

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			1
STATE	STATE DIST.	COUNTY	
TEXAS	CRP	JIM WELLS, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0383	03	024, ETC	SH 141

STATE OF TEXAS

DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

STATE PROJECT NO. C 383-3-24
CSJ: 0383-03-024, ETC

JIM WELLS COUNTY, ETC. SH 141

LIMITS: FROM W. SANTA GERTRUDIS AVE TO US 281

NET LENGTH OF ROADWAY = 66,675.66 FT = 12.627 MI
NET LENGTH OF BRIDGE = 258.00 FT = 0.049 MI
NET LENGTH OF PROJECT = 66,933.66 FT = 12.676 MI

DESIGN SPEED = 65 MPH
GUIDELINES: RDM (JULY 2020) 4R (CH 3, SEC 3)
FUNCTIONAL CLASS: MINOR ARTERIAL
ADT: 6,200 (2026)
ADT: 8,500 (2046)

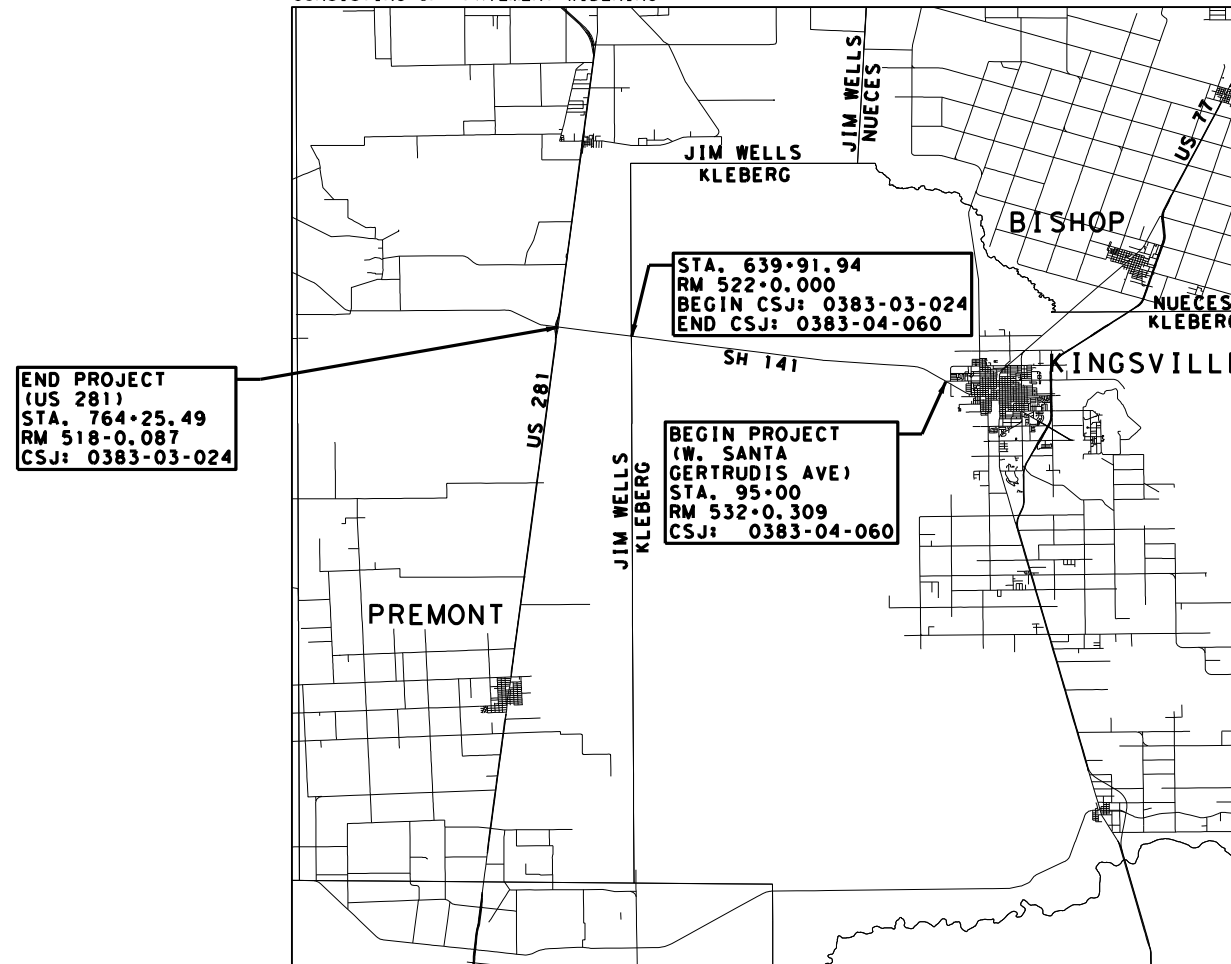
RAS REVIEW NOT REQUIRED

CONSTRUCTION SPEED ZONE REQUESTED

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

FOR THE CONSTRUCTION OF: SUPER 2 PASSING LANES
CONSISTING OF: PAVEMENT WIDENING



EXCEPTIONS: NONE
EQUATIONS: STA. 316+27.47(AH) = STA. 316+19.30(BK) = +8.17 FT.
R.R. CROSSINGS: NONE



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SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND THE SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000-008)

RECOMMENDED FOR LETTING 10/27/2023

DocuSigned by:
Paula Sales-Evans, P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

APPROVED FOR LETTING 10/27/2023

DocuSigned by:
Valente Olivarez
DISTRICT ENGINEER

FILE LOCATION: \$FILES
PROJ. NO. C 383-3-24
LETTING DATE: 01-2024

COUNTY: JIM WELLS, ETC
HWY. NO.: SH 141

LEVELS DISPLAYED	
1	

C/C: DW: C/C: D/W:

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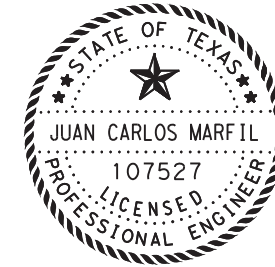
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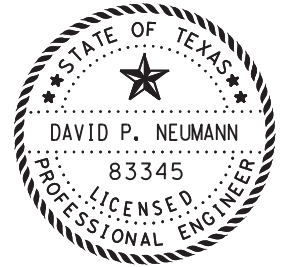
UTILITIES

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THIS STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "##" HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

JC Marfil, P.E.
 JUAN CARLOS MARFIL, P.E. 10/4/2023



THIS STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "###" HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

David P. Neumann, P.E.
 DAVID P. NEUMANN, P.E. 10/4/2023

2023.10.04 11:49:57-05'00'

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 TBPE Firm Reg. No. 10488



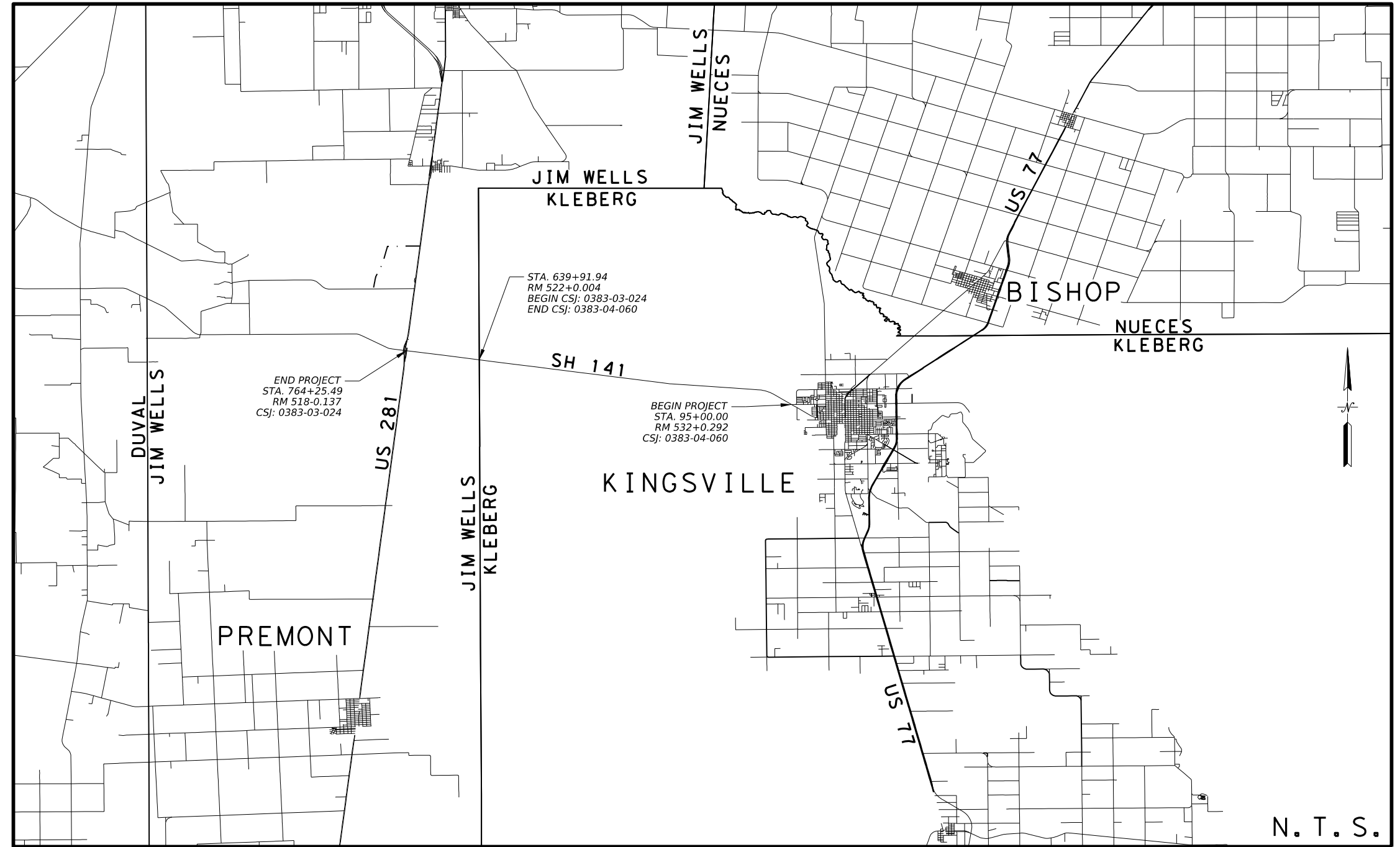
INDEX OF SHEETS

SHEET 1 OF 1

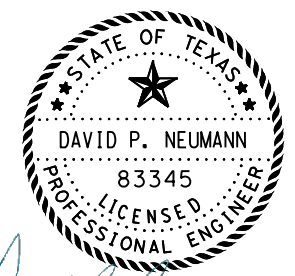
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0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	002	

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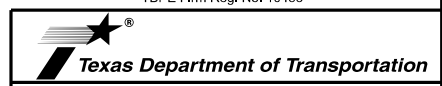
VICINITY MAP



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2023.07.27 23:48:58-05'00'

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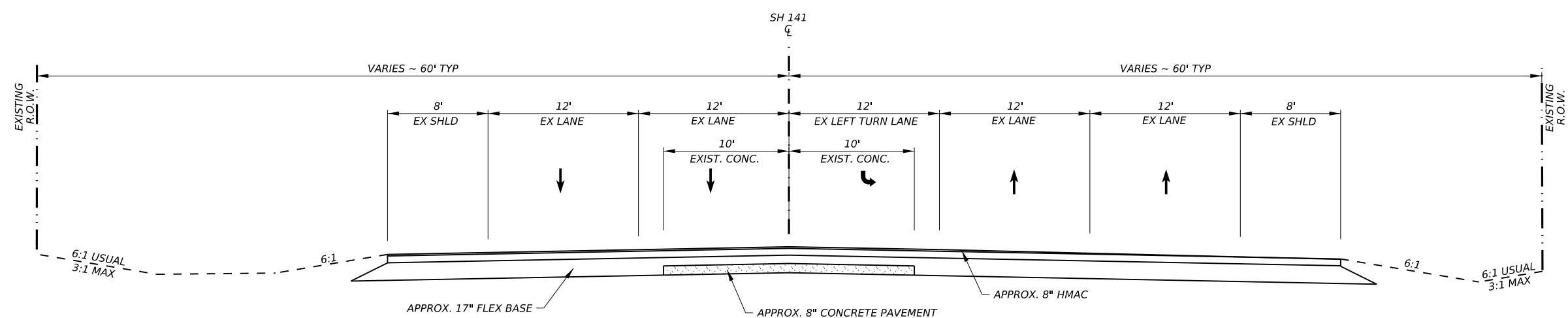
PROJECT LOCATION
MAP

SHEET 1 OF 1

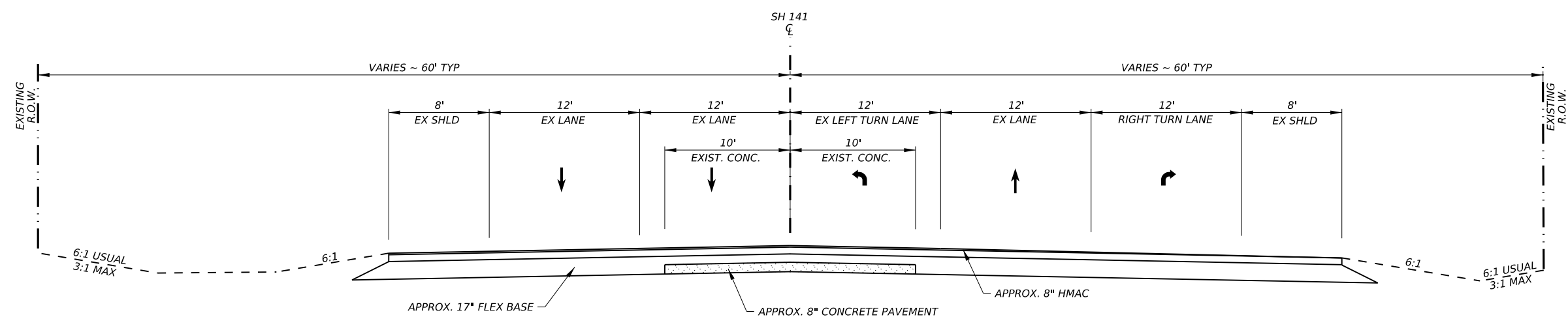
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DIST	COUNTY		SHEET NO.
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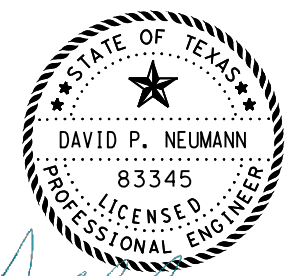


EXISTING TYPICAL SECTION ~ (CSJ: 0383-04-060)
 STATION 98+00 TO STATION 101+61
 STATION 101+61 TO STATION 109+23 ~ (DECEL & GORE AREA TRANSITIONS FROM 12' TO 0')



EXISTING TYPICAL SECTION ~ (CSJ: 0383-04-060)
 STATION 95+00.00 TO STATION 98+00

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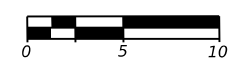
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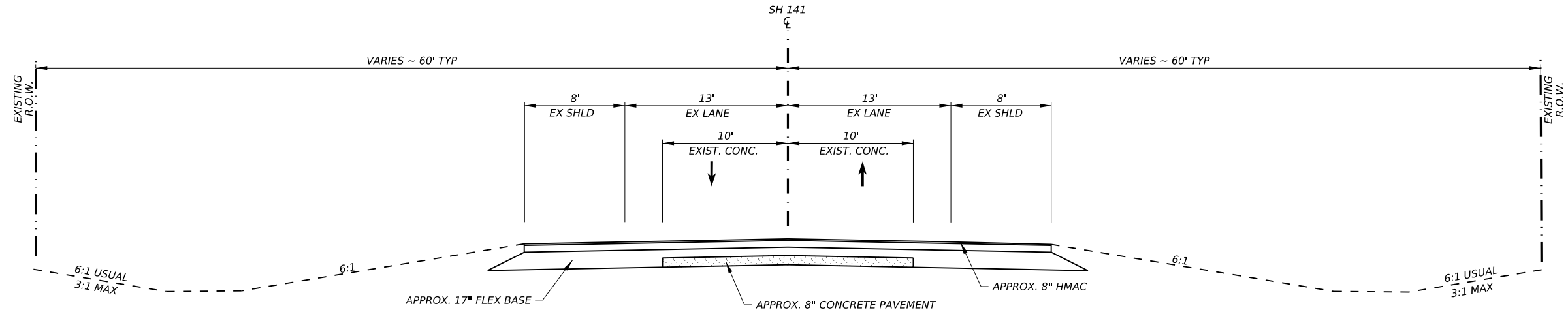
EXISTING TYPICAL SECTIONS

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
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CRP	JIM WELLS, ETC.	004	



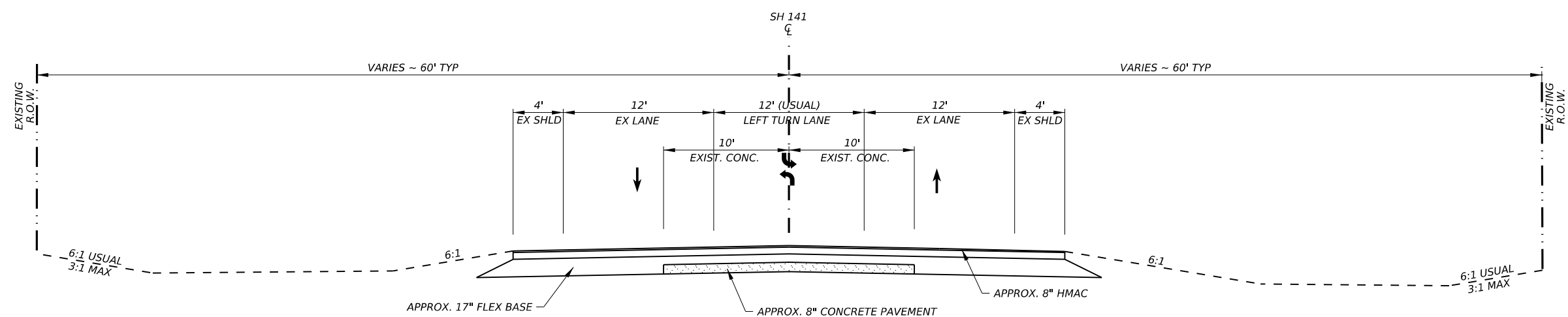
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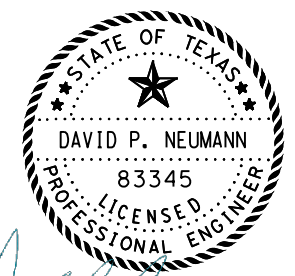
STATION 109+23 TO STATION 384+66 ~ (EQUATION = STA. 316+27.47 (AH) = STA. 316+19.30 (BK) = +8.17 FT.)
STATION 397+47 TO STATION 639+91.94

8" CONCRETE REMOVED
STATION 200+50 TO STATION 210+50
STATION 288+00 TO STATION 291+00



EXISTING TYPICAL SECTION ~ (CSJ: 0383-04-060)

STATION 384+66 TO STATION 387+94 ~ LEFT TURN LANE TRANSITIONS FROM (0' TO 12')
STATION 387+94 TO STATION 395+37
STATION 395+37 TO STATION 397+47 ~ LEFT TURN LANE TRANSITIONS FROM (12' TO 0')

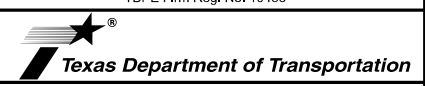


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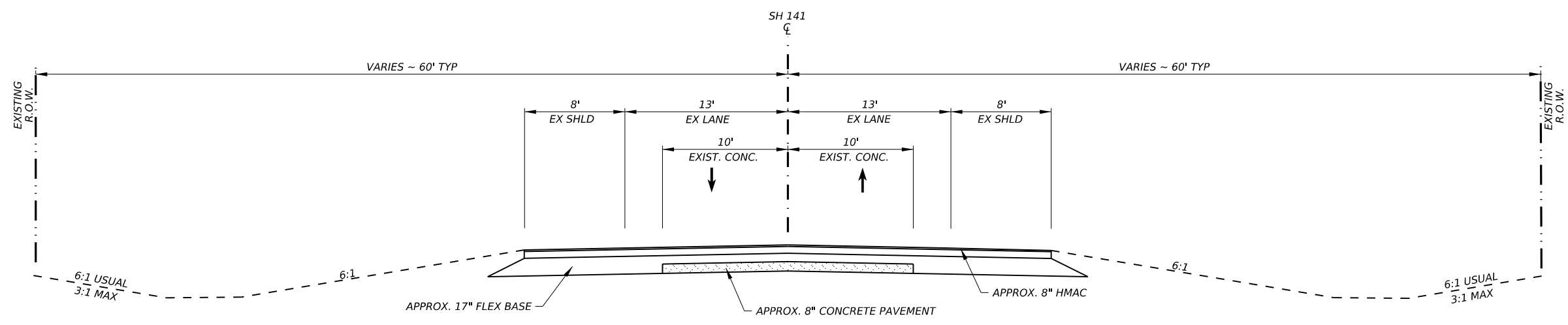
EXISTING TYPICAL SECTIONS

SHEET 2 OF 3

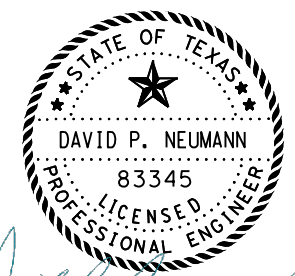
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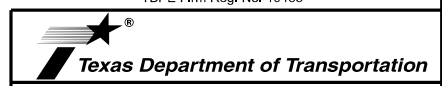
EXISTING TYPICAL SECTION ~ (CSJ: 0383-03-024)
 STATION 639+91.94 TO STATION 764+25.49



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2023.07.27 23:49:41-05'00'

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EXISTING TYPICAL SECTIONS

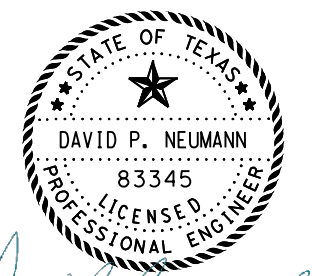
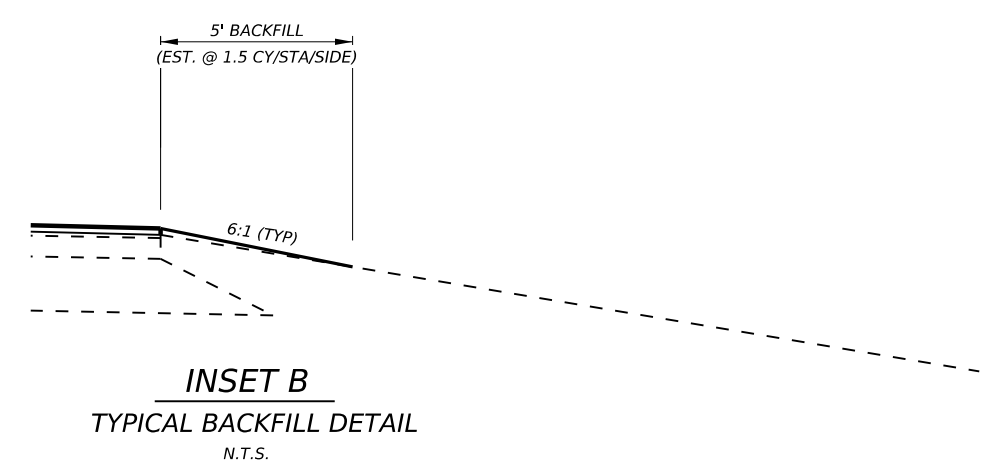
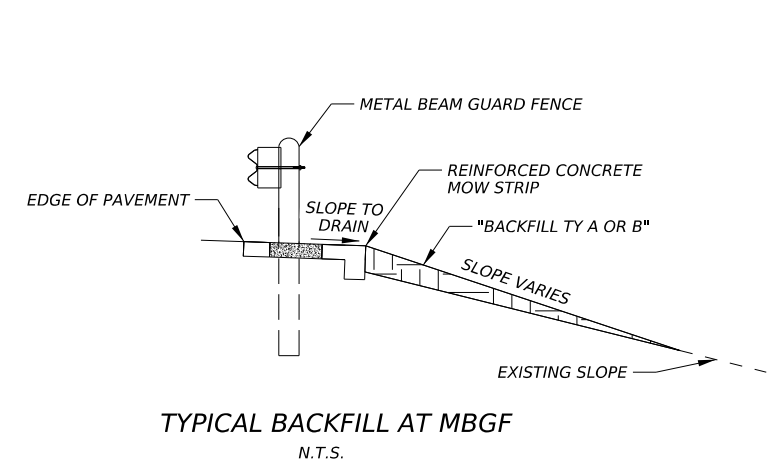
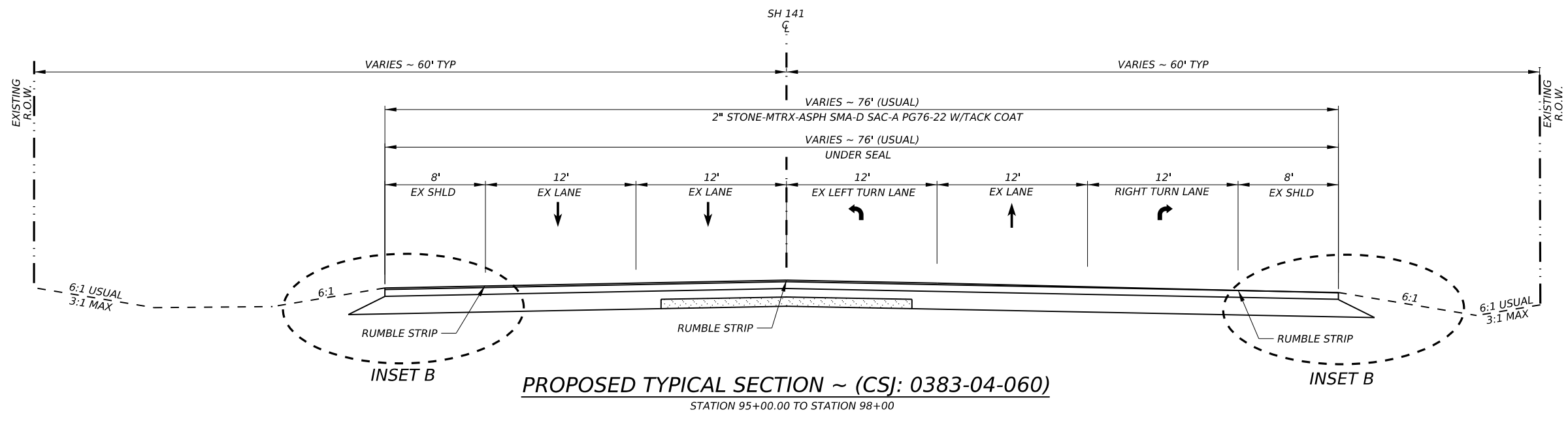
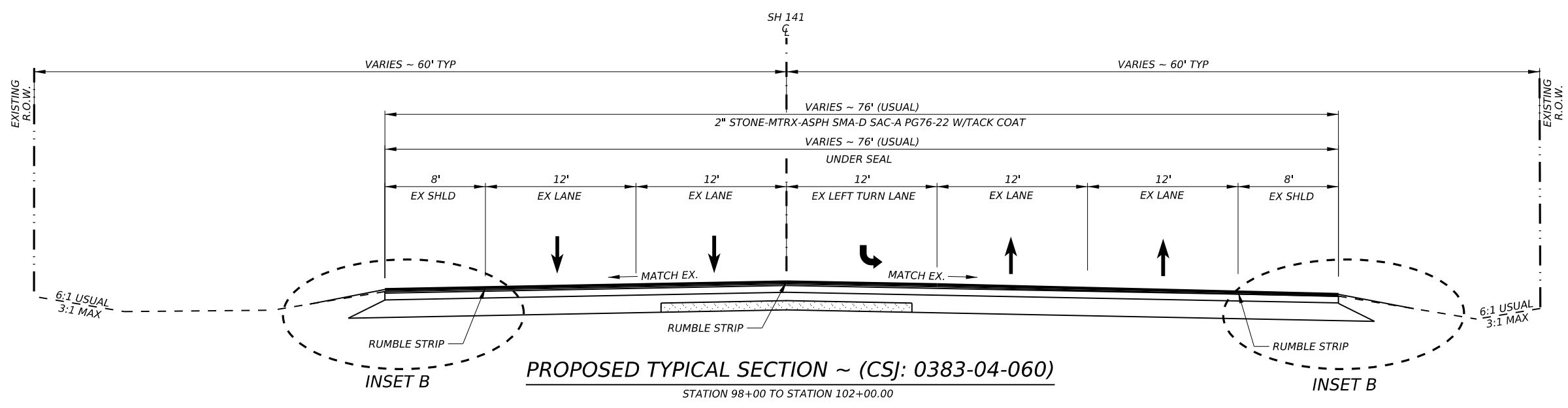
SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	006	



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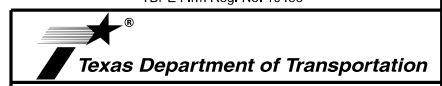
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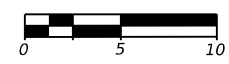
LOCHNER
TBPE Firm Reg. No. 10488



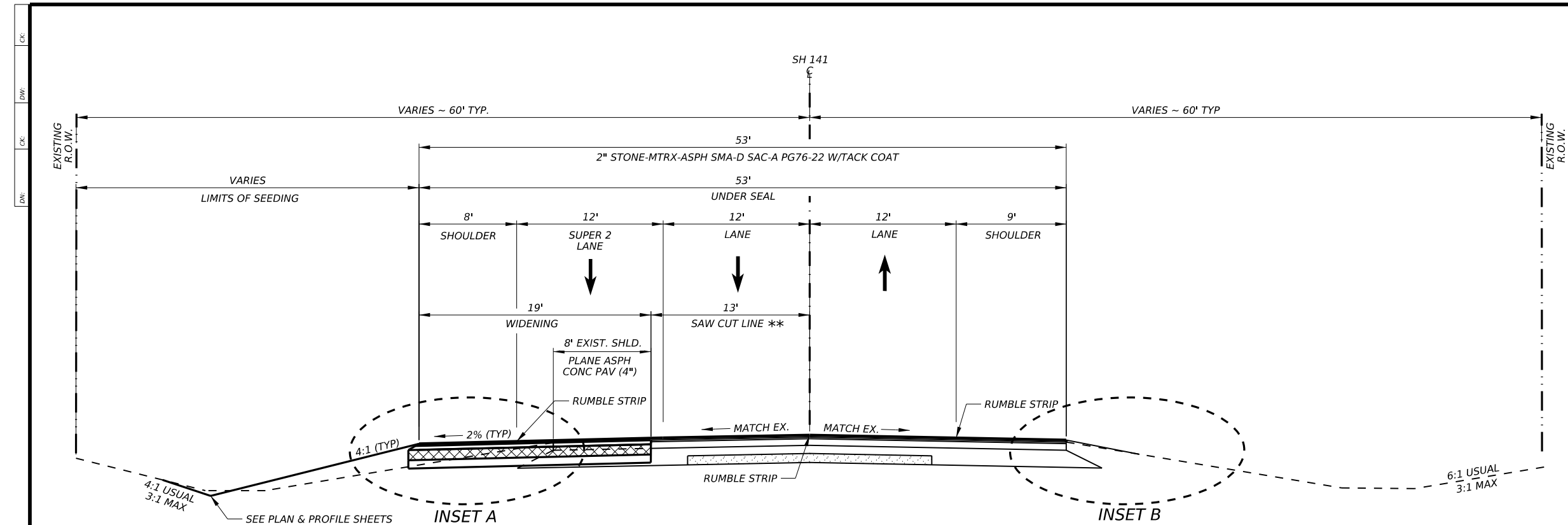
PROPOSED TYPICAL SECTION

SHEET 1 OF 6

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0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	007	



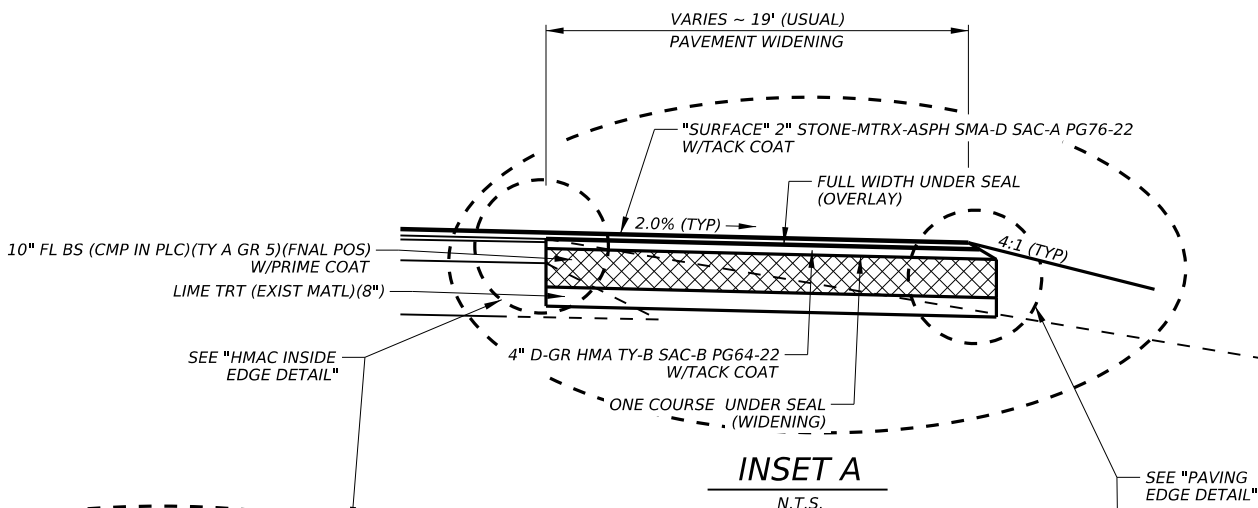
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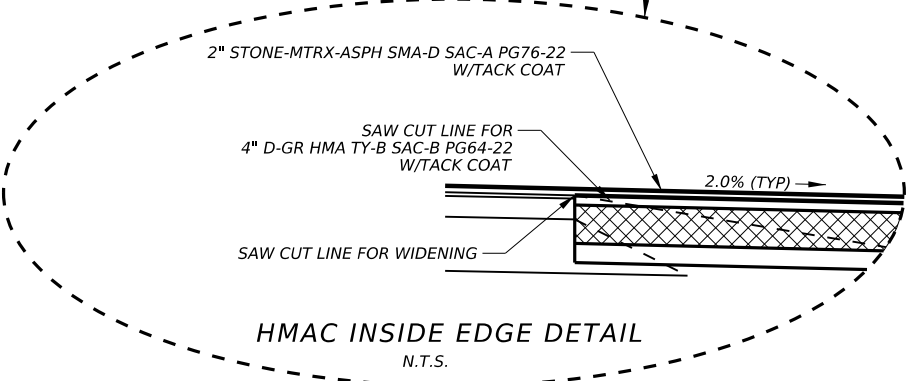
PROPOSED TYPICAL SECTION ~ (CSJ: 0383-04-060)

STATION 102+00.00 TO STATION 192+54.00
STATION 411+19.48 TO STATION 520+81.94

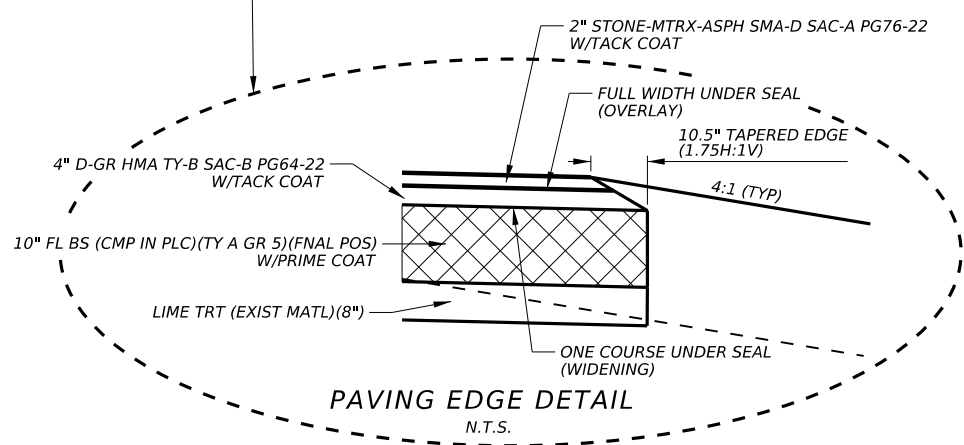
** SAWCUT LINE LOCATION VARIES ~ 13' USUAL - SEE PLAN & PROFILE LAYOUTS.



INSET A
N.T.S.



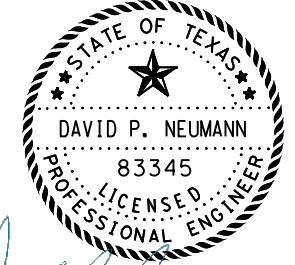
HMAC INSIDE EDGE DETAIL
N.T.S.



PAVING EDGE DETAIL
N.T.S.

NOTES:

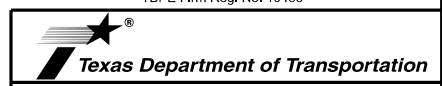
- TACK COAT (ITEM 3076-6066)
- UNDER SEAL (WIDENING):
AGGR (PB GR 4 OR PB GR 4S) SAC B
ASPH (AC-10, CRS-2, OR HFRS-2)
- UNDER SEAL (OVERLAY):
AGGR (PB GR 4S OR PB GR 4) SAC B
ASPH (AC-15P OR AC-20-5TR)
- PRIME COAT (MC-30)



David P. Neumann, P.E.

2023.07.27 23:50:12-05'00'

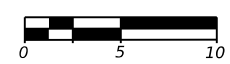
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PROPOSED TYPICAL SECTION

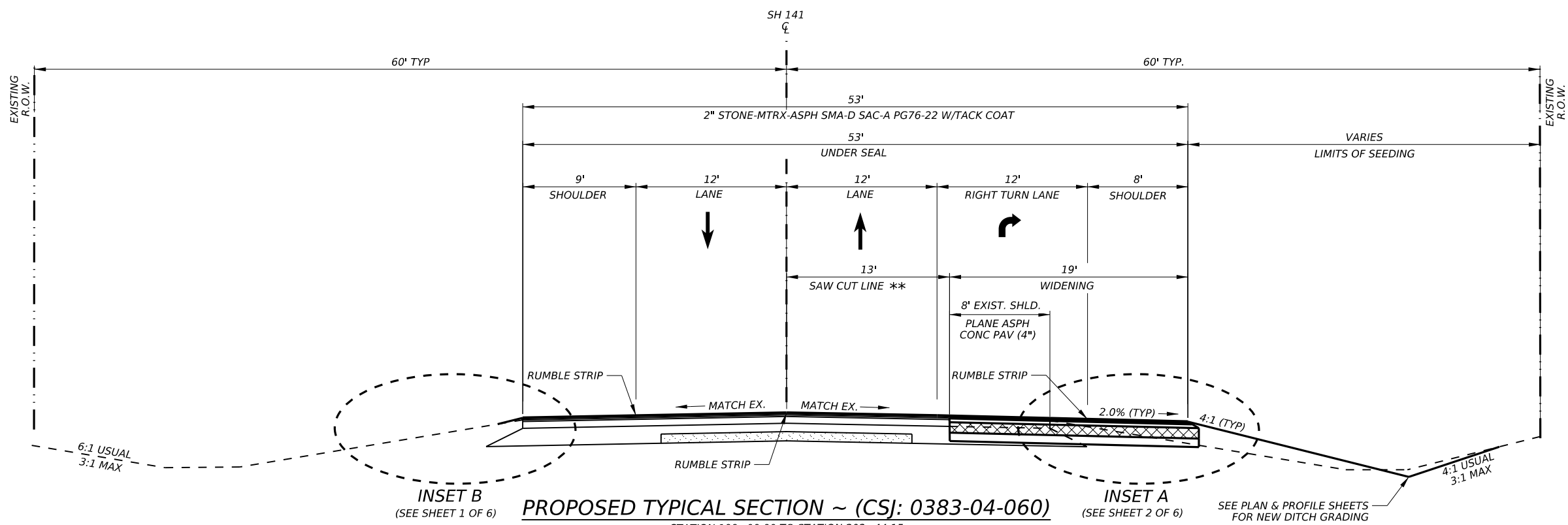
SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	008	



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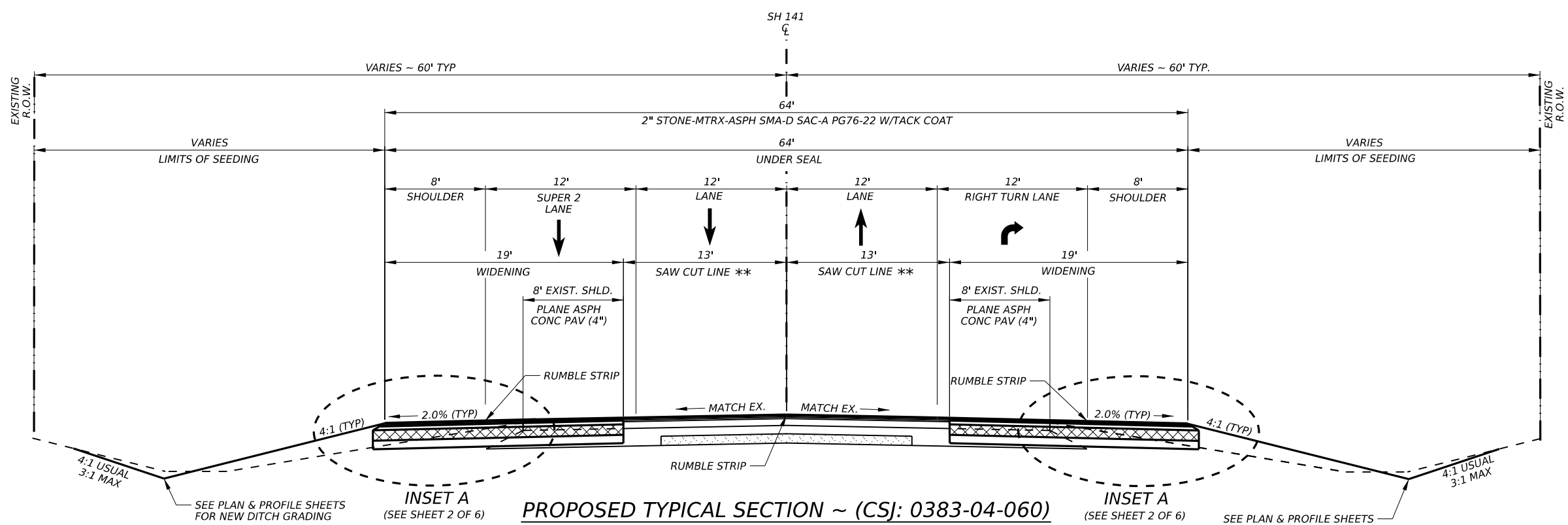
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** SAWCUT LINE LOCATION VARIES ~ 13' USUAL - SEE PLAN & PROFILE LAYOUTS.

PROPOSED TYPICAL SECTION ~ (CSJ: 0383-04-060)

STATION 199+00.00 TO STATION 202+44.15
 STATION 293+00.00 TO STATION 371+27.48
 (EQUATION = STATION 316+27.47 (AH) = STATION 316+19.30 (BK) = +8.17 FT.)
 STATION 520+81.94 TO STATION 531+40.27
 STATION 564+10.27 TO STATION 639+91.94

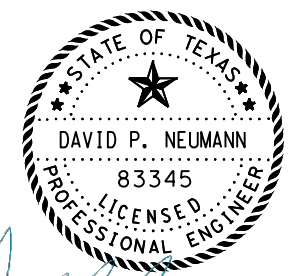


** SAWCUT LINE LOCATION VARIES ~ 13' USUAL - SEE PLAN & PROFILE LAYOUTS.

PROPOSED TYPICAL SECTION ~ (CSJ: 0383-04-060)

NOTE: WIDENING WILL ONLY BE CONSTRUCTED ON ONE (1) SIDE OF THE ROADWAY AT ANY GIVEN TIME.

DATE: 7/27/2023 10:07:06 PM
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David P. Neumann, P.E.
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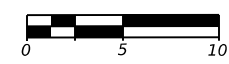
LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

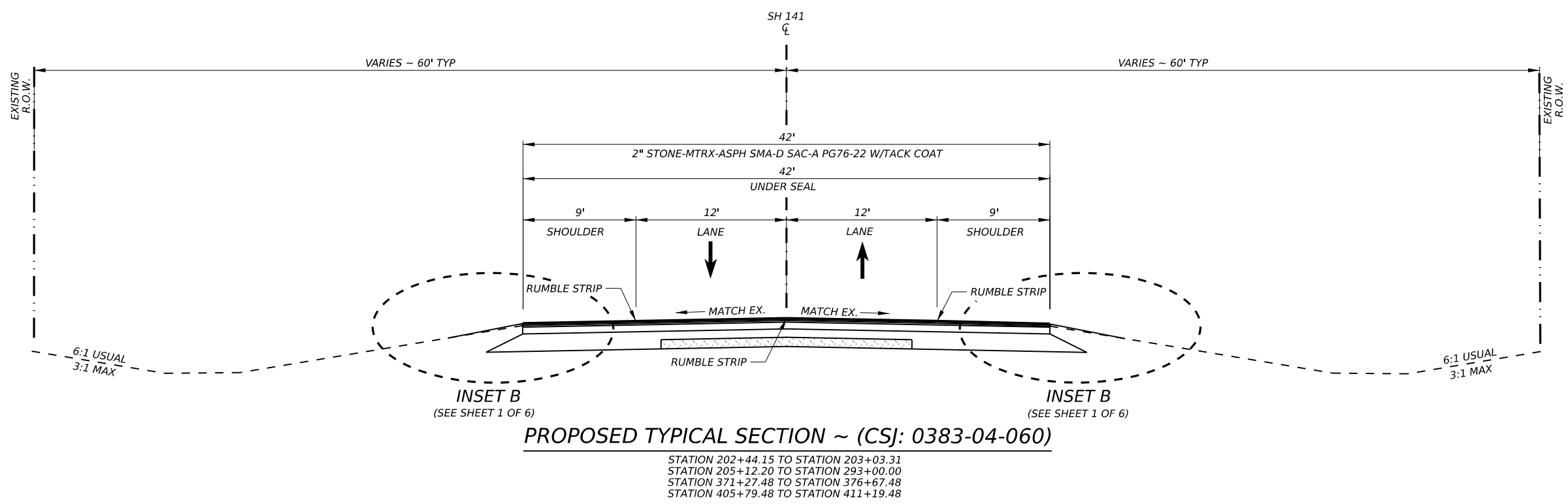
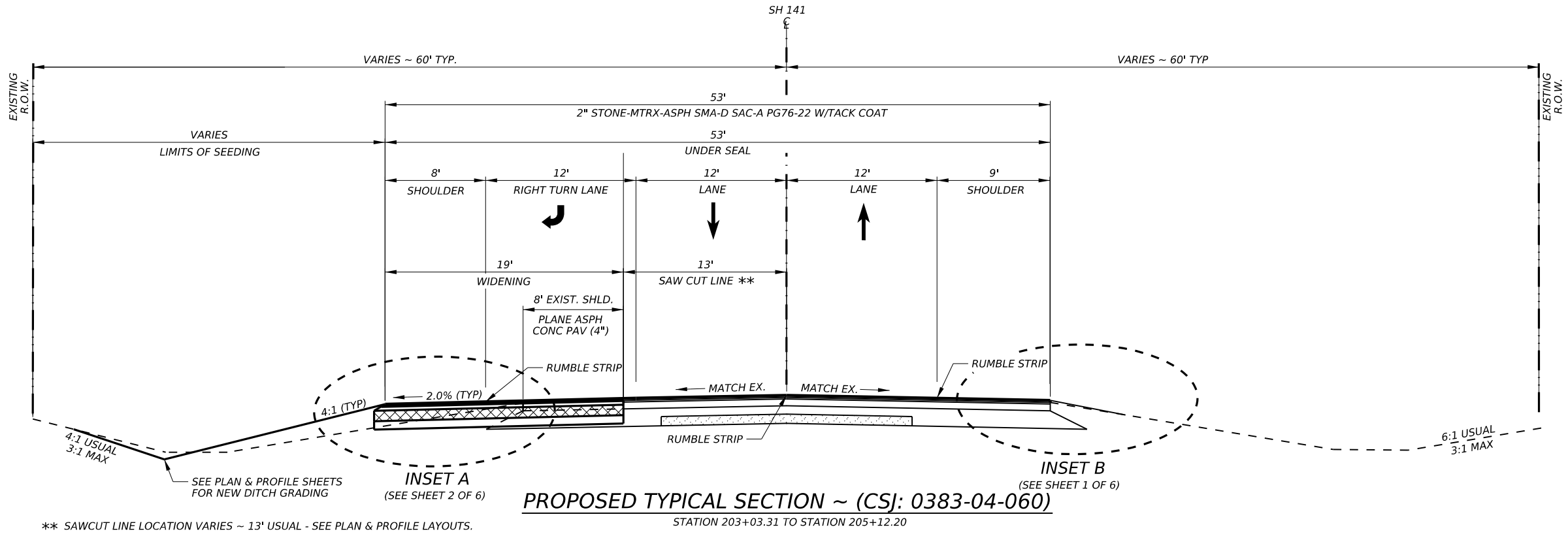
PROPOSED TYPICAL SECTION

SHEET 3 OF 6

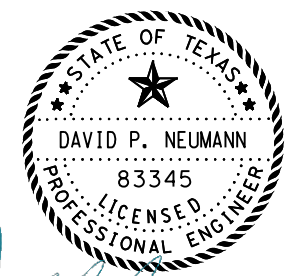
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	009	



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David P. Neumann, P.E.
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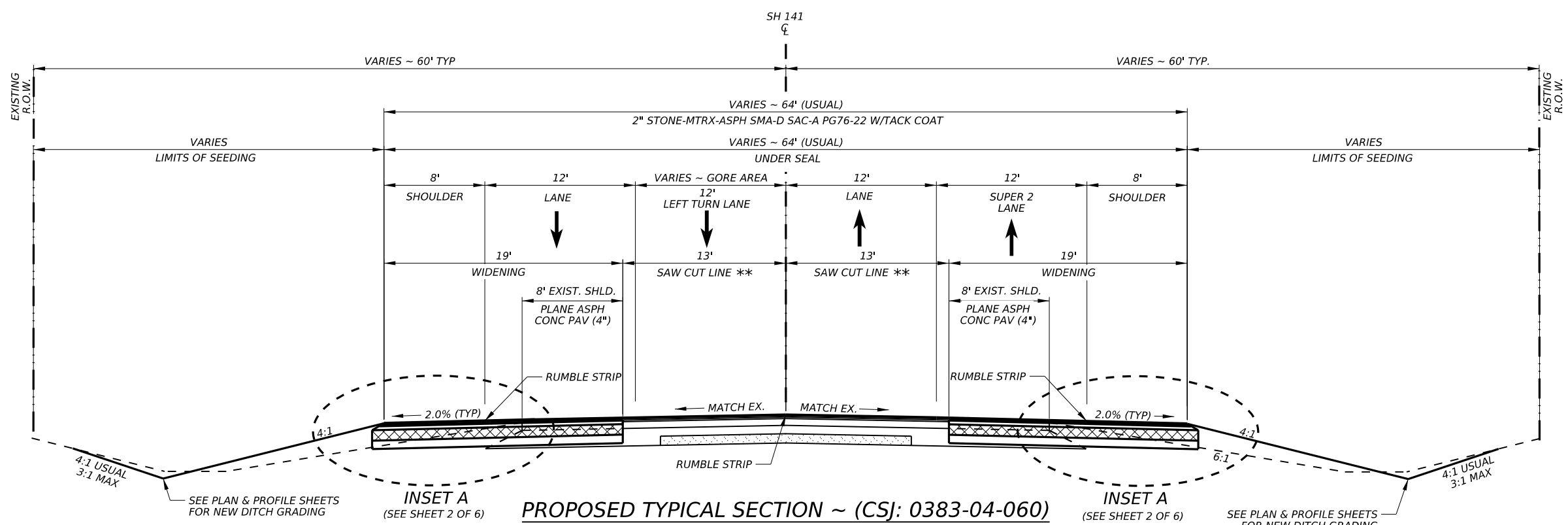
PROPOSED TYPICAL SECTION

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	010	



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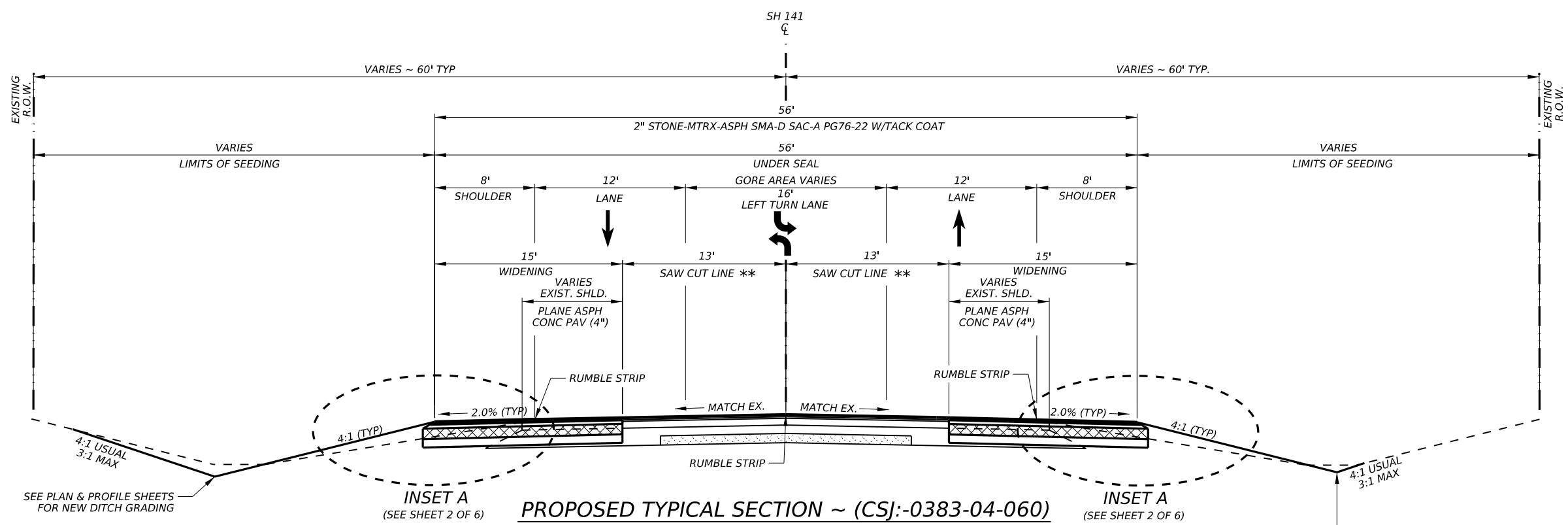


** SAWCUT LINE LOCATION VARIES ~ 13' USUAL - SEE PLAN & PROFILE LAYOUTS.

PROPOSED TYPICAL SECTION ~ (CSJ: 0383-04-060)

STATION 531+40.27 TO STATION 535+90.59 (GORE AREA TRANSITIONS FROM 0' TO 12')
 STATION 535+90.59 TO STATION 546+90.27 (LEFT TURN LANE - 12')
 STATION 546+90.27 TO STATION 555+10.27 (GORE AREA - 12')
 STATION 555+10.27 TO STATION 564+10.27 (GORE AREA TRANSITIONS FROM 12' TO 0')

NOTE: WIDENING WILL ONLY BE CONSTRUCTED ON ONE (1) SIDE OF THE ROADWAY AT ANY GIVEN TIME.



** SAWCUT LINE LOCATION VARIES ~ 13' USUAL - SEE PLAN & PROFILE LAYOUTS.

PROPOSED TYPICAL SECTION ~ (CSJ:-0383-04-060)

STATION 376+67.48 TO STATION 379+67.49 (GORE AREA TRANSITIONS FROM 0' TO 16')
 STATION 379+67.49 TO STATION 390+52.48 (16' LEFT TURN LANE)
 STATION 390+52.48 TO STATION 391+94.48 (INTERSECTION)
 STATION 391+94.48 TO STATION 402+79.46 (16' LEFT TURN LANE)
 STATION 402+79.46 TO STATION 405+79.48 (GORE AREA TRANSITIONS FROM 16' TO 0')

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STATE OF TEXAS
 DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER
 David P. Neumann, P.E.
 2023.07.27 23:42:46-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488
 Texas Department of Transportation

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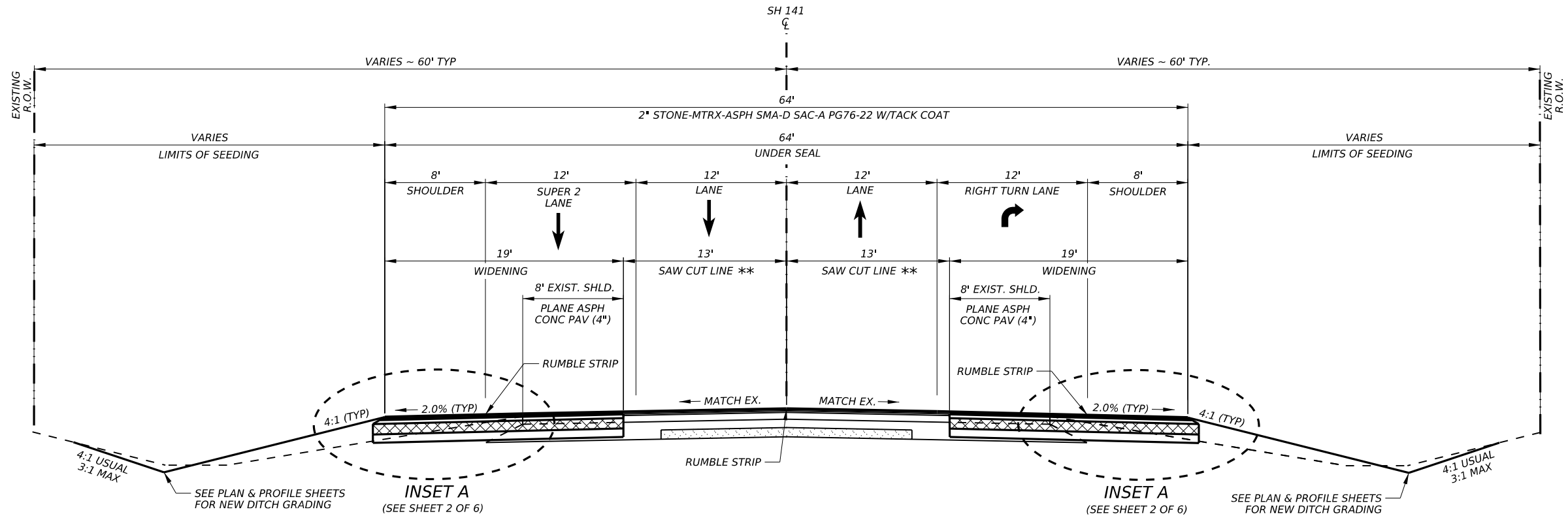
PROPOSED TYPICAL SECTION

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
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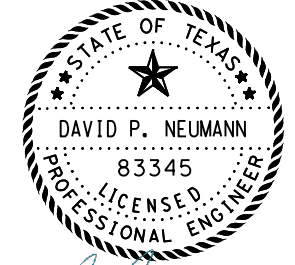
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** SAWCUT LINE LOCATION VARIES ~ 13' USUAL - SEE PLAN & PROFILE LAYOUTS.

PROPOSED TYPICAL SECTION ~ (CSJ: 0383-03-024)

STATION 639+91.94 TO STATION 759+01.94, LEFT STATION 753+75.49 TO STATION 764+25.49, RIGHT



David P. Neumann, P.E.
2023.07.27 23:41:41-05'00'

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TBPE Firm Reg. No. 10488



PROPOSED TYPICAL SECTIONS

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	012



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County: JIM WELLS, ETC

Control: 0383-03-024, ETC.

Highway: SH 141

GENERAL NOTES:

Find, for your information and convenience, tools such as forms, software, materials, and various other information provided by the Department at <https://www.txdot.gov/business.html>. Please note that these tools are updated periodically, and your attention is directed to the latest edition.

In the event of a called evacuation, emergencies, impending adverse weather or as directed, do not perform any work without written authorization. The District reserves the right to suspend all work in support of evacuations or emergencies occurring from other parts of the state. Any work performed, other than work directed by the Department, is unauthorized work in accordance with Item 5.

Sweep, clean and remove any construction waste, surplus materials or debris from the roadway and right of way at the end of each day unless otherwise approved. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Asphalt application season will be established in accordance with Item 316.4.4 Adverse Weather Conditions or as directed by the Engineer.

Cut existing pavement using a saw or other approved method to ensure a neat transverse and/or longitudinal line to assure a smooth tie-in with new pavement. Cut to a minimum depth of the final lift thickness. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Promptly pick up and properly dispose of paper and other materials used for pavement joints.

No person or tool will be permitted within 8 feet of high voltage electrical lines (600 volts or greater) unless arrangements have been made with the power company. No working equipment will be permitted within 10 feet of high voltage electrical lines unless there are warnings posted and an insulated guard is attached to the boom or bucket. The Contractor shall notify the Engineer if there are any conflicts with high voltage electrical lines.

In preparing holes for foundation, care shall be taken so as not to rupture existing drainage structures, electrical conduits, public utilities, etc.

Electrical materials and fittings covered by the plans and specifications for this project shall be in accordance with NEMA standards. The installation shall comply with the applicable provisions of the National Electrical Safety Code and National Electrical Manufacturers Association specifications.

All pavement markings shall be in accordance with the latest edition of Texas MUTCD.

The following standards have been modified: TS-FD-12 (MOD)

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

General Notes

Sheet A

County: JIM WELLS, ETC

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Lucio Ramos, P.E.
Lucia Adame, P.E.

Lucio.Ramos@txdot.gov
Lucia.Adame@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals. Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

<https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

ITEM 2

It is recommended that prospective bidders examine the specified work locations with the Engineer to view the nature of the work, the need for close coordination with the various utilities, traffic control considerations, and other factors influencing the prosecution of the work.

ITEM 5

For this project submit shop drawings for the fabrication of structural items to: kdickey@hwlochner.com, copy TxDOT Area Engineer and CRP-ShopPlanReview@txdot.gov and others as shown in the *Guide to Electronic Shop Drawing Submittal* found at https://ftp.txdot.gov/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf.


Field verify all dimensions and notify Engineer prior to initiating any work.

Verify the locations of utilities, underground or overhead, shown within the limits of the right-of-way. Adhere to OSHA Standards when working within the vicinity of overhead power lines. Coordinate with the utility companies and notify the Engineer of any possible conflicts. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

The 811 call services for a utility location does not include TxDOT facilities. Provide notification to the District Traffic Signal Shop by email at CRP_Utility_Locate@txdot.gov or call 361-739-6044 when planning, drilling, or excavating in areas where existing TxDOT underground utilities exist. Visual evidence of TxDOT underground utilities in the area include

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Sheet B

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illumination poles, ground boxes, flashing beacons, traffic signals, etc. This notification must be provided 48 hours in advance of performing the work, but no earlier than 72 business hours before the work will commence. Drilled shaft locations or excavation areas must be staked prior to the notification so that the underground utilities can be located in relationship to the proposed work.

Notify the Engineer immediately of utility conflicts in accordance with Item 5.6. Refer to Item 4.5 for consideration of differing site conditions.

The responsibility for the construction surveying on this contract will be in accordance with Item 5.9.1, "Method A".

This project was developed using 3D design software and tools. A proposed 3D model of the project In Extensible Markup Language (XML) and 3d PDF format is available upon request. These models are specifically intended to aid the contractor in preparing bids and in the use of automated machine guidance equipment for the project construction. If discrepancies are found, numerical dimensions in the cross-sections and plan sheets govern over the 3D model.

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 6

Inspection at Precast Concrete Fabrication Plants is as follows: TxDOT's Materials and Pavements Section will inspect any precast units at commercial fabrication yards and staging areas. The Area Engineer will inspect all other precast units.

For Department-furnished material, contact the Engineer or his designated representative to request material a minimum of one workday prior to pick up. Load material with contract personnel. Materials are to be stored in a safe location outside TXDOT property or right-of-way, {unless otherwise approved.} Use material furnished by the Department only on the project(s) intended. Return any unused material as soon as possible.

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit an original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

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The Buy America Material Classification Sheet is located at the below link. <https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html> for clarification on material categorization.

ITEM 7

The work performed for Item 7.2.4, "Public Safety and Convenience" will not be measured or paid for directly but will be subsidiary to pertinent Items.

When working at street, farm-to-market, state highway, and county road intersections, schedule work to minimize intersection closures. During nonworking hours, all public road intersections will be open to the traveling public.

The total disturbed area for this project is 43.88 acres. The disturbed area in this project, all project locations in the Contract, and Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain any required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off ROW. When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer.

Establish uniform perennial vegetative coverage with a density of at least 70% of the native background vegetative cover to achieve final stabilization.

Comply with the Texas Aggregate Quarry and Pit Safety Act for waste areas or material source areas resulting from this project.

No significant traffic generator events identified.


ITEM 8

Prepare the progress schedule using the Critical Path Method (CPM). Submit two (2) 11" x 17" hard copies and an electronic file of the original or updated progress schedule. Submit the original progress schedule seven (7) days before the Preconstruction Conference.

Submit an updated progress schedule as directed to show proposed major changes, changes affecting compliance with the contract requirements, or changes affecting the critical path/controlling item of work.

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Working days will be computed and charge in accordance with Article 8.3.1.4, "Standard Workweek".

Work above traffic is not allowed.

Nighttime work is allowable.

Notify the Engineer at least 48 hours in advance of weekend or nighttime work.

In accordance with special provision 000-1243, additional liquidated damages will be assessed in the amount of \$4,463 per working day.

ITEM 9

Monthly progress payments will be made for items of work completed by the 28th day of each month. Any work completed after the 28th will be included for payment in the subsequent monthly progress estimate.

Submit signed request for compensation of material-on-hand (MOH), including any requests from subcontractors, suppliers, or fabricators for MOH, at least two (2) working days prior to the end of the month on the Departments approved forms.

ITEM 100

Coordinate all right of way preparation activities with the project's Storm Water Pollution Prevention Plan (SWP3) and Environmental Permit Issues, and Commitments Sheet (EPIC) or as approved.

Prune trees and shrubs as directed. Use accepted pruning practices in accordance with Item 192 and as defined by the National Arborist Association. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

ITEM 110

For earth cuts, manipulate and compact subgrade in accordance with Item 132.3.4.2, "Compaction Methods, Density Control".

ITEM 132

Use embankment material with a plasticity index (PI) ranging from 10 to 40. Blend or treat approved materials to achieve the desired PI and pulverize the material so that 100% passes the

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3-inch sieve. Retest materials as borrow sources change or when the material changes significantly. Notify the Engineer of the proposed material sources and of changes to material sources. The Engineer may sample and test project materials at any time before compaction throughout the duration of the project to assure specification compliance. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Obtain approval to incorporate existing salvaged asphaltic surface and flexible base materials in the surface layer. If approved, incorporate existing materials no larger than 2 inches in the surface layer. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

The estimated quantities for embankments adjacent to culverts and bridges were calculated using the average-end-area method.

ITEM 134

Backfill pavement edges with reclaimable asphalt material (R.A.P.).

