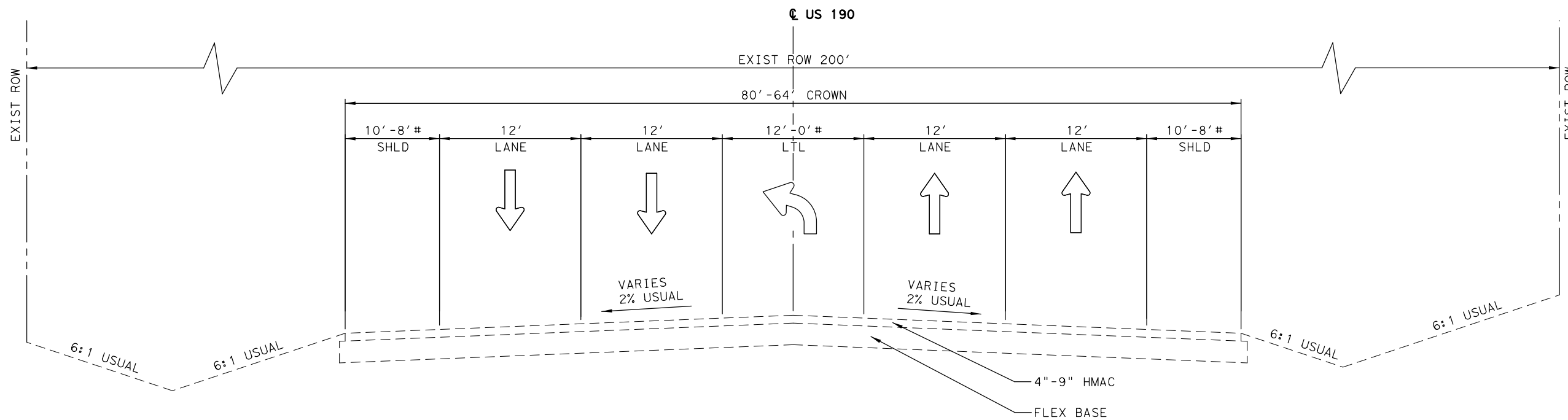


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STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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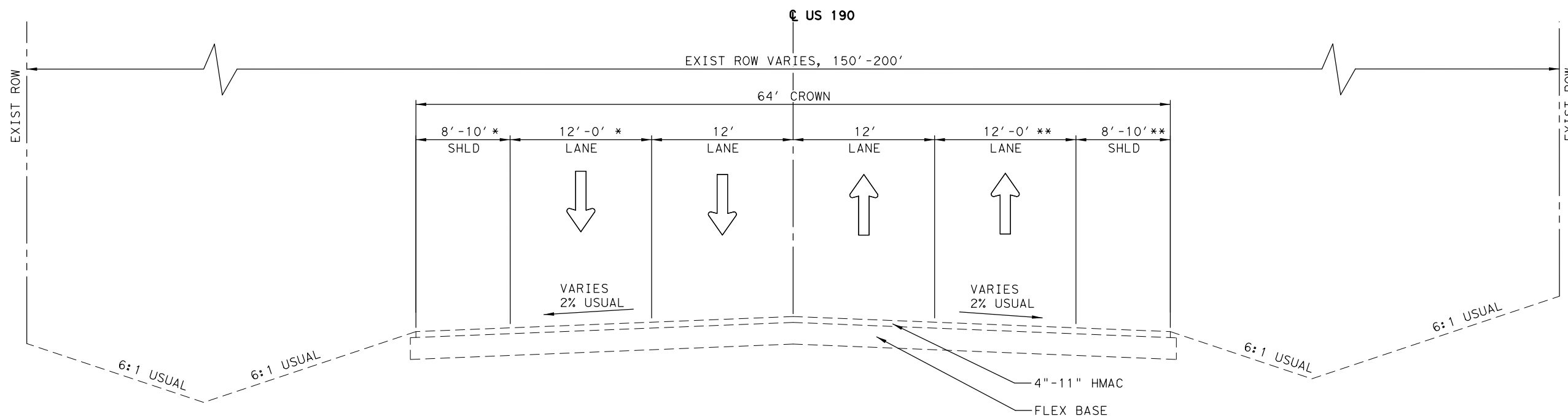
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EXISTING TYPICAL SECTION

STA 42+95.91 - STA 50+54.42

SHOULDER TRANSITIONS FROM 10'-8'
 LTL TRANSITIONS FROM 12'-0'
 AT STA 46+18.52 - STA 50+54.42

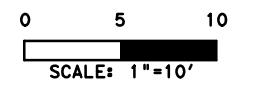


EXISTING TYPICAL SECTION

STA 50+54.42 - STA 135+47.96
 STA 136+73.24 - STA 298+44.68
 STA 300+94.93 - STA 400+99.25

* SHOULDER TRANSITIONS FROM 8'-10'
 LANE TRANSITIONS FROM 12'-0'
 AT STA 393+39.00 - STA 400+99.25

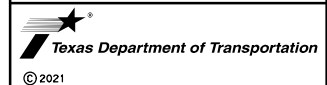
** SHOULDER TRANSITIONS FROM 8'-10'
 LANE TRANSITIONS FROM 12'-0'
 AT STA 382+97.00 - STA 400+99.25



05/13/2021

EXISTING TYPICAL SECTIONS

SHEET 2 OF 4

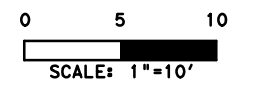
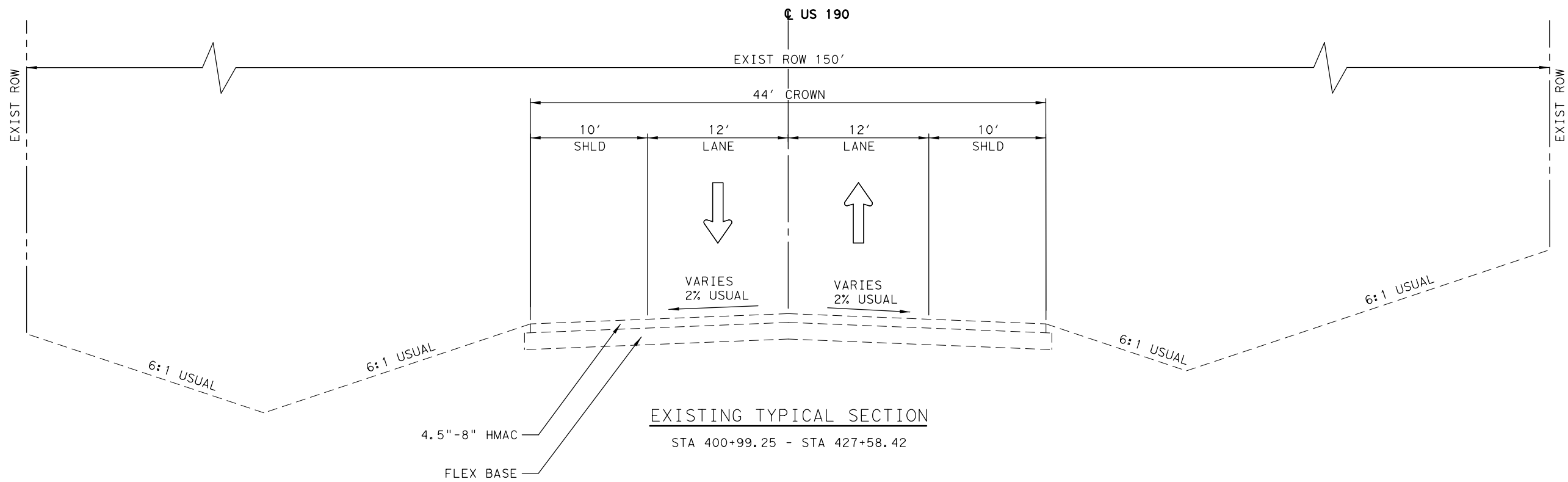


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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
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STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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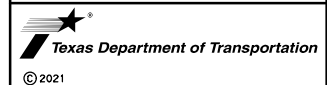
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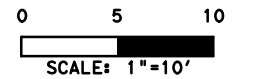
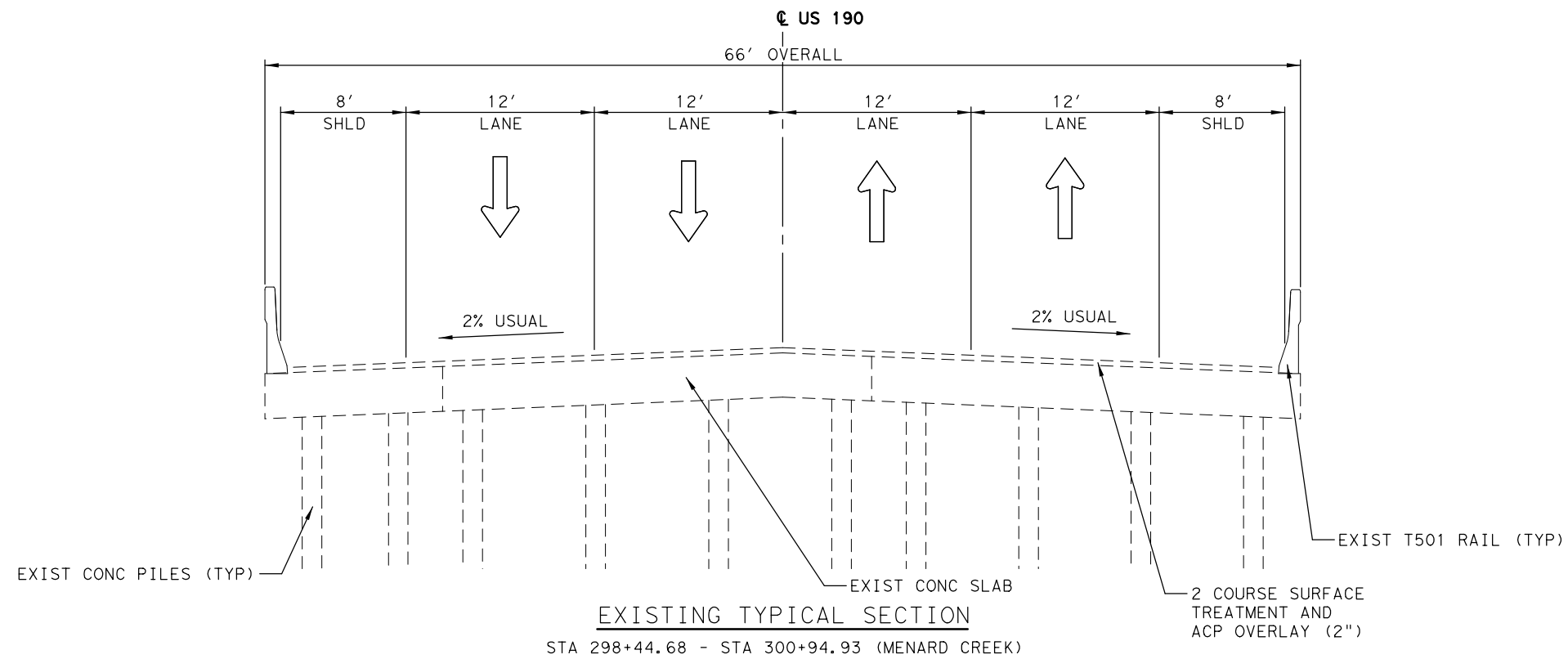
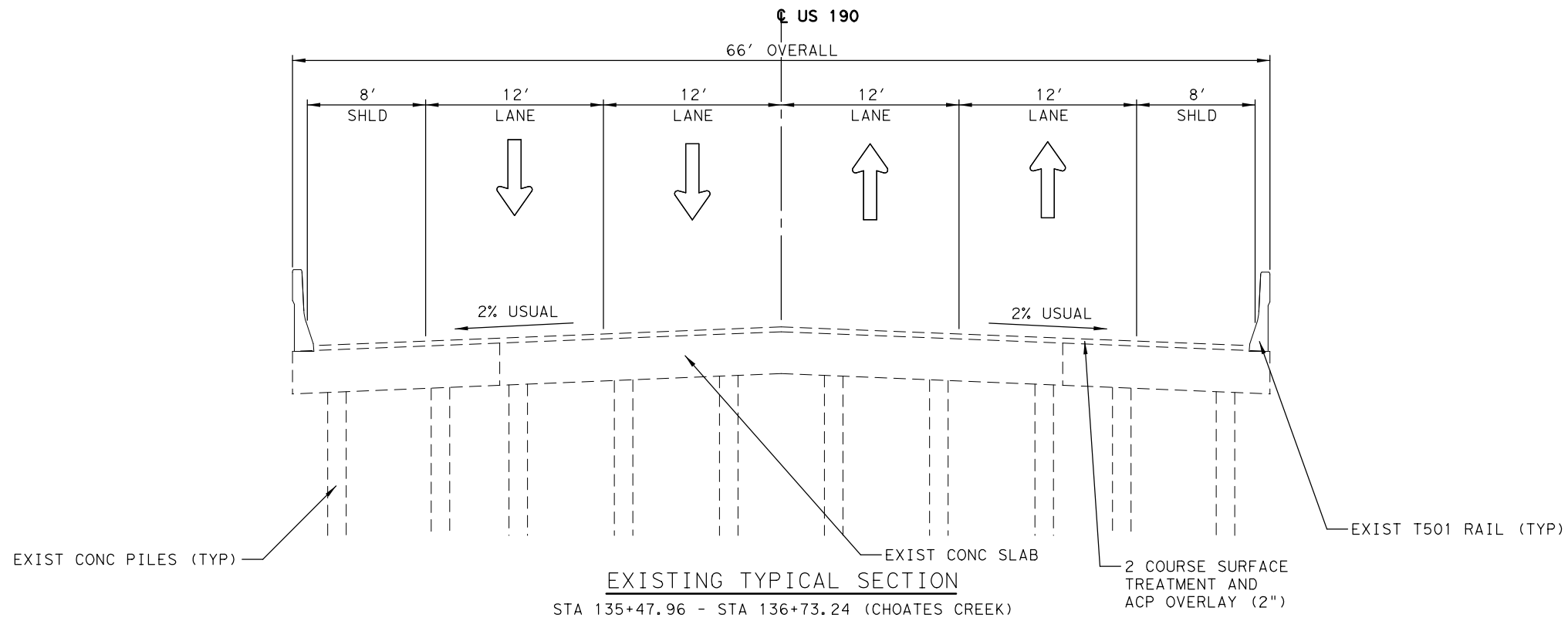
EXISTING TYPICAL SECTIONS

SHEET 3 OF 4



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FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			6
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190



05/13/2021

**EXISTING
 TYPICAL
 SECTIONS**

SHEET 4 OF 4

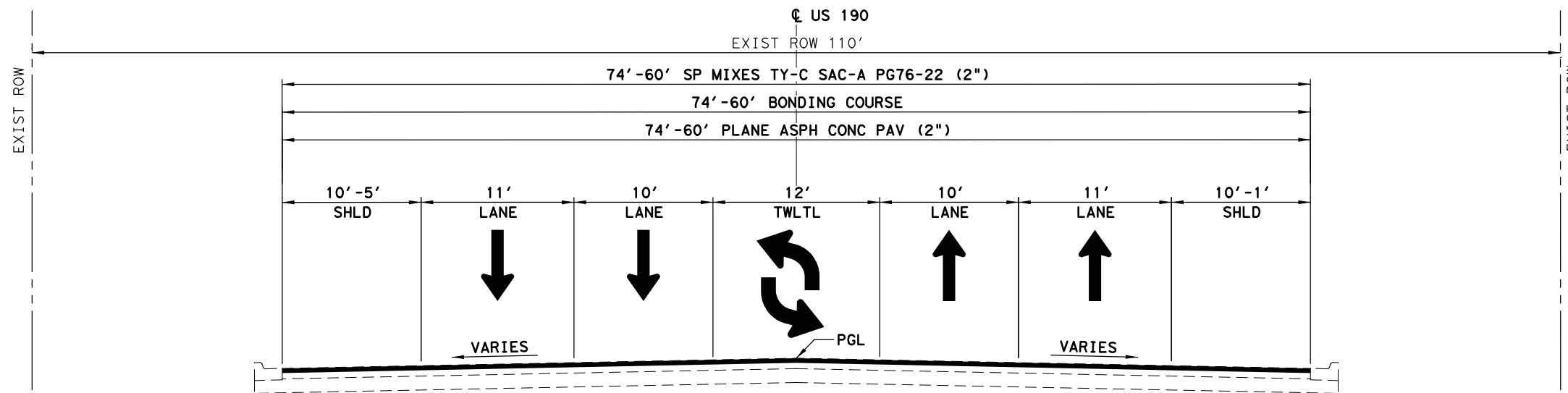


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 TBPE Registration No. F-1046

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.	
6		7	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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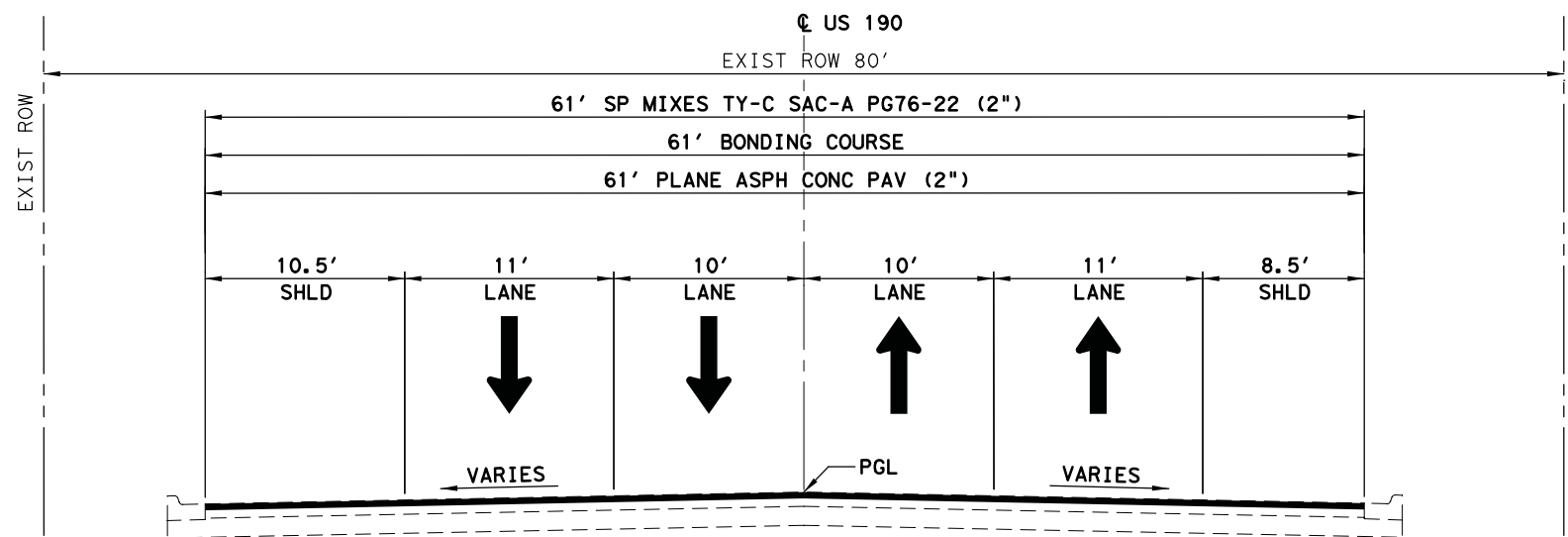
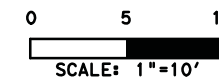
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INCIDENTAL PROPOSED TYPICAL SECTION

STA 1152+34.00 - STA 1191+29.00
 STA 12+87.00 - STA 42+95.91

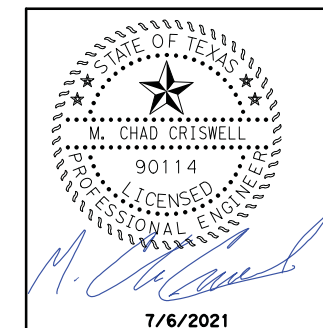
- NOTES:
1. REFER TO TXDOT STANDARD TE (HMAC)-11 FOR PAVEMENT EDGE DETAILS.
 2. SEE ROADWAY PLAN & PROFILE FOR SUPERELEVATION INFORMATION.
 3. USE CARE WHEN WIDENING AND LIME TREATING OVER CROSS DRAINAGE STRUCTURES. DEPTH OF LIME TREATING MAY NEED TO BE REDUCED TO ACCOMMODATE DRAINAGE FEATURES.
 4. USE OF LIME OR CEMENT TREATMENT WILL BE AS DIRECTED.
 5. BLADE 6" EXIST TOPSOIL AND WINDROW OUTSIDE WORK AREA, THEN RETURN TO SLOPES UPON COMPLETION OF ROADWAY WORK. BLADING OFF AND RETURNING EXISTING TOPSOIL TO SLOPES WILL BE PAID ONE TIME UNDER ITEM 150 BLADING.
 6. THERE ARE LOCATIONS WITHIN THE PROJECT LIMITS WHERE TXDOT MAINTENANCE FORCES HAVE REPAIRED BASE FAILURES. THE LOCATION AND LENGTH OF REPAIRS IS UNKNOWN. THERE WILL BE NO ADDITIONAL COMPENSATION FOR AREAS PREVIOUSLY REPAIRED WITH TXDOT MAINTENANCE FORCES.



INCIDENTAL PROPOSED TYPICAL SECTION

STA 1191+29.00 - STA 1201+73.27
 STA 0+00.00 - STA 12+87.00

EQUATION: STA 1201+73.27 (BK) = STA 0+00.00 (AH)



PROPOSED TYPICAL SECTIONS

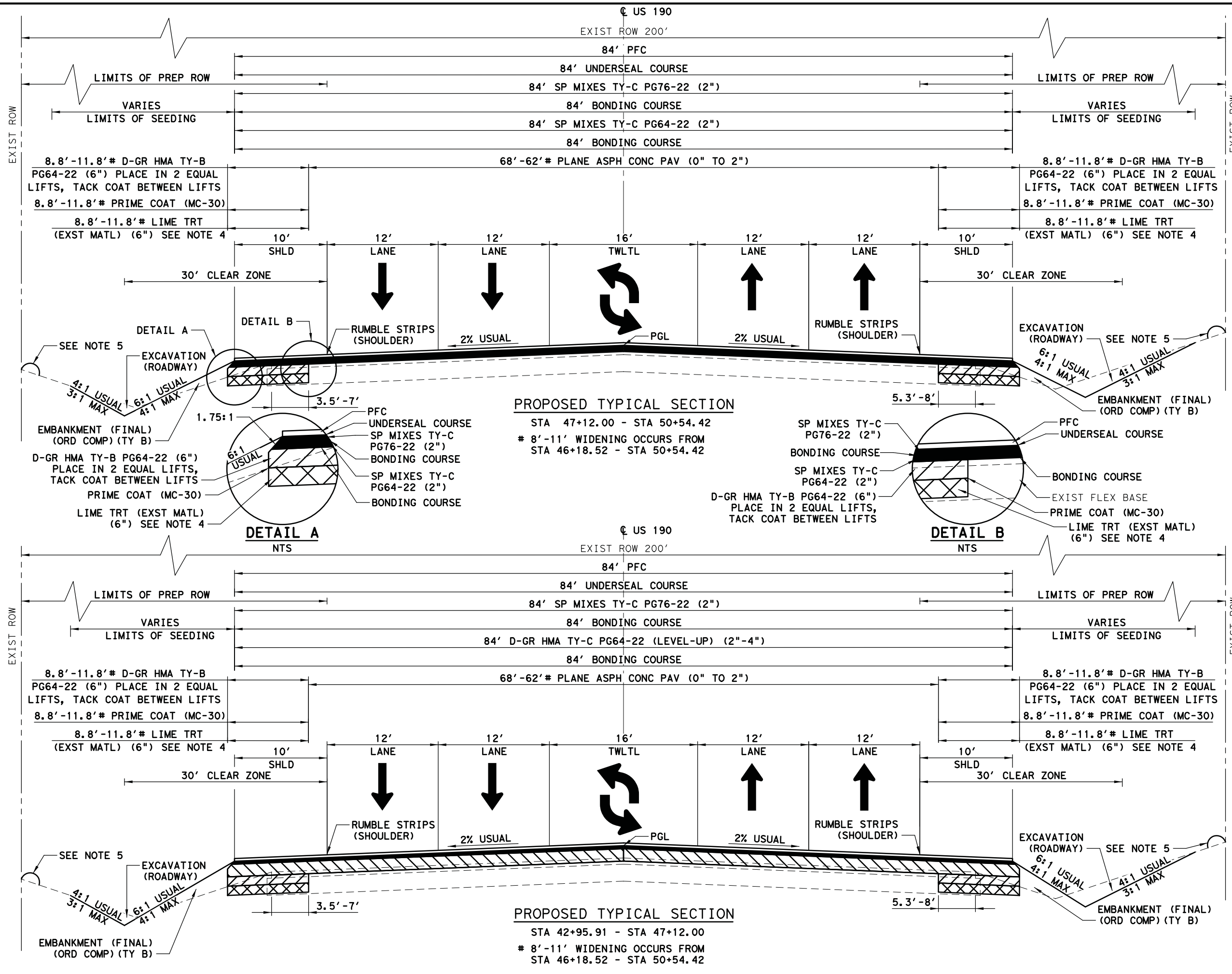
SHEET 1 OF 5



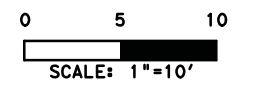
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 10777 Westheimer, Suite 400, Houston, TX 77042
 Tel: 281-658-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

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6		8	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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- NOTES:**
1. REFER TO TXDOT STANDARD TE (HMAC)-11 FOR PAVEMENT EDGE DETAILS.
 2. SEE ROADWAY PLAN & PROFILE FOR SUPERELEVATION INFORMATION.
 3. USE CARE WHEN WIDENING AND LIME TREATING OVER CROSS DRAINAGE STRUCTURES. DEPTH OF LIME TREATING MAY NEED TO BE REDUCED TO ACCOMMODATE DRAINAGE FEATURES.
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PROPOSED TYPICAL SECTIONS

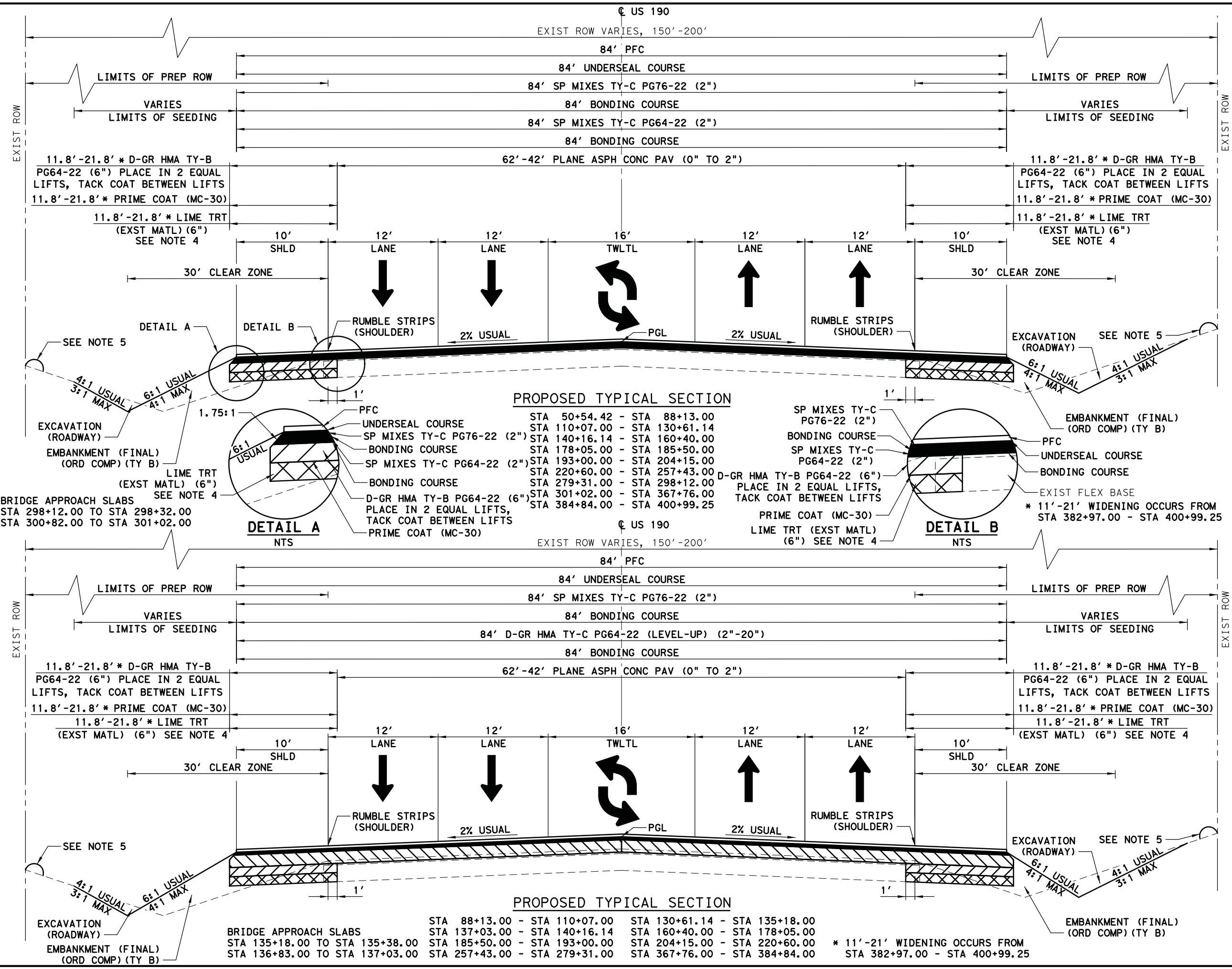
SHEET 2 OF 5

Texas Department of Transportation

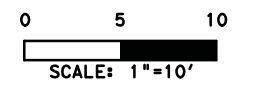
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		9	
STATE	DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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- NOTES:**
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PROPOSED TYPICAL SECTIONS

SHEET 3 OF 5

Texas Department of Transportation		PROJECT NO.		SHEET NO.	
© 2021		6		10	
FED. RD. DIV. NO.	STATE DIST. NO.	COUNTY	HIGHWAY NO.		
6	TX	LFK	POLK		
0213	04	050	US 190		

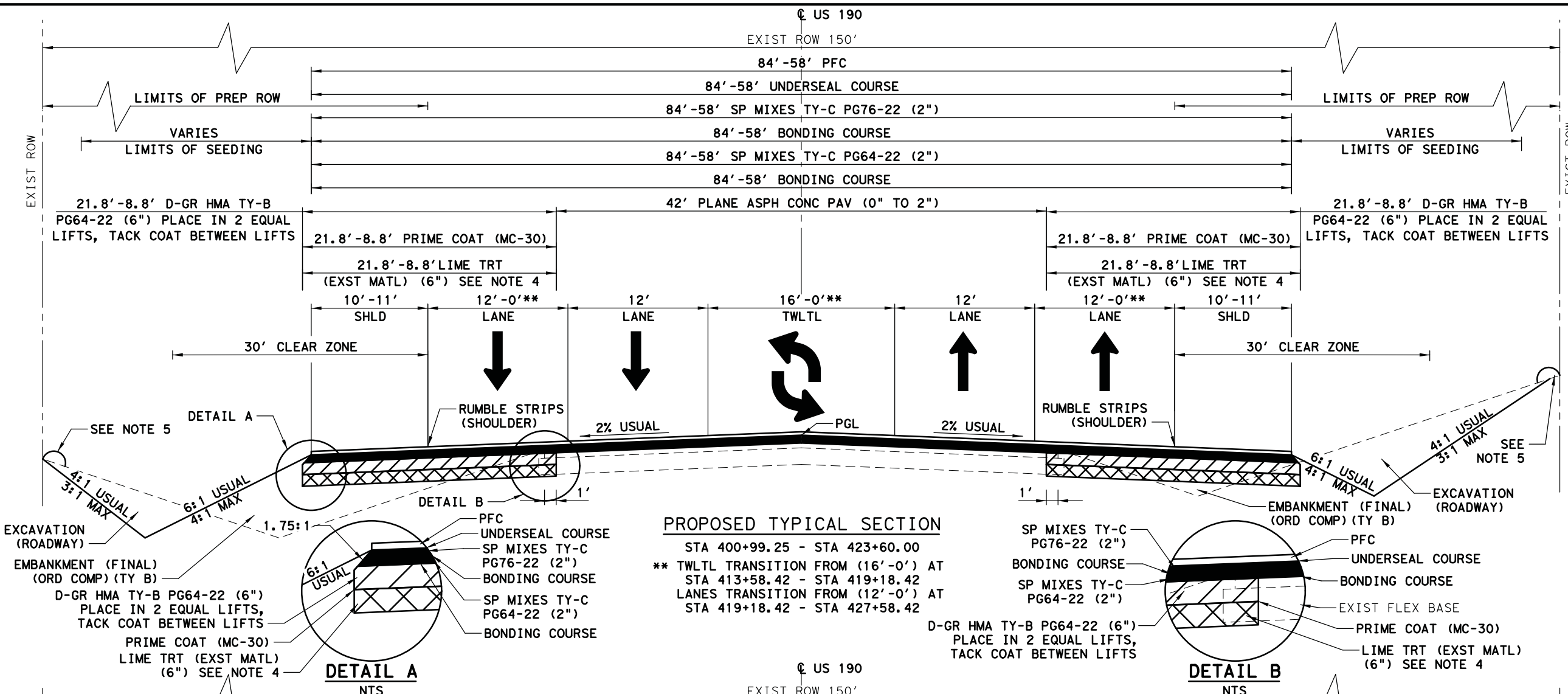
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STA 140+16.14 - STA 160+40.00	STA 178+05.00 - STA 185+50.00
STA 193+00.00 - STA 204+15.00	STA 220+60.00 - STA 257+43.00
STA 220+60.00 - STA 257+43.00	STA 279+31.00 - STA 298+12.00
STA 301+02.00 - STA 367+76.00	STA 384+84.00 - STA 400+99.25

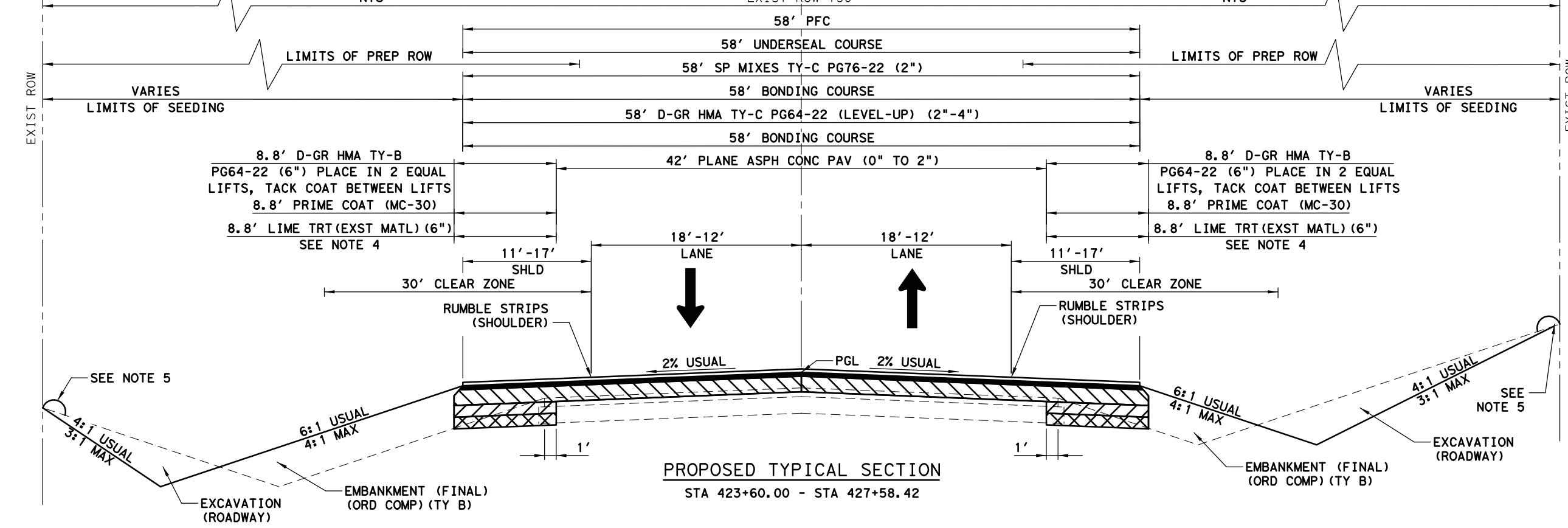
PROPOSED TYPICAL SECTION

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BRIDGE APPROACH SLABS			* 11'-21' WIDENING OCCURS FROM STA 382+97.00 - STA 400+99.25			

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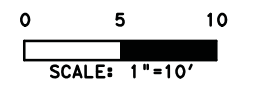


PROPOSED TYPICAL SECTION
 STA 400+99.25 - STA 423+60.00
 ** TWLTL TRANSITION FROM (16'-0') AT
 STA 413+58.42 - STA 419+18.42
 LANES TRANSITION FROM (12'-0') AT
 STA 419+18.42 - STA 427+58.42



PROPOSED TYPICAL SECTION
 STA 423+60.00 - STA 427+58.42

- NOTES:**
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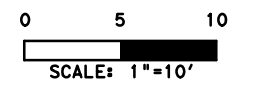
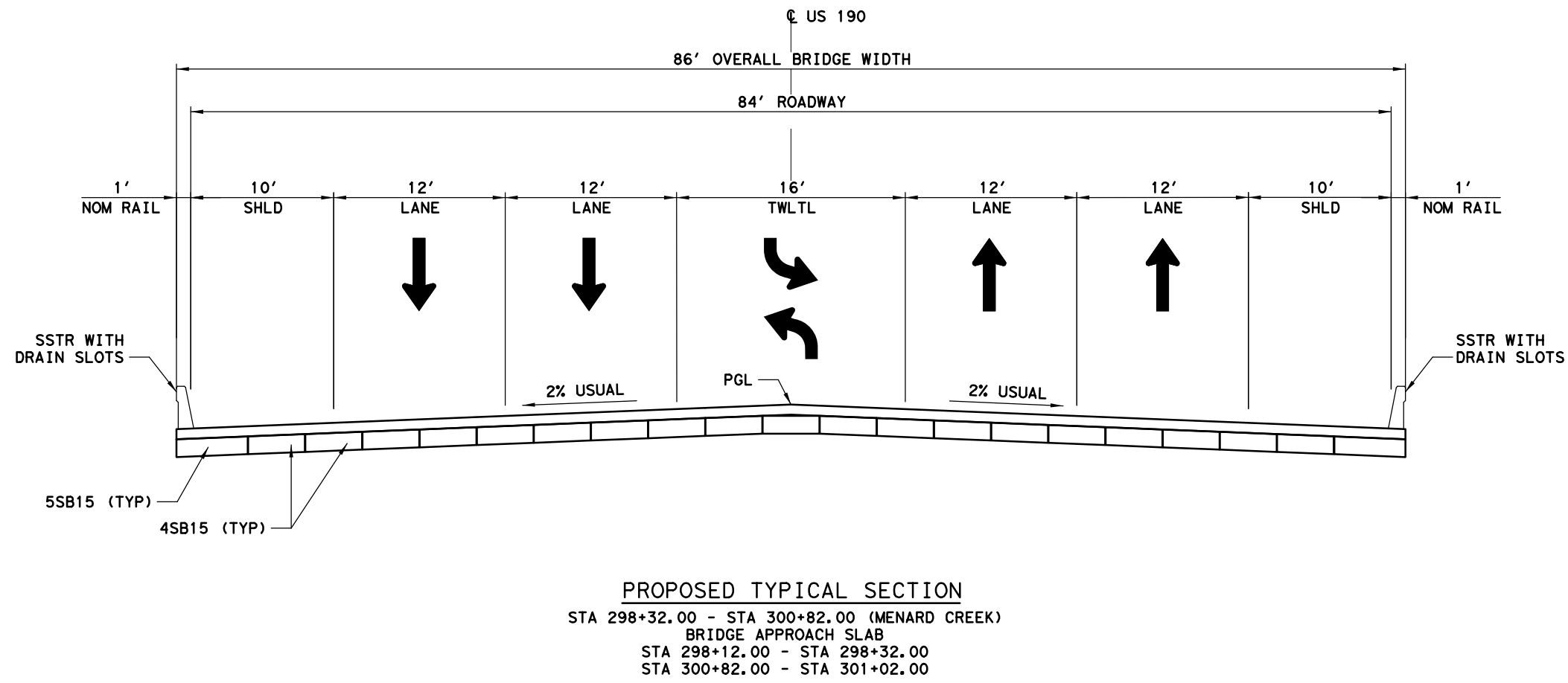
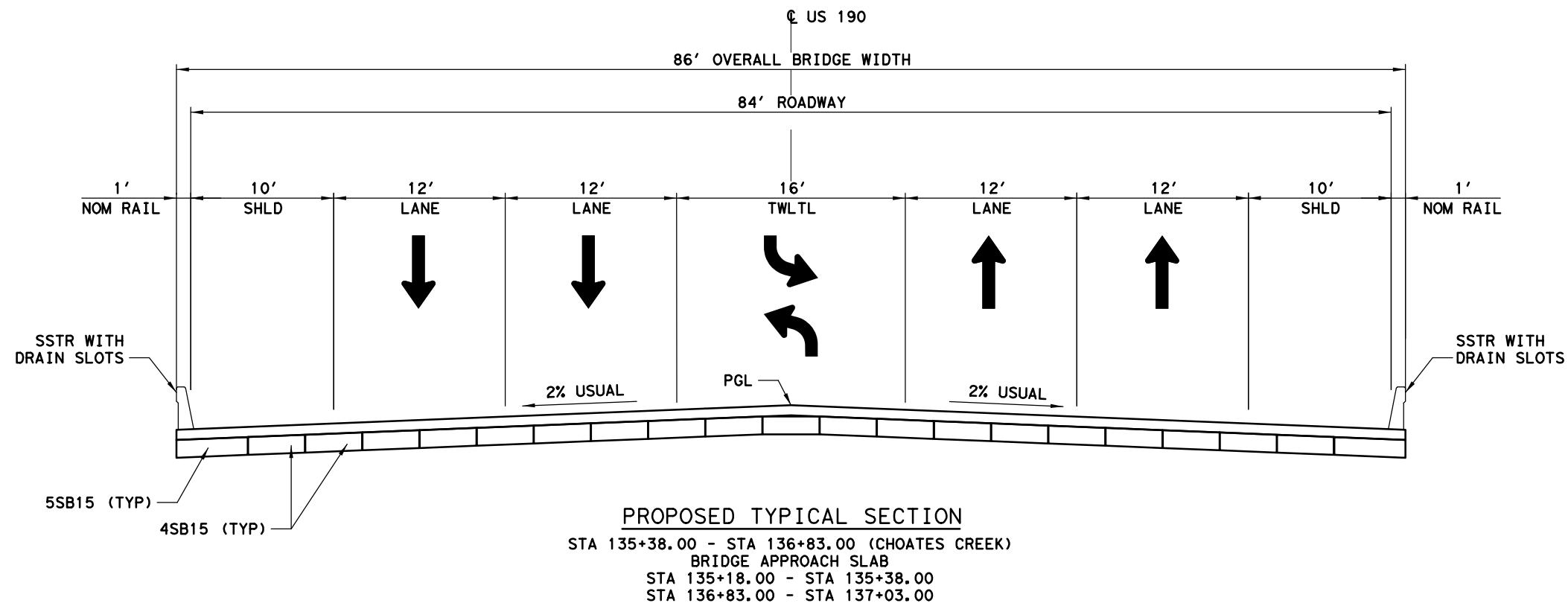
PROPOSED TYPICAL SECTIONS

SHEET 4 OF 5

Texas Department of Transportation		PROJECT NO.		SHEET NO.	
© 2021		6		11	
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6	LFK	POLK	050		
CONTRACT		SECTION	JOB		HIGHWAY NO.
0213		04	050		US 190

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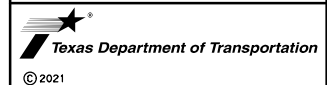
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05/13/2021

**PROPOSED
 TYPICAL
 SECTIONS**

SHEET 5 OF 5



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 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		12	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

GENERAL NOTES:

The following standard detail sheets have been modified.

FD (MOD)

Existing regulatory, warning and guide signs within project limits are to remain visible to the traveling public at all times. If a sign must be repositioned during construction operations, move and install the sign to an approved location. Use care when working near existing signs and repair or replace signs damaged by work operations. All work involved repositioning existing signs will be subsidiary to various bid items.

Furnish materials and make repairs to the existing roadway at any location damaged by construction operations. This work shall be done in an approved manner and will be subsidiary to various bid items.

Ensure drainage structures and outfall channels constructed on this project are free of silt and debris at the time of project acceptance. Final clean out work will be subsidiary to various bid items.

Maintain adequate surface drainage throughout the project limits during all phases of construction.

Provide suitable access at all times to adjacent businesses, private property and side roads.

When construction work necessitates the moving of mailboxes, temporarily relocate them as necessary to keep them clear of construction operations and convenient for the mail carrier. Mounts for temporarily relocating mailboxes shall conform to the Department's "Compliant Work Zone Traffic Control Device List" or the mailbox standard. Temporary relocation of mailboxes will be subsidiary to various bid items.

Remove dirt, silt, rocks, debris and other foreign matter that accumulates in structures due to the Contractor's operations as directed. Keep stream channels open at all times. This work will not be paid for directly, but will be subsidiary to pertinent Items.

Contractor questions on this project are to be addressed to the following individual(s):

Delmy Reyes Delmy.Reyes@txdot.gov

Homar Munoz Homar.Munoz@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
<https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/>

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

Project Mowing

Mow the highway right of way within the project limits a maximum of 3 cycles per year as directed. Mowing will not be measured or paid for directly, but will be subsidiary to various bid items.

The equipment used for mowing shall consist of approved mowing units capable of mowing on slopes without marring finished slope surfaces or injuring existing growth. The minimum cutting width shall not be less than 5 ft., unless otherwise approved.

Mow all areas of existing vegetation and vegetation placed during the project as directed. The mowing height shall be 5 in. unless otherwise directed. Repair portions of sod or grass that are injured during mowing operations as directed.

Mow as close as possible to all fixed objects, exercising extreme care not to damage trees, plants, shrubs, signs, delineators or other appurtenances which are part of the facility. Hand trim around such objects, unless otherwise specified.

Use safety chains or other manufacturer's safety device to prevent damage to people or property caused by flying debris propelled out from under rotary mowers. Chains shall be a minimum size of 5/16 in. and links spaced side by side around the mower's front, sides and rear. When mowing at the specified cutting height, the chains shall be long enough to drag the ground. If at any time, it is determined mowing or trimming equipment is defective to the point that it may affect the quality of work or create an unsafe condition, then that equipment shall be immediately repaired or replaced.

Litter Pickup

Remove litter from the right of way in the limits of this project a maximum of 3 cycles per year as directed. Litter pickup will not be measured or paid for directly, but will be subsidiary to various bid items.

The equipment used for litter pickup shall be approved.

Collect and dispose of all litter deposited by construction operations or the traveling public including cans, bottles, paper, plastic items, metal scraps, lumber, etc. from within the project right of way or as directed. Properly dispose of all collected litter. Do not dump or stockpile collected litter on State property.

For removal of large dead animals, contact nearest TxDOT maintenance section for disposal instructions. Do not bury animal carcasses on State property.

Item 5: Control of the Work

In the event utility lines needing unforeseen adjustments are encountered during construction operations, alter operations and continue to prosecute the contract in such a manner that will allow utility adjustments to be made by others. An extension of working time may be granted for any delays caused by the utility adjustments if deemed necessary.

The Contractor shall contact the following when working near underground pipelines:

Gulf South – Joy Parrot, joy.parrot@bwpipelines.com, 337-988-7116

Sunoco – Juan Vasquez, jivasquez@suncologistic.com, 281-637-6490

Kinder Morgan – Cannon Vickers, cannon_vickers@kindermorgan.com

Enterprise – Tina York, tyork@eprod.com, 281-887-3343

ONEOK – Kalli Ritterbush, kalli.ritterbush@oneok.com, 405-433-1044

Buckeye – Robert Patterson, rpatterson@kielybuilds.com or David Jones, dajones@buckeye.com

Transcanada / Keystone – Todd Snow, 903-571-0801

Electronic files (pdf only) containing cross-sections will be available at the Area Engineer's office.

Precast Alternate Proposals. When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at <https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design>. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

Work in this contract is required to be done on railroad property. Cooperate with the railroads and comply with all of their requirements including obtaining required insurance and training before performing work on railroad property.

This project has a soil disturbance of 5 acres or more.

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activities in the right of way. The Department will post a large site notice, file a notice of intent (NOI), notice of change (NOC), if applicable, and a notice of termination (NOT) along with other requirements per TPDES GP TXR 150000 as the entity having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a primary operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activities in the right of way. In addition to the Department's actions, the Contractor shall file a NOI, NOC, if applicable, and NOT and post a large site notice along with other requirements as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans.

Dispose of all vegetative matter and any other materials removed from State Right of Way in accordance with applicable environmental laws, rules, regulations and requirements.

Burning locations must be approved by the Engineer prior to beginning. Burning activities must be conducted in compliance with Texas Commission on Environmental Quality (TCEQ) regulations. Notify the Engineer when burning activities will take place.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

Work on this project requires authorization from Galveston District United States Army Corps of Engineers (USACE) under Nationwide Permit 14 Pre-construction Notification. No work, including equipment / material storage or construction equipment access, is allowed between Station 210+00 to Station 214+00 and between Station 295+00 to Station 309+00 until USACE authorization has been obtained. The Engineer shall provide a copy of the authorization and permit application to the contractor once received.

Item 8: Prosecution and Progress

For this project, working days will be computed and charged in accordance with Item 8, Section 3.1.4, "Standard Workweek".

Submit monthly progress schedules no later than the 20th calendar day of the month. Failure to comply with this deadline may result in the Engineer withholding progress (monthly) payments.

Provide a Critical Path Method (CPM) Construction Schedule unless otherwise approved.

A 90 day delay has been included to allow the Contractor time to order materials and mobilize.

Item 100: Preparing Right of Way

The equipment used to trim limbs shall be approved. A boom axe will not be allowed.

Item 110: Excavation**Item 132: Embankment**

Hauling materials with scrapers across or along existing roadways will not be permitted without written permission.

Drying of material deeper than 6 inches below subgrade elevations will not be permitted without written permission.

Grading required for shaping driveways and side road turnouts for pipe culverts at all access locations, will be subsidiary to various bid items.

All blading, rolling, and scraper work to construct and remove temporary slopes adjacent to pavement drop-offs, will be subsidiary to various bid items.

Compact embankment material used to reshape existing slopes to a density comparable with adjacent undisturbed material to the satisfaction of the Engineer.

Item 150: Blading

Use blading to reshape slopes and ditches as directed.

Mix a minimum width of 6 ft. from the edge of pavement and a depth of 6 inches using approved equipment prior to blading operations to reshape front slopes. Mixing will be subsidiary to Item 150.

Item 158: Specialized Excavation Work

Use specialized excavation work at structures to improve drainage as directed.

Item 162: Sodding for Erosion Control

Provide Bermuda block sod unless St. Augustine is the prevailing grass cover at particular placement locations. Provide St. Augustine block sod at those locations.

Item 166: Fertilizer

Fertilize all seeded or sodded areas.

Item 168: Vegetative Watering

Equip water trucks with sprinkler systems capable of watering all of the entire seeded or sodded areas from the roadway.

Water all newly placed sodded or seeded areas at the time of installation. Thereafter, maintain the sodded or seeded areas in a well-watered condition, at no time allow the areas to dry to a condition where water stress is evident.

Item 169: Soil Retention Blankets

In areas designated for soil retention blankets (SRB) in the plans, furnish only spray-on products listed on the Approved Product List for Erosion Control Products based upon the Class and Type specified in the plans. Any substitution to spray-on products must be approved in writing, be listed on the Approved Product List for Erosion Control Products based upon Class and Type, and shall not contain UV degradable, photodegradable or polypropylene materials.

Item 275: Cement Treatment (Road-Mixed)

No strength requirement is specified. The target cement content is 3%.

Compact and sprinkle pulverized sections for dust control as directed for traffic use.

Cement treat pulverized sections within 2 days, unless otherwise authorized.

Provide all profile measurement to the Engineer in electronic data files within 3 days after placement of the prime coat using the format specified in Tex-1001-S. The Engineer will use Department software to evaluate longitudinal profiles to determine areas requiring corrective action. Correct 0.1-mi. sections having an average international roughness index (IRI) value greater than 100.0 in. per mile to an IRI value of 100.0 in. per mile or less for each wheel path, unless otherwise shown on the plans.

Item 316: Seal Coat

Apply the covered prime weekly.

Open season for asphalt placement is from May 1 thru August 31. Do not place asphalt outside the open season without written approval.

The uniformity and rate of distribution of asphaltic material will be checked periodically during construction. Apply the seal coat in lane widths unless otherwise directed. Where extra width of surfacing has been provided in transitions and climbing lanes, seal the entire surface width.

Resurface county road turnouts and intersection areas as directed.

Place surface on driveways and other road turnouts prior to placing the final roadway surface.

Cease application of asphalt 2 hr. before sunset unless otherwise directed.

Cure the first course of the surface treatment as directed prior to placing the second course.

Cure the surface treatment as directed prior to placement of the overlay.

Cure the covered prime a minimum of 14 days prior to placement of the surface treatment.

Use pre-coated aggregate with AC-15P or AC-10-2TR, and use non-pre-coated aggregate with RC-250 and CRS-2P.

Furnish medium pneumatic tire rollers in accordance Item 210, "Rolling". Provide enough rollers to perform the work as directed.

Sweep all roadways with a powered rotary broom prior to placement of the surface treatment to remove all loose or excess material or debris. After rolling, sweep as soon as aggregate has sufficiently bonded to remove excess. Use a vacuum broom on all roadway sections having curb and gutter and all roadway sections within the city limits of any city.

Item 354: Planing and Texturing Pavement

Complete planing operations in adjacent lanes and shoulders to the same point at the end of each day.

RAP produced from this project may be used in the HMA mixtures. All RAP not utilized in the HMA shall be delivered to the TxDOT maintenance facility located at Polk County Maintenance Facility, 3161 US Highway 59 N, Livingston, TX 77351.

Blade the existing paved shoulders prior to planing operations to remove existing overgrowth. This work will be subsidiary to Item 354.

Cut the existing shoulder pavement to drain water away from planed travel lanes. This work will be subsidiary to various bid items.

Use an approved ski device to control longitudinal grade.

Where the underlying flexible base is exposed during the planing operation, prime exposed area with asphalt at the rate directed and patch with an approved HMA material at the end of the day's operation in which it occurs. These items of work will not be paid for directly but will be subsidiary to Item 354.

Item 400: Excavation and Backfill for Structures

When cutting an existing roadway open to traffic, complete all operations including structural excavation, laying pipe and backfilling within daylight hours the day they are initiated.

Replace excavated material deemed unsuitable for backfilling with material approved by the Engineer, paid for under the pertinent bid items or as extra work. This provision does not apply to excavated materials that are too wet and are replaced for the Contractor's convenience to expedite the work.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use. Additional material will be subsidiary to various bid items.

Item 420: Concrete Substructures

Limit work on structures crossing the roadway to one side of the roadway at a time. No work shall begin on the opposite side of the roadway until backfilling of the initially extended portion of the structure is completed.

Item 421: Hydraulic Cement Concrete

The Engineer will provide curing facilities and strength testing equipment for acceptance testing at Livingston Area Engineer Office, 3161 US 59 N, Livingston, TX 77351.

Item 432: Riprap

Stone riprap will require the placement of filter fabric prior to placement of stones.

Welded wire fabric will not be allowed for reinforcing concrete riprap. Reinforcing shall consist of No. 3 or 4 bars meeting the requirements of grade 60 reinforcing steel. Place bars on 12 in. centers in each direction, supported on reinforcing chairs.

Item 454: Bridge Expansion Joints

The approved expansion joint systems for Header Joints (Item 454) and Asphalt Plug Joints (SS 4013) is available from the Department's Bridge Division at:

<http://www.txdot.gov/inside-txdot/division/bridge/approved-systems/expansion-joints.html>

Item 462: Concrete Box Culverts and Drains

Provide precast box culverts at Culvert 22 STA 322+22.

Provide cast-in-place box culverts at Culvert 2 STA 57+88, Culvert 3 STA 65+60, Culvert 5 STA 74+60, Culvert 14 STA 188+47, Culvert 16 STA 211+08 and Culvert 21 STA 278+95.

Limit work on box culverts crossing the roadway to one side of the roadway at a time. No work shall begin on the opposite side of the roadway until backfilling of the first side of the box culvert being extended is complete.

Item 464: Reinforced Concrete Pipe

Lay each private entrance or side road pipe culvert to the line and grade as directed.

At locations where existing driveway pipes are to be removed and replaced, replace the top 3 in. of the existing driveway with material equal to or better than the existing driveway material. This work will be subsidiary to various bid items.

Limit work on pipe culverts crossing the road to one side of the roadway at a time. No work shall begin on the opposite side of the roadway until backfilling the first side of the pipe culvert being extended is complete.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use.

Item 465: Junction Boxes, Manholes, and Inlets

All junction boxes, manholes, and inlets are to be precast unless otherwise shown on the plans or directed by the Engineer.

Item 466: Headwalls and Wingwalls

Provide cast-in-place headwalls and wingwalls.

Item 467: Safety End Treatment

Use Type II precast concrete units of the same style and design.

Provide 12 in. deep toewalls on Type II precast safety end treatments.

To improve drainage, grade existing ditch within ten feet of proposed safety end treatment. This work shall be subsidiary to Item 467.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use. Additional material will be subsidiary to various bid items.

Check each location where safety end treatments are to be installed to verify pipe lengths shown will produce the desired slope. Extra pipe will be paid for, but removing and replacing safety end treatment units previously installed under this Contract will not be paid for.

Place safety end treatments along the same slope as the pipe.

Item 480: Cleaning Existing Culverts

Certain box culverts will require cleaning to remove silt and other debris. Waters carried by these box culverts have been determined to be waters of the United States and are under jurisdiction of the U.S. Army Corps of Engineers. Silt and other debris removal shall be immediately hauled to an upland location for dumping. Material will not be side cast into either the water channel or its banks. Removal of the sediment is limited to the minimum necessary to restore the waterway to its configuration when the structure was built. No work will be allowed outside of the right-of-way. This work shall also be restricted to a distance of no more than 10 ft. from the end of the structure.

Item 496: Removing Structures

Place salvageable county road pipe at the Right of Way line.

Materials to be removed, which the Engineer deems salvageable, shall remain the property of the Department.

Item 502: Barricades, Signs, and Traffic Handling

Traffic Control Plan (TCP):

Ensure the Contractor's Responsible Person (CRP) or their alternate for Barricades, Signs and Traffic Handling is available at all times and able to receive instructions from the Engineer or authorized Department representative. The CRP shall be a person that is usually at the project site during normal working hours.

For protection of the traveling public, direct traffic through the work area using signs, flaggers and other devices. Required signs are shown in the plans on the Barricade and Construction Standards and Traffic Control Plan Sheets. The latest edition of the "Texas Manual on Uniform Traffic Control Devices" shall also be used as a guide for handling traffic on this project.

Use "Do Not Pass" (R4-1) signs to mark the beginnings of roadway sections where passing is prohibited and use "Pass With Care" (R4-2) signs to mark the beginnings of roadway sections where passing is permitted. Install signs at the time signing for project limits are erected. Sign placement shall be verified and approved.

This project requires speed reduction signs during construction. Fabricate, provide and maintain speed limit signs (XX mph) as shown on BC(3)-14 standards. Remove or cover regulatory (black and white) speed limit signs, when not applicable.

Furnishing, erecting, relocating and removing temporary speed zone signs is subsidiary to Item 502.

When pavement work begins, use flashing arrow panels and flaggers 24 hr. per day during inclement weather or as directed.

Install "No Center Line" (CW8-12) signs at 2-mile intervals. Install "Loose Gravel" (CW8-7) and "Next XX Miles" (CW7-3aP) signs as directed prior to the start of surface treatment operations.

In general, restrict construction work to single lane widths. Control traffic in accordance with standard drawings WZ(BTS-1) "Traffic Signal Installation Typical Details"; WZ(BTS-2) "Traffic Signal Installation Barricades and Signs"; and, Part VI of the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways". Unless otherwise approved, use an advance warning, flashing arrow panel in addition to the necessary signs, barricades, or other traffic control devices at the work area.

Restrict construction work to single lane widths with only minor disruptions in traffic flow. Lane closures shall conform to the Traffic Control Plan for lane closures as shown in the plans. No overnight closures will be permitted.

Limit lane closures for multilane roads (4 or more lanes) to 2 mi. in length, unless otherwise approved.

Lane closure lengths can exclude the end tapers.

Plan the sequence of work to minimize the time lane closures are in place. Install lane closures only where construction operations are anticipated to start within 1 hr. and limited to the amount of lane that can be reached by the construction activity within 2 hr. unless otherwise approved.

Provide flashing arrow panels to supplement required signs and devices for lane closures.

Provide temporary rumble strips as shown on work zone rumble strip standards.

Provide adequate flaggers to protect the traveling public when working on or near a roadway carrying traffic. All flaggers shall wear hardhats and reflective vests.

Install "Be Prepared to Stop" (CW3-4) and "Flagger Ahead" (CW20-7aD) signs when flaggers are present. Position the signs where good visibility and traffic control can be maintained.

Use a flashing arrow board in addition to the required signs to warn motorists of flaggers.

Use additional flaggers at roadway intersections to direct traffic entering the work area, when deemed necessary by the Engineer.

Open all traffic lanes to traffic at the close of work each day.

Install "Pavement Ends" (CW8-3) and "30 mph" (CW13-1P) signs where the paved surface of the road ends. Use flashing arrow panels to supplement these signs during nighttime hours.

Provide one high-intensity yellow, rotating dome-light on all equipment such as distributors, spreader boxes, lay-down machines, rollers, backhoes, road graders, loaders, etc. Mount lights high enough to be visible from all directions and operating when the equipment is within 30 ft. of the travel way. On all other equipment such as trucks, trailers, automobiles, etc. use emergency flashers while within the work zone.

Install "Shoulder Drop-Off" (CW8-9aT) and "Uneven Lanes" (CW8-11) signs at one-half mile spacings as the hot mix asphalt is placed, unless otherwise directed. Maintain signs until the condition is eliminated.

Install vertical panels or drums at 100-ft. spacings where drop-offs or construction work occurs along edges of existing pavement. Unless otherwise authorized, these shall remain in place until final striping.

Install "Slow Down on Wet Road" (CW8-5aT), "Shoulder Drop-Off" (CW8-17), "Uneven Lanes" (CW8-11), "Bump" (CW8-1) and "Soft Shoulder" (CW8-4) signs during construction as directed.

Restrict construction operations so that no drop off along the edge of pavement will remain overnight.

All blading, rolling and scraper work to construct and remove temporary slopes adjacent to pavement drop-offs, will be considered subsidiary to various bid items.

Notify the Engineer prior to placing any materials or equipment on the right of way. Locate equipment, stockpiles or other materials not in use as far as possible from the driving lanes and in no case closer than 30 ft. unless otherwise authorized. Any equipment, stockpiles, or materials placed within 30 ft. of the driving lane must have adequate signs, barricades or other warning devices as approved. As a minimum place an 8 ft. wide TY III Barricade or drums on the approach side of each site that is within 30 ft. of the driving lane. Use TY III Barricade or drums for the site similarly on the departure side if the location is within 30 ft. of the opposing traffic lane.

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Texas Transportation Code 547.105 authorizes the use of warning lights to promote safety and provides an effective means of gaining the travelling public's attention as they drive in areas where construction crews are present. In order to influence the public to move over when high risk construction activities are taking place, minimize the utilization of blue warning lights. These lights must be used only while performing work on or near the travel lanes or shoulder where the travelling public encounters construction crews that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control. Refrain from leaving the warning lights engaged while travelling from one work location to another or while parked on the right of way away from the pavement or a work zone.

Temporary stop lines as shown on TCP (2-2)-18 should be omitted.

Provide an illuminated flagger station when nighttime work is performed.

All workers on TxDOT right-of-way shall wear reflective clothing meeting ANSI Class II requirements during the day and ANSI Class III requirements during the night.

Item 504: Field Office and Laboratory

Provide a Type D Structure. Asphalt content will be determined by the ignition method.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

Locations and types of BMPs may require adjustments prior to or after placement as directed by the Engineer. Adjustments should be made to ensure BMPs are working effectively and maintain

compliance with the Construction General Permit and water quality requirements associated to Section 404/401 permits. Notify the Engineer prior to making adjustments.

Item 512: Portable Concrete Traffic Barrier

Repair or replace any damage to pavement and/or bridge deck caused by installing, moving, or removing barrier sections at the contractor's expense.

Item 529: Concrete Curb, Gutter, and Combined Curb and Gutter

Concrete curb for the metal beam guard fence transition shall have one No. 3 or No. 4 bar for longitudinal reinforcement. Dowel the curb into the pavement structure using 12 in. long No. 3 or No. 4 bars at 18 in spacing.

Item 530: Intersections, Driveways, and Turnouts

Welded wire fabric will not be allowed for reinforcing concrete driveways. Use reinforcing steel consisting of No. 3 or 4 bars meeting the requirements of grade 60 reinforcing steel. Place bars on 12 in. centers in each direction, supported on reinforcing chairs.

Unless otherwise directed, install 1/2 in. pre-molded expansion joint material between existing concrete and new concrete.

Item 540: Metal Beam Guard Fence

Use round timber posts.

Use timber post on all metal beam guard fence installations except where steel posts are required. Determine length of steel posts for low fill culvert post mounting in the field to insure proper metal beam guard fence height.

At the close of work each day, protect the ends of metal beam guard fence in an approved manner, so that no blunt ends are exposed to approaching traffic. Plastic drums will be required at these locations.

Item 545: Crash Cushion Attenuators

Low maintenance system with narrow back-up width.

Item 560: Mailbox Assemblies

Repair and, if necessary, replace mailboxes damaged by construction operations.

The number and type of mailbox assemblies shown in the plans are for estimating purposes; actual quantities may vary.

Use 1 size 3 reflector mounted as directed for single and double mailbox assemblies.

Use 1 strip of reflective sheeting for multiple mailbox assemblies in lieu of the Type 2 object marker shown on the mailbox standards. Each strip shall be approximately 12 in. wide. Use reflective sheeting conforming to DMS-8600.

Item 585: Ride Quality for Pavement Surfaces

Use Surface Test Type B pay adjustment schedule 2.

Item 618: Conduit

When conduit is laid in a trench or bored, minimum depth to the top of the conduit shall be 3 ft. Where obstructions prevent laying conduit at this depth, place conduit at the maximum depth possible.

Where a trench for laying conduit is cut through pavement, surfaced shoulder, median or driveway, replace the base and surfacing with similar materials equal in appearance and quality to the original construction. Replacing base and surfacing will be subsidiary to Item 618.

Place conduit under existing pavement by boring unless otherwise directed. Pits for boring shall not be closer than 2 ft. from edge of pavement unless otherwise approved. Water jetting will not be permitted. At the close of work each day, cover all open pits and barricade for safety.

When boring is used for under-pavement conduit installations, maximum allowable overcut shall be 1 in. diameter.

Use of a pneumatically driven device for punching holes beneath pavement (commonly known as a "missile") will not be permitted on this project.

All underground conduit bends of 45° or more in PVC conduit systems, including bends into ground boxes, shall be made with rigid metal conduit. Where rigid metal conduit is exposed at any point and where rigid metal conduit extends into ground boxes, bond the metal conduit to the grounding conduction with grounding type bushings or by other approved UL listed grounding connectors. Rigid metal bends will not be paid for separately but will be incidental to the PVC conduit system.

The location of conduits is diagrammatic only and may be shifted to accommodate field conditions as directed.

Item 624: Ground Boxes

Location and estimated number of ground boxes are diagrammatic only. The location and number of ground boxes may vary to accommodate field conditions as directed.

Item 644: Small Roadside Sign Assemblies

Install adjacent signs with bottom edges at equal heights.

Sign placement shall be in accordance with the "Sign Crew Field Book" and 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. Stake all sign support locations for verification and approval.

Existing supports shall not be reused, and shall become the property of the Contractor.

Salvage all sign blanks to be removed and deliver the same day to TxDOT's facility at Polk County Maintenance Facility, 3161 US Highway 59 N, Livingston, TX 77351.

Place relocated signs as close as feasible to existing signs, unless placement conflicts with the Sign Crew Field Book.

Prior to ordering signs, advisory speeds at horizontal curves shall be verified by the department.

Wrap red retroreflective tape (NGIP Code 801-49-87-1008) around the support post of all STOP. Tape shall be placed approximately 4 feet above the surface of the edge of the roadway adjacent to the sign and shall be wrapped to a height of 12 inches. The tape and the placement of the tape on the sign posts shall be subsidiary to the sign assembly.

Item 656: Foundations for Traffic Control Devices

Note and heed all utility warnings before digging in the vicinity of underground utilities.

Before excavating for foundations, take adequate precautions, by probing or uncovering by hand, to prevent damage to storm sewers and public or private utilities. Locations of utility lines and cables shown in the plans are approximate. Other lines and cables may have been installed since completion of these plans.

Item 658: Delineator and Object Marker Assemblies

Install delineators on the departure side of the posts when mounting to metal beam guard fence and guardrail end treatments.

Install CTB barrier reflectors on top of concrete bridge rail and concrete barriers.

Install D-SW delineators on the departure side of steel bridge rail posts.

Item 662: Work Zone Pavement Markings

Place standard work zone pavement markings before traffic is routed over detours.

Install standard work zone pavement markings on the level-up course of the overlay.

Standard work zone pavement markings shall be paint and glass beads or thermoplastic.

Install short term pavement markings (removable) on the hot mix asphalt immediately following final rolling.

Install short term pavement markings (removable) on the finish course of the overlay immediately following final rolling, offset from lane lines so there will be no conflict with permanent stripes.

Place short term pavement markings on the existing pavement after planing.

After placement of permanent striping on the finish course, remove all short term pavement markings.

Furnish Type II glass beads conforming to DMS-8290, "Glass Traffic Beads", for hot applied thermoplastic and traffic paint markings.

Item 666: Reflectorized Pavement Markings

Remove loose aggregate immediately prior to placing pavement markings.

Place reflectorized pavement markings no sooner than 3 days nor later than 14 days after placement of the surface treatment.

Type I markings must meet the minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application.

Before construction operations begin, observe and mark existing passing/no passing zones. Passing/no passing zones shall be verified prior to placement of permanent pavement markings.

Furnish Type II glass beads conforming to DMS-8290, "Glass Traffic Beads", for Type I and II Markings.

Use Type II pavement markings as a sealer for Type I pavement markings.

Item 672: Raised Pavement Markers

Place permanent raised pavement markers after permanent striping has been completed.

Item 684: Traffic Signal Cables

Identify each cable as shown in the plans (Cable 1, etc.) with permanent marking labels (Panduit Type PLM standard single marker tie, Thomas and Betts TY 548M, or equivalent) at each ground box and controller.

Furnish a written summary of the wire tests. This summary shall indicate a description of each wire run, length, and test readings for each test procedure. Additional information such as make, model and type of testing equipment used for each test and the name and title of the individual who performed the tests must be included. Certify the test results as being true and correct prior to submission to the Engineer. Upon detection of a failed wire run test, forward documentation of the failed test to the Engineer and replace the wire run.

Item 3076: Dense-Graded Hot-Mix Asphalt

Trial batches may be required whenever the design has not been produced in the previous 12 months. Trial batches will be subsidiary to the bid item.

No surface aggregate classification is required.

TX-203 Will be ran on the complete mix and a requires minimum of 45%

No Department-owned RAP is available.

RAP produced from this project may be used in the HMA mixtures. All RAP not utilized in the HMA shall be delivered to the TxDOT maintenance facility located at Polk County Maintenance Facility, 3161 US Highway 59 N, Livingston, TX 77351

Provide a tack that meets the requirements of Item 300, Table 3A or Table 10A, unless otherwise approved by the engineer.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough so that stopping between trucks is not ordinarily required. If, in the opinion of the Engineer, sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

A material transfer vehicle (MTV) will be required for all courses of HMA on this project. An MTV is defined as a self-propelled, wheel-mounted vehicle capable of receiving HMA from the haul trucks separate from the paver. The MTV shall have a minimum storage capacity of approximately 25 tons and shall be equipped with a pivoting discharge conveyor and a means of completely remixing the HMA prior to placement.

Add hydrated lime to all HMA mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP and/or RAS. Mixtures that contain RAP and/or RAS shall be designed at a rate of minimum 0.5 % of lime by weight and the test results will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, "Lime and Lime Slurry". The hydrated lime shall be added in accordance with the construction method in Item 301, "Asphalt Antistripping Agents". This lime will be subsidiary to this item.

Cover each load of mixture with waterproof tarpaulins.

Limit uneven pavement to 2 days production.

For HMA placements greater than 2 inches, construct longitudinal joints adjacent to travel ways with a maximum 1 inch vertical edge and an adjacent 3:1 maximum taper.

Along outside pavement edges construct a 3:1 maximum taper or backfill the same day as shown on the plans or as directed.

Remove and properly dispose of any piles of asphaltic concrete and all other debris left on the right of way daily.

Item 3077: Superpave Mixtures

No Department-owned RAP is available.

TX-203 Will be ran on the complete mix and a requires minimum of 45%

Add hydrated lime to all HMA mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP and/or RAS. Mixtures that contain RAP and/or RAS shall be designed at a minimum rate of 0.5 % of lime by weight and the test results will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, "Lime and Lime Slurry". The hydrated lime shall be added in accordance with the construction method in Item 301, "Asphalt Antistripping Agents". This lime will be subsidiary to this item.

Trial batches may be required whenever the design has not been produced in the previous 12 months. Trial batches will be subsidiary to the bid item.

Provide a tack that meets the requirements of Item 300, Table 3A or Table 10A, unless otherwise approved by the engineer.

Cover each load of mixture with waterproof tarpaulins.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough so that stopping between trucks is not ordinarily required. If, in the opinion of the Engineer, sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

A material transfer vehicle (MTV) will be required for all courses of HMA on this project. An MTV is defined as a self-propelled, wheel-mounted vehicle capable of receiving HMA from the haul trucks separate from the paver. The MTV shall have a minimum storage capacity of approximately 25 tons and shall be equipped with a pivoting discharge conveyor and a means of completely remixing the HMA prior to placement.

Remove and properly dispose of any piles of asphaltic concrete and all other debris left on the right of way daily.

On Table 1 under [3077.2.1.3](#), the Sand equivalent, %, Min is void and not replaced. The minimum percent for the sand equivalent shall be 45 for the combined aggregate.

County: Polk

Sheet 13I

Highway: US 190

Control: 0213-04-050

Item 6185: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

Two (2) TMAs (stationary) will be required for this project. The contractor will be responsible for determining if multiple operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Three (3) TMAs will be required on all divided highways for mobile operations and two (2) TMAs will be required on all other roadways for each mobile operation. Quantities were estimated based on one mobile working operation, as per the number of working days. If multiple crews are utilized, additional TMAs will be required.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0213-04-050

DISTRICT Lufkin
HIGHWAY US 190

COUNTY Polk

CONTROL SECTION JOB				0213-04-050		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00132156			
COUNTY				Polk			
HIGHWAY				US 190			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6002	PREPARING ROW	STA	382.000		382.000	
	104-6009	REMOVING CONC (RIPRAP)	SY	9.000		9.000	
	105-6048	REMOVING STAB BASE & ASPH PAV (4"-11")	SY	8,719.000		8,719.000	
	110-6001	EXCAVATION (ROADWAY)	CY	43,710.100		43,710.100	
	132-6004	EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	71,005.300		71,005.300	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	901.000		901.000	
	150-6001	BLADING	STA	382.000		382.000	
	158-6003	SPEC EXCAV WORK (HYD EXCAVATOR)	HR	24.000		24.000	
	162-6002	BLOCK SODDING	SY	691.000		691.000	
	164-6021	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	198,270.000		198,270.000	
	164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	99,135.000		99,135.000	
	164-6031	CELL FBR MLCH SEED(TEMP)(COOL)	SY	99,135.000		99,135.000	
	168-6001	VEGETATIVE WATERING	MG	7,945.000		7,945.000	
	169-6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	13,361.000		13,361.000	
	260-6006	LIME TRT (EXST MATL) (6")	SY	52,282.000		52,282.000	
	260-6043	LIME (HYD, COM OR QK)(SLURRY)	TON	651.000		651.000	
	275-6001	CEMENT	TON	391.000		391.000	
	275-6002	CEMENT TREAT (EXIST MATL) (6")	SY	52,282.000		52,282.000	
	310-6009	PRIME COAT (MC-30)	GAL	20,914.000		20,914.000	
	342-6002	PFC (ASPHALT) PG76-22	TON	1,771.000		1,771.000	
	342-6006	PFC-C (AGGREGATE)(PG76 MIX) SAC-A	TON	27,780.000		27,780.000	
	354-6021	PLANE ASPH CONC PAV(0" TO 2")	SY	256,198.000		256,198.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	58,452.000		58,452.000	
	400-6005	CEM STABIL BKFL	CY	772.000		772.000	
	400-6006	CUT & RESTORING PAV	SY	71.000		71.000	
	401-6001	FLOWABLE BACKFILL	CY	31.000		31.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	104.000		104.000	
	403-6001	TEMPORARY SPL SHORING	SF	2,266.000		2,266.000	
	416-6002	DRILL SHAFT (24 IN)	LF	5,510.000		5,510.000	
	416-6005	DRILL SHAFT (42 IN)	LF	17.000		17.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	40.000		40.000	
	420-6009	CL A CONC (COLLAR)	EA	4.000		4.000	
	420-6013	CL C CONC (ABUT)	CY	101.800		101.800	
	420-6029	CL C CONC (CAP)	CY	123.000		123.000	
	420-6037	CL C CONC (COLUMN)	CY	69.400		69.400	
	420-6076	CL E CONC (SEAL SLAB)	CY	13.000		13.000	
	422-6001	REINF CONC SLAB	SF	33,970.000		33,970.000	



DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Polk	0213-04-050	14



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0213-04-050

DISTRICT Lufkin
HIGHWAY US 190

COUNTY Polk

CONTROL SECTION JOB				0213-04-050		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00132156			
COUNTY				Polk			
HIGHWAY				US 190			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	422-6015	APPROACH SLAB	CY	270.000		270.000	
	425-6011	PRESTR CONC SLAB BEAM (4SB15)	LF	7,429.470		7,429.470	
	425-6012	PRESTR CONC SLAB BEAM (5SB15)	LF	782.050		782.050	
	432-6001	RIPRAP (CONC)(4 IN)	CY	124.000		124.000	
	432-6003	RIPRAP (CONC)(6 IN)	CY	4.000		4.000	
	432-6026	RIPRAP (STONE COMMON)(DRY)(18 IN)	CY	309.000		309.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	1,606.000		1,606.000	
	432-6048	RIPRAP (CEMENT STABILIZED)(5 IN)	CY	38.000		38.000	
	450-6054	RAIL (TY SSTR) (W/DRAIN SLOTS)	LF	838.000		838.000	
	454-6004	ARMOR JOINT (SEALED)	LF	516.000		516.000	
	462-6004	CONC BOX CULV (4 FT X 3 FT)	LF	128.000		128.000	
	462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	20.000		20.000	
	462-6047	CONC BOX CULV (4 FT X 2 FT)(EXTEND)	LF	25.000		25.000	
	462-6048	CONC BOX CULV (4 FT X 3 FT)(EXTEND)	LF	38.000		38.000	
	462-6050	CONC BOX CULV (5 FT X 2 FT)(EXTEND)	LF	25.000		25.000	
	462-6055	CONC BOX CULV (6 FT X 4 FT)(EXTEND)	LF	96.000		96.000	
	462-6070	CONC BOX CULV (9 FT X 7 FT)(EXTEND)	LF	42.000		42.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	4,416.000		4,416.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	908.000		908.000	
	464-6007	RC PIPE (CL III)(30 IN)	LF	198.000		198.000	
	464-6008	RC PIPE (CL III)(36 IN)	LF	106.000		106.000	
	465-6055	INLET (COMPL)(PSL)(SL)(4FTX4FT)	EA	2.000		2.000	
	465-6558	INL(CMP)(PAZD-CZ)(FG)(3FTX3FT-3FTX3FT)	EA	1.000		1.000	
	465-6560	INL(CMP)(PAZD-CZ)(FG)(4FTX4FT-4FTX4FT)	EA	1.000		1.000	
	466-6095	HEADWALL (CH - PW - 0) (DIA= 18 IN)	EA	1.000		1.000	
	466-6097	HEADWALL (CH - PW - 0) (DIA= 24 IN)	EA	3.000		3.000	
	466-6099	HEADWALL (CH - PW - 0) (DIA= 30 IN)	EA	1.000		1.000	
	466-6101	HEADWALL (CH - PW - 0) (DIA= 36 IN)	EA	2.000		2.000	
	466-6103	HEADWALL (CH - PW - 0) (DIA= 48 IN)	EA	1.000		1.000	
	466-6104	HEADWALL (CH - PW - 0) (DIA= 54 IN)	EA	1.000		1.000	
	466-6106	HEADWALL (CH - PW - 0) (DIA= 66 IN)	EA	2.000		2.000	
	466-6107	HEADWALL (CH - PW - 0) (DIA= 72 IN)	EA	2.000		2.000	
	466-6130	HEADWALL (CH - PW - S) (DIA= 24 IN)	EA	1.000		1.000	
	466-6185	WINGWALL (PW - 2) (HW=10 FT)	EA	1.000		1.000	
	466-6192	WINGWALL (PW - 2) (HW=3 FT)	EA	3.000		3.000	
	466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	6.000		6.000	
	466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA	2.000		2.000	

DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Polk	0213-04-050	14A



CONTROLLING PROJECT ID 0213-04-050

DISTRICT Lufkin
HIGHWAY US 190

COUNTY Polk

Estimate & Quantity Sheet

CONTROL SECTION JOB				0213-04-050		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00132156			
COUNTY				Polk			
HIGHWAY				US 190			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	466-6196	WINGWALL (PW - 2) (HW=7 FT)	EA	1.000		1.000	
	466-6197	WINGWALL (PW - 2) (HW=8 FT)	EA	3.000		3.000	
	467-6358	SET (TY II) (18 IN) (RCP) (4: 1) (C)	EA	1.000		1.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	257.000		257.000	
	467-6390	SET (TY II) (24 IN) (RCP) (4: 1) (C)	EA	5.000		5.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	42.000		42.000	
	467-6419	SET (TY II) (30 IN) (RCP) (4: 1) (C)	EA	2.000		2.000	
	467-6423	SET (TY II) (30 IN) (RCP) (6: 1) (P)	EA	3.000		3.000	
	467-6450	SET (TY II) (36 IN) (RCP) (4: 1) (C)	EA	2.000		2.000	
	467-6454	SET (TY II) (36 IN) (RCP) (6: 1) (P)	EA	4.000		4.000	
	480-6001	CLEAN EXIST CULVERTS	EA	7.000		7.000	
	496-6001	REMOV STR (BOX CULVERT)	EA	1.000		1.000	
	496-6002	REMOV STR (INLET)	EA	1.000		1.000	
	496-6004	REMOV STR (SET)	EA	3.000		3.000	
	496-6005	REMOV STR (WINGWALL)	EA	2.000		2.000	
	496-6010	REMOV STR (BRIDGE 100 - 499 FT LENGTH)	EA	2.000		2.000	
	496-6016	REMOV STR (PIPE)	EA	124.000		124.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	40.000		40.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	7,720.000		7,720.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	7,720.000		7,720.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	780.000		780.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	780.000		780.000	
	506-6034	CONSTRUCTION PERIMETER FENCE	LF	1,002.000		1,002.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20,835.000		20,835.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	20,835.000		20,835.000	
	512-6072	PTB (FRN&INSTL)(SGL SLP)(TY 1) OR (STL)	LF	1,110.000		1,110.000	
	512-6074	PTB (MOVE)(SGL SLP)(TY 1) OR (STL)	LF	1,110.000		1,110.000	
	512-6076	PTB (REMOVE)(SGL SLP)(TY 1) OR (STL)	LF	1,110.000		1,110.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	83.000		83.000	
	530-6002	INTERSECTIONS (ACP)	SY	3,113.000		3,113.000	
	530-6004	DRIVEWAYS (CONC)	SY	1,231.000		1,231.000	
	530-6005	DRIVEWAYS (ACP)	SY	15,111.000		15,111.000	
	533-6001	RUMBLE STRIPS (SHOULDER)	LF	75,097.000		75,097.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	1,625.000		1,625.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	8.000		8.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	600.000		600.000	



DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Polk	0213-04-050	14B



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0213-04-050

DISTRICT Lufkin
HIGHWAY US 190

COUNTY Polk

CONTROL SECTION JOB				0213-04-050		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00132156			
COUNTY				Polk			
HIGHWAY				US 190			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	8.000		8.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	14.000		14.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	8.000		8.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	4.000		4.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	4.000		4.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	4.000		4.000	
	560-6004	MAILBOX INSTALL-S (TWG-POST) TY 2	EA	97.000		97.000	
	560-6005	MAILBOX INSTALL-D (TWG-POST) TY 2	EA	4.000		4.000	
	560-6006	MAILBOX INSTALL-M (TWG-POST) TY 2	EA	9.000		9.000	
	610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	5.000		5.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	1,015.000		1,015.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	150.000		150.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	45.000		45.000	
	618-6070	CONDT (RM) (2")	LF	320.000		320.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF	1,485.000		1,485.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	3,370.000		3,370.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	65.000		65.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	125.000		125.000	
	624-6002	GROUND BOX TY A (122311)W/APRON	EA	4.000		4.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	1.000		1.000	
	624-6028	REMOVE GROUND BOX	EA	2.000		2.000	
	628-6045	ELC SRV TY A 240/480 060(NS)SS(E)SP(O)	EA	1.000		1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1.000		1.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	17.000		17.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1.000		1.000	
	644-6031	IN SM RD SN SUP&AM TYS80(1)SA(T-2EXT)	EA	2.000		2.000	
	644-6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA	4.000		4.000	
	644-6051	IN SM RD SN SUP&AM TYS80(2)SA(P-EXAL)	EA	1.000		1.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA	52.000		52.000	
	644-6061	IN SM RD SN SUP&AM TYTWT(1)WS(T)	EA	27.000		27.000	
	644-6075	RELOCATE SM RD SN SUP&AM(SIGN ONLY)	EA	5.000		5.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	100.000		100.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	20.000		20.000	
	658-6016	INSTL DEL ASSM (D-SW)SZ (BRF)GF1 (BI)	EA	44.000		44.000	
	658-6099	INSTL OM ASSM (OM-2Z)(WFLX)GND	EA	69.000		69.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	153,851.000		153,851.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	76,926.000		76,926.000	

DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Polk	0213-04-050	14C



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0213-04-050

DISTRICT Lufkin
HIGHWAY US 190

COUNTY Polk

CONTROL SECTION JOB				0213-04-050		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00132156			
COUNTY				Polk			
HIGHWAY				US 190			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	41,554.000		41,554.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	41,554.000		41,554.000	
	666-6005	REFL PAV MRK TY I (W)4"(DOT)(090MIL)	LF	235.000		235.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	1,155.000		1,155.000	
	666-6299	RE PM W/RET REQ TY I (W)4"(BRK)(090MIL)	LF	23,080.000		23,080.000	
	666-6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	91,430.000		91,430.000	
	666-6311	RE PM W/RET REQ TY I (Y)4"(BRK)(090MIL)	LF	19,513.000		19,513.000	
	666-6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	102,029.000		102,029.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	1,474.000		1,474.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	28.000		28.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA	2.000		2.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	6.000		6.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	4.000		4.000	
	668-6108	PREFAB PAV MRK TY C (Y) (24") (SLD)	LF	200.000		200.000	
	672-6007	REFL PAV MRKR TY I-C	EA	1,209.000		1,209.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	3,136.000		3,136.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	170,804.000		170,804.000	
	690-6038	REMOVAL OF CONTROL CABINET(GRND MNT)	EA	1.000		1.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON	34,503.000		34,503.000	
	3076-6003	D-GR HMA TY-B PG64-22 (EXEMPT)	TON	268.000		268.000	
	3076-6004	D-GR HMA TY-B PG64-22 (LEVEL-UP)	TON	15,383.000		15,383.000	
	3076-6066	TACK COAT	GAL	10,456.000		10,456.000	
	3077-6011	SP MIXESSP-CPG64-22	TON	26,997.000		26,997.000	
	3077-6032	SP MIXESSP-CPG76-22	TON	38,885.000		38,885.000	
	3077-6033	SP MIXESSP-CSAC-A PG76-22	TON	6,430.000		6,430.000	
	3084-6001	BONDING COURSE	GAL	153,938.000		153,938.000	
	3085-6001	UNDERSEAL COURSE	GAL	70,363.000		70,363.000	
	6000-6005	REMOVE UNDERGROUND CONDUIT	LF	100.000		100.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6064-6019	ITS POLE (40 FT)(90 MPH)	EA	1.000		1.000	
	6064-6072	ITS POLE MNT CAB (TY 1)(CONF 1)	EA	1.000		1.000	
	6185-6002	TMA (STATIONARY)	DAY	176.000		176.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	286.000		286.000	
	6227-6001	SOLAR POWERED LED WARNING SIGN	EA	1.000		1.000	
	6304-6001	ITS RVSD (DATA COLLECT ONLY) SYS	EA	1.000		1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Polk	0213-04-050	14D



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0213-04-050

DISTRICT Lufkin
HIGHWAY US 190

COUNTY Polk

CONTROL SECTION JOB				0213-04-050		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00132156			
COUNTY				Polk			
HIGHWAY				US 190			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

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MAILBOX SUMMARY				
ITEM		560		
STATION	LT/RT	MAILBOX INSTALL-S (TWG-POST) TY 2	MAILBOX INSTALL-D (TWG-POST) TY 2	MAILBOX INSTALL-M (TWG-POST) TY 2
		EA	EA	EA
47+97.00	LT	1		
51+15.00	LT	1		
53+50.00	LT	2		
60+23.00	LT	1		
66+42.00	LT	1		
67+89.00	LT	1		
69+58.00	LT	1		
75+49.00	RT			1
76+69.00	LT	1		
82+36.00	LT	1		
94+02.00	LT	1		
94+57.00	RT	1		
95+45.00	LT	1		
97+78.00	RT	1		
107+55.00	RT	1		
109+36.00	RT	1		
109+94.00	RT	1		
111+17.00	RT	1		
113+46.00	LT	1		
120+62.00	LT	1		
129+88.00	RT			1
139+43.00	LT	1		
154+42.00	RT	1		
154+89.00	RT	1		
166+52.00	RT	1		
167+49.00	RT	1		
172+36.00	RT	1		
176+10.00	RT	1		
176+76.00	RT	1		
179+52.00	RT	1		
179+91.00	RT	1		
180+38.00	LT	1		
184+05.00	LT	1		
184+65.00	RT	1		
194+47.00	RT	1		
197+12.00	LT	1		
197+49.00	RT	1		
199+81.00	RT	1		
202+53.00	RT	1		
205+17.00	LT	1		
207+02.00	LT	1		
209+37.00	LT	1		
218+04.00	RT	1		1
219+32.00	RT	1		
221+49.00	LT	1		
222+43.00	RT	1		
224+25.00	LT	1		
226+54.00	RT	1		
227+17.00	RT	1		
229+72.00	RT	1		
232+72.00	LT		1	2
232+95.00	RT	1		
234+91.00	LT	1		
235+43.00	RT	1		
236+59.00	LT	1		
237+83.00	RT	1		
238+85.00	RT	1		
240+69.00	RT	1		
241+58.00	RT	1		
244+07.00	RT	1		
251+33.00	LT	1		
252+23.00	LT	1		
260+13.00	LT	1		
263+54.00	LT	1		
263+92.00	RT	1		
264+78.00	RT	1		
266+11.00	LT	1		
268+79.00	LT	1		
271+85.00	RT	1		
273+44.00	RT	1		
283+78.00	RT	1		
321+34.00	RT	1		
321+61.00	LT		1	
327+61.00	LT	1		
329+55.00	RT	1		
333+07.00	LT		1	
SUBTOTAL		72	3	5

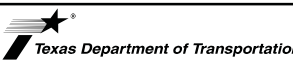
MAILBOX SUMMARY (CONT.)				
ITEM		560		
STATION	LT/RT	MAILBOX INSTALL-S (TWG-POST) TY 2	MAILBOX INSTALL-D (TWG-POST) TY 2	MAILBOX INSTALL-M (TWG-POST) TY 2
		EA	EA	EA
335+64.00	RT	1		
337+63.00	LT	1		
337+74.00	RT	1		
340+34.00	LT	1		
342+58.00	RT	1		1
348+04.00	LT			1
355+44.00	LT	1		
363+87.00	LT	1		
370+23.00	LT			2
370+23.00	RT	1		
374+37.00	LT	1		
375+41.00	LT	1		
377+28.00	RT	1		
377+69.00	LT	1		
380+99.00	LT	1		
386+95.00	LT	1		
388+06.00	RT	1		
389+57.00	LT	1		
391+19.00	RT	1		
393+32.00	RT	1		
399+50.00	RT	1		
403+25.00	RT	1		
403+71.00	LT	1		
404+65.00	RT	1		
406+08.00	LT	1		
407+63.00	LT	1		
409+89.00	RT	1		
415+83.00	RT		1	
SUBTOTAL		25	1	4
PROJECT TOTALS (0213-04-050)		97	4	9

MULTIPLE MAILBOXES		
STATION	LT/RT	# OF MAILBOXES
75+49.00	RT	3
129+88.00	RT	3
218+04.00	RT	1
232+72.00	LT	9
342+58.00	RT	4
348+04.00	LT	3
370+23.00	LT	8

NOTE: FOR CONTRACTOR'S INFORMATION ONLY.

QUANTITY SUMMARIES
(MAILBOX)

SHEET 10 OF 19



BGE, Inc.
10777 Westheimer, Suite 400, Houston, TX 77042
Tel: 281-658-8700 • www.bgeinc.com
TBPE Registration No. F-1046

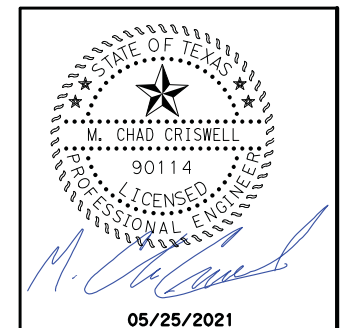
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		24	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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DRAINAGE SUMMARY																							
CULVERT NO.	STATION	EXIST CULVERT	ITEM		104	158	400	401	402	403	420	432			462								
			PROP WORK		REMOVING CONC (RIPRAP)	SPEC EXCAV WORK (HYD EXCAVATOR)	CEM STABIL BKFL	CUT & RESTORING PAV	FLOWABLE BACKFILL	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	CL A CONC (COLLAR)	CL E CONC (SEAL SLAB)	RIPRAP			CONC BOX CULV						
			LT	RT	SY	HR	CY	SY	CY	LF	SF	EA	CY	(CONC) (4 IN)	(CONC) (6 IN)	(STONE COMMON) (DRY) (18 IN)	(4 FT X 3 FT)	(3 FT X 3 FT) (EXTEND)	(4 FT X 2 FT) (EXTEND)	(4 FT X 3 FT) (EXTEND)	(5 FT X 2 FT) (EXTEND)	(6 FT X 4 FT) (EXTEND)	(9 FT X 7 FT) (EXTEND)
1	46+59.00	24" X 128' RCP W/AREA INLET LT & SET RT	EXIST AREA INLET TO BE REMAIN	REM 24" X 4' RCP & SET, EXT W/24" X 12' RCP & INSTALL CH-PW-S (24") (2:1)																			
2	57+88.00	5' X 2' X 110' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/5' X 2' X 13' RCB & INSTALL PW-2 (HW=3')	REM WINGWALL, EXT W/5' X 2' X 12' RCB & INSTALL PW-2 (HW=4')										25						25			
3	65+60.00	4' X 2' X 102' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/4' X 2' X 12' RCB & INSTALL PW-2 (HW=3')	REM WINGWALL, EXT W/4' X 2' X 13' RCB & INSTALL PW-2 (HW=3')										29		25							
4	71+20.00	24" X 100' RCP W/SETS LT & RT	REM SET, EXT W/24" X 8' RCP & INSTALL PSET SC (4:1)	REM 24" X 12' RCP & SET, EXT W/24" X 30' RCP & INSTALL 24" CH-PW-0 (2:1)		2	11			102													
5	74+60.00	2-9' X 7' X 108' MBC W/WINGWALLS LT & RT	REM WINGWALL, EXT W/ 2-9' X 7' X 8' MBC & INSTALL PW-2 (HW=8')	REM WINGWALL, EXT W/ 2-9' X 7' X 13' MBC & INSTALL PW-2 (HW=8')		2				348													42
6	86+20.00	30" X 130' RCP W/AREA INLET LT & SET RT	REM 30" X 6' RCP & INLET, EXT W/30" X 8' RCP & INSTALL AREA DRAIN STYLE FG	REM 30" X 12' RCP & SET, EXT W/30" X 24' RCP & INSTALL 72" CH-PW-0 (2:1)		2				168	1			37									
7	95+87.00	24" X 108' RCP W/SETS LT & RT	REM 24" X 12' RCP & SET, EXT W/24" X 24' RCP & INSTALL PSET-SC (4:1)	REM 24" X 6' RCP & SET, EXT W/24" X 28' RCP & INSTALL 24" CH-PW-0 (2:1)		2	11	4		91													
8	105+05.00	6' X 5' X 156' RCB W/WINGWALLS LT & RT	REM WINGWALL & INSTALL PW-2 (HW=8')	REM WINGWALL & INSTALL PW-2 (HW=10')		2				280													
9	110+80.00	18" X 102' RCP W/SET LT & AREA INLET RT	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)	REM INLET (TO BE FILLED WITH FLOWABLE BACKFILL)					16														
10	122+64.00	30" X 165' RCP W/AREA INLET LT & SET RT	EXIST AREA INLET TO BE REMAIN	REM 30" X 4' RCP & SET, EXT W/30" RCP X 10', INSTALL INLET (COMPL) (PSL) (SL) (4' X 4') & 72" CH-PW-0 (2:1)		9				231			46	4	32								
11	164+09.00	18" X 140' RCP W/SETS LT & RT	REM SET, EXT W/18" X 18' RCP & INSTALL 18" CH-PW-0 (2:1)	REM 18" X 6' RCP & SET, INSTALL 48" CH-PW-0 (2:1)											123								
12	169+09.00	18" X 94' RCP W/SETS LT & RT	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)					15														
13	175+10.00	24" X 75' RCP W/SETS LT & RT	REM SET, EXT W/24" X 26' RCP & INSTALL PSET-SC (4:1)	REM SET, EXT W/24" X 16' RCP & INSTALL PSET-SC (4:1)		2	15																
14	188+47.00	3' X 3' X 110' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/3' X 3' X 13' RCB & INSTALL PW-2 (HW=4')	REM WINGWALL, EXT W/3' X 3' X 7' RCB & INSTALL PW-2 (HW=7')												20							
15	197+85.00	24" X 102' RCP W/SETS LT & RT	REM SET, EXT W/24" X 18' RCP & INSTALL 24" CH-PW-0 (2:1)	REM SET, EXT W/24" X 10' RCP, INSTALL INLET (COMPL) (PSL) (SL) (4' X 4') & 66" CH-PW-0 (2:1)		2				104													
16	211+08.00	4' X 3' X 90' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/4' X 3' X 18' RCB & INSTALL PW-2 (HW=4')	REM WINGWALL, EXT W/4' X 3' X 20' RCB & INSTALL PW-2 (HW=4')																38			
17	231+56.00	36" X 92' RCP W/SETS LT & RT	REM SET, EXT W/36" X 6' RCP & INSTALL PSET-SC (4:1)	REM SET, EXT W/36" X 4' RCP & INSTALL PSET-SC (4:1)																			
18	243+10.00	18" X 96' RCP W/SETS LT & RT	EXIST SET TO BE REMAIN	REM 18" RCP X 30' & SET, EXT W/18" X 48' RCP & INSTALL PSET-SC (4:1)		2	25	13						5									
SUBTOTAL					9	16	62	17	31	0	1324	1	0	46	4	251	0	20	25	38	25	0	42

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITH THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.



QUANTITY SUMMARIES
(DRAINAGE)

SHEET 11 OF 19

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TBPPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		25	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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DRAINAGE SUMMARY (CONT.)

CULVERT NO.	STATION	EXIST CULVERT	ITEM	PROP WORK	464				465			466								466						
					RC PIPE (CL III)				INLET (COMPL) (PSL) (SL) (4FTX4FT)	INL (CMP) (PAZD-CZ) (FG) (3F) TX3FT-3FT X3FT)	INL (CMP) (PAZD-CZ) (FG) (4F) TX4FT-4FT X4FT)	HEADWALL (CH - PW - 0)								HEADWALL (CH - PW - S)	WINGWALL (PW - 2)					
					18 IN	24 IN	30 IN	36 IN				(DIA= 18 IN)	(DIA= 24 IN)	(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 66 IN)	(DIA= 72 IN)		(DIA= 24 IN)	(HW=10 FT)	(HW=3 FT)	(HW=4 FT)	(HW=6 FT)	(HW=7 FT)
EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA		
1	46+59.00	24" X 128' RCP W/AREA INLET LT & SET RT	EXIST AREA INLET TO BE REMAIN	REM 24" X 4' RCP & SET, EXT W/24" X 12' RCP & INSTALL CH-PW-S (24") (2:1)		12														1						
2	57+88.00	5' X2' X 110' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/5' X2' X 13' RCB & INSTALL PW-2 (HW=3')	REM WINGWALL, EXT W/5' X2' X 12' RCB & INSTALL PW-2 (HW=4')																		1	1			
3	65+60.00	4' X2' X 102' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/4' X2' X 12' RCB & INSTALL PW-2 (HW=3')	REM WINGWALL, EXT W/4' X2' X 13' RCB & INSTALL PW-2 (HW=3')																		2				
4	71+20.00	24" X 100' RCP W/SETS LT & RT	REM SET, EXT W/24" X 8' RCP & INSTALL PSET SC (4:1)	REM 24" X 12' RCP & SET, EXT W/24" X 30' RCP & INSTALL 24" CH-PW-0 (2:1)		38						1														
5	74+60.00	2-9' X7' X 108' MBC W/WINGWALLS LT & RT	REM WINGWALL, EXT W/2-9' X7' X 8' MBC & INSTALL PW-2 (HW=8')	REM WINGWALL, EXT W/2-9' X7' X 13' MBC & INSTALL PW-2 (HW=8')																						2
6	86+20.00	30" X 130' RCP W/AREA INLET LT & SET RT	REM 30" X 6' RCP & INLET, EXT W/30" X 8' RCP & INSTALL AREA DRAIN STYLE FG	REM 30" X 12' RCP & SET, EXT W/30" X 24' RCP & INSTALL 72" CH-PW-0 (2:1)			32													1						
7	95+87.00	24" X 108' RCP W/SETS LT & RT	REM 24" X 12' RCP & SET, EXT W/24" X 24' RCP & INSTALL PSET-SC (4:1)	REM 24" X 6' RCP & SET, EXT W/24" X 28' RCP & INSTALL 24" CH-PW-0 (2:1)			52						1													
8	105+05.00	6' X5' X 156' RCB W/WINGWALLS LT & RT	REM WINGWALL & INSTALL PW-2 (HW=8')	REM WINGWALL & INSTALL PW-2 (HW=10')																	1					1
9	110+80.00	18" X 102' RCP W/SET LT & AREA INLET RT	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)	REM INLET (TO BE FILLED WITH FLOWABLE BACKFILL)																						
10	122+64.00	30" X 165' RCP W/AREA INLET LT & SET RT	EXIST AREA INLET TO BE REMAIN	REM 30" X 4' RCP & SET, EXT W/30" RCP X 10', INSTALL INLET (COMPL) (PSL) (SL) (4' X4') & 72" CH-PW-0 (2:1)			10		1													1				
11	164+09.00	18" X 140' RCP W/SETS LT & RT	REM SET, EXT W/18" X 18' RCP & INSTALL 18" CH-PW-0 (2:1)	REM 18" X 6' RCP & SET, INSTALL 48" CH-PW-0 (2:1)		18						1					1									
12	169+09.00	18" X 94' RCP W/SETS LT & RT	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)																						
13	175+10.00	24" X 75' RCP W/SETS LT & RT	REM SET, EXT W/24" X 26' RCP & INSTALL PSET-SC (4:1)	REM SET, EXT W/24" X 16' RCP & INSTALL PSET-SC (4:1)			42																			
14	188+47.00	3' X3' X 110' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/3' X3' X 13' RCB & INSTALL PW-2 (HW=4')	REM WINGWALL, EXT W/3' X3' X 7' RCB & INSTALL PW-2 (HW=7')																			1		1	
15	197+85.00	24" X 102' RCP W/SETS LT & RT	REM SET, EXT W/24" X 18' RCP & INSTALL 24" CH-PW-0 (2:1)	REM SET, EXT W/24" X 10' RCP, INSTALL INLET (COMPL) (PSL) (SL) (4' X4') & 66" CH-PW-0 (2:1)			28		1									1								
16	211+08.00	4' X3' X 90' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/4' X3' X 18' RCB & INSTALL PW-2 (HW=4')	REM WINGWALL, EXT W/4' X3' X 20' RCB & INSTALL PW-2 (HW=4')																			2			
17	231+56.00	36" X 92' RCP W/SETS LT & RT	REM SET, EXT W/36" X 6' RCP & INSTALL PSET-SC (4:1)	REM SET, EXT W/36" X 4' RCP & INSTALL PSET-SC (4:1)				10																		
18	243+10.00	18" X 96' RCP W/SETS LT & RT	EXIST SET TO BE REMAIN	REM 18" RCP X 30' & SET, EXT W/18" X 48' RCP & INSTALL PSET-SC (4:1)		48																				
SUBTOTAL					66	172	42	10	2	0	1	1	3	0	0	1	0	1	2	1	1	3	4	0	1	3

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITH THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.

QUANTITY SUMMARIES
(DRAINAGE)

SHEET 12 OF 19

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TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		26	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190



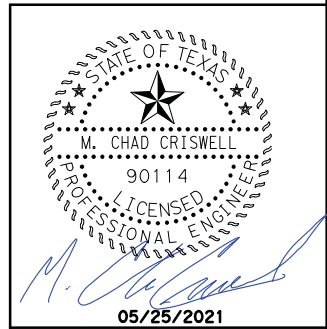
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DRAINAGE SUMMARY (CONT.)

CULVERT NO.	STATION	EXIST CULVERT	ITEM		467					480	496			
			PROP WORK		SET (TY II)					CLEAN EXIST CULVERTS	REMOV STR			
			LT	RT	(18 IN) (RCP) (4: 1) (C)	(24 IN) (RCP) (4: 1) (C)	(30 IN) (RCP) (4: 1) (C)	(30 IN) (RCP) (6: 1) (P)	(36 IN) (RCP) (4: 1) (C)		(BOX CULVERT)	(INLET)	(SET)	(WINGWALL)
EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA		
1	46+59.00	24" X 128' RCP W/AREA INLET LT & SET RT	EXIST AREA INLET TO BE REMAIN	REM 24" X 4' RCP & SET, EXT W/24" X 12' RCP & INSTALL CH-PW-S (24") (2: 1)										
2	57+88.00	5' X2' X 110' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/5' X2' X 13' RCB & INSTALL PW-2 (HW=3')	REM WINGWALL, EXT W/5' X2' X 12' RCB & INSTALL PW-2 (HW=4')										
3	65+60.00	4' X2' X 102' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/4' X2' X 12' RCB & INSTALL PW-2 (HW=3')	REM WINGWALL, EXT W/4' X2' X 13' RCB & INSTALL PW-2 (HW=3')										
4	71+20.00	24" X 100' RCP W/SETS LT & RT	REM SET, EXT W/24" X 8' RCP & INSTALL PSET SC (4:1)	REM 24" X 12' RCP & SET, EXT W/24" X 30' RCP & INSTALL 24" CH-PW-0 (2:1)		1				1				
5	74+60.00	2-9' X7' X 108' MBC W/WINGWALLS LT & RT	REM WINGWALL, EXT W/ 2-9' X7' X 8' MBC & INSTALL PW-2 (HW=8')	REM WINGWALL, EXT W/ 2-9' X7' X 13' MBC & INSTALL PW-2 (HW=8')										
6	86+20.00	30" X 130' RCP W/AREA INLET LT & SET RT	REM 30" X 6' RCP & INLET, EXT W/30" X 8' RCP & INSTALL AREA DRAIN STYLE FG	REM 30" X 12' RCP & SET, EXT W/30" X 24' RCP & INSTALL 72" CH-PW-0 (2:1)										
7	95+87.00	24" X 108' RCP W/SETS LT & RT	REM 24" X 12' RCP & SET, EXT W/24" X 24' RCP & INSTALL PSET-SC (4:1)	REM 24" X 6' RCP & SET, EXT W/24" X 28' RCP & INSTALL 24" CH-PW-0 (2:1)		1				1				
8	105+05.00	6' X5' X 156' RCB W/WINGWALLS LT & RT	REM WINGWALL & INSTALL PW-2 (HW=8')	REM WINGWALL & INSTALL PW-2 (HW=10')						1				
9	110+80.00	18" X 102' RCP W/SET LT & AREA INLET RT	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)	REM INLET (TO BE FILLED WITH FLOWABLE BACKFILL)								1	1	
10	122+64.00	30" X 165' RCP W/AREA INLET LT & SET RT	EXIST AREA INLET TO BE REMAIN	REM 30" X 4' RCP & SET, EXT W/30" RCP X 10', INSTALL INLET (COMPL) (PSL) (SL) (4' X4') & 72" CH-PW-0 (2:1)										
11	164+09.00	18" X 140' RCP W/SETS LT & RT	REM SET, EXT W/18" X 18' RCP & INSTALL 18" CH-PW-0 (2:1)	REM 18" X 6' RCP & SET, INSTALL 48" CH-PW-0 (2:1)										
12	169+09.00	18" X 94' RCP W/SETS LT & RT	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)	REM SET (TO BE FILLED WITH FLOWABLE BACKFILL)									2	
13	175+10.00	24" X 75' RCP W/SETS LT & RT	REM SET, EXT W/24" X 26' RCP & INSTALL PSET-SC (4:1)	REM SET, EXT W/24" X 16' RCP & INSTALL PSET-SC (4:1)		2								
14	188+47.00	3' X3' X 110' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/3' X3' X 13' RCB & INSTALL PW-2 (HW=4')	REM WINGWALL, EXT W/3' X3' X 7' RCB & INSTALL PW-2 (HW=7')										
15	197+85.00	24" X 102' RCP W/SETS LT & RT	REM SET, EXT W/24" X 18' RCP & INSTALL 24" CH-PW-0 (2:1)	REM SET, EXT W/24" X 10' RCP, INSTALL INLET (COMPL) (PSL) (SL) (4' X4') & 66" CH-PW-0 (2:1)										
16	211+08.00	4' X3' X 90' RCB W/WINGWALLS LT & RT	REM WINGWALL, EXT W/4' X3' X 18' RCB & INSTALL PW-2 (HW=4')	REM WINGWALL, EXT W/4' X3' X 20' RCB & INSTALL PW-2 (HW=4')										
17	231+56.00	36" X 92' RCP W/SETS LT & RT	REM SET, EXT W/36" X 6' RCP & INSTALL PSET-SC (4:1)	REM SET, EXT W/36" X 4' RCP & INSTALL PSET-SC (4:1)					2					
18	243+10.00	18" X 96' RCP W/SETS LT & RT	EXIST SET TO BE REMAIN	REM 18" RCP X 30' & SET, EXT W/18" X 48' RCP & INSTALL PSET-SC (4:1)	1									
SUBTOTAL					1	4	0	0	2	3	0	1	3	0

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITH THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.



QUANTITY SUMMARIES
 (DRAINAGE)
 SHEET 13 OF 19

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 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		27	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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DRAINAGE SUMMARY (CONT.)

CULVERT NO.	STATION	EXIST CULVERT	ITEM		104	158	400	401	402	403	420	432			462															
			PROP WORK									REMOVING CONC (RIPRAP)	SPEC EXCAV WORK (HYD EXCAVATOR)	CEM STABIL BKFL	CUT & RESTORING PAV	FLOWABLE BACKFILL	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	CL A CONC (COLLAR)	CL E CONC (SEAL SLAB)	RIPRAP			CONC BOX CULV						
			LT	RT																	(CONC) (4 IN)	(CONC) (6 IN)	(STONE COMMON) (DRY) (18 IN)	(4 FT X 3 FT)	(3 FT X 3 FT) (EXTEND)	(4 FT X 2 FT) (EXTEND)	(4 FT X 3 FT) (EXTEND)	(5 FT X 2 FT) (EXTEND)	(6 FT X 4 FT) (EXTEND)	(9 FT X 7 FT) (EXTEND)
19	263+10.00	30" X 99' RCP W/SETS LT & RT	REM 30" X 34' RCP & SET, EXT W/30" X 48' RCP & INSTALL 30" CH-PW-0 (2:1)	REM SET, EXT W/30" X 18' RCP & INSTALL PSET-SC (4:1)		2	22	5			1																			
20	273+88.00	24" X 107' RCP W/SET LT & AREA INLET RT	REM 24" X 20' RCP & SET, EXT W/24" X 14' & INSTALL PSET-SC (4:1)	REM 24" X 6' RCP & AREA INLET, EXT W/24" X 18' RCP & INSTALL AREA DRAIN STYLE FG			18			71				8																
21	278+95.00	3-6' X 4' X 96' MBC W/ WINGWALLS LT & RT	REM WINGWALL, EXT W/3-6' X 4' X 16' MBC & INSTALL PW-2 (HW=6')	REM WINGWALL, EXT W/3-6' X 4' X 16' MBC & INSTALL PW-2 (HW=6')		2						13										96								
22	322+22.00	EXIST 4' X 2.5' X 83' RCB, EXIST 4' X 3' X 22' RCB & WINGWALLS LT & RT	REM 4' X 2.5' X 83' RCB, REM 4' X 3' X 22' RCB & WINGWALL, PROP 4' X 3' X 128' RCB & INSTALL PW-2 (HW=4')	REMOVE 4' X 3' WINGWALL & INSTALL PW-2 (HW=4')			147	49		104	376		1		13		128													
23	355+92.00	30" RCP X 138' W/SETS LT & RT	REM 30" RCP X 6' RCP & SET, EXT W/30" RCP X 20' & INSTALL PSET-SC 4:1	REM 30" RCP X 18' RCP & SET, EXT W/30" RCP X 30' & INSTALL PSET-SP (6:1)		2	8					1			37															
24	386+46.00	36" X 86' RCP W/SETS LT & RT	REM SET, EXT W/36" X 20' RCP & INSTALL 36" CH-PW-0 (2:1)	REM SET, EXT W/36" X 28' RCP & INSTALL 36" CH-PW-0 (2:1)		2	7					1																		
25	417+10.00	36" X 112' RCP W/SETS LT & RT	REM SET, EXT W/ 36" X 4' RCP & INSTALL 66' CH-PW-0 (2:1)	REM 36" X 6' RCP & SET, EXT W/ 36" X 12' RCP & INSTALL 54' CH-PW-0 (2:1)																										
26	424+52.00	24" X 94' RCP W/SETS LT & RT	EXIST SET TO BE REMAIN	EXIST SET TO BE REMAIN																										
SUBTOTAL					0	8	202	54	0	104	447	3	13	1	0	58	128	0	0	0	0	96	0							
PROJECT TOTALS (CSJ 0213-04-050)					9	24	264	71	31	104	1,771	4	13	47	4	309	128	20	25	38	25	96	42							

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITH THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.



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 (DRAINAGE)
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		28	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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 DATE: 05/25/2021
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DRAINAGE SUMMARY (CONT.)																												
ITEM				464				465				466								466								
CULVERT NO.	STATION	EXIST CULVERT	PROP WORK		RC PIPE (CL III)				INLET (COMPL) (PSL) (SL) (4FTX4FT)	INL (CMP) (PAZD-CZ) (FG) (3F) TX3FT-3FT X3FT)	INL (CMP) (PAZD-CZ) (FG) (4F) TX4FT-4FT X4FT)	HEADWALL (CH - PW - 0)								HEADWALL (CH - PW - S)	WINGWALL (PW - 2)							
			18 IN	24 IN	30 IN	36 IN	(DIA= 18 IN)	(DIA= 24 IN)				(DIA= 30 IN)	(DIA= 36 IN)	(DIA= 48 IN)	(DIA= 54 IN)	(DIA= 66 IN)	(DIA= 72 IN)	(DIA= 24 IN)	(HW=10 FT)		(HW=3 FT)	(HW=4 FT)	(HW=6 FT)	(HW=7 FT)	(HW=8 FT)			
			LT	RT	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	
19	263+10.00	30" X 99' RCP W/SETS LT & RT	REM 30" X 34' RCP & SET, EXT W/30" X 48' RCP & INSTALL 30" CH-PW-0 (2:1)	REM SET, EXT W/30" X 18' RCP & INSTALL PSET-SC (4:1)			66									1												
20	273+88.00	24" X 107' RCP W/SET LT & AREA INLET RT	REM 24" X 20' RCP & SET, EXT W/24" X 14' & INSTALL PSET-SC (4:1)	REM 24" X 6' RCP & AREA INLET, EXT W/24" X 18' RCP & INSTALL AREA DRAIN STYLE FG		32				1																		
21	278+95.00	3-6'X4' X 96' MBC W/ WINGWALLS LT & RT	REM WINGWALL, EXT W/3-6'X4' X 16' MBC & INSTALL PW-2 (HW=6')	REM WINGWALL, EXT W/3-6'X4' X 16' MBC & INSTALL PW-2 (HW=6')																						2		
22	322+22.00	EXIST 4'X2.5' X 83' RCB, EXIST 4'X3' X 22' RCB & WINGWALLS LT & RT	REM 4'X2.5' X 83' RCB, REM 4'X3' X 22' RCB & WINGWALL, PROP 4'X3' X 128' RCB & INSTALL PW-2 (HW=4')	REMOVE 4'X3' WINGWALL & INSTALL PW-2 (HW=4')																						2		
23	355+92.00	30" RCP X 138' W/SETS LT & RT	REM 30" RCP X 6' RCP & SET, EXT W/30" RCP X 20' & INSTALL PSET-SC 4:1	REM 30" RCP X 18' RCP & SET, EXT W/30" RCP X 30' & INSTALL PSET-SP (6:1)			50																					
24	386+46.00	36" X 86' RCP W/SETS LT & RT	REM SET, EXT W/36" X 20' RCP & INSTALL 36" CH-PW-0 (2:1)	REM SET, EXT W/36" X 28' RCP & INSTALL 36" CH-PW-0 (2:1)				48						2														
25	417+10.00	36" X 112' RCP W/SETS LT & RT	REM SET, EXT W/ 36" X 4' RCP & INSTALL 66' CH-PW-0 (2:1)	REM 36" X 6' RCP & SET, EXT W/ 36" X 12' RCP & INSTALL 54' CH-PW-0 (2:1)				16										1	1									
26	424+52.00	24" X 94' RCP W/SETS LT & RT	EXIST SET TO BE REMAIN	EXIST SET TO BE REMAIN																								
SUBTOTAL					0	32	116	64	0	1	0	0	0	1	2	0	1	1	0	0	0	0	0	0	0	0	0	
PROJECT TOTALS (CSJ 0213-04-050)					66	204	158	74	2	1	1	3	1	2	1	1	2	2	1	1	3	6	2	0	3			

DRAINAGE SUMMARY (CONT.)														
ITEM				467					480	496				
CULVERT NO.	STATION	EXIST CULVERT	PROP WORK		SET (TY II)					CLEAN EXIST CULVERTS	REMOV STR			
			18 IN (RCP) (4:1) (C)	24 IN (RCP) (4:1) (C)	30 IN (RCP) (4:1) (C)	30 IN (RCP) (6:1) (P)	36 IN (RCP) (4:1) (C)	(BOX CULVERT)	(INLET)		(SET)	(WINGWALL)		
			LT	RT	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
19	263+10.00	30" X 99' RCP W/SETS LT & RT	REM 30" X 34' RCP & SET, EXT W/30" X 48' RCP & INSTALL 30" CH-PW-0 (2:1)	REM SET, EXT W/30" X 18' RCP & INSTALL PSET-SC (4:1)			1							
20	273+88.00	24" X 107' RCP W/SET LT & AREA INLET RT	REM 24" X 20' RCP & SET, EXT W/24" X 14' & INSTALL PSET-SC (4:1)	REM 24" X 6' RCP & AREA INLET, EXT W/24" X 18' RCP & INSTALL AREA DRAIN STYLE FG		1								
21	278+95.00	3-6'X4' X 96' MBC W/ WINGWALLS LT & RT	REM WINGWALL, EXT W/3-6'X4' X 16' MBC & INSTALL PW-2 (HW=6')	REM WINGWALL, EXT W/3-6'X4' X 16' MBC & INSTALL PW-2 (HW=6')						3				
22	322+22.00	EXIST 4'X2.5' X 83' RCB, EXIST 4'X3' X 22' RCB & WINGWALLS LT & RT	REM 4'X2.5' X 83' RCB, REM 4'X3' X 22' RCB & WINGWALL, PROP 4'X3' X 128' RCB & INSTALL PW-2 (HW=4')	REMOVE 4'X3' WINGWALL & INSTALL PW-2 (HW=4')								1		2
23	355+92.00	30" RCP X 138' W/SETS LT & RT	REM 30" RCP X 6' RCP & SET, EXT W/30" RCP X 20' & INSTALL PSET-SC 4:1	REM 30" RCP X 18' RCP & SET, EXT W/30" RCP X 30' & INSTALL PSET-SP (6:1)			1	1						
24	386+46.00	36" X 86' RCP W/SETS LT & RT	REM SET, EXT W/36" X 20' RCP & INSTALL 36" CH-PW-0 (2:1)	REM SET, EXT W/36" X 28' RCP & INSTALL 36" CH-PW-0 (2:1)										
25	417+10.00	36" X 112' RCP W/SETS LT & RT	REM SET, EXT W/ 36" X 4' RCP & INSTALL 66' CH-PW-0 (2:1)	REM 36" X 6' RCP & SET, EXT W/ 36" X 12' RCP & INSTALL 54' CH-PW-0 (2:1)										
26	424+52.00	24" X 94' RCP W/SETS LT & RT	EXIST SET TO BE REMAIN	EXIST SET TO BE REMAIN										
SUBTOTAL					0	1	2	1	0	3	1	0	0	2
PROJECT TOTALS (CSJ 0213-04-050)					1	5	2	1	2	6	1	1	3	2

ALL CULVERTS WERE ORIGINALLY ANALYZED AT A 10 YEAR FREQUENCY AND THERE IS NO HISTORICAL DATA OF OVERTOPPING EVENTS FOR ANY CULVERT LOCATION IN THIS PROJECT. CULVERTS REQUIRING HYDRAULIC ANALYSIS WERE ANALYZED AT A 10 YEAR FREQUENCY. ALL OTHER CULVERTS WITHIN THE PROJECT LIMITS ARE OPERATING AT AN ESTIMATED 10 YEAR FREQUENCY. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATER AND VELOCITIES WITH THESE STRUCTURES. ADDITIONAL STUDIES NOT JUSTIFIED.


QUANTITY SUMMARIES
 (DRAINAGE)
 SHEET 15 OF 19

 TEXAS DEPARTMENT OF TRANSPORTATION
 BGE, Inc.
 10777 Westheimer, Suite 400, Houston, TX 77042
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 TBPB Registration No. F-1046
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		29	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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TRAFFIC CONTROL SUMMARY

ITEM	512			545			662				677	6001	6185	
TCP PHASE	PTB (FRN & INSTL) (SGL SLP) (TY 1) OR (STL)	PTB (MOVE) (SGL SLP) (TY 1) OR (STL)	PTB (REMOVE) (SGL SLP) (TY 1) OR (STL)	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (REMOVE)	CRASH CUSH ATTEN (INSTL) (S) (N) (TL3)	WK ZN PAV MRK NON-REMOV (W) 4" (SLD)	WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	WK ZN PAV MRK REMOV (W) 4" (SLD)	WK ZN PAV MRK REMOV (Y) 4" (SLD)	ELIM EXT PAV MRK & MRKS (4")	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	EA	DAY	DAY
CULVERT CONSTRUCTION														
ROADWAY CONSTRUCTION														
PHASE 1	1110					4				41,554	41,554			
PHASE 2		1110	1110	4	4		153,851	76,926						
OVERLAY														
PROJECT TOTALS (0213-04-050)	1,110	1,110	1,110	4	4	4	153,851	76,926	41,554	41,554	170,804	2	176	286

TRAFFIC COUNTER SUMMARY

ITEM	416	618	620		624		690	6000	6064		6304
	DRILL SHAFT (42 IN)	CONDT (PVC) (SCH 80) (3")	ELEC CONDR (NO. 6) BARE	ELEC CONDR (NO. 6) INSULATED	GROUND BOX TY D (162922) W/ APRON	REMOVE GROUND BOX	REMOVAL OF CONTROL CABINET (GRND MNT)	REMOVE UNDERGROUND CONDUIT	ITS POLE (40 FT) (90 MPH)	ITS POLE MNT CAB (TY 1) (CONF 1)	ITS RVSD (DATA COLLECT ONLY) SYS
	LF	LF	LF	LF	EA	EA	EA	LF	EA	EA	EA
PROJECT TOTALS (0213-04-050)	17	45	65	125	1	2	1	100	1	1	1

ILLUMINATION SUMMARY

ITEM	416	610	618		620		624	628	
SHEET	DRILL SHAFT (RDWY ILL POLE) (30 IN)	IN RD IL (TY SA) 40T-8 (250W EQ) LED	CONDT (PVC) (SCH 80) (2")	CONDT (PVC) (SCH 80) (2") (BORE)	CONDT (RM) (2")	ELEC CONDR (NO. 8) BARE	ELEC CONDR (NO. 8) INSULATED	GROUND BOX TY A (122311) W/ APRON	ELC SRV TY A 240/480 060 (NS) SS (E) SP (O)
	LF	EA	LF	LF	LF	LF	LF	EA	EA
SHEET (1 OF 3)	16	2	390	150	0	540	1240	2	0
SHEET (2 OF 3)	16	2	560	0	320	880	1920	2	1
SHEET (3 OF 3)	8	1	65	0	0	65	210	0	0
PROJECT TOTALS (0213-04-050)	40	5	1015	150	320	1485	3370	4	1

MBGF SUMMARY

PAVEMENT TRANSITION	ITEM	LENGTH (FT)	540		542		544		3076
			MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	REMOVE METAL BEAM GUARD FENCE	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	D-CR HMA TY-B PG64-22 (EXEMPT)
			LF	EA	LF	EA	EA	EA	TON
INCIDENTAL	TO	42+95.91							
42+95.91	TO	46+18.52	322.61						
46+18.52	TO	47+12.00	93.48						
47+12.00	TO	50+54.42	342.42						
50+54.42	TO	88+13.00	3758.58						
88+13.00	TO	110+07.00	2194.00						
110+07.00	TO	130+61.14	2054.14	237.5			2		36
130+61.14	TO	135+18.00	456.86	150	2	150	2	2	32
135+18.00	TO	137+03.00	185.00						
137+03.00	TO	140+16.14	313.14	150	2	150	2	2	38
140+16.14	TO	160+40.00	2023.86	787.5			4		98
160+40.00	TO	178+05.00	1765.00						
178+05.00	TO	185+50.00	745.00						
185+50.00	TO	193+00.00	750.00						
193+00.00	TO	204+15.00	1115.00						
204+15.00	TO	220+60.00	1645.00						
220+60.00	TO	257+43.00	3683.00						
257+43.00	TO	279+31.00	2188.00						
279+31.00	TO	298+12.00	1881.00	150	2	150	2	2	32
298+12.00	TO	301+02.00	290.00						
301+02.00	TO	367+76.00	6674.00	150	2	150	2	2	32
367+76.00	TO	382+97.00	1521.00						
382+97.00	TO	384+84.00	187.00						
384+84.00	TO	400+99.25	1615.25						
400+99.25	TO	413+58.42	1259.17						
413+58.42	TO	419+18.42	560.00						
419+18.42	TO	422+68.48	350.06						
422+68.48	TO	423+60.00	91.52						
423+60.00	TO	427+58.42	398.42						
PROJECT TOTALS (0213-04-050)			1,625	8	600	8	14	8	268

QUANTITY SUMMARIES

(TCP, TRAFFIC & MBGF)

SHEET 16 OF 19



BGE, Inc.
 10777 Westheimer, Suite 400, Houston, TX 77042
 Tel: 281-558-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		30
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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PAVEMENT MARKING SUMMARY

PAVEMENT TRANSITION			ITEM LENGTH (FT)	533			658			666			
				RUMBLE STRIPS (SHOULDER)	INSTR DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTR DEL ASSM (D-SW) SZ (BRF) GF1 (BI)	INSTR OM ASSM (OM-2Z) (WFLX) GND	REFL PAV MRK TY I (W) 4" (DOT) (090MIL)	REFL PAV MRK TY I (W) 8" (SLD) (090MIL)	RE PM W/RET REQ TY I (W) 4" (BRK) (090MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (090MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (090MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (090MIL)
STATION	TO	STATION	LF	EA	EA	EA	LF	LF	LF	LF	LF	LF	
INCIDENTAL	TO	42+95.91						1,055	4,260	16,333	1,200	23,791	
42+95.91	TO	46+18.52	322.61	646					180	646	157	625	
46+18.52	TO	47+12.00	93.48	187			2		60	187	47	187	
47+12.00	TO	50+54.42	342.42	685					180	685	172	685	
50+54.42	TO	88+13.00	3758.58	7,474			13		1,880	7,474	1,880	7,518	
88+13.00	TO	110+07.00	2194.00	4,200			6		1,100	4,200	1,097	4,388	
110+07.00	TO	130+61.14	2054.14	4,109		9	3		1,040	4,109	1,028	4,109	
130+61.14	TO	135+18.00	456.86	914		7			240	914	229	914	
135+18.00	TO	137+03.00	185.00	370	8		4		100	370	93	370	
137+03.00	TO	140+16.14	313.14	627		8			160	627	157	627	
140+16.14	TO	160+40.00	2023.86	3,926		6			1,020	3,926	1,012	4,048	
160+40.00	TO	178+05.00	1765.00	3,394			5		900	3,394	883	3,530	
178+05.00	TO	185+50.00	745.00	1,490					380	1,490	373	1,490	
185+50.00	TO	193+00.00	750.00	1,456			3		380	1,456	375	1,500	
193+00.00	TO	204+15.00	1115.00	2,163			3		560	2,163	558	2,230	
204+15.00	TO	220+60.00	1645.00	3,027			2		840	3,027	823	3,290	
220+60.00	TO	257+43.00	3683.00	7,070			4		1,860	7,070	1,842	7,366	
257+43.00	TO	279+31.00	2188.00	4,235			8		1,100	4,235	1,094	4,376	
279+31.00	TO	298+12.00	1881.00	3,762		6			960	3,762	941	3,762	
298+12.00	TO	301+02.00	290.00	580	12	2	4		160	580	145	580	
301+02.00	TO	367+76.00	6674.00	13,092		6	4		3,340	13,092	3,337	13,348	
367+76.00	TO	382+97.00	1521.00	2,906					780	2,906	761	3,042	
382+97.00	TO	384+84.00	187.00	374					100	374	94	374	
384+84.00	TO	400+99.25	1615.25	3,231			2		820	3,231	808	3,231	
400+99.25	TO	413+58.42	1259.17	2,443				95	540	2,443	407	2,726	
413+58.42	TO	419+18.42	560.00	1,120			4	140	140	1,120		2,240	
419+18.42	TO	422+68.48	350.06	701						701		701	
422+68.48	TO	423+60.00	91.52	148						148		184	
423+60.00	TO	427+58.42	398.42	767			2			767		797	
PROJECT TOTALS (0213-04-050)			75,097	20	44	69	235	1,155	23,080	91,430	19,513	102,029	

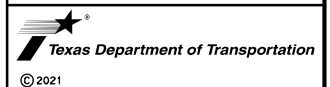
PAVEMENT MARKING SUMMARY (CONT.)

PAVEMENT TRANSITION			ITEM LENGTH (FT)	668					672		
				PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (LNDP ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (RR XING)	PREFAB PAV MRK TY C (Y) (24") (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
STATION	TO	STATION	LF	EA	EA	EA	EA	LF	EA	EA	
INCIDENTAL	TO	42+95.91		1,474	27		5	4	200	248	1,079
42+95.91	TO	46+18.52	322.61						10	18	
46+18.52	TO	47+12.00	93.48						4	6	
47+12.00	TO	50+54.42	342.42						10	18	
50+54.42	TO	88+13.00	3758.58						94	188	
88+13.00	TO	110+07.00	2194.00						56	110	
110+07.00	TO	130+61.14	2054.14						52	104	
130+61.14	TO	135+18.00	456.86						12	24	
135+18.00	TO	137+03.00	185.00						6	10	
137+03.00	TO	140+16.14	313.14						8	16	
140+16.14	TO	160+40.00	2023.86						52	102	
160+40.00	TO	178+05.00	1765.00						46	90	
178+05.00	TO	185+50.00	745.00						20	38	
185+50.00	TO	193+00.00	750.00						20	38	
193+00.00	TO	204+15.00	1115.00						28	56	
204+15.00	TO	220+60.00	1645.00						42	84	
220+60.00	TO	257+43.00	3683.00						94	186	
257+43.00	TO	279+31.00	2188.00						56	110	
279+31.00	TO	298+12.00	1881.00						48	96	
298+12.00	TO	301+02.00	290.00						8	16	
301+02.00	TO	367+76.00	6674.00						168	334	
367+76.00	TO	382+97.00	1521.00						40	78	
382+97.00	TO	384+84.00	187.00						6	10	
384+84.00	TO	400+99.25	1615.25						42	82	
400+99.25	TO	413+58.42	1259.17		1	1	1		32	107	
413+58.42	TO	419+18.42	560.00			1			7	112	
419+18.42	TO	422+68.48	350.06							10	
422+68.48	TO	423+60.00	91.52							4	
423+60.00	TO	427+58.42	398.42							10	
PROJECT TOTALS (0213-04-050)			1,474	28	2	6	4	200	1,209	3,136	

QUANTITY SUMMARIES

(PAVEMENT MARKING)

SHEET 17 OF 19



BGE, Inc.
 10777 Westheimer, Suite 400, Houston, TX 77042
 Tel: 281-558-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			31
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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 DATE: 06/07/2021
 FILE: pw:\bge-pw\bentley-combge-pw-03\Documents\BGE Projects\7005-03_US_190\163MISC\US190_QUANT_18.dgn

SIGNING SUMMARY

PAVEMENT TRANSITION			ITEM	644										6227	
STATION	TO	STATION	LENGTH (FT)	IN SM RD SN SUP & AM TY 10 BWG (1) SA (P)	IN SM RD SN SUP & AM TY 10 BWG (1) SA (T)	IN SM RD SN SUP & AM TY 10 BWG (1) SA (U)	IN SM RD SN SUP & AM TY S80 (1) SA (T-2EXT)	IN SM RD SN SUP & AM TY S80 (1) SA (U-BM)	IN SM RD SN SUP & AM TY S80 (2) SA (P-EXAL)	IN SM RD SN SUP & AM TY TWT (1) WS (P)	IN SM RD SN SUP & AM TY TWT (1) WS (T)	RELOCATE SM RD SN SUP & AM (SIGN ONLY)	REMOVE SM RD SN SUP & AM	SOLAR POWERED LED WARNING SIGN	
INCIDENTAL	TO	42+95.91		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	
42+95.91	TO	46+18.52	322.61							2			2		
46+18.52	TO	47+12.00	93.48									1			
47+12.00	TO	50+54.42	342.42		1				1				2	1	
50+54.42	TO	88+13.00	3758.58	1						4			5		
88+13.00	TO	110+07.00	2194.00		2					4			6		
110+07.00	TO	130+61.14	2054.14					2		2			4		
130+61.14	TO	135+18.00	456.86							1			1		
135+18.00	TO	137+03.00	185.00								2		2		
137+03.00	TO	140+16.14	313.14		1								1		
140+16.14	TO	160+40.00	2023.86		2					4			6		
160+40.00	TO	178+05.00	1765.00		1			2		3			6		
178+05.00	TO	185+50.00	745.00								1		1		
185+50.00	TO	193+00.00	750.00							1	1	1	1		
193+00.00	TO	204+15.00	1115.00		2					2			4		
204+15.00	TO	220+60.00	1645.00		4			1		5		1	9		
220+60.00	TO	257+43.00	3683.00		1			1		4	5		11		
257+43.00	TO	279+31.00	2188.00		2					4	1	1	6		
279+31.00	TO	298+12.00	1881.00		1					1			2		
298+12.00	TO	301+02.00	290.00								1		1		
301+02.00	TO	367+76.00	6674.00							6	9	1	14		
367+76.00	TO	382+97.00	1521.00							3	2		5		
382+97.00	TO	384+84.00	187.00								1		1		
384+84.00	TO	400+99.25	1615.25			1				3	1		5		
400+99.25	TO	413+58.42	1259.17								1				
413+58.42	TO	419+18.42	560.00							1	1		2		
419+18.42	TO	422+68.48	350.06							2	1		3		
422+68.48	TO	423+60.00	91.52												
423+60.00	TO	427+58.42	398.42												
PROJECT TOTALS (0213-04-050)				1	17	1	2	4	1	52	27	5	100	1	

EROSION CONTROL SUMMARY


ITEM	162	164			168*	169	506						
	BLOCK SODDING	CELL FBR MLCH SEED (PERM) (RURAL) (SANDY)	CELL FBR MLCH SEED (TEMP) (WARM)	CELL FBR MLCH SEED (TEMP) (COOL)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY B)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	CONSTRUCTION PERIMETER FENCE	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	SY	MG	SY	LF	LF	SY	SY	LF	LF	LF
PROJECT TOTALS (0213-04-050)	691	198,270	99,135	99,135	7,945	13,361	7,720	7,720	780	780	1,002	20,835	20,835

NOTES:

- SEE BLOCK SOD DETAILS FOR LIMITS OF PLACEMENT
 - LOCATIONS AND TYPES OF BMPs MAY REQUIRE ADJUSTMENTS PRIOR TO OR AFTER PLACEMENT AS DIRECTED BY THE ENGINEER. ADJUSTMENTS SHOULD BE MADE TO ENSURE BMPs ARE WORKING EFFECTIVELY AND MAINTAIN COMPLIANCE WITH THE CONSTRUCTION GENERAL PERMIT AND WATER QUALITY REQUIREMENTS ASSOCIATED TO SECTION 404/401 PERMITS. NOTIFY THE ENGINEER PRIOR TO MAKING ADJUSTMENTS.
- * BASED ON 10 GAL/SY FOR 2 APPLICATIONS

QUANTITY SUMMARIES
(SIGNING & SWP3)

SHEET 18 OF 19


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BGE, Inc.
10777 Westheimer, Suite 400, Houston, TX 77042
Tel: 281-658-8700 • www.bgeinc.com
TBPPE Registration No. F-1046

FED. RD. DIV. NO.		PROJECT NO.		SHEET NO.	
6				32	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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SUMMARY OF BRIDGE QUANTITIES														
BID CODES	400	403	416	420	420	420	422	422	425	425	432	450	454	496
BID ITEM DESCRIPTION	CEM STABIL BKFL	TEMPORARY SPL SHORING	DRILL SHAFT (24 IN)	① CL C CONC (ABUT)	① CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC SLAB BEAM (4SB15)	PRESTR CONC SLAB BEAM (5SB15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY SSTR) (W/DRAIN SLOTS)	ARMOR JOINT (SEALED)	REMOV STR (BRIDGE 100 - 499 FT LENGTH)
BRIDGE	CY	SF	LF	CY	CY	CY	SF	CY	LF	LF	CY	LF	LF	EA
US190 AT CHOATES CREEK	254	115	2079	51.0	41.0	14.7	12470	135.0	2726.97	287.05	625	314.0	172	1
US190 AT MENARD CREEK	254	380	3431	50.8	82.0	54.7	21500	135.0	4702.50	495.00	981	524.0	344	1
TOTAL	508	495	5510	101.8	123.0	69.4	33,970	270.0	7,429.47	782.05	1606	838.0	516	2

① QUANTITIES INCLUDE EARWALL

QUANTITY SUMMARIES (BRIDGE)

SHEET 19 OF 19



White Hawk
 308 SOUTH JURTER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 409.424.2644
 FIRM NUMBER: 12698
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FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			33
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		N TYPE	S TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels		
1	1-1	R2-1	SPEED LIMIT 50	30"X36"	X		TWT	1	WS	P			
	1-2	R2-1	SPEED LIMIT 60	30"X36"	X		TWT	1	WS	P			
	1-3		"NO ENGINE BRAKING"				RELOCATE EXISTING STREET SIGN TO PROPOSED SIGN LOCATION.						
	1-4	D2-3	INDIAN VILLAGE 16 WOODVILLE 12 JASPER 60	114"X42"	X		S80	2	SA	P	EXAL		
	1-5	W3-3		SIGNAL AHEAD	36"X36"	X		10 BWG	1	SA	T		
2	2-1	R2-1	SPEED LIMIT 60	30"X36"	X		TWT	1	WS	P			
	2-2	M1-4 D10-7aT	US 190 TEXAS REFERENCE MARKER # 788	30"X24" 3"X10"	X		TWT	1	WS	P			
	2-3	R2-1	SPEED LIMIT 65	30"X36"	X		TWT	1	WS	P			
3	3-1	W3-5	REDUCED SPEED LIMIT AHEAD 60	36"X36"	X		TWT	1	WS	P			
4	4-1	W14-1 D3-1G	DEAD END CREEKSIDE LN	36"X36"	X		10 BWG	1	SA	P	RELOCATE EXISTING STREET SIGN TO PROPOSED SIGN LOCATION. SUBSIDIARY TO ITEM 644		
5	5-1	S3-1	SCHOOL BUS STOP AHEAD	36"X36"	X		TWT	1	WS	P			
	5-2	D21-2TLR	HINSON HILL RD (LT) WALNUT RIDGE RD (RT)	96"x24"	X		10 BWG	1	SA	T			
6	6-1	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	6-2	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	6-3	D21-2TLR	WALNUT RIDGE RD (LT) HINSON HILL RD (RT)	96"X24"	X		10 BWG	1	SA	T			
	6-4	S3-1	SCHOOL BUS STOP AHEAD	36"X36"	X		TWT	1	WS	P			
	6-5	D1-3		TEXAS FOREST SERVICE DISTRICT OFFICE	102"X42"	X		S80	1	SA	U	BM	
7	7-1	W23-2a	WATCH FOR TRUCKS ENTERING HIGHWAY	36"X36"	X		TWT	1	WS	P			
	7-2	D1-3	TEXAS FOREST SERVICE DISTRICT OFFICE	108"X42"	X		S80	1	SA	U	BM		
8	8-1	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36"X36"	X		TWT	1	WS	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.
<http://www.txdot.gov/>

- NOTE:**
- 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.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).
 - SIGN RELOCATION WILL BE SUBSIDIARY TO ITEM 644.



SUMMARY OF SMALL SIGNS

SOSS SHEET 1 OF 6

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	34	

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 05/13/2021
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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		N TYPE	S TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels		
8	8-2	W23-2a	WATCH FOR TRUCKS ENTERING HIGHWAY	36"X36"	X		TWT	1	WS	P			
	9-1	I-3	CHOATES CREEK	42"X18"	X		TWT	1	WS	T			
9	9-2	I-3	CHOATES CREEK	42"X18"	X		TWT	1	WS	T			
	9-3	D21-1aTR	CRYSTAL LAKE WEST RD (RT)	66"X24"	X		10BWG	1	SA	T			
	9-4	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	9-5	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36"X36"	X		TWT	1	WS	P			
	10-1	D21-1aTL	CRYSTAL LAKE WEST RD (LT)	78"X24"	X		10BWG	1	SA	T			
10	10-2	D21-1aTR	CRYSTAL LAKE EAST RD (RT)	66"X24"	X		10BWG	1	SA	T			
	10-3	R2-1	SPEED LIMIT 25	18"X24"	X		TWT	1	WS	P			
	10-4	R1-1 D3-1G	STOP CRYSTAL LAKE EAST RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
	11-1	D21-3TLL	OLD WOODVILLE RD (LT) HORNET NEST RD (LT)	90"X36"	X		S80	1	SA	U	BM		
11	11-2	D21-1aTL	CRYSTAL LAKE EAST RD (LT)	78"X24"	X		10BWG	1	SA	T			
	11-3	M1-4 D10-7aT	US 190 TEXAS REFERENCE MARKER # 790	30"X24" 3"X10"	X		TWT	1	WS	P			
	11-4	R1-1 D3-1G	STOP OLD WOODVILLE RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
	11-5	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	12-1	D21-3TRR	HORNET NEST RD (RT) OLD WOODVILLE RD (RT)	90"X36"	X		S80	1	SA	U	BM		
12	12-2	D21-1TL	NOB HILL RD (LT)	78"X12"	X		TWT	1	WS	T			
	13-1	R1-1 D3-1G	STOP NOB HILL RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
13	13-2	D21-1TR	NOB HILL RD (RT)	78"X12"	X		TWT	1	WS	T			

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"

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 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).
 - SIGN RELOCATION WILL BE SUBSIDIARY TO ITEM 644.



SUMMARY OF SMALL SIGNS

SOSS SHEET 2 OF 6

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	LFK	POLK	35	

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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		N TYPE	S TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels		
13	13-3	D3-1G	MILL HILL RD				RELOCATE EXISTING STREET SIGN TO PROPOSED SIGN LOCATION.						
14	14-1	D21-1aTR	TURNER CEMETERY RD (RT)	84"X24"	X		10BWG	1	SA	T			
	14-2	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	14-3	D21-2TL	GREENWOOD DR (LT) CRAGER ROAD (LT)	90"X24"	X		10 BWG	1	SA	T			
	14-4	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	14-5	R1-1 D3-1G	STOP CRAGER RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
15	15-1	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	15-2	D21-1aTR	COUNTRY CHARM RD (RT)	78"X24"	X		10BWG	1	SA	T			
	15-3	D21-1aTL	TURNER CEMETERY RD (LT)	96"X24"	X		10BWG	1	SA	T			
	15-4	D21-2TR	CRAGER RD (RT) GREENWOOD DR (RT)	90"X24"	X		10 BWG	1	SA	T			
	15-5	R1-1 D3-1G	STOP COUNTY CHARM RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
	15-6	D21-2TLR	NETTLES CEMETERY RD (LT) TOM CUMMINGS RD (RT)	114"X24"	X		S80	1	SA	T	2EXT		
	15-7	D21-1aTL	COUNTRY CHARM RD (LT)	90"X24"	X		10BWG	1	SA	T			
	15-8	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	15-9	R1-1 D3-1G	STOP TOM CUMMINGS RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
16	16-1	D3-1G	NETTLES RD				RELOCATE EXISTING STREET SIGN TO PROPOSED SIGN LOCATION.						
	16-2	D21-2TLR	TOM CUMMINGS RD (LT) NETTLES CEMETERY RD (RT)	114"X24"	X		S80	1	SA	T	2EXT		
	16-3	D21-1TL	NEEL RD (LT)	60"X12"	X		TWT	1	WS	T			
17	17-1	R1-1 D3-1G	STOP NEEL RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		

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"

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SUMMARY OF SMALL SIGNS

SOSS SHEET 3 OF 6

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© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	LFK	POLK	36	

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 05/13/2021
 MODEL: SUMMARY OF SMALL SIGNS
 FILE: ct\pwork\dir\bgge-pw\emah\mann\dms40799\US190_SMS_01.dgn

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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		N TYPE	S TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels		
17	17-2	D21-1TR	NEEL RD (RT)	60"X12"	X		TWT	1	WS	T			
	17-3	D21-1TR	HATHAWAY RD (RT)	84"X12"	X		TWT	1	WS	T			
18	18-1	R1-1 D3-1G	STOP HATHAWAY RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
	18-2	D21-2TL	BERTS FARM RD (LT) HANT HILL RD (LT)	84"X24"	X		10 BWG	1	SA	T			
	18-3	D21-1TR	BEECH CREEK RD (RT)	96"X12"	X		TWT	1	WS	T			
	18-4	D21-1TL	HATHAWAY RD (LT)	84"X12"	X		TWT	1	WS	T			
	18-5	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	19	19-1	R1-1 D3-1	STOP BERTS FARM RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644	
19-2		D3-1G	HANT HILL RD				RELOCATE EXISTING STREET SIGN TO PROPOSED SIGN LOCATION.						
19-3		D21-1TL	BEECH CREEK RD (LT)	90"X12"	X		TWT	1	WS	T			
19-4		D21-2TR	HANT HILL RD (RT) BERTS FARM RD (RT)	84"X24"	X		10 BWG	1	SA	T			
20	20-1	D21-2TLR	FROST RD (LT) SODA OAKS RD (RT)	84"X24"	X		10 BWG	1	SA	T			
	20-2	M1-4 D10-7aT	US 190 TEXAS REFERENCE MARKER # 792	30"X24" 3"X10"	X		TWT	1	WS	P			
	20-3	W14-1	DEAD END	30"X30"	X		TWT	1	WS	P			
	20-4	R1-1 D3-1G	STOP FROST RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
	20-5	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
21	21-1	D21-2TLR	SODA OAKS RD (LT) FROST RD (RT)	84"X24"	X		10 BWG	1	SA	T			
	21-2	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36"X36"	X		TWT	1	WS	P			
22	22-1	I-3	MENARD CREEK	42"X18"	X		TWT	1	WS	T			

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:**
- 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.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).
 - SIGN RELOCATION WILL BE SUBSIDIARY TO ITEM 644.



SUMMARY OF SMALL SIGNS

SOSS SHEET 4 OF 6

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
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	LFK	POLK	37	

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...163\US190_SMS_01.dgn

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		N TYPE	S TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels		
22	22-2	I-3	MENARD CREEK	42"X18"	X		TWT	1	WS	T			
	23-1	D21-1TR	MENARD CREEK RD (RT)	96"X12"	X		TWT	1	WS	T			
23	23-2	R1-1	STOP	36"X36"	X		TWT	1	WS	P			
	23-3	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36"X36"	X		TWT	1	WS	P			
	23-4	D21-1TL	MENARD CREEK RD (LT)	96"X12"	X		TWT	1	WS	T			
	24-1	D21-1TR	EASTON OAKS RD (RT)	90"X12"	X		TWT	1	WS	T			
24	24-2	I-2cT	SODA	36"X12"	X		TWT	1	WS	P			
	24-3	D3-1G	KATY LN				RELOCATE EXISTING STREET SIGN TO PROPOSED SIGN LOCATION.						
	24-4	R1-1 D3-1G	STOP EASTON OAKS RD	36"x36"	X		TWT	1	WS	P			
	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644												
25	25-1	D21-1TR	W SODA LP (RT)	72"X12"	X		TWT	1	WS	T			
	25-2	D21-1TL	EASTON OAKS RD (LT)	90"X12"	X		TWT	1	WS	T			
	25-3	R1-1 D3-1G	STOP SODA LOOP W	36"x36"	X		TWT	1	WS	P			
	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644												
	25-4	D21-1TR	OLIVIA LN (RT)	60"X12"	X		TWT	1	WS	T			
26	25-5	D21-1TL	W SODA LP (LT)	72"X12"	X		TWT	1	WS	T			
	26-1	R1-1	STOP OLIVIA LN	36"X36"	X		TWT	1	WS	P			
	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644												
26	26-2	D21-1TL	OLIVIA LN (LT)	60"X12"	X		TWT	1	WS	T			
	28-1	R1-1 D3-1G	STOP SARAH LYN DR	36"X36"	X		TWT	1	WS	P			
RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644													
29	29-1	D21-1TR	E SODA LP (RT)	66"X12"	X		TWT	1	WS	T			
	29-2	D21-1TL	E WILLIAMS LN (LT)	84"X12"	X		TWT	1	WS	T			

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:**
- 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.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).
 - SIGN RELOCATION WILL BE SUBSIDIARY TO ITEM 644.



SUMMARY OF SMALL SIGNS

SOSS SHEET 5 OF 6

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	LFK	POLK	38	

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..\163\US190_SMS_01.dgn

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		N TYPE	S TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels		
29	29-3	M1-4 D10-7aT	US 190 TEXAS REFERENCE MARKER # 794	30"X24" 3"X10"	X		TWT	1	WS	P			
	29-4	R1-1 D3-1G	STOP SODA LOOP E	36"x36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
	29-5	D21-1TL	E SODA LP (LT)	66"X12"	X		TWT	1	WS	T			
31	31-1	W2-2L	INTERSECTION (LT)	36"X36"	X		TWT	1	WS	P			
	31-2	D21-1TL	DARDEN RD (LT)	72"X12"	X		TWT	1	WS	T			
	31-3	W9-2TL	LANE ENDS MERGE LEFT	36"x36"	X		TWT	1	WS	P			
	31-4	R1-1	STOP	36"x36"	X		TWT	1	WS	P			
32	32-1	D3-3bTL D3-3bTR	BLUFF CREEK CEMETERY (LT) BLUFF CREEK CEMETERY (RT)	60"X36" 60"X36"	X		10 BWG	1	SA	U			
	32-2	D21-1TR	DARDEN RD (RT)	72"X12"	X		TWT	1	WS	T			
	32-3	D21-1TR	GREER RD (RT)	66"X12"	X		TWT	1	WS	T			
	32-4	W2-2R	INTERSECTION (RT)	36"X36"	X		TWT	1	WS	P			
33	33-1	R1-1 D3-1G	STOP GREER RD	36"X36"	X		TWT	1	WS	P	RELOCATE EXISTING STREET SIGN TO PROPOSED STOP SIGN LOCATION. SUBSIDIARY TO ITEM 644		
	33-2	D21-1TL	GREER RD (LT)	66"X12"	X		TWT	1	WS	T			
	33-3	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36"X36"	X		TWT	1	WS	P			

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
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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.
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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).
4. SIGN RELOCATION WILL BE SUBSIDIARY TO ITEM 644.



SUMMARY OF SMALL SIGNS

SOSS SHEET 6 OF 6

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© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
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	LFK	POLK	39	

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...163MISC\US190_SMS_01.dgn

TCP SEQUENCE OF WORK

PHASE 1 STEP 1

- PLACE ADVANCE WARNING SIGNS IN ACCORDANCE WITH APPLICABLE TRAFFIC CONTROL STANDARDS.
- INSTALL SWP3 FEATURES THROUGHOUT THE PROJECT.
- PREP ROW.
- EXTEND EXISTING CROSS CULVERTS.
 1. CONSTRUCT CULVERTS 07 & 19 USING STANDARD TCP (2-4A).
 2. CONSTRUCT CULVERTS 18 & 22 USING STANDARD TCP (2-4B).

PHASE 1 STEP 2

- PLACE WORK ZONE PAVEMENT MARKINGS, DELINEATORS AND SIGNS TO ACCOMMODATE TRAFFIC SHIFT. SHIFT TRAFFIC.
- WIDEN PAVEMENT TO PROPOSED ROADWAY WIDTH.
 1. PLANE 0"-2" ACROSS EXISTING PAVEMENT WIDTH.
 2. SAWCUT 1' INSIDE EXIST EOP.
 3. LIME OR CEMENT TREAT 6" EXISTING MATERIAL AND PRIME COAT.
 4. PLACE 6" D-GR HMA TY-B IN 2 EQUAL LIFTS AND TACK COAT BETWEEN LIFTS.
 5. PLACE BONDING COURSE AND 2" SUPERPAVE TY-C ACROSS PROPOSED PAVEMENT WIDTH AND PLACE WORK ZONE PAVEMENT MARKINGS.
- CONSTRUCT BRIDGES PER TCP TYPICAL SECTION, BRIDGE PHASING, PHASING LAYOUT DETAILS AND STANDARD TCP (2-5).
- CONSTRUCT DRIVEWAYS AND DRIVEWAY CULVERTS ALONG WB ROADWAY.

PHASE 2

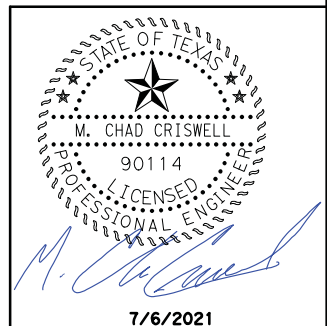
- PLACE WORK ZONE PAVEMENT MARKINGS, DELINEATORS AND SIGNS TO ACCOMMODATE TRAFFIC SHIFT. SHIFT TRAFFIC.
- WIDEN PAVEMENT TO PROPOSED ROADWAY WIDTH.
 1. PLANE 0"-2" ACROSS EXISTING PAVEMENT WIDTH.
 2. SAWCUT 1' INSIDE EXIST EOP.
 3. LIME OR CEMENT TREAT 6" EXISTING MATERIAL AND PRIME COAT.
 4. PLACE 6" D-GR HMA TY-B IN 2 EQUAL LIFTS AND TACK COAT BETWEEN LIFTS.
 5. PLACE BONDING COURSE AND 2" SUPERPAVE TY-C ACROSS PROPOSED PAVEMENT WIDTH AND PLACE WORK ZONE PAVEMENT MARKINGS.
- CONSTRUCT BRIDGES PER TCP TYPICAL SECTION, BRIDGE PHASING, PHASING LAYOUT DETAILS AND STANDARD TCP (2-5).
- CONSTRUCT DRIVEWAYS AND DRIVEWAY CULVERTS ALONG EB ROADWAY.

PHASE 3

- INCIDENTAL WORK - THIS SHALL BE COMPLETED AS NIGHTTIME WORK AS DESCRIBED IN ITEM 8 SECTION 3.3 IN TXDOT'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES.
 1. PLANE 2" ACROSS EXISTING PAVEMENT WIDTH FROM EAST SIDE OF BRIAR WAY STREET TO BEGINNING OF PROJECT.
 2. PLACE FINAL FULL WIDTH BONDING COURSE.
 3. PLACE FINAL FULL WIDTH 2" SUPERPAVE TY-C SAC-A.
 4. PLACE FINAL PAVEMENT MARKINGS.
- PROJECT WORK
 1. PLACE FULL WIDTH BONDING COURSE.
 2. PLACE FINAL FULL WIDTH 2" SUPERPAVE TY-C.
 3. PLACE FINAL FULL WIDTH UNDERSEAL COURSE.
 4. PLACE FINAL FULL WIDTH PFC.
 5. PLACE FINAL PAVEMENT MARKINGS AND SIGNS.
 6. INSTALL TRAFFIC COUNTER LOOPS USING STANDARD TCP (2-4B).
 7. INSTALL ILLUMINATION AT CHOATES CREEK BRIDGE.
 8. PERFORM FINAL CLEANUP.

NOTE:

1. CONTRACTOR TO PROVIDE SUITABLE ACCESS AT ALL TIMES TO ADJACENT BUSINESS, PRIVATE PROPERTY AND SIDE ROADS.



**TCP
SEQUENCE
OF WORK**

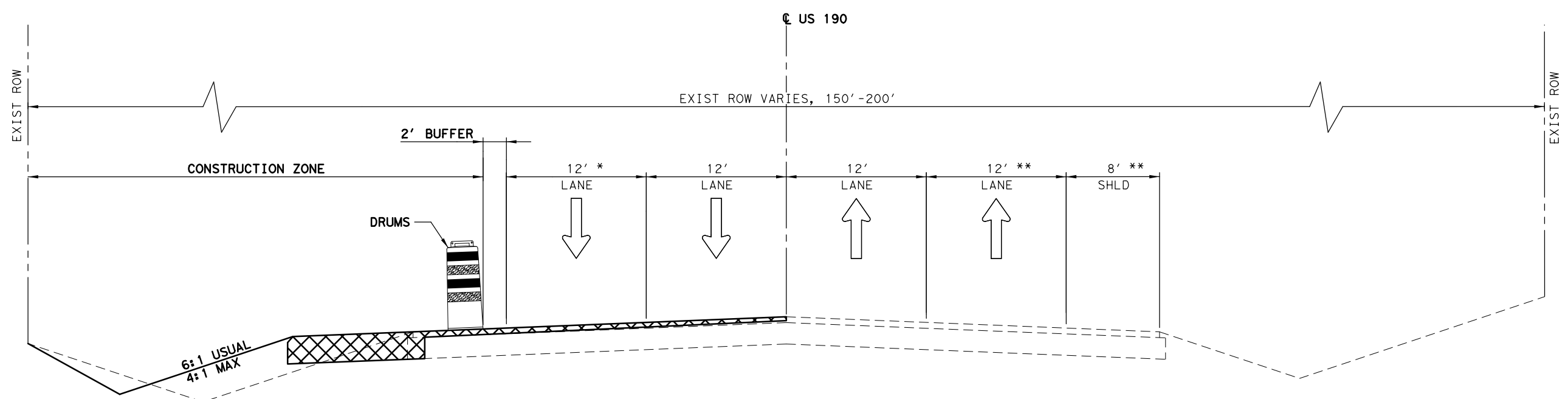


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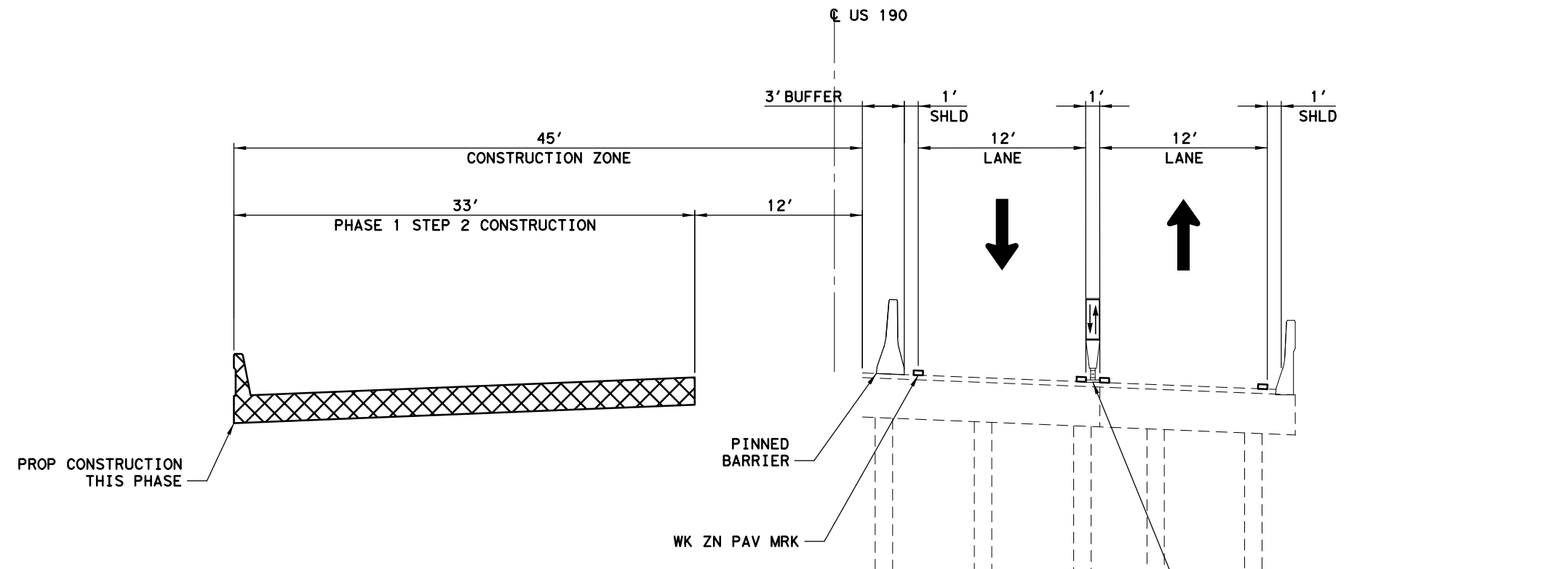
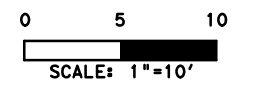
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PREVIOUSLY CONSTRUCTED

PHASE 1 STEP 2 - ROADWAY WIDENING
 STA 42+95.91 - STA 135+18.00
 STA 301+02.00 - STA 400+99.25

* LANE TRANSITIONS FROM 12'-0"
 AT STA 382+97.00 - STA 400+99.25

** SHOULDER TRANSITIONS FROM 8'-10"
 LANE TRANSITIONS FROM 12'-0"
 AT STA 393+39.00 - STA 400+99.25

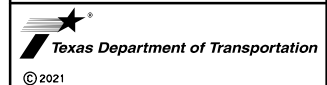


PHASE 1 STEP 2 - BRIDGE PHASING
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 STA 298+12.00 - STA 301+02.00 (MENARD CREEK)

05/13/2021

TCP TYPICAL SECTIONS

SHEET 1 OF 4

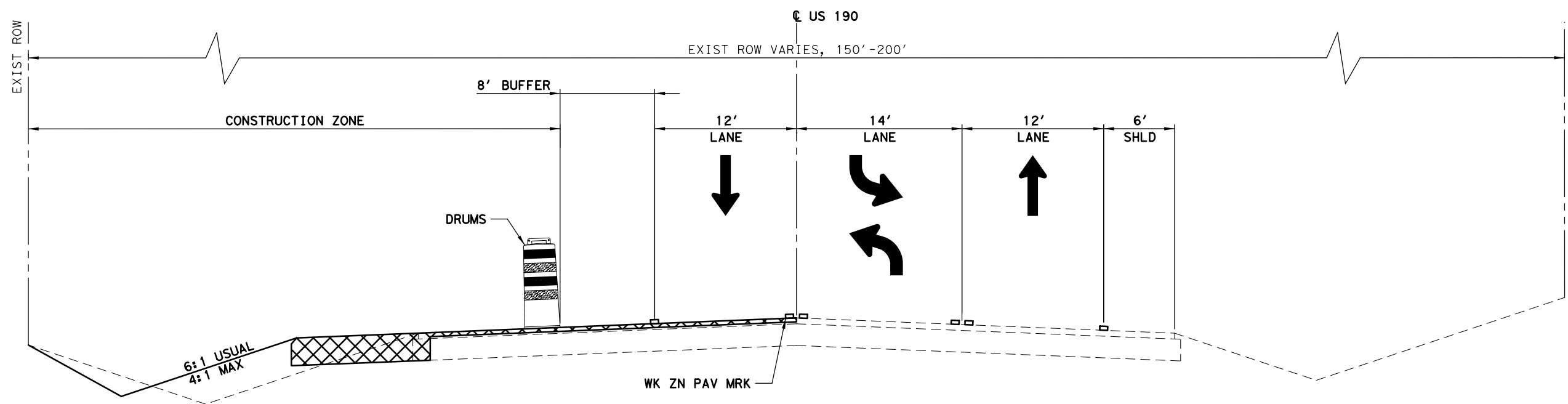


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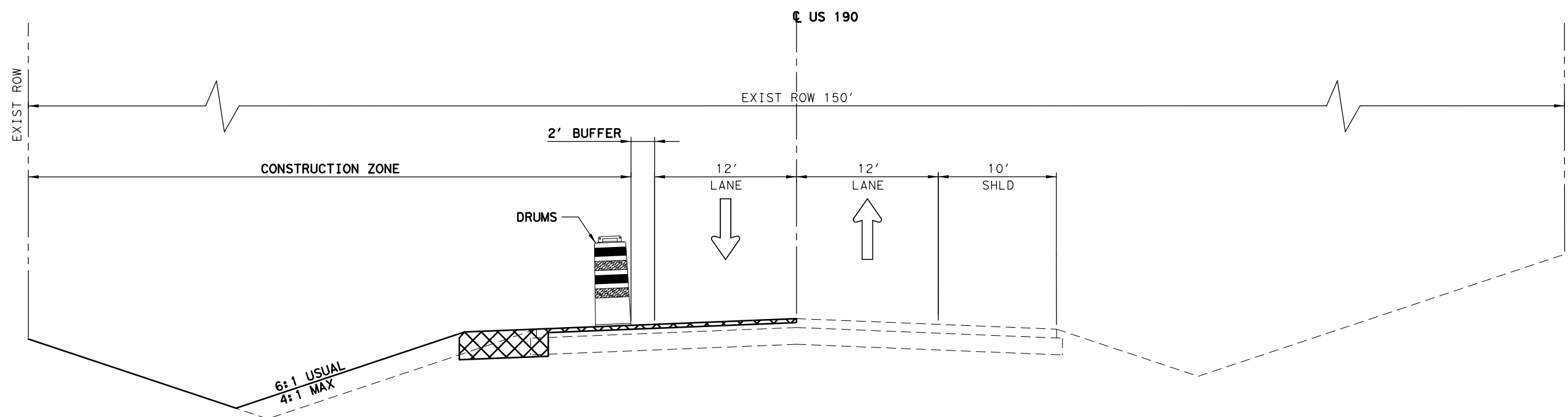
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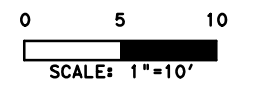
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 STA 137+03.00 - STA 298+12.00



PHASE 1 STEP 2 - ROADWAY WIDENING
 STA 400+99.25 - STA 427+58.42

LEGEND


-  WORK THIS PHASE
-  PREVIOUSLY CONSTRUCTED



05/13/2021

**TCP
TYPICAL
SECTIONS**

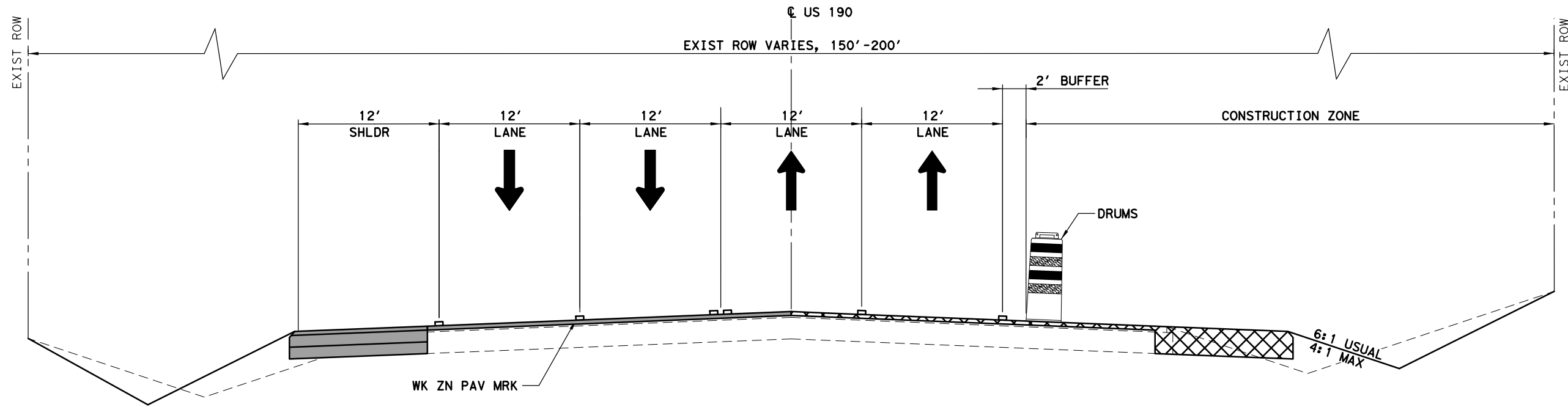
SHEET 2 OF 4


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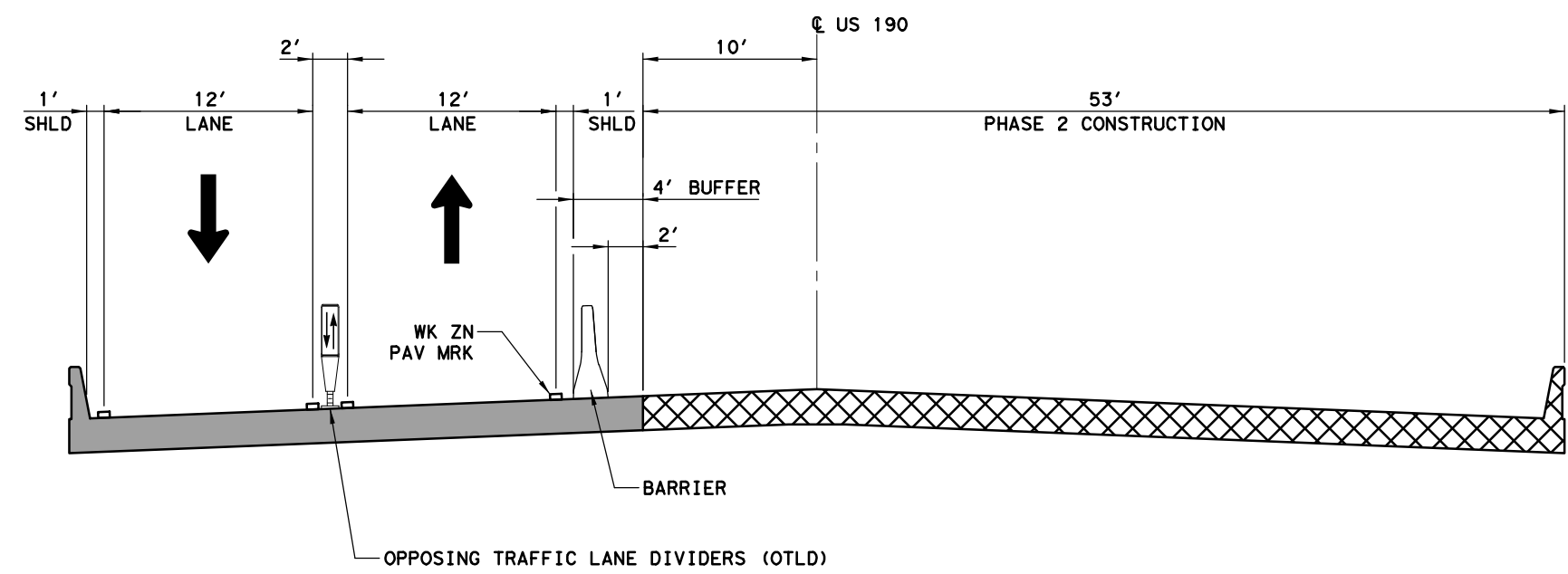
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WORK THIS PHASE

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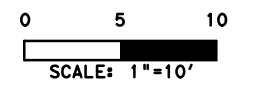
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 STA 301+02.00 - STA 400+99.25



PHASE 2 - BRIDGE PHASING

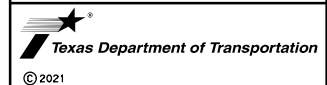
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 STA 298+12.00 - STA 301+02.00 (MENARD CREEK)



05/13/2021

**TCP
 TYPICAL
 SECTIONS**

SHEET 3 OF 4

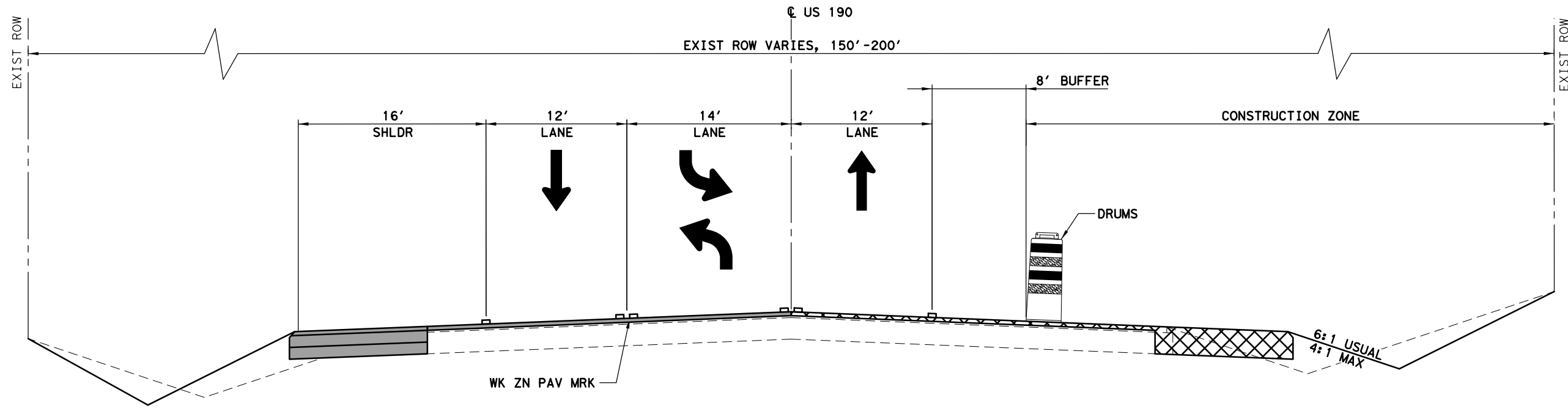


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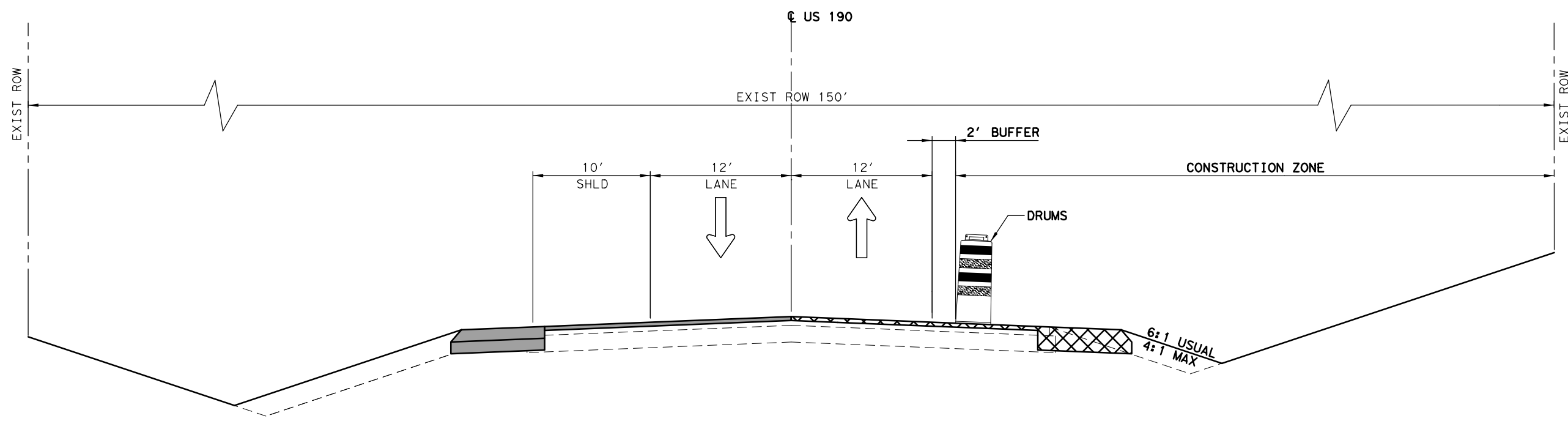
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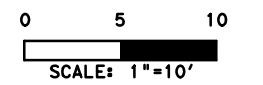
PHASE 2 - ROADWAY WIDENING
 STA 137+03.00 - STA 298+12.00



PHASE 2 - ROADWAY WIDENING
 STA 400+99.25 - STA 427+58.42

LEGEND

- WORK THIS PHASE
- PREVIOUSLY CONSTRUCTED



05/13/2021

**TCP
TYPICAL
SECTIONS**

SHEET 4 OF 4

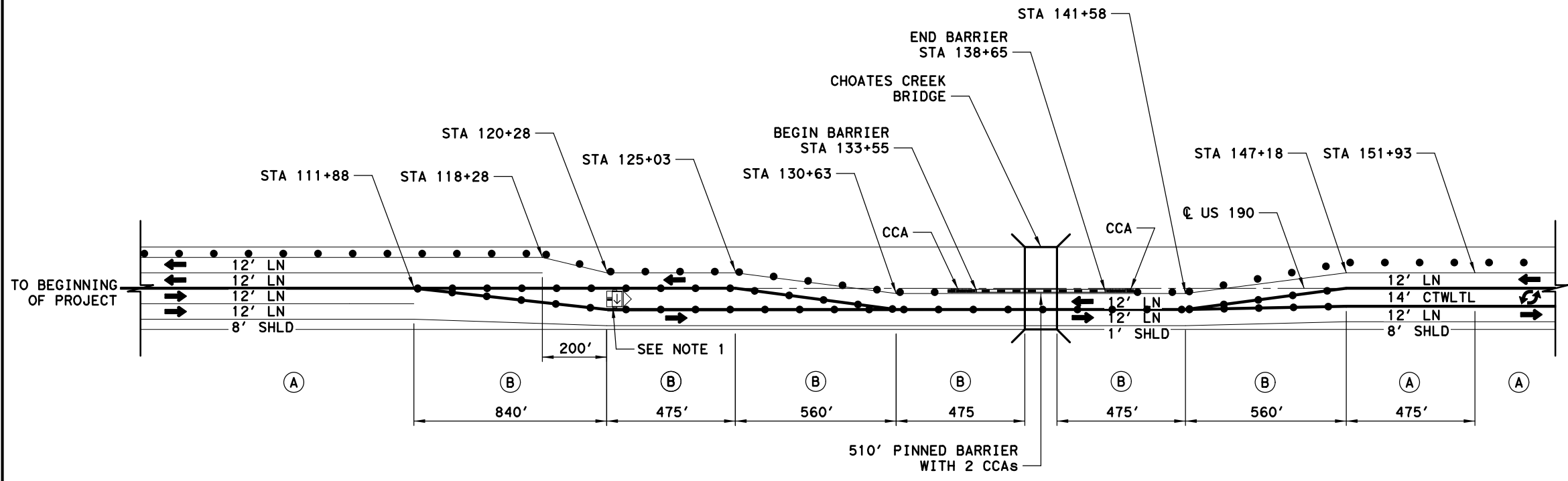
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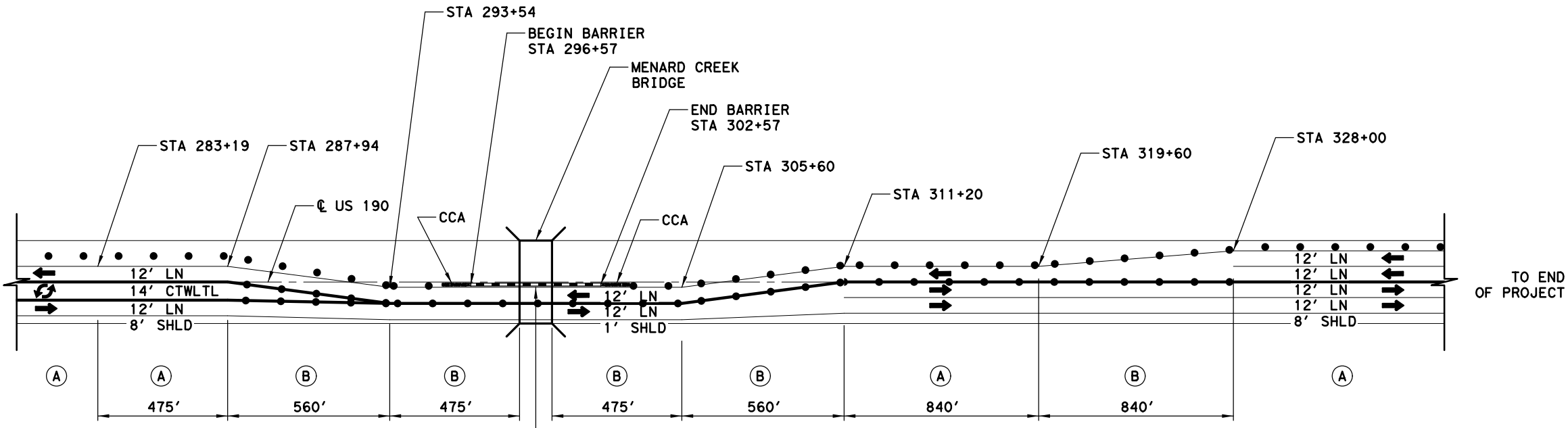
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0213	04	050	US 190

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CHOATES CREEK BRIDGE
 PHASE 1



MENARD CREEK BRIDGE
 PHASE 1

- LEGEND**
- ➔ DIRECTION OF TRAFFIC
 - CHANNELIZING DEVICES
 - BARRIER
 - Ⓐ CHANNELIZING DEVICES SPACED AT 140'
 - Ⓑ CHANNELIZING DEVICES SPACED AT 70'
 - ➡ TRAILER MOUNTED FLASHING ARROW BOARD

NOTE:
 1. FLASHING ARROW BOARD IS SUBSIDIARY TO ITEM 502.

NTS

05/13/2021

PHASING LAYOUT DETAILS

SHEET 1 OF 2

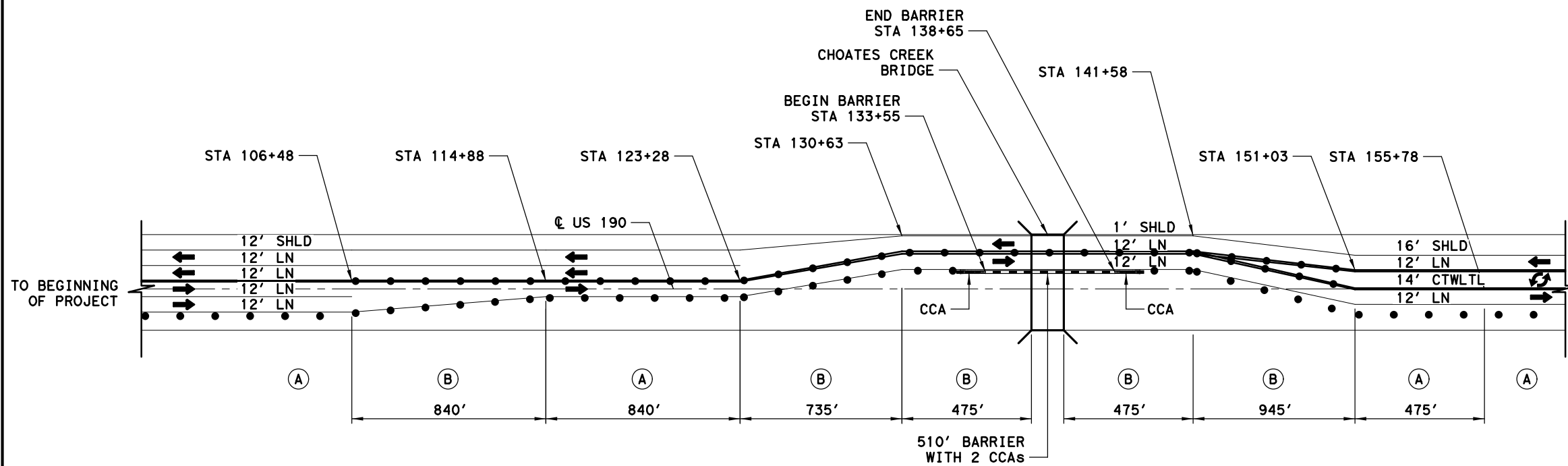
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TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
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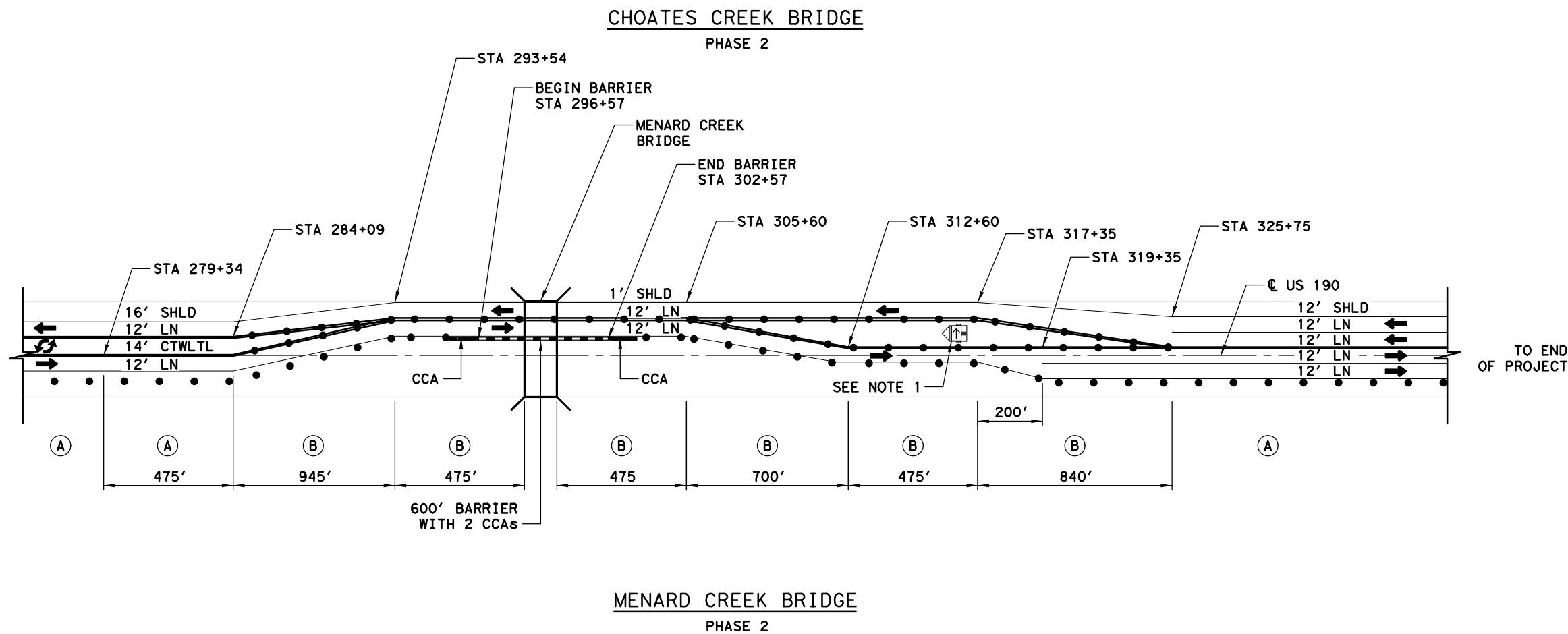


LEGEND

- ➔ DIRECTION OF TRAFFIC
- CHANNELIZING DEVICES
- BARRIER
- Ⓐ CHANNELIZING DEVICES SPACED AT 140'
- Ⓑ CHANNELIZING DEVICES SPACED AT 70'
- ➔ TRAILER MOUNTED FLASHING ARROW BOARD

NOTE:

1. FLASHING ARROW BOARD IS SUBSIDIARY TO ITEM 502.

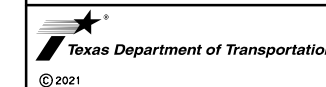


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PHASING LAYOUT DETAILS

SHEET 2 OF 2



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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

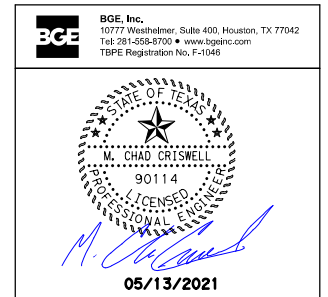
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LOC NO	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION												
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE / RESET		L N	L W	R N	R W	S N	S W			
															MOVE/RESET	FROM LOC #									
1	P1 S2	9 OF 33	CHOATES CREEK BRIDGE	133+55	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'	1									1			
2	P1 S2	9 OF 33	CHOATES CREEK BRIDGE	138+65	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'	1									1			
3	P1 S2	22 OF 33	MENARD CREEK BRIDGE	296+57	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'	1									1			
4	P1 S2	22 OF 33	MENARD CREEK BRIDGE	302+57	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'	1									1			
5	P2 S1	9 OF 33	CHOATES CREEK BRIDGE	133+55	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'			1	1									
6	P2 S1	9 OF 33	CHOATES CREEK BRIDGE	138+65	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'			1	2									
7	P2 S1	22 OF 33	MENARD CREEK BRIDGE	296+57	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'			1	3									
8	P2 S1	22 OF 33	MENARD CREEK BRIDGE	302+57	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'			1	4									
	P2 S1	9 OF 33	CHOATES CREEK BRIDGE	133+55	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'		1		5									
	P2 S1	9 OF 33	CHOATES CREEK BRIDGE	138+65	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'		1		6									
	P2 S1	22 OF 33	MENARD CREEK BRIDGE	296+57	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'		1		7									
	P2 S1	22 OF 33	MENARD CREEK BRIDGE	302+57	TL-3	UNI	ASPHALT	N/A	SSCB	24"	42"	50'		1		8									
PROJECT TOTALS (0213-04-050)													4	4	4										4

LEGEND:
 L=LOW MAINTENANCE
 R=REUSABLE
 S=SACRIFICIAL
 N=NARROW
 W=WIDE
 FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
<http://www.dot.state.tx.us/insdot/orgchart/cmd/cserve/standard/rdwylse.htm>

CRASH CUSHION SUMMARY SHEET



FILE: ccss.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT 0213	SECT 04	JOB 050
REVISIONS	DIST LFK	COUNTY POLK	HIGHWAY US 190
	FEDERAL AID PROJECT	SHEET NO. 47	

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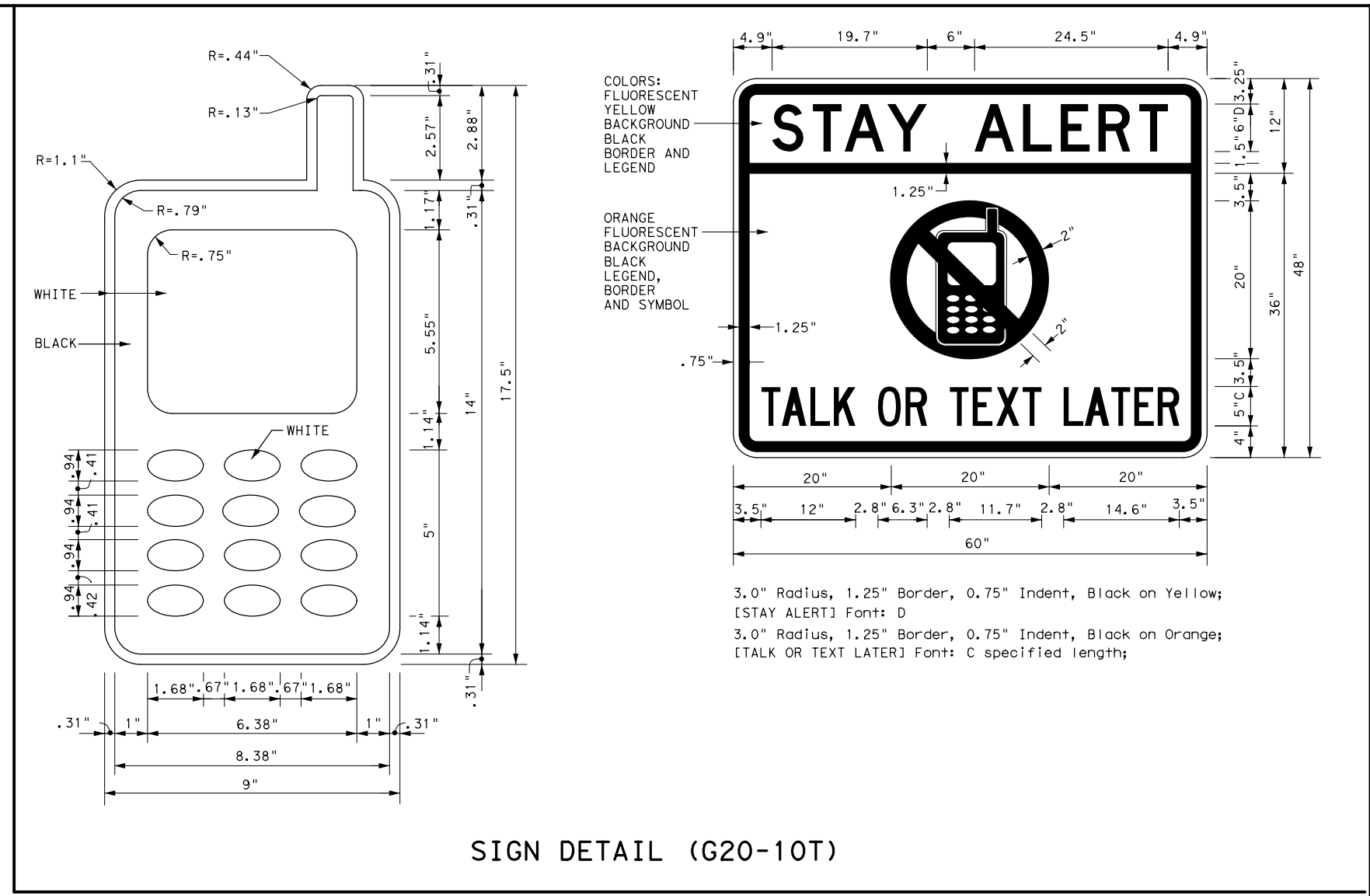
BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- 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 APPAREL NOTES:

- 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.

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SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
 Traffic Operations Division - TE
 Phone (512) 416-3118

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	

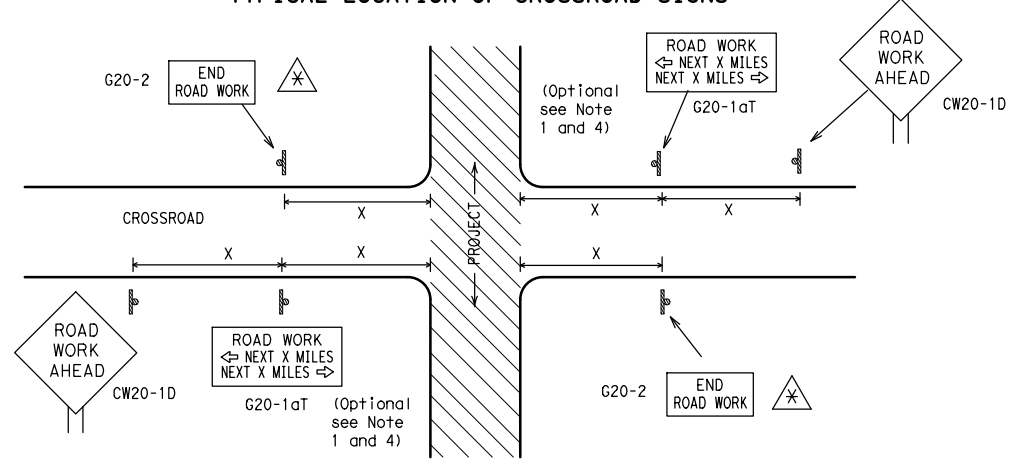
SHEET 1 OF 12

		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS			
BC (1) - 14			
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© TxDOT November 2002	CONT: 0213	SECT: 04	JOB: 050
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4-03 5-10 8-14	LFK POLK		SHEET NO. 48
9-07 7-13			

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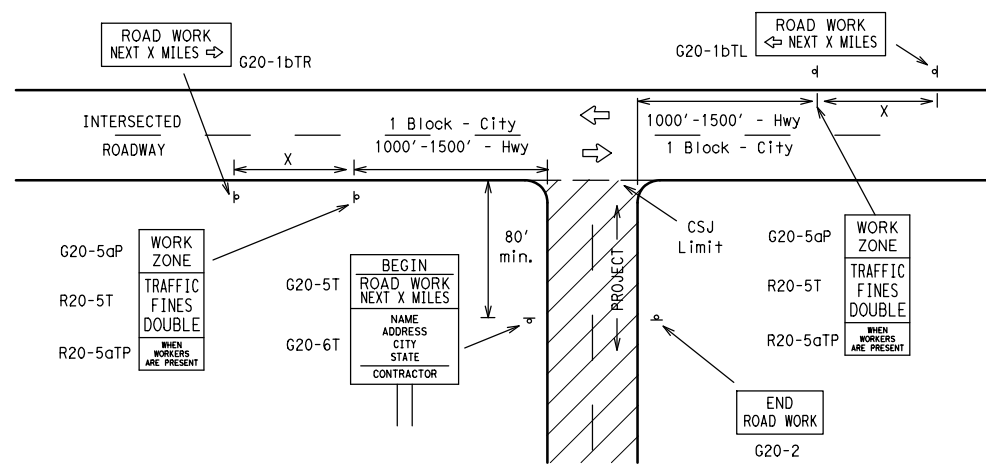
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ⚠ May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- 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.
 - 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. This information shall be shown in the plans.
 - 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.
 - 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.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - 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

- 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.
- 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}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed	Sign Δ Spacing "X"
CW20 ⁴	48" x 48"	48" x 48"	MPH	Feet (Apprx.)
CW21			30	120
CW22			35	160
CW23			40	240
CW25			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			75	900 ²
			80	1000 ²
			*	* ³

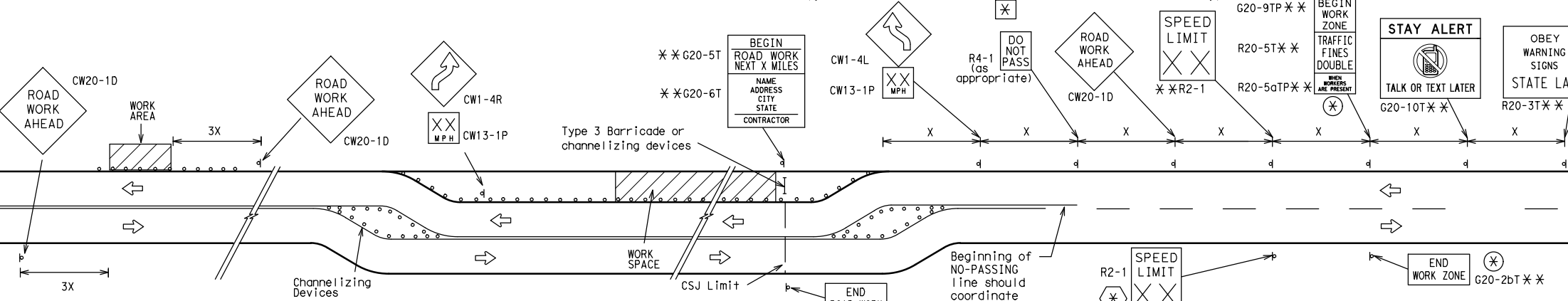
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

Δ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

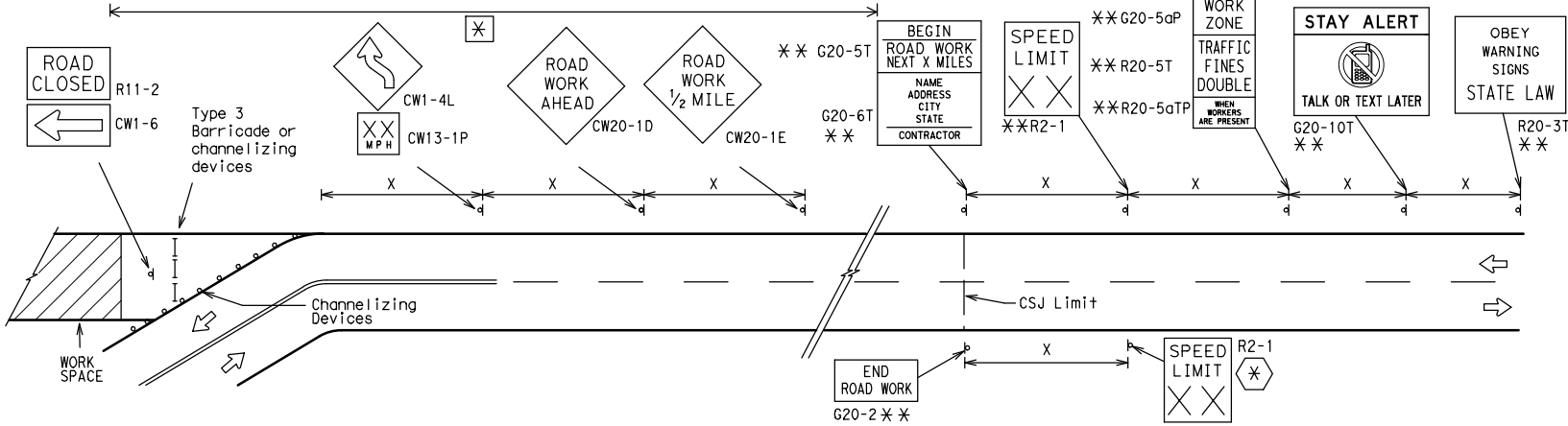
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
- Only diamond shaped warning sign sizes are indicated.
- 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

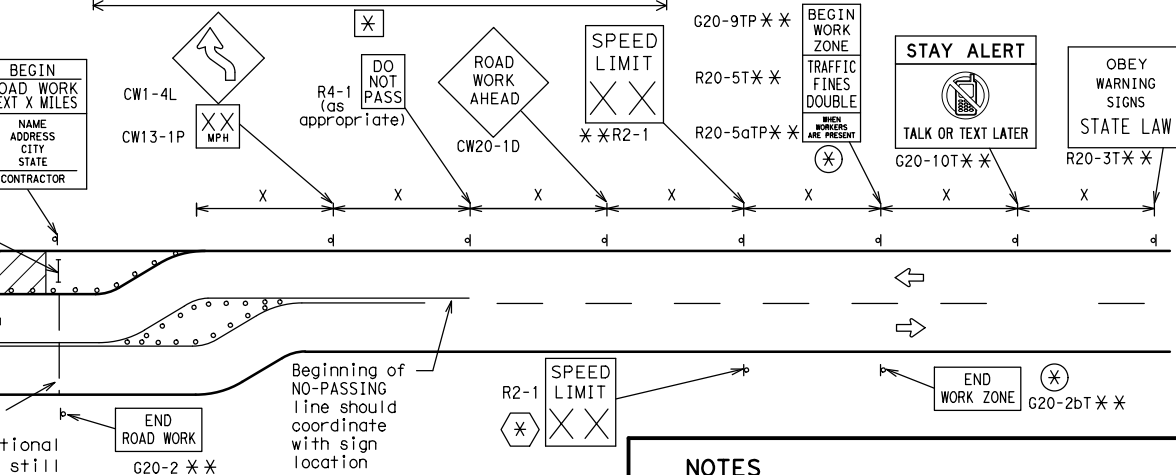


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT 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.
- ** Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.
- ⊗ 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.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

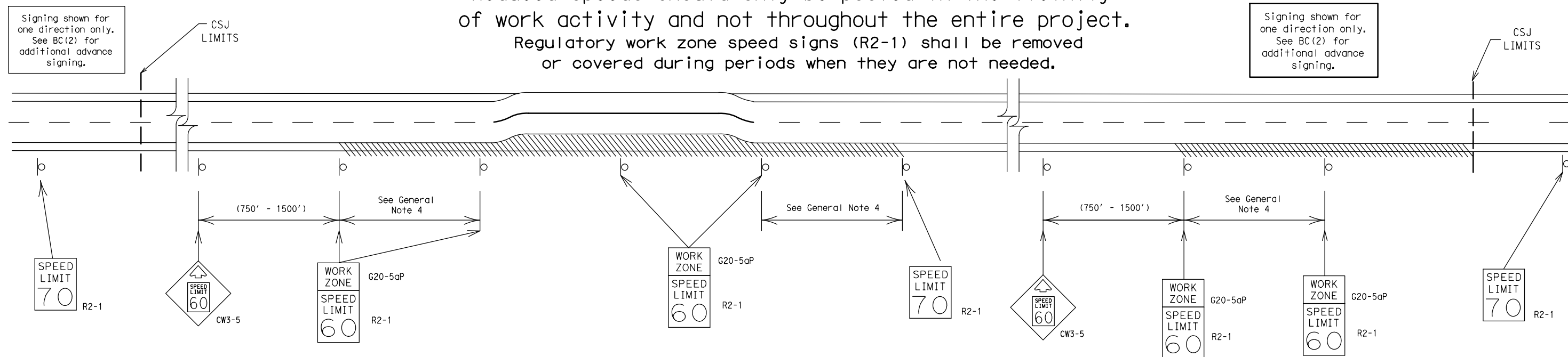
BC(2)-14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
9-07	8-14	DIST	COUNTY	SHEET NO.
7-13		LFK	POLK	49

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:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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 travelled 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 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.

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SHEET 3 OF 12



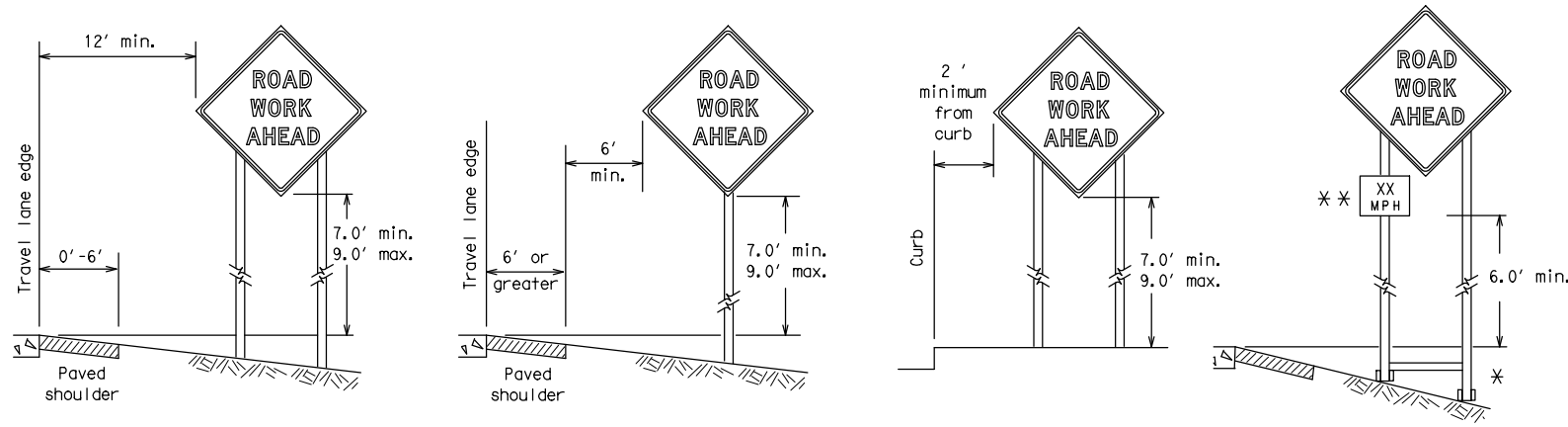
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 14

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
9-07	8-14	0213	04	050	US 190
7-13		DIST	COUNTY	SHEET NO.	
		LFK	POLK	50	

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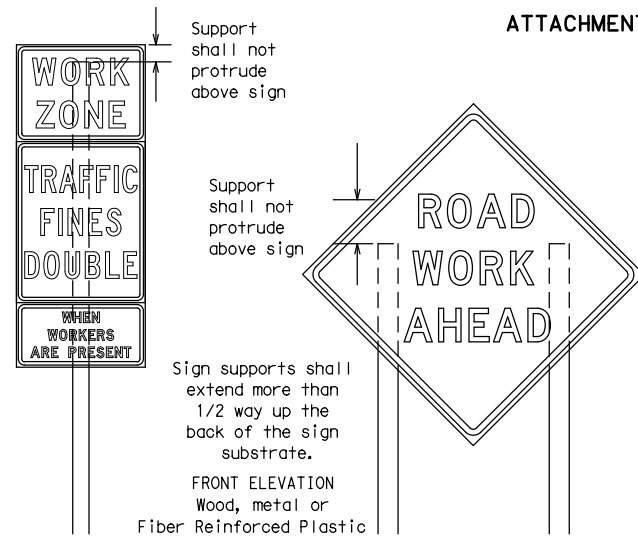
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



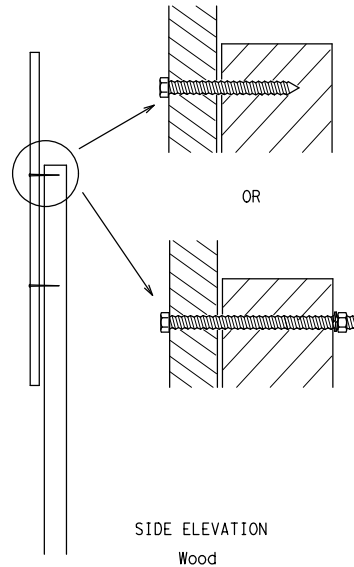
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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

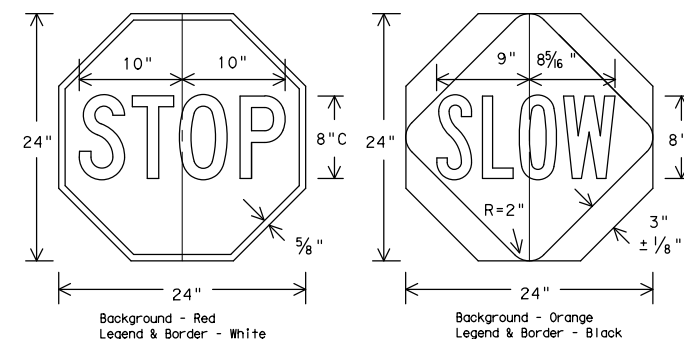


Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

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 splice 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

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
- When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- 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.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- 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, 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- 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

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
 - Wooden sign posts shall be painted white.
 - Barricades shall NOT be used as sign supports.
 - 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.
 - 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.
 - The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). 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.
 - 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.
 - 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.
 - 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)**
- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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

- 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

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- 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

- 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

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- 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.
- 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.
- 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 shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- 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.

SHEET 4 OF 12



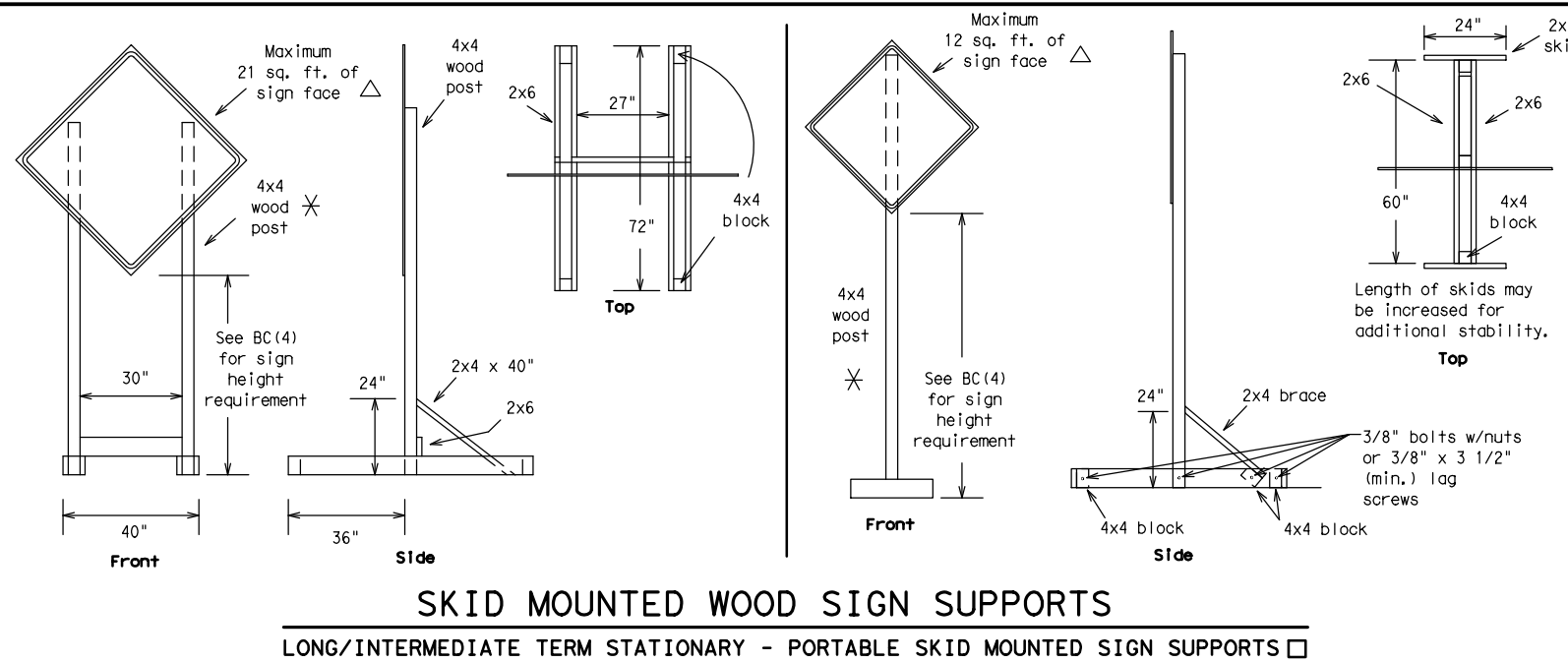
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 14

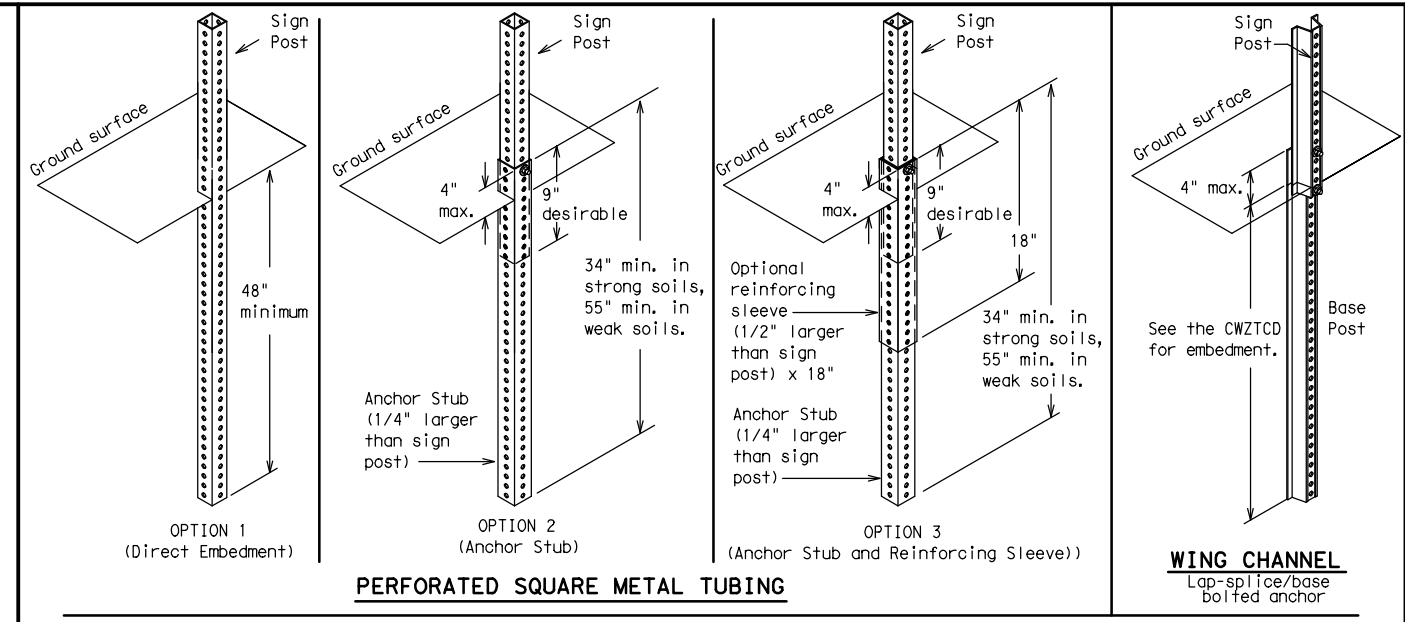
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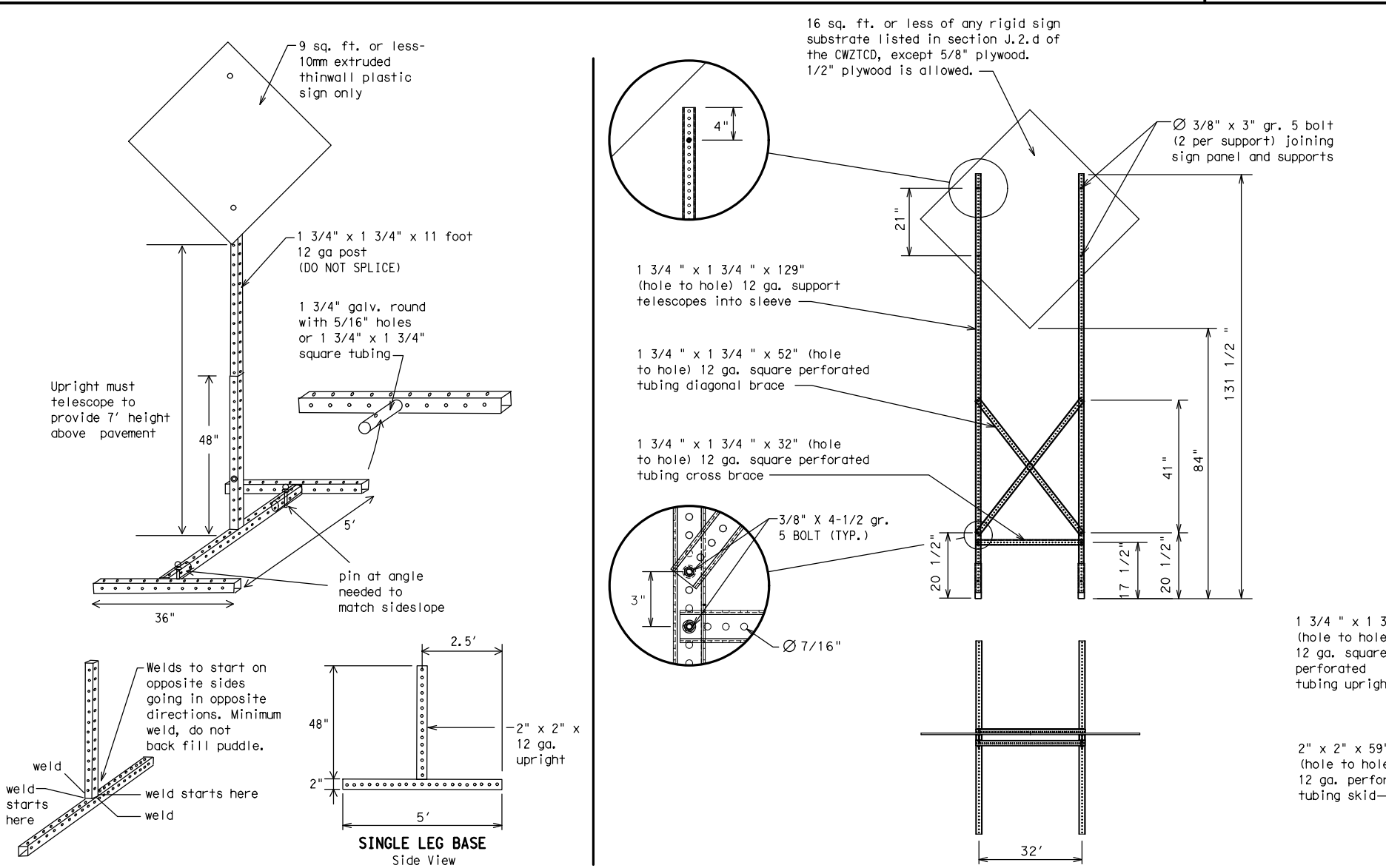


SKID MOUNTED WOOD SIGN SUPPORTS
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

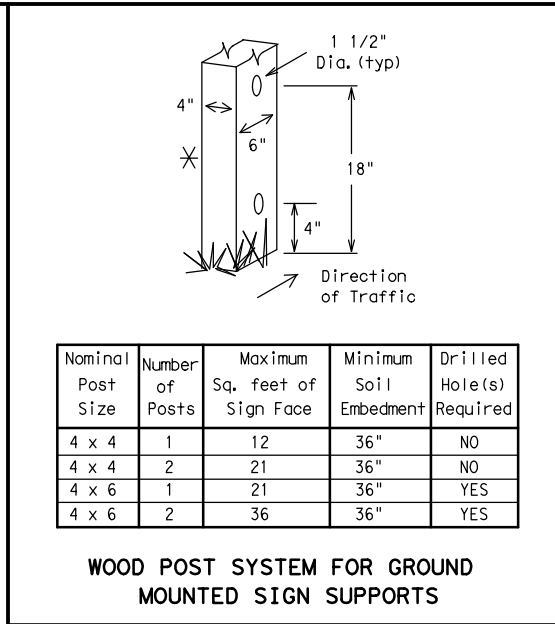


GROUND MOUNTED SIGN SUPPORTS

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



WOOD POST SYSTEM FOR GROUND 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**
- 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.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - 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.

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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7-13	LFK	POLK	52	

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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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

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WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLRS
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	Hwy	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *

FORM X LINES RIGHT
USE XXXXX RD EXIT
USE EXIT I-XX NORTH
USE I-XX E TO I-XX N
WATCH FOR TRUCKS
EXPECT DELAYS
PREPARE TO STOP
END SHOULDER USE
WATCH FOR WORKERS

Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXX 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

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.

SHEET 6 OF 12

<h3>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</h3>			
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7-13			

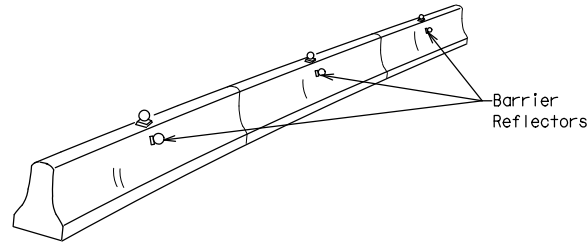
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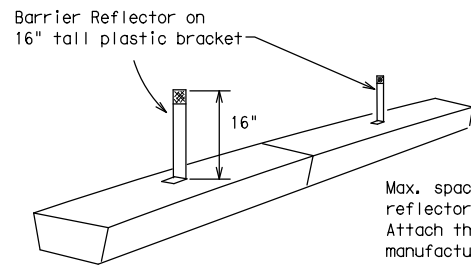
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

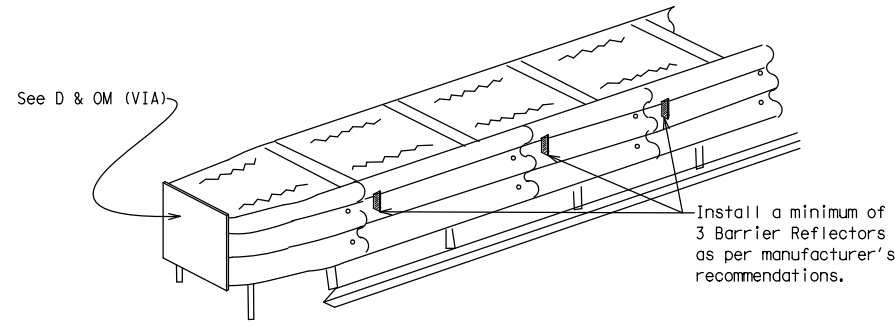


CONCRETE TRAFFIC BARRIER (CTB)

- 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.
- 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.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.



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 crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

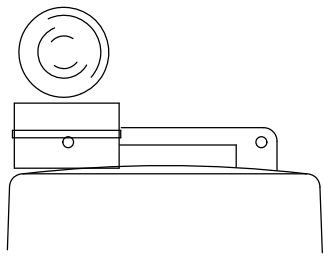
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

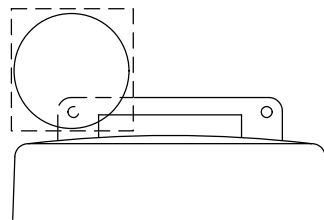
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 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

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



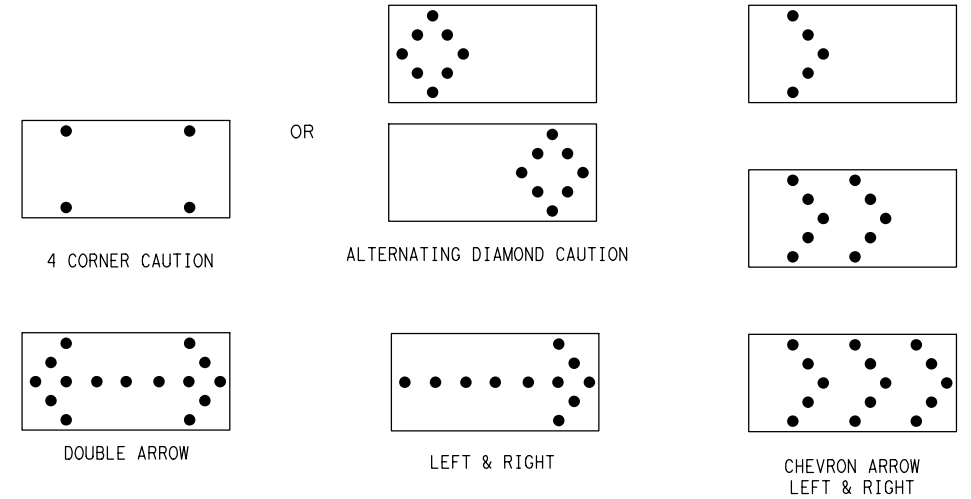
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- 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

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- 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 Operations Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC (7) - 14

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13	LFK	POLK	54	

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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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

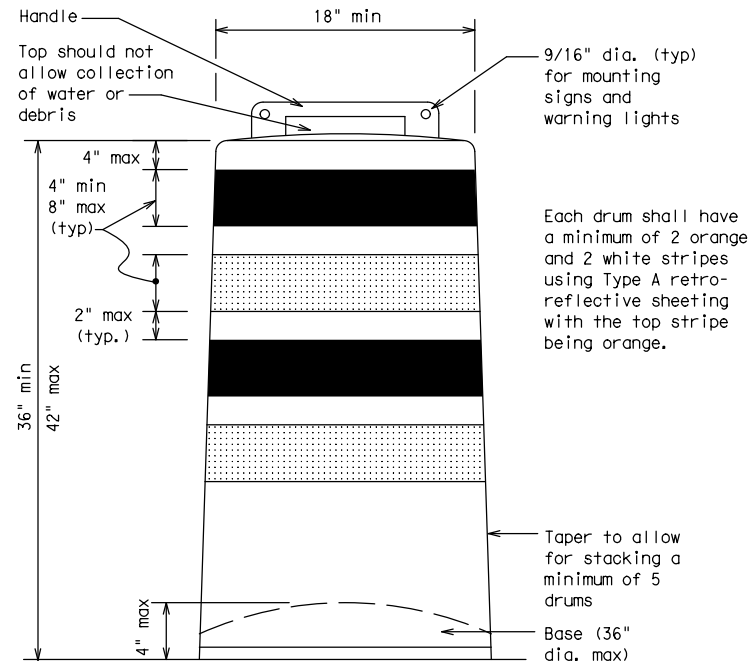
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 - The body and base shall lock together in such a manner that the body separates from the base when impacted 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
 - Drum body shall have a maximum unballasted weight of 11 lbs.
 - Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- 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 reflective sheeting shall be supplied unless otherwise specified in the plans.
- 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.

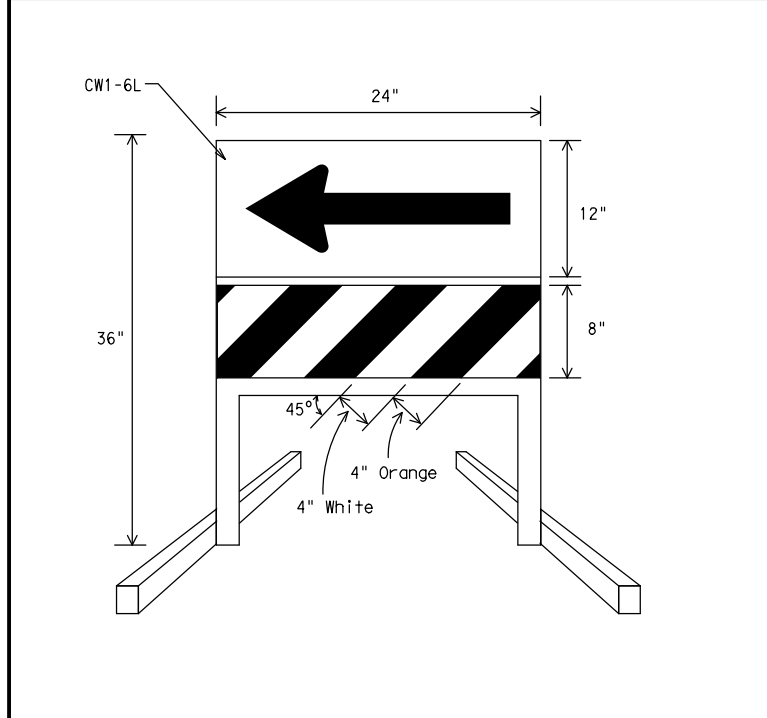
BALLAST

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.



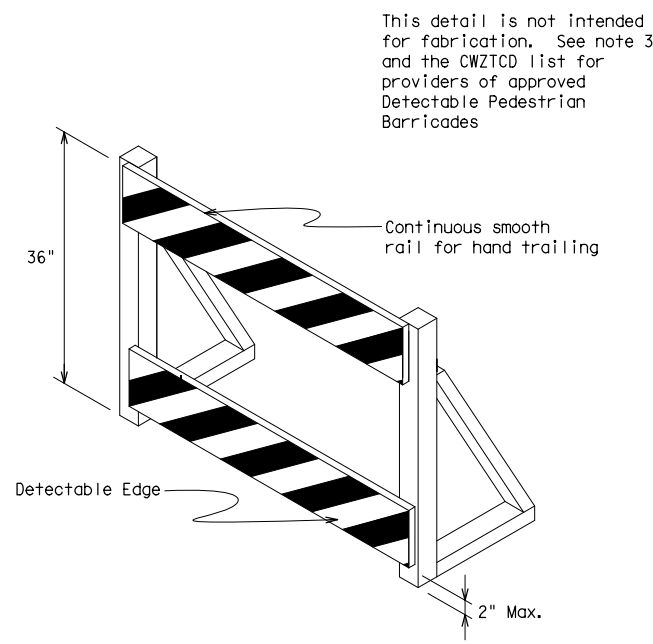
Each drum shall have a minimum of 2 orange and 2 white stripes using Type A retro-reflective sheeting with the top stripe being orange.

Taper to allow for stacking a minimum of 5 drums



DIRECTION INDICATOR BARRICADE

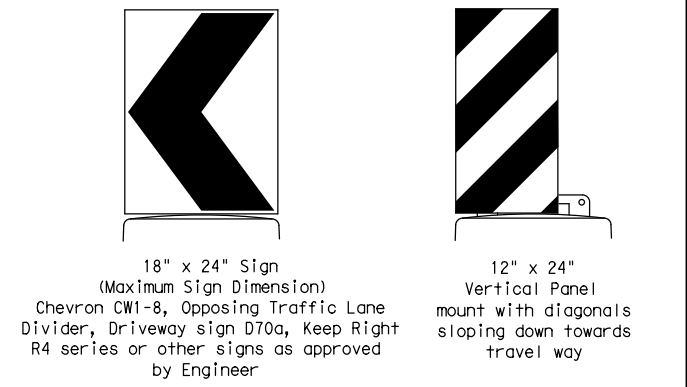
- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
- Double arrows on the Direction Indicator Barricade will not be allowed.
- Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

DETECTABLE PEDESTRIAN BARRICADES

- 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.
- Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
- 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.
- 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 for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
- Warning lights shall not be attached to detectable pedestrian barricades.
- Detectable pedestrian barricades may 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.



Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- 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.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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.

SHEET 8 OF 12

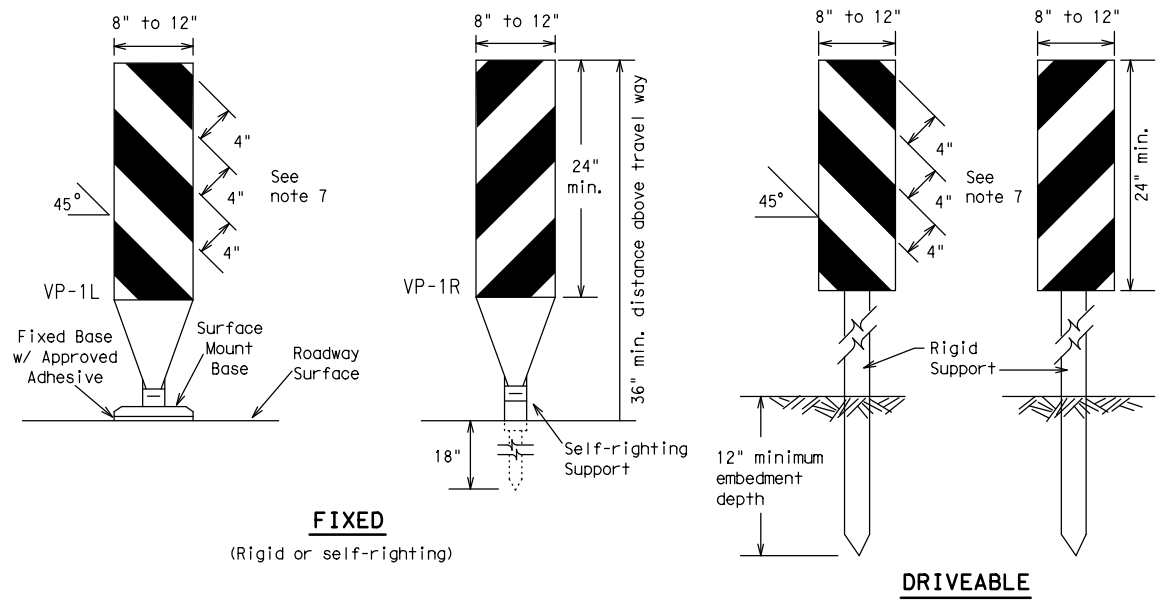
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 14

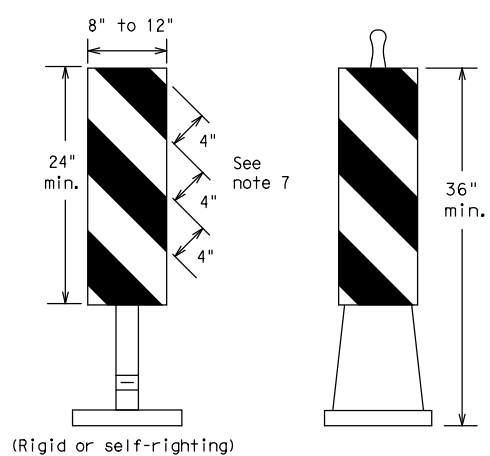
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FIXED
(Rigid or self-righting)

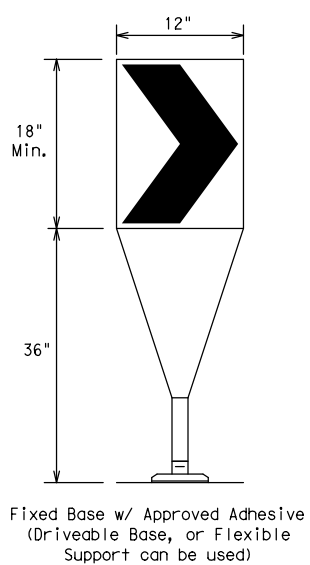
DRIVEABLE



PORTABLE

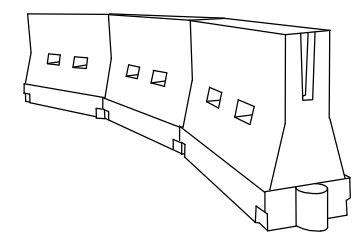
VERTICAL PANELS (VPs)

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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 Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- 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.
- 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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- 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 NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
- 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.
- 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.
- 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.
- 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

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- 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.

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = 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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

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7-13		LFK	POLK	56					

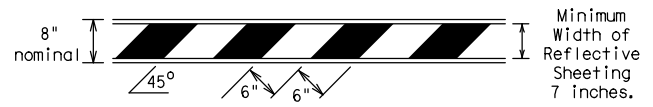
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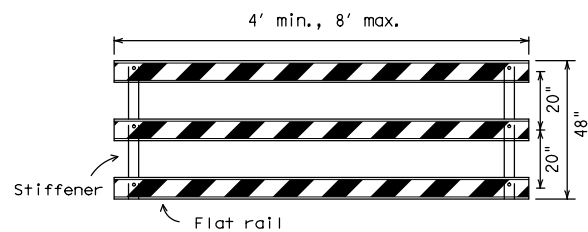
TYPE 3 BARRICADES

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 conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



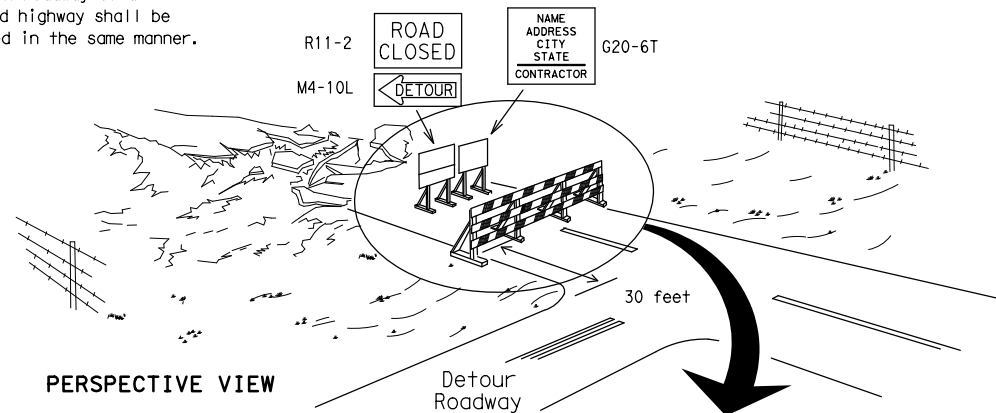
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

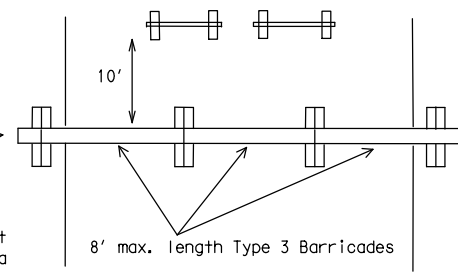
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

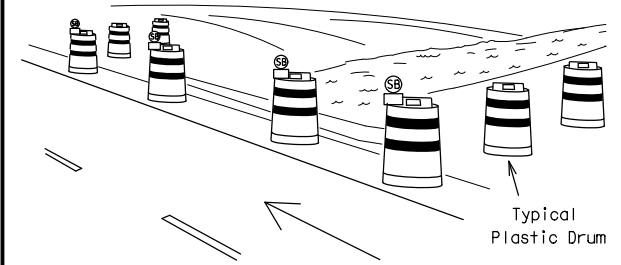
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



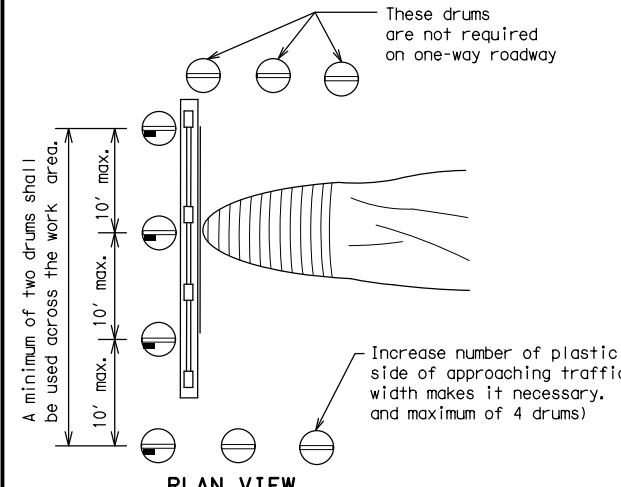
PLAN VIEW

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

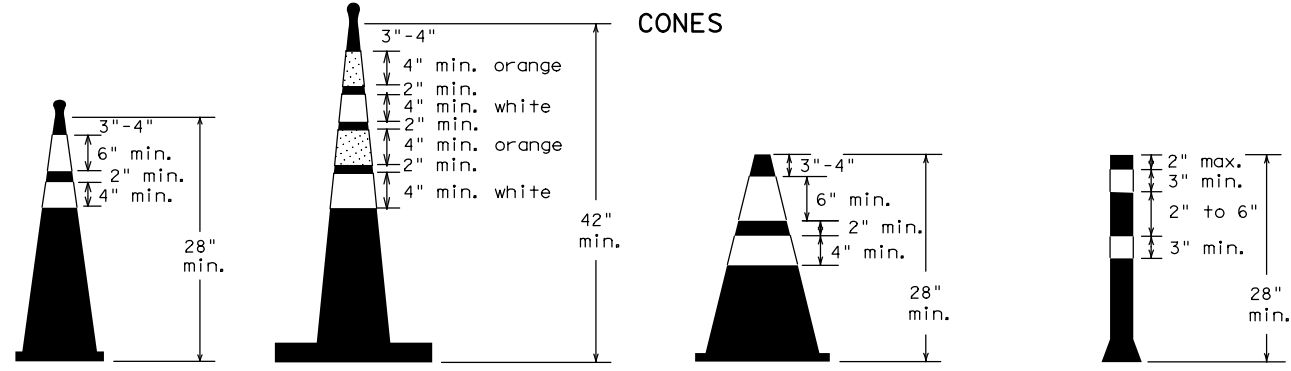


PLAN VIEW

1. Where positive redirection 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
	Steady burn warning light or yellow warning reflector

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



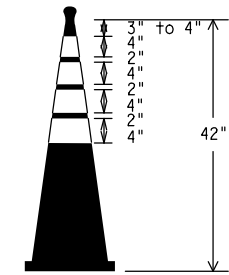
Two-Piece cones

One-Piece cones

Tubular Marker

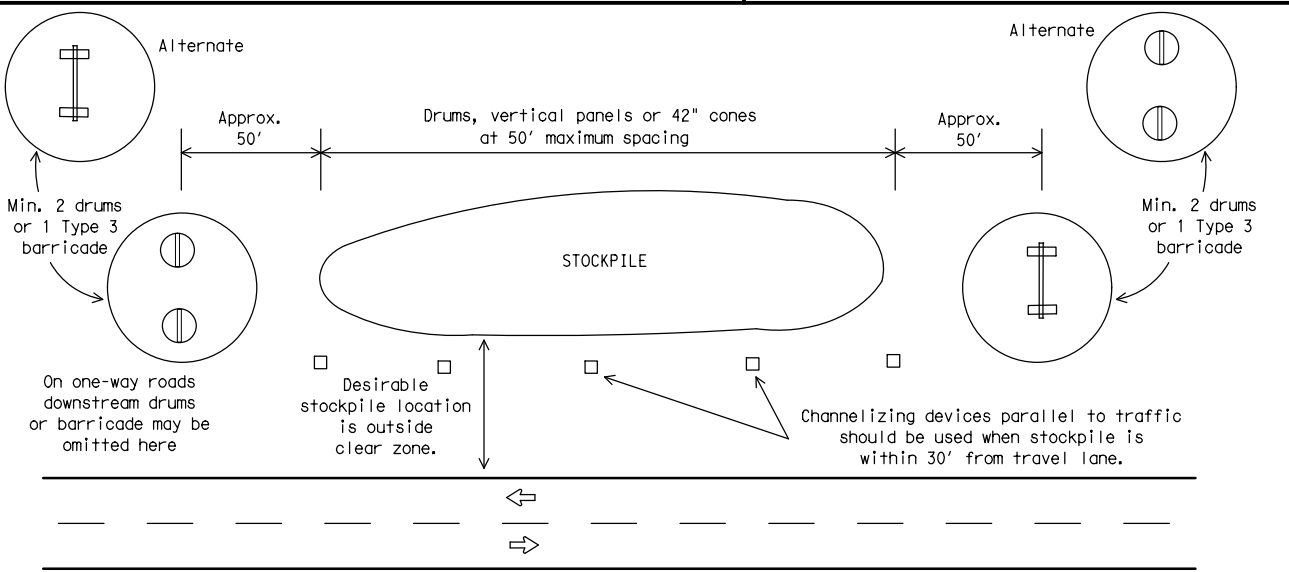
28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGE LINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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 used at night 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.
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.

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13	LFK	POLK	57	

DATE: 05/26/2021 09:00:47
 FILE: c:\pwworkdir\boe_pw\eman\lmann\dms58434\bc-14.dgn

WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

- Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
- Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

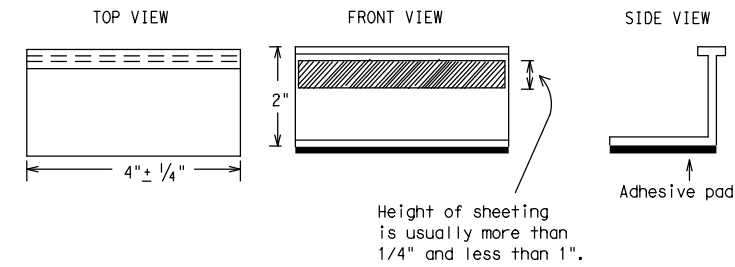
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

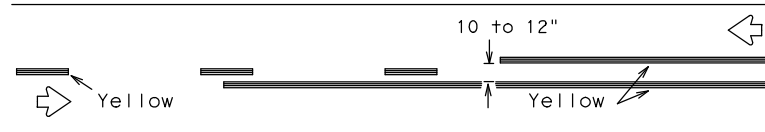
BC(11)-14

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11-02 8-14	LFK	POLK	58	

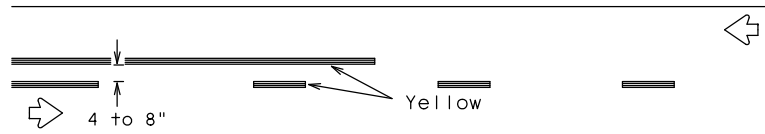
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PAVEMENT MARKING PATTERNS

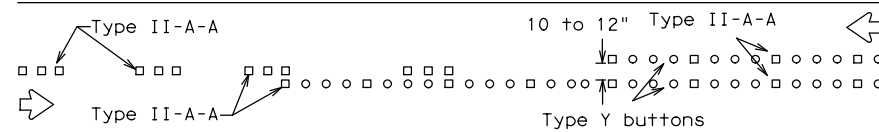


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

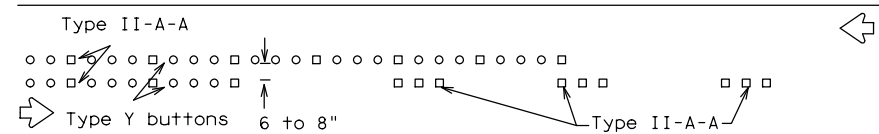


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.

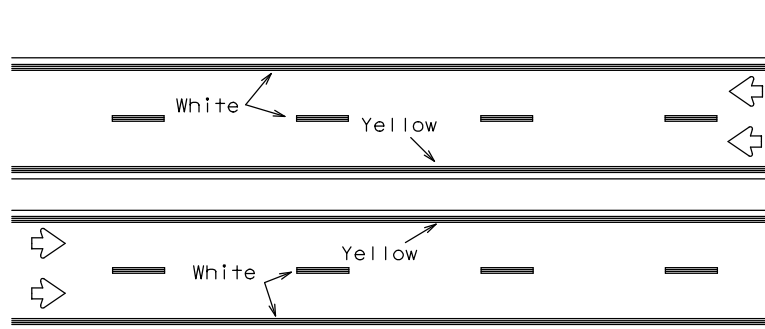


RAISED PAVEMENT MARKERS - PATTERN A



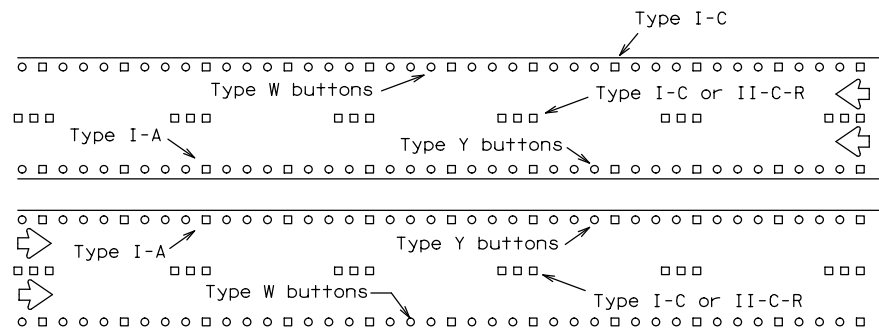
RAISED PAVEMENT MARKERS - PATTERN B

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



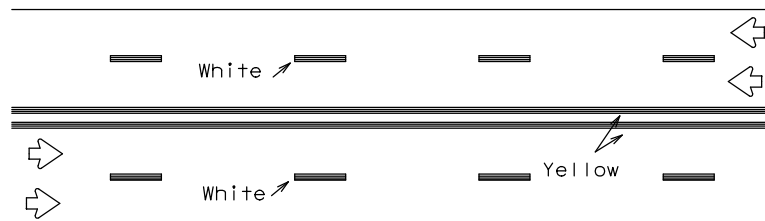
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



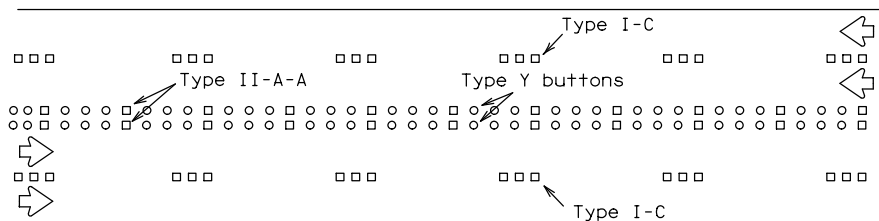
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



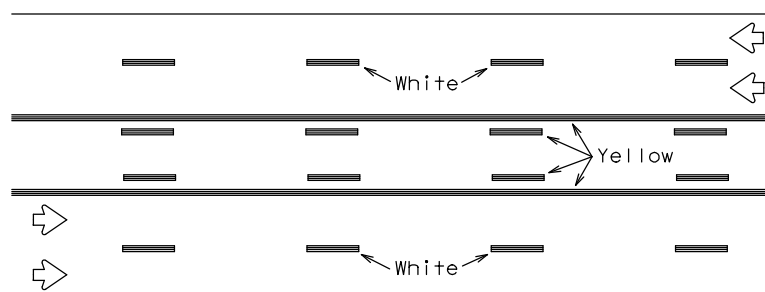
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



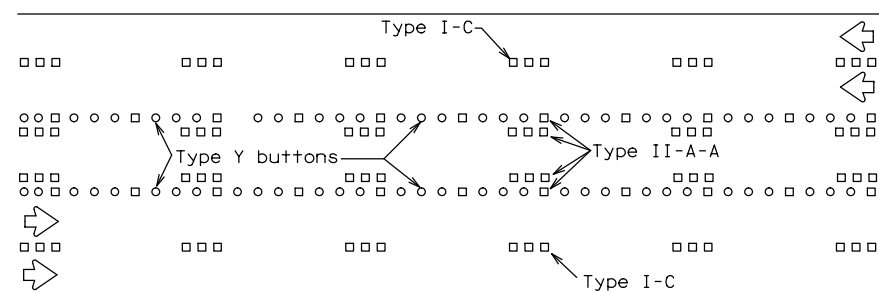
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

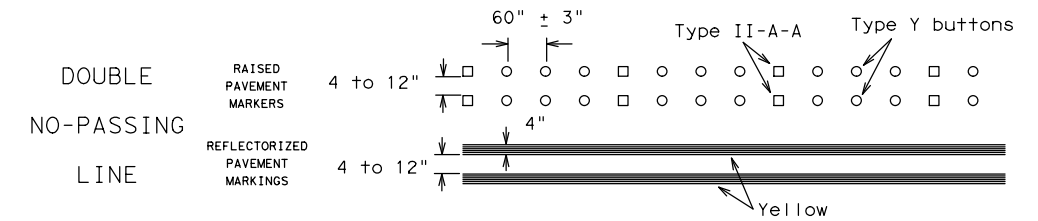
Prefabricated markings may be substituted for reflectORIZED pavement markings.



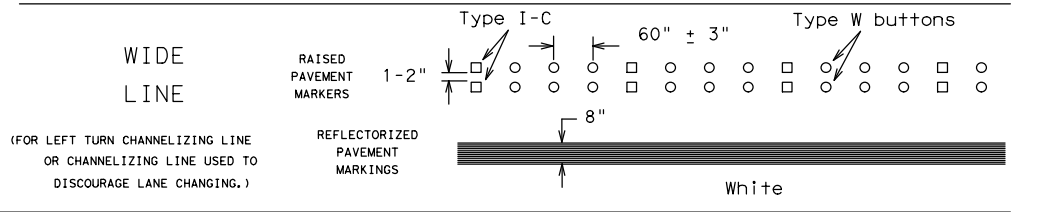
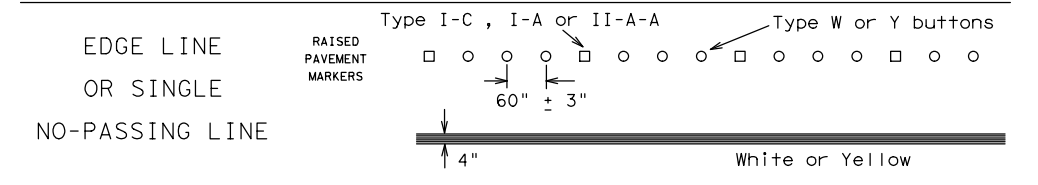
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

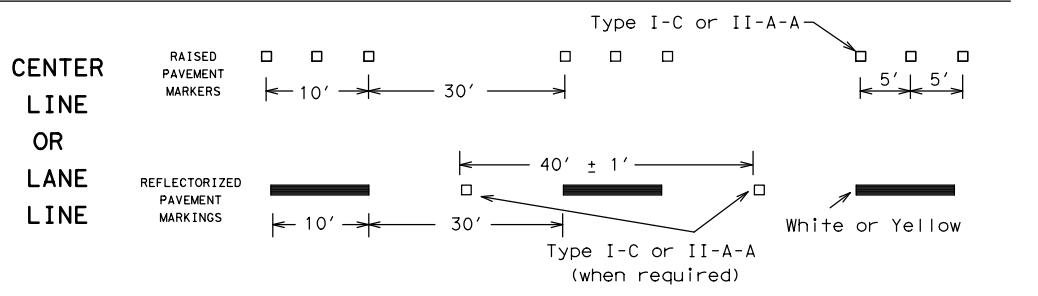
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



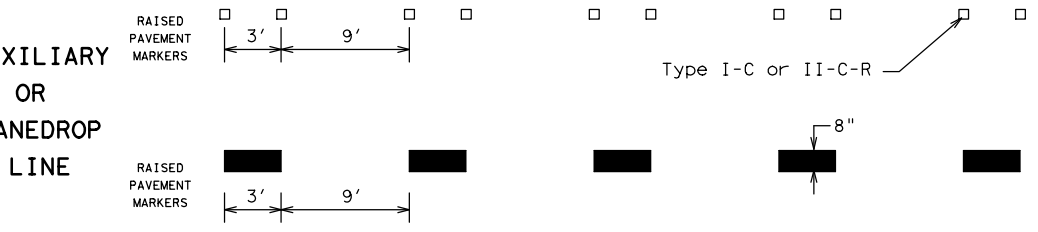
SOLID LINES



BROKEN LINES

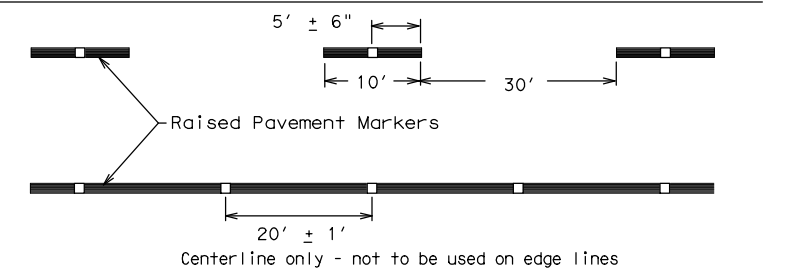


AUXILIARY OR LANEDROP LINE



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.



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0213	04	050	US 190
1-97 9-07	DIST	COUNTY	SHEET NO.	
2-98 7-13	LFK	POLK	59	
11-02 8-14				

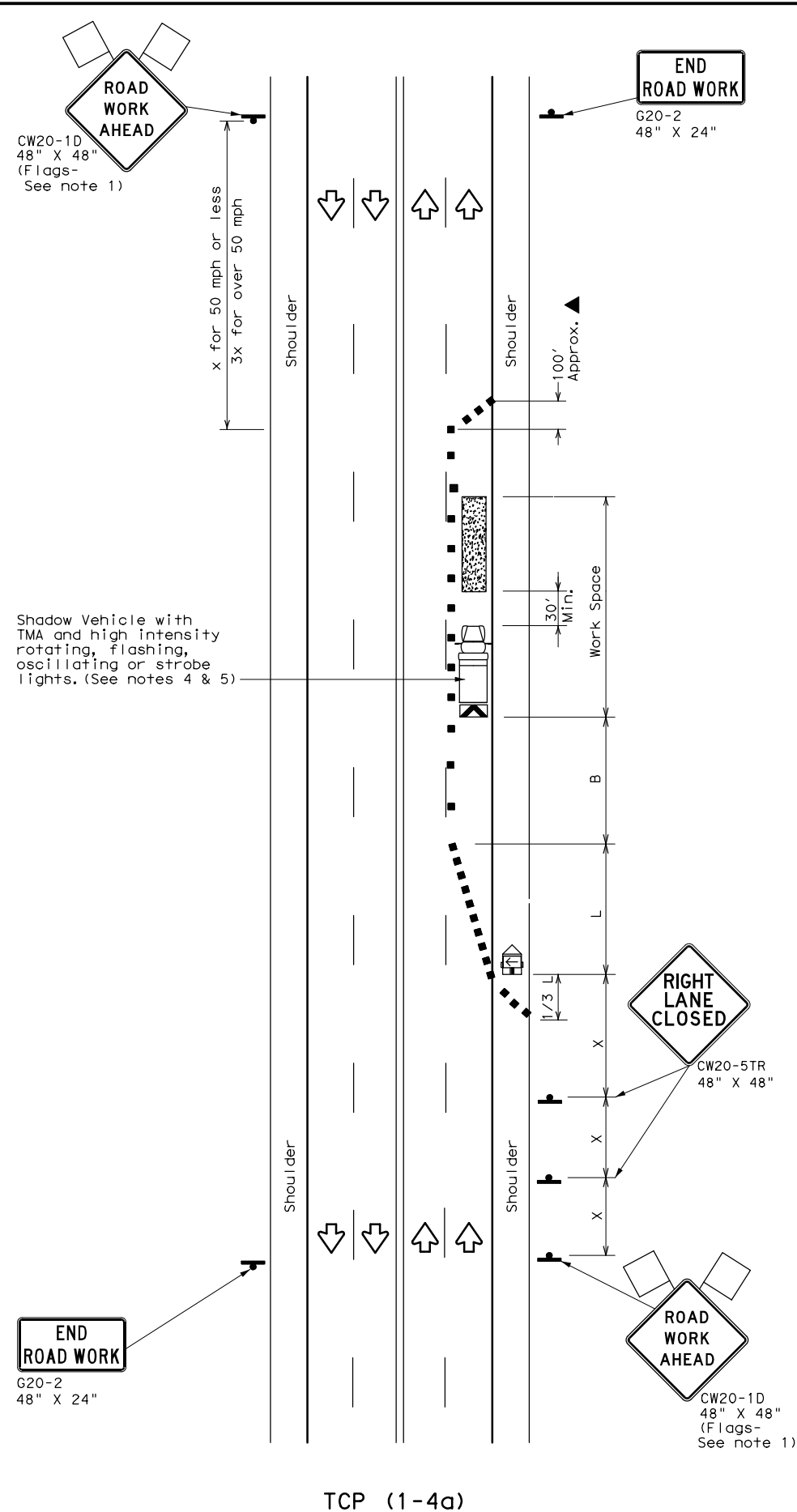
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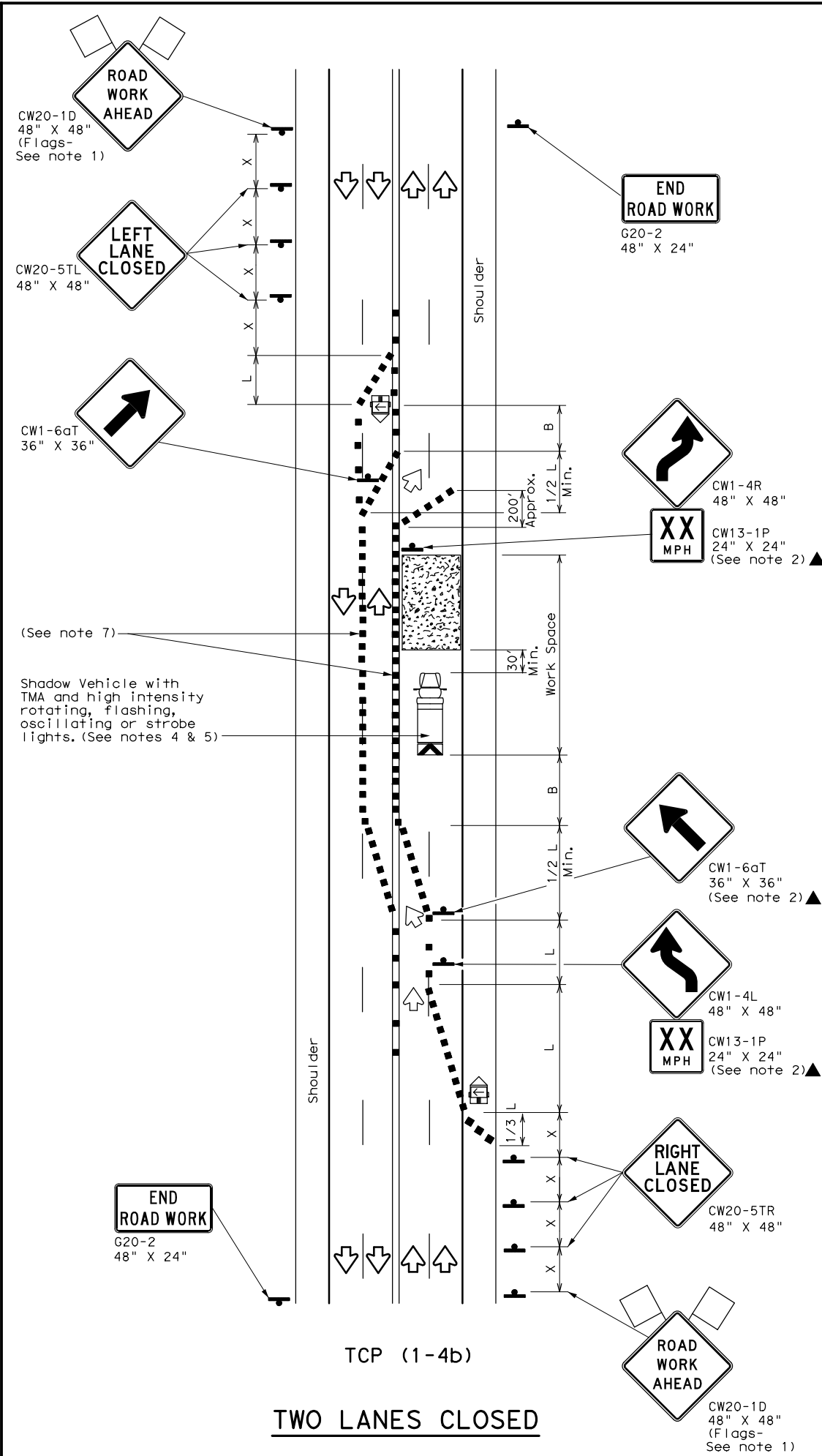
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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DATE: 05/13/2021 06:31:31
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TCP (1-4a)
ONE LANE CLOSED



TCP (1-4b)
TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**
- Flags attached to signs where shown are REQUIRED.
 - 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.
 - The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

- 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 where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

- 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 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas 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**

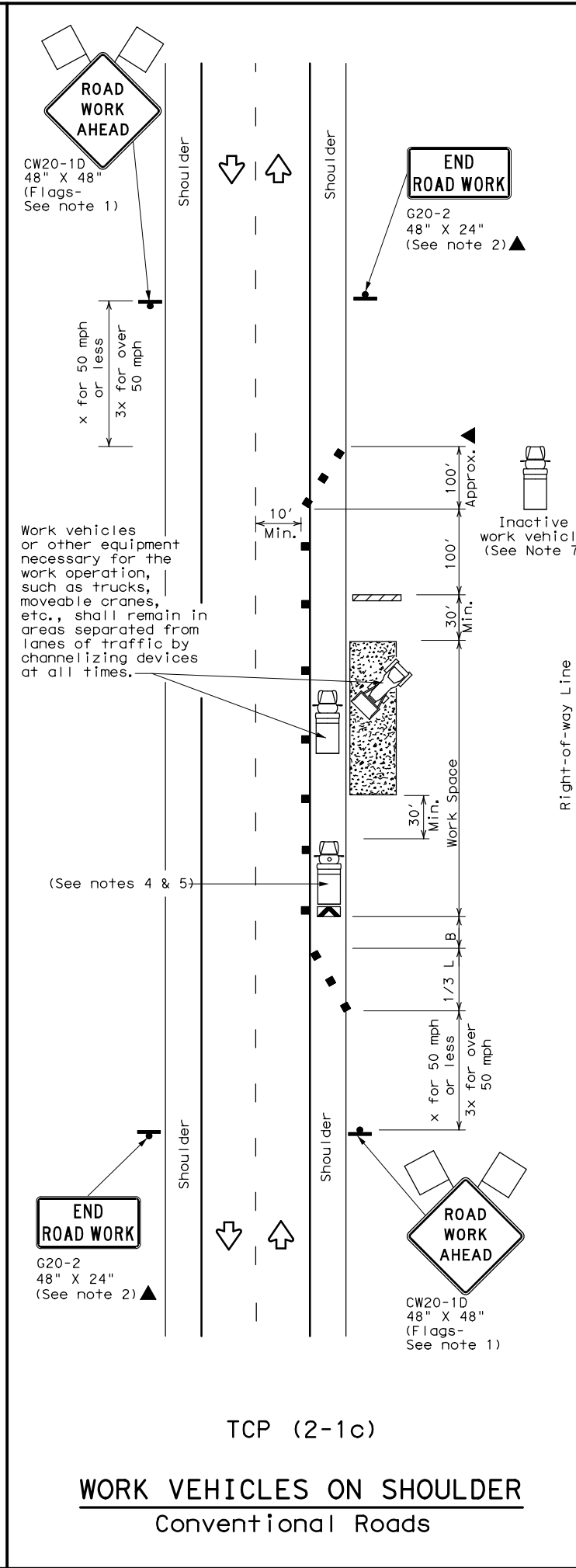
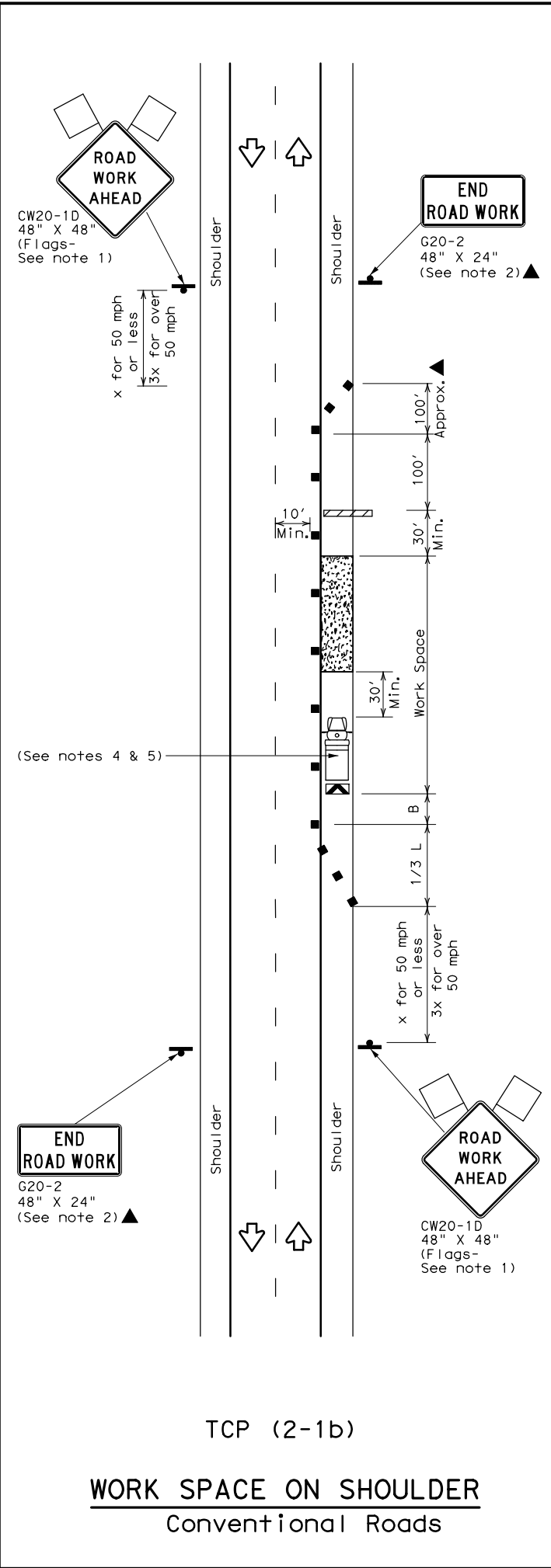
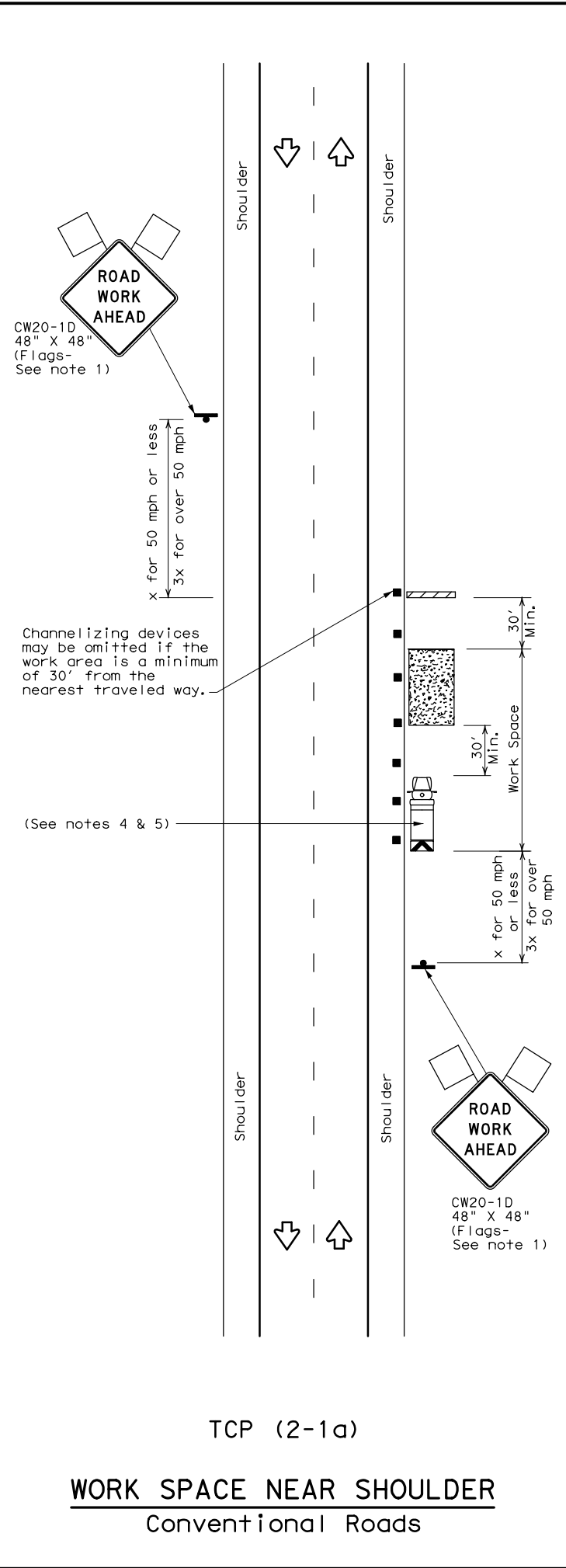
TCP (1-4) - 18

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2-94 4-98				
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	LFK	POLK		60

154

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LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**
- Flags attached to signs where shown, are REQUIRED.
 - 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.
 - Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
 - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.