When using backfill type A, use backfill material with a plasticity index (PI) ranging from 10 to 40. Notify the Engineer of the proposed material sources and of changes to material sources. The Engineer may sample and test project materials at any time before compaction throughout the duration of the project to assure specification compliance.

R.A.P. material must pass a 2" sieve. All material not passing sieve will be removed and disposed of properly. This shall be considered subsidiary to Item 134.

Windrow the existing topsoil and grass along the edge of the grading operations or as directed. After grading operations are completed, spread the topsoil and grass uniformly on all slopes and ditch lines. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Manipulate and compact backfill material in accordance with Item 132.3.4.1, "Ordinary Compaction". The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.


Apply SS-1 at a rate of application of 0.15 gallon per square yard. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

ITEM 164

Restore and seed areas not shown in the plans disturbed by the Contractor's operations. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

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Notify the Engineer of the unavailability of any seed mix. Make changes to the seed mix as approved.

Use a tacking agent of 50% SS-1 and 50% water and apply the agent at a rate of 0.10 gal/sy or as directed. A biodegradable tacking agent may be used in lieu of the SS-1 tacking agent in accordance with the manufacturer's recommendations when approved. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

ITEM 166

Furnish and apply slow-release nitrogen fertilizer with a rate of 60 pounds of nitrogen per acre.

ITEM 168

Distribute water to only those areas shown in the plans or as directed. Excessive overspray will not be permitted.

Water all areas of the project to be seeded or sodded every two (2) days for 90 days or as directed. Apply water in a manner to ensure adequate moisture but not to erode the soil in-place. During periods of adequate moisture, mechanical watering may not be required as approved. Upon final stabilization, the Engineer may require continuing watering as specified for a period not to exceed 30 days.

The Basis of Estimate below establishes the approximate quantity of water required to complete the 90-day watering cycle:

Rate	Water (Gal/Acre/Day)	Area (Acre)	Total Gallons (Min)
0.25 inch/week	1961	1	88,245

ITEM 247

For Table 1, "Material Requirements" a minimum plasticity index (PI) of 4 is required for Ty A Flex Base.

When requested, stake with blue tops, at 100-foot intervals, the lines and grade shown in the plans.

For Alternate Bid:

If Item 0247-6057 FL BS (CMP IN PLC) TY E GR 1-2 is selected, the base material will meet all the requirements of item 247, but will include the following modifications and requirements: Minimum Plasticity Index: 2

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Maximum Wet Ball Mill Value: 45
Minimum Triaxial 0 Lateral Pressure: 30 PSI
Minimum Triaxial 15 Lateral Pressure: 150 PSI

Type E material consists of crushed stone produced and graded from oversize quarried aggregate that originates from a single, naturally occurring source. Do not use crushed or uncrushed gravel. Blending of two or more sources, except sand or any other additive, is allowed.

ITEM 302

Provide aggregates with a minimum surface aggregate classification (SAC) of "B" unless otherwise shown. The SAC for sources on the Department's Aggregate Quality Monitoring Program (AQMP) is listed in the Department's Bituminous Rated Source Quality Catalogue (BRSQC). SAC requirements apply to aggregates used on all final roadway surfaces, including shoulders.

For precoated aggregate Type PB crushed gravel will not be used.

ITEM 310

Use MC-30 at a rate of 0.20 gallons per square yard or as directed.

A minimum prime coat curing period shall be determined by the Engineer during or prior to the preconstruction meeting. This curing period may be revised by the Engineer throughout the duration of the project pending weather and observed performance.

ITEM 314

Reference the General Note for Item 310, "Prime Coat" for mixture and rates of application.

ITEM 316

Do not place surface treatment on exposed concrete structures unless directed.


Furnish a distributor equipped with a working hand hose.

Material rates shown are for estimating purposes only. Adjust actual rates based on the material used, the existing condition and type of roadway surface, and as approved.

When using asphalt emulsion, a minimum 24-hour curing period is required before placing any subsequent asphalt courses.

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Remove vegetation and blade pavement edges prior to surfacing operations. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Broom and clean sealed sections of roadway and all adjacent paved surfaces, including the gutter line, of any surplus aggregate before opening to traffic or as directed.

ITEM 320

Provide the type of windrow pick-up equipment for approval prior to beginning paving operations.

Use of motor grader will not be permitted unless approved.

ITEM 351

Use of motor grader will not be permitted unless approved.

Saw cut and remove the full depth of pavement repair at all transverse joints.

ITEM 354

Reclaimable asphalt material (RAP) may be retained only if incorporated into the project. Incorporate the RAP into the pavement mix design, into the backfill for pavement edges, into temporary structures, or as approved.

Any RAP remaining from the contract is to be stockpiled at:

East of L E Ramey Golf Course
2522 E. Escondido Rd.
Kingsville, TX 78363
27°28'41.17"N, 97°49'50.50"W

If the location is considered full, the alternate location will be at FM 772 at BU 77.

ITEM 400

Compact each layer to meet the density and consolidation of the adjacent undisturbed material.

Use cement-stabilized backfill for culvert and storm drains located beneath the pavement structure.

General Notes

Sheet I

County: JIM WELLS, ETC

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ITEM 420

Set a Department-furnished brass disk on all bridge abutments and culvert headwalls as directed. The work performed will not be measured or paid directly but will be subsidiary to pertinent Items.

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 421

The Engineer will provide strength-testing equipment for acceptance testing.

Furnish curing facilities adequately sized for this project as approved.

Furnish test molds for cylindrical concrete specimens measuring four (4") inches in diameter by eight (8") inches in length.

ITEM 427

Provide a rub finish for Surface Area II unless otherwise directed.

ITEM 432

Saw cut the existing riprap to ensure a neat transverse and/or longitudinal line to assure a smooth tie-in with new riprap. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.


Use Cap Option C for the joint between the face of the abutment and riprap as shown on the standard sheet "Concrete Riprap (CRR)".

Reinforce concrete riprap with flat sheets of welded wire fabric or with No. 3 reinforcing bars spaced at a maximum of 12 inch in each direction.

Weep holes shall be required unless otherwise directed by engineer.

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ITEM 462

Use cold-applied, plastic asphalt sewer joint compound for all joints. Provide sandproof tape for all pipe placed in cohesionless backfill material as approved or provide gaskets that conform to Item 464.2.7.3.

Cement stabilized backfill is not considered cohesionless for this item.

The work performed for concrete collars will not be measured or paid for directly but will be subsidiary to pertinent Items.

ITEM 464

The work performed for concrete collars will not be measured or paid for directly but will be subsidiary to pertinent Items.

ITEM 467

The flowline of the safety end treatment shall match the flowline of the culvert.

Reinforce concrete riprap with 4 x 4 – W2.9 x W2.9 welded wire fabric or with No. 3 reinforcing bars spaced at a maximum of 12 inch in each direction.

The work performed for concrete collars will not be measured or paid for directly but will be subsidiary to pertinent Items.

All safety end treatments shall include riprap to the dimensions shown on PSET-RR. This riprap shall be subsidiary to Item 467.

The removal and reinstallation of pipe runners requires new pipe for all installation.

ITEM 500

"Materials on Hand" payments are not considered when determining partial payments.

ITEM 502

Furnish additional barricades, signs, and traffic handling as directed. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Traffic control for daytime lane closures shall be in accordance with applicable standards. Traffic control shall include temporary rumble strips in accordance with WZ (RS)-22.

General Notes

Sheet K

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When advanced warning flashing arrow panels are specified, furnish one (1) standby unit in good condition at the job site for immediate use.

Attach stop/slow paddle to a staff with a minimum length of 6 feet to the bottom of the sign.

The use of a pilot vehicle in conjunction with flaggers will be permitted. If used, provide positive and unrestricted communication between the driver of the pilot vehicle and the flaggers. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Contractors' attention is directed to a construction speed zone. Signage is subsidiary to Item 502.

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.

All items marked as optional on all traffic control standards shall be required unless otherwise approved by an Engineer.

Trail vehicle shall be required on all mobile traffic control operations.

ITEM 504

Apply for and secure permits necessary for the buildings and pay all utility meter deposits and service bills. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

Provide 2 sets of keys for all facilities, which include but are not limited to the field office and/or laboratory.


Maintain all mechanical, electrical, and plumbing facilities at all times.

Provide one (1) Type C Structure (Field Office). This field office shall be for TxDOT use only and shall be a separate structure from the Contractor's facilities.

Furnish and install adequate equipment, outlets, lighting, air conditioning, heating, and ventilation as approved. Arrange and install outlets as directed with no less than one (1) outlet per wall. Portable toilets will not be allowed.

General Notes

Sheet L

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Provide 2 standard size office desk, 4 office chairs, 1 conference table, 1 bookcase, and 2 locking filing cabinets as approved. Provide solar screens, blinds, or shades.

Provide 1 phone line and 1 phone. A cell phone will not be allowed unless approved.

Provide high speed internet connectivity, a paper copier / scanner/ printer / facsimile.

Provide one (1) Type D Structure (Asphalt Mix Control Laboratory). This laboratory shall be for TxDOT use only and shall be a separate structure from the Contractor's facilities.

Portable toilets will not be allowed.

Secure all exterior openings with bars.

Provide 2 sets of keys for all facilities.

Provide 2 standard size office desk, 4 office chairs, 2 bookcases, and 2 filing cabinets as approved. Provide solar screens, blinds, or shades.

Provide high speed internet connectivity, a printer/fax/scan/copier, and a telephone.

Provide hot water or a hot water dispenser capable of generating one (1) gallon of water at 140 degrees Fahrenheit with acceptable water pressure.

Provide Safety Equipment as follows:

- (1) ONE EYE WASH STATION
- (2) ONE FIRST AID KIT

Provide doors with a minimum width of 36 inches and 80 inches in height. Secure all exterior openings with bars.

Asphalt content will be measured by Ignition Method.

ITEM 506

Designate in writing a Contractor Responsible Person (CRP) for implementing, maintaining, and reviewing environmental requirements.

ITEM 530

If conditions warrant, driveway locations, widths, or lengths may be adjusted as directed.

General Notes

Sheet M

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Highway: SH 141

ITEM 533

Construct shoulder texturing at a distance of 6 inches from the edge line in accordance to RS(2)-23 Option 4.

Construct centerline texturing in accordance to RS(3)-23 Option 1.

Construct centerline texturing in accordance to RS(4)-23 Option 1.

ITEM 540

Complete each location during the working day. No exposed bridge rail or guard fence ends will be permitted at the end of the working day or unattended during the working day.

Mixing of wood post types and shapes will not be permitted at the same location.

Type II Galvanization coatings will be used.

ITEM 542

Any metal beam guard fence remaining from the contract is to remain with the Contractor.

ITEM 585

Use Surface Test Type B and Pay Adjustment Schedule 2 to evaluate ride quality of the travel lanes on the existing mainlanes (inside lanes) in accordance with Item 585, "Ride Quality for Pavement Surfaces."


Use Surface Test Type B and Pay Adjustment Schedule 1 to evaluate ride quality of the travel lanes on the widened sections (outside lanes on the passing section) in accordance with Item 585, "Ride Quality for Pavement Surfaces."

ITEM 610

Luminaires shall be rated at 240VAC and 250W EQ LED.

General Notes

Sheet N

 © 2023 GENERAL NOTES	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
	6		SH 141
	STATE	DISTRICT	COUNTY
	TEXAS	CRP	JIM WELLS, ETC.
	CONTROL	SECTION	JOB
	0383	03	024, ETC.
			SHEET NO.
			13F

County: JIM WELLS, ETC

Control: 0383-03-024, ETC.

Highway: SH 141

ITEM 618

Seal all conduits terminating in ground boxes and pole foundations with a sealant made of polyurethane or equivalent that will cure in the presence of moisture. Ensure sealant is suitable for sealing ends with electrical conductor extending past the ends of the conduit. Inject the sealant a minimum of 3 inches and a maximum of 5 inches into the conduit.

Provide rigid metal conduit (RMC) elbows for all underground conduit bends of 45 degrees or more, including bends into ground boxes. Provide a polyvinyl chloride conduit (PVC) elbow in lieu of a RMC elbow for conduit 1 inch or larger. Ensure the elbow is the same schedule rating as the conduit to which it is connected.

Bond the RMC to the grounding conductor with grounding type bushings when the RMC is exposed or extends into the ground box.

Provide a flat, high tensile strength polyester fiber pull tape in each conduit to pull conductors.

Provide wide sweep conduit elbows.

Jacking of conduit will not be permitted.

All conduit placed in non-traffic areas shall be placed by open trench method at a minimum depth of 2.0 feet. All conduit runs under pavement or driveways shall be bored. Where boring is required, it shall be placed at a minimum depth of 3.5 feet.

ITEM 620

Bond grounding conductors that share the same conduit, junction box, ground box, or structure together at every accessible point in accordance with the National Electric Code and TxDOT requirements. Install insulated electrical grounding conductors in conduits as shown on the plans, provide cable with green color insulation.

Slack conductors required by standard sheet ED(3)-14 inside ground boxes and those inside traffic signal pole assemblies will not be paid for directly but will be subsidiary to other items.

ITEM 628

Provide a meter box for all electrical services.

ITEM 636

All sign wraps are subsidiary to Item 636.

General Notes

Sheet O

County: JIM WELLS, ETC

Control: 0383-03-024, ETC.

Highway: SH 141

Field verify vertical clearance as directed by the online Texas Department of Transportation manual, "Sign Guidelines and Applications Manual" chapter 6 section 3. The Engineer's approval will be required prior to fabrication.

Furnish new sign supports when replacing overhead signs. This will be subsidiary to pertinent items.

Any signs remaining from the contract is to remain with the Contractor.

ITEM 644

Use crash worthy supports as shown on the BC sheets, the CWZTCD, or as directed for signs relocated using temporary supports. The work performed will not be measured or paid for directly but will be subsidiary to pertinent Items.

All slip bases and hardware including but not limited to nuts, bolts, screws and washers will be galvanized. All sign and housing components will be galvanized. Slip bases shall be clamp-style.

Any signs, posts, and foundations remaining from the contract is to remain with the Contractor.

ITEM 658

Furnish round delineators and object markers.

ITEM 662

Use temporary flexible-reflective roadway marker tabs at the beginning and end of no passing zones as shown on the TCP (7-1)-13 for seal coats and WZ(STPM)-23 for hot mix overlays.

ITEM 666

Establish and mark the location of existing standard pavement markings including but not limited to edge lines, transitions, passing and no passing zones, gore areas, etc.


ITEM 677

Eliminate all conflicting pavement markings as work progresses or as directed.

Removal method must be approved by the Engineer.

General Notes

Sheet P

 © 2023 GENERAL NOTES	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
	6		SH 141
	STATE	DISTRICT	COUNTY
	TEXAS	CRP	JIM WELLS, ETC.
	CONTROL	SECTION	JOB
	0383	03	024, ETC.
			SHEET NO.
			13G

County: JIM WELLS, ETC

Control: 0383-03-024, ETC.

Highway: SH 141

No Surface Treatment Method on concrete surfaces.

When using Surface Treatment Method for asphaltic pavements, use a PB Grade 5 aggregate at an application rate of 1 cy/130 sy and asphalt AC-10, CRS-2 or HFRS-2 at a application rate of 0.39 Gal/sy.

ITEM 680

Do not activate traffic signals without approval. For new signal installations, notify the Engineer two (2) weeks in advance of the activation date for advertisement purposes and place the signals on flash as directed.

The locations shown on the plans for signal pole foundations, conduit and other items may be adjusted to better fit field conditions as approved.

The following items should be used: Econolite Cobalt TS2 Type1, EDI Smart monitor MMU-16LEip with 10/100Mbps Ethernet Port, and Ethernet Switch with 8 port and power supply.

Integrate the proposed traffic signal(s) into the existing Advanced Traffic Management System (ATMS) as shown on the plans. Centraacs ATMS software, which utilizes Econolite controllers, is currently in use in the Corpus Christi District. Provide controllers on this project that fully communicate with the existing ATMS software. For use when signal controller is furnished by contractor.

This project includes the installation of at least one cellular modem at the location(s) specified in the plans. Cellular modem(s) and power supply(s) will be furnished by the department. Provide all materials not supplied by the department necessary for the cellular modem installation. All materials provided by the contractor must be new unless otherwise shown on the plans. Verify operation of the cellular modem(s) together with operation of its links; demonstrate that data can be transmitted at a satisfactory rate from the field location to the central location. Demonstrate that the cellular modem(s) data packets are being received at the central site via a networked computer. Transportation, installation and incidentals for installation of the cellular modem(s) shall be considered subsidiary to item 680.

Damage to existing facilities such as traffic signal equipment, conduit, cables, etc. caused by the contractor during construction will be replaced by the contractor at no cost to TxDOT with equipment as approved by the engineer. Replace all pavements, sidewalk, curb, riprap or any item damaged during construction subsidiary to various bid items with no direct payment.

Use LED lamps from the prequalified material producer lists as shown on the Texas Department of Transportation (TxDOT) – Construction Division’s (CST) material producer list. Category is “Roadway Illumination and Electrical Supplies.” under item 610.

General Notes

Sheet Q

County: JIM WELLS, ETC

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Item 680-6004 “Removing Traffic Signals” shall include removal of various traffic signal components (conductors, traffic signal cables, overhead flashing beacon head assemblies, poles and foundations) as directed by the Engineer.

Return all materials deemed salvageable by the Engineer, including signal poles to the Department at the address below. Contractor to dispose of unsalvageable materials in accordance with federal, state, and local regulations.

Carlos Carrillo
1701 S. Padre Island Dr.
Corpus Christi, Texas 78416

Refer to Summary of Materials plan sheet for State Provided Materials. Contractor shall be responsible with the coordination of state provided material vendors to ensure proper final installation and programming. The contractor shall be responsible for a functional traffic signal system prior to final acceptance. The contractor shall perform test as described in paragraph 3.1.8 “Test Period” under this bid item before final acceptance.

Removal of Highway Traffic Signals includes various traffic signal components. Only remove existing traffic poles and foundations as stated in the plans.

ITEM 684

Aluminum conductors will not be permitted.

Coil an extra 5 feet of cable in each ground box, pole base, and controller assembly.

Cable used for inside signal heads, controller cabinet, coils in ground boxes, pole base will not be paid for directly but will be subsidiary to pertinent items.

Use factory-applied waterproof sealant wire nuts on conductors in traffic signal pole bases that do not have existing terminal strips. Install wire nuts in an upright position to prevent the accumulation of water. All materials and labor associated with installation of waterproof sealant wire nuts will not be paid for directly but will be subsidiary to pertinent items to the installation of conductors.


ITEM 3076

SAC requirements apply to aggregates used on all surfaces.

Construct longitudinal joints with a joint maker providing a maximum one (1) inch vertical edge (1/2 inch desirable) with an adjacent 6:1 taper. Backfill edges within the same day.

General Notes

Sheet R

 © 2023 GENERAL NOTES	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
	6		SH 141
	STATE	DISTRICT	COUNTY
	TEXAS	CRP	JIM WELLS, ETC.
	CONTROL	SECTION	JOB
	0383	03	024, ETC.
			SHEET NO.
			13H

County: JIM WELLS, ETC

Control: 0383-03-024, ETC.

Highway: SH 141

The Engineer reserves the right to test all sources even if the source is listed in the Bituminous Source Rated Quality Catalog

Provide the testing lab samples to calibrate the ignition oven no later than five (5) working days prior to mix design verification.

Place HMA utilizing an automatic, dual, longitudinal-grade control system and automatic transverse-grade control system as specified under Item 320, unless otherwise approved by the Engineer.

Contractor shall temporarily cover all inlets during the milling and paving operations. Inlets shall be uncovered when milling and paving operations are complete. This shall be subsidiary to Item 3076 and not paid for directly.

ITEM 6001

Furnish the portable changeable message signs displaying the correct message at least seven (7) days prior to beginning work or as directed.

The Contractor's Responsible Person (CRP) will maintain full control of messages at all times.

The Engineer will provide the sign message text to use at each sign.

Standby time will not be measured or paid for directly but will be subsidiary to pertinent Items.

Portable changeable message signs may be moved, and message changed at any time as deemed necessary by the Engineer. This will be considered subsidiary to Item 6001.

Portable changeable message signs paid by the each apply to the full contract, regardless of the sub CSJ's.

ITEM 6010

Install only CCTV camera. The Department will provide the following: IP Camera, equipment, and pole bracket.

ITEM 6058

The external battery backup system should include the following items:
Rugged UPS Module, Battery Charge Management System, Universal Automatic Transfer Switch (UATS), Gel Cell Batteries, 48" Outdoor Traffic BBS Enclosure

General Notes

Sheet S

County: JIM WELLS, ETC

Control: 0383-03-024, ETC.

Highway: SH 141

ITEM 6185

A minimum of 2 TMAS will be required. However, additional units may be necessary depending on the work in progress.


Provide manufacturer's curb weight or certified scales weight ticket to the Engineer for approval.

ITEM 6292

The Radar Presence and Advance Devices should be Wavetronix-Smart Sensor Matrix with Wavetronix Click System Controller.

General Notes

Sheet T

 © 2023 GENERAL NOTES	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
	6		SH 141
	STATE	DISTRICT	COUNTY
	TEXAS	CRP	JIM WELLS, ETC.
	CONTROL	SECTION	JOB
	0383	03	024, ETC.
			SHEET NO.
			131

County: JIM WELLS, ETC

Control: 0383-03-024, ETC.

Highway: SH 141

SPECIFICATION DATA

UNIT WEIGHT ESTIMATES

ITEM 247: FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS) ----- 135 LBS/CF
ITEM 3076: (4") D-GR HMA TY-B SAC-B PG64-22 ----- 440 LBS/SY
ITEM 3080: (2") STONE-MTRX-ASPH SMA-D SAC-A PG76-22 ----- 240 LBS/SY

BASIS OF ESTIMATE

ITEM 260: LIME (HYD(SLY OR DRY) COM OR QK(DRY)(8")(6%) ----- 26 LBS/SY
ITEM 310: PRIME COAT (MC-30) ----- 0.20 GAL/SY
ITEM 3076: TACK COAT ----- 0.08 GAL/SY

COMPACTION REQUIREMENTS FOR BASE COURSE

ITEM 247: FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)
FL BS (CMP IN PLC)(TY E GR1-2)(FNAL POS)
DENSITY ----- 100% MIN.
LIFTS ----- ALL

SURFACE TREATMENT DATA

ONE COURSE SURFACE UNDERSEAL (WIDENING)


ASPHALT TYPE ----- AC-10, CRS-2, OR HFRS-2
AVERAGE ASPHALT RATE ----- 0.39 GAL/SY
AGGREGATE RATE ----- 1 CY/110 SY
AGGREGATE TYPE ----- PB
AGGREGATE GRADE ----- 4 OR 4S, SAC-B

ONE COURSE SURFACE UNDERSEAL (FULL WIDTH)

ASPHALT TYPE ----- AC-15P OR AC-20-5TR
AVERAGE ASPHALT RATE ----- 0.39 GAL/SY
AGGREGATE RATE ----- 1 CY/110 SY
AGGREGATE TYPE ----- PB
AGGREGATE GRADE ----- 4 OR 4S, SAC-B

General Notes

Sheet U

 © 2023 GENERAL NOTES	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
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	TEXAS	CRP	JIM WELLS, ETC.
	CONTROL	SECTION	JOB
	0383	03	024, ETC.
			SHEET NO.
			13J



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0383-03-024

DISTRICT Corpus Christi
HIGHWAY SH 141

COUNTY Jim Wells, Kleberg

CONTROL SECTION JOB				0383-03-024		0383-04-060		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00120020		A00120021			
COUNTY				Jim Wells		Kleberg			
HIGHWAY				SH 141		SH 141			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	104-6037	REMOVE CONC (RAIL)	LF			30.000		30.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF			1,611.000		1,611.000	
	110-6001	EXCAVATION (ROADWAY)	CY	13,217.000		48,318.000		61,535.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	6,371.000		26,912.000		33,283.000	
	134-6004	BACKFILL (TY A OR B)	STA	124.000		542.000		666.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	42,054.000		170,366.000		212,420.000	
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	SY	42,054.000		170,366.000		212,420.000	
	168-6001	VEGETATIVE WATERING	MG	766.400		3,105.100		3,871.500	
	260-6027	LIME TRT (EXST MATL)(8")	SY	16,768.000		67,148.000		83,916.000	
	260-6083	LIME (HYD(SLY OR DRY) COM OR QK(DRY)	TON	647.000		2,455.000		3,102.000	
	310-6009	PRIME COAT (MC-30)	GAL	5,323.000		20,216.000		25,539.000	
	316-6001	ASPH (MULTI OPTION)	GAL	10,380.000		39,422.000		49,802.000	
	316-6427	AGGR(TY-PB GR-4S OR TY-PB GR-4)(SAC-B)	CY	896.000		3,702.000		4,598.000	
	316-6448	ASPH (AC-15P OR AC-20-5TR)	GAL	28,054.000		119,376.000		147,430.000	
	354-6029	PLANE ASPH CONC PAV(0" TO 6")	SY			3,337.000		3,337.000	
	354-6037	PLANE CONC PAV(0" TO 2")	SY			1,513.000		1,513.000	
	354-6057	PLANE ASPH CONC PAV (4")	SY	11,520.000		44,426.000		55,946.000	
	400-6005	CEM STABIL BKFL	CY	4.300		45.800		50.100	
	400-6008	CUT & RESTORE ASPH PAVING	SY			42.000		42.000	
	400-6012	CUT AND RESTORE PAV (FLEX BASE)	SY			27.000		27.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF			30.000		30.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF			44.000		44.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY			188.000		188.000	
	451-6019	RETROFIT RAIL (TY T631)	LF			120.580		120.580	
	462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	10.000		60.000		70.000	
	462-6062	CONC BOX CULV (7 FT X 7 FT)(EXTEND)	LF			19.000		19.000	
	462-6175	CONC. BOX CULV (6.5 FT X 3 FT) (EXTEND)	LF	10.000		261.000		271.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF			56.000		56.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF			60.000		60.000	
	466-6179	WINGWALL (PW - 1) (HW=4 FT)	EA			4.000		4.000	
	466-6183	WINGWALL (PW - 1) (HW=8 FT)	EA			1.000		1.000	
	467-6004	SET (REPLACE PIPE RUNNER)	EA			10.000		10.000	
	467-6112	SET (TY I)(S=3 FT)(HW= 4 FT)(4:1)(C)	EA	1.000		5.000		6.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA			4.000		4.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA			4.000		4.000	
	467-6596	SET (TY I) (S=6.5FT) (HW=4FT) (4:1)(C)	EA	1.000		7.000		8.000	
	480-6001	CLEAN EXIST CULVERTS	EA	1.000		11.000		12.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0383-03-024

DISTRICT Corpus Christi
HIGHWAY SH 141

COUNTY Jim Wells, Kleberg

CONTROL SECTION JOB				0383-03-024		0383-04-060		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00120020		A00120021			
COUNTY				Jim Wells		Kleberg			
HIGHWAY				SH 141		SH 141			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	496-6004	REMOV STR (SET)	EA	2.000		26.000		28.000	
	496-6007	REMOV STR (PIPE)	LF			192.000		192.000	
	500-6001	MOBILIZATION	LS	0.192		0.808		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		17.000		21.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF			340.000		340.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF			340.000		340.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	94.000		846.000		940.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	94.000		846.000		940.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	440.000		2,371.000		2,811.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	440.000		2,371.000		2,811.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF			50.000		50.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF			50.000		50.000	
	529-6038	CONC CURB (RIBBON)	LF			16.500		16.500	
	530-6002	INTERSECTIONS (ACP)	SY			73.000		73.000	
	530-6005	DRIVEWAYS (ACP)	SY	135.000		1,645.000		1,780.000	
	533-6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	24,756.000		133,104.000		157,860.000	
	533-6004	RUMBLE STRIPS (CENTERLINE) ASPHALT	LF	12,378.000		66,552.000		78,930.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF			1,717.500		1,717.500	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA			6.000		6.000	
	540-6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF			70.000		70.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF			800.000		800.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA			8.000		8.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA			18.000		18.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA			12.000		12.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF			200.000		200.000	
	618-6033	CONDT (PVC) (SCH 40) (4")	LF			225.000		225.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF			215.000		215.000	
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF			635.000		635.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF			410.000		410.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF			135.000		135.000	
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF			655.000		655.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA			6.000		6.000	
	628-6002	REMOVE ELECTRICAL SERVICES	EA			1.000		1.000	
	628-6148	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	EA			1.000		1.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	0.600		0.800		1.400	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	6.000		19.000		25.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1.000		1.000		2.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0383-03-024

DISTRICT Corpus Christi
HIGHWAY SH 141

COUNTY Jim Wells, Kleberg

CONTROL SECTION JOB				0383-03-024		0383-04-060		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00120020		A00120021			
COUNTY				Jim Wells		Kleberg			
HIGHWAY				SH 141		SH 141			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	644-6038	IN SM RD SN SUP&AM TYS80(1)SA(U-EXAL)	EA			5.000		5.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA	3.000		15.000		18.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	3.000		13.000		16.000	
	644-6080	RELOCATE SM RD SN SUP & AM TY TEMP	EA	5.000		16.000		21.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA			23.000		23.000	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	2.000		25.000		27.000	
	662-6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF	2,390.000		8,290.000		10,680.000	
	662-6006	WK ZN PAV MRK NON-REMOV (W)6"(DOT)	LF	252.000		1,206.000		1,458.000	
	662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	58,088.000		240,640.000		298,728.000	
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	660.000		3,784.000		4,444.000	
	662-6035	WK ZN PAV MRK NON-REMOV (Y)6"(BRK)	LF			1,640.000		1,640.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	24,868.000		102,773.000		127,641.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	330.000		1,402.000		1,732.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	2,486.000		10,399.000		12,885.000	
	666-6017	REFL PAV MRK TY I (W)6"(DOT)(090MIL)	LF	252.000		1,323.000		1,575.000	
	666-6029	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF			576.000		576.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	660.000		3,160.000		3,820.000	
	666-6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	24.000		93.000		117.000	
	666-6101	REF PAV MRK TY I(W)36"(YLD TRI)(090MIL)	EA			5.000		5.000	
	666-6146	REFL PAV MRK TY I (Y)24"(SLD)(090MIL)	LF			899.000		899.000	
	666-6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	2,390.000		8,360.000		10,750.000	
	666-6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	24,868.000		108,285.000		133,153.000	
	666-6317	RE PM W/RET REQ TY I (Y)6"(BRK)(090MIL)	LF			1,840.000		1,840.000	
	666-6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	24,868.000		104,033.000		128,901.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	2.000		16.000		18.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA	2.000		6.000		8.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	2.000		16.000		18.000	
	672-6007	REFL PAV MRKR TY I-C	EA	182.000		704.000		886.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	324.000		1,832.000		2,156.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	29,044.000		120,320.000		149,364.000	
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA			1.000		1.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA			1.000		1.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA			8.000		8.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA			2.000		2.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA			8.000		8.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA			4.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA			8.000		8.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0383-03-024

DISTRICT Corpus Christi
HIGHWAY SH 141

COUNTY Jim Wells, Kleberg

CONTROL SECTION JOB				0383-03-024		0383-04-060		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00120020		A00120021			
COUNTY				Jim Wells		Kleberg			
HIGHWAY				SH 141		SH 141			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	682-6006	VEH SIG SEC (12")LED(REDAW)	EA			2.000		2.000	
	682-6049	BACKPLATE W/REFL BRDR(4 SEC)	EA			2.000		2.000	
	682-6060	BACKPLATE W/REFL BRDR(3 SEC)	EA			8.000		8.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF			445.000		445.000	
	684-6042	TRF SIG CBL (TY A)(14 AWG)(16 CONDR)	LF			665.000		665.000	
	685-6005	RELOCT RDSO FLSH BCN AM (SOLAR PWRD)	EA			3.000		3.000	
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA			2.000		2.000	
	686-6053	INS TRF SIG PL AM(S)1 ARM(50')	EA			1.000		1.000	
	686-6055	INS TRF SIG PL AM(S)1 ARM(50')LUM	EA			1.000		1.000	
	690-6036	INSTALL OF FND FOR GROUND MNT CABINETS	EA			1.000		1.000	
	752-6003	TREE TRIMMING / BRUSH REMOVAL	MI	2.350		10.270		12.620	
	752-6004	TREE TRIMMING / BRUSH REMOVAL(CHANNELS)	AC			0.300		0.300	
	786-6001	CARBON FIBER REINF POLYMER PROTECTION	SF			70.000		70.000	
	3076-6002	D-GR HMA TY-B SAC-B PG64-22	TON	6,025.000		22,723.000		28,748.000	
	3076-6066	TACK COAT	GAL	7,884.000		32,575.000		40,459.000	
	3080-6007	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	8,639.000		36,732.000		45,371.000	
	5092-6001	FILLING MILLED ASPHALT RUMBLE STRIPS	LF	29,044.000		120,320.000		149,364.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000		4.000	
	6004-6031	ITS COM CBL (ETHERNET)	LF			120.000		120.000	
	6010-6002	CCTV FIELD EQUIPMENT (DIGITAL)	EA			1.000		1.000	
	6010-6004	CCTV MOUNT (POLE)	EA			1.000		1.000	
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA			1.000		1.000	
	6185-6002	TMA (STATIONARY)	DAY	40.000		120.000		160.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	10.000		30.000		40.000	
	6227-6002	SOLAR POWERED LED ROADSIDE SIGN	EA	1.000				1.000	
	6292-6001	RVDS(PRESENCE DETECTION ONLY)	EA			4.000		4.000	
	6292-6002	RVDS(ADVANCE DETECTION ONLY)	EA			2.000		2.000	
	6367-6001	INST OF FIELD HARDENED ETHERNET SWITCH	EA			1.000		1.000	
	6435-6002	INSTALLATION OF CELLULAR MODEM	EA			1.000		1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000				1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	
1A	247-6057	FL BS (CMP IN PLC)(TYE GR1-2)(FNAL POS)	CY	7,724.000		29,125.000		36,849.000	
1	247-6366	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	CY	7,724.000		29,125.000		36,849.000	

SUMMARY OF TRAFFIC CONTROL

LOCATION	0662-6005 WK ZN PAV MRK NON-REMOV (W)6"(BRK)	0662-6006 WK ZN PAV MRK NON-REMOV (W)6"(DOT)	0662-6008 WK ZN PAV MRK NON-REMOV (W)6"(SLD)	0662-6012 WK ZN PAV MRK NON-REMOV (W)8"(SLD)	0662-6035 WK ZN PAV MRK NON-REMOV (Y)6"(BRK)	0662-6037 WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	0662-6109 WK ZN PAV MRK SHT TERM (TAB)TY W	0662-6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	0644-6080 RELOCATE SM RD SN SUP & AM TY TEMP	0677-6002 ELIM EXT PAV MRK & MRKS (6")	5092-6001 FILLING MILLED ASPHALT RUMBLE STRIPS	6001-6002 PORTABLE CHANGEABLE MESSAGE SIGN	6185-6002 TMA (STATIONARY)	6185-6003 TMA (MOBILE OPERATION)
	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF	EA	DAY	HR
CSJ: 0383-04-060 TOTALS:	8290	1206	240640	3784	1640	102773	1402	10399	16	120320	120320	2	120	30
CSJ: 0383-03-024 TOTALS:	2390	252	58088	660		24868	330	2486	5	29044	29044	2	40	10
PROJECT TOTALS:	10680	1458	298728	4444	1640	127641	1732	12885	21	149364	149364	4	160	40

SUMMARY OF ROADWAY (BASE BID)

LOCATION	0110-6001 EXCAVATION ROADWAY	0132-6006 EMBANKMENT (FINAL) (DENS CONT)(TY C)	0134-6004 BACKFILL (TY A OR B)	0247-6366 FL BS (CMP IN PLC) (TYA GR 5) (FNAL POS)	0260-6027 LIME TRT (EXST MATL)(8")	0260-6083 LIME (HYD(SLY OR DRY COM OR QK(DRY)	0310-6009 PRIME COAT (MC-30)	0316-6001 ASPH (MULTI OPTION)	0316-6427 AGGR (TY-PB GR-4S OR TY-PB GR-4)(SAC-B)	0316-6448 ASPH (AC-15P OR AC-20-5TR)	0354-6029 PLANE ASPH CONC PAV (0" TO 6")	0354-6037 PLANE ASPH CONC PAV (0" TO 2")	0354-6057 PLANE ASPH CONC PAV (4")	0529-6038 CONC CURB (RIBBON)
	CY	CY	STA	CY	SY	TON	GAL	GAL	CY	GAL	SY	SY	SY	LF
CSJ: 0383-04-060 TOTALS:	48318	26912	542	29125	67148	2455	20216	39422	3702	119376	3337	1513	44426	16.5
CSJ: 0383-03-024 TOTALS:	13217	6371	124	7724	16768	647	5323	10380	896	28054			11520	
PROJECT TOTALS:	61535	33283	666	36849	83916	3102	25539	49802	4598	147430	3337	1513	55946	16.5

■ - FOR WIDENING AREA UNDERSEAL: ASPH (AC-10, CRS-2, OR HFRS-2)

▲ - FOR FULL WIDTH UNDERSEAL

FOR CONTRACTORS INFORMATION: ITEM NO. 0316-6427 INCLUDES BOTH UNDERSEAL QUANTITIES FOR THE WIDENING AND FULLWIDTH.

SUMMARY OF ROADWAY (BASE BID)(CONTINUED)

LOCATION	0533-6003 RUMBLE STRIPS (SHOULDER) ASPHALT	0533-6004 RUMBLE STRIPS (CENTERLINE) ASPHALT	0752-6003 TREE TRIMMING / BRUSH REMOVAL	0752-6004 TREE TRIMMING / BRUSH REMOVAL (CHANNELS)	3076-6002 D-GR HMA TY-B PG64-22	3076-6066 TACK COAT	3080-6007 STONE-MTRX- ASPH SMA-D SAC-A PG76-22
	LF	LF	MI	AC	TON	GAL	TON
CSJ: 0383-04-060 TOTALS:	133104	66552	10.27	0.30	22723	32575	36732
CSJ: 0383-03-024 TOTALS:	24756	12378	2.35	0	6025	7884	8639
PROJECT TOTALS:	157860	145482	12.62	0.30	28748	40459	45371

FOR CONTRACTORS INFORMATION: ITEM 3076-6066 INCLUDES TACK QUANTITIES FOR BOTH THE WIDENING AND THE FULLWIDTH OVERLAY.

SUMMARY OF ROADWAY (ALTERNATE BID)

LOCATION	0247-6057 FL BS (CMP IN PLC) (TYE GR1-2) (FNAL POS)
	CY
CSJ: 0383-04-060 TOTALS:	29125
CSJ: 0383-03-024 TOTALS:	7724
PROJECT TOTALS:	36849

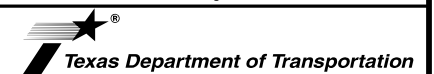
SUMMARY OF DRIVEWAY ITEMS

LOCATION	STATION	DRV #	AVG		RADIUS		0400-6008 CUT & RESTORE ASPH PAVING	0400-6012 CUT & RESTORE PAV (FLEX BASE)	0530-6005 DRIVEWAYS (ACP)	0464-6003 RC PIPE (CL III)(18 IN)	0467-6363 SET (TY II) (18 IN)(RCP) (6:1)(P)	0496-6004 REMOV STR (SET)	0496-6007 REMOV STR (PIPE)
			WIDTH	LENGTH	R1	R2	SY	SY	SY	LF	EA	EA	LF
			FT	FT									
PLAN & PROFILE SHEET NO. 6	159+84, LT.	DRV 6-1	16	29	15	15			64	20	2	2	44
PLAN & PROFILE SHEET NO. 6	160+45, RT.	DRV 6-2	16	37	15	15			77				
PLAN & PROFILE SHEET NO. 10	202+74, LT.	DRV 10-1	12	40	30	30	18		123	36	2	2	36
PLAN & PROFILE SHEET NO. 10	202+80, RT.	DRV 10-2	12	38	N/A	30			125				
PLAN & PROFILE SHEET NO. 10	204+92, RT.	DRV 10-3	12	38	30	N/A			146				
PLAN & PROFILE SHEET NO. 12	227+14, LT.	DRV 12-1	16	39	15	15			81				
PLAN & PROFILE SHEET NO. 25	391+35, LT.	DRV 25-1	34	63	50	50			400				
PLAN & PROFILE SHEET NO. 25	391+37, RT.	DRV 25-2	34	42	40	40			259				
PLAN & PROFILE SHEET NO. 29	434+70, RT.	DRV 29-1	12	40	15	15			64				
PLAN & PROFILE SHEET NO. 31	463+98, RT.	DRV 30-1	16	38	15	15			81				
PLAN & PROFILE SHEET NO. 36	518+26, RT.	DRV 36-1	16	38	15	15			81				
PLAN & PROFILE SHEET NO. 42	590+18, LT.	DRV 42-1	16	39	15	15			84				
PLAN & PROFILE SHEET NO. 44	612+50, RT.	DRV 44-1	16	27	15	15			60				
CSJ: 0383-04-060 TOTALS:							18	27	1645	56	4	4	80
PLAN & PROFILE SHEET NO. 56	758+30, LT.	DRV 56-1	16	28	15	15			73				
PLAN & PROFILE SHEET NO. 56	761+29, RT.	DRV 56-2	16	28	15	15			62				
CSJ: 0383-03-024 TOTALS:									135				
TOTALS:							18	27	1780	56	4	4	80

NOTE: DRIVEWAYS WILL BE CONSTRUCTED TO THE R.O.W. TO TIE-IN AS DIRECTED. REFER TO DRIVEWAY DETAILS FOR ADDITIONAL INFORMATION.

LOCHNER

TBPE Firm Reg. No. 10488



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SUMMARY OF QUANTITIES

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	016	

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SUMMARY OF INTERSECTION ITEMS

LOCATION	STATION	INT #	WIDTH		LENGTH		RADIUS		0400-6005 CEM STABIL BKFL	0400-6008 CUT & RESTORE ASPH PAVING	0530-6002 INTERSECTIONS (ACP)	0464-6005 RC PIPE (CL III)(24 IN)	0467-6395 SET (TY II) (24 IN)(RCP) (6:1)(P)	0496-6004 REMOV STR (SET)	0496-6007 REMOV STR (PIPE)
			FT	FT	R1	R2	CY	SY	SY	LF	EA	EA	LF		
PLAN & PROFILE SHEET NO. 37	535+95. RT.	INT-37-1	20	28	15	15		18.8	24	73	60	4	4	4	112
CSJ: 0383-04-060 TOTALS:									18.8	24	73	60	4	4	112
TOTALS:									18.8	24	73	60	4	4	112

NOTE: INTERSECTIONS WILL BE CONSTRUCTED TO THE R.O.W. TO TIE-IN AS DIRECTED.
REFER TO DRIVEWAY DETAILS FOR ADDITIONAL INFORMATION.

SUMMARY OF DRAINAGE


LOCATION	0400-6005 CEM STABIL BKFL	0462-6046 CONC BOX CULV (3 FT X 3 FT) (EXTEND)	0462-6062 CONC BOX CULV (7 FT X 7 FT) (EXTEND)	0462-6175 CONC BOX CULV (6.5 FT X 3 FT) (EXTEND)	0466-6183 WINGWALL (PW-1) (HW=8 FT)	0467-6004 SET (REPLACE PIPE RUNNER)	0467-6112 SET (TY I) (S=3FT)(HW=4FT) (4:1)(C)	0467-6596 SET (TY I) (S=6.5FT)(HW=4FT) (4:1)(C)	0480-6001 CLEAN EXIST CULVERTS	0496-6004 REMOV STR (SET)										
	CY	LF	LF	LF	EA	EA	EA	EA	EA	EA										
CULVERT STA. 117+80.27	3.7			11		2		1	1	1										
CULVERT STA. 215+95.92									1											
CULVERT STA. 313+37.37	10.3		19		1				1	1										
CULVERT STA. 353+10.90	2.1	8					1	1	1	1										
CULVERT STA. 384+08.59	1.3	14					2	1	1	2										
CULVERT STA. 600+82.82	5.4	11		22		1	1	2	1	3										
CULVERT STA. 628+90.76	4.2	12		12		1	1	1	1	2										
CSJ: 0383-04-060 TOTALS:											27	45	19	45	1	4	5	4	7	10
CULVERT STA. 733+71.76	4.3	10		10			1	1	1	2										
CSJ: 0383-03-024 TOTALS:											4.3	10		10			1	1	1	2
PROJECT TOTALS:											31.3	55	19	55	2	4	6	5	8	12

SUMMARY OF BRIDGE QUANTITIES


LOCATION	N.B.I. NO.	0451-6019 RETROFIT RAIL (TY T631)	0462-6046 CONC BOX CULV (3 FT X 3 FT) (EXTEND)	0462-6175 CONC BOX CULV (6.5 FT X 3 FT) (EXTEND)	0466-6179 WINGWALL (PW-1) (HW=4 FT)	0467-6004 SET (REPLACE PIPE RUNNER)	0467-6596 SET (TY I) (S=6.5FT)(HW=4FT) (4:1)(C)	0480-6001 CLEAN EXIST CULVERTS	0496-6004 REMOV STR (SET)	0786-6001 CARBON FIBER REINF POLYMER PROTECTION									
		LF	LF	LF	EA	EA	EA	EA	EA	SF									
CULVERT STA. 164+98.54	N.B.I. NO. 16-137-0-0383-04-006			30		1	3	1	3										
STOCK PASS BRIDGE / STA. 206+23.06 TO STA. 206+73.06	N.B.I. NO. 16-137-0-0383-04-010	120.58																	
CULVERT STA. 500+35.88	N.B.I. NO. 16-137-0-0383-04-003		15	45	1	4		1	4	70									
CULVERT STA. 525+81.47	N.B.I. NO. 16-137-0-0383-04-002			45	1	1		1	3										
CULVERT STA. 540+02.12	N.B.I. NO. 16-137-0-0383-04-001			96	2			1	6										
CSJ: 0383-04-060 TOTALS:											120.58	15	216	4	6	3	4	16	70
PROJECT TOTALS:											120.58	15	216	4	6	3	4	16	70

SUMMARY OF METAL BEAM GUARD FENCE

LOCATION	0104-6037 REMOVING CONC (RAIL)	0104-6054 REMOVING CONCRETE (MOW STRIP)	0432-6045 RIPRAP (MOW STRIP) (4 IN)	0540-6001 MTL BEAM GD FEN(TIM POST)	0540-6006 MTL BEAM GD FEN TRANS (THRIE-BEAM)	0540-6020 MTL W-BEAM GD FEN (LOW FILL CULVERT)	0542-6001 REMOVE METAL BEAM GUARD FENCE	0542-6004 RM MTL BM GD FENCE TRANS (THRIE-BEAM)	0544-6001 GUARDRAIL END TREATMENT (INSTALL)	0544-6003 GUARDRAIL END TREATMENT (REMOVE)										
	LF	LF	CY	LF	EA	LF	LF	LF	EA	EA										
PLAN & PROFILE SHEET NO. 10		427	46.2	350			250		4	4										
PLAN & PROFILE SHEET NO. 17		595	38.6	300	4		300	4	4	4										
PLAN & PROFILE SHEET NO. 19	30	589	19.5	200	2		250	4	2	4										
PLAN & PROFILE SHEET NO. 34			21.1	218.5		19			2											
PLAN & PROFILE SHEET NO. 36			21.1	218.5		19			2											
PLAN & PROFILE SHEET NO. 38			41.5	430.5		32			4											
CSJ: 0383-04-060 TOTALS:											30	1611	188	1717.5	6	70	800	8	18	12
PROJECT TOTALS:											30	1611	188	1717.5	6	70	800	8	18	12



TBPE Firm Reg. No. 10488



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SUMMARY OF QUANTITIES

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	017	

SUMMARY OF PAVEMENT & DELINEATOR / OBJECT MARKERS

LOCATION	0658-6062 INSTL DEL ASSM (D-SW)SZ 1 (BRF)GF2(BI)	0658-6100 INSTL OM ASSM (OM-22)(WFLX) GND(BI)	0666-6017 REFL PAV MRK TY I (W) 6"(DOT)(090MIL)	0666-6029 REFL PAV MRK TY I (W) 8"(DOT)(090MIL)	0666-6035 REFL PAV MRK TY I (W) 8"(SLD)(090MIL)	0666-6047 REFL PAV MRK TY I (W) 24"(SLD)(090MIL)	0666-6101 REFL PAV MRK TY I(W)36" (YLD TRI)(090MIL)	0666-6146 REFL PAV MRK TY I (Y) 24"(SLD)(090MIL)
	EA	EA	LF	LF	LF	LF	EA	LF
SHEET 1 OF 28		2	117	108	1171	93	5	
SHEET 2 OF 28								
SHEET 3 OF 28		4						
SHEET 4 OF 28								
SHEET 5 OF 28	8		111	159	584			
SHEET 6 OF 28								
SHEET 7 OF 28								
SHEET 8 OF 28								
SHEET 9 OF 28	10		111					
SHEET 10 OF 28	5	1						
SHEET 11 OF 28		2	150					
SHEET 12 OF 28			105	28				
SHEET 13 OF 28		2		281	941			
SHEET 14 OF 28			246					
SHEET 15 OF 28			6					
SHEET 16 OF 28								
SHEET 17 OF 28		4						
SHEET 18 OF 28		4	222					
SHEET 19 OF 28		4			464			263
SHEET 20 OF 28								636
SHEET 21 OF 28								
SHEET 22 OF 28		2	33					
SHEET 23 OF 28			222					
CSJ: 0383-04-060 TOTALS:	23	25	1323	576	3160	93	5	899
SHEET 23 OF 28								
SHEET 24 OF 28			252					
SHEET 25 OF 28								
SHEET 26 OF 28								
SHEET 27 OF 28		2						
SHEET 28 OF 28					660	24		
CSJ: 0383-03-024 TOTALS:		2	252		660	24		
PROJECT TOTALS:	23	27	1575	576	3820	117	5	899

SUMMARY OF PAVEMENT & DELINEATOR / OBJECT MARKERS (CONTINUED)

LOCATION	0666-6305 RE PM W/RET REQ TY I (W) 6"(BRK)(090MIL)	0666-6308 RE PM W/RET REQ TY I (W) 6"(SLD)(090MIL)	0666-6317 RE PM W/RET REQ TY I (Y) 6"(BRK)(090MIL)	0666-6320 RE PM W/RET REQ TY I (Y) 6"(SLD)(090MIL)	0668-6077 PREFAB PAV MRK TY C (W) (ARROW)	0668-6083 PREFAB PAV MRK TY C (W) (LNDP ARROW)	0668-6085 PREFAB PAV MRK TY C (W) (WORD)	0672-6007 REFL PAV MRKR TY I-C	0672-6009 REFL PAV MRKR TY II-A-A
	LF	LF	LF	LF	EA	EA	EA	EA	EA
SHEET 1 OF 28	560	4317		5938	7		7	84	104
SHEET 2 OF 28	600	4800		4800				30	60
SHEET 3 OF 28	600	4800		4800				30	60
SHEET 4 OF 28	600	4800		4800				30	60
SHEET 5 OF 28	110	4668		4800	3		3	54	60
SHEET 6 OF 28		4800	640	900					42
SHEET 7 OF 28		4800	600						30
SHEET 8 OF 28		4800	600	1200					45
SHEET 9 OF 28	310	4800		4800				25	60
SHEET 10 OF 28	600	4800		4800				30	60
SHEET 11 OF 28	450	4800		4800		1		35	60
SHEET 12 OF 28		4800		5700		1		11	146
SHEET 13 OF 28		4516		5416	4		4	66	268
SHEET 14 OF 28		4800		4800		1		20	60
SHEET 15 OF 28	590	4800		4800		1		31	60
SHEET 16 OF 28	600	4800		4800				30	60
SHEET 17 OF 28	600	4800		4800				30	60
SHEET 18 OF 28	370	4800		4800				37	60
SHEET 19 OF 28	600	4800		6459	2		2	54	158
SHEET 20 OF 28	600	4800		7636				30	141
SHEET 21 OF 28	600	4800		4800				30	60
SHEET 22 OF 28	570	4800		4800		1		29	60
SHEET 23 OF 28		3584		3584		1		18	45
CSJ: 0383-04-060 TOTALS:	8360	108285	1840	104033	16	6	16	704	1832
SHEET 23 OF 28		1216		1216					30
SHEET 24 OF 28	280	4800		4800		2		35	60
SHEET 25 OF 28	600	4800		4800				30	60
SHEET 26 OF 28	600	4800		4800				30	60
SHEET 27 OF 28	600	4800		4800				30	60
SHEET 28 OF 28	310	4452		4452	2		2	57	54
CSJ: 0383-03-024 TOTALS:	2390	24868		24868	2	2	2	182	324
PROJECT TOTALS:	10750	133153	1840	128901	18	8	18	886	2156

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Texas Department of Transportation

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SUMMARY OF QUANTITIES

SHEET 3 OF 4

COUNT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	018

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SUMMARY OF SIGNS

LOCATION	0636-6001 ALUMINUM SIGNS (TY A)	0644-6027 IN SM RD SN SUP & AM TYS80(1)SA(P)	0644-6030 IN SM RD SN SUP & AM TYS80(1)SA(T)	0644-6038 IN SM RD SN SUP & AM TYS80(1)SA(U-EXAL)	0644-6070 RELOCATE SM RD SN SUP&AM TY S80	0644-6076 REMOVE SM RD SN SUP&AM	0685-6005 RELOCT RDS FLSH CDN AM (SOLAR PWRD)	6227-6002 SOLAR POWERED LED ROADSIDE SIGN
	SF	EA	EA	EA	EA	EA	EA	EA
SHEET 1 OF 28		4			3	4	1	
SHEET 2 OF 28		2			2	2		
SHEET 3 OF 28			1		1	1		
SHEET 4 OF 28				1				
SHEET 5 OF 28	0.4	2			1	1		
SHEET 6 OF 28								
SHEET 7 OF 28								
SHEET 8 OF 28								
SHEET 9 OF 28		1		1				
SHEET 10 OF 28		1		1	2	2		
SHEET 11 OF 28		2						
SHEET 12 OF 28					1	1	1	
SHEET 13 OF 28					1	1	1	
SHEET 14 OF 28		1		1	1	1		
SHEET 15 OF 28		2			1			
SHEET 16 OF 28								
SHEET 17 OF 28								
SHEET 18 OF 28		2						
SHEET 19 OF 28								
SHEET 20 OF 28								
SHEET 21 OF 28								
SHEET 22 OF 28		2						
SHEET 23 OF 28	0.4			1	2			
CSJ: 0383-04-060 TOTALS:	0.8	19	1	5	15	13	3	
SHEET 23 OF 28								
SHEET 24 OF 28		2						
SHEET 25 OF 28								
SHEET 26 OF 28								
SHEET 27 OF 28								
SHEET 28 OF 28	0.6	4	1		3	3		1
CSJ: 0383-03-024 TOTALS:	0.6	6	1		3	3		1
PROJECT TOTALS:	1.4	25	2	5	18	16	3	1

SUMMARY OF EROSION CONTROL (SW3P)

LOCATION	0160-6003 FURNISHING AND PLACING TOPSOIL (4")	0164-6033 DRILL SEEDING (PERM)(RURAL) (SANDY)	0168-6001 VEGETATIVE WATERING	0506-6001 ROCK FILTER DAMS (INSTALL)(TY 1)	0506-6011 ROCK FILTER DAMS (REMOVE)	0506-6020 CONSTRUCTION EXISTS (INSTALL)(TY 1)	0506-6024 CONSTRUCTION EXITS (REMOVE)	0506-6038 TEMP SEDMT CONT FENCE (INSTALL)	0506-6039 TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	MG	LF	LF	SY	SY	LF	LF
EROSION CONTROL LAYOUT SHEET 1 OF 28	5300	5300	96.6			94	94	80	80
EROSION CONTROL LAYOUT SHEET 2 OF 28	7398	7398	134.8					502	502
EROSION CONTROL LAYOUT SHEET 3 OF 28	7368	7368	134.3	40	40			40	40
EROSION CONTROL LAYOUT SHEET 4 OF 28	7660	7660	139.6					80	80
EROSION CONTROL LAYOUT SHEET 5 OF 28	8878	8878	161.8			188	188	96	96
EROSION CONTROL LAYOUT SHEET 6 OF 28									
EROSION CONTROL LAYOUT SHEET 7 OF 28									
EROSION CONTROL LAYOUT SHEET 8 OF 28									
EROSION CONTROL LAYOUT SHEET 9 OF 28	7972	7972	145.3			94	94	93	93
EROSION CONTROL LAYOUT SHEET 10 OF 28	8186	8186	149.2	30	30			390	390
EROSION CONTROL LAYOUT SHEET 11 OF 28	7520	7520	137.1	40	40			20	20
EROSION CONTROL LAYOUT SHEET 12 OF 28	9224	9224	168.1			188	188	80	80
EROSION CONTROL LAYOUT SHEET 13 OF 28	16602	16602	302.6					160	160
EROSION CONTROL LAYOUT SHEET 14 OF 28	6952	6952	126.7			94	94	60	60
EROSION CONTROL LAYOUT SHEET 15 OF 28	7490	7490	136.5					80	80
EROSION CONTROL LAYOUT SHEET 16 OF 28	7500	7500	136.7					80	80
EROSION CONTROL LAYOUT SHEET 17 OF 28	7508	7508	136.8	36	36			40	40
EROSION CONTROL LAYOUT SHEET 18 OF 28	8338	8338	152.0	36	36			60	60
EROSION CONTROL LAYOUT SHEET 19 OF 28	13580	13580	247.5	72	72	94	94	20	20
EROSION CONTROL LAYOUT SHEET 20 OF 28	12272	12272	223.7					120	120
EROSION CONTROL LAYOUT SHEET 21 OF 28	7390	7390	134.7					80	80
EROSION CONTROL LAYOUT SHEET 22 OF 28	7318	7318	133.4	36	36			40	40
EROSION CONTROL LAYOUT SHEET 23 OF 28	5910	5910	107.7	50	50	94	94	250	250
CSJ: 0383-04-060 TOTALS:	170366	170366	3105.1	340	340	846	846	2371	2371
EROSION CONTROL LAYOUT SHEET 23 OF 28	2352	2352	42.8			94	94	20	20
EROSION CONTROL LAYOUT SHEET 24 OF 28	7568	7568	137.9					80	80
EROSION CONTROL LAYOUT SHEET 25 OF 28	7578	7578	138.1					80	80
EROSION CONTROL LAYOUT SHEET 26 OF 28	7586	7586	138.3					80	80
EROSION CONTROL LAYOUT SHEET 27 OF 28	7596	7596	138.4					60	60
EROSION CONTROL LAYOUT SHEET 28 OF 28	9374	9374	170.9					120	120
CSJ: 0383-03-024 TOTALS:	42054	42054	766.4			94	94	440	440
PROJECT TOTALS:	212420	212420	3871.5	340	340	940	940	2811	2811

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**SUMMARY OF
QUANTITIES**

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		019

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SH 141 @ SANTA GERTRUDIS/KING RANCH

BID ITEM	DESCRIPTION	UNIT	ESTIMATE
0416 6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	30
0416 6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	44
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	50
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	50
0618 6023	CONDT (PVC)(SCH 40)(2")	LF	200
0618 6033	CONDT (PVC)(SCH 40)(4")	LF	225
0618 6047	CONDT (PVC)(SCH 80)(2")BORE	LF	215
0618 6059	CONDT (PVC)(SCH 80)(4")BORE	LF	425
0618 6059	CONDT (PVC)(SCH 80)(4")BORE (FUTURE USE)	LF	210
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	410
0620 6010	ELEC CONDR (NO.6) INSULATED	LF	135
0621 6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	655
0624 6010	GROUND BOX TY D (162922)W/APRON	EA	6
0628 6002	REMOVE ELECTRICAL SERVICES	EA	1
0628 6148	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	EA	1
0680 6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1
0680 6004	REMOVING TRAFFIC SIGNALS(FLASH BEACON)	EA	1
0682 6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682 6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2
0682 6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682 6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4
0682 6005	VEH SIG SEC (12")LED(RED)	EA	8
0682 6006	VEH SIG SEC (12")LED(RED ARW)	EA	2
0682 6049	BACKPLATE W/REFL BRDR(4 SEC)	EA	2
0682 6060	BACKPLATE W/REFL BRDR(3 SEC)	EA	8
* 0684 6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	445
* 0684 6042	TRF SIG CBL (TY A)(14 AWG)(16 CONDR)*	LF	665
0686 6047	INS TRF SIG PL AM (S) 1 ARM(44')LUM	EA	2
0686 6053	INS TRF SIG PL AM (S)1 ARM(50')	EA	1
0686 6055	INS TRF SIG PL AM (S)1 ARM(50')LUM	EA	1
0690 6036	INSTALL OF FND FOR GROUND MNT CABINETS	EA	1
* 6004 6031	ITS COM CBL(ETHERNET)	LF	120
6010 6002	CCTV FIELD EQUIP (DIGITAL)	EA	1
6010 6004	CCTV MOUNT (POLE)	EA	1
6058 6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1
6292 6001	RVDS(PRESENCE DETECTION ONLY)	EA	4
** 6292 XXX1	RADAR PRESENCE DETECTOR COMM CABLE	LF	940
6292 6002	RVDS(ADVANCE DETECTION ONLY)	EA	2
*** 6292 XXX2	RADAR ADVANCE DETECTOR COMM CABLE	LF	550
6367 6001	INST OF FIELD HARDENED ETHERNET SWITCH	EA	1
6435 6002	INSTALLATION OF CELLULAR MODEM	EA	1
CONTRACTOR PROVIDES	1 1/2" DIA THREADED COUPLING & CGB CONNECTOR	EA	10
**** 0686 6XXX	ITS/TRAFFIC SIGNAL POLE RODENT DETERRANT	EA	4

*COIL 5 FT CONDUCTOR INSIDE THE SIGNAL HEADS, GROUND BOXES, POLE BASE, CONTROLLER AS PER ITEM 684 SPECIFICATION, ADDITIONAL CABLE IS SUBSIDIARY TO ITEM 684.

** SUBSIDIARY TO BID ITEM 6292 6001

***SUBSIDIARY TO BID ITEM 6292 6002

****SUBSIDIARY TO BID ITEM 0686 6047, 6053, & 6055

TXDOT WILL PROVIDE THE FOLLOWING EQUIPMENT FOR INSTALLATION ONLY.

CCTV FIELD EQUIPMENT

1. AXIS CAMERA & MOUNTING BRACKET
2. AXIS CAMERA POE INJECTOR
3. ASTRO BRACKETS 2 PER CAMERA
4. 10' GUSSETED TUBE

CELLULAR MODEM EQUIPMENT

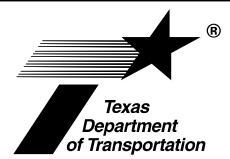
1. CISCO 1101 CELLULAR ROUTER
2. 24VDC POWER SUPPLY
3. CELLULAR ANTENNA

ETHERNET EQUIPMENT

1. ETHERNET SWITCH
2. POWER SUPPLY

SH 141
SUMMARY OF
MATERIALS SHEET

SHEET 1 OF 1

			
CONT	SECT	JOB	HIGHWAY
0383	03	024	SH141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS		20

SUMMARY OF MATERIALS FOR CONTRACTOR'S USE

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GENERAL

- A. INSTALL ALL SIGNS, BARRICADES AND TRAFFIC CONTROL DEVICES AS SHOWN AND IN ACCORDANCE WITH THE STANDARD BC SHEETS AND AS DIRECTED.
- B. ADDITIONAL SIGNS, BARRICADES OR TRAFFIC CONTROL DEVICES OTHER THAN THOSE SPECIFIED MAY BE REQUIRED FOR THE SAFE MOVEMENT OF TRAFFIC THROUGHOUT THE PROJECT. SEE GENERAL NOTES FOR ADDITIONAL DETAILS.
- C. WORK SITES SHOULD BE CAREFULLY MONITORED TO ENSURE THAT TRAFFIC CONTROL MEASURES ARE OPERATING EFFECTIVELY AND THAT ALL DEVICES USED ARE CLEARLY VISIBLE, CLEAN AND IN GOOD REPAIR.
- D. THE ENGINEER MAY DIRECT THE CONTRACTOR TO VARY THE NUMBER AND LOCATION OF SIGNS, BARRICADES AND CHANNELIZING DEVICES FROM THOSE INDICATED ON THE PLANS IN ORDER TO MAINTAIN SAFE AND UNINTERRUPTED FLOW OF TRAFFIC, PARTICULARLY IN THOSE AREAS OF IMMEDIATE WORK.
- E. NO EQUIPMENT WILL REMAIN IN A POSITION OVERNIGHT OR ANY OTHER NON-WORK PERIODS THAT WILL ENDANGER THE TRAVELING PUBLIC.
- F. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE ACCESS TO PRIVATE PROPERTY AT ALL TIMES AND IN ALL WEATHER CONDITIONS. DRIVEWAYS WILL BE PLACED ACCORDING TO THE PLANS AND AS DIRECTED. TEMPORARY DRIVEWAYS WILL BE CONSTRUCTED IMMEDIATELY AFTER THE CONTRACTOR HAS DISTURBED OR ALTERED THE EXISTING DRIVEWAYS.
- G. COMPLETE ALL WORK ON PROJECT AS SHOWN ON THE VARIOUS PLAN SHEETS AND IN COMPLIANCE WITH THE GENERAL NOTES OF THIS CONTRACT.
- H. ANY REQUEST TO ALTER THE SEQUENCE OF OPERATION OF TRAFFIC CONTROL PLAN WILL BE SUBMITTED TO THE ENGINEER FOR WRITTEN APPROVAL.
- J. THE ENGINEER WILL BE NOTIFIED PRIOR TO ANY LANE CLOSURE. PROVIDE ONE (1) WEEK NOTICE TO THE ENGINEER OF ANY PLANNED LANE CLOSURES TO ALLOW COORDINATION. THE PROJECT ENGINEER MUST APPROVE ALL CLOSURES PRIOR TO IMPLEMENTATION.
- K. THE CONTRACTOR WILL MAINTAIN PERMANENT SIGNS WITHIN PROJECT LIMITS AND COVER SIGNS NOT IN USE. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO THE ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING".

SEQUENCE OF CONSTRUCTION:

THE CONTRACTORS OPERATION WILL BE SUCH THAT THE SAFETY OF THE TRAVELING PUBLIC WILL BE OF PRIME IMPORTANCE. THE SEQUENCES AS SHOWN CAN OVERLAP, AS NECESSARY. THE SEQUENCE OF CONSTRUCTION WILL GENERALLY CONFORM TO THE FOLLOWING SEQUENCE:

PHASE 1

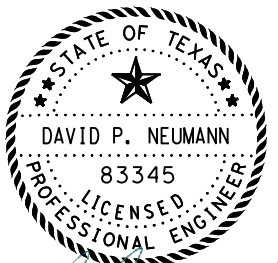
- 1) SET PROJECT BARRICADES, TRAFFIC CONTROL DEVICES AND SIGNS IN ACCORDANCE WITH TRAFFIC CONTROL STANDARDS, TMUTCD AND GENERAL NOTES.
- 2) INSTALL BEST MANAGEMENT PRACTICES (BMP) AND EROSION CONTROL DEVICES AS SHOWN OR AS DIRECTED.
- 3) EXISTING SIGNS THAT CONFLICT WITH THE PAVEMENT WIDENING WILL BE MOVED AND PLACED ON SKIDS FOR TEMPORARY USE AS DIRECTED.
- 4) INSTALL PROPOSED TRAFFIC SIGNAL AT SH 141 & W SANTA GERTRUDIS AVE AS SHOWN IN THE PLANS.
- 5) CONSTRUCT DRAINAGE WORK AS SHOWN IN THE PLANS FOR THE PHASE THAT WILL BE CONSTRUCTED FIRST.
- 6) ELIMINATE EXISTING PAVEMENT MARKINGS FOR THE DISTANCE OF WORK AREA OR AS DIRECTED. PLACE WORK ZONE PAVEMENT MARKINGS AND SHIFT TRAFFIC, REFER TO TCP(2-3) FOR TRAFFIC CONTROL PLACEMENT FOR WORK AREAS. CONSTRUCT PAVEMENT WIDENING AS SHOWN IN THE PLANS. ONLY ONE (1) SIDE OF THE ROADWAY WILL BE CONSTRUCTED AT ANY GIVEN TIME.
- 7) ONCE PAVEMENT WIDENING IS COMPLETE ON ONE SIDE, INSTALL PROPOSED SIGNS, PLACE WORK ZONE PAVEMENT MARKINGS FOR PHASE 2, AND OPEN UP TO TRAFFIC.