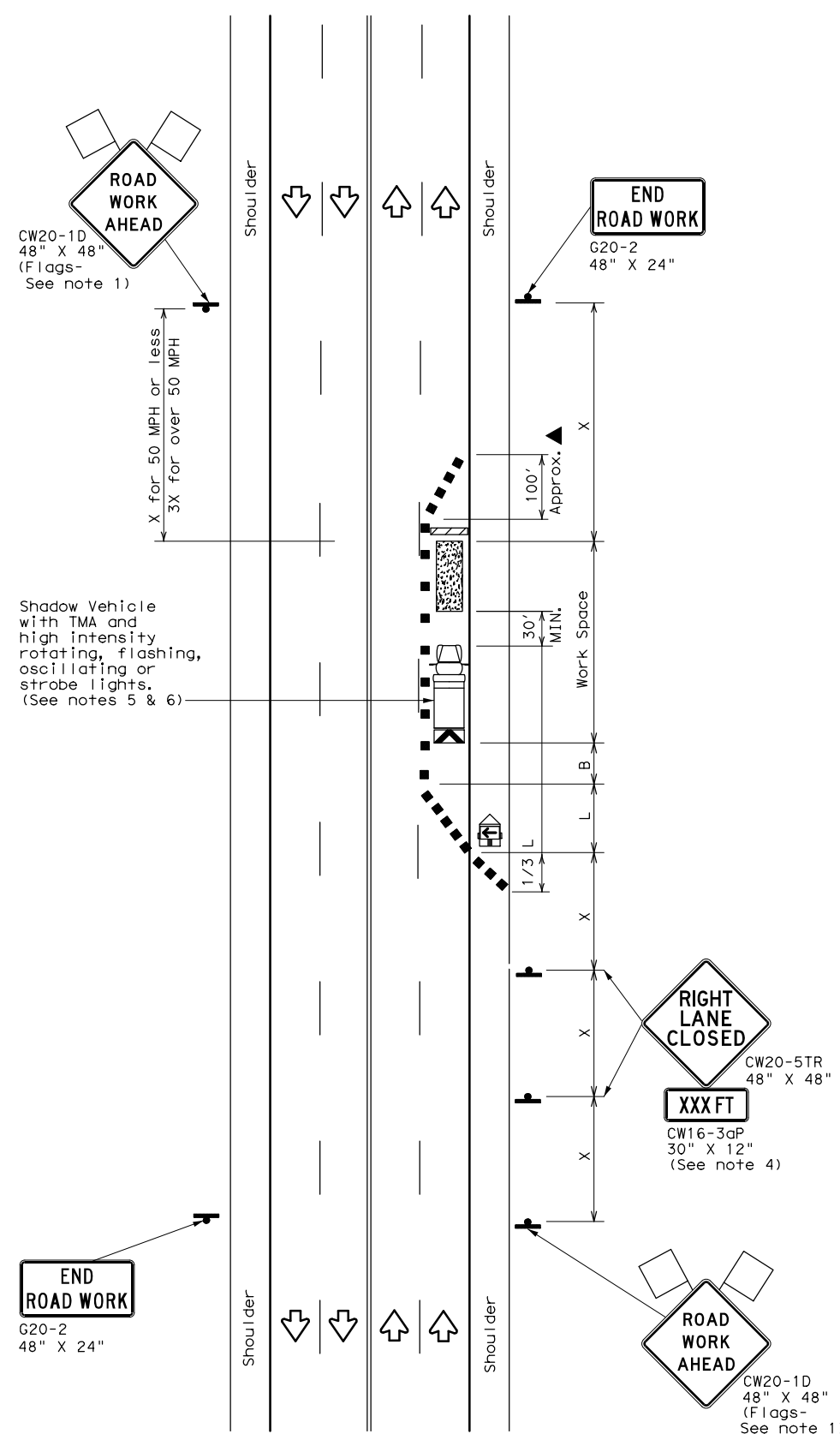
**TRAFFIC CONTROL PLAN
 CONVENTIONAL ROAD
 SHOULDER WORK**

TCP (2-1) - 18

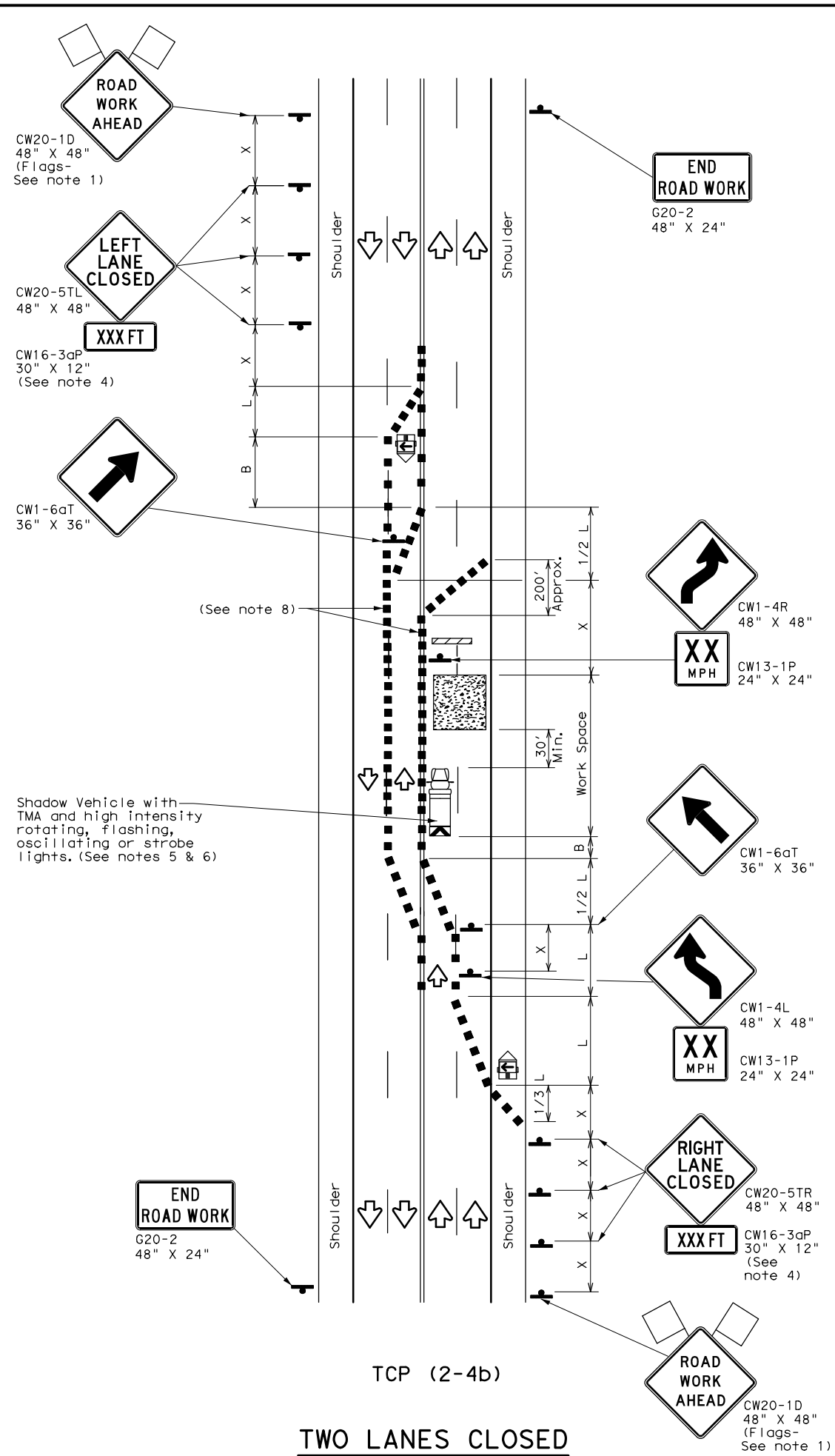
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© TxDOT December 1985	CON:	SECT:	JOB:	HIGHWAY:
REVISIONS	0213	04	050	US 190
2-94 4-98	DIST:	COUNTY:	SHEET NO.	
8-95 2-12	LFK	POLK	61	
1-97 2-18				

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DATE: 05/13/2021 06:31:44
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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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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

- Flags attached to signs where shown, are REQUIRED.
- 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.
- The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
- 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.
- 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.
- 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)

- 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)

- 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.



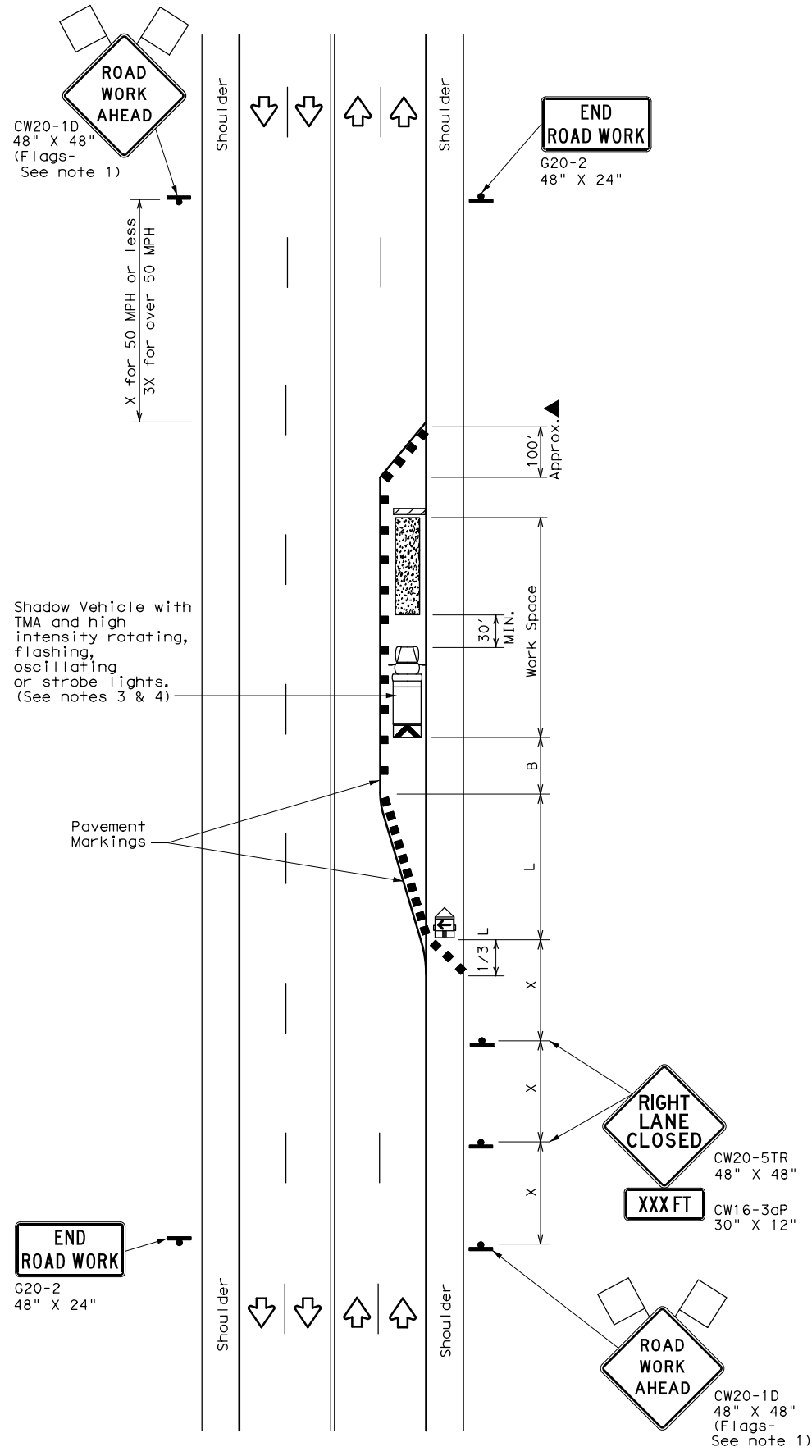
**TRAFFIC CONTROL PLAN
 LANE CLOSURES ON MULTILANE
 CONVENTIONAL ROADS**

TCP (2-4) - 18

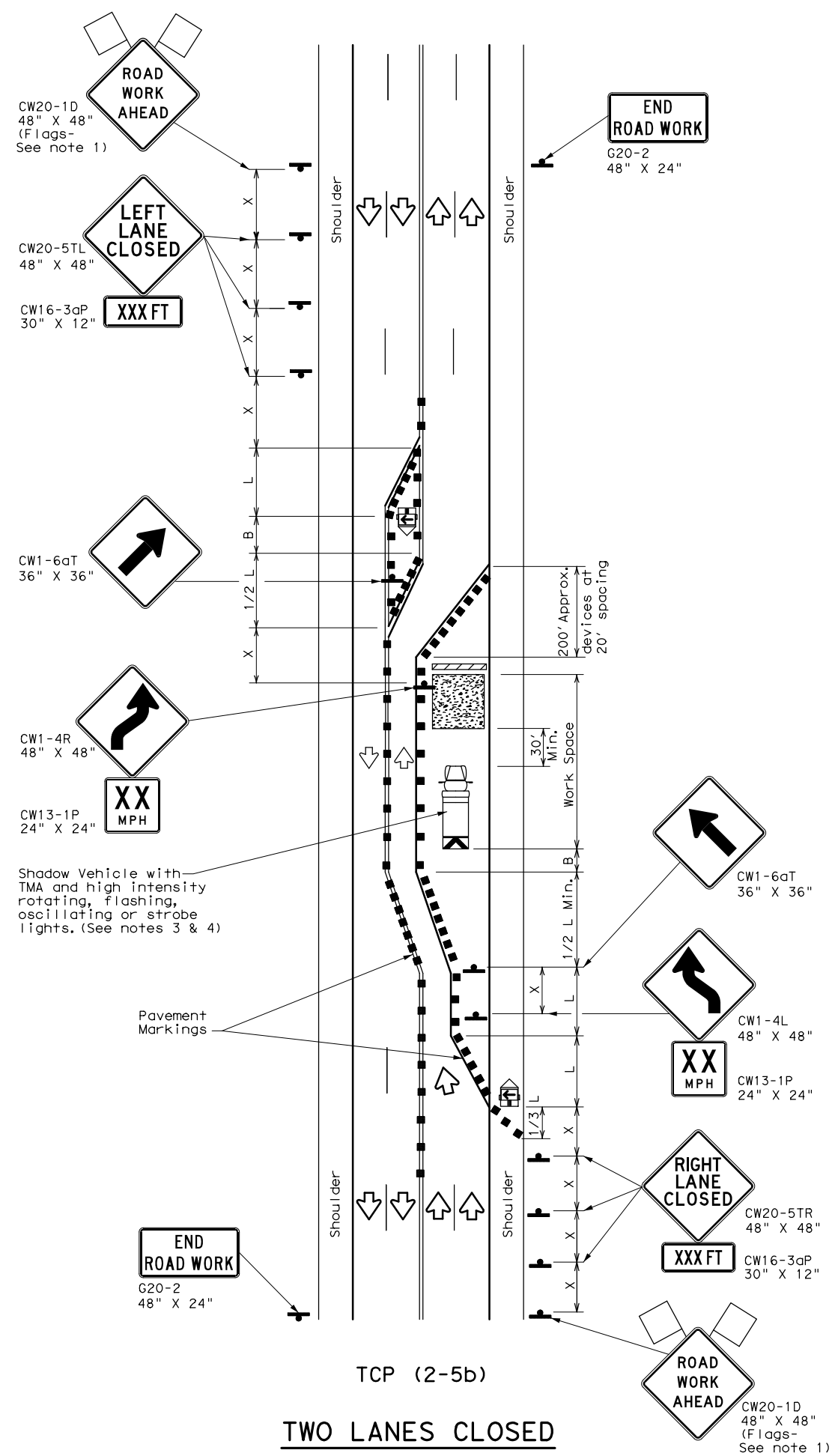
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
8-95 3-03	DIST	COUNTY	SHEET NO.	
1-97 2-12	LFK	POLK	62	
4-98 2-18				

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DATE: 05/13/2021 06:31:51
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TCP (2-5a)
ONE LANE CLOSED



TCP (2-5b)
TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed * X	Formula	Minimum Desirable Taper Lengths X*			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**
- Flags attached to signs where shown, are REQUIRED.
 - 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.
 - 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.
 - 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.
 - The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

- TCP (2-5a)**
- 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 (2-5b)**
- Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

Traffic Operations Division Standard

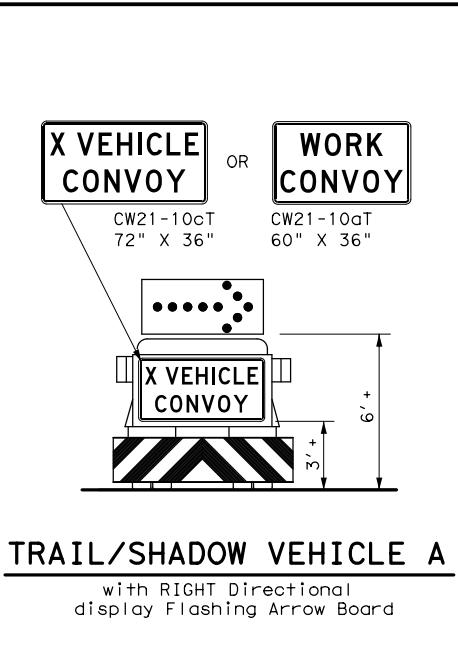
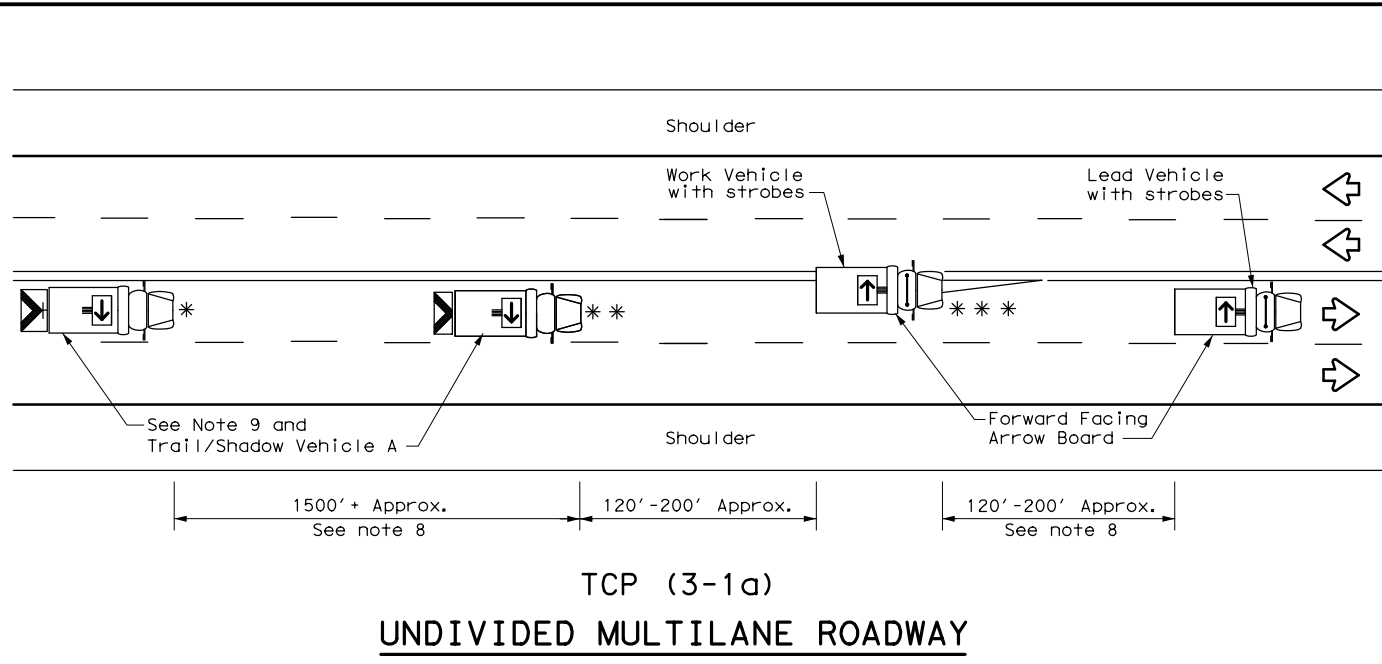
TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.
TCP (2-5) - 18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
8-95 2-12	0213	04	050	US 190
1-97 3-03	DIST	COUNTY	SHEET NO.	
4-98 2-18	LFK	POLK	63	

165

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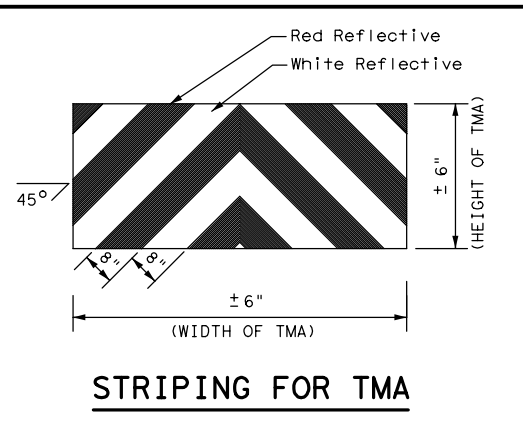
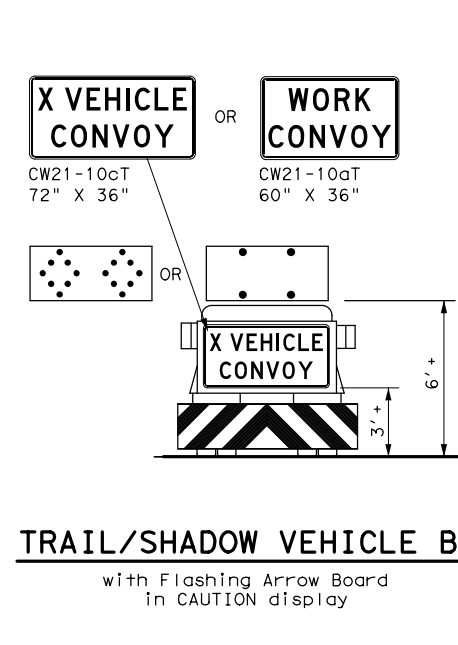
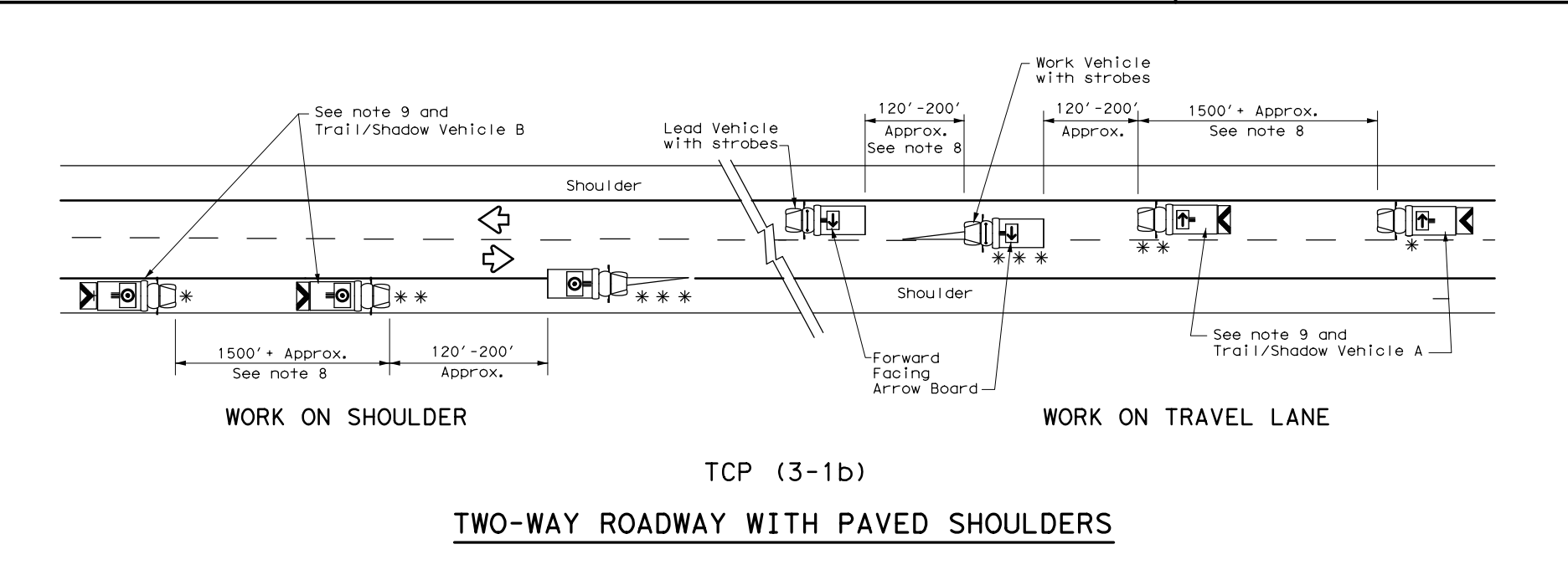


LEGEND				
*	Trail Vehicle	ARROW BOARD DISPLAY		
**	Shadow Vehicle			
***	Work Vehicle		RIGHT Directional	
	Heavy Work Vehicle		LEFT Directional	
	Truck Mounted Attenuator (TMA)		Double Arrow	
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)	

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GENERAL NOTES

- TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
- 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.
- The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
- Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
- Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- 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 and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
- "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY" (CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
- On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



Texas Department of Transportation
 Traffic Operations Division Standard

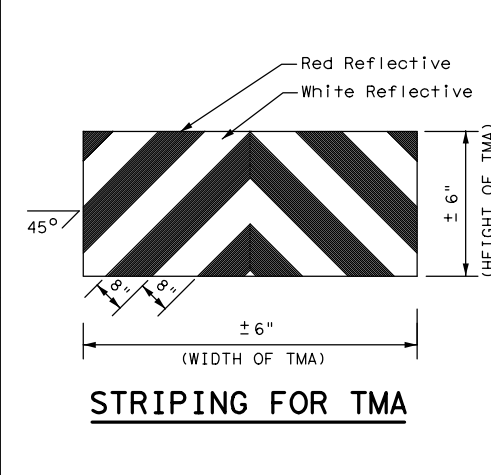
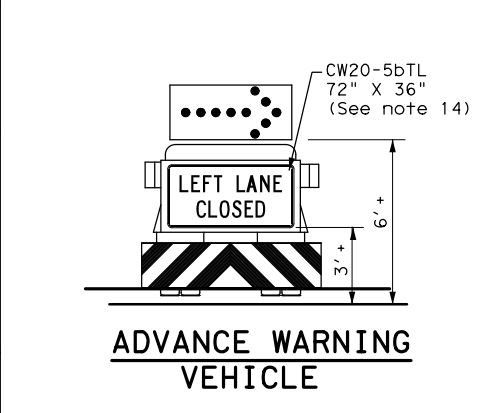
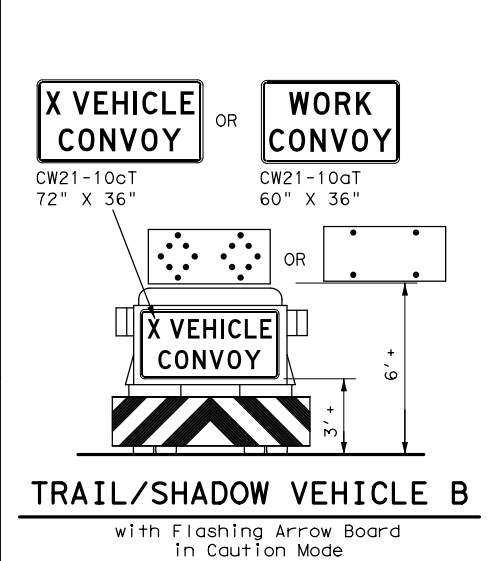
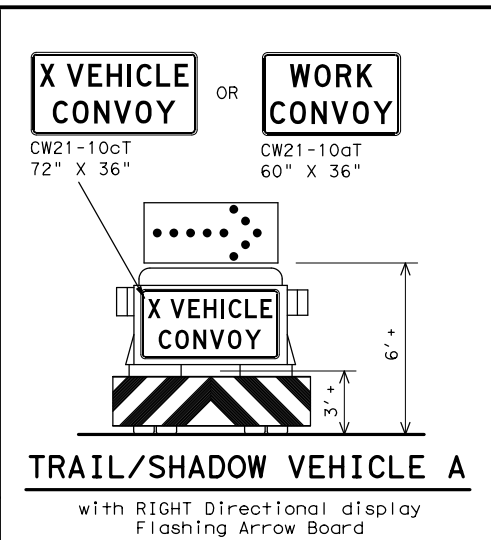
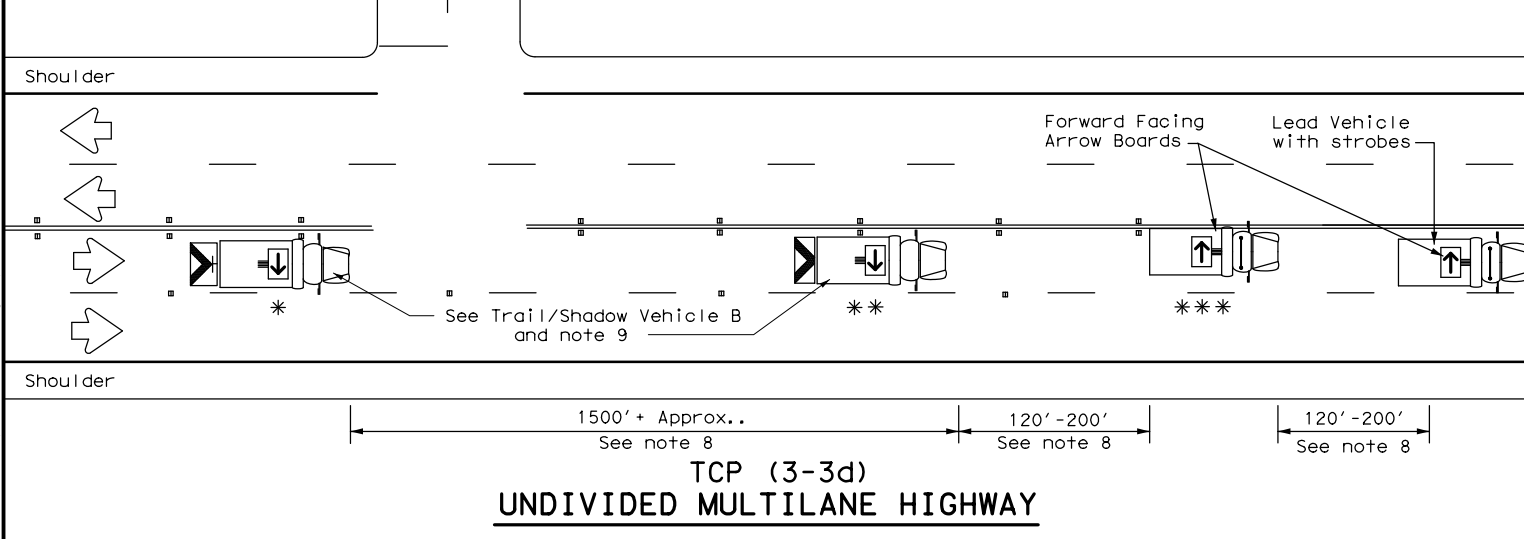
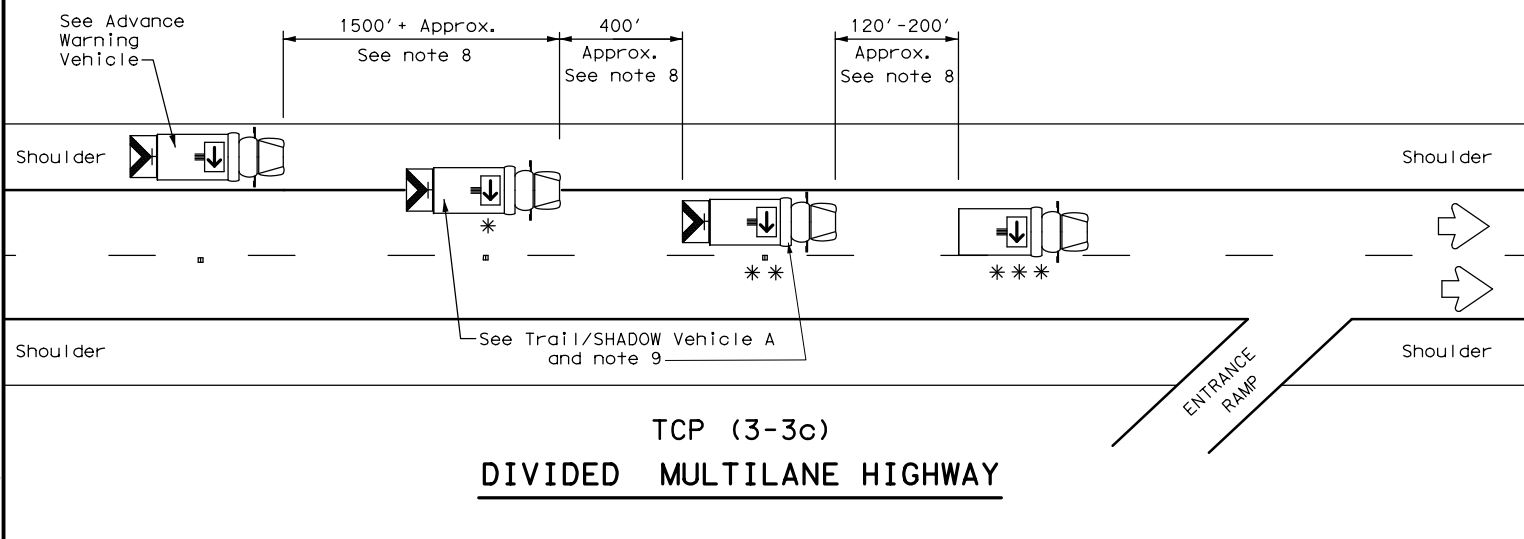
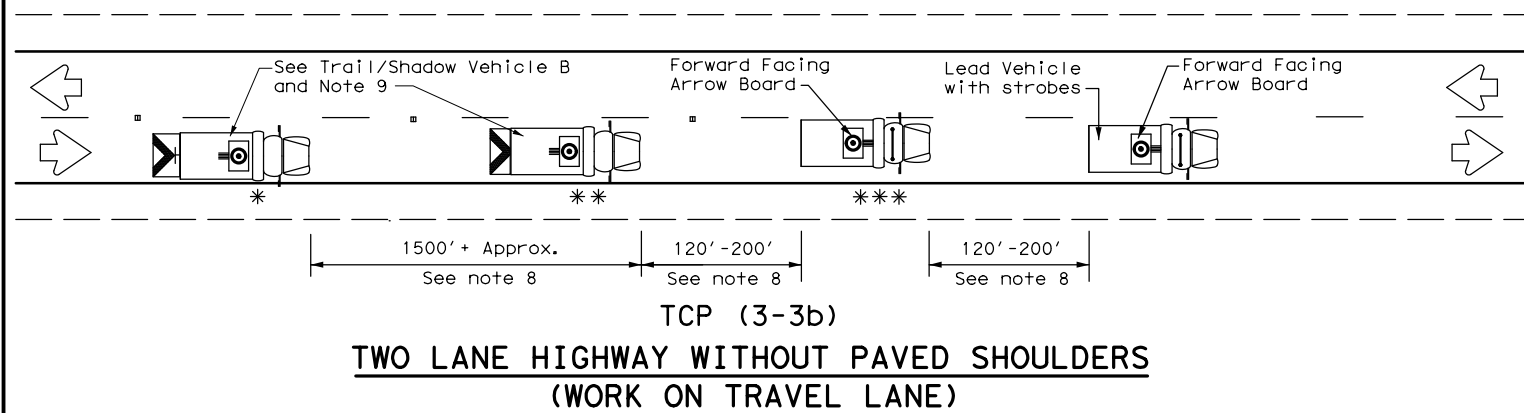
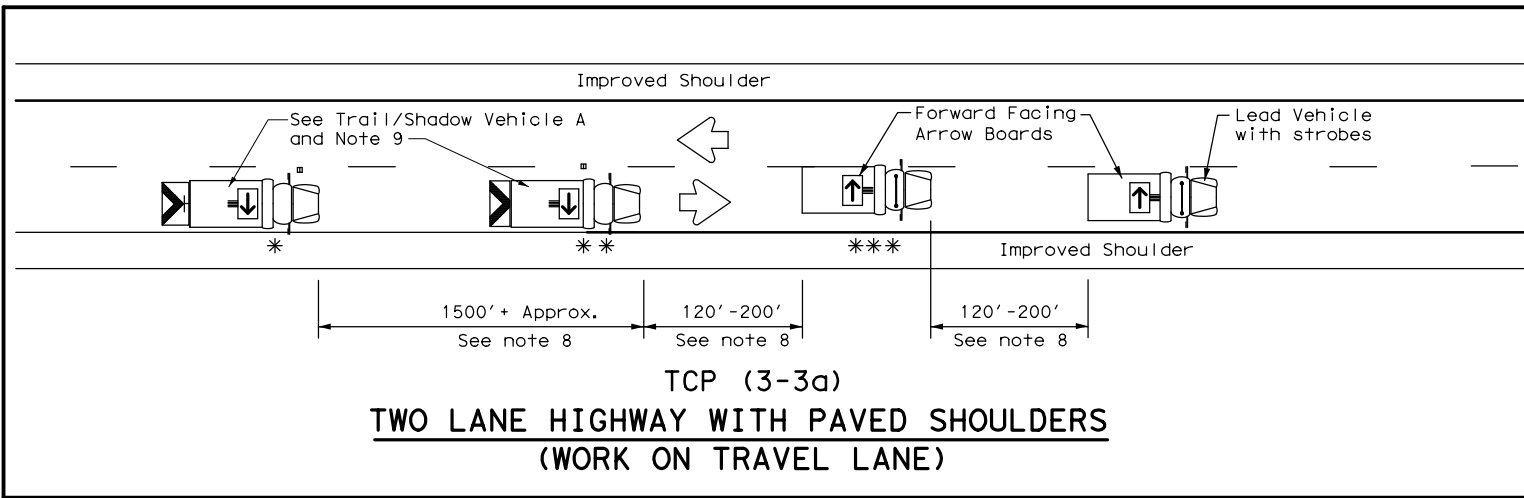
**TRAFFIC CONTROL PLAN
 MOBILE OPERATIONS
 UNDIVIDED HIGHWAYS**

TCP (3-1)-13

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
2-94 4-98				
8-95 7-13				
1-97	DIST	COUNTY	SHEET NO.	
	LFK	POLK	64	

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DATE: 05/13/2021 06:32:03
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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
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. 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.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
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 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 and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or 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 may 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. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

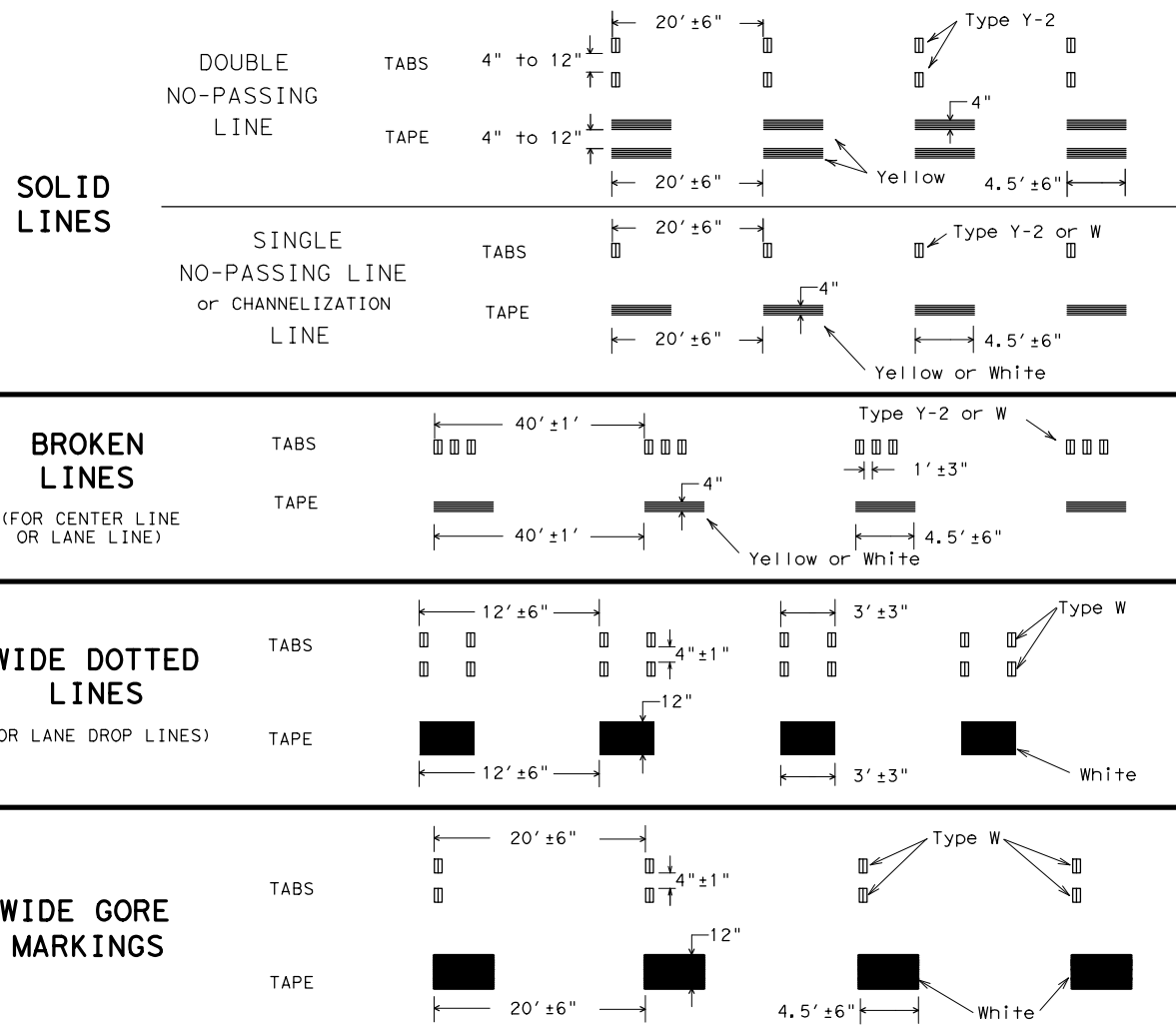
**TRAFFIC CONTROL PLAN
 MOBILE OPERATIONS
 RAISED PAVEMENT
 MARKER INSTALLATION/
 REMOVAL
 TCP (3-3) - 14**

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© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	LFK	POLK	65	
1-97 7-14				

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DATE: 05/13/2021 06:32:09
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WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



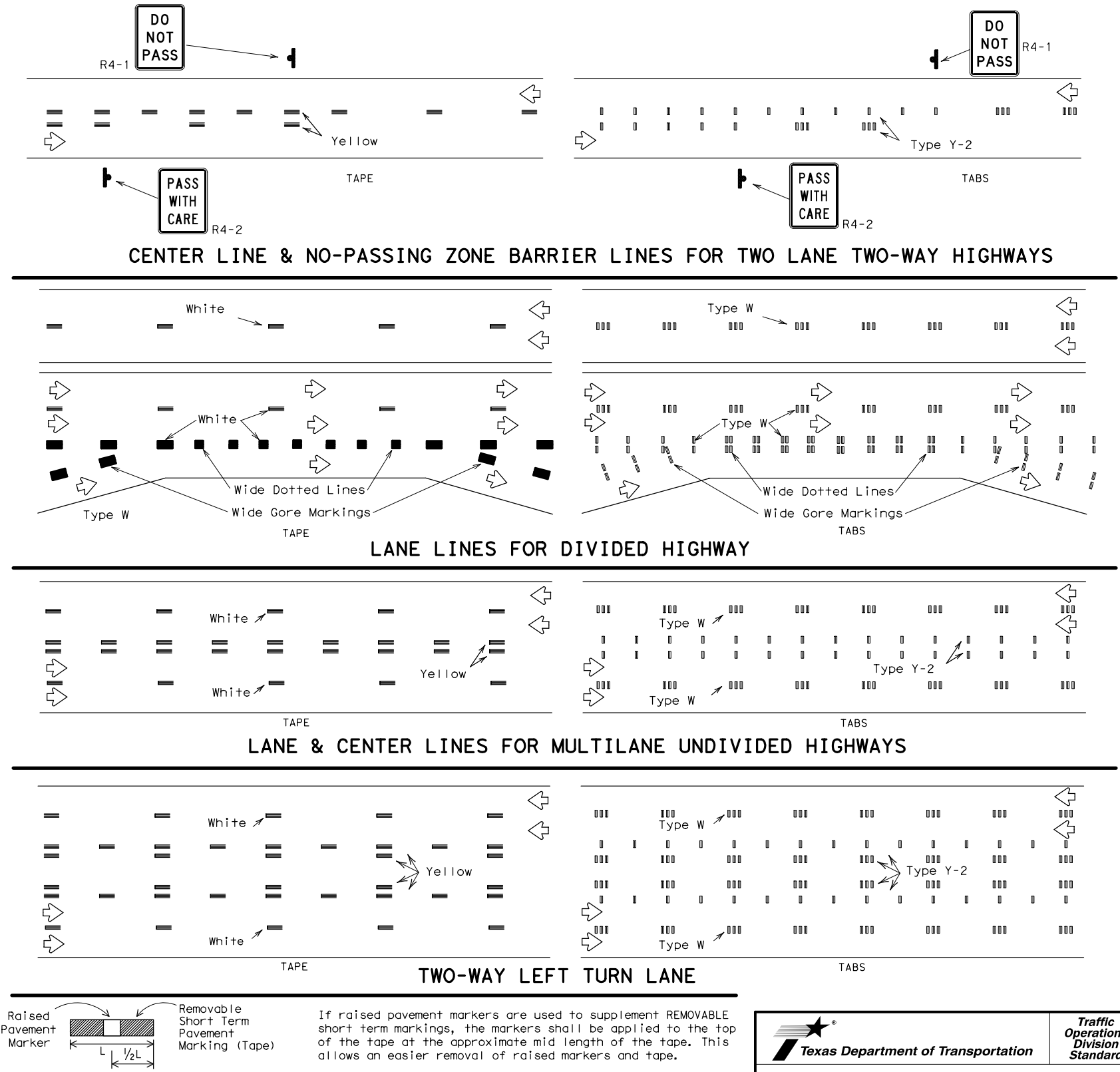
NOTES:

- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
- Short term pavement markings shall NOT be used to simulate edge lines.
- Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
- Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
- No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
- For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
- For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
- For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

- Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
- Tabs shall meet requirements of Departmental Material Specification DMS-8242.
- When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
- No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



PREFABRICATED PAVEMENT MARKINGS

- Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
- Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Construction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

- DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm



WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ (STPM) - 13

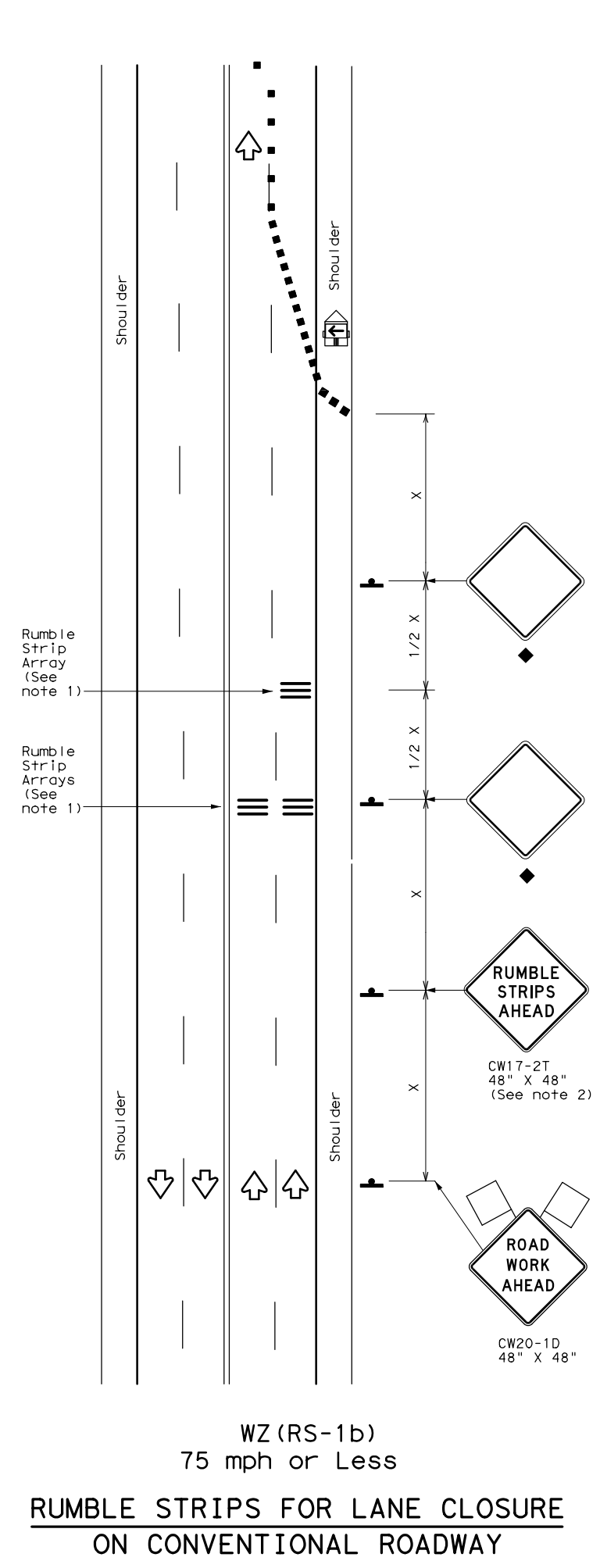
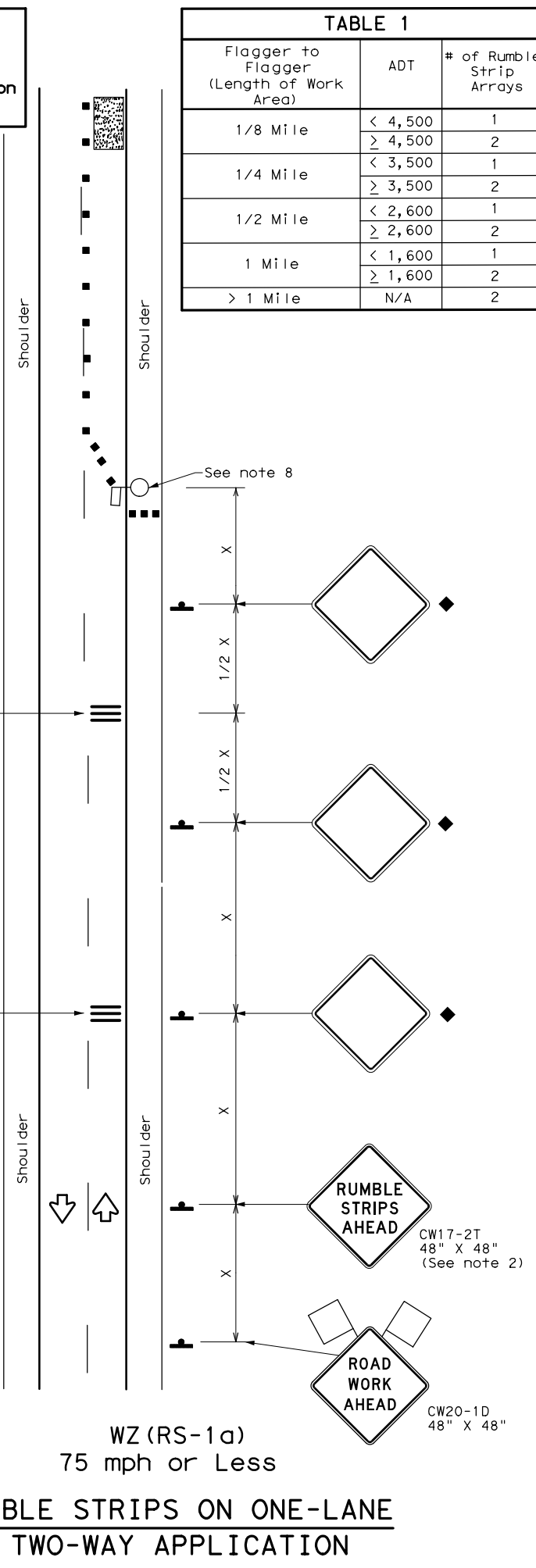
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© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0213	04	050	US 190				
1-97		DIST	COUNTY	SHEET NO.					
3-03		LFK	POLK	66					
7-13									

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DATE: 05/13/2021 06:32:15
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Warning sign and rumble strip sequence in opposite direction is same as below

Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



GENERAL NOTES

- Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
- The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD" sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
- Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
- Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
- Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
- Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
- This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
- The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
- Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = 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)

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.

Texas Department of Transportation
 Traffic Operations Division Standard

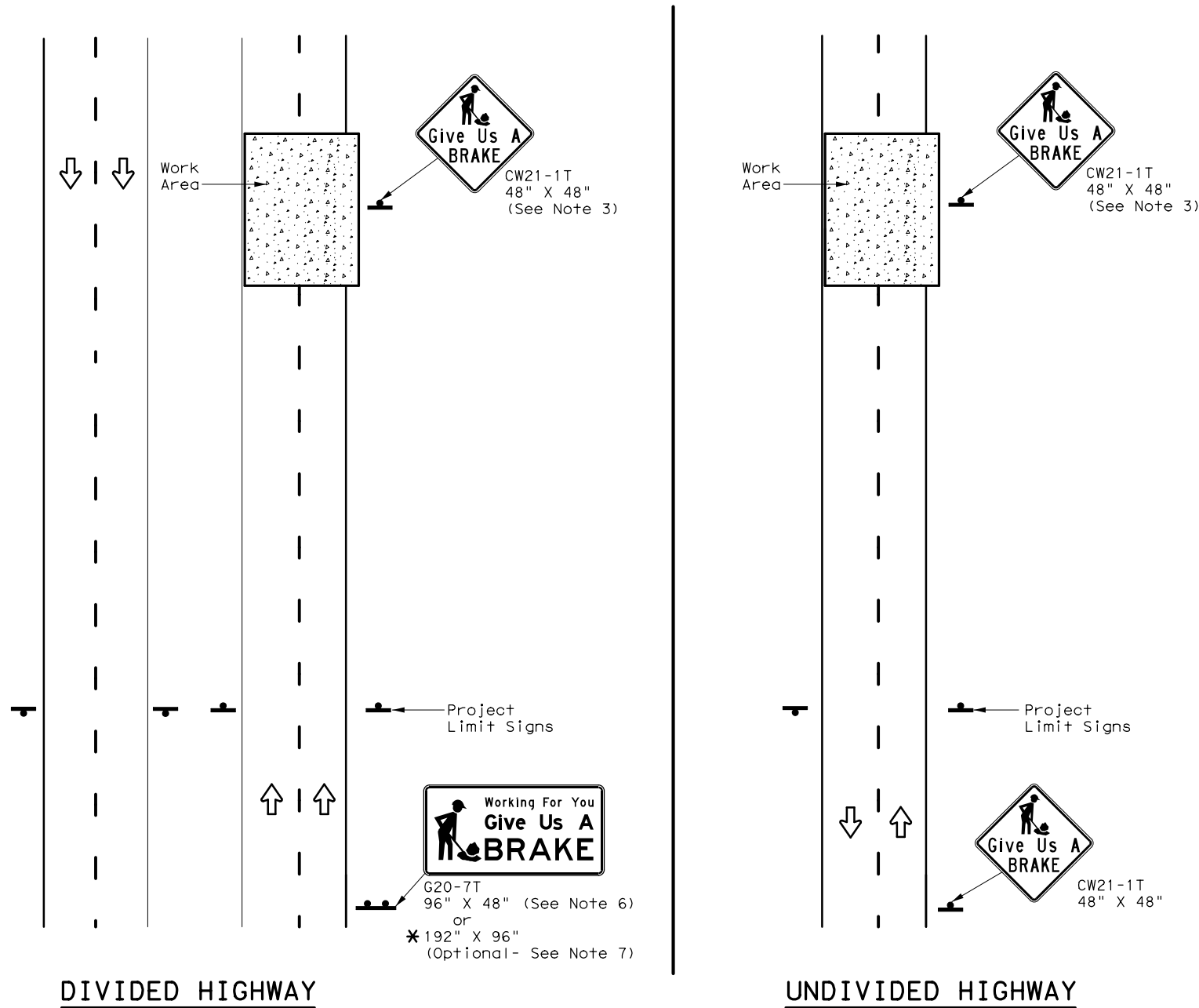
TEMPORARY RUMBLE STRIPS

WZ (RS) - 16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
2-14	DIST	COUNTY	SHEET NO.	
4-16	LFK	POLK	67	

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SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL		DRILLED SHAFT
						Size	(LF)	
							① ②	24" DIA. (LF)
Orange	G20-7T		96" X 48"	Type B _{FL} or C _{FL}	32	▲	▲ ▲	▲
Orange	G20-7T		192" X 96"	Type B _{FL} or C _{FL}	128	W8x18	16 17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B _{FL} OR TYPE C _{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

- See BC and SMD sheets for additional sign support details.
- Sign locations shall be approved by the Engineer.
- For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
- Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
- Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
- The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
- The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
 Item 636 - Aluminum Signs
 Item 647 - Large Roadside Sign Supports and Assemblies.
 Item 416 - Drilled Shaft Foundations
- 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.



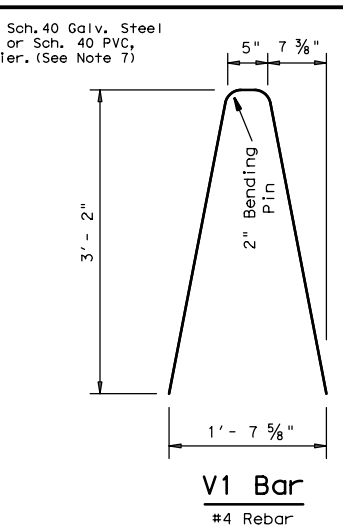
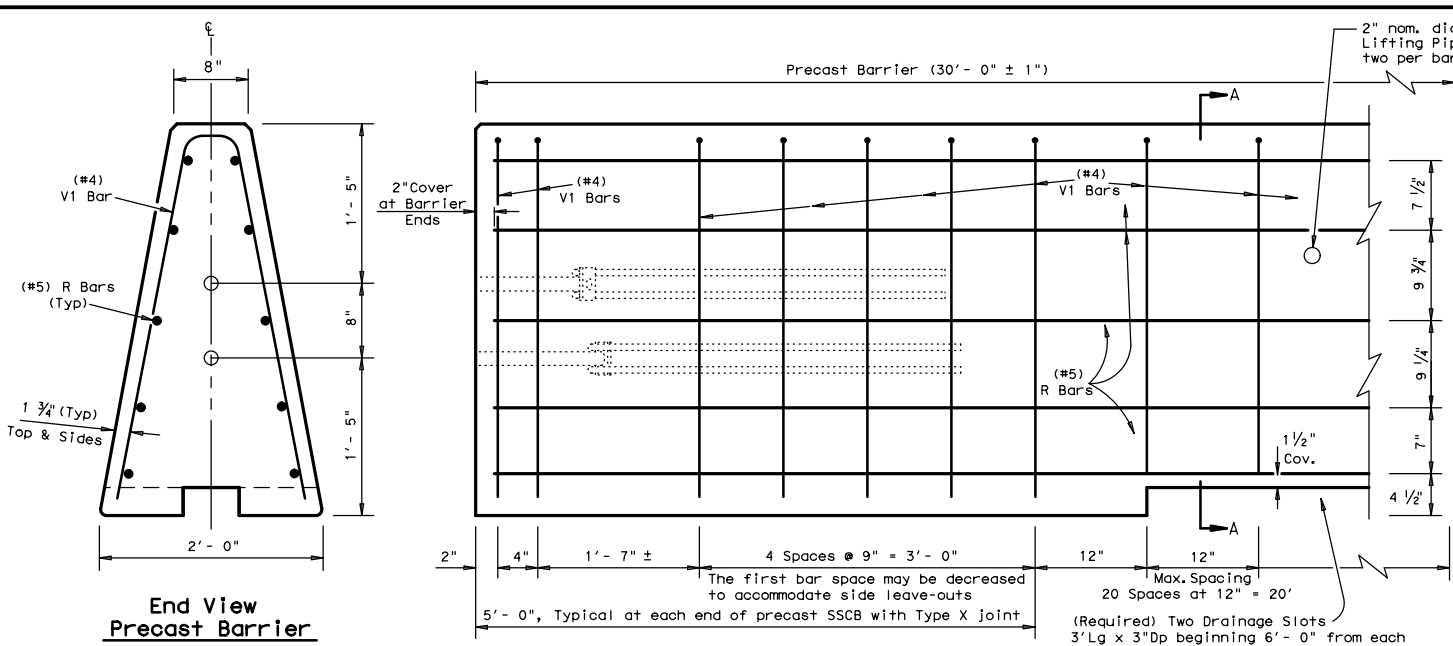
WORK ZONE
 "GIVE US A BRAKE"
 SIGNS

WZ (BRK) - 13

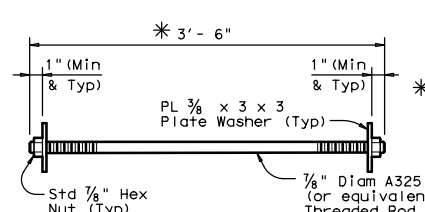
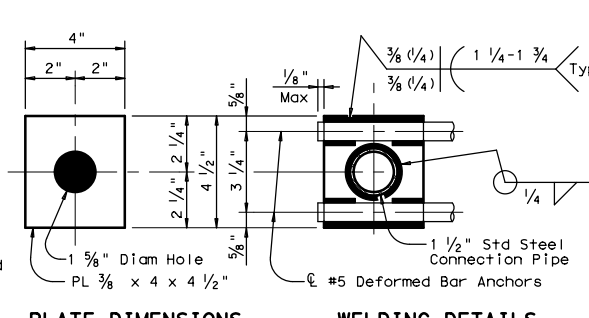
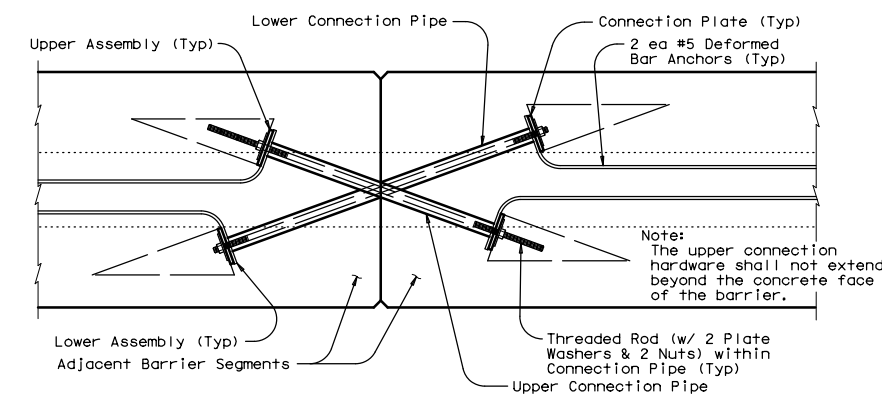
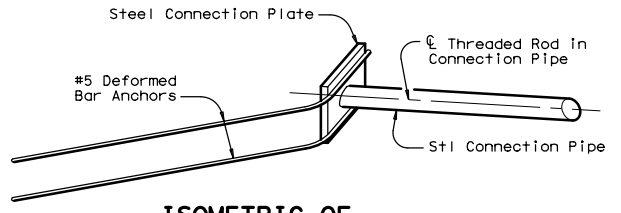
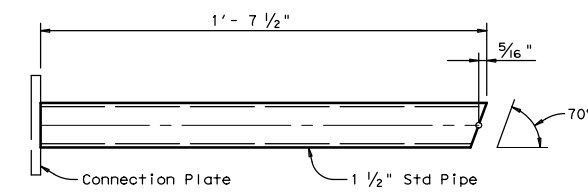
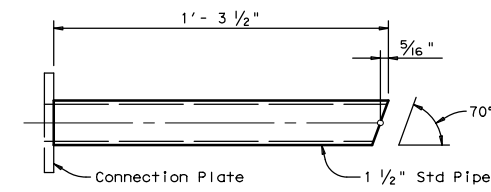
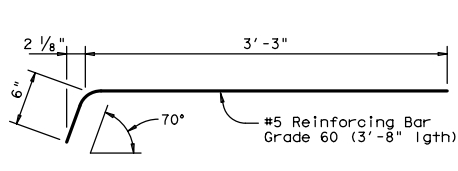
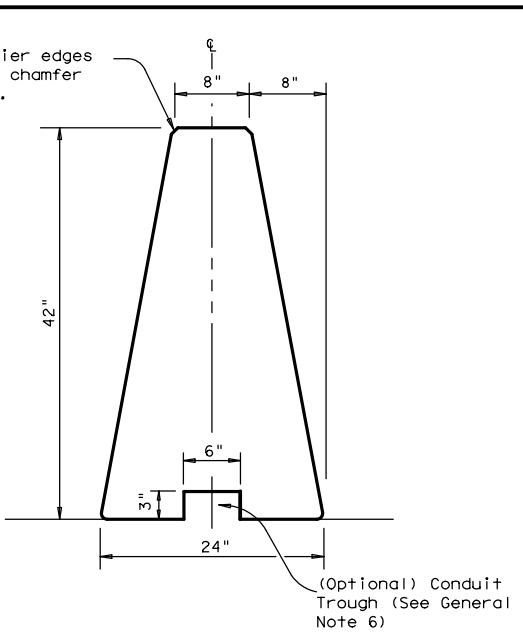
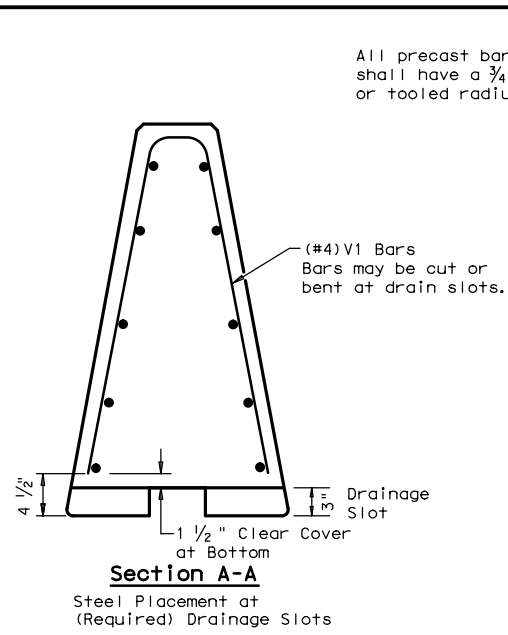
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REVISIONS		0213	04	050	US 190				
6-96	5-98	7-13			DIST	COUNTY	SHEET NO.		
8-96	3-03			LFK	POLK	68			

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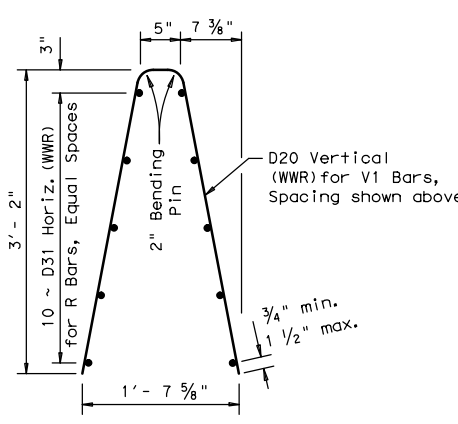


Note:
 V1 Bars above the drainage slots may be bent to accommodate 1 1/2" clear cover as directed by the Engineer.

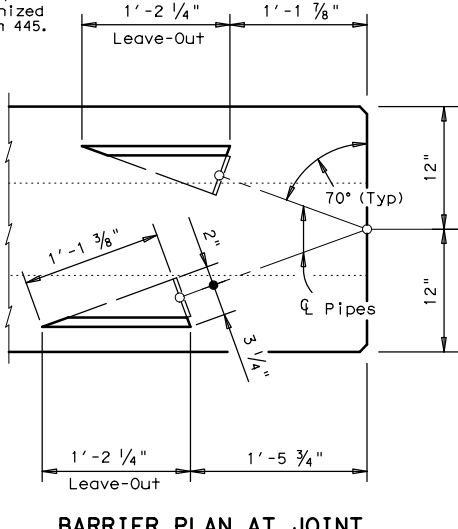


* The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.

Weight of one precast 30 ft. (SSCB) segment = Approx. 10.5 Tons or 717 lbs per ft.



- (WWR) General Notes**
- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
 - Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
 - All reinforcement shall comply with Item 440, "Reinforcing Steel."
 - 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".



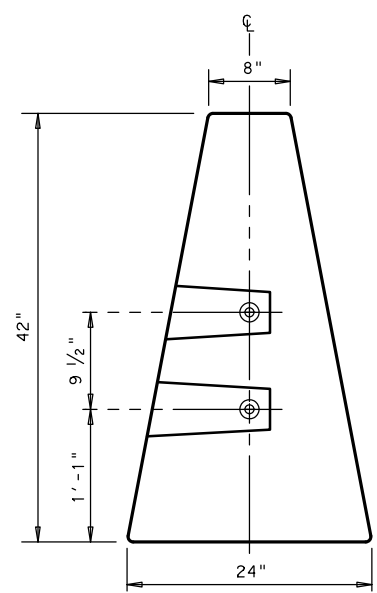
General Notes

- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a 3/4" chamfer or a tooled radius.
- All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- 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.
- 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.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."

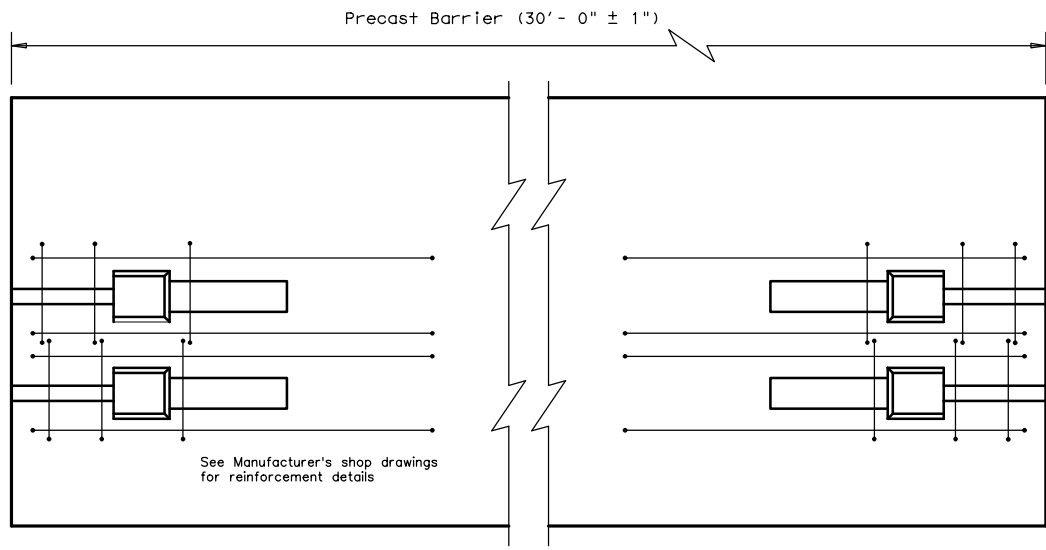
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SINGLE SLOPE CONCRETE BARRIER PRECAST BARRIER (TYPE 1) SSCB (2) - 10			
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© TxDOT December 2010	CONT: 0213	SECT: 04	JOB: 050
REVISIONS	DIST: LFK	COUNTY: POLK	HIGHWAY: US 190
			SHEET NO.: 69

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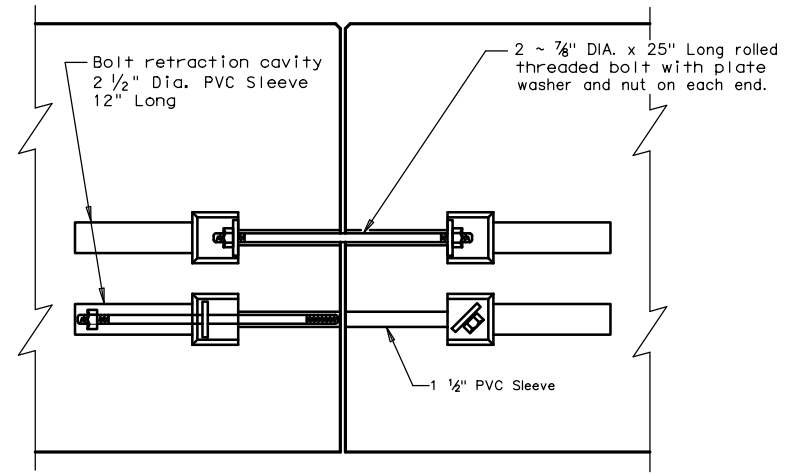
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END VIEW
"QUICK-BOLT" POCKET LOCATIONS

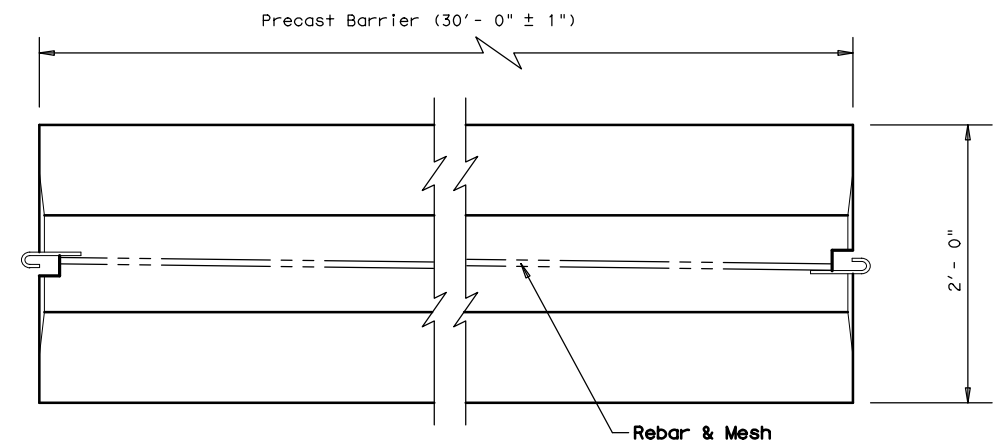


ELEVATION VIEW
"QUICK-BOLT" (SSCB)
See Manufacturer's shop drawing for additional details

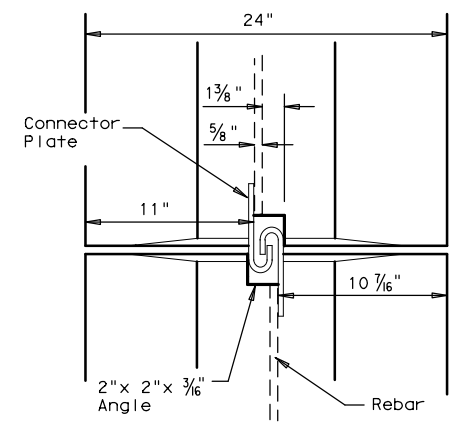


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

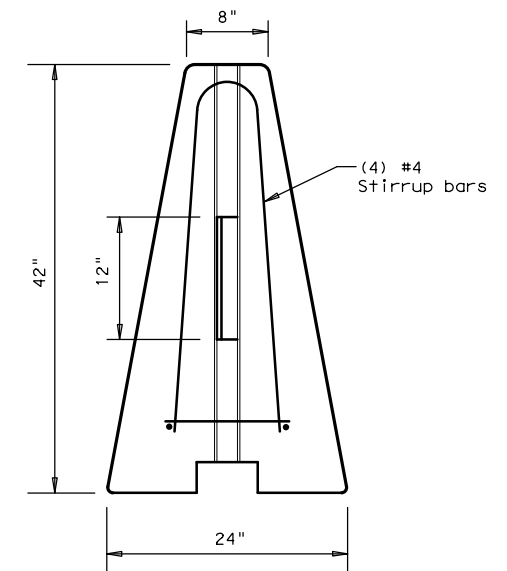
Joint Connection (Type Q)



TOP VIEW
PRECAST (SSCB) WITH J-J HOOKS
See Manufacturer's shop drawing for additional details



VIEW FROM ABOVE
J-J HOOK CONNECTION



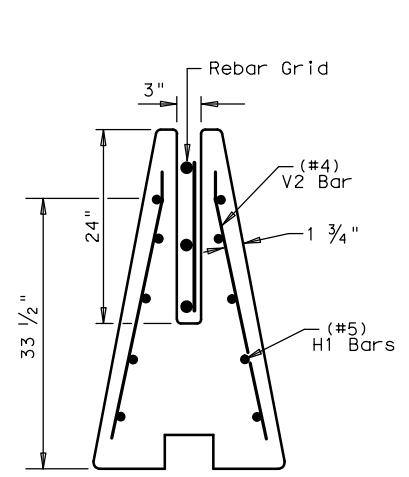
END VIEW

Proprietary Joint Connections (SSCB)

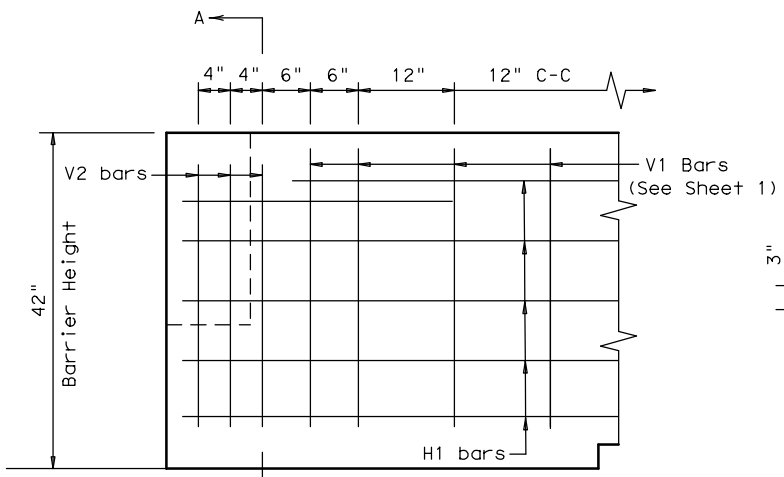
Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
Quick-Bolt by Bexar Concrete, (210)497-3773

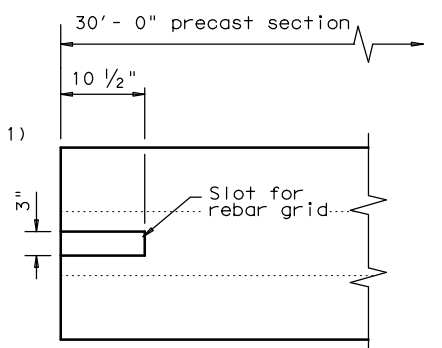
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.



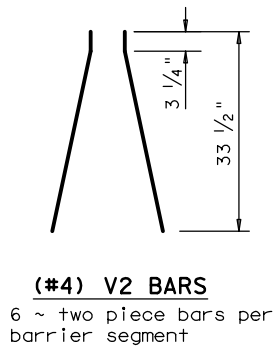
SECTION A-A
Showing (Type R)
Rebar Grid



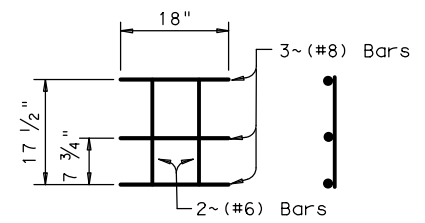
ELEVATION
V1 Bars (See Sheet 1)



TOP VIEW
JOINT CONNECTION
Typical at both ends of barrier segment



(#4) V2 BARS
6 ~ two piece bars per barrier segment



WELDED REBAR GRID

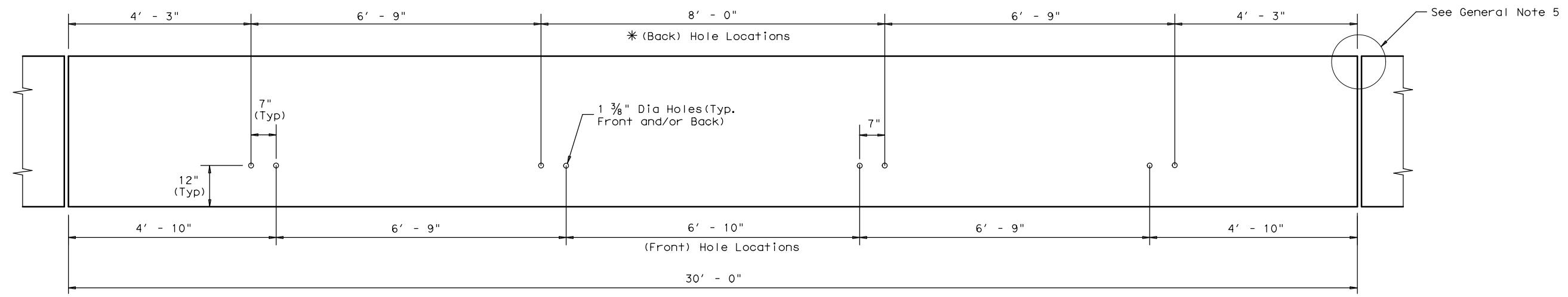
Joint Connection (Type R)



SINGLE SLOPE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
SSCB (2) - 10

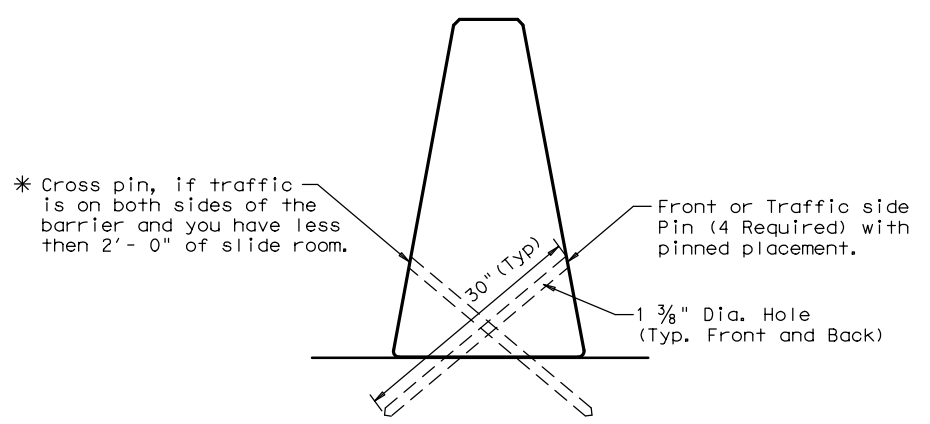
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	LFK	POLK	70	

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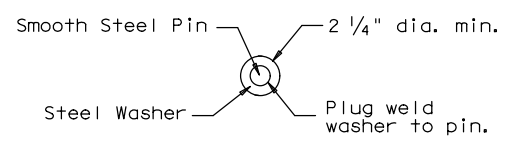
DETAIL 1

Precast SSCB (42")
Showing hole locations

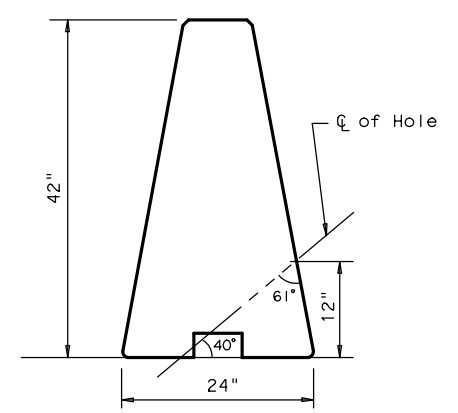


DETAIL 2

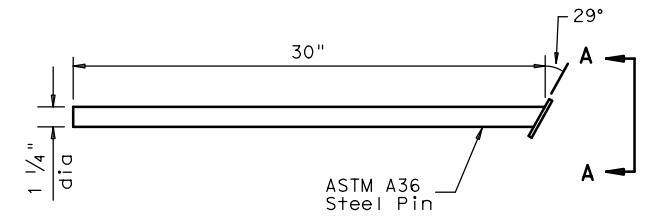
Placement on (ACP)
Asphalt Conc. Pavement
or Treated Base Material
(30" Pin required)



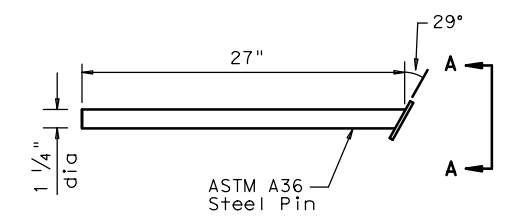
VIEW A-A



HOLE LOCATION DETAIL

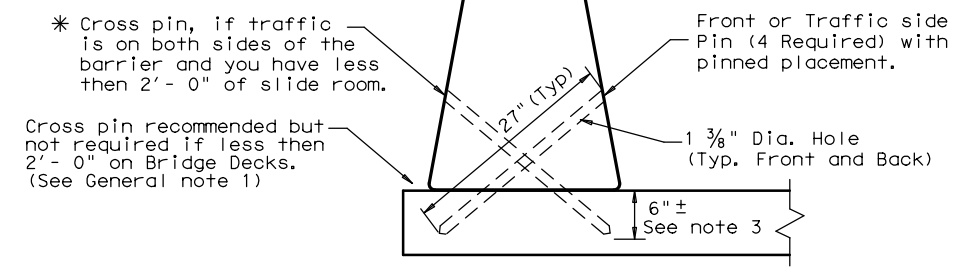


(30") PIN DETAIL
See Detail 2



(27") PIN DETAIL
See Detail 3

Note:
Steel washer welded to pin at 29° angle so that the washer is flush with barrier surface. (See View A-A)

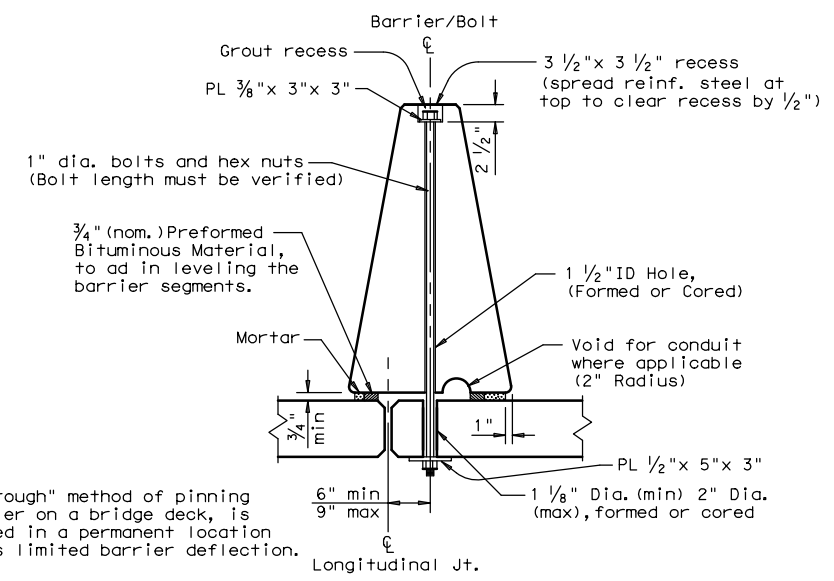


DETAIL 3

Bridge Deck or CRCP
(27" Pin required).

CORE DRILLING EXISTING BARRIER

Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete exceeding 1/2" shall be patched.



Note:
The "Bolt Through" method of pinning precast barrier on a bridge deck, is primarily used in a permanent location that requires limited barrier deflection.

PRECAST SSCB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

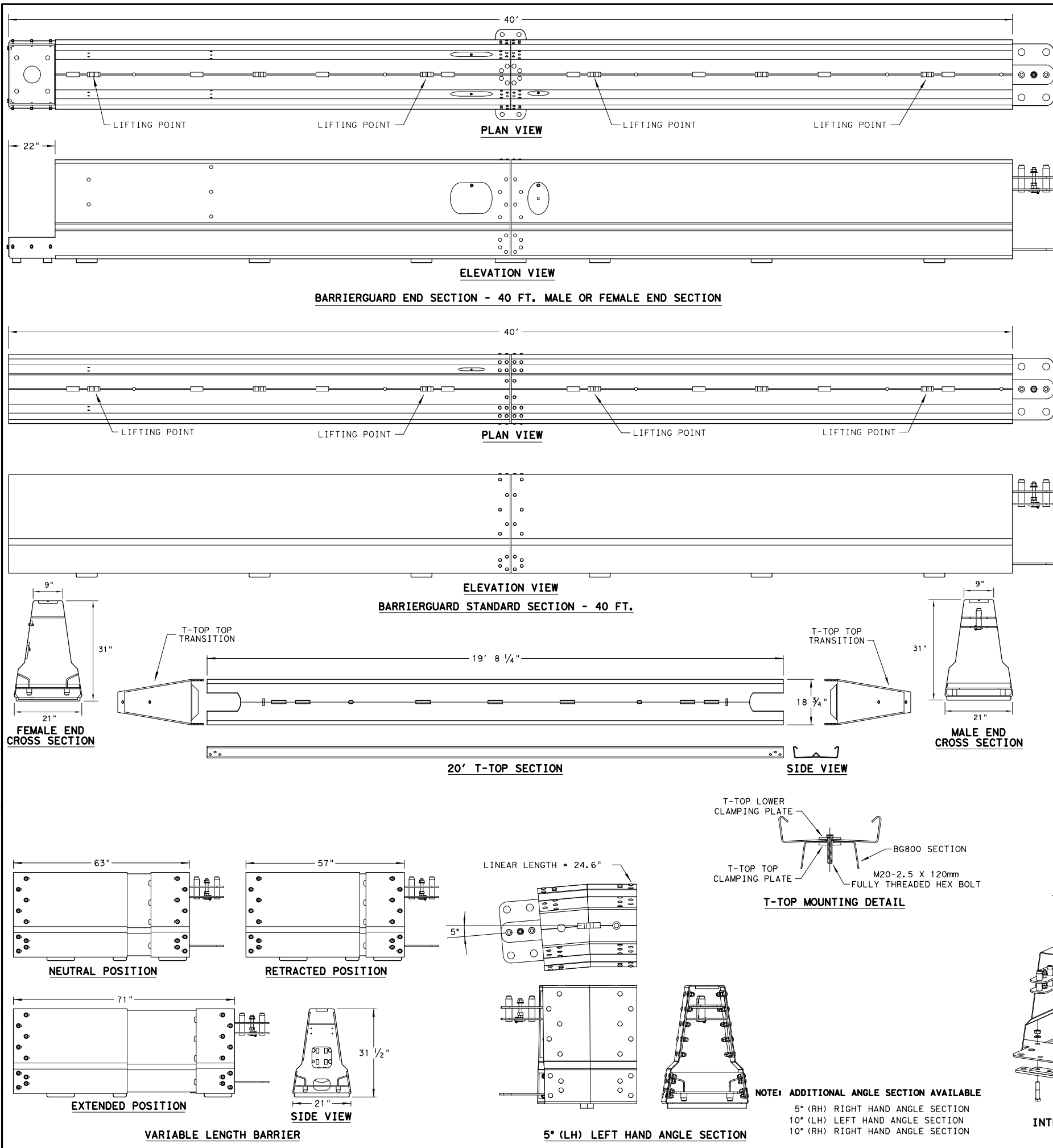
For bolt through locations, use the (Front) hole locations shown on Detail 1.

GENERAL NOTES

- These details provide a method of laterally restraining precast concrete barrier to limit deflections under normally expected passenger vehicle impacts. These details are intended for use in work zones, primarily on bridge decks, or pavement where temporary barrier must be placed less than 2 ft. from the longitudinal edge of the deck or dropoff and parallel to the direction of travel. Other applications of these details are acceptable as directed by the Engineer.
- Each precast concrete barrier section shall have a minimum of four or total of eight 1 3/8 in. ID holes formed or cored through the barrier. The center lines of the holes are shown in the hole location detail. If rebar is encountered, the entry point may be shifted 2" plus or minus longitudinally along the barrier. The eight holes are spaced along the length of the barrier as shown in Detail 1.
- The drilling of the travel surface is accomplished by placing the pre-drilled barrier section on the travel surface in the desired position. Then the hole is drilled with the bit passing through the hole in the barrier. The bit is to be inserted into the hole in the barrier so that the travel surface is drilled to a point which is slightly more than the pin length.
- Note that steel washers have been welded to the top of the steel pins to aid in the removal of the pins, when the barrier is removed.
- See SSCB(2) standard sheet for reinforcement requirements and joint connection types.
- The forming or coring of holes in the barrier, drilling of holes in bridge deck or pavement, fabrication and materials for the 1 1/4 in. pins, installation of pins, and any repair to the barrier shall be considered as subsidiary to the barrier bid items.
- The barrier and travel surface will be repaired as directed by the Engineer in accordance with Item 429, "Concrete Structure Repair."
- All steel pins shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
- Weight of barrier is approx. 700 lbs per foot.

		Design Division Standard	
SINGLE SLOPE CONCRETE BARRIER PRECAST BARRIER (TYPE 1) PINNED PLACEMENT SSCB (5) - 10			
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GENERAL NOTES

- THE SYSTEM SHOWN ON THIS DRAWING IS A PROPRIETARY BARRIER TRADED AS BARRIERGUARD 800 AND BARRIERGUARD 800 MDS AND HAS BEEN DESIGNED AND MANUFACTURED BY LAURA METAAL ROAD SAFETY INC. FOR TECHNICAL ASSISTANCE AND APPLICATION SUPPORT CONTACT LEE STUART AT LAURA METAAL ROAD SAFETY INC. AT (702) 664-2009 OR lstuart.laurametaal@outlook.com
- THE BARRIERGUARD 800 SYSTEM HAS BEEN CRASH TESTED TO MASH AND HAS FHWA APPROVAL AS A TL-3 BARRIER. THE DEFLECTION TABLE OUTLINES BASIC SYSTEM PERFORMANCE AND COMPONENT ANCHORING REQUIREMENTS.
- THIS DRAWING PACKAGE PROVIDES THE RELEVANT INFORMATION AND GENERAL GRAPHICS REQUIRED TO IDENTIFY THE COMPONENT PARTS OF BARRIERGUARD 800 AND THEIR INCORPORATION AS A WHOLE SYSTEM FOR DEPARTMENTAL STANDARD APPLICATIONS.
- BARRIERGUARD 800 REQUIRES ANCHORING (PINNING) AT EACH END OF THE INSTALLED LENGTH. (INTERMEDIATE ANCHORS CAN BE USED TO REDUCE DEFLECTION).
- INSTALLATION OF BARRIERGUARD 800 OR BARRIERGUARD 800 MDS, NORMALLY STARTS WITH A MALE TERMINAL SECTION AND IS FINISHED WITH A FEMALE TERMINAL SECTION. STANDARD SECTIONS ARE USED BETWEEN THE TERMINAL SECTIONS TO OBTAIN THE REQUIRED LENGTH OF POSITIVE BARRIER PROTECTION.
- THE FULL HEIGHT TERMINAL (FHT) SECTIONS MAY BE CAPPED WITH A FHT COVER, HOWEVER IF EXPOSED TO ON-COMING TRAFFIC THE END SHOULD BE PROTECTED WITH A SUITABLE CRASH CUSHION. THE BARRIERGUARD 800 RANGE IS COMPATIBLE WITH MOST COMMONLY USED CRASH CUSHION END TREATMENTS. FOR DETAILS OF BARRIERGUARD 800 CRASH CUSHION CONNECTIONS THAT ARE NOT DETAILED WITHIN THESE DRAWINGS, PLEASE CONTACT LAURA METAAL ROAD SAFETY INC. FOR MORE DETAILS. THE FULL HEIGHT TERMINAL COVER IS SUITABLE FOR THE "DOWN STREAM" END OF A SYSTEM THAT DOES NOT HAVE EXPOSURE TO ON-COMING TRAFFIC.
- WHEN INSTALLING THE MINIMUM DEFLECTION SYSTEM (MDS), THE SYSTEM CAN BE INSTALLED WITH ADDITIONAL INTERMEDIATE ANCHORS ALONG THE LENGTH OF THE BARRIER RUN AT INTERVALS SHOWN IN THE DEFLECTION TABLE. EACH BARRIER RUN CAN BE MADE UP OF ANY MIXTURE OF THE SYSTEMS BY THE INTRODUCTION OF INTERMEDIATE ANCHORS AND/OR T-TOP AS REQUIRED.
- THERE ARE SEVERAL METHODS OF ACHIEVING RADIUS IN A LENGTH OF BARRIERGUARD 800. RADIUS CAN BE ACHIEVED USING VARIOUS METHODS AND THUS ALLOWING THE BARRIERGUARD TO FOLLOW THE DESIRED CURVATURE IN THE INSTALLATION, THESE METHODS ARE, THE MOVEMENT IN THE QUICKLINK, ADJUSTABLE 20FT. SECTIONS OR SHORT ANGLED SECTIONS WHICH ALLOW A RADIUS AS LOW AS 12FT. FOR FURTHER INFORMATION AND ADVICE CONTACT LAURA METAAL ROAD SAFETY INC.
- A BARRIERGUARD 800 VARIABLE LENGTH BARRIER (VLB) SECTION SHOULD BE USED WHEN BARRIERGUARD 800 OR BARRIERGUARD 800 MDS IS ANCHORED ACROSS A BRIDGE EXPANSION JOINT. IF T-TOP IS TO BE USED IN CONJUNCTION WITH THE VLB, THE T-TOP SHOULD BE USED FOR MINIMUM 40FT ON EITHER SIDE OF THE VLB AND TERMINATED WITH TRANSITIONS. THE VLB SECTION PROVIDES APPROXIMATELY 7in OF EXTENSION AND 7in OF CONTRACTION. MULTIPLE VLB'S CAN BE LINKED TOGETHER TO PROVIDE MORE EXPANSION OR CONTRACTION. THE VLB'S SHOULD BE PLACED IN THE VICINITY OF THE EXPANSION JOINT. THE VLB DOES NOT NEED TO BE PLACED DIRECTLY OVER THE EXPANSION JOINT BUT MUST BE BETWEEN THE NEAREST ANCHORS ON EACH SIDE OF THE JOINT. IT IS RECOMMENDED THAT THE VLB IS PLACED WITHIN 40FT OF THE JOINT.
- THE T-TOP CAN BE INSTALLED EITHER BEFORE OR AFTER THE BARRIERGUARD 800 HAS BEEN FULLY ASSEMBLED AND ANCHORED IN PLACE. T-TOP IS REQUIRED WHEN THE BARRIERGUARD 800 IS USED AS A MDS, ANCHORED EVERY 20FT, GATE SECTIONS AND VARIABLE LENGTH BARRIERS. THE T-TOP SHOULD EXTEND 40FT ON EITHER SIDE OF THESE CONDITIONS AND BE TERMINATED WITH TRANSITIONS.
- THE BARRIERGUARD 800 RANGE HAS BEEN DESIGNED TO BE USED ON AND HAS BEEN TESTED ANCHORED ON ASPHALT, CONCRETE AND COMPACTED SUBBASE. CONTACT LAURA METAAL ROAD SAFETY INC. FOR FURTHER INFORMATION.
- BARRIERGUARD 800 COMPONENTS ARE MANUFACTURED IN SI [METRIC] UNITS. ENGLISH UNITS SHOWN ARE APPROXIMATE. ALL COMPONENTS ARE FULLY GALVANIZED.
- BARRIERGUARD 800 SYSTEMS SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS DETAILED DRAWINGS, PROCEDURES AND SPECIFICATIONS. FOR ANY INSTALATIONS OUTSIDE OF THE SCOPE OF THESE DRAWINGS PLEASE CONTACT LAURA METAAL ROAD SAFETY INC. FOR DETAILS.

BARRIERGUARD 800 DEFLECTION TABLE

	STANDARD SYSTEM	MINIMUM DEFLECTION SYSTEMS (MDS)
DESCRIPTION	ONLY ANCHORED AT THE EXTREME ENDS OF THE BARRIER LENGTH	ANCHORED EVERY 20 FT.
DEFLECTION AT MASH TL-3	5'-6"	18 1/2"
T-TOP REQUIREMENTS	NONE REQUIRED	REQUIRED FOR MDS SECTIONS

STANDARD ANCHORING REQUIREMENTS (TABLE)

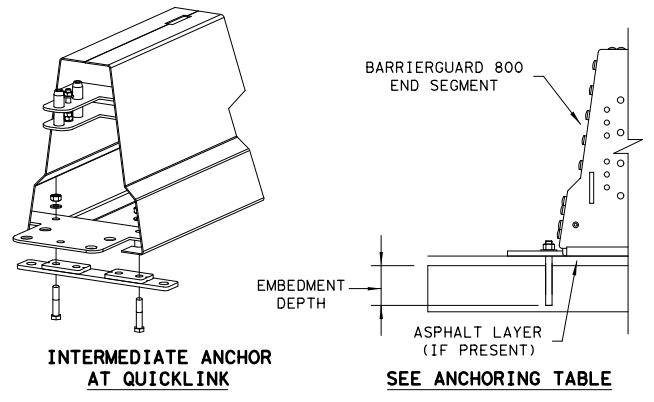
	RESIN STUD ANCHORS			DRIVEN ANCHORS		Hilti HSL-3 SHALLOW MECHANICAL
	CONCRETE*	UNREINFORCED CONCRETE*	ASPHALT	ASPHALT	SUBBASE/SOIL	CONCRETE
ANCHOR DIAMETER	1 in.	1 in.	1 in.	1-3/16 in.	5-1/2 in.	× ×
EMBEDMENT DEPTH	6 in.	8 in.	16 in.	16 in.	32 in.	× ×
DRILL DIAMETER	1-1/8 in.	1-1/8 in.	1-1/8 in.	1-3/16 in.	DRIVEN	× ×
PULL OUT CAPACITY (MIN)	17500 lb	17500 lb	N/A	N/A	N/A	× ×
SHEAR CAPACITY (MIN)	25000 lb	25000 lb	N/A	N/A	N/A	× ×

* ALTERNATIVE ANCHORS INCLUDING MECHANICAL ANCHORS FOR CONCRETE MAYBE USED IF THEY MEET THE STRENGTH REQUIREMENTS LISTED, DETAILS WILL BE MANUFACTURER SPECIFIC.
 ** CONTACT: LAURA METAAL ROAD SAFETY INC. FOR SPECIFIC APPLICATION.

Texas Department of Transportation Design Division Standard

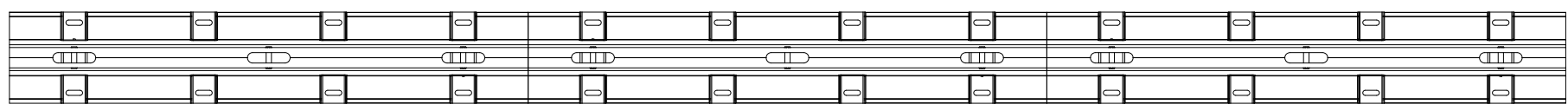
BARRIERGUARD 800 SYSTEM
STEEL BARRIER
MASH TL-3
BARRIERGUARD-19

FILE: barrierguard19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	72	

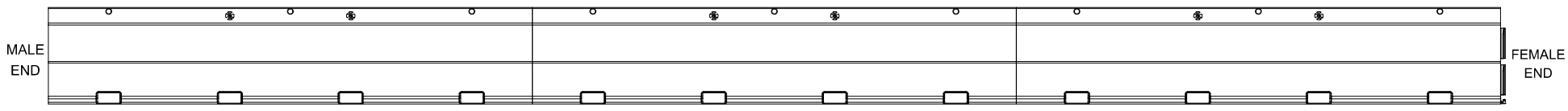


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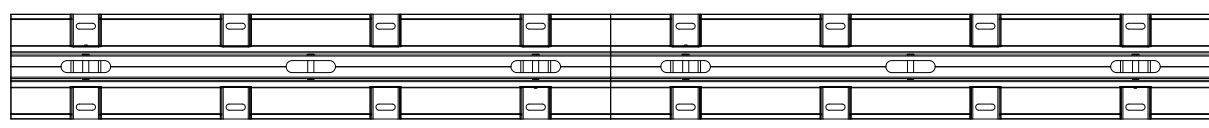
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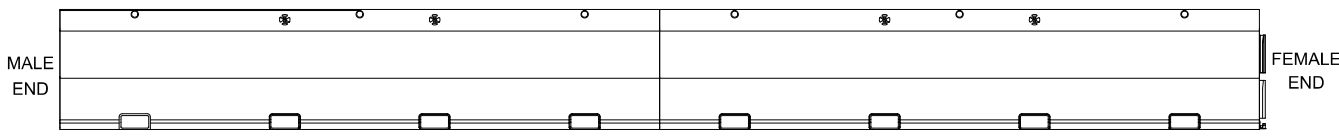
PLAN VIEW



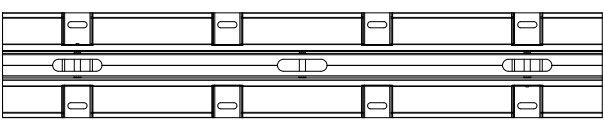
ELEVATION VIEW
 ZONEGUARD STANDARD UNIT x 50'-0"



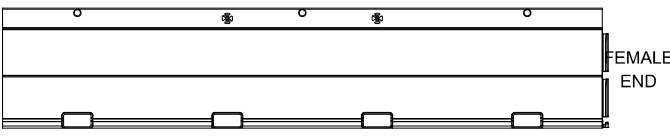
PLAN VIEW



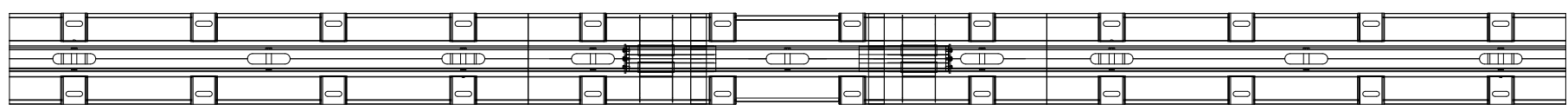
ELEVATION VIEW
 ZONEGUARD STANDARD UNIT x 33'-4"



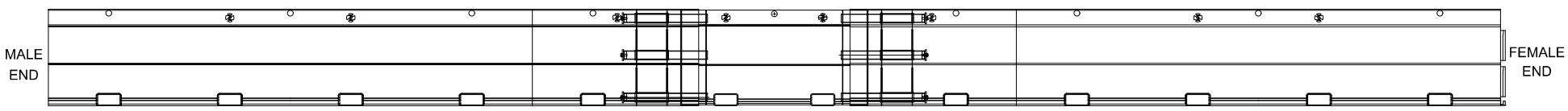
PLAN VIEW



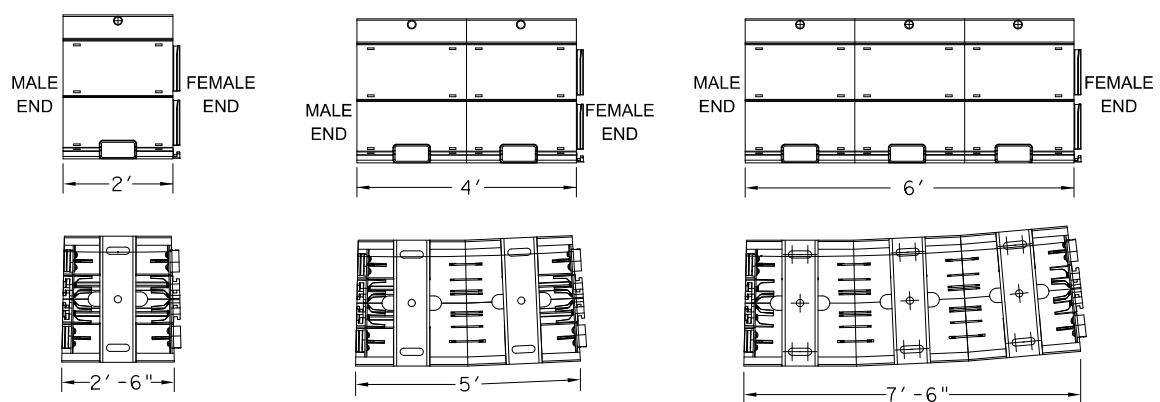
ELEVATION VIEW
 ZONEGUARD STANDARD UNIT x 16'-8"



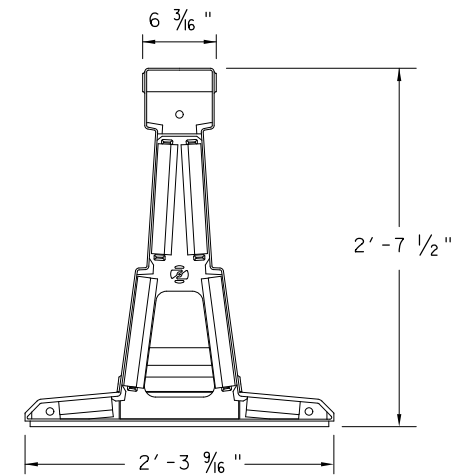
PLAN VIEW



ELEVATION VIEW
 ZONEGUARD EXPANSION UNIT x 46'-5 1/2"
 (SEE GENERAL NOTE 5)



ZONEGUARD RADIUS UNITS



ZONEGUARD TYPICAL SECTION

GENERAL NOTES

- FOR TECHNICAL AND APPLICATION SUPPORT PLEASE CONTACT HILL & SMITH INC. AT 614-340-6294.
- ZONEGUARD HAS BEEN ACCEPTED BY FHWA AS A MASH TL-3 LONGITUDINAL BARRIER.
- STANDARD INSTALLATIONS REQUIRE ANCHORING AT EACH END OF THE RUN. MINIMUM DEFLECTION INSTALLATIONS REQUIRE ANCHORING AT 33'-4 CENTERS. NO MODIFICATIONS ARE NECESSARY OTHER THAN INCREASED ANCHORING.
- 50-0' UNITS CAN BE USED TO ACHIEVE DOWN TO AN 800' RADIUS CURVE. 16'-8" UNITS CAN BE USED TO ACHIEVE CURVES DOWN TO 250' RADIUS. SPECIAL SHORT UNITS (SHOWN) IN 2.5 DEGREE INCREMENTS CAN BE USED TO ACHIEVE DIRECTION CHANGES OR AT A FIXED RADIUS OF 47'-0".
- HILL & SMITH OFFERS AN EXPANSION UNIT THAT CAN BE USED ACROSS A BRIDGE EXPANSION JOINT OR TO ACCOMMODATE THERMAL EXPANSION. THE UNIT IS ANCHORED IN THE MIDDLE, AND ADJUSTED ACCORDING TO THE TEMPERATURE AT THE TIME OF INSTALLATION. THE EXPANSION JOINT CAN BE USED WITH ENGINEER APPROVAL. THE EXPANSION UNIT HAS NOT BEEN ASSESSED TO MASH CRITERIA.
- ANCHOR PINS ARE 1 1/4" DIAMETER. LENGTH IS 1'-8" FOR ASPHALT AND 1'-0" FOR CONCRETE. SEE ANCHORING TABLE FOR ADDITIONAL DETAILS.

	STANDARD INSTALLATION	MINIMUM DEFLECTION INSTALLATION CONCRETE	MINIMUM DEFLECTION INSTALLATION ASPHALT
	FOUR ANCHORS AT END OF THE RUN	TWO ANCHORS (ONE EACH SIDE) EVERY 33'-4"	TWO ANCHORS (ONE EACH SIDE) EVERY 33'-4"
MASH TL-3 DEFLECTION (2270 KG TRUCK @ 25° & 100 KM/HR)	6'-10"	5"	2'-0"

EXPECTED DEFLECTION TABLE

DESCRIPTION	ASPHALT	CONCRETE
1 1/4" PIN ANCHOR	1'-8" LONG, MINIMUM ASPHALT COVER OF 3"	1'-0" LONG, MINIMUM CONCRETE COVER OF 6"
1 1/4" ALL THREAD ANCHOR		1'-0" LONG, MINIMUM EMBEDMENT OF 6"

ANCHORING TABLE

ALTERNATE ANCHORING METHODS CERTIFIED BY HILL & SMITH, INC. ARE AVAILABLE PER FHWA APPROVAL LETTER.

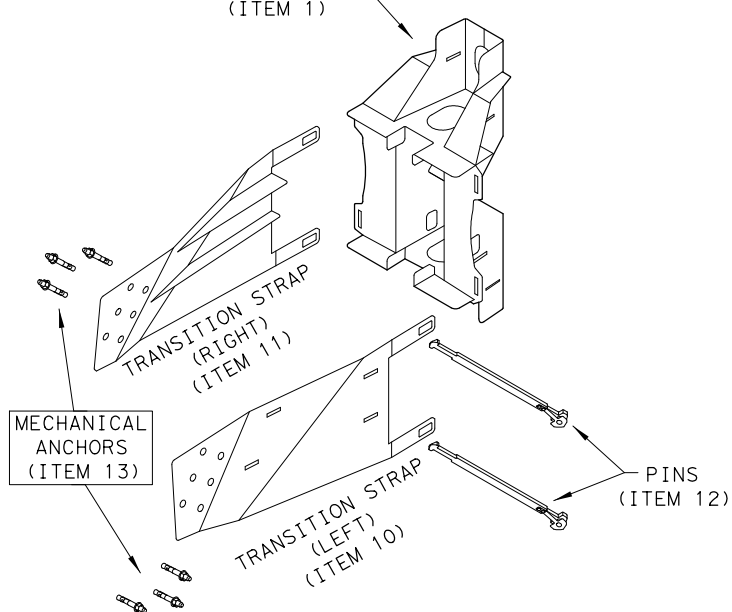
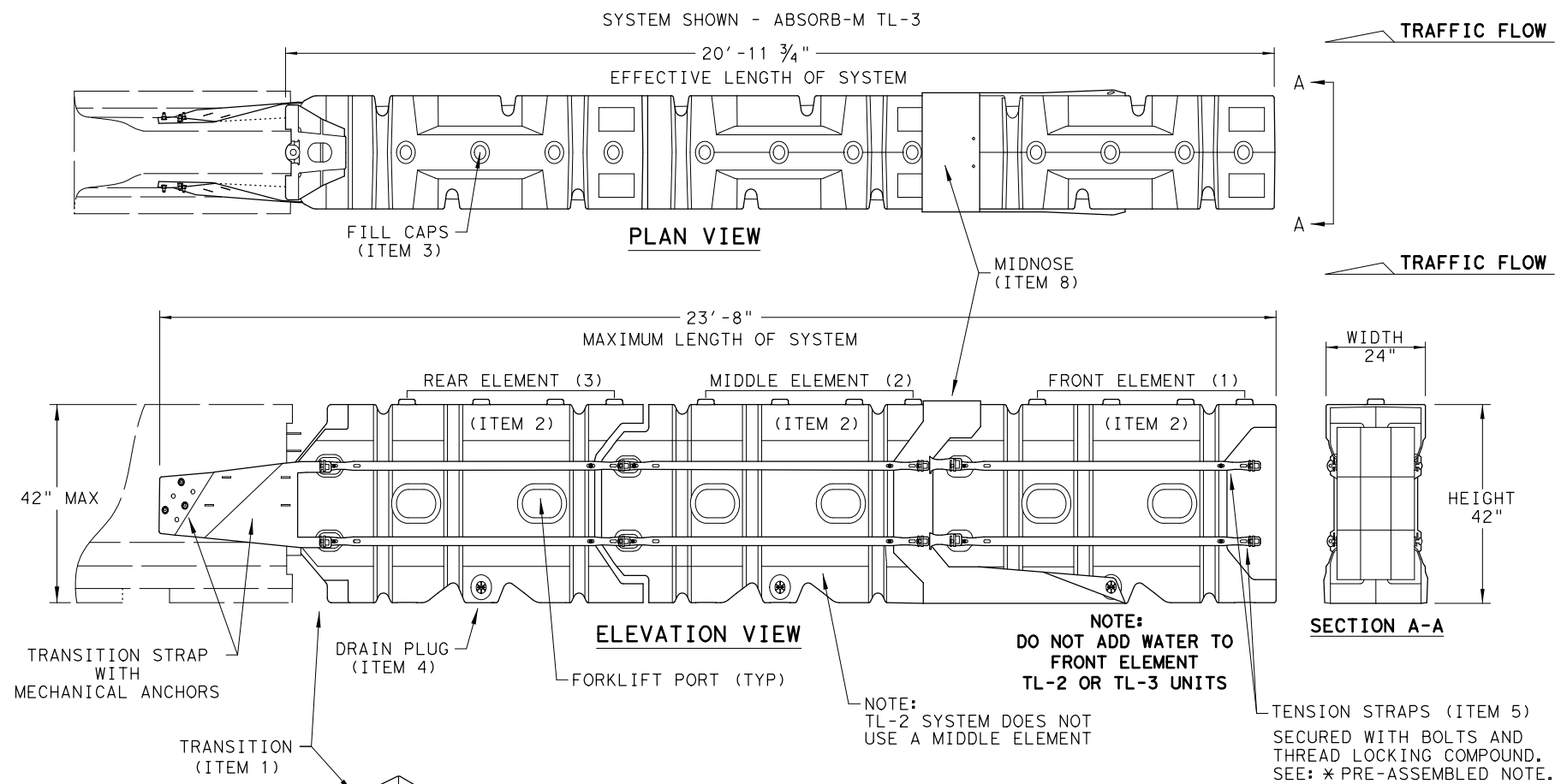
Design Division Standard

ZONEGUARD SYSTEM STEEL BARRIER MASH TL-3 ZONEGUARD-19

FILE: zoneguard19	DN: TxDOT	CK: KM	DW: VP	CK: CGL
© TxDOT: JULY 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	73	

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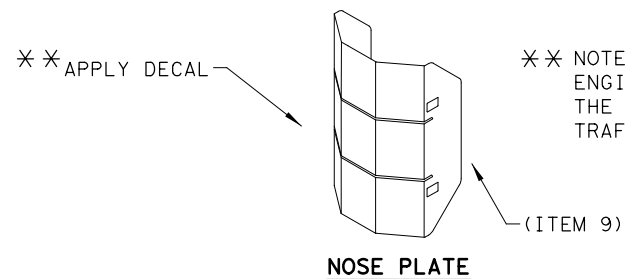


THE ABSORB-M IS A NON-REDIRECTIVE, GATING, CRASH CUSHION DESIGNED TO MEET THE LATEST TL-3 & TL-2 MASH REQUIREMENTS.

THE SYSTEM IS DESIGNED TO ACCOMMODATE A VARIETY OF F-SHAPE AND SINGLE SLOPE CONCRETE BARRIERS. CONTACT THE MANUFACTURER FOR GUIDANCE REGARDING OTHER ALLOWABLE SHAPES.

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"

NOTE: CROSS SLOPES OF UP TO 8% (OR 1:12 SLOPE) CAN BE ACCOMMODATED WITH STANDARD HARDWARE SHOWN WITHIN THE INSTRUCTIONS MANUAL. FOR SLOPES WITH EXCESS OF 8% (OR 1:12) CONTACT, LINDSAY TRANSPORTATION SOLUTIONS.



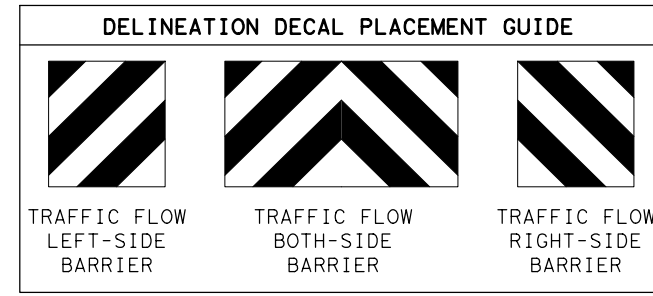
NOTE: APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALS ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

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

GENERAL NOTES

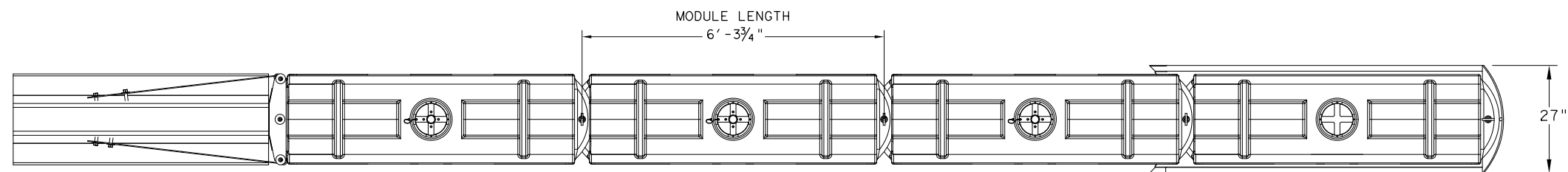
- FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
- THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
- THE ABSORB-M 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.
- MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
- THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
- THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
- THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
- DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).



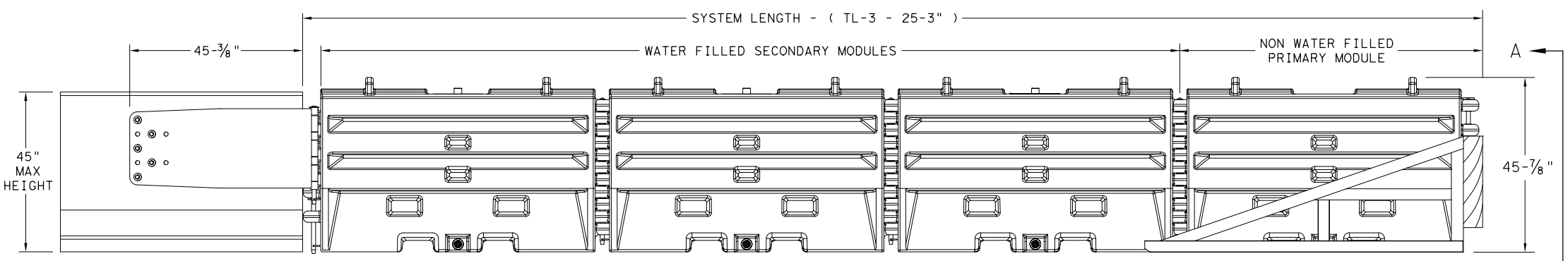
SACRIFICIAL

		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
© TxDOT: JULY 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0213 04	050	US 190
DIST	COUNTY	SHEET NO.	
LFK	POLK	74	

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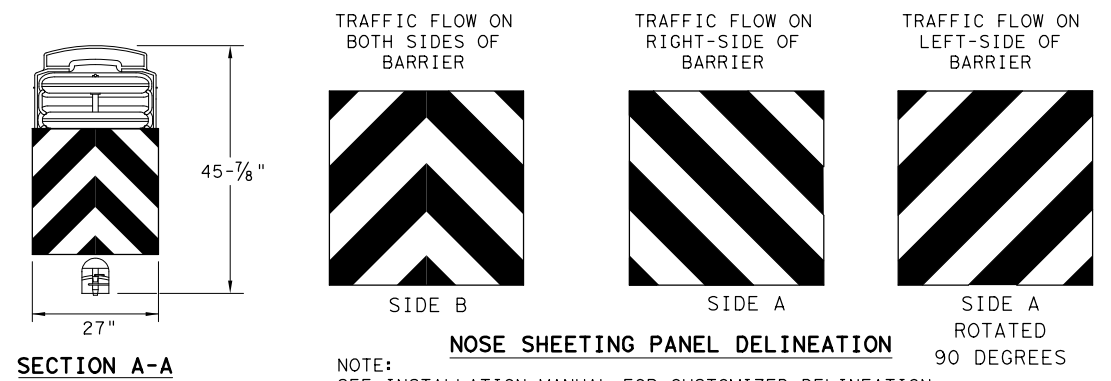
PLAN VIEW



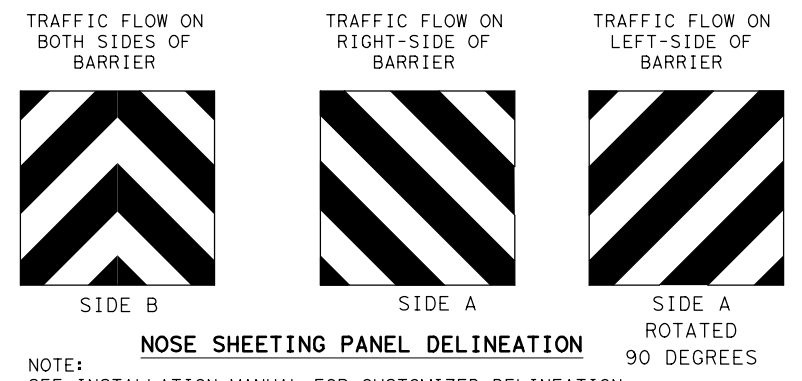
ELEVATION VIEW

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



SECTION A-A

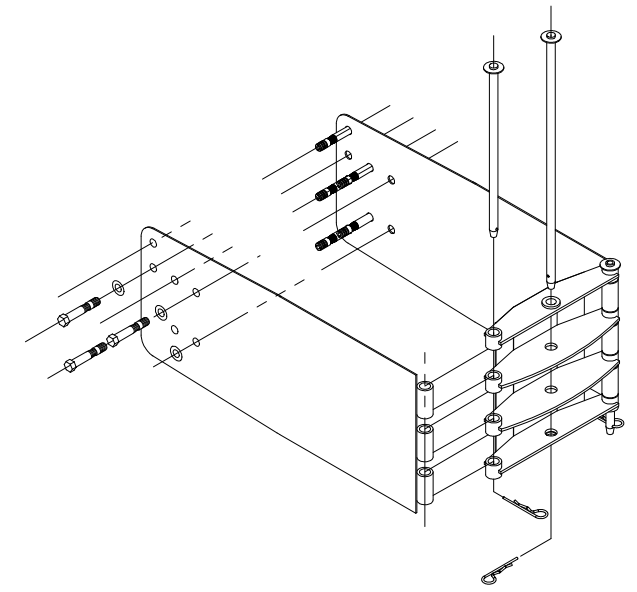


NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25' 3"

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

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:
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DIST	COUNTY		SHEET NO.	
LFK	POLK		75	

CONTROL POINT	SURFACE COORDINATES		GRID COORDINATES		LATITUDE	LONGITUDE	ELEVATION	DESCRIPTION
	NORTHING	EASTING	NORTHING	EASTING				
CP1	10,264,891.570	3,997,719.243	10,263,659.930	3,997,239.574	30° 42' 39.06088"	94° 55' 09.34384"	175.853	SET TxDOT 3 1/4 INCH ALUMINUM DISK IN CONCRETE
CP2	10,264,788.660	4,005,355.965	10,263,557.030	4,004,875.380	30° 42' 34.35813"	95° 53' 42.02907"	254.987	SET TxDOT 3 1/4 INCH ALUMINUM DISK IN CONCRETE
CP3	10,265,177.820	4,012,874.687	10,263,946.150	4,012,393.200	30° 42' 34.56068"	94° 52' 15.79002"	326.227	SET TxDOT 3 1/4 INCH ALUMINUM DISK IN CONCRETE
CP4	10,262,940.770	4,020,468.713	10,261,709.360	4,019,986.315	30° 42' 08.74933"	94° 50' 50.17231"	271.420	SET TxDOT 3 1/4 INCH ALUMINUM DISK IN CONCRETE
CP5	10,263,552.480	4,029,155.583	10,262,321.000	4,028,672.142	30° 42' 10.54719"	94° 49' 10.45000"	321.811	SET TxDOT 3 1/4 INCH ALUMINUM DISK IN CONCRETE
CP6	10,262,355.000	4,037,516.837	10,261,123.670	4,037,032.393	30° 41' 54.60006"	94° 47' 35.48320"	255.569	SET TxDOT 3 1/4 INCH ALUMINUM DISK IN CONCRETE

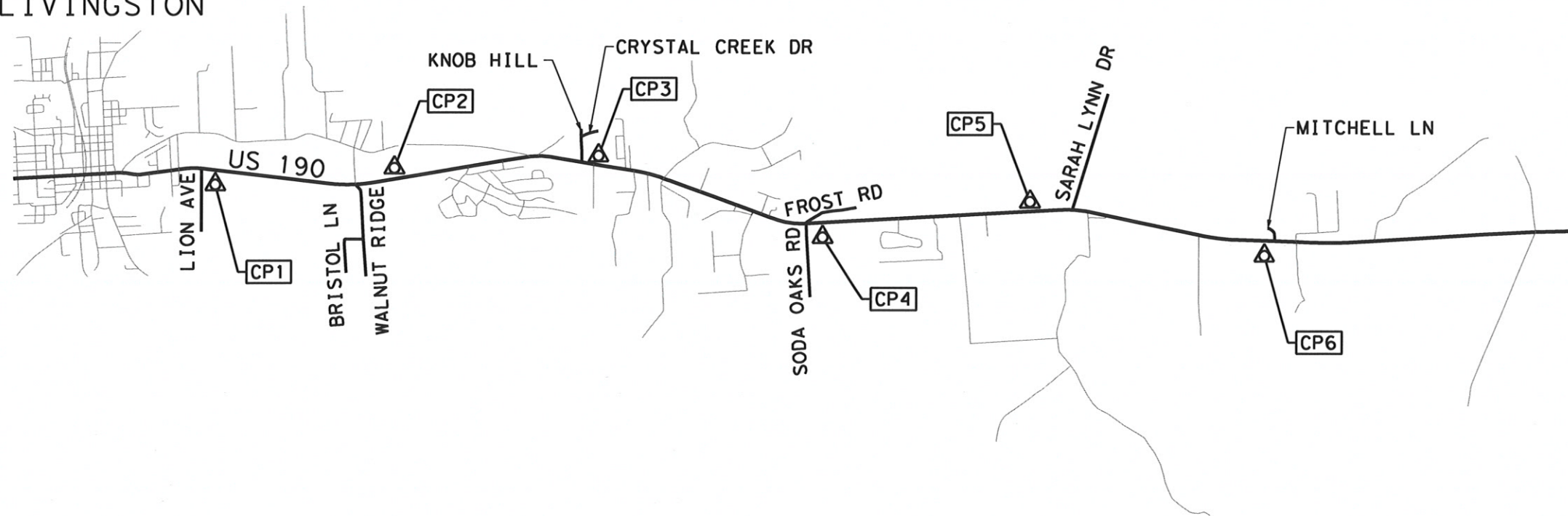
NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM TEXAS CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) 2011 ADJUSTMENT, EPOCH 2010 (GEOID 12A). ALL DISTANCES AND COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012
2. ALL HORIZONTAL CONTROL OF THIS PROJECT WAS ESTABLISHED BY TxDOT VIRTUAL REFERENCE SYSTEM NETWORK (TXLV LIVINGSTON), BASED ON THREE AVERAGED 180 EPOCH OBSERVATIONS
3. UNIT OF MEASURE IS U.S. SURVEY FOOT
4. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON THREE 180 EPOCH OBSERVATIONS UTILIZING THE TxDOT VIRTUAL REFERENCE SYSTEM NETWORK (TXLV LIVINGSTON)
5. FIELD SURVEYS WERE PERFORMED DURING JULY 2020

I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN HEREON WAS DETERMINED BY MULTIPLE GPS OBSERVATIONS ACCESSING THE STATE VIRTUAL REFERENCE SYSTEM IN JULY 2020, AND IS CORRECTLY SHOWN HEREON.



LIVINGSTON



Christopher R. Freeman
CHRISTOPHER R. FREEMAN - R.P.L.S. NO. 5701



M. Chad Criswell

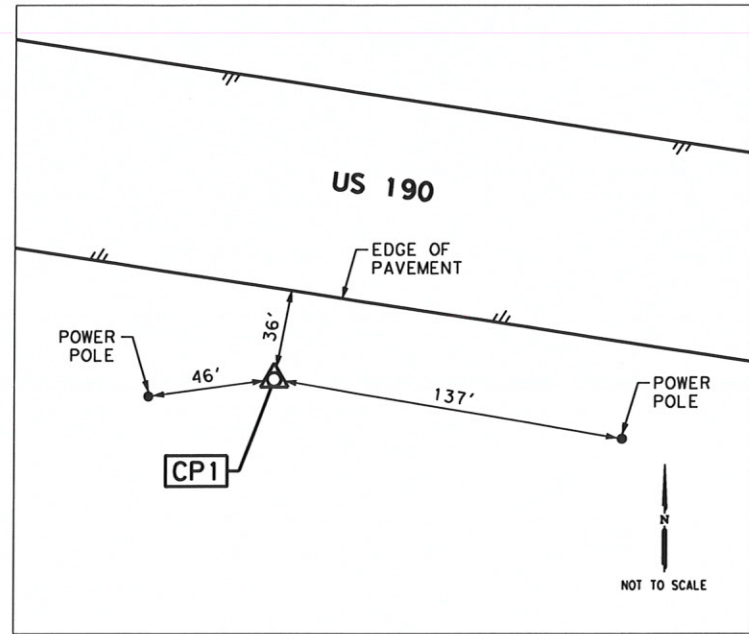
THIS SURVEY CONTROL HAS BEEN ACCEPTED AND INCORPORATED INTO THE PS&E.

LTRA LINA T. RAMEY & ASSOCIATES, INC.
3320 Belt Line Road
Farmers Branch, Texas 75234 - 214-979-1144
TBPELS FIRM NO. F-782, 10140700



**SURVEY CONTROL DATA
US 190**

				SHEET 1 OF 2
STATE	CONT.	SECT.	JOB	SHEET NO.
TEXAS	0213	04	050	76
DIST	COUNTY		HIGHWAY	
LUFKIN	POLK		US 190	

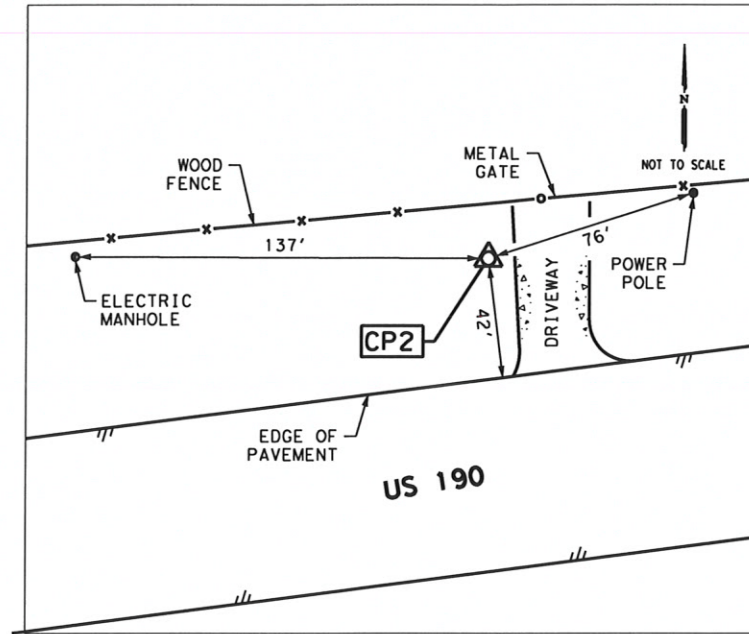


CONTROL POINT: CP1

CP# CP1 IS A 3 1/4 INCH TxDOT ALUMINUM DISK SET IN CONCRETE, LOCATED ON THE SOUTH SIDE OF US 190, +/- 235.9' EAST OF THE INTERSECTION OF US 190 AND LION AVE

LATITUDE: 30° 42' 39.06088"
LONGITUDE: 94° 55' 09.34384"

SURFACE COORDINATES: GRID COORDINATES:
NORTHING: 10,264,891.570 NORTHING: 10,263,659.930
EASTING: 3,997,719.243 EASTING: 3,997,239.574
ELEVATION: 175.853 ELEVATION: 175.853

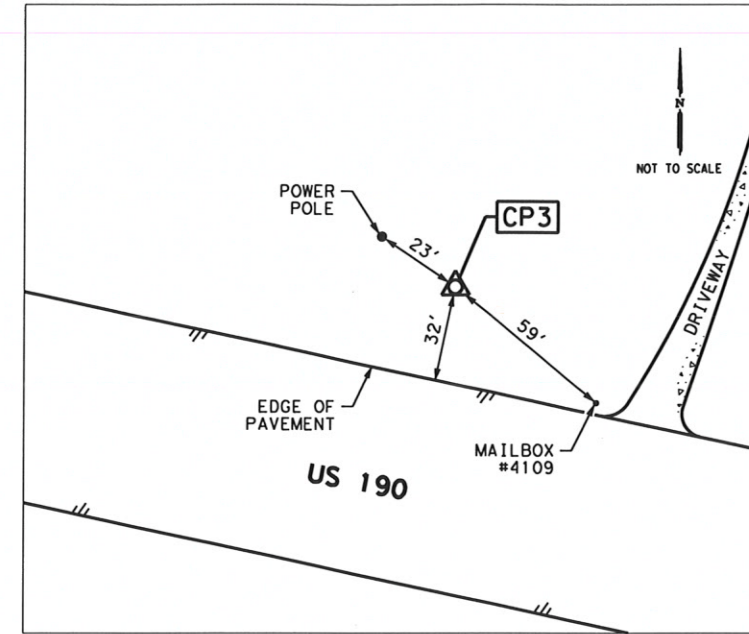


CONTROL POINT: CP2

CP# CP2 IS A 3 1/4 INCH TxDOT ALUMINUM DISK SET IN CONCRETE, LOCATED ON THE NORTH SIDE OF US 190, +/- 1,989.2' EAST OF THE INTERSECTION OF US 190 AND WALNUT RIDGE

LATITUDE: 30° 42' 34.35813"
LONGITUDE: 94° 53' 42.02907"

SURFACE COORDINATES: GRID COORDINATES:
NORTHING: 10,264,788.660 NORTHING: 10,263,557.030
EASTING: 4,005,355.965 EASTING: 4,004,875.380
ELEVATION: 254.987 ELEVATION: 254.987

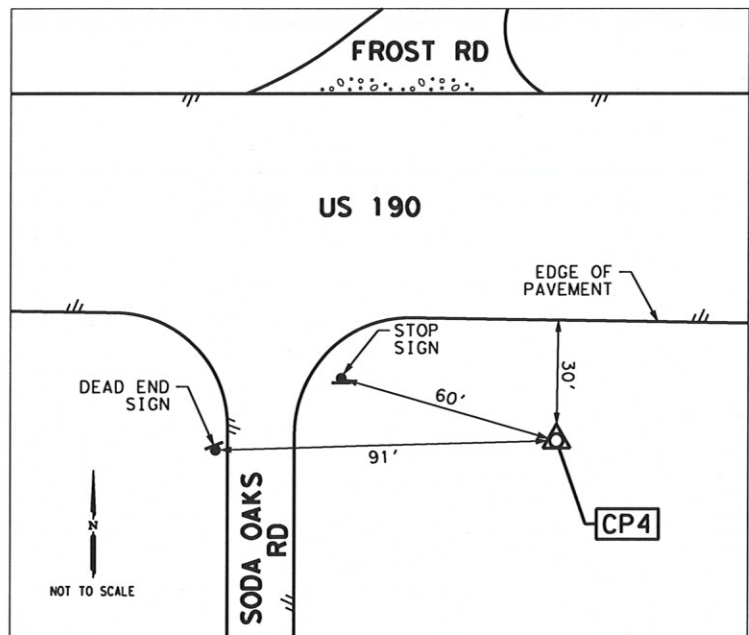


CONTROL POINT: CP3

CP# CP3 IS A 3 1/4 INCH TxDOT ALUMINUM DISK SET IN CONCRETE, LOCATED ON THE NORTH SIDE OF US 190, +/- 1,021.9' EAST OF THE INTERSECTION OF US 190 AND KNOBB HILL

LATITUDE: 30° 42' 34.56068"
LONGITUDE: 94° 52' 15.79002"

SURFACE COORDINATES: GRID COORDINATES:
NORTHING: 10,265,177.820 NORTHING: 10,263,946.150
EASTING: 4,012,874.687 EASTING: 4,012,393.200
ELEVATION: 326.227 ELEVATION: 326.227

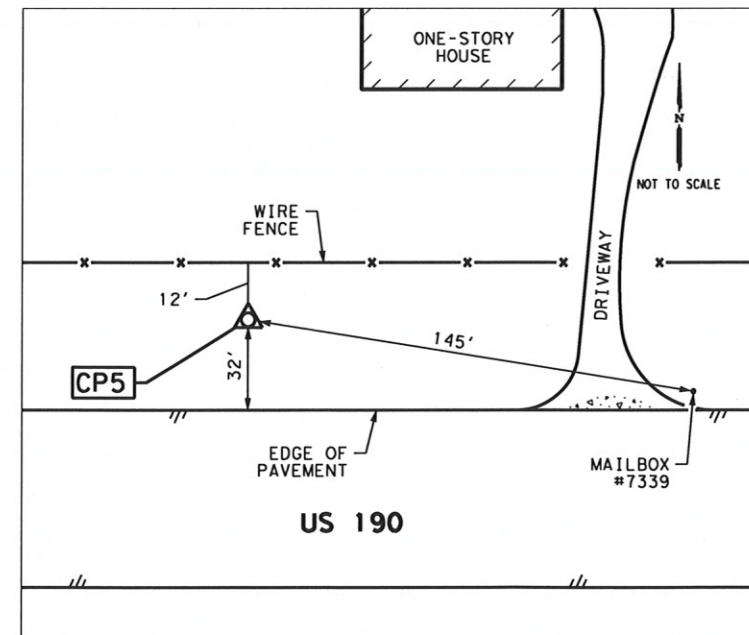


CONTROL POINT: CP4

CP# CP4 IS A 3 1/4 INCH TxDOT ALUMINUM DISK SET IN CONCRETE, LOCATED ON THE SOUTH SIDE OF US 190, +/- 81.4' EAST OF THE INTERSECTION OF US 190 AND SODA OAKS RD

LATITUDE: 30° 42' 08.74933"
LONGITUDE: 94° 50' 50.17231"

SURFACE COORDINATES: GRID COORDINATES:
NORTHING: 10,262,940.770 NORTHING: 10,261,709.360
EASTING: 4,020,468.713 EASTING: 4,019,986.315
ELEVATION: 271.420 ELEVATION: 271.420

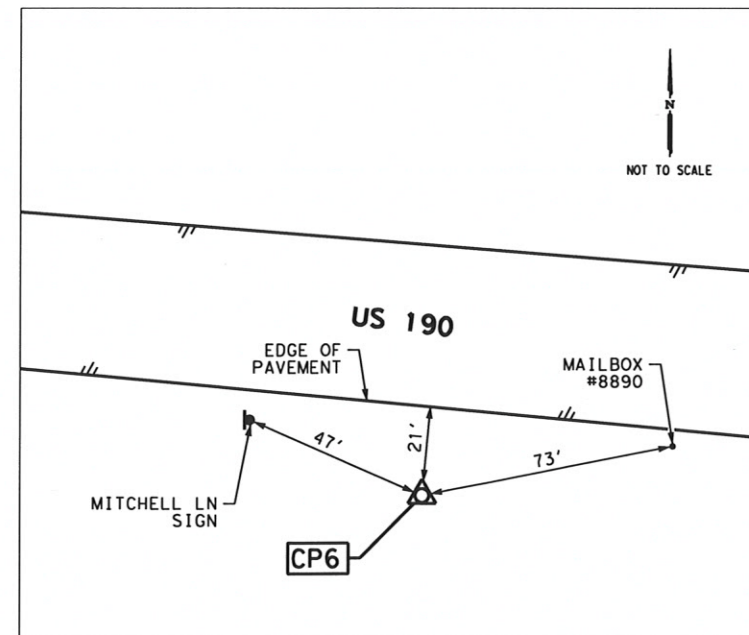


CONTROL POINT: CP5

CP# CP5 IS A 3 1/4 INCH TxDOT ALUMINUM DISK SET IN CONCRETE, LOCATED ON THE WEST SIDE OF US 190, +/- 724.1' WEST OF THE INTERSECTION OF US 190 AND SARAH LYNN DR

LATITUDE: 30° 42' 10.54719"
LONGITUDE: 94° 49' 10.45000"

SURFACE COORDINATES: GRID COORDINATES:
NORTHING: 10,263,555.480 NORTHING: 10,262,321.000
EASTING: 4,029,155.583 EASTING: 4,028,672.142
ELEVATION: 321.811 ELEVATION: 321.811



CONTROL POINT: CP6

CP# CP6 IS A 3 1/4 INCH TxDOT ALUMINUM DISK SET IN CONCRETE, LOCATED ON THE SOUTH SIDE OF US 190, +/- 493.3' WEST OF THE INTERSECTION OF US 190 AND MITCHELL LN

LATITUDE: 30° 41' 54.60006"
LONGITUDE: 94° 47' 35.48320"

SURFACE COORDINATES: GRID COORDINATES:
NORTHING: 10,262,355.000 NORTHING: 10,261,123.670
EASTING: 4,037,516.837 EASTING: 4,037,032.393
ELEVATION: 255.569 ELEVATION: 255.569

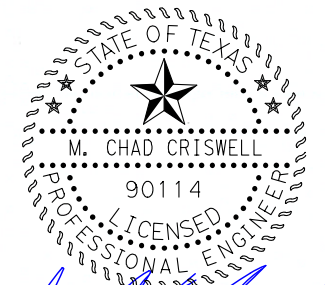
NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM TEXAS CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) 2011 ADJUSTMENT, EPOCH 2010 (GEOID 12A). ALL DISTANCES AND COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012
2. ALL HORIZONTAL CONTROL OF THIS PROJECT WAS ESTABLISHED BY TxDOT VIRTUAL REFERENCE SYSTEM NETWORK (TXLV LIVINGSTON), BASED ON THREE AVERAGED 180 EPOCH OBSERVATIONS
3. UNIT OF MEASURE IS U.S. SURVEY FOOT
4. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON THREE 180 EPOCH OBSERVATIONS UTILIZING THE TxDOT VIRTUAL REFERENCE SYSTEM NETWORK (TXLV LIVINGSTON)
5. FIELD SURVEYS WERE PERFORMED DURING JULY 2020

I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN HEREON WAS DETERMINED BY MULTIPLE GPS OBSERVATIONS ACCESSING THE STATE VIRTUAL REFERENCE SYSTEM IN JULY 2020, AND IS CORRECTLY SHOWN HEREON.



Christopher R. Freeman
CHRISTOPHER R. FREEMAN - R.P.L.S. NO. 5701



M. Chad Criswell

THIS SURVEY CONTROL HAS BEEN ACCEPTED AND INCORPORATED INTO THE PS&E.

LTRA LINA T. RAMEY & ASSOCIATES, INC.
3320 Belt Line Road
Farmers Branch, Texas 75234 - 214-979-1144
TBPELS FIRM NO. F-782, 10140700



SURVEY CONTROL DATA
US 190

SHEET 2 OF 2			
STATE	CONT.	SECT.	JOB
TEXAS	0213	04	050
DIST	COUNTY	HIGHWAY	
LUFKIN	POLK	US 190	
			SHEET NO. 77

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 DATE: 05/13/2021
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CSJ 0213-04-050
PROPOSED CENTERLINE - US 190

Chain US190 contains:
 US1901 CUR US190 3 US1906 CUR US190 8 CUR US190 9 CUR
 US190 10 CUR US190 13 CU-
 R US190 14 CUR US190 15 US19018 US19020 CUR US190 22
 CUR US190 25 CUR US190 26

Beginning chain US190 description
 Feature: Road Centerline
 =====

Point US1901 N 10,264,876.4422 E
 3,996,388.8358 Sta 30+00.00

Course from US1901 to PC US190 3 N 81°15' 39.68" E Dist
 545.2139

CURVE US190 1

Curve Data

Curve US190 1
 P.I. Station 39+22.41 N
 10,265,016.5875 E 3,997,300.5409
 Delta = 15°00' 06.10" (RT)
 Degree = 2°00' 00.00"
 Tangent = 377.1997
 Length = 750.0847
 Radius = 2,864.7890
 External = 24.7258
 Long Chord = 747.9439
 Mid. Ord. = 24.5142
 P.C. Station 35+45.21 N
 10,264,959.2784 E 3,996,927.7202
 P.T. Station 42+95.30 N
 10,264,975.4398 E 3,997,675.4895
 C.C. N
 10,262,127.7474 E 3,997,362.9769
 Back = N 81°15' 39.68" E
 Ahead = S 83°44' 14.22" E
 Chord Bear = N 88°45' 42.73" E

Course from PT US190 3 to US1906 S 83°44' 14.22" E Dist
 3,055.4970

Point US1906 N 10,264,642.1233 E
 4,000,712.7518 Sta 73+50.80

Course from US1906 to PC US190 8 S 83°38' 09.49" E Dist
 1,761.8886

CURVE US190 2

Curve Data

Curve US190 2
 P.I. Station 99+17.52 N
 10,264,357.6149 E 4,003,263.6571
 Delta = 15°59' 31.33" (LT)
 Degree = 1°00' 00.00"
 Tangent = 804.8336
 Length = 1,599.2035
 Radius = 5,729.5780
 External = 56.2513
 Long Chord = 1,594.0175
 Mid. Ord. = 55.7044
 P.C. Station 91+12.68 N
 10,264,446.8267 E 4,002,463.7831
 P.T. Station 107+11.89 N
 10,264,492.2239 E 4,004,057.1541
 C.C. N
 10,270,141.0974 E 4,003,098.8783
 Back = S 83°38' 09.49" E
 Ahead = N 80°22' 19.18" E
 Chord Bear = N 88°22' 04.84" E

CURVE US190 3

Curve Data

Curve US190 3
 P.I. Station 135+84.58 N
 10,264,972.6837 E 4,006,889.3832
 Delta = 0°03' 46.96" (LT)
 Degree = 0°00' 03.95"
 Tangent = 2,872.6927
 Length = 5,745.3849
 Radius = 5,221,586.6984
 External = 0.7902
 Long Chord = 5,745.3846
 Mid. Ord. = 0.7902
 P.C. Station 107+11.89 N
 10,264,492.2239 E 4,004,057.1541
 P.T. Station 164+57.27 N
 10,265,456.2595 E 4,009,721.0820
 C.C. N
 15,412,529.7657 E 3,130,743.2834
 Back = N 80°22' 19.18" E
 Ahead = N 80°18' 32.22" E
 Chord Bear = N 80°20' 25.70" E

CURVE US190 4

Curve Data

Curve US190 4
 P.I. Station 169+26.94 N
 10,265,535.3207 E 4,010,184.0444
 Delta = 18°37' 15.36" (RT)
 Degree = 2°00' 00.00"
 Tangent = 469.6646
 Length = 931.0467
 Radius = 2,864.7890
 External = 38.2440
 Long Chord = 926.9546
 Mid. Ord. = 37.7402
 P.C. Station 164+57.27 N
 10,265,456.2595 E 4,009,721.0820
 P.T. Station 173+88.32 N
 10,265,462.4167 E 4,010,648.0162
 C.C. N
 10,262,632.3517 E 4,010,203.3274
 Back = N 80°18' 32.22" E
 Ahead = S 81°04' 12.41" E
 Chord Bear = N 89°37' 09.91" E

Course from PT US190 10 to PC US190 13 S 81°04' 12.41"
 E Dist 3,336.5590

CURVE US190 5

Curve Data

Curve US190 5
 P.I. Station 212+38.94 N
 10,264,864.7011 E 4,014,451.9657
 Delta = 10°52' 33.58" (RT)
 Degree = 1°03' 39.72"
 Tangent = 514.0637
 Length = 1,025.0384
 Radius = 5,400.0000
 External = 24.4135
 Long Chord = 1,023.5002
 Mid. Ord. = 24.3036
 P.C. Station 207+24.88 N
 10,264,944.4970 E 4,013,944.1329
 P.T. Station 217+49.92 N
 10,264,690.5186 E 4,014,935.6205
 C.C. N
 10,259,609.9502 E 4,013,105.9142
 Back = S 81°04' 12.41" E
 Ahead = S 70°11' 38.83" E
 Chord Bear = S 75°37' 55.62" E

CURVE US190 6

Curve Data

Curve US190 6
 P.I. Station 239+37.15 N
 10,263,949.4097 E 4,016,993.4669
 Delta = 0°02' 12.93" (RT)
 Degree = 0°00' 03.04"
 Tangent = 2,187.2298
 Length = 4,374.4595
 Radius = 6,787,631.4244
 External = 0.3524
 Long Chord = 4,374.4594
 Mid. Ord. = 0.3524
 P.C. Station 217+49.92 N
 10,264,690.5186 E 4,014,935.6205
 P.T. Station 261+24.38 N
 10,263,206.9747 E 4,019,050.8353
 C.C. N
 3,878,574.6691 E 1,715,051.9907
 Back = S 70°11' 38.83" E
 Ahead = S 70°09' 25.90" E
 Chord Bear = S 70°10' 32.36" E

CURVE US190 7

Curve Data

Curve US190 7
 P.I. Station 268+46.77 N
 10,262,961.7665 E 4,019,730.3340
 Delta = 23°00' 14.86" (LT)
 Degree = 1°36' 50.28"
 Tangent = 722.3889
 Length = 1,425.3171
 Radius = 3,550.0000
 External = 72.7539
 Long Chord = 1,415.7630
 Mid. Ord. = 71.2928
 P.C. Station 261+24.38 N
 10,263,206.9747 E 4,019,050.8353
 P.T. Station 275+49.69 N
 10,263,001.6044 E 4,020,451.6236
 C.C. N
 10,266,546.2021 E 4,020,255.8500
 Back = S 70°09' 25.90" E
 Ahead = N 86°50' 19.24" E
 Chord Bear = S 81°39' 33.33" E

Course from PT US190 15 to US19018 N 86°50' 19.24" E
 Dist 2,804.2774

Point US19018 N 10,263,156.2533 E
 4,023,251.6334 Sta 303+53.97

Course from US19018 to US19020 N 86°21' 44.63" E Dist
 994.5793

Point US19020 N 10,263,219.3549 E
 4,024,244.2089 Sta 313+48.55

Course from US19020 to PC US190 22 N 86°51' 47.56" E
 Dist 5,789.7942

05/13/2021

**HORIZONTAL
 ALIGNMENT
 DATA**

SHEET 1 OF 2



BGE, Inc.
 10777 Westheimer, Suite 400, Houston, TX 77042
 Tel: 281-658-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		78
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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CSJ 0213-04-050
 PROPOSED CENTERLINE - US 190 (CONT.)

CURVE US190 8

Curve Data

Curve US190 8
 P.I. Station 376+33.14 N
 10,263,563.2473 E 4,030,519.3813
 Delta = 14°45' 41.85" (RT)
 Degree = 1°30' 00.00"
 Tangent = 494.7942
 Length = 984.1084
 Radius = 3,819.7190
 External = 31.9137
 Long Chord = 981.3889
 Mid. Ord. = 31.6493
 P.C. Station 371+38.34 N
 10,263,536.1722 E 4,030,025.3285
 P.T. Station 381+22.45 N
 10,263,463.5451 E 4,031,004.0263
 C.C. N
 10,259,722.1761 E 4,030,234.3434
 Back = N 86°51' 47.56" E
 Ahead = S 78°22' 30.59" E
 Chord Bear = S 85°45' 21.52" E

Course from PT US190 22 to PC US190 25 S 78°22' 30.59"
 E Dist 4,535.5682

CURVE US190 9

Curve Data

Curve US190 9
 P.I. Station 431+37.58 N
 10,262,452.9845 E 4,035,916.2826
 Delta = 9°17' 37.30" (LT)
 Degree = 0°58' 16.01"
 Tangent = 479.5584
 Length = 957.0129
 Radius = 5,900.0000
 External = 19.4574
 Long Chord = 955.9641
 Mid. Ord. = 19.3935
 P.C. Station 426+58.02 N
 10,262,549.6167 E 4,035,446.5610
 P.T. Station 436+15.03 N
 10,262,433.4785 E 4,036,395.4441
 C.C. N
 10,268,328.5959 E 4,036,635.4257
 Back = S 78°22' 30.59" E
 Ahead = S 87°40' 07.90" E
 Chord Bear = S 83°01' 19.24" E

05/13/2021

HORIZONTAL
 ALIGNMENT
 DATA

SHEET 2 OF 2

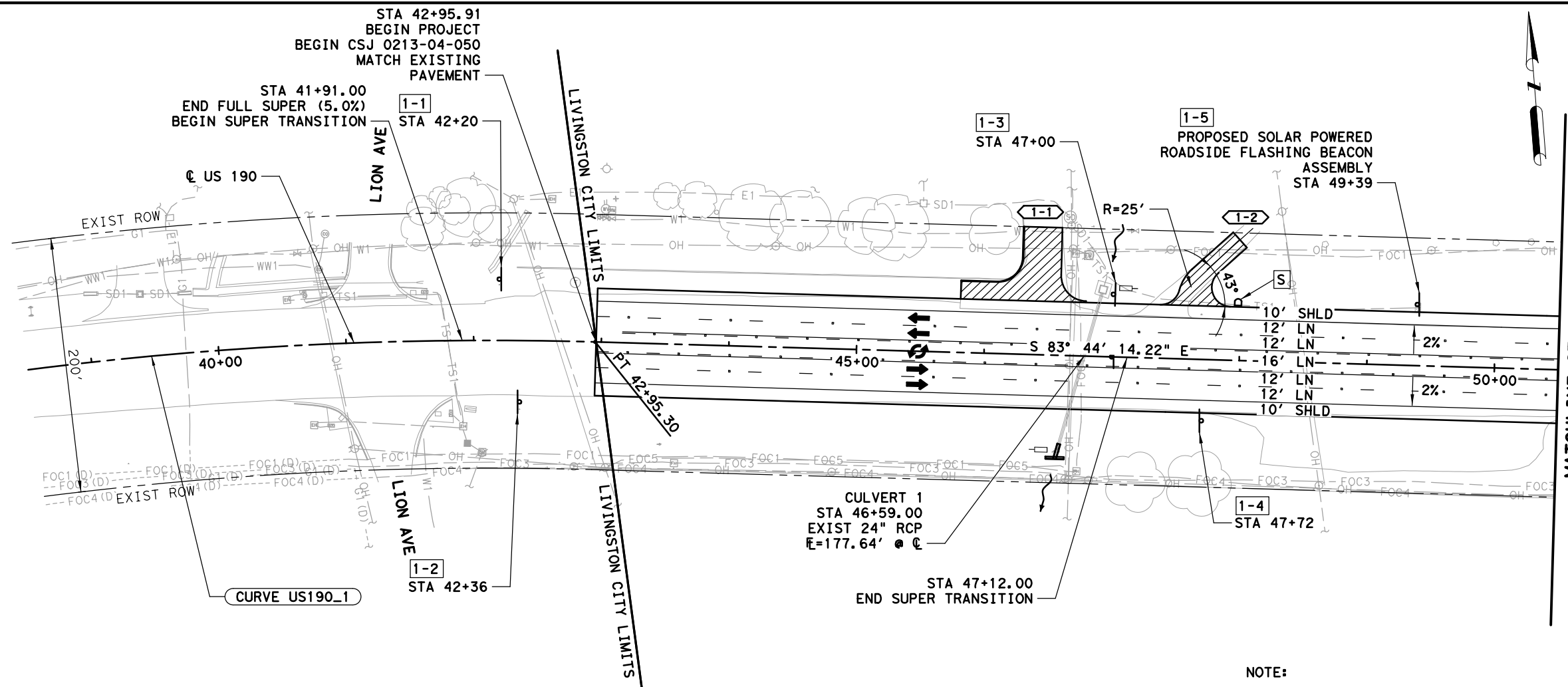


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 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			79
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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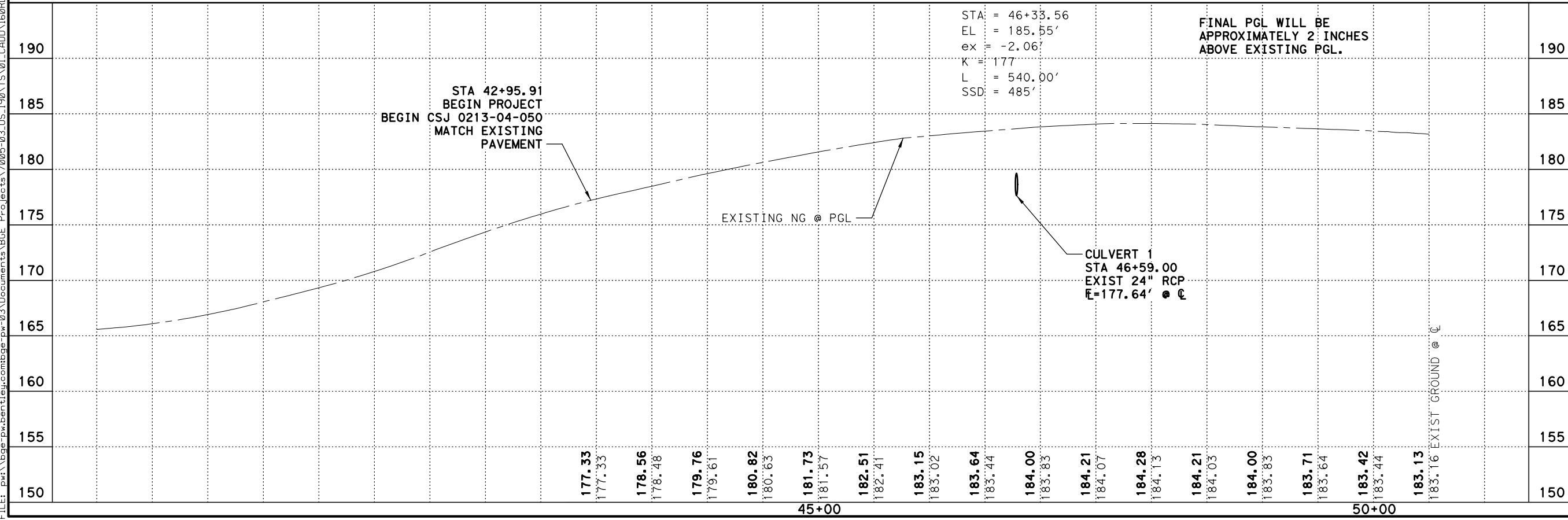
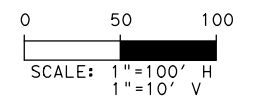
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [D] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ~ — FLOW DIRECTION

NOTE:
 1. PROP INCIDENTAL WORK LIMITS:
 STA 0+00.00 - STA 42+95.91
 STA 1133+38.00 - STA 1191+29.00



190
185
180
175
170
165
160
155
150

45+00
50+00

05/13/2021

ROADWAY PLAN & PROFILE
 (BEGIN CSJ-STA 50+50)

SHEET 1 OF 33

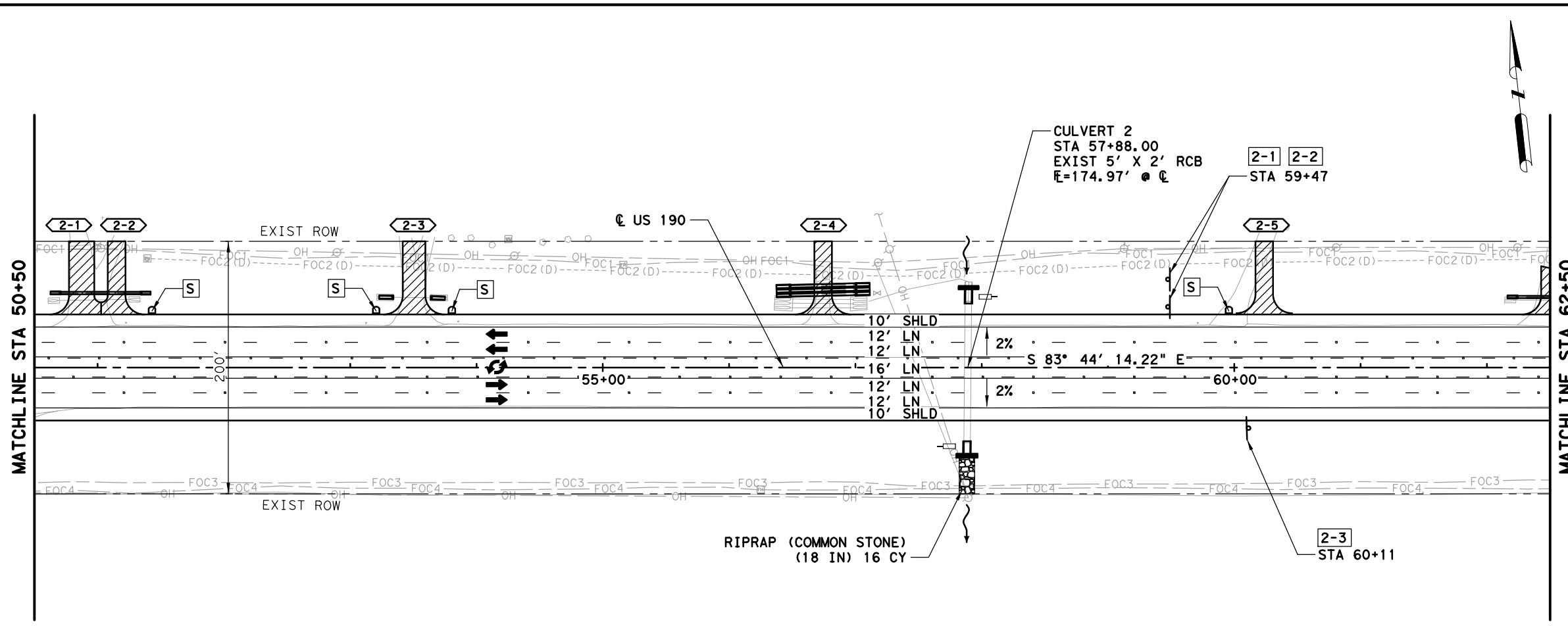
Texas Department of Transportation

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 TBPE Registration No. F-1046

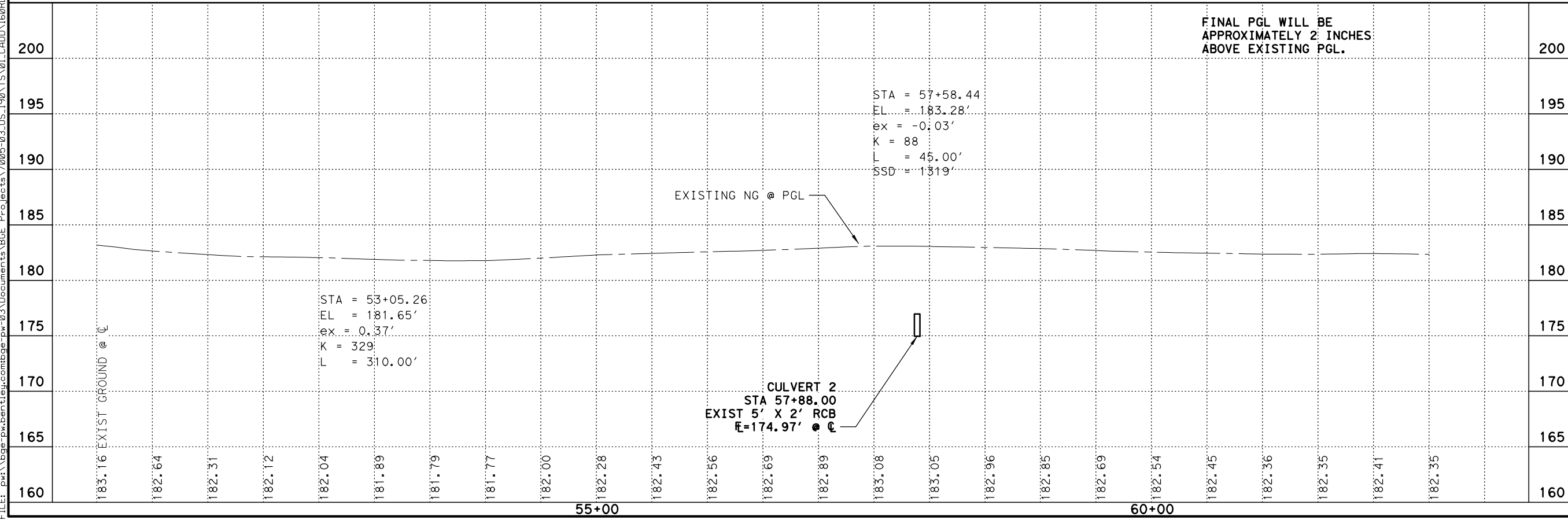
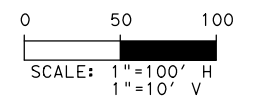
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6		80
STATE DIST. NO.	COUNTY	
TEXAS LFK	POLK	
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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- LEGEND**
- EX — EXISTING ELECTRICAL
 - TS X — EXISTING TRAFFIC SIGNAL
 - TX — EXISTING TELEPHONE
 - GX — EXISTING GAS
 - PL X — EXISTING PIPELINE
 - FOC X — EXISTING FIBER OPTIC
 - WX — EXISTING WATER
 - WW X — EXISTING WASTE WATER
 - OH — EXISTING OVERHEAD
 - ⊙ — EXISTING SIGN
 - X — EXISTING FENCE
 - [S] — MAILBOX (SINGLE)
 - [D] — MAILBOX (DOUBLE)
 - [M] — MAILBOX (MULTIPLE)
 - [#] — PROPOSED MAILBOX
 - [#] — PROPOSED SIGN
 - ⊙ — DELINEATOR
 - — OBJECT MARKER
 - — DIRECTION OF TRAFFIC
 - CURVE US190 # — CURVE NUMBER
 - [Hatched] — DRIVEWAY CONSTRUCTION
 - [Cross-hatched] — INTERSECTION CONSTRUCTION
 - [# in circle] — DRIVEWAY NUMBER
 - — FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE
(STA 50+50-STA 62+50)

SHEET 2 OF 33

Texas Department of Transportation

BGE, Inc.
 10777 Westheimer, Suite 400, Houston, TX 77042
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 TBPE Registration No. F-1046

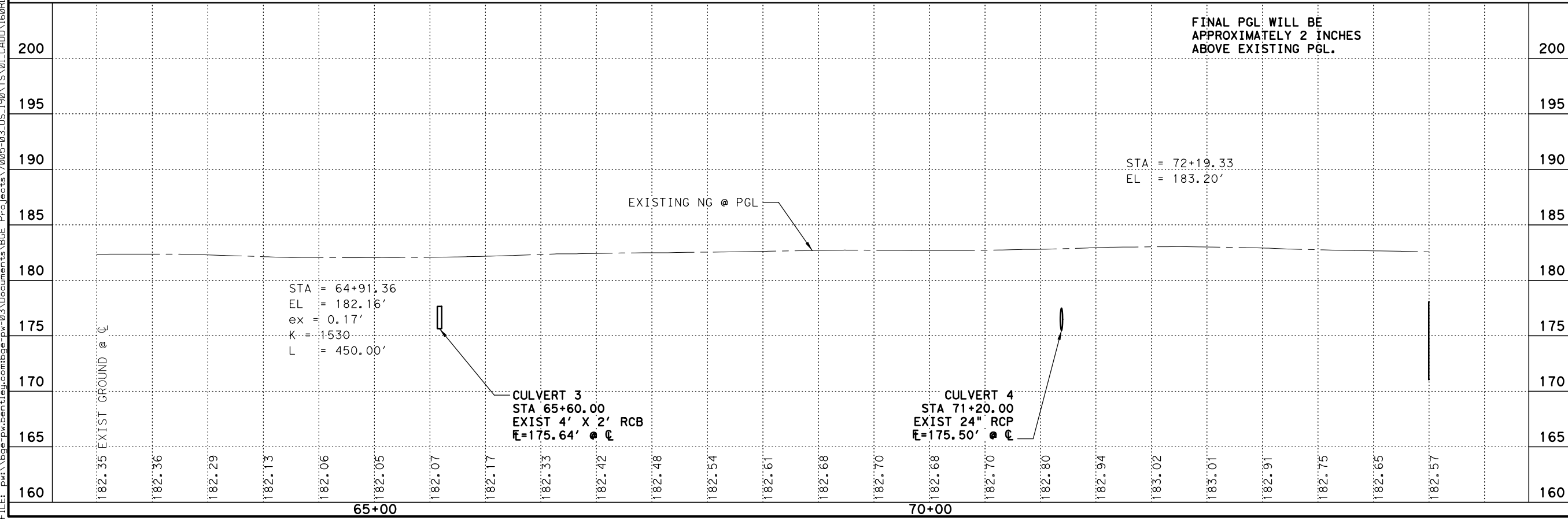
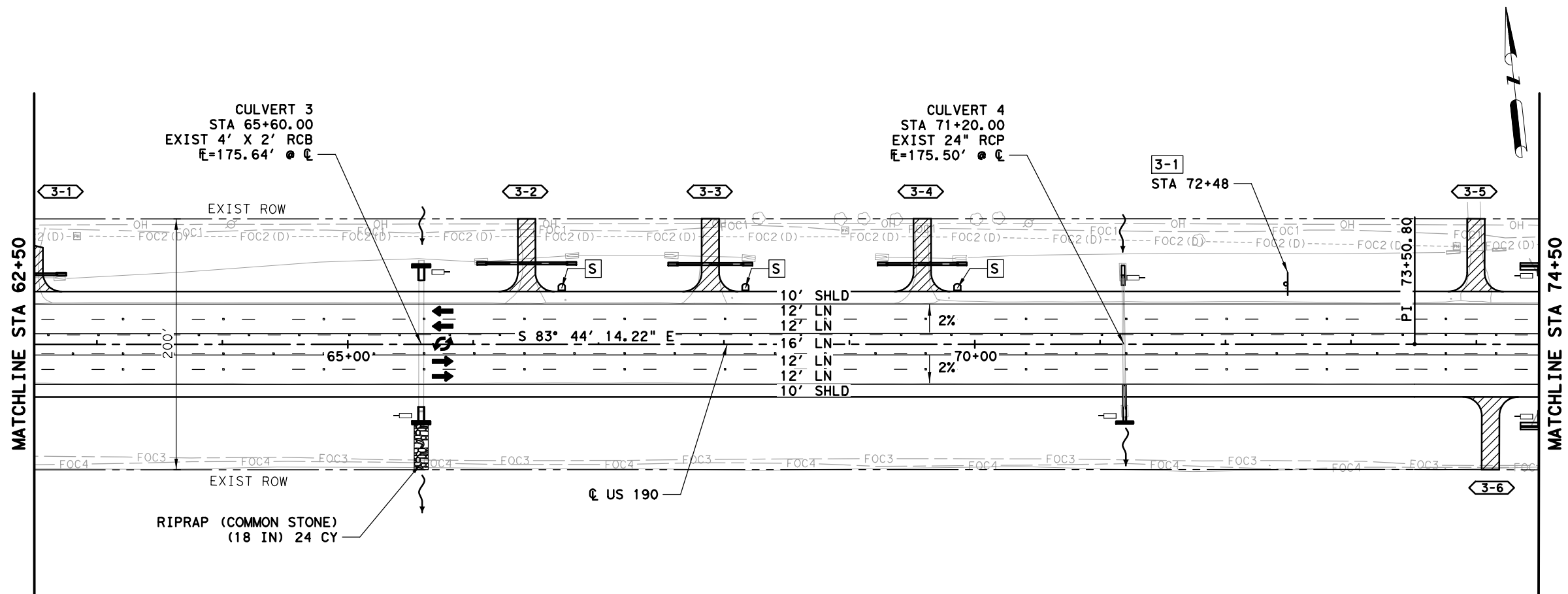
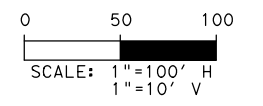
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6		81
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- ⊙ — CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [#] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE
(STA 62+50-STA 74+50)

SHEET 3 OF 33

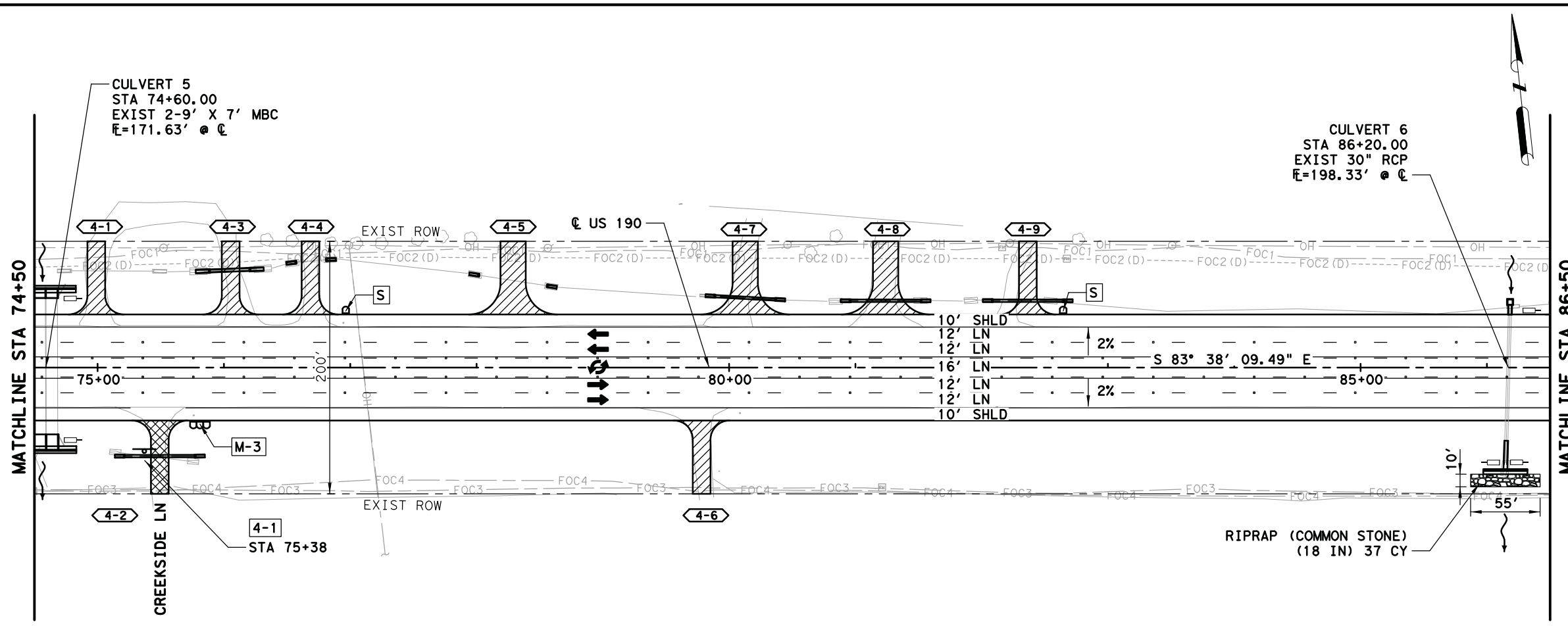
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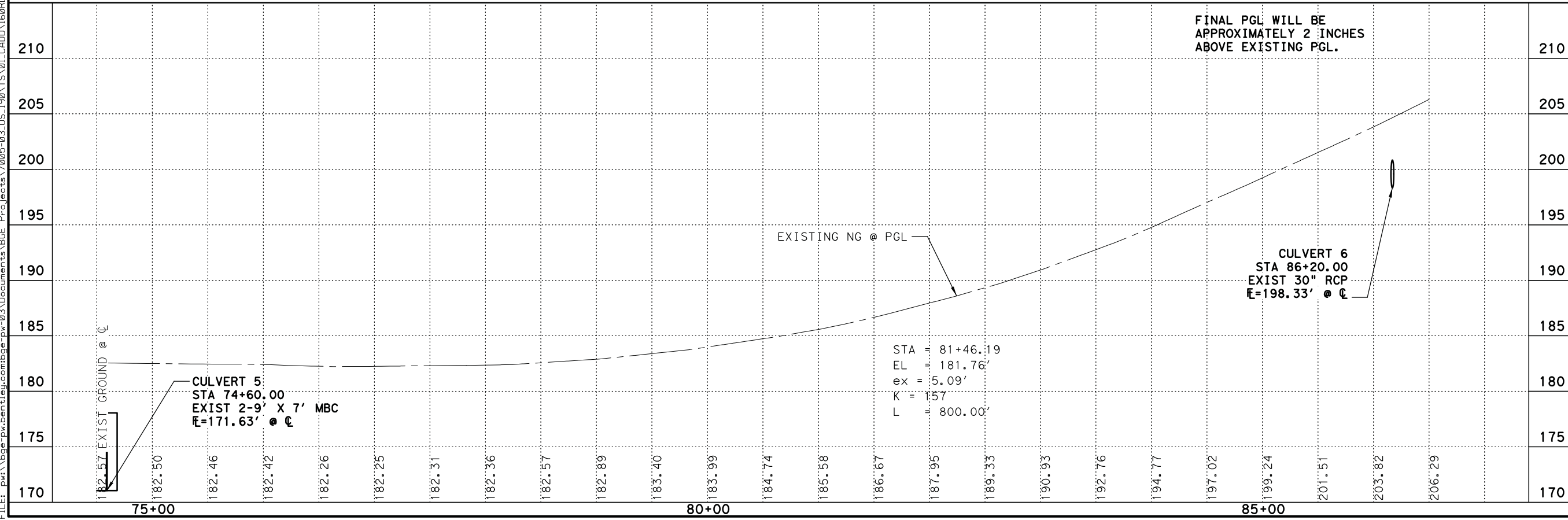
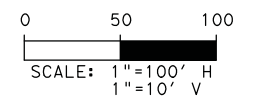
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STATE DIST. NO.	COUNTY	
TEXAS	FLK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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- LEGEND**
- EX — EXISTING ELECTRICAL
 - TS X — EXISTING TRAFFIC SIGNAL
 - TX — EXISTING TELEPHONE
 - GX — EXISTING GAS
 - PL X — EXISTING PIPELINE
 - FOC X — EXISTING FIBER OPTIC
 - WX — EXISTING WATER
 - WW X — EXISTING WASTE WATER
 - OH — EXISTING OVERHEAD
 - ⊙ — EXISTING SIGN
 - X — EXISTING FENCE
 - [S] — MAILBOX (SINGLE)
 - [D] — MAILBOX (DOUBLE)
 - [M] — MAILBOX (MULTIPLE)
 - [#] — PROPOSED MAILBOX
 - [#] — PROPOSED SIGN
 - ⊙ — DELINEATOR
 - — OBJECT MARKER
 - — DIRECTION OF TRAFFIC
 - ⊙ — CURVE US190 # — CURVE NUMBER
 - [Hatched] — DRIVEWAY CONSTRUCTION
 - [Cross-hatched] — INTERSECTION CONSTRUCTION
 - [#] — DRIVEWAY NUMBER
 - — FLOW DIRECTION



STATE OF TEXAS
 M. CHAD CRISWELL
 90114
 LICENSED PROFESSIONAL ENGINEER
 05/25/2021

**ROADWAY
 PLAN &
 PROFILE**
 (STA 74+50-STA 86+50)

SHEET 4 OF 33

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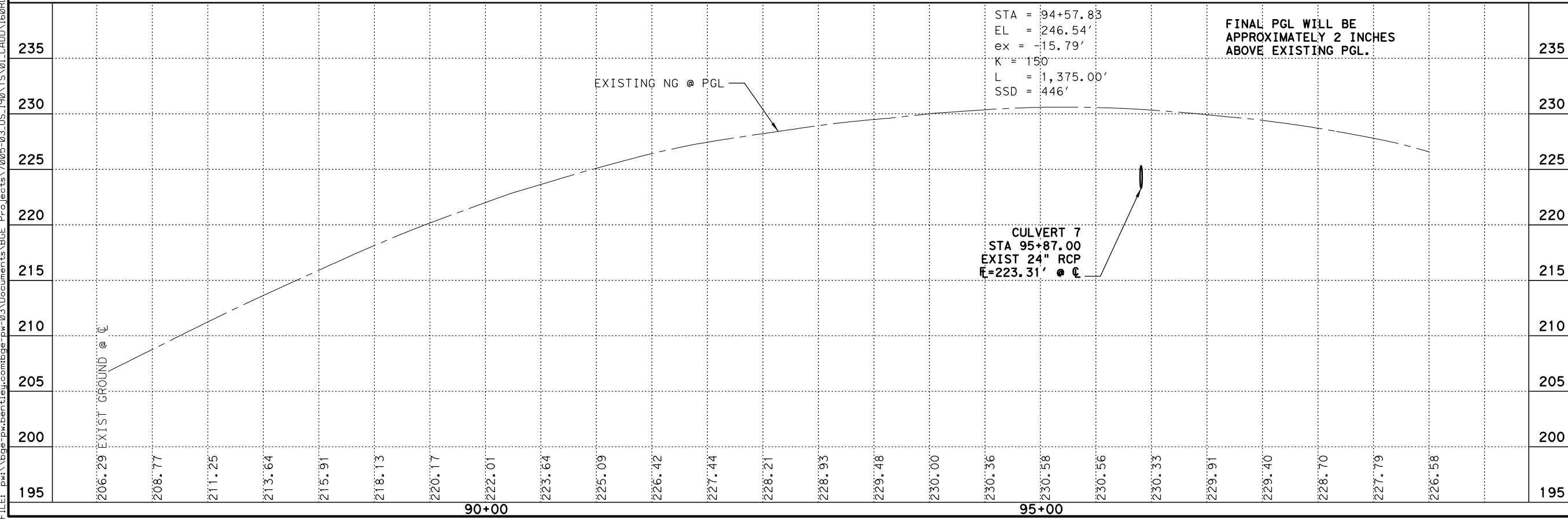
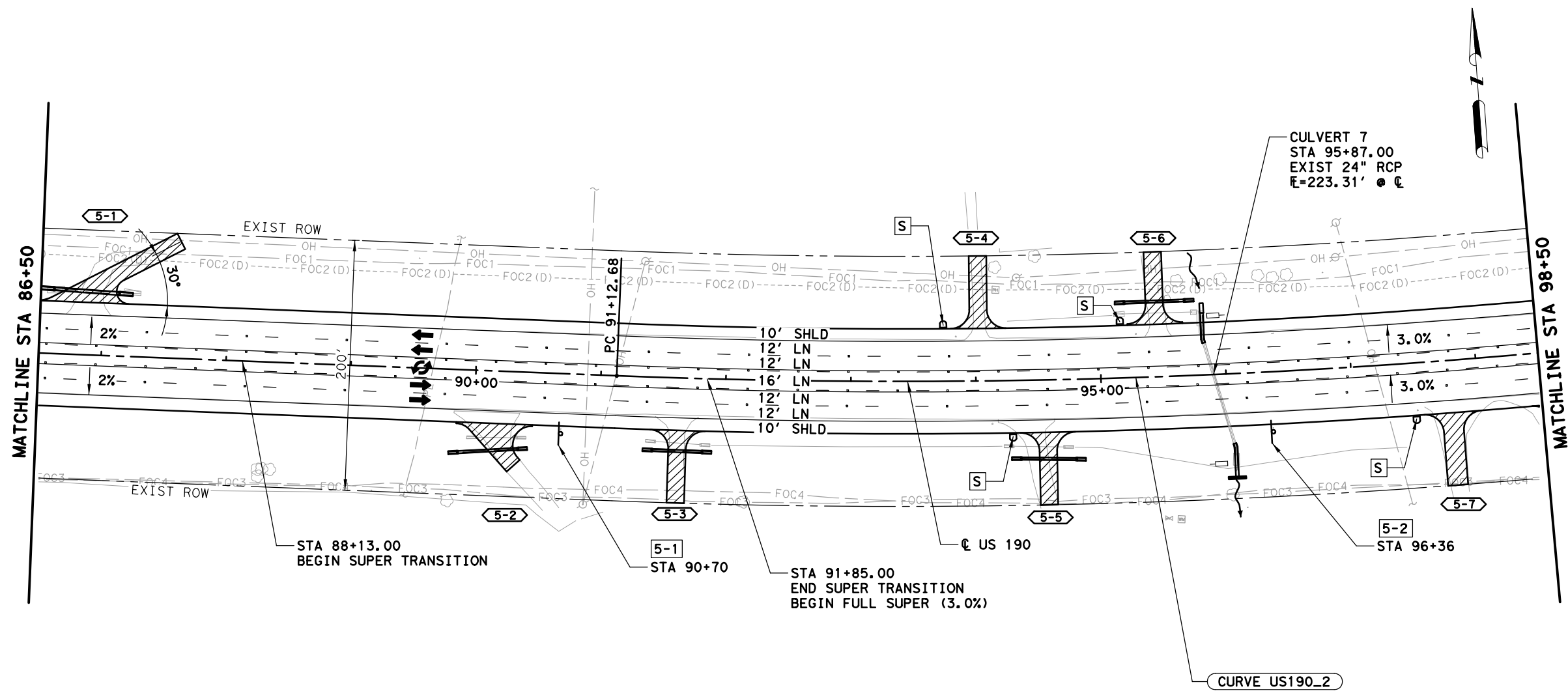
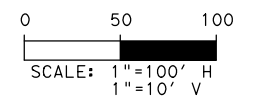
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TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [#] — DRIVEWAY NUMBER
- ~ — FLOW DIRECTION



235

230

225

220

215

210

205

200

195

90+00

95+00

05/13/2021

ROADWAY PLAN & PROFILE
 (STA 86+50-STA 98+50)

SHEET 5 OF 33

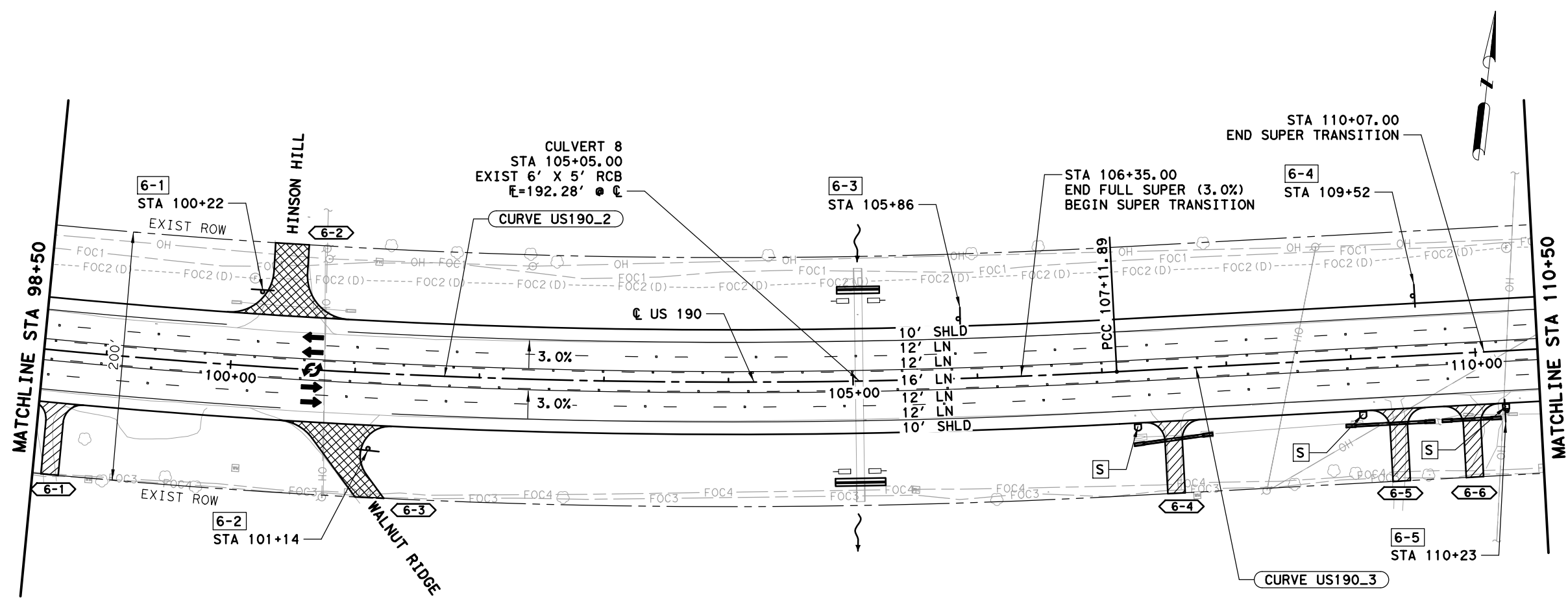
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6		84	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

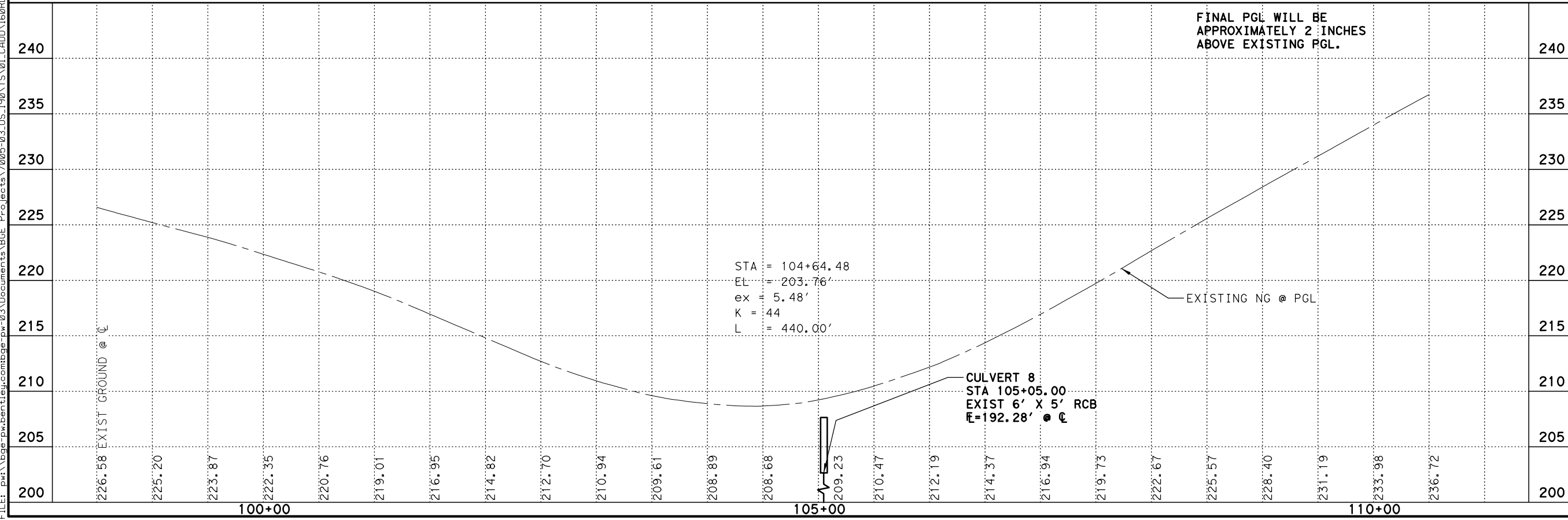
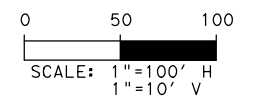
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [#] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



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ROADWAY PLAN & PROFILE

(STA 98+50-STA 110+50)

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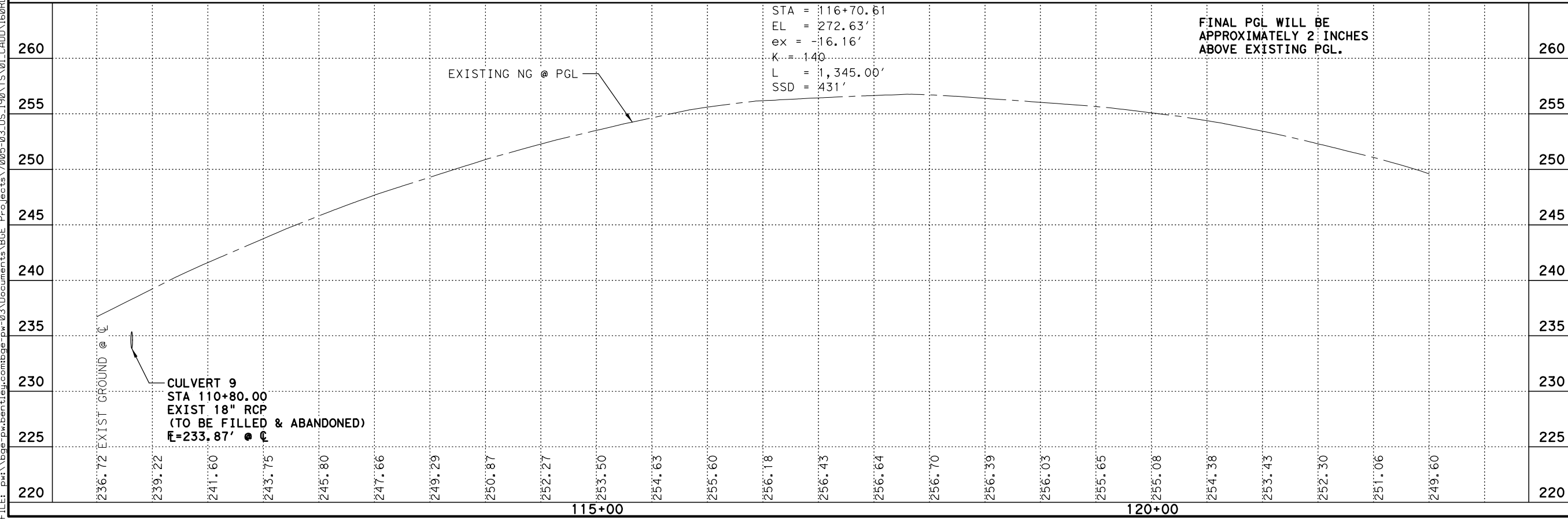
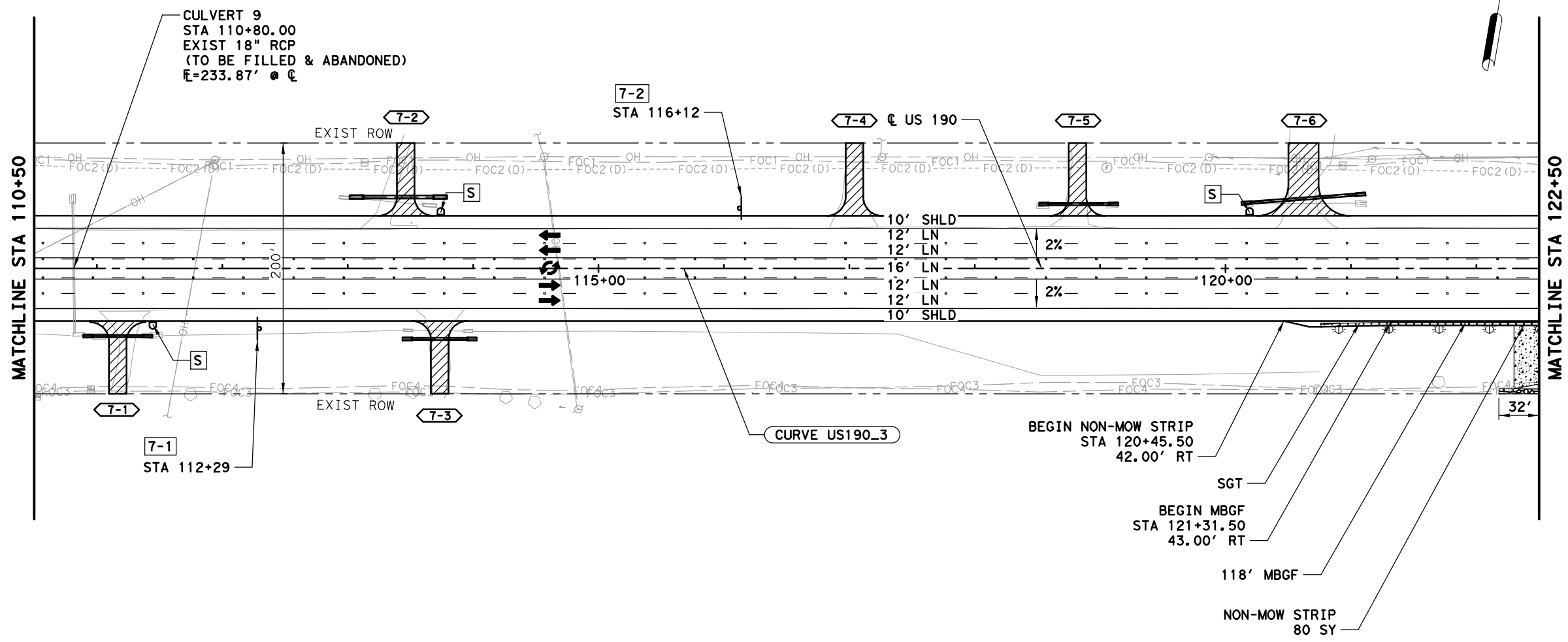
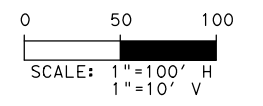
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6		85	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in hexagon] — DRIVEWAY NUMBER
- — FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE

(STA 110+50-STA 122+50)

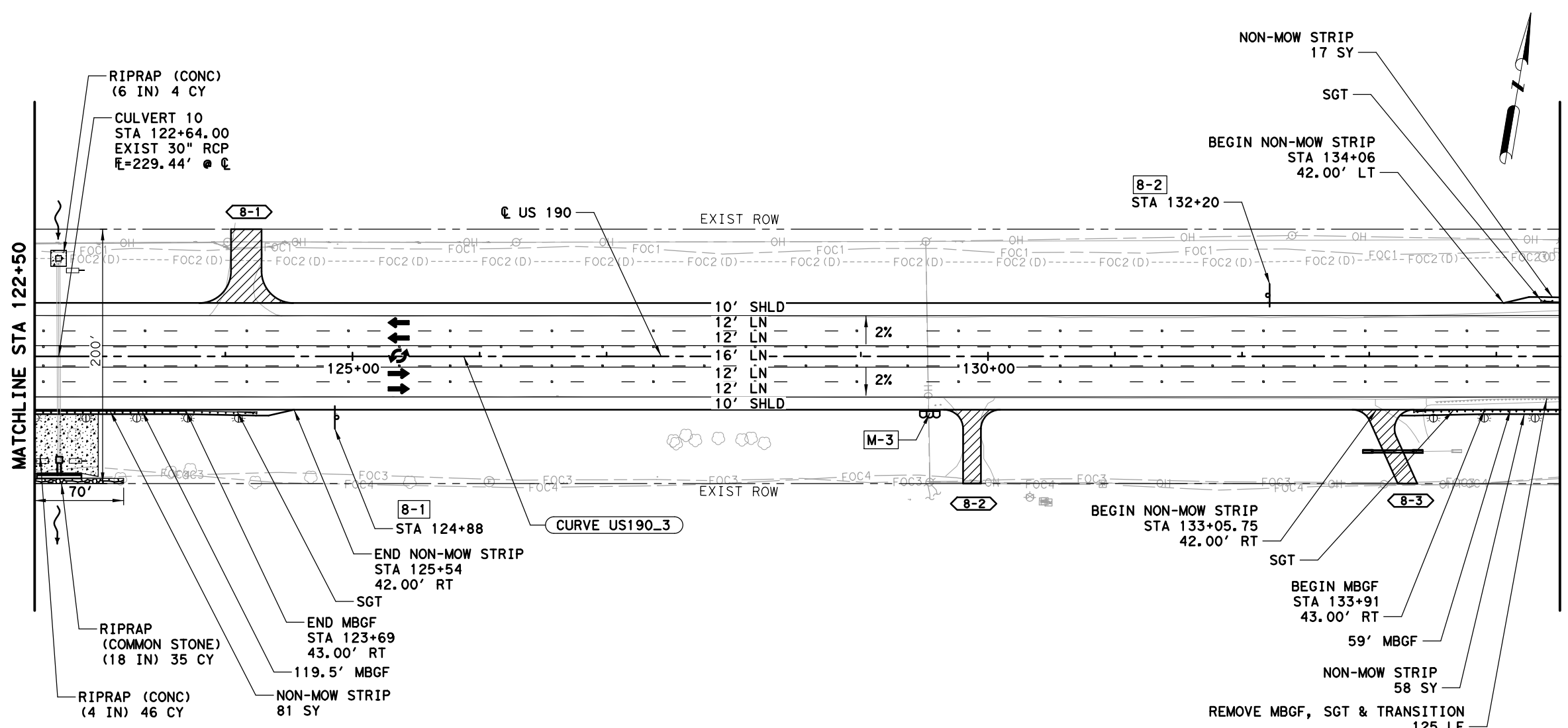
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6				86	
STATE	DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
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- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- — FLOW DIRECTION

0 50 100
 SCALE: 1"=100' H
 1"=10' V



245 240 235 230 225 220 215 210 205

245 240 235 230 225 220 215 210 205

05/13/2021

ROADWAY PLAN & PROFILE

(STA 122+50-STA 134+50)

SHEET 8 OF 33

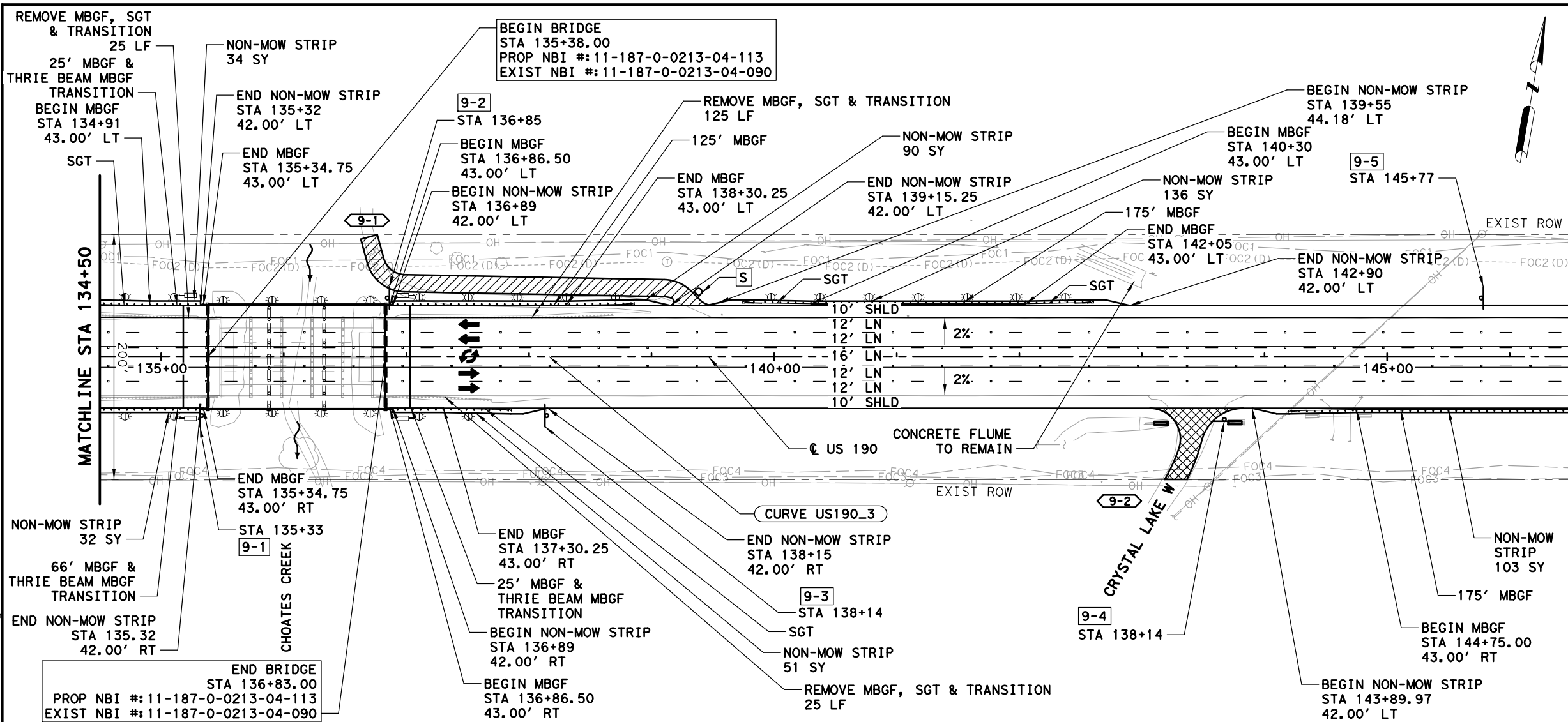
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STATE	COUNTY	
TEXAS	POLK	
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

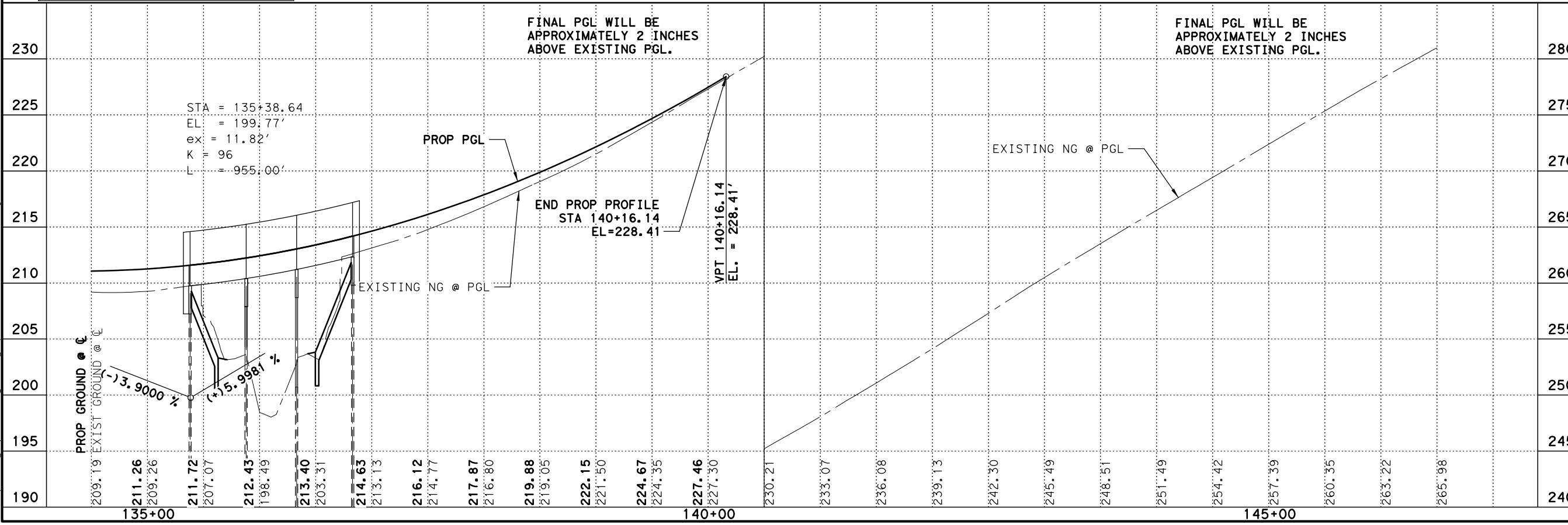
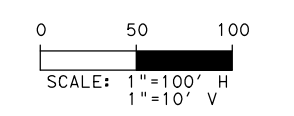
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- [] — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- (#) — CURVE US190 #
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- > — FLOW DIRECTION



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ROADWAY PLAN & PROFILE

(STA 134+50-STA 146+50)

SHEET 9 OF 33

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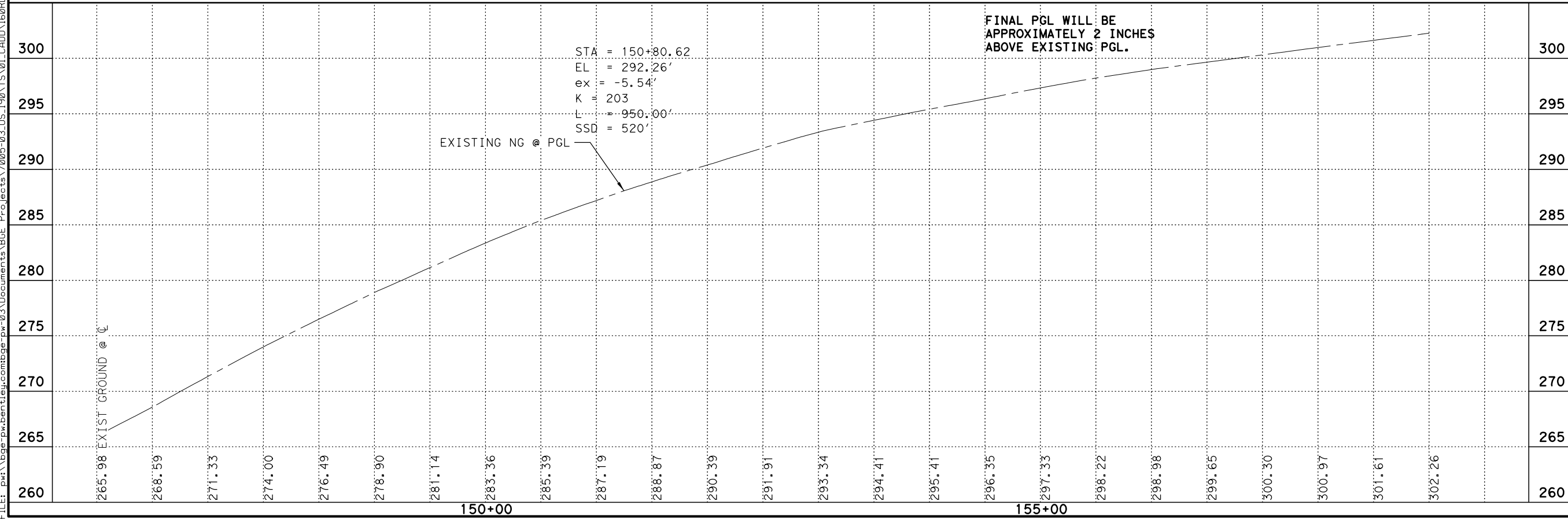
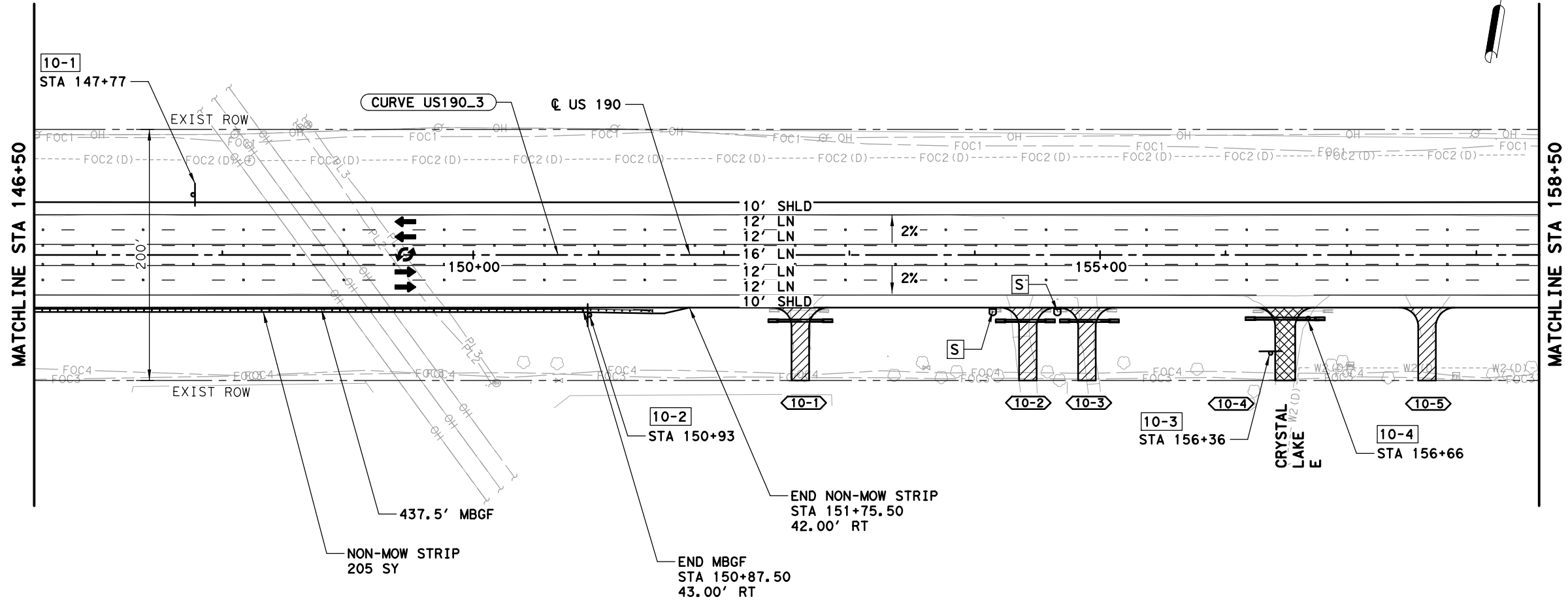
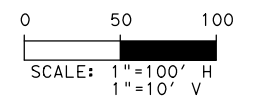
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TEXAS	POLK	
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND

- E X — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- T X — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [D] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



05/13/2021

**ROADWAY
PLAN &
PROFILE**
(STA 146+50-STA 158+50)

SHEET 10 OF 33

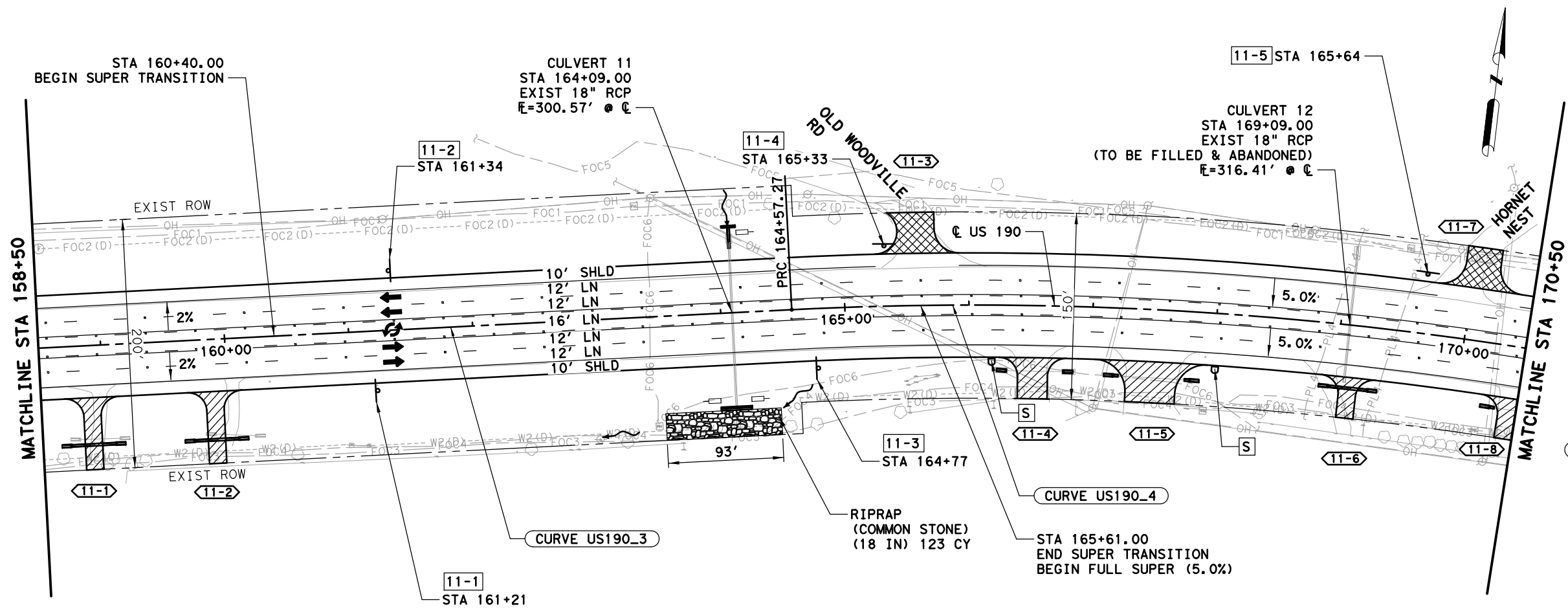
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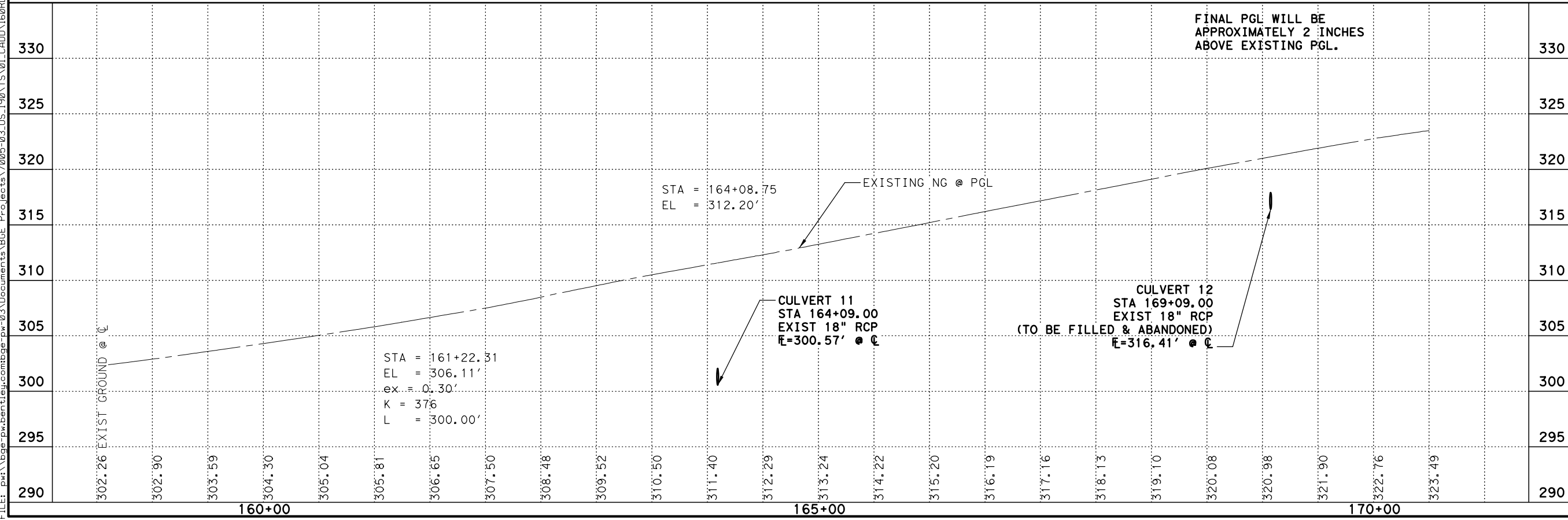
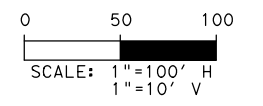
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6				89	
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TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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- LEGEND**
- EX — EXISTING ELECTRICAL
 - TS X — EXISTING TRAFFIC SIGNAL
 - TX — EXISTING TELEPHONE
 - GX — EXISTING GAS
 - PL X — EXISTING PIPELINE
 - FOC X — EXISTING FIBER OPTIC
 - WX — EXISTING WATER
 - WW X — EXISTING WASTE WATER
 - OH — EXISTING OVERHEAD
 - OH — EXISTING SIGN
 - X — EXISTING FENCE
 - [S] MAILBOX (SINGLE)
 - [D] MAILBOX (DOUBLE)
 - [M] MAILBOX (MULTIPLE)
 - [#] PROPOSED MAILBOX
 - [#] PROPOSED SIGN
 - DELINEATOR
 - OBJECT MARKER
 - DIRECTION OF TRAFFIC
 - CURVE US190 # CURVE NUMBER
 - [Hatched Box] DRIVEWAY CONSTRUCTION
 - [Cross-hatched Box] INTERSECTION CONSTRUCTION
 - [# in Circle] DRIVEWAY NUMBER
 - ~ FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE
 (STA 158+50-STA 170+50)

SHEET 11 OF 33

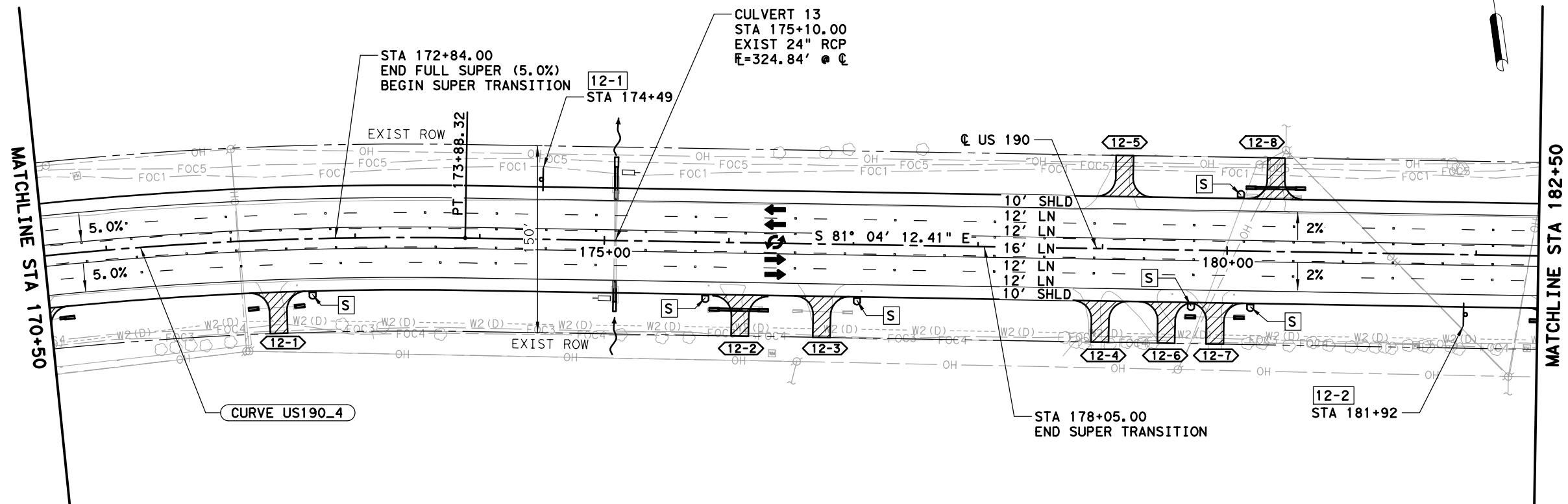
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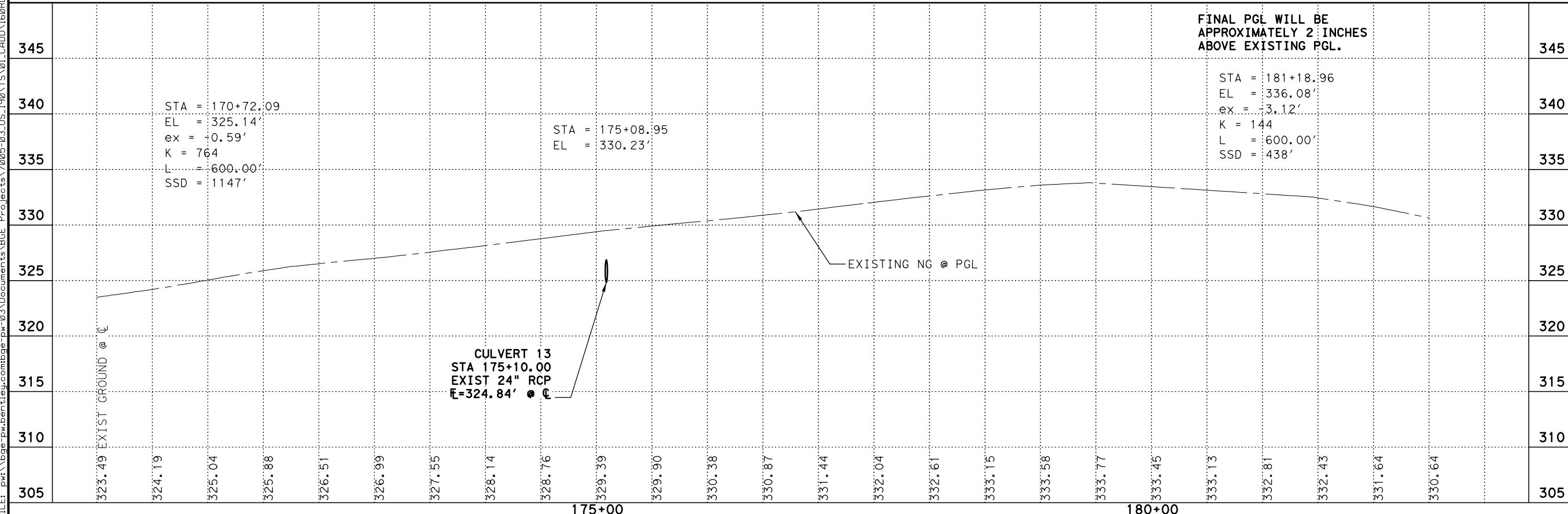
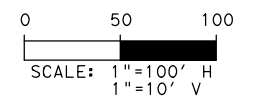
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6		90
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CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
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LEGEND	
— EX —	EXISTING ELECTRICAL
— TS X —	EXISTING TRAFFIC SIGNAL
— TX —	EXISTING TELEPHONE
— GX —	EXISTING GAS
— PL X —	EXISTING PIPELINE
— FOC X —	EXISTING FIBER OPTIC
— WX —	EXISTING WATER
— WW X —	EXISTING WASTE WATER
— OH —	EXISTING OVERHEAD
⊙	EXISTING SIGN
— X —	EXISTING FENCE
[S]	MAILBOX (SINGLE)
[D]	MAILBOX (DOUBLE)
[M]	MAILBOX (MULTIPLE)
[D]	PROPOSED MAILBOX
[#]	PROPOSED SIGN
⊙	DELINEATOR
[]	OBJECT MARKER
→	DIRECTION OF TRAFFIC
○ #	CURVE US190 #
[Hatched]	DRIVEWAY CONSTRUCTION
[Cross-hatched]	INTERSECTION CONSTRUCTION
[#]	DRIVEWAY NUMBER
→	FLOW DIRECTION



345	345
340	340
335	335
330	330
325	325
320	320
315	315
310	310
305	305

05/13/2021

ROADWAY PLAN & PROFILE

(STA 170+50-STA 182+50)

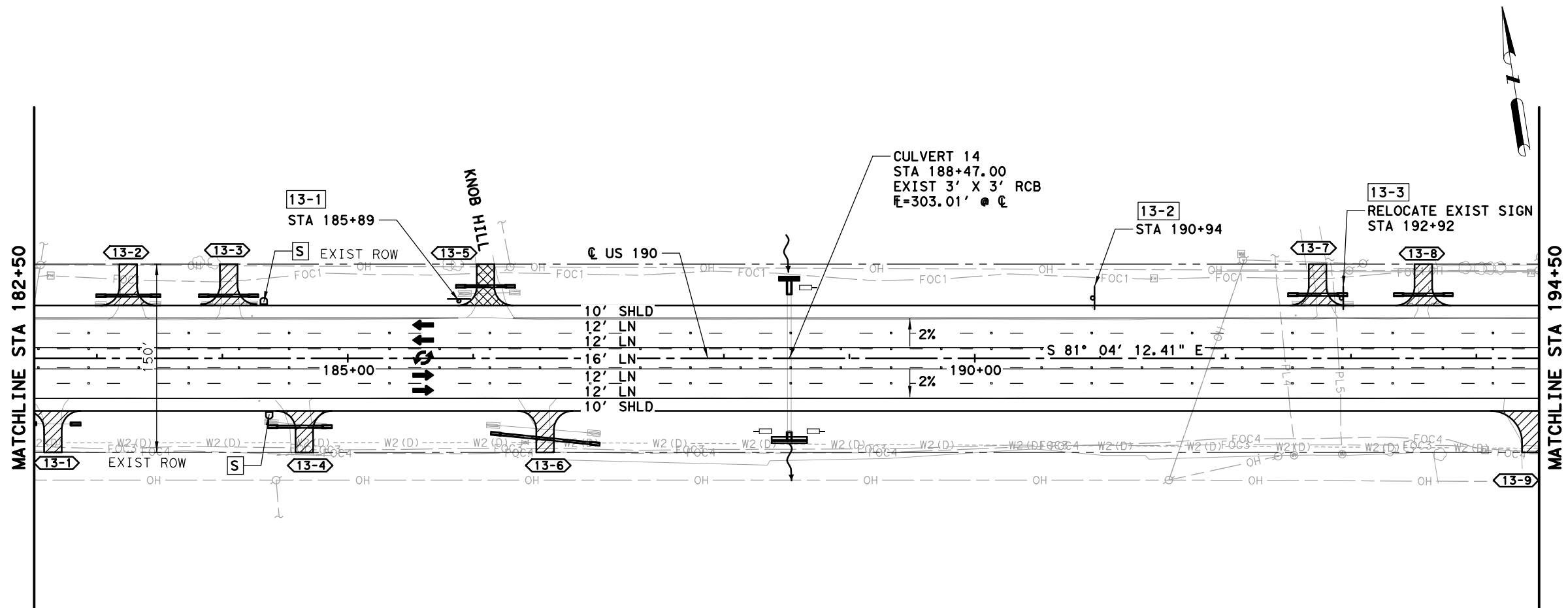
SHEET 12 OF 33

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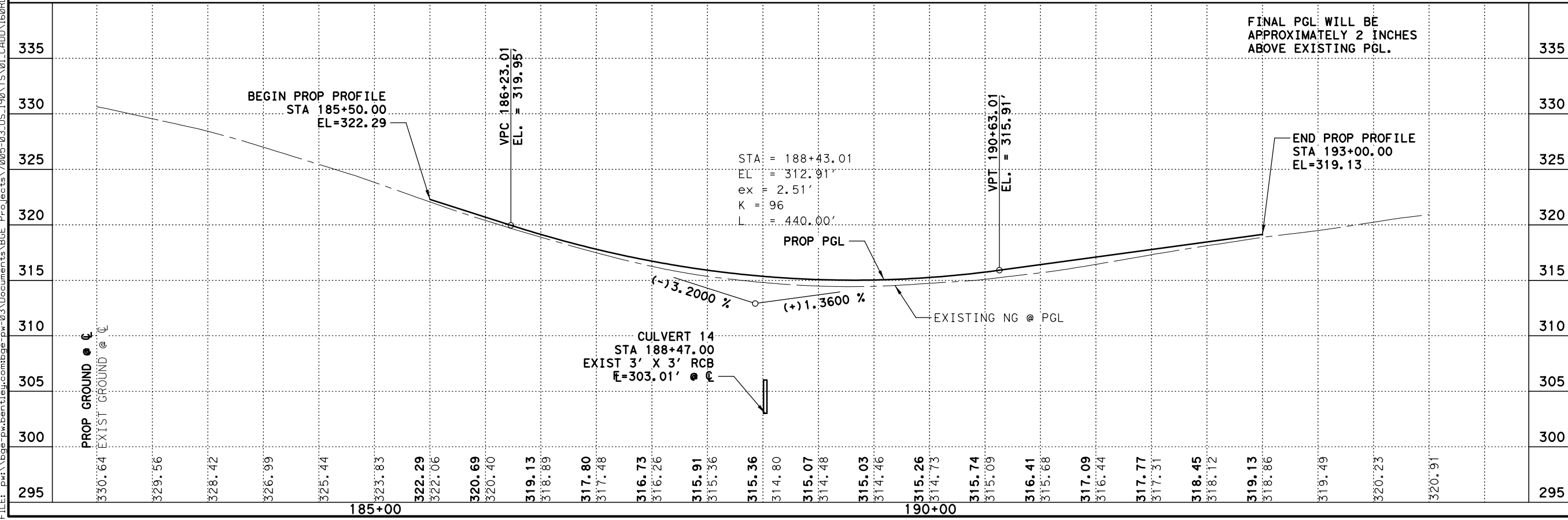
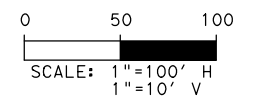
FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		91
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND

- E X — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- T X — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊕ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- ⌒ — CURVE US190 #
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE
 (STA 182+50-STA 194+50)

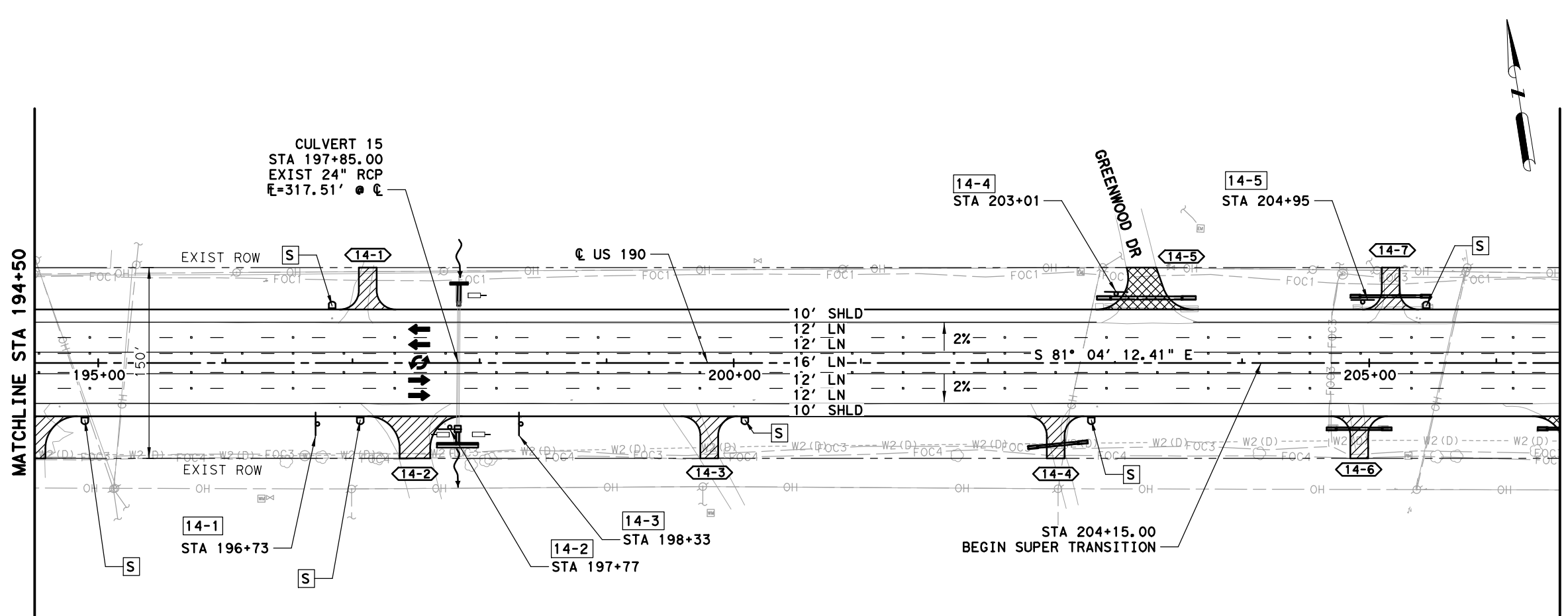
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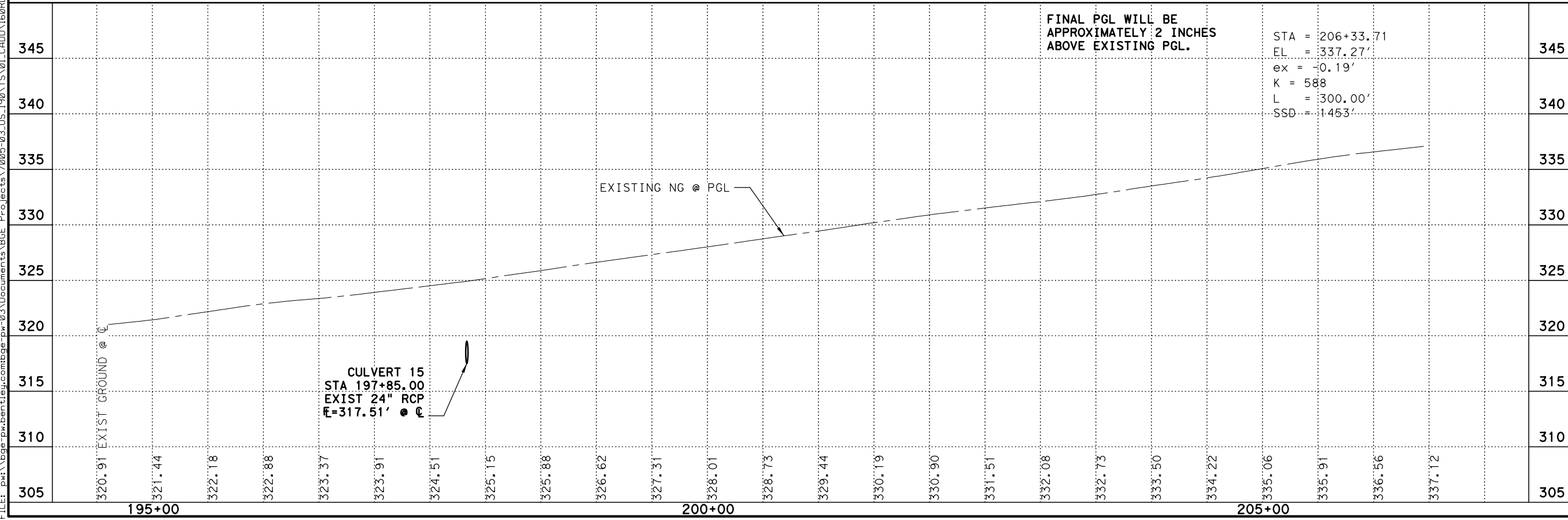
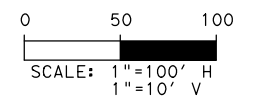
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6		92
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND

- E X — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- T X — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- ⤵ — CURVE US190 # CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE

(STA 194+50-STA 206+50)

SHEET 14 OF 33

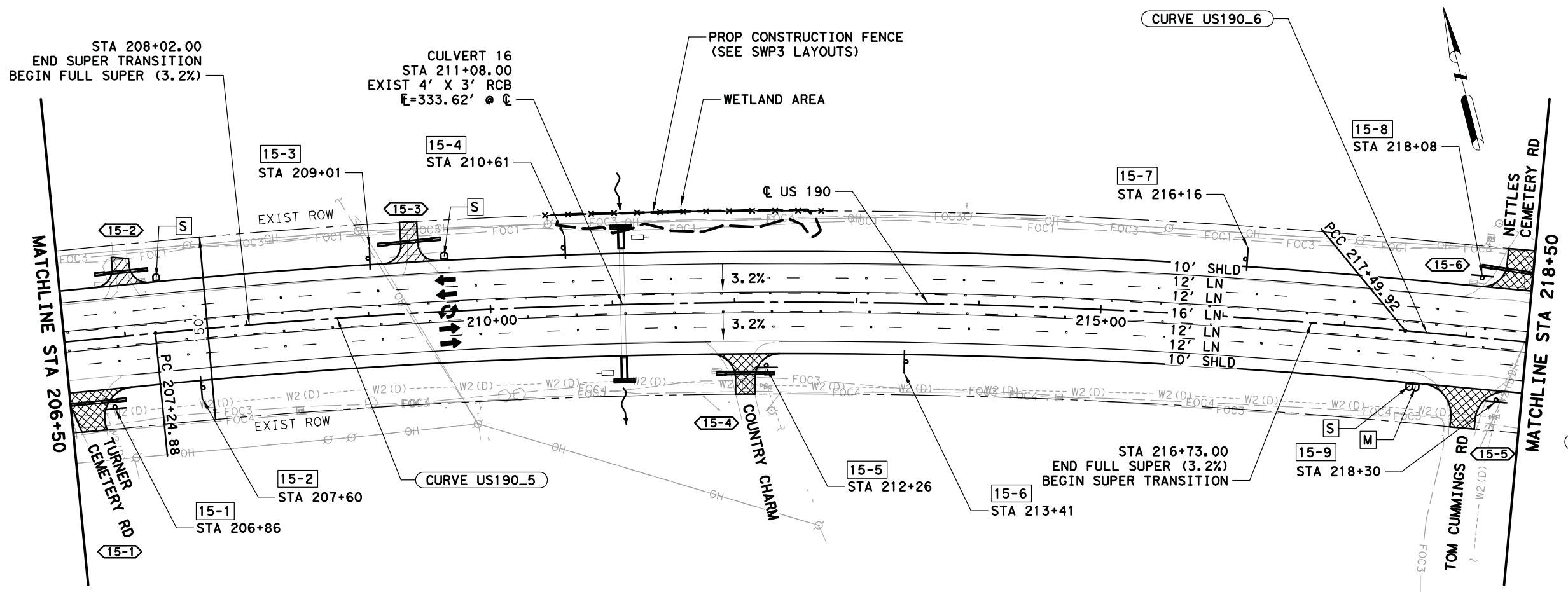
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FED. RD. DIV. NO.		PROJECT NO.		SHEET NO.	
6				93	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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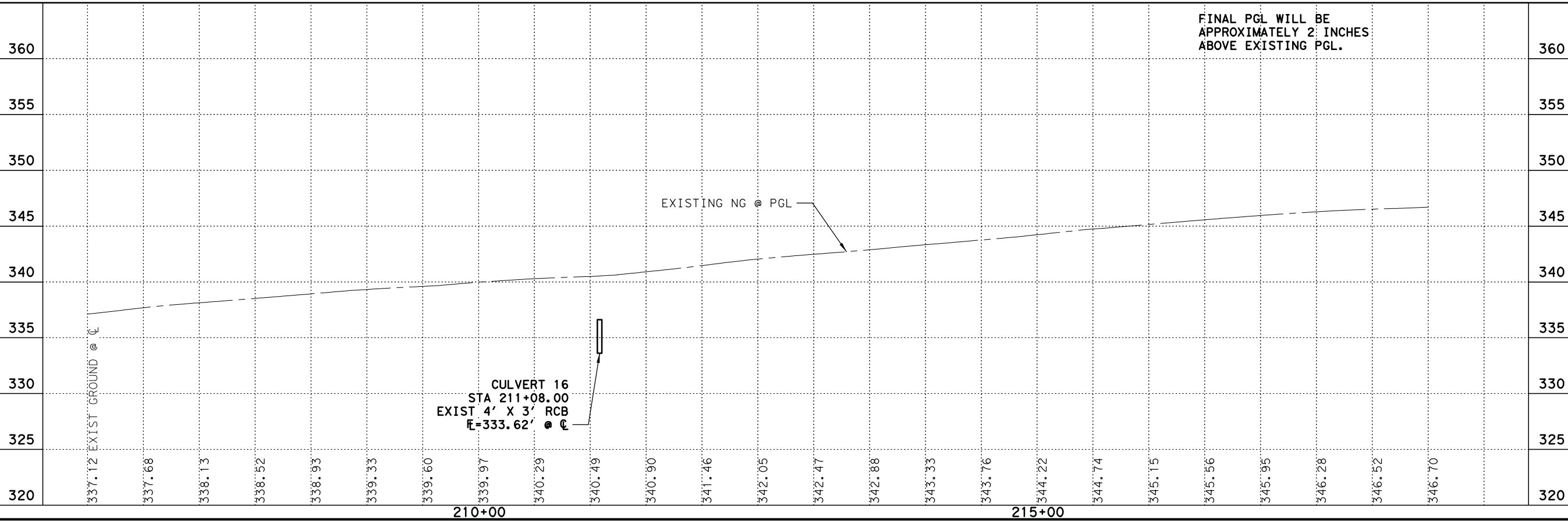
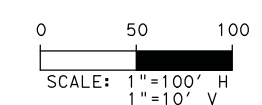
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [#] — DRIVEWAY NUMBER
- — FLOW DIRECTION

NOTE:
 1. USACE AUTHORIZATION REQUIRED BETWEEN STA 210+00 STA 214+00 AND NO WORK IS ALLOWED UNTIL IT IS OBTAINED. REFER TO GENERAL NOTES AND EPIC FOR MORE INFORMATION.