PHASE 2

- 1) INSTALL BEST MANAGEMENT PRACTICES (BMP) AND EROSION CONTROL DEVICES AS SHOWN OR AS DIRECTED.
- 2) EXISTING SIGNS THAT CONFLICT WITH THE PAVEMENT WIDENING WILL BE MOVED AND PLACED ON SKIDS FOR TEMPORARY USE AS DIRECTED.
- 3) ELIMINATE EXISTING PAVEMENT MARKINGS FOR THE DISTANCE OF WORK AREA OR AS DIRECTED. PLACE WORK ZONE PAVEMENT MARKINGS AND SHIFT TRAFFIC, REFER TO TCP(2-3) FOR TRAFFIC CONTROL PLACEMENT FOR WORK AREAS. CONSTRUCT PAVEMENT WIDENING AND DRAINAGE WORK ON THE REMAINING SIDE AS SHOWN IN THE PLANS.
- 4) ONCE PAVEMENT WIDENING IS COMPLETE, INSTALL PROPOSED SIGNS, PLACE WORK ZONE PAVEMENT MARKINGS, AND OPEN UP TO TRAFFIC.
- 5) CONSTRUCT MILLING AT BRIDGE LOCATIONS (STOCK PASS AND SANTA GERTRUDIS BRIDGES) AND BRIDGE RAIL REPLACEMENT (STOCK PASS BRIDGE) AND REPLACE METAL BEAM GUARD FENCE AS SHOWN IN THE PLANS. CONTRACTORS SEQUENCE OF OPERATION SHALL BE SUCH THAT THE FINAL HMA SURFACE WILL OCCUR AS SOON AS POSSIBLE AFTER THE MILLING AT THESE BRIDGE LOCATIONS.
- 6) PERFORM FINAL HMA OVERLAY AS SHOWN IN THE PLANS.

PAVING OPERATIONS WILL END SO THAT THE DISTANCE OF UNEVEN LANES IS MINIMAL PRIOR TO THE END OF EACH DAYS WORK. WORK ZONE TABS WILL BE USED ON FINAL PAVING OPERATIONS UNTIL PERMANENT STRIPING CAN BE PLACED, AS DIRECTED.

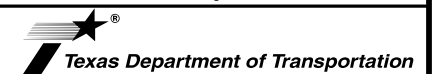
- 7) COMPLETE ALL OTHER WORK AS SHOWN ON THE PLANS AND AS DIRECTED. UPON COMPLETION, PERFORM FINAL PROJECT CLEAN-UP. REMOVE EROSION CONTROLS (BMP) WHEN DIRECTED.



David P. Neumann, P.E.

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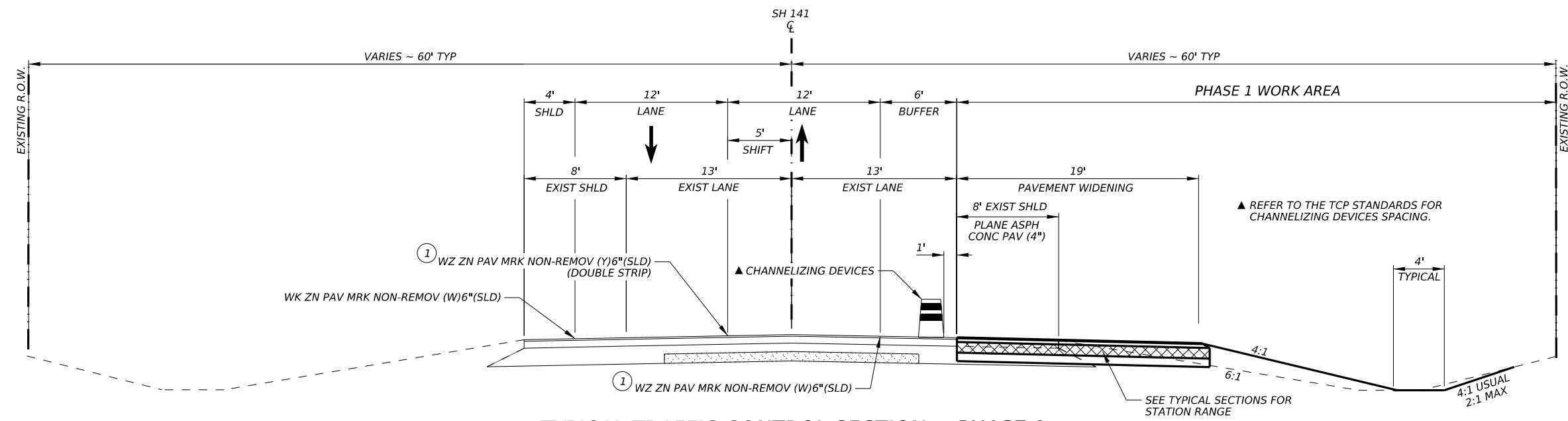
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TRAFFIC CONTROL PLAN SEQUENCE OF CONSTRUCTION

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	021	

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TYPICAL TRAFFIC CONTROL SECTION ~ PHASE 1

SH 141 (STATION 98+00.00 TO STATION 639+91.94) CSJ: 0383-04-060
 SH 141 (STATION 639+91.94 TO STATION 764+25.49) CSJ: 0383-03-024

NOTE: WIDENING WILL ONLY BE CONSTRUCTED ON ONE (1) SIDE OF THE ROADWAY AT ANY GIVEN TIME.

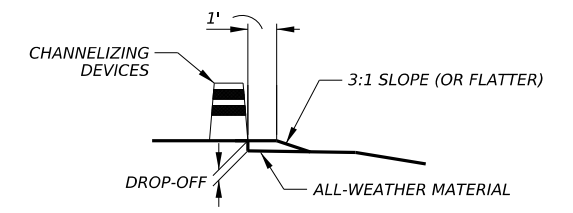
THE TYPICAL IS SHOWN FOR ILLUSTRATION PURPOSES ONLY, THE CONTRACTOR WILL NOTIFY THE ENGINEER AS TO WHICH SIDE WILL WORK BEST FOR THE CONSTRUCTION SEQUENCE.

GENERAL NOTES:

TRAFFIC SHIFTS AND TRAFFIC CONTROL PLAN AND SIGNAGE WILL FOLLOW TCP (2-3b) SHOWN IN STANDARD TCP(2-3)-23.

① - AT THE END OF EACH COMPLETED SECTION, WORK ZONE PAVEMENT MARKINGS WILL BE ELIMINATED AND TRAFFIC MOVED BACK TO THE ORIGINAL LANE CONFIGURATION.

TRAFFIC CONTROL FOR THE FINAL HMA OVERLAY REFER TO TCP(2-2). THE CONTRACTOR WILL USE ALTERNATING PAVING LANES EACH DAY, TWO (2) MILES MAX OR AS DIRECTED TO MINIMIZE THE AMOUNT OF UNEVEN LANES.



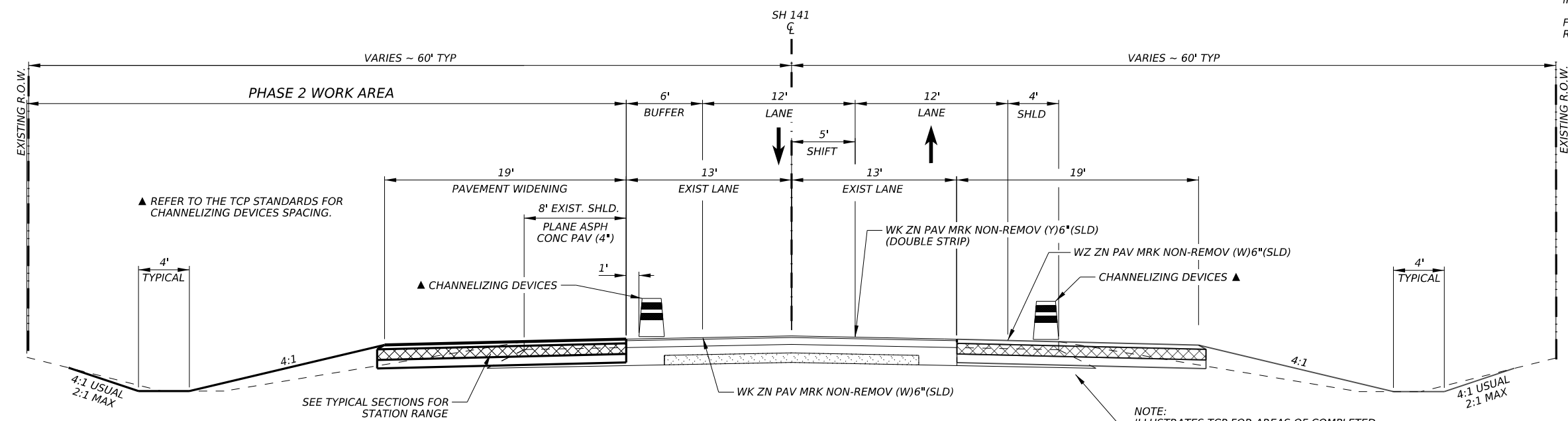
PAVEMENT EDGE DROP-OFF DETAIL

- LESS THAN 2 INCHES: CW 8-11 SIGNS ARE REQUIRED.
- GREATER THAN 2 INCHES: CHANNELIZATION DEVICES AND EITHER CW 8-9a OR CW 8-11 SIGNS ARE REQUIRED.
- THE SAFETY SLOPE WILL BE CONSTRUCTED WITH AN ALL-WEATHER MATERIAL SUCH AS RAP, WHICH IS CLEAN AND FREE OF DEBRIS AND LARGE ROCKS.

NOTE:

ALL TRAFFIC CONTROL DEVICES WILL CONFORM WITH THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" (TMUTCD), AND WILL BE MAINTAINED AS DIRECTED. ADDITIONAL GUIDELINES FOR TRAFFIC CONTROL DEVICES MAY BE FOUND IN THE TMUTCD.

FOR CHANNELING DEVICE PLACEMENT AND SPACING FOR ALL PHASES, REFER TO THE TCP STANDARDS.

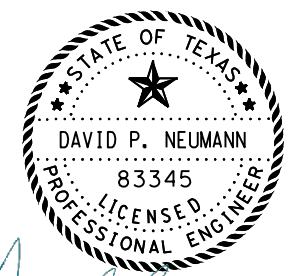


TYPICAL TRAFFIC CONTROL SECTION ~ PHASE 2

SH 141 (STATION 98+00.00 TO STATION 639+91.94) CSJ: 0383-04-060
 SH 141 (STATION 639+91.94 TO STATION 764+25.49) CSJ: 0383-03-024

NOTE: WIDENING WILL ONLY BE CONSTRUCTED ON ONE (1) SIDE OF THE ROADWAY AT ANY GIVEN TIME.

THE TYPICAL IS SHOWN FOR ILLUSTRATION PURPOSES ONLY, THE CONTRACTOR WILL NOTIFY THE ENGINEER AS TO WHICH SIDE WILL WORK BEST FOR THE CONSTRUCTION SEQUENCE.



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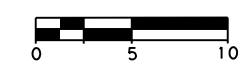
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TRAFFIC CONTROL SECTIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	022	



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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

DATE:
FILE:

WORKER SAFETY NOTES:


1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.
2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

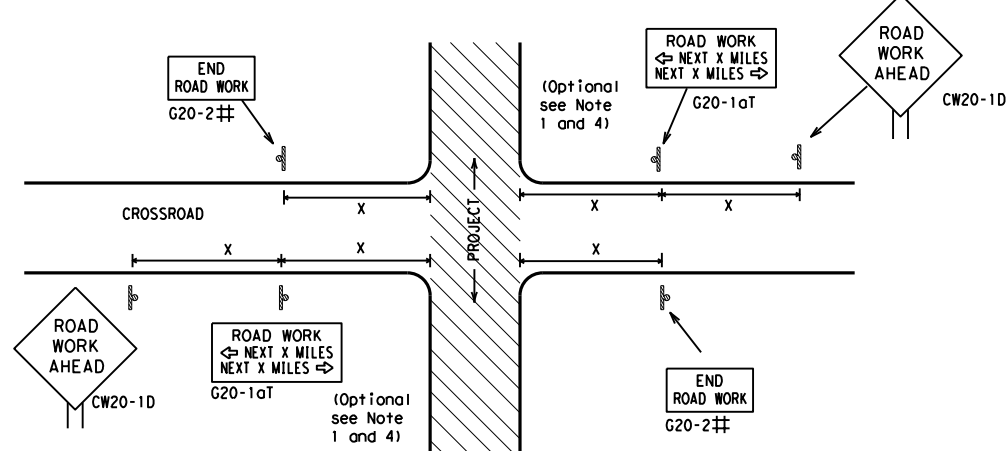
<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p> <p>BC (1) - 21</p>			
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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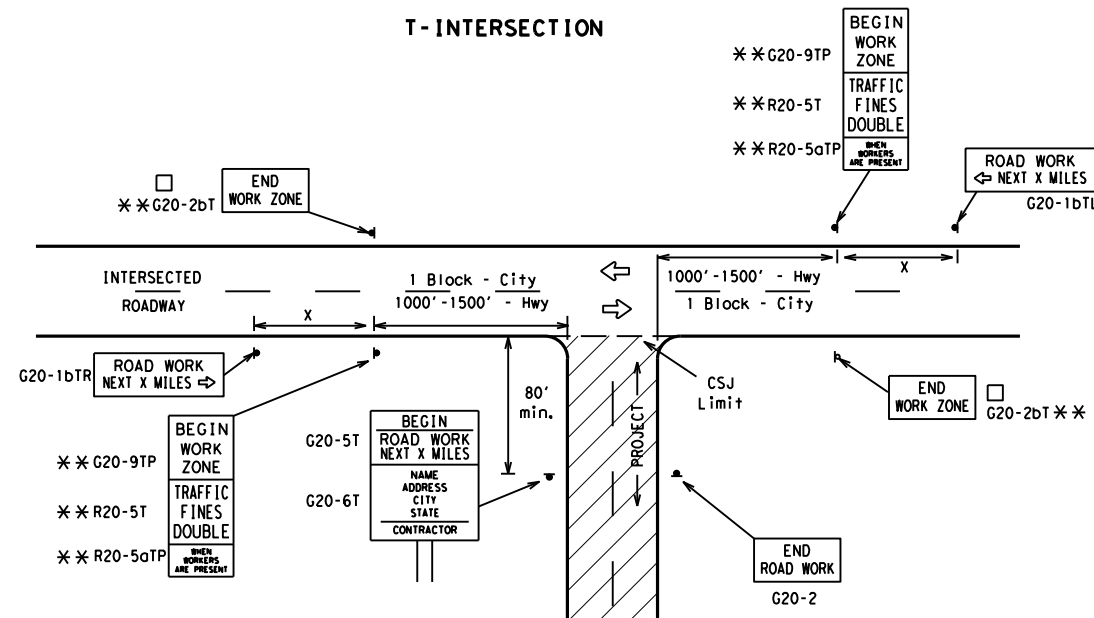
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ## 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 as per TMUTCD Part 5. 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 MPH	Sign Δ Spacing "X" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	60	600 ²
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12			65	700 ²
			70	800 ²
			75	900 ²
			80	1000 ²
*			*	* ³

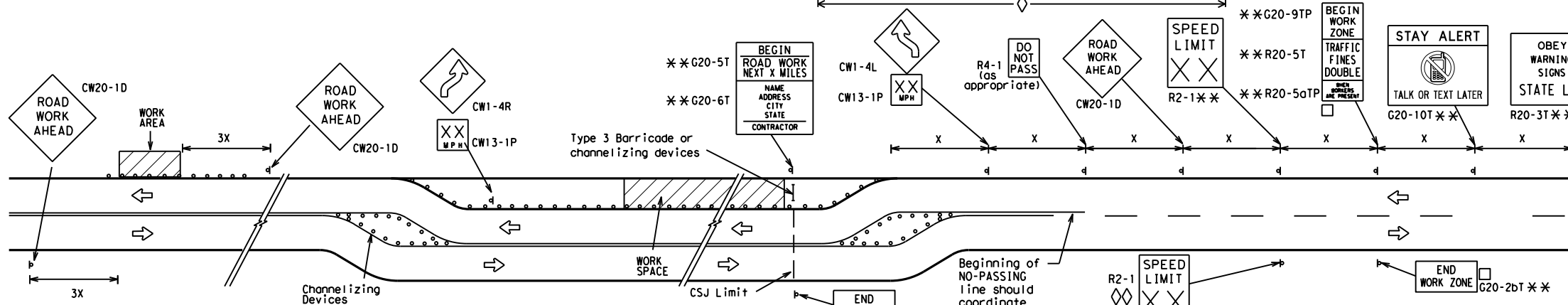
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

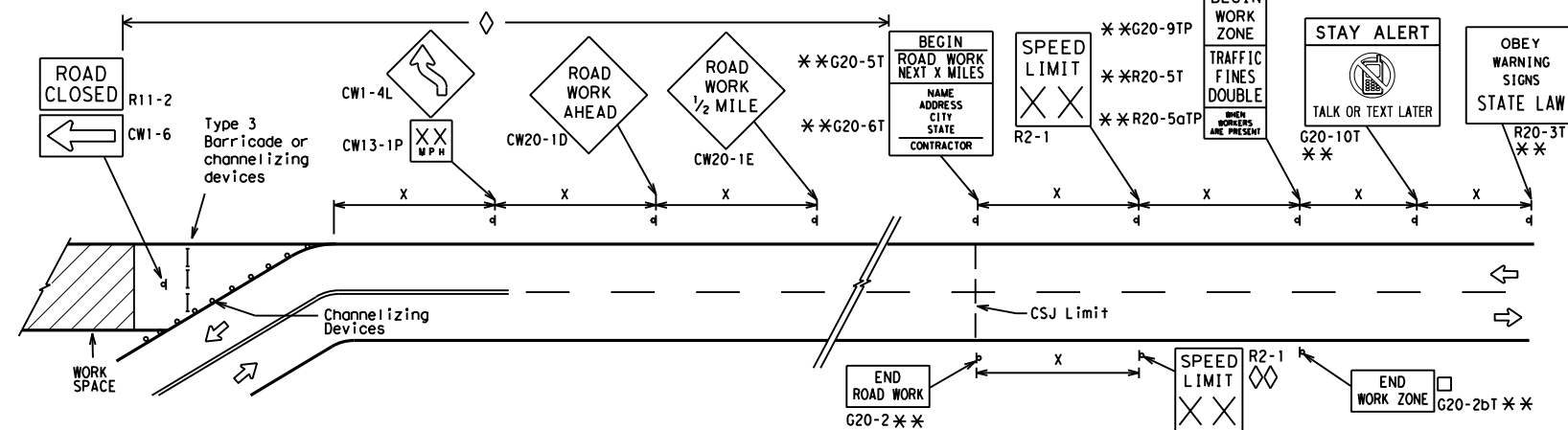
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. 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



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
 - ** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
 - ◇ Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
 - ◇◇ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

—	Type 3 Barricade
○ ○ ○	Channelizing Devices
■	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

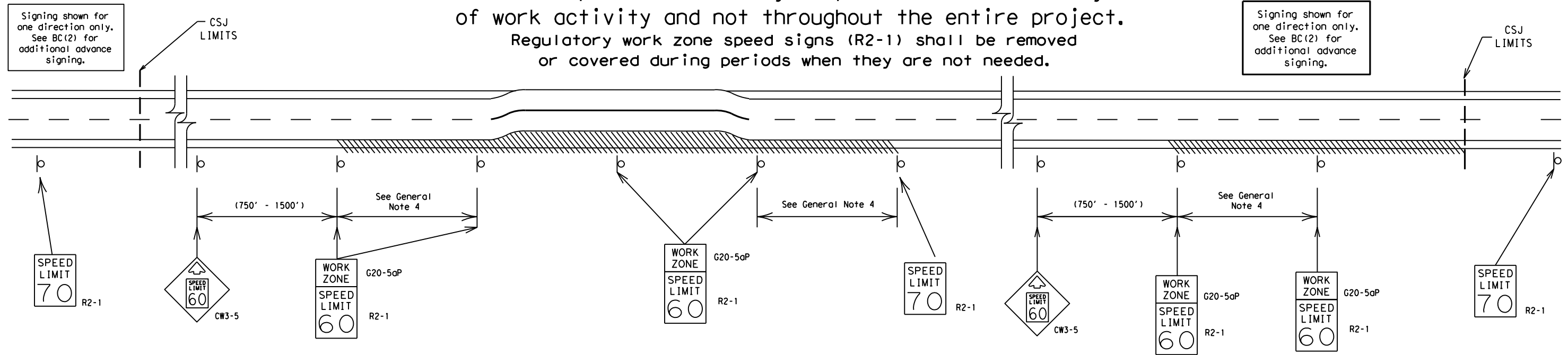
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

- 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 traveled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered. (See Removing or Covering on BC(4)).

GENERAL NOTES

- 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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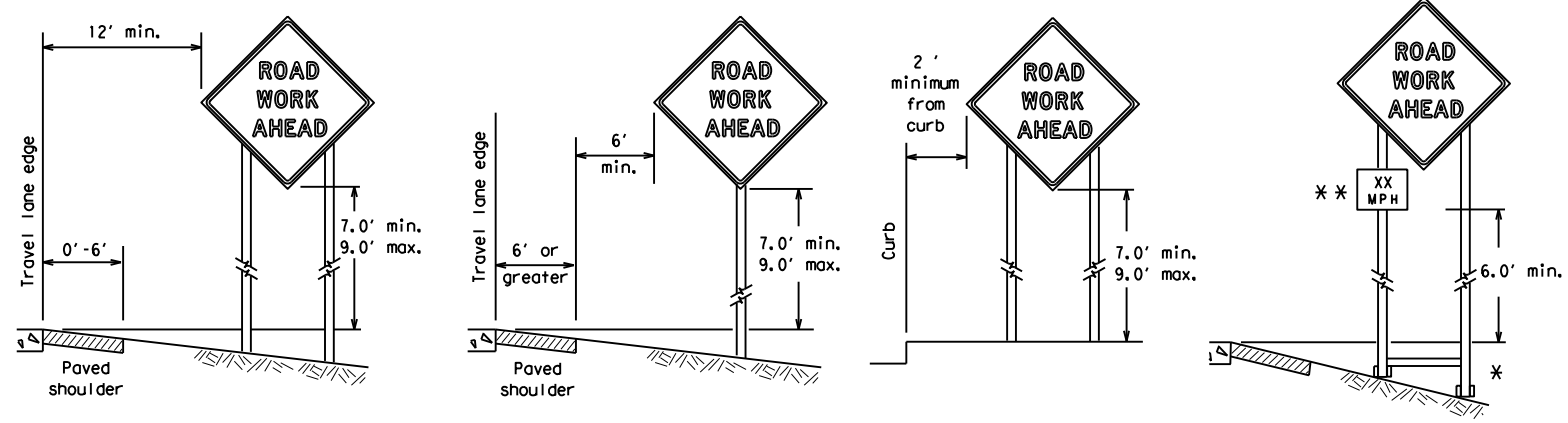
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

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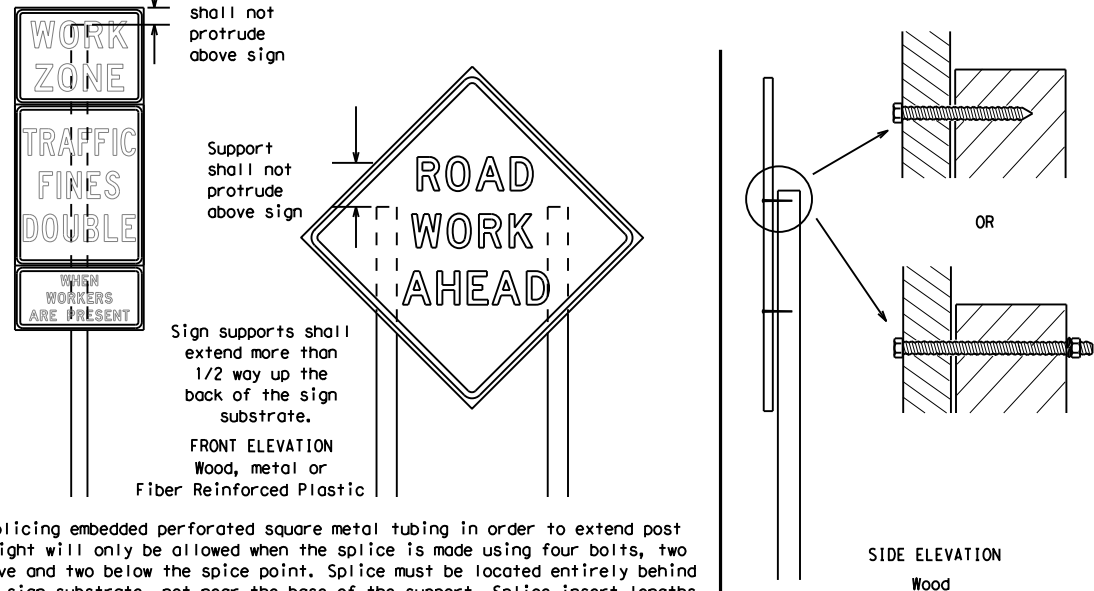
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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



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.

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) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- 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

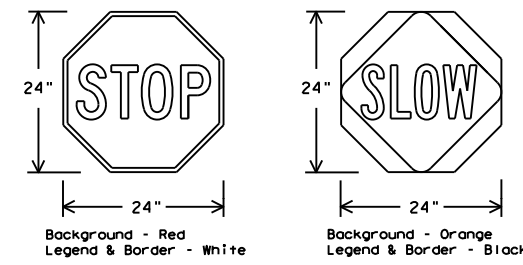
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not 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.

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".
- STOP/SLOW paddles shall be retroreflective when used at night.
- 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.



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
- 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 standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- 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.

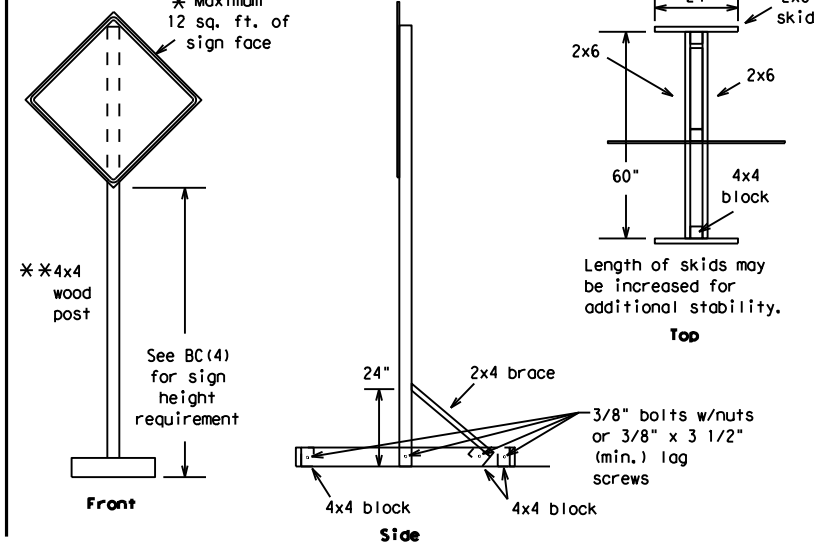
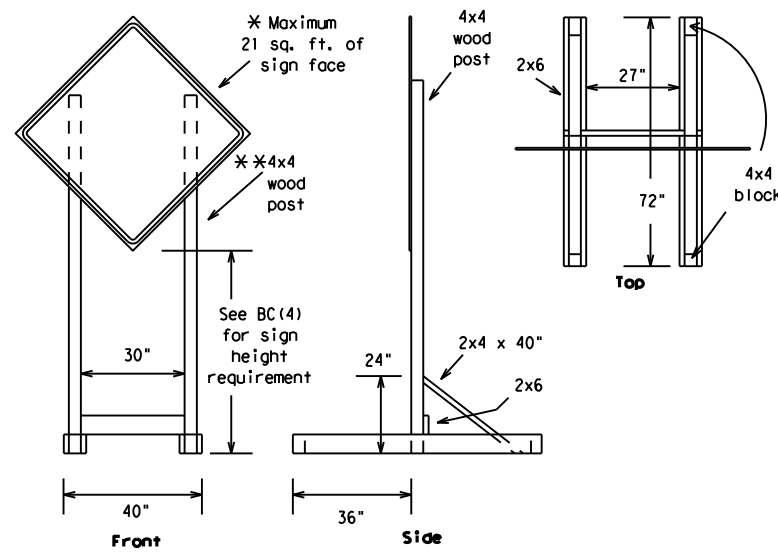


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

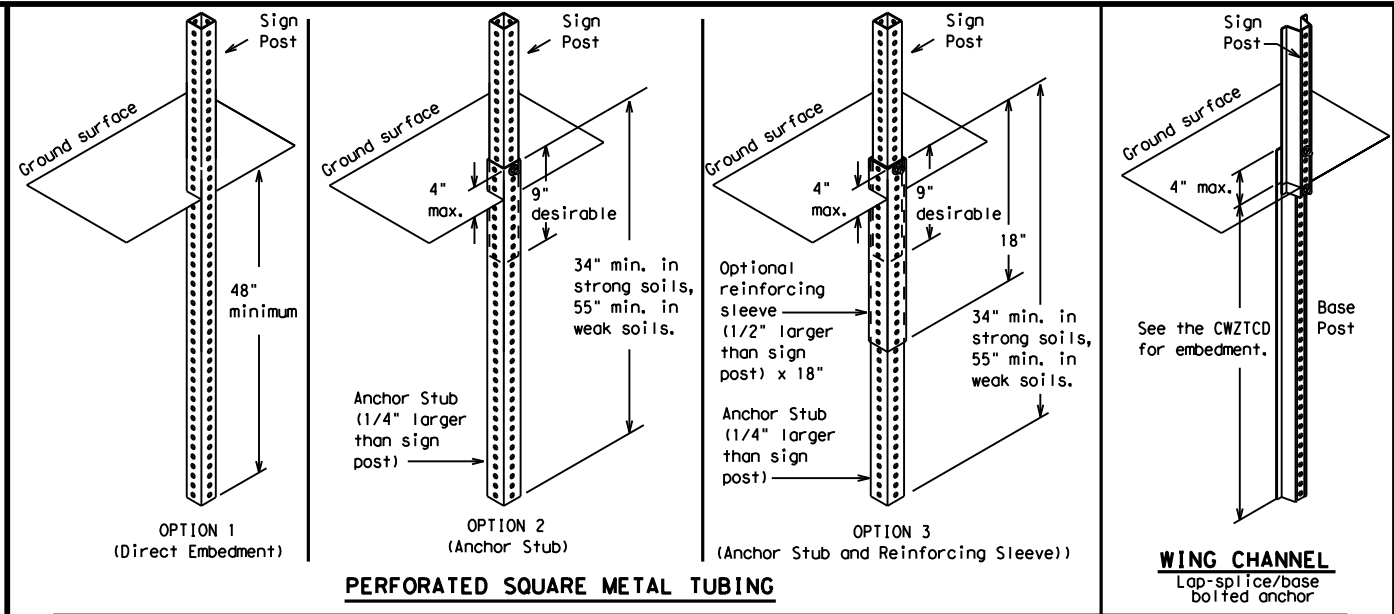
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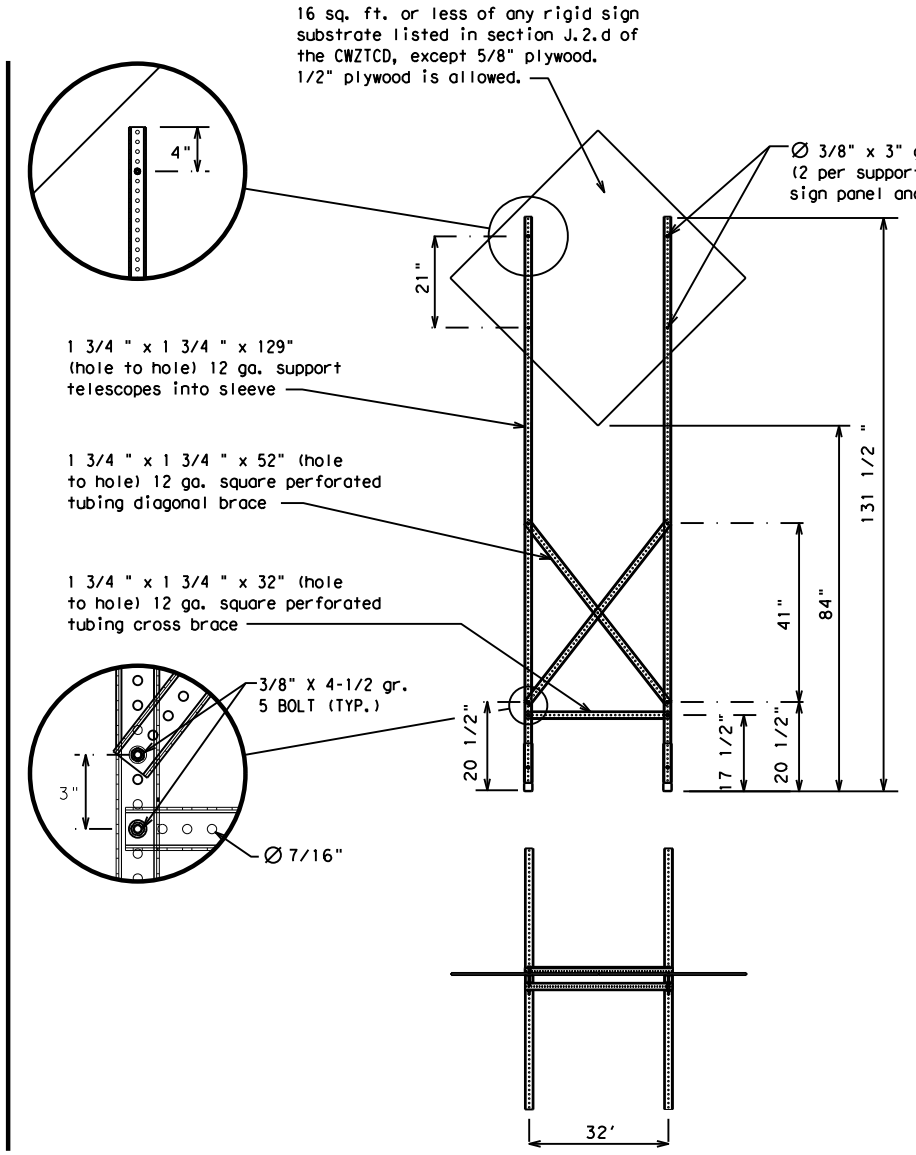
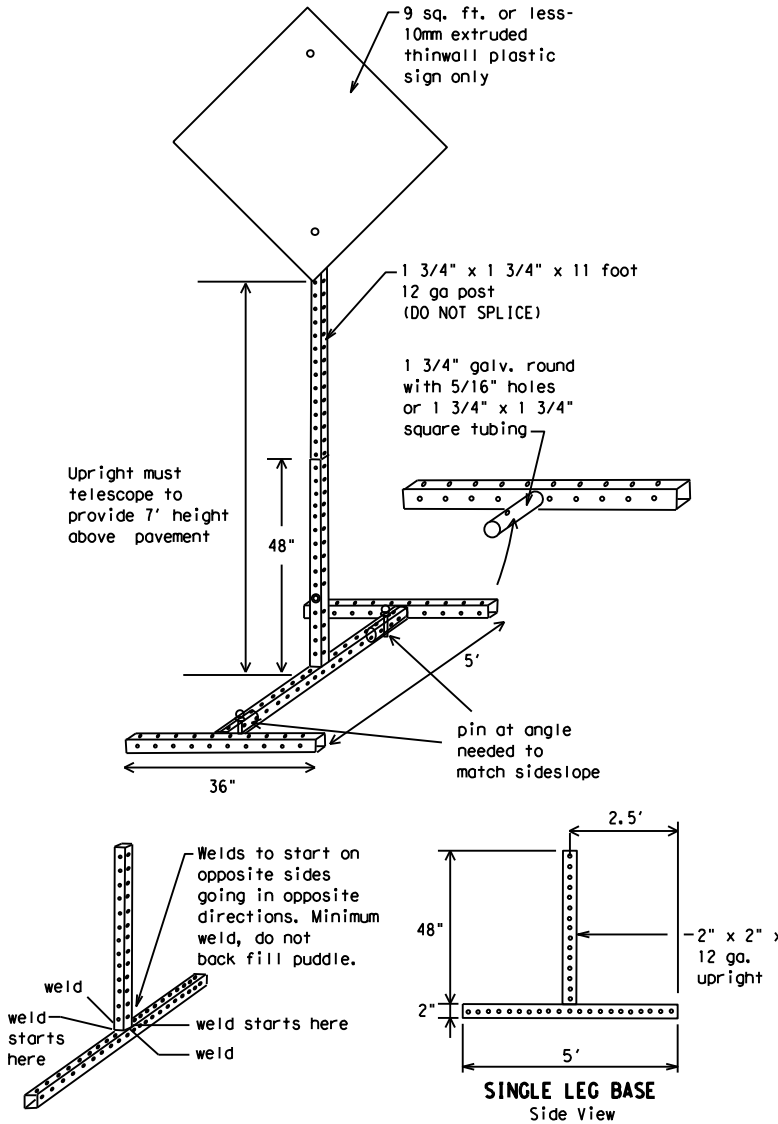
SKID MOUNTED WOOD SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

- ### GENERAL NOTES
- 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) - 21

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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

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.

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
ROAD REPAIRS XXXX FT
FLAGGER 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
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 XXXXXX
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.

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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
Canal	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	TRVLR
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

DATE: FILE:



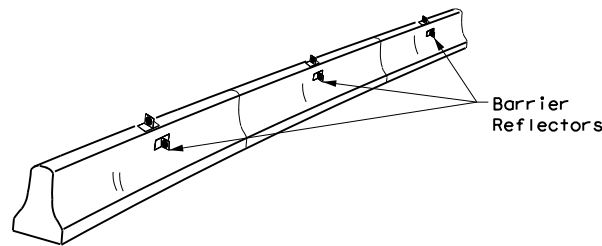
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	CRP	JIM WELLS, ETC.	028	

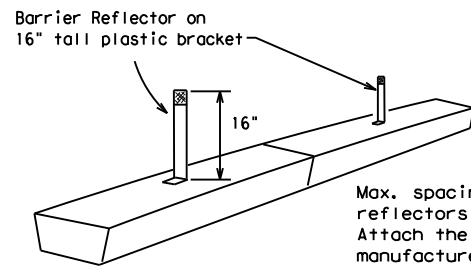
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors 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.

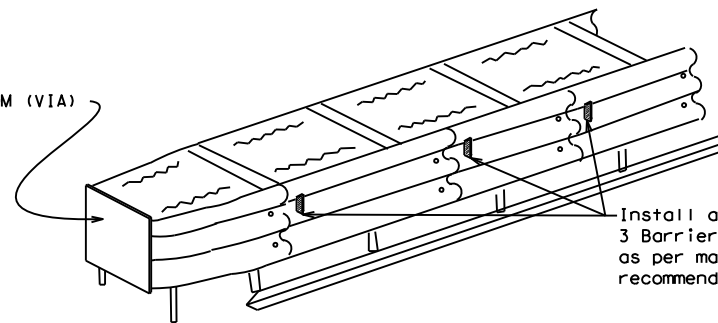


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

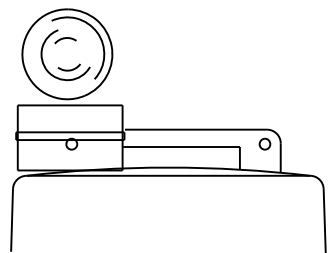
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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

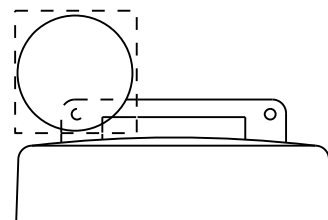
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.

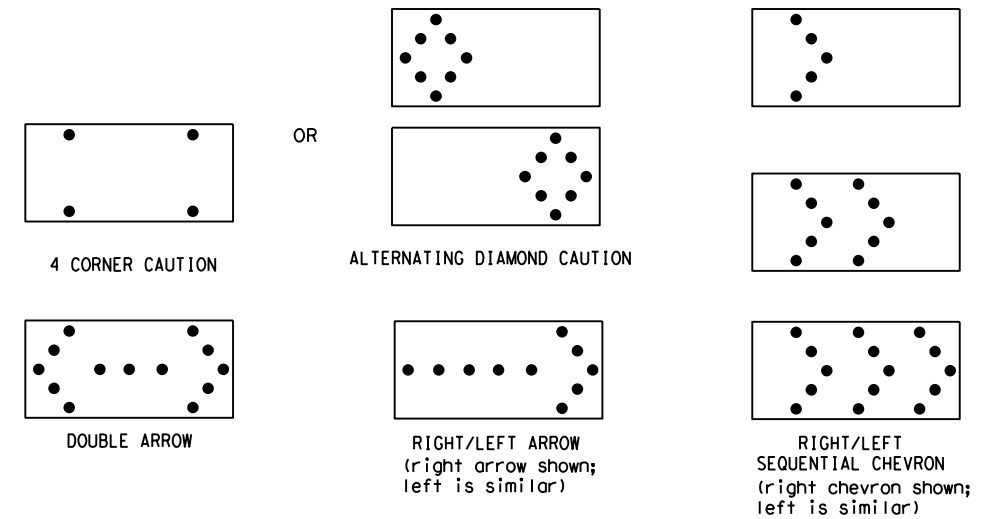


Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

DATE:
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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 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.



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

BC (7) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0383	03	024, ETC.		SH 141			
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13	5-21	CRP	JIM WELLS, ETC.		029				

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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:

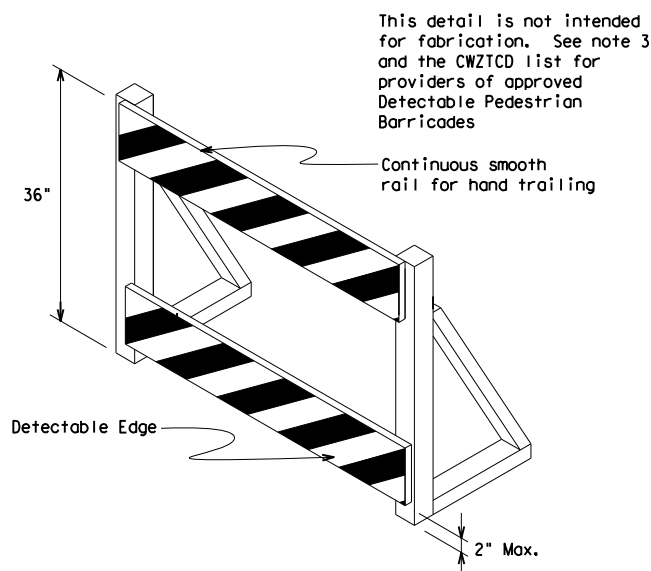
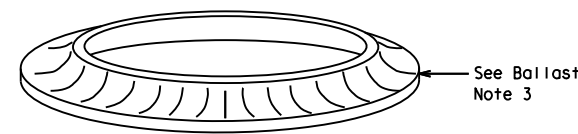
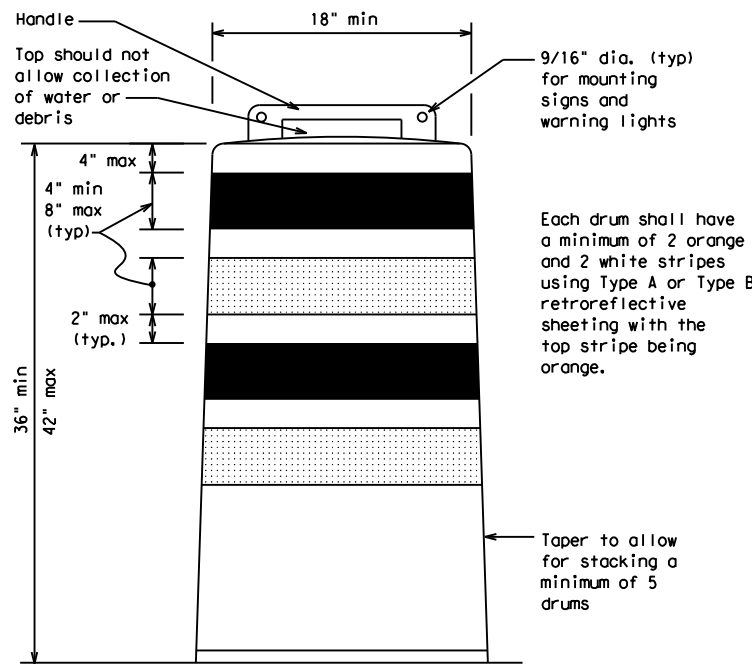
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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 or Type B 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.

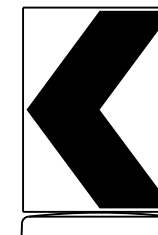
BALLAST

- 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.

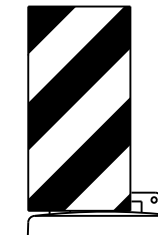


DETECTABLE PEDESTRIAN BARRICADES

- 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. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
- Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
- 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 (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 should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24" Vertical Panel
mount with diagonals sloping down towards travel way

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- 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 or Type B. 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



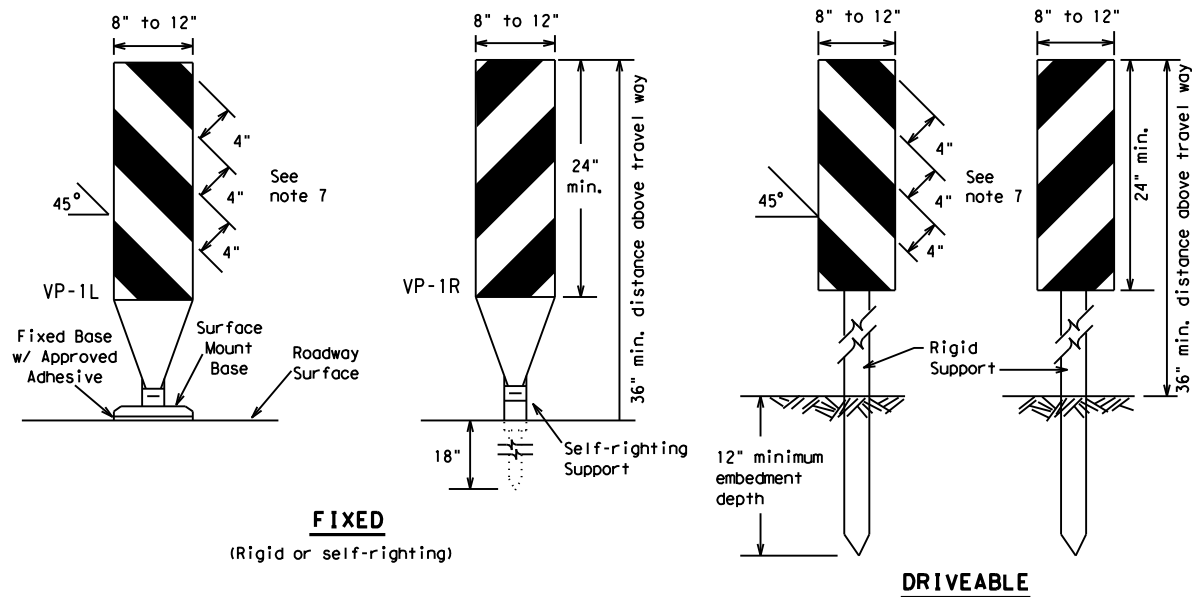
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

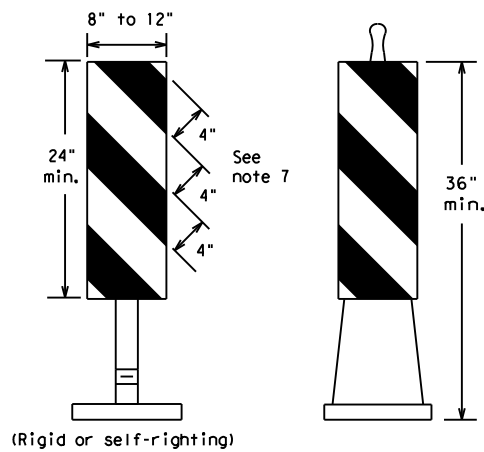
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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0383	03	024, ETC.		SH 141			
4-03	8-14					DIST		COUNTY	SHEET NO.
9-07	5-21					CRP		JIM WELLS, ETC.	030
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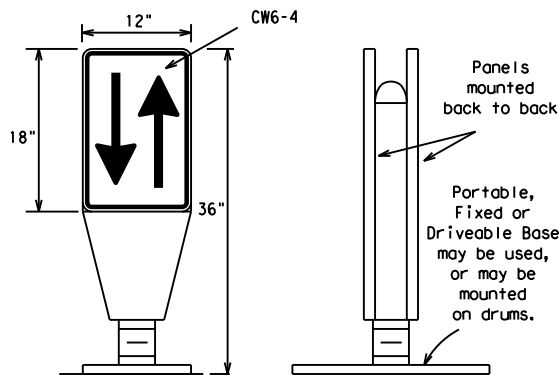


- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use 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 or Type B 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.

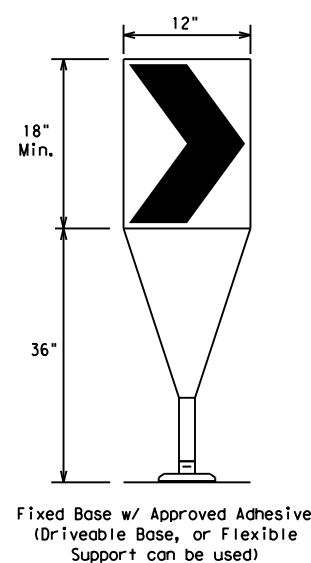


VERTICAL PANELS (VPs)

- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

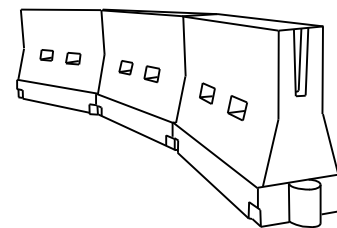


OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



- 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). Place reflective sheeting 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 Manual for Assessing Safety Hardware (MASH) 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) - 21

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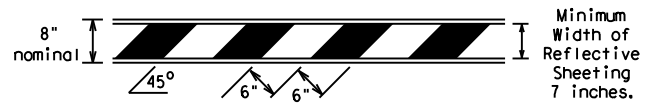
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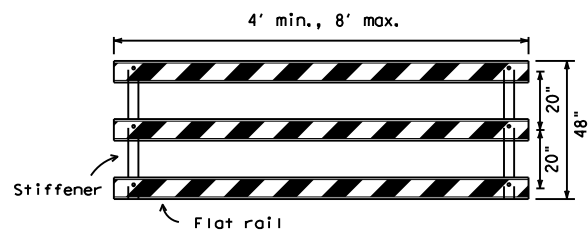
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



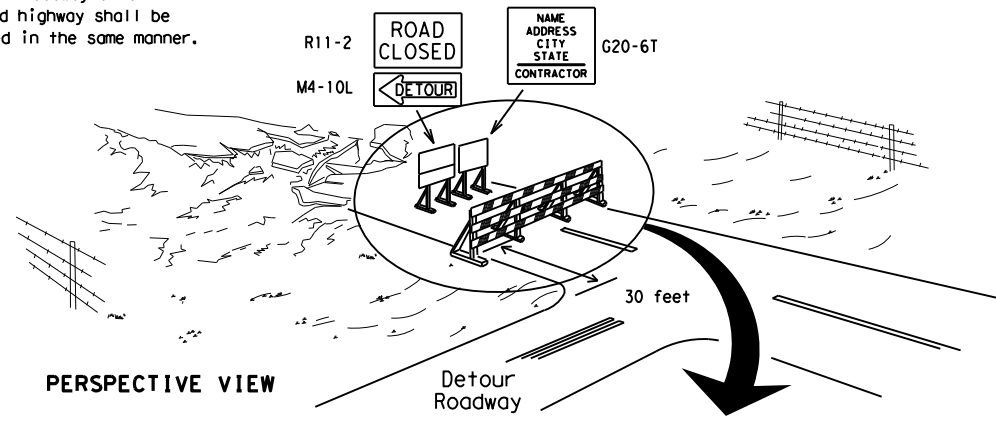
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

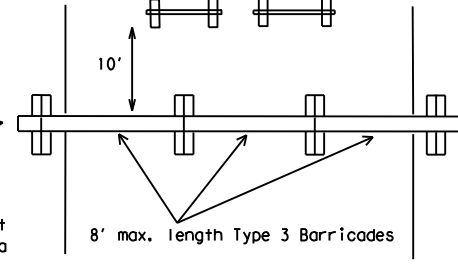
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

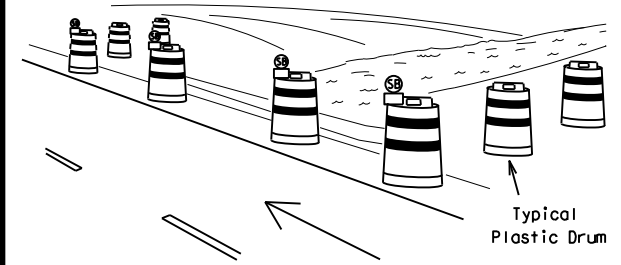
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

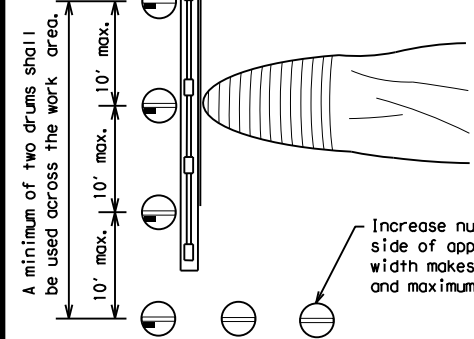
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

These drums are not required on one-way roadway

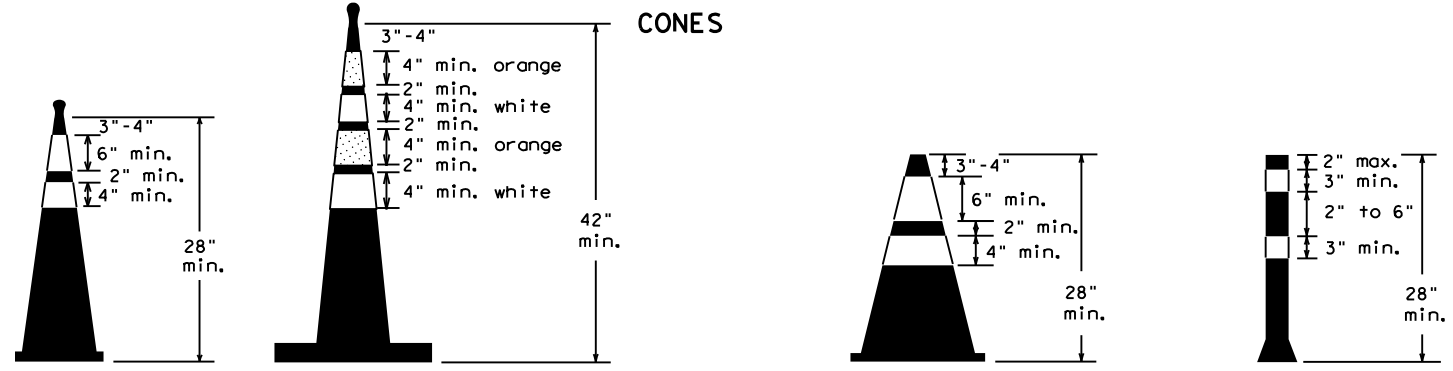


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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



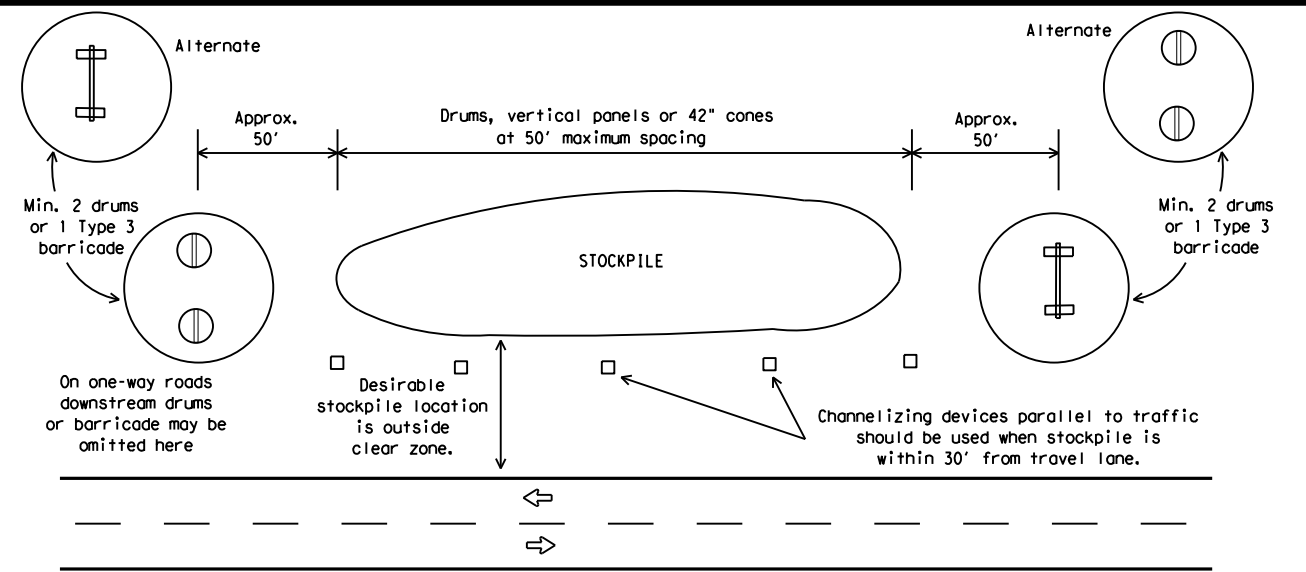
Two-Piece cones

One-Piece cones

Tubular Marker

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

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

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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.

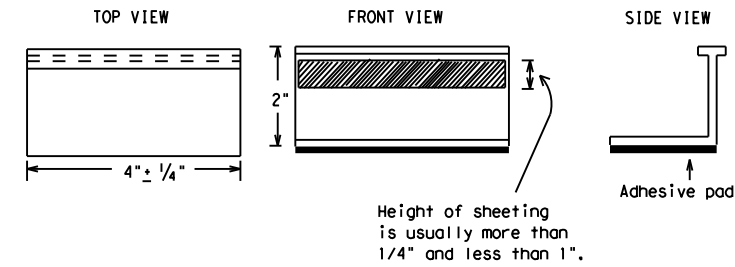
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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

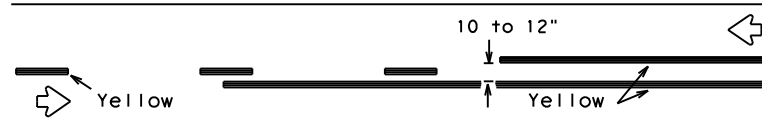
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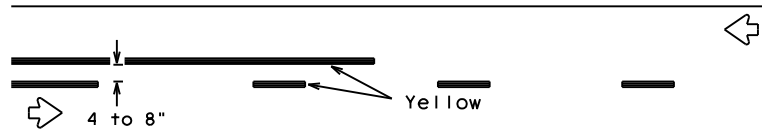
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PAVEMENT MARKING PATTERNS

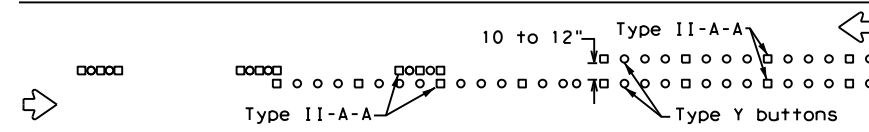


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

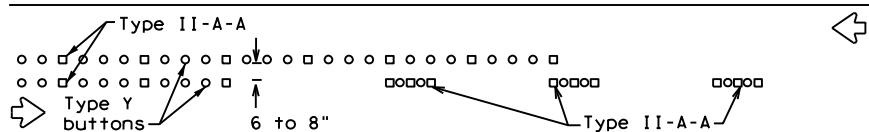


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.

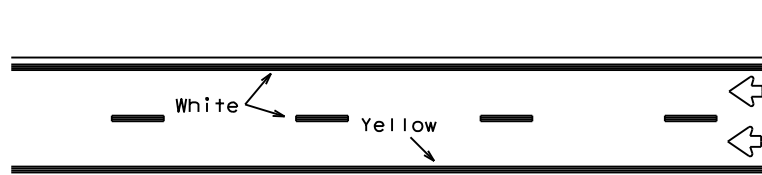


RAISED PAVEMENT MARKERS - PATTERN A



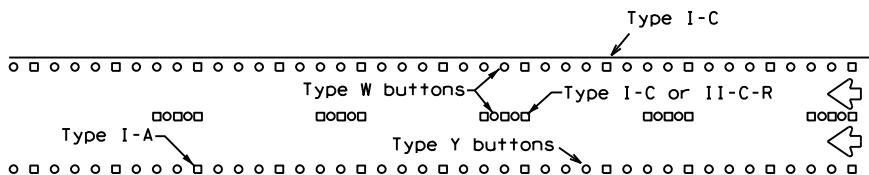
RAISED PAVEMENT MARKERS - PATTERN B

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



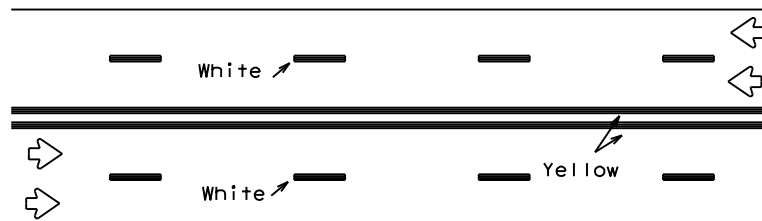
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



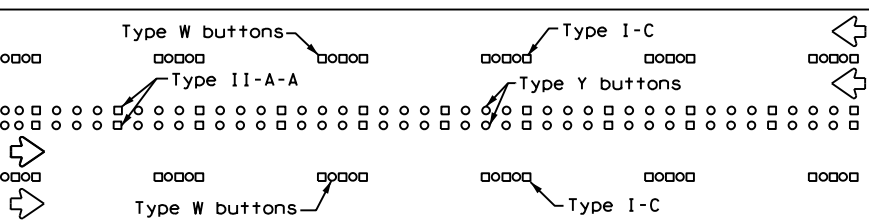
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



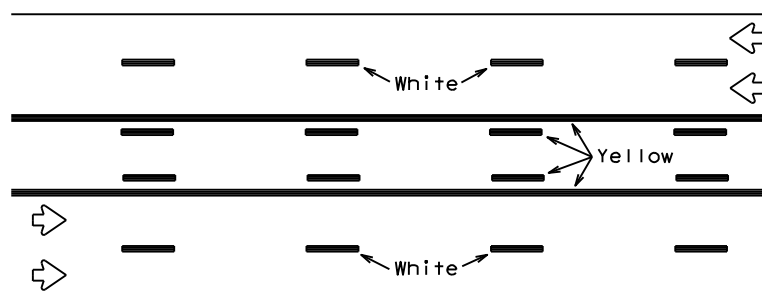
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



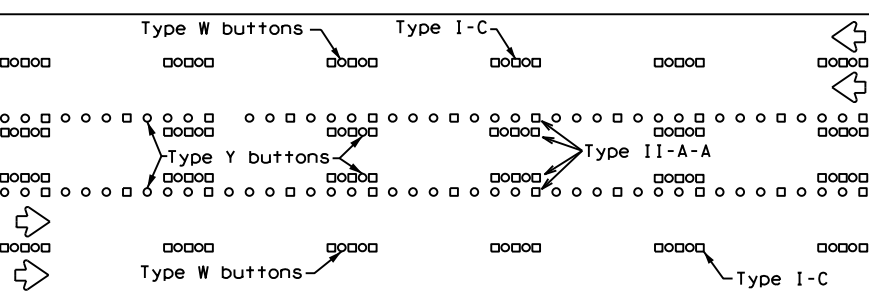
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

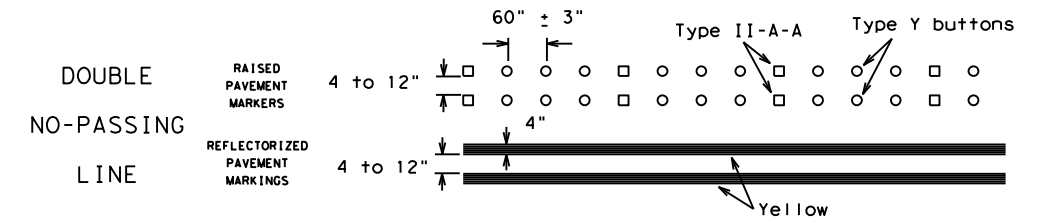
Prefabricated markings may be substituted for reflectORIZED pavement markings.