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

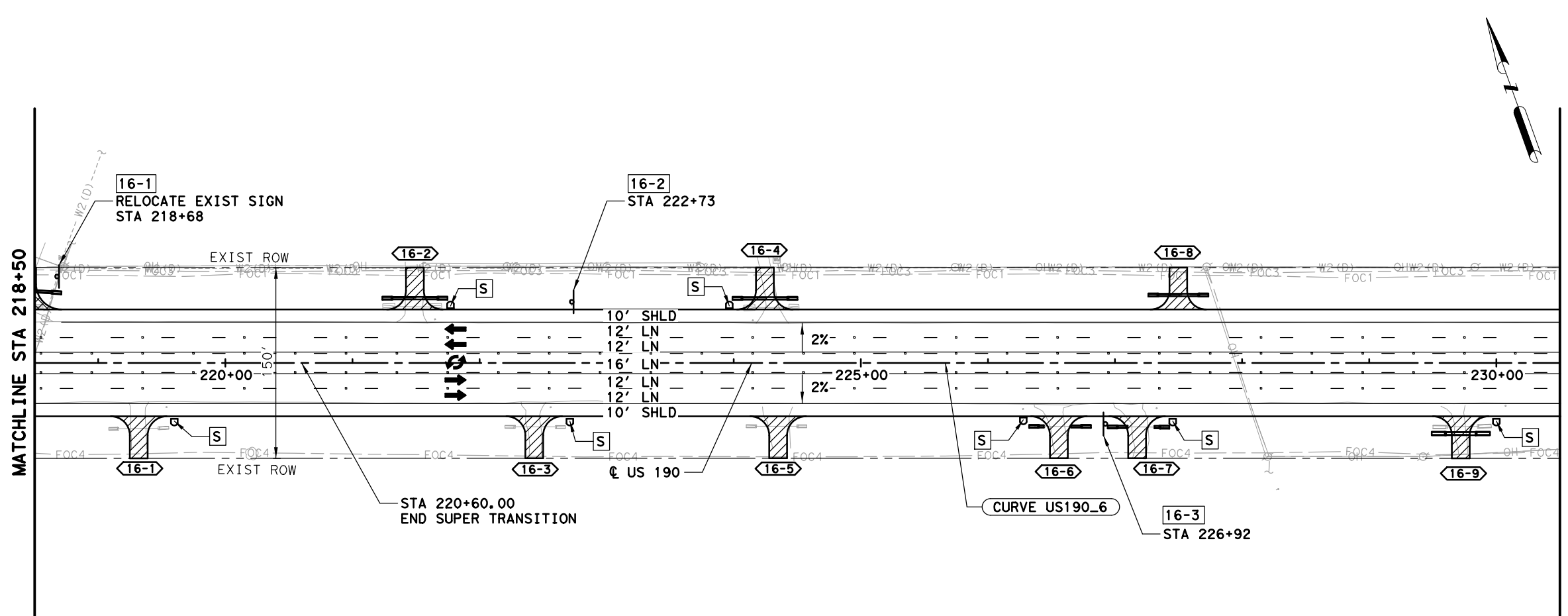
ROADWAY PLAN & PROFILE
 (STA 206+50-STA 218+50)

SHEET 15 OF 33

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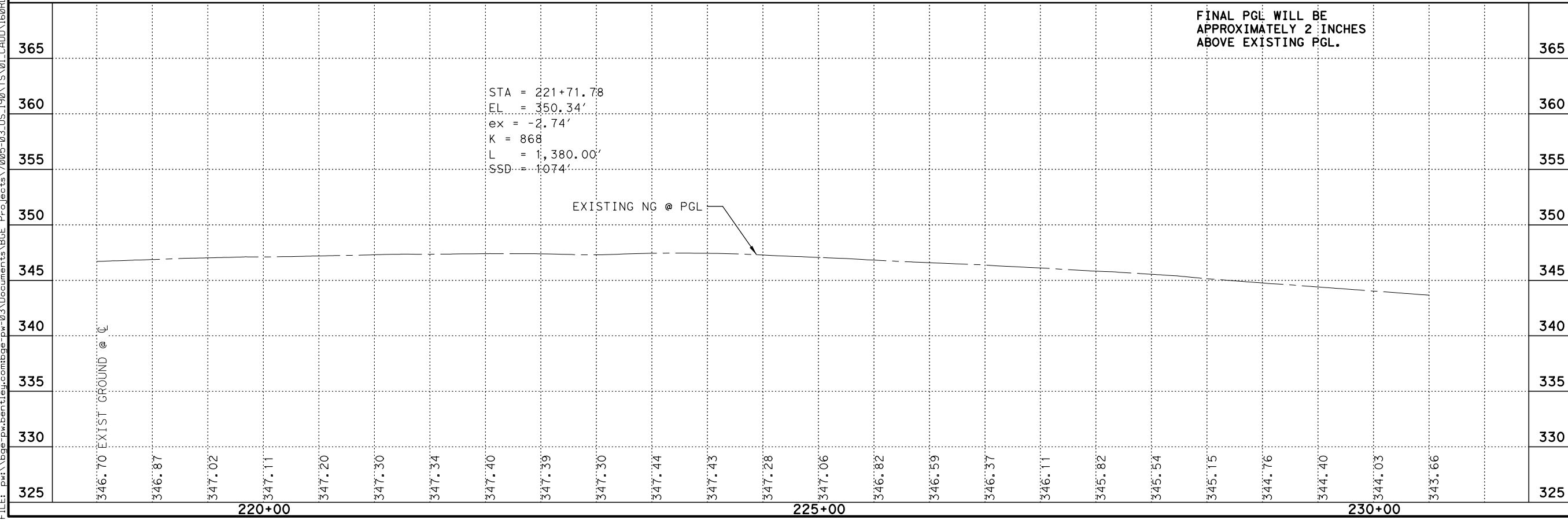
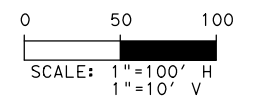
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6				94	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- ⊙ — CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [#] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE

(STA 218+50-STA 230+50)

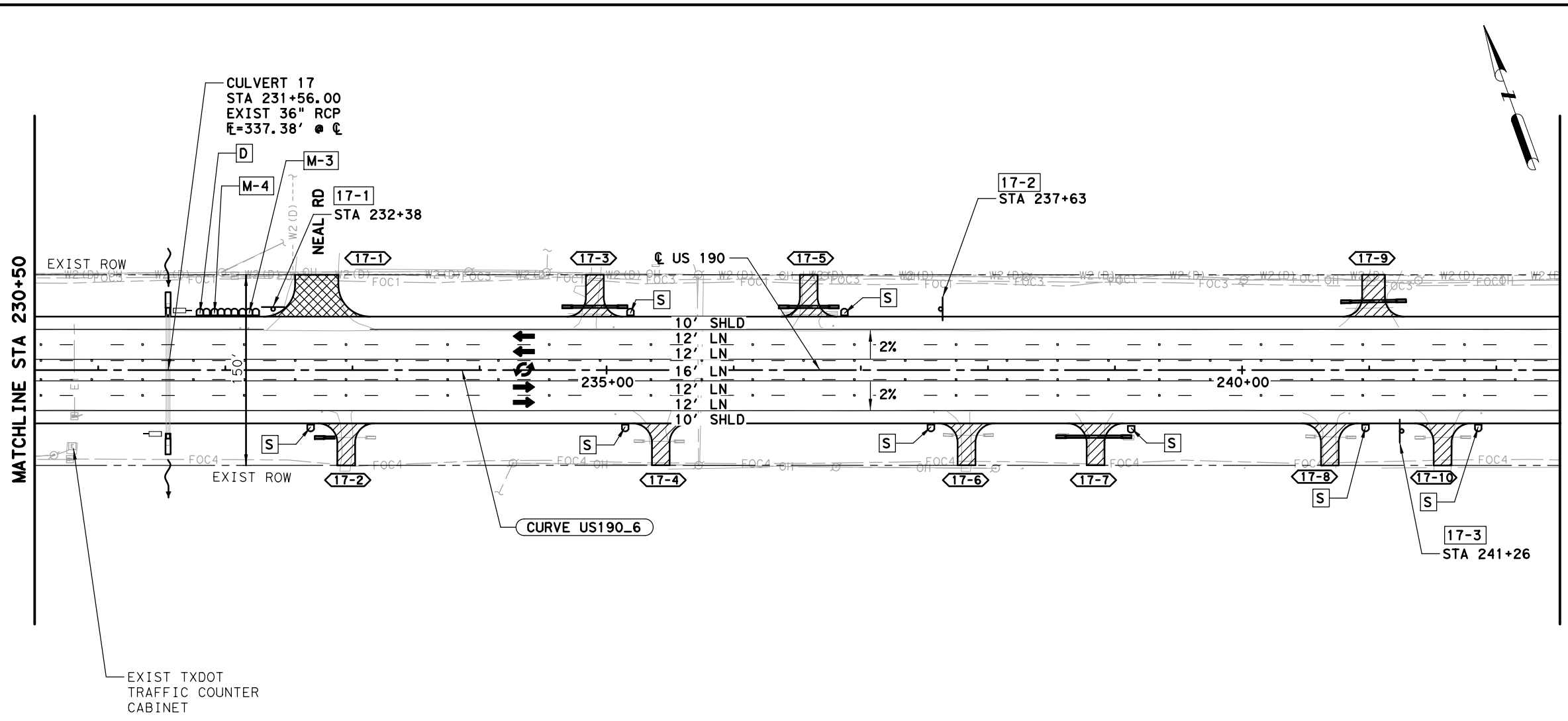
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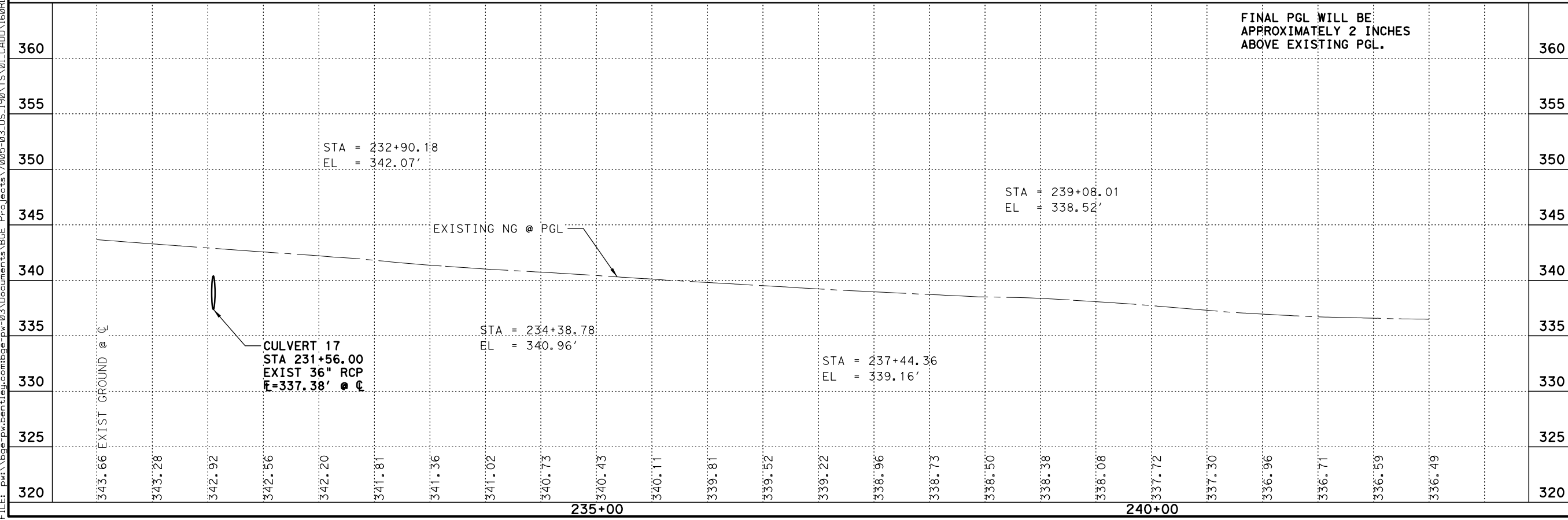
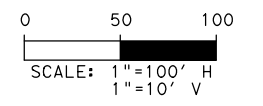
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6				95	
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TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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- LEGEND**
- E X — EXISTING ELECTRICAL
 - TS X — EXISTING TRAFFIC SIGNAL
 - T X — EXISTING TELEPHONE
 - G X — EXISTING GAS
 - PL X — EXISTING PIPELINE
 - FOC X — EXISTING FIBER OPTIC
 - W X — EXISTING WATER
 - WW X — EXISTING WASTE WATER
 - OH — EXISTING OVERHEAD
 - ⊙ — EXISTING SIGN
 - X — EXISTING FENCE
 - [S] — MAILBOX (SINGLE)
 - [D] — MAILBOX (DOUBLE)
 - [M] — MAILBOX (MULTIPLE)
 - [D] — PROPOSED MAILBOX
 - [#] — PROPOSED SIGN
 - ⊙ — DELINEATOR
 - — OBJECT MARKER
 - — DIRECTION OF TRAFFIC
 - CURVE US190 # — CURVE NUMBER
 - [Hatched] — DRIVEWAY CONSTRUCTION
 - [Cross-hatched] — INTERSECTION CONSTRUCTION
 - [# in circle] — DRIVEWAY NUMBER
 - ~ — FLOW DIRECTION



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

360
355
350
345
340
335
330
325
320

360
355
350
345
340
335
330
325
320

05/13/2021

ROADWAY PLAN & PROFILE
(STA 230+50-STA 242+50)

SHEET 17 OF 33

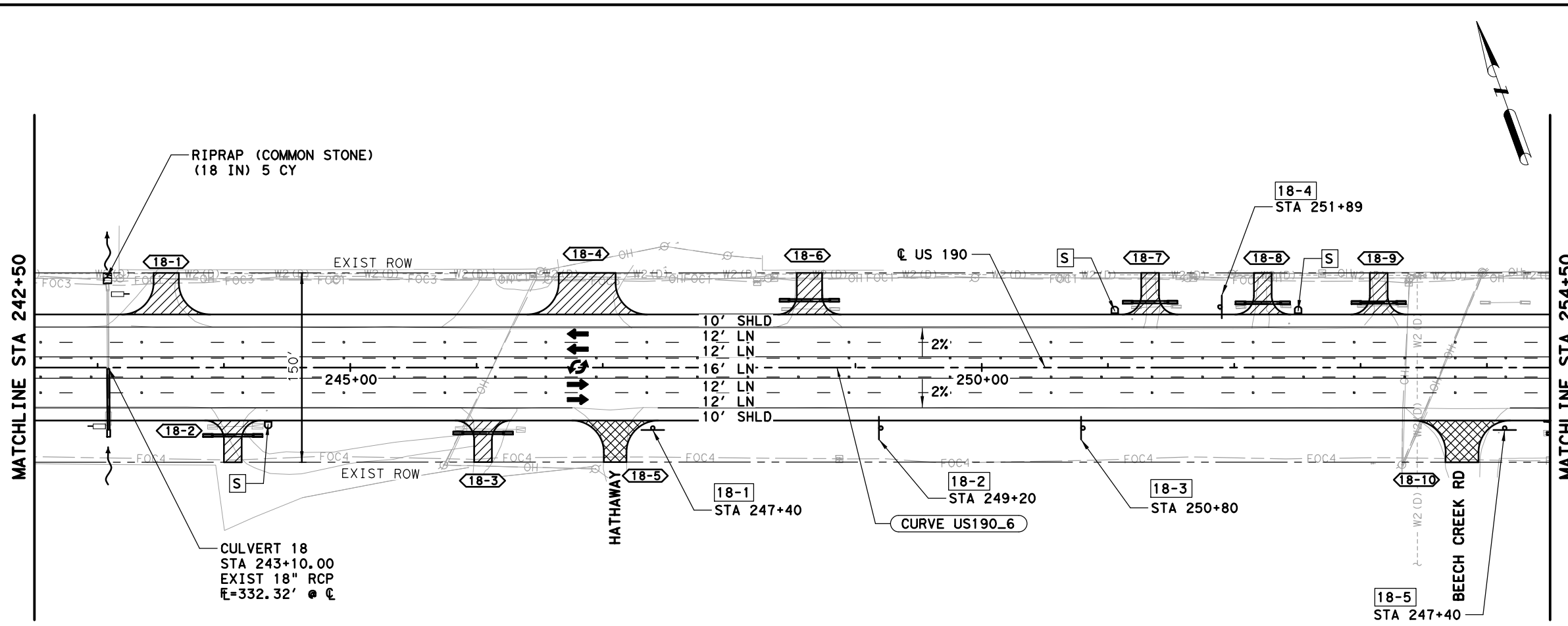
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		96
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

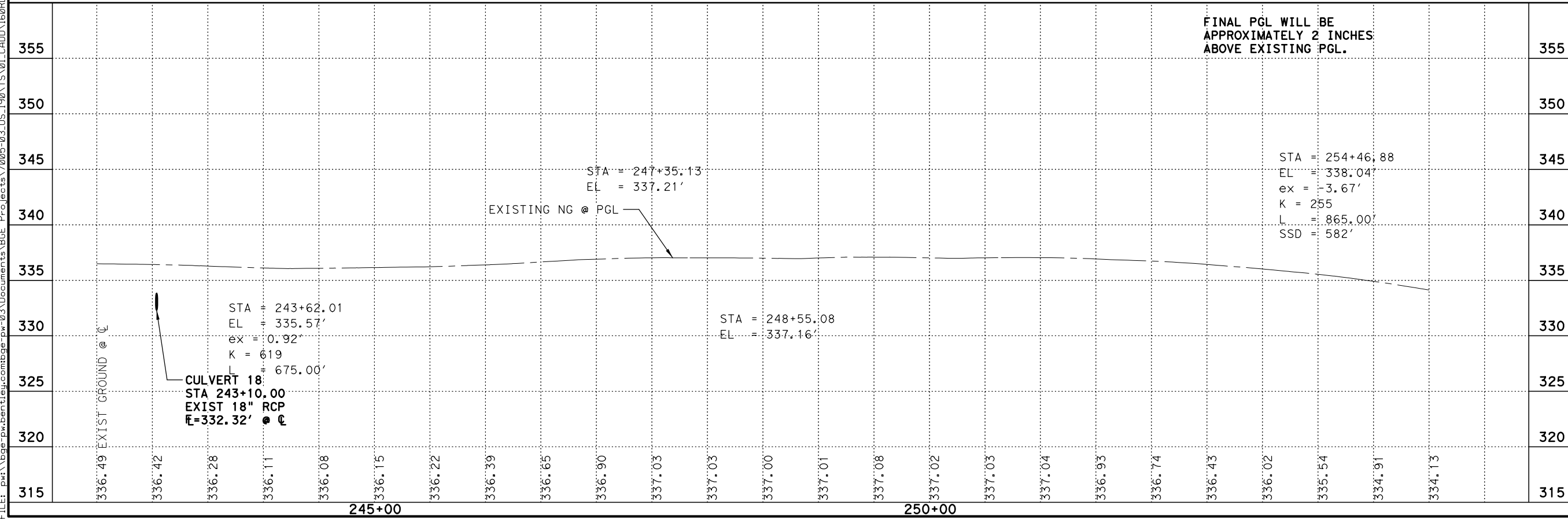
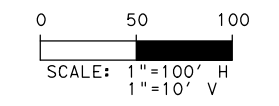
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LEGEND

- E X — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- T X — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- ⊙ — CURVE US190 # CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

STA = 254+46.88
 EL = 338.04'
 ex = -3.67'
 K = 255
 L = 865.00'
 SSD = 582'

355

350

345

340

335

330

325

320

315

05/13/2021

ROADWAY PLAN & PROFILE

(STA 242+50-STA 254+50)

SHEET 18 OF 33

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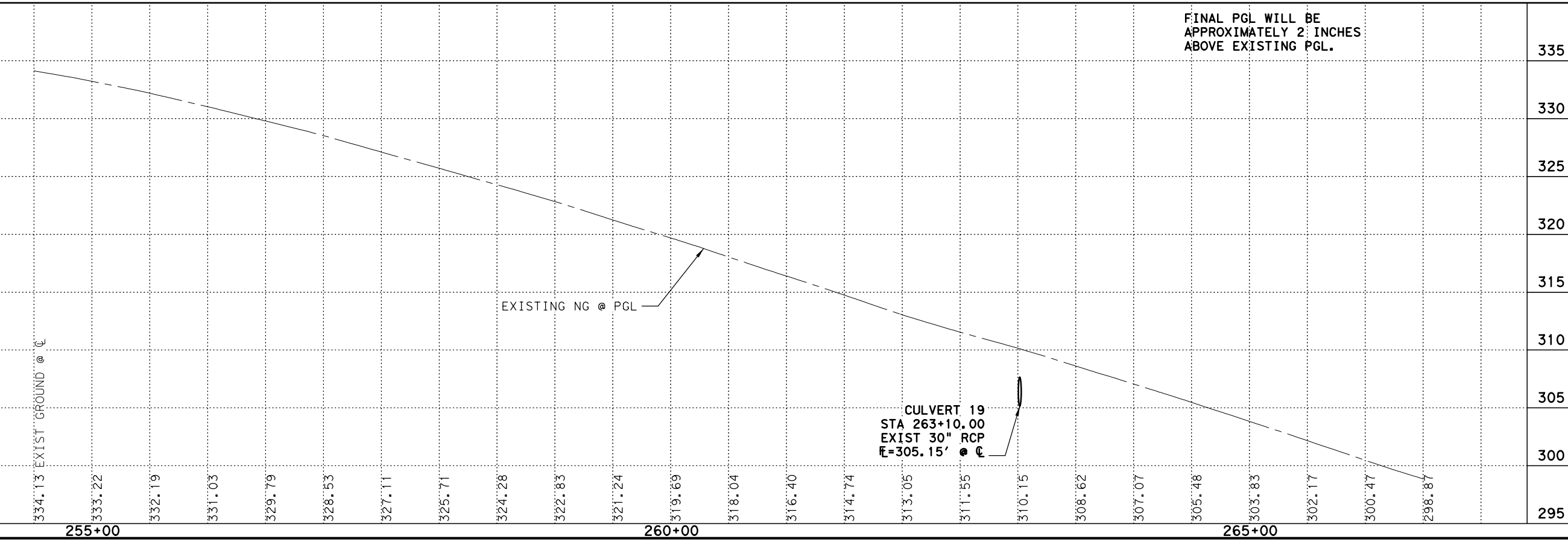
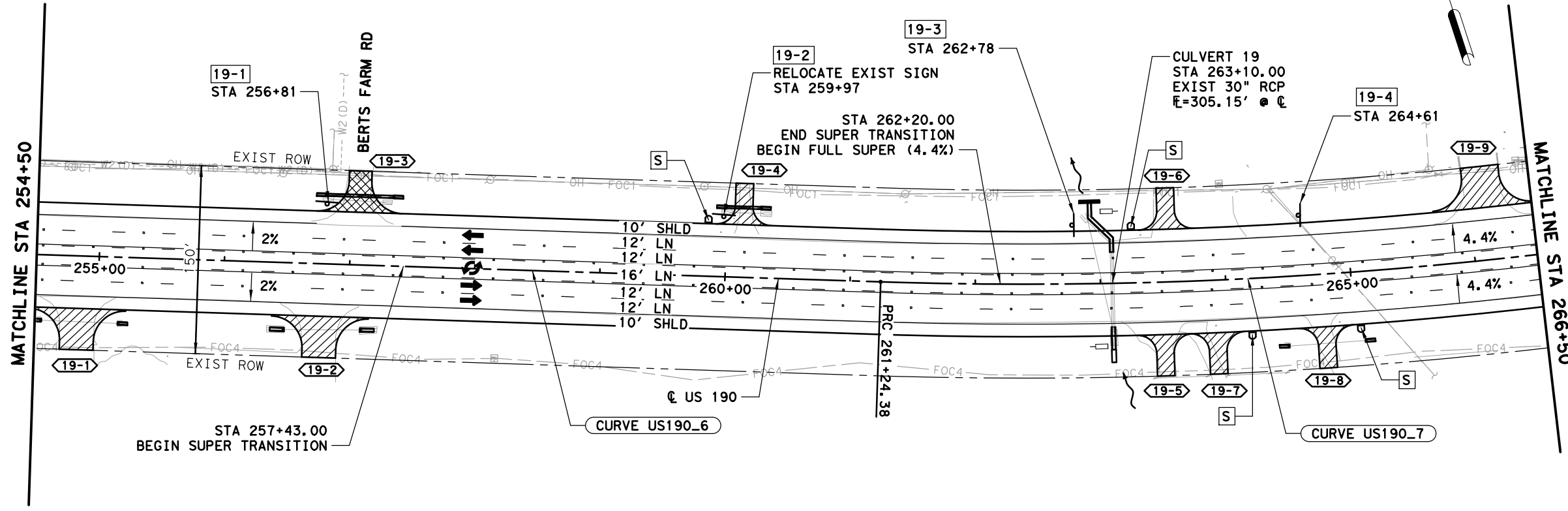
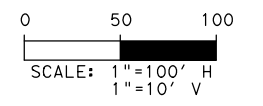
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6		97
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
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- X — EXISTING FENCE
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- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in diamond] — DRIVEWAY NUMBER
- ~ — FLOW DIRECTION



ROADWAY
 PLAN &
 PROFILE
 (STA 254+50-STA 266+50)

SHEET 19 OF 33

05/13/2021

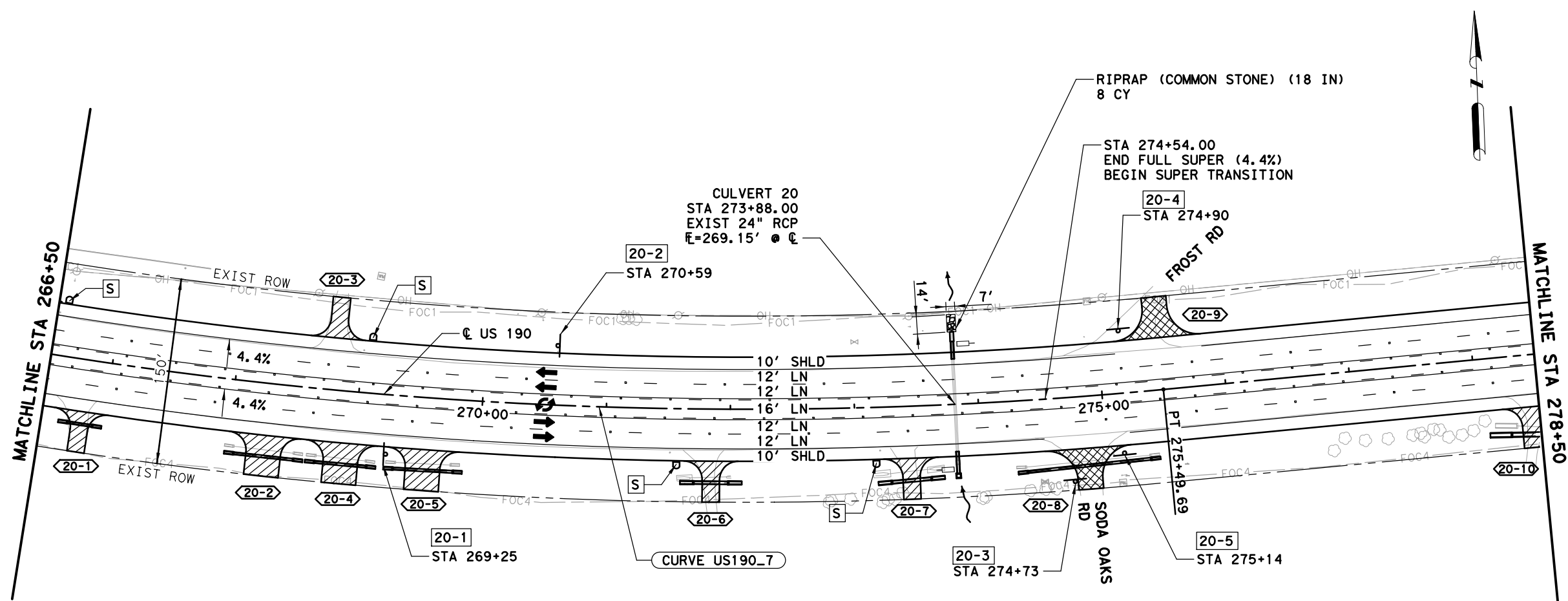
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FED. RD. DIST. NO.		PROJECT NO.		SHEET NO.	
6				98	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

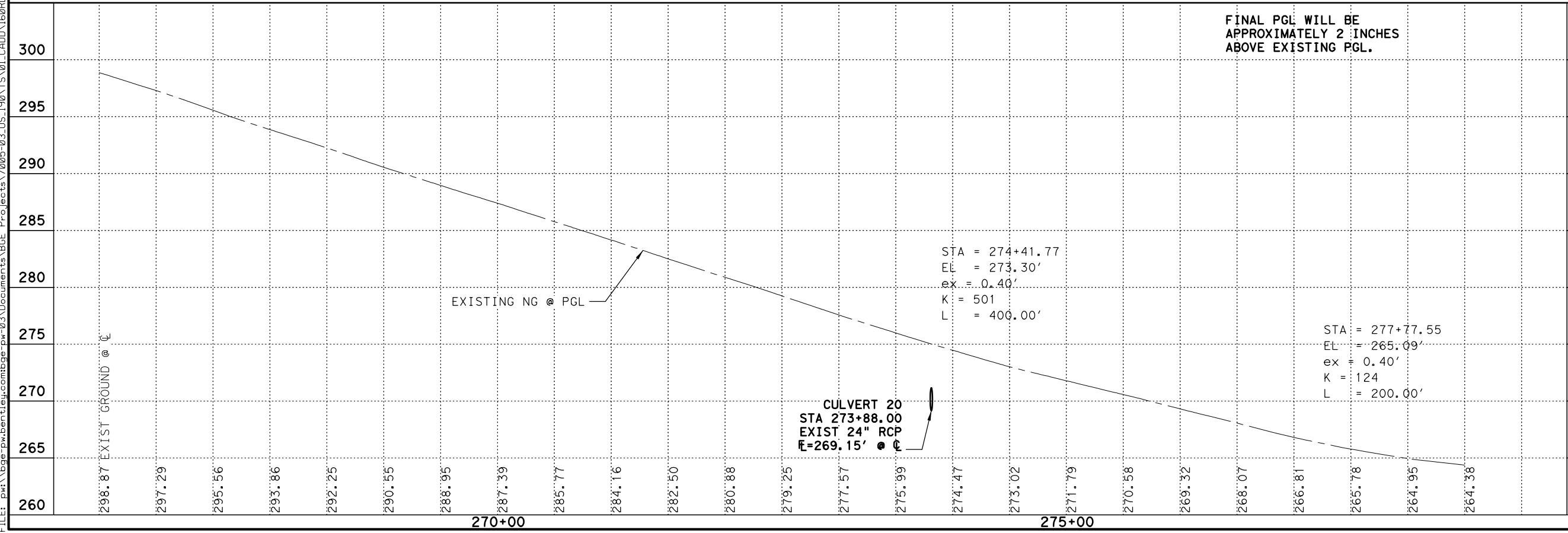
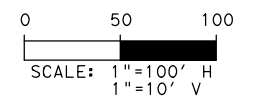
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊕ — DELINEATOR
- [] — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- — CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ~ — FLOW DIRECTION



300
295
290
285
280
275
270
265
260

270+00 275+00

FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

05/13/2021

ROADWAY PLAN & PROFILE

(STA 266+50-STA 278+50)

SHEET 20 OF 33

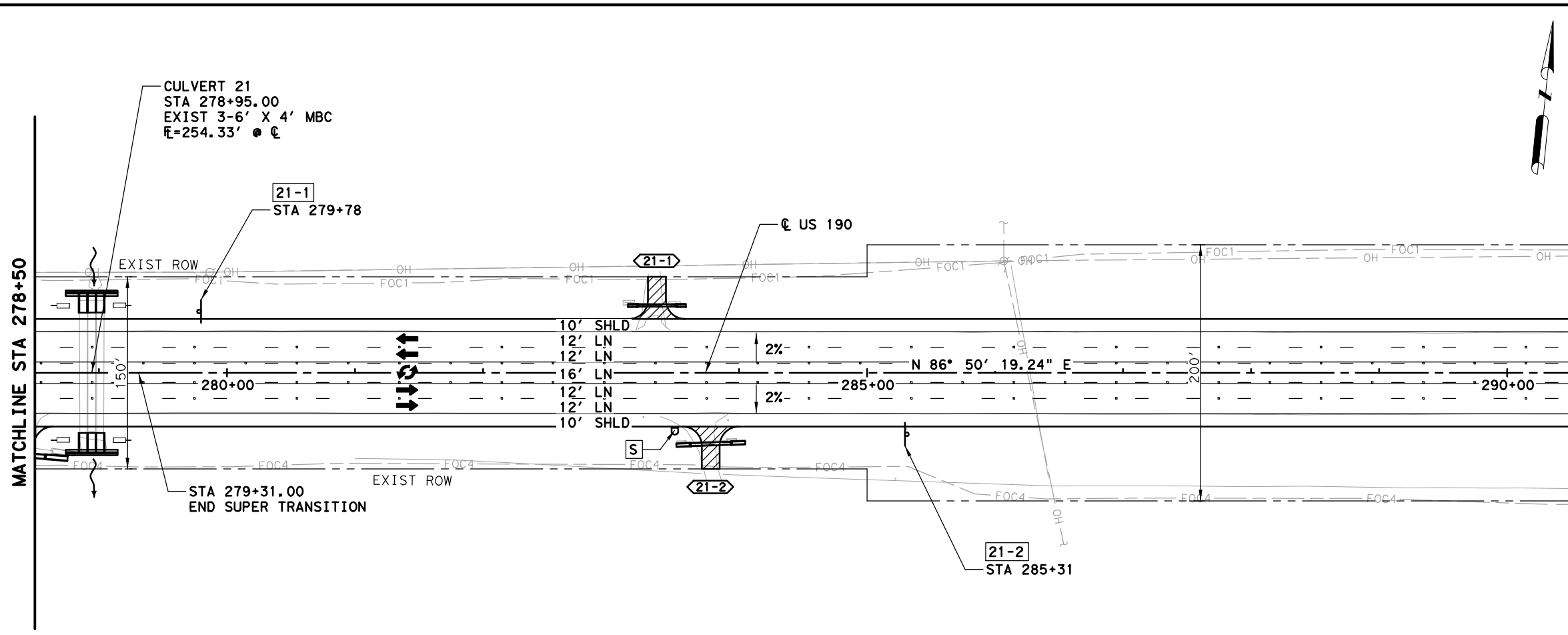
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FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		99
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

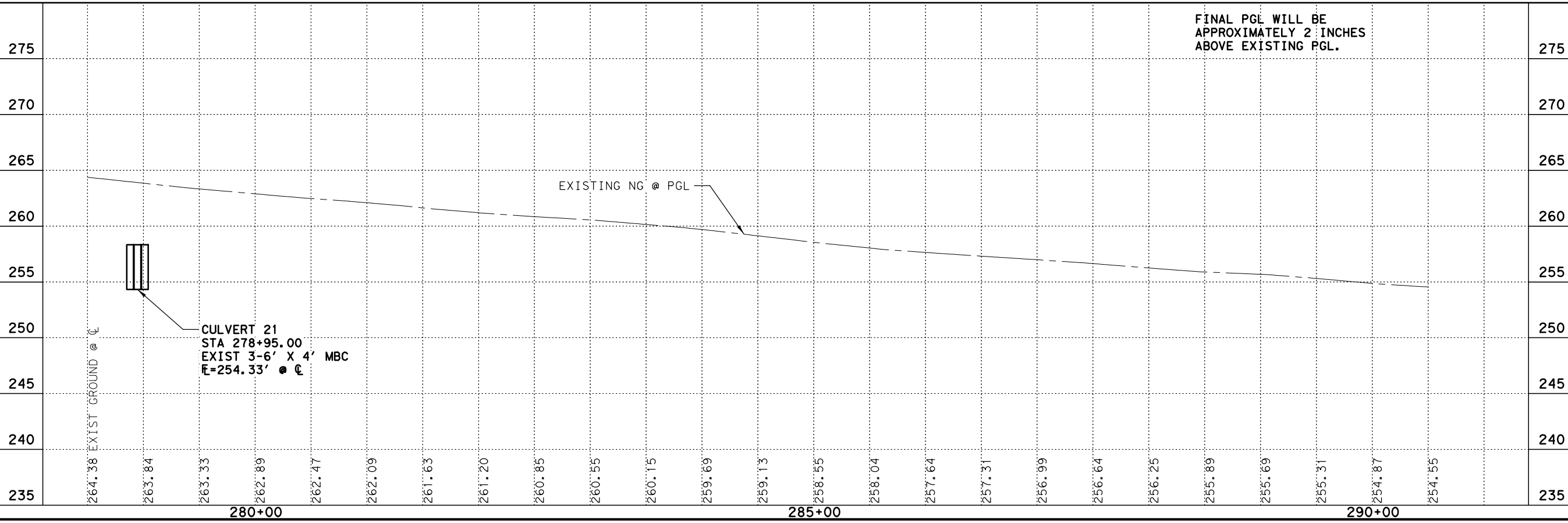
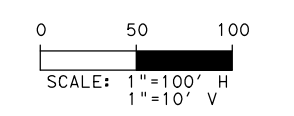
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- [] — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in hexagon] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



275
270
265
260
255
250
245
240
235

280+00 285+00 290+00

05/13/2021

ROADWAY PLAN & PROFILE
(STA 278+50-STA 290+50)

SHEET 21 OF 33

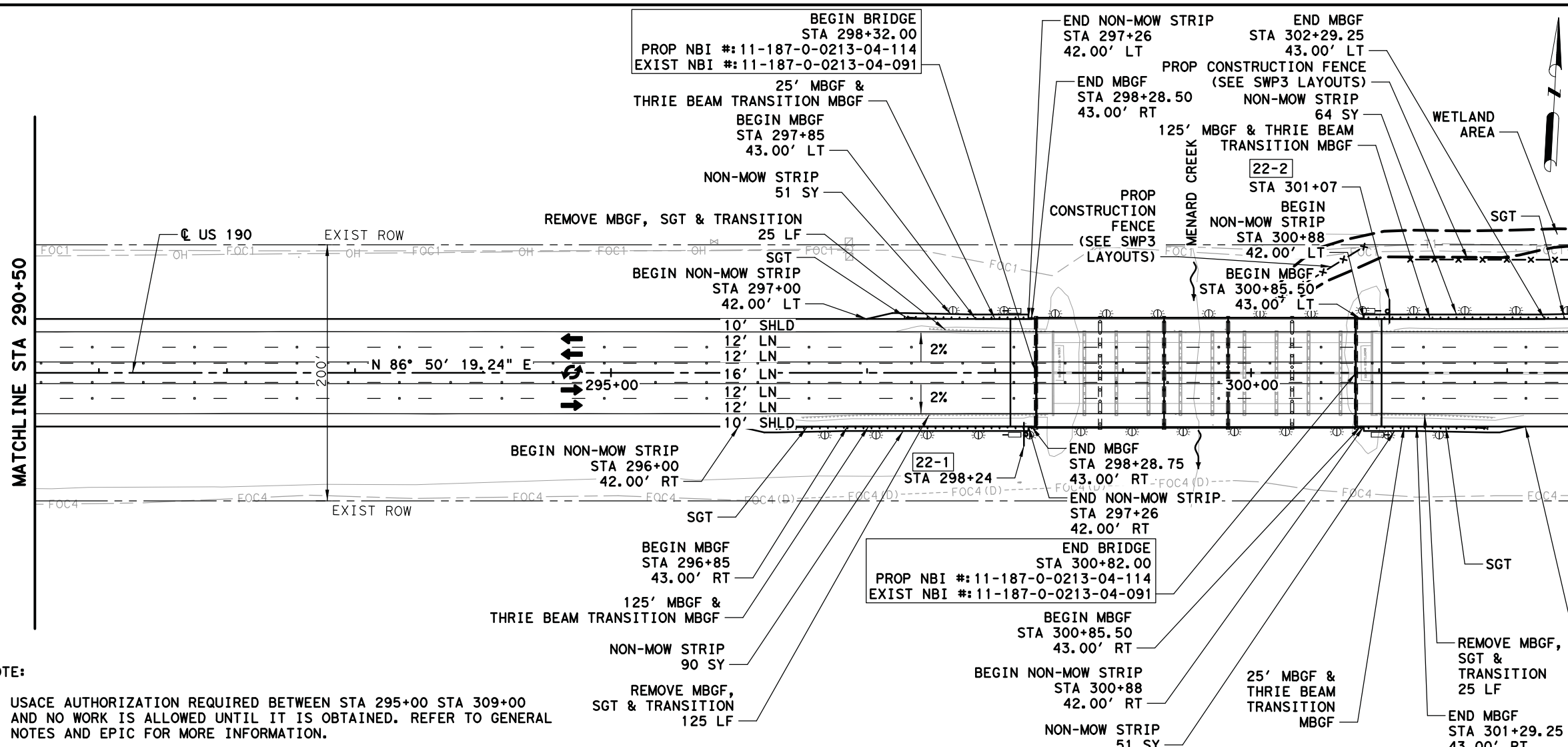
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FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		100
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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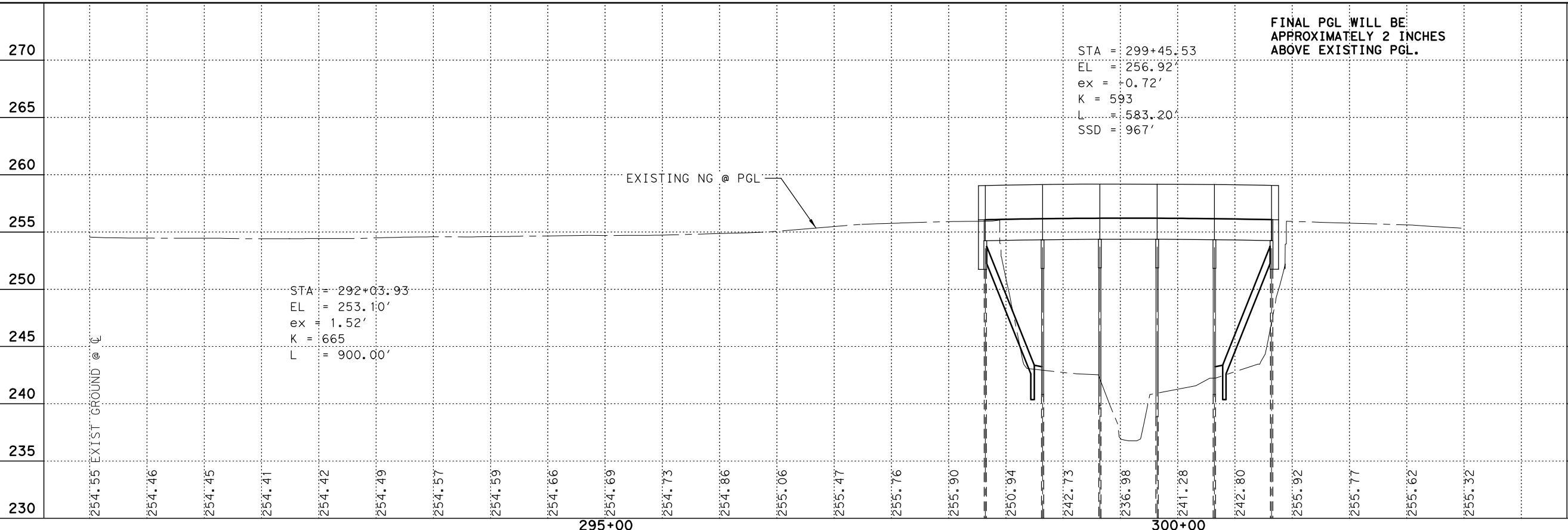
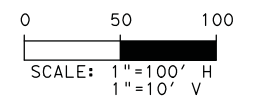
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [#] — PROPOSED MAILBOX
- ⊙ — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION

NOTE:
 1. USACE AUTHORIZATION REQUIRED BETWEEN STA 295+00 STA 309+00 AND NO WORK IS ALLOWED UNTIL IT IS OBTAINED. REFER TO GENERAL NOTES AND EPIC FOR MORE INFORMATION.



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

STATE OF TEXAS
 M. CHAD CRISWELL
 90114
 LICENSED PROFESSIONAL ENGINEER
 06/07/2021

ROADWAY PLAN & PROFILE
 (STA 290+50-STA 302+50)

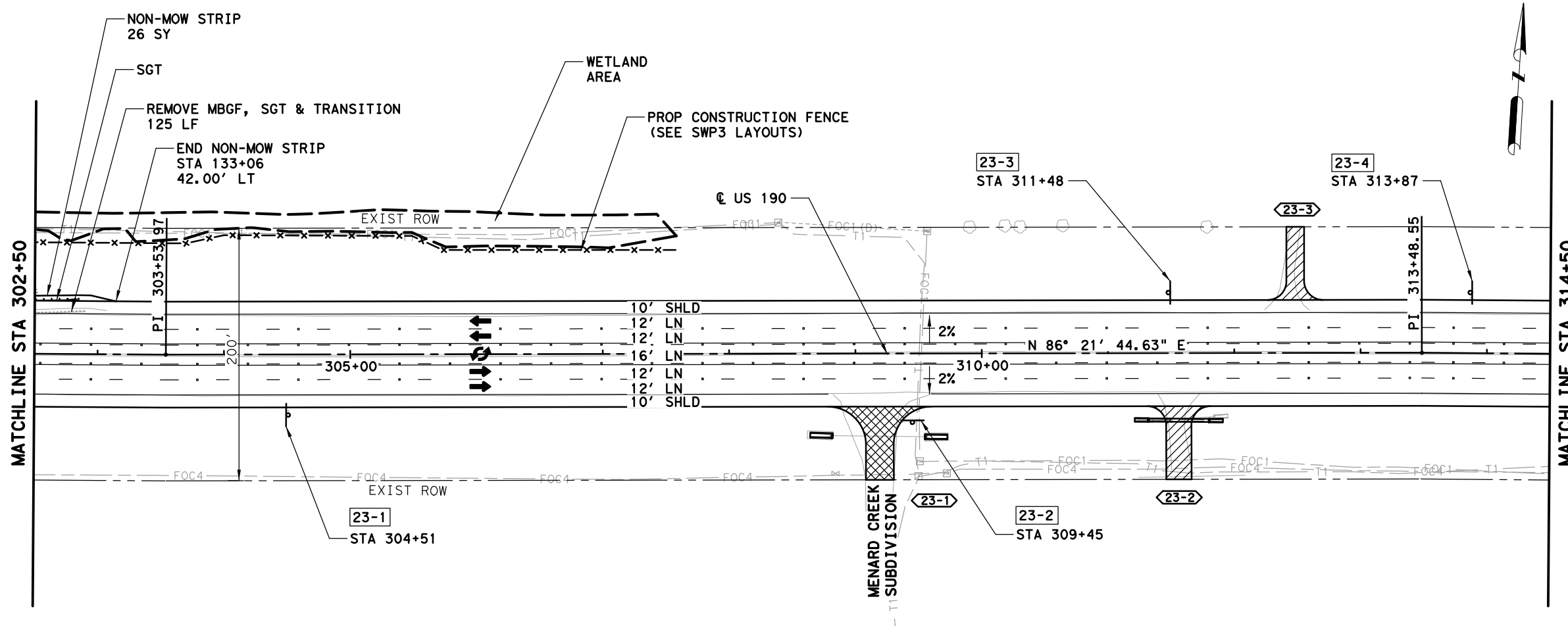
SHEET 22 OF 33



BGE, Inc. 10777 Westheimer, Suite 400, Houston, TX 77042 Tel: 281-658-8700 • www.bgeinc.com TBPE Registration No. F-1046		PROJECT NO.	SHEET NO.
6		101	101
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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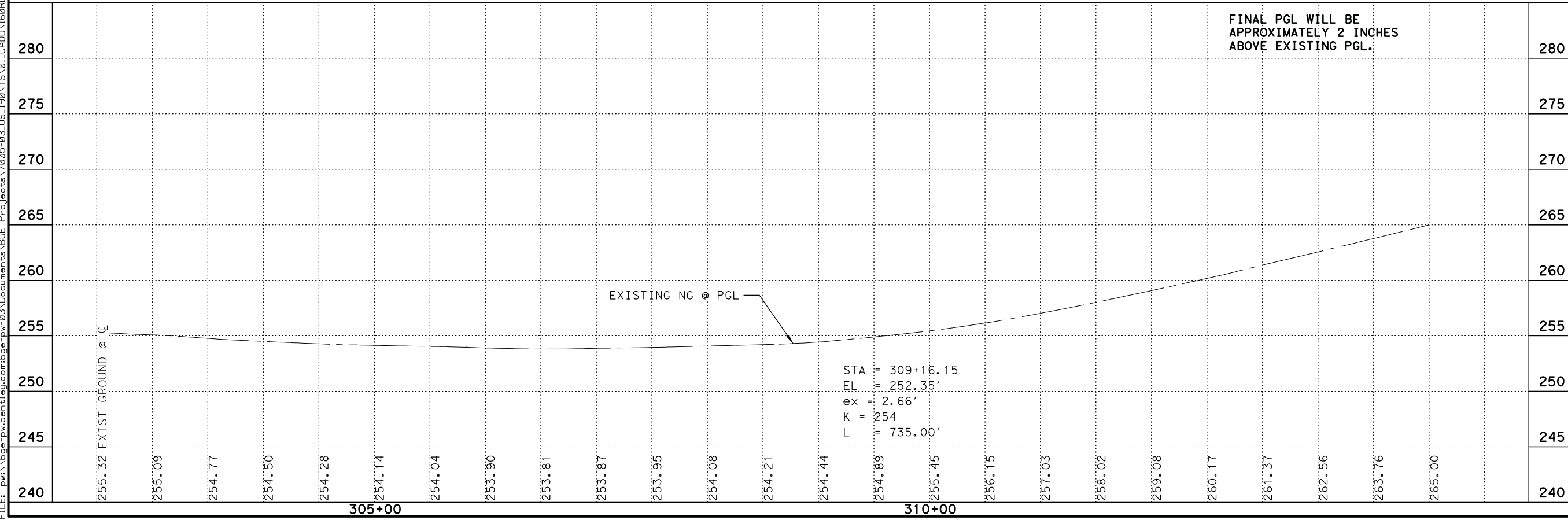
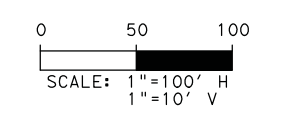
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- # — PROPOSED SIGN
- ⊕ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched Box] — DRIVEWAY CONSTRUCTION
- [Cross-hatched Box] — INTERSECTION CONSTRUCTION
- [Hexagon with #] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION

NOTE:
 1. USACE AUTHORIZATION REQUIRED BETWEEN STA 295+00 STA 309+00 AND NO WORK IS ALLOWED UNTIL IT IS OBTAINED. REFER TO GENERAL NOTES AND EPIC FOR MORE INFORMATION.



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

ROADWAY PLAN & PROFILE
 (STA 302+50-STA 314+50)
 SHEET 23 OF 33

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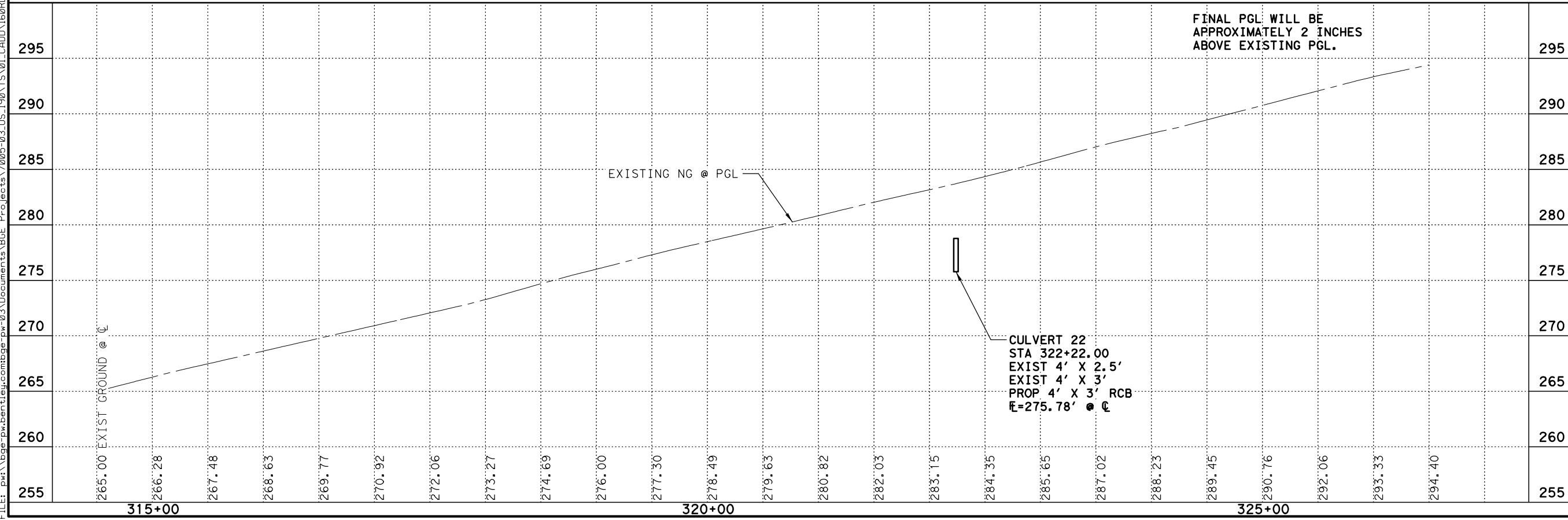
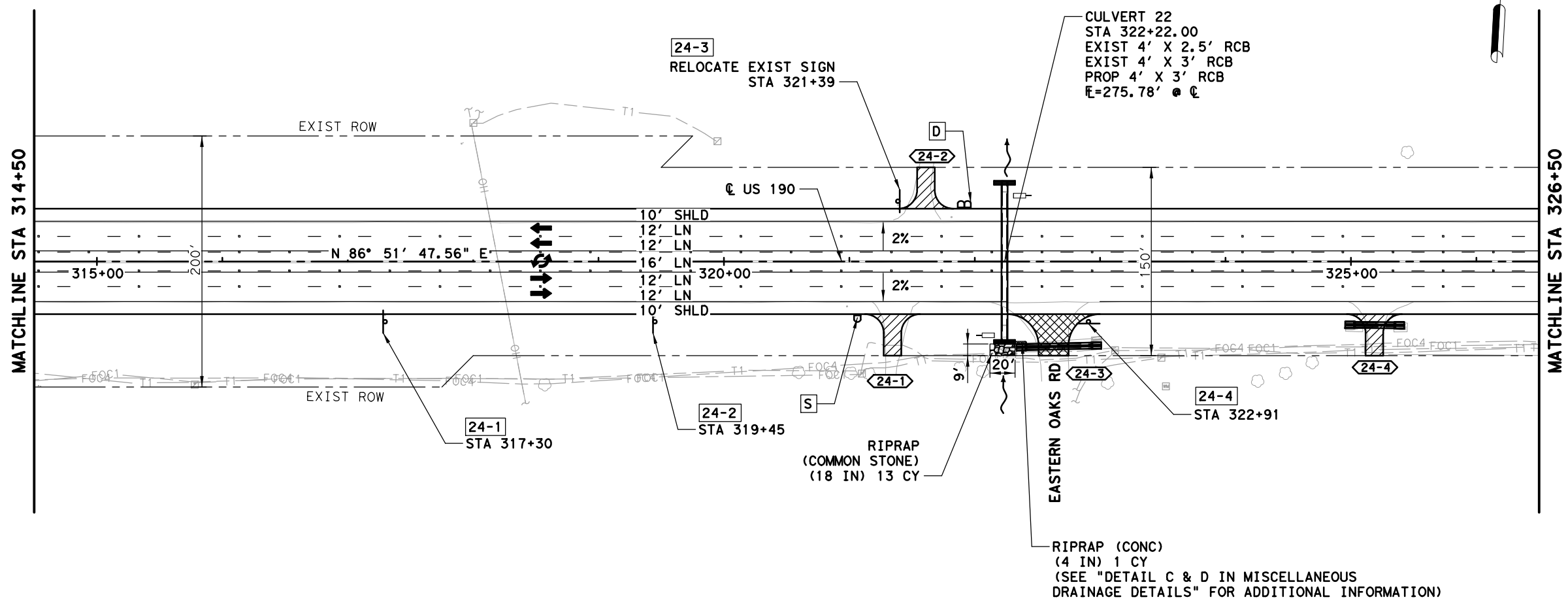
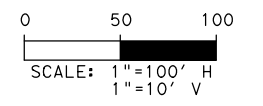
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6		102
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [D] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in hexagon] — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



05/13/2021

**ROADWAY
PLAN &
PROFILE**
(STA 314+50-STA 326+50)

SHEET 24 OF 33

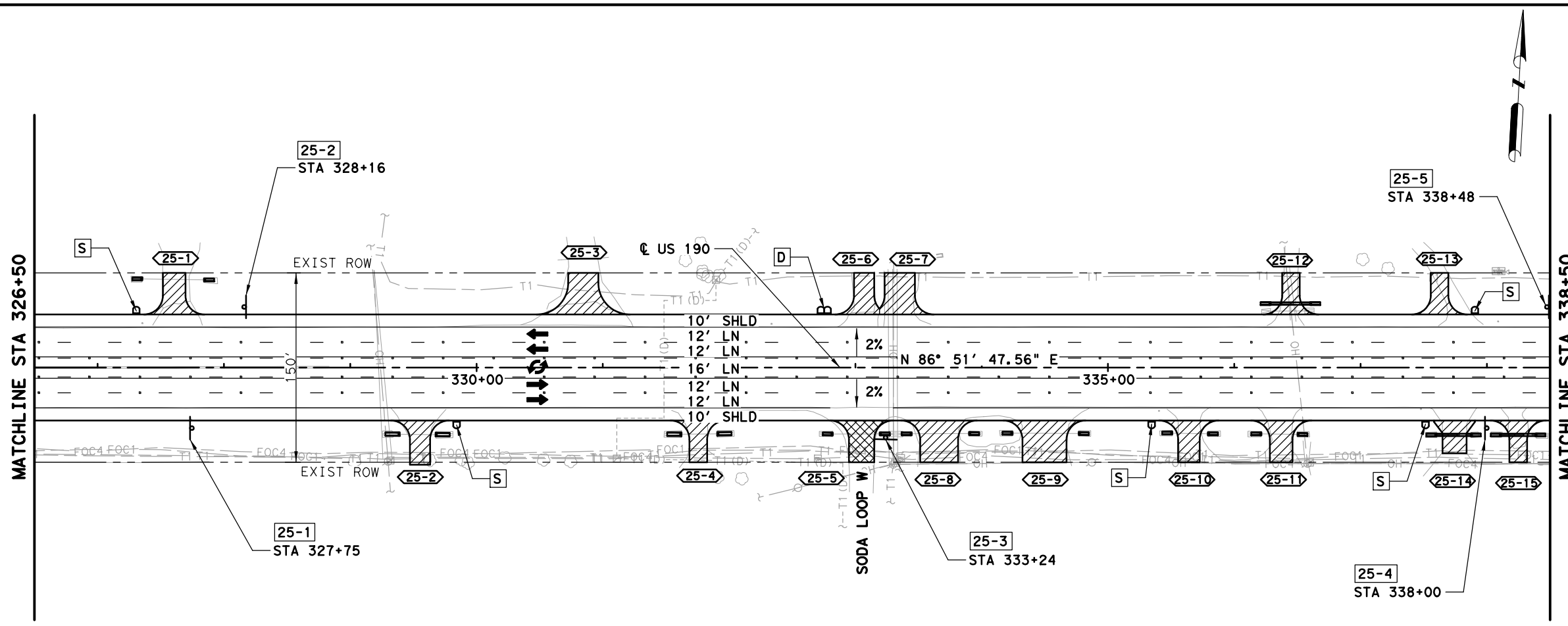
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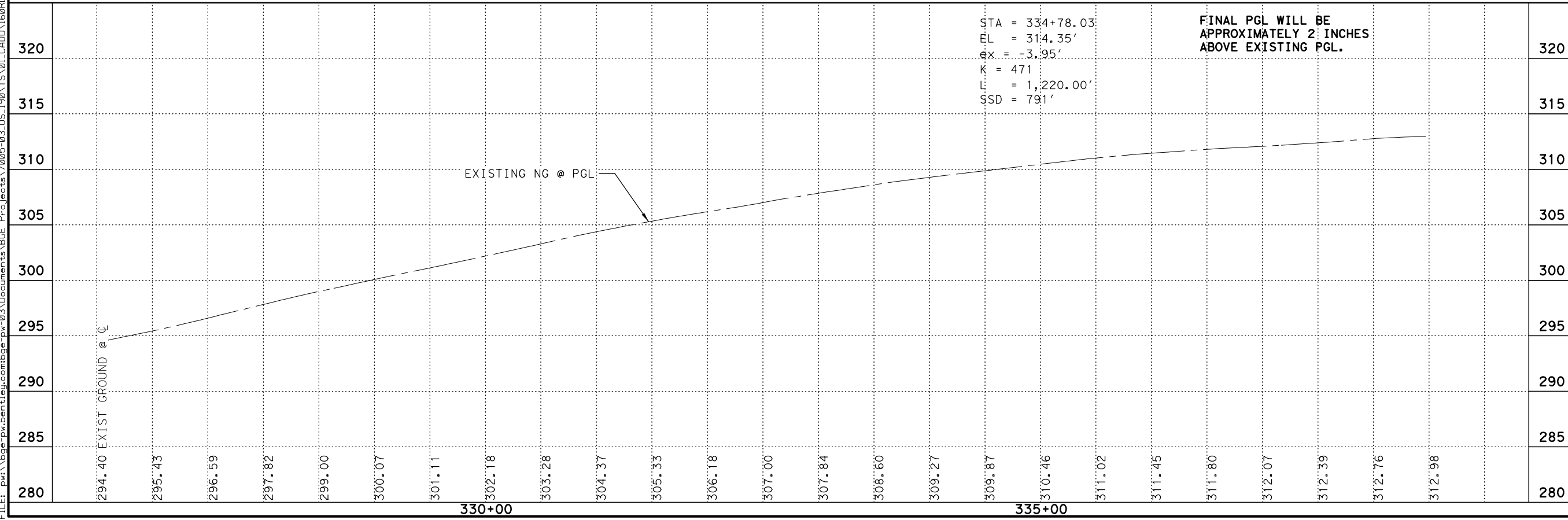
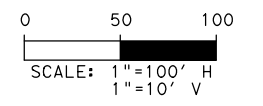
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6				103	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
255	04	050	US 190		

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- LEGEND**
- EX — EXISTING ELECTRICAL
 - TS X — EXISTING TRAFFIC SIGNAL
 - TX — EXISTING TELEPHONE
 - GX — EXISTING GAS
 - PL X — EXISTING PIPELINE
 - FOC X — EXISTING FIBER OPTIC
 - WX — EXISTING WATER
 - WW X — EXISTING WASTE WATER
 - OH — EXISTING OVERHEAD
 - ⊙ — EXISTING SIGN
 - X — EXISTING FENCE
 - [S] — MAILBOX (SINGLE)
 - [D] — MAILBOX (DOUBLE)
 - [M] — MAILBOX (MULTIPLE)
 - [D] — PROPOSED MAILBOX
 - [#] — PROPOSED SIGN
 - ⊙ — DELINEATOR
 - — OBJECT MARKER
 - ➔ — DIRECTION OF TRAFFIC
 - ⊙ — CURVE US190 # CURVE NUMBER
 - [Hatched] — DRIVEWAY CONSTRUCTION
 - [Cross-hatched] — INTERSECTION CONSTRUCTION
 - [# in circle] — DRIVEWAY NUMBER
 - ➔ — FLOW DIRECTION



320
315
310
305
300
295
290
285
280

330+00
335+00

STA = 334+78.03
 EL = 314.35'
 ex = -3.95'
 K = 471
 L = 1,220.00'
 SSD = 791'

FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

320
315
310
305
300
295
290
285
280

05/13/2021

ROADWAY PLAN & PROFILE
 (STA 326+50-STA 338+50)

SHEET 25 OF 33

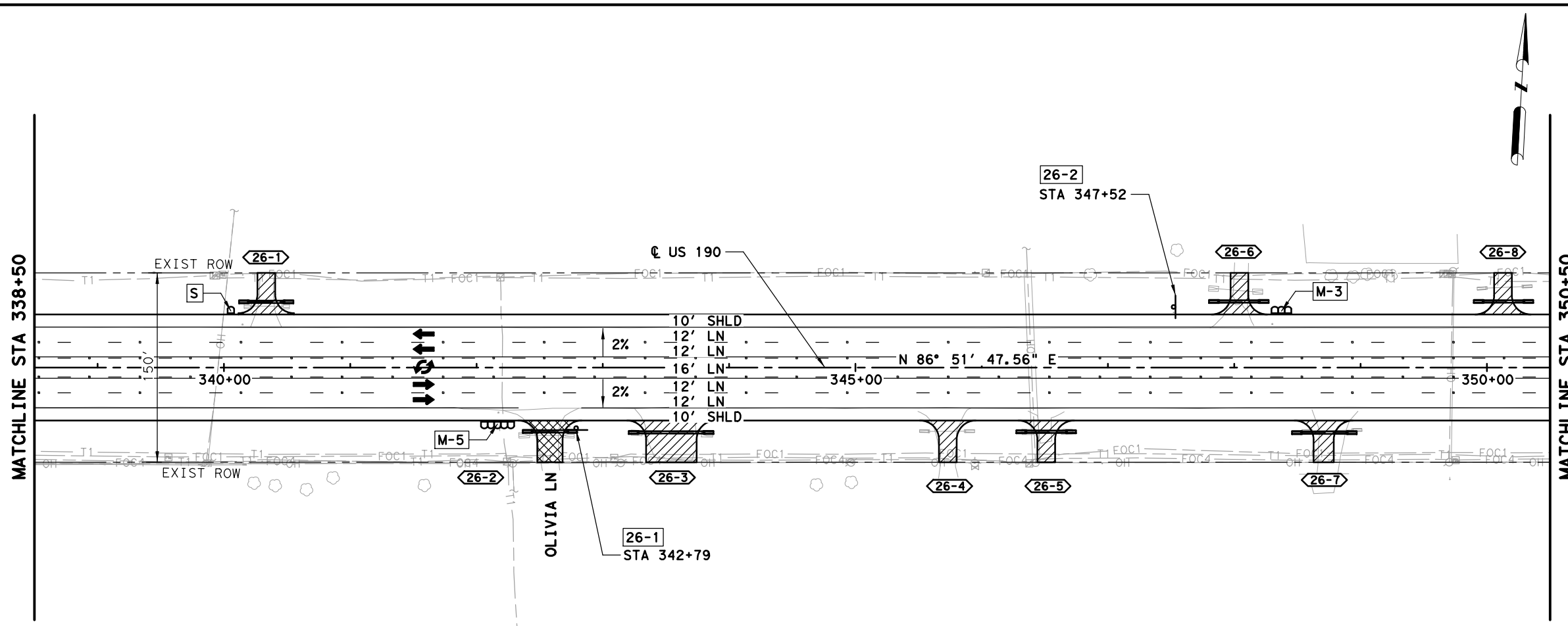
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		104
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

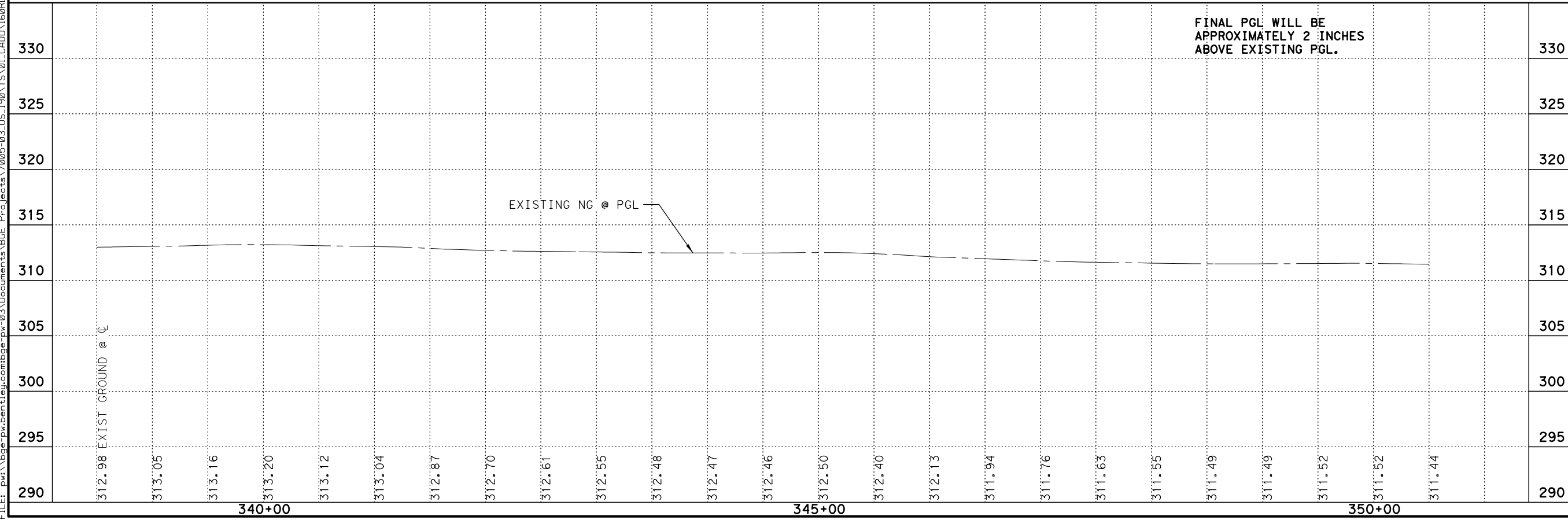
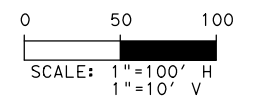
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LEGEND

- E X — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- T X — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- S — MAILBOX (SINGLE)
- D — MAILBOX (DOUBLE)
- M — MAILBOX (MULTIPLE)
- — PROPOSED MAILBOX
- # — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- ▨ — DRIVEWAY CONSTRUCTION
- ▩ — INTERSECTION CONSTRUCTION
- ⬡ — DRIVEWAY NUMBER
- — FLOW DIRECTION



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

330	330
325	325
320	320
315	315
310	310
305	305
300	300
295	295
290	290

05/13/2021

ROADWAY PLAN & PROFILE

(STA 338+50-STA 350+50)

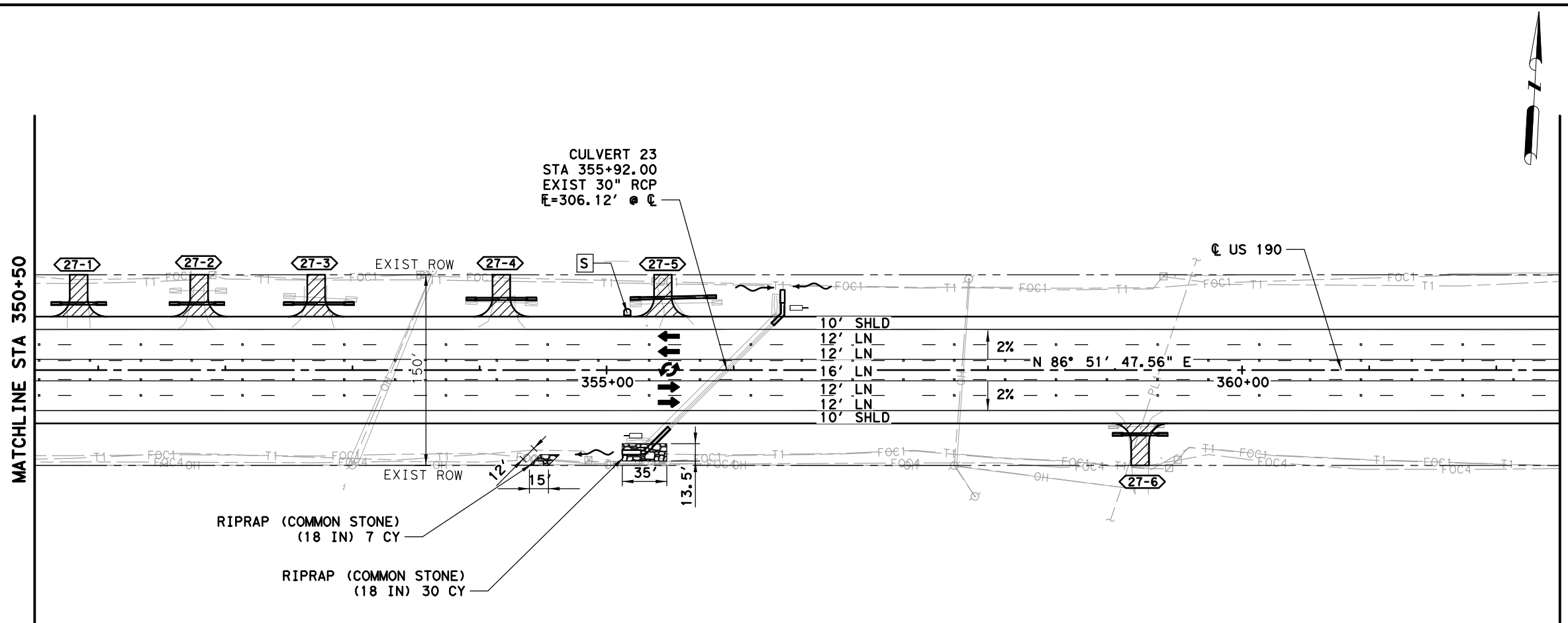
SHEET 26 OF 33

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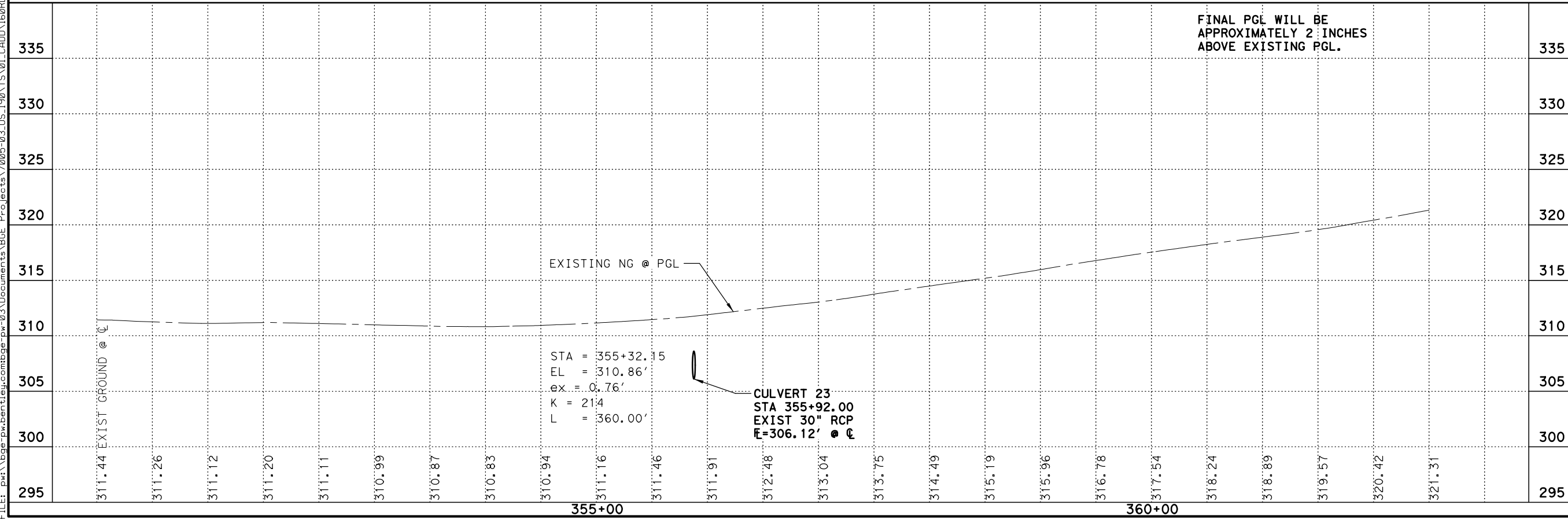
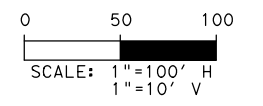
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6				105	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
		050	US 190		

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- LEGEND**
- EX — EXISTING ELECTRICAL
 - TS X — EXISTING TRAFFIC SIGNAL
 - TX — EXISTING TELEPHONE
 - GX — EXISTING GAS
 - PL X — EXISTING PIPELINE
 - FOC X — EXISTING FIBER OPTIC
 - WX — EXISTING WATER
 - WW X — EXISTING WASTE WATER
 - OH — EXISTING OVERHEAD
 - ⊙ — EXISTING SIGN
 - X — EXISTING FENCE
 - [S] — MAILBOX (SINGLE)
 - [D] — MAILBOX (DOUBLE)
 - [M] — MAILBOX (MULTIPLE)
 - [] — PROPOSED MAILBOX
 - [#] — PROPOSED SIGN
 - ⊙ — DELINEATOR
 - [] — OBJECT MARKER
 - — DIRECTION OF TRAFFIC
 - CURVE US190 # — CURVE NUMBER
 - [Hatched] — DRIVEWAY CONSTRUCTION
 - [Cross-hatched] — INTERSECTION CONSTRUCTION
 - [# in circle] — DRIVEWAY NUMBER
 - ~ — FLOW DIRECTION



STA = 355+32.15
 EL = 310.86'
 ex = 0.76'
 K = 214
 L = 360.00'

CULVERT 23
 STA 355+92.00
 EXIST 30" RCP
 E=306.12' @ C

FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

335

330

325

320

315

310

305

300

295

355+00

360+00

05/13/2021

ROADWAY PLAN & PROFILE
 (STA 350+50-STA 362+50)

SHEET 27 OF 33

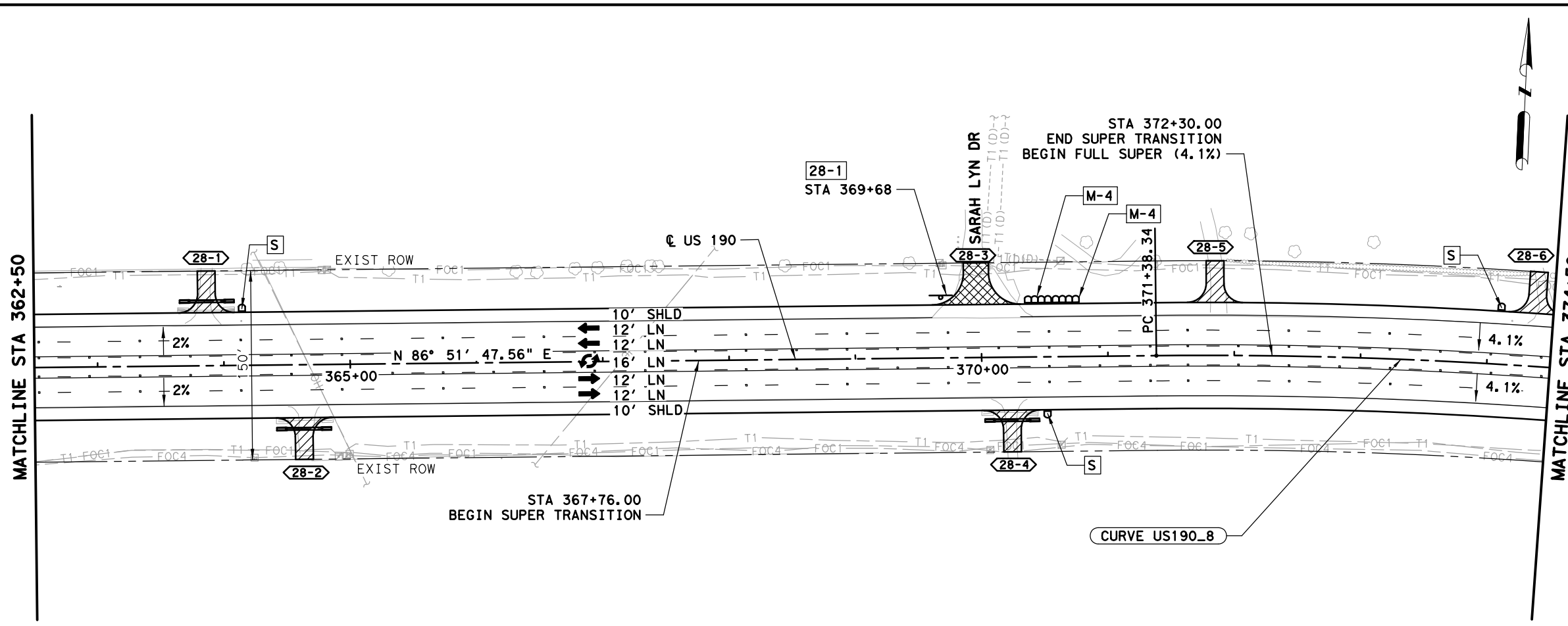
Texas Department of Transportation

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 TBPE Registration No. F-1046

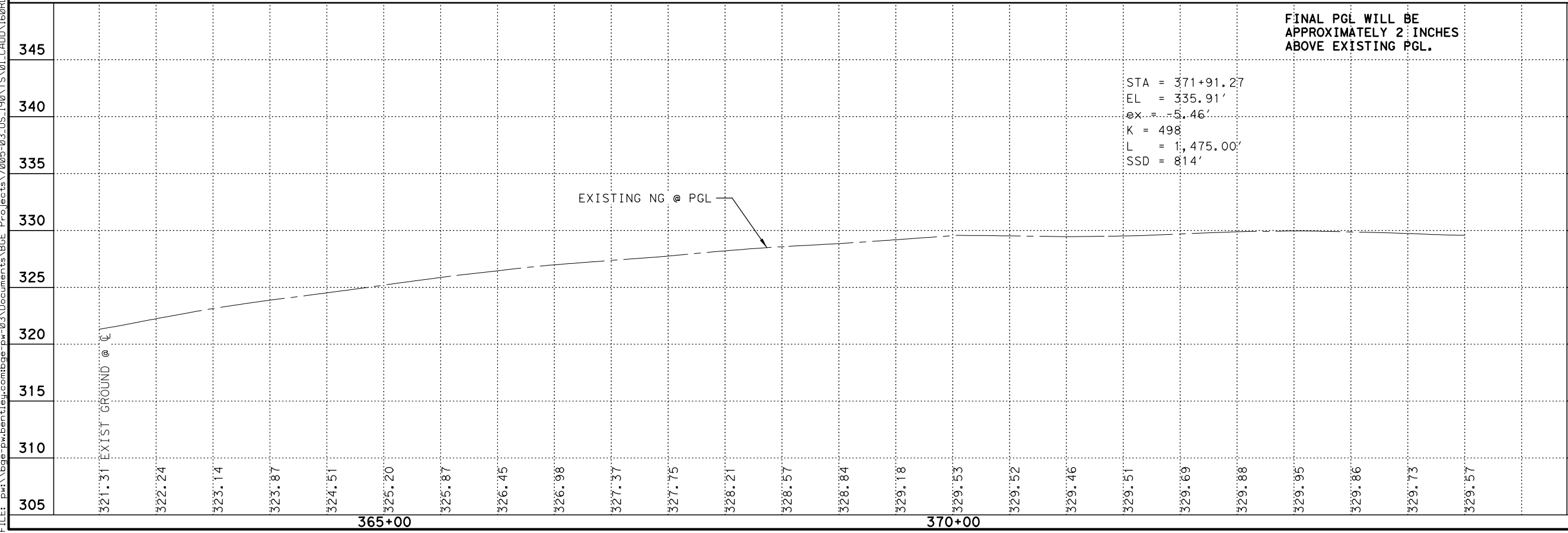
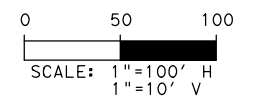
FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		106
STATE DIST. NO.	COUNTY	
TEXAS	POLK	
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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MODEL NAME: PLAN (I) PROFILE
 DATE: 05/13/2021
 FILE: pw:\bge-pw\bentley.combge-pw-03\Documents\BGE_Projects\7005-03_US_190\TS\01_CADD\160RDWY\US190_PP_28.dgn



- LEGEND**
- EX — EXISTING ELECTRICAL
 - TS X — EXISTING TRAFFIC SIGNAL
 - TX — EXISTING TELEPHONE
 - GX — EXISTING GAS
 - PL X — EXISTING PIPELINE
 - FOC X — EXISTING FIBER OPTIC
 - WX — EXISTING WATER
 - WW X — EXISTING WASTE WATER
 - OH — EXISTING OVERHEAD
 - ⊙ — EXISTING SIGN
 - X — EXISTING FENCE
 - [S] — MAILBOX (SINGLE)
 - [D] — MAILBOX (DOUBLE)
 - [M] — MAILBOX (MULTIPLE)
 - [#] — PROPOSED MAILBOX
 - [#] — PROPOSED SIGN
 - ⊙ — DELINEATOR
 - — OBJECT MARKER
 - ➔ — DIRECTION OF TRAFFIC
 - CURVE US190 # — CURVE NUMBER
 - [Hatched] — DRIVEWAY CONSTRUCTION
 - [Cross-hatched] — INTERSECTION CONSTRUCTION
 - [# in circle] — DRIVEWAY NUMBER
 - ➔ — FLOW DIRECTION



345

340

335

330

325

320

315

310

305

365+00

370+00

STA = 371+91.27
 EL = 335.91'
 ex = -5.46'
 K = 498
 L = 1,475.00'
 SSD = 814'

EXISTING NG @ PGL

FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

05/13/2021

ROADWAY PLAN & PROFILE
 (STA 362+50-STA 374+50)

SHEET 28 OF 33

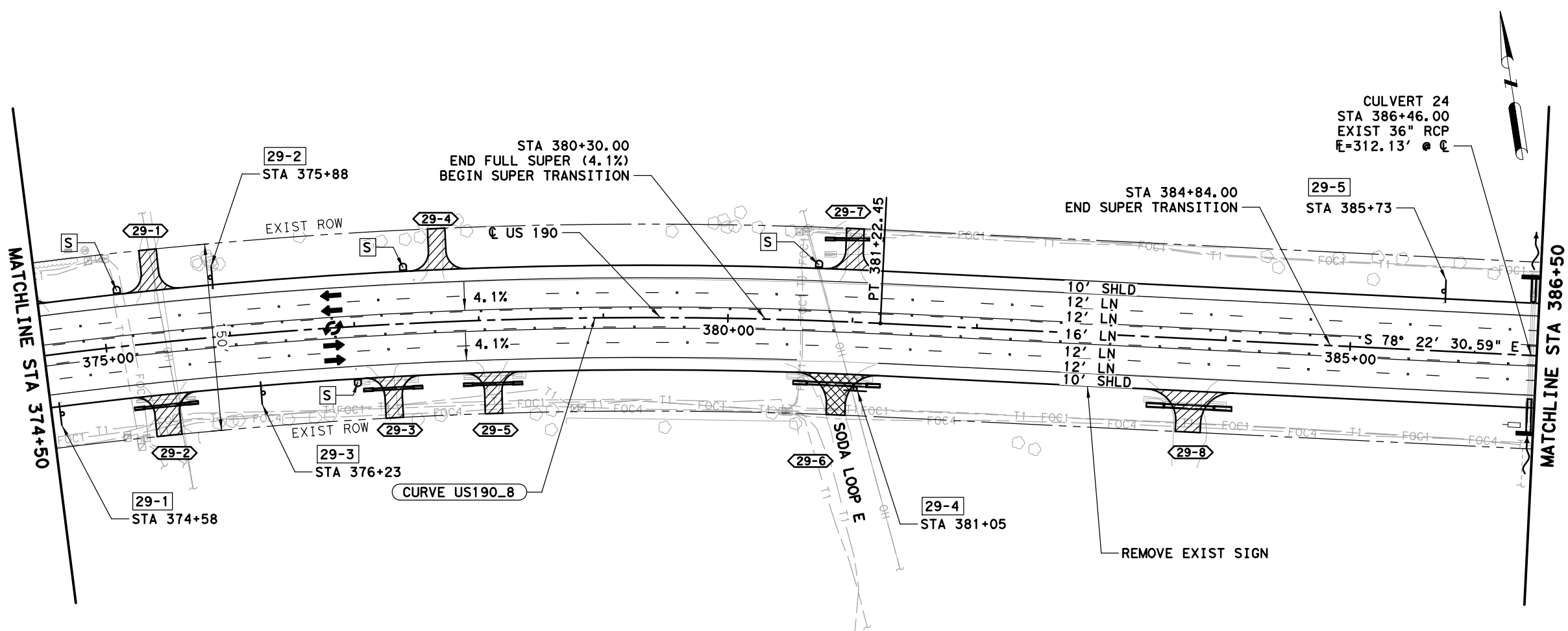
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		107
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

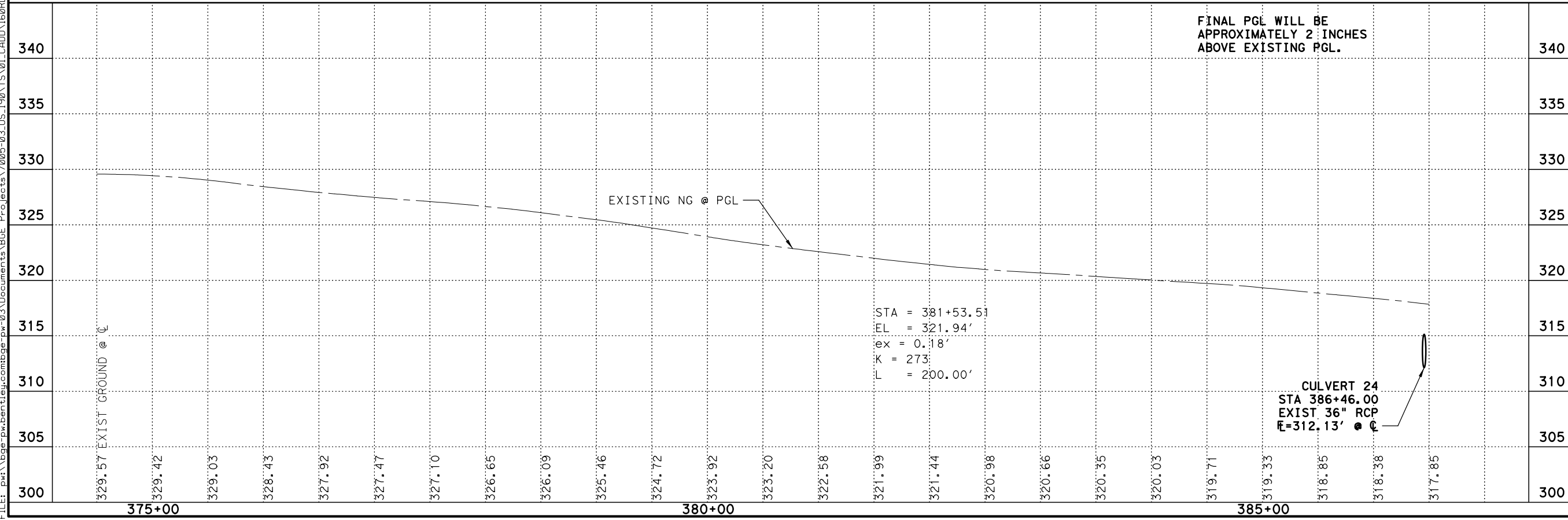
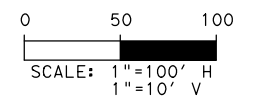
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- T X — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- [] — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in hexagon] — DRIVEWAY NUMBER
- ~ — FLOW DIRECTION



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

340	340
335	335
330	330
325	325
320	320
315	315
310	310
305	305
300	300

05/13/2021

ROADWAY PLAN & PROFILE

(STA 374+50-STA 386+50)

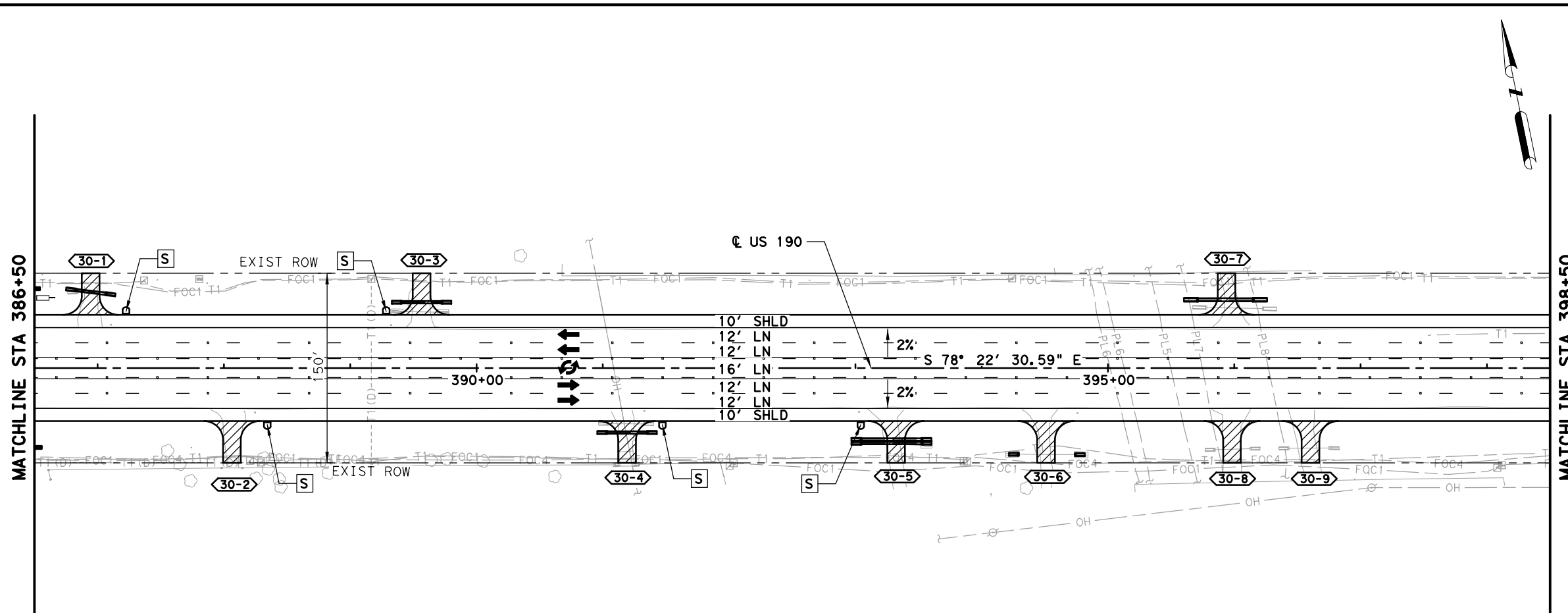
SHEET 29 OF 33

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 TBPE Registration No. F-1046

FED. RD. DIST. NO. 6	PROJECT NO.	SHEET NO. 108
STATE TX	STATE DIST. NO. LFK	COUNTY POLK
CONT. 0213	SECT. 04	JOB 050
		HIGHWAY NO. US 190

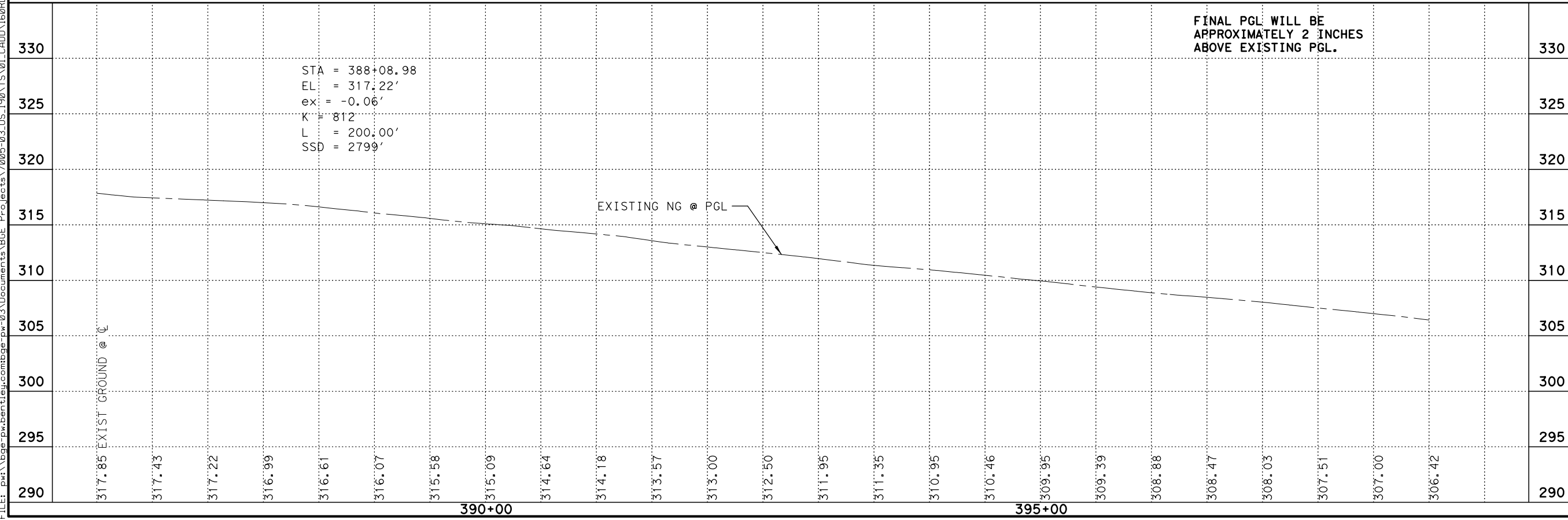
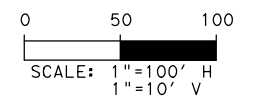
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- G X — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- W X — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- S — MAILBOX (SINGLE)
- D — MAILBOX (DOUBLE)
- M — MAILBOX (MULTIPLE)
- — PROPOSED MAILBOX
- # — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- # — CURVE US190 #
- ▨ — DRIVEWAY CONSTRUCTION
- ▩ — INTERSECTION CONSTRUCTION
- ⬢ # — DRIVEWAY NUMBER
- — FLOW DIRECTION



330

325

320

315

310

305

300

295

290

390+00

395+00

STA = 388+08.98
 EL = 317.22'
 ex = -0.06'
 K = 812
 L = 200.00'
 SSD = 2799'

EXISTING NG @ PGL

FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

05/13/2021

ROADWAY PLAN & PROFILE

(STA 386+50-STA 398+50)

SHEET 30 OF 33

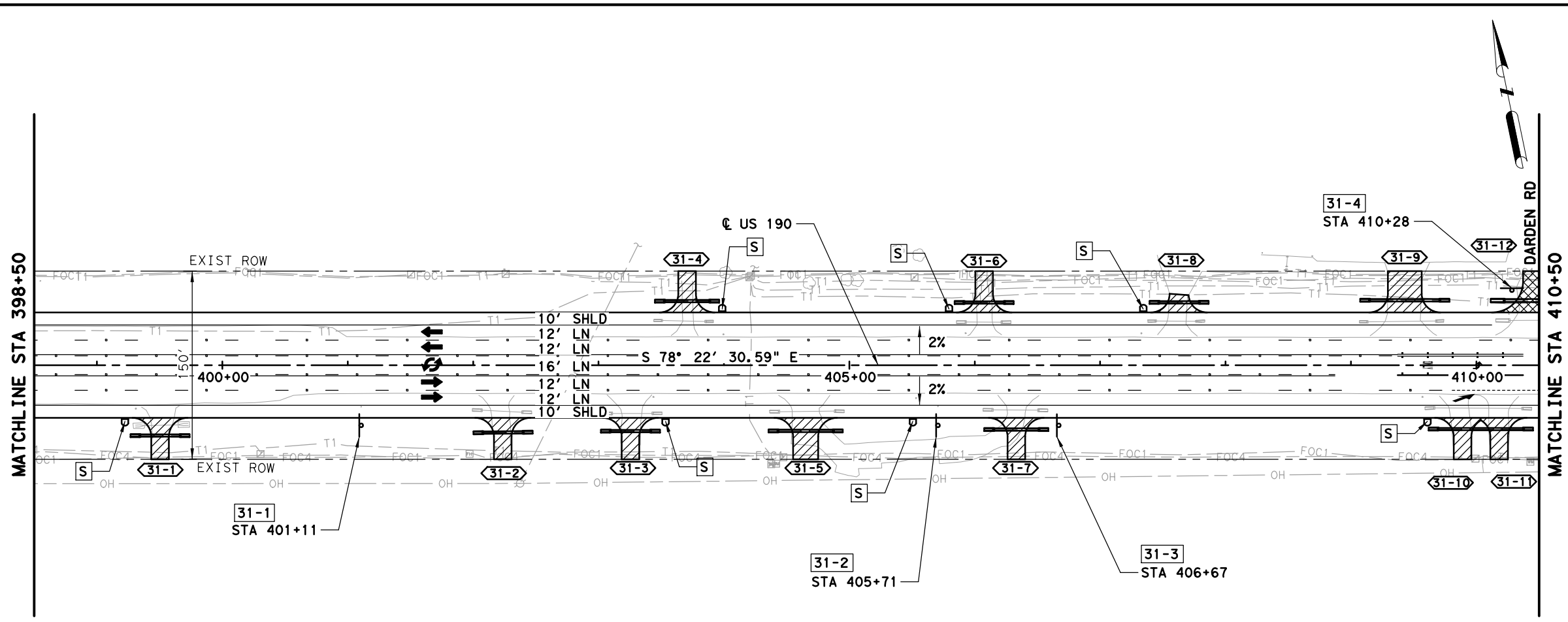
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 TBPE Registration No. F-1046

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.	
6		109	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

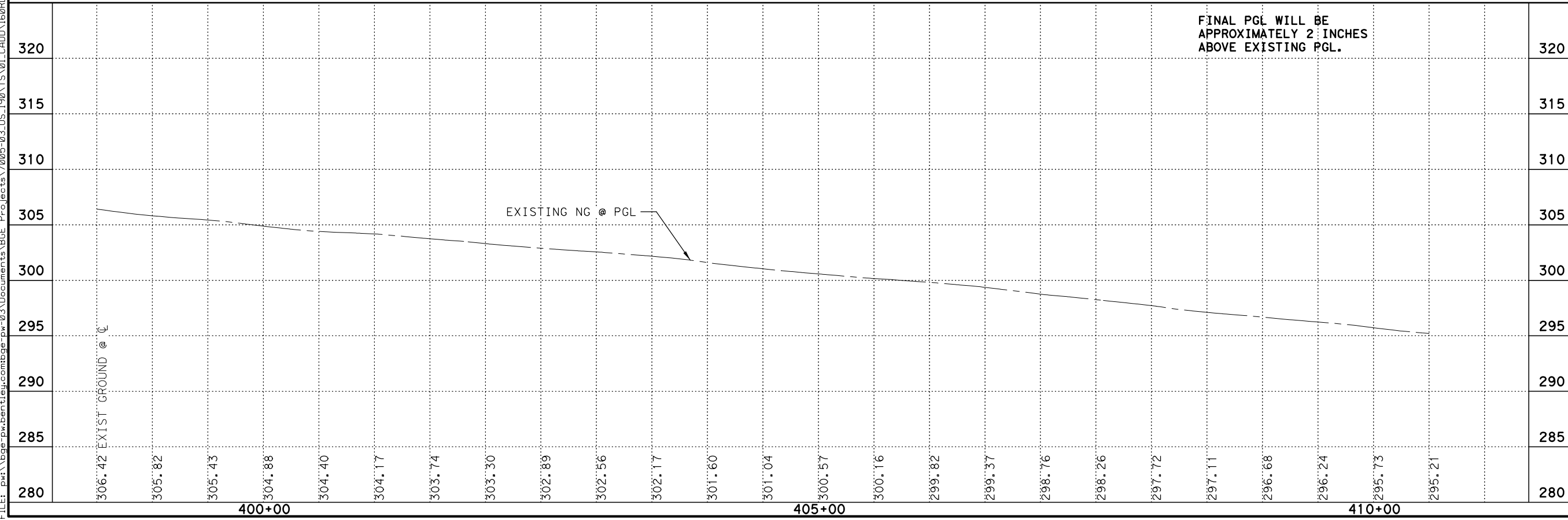
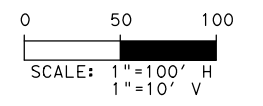
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 DATE: 05/13/2021
 FILE: pw:\bge-pw\bentley-combge-pw-03\Documents\BGE_Projects\7005-03_US_190\TS\01_CADD\160RDWY\US190_PP_31.dgn



LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- S — MAILBOX (SINGLE)
- D — MAILBOX (DOUBLE)
- M — MAILBOX (MULTIPLE)
- ⊕ — PROPOSED MAILBOX
- # — PROPOSED SIGN
- ⊕ — DELINEATOR
- — OBJECT MARKER
- ➔ — DIRECTION OF TRAFFIC
- CURVE US190 # — CURVE NUMBER
- ▨ — DRIVEWAY CONSTRUCTION
- ▩ — INTERSECTION CONSTRUCTION
- ⬢# — DRIVEWAY NUMBER
- ➔ — FLOW DIRECTION



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

05/13/2021

ROADWAY PLAN & PROFILE

(STA 398+50-STA 410+50)

SHEET 31 OF 33

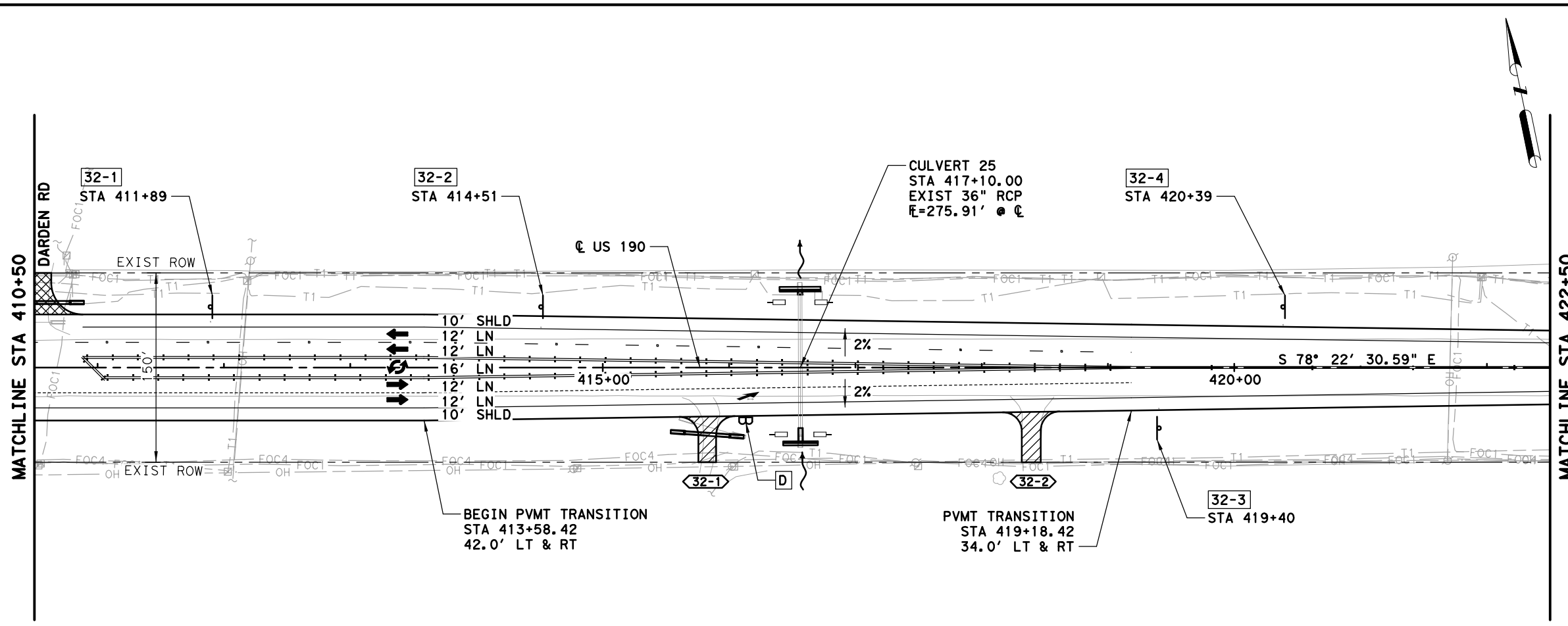
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FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		110
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

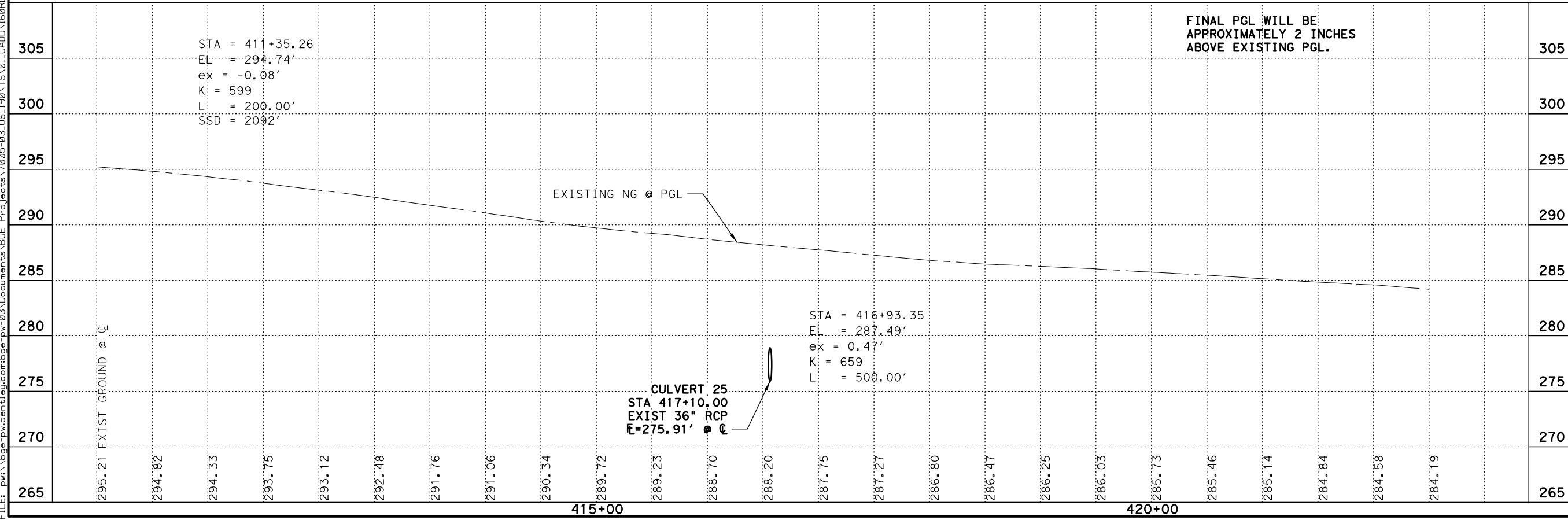
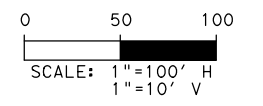
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LEGEND

- EX — EXISTING ELECTRICAL
- TS X — EXISTING TRAFFIC SIGNAL
- TX — EXISTING TELEPHONE
- GX — EXISTING GAS
- PL X — EXISTING PIPELINE
- FOC X — EXISTING FIBER OPTIC
- WX — EXISTING WATER
- WW X — EXISTING WASTE WATER
- OH — EXISTING OVERHEAD
- ⊙ — EXISTING SIGN
- X — EXISTING FENCE
- [S] — MAILBOX (SINGLE)
- [D] — MAILBOX (DOUBLE)
- [M] — MAILBOX (MULTIPLE)
- [] — PROPOSED MAILBOX
- [#] — PROPOSED SIGN
- ⊙ — DELINEATOR
- — OBJECT MARKER
- — DIRECTION OF TRAFFIC
- (#) — CURVE US190 # CURVE NUMBER
- [Hatched] — DRIVEWAY CONSTRUCTION
- [Cross-hatched] — INTERSECTION CONSTRUCTION
- [# in circle] — DRIVEWAY NUMBER
- ~ — FLOW DIRECTION



05/13/2021

ROADWAY PLAN & PROFILE

(STA 410+50-STA 422+50)

SHEET 32 OF 33

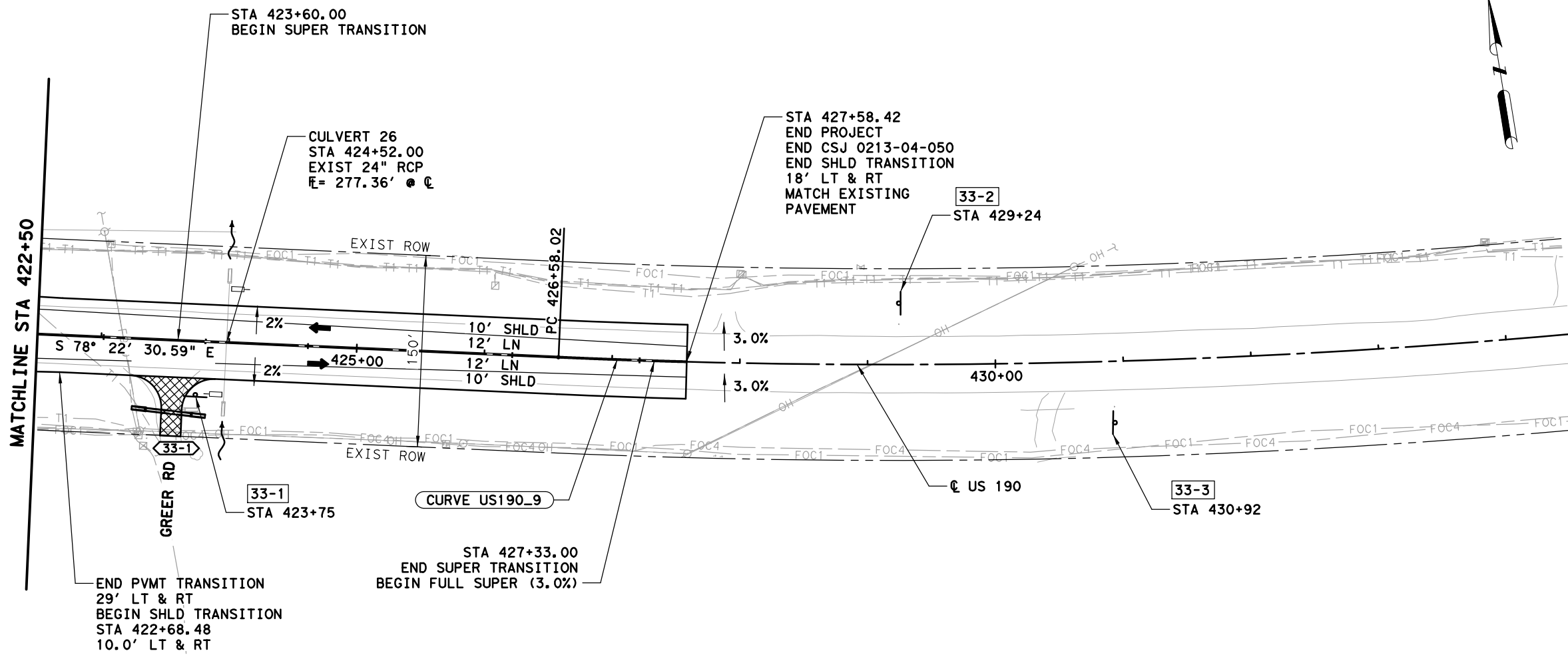
Texas Department of Transportation

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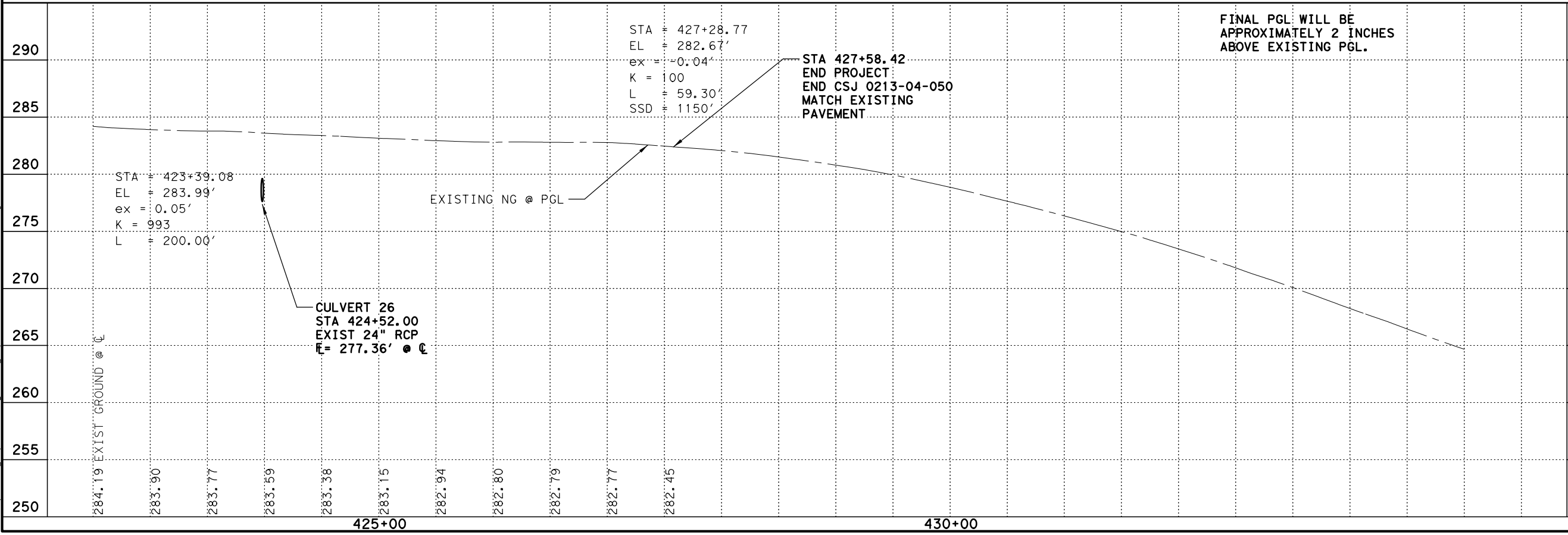
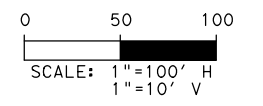
FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		111
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND	
— EX —	EXISTING ELECTRICAL
— TS X —	EXISTING TRAFFIC SIGNAL
— TX —	EXISTING TELEPHONE
— GX —	EXISTING GAS
— PL X —	EXISTING PIPELINE
— FOC X —	EXISTING FIBER OPTIC
— WX —	EXISTING WATER
— WW X —	EXISTING WASTE WATER
— OH —	EXISTING OVERHEAD
⊙	EXISTING SIGN
— X —	EXISTING FENCE
[S]	MAILBOX (SINGLE)
[D]	MAILBOX (DOUBLE)
[M]	MAILBOX (MULTIPLE)
[]	PROPOSED MAILBOX
[#]	PROPOSED SIGN
⊘	DELINEATOR
[]	OBJECT MARKER
→	DIRECTION OF TRAFFIC
CURVE US190 #	CURVE NUMBER
[Hatched]	DRIVEWAY CONSTRUCTION
[Cross-hatched]	INTERSECTION CONSTRUCTION
[# in circle]	DRIVEWAY NUMBER
~	FLOW DIRECTION



FINAL PGL WILL BE APPROXIMATELY 2 INCHES ABOVE EXISTING PGL.

290	290
285	285
280	280
275	275
270	270
265	265
260	260
255	255
250	250

05/13/2021

ROADWAY PLAN & PROFILE

(STA 422+50-END CSJ)

SHEET 33 OF 33

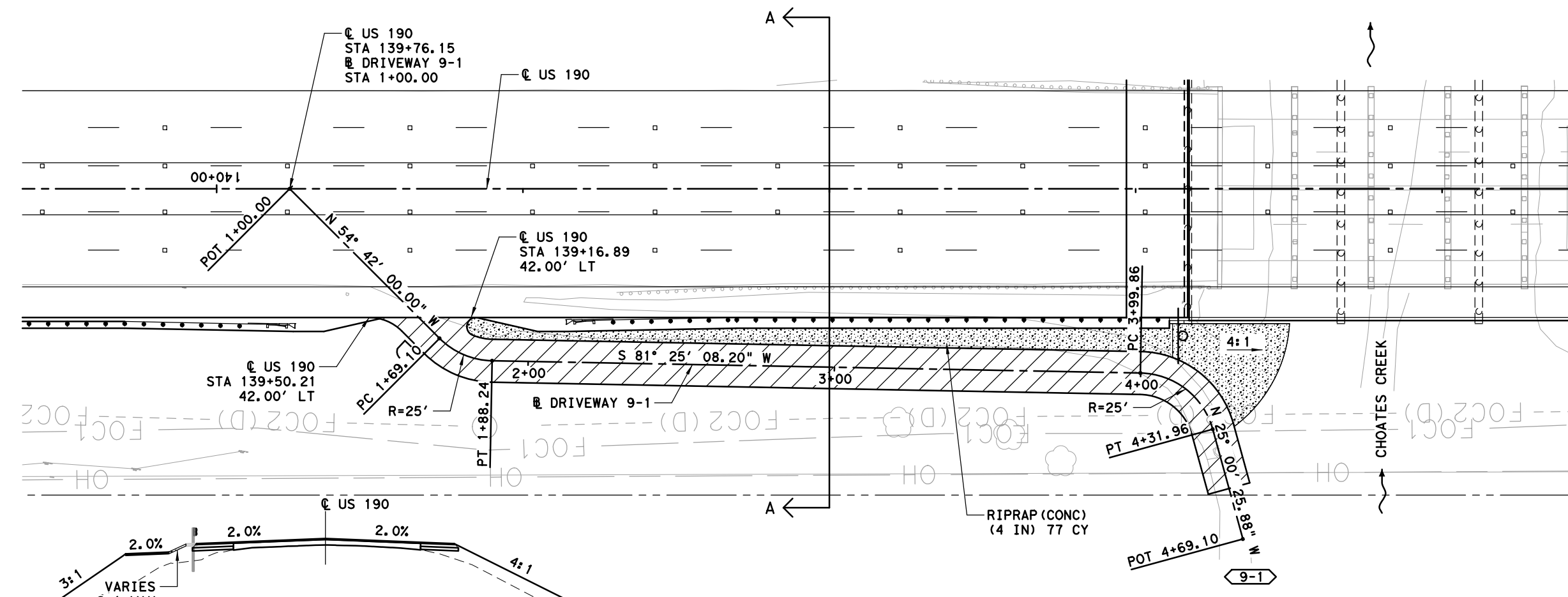
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FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.	
6		112	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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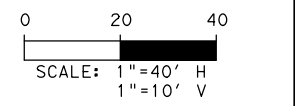
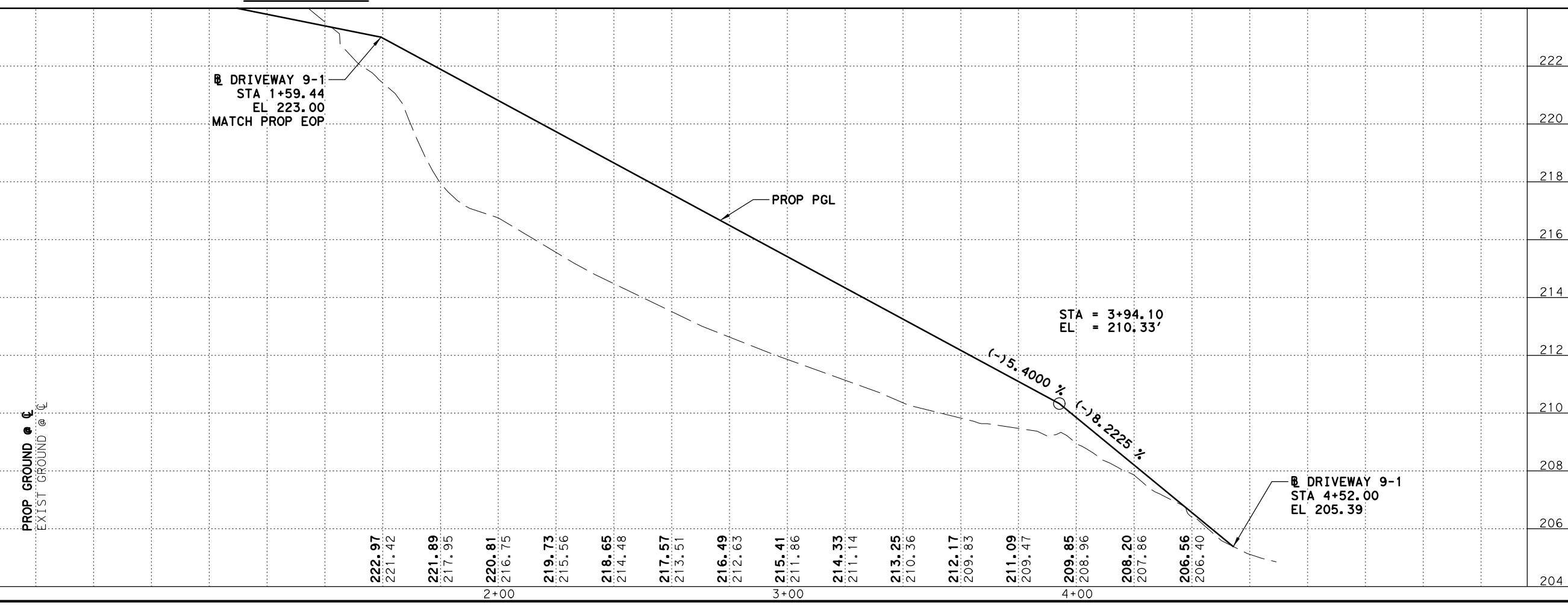
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 DATE: 05/13/2021
 FILE: p:\bge-pw\bentley.combge-pw-03\Documents\BGE_Projects\7005-03_US_190\TS\01_CADD\160RDWY\US190_MISC_DET_01



LEGEND

- FOC X — EXISTING FIBER OPTIC
- OH — EXISTING OVERHEAD
- [Hatched Box] DRIVEWAY CONSTRUCTION
- [Stippled Box] CONCRETE RIPRAP
- [Cross-hatched Box] INTERSECTION CONSTRUCTION
- [Hexagon with #] DRIVEWAY NUMBER
- [Arrow] FLOW DIRECTION

SECTION A-A



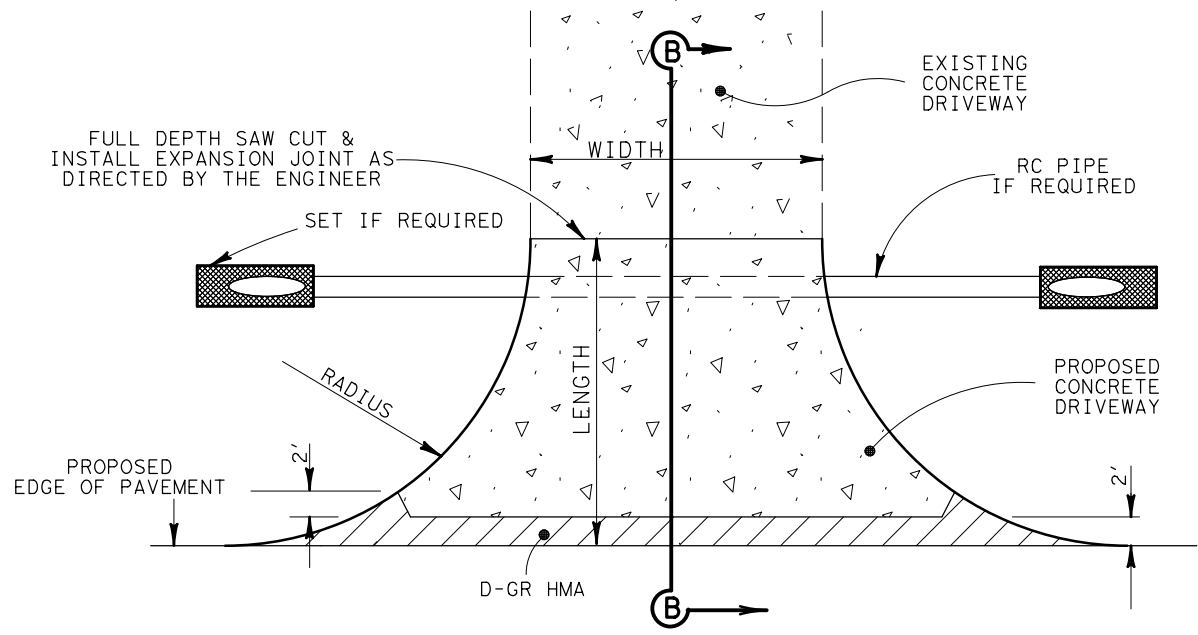
05/13/2021

MISCELLANEOUS ROADWAY DETAILS (DRIVEWAY 9-1)

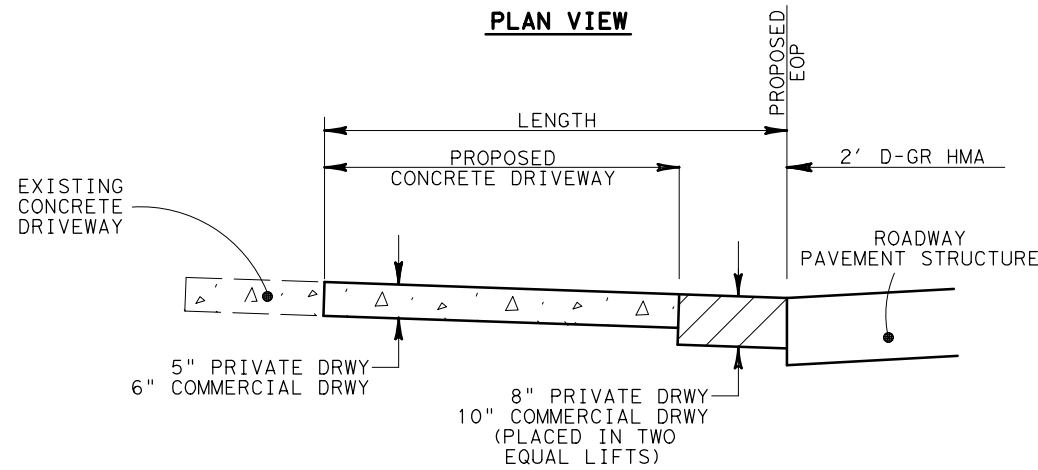
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		113
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

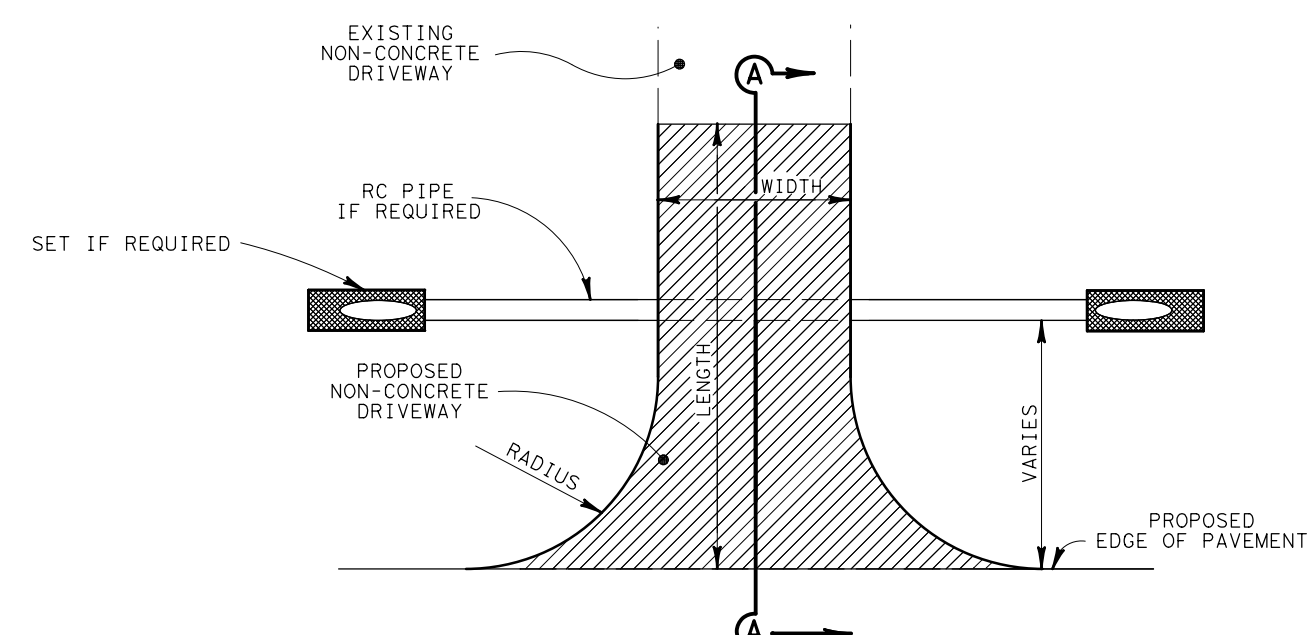


PLAN VIEW

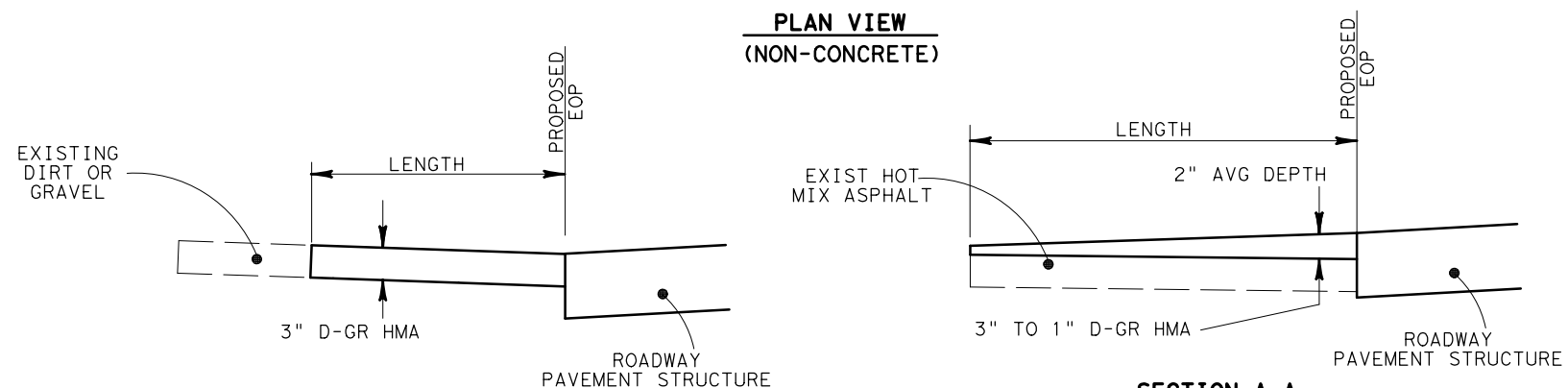


SECTION B-B

**TYPICAL RURAL DRIVEWAY
(CONCRETE)**



**PLAN VIEW
(NON-CONCRETE)**



**SECTION A-A
(EXIST DIRT OR GRAVEL)**

**SECTION A-A
(EXIST HOT MIX ASPHALT)**

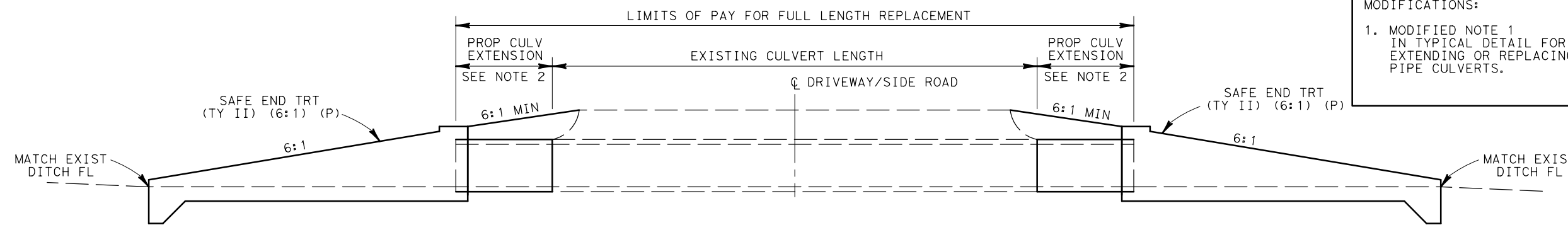
**TYPICAL RURAL DRIVEWAY
(NON-CONCRETE)**

CONCRETE DRIVEWAY NOTES:

1. USE REINFORCING STEEL CONSISTING OF NO.3 OR 4 BARS MEETING THE REQUIREMENTS OF GRADE 40 OR 60 REINFORCING STEEL. PLACE BARS ON 12 INCH CENTERS IN EACH DIRECTION, SUPPORTED ON REINFORCING CHAIRS.
2. WELDED WIRE FABRIC WILL NOT BE ALLOWED FOR REINFORCING.
3. UNLESS OTHERWISE DIRECTED, INSTALL 1/2 INCH PREMOLDED EXPANSION JOINT MATERIAL BETWEEN EXISTING CONCRETE AND NEW CONCRETE.
4. D-GR HMA SUBSIDIARY TO ITEM 530.

NON-CONCRETE DRIVEWAY NOTES:

PREPARATION AND CONSTRUCTION OF DRIVEWAYS SHALL BE PAID FOR UNDER ITEM 530 INTERSECTIONS, DRIVEWAYS, AND TURNOUTS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVAL OF EXISTING GRAVEL AND DIRT DRIVEWAYS. THE NECESSARY EXCAVATION, GRADING, COMPACTION, HMA AND INCIDENTALS WILL BE CONSIDERED SUBSIDIARY TO ITEM 530.



MODIFICATIONS:

1. MODIFIED NOTE 1 IN TYPICAL DETAIL FOR EXTENDING OR REPLACING PIPE CULVERTS.

DRIVEWAY NOTES:

1. SEE SUMMARY OF DRIVEWAYS FOR LENGTHS, WIDTHS, RADII, MATERIAL TYPE, AND DRIVEWAY CULVERT OFFSETS.
2. THICKNESS OF MATERIALS MAY VARY IN SUPERELEVATED AREAS.

CULVERT NOTES:

1. FULL LENGTH CULVERT REPLACEMENTS TO BE PLACED SYMMETRICAL ABOUT DRIVEWAY/SIDE ROAD CENTERLINE, OR AS DIRECTED.
2. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTRUCT THE PROPOSED PARALLEL SETS IN SUCH A MANNER AS TO PROVIDE A MINIMUM SIDE SLOPE OF 6:1 BETWEEN THE EDGE OF THE DRIVEWAY OR SIDE ROAD PAVEMENT AND THE TOP OF THE SET HEADWALL. ADDITIONAL PIPE NEEDED TO ACQUIRE 6:1 MIN SLOPE WILL BE PAID FOR UNDER ITEM 464.

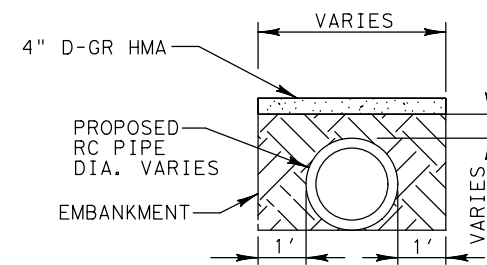
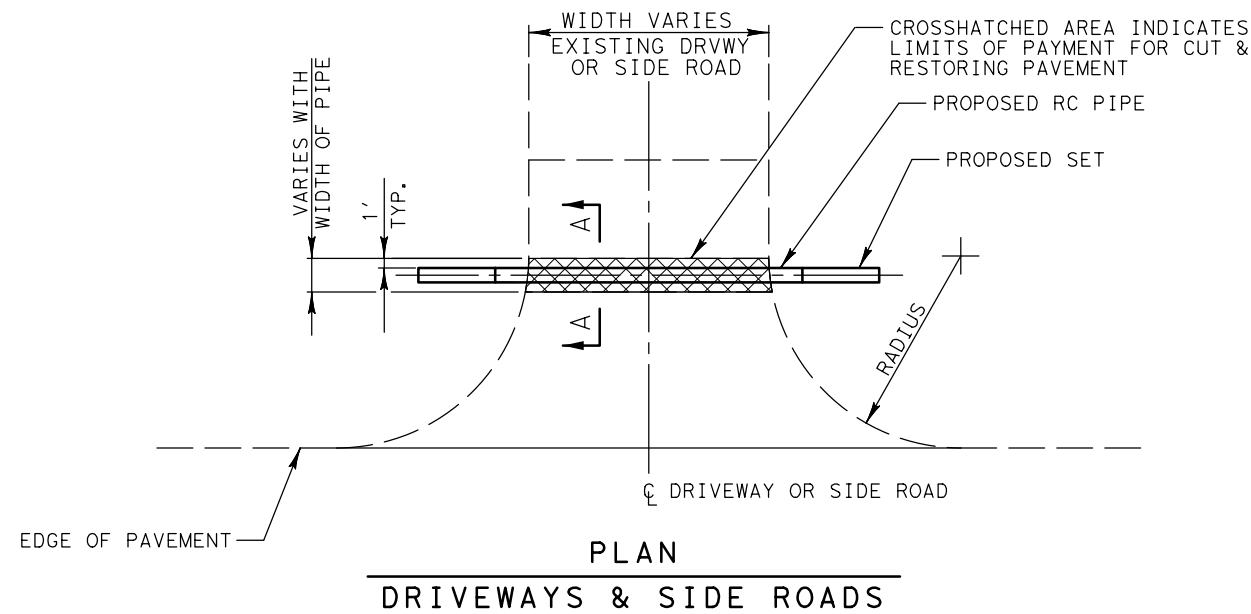
**TYPICAL DETAIL
FOR EXTENDING OR REPLACING
PIPE CULVERTS AT DRIVEWAYS & SIDE ROADS**

ISSUED 03-08

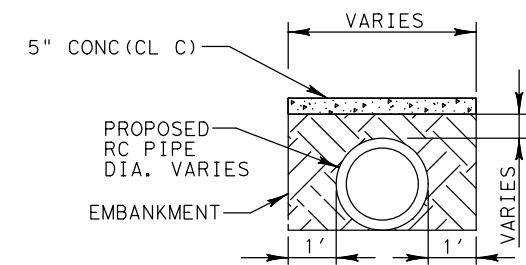
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LUFKIN DISTRICT STANDARD
**RURAL DRIVEWAY
DETAILS**
NOT TO SCALE

FED. NO.	PROJECT NO.		SHEET NO.
6			114
STATE	DISTRICT	COUNTY	
TEXAS	LFK	POLK	
CONTROL	SECTION	JOB	HIGHWAY NO.
0213	04	050	US 190

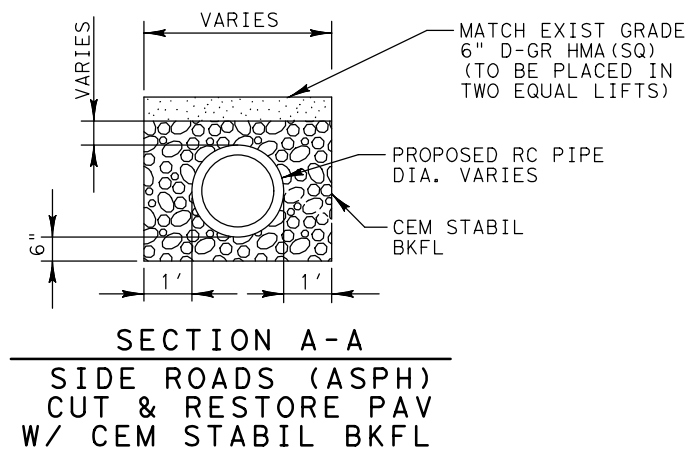
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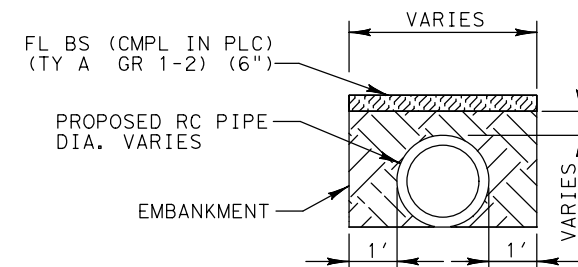
SECTION A-A
DRIVEWAYS (ASPH)
CUT & RESTORE PAV



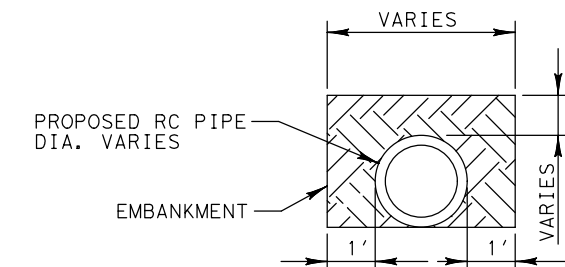
SECTION A-A
DRIVEWAYS (CONC)
CUT & RESTORE PAV



SECTION A-A
SIDE ROADS (ASPH)
CUT & RESTORE PAV
W/ CEM STABIL BKFL



SECTION A-A
DRIVEWAYS & SIDE ROADS
(GRAVEL)



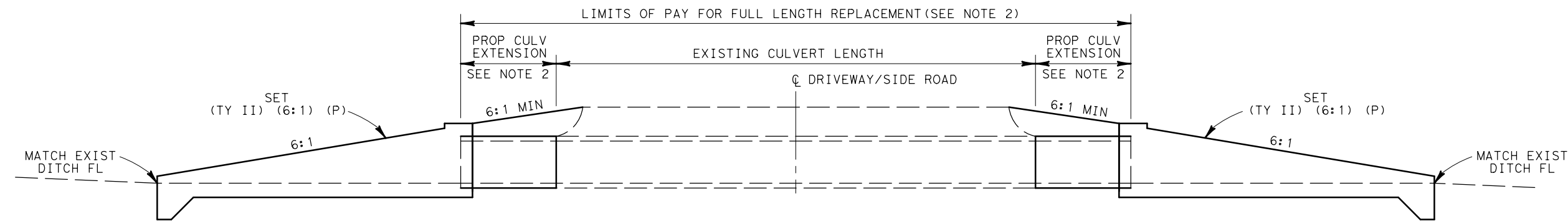
SECTION A-A
DRIVEWAYS & SIDE ROADS
(GRASS/DIRT)

CONCRETE DRIVEWAY NOTES:

1. USE REINFORCING STEEL CONSISTING OF NO.3 OR 4 BARS MEETING THE REQUIREMENTS OF GRADE 60 REINFORCING STEEL. PLACE BARS ON 12 INCH CENTERS IN EACH DIRECTION, SUPPORTED ON REINFORCING CHAIRS. INSTALL DOWELS SIX INCHES INTO EXISTING CONCRETE USING EPOXY GROUT.
2. WELDED WIRE FABRIC WILL NOT BE ALLOWED FOR REINFORCING.
3. UNLESS OTHERWISE DIRECTED, INSTALL 1/2 INCH PREMOLDED EXPANSION JOINT MATERIAL BETWEEN EXISTING CONCRETE AND NEW CONCRETE.
4. UNLESS OTHERWISE DIRECTED, CUT & RESTORE CONCRETE DRIVEWAYS AND SIDEROADS AS SHOWN ABOVE OR TO THE NEAREST JOINT.

DRIVEWAY NOTES:

1. LIMITS OF STRUCTURAL EXCAVATION SHOULD BE DEFINED BY SAWCUTTING AT ASPHALT AND CONCRETE DRIVEWAYS. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO ITEM 400.
2. D-GR HMA TYPE & RATE AS SHOWN ELSEWHERE IN THE PLANS.



CULVERT NOTES:

1. PLACE FULL LENGTH CULVERT REPLACEMENTS SYMMETRICAL ABOUT DRIVEWAY/SIDE ROAD CENTERLINE & AT THE SAME HORIZONTAL OFFSET AS THE ORIGINAL PIPE UNLESS OTHERWISE DIRECTED.
2. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTRUCT THE PROPOSED PARALLEL SETS IN SUCH A MANNER AS TO PROVIDE A MINIMUM SIDE SLOPE OF 6:1 BETWEEN THE EDGE OF THE DRIVEWAY OR SIDE ROAD PAVEMENT AND THE TOP OF THE SET HEADWALL. ADDITIONAL PIPE NEEDED TO ACQUIRE 6:1 MIN SLOPE WILL BE PAID FOR UNDER ITEM 464.

TYPICAL DETAIL
FOR EXTENDING OR REPLACING
PIPE CULVERTS AT DRIVEWAYS & SIDE ROADS

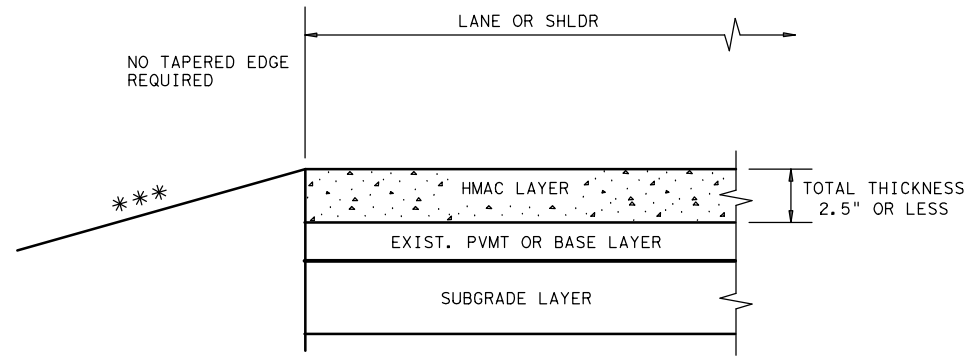
REVISED 12-17
ISSUED 04-09

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DRIVEWAY & SIDE ROAD CUT & RESTORE PAVEMENT DETAILS			
NOT TO SCALE			
FED. NO. DIV. NO.	PROJECT NO.		SHEET NO.
6			115
STATE	DISTRICT	COUNTY	
TEXAS	LFK	POLK	
CONTROL	SECTION	JOB	HIGHWAY NO.
0213	04	050	US 190

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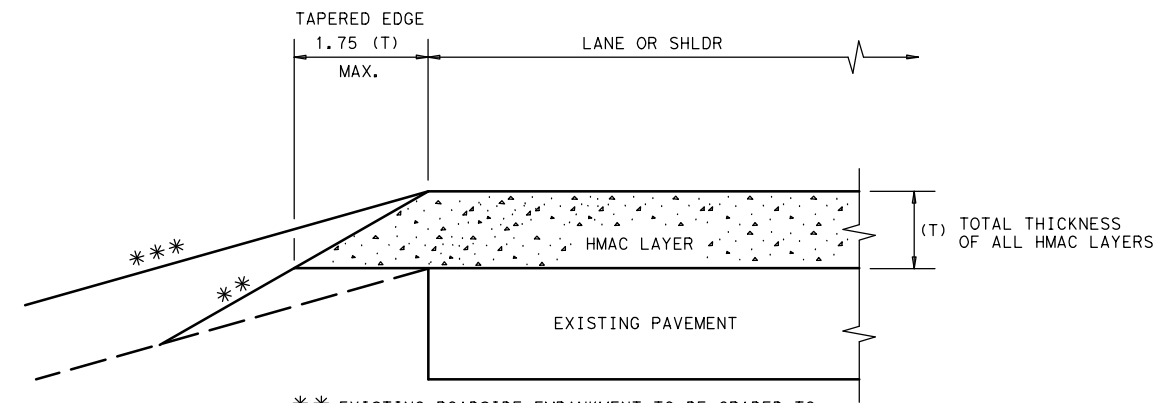
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DATE: 05/13/2021
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*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

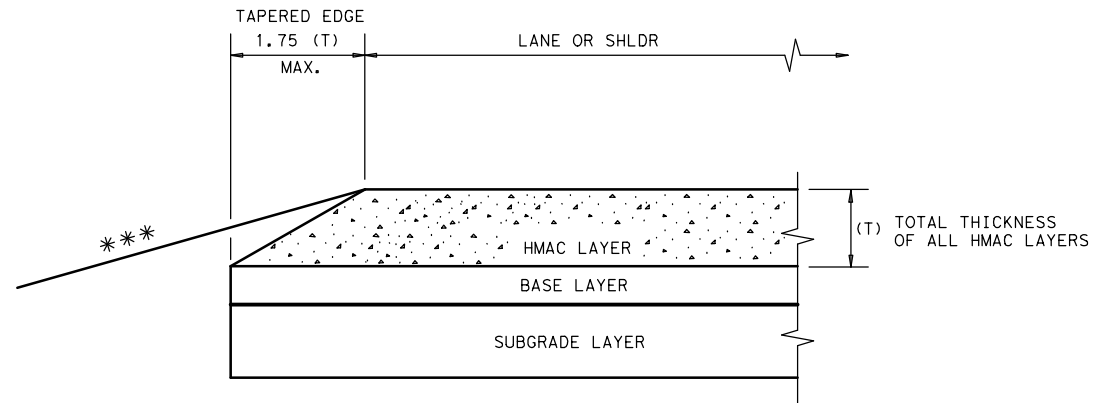
CONDITION - 1
 THIN HMAC SURFACES OR HMAC OVERLAY
 WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

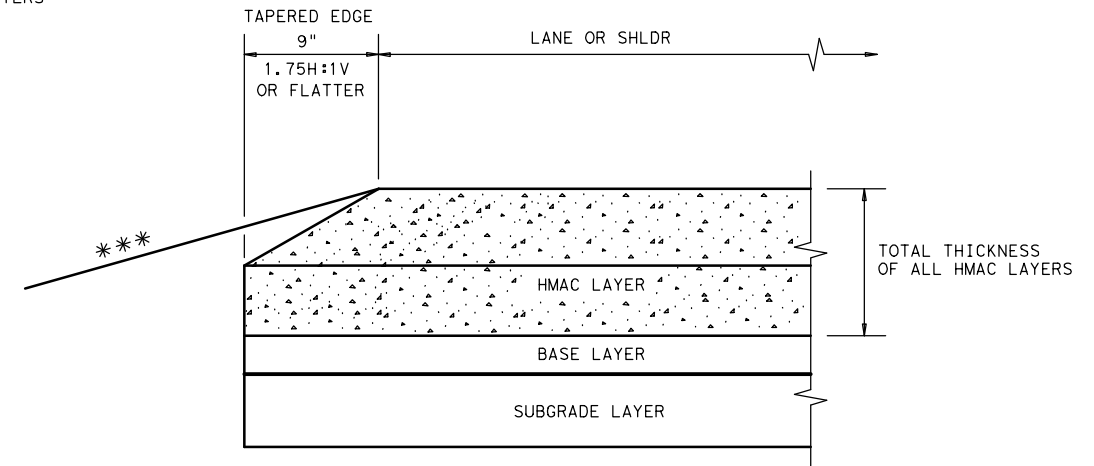
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
 OVERLAY OF EXISTING PAVEMENT
 HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
 NEW OR RECONSTRUCTED PAVEMENT
 HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

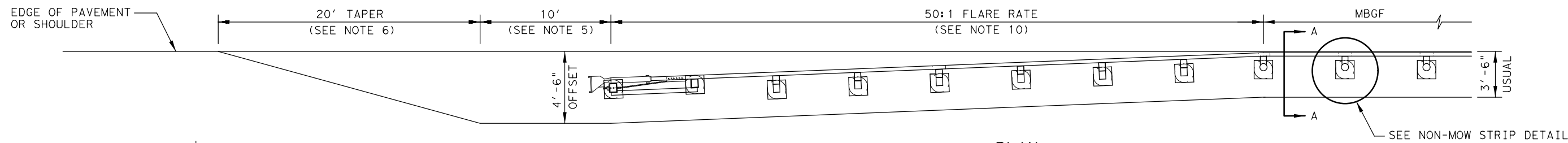
CONDITION - 4
 NEW OR RECONSTRUCTED PAVEMENT
 HMAC THICKNESS 5" OR GREATER

GENERAL NOTES

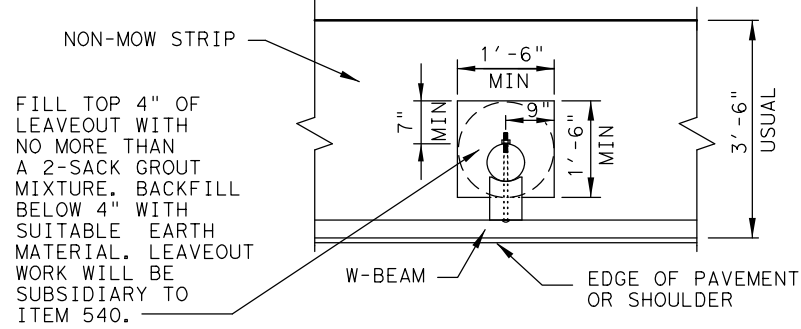
1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

(NOT TO SCALE)

					Design Division Standard	
TAPERED EDGE DETAILS HMAC PAVEMENT						
TE (HMAC) - 11						
FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:		
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY		
REVISIONS			0213	04	050	US 190
		DIST	COUNTY	SHEET NO.		
		LFK	POLK	116		

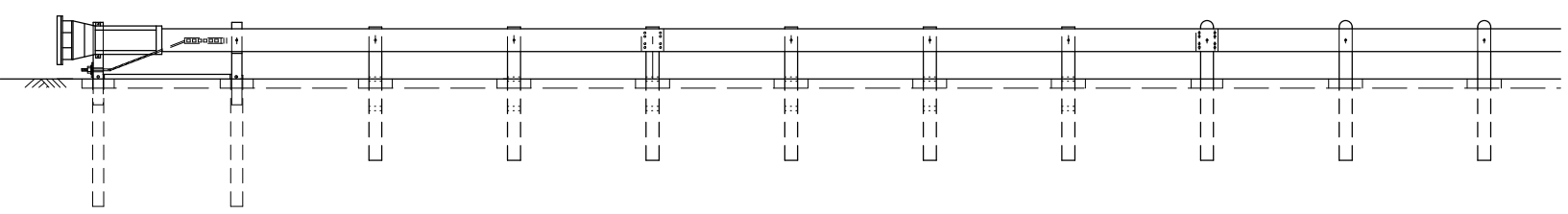


PLAN



NON-MOW STRIP DETAIL

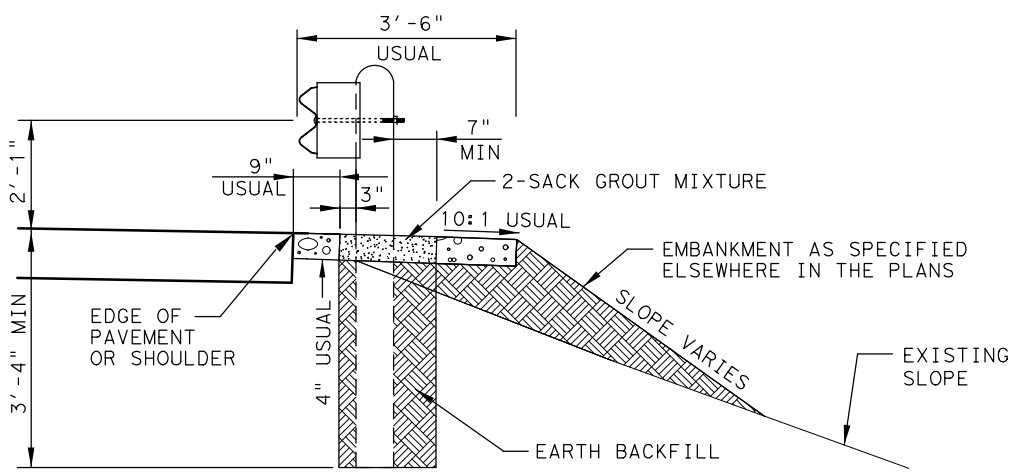
HOT MIX ASPHALTIC PAVEMENT NON-MOW STRIP WITH 18"X18" OR 18" DIA. MINIMUM LEAVEOUT



ELEVATION

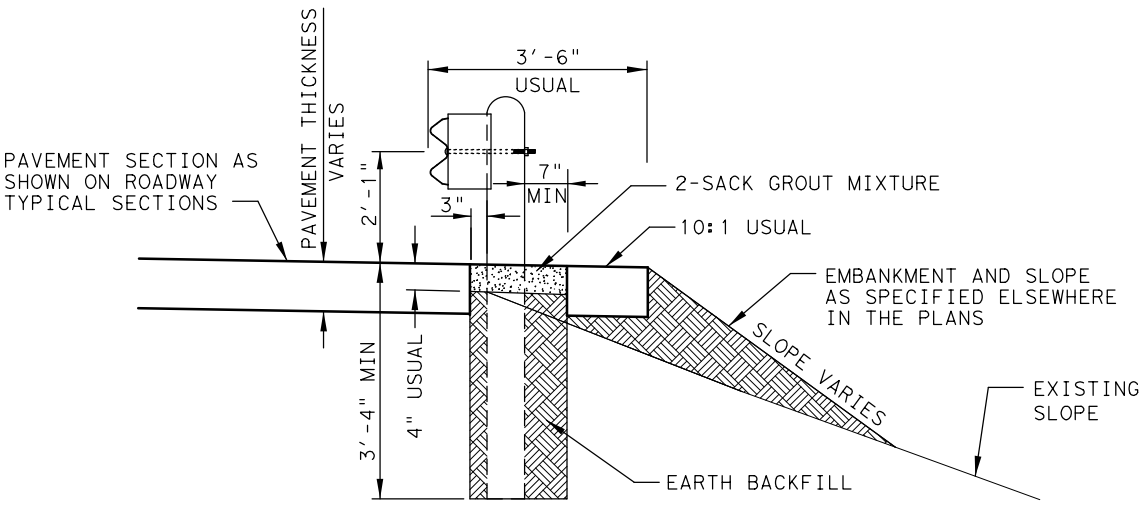
GENERAL NOTES

- NON-MOW STRIPS SHALL BE HOT MIX ASPHALTIC PAVEMENT UNLESS OTHERWISE SHOWN ON THE PLANS. HOT MIX ASPHALTIC PAVEMENT SHALL MEET THE REQUIREMENTS OF AND BE PLACED IN ACCORDANCE WITH THE PERTINENT BID ITEM AS SHOWN ON THE PLANS. OTHER MATERIALS MAY BE USED AS INDICATED ELSEWHERE IN THE PLANS. MATERIALS FOR THE OPTIONAL WIDENED PAVEMENT SECTION SHALL BE AS SHOWN IN THE ROADWAY TYPICAL SECTIONS.
- THE TYPE OF APPROVED POST WILL BE SHOWN ELSEWHERE IN THE PLANS. SEE THE APPLICABLE STANDARD SHEETS FOR ADDITIONAL DETAILS AND INFORMATION.
- THE LIMITS OF PAYMENT FOR HOT MIX ASPHALTIC PAVEMENT WILL INCLUDE LEAVEOUTS FOR POST.
- THE LEAVEOUTS SHALL BE FILLED WITH NO MORE THAN A 2-SACK GROUT MIXTURE AND PLACED IN ACCORDANCE WITH SECTION 421.2.7, "MORTAR AND GROUT". PAYMENT FOR FURNISHING AND PLACING THE GROUT MIXTURE WILL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.
- THE NON-MOW STRIP SHALL BE EXTENDED FULL WIDTH FOR 10' IN ADVANCE OF THE GUARDRAIL END TREATMENT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- A 20' TAPER WILL BE USED IN ADVANCE OF GUARDRAIL UNLESS OTHERWISE SHOWN IN THE PLANS, OR DIRECTED BY THE ENGINEER.
- EXACT LOCATION OF MBGF PLACEMENT WILL BE SHOWN ELSEWHERE IN THE PLANS TO MEET APPROPRIATE CLEAR ROADWAY WIDTH AND CLEAR ZONE REQUIREMENTS.
- EXCAVATION REQUIRED TO CONSTRUCT NON-MOW STRIP WILL NOT BE MEASURED OR PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.
- THE FLARE RATE MAY BE DECREASED OR ELIMINATED IF DIRECTED BY THE ENGINEER.
- WHEN THE EXISTING NON-MOW STRIP IS TO REMAIN IN PLACE, FILLING THE EXISTING POST HOLES WITH GROUT AND DIGGING NEW POST HOLES WILL BE SUBSIDIARY. THE TOP 4 INCHES OF A POST HOLE WITHIN AN EXISTING NON-MOW STRIP SHALL BE BACKFILLED WITH HMA. THIS WORK WILL NOT BE PAID FOR BUT WILL BE SUBSIDIARY TO ITEM 542.



SECTION A-A

ASPHALTIC NON-MOW STRIP



OPTIONAL SECTION A-A

WIDEN PAVEMENT SECTION

NOT TO SCALE

LUFKIN DISTRICT STANDARD

NON-MOW STRIP DETAILS

REVISED: 2-19-09
 ADDED EDGE OF PAVEMENT OR SHOULDER LINE TO PLAN VIEW AND DETAIL.
 REVISED: 7-16-10
 CHANGED DEPTH OF NON-MOW STRIP FROM 5" TO 4".
 REVISED: 12-30-11
 REVISED HEIGHT OF W-BEAM ABOVE PAVEMENT SURFACE
 REVISED: 9-29-16
 REVISED SLOPE BEHIND POSTS; REMOVED SLOPE GENERAL NOTE
 REVISED: 10-20-2016
 MODIFIED TITLE BLOCK
 REVISED: 04-07-2017
 ADDED NOTE 10
 REVISED: 07-10-2017
 REVISED SLOPE BEHIND MBGF
 REVISED: 02-02-2018
 REVISED SPECIFICATION REFERENCE IN NOTE 4



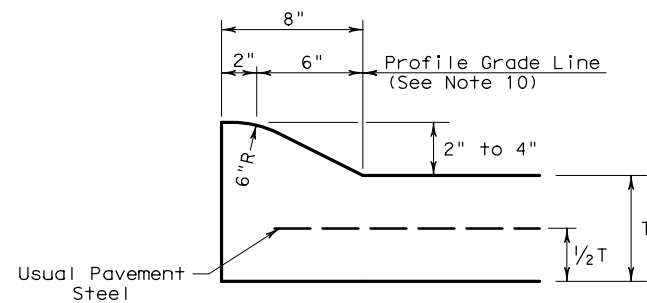
CONT	SECT	JOB	HIGHWAY
0213	04	050	US 190
DIST	COUNTY	SHEET NO.	
LFK	POLK	117	

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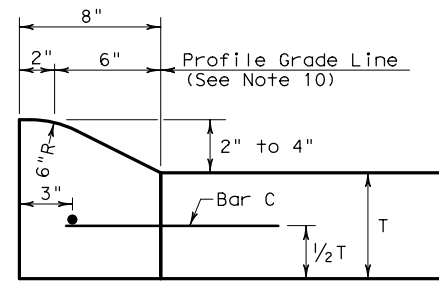
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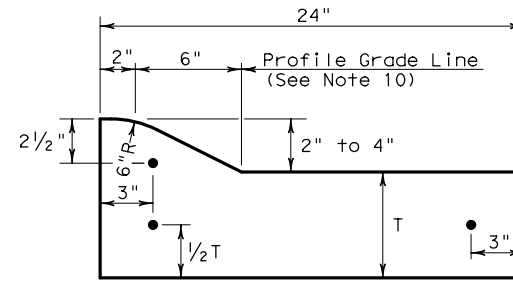
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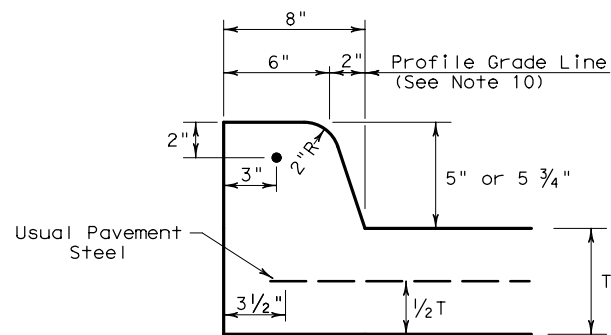
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 2" - 4" HEIGHT



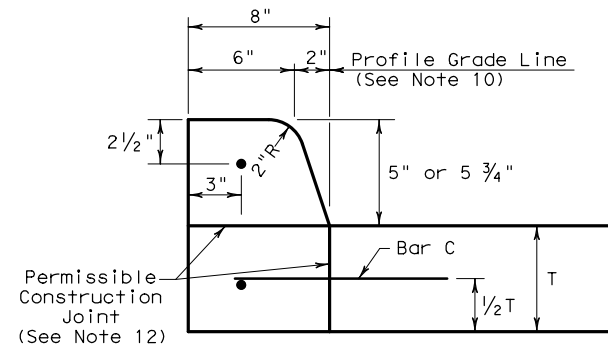
TYPE I CURB
 2" - 4" HEIGHT



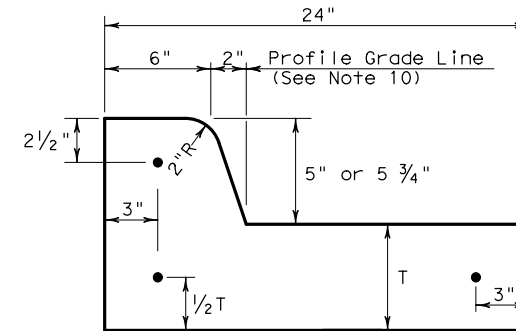
TYPE I CURB AND GUTTER
 2" - 4" HEIGHT



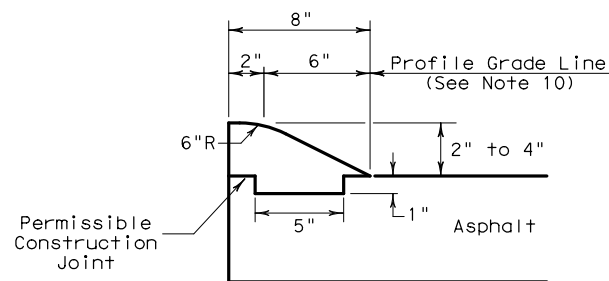
TYPE II CURB (MONOLITHIC)
 5" - 5 3/4" HEIGHT



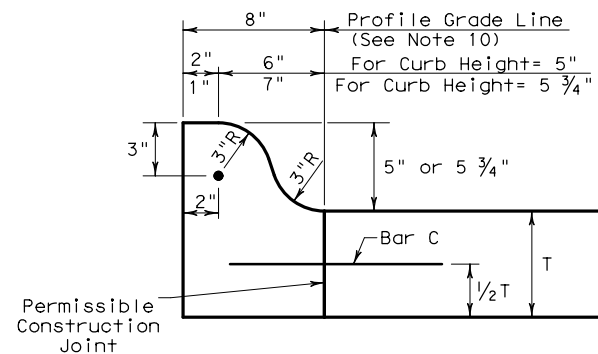
TYPE II CURB
 5" - 5 3/4" HEIGHT



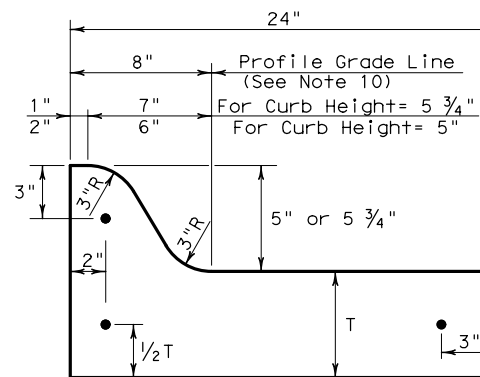
TYPE II CURB AND GUTTER
 5" - 5 3/4" HEIGHT



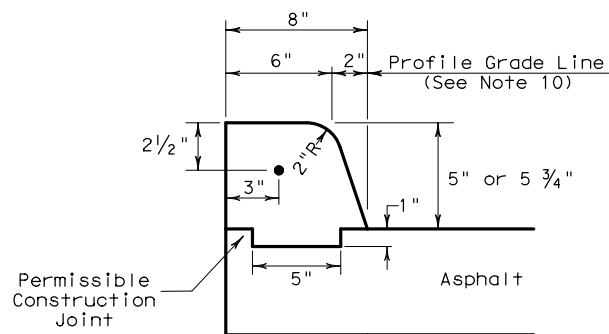
TYPE III CURB (KEYED)
 2" - 4" HEIGHT



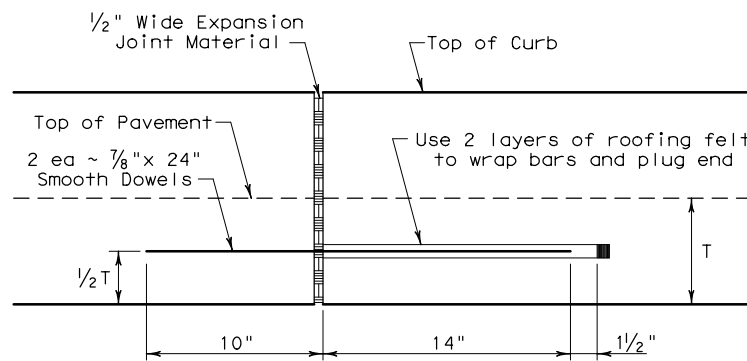
TYPE IIa CURB
 5" - 5 3/4" HEIGHT



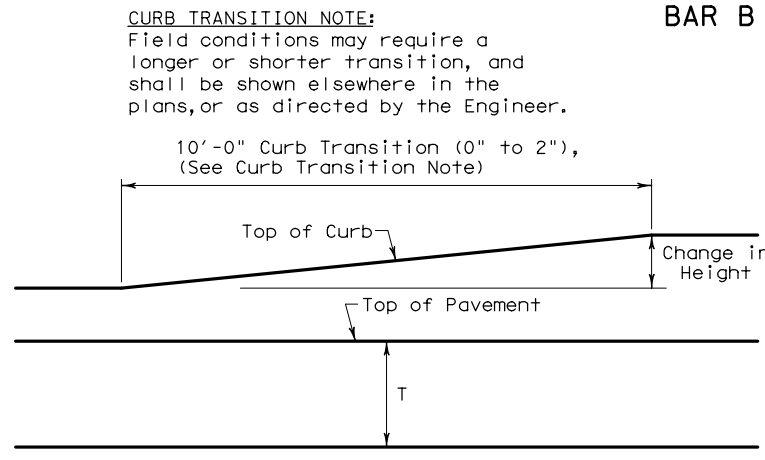
TYPE IIa CURB AND GUTTER
 5" - 5 3/4" HEIGHT



TYPE IV CURB (KEYED)
 5" - 5 3/4" HEIGHT



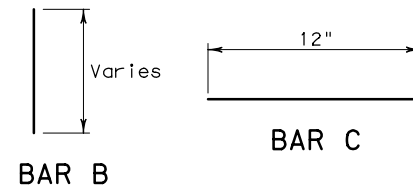
EXPANSION JOINT DETAIL



CURB TRANSITION
 Note: To be paid for as Highest Curb

GENERAL NOTES

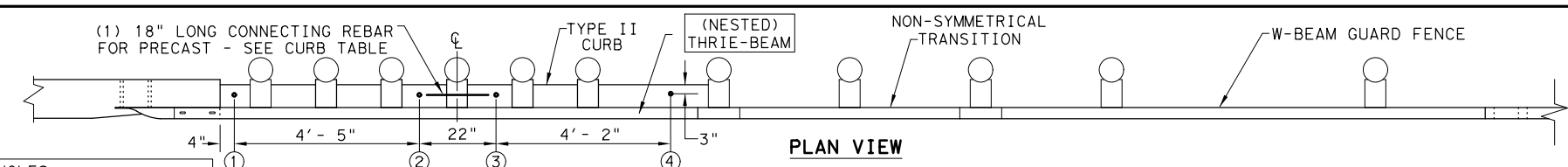
- All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
- Concrete shall be Class A.
- When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is 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."
- Round exposed sharp edges with a rounding tool, to a minimum radius of 1/4 inch.
- All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
- Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
- 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.
- Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
- Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
- Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
- One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
- 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.
- Bar B used as needed to support curb reinforcing steel during concrete placement.



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.

				Design Division Standard	
CONCRETE CURB AND GUTTER					
CCCG-21					
FILE: cccg21.dgn	DN: TxDOT	CK: AN	DW: SS	CK: KM	
© TxDOT: FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY	
REVISTONS	0213	04	050	US 190	
	DIST	COUNTY		SHEET NO.	
	LFK	POLK		118	

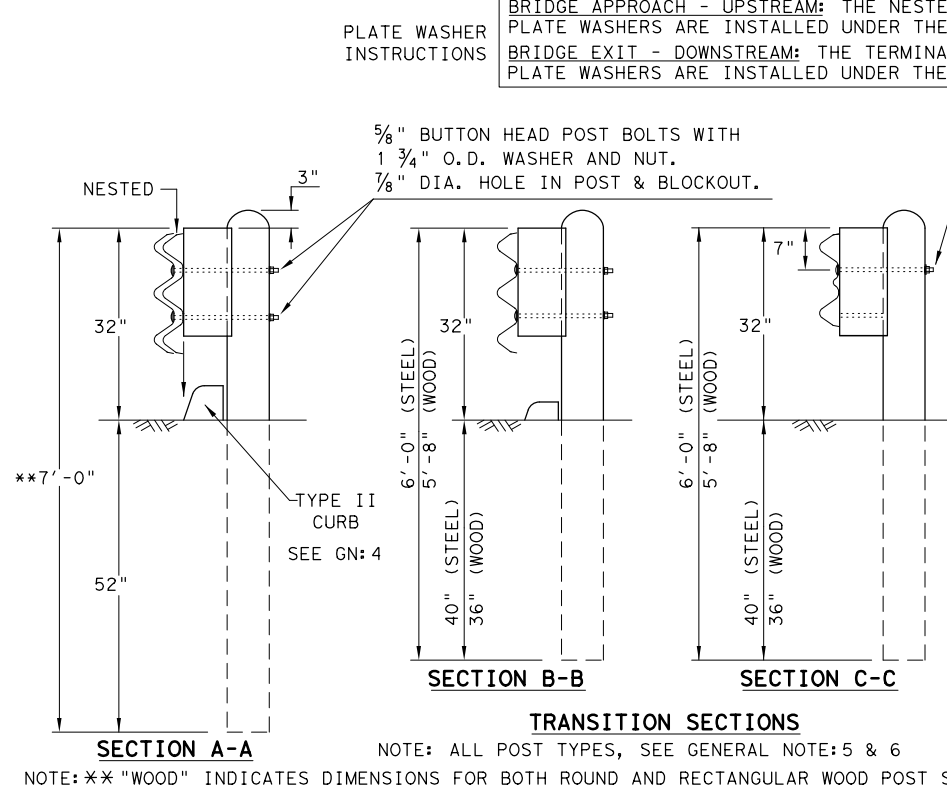
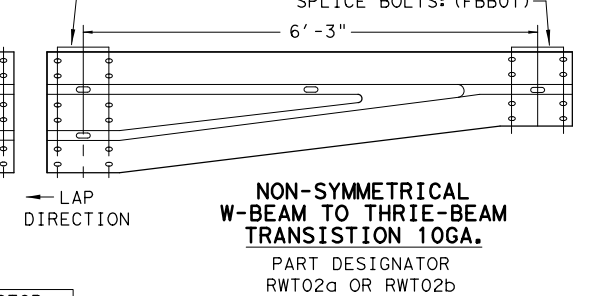
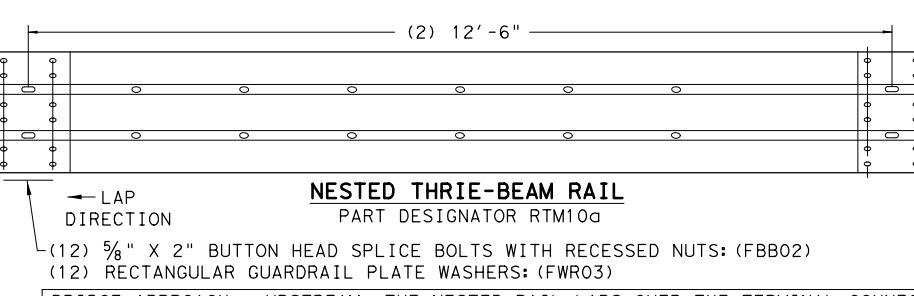
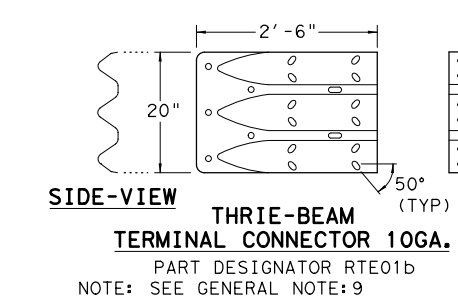
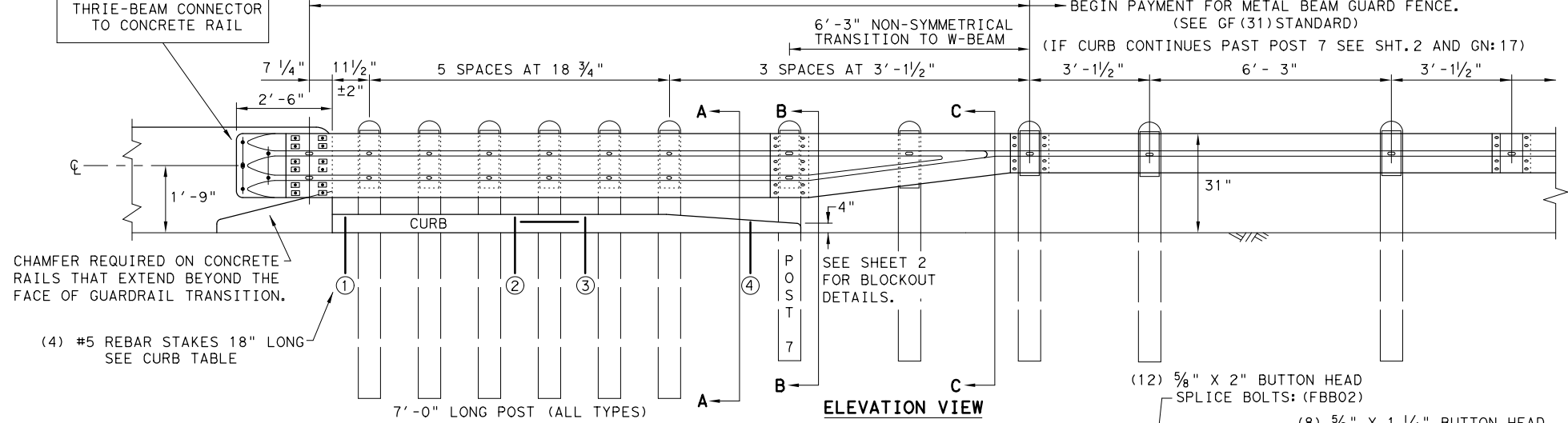
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- (5) 1" DIA. HOLES.
- (5) 7/8" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
- (10) 1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
- (5) 7/8" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

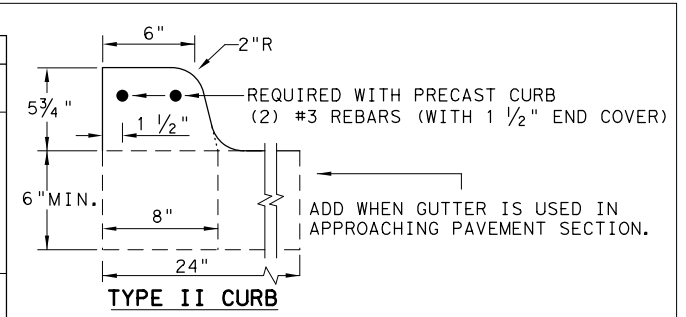
NOTE:
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE 7/8" HEX NUT. TRIM AS REQUIRED.

NOTE:
CURB IS A REQUIRED COMPONENT FOR THE TRANSITION TO FUNCTION PROPERLY. SEE GENERAL NOTES: 2-4 AND 16-17.



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 1/2" BELOW TOP OF CURB.	
FILL HOLES WITH APPROVED GROUT MIXTURE.	

* 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.



NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

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- 3/4" HEIGHT); SEE CURRENT CCG 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 1/2" 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 5/8" 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 5/8" 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
SHEET 1 OF 2

Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

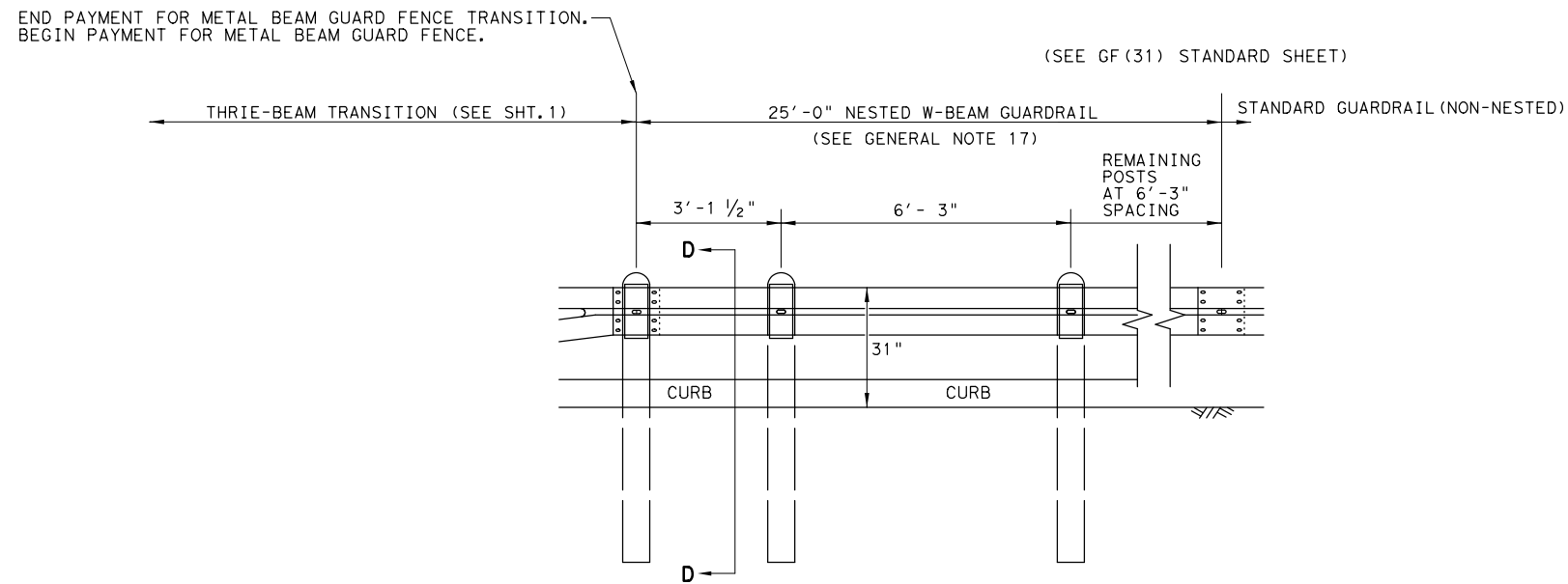
GF (31) TR TL3-20

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	LFK	POLK	119	

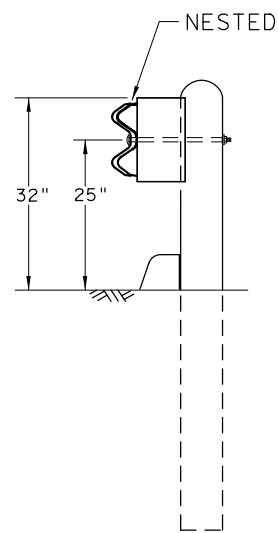
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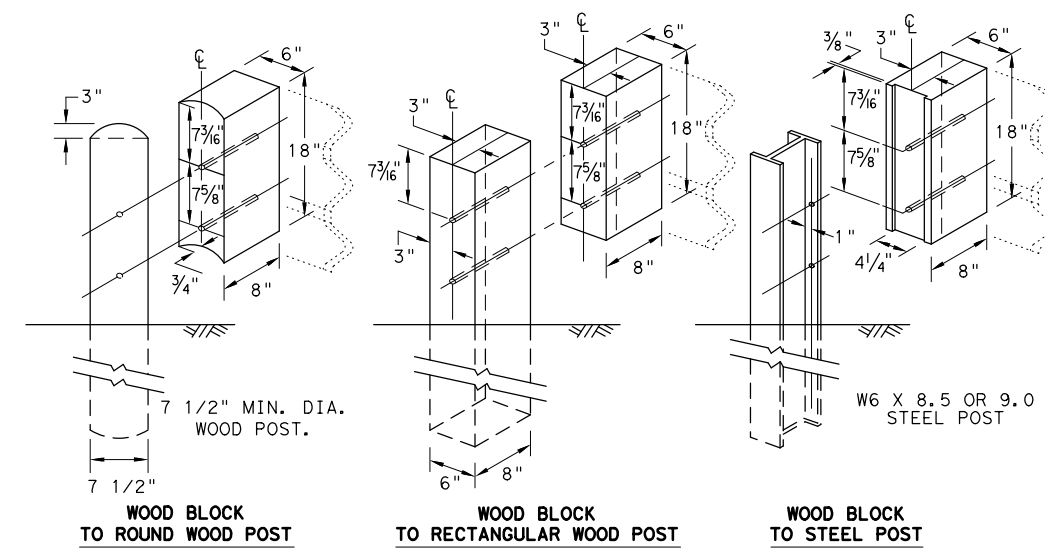
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

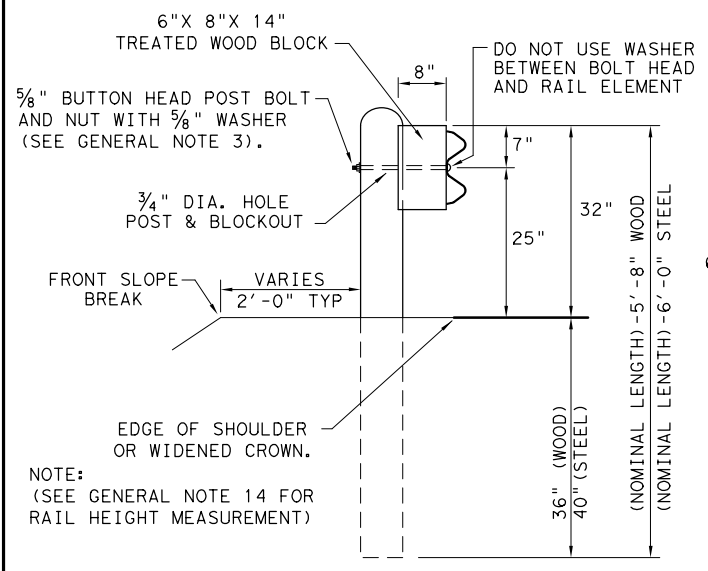
SHEET 2 OF 2



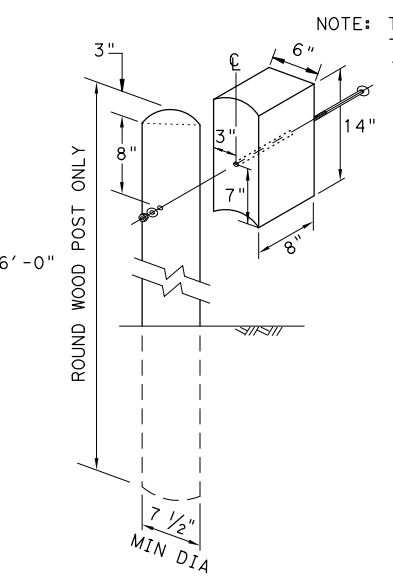
METAL BEAM GUARD FENCE
 THREE-BEAM TRANSITION
 TL-3 MASH COMPLIANT
 GF (31) TR TL3-20

FILE: gf31tr+1320.dgn	DN: TXDOT	CK: KM	DW: KM	CK: CGL/AG
©TXDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	120	

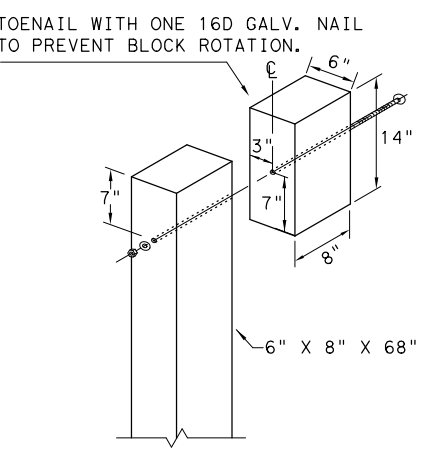
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.
 DATE: 05/13/2021
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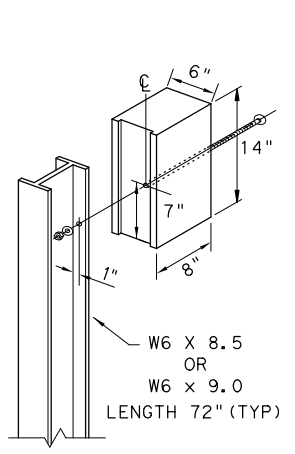
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST



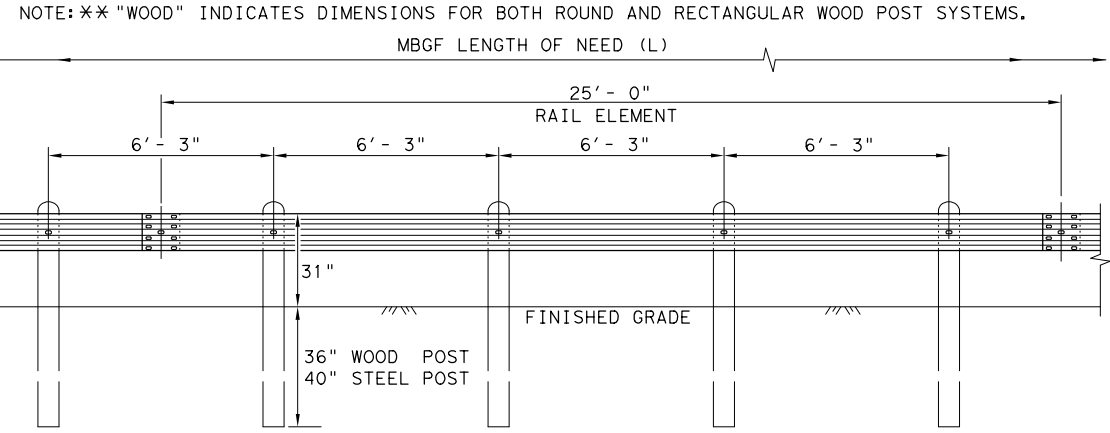
WOOD BLOCK TO RECTANGULAR WOOD POST



ROUTED WOOD BLOCK TO I-BEAM STEEL POST

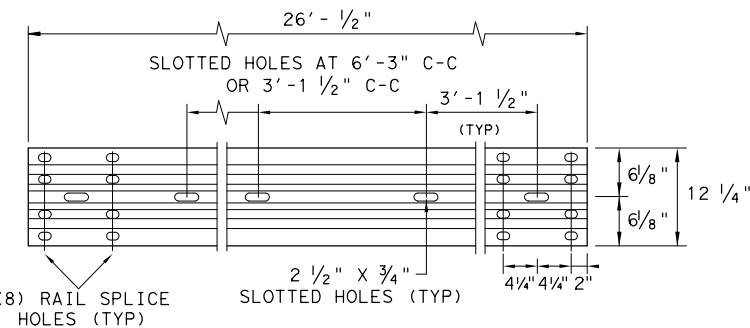
GENERAL NOTES

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 1/2" 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 5/8" WASHER (FWC16d) 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.



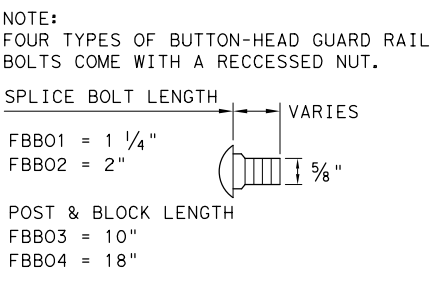
ELEVATION MID-SPAN RAIL SPLICE

SHOWING A 25' - 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



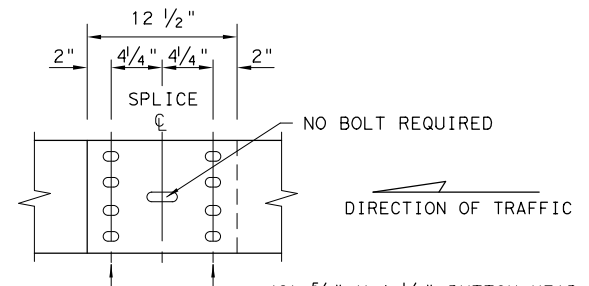
ELEVATION 25' - 0" (NOM.) W-BEAM SECTION

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES. SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.



BUTTON HEAD BOLT

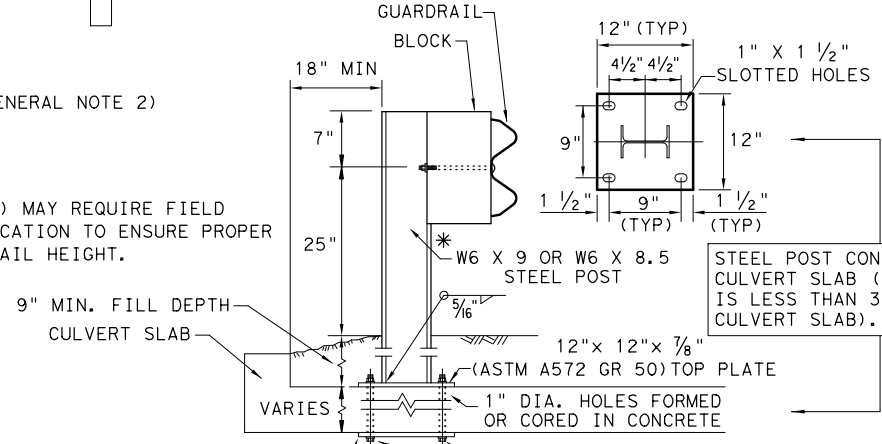
NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



LOW FILL CULVERT POST

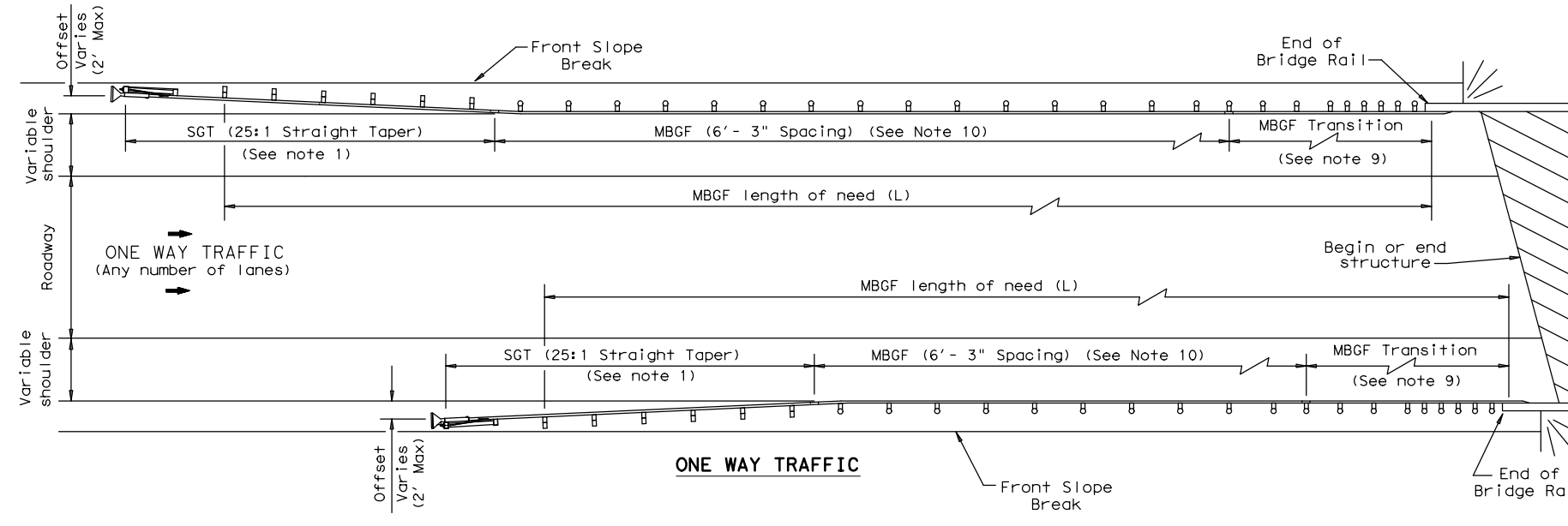
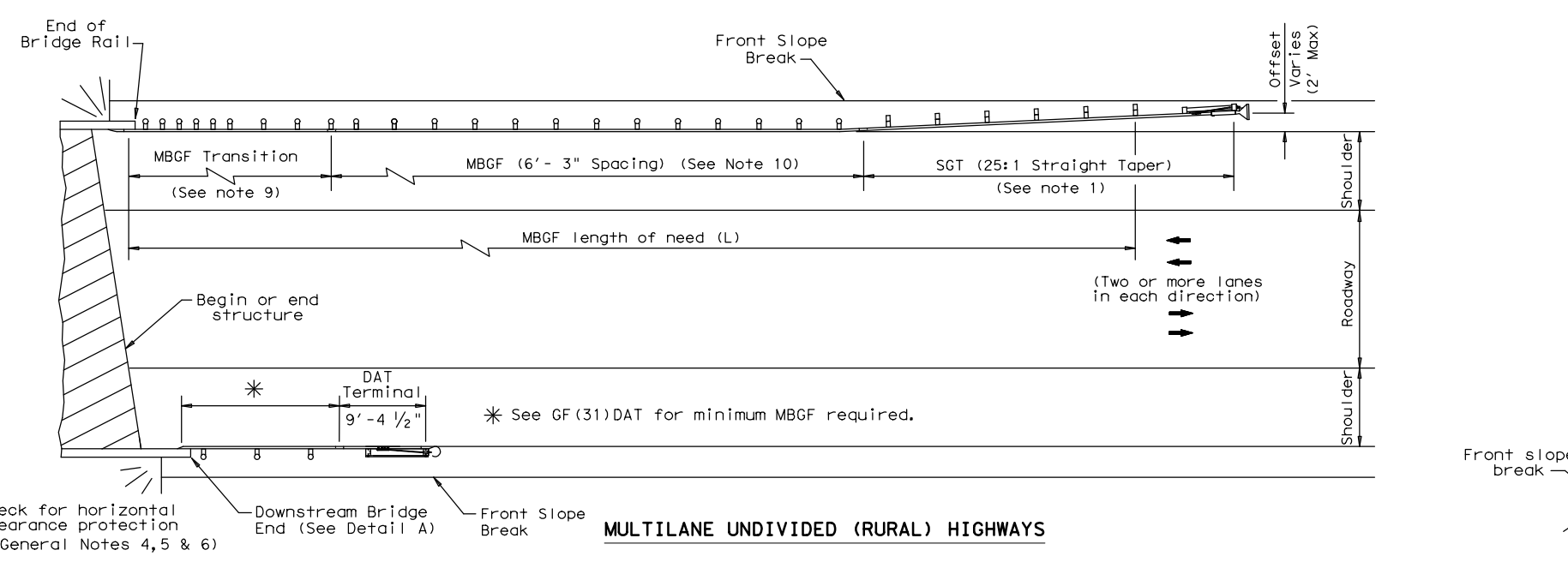
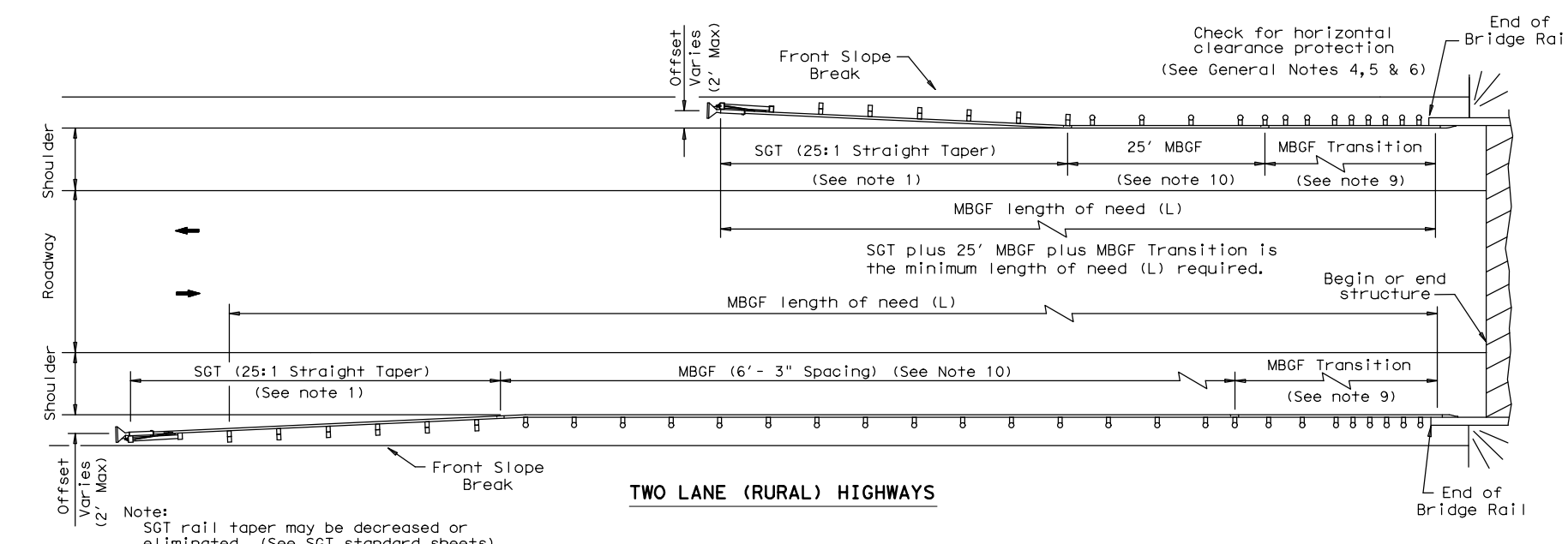
- NOTE: TWO INSTALLATION OPTIONS.
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
 2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" 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 1/4" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

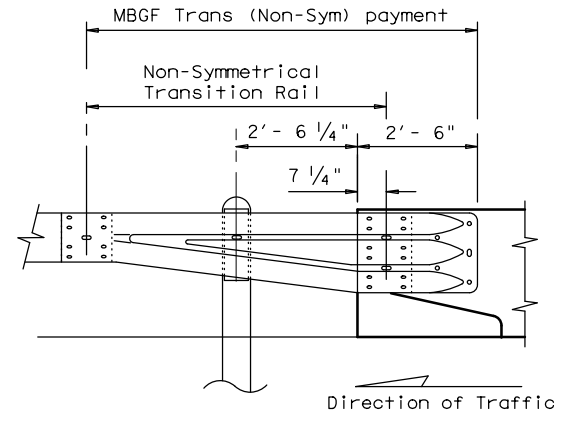
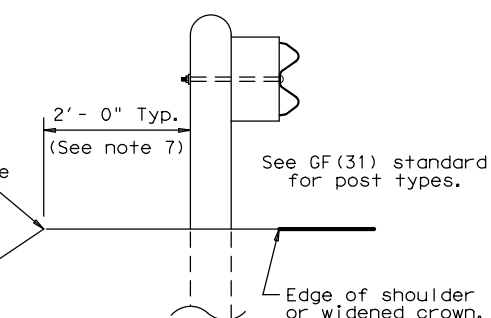
			Design Division Standard		
			METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT GF(31)-19		
FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG	
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
	0213	04	050	US 190	
	DIST	COUNTY		SHEET NO.	
	LFK	POLK		121	

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- ### GENERAL NOTES
- For more detail: See GF(31), SGT()31, GF(31)TR, and GF(31)TL2 standard sheets.
 - Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
 - Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
 - MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
 - Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
 - Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
 - The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'-0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
 - For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
 - Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
 - A minimum 25' length of MBGF will be required.

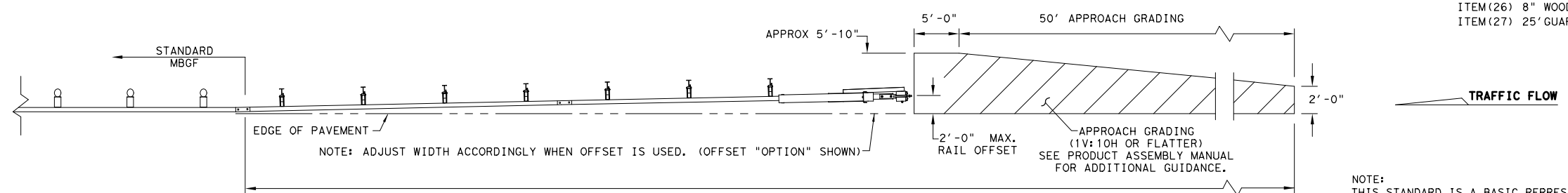
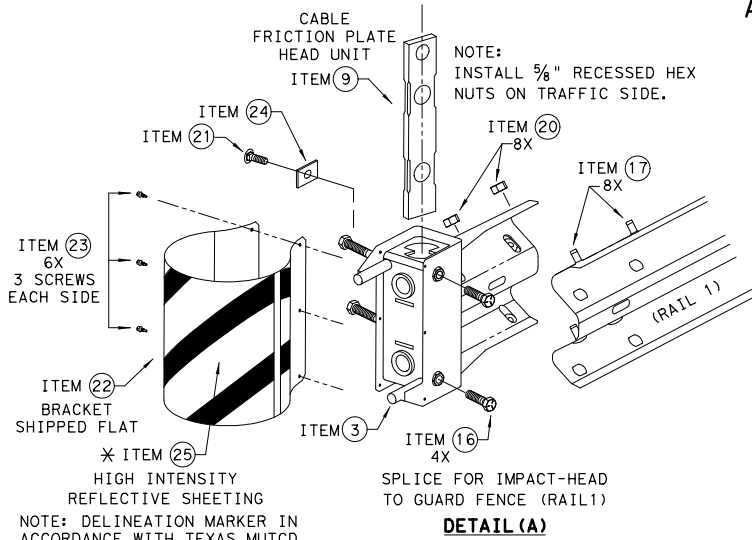
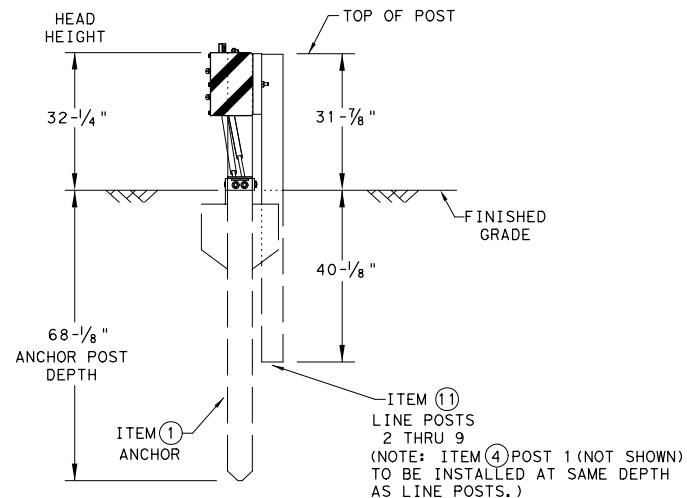
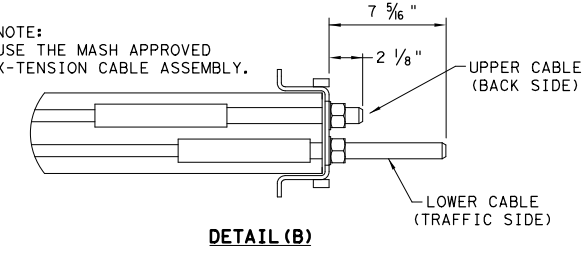
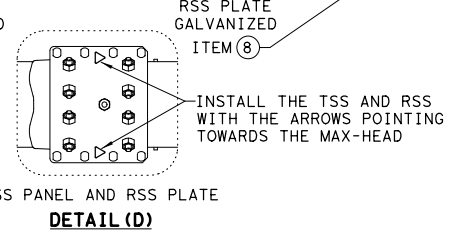
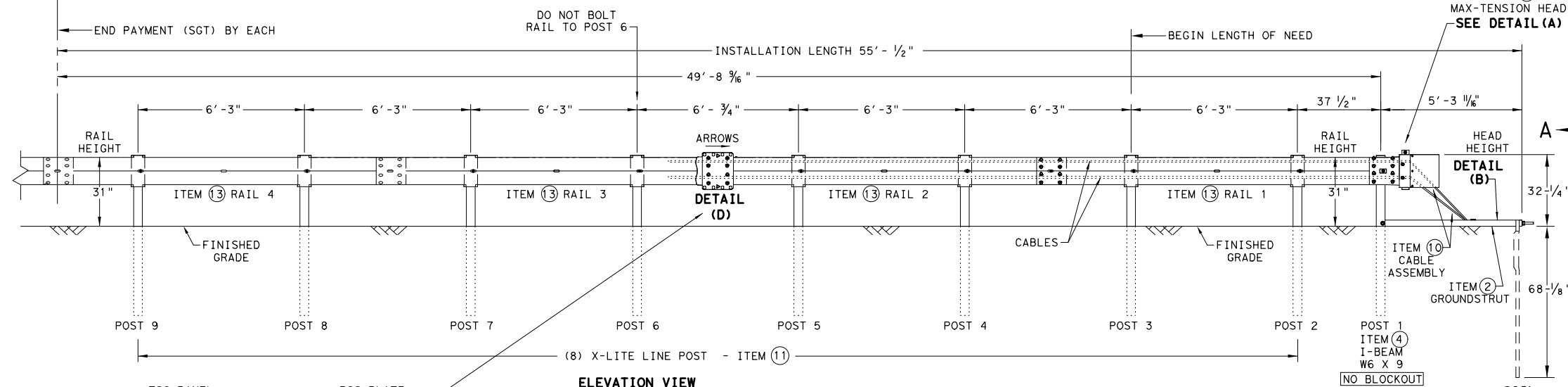
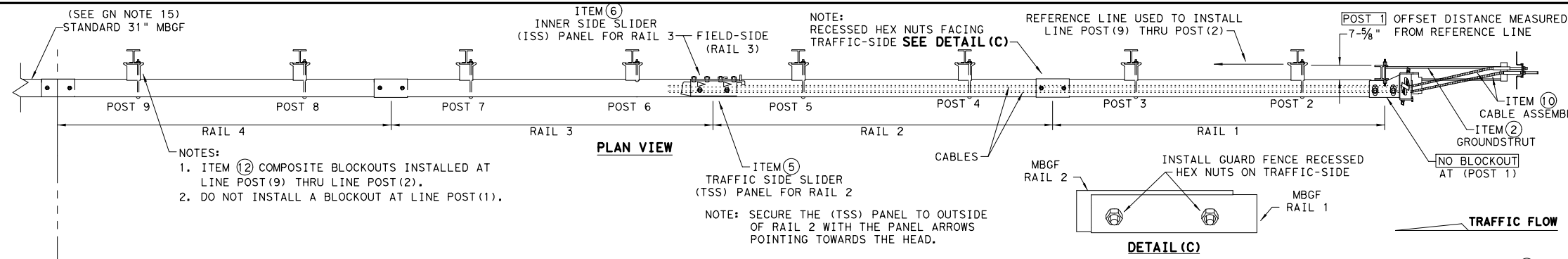


Note: All rail elements shall be lapped in the direction of adjacent traffic.

		Design Division Standard	
<h2>BRIDGE END DETAILS</h2> <h3>(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)</h3> <h1>BED-14</h1>			
FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP
© TxDOT: December 2011	CONT: 0213	SECT: 04	JOB: 050
REVISIONS	DIST: LFK		COUNTY: POLK
REVISED APRIL 2014 SEE (MEMO 0414)	HIGHWAY: US 190		SHEET NO.: 122

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GENERAL NOTES

- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
- FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE: MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
- 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.
- FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TxDOT'S LATEST ROADWAY MOW STRIP STANDARD.
- ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
- SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
- 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.
- REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
- IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
- POSTS SHALL NOT BE SET IN CONCRETE.
- 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.
- MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
- IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
- THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
- 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	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWRO3	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

Texas Department of Transportation
 Design Division Standard

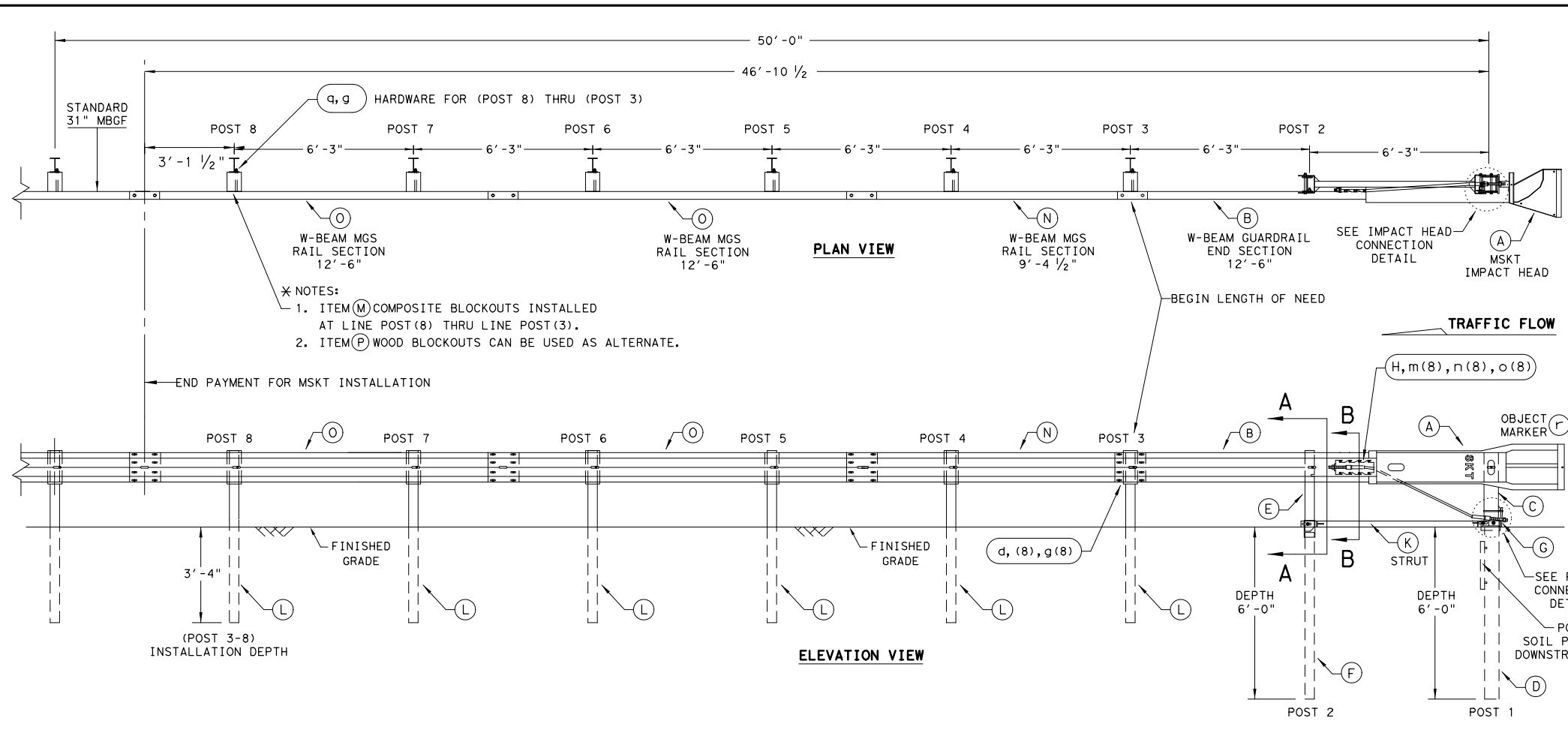
**MAX-TENSION END TERMINAL
 MASH - TL-3
 SGT (11S) 31-18**

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© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
DIST	COUNTY		SHEET NO.	
LFK	POLK		123	

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

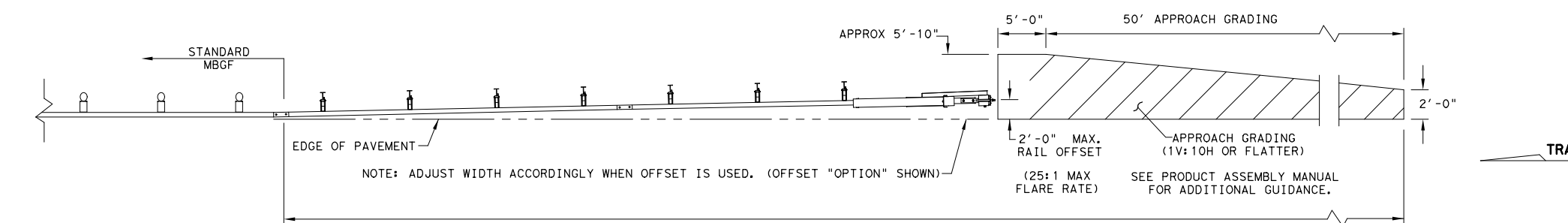
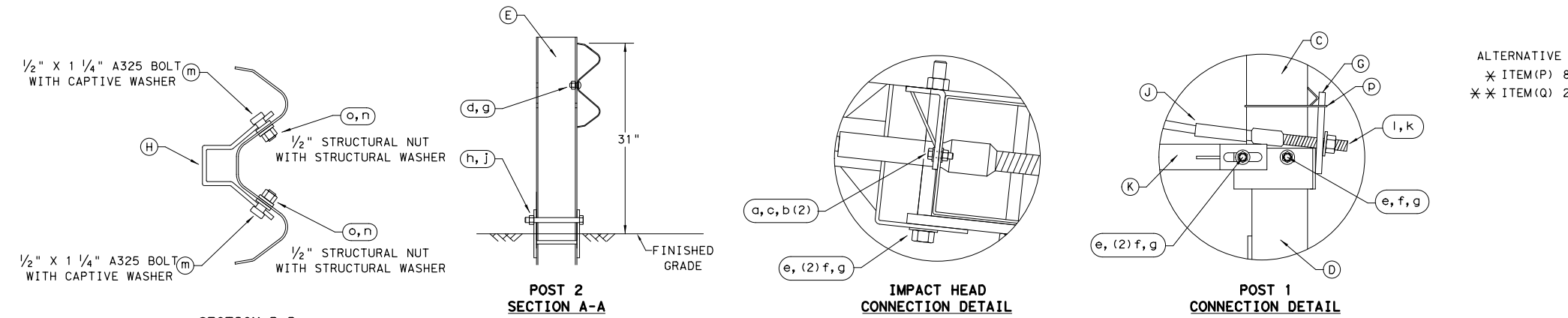
DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

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- GENERAL NOTES**
- 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
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
 - 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.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
 - 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.
 - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBSGF STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBSGF.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
 - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
 - THE SYSTEM IS SHOWN WITH TWO 12'-6" MBSGF PANELS, ONE 25'-0" MBSGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
 - 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.

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 1/8" 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 1/2")	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	5/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/8" WASHER	W0516
c	2	5/8" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/8" O.D. x 3/8" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



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.

Design Division Standard

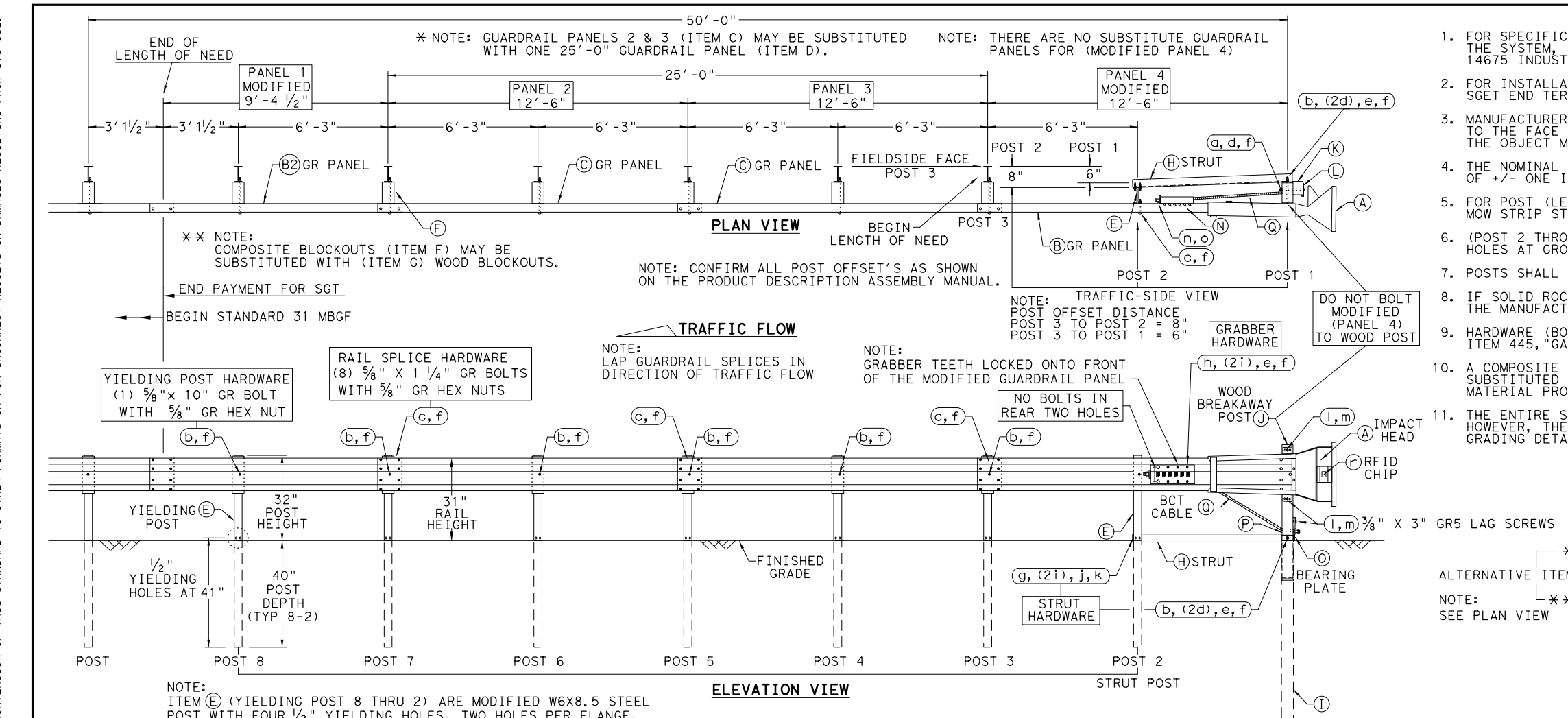
SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT (12S) 31-18

FILE: sgt12s3118.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CL
© TXDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	124	

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.

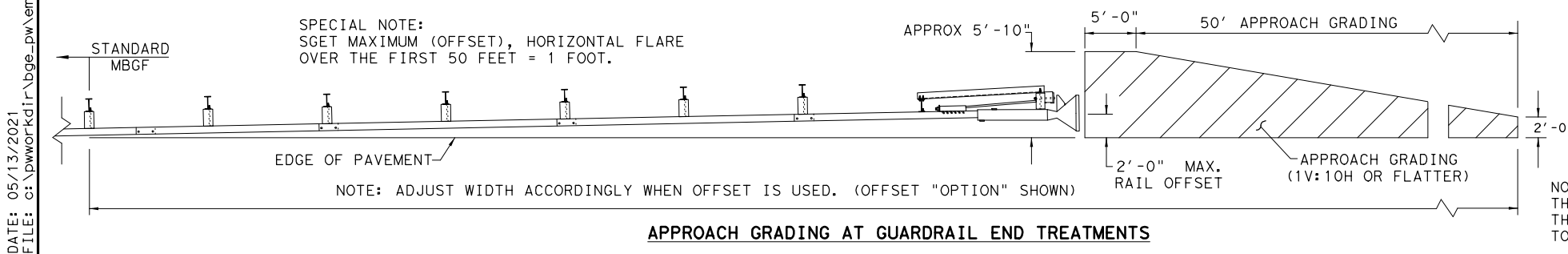
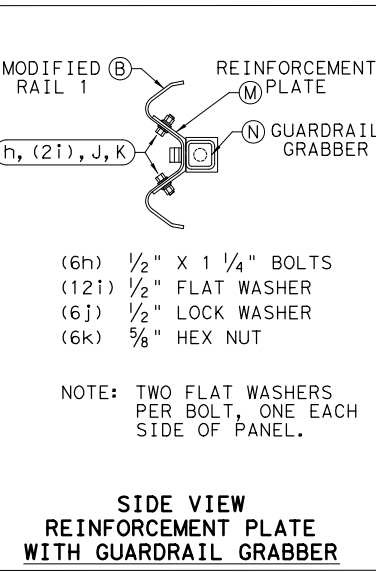
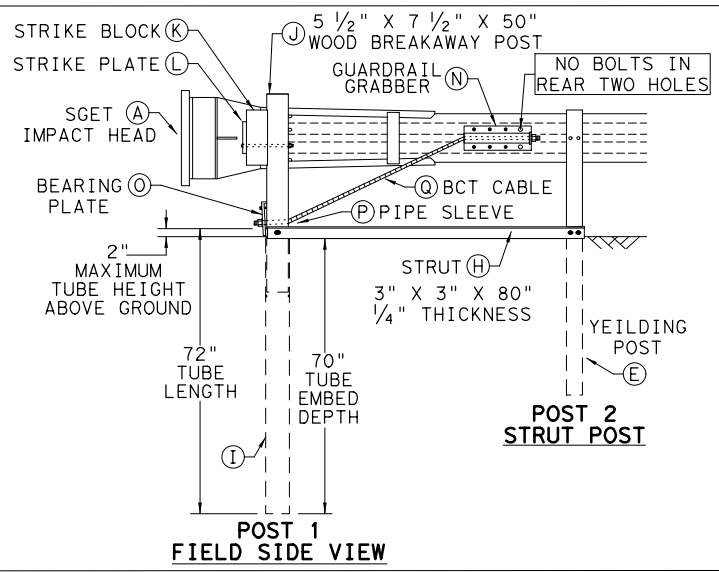
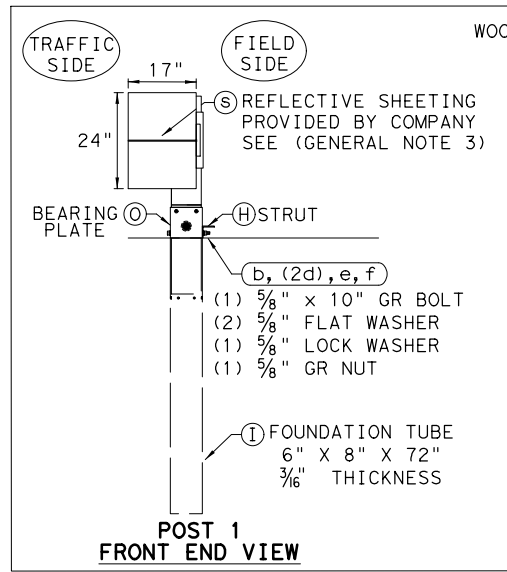
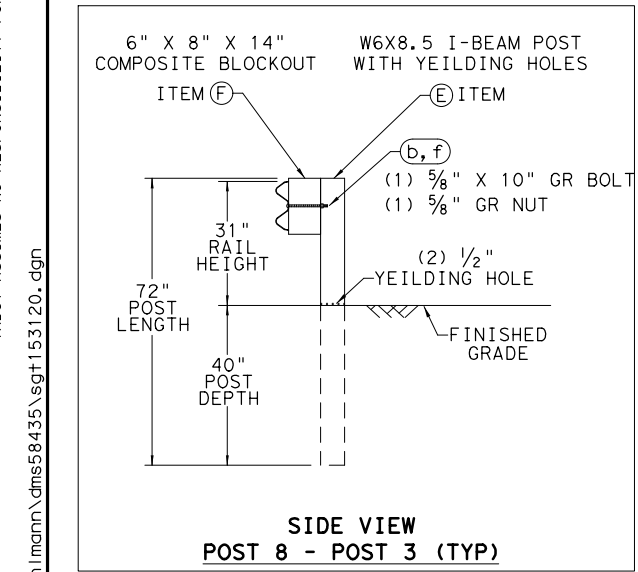


- ### GENERAL NOTES
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
 - 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.
 - THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - 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.
 - 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"	WB08
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	WSBK14
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"	GR17
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

ITEM	QTY	SMALL HARDWARE	ITEM #
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 A563HDG	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



NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT (15) 31-20

FILE: sgt153120.dgn	DN: TXDOT	CK: KM	DW: VP	CK: VP
© TXDOT: APRIL 2020	CONT: 0213	SECT: 04	JOB: 050	HIGHWAY: US 190
REVISIONS	DIST: LFK	COUNTY: POLK	SHEET NO. 125	

DATE: 05/13/2021
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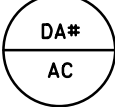


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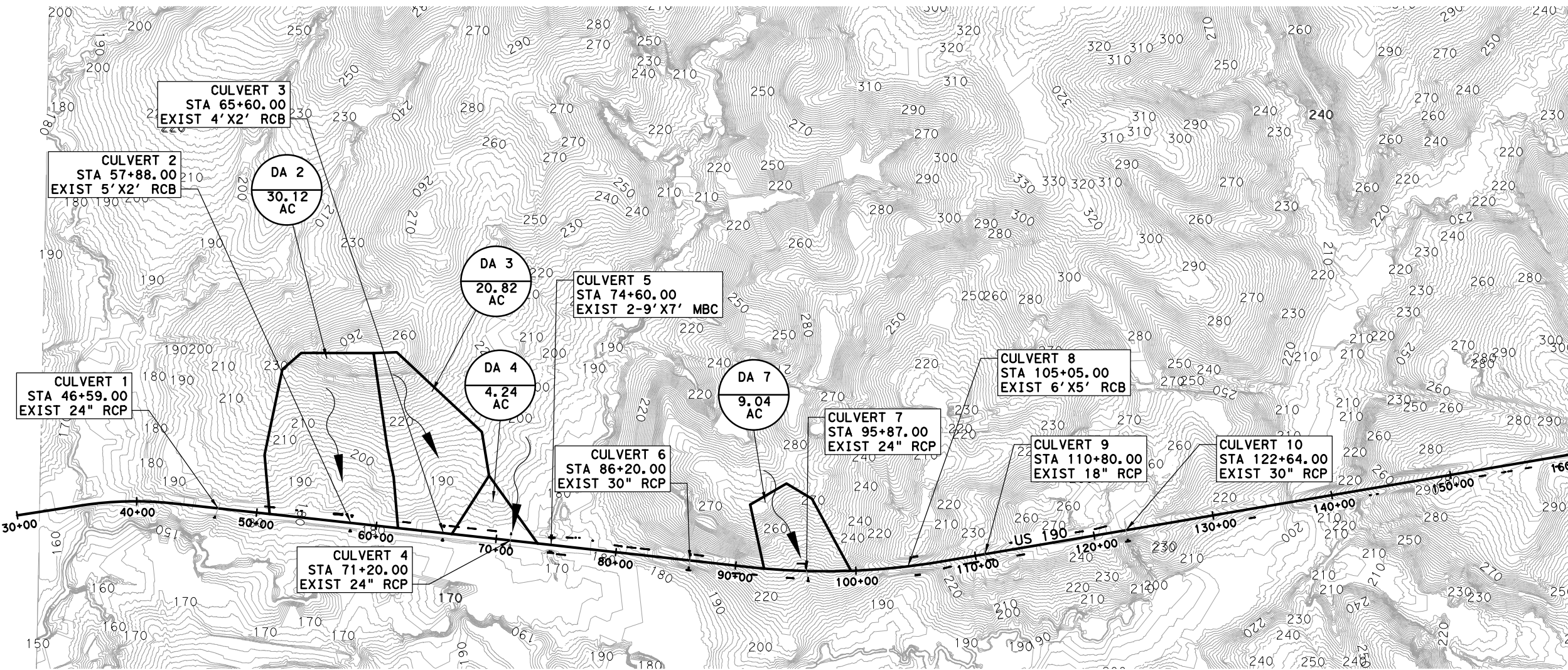
NOTES:

- ONLY STRUCTURES EXTENDED MORE THAN 20% OR REPLACED ARE ANALYZED

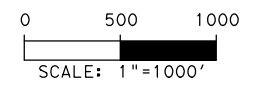
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 USGS16-70CM-NECHES-BASIN_3094181_HYPSO
 USGS16-70CM-NECHES-BASIN_3094172_HYPSO
 ALL USED AT A 1:1 SCALE

LEGEND

-  DRAINAGE AREA BOUNDARY
-  DRAINAGE AREA ID
ACREAGE
-  CONTOURS
-  FLOW DIRECTIONS



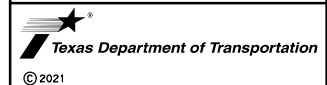
MATCHLINE STA 160+00.00



05/13/2021

DRAINAGE AREA MAP

SHEET 1 OF 3



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 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		126	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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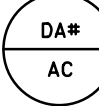


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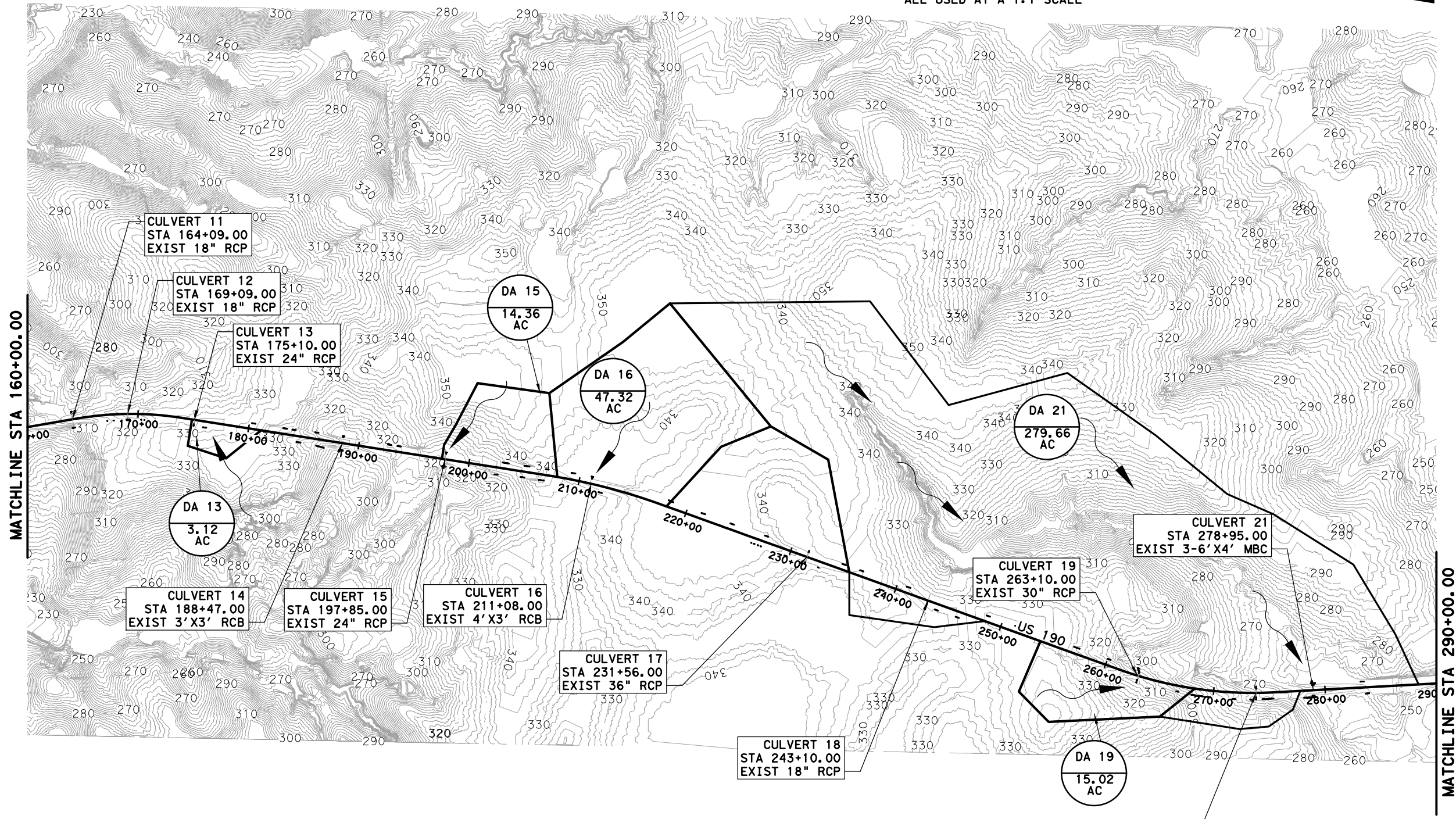
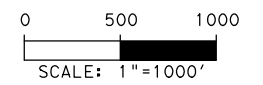
NOTES:

1. ONLY STRUCTURES EXTENDED MORE THAN 20% OR REPLACED ARE ANALYZED
2. DRAINAGE AREA #21 INCLUDES SUB AREAS 18, 19, AND 20.

THE QUADRANGLES USED ARE:
 USGS16-70CM-NECHES-BASIN_3094094_HYPSO
 USGS16-70CM-NECHES-BASIN_3094181_HYPSO
 USGS16-70CM-NECHES-BASIN_3094172_HYPSO
 ALL USED AT A 1:1 SCALE

LEGEND

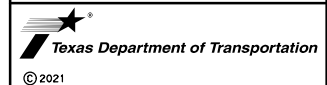
-  DRAINAGE AREA BOUNDARY
-  DRAINAGE AREA ID
ACREAGE
-  CONTOURS
-  FLOW DIRECTIONS



05/13/2021

DRAINAGE AREA MAP

SHEET 2 OF 3

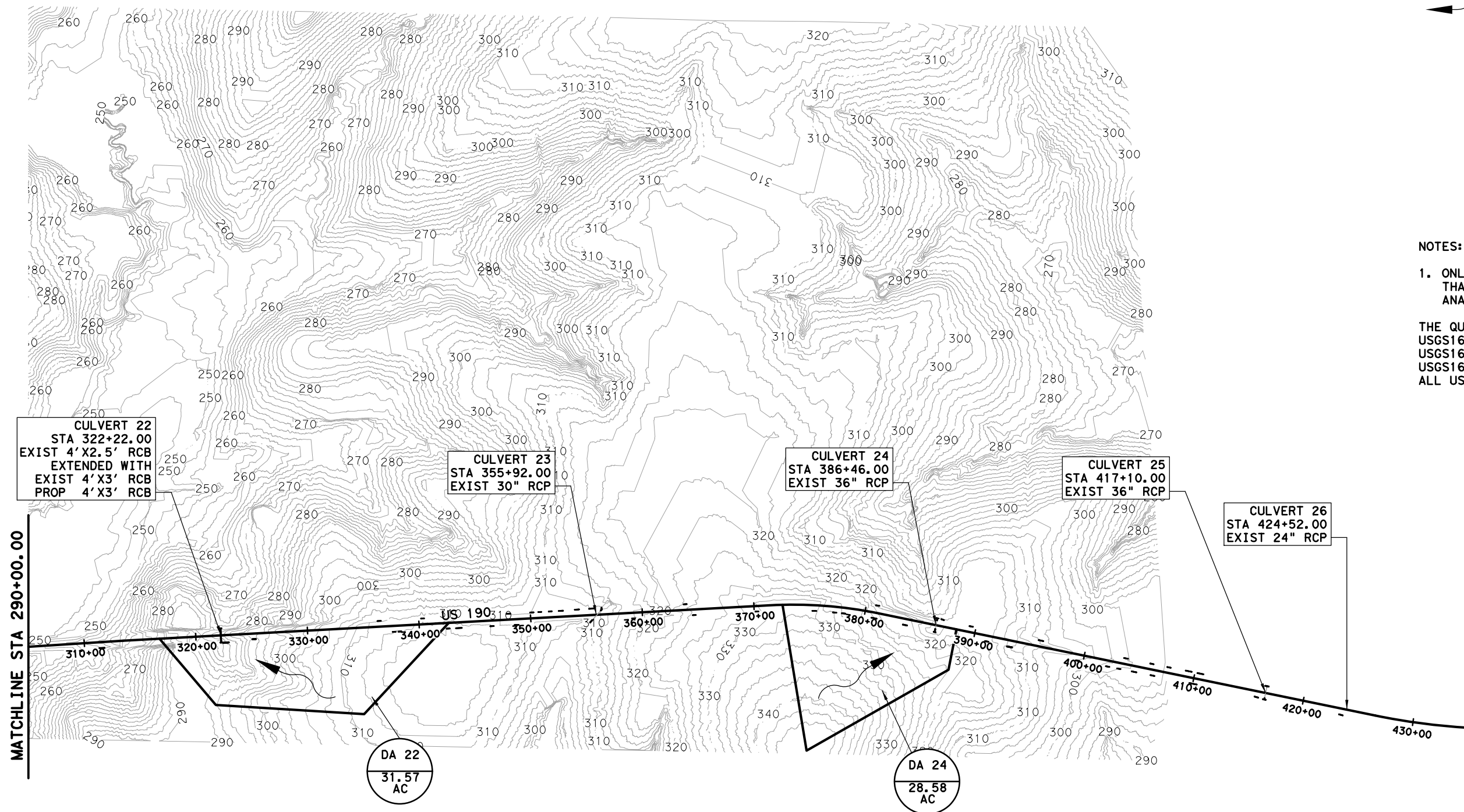


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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		127	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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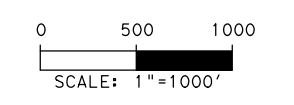
LEGEND

- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA ID
ACREAGE
- CONTOURS
- FLOW DIRECTIONS

NOTES:

- ONLY STRUCTURES EXTENDED MORE THAN 20% OR REPLACED ARE ANALYZED

THE QUADRANGLES USED ARE:
 USGS16-70CM-NECHES-BASIN_3094094_HYPSO
 USGS16-70CM-NECHES-BASIN_3094181_HYPSO
 USGS16-70CM-NECHES-BASIN_3094172_HYPSO
 ALL USED AT A 1:1 SCALE



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DRAINAGE AREA MAP

SHEET 3 OF 3

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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		128	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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TIME OF CONCENTRATION COMPUTATIONS																																		
OVERLAND FLOW									SHALLOW CONCENTRATED FLOW							CHANNEL FLOW										Total Reach Length		Total Elev Drop		Total T _c		Total Calculated T _c		T _c Used
D. A.	CUL #	High Elev (ft)	Low Elev (ft)	Reach Length (ft)	Slope (ft/ft)	n	2yr, 24-hr Rainfall Depth (in)	T _r (hr)	High Elev (ft)	Low Elev (ft)	Reach Length (ft)	Slope (ft/ft)	Paved / Unpaved	V (ft/sec)	T _r (hr)	High Elev (ft)	Low Elev (ft)	Reach Length (ft)	Slope (ft/ft)	n	A (ft ²)	WP (ft)	R (ft)	V (ft/sec)	T _r (hr)	(ft)	(ft)	(hr)	(min)	(min)				
2	2	250.00	241.81	100.00	0.082	0.150	4.75	0.08	241.8	176.14	1424.38	0.046	Unpaved	3.46	0.11												1524	74	0.19	11.43	11.43			
3	3	265.00	262.03	100.00	0.030	0.150	4.75	0.11	262.0	176.39	1529.24	0.056	Unpaved	3.82	0.11												1629	89	0.23	13.54	13.54			
4	4	195.82	189.95	100.00	0.059	0.150	4.75	0.09	189.9	176.13	474.72	0.029	Unpaved	2.75	0.05												575	20	0.13	8.10	10.00			
7	7	280.00	274.43	100.00	0.056	0.150	4.75	0.09	274.4	225.87	650.08	0.075	Unpaved	4.41	0.04												750	54	0.13	7.79	10.00			
13	13	337.67	335.31	100.00	0.024	0.350	4.75	0.25	335.3	325.14	360.16	0.028	Unpaved	2.71	0.04												460	13	0.28	17.02	17.02			
15	15	346.11	345.35	100.00	0.008	0.300	4.75	0.34	345.3	319.19	1313.48	0.020	Unpaved	2.28	0.16												1413	27	0.50	30.24	30.24			
16	16	354.00	352.01	100.00	0.020	0.800	4.75	0.51	352.0	333.65	1726.20	0.011	Unpaved	1.66	0.29												1826	20	0.80	48.04	48.04			
19	19	344.00	341.24	100.00	0.028	0.750	4.75	0.43	341.2	305.99	853.64	0.041	Unpaved	3.28	0.07												954	38	0.50	29.96	29.96			
21	21	354.00	353.38	100.00	0.006	0.800	4.75	0.82	353.4	320.00	2218.69	0.015	Unpaved	1.98	0.31	320.00	254.56	5347.66	0.012	0.800	330.03	212.54	1.55	0.28	5.38	7666	99	6.51	390.31	390.31				
22	22	311.11	310.08	100.00	0.010	0.350	4.75	0.34	310.1	274.44	1462.81	0.024	Unpaved	2.52	0.16												1563	37	0.51	30.36	30.36			
24	24	351.04	349.73	100.00	0.013	0.450	4.75	0.38	349.7	312.07	1683.14	0.022	Unpaved	2.41	0.19												1783	39	0.58	34.58	34.58			

RUNOFF COMPUTATIONS - RATIONAL METHOD									
D. A.	CUL #	COMPOSITE RUNOFF COEFFICIENT C	T _c (MIN)	INTENSITY I (IN/HR)	AREA (FT ²)	AREA (AC)	Q (CFS)	25-YR	100-YR
2	2	0.35	11.43	8.97	1311919	30.12	94.56	119.44	
3	3	0.34	13.54	8.41	907109	20.82	59.53	75.32	
4	4	0.33	10.00	9.40	184842	4.24	13.15	16.58	
7	7	0.38	10.00	9.40	393902	9.04	32.29	40.71	
13	13	0.38	17.02	7.65	135959	3.12	9.07	11.51	
15	15	0.37	30.24	5.79	625358	14.36	30.76	39.37	
16	16	0.33	48.04	4.46	2061274	47.32	69.65	89.95	
19	19	0.40	29.96	5.82	654357	15.02	34.97	44.76	
22	22	0.33	30.36	5.78	1375178	31.57	60.22	77.09	
24	24	0.36	34.58	5.38	1244783	28.58	55.35	71.10	

C-VALUE COMPUTATIONS						
D. A.	CUL #	Relief C _r	Soil Infiltration C _i	Vegetal Cover C _v	Surface Storage C _s	Composite Runoff Coefficient C
2	2	0.14	0.06	0.06	0.09	0.35
3	3	0.13	0.06	0.06	0.09	0.34
4	4	0.13	0.06	0.05	0.09	0.33
7	7	0.17	0.08	0.06	0.07	0.38
13	13	0.17	0.08	0.04	0.09	0.38
15	15	0.14	0.07	0.06	0.10	0.37
16	16	0.14	0.08	0.04	0.07	0.33
19	19	0.15	0.07	0.08	0.10	0.40
21	21	0.22	0.10	0.06	0.09	0.47
22	22	0.14	0.05	0.06	0.08	0.33
24	24	0.14	0.06	0.06	0.10	0.36

RUNOFF COMPUTATIONS - NRCS (TR-55) METHOD									
D. A.	CUL #	DESIGN YEAR	AREA (MI ²)	RCN	T _c (MIN)	T _c (HR)	P (IN)	F	Q _r (CFS)
21	21	25	0.44	73	390.31	6.51	7.40	0.97	160
		100	0.44	73	390.31	6.51	9.20	0.97	220

NOTES:

- ONLY STRUCTURES EXTENDED MORE THAN 20%, OR LOCATED IN A FEMA FLOOD ZONE "A" ARE ANALYZED.
- RATIONAL METHOD USED FOR AREAS < 200 AC.
- NRCS METHOD USED FOR AREAS > 200 AC.

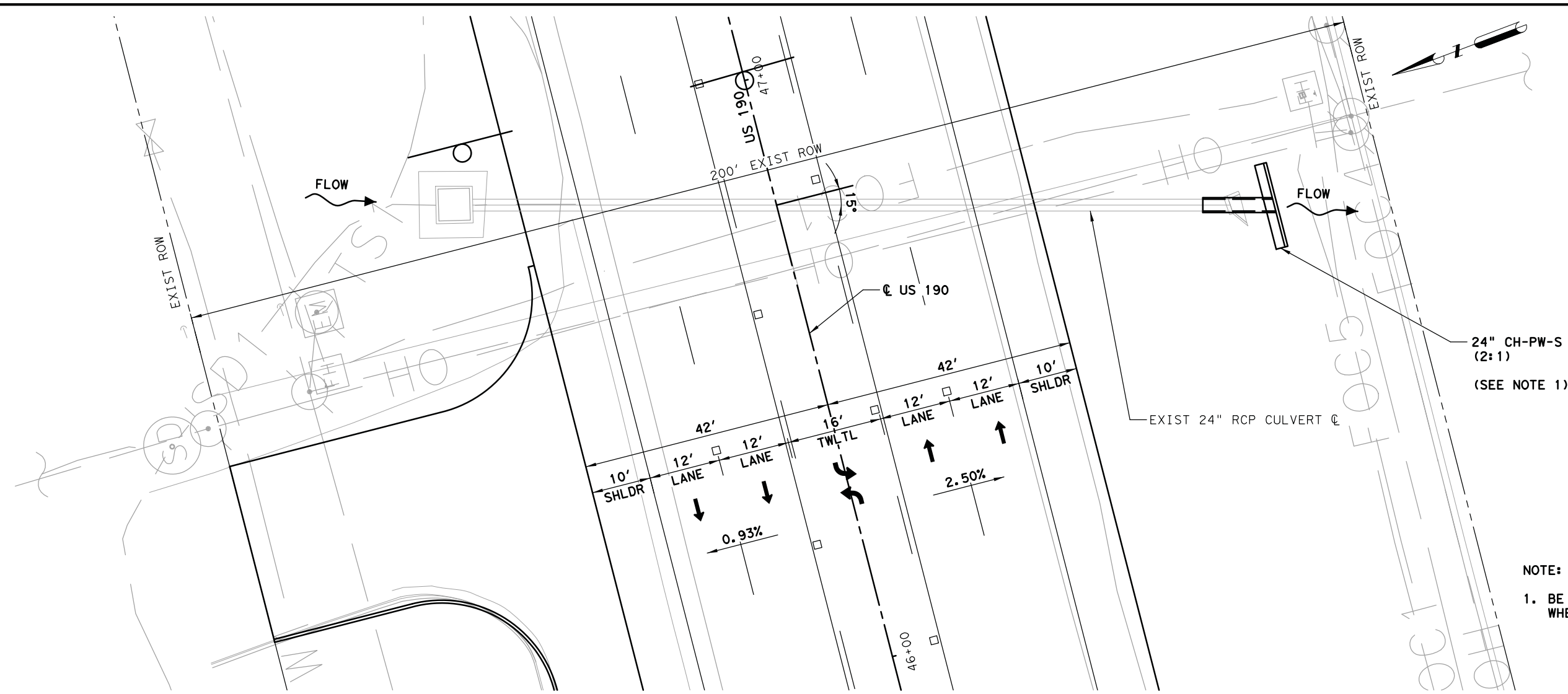
05/13/2021

DRAINAGE AREA CALCULATIONS



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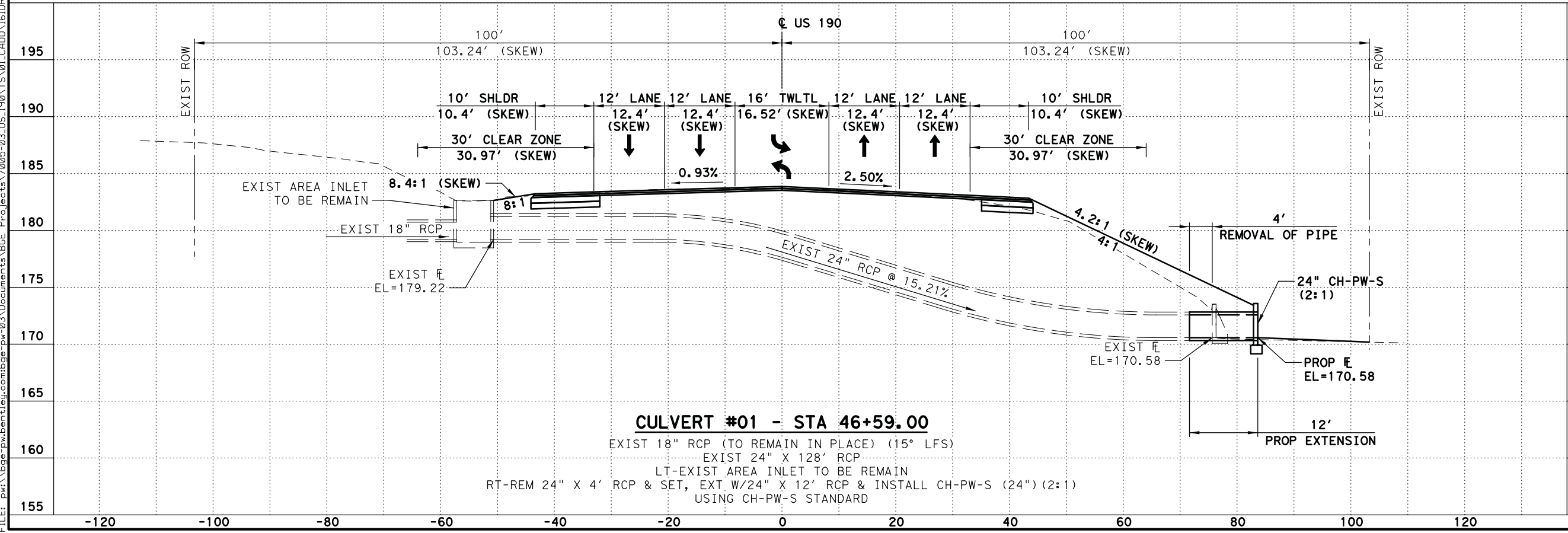
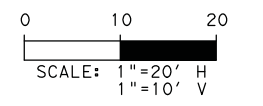
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6		129
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190



24" CH-PW-S (2:1)
 (SEE NOTE 1)

EXIST 24" RCP CULVERT

NOTE:
 1. BE AWARE OF OVERHEAD POWER LINES WHEN CONSTRUCTING PROPOSED CULVERT.



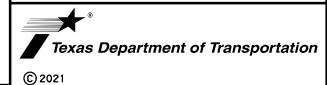
CULVERT #01 - STA 46+59.00

EXIST 18" RCP (TO REMAIN IN PLACE) (15' LFS)
 EXIST 24" X 128' RCP
 LT-EXIST AREA INLET TO BE REMAIN
 RT-REM 24" X 4' RCP & SET, EXT W/24" X 12' RCP & INSTALL CH-PW-S (24") (2:1)
 USING CH-PW-S STANDARD



CULVERT LAYOUT

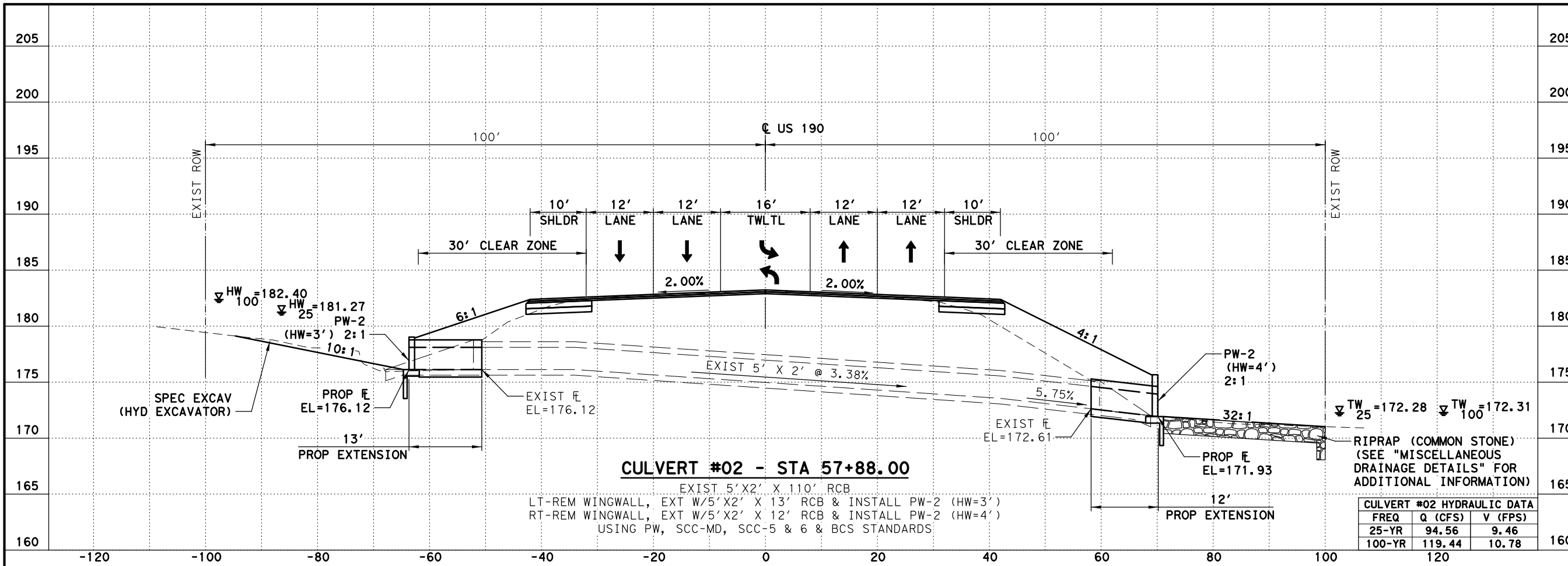
SHEET 1 OF 15



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STATE TEXAS	STATE DIST. NO. LFK	COUNTY POLK		
CONT. 0213	SECT. 04	JOB 050	HIGHWAY NO. US 190	

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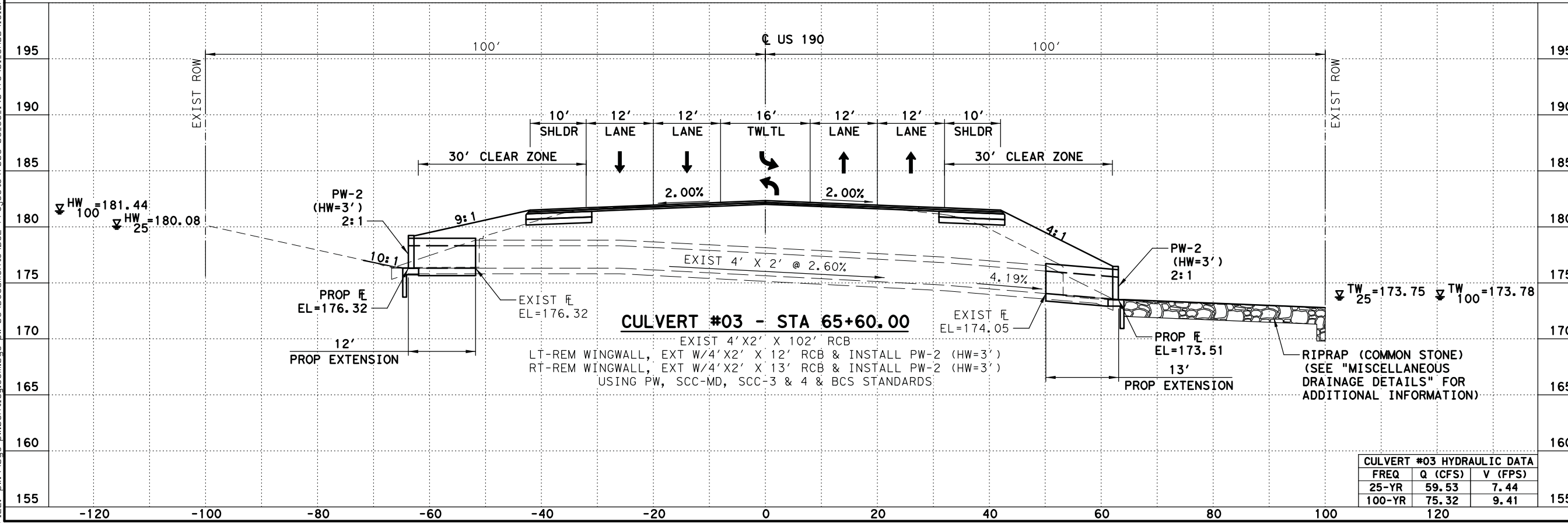
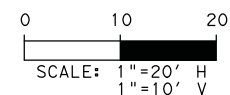
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CULVERT #02 - STA 57+88.00

EXIST 5' X 2' X 1.10' RCB
 LT-REM WINGWALL, EXT W/5' X 2' X 13' RCB & INSTALL PW-2 (HW=3')
 RT-REM WINGWALL, EXT W/5' X 2' X 12' RCB & INSTALL PW-2 (HW=4')
 USING PW, SCC-MD, SCC-5 & 6 & BCS STANDARDS

CULVERT #02 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	94.56	9.46
100-YR	119.44	10.78



CULVERT #03 - STA 65+60.00

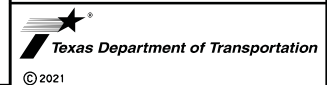
EXIST 4' X 2' X 102' RCB
 LT-REM WINGWALL, EXT W/4' X 2' X 12' RCB & INSTALL PW-2 (HW=3')
 RT-REM WINGWALL, EXT W/4' X 2' X 13' RCB & INSTALL PW-2 (HW=3')
 USING PW, SCC-MD, SCC-3 & 4 & BCS STANDARDS

CULVERT #03 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	59.53	7.44
100-YR	75.32	9.41



CULVERT LAYOUT

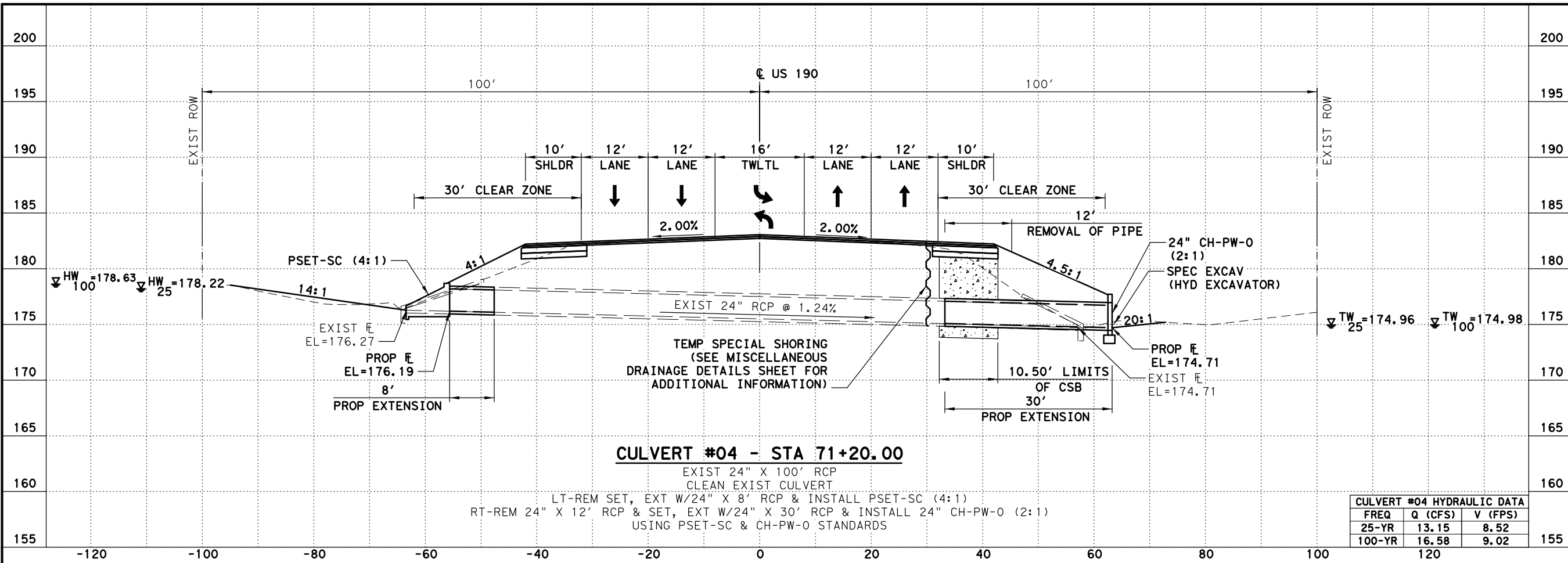
SHEET 2 OF 15



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FED. RD. DIST. NO. 6	PROJECT NO. 131
STATE DIST. NO. TEXAS	COUNTY LFK POLK
CONT. SECT. 0213 04	JOB HIGHWAY NO. 050 US 190

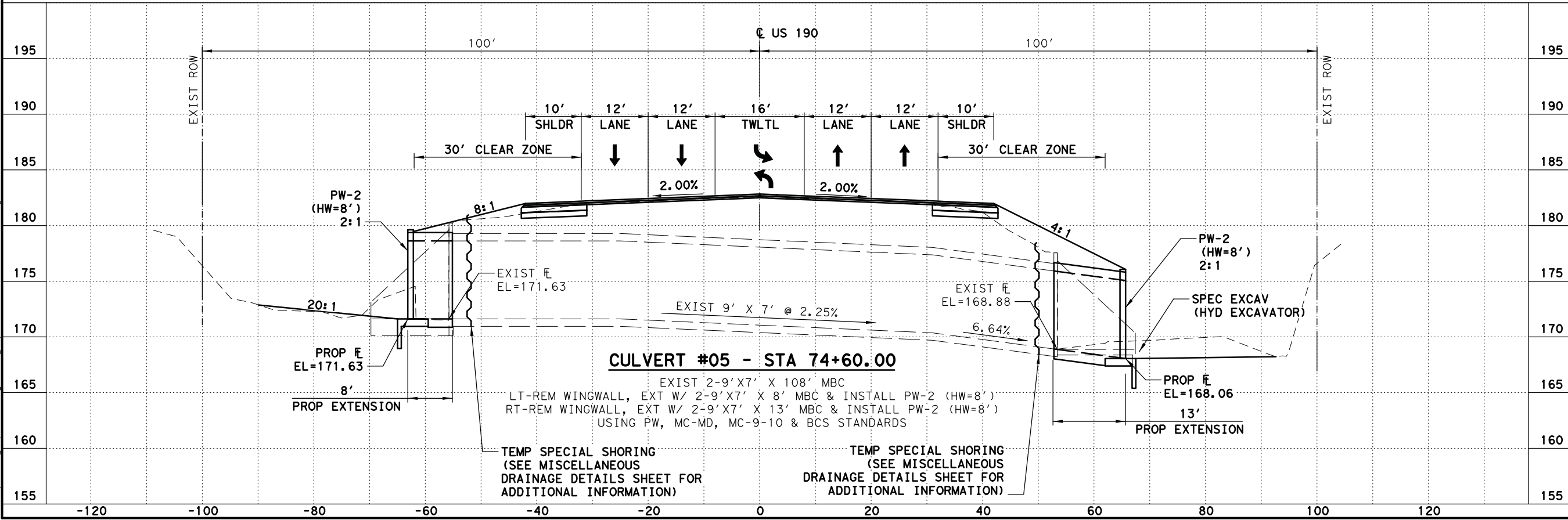
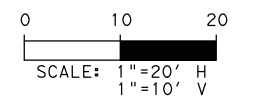
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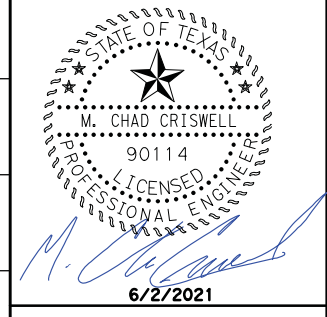


CULVERT #04 - STA 71+20.00
 EXIST 24" X 100' RCP
 CLEAN EXIST CULVERT
 LT-REM SET, EXT W/24" X 8' RCP & INSTALL PSET-SC (4:1)
 RT-REM 24" X 12' RCP & SET, EXT W/24" X 30' RCP & INSTALL 24" CH-PW-0 (2:1)
 USING PSET-SC & CH-PW-0 STANDARDS

CULVERT #04 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	13.15	8.52
100-YR	16.58	9.02

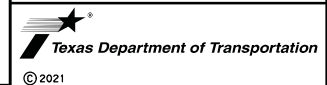


CULVERT #05 - STA 74+60.00
 EXIST 2-9' X 7' X 108' MBC
 LT-REM WINGWALL, EXT W/ 2-9' X 7' X 8' MBC & INSTALL PW-2 (HW=8')
 RT-REM WINGWALL, EXT W/ 2-9' X 7' X 13' MBC & INSTALL PW-2 (HW=8')
 USING PW, MC-MD, MC-9-10 & BCS STANDARDS



CULVERT LAYOUT

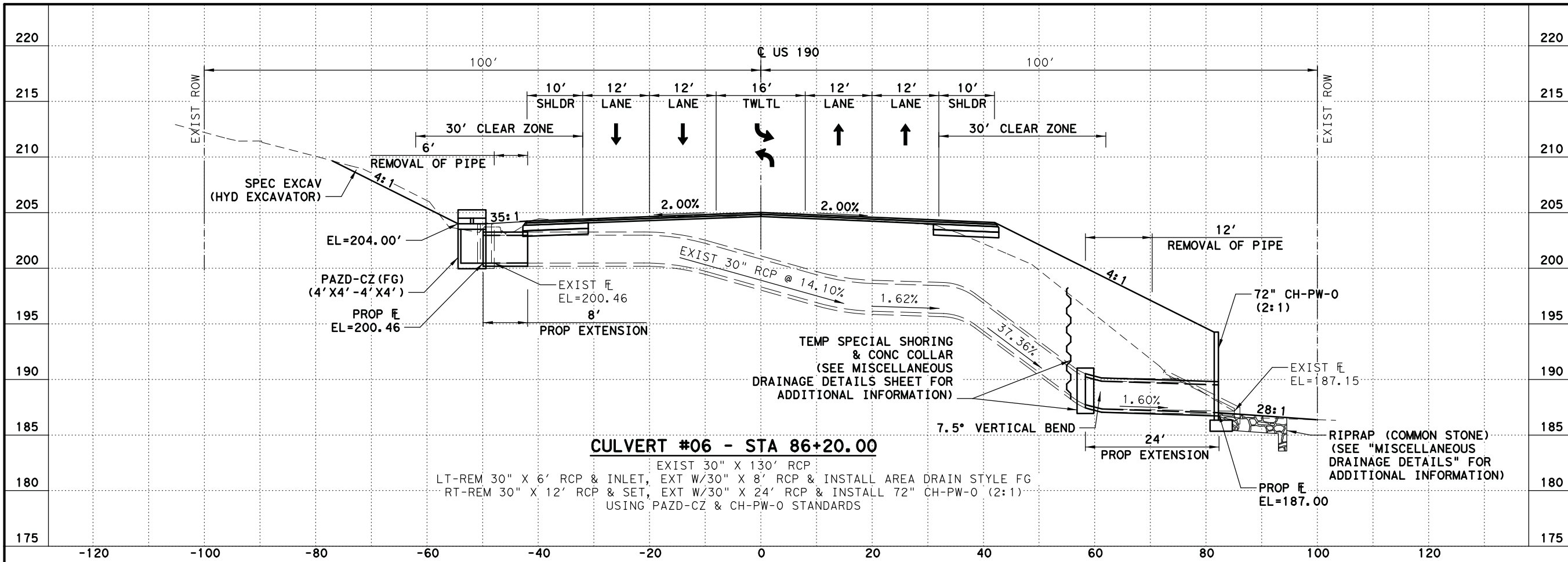
SHEET 3 OF 15



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FED. RD. DIV. NO. 6	PROJECT NO.	COUNTY 132	
STATE DIST. NO. TEXAS	STATE DIST. NO. LFK	COUNTY POLK	
CONT. 0213	SECT. 04	JOB 050	HIGHWAY NO. US 190

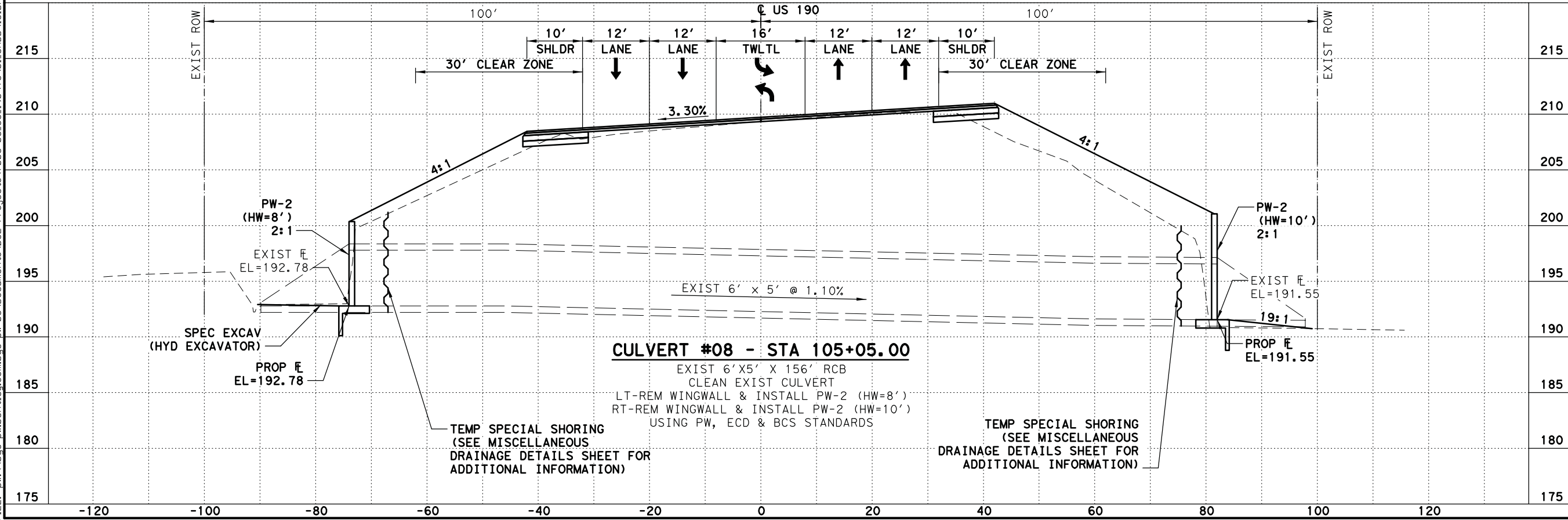
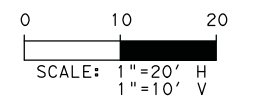
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CULVERT #06 - STA 86+20.00
 EXIST 30" X 130' RCP
 LT-REM 30" X 6' RCP & INLET, EXT W/30" X 8' RCP & INSTALL AREA DRAIN STYLE FG
 RT-REM 30" X 12' RCP & SET, EXT W/30" X 24' RCP & INSTALL 72" CH-PW-0 (2:1)
 USING PAZD-CZ & CH-PW-0 STANDARDS

NOTES:
 THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0) (DIA=72IN). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR A 54IN DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-0, EXCEPT FOR THE "K" DIMENSION (TOP OF THE PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.



CULVERT #08 - STA 105+05.00
 EXIST 6' X 5' X 156' RCB
 CLEAN EXIST CULVERT
 LT-REM WINGWALL & INSTALL PW-2 (HW=8')
 RT-REM WINGWALL & INSTALL PW-2 (HW=10')
 USING PW, ECD & BCS STANDARDS



CULVERT LAYOUT

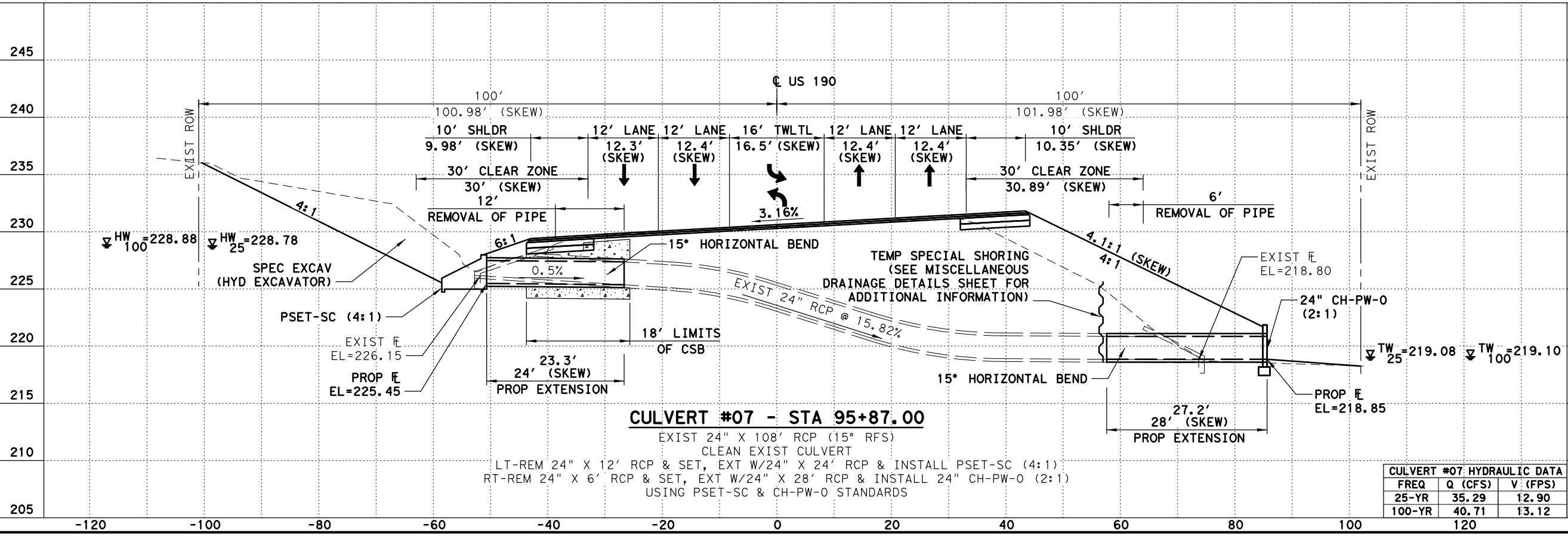
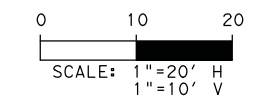
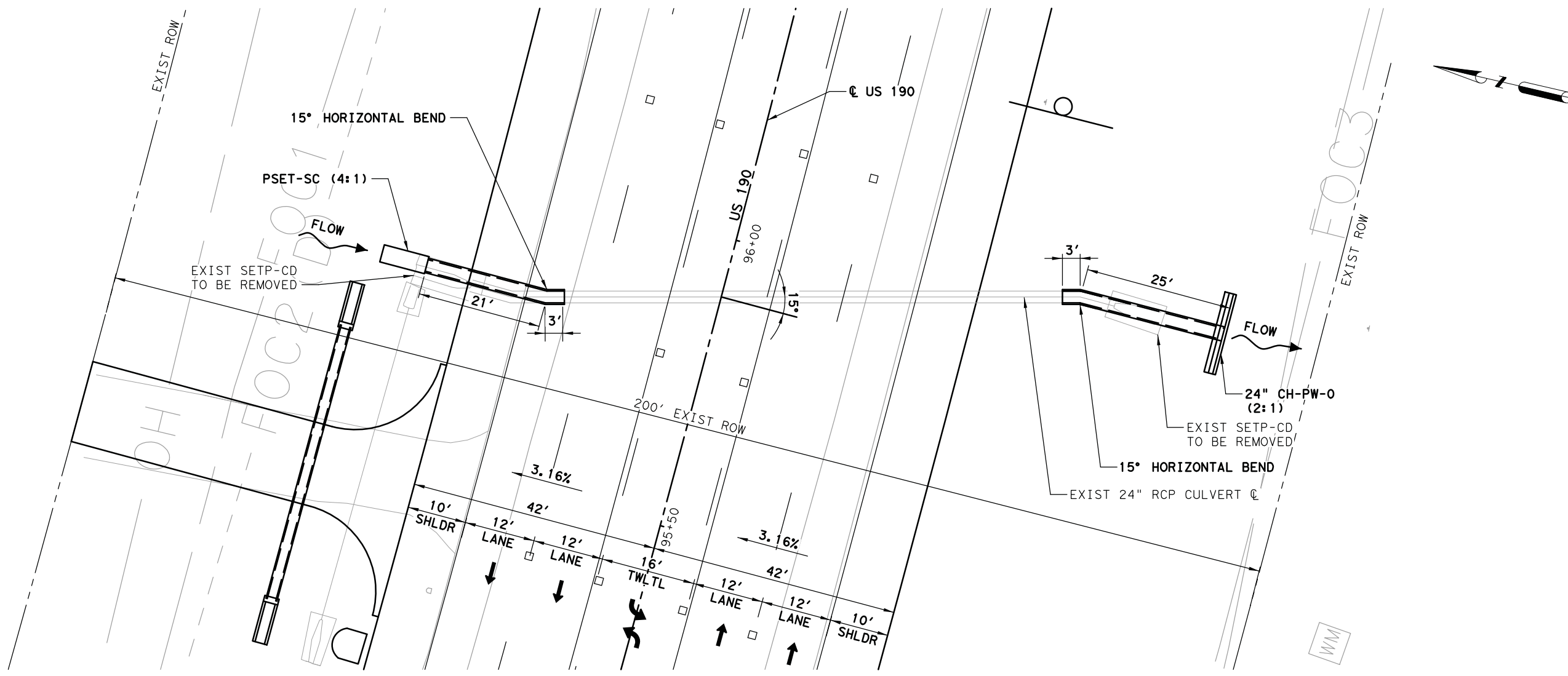
SHEET 4 OF 15



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FED. RD. DIV. NO. 6	PROJECT NO.	COUNTY POLK	
STATE TEXAS	STATE DIST. NO. LFK	JOB 050	HIGHWAY NO. US 190

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CULVERT #07 - STA 95+87.00
 EXIST 24" X 108' RCP (15° RFS)
 CLEAN EXIST CULVERT
 LT-REM 24" X 12' RCP & SET, EXT W/24" X 24' RCP & INSTALL PSET-SC (4:1)
 RT-REM 24" X 6' RCP & SET, EXT W/24" X 28' RCP & INSTALL 24" CH-PW-0 (2:1)
 USING PSET-SC & CH-PW-0 STANDARDS

CULVERT #07: HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	35.29	12.90
100-YR	40.71	13.12

6/2/2021

CULVERT LAYOUT

SHEET 5 OF 15

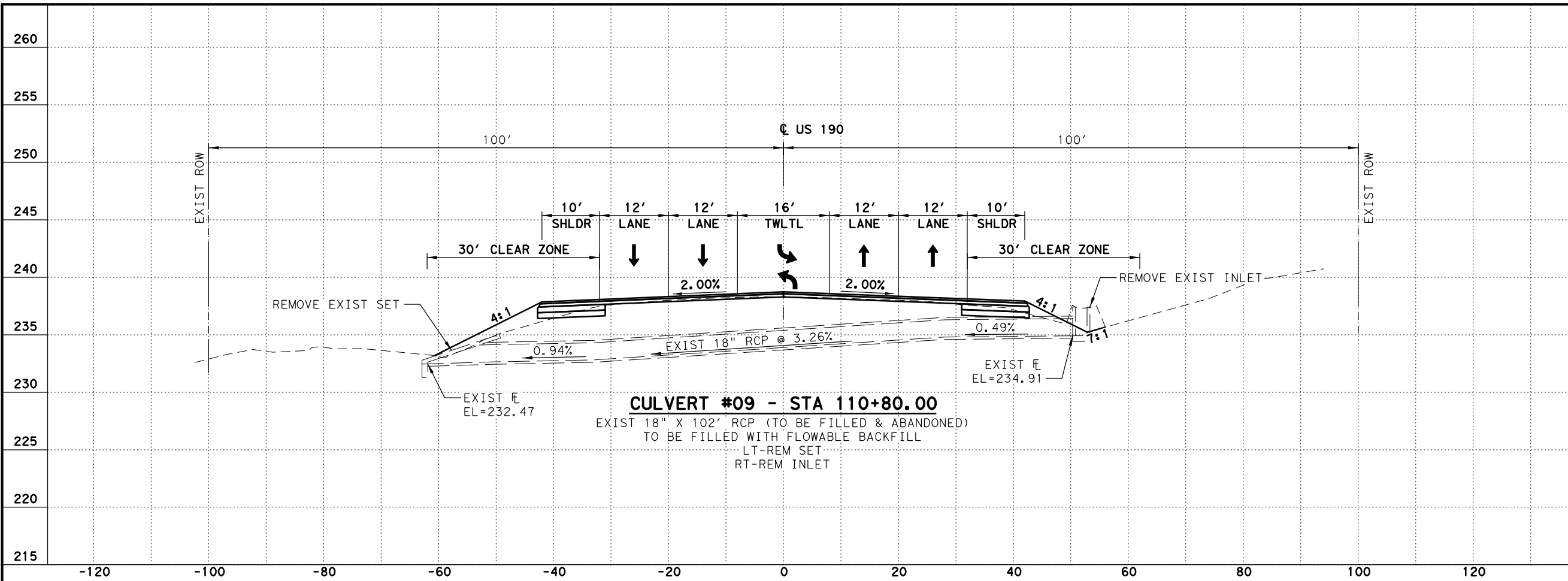
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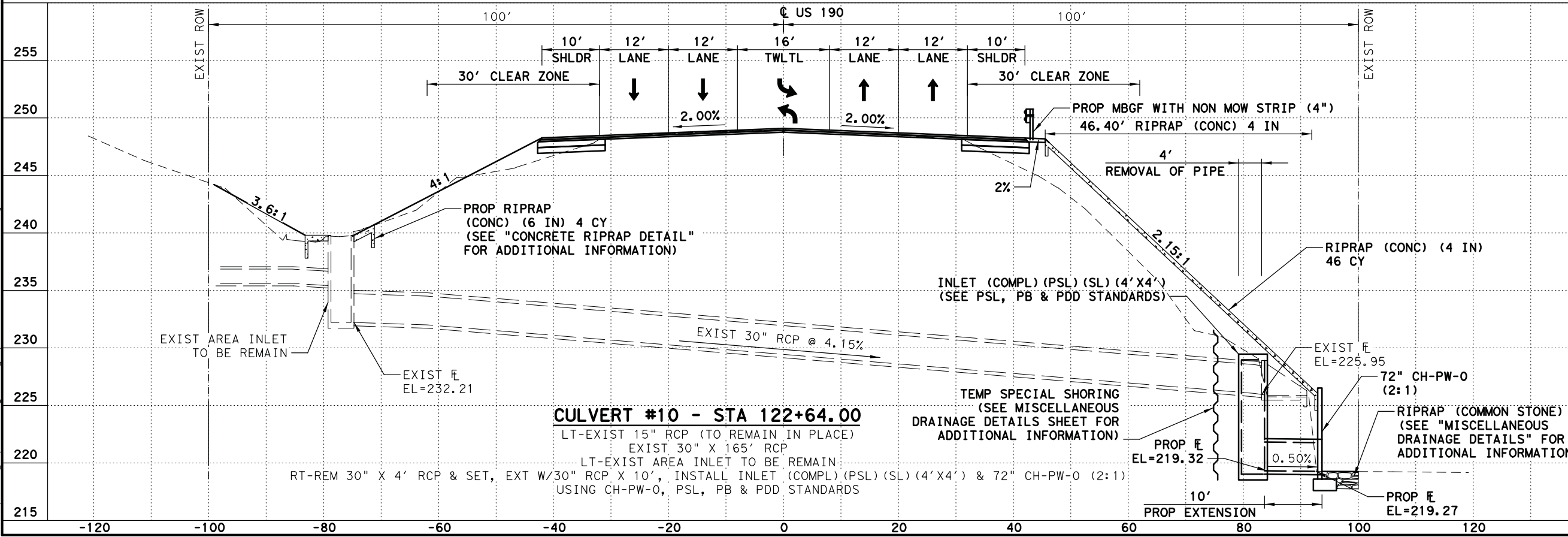
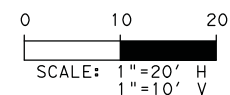
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STATE	DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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NOTES:
 THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0) (DIA=72IN). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR A 72IN DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-0, EXCEPT FOR THE "K" DIMENSION (TOP OF THE PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.



STATE OF TEXAS
 M. CHAD CRISWELL
 90114
 LICENSED PROFESSIONAL ENGINEER
 6/2/2021

CULVERT LAYOUT

SHEET 6 OF 15

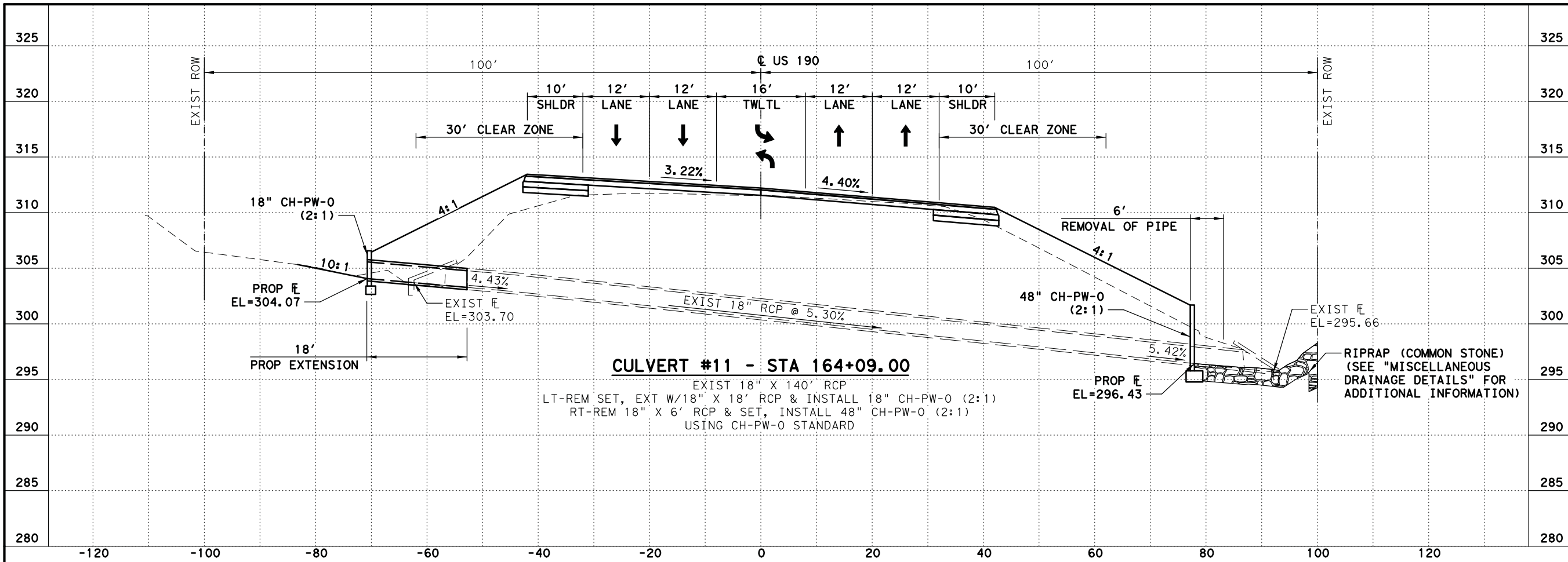
Texas Department of Transportation
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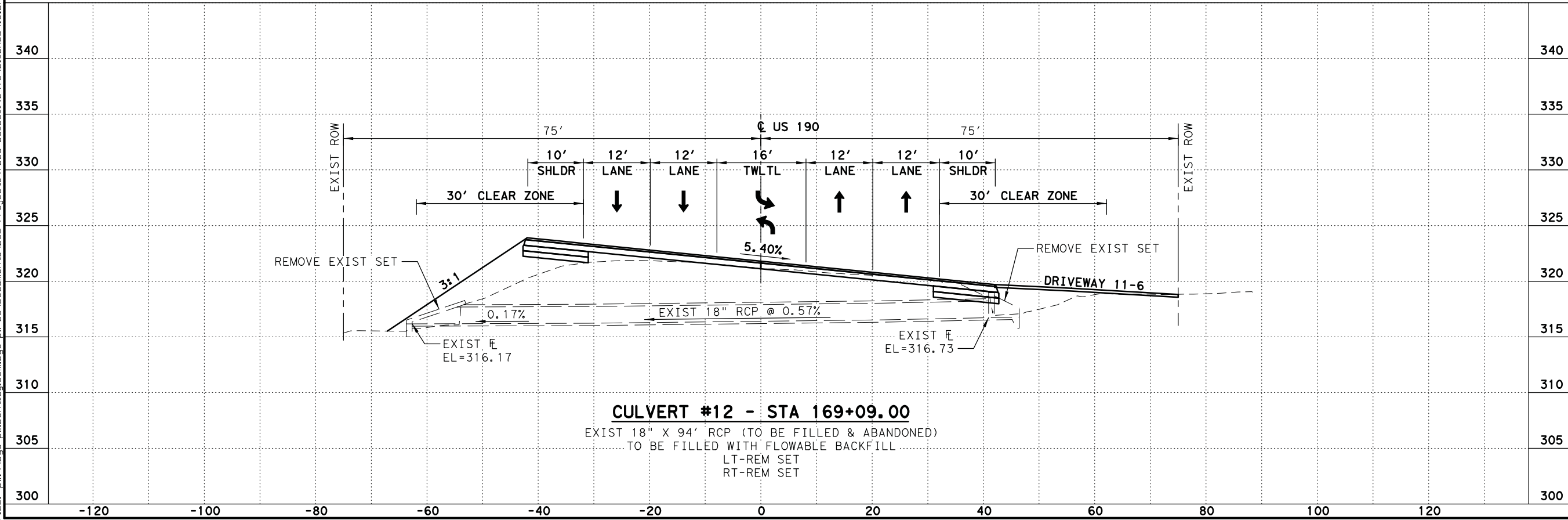
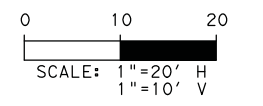
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STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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NOTES:
 325 THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0) (DIA=48IN). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR A 48IN DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-0, EXCEPT FOR THE "K" DIMENSION (TOP OF THE PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.
 320
 315
 310
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6/2/2021

CULVERT LAYOUT

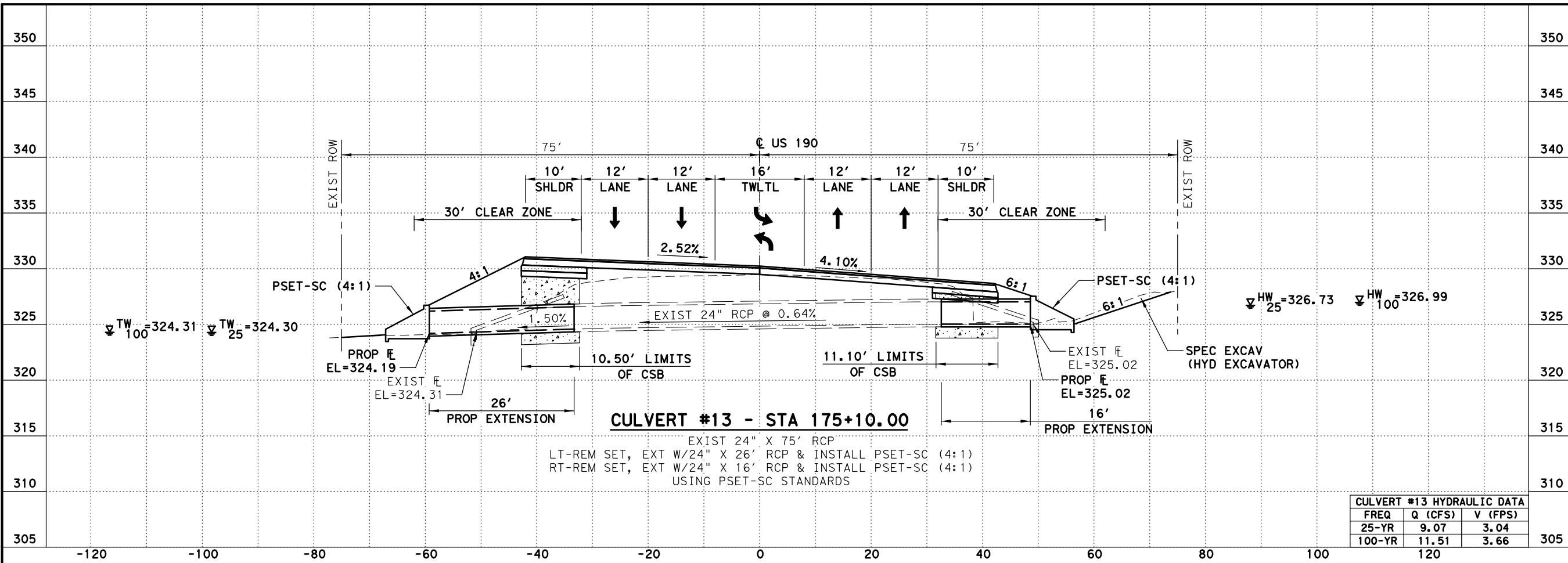
SHEET 7 OF 15

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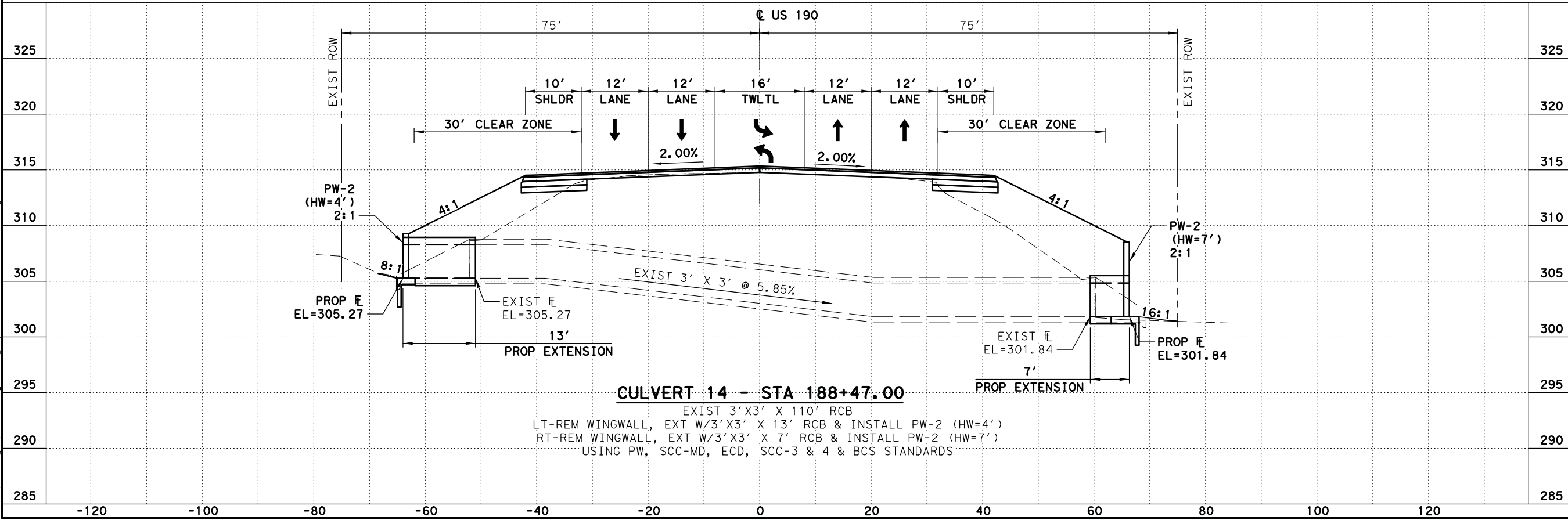
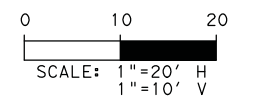
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TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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CULVERT #13 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	9.07	3.04
100-YR	11.51	3.66



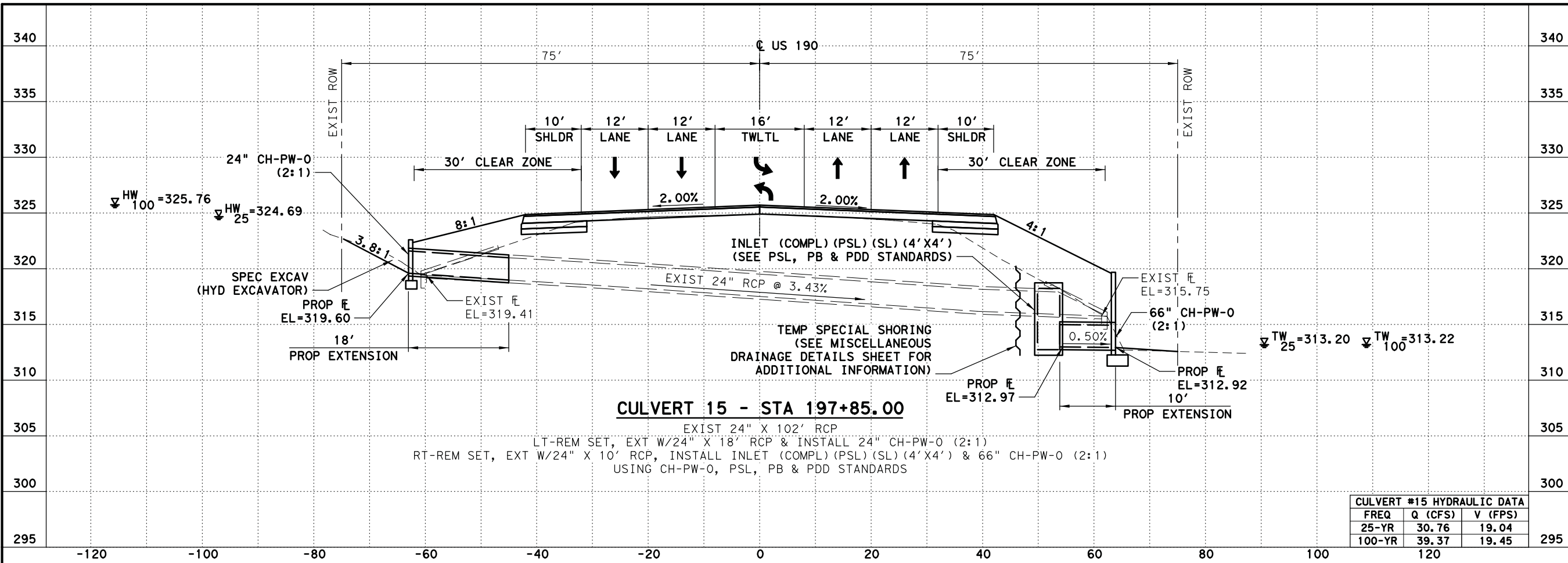
CULVERT LAYOUT

SHEET 8 OF 15

Texas Department of Transportation			
FED. RD. DIST. NO.	PROJECT NO.		
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STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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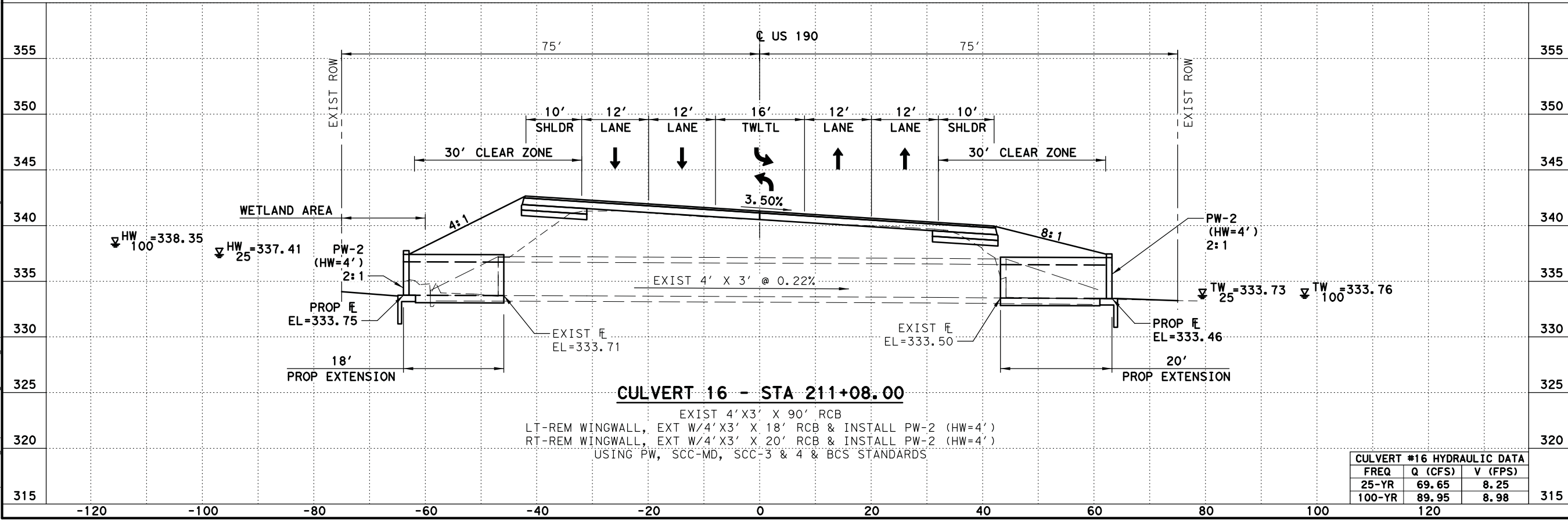
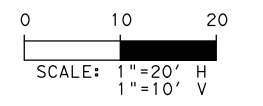


CULVERT 15 - STA 197+85.00

EXIST 24" X 102' RCP
 LT-REM SET, EXT W/24" X 18' RCP & INSTALL 24" CH-PW-0 (2:1)
 RT-REM SET, EXT W/24" X 10' RCP, INSTALL INLET (COMPL) (PSL) (SL) (4'X4') & 66" CH-PW-0 (2:1)
 USING CH-PW-0, PSL, PB & PDD STANDARDS

CULVERT #15 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	30.76	19.04
100-YR	39.37	19.45

NOTES:
 THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0) (DIA=66IN). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR A 66IN DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-0, EXCEPT FOR THE "K" DIMENSION (TOP OF THE PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.



CULVERT 16 - STA 211+08.00

EXIST 4'X3' X 90' RCB
 LT-REM WINGWALL, EXT W/4'X3' X 18' RCB & INSTALL PW-2 (HW=4')
 RT-REM WINGWALL, EXT W/4'X3' X 20' RCB & INSTALL PW-2 (HW=4')
 USING PW, SCC-MD, SCC-3 & 4 & BCS STANDARDS

CULVERT #16 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	69.65	8.25
100-YR	89.95	8.98

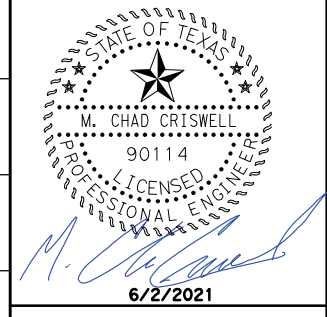
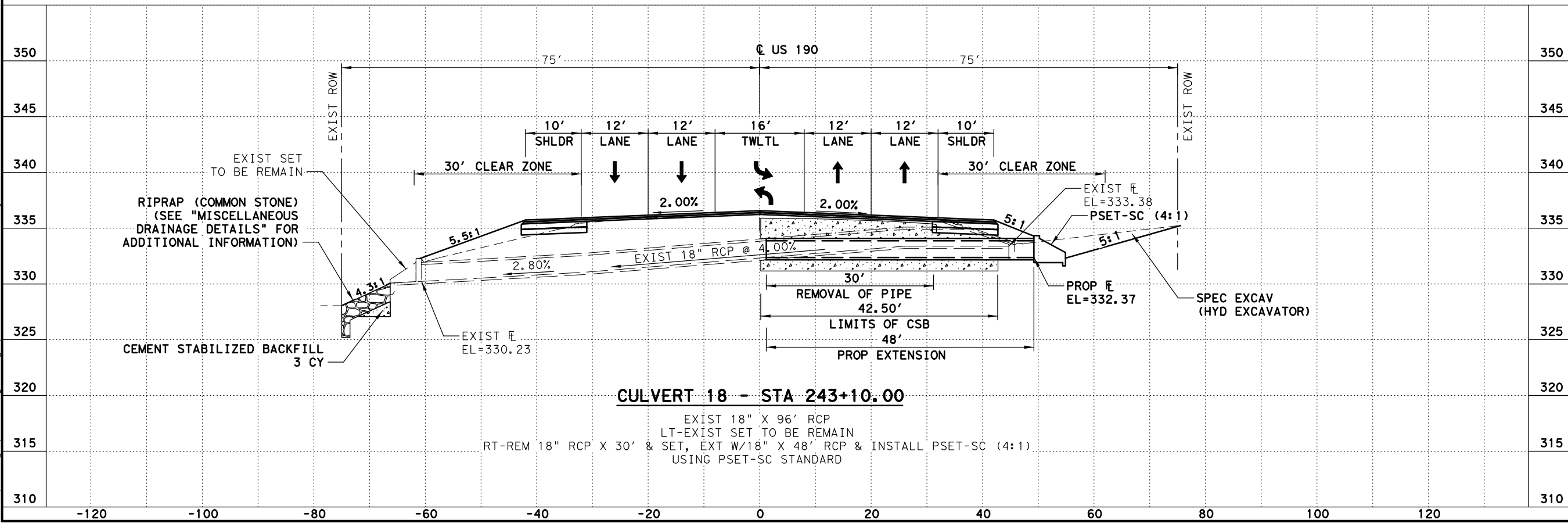
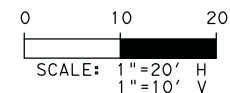
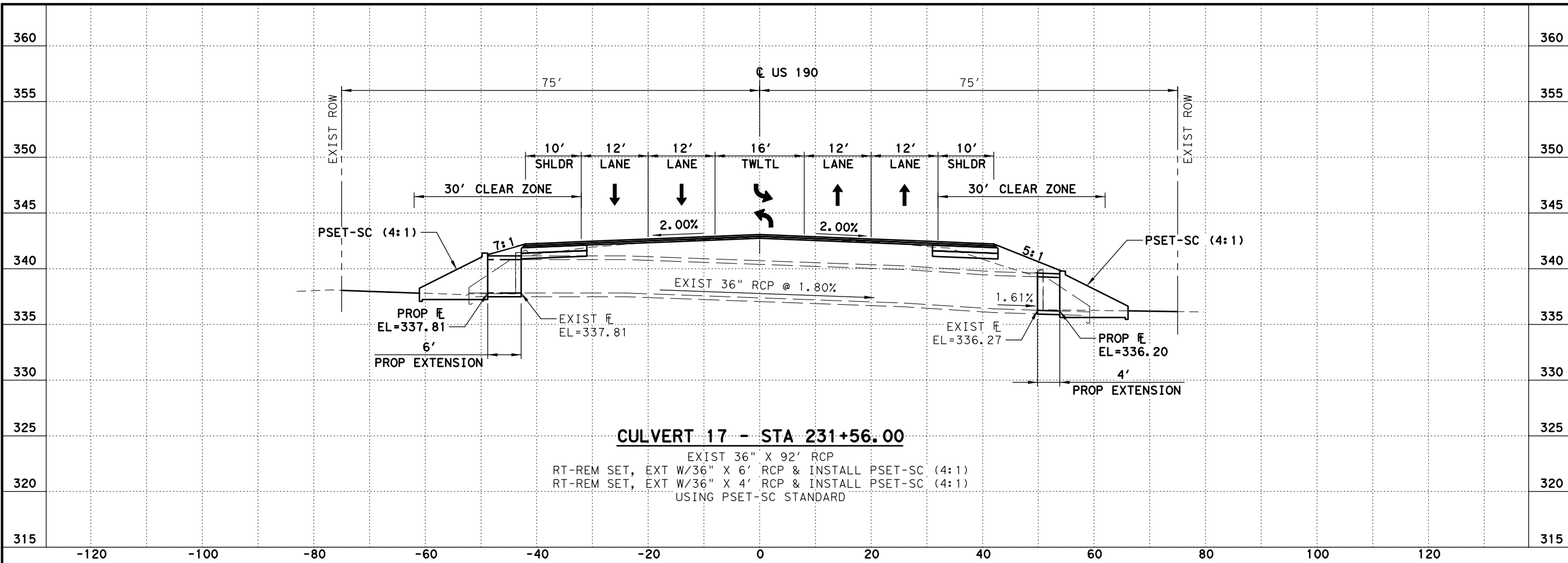
CULVERT LAYOUT

SHEET 9 OF 15

Texas Department of Transportation			
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
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STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

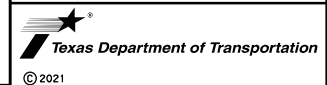
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CULVERT LAYOUT

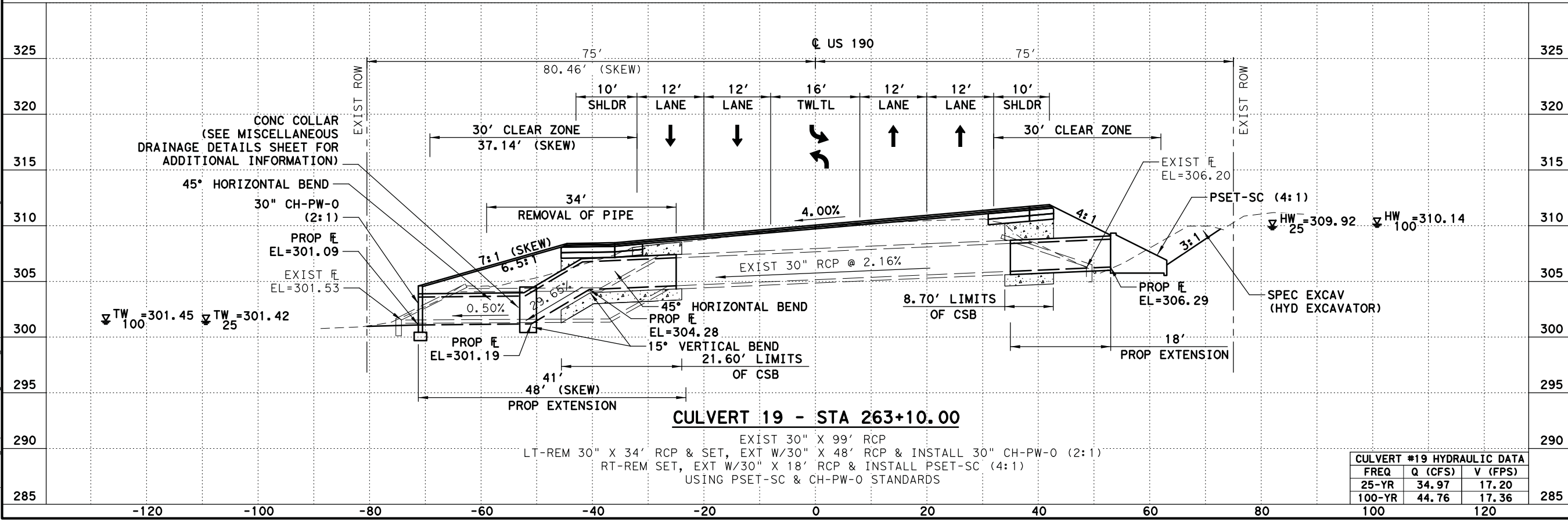
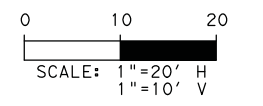
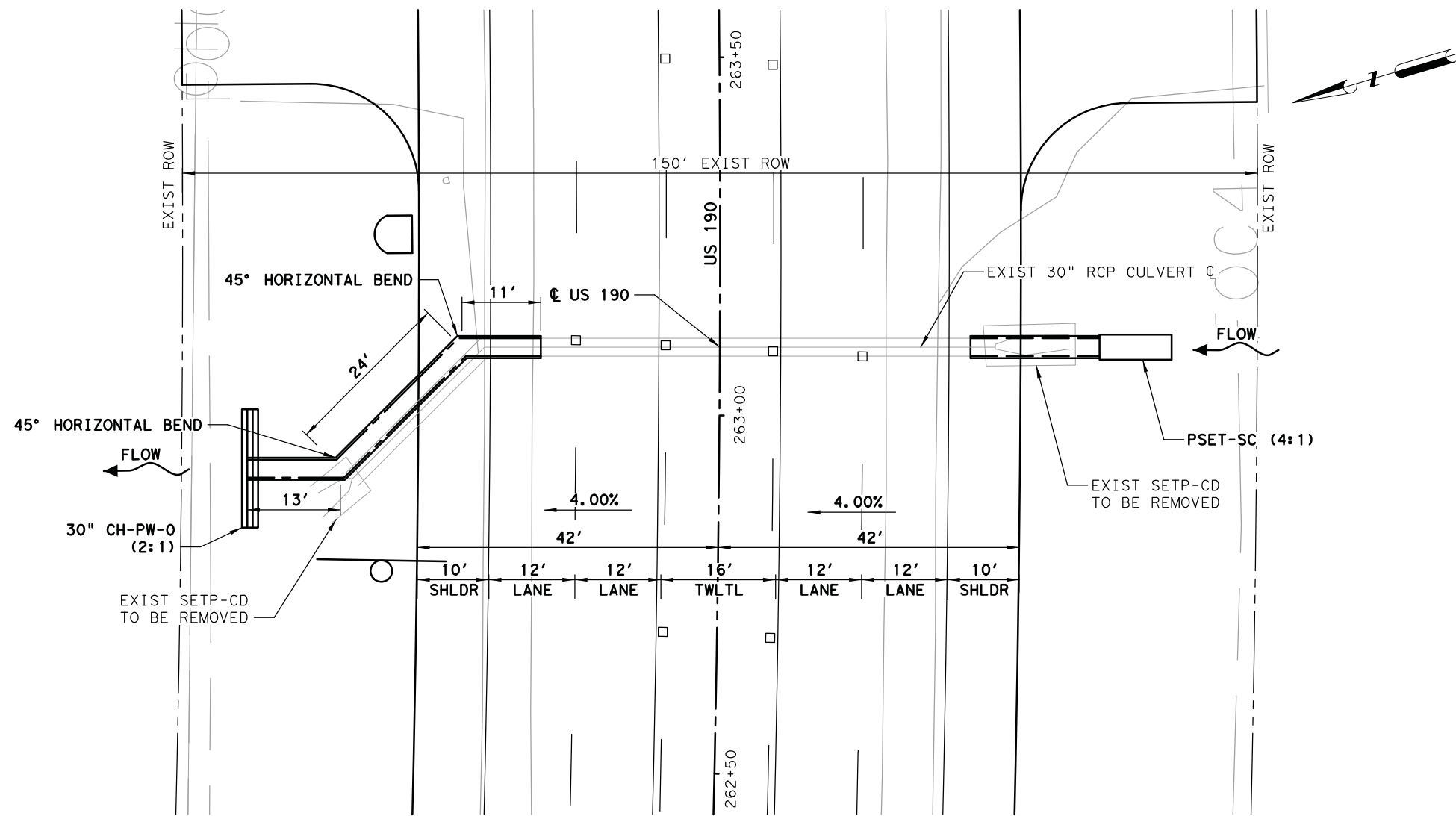
SHEET 10 OF 15



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FED. RD. DIV. NO. 6	PROJECT NO.	COUNTY	
STATE TEXAS	STATE DIST. NO. LFK	COUNTY POLK	
CONT. 0213	SECT. 04	JOB 050	HIGHWAY NO. US 190

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MODEL NAME: CULVERT LAYOUT
 DATE: 6/2/2021
 FILE: pw:\bge-pw\bentley.combge-pw-03\Documents\BGE_Projects\7005-03_US_190\TS\01_CADD\16\DRN\US190_DRN.12



CULVERT 19 - STA 263+10.00

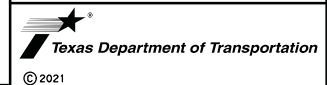
EXIST 30" X 99' RCP
 LT-REM 30" X 34' RCP & SET, EXT W/30" X 48' RCP & INSTALL 30" CH-PW-0 (2:1)
 RT-REM SET, EXT W/30" X 18' RCP & INSTALL PSET-SC (4:1)
 USING PSET-SC & CH-PW-0 STANDARDS

CULVERT #19 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	34.97	17.20
100-YR	44.76	17.36

M. CHAD CRISWELL
 90114
 LICENSED PROFESSIONAL ENGINEER
 6/2/2021

CULVERT LAYOUT

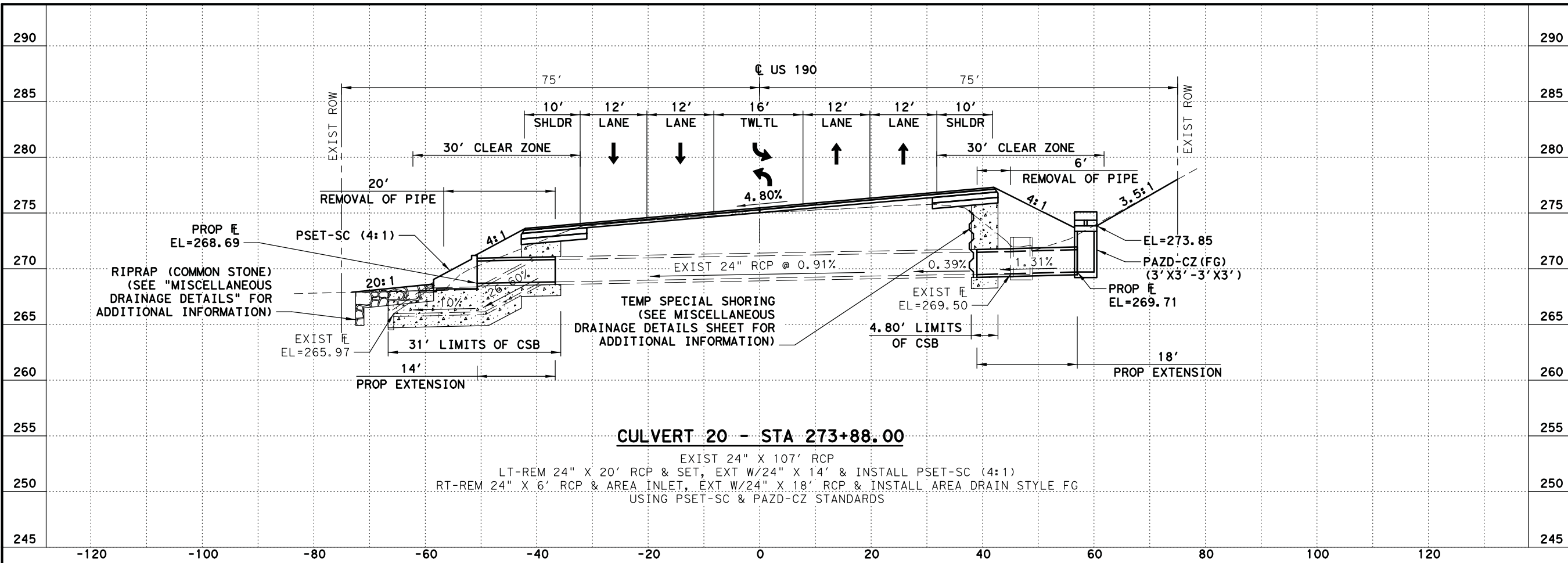
SHEET 11 OF 15



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6		140		140	
STATE	DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

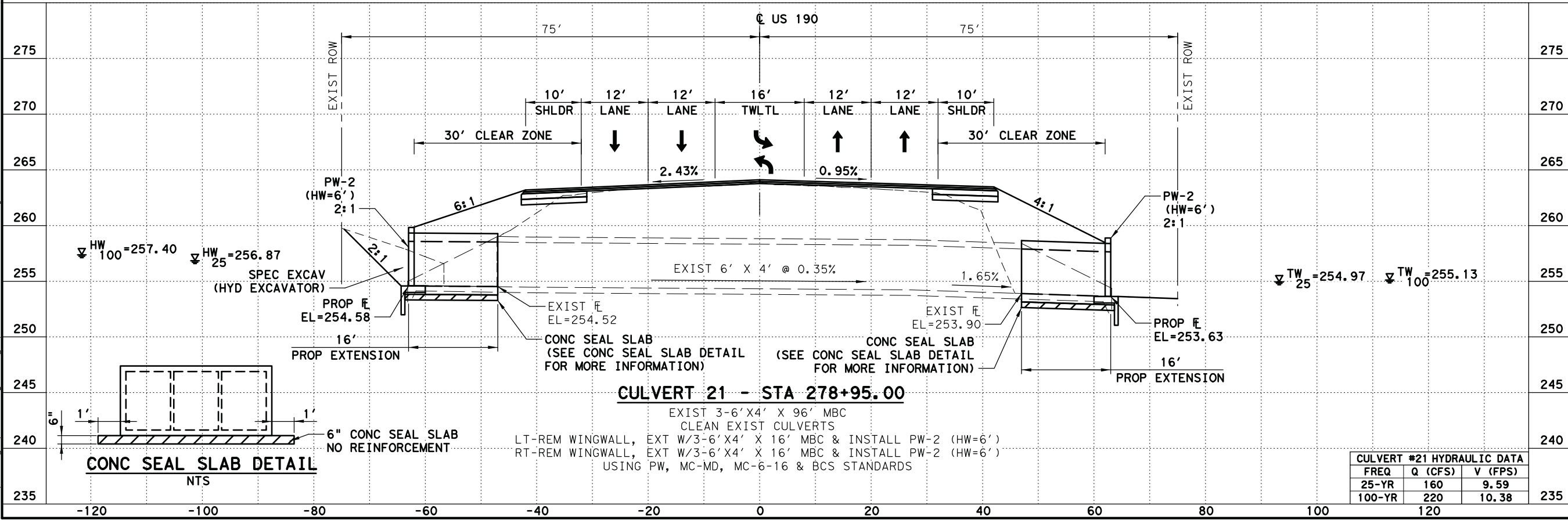
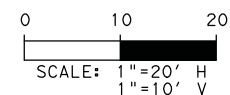
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MODEL NAME: CULVERT LAYOUT
 DATE: 6/2/2021
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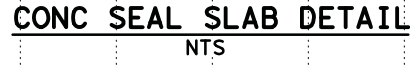
CULVERT 20 - STA 273+88.00

EXIST 24" X 107' RCP
 LT-REM 24" X 20' RCP & SET, EXT W/24" X 14' & INSTALL PSET-SC (4:1)
 RT-REM 24" X 6' RCP & AREA INLET, EXT W/24" X 18' RCP & INSTALL AREA DRAIN STYLE FG
 USING PSET-SC & PAZD-CZ STANDARDS



CULVERT 21 - STA 278+95.00

EXIST 3-6'X4' X 96' MBC
 CLEAN EXIST CULVERTS
 LT-REM WINGWALL, EXT W/3-6'X4' X 16' MBC & INSTALL PW-2 (HW=6')
 RT-REM WINGWALL, EXT W/3-6'X4' X 16' MBC & INSTALL PW-2 (HW=6')
 USING PW, MC-MD, MC-6-16 & BCS STANDARDS



CULVERT #21 HYDRAULIC DATA			
FREQ	Q (CFS)	V (FPS)	
25-YR	160	9.59	
100-YR	220	10.38	



CULVERT LAYOUT

SHEET 12 OF 15

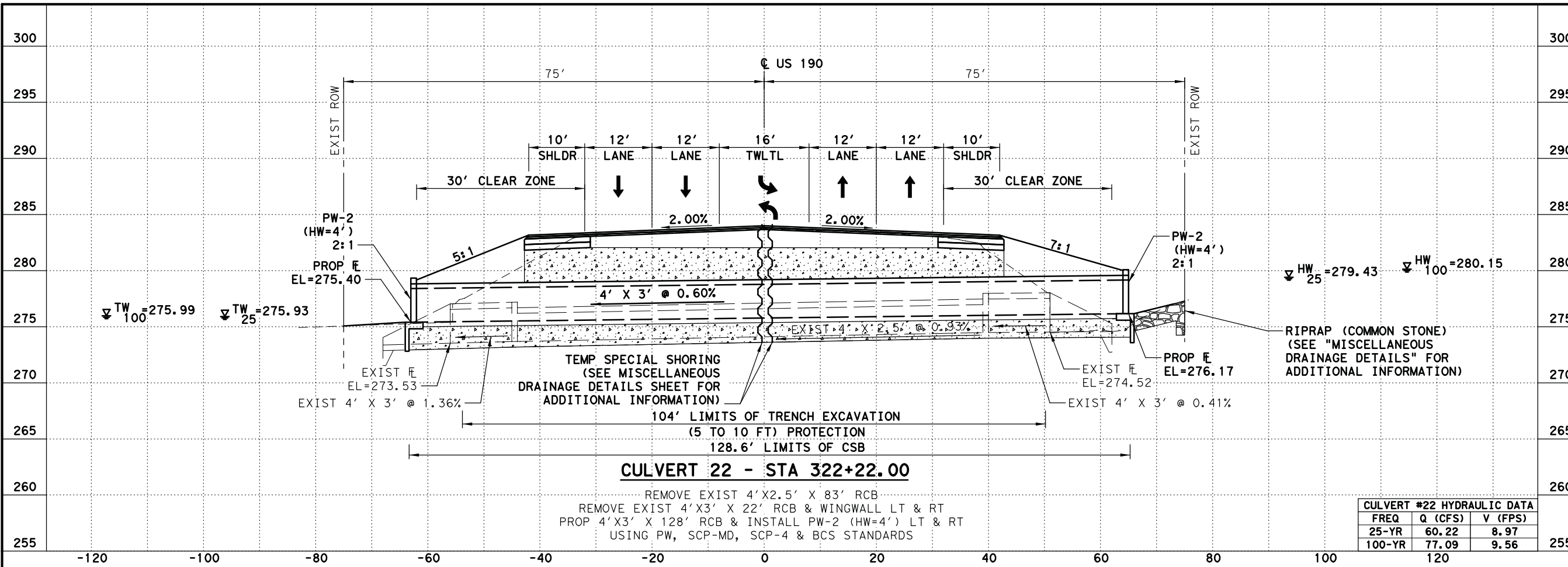


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FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		141
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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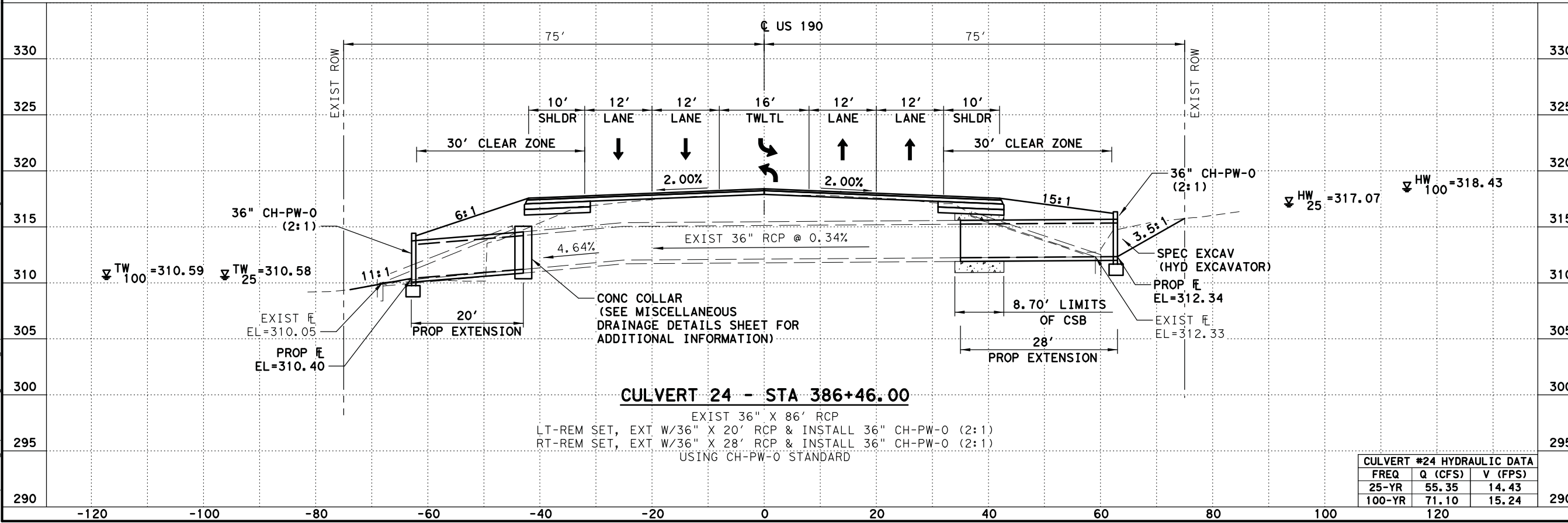
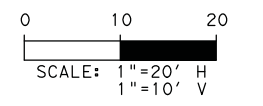
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CULVERT 22 - STA 322+22.00

REMOVE EXIST 4' X 2.5' X 83' RCB
 REMOVE EXIST 4' X 3' X 22' RCB & WINGWALL LT & RT
 PROP 4' X 3' X 128' RCB & INSTALL PW-2 (HW=4') LT & RT
 USING PW, SCP-MD, SCP-4 & BCS STANDARDS

CULVERT #22 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	60.22	8.97
100-YR	77.09	9.56



CULVERT 24 - STA 386+46.00

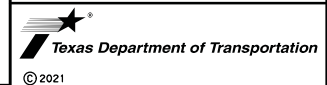
EXIST 36" X 86' RCP
 LT-REM SET, EXT W/36" X 20' RCP & INSTALL 36" CH-PW-0 (2:1)
 RT-REM SET, EXT W/36" X 28' RCP & INSTALL 36" CH-PW-0 (2:1)
 USING CH-PW-0 STANDARD

CULVERT #24 HYDRAULIC DATA		
FREQ	Q (CFS)	V (FPS)
25-YR	55.35	14.43
100-YR	71.10	15.24

6/2/2021

CULVERT LAYOUT

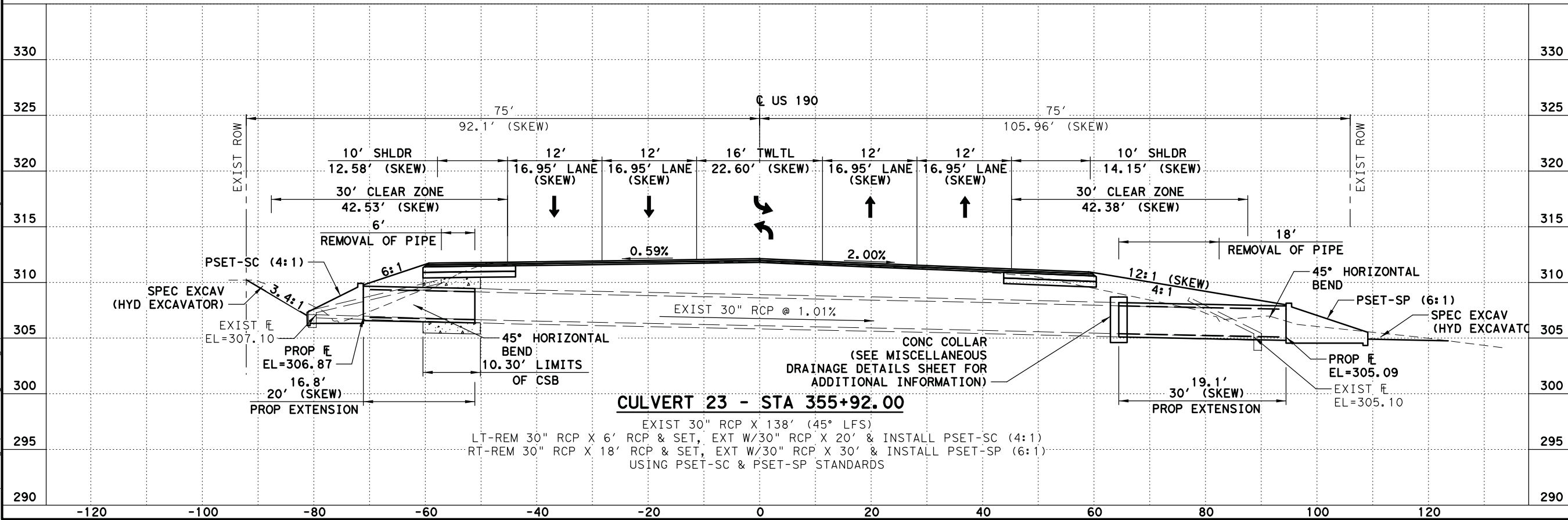
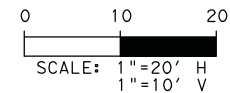
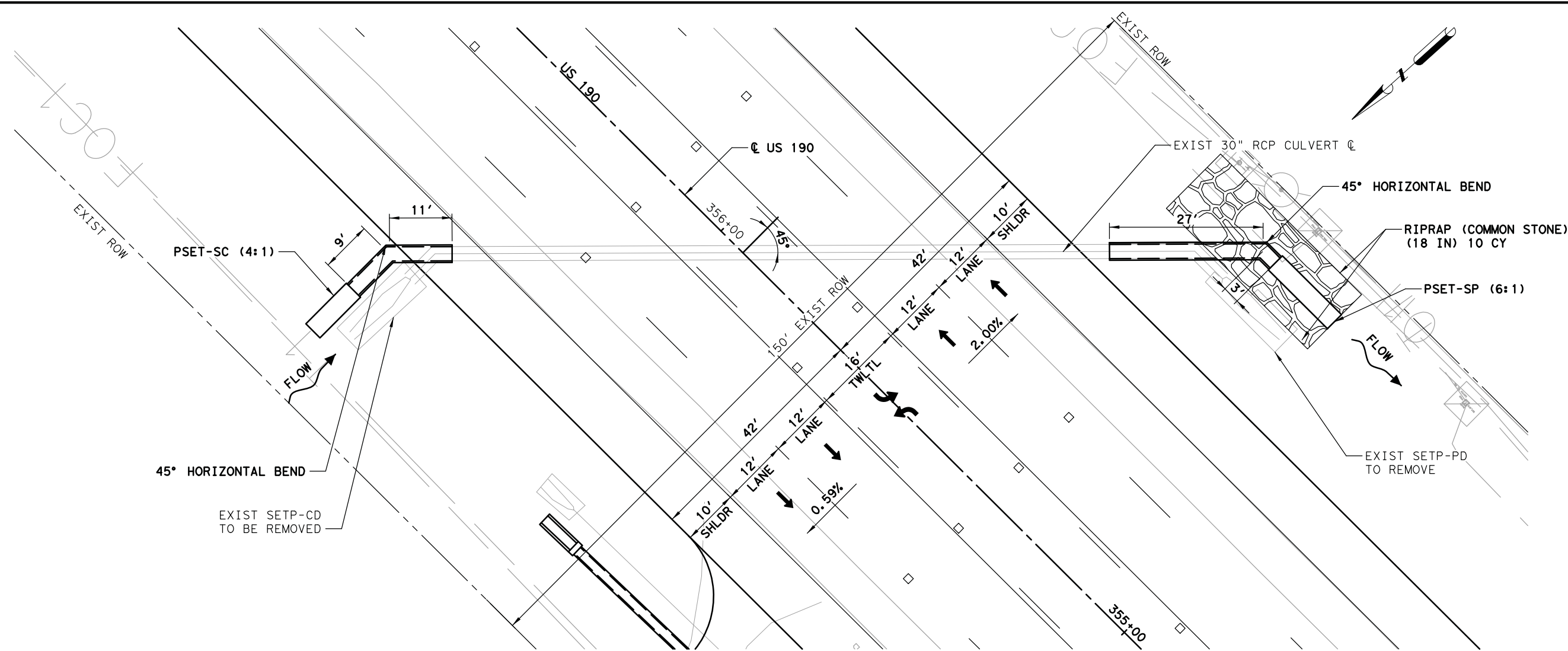
SHEET 13 OF 15



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FED. RD. DIV. NO.	6	STATE DIST. NO.	142
STATE	TEXAS	COUNTY	POLK
CONTRACT	04	JOB	050
		HIGHWAY NO.	US 190

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6/2/2021

CULVERT LAYOUT

SHEET 14 OF 15

Texas Department of Transportation

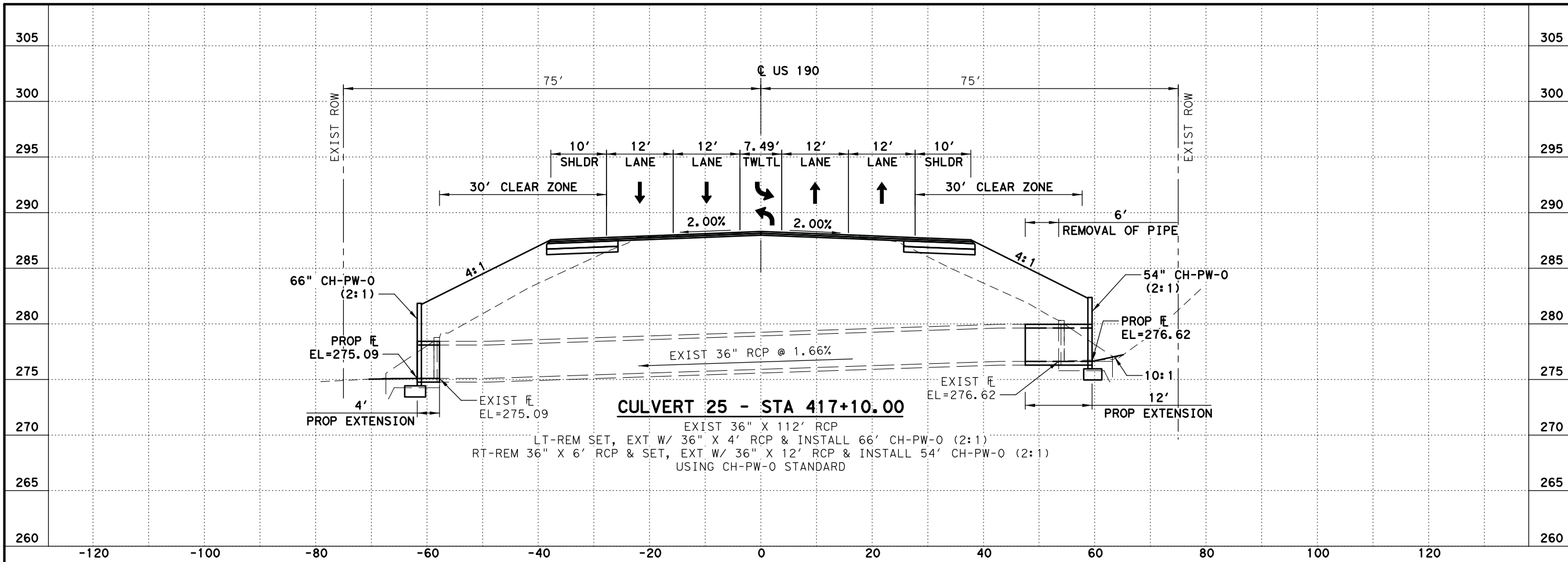
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FED. RD. DIV. NO.		PROJECT NO.		SHEET NO.	
6				143	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
2913	04	050	US 190		

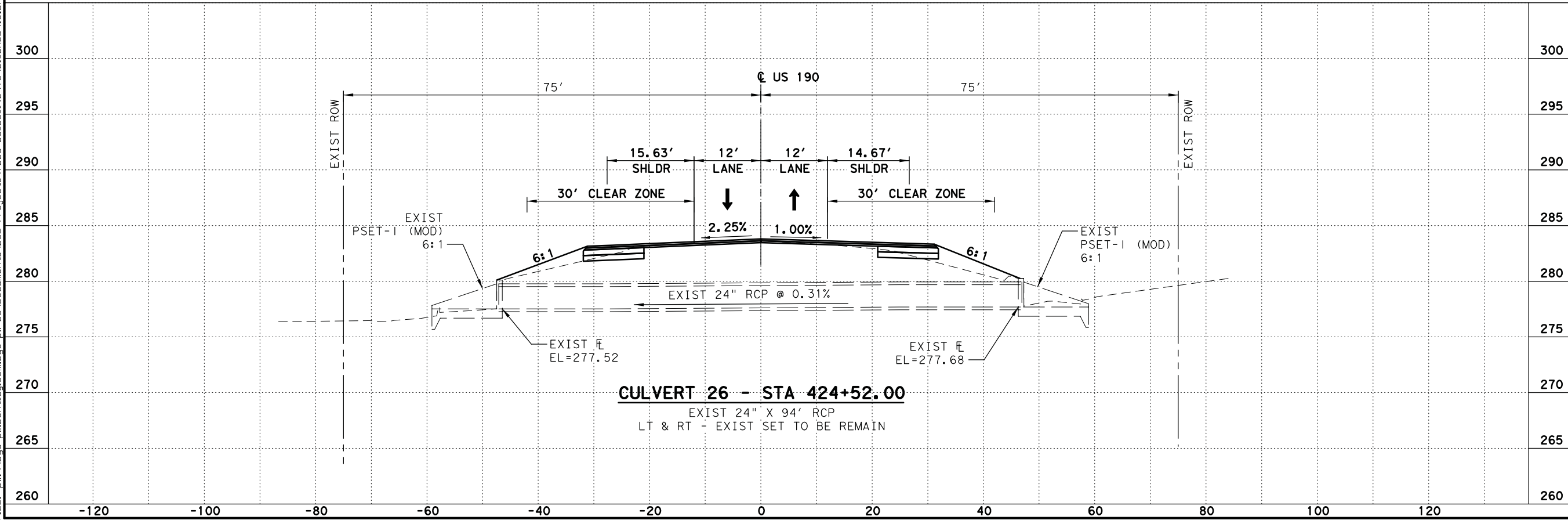
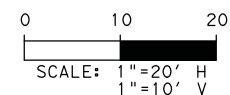
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CULVERT 25 - STA 417+10.00
 EXIST 36" X 112' RCP
 LT-REM SET, EXT W/ 36" X 4' RCP & INSTALL 66' CH-PW-0 (2:1)
 RT-REM 36" X 6' RCP & SET, EXT W/ 36" X 12' RCP & INSTALL 54' CH-PW-0 (2:1)
 USING CH-PW-0 STANDARD

NOTES:
 THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0) (DIA=54IN) & (DIA=66IN). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR A 54IN & 66IN DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-0, EXCEPT FOR THE "K" DIMENSION (TOP OF THE PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.



CULVERT 26 - STA 424+52.00
 EXIST 24" X 94' RCP
 LT & RT - EXIST SET TO BE REMAIN

STATE OF TEXAS
 M. CHAD CRISWELL
 90114
 LICENSED PROFESSIONAL ENGINEER
 6/2/2021

CULVERT LAYOUT

SHEET 15 OF 15

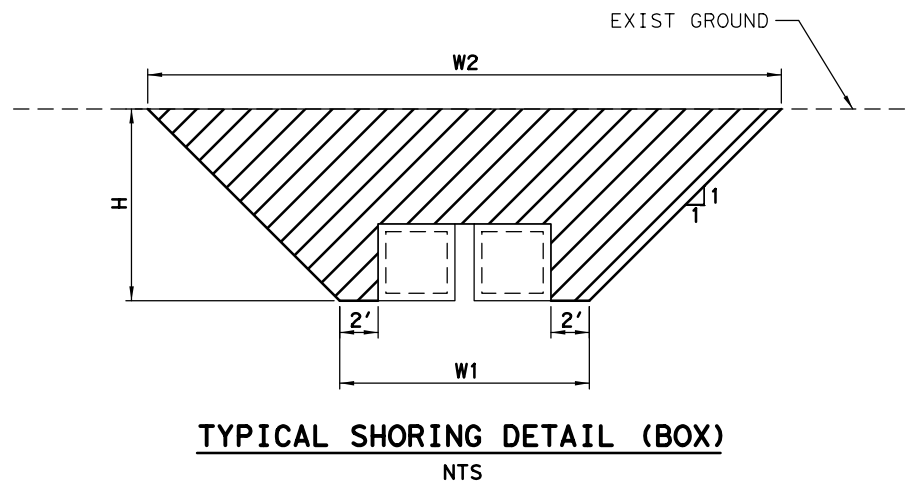
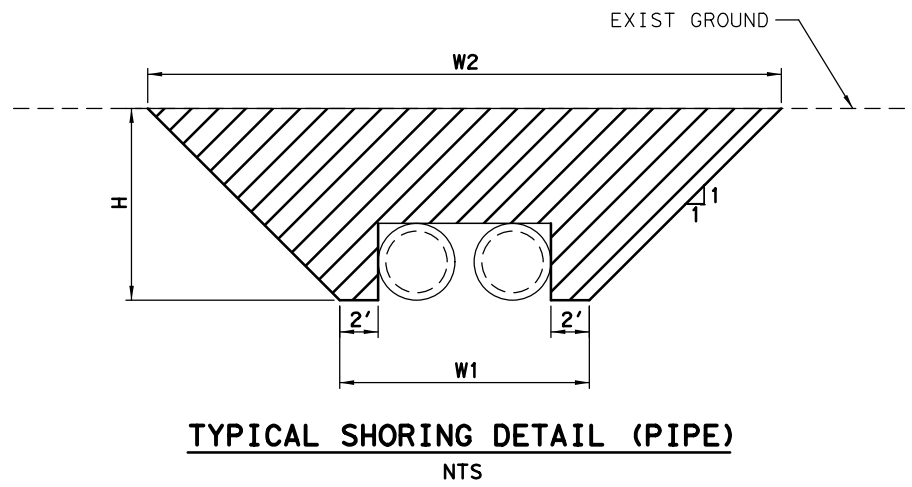
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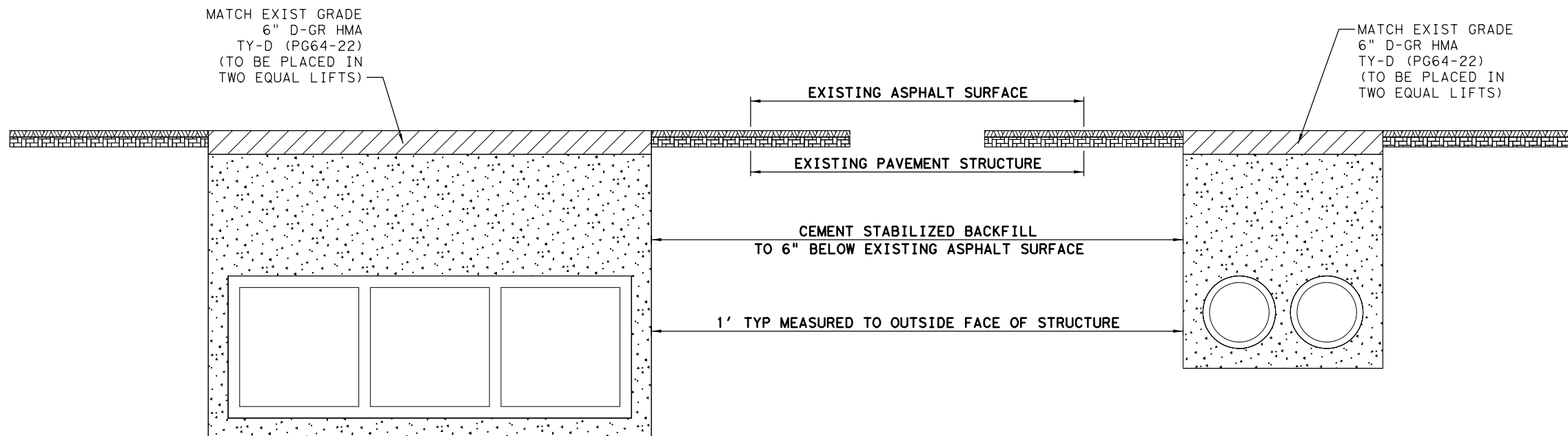
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6		144
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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MODEL NAME: MISCELLANEOUS DRAINAGE DETAILS
 DATE: 05/13/2021 06:40:09
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TEMPORARY SPECIAL SHORING						
CULVERT	SIDE	STRUCTURE	W1	W2	H	403 6001
						TEMPORARY SPL SHORING
			FT	FT	FT	SF
#04	RIGHT	24"	7	22	7.5	102
#05	LEFT	2-9' X 7'	24	44	10	174
	RIGHT	2-9' X 7'	24	44	10	174
#06	RIGHT	30"	8	28	10	168
#07	RIGHT	24"	7	21	7	91
#08	LEFT	6' X 5'	12	30	9	140
	RIGHT	6' X 5'	12	30	9	140
#10	RIGHT	30"	9	35	13	231
#15	RIGHT	24"	9	25	8	104
#20	RIGHT	24"	7	19	6	71
#22	LEFT	4' X 2.5'	9	30	10.5	188
	RIGHT	4' X 2.5'	9	30	10.5	188



CUT & RESTORE EXISTING PAVEMENT DETAIL
 NTS

NOTE:
 SAW CUT EXISTING PAVEMENT ON BOTH SIDES OF CULVERT TO PROVIDE A SMOOTH, EVEN EDGE FOR PAVEMENT REPAIR. SAW CUTTING WILL BE SUBSIDIARY TO CULVERT ITEMS.

05/13/2021

MISCELLANEOUS DRAINAGE DETAILS

SHEET 1 OF 3

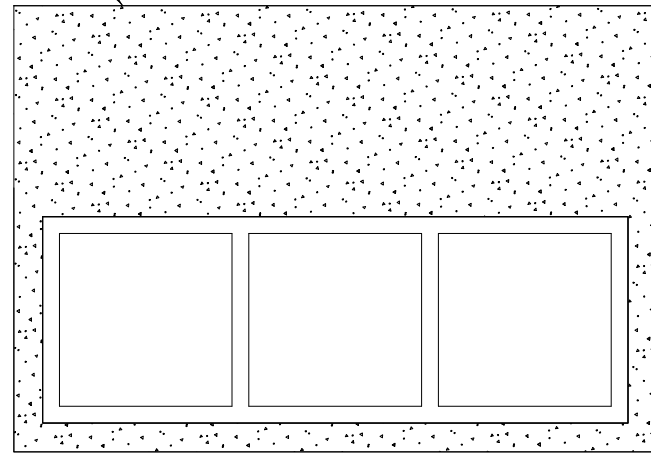
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		145	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

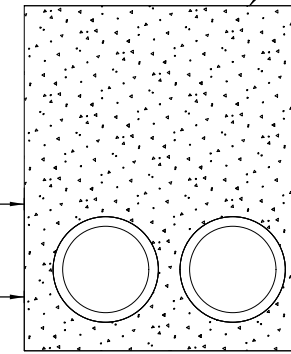
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 DATE: 05/13/2021
 FILE: pw:\bge-pw\bentley\combg-pw-03\Documents\BGE_Projects\7005-03_US_190\TS\01_CADD\16\DRN\US190_MISC_DET_02.dgn

BOTTOM OF CEMENT OR LIME TREATED BASE



CEMENT STABILIZED BACKFILL
TO BOTTOM OF PROPOSED SUBGRADE

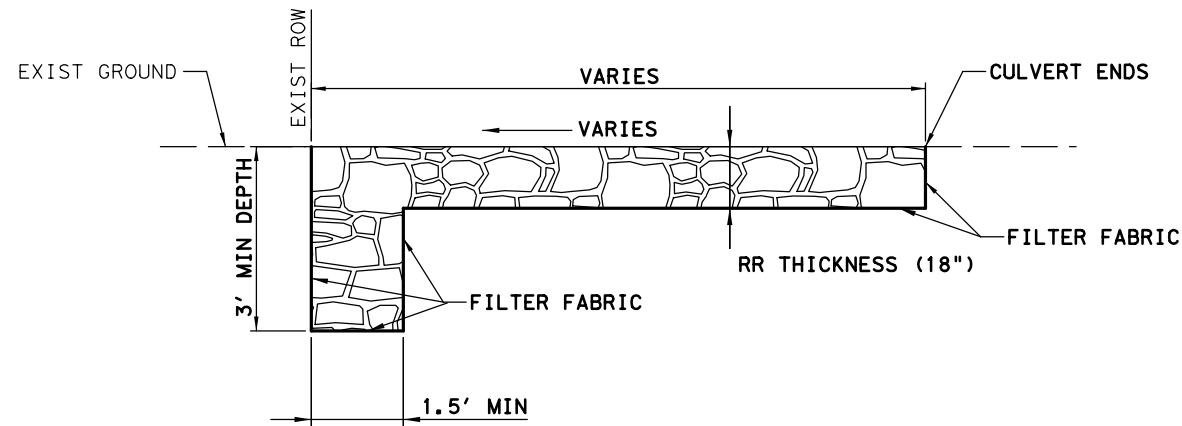
1' TYP MEASURED TO OUTSIDE FACE OF STRUCTURE



BOTTOM OF CEMENT OR LIME TREATED BASE

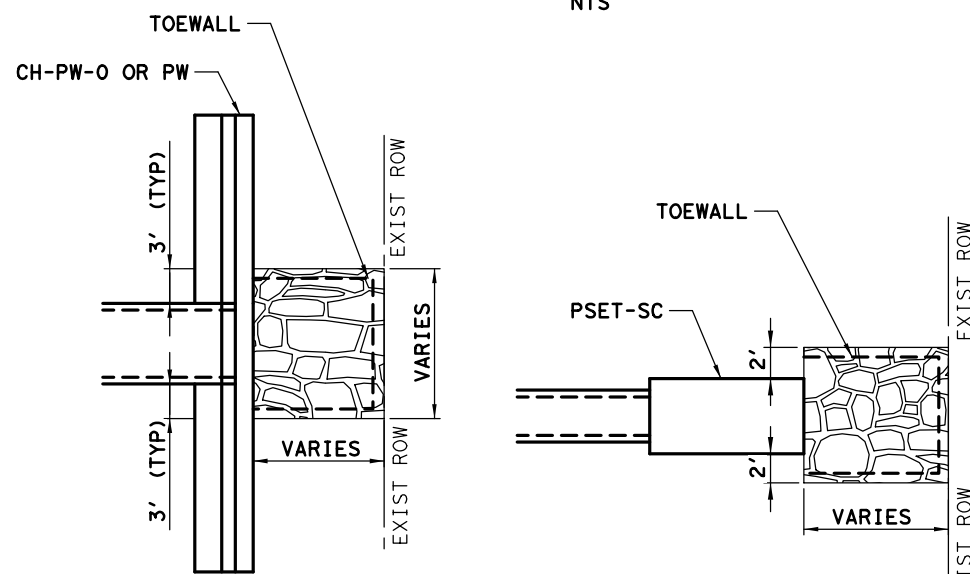
BACKFILL DETAIL

NTS



RIPRAP AT CULVERT ENDS (STONE COMMON)

PROFILE
NTS

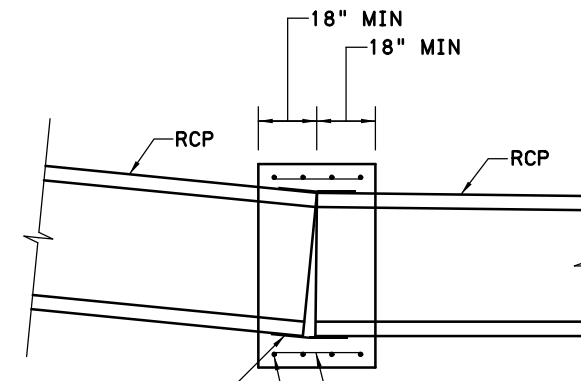


TYPICAL RIPRAP (STONE COMMON)

AT CULVERT END

PLAN VIEW
NTS

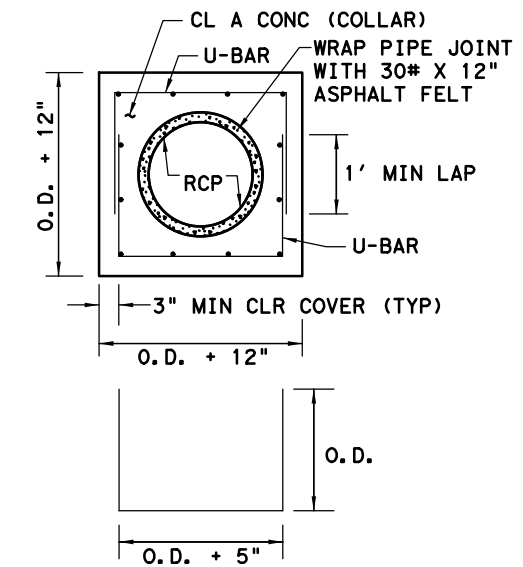
NOTE: SEE ROADWAY P&P FOR MORE DETAILS



WRAP PIPE JOINT WITH
30# X 12" ASPHALT FELT

CONCRETE PIPE COLLAR

NTS

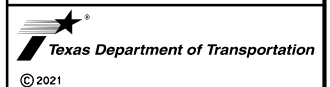


U-BAR DETAIL

05/13/2021

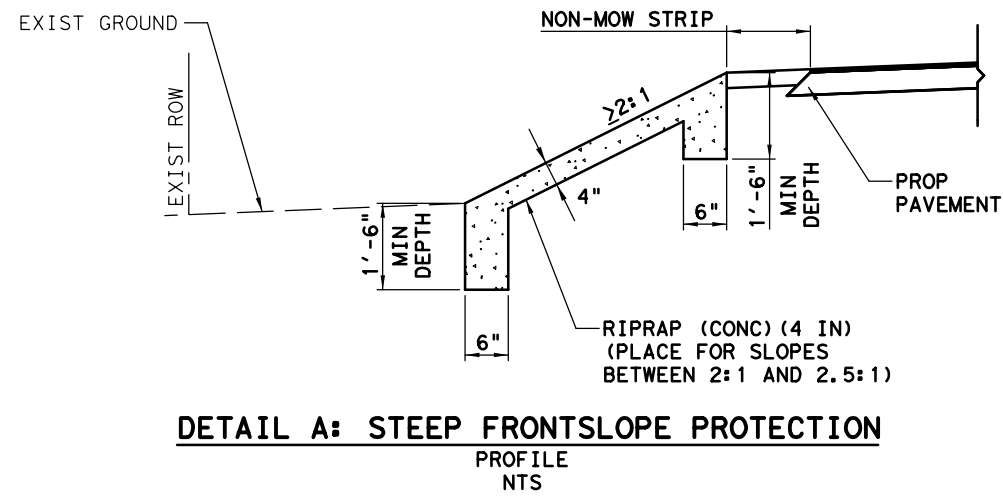
**MISCELLANEOUS
DRAINAGE
DETAILS**

SHEET 2 OF 3



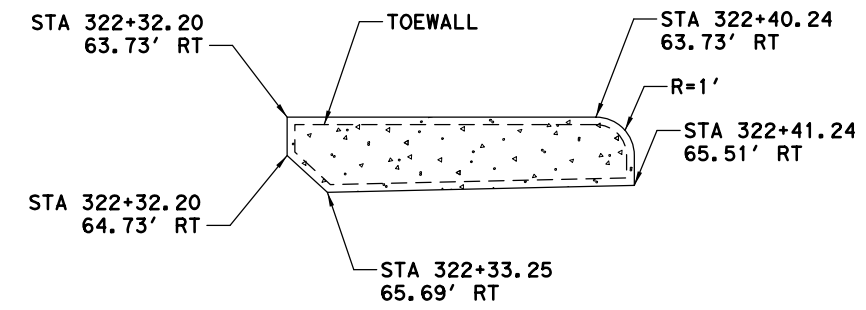
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		146	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190



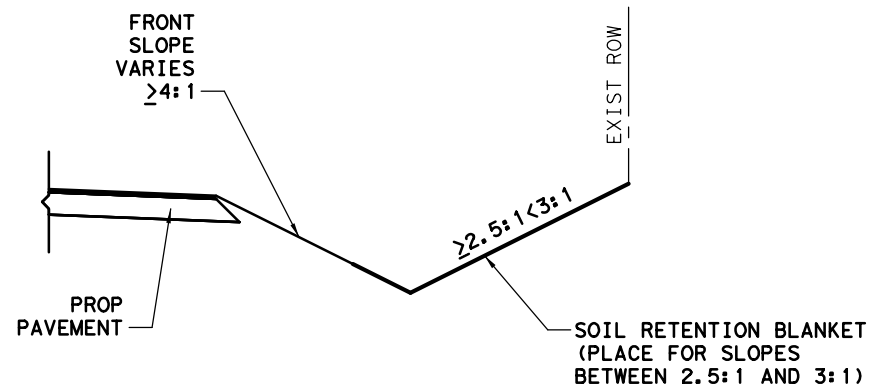
DETAIL A: STEEP FRONTSLOPE PROTECTION

PROFILE
NTS



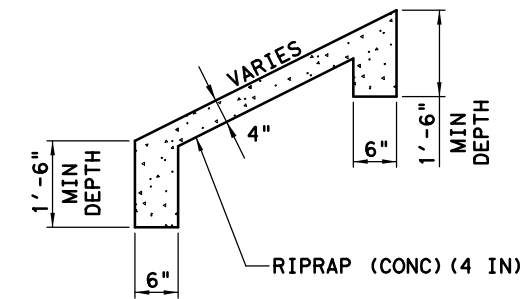
DETAIL C: RIPRAP CONC @ CULVERT # 22 STA 322+22.00

PLAN
NTS



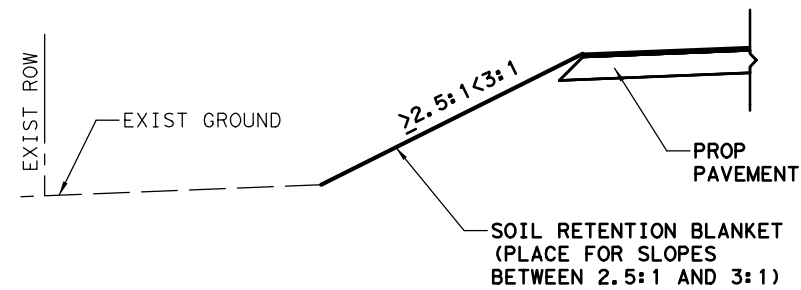
DETAIL B: STEEP SLOPE PROTECTION

PROFILE
NTS



DETAIL D: RIPRAP CONC @ CULVERT # 22 STA 322+22.00

PROFILE
NTS



NOTE:
CONTRACTOR MAY TRANSITION BETWEEN
DETAILS A & B AS CONDITIONS
PERMIT AND AS DIRECTED.

05/13/2021

MISCELLANEOUS
DRAINAGE
DETAILS

SHEET 3 OF 3



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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		147	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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DATE: 05/25/2021 10:58:59
 FILE: c:\pwworkdir\Bge_pw\eman\m\ms40789\US190_BCS.dgn

Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope (SL:1)	T Culvert Top Slab Thick's (in)	U Culvert Wall Thick's (in)	C Estimated Curb Height (ft)	Hw Height of Wing (ft)	A Curb to End of Wingwall (ft)	B Offset of End of Wingwall (ft)	Lw Length of Longest Wingwall (ft)	Ltw Culvert Toewall Length (ft)	Atw Anchor Toewall Length (ft)	Riprap Apron (C. Y.)	Class "C" Conc. (Curb) (CY) (2)	Class "C" Conc. (Wing.) (CY) (3)	Total Wingwall Area (SF)
CULVERT # 02 - STA 57+88.97 (Lt)	1 ~ 5' X 2'	2.165'	SCC-5&6	PW-2	0	2:1	8"	7"	0.250	2.917	N/A	N/A	4.833	6.167	N/A	0	0.10	2.50	27
CULVERT # 02 - STA 57+88.97 (Rt)	1 ~ 5' X 2'	3.064'	SCC-5&6	PW-2	0	2:1	8"	7"	1.000	3.667	N/A	N/A	6.333	6.167	N/A	0	0.20	3.70	45
CULVERT # 03 - STA 65+60.00 (Lt)	1 ~ 4' X 2'	1.435'	SCC-3&4	PW-2	0	2:1	8"	7"	0.250	2.917	N/A	N/A	4.833	5.167	N/A	0	0.00	2.40	27
CULVERT # 03 - STA 65+60.00 (Rt)	1 ~ 4' X 2'	2.759'	SCC-3&4	PW-2	0	2:1	8"	7"	0.250	2.917	N/A	N/A	4.833	5.167	N/A	0	0.00	2.40	27
CULVERT # 05 - STA 74+60.00 (Lt)	2 ~ 9' X 7'	0.971'	MC-9-10	PW-2	0	2:1	9"	7"	0.250	8	N/A	N/A	14.000	19.75	N/A	0	0.20	15.10	218
CULVERT # 05 - STA 74+60.00 (Rt)	2 ~ 9' X 7'	2.609'	MC-9-10	PW-2	0	2:1	9"	7"	0.167	7.917	N/A	N/A	13.833	19.75	N/A	0	0.10	15.00	213
CULVERT # 08 - STA 105+05.00 (Lt)	1 ~ 6' X 5'	10'	SCC-5&6	PW-2	0	2:1	8"	7"	2.000	7.667	N/A	N/A	13.333	7.167	N/A	0	0.50	13.30	198
CULVERT # 08 - STA 105+05.00 (Rt)	1 ~ 6' X 5'	13.5'	SCC-5&6	PW-2	0	2:1	8"	7"	3.917	9.583	N/A	N/A	17.167	7.167	N/A	0	1.00	21.80	323
CULVERT # 14 - STA 188+47.00 (Lt)	1 ~ 3' X 3'	3.323'	SCC-3&4	PW-2	0	2:1	8"	7"	0.333	4	N/A	N/A	6.000	4.167	N/A	0	0.10	3.30	42
CULVERT # 14 - STA 188+47.00 (Rt)	1 ~ 3' X 3'	4.667'	SCC-3&4	PW-2	0	2:1	8"	7"	3.000	6.667	N/A	N/A	11.333	4.167	N/A	0	0.50	10.00	145
CULVERT # 16- STA 211+08.00 (Lt)	1 ~ 4' X 3'	4.415'	SCC-3&4	PW-2	0	2:1	8"	7"	0.333	4	N/A	N/A	6.000	5.167	N/A	0	0.10	3.30	42
CULVERT # 16- STA 211+08.00 (Rt)	1 ~ 4' X 3'	2.515'	SCC-3&4	PW-2	0	2:1	8"	7"	0.333	4	N/A	N/A	6.000	5.167	N/A	0	0.10	3.30	42
CULVERT # 21- STA 278+95.00 (Lt)	3 ~ 6' X 4'	2.968'	MC-6-16	PW-2	0	2:1	9"	7"	0.500	5.25	N/A	N/A	8.500	20.333	N/A	0	0.40	7.00	83
CULVERT # 21- STA 278+95.00 (Rt)	3 ~ 6' X 4'	3.834'	MC-6-16	PW-2	0	2:1	9"	7"	0.479	5.229	N/A	N/A	8.458	20.333	N/A	0	0.40	7.00	82
CULVERT # 22- STA 322+22.00 (Both)	1 ~ 4' X 3'	4.8'	SCP-4	PW-2	0	2:1	5"	5"	0.500	3.917	N/A	N/A	6.833	4.833	N/A	0	0.20	7.80	104

NOTES:
 Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;
 30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical
 • Side slope at culvert for flared or straight wingwalls.
 • Channel slope for parallel wingwalls.
 • Slope must be 3:1 or flatter for safety end treatments.

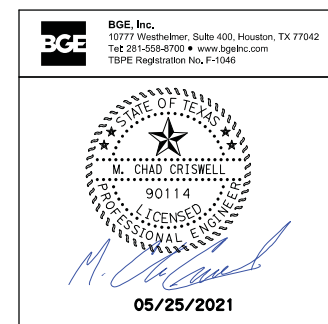
T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.
 U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.
 C = Curb height
 See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.
 Hw = Height of wingwall
 A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)
 B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)
 Lw = Length of longest wingwall.
 Ltw = Length of culvert toewall (not applicable when using riprap apron)
 Atw = Length of anchor toewall (applicable to safety end treatment only)
 Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.
 Area for four wingwalls (two structure ends) if Both.

- ① Round the wall heights shown to the nearest foot for bidding purposes.
- ② Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.
- ③ Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.
- ④ Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

SPECIAL NOTE:

This sheet is a supplement to the box culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.



		Bridge Division Standard	
<h2>BOX CULVERT SUPPLEMENT</h2> <h3>WINGS AND END TREATMENTS</h3>			
BCS			
FILE: bcsstdel-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
CTxDOT February 2020	CONT SECT	JOB	HIGHWAY
REVISIONS	0213 04	050	US 190
	DIST	COUNTY	SHEET NO.
	LFK	POLK	148

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TABLE OF DIMENSIONS AND REINFORCING STEEL
 (Wings for one structure end)

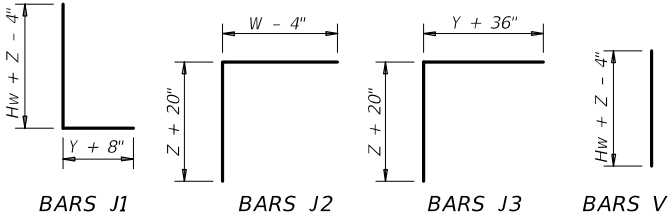
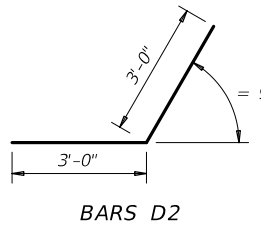
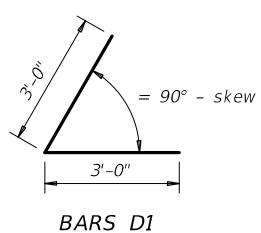
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-wings) (4)		Estimated Quantities per ft of Toewall (1-toewall)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa				
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"

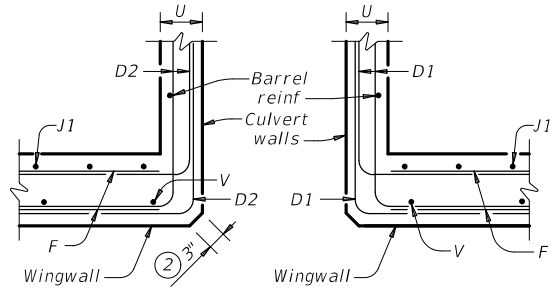


WING DIMENSION FORMULAS:
 (All values are in feet.)
 $Hw = H + T + C$
 $Lw = (Hw) (SL) \div \cosine (\theta)$ for Type PW-1
 $= (Hw - 1') (SL) \div \cosine (\theta)$ for Type PW-2 and $Hw \geq 4'$
 $= (Hw - 0.5') (SL) \div \cosine (\theta)$ for Type PW-2 and $Hw < 4'$
 For cast-in-place culverts:
 $Ltw = [(N) (S) + (N + 1) (U)] \div \cosine (\theta)$
 For precast culverts:
 $Ltw = [(N) (2 U + S) + (N - 1) (0.5')] \div \cosine (\theta)$
 Total Wingwall Area (two wings ~ SF)
 $= (2)(Hw)(Lw)$ for Type PW-1
 $= (2)(Hw)(Lw) - 6 SF$ for Type PW-2 and $Hw \geq 4'$
 $= (2)(Hw)(Lw) - 1.5 SF$ for Type PW-2 and $Hw < 4'$

Hw = Height of wingwall
 Lw = Length of wingwall
 Ltw = Culvert toewall length
 N = Number of culvert spans
 $SL:1$ = Channel slope ratio, (horizontal: 1 vertical, usual value is 2:1)
 θ = Culvert skew

See applicable box culvert standard sheet for S, H, T, and U values.

- Skew = 0°
- At discharge end, chamfer may be 3/4" minimum.
- For 15° skew ~ 1"
For 30° skew ~ 2"
For 45° skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.



SECTION C-C - PW-1

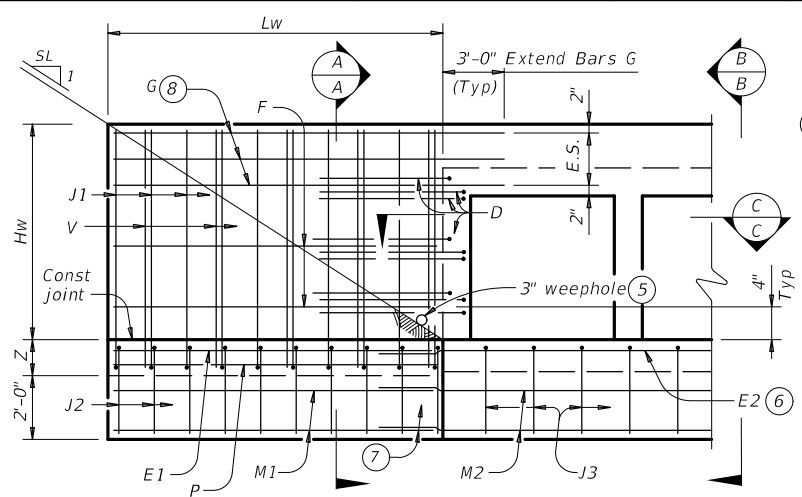
SECTION C-C - PW-2

DESIGNER NOTES:
 Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
 Type PW-2 can only be used for applications without a railing mounted to the wingwall.

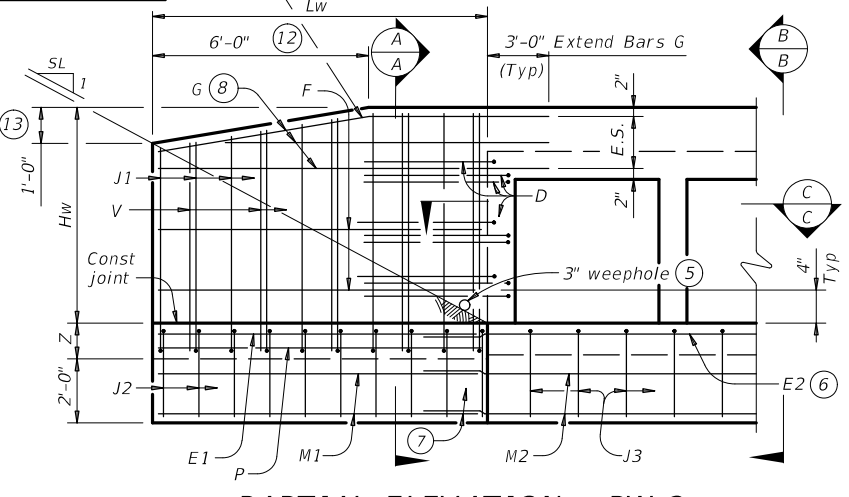
MATERIAL NOTES:
 Provide Class C concrete (f'c=3,600 psi).
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.

GENERAL NOTES:
 Designed in accordance with AASHTO LRFD Bridge Design Specifications.
 Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
 See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
 Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

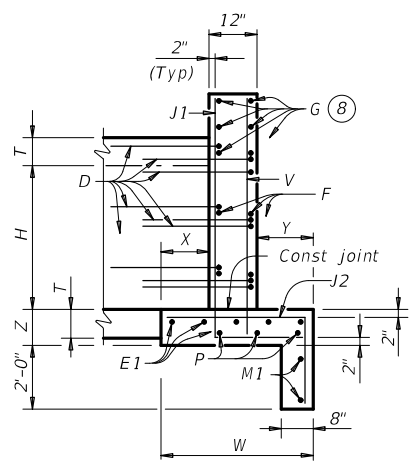
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



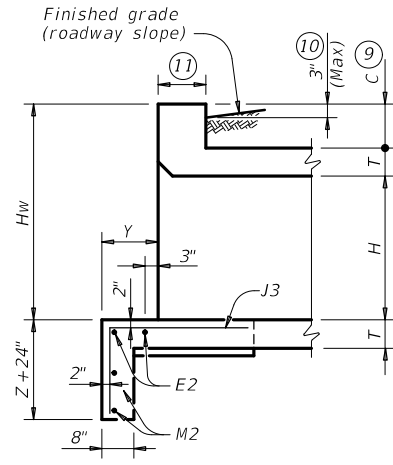
PARTIAL ELEVATION - PW-1



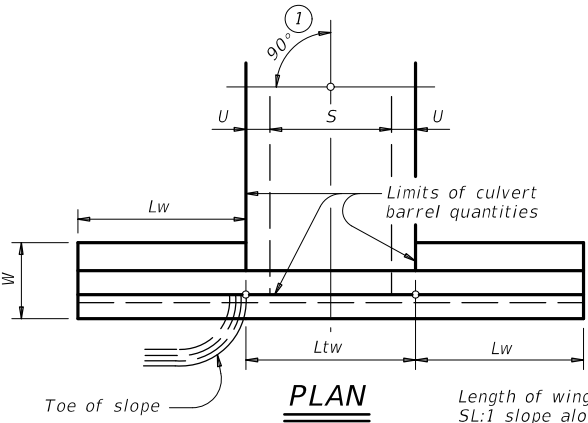
PARTIAL ELEVATION - PW-2



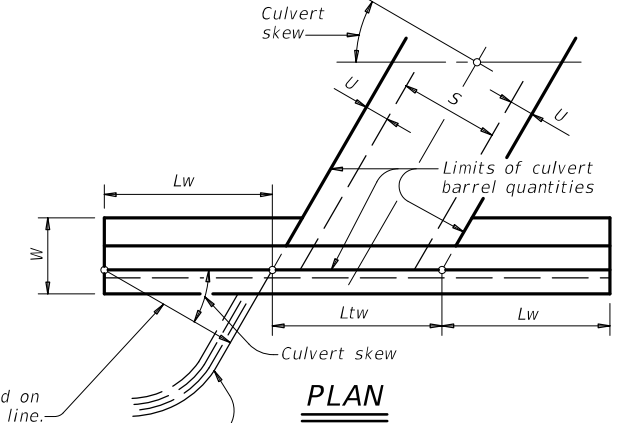
SECTION A-A
 (Showing wing reinforcement.)



SECTION B-B
 (Showing wing reinforcement.)



PLAN
 Length of wings based on SL:1 slope along this line.
DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN
DETAILS FOR SKEWED BOX CULVERTS
 (Showing 30° skew.)

Texas Department of Transportation
 Bridge Division Standard

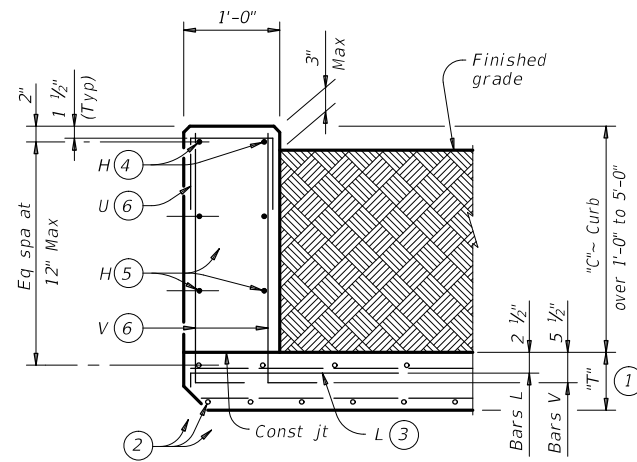
CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

FILE: pwstde01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	149	

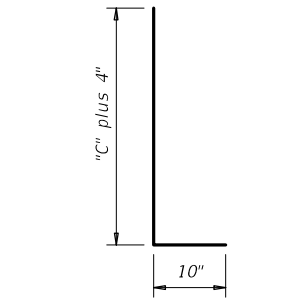
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DATE: 05/13/2021 06:40:35
FILE: c:\pwworkdir\bgp_pw\eman\mann\dms58436\ecds\de1-20.dgn



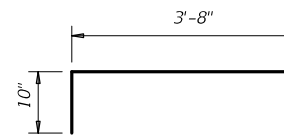
TYPICAL SECTION

Used for curbs over 1'-0" to 5'-0"



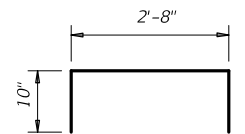
BARS V (#5)

Spaced at 12" Max



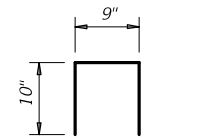
BARS L (#5)

Spaced at 12" Max



OPTIONAL BARS L (#5)

Spaced at 12" Max



BARS U (#4)

Spaced at 12" Max

- ① "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.
- ② Adjust normal culvert slab bars as necessary to clear obstructions.
- ③ Place bars L as shown. Tilt hook as necessary to maintain cover.
- ④ Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.
- ⑤ Additional bars H(#4) as required to maintain 12" Max spacing.
- ⑥ Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.
- ⑦ Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.
- ⑧ Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:

Adjust reinforcing steel as necessary to provide 1 1/4" cover. For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.
Provide bar laps, where required, as follows:
• Uncoated or galvanized ~ #4 = 1'-8" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



EXTENDED CURB DETAILS
FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

FILE: ecdside1-20.dgn	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	150	

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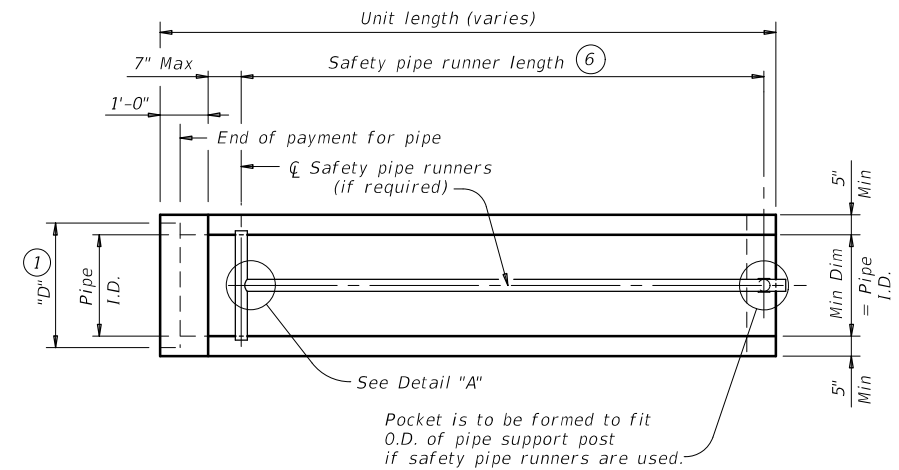
DATE: 05/13/2021 06:40:39
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REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (8)	"D" (1)	Slope	Min Length of Unit	Single Pipe		Multiple Pipes	
						Skew	Pipe Runners Required	Skew	Pipe Runners Required
12"	2"	1.15"	17.00"	3:1	2' - 11"	≤ 45°	No	≤ 45°	No
				4:1	3' - 6"				
				6:1	4' - 9"				
15"	2 1/4"	1.30"	20.50"	3:1	3' - 8"	≤ 45°	No	≤ 45°	No
				4:1	4' - 7"				
				6:1	6' - 5"				
18"	2 1/2"	1.60"	24.00"	3:1	4' - 6"	≤ 45°	No	≤ 45°	No
				4:1	5' - 8"				
				6:1	8' - 0"				
24"	3"	1.95"	31.00"	3:1	6' - 2"	≤ 45°	No	= 30°	No
				4:1	7' - 10"				
				6:1	11' - 3"				
30"	3 1/2"	2.65"	38.50"	3:1	7' - 10"	= 15°	No	= 15°	No
				4:1	10' - 1"				
				6:1	14' - 8"				
36"	4"	2.75"	45.50"	3:1	9' - 5"	= 0°	No	= 0°	Yes
				4:1	12' - 3"				
				6:1	17' - 11"				
42"	4 1/2"	N/A	52.50"	3:1	11' - 1"	≥ 0°	Yes	≥ 0°	Yes
				4:1	14' - 5"				
				6:1	21' - 2"				

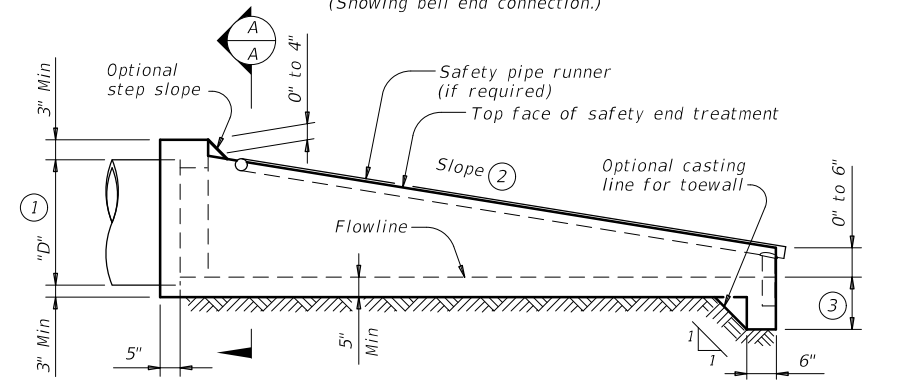
SAFETY PIPE RUNNER DIMENSIONS

Max Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11' - 2"	3" STD	3.500"	3.068"
15' - 6"	3 1/2" STD	4.000"	3.548"
20' - 10"	4" STD	4.500"	4.026"
35' - 4"	5" STD	5.563"	5.047"



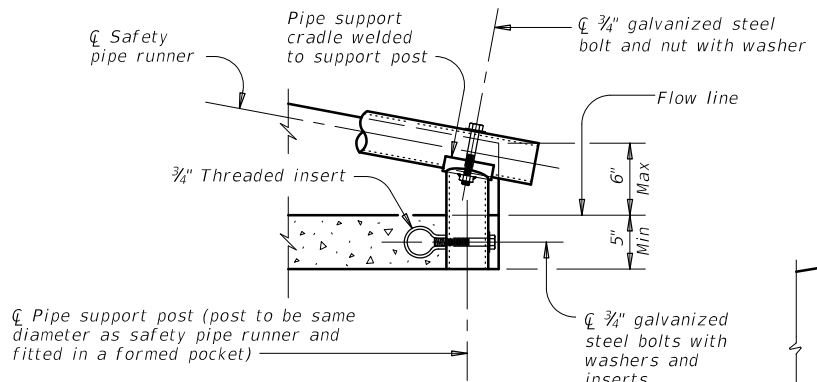
PLAN

(Showing bell end connection.)



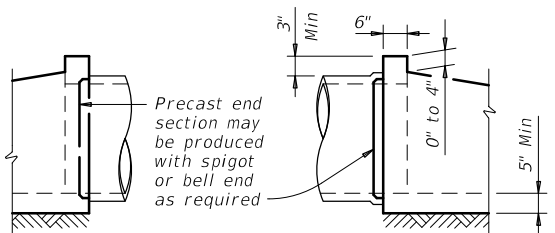
LONGITUDINAL ELEVATION

(Showing bell end connection.)



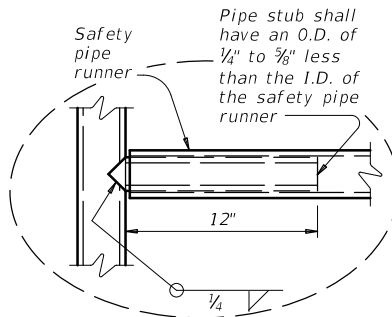
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

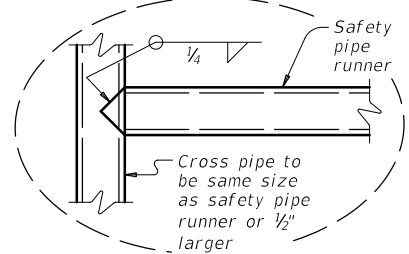


OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment)



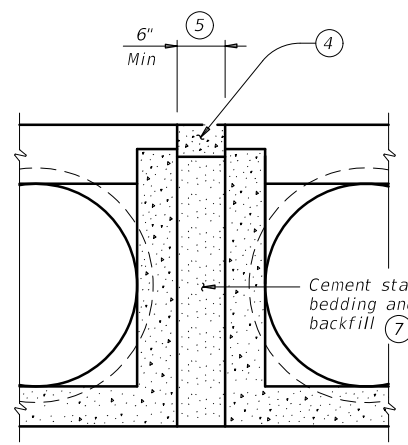
OPTION A



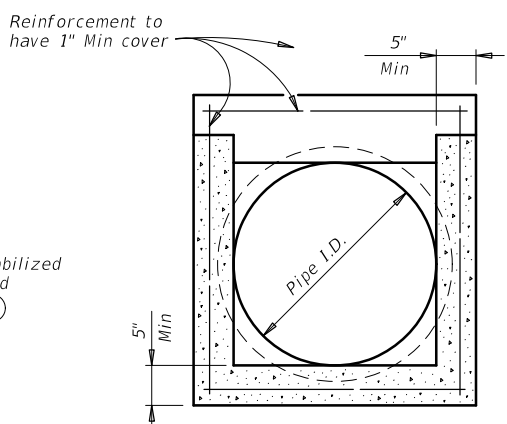
OPTION B

DETAIL A

(If required)

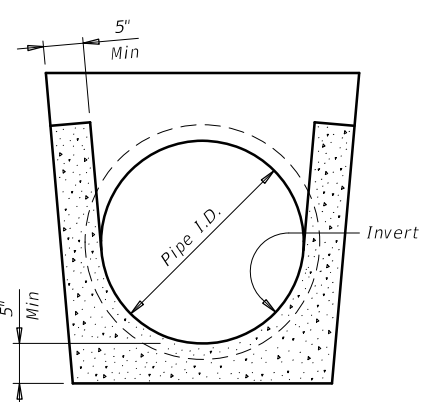


MULTIPLE PIPE INSTALLATION

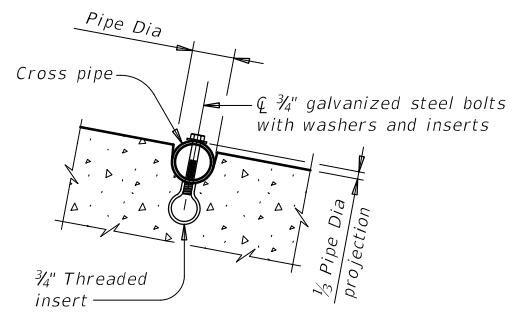


OPTION WITH SQUARE BOTTOM

SECTION A-A



OPTION WITH INVERT BOTTOM



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

- Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.
- Slope as shown elsewhere in plans. Slope of 3:1 or flatter is required for vehicle safety.
- Toewall to be used only when dimension is shown elsewhere in the plans.
- 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".
- Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- Measured along slope.
- Provide cement stabilized bedding and backfill in accordance with the Item 400, "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.
- Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "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.

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.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below:

- Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).
- For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor, the next larger size of safety end treatment may be furnished as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Provide safety pipe runners, cross pipes, pipe support posts, and pipe stubs meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

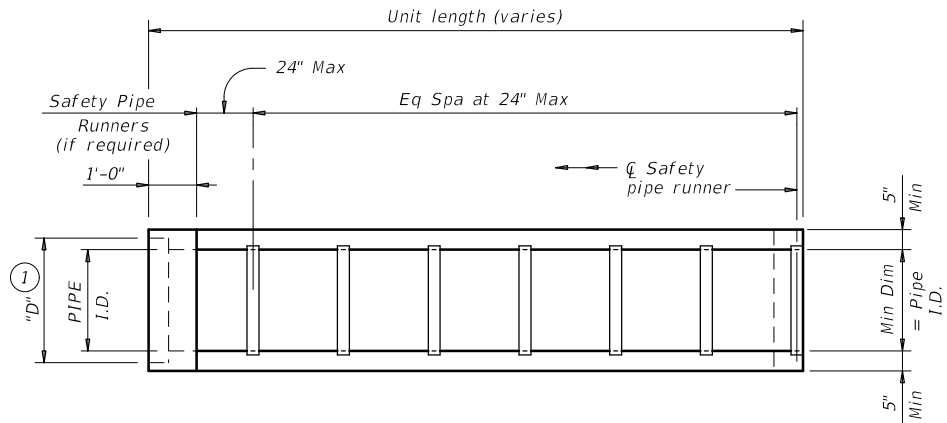
Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464 "Reinforced Concrete Pipe". Connect TP by grouting. See PBGC standard for grouted connections with TP and precast safety end treatment.

		Bridge Division Standard	
<h2>PRECAST SAFETY END TREATMENT</h2> <h3>TYPE II ~ CROSS DRAINAGE</h3>			
<h2>PSET-SC</h2>			
FILE: psetscss-20.dgn	DN: RLW	CK: KLR	DW: JTR
©TxDOT February 2020	CONTRACT: 0213 04	SECTION: 050	HIGHWAY: US 190
REVISIONS:	DIST: LFK	COUNTY: POLK	SHEET NO: 151

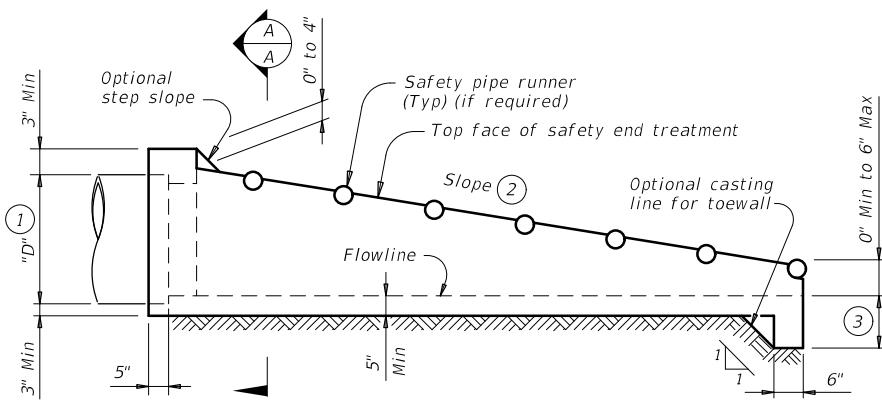
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 05/13/2021 06:40:44
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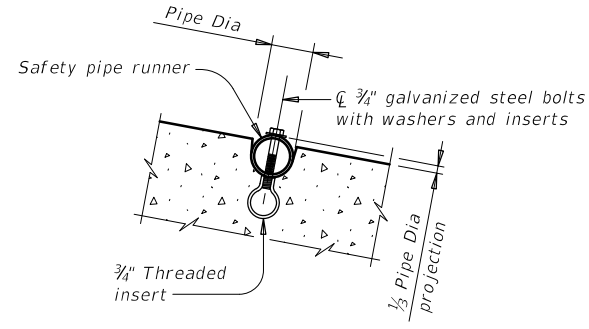
PLAN

(Showing bell end connection.)



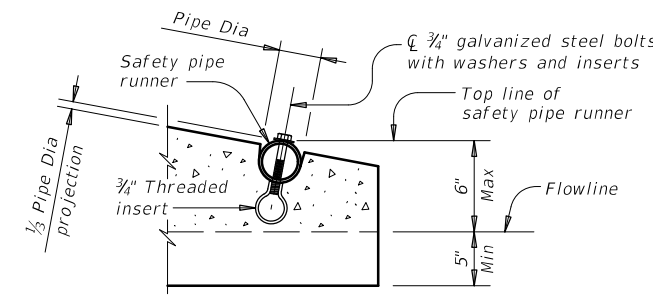
LONGITUDINAL ELEVATION

(Showing bell end connection.)

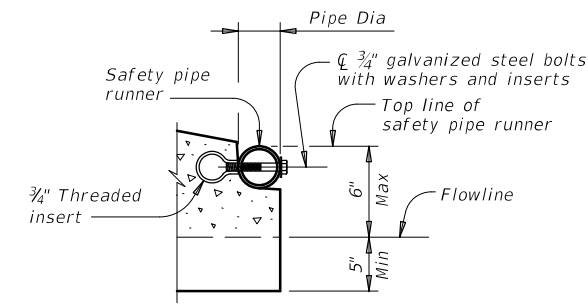


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



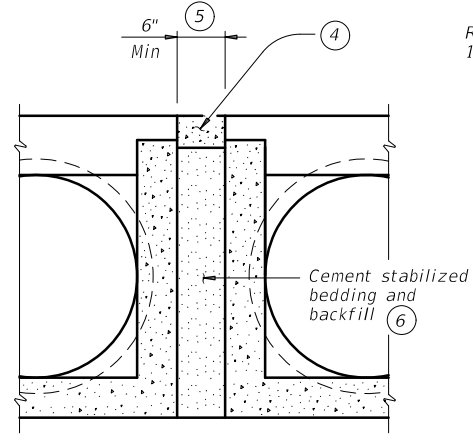
OPTION A



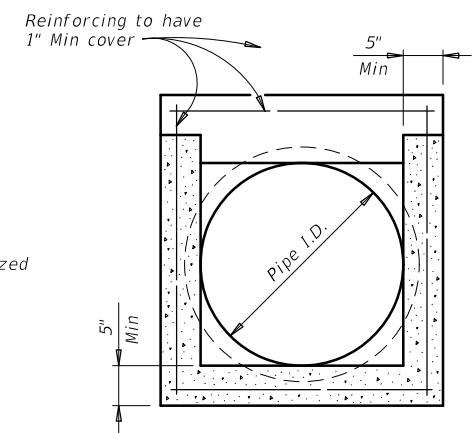
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

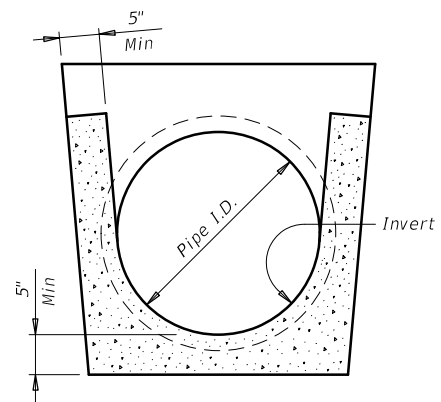


MULTIPLE PIPE INSTALLATION

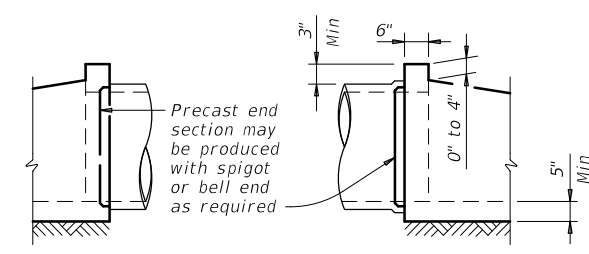


OPTION WITH SQUARE BOTTOM

SECTION A-A



OPTION WITH INVERT BOTTOM



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' - 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 1/4"	1.30"	20.50"	6:1	6' - 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 1/2"	1.60"	24.00"	6:1	8' - 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' - 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 1/2"	2.65"	38.50"	6:1	14' - 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' - 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 1/2"	N/A	52.50"	6:1	21' - 2"	Yes	Yes	4" STD	4.500"	4.026"

- Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.
- Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.
- Toewall to be used only when dimension is shown elsewhere in the plans.
- 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".
- Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- Provide cement stabilized bedding and backfill in accordance with the Item 400, "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.
- Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "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.
 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.
 Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below:
 A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).
 B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).
 At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.
 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.
 Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.
 Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.
 Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See PBGC standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation Bridge Division Standard

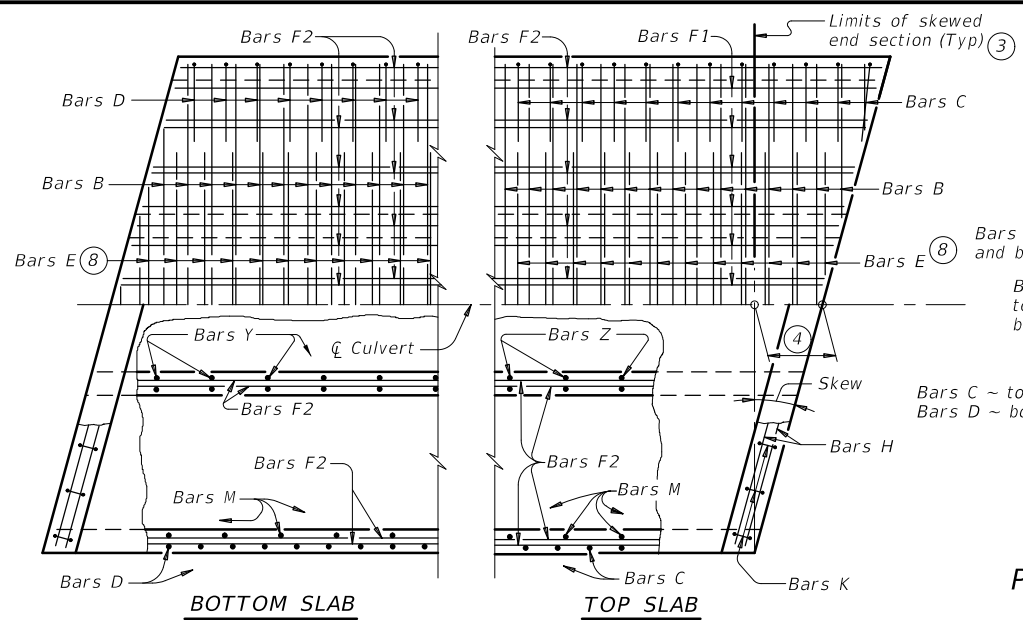
PRECAST SAFETY END TREATMENT TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetspss-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	152	

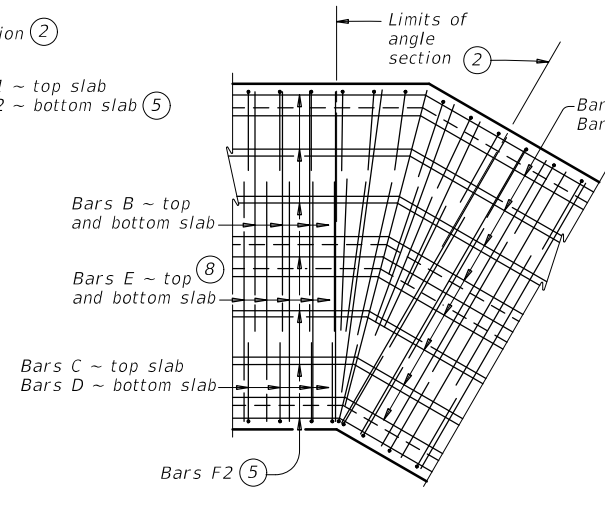
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 05/13/2021 06:40:50
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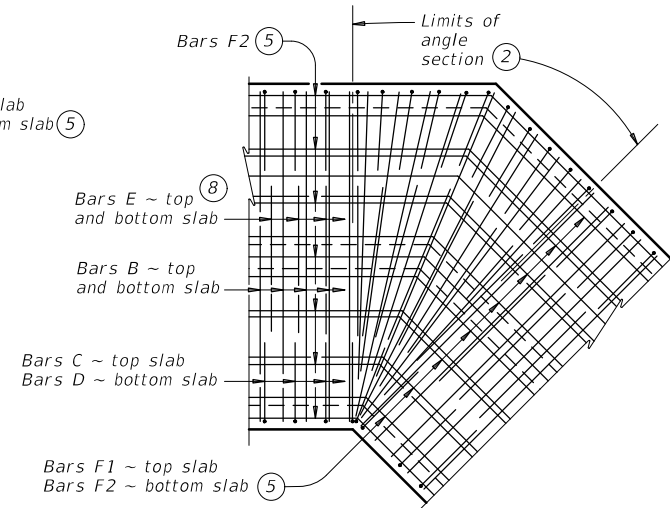


PLAN OF SKEWED ENDS ~ FROM 0° TO 15°

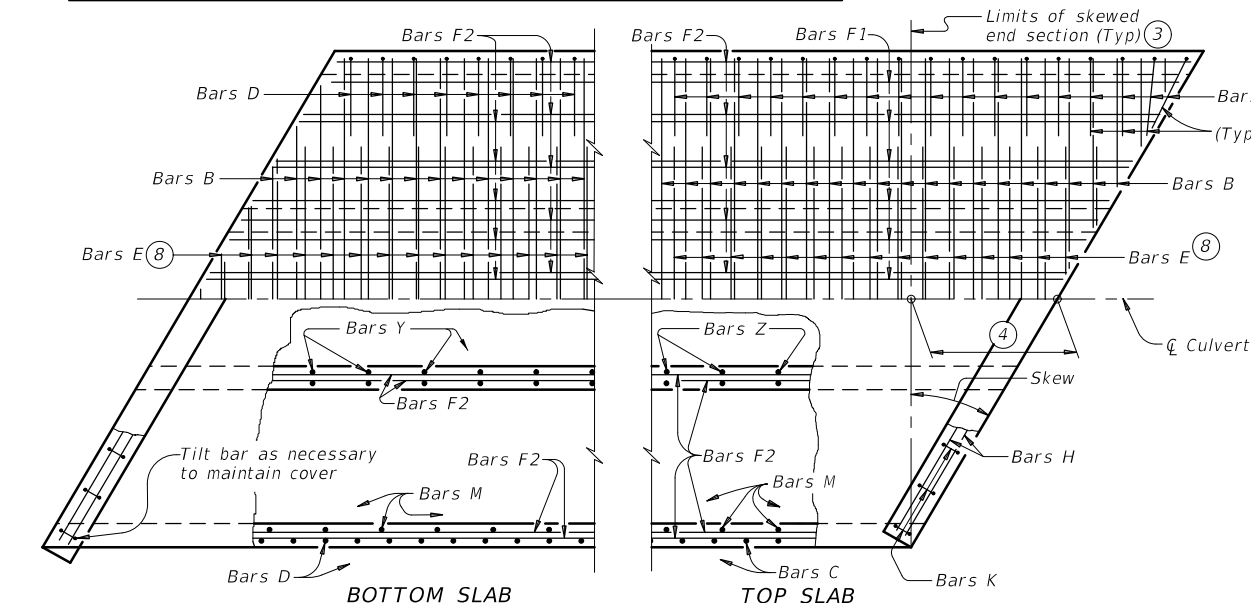
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°



PLAN OF SKEWED ENDS ~ OVER 15° TO 30°

- ① For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
 For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, Class C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, N_{ba} , of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.
 Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.
- ② When the spacing between Bars B or Bars E becomes less than half of the normal spacing, cut bars to avoid conflict.
- ③ The length of Bars B and Bars E will vary in the skewed end sections.
- ④ $[0.5 \times \text{overall width}] \times [\text{tangent of the skew angle}]$
- ⑤ Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- ⑥ When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- ⑦ At the Contractor's option, for skews of 15° or less, place Bars B, C, D, and E parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B and Bars E shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets to accommodate the skew.
- ⑧ Extend Bars E as shown on the MC standard sheet for direct traffic culverts.

CONSTRUCTION NOTES:

Do not use permanent forms.
 When required, lap Bars H 1'-8" for uncoated or galvanized bars.
 Provide a minimum of 1 1/2" clear cover.

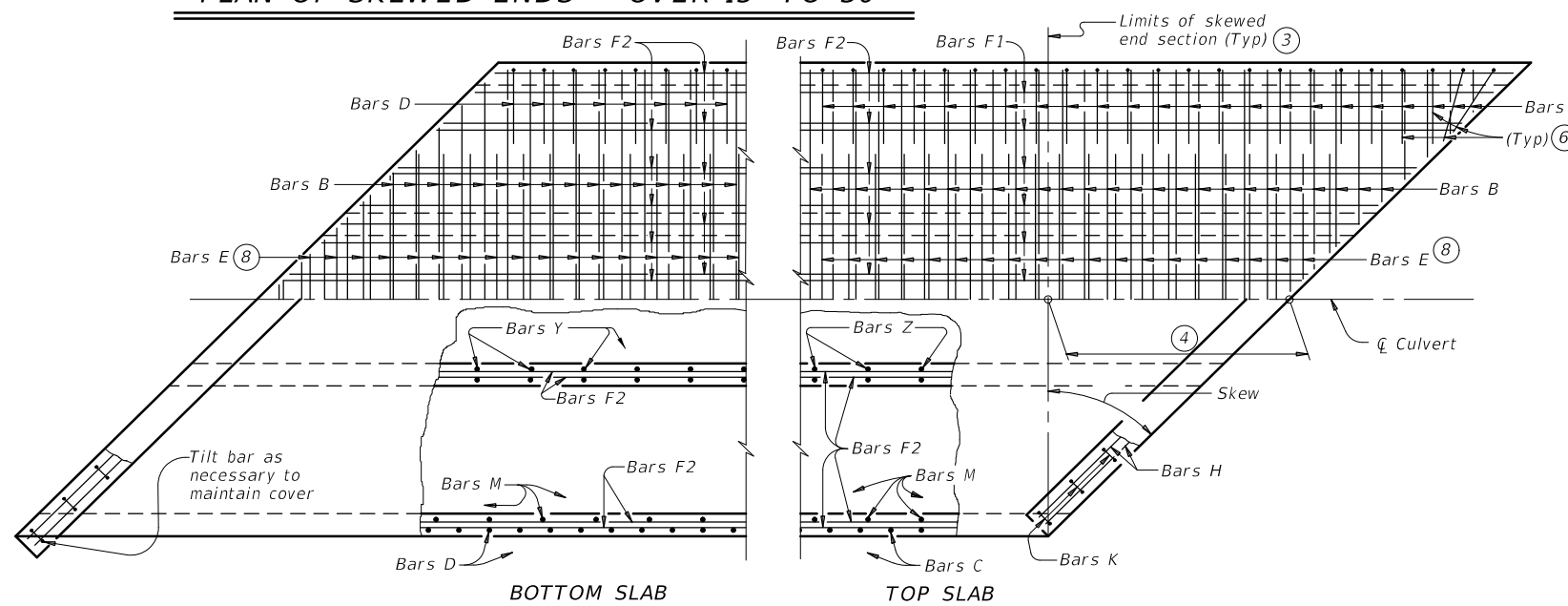
MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel, if required elsewhere in the plans.
 Provide Class C concrete ($f'_c = 3,600$ psi) with these exceptions:
 provide Class S concrete ($f'_c = 4,000$ psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

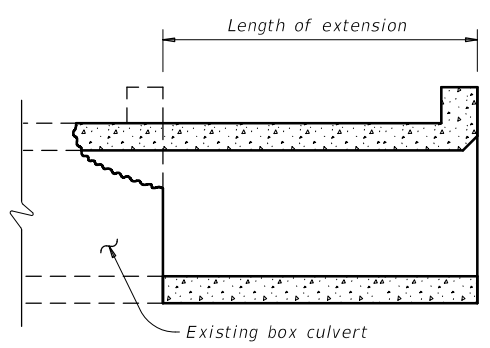
GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
 Refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for details of straight sections of culvert.
 For skewed sections and angle sections, refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
 For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



LENGTHENING DETAIL

HL93 LOADING



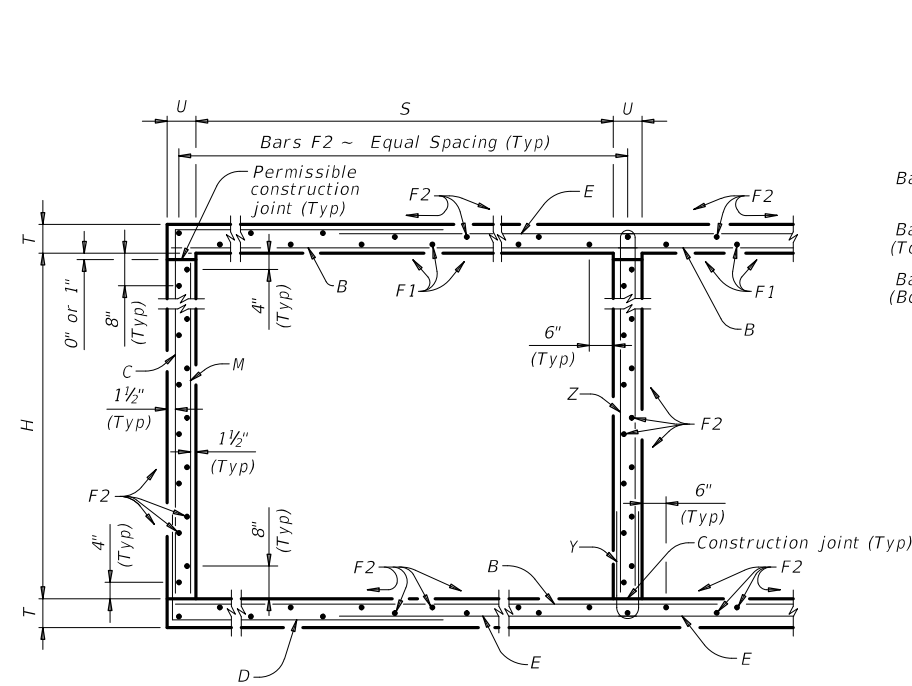
**MULTIPLE BOX CULVERTS
 CAST-IN-PLACE
 MISCELLANEOUS DETAILS**

MC-MD

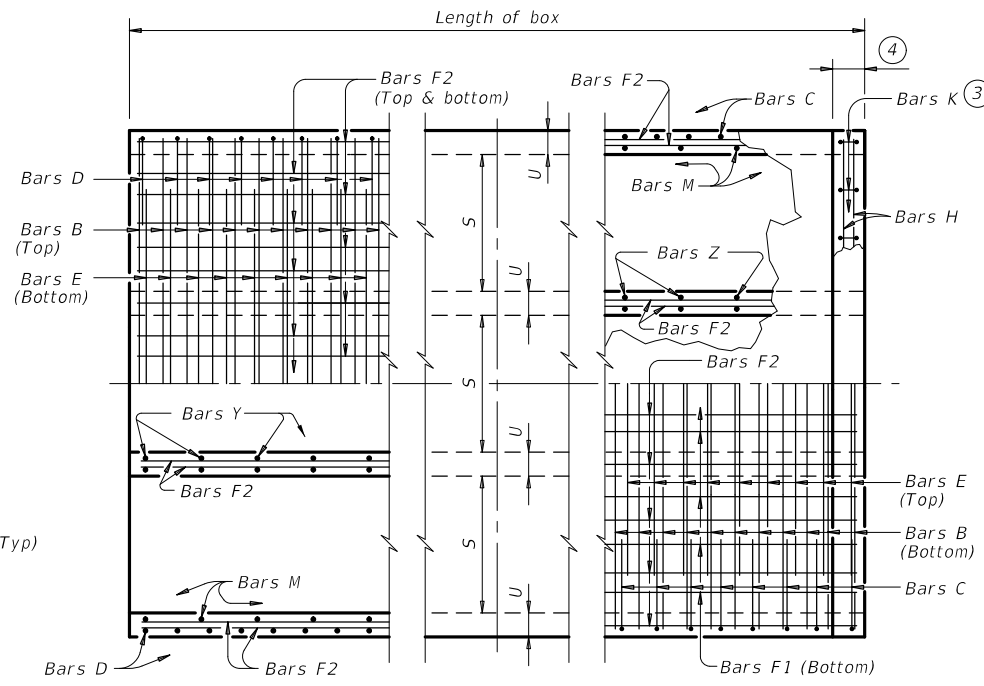
FILE: mc-mdste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	153	

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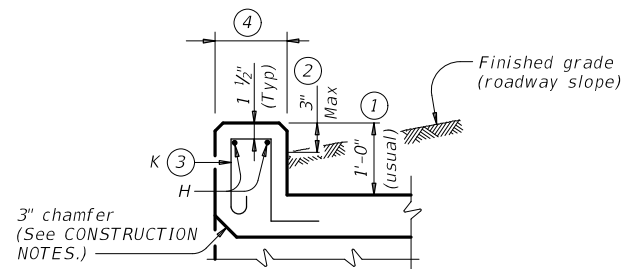
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TYPICAL SECTION

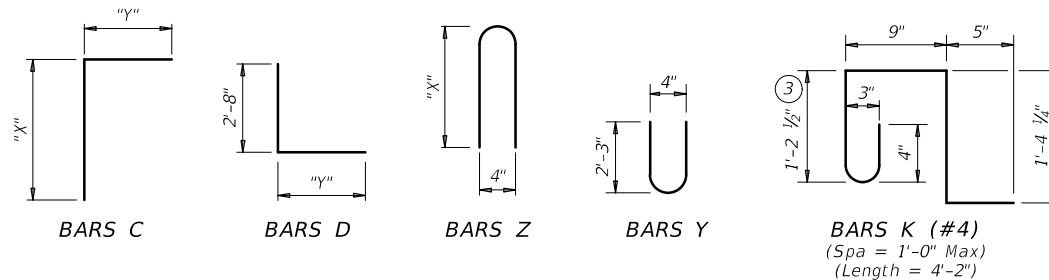


BOTTOM SLAB
PART PLANS
TOP SLAB



SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
2'-0"	2'-7 1/2"	4'-1"
3'-0"	3'-7 1/2"	4'-1"
4'-0"	4'-7 1/2"	4'-1"
5'-0"	5'-7 1/2"	4'-1"
6'-0"	6'-7 1/2"	4'-1"



- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86"
 Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

Do not use permanent forms.
 Chamfer the bottom edge of the top slab 3" at the entrance.
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:

- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

 Provide bar laps, where required, as follows:

- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min
- Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
 See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
 6'-0" SPAN
 0' TO 16' FILL

MC-6-16

FILE: mc616ste-20.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	154	

BILLS OF REINFORCING STEEL (For Box Length = 40 feet)

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																											QUANTITIES																	
					Bars B				Bars C & D				Bars E			Bars F1 ~ #4			Bars F2 ~ #4			Bars M ~ #4			Bars Y & Z ~ #4				Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total												
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bars C		Bars D		No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Bars Y		Bars Z		Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
													Length	Wt	Length	Wt																				Length	Wt	Length	Wt										
2	6'-0"	2'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	44	18"	39'-9"	1,168	108	9"	2'-0"	144	54	9"	4'-9"	171	5'-5"	195	13'-6"	36	30	84	0.894	182.4	1.0	120	36.8	7,414
3	6'-0"	2'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	63	18"	39'-9"	1,673	108	9"	2'-0"	144	108	9"	4'-9"	343	5'-5"	391	20'-1"	54	44	122	1.302	260.9	1.5	176	53.6	10,611
4	6'-0"	2'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	82	18"	39'-9"	2,177	108	9"	2'-0"	144	162	9"	4'-9"	514	5'-5"	586	26'-8"	71	56	156	1.711	339.4	2.0	227	70.4	13,801
5	6'-0"	2'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	101	18"	39'-9"	2,682	108	9"	2'-0"	144	216	9"	4'-9"	685	5'-5"	782	33'-3"	89	70	195	2.120	417.9	2.5	284	87.3	16,999
6	6'-0"	2'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	120	18"	39'-9"	3,186	108	9"	2'-0"	144	270	9"	4'-9"	857	5'-5"	977	39'-10"	106	82	228	2.529	496.4	3.0	334	104.1	20,189
2	6'-0"	3'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	50	18"	39'-9"	1,328	108	9"	3'-0"	216	54	9"	4'-9"	171	7'-5"	268	13'-6"	36	30	84	0.958	192.8	1.0	120	39.3	7,832
3	6'-0"	3'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	71	18"	39'-9"	1,885	108	9"	3'-0"	216	108	9"	4'-9"	343	7'-5"	535	20'-1"	54	44	122	1.389	274.4	1.5	176	57.1	11,152
4	6'-0"	3'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	92	18"	39'-9"	2,443	108	9"	3'-0"	216	162	9"	4'-9"	514	7'-5"	803	26'-8"	71	56	156	1.819	356.1	2.0	227	74.7	14,469
5	6'-0"	3'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	113	18"	39'-9"	3,000	108	9"	3'-0"	216	216	9"	4'-9"	685	7'-5"	1,070	33'-3"	89	70	195	2.250	437.7	2.5	284	92.5	17,790
6	6'-0"	3'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	134	18"	39'-9"	3,558	108	9"	3'-0"	216	270	9"	4'-9"	857	7'-5"	1,338	39'-10"	106	82	228	2.681	519.3	3.0	334	110.2	21,107
2	6'-0"	4'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	50	18"	39'-9"	1,328	108	9"	4'-0"	289	54	9"	4'-9"	171	9'-5"	340	13'-6"	36	30	84	1.023	199.2	1.0	120	41.9	8,089
3	6'-0"	4'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	71	18"	39'-9"	1,885	108	9"	4'-0"	289	108	9"	4'-9"	343	9'-5"	679	20'-1"	54	44	122	1.475	282.6	1.5	176	60.5	11,481
4	6'-0"	4'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	92	18"	39'-9"	2,443	108	9"	4'-0"	289	162	9"	4'-9"	514	9'-5"	1,019	26'-8"	71	56	156	1.927	366.1	2.0	227	79.1	14,870
5	6'-0"	4'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	113	18"	39'-9"	3,000	108	9"	4'-0"	289	216	9"	4'-9"	685	9'-5"	1,359	33'-3"	89	70	195	2.380	449.5	2.5	284	97.7	18,264
6	6'-0"	4'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	134	18"	39'-9"	3,558	108	9"	4'-0"	289	270	9"	4'-9"	857	9'-5"	1,698	39'-10"	106	82	228	2.832	533.0	3.0	334	116.2	21,652
2	6'-0"	5'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	56	18"	39'-9"	1,487	108	9"	5'-0"	361	54	9"	4'-9"	171	11'-5"	412	13'-6"	36	30	84	1.088	209.6	1.0	120	44.5	8,505
3	6'-0"	5'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	79	18"	39'-9"	2,098	108	9"	5'-0"	361	108	9"	4'-9"	343	11'-5"	824	20'-1"	54	44	122	1.562	296.2	1.5	176	64.0	12,024
4	6'-0"	5'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	102	18"	39'-9"	2,708	108	9"	5'-0"	361	162	9"	4'-9"	514	11'-5"	1,235	26'-8"	71	56	156	2.035	382.7	2.0	227	83.4	15,536
5	6'-0"	5'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	125	18"	39'-9"	3,319	108	9"	5'-0"	361	216	9"	4'-9"	685	11'-5"	1,647	33'-3"	89	70	195	2.509	469.3	2.5	284	102.8	19,056
6	6'-0"	5'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	148	18"	39'-9"	3,930	108	9"	5'-0"	361	270	9"	4'-9"	857	11'-5"	2,059	39'-10"	106	82	228	2.983	555.9	3.0	334	122.3	22,570
2	6'-0"	6'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	10'-8"	1,202	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	62	18"	39'-9"	1,646	108	9"	6'-0"	433	54	9"	4'-9"	171	13'-5"	484	13'-6"	36	30	84	1.153	220.0	1.0	120	47.1	8,921
3	6'-0"	6'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	10'-8"	1,202	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	87	18"	39'-9"	2,310	108	9"	6'-0"	433	108	9"	4'-9"	343	13'-5"	968	20'-1"	54	44	122	1.648	309.7	1.5	176	67.4	12,565
4	6'-0"	6'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	10'-8"	1,202	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	112	18"	39'-9"	2,974	108	9"	6'-0"	433	162	9"	4'-9"	514	13'-5"	1,452	26'-8"	71	56	156	2.144	399.4	2.0	227	87.7	16,204
5	6'-0"	6'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	10'-8"	1,202	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	137	18"	39'-9"	3,638	108	9"	6'-0"	433	216	9"	4'-9"	685	13'-5"	1,936	33'-3"	89	70	195	2.639	489.1	2.5	284	108.0	19,849
6	6'-0"	6'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	10'-8"	1,202	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	162	18"	39'-9"	4,302	108	9"	6'-0"	433	270	9"	4'-9"	857	13'-5"	2,420	39'-10"	106	82	228	3.134	578.9	3.0	334	128.3	23,488

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HL93 LOADING SHEET 2 OF 2



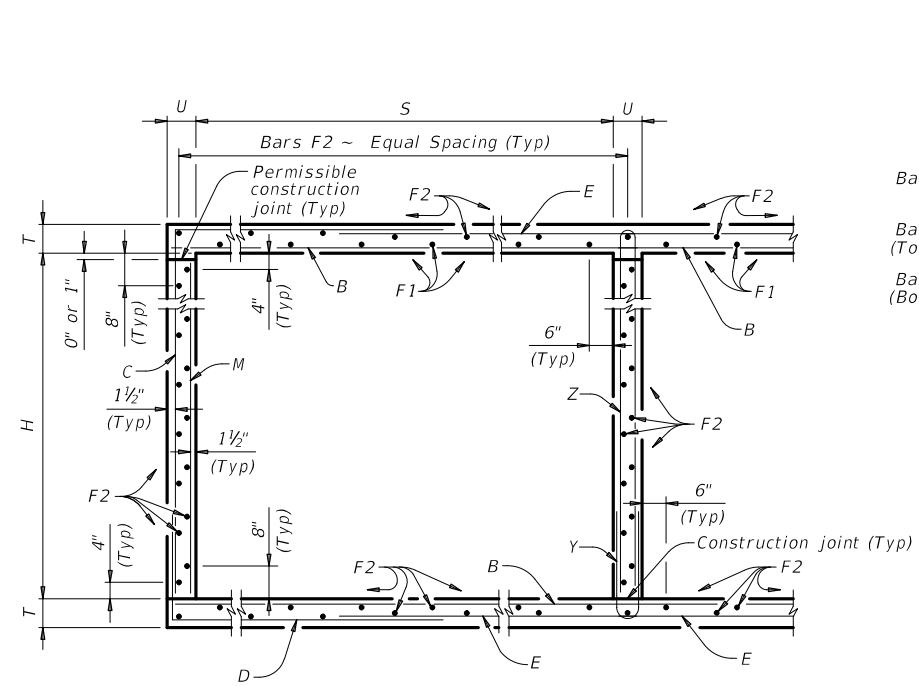
**MULTIPLE BOX CULVERTS
CAST-IN-PLACE
6'-0" SPAN
0' TO 16' FILL**

MC-6-16

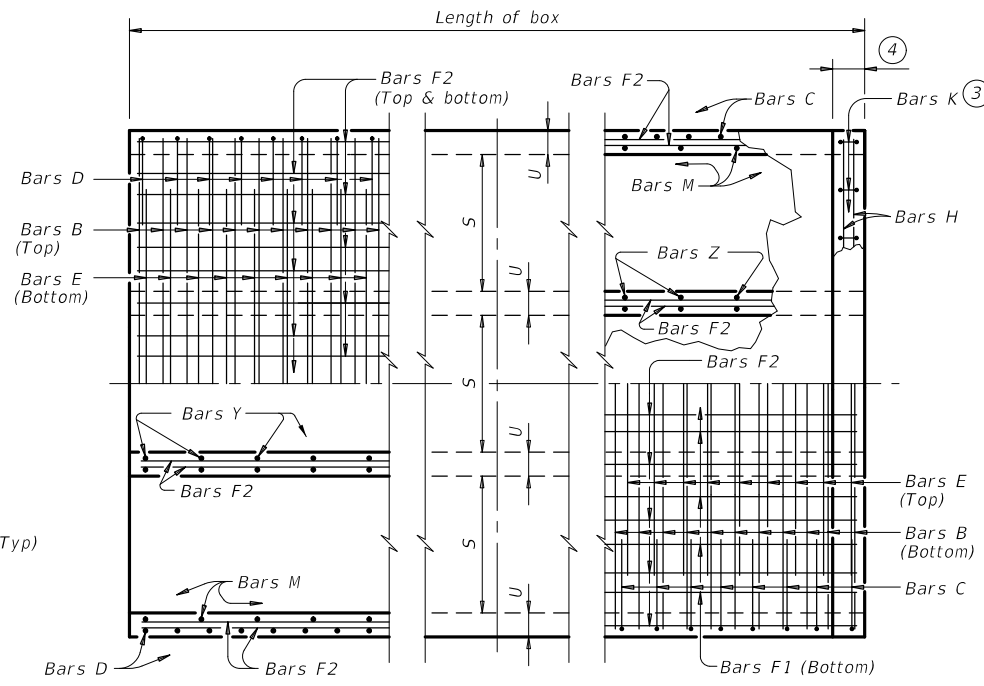
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REVISED: REVISIONS		COUNTY: POLK		SHEET NO: 155

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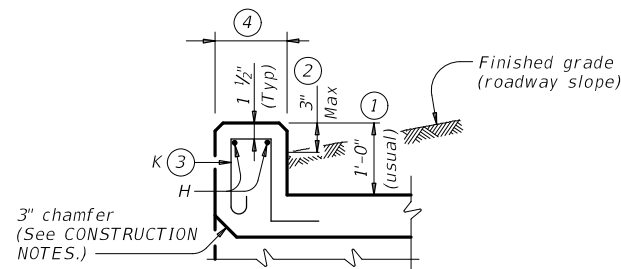
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TYPICAL SECTION

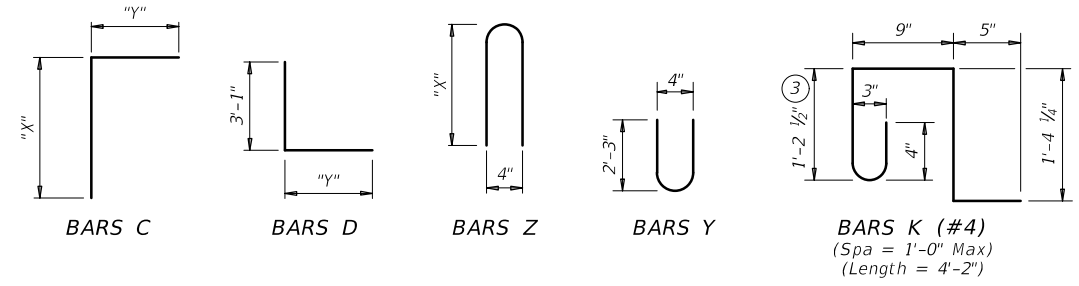


BOTTOM SLAB **TOP SLAB**
PART PLANS



SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
4'-0"	4'-7 1/2"	5'-5"
5'-0"	5'-7 1/2"	5'-5"
6'-0"	6'-7 1/2"	5'-5"
7'-0"	7'-7 1/2"	5'-5"
8'-0"	8'-7 1/2"	5'-5"
9'-0"	9'-7 1/2"	5'-5"



- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:
 Do not use permanent forms.
 Chamfer the bottom edge of the top slab 3" at the entrance.
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
 • culverts with overlay,
 • culverts with 1-to-2 course surface treatment, or
 • culverts with the top slab as the final riding surface.
 Provide bar laps, where required, as follows:
 • Uncoated or galvanized ~ #4 = 1'-8" Min
 • Uncoated or galvanized ~ #5 = 2'-1" Min
 • Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
 See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
 Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
 9'-0" SPAN
 0' TO 10' FILL

MC-9-10

FILE: mc910ste-20.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	156	

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 DATE: 05/13/2021 06:41:02

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES																				
					Bars B					Bars C & D				Bars E				Bars F1 ~ #4			Bars F2 ~ #4			Bars M ~ #4			Bars Y & Z ~ #4				Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total										
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bars C		Bars D		No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Bars Y		Bars Z		Length	Wt	No.	Wt	Conc (CY)	Ref (Lb)	Conc (CY)	Ref (Lb)	Conc (CY)	Ref (Lb)				
2	9'-0"	4'-0"	9"	7"	162	#6	6"	19'-6"	4,745	108	#6	9"	10'-1"	1,636	8'-7"	1,392	162	#6	6"	14'-1"	3,427	14	18"	39'-9"	372	62	18"	39'-9"	1,646	108	9"	4'-0"	289	54	9"	4'-9"	171	9'-5"	340	19'-6"	52	42	117	1.356	350.5	1.5	169	55.7	14,187

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

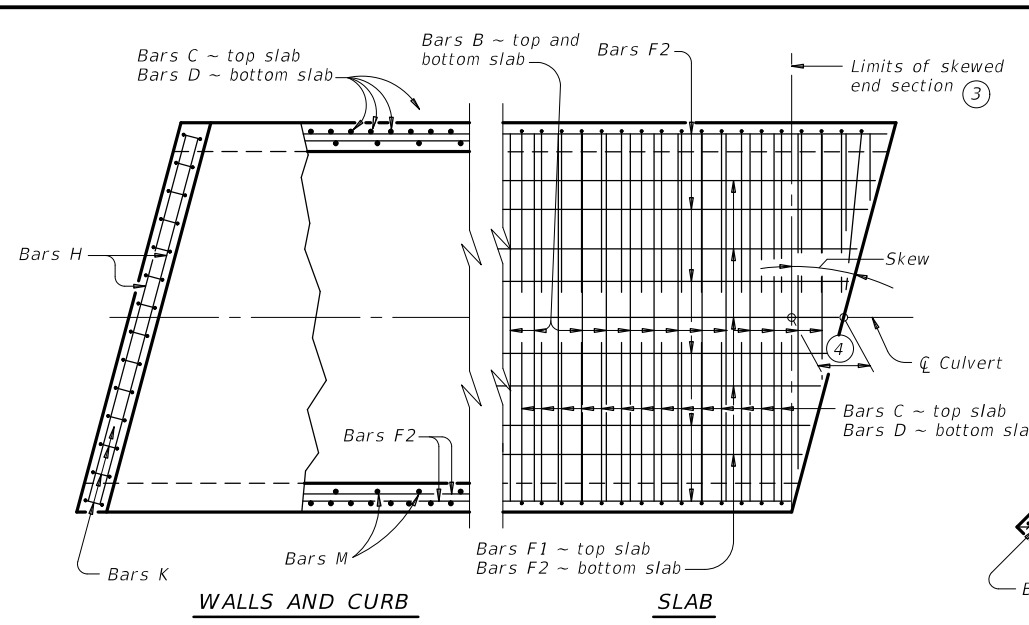
MULTIPLE BOX CULVERTS
CAST-IN-PLACE
9'-0" SPAN
0' TO 10' FILL

MC-9-10

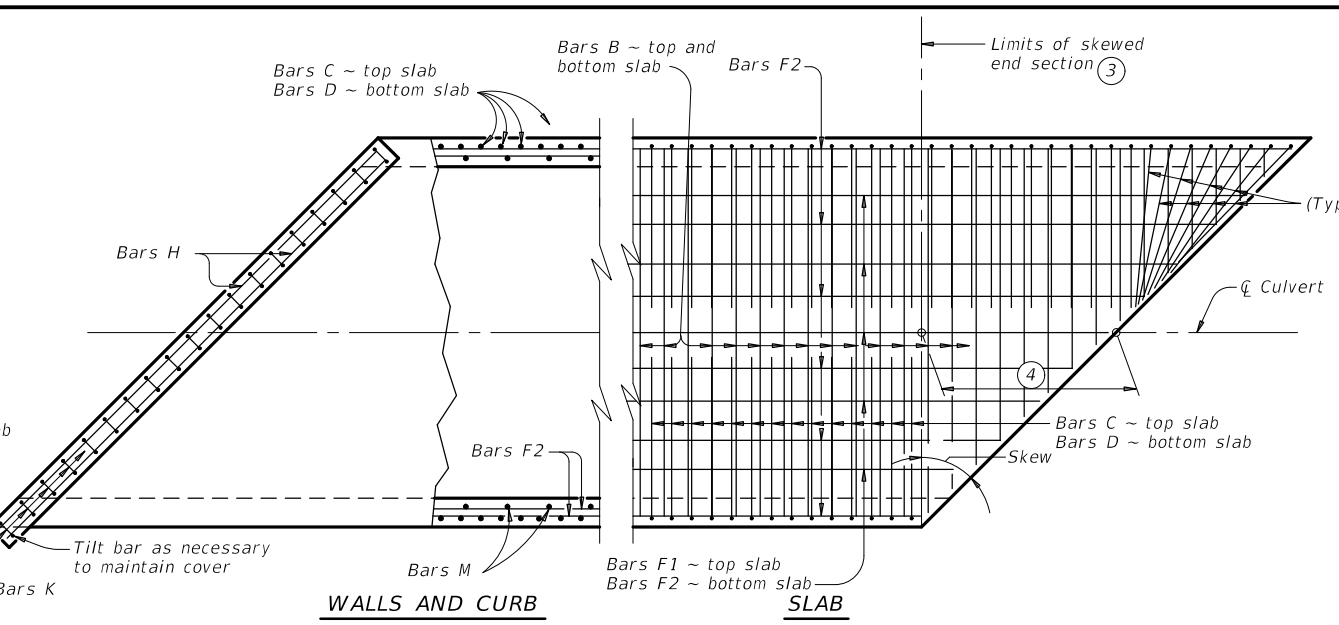
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REVISIONS		0213	04	050	US 190
		DIST	COUNTY		SHEET NO.
		LFK	POLK		157

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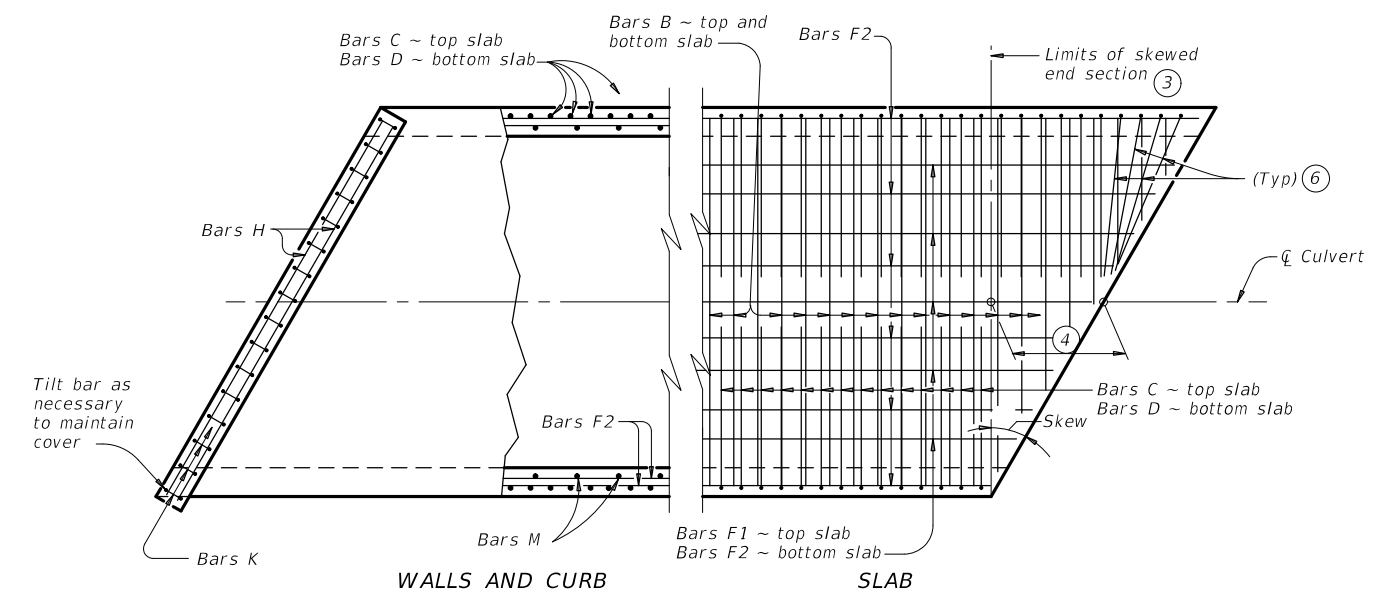
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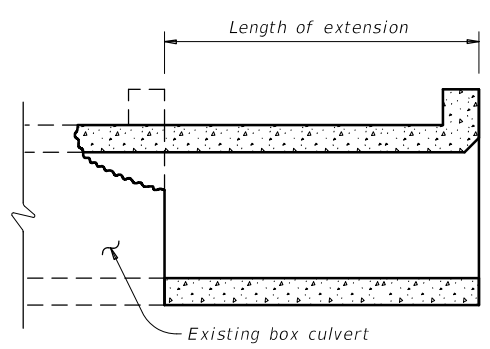
PLAN OF SKEWED ENDS ~ FROM 0° TO 15°



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



LENGTHENING DETAIL

1 For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
 For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.
 Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

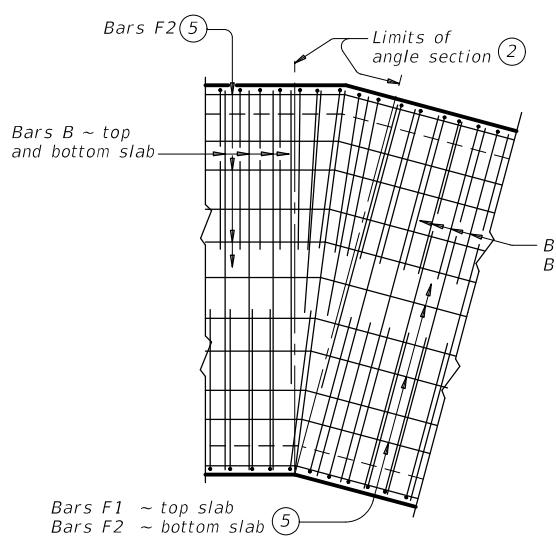
- 2 When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.
- 3 The length of Bars B vary in the skewed end sections.
- 4 $[One\ half\ of\ overall\ width] \times [tangent\ of\ the\ skew\ angle]$
- 5 Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- 6 When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- 7 At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standards sheets to accommodate the skew.

CONSTRUCTION NOTES:
 Do not use permanent forms.
 When required, lap Bars H 1'-8" for uncoated or galvanized bars.
 Provide a minimum of 1 1/2" clear cover.

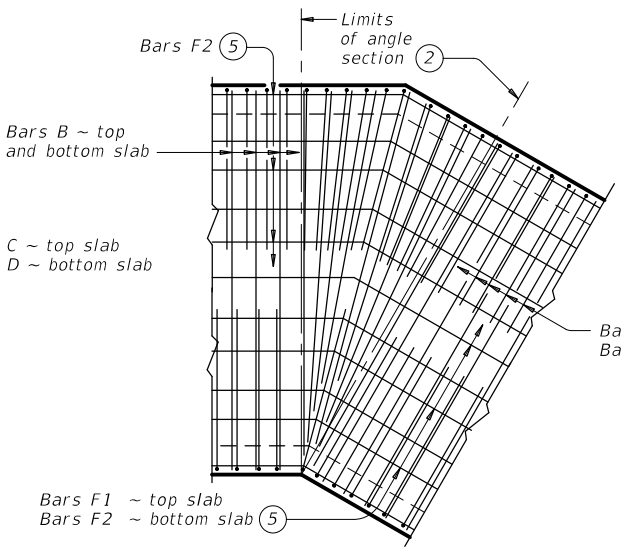
MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel, if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) with these exceptions:
 provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.
 For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
 For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-In-Place (SCC) standard sheets by the cosine of the skew angle.

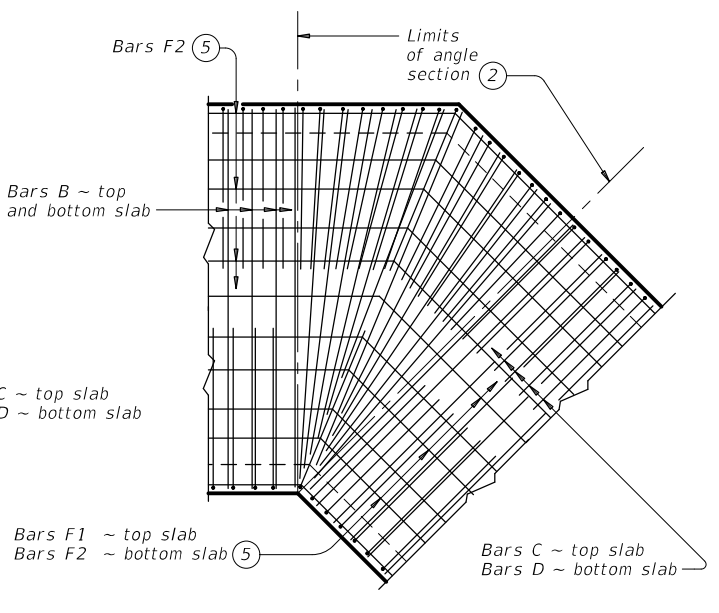
Cover dimensions are clear dimensions, unless noted otherwise.



PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



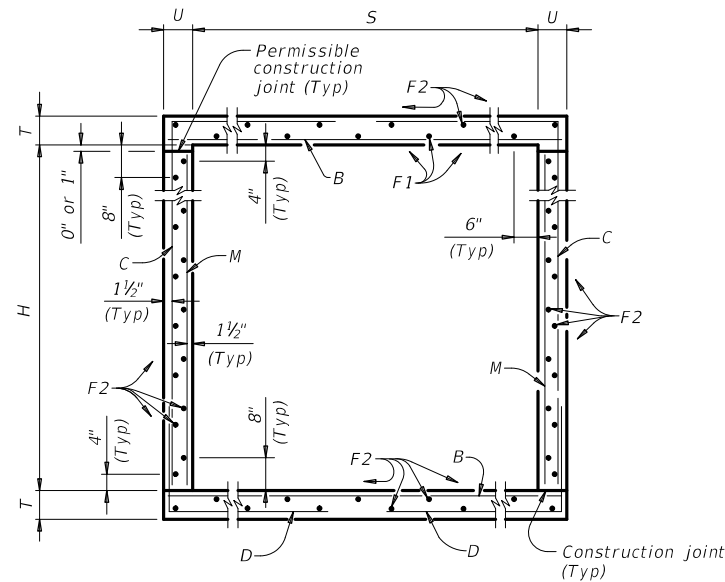
PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

HL93 LOADING

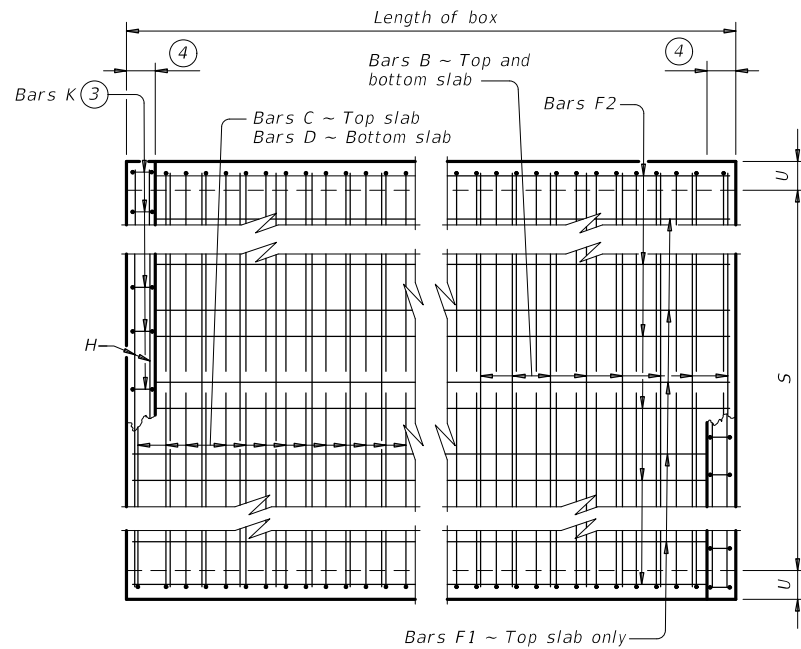
		Bridge Division Standard	
SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS			
SCC-MD			
FILE: sccmdste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT: 0213	SECT: 04	JOB: 050
REVISIONS			HIGHWAY: US 190
	DIST: LFK	COUNTY: POLK	SHEET NO: 158

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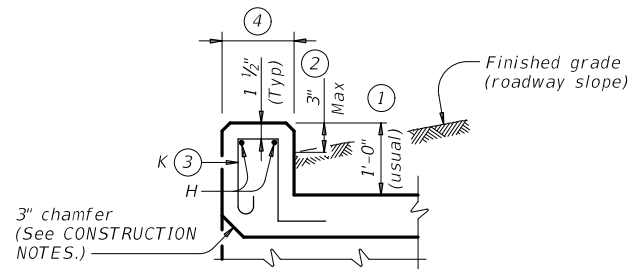
DATE: 05/13/2021 06:41:12
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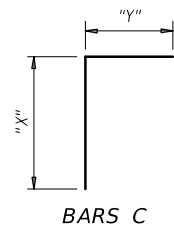
TYPICAL SECTION



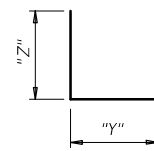
PLAN OF REINF STEEL



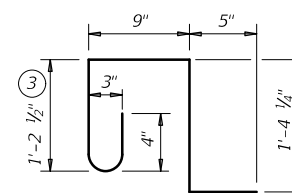
SECTION THRU CURB



BARS C



BARS D



BARS K (#4)
 (Spa = 1'-0" Max)
 (Length = 4'-2")

- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
 - culverts with overlay,
 - culverts with 1-to-2 course surface treatment, or
 - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
 - Uncoated or galvanized ~ #4 = 1'-8" Min
 - Uncoated or galvanized ~ #5 = 2'-1" Min

GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 2



**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

SCC-3 & 4

FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	LFK	POLK	159	

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DATE: 05/13/2021 06:41:12
 FILE: c:\pwworkdir\user\man\mms58436\scc34ste-21.dgn

SECTION DIMENSIONS				FILL HEIGHT ⁵	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B				Bars C				Bars D				Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total								
					S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)
3' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	5' - 4"	385	2' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	19	39' - 9"	505	3' - 11"	10	10	28	0.292	48.1	0.3	38	12.0	1,960
3' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	6' - 4"	457	3' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	23	39' - 9"	611	3' - 11"	10	10	28	0.335	54.3	0.3	38	13.7	2,210
4' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	5' - 8"	613	2' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	21	39' - 9"	558	4' - 11"	13	12	33	0.342	63.4	0.4	46	14.1	2,581
4' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	6' - 8"	721	3' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.385	70.5	0.4	46	15.8	2,867
4' - 0"	4' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	7' - 8"	830	4' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	4' - 0"	289	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.428	75.1	0.4	46	17.5	3,049

⁵ For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.



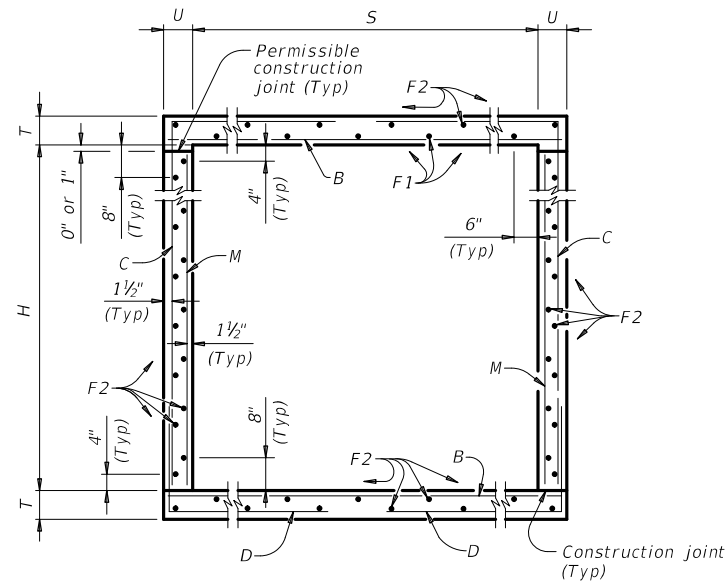
**SINGLE BOX CULVERTS
CAST-IN-PLACE
0' TO 30' FILL**

SCC-3 & 4

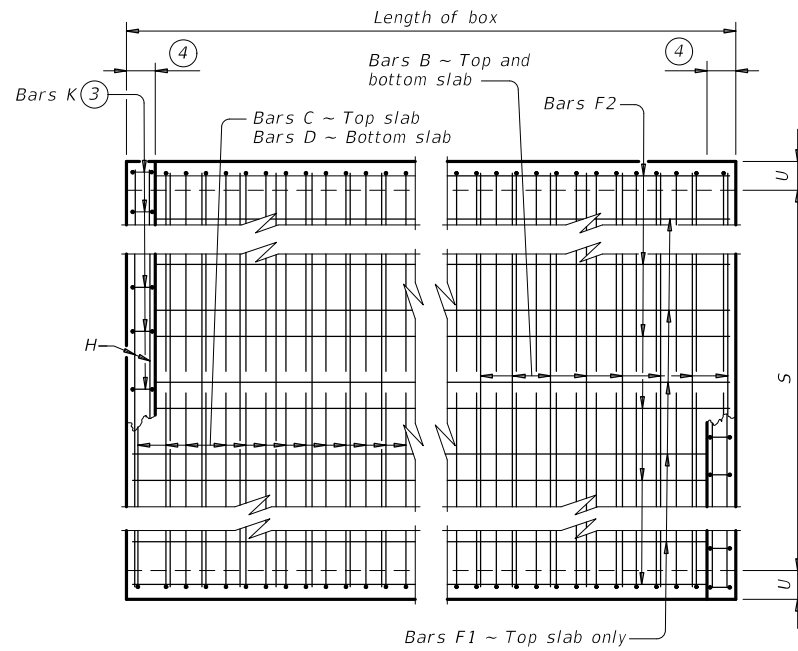
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	LFK	POLK	160	

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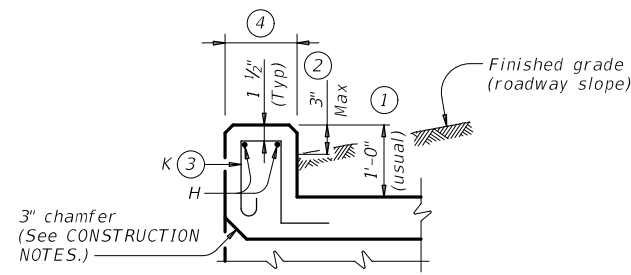
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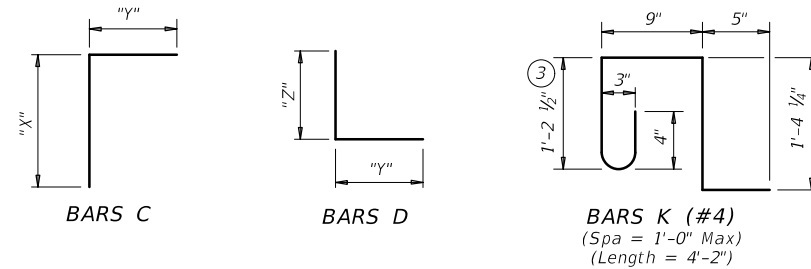
TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB



- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
 - culverts with overlay,
 - culverts with 1-to-2 course surface treatment, or
 - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
 - Uncoated or galvanized ~ #4 = 1'-8" Min
 - Uncoated or galvanized ~ #5 = 2'-1" Min
 - Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 2



**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

SCC-5 & 6

FILE: scc56ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	LFK	POLK	161	

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DATE: 05/13/2021 06:41:18
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SECTION DIMENSIONS				FILL HEIGHT ⑤	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																									QUANTITIES													
					Bars B					Bars C					Bars D					Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total					
					S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)
5'-0"	2'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	6'-3"	704	2'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	2'-0"	144	4	39'-9"	106	22	39'-9"	584	5'-11"	16	14	39	0.391	80.5	0.5	55	16.1	3,276
5'-0"	2'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	6'-4"	713	2'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	2'-0"	144	4	39'-9"	106	22	39'-9"	584	5'-11"	16	14	39	0.429	81.0	0.5	55	17.6	3,294
5'-0"	3'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	7'-3"	817	3'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	3'-0"	216	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.434	87.8	0.5	55	17.8	3,567
5'-0"	3'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	7'-4"	826	3'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	3'-0"	216	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.472	88.3	0.5	55	19.3	3,585
5'-0"	4'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	8'-3"	929	4'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	4'-0"	289	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.477	92.4	0.5	55	19.5	3,752
5'-0"	4'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	8'-4"	939	4'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	4'-0"	289	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.515	92.9	0.5	55	21.1	3,771
5'-0"	5'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	9'-3"	1,042	5'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	5'-0"	361	4	39'-9"	106	30	39'-9"	797	5'-11"	16	14	39	0.521	99.7	0.5	55	21.3	4,044
5'-0"	5'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	9'-4"	1,051	5'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	5'-0"	361	4	39'-9"	106	30	39'-9"	797	5'-11"	16	14	39	0.559	100.2	0.5	55	22.8	4,062
6'-0"	2'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	6'-7"	742	2'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	2'-0"	144	5	39'-9"	133	25	39'-9"	664	6'-11"	18	16	45	0.440	89.1	0.5	63	18.1	3,628
6'-0"	2'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	6'-8"	1,126	2'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	2'-0"	144	5	39'-9"	133	25	39'-9"	664	6'-11"	18	16	45	0.485	108.6	0.5	63	19.9	4,407
6'-0"	2'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	6'-10"	1,155	2'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	2'-0"	110	5	39'-9"	133	25	39'-9"	664	7'-1"	19	18	50	0.551	109.9	0.5	69	22.6	4,463
6'-0"	3'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	7'-7"	854	3'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	3'-0"	216	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.484	96.4	0.5	63	19.9	3,918
6'-0"	3'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	7'-8"	1,295	3'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	3'-0"	216	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.528	117.3	0.5	63	21.6	4,754
6'-0"	3'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	7'-10"	1,324	3'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	3'-0"	164	5	39'-9"	133	29	39'-9"	770	7'-1"	19	18	50	0.601	118.1	0.5	69	24.6	4,792
6'-0"	4'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	8'-7"	967	4'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	4'-0"	289	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.527	101.0	0.5	63	21.6	4,104
6'-0"	4'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	8'-8"	1,464	4'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	4'-0"	289	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.571	123.3	0.5	63	23.4	4,996
6'-0"	4'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	8'-10"	1,493	4'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	4'-0"	219	5	39'-9"	133	29	39'-9"	770	7'-1"	19	18	50	0.650	123.7	0.5	69	26.5	5,016
6'-0"	5'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	9'-7"	1,080	5'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	5'-0"	361	5	39'-9"	133	33	39'-9"	876	6'-11"	18	16	45	0.570	108.3	0.5	63	23.3	4,395
6'-0"	5'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	9'-8"	1,633	5'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	5'-0"	361	5	39'-9"	133	33	39'-9"	876	6'-11"	18	16	45	0.614	132.0	0.5	63	25.1	5,343
6'-0"	5'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	9'-10"	1,661	5'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	5'-0"	274	5	39'-9"	133	33	39'-9"	876	7'-1"	19	18	50	0.700	131.9	0.5	69	28.5	5,345
6'-0"	6'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	10'-7"	1,192	6'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	6'-0"	433	5	39'-9"	133	37	39'-9"	982	6'-11"	18	16	45	0.613	115.6	0.5	63	25.0	4,685
6'-0"	6'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	10'-8"	1,802	6'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	6'-0"	433	5	39'-9"	133	37	39'-9"	982	6'-11"	18	16	45	0.657	140.7	0.5	63	26.8	5,690
6'-0"	6'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	10'-10"	1,830	6'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	6'-0"	329	5	39'-9"	133	37	39'-9"	982	7'-1"	19	18	50	0.749	140.2	0.5	69	30.5	5,675

⑤ For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.



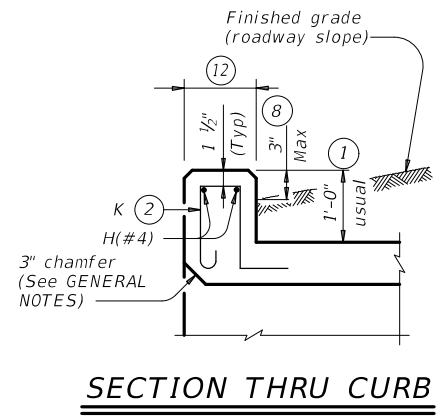
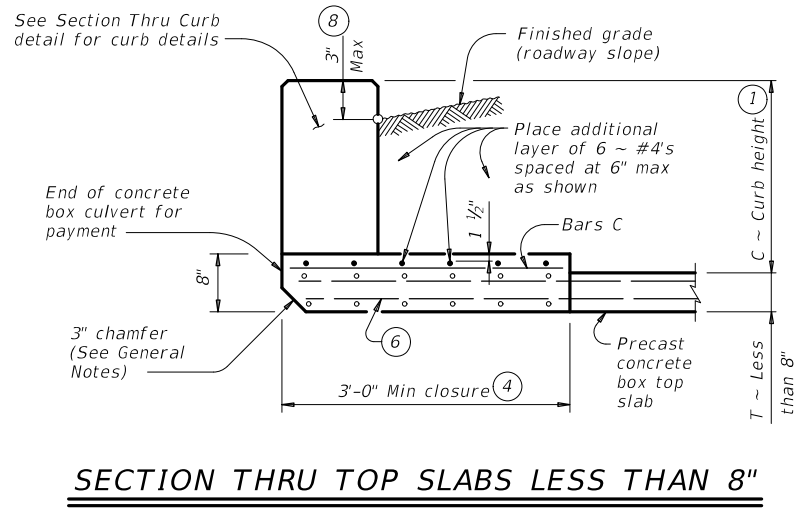
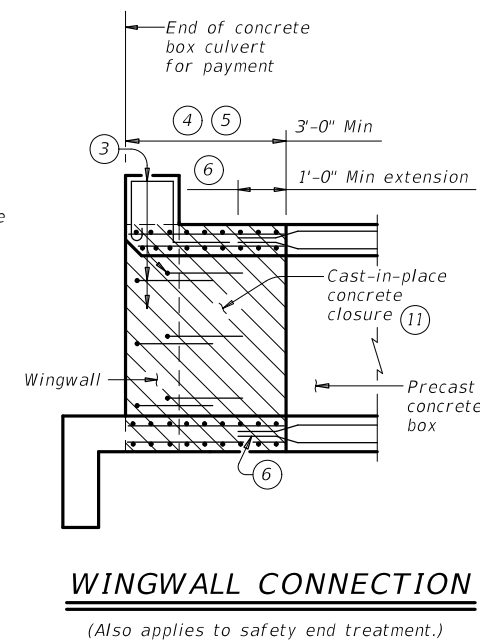
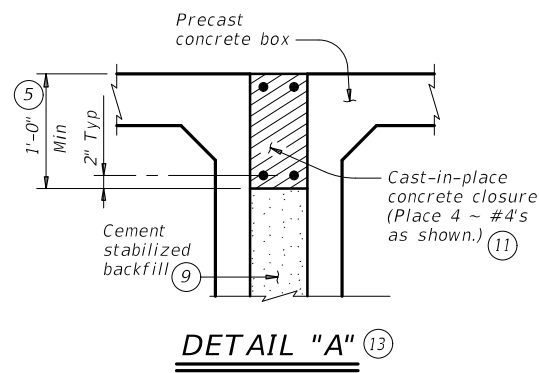
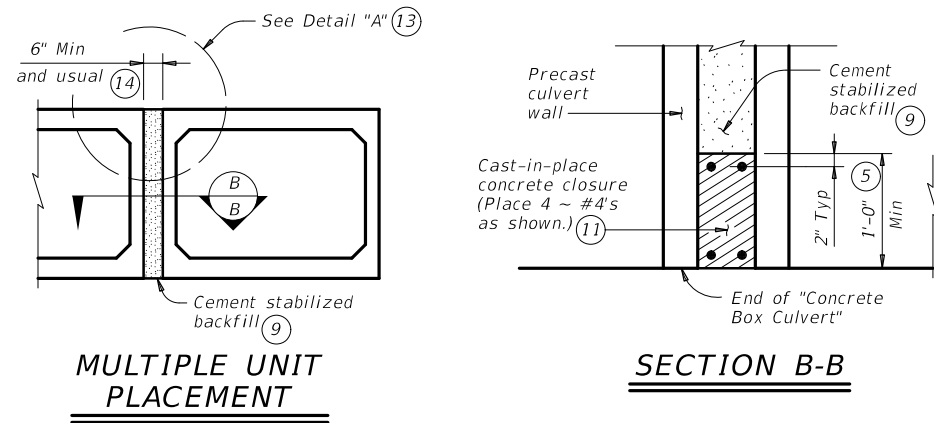
**SINGLE BOX CULVERTS
CAST-IN-PLACE
0' TO 30' FILL**

SCC-5 & 6

FILE: scc56ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	LFK	POLK	162	

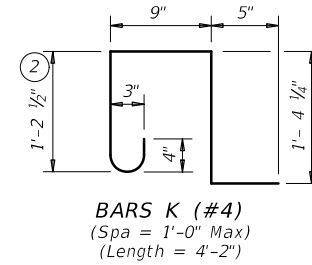
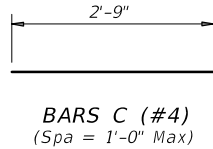
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QUANTITIES PER FOOT OF CURB (10)

Reinforcing Steel	4.12 Lb
Concrete	0.037 CY

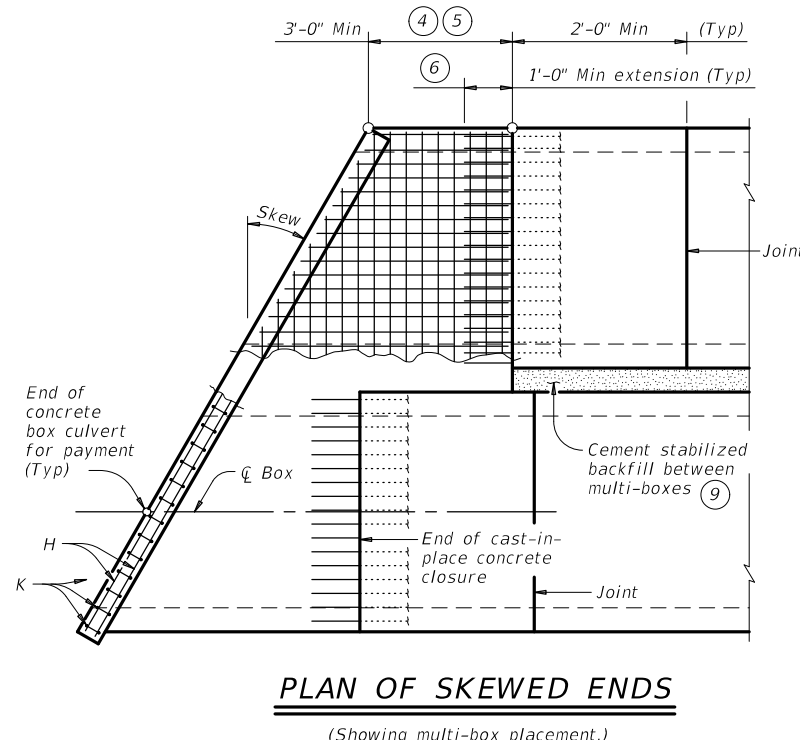
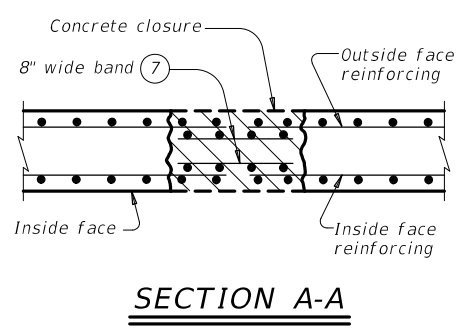
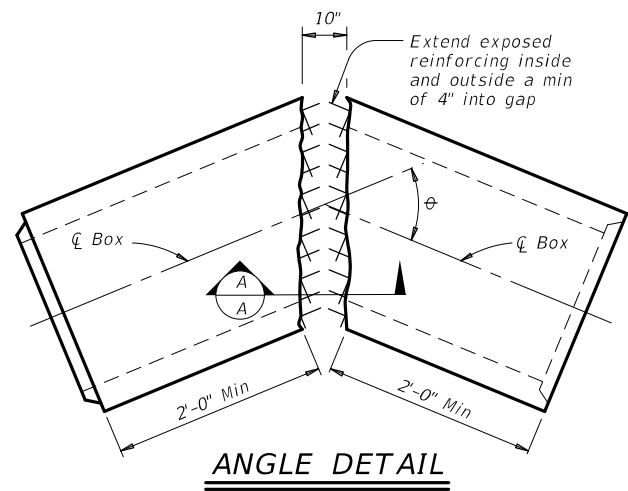


- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
- Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.
- For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.
- Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).
- Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Cement stabilized backfill between boxes is considered part of the box culvert for payment.
- All curb concrete and reinforcing is considered part of the box culvert for payment.
- Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
- This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide ASTM A1064 welded wire reinforcement.
 Provide Class C concrete (f'c = 3,600 psi) for the closures.
 Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
 Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
 Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bars dimensions are out-to-out of bars.



HL93 LOADING

Texas Department of Transportation
 Bridge Division Standard

**BOX CULVERTS
 PRECAST
 MISCELLANEOUS DETAILS**

SCP-MD

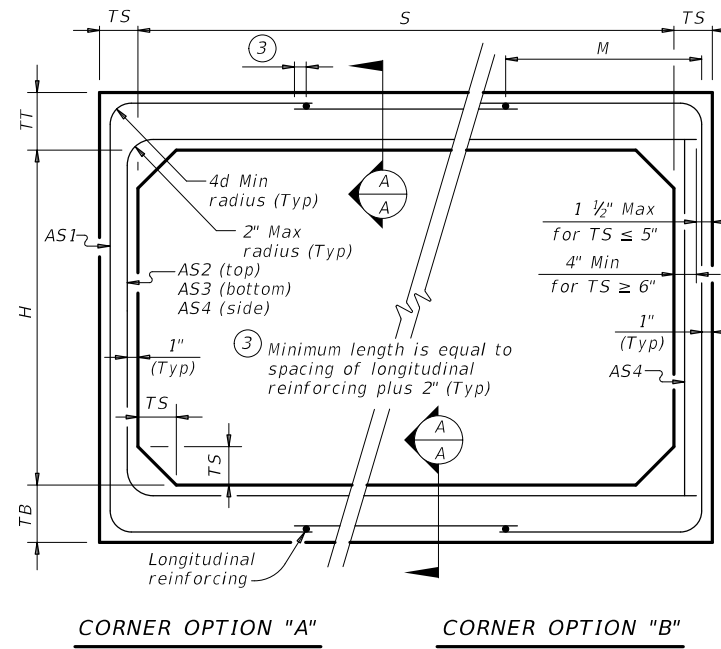
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©TxDOT February 2020	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	163	

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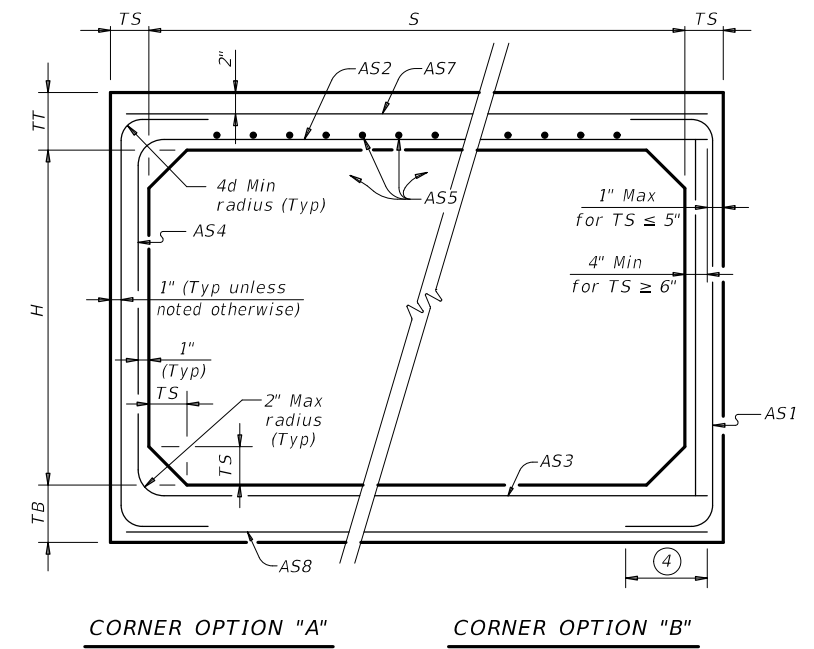
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BOX DATA

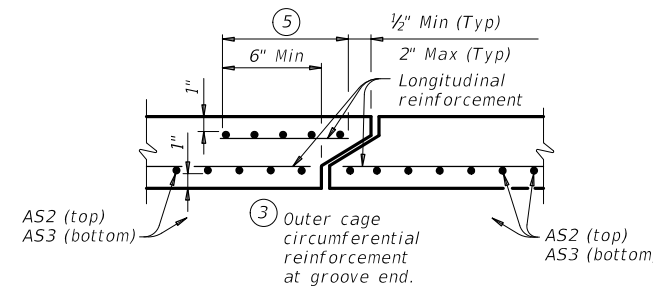
SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ^②						① Lift Weight (tons)	
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7		AS8
4	2	7.5	6	5	< 2	-	0.18	0.27	0.15	0.12	0.18	0.18	0.14	4.5
4	2	5	5	5	2 < 3	38	0.18	0.19	0.17	0.12	-	-	-	3.6
4	2	5	5	5	3 - 5	38	0.13	0.13	0.13	0.12	-	-	-	3.6
4	2	5	5	5	10	38	0.12	0.12	0.12	0.12	-	-	-	3.6
4	2	5	5	5	15	38	0.14	0.16	0.16	0.12	-	-	-	3.6
4	2	5	5	5	20	38	0.18	0.20	0.21	0.12	-	-	-	3.6
4	2	5	5	5	25	38	0.23	0.25	0.25	0.12	-	-	-	3.6
4	2	5	5	5	30	38	0.28	0.30	0.30	0.12	-	-	-	3.6
4	3	7.5	6	5	< 2	-	0.18	0.31	0.18	0.12	0.18	0.18	0.14	5.0
4	3	5	5	5	2 < 3	38	0.15	0.23	0.20	0.12	-	-	-	4.1
4	3	5	5	5	3 - 5	38	0.12	0.16	0.16	0.12	-	-	-	4.1
4	3	5	5	5	10	38	0.12	0.14	0.14	0.12	-	-	-	4.1
4	3	5	5	5	15	38	0.12	0.18	0.18	0.12	-	-	-	4.1
4	3	5	5	5	20	38	0.14	0.23	0.24	0.12	-	-	-	4.1
4	3	5	5	5	25	38	0.17	0.29	0.29	0.12	-	-	-	4.1
4	3	5	5	5	30	38	0.21	0.35	0.35	0.12	-	-	-	4.1
4	4	7.5	6	5	< 2	-	0.18	0.33	0.20	0.12	0.18	0.18	0.14	5.5
4	4	5	5	5	2 < 3	38	0.12	0.26	0.23	0.12	-	-	-	4.6
4	4	5	5	5	3 - 5	38	0.12	0.18	0.18	0.12	-	-	-	4.6
4	4	5	5	5	10	38	0.12	0.15	0.15	0.12	-	-	-	4.6
4	4	5	5	5	15	38	0.12	0.19	0.20	0.12	-	-	-	4.6
4	4	5	5	5	20	38	0.12	0.25	0.25	0.12	-	-	-	4.6
4	4	5	5	5	25	38	0.14	0.31	0.31	0.12	-	-	-	4.6
4	4	5	5	5	30	38	0.17	0.37	0.37	0.12	-	-	-	4.6



FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT



SECTION A-A
(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
 Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
 Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:
 Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

① For box length = 8'-0"
 ② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.

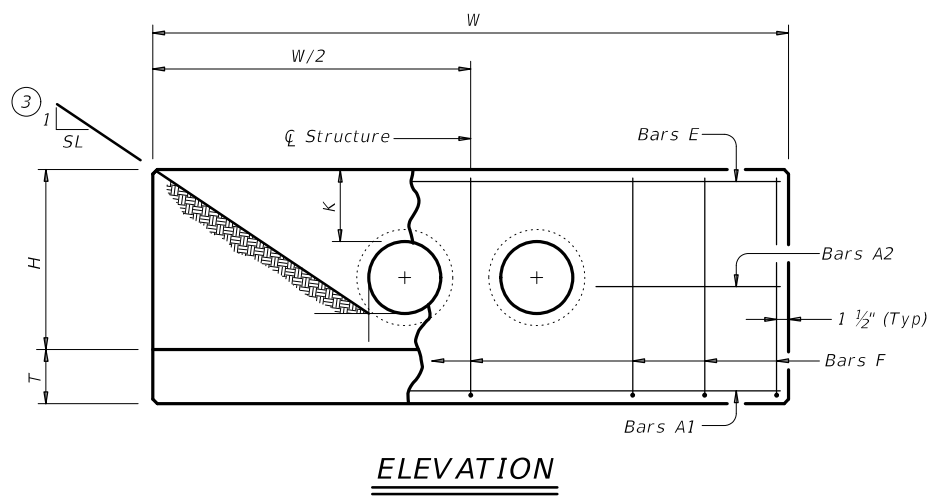
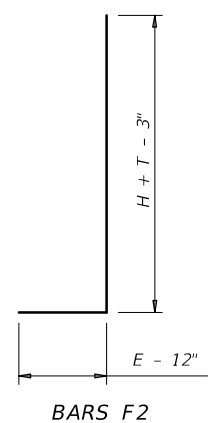
HL93 LOADING

		Bridge Division Standard	
SINGLE BOX CULVERTS PRECAST 4'-0" SPAN			
SCP-4			
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©TxDOT February 2020	CONT: 0213	SECT: 04	JOB: 050
REVISIONS	DIST: LFK		COUNTY: POLK
			SHEET NO. 164

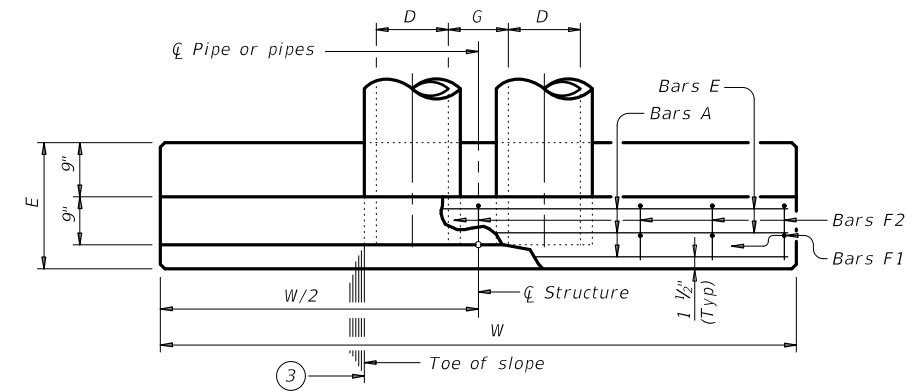
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**TABLE OF VARIABLE DIMENSIONS (5)
AND QUANTITIES FOR ONE HEADWALL**

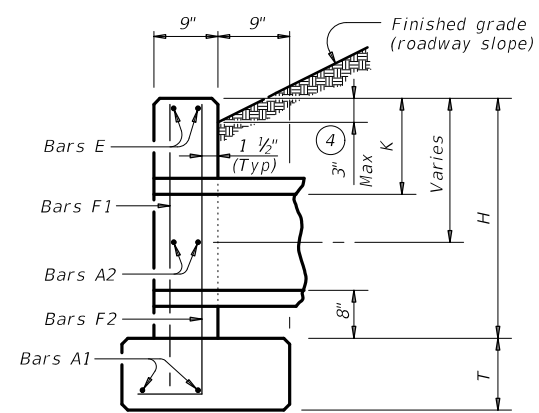
Slope	Dia of Pipe (D)	Values for One Pipe		Values To Be Added for Each Add'l Pipe			
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' - 0"	122	1.1	1' - 9"	15	0.2
	15"	10' - 3"	136	1.3	2' - 2"	16	0.2
	18"	11' - 6"	163	1.5	2' - 8"	19	0.3
	21"	12' - 9"	200	1.8	3' - 1"	31	0.4
	24"	14' - 0"	217	2.1	3' - 7"	34	0.4
	27"	15' - 3"	254	2.4	3' - 11"	37	0.5
	30"	16' - 6"	272	2.7	4' - 4"	40	0.6
	33"	17' - 9"	314	3.1	4' - 8"	43	0.6
	36"	19' - 0"	371	3.9	5' - 1"	46	0.8
	42"	21' - 6"	442	4.9	5' - 10"	52	1.0
	48"	25' - 0"	569	6.4	6' - 7"	59	1.3
	54"	27' - 6"	701	7.5	7' - 6"	82	1.6
60"	30' - 0"	794	8.8	8' - 3"	90	1.8	
66"	32' - 6"	894	10.2	8' - 9"	96	2.0	
72"	35' - 0"	1,055	11.7	9' - 4"	103	2.3	
3:1	12"	13' - 0"	175	1.6	1' - 9"	14	0.2
	15"	14' - 9"	193	1.9	2' - 2"	17	0.2
	18"	16' - 6"	228	2.2	2' - 8"	19	0.3
	21"	18' - 3"	299	2.6	3' - 1"	31	0.4
	24"	20' - 0"	323	3.0	3' - 7"	33	0.4
	27"	21' - 9"	371	3.5	3' - 11"	37	0.5
	30"	23' - 6"	415	4.0	4' - 4"	40	0.5
	33"	25' - 3"	469	4.6	4' - 8"	43	0.6
	36"	27' - 0"	556	5.7	5' - 1"	46	0.8
	42"	30' - 6"	675	7.1	5' - 10"	52	1.0
	48"	35' - 6"	837	9.2	6' - 7"	59	1.3
	54"	39' - 0"	1,015	11.0	7' - 6"	84	1.6
60"	42' - 6"	1,171	12.9	8' - 3"	91	1.8	
66"	46' - 0"	1,298	14.9	8' - 9"	98	2.0	
72"	49' - 6"	1,561	17.1	9' - 4"	103	2.3	
4:1	12"	17' - 0"	229	2.0	1' - 9"	15	0.2
	15"	19' - 3"	266	2.4	2' - 2"	17	0.2
	18"	21' - 6"	308	2.9	2' - 8"	19	0.3
	21"	23' - 9"	382	3.5	3' - 1"	31	0.3
	24"	26' - 0"	430	3.9	3' - 7"	34	0.4
	27"	28' - 3"	486	4.7	3' - 11"	37	0.5
	30"	30' - 6"	539	5.2	4' - 4"	40	0.6
	33"	32' - 9"	603	6.0	4' - 8"	42	0.6
	36"	35' - 0"	738	7.5	5' - 1"	47	0.8
	42"	39' - 6"	881	9.3	5' - 10"	52	1.0
	48"	46' - 0"	1,102	12.1	6' - 7"	61	1.3
	54"	50' - 6"	1,364	14.4	7' - 6"	84	1.6
60"	55' - 0"	1,547	16.9	8' - 3"	91	1.8	
66"	59' - 6"	1,741	19.5	8' - 9"	98	2.0	
72"	64' - 0"	2,077	22.4	9' - 4"	102	2.3	
6:1	12"	25' - 0"	336	3.0	1' - 9"	14	0.2
	15"	28' - 3"	384	3.6	2' - 2"	17	0.2
	18"	31' - 6"	452	4.2	2' - 8"	19	0.3
	21"	34' - 9"	581	5.1	3' - 1"	31	0.4
	24"	38' - 0"	644	5.8	3' - 7"	34	0.4
	27"	41' - 3"	737	6.9	3' - 11"	37	0.5
	30"	44' - 6"	807	7.7	4' - 4"	39	0.6
	33"	47' - 9"	912	8.9	4' - 8"	44	0.6
	36"	51' - 0"	1,108	11.0	5' - 1"	48	0.8
	42"	57' - 6"	1,318	13.7	5' - 10"	54	1.0
	48"	67' - 0"	1,682	17.9	6' - 7"	59	1.3
	54"	73' - 6"	2,072	21.3	7' - 6"	83	1.6
60"	80' - 0"	2,351	24.9	8' - 3"	89	1.8	
66"	86' - 6"	2,643	28.9	8' - 9"	96	2.0	
72"	93' - 0"	3,121	33.1	9' - 4"	101	2.3	



ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE

- ① Total quantities include one 3'-1" lap for bars over 60' in length.
- ② Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- ③ Indicated slope is perpendicular to centerline pipe or pipes.
- ④ For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ⑤ Dimensions shown are usual and maximum.
- ⑥ Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' - 9"	1' - 0"	2' - 8"	0' - 9"	1' - 9"
15"	0' - 11"	1' - 0"	2' - 11"	0' - 9"	1' - 9"
18"	1' - 2"	1' - 0"	3' - 2"	0' - 9"	1' - 9"
21"	1' - 4"	1' - 0"	3' - 5"	0' - 9"	2' - 0"
24"	1' - 7"	1' - 0"	3' - 8"	0' - 9"	2' - 0"
27"	1' - 8"	1' - 0"	3' - 11"	0' - 9"	2' - 3"
30"	1' - 10"	1' - 0"	4' - 2"	0' - 9"	2' - 3"
33"	1' - 11"	1' - 0"	4' - 5"	0' - 9"	2' - 6"
36"	2' - 1"	1' - 0"	4' - 8"	1' - 0"	2' - 6"
42"	2' - 4"	1' - 0"	5' - 2"	1' - 0"	2' - 9"
48"	2' - 7"	1' - 3"	5' - 11"	1' - 0"	3' - 0"
54"	3' - 0"	1' - 3"	6' - 5"	1' - 0"	3' - 3"
60"	3' - 3"	1' - 3"	6' - 11"	1' - 0"	3' - 6"
66"	3' - 3"	1' - 3"	7' - 5"	1' - 0"	3' - 9"
72"	3' - 4"	1' - 3"	7' - 11"	1' - 0"	4' - 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' - 6"	~
E	#5	~	2
F	#5	1' - 0"	~

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation
Bridge Division Standard

CONCRETE HEADWALLS
WITH PARALLEL WINGS FOR
NON-SKEWED PIPE CULVERTS

CH-PW-0

FILE: chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	165	

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL ⑤

Slope	Dia of Pipe (D)	15° Skew						30° Skew						45° Skew					
		Values for One Pipe			Values To Be Added For Each Add'l Pipe			Values for One Pipe			Values To Be Added For Each Add'l Pipe			Values for One Pipe			Values To Be Added For Each Add'l Pipe		
		W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②
2:1	12"	9'-4"	124	1.1	1'-9 3/4"	15	0.2	10'-5"	130	1.2	2'-0"	16	0.2	12'-9"	159	1.5	2'-5 3/4"	17	0.3
	15"	10'-7"	136	1.3	2'-3"	17	0.2	11'-10"	159	1.5	2'-6"	18	0.2	14'-6"	191	1.8	3'-0 3/4"	20	0.3
	18"	11'-11"	165	1.5	2'-9"	19	0.3	13'-3"	174	1.7	3'-1"	29	0.3	16'-3"	207	2.1	3'-9 1/4"	33	0.4
	21"	13'-2"	203	1.9	3'-2 1/4"	31	0.4	14'-9"	233	2.1	3'-6 3/4"	33	0.4	18'-0"	276	2.6	4'-4 1/4"	36	0.5
	24"	14'-6"	240	2.1	3'-8 1/4"	34	0.4	16'-2"	251	2.4	4'-1 3/4"	36	0.5	19'-10"	318	2.9	5'-0 3/4"	39	0.6
	27"	15'-9"	258	2.5	4'-0 3/4"	38	0.5	17'-7"	292	2.8	4'-6 1/4"	39	0.6	21'-7"	342	3.4	5'-6 1/4"	44	0.7
	30"	17'-1"	297	2.8	4'-5 3/4"	40	0.6	19'-1"	311	3.1	5'-0"	42	0.6	23'-4"	388	3.8	6'-1 3/4"	47	0.8
	33"	18'-5"	320	3.3	4'-9 3/4"	43	0.6	20'-6"	358	3.6	5'-4 3/4"	46	0.7	25'-1"	439	4.4	6'-7 1/4"	51	0.9
	36"	19'-8"	401	4.0	5'-3"	47	0.9	21'-11"	422	4.5	5'-10 3/4"	50	0.9	26'-10"	517	5.5	7'-2 1/4"	55	1.2
	42"	22'-3"	476	5.0	6'-0 3/4"	53	1.1	24'-10"	528	5.6	6'-8 3/4"	56	1.2	30'-5"	634	6.9	8'-3"	76	1.4
	48"	25'-11"	577	6.6	6'-9 3/4"	60	1.3	28'-10"	637	7.3	7'-7 1/4"	79	1.5	35'-4"	791	9.0	9'-3 3/4"	88	1.8
	54"	28'-6"	711	7.8	7'-9"	83	1.6	31'-9"	781	8.7	8'-8"	81	1.8	38'-11"	958	10.7	10'-7 1/4"	97	2.2
60"	31'-1"	805	9.2	8'-6 1/4"	91	1.9	34'-8"	881	10.2	9'-6 1/4"	97	2.1	42'-5"	1,113	12.5	11'-8"	124	2.6	
66"	33'-8"	907	10.6	9'-0 3/4"	98	2.1	37'-6"	1,028	11.8	10'-1 1/4"	102	2.4	46'-0"	1,235	14.5	12'-4 1/4"	132	2.9	
72"	36'-3"	1,071	12.1	9'-8"	105	2.4	40'-5"	1,207	13.5	10'-9 1/4"	110	2.6	49'-6"	1,446	16.6	13'-2 1/4"	141	3.2	
3:1	12"	13'-6"	178	1.6	1'-9 3/4"	15	0.2	15'-0"	189	1.8	2'-0"	15	0.2	18'-5"	237	2.2	2'-5 3/4"	17	0.2
	15"	15'-3"	212	1.9	2'-3"	17	0.2	17'-0"	223	2.1	2'-6"	17	0.3	20'-10"	276	2.6	3'-0 3/4"	20	0.3
	18"	17'-1"	231	2.3	2'-9"	19	0.3	19'-1"	259	2.5	3'-1"	29	0.3	23'-4"	318	3.1	3'-9 1/4"	32	0.4
	21"	18'-11"	306	2.7	3'-2 1/4"	31	0.4	21'-1"	339	3.0	3'-6 3/4"	33	0.4	25'-10"	413	3.7	4'-4 1/4"	36	0.5
	24"	20'-8"	345	3.1	3'-8 3/4"	35	0.4	23'-1"	384	3.5	4'-1 3/4"	36	0.5	28'-3"	462	4.2	5'-0 3/4"	40	0.6
	27"	22'-6"	376	3.7	4'-0 3/4"	38	0.5	25'-1"	438	4.1	4'-6 1/4"	39	0.6	30'-9"	522	5.0	5'-6 1/4"	44	0.7
	30"	24'-4"	422	4.1	4'-5 3/4"	40	0.6	27'-2"	466	4.6	5'-0"	42	0.6	33'-3"	578	5.6	6'-1 3/4"	47	0.8
	33"	26'-2"	476	4.8	4'-10"	43	0.6	29'-2"	522	5.3	5'-4 3/4"	46	0.7	35'-9"	644	6.5	6'-7 1/4"	51	0.9
	36"	27'-11"	590	5.9	5'-3"	47	0.8	31'-2"	645	6.6	5'-10 3/4"	50	0.9	38'-2"	787	8.0	7'-2 1/4"	56	1.2
	42"	31'-7"	684	7.3	6'-0 1/4"	53	1.1	35'-3"	776	8.2	6'-8 3/4"	56	1.2	43'-2"	933	10.0	8'-3"	79	1.4
	48"	36'-9"	880	9.6	6'-9 3/4"	61	1.3	41'-0"	953	10.7	7'-7 1/4"	81	1.5	50'-2"	1,166	13.1	9'-3 3/4"	88	1.8
	54"	40'-5"	1,065	11.4	7'-9"	85	1.6	45'-0"	1,185	12.7	8'-8"	89	1.8	55'-2"	1,435	15.5	10'-7 1/4"	97	2.2
60"	44'-0"	1,224	13.3	8'-6 1/4"	93	1.9	49'-1"	1,356	14.8	9'-6 1/4"	96	2.1	60'-1"	1,635	18.2	11'-8"	124	2.6	
66"	47'-7"	1,357	15.4	9'-1"	98	2.1	53'-1"	1,497	17.2	10'-1 1/4"	103	2.3	65'-1"	1,892	21.1	12'-4 1/4"	130	2.9	
72"	51'-3"	1,624	17.7	9'-8"	105	2.3	57'-2"	1,787	19.7	10'-9 1/4"	109	2.6	70'-0"	2,218	24.1	13'-2 1/4"	139	3.2	
4:1	12"	17'-7"	232	2.1	1'-9 3/4"	15	0.2	19'-8"	259	2.4	2'-0"	16	0.2	24'-0"	314	2.9	2'-5 3/4"	18	0.2
	15"	19'-11"	272	2.5	2'-3"	17	0.2	22'-3"	301	2.8	2'-6"	18	0.3	27'-3"	361	3.5	3'-0 3/4"	21	0.3
	18"	22'-3"	313	3.0	2'-9"	19	0.3	24'-10"	344	3.3	3'-1"	29	0.3	30'-5"	427	4.0	3'-9 1/4"	32	0.4
	21"	24'-7"	407	3.6	3'-2 1/4"	31	0.4	27'-5"	446	4.0	3'-6 3/4"	33	0.4	33'-7"	549	4.9	4'-4 1/4"	36	0.5
	24"	26'-11"	455	4.1	3'-8 3/4"	35	0.4	30'-0"	499	4.5	4'-1 3/4"	36	0.5	36'-9"	609	5.6	5'-0 3/4"	40	0.6
	27"	29'-3"	514	4.8	4'-0 3/4"	38	0.5	32'-7"	562	5.4	4'-6 1/4"	40	0.6	39'-11"	703	6.6	5'-6 1/4"	43	0.7
	30"	31'-7"	568	5.4	4'-5 3/4"	40	0.6	35'-3"	620	6.0	5'-0"	42	0.6	43'-2"	768	7.4	6'-1 3/4"	49	0.8
	33"	33'-11"	634	6.2	4'-10"	43	0.7	37'-10"	710	7.0	5'-4 3/4"	46	0.7	46'-4"	848	8.5	6'-7 1/4"	52	0.9
	36"	36'-3"	776	7.7	5'-3"	48	0.9	40'-5"	868	8.6	5'-10 3/4"	49	0.9	49'-6"	1,058	10.6	7'-2 1/4"	56	1.1
	42"	40'-11"	921	9.6	6'-0 1/4"	53	1.0	45'-7"	1,022	10.7	6'-8 3/4"	57	1.2	55'-10"	1,262	13.1	8'-3"	78	1.4
	48"	47'-7"	1,152	12.6	6'-10"	61	1.3	53'-1"	1,268	14.0	7'-7 1/4"	80	1.5	65'-1"	1,587	17.2	9'-3 3/4"	86	1.8
	54"	52'-3"	1,416	14.9	7'-9 1/4"	86	1.6	58'-4"	1,589	16.6	8'-8"	89	1.8	71'-5"	1,924	20.4	10'-7 1/4"	95	2.2
60"	56'-11"	1,606	17.5	8'-6 3/4"	92	1.9	63'-6"	1,806	19.5	9'-6 1/4"	95	2.1	77'-9"	2,192	23.9	11'-8"	122	2.6	
66"	61'-7"	1,819	20.2	9'-0 3/4"	97	2.1	68'-8"	2,019	22.5	10'-1 1/4"	101	2.4	84'-2"	2,472	27.6	12'-4 1/4"	131	2.9	
72"	66'-3"	2,150	23.2	9'-8"	104	2.4	73'-11"	2,379	25.9	10'-9 1/4"	108	2.6	90'-6"	2,937	31.7	13'-2 1/4"	138	3.2	
6:1	12"	25'-11"	342	3.1	1'-9 3/4"	15	0.2	28'-10"	374	3.5	2'-0"	16	0.2	35'-4"	456	4.3	2'-5 3/4"	17	0.2
	15"	29'-3"	390	3.7	2'-3"	17	0.2	32'-7"	442	4.2	2'-6"	18	0.2	39'-11"	549	5.1	3'-0 3/4"	20	0.3
	18"	32'-7"	459	4.4	2'-9"	20	0.3	36'-4"	515	4.9	3'-1"	29	0.3	44'-7"	629	6.0	3'-9 1/4"	33	0.4
	21"	36'-0"	608	5.3	3'-2 1/4"	31	0.4	40'-2"	660	5.9	3'-6 3/4"	33	0.4	49'-2"	823	7.2	4'-4 1/4"	38	0.5
	24"	39'-4"	672	6.0	3'-8 3/4"	35	0.4	43'-11"	748	6.7	4'-1 3/4"	36	0.5	53'-9"	920	8.2	5'-0 3/4"	42	0.6
	27"	42'-8"	770	7.1	4'-0 3/4"	38	0.5	47'-8"	852	8.0	4'-6 1/4"	41	0.5	58'-4"	1,039	9.7	5'-6 1/4"	45	0.7
	30"	46'-1"	839	8.0	4'-5 3/4"	40	0.6	51'-5"	949	8.9	5'-0"	44	0.6	62'-11"	1,162	10.9	6'-1 3/4"	48	0.8
	33"	49'-5"	947	9.2	4'-10"	45	0.7	55'-2"	1,040	10.3	5'-4 3/4"	48	0.7	67'-6"	1,292	12.6	6'-7 1/4"	50	0.9
	36"	52'-10"	1,151	11.4	5'-3"	49	0.8	58'-11"	1,287	12.7	5'-10 3/4"	51	1.0	72'-1"	1,583	15.6	7'-2 1/4"	55	1.1
	42"	59'-6"	1,365	14.2	6'-0 1/4"	55	1.0	66'-5"	1,530	15.8	6'-8 3/4"	57	1.2	81'-4"	1,875	19.4	8'-3"	76	1.4
	48"	69'-4"	1,737	18.5	6'-10"	59	1.3	77'-4"	1,942	20.7	7'-7 1/4"	79	1.5	94'-9"	2,368	25.3	9'-3 3/4"	86	1.8
	54"	76'-1"	2,138	22.0	7'-9 1/4"	83	1.6	84'-10"	2,378	24.6	8'-8"	87	1.8	103'-11"	2,912	30.1	10'-7 1/4"	95	2.2
60"	82'-10"	2,426	25.8	8'-6 3/4"	90	1.9	92'-5"	2,681	28.8	9'-6 1/4"	94	2.1	113'-2"	3,294	35.3	11'-8"	122	2.6	
66"	89'-7"	2,730	29.9	9'-0 3/4"	96	2.1	99'-11"	3,038	33.3	10'-1 1/4"	101	2.4	122'-4"	3,697	40.8	12'-4 1/4"	130	2.9	
72"	96'-3"	3,218	34.2	9'-8"	102	2.4	107'-5"	3,580	38.2	10'-9 1/4"	108	2.6	131'-6"	4,372	46.8	13'-2 1/4"	139	3.2	

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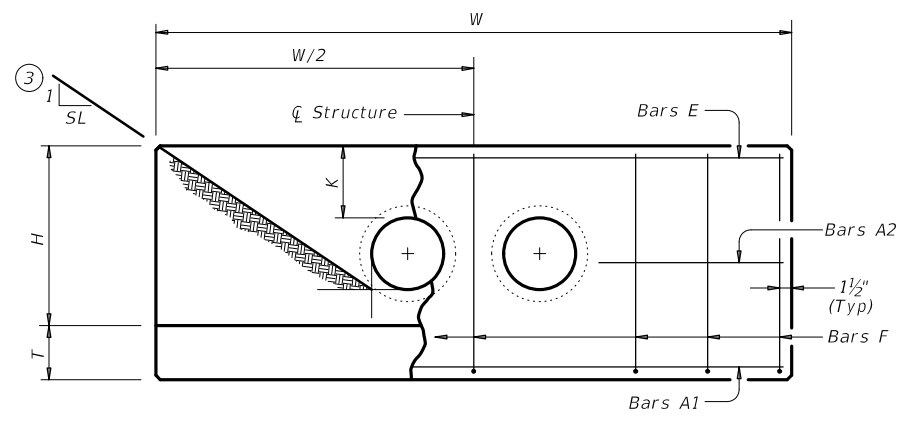
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TABLE OF CONSTANT DIMENSIONS

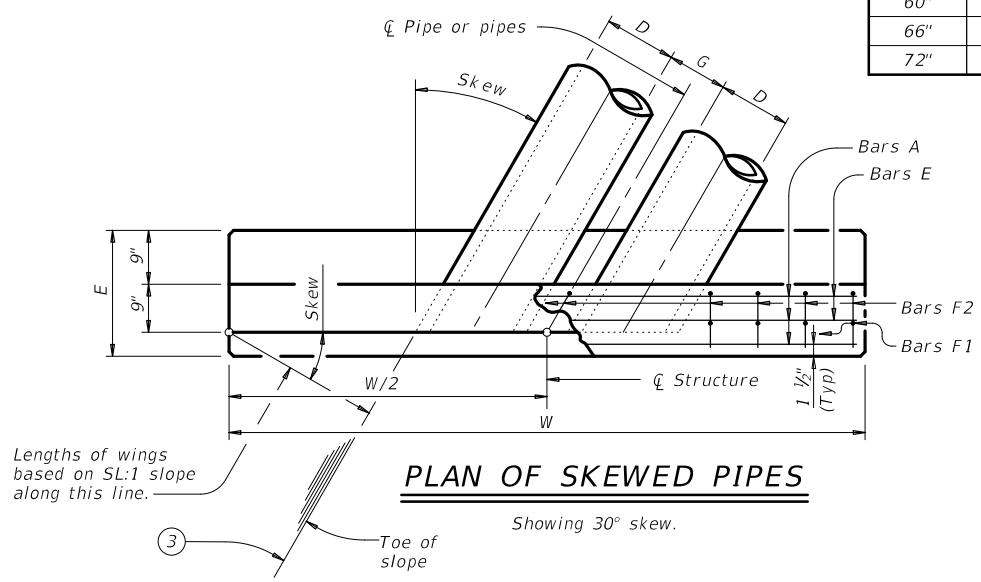
Dia of Pipe (D)	G	K ⑤	H	T	E
12"	0'-9"	1'-0"	2'-8"	0'-9"	1'-9"
15"	0'-11"	1'-0"	2'-11"	0'-9"	1'-9"
18"	1'-2"	1'-0"	3'-2"	0'-9"	1'-9"
21"	1'-4"	1'-0"	3'-5"	0'-9"	2'-0"
24"	1'-7"	1'-0"	3'-8"	0'-9"	2'-0"
27"	1'-8"	1'-0"	3'-11"	0'-9"	2'-3"
30"	1'-10"	1'-0"	4'-2"	0'-9"	2'-3"
33"	1'-11"	1'-0"	4'-5"	0'-9"	2'-6"
36"	2'-1"	1'-0"	4'-8"	1'-0"	2'-6"
42"	2'-4"	1'-0"	5'-2"	1'-0"	2'-9"
48"	2'-7"	1'-3"	5'-11"	1'-0"	3'-0"
54"	3'-0"	1'-3"	6'-5"	1'-0"	3'-3"
60"	3'-3"	1'-3"	6'-11"	1'-0"	3'-6"
66"	3'-3"	1'-3"	7'-5"	1'-0"	3'-9"
72"	3'-4"	1'-3"	7'-11"	1'-0"	4'-0"

TABLE OF ⑥ REINFORCING STEEL

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1'-6"	~
E	#5	~	2
F	#5	1'-0"	~

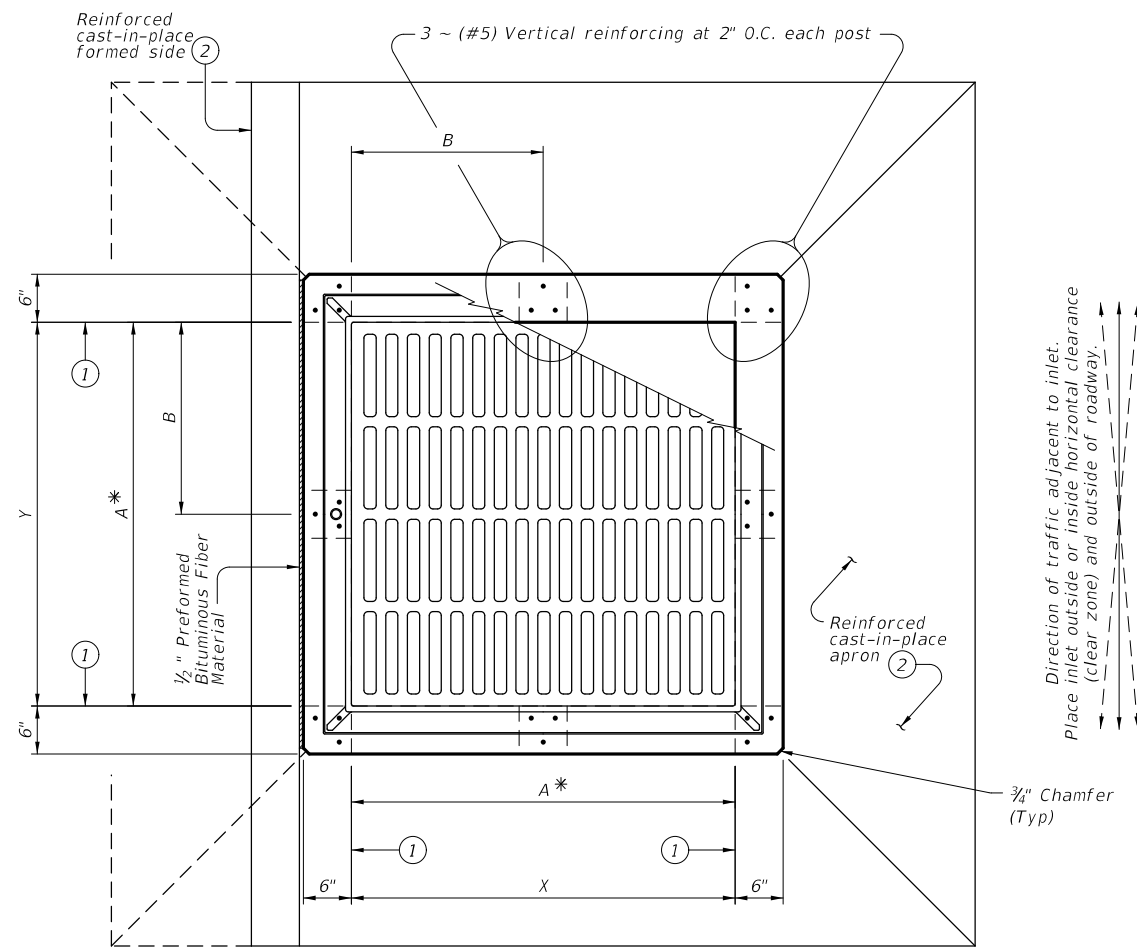


ELEVATION

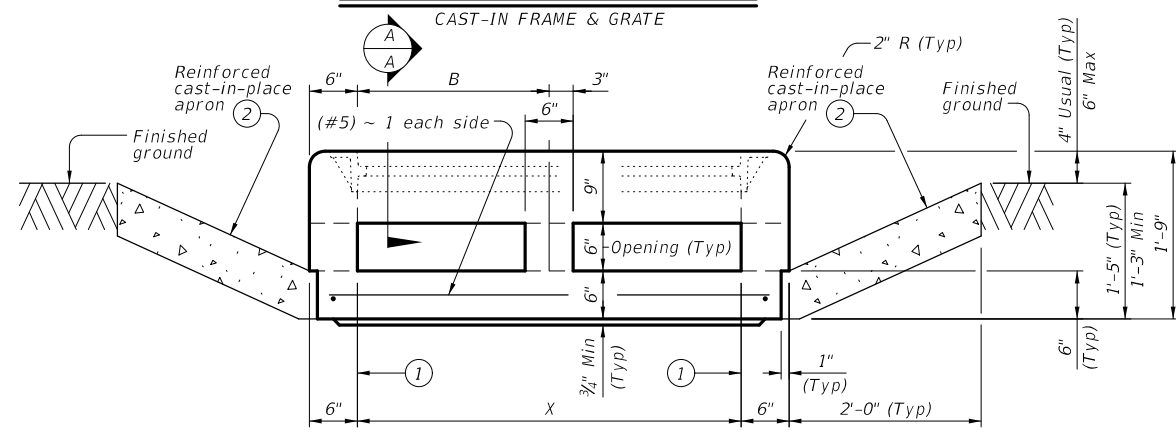


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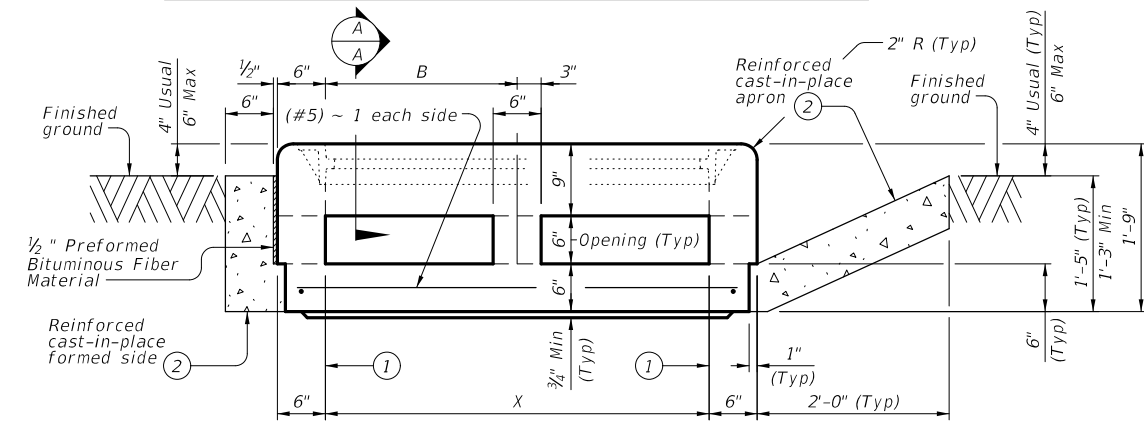
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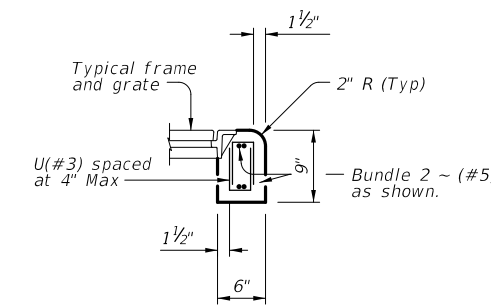
PLAN VIEW ~ STYLE 'FG' ③



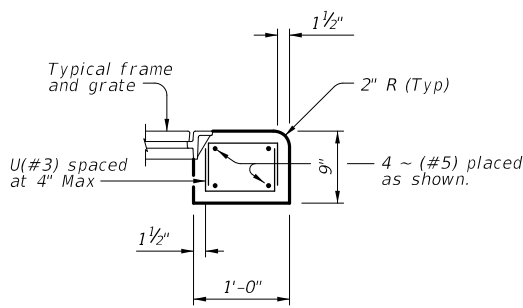
ELEVATION VIEW WITHOUT FORMED SIDE ④



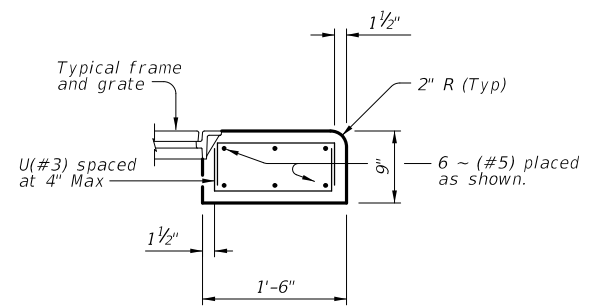
ELEVATION VIEW WITH FORMED SIDE ④



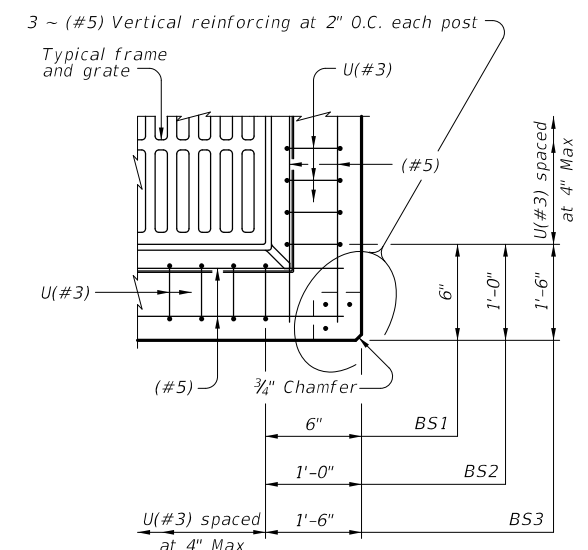
SECTION A-A ~ BS1



SECTION A-A ~ BS2



SECTION A-A ~ BS3

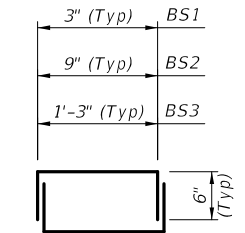


TYPICAL CORNER REINFORCING PLAN DETAIL

Showing BS2 other beam sections similar.

Style	Size (X x Y)	A x A *	B x B	Beam Section
FG	3'x3'	3'x3'	1.5'x1.5'	BS1
FG	4'x4'	3'x3'	2'x2'	BS2
FG	4'x4'	4'x4'	2'x2'	BS1
FG	5'x5'	3'x3'	2.5'x2.5'	BS3
FG	5'x5'	4'x4'	2.5'x2.5'	BS2

*Nominal frame/grate size.



BARS U (#3)
Showing one complete bar.

- ① Matches inside face of wall of precast base or riser below inlet.
- ② Construct cast-in-place reinforced concrete with or without formed side. Place formed side/sides as directed elsewhere in the plans. Formed sides may only be used on sides parallel to traffic. Use Class "C" concrete. Apron and formed side reinforcing not shown for clarity. Apron and formed side are subsidiary to PAZD-CZ. Apron is 2'-0" width around precast zone drain, unless an optional formed side is used. For apron and formed side, provide (#4) reinforcing at 12" O.C.
- ③ Top slab reinforcing not shown for clarity.
- ④ Top slab reinforcing and post reinforcing not shown for clarity.

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 clear cover of 3/4" to reinforcing from bottom of slab and 2" to reinforcing from top of slab for structural reinforcement.
4. Provide 1 1/2" end cover on (#5) reinforcing.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
6. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast Area Zone Drain within Clear Zone (PAZD-CZ) is for use in ditches and medians outside and inside of the horizontal clearance (clear zone). PAZD-CZ is never placed in the 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 1/2 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. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

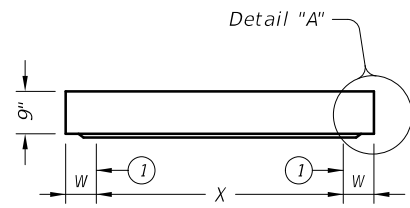
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING

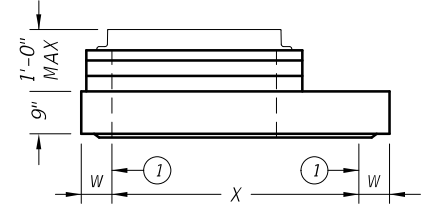
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<h3>PAZD-CZ</h3>			
FILE: prestd15-20.dgn	DN: SDC	CK: TAR	DW: JTR
©TxDOT February 2020	CONTRACT: 0213	SECTION: 04	JOB: 050
REVISIONS	COUNTY: POLK		SHEET NO.: 167

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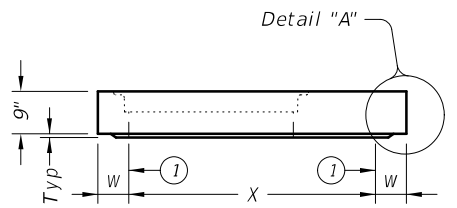
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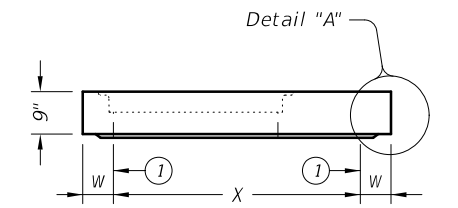
ELEVATION VIEW



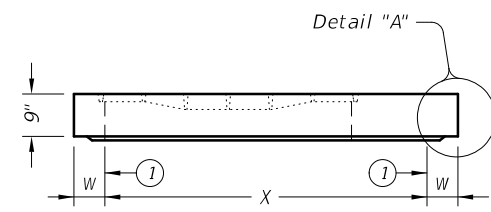
ELEVATION VIEW



ELEVATION VIEW

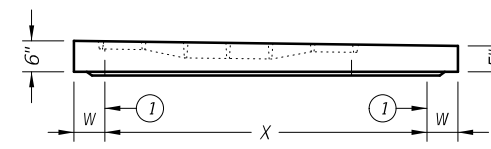


ELEVATION VIEW

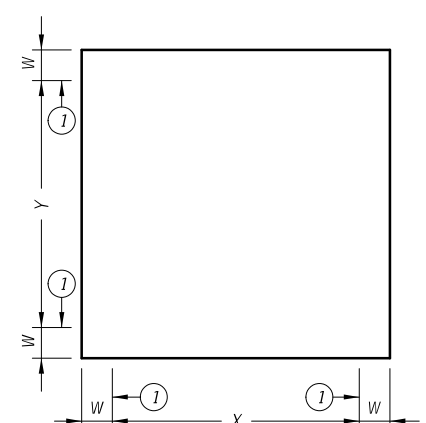


STYLE 'FG'

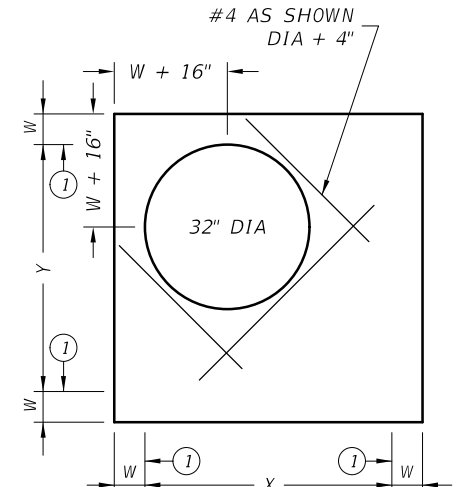
ORIENT TAPER TO CORRESPOND WITH ROADWAY CROSS-SLOPE.



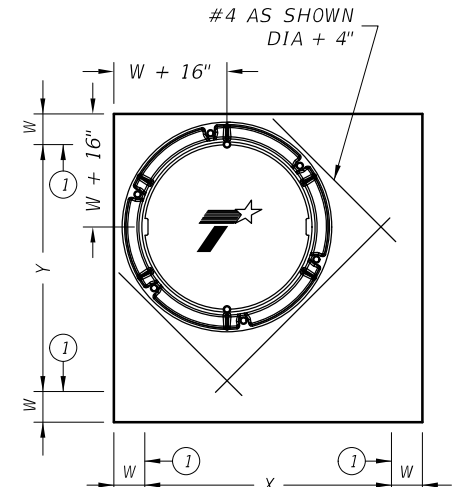
STYLE 'SFG'
ELEVATION VIEW



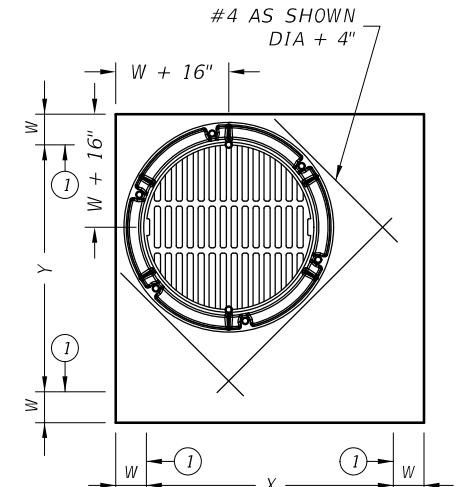
PLAN VIEW
 NO OPENINGS
STYLE 'SL'



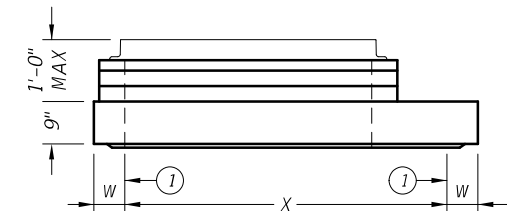
PLAN VIEW
 SHIP LOOSE RING & COVER
STYLE 'RH'



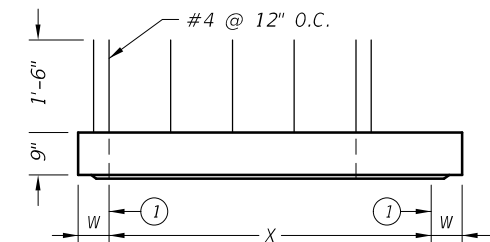
PLAN VIEW
 32" DIA CAST-IN RING & COVER
STYLE 'RC'



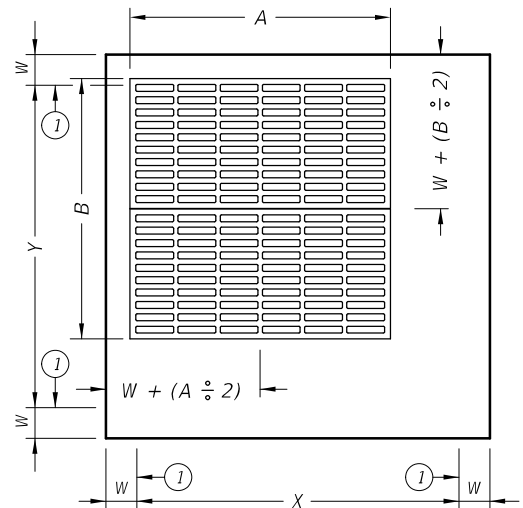
PLAN VIEW
 32" DIA CAST-IN RING & GRATE
STYLE 'RG'



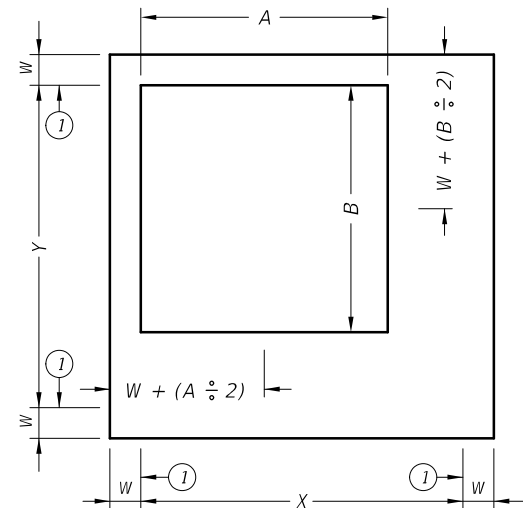
ELEVATION VIEW



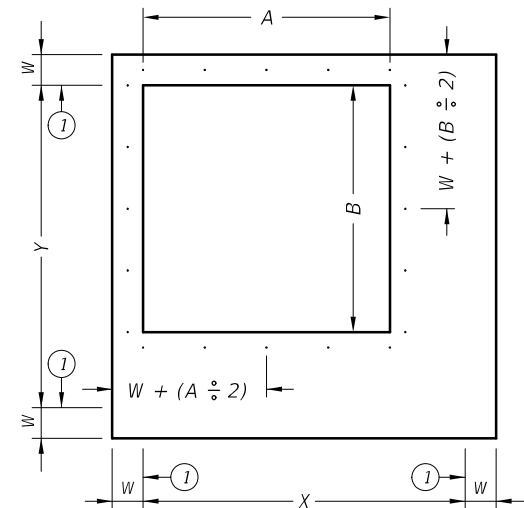
ELEVATION VIEW



PLAN VIEW
 CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



PLAN VIEW
 SHIP LOOSE FRAME & GRATE
STYLE 'SH'



PLAN VIEW
 EXPOSED REBAR
STYLE 'SI'

① Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2



PRECAST SLAB LID

PSL

FILE: prest05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	168	

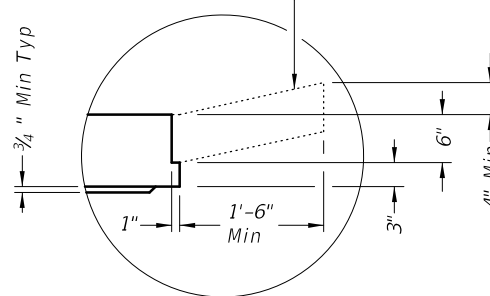
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DATE: 05/13/2021 06:41:48
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Style	Size (X x Y)	W ②	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in ² /ft	0.37 in ² /ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in ² /ft	0.37 in ² /ft
SFG	3'x3'	6"	3'x3'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x4'	6"	n/a	0.34 in ² /ft	0.34 in ² /ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in ² /ft	0.41 in ² /ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in ² /ft	0.41 in ² /ft
SFG	4'x4'	6"	4'x4'	0.32 in ² /ft	0.32 in ² /ft
SL	3'x5'	6"	n/a	0.39 in ² /ft	0.39 in ² /ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in ² /ft	0.48 in ² /ft
SFG	3'x5'	6"	3'x5'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x5'	6"	n/a	0.42 in ² /ft	0.42 in ² /ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in ² /ft	0.42 in ² /ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in ² /ft	0.66 in ² /ft
SL	5'x5'	6"	n/a	0.36 in ² /ft	0.36 in ² /ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in ² /ft	0.43 in ² /ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in ² /ft	0.63 in ² /ft
SL	5'x6'	6"/8"	n/a	0.48 in ² /ft	0.48 in ² /ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in ² /ft	0.60 in ² /ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in ² /ft	0.60 in ² /ft
SL	6'x6'	6"/8"	n/a	0.43 in ² /ft	0.43 in ² /ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in ² /ft	0.59 in ² /ft
SL	8'x8'	8"/10"	n/a	0.45 in ² /ft	0.45 in ² /ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in ² /ft	0.45 in ² /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 3/4" 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 3/4".
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 1/2 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



Bridge Division Standard

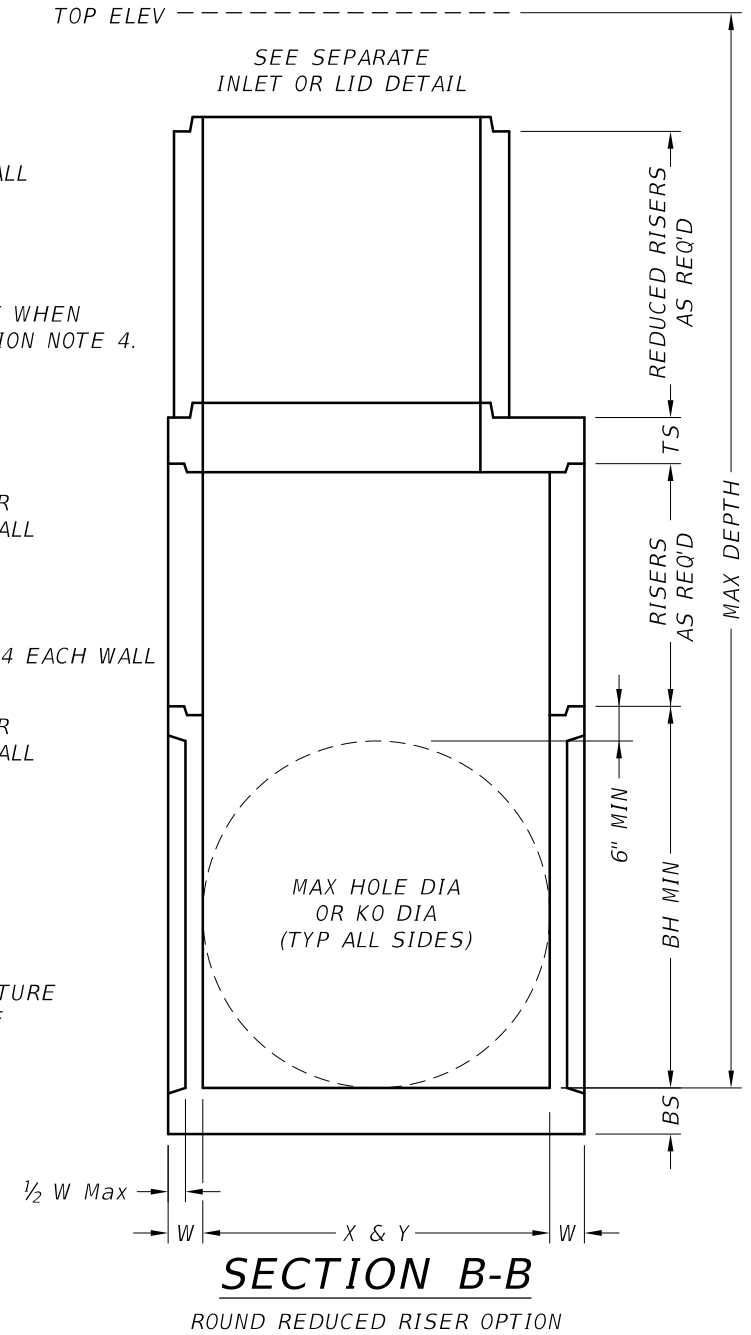
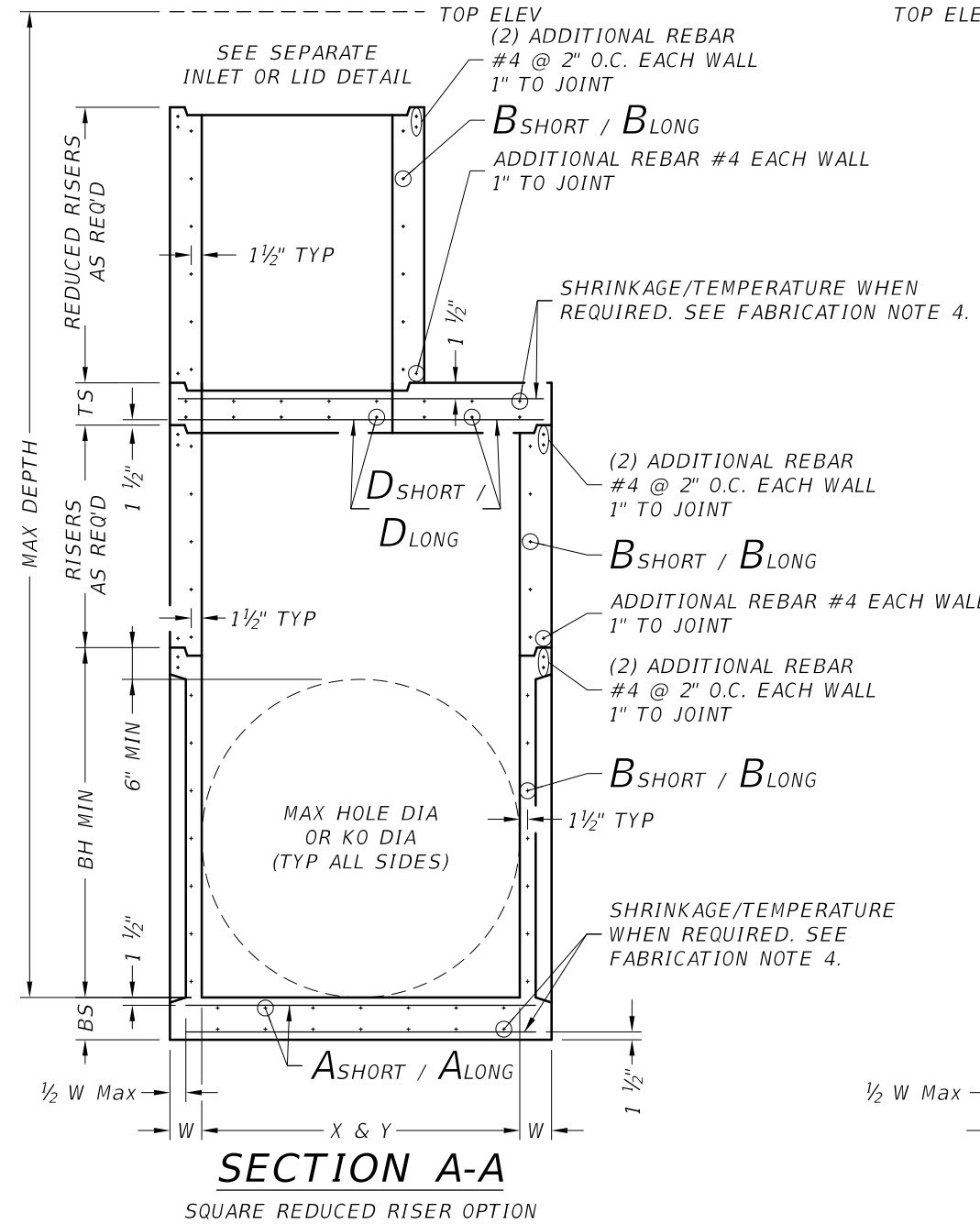
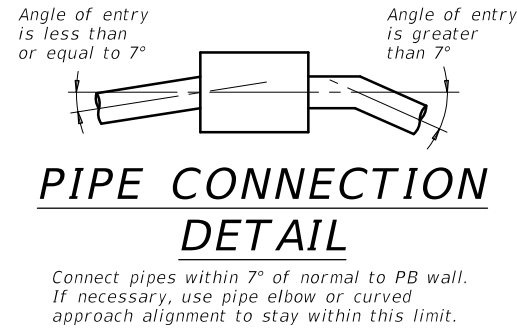
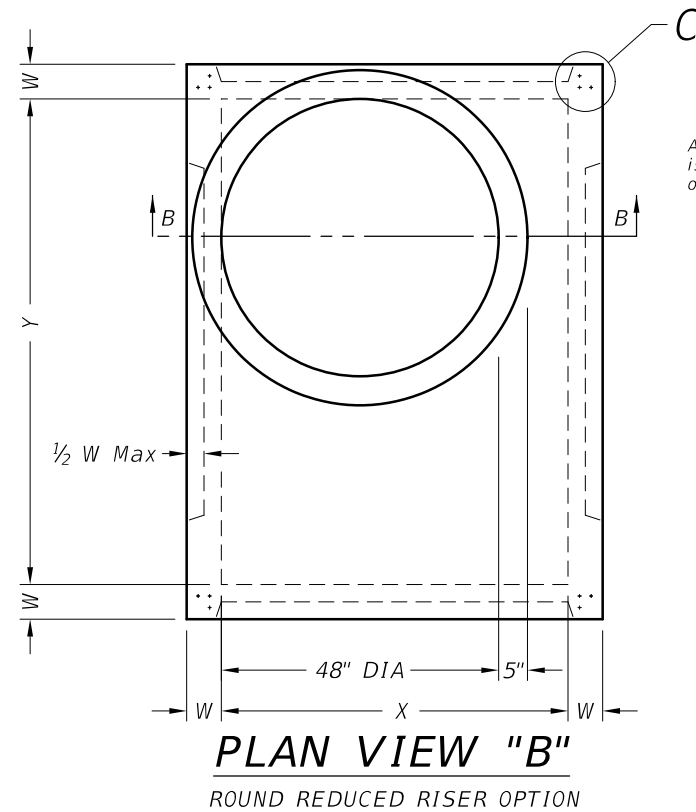
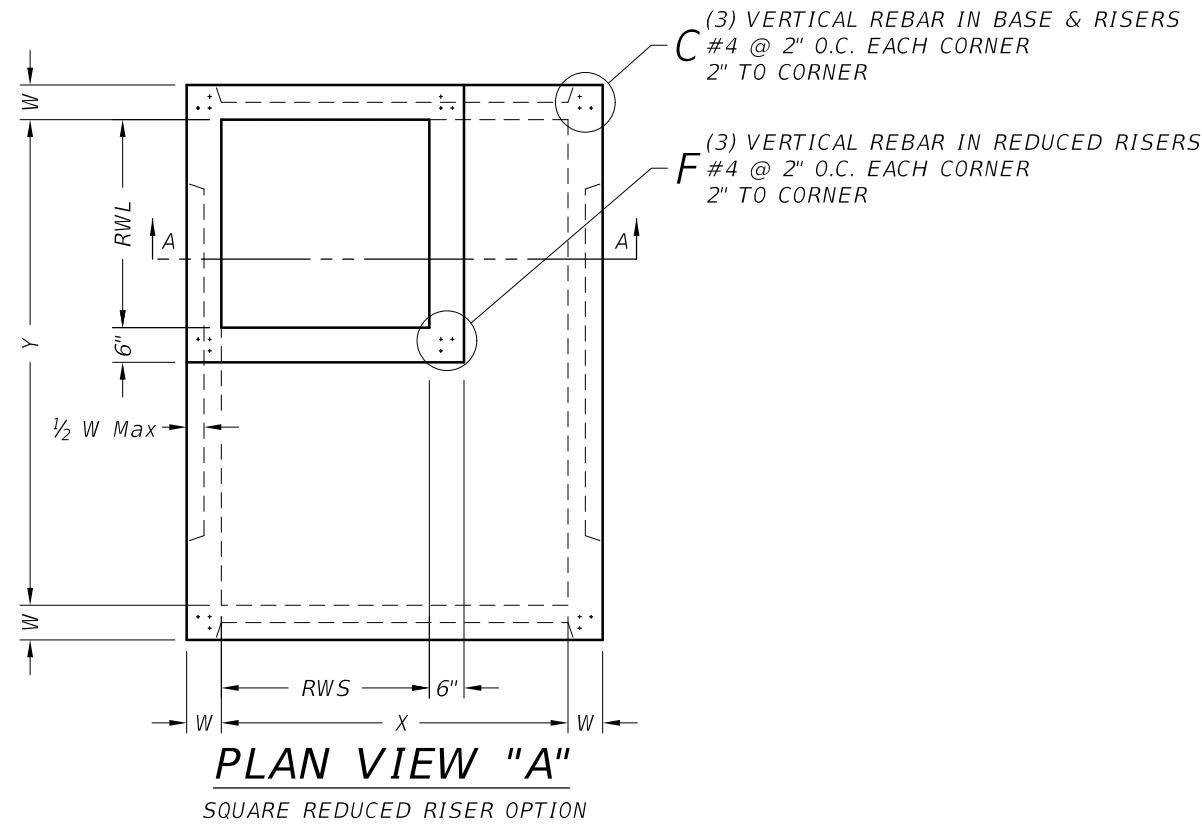
PRECAST SLAB LID

PSL

FILE: prest05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	169	

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DATE: 05/13/2021 06:41:53
 FILE: c:\pwworkdir\lbgp_pw\eman\lman\dms58436\prest01-20.dgn



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 1/2" 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 3/4".
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 1/2 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: prest01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	170	

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DATE: 05/13/2021 06:41:57
 FILE: c:\pwworkdir\lbgp_pw\eman\lmann\dms58436\prest10-20.dgn

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	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	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:

- Maximum spacing of reinforcement is 8".
- 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.

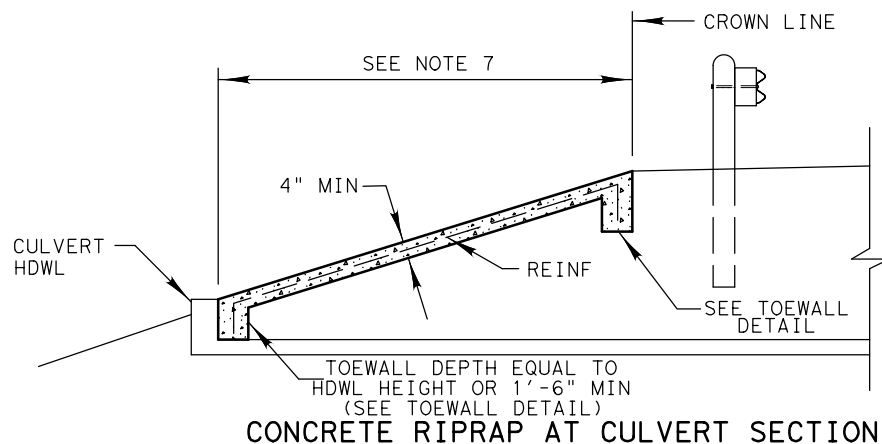
GENERAL NOTES:

- Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
- 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.
- 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".

HL93 LOADING

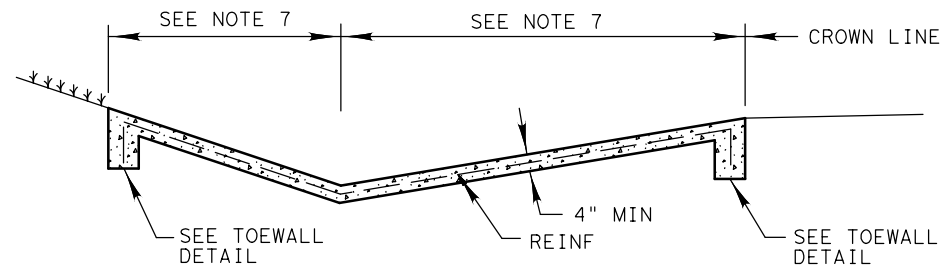
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<h3>PDD</h3>			
FILE: prest10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT: 0213	SECT: 04	JOB: 050
REVISIONS	COUNTY: POLK		HIGHWAY: US 190
	DIST: LFK	COUNTY: POLK	SHEET NO: 171

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 05/13/2021 06:42:02
 c:\pwworking\lbgg\pwworking\emath\lmann\dms58436\ConcRiprapDet+Dist.stnd.dgn



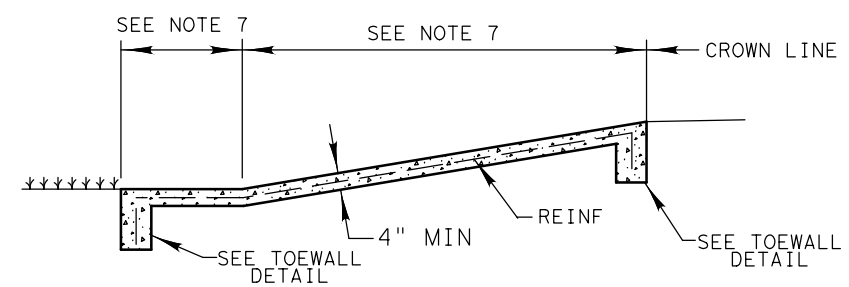
CONCRETE RIPRAP AT CULVERT SECTION

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC) (4 IN).



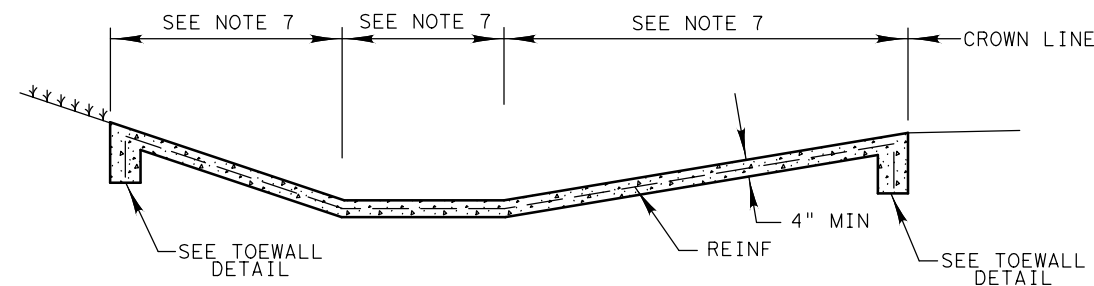
CONCRETE RIPRAP AT TYPICAL V-BOTTOM DITCH

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC) (4 IN).



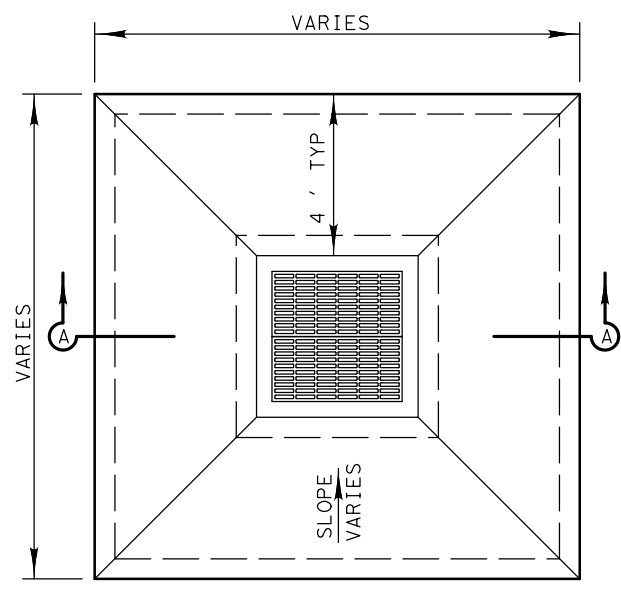
CONCRETE RIPRAP AT TYPICAL FILL SECTION

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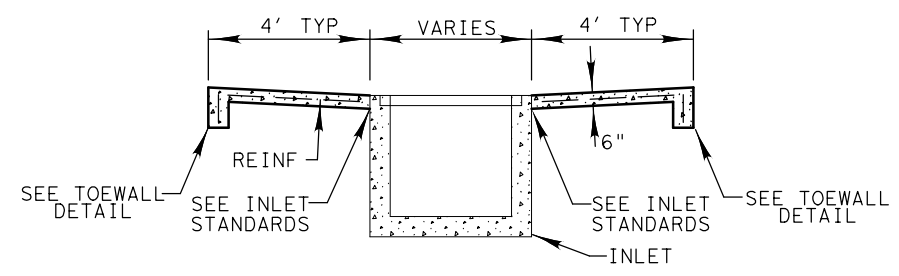


CONCRETE RIPRAP AT TYPICAL FLAT BOTTOM DITCH

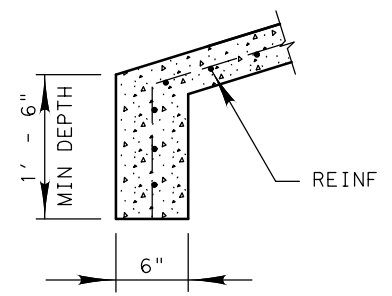
QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC) (4 IN).