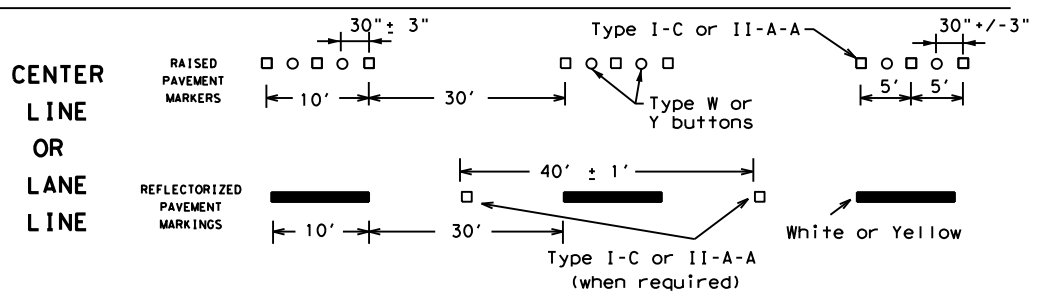
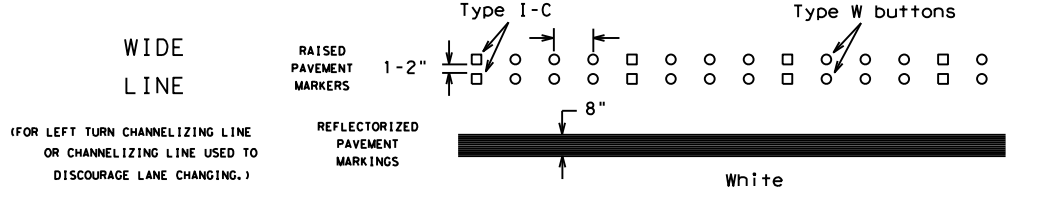
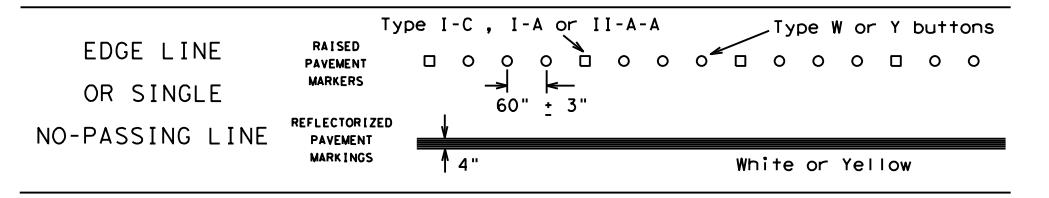
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

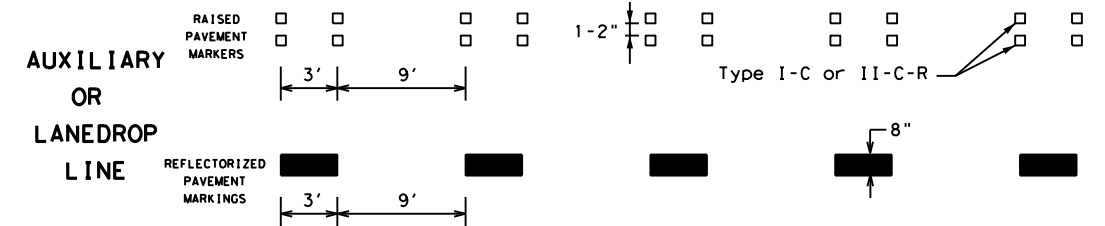
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

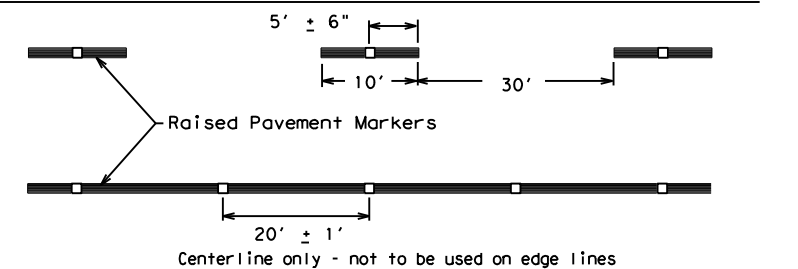


BROKEN LINES



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



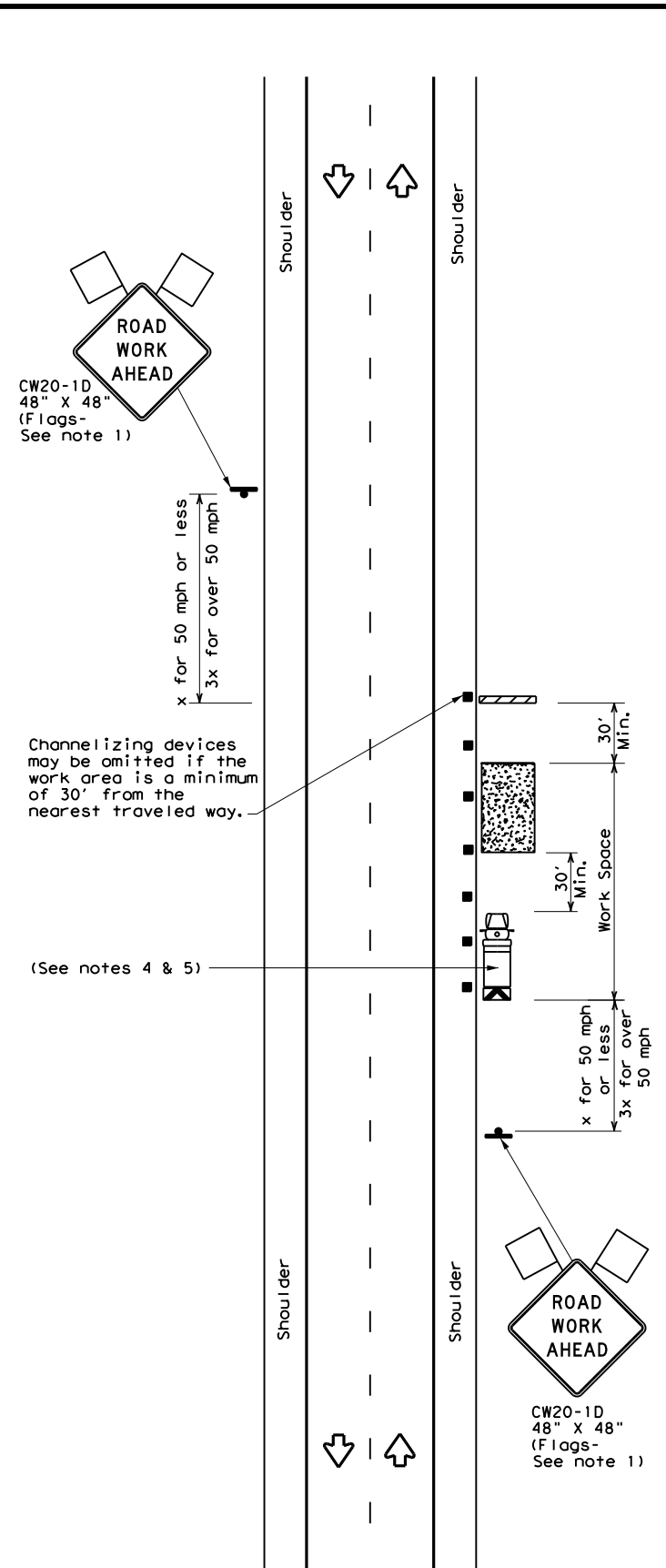
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
1-97 9-07 5-21				
2-98 7-13				
11-02 8-14	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	034	

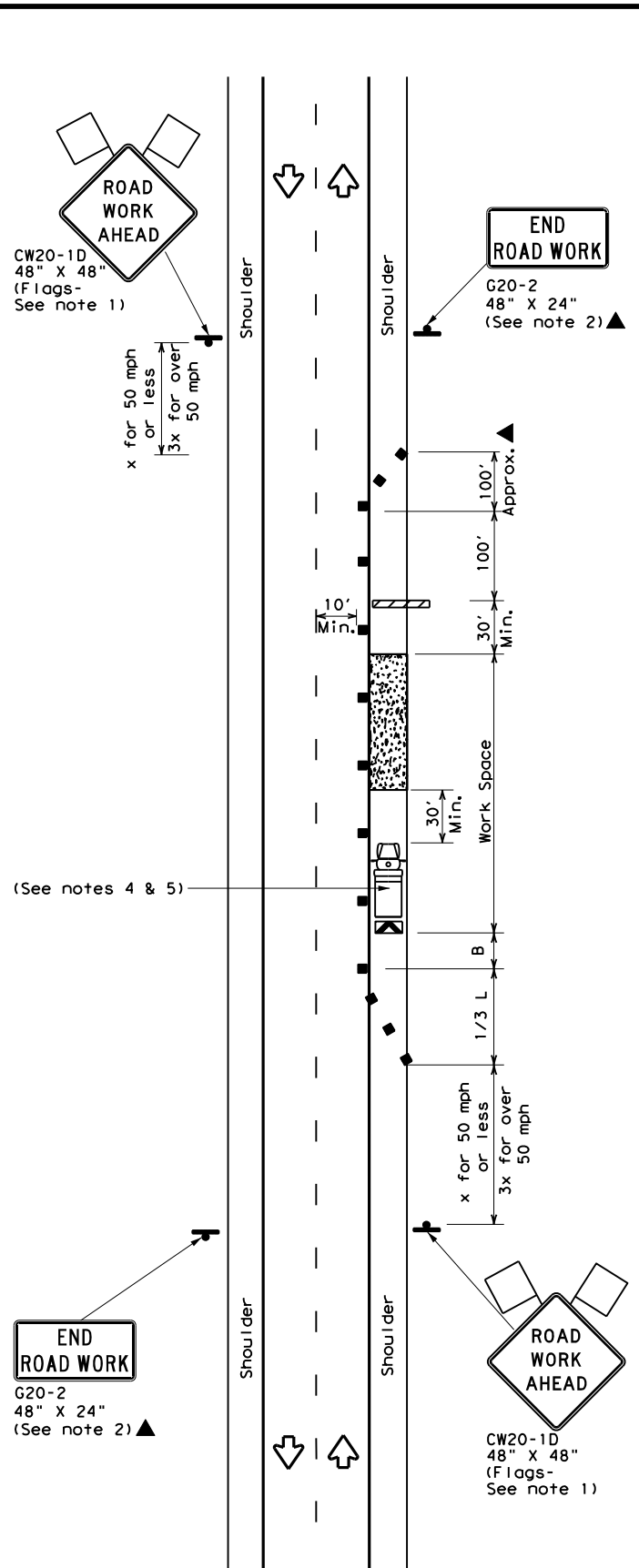
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DATE: FILE:



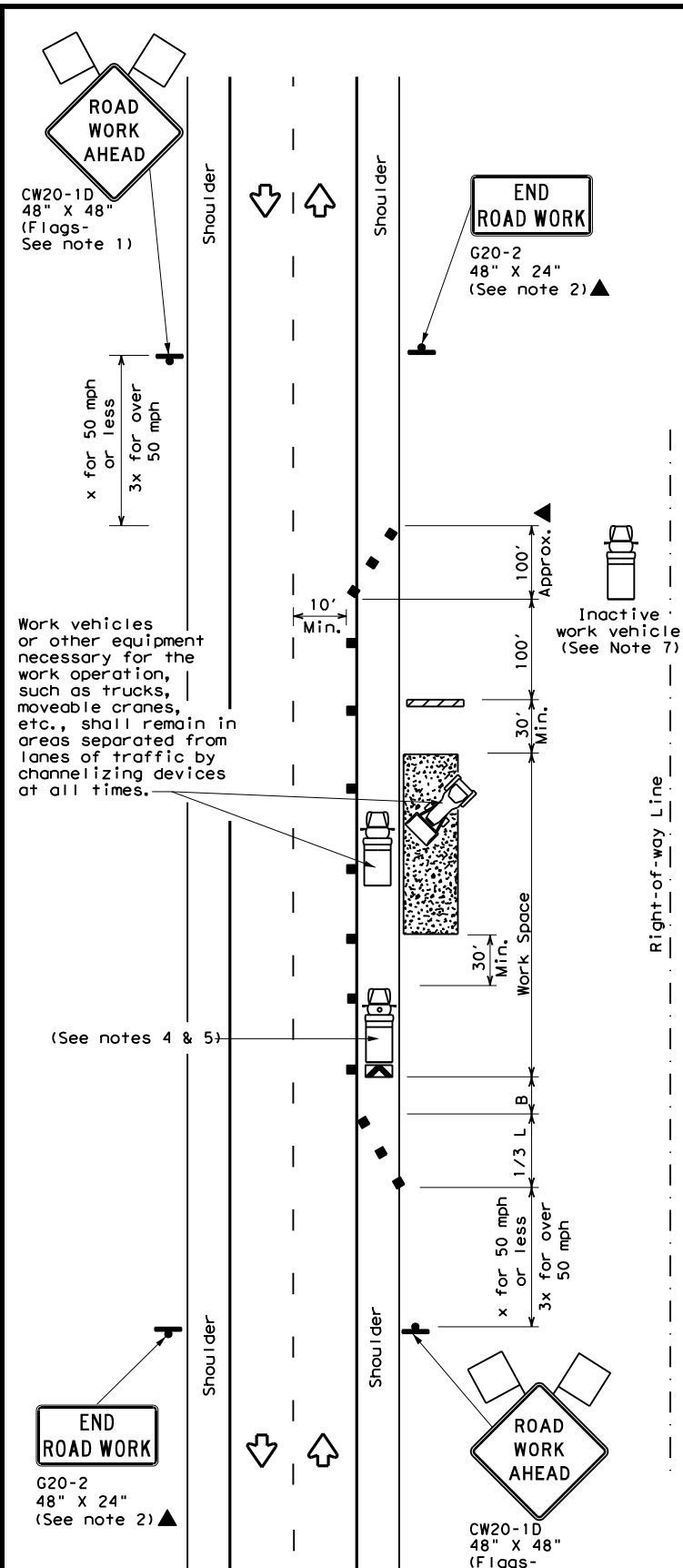
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		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	L = WS	265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50	L = WS	500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60	L = WS	600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	L = WS	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

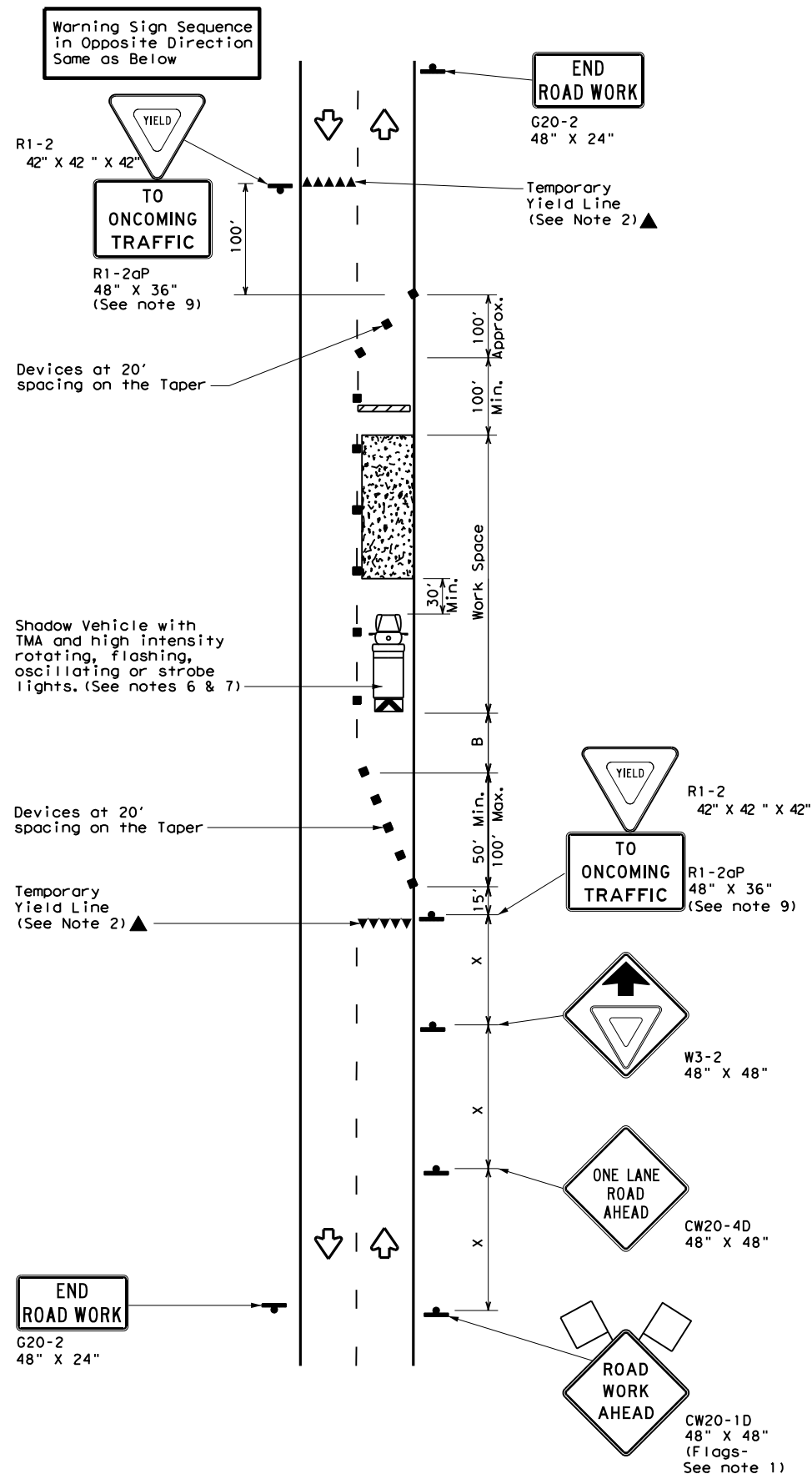
- Flags attached to signs where shown, are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
- Stockpiled material should be placed a 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

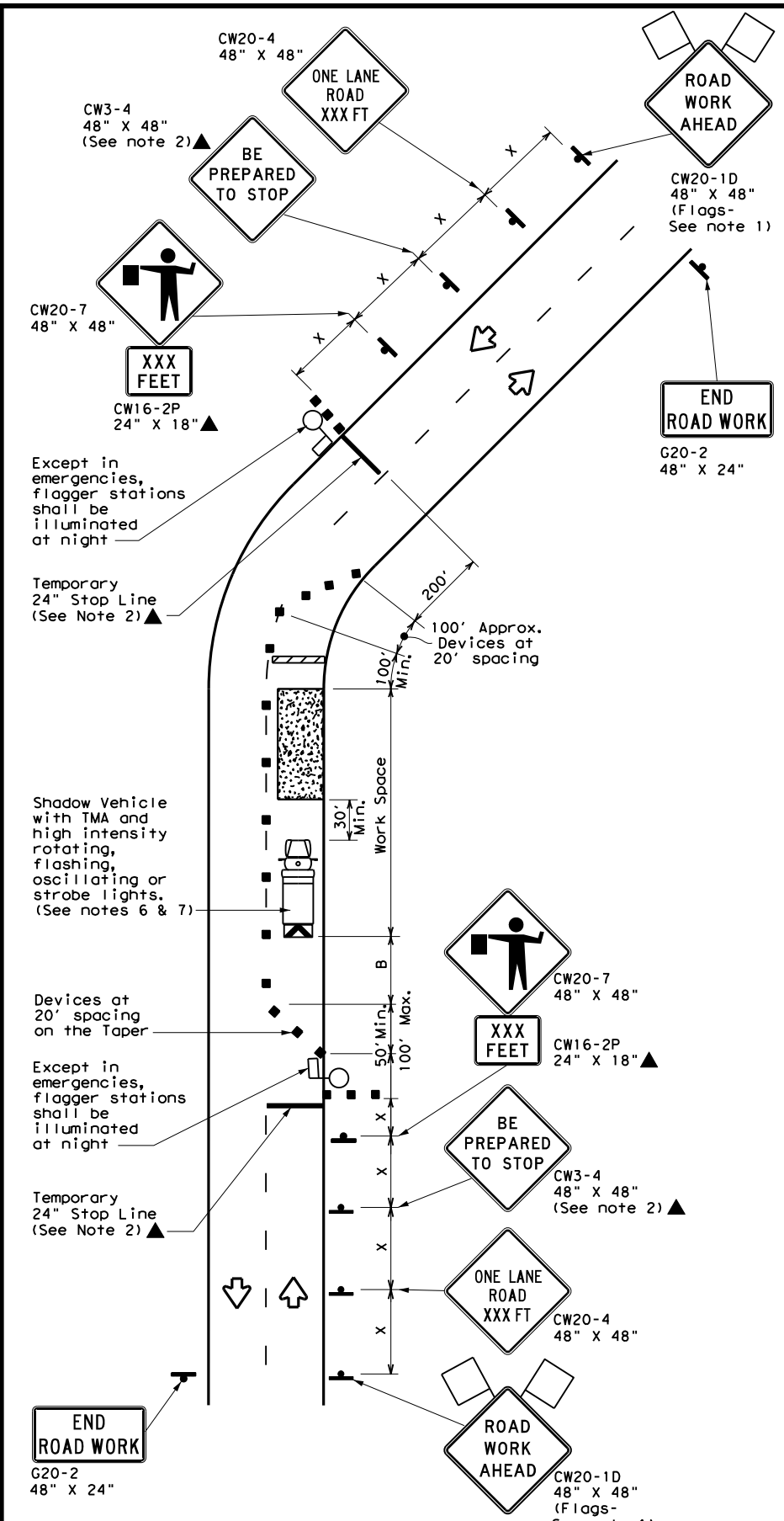
TCP (2-1) - 18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TXDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	CRP	JIM WELLS, ETC.	035	
1-97 2-18				

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TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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 CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
 - Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - 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.
- TCP (2-2a)**
- The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
 - The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- TCP (2-2b)**
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation
 Traffic Operations Division Standard

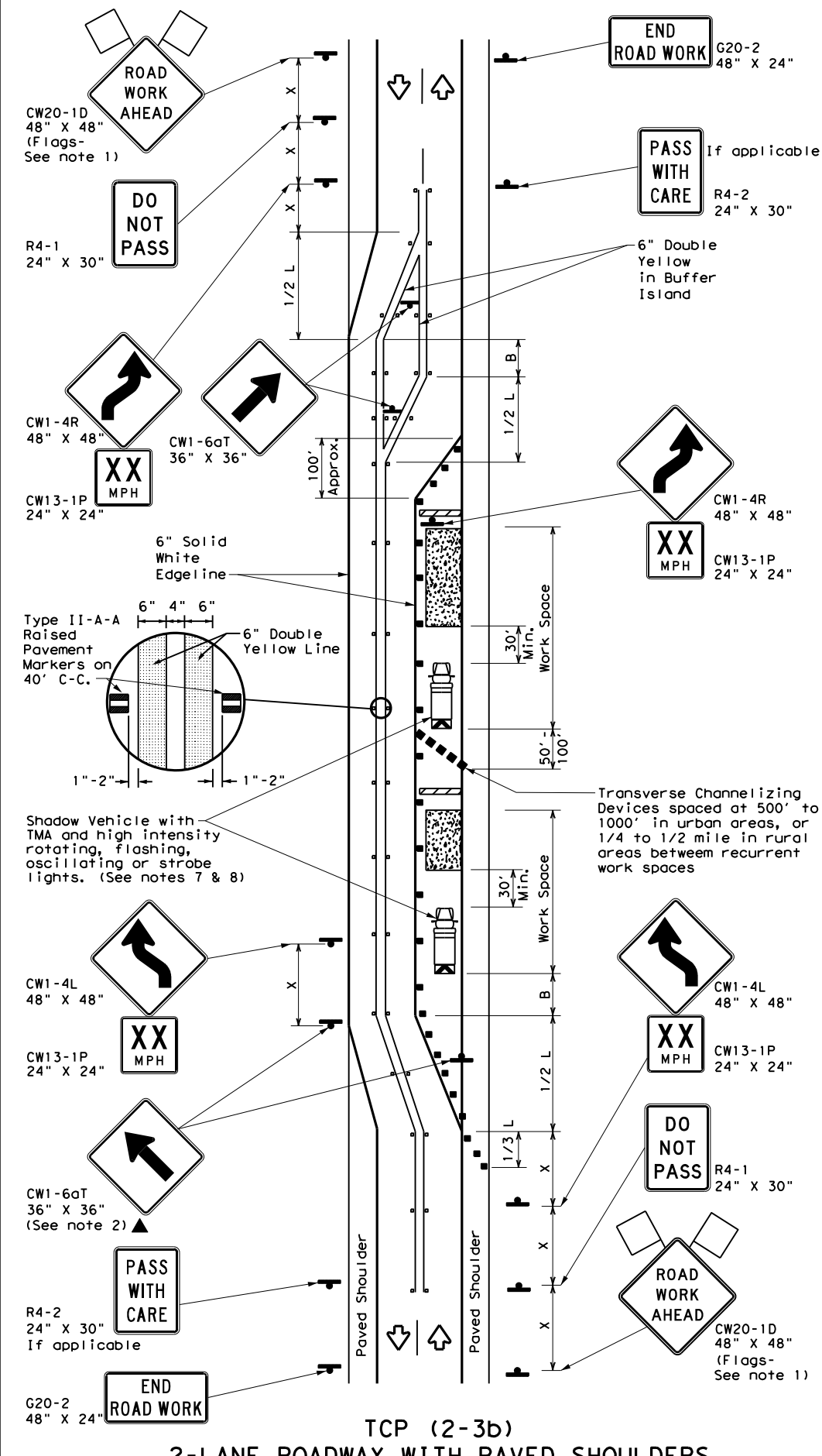
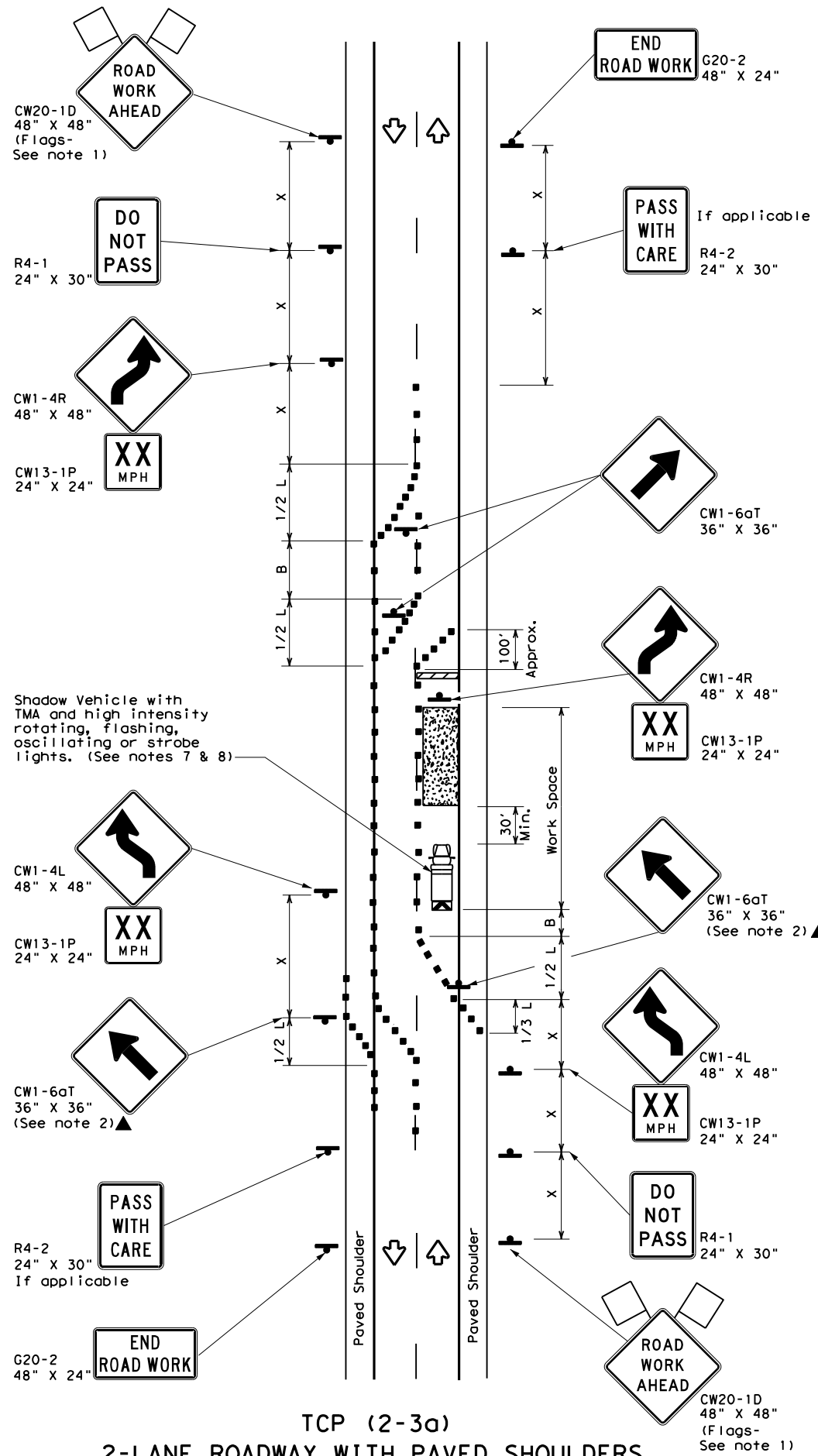
**TRAFFIC CONTROL PLAN
 ONE-LANE TWO-WAY
 TRAFFIC CONTROL**

TCP (2-2) - 18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
8-95 3-03				
1-97 2-12				
4-98 2-18				
	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS, ETC.		036

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DATE: FILE:



LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed * X	Formula L = WS ² / 60	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)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
			✓	✓
				TCP (2-3b) ONLY

- 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.
 - When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
 - Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
 - The R4-1 "DO NOT PASS," R4-2 "PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
 - Conflicting pavement marking shall be removed for long term projects.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-3a)**
- Conflicting pavement markings shall be removed for long-term projects. 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 device spacing is intended for the area of the conflicting markings, not the entire work zone.

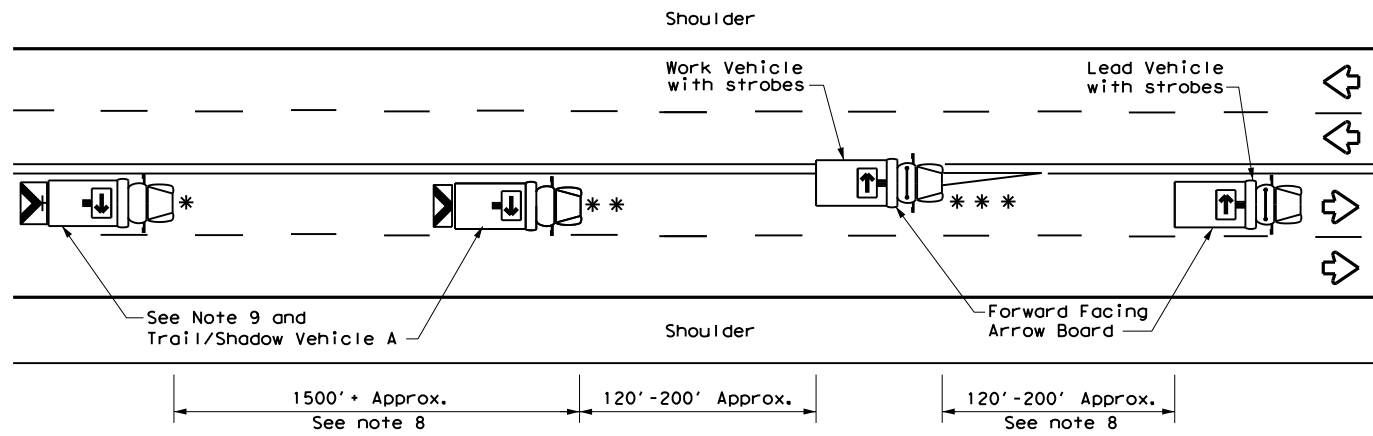


TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON
TWO-LANE ROADS

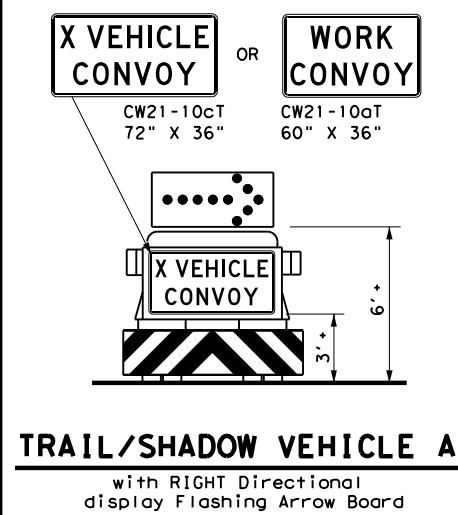
TCP (2-3) -23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
12-85 4-98 2-18	0383	03	024, ETC.	SH 141
8-95 3-03 4-23	DIST	COUNTY	SHEET NO.	
1-97 2-12	CRP	JIM WELLS, ETC.	037	

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TCP (3-1a)
UNDIVIDED MULTILANE ROADWAY



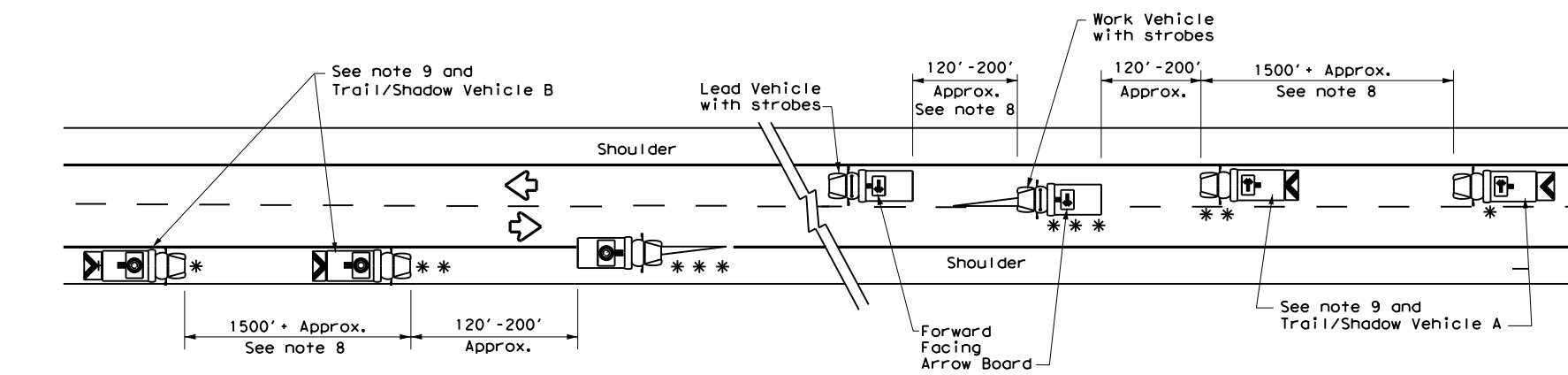
TRAIL/SHADOW VEHICLE A
with RIGHT Directional display Flashing Arrow Board

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)

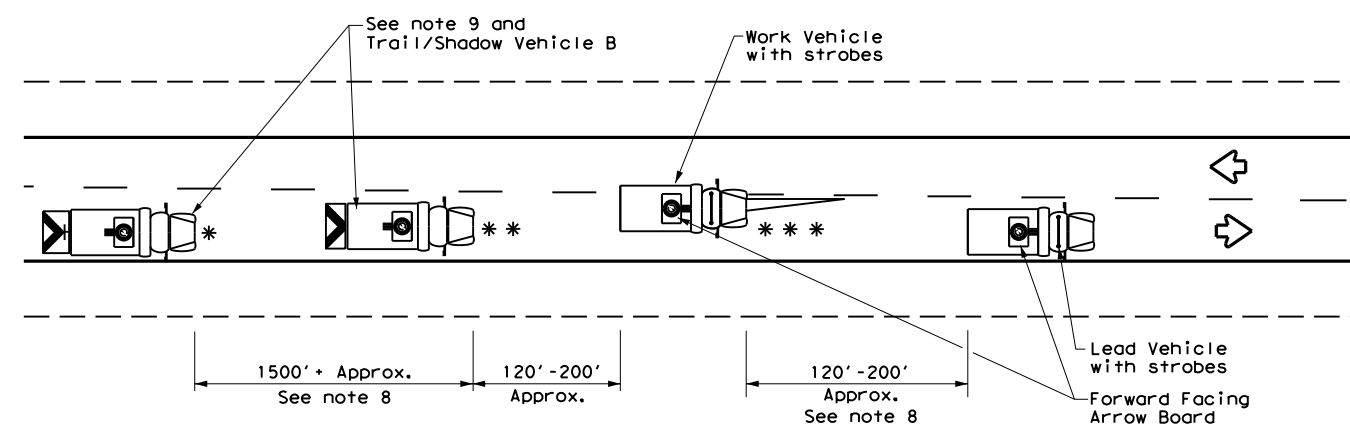
TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
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GENERAL NOTES

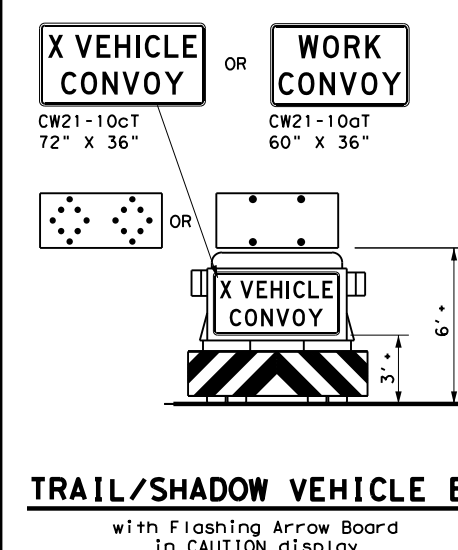
- TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic 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.



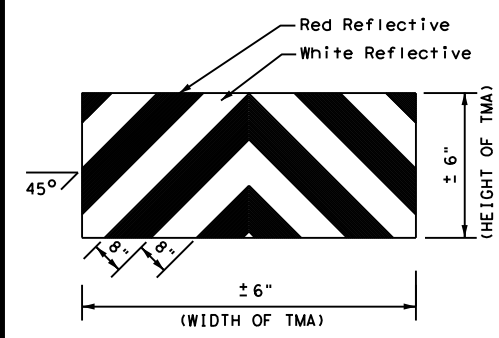
TCP (3-1b)
TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)
TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B
with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

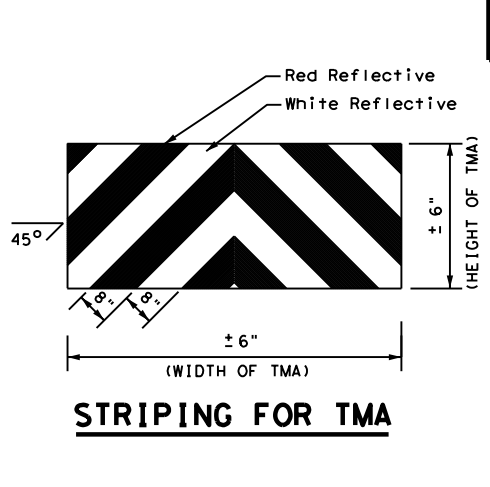
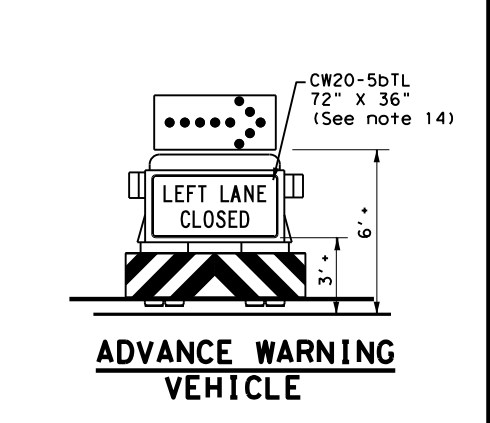
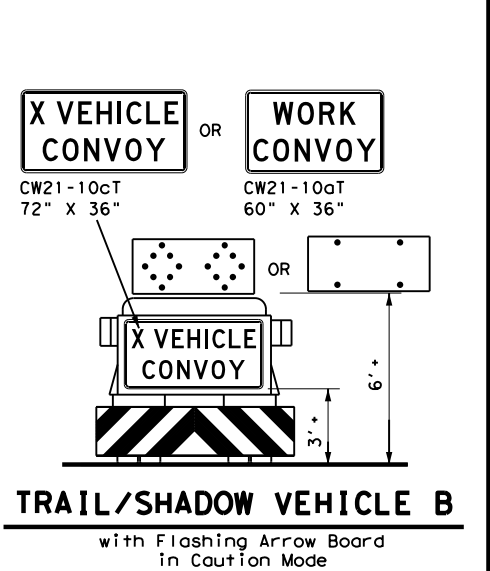
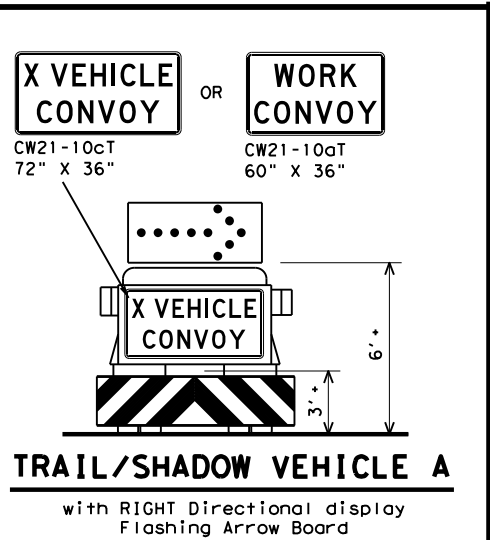
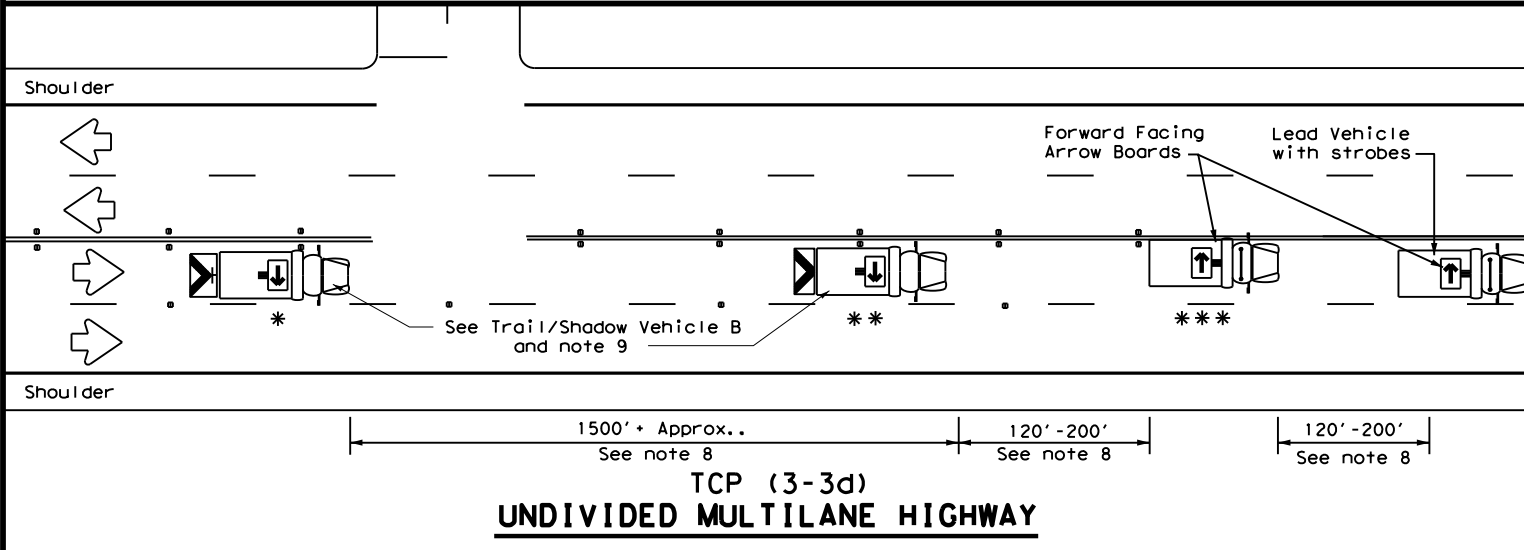
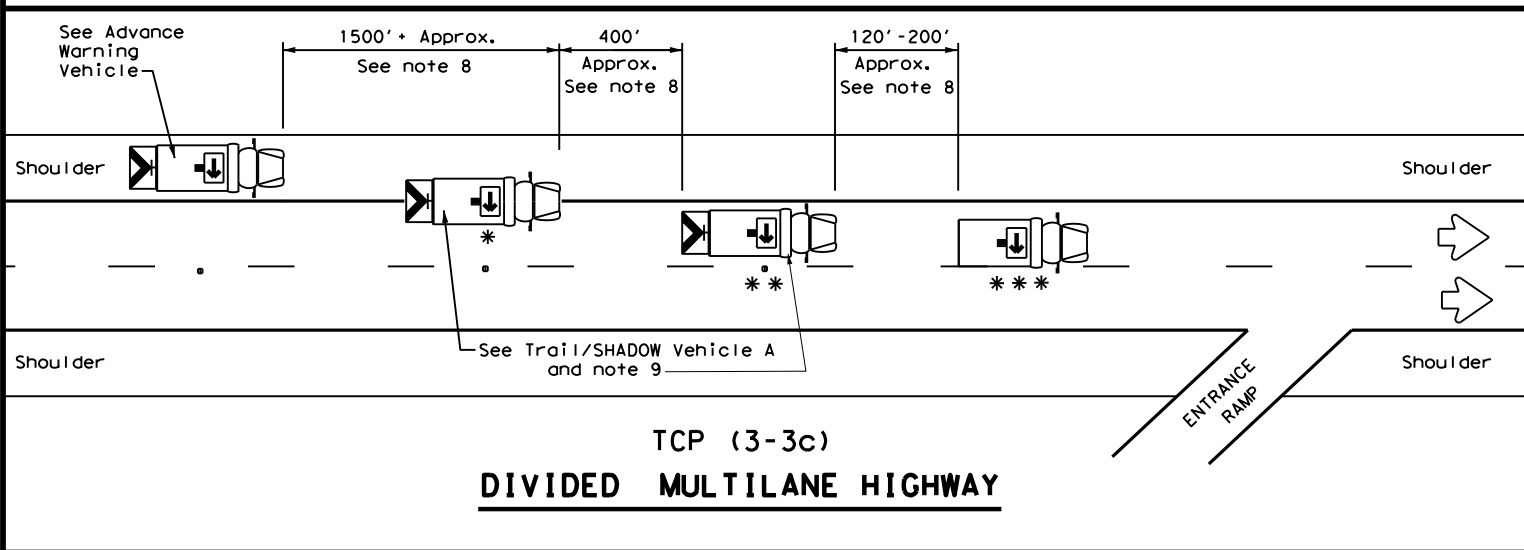
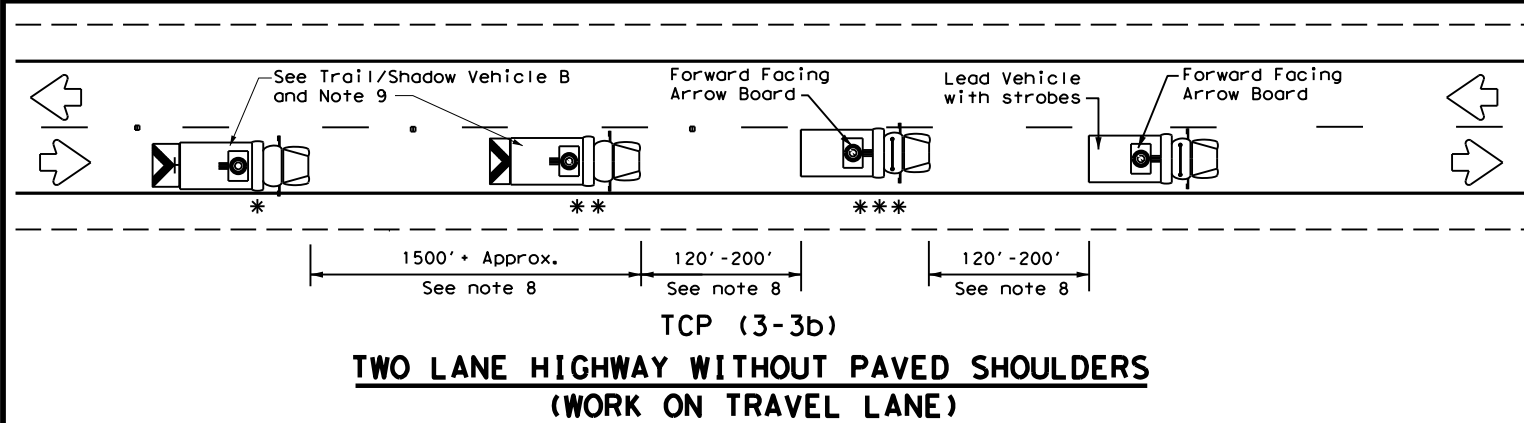
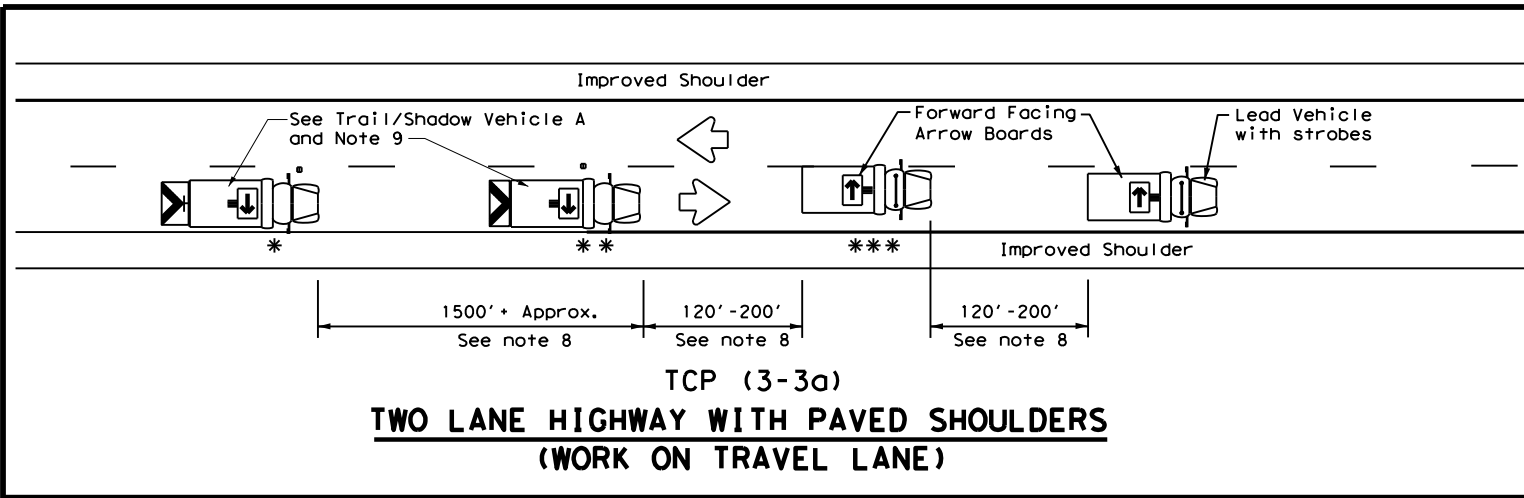
**TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
UNDIVIDED HIGHWAYS**

TCP (3-1) - 13

FILE:	tcp3-1.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0383	03	024, ETC.		SH 141			
2-94	4-98								
8-95	7-13								
1-97									
CRP	JIM WELLS, ETC.					SHEET NO.		038	

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DATE: FILE:



LEGEND		
* Trail Vehicle		ARROW BOARD DISPLAY
** Shadow Vehicle		
*** Work Vehicle		RIGHT Directional
		LEFT Directional
		Double Arrow
		CAUTION (Alternating Diamond or 4 Corner Flash)

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

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 Operations Division Standard

TRAFFIC CONTROL PLAN

MOBILE OPERATIONS

RAISED PAVEMENT

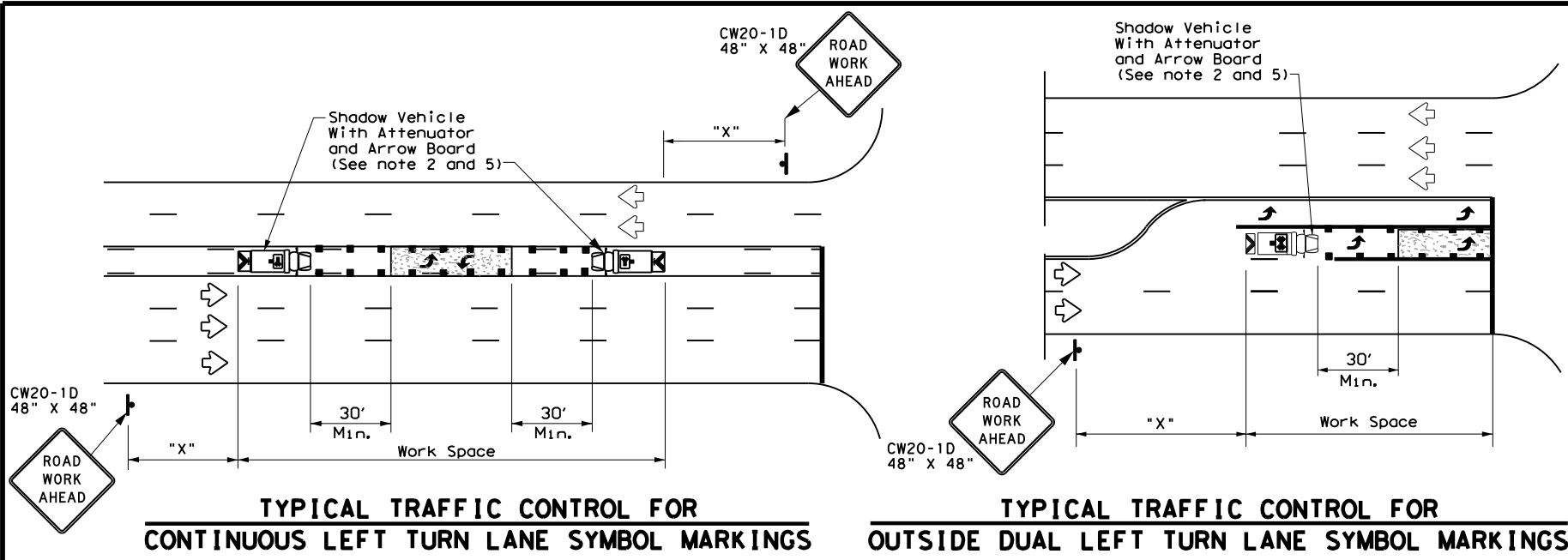
MARKER INSTALLATION/REMOVAL

TCP (3-3) - 14

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© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
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8-95 7-13				
1-97 7-14				
	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS, ETC.		039

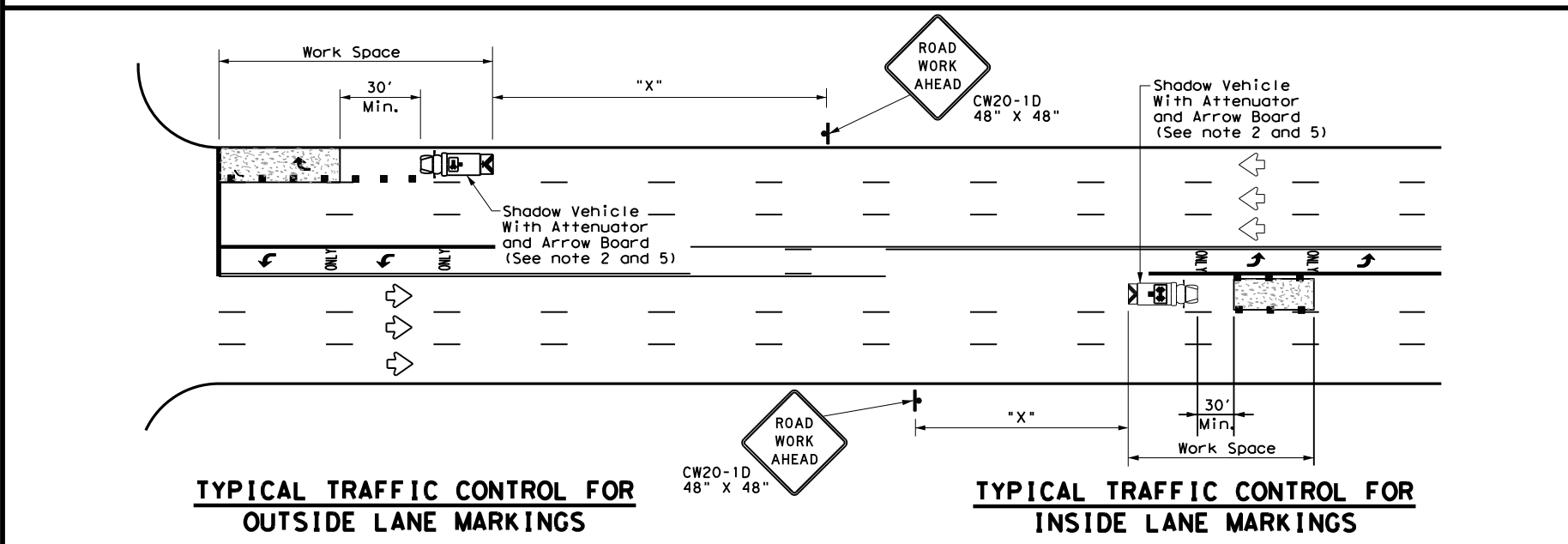
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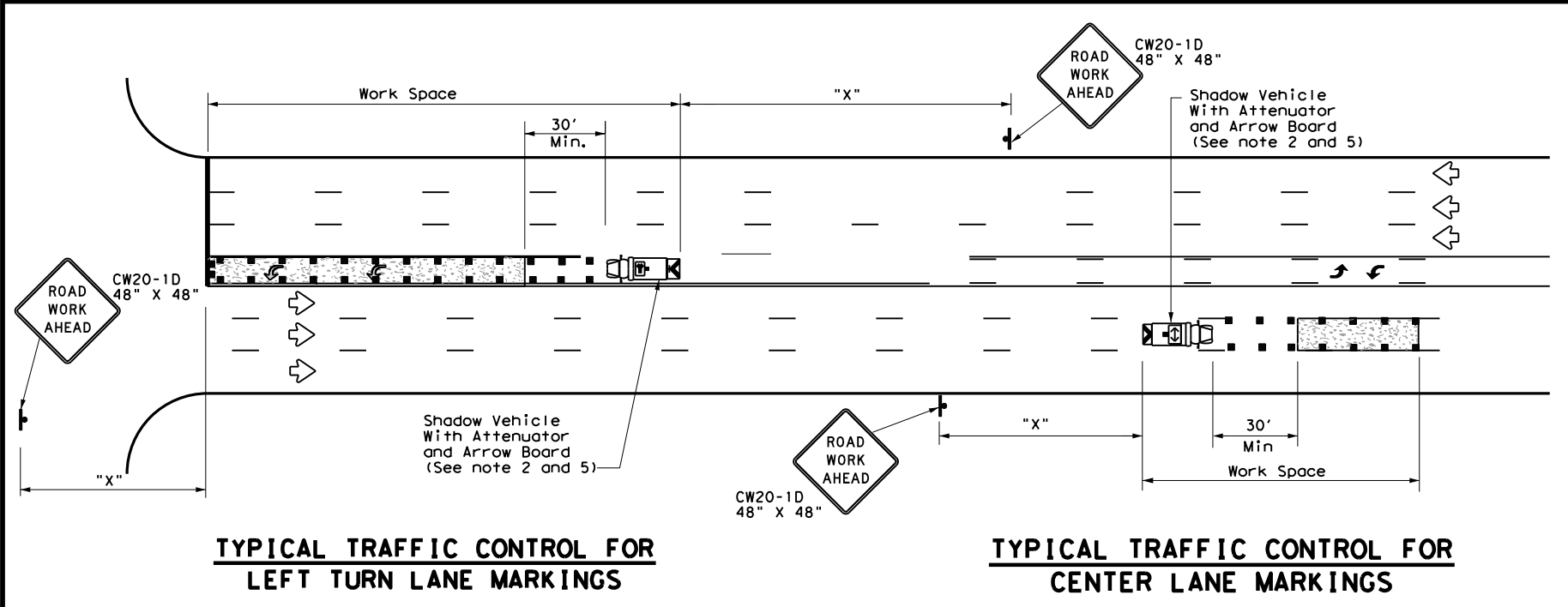
TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR CENTER LANE MARKINGS

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	Channelizing Devices

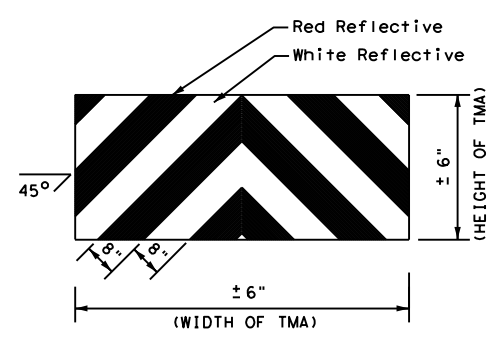
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'
35		205'	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)

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

GENERAL NOTES

1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

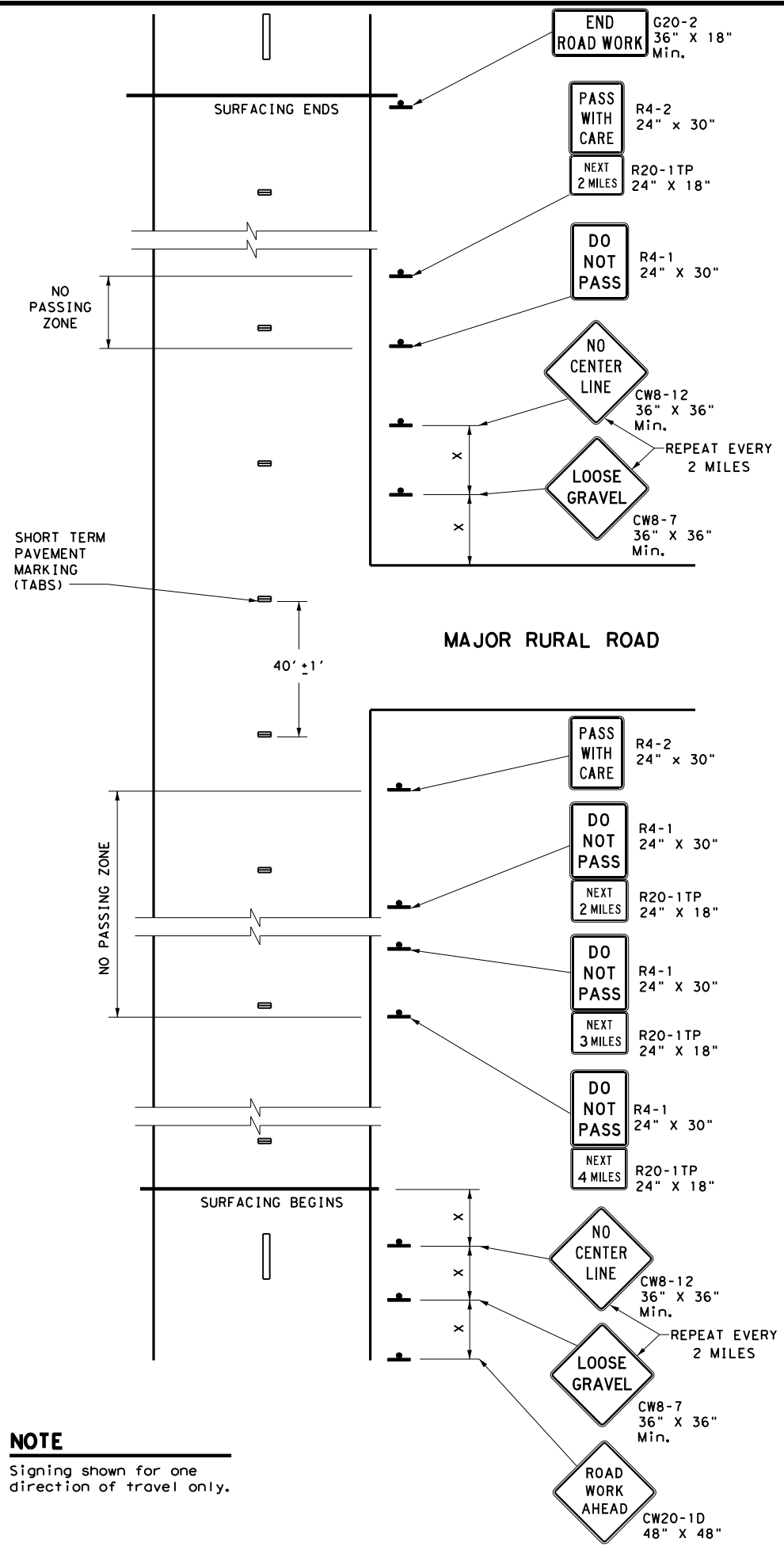
Texas Department of Transportation
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN
 MOBILE OPERATIONS FOR
 ISOLATED WORK AREAS
 UNDIVIDED HIGHWAYS
 TCP(3-4)-13**

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	040	

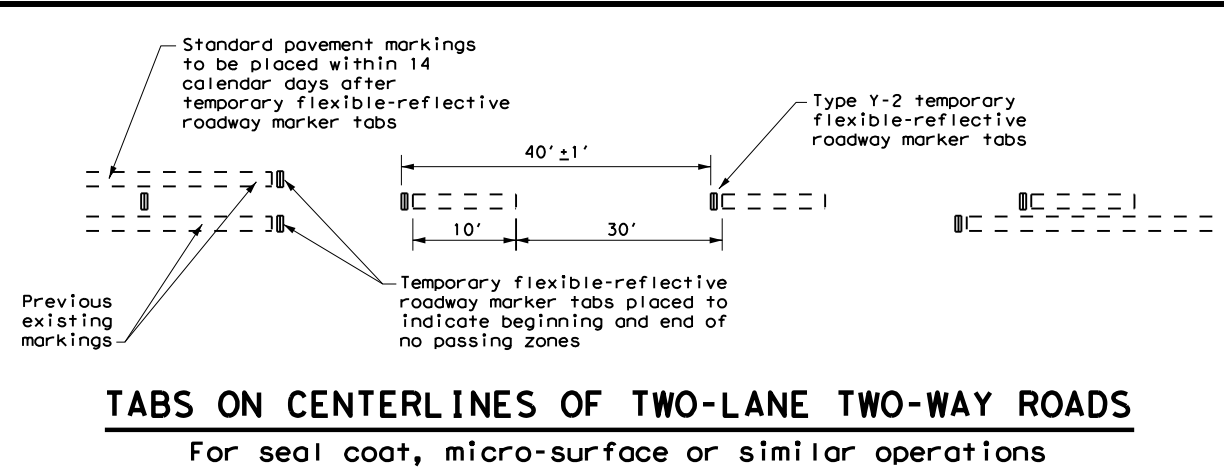
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FILE:



NOTE
Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS
For seal coat, micro-surface or similar operations

"DO NOT PASS" SIGN (R4-1) and NO-PASSING ZONES

- A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.
- B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.
- C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.
- D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

- A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.
- B. At the time construction activity obliterates the existing center line markings (low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.
- C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

- A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.
- B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

- A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.
- B. Tabs shall not be used to simulate edge lines.
- C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

- A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.
- B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T) sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