CONCRETE RIPRAP AT INLET



**CONCRETE RIPRAP AT INLET
 RIPRAP APRON DETAILS
 SECTION A-A**



TOEWALL DETAIL

GENERAL NOTES:

1. USE CL B CONCRETE UNLESS OTHERWISE NOTED IN PLANS. USE CL A CONCRETE FOR RIPRAP APRON AROUND INLETS.
2. PROVIDE CONSTRUCTION JOINTS OR GROOVED JOINTS EXTENDING THE FULL SLANT SLOPE HEIGHT AT INTERVALS OF APPROXIMATELY 20 FEET UNLESS OTHERWISE DIRECTED.
3. PLACE PREMOLDED OR BOARD EXPANSION JOINTS VERTICALLY AND AT RIGHT ANGLES TO THE LONGITUDINAL AXIS OF THE RIPRAP IN SECTIONS NO LESS THAN 8 FEET IN WIDTH OR MORE THAN 40 FEET IN LENGTH.
4. RIPRAP MAY EXTEND BEYOND CROWN LINE, UP TO EDGE OF PAVEMENT.
5. USE NO.3 OR NO.4 BARS @ 12" O.C. IN BOTH DIRECTIONS SUPPORTED ON REINFORCING CHAIRS.
6. SEE QUANTITY SUMMARIES FOR RIPRAP LOCATIONS.
7. CONSTRUCT SLOPES TO THAT OF THE APPROPRIATE TYPICAL SECTION OR CROSS SECTION UNLESS OTHERWISE DIRECTED.

NOT TO SCALE

LUFKIN DISTRICT STANDARD

**CONCRETE RIPRAP
 DETAILS**

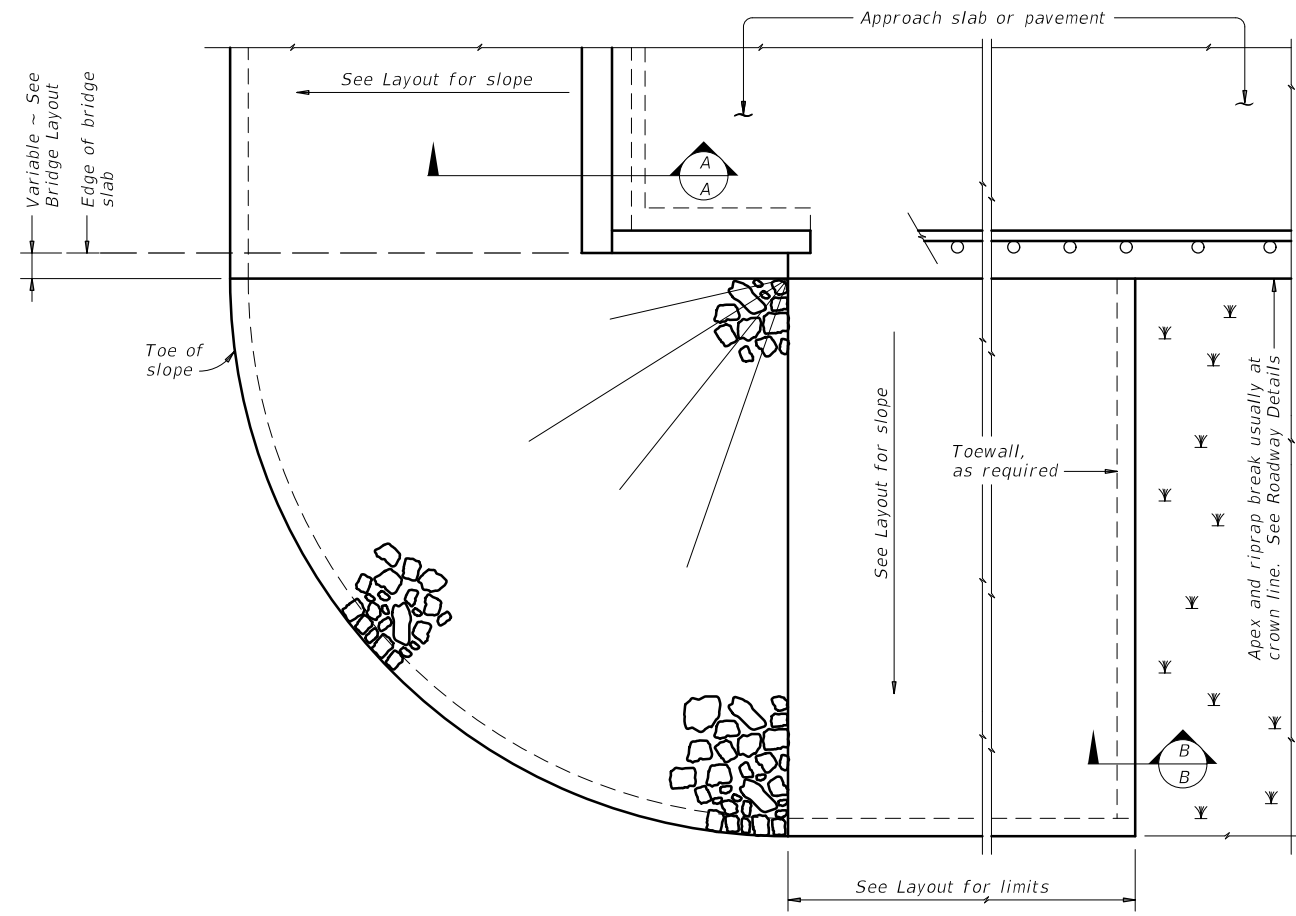


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DIST	COUNTY	SHEET NO.	
LFK	POLK	172	

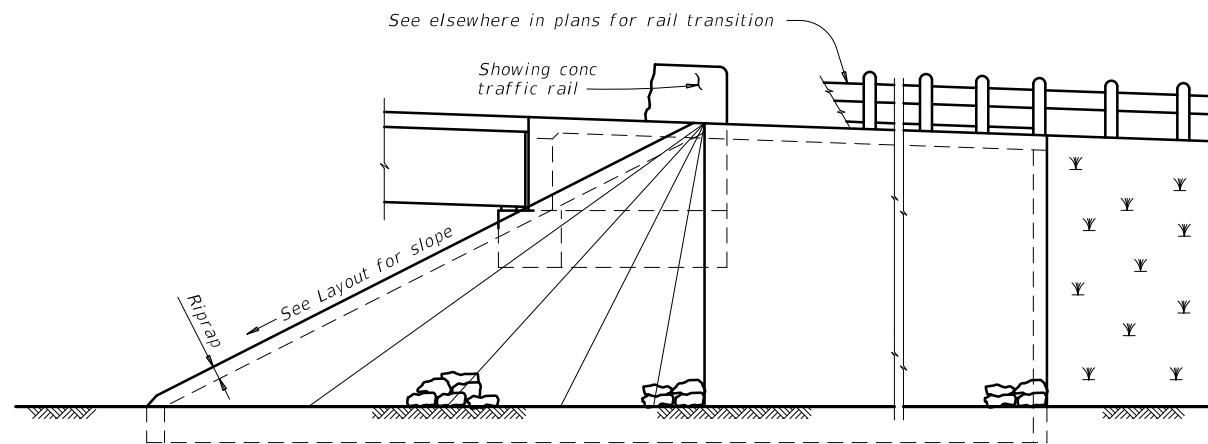
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 REVISED 03-14
 REVISED 10/20/2016: MODIFIED TITLE BLOCK
 REVISED 04/03/2017: MODIFIED NOTES FOR PAYMENT

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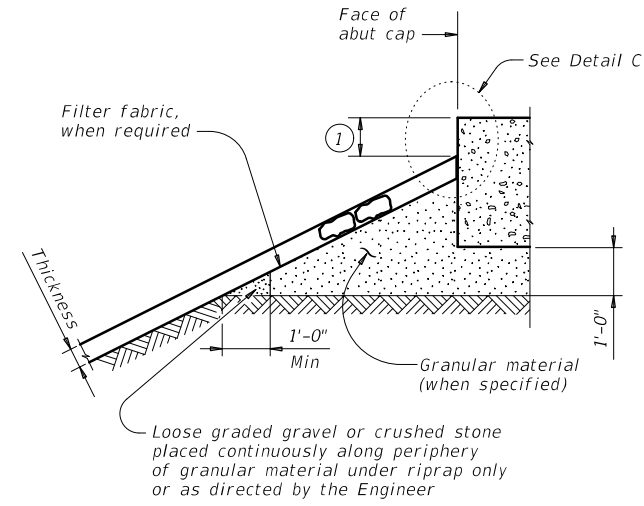
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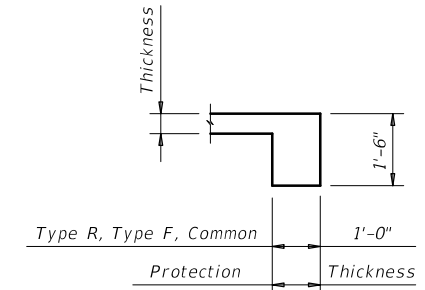
PLAN



ELEVATION

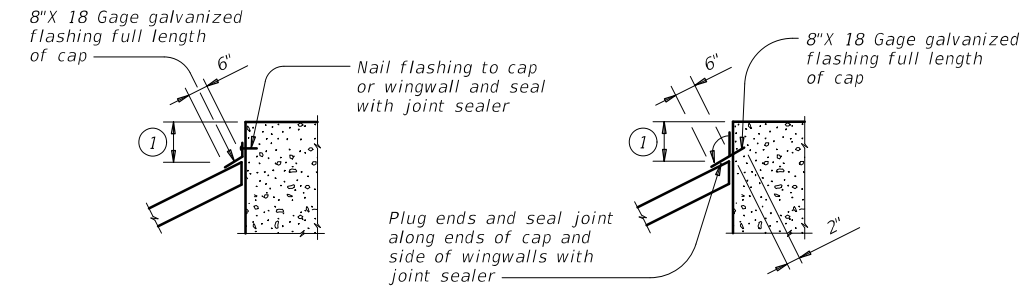


SECTION A-A AT CAP



SECTION B-B

Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C

① Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:
 Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
 See elsewhere in plans for locations and details of shoulder drains.

		Bridge Division Standard	
<h1>STONE RIPRAP</h1>			
<h2>SRR</h2>			
FILE: srrstd1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONTRACT: 0213 04	SECTION: 050	JOB: US 190
REVISIONS	DIST: LFK	COUNTY: POLK	SHEET NO: 173

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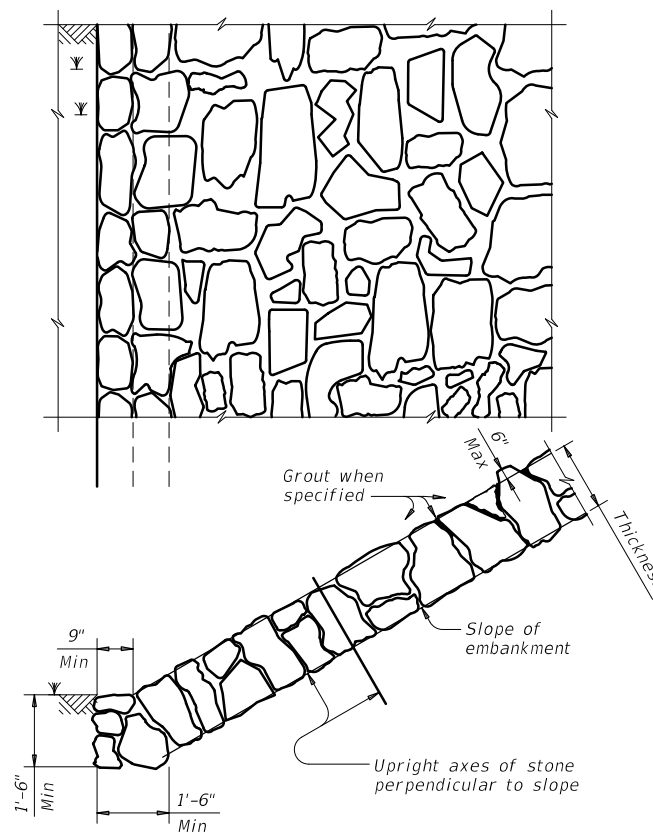


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

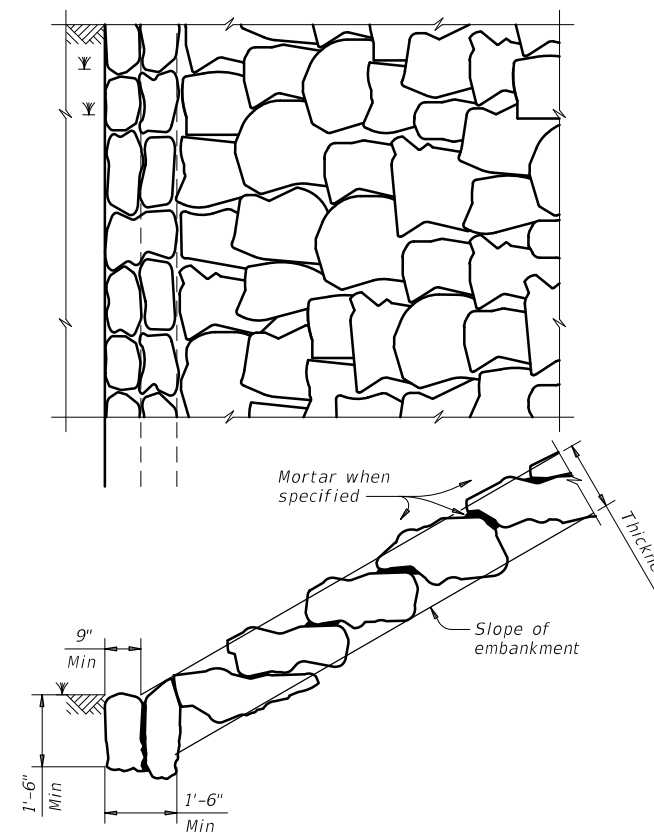


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

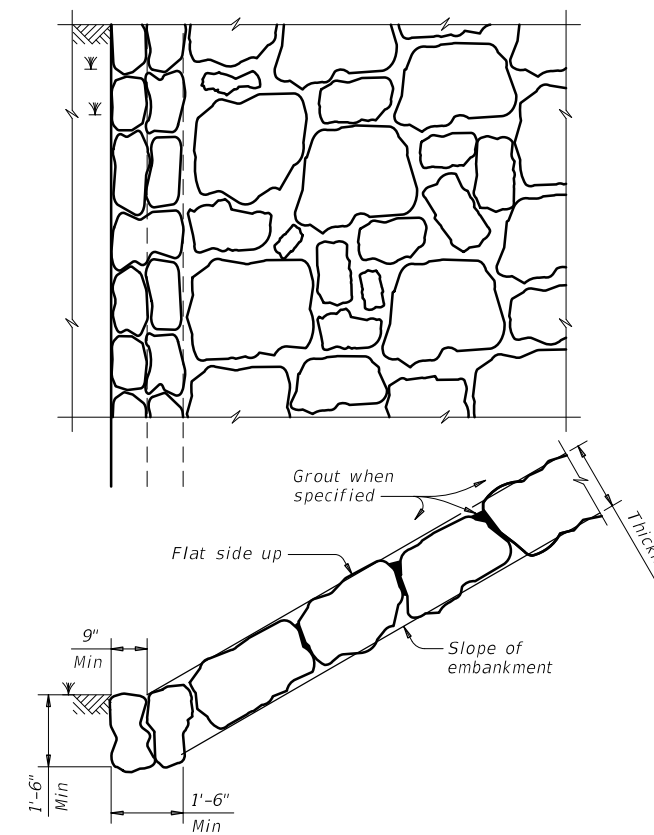


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

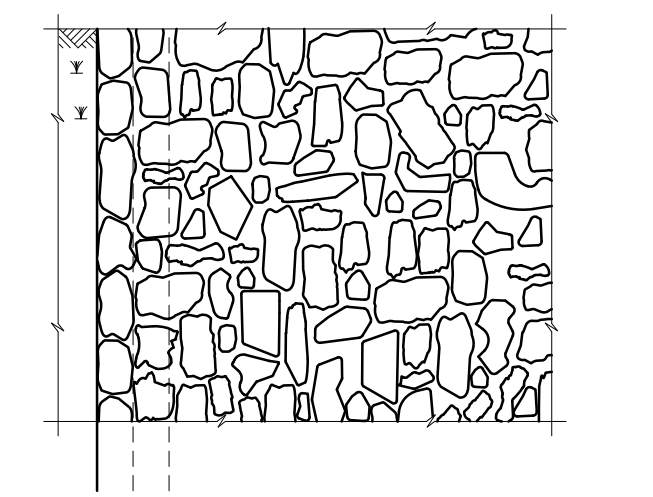


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

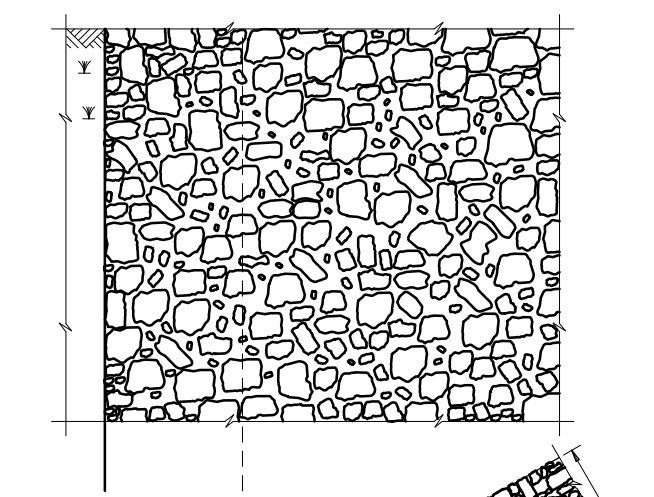
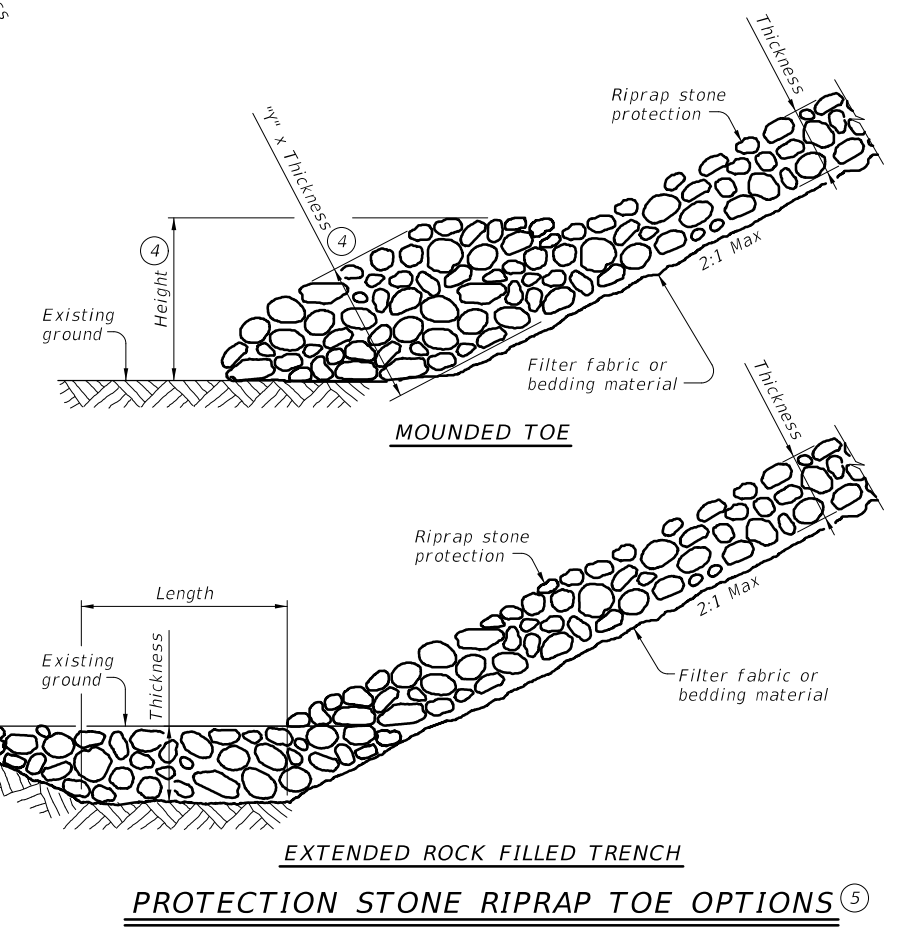


FIGURE 5 ~ PROTECTION STONE RIPRAP

- ② Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.
- ③ Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.
- ④ "Y" and Height need to be defined. See layout or detail sheet for values if this option is used.
- ⑤ List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



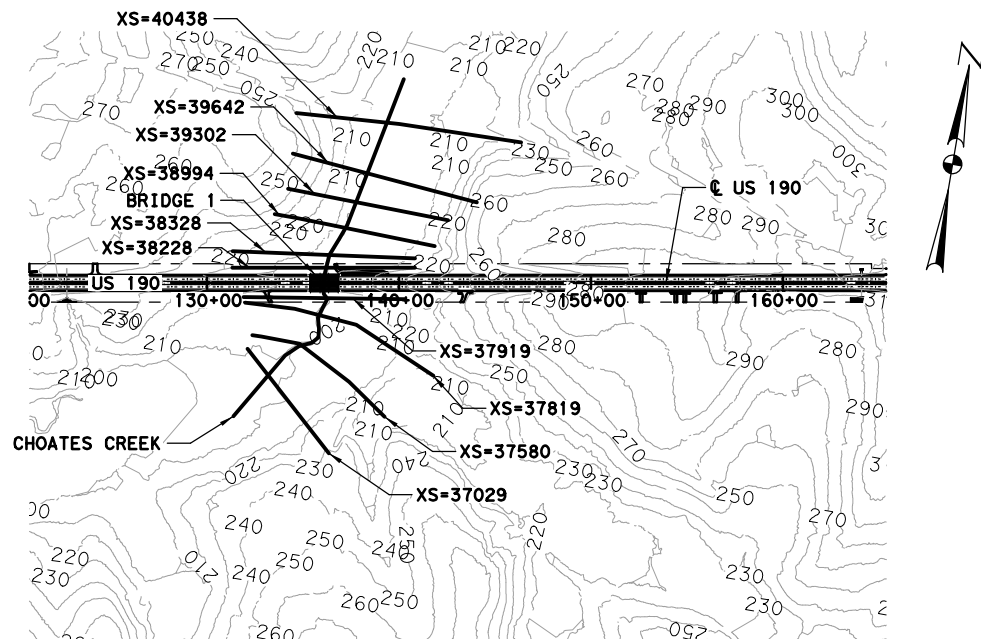
PROTECTION STONE RIPRAP TOE OPTIONS ⑤

SHEET 2 OF 2

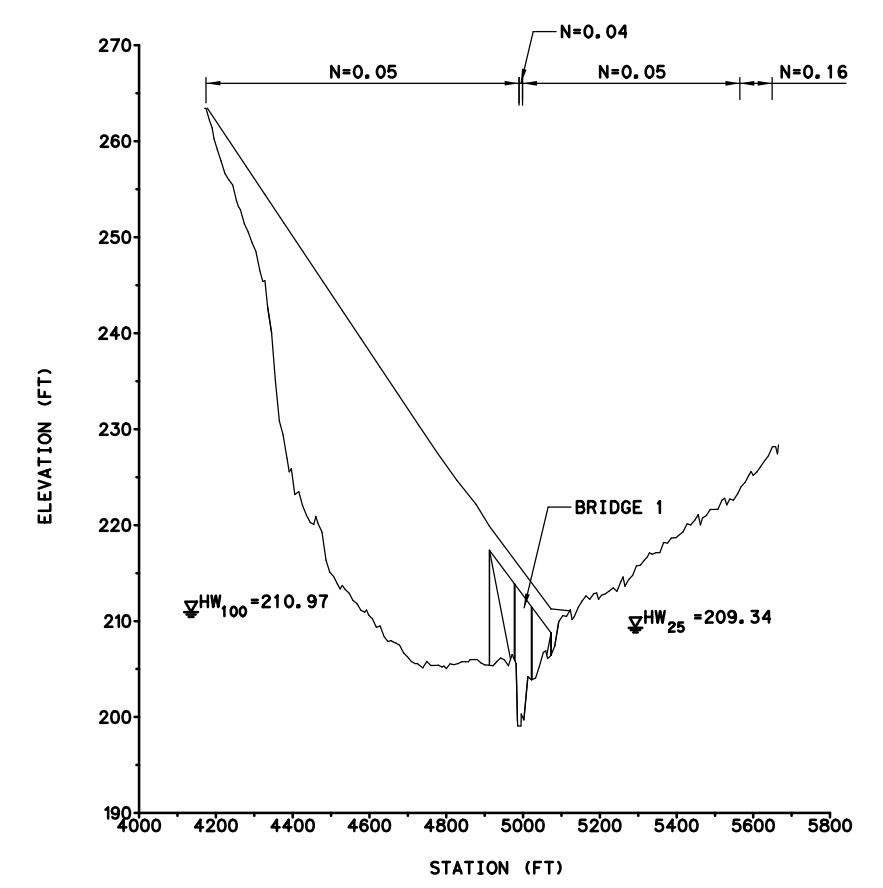
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<h3>SRR</h3>			
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©TxDOT April 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0213 04	050	US 190
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	LFK	POLK	174

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HEC-RAS CROSS SECTION MAP
 SCALE: 1" = 1000'



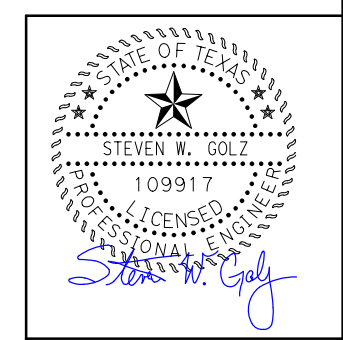
PROPOSED UPSTREAM HEC-RAS CROSS SECTION (XS=38100.00)

EXISTING HYDRAULIC RESULTS - BRIDGE 1 AT US 190						
MODEL SECTION	25 YEAR STORM FREQUENCY			100 YEAR STORM FREQUENCY		
	Q (CFS)	V (FT/S)	WSEL (FT)	Q (CFS)	V (FT/S)	WSEL (FT)
40438.00	2826.00	1.74	214.36	4299.00	1.95	215.47
39642.00	2826.00	2.47	212.43	4299.00	2.61	213.64
39302.00	2826.00	2.34	211.41	4299.00	2.64	212.68
38994.00	2826.00	3.19	210.31	4299.00	3.18	211.71
38328.00	2826.00	2.55	209.42	4299.00	2.56	211.04
38228.0 - UPSTREAM OF OPENING	2826.00	2.91	209.32	4299.00	3.05	210.95
38100.0 - BRIDGE						
37919.0 - DOWNSTREAM OF OPENING	2826.00	4.31	206.19	4299.00	4.95	207.18
37819.00	2826.00	3.33	205.69	4299.00	3.69	206.72
37580.00	3768.00	2.75	204.99	5807.00	3.13	206.05
37029.00	3768.00	2.49	203.30	5807.00	2.57	204.56

PROPOSED HYDRAULIC RESULTS - BRIDGE 1 AT US 190						
MODEL SECTION	25 YEAR STORM FREQUENCY			100 YEAR STORM FREQUENCY		
	Q (CFS)	V (FT/S)	WSEL (FT)	Q (CFS)	V (FT/S)	WSEL (FT)
40438.00	2826.00	1.74	214.36	4299.00	1.95	215.47
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39302.00	2826.00	2.34	211.41	4299.00	2.64	212.68
38994.00	2826.00	3.19	210.31	4299.00	3.18	211.71
38328.00	2826.00	2.55	209.42	4299.00	2.53	211.05
38228.0 - UPSTREAM OF OPENING	2826.00	2.81	209.34	4299.00	2.94	210.97
38100.0 - BRIDGE						
37919.0 - DOWNSTREAM OF OPENING	2826.00	4.20	206.18	4299.00	4.80	207.18
37819.00	2826.00	3.28	205.70	4299.00	3.62	206.73
37580.00	3768.00	2.77	205.00	5807.00	3.17	206.06
37029.00	3768.00	2.49	203.30	5807.00	2.57	204.56

HYDRAULIC METHOD

1. STRUCTURE LOCATED IN ZONE A PER FIRM PANEL 48373C0460C (EFFECTIVE 09/03/2010) & 48373C0500C (EFFECTIVE 09/03/2010).
2. HEC-RAS VERSION 5.0.7 USED FOR ANALYSIS AND DESIGN.
3. LETTER SENT TO FLOOD PLAIN ADMINISTRATOR ON 04/05/2021.
4. NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION, PER FEMA BASE LEVEL MODELING FOR BOTH EXISTING AND PROPOSED CONDITIONS.
5. EXISTING AND PROPOSED MODEL PASSES THE 25 YR EVENT.
6. HYDROLOGIC DATA FOR CHOATES CREEK AND MENARD CREEK ARE BASED OFF OF THE FEMA BASE LEVEL ENGINEERING DATA. DATA WAS DOWNLOADED FROM FEMA IN DECEMBER 2020.



HYDRAULIC DATA SHEET
 (CHOATES CREEK)
 SHEET 1 OF 2

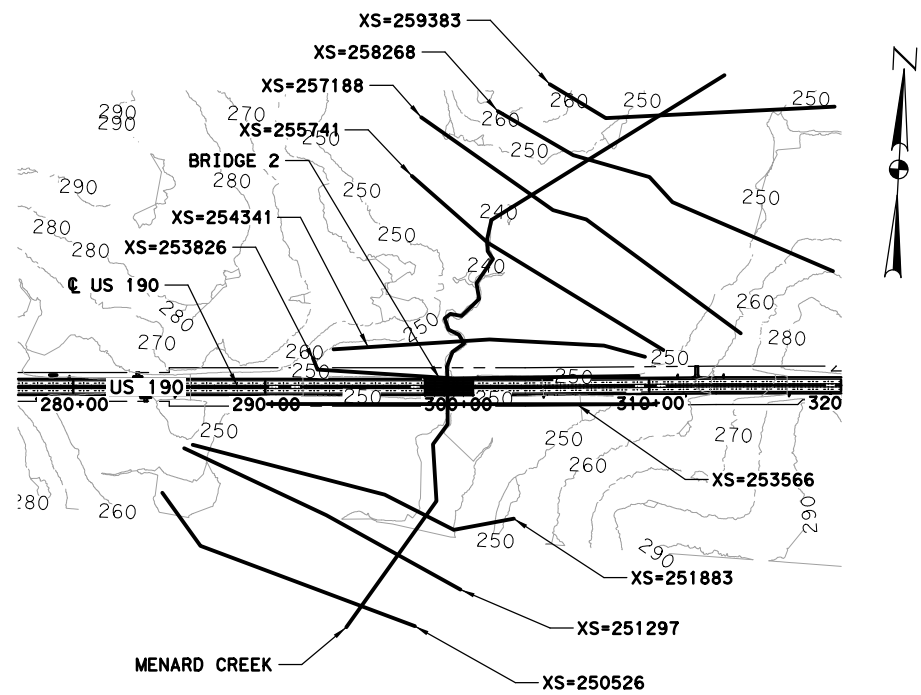
Texas Department of Transportation
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 Tel: 281-558-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

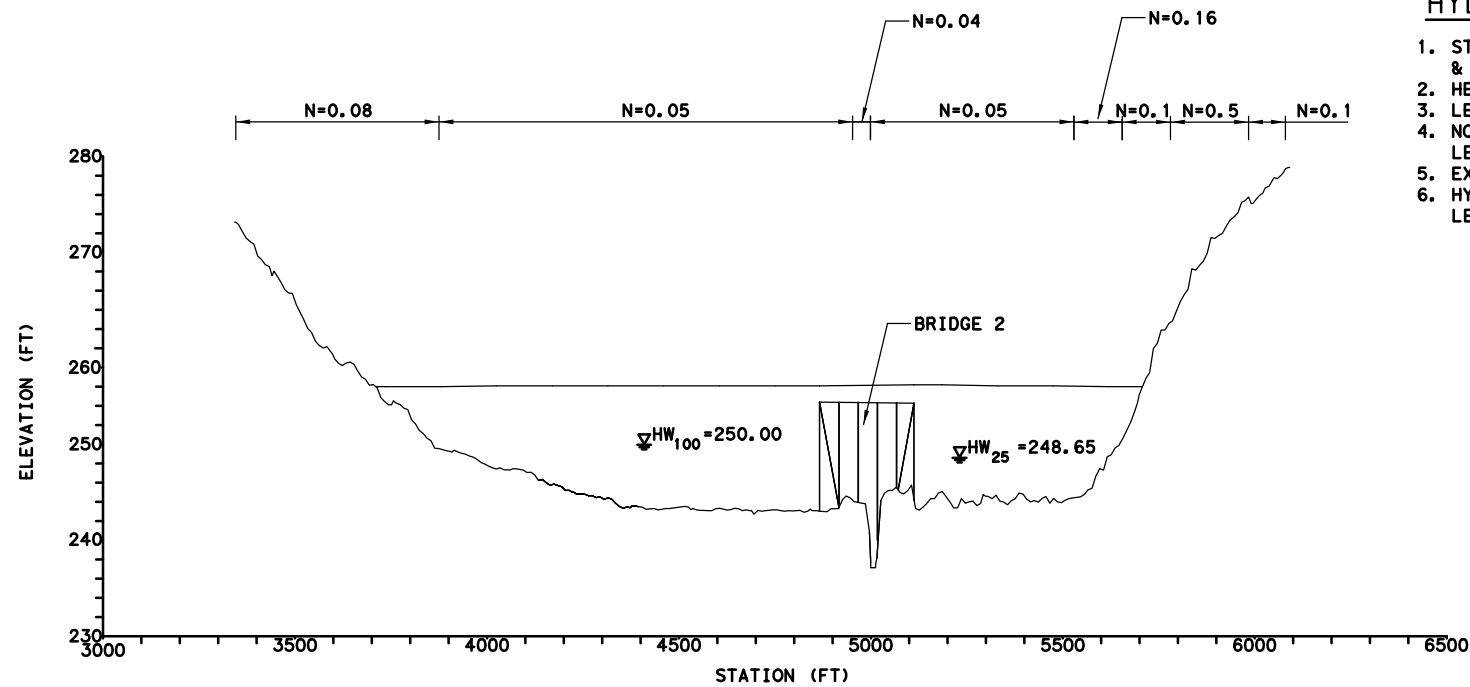
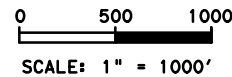
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HEC-RAS CROSS SECTION MAP



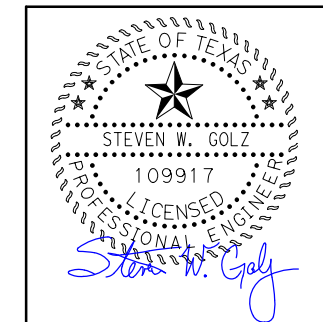
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259383.00	3733.00	1.81	252.79	5698.00	1.72	253.69
258268.00	3733.00	0.66	252.10	5698.00	0.78	253.02
257188.00	3733.00	1.50	251.51	5698.00	1.65	252.40
255741.00	3733.00	1.74	249.86	5698.00	1.59	251.02
254341.00	3733.00	1.01	248.90	5698.00	1.04	250.27
253826. - UPSTREAM OF OPENING	3733.00	2.48	248.63	5698.00	2.85	249.99
253700. - BRIDGE						
253566. - DOWNSTREAM OF OPENING	3733.00	3.16	247.65	5698.00	3.88	248.66
251883.00	3733.00	1.70	245.42	5698.00	1.66	246.48
251297.00	3733.00	1.74	244.73	5698.00	1.75	245.91
250526.00	3733.00	1.37	243.89	5698.00	1.51	245.16

PROPOSED HYDRAULIC RESULTS - BRIDGE 2 AT US 190						
MODEL SECTION	25 YEAR STORM FREQUENCY			100 YEAR STORM FREQUENCY		
	Q (CFS)	V (FT/S)	WSEL (FT)	Q (CFS)	V (FT/S)	WSEL (FT)
259383.00	3733.00	1.81	252.79	5698.00	1.72	253.68
258268.00	3733.00	0.66	252.10	5698.00	0.78	253.02
257188.00	3733.00	1.50	251.51	5698.00	1.65	252.39
255741.00	3733.00	1.74	249.85	5698.00	1.59	251.00
254341.00	3733.00	1.01	248.89	5698.00	1.04	250.25
253826. - UPSTREAM OF OPENING	3733.00	2.48	248.65	5698.00	2.85	250.00
253700. - BRIDGE						
253566. - DOWNSTREAM OF OPENING	3733.00	3.16	247.55	5698.00	3.88	248.55
251883.00	3733.00	1.70	245.42	5698.00	1.66	246.48
251297.00	3733.00	1.74	244.73	5698.00	1.75	245.91
250526.00	3733.00	1.37	243.89	5698.00	1.51	245.16

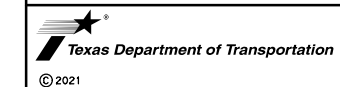
HYDRAULIC METHOD

1. STRUCTURE LOCATED IN ZONE A PER FIRM PANEL 48373C0460C (EFFECTIVE 09/03/2010) & 48373C0500C (EFFECTIVE 09/03/2010).
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HYDRAULIC DATA SHEET (MENARD CREEK)

SHEET 2 OF 2



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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

BRIDGE ESTIMATED QUANTITIES (US 190 AT CHOATES CREEK)														
BID CODES	0400 6005	0403 6001	0416 6002	0420 6013	0420 6029	0420 6037	0422 6001	0422 6015	0425 6011	0425 6012	0432 6033	0450 6054	0454 6004	0496 6010
BRIDGE ELEMENTS	CEM STABIL BKFL	TEMPORARY SPL SHORING	DRILL SHAFT (24 IN)	① CL C CONC (ABUT)	① CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC SLAB BEAM (45B15)	PRESTR CONC SLAB BEAM (55B15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY SSTR) (W/DRAIN SLOTS)	ARMOR JOINT (SEALED)	REMOV STR (BRIDGE 100 - 499 FT LENGTH)
	CY	SF	LF	CY	CY	CY	SF	CY	LF	LF	CY	LF	LF	EA
ABUTMENT 1	127	86	469	25.5				67.5			312	12.0	86	
BENT 2			585		20.5	6.3								
BENT 3			549		20.5	8.4								
ABUTMENT 4	127	29	476	25.5				67.5			313	12.0	86	
PRESTR CONC UNIT 1							12470		2726.97	287.05		290.0		
TOTAL	254	115	2079	51.0	41.0	14.7	12,470	135.0	2,726.97	287.05	625	314.0	172	1

① QUANTITIES INCLUDE EARWALL



5/20/2021

BRIDGE ESTIMATED QUANTITIES

(CHOATES CREEK)

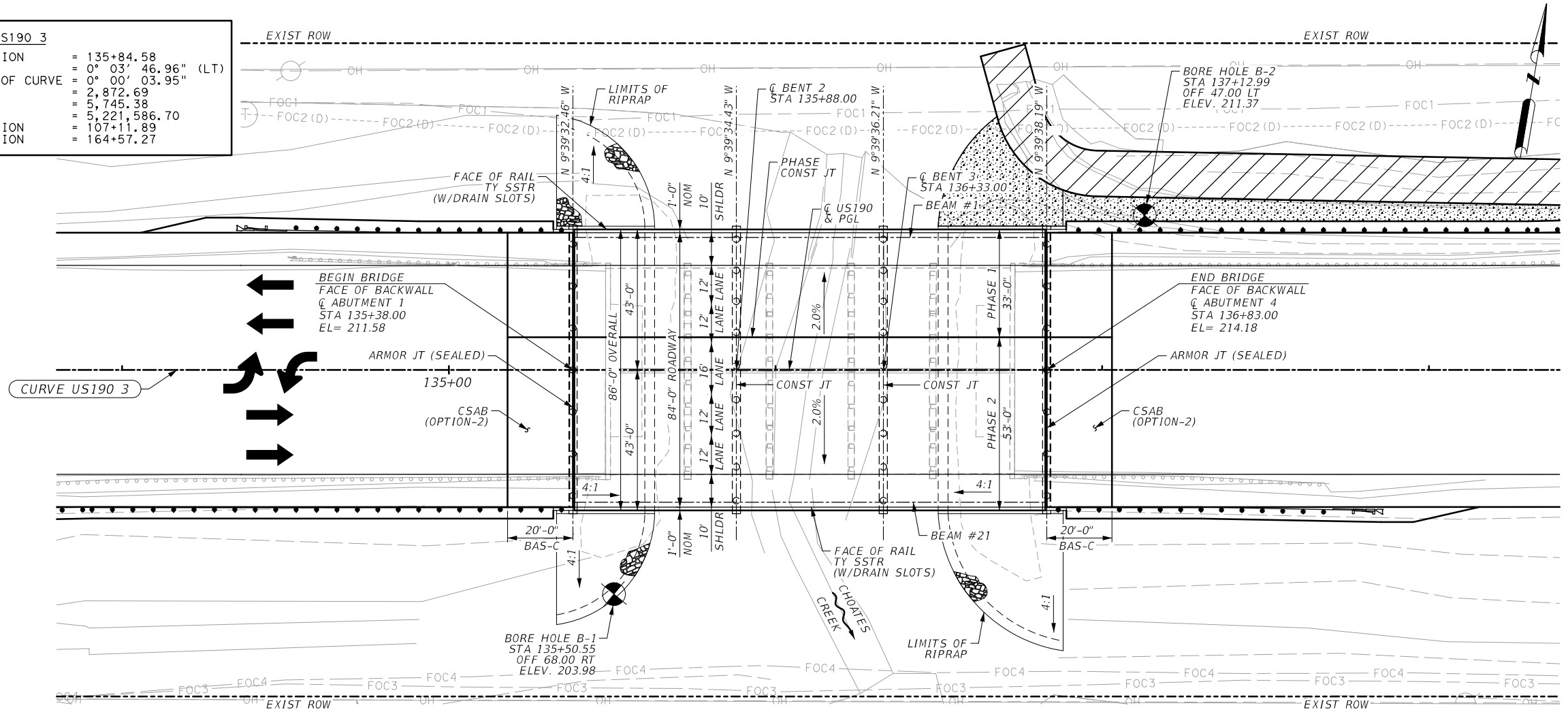


White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6944
 FIRM NUMBER: 12698
 Copyright: 2021

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			177
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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CURVE US190_3	
PI STATION	= 135+84.58
DELTA	= 0° 03' 46.96" (LT)
DEGREE OF CURVE	= 0° 00' 03.95"
TANGENT	= 2,872.69
LENGTH	= 5,745.38
RADIUS	= 5,221,586.70
PC STATION	= 107+11.89
PT STATION	= 164+57.27



GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9th EDITION (2020) AND CURRENT INTERIMS.

ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROWN AND/OR SUPERELEVATIONS.

CONTRACTOR SHALL VERIFY LOCATIONS OF UTILITIES PRIOR TO CONSTRUCTION, EXCAVATION OR DRILLING.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO ORDERING MATERIALS.

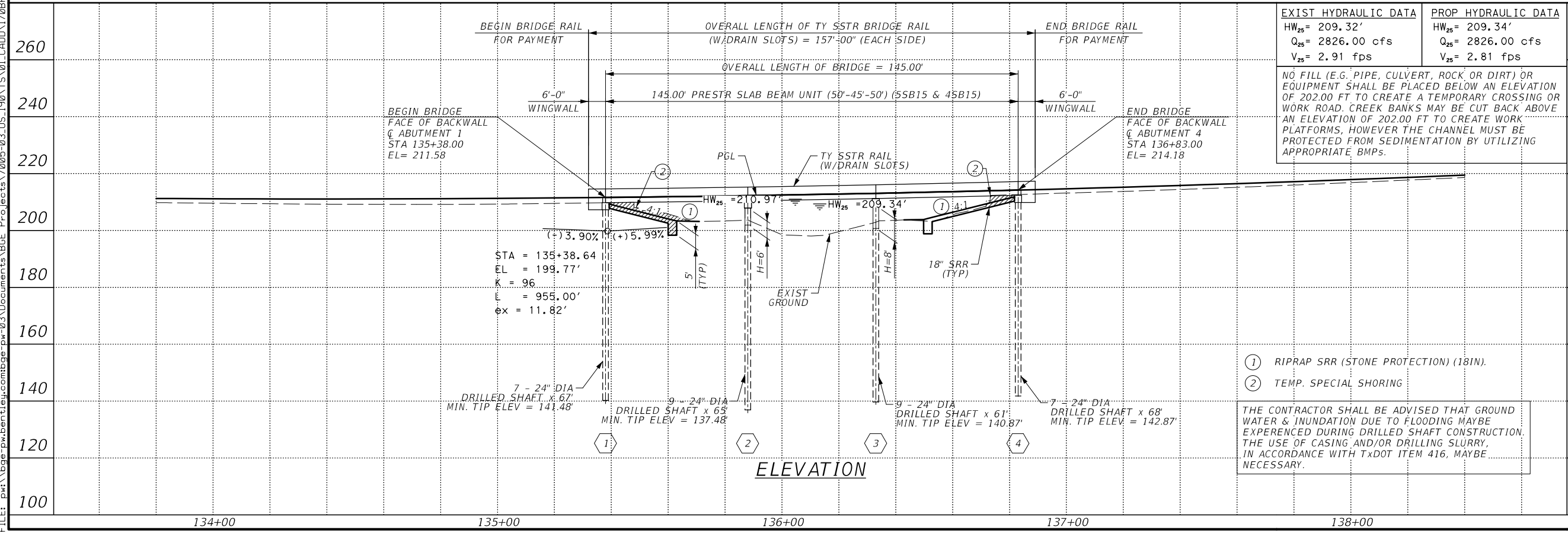
THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.

SEE BORING LOG SHEETS FOR TEST HOLE INFORMATION

DESIGN SPEED: 50 MPH
 ADT (EXIST): 13,900 VPD (2022)
 ADT (PROP): 19,200 VPD (2042)
 FUNCTIONAL CLASSIFICATION: RURAL PRINCIPAL ARTERIAL
 TERRAIN: ROLLING
 EXIST NBI NO: 11-187-0213-04-090
 PROP NBI NO: 11-187-0-0213-04-113

SCALE: 1"=40'
 HL93 LOADING

PLAN



ELEVATION

EXIST HYDRAULIC DATA	PROP HYDRAULIC DATA
HW ₂₅ = 209.32'	HW ₂₅ = 209.34'
Q ₂₅ = 2826.00 cfs	Q ₂₅ = 2826.00 cfs
V ₂₅ = 2.91 fps	V ₂₅ = 2.81 fps

NO FILL (E.G. PIPE, CULVERT, ROCK OR DIRT) OR EQUIPMENT SHALL BE PLACED BELOW AN ELEVATION OF 202.00 FT TO CREATE A TEMPORARY CROSSING OR WORK ROAD. CREEK BANKS MAY BE CUT BACK ABOVE AN ELEVATION OF 202.00 FT TO CREATE WORK PLATFORMS, HOWEVER THE CHANNEL MUST BE PROTECTED FROM SEDIMENTATION BY UTILIZING APPROPRIATE BMPs.

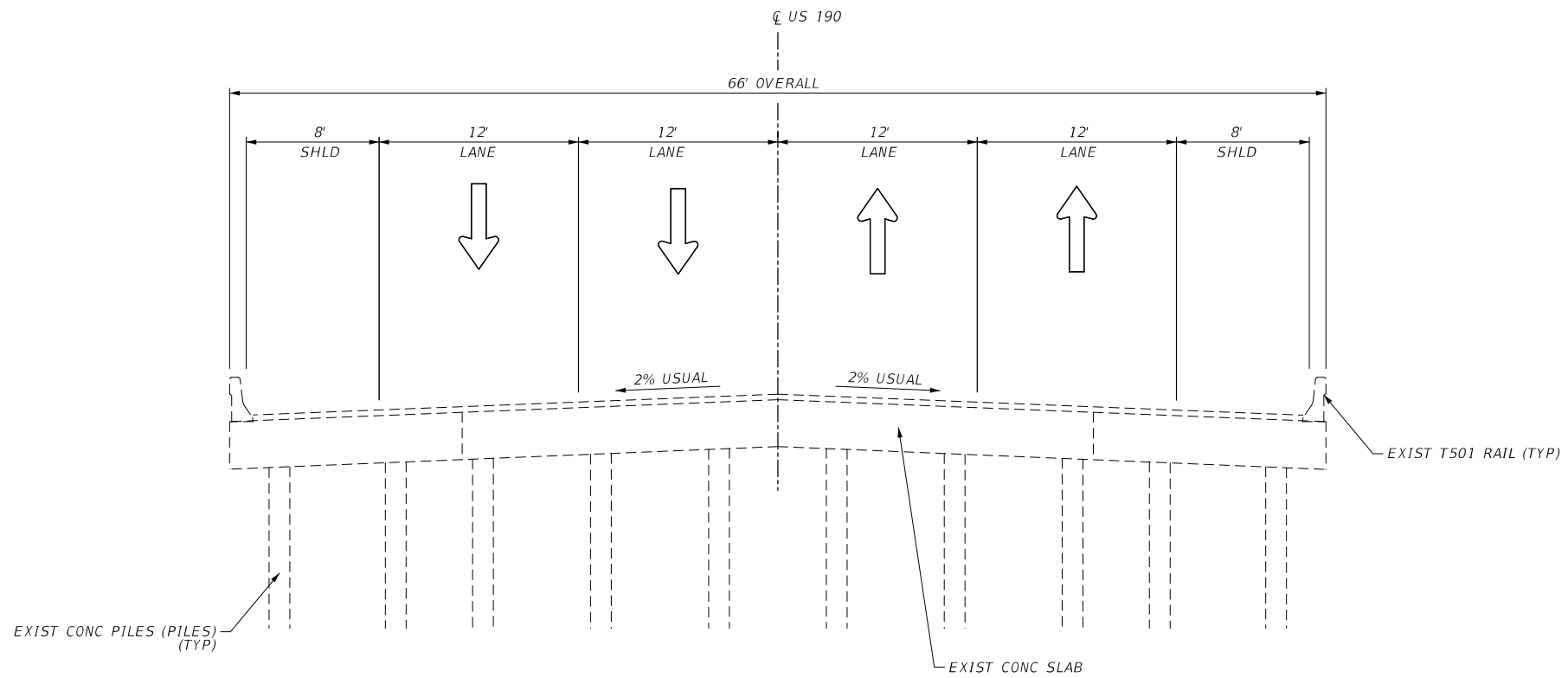
- ① RIPRAP SRR (STONE PROTECTION) (18IN).
- ② TEMP. SPECIAL SHORING

THE CONTRACTOR SHALL BE ADVISED THAT GROUND WATER & INUNDATION DUE TO FLOODING MAYBE EXPERIENCED DURING DRILLED SHAFT CONSTRUCTION. THE USE OF CASING AND/OR DRILLING SLURRY, IN ACCORDANCE WITH TXDOT ITEM 416, MAYBE NECESSARY.

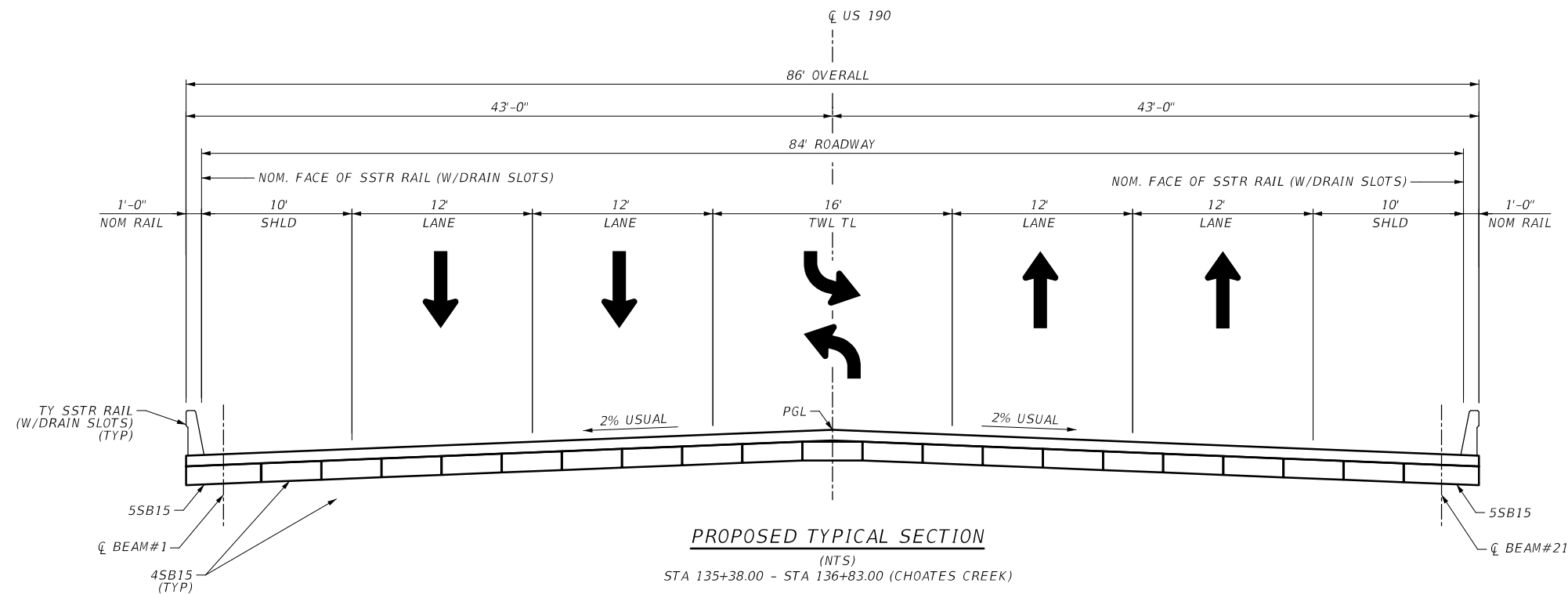
260		260																								
240		240																								
220		220																								
200		200																								
180		180																								
160	<p>6/9/2021</p> <p>BRIDGE LAYOUT (CHOATES CREEK)</p>	160																								
140		140																								
120		120																								
100	<table border="1"> <tr> <td>FED. RD. DIST. NO.</td> <td>PROJECT NO.</td> <td>SHEET NO.</td> </tr> <tr> <td>6</td> <td></td> <td>178</td> </tr> <tr> <td>STATE</td> <td>STATE DIST. NO.</td> <td>COUNTY</td> </tr> <tr> <td>TEXAS</td> <td>LFK</td> <td>POLK</td> </tr> <tr> <td>CONT.</td> <td>SECT.</td> <td>JOB</td> </tr> <tr> <td>0213</td> <td>04</td> <td>050</td> </tr> <tr> <td></td> <td></td> <td>HIGHWAY NO.</td> </tr> <tr> <td></td> <td></td> <td>US 190</td> </tr> </table>	FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.	6		178	STATE	STATE DIST. NO.	COUNTY	TEXAS	LFK	POLK	CONT.	SECT.	JOB	0213	04	050			HIGHWAY NO.			US 190	100
FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.																								
6		178																								
STATE	STATE DIST. NO.	COUNTY																								
TEXAS	LFK	POLK																								
CONT.	SECT.	JOB																								
0213	04	050																								
		HIGHWAY NO.																								
		US 190																								

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EXISTING TYPICAL SECTION
 (NTS)
 STA 135+47.96 - STA 136+73.24 (CHOATES CREEK)



PROPOSED TYPICAL SECTION
 (NTS)
 STA 135+38.00 - STA 136+83.00 (CHOATES CREEK)

HL93 LOADING



5/20/2021

**TYPICAL
 BRIDGE
 SECTION**
 (CHOATES CREEK)




White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6944
 FIRM NUMBER: 12698


FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		179	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

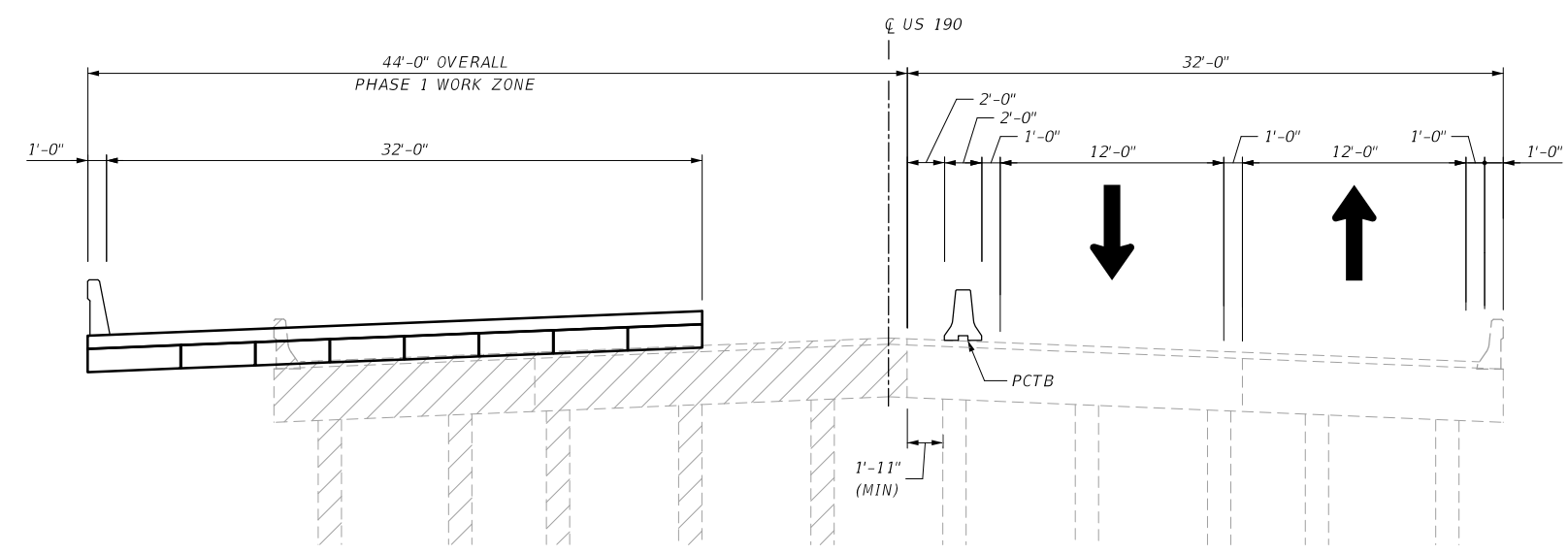
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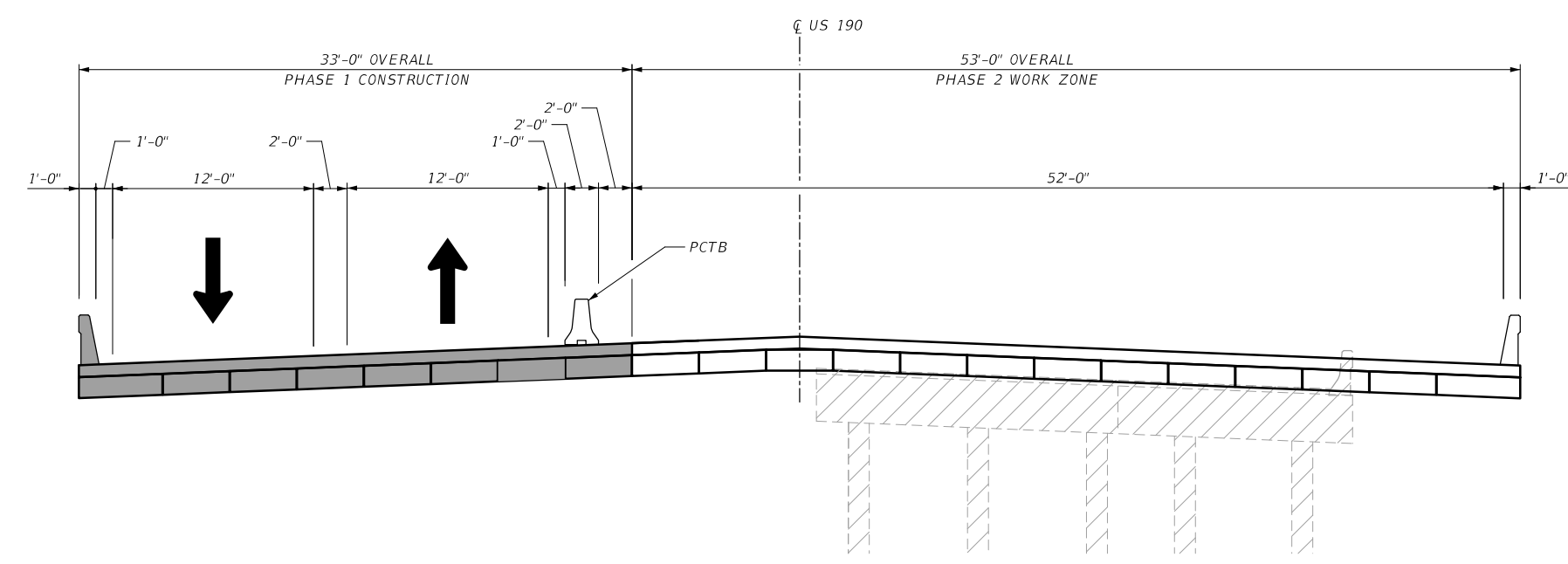
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 REMOVE EXIST. STRUCTURE

 CONST. PREVIOUS PHASE



PHASE 1 CONSTRUCTION TYPICAL SECTION
 (NTS)
 STA 135+38.00 - STA 137+83.00 (CHOATES CREEK)



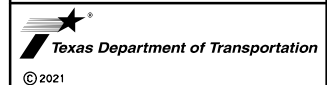
PHASE 2 CONSTRUCTION TYPICAL SECTION
 (NTS)
 STA 135+38.00 - STA 136+83.00 (CHOATES CREEK)

HL93 LOADING



5/20/2021

TYPICAL BRIDGE PHASING
 (CHOATES CREEK)

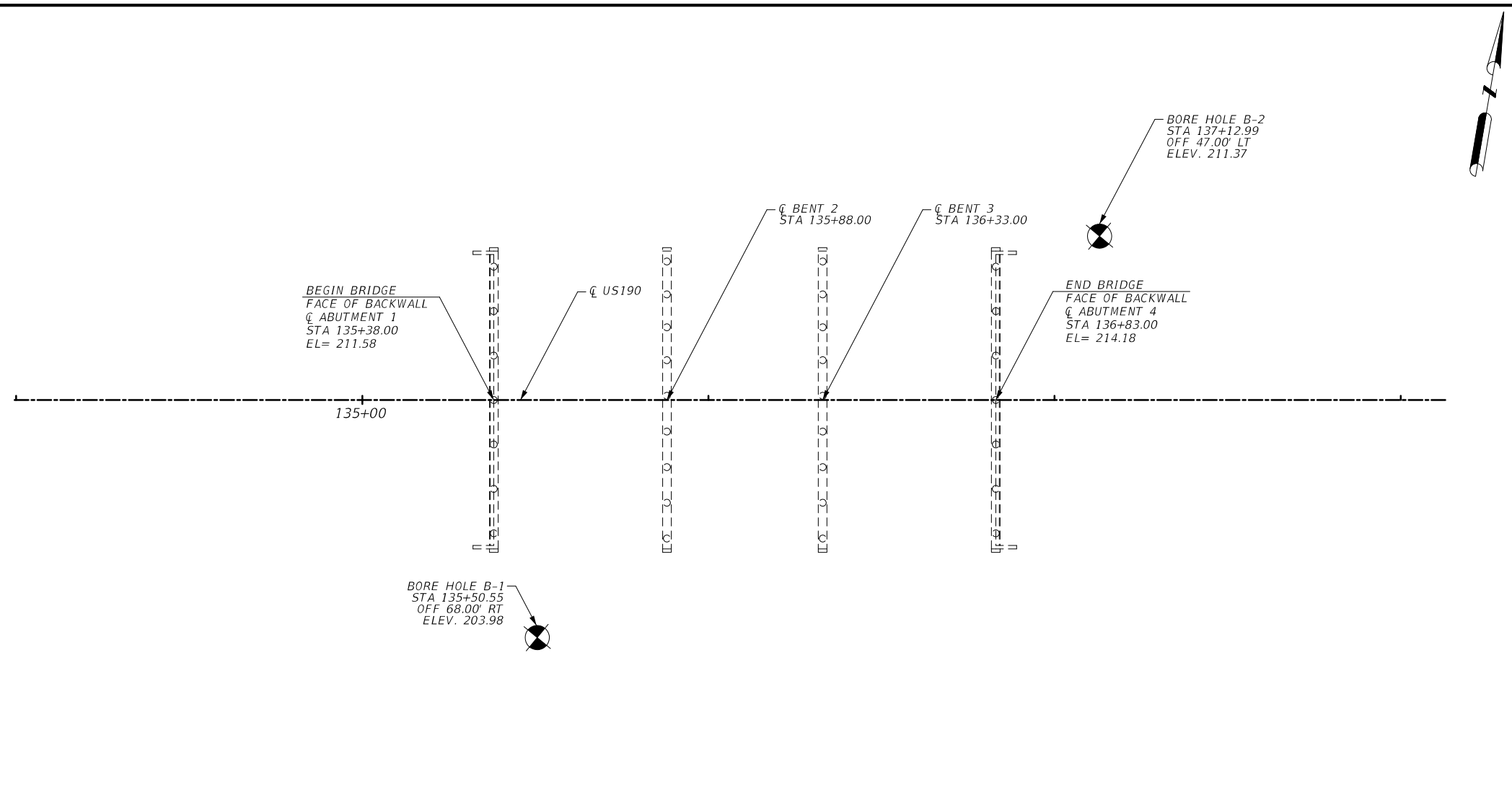


White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.8844
 FIRM NUMBER: 12998
 Copyright: 2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		180	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

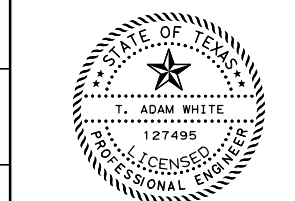
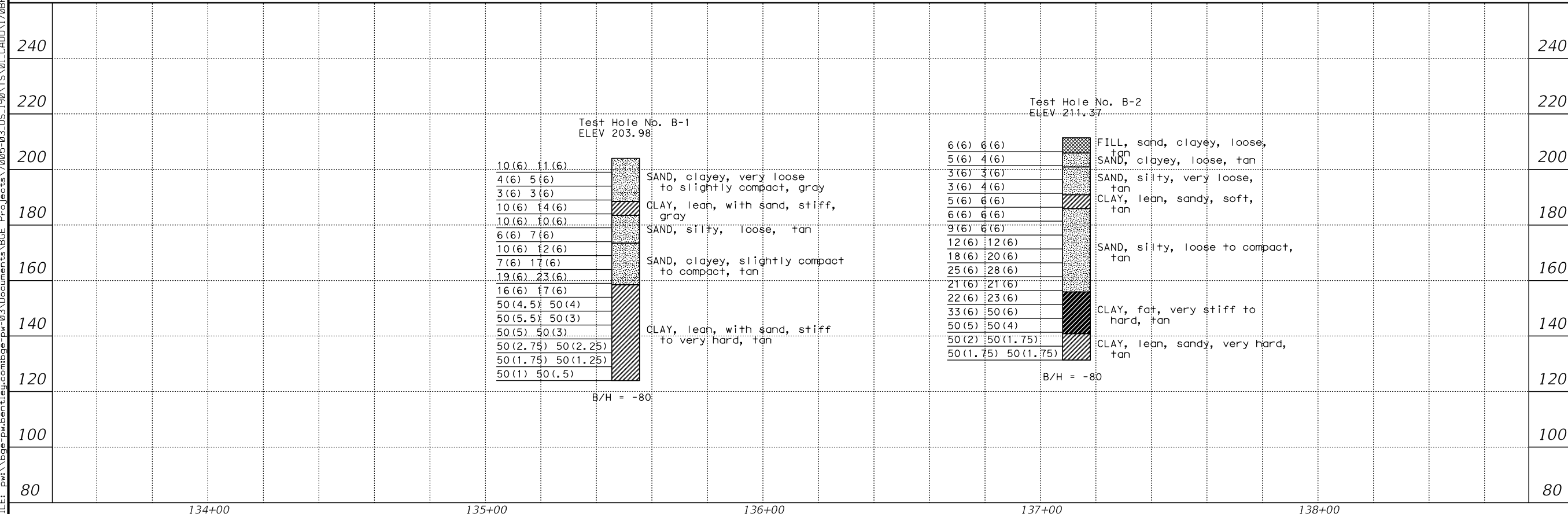
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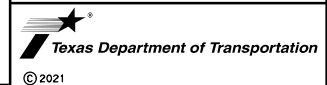
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 BORING LOCATION

0 20 40
 SCALE: 1"=40'
 HL93 LOADING



Adam White
 5/19/2021

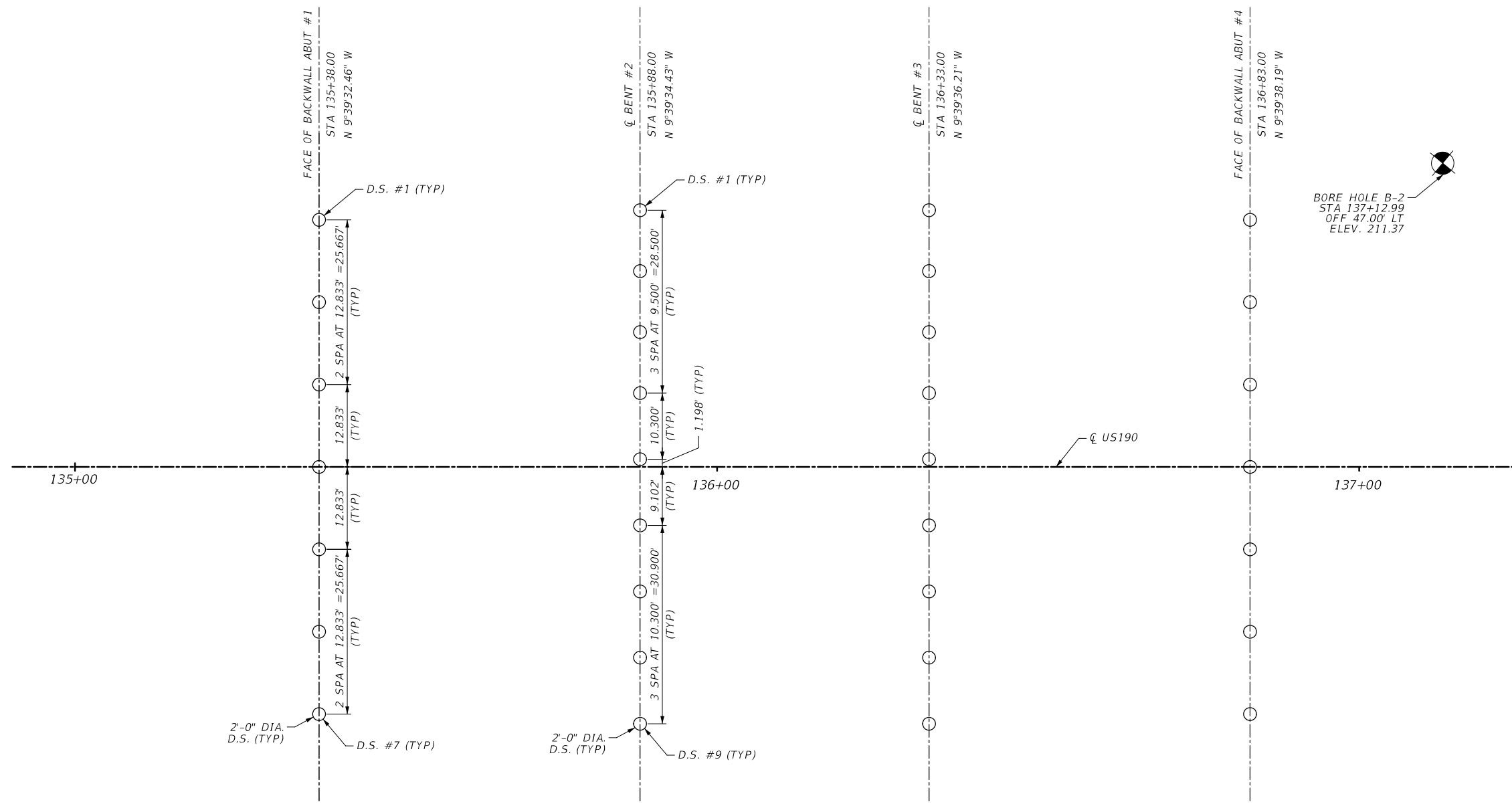
BRIDGE BORING LOGS
 (CHOATES CREEK)



FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		181
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

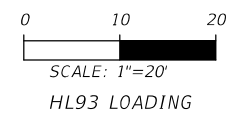
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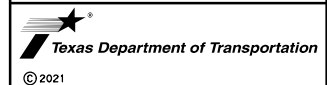
FOUNDATION LAYOUT

GENERAL NOTES:
 SEE COMMON FOUNDATION DETAILS (FD) STANDARD SHEET FOR ALL ABUTMENT FOUNDATION DETAILS AND NOTES NOT SHOWN.
 SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTHS.
 SEE BRIDGE BORING LOGS FOR BORING LOG DATA.
 SEE ABUTMENT DETAILS SHEET AND BENT DETAIL SHEETS FOR CALCULATED DRILLED SHAFT DESIGN LOADS.



5/20/2021

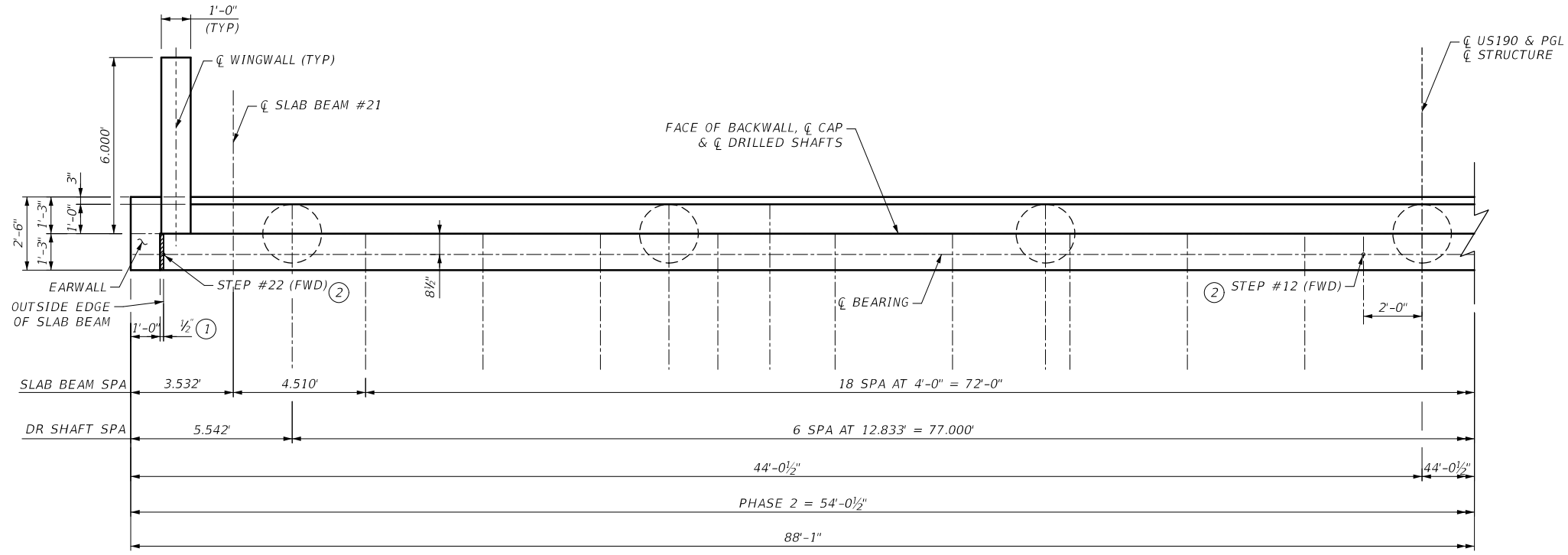
FOUNDATION LAYOUT
 (CHOATES CREEK)



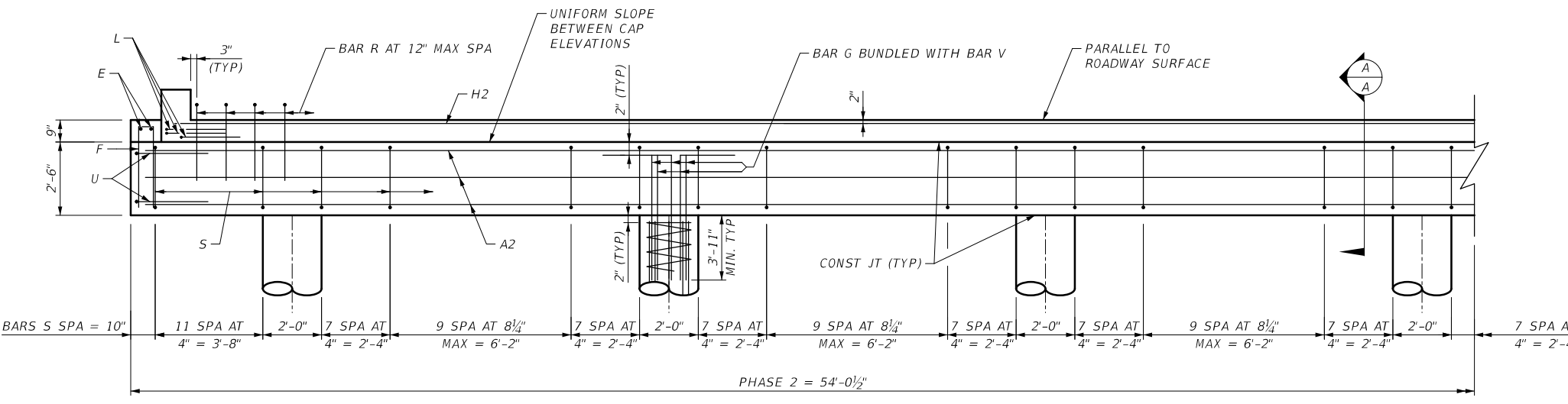
White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 409.424.2844
 FIRM NUMBER: 12698
 Copyright: 2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		182	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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PLAN



ELEVATION

TABLE OF ESTIMATED QUANTITIES ③				
BAR	No.	SIZE	LENGTH	WEIGHT
A1	8	#11	40'-4"	1,714
A2	8	#11	53'-4"	2,267
E	4	#4	2'-2"	6
F	10	#4	6'-4"	42
G	56	#9	7'-10"	1,491
H1	2	#5	35'-11"	75
H2	2	#5	52'-8"	110
L	6	#6	4'-0"	36
S	168	#5	9'-4"	1,635
U	4	#6	7'-1"	43
R	86	#5	7'-10"	703
wH1	8	#6	5'-8"	68
wH2	8	#6	6'-11"	83
wU	12	#4	1'-8"	13
wV	28	#5	4'-2"	122
REINFORCING STEEL			LB	8,408
CLASS "C" CONCRETE			CY	25.5

- GENERAL NOTES:**
- DESIGNED ACCORDING TO AASHTO LRFD SPECIFICATIONS, 9th EDITION (2020) AND CURRENT INTERIMS.
 - COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.
 - SEE STANDARD FD FOR ALL FOUNDATION DETAILS AND NOTES.
 - CALCULATED FOUNDATION LOADS = 145 TONS PER DRILLED SHAFT.
 - CONCRETE QUANTITY INCLUDES EAR WALLS.
- MATERIAL NOTES:**
- PROVIDE CLASS C CONCRETE ($f'_c = 3,600$ psi)
 - PROVIDE GRADE 60 REINFORCING STEEL.

- PROVIDE 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO BEAM WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL PERPENDICULAR TO CAP. DO NOT CAST EARWALLS UNTIL BEAMS ARE ERECTED IN THEIR FINAL POSITION.
- SEE CAP ELEVATIONS SHEET FOR ELEVATIONS.
- FOR CONTRACTORS INFORMATION ONLY.
- INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.

HL93 LOADING

5/20/2021

ABUTMENT NO.1
(CHOATES CREEK)

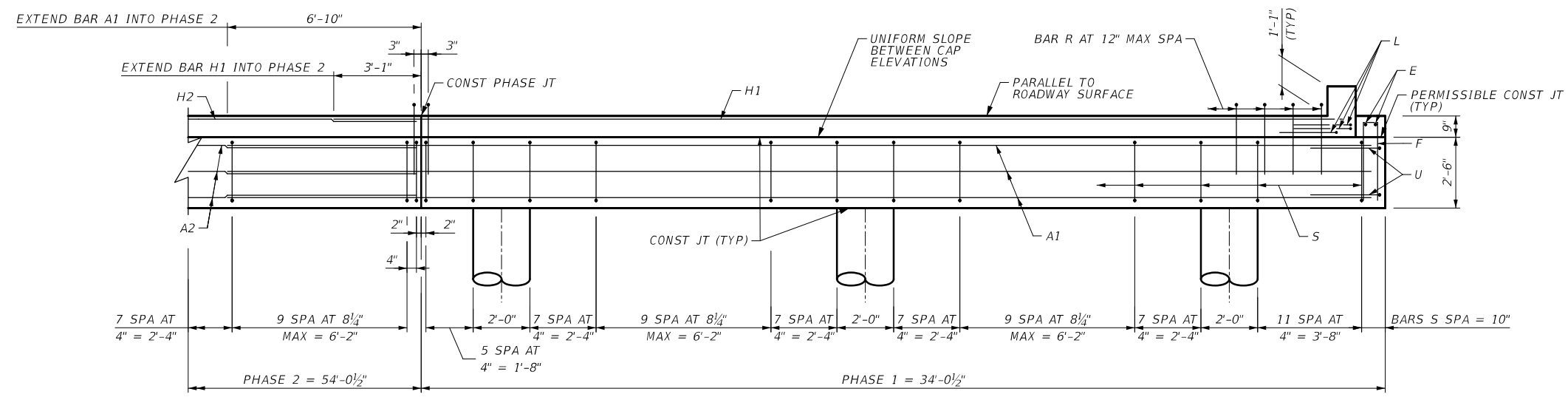
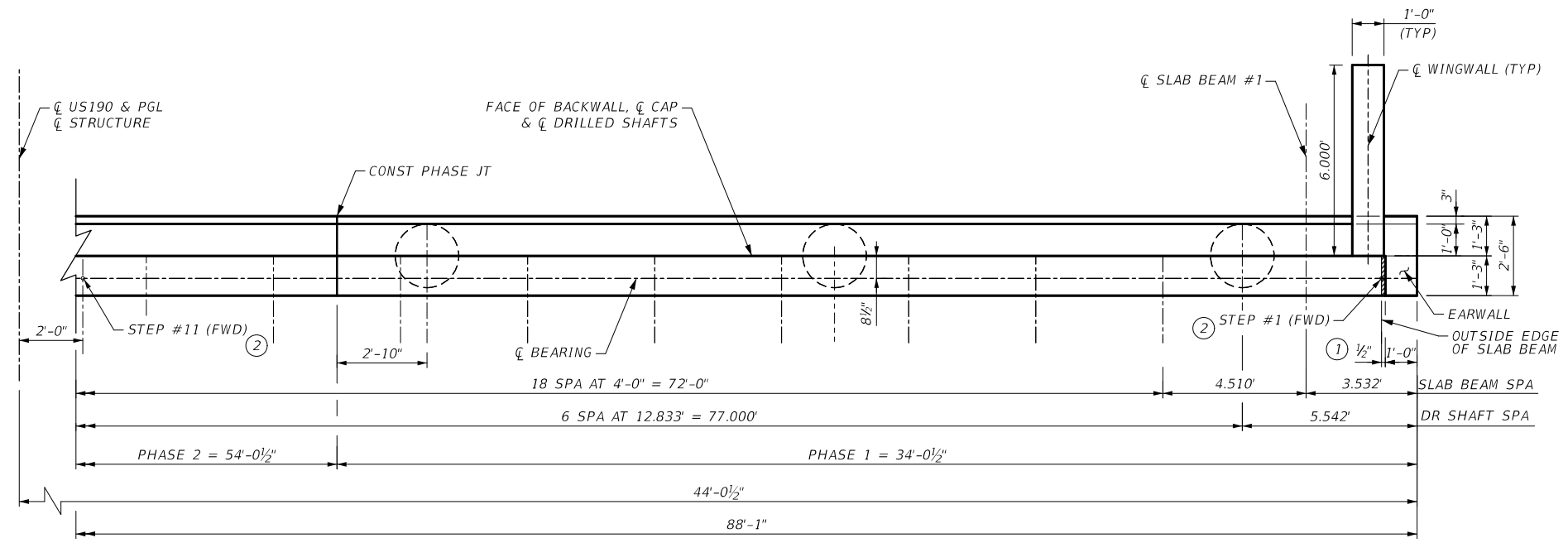
SHEET 1 OF 3

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309 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 972.942.6944
FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		183	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

GENERAL NOTES:
 1. SEE SHEET 1 OF 3 FOR NOTES



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HL93 LOADING

5/20/2021

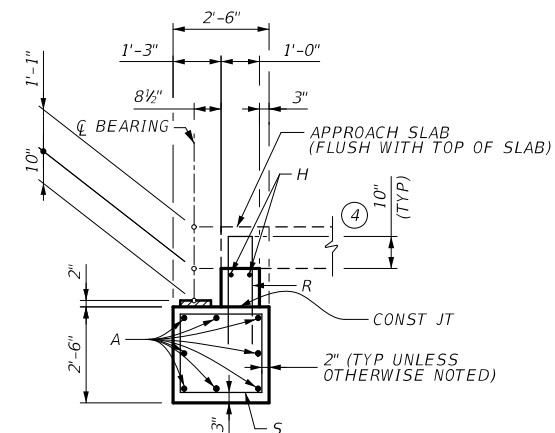
ABUTMENT NO.1
 (CHOATES CREEK)

SHEET 2 OF 3

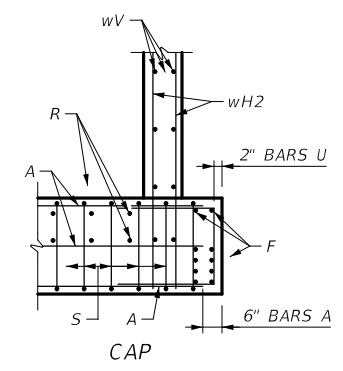
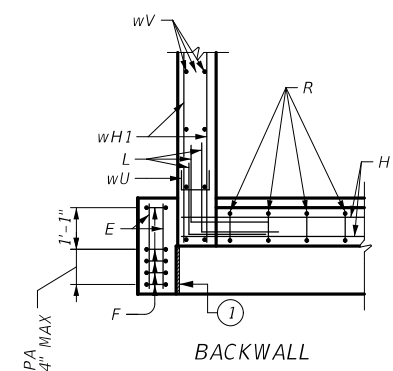
Texas Department of Transportation
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White Hawk
 309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6844
 FIRM NUMBER: 12998

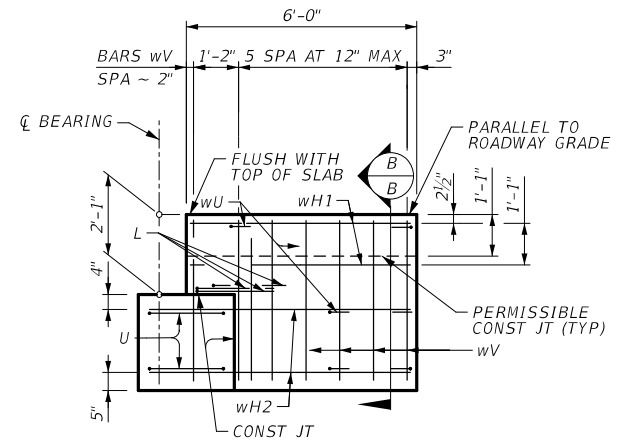
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190



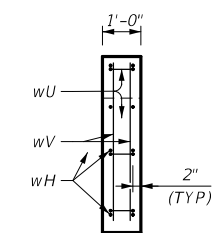
SECTION A-A
 (WITH APPROACH SLAB)
 NOTE: AT CONTRACTOR'S OPTION, BACKWALL MAY BE CAST WITH APPROACH SLAB.



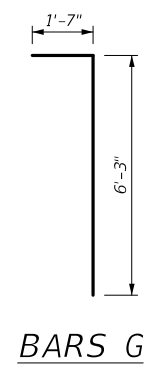
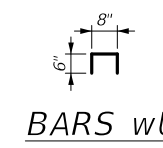
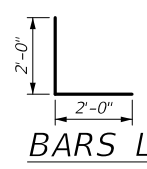
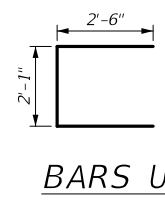
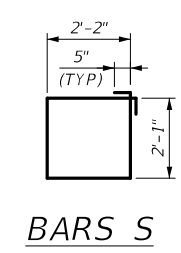
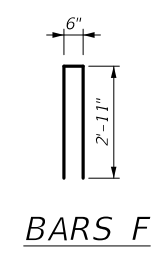
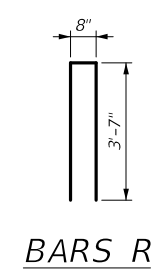
CORNER DETAILS



WINGWALL ELEVATION
 (EARWALL NOT SHOWN FOR CLARITY)



SECTION B-B



BARS R

BARS F

BARS S

BARS U

BARS L

BARS wU

BARS G

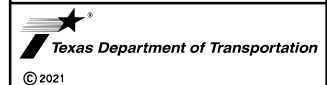
HL93 LOADING



5/20/2021

ABUTMENT NO.1
 (CHOATES CREEK)

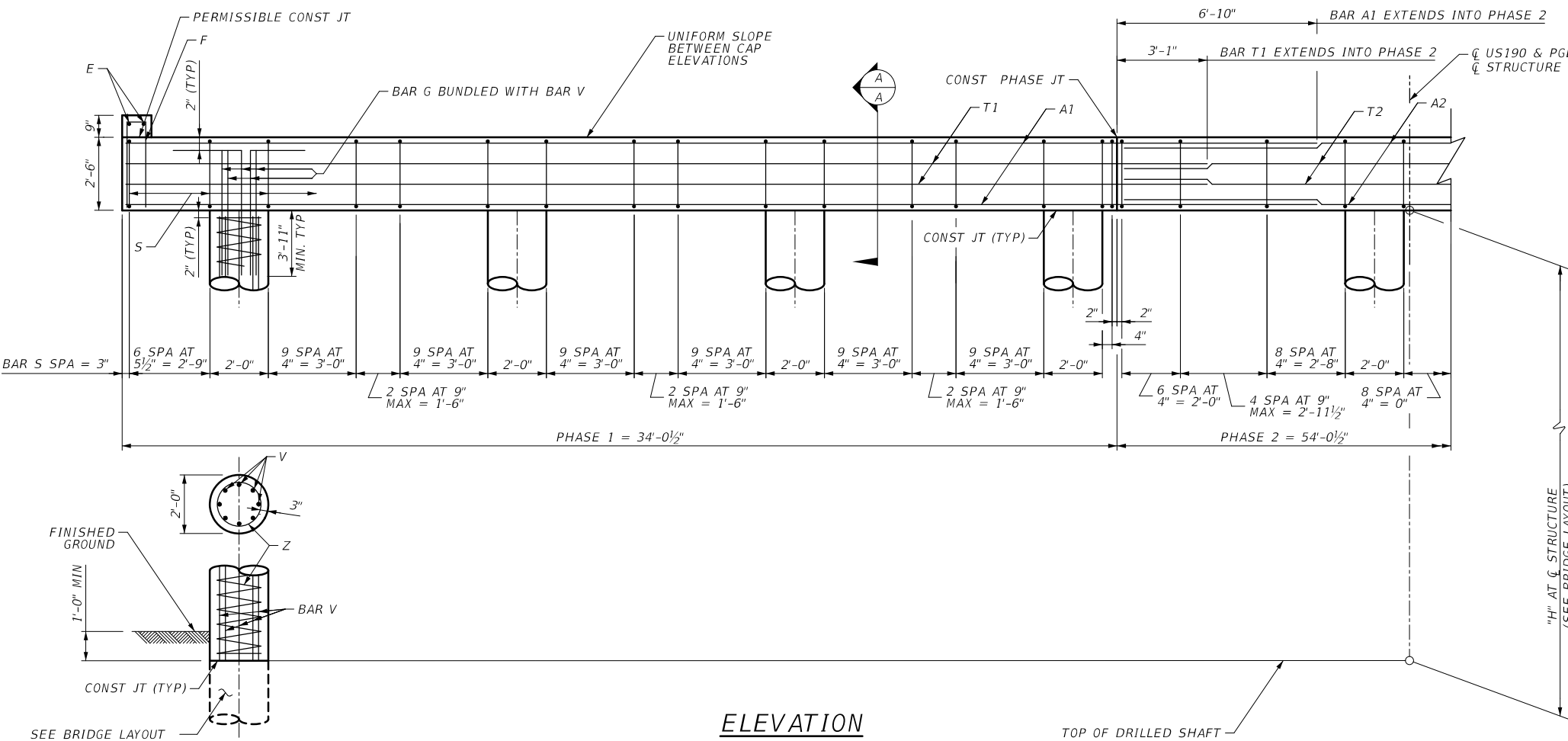
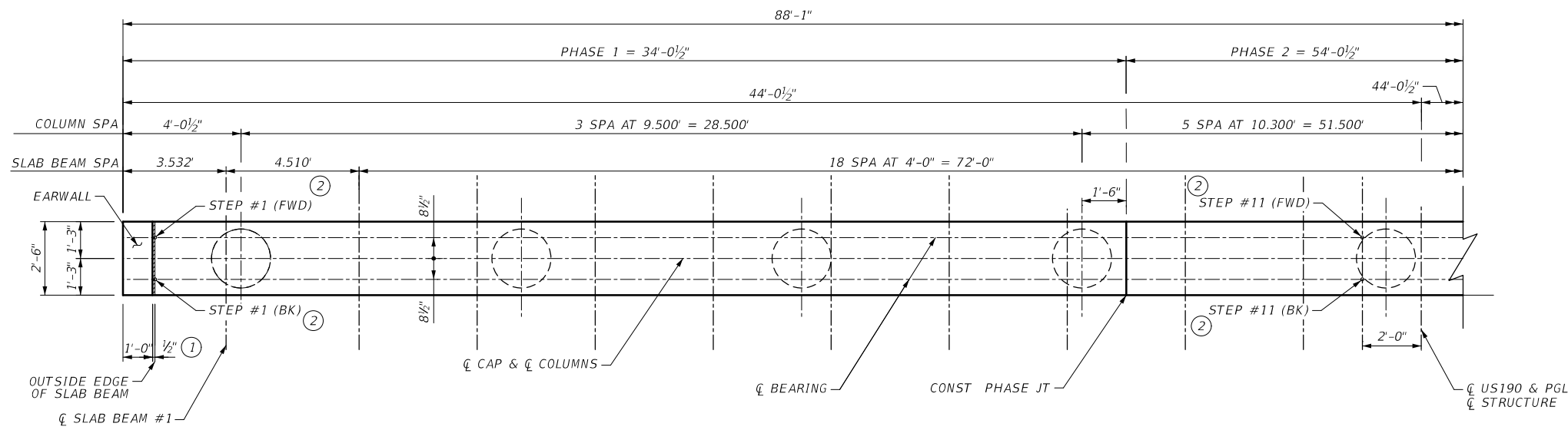
SHEET 3 OF 3



White Hawk
 309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6944
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		185	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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BAR	No.	SIZE	LENGTH	WEIGHT	
A1	10	#11	40'-8"	2,161	
A2	10	#11	53'-8"	2,851	
E	4	#4	2'-2"	6	
F	14	#4	6'-6"	61	
G	72	#9	7'-10"	1,918	
S	182	#5	9'-8"	1,835	
T1	4	#5	36'-11"	154	
T2	4	#5	53'-8"	224	
REINFORCING STEEL				LB	9,209
CLASS "C" CONCRETE (CAP)				CY	20.5

BENT	COLUMN HEIGHT "H" (FT)	BARS V 72 - #9		BARS Z 9 - #3		REIF STEEL LB	CLASS "C" CONC CY
		LENGTH	WEIGHT	LENGTH	WEIGHT		
2	6	5'-10"	1428	71'-2"	241	1669	6.3
3	8	7'-10"	1918	90'-2"	305	2223	8.4

- GENERAL NOTES:**
- DESIGNED ACCORDING TO AASHTO LRFD SPECIFICATIONS 9TH EDITION (2020) AND CURRENT INTERIMS.
 - COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.
 - SEE STANDARD FD FOR ALL FOUNDATION DETAILS AND NOTES.
 - CALCULATED FOUNDATION LOADS
 BENT 2 = 146 TONS/DS
 BENT 3 = 146 TONS/DS
 - CONCRETE QUANTITY INCLUDES EAR WALLS.
- MATERIAL NOTES:**
- PROVIDE CLASS C CONCRETE (f'c = 3,600 psi)
 - PROVIDE GRADE 60 REINFORCING STEEL.

- PROVIDE 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO BEAM WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL WITH VERTICAL SIDE OF BEAM. DO NOT CAST EAR WALLS UNTIL BEAMS ARE ERECTED IN THEIR FINAL POSITION.
- SEE CAP ELEVATIONS SHEET FOR ELEVATIONS.
- QUANTITIES SHOWN ARE FOR ONE CAP ONLY.
- ADJUST BARS V LENGTH BY 1'-0" AND BARS Z LENGTH BY 9'-6" FOR EACH 1 LINEAR FOOT OF VARIATION IN THE "H" VALUE.
- ADJUST REINFORCING STEEL TOTAL BY 277 LB AND CLASS "C" CONC. (COL) TOTAL BY 1.05 CY FOR EACH 1 LINEAR FOOT OF VARIATION IN THE "H" VALUE.
- FOR CONTRACTORS INFORMATION ONLY.

HL93 LOADING

5/20/2021

BENT 2 & 3
(CHOATES CREEK)

SHEET 1 OF 2

Texas Department of Transportation
 © 2021

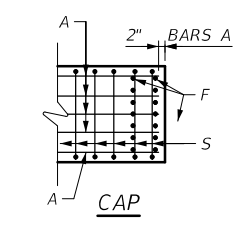
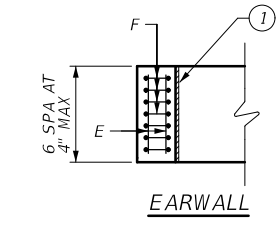
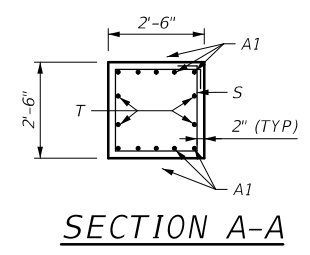
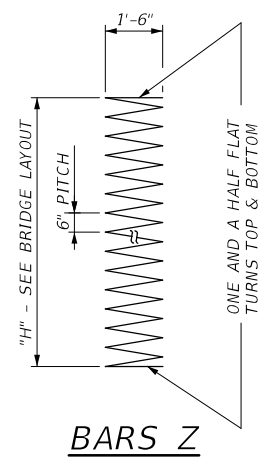
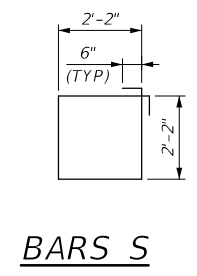
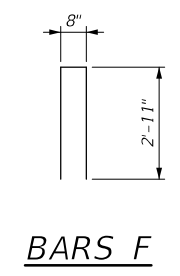
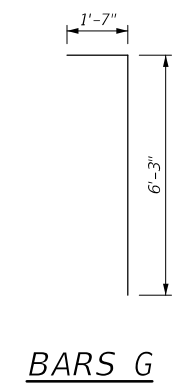
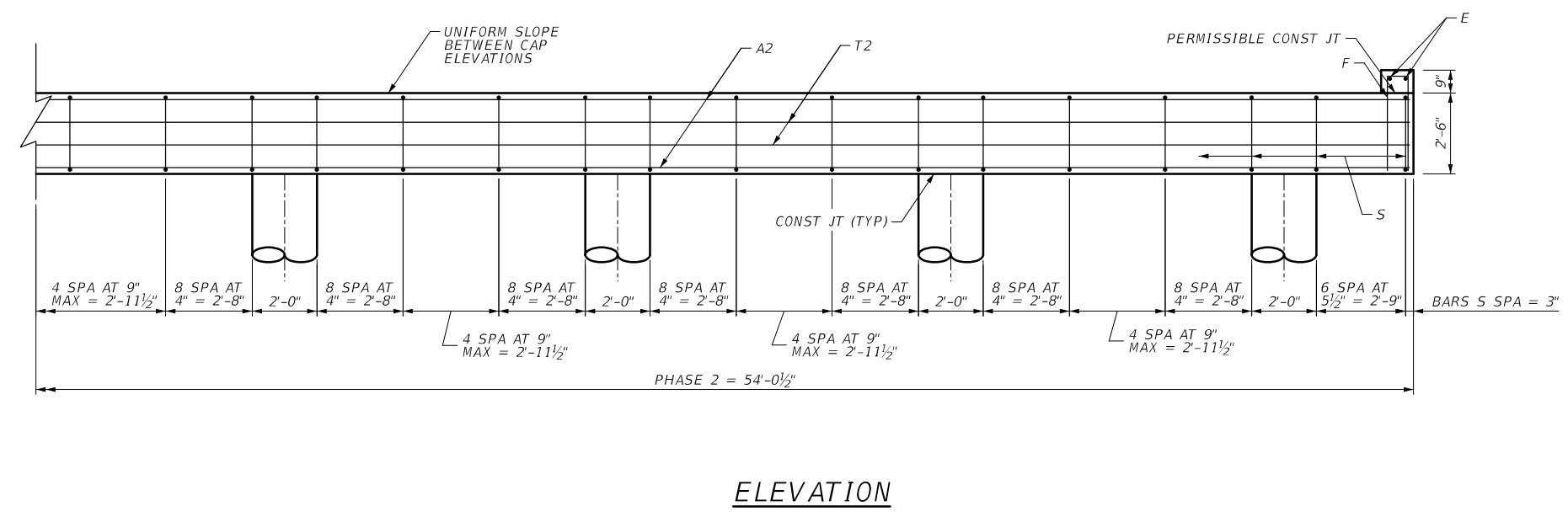
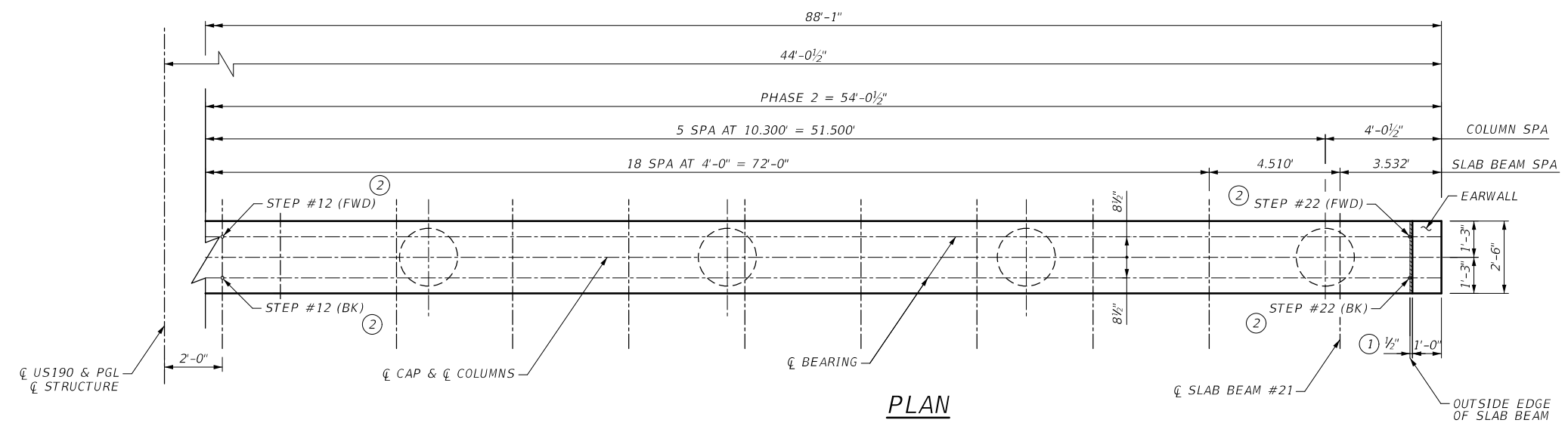
308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.962.6244
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		186	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

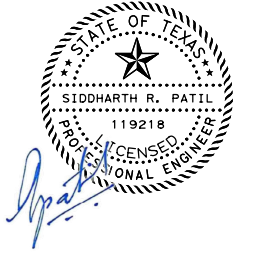
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GENERAL NOTES:
 1. SEE SHEET 1 OF 2 FOR NOTES



HL93 LOADING



5/20/2021

BENT 2 & 3
 (CHOATES CREEK)

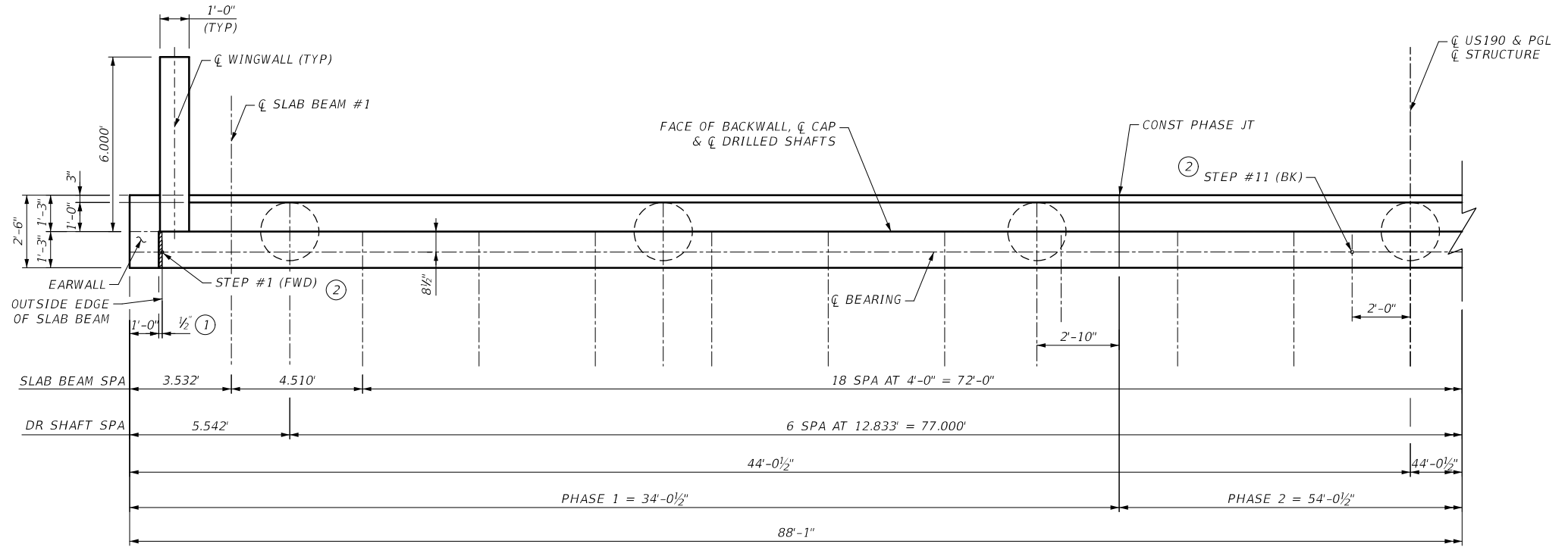
SHEET 2 OF 2



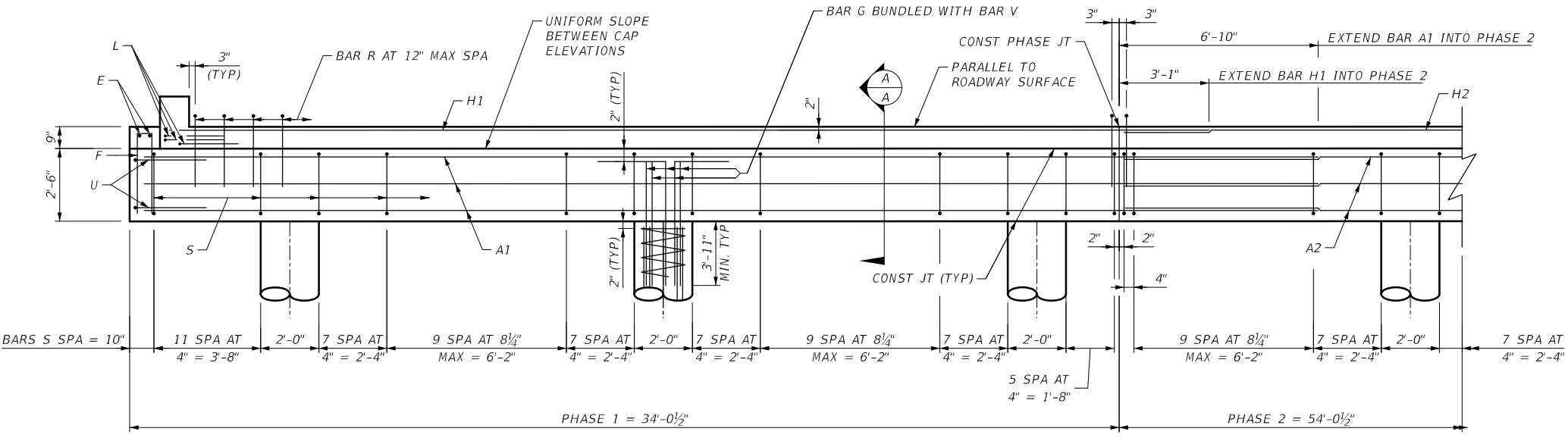
White Hawk CONSULTING ENGINEERS
 309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6644
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		187	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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PLAN



ELEVATION

TABLE OF ESTIMATED QUANTITIES (3)				
BAR	No.	SIZE	LENGTH	WEIGHT
A1	8	#11	40'-4"	1,714
A2	8	#11	53'-4"	2,267
E	4	#4	2'-2"	6
F	10	#4	6'-4"	42
G	56	#9	7'-10"	1,491
H1	2	#5	35'-11"	75
H2	2	#5	52'-8"	110
L	6	#6	4'-0"	36
S	168	#5	9'-4"	1,635
U	4	#6	7'-1"	43
R	86	#5	7'-10"	703
wH1	8	#6	5'-8"	68
wH2	8	#6	6'-11"	83
wU	12	#4	1'-8"	13
wV	28	#5	4'-2"	122
REINFORCING STEEL			LB	8,408
CLASS "C" CONCRETE			CY	25.5

GENERAL NOTES:

- DESIGNED ACCORDING TO AASHTO LRFD SPECIFICATIONS, 9th EDITION (2020) AND CURRENT INTERIMS.
- COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.
- SEE STANDARD FD FOR ALL FOUNDATION DETAILS AND NOTES.
- CALCULATED FOUNDATION LOADS = 145 TONS PER DRILLED SHAFT.
- CONCRETE QUANTITY INCLUDES EAR WALLS.

MATERIAL NOTES:

- PROVIDE CLASS C CONCRETE ($f'c = 3,600$ psi)
- PROVIDE GRADE 60 REINFORCING STEEL.

- PROVIDE 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO BEAM WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL PERPENDICULAR TO CAP. DO NOT CAST EARWALLS UNTIL BEAMS ARE ERECTED IN THEIR FINAL POSITION.
- SEE CAP ELEVATIONS SHEET FOR ELEVATIONS.
- FOR CONTRACTORS INFORMATION ONLY.
- INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.

HL93 LOADING

5/20/2021

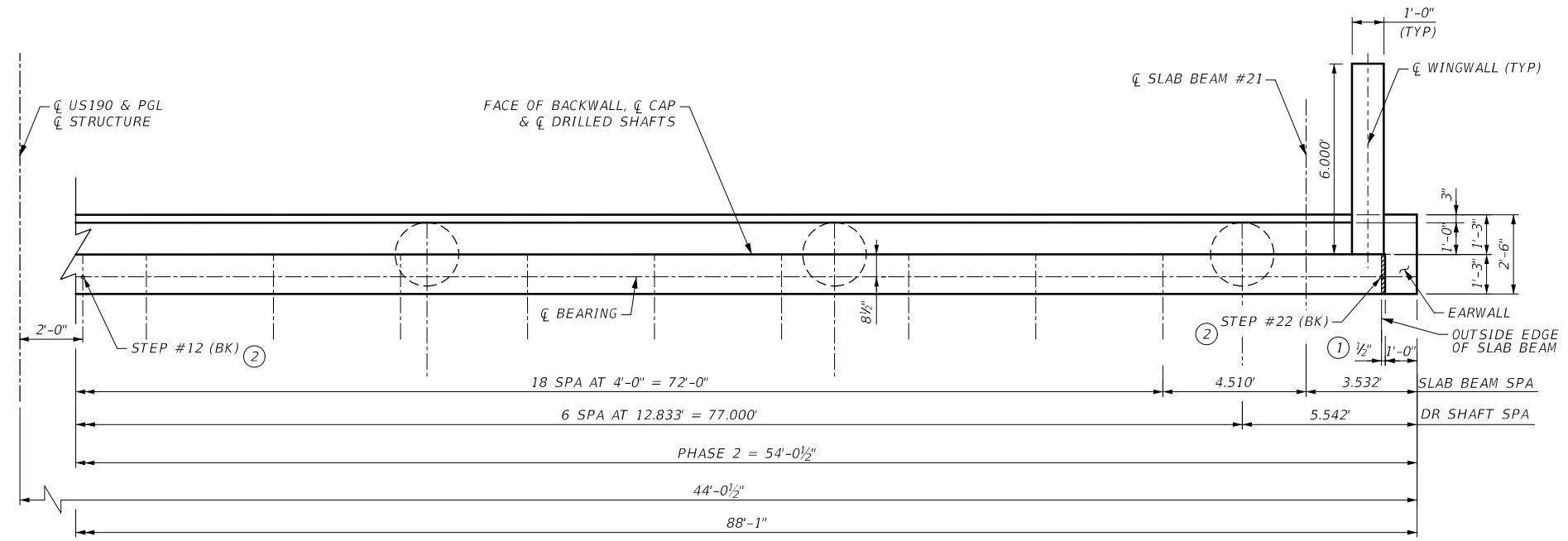
ABUTMENT NO. 4
(CHOATES CREEK)

SHEET 1 OF 3

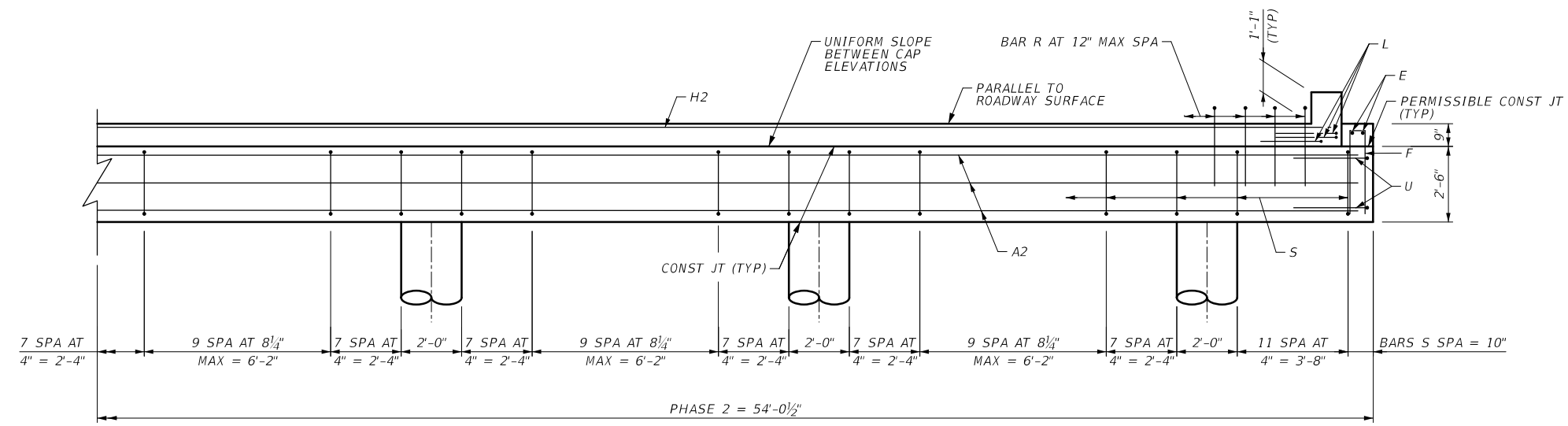
308 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 972.942.6644
FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		188	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

GENERAL NOTES:
 1. SEE SHEET 1 OF 3 FOR NOTES



PLAN



ELEVATION

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HL93 LOADING

5/20/2021

ABUTMENT NO.4
(CHOATES CREEK)

SHEET 2 OF 3

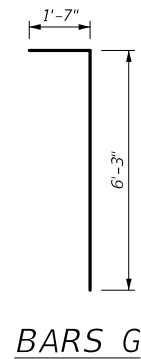
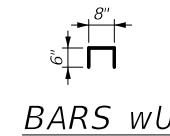
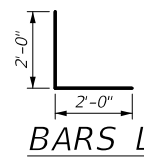
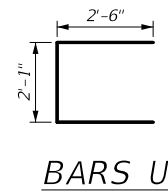
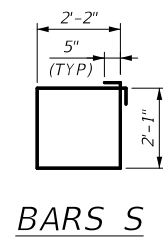
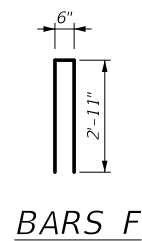
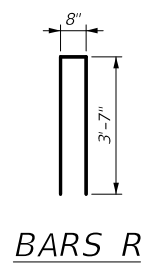
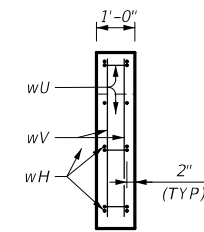
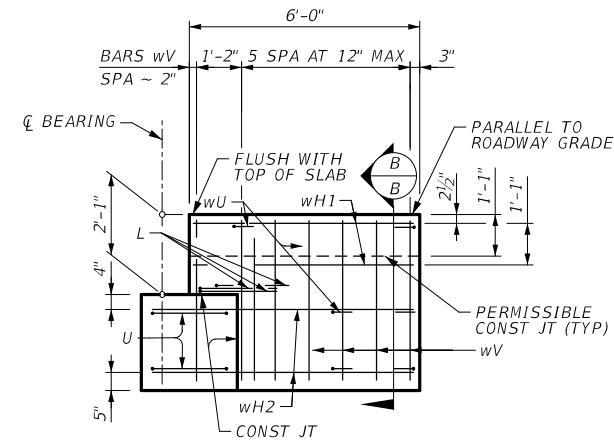
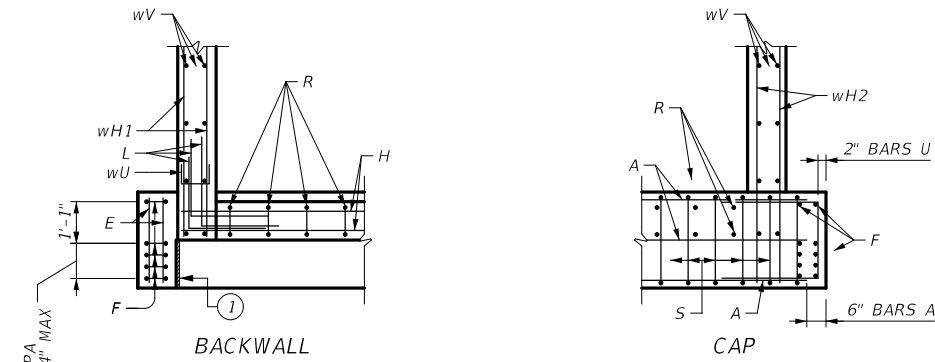
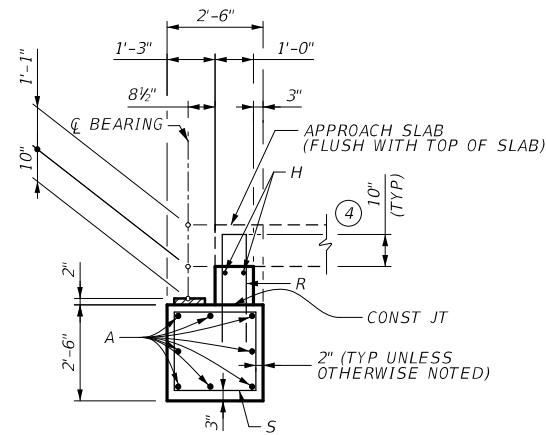
Texas Department of Transportation
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White Hawk
309 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 469.942.6844
FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		189	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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HL93 LOADING



5/20/2021

ABUTMENT NO.4
 (CHOATES CREEK)

SHEET 3 OF 3

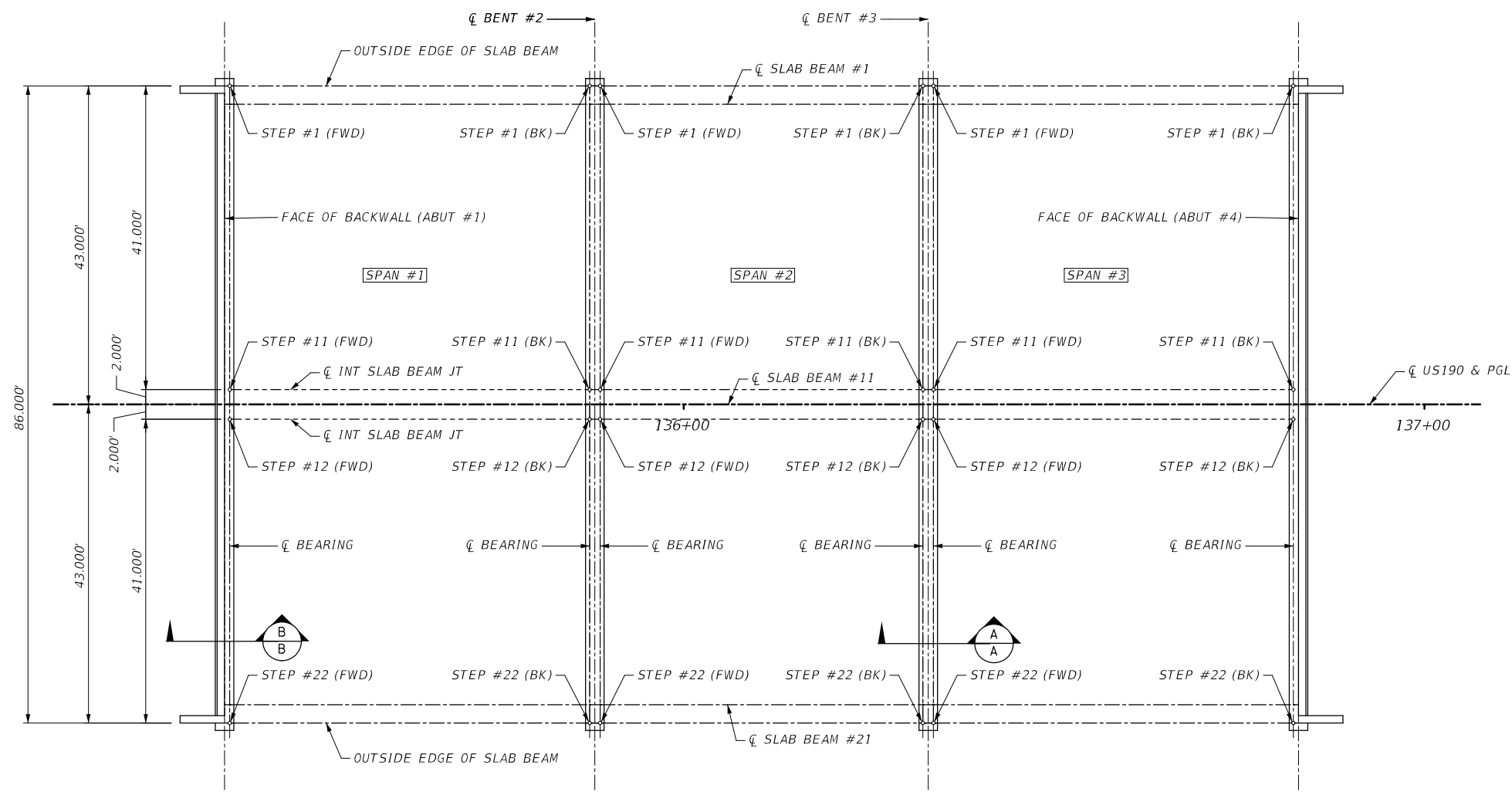


White Hawk Engineering & Construction
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 469.242.8844
 FIRM NUMBER: 12898

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		190	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

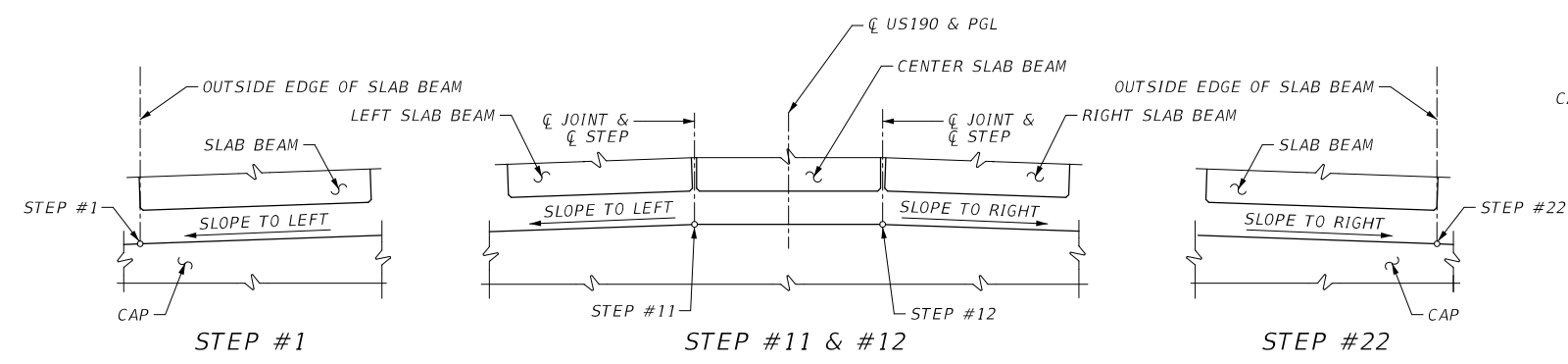
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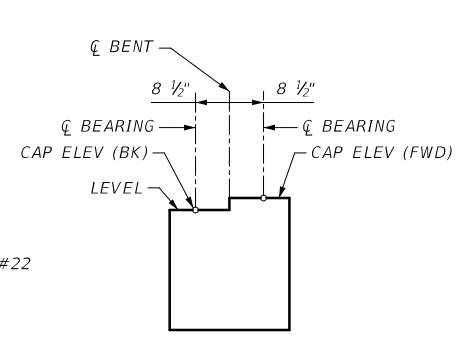


PLAN OF STEP LOCATIONS

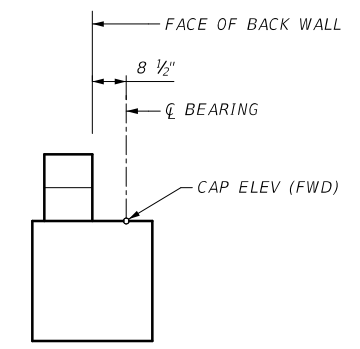
CAP ELEVATIONS (US 190 AT CHOATES CREEK)					
		STEP 1	STEP 11	STEP 12	STEP 22
ABUT 1	(FWD)	208.645	209.465	209.465	208.645
BENT 2	(BK)	209.277	210.097	210.097	209.277
	(FWD)	209.299	210.119	210.119	209.299
BENT 3	(BK)	210.080	210.900	210.900	210.080
	(FWD)	210.109	210.929	210.929	210.109
ABUT 4	(BK)	211.219	212.039	212.039	211.219



COMMON TRANSVERSE SECTIONS AT STEP LOCATIONS



SECTION A-A



SECTION B-B

HL93 LOADING



5/20/2021

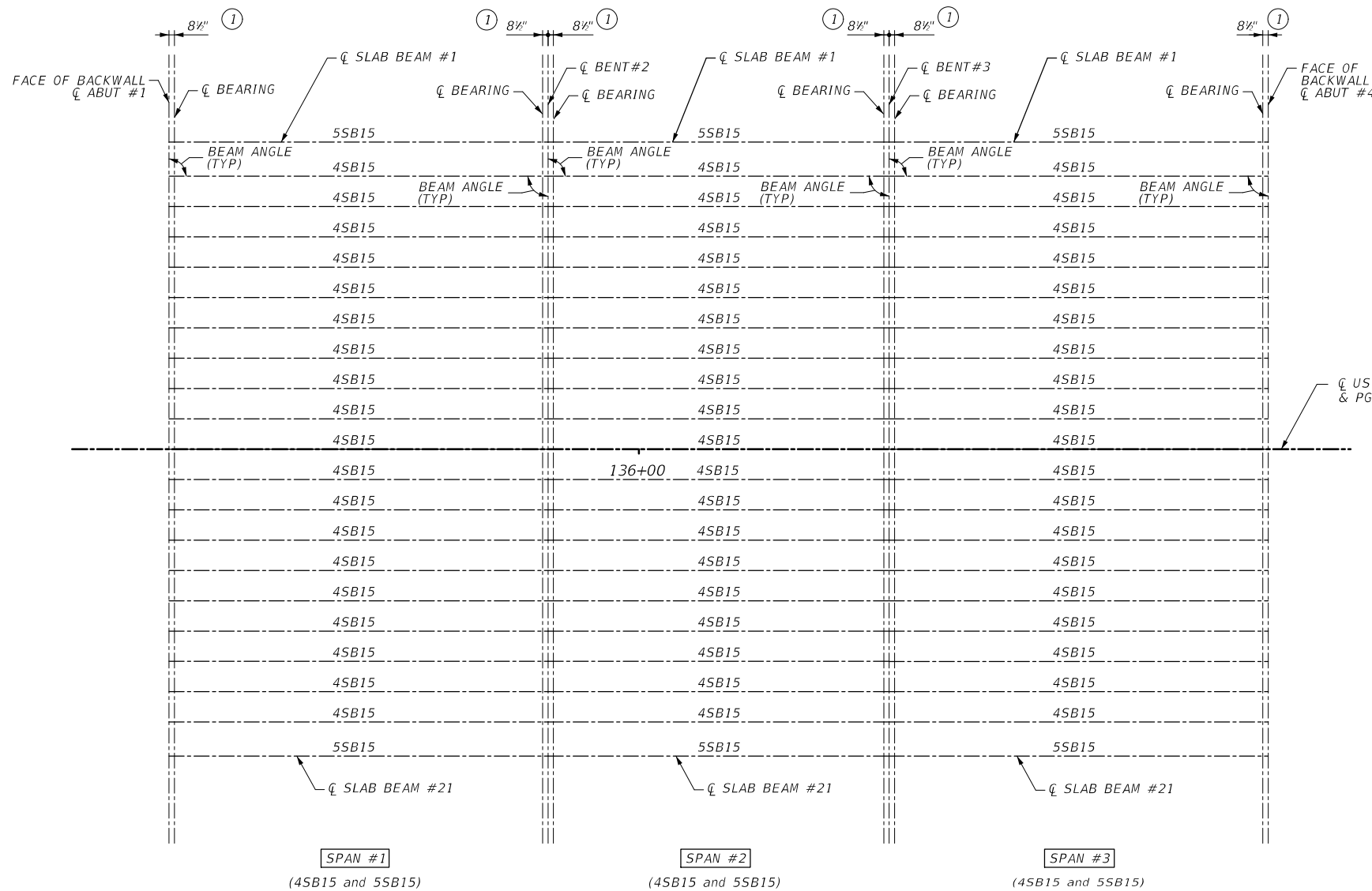
CAP ELEVATION DETAILS (CHOATES CREEK)



309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.962.6944
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		191	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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FRAMING PLAN

BEAM REPORT
 BEAM REPORT AT CENTER OF BOX, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	TRUE DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE	BEAM BEARING
BOX 1	49.9996	48.5829	49.5038	0.01301	N 80 20 26.56 E
BOX 2	49.9997	48.5830	49.5038	0.01301	N 80 20 26.56 E
BOX 3	49.9997	48.5830	49.5039	0.01301	N 80 20 26.56 E
BOX 4	49.9997	48.5831	49.5039	0.01301	N 80 20 26.56 E
BOX 5	49.9998	48.5831	49.5040	0.01301	N 80 20 26.56 E
BOX 6	49.9998	48.5831	49.5040	0.01301	N 80 20 26.56 E
BOX 7	49.9999	48.5832	49.5040	0.01301	N 80 20 26.56 E
BOX 8	49.9999	48.5832	49.5041	0.01301	N 80 20 26.56 E
BOX 9	49.9999	48.5833	49.5041	0.01301	N 80 20 26.56 E
BOX 10	50.0000	48.5833	49.5041	0.01301	N 80 20 26.56 E
BOX 11	50.0000	48.5833	49.5042	0.01301	N 80 20 26.56 E
BOX 12	50.0000	48.5834	49.5042	0.01301	N 80 20 26.56 E
BOX 13	50.0001	48.5834	49.5043	0.01301	N 80 20 26.56 E
BOX 14	50.0001	48.5834	49.5043	0.01301	N 80 20 26.56 E
BOX 15	50.0002	48.5835	49.5043	0.01301	N 80 20 26.56 E
BOX 16	50.0002	48.5835	49.5044	0.01301	N 80 20 26.56 E
BOX 17	50.0002	48.5836	49.5044	0.01301	N 80 20 26.56 E
BOX 18	50.0003	48.5836	49.5045	0.01301	N 80 20 26.56 E
BOX 19	50.0003	48.5836	49.5045	0.01301	N 80 20 26.56 E
BOX 20	50.0004	48.5837	49.5045	0.01301	N 80 20 26.56 E
BOX 21	50.0004	48.5837	49.5046	0.01301	N 80 20 26.56 E

BENT REPORT

ABUT NO. 1 (S 9 39 32.46 E)				BENT NO. 2 (S 9 39 34.43 E)			
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L				DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L			
BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S		BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S	
SPAN 1				SPAN 1			
STEP 1				STEP 1			
BOX 1 LEFT	0.0000	89	59	59.01	BOX 1 LEFT	0.0000	89 59 59.01
BOX 1 CENTER				BOX 1 CENTER			
BOX 1 RIGHT	5.0000	89	59	59.01	BOX 1 RIGHT	5.0000	89 59 59.01
BOX 2 LEFT				BOX 2 LEFT			
BOX 2 CENTER	4.0000	89	59	59.01	BOX 2 CENTER	4.0000	89 59 59.01
BOX 2 RIGHT				BOX 2 RIGHT			
BOX 3 LEFT				BOX 3 LEFT			
BOX 3 CENTER	4.0000	89	59	59.01	BOX 3 CENTER	4.0000	89 59 59.01
BOX 3 RIGHT				BOX 3 RIGHT			
BOX 4 LEFT				BOX 4 LEFT			
BOX 4 CENTER	4.0000	89	59	59.01	BOX 4 CENTER	4.0000	89 59 59.01
BOX 4 RIGHT				BOX 4 RIGHT			
BOX 5 LEFT				BOX 5 LEFT			
BOX 5 CENTER	4.0000	89	59	59.01	BOX 5 CENTER	4.0000	89 59 59.01
BOX 5 RIGHT				BOX 5 RIGHT			
BOX 6 LEFT				BOX 6 LEFT			
BOX 6 CENTER	4.0000	89	59	59.01	BOX 6 CENTER	4.0000	89 59 59.01
BOX 6 RIGHT				BOX 6 RIGHT			
BOX 7 LEFT				BOX 7 LEFT			
BOX 7 CENTER	4.0000	89	59	59.01	BOX 7 CENTER	4.0000	89 59 59.01
BOX 7 RIGHT				BOX 7 RIGHT			
BOX 8 LEFT				BOX 8 LEFT			
BOX 8 CENTER	4.0000	89	59	59.01	BOX 8 CENTER	4.0000	89 59 59.01
BOX 8 RIGHT				BOX 8 RIGHT			
BOX 9 LEFT				BOX 9 LEFT			
BOX 9 CENTER	4.0000	89	59	59.01	BOX 9 CENTER	4.0000	89 59 59.01
BOX 9 RIGHT				BOX 9 RIGHT			
BOX 10 LEFT				BOX 10 LEFT			
BOX 10 CENTER	4.0000	89	59	59.01	BOX 10 CENTER	4.0000	89 59 59.01
BOX 10 RIGHT				BOX 10 RIGHT			
BOX 11 LEFT				BOX 11 LEFT			
BOX 11 CENTER	4.0000	89	59	59.01	BOX 11 CENTER	4.0000	89 59 59.01
BOX 11 RIGHT				BOX 11 RIGHT			
BOX 12 LEFT				BOX 12 LEFT			
BOX 12 CENTER	4.0000	89	59	59.01	BOX 12 CENTER	4.0000	89 59 59.01
BOX 12 RIGHT				BOX 12 RIGHT			
BOX 13 LEFT				BOX 13 LEFT			
BOX 13 CENTER	4.0000	89	59	59.01	BOX 13 CENTER	4.0000	89 59 59.01
BOX 13 RIGHT				BOX 13 RIGHT			
BOX 14 LEFT				BOX 14 LEFT			
BOX 14 CENTER	4.0000	89	59	59.01	BOX 14 CENTER	4.0000	89 59 59.01
BOX 14 RIGHT				BOX 14 RIGHT			
BOX 15 LEFT				BOX 15 LEFT			
BOX 15 CENTER	4.0000	89	59	59.01	BOX 15 CENTER	4.0000	89 59 59.01
BOX 15 RIGHT				BOX 15 RIGHT			
BOX 16 LEFT				BOX 16 LEFT			
BOX 16 CENTER	4.0000	89	59	59.01	BOX 16 CENTER	4.0000	89 59 59.01
BOX 16 RIGHT				BOX 16 RIGHT			
BOX 17 LEFT				BOX 17 LEFT			
BOX 17 CENTER	4.0000	89	59	59.01	BOX 17 CENTER	4.0000	89 59 59.01
BOX 17 RIGHT				BOX 17 RIGHT			
BOX 18 LEFT				BOX 18 LEFT			
BOX 18 CENTER	4.0000	89	59	59.01	BOX 18 CENTER	4.0000	89 59 59.01
BOX 18 RIGHT				BOX 18 RIGHT			
BOX 19 LEFT				BOX 19 LEFT			
BOX 19 CENTER	4.0000	89	59	59.01	BOX 19 CENTER	4.0000	89 59 59.01
BOX 19 RIGHT				BOX 19 RIGHT			
BOX 20 LEFT				BOX 20 LEFT			
BOX 20 CENTER	4.0000	89	59	59.01	BOX 20 CENTER	4.0000	89 59 59.01
BOX 20 RIGHT				BOX 20 RIGHT			
BOX 21 LEFT				BOX 21 LEFT			
BOX 21 CENTER	4.0000	89	59	59.01	BOX 21 CENTER	4.0000	89 59 59.01
BOX 21 RIGHT				BOX 21 RIGHT			
STEP 22 TOTAL	5.0000	89	59	59.01	STEP 22 TOTAL	5.0000	89 59 59.01
TOTAL	86.0002				TOTAL	86.0002	

- ① SEE PSBEB FOR ORIENTATION OF DIMENSION.
- ② BEAM LENGTHS SHOWN ARE BOTTOM SLAB BEAM LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

HL93 LOADING

5/20/2021

FRAMING PLAN UNIT-1 (CHOATES CREEK)

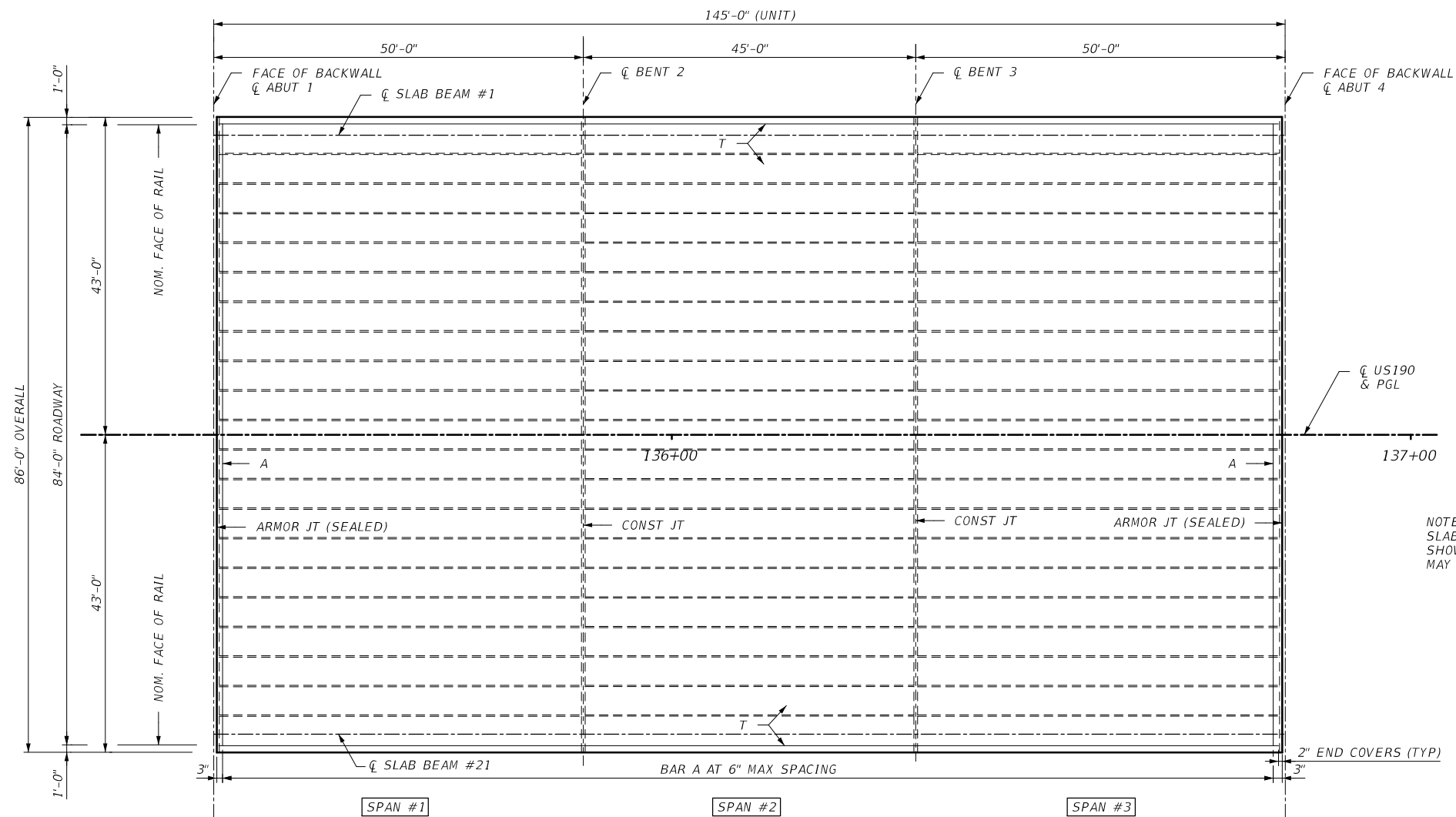
SHEET 1 OF 2

Texas Department of Transportation

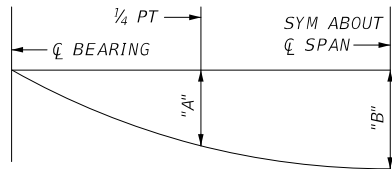
White Hawk Engineering

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		192
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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PLAN



DEAD LOAD DEFLECTION DIAGRAM

NOTE: DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY (E = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DIMENSIONS MAY BE LESS. ADJUST BASED ON FIELD VERIFICATION.

TABLE OF VARIABLE VALUES

SPAN No.	BEAM No.	DEADLOAD DEFLECTION	
		"A" FT	"B" FT
1	ALL	0.028	0.039
2	ALL	0.018	0.025
3	ALL	0.028	0.039

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONCRETE SLAB (SLAB BEAM)	CLASS 5 CONC	PRESTR CONC SLAB BEAM		TOTAL REINF STEEL LB
			4SB15 LF	5SB15 LF	
No.	SF	CY			
1	4,300	106	940.58	99.01	12,040
2	3,870	96	845.64	89.01	10,836
3	4,300	106	940.75	99.03	12,040
TOTAL	12,470	308	2,726.97	287.05	34,916

TABLE OF SECTION DEPTHS

SPAN No.	BEAM No.	"X"	"Y"
		IN	IN
ALL	ALL	8.0	23.0

GENERAL NOTES:
 DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9th EDITION (2020) AND CURRENT INTERIMS.

SEE APPLICABLE RAIL DETAILS FOR RAIL ANCHORAGE IN SLAB.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

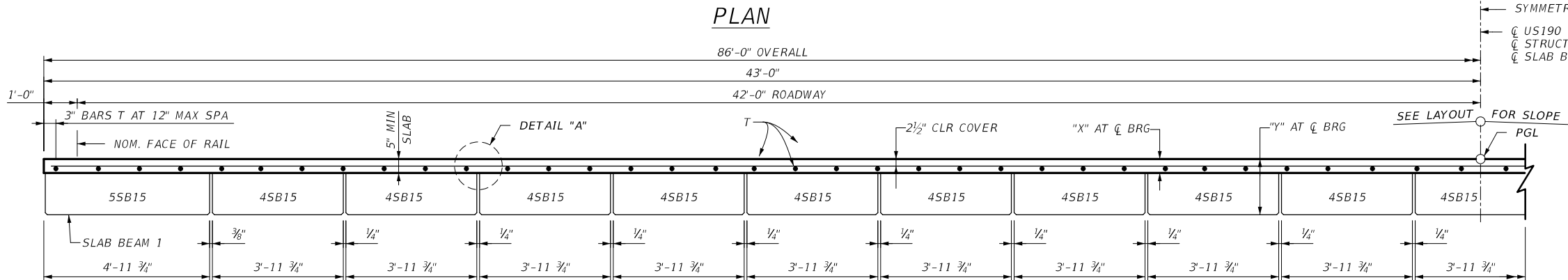
MATERIAL NOTES:

PROVIDE CLASS 5 CONCRETE (f'c = 4,000 psi).

PROVIDE GRADE 60 REINFORCING STEEL.

PROVIDE BAR LAPS, WHERE REQUIRED, AS FOLLOWS:
 UNCOATED ~ #4 = 1'-7"
 ~ #5 = 2'-0"

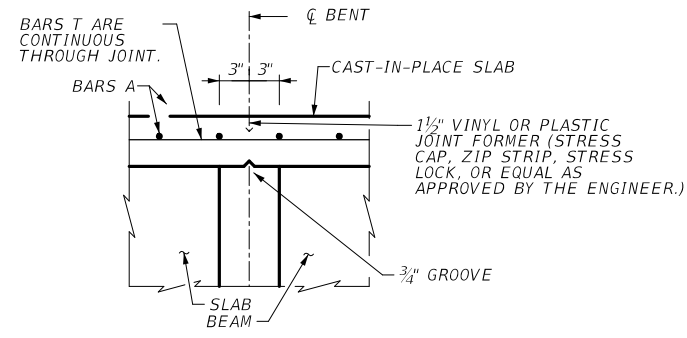
DEFORMED WELDED WIRE REINFORCEMENT (WWR) (ASTM A1064) OF EQUAL SIZE AND SPACING MAY BE SUBSTITUTED FOR BARS A OR T UNLESS NOTED OTHERWISE.



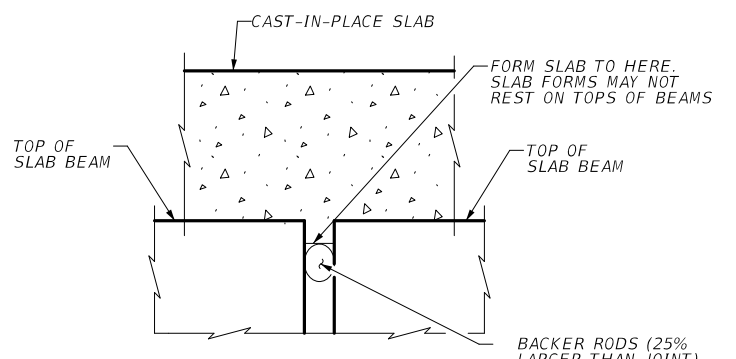
TYPICAL TRANSVERSE SECTION

BAR TABLE

BAR	SIZE
A	#5
T	#4



CONTINUOUS SLAB DETAIL

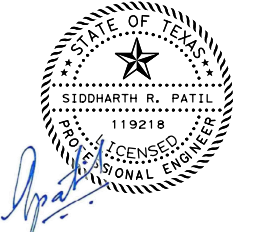


DETAIL "A"

BACKER RODS (25% LARGER THAN JOINT) MAY BE USED AS FORM. SECURE WITH COMPATIBLE ADHESIVE AS REQUIRED.

- ① FOR CONTRACTORS INFORMATION ONLY.
- ② LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTH S WITH ADJUSTMENTS MADE FOR GIRDER SLOPE. SEE FRAMING PLAN SHEET FOR BEAM LENGTHS.
- ③ REINFORCING STEEL WEIGHT IS CALCULATED USING AN ADJUSTMENT FACTOR OF 2.8 PSF.

HL93 LOADING



5/20/2021

145'-0" PRESTRESSED
 CONCRETE SLAB
 BEAM UNIT-1
 SPAN (1-3)
 (CHOATES CREEK)

Texas Department of Transportation

308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.960.4644
 F: 972.960.4644

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		194
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

BRIDGE ESTIMATED QUANTITIES (US 190 AT MENARD CREEK)														
BID CODES	0400 6005	0403 6001	0416 6002	0420 6013	0420 6029	0420 6037	0422 6001	0422 6015	0425 6011	0425 6012	0432 6033	0450 6054	0454 6004	0496 6010
BRIDGE ELEMENTS	CEM STABIL BKFL	TEMPORARY SPL SHORING	DRILL SHAFT (24 IN)	① CL C CONC (ABUT)	① CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC SLAB BEAM (45B15)	PRESTR CONC SLAB BEAM (55B15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY SSTR) (W/DRAIN SLOTS)	ARMOR JOINT (SEALED)	REMOV STR (BRIDGE 100 - 499 FT LENGTH)
	CY	SF	LF	CY	CY	CY	SF	CY	LF	LF	CY	LF	LF	EA
ABUTMENT 1	127	78	462	25.4				67.5			491	12.0	86	
BENT 2			580		20.5	12.8								
BENT 3			570		20.5	14.0							86	
BENT 4			630		20.5	15.1							86	
BENT 5			650		20.5	12.8								
ABUTMENT 6	127	302	539	25.4				67.5			491	12.0	86	
PRESTR CONC UNIT 1							8600		1881.00	198.00		200.0		
PRESTR CONC UNIT 2							4300		940.50	99.00		100.0		
PRESTR CONC UNIT 3							8600		1881.00	198.00		200.0		
TOTAL	254	380	3431	50.8	82.0	54.7	21,500	135.0	4,702.50	495.00	981	524.0	344	1

① QUANTITIES INCLUDE EARWALL

HL93 LOADING



5/20/2021

BRIDGE ESTIMATED QUANTITIES

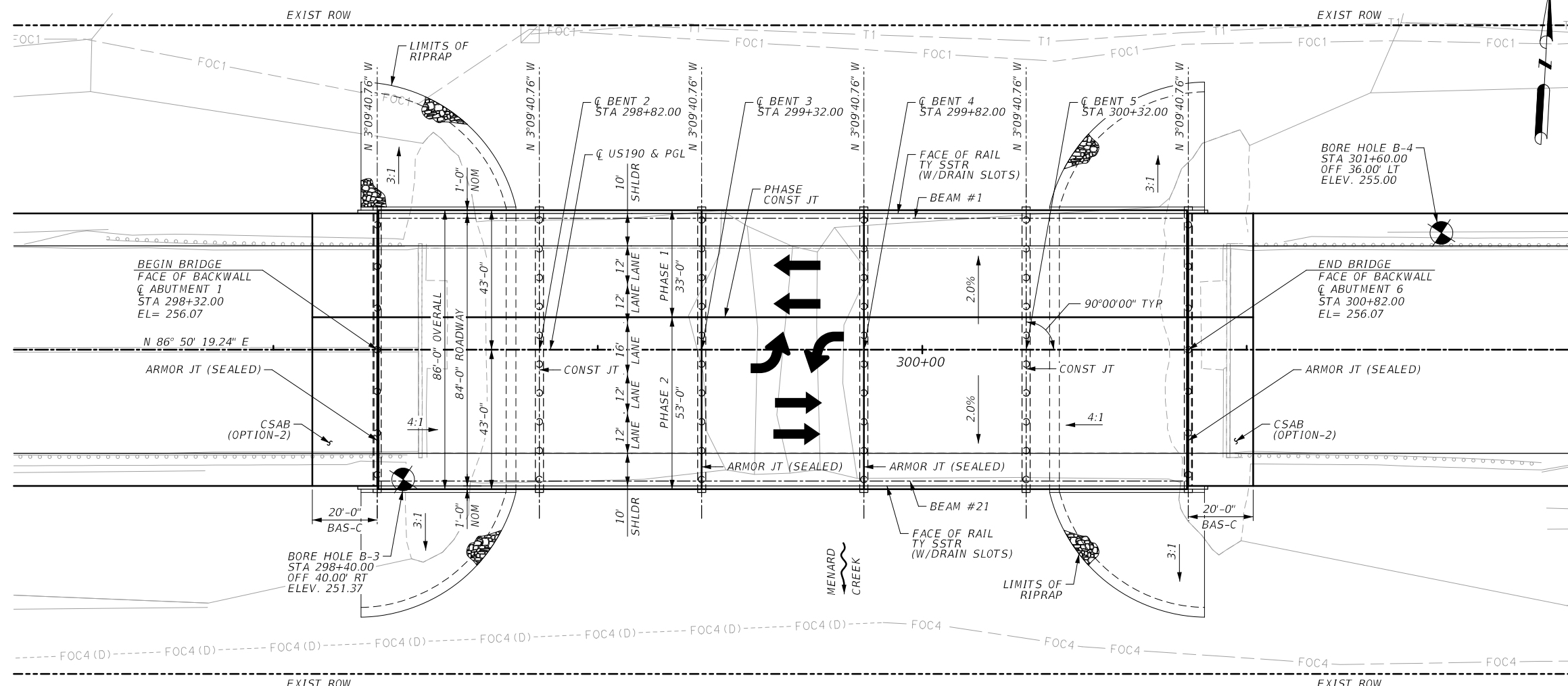
(MENARD CREEK)



White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.942.6944
 FIRM NUMBER: 12698
 Copyright: 2021

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			195
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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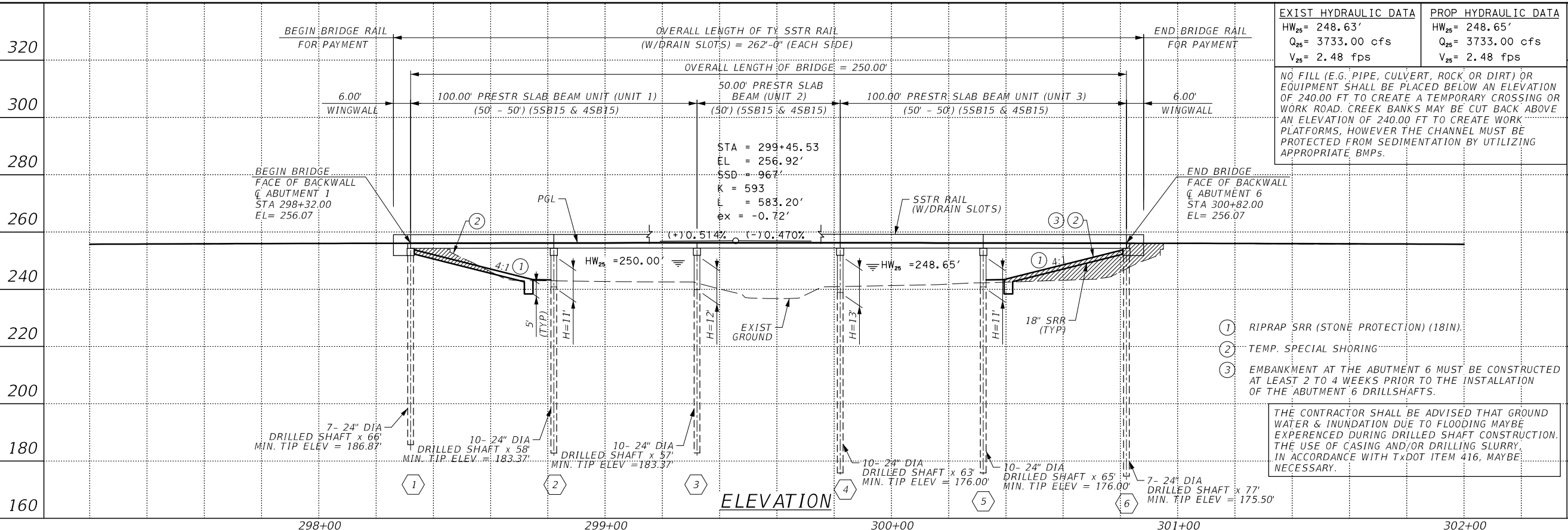
PLAN

GENERAL NOTES:
 DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9th EDITION (2020) AND CURRENT INTERIMS.
 ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROWN AND/OR SUPERELEVATIONS.
 CONTRACTOR SHALL VERIFY LOCATIONS OF UTILITIES PRIOR TO CONSTRUCTION, EXCAVATION OR DRILLING.
 CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO ORDERING MATERIALS.
 THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
 SEE BORING LOG SHEETS FOR TEST HOLE INFORMATION

DESIGN SPEED: 50 MPH
 ADT (EXIST): 13,900 VPD (2022)
 ADT (PROP): 19,200 VPD (2042)
 FUNCTIONAL CLASSIFICATION: RURAL PRINCIPAL ARTERIAL
 TERRAIN: ROLLING

EXIST NBI NO: 11-187-0213-04-091
 PROP NBI NO: 11-187-0-0213-04-114

SCALE: 1"=40'
 HL93 LOADING



ELEVATION

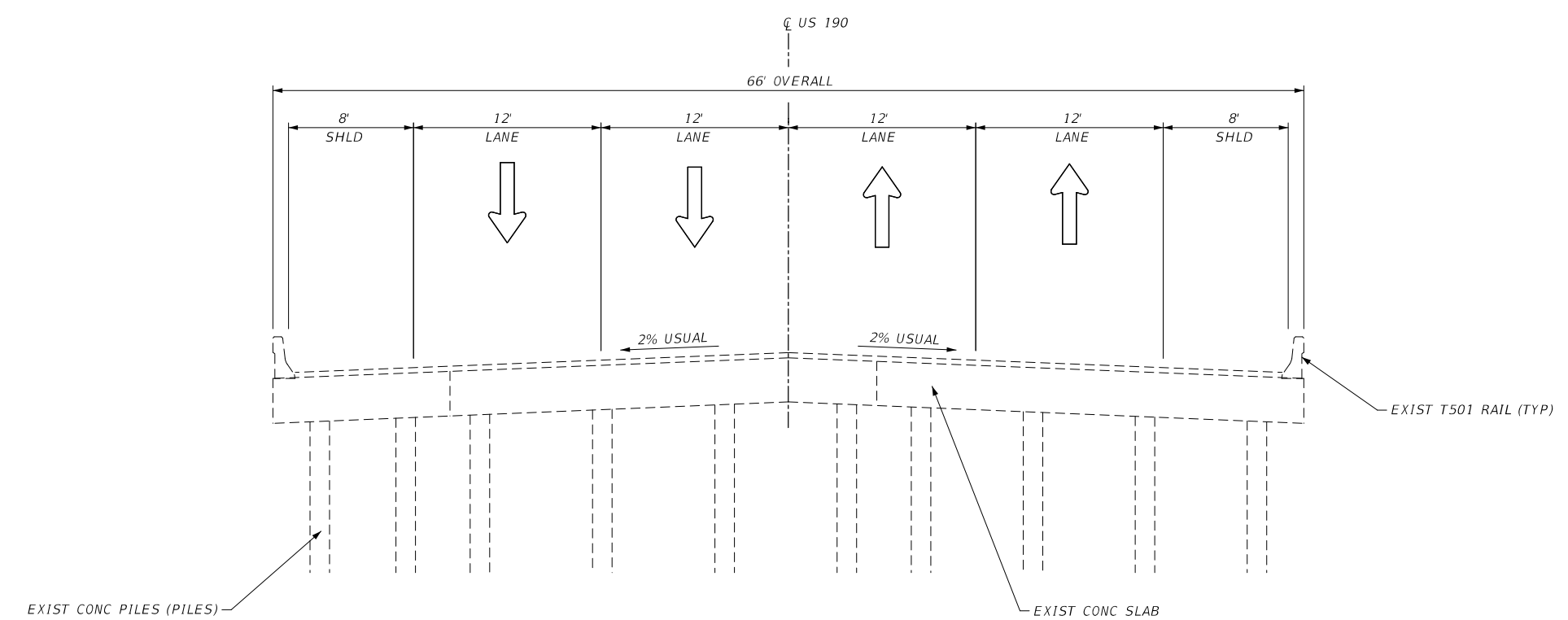
EXIST HYDRAULIC DATA	PROP HYDRAULIC DATA
HW ₂₅ = 248.63'	HW ₂₅ = 248.65'
Q ₂₅ = 3733.00 cfs	Q ₂₅ = 3733.00 cfs
V ₂₅ = 2.48 fps	V ₂₅ = 2.48 fps

NO FILL (E.G. PIPE, CULVERT, ROCK OR DIRT) OR EQUIPMENT SHALL BE PLACED BELOW AN ELEVATION OF 240.00 FT TO CREATE A TEMPORARY CROSSING OR WORK ROAD. CREEK BANKS MAY BE CUT BACK ABOVE AN ELEVATION OF 240.00 FT TO CREATE WORK PLATFORMS, HOWEVER THE CHANNEL MUST BE PROTECTED FROM SEDIMENTATION BY UTILIZING APPROPRIATE BMPs.

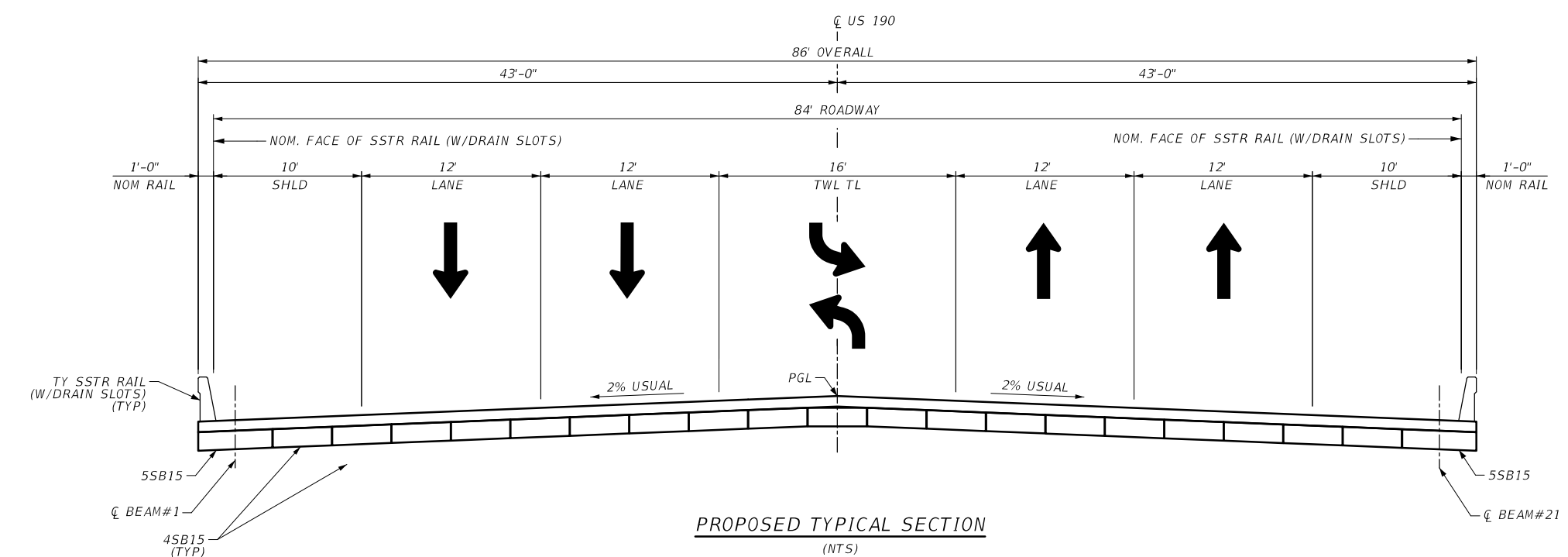
- ① RIPRAP SRR (STONE PROTECTION) (18IN).
- ② TEMP. SPECIAL SHORING
- ③ EMBANKMENT AT THE ABUTMENT 6 MUST BE CONSTRUCTED AT LEAST 2 TO 4 WEEKS PRIOR TO THE INSTALLATION OF THE ABUTMENT 6 DRILLSHAFTS.

THE CONTRACTOR SHALL BE ADVISED THAT GROUND WATER & INUNDATION DUE TO FLOODING MAYBE EXPERIENCED DURING DRILLED SHAFT CONSTRUCTION. THE USE OF CASING AND/OR DRILLING SLURRY, IN ACCORDANCE WITH TXDOT ITEM 416, MAYBE NECESSARY.

320		6/9/2021																							
300		<p>BRIDGE LAYOUT (MENARD CREEK)</p> <p>Texas Department of Transportation © 2021</p> <p>308 SOUTH JUPITER ROAD, SUITE 200 ALLEN, TX 75002 P: 972.942.6844 FIRM NUMBER: 12998</p>																							
280																									
260																									
240																									
220	<p>① RIPRAP SRR (STONE PROTECTION) (18IN).</p> <p>② TEMP. SPECIAL SHORING</p> <p>③ EMBANKMENT AT THE ABUTMENT 6 MUST BE CONSTRUCTED AT LEAST 2 TO 4 WEEKS PRIOR TO THE INSTALLATION OF THE ABUTMENT 6 DRILLSHAFTS.</p>																								
200	<p>THE CONTRACTOR SHALL BE ADVISED THAT GROUND WATER & INUNDATION DUE TO FLOODING MAYBE EXPERIENCED DURING DRILLED SHAFT CONSTRUCTION. THE USE OF CASING AND/OR DRILLING SLURRY, IN ACCORDANCE WITH TXDOT ITEM 416, MAYBE NECESSARY.</p>																								
180	<table border="1"> <tr> <td>FED. RD. DIV. NO.</td> <td>PROJECT NO.</td> <td>SHEET NO.</td> </tr> <tr> <td>6</td> <td></td> <td>196</td> </tr> <tr> <td>STATE</td> <td>STATE DIST. NO.</td> <td>COUNTY</td> </tr> <tr> <td>TEXAS</td> <td>LFK</td> <td>POLK</td> </tr> <tr> <td>CONT.</td> <td>SECT.</td> <td>JOB</td> </tr> <tr> <td>0213</td> <td>04</td> <td>050</td> </tr> <tr> <td></td> <td></td> <td>HIGHWAY NO.</td> </tr> <tr> <td></td> <td></td> <td>US 190</td> </tr> </table>	FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	6		196	STATE	STATE DIST. NO.	COUNTY	TEXAS	LFK	POLK	CONT.	SECT.	JOB	0213	04	050			HIGHWAY NO.			US 190
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.																							
6		196																							
STATE	STATE DIST. NO.	COUNTY																							
TEXAS	LFK	POLK																							
CONT.	SECT.	JOB																							
0213	04	050																							
		HIGHWAY NO.																							
		US 190																							
160																									



EXISTING TYPICAL SECTION
 (NTS)
 STA 298+44.68 - STA 300+94.93 (MENARD CREEK)



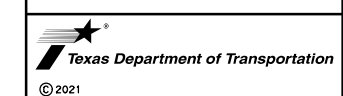
PROPOSED TYPICAL SECTION
 (NTS)
 STA 298+32.00 - STA 300+82.00 (MENARD CREEK)

HL93 LOADING



5/20/2021

TYPICAL BRIDGE SECTION
 (MENARD CREEK)





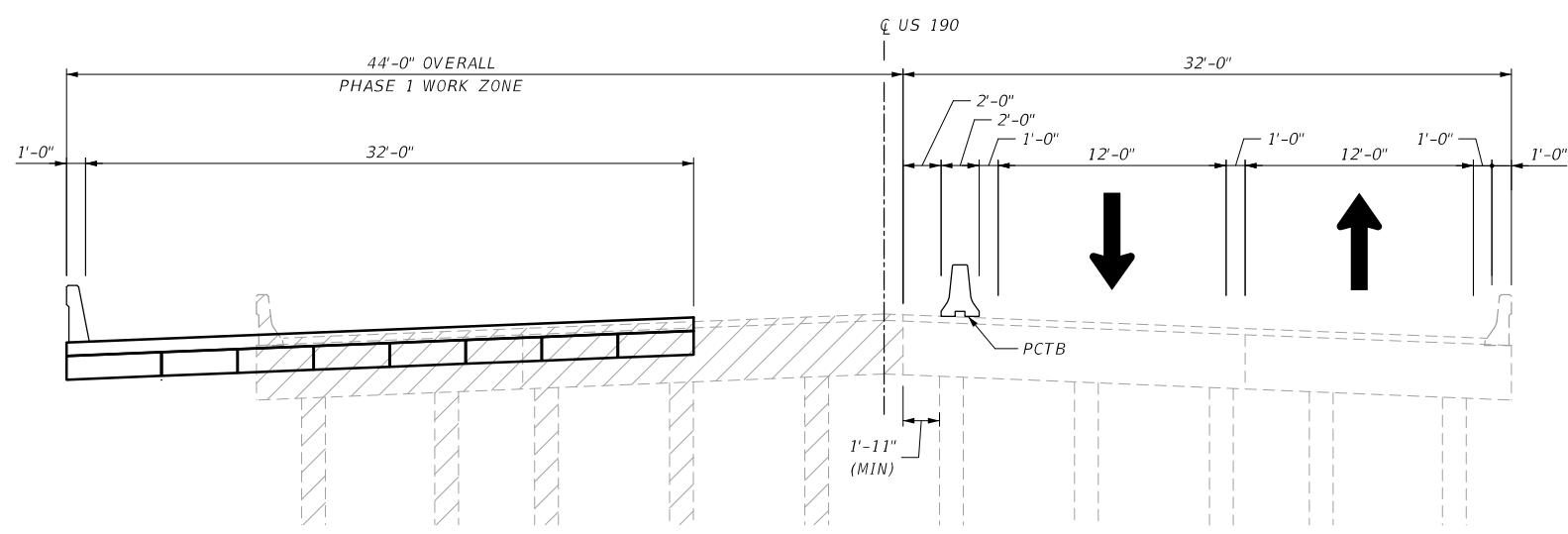
White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6944
 FIRM NUMBER: 12698

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		197	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

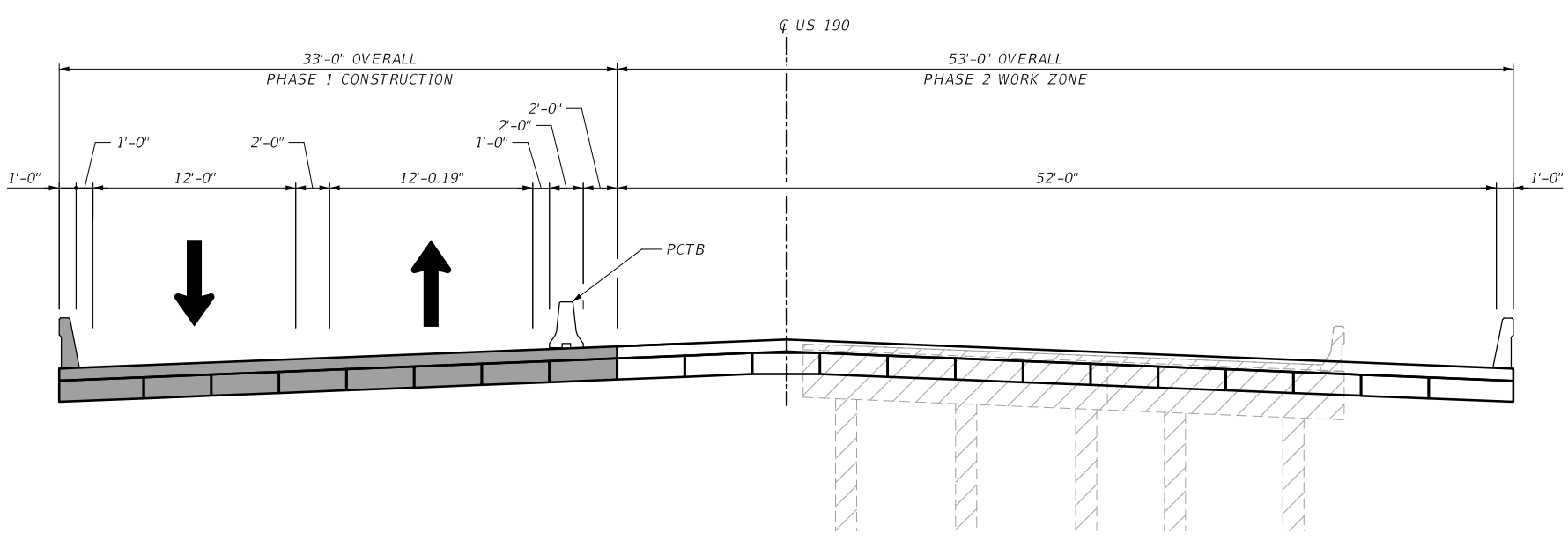
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LEGEND:
 REMOVE EXIST. STRUCTURE
 CONST. PREVIOUS PHASE



PHASE 1 CONSTRUCTION TYPICAL SECTION
 (NTS)
 STA 298+29.50 - STA 300+84.50 (MENARD CREEK)



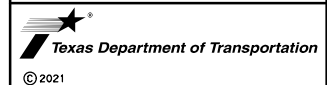
PHASE 2 CONSTRUCTION TYPICAL SECTION
 (NTS)
 STA 298+29.50 - STA 300+84.50 (MENARD CREEK)

HL93 LOADING



5/20/2021

TYPICAL
 BRIDGE
 PHASING
 (MENARD CREEK)

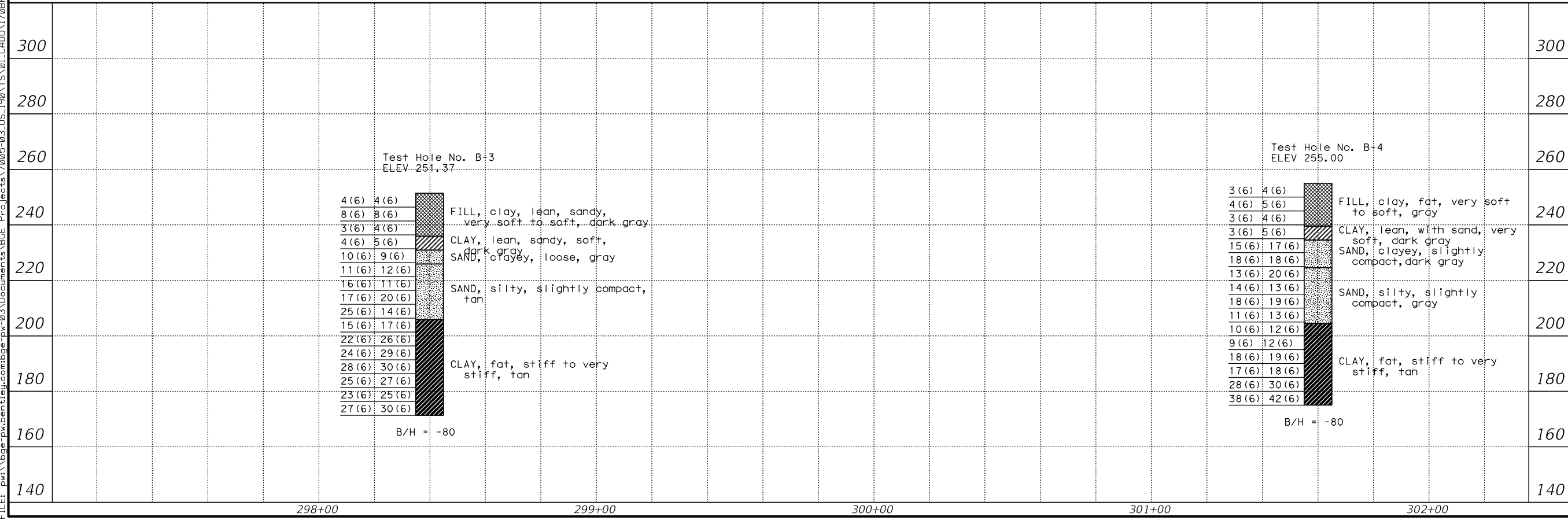
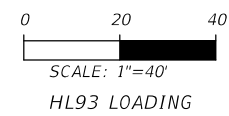
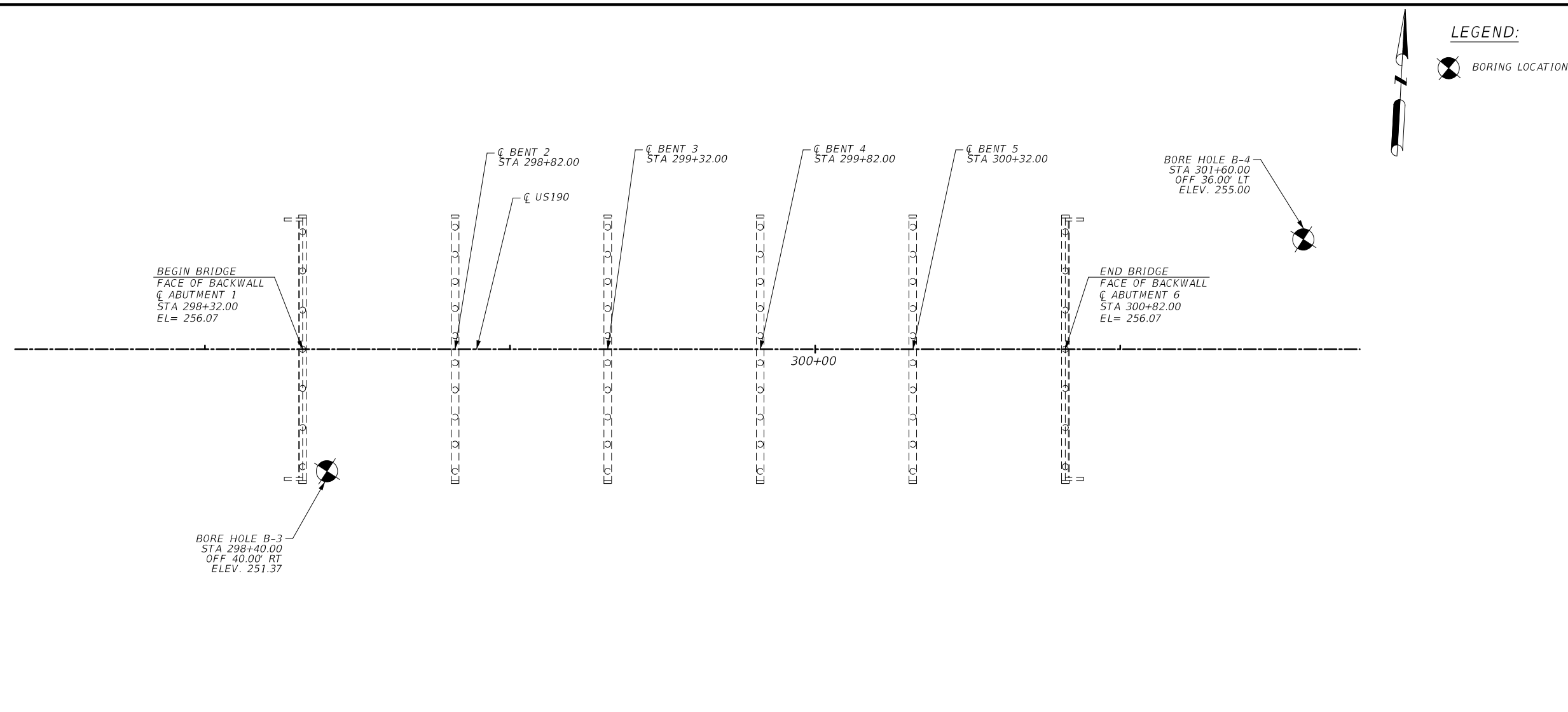


White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 409.424.8844
 FIRM NUMBER: 12998
 Copyright: 2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		198	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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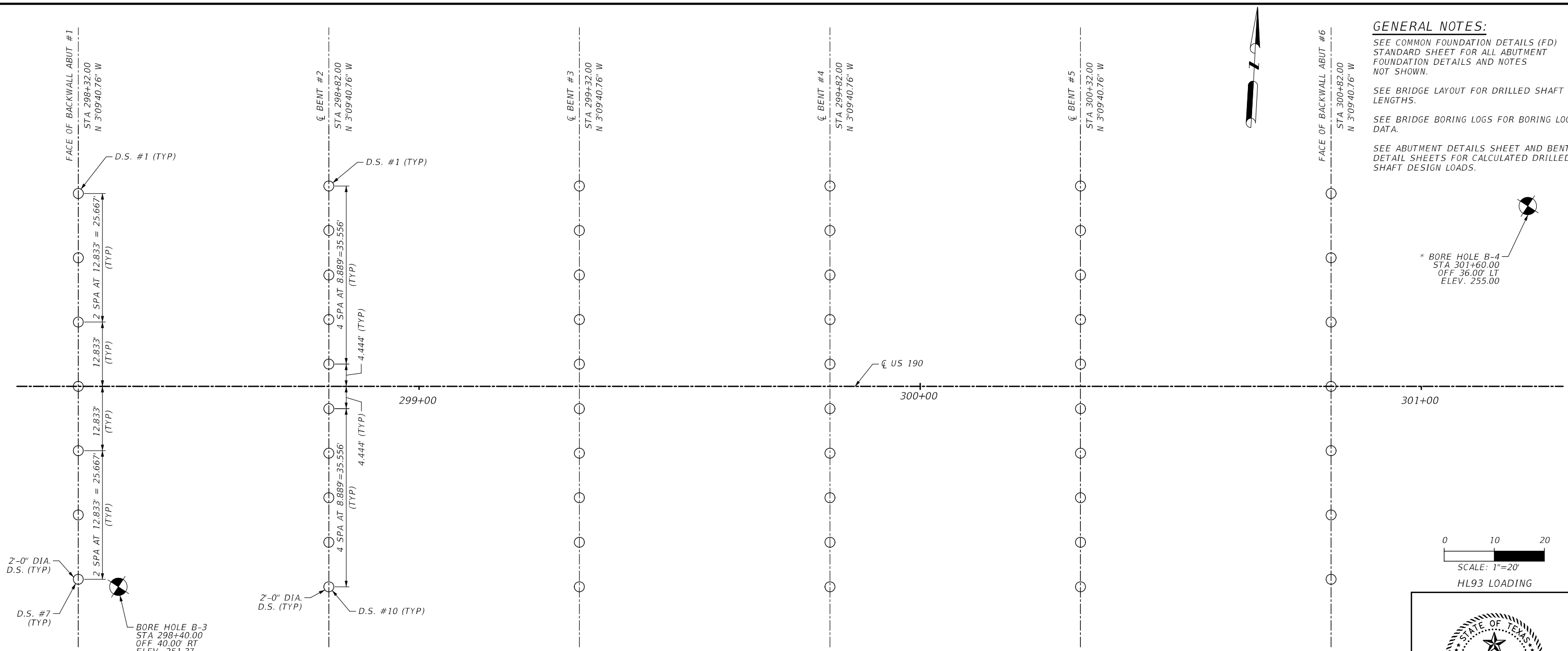
Adam White
 5/19/2021

BRIDGE BORING LOGS
 (MENARD CREEK)

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		199
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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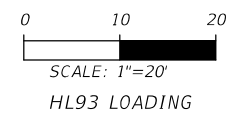
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FOUNDATION LAYOUT

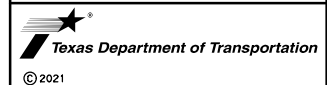
GENERAL NOTES:
 SEE COMMON FOUNDATION DETAILS (FD) STANDARD SHEET FOR ALL ABUTMENT FOUNDATION DETAILS AND NOTES NOT SHOWN.
 SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTHS.
 SEE BRIDGE BORING LOGS FOR BORING LOG DATA.
 SEE ABUTMENT DETAILS SHEET AND BENT DETAIL SHEETS FOR CALCULATED DRILLED SHAFT DESIGN LOADS.

* BORE HOLE B-4
 STA 301+60.00
 OFF 36.00' LT
 ELEV. 255.00



5/20/2021

FOUNDATION LAYOUT
 (MENARD CREEK)

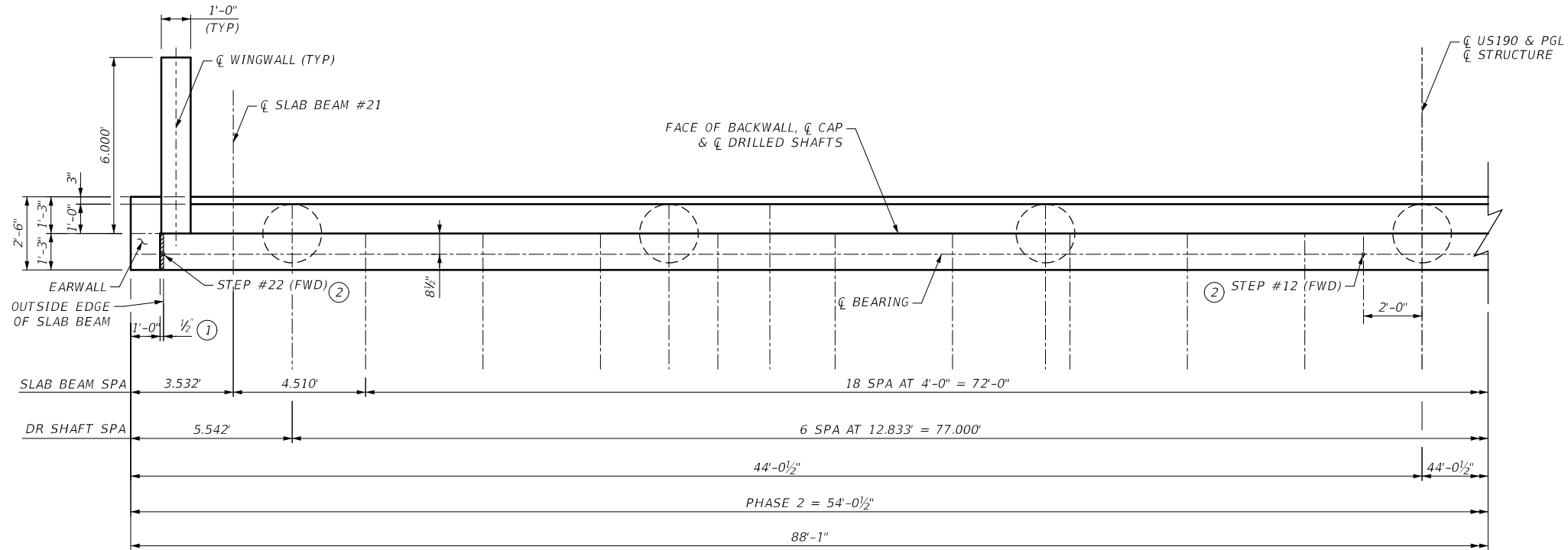


308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.942.6944
 FIRM NUMBER: 12698
 Copyright: 2021

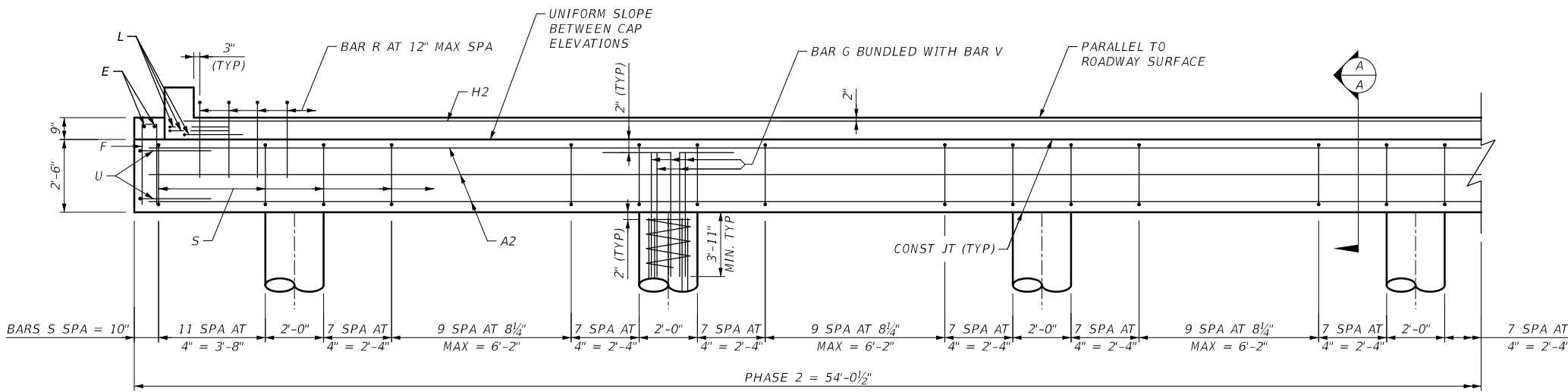
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		200	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

* LOCATION OF BORE HOLE SHOWN IS NOT ON ACTUAL LOCATION.

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PLAN



ELEVATION

TABLE OF ESTIMATED QUANTITIES ③				
BAR	No.	SIZE	LENGTH	WEIGHT
A1	8	#11	40'-4"	1,714
A2	8	#11	53'-4"	2,267
E	4	#4	2'-2"	6
F	10	#4	6'-4"	42
G	56	#9	7'-10"	1,491
H1	2	#5	35'-11"	75
H2	2	#5	52'-8"	110
L	6	#6	4'-0"	36
S	168	#5	9'-4"	1,635
U	4	#6	7'-1"	43
R	86	#5	7'-10"	703
wH1	8	#6	5'-8"	68
wH2	8	#6	6'-11"	83
wU	12	#4	1'-8"	13
wV	28	#5	4'-1"	119
REINFORCING STEEL			LB	8,406
CLASS "C" CONCRETE			CY	25.4

GENERAL NOTES:

- DESIGNED ACCORDING TO AASHTO LRFD SPECIFICATIONS, 9th EDITION (2020) AND CURRENT INTERIMS.
- COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.
- SEE STANDARD FD FOR ALL FOUNDATION DETAILS AND NOTES.
- CALCULATED FOUNDATION LOADS = 131 TONS PER DRILLED SHAFT.
- CONCRETE QUANTITY INCLUDES EAR WALLS.

MATERIAL NOTES:

- PROVIDE CLASS C CONCRETE ($f'c = 3,600$ psi)
- PROVIDE GRADE 60 REINFORCING STEEL.

- PROVIDE 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO BEAM WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL PERPENDICULAR TO CAP. DO NOT CAST EARWALLS UNTIL BEAMS ARE ERECTED IN THEIR FINAL POSITION.
- SEE CAP ELEVATIONS SHEET FOR ELEVATIONS.
- FOR CONTRACTORS INFORMATION ONLY.
- INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.

HL93 LOADING

5/20/2021

ABUTMENT NO.1
(MENARD CREEK)

SHEET 1 OF 3

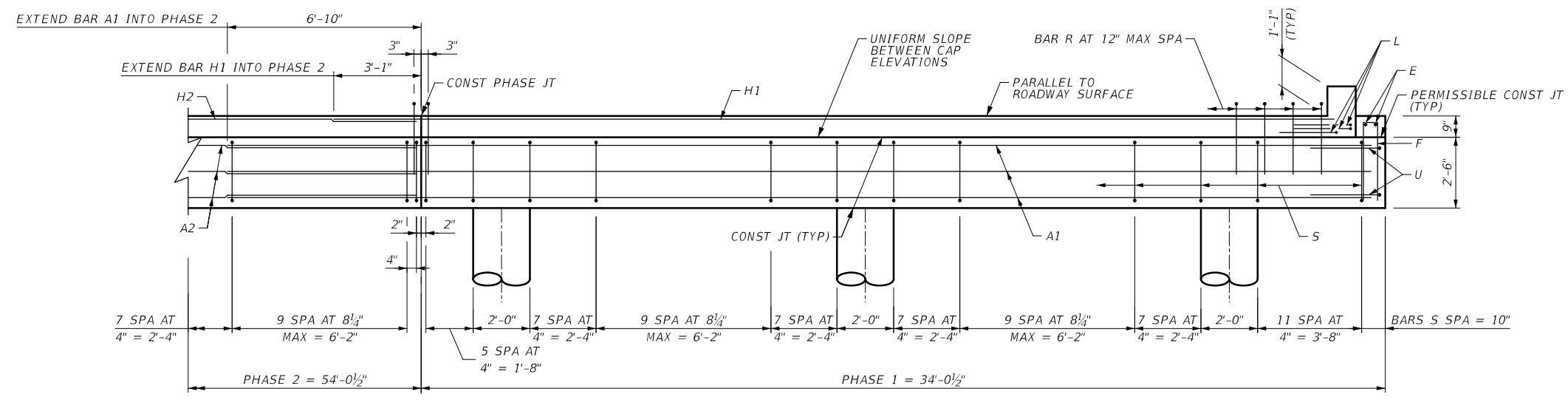
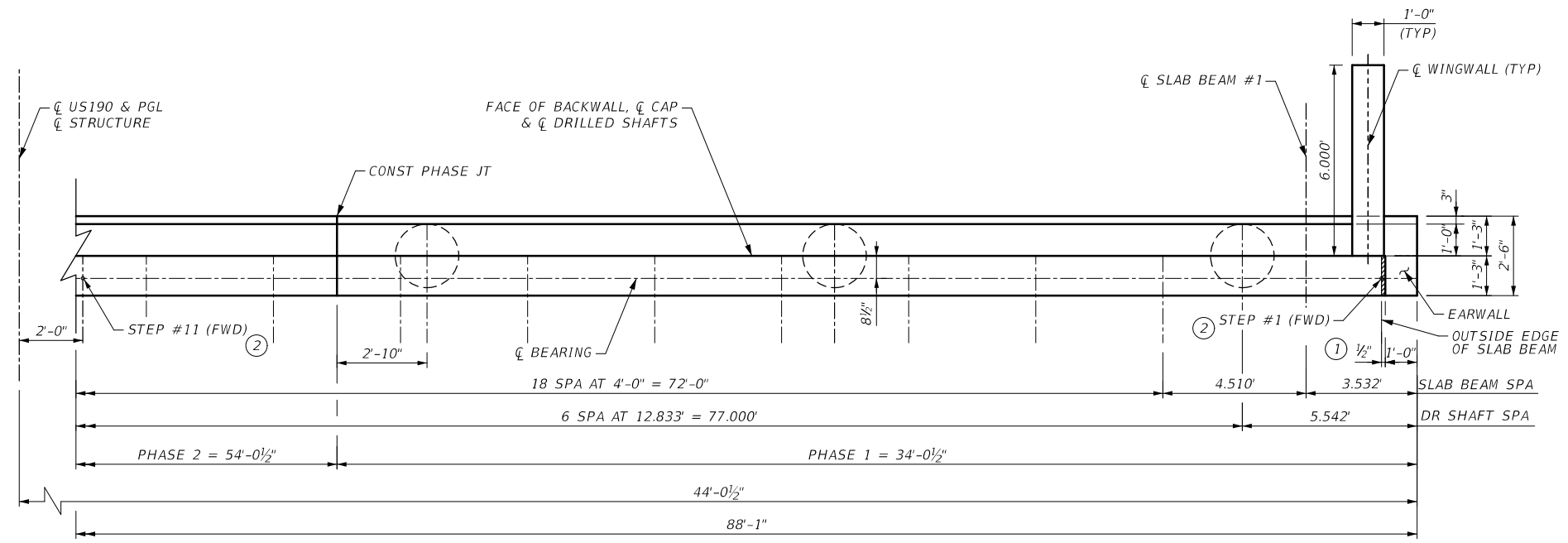
Texas Department of Transportation
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308 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 972.962.4644
F: 972.962.4644
FIRM NUMBER: 12998
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		201	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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GENERAL NOTES:
 1. SEE SHEET 1 OF 3 FOR NOTES



HL93 LOADING

5/20/2021

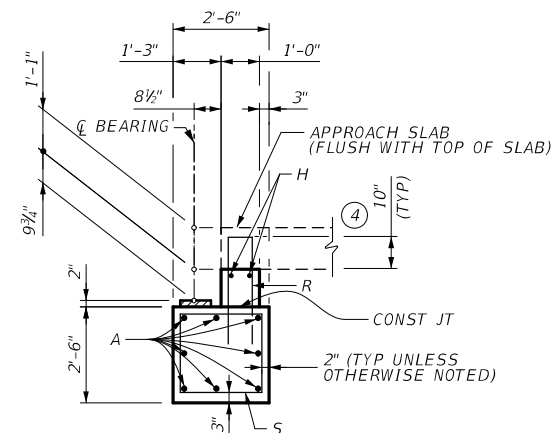
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 (MENARD CREEK)

SHEET 2 OF 3

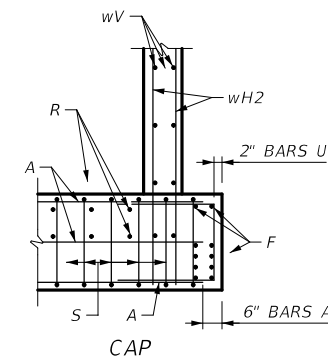
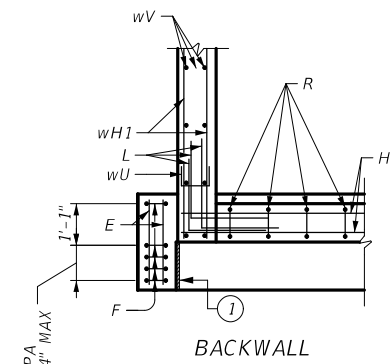
Texas Department of Transportation
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White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 469.962.9844
 FIRM NUMBER: 129598
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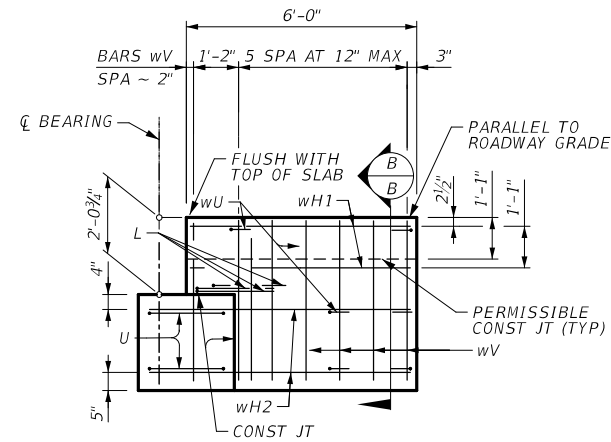
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STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190



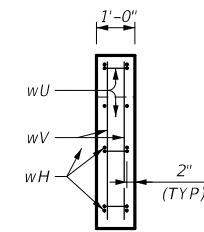
SECTION A-A
 (WITH APPROACH SLAB)
 NOTE: AT CONTRACTOR'S OPTION, BACKWALL MAY BE CAST WITH APPROACH SLAB.



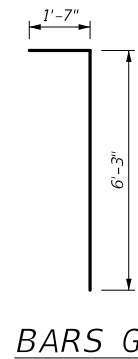
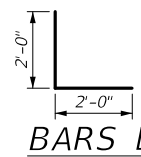
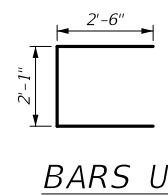
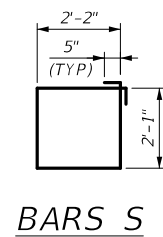
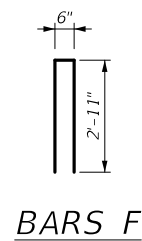
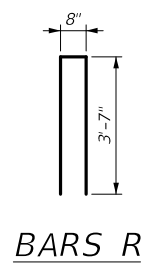
CORNER DETAILS



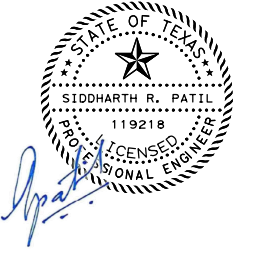
WINGWALL ELEVATION
 (EARWALL NOT SHOWN FOR CLARITY)



SECTION B-B



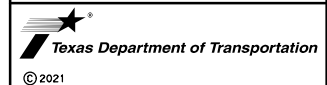
HL93 LOADING



5/20/2021

ABUTMENT NO.1
 (MENARD CREEK)

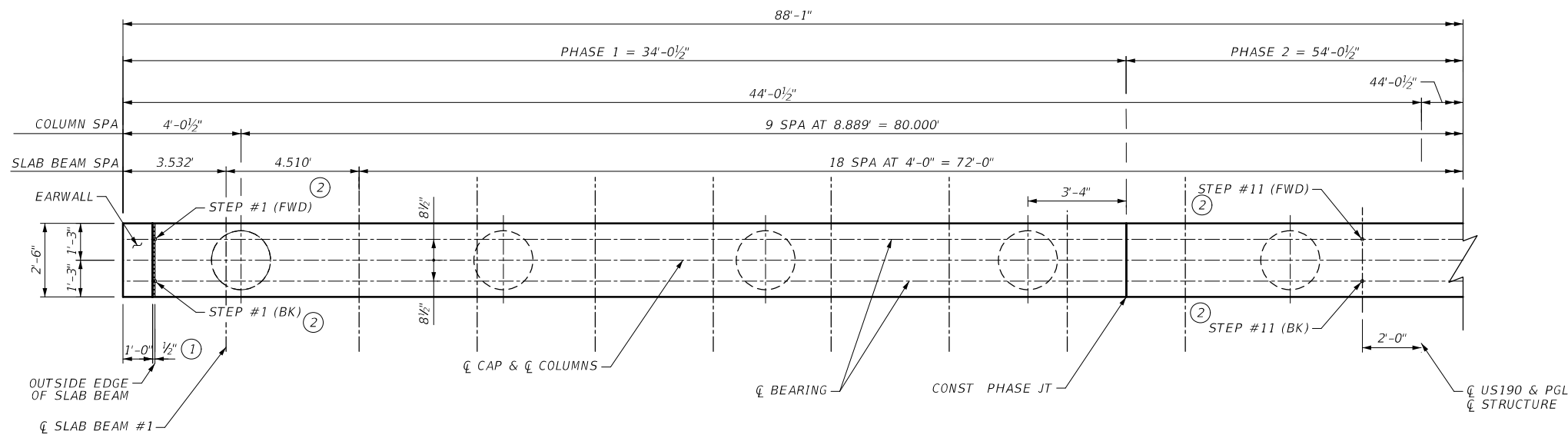
SHEET 3 OF 3



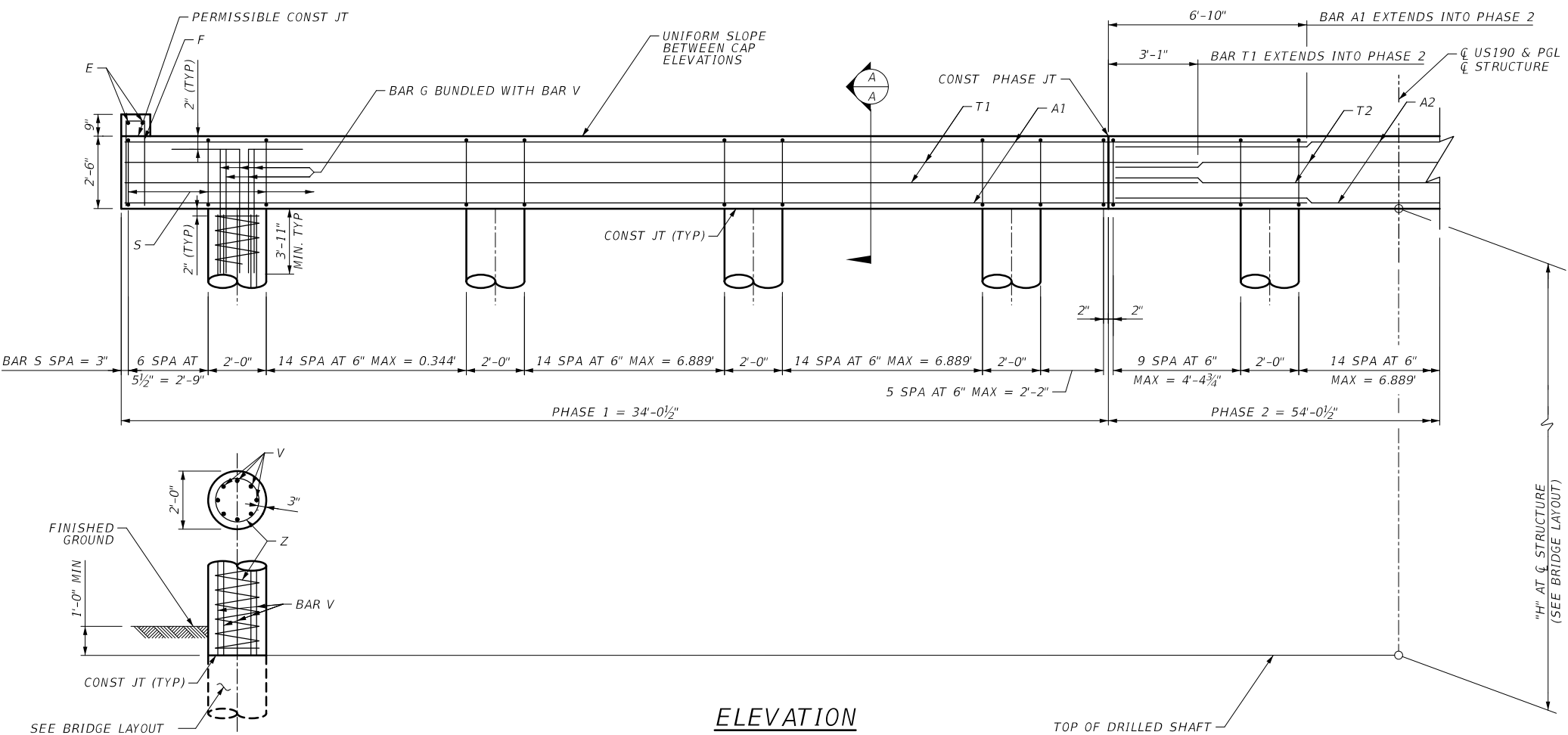
White Hawk
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6844
 FIRM NUMBER: 12698

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		203	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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PLAN



ELEVATION

SEE BRIDGE LAYOUT FOR FOUNDATION TYPE.
 SEE FD SHEET FOR DETAILS.

BAR	No.	SIZE	LENGTH	WEIGHT	
A1	10	#11	40'-8"	2,161	
A2	10	#11	53'-8"	2,851	
E	4	#4	2'-2"	6	
F	14	#4	6'-6"	61	
G	80	#9	7'-10"	2,131	
S	150	#5	9'-8"	1,512	
T1	4	#5	36'-11"	154	
T2	4	#5	53'-8"	224	
REINFORCING STEEL				LB	9,099
CLASS "C" CONCRETE (CAP)				CY	20.5

BENT	COLUMN HEIGHT "H" (FT)	BARS V 80 - #9		BARS Z 10 - #3		REIF STEEL LB	CLASS "C" CONC CY
		LENGTH	WEIGHT	LENGTH	WEIGHT		
2	11	10'-10"	2947	118'-8"	446	3393	12.8
3	12	11'-10"	3219	128'-2"	482	3701	14.0
4	13	12'-10"	3491	137'-8"	518	4009	15.1
5	11	10'-10"	2947	118'-8"	446	3393	12.8

- GENERAL NOTES:**
- DESIGNED ACCORDING TO AASHTO LRFD SPECIFICATIONS 9TH EDITION (2020) AND CURRENT INTERIMS.
 - COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.
 - SEE STANDARD FD FOR ALL FOUNDATION DETAILS AND NOTES.
 - CALCULATED FOUNDATION LOADS
 BENT 2 = 134 TONS/DS
 BENT 3 = 134 TONS/DS
 BENT 4 = 134 TONS/DS
 BENT 5 = 134 TONS/DS
 - CONCRETE QUANTITY INCLUDES EAR WALLS.

- MATERIAL NOTES:**
- PROVIDE CLASS C CONCRETE ($f'c = 3,600$ psi)
 - PROVIDE GRADE 60 REINFORCING STEEL.

- PROVIDE 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO BEAM WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL WITH VERTICAL SIDE OF BEAM. DO NOT CAST EAR WALLS UNTIL BEAMS ARE ERECTED IN THEIR FINAL POSITION.
- SEE CAP ELEVATIONS SHEET FOR ELEVATIONS.
- QUANTITIES SHOWN ARE FOR ONE CAP ONLY.
- ADJUST BARS V LENGTH BY 1'-0" AND BARS Z LENGTH BY 9'-6" FOR EACH 1 LINEAR FOOT OF VARIATION IN THE "H" VALUE.
- ADJUST REINFORCING STEEL TOTAL BY 367 LB AND CLASS "C" CONC. (COL) TOTAL BY 1.16 CY FOR EACH 1 LINEAR FOOT OF VARIATION IN THE "H" VALUE.
- FOR CONTRACTORS INFORMATION ONLY.

HL93 LOADING

5/20/2021

BENT 2 - 5
(MENARD CREEK)

SHEET 1 OF 2

Texas Department of Transportation
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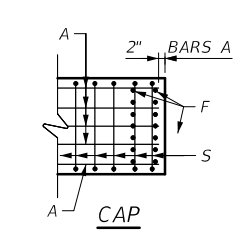
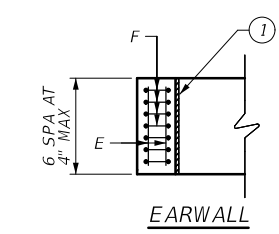
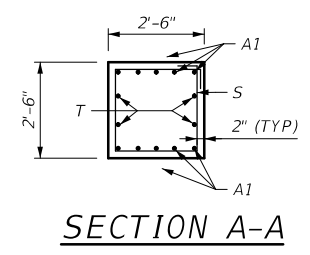
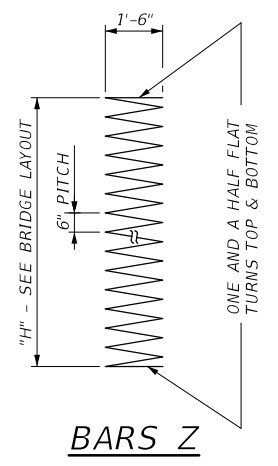
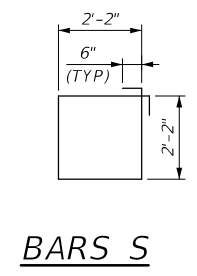
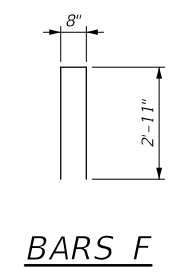
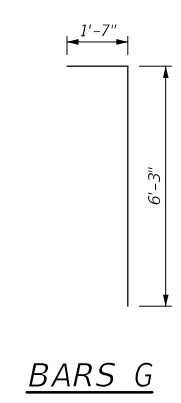
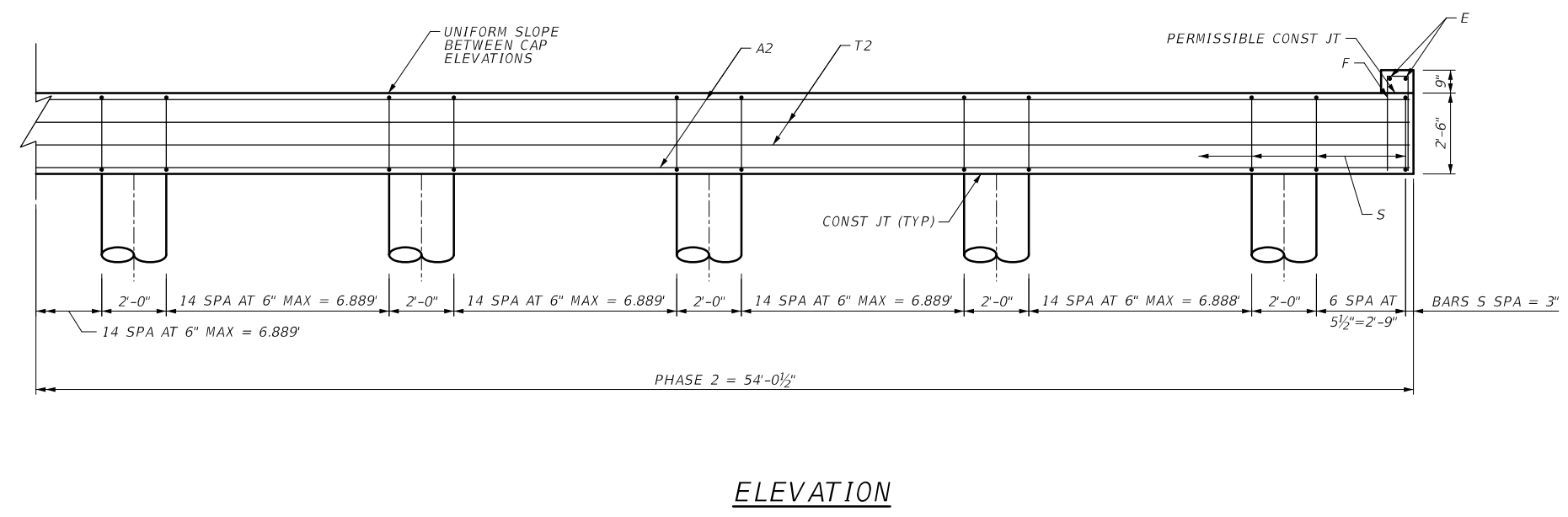
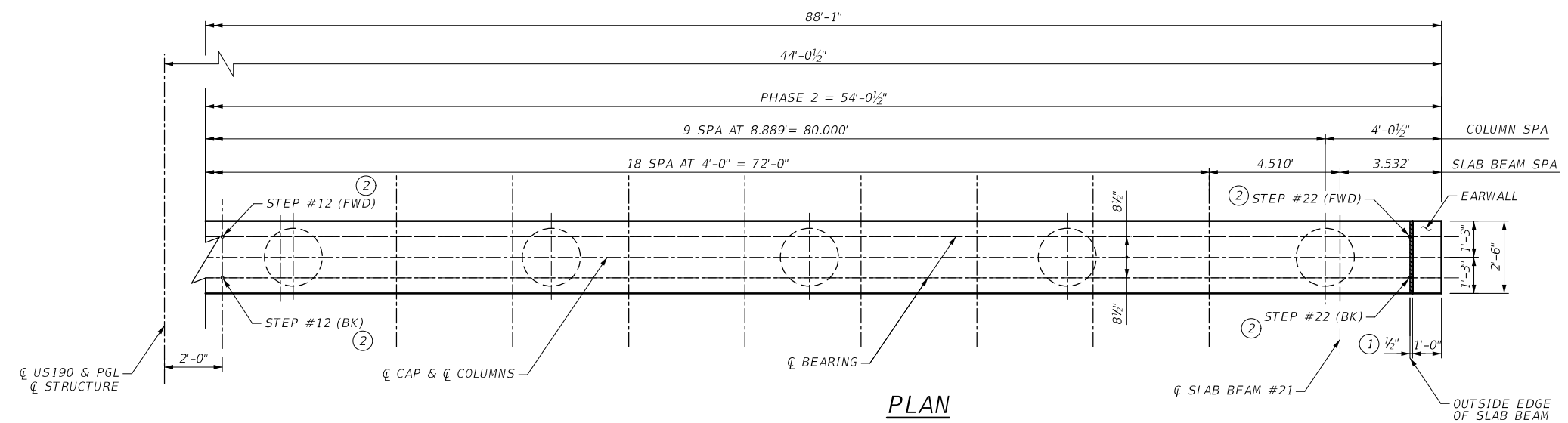
308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.962.6944
 F: 972.962.6944
 FRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		204	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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GENERAL NOTES:
 1. SEE SHEET 1 OF 2 FOR NOTES



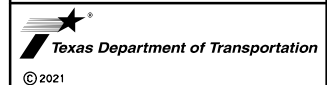
HL93 LOADING



5/20/2021

BENT 2 - 5
 (MENARD CREEK)

SHEET 2 OF 2



White Hawk
 309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.2844
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		205	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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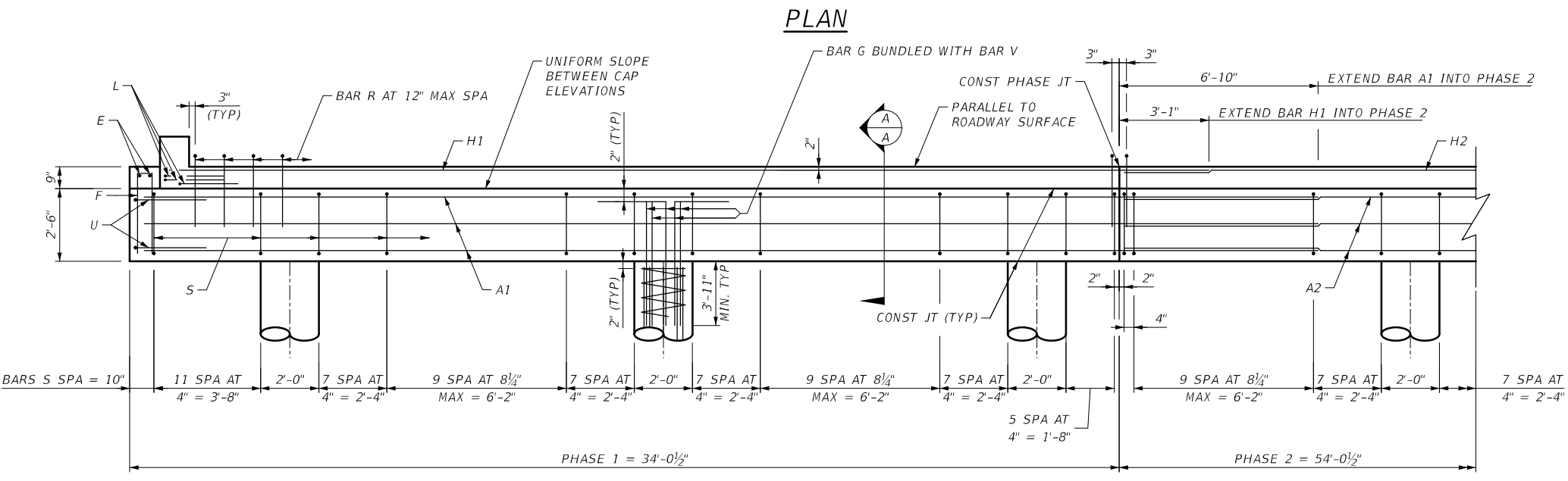
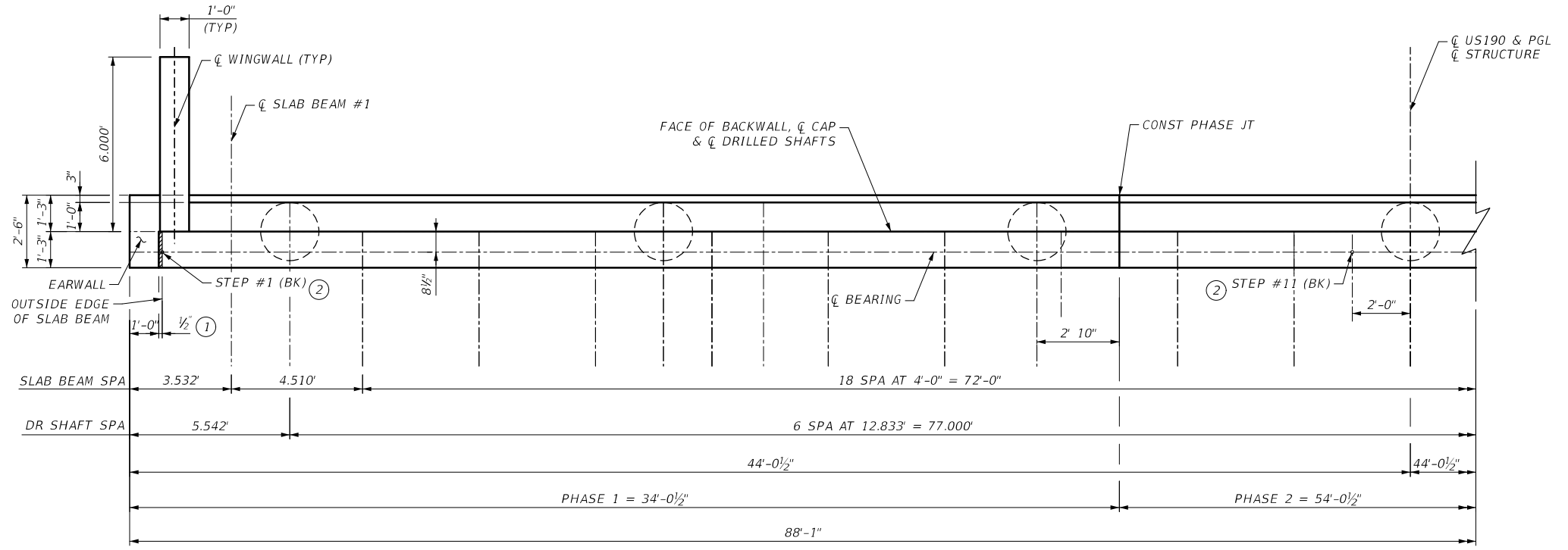


TABLE OF ESTIMATED QUANTITIES ③				
BAR	No.	SIZE	LENGTH	WEIGHT
A1	8	#11	40'-4"	1,714
A2	8	#11	53'-4"	2,267
E	4	#4	2'-2"	6
F	10	#4	6'-4"	42
G	56	#9	7'-10"	1,491
H1	2	#5	35'-11"	75
H2	2	#5	52'-8"	110
L	6	#6	4'-0"	36
S	168	#5	9'-4"	1,635
U	4	#6	7'-1"	43
R	86	#5	7'-10"	703
wH1	8	#6	5'-8"	68
wH2	8	#6	6'-11"	83
wU	12	#4	1'-8"	13
wV	28	#5	4'-1"	119
REINFORCING STEEL			LB	8,406
CLASS "C" CONCRETE			CY	25.4

- GENERAL NOTES:**
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 - SEE STANDARD FD FOR ALL FOUNDATION DETAILS AND NOTES.
 - CALCULATED FOUNDATION LOADS = 131 TONS PER DRILLED SHAFT.
 - CONCRETE QUANTITY INCLUDES EAR WALLS.
- MATERIAL NOTES:**
- PROVIDE CLASS C CONCRETE ($f'_c = 3,600$ psi)
 - PROVIDE GRADE 60 REINFORCING STEEL.

- PROVIDE 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO BEAM WITH AN APPROVED ADHESIVE. CAST INSIDE FACE OF EARWALL PERPENDICULAR TO CAP. DO NOT CAST EARWALLS UNTIL BEAMS ARE ERECTED IN THEIR FINAL POSITION.
- SEE CAP ELEVATIONS SHEET FOR ELEVATIONS.
- FOR CONTRACTORS INFORMATION ONLY.
- INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.

HL93 LOADING

5/20/2021

ABUTMENT NO. 6
(MENARD CREEK)

SHEET 1 OF 3

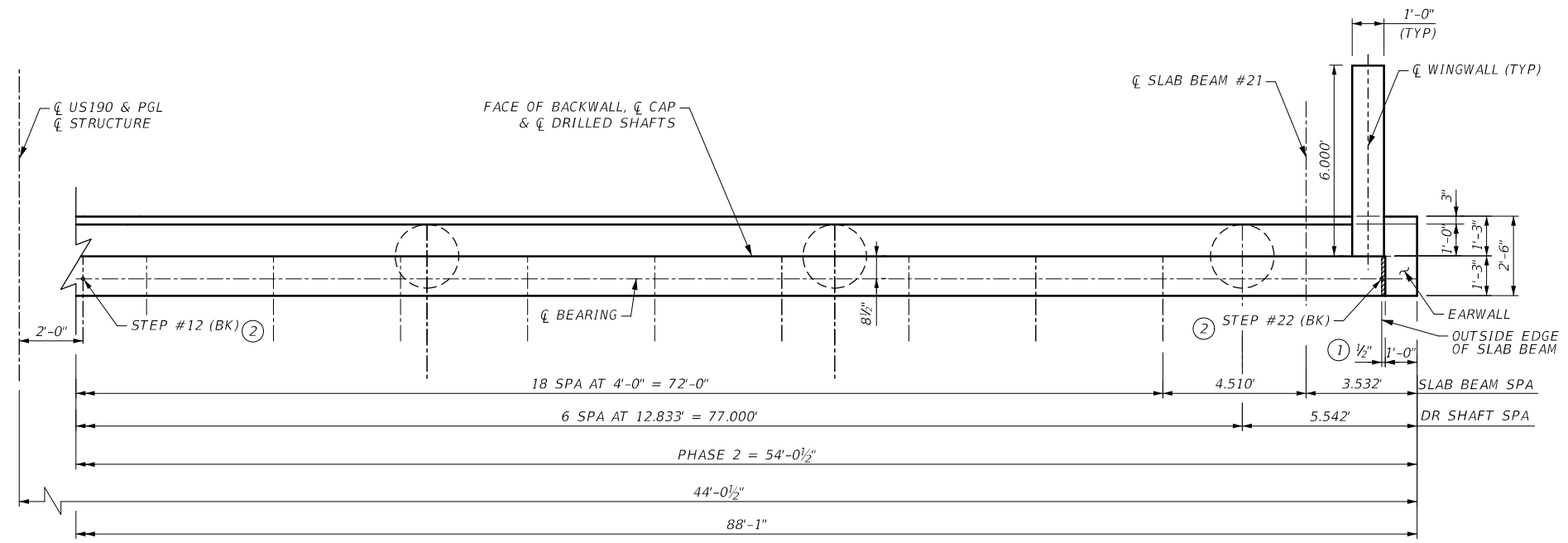
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309 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 972.942.6944
FIRM NUMBER: 12998

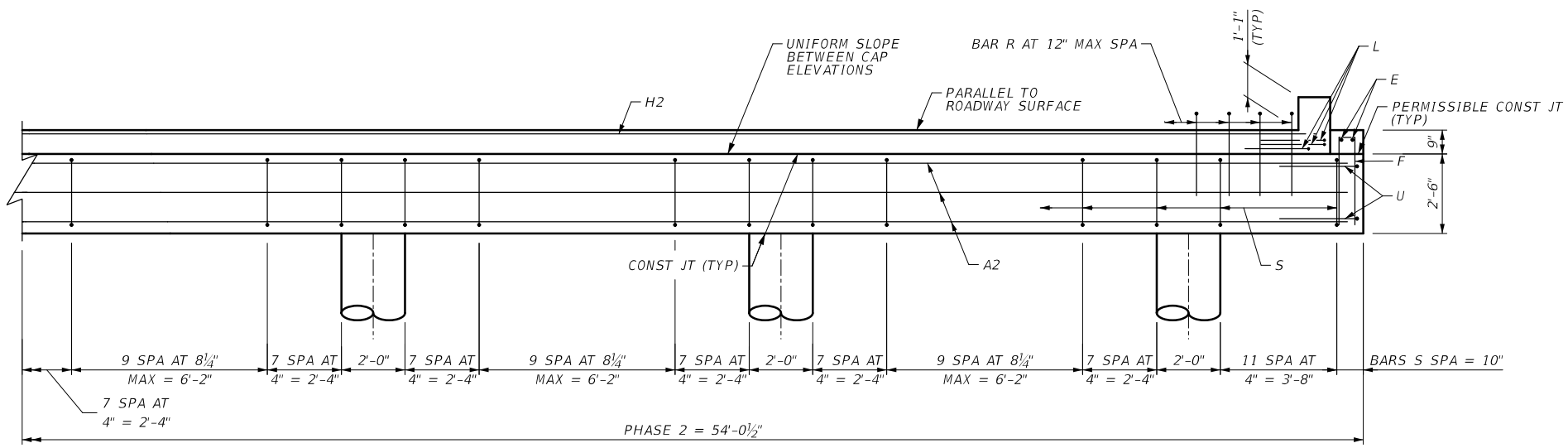
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6		206	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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GENERAL NOTES:
 1. SEE SHEET 1 OF 3 FOR NOTES

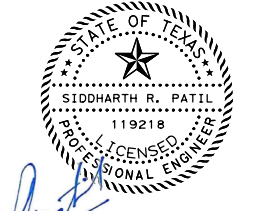


PLAN



ELEVATION

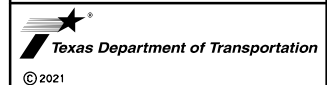
HL93 LOADING



S. Patil
 5/20/2021

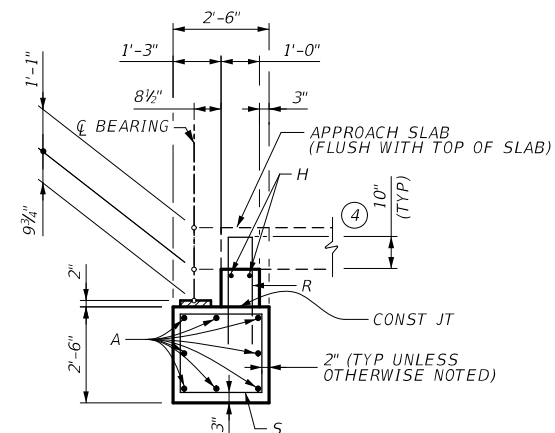
ABUTMENT NO. 6
 (MENARD CREEK)

SHEET 2 OF 3

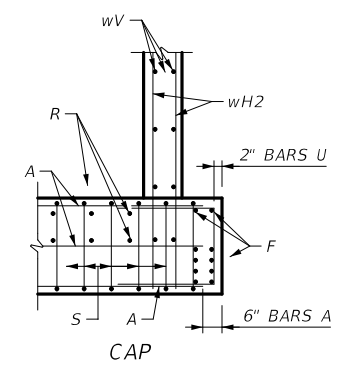
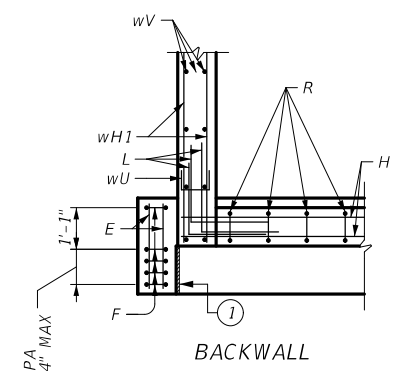


White Hawk
 309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 409.424.2644
 FIRM NUMBER: 12698
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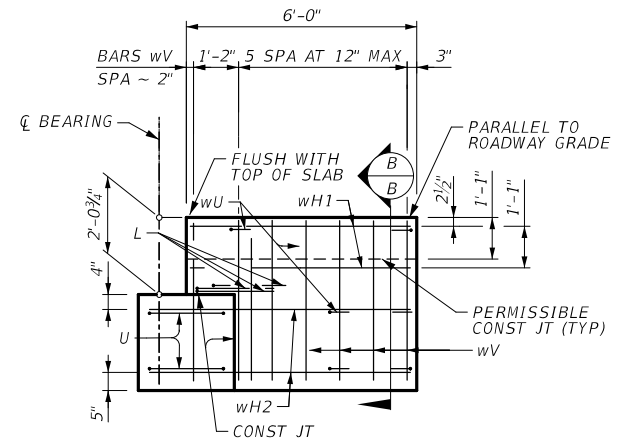
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0213	04	050	US 190



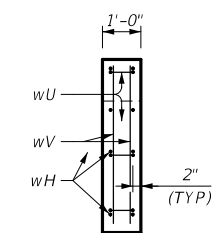
SECTION A-A
 (WITH APPROACH SLAB)
 NOTE: AT CONTRACTOR'S OPTION, BACKWALL MAY BE CAST WITH APPROACH SLAB.



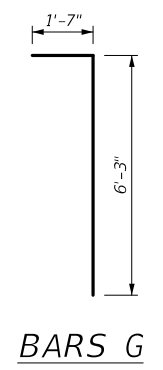
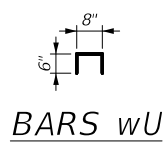
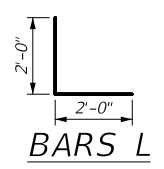
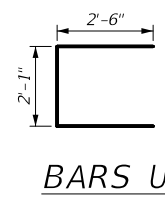
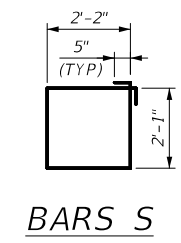
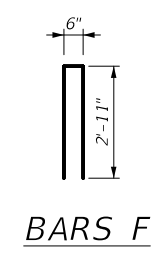
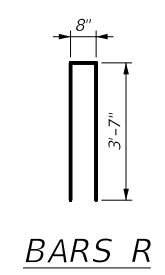
CORNER DETAILS



WINGWALL ELEVATION
 (EARWALL NOT SHOWN FOR CLARITY)



SECTION B-B



BARS R

BARS F

BARS S

BARS U

BARS L

BARS wU

BARS G

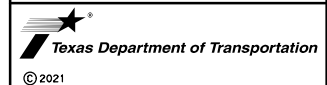
HL93 LOADING



5/20/2021

ABUTMENT NO.6
 (MENARD CREEK)

SHEET 3 OF 3

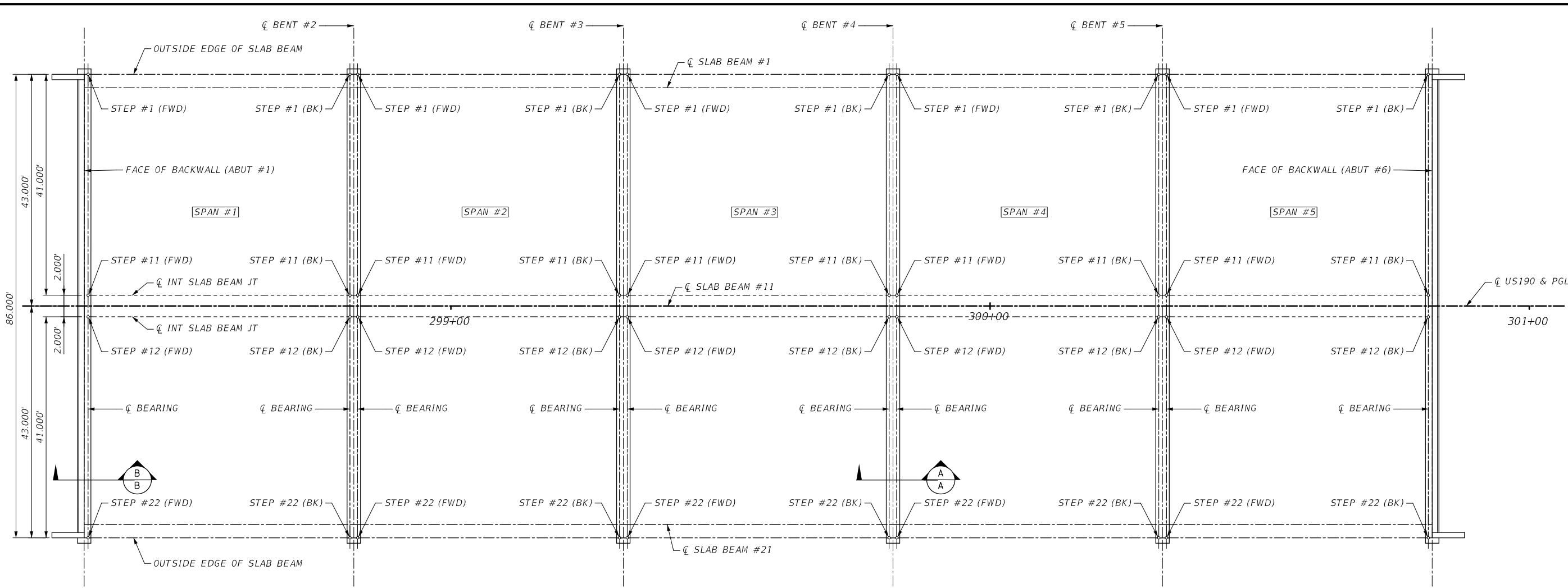


White Hawk
 309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6844
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		208	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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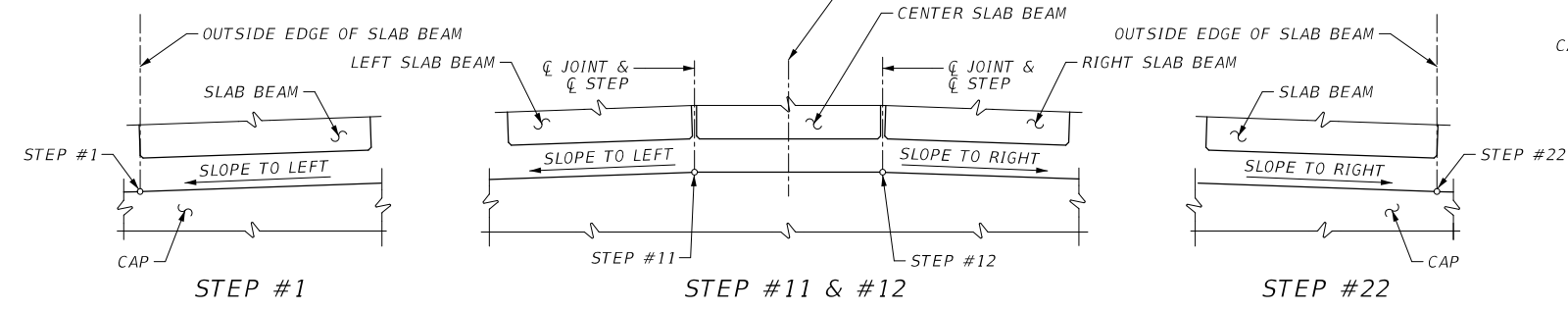
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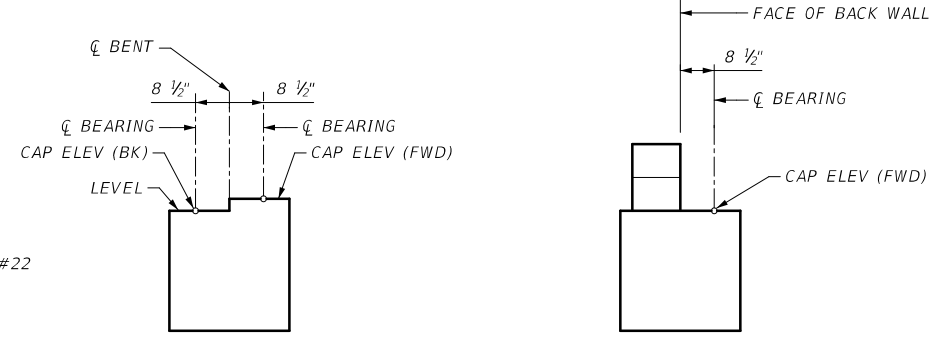
CAP ELEVATIONS (US 190 AT MENARD CREEK)

		STEP 1	STEP 11	STEP 12	STEP 22
ABUT 1	(FWD)	253.147	253.967	253.967	253.147
BENT 2	(BK)	253.230	254.050	254.050	253.230
	(FWD)	253.232	254.052	254.052	253.232
BENT 3	(BK)	253.275	254.095	254.095	253.275
	(FWD)	253.275	254.095	254.095	253.275
BENT 4	(BK)	253.277	254.097	254.097	253.277
	(FWD)	253.276	254.096	254.096	253.276
BENT 5	(BK)	253.237	254.057	254.057	253.237
	(FWD)	253.235	254.055	254.055	253.235
ABUT 6	(BK)	253.154	253.974	253.974	253.154

PLAN OF STEP LOCATIONS



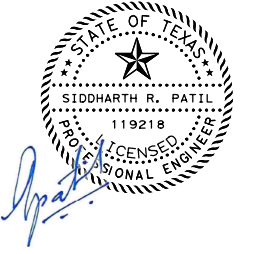
COMMON TRANSVERSE SECTIONS AT STEP LOCATIONS



SECTION A-A

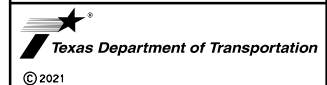
SECTION B-B

HL93 LOADING



5/20/2021

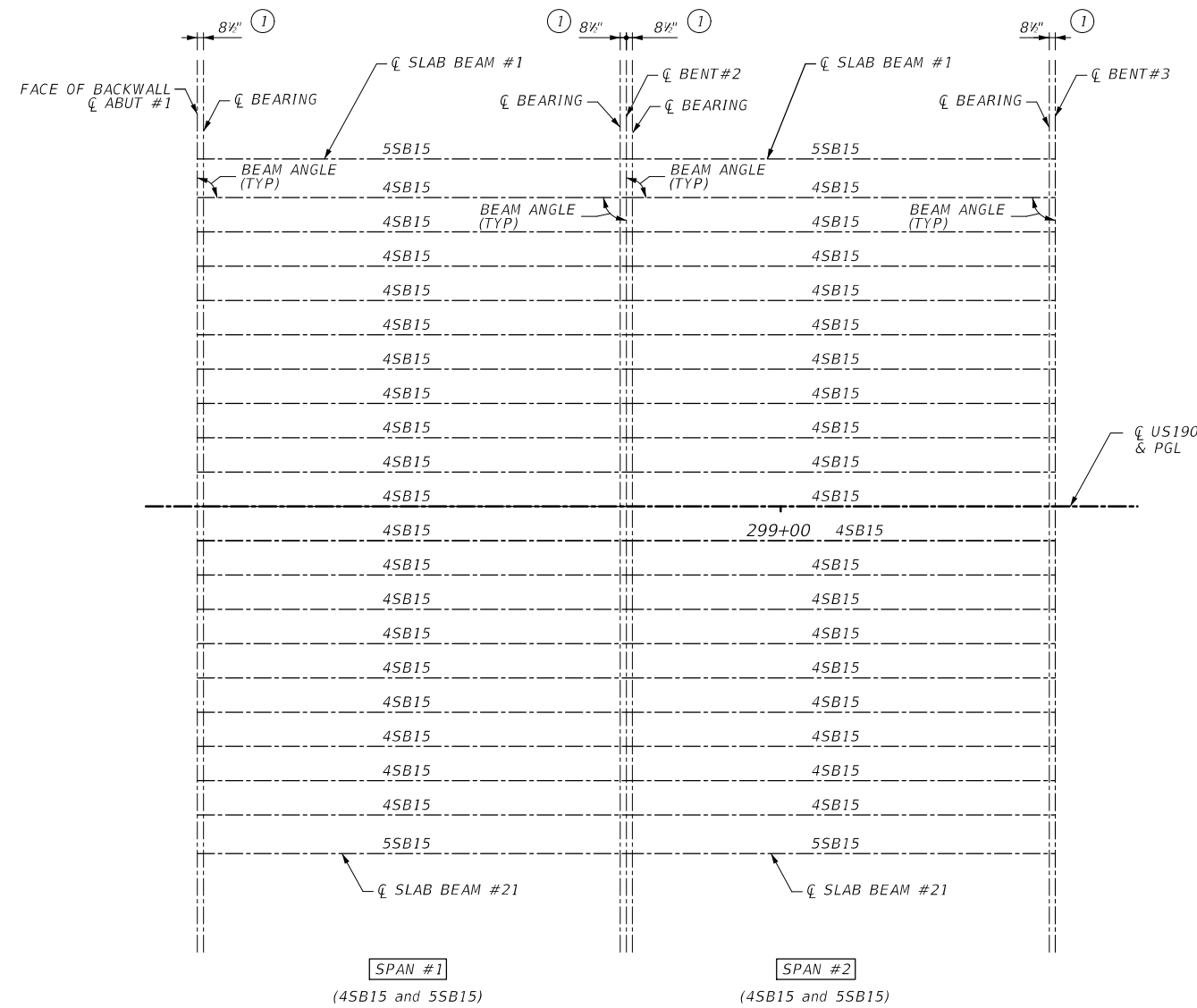
**CAP ELEVATION
 DETAILS
 (MENARD CREEK)**



309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.942.6944
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		209
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB HIGHWAY NO.
0213	04	050 US 190

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FRAMING PLAN

BEAM REPORT

BEAM REPORT AT CENTER OF BOX, SPAN 1

BOX	HORIZONTAL DISTANCE C-C BENT	TRUE DISTANCE C-C BRG.	BEAM BOT. BM. FLG. (2)	BEAM SLOPE	BEAM BEARING
BOX 1	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 2	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 3	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 4	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 5	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 6	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 7	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 8	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 9	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 10	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 11	50.0000	48.5833	49.5000	0.00172	N 86 50 19.26 E
BOX 12	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 13	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 14	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 15	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 16	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 17	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 18	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 19	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 20	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E
BOX 21	50.0000	48.5833	49.5001	0.00172	N 86 50 19.26 E

BENT REPORT

ABUT. NO. 1 (S 3 9 40.74 E)				BENT NO. 2 (S 3 9 40.74 E)			
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L				DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L			
BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S		BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S	
SPAN 1				SPAN 1			
STEP 1				STEP 1			
BOX 1 LEFT	0.0000	90	0 0.00	BOX 1 LEFT	0.0000	90	0 0.00
BOX 1 CENTER				BOX 1 CENTER			
BOX 1 RIGHT	5.0000	90	0 0.00	BOX 1 RIGHT	5.0000	90	0 0.00
BOX 2 LEFT				BOX 2 LEFT			
BOX 2 CENTER	4.0000	90	0 0.00	BOX 2 CENTER	4.0000	90	0 0.00
BOX 2 RIGHT				BOX 2 RIGHT			
BOX 3 LEFT				BOX 3 LEFT			
BOX 3 CENTER	4.0000	90	0 0.00	BOX 3 CENTER	4.0000	90	0 0.00
BOX 3 RIGHT				BOX 3 RIGHT			
BOX 4 LEFT				BOX 4 LEFT			
BOX 4 CENTER	4.0000	90	0 0.00	BOX 4 CENTER	4.0000	90	0 0.00
BOX 4 RIGHT				BOX 4 RIGHT			
BOX 5 LEFT				BOX 5 LEFT			
BOX 5 CENTER	4.0000	90	0 0.00	BOX 5 CENTER	4.0000	90	0 0.00
BOX 5 RIGHT				BOX 5 RIGHT			
BOX 6 LEFT				BOX 6 LEFT			
BOX 6 CENTER	4.0000	90	0 0.00	BOX 6 CENTER	4.0000	90	0 0.00
BOX 6 RIGHT				BOX 6 RIGHT			
BOX 7 LEFT				BOX 7 LEFT			
BOX 7 CENTER	4.0000	90	0 0.00	BOX 7 CENTER	4.0000	90	0 0.00
BOX 7 RIGHT				BOX 7 RIGHT			
BOX 8 LEFT				BOX 8 LEFT			
BOX 8 CENTER	4.0000	90	0 0.00	BOX 8 CENTER	4.0000	90	0 0.00
BOX 8 RIGHT				BOX 8 RIGHT			
BOX 9 LEFT				BOX 9 LEFT			
BOX 9 CENTER	4.0000	90	0 0.00	BOX 9 CENTER	4.0000	90	0 0.00
BOX 9 RIGHT				BOX 9 RIGHT			
BOX 10 LEFT				BOX 10 LEFT			
BOX 10 CENTER	4.0000	90	0 0.00	BOX 10 CENTER	4.0000	90	0 0.00
BOX 10 RIGHT				BOX 10 RIGHT			
STEP 11				STEP 11			
BOX 11 LEFT	4.0000	90	0 0.00	BOX 11 LEFT	4.0000	90	0 0.00
BOX 11 CENTER				BOX 11 CENTER			
BOX 11 RIGHT				BOX 11 RIGHT			
STEP 12				STEP 12			
BOX 12 LEFT	4.0000	90	0 0.00	BOX 12 LEFT	4.0000	90	0 0.00
BOX 12 CENTER				BOX 12 CENTER			
BOX 12 RIGHT				BOX 12 RIGHT			
BOX 13 LEFT				BOX 13 LEFT			
BOX 13 CENTER	4.0000	90	0 0.00	BOX 13 CENTER	4.0000	90	0 0.00
BOX 13 RIGHT				BOX 13 RIGHT			
BOX 14 LEFT				BOX 14 LEFT			
BOX 14 CENTER	4.0000	90	0 0.00	BOX 14 CENTER	4.0000	90	0 0.00
BOX 14 RIGHT				BOX 14 RIGHT			
BOX 15 LEFT				BOX 15 LEFT			
BOX 15 CENTER	4.0000	90	0 0.00	BOX 15 CENTER	4.0000	90	0 0.00
BOX 15 RIGHT				BOX 15 RIGHT			
BOX 16 LEFT				BOX 16 LEFT			
BOX 16 CENTER	4.0000	90	0 0.00	BOX 16 CENTER	4.0000	90	0 0.00
BOX 16 RIGHT				BOX 16 RIGHT			
BOX 17 LEFT				BOX 17 LEFT			
BOX 17 CENTER	4.0000	90	0 0.00	BOX 17 CENTER	4.0000	90	0 0.00
BOX 17 RIGHT				BOX 17 RIGHT			
BOX 18 LEFT				BOX 18 LEFT			
BOX 18 CENTER	4.0000	90	0 0.00	BOX 18 CENTER	4.0000	90	0 0.00
BOX 18 RIGHT				BOX 18 RIGHT			
BOX 19 LEFT				BOX 19 LEFT			
BOX 19 CENTER	4.0000	90	0 0.00	BOX 19 CENTER	4.0000	90	0 0.00
BOX 19 RIGHT				BOX 19 RIGHT			
BOX 20 LEFT				BOX 20 LEFT			
BOX 20 CENTER	4.0000	90	0 0.00	BOX 20 CENTER	4.0000	90	0 0.00
BOX 20 RIGHT				BOX 20 RIGHT			
BOX 21 LEFT				BOX 21 LEFT			
BOX 21 CENTER	4.0000	90	0 0.00	BOX 21 CENTER	4.0000	90	0 0.00
BOX 21 RIGHT				BOX 21 RIGHT			
STEP 22				STEP 22			
TOTAL	86.0002	90	0 0.00	TOTAL	86.0002	90	0 0.00

- ① SEE PSBEB FOR ORIENTATION OF DIMENSION.
- ② BEAM LENGTHS SHOWN ARE BOTTOM SLAB BEAM LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

HL93 LOADING



5/20/2021

**FRAMING PLAN
UNIT-1
SPAN (1-2)
(MENARD CREEK)**

SHEET 1 OF 2



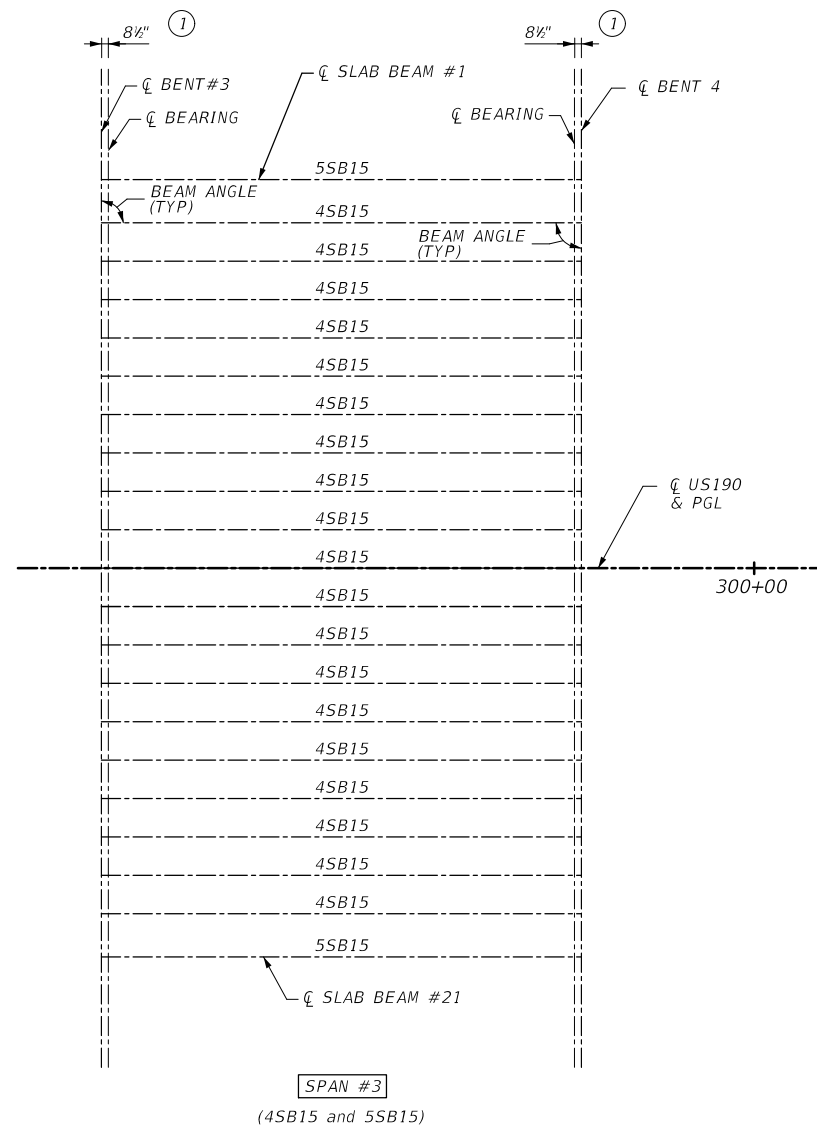
White Hawk CONSULTING ENGINEERS
 308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.2844
 FIRM NUMBER: 12998
 Copyright 2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		210
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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FRAMING PLAN
 (4SB15 and 5SB15)

BEAM REPORT
 BEAM REPORT AT CENTER OF BOX, SPAN 3

BOX	HORIZONTAL DISTANCE C-C BENT	TRUE DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE	BEAM BEARING
BOX 1	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 2	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 3	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 4	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 5	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 6	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 7	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 8	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 9	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 10	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 11	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 12	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 13	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 14	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 15	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 16	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 17	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 18	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 19	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 20	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E
BOX 21	50.0000	48.5833	49.5000	0.00003	N 86 50 19.26 E

BENT REPORT

BENT NO. 3 (S 3 9 40.74 E)			BENT NO. 4 (S 3 9 40.74 E)		
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L			DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L		
BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S	BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S
SPAN 3			SPAN 3		
STEP 1			STEP 1		
LEFT	0.0000	90 0 0.00	LEFT	0.0000	90 0 0.00
BOX 1 CENTER			BOX 1 CENTER		
RIGHT	5.0000	90 0 0.00	RIGHT	5.0000	90 0 0.00
LEFT			LEFT		
BOX 2 CENTER	4.0000	90 0 0.00	BOX 2 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 3 CENTER	4.0000	90 0 0.00	BOX 3 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 4 CENTER	4.0000	90 0 0.00	BOX 4 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 5 CENTER	4.0000	90 0 0.00	BOX 5 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 6 CENTER	4.0000	90 0 0.00	BOX 6 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 7 CENTER	4.0000	90 0 0.00	BOX 7 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 8 CENTER	4.0000	90 0 0.00	BOX 8 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 9 CENTER	4.0000	90 0 0.00	BOX 9 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 10 CENTER	4.0000	90 0 0.00	BOX 10 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 11 CENTER	4.0000	90 0 0.00	BOX 11 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 12 CENTER	4.0000	90 0 0.00	BOX 12 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 13 CENTER	4.0000	90 0 0.00	BOX 13 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 14 CENTER	4.0000	90 0 0.00	BOX 14 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 15 CENTER	4.0000	90 0 0.00	BOX 15 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 16 CENTER	4.0000	90 0 0.00	BOX 16 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 17 CENTER	4.0000	90 0 0.00	BOX 17 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 18 CENTER	4.0000	90 0 0.00	BOX 18 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 19 CENTER	4.0000	90 0 0.00	BOX 19 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 20 CENTER	4.0000	90 0 0.00	BOX 20 CENTER	4.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
BOX 21 CENTER	5.0000	90 0 0.00	BOX 21 CENTER	5.0000	90 0 0.00
RIGHT			RIGHT		
LEFT			LEFT		
STEP 22			STEP 22		
TOTAL	86.0002		TOTAL	86.0002	

HL93 LOADING



5/20/2021

FRAMING PLAN
 UNIT-2
 SPAN (3)
 (MENARD CREEK)



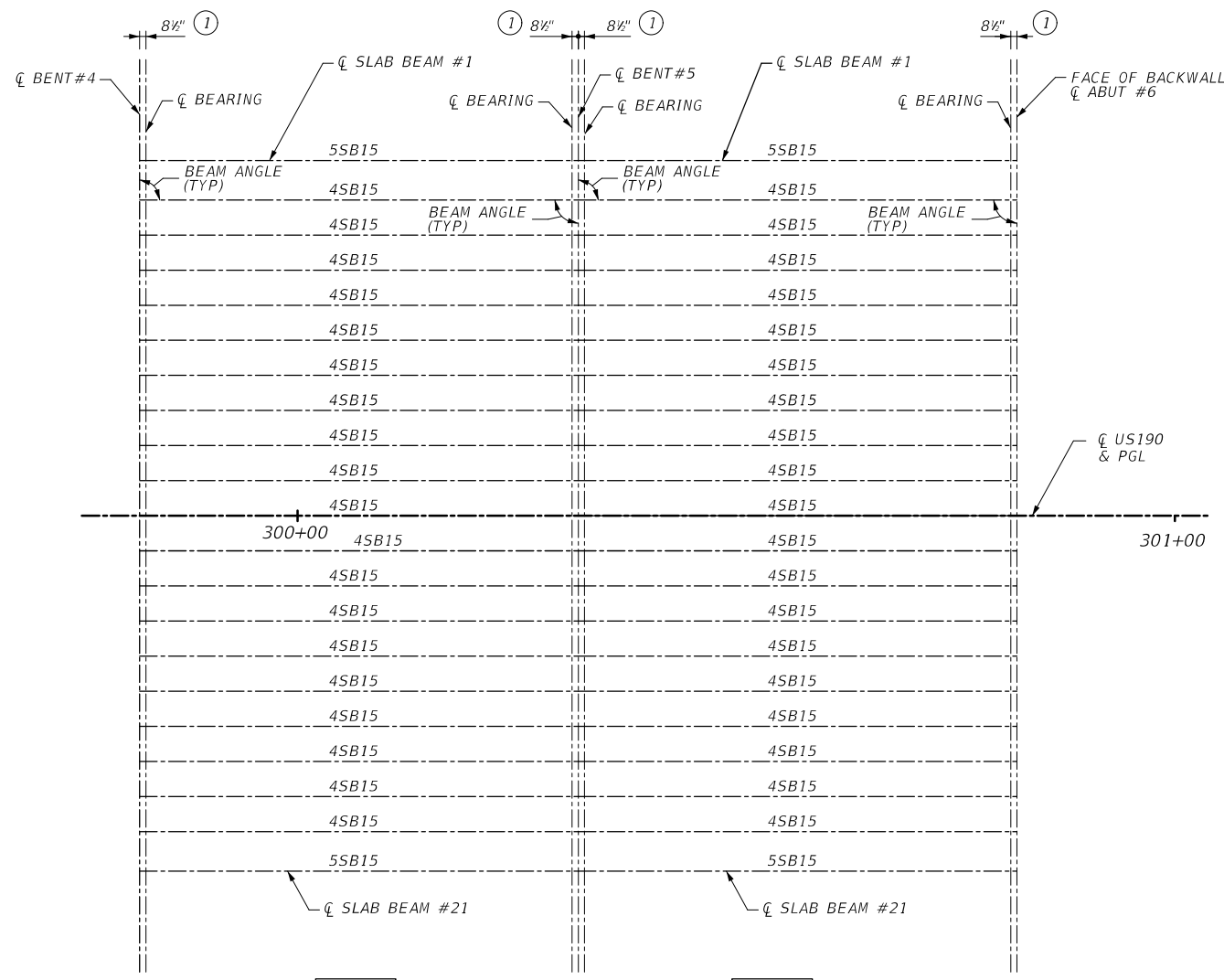
- ① SEE PSBEB FOR ORIENTATION OF DIMENSION.
 ② BEAM LENGTHS SHOWN ARE BOTTOM SLAB BEAM LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.342.6644
 FIRM NUMBER: 12898

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.	
6		212	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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SPAN #4
(4SB15 and 5SB15)
SPAN #5
(4SB15 and 5SB15)

FRAMING PLAN

BEAM REPORT

BEAM REPORT AT CENTER OF BOX, SPAN 4

BOX	HORIZONTAL DISTANCE C-C BENT	TRUE DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE	BEAM BEARING
BOX 1	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 2	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 3	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 4	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 5	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 6	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 7	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 8	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 9	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 10	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 11	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 12	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 13	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 14	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 15	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 16	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 17	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 18	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 19	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 20	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E
BOX 21	50.0000	48.5833	49.5000	-0.00081	N 86 50 19.26 E

BENT REPORT

BENT NO. 4 (S 3 9 40.74 E)					BENT NO. 5 (S 3 9 40.74 E)				
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L					DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L				
SPAN	BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S		SPAN	BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S	
SPAN 4	STEP 1 LEFT	0.0000	90	0 0.00	SPAN 4	STEP 1 LEFT	0.0000	90	0 0.00
	STEP 1 RIGHT	0.0000	90	0 0.00		STEP 1 RIGHT	0.0000	90	0 0.00
BOX 1	LEFT	5.0000	90	0 0.00	BOX 1	LEFT	5.0000	90	0 0.00
	CENTER					CENTER			
BOX 2	LEFT	4.0000	90	0 0.00	BOX 2	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 3	LEFT	4.0000	90	0 0.00	BOX 3	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 4	LEFT	4.0000	90	0 0.00	BOX 4	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 5	LEFT	4.0000	90	0 0.00	BOX 5	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 6	LEFT	4.0000	90	0 0.00	BOX 6	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 7	LEFT	4.0000	90	0 0.00	BOX 7	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 8	LEFT	4.0000	90	0 0.00	BOX 8	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 9	LEFT	4.0000	90	0 0.00	BOX 9	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
BOX 10	LEFT	4.0000	90	0 0.00	BOX 10	LEFT	4.0000	90	0 0.00
	CENTER					CENTER			
STEP 11	LEFT	4.0000	90	0 0.00	STEP 11	LEFT	4.0000	90	0 0.00
STEP 12	LEFT	4.0000	90	0 0.00	STEP 12	LEFT	4.0000	90	0 0.00
BOX 11	LEFT	4.0000	90	0 0.00	BOX 11	LEFT	4.0000	90	0 0.00
BOX 12	LEFT				BOX 12	LEFT			
BOX 13	LEFT	4.0000	90	0 0.00	BOX 13	LEFT	4.0000	90	0 0.00
BOX 14	LEFT				BOX 14	LEFT			
BOX 15	LEFT	4.0000	90	0 0.00	BOX 15	LEFT	4.0000	90	0 0.00
BOX 16	LEFT				BOX 16	LEFT			
BOX 17	LEFT	4.0000	90	0 0.00	BOX 17	LEFT	4.0000	90	0 0.00
BOX 18	LEFT				BOX 18	LEFT			
BOX 19	LEFT	4.0000	90	0 0.00	BOX 19	LEFT	4.0000	90	0 0.00
BOX 20	LEFT				BOX 20	LEFT			
BOX 21	LEFT	4.0000	90	0 0.00	BOX 21	LEFT	4.0000	90	0 0.00
STEP 22	TOTAL				STEP 22	TOTAL			
TOTAL					TOTAL				

- ① SEE PSBEB FOR ORIENTATION OF DIMENSION.
- ② BEAM LENGTHS SHOWN ARE BOTTOM SLAB BEAM LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

HL93 LOADING



5/20/2021

FRAMING PLAN UNIT-3

SPAN (4-5)
(MENARD CREEK)

SHEET 1 OF 2

Texas Department of Transportation
© 2021

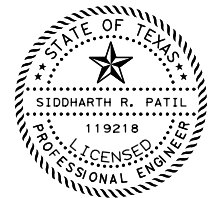
309 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 972.660.4644
F: 972.660.2844
FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		213	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

BENT NO. 5 (S 3 9 40.74 E)				ABUT NO. 6 (S 3 9 40.74 E)			
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L				DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 43.0000 L			
BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S		BOX	STEP SPAC. (CL BENT)	BEAM ANGLE D M S	
SPAN 5				SPAN 5			
STEP 1	0.0000	90	0 0.00	STEP 1	0.0000	90	0 0.00
BOX 1				BOX 1			
	5.0000	90	0 0.00		5.0000	90	0 0.00
BOX 2				BOX 2			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 3				BOX 3			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 4				BOX 4			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 5				BOX 5			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 6				BOX 6			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 7				BOX 7			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 8				BOX 8			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 9				BOX 9			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 10				BOX 10			
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STEP 11				STEP 11			
BOX 11				BOX 11			
	4.0000	90	0 0.00		4.0000	90	0 0.00
STEP 12				STEP 12			
BOX 12				BOX 12			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 13				BOX 13			
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BOX 14				BOX 14			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 15				BOX 15			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 16				BOX 16			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 17				BOX 17			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 18				BOX 18			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 19				BOX 19			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 20				BOX 20			
	4.0000	90	0 0.00		4.0000	90	0 0.00
BOX 21				BOX 21			
	4.0000	90	0 0.00		4.0000	90	0 0.00
STEP 22				STEP 22			
TOTAL	86.0002	90	0 0.00	TOTAL	86.0002	90	0 0.00

BEAM REPORT AT CENTER OF BOX, SPAN 5						
	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG.	BEAM SLOPE	BEAM BEARING	
BOX 1	50.0000	48.5833	49.5001 (2)	-0.00166	N 86 50	19.26 E
BOX 2	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 3	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 4	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 5	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 6	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 7	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 8	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 9	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 10	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 11	50.0000	48.5833	49.5000	-0.00166	N 86 50	19.26 E
BOX 12	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 13	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 14	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 15	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 16	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 17	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 18	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 19	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 20	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E
BOX 21	50.0000	48.5833	49.5001	-0.00166	N 86 50	19.26 E

HL93 LOADING



5/20/2021

**FRAMING PLAN
UNIT-3**

SPAN (4-5)
(MENARD CREEK)

SHEET 2 OF 2



White Hawk
308 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 972.942.9844
FIRM NUMBER: 12898

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			214
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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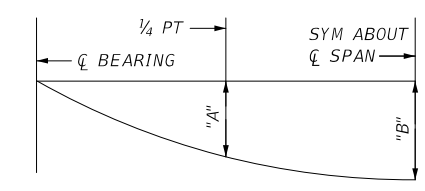
TABLE OF ESTIMATED QUANTITIES ⁽¹⁾					
SPAN	REINF CONCRETE SLAB (SLAB BEAM)	CLASS S CONC	PRESTR CONC SLAB BEAM		TOTAL REINF STEEL
			② 4SB15	② 5SB15	
No.	SF	CY	LF	LF	LB
1	4300	103	940.50	99.00	12,040
2	4300	103	940.50	99.00	12,040
3	4300	103	940.50	99.00	12,040
4	4300	103	940.50	99.00	12,040
5	4300	103	940.50	99.00	12,040
TOTAL	21,500	515	4,702.50	495.00	60,200 ⁽³⁾

GENERAL NOTES:
 DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9th EDITION (2020) AND CURRENT INTERIMS.
 SEE APPLICABLE RAIL DETAILS FOR RAIL ANCHORAGE IN SLAB.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

MATERIAL NOTES:
 PROVIDE CLASS S CONCRETE (f'c = 4,000 psi).
 PROVIDE GRADE 60 REINFORCING STEEL.
 PROVIDE BAR LAPS, WHERE REQUIRED, AS FOLLOWS:
 UNCOATED ~ #4 = 1'-7"
 ~ #5 = 2'-0"

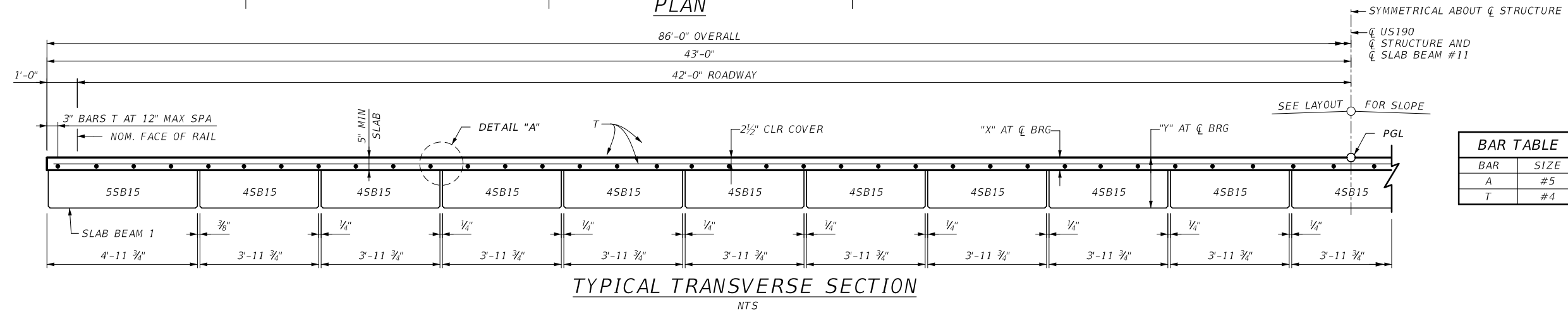
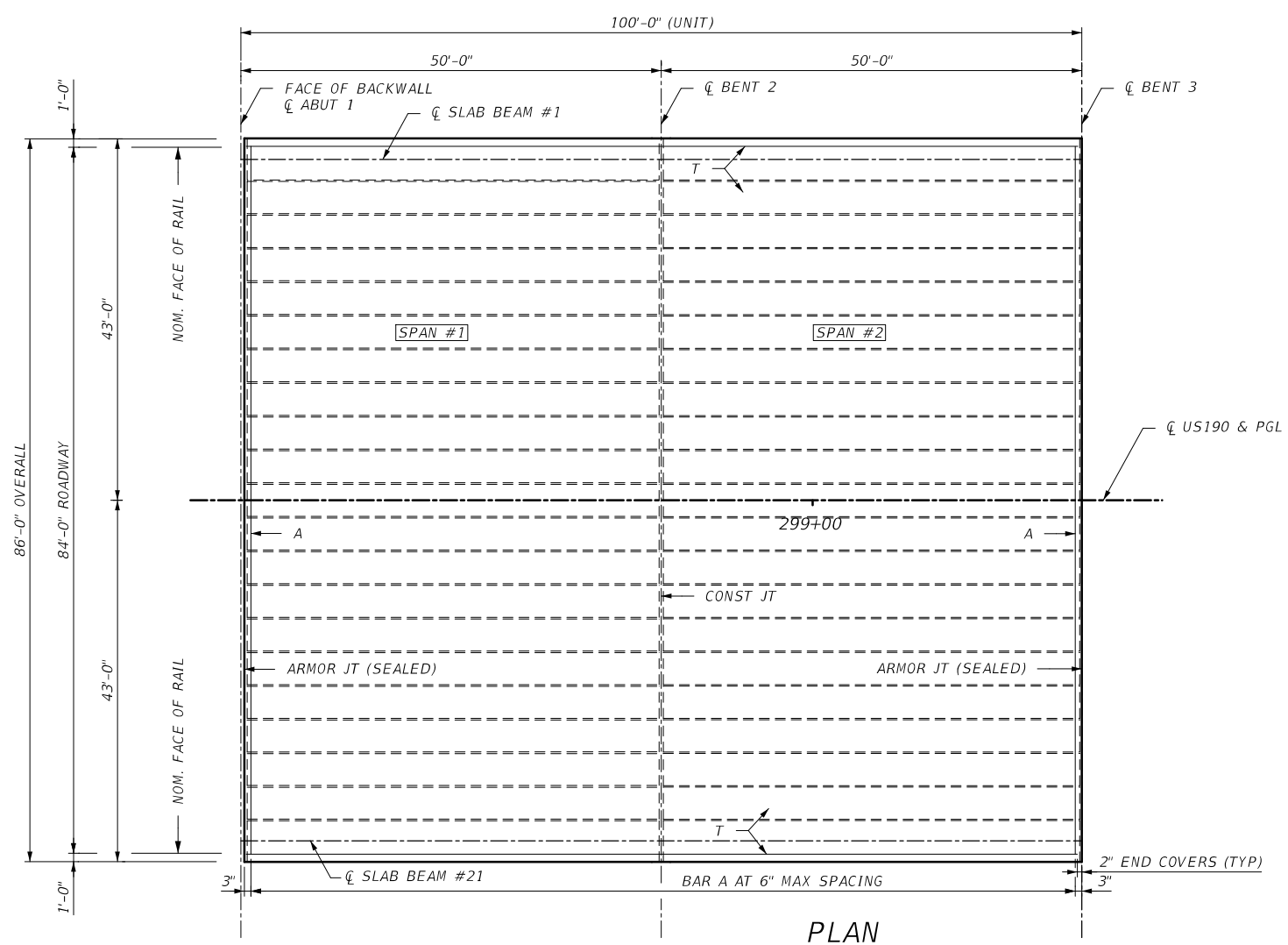
DEFORMED WELDED WIRE REINFORCEMENT (WWR) (ASTM A1064) OF EQUAL SIZE AND SPACING MAY BE SUBSTITUTED FOR BARS A OR T UNLESS NOTED OTHERWISE.