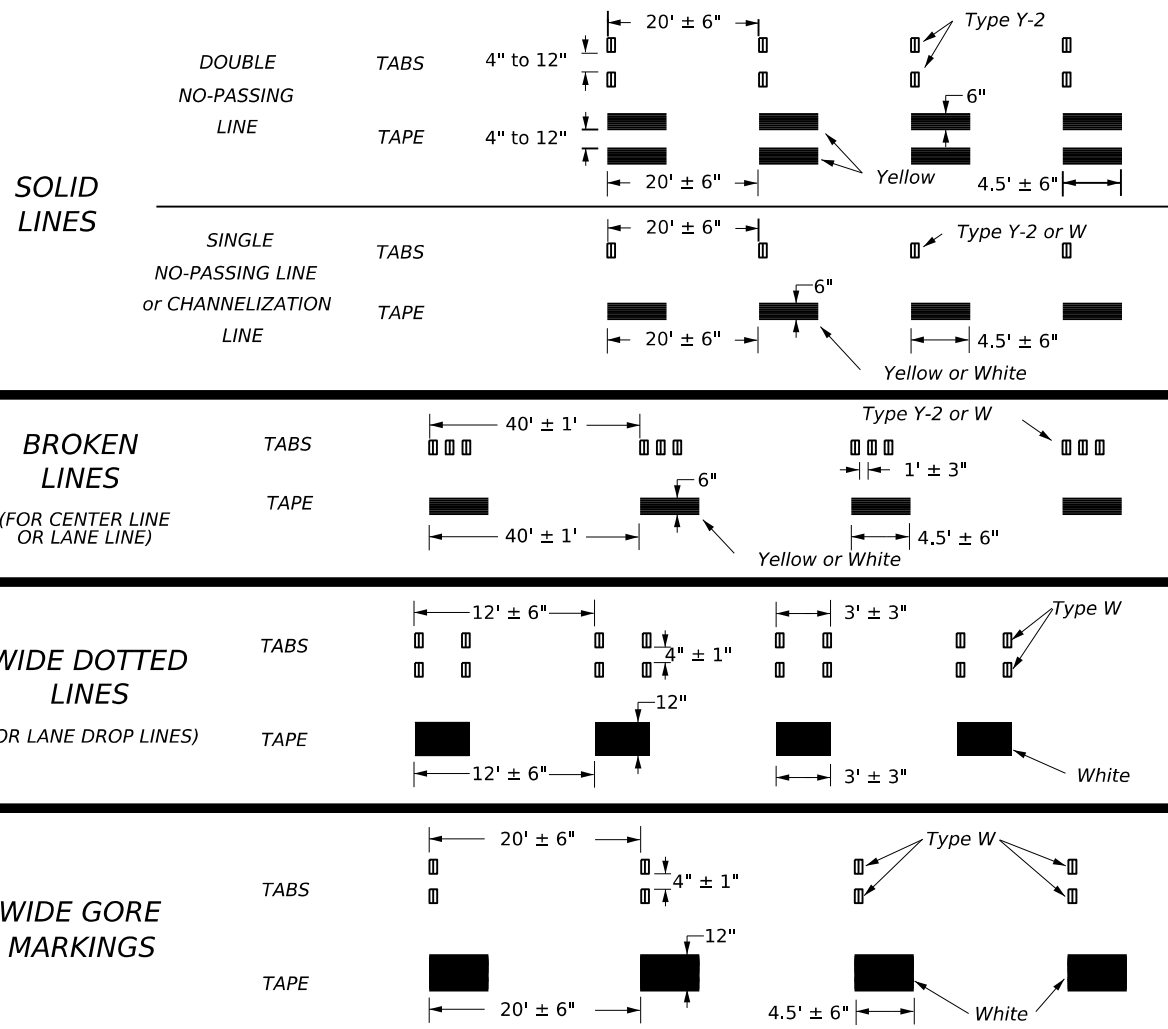


TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS
TCP (7-1) - 13

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REVISIONS:	4-92 4-98	DIST:		COUNTY:		SHEET NO.:			
	1-97 7-13	CRP:		JIM WELLS, ETC.					041

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WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



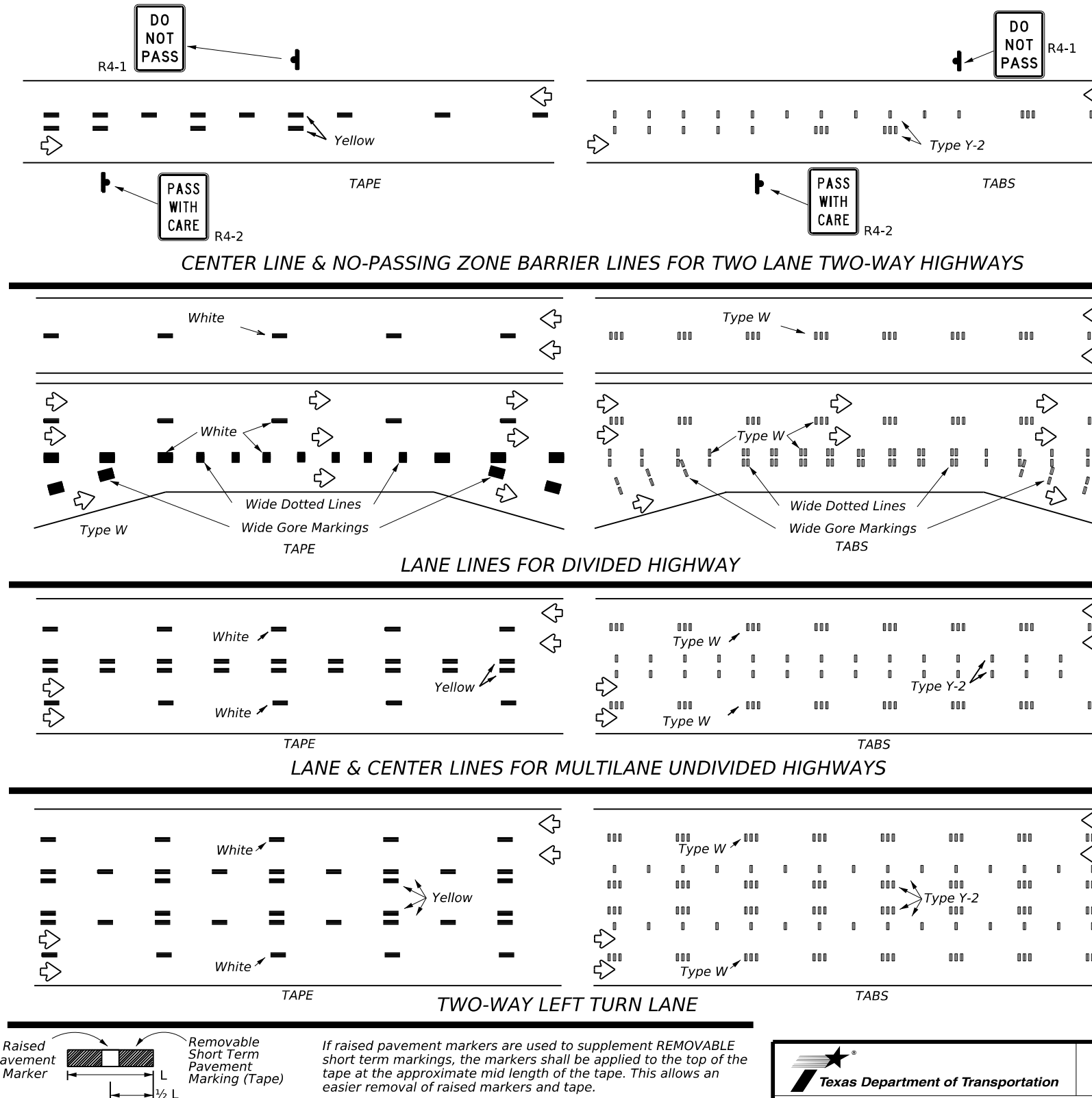
NOTES:

- 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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

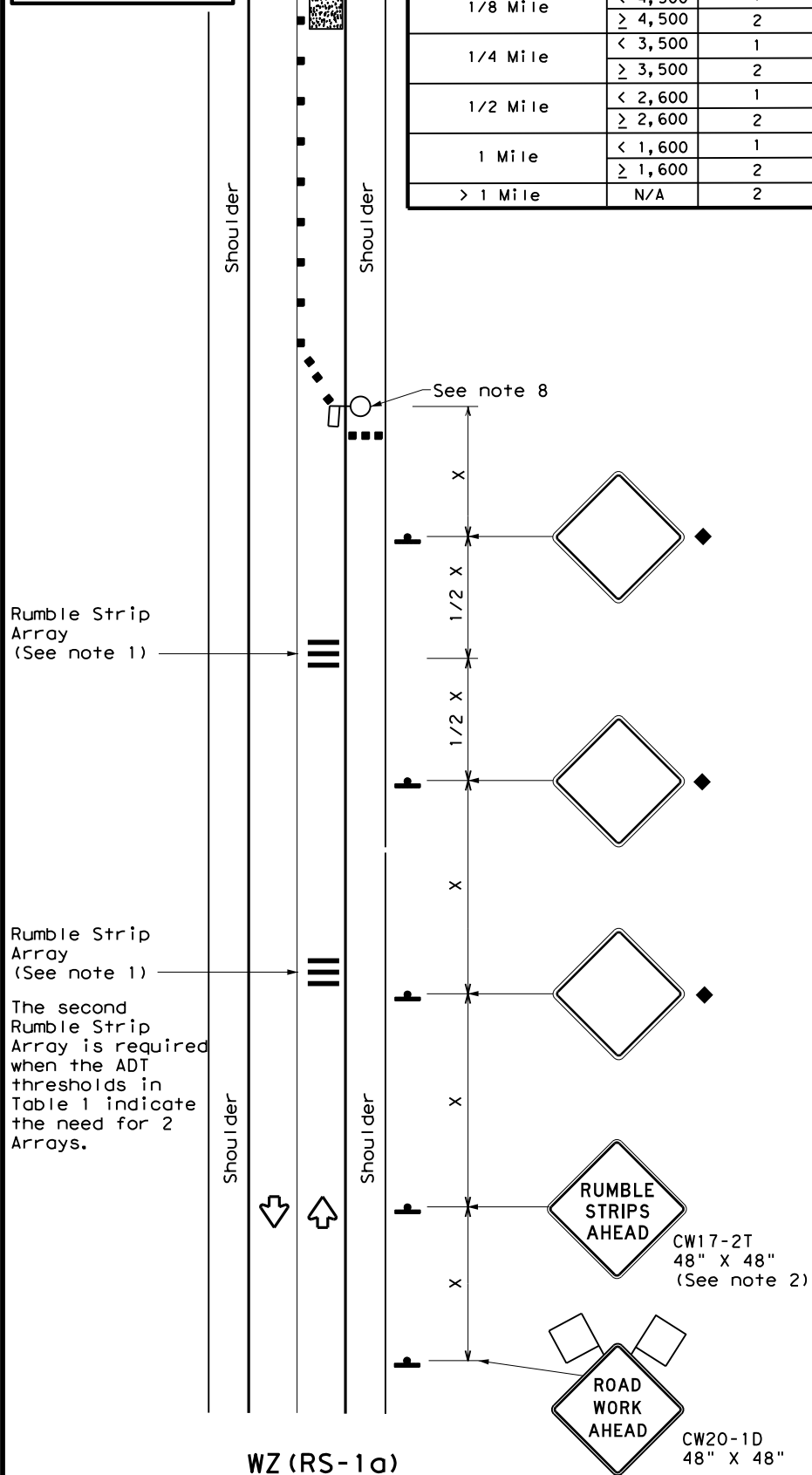
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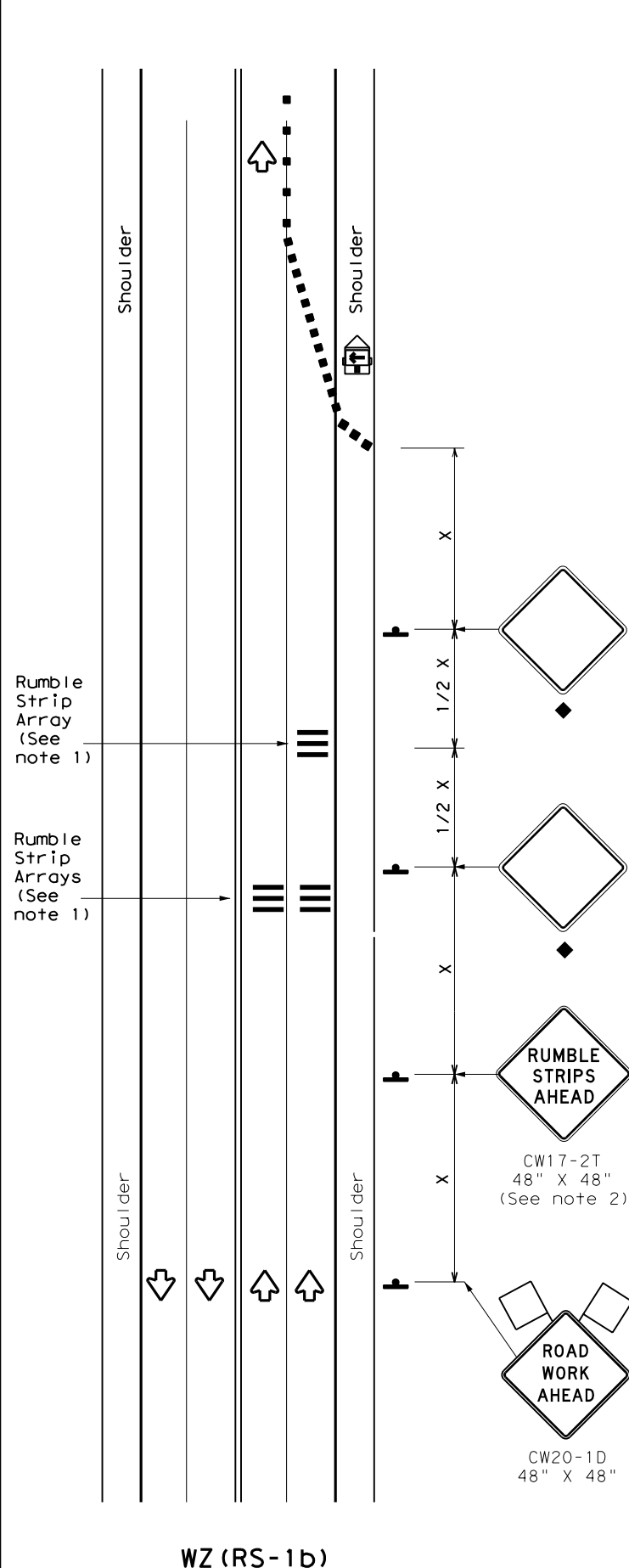
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Warning sign and rumble strip sequence in opposite direction is same as below.

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



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

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.
- Remove Temporary Rumble Strips before removing the advanced 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 Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
- Replace defective Temporary Rumble Strips as directed by the Engineer.
- Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

	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.
 * For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

Texas Department of Transportation
 Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

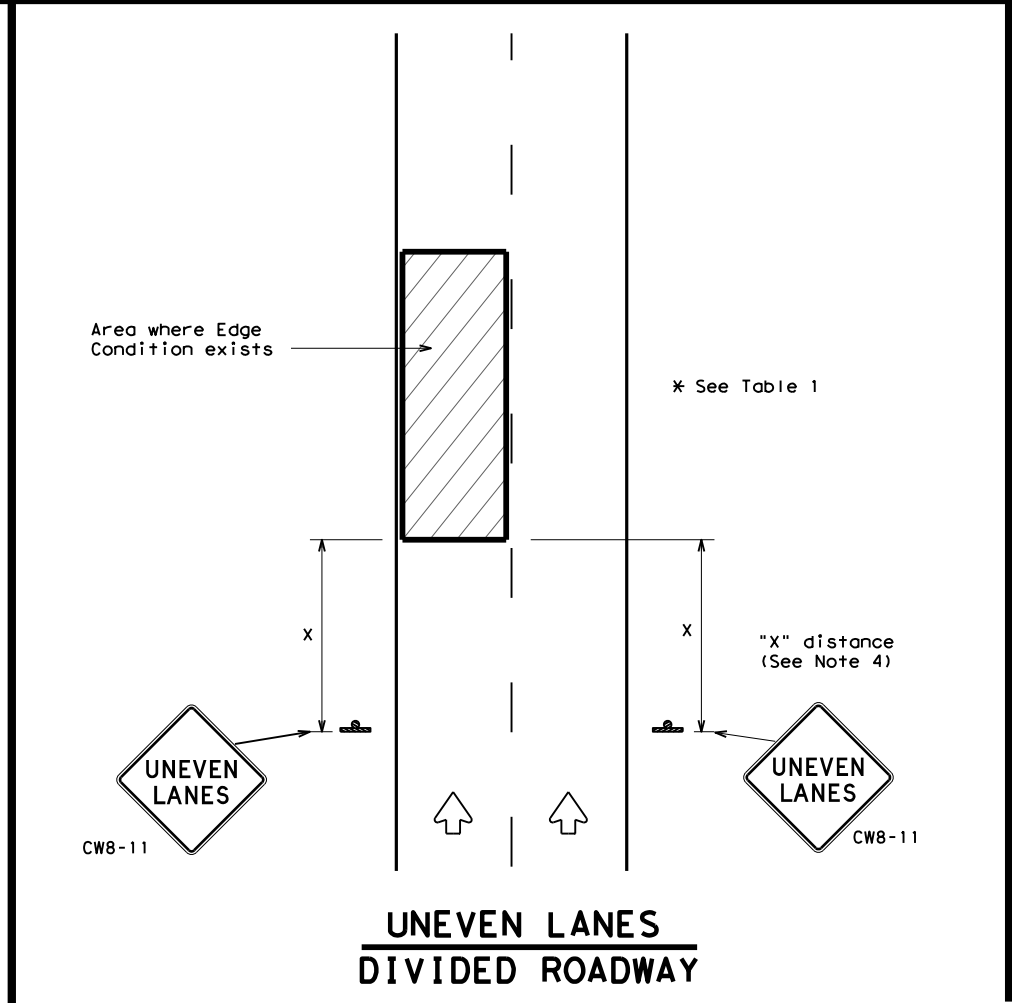
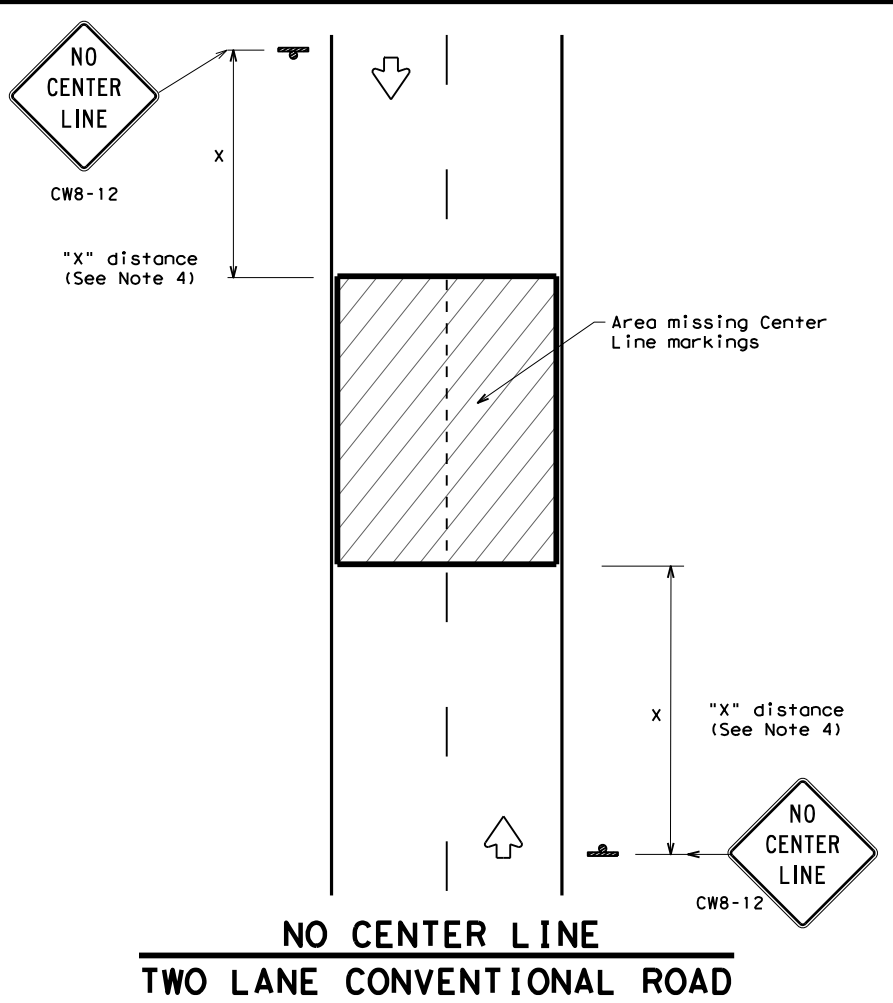
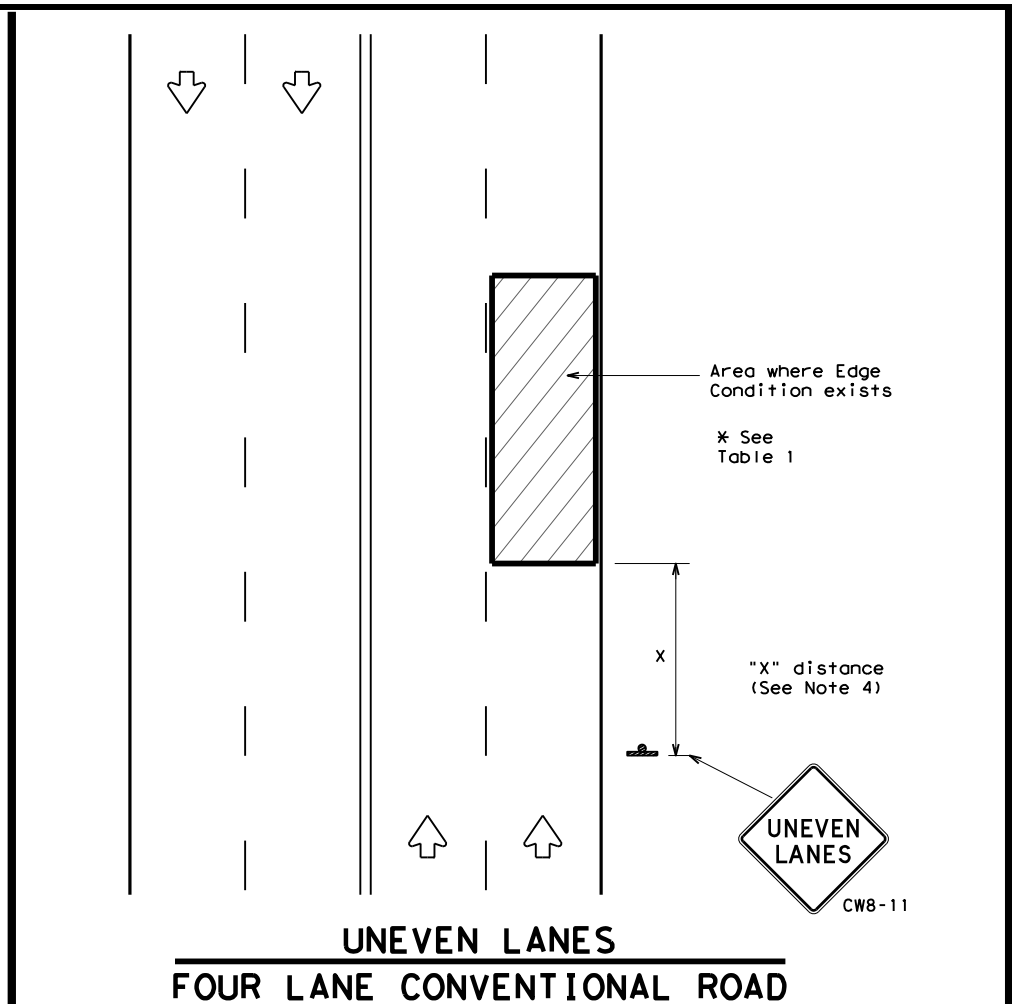
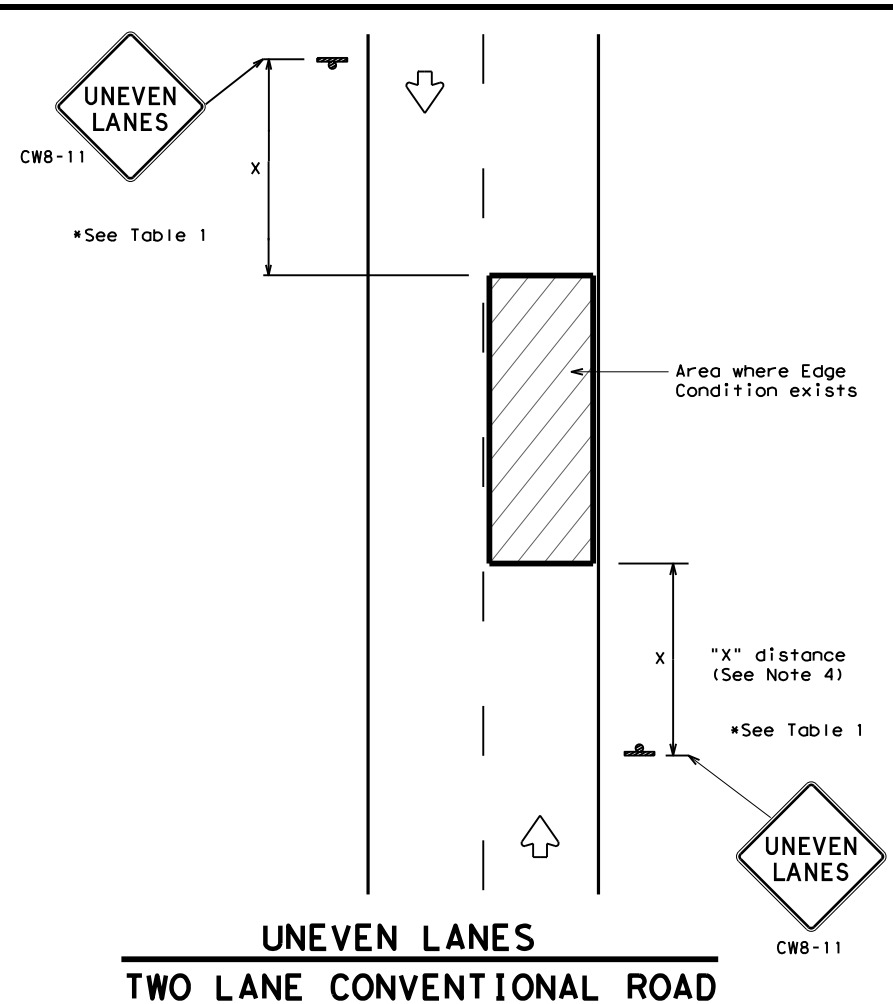
WZ (RS) - 22

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DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

- If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
- UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
- NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
- Signs shall be spaced at the distances recommended as per BC standards.
- Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
- Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
- Short term markings shall not be used to simulate edge lines.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1		
Edge Condition	Edge Height (D)	* Warning Devices
①	Less than or equal to: 1/4" (maximum-planing) 1/2" (typical-overlay)	Sign: CW8-11
②	Less than or equal to 3"	Sign: CW8-11
③	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"



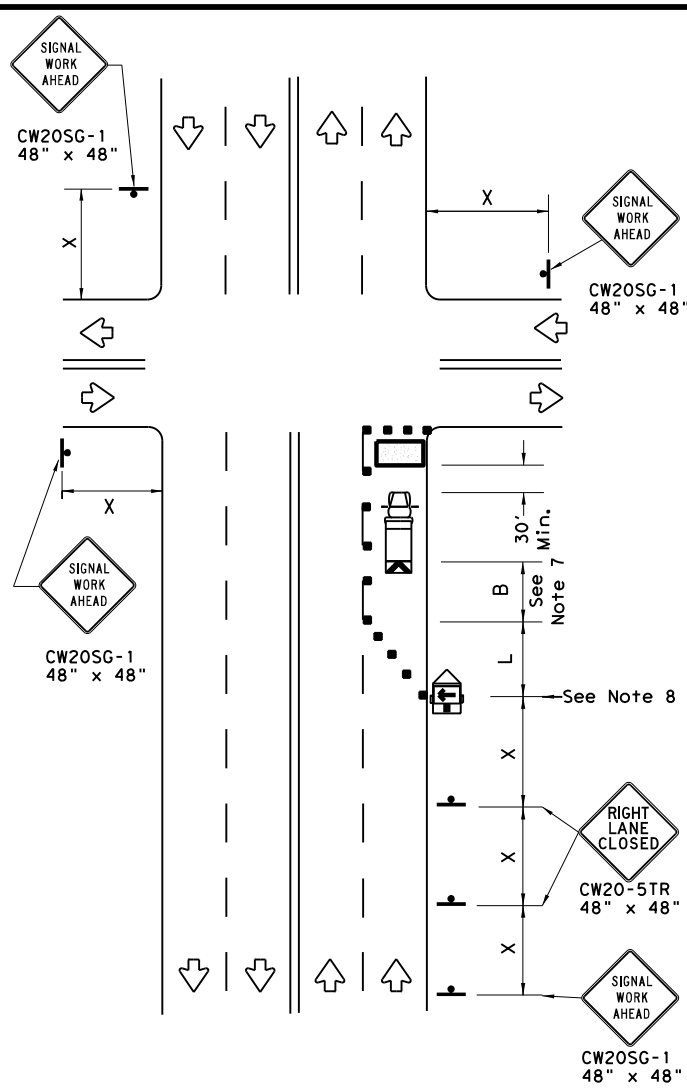
SIGNING FOR UNEVEN LANES

WZ (UL) - 13

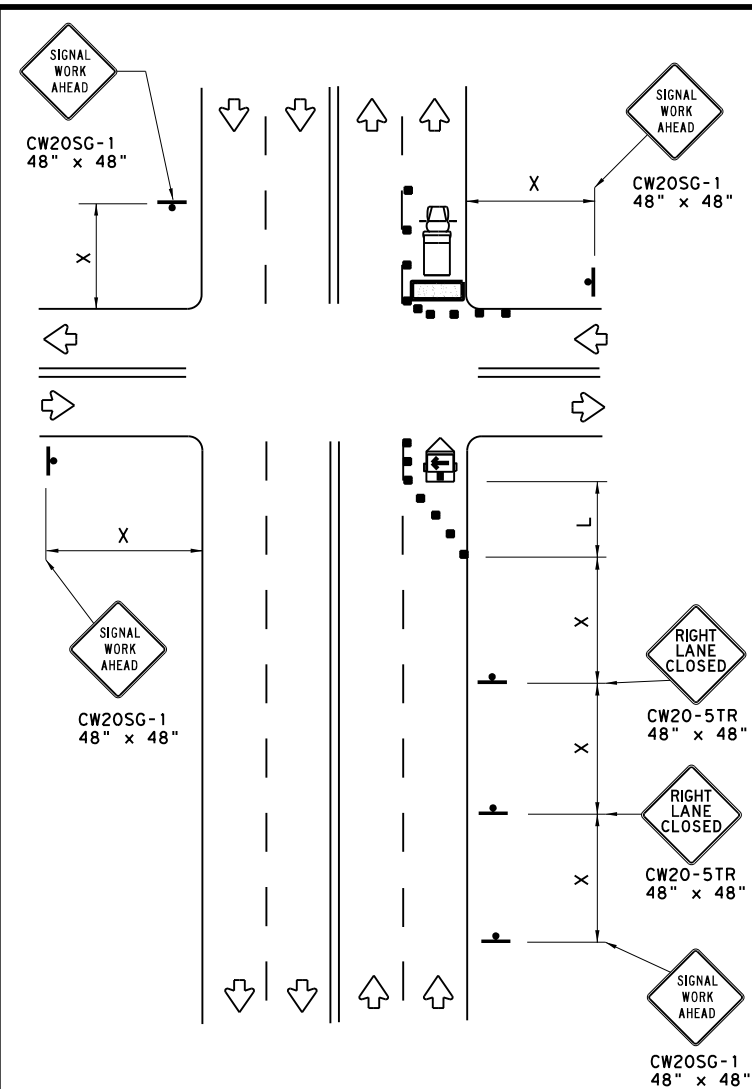
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© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
8-95 2-98 7-13	DIST	COUNTY	SHEET NO.	
1-97 3-03	CRP	JIM WELLS, ETC.	044	

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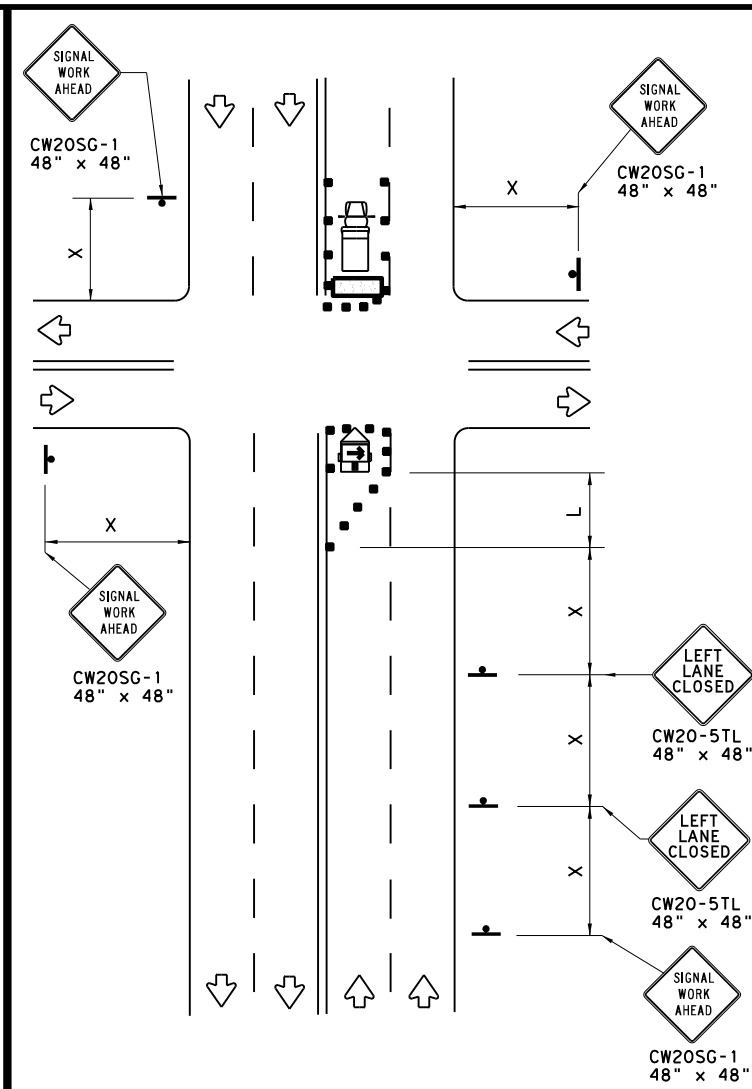
DATE: FILE:



NEAR SIDE LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY



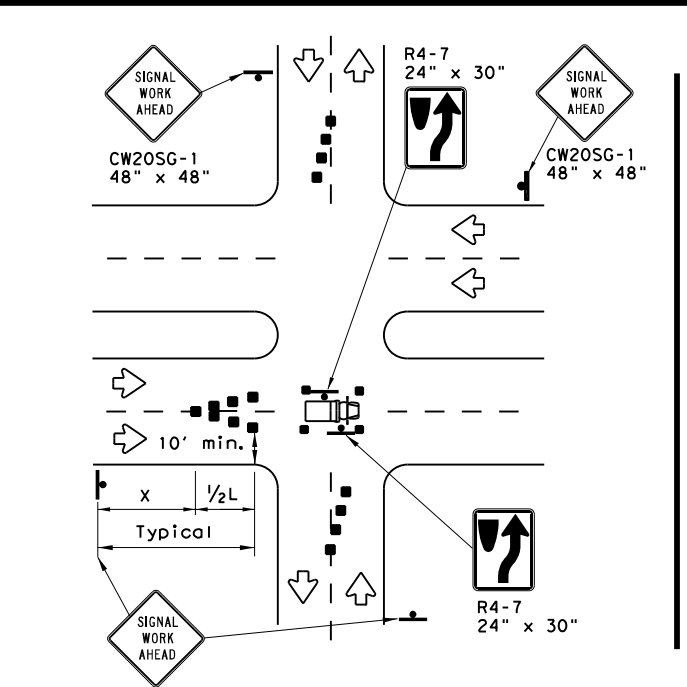
FAR SIDE LEFT LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY

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

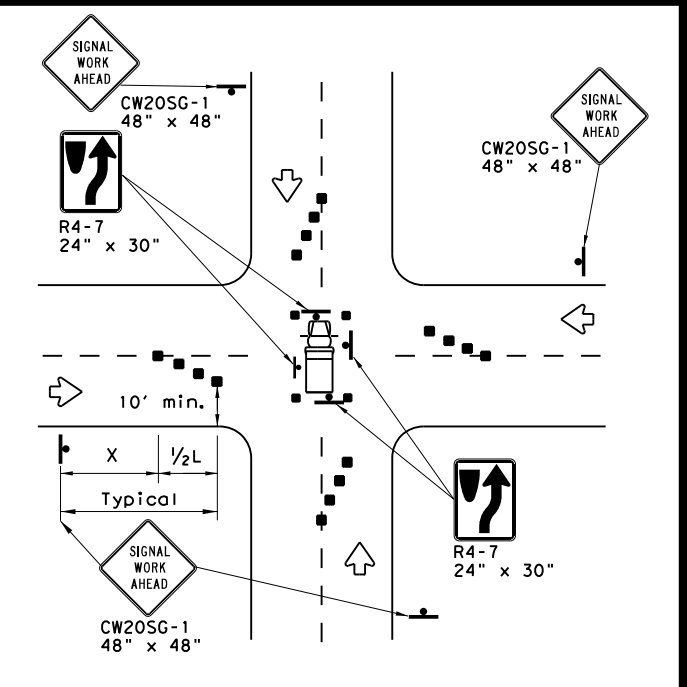
Posted Speed *	Formula	Minimum Desirable Taper Lengths * X			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
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)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.



OPERATIONS IN THE INTERSECTION
SHORT DURATION



GENERAL NOTES

- The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
- Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
- Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
- Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
- High level warning devices (flag trees) may be used at corners of the vehicle.
- When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
- For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
- The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
- Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.



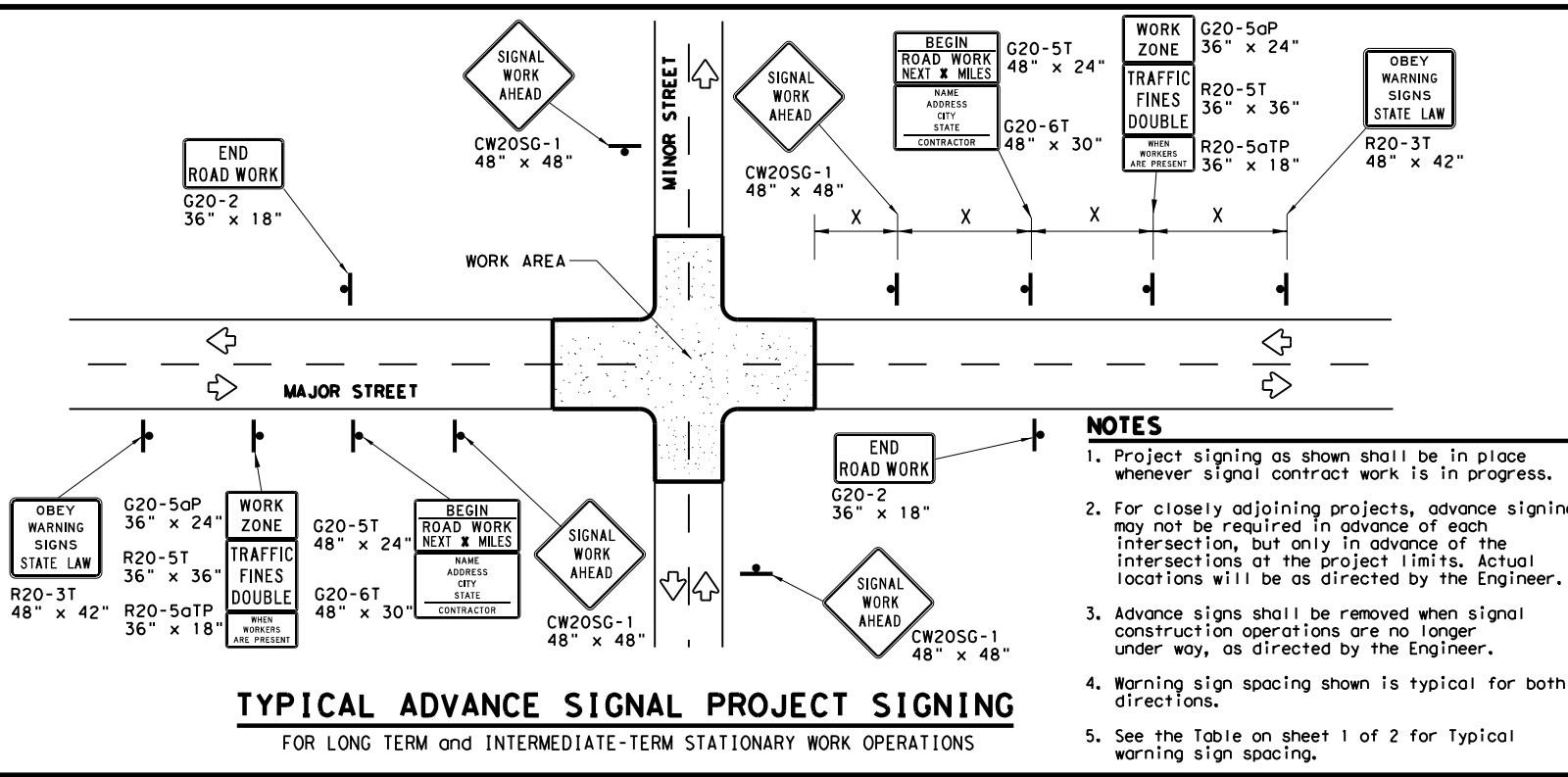
TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
2-98 10-99 7-13	DIST	COUNTY	SHEET NO.	
4-98 3-03	CRP	JIM WELLS, ETC.	045	

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DATE: FILE:



- NOTES**
1. Project signing as shown shall be in place whenever signal contract work is in progress.
 2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
 3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
 4. Warning sign spacing shown is typical for both directions.
 5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 60.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

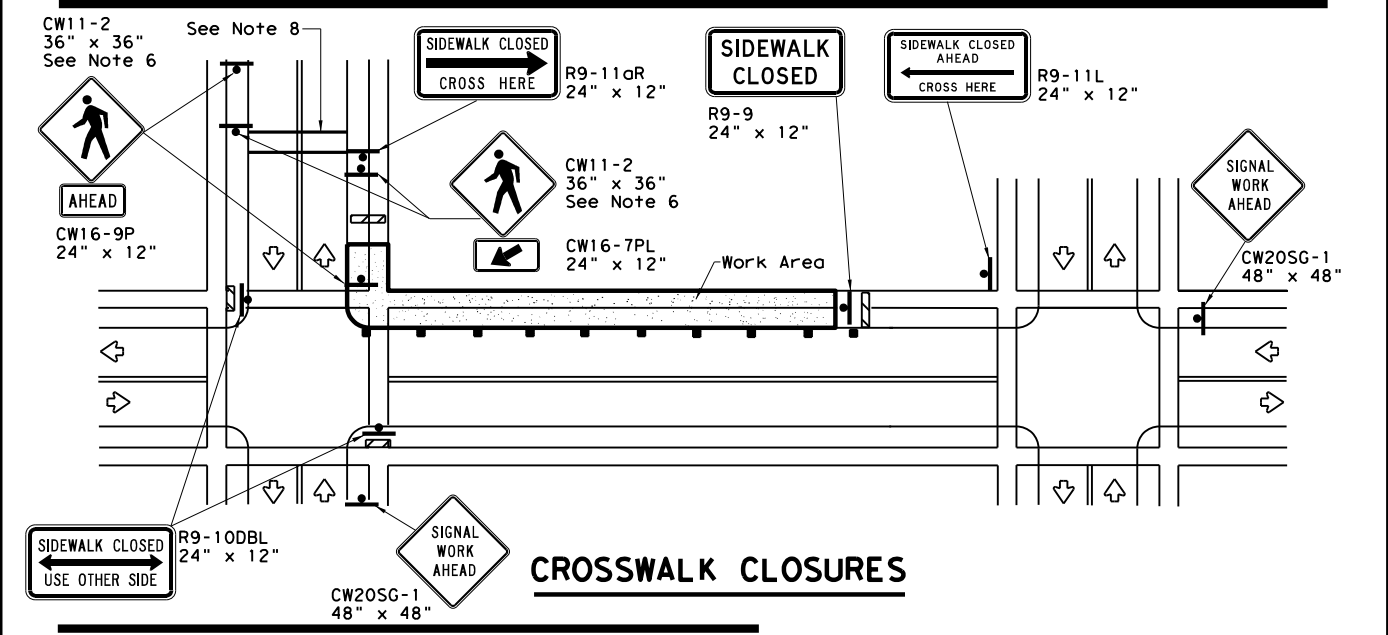
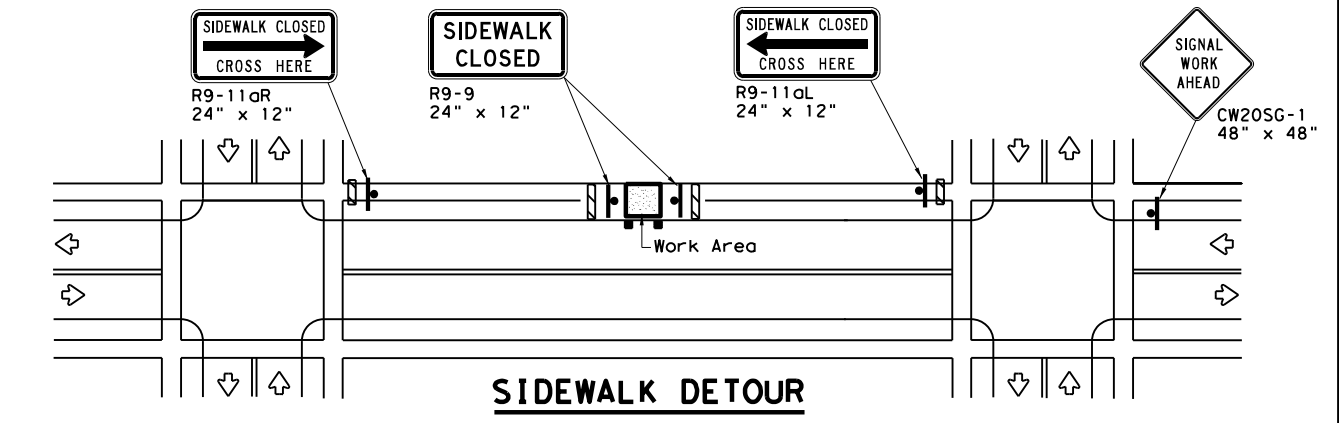
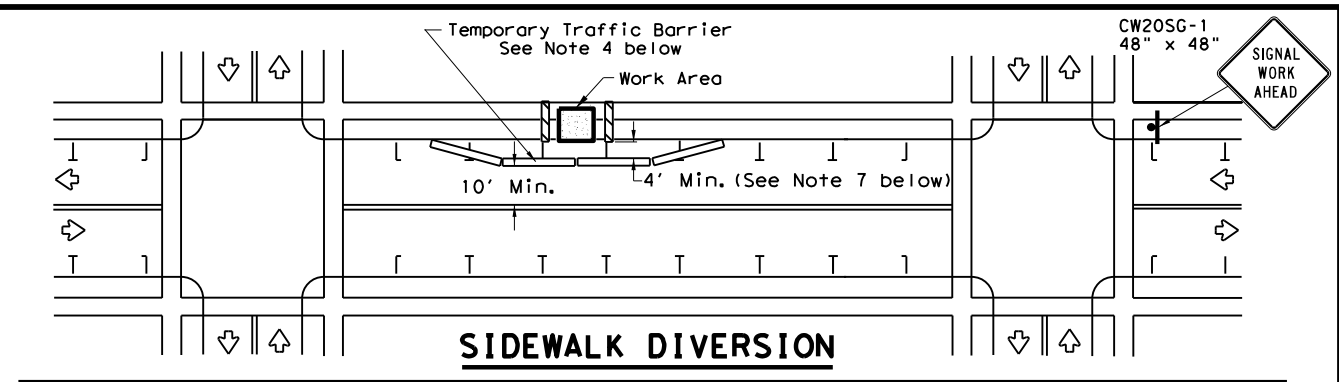
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber, such as tire inner tubes, shall not be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

SHEET 2 OF 2



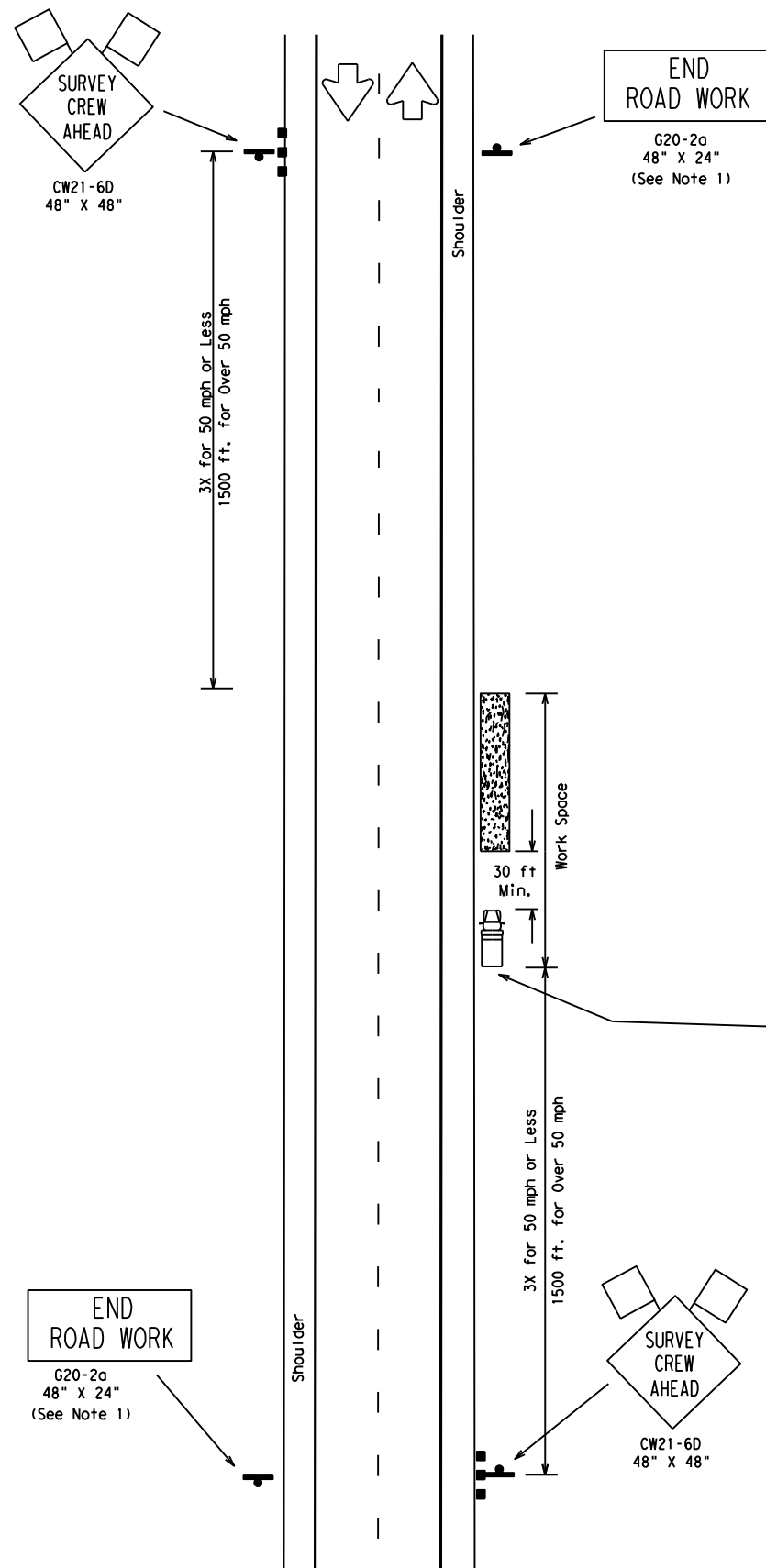
TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ (BTS-2) - 13

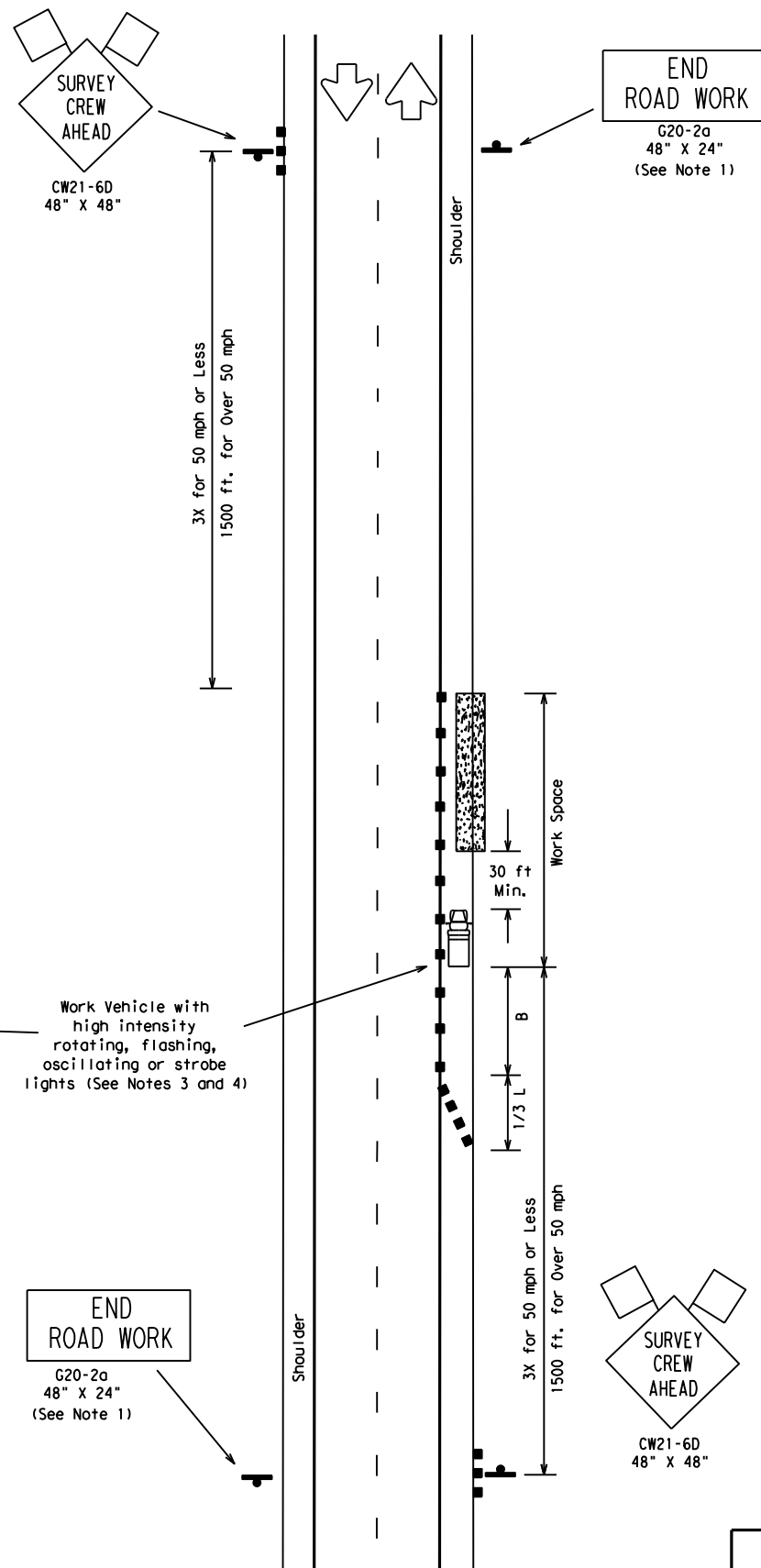
FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
2-98 10-99 7-13	DIST	COUNTY	SHEET NO.	
4-98 3-03	CRP	JIM WELLS, ETC.	046	

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DATE: 2/16/2022
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TCP (S-1a)
WORK OFF SHOULDER
OR PAVED SURFACE



TCP (S-1b)
WORK ON SHOULDER

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
Corrected misspelling.

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Device		Min. Sign Spacing "X" Distance	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' - 75'	120'	90'
35		205'	225'	245'	35'	70' - 90'	160'	120'
40		265'	295'	320'	40'	80' - 100'	240'	155'
45		450'	495'	540'	45'	90' - 110'	320'	195'
50		500'	550'	600'	50'	100' - 125'	400'	240'
55		550'	605'	660'	55'	110' - 140'	500'	295'
60		600'	660'	720'	60'	120' - 150'	600'	350'
65	650'	715'	780'	65'	130' - 165'	700'	410'	
70	700'	770'	840'	70'	140' - 175'	800'	475'	
75	750'	825'	900'	75'	150' - 185'	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

- GENERAL NOTES:
- The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
 - Channelizing devices on the shoulder taper and tangent section may be omitted for short duration (less than 1 hour) work.
 - If line-of-sight requirements for surveying operations will preclude the placement of the Work Vehicle to protect workers, the channelizing devices mentioned in Note 2 are required.
 - A Shadow Vehicle with a Truck Mounted Attenuator and flashing warning lights/arrow panel in caution mode may be used in lieu of the Work Vehicle to protect the work space.
 - The CW20-1D "ROAD WORK AHEAD" sign may be substituted for the CW21-6D "SURVEY CREW AHEAD" sign.
 - This plan may also be used for shoulder work or off shoulder work for multilane undivided roadways.
 - The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.
- TCP (S-1a)
- Cones may be placed at edge of pavement adjacent to the work space to enhance safety.

Texas Department of Transportation
Traffic Operations Division

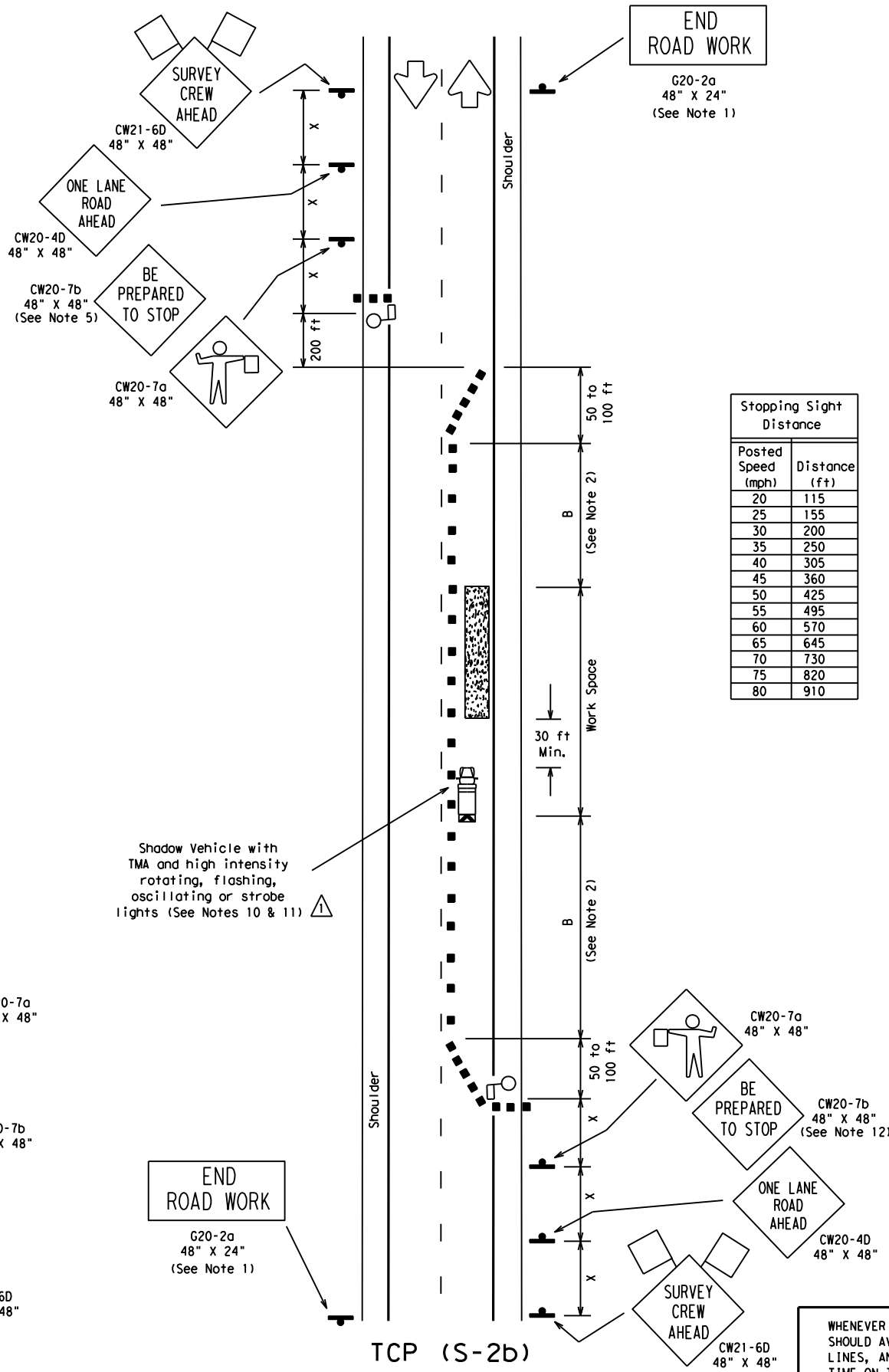
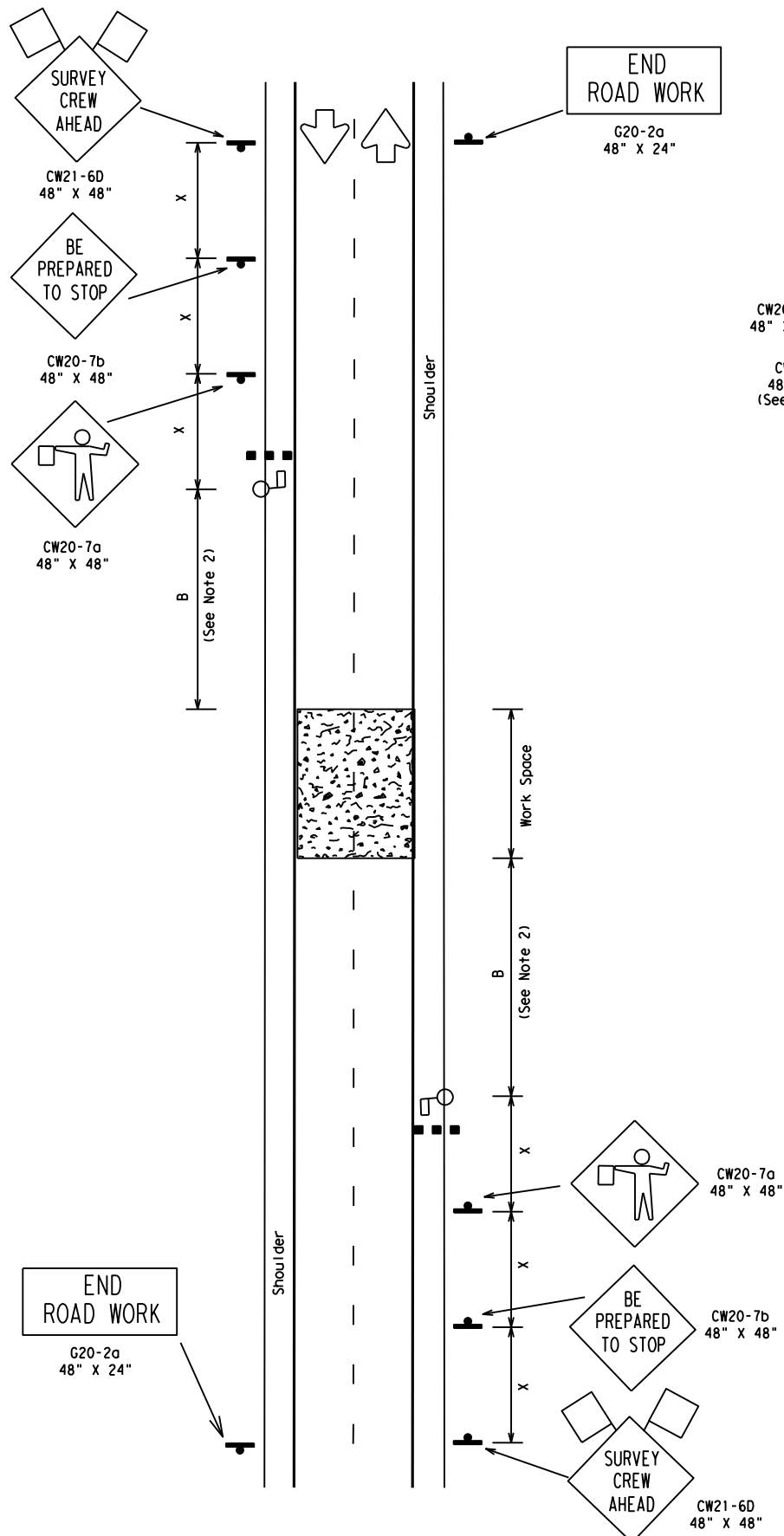
TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP (S-1) - 08A

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8-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0383	03	024, ETC.	SH 141
		DIST	COUNTY	SHEET NO.	
		CRP	JIM WELLS, ETC.	047	

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DATE: 2/16/2022
FILE:



LEGEND

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

Posted Speed \times	Formula	Minimum Desirable Taper Lengths $\times \times$			Suggested Maximum Spacing of Device		Min. Sign Spacing "X" Distance	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' - 75'	120'	90'
35		205'	225'	245'	35'	70' - 90'	160'	120'
40	L=WS	265'	295'	320'	40'	80' - 100'	240'	155'
45		450'	495'	540'	45'	90' - 110'	320'	195'
50	L=WS	500'	550'	600'	50'	100' - 125'	400'	240'
55		550'	605'	660'	55'	110' - 140'	500'	295'
60	L=WS	600'	660'	720'	60'	120' - 150'	600'	350'
65		650'	715'	780'	65'	130' - 165'	700'	410'
70	L=WS	700'	770'	840'	70'	140' - 175'	800'	475'
75		750'	825'	900'	75'	150' - 185'	900'	540'

* Conventional Roads Only
 $\times \times$ 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
	✓	✓		

DEFINITIONS:
 SHORT DURATION - work that occupies a location up to 1 hour.
 SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

- GENERAL NOTES:
- The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
 - Adequate Stopping Sight Distance (see Stopping Sight Distance table) should be maintained from approaching traffic to the flagger or a queue of stopped vehicles. The Buffer Space "B" should be extended around curves or other obstacles, when necessary, to have adequate Stopping Sight Distance to the flagger station.
 - Flaggers should use two-way radios or other means of communication while flagging.
 - The length of the work space should be based on the ability of the flaggers to communicate.
 - CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
 - The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.
- TCP (S-2a)
- Road closures shall be less than 20 minutes. Closures less than 5 minutes are desirable.
 - Sign spacing should be increased if traffic repeatedly queues past the CW20-7b "BE PREPARED TO STOP" sign.
 - The surveying instrument should not be located on the paved surface.
- TCP (S-2b)
- For short duration work the Shadow Vehicle with a TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
 - Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
 - The CW20-7b "BE PREPARED TO STOP" sign is optional. When used, it should be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign.

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECESSARY PERIODS OF TIME ON THE ROAD SURFACE.

8-18-08 Revision
 ⚠ Corrected reference to notes.

Texas Department of Transportation
 Traffic Operations Division

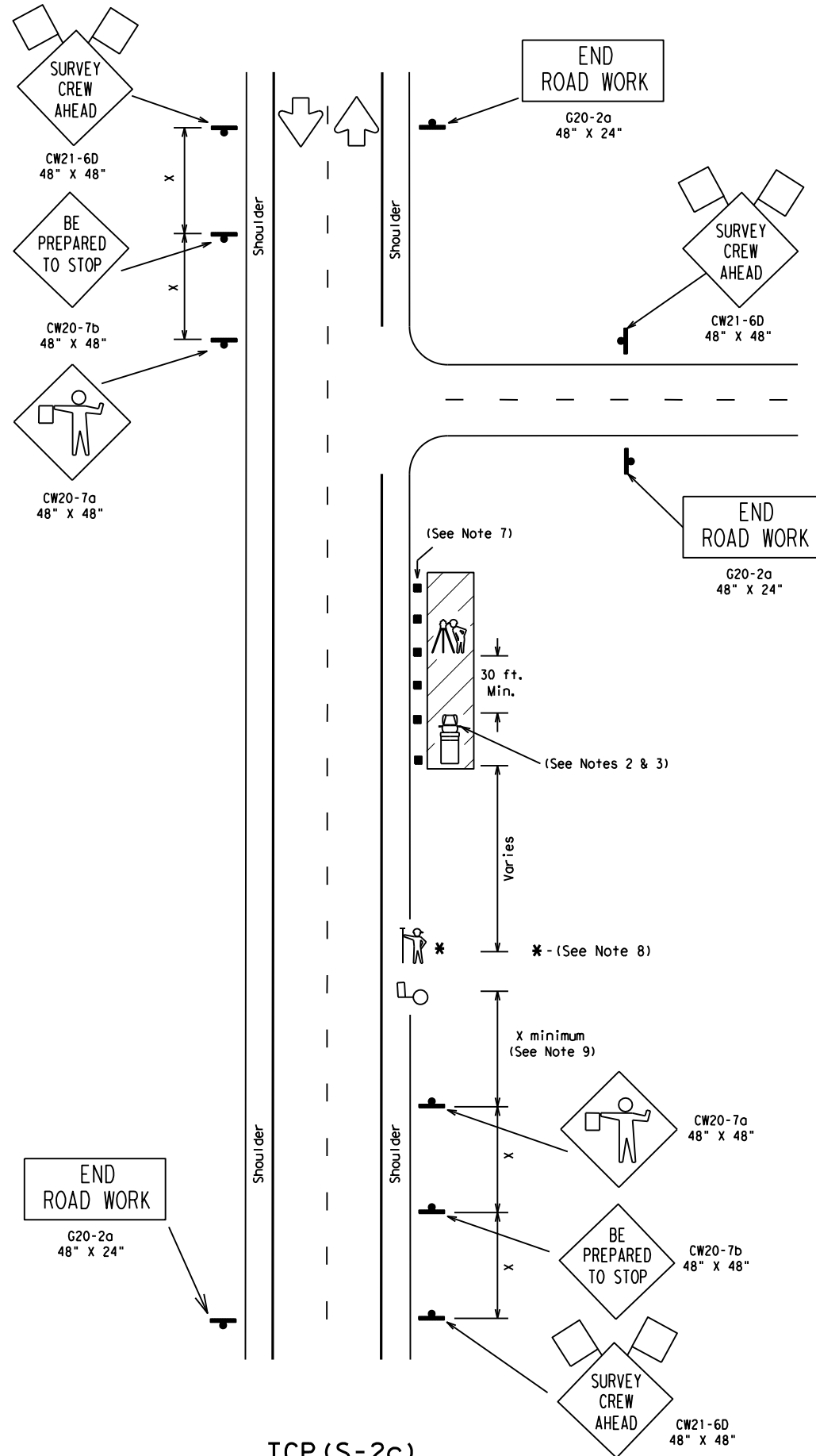
TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP (S-2) - 08A

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8-08	REVISIONS	CONT	SECT	JOB
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		DIST	COUNTY	SHEET NO.
		CRP	JIM WELLS, ETC.	048

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DATE: 2/16/2022
FILE:



TCP (S-2c)

Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

LEGEND

- Type III Barricade
- Channelizing Devices
- Flag
- Work Vehicle
- Truck Mounted Attenuator (TMA)
- Flagger
- Sign Post
- Survey Rodman
- Instrument Person

Posted Speed %	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Device		Min. Sign Spacing "x" Distance	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' - 75'	120'	90'
35		205'	225'	245'	35'	70' - 90'	160'	120'
40		265'	295'	320'	40'	80' - 100'	240'	155'
45	L=WS	450'	495'	540'	45'	90' - 110'	320'	195'
50		500'	550'	600'	50'	100' - 125'	400'	240'
55		550'	605'	660'	55'	110' - 140'	500'	295'
60		600'	660'	720'	60'	120' - 150'	600'	350'
65		650'	715'	780'	65'	130' - 165'	700'	410'
70		700'	770'	840'	70'	140' - 175'	800'	475'
75		750'	825'	900'	75'	150' - 185'	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)

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

DEFINITIONS:

MOBILE - work that moves continuously or intermittently (stopping up to approximately 15 minutes).

SHORT DURATION - work that occupies a location up to 1 hour.

SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

- The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
- Work Vehicle with high intensity rotating, flashing, oscillating or strobe lights should be used to protect work space.
- When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Heavy Work Vehicle.
- CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" SIGNS.
- The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads may be omitted when approved by the Engineer.
- The Surveying Instrument shall not be located on the paved surface.
- Cones at edge of pavement adjacent to instrument person may be omitted when approved by the Engineer.
- Rodman may only enter roadway when accompanied by flagger and as traffic allows.
- The distance between the advance warning signs and the work should not exceed a two mile maximum.
- Flaggers and Survey Crew should use two-way radios or other means of communication.
- Survey Crew and Flaggers shall wear high-visibility apparel meeting the ANSI 107-2007 standard performance for Class 2 or Class 3 risk exposure.
- Additional traffic control devices may be required to address local site conditions.
- Stopping Sight Distance shall be maintained from approaching traffic to the flagger. See "Stopping Sight Distance" table.

SURVEY PARTIES SHOULD AVOID ANY UNNECESSARY PERIODS OF TIME ON THE ROAD SURFACE.

This TCP is to cover two lane rural type roadways as determined by the Engineer. All other type roadways will be covered by other established Survey TCP'S.

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Traffic Operations Division

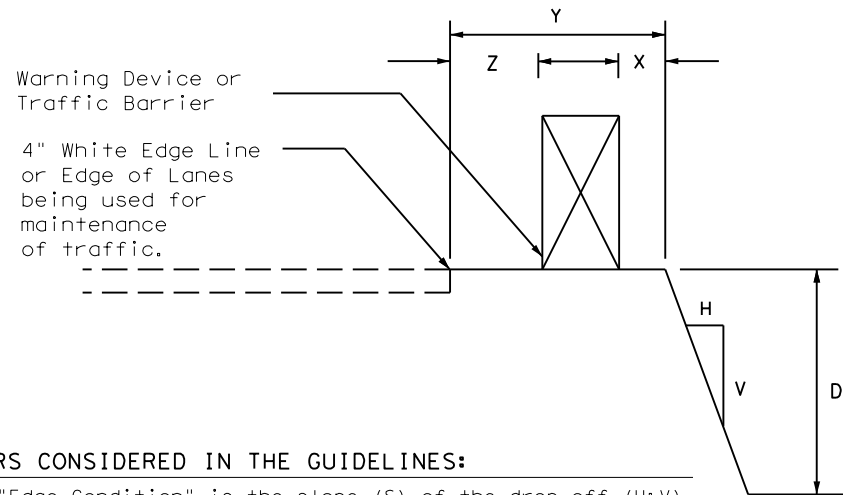
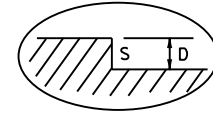
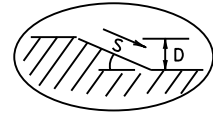
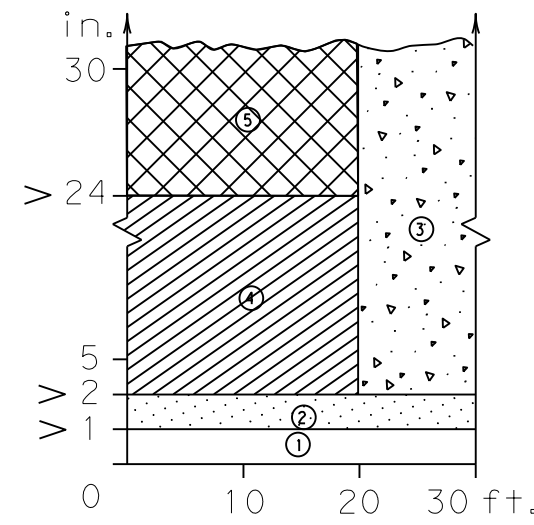
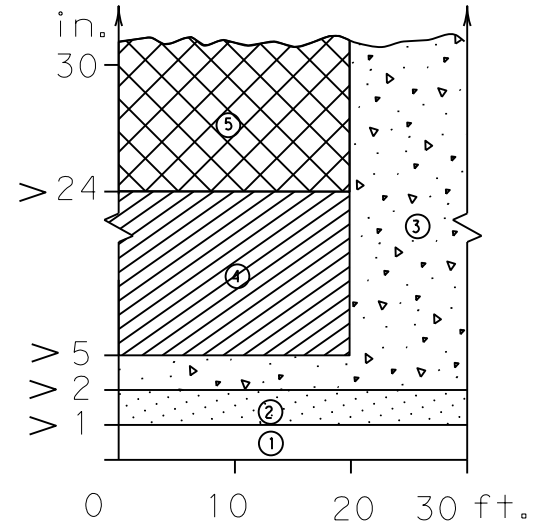
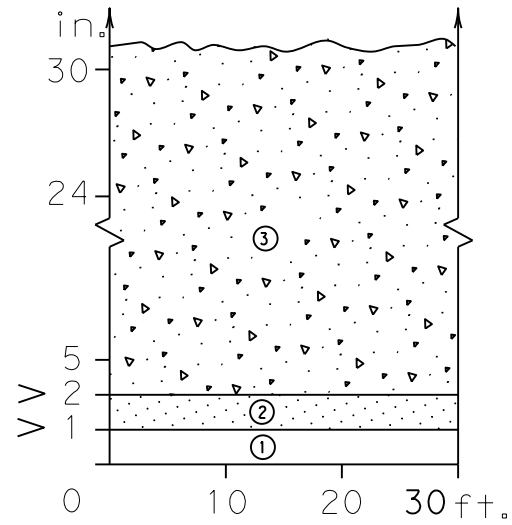
TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP (S-2c) - 10

© TxDOT January 2010		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
		0383	03	024, ETC.	SH 141
		DIST	COUNTY		SHEET NO.
		CRP	JIM WELLS, ETC.		049

DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet



Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

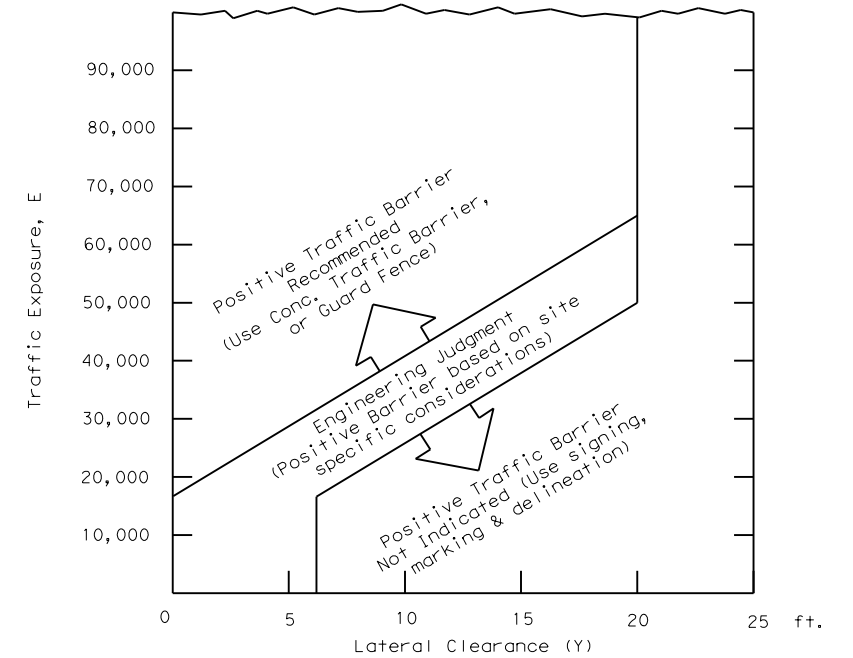
FACTORS CONSIDERED IN THE GUIDELINES:

- The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height" is the depth of the drop-off "D".
- Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.
- In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.
- The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.
- If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Edge Condition Notes:

- Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.
- Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exceeds 24 inches, the possibility for rollover is greater in most vehicles.
- Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.
- Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 ([Cross-hatched])



- $E = ADT \times T$
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.
- Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.
- An approved end treatment should be provided for any positive barrier end located within the clear zone.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

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:
FILE:

Engineer's Seal

2023.07.27 23:27:13-05'00'

Date: 7/26/2023

David P. Neumann, P.E.

Texas Department of Transportation

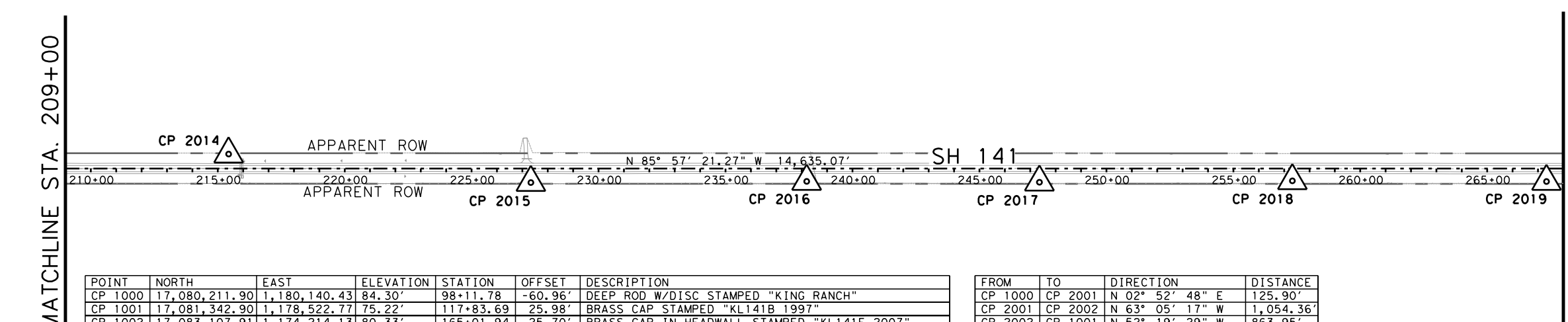
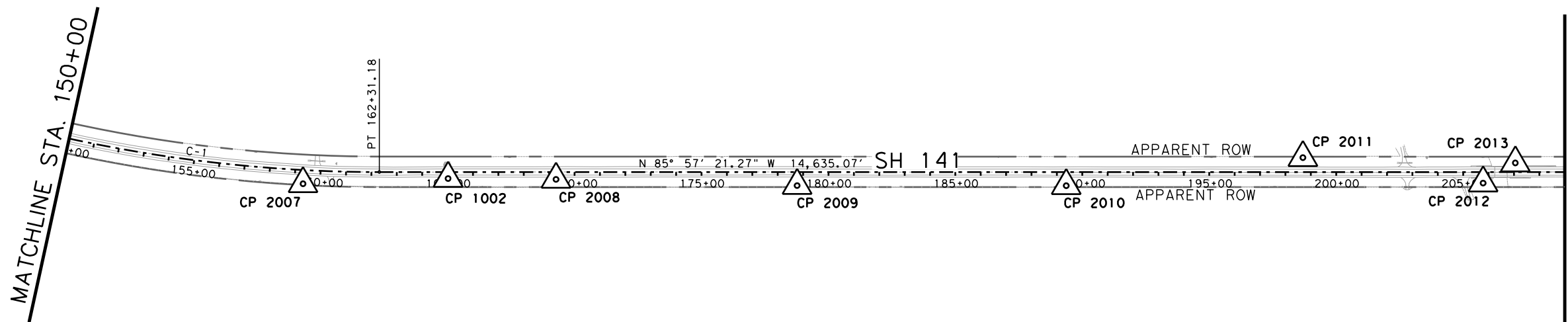
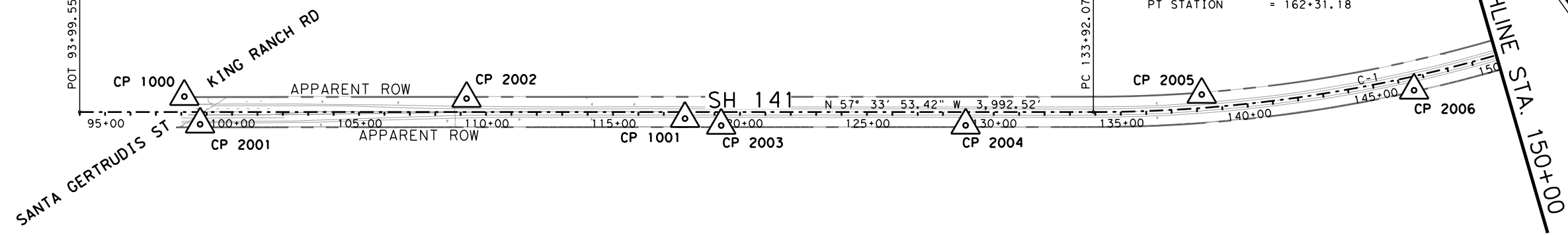
Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN:	CK:	DW:	CK:
© TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
03-01	DIST	COUNTY	SHEET NO.	
08-01	CRP	JIM WELLS, ETC.	050	
9-21				

POINT	SOURCE	NORTH	EAST	ELEV	SOURCE	NORTH	EAST	ELEV	N DIFF	E DIFF	ELEV DIFF
CP 1000	TXDOT PUBLISHED	17,080,211.87	1,180,140.43	84.30'	RTN	17,080,211.90	1,180,140.43	84.29'	0.03	0.00	-0.01
CP 1001	TXDOT PUBLISHED	17,081,342.87	1,178,522.71	75.24'	RTN	17,081,342.90	1,178,522.77	75.28'	0.03	0.06	0.04
CP 1002	TXDOT PUBLISHED	17,083,107.83	1,174,214.05	80.35'	RTN	17,083,107.91	1,174,214.13	80.32'	0.08	0.08	-0.03

C-1
 PI STATION = 148+41.40
 DELTA = 28° 23' 27.85" (LT)
 DEGREE OF CURVE = 1° 00' 00.00"
 TANGENT = 1,449.33
 LENGTH = 2,839.11
 RADIUS = 5,729.58
 PC STATION = 133+92.07
 PT STATION = 162+31.18



POINT	NORTH	EAST	ELEVATION	STATION	OFFSET	DESCRIPTION
CP 1000	17,080,211.90	1,180,140.43	84.30'	98+11.78	-60.96'	DEEP ROD W/DISC STAMPED "KING RANCH"
CP 1001	17,081,342.90	1,178,522.77	75.22'	117+83.69	25.98'	BRASS CAP STAMPED "KL141B 1997"
CP 1002	17,083,107.91	1,174,214.13	80.33'	165+01.94	25.70'	BRASS CAP IN HEADWALL STAMPED "KL141E 2007"
CP 2001	17,080,337.64	1,180,146.75	80.20'	98+73.88	48.56'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2002	17,080,814.87	1,179,206.58	75.05'	109+23.34	-52.92'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2003	17,081,442.50	1,178,417.18	73.78'	119+26.23	53.41'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2004	17,081,958.37	1,177,604.28	76.75'	128+88.99	52.80'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2005	17,082,354.20	1,176,754.06	75.75'	138+23.28	-53.06'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2006	17,082,788.73	1,176,039.51	77.59'	146+53.41	53.95'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2007	17,083,088.00	1,174,785.42	79.90'	159+33.34	53.94'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2008	17,083,141.17	1,173,790.32	80.19'	169+27.04	28.99'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2009	17,083,232.48	1,172,844.76	82.15'	178+76.69	53.39'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2010	17,083,307.66	1,171,787.49	83.57'	189+36.63	53.81'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2011	17,083,263.15	1,170,850.10	90.95'	198+68.54	-56.69'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2012	17,083,413.26	1,170,149.09	98.07'	205+78.39	43.61'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2013	17,083,342.96	1,170,016.90	96.87'	207+05.29	-35.84'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2014	17,083,380.91	1,169,179.85	87.81'	215+42.94	-57.02'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2015	17,083,576.80	1,168,000.38	91.99'	227+33.29	55.20'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2016	17,083,648.83	1,166,916.50	91.62'	238+19.55	50.62'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2017	17,083,716.84	1,166,002.24	92.32'	247+36.33	53.98'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2018	17,083,781.54	1,165,008.21	94.24'	257+32.44	48.41'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2019	17,083,854.75	1,164,009.94	95.22'	267+33.40	51.04'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"

FROM	TO	DIRECTION	DISTANCE
CP 1000	CP 2001	N 02° 52' 48" E	125.90'
CP 2001	CP 2002	N 63° 05' 17" W	1,054.36'
CP 2002	CP 1001	N 52° 19' 29" W	863.95'
CP 1001	CP 2003	N 46° 40' 21" W	145.16'
CP 2003	CP 2004	N 57° 36' 03" W	962.76'
CP 2004	CP 2005	N 65° 02' 06" W	937.85'
CP 2005	CP 2006	N 58° 41' 44" W	836.30'
CP 2006	CP 2007	N 76° 34' 41" W	1,289.30'
CP 2007	CP 1002	N 88° 00' 15" W	571.64'
CP 1002	CP 2008	N 85° 30' 45" W	425.11'
CP 2008	CP 2009	N 84° 29' 04" W	949.96'
CP 2009	CP 2010	N 85° 55' 58" W	1,059.94'
CP 2010	CP 2011	S 87° 16' 55" W	938.44'
CP 2011	CP 2012	N 77° 54' 49" W	716.90'
CP 2012	CP 2013	S 61° 59' 43" W	149.72'
CP 2013	CP 2014	N 87° 24' 16" W	837.91'
CP 2014	CP 2015	N 80° 34' 13" W	1,195.63'
CP 2015	CP 2016	N 86° 11' 52" W	1,086.27'
CP 2016	CP 2017	N 85° 44' 44" W	916.79'
CP 2017	CP 2018	N 86° 16' 34" W	996.13'
CP 2018	CP 2019	N 85° 48' 19" W	1,000.96'

- NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
 2. ALL PROJECT ELEVATIONS ARE ON NAVD88 UTILIZING NAVD 88 AND GEOID 18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 84.299 FEET ON TXDOT MONUMENT "KING RANCH".
 3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
 4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

SCALE: 1" = 250' (22" X 34")
 SCALE: 1" = 500' (11" X 17")
 GRAPHIC SCALE IN FEET



SIGNED: *Brandon M. Absher* 2023.07.26 13:57:53 -05'00'
 BRANDON M. ABSHER
 REGISTERED PROFESSIONAL
 LAND SURVEYOR TEXAS No. 6654

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



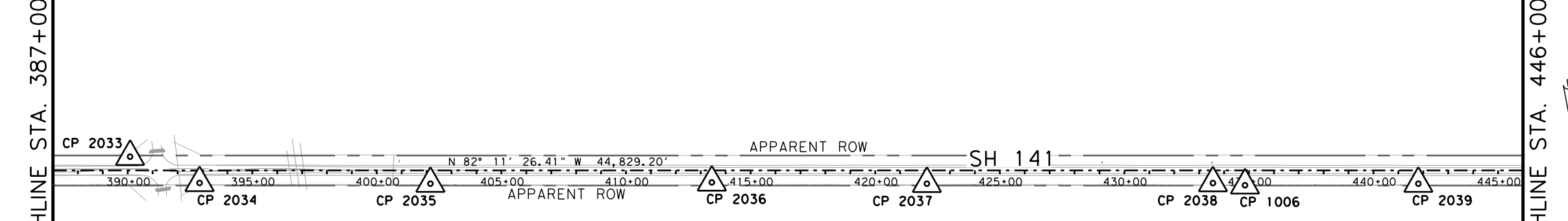
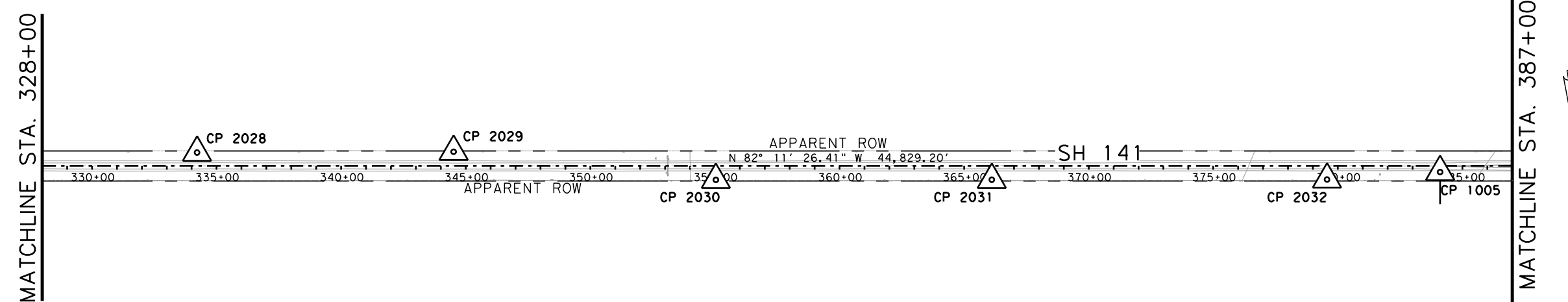
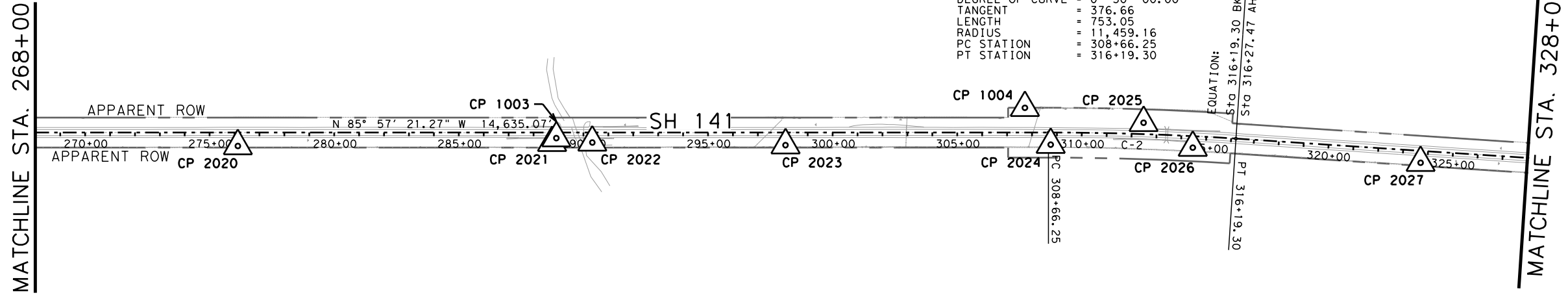
SH 141
 SURVEY CONTROL
 INDEX SHEET

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, KLEBERG	51	

POINT	SOURCE	NORTH	EAST	ELEV	SOURCE	NORTH	EAST	ELEV	N DIFF	E DIFF	ELEV DIFF
CP 1003	TXDOT PUBLISHED	17,083,978.50	1,161,855.36	97.35'	RTN	17,083,978.56	1,161,855.40	97.40'	0.06	0.04	0.05
CP 1004	TXDOT PUBLISHED	17,083,990.13	1,159,971.10	97.37'	RTN	17,083,990.08	1,159,971.12	97.30'	-0.05	0.02	-0.07
CP 1005	TXDOT PUBLISHED	17,085,118.70	1,152,418.08	108.27'	RTN	17,085,118.75	1,152,418.21	108.20'	0.05	0.13	-0.07
CP 1006	TXDOT PUBLISHED	17,085,842.92	1,147,396.16	111.73'	RTN	17,085,842.89	1,147,396.24	111.66'	-0.03	0.08	-0.07

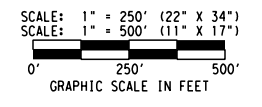
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 LENGTH = 753.05
 RADIUS = 11,459.16
 PC STATION = 308+66.25
 PT STATION = 316+19.30



POINT	NORTH	EAST	ELEVATION	STATION	OFFSET	DESCRIPTION
CP 1003	17,083,978.56	1,161,855.40	97.33'	288+91.30	22.59'	BRASS CAP ON CONCRETE BARRIER STAMPED "KL141D 1997"
CP 1004	17,083,990.08	1,159,971.12	97.36'	307+71.70	-98.80'	DEEP ROD W/DISK STAMPED "MANTAZA"
CP 1005	17,085,118.75	1,152,418.21	108.28'	384+10.36	24.29'	BRASS CAP IN HEADWALL STAMPED "KL141F 2007"
CP 1006	17,085,842.89	1,147,396.24	111.73'	434+84.14	59.35'	DEEP ROD W/DISK STAMPED "PUERTOS"
CP 2020	17,083,919.97	1,163,132.63	95.96'	276+13.12	54.23'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2021	17,083,995.99	1,161,873.81	91.13'	288+74.17	41.28'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2022	17,084,006.39	1,161,712.62	87.82'	290+35.69	40.28'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2023	17,084,071.58	1,160,939.92	94.14'	298+11.06	50.82'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2024	17,084,144.68	1,159,878.17	93.25'	308+75.36	48.86'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2025	17,084,083.44	1,159,500.17	94.04'	312+46.63	-45.23'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2026	17,084,196.92	1,159,310.27	92.81'	314+48.08	46.21'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2027	17,084,321.74	1,158,402.48	97.25'	323+73.28	47.80'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2028	17,084,363.51	1,157,350.09	98.55'	334+21.59	-53.81'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2029	17,084,500.28	1,156,329.60	100.61'	344+51.20	-56.97'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2030	17,084,754.96	1,155,302.16	103.98'	355+03.72	55.74'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2031	17,084,904.98	1,154,204.95	106.15'	366+11.13	55.28'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2032	17,085,086.84	1,152,872.05	106.17'	379+56.38	54.35'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2033	17,085,121.46	1,151,813.70	108.03'	390+09.62	-55.16'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2034	17,085,263.79	1,151,551.77	108.09'	392+88.47	50.26'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2035	17,085,392.40	1,150,634.23	107.92'	402+14.97	53.00'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2036	17,085,540.79	1,149,514.53	108.65'	413+44.45	47.87'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2037	17,085,663.27	1,148,660.25	110.14'	422+07.45	53.14'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2038	17,085,816.71	1,147,522.53	111.39'	433+55.47	50.57'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2039	17,085,931.18	1,146,706.10	112.82'	441+79.87	53.04'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"

FROM	TO	DIRECTION	DISTANCE
CP 2020	CP 2021	N 86° 32' 40" W	1,261.11'
CP 2021	CP 1003	S 46° 33' 42" W	25.35'
CP 1003	CP 2022	N 78° 58' 16" W	145.47'
CP 2022	CP 2023	N 85° 10' 38" W	775.45'
CP 2023	CP 1004	S 85° 11' 29" W	972.22'
CP 1004	CP 2024	N 31° 00' 58" W	180.40'
CP 2024	CP 2025	S 80° 47' 48" W	382.93'
CP 2025	CP 2026	N 59° 08' 16" W	221.22'
CP 2026	CP 2027	N 82° 10' 15" W	916.33'
CP 2027	CP 2028	N 87° 43' 37" W	1,053.22'
CP 2028	CP 2029	N 82° 22' 00" W	1,029.62'
CP 2029	CP 2030	N 76° 04' 42" W	1,058.53'
CP 2030	CP 2031	N 82° 12' 52" W	1,107.42'
CP 2031	CP 2032	N 82° 13' 49" W	1,345.25'
CP 2032	CP 1005	N 85° 58' 44" W	454.97'
CP 1005	CP 2033	N 89° 44' 35" W	604.51'
CP 2033	CP 2034	N 61° 28' 50" W	298.11'
CP 2034	CP 2035	N 82° 01' 16" W	926.50'
CP 2035	CP 2036	N 82° 27' 03" W	1,129.49'
CP 2036	CP 2037	N 81° 50' 27" W	863.02'
CP 2037	CP 2038	N 82° 19' 08" W	1,148.02'
CP 2038	CP 1006	N 78° 17' 17" W	128.97'
CP 1006	CP 2039	N 82° 42' 37" W	695.77'

- NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
 2. ALL PROJECT ELEVATIONS ARE ON NAVD88 UTILIZING NAVD 88 AND GEOID 18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 84.299 FEET ON TXDOT MONUMENT "KING RANCH".
 3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
 4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



2023.07.26
 13:58:09
 -05'00"
 SIGNED: BRANDON M. ABSHER
 REGISTERED PROFESSIONAL
 LAND SURVEYOR TEXAS No. 6654

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



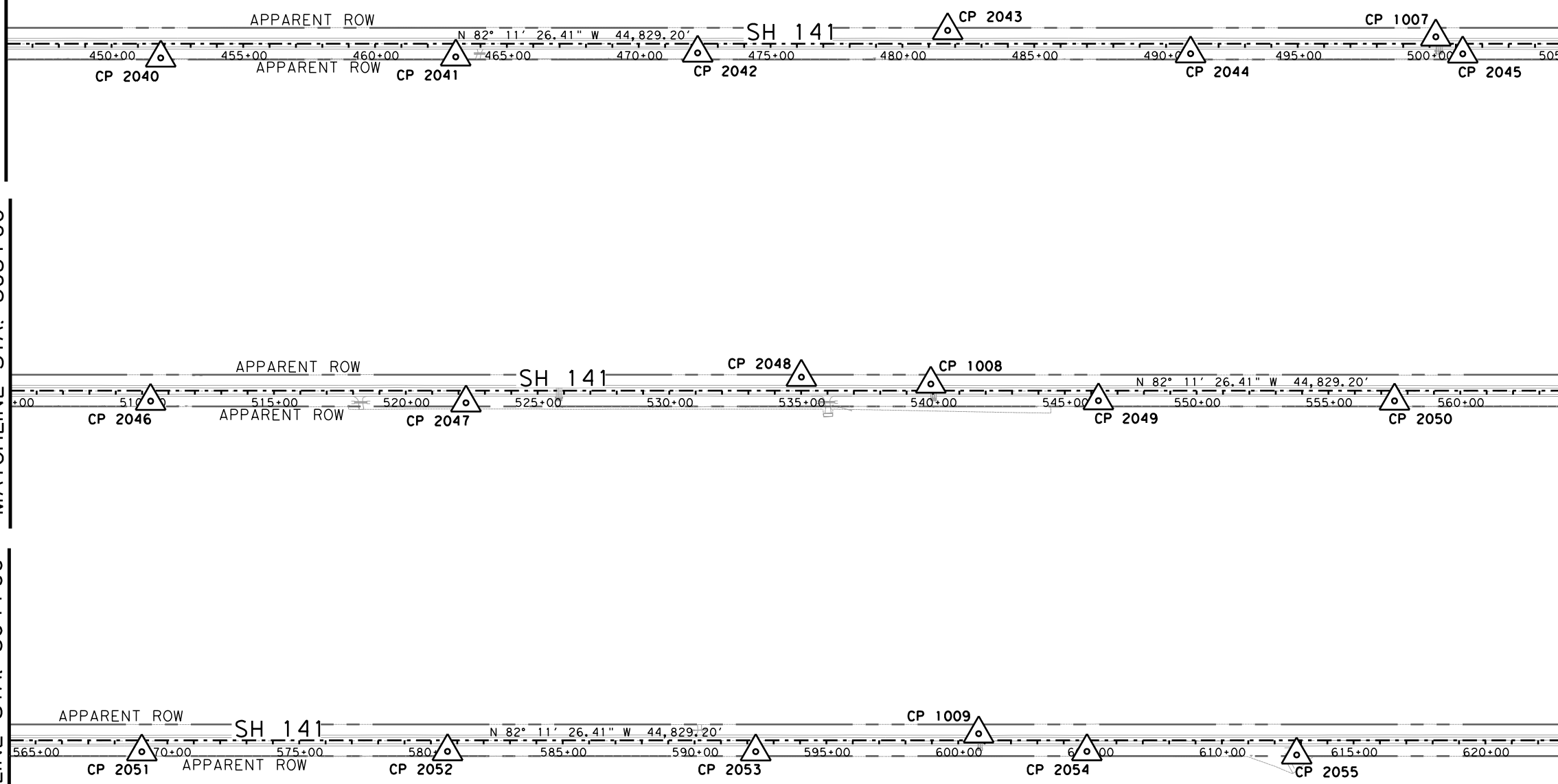
SH 141
 SURVEY CONTROL
 INDEX SHEET

SHEET 2 OF 4

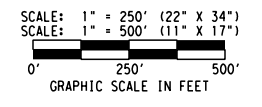
CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, KLEBERG	52	

POINT	SOURCE	NORTH	EAST	ELEV	SOURCE	NORTH	EAST	ELEV	N DIFF	E DIFF	ELEV DIFF
CP 1007	TXDOT PUBLISHED	17,086,646.46	1,140,905.58	120.85'	RTN	17,086,646.43	1,140,905.73	120.71'	-0.03	0.15	-0.14
CP 1008	TXDOT PUBLISHED	17,087,186.68	1,136,974.49	123.06'	RTN	17,087,186.67	1,136,974.62	122.99'	-0.01	0.13	-0.07
CP 1009	TXDOT PUBLISHED	17,088,013.79	1,130,945.08	132.13'	RTN	17,088,013.86	1,130,945.24	132.18'	0.07	0.16	0.05

MATCHLINE STA. 446+00
MATCHLINE STA. 505+00
MATCHLINE STA. 564+00
MATCHLINE STA. 623+00
MATCHLINE STA. 505+00
MATCHLINE STA. 564+00
MATCHLINE STA. 623+00



- NOTES:
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 - THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
 - ALL MEASUREMENTS ARE U.S. SURVEY FEET.



2023.07.26
13:58:20
-05'00"
SIGNED: BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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



SH 141
SURVEY CONTROL
INDEX SHEET

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, KLEBERG	53	

POINT	NORTH	EAST	ELEVATION	STATION	OFFSET	DESCRIPTION
CP 1007	17,086,646.43	1,140,905.73	120.85'	500+23.64	-26.48'	BRASS CAP STAMPED "KL141G 2007"
CP 1008	17,087,186.67	1,136,974.62	123.04'	539+91.69	-25.40'	BRASS CAP STAMPED "KL141H"
CP 1009	17,088,013.86	1,130,945.24	132.21'	600+77.55	-25.13'	BRASS CAP STAMPED "KL141K 2007"
CP 2040	17,086,068.61	1,145,708.58	113.93'	451+86.82	53.66'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2041	17,086,216.88	1,144,599.42	115.15'	463+05.84	49.85'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2042	17,086,326.72	1,143,688.22	114.92'	472+23.51	34.85'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2043	17,086,370.92	1,142,737.01	116.03'	481+71.91	-50.60'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2044	17,086,583.59	1,141,836.12	117.76'	490+93.34	37.68'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2045	17,086,724.30	1,140,813.30	118.47'	501+25.79	38.11'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2046	17,086,848.92	1,139,915.42	118.88'	510+32.28	39.58'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2047	17,087,017.81	1,138,731.22	119.89'	522+28.44	46.00'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2048	17,087,094.04	1,137,457.46	121.28'	535+00.75	-51.56'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2049	17,087,335.75	1,136,353.34	121.04'	546+27.47	37.89'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2050	17,087,489.23	1,135,240.72	124.14'	557+50.63	38.76'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2051	17,087,650.28	1,134,099.47	129.05'	569+03.18	43.25'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2052	17,087,806.83	1,132,950.45	131.79'	580+62.81	42.22'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2053	17,087,966.39	1,131,792.40	132.79'	592+31.80	42.95'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2054	17,088,136.41	1,130,547.61	130.37'	604+88.15	42.25'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2055	17,088,257.45	1,129,761.12	138.77'	612+83.79	55.31'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"

FROM	TO	DIRECTION	DISTANCE
CP 2040	CP 2041	N 82° 23' 09" W	1,119.03'
CP 2041	CP 2042	N 83° 07' 36" W	917.79'
CP 2042	CP 2043	N 87° 20' 22" W	952.24'
CP 2043	CP 2044	N 76° 43' 04" W	925.65'
CP 2044	CP 1007	N 86° 08' 10" W	932.51'
CP 1007	CP 2045	N 49° 53' 02" W	120.85'
CP 2045	CP 2046	N 82° 05' 52" W	906.50'
CP 2046	CP 2047	N 81° 53' 00" W	1,196.18'
CP 2047	CP 2048	N 86° 34' 31" W	1,276.04'
CP 2048	CP 1008	N 79° 08' 25" W	491.64'
CP 1008	CP 2049	N 76° 30' 22" W	638.92'
CP 2049	CP 2050	N 82° 08' 46" W	1,123.16'
CP 2050	CP 2051	N 81° 58' 03" W	1,152.56'
CP 2051	CP 2052	N 82° 14' 29" W	1,159.63'
CP 2052	CP 2053	N 82° 09' 17" W	1,169.00'
CP 2053	CP 1009	N 86° 47' 35" W	848.48'
CP 1009	CP 2054	N 72° 52' 16" W	416.09'
CP 2054	CP 2055	N 81° 15' 01" W	795.75'

POINT	SOURCE	NORTH	EAST	ELEV	SOURCE	NORTH	EAST	ELEV	N DIFF	E DIFF	ELEV DIFF
CP 1010	TXDOT PUBLISHED	17,088,396.39	1,128,156.16	137.60'	RTN	17,088,396.41	1,128,156.31	137.67'	0.02	0.15	0.07
CP 1011	TXDOT PUBLISHED	17,089,057.98	1,123,077.98	143.01'	RTN	17,089,057.97	1,123,078.12	143.05'	-0.01	0.14	0.04
CP 1012	TXDOT PUBLISHED	17,089,869.83	1,117,783.46	158.50'	RTN	17,089,869.85	1,117,783.46	158.61'	0.02	0.10	0.11
CP 1013	TXDOT PUBLISHED	17,090,115.96	1,115,354.87	160.95'	RTN	17,090,116.02	1,115,355.01	161.04'	0.08	0.14	0.09
CP 1014	TXDOT PUBLISHED	17,090,411.93	1,114,577.59	N/A	RTN	17,090,411.76	1,114,577.84	182.93'	-0.17	0.25	N/A

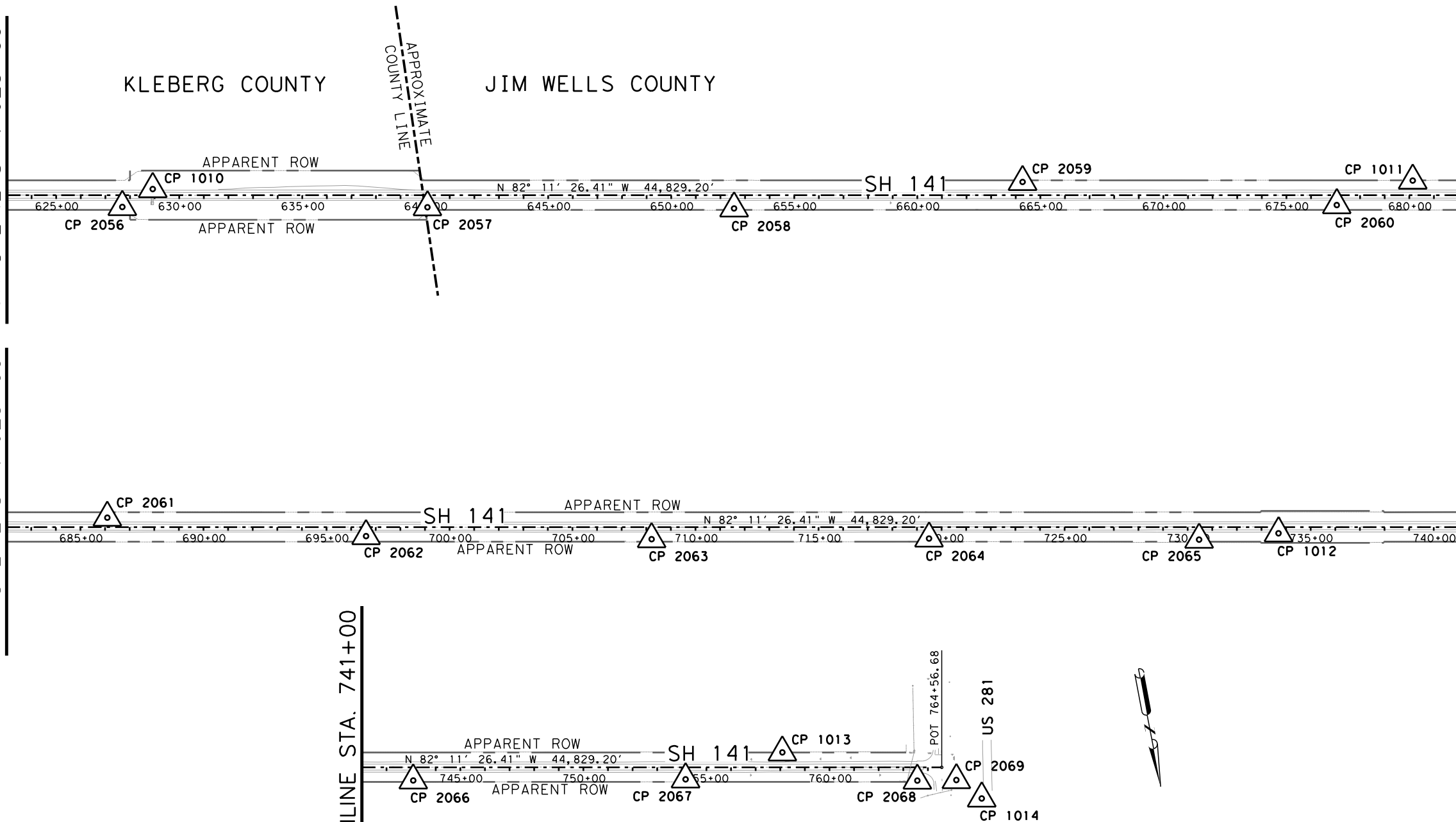
MATCHLINE STA. 623+00

MATCHLINE STA. 623+00

MATCHLINE STA. 741+00

MATCHLINE STA. 623+00

MATCHLINE STA. 741+00



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 - ALL MEASUREMENTS ARE U.S. SURVEY FEET.

SCALE: 1" = 880' (22" X 34")
SCALE: 1" = 500' (11" X 17")
0' 25' 500'
GRAPHIC SCALE IN FEET



2023.07.26
13:58:30
-05'00"
SIGNED: BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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



SH 141
SURVEY CONTROL
INDEX SHEET

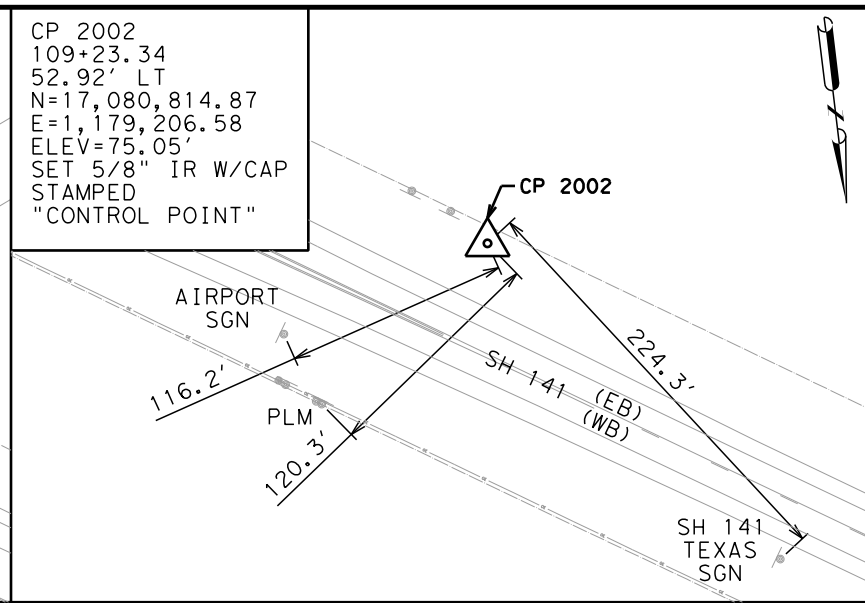
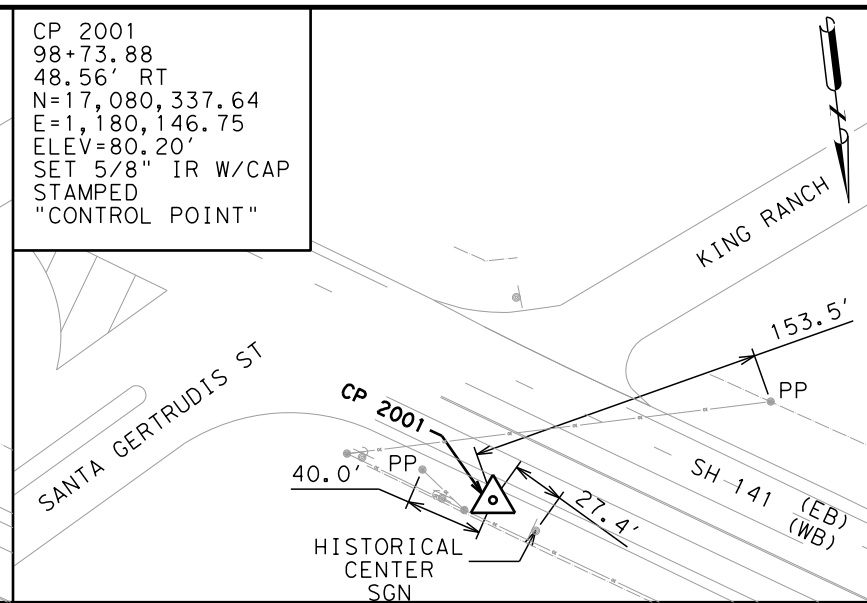
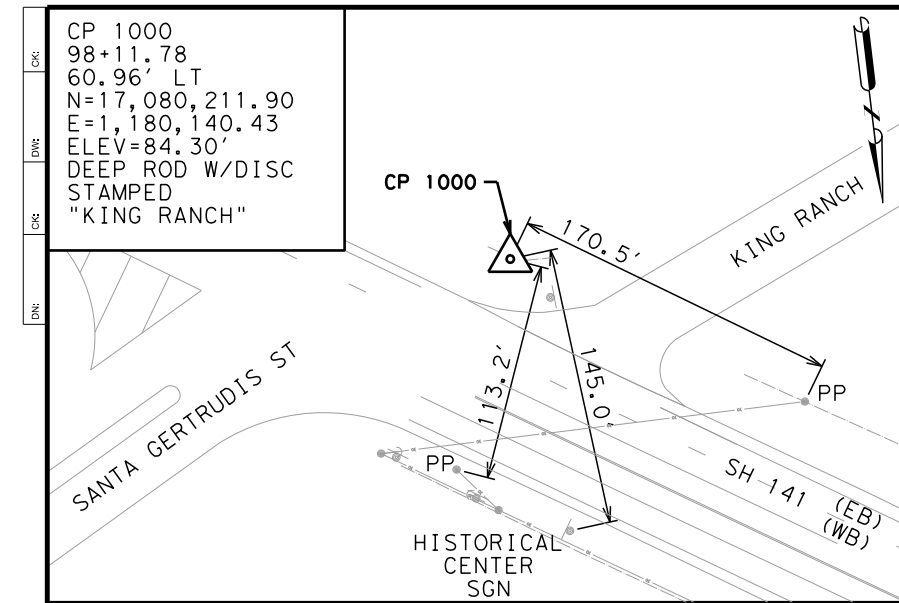
SHEET 4 OF 4

Point	North	East	Elevation	Station	Offset	Description
CP 1010	17,088,396.41	1,128,156.31	137.69'	628+92.59	-25.08'	BRASS CAP STAMPED "KL141J"
CP 1011	17,089,057.97	1,123,078.12	142.96'	680+13.59	-59.66'	DEEP ROD W/DISC STAMPED "MOTAS 2008"
CP 1012	17,089,869.85	1,117,783.46	158.51'	733+69.45	25.26'	BRASS CAP STAMPED "JW141A 2007"
CP 1013	17,090,116.02	1,115,355.01	161.03'	758+08.83	-60.81'	DEEP ROD W/DISC STAMPED "RATAMOSA"
CP 1014	17,090,411.76	1,114,577.84	182.92'	NA	NA	DEEP ROD W/DISC STAMPED "ESCONDIDO"
CP 2056	17,088,451.75	1,128,288.81	135.59'	627+68.84	47.76'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2057	17,088,621.48	1,127,060.24	136.66'	640+09.08	48.97'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2058	17,088,795.55	1,125,826.18	138.12'	652+55.35	53.75'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2059	17,088,848.26	1,124,649.83	141.97'	664+27.96	-53.87'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2060	17,089,114.85	1,123,397.50	141.50'	677+04.89	40.09'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2061	17,089,160.02	1,122,490.82	143.26'	686+09.30	-38.36'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2062	17,089,377.29	1,121,459.14	145.72'	696+60.93	36.71'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2063	17,089,547.20	1,120,310.94	151.38'	708+21.57	49.04'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2064	17,089,697.89	1,119,193.66	159.16'	719+48.97	46.52'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2065	17,089,851.52	1,118,106.84	158.53'	730+46.58	51.04'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2066	17,090,025.21	1,116,856.96	157.82'	743+08.47	53.29'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2067	17,090,171.06	1,115,759.61	159.09'	754+15.46	48.69'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2068	17,090,304.14	1,114,827.16	162.90'	763+57.35	53.84'	SET 5/8" IR W/CAP STAMPED "CONTROL POINT"
CP 2069	17,090,323.56	1,114,669.73	162.66'	NA	NA	SET MAGNAIL

From	To	Direction	Distance
CP 2056	CP 1010	S 67° 19' 44" W	143.60'
CP 1010	CP 2057	N 78° 23' 45" W	1,118.94'
CP 2057	CP 2058	N 81° 58' 15" W	1,246.28'
CP 2058	CP 2059	N 87° 26' 05" W	1,177.53'
CP 2059	CP 2060	N 77° 58' 56" W	1,280.39'
CP 2060	CP 1011	S 79° 54' 07" W	324.41'
CP 1011	CP 2061	N 80° 08' 32" W	596.09'
CP 2061	CP 2062	N 78° 06' 28" W	1,054.31'
CP 2062	CP 2063	N 81° 34' 56" W	1,160.70'
CP 2063	CP 2064	N 82° 19' 08" W	1,127.40'
CP 2064	CP 2065	N 81° 57' 16" W	1,097.62'
CP 2065	CP 1012	N 86° 45' 19" W	323.90'
CP 1012	CP 2066	N 80° 28' 51" W	939.44'
CP 2066	CP 2067	N 82° 25' 45" W	1,107.00'
CP 2067	CP 1013	S 82° 15' 14" W	408.32'
CP 1013	CP 2068	N 70° 23' 05" W	560.37'
CP 2068	CP 2069	N 82° 58' 02" W	158.62'
CP 2069	CP 1014	N 46° 10' 40" W	127.37'

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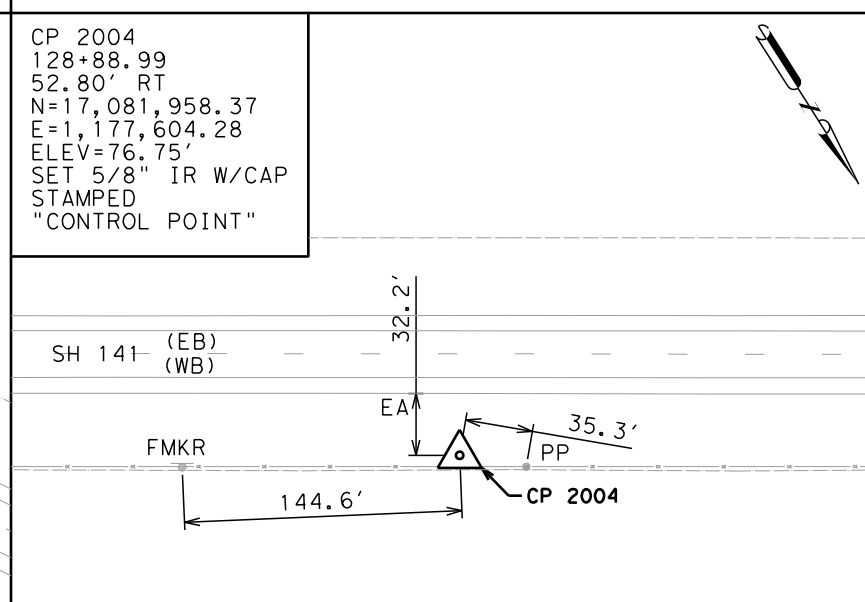
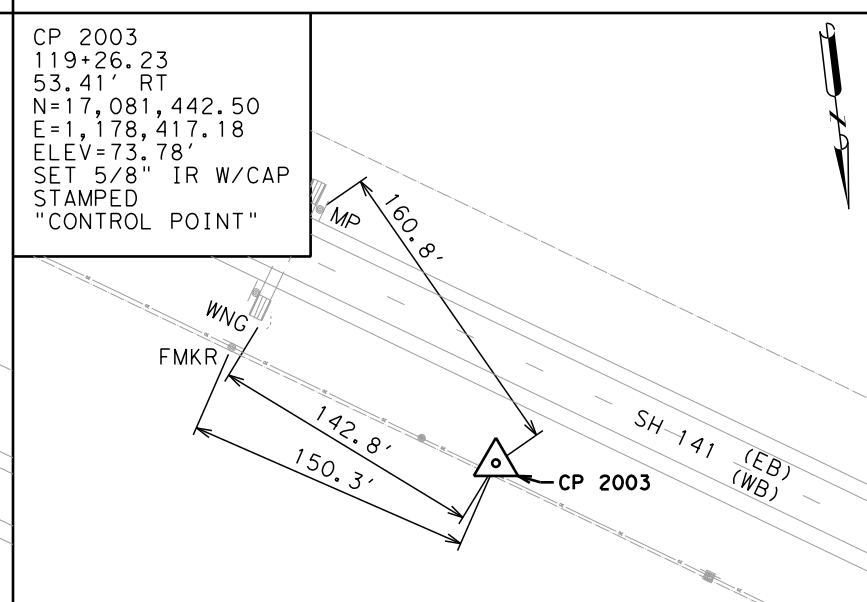
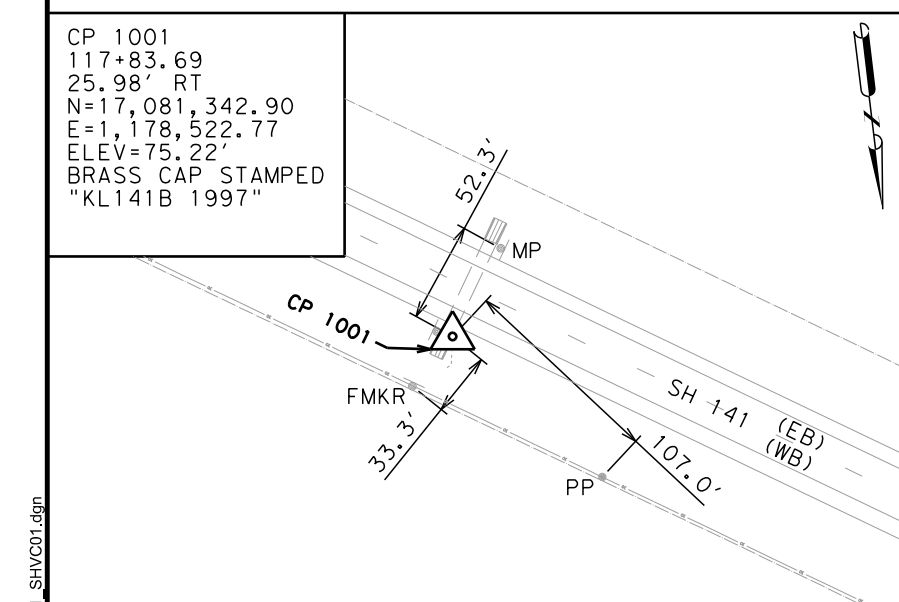
CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, KLEBERG	54	



SITUATED AT THE INTERSECTION OF THE SOUTHWEST ROW OF SH 141 AND THE SOUTH ROW OF KING RANCH

SITUATED ON THE NORTHEAST SIDE OF SH 141 APPROXIMATELY 140 FEET NORTHWEST OF SANTA GERTRUDIS ST

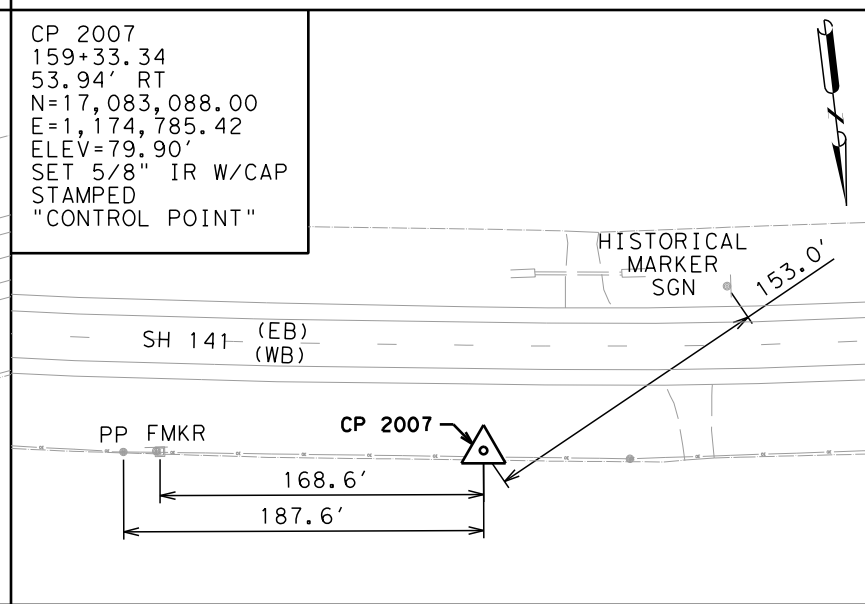
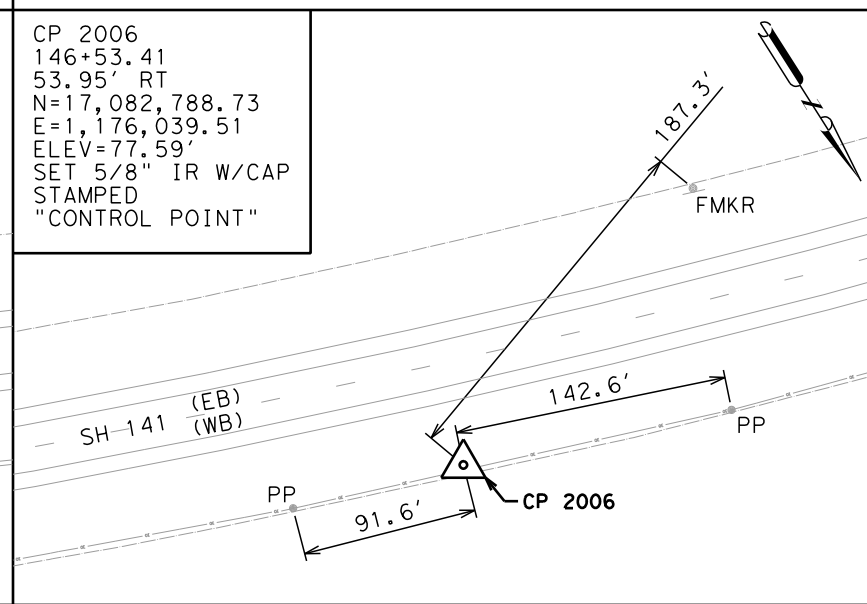
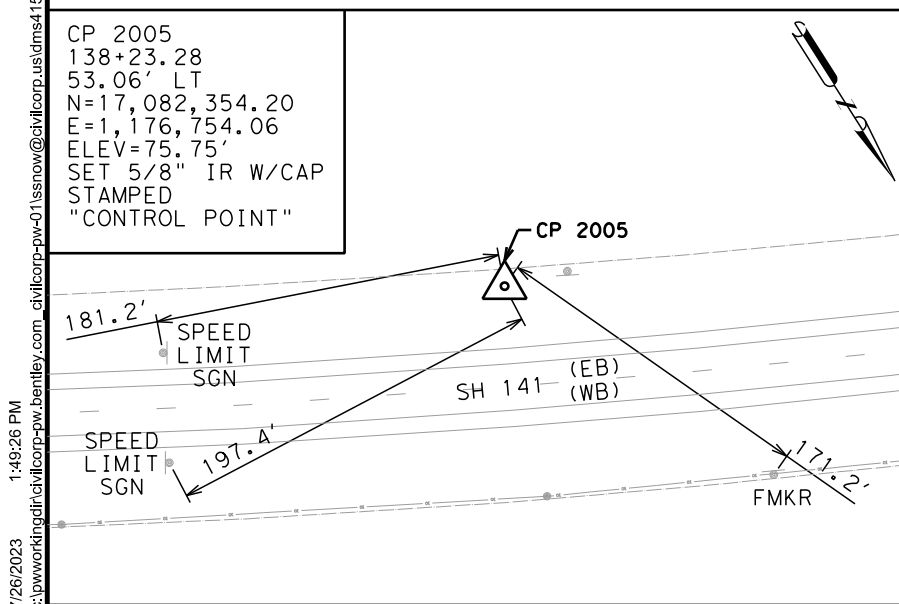
SITUATED ON THE SOUTHWEST SIDE OF SH 141 APPROXIMATELY 0.20 MILES NORTHWEST OF KING RANCH



SITUATED ON THE NORTHEAST SIDE OF SH 141 APPROXIMATELY 0.39 MILES NORTHWEST OF KING RANCH

SITUATED ON THE NORTHEAST SIDE OF SH 141 APPROXIMATELY 0.41 MILES NORTHWEST OF KING RANCH

SITUATED ON THE NORTHWEST SIDE OF SH 141 APPROXIMATELY 0.60 MILES NORTHWEST OF KING RANCH



SITUATED ON THE SOUTHEAST SIDE OF SH 141 APPROXIMATELY 0.77 MILES NORTHWEST OF KING RANCH

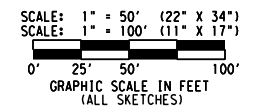
SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 0.93 MILES NORTHWEST OF KING RANCH

SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 1.18 MILES NORTHWEST OF KING RANCH

DATE: 7/26/2023 1:49:26 PM
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NOTES:

1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
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4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



2023.07.26
 13:58:40 -05'00'

SIGNED: BRANDON M. ABSHER
 REGISTERED PROFESSIONAL
 LAND SURVEYOR TEXAS No. 6654

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



SH 141
 HORIZONTAL &
 VERTICAL CONTROL
 SHEET

SHEET 1 OF 10

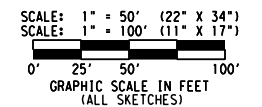
CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		55

CP 1002
 165+01.94
 25.70' RT
 N=17,083,107.91
 E=1,174,214.13
 ELEV=80.33'
 BRASS CAP IN
 HEADWALL STAMPED
 "KL141E 2007"

CP 2008
 169+27.04
 28.99' RT
 N=17,083,141.17
 E=1,173,790.32
 ELEV=80.19'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"

CP 2009
 178+76.69
 53.39' RT
 N=17,083,232.48
 E=1,172,844.76
 ELEV=82.15'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"

NOTES:
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2023.07.26
 13:58:51 -05'00'

SIGNED:
 BRANDON M. ABSHER
 REGISTERED PROFESSIONAL
 LAND SURVEYOR TEXAS No. 6654

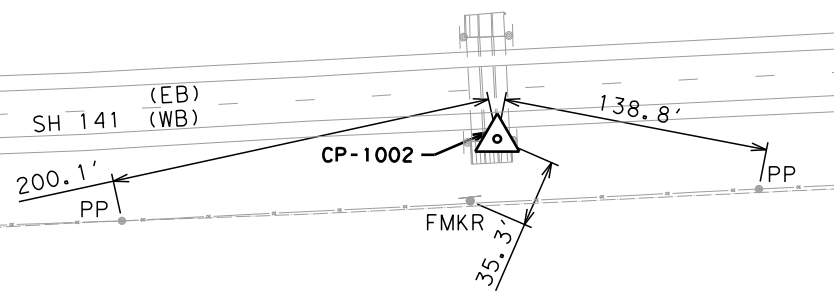
THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E



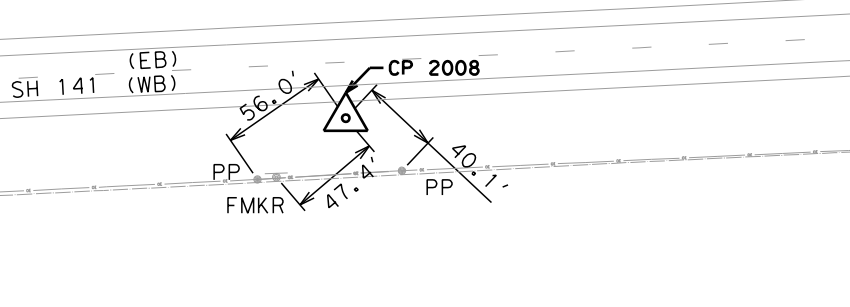
SH 141
 HORIZONTAL &
 VERTICAL CONTROL
 SHEET

SHEET 2 OF 10

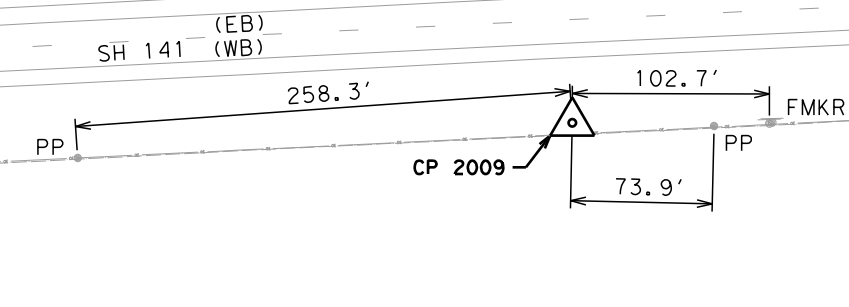
CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		56



SITUATED ON THE NORTH SIDE OF SH 141
 APPROXIMATELY 1.28 MILES WEST OF W SANTA GERTRUDIS ST.