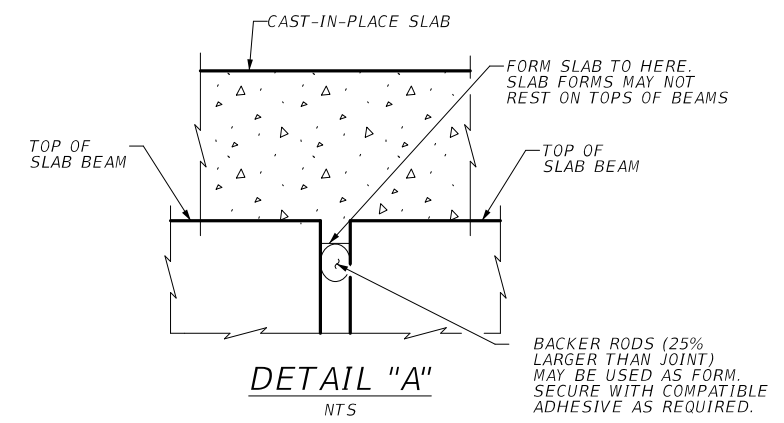
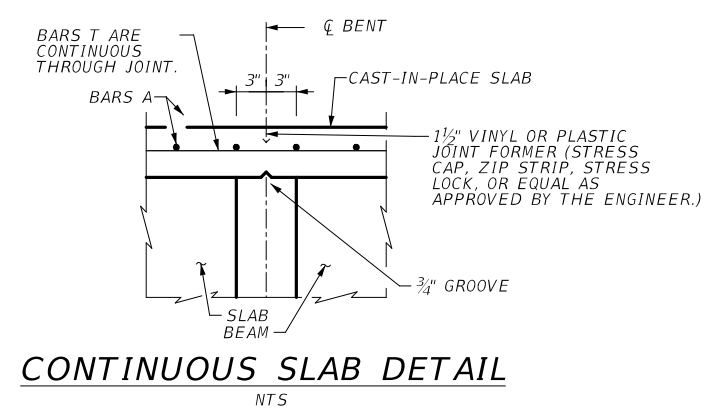
DEAD LOAD DEFLECTION DIAGRAM

NOTE: DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY (E = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DIMENSIONS MAY BE LESS. ADJUST BASED ON FIELD VERIFICATION.

TABLE OF VARIABLE VALUES					
SPAN No.	BEAM No.	DEADLOAD DEFLECTION		SECTION DEPTHS	
		"A"	"B"	"X"	"Y"
		FT	FT	IN	IN
1	ALL	0.028	0.039	7 3/4"	22 3/4"
2	ALL	0.028	0.039	7 3/4"	22 3/4"



BAR TABLE	
BAR	SIZE
A	#5
T	#4



- ① FOR CONTRACTORS INFORMATION ONLY.
- ② LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTH S WITH ADJUSTMENTS MADE FOR GIRDER SLOPE. SEE FRAMING PLAN SHEET FOR BEAM LENGTHS.
- ③ REINFORCING STEEL WEIGHT IS CALCULATED USING AN ADJUSTMENT FACTOR OF 2.8 PSF.

HL93 LOADING

5/20/2021

100'-0" PRESTRESSED
CONCRETE SLAB BEAM UNIT-1
 SPAN (1-2)
 (MENARD CREEK)

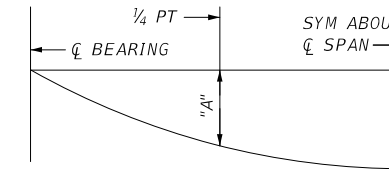
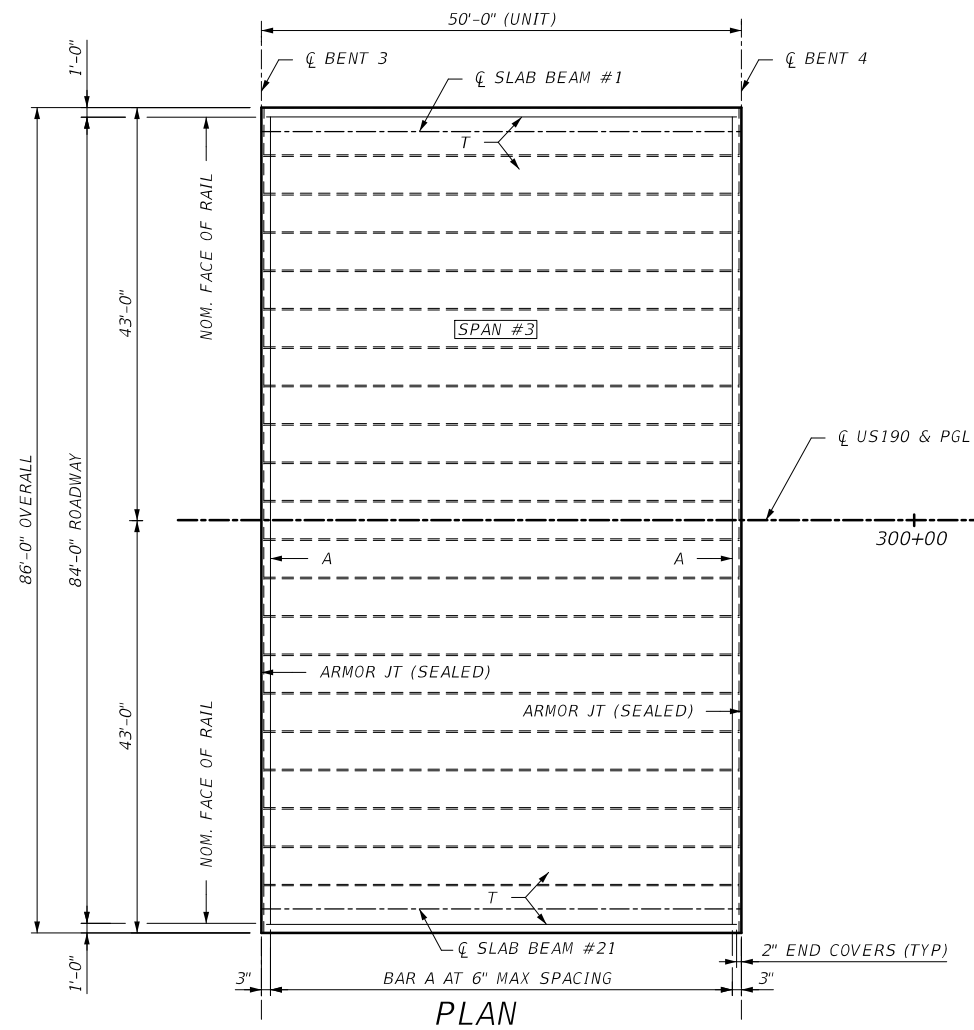
SHEET 1 OF 3

Texas Department of Transportation
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308 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.962.4644
 FIRM NUMBER: 12998

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		215	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

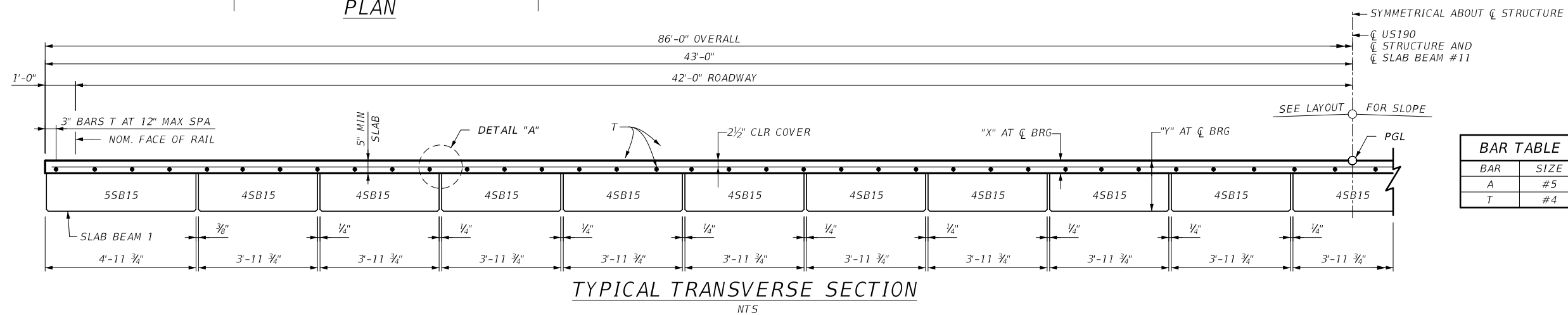
GENERAL NOTES:
SEE SHEET 1 OF 3 FOR NOTES



DEAD LOAD DEFLECTION DIAGRAM

NOTE: DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY (E = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DIMENSIONS MAY BE LESS. ADJUST BASED ON FIELD VERIFICATION.

TABLE OF VARIABLE VALUES					
SPAN No.	BEAM No.	DEADLOAD DEFLECTION		SECTION DEPTHS	
		"A" FT	"B" FT	"X" IN	"Y" IN
3	ALL	0.028	0.039	7 3/4"	22 3/4"



BAR TABLE	
BAR	SIZE
A	#5
T	#4

- FOR CONTRACTORS INFORMATION ONLY.
- LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE. SEE FRAMING PLAN SHEET FOR BEAM LENGTHS.
- REINFORCING STEEL WEIGHT IS CALCULATED USING AN ADJUSTMENT FACTOR OF 2.8 PSF.

HL93 LOADING



5/20/2021

50'-0" PRESTRESSED
CONCRETE SLAB
BEAM UNIT-2
SPAN (3)
(MENARD CREEK)

SHEET 2 OF 3

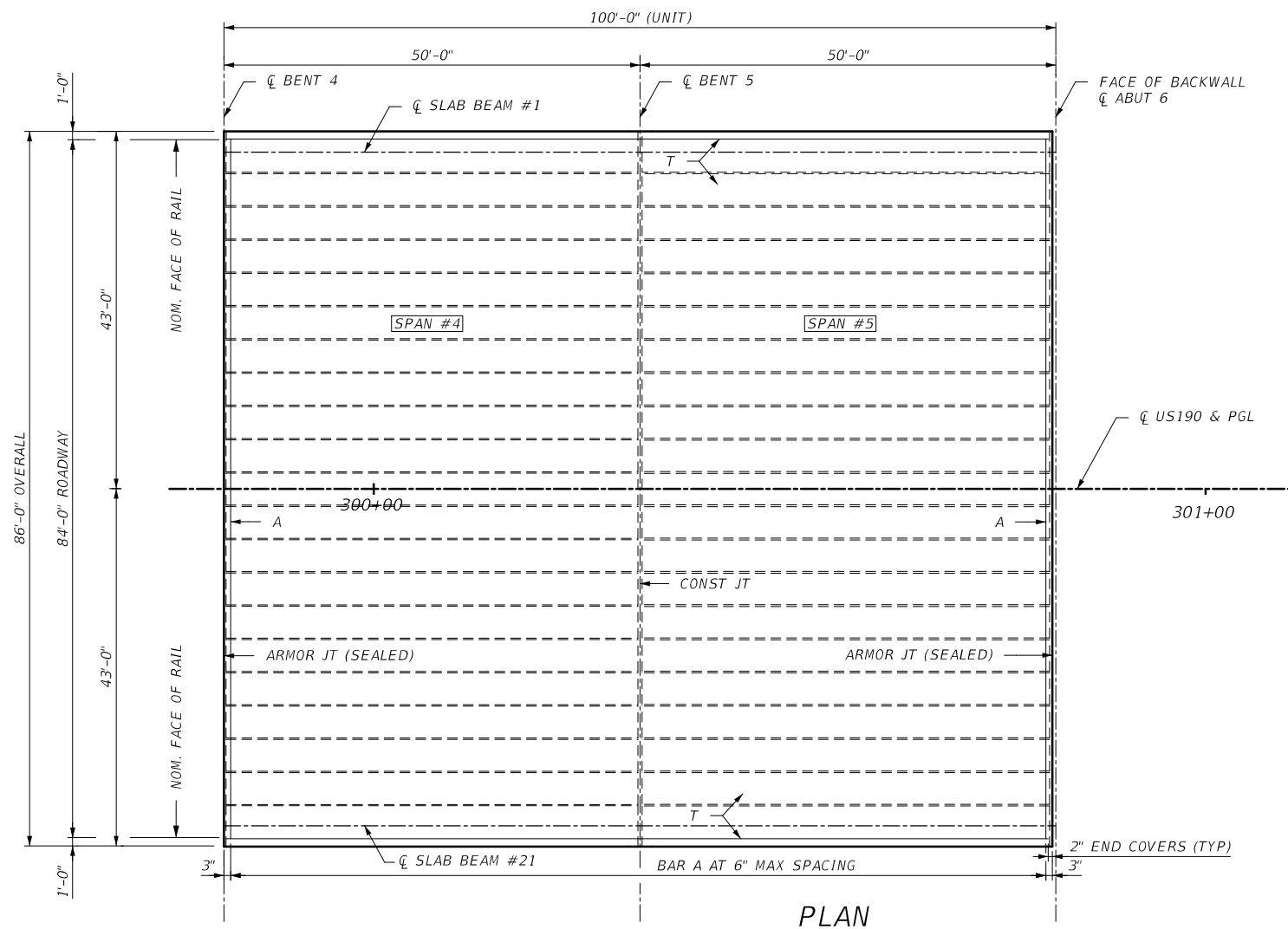


309 SOUTH JUPITER ROAD, SUITE 200
ALLEN, TX 75002
P: 972.942.6544
FIRM NUMBER: 12898

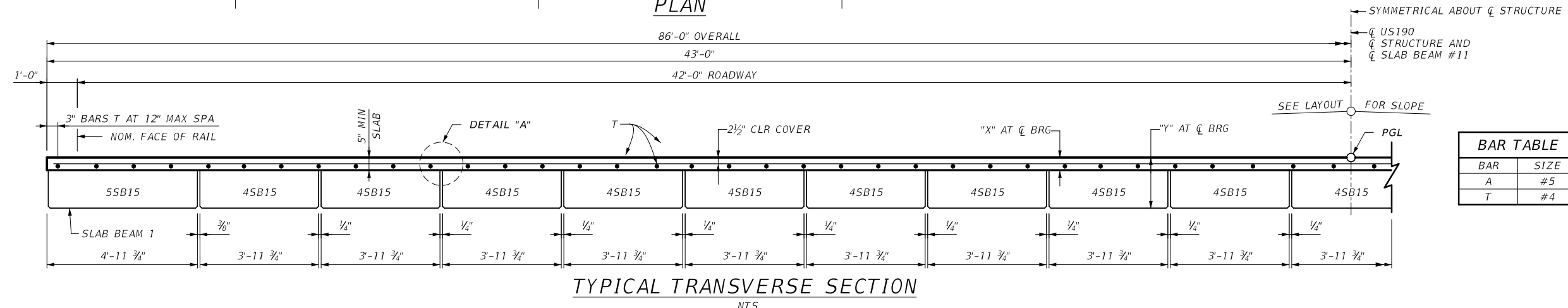
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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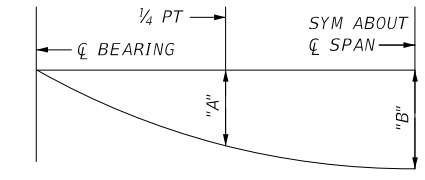


PLAN



TYPICAL TRANSVERSE SECTION
NTS

GENERAL NOTES:
SEE SHEET 1 OF 3 FOR NOTES



DEAD LOAD DEFLECTION DIAGRAM

NOTE: DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY (E = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DIMENSIONS MAY BE LESS. ADJUST BASED ON FIELD VERIFICATION.

TABLE OF VARIABLE VALUES					
SPAN No.	BEAM No.	DEADLOAD DEFLECTION		SECTION DEPTHS	
		"A" FT	"B" FT	"X" IN	"Y" IN
4	ALL	0.028	0.039	7 3/4"	22 3/4"
5	ALL	0.028	0.039	7 3/4"	22 3/4"

BAR TABLE	
BAR	SIZE
A	#5
T	#4

- FOR CONTRACTORS INFORMATION ONLY.
- LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE. SEE FRAMING PLAN SHEET FOR BEAM LENGTHS.
- REINFORCING STEEL WEIGHT IS CALCULATED USING AN ADJUSTMENT FACTOR OF 2.8 PSF.

HL93 LOADING

5/20/2021

100'-0" PRESTRESSED
**CONCRETE SLAB
 BEAM UNIT-3**
 SPAN (4-5)
 (MENARD CREEK)

SHEET 3 OF 3

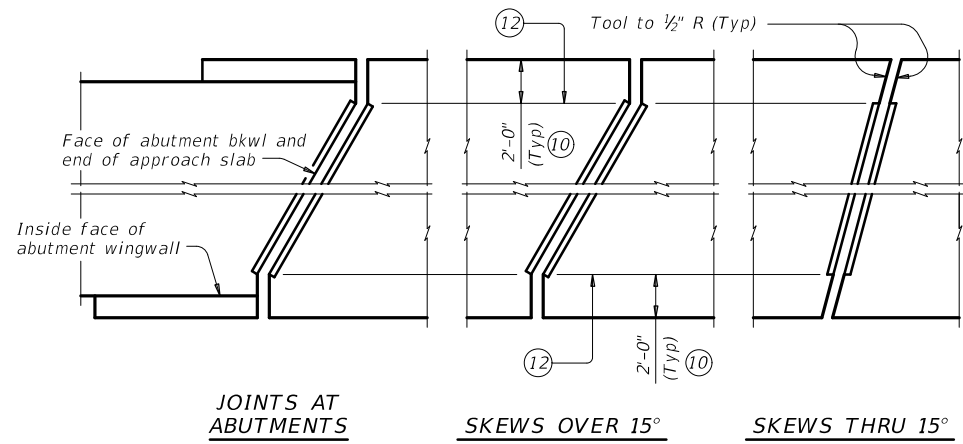
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309 SOUTH JUPITER ROAD, SUITE 200
 ALLEN, TX 75002
 P: 972.942.4644
 FIRM NUMBER: 12698

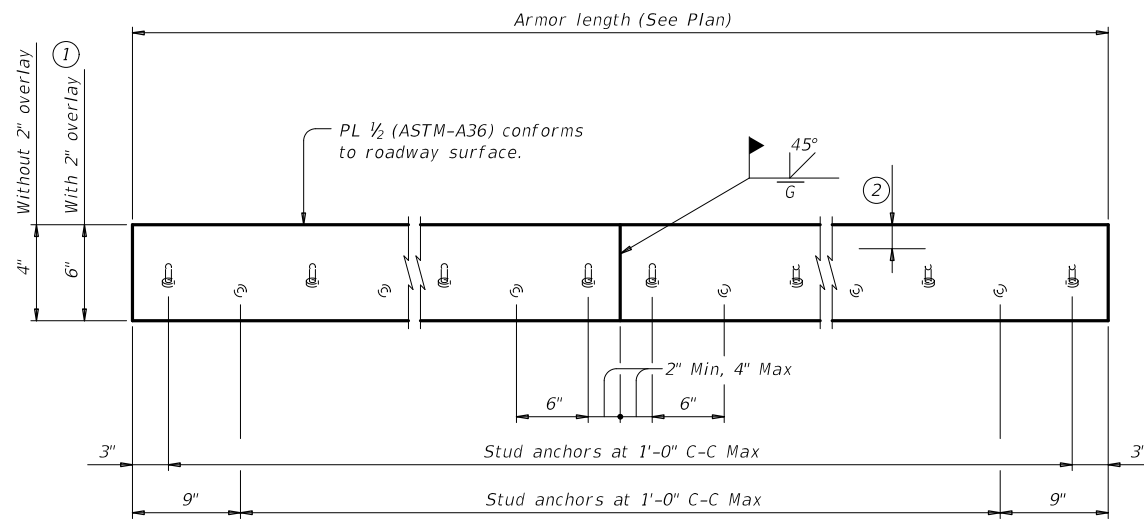
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6		217	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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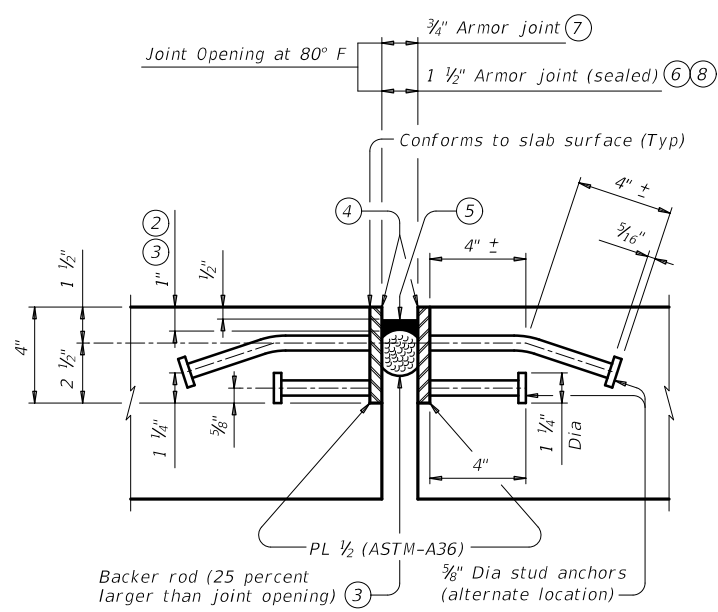


JOINTS AT ABUTMENTS
SKEWS OVER 15°
SKEWS THRU 15°
PLANS OF ARMOR PLATES

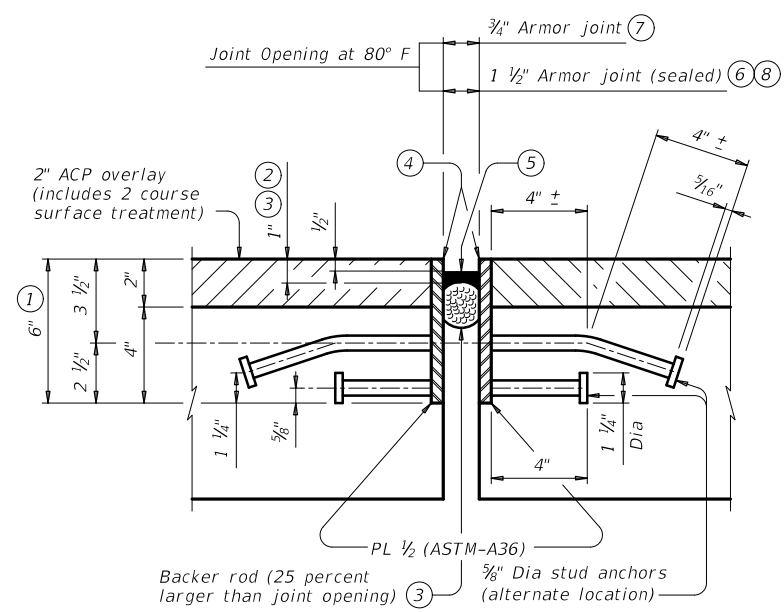


ELEVATION OF BASIC ARMOR PLATE

- ① Adjust 6" plate height for overlay thicknesses other than the 2" shown. Adjust weight by 1.70 plf for each 1/2" variation in thickness.
- ② Do not paint top 1/2" of plate if using sealed armor joint.
- ③ Set top of backer rod 1" below top of armor plate. Backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- ④ Blast clean entire contact area between sealant and plate (SSPC-SP10) before installing sealant. Light brush blast and thoroughly clean all dust and debris from concrete surfaces in contact with joint sealant before application of silicone seal.
- ⑤ Use Class 7 joint sealant that conforms to DMS-6310.
- ⑥ Place sealant while ambient temperature is between 55°F and 80°F and is rising.
- ⑦ Armor joint does not include joint sealant or backer rod.
- ⑧ Armor joint (sealed) includes Class 7 joint sealant and backer rod.
- ⑨ Form vertical leg of seal as per the Manufacturer's recommendations. Use Class 4 joint sealant if Class 7 cannot be installed correctly. Install according to Manufacturer's recommendations.
- ⑩ Unless shown otherwise, terminate armor plate at slab break point if break is more than 2'-0" from slab edge.
- ⑪ See "Plans of Armor Plates".
- ⑫ At Fabricator's option, armor plate may extend up to 6" beyond this point for skews through 15°.
- ⑬ Align shipping angle perpendicular to joint.



SHOWN WITHOUT 2" OVERLAY AT JOINT LOCATION



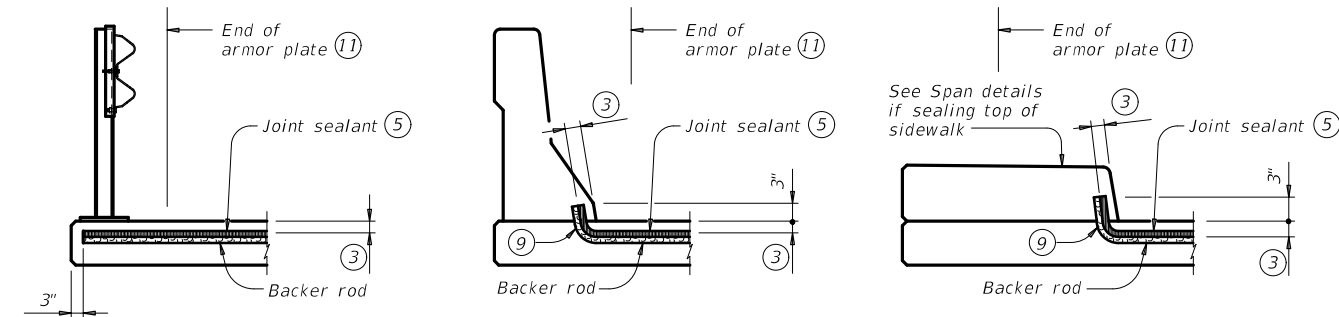
SHOWN WITH 2" OVERLAY AT JOINT LOCATION

ARMOR JOINT SECTIONS
 Showing Armor Joint (Sealed)

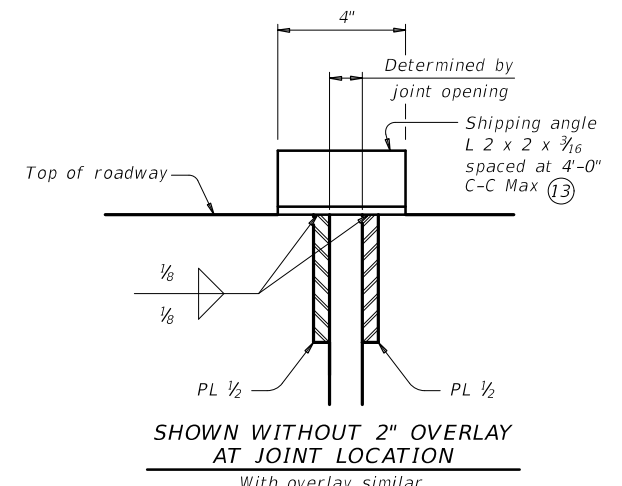
FABRICATION NOTES:
 Match mark corresponding plate sections and secure together for shipment with shipping angle. Do not use erection bolts. Ship armor joints in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for stage construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max. Weld studs in accordance with AWS D1.1. Use groove welds for all shop and field butt splices. Grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop. Paint the entire steel section, except as stated in Note 2, with System II or IV primer in accordance with Item 446 "Field Cleaning and Painting Steel." Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Items 446.4.7.3 and 446.4.7.4. Shop drawings for the fabrication of armor joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

CONSTRUCTION NOTES:
 Secure armor joints in position and place to proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for Armor Joint. Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

GENERAL NOTES:
 Provide armor joints at locations shown on the plans. Provide the seal when "Armor Joint (Sealed)" is noted on the plans. These joint details accommodate a joint movement range of 1 3/8" (3/4" opening movement and 5/8" closure movement). Payment for armor joint, with or without seal, is based on length of armor plate.



JOINT SEALANT TERMINATION DETAILS
 Armor joint (sealed) only. Armor plate is not shown for clarity.



SHIPPING ANGLE

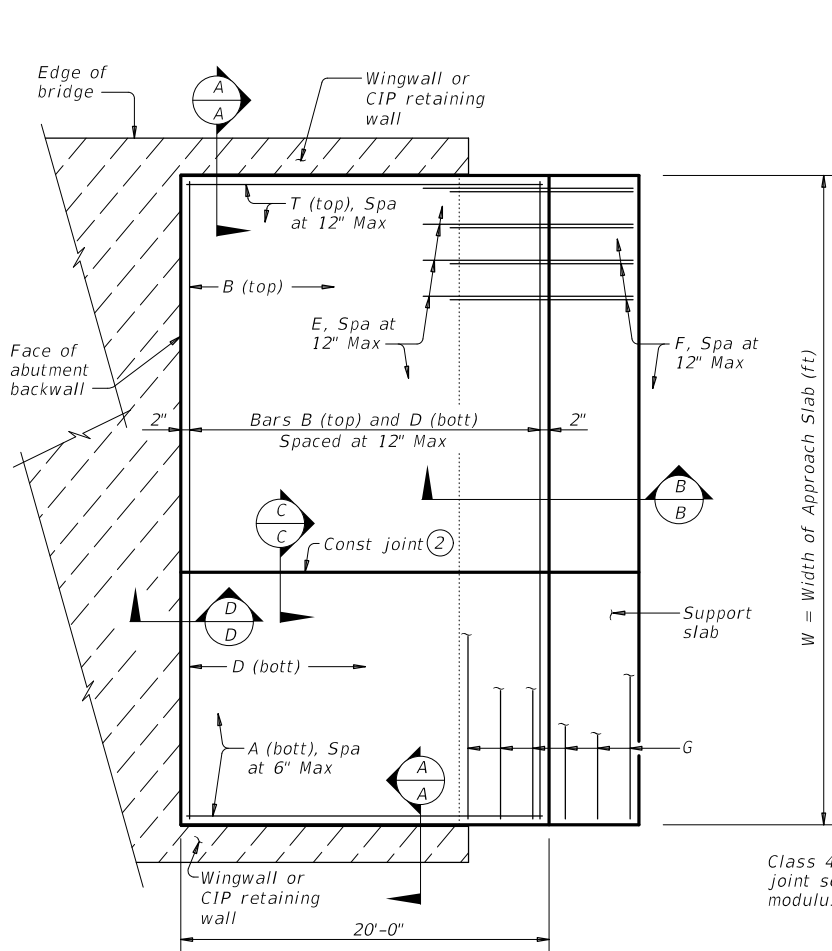
An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

WEIGHTS FOR ONE ARMOR JOINT (2 PLATES)	
WITHOUT OVERLAY	16.10 plf
WITH 2" OVERLAY ①	22.90 plf

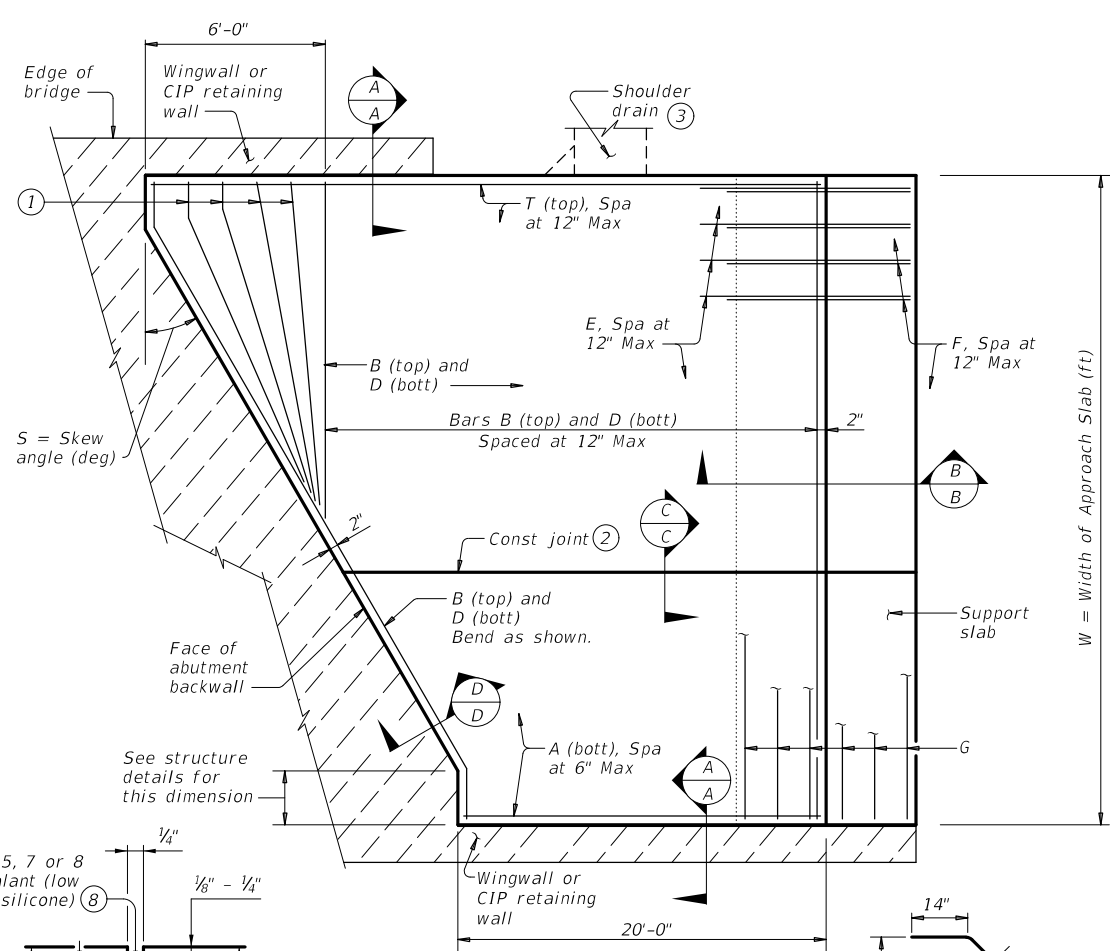
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ARMOR JOINT DETAILS					
AJ					
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REV: 0213	SECT: 04	JOB: 050	HIGHWAY		
DIST: LFK	COUNTY: POLK	SHEET NO. 220			

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PLAN
(Showing non-skewed approach slab.)



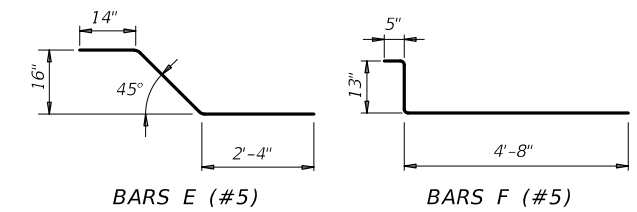
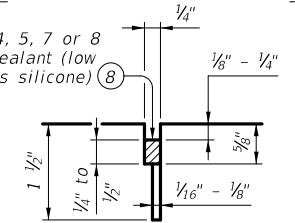
PLAN
(Showing skewed approach slab.)

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
E	#5
F	#5
G	#5
T	#5

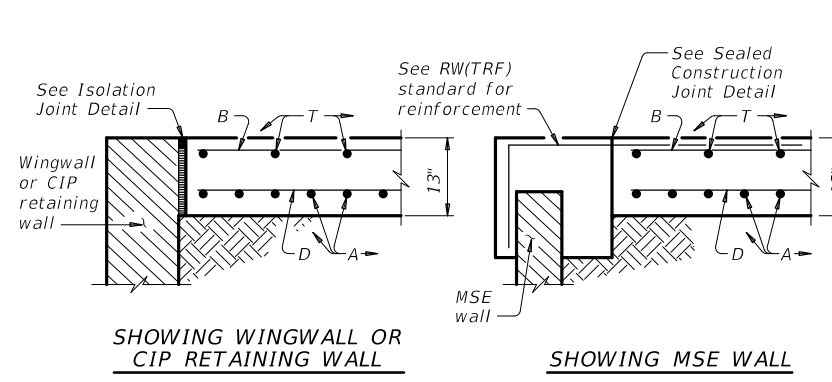
APPROXIMATE QUANTITIES ⁽⁴⁾	
Reinf steel weight = 8.5 Lbs/SF of Approach Slab = 18.4 Lbs/LF of Support Slab	
Vol of Appr Slab Conc (CY) = 1.057W - 0.008W x T + 0.02W ² Tan S (Includes Support Slab)	
W = Width of Approach Slab (ft)	
T = Conc Pavement Thickness (in)	
S = Skew Angle (deg)	

- ① Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.
- ② Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.
- ③ See details elsewhere in plans for shoulder drain location and details.
- ④ For Contractor's information only. Quantities shown are for one approach slab only.
- ⑤ On portion of support slab that supports the concrete pavement, adjust top surface elevation, if required, to accommodate concrete pavement thickness. Smooth trowel finish. Oil top of support slab with 60 grade oil and apply heavy coat of powdered graphite. Press down one layer of 30# roofing felt.
- ⑥ Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.
- ⑦ See details elsewhere in plans for required cross-slope.
- ⑧ Place in accordance with Item 438.
- ⑨ Provide backer rod that is 25% larger than joint opening and compatible with the sealant.
- ⑩ If bridge rail is present at the wingwall or CIP retaining wall, place 1/2" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

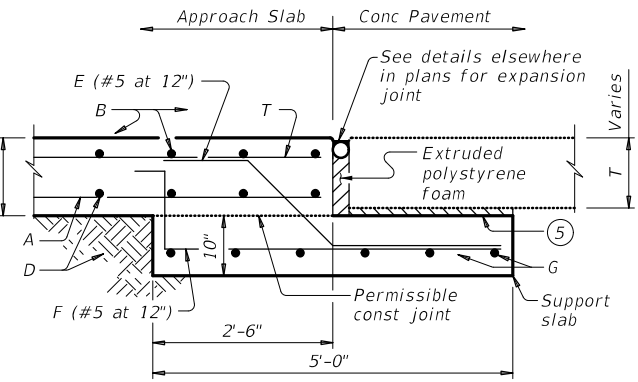
LONGITUDINAL SAW CUT JOINT DETAIL



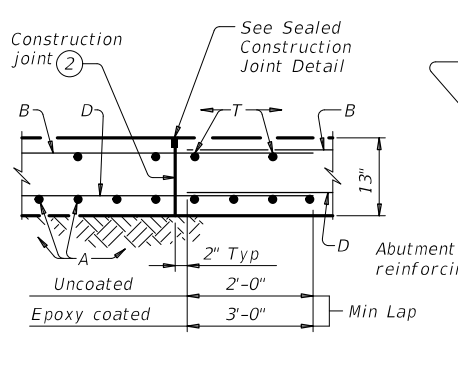
GENERAL NOTES:
 Construct approach slab in accordance with Item 422.
 Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.
 Provide Grade 60 reinforcing steel.
 Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 1/2" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 1/2" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)
 Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310, "Joint Sealants and Fillers."
 Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.
 Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.
 Cure for 4 days using water or membrane curing per Item 422.
 All details shown herein are subsidiary to bridge approach slab.
 Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.



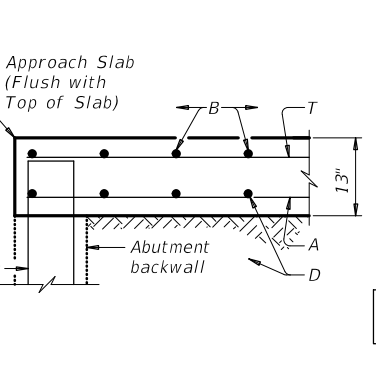
SECTION A-A



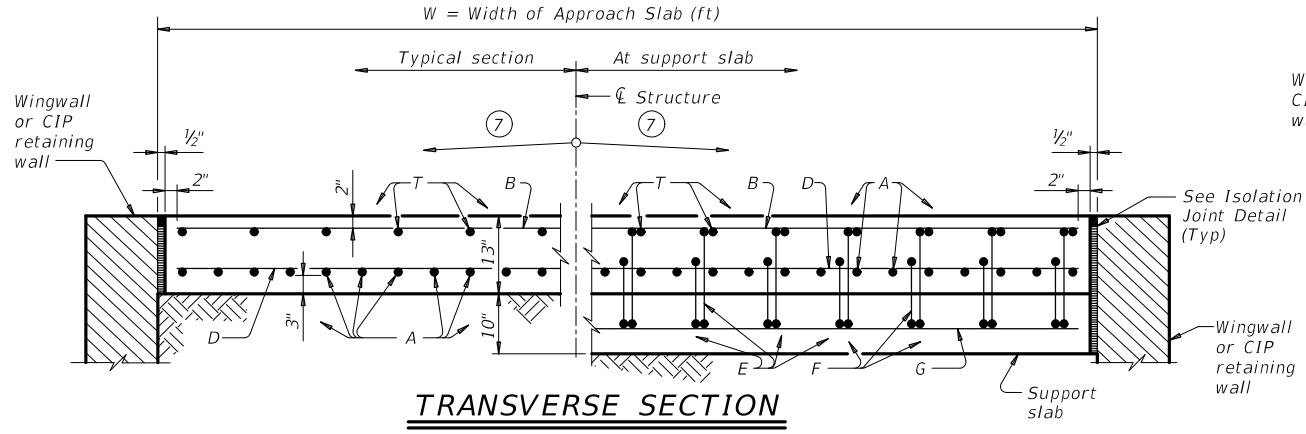
SECTION B-B



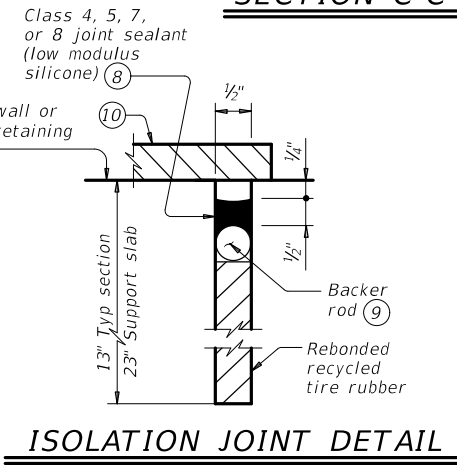
SECTION C-C



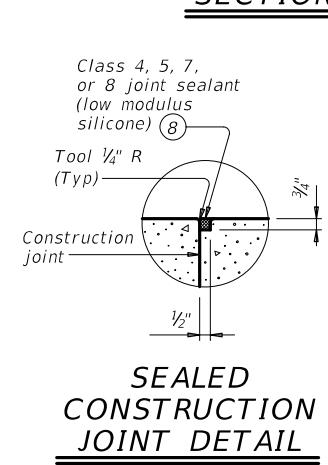
SECTION D-D



TRANSVERSE SECTION



ISOLATION JOINT DETAIL

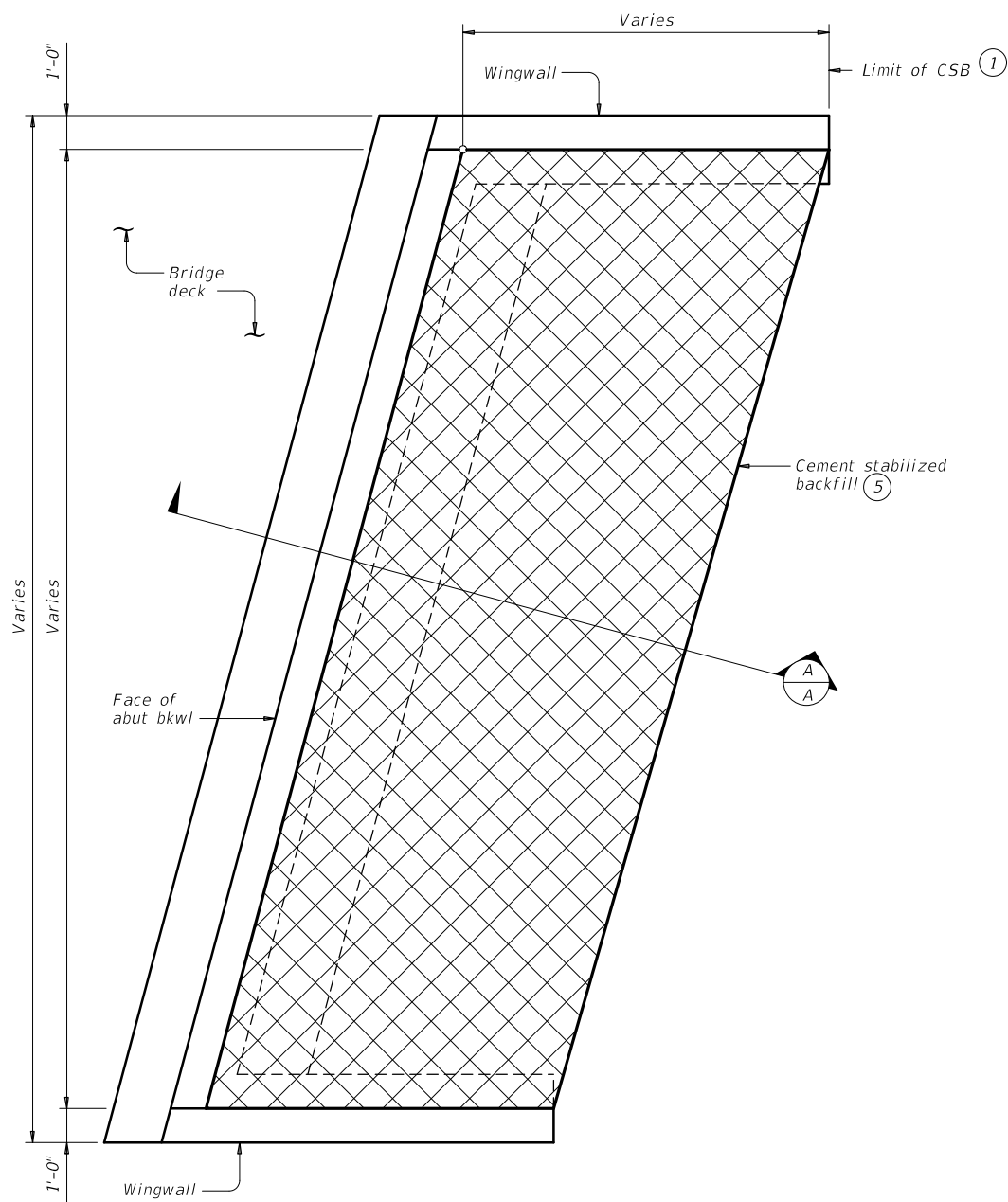


SEALED CONSTRUCTION JOINT DETAIL

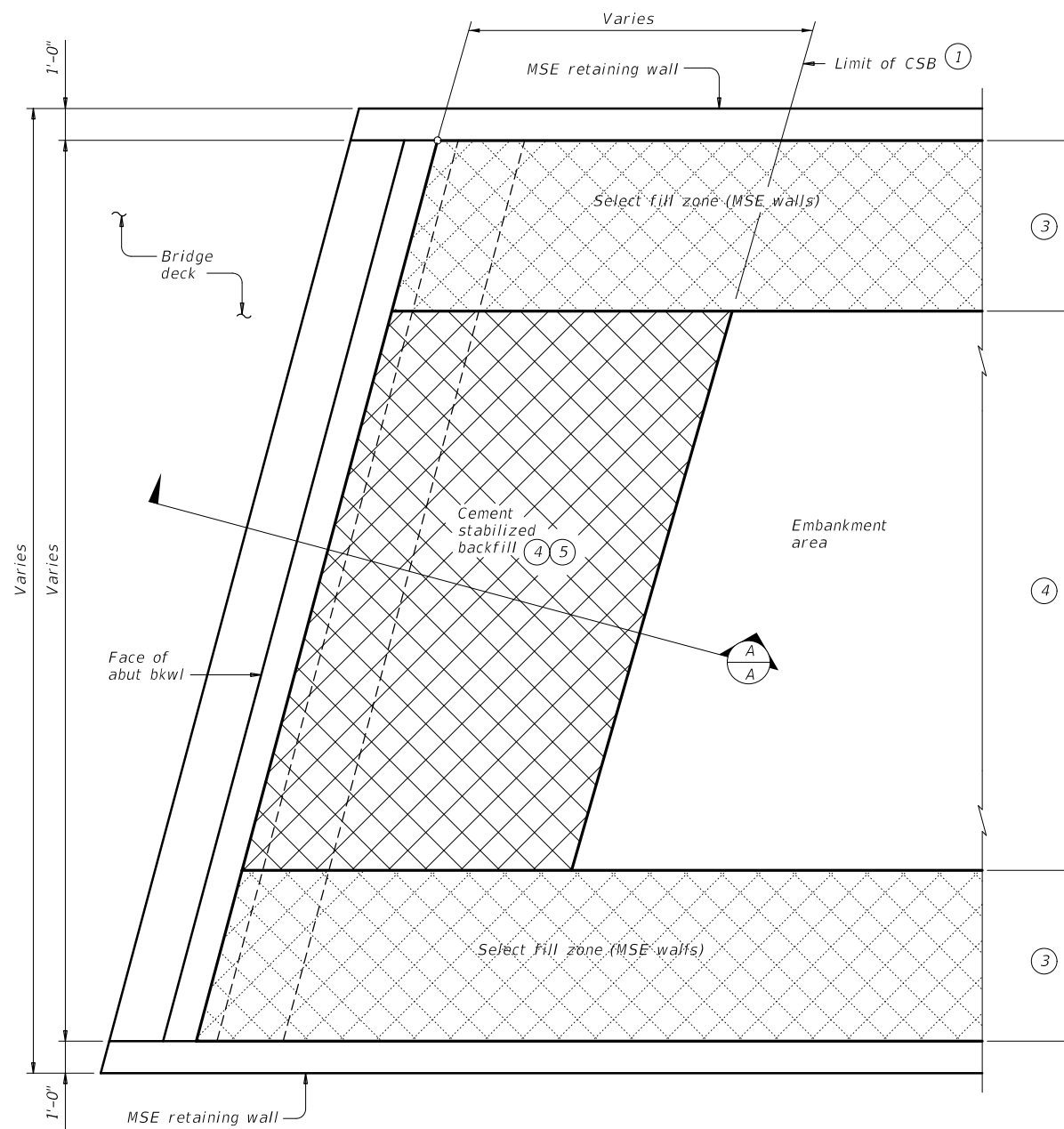
		Bridge Division Standard	
BRIDGE APPROACH SLAB CONCRETE PAVEMENT			
BAS-C			
FILE: bascte1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONTRACT	SECTION	JOB
REVISIONS	0213	04	050
02-20: Removed stress relieving pad.	DIST	COUNTY	SHEET NO.
	LFK	POLK	221

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DATE: 5/20/2021 3:44:07 PM
 FILE: \\US190_BRG04_csabste1-20.dgn



OPTION 1 ~ PLAN WITH WINGWALLS
 Cast-in-place retaining walls similar.

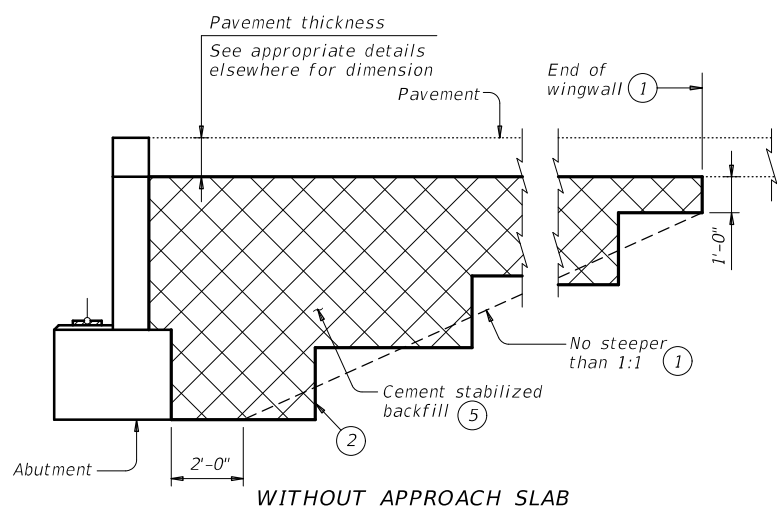


OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

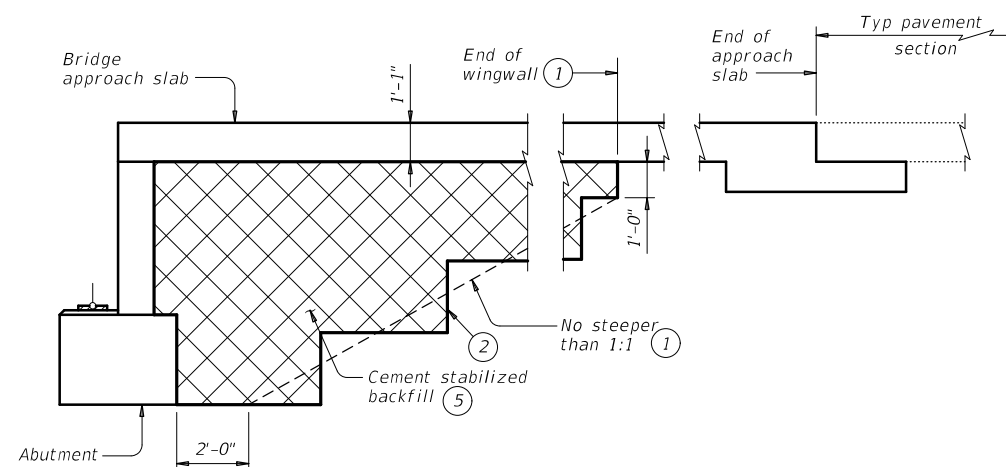
- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ④ When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.
- ⑤ If shown in the plans flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
 - a) If flowable backfill is to be placed over MSE backfill then a filter fabric will be placed over the flowable fill; and
 - b) Place flowable fill in lifts not exceeding 2 feet in height, place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

GENERAL NOTES:

See the Bridge Layout for selected Option. Option 2 is intended for new construction requiring high plasticity embankment fill with a plasticity index (PI) greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays. Option 1 is intended for construction only requiring PI controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment. Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments. If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", to the limits shown at bridge abutments. Details are drawn showing left forward skew. See Bridge Layout for actual skew direction. These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.



WITHOUT APPROACH SLAB



SECTION A-A

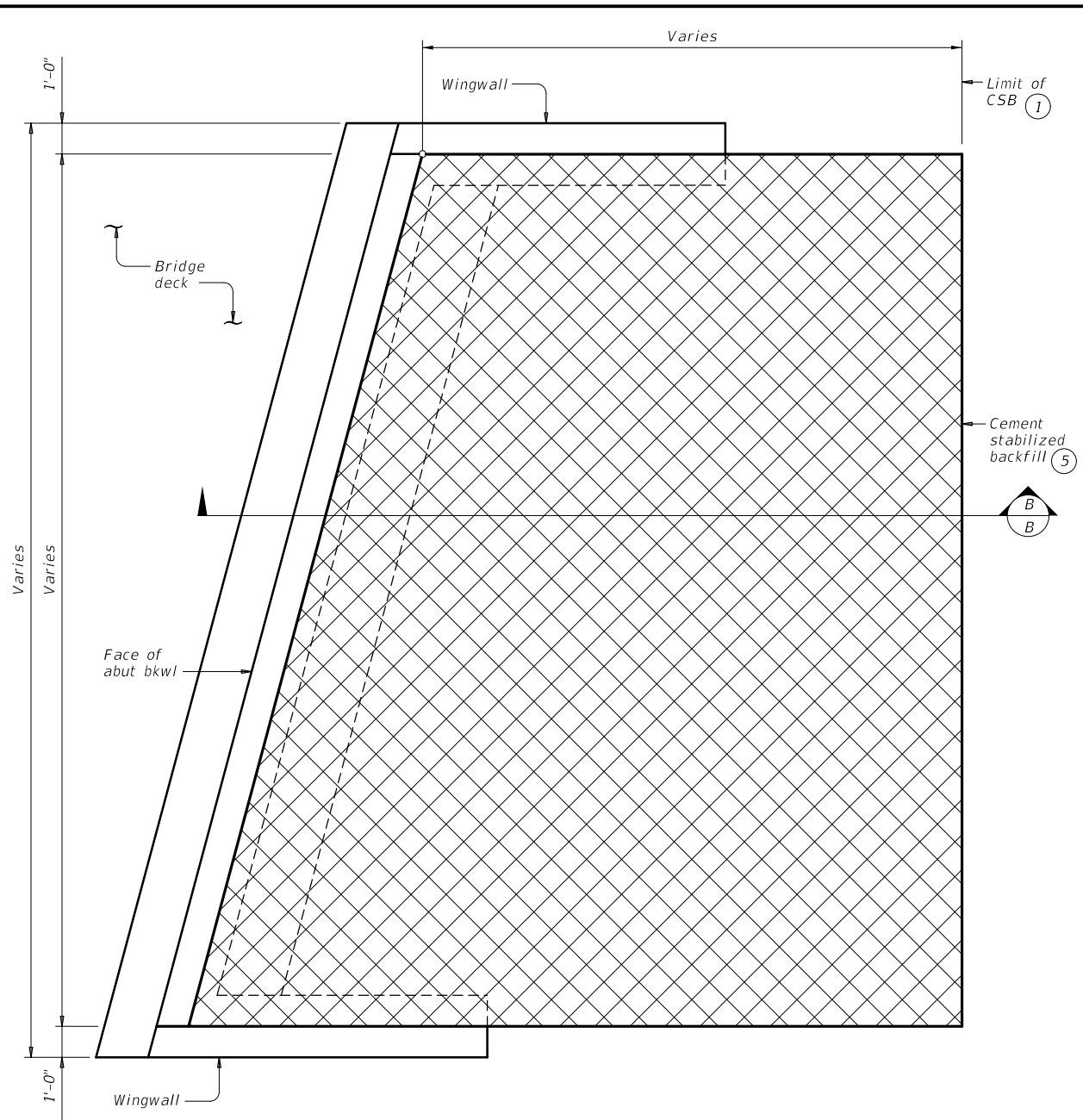
WITH APPROACH SLAB
 (Showing BAS-C, BAS-A similar.)

SHEET 1 OF 2

		Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT			
CSAB			
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT	April 2019	CONTRACT	SECT
0213	04	050	US 190
02-20: Added Option 2.	DIST	COUNTY	SHEET NO.
	LFK	POLK	222

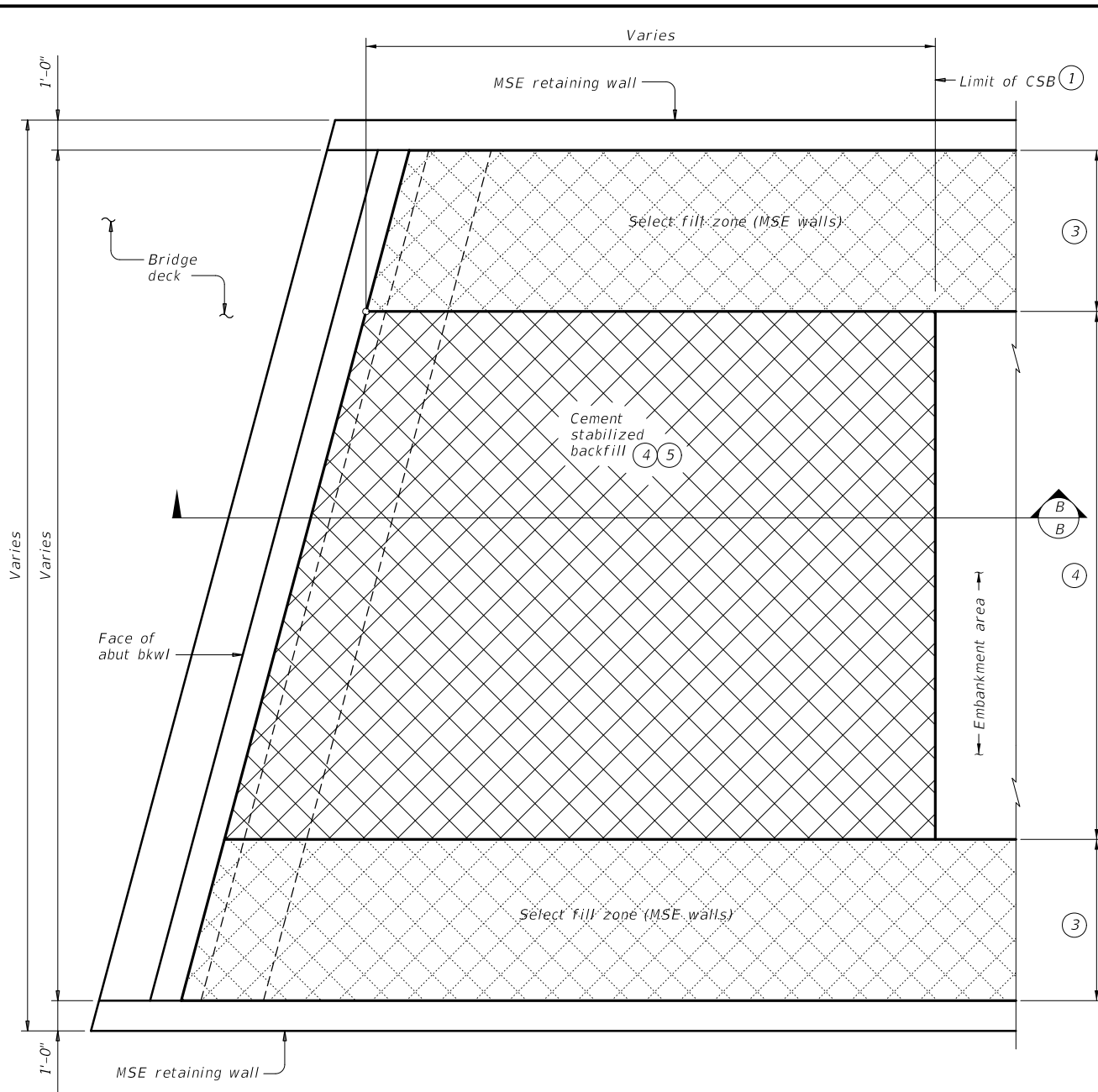
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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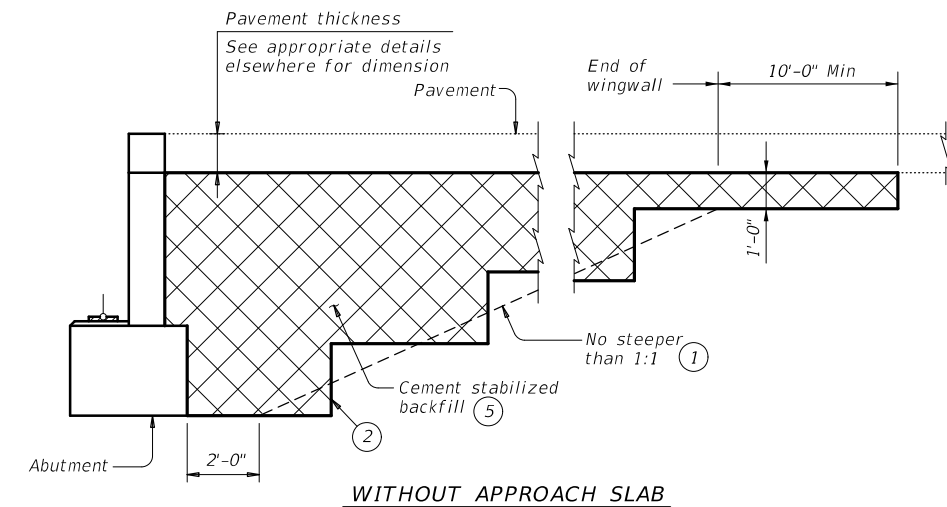
OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

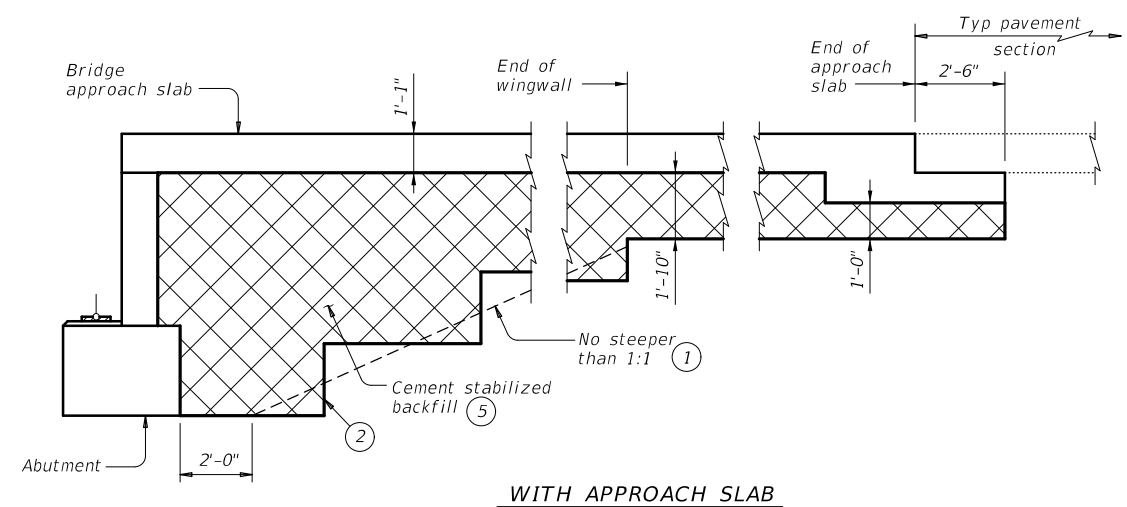


OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ④ When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.
- ⑤ If shown in the plans flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
 - a). If flowable backfill is to be placed over MSE backfill then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
 - b). Place flowable fill in lifts not exceeding 2 feet in height, place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).



WITHOUT APPROACH SLAB



SECTION B-B

WITH APPROACH SLAB
 (Showing BAS-C, BAS-A similar.)

SHEET 2 OF 2



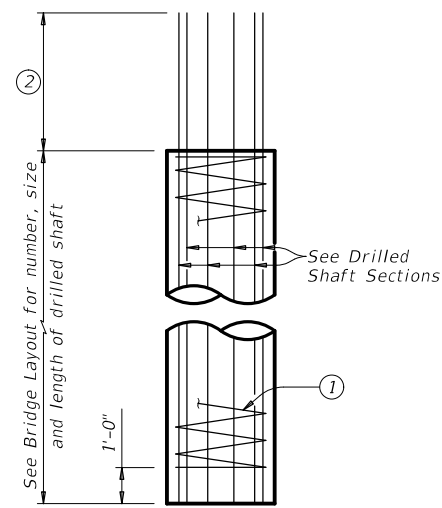
**CEMENT STABILIZED
 ABUTMENT BACKFILL
 BRIDGE ABUTMENT**

CSAB

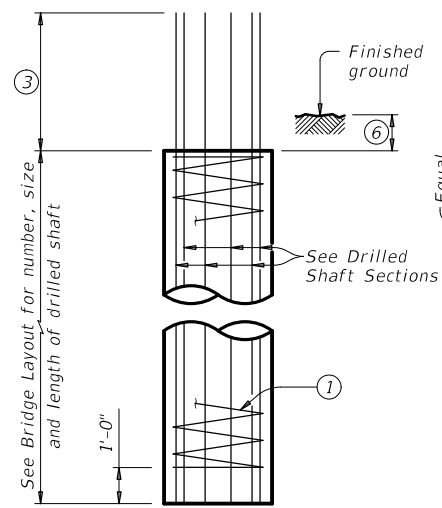
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
02-20: Added Option 2.	DIST	COUNTY	SHEET NO.	
	LFK	POLK	223	

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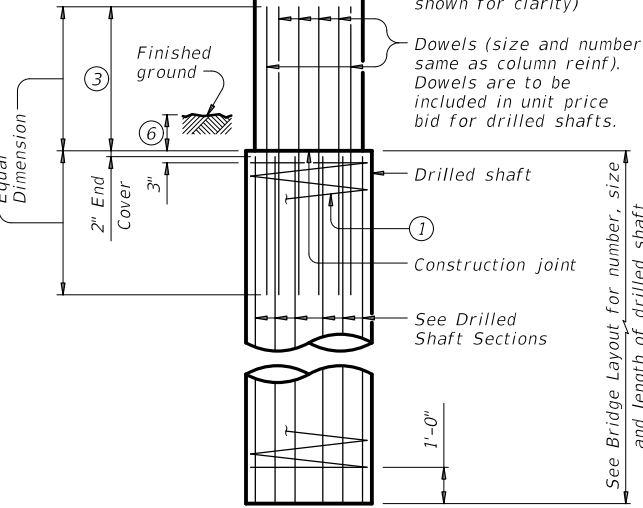
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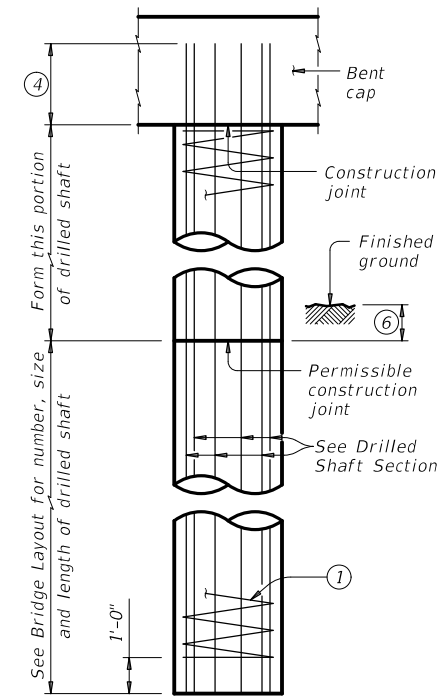
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



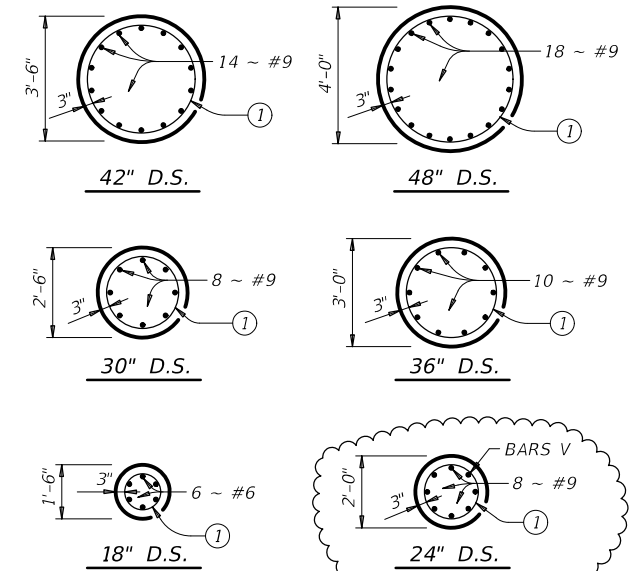
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL ⑤



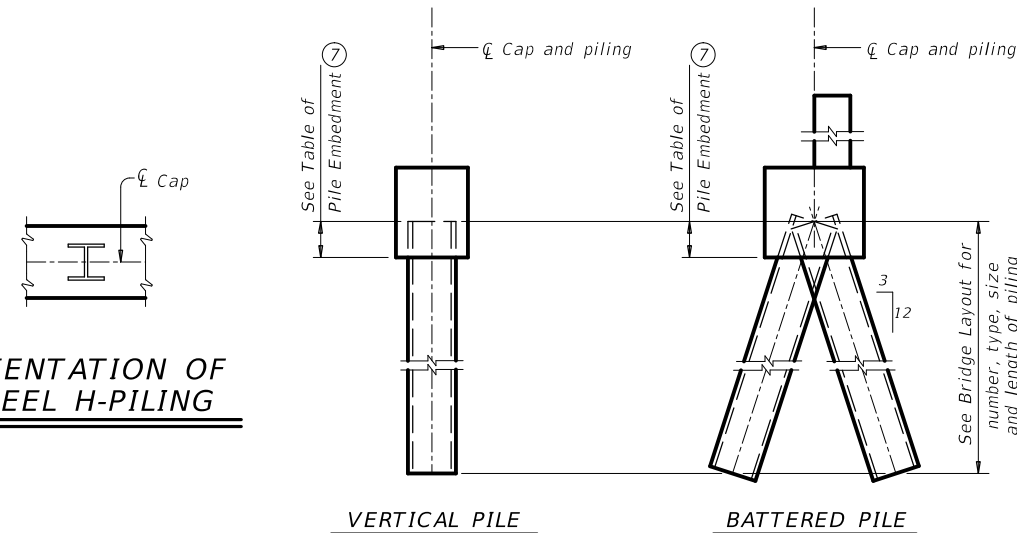
DRILLED SHAFT SECTIONS

DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

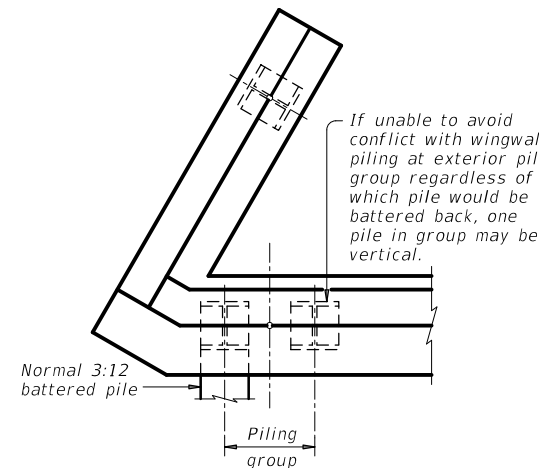
ORIENTATION OF STEEL H-PILING



VERTICAL PILE

BATTERED PILE

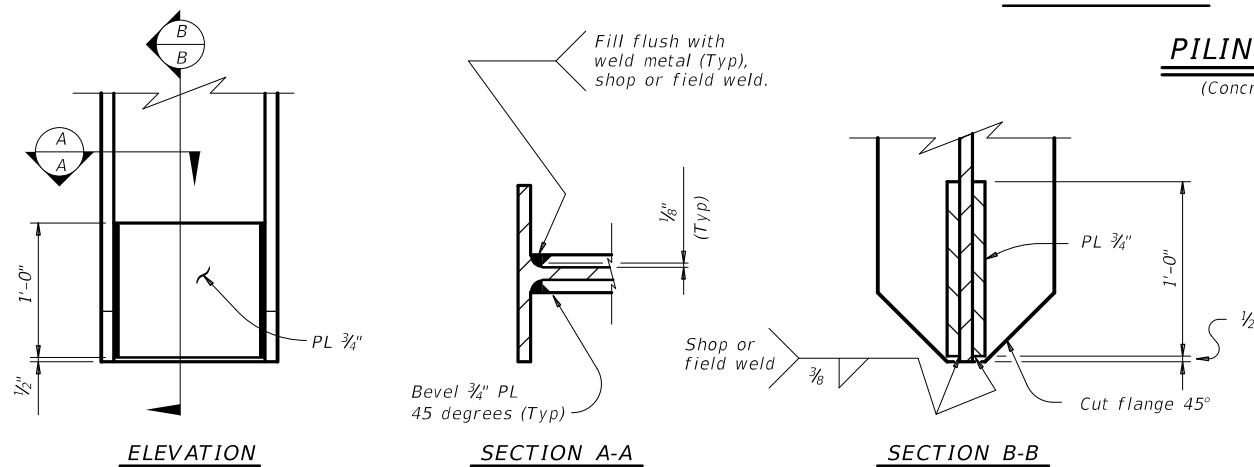
PILING DETAILS
(Concrete or steel H)



DETAIL "A"

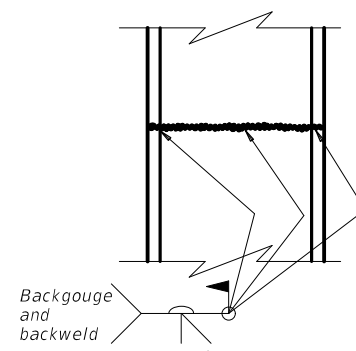
(Showing plan view of a 30° skewed abutment)

- ① #3 spiral at 6" pitch (one and a half flat turns top and bottom).
- ② Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"
- ③ Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"
- ④ Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"
- ⑤ Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.
- ⑥ 1'-0" Min, unless shown otherwise on plans.
- ⑦ Or as shown on plans.



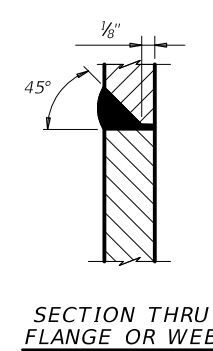
STEEL H-PILE TIP REINFORCEMENT

See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.

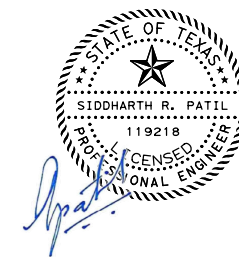


STEEL H-PILE SPLICE DETAIL

Use when required.



SECTION THRU FLANGE OR WEB



5/20/2021

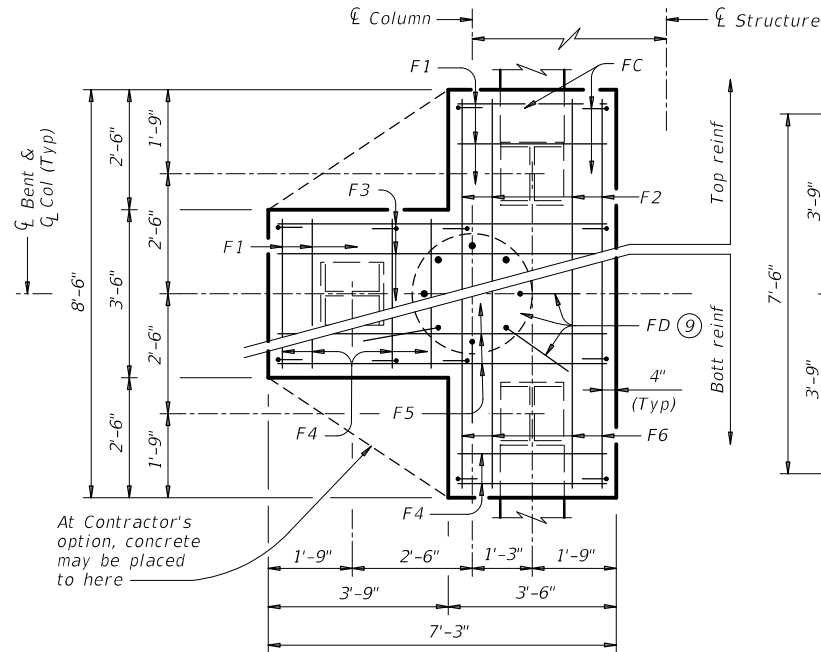
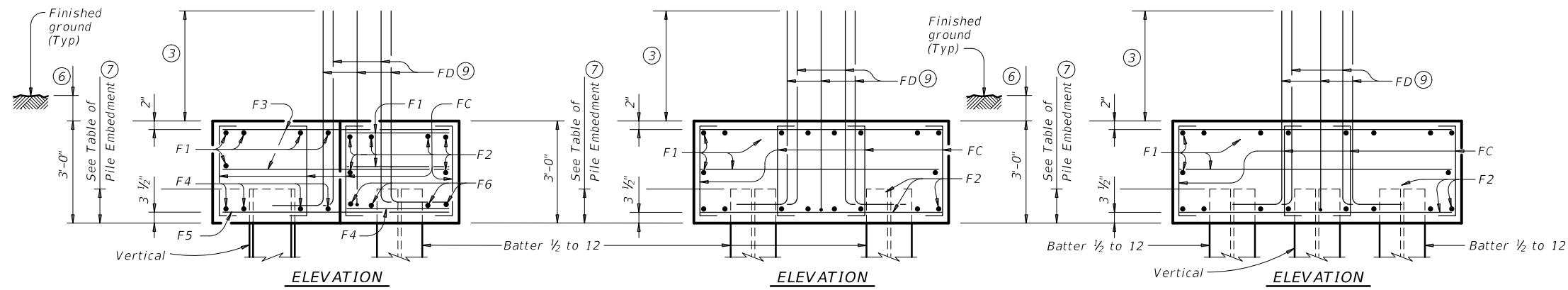
REVISED 24" D.S. DESIGN

SHEET 1 OF 2

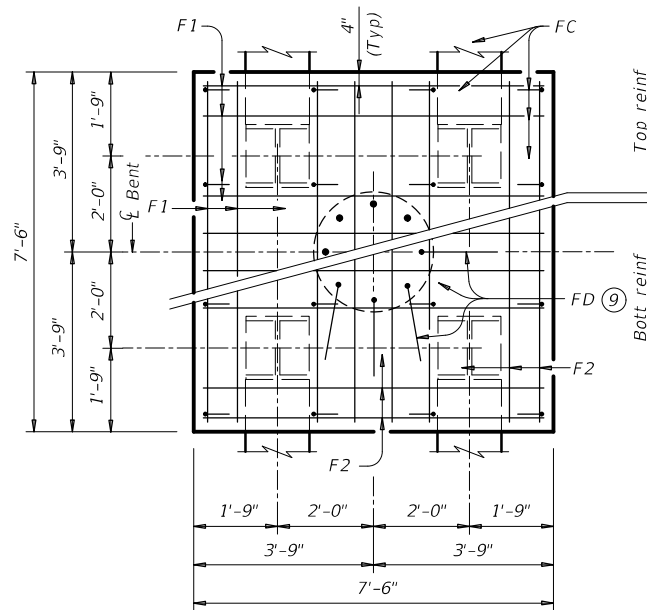
		Bridge Division Standard	
COMMON FOUNDATION DETAILS			
FD (MOD)			
FILE: fdstoe01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
REVISIONS	CONTRACT	SECTION	JOB
01-20: Added #11 bars to the FD bars.	0213	04	050
	DIST	COUNTY	SHEET NO.
	LFK	POLK	224

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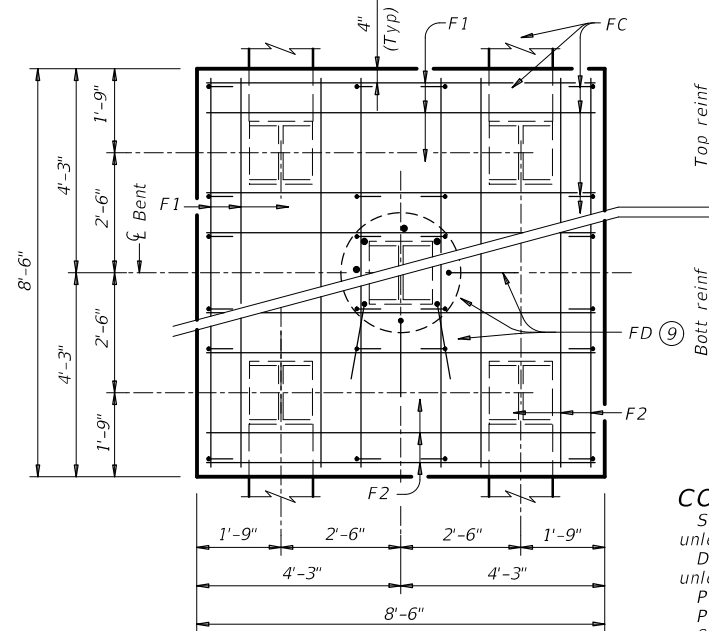
DATE: 5/20/2021 3:44:12 PM
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THREE PILE FOOTING^⑧
 For 36" Dia and smaller columns.

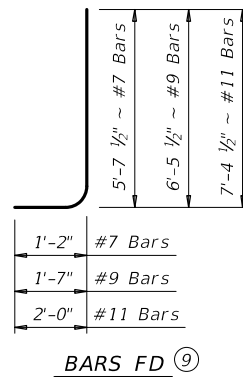
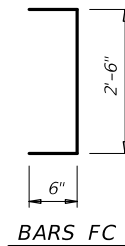


FOUR PILE FOOTING^⑧
 For 42" Dia and smaller columns.



FIVE PILE FOOTING^⑧
 For 42" Dia and smaller columns.

At Contractor's option, concrete may be placed to here



- ③ Min lap with column reinforcing:
 #7 Bars = 2'-11"
 #9 Bars = 3'-9"
 #11 Bars = 4'-8"
- ⑥ 1'-0" Min, unless shown otherwise on plans.
- ⑦ Or as shown on plans.
- ⑧ See Bridge Layout for type, size and length of piling.
- ⑨ Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.
- ⑩ Adjust FD quantity, size and weight as needed to match column reinforcing.

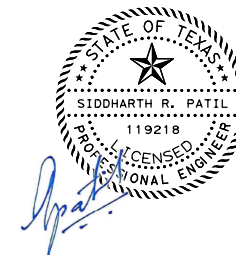
TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING					
Bar	No.	Size	Length	Weight	
F1	11	#4	3'- 2"	23	
F2	6	#4	8'- 2"	33	
F3	6	#4	6'- 11"	28	
F4	8	#9	3'- 2"	86	
F5	4	#9	6'- 11"	94	
F6	4	#9	8'- 2"	111	
FC	12	#4	3'- 6"	28	
FD ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	623
Class "C" Concrete				CY	4.8
ONE 4 PILE FOOTING					
Bar	No.	Size	Length	Weight	
F1	20	#4	7'- 2"	96	
F2	16	#8	7'- 2"	306	
FC	16	#4	3'- 6"	37	
FD ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	659
Class "C" Concrete				CY	6.3
ONE 5 PILE FOOTING					
Bar	No.	Size	Length	Weight	
F1	20	#4	8'- 2"	109	
F2	16	#9	8'- 2"	444	
FC	24	#4	3'- 6"	56	
FD ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	829
Class "C" Concrete				CY	8.0

CONSTRUCTION NOTES:
 See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.
 Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.
 Provide Class C Concrete ($f'_c = 3,600$ psi), unless shown otherwise.
 Provide Grade 60 reinforcing steel.
 Galvanize reinforcing if shown elsewhere in the plans.
 Provide bar laps for drilled shaft reinforcing, where required, as follows:
 Uncoated or galvanized (#6) ~ 2'-6"
 Uncoated or galvanized (#7) ~ 2'-11"
 Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

DESIGNER NOTES:
 Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.
 Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.
 Maximum allowable pile loads for the footings shown are:
 72 Tons/Pile with 24" Dia Columns
 80 Tons/Pile with 30" Dia Columns
 100 Tons/Pile with 36" Dia Columns
 120 Tons/Pile with 42" Dia Columns



5/20/2021

REVISED 24" D.S. DESIGN

SHEET 2 OF 2



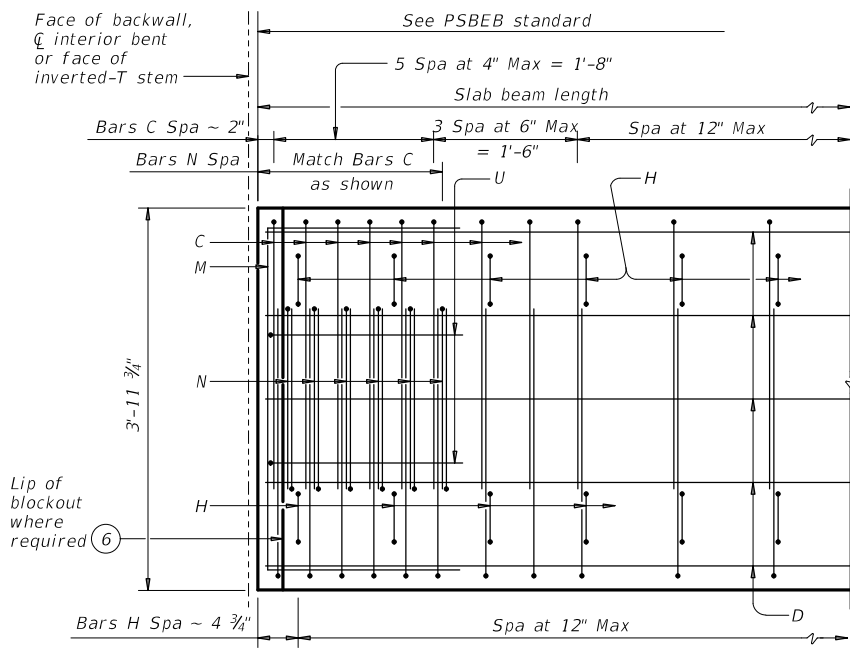
COMMON FOUNDATION DETAILS

FD (MOD)

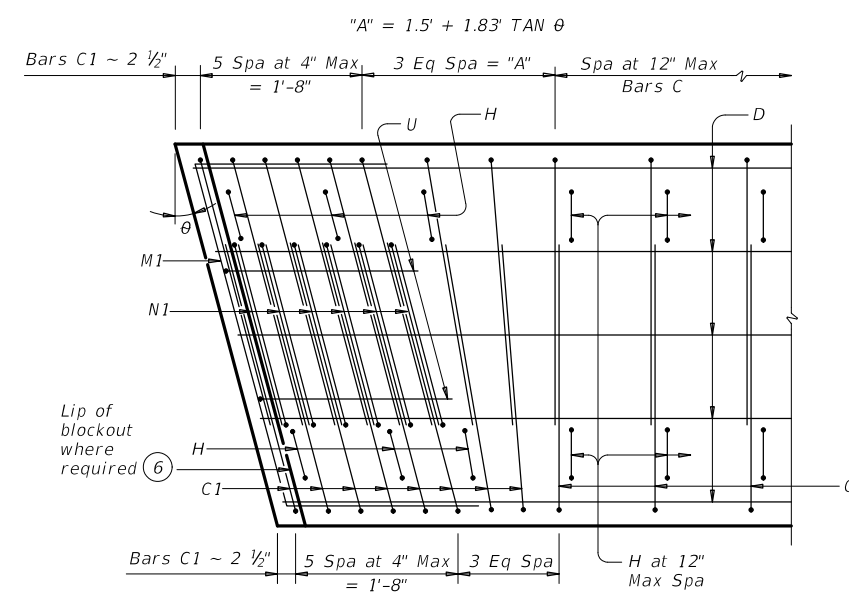
FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
CONTRACT: 0213 04	SECTION: 050	JOB: US 190	HIGHWAY	
REVISIONS: 01-20: Added #11 bars to the FD bars.	DIST: LFK	COUNTY: POLK	SHEET NO: 225	

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DATE: 5/20/2021 3:44:15 PM
 FILE: ... \US190_BRG06_psbst-s02-17.dgn

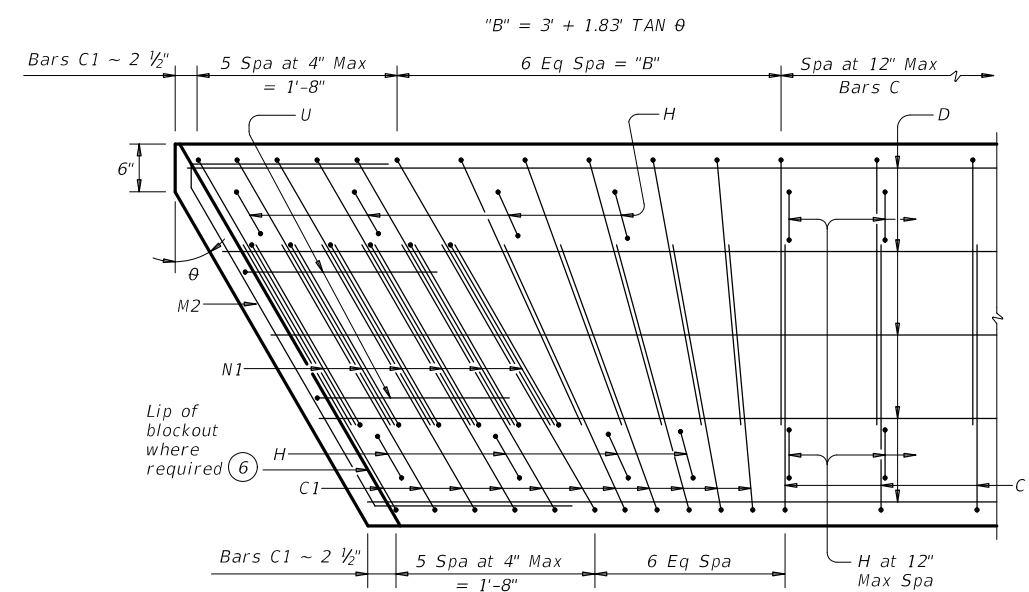


PART PLAN



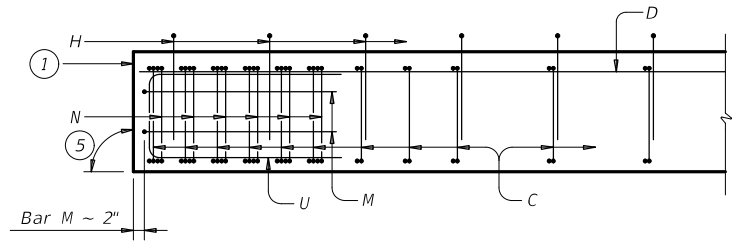
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

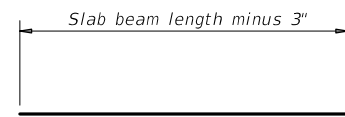


PART SKEW PLAN

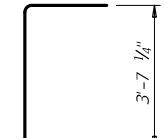
(Showing θ over 15° to 30° Skew)



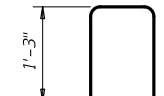
ELEVATION



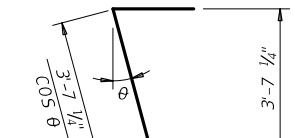
BARS D(#6)



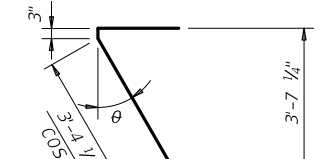
BARS M(#4)



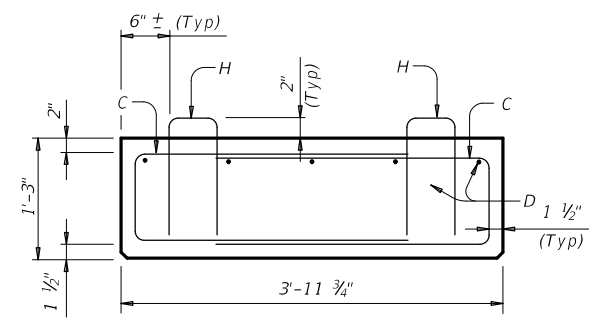
BARS H(#4)



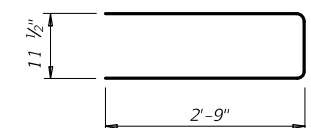
BARS M1(#4)



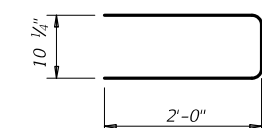
BARS M2(#4)



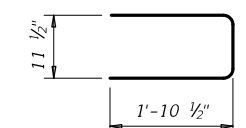
SECTION



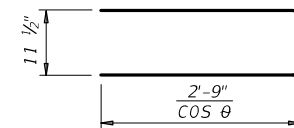
BARS C(#4)



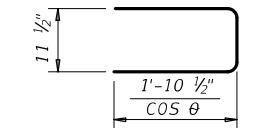
BARS U(#5)



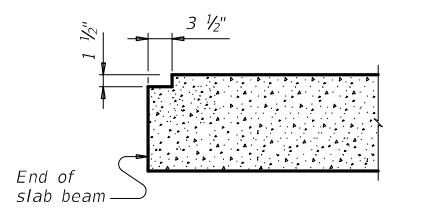
BARS N(#4)



BARS C1(#4)



BARS N1(#4)

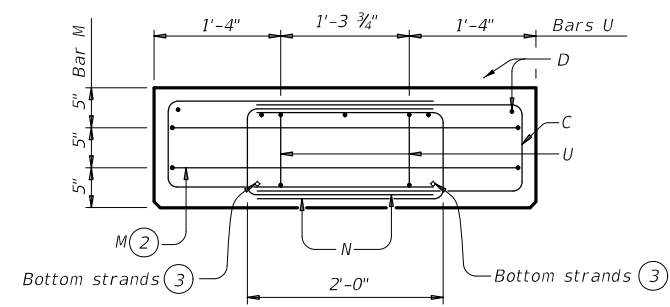


ELEVATION OF BLOCKOUT (6)

BEAM PROPERTIES		
Area	in ²	716.2
Y top	in	7.50
Y bott	in	7.50
I	in ⁴	13,429
Weight (4)	lb/ft	746

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.
 These details can be used for any skew angle up to a maximum of 30 degrees.
 Chamfer all exposed corners 3/4" or round to a 3/4" radius.
 Details are drawn showing right forward skew. See Bridge Layout for actual direction.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.



END MAT REINFORCING

Bars H not shown for clarity.

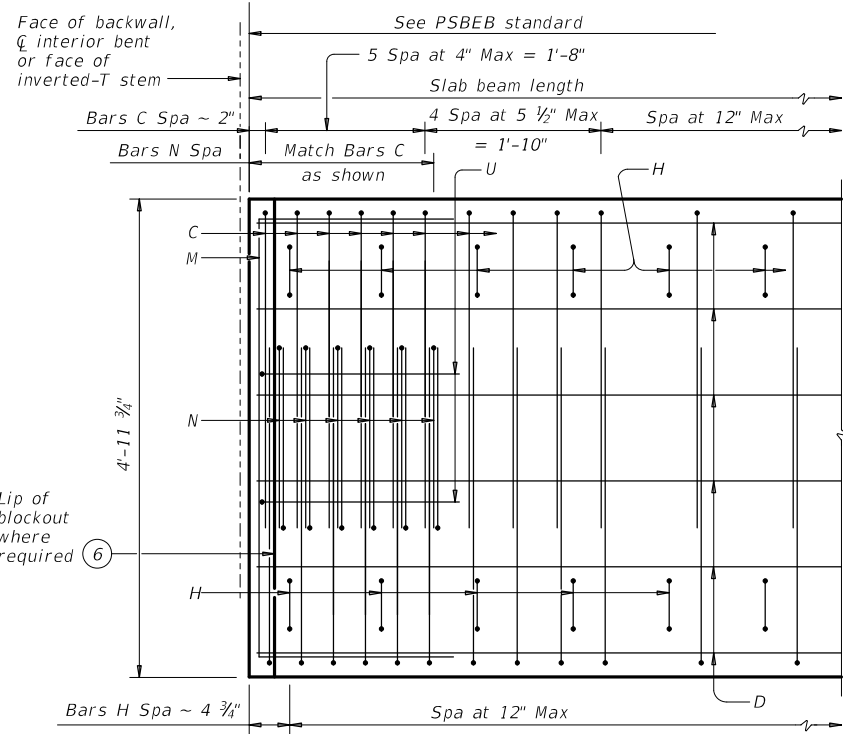
- (1) See End Mat Reinforcing detail.
- (2) Adjust bars M vertically to avoid strands.
- (3) See sheet PSBND or PSBSD for strand locations.
- (4) Assumes 150 pcf weight density of concrete.
- (5) 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
- (6) Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

HL93 LOADING

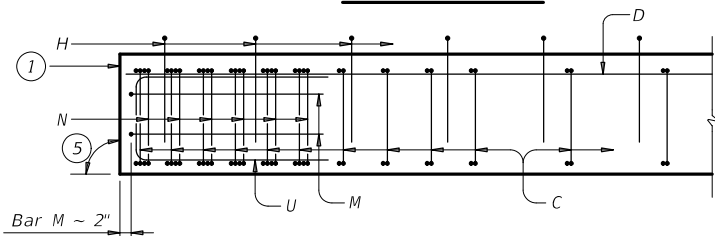
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PRESTRESSED CONCRETE SLAB BEAM DETAILS (TYPE 4SB15)			
PSB-4SB15			
FILE: psbsts02-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONTRACT NO. 0213	SECTION 04	JOB NO. 050
REVISIONS	COUNTY		SHEET NO.
	LFK POLK		226

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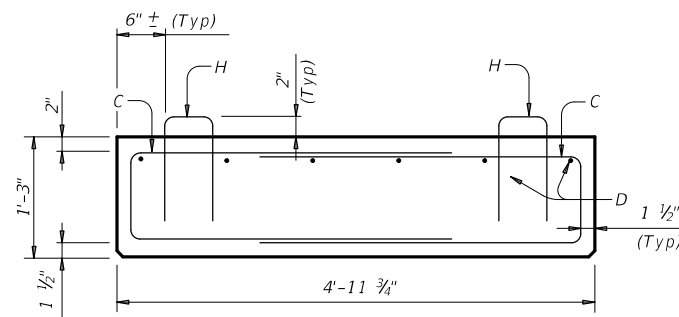
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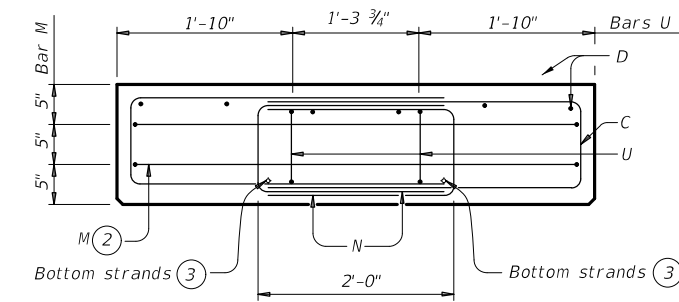
PART PLAN



ELEVATION

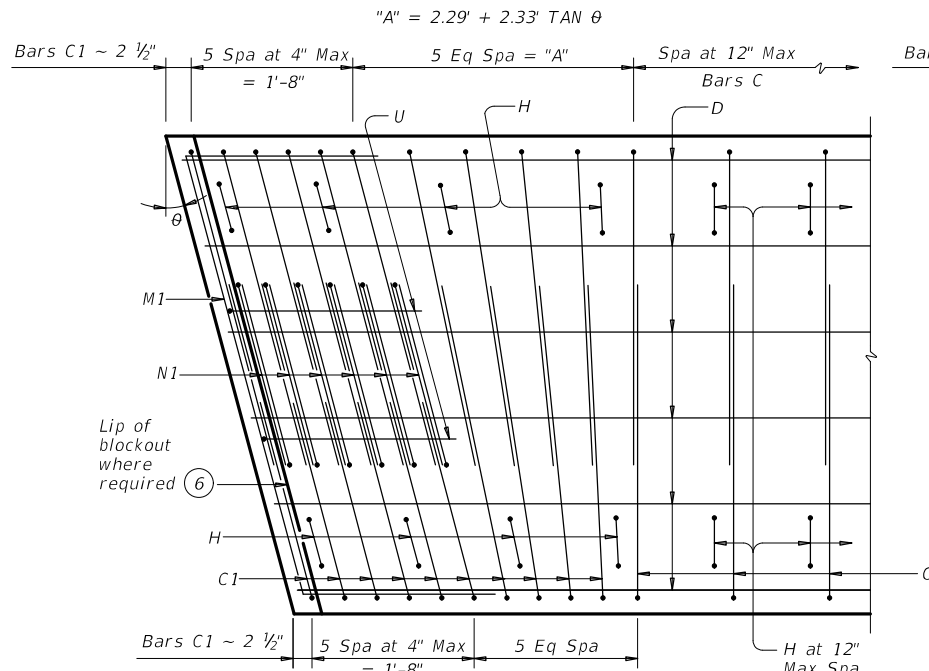


SECTION



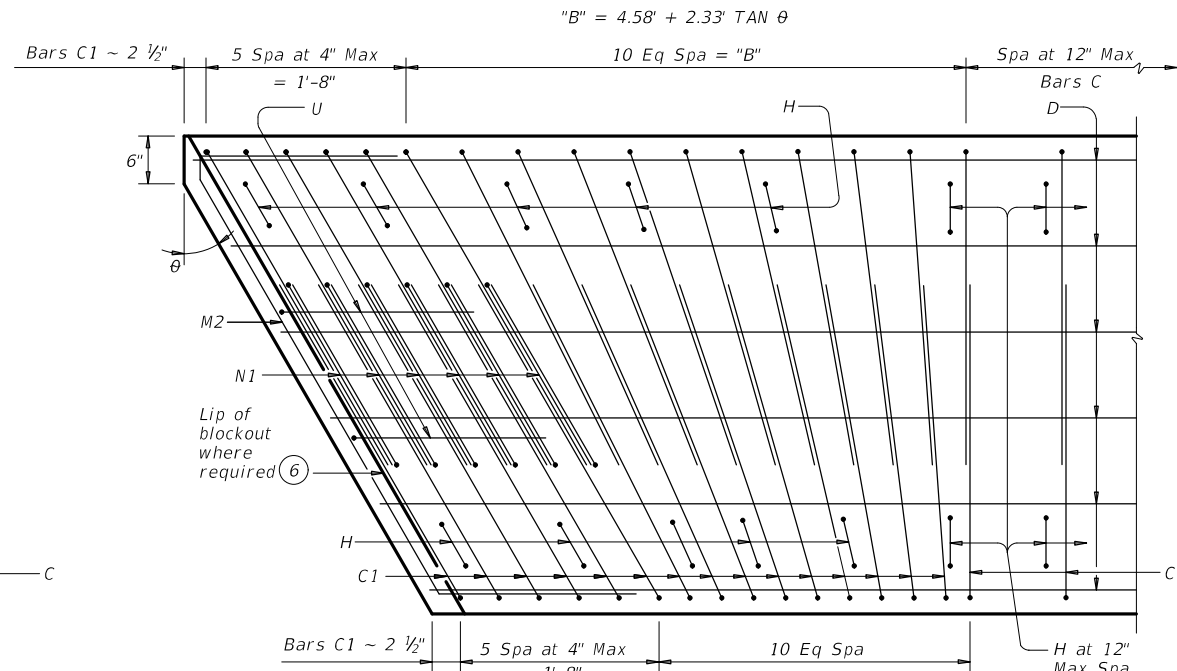
END MAT REINFORCING

Bars H not shown for clarity.



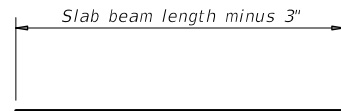
PART SKEW PLAN

(Showing θ over 0° to 15° skew)

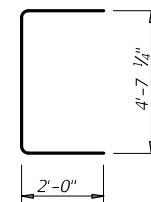


PART SKEW PLAN

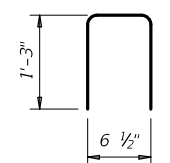
(Showing θ over 15° to 30° skew)



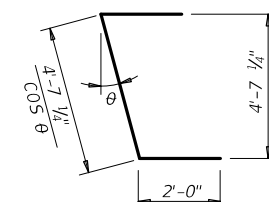
BARS D(#6)



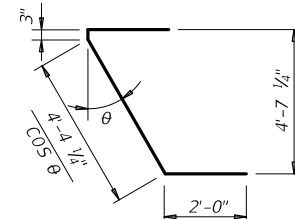
BARS M(#4)



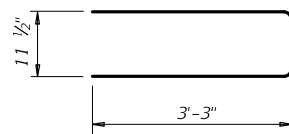
BARS H(#4)



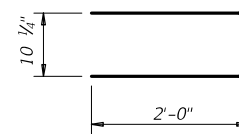
BARS M1(#4)



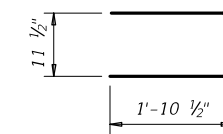
BARS M2(#4)



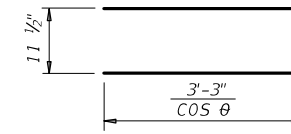
BARS C(#4)



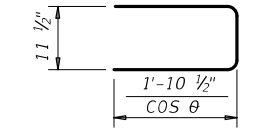
BARS U(#5)



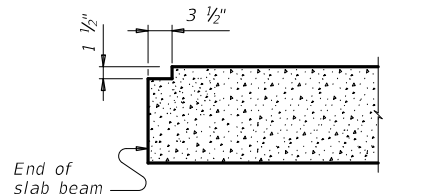
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT ⑥

BEAM PROPERTIES		
Area	in ²	896.2
Y top	in	7.50
Y bott	in	7.50
I	in ⁴	16,805
Weight	lb/ft	934

GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications. Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.
- Provide Grade 60 reinforcing steel.
- An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.
- These details can be used for any skew angle up to a maximum of 30 degrees.
- Chamfer all exposed corners 3/4" or round to a 3/4" radius.
- Details are drawn showing right forward skew. See Bridge Layout for actual direction.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

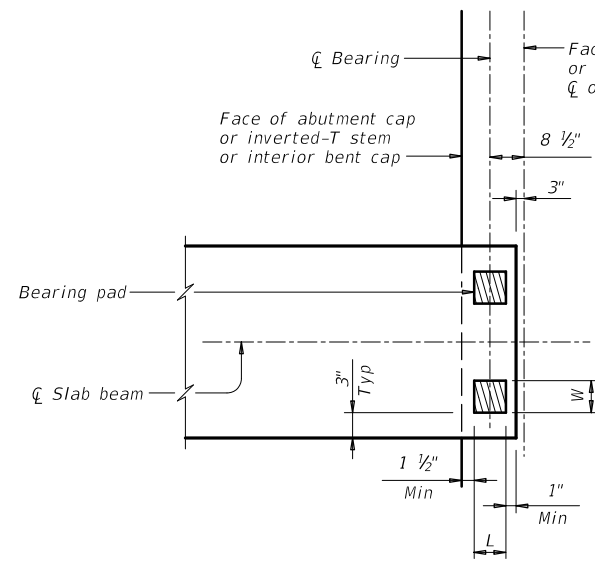
- ① See End Mat Reinforcing detail.
- ② Adjust bars M vertically to avoid strands.
- ③ See sheet PSBND or PSBSD for strand locations.
- ④ Assumes 150 pcf weight density of concrete.
- ⑤ 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
- ⑥ Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

HL93 LOADING

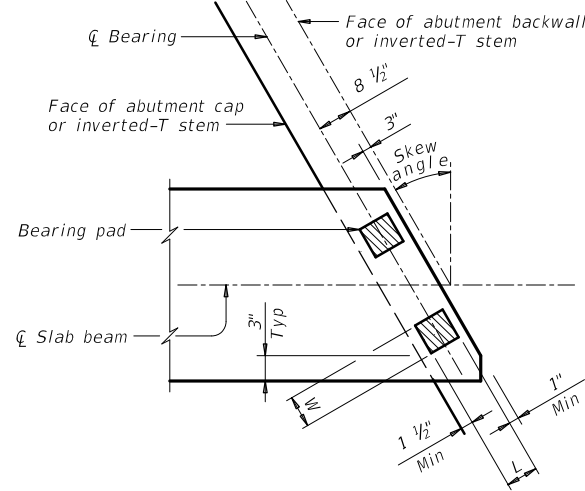
		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM DETAILS (TYPE 5SB15)			
PSB-5SB15			
FILE: psbsts04-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONT	SECT	JOB
REVISIONS	0213	04	050
DIST	COUNTY	SHEET NO.	
LFK	POLK	227	

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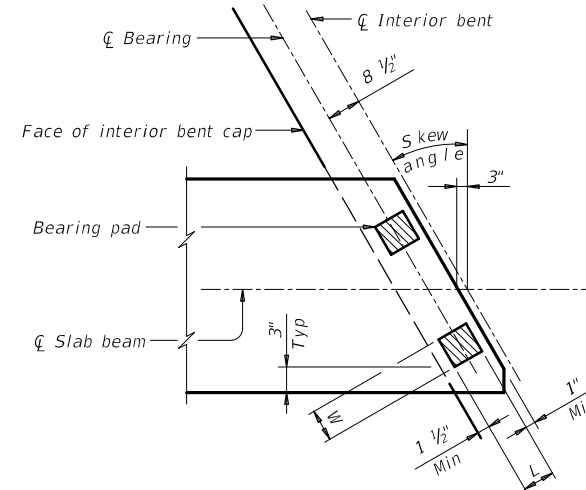
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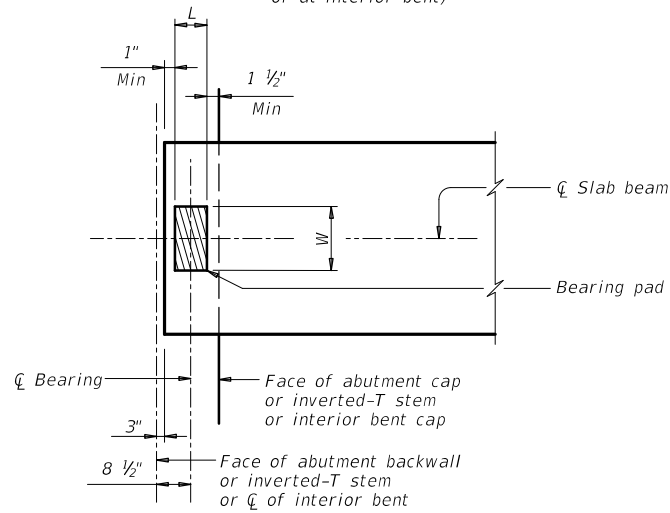
TWO-PAD DETAIL PLAN
 (At abutment or inverted-T cap or at interior bent)



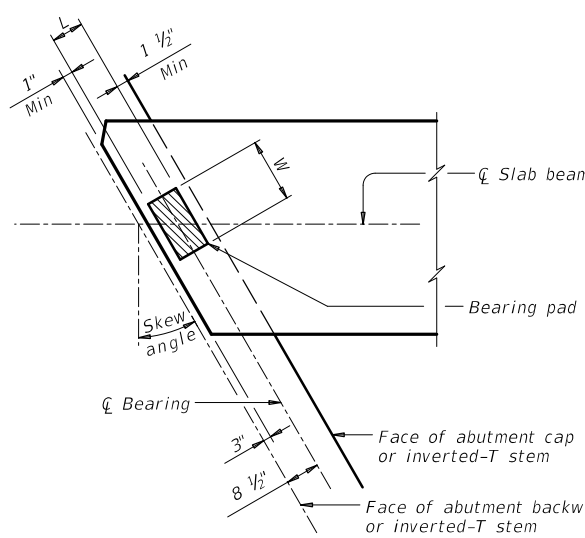
TWO-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



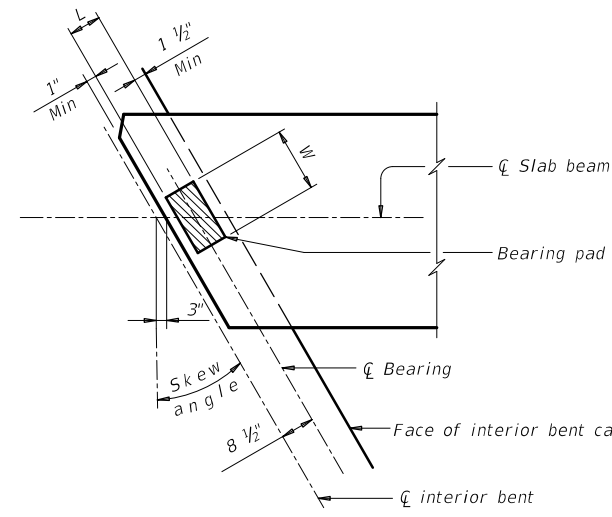
TWO-PAD DETAIL SKEW PLAN
 (At interior bent)



ONE-PAD DETAIL PLAN
 (At abutment or inverted-T cap or at interior bent)



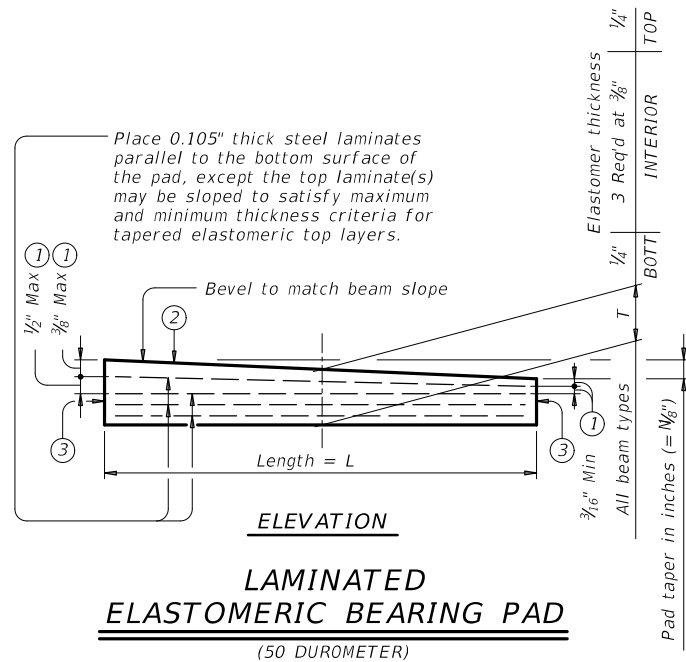
ONE-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
 (At interior bent)

ELASTOMERIC BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

Place one bearing pad at forward station beam end.
 Place two bearing pads at back station beam end.



LAMINATED ELASTOMERIC BEARING PAD
 (50 DUROMETER)

- ① Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.
- ② Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in 1/8" increments) in this mark.
 Examples: N=0, (for 0" taper)
 N=1, (for 1/8" taper)
 N=2, (for 1/4" taper)
 (etc.)
 Fabricated pad top surface slope must not vary from plan beam slope by more than $\left(\frac{0.0625}{\text{Length}}\right)$ IN/IN.
- ③ Locate permanent mark here.

TABLE OF BEARING PAD DIMENSIONS (ALL PRESTR CONC SLAB BM TYPES)

One-Pad (Ty SB1-"N") ②			Two-Pad (Ty SB2-"N") ②		
W	L	T	W	L	T
14"	7"	2"	7"	7"	2"

Pad sizes shown are applicable for the following conditions:

- (1) All one, two and three span units where the minimum span length is not less than 25' and the maximum span is not more than 50'.
- (2) Skews less than or equal to 30°.

GENERAL NOTES:

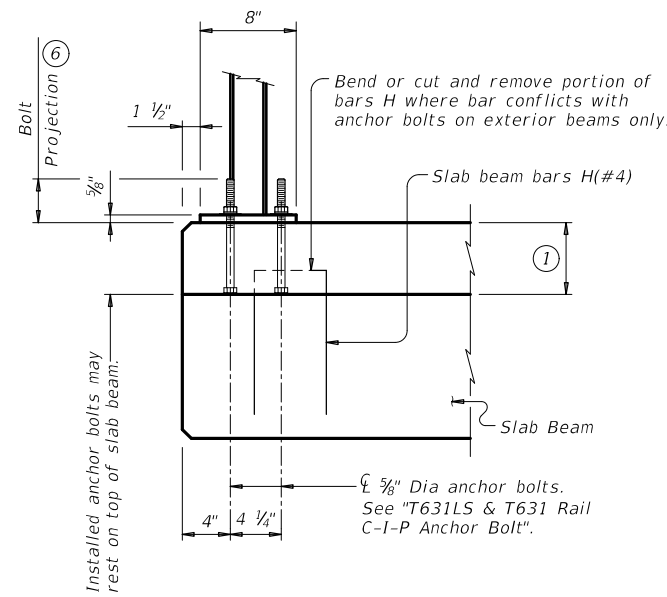
These details accommodate skew angles up to 30°. Shop drawings for approval are required. A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer. Cost of furnishing and installing elastomeric bearings must be included in unit price bid for "Prestressed Concrete Slab Beams".

HL93 LOADING

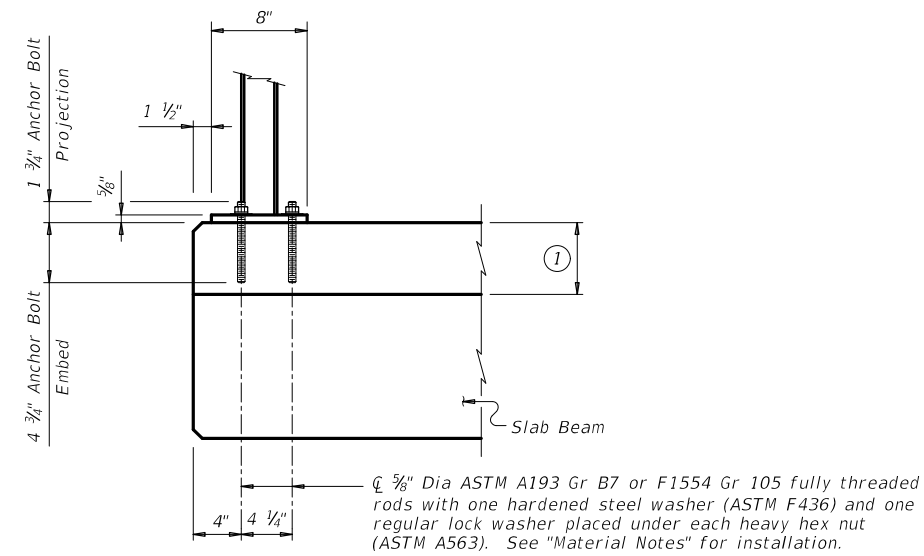
		Bridge Division Standard	
ELASTOMERIC BEARING AND BEAM END DETAILS			
PRESTR CONCRETE SLAB BEAM			
PSBEB			
FILE: psbste06-17.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT January 2017	CONT	SECT	JOB
REVISIONS	0213	04	050
	DIST	COUNTY	SHEET NO.
	LFK	POLK	228

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DATE: 5/20/2021 3:44:25 PM
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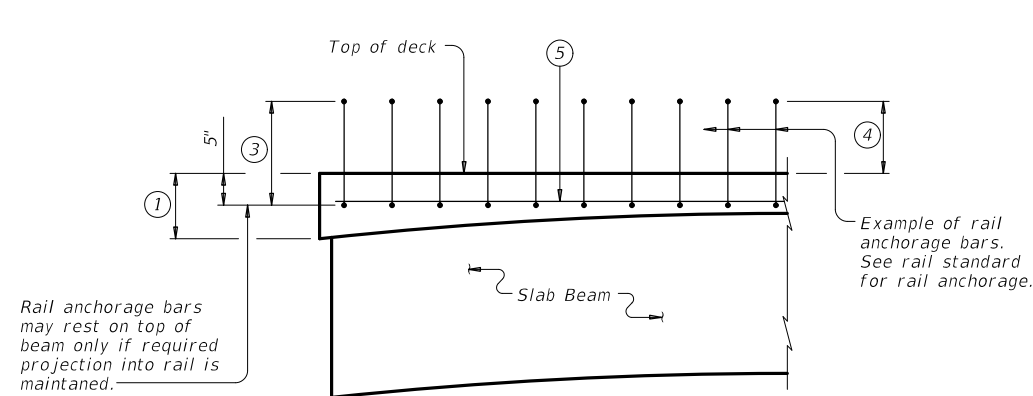


CAST-IN-PLACE ANCHORAGE OPTION

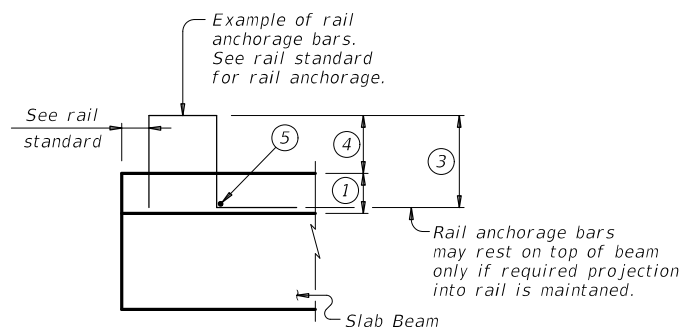


ADHESIVE ANCHORAGE OPTION

T631LS & T631 RAIL ANCHORAGE PLACEMENT (2)(7)



PART SPAN ELEVATION

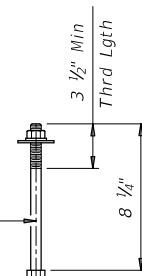


SECTION

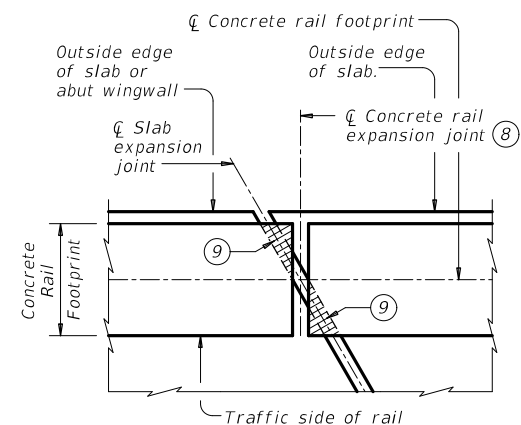
TYPICAL CONCRETE RAIL ANCHORAGE

(Showing typical concrete rail anchorage)

1/2" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563).



T631LS & T631 RAIL C-I-P ANCHOR BOLT



PLAN OF CONCRETE RAILS AT EXPANSION JOINTS

- 1 Cast-in-place slab thickness varies due to beam camber (5" minimum).
- 2 Replace cast-in-place anchor bolts shown on T631LS and T631 Rail standard with an adhesive anchor system or cast-in-place anchor bolts shown on this sheet.
- 3 Bar length shown on rail standard, minus 1 1/4". Adjust bar length for a raised sidewalk.
- 4 See rail standard for projection from finished grade or top of sidewalk.
- 5 Place additional (#5) longitudinal bar.
- 6 Excess bolt length has been provided to accommodate a variable slab thickness due to beam camber. If slab thickness on span details exceed 7", bolt length must be increased accordingly. After posts have been set and bolts tightened, bolt projection above nuts of more than 1/2" must be cut off and painted with two coats of zinc-rich paint conforming to the Item 445 "Galvanizing".
- 7 Distance from end of top outside edge of slab to center of first bolt group can not be less than 9", except: 15° Skew: 1'-0" (acute corner only) 30° Skew: 1'-3" (acute corner only)
- 8 Location of rail expansion joint must be at the intersection of slab expansion joint, rail footprint and perpendicular to slab outside edge.
- 9 Cross-hatched area must have 1/2" preformed bituminous fiber material under concrete rail, as shown.

CONSTRUCTION NOTES:

Rail anchorage bars may be field bent as required to clear rail reinforcing or provide minimum cover shown on standard rail detail sheets. Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Galvanize all steel components of steel rail system. Provide Grade 60 reinforcing steel. Cast-in-place anchorage system for T631LS and T631 Rail must be 1/2" Dia heavy hex head anchor bolts (ASTM F3125 Gr 325 or A449) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed anchor bolts 4 1/2" minimum. Adhesive anchors for T631LS and T631 Rail must be 1/2" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed fully threaded rod into slab and/or abutment wingwall using a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4 3/4". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 8 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Epoxy coat or galvanize reinforcing steel shown on this standard if rail reinforcement is epoxy coated or galvanized.

GENERAL NOTES:

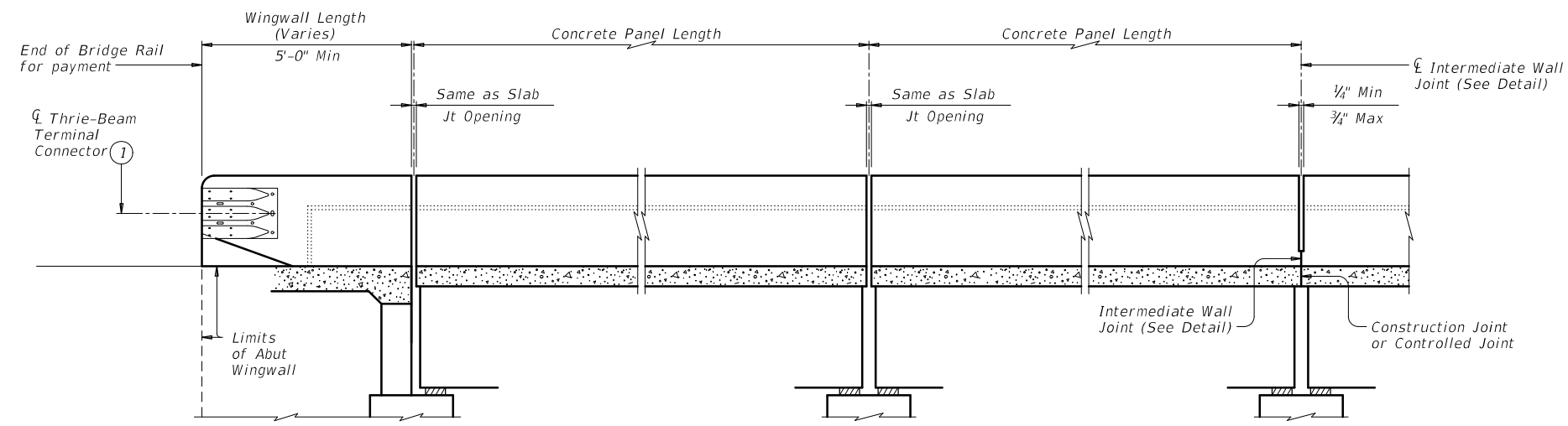
Designed in accordance with AASHTO LRFD Bridge Design Specifications. This standard is for use with structures with a 5" minimum cast-in-place concrete slab. This standard may require modification for interior rails. This standard does not apply to median barriers. This standard does not provide details for Type T221P, T224, T80HT, T80SS, C412, PR11, PR22 and PR3 rails on slab beam bridges. See rail standards for approved speed restrictions, notes and details not shown.

Cover dimensions are clear dimensions, unless noted otherwise.

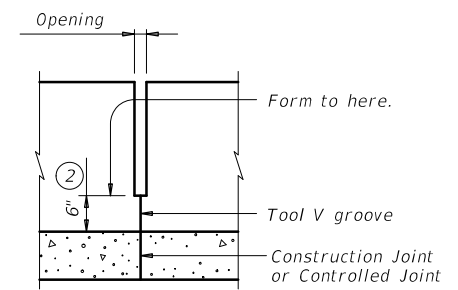
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RAIL ANCHORAGE DETAILS			
PRESTR CONCRETE SLAB BEAMS			
PSBRA			
FILE: psbste07-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT January 2017	CONTRACT	SECTION	JOB
REVISIONS	0213	04	050
03-18: Updated adhesive anchor notes.	DIST	COUNTY	SHEET NO.
	LFK	POLK	229

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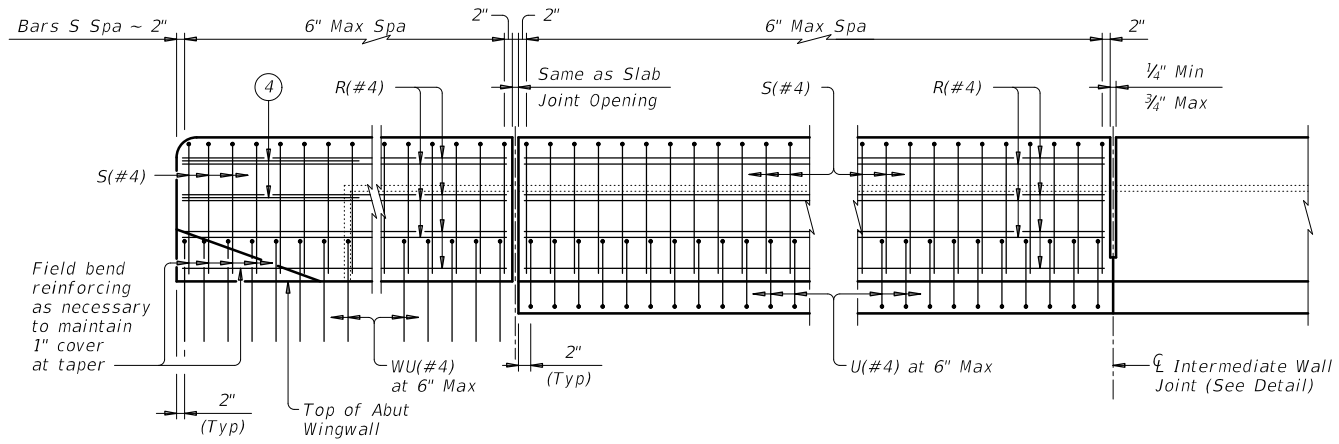
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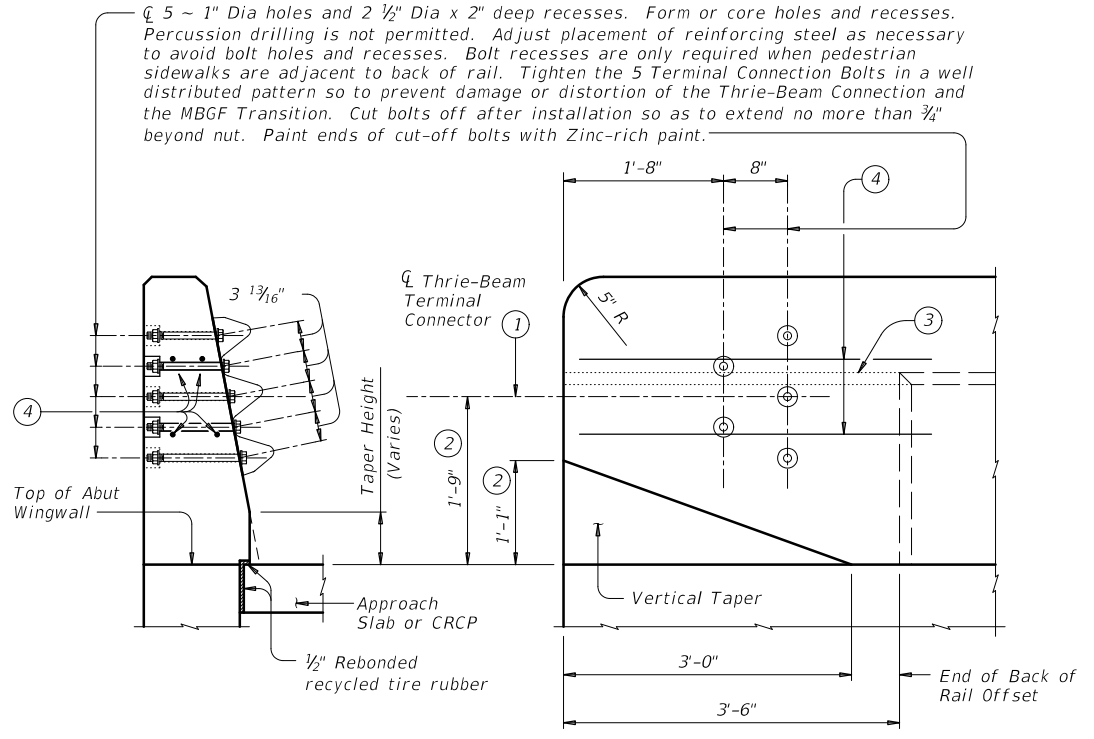
ROADWAY ELEVATION OF RAIL
 AT ABUTMENTS AT BENTS WITH SLAB EXP JOINTS AT BENTS WITHOUT SLAB EXP JOINTS



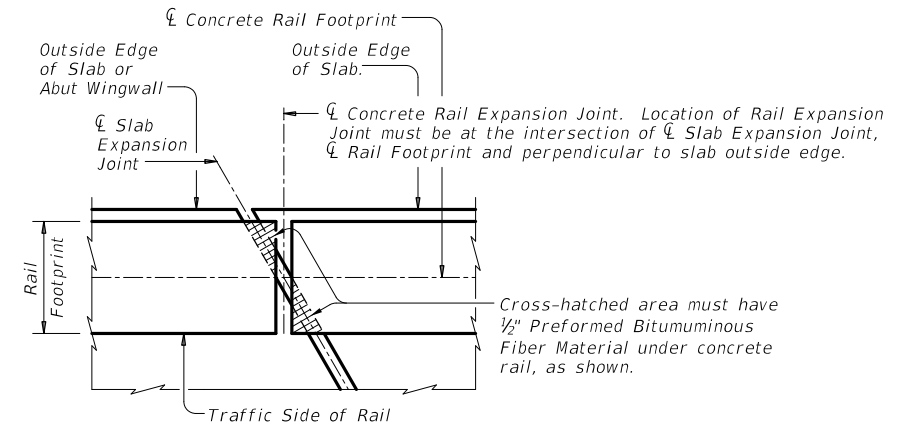
INTERMEDIATE WALL JOINT DETAIL
 Provide at all interior bents without slab expansion joints.



ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



SECTION ELEVATION
TERMINAL CONNECTION DETAILS



PLAN OF RAIL AT EXPANSION JOINTS
 Example showing Slab Expansion Joints without breakbacks.

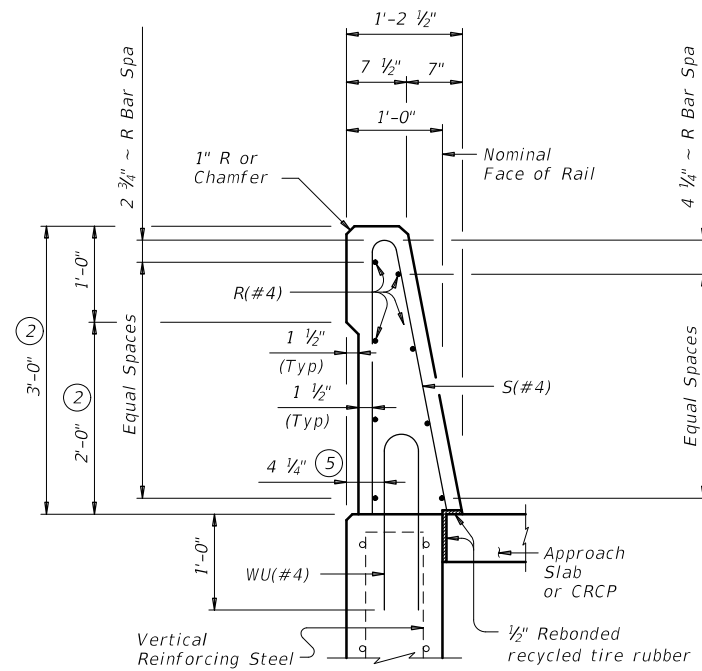
- 1 Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- 2 Increase 2" for structures with Overlay.
- 3 Back of rail offset 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.

SHEET 1 OF 2

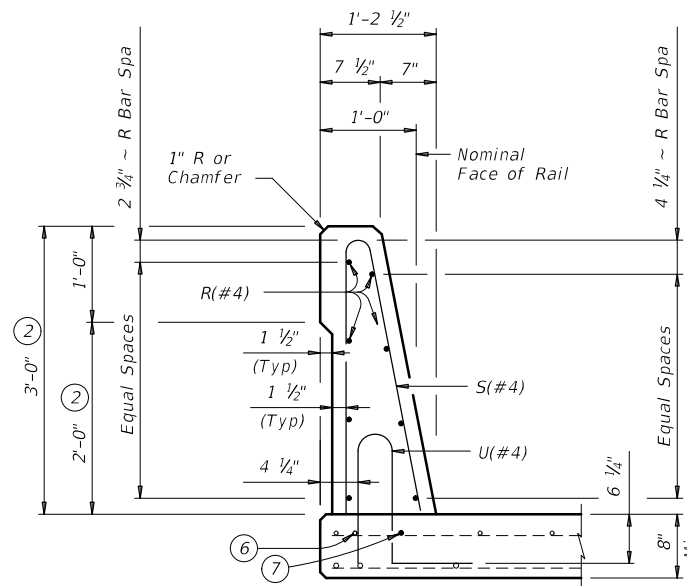
		Bridge Division Standard	
TRAFFIC RAIL SINGLE SLOPE			
TYPE SSTR			
FILE: r1std014-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONT	SECT	JOB
REVISIONS	0213	04	050
	DIST	COUNTY	SHEET NO.
	LFK	POLK	230

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.

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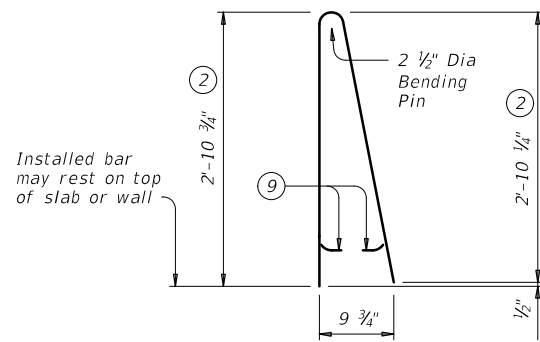


ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

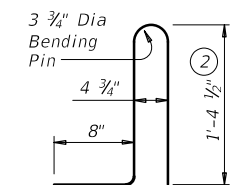


ON BRIDGE SLAB

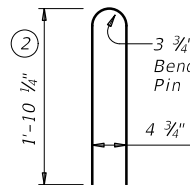
SECTIONS THRU RAIL



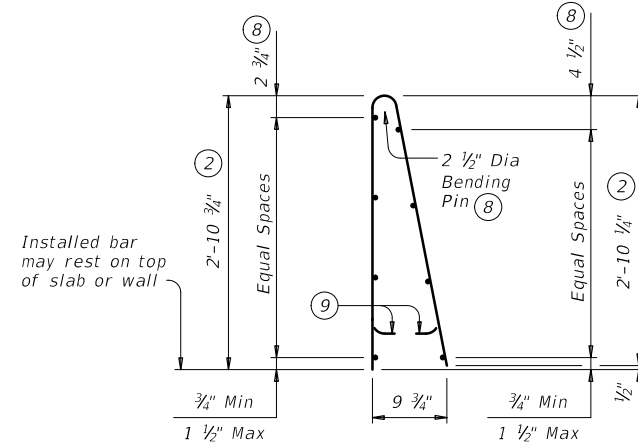
BARS S (#4)



BARS U (#4)



BARS WU (#4)



OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

- ② Increase 2" for structures with Overlay.
- ⑤ 5 1/4" 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.

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 a heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a 3/8" width x 1/4" 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.

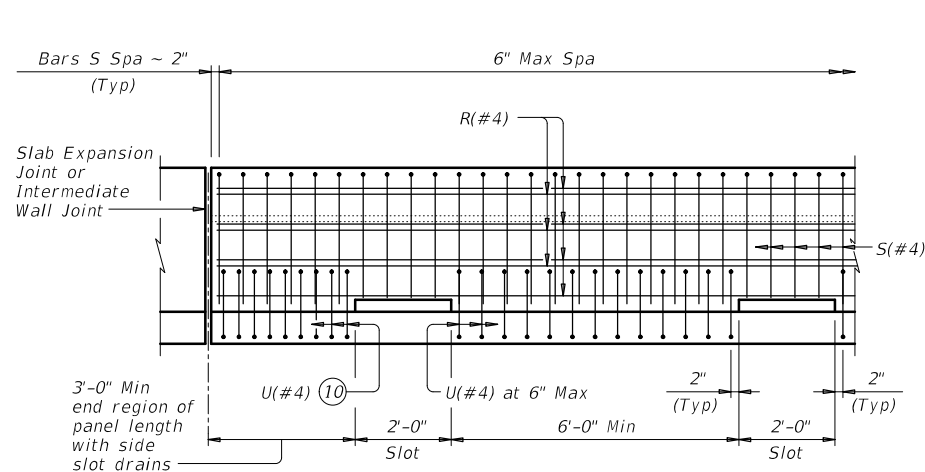
MATERIAL NOTES:

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:

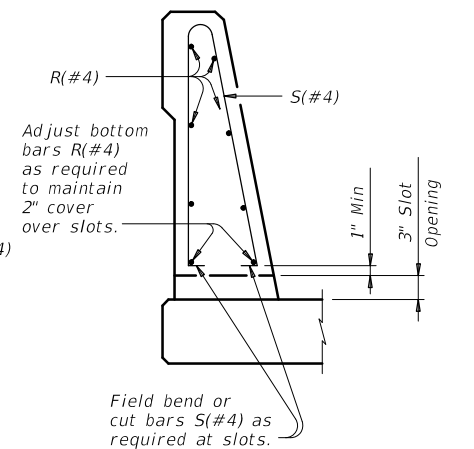
This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and 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 pcf.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.



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

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
Minimum	No. of Wires	Spacing
Maximum	8	4"
Maximum Wire Size Differential	10	8"
	The smaller wire must have an area of 40% or more of the larger wire.	

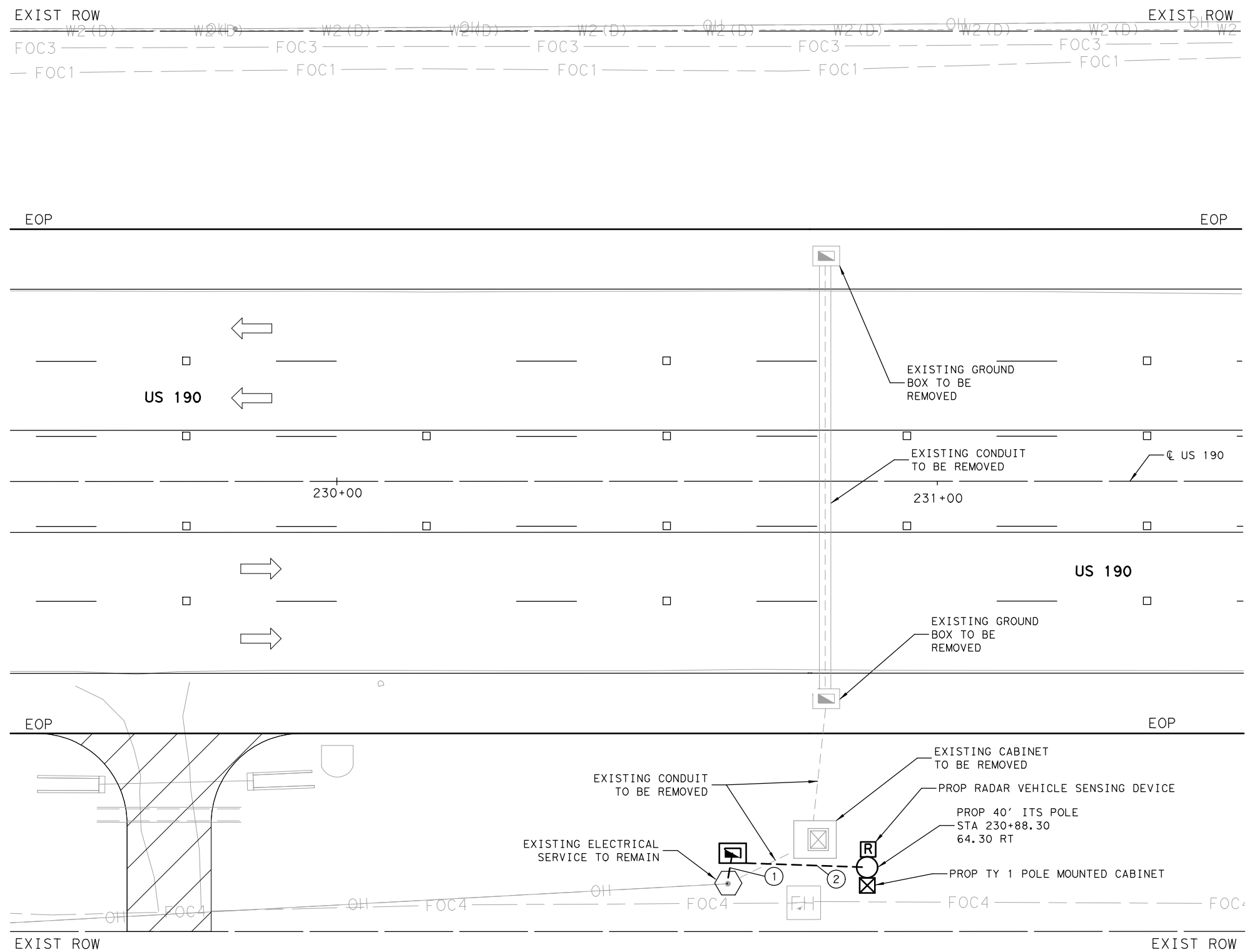
Texas Department of Transportation
 Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

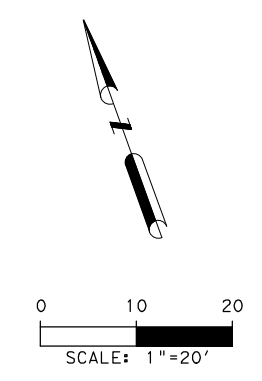
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©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
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- PROPOSED LEGEND**
- TY D GROUND BOX W/ APRON
 - CONDUIT
 - RADAR VEHICLE SENSING DEVICE
 - ITS POLE
 - TY 1 CABINET
 - RUN NUMBER
- EXISTING LEGEND**
- TRAFFIC SIGNAL CABINET
 - SERVICE METER AND DISCONNECT
 - GROUND BOX - TO BE REMOVED
 - CONDUIT - TO BE REMOVED
 - CONDUIT (BORE) - TO BE REMOVED



CONDUIT AND CONDUCTOR RUNS						
RUN NO.	CONDUIT (618)		CONDUCTORS (620)			
	PVC		GROUND		CONDUCTOR	
	3" (SCHD 80)		#6 BARE		#6 INSULATED	
	NO.	TRENCH	NO.	LENGTH	NO.	LENGTH
1	EA	LF	EA	LF	EA	LF
1	1	10	1	15	2	15
2	1	30	1	40	2	40
TOTAL		40		55		110
EST.		45		65		125

- NOTES:
- THE CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES FOR LOCATION OF UNDERGROUND FACILITIES AT LEAST 48 HOURS PRIOR TO ANY DRILLING, BORING, TRENCHING, OR EXCAVATING.
 - THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.
 - THE CONTRACTOR SHALL REMOVE EXISTING LOOP WIRE AT TIME OF PAVEMENT REPLACEMENT. EXISTING CONDUIT AND GROUND BOXES SHALL BE REMOVED AS NOTED IN THE PLANS.
 - TXDOT TPP WILL FURNISH AND INSTALL THE CELL MODEM AND MOUNT AN EXTERNAL ANTENNA ON THE CABINET.
 - PRIOR TO THE CONTRACTOR REMOVING THE EXISTING INFRASTRUCTURE, TXDOT TPP WILL NEED TWO (2) WEEKS NOTIFICATION SO THE SITE CAN BE DECOMMISSIONED AND THE INTERIOR ELECTRONICS RECLAIMED.
 - RADAR DETECTOR MUST HAVE SHOWN PRIOR INTEGRATION TO TPP DATA SYSTEM.
 - THE 40' ITS POLE SHALL BE PLACED AT A MINIMUM OF 30' FROM THE EDGE OF THE PROPOSED TRAVEL LANE.

Heidi M. Criswell

6/8/2021

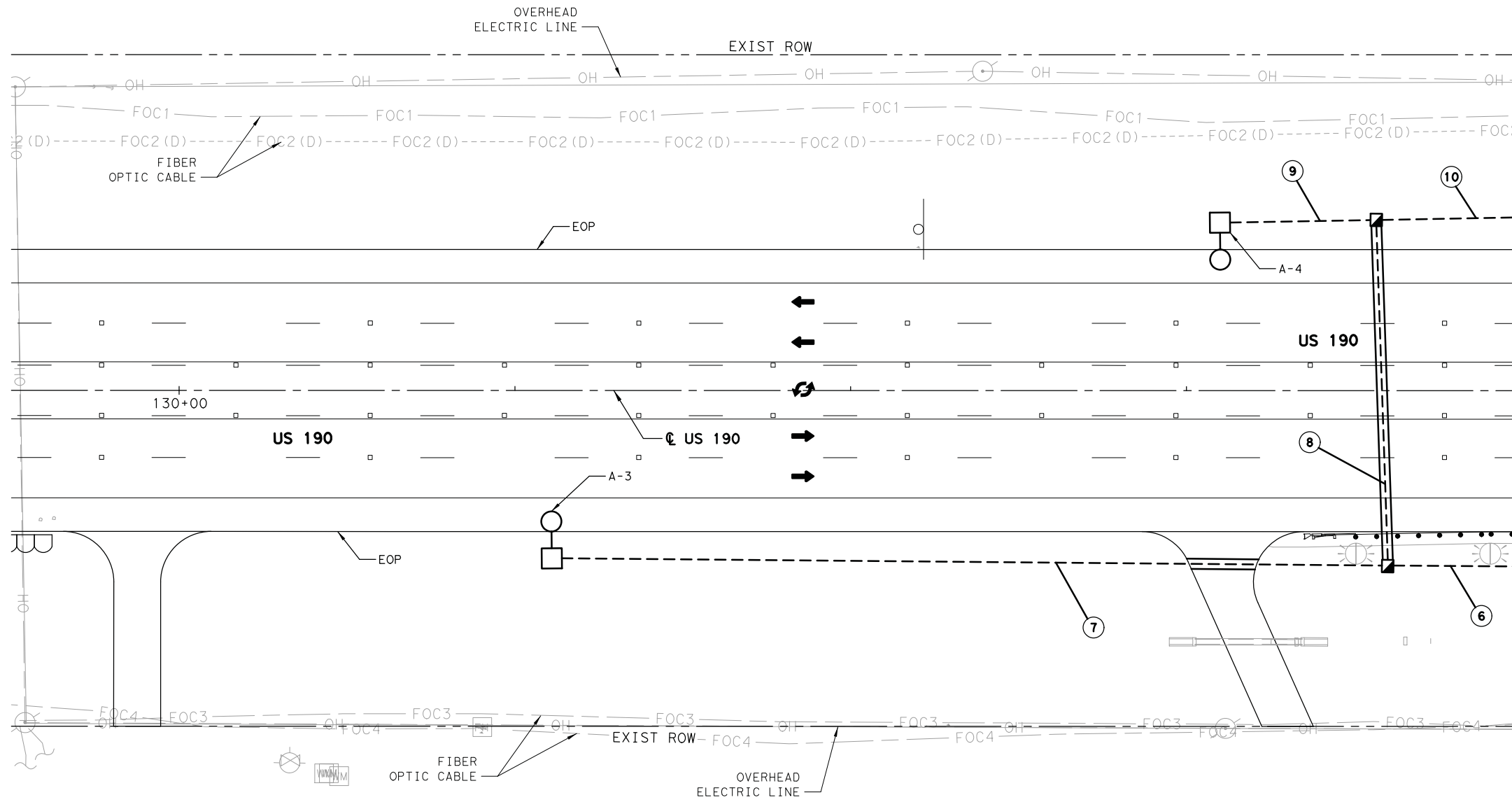
TRAFFIC COUNTER LAYOUT

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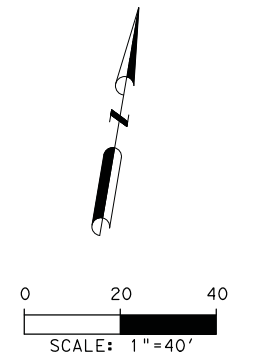
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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LEGEND

- ➔ DIRECTION OF TRAFFIC
- (SCF)— SEDIMENT CONTROL FENCE
- (MBGF)— METAL BEAM GUARD FENCE
- ⬡ ELECTRICAL SERVICE
- ⬢ TY A GROUND BOX W/ APRON
- ⊠ JUNCTION BOX (BRIDGE MOUNTED)
- 2" PVC SCH 80 CONDUIT
- ==== 2" PVC SCH 80 CONDUIT (BORE)
- - - - 2" RIGID METAL CONDUIT (BRIDGE MOUNTED)
- GROUND MOUNTED LUMINAIRE
- ⊗ RUN NUMBER
- X-X LUMINAIRE ASSEMBLY ID
- POLE NO. / CIRCUIT NO.



RUN NO.	CONDUIT AND CONDUCTOR RUNS				
	GROUND (LF)	CONDUCTOR (LF)	CONDUIT (LF)		
	#8 BARE	#8 XHHW	2" PVC SCHD 80	2" PVC SCHD 80 (BORE)	2" RMC (BRIDGE MOUNTED)
6	50	100	50	-	-
7	260	600	230	30	-
8	120	240	-	120	-
9	60	200	60	-	-
10	50	100	50	-	-
TOTALS	540	1240	390	150	0

ROADWAY ILLUMINATION ASSEMBLY SHEET SUMMARY						
FIXTURE NO.	STATION/OFFSET	REFERENCE CENTERLINE	LAMP		STANDARD TYPE	
			EQ WATTS	TYPE		
A-3	131+10.96 / 46.99' RT	US 190	250	LED	(TYSA) 40T-8 (250W EQ) LED	
A-4	133+10.03 / 47.01' LT	US 190	250	LED	(TYSA) 40T-8 (250W EQ) LED	

ILLUMINATION QUANTITIES (THIS SHEET ONLY)			
ITEM-CODE	DESCRIPTION	UNIT	TOTAL
416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	16
610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	2
618-6046	COND (PVC) (SCH 80) (2")	LF	390
618-6047	COND (PVC) (SCH 80) (2") (BORE)	LF	150
620-6007	ELEC CONDR (NO. 8) BARE	LF	540
620-6008	ELEC CONDR (NO. 8) INSULATED	LF	1240
624-6002	GROUND BOX TY A (122311) W/APRON	EA	2

- NOTES:**
1. THE CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES FOR LOCATION OF UNDERGROUND FACILITIES AT LEAST 48 HOURS PRIOR TO ANY DRILLING, BORING, TRENCHING, OR EXCAVATING.
 2. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.
 3. STATION AND OFFSET BASED ON C US 190 UNLESS OTHERWISE NOTED.
 4. CONTRACTOR TO ENSURE ILLUMINATION POLES WITHOUT BARRICADE PROTECTION ARE A MINIMUM 15' FROM EDGE OF TRAVEL LANE.

Drew Davis P.E.

5/21/2021

ILLUMINATION LAYOUTS

(STA 129+50-STA 134+00)

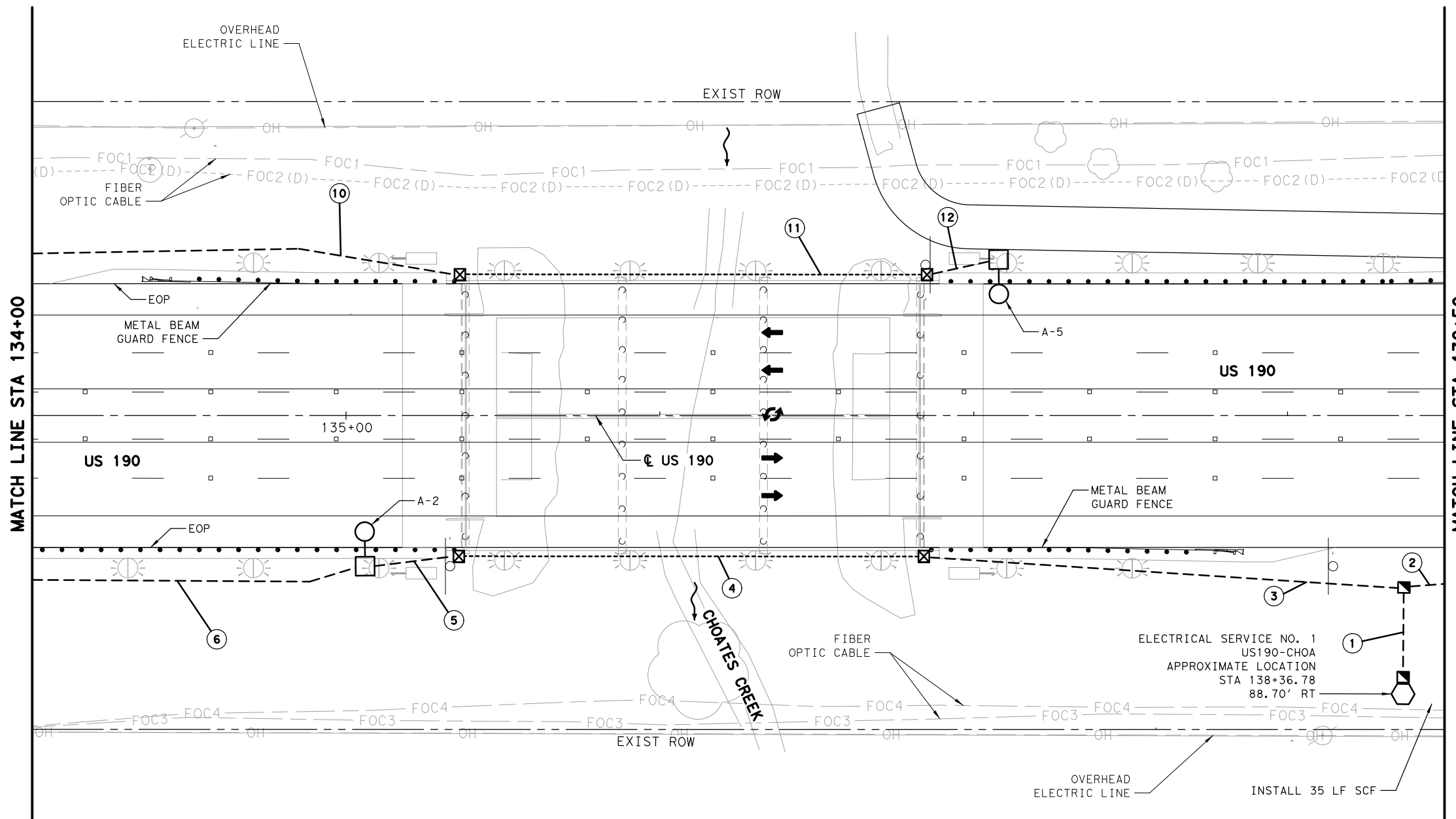
SHEET 1 OF 3

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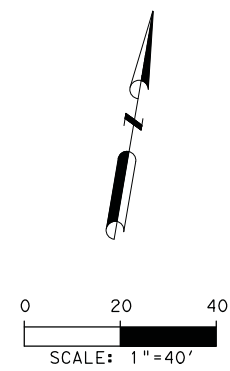
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STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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LEGEND

- ➔ DIRECTION OF TRAFFIC
- (SCF)— SEDIMENT CONTROL FENCE
- METAL BEAM GUARD FENCE
- ⬡ ELECTRICAL SERVICE
- ⬢ TY A GROUND BOX W/ APRON
- ⬤ JUNCTION BOX (BRIDGE MOUNTED)
- - - 2" PVC SCH 80 CONDUIT
- ==== 2" PVC SCH 80 CONDUIT (BORE)
- 2" RIGID METAL CONDUIT (BRIDGE MOUNTED)
- ⊠ GROUND MOUNTED LUMINAIRE
- ⊗ RUN NUMBER
- X-X LUMINAIRE ASSEMBLY ID
- POLE NO. / CIRCUIT NO.



RUN NO.	CONDUIT AND CONDUCTOR RUNS				
	GROUND (LF)	CONDUCTOR (LF)	CONDUIT (LF)		
	#8 BARE	#8 XHHW	2" PVC SCHD 80	2" PVC SCHD 80 (BORE)	*2" RMC (BRIDGE MOUNTED)
1	45	90	45	-	-
2	20	40	20	-	-
3	165	330	165	-	-
4	160	320	-	-	160
5	40	160	40	-	-
6	110	220	110	-	-
10	145	290	145	-	-
11	160	320	-	-	160
12	35	150	35	-	-
TOTALS	880	1920	560	0	320

*JUNCTION BOX SUBSIDIARY TO RMC

ROADWAY ILLUMINATION ASSEMBLY SHEET SUMMARY						
FIXTURE NO.	STATION/OFFSET	REFERENCE CENTERLINE	LAMP		STANDARD TYPE	
			EQ WATTS	TYPE		
A-2	135+06.05 / 44.98' RT	US 190	250	LED	(TYSA) 40T-8 (250W EQ) LED	
A-5	137+07.96 / 46.74' LT	US 190	250	LED	(TYSA) 40T-8 (250W EQ) LED	

ILLUMINATION QUANTITIES (THIS SHEET ONLY)			
ITEM-CODE	DESCRIPTION	UNIT	TOTAL
416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	16
610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	2
618-6046	CONDT (PVC) (SCH 80) (2")	LF	560
618-6070	CONDT (RM) (2")	LF	320
620-6007	ELEC CONDR (NO. 8) BARE	LF	880
620-6008	ELEC CONDR (NO. 8) INSULATED	LF	1920
624-6002	GROUND BOX TY A (122311) W/APRON	EA	2
628-6045	ELC SRV TY A 240/480 60(NS)SS(E)SP(O)	EA	1

ELECTRICAL SERVICE DATA										
SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE TXDOT ED-14 STANDARDS)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO/SIZE	SAFETY SWITCH AMPS	MAIN CKT BREAKER POLE/AMP	TWO-POLE CONTRACTOR AMPS	CIRCUIT	BRANCH CKT. BKR. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
NO. 1 US190-CHOA	ELC SRV TY A 240/480 60 (NS) SS (E) SP (O)	1 1/2"	3/#6	N/A	2P/60	60	A	1P/20	5	1.200

- NOTES:**
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 - THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.
 - STATION AND OFFSET BASED ON $\text{\textcircled{C}}$ US 190 UNLESS OTHERWISE NOTED.

Drew C. Davis P.E.

5/21/2021

ILLUMINATION LAYOUTS

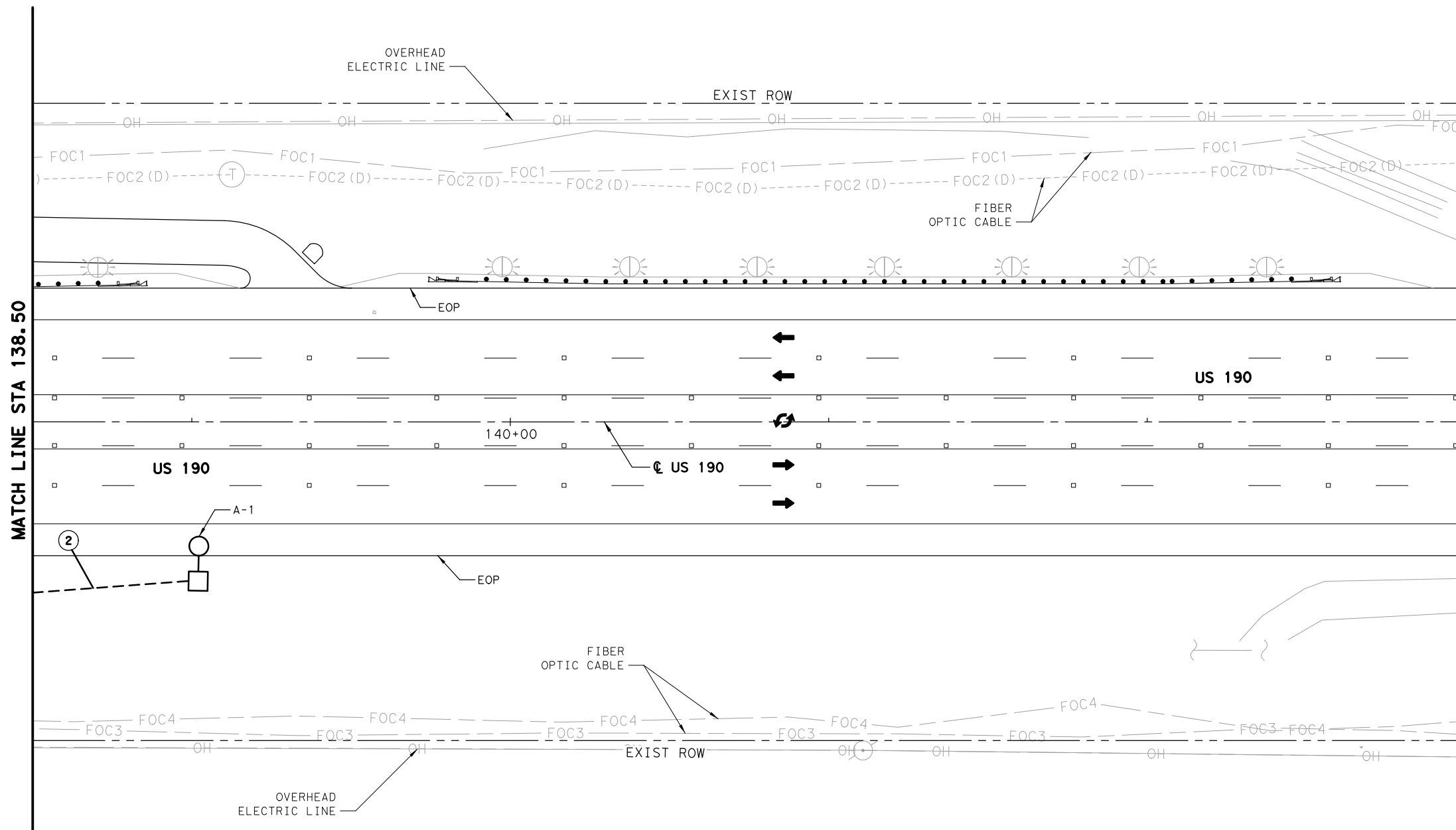
(STA 134+00-STA 138+50)

SHEET 2 OF 3

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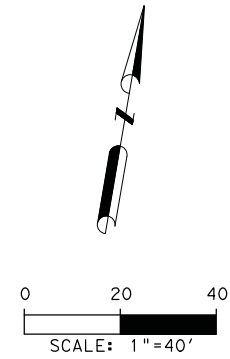
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CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

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LEGEND

- ➔ DIRECTION OF TRAFFIC
- (SCF)— SEDIMENT CONTROL FENCE
- (MB)— METAL BEAM GUARD FENCE
- ⬡ ELECTRICAL SERVICE
- ⬢ TY A GROUND BOX W/ APRON
- ⊠ JUNCTION BOX (BRIDGE MOUNTED)
- 2" PVC SCH 80 CONDUIT
- === 2" PVC SCH 80 CONDUIT (BORE)
- 2" RIGID METAL CONDUIT (BRIDGE MOUNTED)
- ⊡ GROUND MOUNTED LUMINAIRE
- (X) RUN NUMBER
- X-X LUMINAIRE ASSEMBLY ID
- POLE NO. / CIRCUIT NO.



RUN NO.	CONDUIT AND CONDUCTOR RUNS				
	GROUND (LF)	CONDUCTOR (LF)	CONDUIT (LF)		
	#8 BARE	#8 XHHW	2" PVC SCHD 80	2" PVC SCHD 80 (BORE)	2" RMC (BRIDGE MOUNTED)
2	65	210	65	-	-
TOTALS	65	210	65	0	0

ROADWAY ILLUMINATION ASSEMBLY SHEET SUMMARY					
FIXTURE NO.	STATION/OFFSET	REFERENCE CENTERLINE	LAMP		STANDARD TYPE
			EQ WATTS	TYPE	
A-1	139+02.04 / 46.99' RT	US 190	250	LED	(TYSA) 40T-8 (250W EQ) LED

ILLUMINATION QUANTITIES (THIS SHEET ONLY)			
ITEM-CODE	DESCRIPTION	UNIT	TOTAL
416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	8
610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	1
618-6046	COND (PVC) (SCH 80) (2")	LF	65
620-6007	ELEC CONDR (NO.8) BARE	LF	65
620-6008	ELEC CONDR (NO.8) INSULATED	LF	210

- NOTES:**
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 - THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.
 - STATION AND OFFSET BASED ON C US 190 UNLESS OTHERWISE NOTED.
 - CONTRACTOR TO ENSURE ILLUMINATION POLES WITHOUT BARRICADE PROTECTION ARE A MINIMUM 15' FROM EDGE OF TRAVEL LANE.

Drew Davis P.E.

05/27/2021

ILLUMINATION LAYOUTS

(STA 138+50-STA 143+00)

SHEET 3 OF 3

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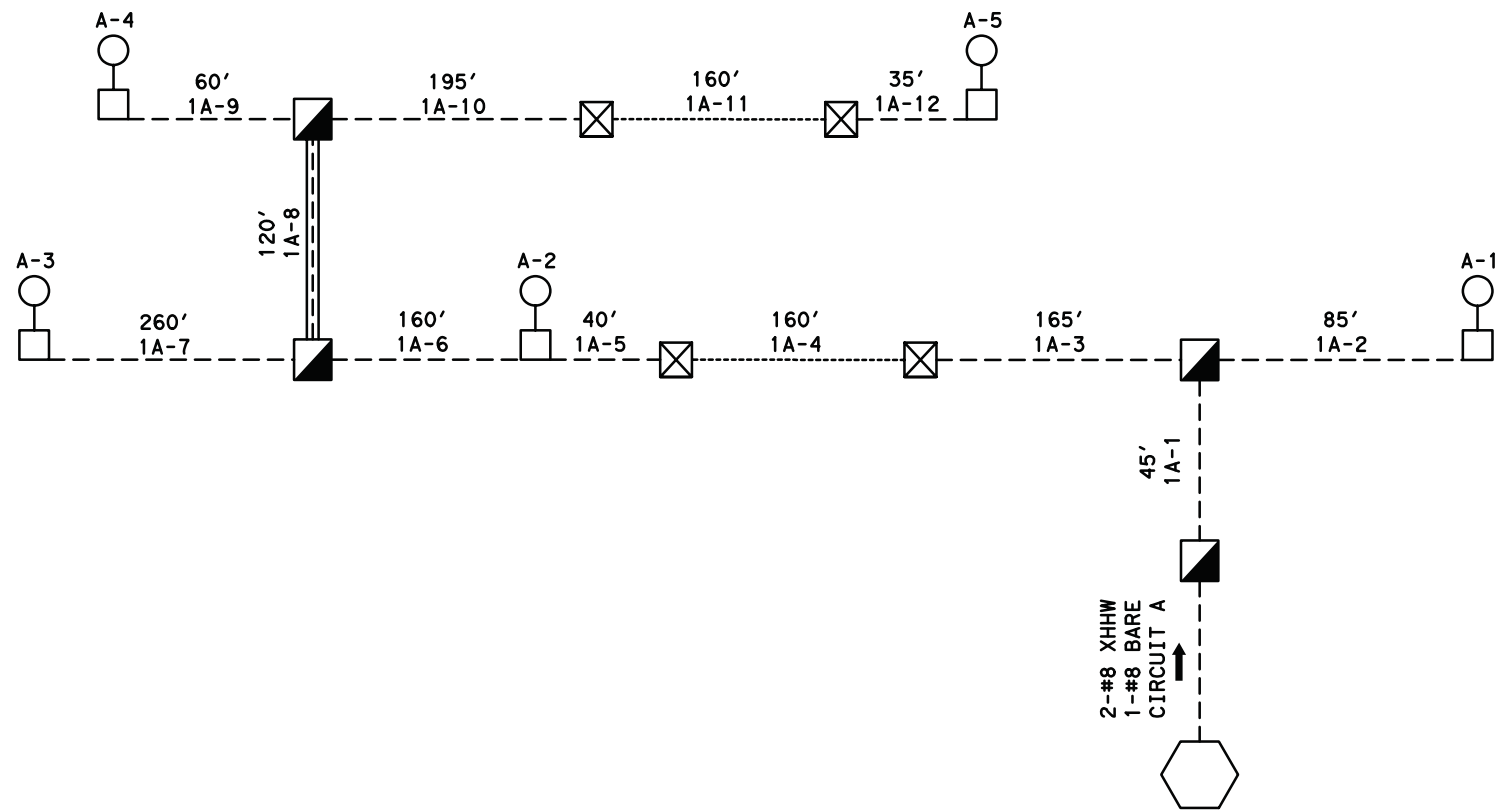
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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LEGEND

- ELECTRICAL SERVICE
- ▣ TY A GROUND BOX W/ APRON
- ⊠ JUNCTION BOX (BRIDGE MOUNTED)
- 2" PVC SCH 80 CONDUIT
- === 2" PVC SCH 80 CONDUIT (BORE)
- 2" RIGID METAL CONDUIT (BRIDGE MOUNTED)
- GROUND MOUNTED LUMINAIRE
- X-X LUMINAIRE ASSEMBLY ID
 L L
 POLE NO.
 CIRCUIT NO.



2-#8 XHHW
 1-#8 BARE
 CIRCUIT A

ELECTRICAL SERVICE NO. 1
 (US190-CHOA)
 ELC SRV TY A 240/480 60(NS)SS(E)SP(O)



Drew C. Davis P.E.

05/25/2021

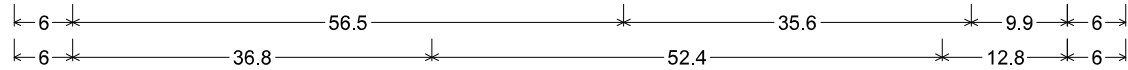
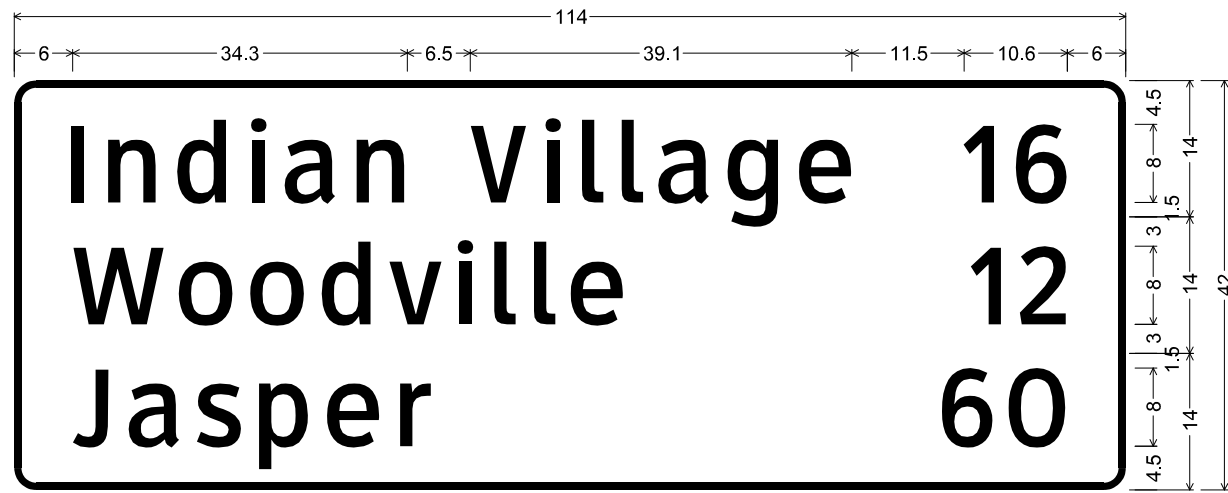
ELECTRICAL SERVICE ONE LINE DIAGRAM



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FED. DIV. NO.	PROJECT NO.	SHEET NO.	
6		236	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

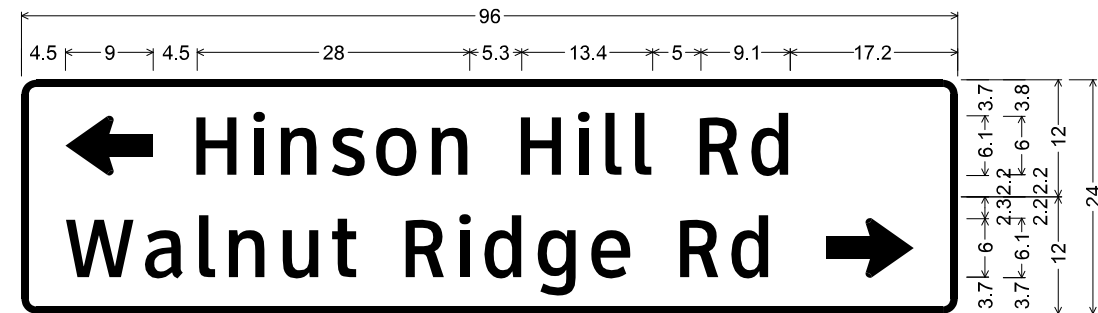
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 DATE: 05/13/2021
 FILE: pw:\bge-pw\bentley\combg-pw-03\Documents\BGE Projects\7005-03_US_190\TS\01_CADD\162SMS\US190_SD_01.dgn



D2-3_114x42;

- 2.3" Radius, 0.8" Border, White on, Green;
"Indian Village", ClearviewHwy-3-W; "16", ClearviewHwy-3-W;
- 2.3" Radius, 0.8" Border, White on, Green;
"Woodville", ClearviewHwy-3-W; "12", ClearviewHwy-3-W;
- 2.3" Radius, 0.8" Border, White on, Green;
"Jasper", ClearviewHwy-3-W; "60", ClearviewHwy-3-W;

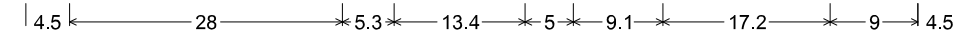
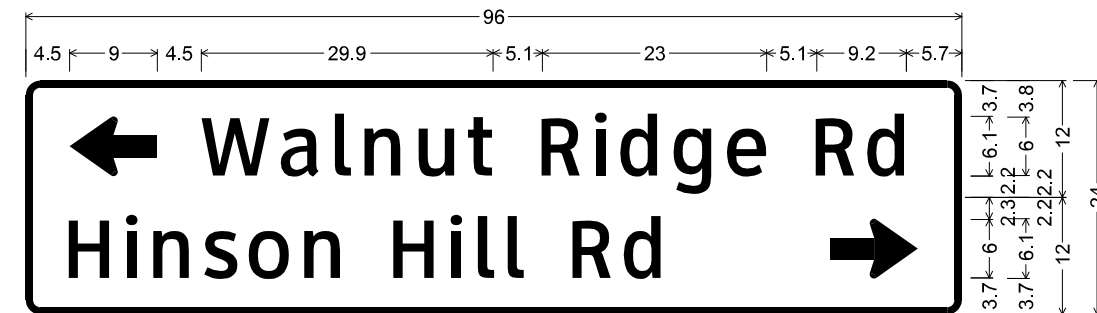
Sheet # : (SHEET 1 OF 33);
SIGN # : 1-4



D21-2TLR_96x24;

- 1.5" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180"; "Hinson Hill Rd", ClearviewHwy-3-W;
- 1.5" Radius, 0.8" Border, White on, Green;
"Walnut Ridge Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0°;

Sheet # : (SHEET 5 OF 33);
Sign # : 5-2

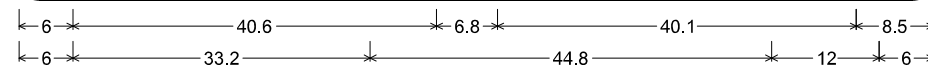
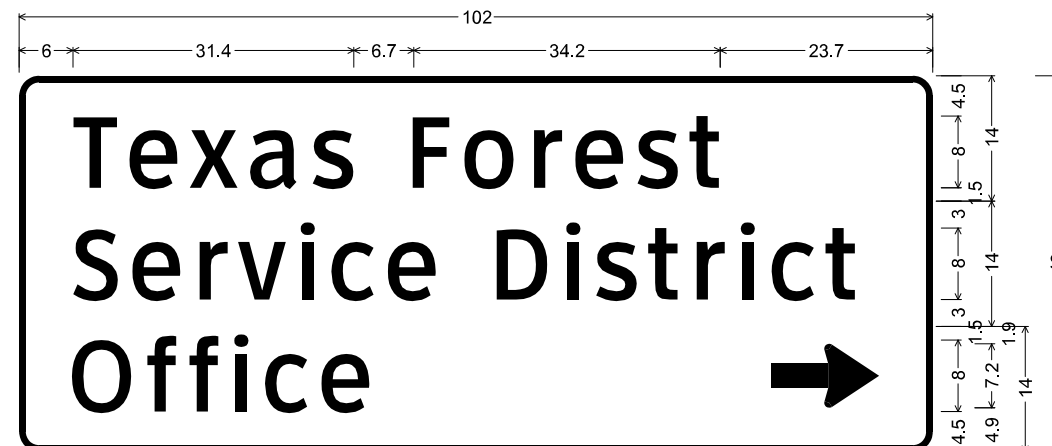


D21-2TLR_96x24;

- 1.5" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180"; "Walnut Ridge Rd", ClearviewHwy-3-W;

- 1.5" Radius, 0.8" Border, White on, Green;
"Hinson Hill Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0°;

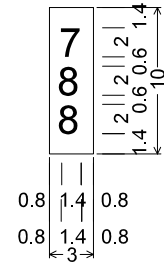
Sheet # : (SHEET 6 OF 33);
Sign # : 6-3



D1-3_102x42;

- 2.3" Radius, 0.8" Border, White on, Green;
"Texas Forest", ClearviewHwy-3-W;
- 2.3" Radius, 0.8" Border, White on, Green;
"Service District", ClearviewHwy-3-W;
- 2.3" Radius, 0.8" Border, White on, Green;
"Office", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0°;

Sheet # : (SHEET 6 OF 33);
Sign # : 6-5



- D10-7aT_3x10;
- No border, White on, Green;
- "7", ClearviewHwy-4-W;
- "8", ClearviewHwy-4-W;
- "8", ClearviewHwy-4-W;

SEE ROADWAY PLAN & PROFILE
Sheet # : (SHEET 2 OF 33);
Sign # : 2-2

05/13/2021

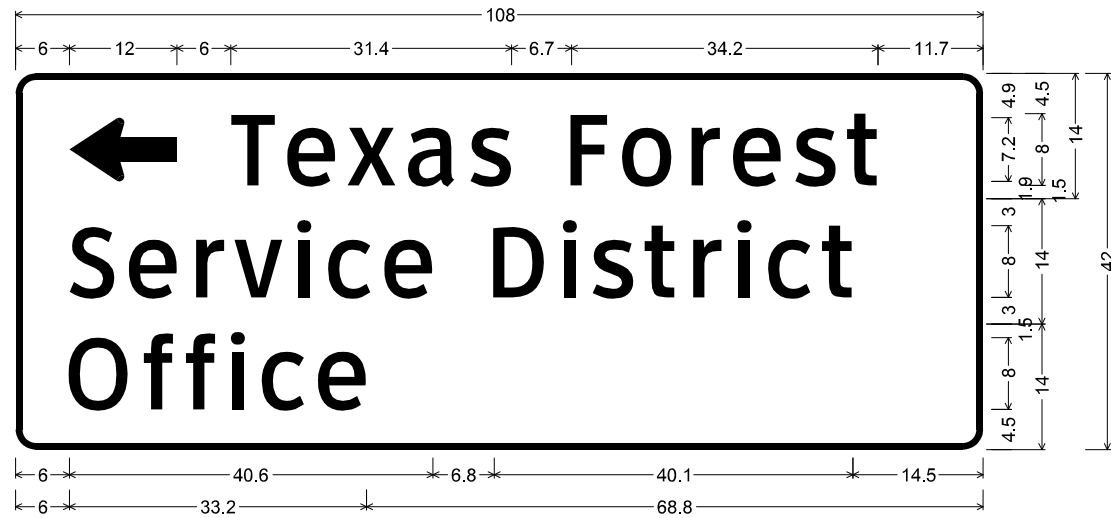
GUIDE SIGN DETAILS

SHEET 1 OF 8

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TBP Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		237	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

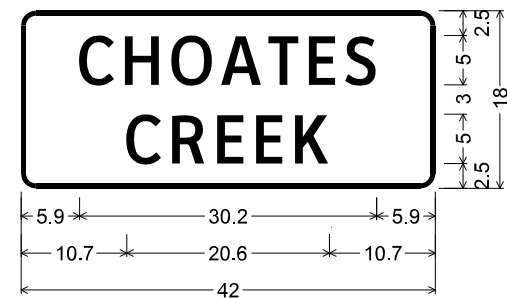


D1-3_108x42

2.3" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 12.0" X 7.1" 180"; "Texas Forest", ClearviewHwy-3-W;

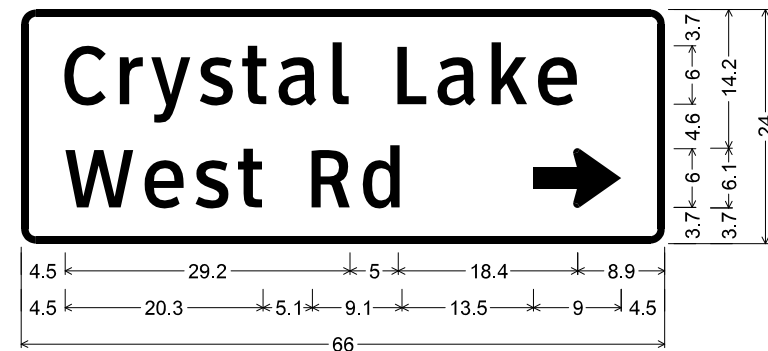
2.3" Radius, 0.8" Border, White on, Green;
 "Service District", ClearviewHwy-3-W;

2.3" Radius, 0.8" Border, White on, Green;
 "Office", ClearviewHwy-3-W;
 Sheet # : (SHEET 7 OF 33);
 Sign # : 7-2



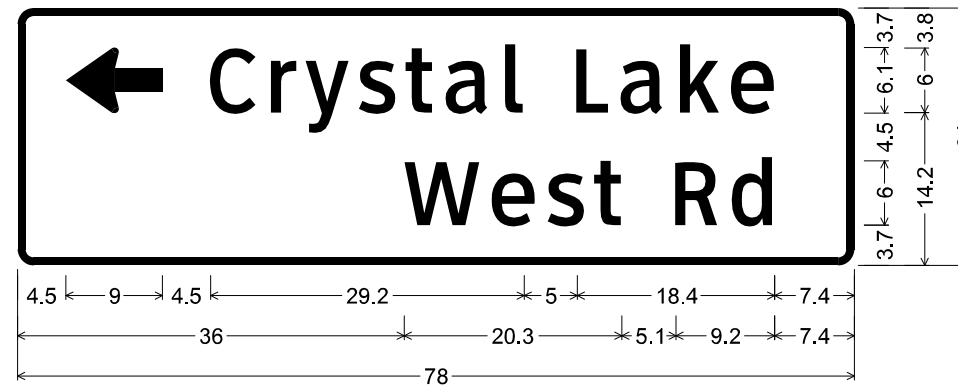
I-3_42x18;

1.5" Radius, 0.5" Border, White on, Green;
 "CHOATES", ClearviewHwy-3-W;
 "CREEK", ClearviewHwy-3-W;
 Sheet # : (SHEET 9 OF 33);
 Sign # : 9-1 & 9-2



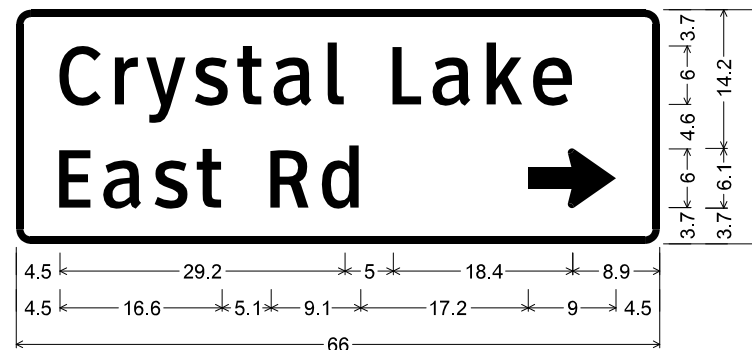
D21-1aTR_66x24;

1.5" Radius, 0.8" Border, White on, Green;
 "Crystal Lake", ClearviewHwy-3-W;
 "West Rd", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0°;
 Sheet # : (SHEET 9 OF 33);
 Sign # : 9-3



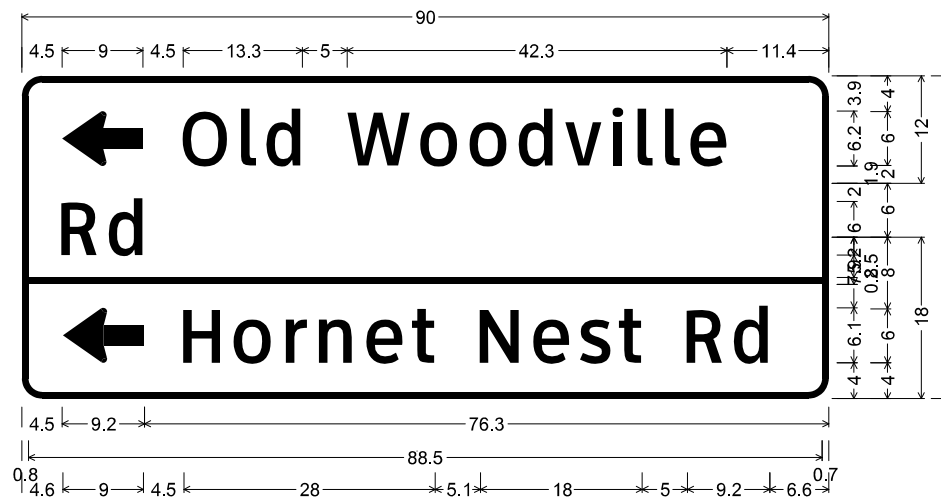
D21-1aTL_78x24;

1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180°;
 "Crystal Lake", ClearviewHwy-3-W; "West Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 10 OF 33);
 Sign # : 10-1



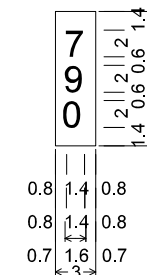
D21-1aTR_66x24;

1.5" Radius, 0.8" Border, White on, Green;
 "Crystal Lake", ClearviewHwy-3-W;
 "East Rd", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0°;
 Sheet # : (SHEET 10 OF 33);
 Sign # : 10-2



D21-3TLL_90x36;

2.3" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180°; "Old Woodville", ClearviewHwy-3-W;
 2.3" Radius, 0.8" Border, White on, Green;
 "Rd", ClearviewHwy-3-W;
 2.3" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180°; "Hornet Nest Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 11 OF 33);
 Sign # : 11-1



D10-7aT 3in;

No border, White on, Green;
 "7", ClearviewHwy-4-W;
 "9", ClearviewHwy-4-W;
 "0", ClearviewHwy-4-W;

SEE ROADWAY PLAN AND PRORIFLE
 Sheet # : (SHEET 11 OF 33);
 Sign # : 11-3

05/13/2021

GUIDE SIGN
DETAILS

SHEET 2 OF 8

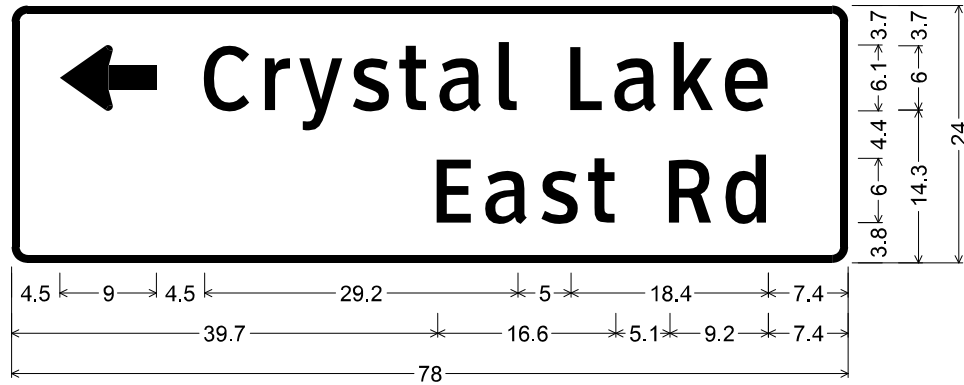
Texas Department of Transportation
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TBPPE Registration No. F-1046

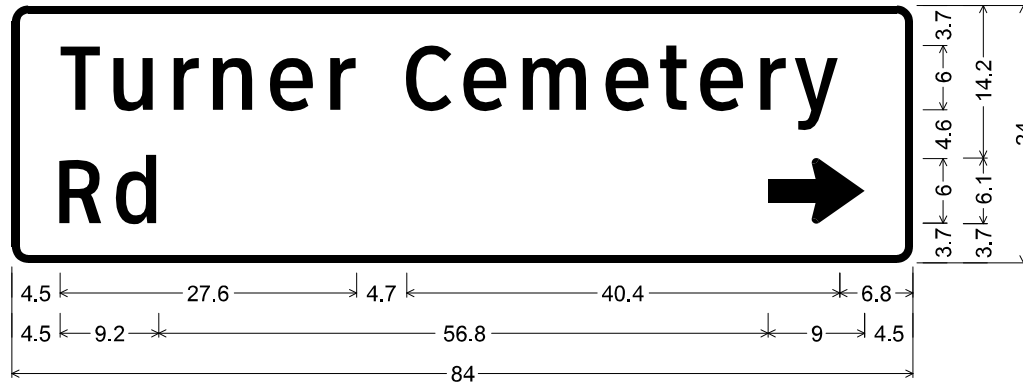
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		238

STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

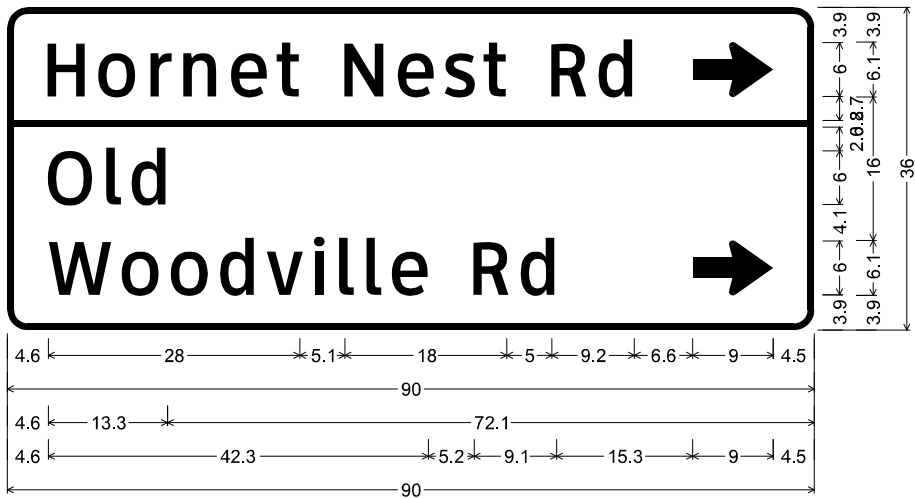
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 DATE: 05/13/2021
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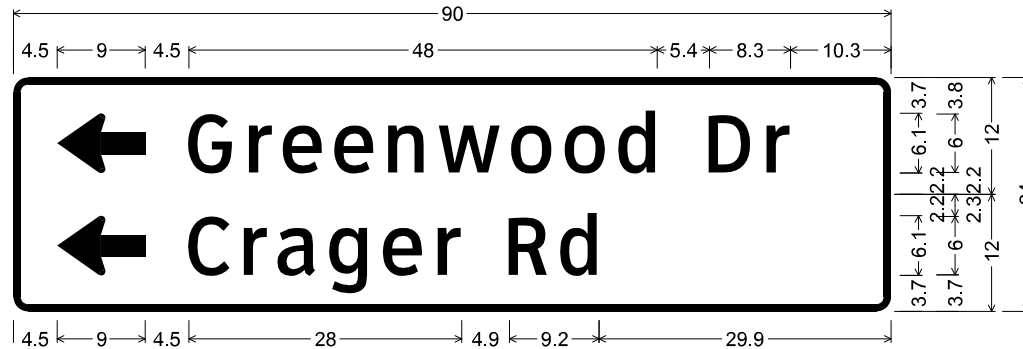
D21-1aTL_78x24;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180°;
 "Crystal Lake", ClearviewHwy-3-W; "East Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 11 OF 33);
 Sign # : 11-2



D21-1aTR_84x24;
 1.5" Radius, 0.8" Border, White on, Green;
 "Turner Cemetery", ClearviewHwy-3-W; "Rd", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0°;
 Sheet # : (SHEET 14 OF 33);
 Sign # : 14-1



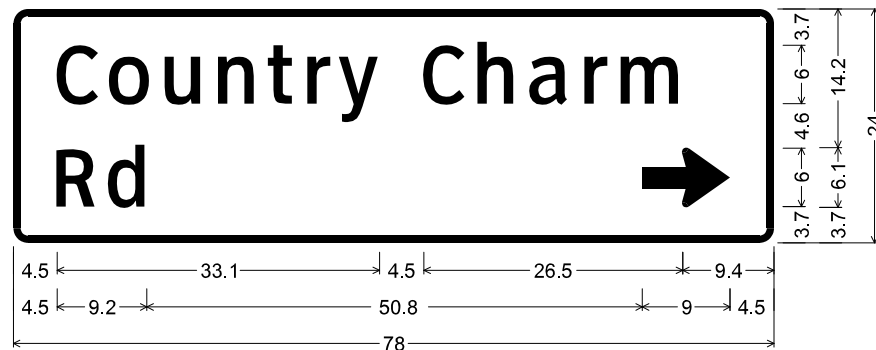
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 "Hornet Nest Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0°;
 "Old", ClearviewHwy-3-W; "Woodville Rd", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0°;
 Sheet # : (SHEET 12 OF 33);
 Sign # : 12-1



D21-2TL_90x24;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180°; "Greenwood Dr", ClearviewHwy-3-W;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180°; "Crager Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 14 OF 33);
 Sign # : 14-3



D21-1TL_78x12;
 1.5" Radius, 0.5" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180°;
 "Knob Hill Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 12 OF 33);
 Sign # : 12-2



D21-1aTR_78x24;
 1.5" Radius, 0.8" Border, White on, Green;
 "Country Charm", ClearviewHwy-3-W; "Rd", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0°;
 Sheet # : (SHEET 15 OF 33);
 Sign # : 15-2



D21-1TR_78x12;
 1.5" Radius, 0.5" Border, White on, Green;
 "Knob Hill Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0°;
 Sheet # : (SHEET 13 OF 33);
 Sign # : 13-2

05/13/2021

GUIDE SIGN
 DETAILS

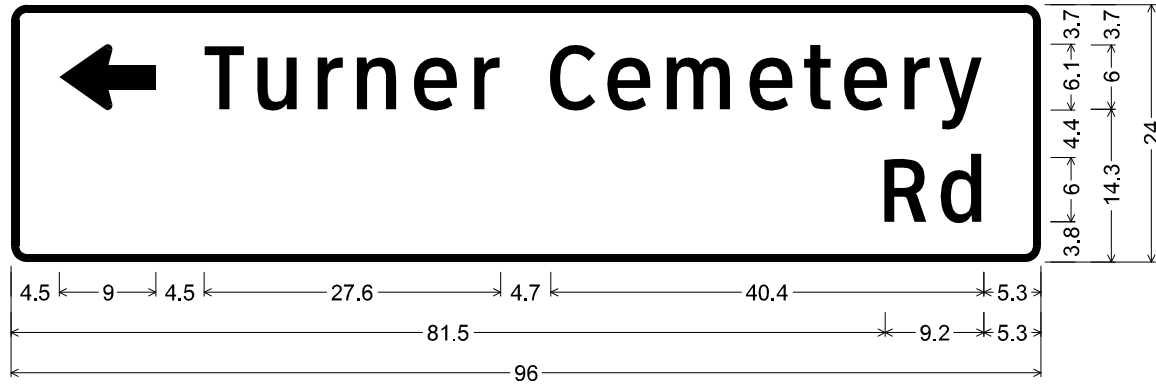
SHEET 3 OF 8



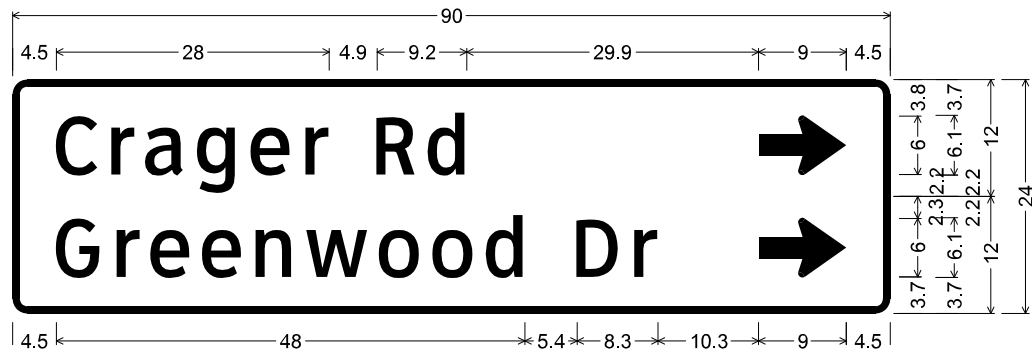
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 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		239	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

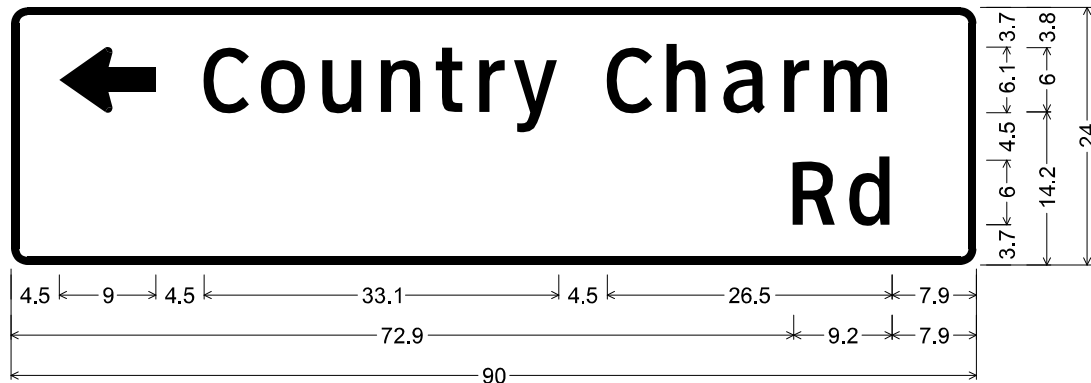
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 DATE: 05/13/2021
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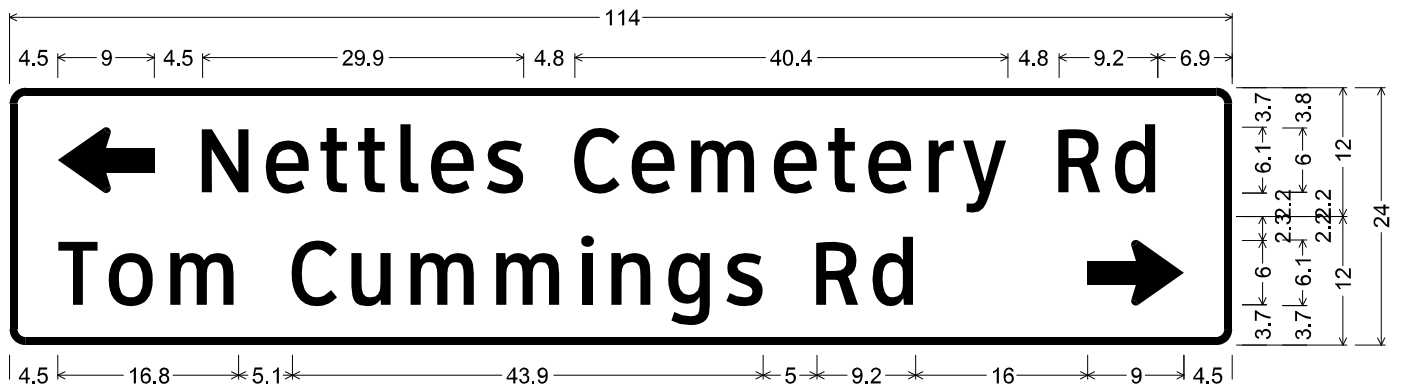
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 Standard Arrow Custom 9.0" X 6.1" 180"; "Turner Cemetery", ClearviewHwy-3-W;
 "Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 15 OF 33);
 Sign # : 15-3



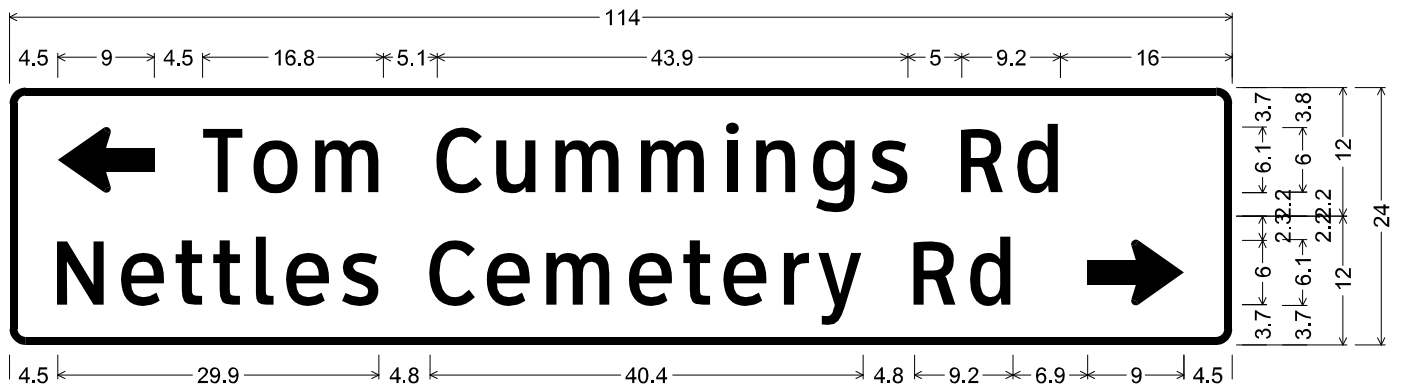
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 "Crager Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 1.5" Radius, 0.8" Border, White on, Green;
 "Greenwood Dr", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 15 OF 33);
 Sign # : 15-4



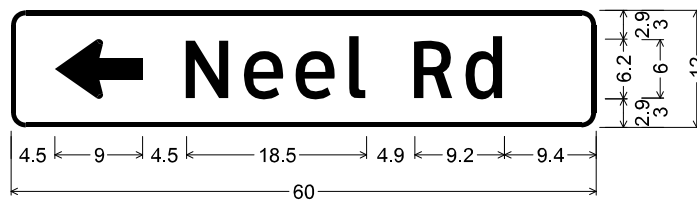
D21-1aTL_90x24;
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 Standard Arrow Custom 9.0" X 6.1" 180"; "Country Charm", ClearviewHwy-3-W;
 "Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 15 OF 33);
 Sign # : 15-7



D21-2TLR 114x24;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180"; "Nettles Cemetery Rd", ClearviewHwy-3-W;
 1.5" Radius, 0.8" Border, White on, Green;
 "Tom Cummings Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 15 OF 33);
 Sign # : 15-6



D21-2TLR 114x24;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180"; "Tom Cummings Rd", ClearviewHwy-3-W;
 1.5" Radius, 0.8" Border, White on, Green;
 "Nettles Cemetery Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 16 OF 33);
 Sign # : 16-2



D21-1TL_60x12;
 1.5" Radius, 0.5" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180";
 "Neel Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 16 OF 33);
 Sign # : 16-3

05/13/2021

GUIDE SIGN
 DETAILS

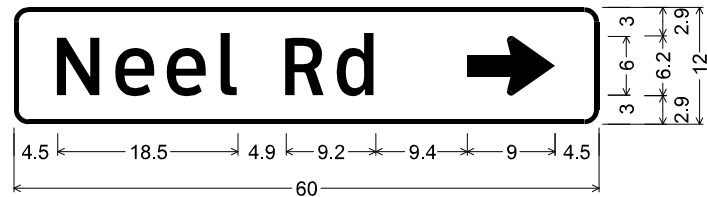
SHEET 4 OF 8



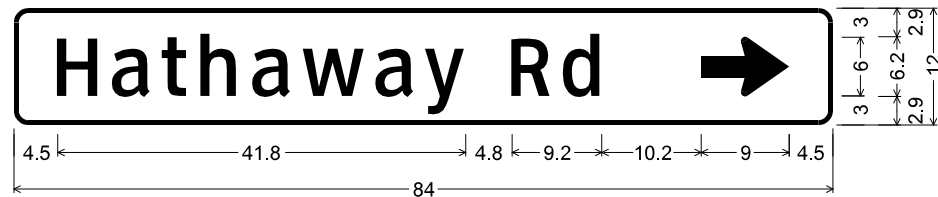
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		240	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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 DATE: 05/13/2021
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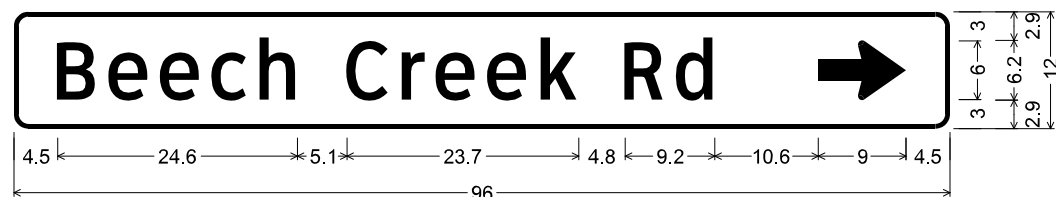
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 Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 17 OF 33);
 Sign # : 17-2



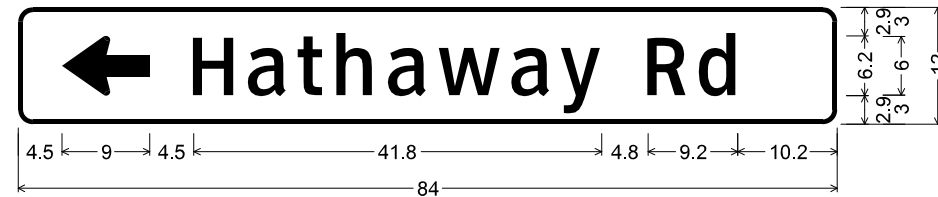
D21-1TR_84x12;
 1.5" Radius, 0.5" Border, White on, Green;
 "Hathaway Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 17 OF 33);
 Sign # : 17-3



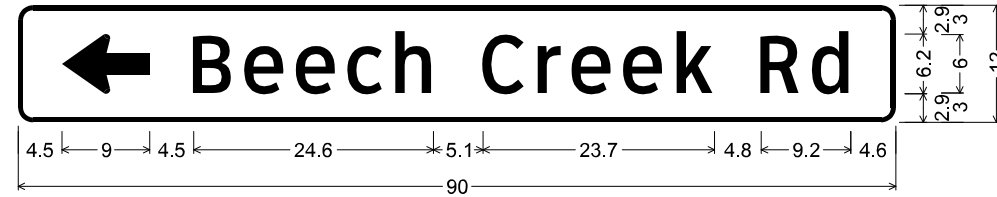
D21-2TL_84x24;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180"; "Berts Farm Rd", ClearviewHwy-3-W;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180"; "Hant Hill Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 18 OF 33);
 Sign # : 18-2



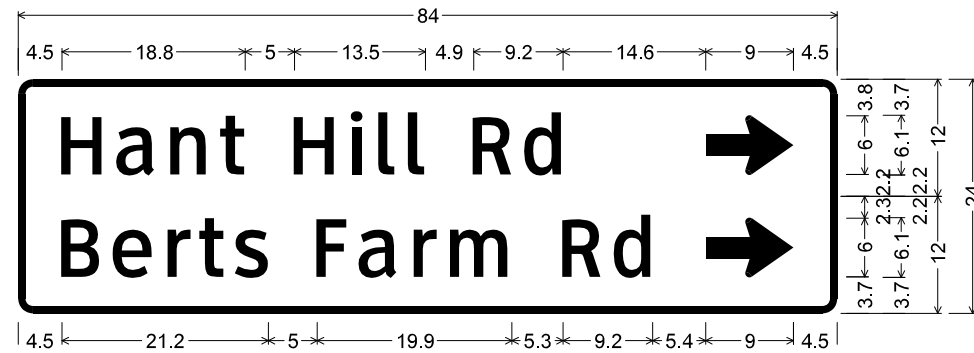
D21-1TR_96x12;
 1.5" Radius, 0.5" Border, White on, Green;
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 Sheet # : (SHEET 18 OF 33);
 Sign # : 18-3



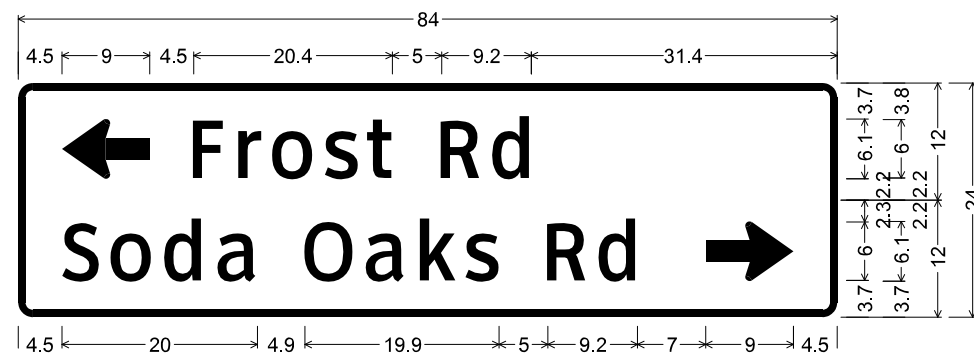
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 Sheet # : (SHEET 18 OF 33);
 Sign # : 18-4



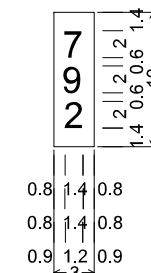
D21-1TL_90x12;
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 Standard Arrow Custom 9.0" X 6.1" 180"; "Beech Creek Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 19 OF 33);
 Sign # : 19-3



D21-2TR_84x24;
 1.5" Radius, 0.8" Border, White on, Green;
 "Hant Hill Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 1.5" Radius, 0.8" Border, White on, Green;
 "Berts Farm Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 19 OF 33);
 Sign # : 19-4



D21-2TLR_84x24;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180"; "Frost Rd", ClearviewHwy-3-W;
 1.5" Radius, 0.8" Border, White on, Green;
 "Soda Oaks Rd", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 20 OF 33);
 Sign # : 20-1



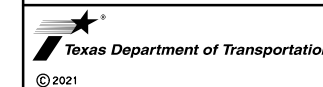
D10-7aT 3in;
 No border, White on, Green;
 "7", ClearviewHwy-4-W;
 "9", ClearviewHwy-4-W;
 "2", ClearviewHwy-4-W;

SEE ROADWAY PLAN AND PROFILE
 Sheet # : (SHEET 20 OF 33);
 Sign # : 20-2

05/13/2021

GUIDE SIGN
 DETAILS

SHEET 5 OF 8



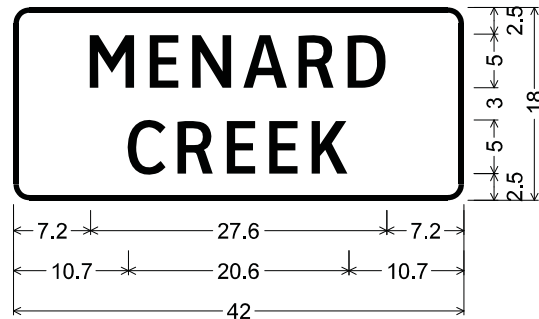
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 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		241
STATE	STATE DIST. NO.	COUNTY
TEXAS	LFK	POLK
CONT.	SECT.	JOB
0213	04	050
		HIGHWAY NO.
		US 190

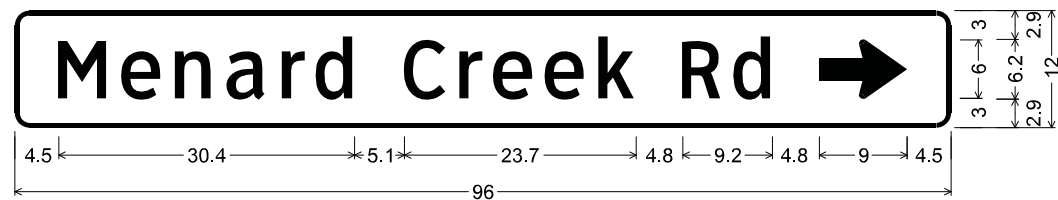
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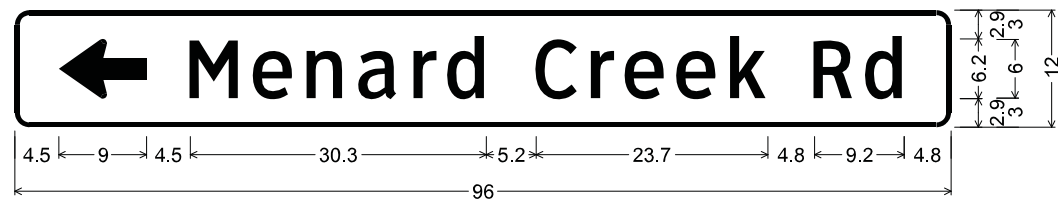
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 Sign # : 21-1



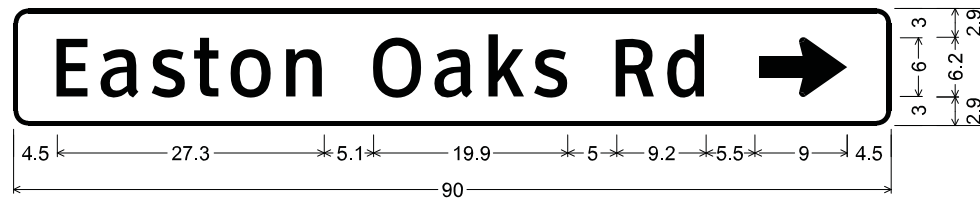
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 Sheet # : (SHEET 22 OF 33);
 Sign # : 22-1 & 22-2



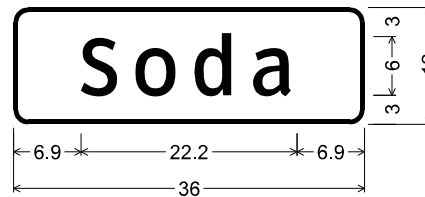
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 Sign # : 23-1



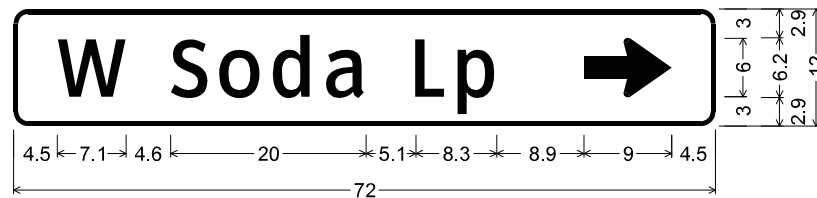
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 Sign # : 23-4



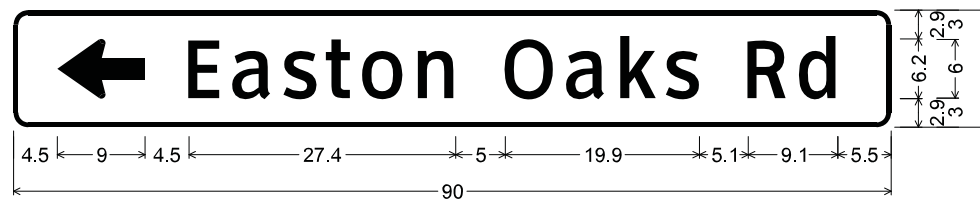
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 Sign # : 24-1



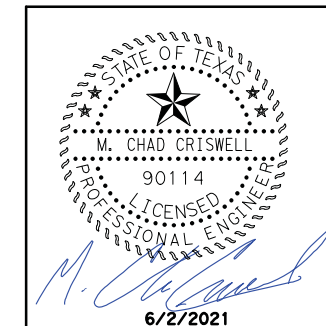
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 Sheet # : (SHEET 24 OF 33);
 Sign # : 24-2



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 "W Soda Lp", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0";
 Sheet # : (SHEET 25 OF 33);
 Sign # : 25-1



D21-1TL_90x12;
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 Sign # : 25-2



GUIDE SIGN DETAILS

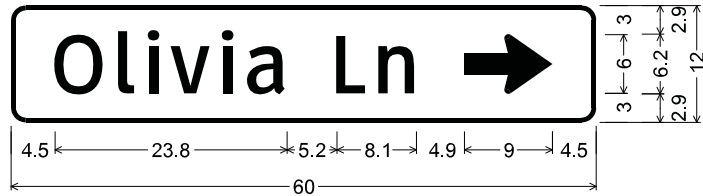
SHEET 6 OF 8



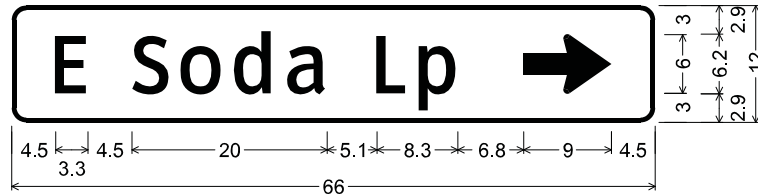
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6				242	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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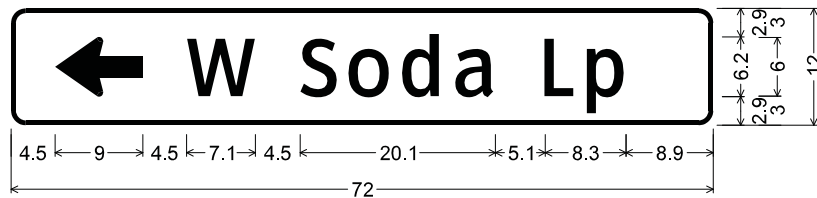
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 Sign # : 25-4



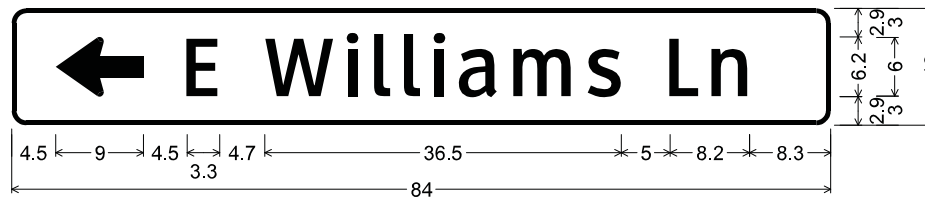
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 Sign # : 29-1



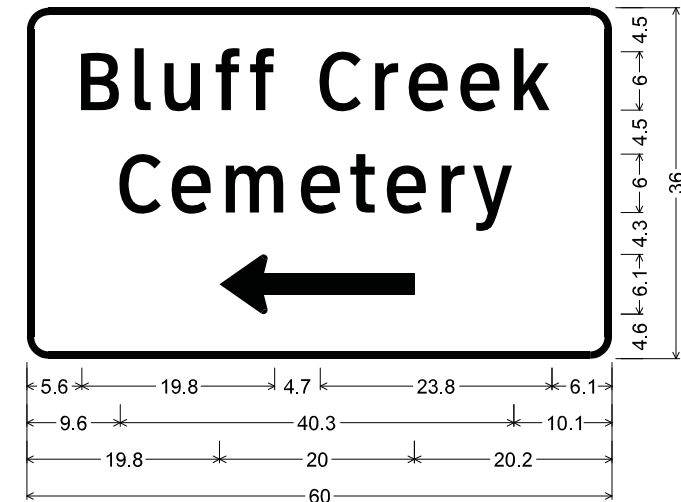
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 Sign # : 31-2



D21-1TL_72x12;
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 Sign # : 25-5



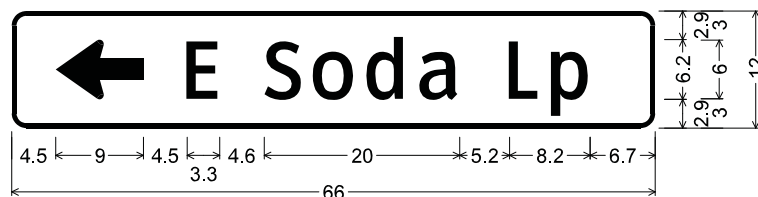
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 Sign # : 29-2



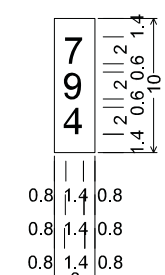
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 Standard Arrow Custom 20.0" X 6.1" 180';
 Sheet # : (SHEET 32 OF 33);
 Sign # : 32-1



D21-1TL_60x12;
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 Standard Arrow Custom 9.0" X 6.1" 180';
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 Sheet # : (SHEET 26 OF 33);
 Sign # : 26-2



D21-1TL_66x12;
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 Sign # : 29-5

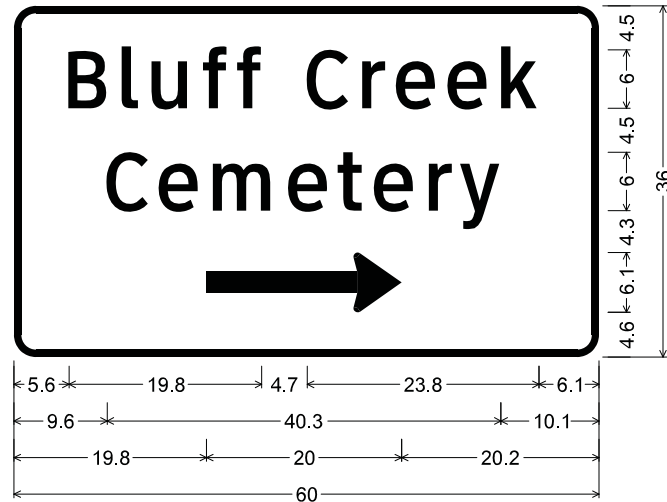


D10-7aT 3in;
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 "4", ClearviewHwy-4-W;

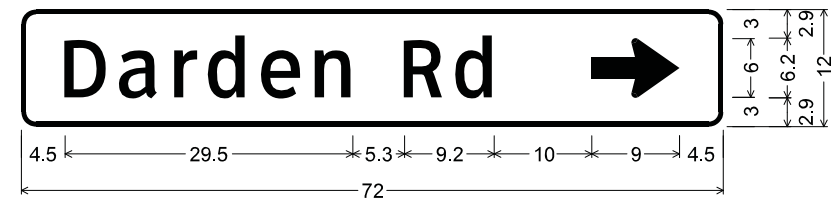
SEE ROADWAY PLAN AND PROFILE
 Sheet # : (SHEET 29 OF 33);
 Sign # : 29-3



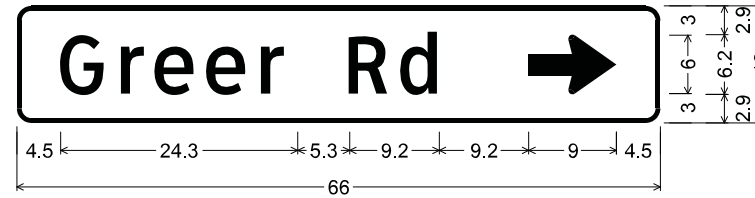
GUIDE SIGN DETAILS			
SHEET 7 OF 8			
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		243	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190



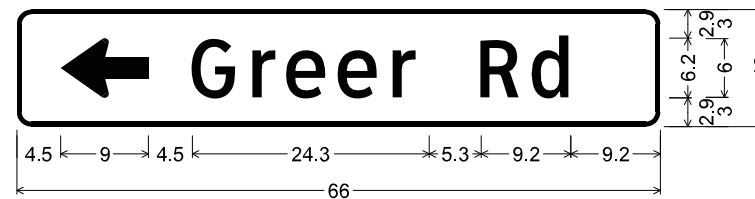
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 Sheet # : (SHEET 32 OF 33);
 Sign # : 32-1



D21-1TR_72x12;
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 Standard Arrow Custom 9.0" X 6.1" 0';
 Sheet # : (SHEET 32 OF 33);
 Sign # : 32-2



D21-1TR_66x12;
 1.5" Radius, 0.5" Border, White on, Green;
 "Greer Rd", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0';
 Sheet # : (SHEET 32 OF 33);
 Sign # : 32-3



D21-1TL_66x12;
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 Standard Arrow Custom 9.0" X 6.1" 180';
 "Greer Rd", ClearviewHwy-3-W;
 Sheet # : (SHEET 33 OF 33);
 Sign # : 33-2

STATE OF TEXAS
 M. CHAD CRISWELL
 90114
 LICENSED PROFESSIONAL ENGINEER
 05/25/2021

GUIDE SIGN DETAILS

SHEET 8 OF 8

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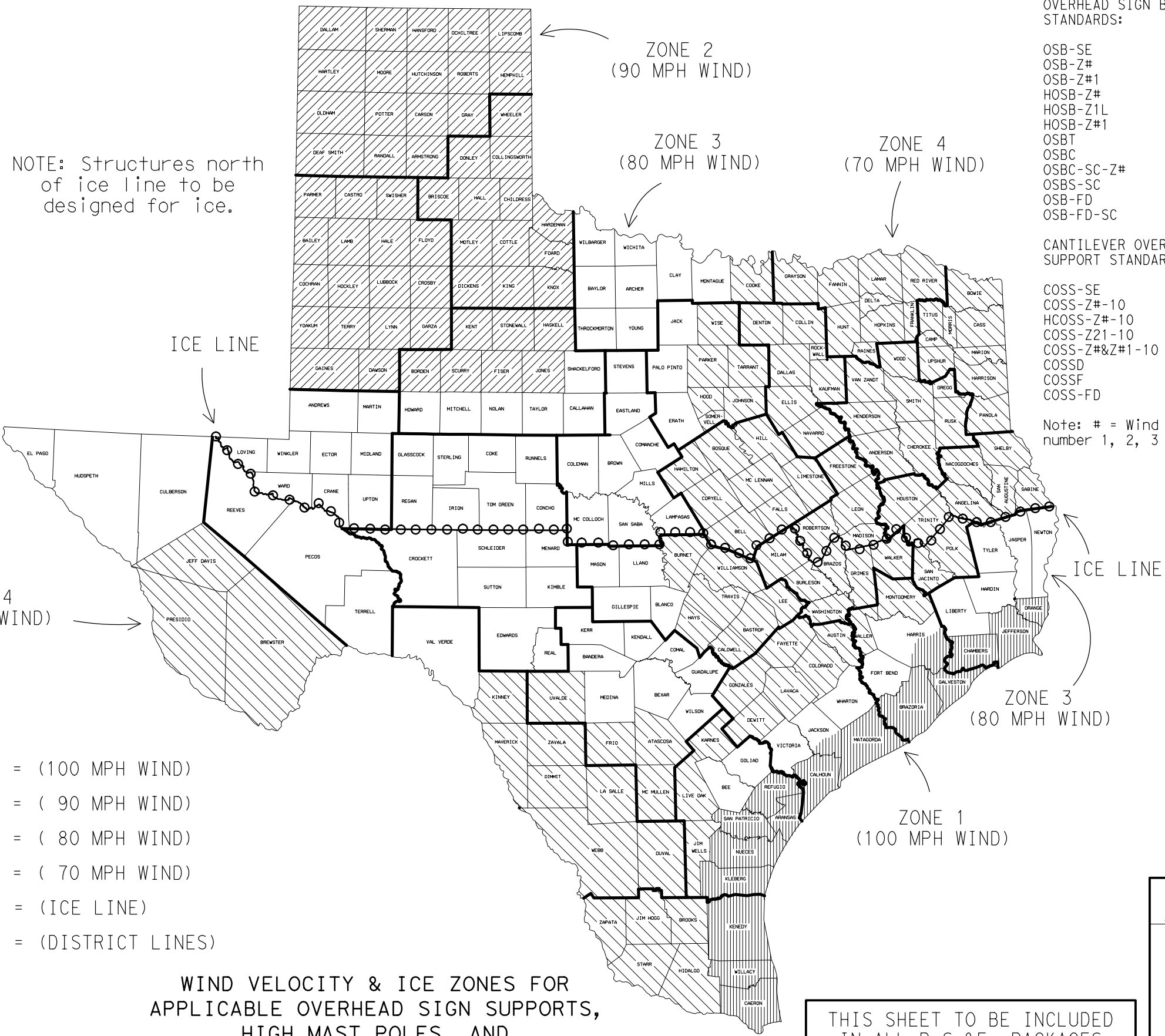
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6		244	
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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DATE: 06/03/2021 16:02:25
 FILE: c:\pwworkdir\bgp_dw\eman\mamn\dms58437\windice.dgn

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
- 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
- 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



NOTE: Structures north of ice line to be designed for ice.

LEGEND

- ZONE 1 - [diagonal lines] = (100 MPH WIND)
- ZONE 2 - [diagonal lines] = (90 MPH WIND)
- ZONE 3 - [white box] = (80 MPH WIND)
- ZONE 4 - [diagonal lines] = (70 MPH WIND)
- [dashed line with circles] = (ICE LINE)
- [solid black line] = (DISTRICT LINES)

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

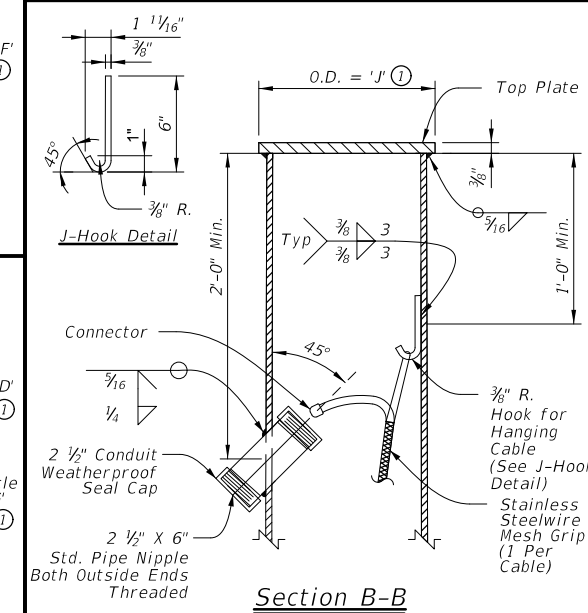
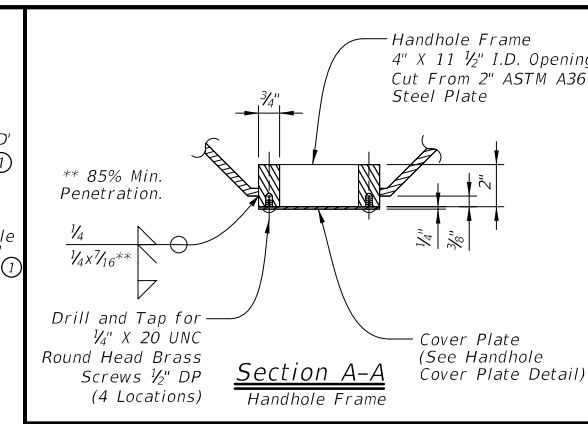
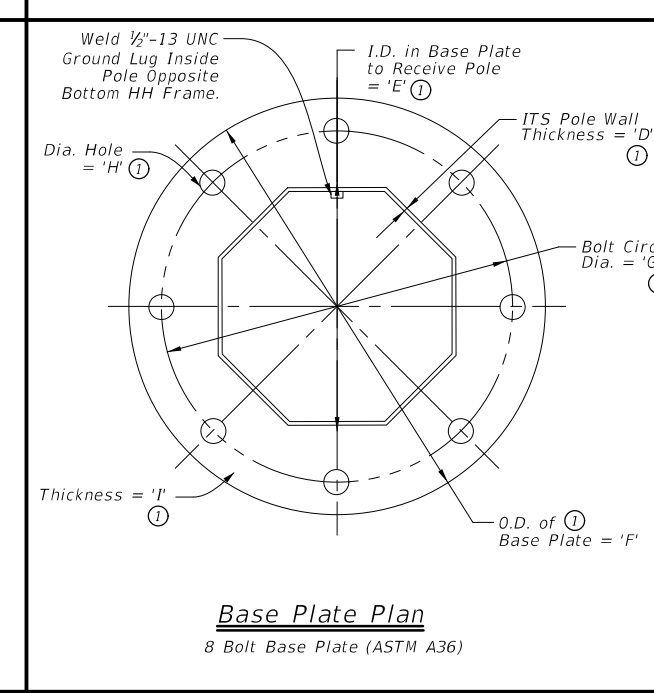
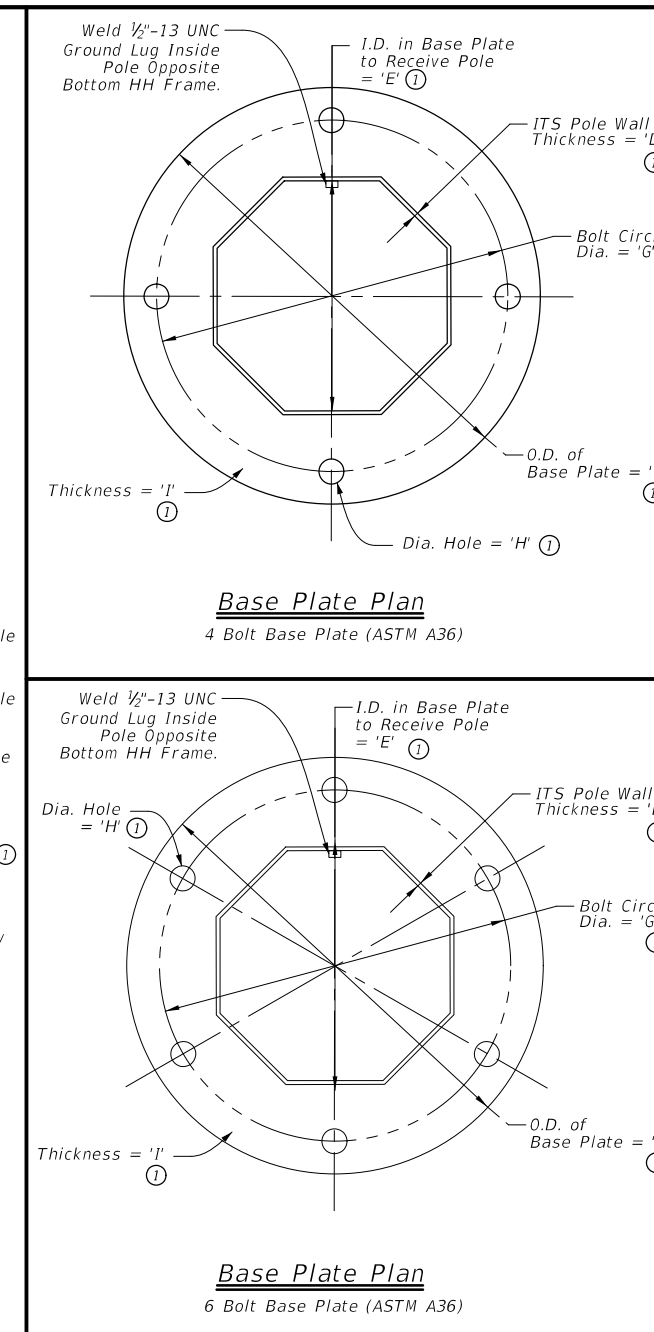
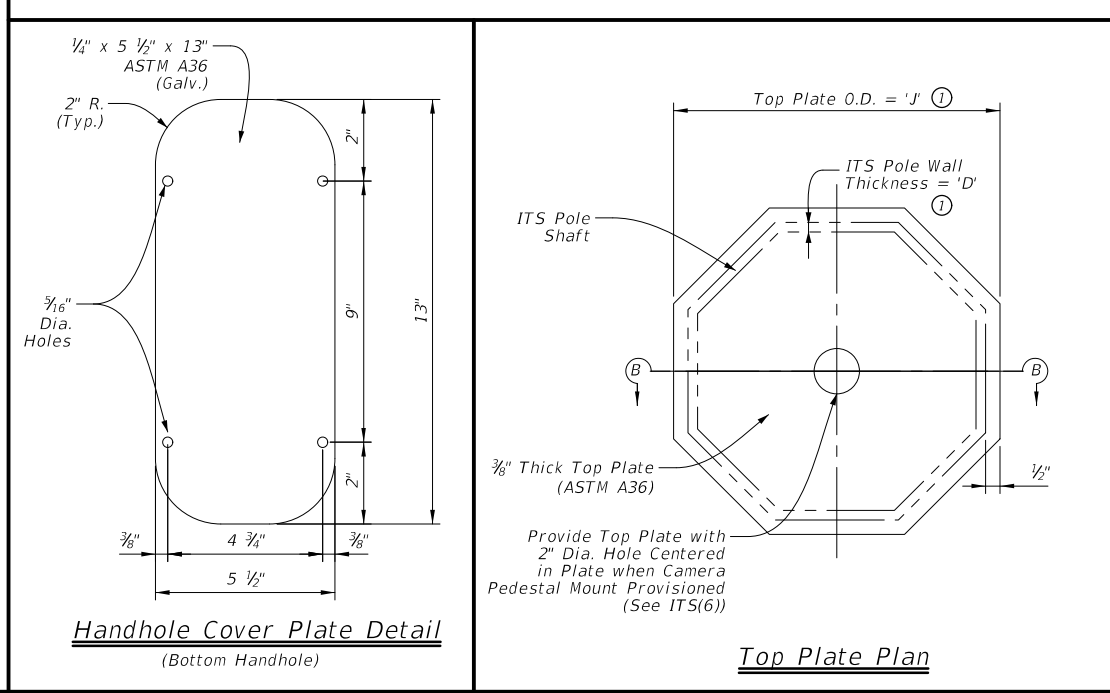
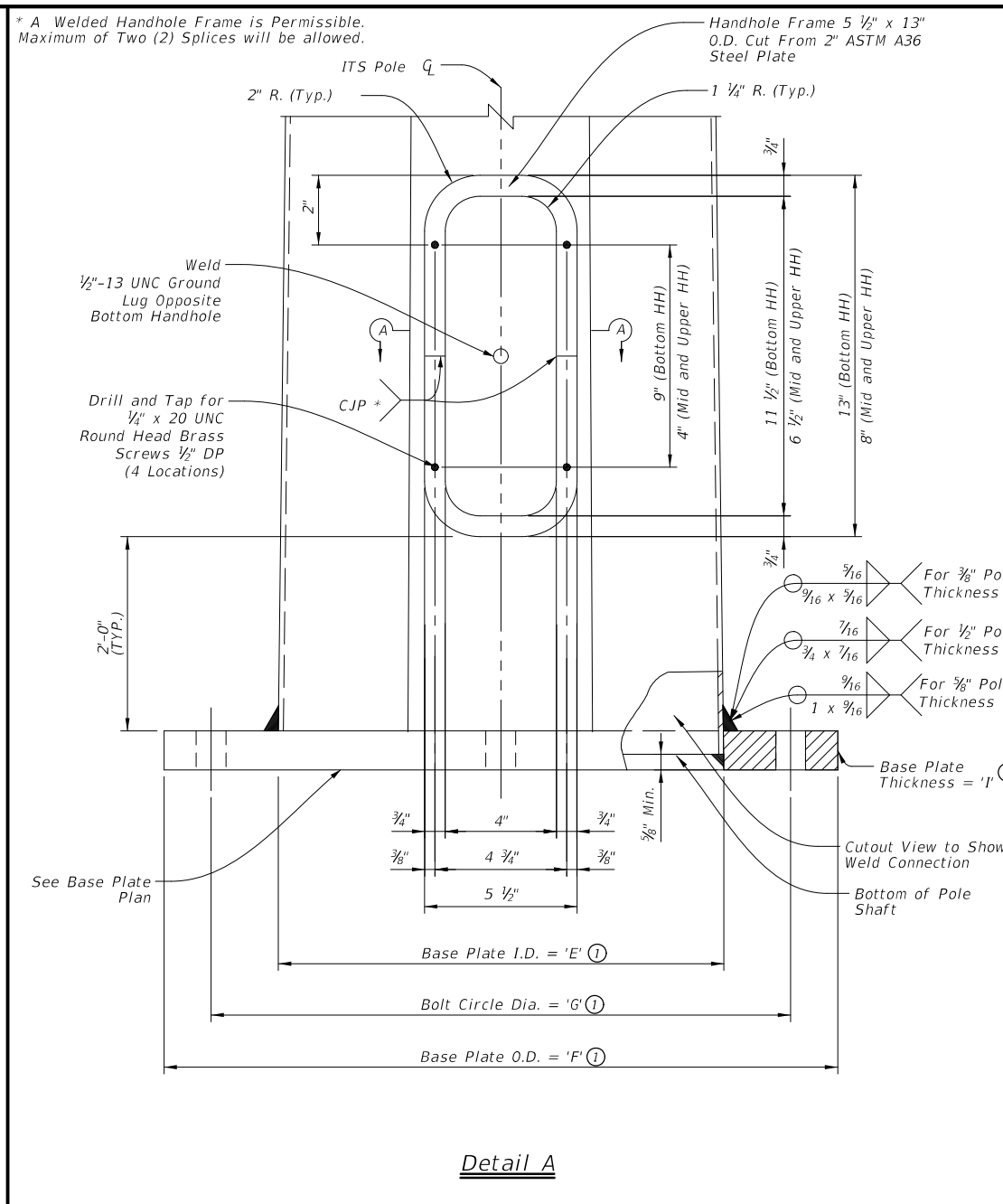
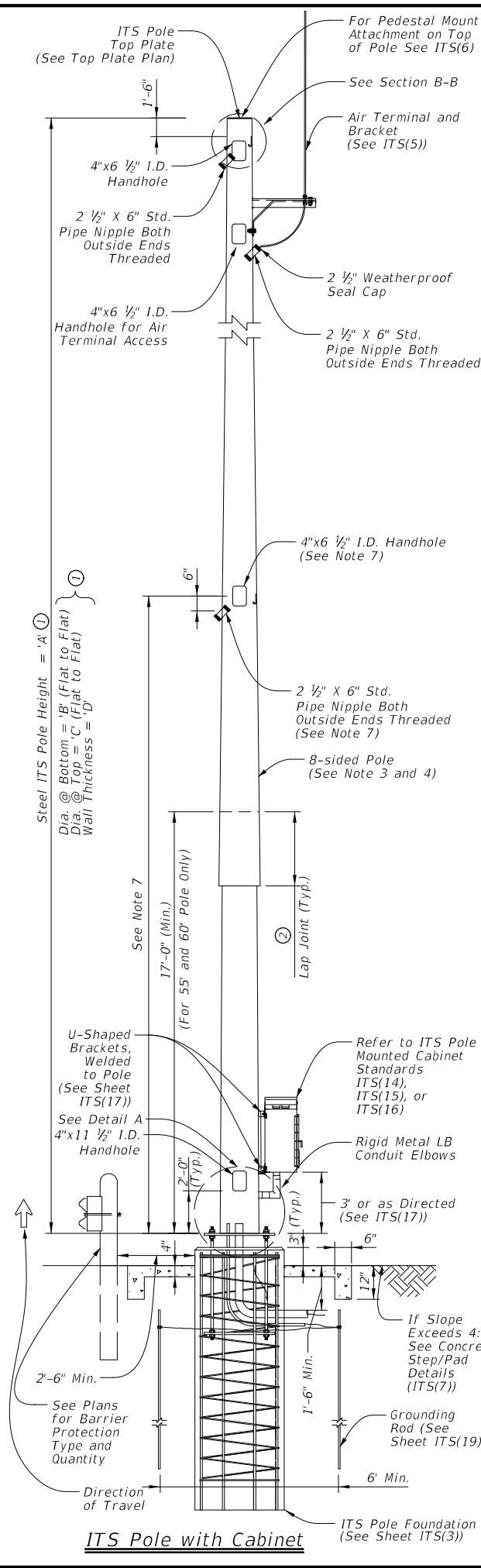
FOR HARRIS CO. ONLY
 Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
 Zone line is just North of SH 616.

		Traffic Operations Division Standard	
<h2>WIND VELOCITY AND ICE ZONES</h2> <h3>WV & IZ-14</h3>			
FILE: windice.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 1996	CONT	SECT	JOB
REVISIONS	0213	04	050
8-14-Added list of applicable standards, restricting use to structures designed for Fastest Mile wind speeds.	DIST	COUNTY	SHEET NO.
	LFK	POLK	245

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DATE: 06/03/2021 16:02:29
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- General Notes**
1. Designed according to Sixth Edition 2013 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications.
 2. Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
 3. Deviation from the design criteria, values, and dimensions shown herein and on ITS(4), constitutes an alternative design and will require submission of shop drawings and calculations for approval, sealed by a Texas Professional Engineer.
 4. Direct substitution of twelve sided or round poles, matching the design criteria, values, and dimensions shown herein, require submission of shop drawings for approval to confirm design criteria and values on ITS(4) is met.
 5. Locate handholes opposite of the direction of travel.
 6. Appropriate number of anchor bolts for base plate determined by height of pole. See 'L' on sheet ITS(4).
 7. Location for ITS equipment mount may vary by device. Locate mid span handhole and pipe nipple to accommodate location for ITS equipment as identified in the plans or per manufacturer recommendations. Identify location for mid span handhole and pipe nipple on shop drawings for approval.
- Reference Notes:**
- ① See tables on Sheet ITS(4) for values of dimension variables.
 - ② See lap joint note for 55' and 60' pole heights on ITS(4) at the bottom of each table.

Texas Department of Transportation
 Traffic Operations Division Standard

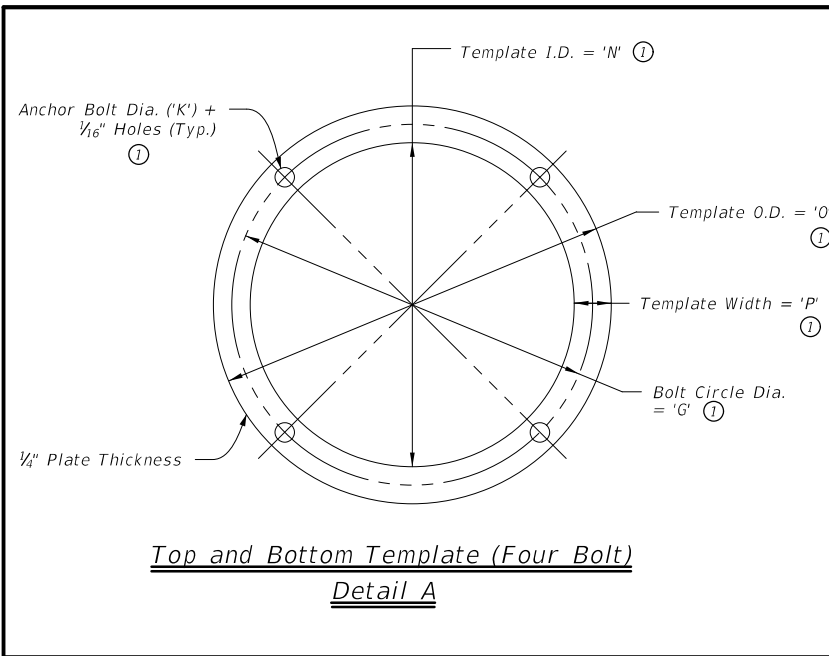
**ITS POLE DETAILS
 OCTAGONAL POLE
 (EIGHT SIDED POLE)**

ITS(1)-15

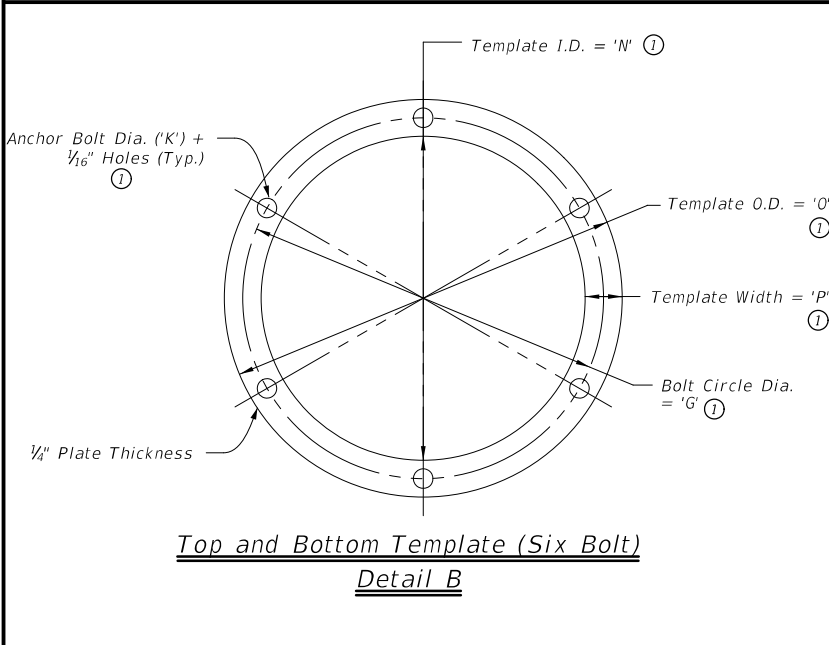
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©TxDOT June 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	245A	

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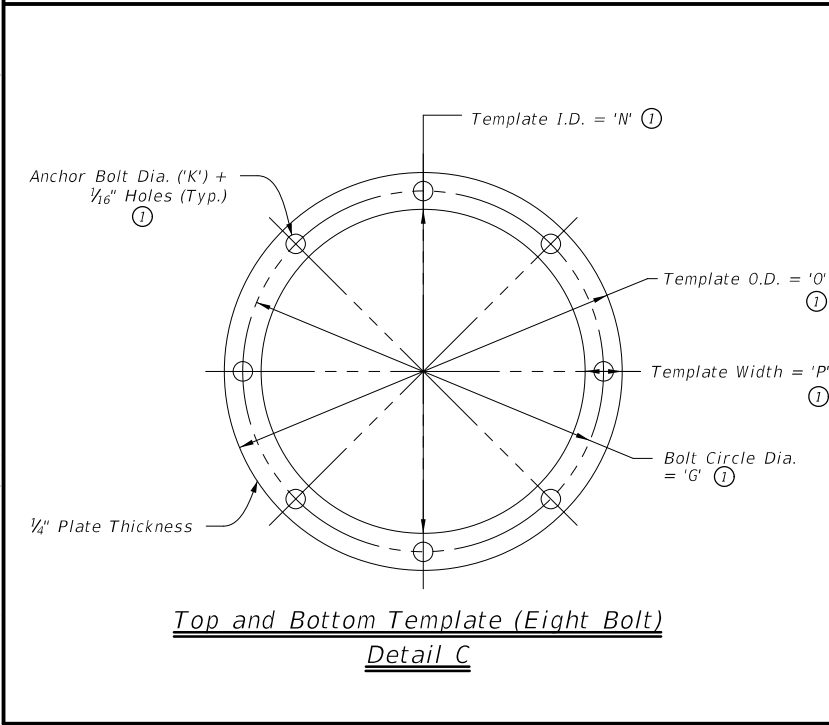
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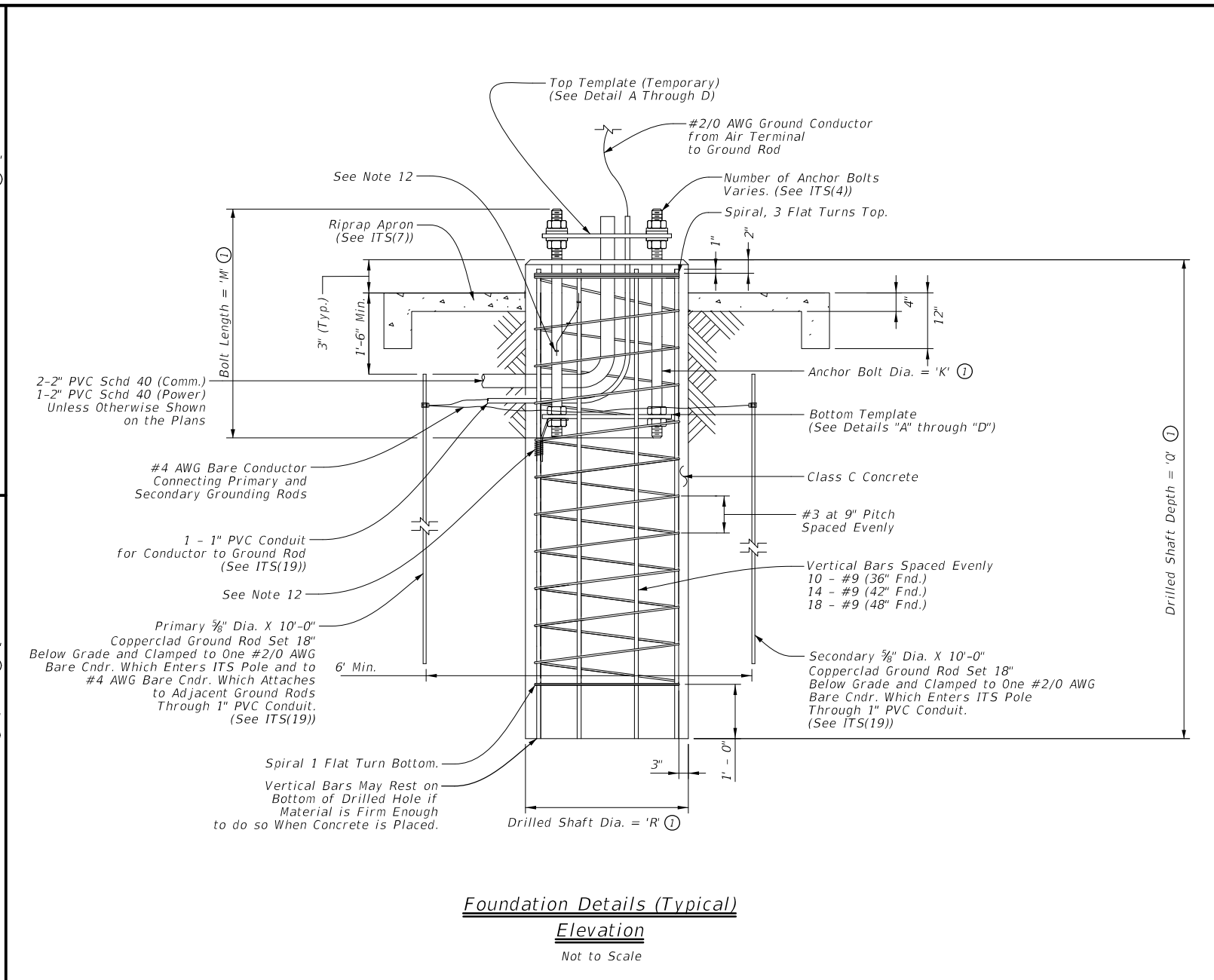
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Detail A



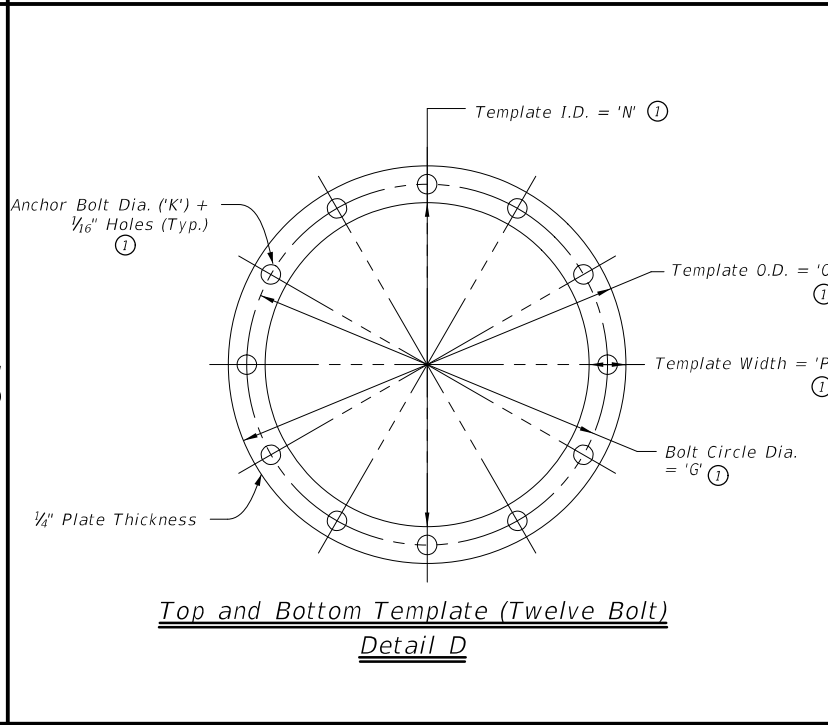
Top and Bottom Template (Six Bolt)
Detail B



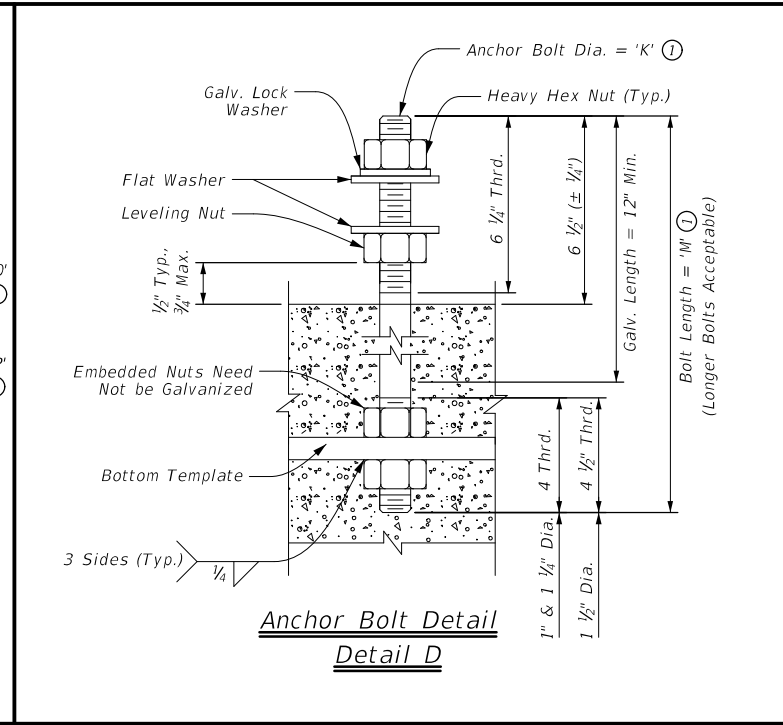
Top and Bottom Template (Eight Bolt)
Detail C



Foundation Details (Typical)
Elevation
 Not to Scale



Top and Bottom Template (Twelve Bolt)
Detail D



Anchor Bolt Detail
Detail D

- General Notes:**
1. Drilled shaft concrete shall be Class "C" (f'c = 3,600 PSI) in accordance with Item 416, "Drilled Shaft Foundations."
 2. Reinforcing bars shall be Grade 60 (Fy = 60 KSI) and conform to ASTM A-615. All reinforcing shall conform to Item 440, "Reinforcing Steel."
 3. Provide ASTM A-36 steel for templates. Top and bottom templates need not be galvanized.
 4. Anchor bolts shall be rigidly held in position during concrete placement using steel templates at the top and bottom. Top templates shall remain in place until the concrete has cured in place beyond initial set time.
 5. Lubricate and tighten anchor bolts, when erecting pole, in accordance with Item 449, "Anchor Bolts."
 6. Anchor bolts shall conform to ASTM F1554 Grade 55, or ASTM A193 B7 with ASTM A194 Grade 2H or A563 heavy hex nuts with F436 washers. Galvanize a minimum of the top end thread length plus 6 inches 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."
 7. All vertical reinforcement shall be carried to the bottom of the drilled shaft.
 8. Place three flat turns of the spiral bar at the top and one flat turn at the bottom of the drilled shaft.
 9. Drilled shaft shall be measured by the linear foot and paid under Item 416, "Drill Shaft Foundations."
 10. If rock is encountered, the drilled shaft to extend a minimum of two diameters into solid rock.
 11. Location for conduit entering foundation may vary. Orient conduit entering foundation to coincide with location of ground boxes and primary ground rod.
 12. Bond anchor bolts to rebar with #2/0 AWG jumper and two mechanical connectors or by bending No. 3 bar on bottom template as shown and wire tightly with ten turns of No. 10 wire or one mechanical connector. Mechanical connectors shall be UL Listed for concrete encasement.

Reference Notes:

- ① See tables on Sheet ITS(4) for values of dimension variables.

Texas Department of Transportation
 Traffic Operations Division Standard

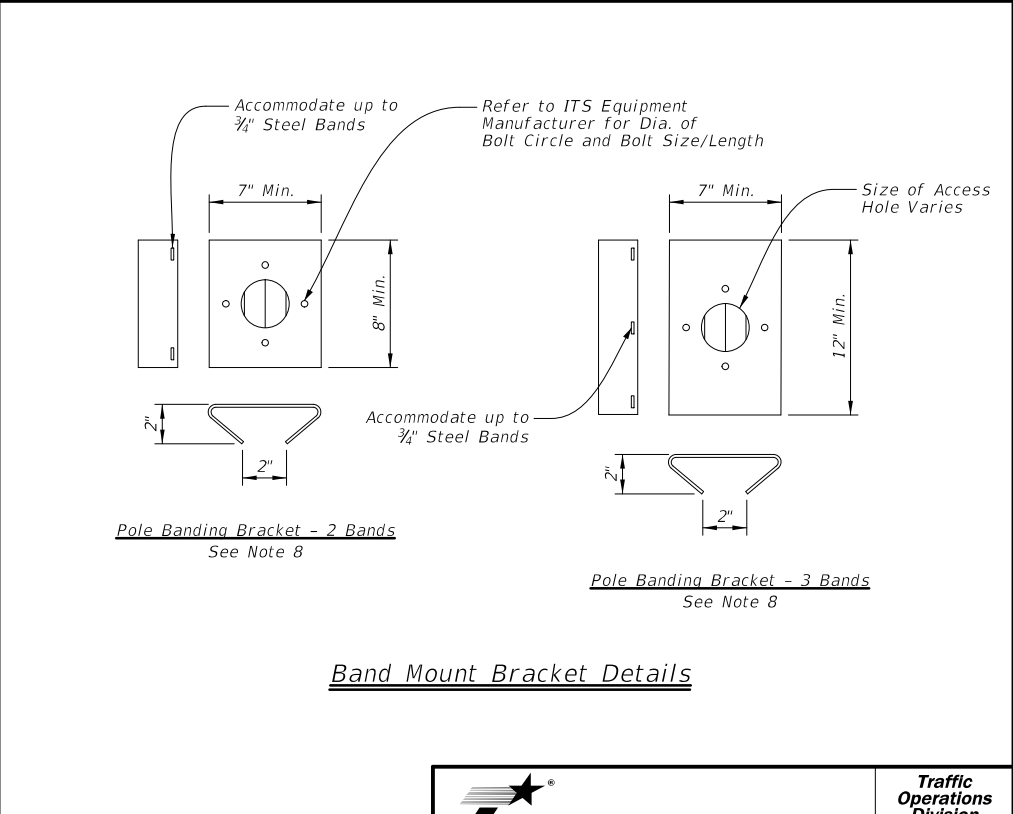
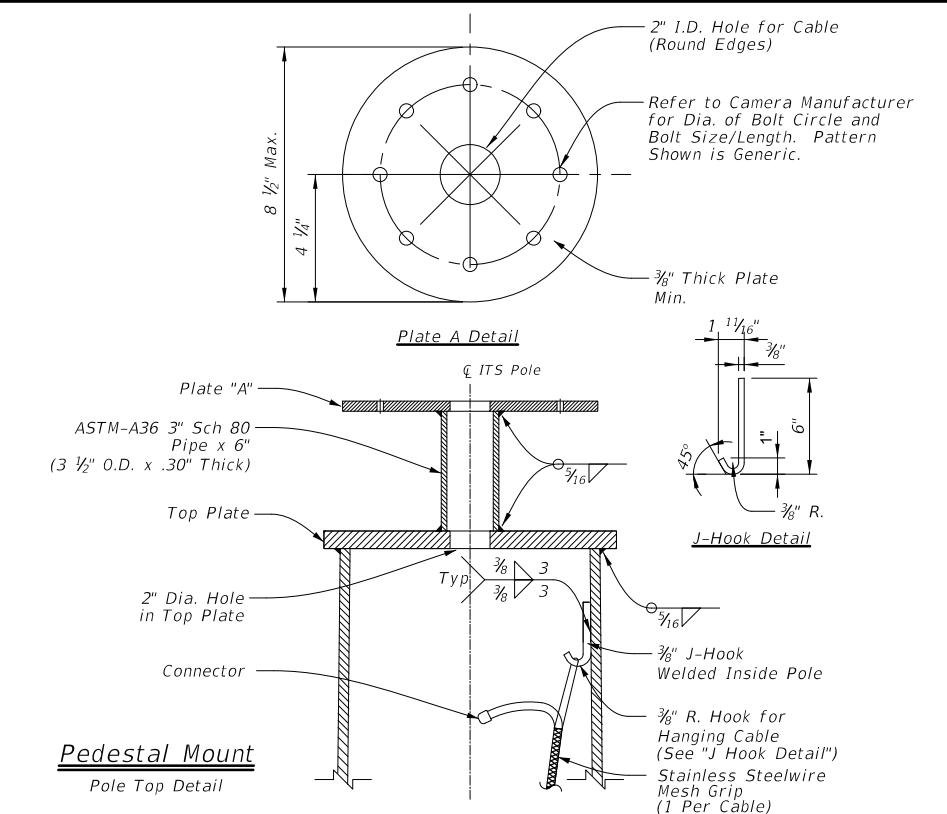
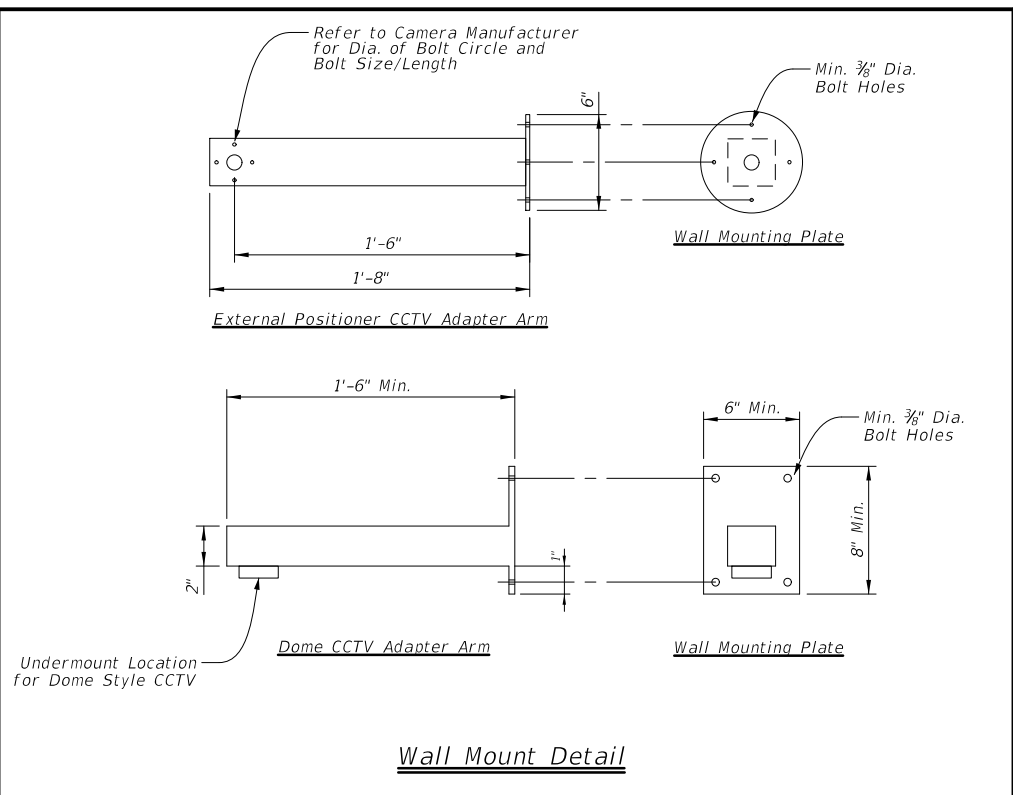
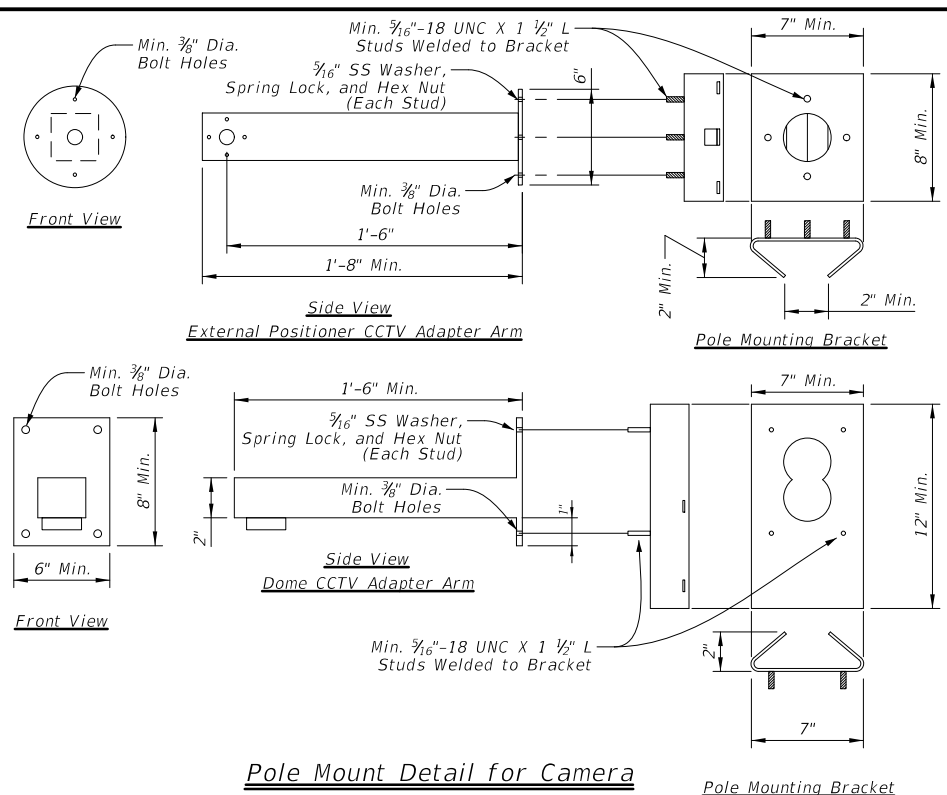
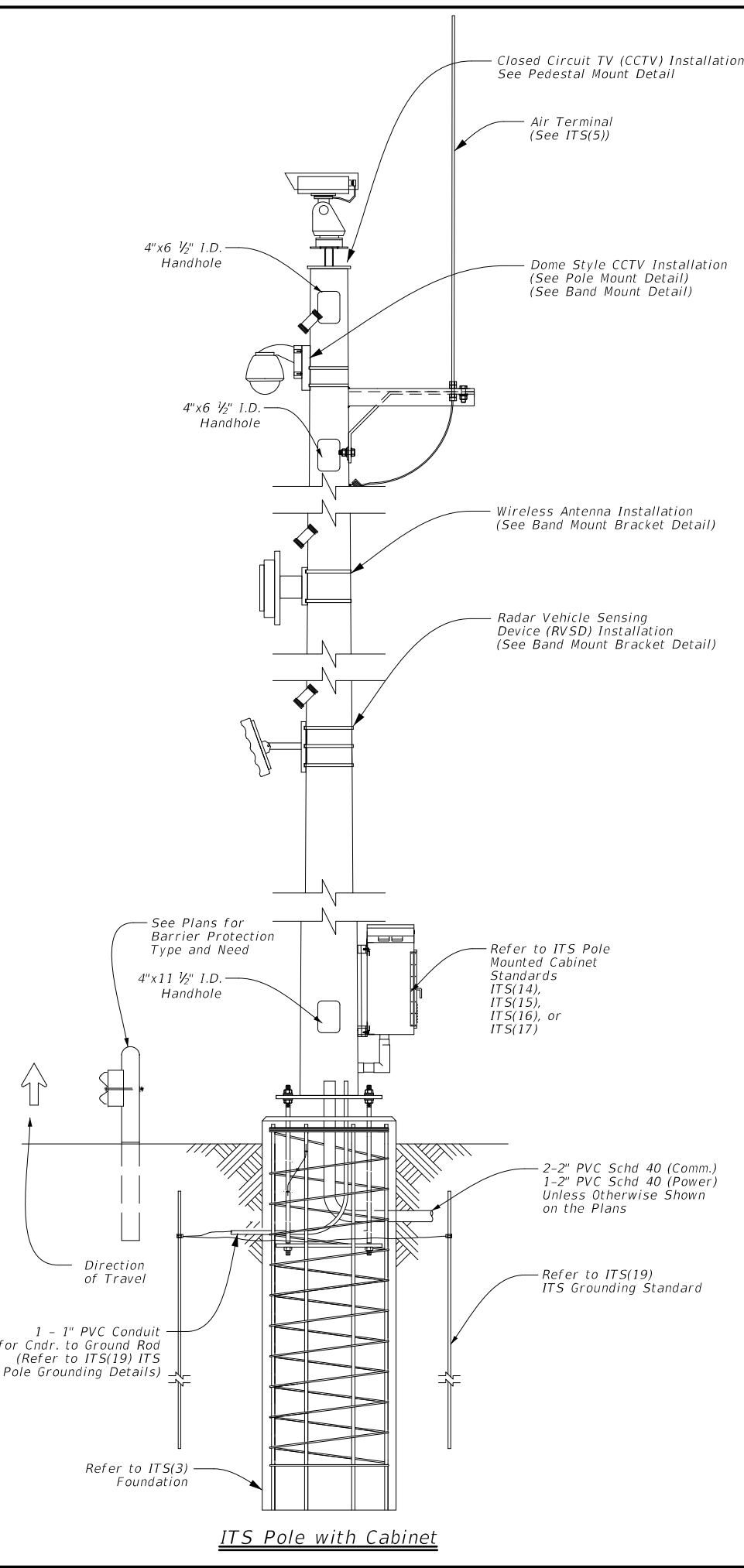
ITS POLE FOUNDATION DETAILS

ITS(3)-16

FILE: its(3)-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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April 2016	REVISIONS	0213	04	050
	DIST	COUNTY	SHEET NO.	
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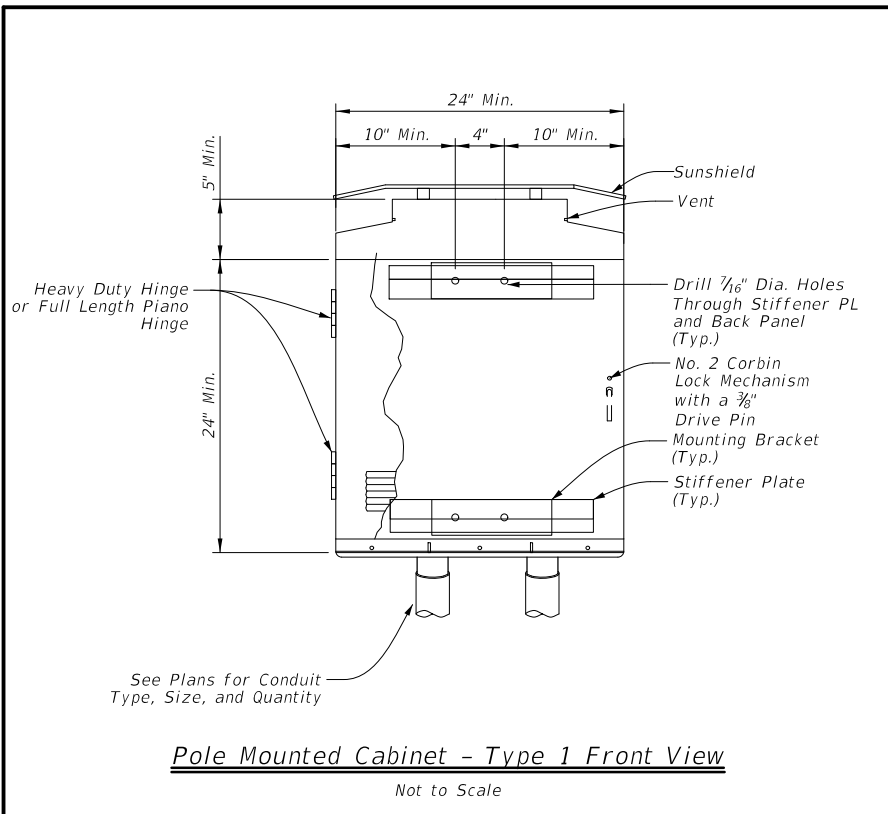


- General Notes:**
- Designed according to Sixth Edition AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications.
 - Hang all cabling inside ITS pole structure with stainless steel wire mesh grips.
 - Bolt positioning in the pedestal top plate (Plate "A") for the pan/tilt base must be determined in the field per camera manufacturers recommendations. This will allow positioning of the camera to maximize coverage area. The Engineer will determine the camera's blind zone at each location.
 - Provide pedestal top plate and Plate "A" that conform to ASTM A36.
 - Make all welds conform to Item 441 and AWS D 1.1 (Structural Welding). Repair damaged galvanized coating per Item 445, "Galvanizing."
 - Galvanize parts in accordance with Item 445, "Galvanizing" unless otherwise noted.
 - The type of ITS equipment shown to be mounted to the ITS pole is intended to represent the most common ITS equipment applications and should not be treated as all inclusive. Other ITS equipment applications may exist that are project specific.
 - Mounting brackets are intended to be diagrammatic and for information only, and are not all inclusive. Contractor responsible for submitting mounting bracket design for approval by the Engineer prior to fabrication. Mounting bracket designed to support a maximum 35 Lbs. Off-the-shelf mounting brackets are acceptable and shall be submitted by shop drawing for approval.
 - Mounting heights to be determined in the field based on manufacturer recommendations.

		Traffic Operations Division Standard	
ITS POLE EQUIPMENT MOUNTING DETAILS ITS(6)-15			
FILE: its(6)-15.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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REVISIONS	DIST: LFK	COUNTY: POLK	SHEET NO.: 245D

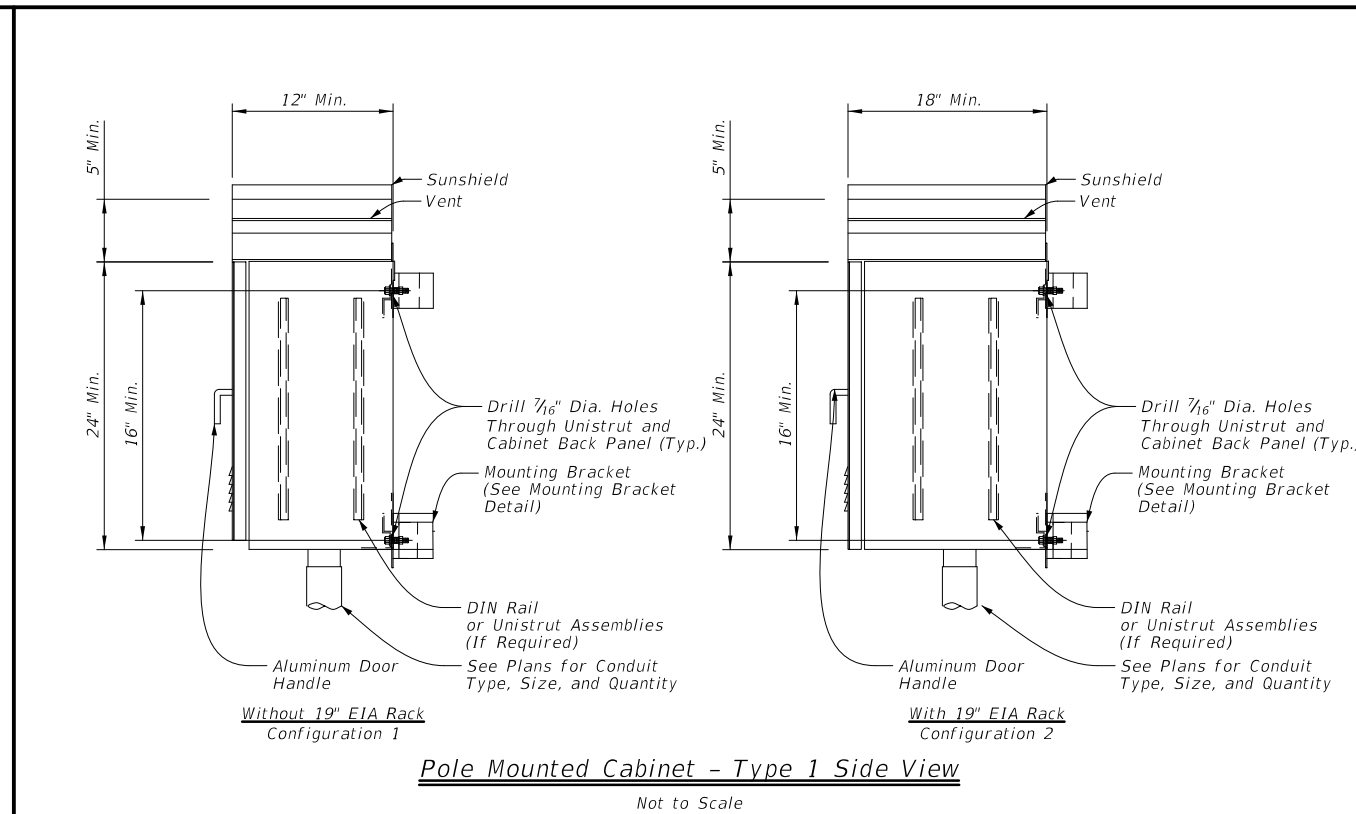
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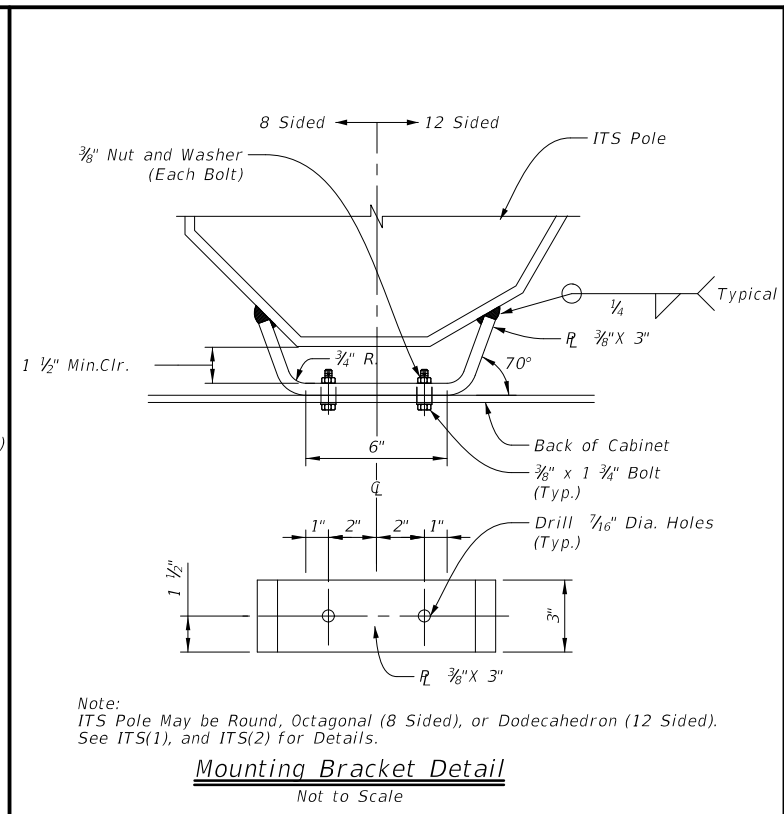
Pole Mounted Cabinet - Type 1 Front View

Not to Scale



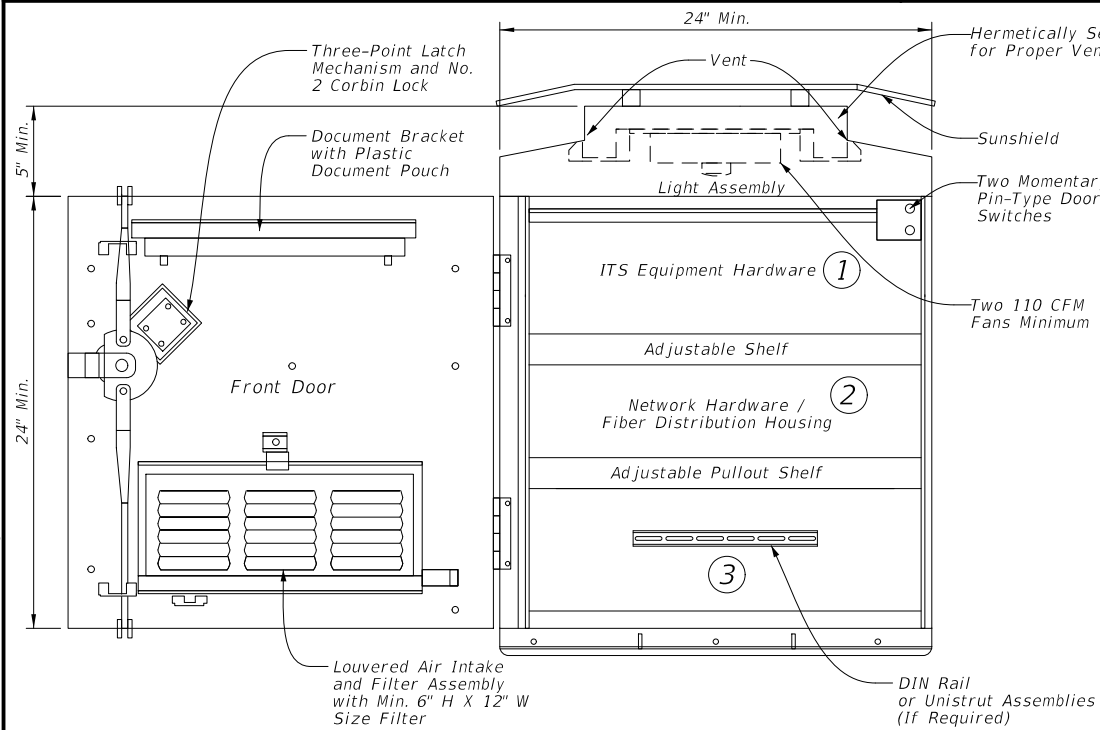
Pole Mounted Cabinet - Type 1 Side View

Not to Scale



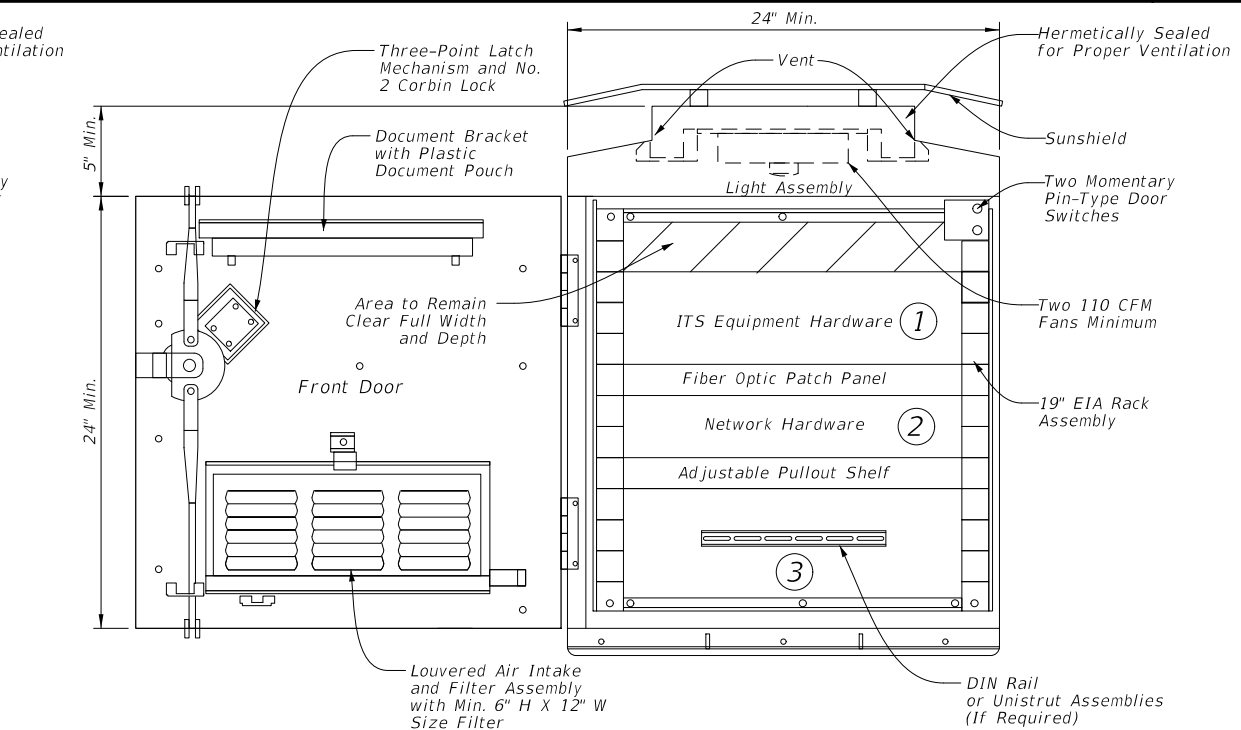
Mounting Bracket Detail

Not to Scale



Interior - Type 1 Without 19" EIA Rack - Front View

Not to Scale



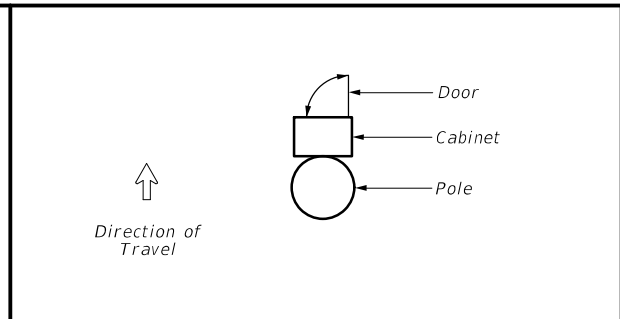
Interior - Type 1 With 19" EIA Rack - Front View

Not to Scale

Typical Equipment Layout Legend	
Example Equipment	
①	CCTV Interface Panel, Radar Vehicle Sensing Device (RVSD) Equipment, Environmental Sensor Station (ESS) Equipment, Bluetooth Equipment, or ITS Radio Equipment (See General Note 1)
②	Ethernet Switch, Video Encoder, Terminal Server, Fiber Optic Transceivers, or Media Conversion Equipment (See General Note 1)
③	Power Distribution Assembly, Service Entrance Breakers, Primary AC Power, Auxiliary Power Strip, Ground Bus Bar Surge Protection Equipment

General Notes:

- Layout of hardware equipment and configuration shown is diagrammatic in nature and intended to represent a preferred Type 1 pole mounted cabinet setup. Hardware needed for each Type 1 cabinet varies and not all cabinet equipment may be shown. The contractor will be responsible for configuring cabinets with all appropriate ITS hardware and power supplies in accordance with the plans and specifications. The contractor may alter the cabinet configuration shown to maximize space and ensure easy access for maintenance.
- Mount cabinet as detailed on ITS(14) or ITS(17). Orientation of cabinet on ITS pole may vary depending on field conditions. Mount the pole mounted cabinet to the backside of the ITS pole, to allow maintenance personnel to access the cabinet while being able to view oncoming traffic.
- For ITS pole sites located on slopes greater than 4H:1V, mount the cabinet to the backside of the ITS pole as detailed on ITS(7). Mounting height to accommodate maintenance pad for easy access.
- All dimensions are approximate and represent minimum cabinet dimensions.
- Provide conduit entrances at the bottom of the cabinet.
- Paid under Special Specification "ITS Pole with Cabinet" (Configuration 1) without 19" EIA rack. Paid under Special Specification "ITS Pole with Cabinet" (Configuration 2) with 19" EIA rack.



Orientation of Type 1 Cabinet on ITS Pole (Typical)

Not to Scale



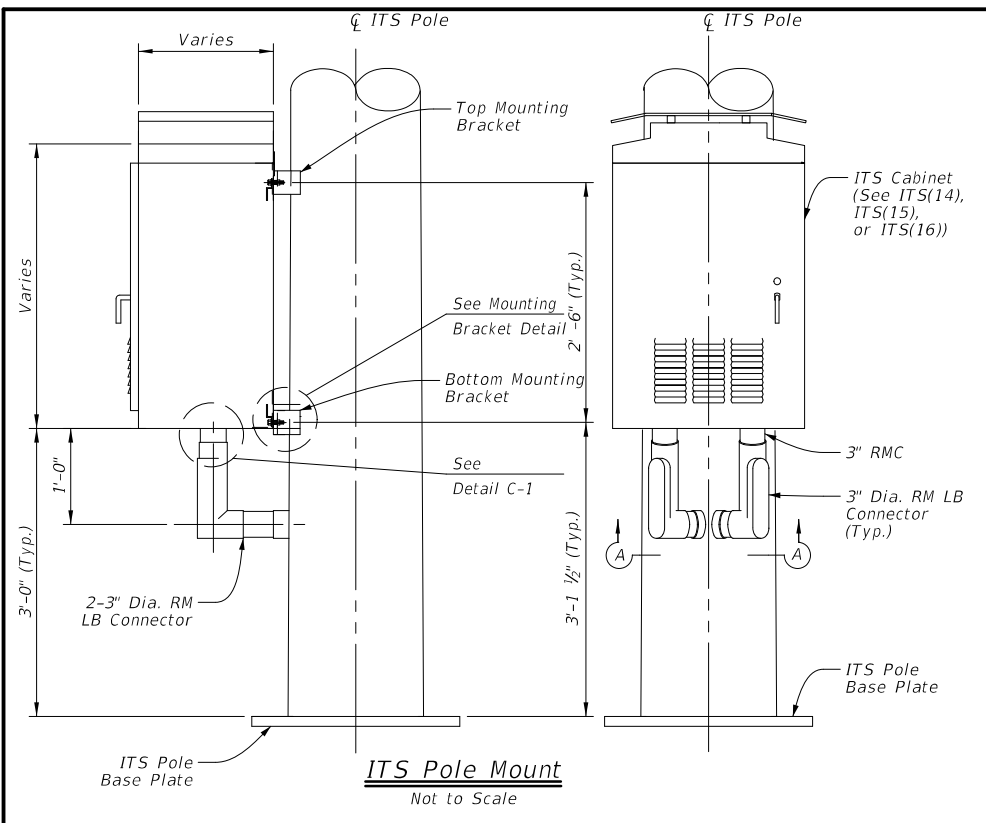
ITS POLE MOUNTED CABINET TYPE 1 DETAILS

ITS(14)-15

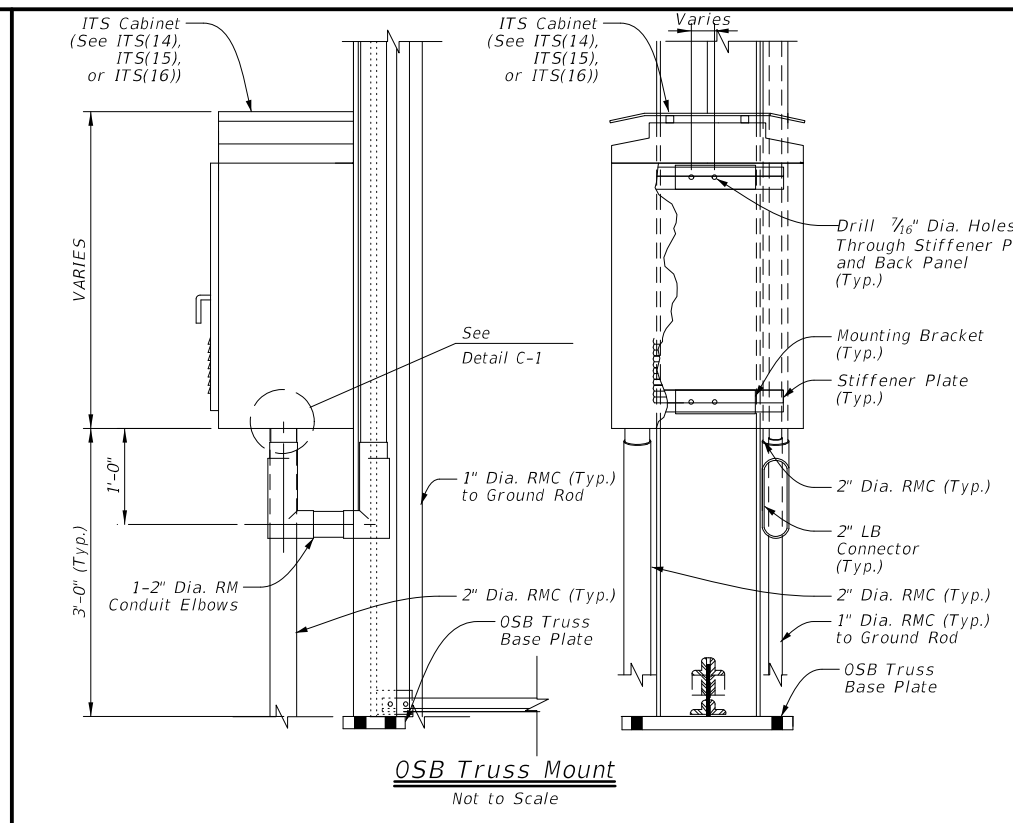
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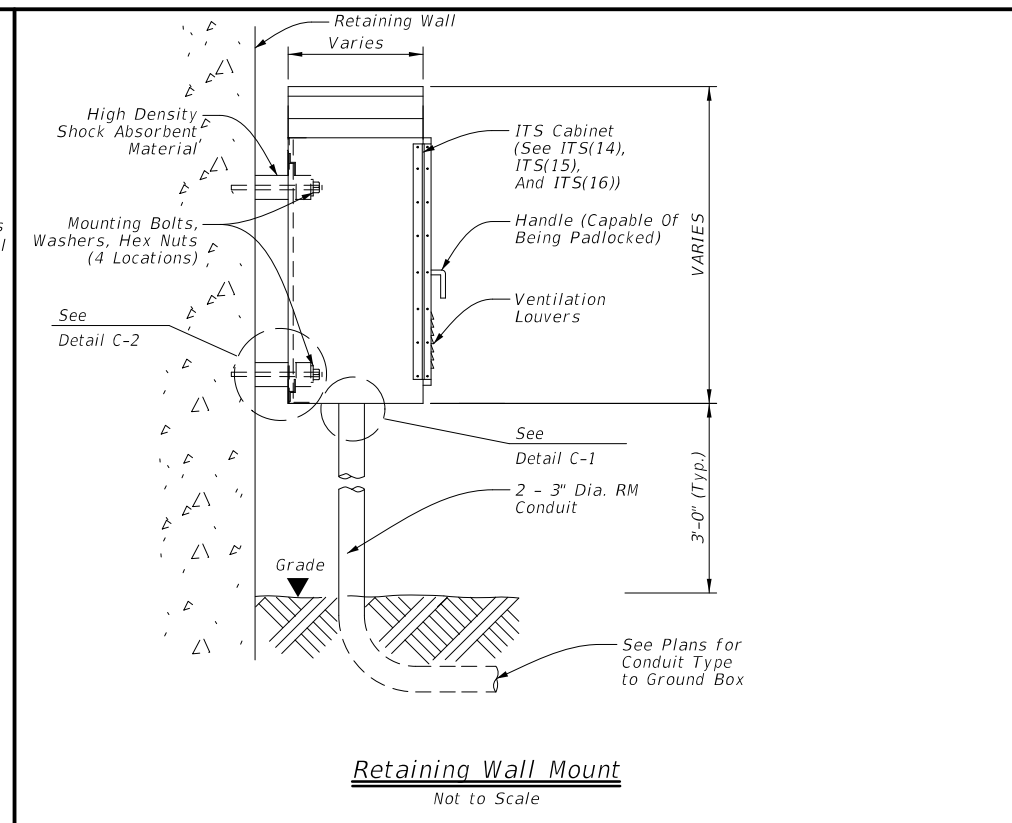
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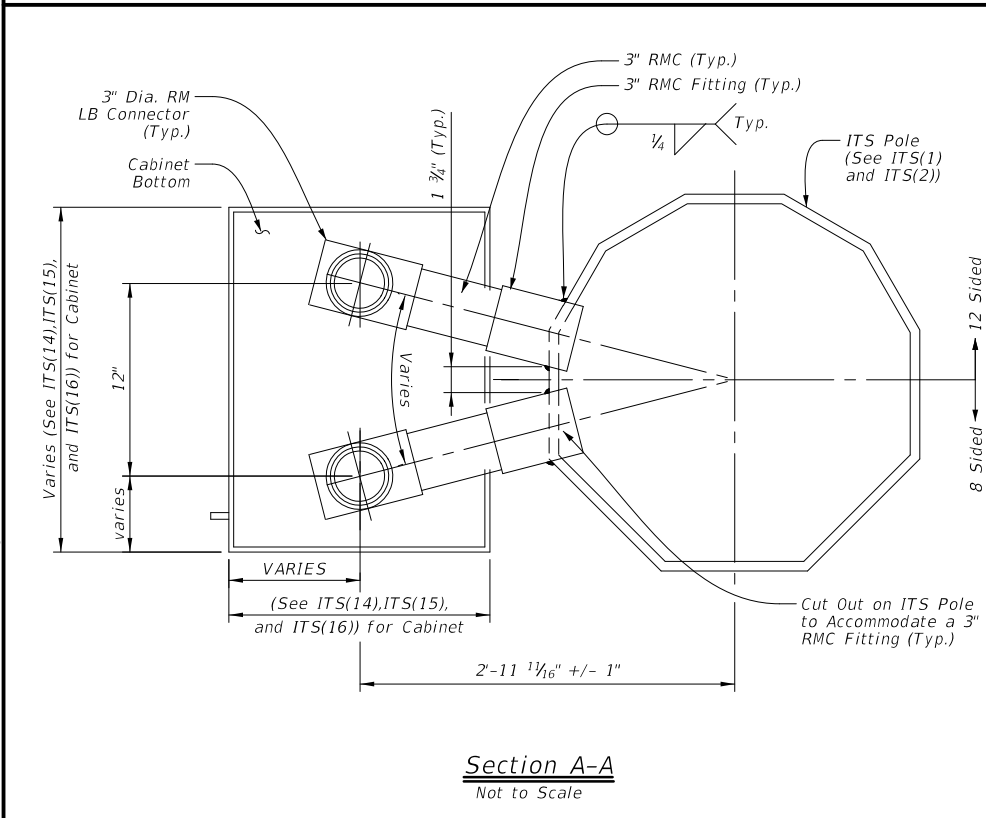
ITS Pole Mount
Not to Scale



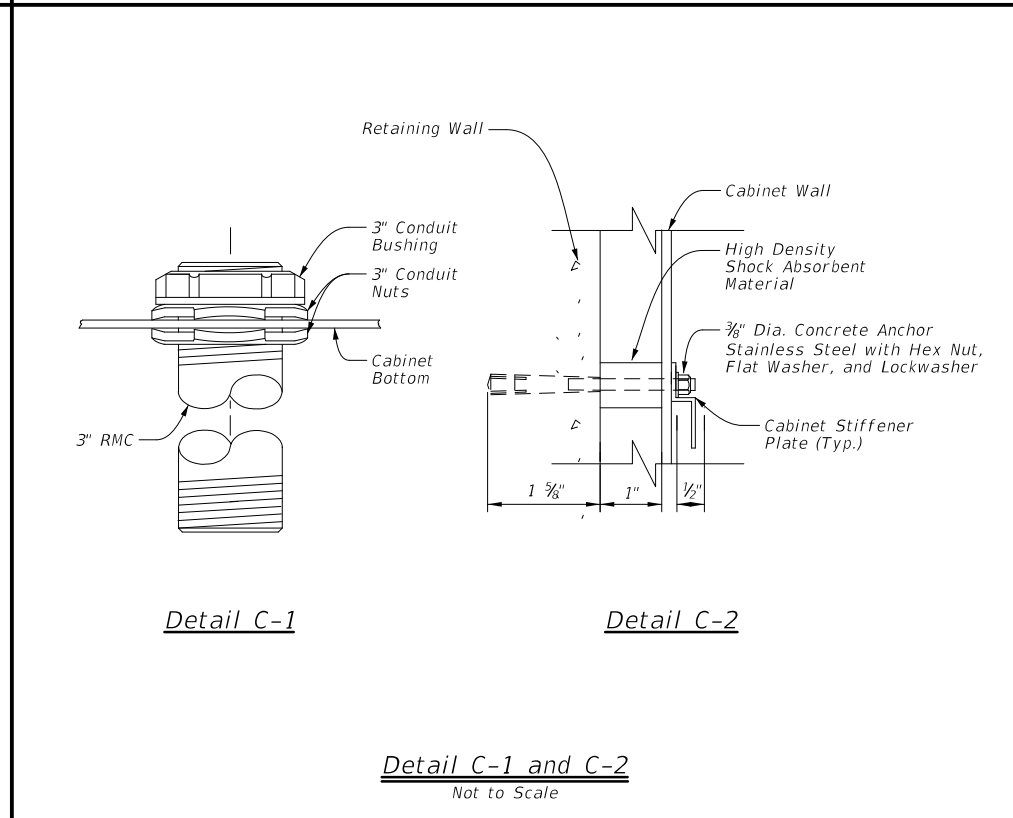
OSB Truss Mount
Not to Scale



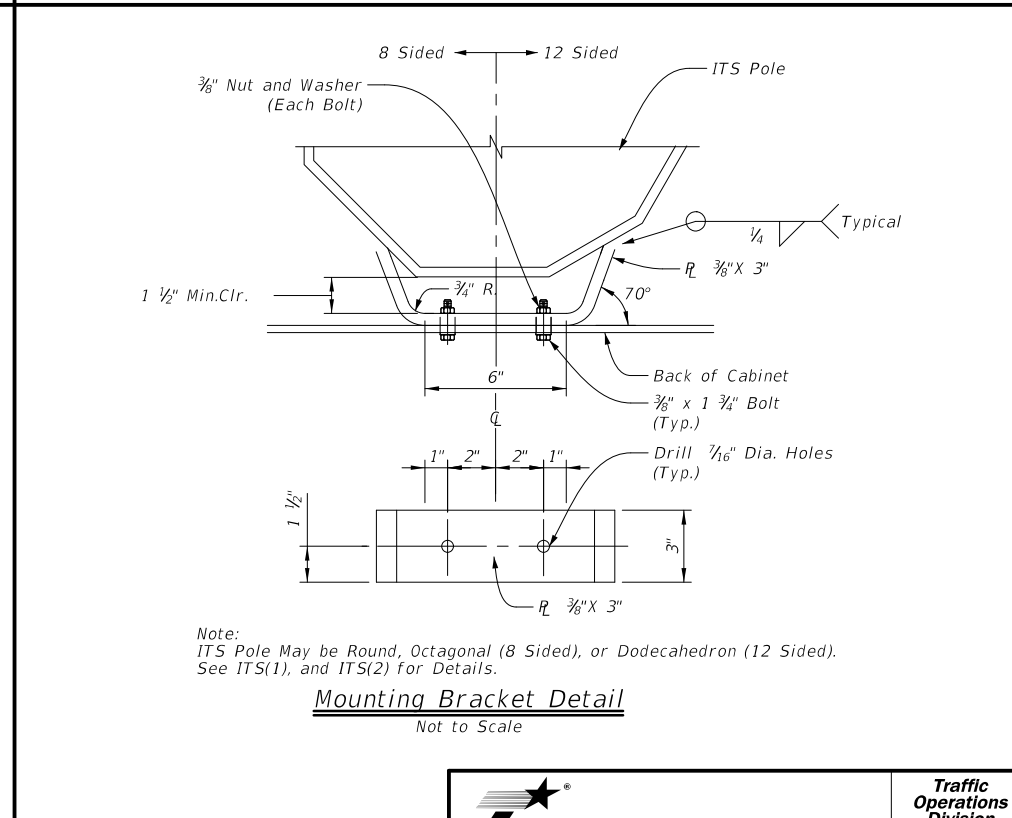
Retaining Wall Mount
Not to Scale



Section A-A
Not to Scale



Detail C-1 and C-2
Not to Scale



Mounting Bracket Detail
Not to Scale

General Notes:

1. Mount cabinet as detailed on ITS(14), ITS(15), ITS(16), or ITS(17). Orientation of cabinet on ITS pole may vary depending on field conditions. Mount the pole mounted cabinet to the backside of the ITS pole, to allow maintenance personnel to access the cabinet while being able to view oncoming traffic.
2. For ITS pole sites located on slopes greater than 4V:1H, mount the cabinet to the backside of the ITS pole as detailed on ITS(7). Mounting height to accommodate maintenance pad for easy access.
3. All dimensions are approximate and represent minimum dimensions.
4. Provide conduit entrances at the bottom of the cabinet.

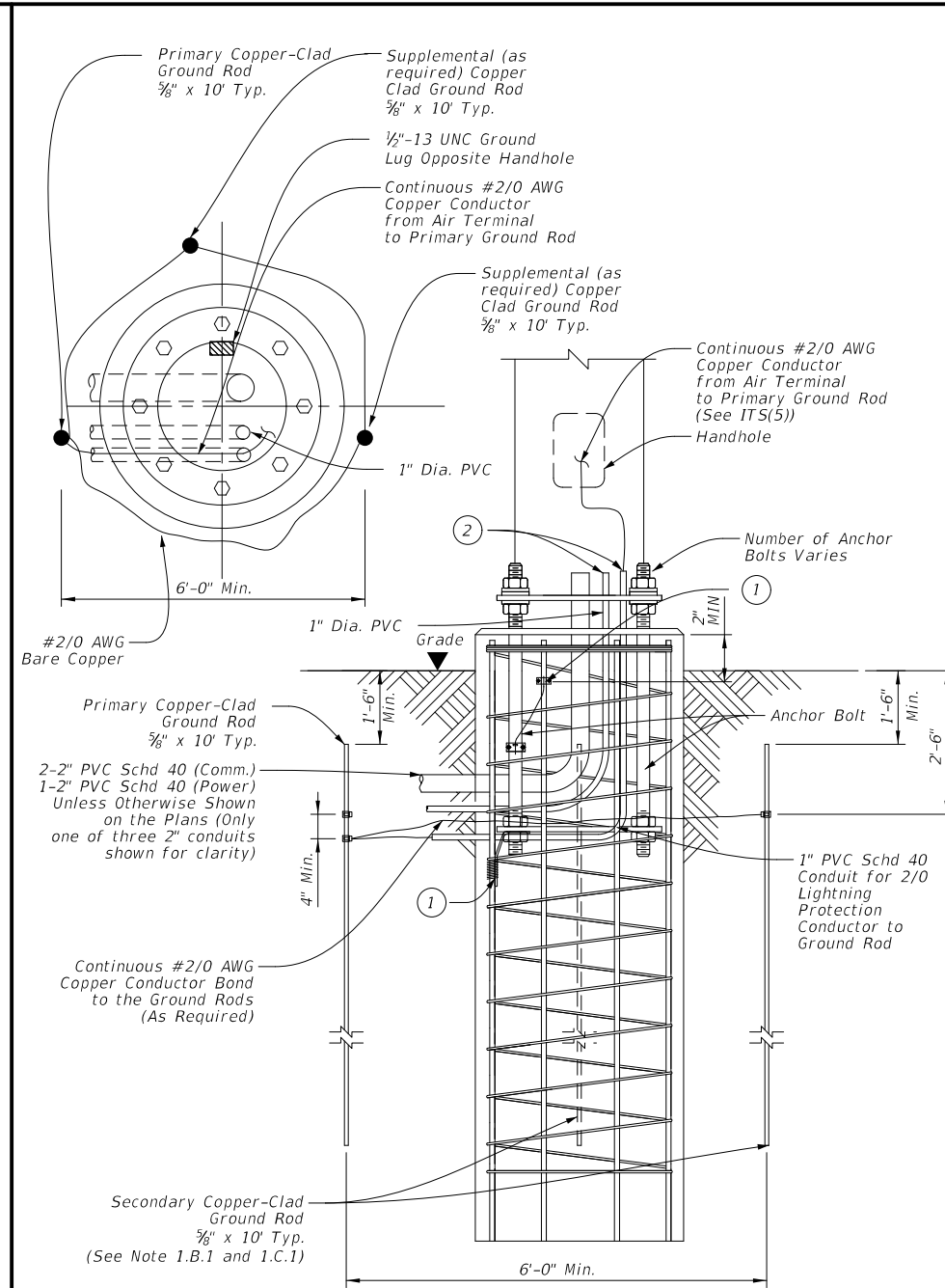
		Traffic Operations Division Standard	
<h2>ITS POLE MOUNTED CABINET MISC. MOUNTING DETAILS</h2> <h3>ITS(17)-15</h3>			
FILE: its(17)-15.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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REVISIONS	HIGHWAY: US 190		SHEET NO.: 245F
DIST: LFK	COUNTY: POLK		

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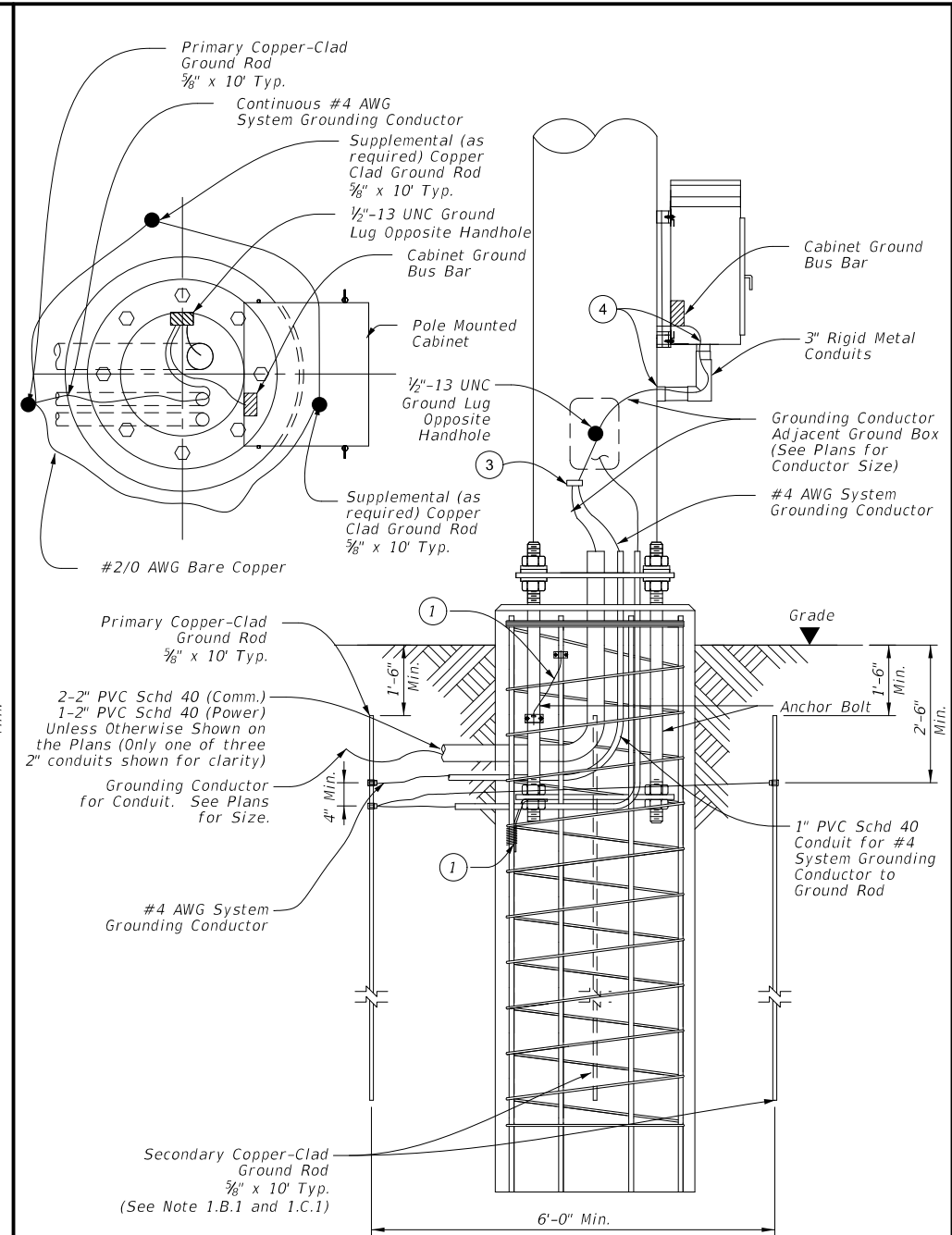
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General Notes:

1. Grounding System:
 - A. Description:
 1. Provide ground system consisting of copper wires, ground rods, and concrete-encased grounding electrodes (Ufers), of the configuration shown to minimize potential gradient irregularities, drain leakage, and fault currents to earth.
 - B. Performance:
 1. Provide a grounding system, consisting of a minimum one ground rod, having a resistance not greater than 5 Ohms to ground. Provide up to 2 additional supplemental ground rods if necessary to achieve a resistance not greater than 5 Ohms to ground. If a total of 3 ground rods is needed then install as as part of a ground ring.
 2. If a ground ring is required, provide a minimum conductor length of 20 ft. placed at a minimum depth of 30 in..
 - C. Design Criteria:
 1. The grounding system of the ITS pole may be bonded below grade to the grounding systems of other nearby equipment to meet the specified grounding resistance. A minimum of one ground rod for the ITS pole is still required.
 2. Separately measure the grounding resistance of each system before bonding together below grade.
 3. Only provide UL-approved materials listed for grounding systems.
 4. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture, unless moisture is permanently excluded from the junction of such materials.
 5. Submit product data for the materials and products used to perform the work of this section.
 - D. Materials:
 1. Conductors:
 - a. Bare Ground Conductor:
 - 1) Provide prequalified copper conductors appearing on the Material Producers List according to Item 618.
 2. Ground Compression Connectors:
 - a. Provide molds, thermite packages, and other material for exothermic welding of grounding connections.
 - b. Provide listed compression connectors fully rated to carry 100% of the cable rating and that meet IEEE 837. Provide compression materials from a single manufacturer throughout the project.
 3. Ground Rods:
 - a. Provide copper-clad steel ground rods conforming to the requirements specified in DMS 11040.
 - 1) Diameter: 5/8 in.
 - 2) Length: 10 ft.
 2. Installation:
 - A. Install grounding components and systems in accordance with the requirements specified in IEEE 142.
 - B. System Grounding:
 1. Ground Rods:
 - a. Drive ground rods into the ground until the tops of the rods are a minimum of 18 in. below finished grade.
 - b. If multiple ground rods are needed to meet the minimum resistance of 5 Ohms, space ground rods as evenly as possible, at least 6 feet apart, so conductors will be connected below grade.
 2. Conductors:
 - a. Provide minimum No. 2/0 AWG ground wire for lightning protection from air terminal.
 - b. Provide minimum No. 4 AWG ground wire for system and equipment grounding.
 - c. Using suitable fasteners, securely attach exposed ground wires to structural supports at not more than 2 ft. intervals, where applicable.
 - d. Bends in ground wires greater than 45 degrees are unacceptable.
 3. Cable Connections:
 - a. Use exothermic-welded connections or listed compression connectors for conductor splices and connections between conductors and other components.
 3. Testing:
 - A. Resistance Test:
 1. Test Procedure:
 - a. The ground-resistance measurements of each ground Rod shall be taken.
 - 1) The resistance to ground shall be measured in accordance with the fall-of-potential method specified in IEEE 81 and IEEE 142.
 - 2) Ground-resistance measurements shall be made in normally dry weather, not less than 48 hours after rainfall, and with the ground under test isolated from other grounds.
 - b. Test reports shall be prepared that indicate the location of the ground rod, the grounding system, and the resistance and soil conditions at the time the test was performed.
 2. Acceptance Criteria:
 - a. The grounding system must have a resistance not greater than 5 Ohms.
 - b. Do not energize any part of the electrical distribution system prior to the resistance testing of that system's ground rods and grounding system, and submission of the test results for approval.
 3. Inspections:
 - a. Prepare and submit as-built record drawings of the grounding system as installed and test reports for approval.



Grounding System
Not to Scale



Grounding System with Pole Mounted Cabinet
Not to Scale

Reference Notes:

- ① Bond anchor bolts to rebar with #2/0 AWG jumper and two mechanical connectors or by bending No. 3 bar on bottom template as shown and wire tightly with ten turns of No. 10 wire or one mechanical connector. Mechanical connectors shall be UL Listed for concrete encasement.
- ② Cut PVC approximately 1 in. above concrete and install bell or bushing. Align conduit as close as possible to point of attachment to base plate to minimize bends in #2/0 wire.
- ③ Bond grounding conductors via cadweld or mechanical connector, rated for size and number of conductors.
- ④ Provide and install a grounding type bushing on metal conduit terminations. 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.

Texas Department of Transportation
 Traffic Operations Division Standard

ITS POLE GROUNDING DETAILS

ITS(19)-17

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7-17	REVISIONS	0213	04	050 US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	245G	

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 1/2 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.

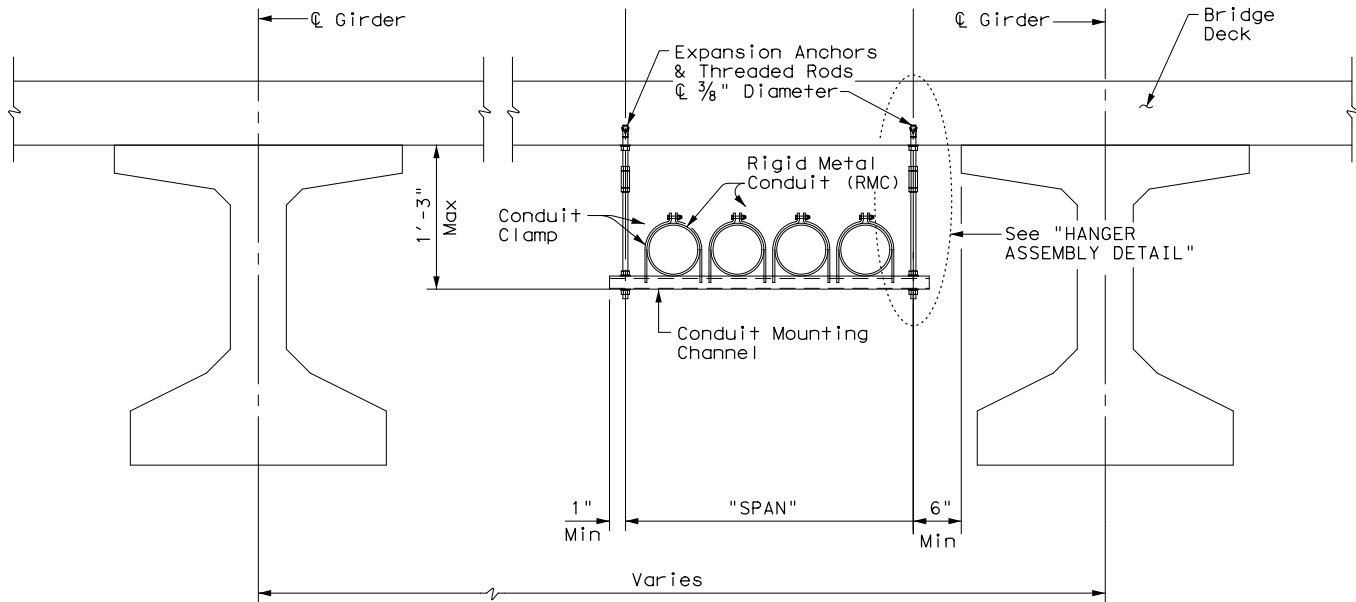
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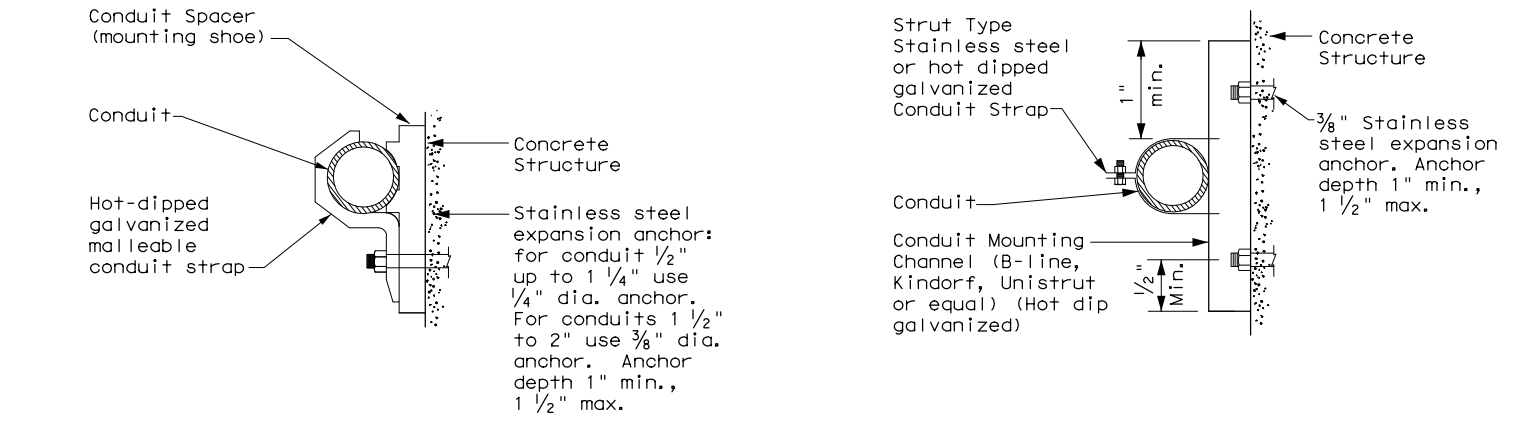
			
<h1>ELECTRICAL DETAILS CONDUITS & NOTES</h1>			
<h2>ED(1)-14</h2>			
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CONDUIT HANGING DETAIL

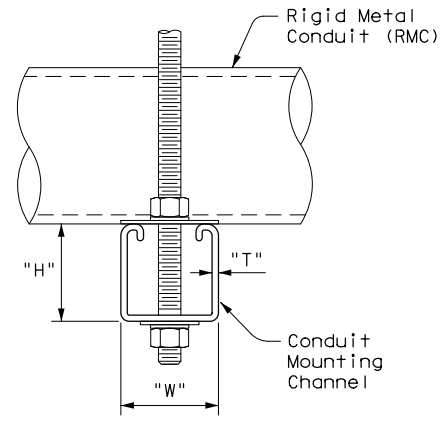


CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
 See ED(1)B.2

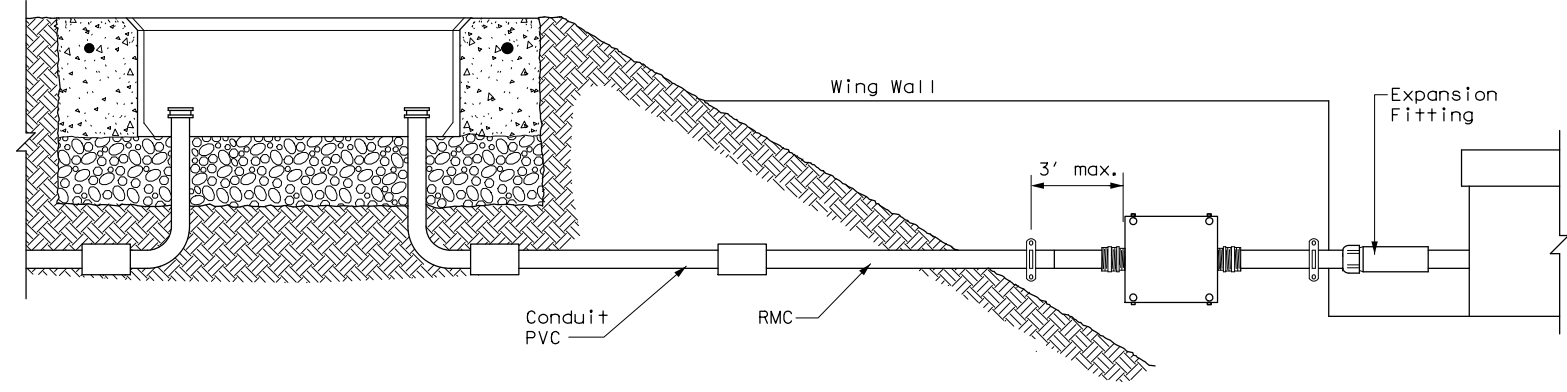
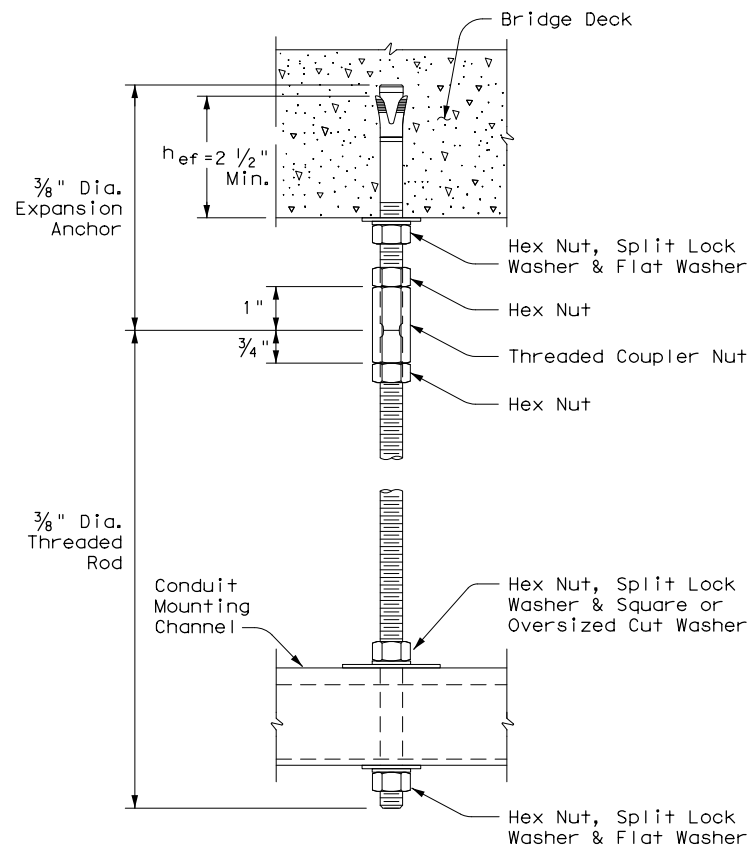
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.



HANGER ASSEMBLY DETAIL

ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef}) as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.
6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.



ELECTRICAL DETAILS
 CONDUIT SUPPORTS

ED(2)-14

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REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	247	

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

- 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.
- 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.
- 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.
- 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

- 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.
- 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.
- 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.
- Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
- 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.
- Support conductors in illumination poles with a J-hook at the top of the pole.
- 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.
- Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
- Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
- 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.
- 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.

- 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

- Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
- 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.
- Use listed wire nuts with factory applied sealant for temporary wiring where approved.
- 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.
- Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

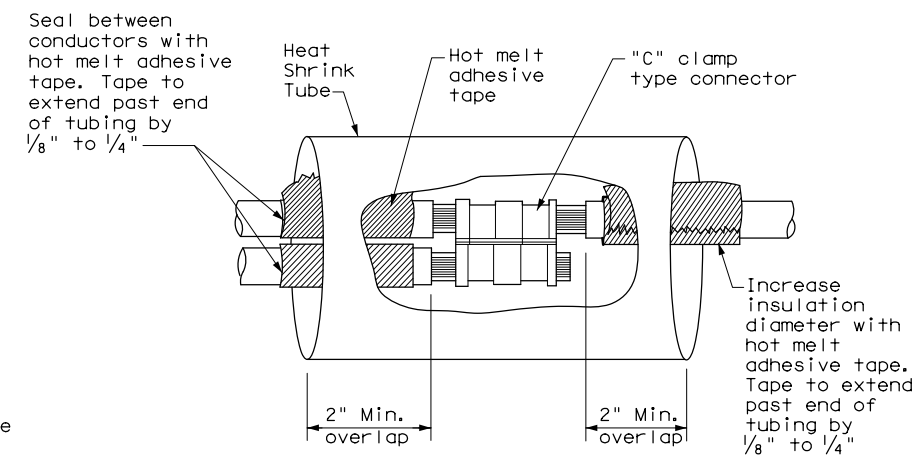
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

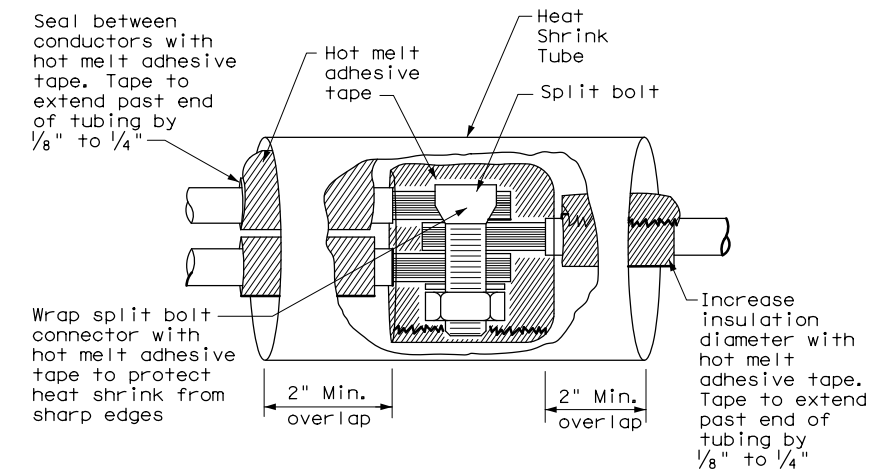
- Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

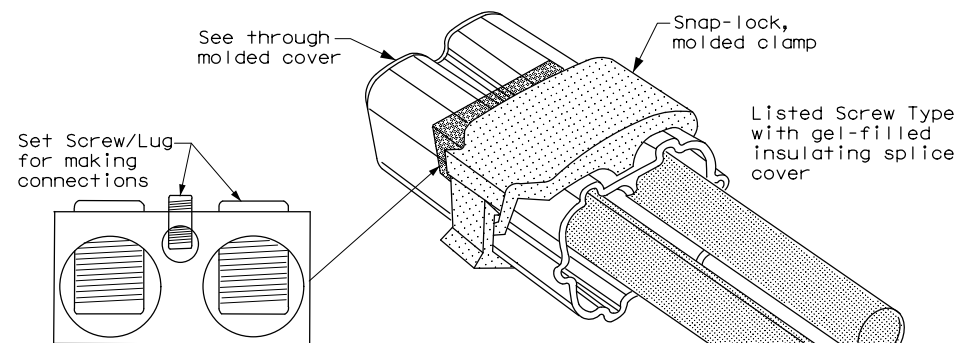
- Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
- Do not place ground rods in the same drilled hole as a timber pole.
- Install ground rods so the imprinted part number is at the upper end of the rod.
- Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
- 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.
- 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.
- 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**

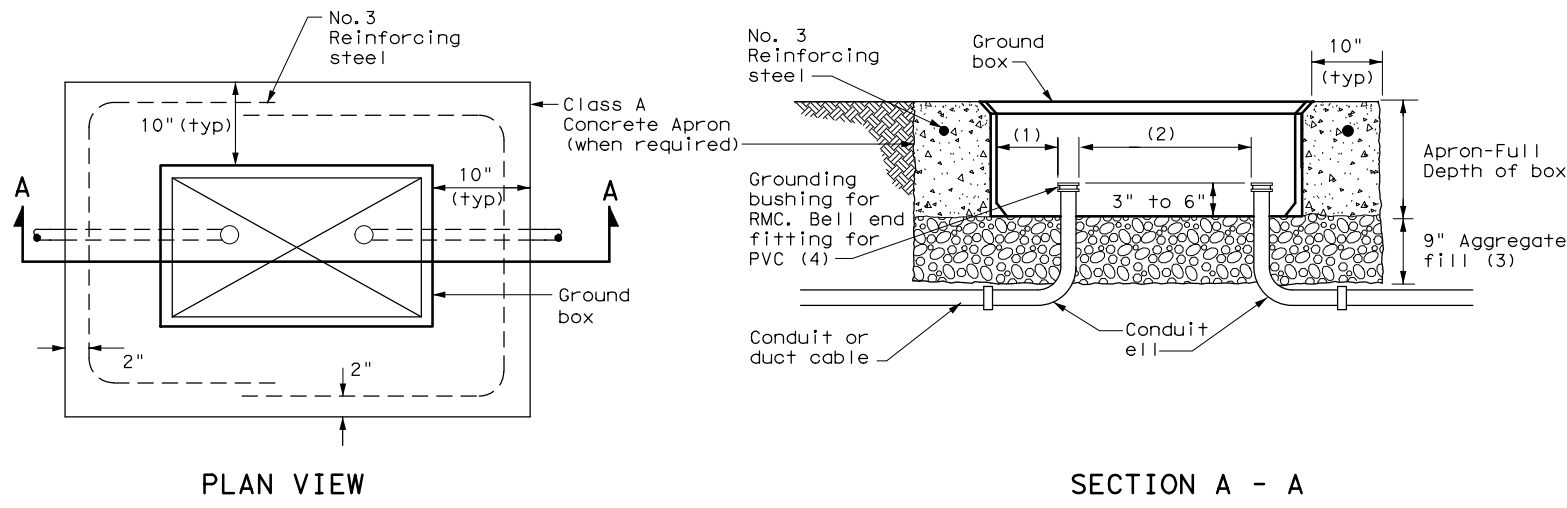
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		Texas Department of Transportation		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUCTORS</h2>					
<h3>ED(3)-14</h3>					
FILE:	ed3-14.dgn	DN:	TxDOT	CK:	TxDOT
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REVISIONS		JOB:	050		HIGHWAY:
		DIST:	POLK		SHEET NO.:
		LFK:			248

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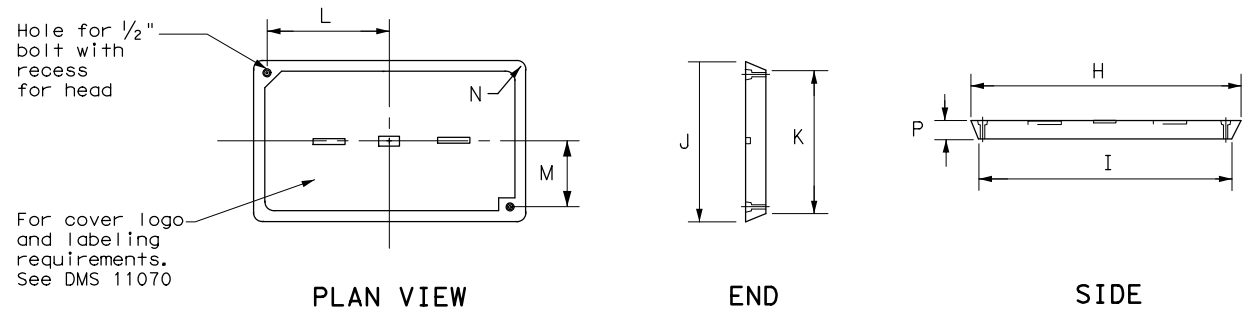


APRON FOR GROUND BOX

- (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



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.

				Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS</h2> <h3>GROUND BOXES</h3> <h4>ED(4)-14</h4>					
FILE:	ed4-14.dgn	DN:	TxDOT	CK:	TxDOT
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REVISIONS		0213	04	050	US 190
DIST	COUNTY	SHEET NO.			
LFK	POLK	249			

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 1/2 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 1/2 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 1/2 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

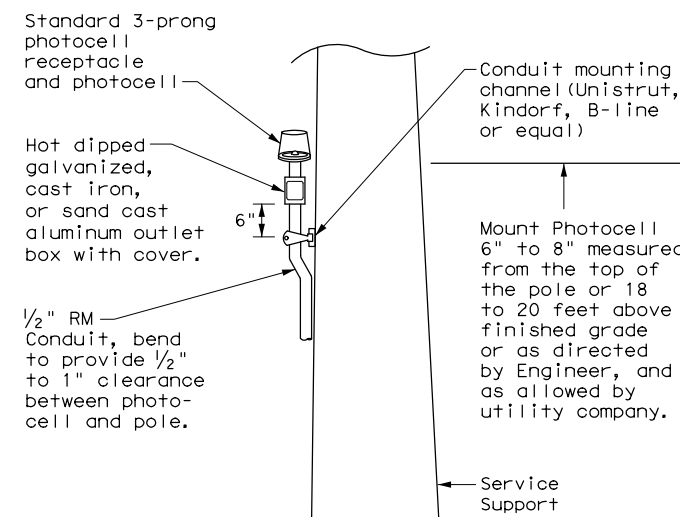
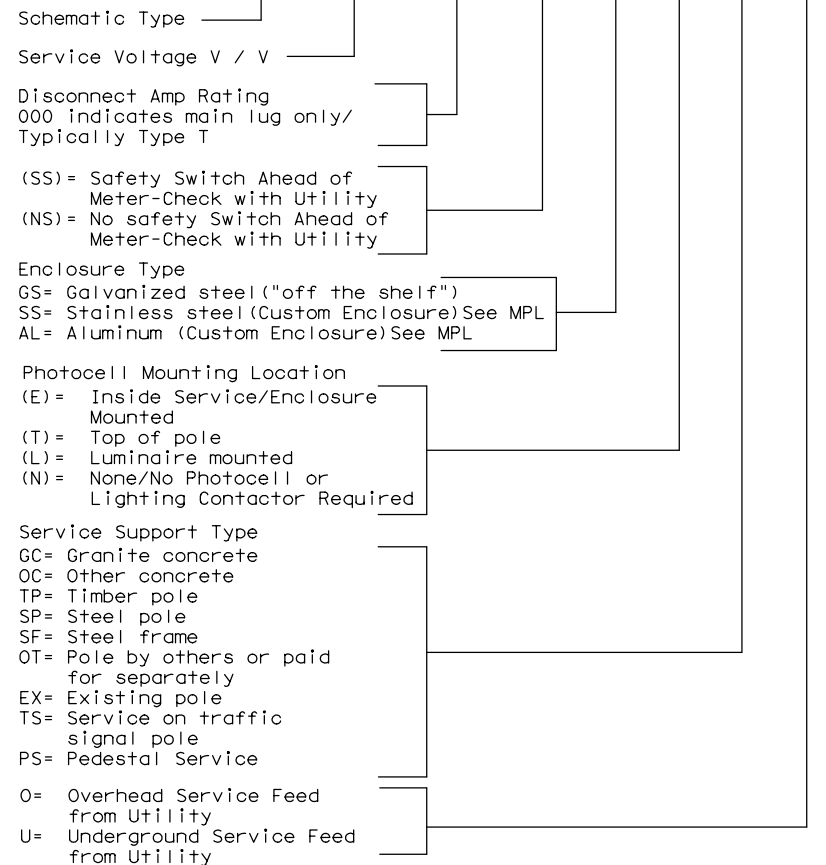
1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA												
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit *xS 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 1/4"	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 1/4"	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)



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.



ELECTRICAL DETAILS SERVICE NOTES & DATA

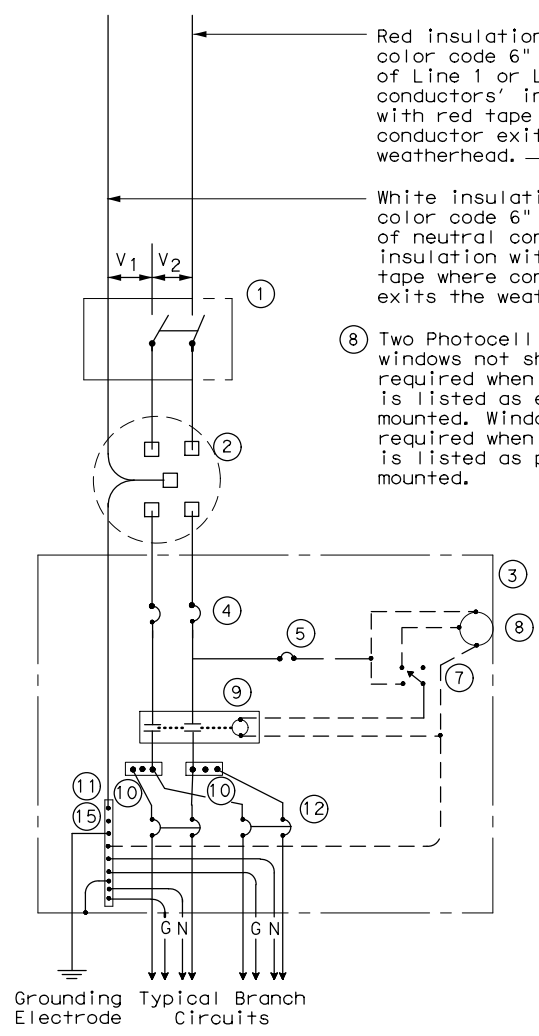
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	DIST	COUNTY	SHEET NO.	
	LFK	POLK	250	

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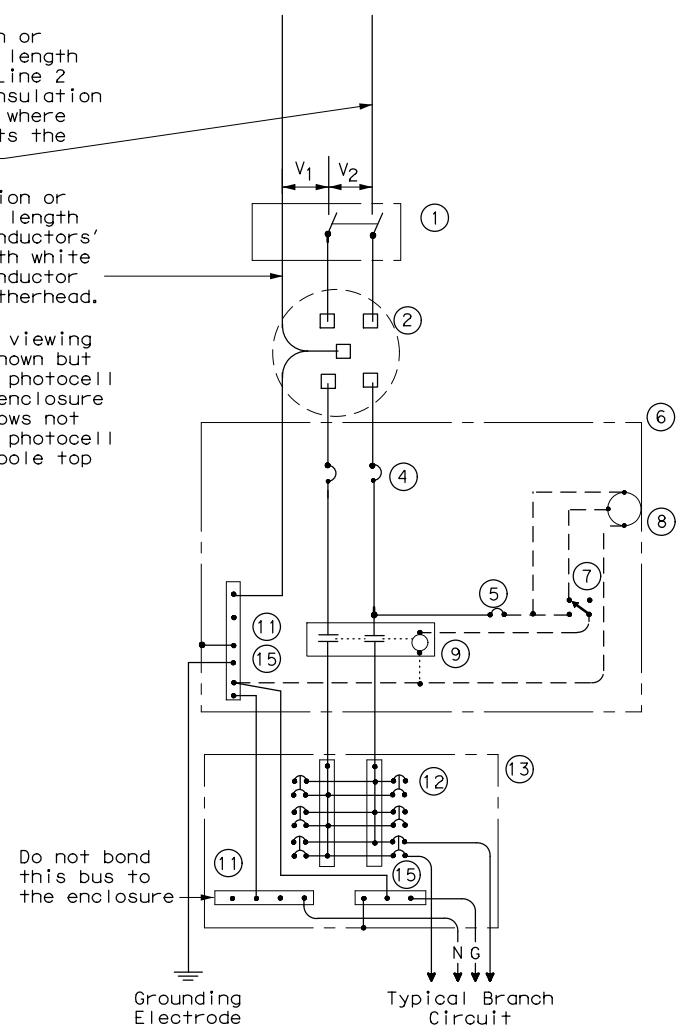
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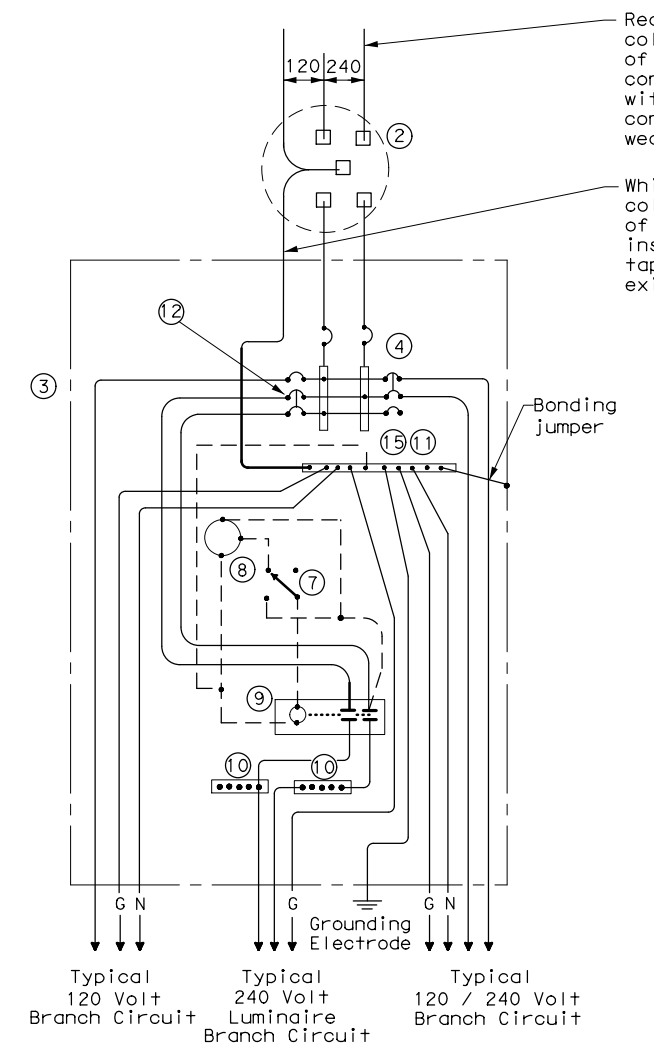


**SCHEMATIC TYPE A
THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.
 White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.
 ⑧ Two Photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.

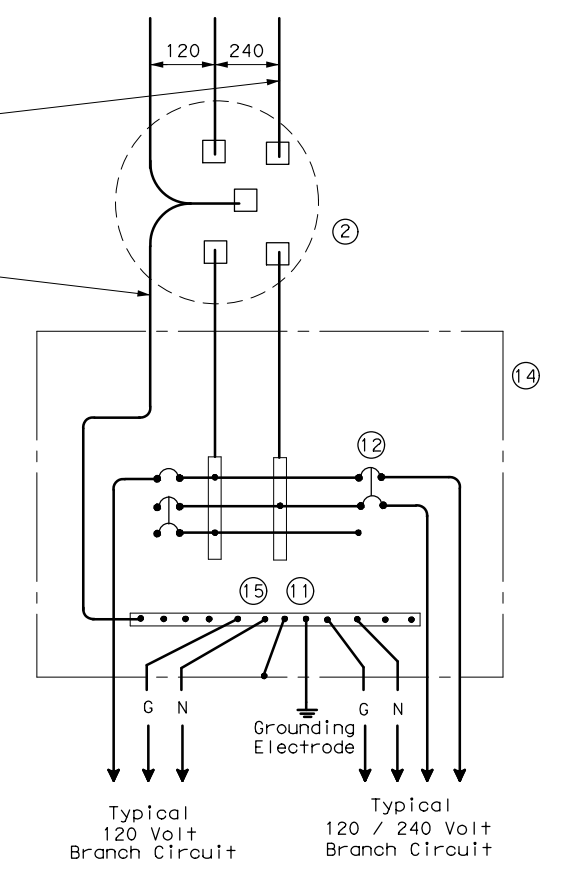


**SCHEMATIC TYPE C
THREE WIRE**



**SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.
 White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.



**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

				Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES					
ED(6)-14					
FILE:	ed6-14.dgn	DN:	TxDOT	CK:	TxDOT
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REVISIONS		JOB:	050	HIGHWAY:	US 190
DIST:	LFK	COUNTY:	POLK	SHEET NO.:	251

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SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 1/2 in. or 1 3/8 in. wide by 1 in. up to 3 3/4 in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.
2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.
3. Provide and install galvanized 3/4 in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized 3/4 in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 1/4 in. to 3 1/2 in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.
4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.
5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.
6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.
7. Drill and tap steel poles and frames for 1/2 in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.
8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.
9. Provide 1/4" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.
10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.
11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

White insulation or color code 6" of neutral conductor's insulation with white tape where conductor exits weatherhead.

Red insulation or color code 6" length of Line 1 or Line 2 conductor's insulation with red tape where conductor exits the weatherhead. Conductor slack length, 12" min., 18" max.

2" to 6" 4" (typ.)

RMC

Service Enclosure

Inset A

Channel bracket or other arrangement approved by the Engineer. (Kindorf, Unistrut, B-line or equal.)

Inset A

Inset B

60" TYP.

2"

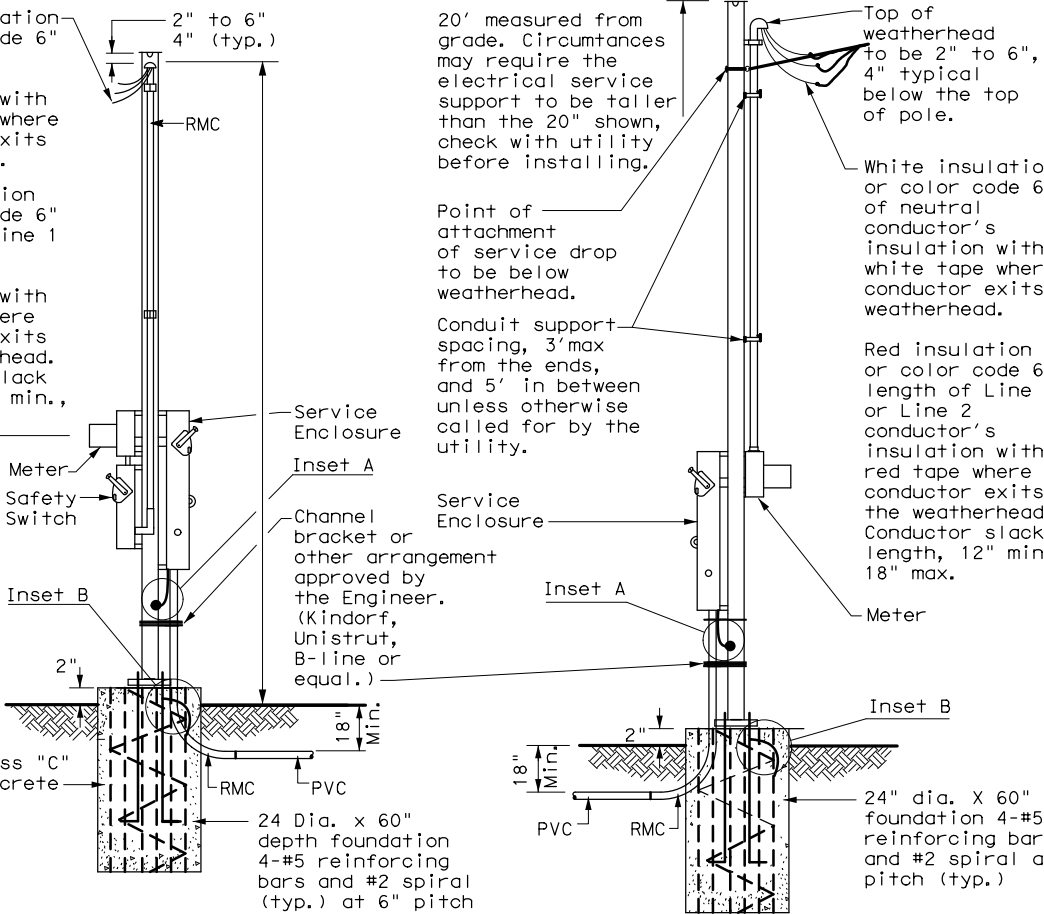
18" Min.

Class "C" concrete

RMC

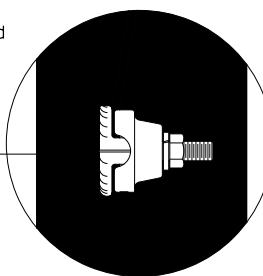
PVC

24 Dia. x 60" depth foundation 4-#5 reinforcing bars and #2 spiral (typ.) at 6" pitch

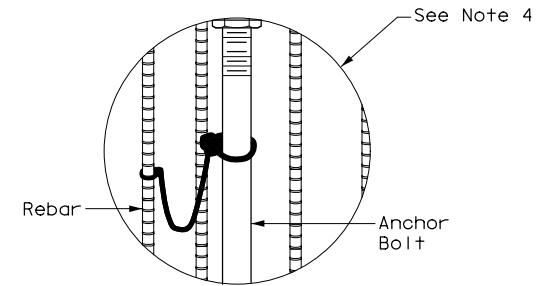


WITH SAFETY SWITCH WITHOUT SAFETY SWITCH
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE

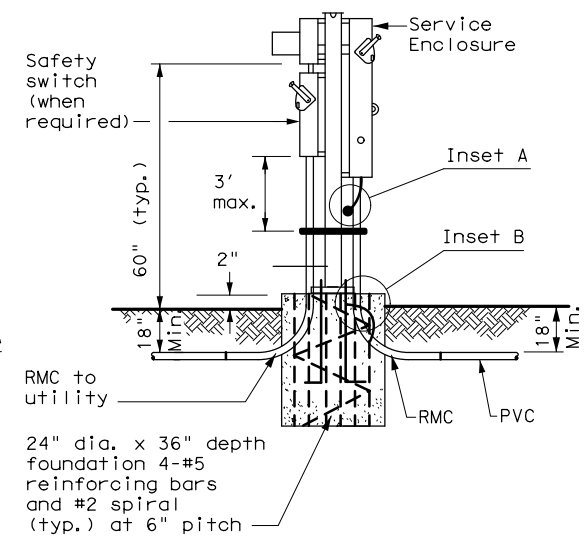
Drill, top, and thread 1/2" X 13 UNC. Install tank ground fitting, connect electrical service grounding electrode conductor. See Note 7.



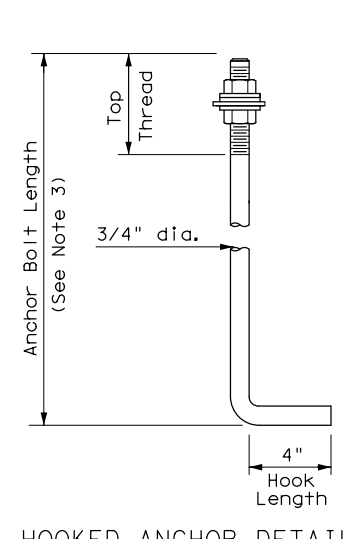
FRONT VIEW
INSET A



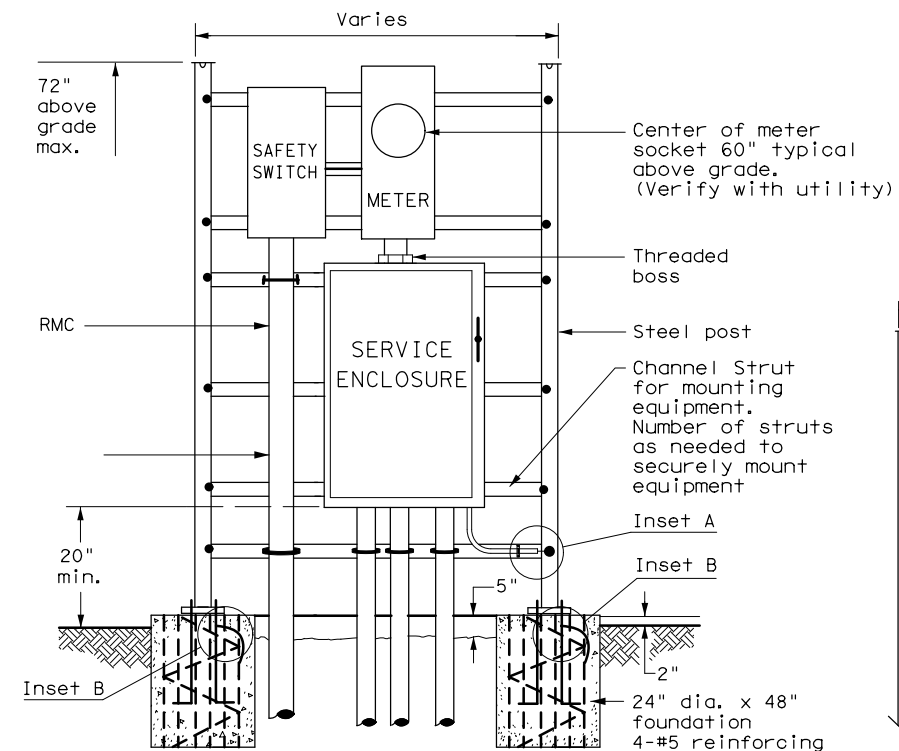
INSET B



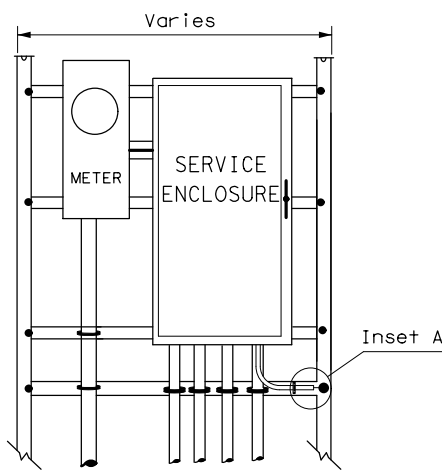
WITH SAFETY SWITCH
SERVICE SUPPORT TYPE SP (U) - UNDERGROUND SERVICE



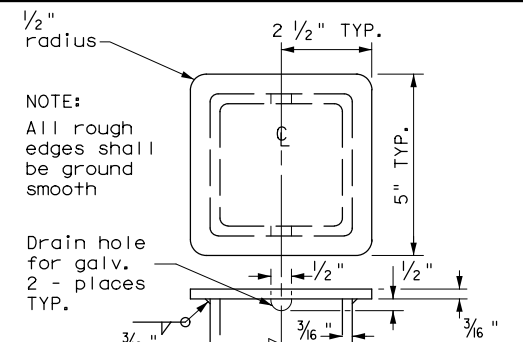
HOOKED ANCHOR DETAIL



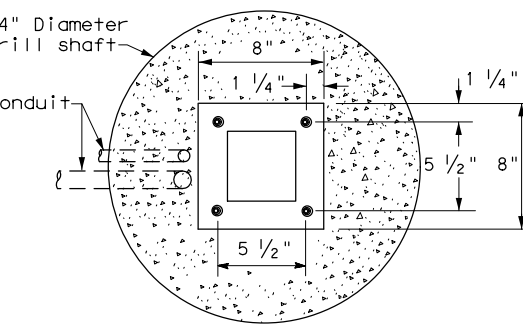
WITH SAFETY SWITCH
FRONT VIEW
SERVICE SUPPORT TYPE SF (U) - UNDERGROUND SERVICE



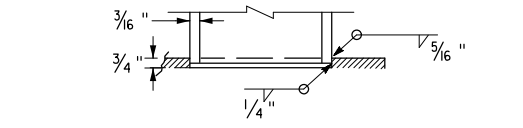
WITHOUT SAFETY SWITCH
SERVICE SUPPORT TYPE SF (U) - UNDERGROUND SERVICE



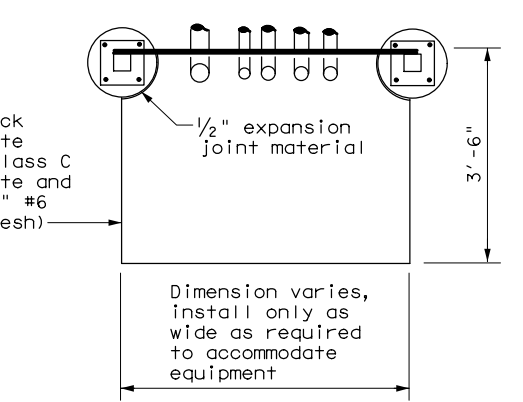
POLE TOP PLATE



BASE PLATE DETAIL



BOTTOM OF POLE



TOP VIEW
SERVICE SUPPORT TY SF (O) & SF (U)

		Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP ED(7)-14			
FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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REVISIONS	0213	04	050
	DIST	COUNTY	SHEET NO.
	LFK	POLK	252

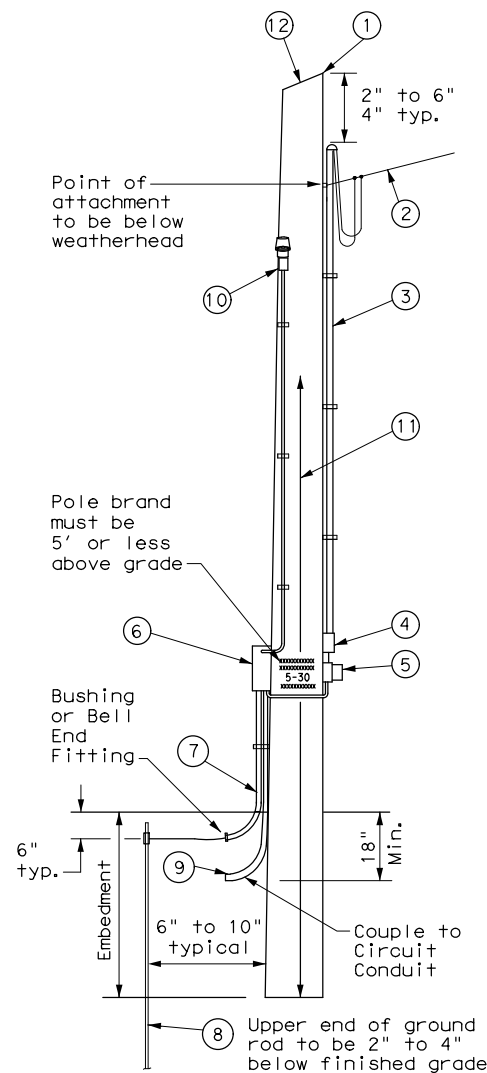
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TIMBER POLE (TP) SERVICE SUPPORT NOTES

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 electrical 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 3/8 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.

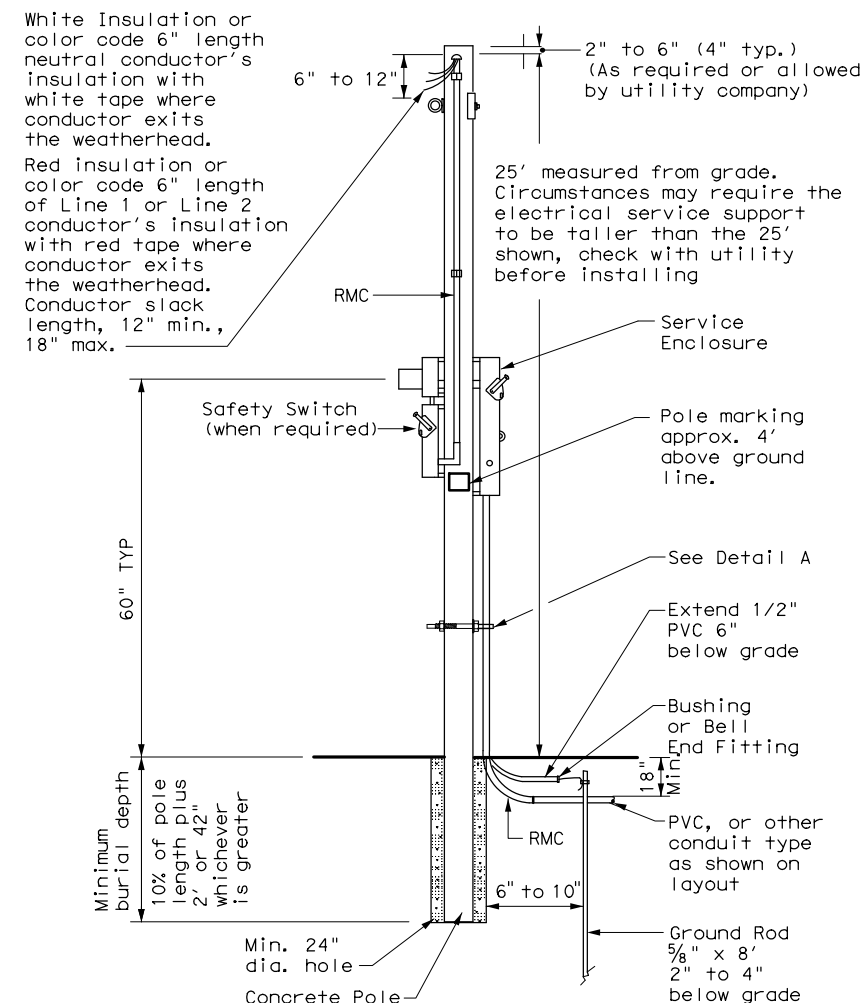


SERVICE SUPPORT TYPE TP (O)

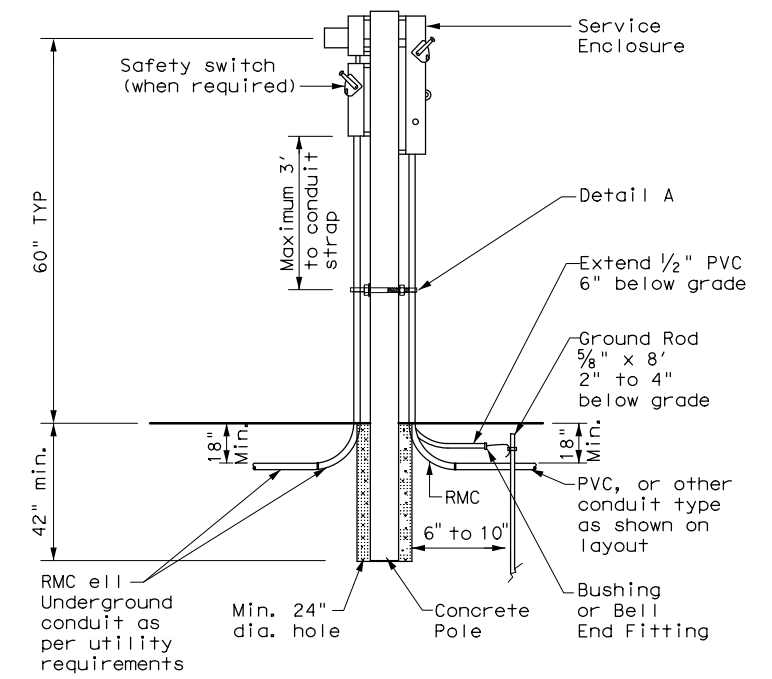
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

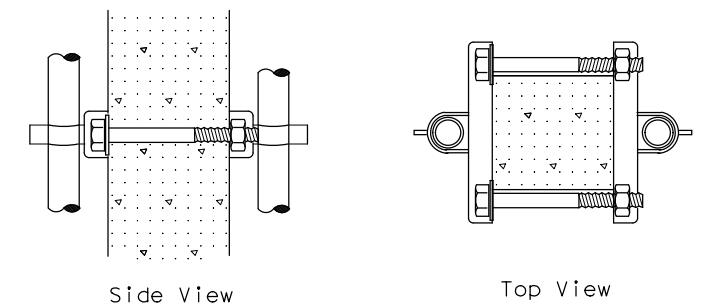
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' 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.

		Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP			
ED(10)-14			
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			SHEET NO.: 253

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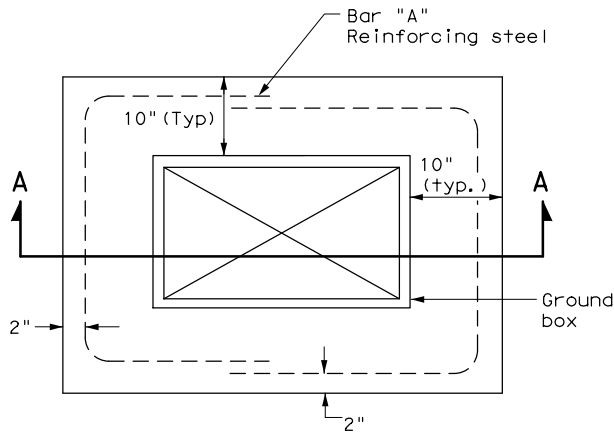
BATTERY BOX GROUND BOXES NOTES

A. MATERIALS

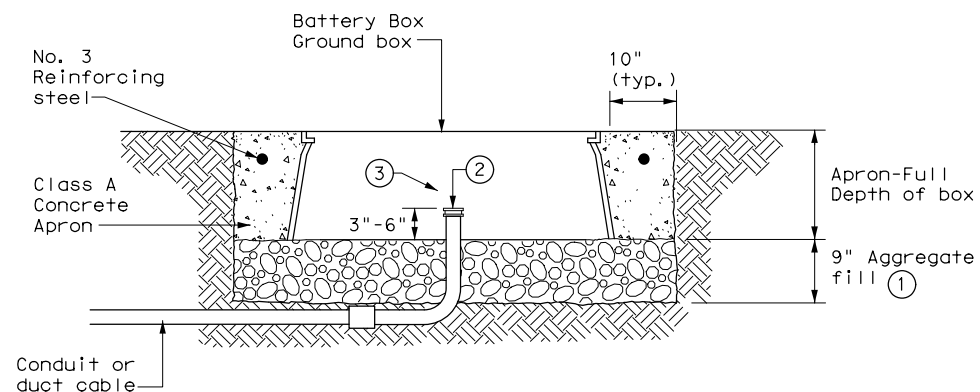
1. Provide polymer concrete or fiberglass reinforced plastic (FRP) battery box ground box and cover in accordance with Departmental Material Specification (DMS) 11071 "Battery Box Ground Boxes." Battery box will accommodate up to 4 batteries, each measuring 8 in. x 13.5 in. x 10 in. (W x L x D). Label battery box ground box cover in accordance with DMS 11071.
2. Supply a marine grade batteries with covers. Secure the marine grade batteries with covers to the stainless steel rack in the bottom of the ground box with tie down straps.

B. CONSTRUCTION METHODS

1. Ensure conduit entry will not interfere with placement of the batteries in the battery box ground box.
2. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting battery box ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure the aggregate bed is in place and is a minimum of 9 in. deep prior to setting the box. Install battery box ground box on top of aggregate.
3. Cast battery 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. Battery box ground box aprons, including concrete and reinforcing steel, are subsidiary to battery box ground boxes when called for by descriptive code.
4. Bolt covers down when not working in battery box ground boxes. Keep bolt holes in the box clear of dirt.



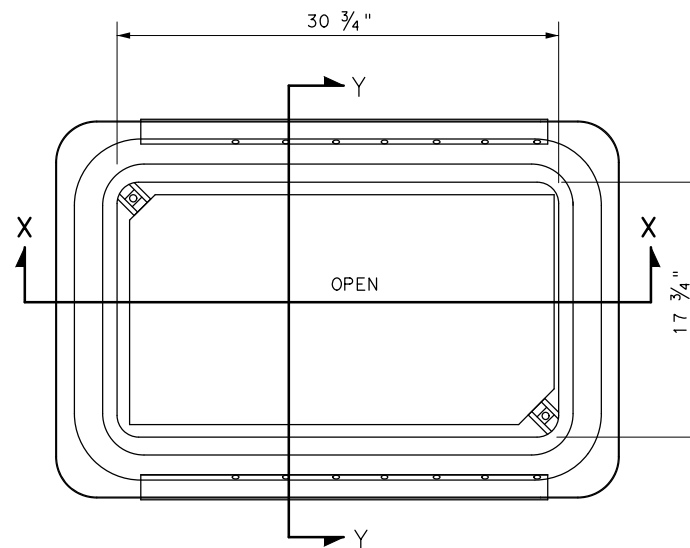
PLAN VIEW



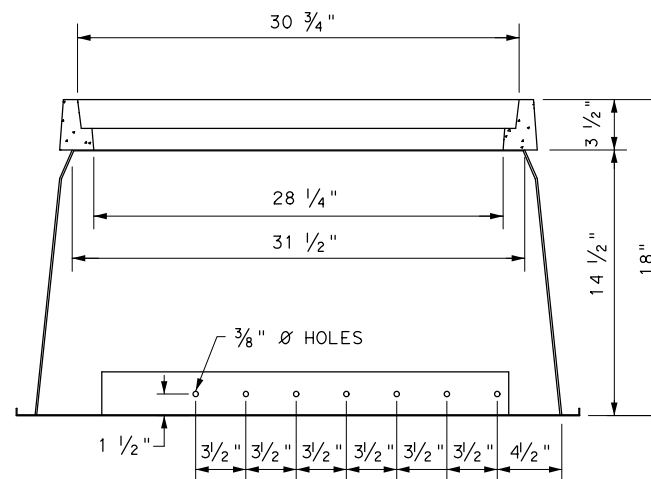
SECTION A - A

APRON FOR BATTERY BOX GROUND BOXES

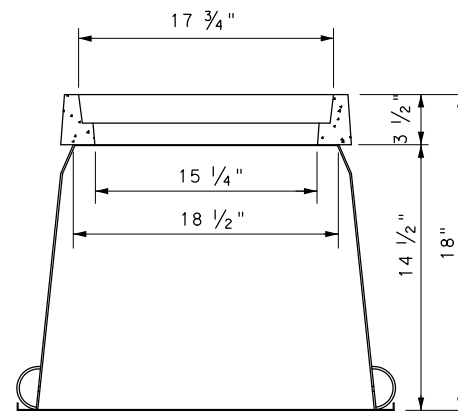
- ① Place aggregate under the box and not in the box. Aggregate should not encroach on the interior volume of the box.
- ② Install bushing or bell end fitting on the upper end of all ells.
- ③ Install all conduits in a neat and workmanlike manner.



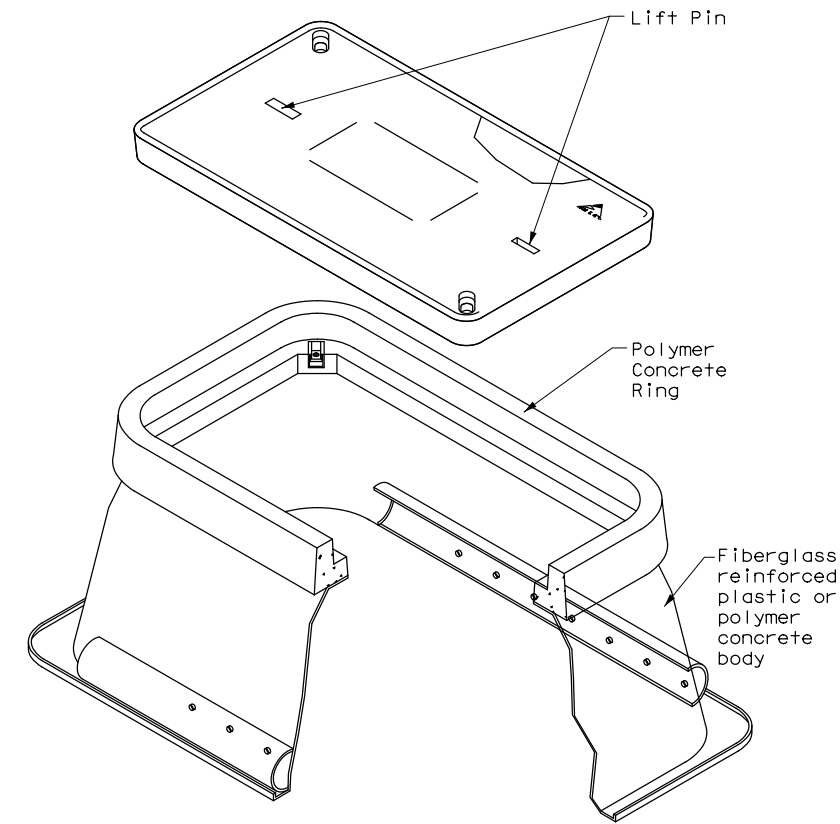
BATTERY BOX TOP VIEW



SECTION X-X



SECTION Y-Y



		Traffic Operations Division Standard	
ELECTRICAL DETAILS BATTERY BOX GROUND BOXES			
ED(12)-14			
FILE: ed12-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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DIST: LFK	COUNTY: POLK	SHEET NO.: 254	

ROADWAY ILLUMINATION ASSEMBLY NOTES

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1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.
2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.
3. 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, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.
4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.
5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.
 - a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.
 - b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:
 - i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).
 - ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.
6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.
7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.
8. Install T-Base with following procedure:
 - a. Anchor Bolt Tightening.
 - i. Coat the threads of the anchor bolts with electrically conductive lubricant.
 - ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.
 - iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.
 - iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.
 - v. Check top of T-base for level. If not level then foundation must be leveled.
 - b. Top Bolt Procedure
 - i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

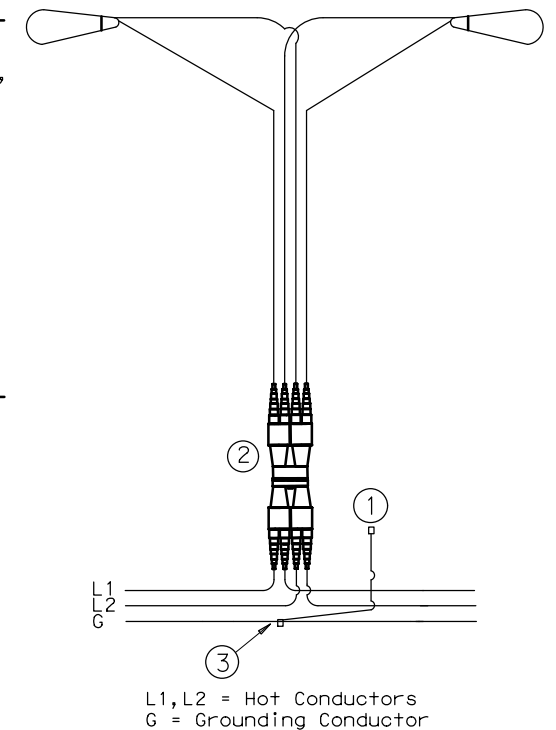
- ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."
- iii. Tighten each nut to 150 ft-lb. using a torque wrench.
- c. Level and Plumb
 - i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.
9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).
10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.
11. Mount luminaires on arms level as shown by the luminaire level indicator.
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

- ① Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.
- ② Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.
- ③ Split Bolt or other connector.

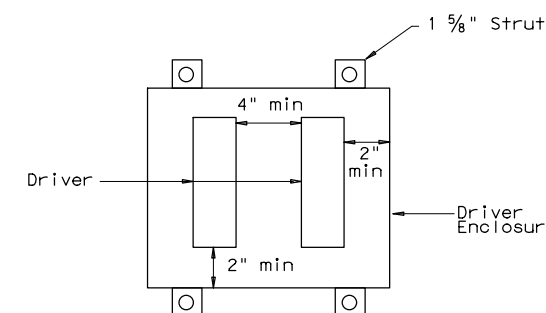
Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):
 - a. Provide NEMA 3R outdoor enclosure or as approved.
 - b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.
 - c. Install drivers with at least 2 inches of space from enclosure walls.
 - d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment
 - e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.
 - f. Provide remote drivers with a maximum of 100 watts
 - g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

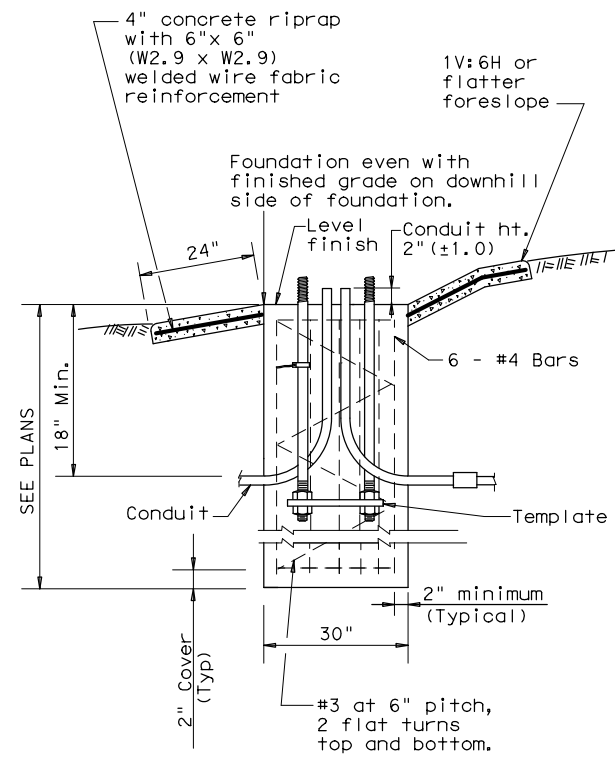


Driver Spacing In Remote Enclosure

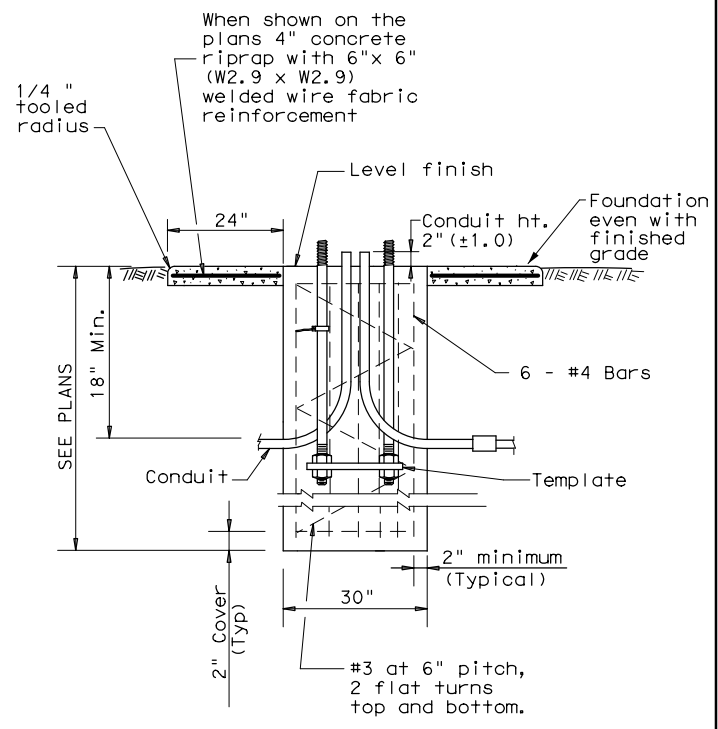
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SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1

ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1 in. x 30 in.
40-50 ft.	15 in.	17 1/4 in.	1 1/4 in. x 30 in.

TABLE 2

RECOMMENDED FOUNDATION LENGTHS
(See note 1)

MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
<20 ft.	6'	6'	6'
>20 ft. to 30 ft.	8'	6'	6'
>30 ft. to 40 ft.	8'	8'	6'
>40 ft. to 50 ft.	10'	8'	6'

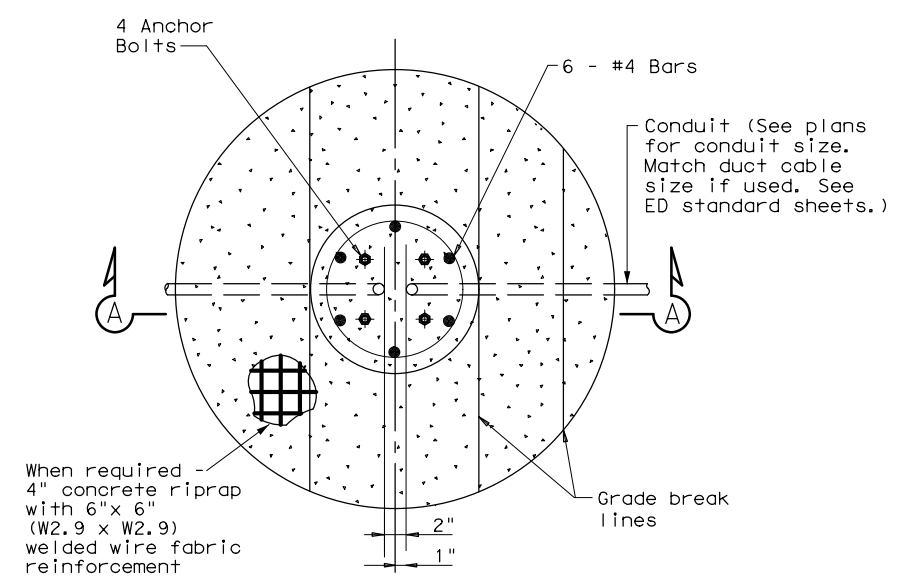
TABLE 3

PAY QUANTITY OF RIPRAP PER FOUNDATION
(Install only when shown on the plans)

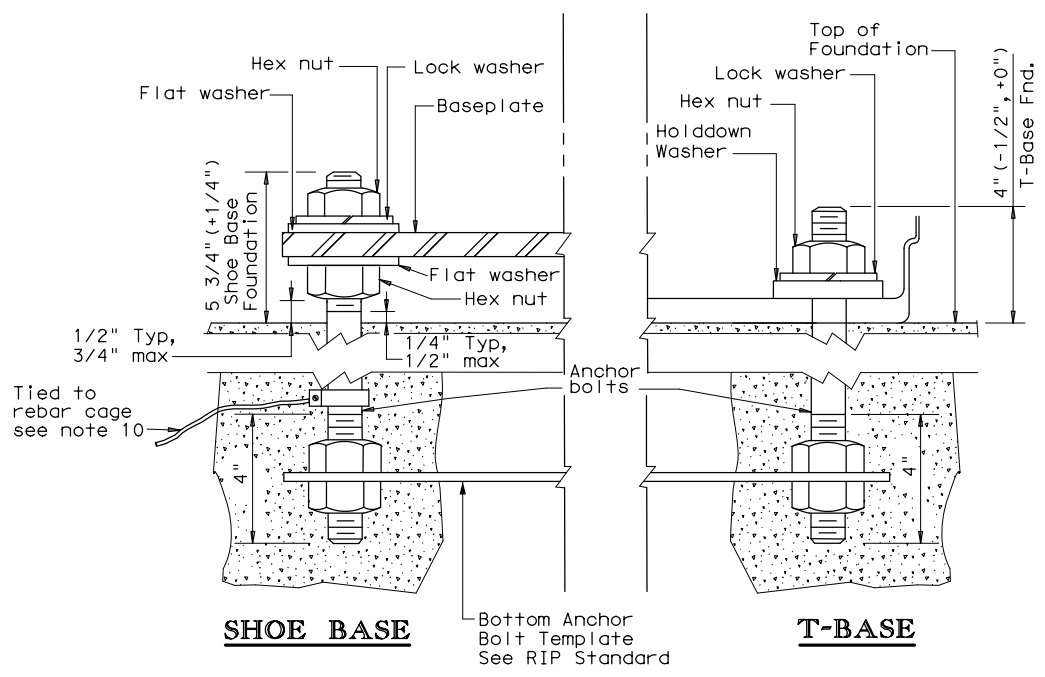
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

- "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
- Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
- Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
- Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
- Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
- Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
- Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
- Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
- Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
- Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
- Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.



ROADWAY ILLUMINATION DETAILS (RDWY ILLUM FOUNDATIONS) RID(2)-20

FILE: rid2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
1-11	DIST	COUNTY	SHEET NO.	
7-17	LFK	POLK	256	
12-20				

SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base					T-Base					CSB/SSCB Mounted				
	Designation				Quantity	Designation				Quantity	Designation				Quantity
	Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire	
20	(Type SA 20 S - 4)			(150W EQ) LED		(Type SA 20 T - 4)			(150W EQ) LED						
	(Type SA 20 S - 4 - 4)			(150W EQ) LED		(Type SA 20 T - 4 - 4)			(150W EQ) LED						
30	(Type SA 30 S - 4)			(250W EQ) LED		(Type SA 30 T - 4)			(250W EQ) LED		(Type SP 28 S - 4)		(250W EQ) LED		
	(Type SA 30 S - 4 - 4)			(250W EQ) LED		(Type SA 30 T - 4 - 4)			(250W EQ) LED		(Type SP 28 S - 4 - 4)		(250W EQ) LED		
	(Type SA 30 S - 8)			(250W EQ) LED		(Type SA 30 T - 8)			(250W EQ) LED		(Type SP 28 S - 8)		(250W EQ) LED		
	(Type SA 30 S - 8 - 8)			(250W EQ) LED		(Type SA 30 T - 8 - 8)			(250W EQ) LED		(Type SP 28 S - 8 - 8)		(250W EQ) LED		
40	(Type SA 40 S - 4)			(250W EQ) LED		(Type SA 40 T - 4)			(250W EQ) LED		(Type SP 38 S - 4)		(250W EQ) LED		
	(Type SA 40 S - 4 - 4)			(250W EQ) LED		(Type SA 40 T - 4 - 4)			(250W EQ) LED		(Type SP 38 S - 4 - 4)		(250W EQ) LED		
	(Type SA 40 S - 8)			(250W EQ) LED		(Type SA 40 T - 8)			(250W EQ) LED		(Type SP 38 S - 8)		(250W EQ) LED		
	(Type SA 40 S - 8 - 8)			(250W EQ) LED		(Type SA 40 T - 8 - 8)			(250W EQ) LED		(Type SP 38 S - 8 - 8)		(250W EQ) LED		
	(Type SA 40 S - 10)			(250W EQ) LED		(Type SA 40 T - 10)			(250W EQ) LED		(Type SP 38 S - 10)		(250W EQ) LED		
	(Type SA 40 S - 10 - 10)			(250W EQ) LED		(Type SA 40 T - 10 - 10)			(250W EQ) LED		(Type SP 38 S - 10 - 10)		(250W EQ) LED		
	(Type SA 40 S - 12)			(250W EQ) LED		(Type SA 40 T - 12)			(250W EQ) LED		(Type SP 38 S - 12)		(250W EQ) LED		
	(Type SA 40 S - 12 - 12)			(250W EQ) LED		(Type SA 40 T - 12 - 12)			(250W EQ) LED		(Type SP 38 S - 12 - 12)		(250W EQ) LED		
	50	(Type SA 50 S - 4)			(400W EQ) LED		(Type SA 50 T - 4)			(400W EQ) LED		(Type SP 48 S - 4)		(400W EQ) LED	
		(Type SA 50 S - 4 - 4)			(400W EQ) LED		(Type SA 50 T - 4 - 4)			(400W EQ) LED		(Type SP 48 S - 4 - 4)		(400W EQ) LED	
(Type SA 50 S - 8)				(400W EQ) LED		(Type SA 50 T - 8)			(400W EQ) LED		(Type SP 48 S - 8)		(400W EQ) LED		
(Type SA 50 S - 8 - 8)				(400W EQ) LED		(Type SA 50 T - 8 - 8)			(400W EQ) LED		(Type SP 48 S - 8 - 8)		(400W EQ) LED		
(Type SA 50 S - 10)				(400W EQ) LED		(Type SA 50 T - 10)			(400W EQ) LED		(Type SP 48 S - 10)		(400W EQ) LED		
(Type SA 50 S - 10 - 10)				(400W EQ) LED		(Type SA 50 T - 10 - 10)			(400W EQ) LED		(Type SP 48 S - 10 - 10)		(400W EQ) LED		
(Type SA 50 S - 12)				(400W EQ) LED		(Type SA 50 T - 12)			(400W EQ) LED		(Type SP 48 S - 12)		(400W EQ) LED		
(Type SA 50 S - 12 - 12)				(400W EQ) LED		(Type SA 50 T - 12 - 12)			(400W EQ) LED		(Type SP 48 S - 12 - 12)		(400W EQ) LED		

OTHER				
Designation				Quantity
Pole	A1	A2	Luminaire	

GENERAL NOTES:

- All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the Department such warranties or guarantees.
- The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.
- Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.
- Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.
 - Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer licensed in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
 - Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. All poles shall be designed for 110 mph 3-second gust wind speeds. The Gust Factor, G, and Wind Importance Factor, Ir, shall be applied as per the AASHTO Specifications assuming a 25-year design life. The design wind pressure for hurricane wind velocities greater than 100 mph shall not be less than the design wind pressure using 100 mph with the non-hurricane Wind Importance Factor, Ir, value. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
 - Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
 - Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.
- Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.
 - Meet all of the requirements stated above for optional steel pole designs and the following:
 - Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
 - Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
 - Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
 - Pole components shall be constructed using the following material:
 - Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
 - Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
 - Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
 - Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
 - Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
 - Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.
- Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.
- Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations except for poles with 4 ft. luminaire arms, which shall be 3'-0" lower than the nominal height, unless otherwise shown or directed.

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED

SA: Pole and mast arm may be steel or aluminum.
 ST: Pole and mast arm must be steel.
 AL: Pole and mast arm must be aluminum.
 SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).

Two numerical digits denote nominal mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret. Wall Mount)

First number denotes length of mast arm in feet.

Use of second mast arm is indicated by second dashed number which denotes length in feet.

Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)

Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

Texas Department of Transportation
 Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

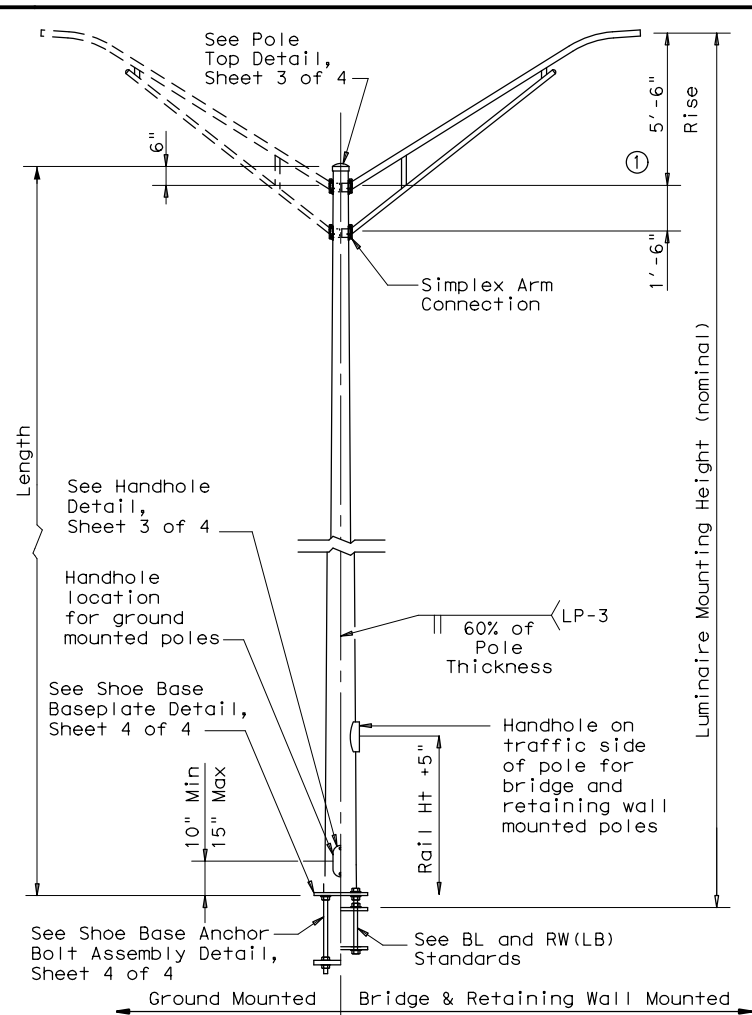
RIP(1)-19

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7-17	REVISIONS	0213	04	050
12-19	DIST	COUNTY		SHEET NO.
	LFK	POLK		257

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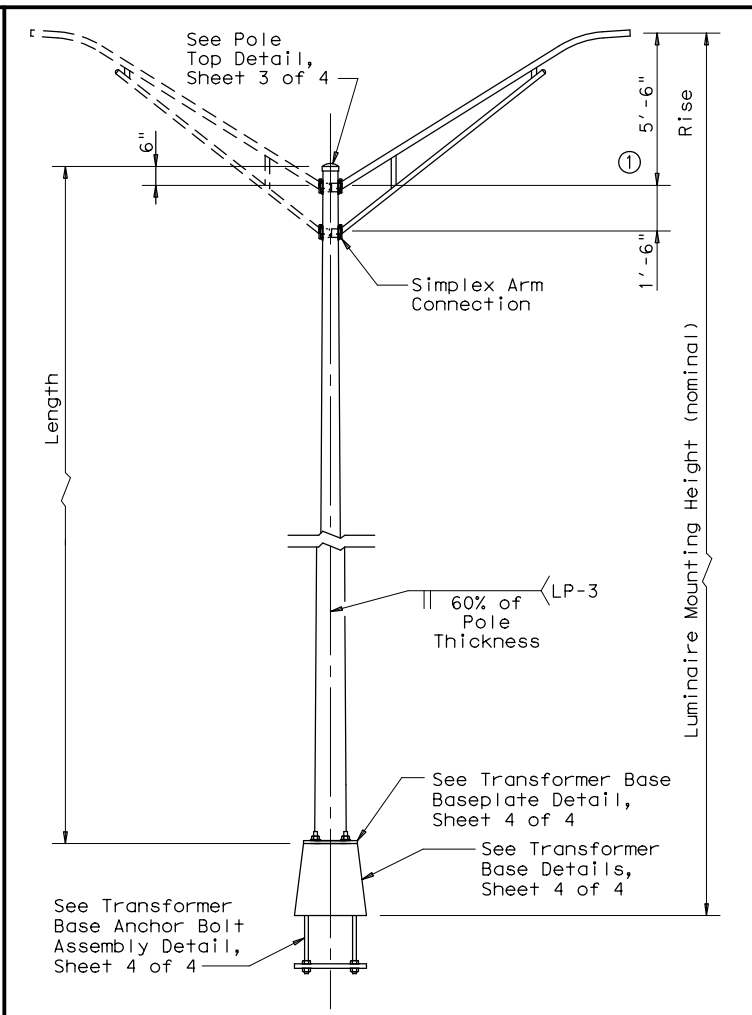
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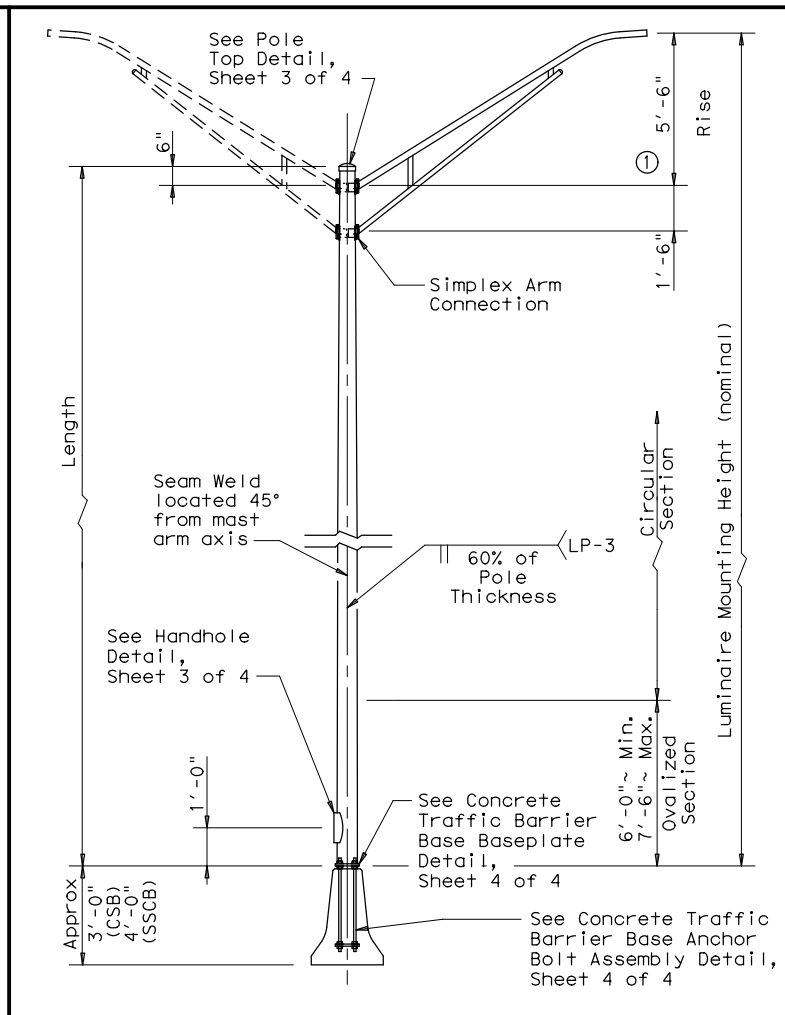
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About C of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

NOTES:

- 2'-6" rise for 4 ft. luminaire arms.
- Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.
- A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

POLE ASSEMBLY FABRICATION TOLERANCES TABLE

DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

GENERAL NOTES:

- Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
- Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
- Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance 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 these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
- For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
- Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
- Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
- Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
- Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
- Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
- All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
- The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
- Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
- Erect transformer base poles in accordance with sheet RID(1).

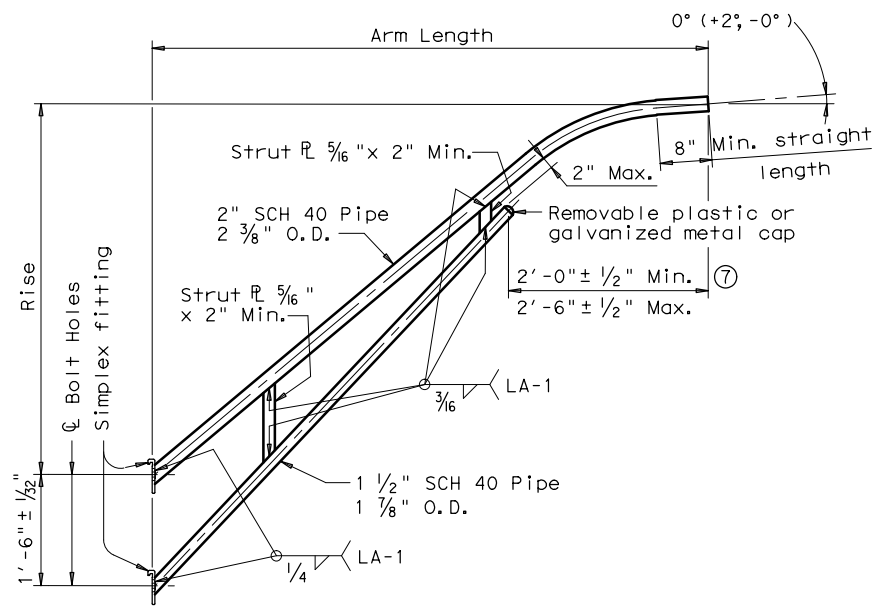


ROADWAY ILLUMINATION POLES
RIP(2)-19

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REVISIONS	0213	04	050	US 190
7-17	DIST	COUNTY	SHEET NO.	
12-19	LFK	POLK	258	

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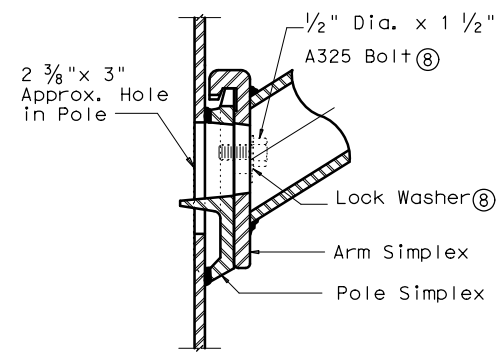
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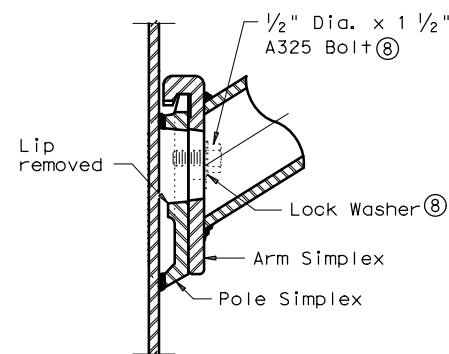
LUMINAIRE ARM

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"

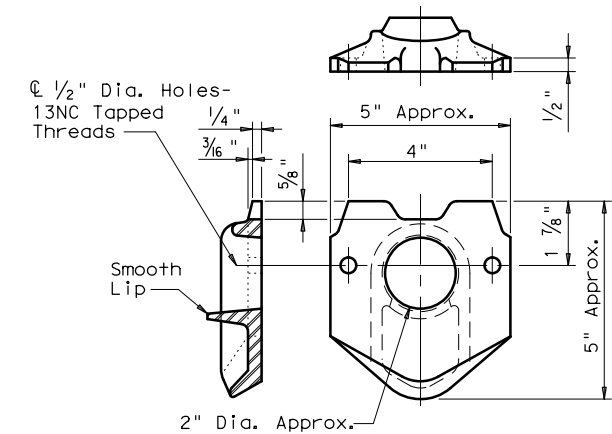


UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

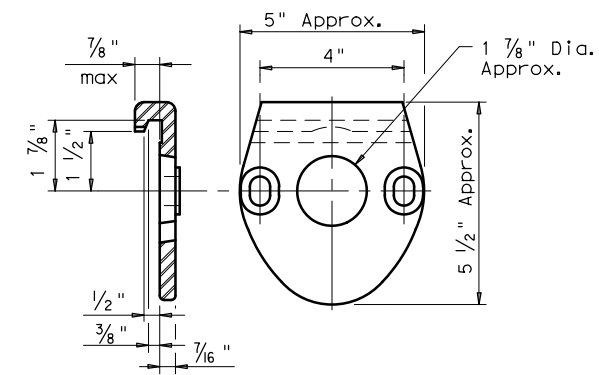


LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B



POLE SIMPLEX DETAIL



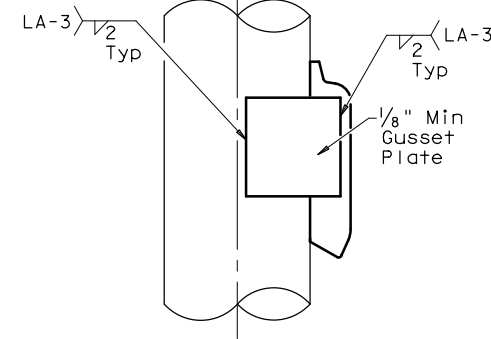
ARM SIMPLEX DETAIL

NOTES:

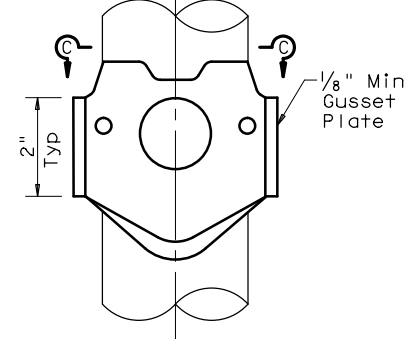
- ④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- ⑤ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- ⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.
- ⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.
- ⑧ Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.
- ⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.
- ⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

MATERIALS

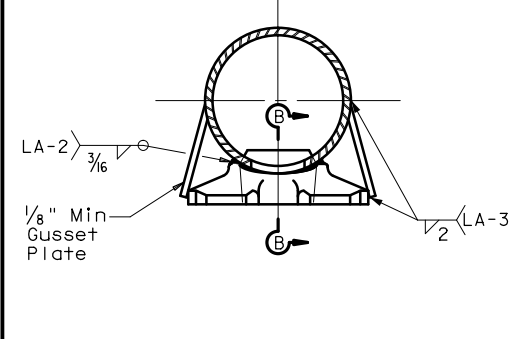
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted



SIDE

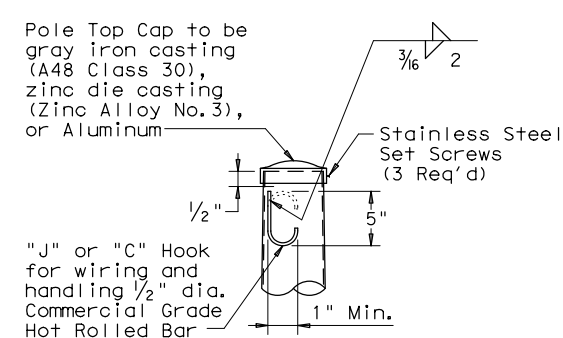


ELEVATION

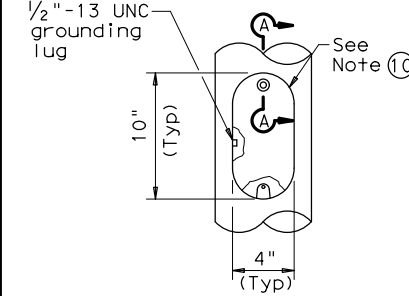


SECTION C-C

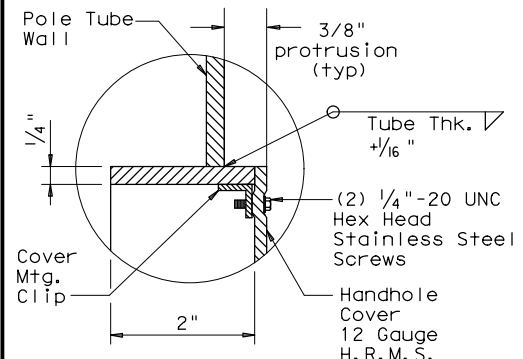
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

SHEET 3 OF 4

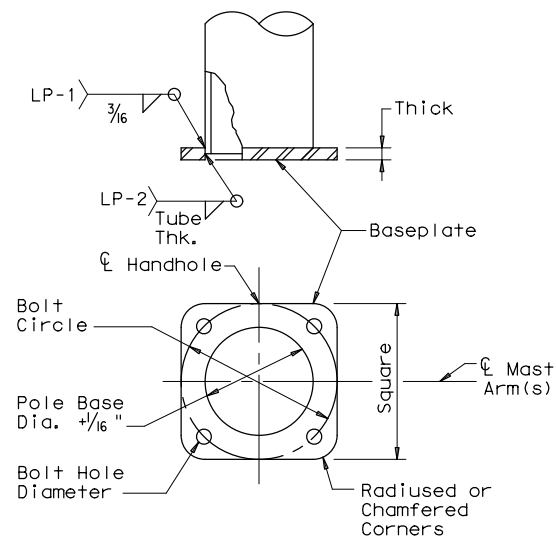


ROADWAY ILLUMINATION POLES
RIP(3)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
7-17	DIST	COUNTY	SHEET NO.	
12-19	LFK	POLK	259	

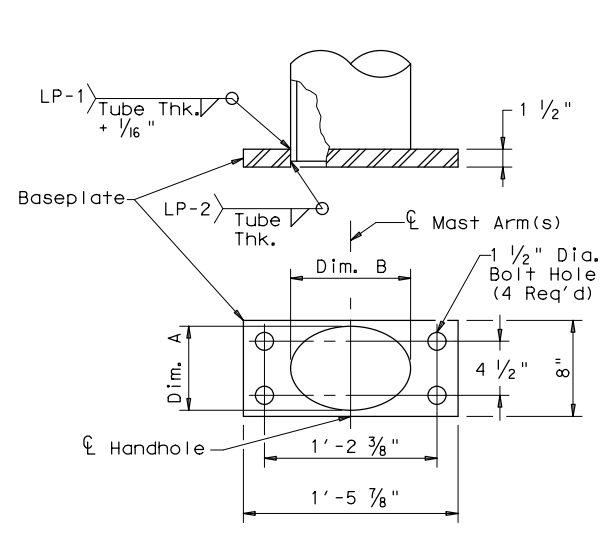
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DATE: 05/13/2021 10:39:13
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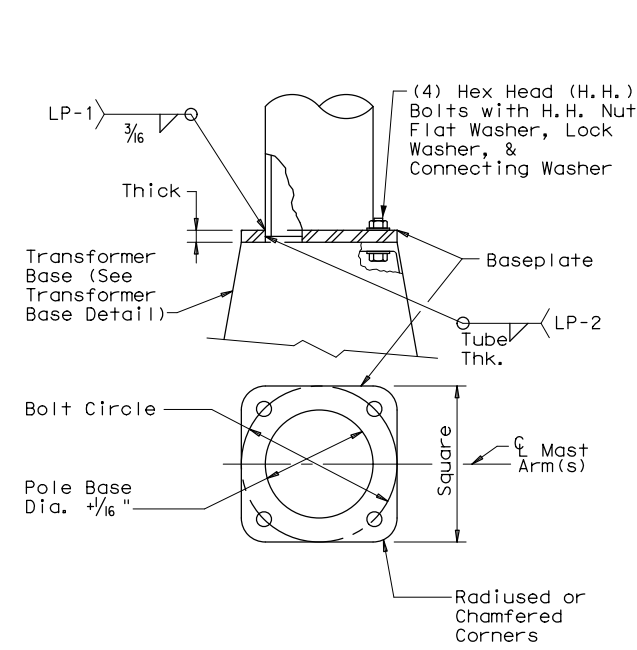
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20' - 39'	13"	13"	1 1/4"	1 1/4"
40'	15"	15"	1 1/4"	1 1/2"
50'	15"	15"	1 1/2"	1 1/2"



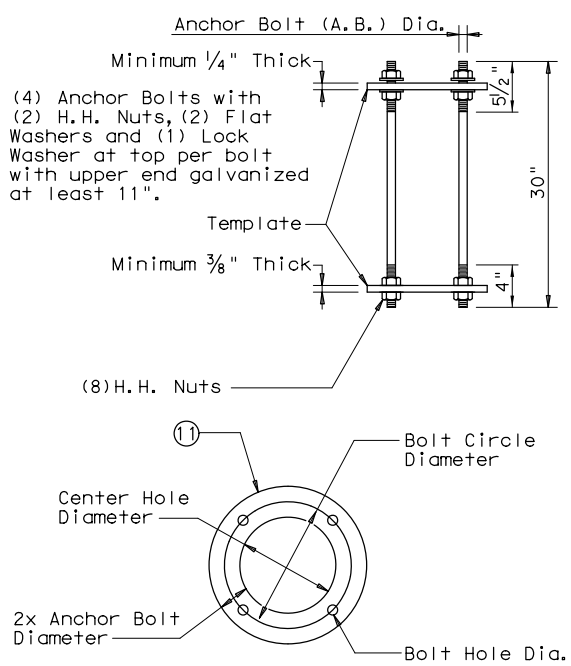
CONCRETE TRAFFIC BARRIER BASE BASEPLATE

CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (12)	DIM. A	DIM. B
28' - 38'	9"	7" ± 1/4"	10" ± 1/4"
48'	10 1/2"	7" ± 1/4"	13" ± 1/4"



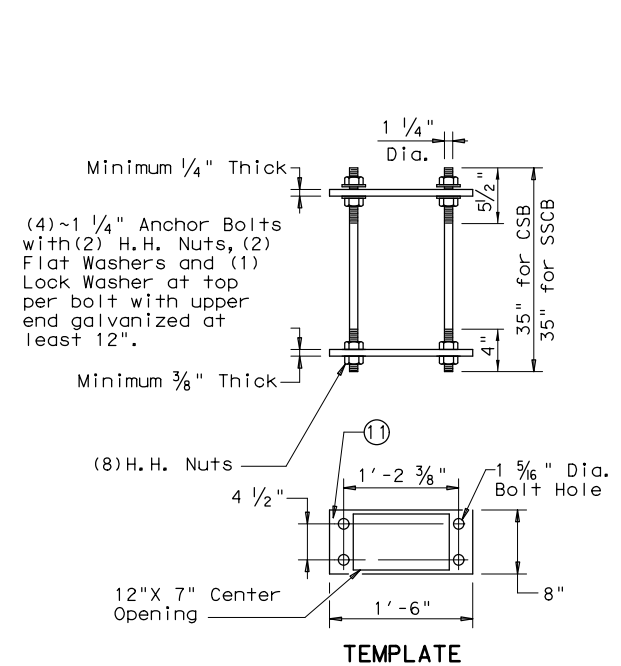
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20' - 39'	13"	13"	1 1/4"	1"	1 1/4"	A
40'	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50'	15"	15"	1 1/2"	1 1/4"	1 1/2"	B



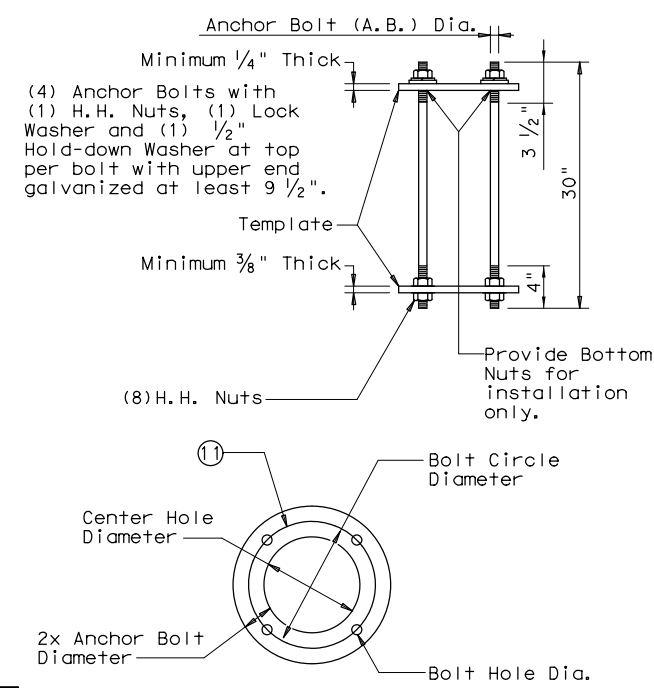
SHOE BASE ANCHOR BOLT ASSEMBLY

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	13"	11"	1 1/16"
40' - 50'	1 1/4"	15"	12 1/2"	1 5/16"



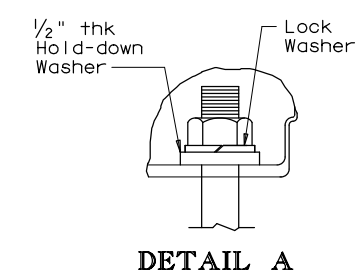
CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	14"	12"	1 1/16"
40' - 50'	1 1/4"	17 1/4"	14 3/4"	1 5/16"

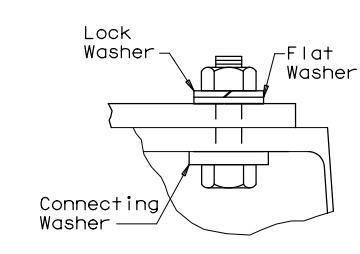


TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

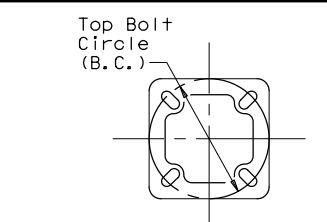
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



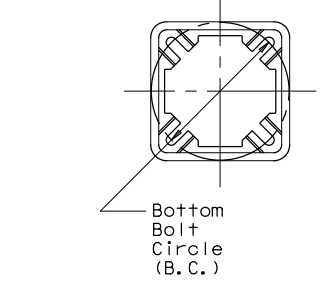
DETAIL A



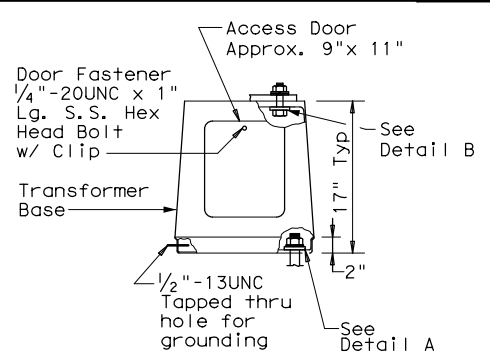
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

- For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
- All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
- Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
- Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
- Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

- Anchor Bolt Templates do not need to be galvanized.
- Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"

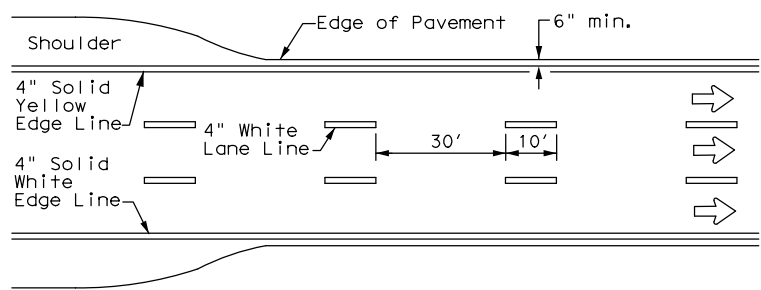


**ROADWAY ILLUMINATION POLES
RIP(4)-19**

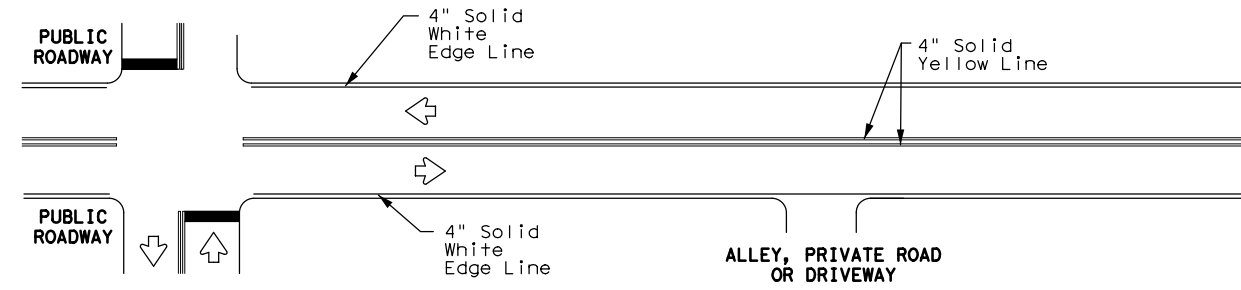
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©TxDOT January 2007	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
7-17	DIST	COUNTY	SHEET NO.	
12-19	LFK	POLK	260	

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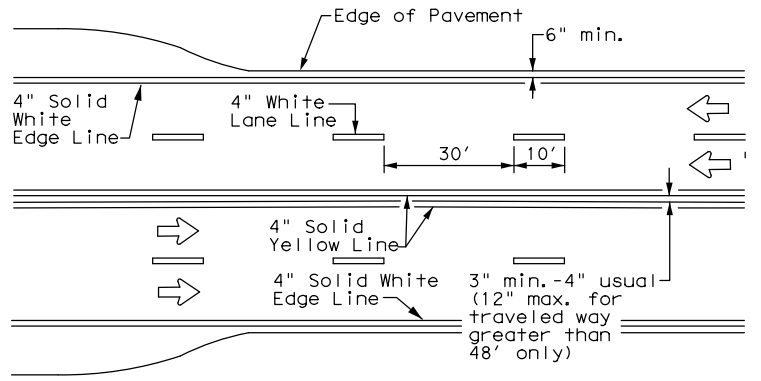
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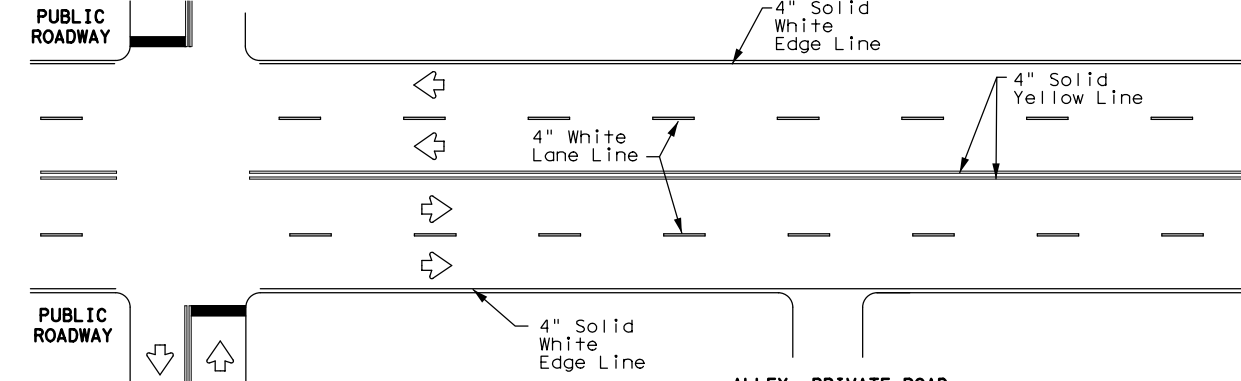
**EDGE LINE AND LANE LINES
 ONE-WAY ROADWAY
 WITH OR WITHOUT SHOULDERS**



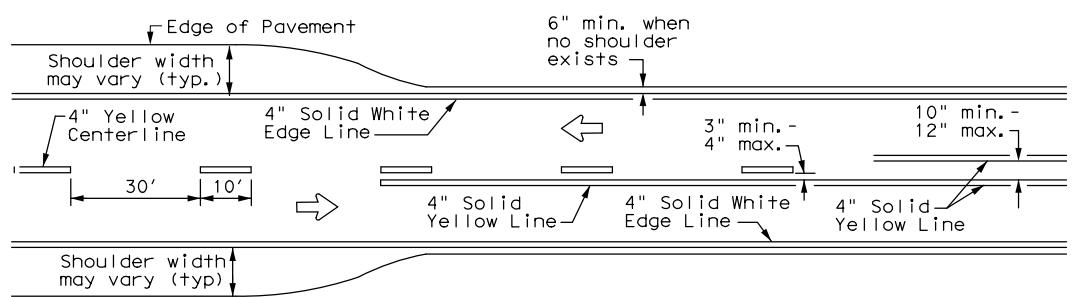
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT
 MARKINGS THROUGH INTERSECTIONS**



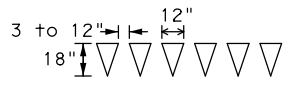
**CENTERLINE AND LANE LINES
 FOUR LANE TWO-WAY ROADWAY
 WITH OR WITHOUT SHOULDERS**



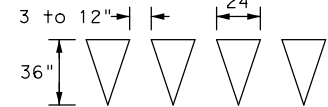
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
 MARKINGS THROUGH INTERSECTIONS**



**TWO LANE TWO-WAY ROADWAY
 WITH OR WITHOUT SHOULDERS**



For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

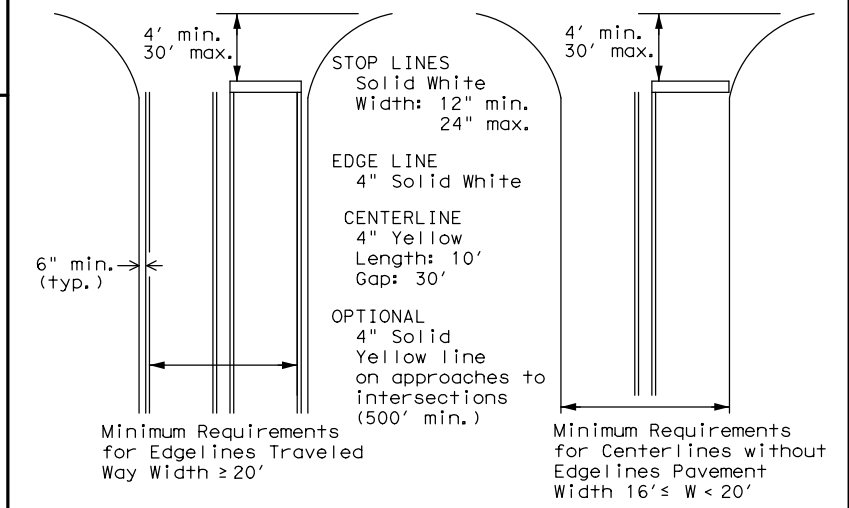
YIELD LINES

GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines 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 inside of edgeline to the inside of edgeline 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.

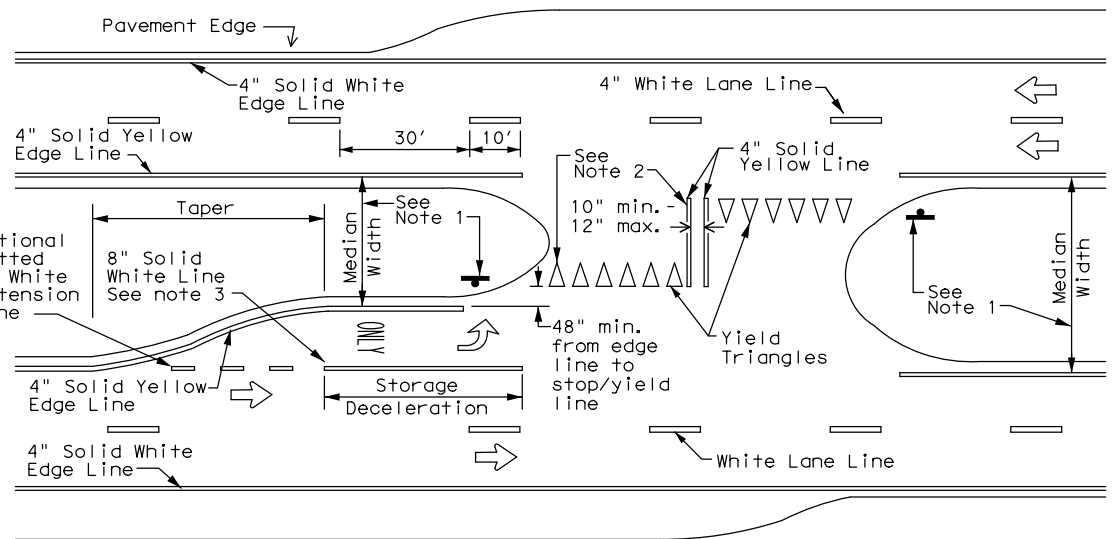


**GUIDE FOR PLACEMENT OF STOP LINES,
 EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Highways

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 are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield triangles 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.



FOUR LANE DIVIDED ROADWAY CROSSOVERS



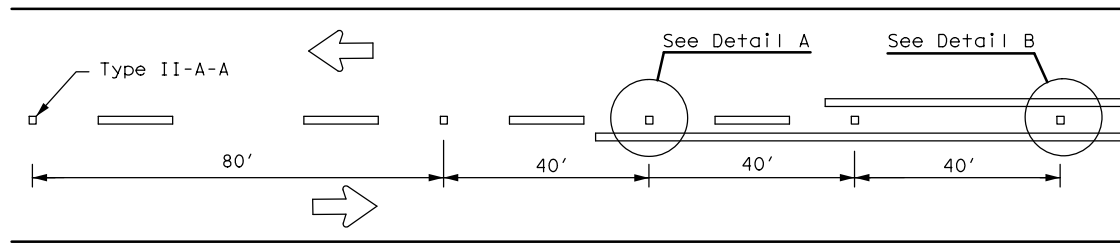
**TYPICAL STANDARD
 PAVEMENT MARKINGS**

PM(1)-20

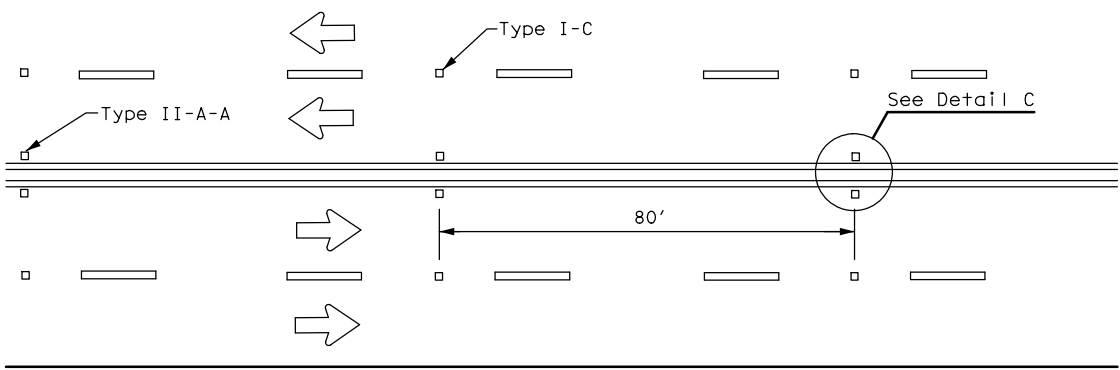
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© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS	0213	04	050	US 190
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	LFK	POLK	261	

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

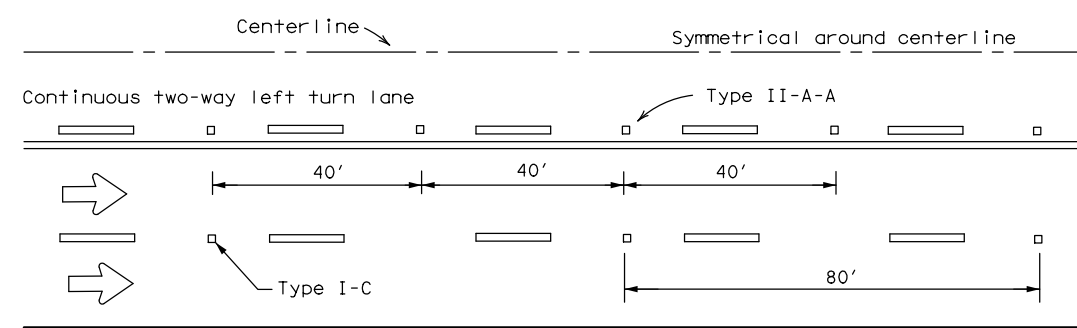
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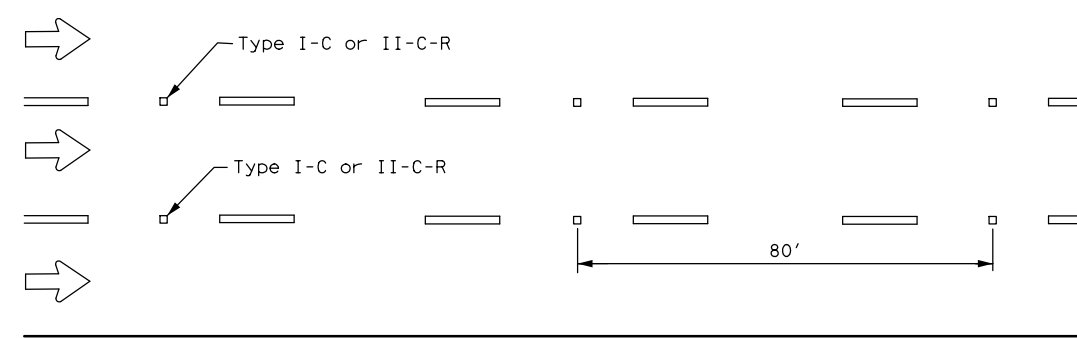
CENTERLINE FOR ALL TWO LANE ROADWAYS



**CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS**

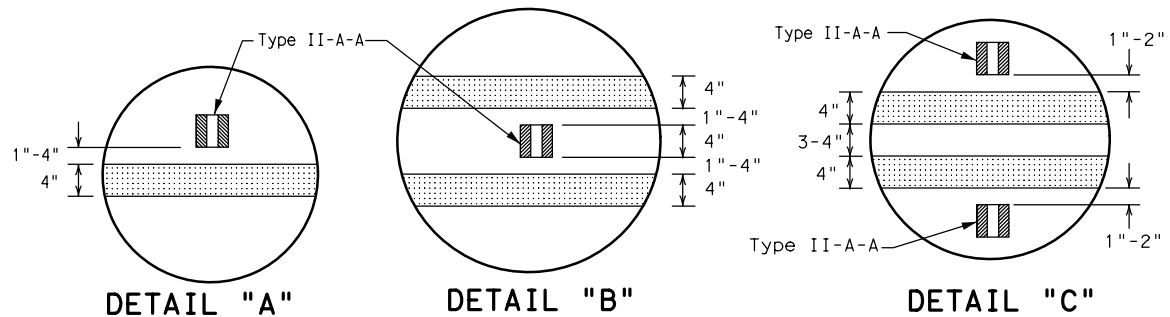


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



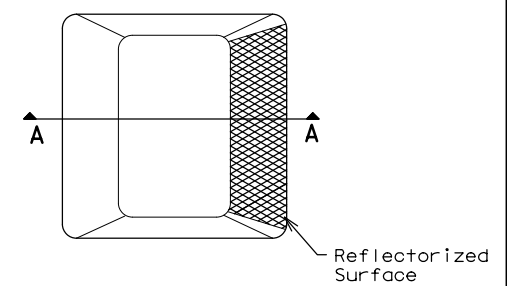
LANE LINES FOR ONE-WAY ROADWAY (NON-FREWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

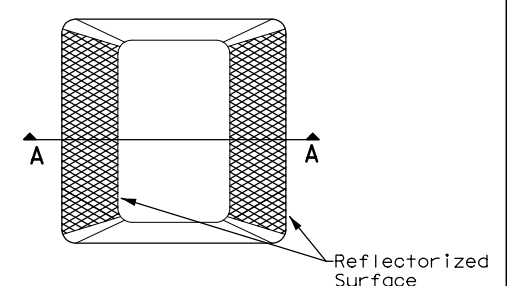


MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

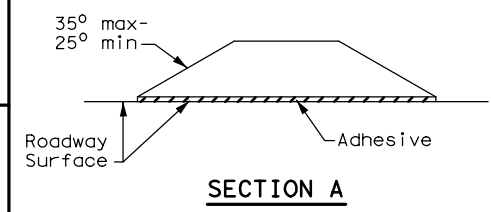
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



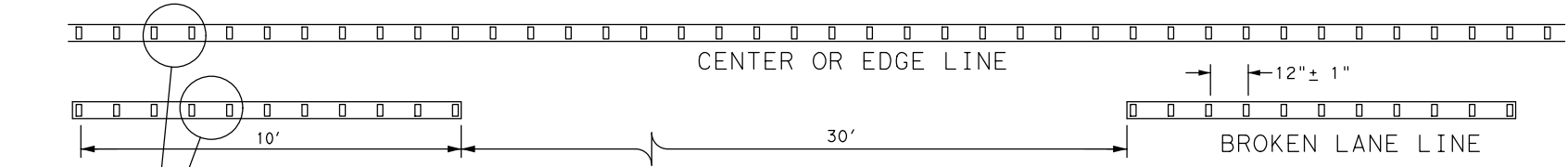
Type II (Top View)



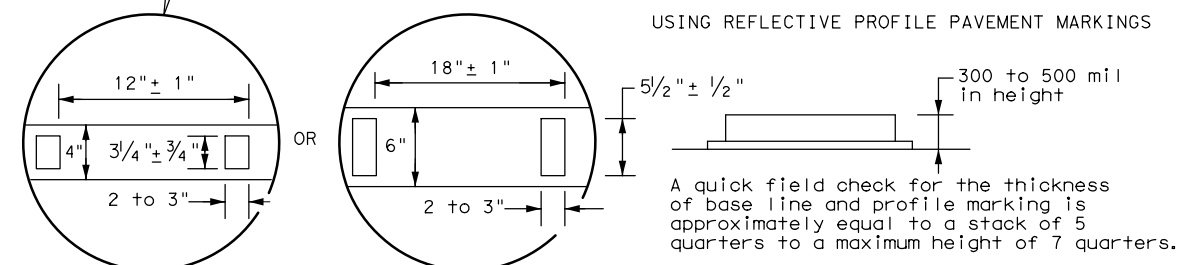
RAISED PAVEMENT MARKERS

GENERAL NOTES

- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



**REFLECTORIZED PROFILE
PATTERN DETAIL
USING REFLECTIVE PROFILE PAVEMENT MARKINGS**



NOTE
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.



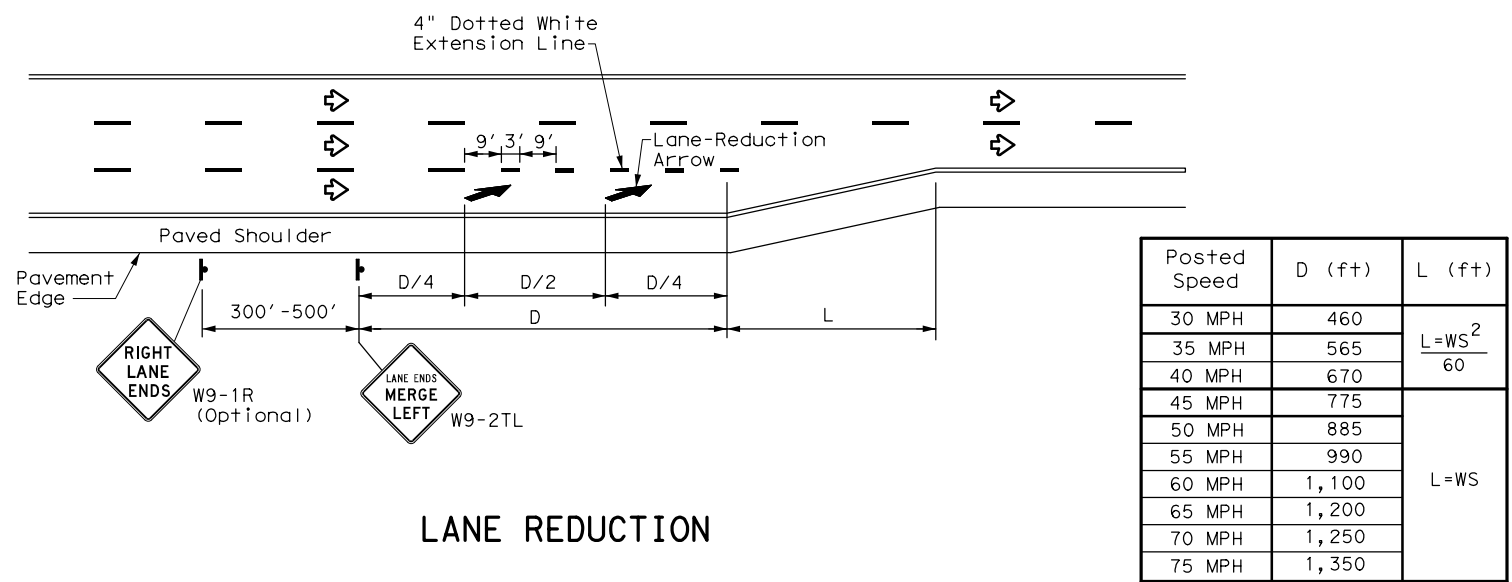
**POSITION GUIDANCE USING
RAISED MARKERS
REFLECTORIZED PROFILE
MARKINGS
PM(2) - 20**

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10 REVISIONS	0213	04	050	US 190
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	LFK	POLK	262	

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LANE REDUCTION

NOTES

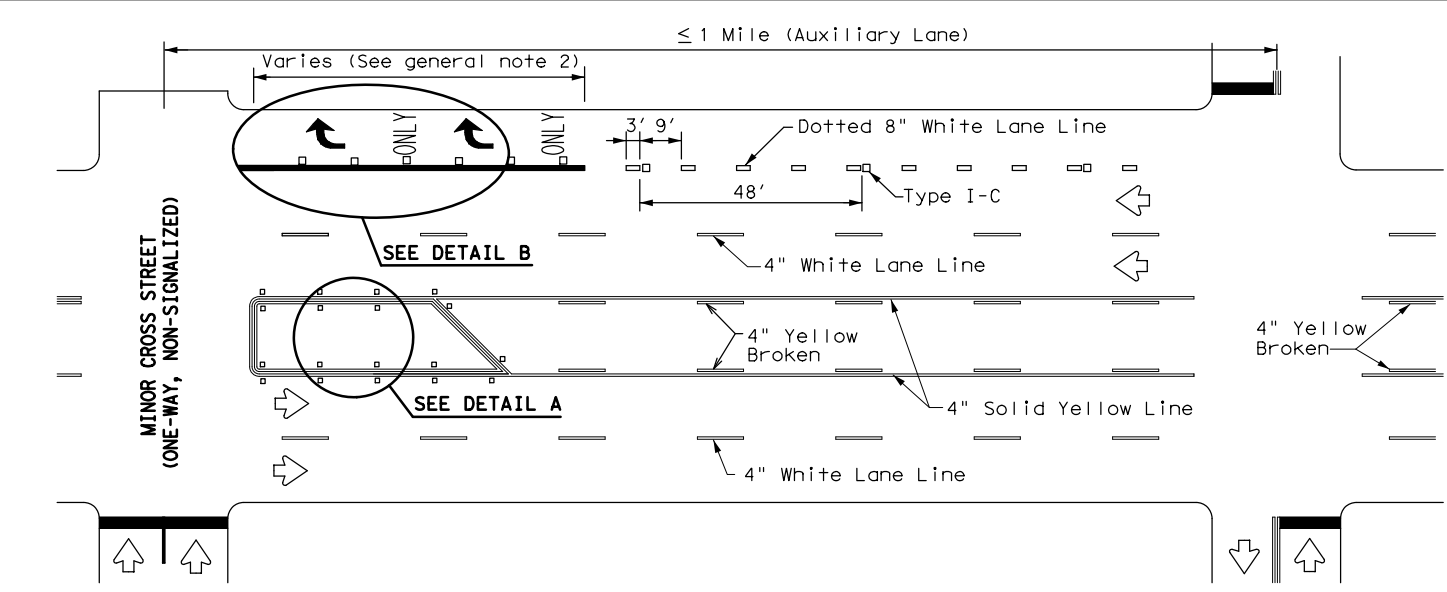
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
- On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

GENERAL NOTES

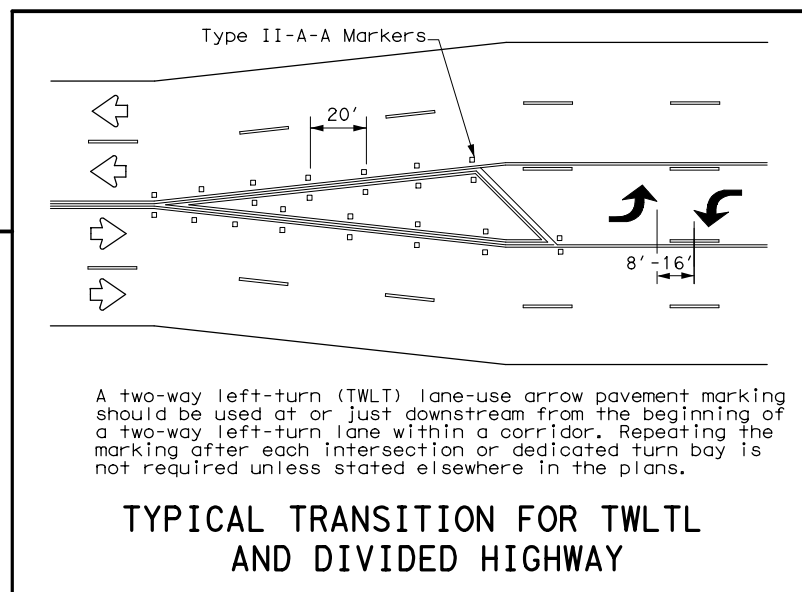
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
- Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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

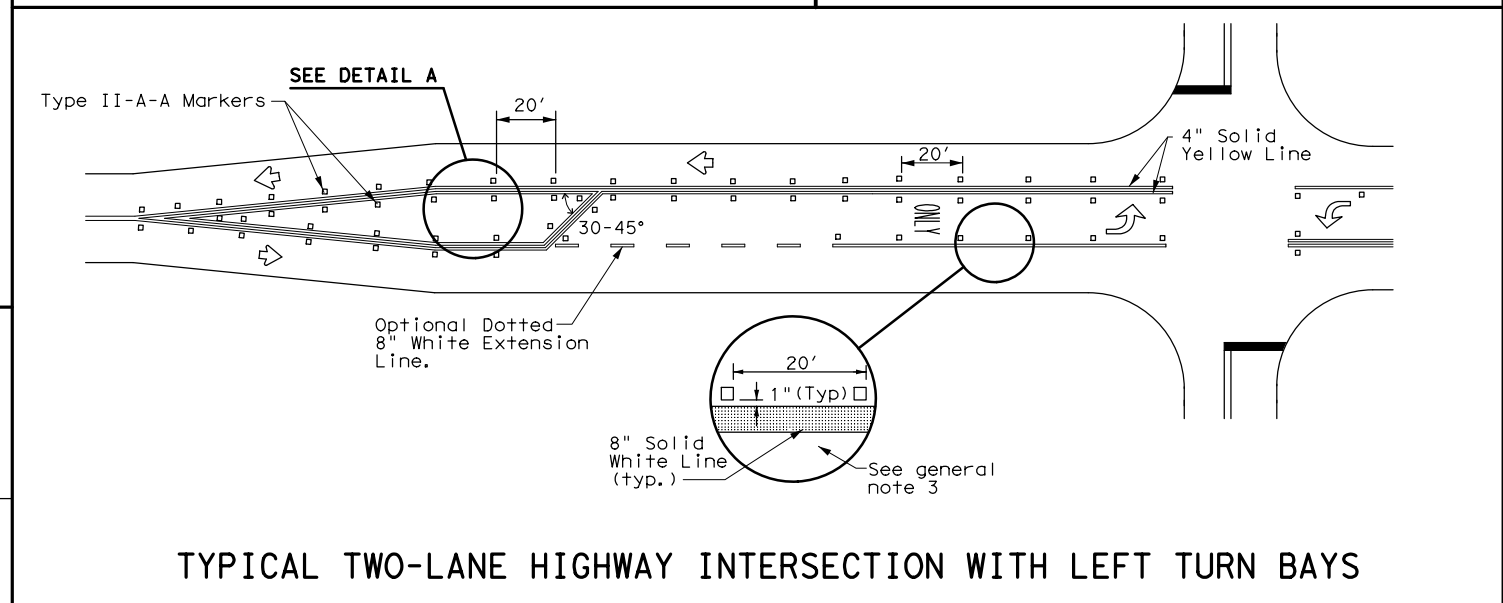
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



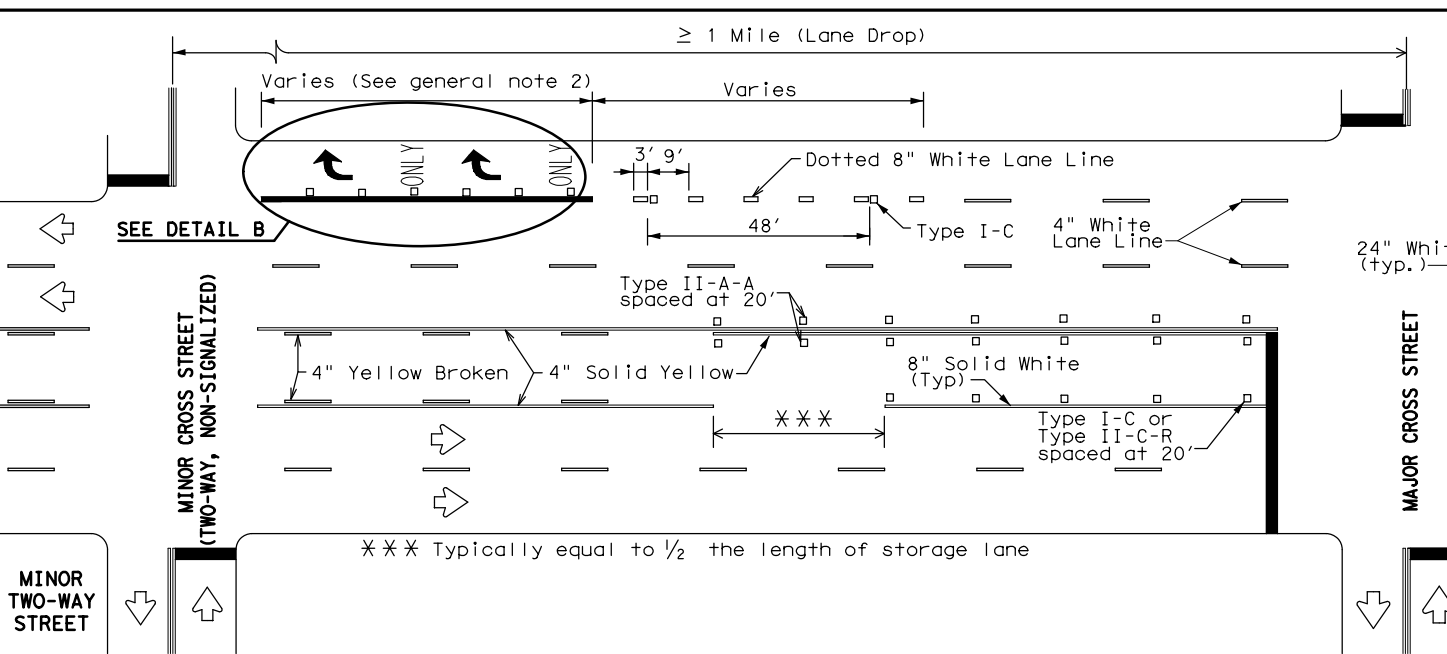
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



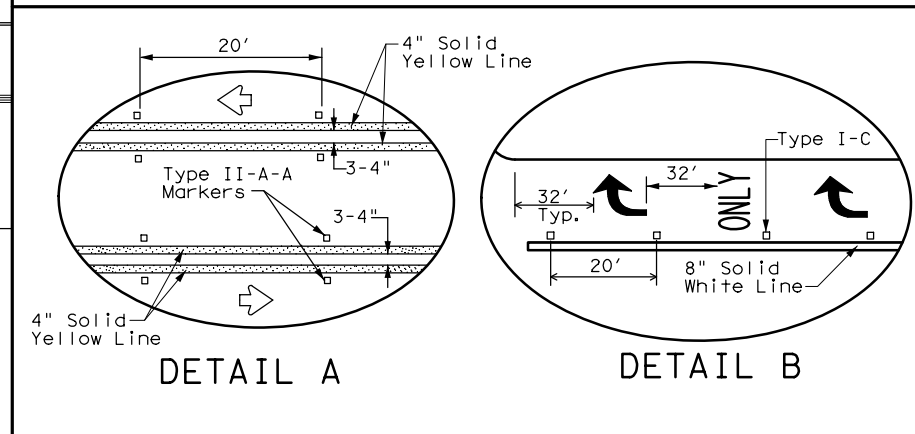
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



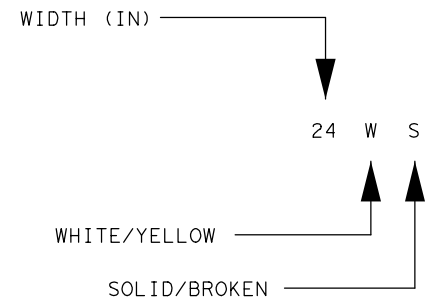
DETAIL A

DETAIL B

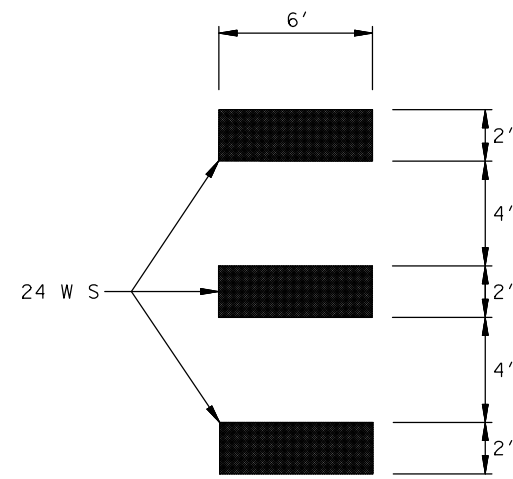
Texas Department of Transportation
 Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

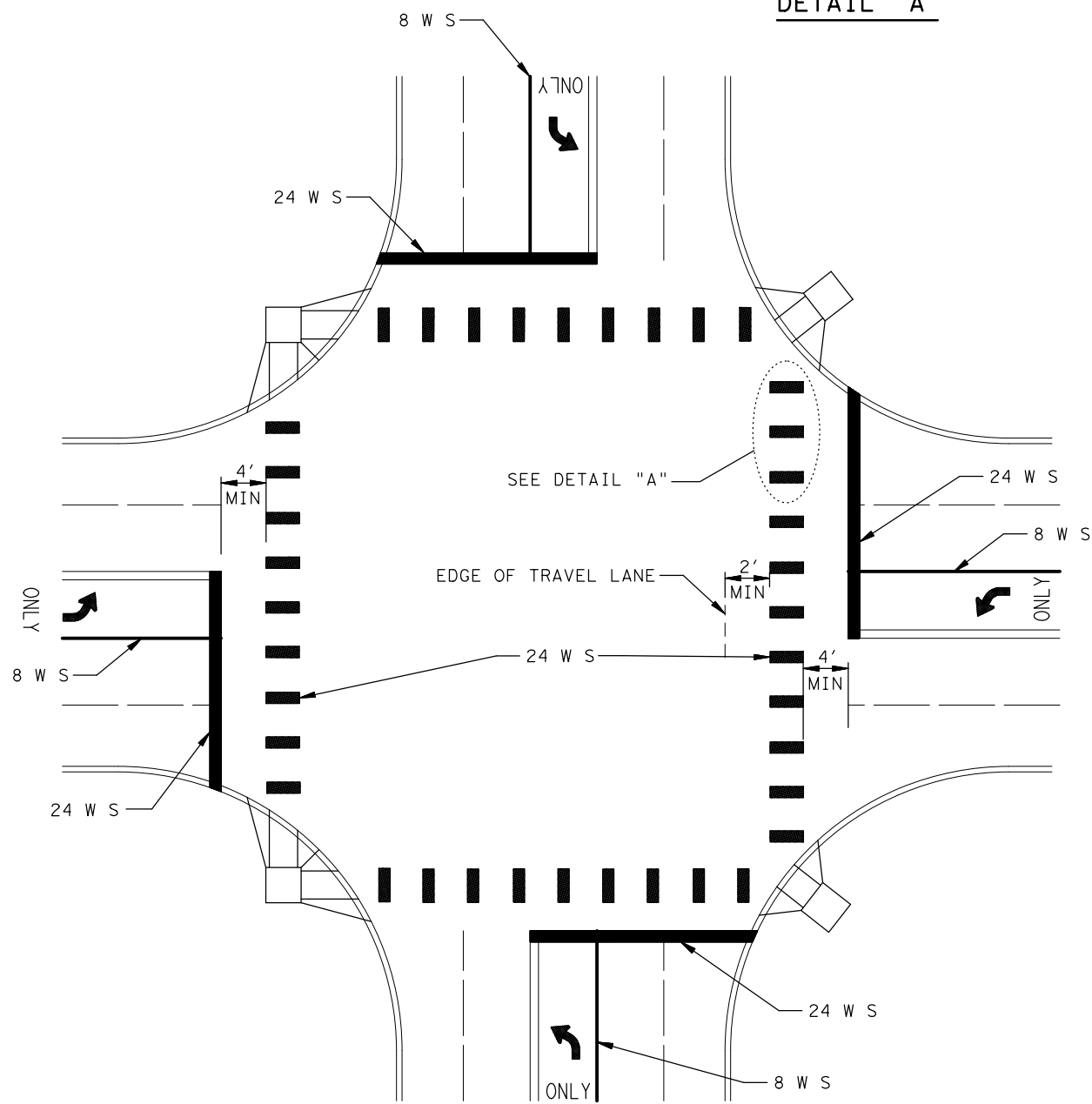
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© TxDOT April 1998	CONTRACT	SECTION	JOB	HIGHWAY
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8-00 2-12	LFK	POLK	263	
3-03 6-20				



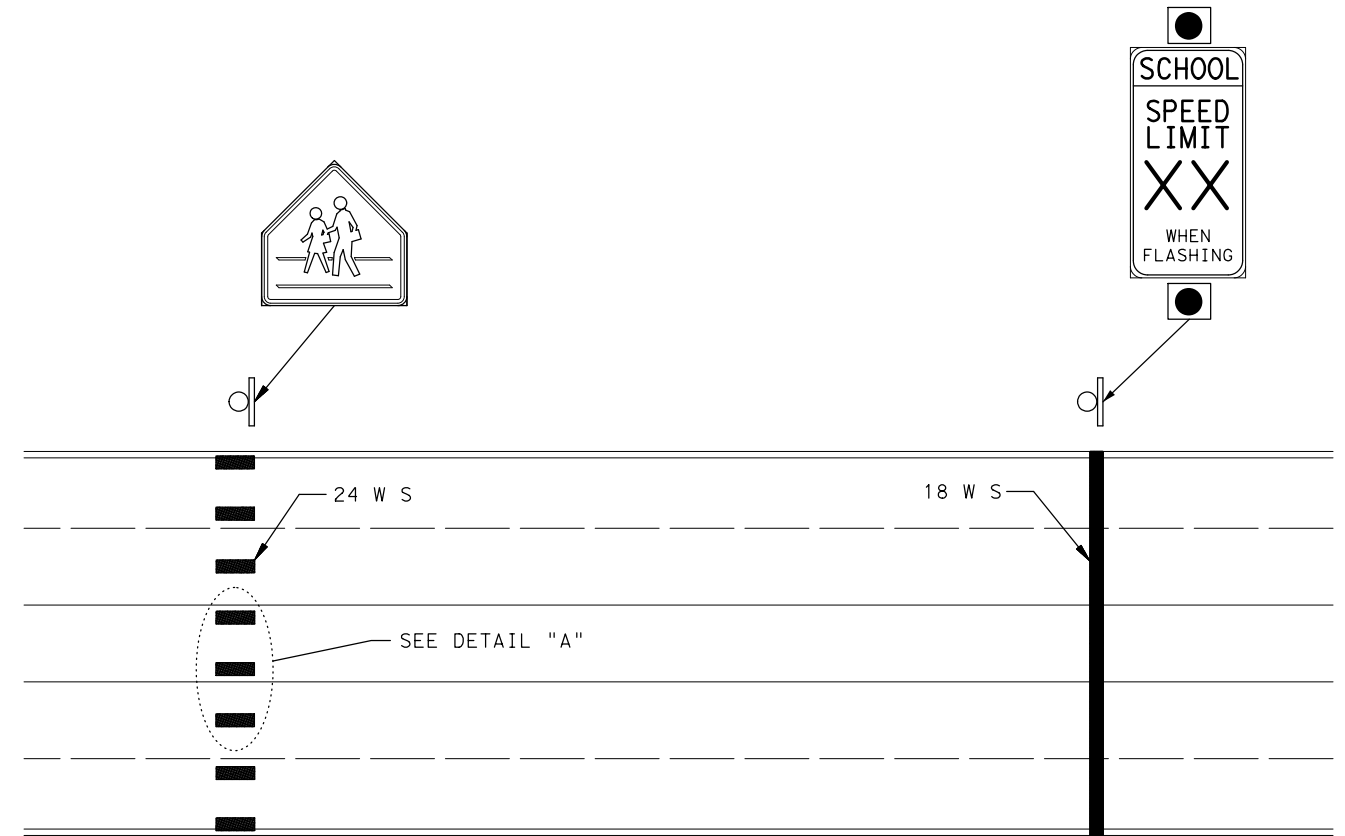
REFLECTIVE PAVEMENT MARKING



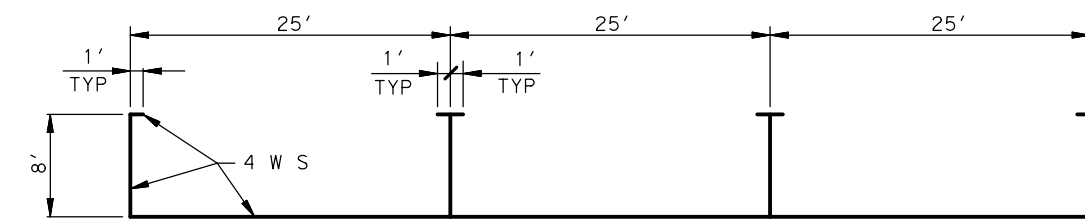
DETAIL "A"



TYPICAL INTERSECTION PAVEMENT MARKING DETAIL

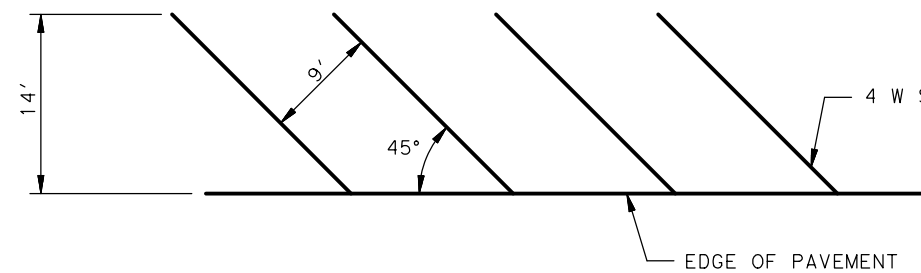


TYPICAL SCHOOL ZONE PAVEMENT MARKING DETAIL



TYPICAL PARALLEL PARKING DETAIL*

*DETAILS SHOWN FOR ILLUSTRATION ONLY. STRIPES MAY BE PLACED AT EXISTING LOCATIONS AS DIRECTED BY THE ENGINEER.



TYPICAL ANGLE PARKING DETAIL*

DISCLAIMER
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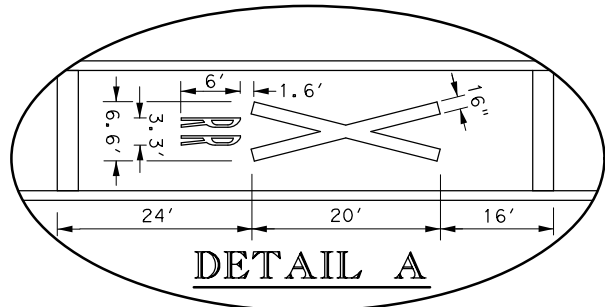
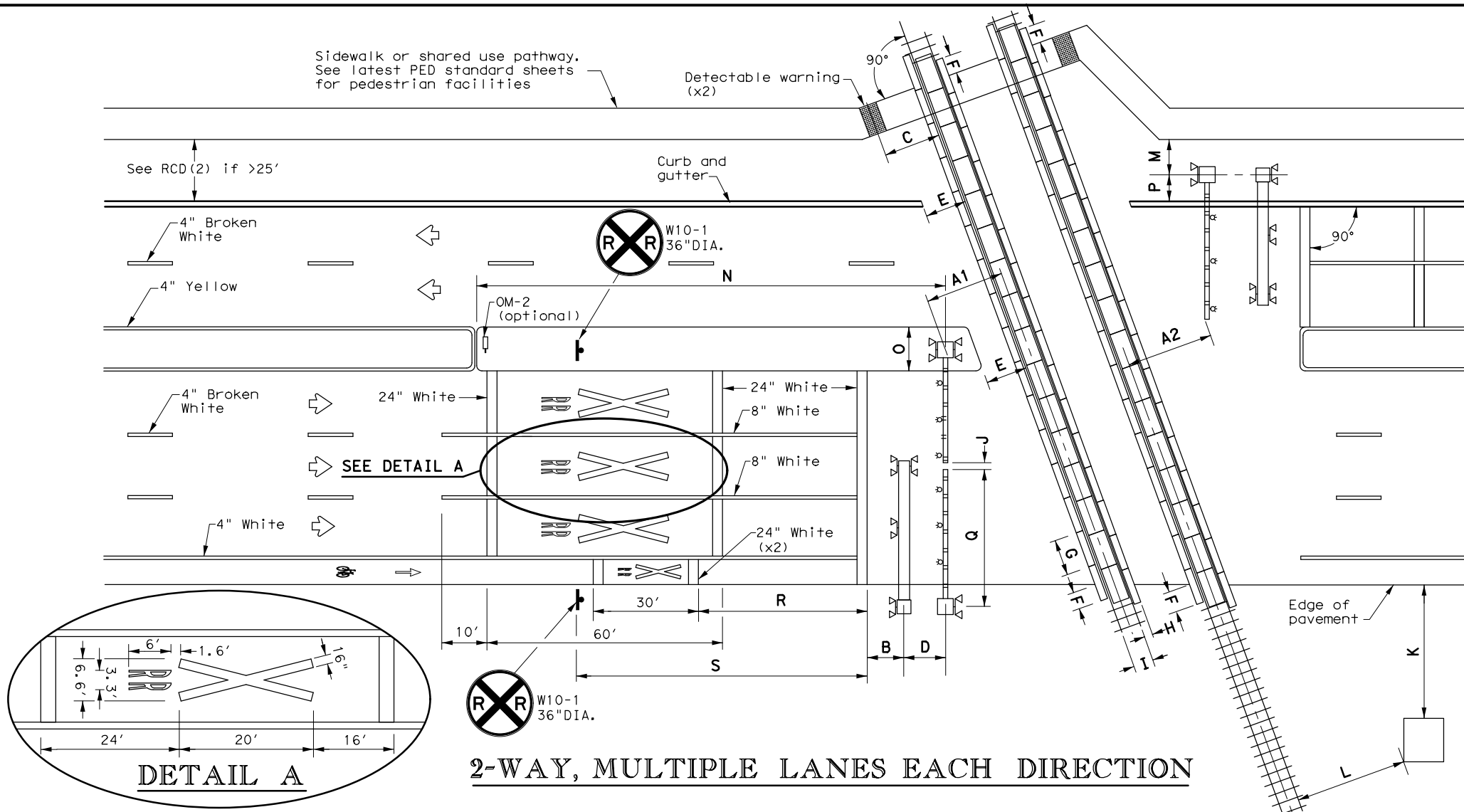
NOT TO SCALE
 LUFKIN DISTRICT STANDARD
TYPICAL PAVEMENT MARKING DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION ©2021			
CONT	SECT	JOB	HIGHWAY
0213	04	050	US 190
DIST	COUNTY	SHEET NO.	
LFK	POLK	264	

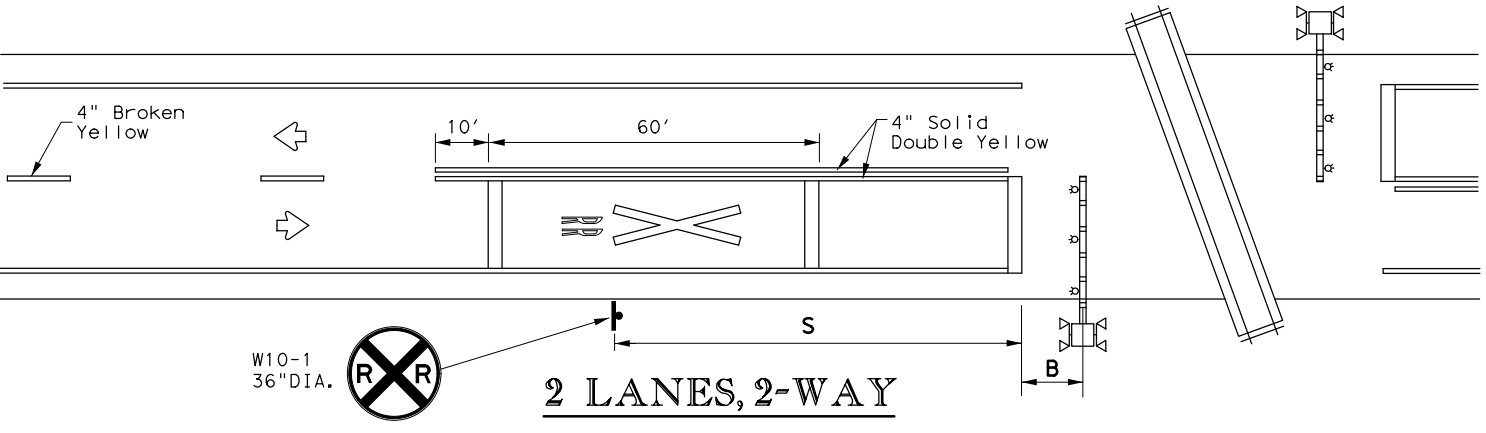
ISSUED 03-08
 REVISED 10-20-2016: MODIFIED TITLE BLOCK

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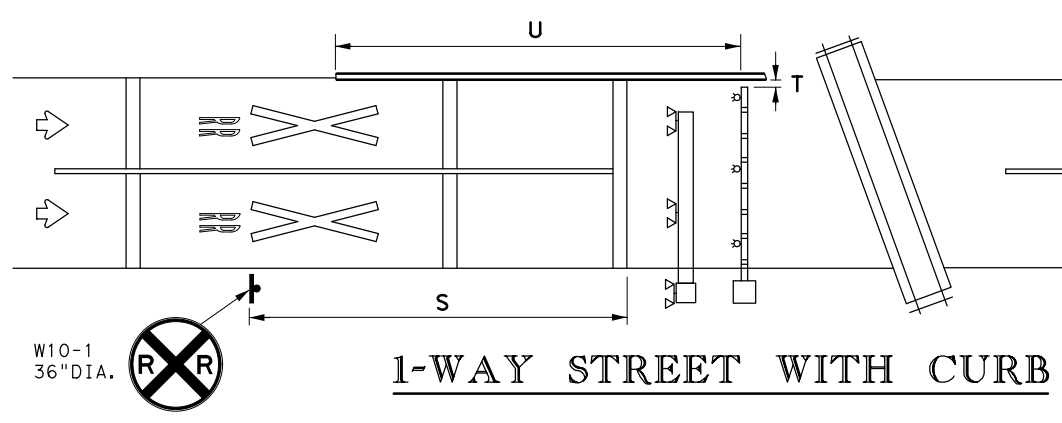
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2-WAY, MULTIPLE LANES EACH DIRECTION



2 LANES, 2-WAY



1-WAY STREET WITH CURB

- NOTES**
- T: Tip of gate to edge of curb: 1' max for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations
 - U: Non-traversable curb length from gate: 100' min. for a Quiet Zone SSM, 10' min for all other locations.

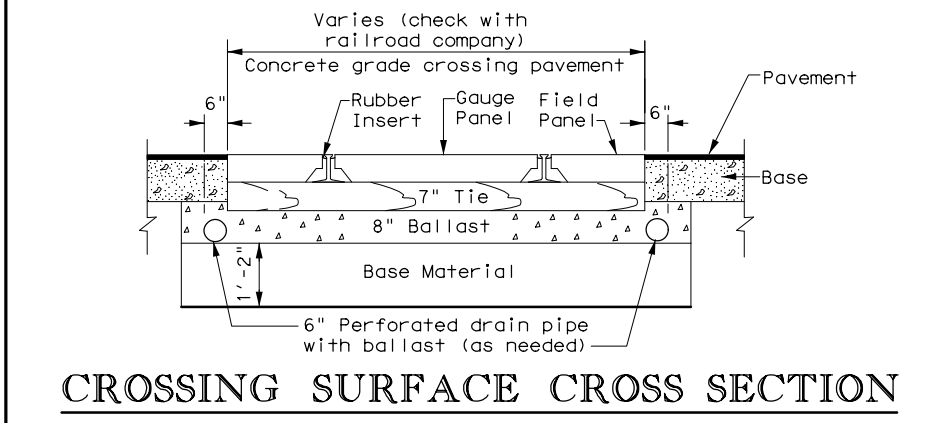
TABLE 1

Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND

	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

- GENERAL NOTES**
- 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" tall minimum and used on roadways where speed does not exceed 40 mph.
 - Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
 - Medians preferred whenever possible to prevent vehicles from driving around gates.
 - Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
 - See SMD standard sheets for sign mounting details.
 - See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



CROSSING SURFACE CROSS SECTION

- NOTES**
- A1: Center of RR mast to center of rail: 12' minimum, 15' typical.
 - A2: Tip of gate to center of rail: 12' minimum, 15' typical.
 - B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).
 - C: Center of detectable warning device to nearest rail: 6' minimum
 - D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.
 - E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.
 - F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.
 - G: Length of panels along rail: 8' typical.
 - H: Width of field panel: 2' typical (check with railroad company).
 - I: Distance between rails: 4'-8.5".
 - J: Tip of gate to tip of gate: 2' maximum for Quiet Zone SSM or 90% of traveled way covered by gates for all other locations.
 - K: Nearest edge of RR cabin from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.
 - L: Nearest edge of RR cabin from nearest rail: 25' typical.
 - M: Center of RR mast to edge of sidewalk: 6' minimum.
 - N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60' will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.
 - O: Width of median: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.
 - P: Center of RR mast to face of curb: 4'-3" minimum. Center of RR mast to edge of pavement (with shoulder): 6' minimum. Center of RR mast to edge of pavement (no shoulder): 8'-3" minimum. NOTE: BNSF prefers 5'-3", 7', and 9'-3" minimums, respectively.
 - Q: Gate length: 28' or less typical, but railroad company may allow up to 32' under special circumstances.
 - R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.
 - S: 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.

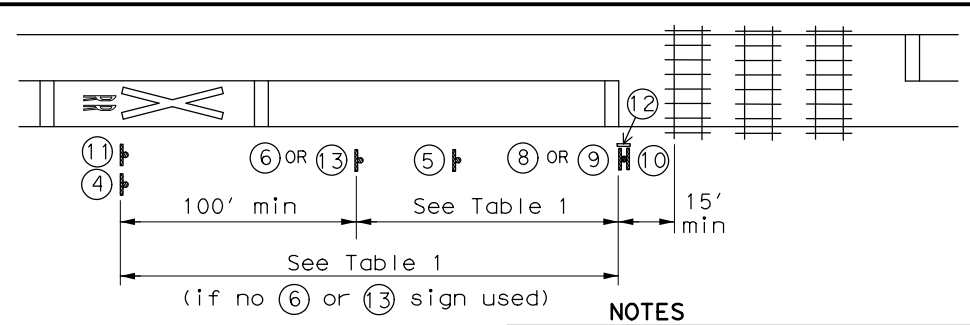
Texas Department of Transportation
 Traffic Operations Division Standard

**RAILROAD CROSSING DETAILS
 SIGNING, STRIPING, AND
 DEVICE PLACEMENT
 RCD(1)-16**

FILE: rcd1-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	LFK	POLK	265	

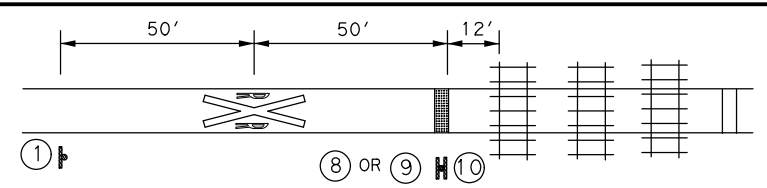
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PASSIVE CROSSING

- NOTES**
1. Stop or yield sign may also be installed to the left of the crossbuck sign, rather than below it.
 2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.



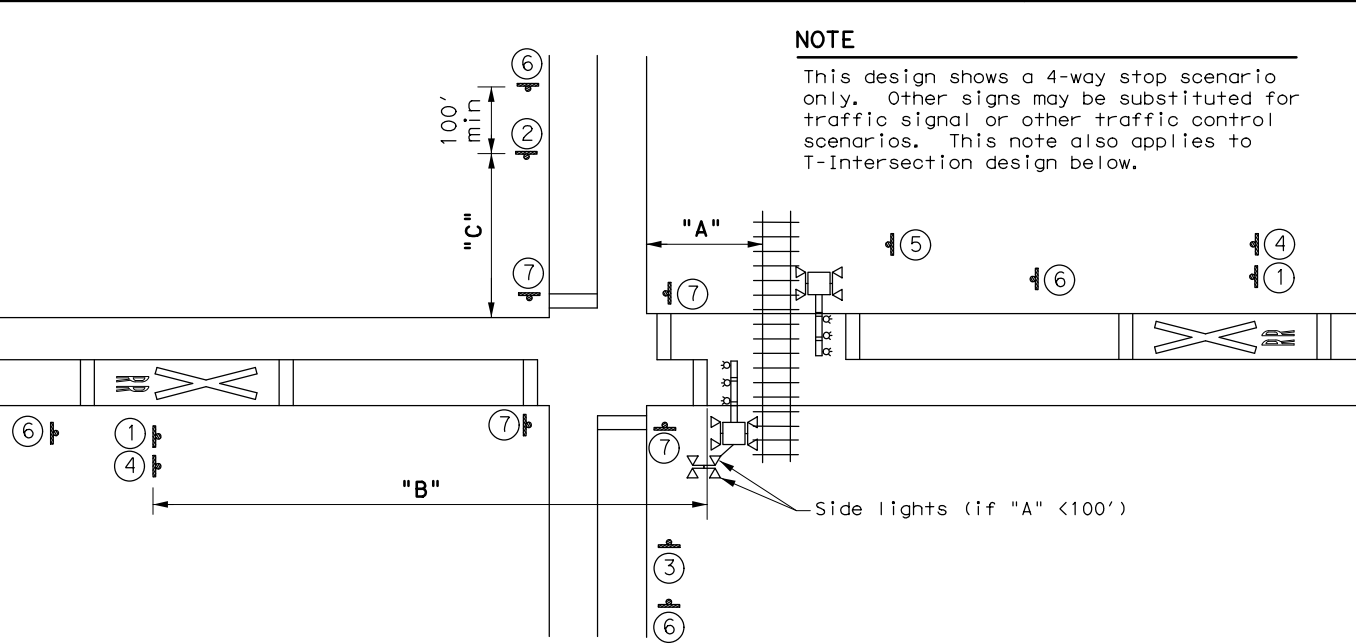
PATHWAY CROSSING

- NOTES**
1. A shared use pathway is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
 2. Detectable warning used at stop bar.
 3. Smaller sign sizes preferred than shown to the right on this sheet.

TABLE 1

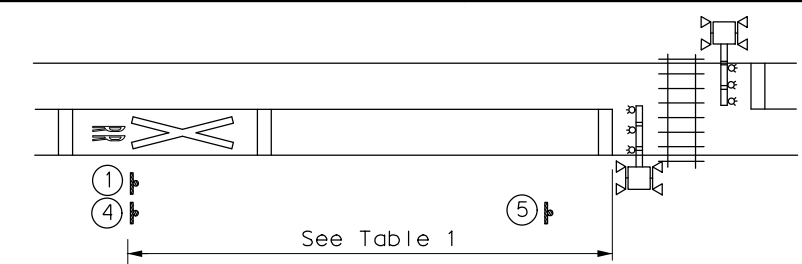
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

- GENERAL NOTES**
1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS Plaque (R15-2P) (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
 2. LOW GROUND CLEARANCE (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 Sect. 2C.05 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 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 Design for Texas (SHSD) manual for sign and pavement marking details.

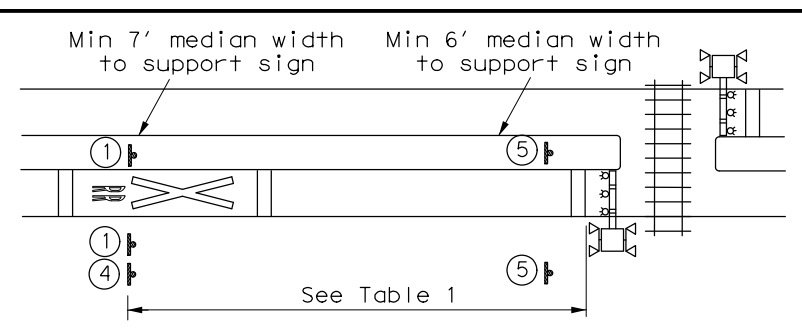


	"A" < 100'	"A" ≥ 100'
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within 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.

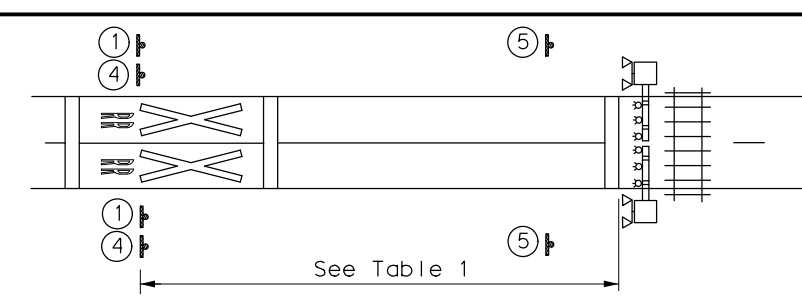
GRADE CROSSING NEAR A PARALLEL STREET



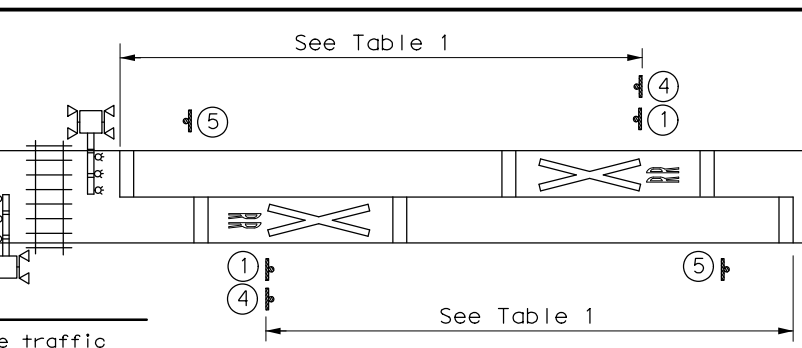
2-WAY



2-WAY WITH MEDIAN

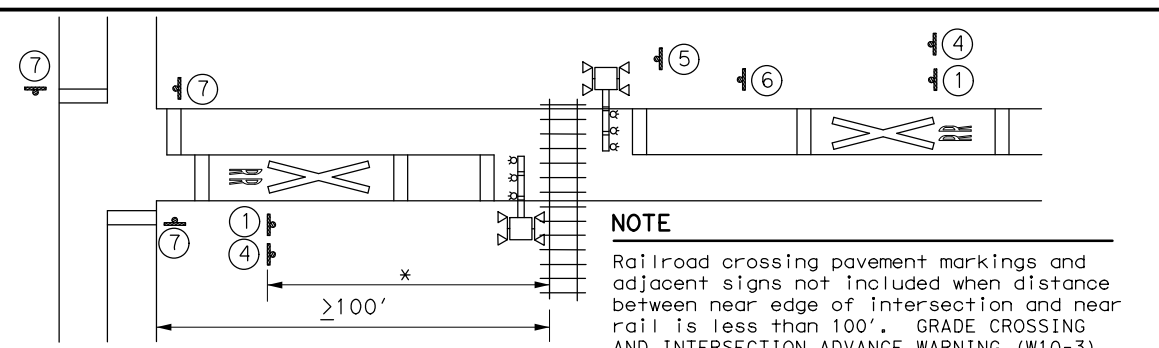


1-WAY



2 ADJACENT CROSSINGS

- NOTE**
- Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.



T-INTERSECTION

- NOTE**
- Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100'. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.
- *Use Table 1 if sufficient space exists.

SIGNS

** ① W10-1 36"DIA.	** ② W10-2L 36"X36"	** ③ W10-2R 36"X36"	IF NEEDED ④ LOW GROUND CLEARANCE W10-5P 30"X24"
IF NEEDED ⑤ R8-8 24"X30"	IF NEEDED ⑥ W3-1 30"X30"	⑦ STOP R1-1 36"X36" ALL WAY R1-3P 18"X6"	⑧ STOP R15-1 48"X9" R15-2P 27"X18" R1-1 36"X36"
⑨ R15-1 48"X9" R15-2P 27"X18" YIELD R1-2 48"X48"X48"	⑩ R15-1 48"X9" R15-2P 27"X18"	⑪ ** NO GATES OR LIGHTS W10-13P 30"X24"	⑫ I-13 15"X9" REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H Sign may be placed perpend. to travel lanes.
⑬ W3-2 30"X30"	⑬ NO TRAIN HORN W10-9P 30"X24"	⑬ LOW GROUND CLEARANCE W10-5P 30"X24"	

**** Includes a NO TRAIN HORN Plaque (W10-9P) if crossing is in a Quiet Zone. LOW GROUND CLEARANCE Plaque (W10-5P) if needed is mounted below W10-2/W10-3/W10-4 signs.**

Texas Department of Transportation Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-16

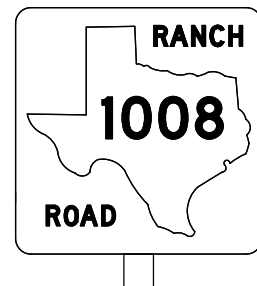
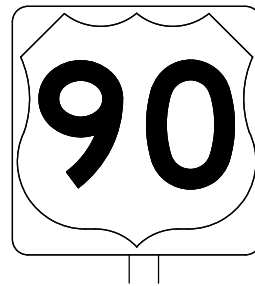
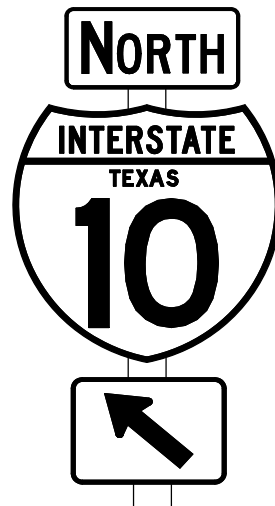
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©TxDOT FEBRUARY 2016 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	266	

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REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

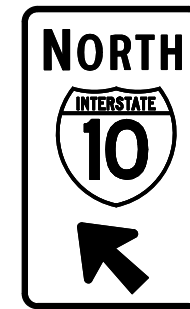
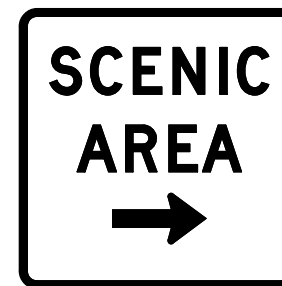
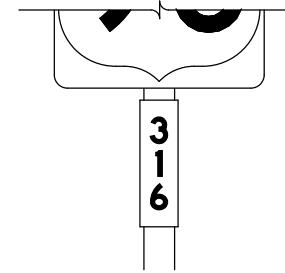
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

- Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.
- Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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/>



TYPICAL SIGN REQUIREMENTS

TSR(3) - 13

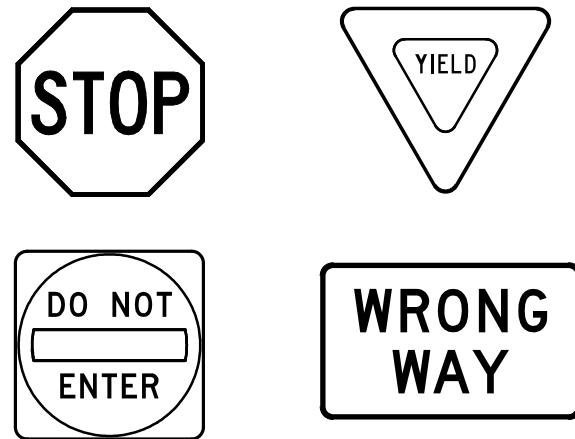
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©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0213	04	050	US 190				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		LFK	POLK	267					

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REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

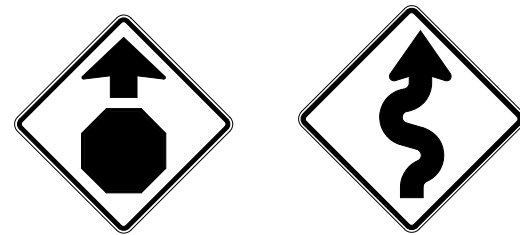
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
- Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

<http://www.txdot.gov/>



TYPICAL SIGN REQUIREMENTS

TSR(4)-13

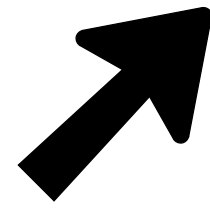
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REVISIONS		0213	04	050	US 190				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		LFK	POLK	268					

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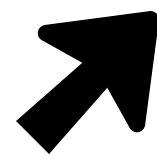
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ARROW DETAILS

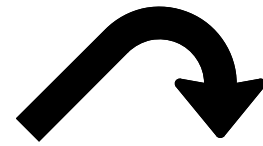
for Large Ground-Mounted and Overhead Guide Signs



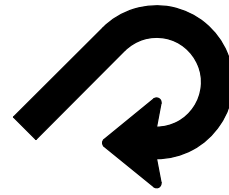
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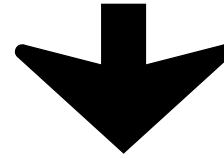
Type B



E-3



E-4



Down Arrow

TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

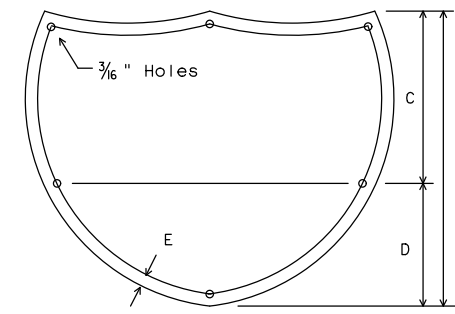
CODE	USED ON SIGN NO.
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E-4	E5-1bT

NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

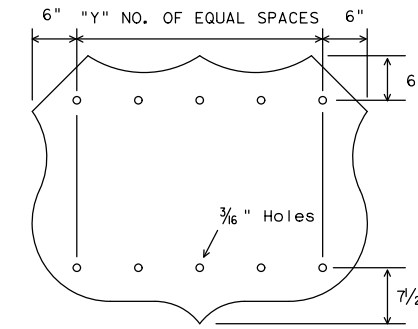
The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)



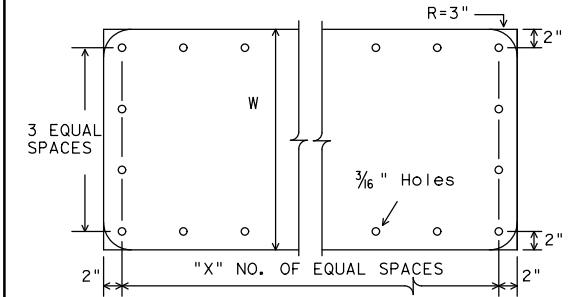
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4



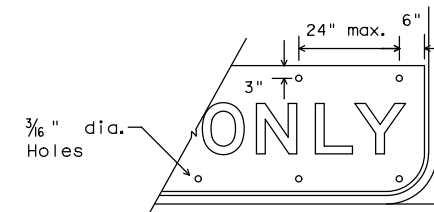
U.S. ROUTE MARKERS

Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



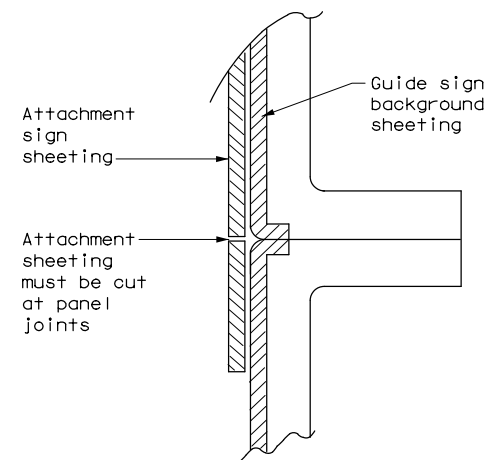
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5



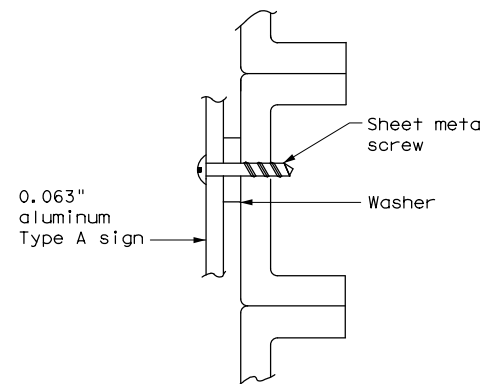
EXIT ONLY PANEL

MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)

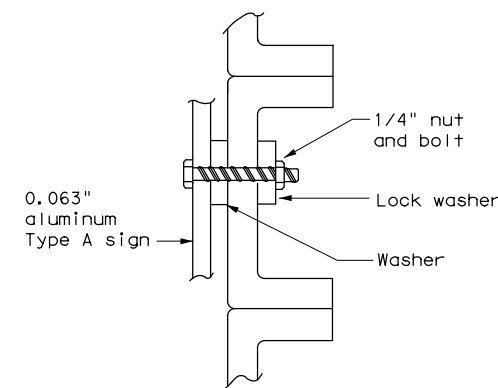


DIRECT APPLIED ATTACHMENT

- NOTE:**
- Sheeting for legend, symbols, and borders must be cut at panel joints.
 - Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



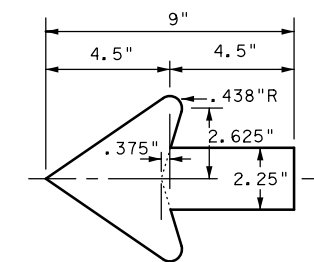
SCREW ATTACHMENT



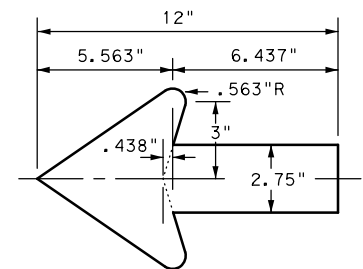
NUT/BOLT ATTACHMENT

- NOTE:**
- Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.



TYPICAL SIGN REQUIREMENTS

TSR (5) - 13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT SECT	JOB	HIGHWAY	
REVISIONS	0213 04	050	US 190	
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	LFK	POLK	269	

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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)

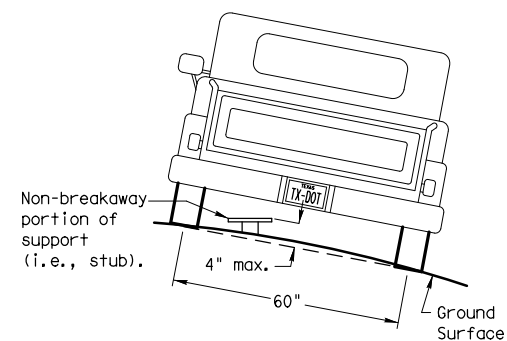
Post Type
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD (FRP))
 TWT = Thin-Walled Tubing (see SMD (TWT))
 10BWG = 10 BWG Tubing (see SMD (SLIP-1) to (SLIP-3))
 S80 = Schedule 80 Pipe (see SMD (SLIP-1) to (SLIP-3))

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-3))

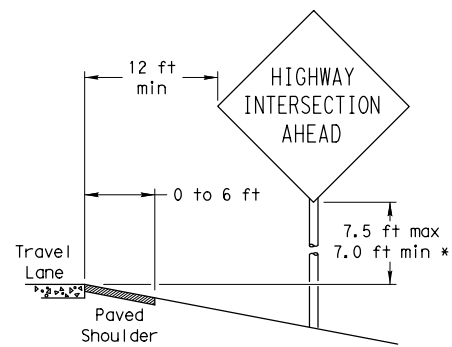
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

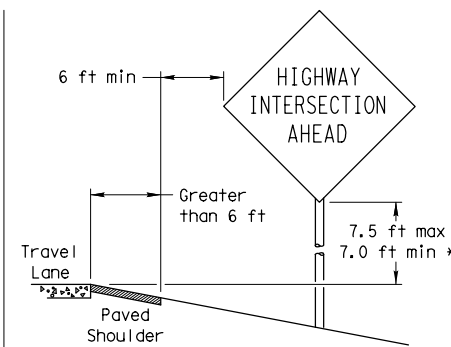
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

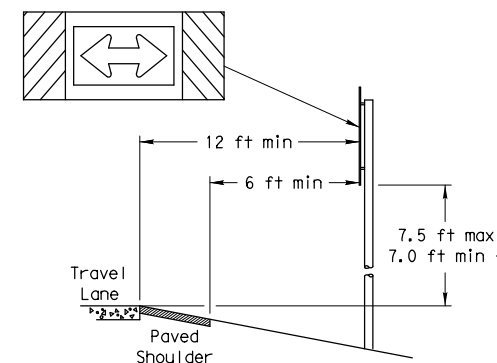
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

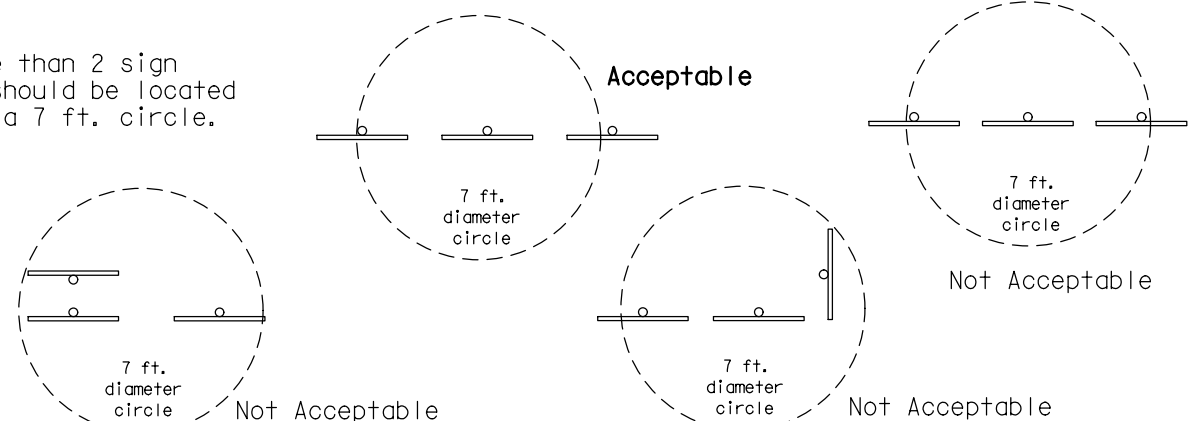
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

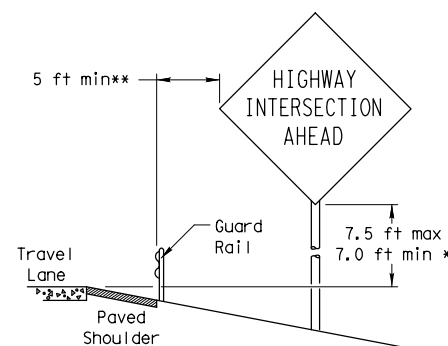


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

No more than 2 sign posts should be located within a 7 ft. circle.

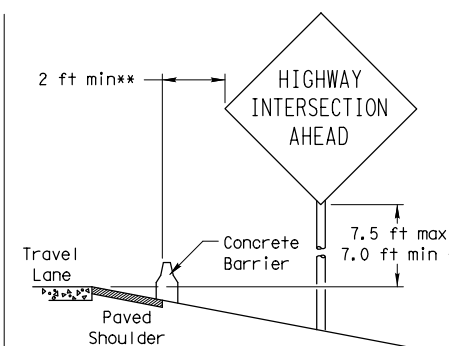


BEHIND BARRIER



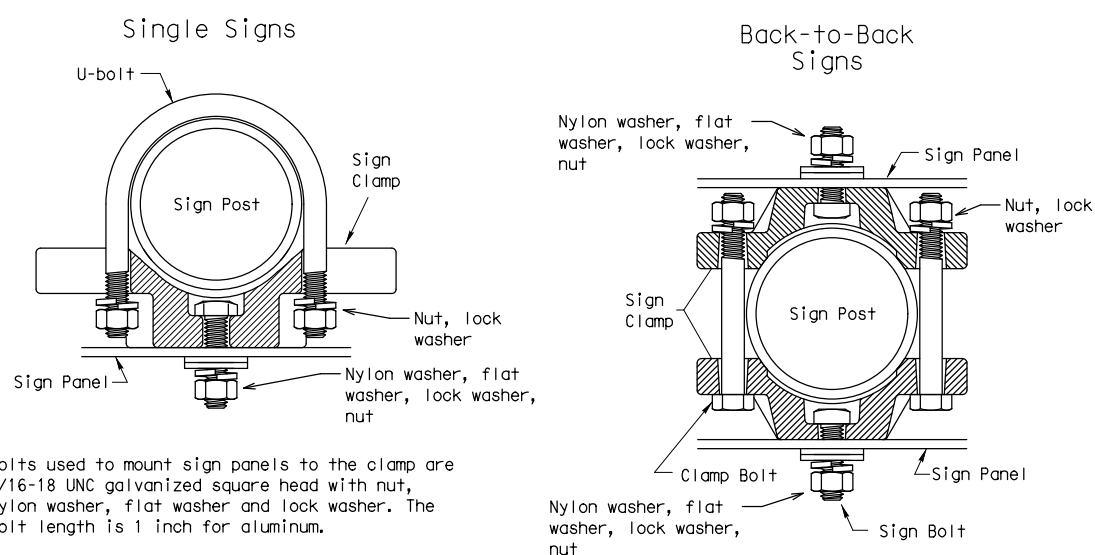
BEHIND GUARDRAIL

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.



BEHIND CONCRETE BARRIER

TYPICAL SIGN ATTACHMENT DETAIL



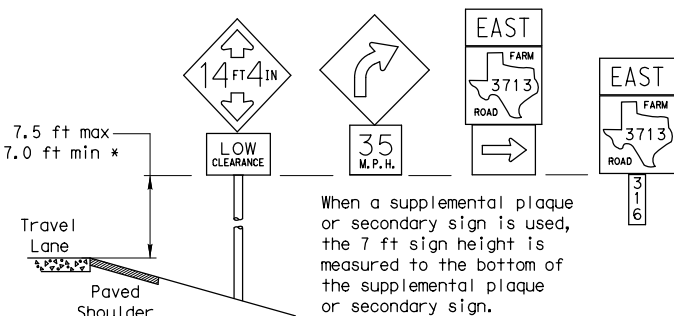
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

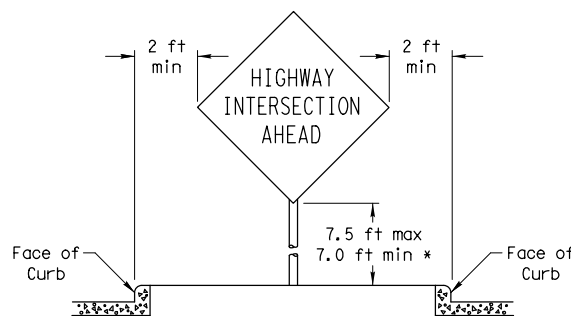
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

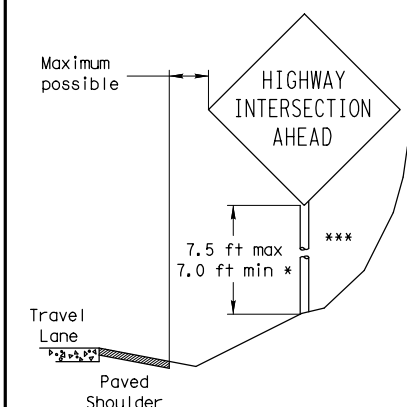


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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.

* 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>

Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD (GEN) -08

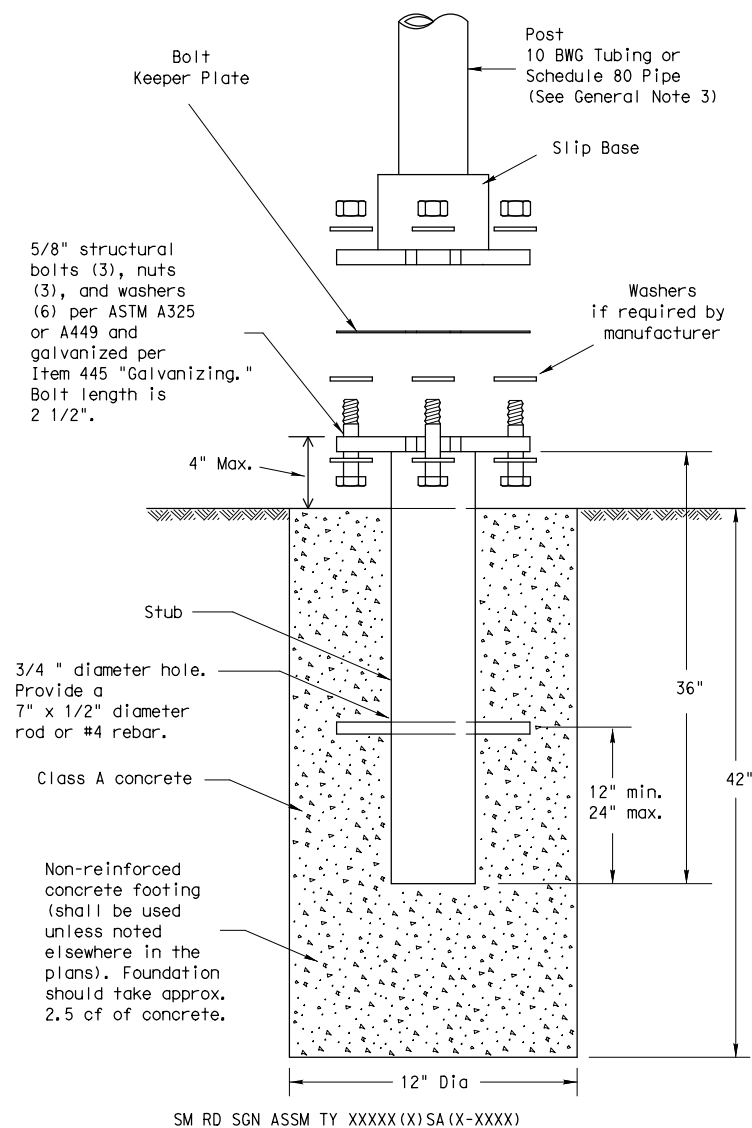
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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0213	04	050	US 190
		DIST	COUNTY		SHEET NO.
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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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:

- 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.
- 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
- 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>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

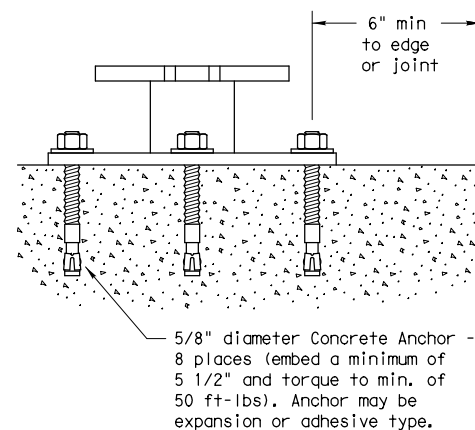
Foundation

- 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.
- 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.
- 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.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

- 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.
- 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, "Epoxyes 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.

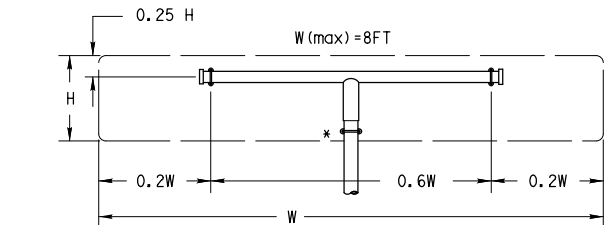
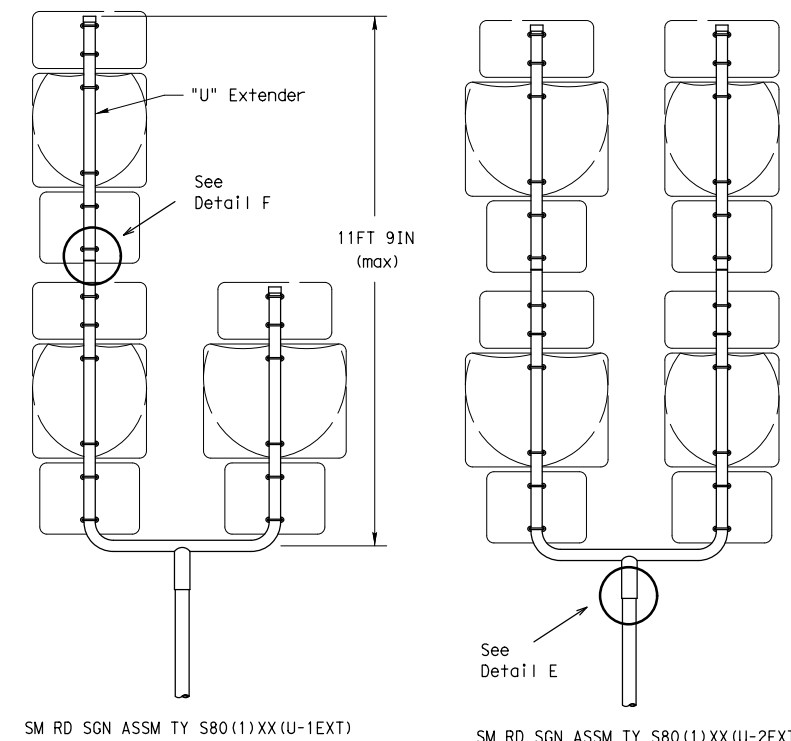
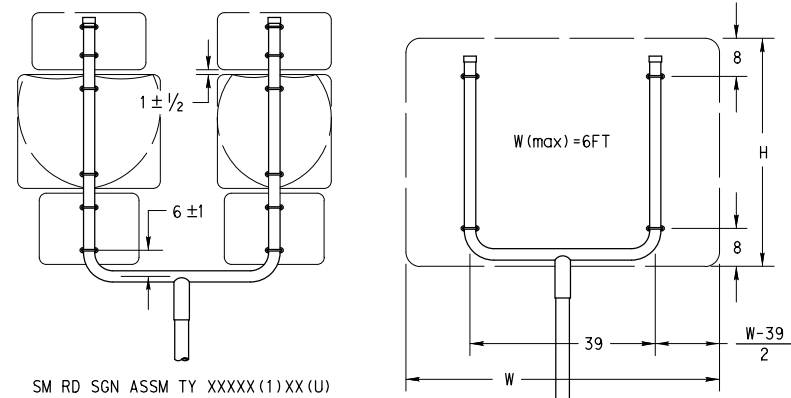
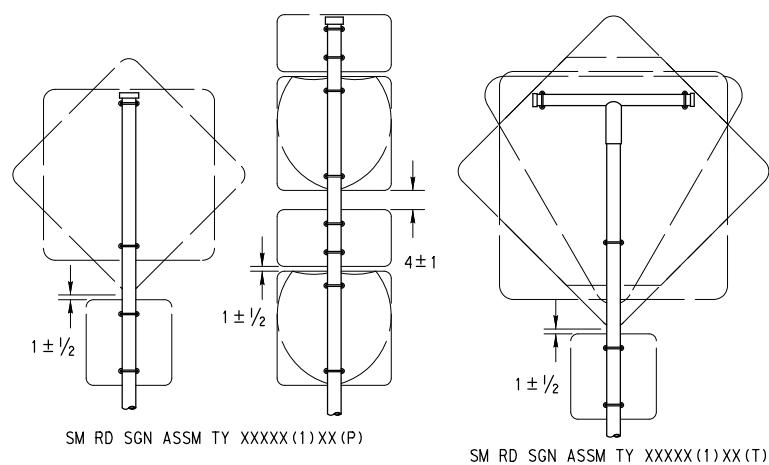
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-1)-08

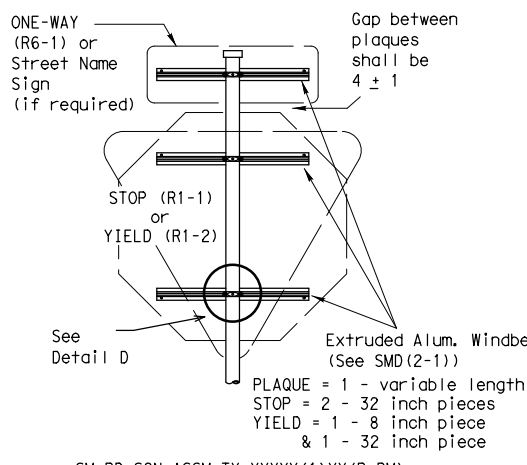
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		DIST	COUNTY	SHEET NO.	
		LFK	POLK	271	

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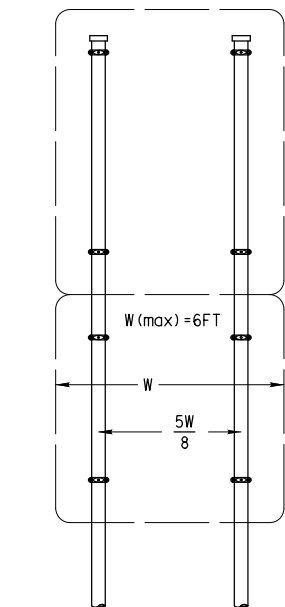
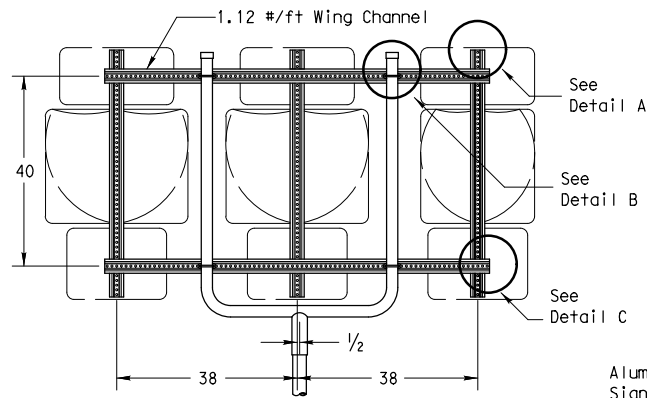
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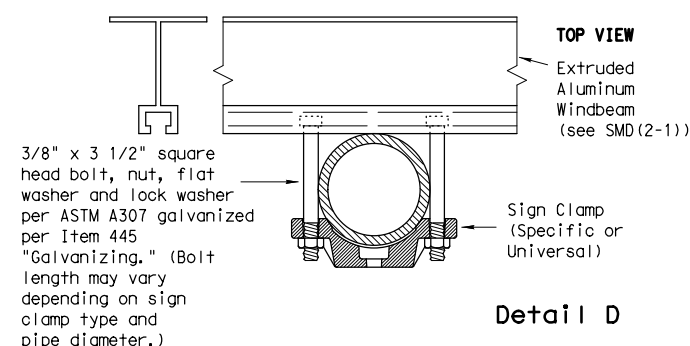
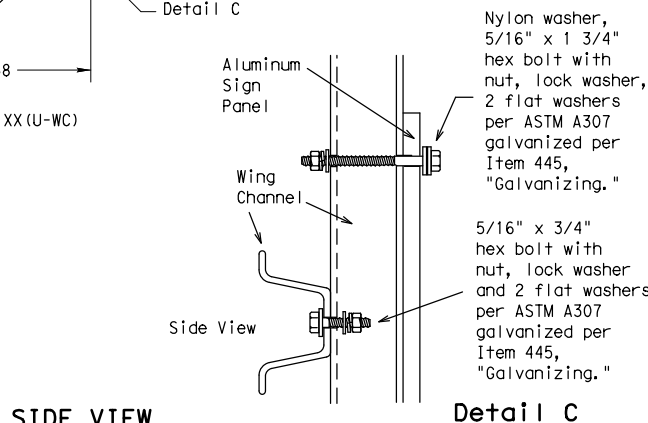
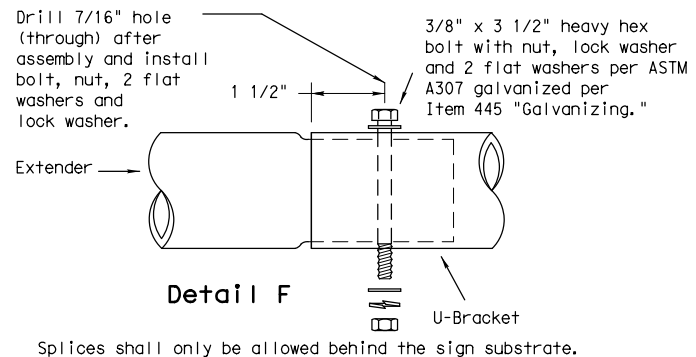
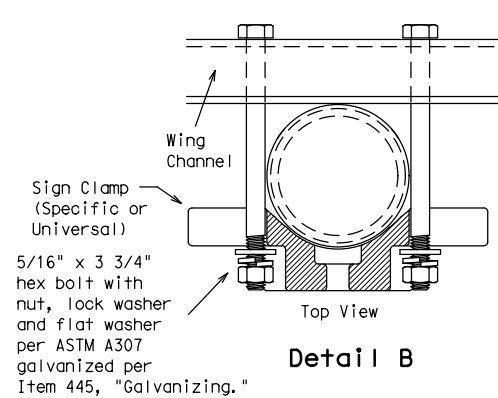
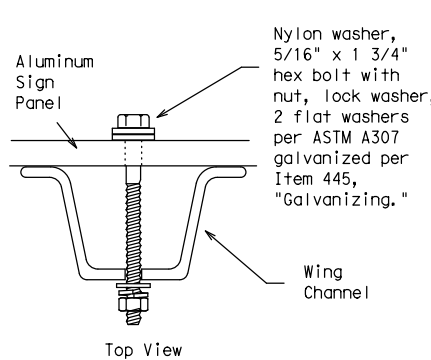
All dimensions are in english unless detailed otherwise.



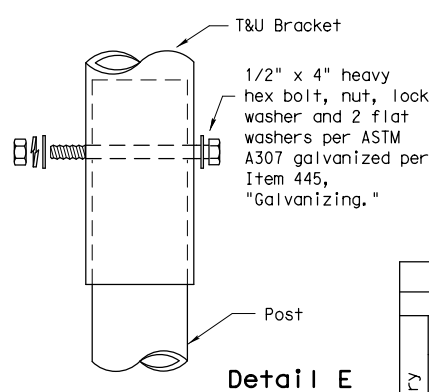
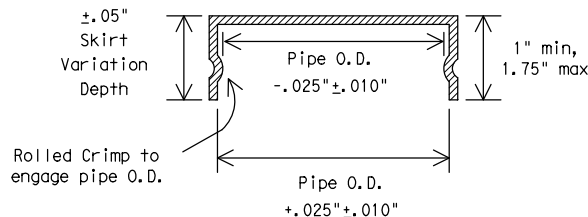
SM RD SGN ASSM TY XXXX(1)XX(P-BM)



SM RD SGN ASSM TY XXXX(2)XX(P)



FRICION 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.