SITUATED ON THE NORTH SIDE OF SH 141
 APPROXIMATELY 1.37 MILES WEST OF W SANTA GERTRUDIS ST.

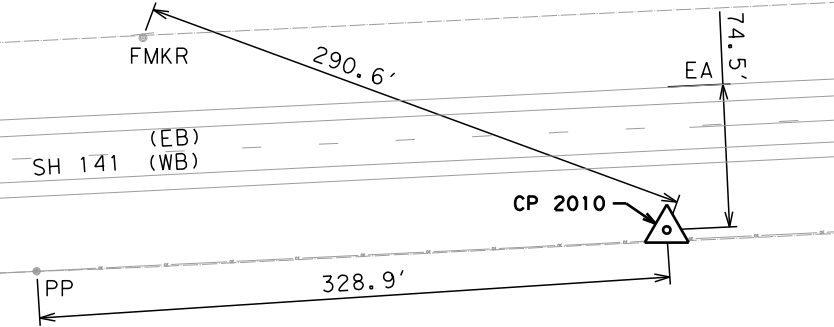


SITUATED ON THE NORTH SIDE OF SH 141
 APPROXIMATELY 1.55 MILES WEST OF W SANTA GERTRUDIS ST.

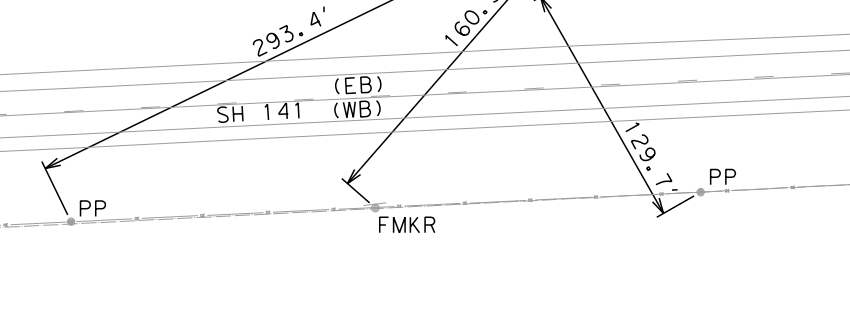
CP 2010
 189+36.63
 53.81' RT
 N=17,083,307.66
 E=1,171,787.49
 ELEV=83.57'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"

CP 2011
 198+68.54
 56.69' LT
 N=17,083,263.15
 E=1,170,850.10
 ELEV=90.95'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"

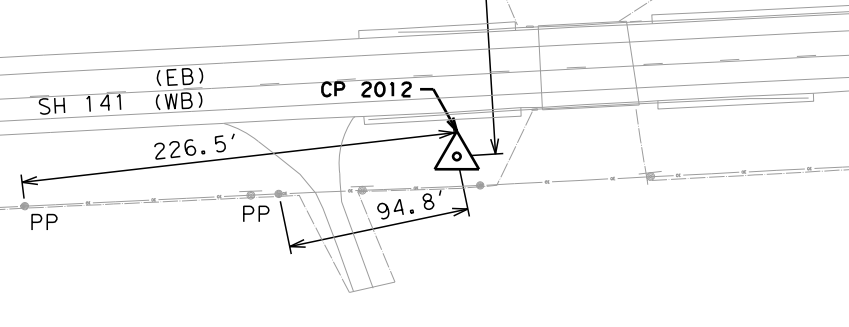
CP 2012
 205+78.39
 43.61' RT
 N=17,083,413.26
 E=1,170,149.09
 ELEV=98.07'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"



SITUATED ON THE NORTH SIDE OF SH 141
 APPROXIMATELY 1.74 MILES WEST OF W SANTA GERTRUDIS ST.



SITUATED ON THE SOUTH SIDE OF SH 141
 APPROXIMATELY 1.92 MILES WEST OF W SANTA GERTRUDIS ST.

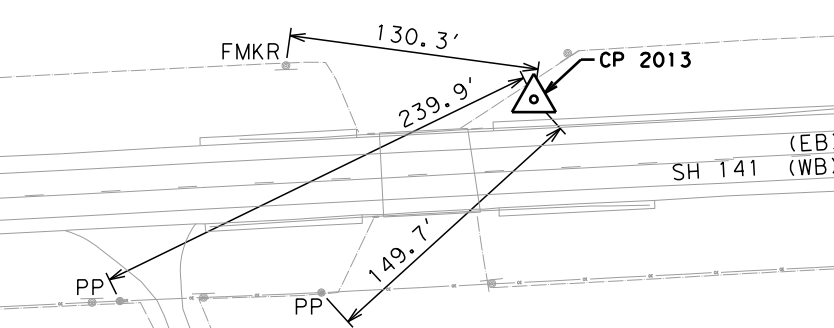


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 APPROXIMATELY 2.06 MILES WEST OF W SANTA GERTRUDIS ST.

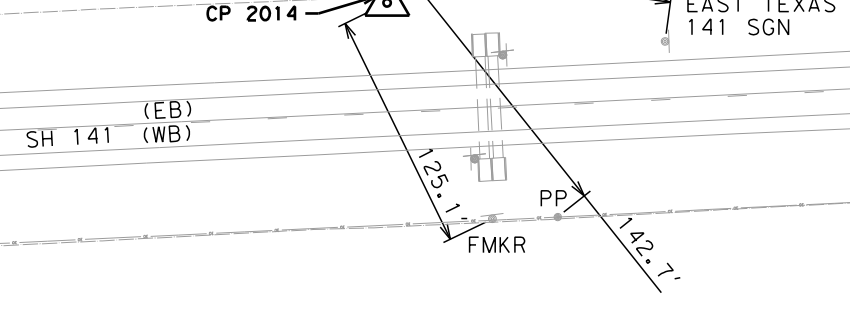
CP 2013
 207+05.29
 35.84' LT
 N=17,083,342.96
 E=1,170,016.90
 ELEV=96.87'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"

CP 2014
 215+42.94
 57.02' LT
 N=17,083,380.91
 E=1,169,179.85
 ELEV=87.81'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"

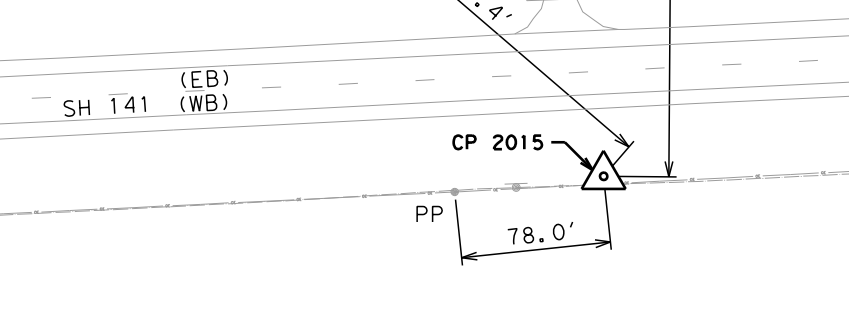
CP 2015
 227+33.29
 55.20' RT
 N=17,083,576.80
 E=1,168,000.38
 ELEV=91.99'
 SET 5/8" IR W/CAP
 STAMPED
 "CONTROL POINT"



SITUATED ON THE SOUTH SIDE OF SH 141
 APPROXIMATELY 2.08 MILES WEST OF W SANTA GERTRUDIS ST.

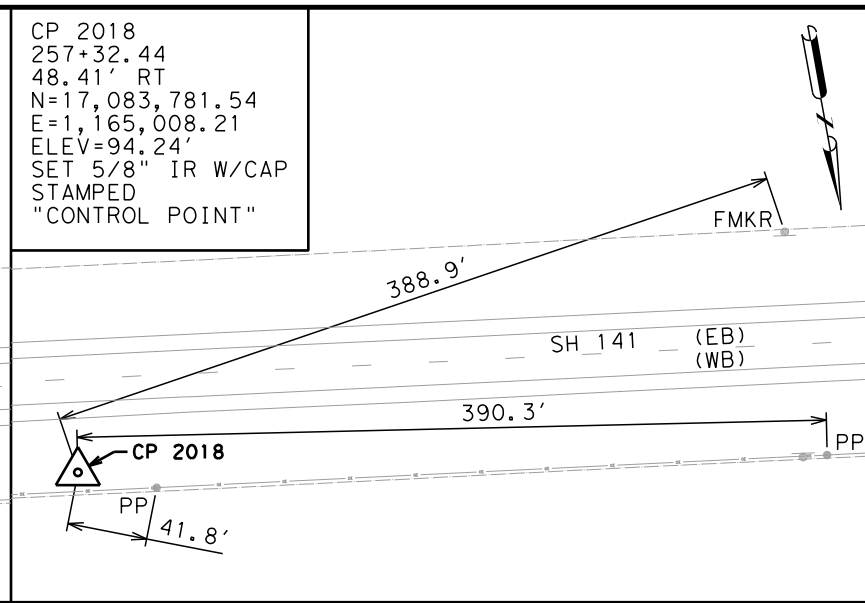
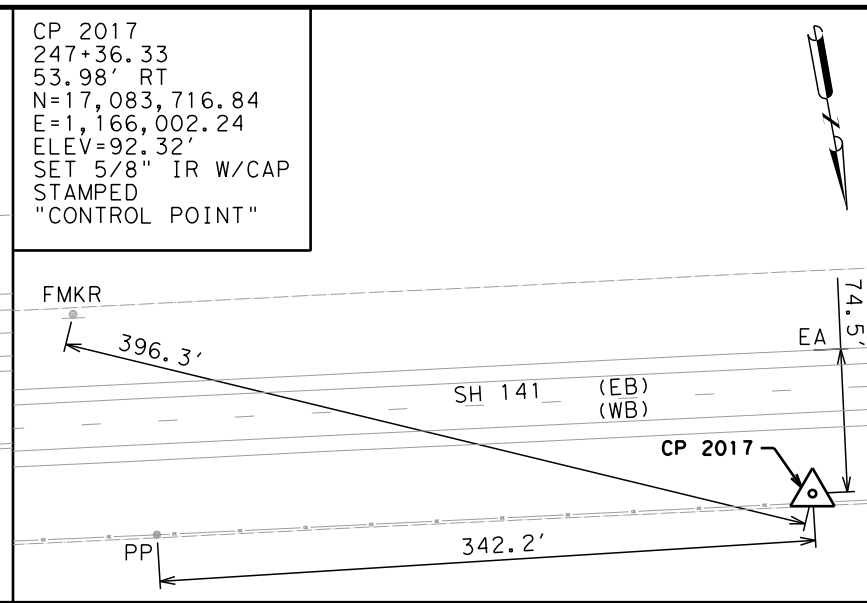
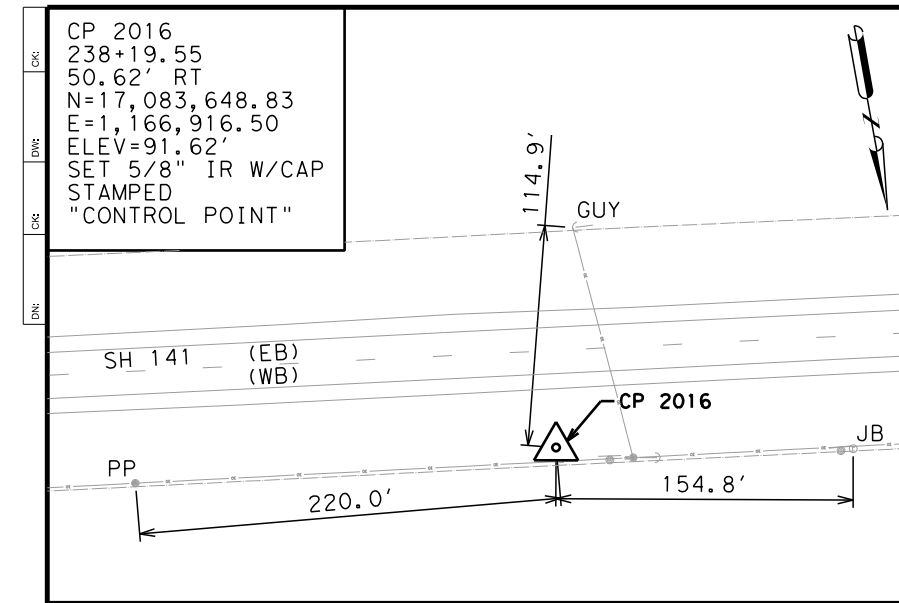


SITUATED ON THE SOUTH SIDE OF SH 141
 APPROXIMATELY 2.24 MILES WEST OF W SANTA GERTRUDIS ST.



SITUATED ON THE NORTH SIDE OF SH 141
 APPROXIMATELY 2.47 MILES WEST OF W SANTA GERTRUDIS ST.

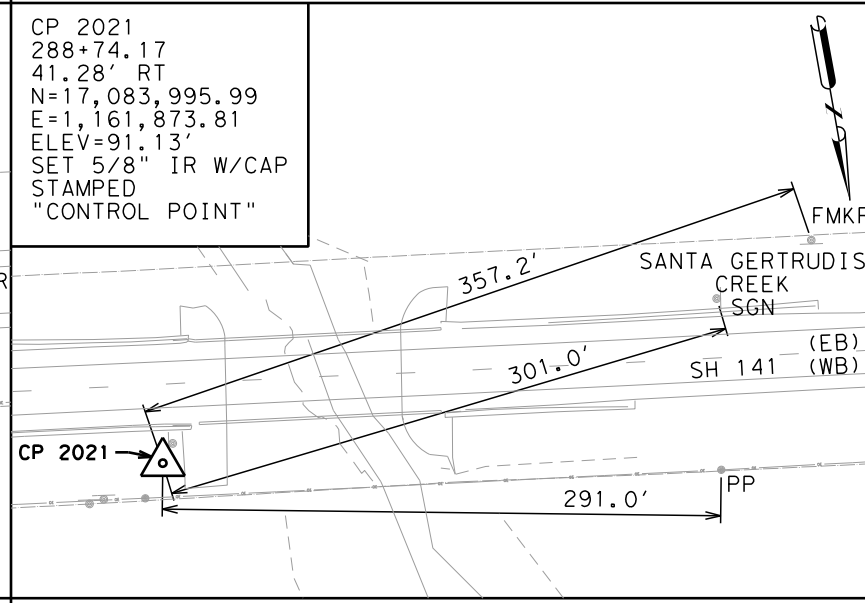
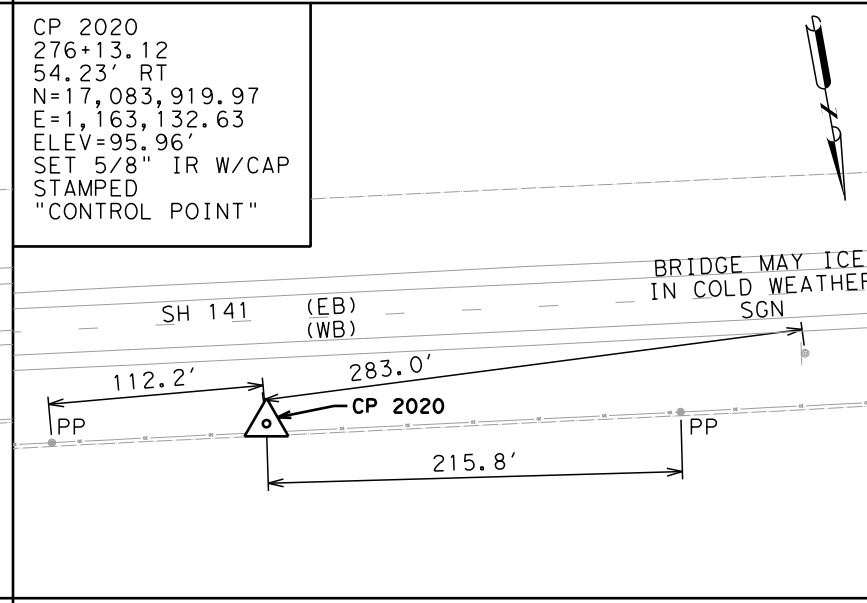
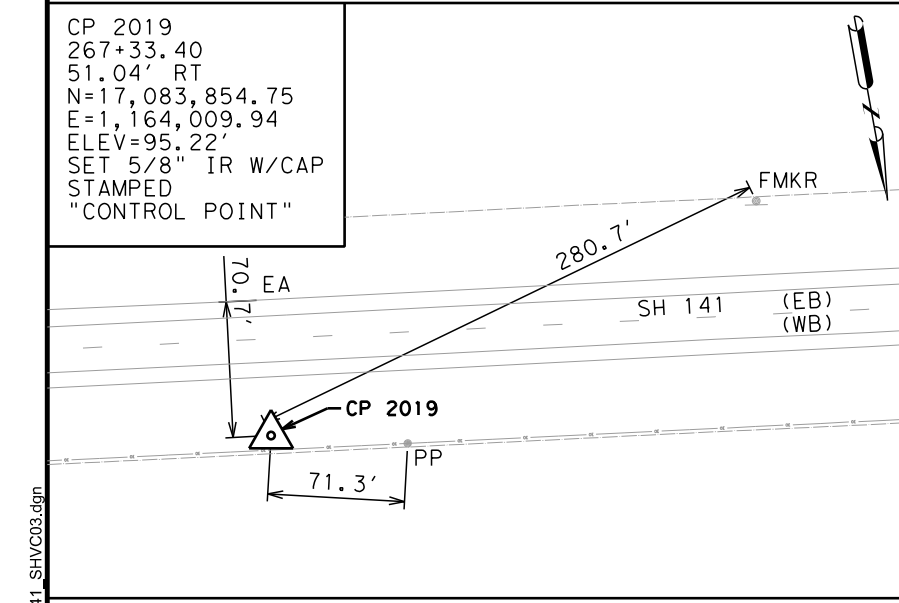
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SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 2.67 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 2.84 MILES WEST OF SANTA GERTRUDIS ST

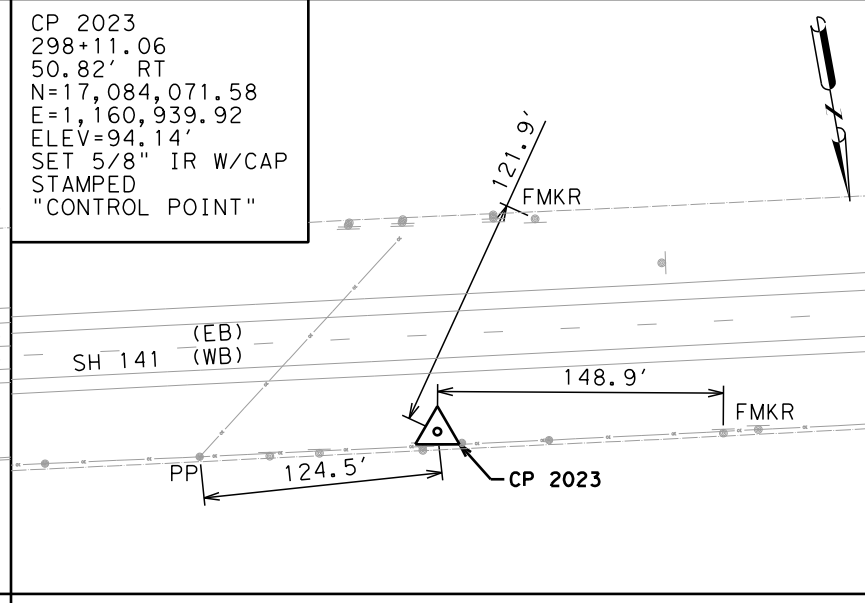
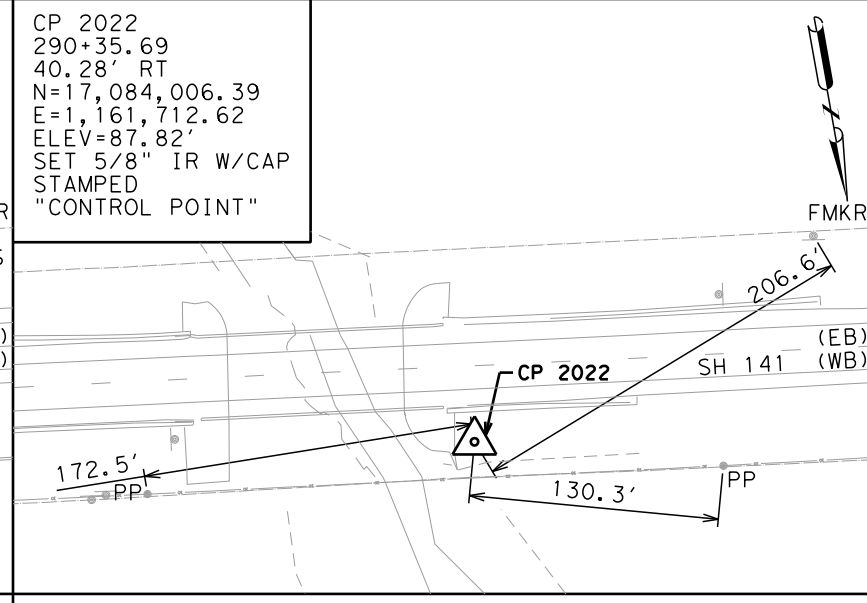
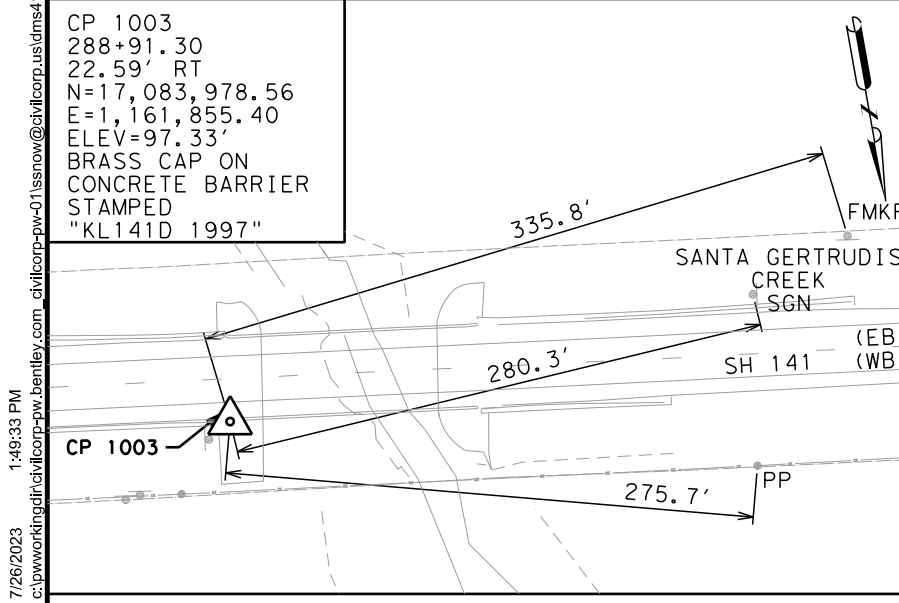
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.06 MILES WEST OF SANTA GERTRUDIS ST



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.22 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.39 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.63 MILES WEST OF SANTA GERTRUDIS ST

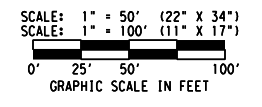


SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.63 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.66 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.80 MILES WEST OF SANTA GERTRUDIS ST

- NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
 2. ALL PROJECT ELEVATIONS ARE ON NAVD88 UTILIZING NAVD 88 AND GEOID 18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 84.299 FEET ON TXDOT MONUMENT "KING RANCH".
 3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
 4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



2023.07.26
13:59:05
-05'00"
SIGNED: *Brandon M. Absber*
BRANDON M. ABSBER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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

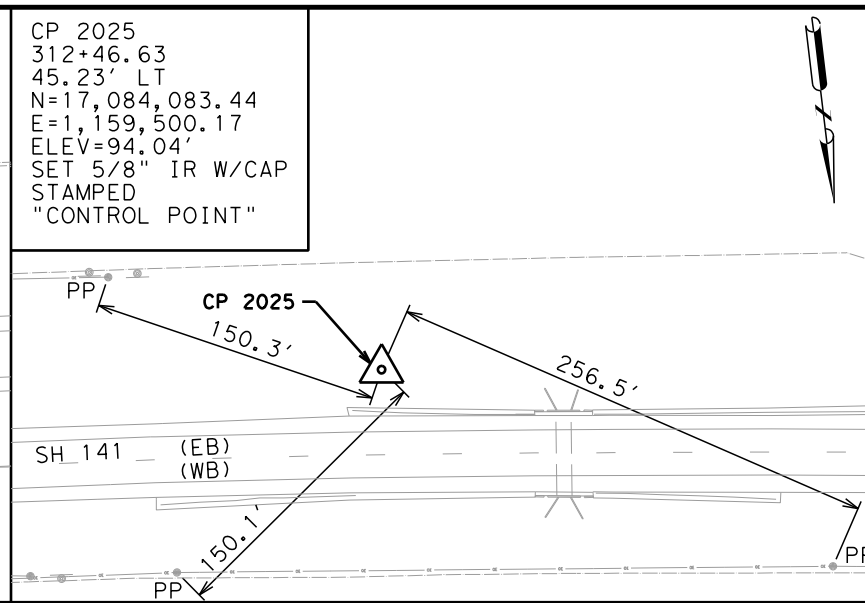
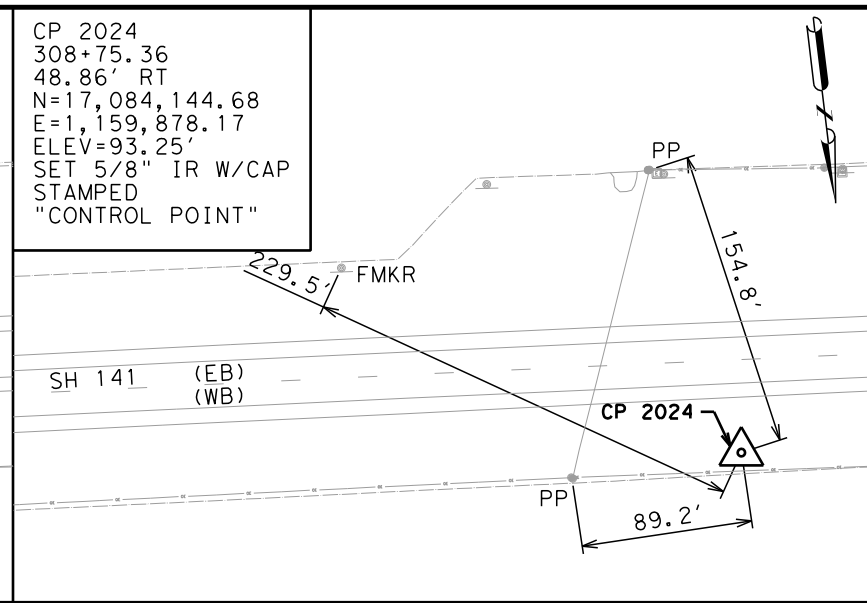
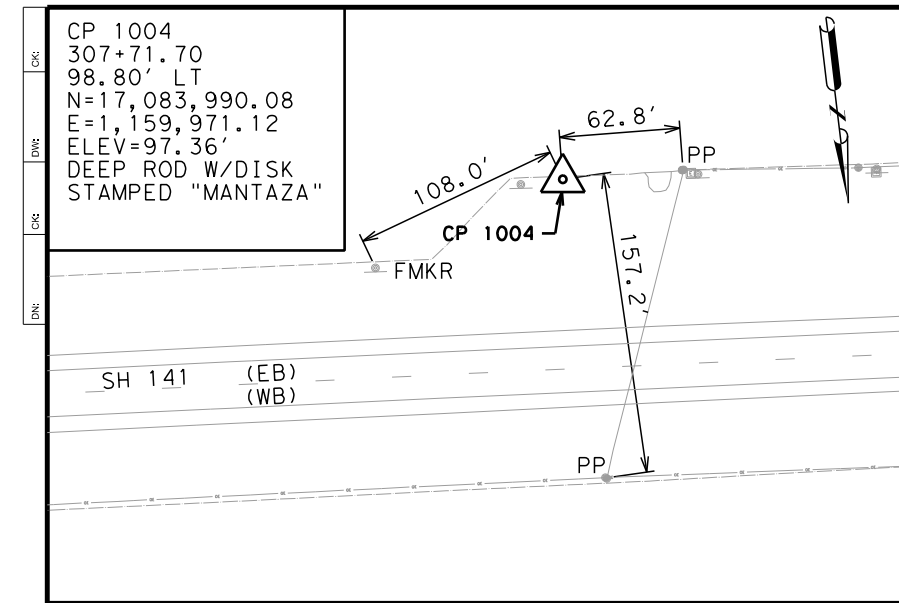


SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

SHEET 3 OF 10

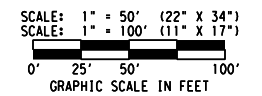
CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		57

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NOTES:

1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
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3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



SIGNED: *Brandon M. Absher* 2023.07.26
13:59:16 -05'00'

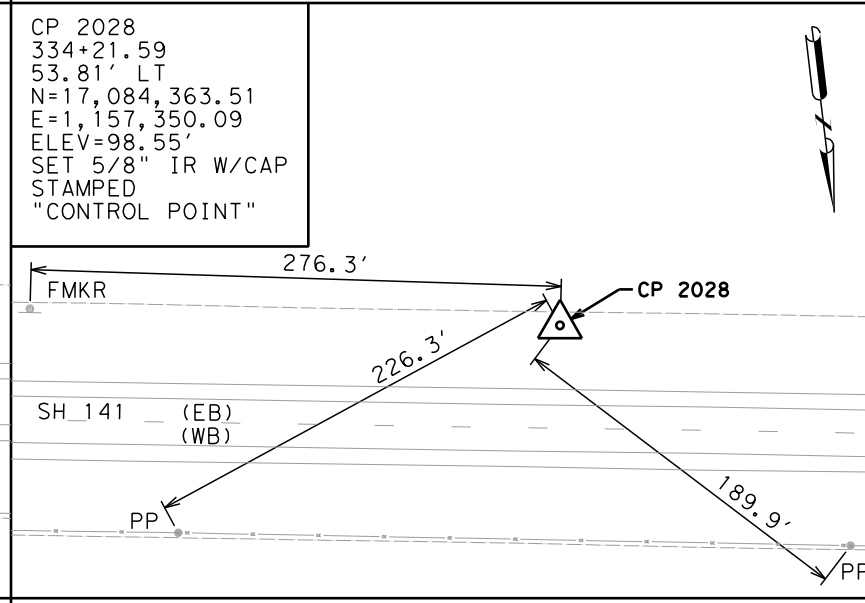
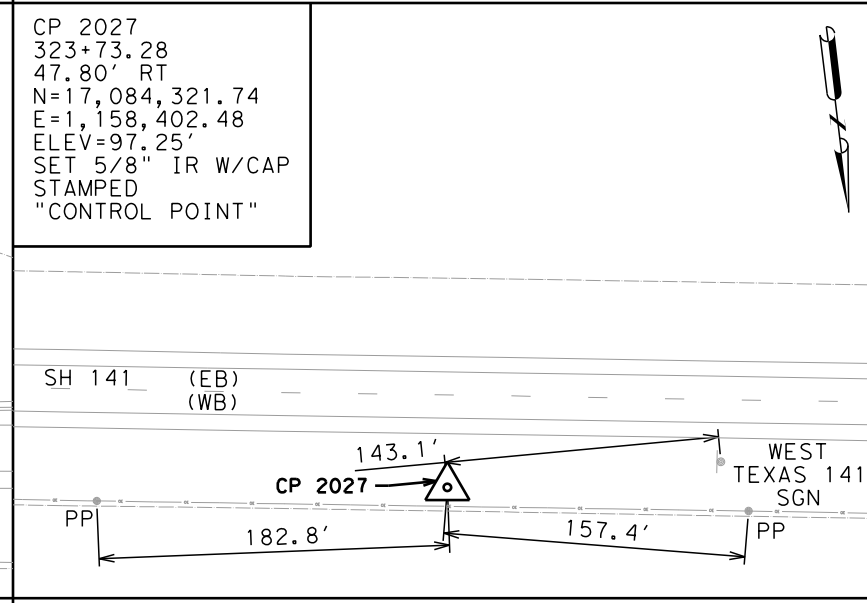
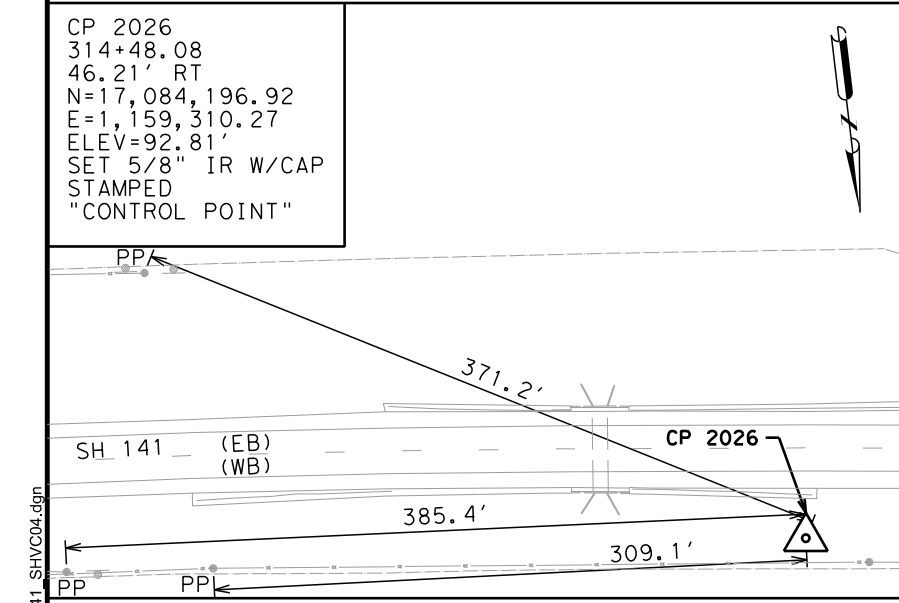
SIGNED: BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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

SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 3.99 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.01 MILES WEST OF SANTA GERTRUDIS ST

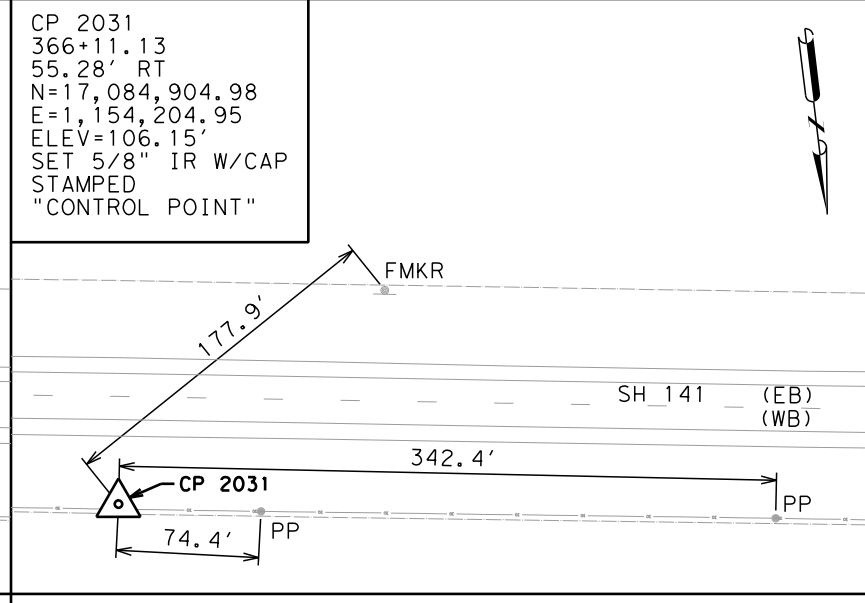
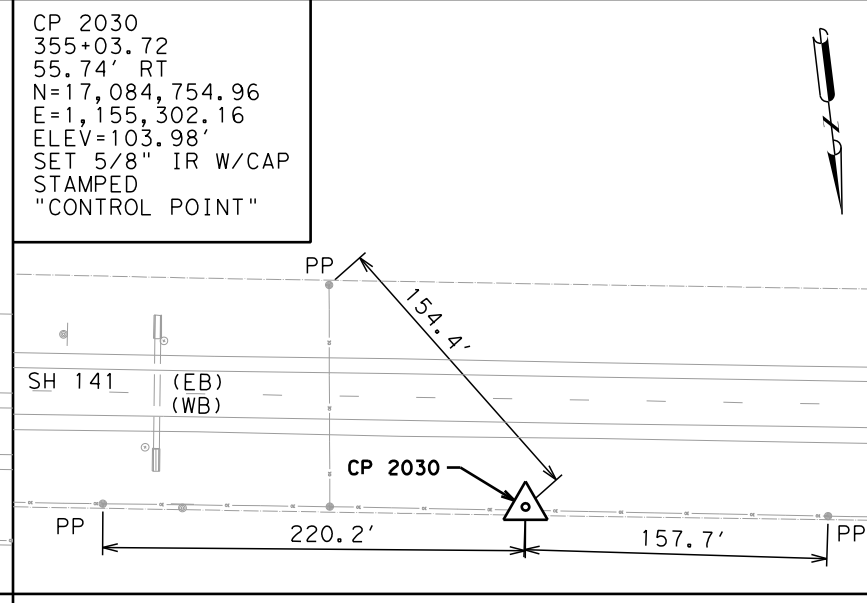
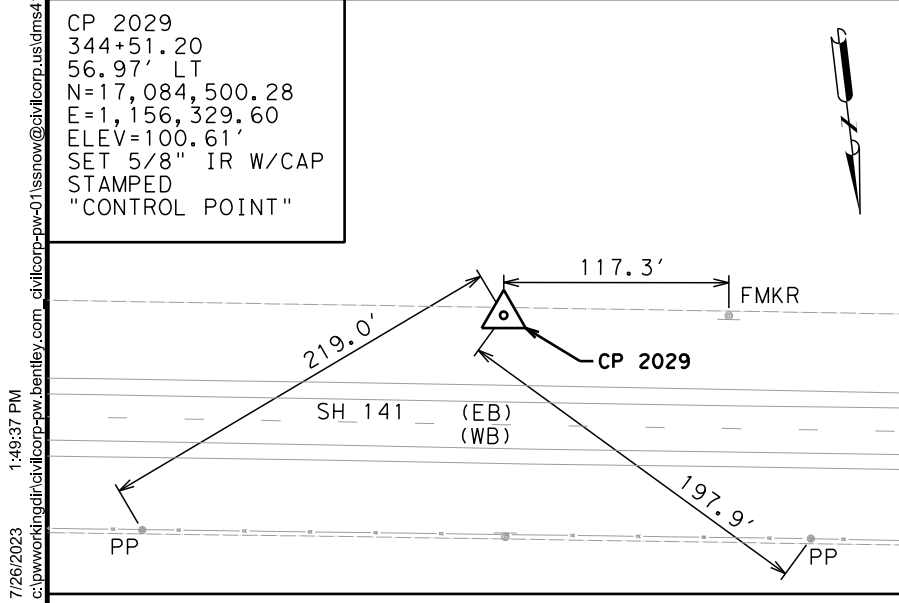
SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 4.08 MILES WEST OF SANTA GERTRUDIS ST



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.12 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.29 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 4.49 MILES WEST OF SANTA GERTRUDIS ST



SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 4.68 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.88 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.09 MILES WEST OF SANTA GERTRUDIS ST



SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

SHEET 4 OF 10

CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		58

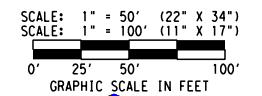
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CP 2032
379+56.38
54.35' RT
N=17,085,086.84
E=1,152,872.05
ELEV=106.17'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 1005
384+10.36
24.29' RT
N=17,085,118.75
E=1,152,418.21
ELEV=108.28'
BRASS CAP IN
HEADWALL STAMPED
"KL141F 2007"

CP 2033
390+09.62
55.16' LT
N=17,085,121.46
E=1,151,813.70
ELEV=108.03'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
2. ALL PROJECT ELEVATIONS ARE ON NAVD88 UTILIZING NAVD 88 AND GEOID 18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 84.299 FEET ON TXDOT MONUMENT "KING RANCH".
3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



2023.07.26
13:59:26
-05'00"

SIGNED: BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

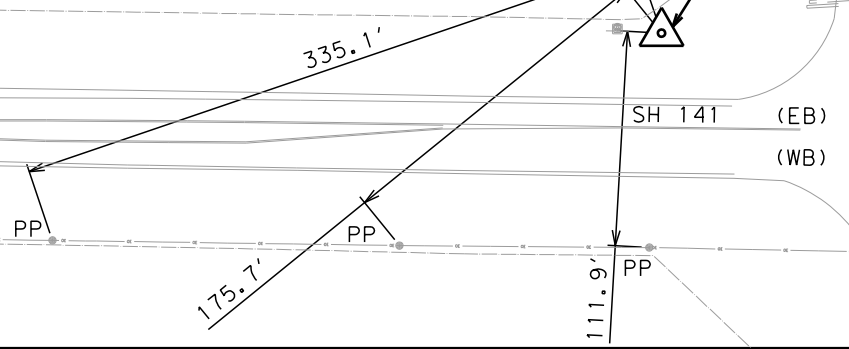
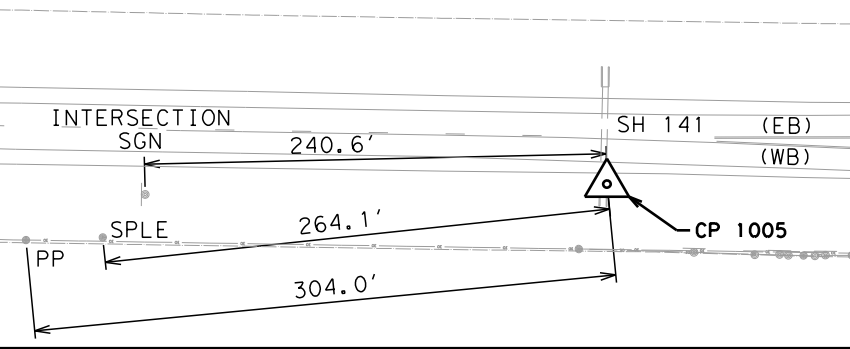
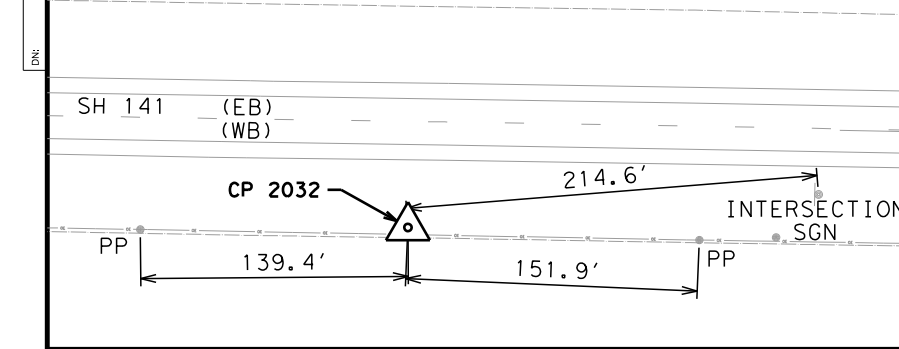
THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E



SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

SHEET 5 OF 10

CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		59



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.35 MILES WEST OF SANTA GERTRUDIS ST

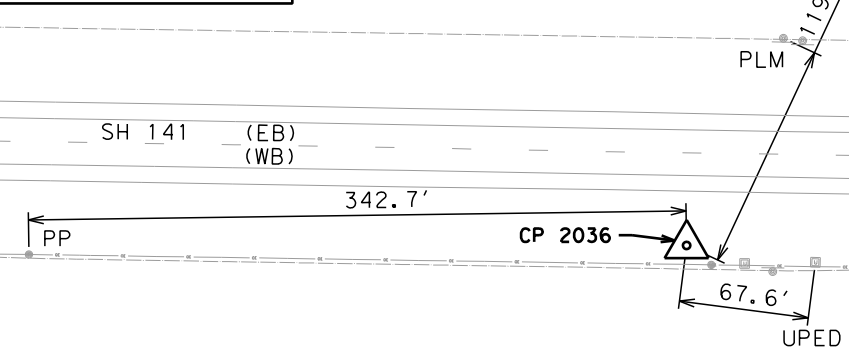
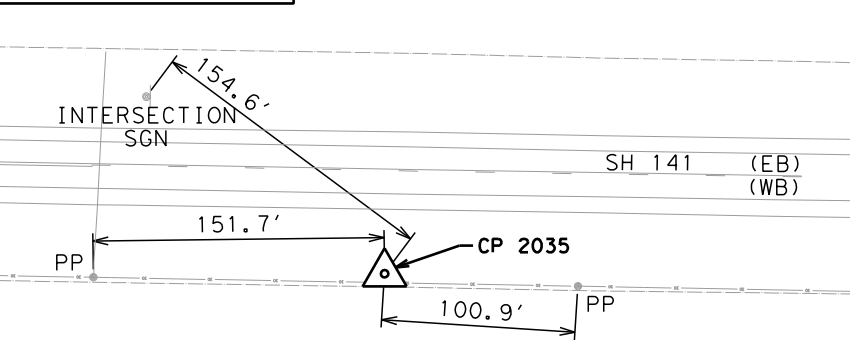
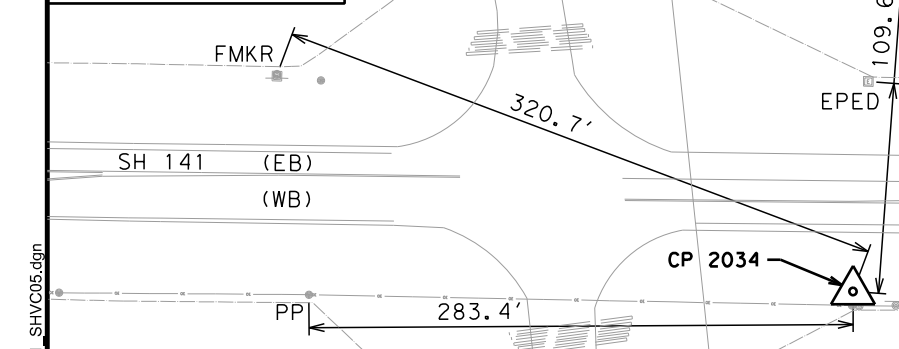
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.43 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 5.55 MILES WEST OF SANTA GERTRUDIS ST

CP 2034
392+88.47
50.26' RT
N=17,085,263.79
E=1,151,551.77
ELEV=108.09'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2035
402+14.97
53.00' RT
N=17,085,392.40
E=1,150,634.23
ELEV=107.92'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2036
413+44.45
47.87' RT
N=17,085,540.79
E=1,149,514.53
ELEV=108.65'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.60 MILES WEST OF SANTA GERTRUDIS ST

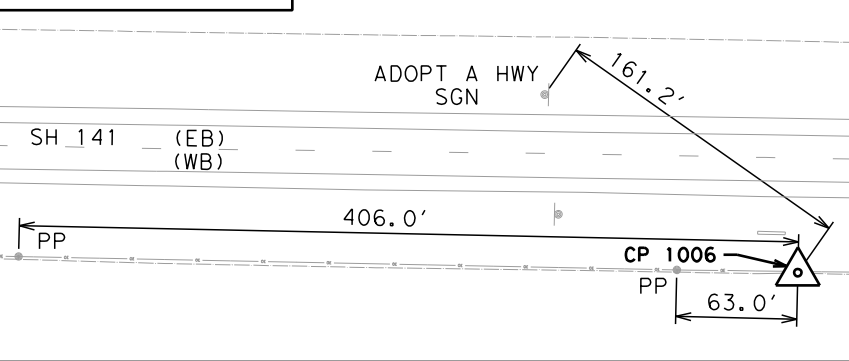
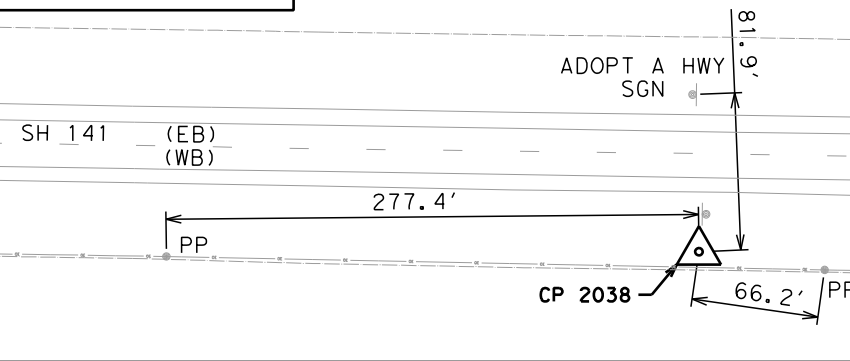
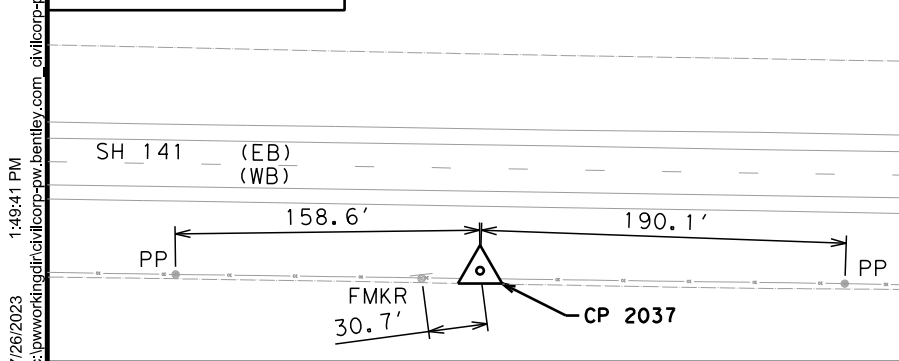
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.77 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.99 MILES WEST OF SANTA GERTRUDIS ST

CP 2037
422+07.45
53.14' RT
N=17,085,663.27
E=1,148,660.25
ELEV=110.14'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2038
433+55.47
50.57' RT
N=17,085,816.71
E=1,147,522.53
ELEV=111.39'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 1006
434+84.14
59.35 RT
N=17,085,842.89
E=1,147,396.24
ELEV=111.73'
DEEP ROD W/DISC
STAMPED "PUERTOS"



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 6.15 MILES WEST OF SANTA GERTRUDIS ST

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 6.27 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 6.24 MILES EAST OF US 281 NB ENTRANCE RAMP

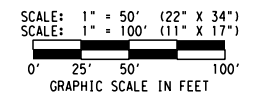
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CP 2039
441+79.87
53.04' RT
N=17,085,931.18
E=1,146,706.10
ELEV=112.82'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2040
451+86.82
53.66' RT
N=17,086,068.61
E=1,145,708.58
ELEV=113.93'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2041
463+05.84
49.85' RT
N=17,086,216.88
E=1,144,599.42
ELEV=115.15'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
2. ALL PROJECT ELEVATIONS ARE ON NAVD88 UTILIZING NAVD 88 AND GEOID 18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 84.299 FEET ON TXDOT MONUMENT "KING RANCH".
3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



2023.07.26
13:59:37
-05'00"

SIGNED: BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

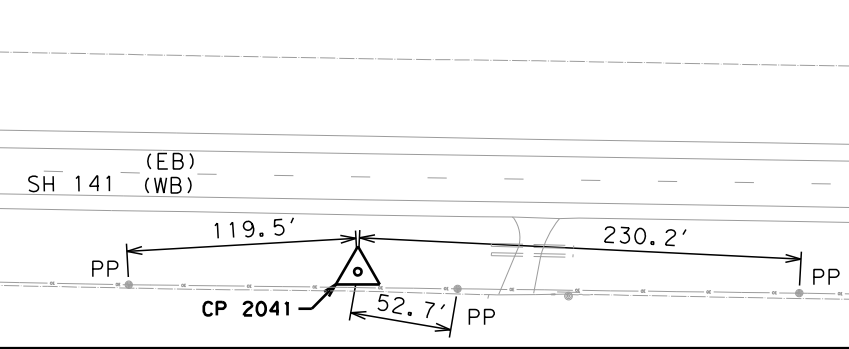
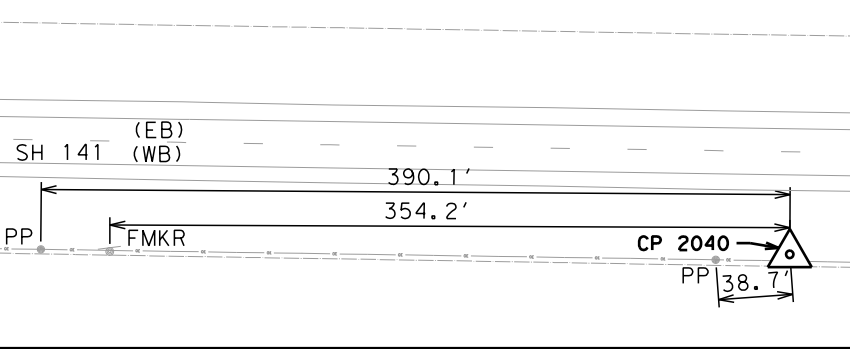
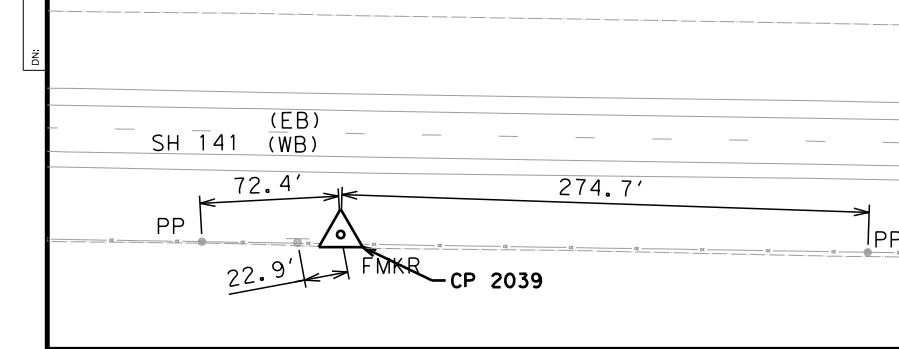
THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E



SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

SHEET 6 OF 10

CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		60



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 6.11 MILES EAST OF US 281 NB ENTRANCE RAMP

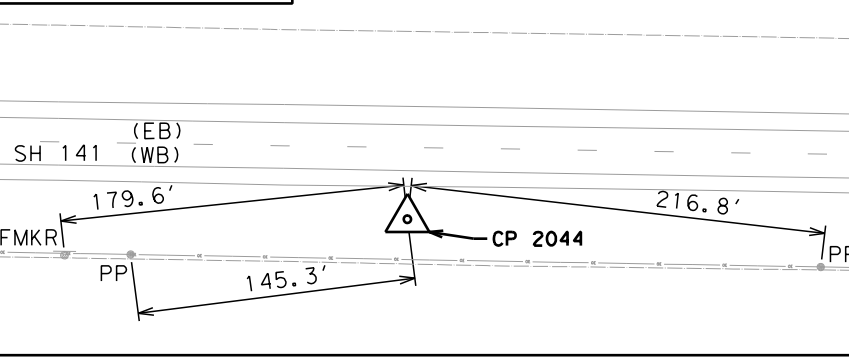
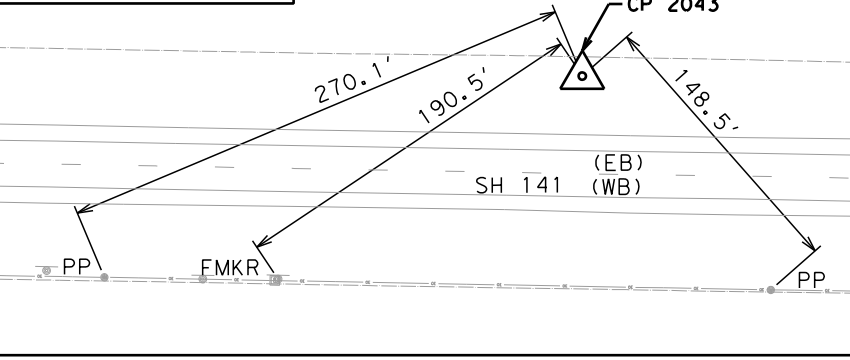
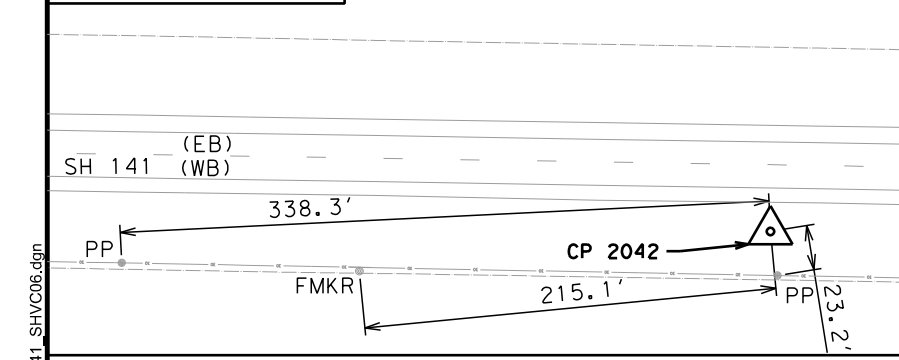
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.92 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.71 MILES EAST OF US 281 NB ENTRANCE RAMP

CP 2042
472+23.51
34.85' RT
N=17,086,326.72
E=1,143,688.22
ELEV=114.92'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2043
481+71.91
50.60' LT
N=17,086,370.92
E=1,142,737.01
ELEV=116.03'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2044
490+93.34
37.68' RT
N=17,086,583.59
E=1,141,836.12
ELEV=117.76'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.54 MILES EAST OF US 281 NB ENTRANCE RAMP

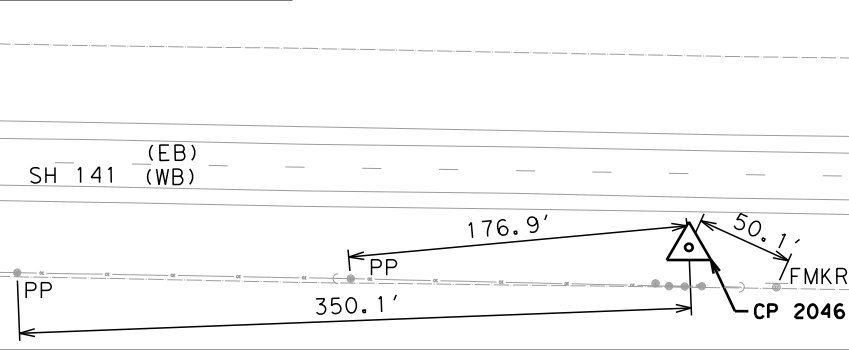
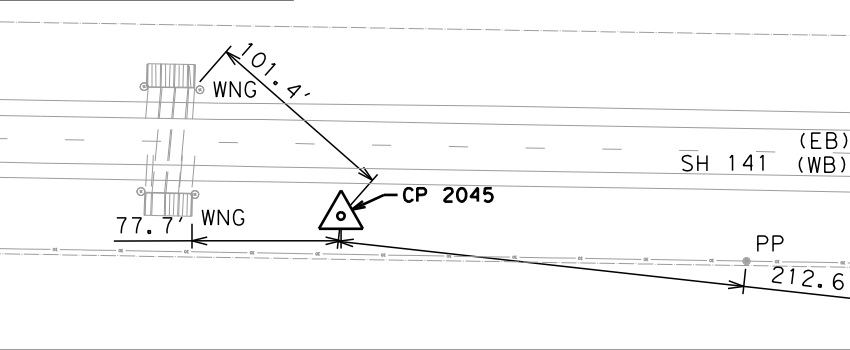
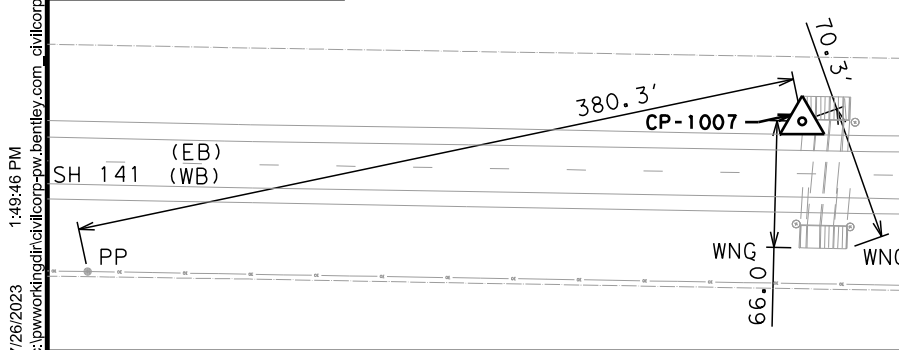
SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 5.36 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 5.18 MILES EAST OF US 281 NB ENTRANCE RAMP

CP 1007
500+23.64
26.48' LT
N=17,086,646.43
E=1,140,905.73
ELEV=120.85'
BRASS CAP STAMPED
"KL141G 2007"

CP 2045
501+25.79
38.11' RT
N=17,086,724.30
E=1,140,813.30
ELEV=118.47'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2046
510+32.28
39.58' RT
N=17,086,848.92
E=1,139,915.42
ELEV=118.88'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 5.01 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.99 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.82 MILES EAST OF US 281 NB ENTRANCE RAMP

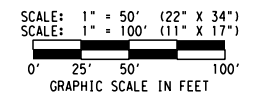
DATE: 7/26/2023 1:49:46 PM
FILE: c:\pwworking\civilcorp-pw-bentley.com\civilcorp-us\dms41509\SH141_SHVC06.dgn

CP 2047
522+28.44
46.00' RT
N=17,087,017.81
E=1,138,731.22
ELEV=119.89'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2048
535+00.75
51.56' LT
N=17,087,094.04
E=1,137,457.46
ELEV=121.28'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 1008
539+91.69
25.40' LT
N=17,087,186.67
E=1,136,974.62
ELEV=123.04'
BRASS CAP STAMPED
"KL141H"

NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
2. ALL PROJECT ELEVATIONS ARE ON NAVD88 UTILIZING NAVD 88 AND GEOID 18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 84.299 FEET ON TXDOT MONUMENT "KING RANCH".
3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



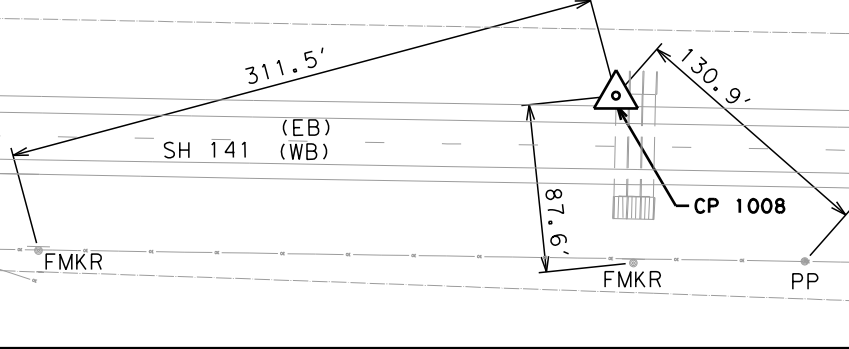
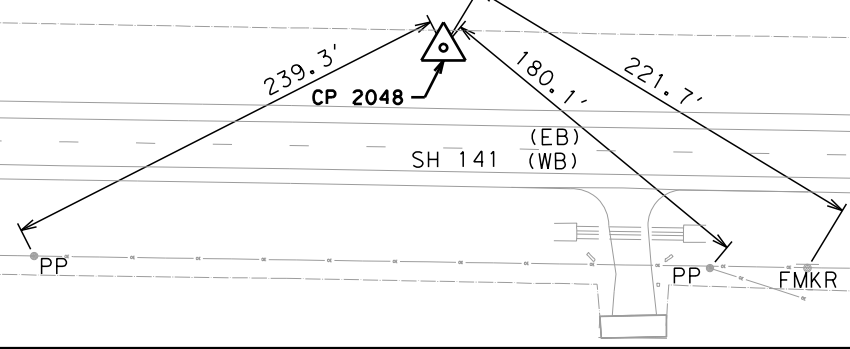
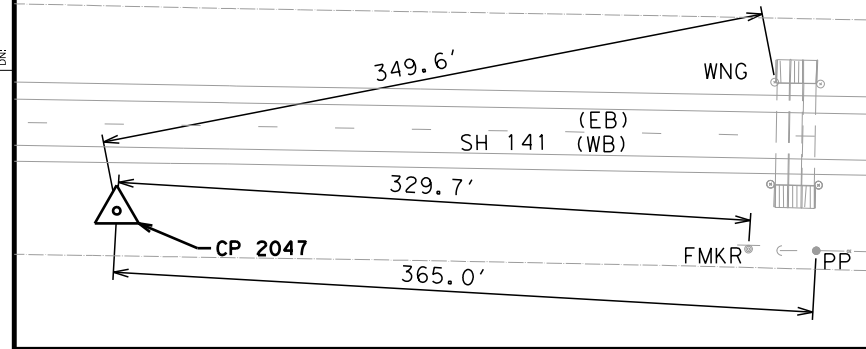
2023.07.26
13:59:48
-05'00"
SIGNED: BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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



SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

SHEET 7 OF 10			
CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		61



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.59 MILES EAST OF US 281 NB ENTRANCE RAMP