GENERAL NOTES:

- SIGN SUPPORT # OF POSTS MAX. SIGN AREA

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
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
- 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.
- Post open ends shall be fitted with Friction Caps.
- 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)
Warning	48x60-inch signs	TY S80(1)XX(T)
	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)

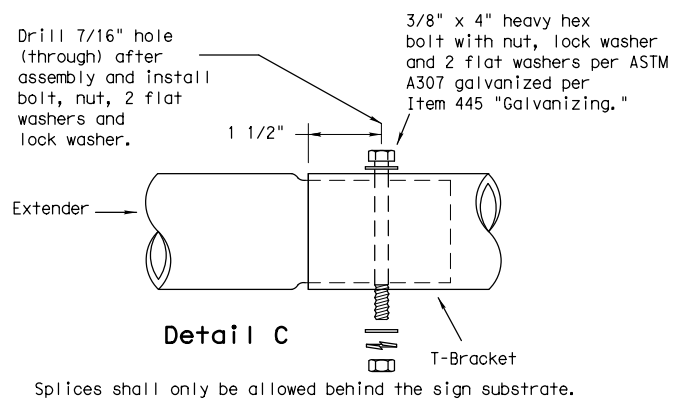
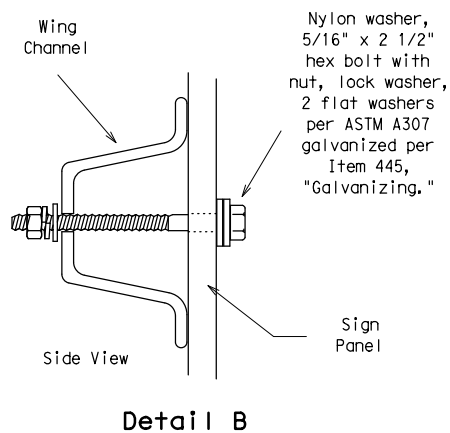
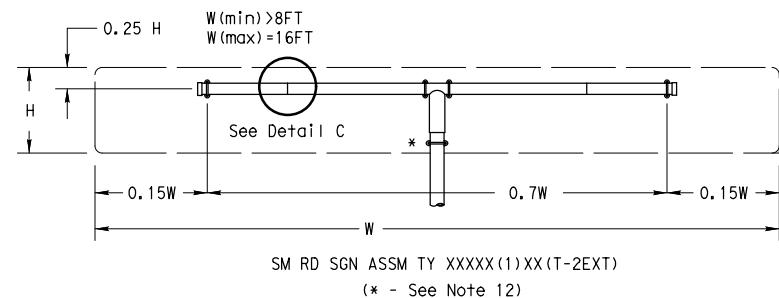


SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM
 SMD(SLIP-2)-08

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9-08	REVISIONS	CONT	SECT	JOB
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		LFK	POLK	272

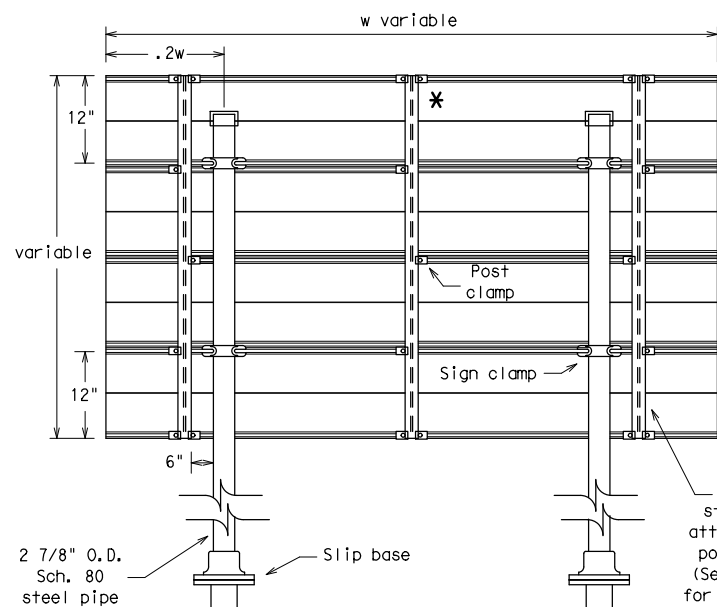
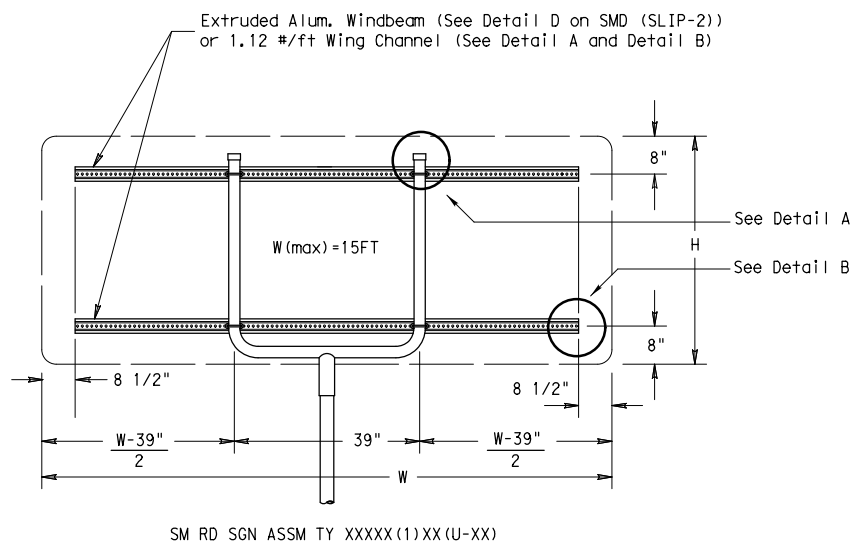
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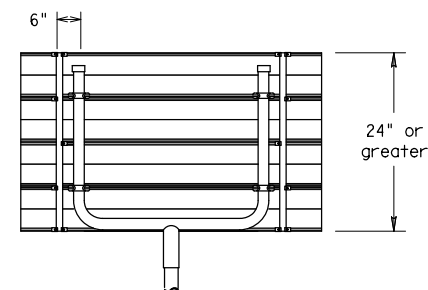
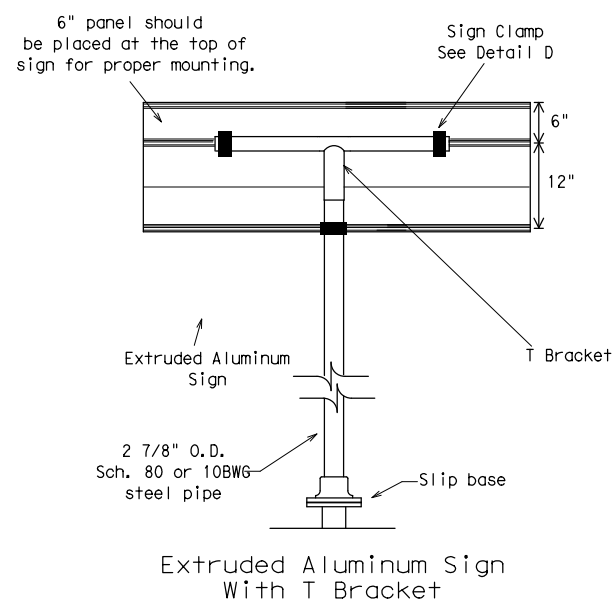
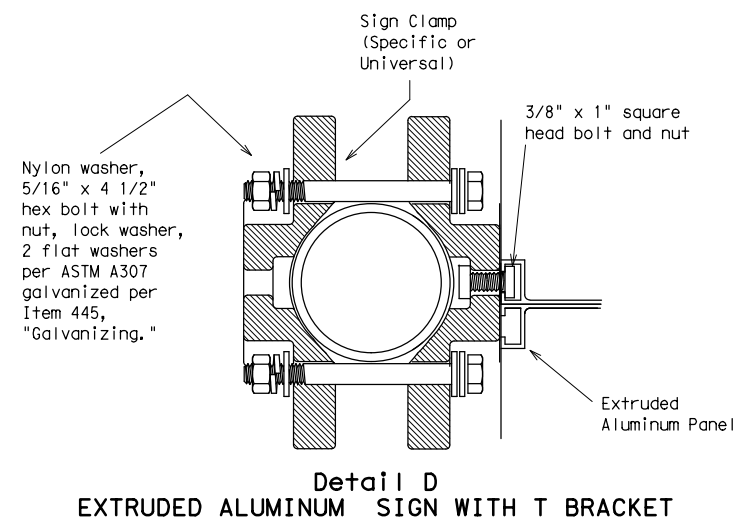
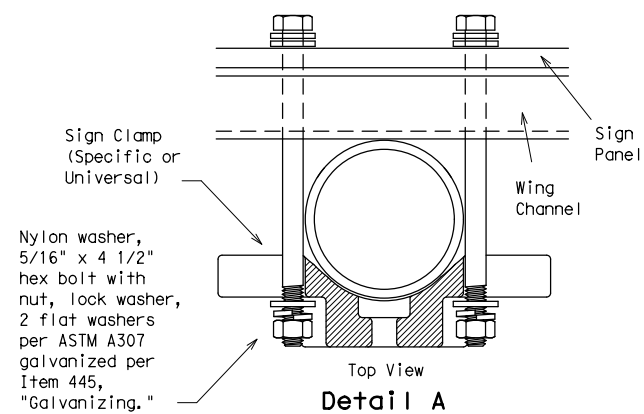
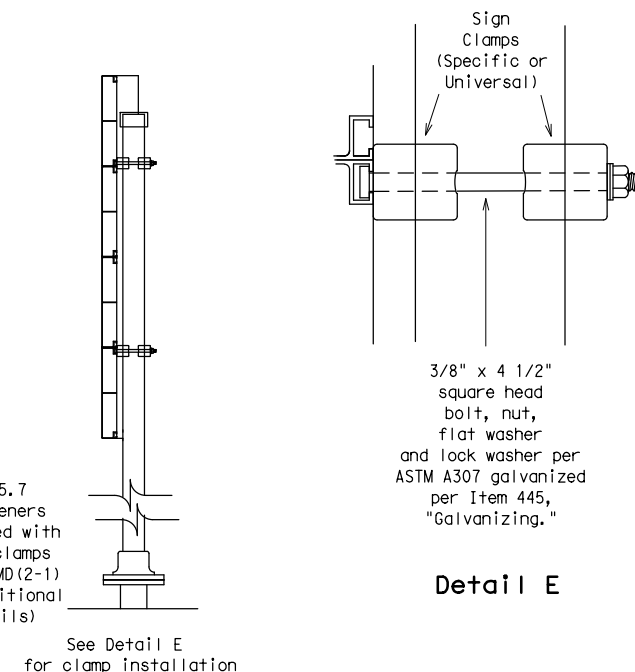


GENERAL NOTES:

- | 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 |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- 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.
- Post open ends shall be fitted with Friction Caps.



* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details
 See Detail E for clamp installation

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)
Warning	48x60-inch signs	TY S80(1)XX(T)
	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)

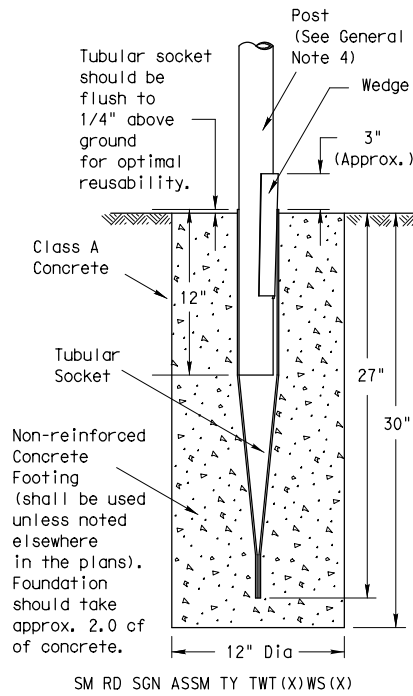
Texas Department of Transportation
 Traffic Operations Division

**SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM
 SMD (SLIP-3) -08**

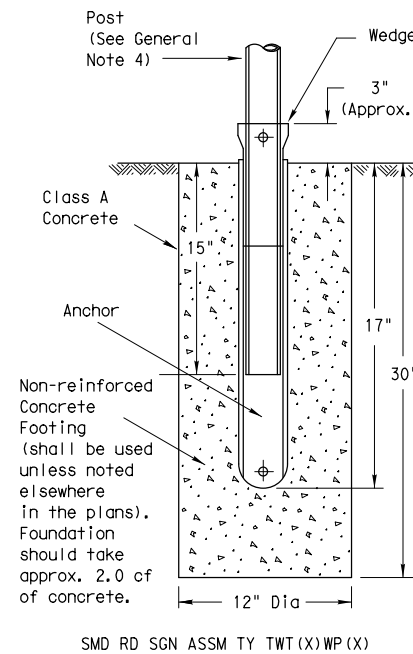
© TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB
		0213	04	050
		DIST	COUNTY	SHEET NO.
		LFK	POLK	273

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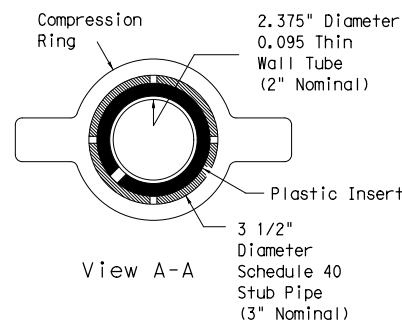
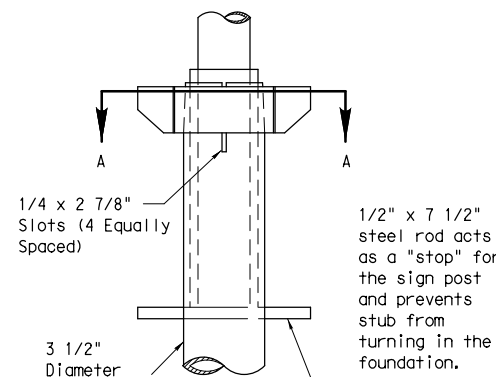
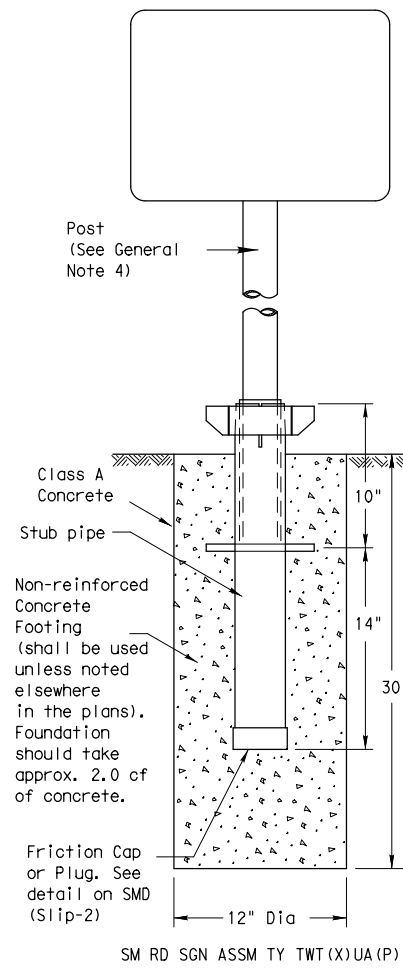
Wedge Anchor Steel System



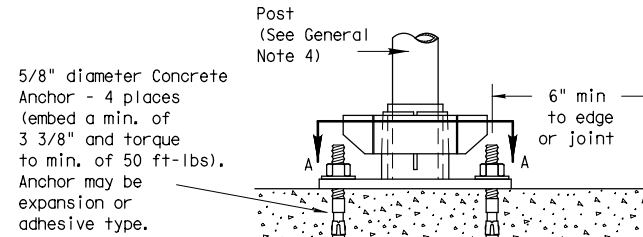
Wedge Anchor High Density Polyethylene (HDPE) System



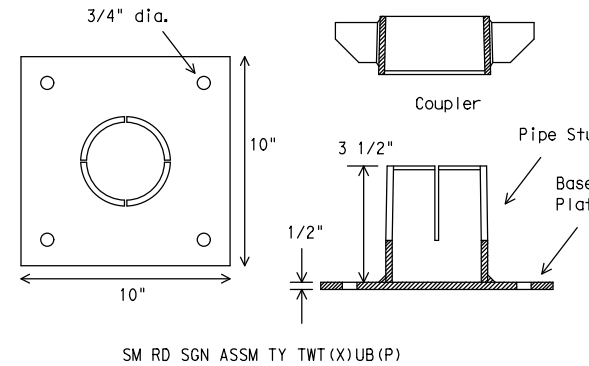
Universal Anchor System with Thin-Walled Tubing Post



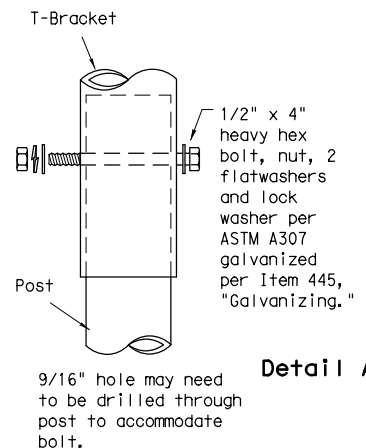
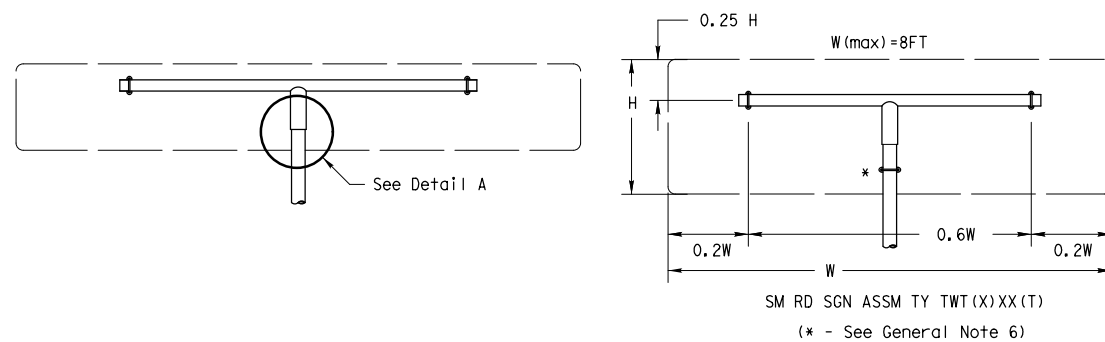
Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10\"/>



Concrete anchor consists of 5/8\"/>



Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



NOTE
The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

- GENERAL NOTES:
- The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
 - The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
 - Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer_list.htm
 - Material used as post with this system shall conform to the following specifications:
 - 13 BWG Tubing (2.375\"/>
 - Sign blanks shall be the sizes and shapes shown on the plans.
 - Additional sign clamp required on the \"T-bracket\" post for 24\"/>
 - Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
 - See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>

- WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE
- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18\"/>
 - 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. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
 - Insert tubular socket into concrete until top of socket is approximately 1/4\"/>
 - Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
 - Attach the sign to the sign post.
 - Insert the sign post into socket and align sign face with roadway.
 - Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

- UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE
- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18\"/>
 - Insert base post in hole to depths shown and backfill hole with concrete.
 - Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
 - Attach the sign to the sign post.
 - Install plastic insert around bottom of post.
 - Insert sign post into base post. Lower until the post comes to rest on steel rod.
 - Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
 - Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

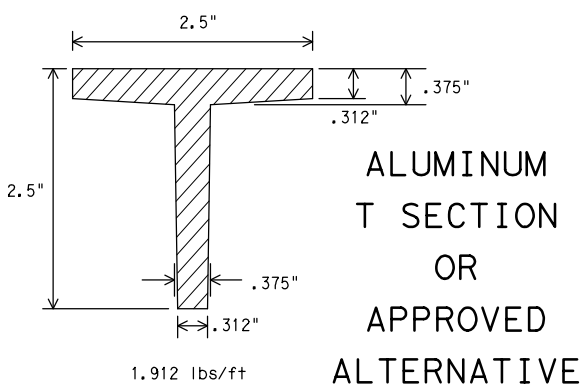
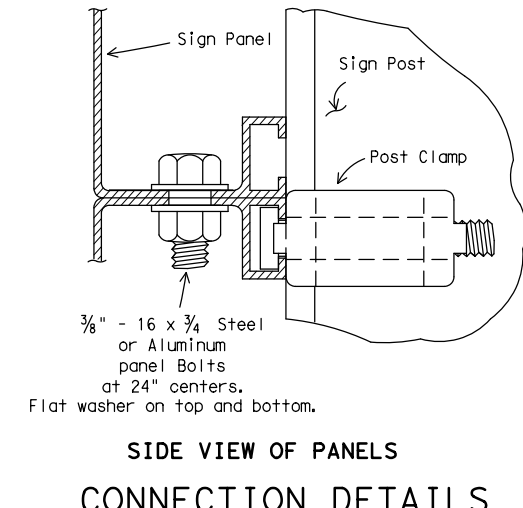
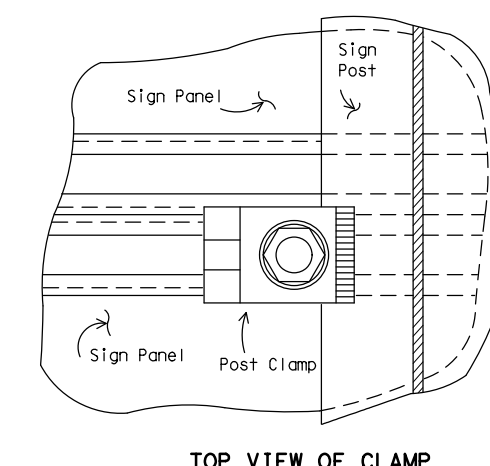
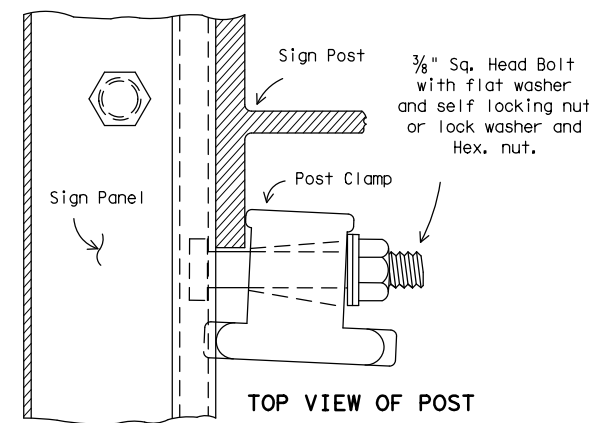
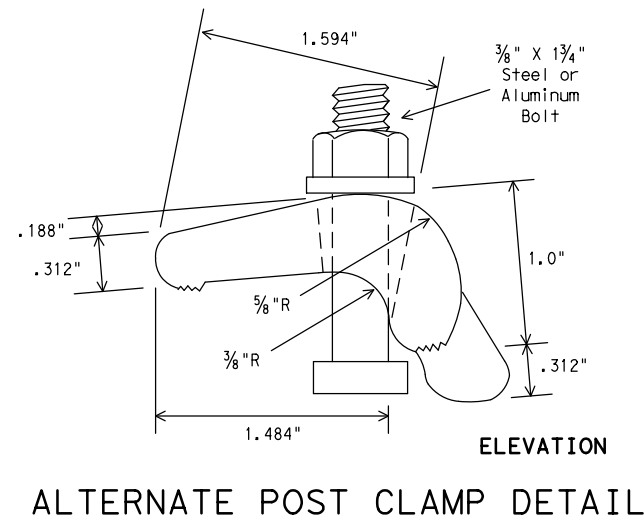
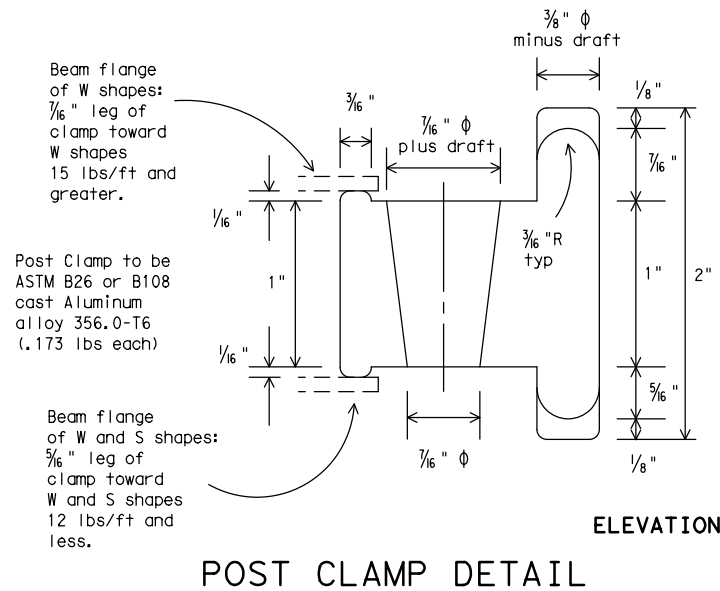
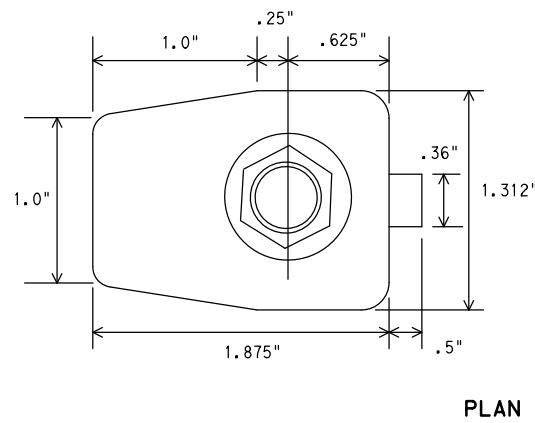
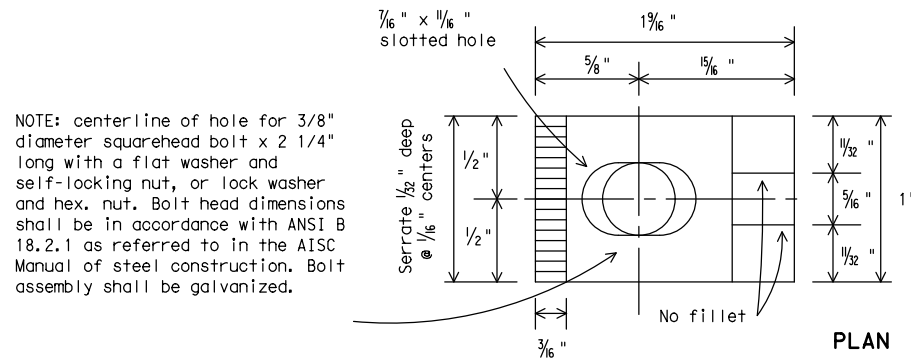


SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST SMD (TWT) -08

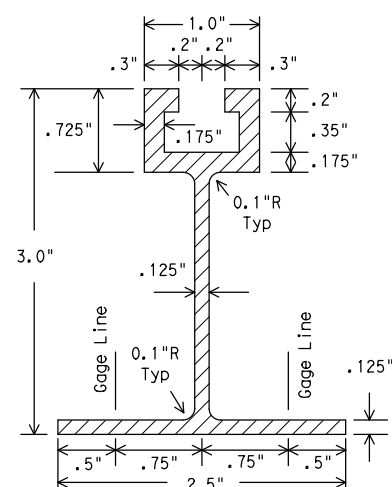
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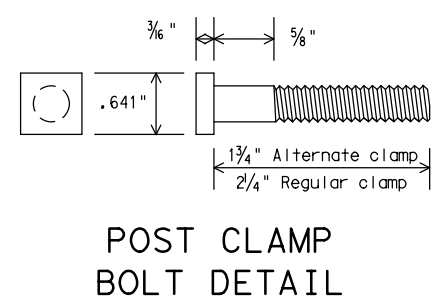
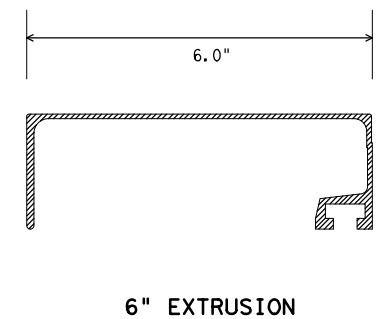
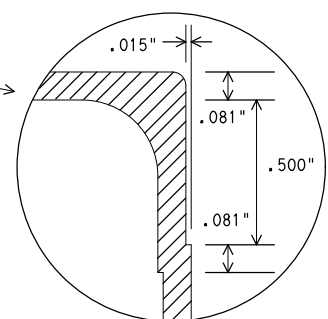
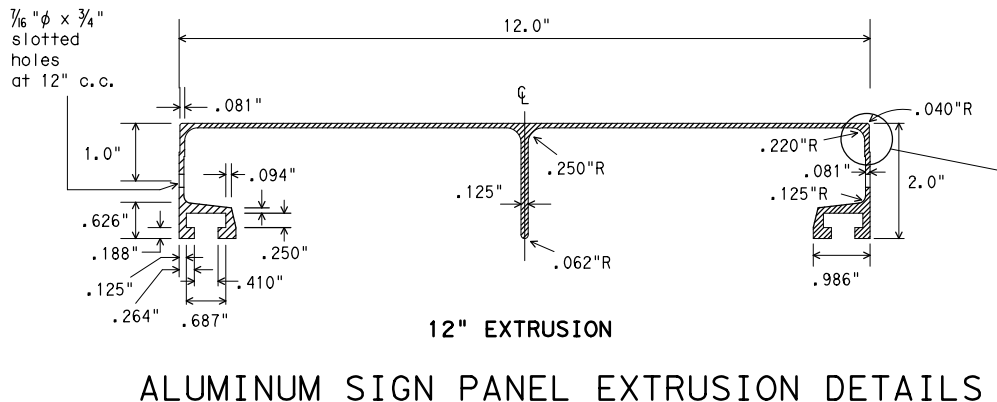
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WINDBEAM CROSS SECTION
 Windbeam to be extruded aluminum (1.175 lbs/ft) or approved alternative



SIDE VIEW OF PANELS CONNECTION DETAILS



DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN HARDWARE	DMS-7120

- GENERAL NOTES:
- Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
 - Materials and fabrication shall conform to the requirements of the Department material specifications.
 - Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal For Structures."
 - For fiberglass substrate connection details, see manufacturer's recommendations.

Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS-
 EXTRUDED ALUMINUM
 SIGN PANELS & HARDWARE
 SMD(2-1)-08

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		DIST: LFK	COUNTY: POLK		SHEET NO.: 275

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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES	
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE		
									INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX (XX) NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE 1 or 2 TYPE OF POST OR DELINEATOR WC = Wing Channel Post YFLX = Yellow Flexible Post WFLX = White Flexible Post BRFL = Barrier Reflector TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back
SHEETING: Yellow, White or Red Type B or C reflective sheeting				SHEETING: Yellow, White or Red Type B or C Reflective Sheeting					
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.				POST TYPE: WC, YFLX, WFLX		POST TYPE: WC, YFLX, WFLX			
				MOUNT TYPE: GND		MOUNT TYPE: GND, SRF			

OBJECT MARKERS								D & OM DESCRIPTIVE CODES	
DEVICE	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)	INSTL OM ASSM (OM-XX) (XXXX)XXX (XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector unit (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 TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional
		OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	
SHEETING: Yellow-Type B _{FL} or C _{FL} Sheeting		SHEETING: Yellow - Type B or C Sheeting			SHEETING: Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting			SHEETING: Red -Type B _{FL} or C _{FL} Sheeting	
POST TYPE: TWT		POST TYPE: WC			POST TYPE: WFLX			POST TYPE: TWT	
MOUNT TYPE: WAS, WAP		MOUNT TYPE: GND			MOUNT TYPE: GND, SRF			MOUNT TYPE: WAS, WAP	

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

BARRIER REFLECTORS (BRF)			CHEVRONS				ONE DIRECTION LARGE ARROW		NOTE: Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.
DEVICE	GF1	GF2	CTB	W1-8		W1-6			
SHEETING: Yellow, White, Red			SIZE (W x L): 18"x 24" (Conventional), 24"x 30" (Conventional Oversize), 30"x 36" (Expressway), 36" x 48" (Freeway)		SIZE (W x L): 48" x 24" (Conventional), 60" x 30" (Expressway & Freeway)				
NOTE: 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.			MOUNTING HEIGHT: 4'-0" or 7'-0"		MOUNTING HEIGHT: 7'-0" Only		MOUNTING HEIGHT: 7'-0"		
			NOTE: 1. CHEVRON (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, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).						

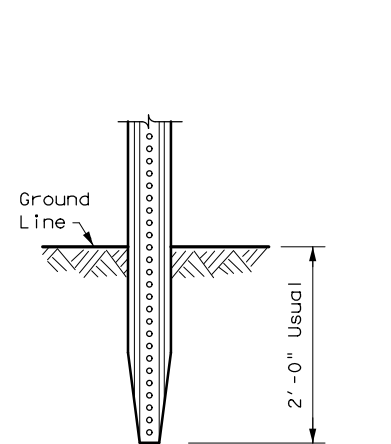
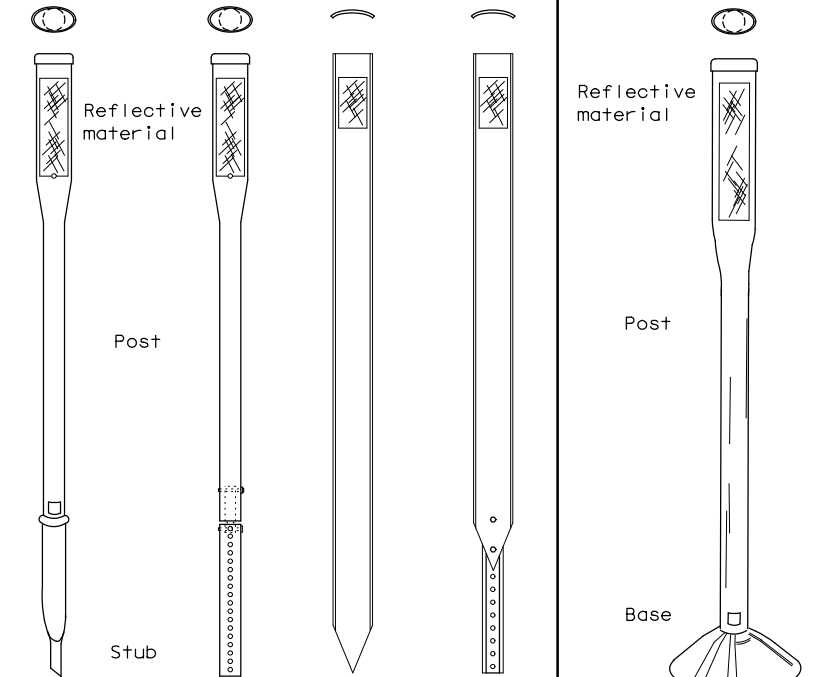
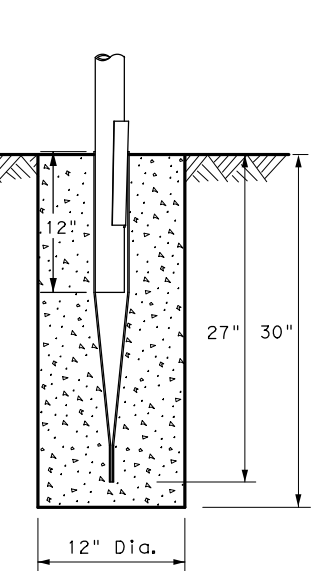
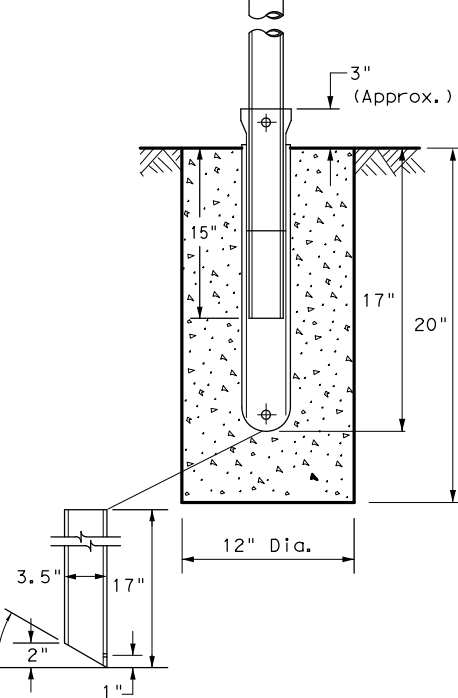
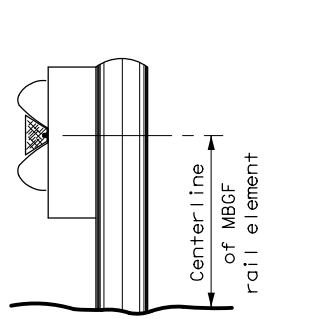
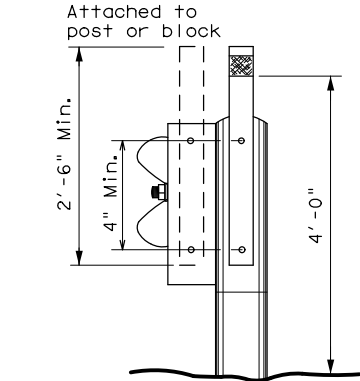
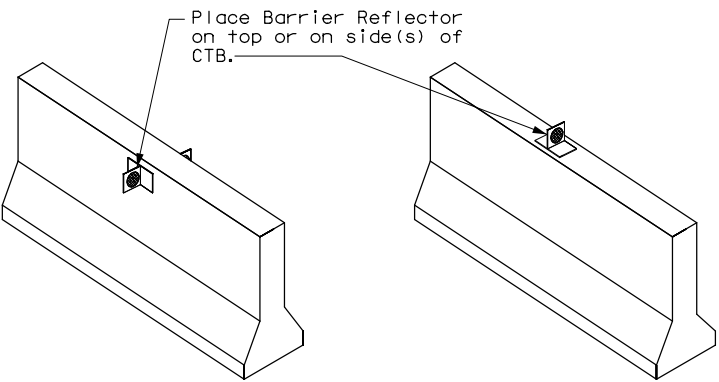
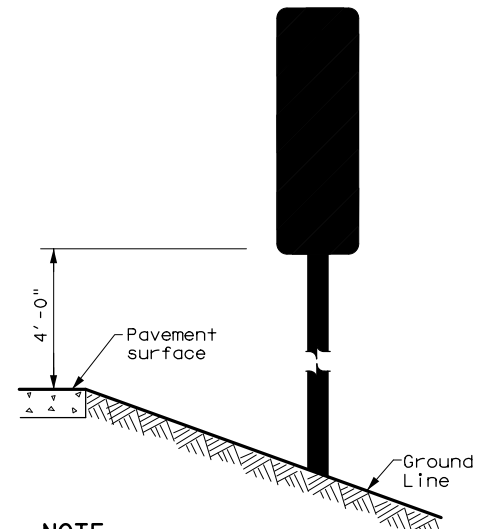
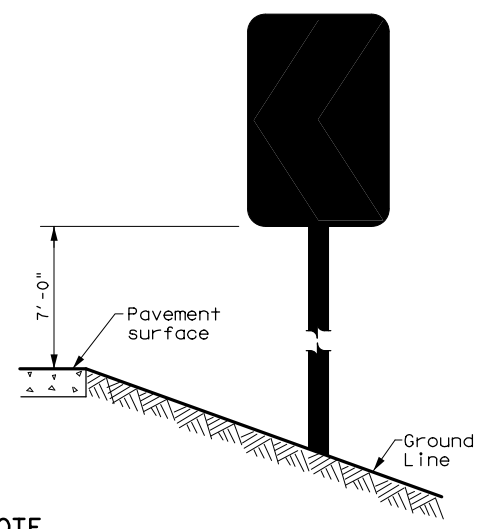
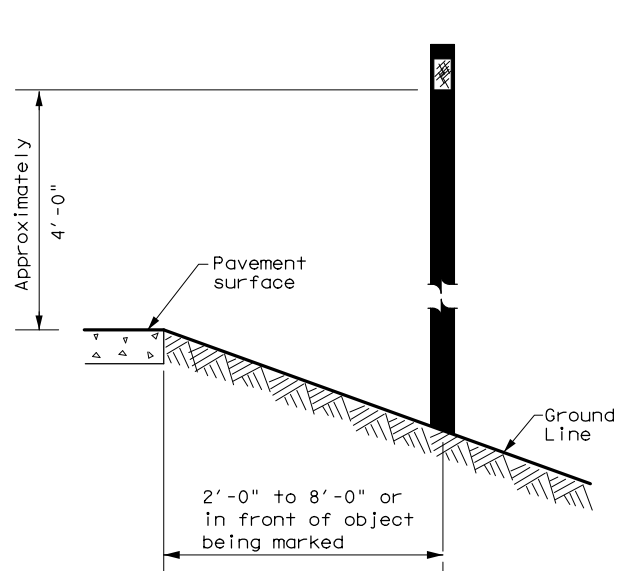
Texas Department of Transportation
 Traffic Safety Division Standard


DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION
D & OM(1)-20

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© TXDOT August 2004	CONT: 0213	SECT: 04	JOB: 050	HIGHWAY: US 190
10-09 3-15	DIST: LFK	COUNTY: POLK	SHEET NO. 276	
4-10 7-20				

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POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS		
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT	
GND	GND	SRF	WAS	WAP	GF1	
						
	EMBEDDED		SURFACE MOUNT	STEEL	PLASTIC	CONCRETE TRAFFIC BARRIER (CTB) 
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.	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. 4. 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.		NOTE 1. Install per manufacturer's recommendations.		GENERAL NOTES 1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and 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 object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface. 6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.	
TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS	CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN		DELINEATORS AND TYPE 2 OBJECT MARKERS			
						
NOTE Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)	NOTE Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.		See general notes 1, 2 and 3.			



Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	LFK	POLK	277	

20B

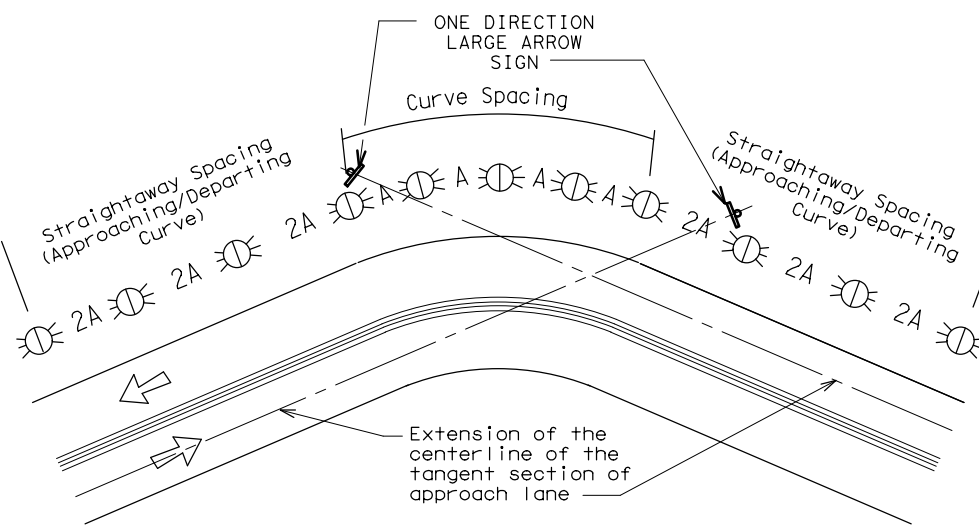
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

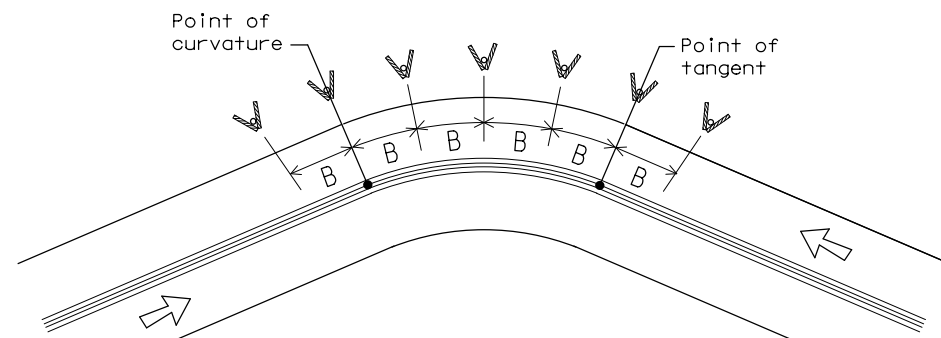
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

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)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	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).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp. Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 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 3 on D&OM(4))	100 feet (See Detail 3 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	Every 5th cable barrier post (up to 100' max)
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

NOTES

- Unless indicated otherwise, 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.
- Barrier reflectors may be used to replace required delineators.
- Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation
Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

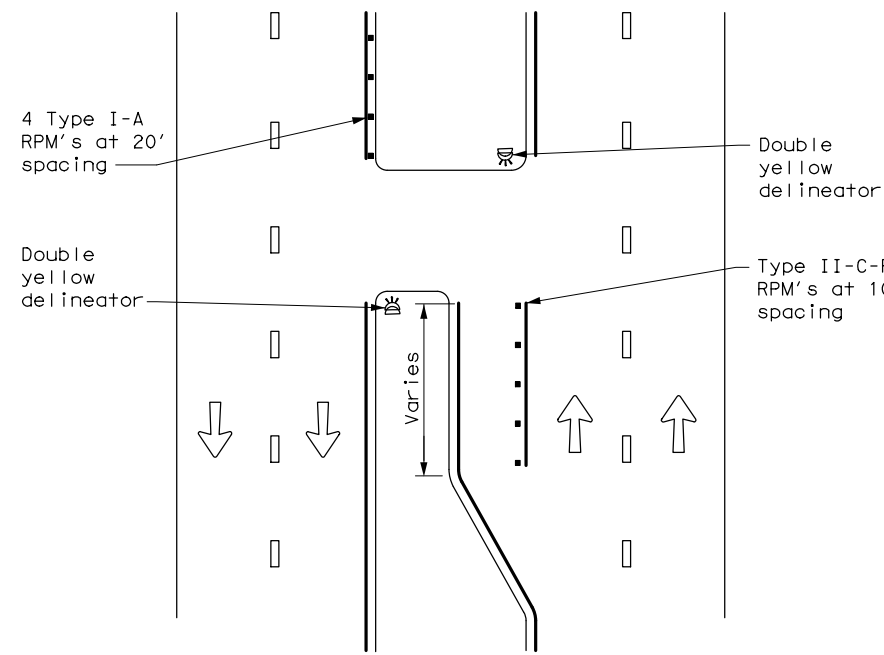
D & OM(3)-20

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© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS		0213	04	050 US 190
3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	LFK	POLK	278	

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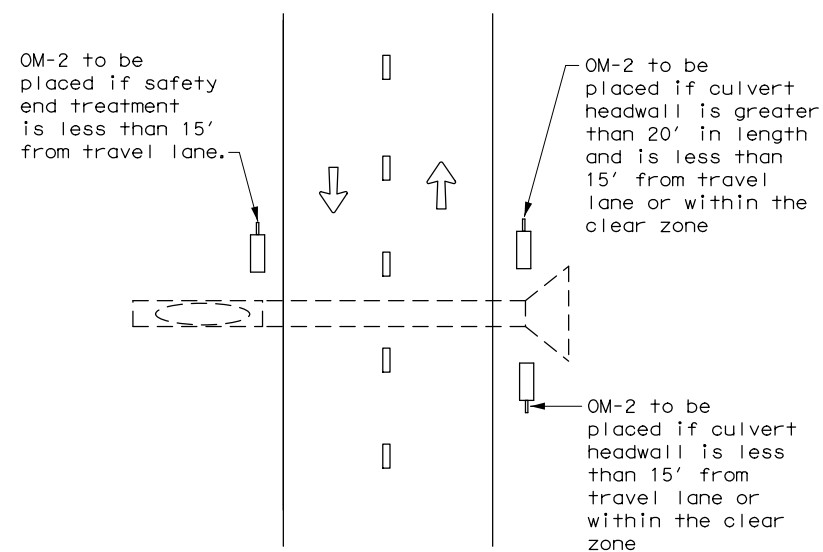
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CROSSOVERS



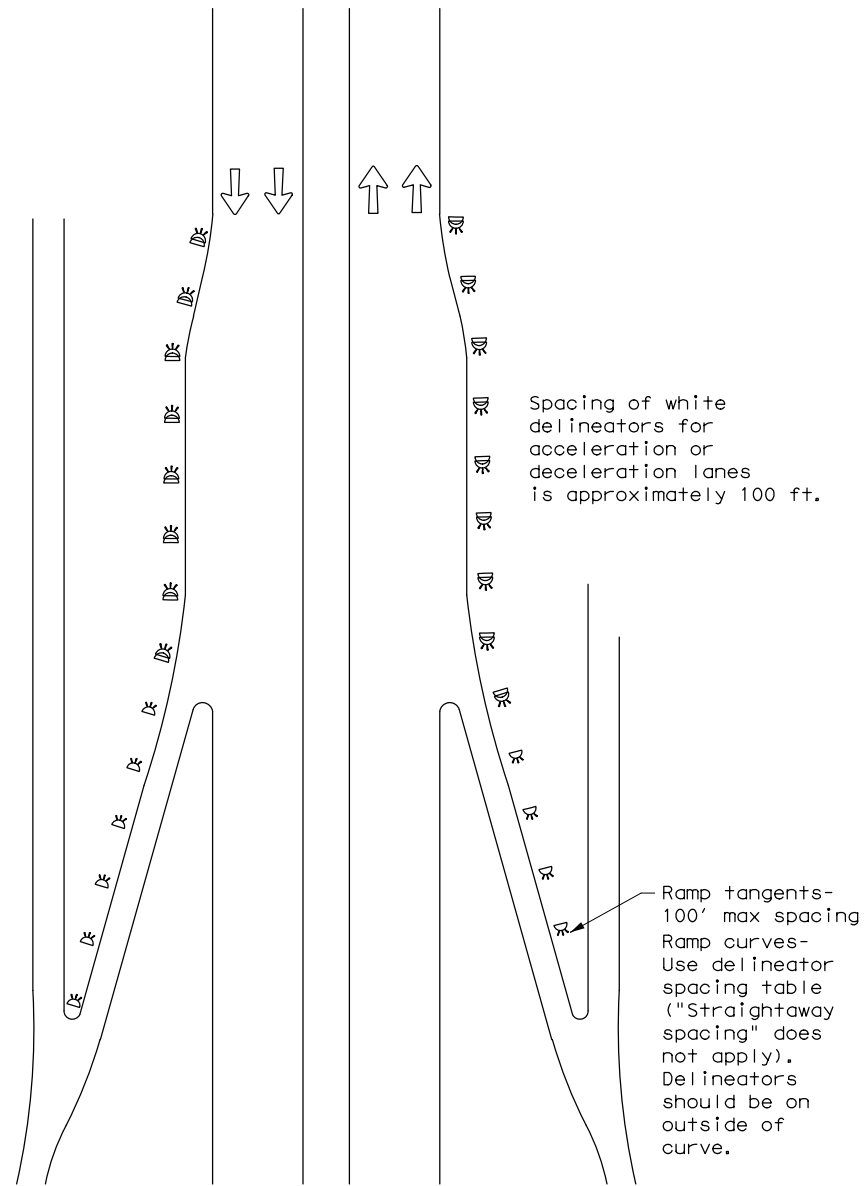
DETAIL 1

FOR CULVERTS WITHOUT MBGF



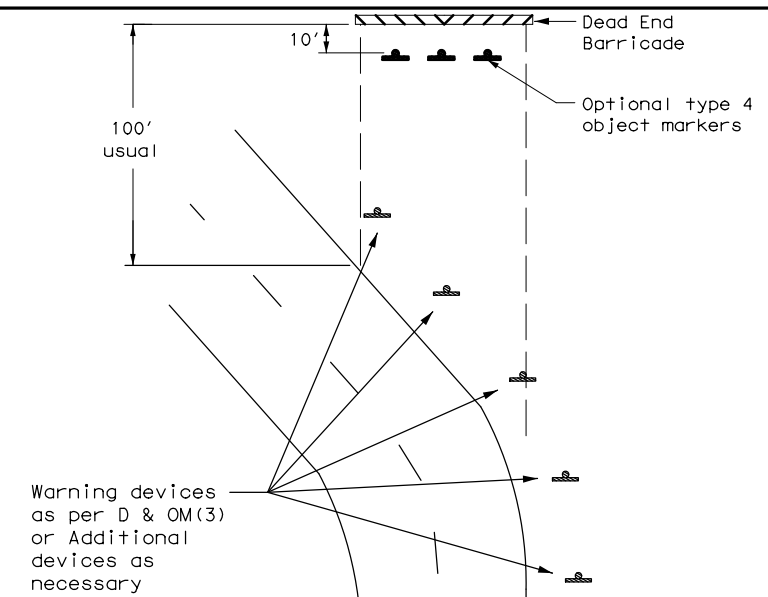
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



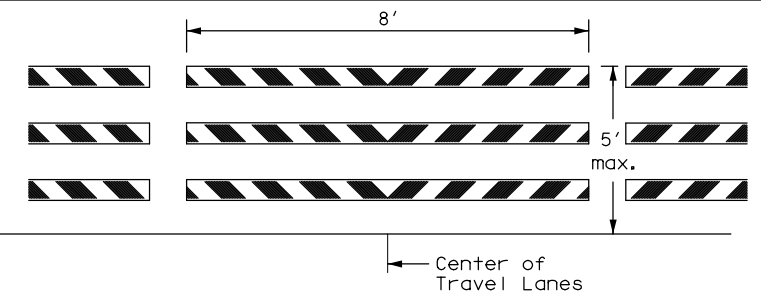
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



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 compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator



DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

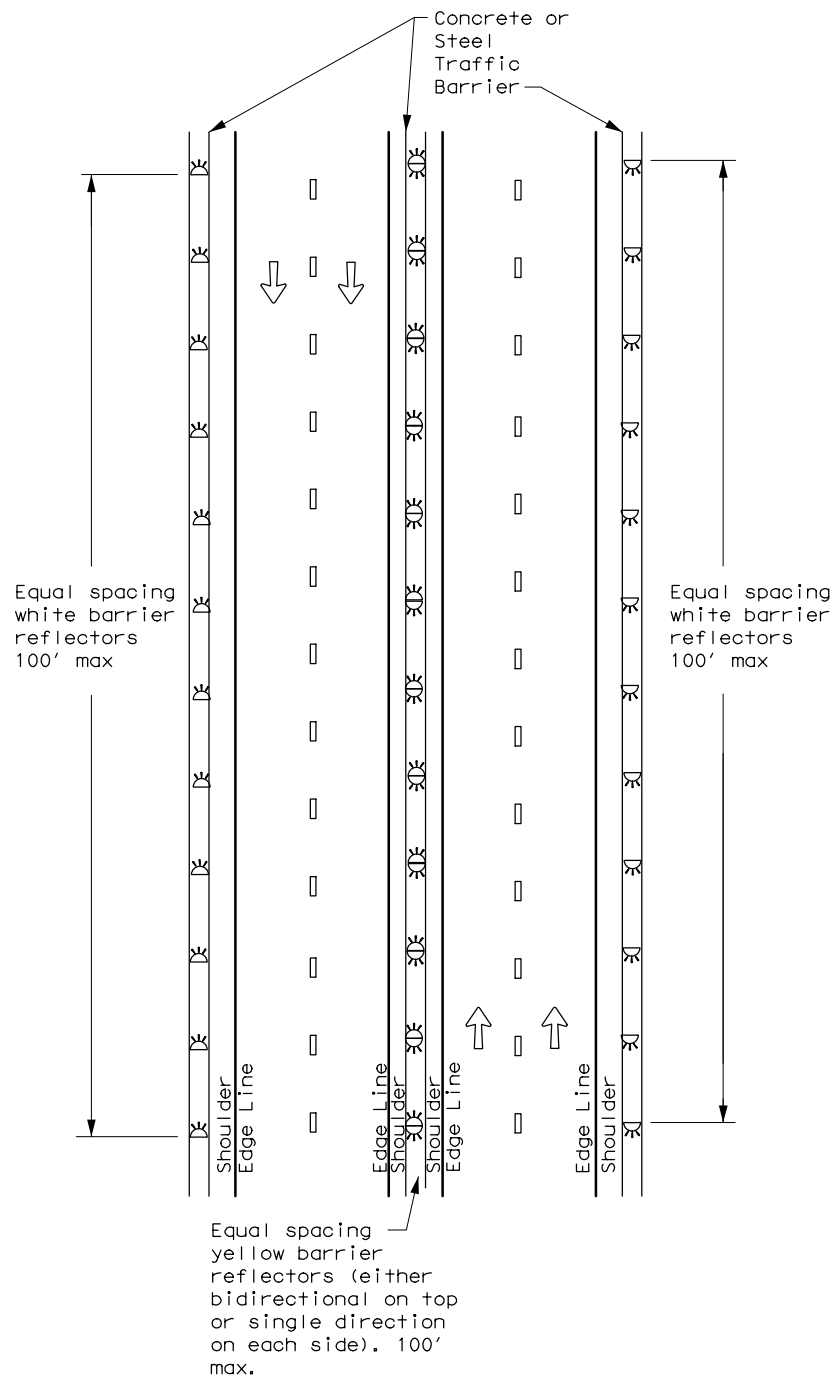
D & OM(4)-20

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3-15	DIST	COUNTY	SHEET NO.	
7-20	LFK	POLK	279	

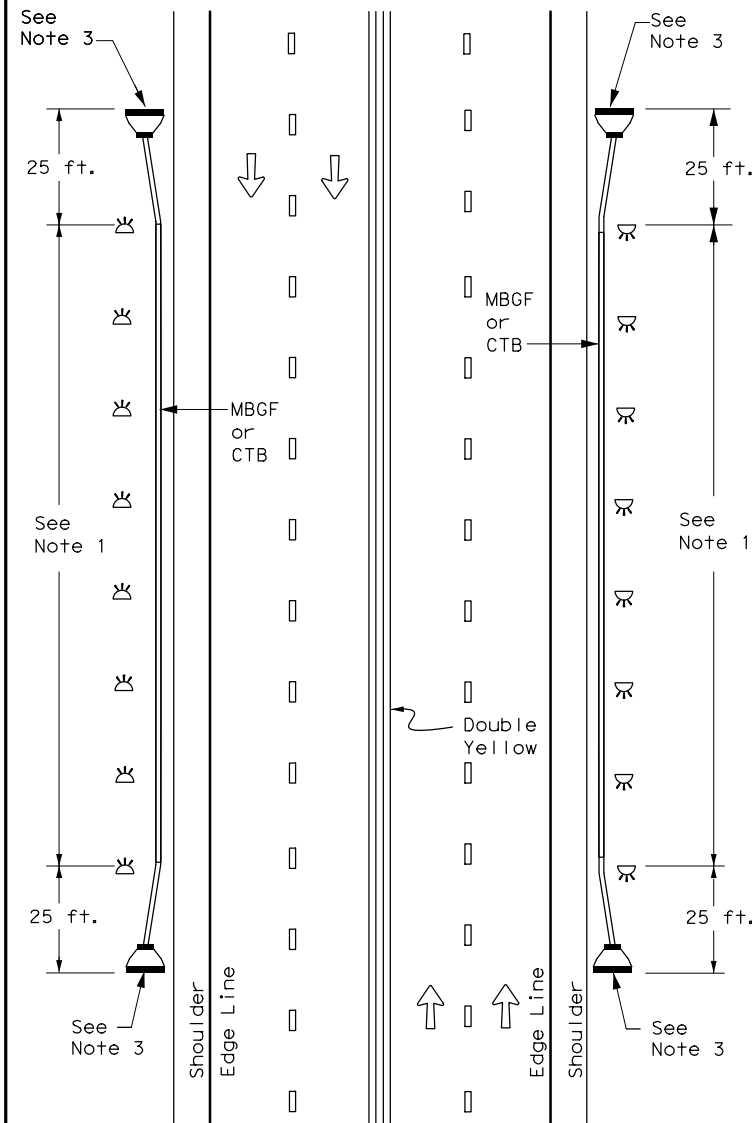
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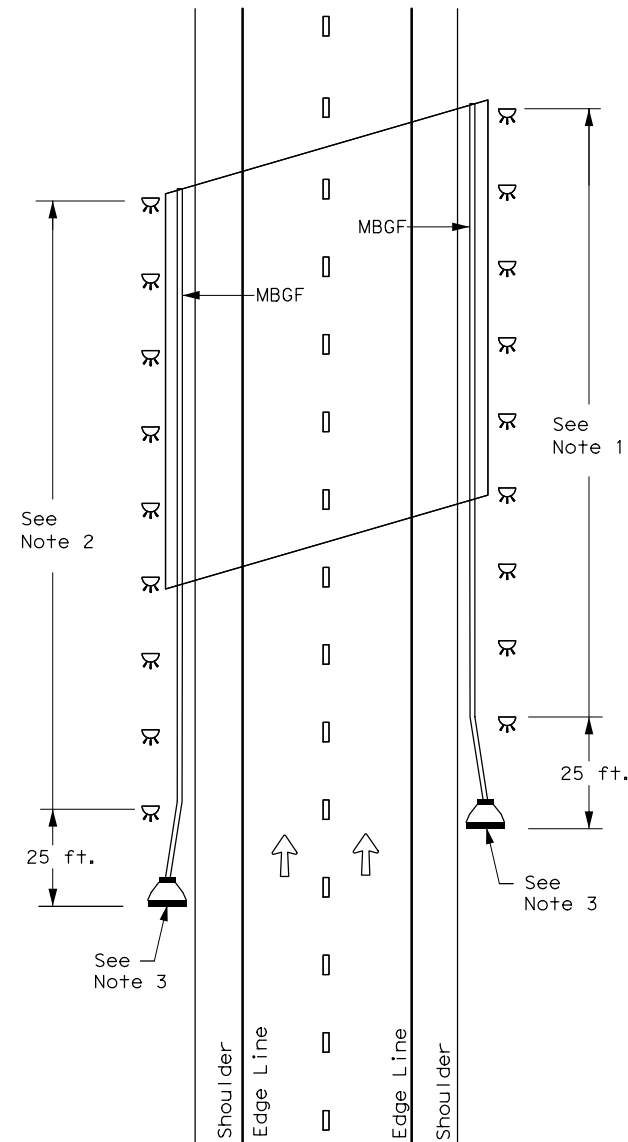
CONTINUOUS CONCRETE OR STEEL BARRIER



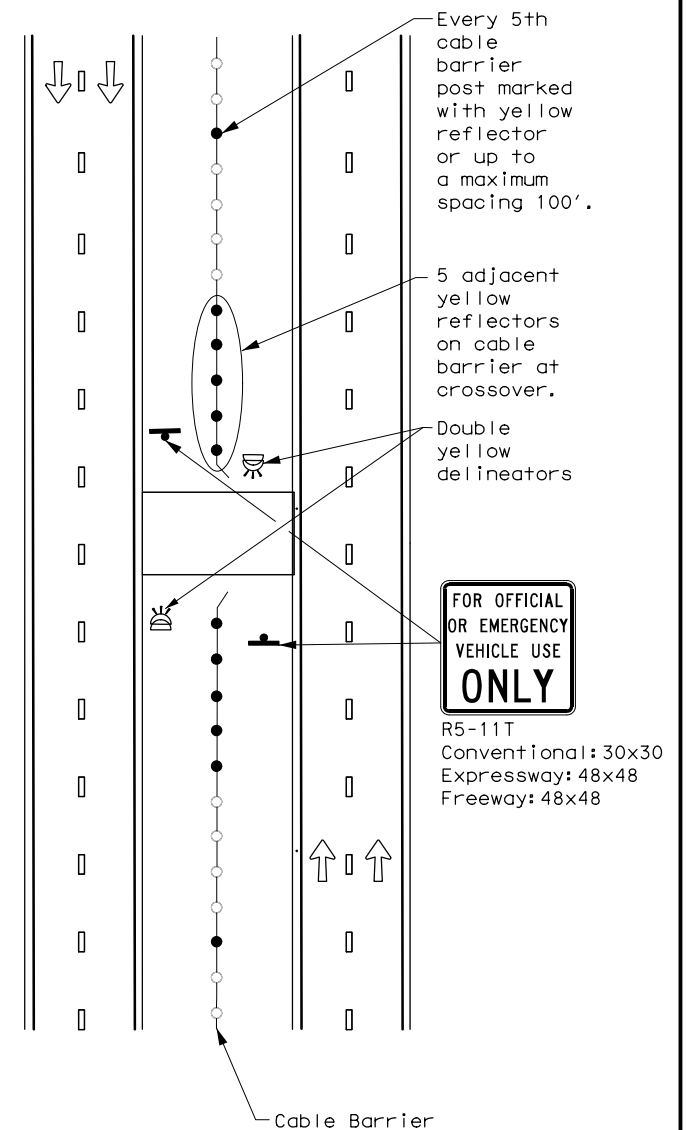
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100' max), but not less than 3 single directional white barrier reflectors or delineators. On Continuous Barrier, equal spacing (100' max.)
2. Equal spacing (100' max), but not less than 3 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.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

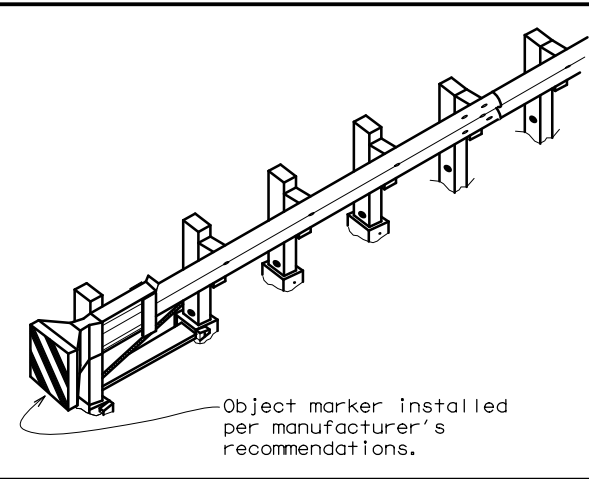
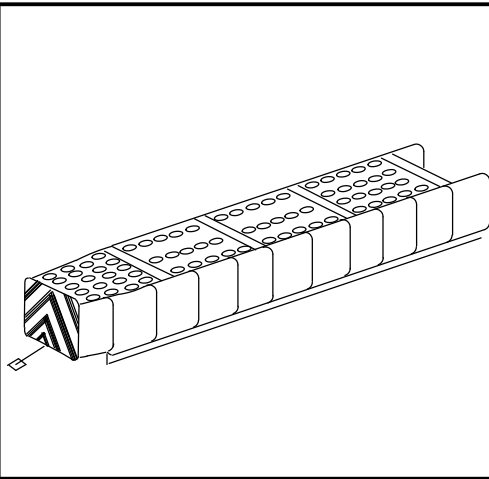
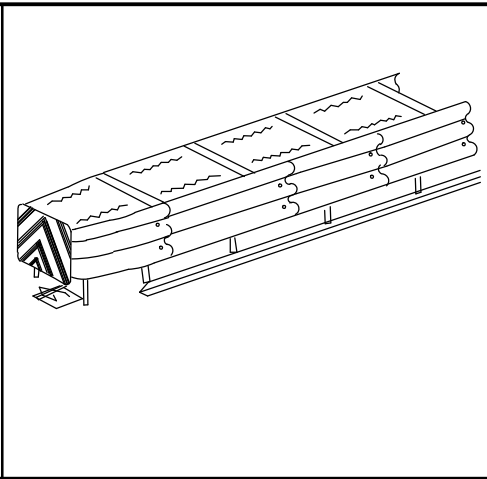
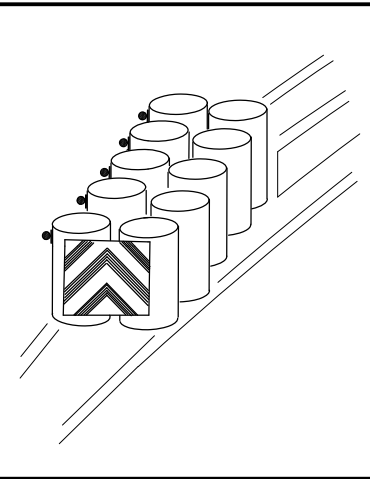


DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

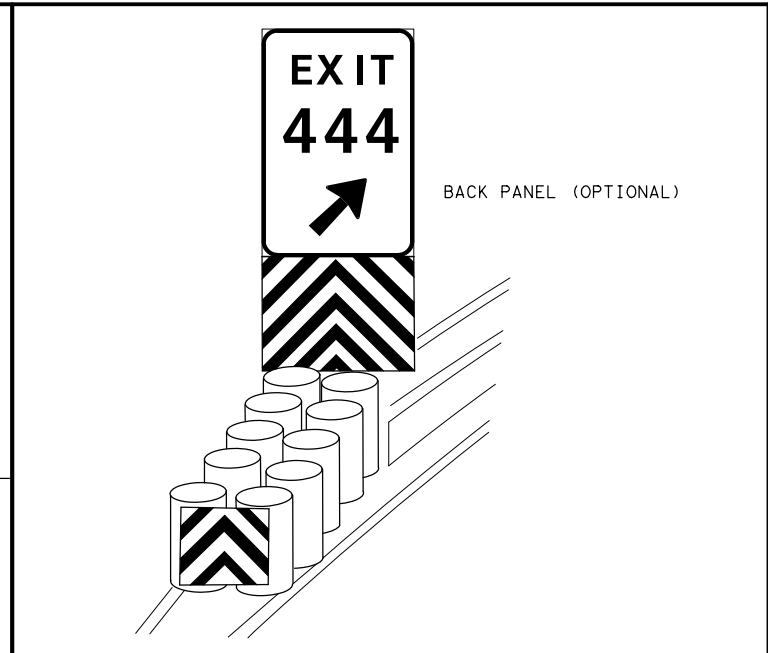
D & OM(6)-20

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	LFK	POLK	280		

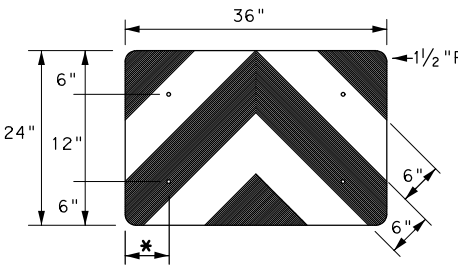
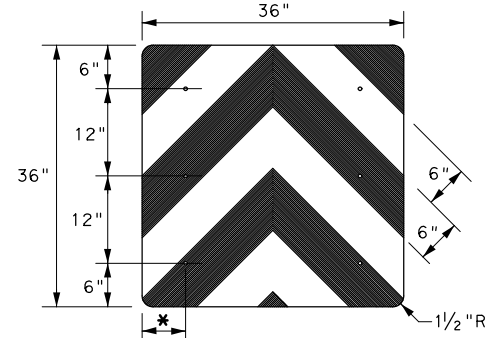
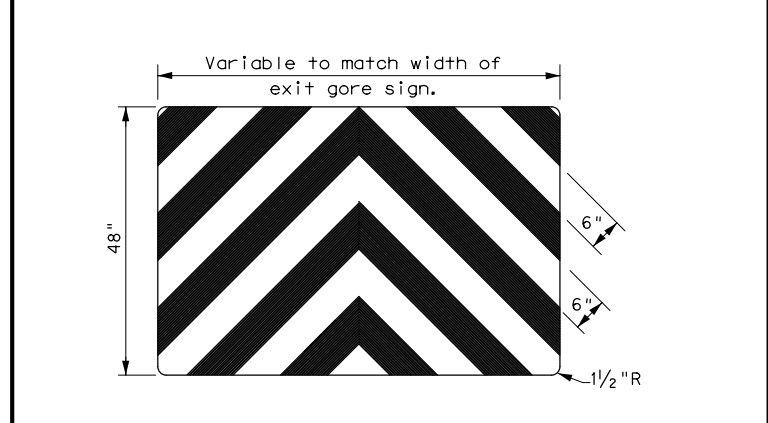
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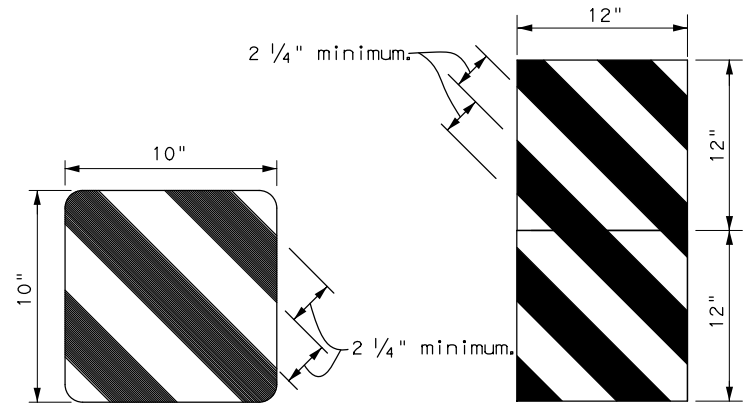
Object marker installed per manufacturer's recommendations.



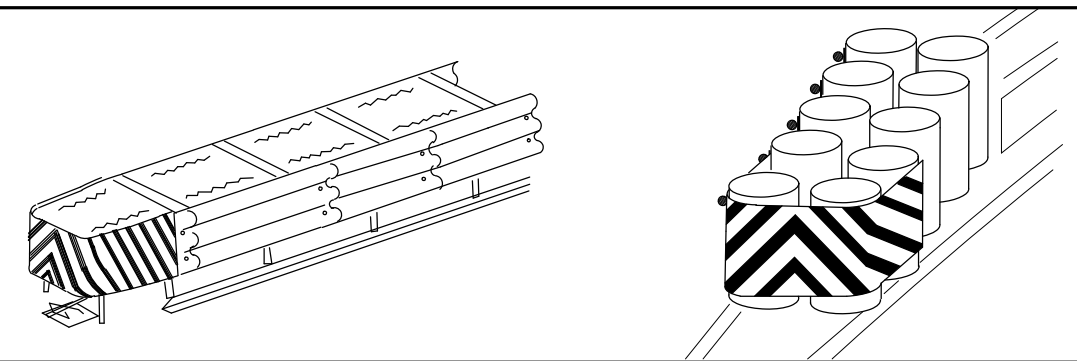
BACK PANEL (OPTIONAL)



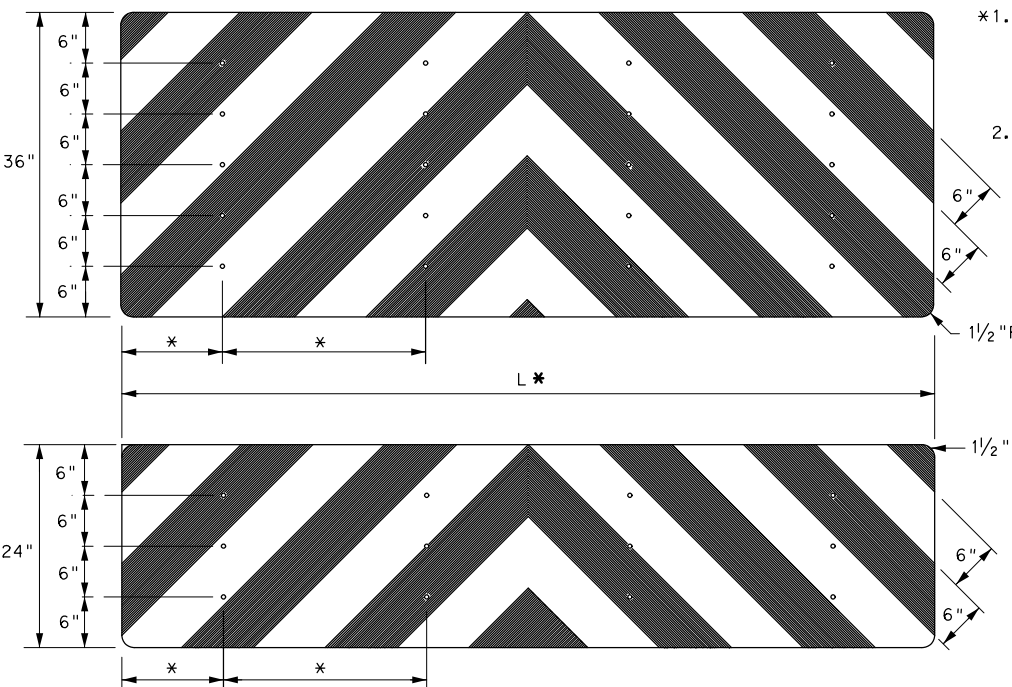
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer



OBJECT MARKERS SMALLER THAN 3 FT²



- NOTES**
- Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturer's recommendation, or as directed by the Engineer.
 - Mounting should be flush with top of attenuator. Minimum size 96" x 24".



NOTES

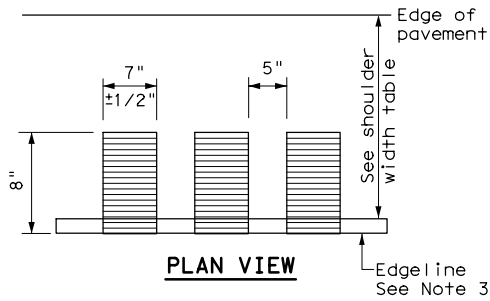
- Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
- Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, 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.
- Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 1/4".
- Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
- Object Marker at nose of attenuator is subsidiary to the attenuator.
- See D & OM (1-4) for required barrier reflectors.

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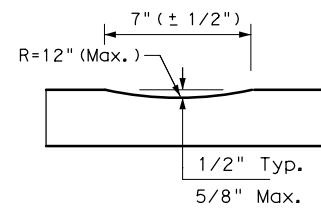
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DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA)-20					
FILE: domv1a20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT	
© TXDOT December 1989	CONT	SECT	JOB	HIGHWAY	
REVISIONS			0213 04	050	US 190
4-92 8-04					
8-95 3-15					
4-98 7-20	DIST	COUNTY		SHEET NO.	
	LFK	POLK		281	
20G					

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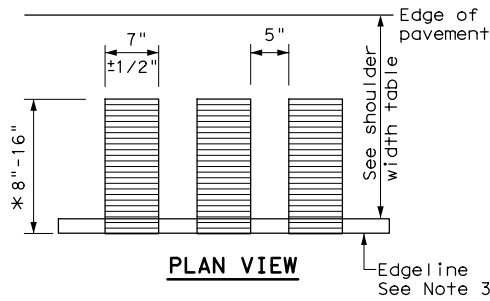


PLAN VIEW

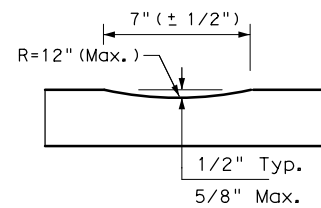


PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

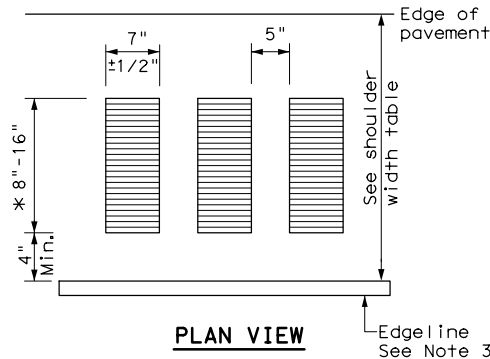


PLAN VIEW



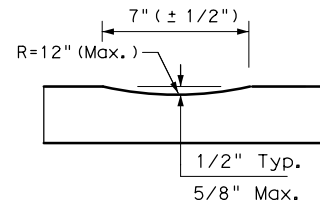
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



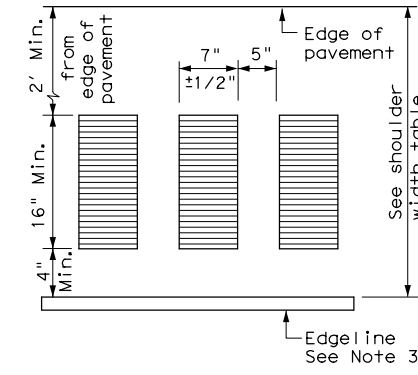
PLAN VIEW

* This distance may vary based on width of shoulder

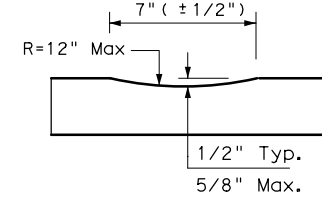


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

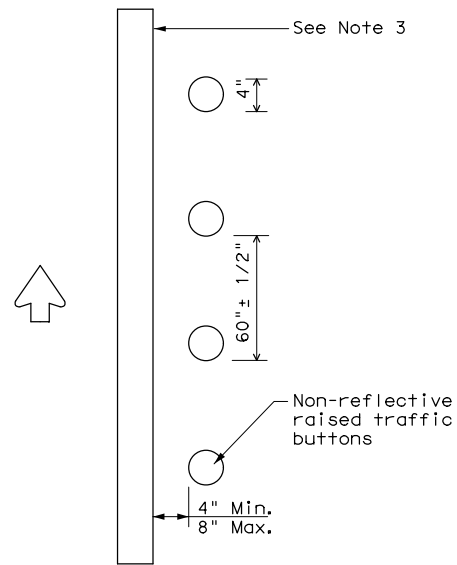


PLAN VIEW



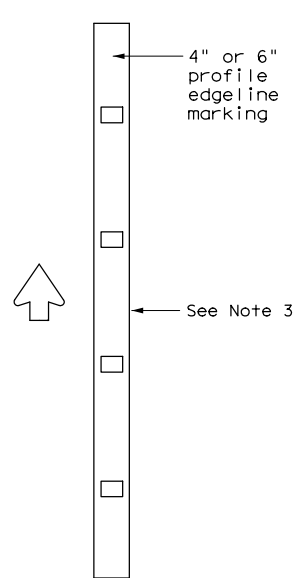
PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3 5 OR 6	Option 2, 4, 5 OR 6

GENERAL NOTES

- Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
- Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
- Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
- See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

- See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
- Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
- Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
- Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.

- On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

- Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
- Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
- Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
- The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
- Raised profile thermoplastic markings used as edgelines may substitute for buttons.

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13			
FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT October 2013	CONT	SECT	JOB
REVISIONS	0213	04	050
	DIST	COUNTY	SHEET NO.
	LFK	POLK	282

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent 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 adjacent 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 30 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, KCS/TEXMEX 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 14' - 0" (KCS) horizontal from centerline of track
- B. 22' (KCS) 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.

					
RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS					
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	LFK	POLK	283		

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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 Contractor'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 steel bridge 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 horizontal and vertical clearances 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 will occur. 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 1-800-336-9193
7:00 AM to 9:00 PM CST Monday-Friday except holidays,
staffed 24 hrs/day for emergencies
48 hrs notice required

BNSF 1-800-533-2891
24 hour number
5 working days notice required

KCS 1-800-344-8377
Texas One Call, a 24 hour number
48 hrs notice required, excluding weekends and holidays

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 1/4 inch 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's work and at least 30 working days in advance of any Contractor's 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.



RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
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March 2020	DIST	COUNTY	SHEET NO.	
	LFK	POLK	284	

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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 755949L
 Crossing Type: AT GRADE
 RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD (UPRR)
 Operating RR Company at Track: UNION PACIFIC RAILROAD (UPRR)
 RR MP: 71.170
 RR Subdivision: LUFKIN
 City: LIVINGSTON
 County: POLK
 CSJ at this Crossing: 0213-04-050
 Highway/Roadway name crossing the railroad: US 190/CHURCH STREET
 # of regularly scheduled trains per day at this crossing: 8
 # of switching movements per day at this crossing: 0
 % of estimated contract cost of work within railroad ROW: 0.5%

Scope of Work at this Crossing to Be Performed by State Contractor:
REPAIR PAVEMENT BY MILL & INLAY OPERATIONS AT LOCATION AS DIRECTED.

Scope of Work at this Crossing to Be Performed by Railroad Company:
PROVIDE FLAGGING SERVICES WHEN WORK IS WITHIN 25 FEET OF THE NEAREST RAIL.

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

N/A

III. FLAGGING & INSPECTION

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: TxDOT will pay flagging invoices
 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
 BNSF - BNSF.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 KCS - KCS.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 - Bottom Line On-Track Safety Services
 botttomline076@aol.com, 903-767-7630

OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

- Not Required
 Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

- Required
 Not Required

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.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

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.

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 combined single limit
Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

- Not Required
 Required: TxDOT to assist in obtaining (see Item 5, Article 8.3)

With the following railroad companies: UNION PACIFIC RAILROAD (UPRR)

- Required: Contractor to obtain (see Item 5, Article 8.4)

With the following railroad companies: _____

Railroad website: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

<http://www.txdot.gov/inside-txdot/division/rail/samples.html>

Approved ROE Agreement 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 ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

- Not Required
 Required


See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

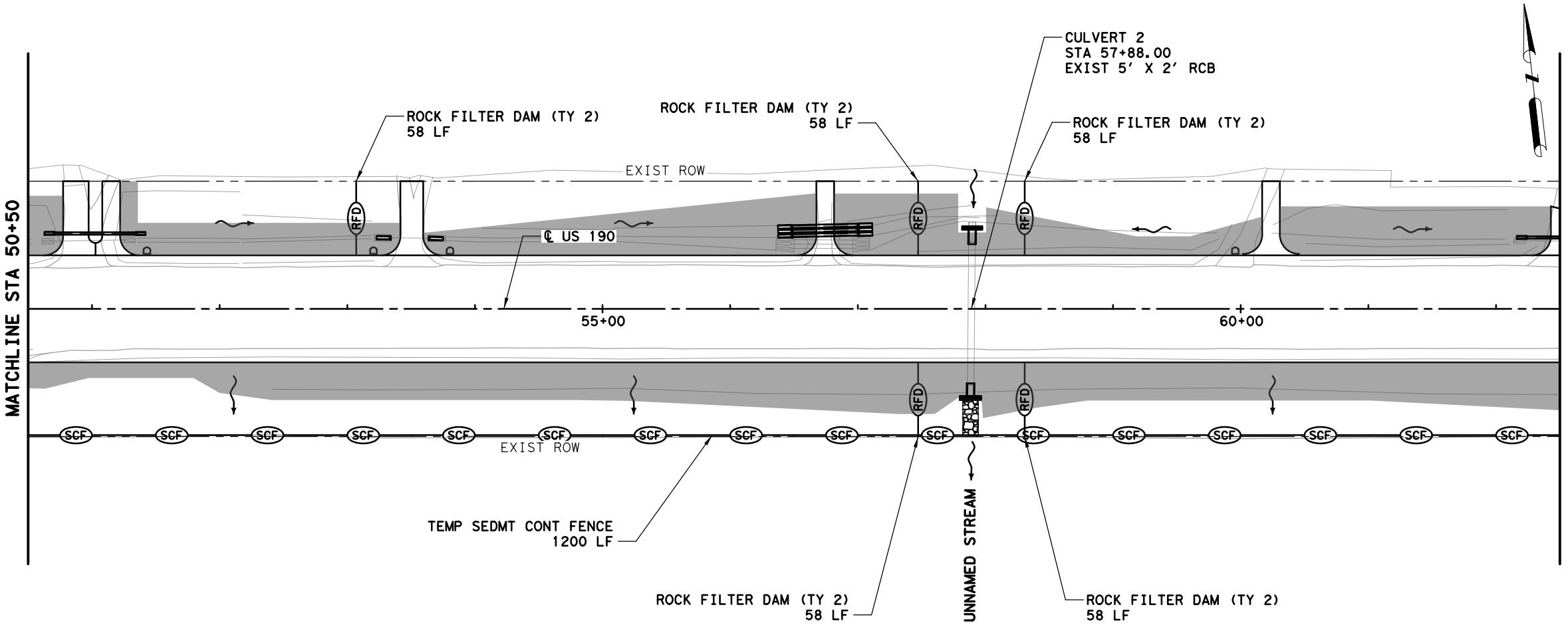
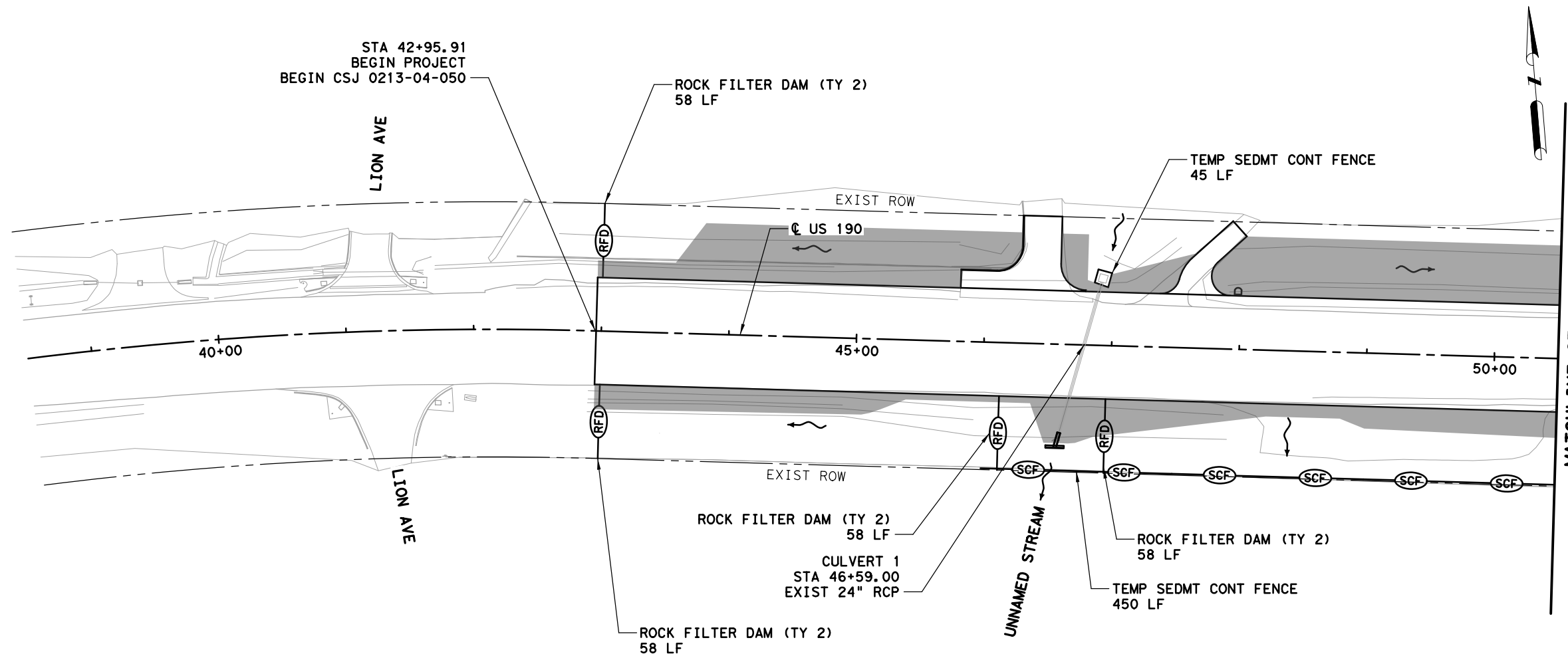
IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific Railroad Emergency Line
at 800-848-8715
Location: DOT 755949L
RR Milepost: 71.170 Lufkin Subdivision

 Texas Department of Transportation				Rail Division	
RAILROAD SCOPE OF WORK PROJECT SPECIFIC DETAILS					
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		LFK	POLK		285

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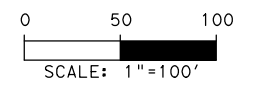
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

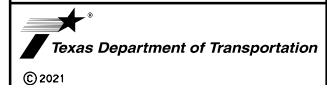


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SWP3 LAYOUT

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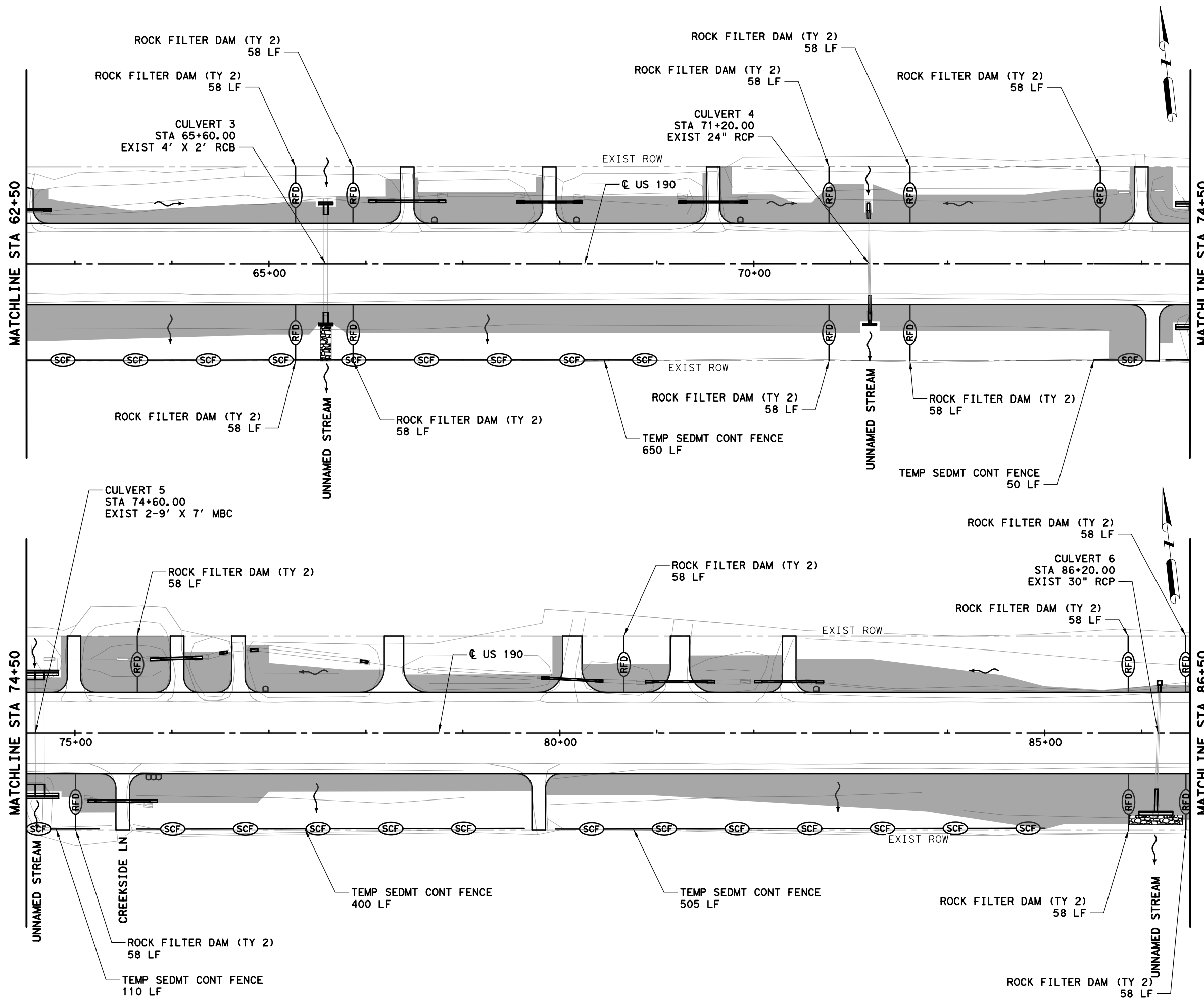


BGE, Inc.
 10777 Westheimer, Suite 400, Houston, TX 77042
 Tel: 281-558-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

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6		286	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
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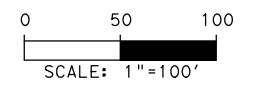
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LEGEND

- DIRECTION OF FLOW
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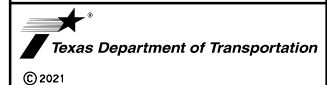
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- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



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SWP3 LAYOUT
 (STA 62+50-STA 86+50)

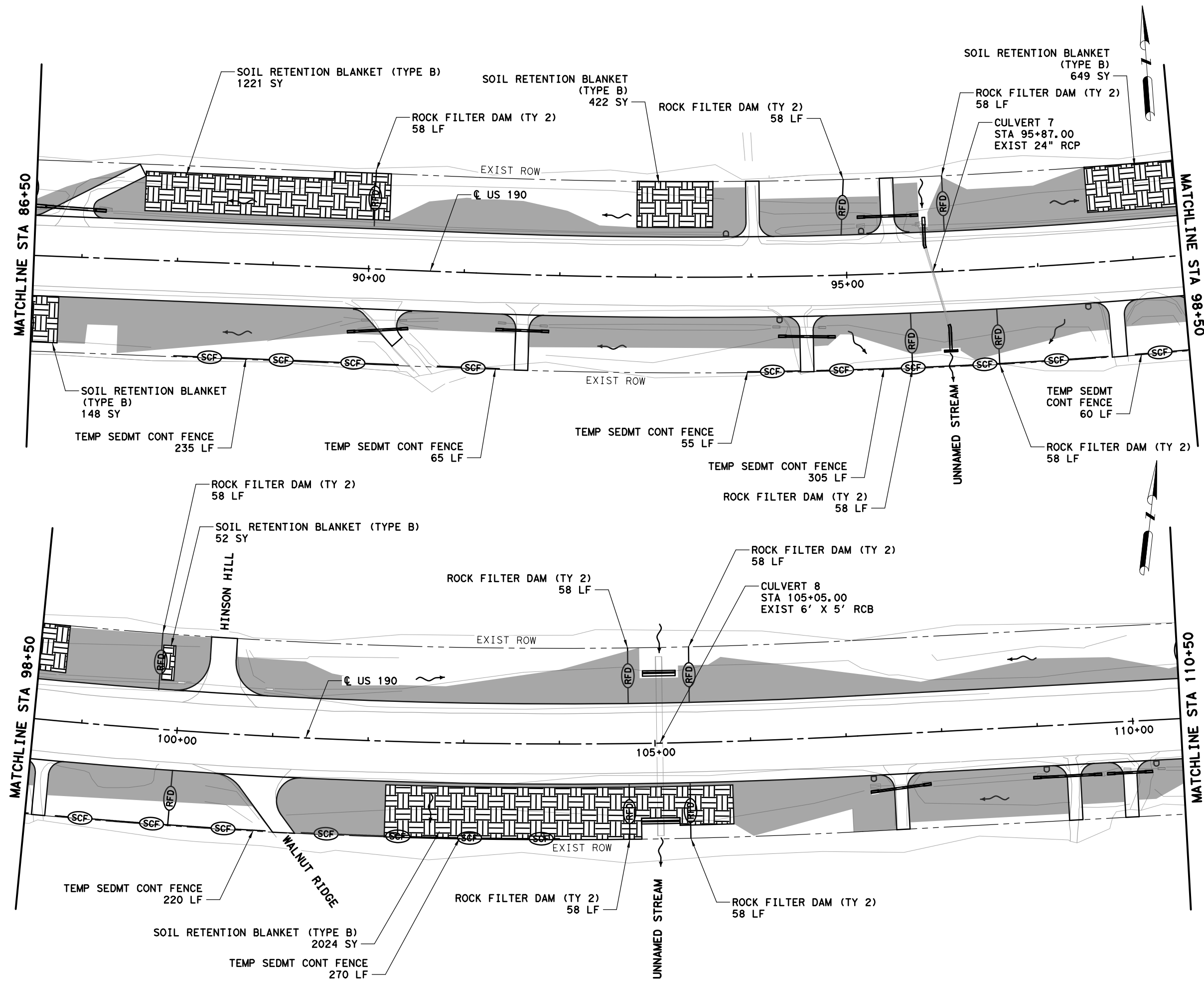
SHEET 2 OF 17



BGE, Inc. 10777 Westheimer, Suite 400, Houston, TX 77042 Tel: 281-658-8700 • www.bgeinc.com TBPE Registration No. F-1046		PROJECT NO.	SHEET NO.
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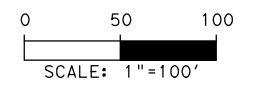
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LEGEND

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05/13/2021

SWP3 LAYOUT
 (STA 86+50-STA 110+50)

SHEET 3 OF 17

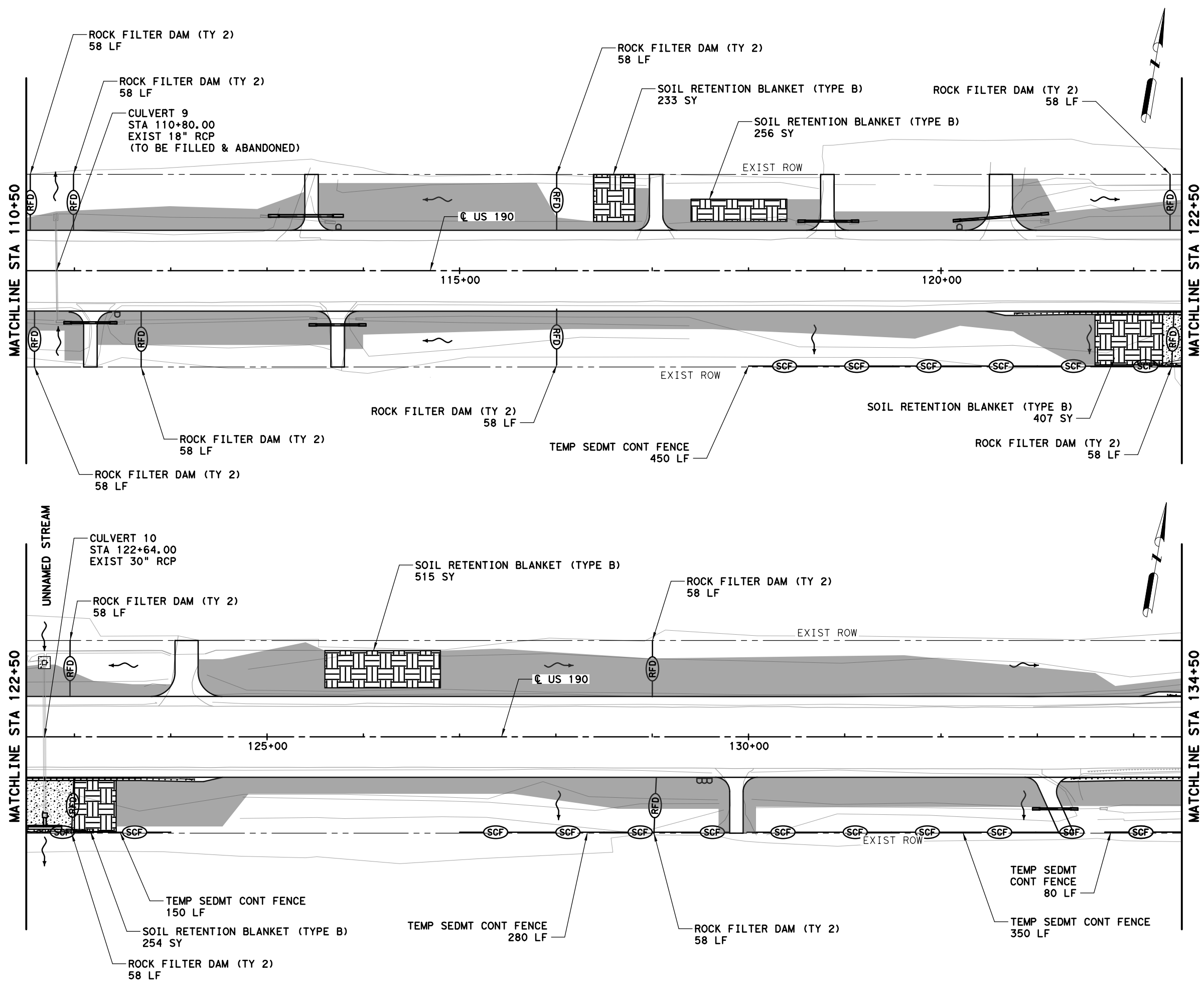
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		288	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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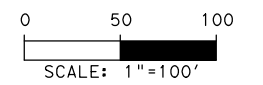
LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

NOTES:

- PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
- LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.

LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 110+50-STA 134+50)

SHEET 4 OF 17

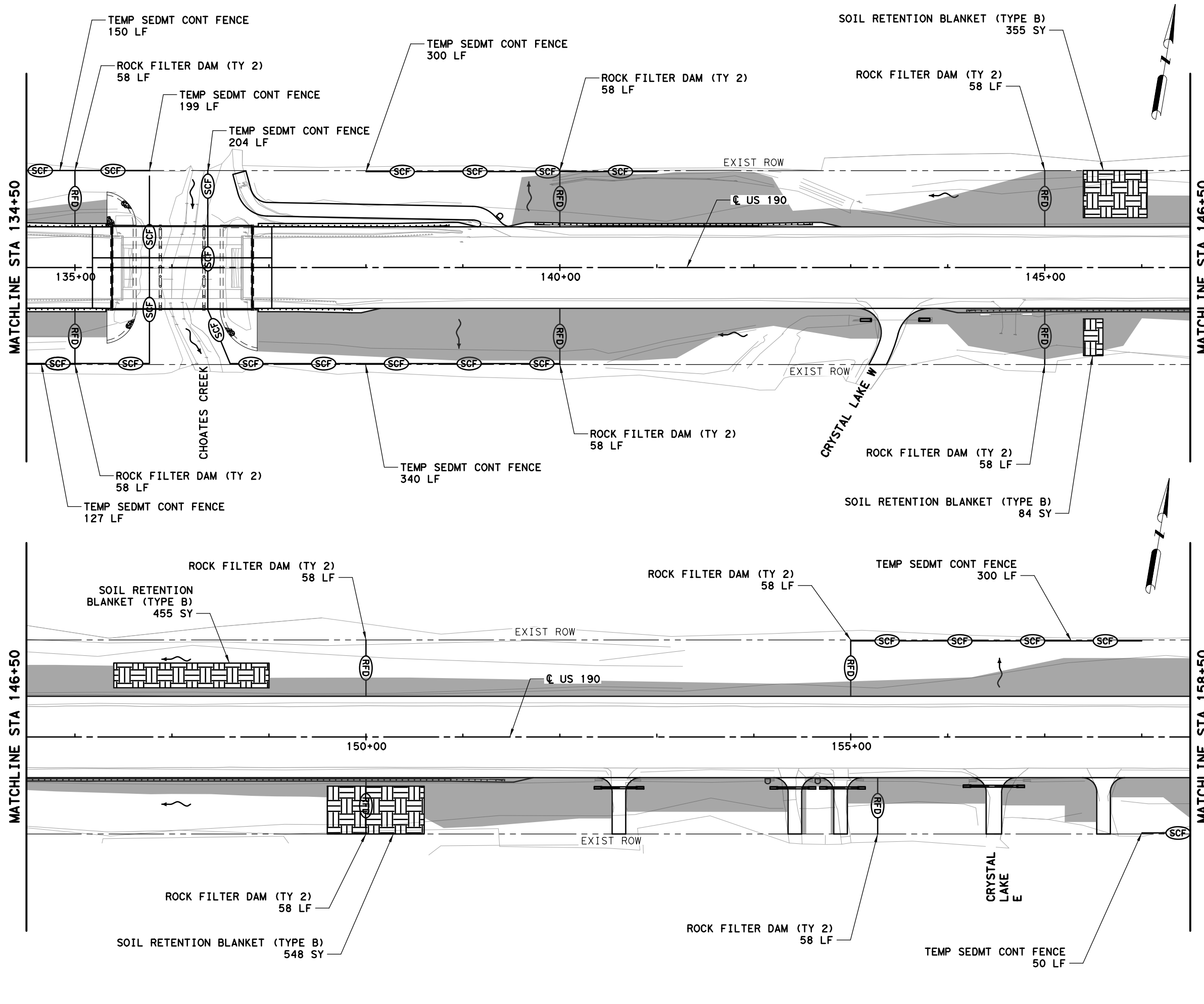
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		289	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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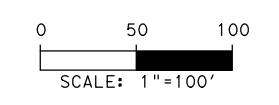
LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

NOTES:

1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.

LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
(STA 134+50-STA 158+50)

SHEET 5 OF 17

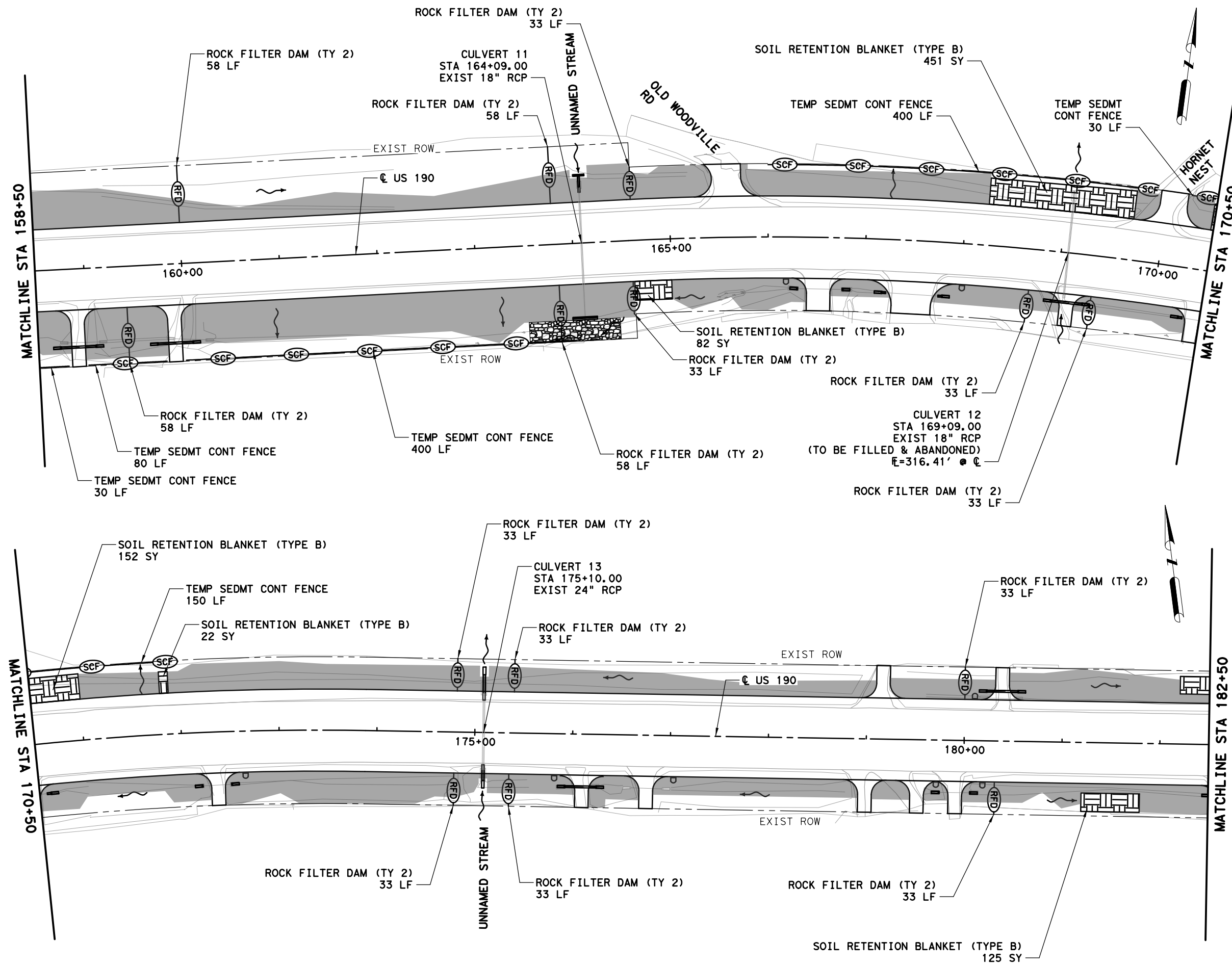
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FED. RD. DIV. NO.		PROJECT NO.		SHEET NO.	
6				290	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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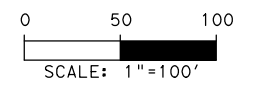
LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

NOTES:

1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.

LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 158+50-STA 182+50)

SHEET 6 OF 17

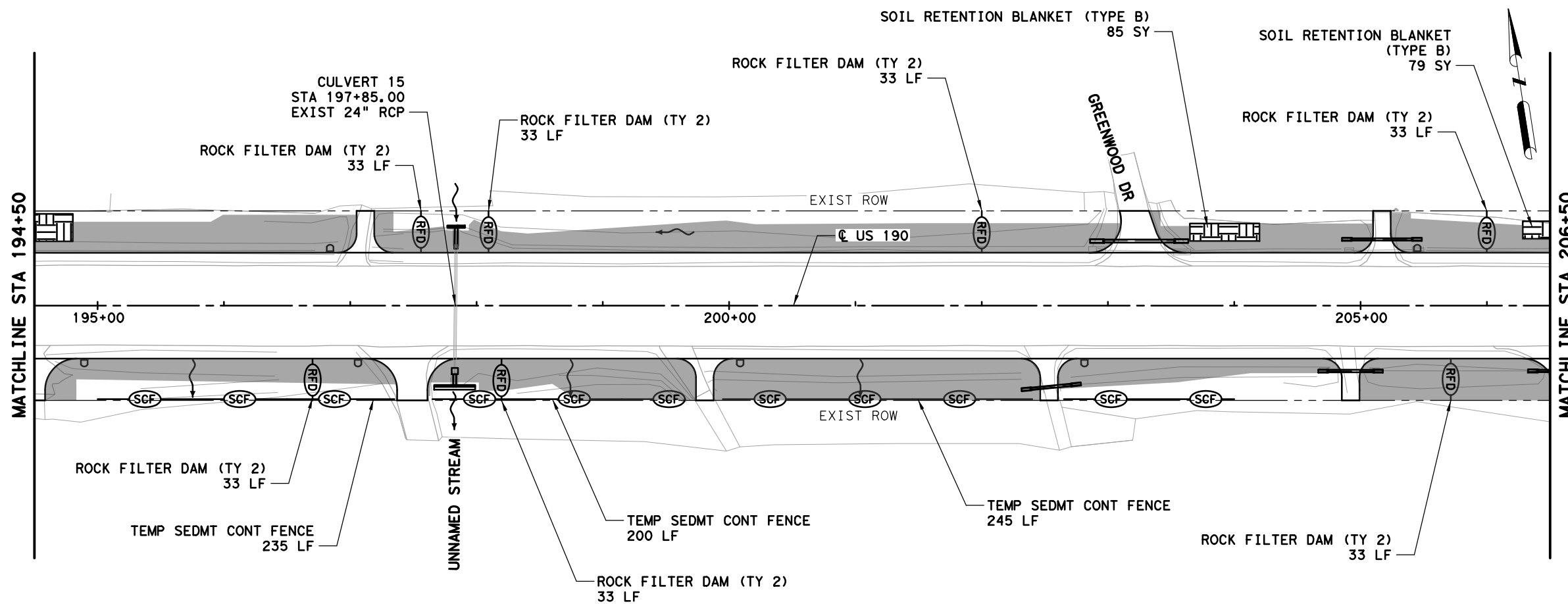
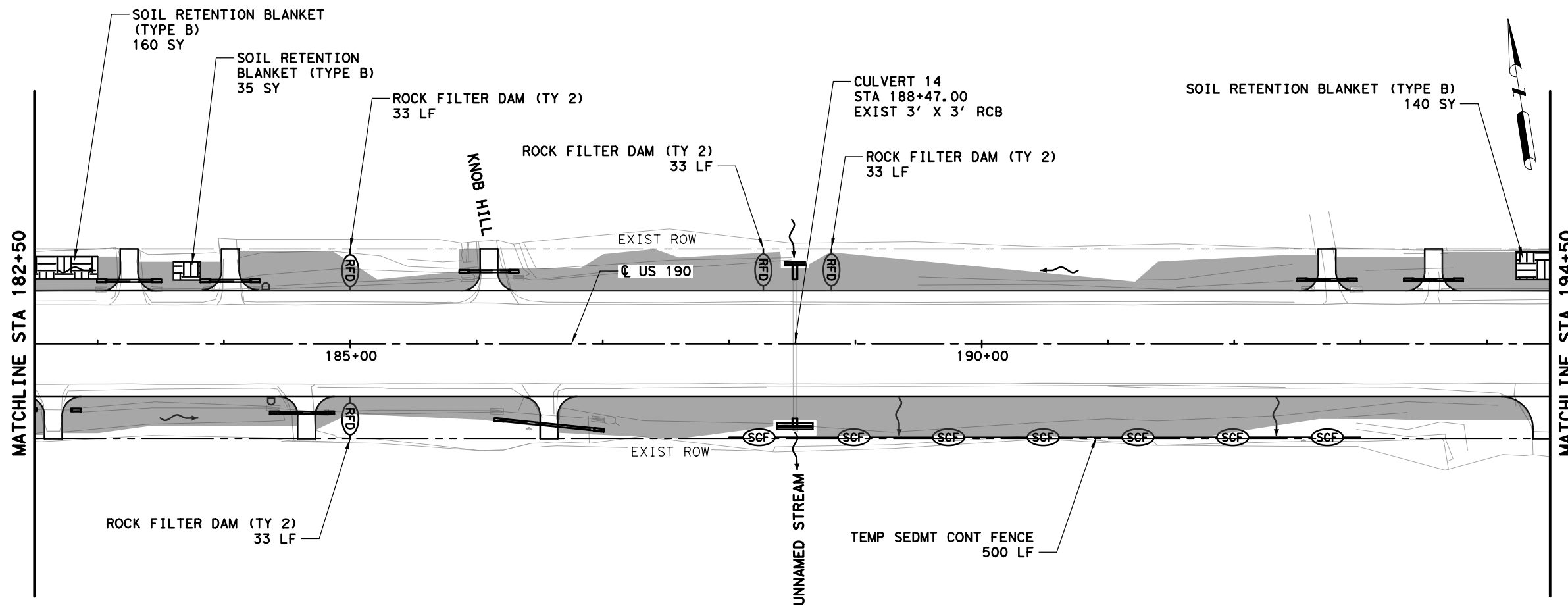
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		291	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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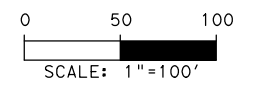
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 182+50-STA 206+50)

SHEET 7 OF 17

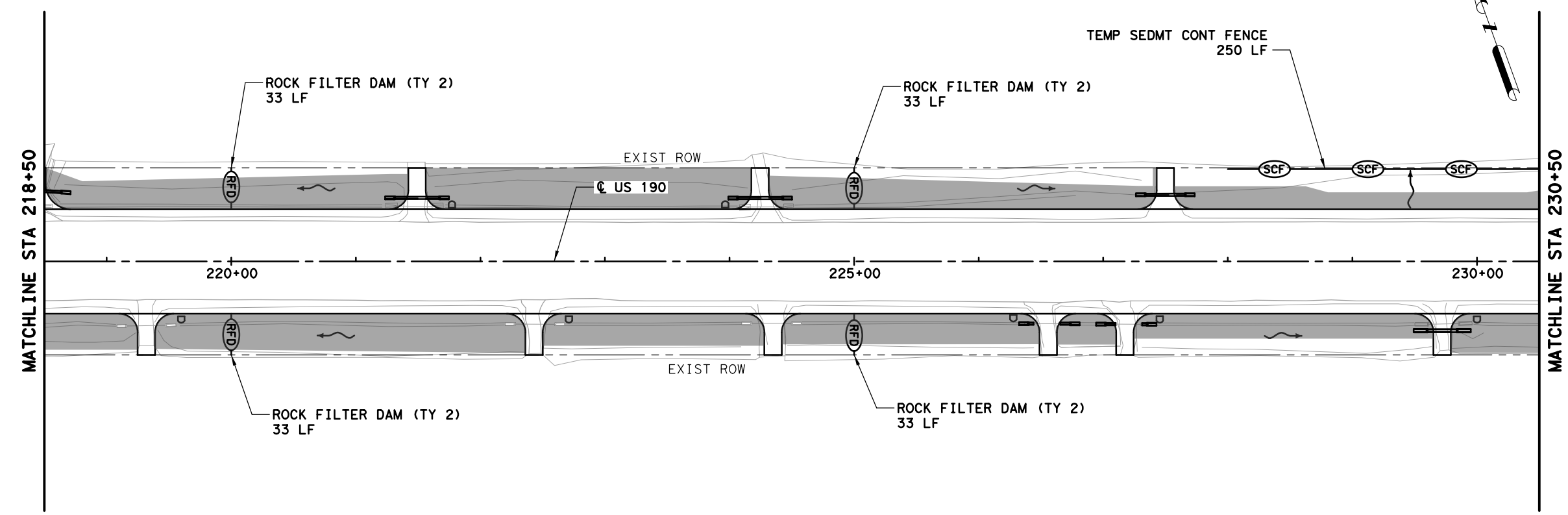
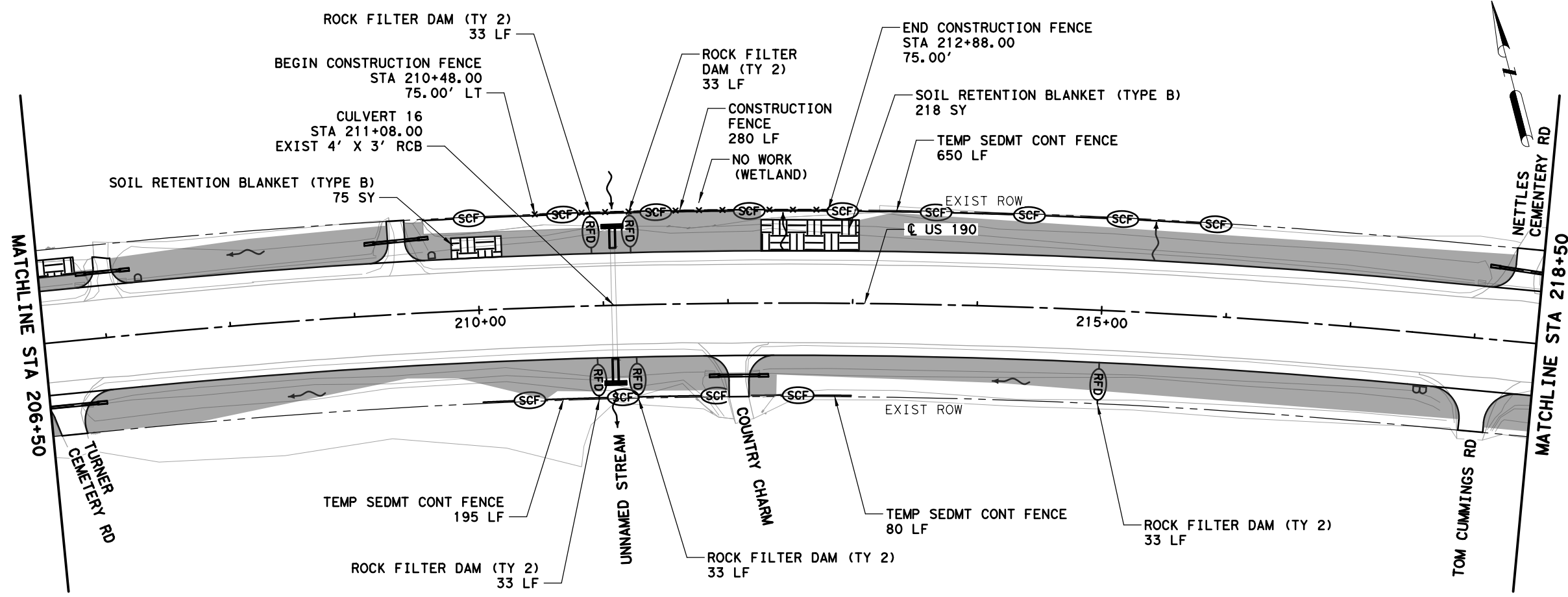
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		292	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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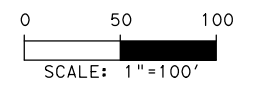
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 206+50-STA 230+50)

SHEET 8 OF 17

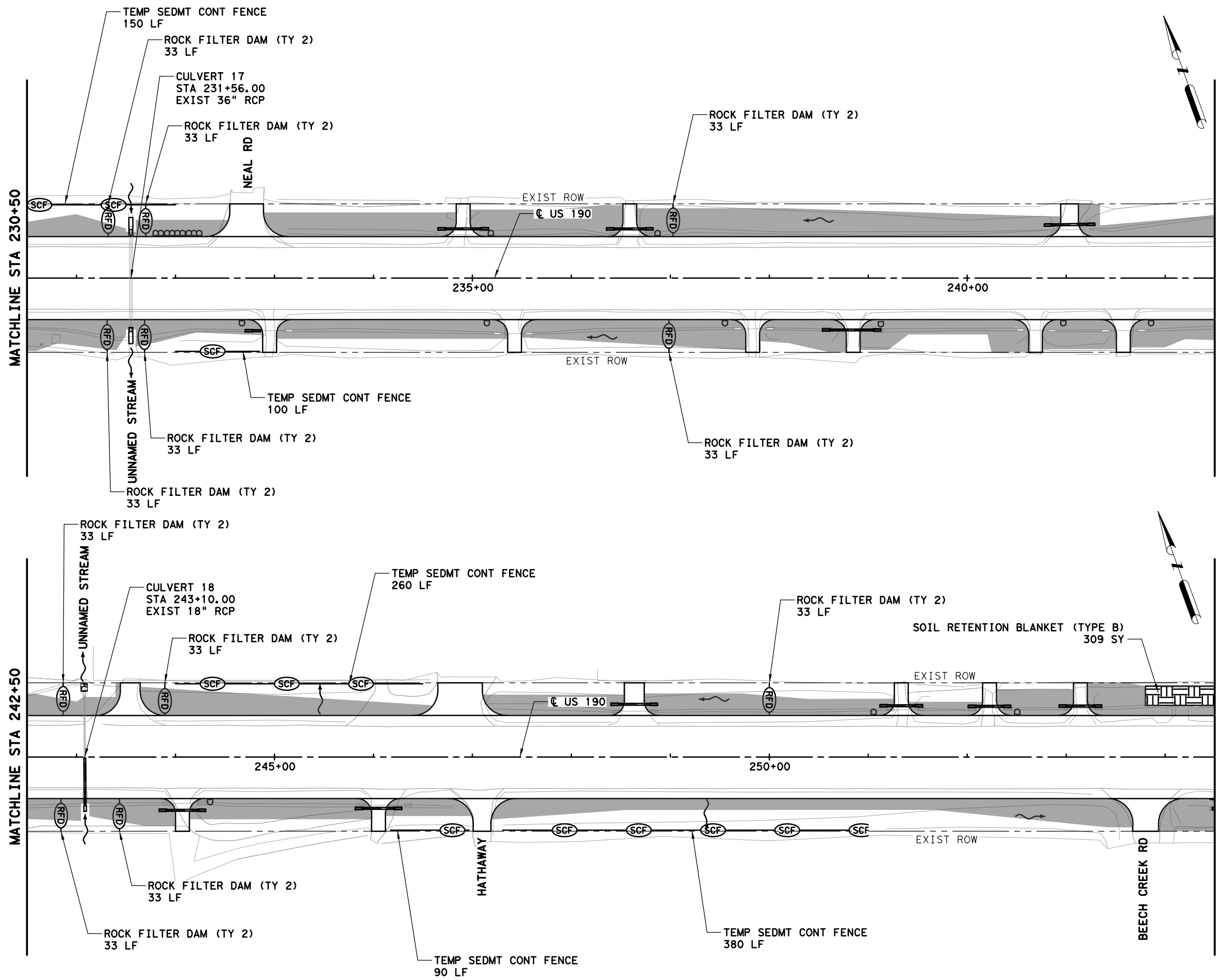
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		293	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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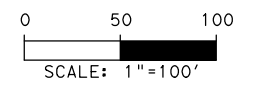
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

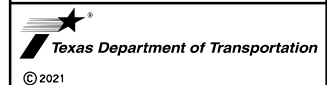


05/13/2021

SWP3 LAYOUT

(STA 230+50-STA 254+50)

SHEET 9 OF 17

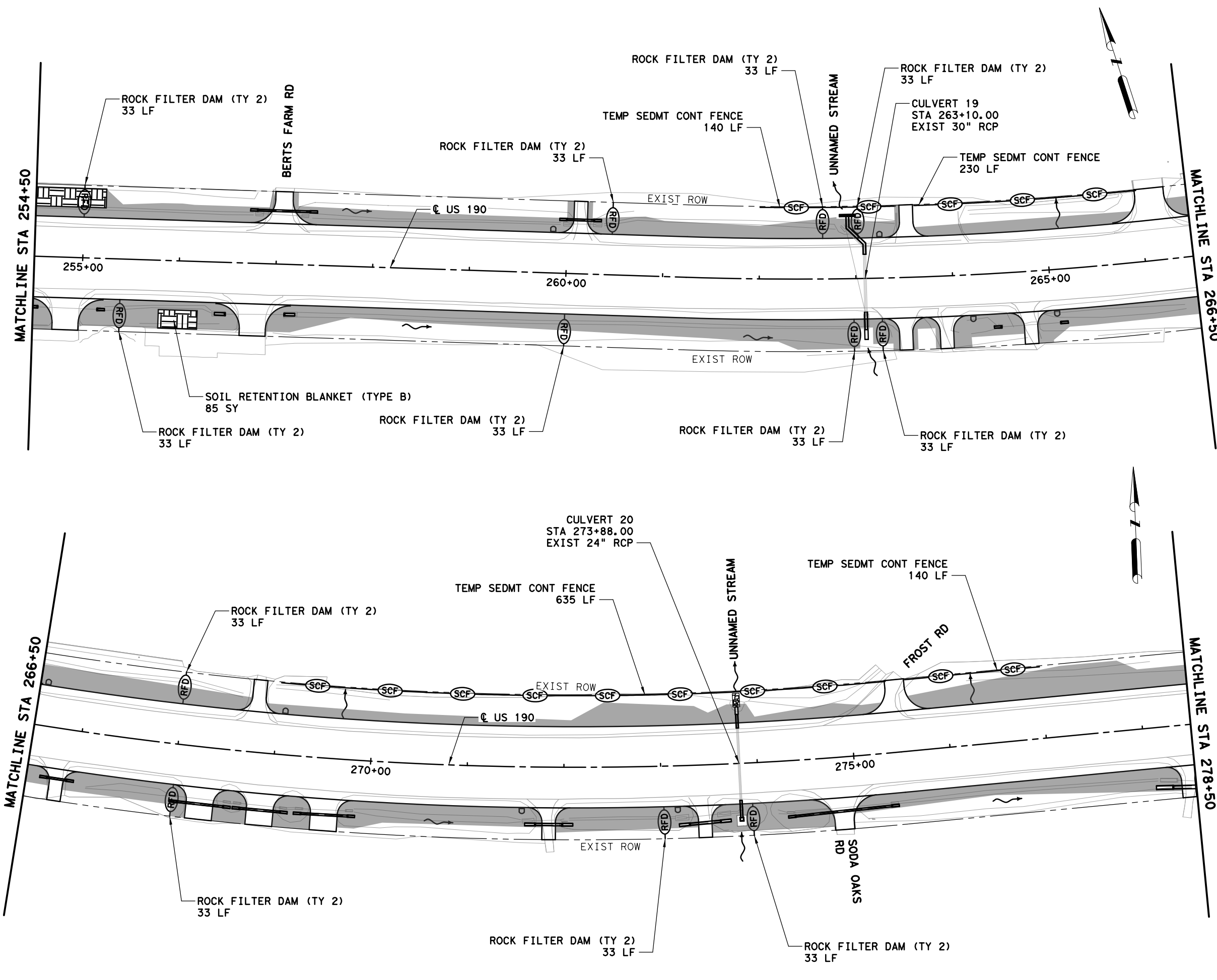


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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		294	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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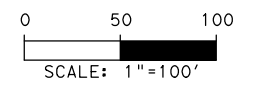
LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

NOTES:

- PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
- LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.

LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 254+50-STA 278+50)

SHEET 10 OF 17

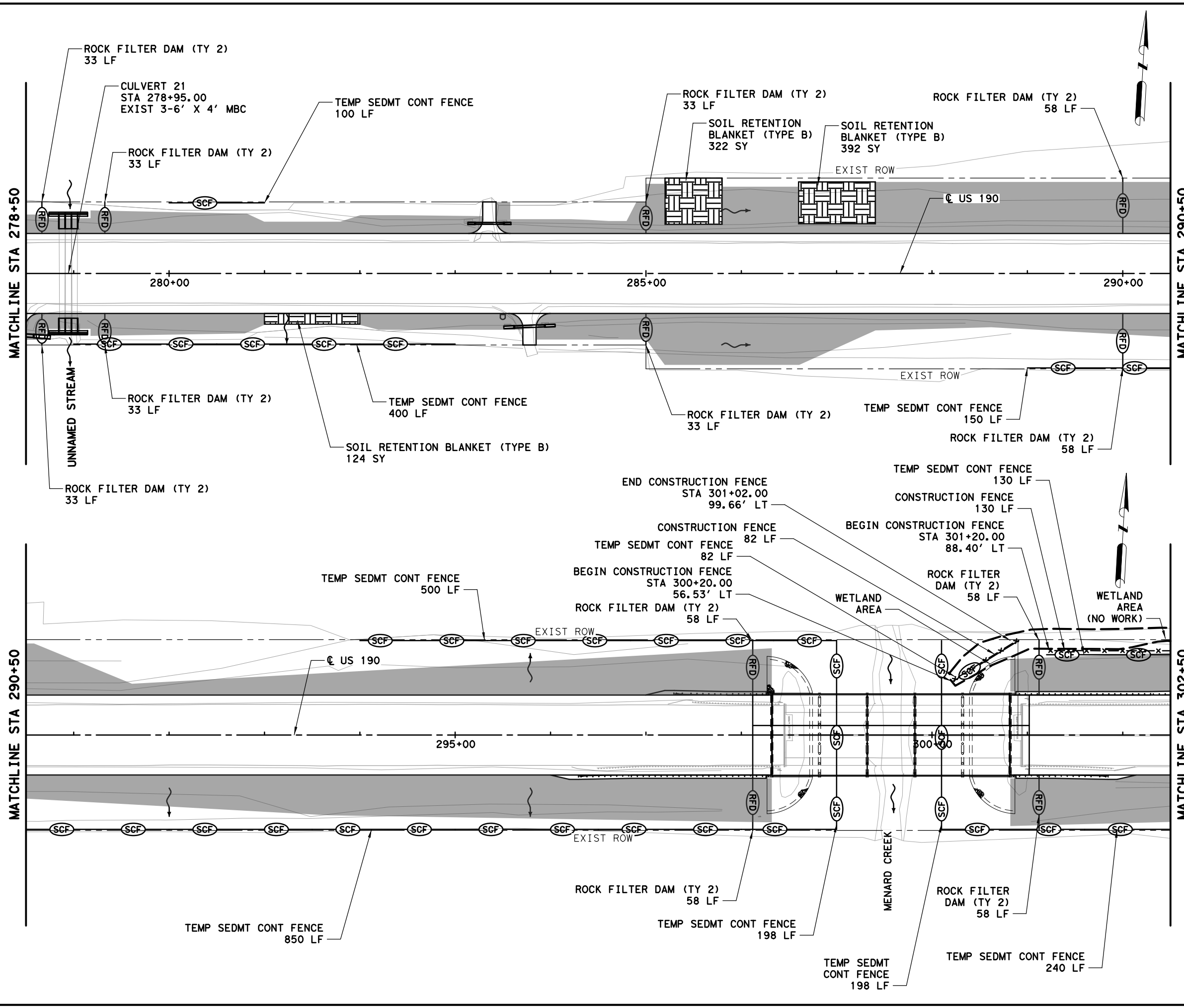
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		295	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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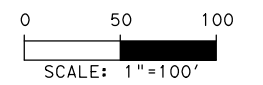
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
- PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 - LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 278+50-STA 302+50)

SHEET 11 OF 17

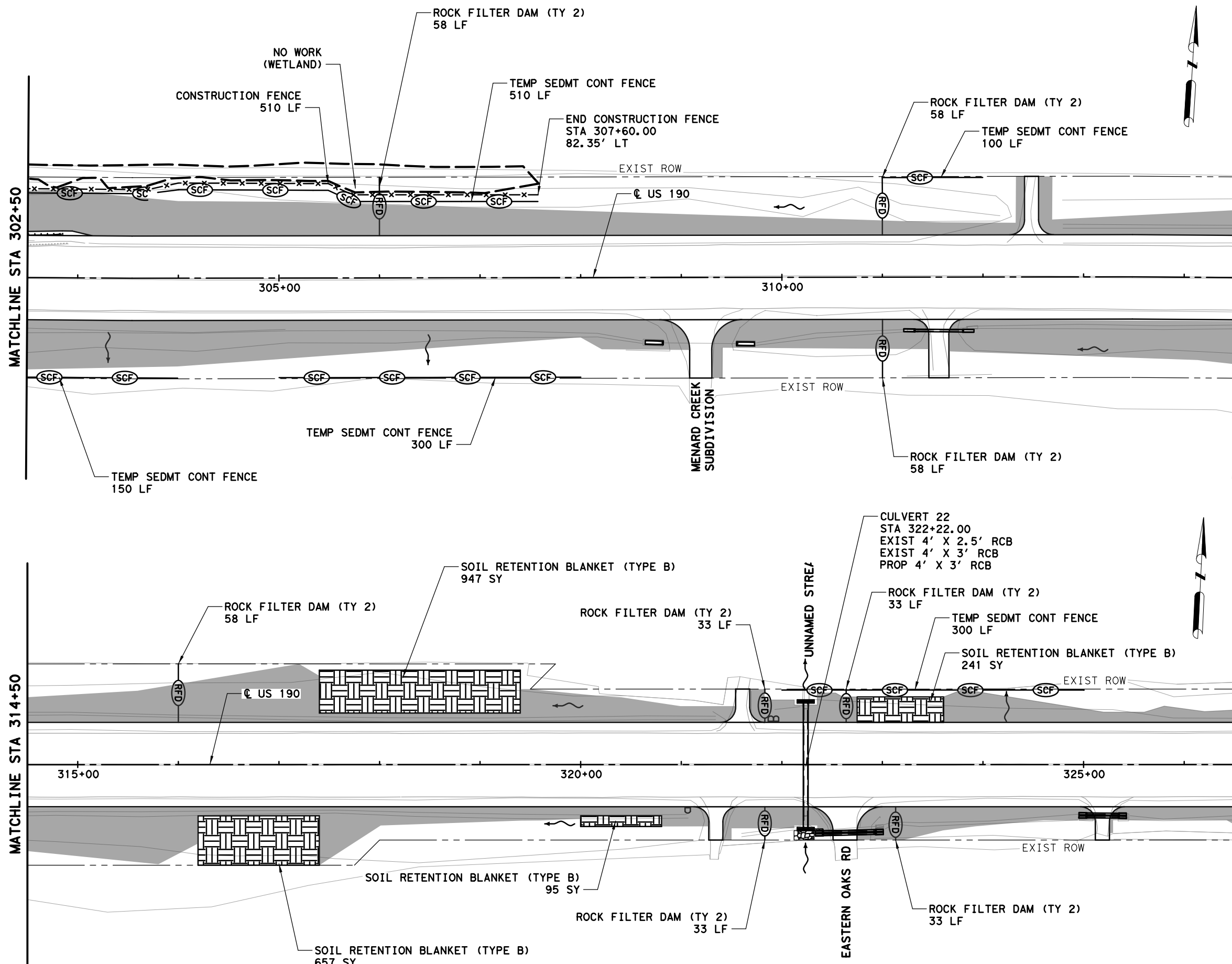
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		296	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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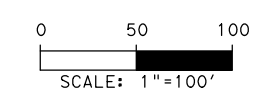
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 302+50-STA 326+50)

SHEET 12 OF 17

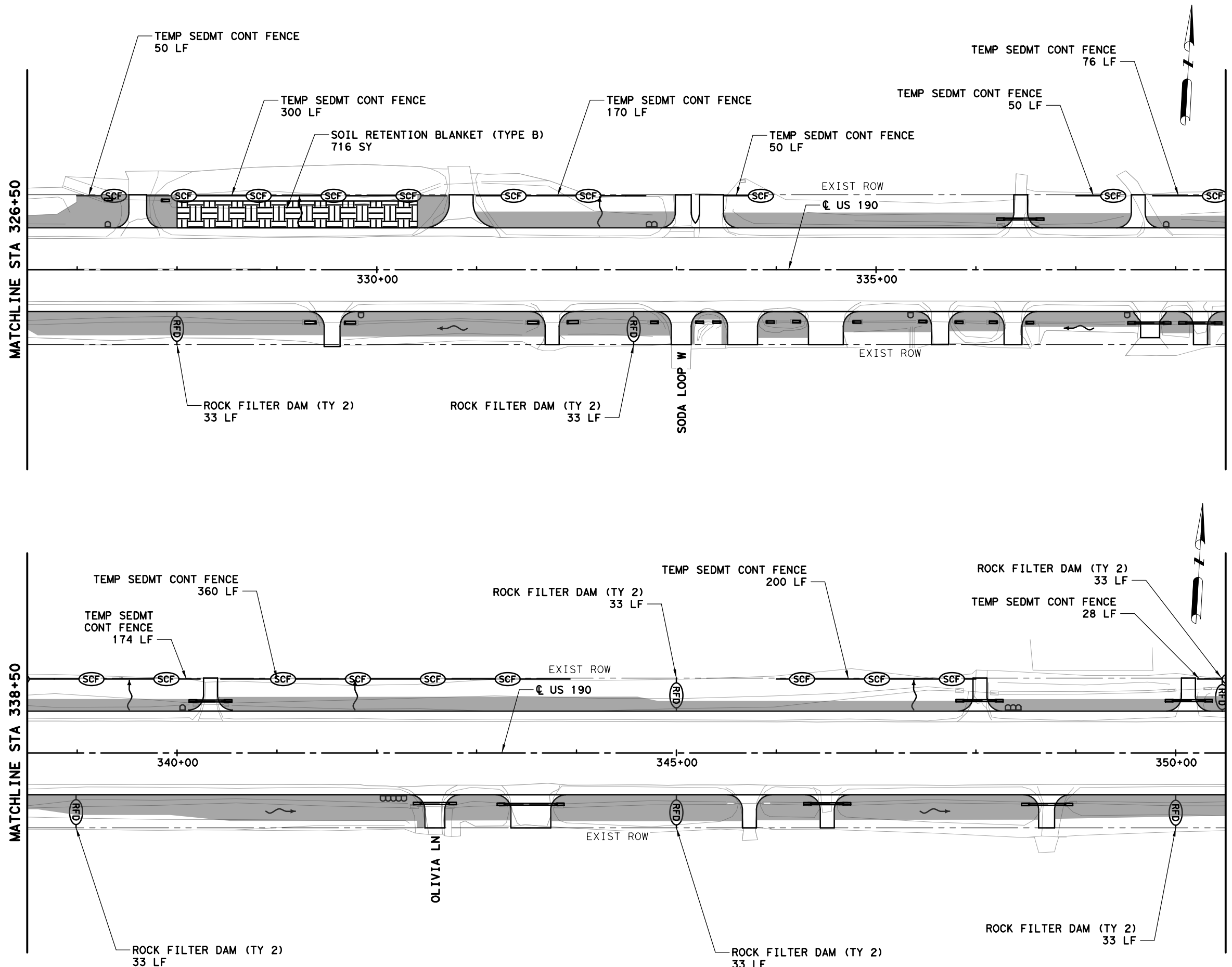
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		297	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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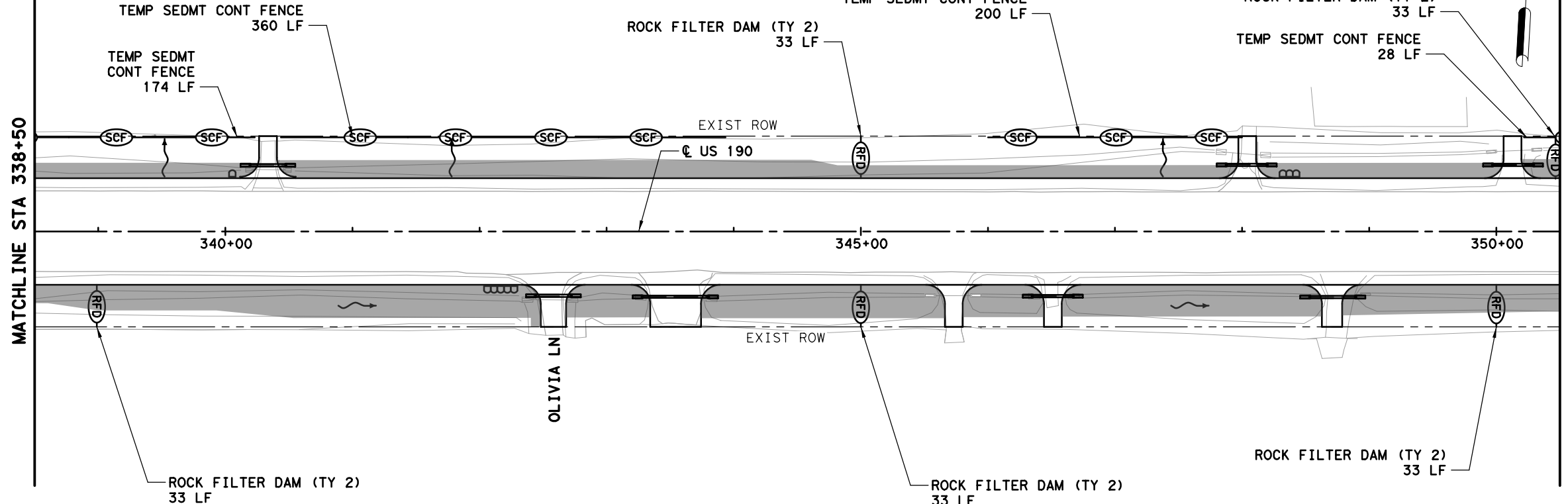
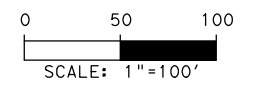
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT

(STA 326+50-STA 350+50)

SHEET 13 OF 17

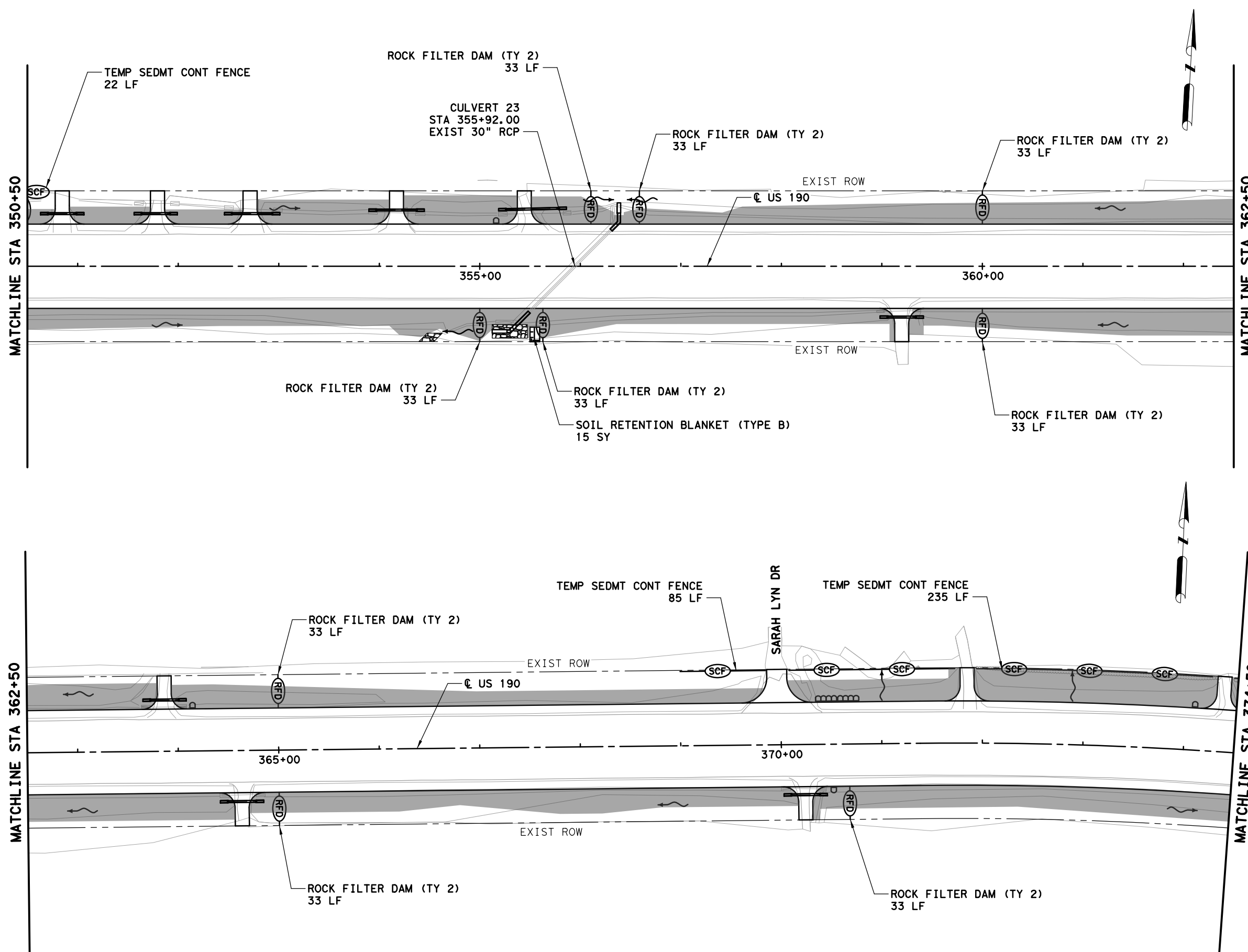


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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		298	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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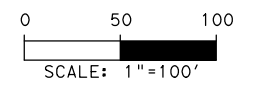
LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

NOTES:

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LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 350+50-STA 374+50)

SHEET 14 OF 17

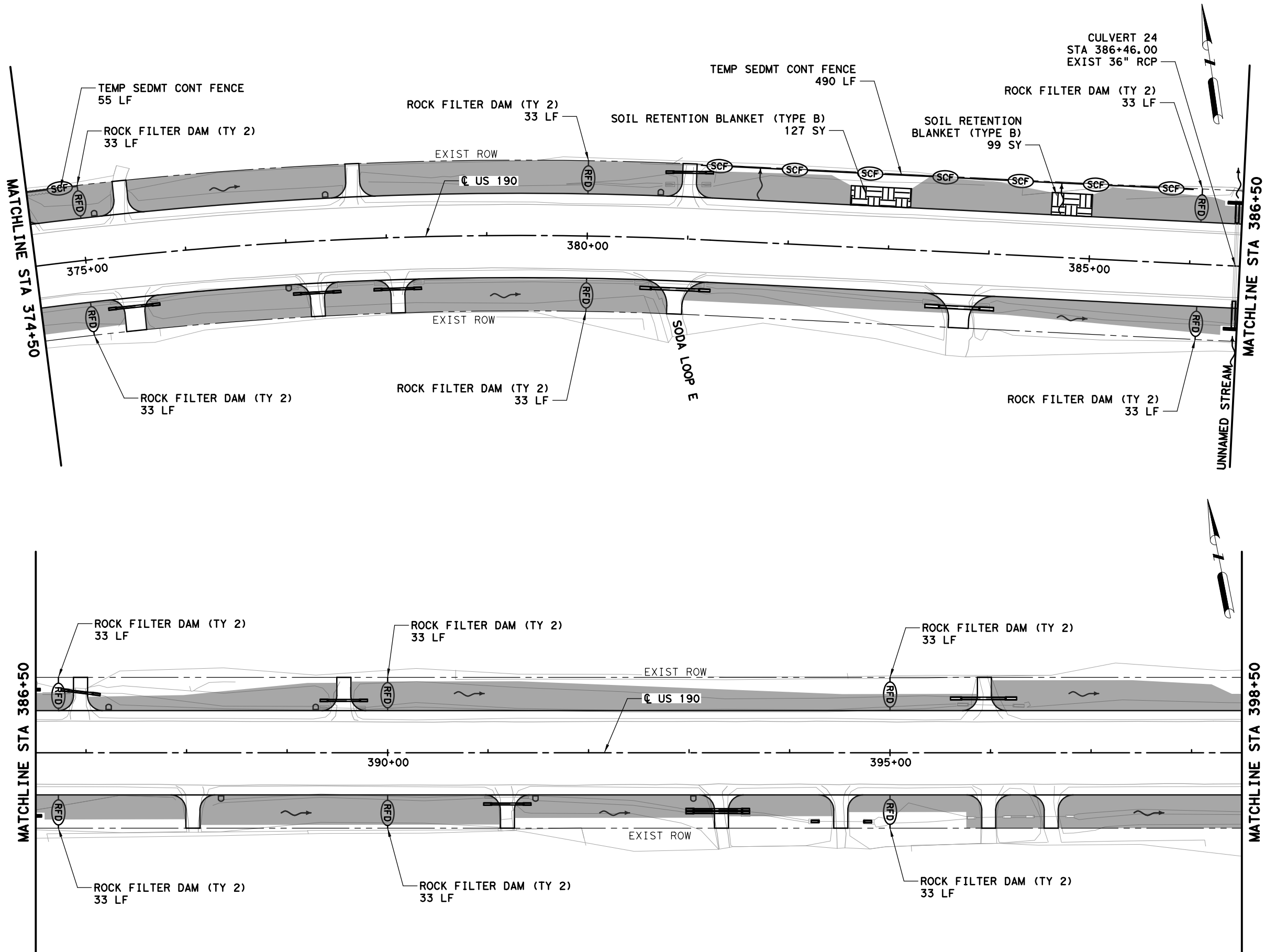
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 Tel: 281-558-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		299	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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 DATE: 05/13/2021
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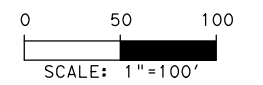
LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

NOTES:

1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.

LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
 (STA 374+50-STA 398+50)

SHEET 15 OF 17

Texas Department of Transportation

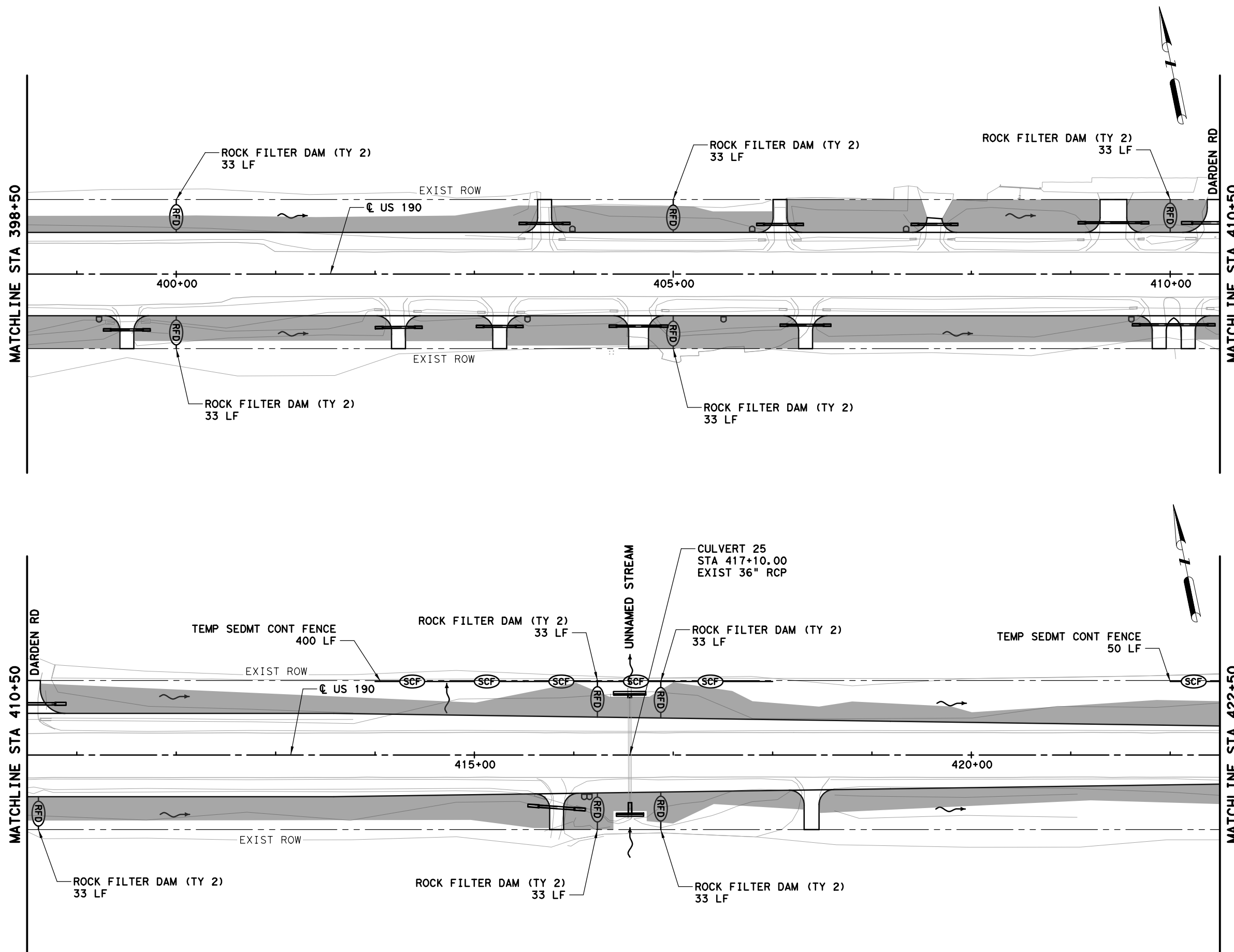
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FED. DIST. NO.	PROJECT NO.	SHEET NO.	
6		300	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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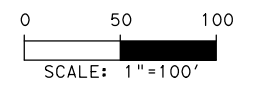
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
 2. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER. INQUIRE PRIOR TO PLACEMENT.
- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
(STA 398+50-STA 422+50)

SHEET 16 OF 17

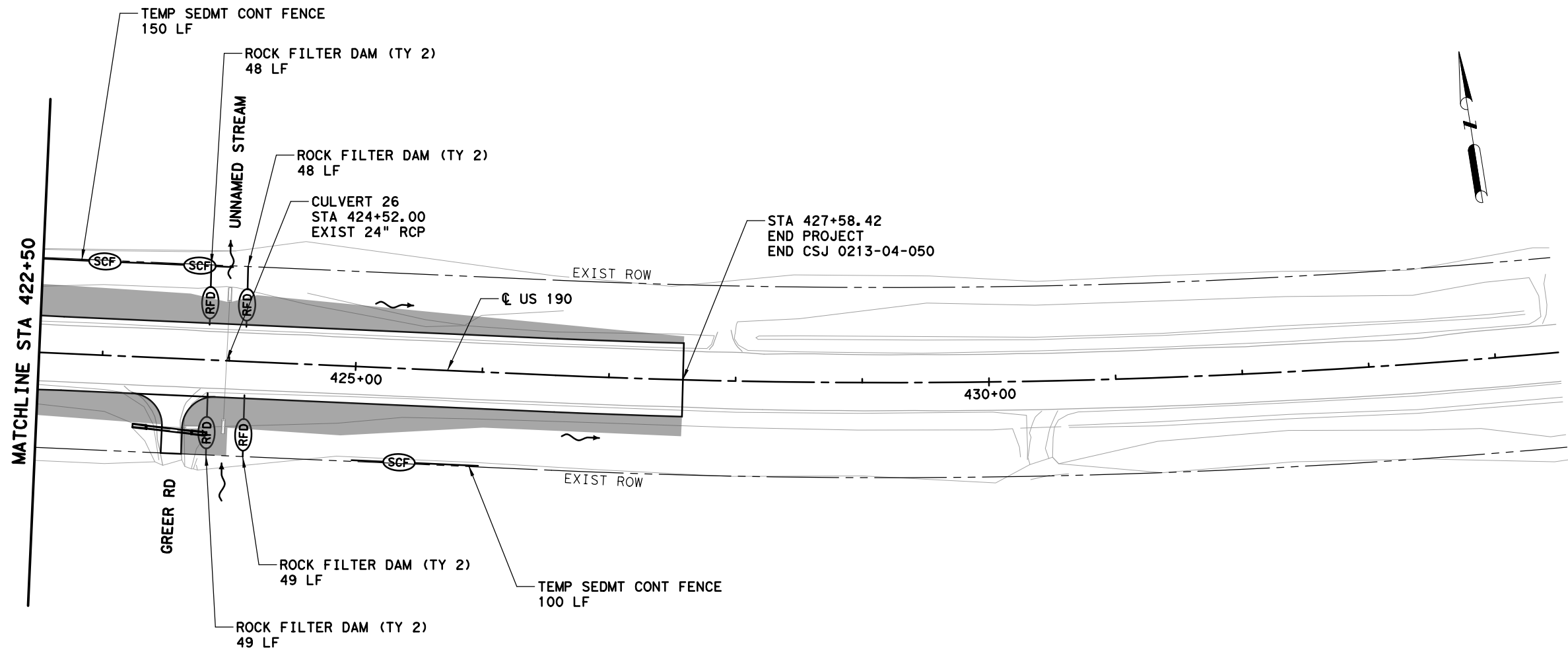
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FED. RD. DIV. NO.		PROJECT NO.		SHEET NO.	
6				301	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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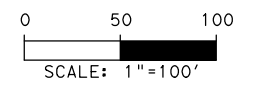
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 DATE: 05/13/2021
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LEGEND

- DIRECTION OF FLOW
- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- CONSTRUCTION EXITS
- DITCH FLOW
- CONSTRUCTION FENCE
- SOIL RETENTION BLANKETS
- AREA OF DISTURBANCE/ SEEDING
- CONC RIPRAP (4 IN)

- NOTES:**
1. PLACE SEEDING BETWEEN EDGE OF PAVEMENT AND RIGHT-OF-WAY WITHIN THE PROJECT LIMITS.
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- LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.



05/13/2021

SWP3 LAYOUT
(STA 422+50-END CSJ)

SHEET 17 OF 17

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FED. RD. DIV. NO.		PROJECT NO.		SHEET NO.	
6				302	
STATE	STATE DIST. NO.	COUNTY			
TEXAS	LFK	POLK			
CONT.	SECT.	JOB	HIGHWAY NO.		
0213	04	050	US 190		

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NOTES:

- (1) THE PURPOSE OF THIS SHEET IS TO POINT THE USER TO THE APPROPRIATE LOCATIONS TO FIND THE REQUIRED CONTENT OF THE SWP3.
- (2) THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SWP3.

PROJECT DESCRIPTION

- A. NATURE OF ACTIVITY: FOR CONSTRUCTION OF REHABILITATE EXISTING ROAD AND ADD CONTINUOUS TWO-WAY LEFT TURN LANE.
- B. POTENTIAL POLLUTANTS AND THEIR SOURCES:
 POLLUTANT: SEDIMENT SOURCE: DISTURBED SOIL
 POLLUTANT: OIL AND GREASE SOURCE: VEHICLES
- C. INTENDED SEQUENCE OF ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR ESTIMATED START DATES AND DURATION OF SOIL-DISTURBING ACTIVITIES
- D. TOTAL AREA OF SITE: 150.29 ACRES
 AREA TO BE DISTURBED: 40.96 ACRES
 CSJ 0213-04-050
- E. DATA DESCRIBING THE SOIL OR QUALITY OF ANY DISCHARGE FROM THE SITE: SAND, SANDY LOAM, CLAY, SANDY CLAY LOAM
- F. GENERAL LOCATION MAP: SEE TITLE SHEET OF THE PROJECT PLANS
- G. DETAILED SITE MAP/MAPS INDICATING THE FOLLOWING:
 - i. DRAINAGE PATTERNS: SEE SWP3 LAYOUTS
 - ii. ANTICIPATED SLOPES AFTER MAJOR GRADING ACTIVITIES: SEE TYPICAL SECTIONS
 - iii. AREAS WHERE SOIL DISTURBANCE WILL OCCUR: SEE SWP3 LAYOUTS
 - iv. LOCATIONS OF ALL CONTROLS OR BUFFERS (PLANNED/IN PLACE): SEE SWP3 LAYOUTS
 - v. LOCATIONS WHERE TEMPORARY OR PERMANENT STABILIZATION PRACTICES ARE EXPECTED TO BE USED: SEE SWP3 LAYOUTS
 - vi. LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES: SEE SWP3 LAYOUTS
 - vii. SURFACE WATERS, INCLUDING WETLANDS, AT, ADJACENT, OR IN CLOSE PROXIMITY TO THE SITE (* INDICATES IMPAIRED WATERS): SEE SWP3 LAYOUTS
 - viii. LOCATIONS WHERE STORMWATER DISCHARGES DIRECTLY TO A SURFACE WATER BODY OR MS4: SEE SWP3 LAYOUTS
 - ix. VEHICLE WASH AREAS: N/A
 - x. DESIGNATED POINTS ON THE SITE WHERE VEHICLES WILL EXIT FROM UNSTABLE DIRT TO PAVED ROAD: N/A
- H. LOCATION AND DESCRIPTION OF CONSTRUCTION SUPPORT ACTIVITIES AUTHORIZED UNDER THE PERMITTEE'S NOI: CONSTRUCTION SUPPORT ACTIVITIES ARE NOT COVERED UNDER THIS SWP3 AS IT IS NOT AUTHORIZED UNDER THIS PERMITTEE'S CGP. THE PERMITTEE WILL MAKE REFERENCE TO CONSTRUCTION SUPPORT ACTIVITIES THAT ARE COVERED UNDER THE CONTRACTOR'S SWP3 AND CGP ON SWP3 LAYOUTS
- I. NAME OF RECEIVING WATER(S) AT OR NEAR SITE: CHOATES CREEK AND UNNAMED TRIBUTARIES TO CHOATES & MENARD CREEK AND UNNAMED TRIBUTARIES TO MENARD.
 AN ASTERISK (*) INDICATES IMPAIRED WATER.
 NEAREST CLASSIFIED SEGMENT NUMBER: 0802
 CLASSIFIED SEGMENT NAME: TRINITY RIVER BELOW LAKE LIVINGSTON
- J. COPY OF TPDES GENERAL PERMIT: SEE SWP3 FILE
- K. NOI AND ACKNOWLEDGEMENT CERTIFICATE OR SITE NOTICE: SEE SWP3 FILE
- L. STORMWATER AND ALLOWABLE NON-STORMWATER DISCHARGE LOCATIONS: SEE SWP3 LAYOUTS
- M. LOCATIONS OF POLLUTANT GENERATING ACTIVITIES: ACTIVITIES AUTHORIZED UNDER THIS PERMITTEE'S CGP CAN BE FOUND ON SWP3 LAYOUTS. THIS SHEET WILL ALSO REFERENCE THE LOCATION OF POLLUTANT GENERATING ACTIVITIES THAT ARE COVERED BY THE CONTRACTOR'S CGP AND SWP3.

DESCRIPTION OF BMPS

A. GENERAL REQUIREMENTS: EROSION AND SEDIMENT CONTROLS SHOWN ON SWP3 LAYOUTS WERE DESIGNED TO RETAIN SEDIMENT ON-SITE TO THE EXTENT PRACTICABLE WITH CONSIDERATION OF LOCAL TOPOGRAPHY, SOIL TYPE, AND RAINFALL. THE EROSION AND SEDIMENT CONTROLS WILL BE INSTALLED AND MAINTAINED ACCORDING TO MANUFACTURER AND TXDOT STORM WATER MANAGEMENT GUIDELINES. CONTROLS TO MINIMIZE THE OFF-SITE TRANSPORT OF LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION MATERIALS INCLUDE: CONSTRUCTION MATERIALS TO BE STORED IN LOCATIONS THAT MINIMIZE THEIR EXPOSURE TO PRECIPITATION & STORM WATER RUNOFF; COLLECTION OF CONSTRUCTION DEBRIS IN RECEPTACLES WITH A SECURE COVER MEETING STATE AND LOCAL SOLID WASTE MANAGEMENT REGULATIONS; HAULING AND EMPTYING RECEPTACLES AT APPROVED LANDFILL SITES; PROHIBITING THE BURIAL OF CONSTRUCTION DEBRIS; COLLECTION OF SANITARY WASTE FROM PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

B. EROSION CONTROL AND STABILIZATION PRACTICES

<u>T,P</u> TEMP/PERM SEEDING	<u>P</u> PROTECTION OF TREES AND VEGETATION
<u>-</u> MULCHING (HAY OR STRAW)	<u>-</u> GEOTEXTILES
<u>-</u> VEGETATIVE BUFFER STRIPS	<u>T</u> SLOPE TEXTURING
<u>-</u> SOD STABILIZATION	<u>-</u> TEMP VELOCITY DISSIPATION DEVICES
<u>P</u> BLOCK SOD	<u>-</u> FLOW DIVERSION MECHANISMS
<u>P</u> OTHER (SOIL RETENTION BLANKETS)	T = TEMPORARY; P = PERMANENT

DATES:

- 1. MAJOR GRADING ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR THESE DATES
- 2. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE: _____
- 3. WHEN STABILIZATION MEASURES ARE INITIATED: _____

INITIATE EROSION CONTROL AND STABILIZATION MEASURES IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. INITIATE STABILIZATION MEASURES THAT PROVIDE A PROTECTIVE COVER IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. "IMMEDIATELY" MEANS NO LATER THAN THE NEXT WORK DAY FOLLOWING THE DAY WHEN THE SOIL-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. STABILIZATION MEASURES MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION BEGINS.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

C. SEDIMENT CONTROL PRACTICES

<u>T</u> SILT FENCE	<u>-</u> VEGETATIVE BUFFER STRIPS
<u>T</u> OTHER (ROCK FILTER DAMS)	

IF SITE WILL DISTURB 10 OR MORE ACRES WITHIN A COMMON DRAINAGE LOCATION AND A SEDIMENTATION BASIN IS NOT FEASIBLE, PROVIDE REASON: NOT ENOUGH SPACE WITHIN ROW

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

DESCRIPTION OF PERMANENT STORM WATER CONTROLS

PROVIDE A DESCRIPTION OF ANY MEASURES THAT WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT MAY OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED: N/A

OTHER REQUIRED CONTROLS AND BMPS

TXDOT WILL UTILIZE ROCK AT CONSTRUCTION ENTRANCES AND SPRINKLING, AS NEEDED, TO MINIMIZE OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST.

SEE SECTION A ABOVE FOR DESCRIPTION OF CONSTRUCTION AND WASTE MATERIALS AND CONTROLS USED FOR THOSE THAT MAY BE STORED ON-SITE.

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, FUELS, MOTOR OIL, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. STORE MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS. CONTACT THE SPILL COORDINATOR IMMEDIATELY IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS.

MAINTENANCE REQUIREMENTS

EFFECTIVELY MAINTAIN THE OPERATING CONDITIONS OF ALL EROSION AND SEDIMENT CONTROL AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THE SWP3. IF SITE INSPECTIONS REQUIRED BY THIS PERMIT IDENTIFY BMP'S THAT ARE NOT OPERATING EFFECTIVELY, MAINTENANCE SHALL BE PERFORMED BEFORE THE NEXT ANTICIPATED STORM EVENT, OR AS NECESSARY TO MAINTAIN THE CONTINUED EFFECTIVENESS OF STORM WATER CONTROLS. IF MAINTENANCE PRIOR TO THE NEXT ANTICIPATED STORM EVENT IS UNPRACTICABLE, SCHEDULE AND ACCOMPLISH MAINTENANCE AS SOON AS PRACTICAL. CONTROLS THAT HAVE BEEN INTENTIONALLY DISABLED, RUN-OVER, REMOVED OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY UPON DISCOVERY. IF A CONTROL HAS BEEN USED INCORRECTLY, IS PERFORMING INADEQUATELY OR IS DAMAGED, THE OPERATOR SHALL REPLACE OR MODIFY THE CONTROL AS SOON AS PRACTICABLE AFTER THE DISCOVERY.

INSPECTION OF CONTROLS

A) QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, ONCE EVERY 7 CALENDAR DAYS. DISTURBED AREAS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. SEDIMENT AND EROSION CONTROL MEASURES IDENTIFIED ON THE SWP3 SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

D) THE SWP3 MUST BE MODIFIED BASED ON THE RESULTS OF INSPECTION TO BETTER CONTROL POLLUTANTS IN RUNOFF. REVISIONS TO THE SWP3 MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOLLOWING THE INSPECTION. IF EXISTING BMPS ARE MODIFIED OR ADDITIONAL BMPS ARE NECESSARY, AN IMPLEMENTATION SCHEDULE MUST BE DESCRIBED IN THE SWP3. IMPLEMENTATION OF CHANGES SHOULD BE DONE PRIOR TO THE NEXT STORM EVENT IF POSSIBLE, OTHERWISE, THEY SHOULD BE DONE AS SOON AS PRACTICABLE.

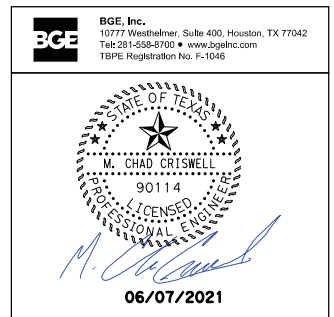
E) A REPORT SUMMARIZING THE SCOPE, DATE, NAME AND QUALIFICATIONS OF INSPECTOR, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWP3 SHALL BE PRODUCED AND RETAINED AS PART OF THE SWP3. MAJOR OBSERVATIONS INCLUDE: LOCATIONS OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE, LOCATIONS OF BMPS THAT NEED TO BE MAINTAINED, LOCATIONS OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION AND LOCATIONS WHERE BMPS ARE NEEDED. ACTIONS TAKEN AS A RESULT OF INSPECTIONS MUST BE DESCRIBED WITHIN AND RETAINED AS PART OF THE SWP3. REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE, THE REPORT MUST CONTAIN A CERTIFICATION THAT THE SITE IS IN COMPLIANCE WITH THE SWP3 AND PERMIT.

OTHER SWP3 CONTENT

TXDOT WILL ENSURE THE APPROPRIATE POLLUTION PREVENTION MEASURES (I.E. VEGETATED BUFFER STRIPS, SILT FENCE, ETC.) ARE IDENTIFIED AND IMPLEMENTED FOR ALL ELIGIBLE NON-STORMWATER WATER COMPONENTS OF DISCHARGE SUCH AS WASHING OF VEHICLES, STRUCTURES, AND PAVEMENT WHERE SOAPS AND DETERGENTS ARE NOT USED AND THE PURPOSE IS TO REMOVE DIRT, MUD OR DUST; UNCONTAMINATED WATER USED FOR DUST CONTROL; AND LAWN WATERING AND SIMILAR IRRIGATION DRAINAGE.

CHECKLIST FOR CONTENTS OF AREA OFFICE SWP3 FILE:

- CONTACT FORM *
- NOI AND ACKNOWLEDGEMENT CERTIFICATE (IF EQUAL OR GREATER THAN 5 ACRES)
- APPLICABLE CONSTRUCTION SITE NOTICE *
- SWP3 CERTIFICATION STATEMENT (SIGNED BY AE)
- TPDES GENERAL PERMIT
- SWP3 PLAN
- INSPECTION AND MAINTENANCE REPORT
- INSPECTOR QUALIFICATION FORM
- DELEGATION OF SIGNATURE AUTHORITY (ALL INSPECTORS SIGNING REPORTS)
- NOTICE OF TERMINATION



* SYMBOL INDICATES THAT THE INFORMATION SHOULD BE DISPLAYED ON THE PROJECT BULLETIN BOARD

ANY REPORTABLE QUANTITY OF HAZARDOUS MATERIAL RELEASE MUST BE REPORTED TO NATIONAL RESPONSE CENTER AT 1-800-424-8802 AND TO STATE OF TEXAS SPILL-REPORTING HOTLINE AT 1-800-832-8224

TXDOT SWP3 INDEX (SWP3I)

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CONT	SECT	JOB	HIGHWAY
0213	04	050	US 190
DIST		COUNTY	SHEET NO.
LFK		POLK	303

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DATE: \$DATE\$ \$TIME\$
FILE: \$FILE\$

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. N/A
 No Action Required Required Action
 Action No.

exceeds more than 5 acres of ground disturbance; therefore, TPDES Construction General Permit (CGP) applies. The following actions are required:

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with SWP3 and water quality requirements associated with Section 404 and 401 permits; revise when necessary to control pollution or required by Engineer.
3. The project will

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

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):

No Permit Required
 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)
 Individual 404 Permit Required
 Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. Project contains several waters of the U.S., including: Choates Creek Menard Creek, Unnamed tributaries and associated wetlands. Refer to USACE permit application for further information for locations and permitted work.
2. Work on this project requires authorization from Galveston District United States Army Corps of Engineers (USACE) under Nationwide Permit 14 Pre-construction Notification. No work, including equipment/material storage or construction equipment access, is allowed between station 210+00 and 214+00 and between station 295+00 and 309+00 until USACE authorization has been obtained. Engineer shall provide a copy of the authorization and permit application to the contractor once received.
3. Please refer to USACE Authorization letter and EPIC sheet 2 of 2 for NWP #14 with PCN permit requirements.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
<input type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input checked="" type="checkbox"/> Blankets/Matting	<input checked="" type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input checked="" type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input checked="" type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input checked="" type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> Grassy Swales

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.

No Action Required Required Action
 Action No.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. 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.

No Action Required Required Action
 Action No.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

If any federally listed species are observed, cease work in the area immediately, do not disturb species or habitat and contact the Engineer.

No Action Required Required Action
 Action No.

1. In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

TPWD Commitment Notes:

1. Alligator snapping turtle, Southern crawfish frog, Southern dusky salamander, Strecker's chorus frog, Woodhouse's toad, Blackbelted crayfish, and Neches Crayfish may occur in the project area. Avoid harming species if encountered. PSLs proposed within state-owned ROW should be located in uplands away from aquatic features. Minimize impacts to shoreline basking/overwinter sites (e.g. sand bars, exposed rock, debris piles, crayfish burrows) where feasible. Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for aquatic reptiles and amphibians, where feasible.
2. Eastern spotted skunk, Long-tailed weasel, Swamp rabbit, and Woodland vole may occur in the project area. Avoid harming species if encountered. Avoid or minimize disturbing or removing logs, leaf litter, stumps, and dens, where feasible.
3. Timber rattlesnake may occur in the project area. Avoid harming species if encountered. If the species is found on project site, allow species to safely leave the project area. Visually inspect excavation areas for trapped wildlife prior to backfilling. Avoid or minimize disturbing or removing down trees, rotting stumps, and leaf litter, where feasible.
4. Louisiana Pigtoe, Texas Heelsplitter, Blackspot shiner, Sabine shiner, and Western Creek chubsucker may occur in the project area. Install and maintain Water Quality BMPs associated with Section 404 & 401 (i.e. silt fence, rock filter dams, avoid impact WOTUS, etc.) around creeks and aquatic features that cross the project area to avoid impacts to aquatic wildlife.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SWP3: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) 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 Material Safety Data Sheets (MSDS) 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 bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. 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.

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

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

Yes No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

No Action Required Required Action


Action No.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

No Action Required Required Action

Action No.

		Design Division Standard		
<h2>ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS</h2> <h3>EPIC</h3>				
SHEET 1 OF 2				
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
12-12-2011 1051 REVISIONS	0213	04	050	US 190
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	LFK	POLK	304	

NWP GENERAL CONDITIONS

AS APPLICABLE TO
THIS PROJECT

2. AQUATIC LIFE MOVEMENTS. NO ACTIVITY MAY SUBSTANTIALLY DISRUPT THE NECESSARY LIFE CYCLE MOVEMENTS OF THOSE SPECIES OF AQUATIC LIFE INDIGENOUS TO THE WATERBODY, INCLUDING THOSE SPECIES THAT NORMALLY MIGRATE THROUGH THE AREA, UNLESS THE ACTIVITY'S PRIMARY PURPOSE IS TO IMPOUND WATER.
3. SPAWNING AREAS. ACTIVITIES IN SPAWNING AREAS DURING SPAWNING SEASONS MUST BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. ACTIVITIES THAT RESULT IN THE PHYSICAL DESTRUCTION (E.G., THROUGH EXCAVATION, FILL, OR DOWNSTREAM SMOTHERING BY SUBSTANTIAL TURBIDITY) OF AN IMPORTANT SPAWNING AREA ARE NOT AUTHORIZED.
6. SUITABLE MATERIAL. NO ACTIVITY MAY USE UNSUITABLE MATERIAL (E.G., TRASH, DEBRIS, CAR BODIES, ASPHALT, ETC.). MATERIAL USED FOR CONSTRUCTION OR DISCHARGED MUST BE FREE FROM TOXIC POLLUTANTS IN TOXIC AMOUNTS (SEE SECTION 307 OF THE CLEAN WATER ACT).
8. ADVERSE EFFECTS FROM IMPOUNDMENTS. IF THE ACTIVITY CREATES AN IMPOUNDMENT OF WATER, ADVERSE EFFECTS TO THE AQUATIC SYSTEM DUE TO ACCELERATING THE PASSAGE OF WATER, AND/OR RESTRICTING ITS FLOW MUST BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE.
9. MANAGEMENT OF WATER FLOWS. TO THE MAXIMUM EXTENT PRACTICABLE, THE PRE-CONSTRUCTION COURSE, CONDITION, CAPACITY, AND LOCATION OF OPEN WATERS MUST BE MAINTAINED FOR EACH ACTIVITY, INCLUDING STREAM CHANNELIZATION AND STORM WATER MANAGEMENT ACTIVITIES, EXCEPT AS PROVIDED BELOW. THE ACTIVITY MUST BE CONSTRUCTED TO WITHSTAND EXPECTED HIGH FLOWS. THE ACTIVITY MUST NOT RESTRICT OR IMPEDE THE PASSAGE OF NORMAL OR HIGH FLOWS, UNLESS THE PRIMARY PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER OR MANAGE HIGH FLOWS. THE ACTIVITY MAY ALTER THE PRE-CONSTRUCTION COURSE, CONDITION, CAPACITY, AND LOCATION OF OPEN WATERS IF IT BENEFITS THE AQUATIC ENVIRONMENT (E.G., STREAM RESTORATION OR RELOCATION ACTIVITIES).
11. EQUIPMENT. HEAVY EQUIPMENT WORKING IN WETLANDS OR MUD FLATS MUST BE PLACED ON MATS, OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE.
12. SOIL EROSION AND SEDIMENT CONTROLS. APPROPRIATE SOIL EROSION AND SEDIMENT CONTROLS MUST BE USED AND MAINTAINED IN EFFECTIVE OPERATING CONDITION DURING CONSTRUCTION, AND ALL EXPOSED SOIL AND OTHER FILLS, AS WELL AS ANY WORK BELOW THE ORDINARY HIGH WATER MARK OR HIGH TIDE LINE, MUST BE PERMANENTLY STABILIZED AT THE EARLIEST PRACTICABLE DATE. PERMITTEES ARE ENCOURAGED TO PERFORM WORK WITHIN WATERS OF THE UNITED STATES DURING PERIODS OF LOW-FLOW OR NO-FLOW.
13. REMOVAL OF TEMPORARY FILLS. TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO PRE-CONSTRUCTION ELEVATIONS. THE AFFECTED AREAS MUST BE REVEGETATED, AS APPROPRIATE.
14. PROPER MAINTENANCE. ANY AUTHORIZED STRUCTURE OR FILL SHALL BE PROPERLY MAINTAINED, INCLUDING MAINTENANCE TO ENSURE PUBLIC SAFETY AND COMPLIANCE WITH APPLICABLE NWP GENERAL CONDITIONS, AS WELL AS ANY ACTIVITY-SPECIFIC CONDITIONS ADDED BY THE DISTRICT ENGINEER TO AN NWP AUTHORIZATION.
23. MITIGATION. THE DISTRICT ENGINEER WILL CONSIDER SEVERAL FACTORS WHEN DETERMINING APPROPRIATE AND PRACTICABLE MITIGATION NECESSARY TO ENSURE THAT ADVERSE EFFECTS ON THE AQUATIC ENVIRONMENT ARE MINIMAL.
25. WATER QUALITY. WHERE STATES AND AUTHORIZED TRIBES, OR EPA WHERE APPLICABLE, HAVE NOT PREVIOUSLY CERTIFIED COMPLIANCE OF AN NWP WITH CWA SECTION 401, INDIVIDUAL 401 WATER QUALITY CERTIFICATION MUST BE OBTAINED OR WAIVED (SEE 33 CFR 330.4(C)). THE DISTRICT ENGINEER OR STATE OR TRIBE MAY REQUIRE ADDITIONAL WATER QUALITY MANAGEMENT MEASURES TO ENSURE THAT THE AUTHORIZED ACTIVITY DOES NOT RESULT IN MORE THAN MINIMAL DEGRADATION OR WATER QUALITY.
27. REGIONAL AND CASE-BY-CASE CONDITIONS. THE ACTIVITY MUST COMPLY WITH ANY REGIONAL CONDITIONS THAT MAY HAVE BEEN ADDED BY THE DIVISION ENGINEER (SEE 33 CFR 330.4(E)) AND WITH ANY CASE SPECIFIC CONDITIONS ADDED BY THE CORPS OR BY THE STATE, INDIAN TRIBE, OR U.S. EPA IN ITS SECTION 401 WATER QUALITY CERTIFICATION, OR BY THE STATE IN ITS COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION.

FOR A COMPLETE LIST OF GENERAL CONDITIONS GO TO:

<http://www.swf.usace.army.mil/Missions/Regulatory/Permitting/NationwideGeneralPermits.aspx>

USACE - PERMIT #14

AS APPLICABLE TO
THIS PROJECT

ACTIVITIES REQUIRED FOR CROSSINGS OF WATERS OF THE UNITED STATES ASSOCIATED WITH THE CONSTRUCTION, EXPANSION, MODIFICATION, OR IMPROVEMENT OF LINEAR TRANSPORTATION PROJECTS (E.G., ROADS, HIGHWAYS, RAILWAYS, TRAILS, AIRPORT RUNWAYS, AND TAXIWAYS) IN WATERS OF THE U.S. FOR LINEAR TRANSPORTATION PROJECTS IN NON-TIDAL WATERS, THE DISCHARGE CANNOT CAUSE THE LOSS OF GREATER THAN 1/2-ACRE OF WATERS OF THE U.S. ANY STREAM CHANNEL MODIFICATION, INCLUDING BANK STABILIZATION, IS LIMITED TO THE MINIMUM NECESSARY TO CONSTRUCT OR PROTECT THE LINEAR TRANSPORTATION PROJECT; SUCH MODIFICATIONS MUST BE IN THE IMMEDIATE VICINITY OF THE PROJECT.

THIS NWP ALSO AUTHORIZES TEMPORARY STRUCTURES, FILLS, AND WORK NECESSARY TO CONSTRUCT THE LINEAR TRANSPORTATION PROJECT. APPROPRIATE MEASURES MUST BE TAKEN TO MAINTAIN DOWNSTREAM FLOWS AND MINIMIZE FLOODING TO THE MAXIMUM EXTENT PRACTICABLE, WHEN TEMPORARY STRUCTURES, WORK, AND DISCHARGES, INCLUDING COFFERDAMS, ARE NECESSARY FOR CONSTRUCTION ACTIVITIES, ACCESS FILLS, OR DEWATERING OF CONSTRUCTION SITES. TEMPORARY FILLS MUST CONSIST OF MATERIALS, AND BE PLACED IN A MANNER THAT WILL NOT BE ERODED BY EXPECTED HIGH FLOWS. TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO PRE-CONSTRUCTION ELEVATIONS. THE AREAS AFFECTED BY TEMPORARY FILLS MUST BE REVEGETATED, AS APPROPRIATE.

THIS NWP CANNOT BE USED TO AUTHORIZE NON-LINEAR FEATURES COMMONLY ASSOCIATED WITH TRANSPORTATION PROJECTS, SUCH AS VEHICLE MAINTENANCE OR STORAGE BUILDINGS, PARKING LOTS, TRAIN STATIONS, OR AIRCRAFT HANGARS.

NOTIFICATION: THE PERMITTEE MUST SUBMIT A PRE-CONSTRUCTION NOTIFICATION (PCN) TO THE DISTRICT ENGINEER PRIOR TO COMMENCING THE ACTIVITY IF: (1) THE LOSS OF WATERS OF THE U.S. EXCEEDS 1/10-ACRE; OR (2) THERE IS A DISCHARGE IN A SPECIAL AQUATIC SITE, INCLUDING WETLANDS.

NOTE:

THE PROJECT CROSSES JURISDICTIONAL WATERS OF THE U.S. AND A NWP #14 WITH A PRE-CONSTRUCTION NOTIFICATION (PCN) HAS BEEN UTILIZED. THIS PERMIT AUTHORIZES THE ACTIVITIES WHICH WILL IMPACT WATERS OF THE U.S. THE NWP GENERAL CONDITIONS AND THE NWP #14 LIMITS DESCRIBED IN THE PCN MUST BE FOLLOWED IN ORDER TO MAINTAIN COMPLIANCE WITH THE NWP. IF IMPACTS WILL EXCEED THOSE SET FORTH IN THE PCN, CONTACT THE TXDOT LUFKIN DISTRICT ENVIRONMENTAL SECTION AT 1-800-687-8087 PRIOR TO INITIATING WORK AS ADDITIONAL COORDINATION WITH THE USACE MAY BE REQUIRED.

**ENVIRONMENTAL PERMITS,
ISSUES AND COMMITMENTS (EPIC) □**

USACE



**EPIC
(ENVIRONMENTAL PERMITS,
ISSUES AND COMMITMENTS)**

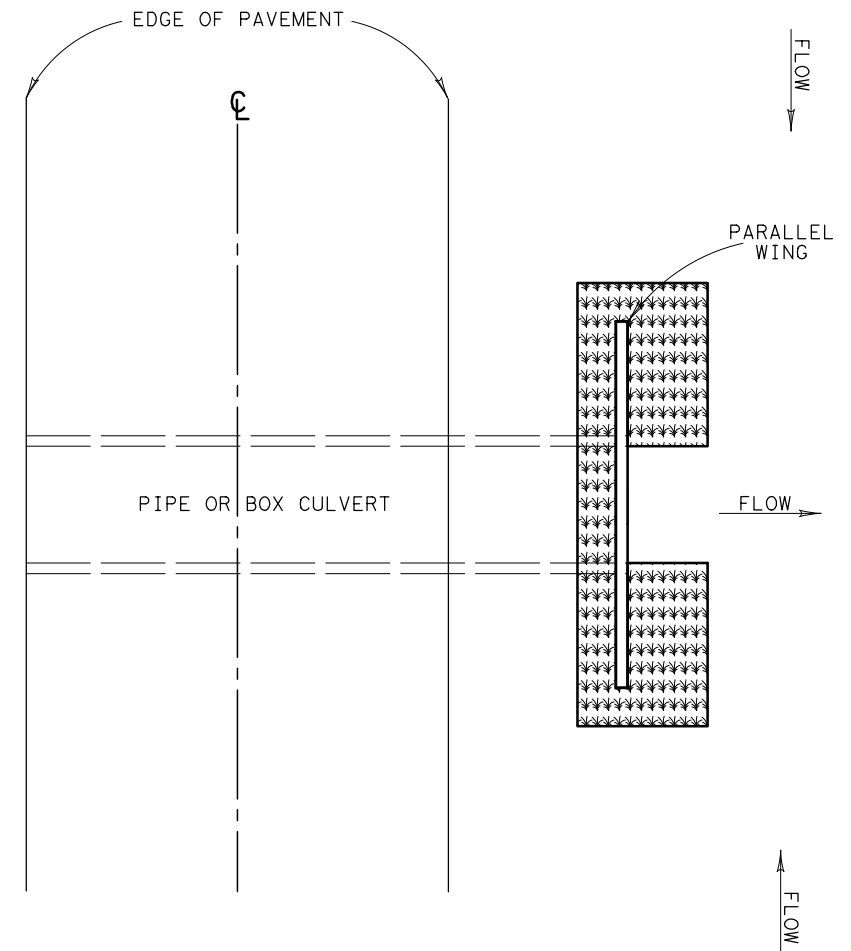
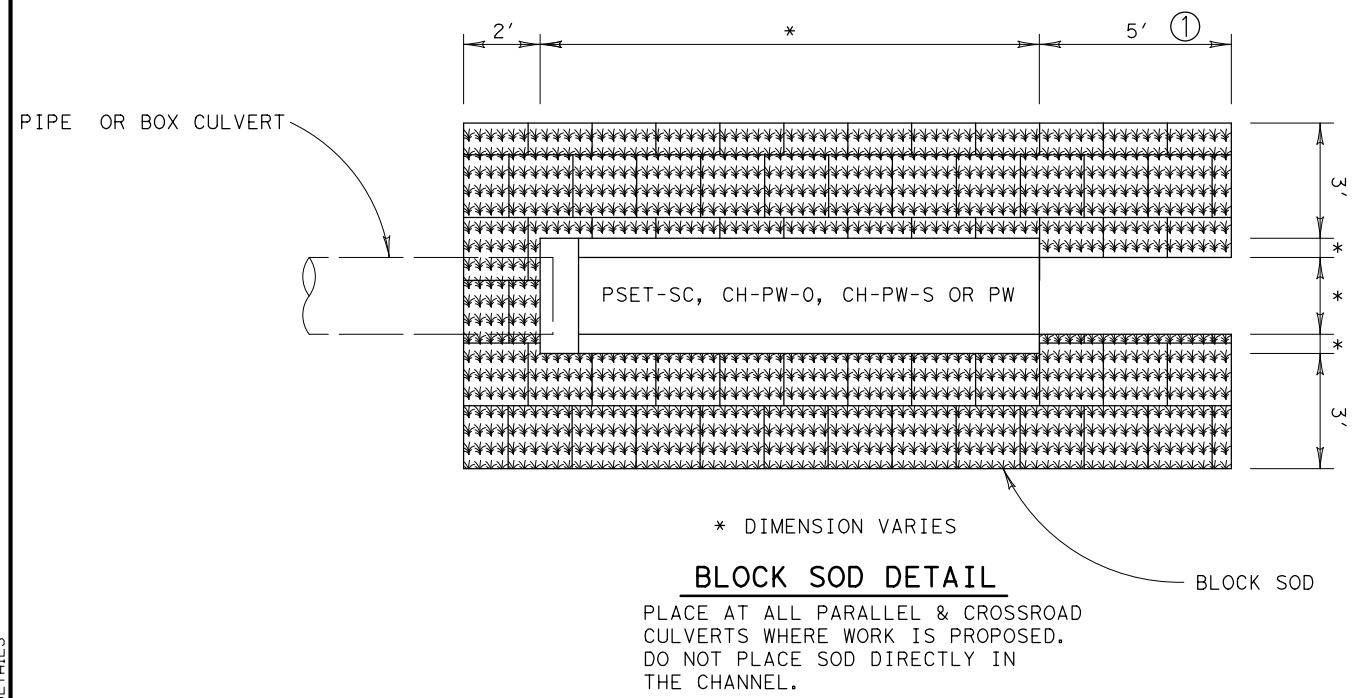
SHEET 2 OF 2

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© TXDOT: February 2015	CONT	SECT	JOB	HIGHWAY
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05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	LFK	POLK	305	

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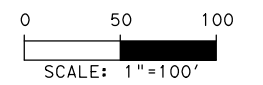
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PARALLEL WING CROSS DRAINAGE DETAIL ①

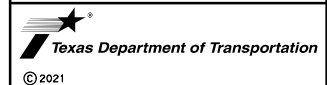
LEGEND
 BLOCK SODDING



① DO NOT PLACE BLOCK SOD WHERE RIPRAP (STONE COMMON) IS INSTALLED.

05/13/2021

BLOCK SOD DETAILS

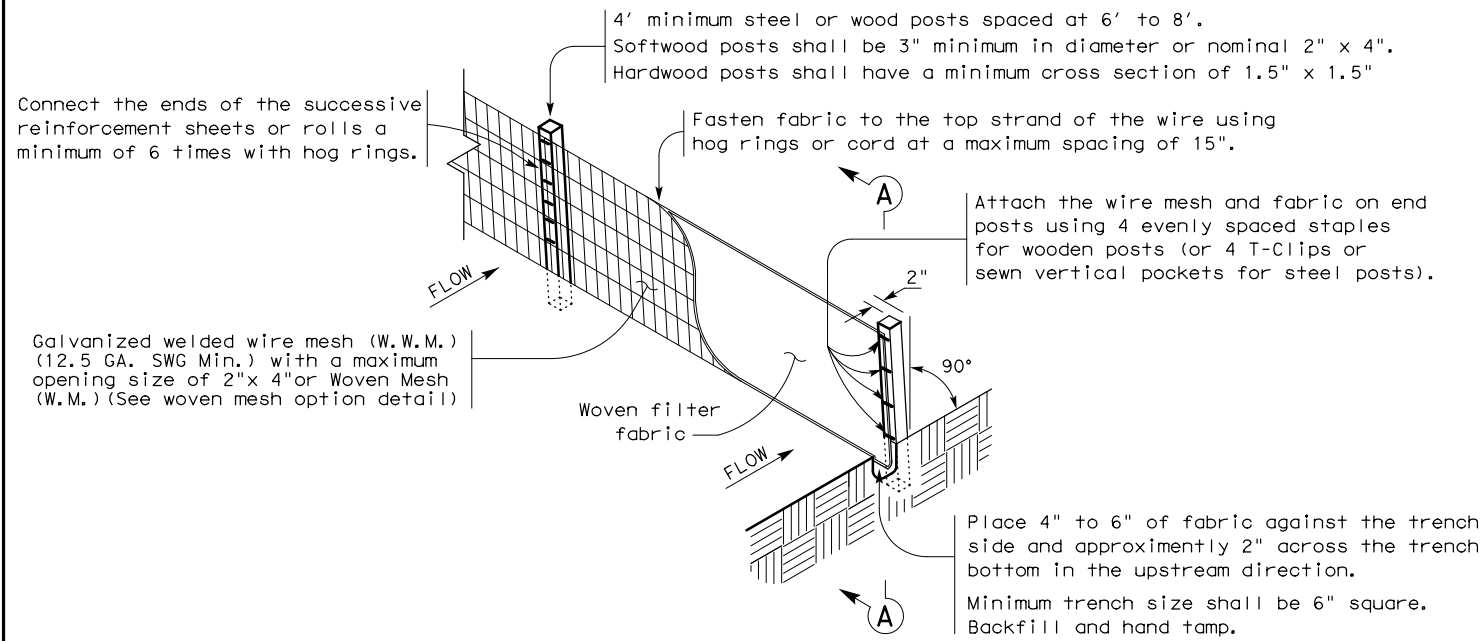


BGE, Inc.
 10777 Westheimer, Suite 400, Houston, TX 77042
 Tel: 281-558-8700 • www.bgeinc.com
 TBPE Registration No. F-1046

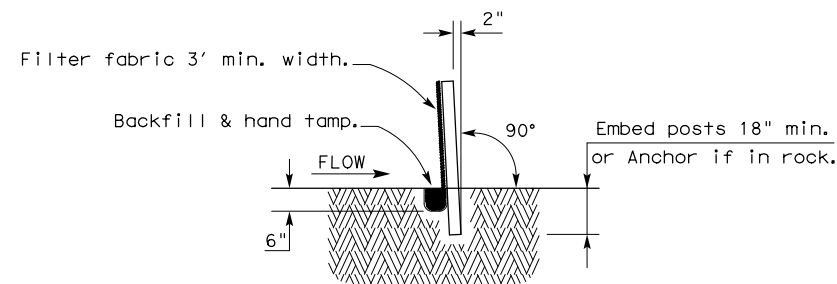
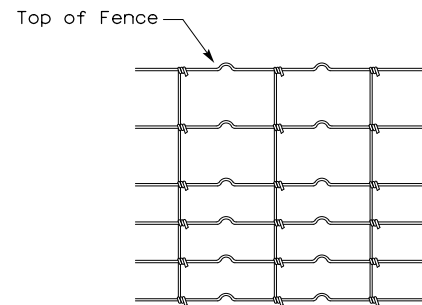
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		306	
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TEXAS	LFK	POLK	
CONT.	SECT.	JOB	HIGHWAY NO.
0213	04	050	US 190

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TEMPORARY SEDIMENT CONTROL FENCE



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.

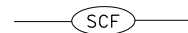
SEDIMENT CONTROL FENCE USAGE GUIDELINES

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/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

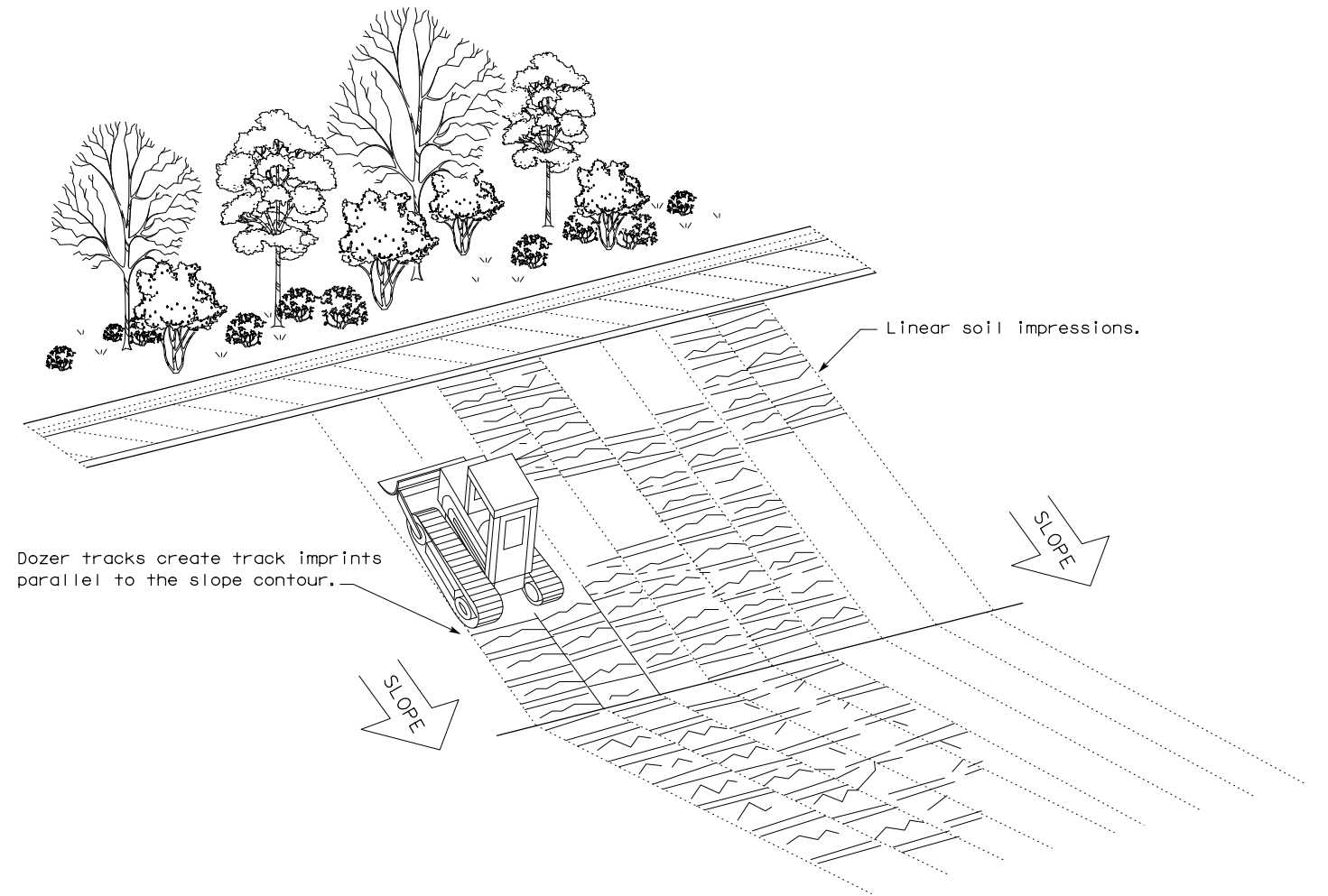
LEGEND

Sediment Control Fence



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 continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

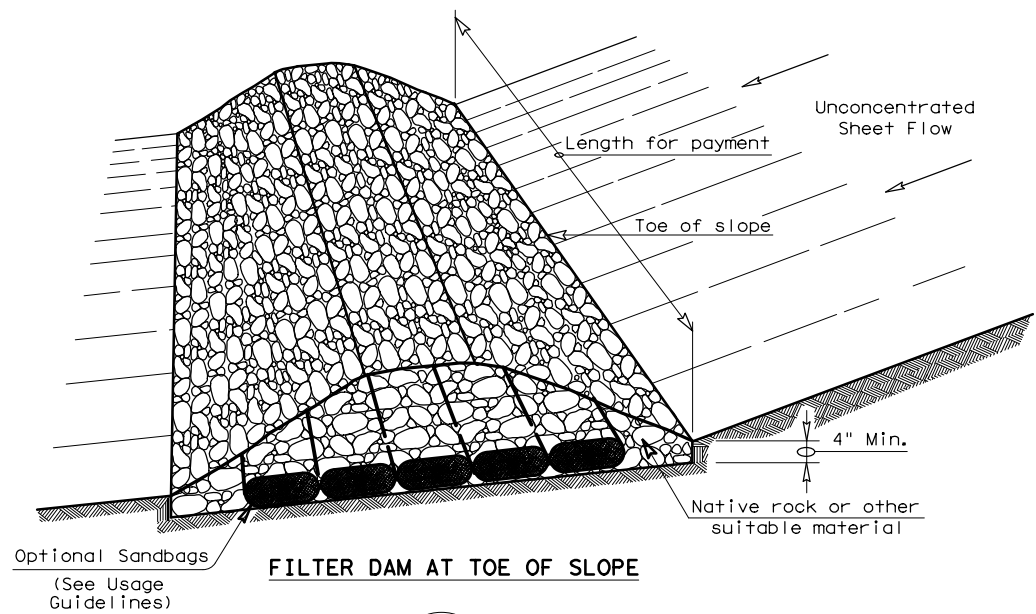


VERTICAL TRACKING

				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	0213	04	050	US 190	
	DIST	COUNTY		SHEET NO.	
	LFK	POLK		307	

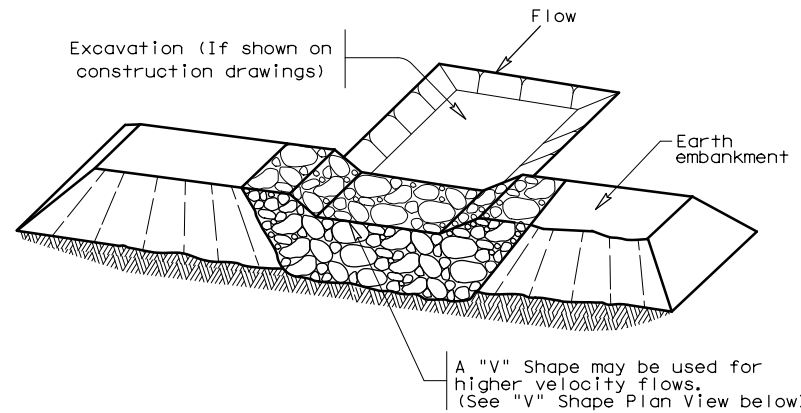
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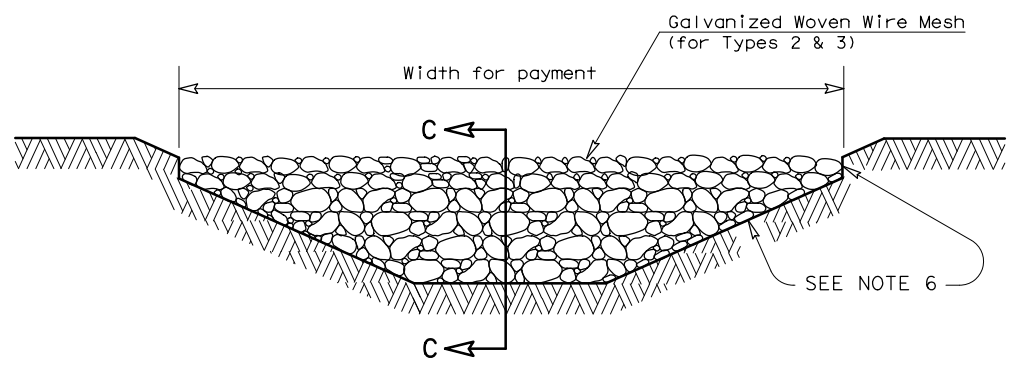
FILTER DAM AT TOE OF SLOPE

— (RFD1) —



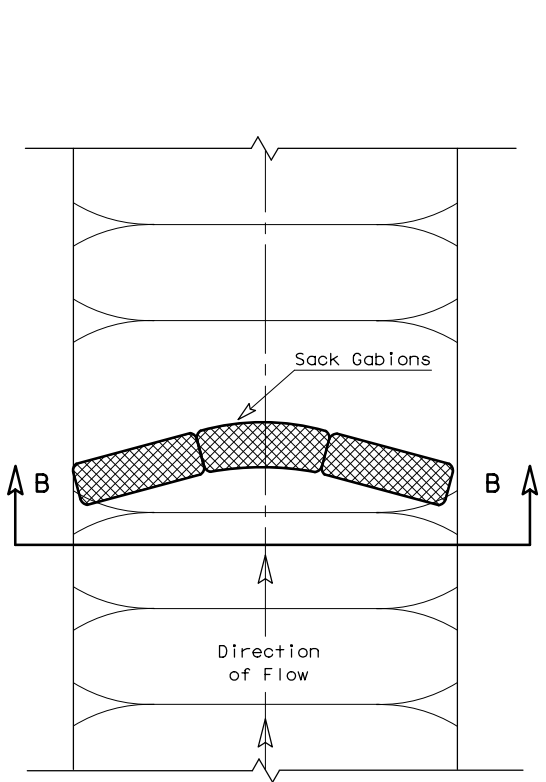
FILTER DAM AT SEDIMENT TRAP

— (RFD1) — OR — (RFD2) —

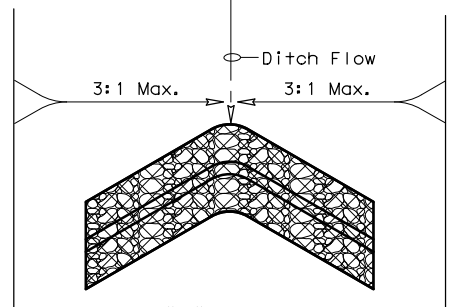


FILTER DAM AT CHANNEL SECTIONS

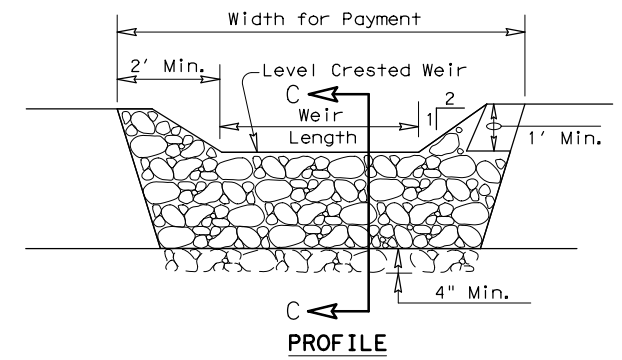
— (RFD1) — OR — (RFD2) — OR — (RFD3) —



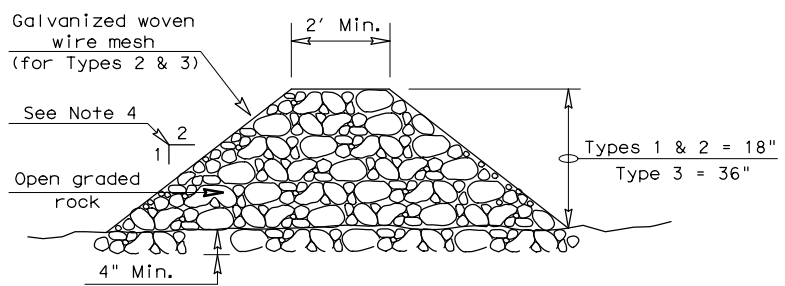
PLAN VIEW



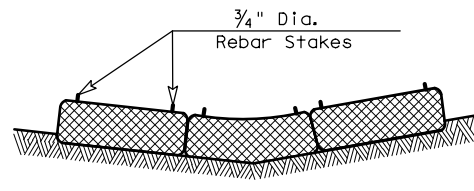
"V" SHAPE PLAN VIEW



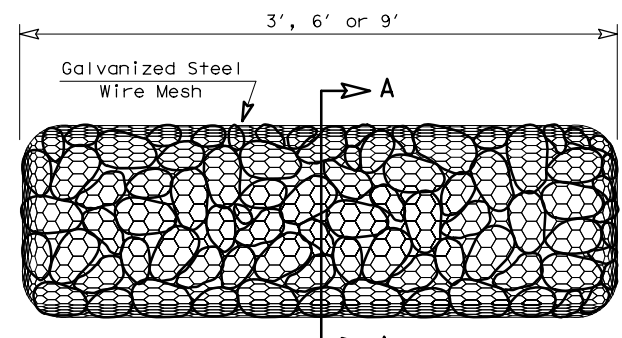
PROFILE



SECTION C-C

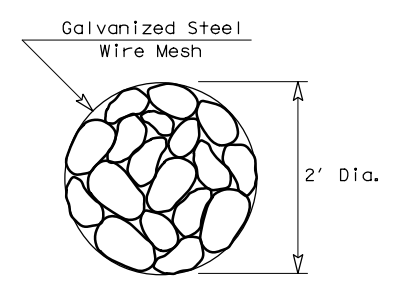


SECTION B-B



TYPE 4 (SACK GABIONS)

— (RFD4) —



SECTION A-A

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/FT² 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 (approximately 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 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
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.

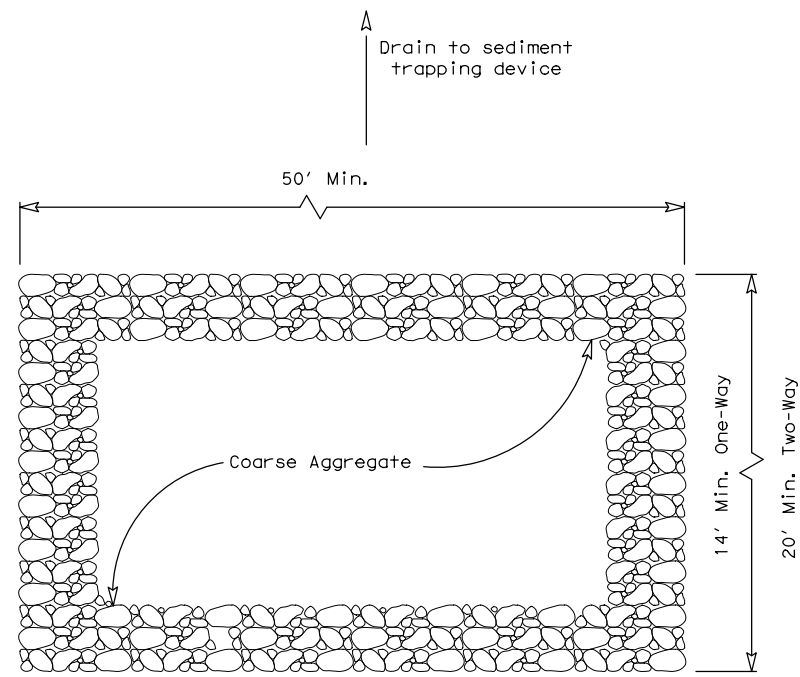
PLAN SHEET LEGEND

- Type 1 Rock Filter Dam — (RFD1) —
- Type 2 Rock Filter Dam — (RFD2) —
- Type 3 Rock Filter Dam — (RFD3) —
- Type 4 Rock Filter Dam — (RFD4) —

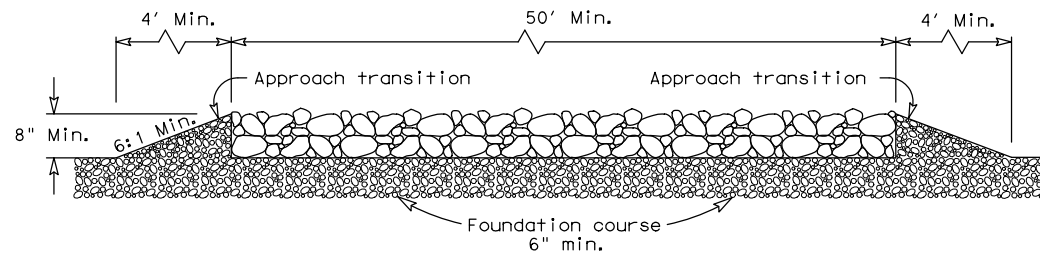
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TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC (2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0213 04	050	US 190
	DIST	COUNTY	SHEET NO.
	LFK	POLK	308

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PLAN VIEW

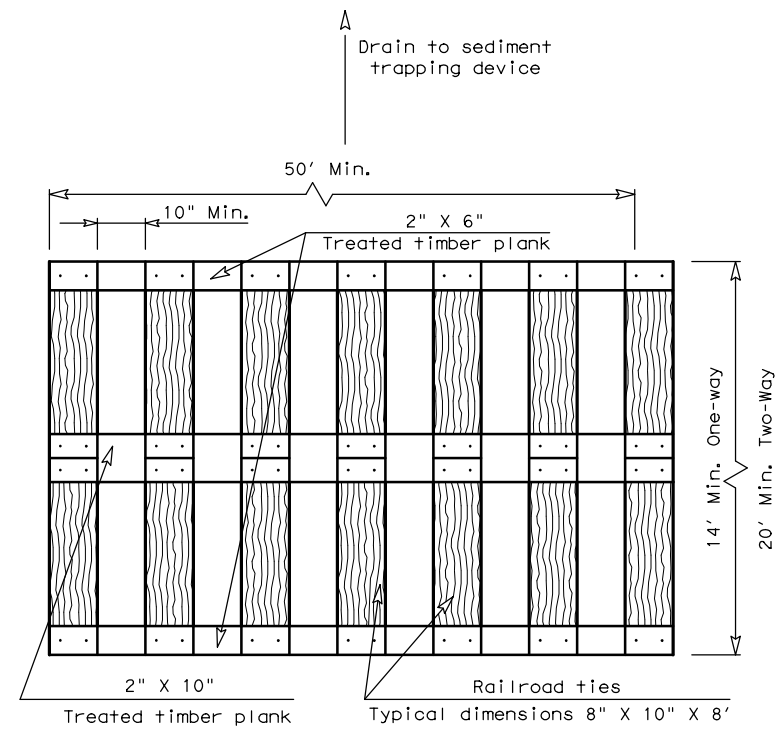


ELEVATION VIEW

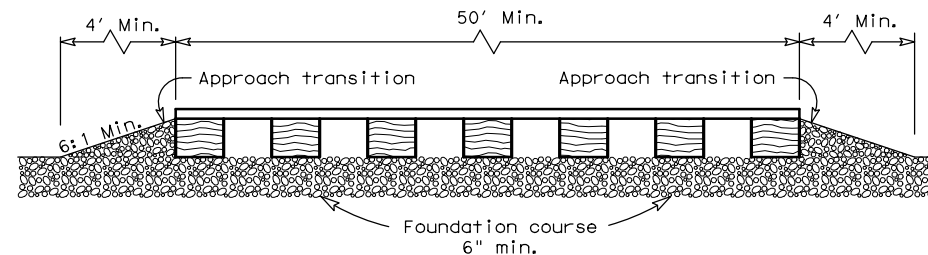
CONSTRUCTION EXIT (TYPE 1)
ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

- The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
- The coarse aggregate should be open graded with a size of 4" to 8".
- The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
- The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materials approved by the Engineer.
- The construction exit shall be graded to allow drainage to a sediment trapping device.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.
- 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.



PLAN VIEW

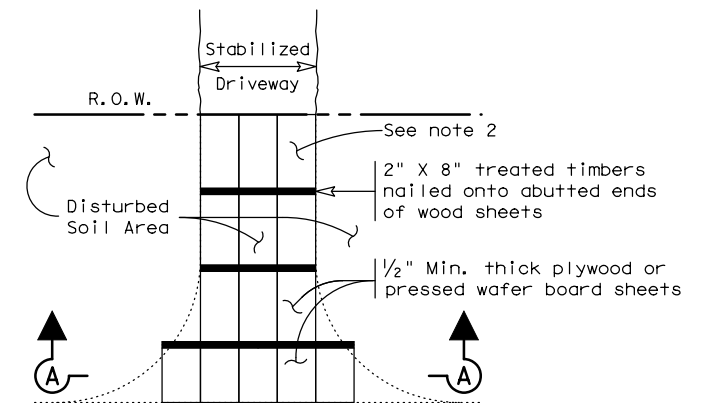


ELEVATION VIEW

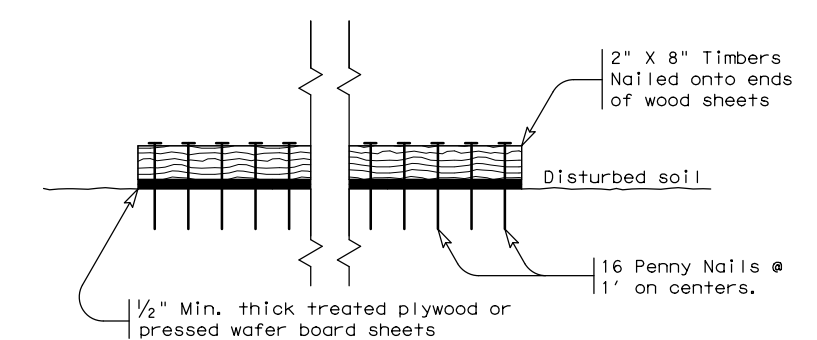
CONSTRUCTION EXIT (TYPE 2)
TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

- The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
- The treated timber planks shall be attached to the railroad ties with 1/2" x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
- The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
- The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
- The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
- The construction exit should be graded to allow drainage to a sediment trapping device.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.
- 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.



PLAN VIEW



SECTION A-A
CONSTRUCTION EXIT (TYPE 3)
SHORT TERM

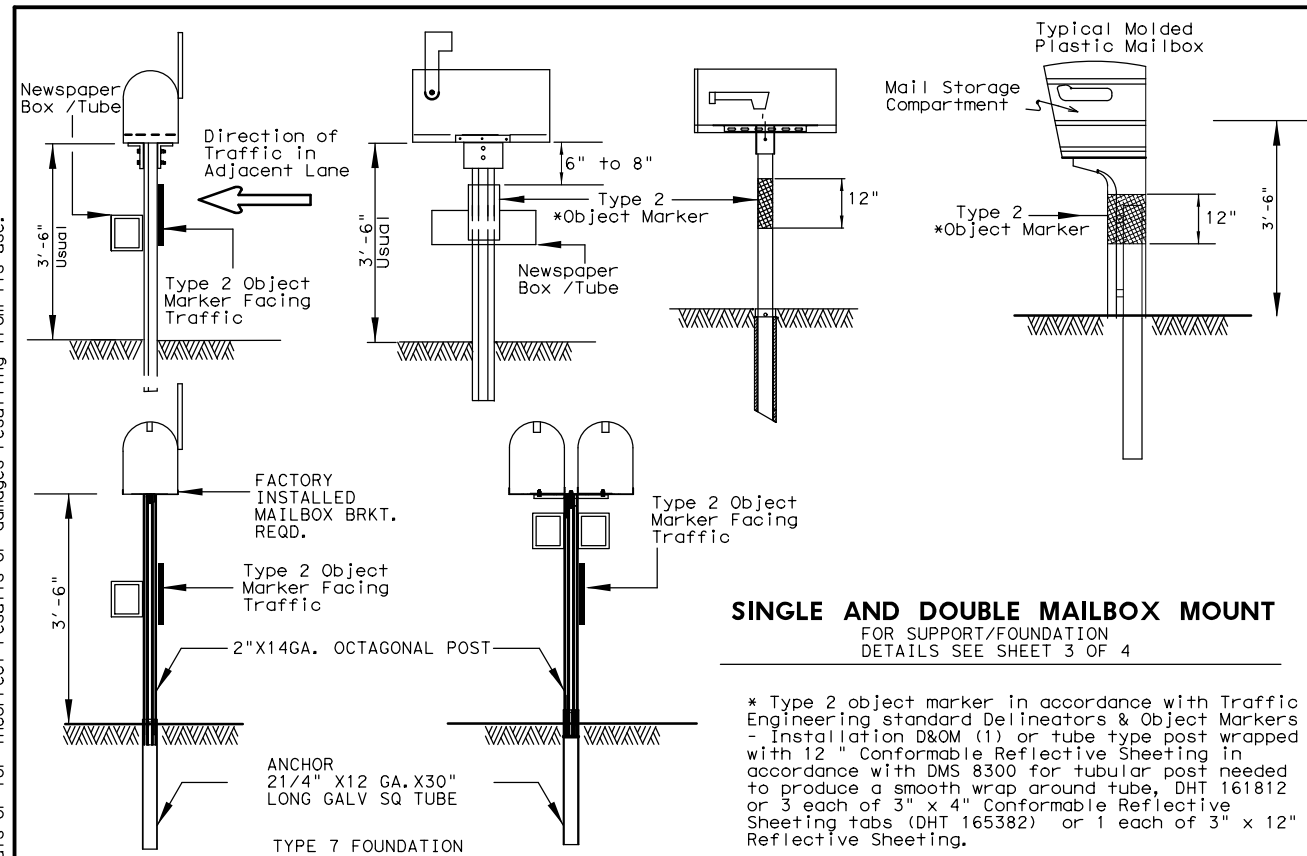
GENERAL NOTES (TYPE 3)

- The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
- 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.
- The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC(3)-16			
FILE: ec316	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0213	04	050
	DIST	COUNTY	SHEET NO.
	LFK	POLK	309

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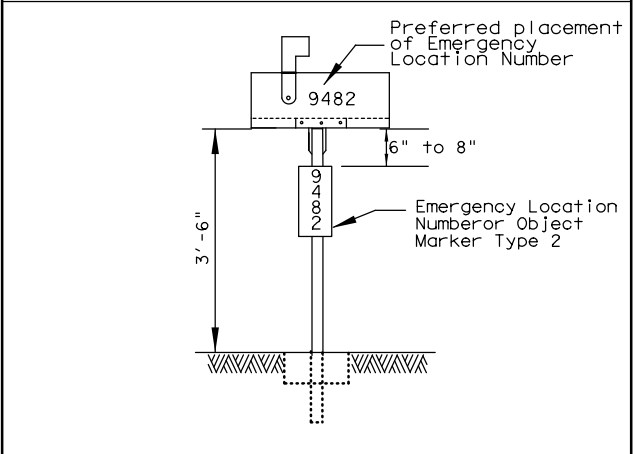
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SINGLE AND DOUBLE MAILBOX MOUNT
 FOR SUPPORT/FOUNDATION
 DETAILS SEE SHEET 3 OF 4

* Type 2 object marker in accordance with Traffic Engineering standard Delineators & Object Markers - Installation D&OM (1) or tube type post wrapped with 12" Conformable Reflective Sheeting in accordance with DMS 8300 for tubular post needed to produce a smooth wrap around tube, DHT 161812 or 3 each of 3" x 4" Conformable Reflective Sheeting tabs (DHT 165382) or 1 each of 3" x 12" Reflective Sheeting.

Note: Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Pedestrian Facilities Curb ramps standard *PED-XX for pedestrian facilities.
 *PED-XX: XX is the standard year for example PED-12, PED-13, etc.



PLACEMENT OF EMERGENCY LOCATION NUMBER

Location Number shall be placed on: 1. A yellow, type A plate with class 1 flat surface reflective sheeting in accordance with DMS 8600. The color of numbers shall be black. or 2. A green or blue plate with white numbers attached to post beside the object marker. Other contrasting color configuration, as approved, may be used. (Use Same type plate as used for the type 2 Object Marker. Recommended sign size is 6" by 15")

SIZE	TYPICAL MAILBOX SIZE			LIGHT WEIGHT MATERIAL	
	LENGTH	WIDTH	HEIGHT	SHEET METAL	**PLASTIC
SMALL	19 1/2	6	7	5	5
MEDIUM	22 1/2	8	11 1/2	7	7
LARGE	23 1/2*	11 1/2*	13 1/2*	10	10

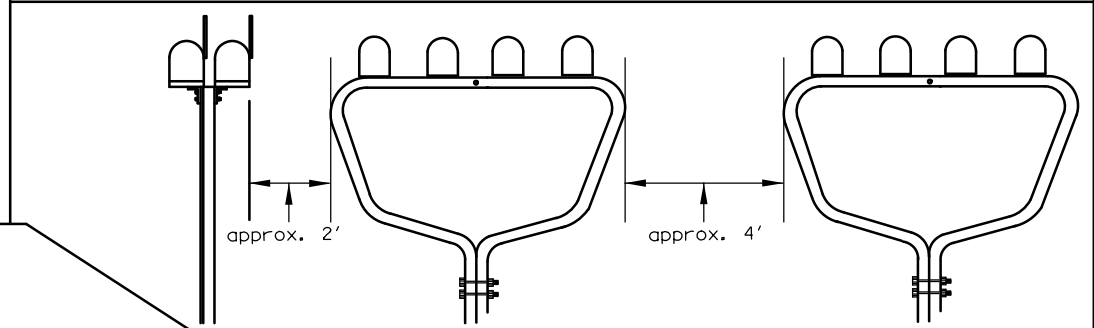
* Maximum allowed dimensions for mailbox
 ** Excluding Molded Plastic on 4 X 4 Post

VIEW	LOCKABLE ARCHITECTURAL MAILBOX SIZE (INCHES)				WEIGHT (POUNDS)
	TOP	BOTTOM	FRONT SIDE	BACK SIDE	
SIDE	18	15	18.3	15	22.4
BACK	11 1/2	11 1/2		15	

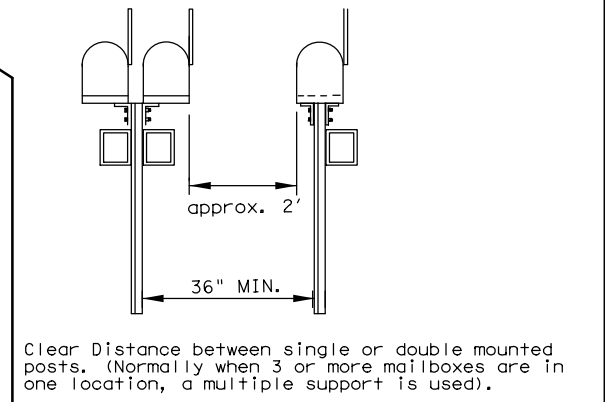
SEE TOP RIGHT CORNER OF SHEET 2 OF 4

Mailboxes shall be made of light weight sheet metal or light weight plastic. Lockable architectural mailboxes shall meet the requirements of the above table.
 Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

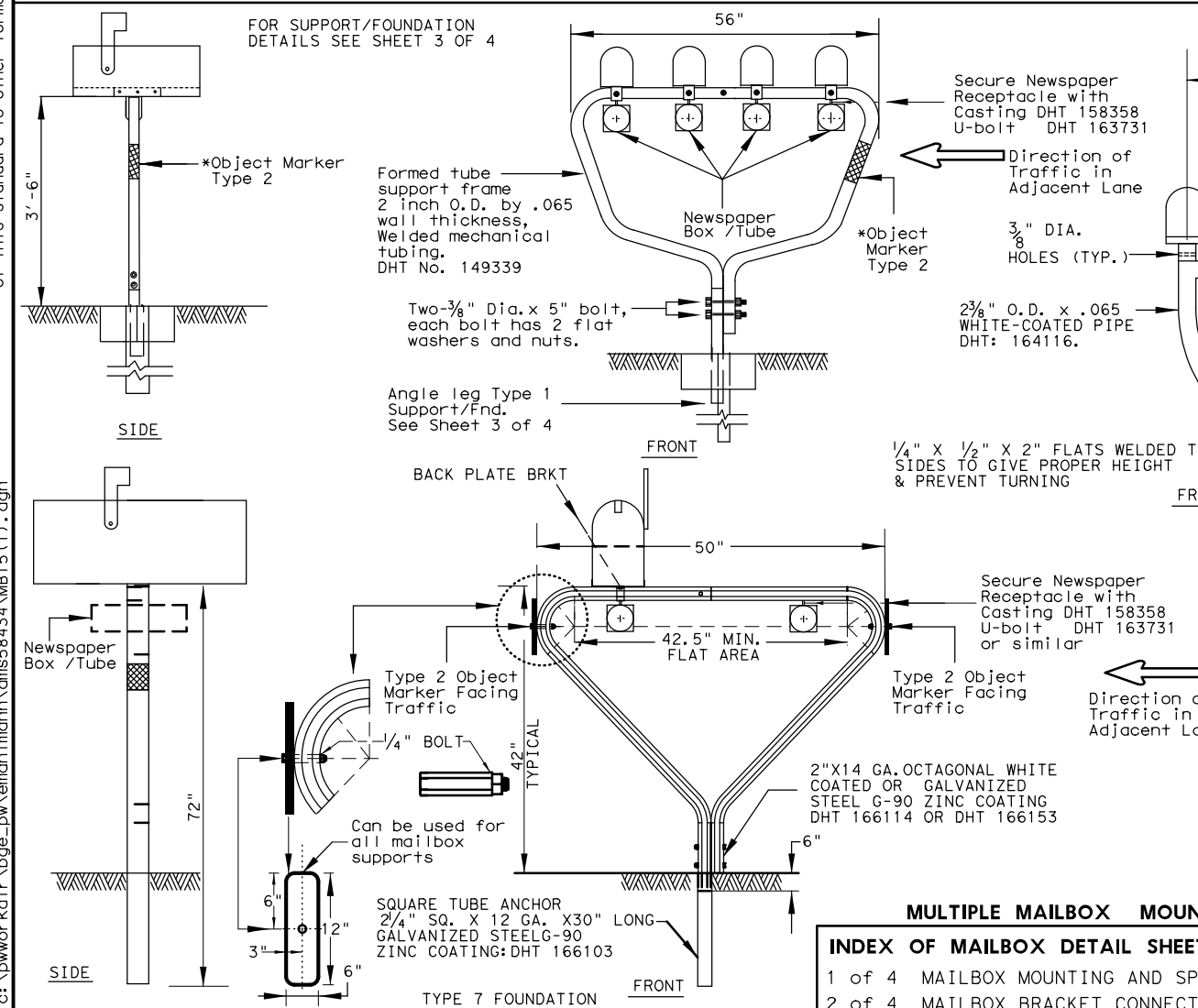
MAILBOX SIZES



MULTIPLE MAILBOX PLACEMENT



SINGLE & DOUBLE MAILBOX PLACEMENT



DOUBLE AND MULTIPLE MAILBOX MOUNT

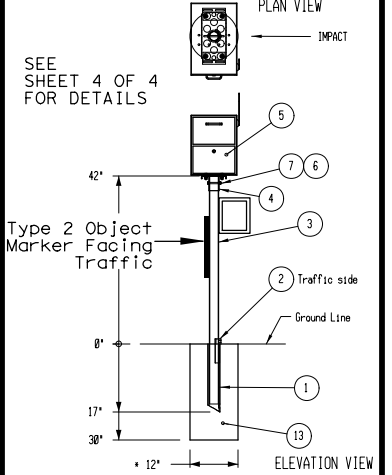
FOR SUPPORT/FOUNDATION
 DETAILS SEE SHEET 3 OF 4
 FOR DHT NUMBERS
 SEE SHEET 4 OF 4

NEWSPAPER RECEPTACLE

A light weight receptacle for newspaper delivery can be attached to mailbox posts as shown on this page if the receptacle:

- Does not touch the mailbox.
- Does not present a hazard to traffic or delivery of the mail.
- Does not extend beyond the front of the mailbox.
- Does not display advertising, except the publication title.
- Newspaper receptacles on separate supports are prohibited.

LOCKABLE ARCHITECTURAL MAILBOX



MULTIPLE MAILBOX MOUNT

INDEX OF MAILBOX DETAIL SHEETS

- 1 of 4 MAILBOX MOUNTING AND SPACING
- 2 of 4 MAILBOX BRACKET CONNECTING DETAILS
- 3 of 4 MAILBOX SUPPORT / FOUNDATION
- 4 of 4 TABLE OF DHT NUMBERS

SHEET 1 OF 4

Texas Department of Transportation

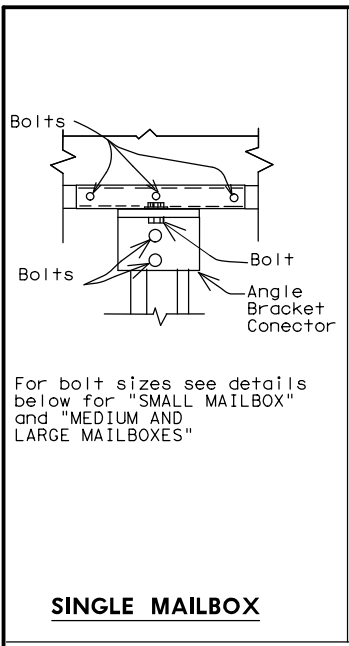
Maintenance Division Standard

MAILBOX MOUNTING AND SPACING MB-15(1)

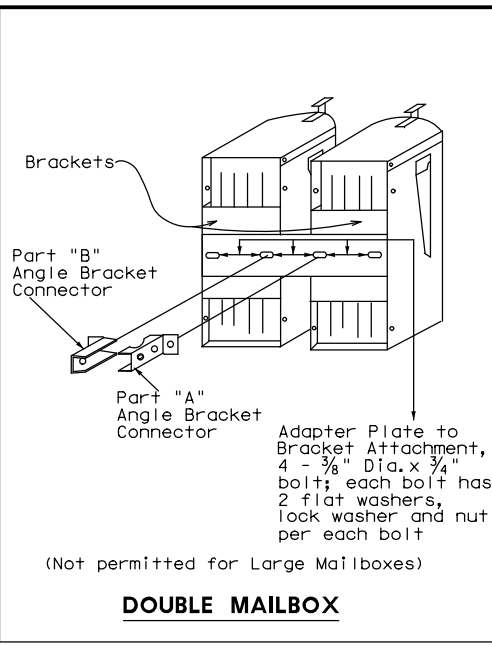
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© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS:	0213	04	050	US 190
Added additional newspaper receptacle for double mailbox support	DIST	COUNTY	SHEET NO.	
	LFK	POLK	310	

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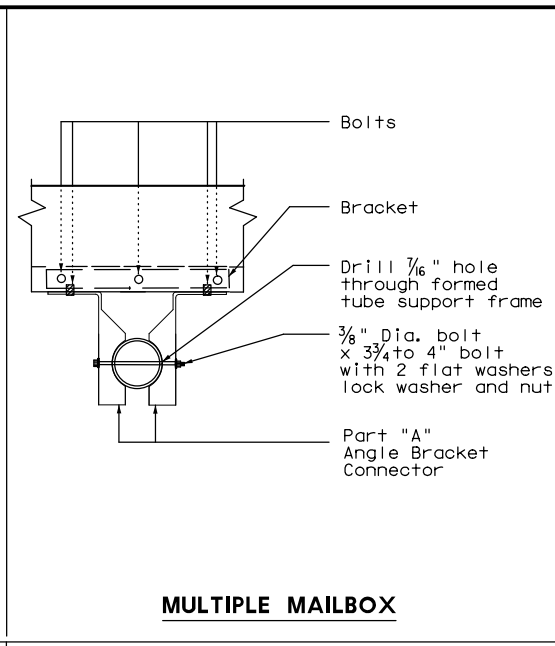
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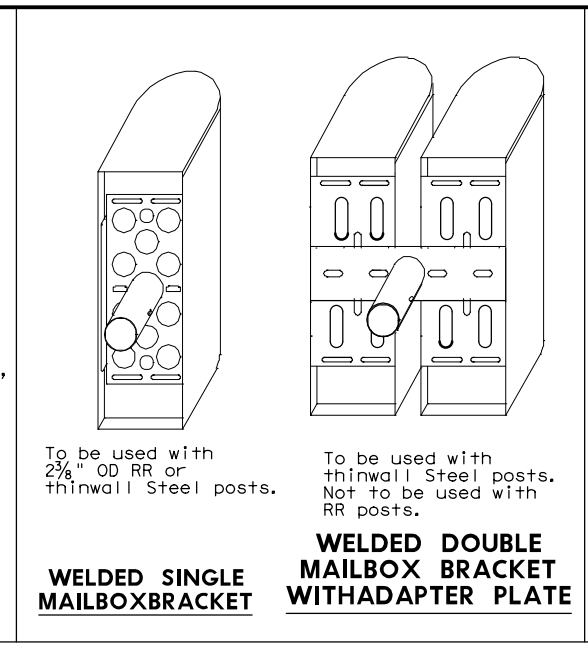
SINGLE MAILBOX



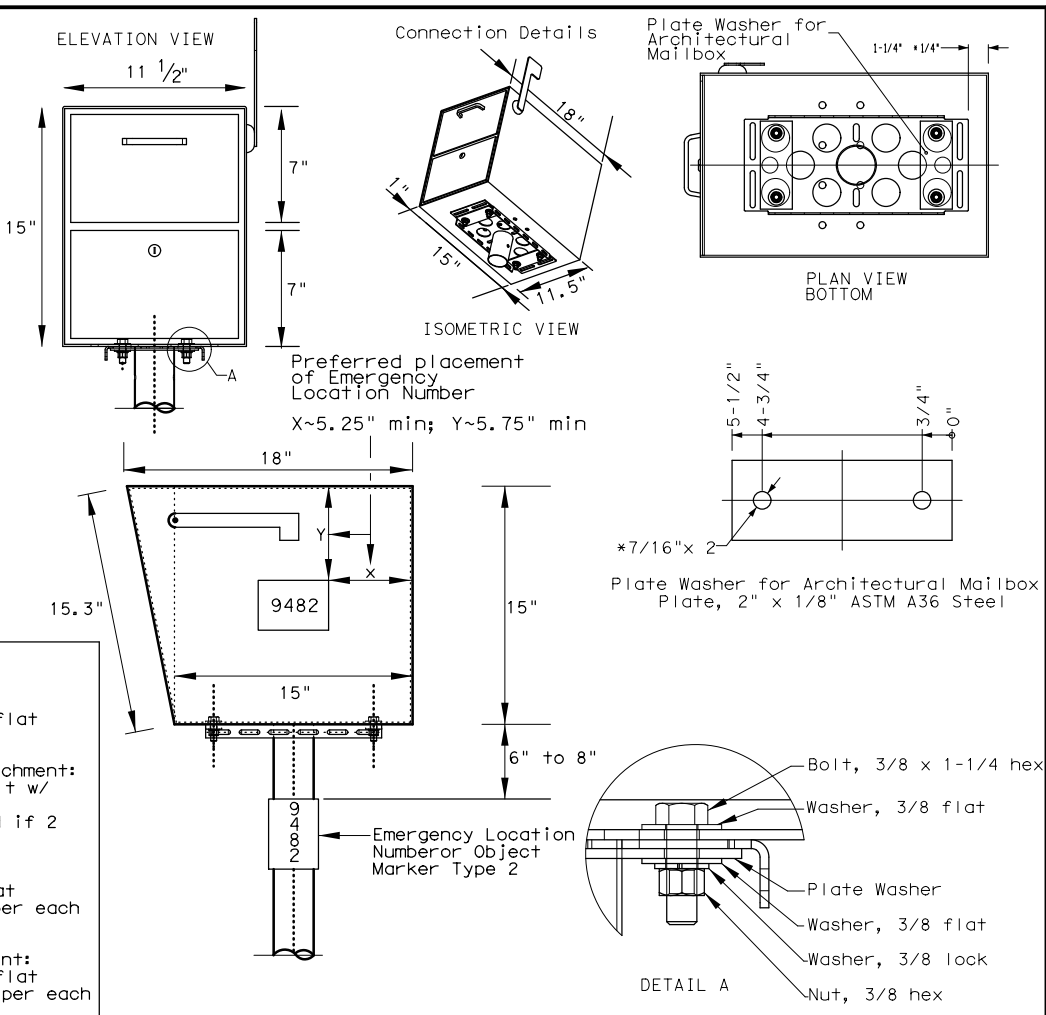
DOUBLE MAILBOX



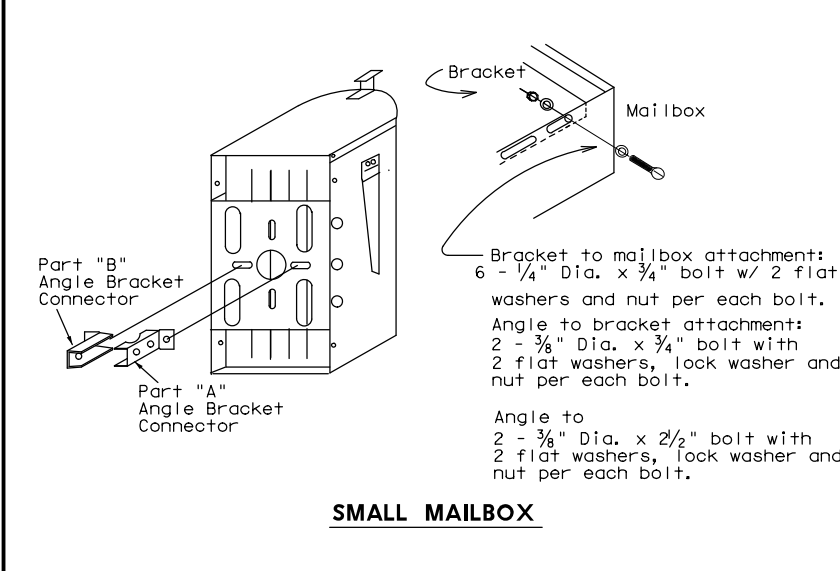
MULTIPLE MAILBOX



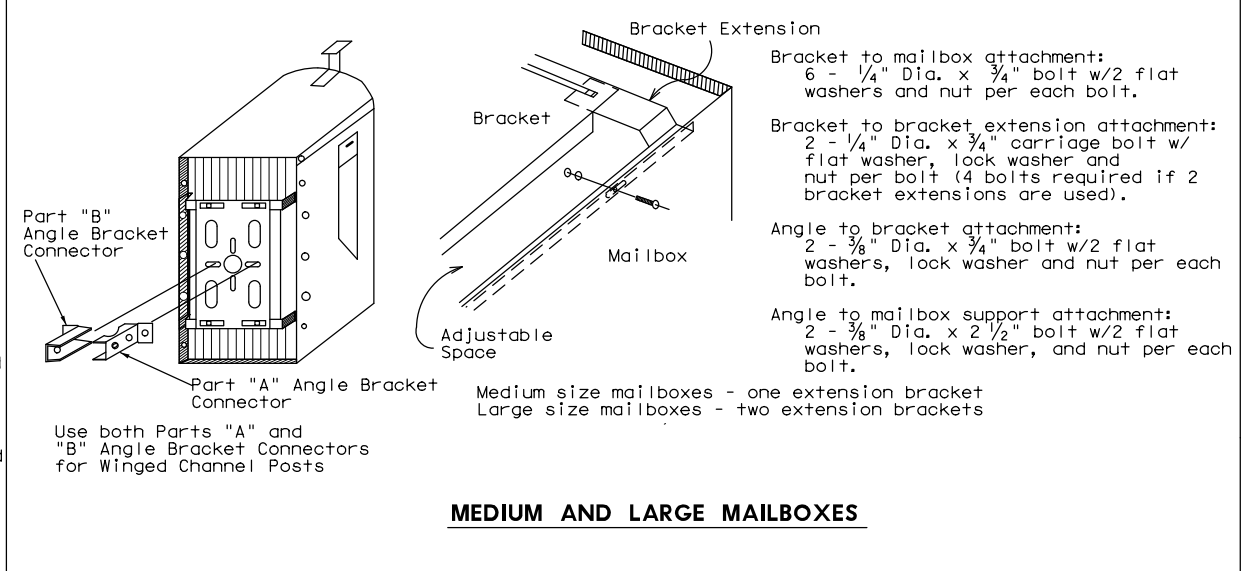
WELDED SINGLE MAILBOX BRACKET **WELDED DOUBLE MAILBOX BRACKET WITH ADAPTER PLATE**



LOCKABLE ARCHITECTURAL MAILBOX CONNECTION DETAILS



SMALL MAILBOX

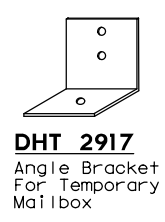
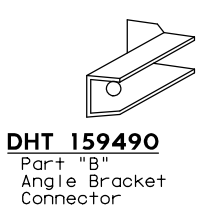
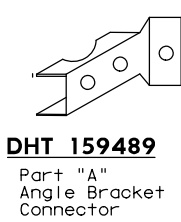
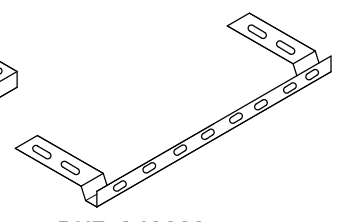
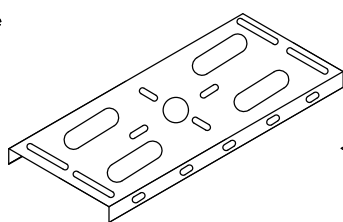
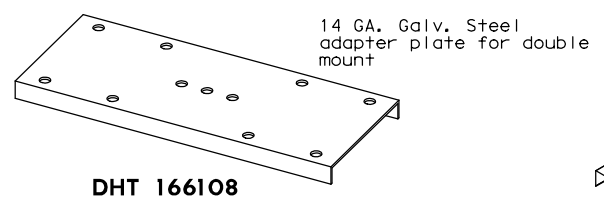
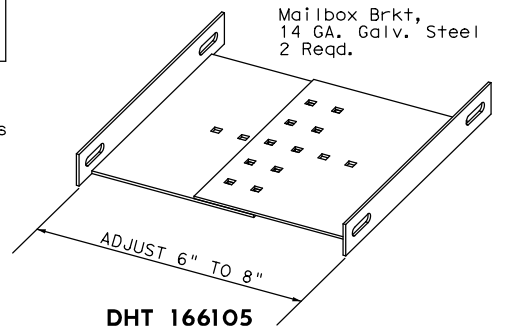
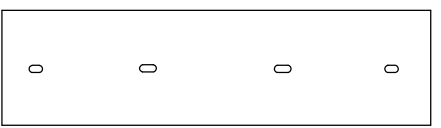
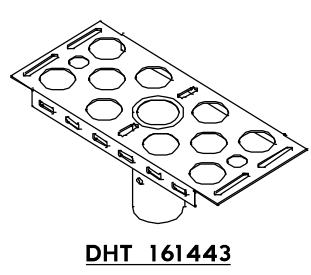
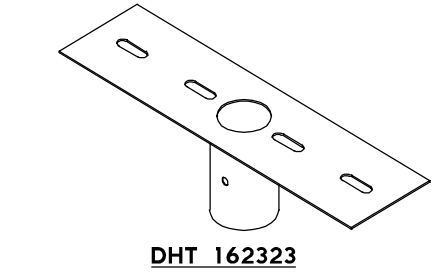


MEDIUM AND LARGE MAILBOXES

GENERAL NOTES

- Connecting hardware detailed on this sheet is for the hardware that the Department stocks at the Regional Warehouses. This hardware is available to the contractor only when so stated elsewhere in the plans or specification.
- Hardware for mounting mailboxes to the support/foundation furnished by industry should be used when shown on the Maintenance Divisions "Approved Products List." Only mailbox hardware that have been crash tested in accordance with NCHRP Report 350, will be on the approved list.
- Hardware furnished by industry shall be erected in accordance with the manufacturer's recommendation.
- Bracket and bracket extension shall be constructed of 14 gauge galvanized steel sheet metal.
- The angles, brackets and adapter plates shall be constructed of 12 gauge galvanized steel sheet metal.
- Items with evidence of damage to the galvanized coating or wet storage stains (white rust) will not be accepted.

SHEET 2 OF 4



HARDWARE AT TXDOT REGIONAL WAREHOUSES

Brackets and adapter plate shown in this section should be available to the Contractor when stated elsewhere in plans or specifications.

DHT 148939 **DHT 148938**

Mailbox Bracket Used for extending 6" wide bracket to attach larger mailboxes. Bracket Extension

See Table of Applicable DHT Numbers on sheet 4 of 4 for DHT description and unit of measure.

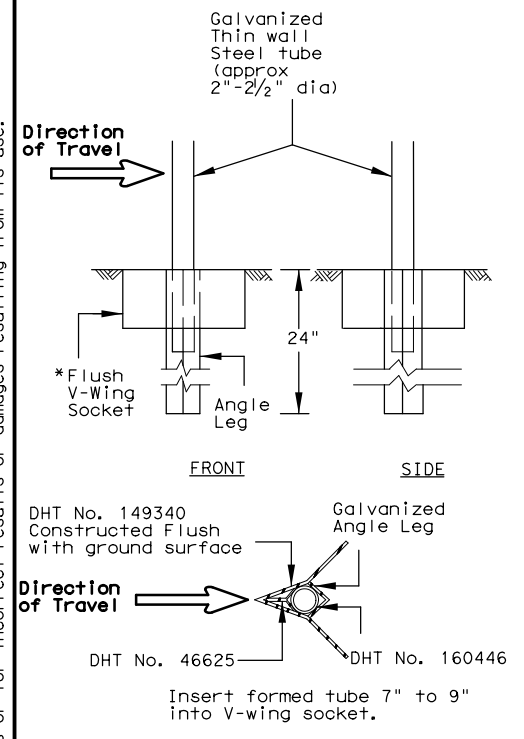
Texas Department of Transportation
 Maintenance Division Standard

MAILBOX BRACKET CONNECTING DETAILS MB-15(1)

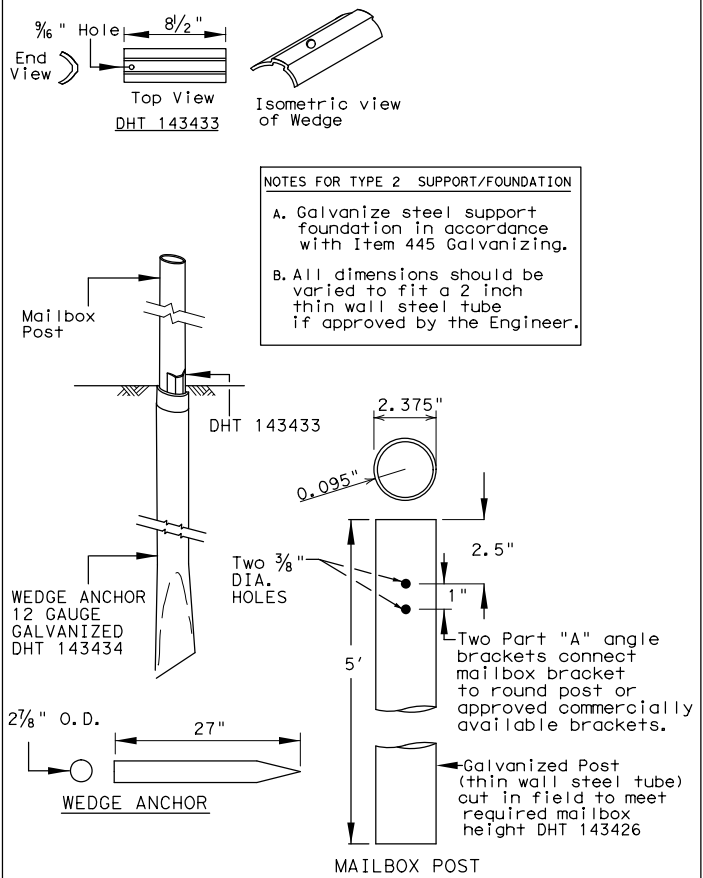
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© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	LFK	POLK	311	

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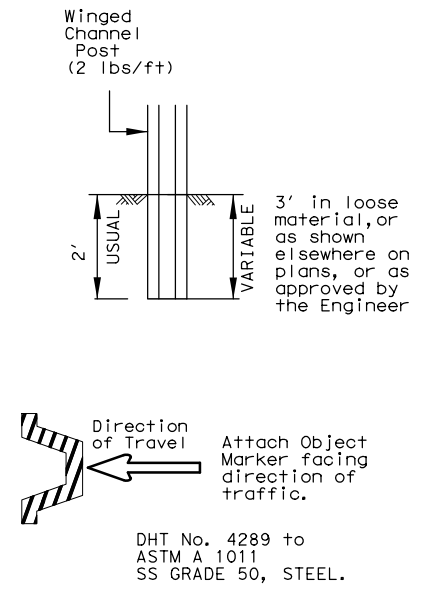
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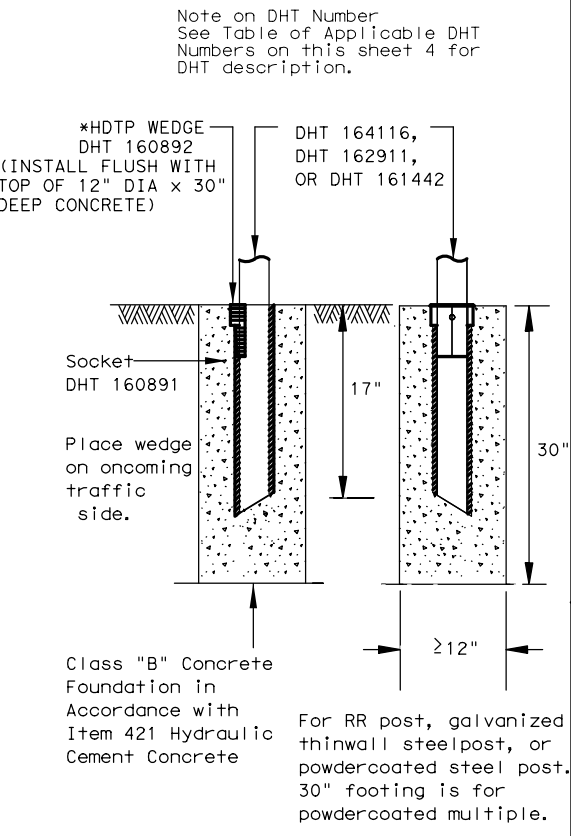
TYPE 1 SUPPORT/FOUNDATION
 THIN WALL STEEL TUBE w/ V-LOC ANCHORAGE



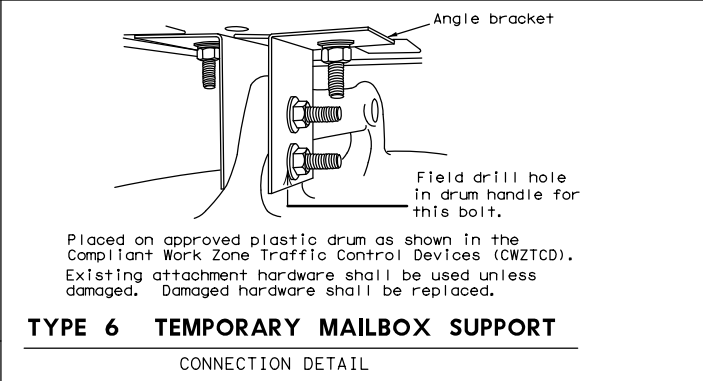
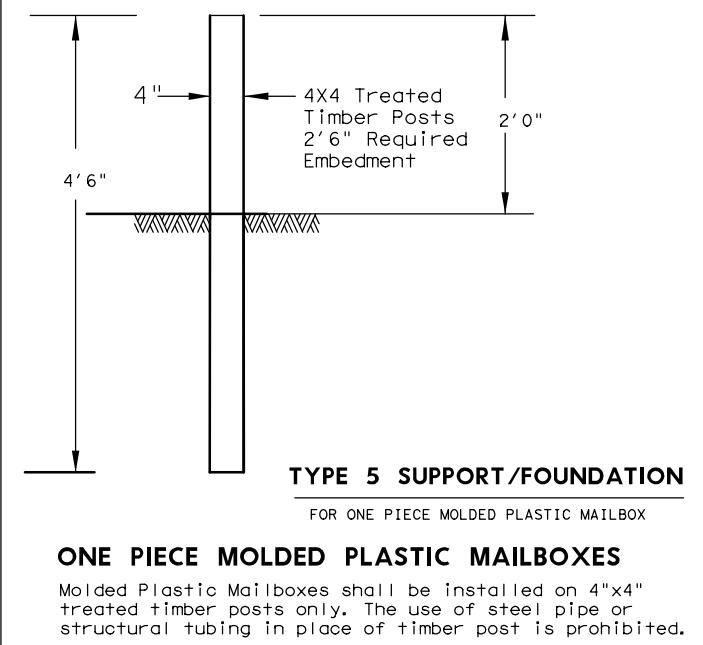
TYPE 2 SUPPORT/FOUNDATION
 THIN WALL STEEL TUBE w/ WEDGE ANCHOR SYSTEM



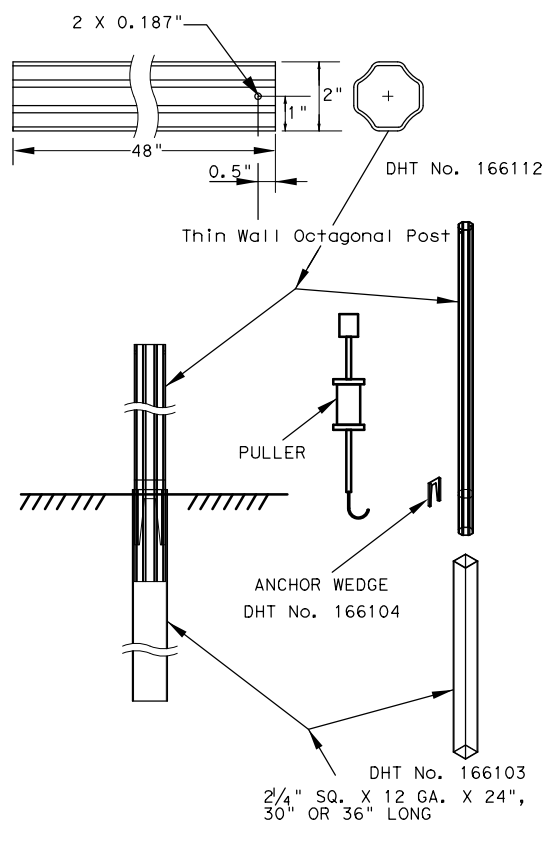
TYPE 3 SUPPORT/FOUNDATION
 WINGED CHANNEL POST



TYPE 4 SUPPORT/FOUNDATION
 FOR WHITECOATED STEEL POST, MULTIPLE POST, AND RECYCLED RUBBER.



- GENERAL NOTES**
- Erect post plumb or vertical.
 - When galvanized part is required galvanize in accordance with Item 445.
 - type 1, 2, 3, 4 or 7 supports or foundation can be used for single or double mailbox installations. The RCR post should be used only for a single installation with a small mailbox. The Type 5 support/foundation is used for the single molded plastic mailbox. The Type 4 support/foundation is used for the 2.375" O.D. RR post, thin wall steel post, and white multiple mailbox post.
 - The Type 1 or type 7 support/foundation can be used for a multiple mailbox mount.
 - The Type 4 support should be used with thin wall steel pipe for the medium, large and double mailbox installations.
 - Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition.



TYPE 7 MAILBOX SUPPORT/FOUNDATION
 CONNECTION DETAIL

MB-(X) ASSM TY (XXX) (X) (XX) / ((OPTIONAL))

Type of Mailbox
 S = Single
 D = Double
 M = Multiple
 SP = Single Plastic

Type of Post
 WC = Winged Channel Post
 RR = Recycled Rubber
 TW = Thin Walled White Tubing
 TWG = Thin Walled Galvanized Tubing
 TIM = Timber

Type of Foundation
 Ty 1 = V-Loc
 Ty 2 = Wedge Anchor Steel System
 Ty 3 = Winged Channel post
 Ty 4 = Wedge Anchor Plastic System
 Ty 5 = 4 X 4 Post
 Ty 7 = Wedge Anchor

Type of Bracket
 AB = Angle Bracket.
 TB = 2.375" Tube Bracket

DOUBLE AND LARGE MAILBOXES MUST BE ON STEEL POST.

*HOTP: High density thermoplastic polyesters



MAILBOX SUPPORT AND FOUNDATION
MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0213	04	050	US 190
	DIST	COUNTY	SHEET NO.	
	LFK	POLK	312	

LOCKABLE ARCHITECTURAL MAILBOX

SINGLE-MOUNT INSTALLATION PARTS			
#	PART NAME	PART/DHT #	QTY
1	SOCKET, TYPE 4 FOUNDATION	160891	1
2	WEDGE FOR TYPE 4 FOUNDATION	160892	1
3	THIN-WALL WHITE STEEL TUBE 2.375 OD	162911	1
4	BRACKET FOR ATTACHING MAILBOX	161443	1
5	ARCHITECTURAL MAILBOX	SEE NOTE	1
6	NUT, 5/16" HEX	NUT, 5/16" HEX	1
7	BOLT, 5/16 X 3 HEX	GRADE 5	1
8	PLATE WASHER FOR ARCHITECTURAL MAILBOX	SEE SEE SHEET 2	2
9	WASHER, 3/8 FLAT		8
10	WASHER, 3/8 LOCK		4
11	NUT, 3/8 HEX		4
12	BOLT, 3/8 X 1-1/4 HEX	GRADE 5	4
13	CONCRETE, CLASS B (2000 PSI)		1

LOCKABLE ARCHITECTURAL MAILBOX DETAILS

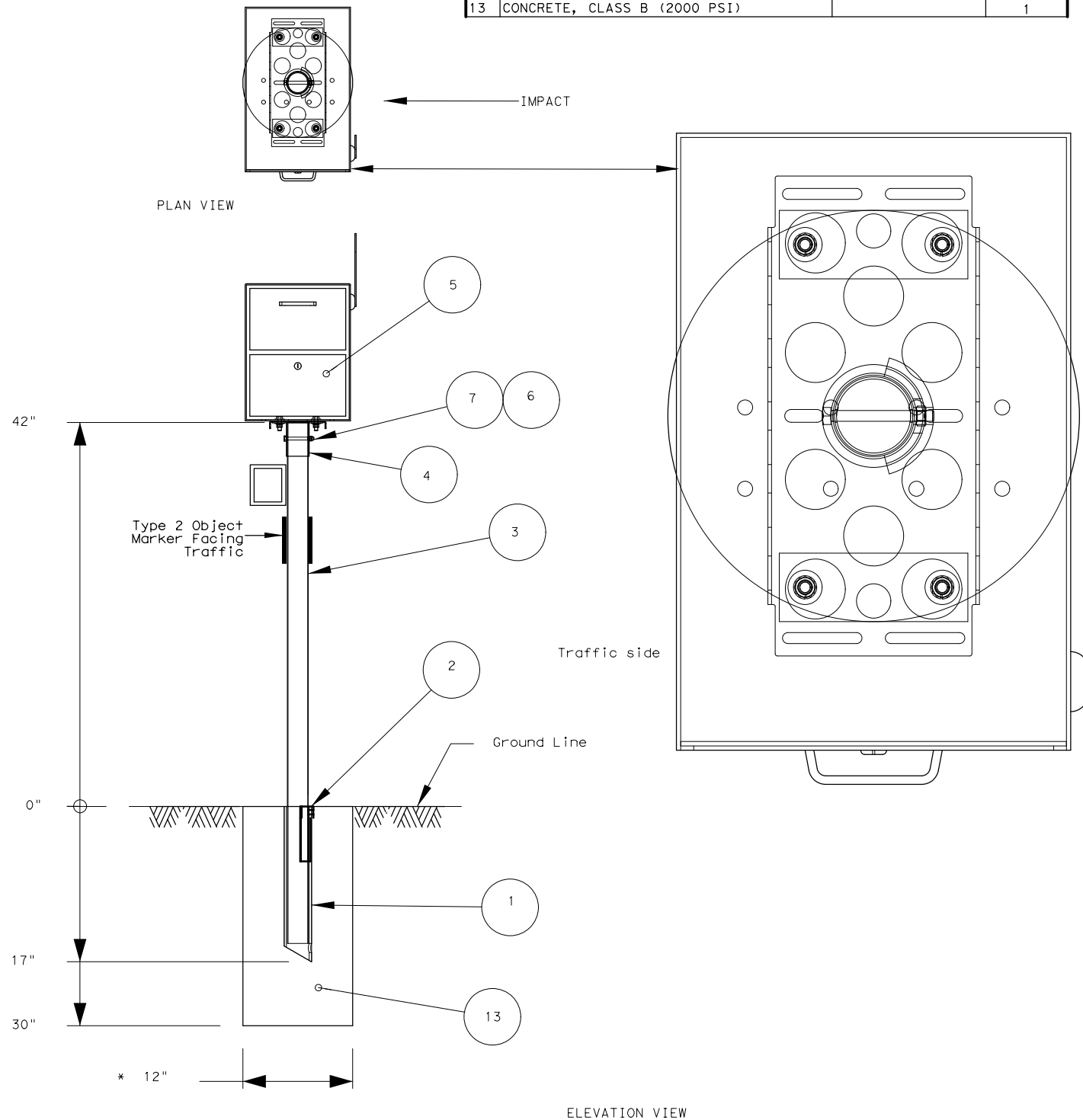


TABLE OF APPLICABLE DHT NUMBERS	
DHT NUMBER	DESCRIPTION
FOUNDATIONS	
46625	WEDGE FOR V-WING SOCKET FOR TYPE 1 FOUNDATION
149340	V-WING SOCKET FOR TYPE 1 FOUNDATION
143433	WEDGE FOR TYPE 2 FOUNDATION
143434	ANCHOR FOR TYPE 2 FOUNDATION
166103	ANCHOR FOR TYPE 7 FOUNDATION
160891	SOCKET FOR TYPE 4 FOUNDATION
160892	WEDGE FOR TYPE 4 FOUNDATION
166104	WEDGE FOR TYPE 7 FOUNDATION
POSTS	
4289	WINGED CHANNEL MAILBOX POST
149339	MULTIPLE MAILBOX POST (GALVANIZED TUBING)
164116	MULTIPLE MAILBOX POST (WHITE COATED)
166114	MULTIPLE MAILBOX POST (WHITE COATED OCTAGONAL)
166153	MULTIPLE MAILBOX POST (GALVANIZED OCTAGONAL)
161442	RECYCLED RUBBER POST. FOR SMALL MAILBOX ONLY
143426	THIN-WALL GALVANIZED STEEL TUBE 2.375" OUTER DIAMETER
162911	THINWALL WHITE STEEL TUBE 2.375" OUTER DIAMETER
	SINGLE OR DOUBLE THIN-WALL MAILBOX POST GALVANIZED
166152	2" OCTAGONAL
	SINGLE OR DOUBLE THIN-WALL MAILBOX POST WHITECOATED
166112	2" OCTAGONAL
REFLECTIVE SHEETING	
161812	REFLECTIVE SHEETING FOR EMERGENCY LOCATION NUMBER PANEL
CONNECTING HARDWARE	
2917	ANGLE BRACKET USED FOR TEMPORARY MAILBOX SUPPORT
166105	BRACKET FOR SINGLE MOUNTING OF MAILBOXES (MOUNTING KIT)
3789	PLATE FOR DOUBLE MOUNTING OF MAILBOXES
166108	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES (MOUNTING KIT)
166111	BRACKET FOR MULTIPLE MOUNTING OF MAILBOXES (MOUNTING KIT)
148939	BRACKET FOR ATTACHING SMALL OR MEDIUM SIZE MAIL BOX
148938	EXTENDER TO BRACKET FOR ATTACHING LARGE MAILBOX
159489	ANGLE BRACKET PART A
159490	ANGLE BRACKET PART B
	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES ON THINWALL
162323	STEEL POST, GALVANIZED OR POWDERCOATED.
	BRACKET FOR ATTACHING MAILBOX TO RECYCLED RUBBER POST
161443	AND TO MULTIPLE WHITE MAILBOX POST
158358	CASTING (NEWSPAPER RECEPTACLE BRACKET)
163731	U-BOLT (NEWSPAPER RECEPTACLE BRACKET)
160698	BOLT; HEX HEAD, GALV; 3/8"DIA X 3/4"L HD, W/2-FLAT WASHERS
163750	BOLT; HEX HEAD, GALV; 3/8" X 1-1/2, 16 NC, W/WASHERS
160701	BOLT; HEX HEAD, GALV; 3/8"DIA X 2-1/2"L, HD, W/2-FLAT WASHERS
163730	BOLT; HEX HEAD, GALV; 3/8" X 3-1/2", NC, W/NUT, 2 FLAT WASHERS
160699	BOLT; HEX HEAD, GALV; 3/8"DIA X 3-3/4"L HD, W/2-FLAT WASHERS
160700	BOLT; HEX HEAD, GALV; 3/8"DIA X 4"L HD, W/2-FLAT WASHERS

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**DHT NUMBERS TABLE
MB-15(1)**

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