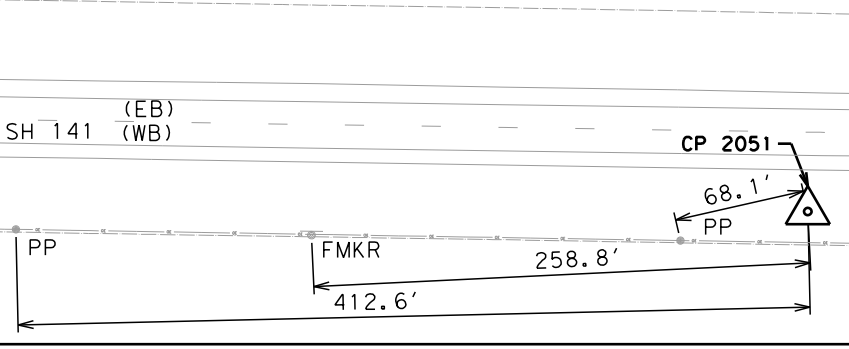
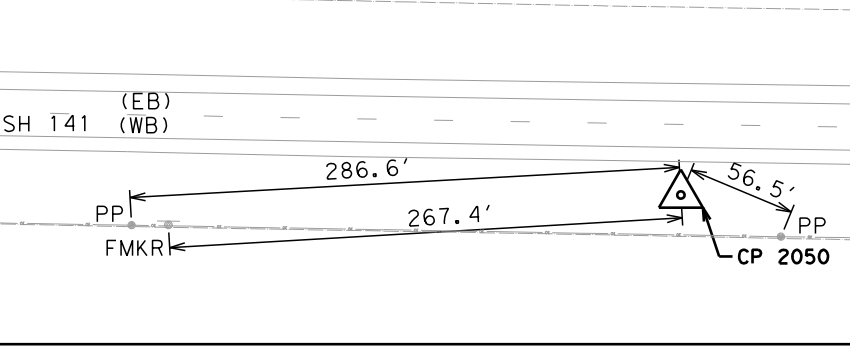
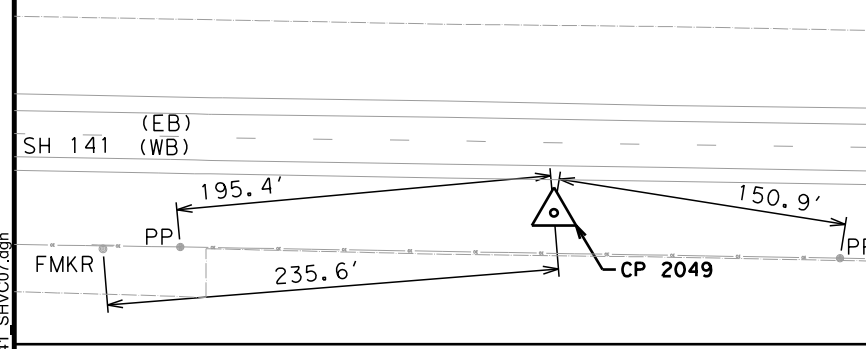
SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 4.35 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 4.25 MILES EAST OF US 281 NB ENTRANCE RAMP

CP 2049
546+27.47
37.89' RT
N=17,087,335.75
E=1,136,353.34
ELEV=121.04'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2050
557+50.63
38.76' RT
N=17,087,489.23
E=1,135,240.72
ELEV=124.14'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2051
569+03.18
43.25' RT
N=17,087,650.28
E=1,134,099.47
ELEV=129.05'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 4.13 MILES EAST OF US 281 NB ENTRANCE RAMP

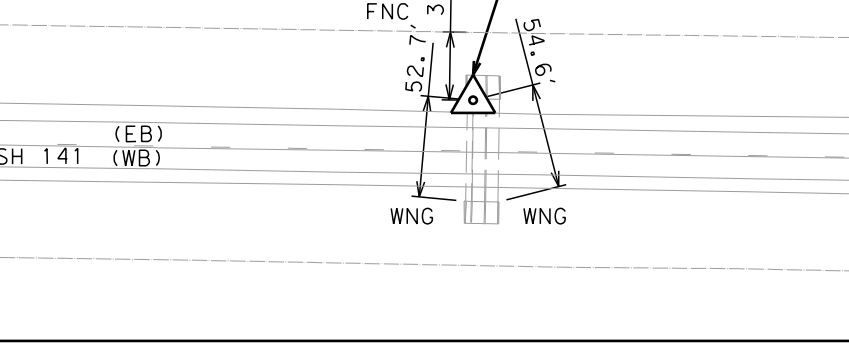
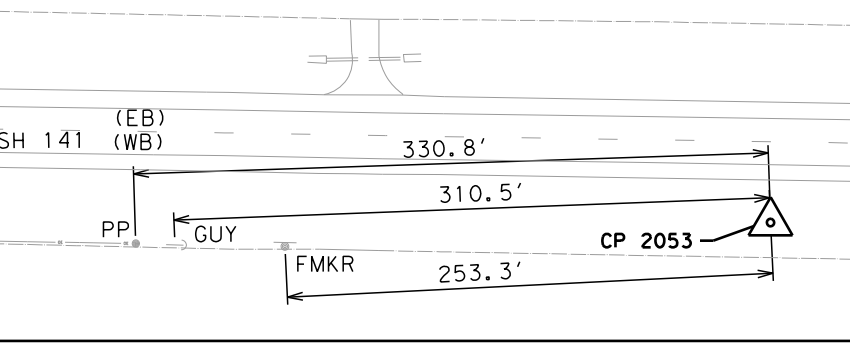
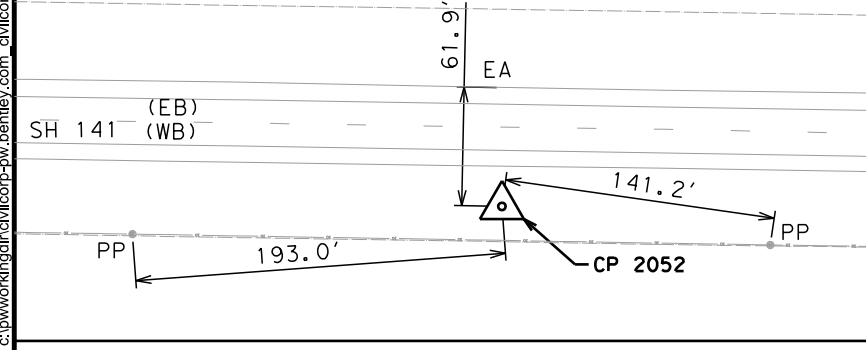
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.92 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.70 MILES EAST OF US 281 NB ENTRANCE RAMP

CP 2052
580+62.81
42.22' RT
N=17,087,806.83
E=1,132,950.45
ELEV=131.79'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 2053
592+31.80
42.95' RT
N=17,087,966.39
E=1,131,792.40
ELEV=132.79'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

CP 1009
600+77.55
25.13' LT
N=17,088,013.86
E=1,130,945.24
ELEV=132.21'
BRASS CAP STAMPED
"KL141K 2007"

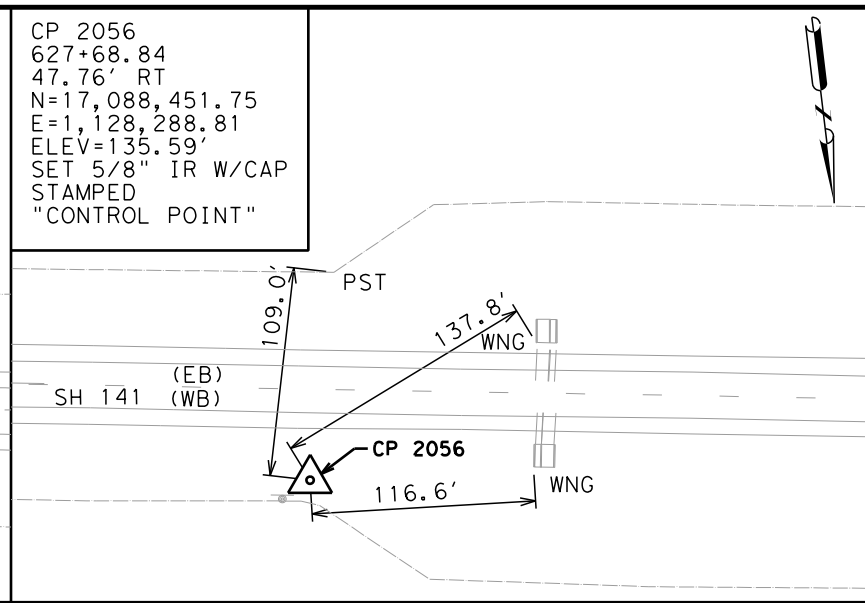
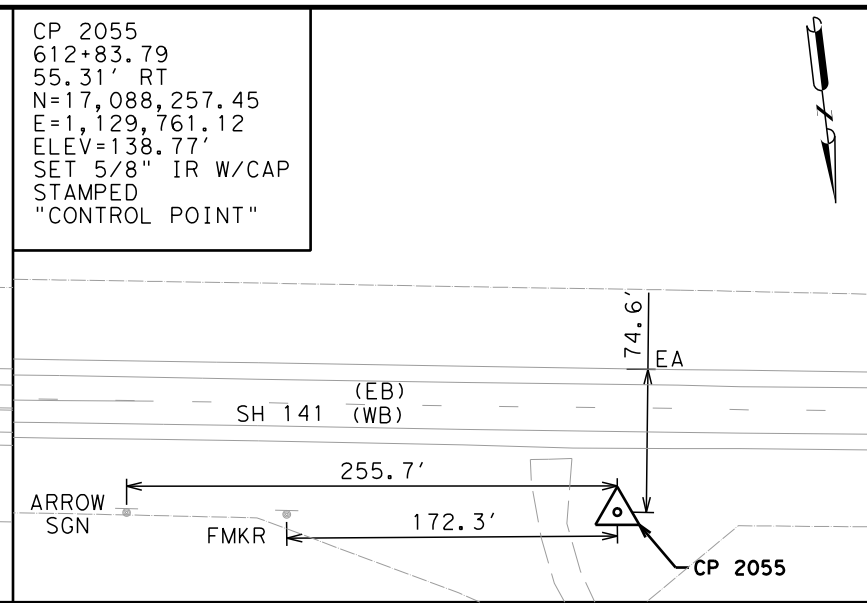
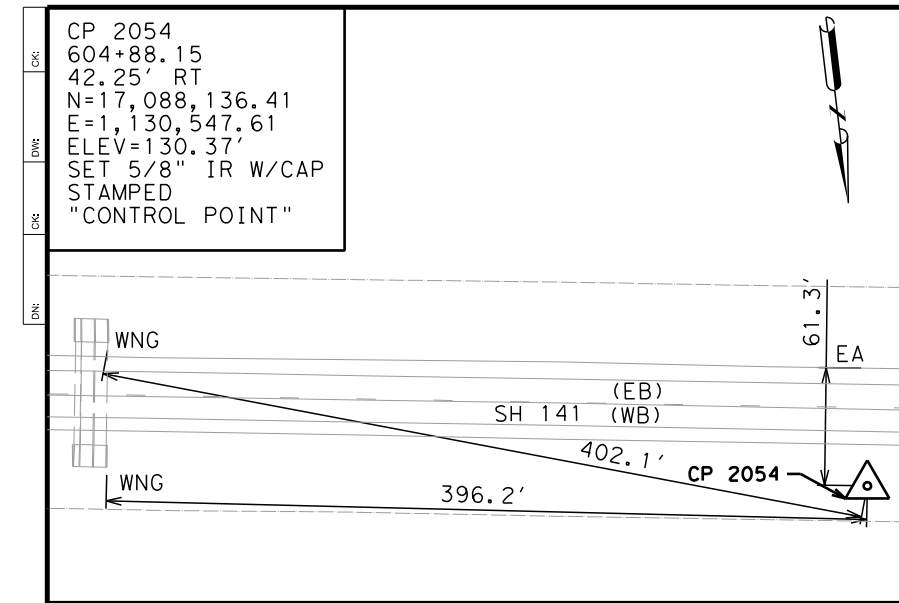


SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.48 MILES EAST OF US 281 NB ENTRANCE RAMP

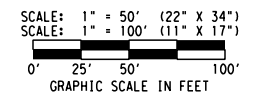
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 3.26 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 3.10 MILES EAST OF US 281 NB ENTRANCE RAMP

DATE: 7/26/2023 1:49:50 PM
FILE: c:\pwworking\civilcorp-pw-bentley.com\civilcorp-us\dms41509\SH141_SHVC07.dgn



NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
2. ALL PROJECT ELEVATIONS ARE ON NAVD88 UTILIZING NAVD 88 AND GEOID 18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 84.299 FEET ON TXDOT MONUMENT "KING RANCH".
3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



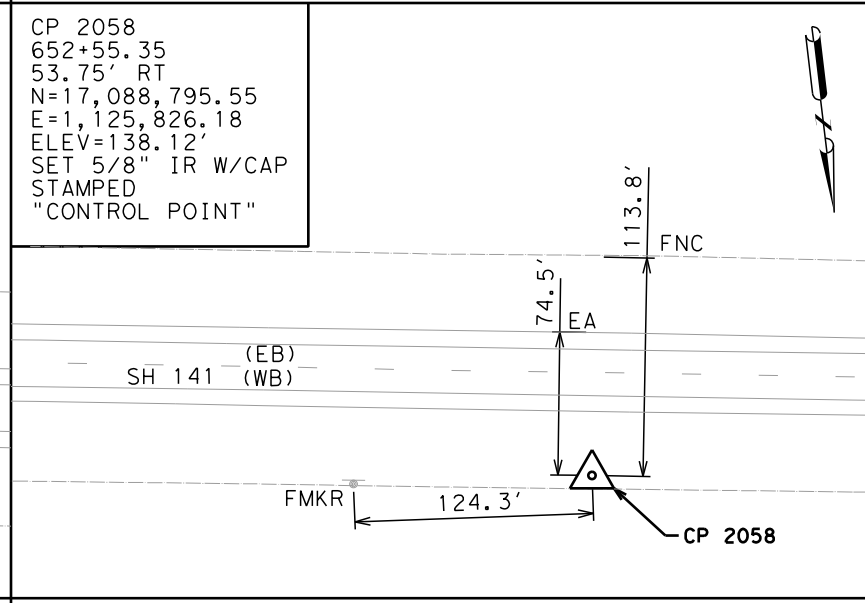
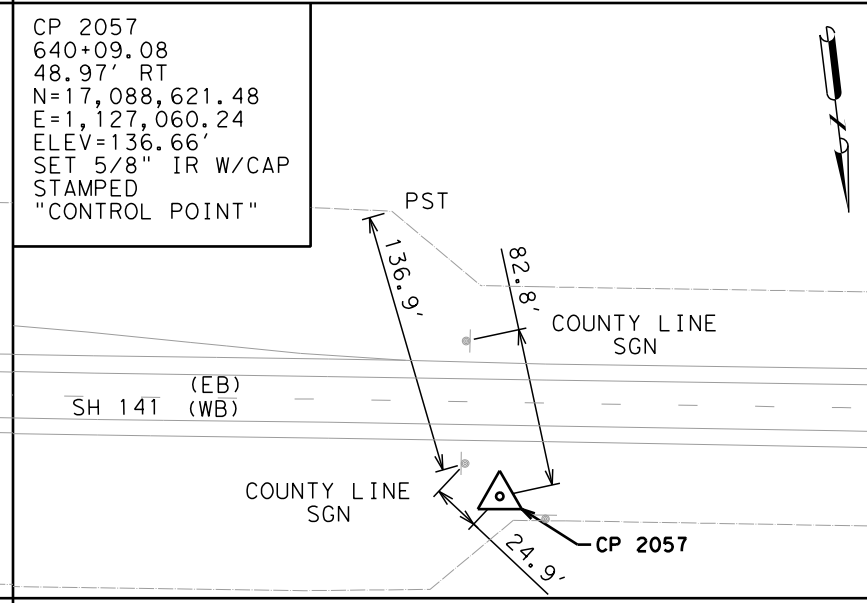
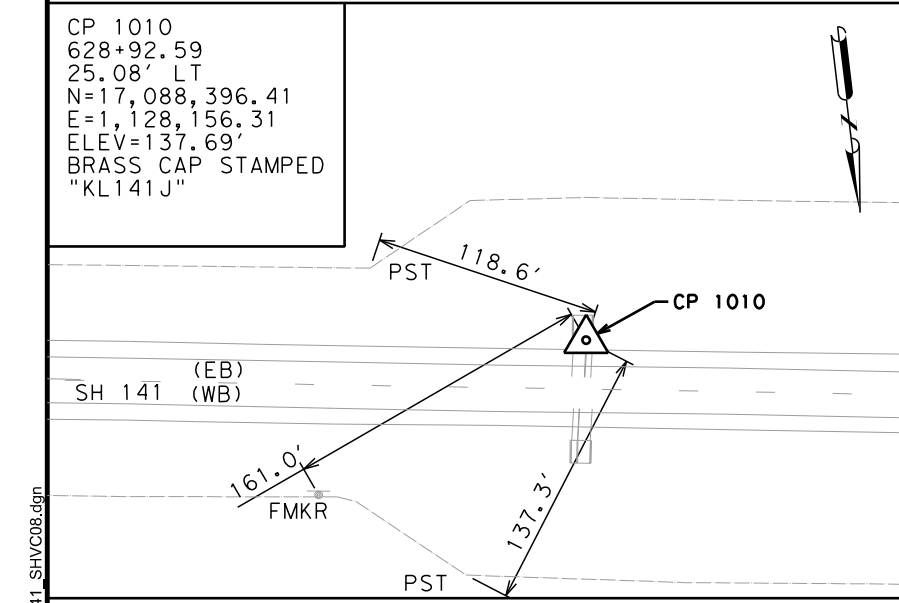
2023.07.26
14:00:01
-05'00"
SIGNED: BRANDON M. ABSBER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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

SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 3.02 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 2.87 MILES EAST OF US 281 NB ENTRANCE RAMP

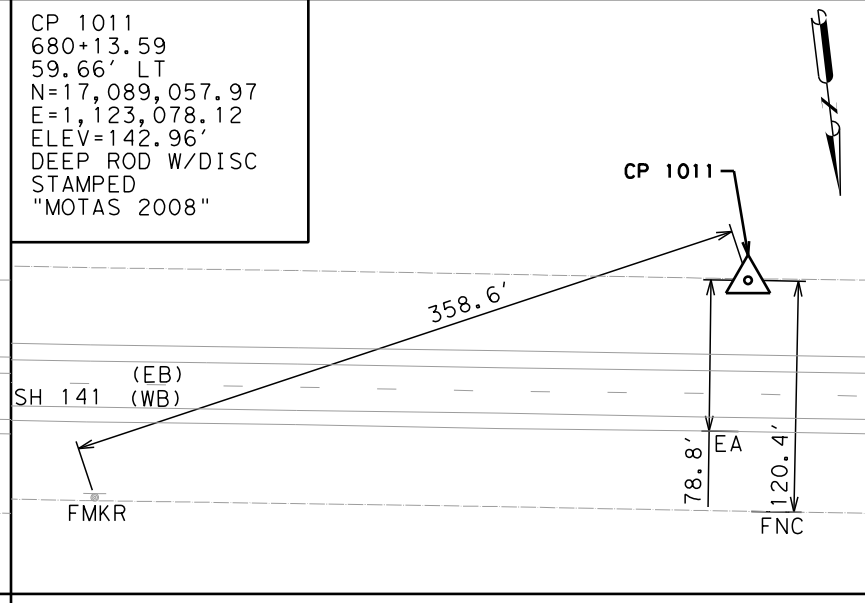
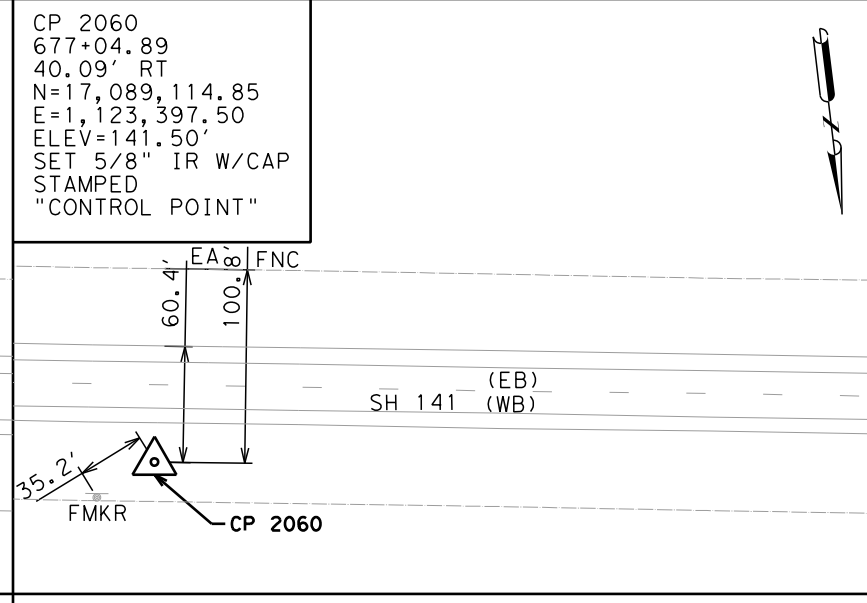
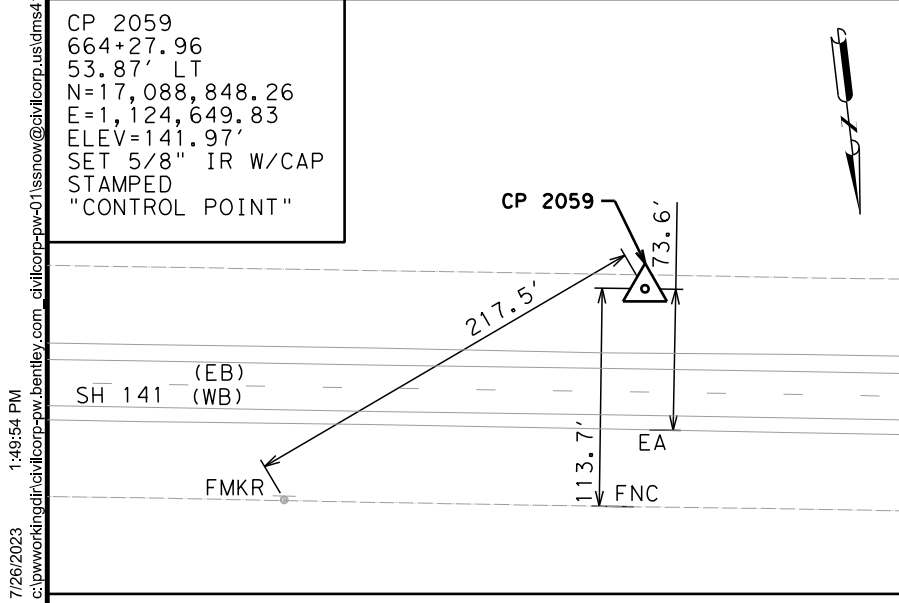
SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 2.59 MILES EAST OF US 281 NB ENTRANCE RAMP



SITUATED ON THE SOUTH SIDE OF SH 141 APPROXIMATELY 2.57 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 2.36 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 2.12 MILES EAST OF US 281 NB ENTRANCE RAMP



SITUATED ON THE SOUTH SIDE OF SH 141 APPROXIMATELY 1.90 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141 APPROXIMATELY 1.66 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE SOUTH SIDE OF SH 141 APPROXIMATELY 1.60 MILES EAST OF US 281 NB ENTRANCE RAMP



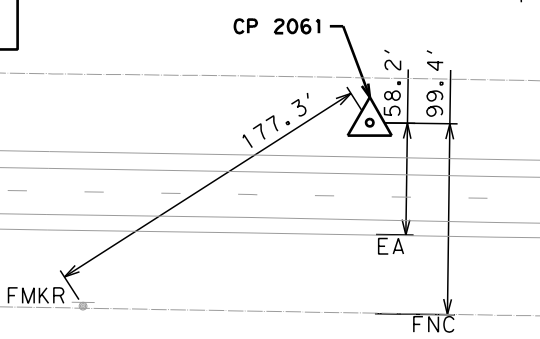
SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

SHEET 8 OF 10

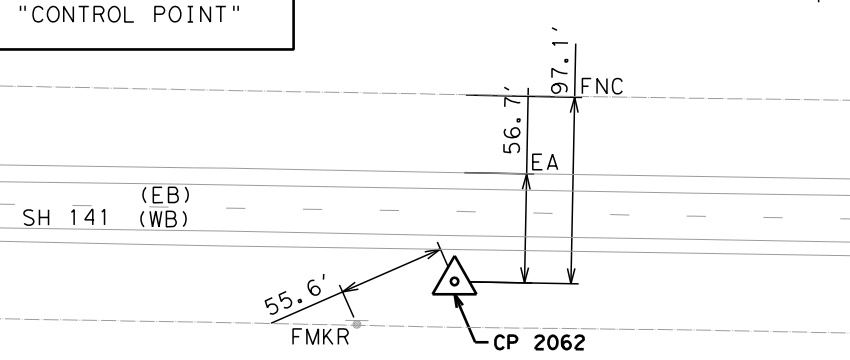
CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		62

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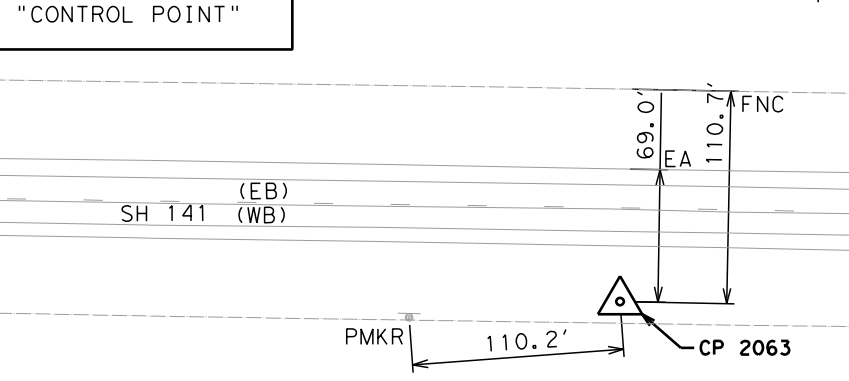
CP 2061
686+09.30
38.36' LT
N=17,089,160.02
E=1,122,490.82
ELEV=143.26'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



CP 2062
696+60.93
36.71' RT
N=17,089,377.29
E=1,121,459.14
ELEV=145.72'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



CP 2063
708+21.57
49.04' RT
N=17,089,547.20
E=1,120,310.94
ELEV=151.38'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"

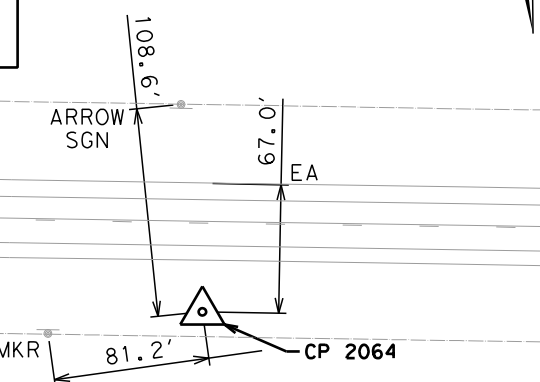


SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 1.49 MILES EAST OF US 281 NB ENTRANCE RAMP

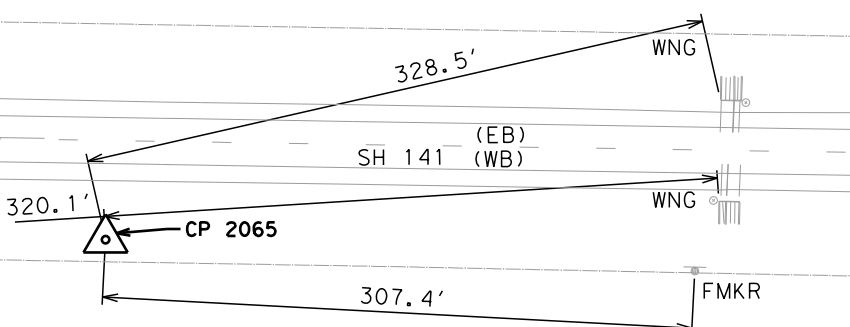
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 1.29 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 1.07 MILES EAST OF US 281 NB ENTRANCE RAMP

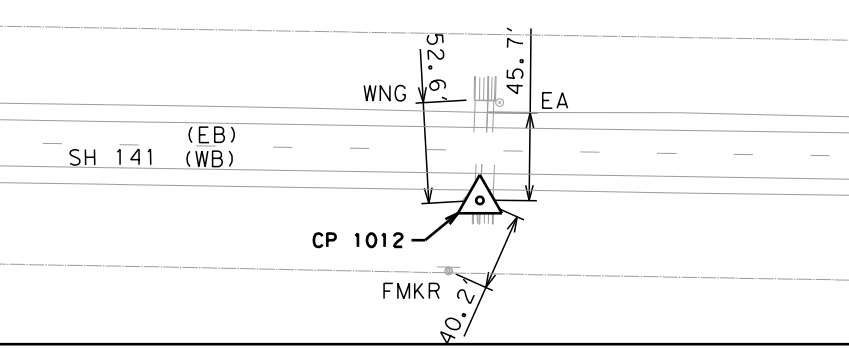
CP 2064
719+48.97
46.52' RT
N=17,089,697.89
E=1,119,193.66
ELEV=159.16'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



CP 2065
730+46.58
51.04' RT
N=17,089,851.52
E=1,118,106.84
ELEV=158.53'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



CP 1012
733+69.45
25.26' RT
N=17,089,869.85
E=1,117,783.46
ELEV=158.51'
BRASS CAP STAMPED
"JW141A 2007"

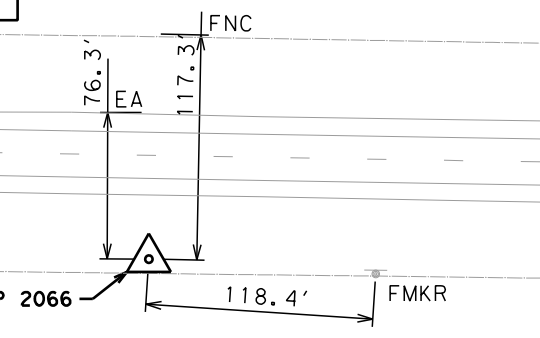


SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 0.85 MILES EAST OF US 281 NB ENTRANCE RAMP

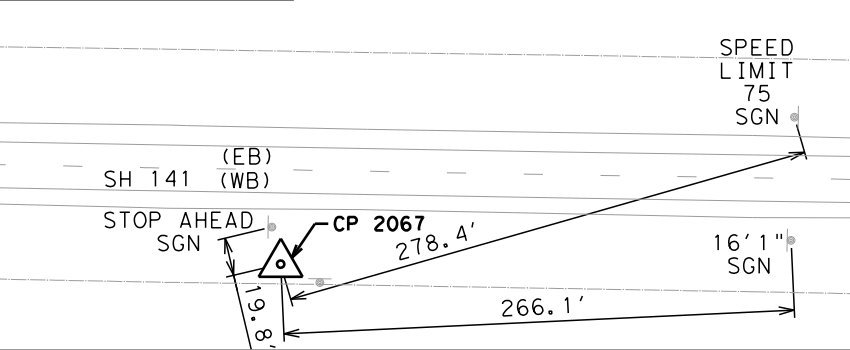
SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 0.65 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 0.58 MILES EAST OF US 281 NB ENTRANCE RAMP

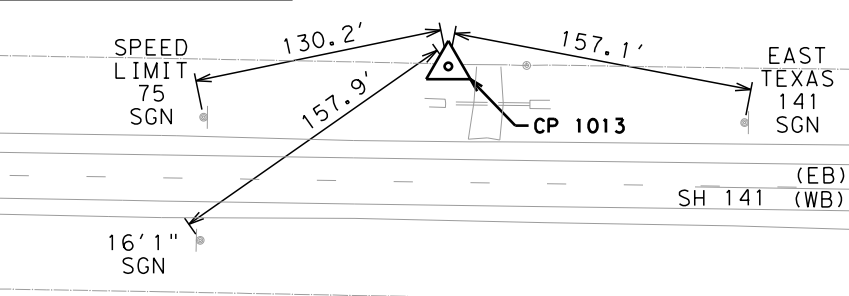
CP 2066
743+08.47
53.29' RT
N=17,090,025.21
E=1,116,856.96
ELEV=157.82'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



CP 2067
754+15.46
48.69' RT
N=17,090,171.06
E=1,115,759.61
ELEV=159.09'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



CP 1013
758+08.83
60.81' LT
N=17,090,116.02
E=1,115,355.01
ELEV=161.03'
DEEP ROD W/DISC
STAMPED "RATAMOSA"

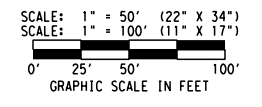


SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 0.41 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE NORTH SIDE OF SH 141
APPROXIMATELY 0.20 MILES EAST OF US 281 NB ENTRANCE RAMP

SITUATED ON THE SOUTH SIDE OF SH 141
APPROXIMATELY 0.12 MILES EAST OF US 281 NB ENTRANCE RAMP

- NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00063.
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 3. THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION. THE UPDATED, RECOVERED CONTROL WAS PREVIOUSLY ESTABLISHED BY TXDOT.
 4. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



2023.07.26
14:00:13
-05'00"
SIGNED: BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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



SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

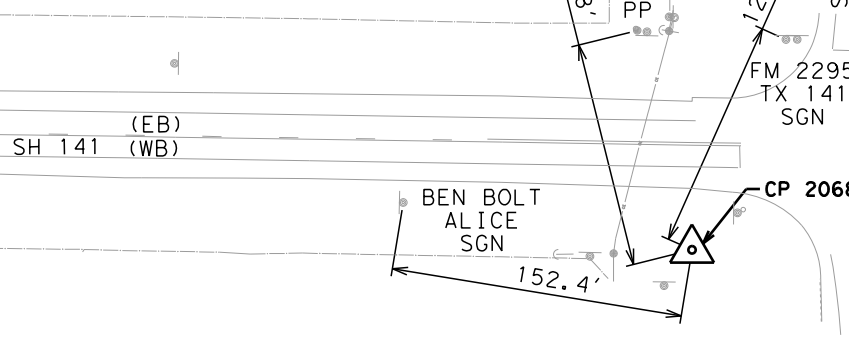
SHEET 9 OF 10

CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, KLEBERG		63

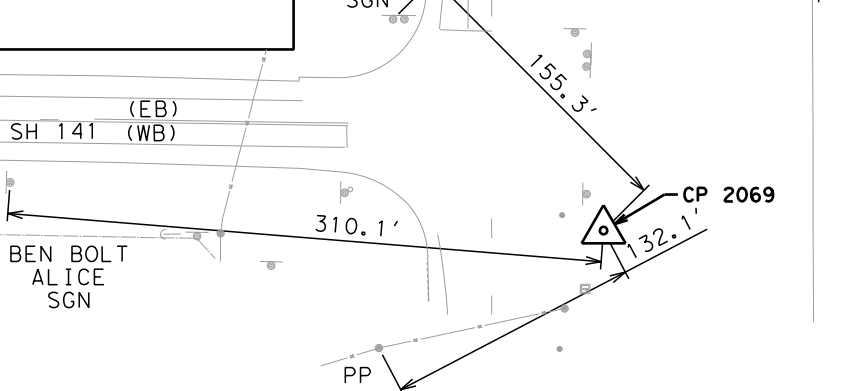
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CPK
DNR
DNR

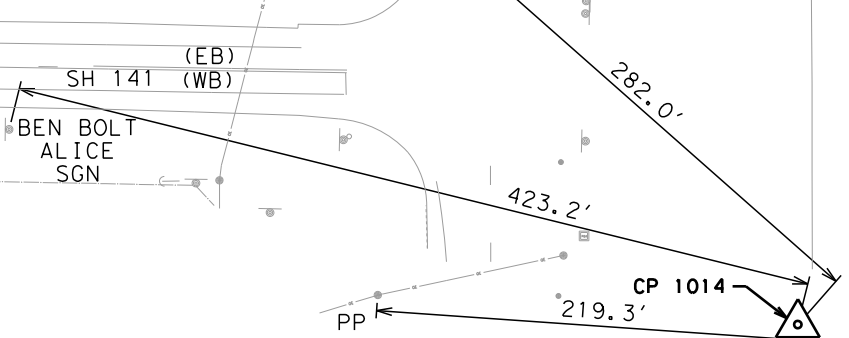
CP 2068
763+57.35
53.84' RT
N=17,090,304.14
E=1,114,827.16
ELEV=162.90'
SET 5/8" IR W/CAP
STAMPED
"CONTROL POINT"



CP 2069
NA
NA RT
N=17,090,323.56
E=1,114,669.73
ELEV=162.66'
SET MAG NAIL



CP 1014
NA
NA RT
N=17,090,411.76
E=1,114,577.84
ELEV=182.92'
DEEP ROD W/DISC
STAMPED
"ESCONDIDO"

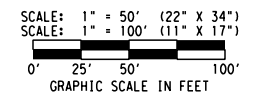


SITUATED AT THE INTERSECTION OF THE NORTH ROW OF SH 141 AND THE EAST ROW OF US 281

SITUATED ON THE WEST SIDE OF US 281 NORTHBOUND ENTRANCE RAMP APPROXIMATELY 140 FEET WEST OF SH 141

SITUATED ON THE EAST SIDE OF US 281 NORTH BOUND APPROXIMATELY 270 FEET NORTHWEST OF SH 141

- NOTES:
1. ALL COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE HXGN SMARTNET NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000063.
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2023.07.26
14:00:27
-05'00"
SIGNED: *Brandon M. Absher*
BRANDON M. ABSHER
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 6654

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



SH 141
HORIZONTAL &
VERTICAL CONTROL
SHEET

SHEET 10 OF 10

CONT	SECT	JOB	HIGHWAY
0383	03, 04	024, 060	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, KLEBERG	64	

DATE: 7/26/2023 1:50:01 PM
FILE: c:\pwworking\civilcorp-pw-01\ssnov@civilcorp.us\dms41509\SH141_SHVC10.dgn

**SH 141
HORIZONTAL ALIGNMENT DATA**

Alignment Name: BL CL-SH141
 Alignment Description:
 Alignment Style: Alignment\Baseline
 Station Northing Easting

Element: Linear
 POT () 93+99.550 R1 17080042.255 1180521.046
 PC () 133+92.073 R1 17082183.624 1177151.361
 Tangential Direction: N57.565°W
 Tangential Length: 3992.523

Element: Circular
 PC () 133+92.073 R1 17082183.624 1177151.361
 PI () 148+41.404 R1 17082960.965 1175928.127
 CC () 17077347.866 1174078.331
 PT () 162+31.180 R1 17083063.178 1174482.405
 Radius: 5729.578
 Delta: 28.391° Left
 Degree of Curvature (Arc): 1.000°
 Length: 2839.107

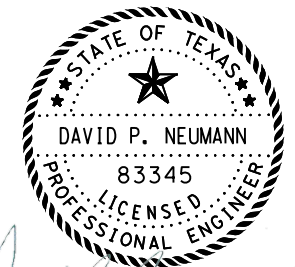
Tangent: 1449.331
 Chord: 2810.150
 Middle Ordinate: 174.956
 External: 180.466
 Back Tangent Direction: N57.565°W
 Back Radial Direction: N32.435°E
 Chord Direction: N71.760°W
 Ahead Radial Direction: N4.044°E
 Ahead Tangent Direction: N85.956°W

Element: Linear
 PT () 162+31.180 R1 17083063.178 1174482.405
 PC () 308+66.252 R1 17084095.304 1159883.773
 Tangential Direction: N85.956°W
 Tangential Length: 14635.072

Element: Circular
 PC () 308+66.252 R1 17084095.304 1159883.773
 PI () 312+42.912 R1 17084121.867 1159508.051
 CC () 17095525.927 1160691.920
 PT () 316+27.473 R2 17084173.047 1159134.885
 Radius: 11459.156
 Delta: 3.765° Right
 Degree of Curvature (Arc): 0.500°
 Length: 753.048

Tangent: 376.660
 Chord: 752.913
 Middle Ordinate: 6.185
 External: 6.189
 Back Tangent Direction: N85.956°W
 Back Radial Direction: N4.044°E
 Chord Direction: N84.073°W
 Ahead Radial Direction: N7.809°E
 Ahead Tangent Direction: N82.191°W

Element: Linear
 PT () 316+27.473 R2 17084173.047 1159134.885
 EQNBK 316+19.300 R1 17084173.047 1159134.885
 EQNAHD 316+27.473 R2 17084173.047 1159134.885
 POT () 764+56.676 R2 17090264.301 1114721.440
 Tangential Direction: N82.191°W
 Tangential Length: 44829.203



David P. Neumann, P.E.

2023.07.27 23:18:28-05'00'

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 TBPE Firm Reg. No. 10488



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ALIGNMENT DATA

SHEET 1 OF 1






CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		065

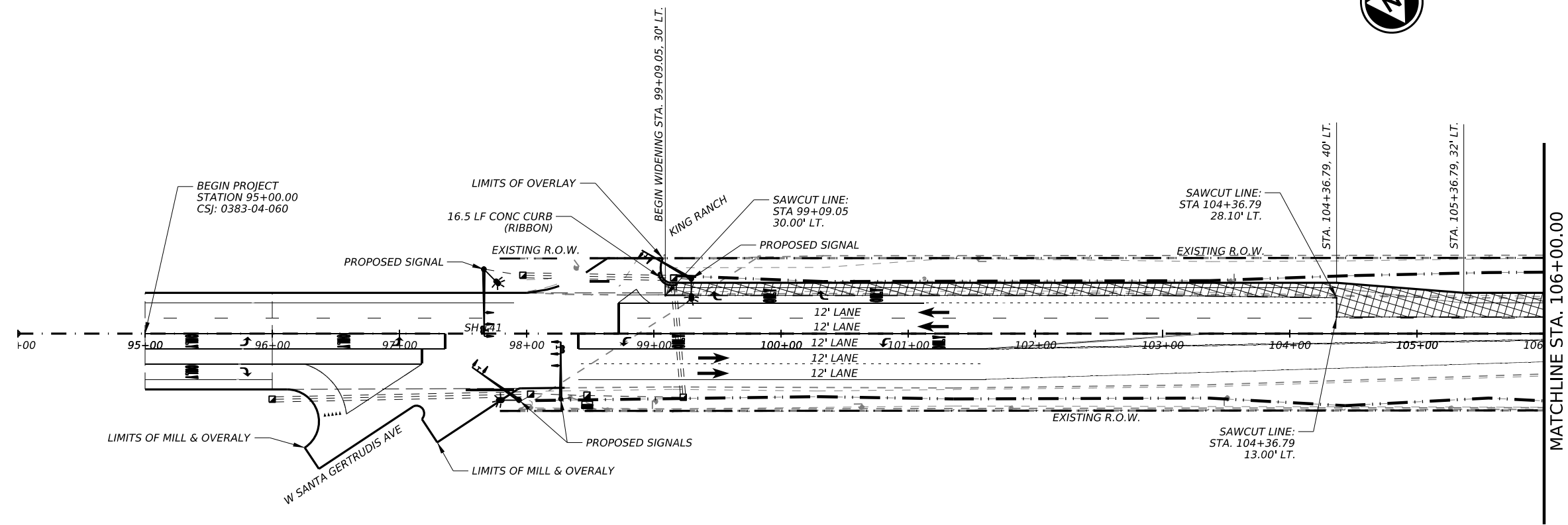
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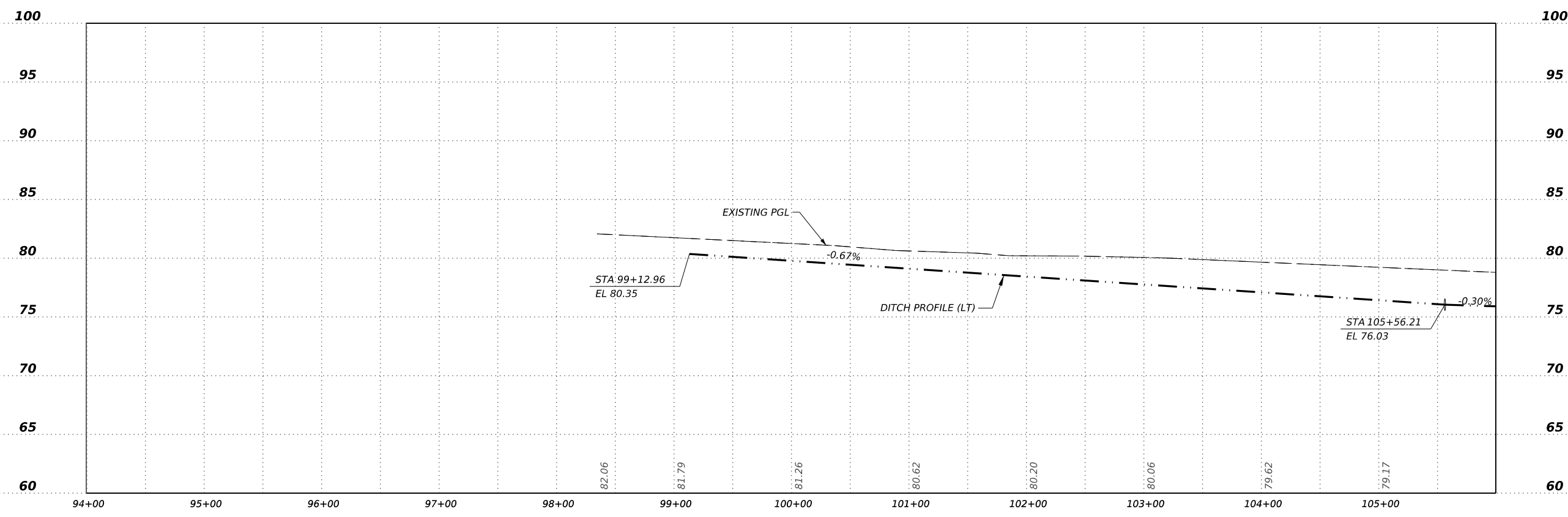
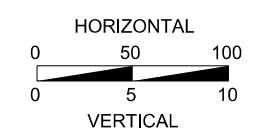
NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



- NOTE:
- 1) SEE INTERSECTION LAYOUT FOR MILLING LIMITS.
 - 2) SEE SH 141 TRAFFIC SIGNAL PROPOSED LAYOUT FOR DETAILS.



DAVID P. NEUMANN
83345
LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.27 22:33:01-05'00'

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Texas Department of Transportation

PLAN & PROFILE
STA. 98+00 TO STA. 106+00

SHEET 1 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		066

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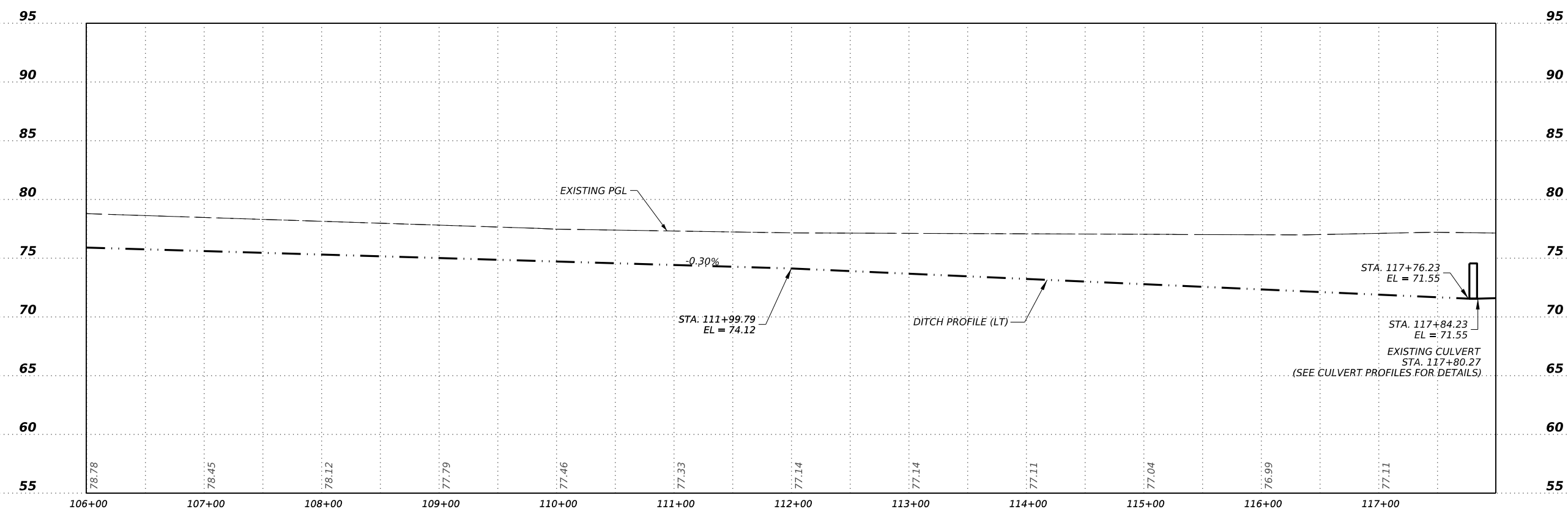
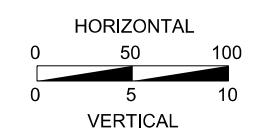
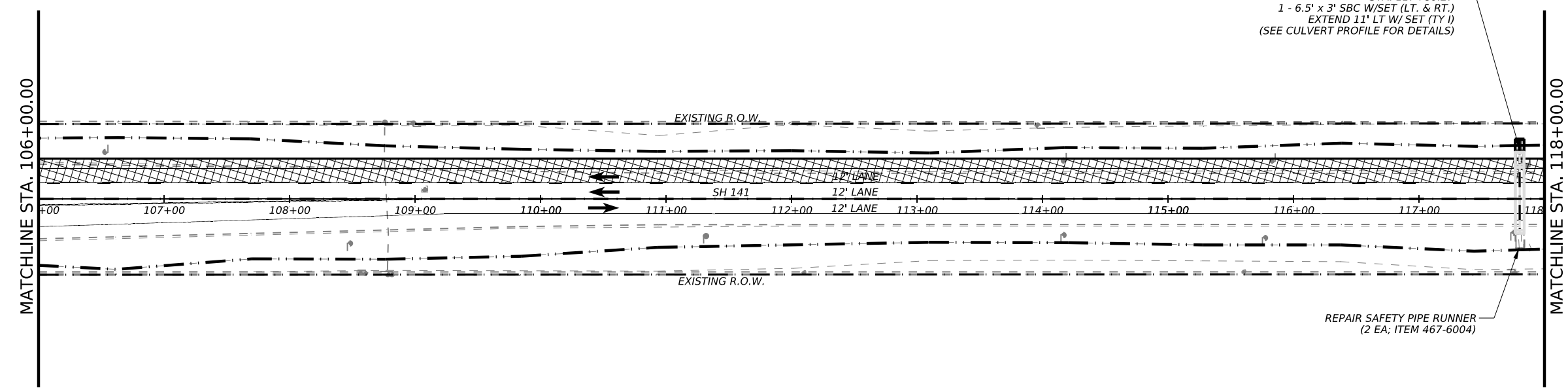
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

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2023.07.27 22:58:00-05'00'

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Texas Department of Transportation

PLAN & PROFILE
 STA. 106+00 TO STA. 118+00

SHEET 2 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	067

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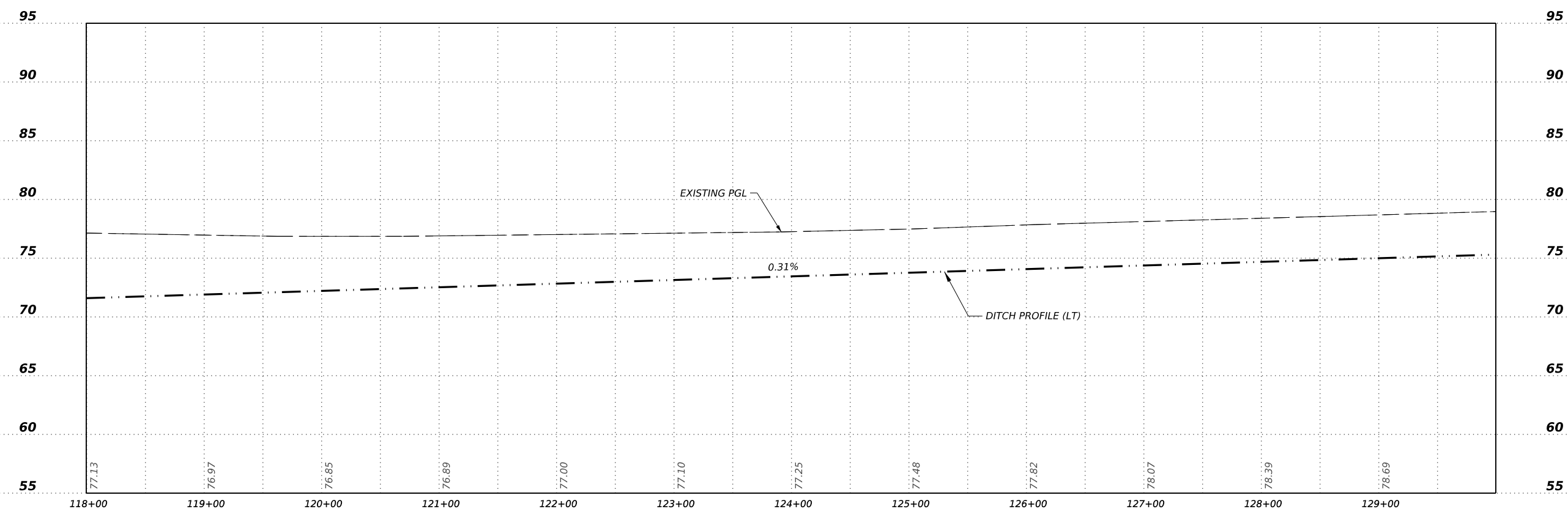
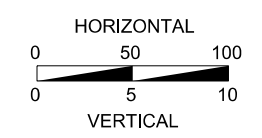
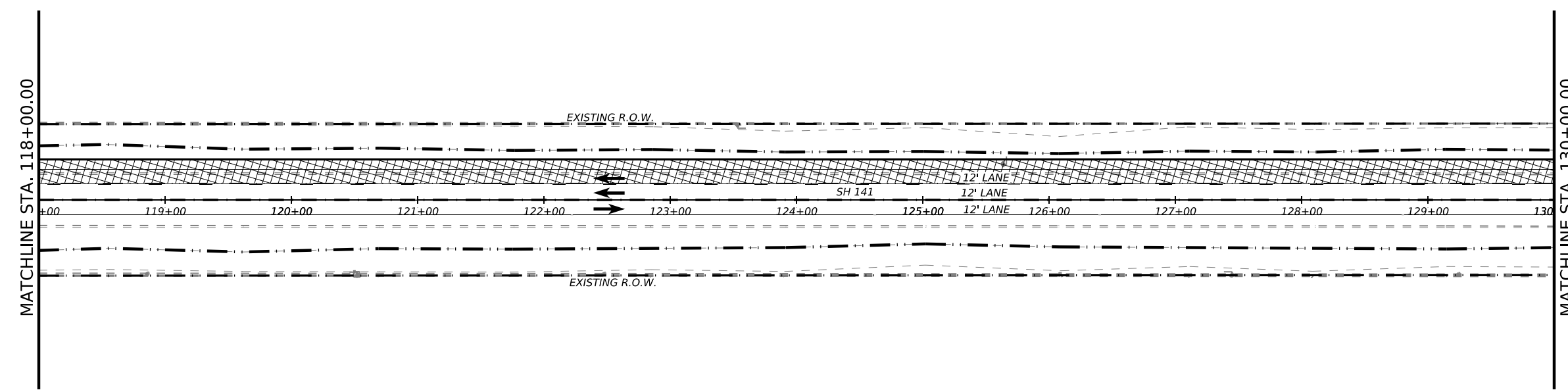
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



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 2023.07.27 22:30:08-05'00'
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PLAN & PROFILE
 STA. 118+00 TO STA. 130+00

SHEET 3 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	068	

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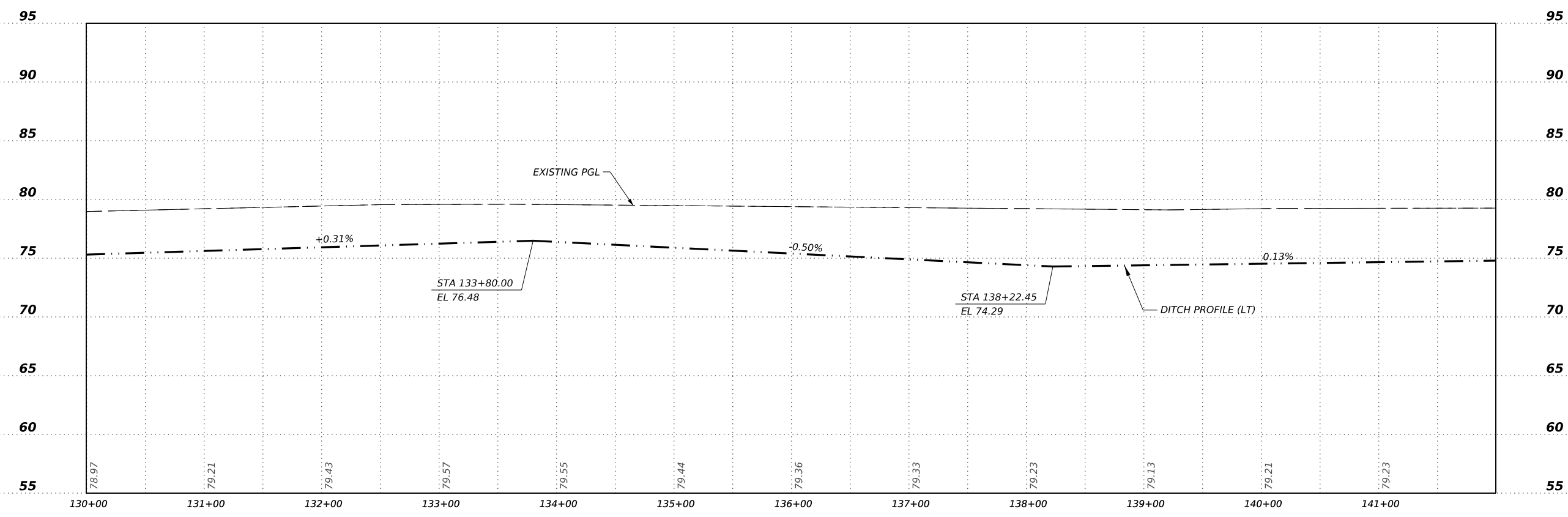
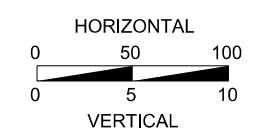
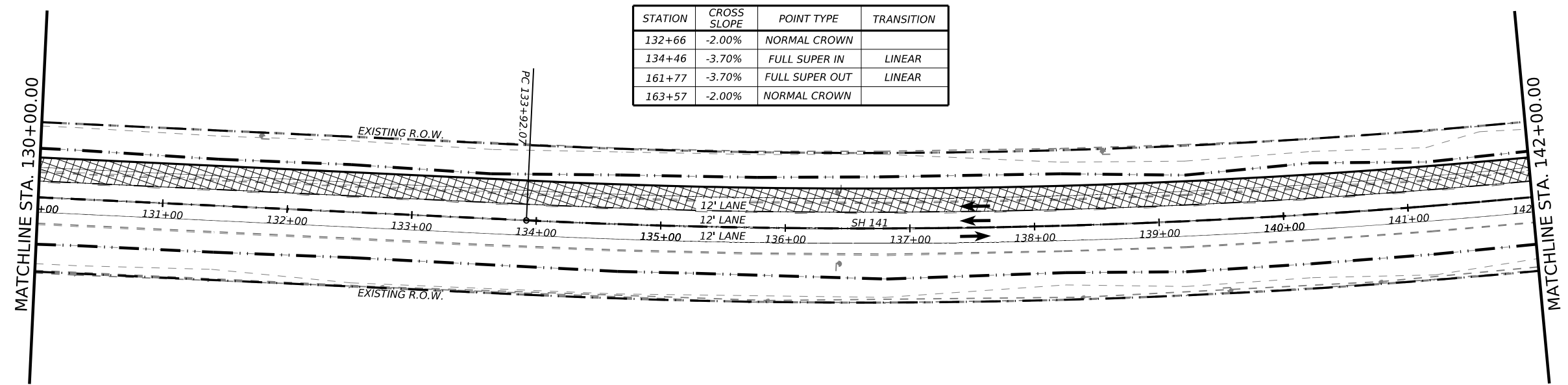
NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X

SUPERELEVATION TABLE

STATION	CROSS SLOPE	POINT TYPE	TRANSITION
132+66	-2.00%	NORMAL CROWN	
134+46	-3.70%	FULL SUPER IN	LINEAR
161+77	-3.70%	FULL SUPER OUT	LINEAR
163+57	-2.00%	NORMAL CROWN	



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

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 2023.07.27 22:37:11-05'00'

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 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 130+00 TO STA. 142+00

SHEET 4 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		069






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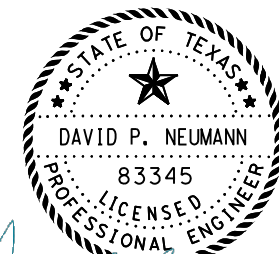
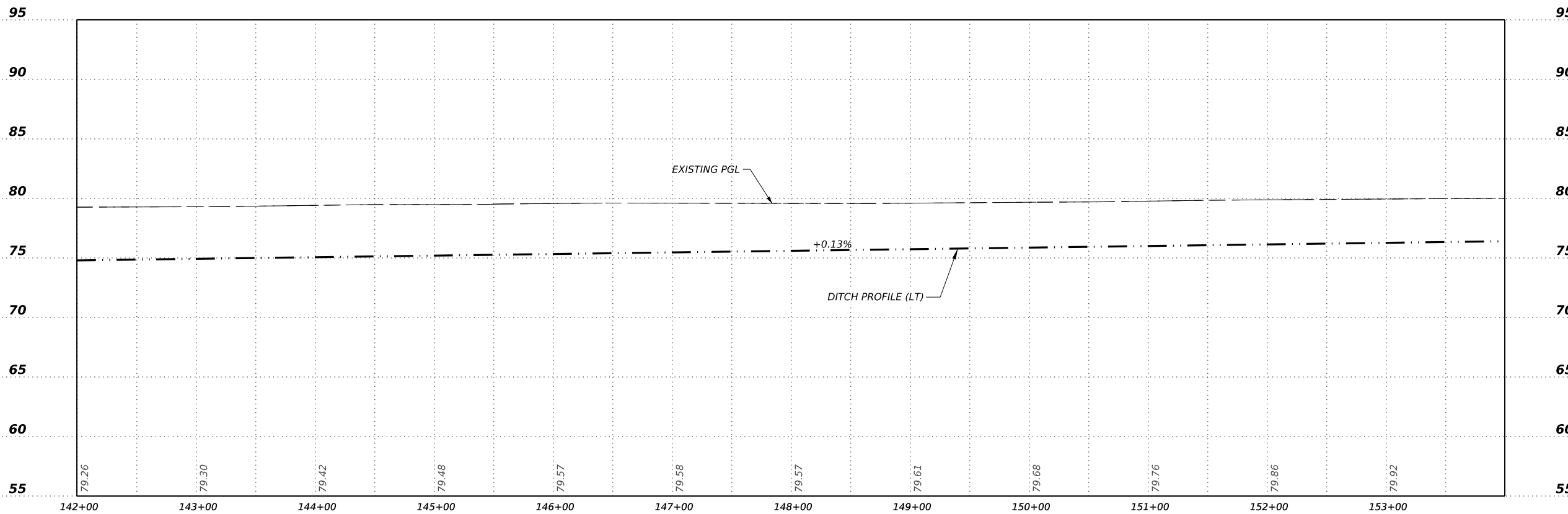
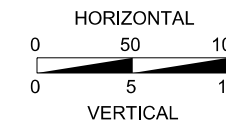
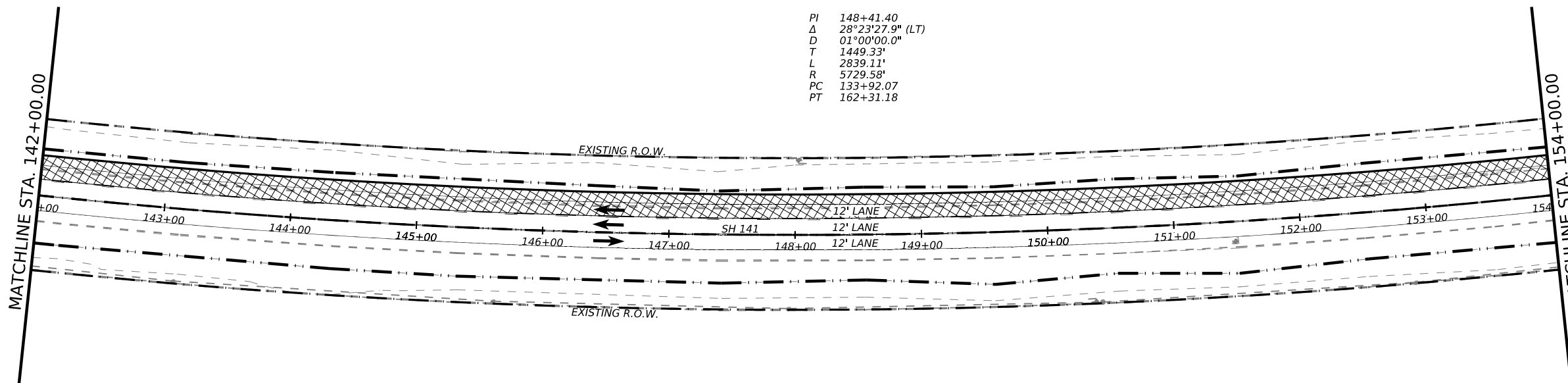


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

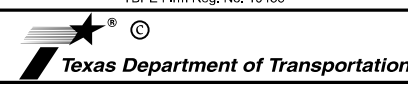
-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X

PI 148+41.40
 Δ 28°23'27.9" (LT)
 D 01°00'00.0"
 T 1449.33'
 L 2839.11'
 R 5729.58'
 PC 133+92.07
 PT 162+31.18



David P. Neumann, P.E.
 2023.07.27 22:43:58-05'00'

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PLAN & PROFILE
 STA. 142+00 TO STA. 154+00

SHEET 5 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	070	

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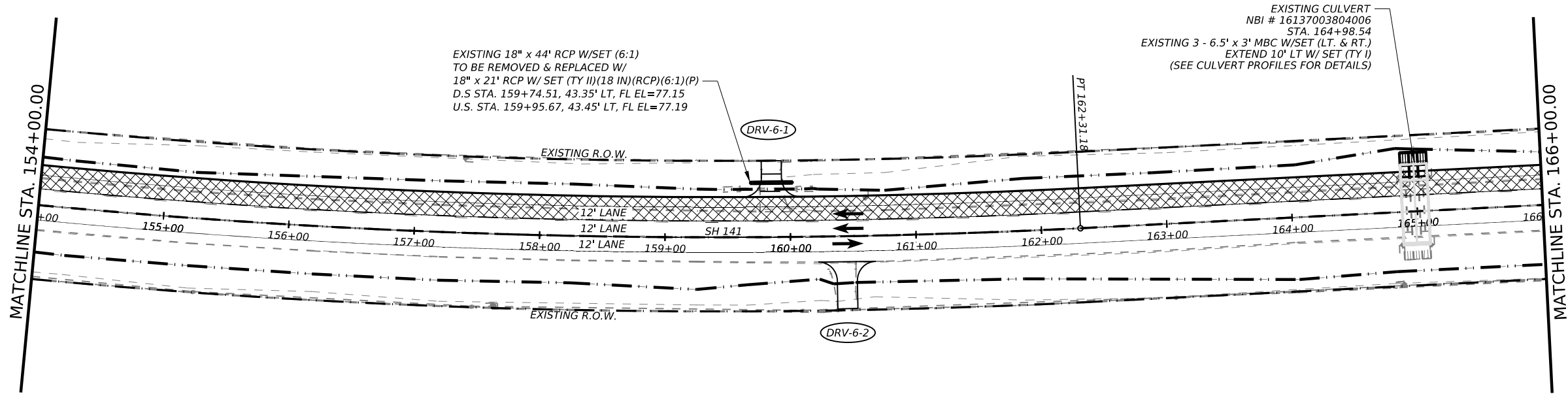
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

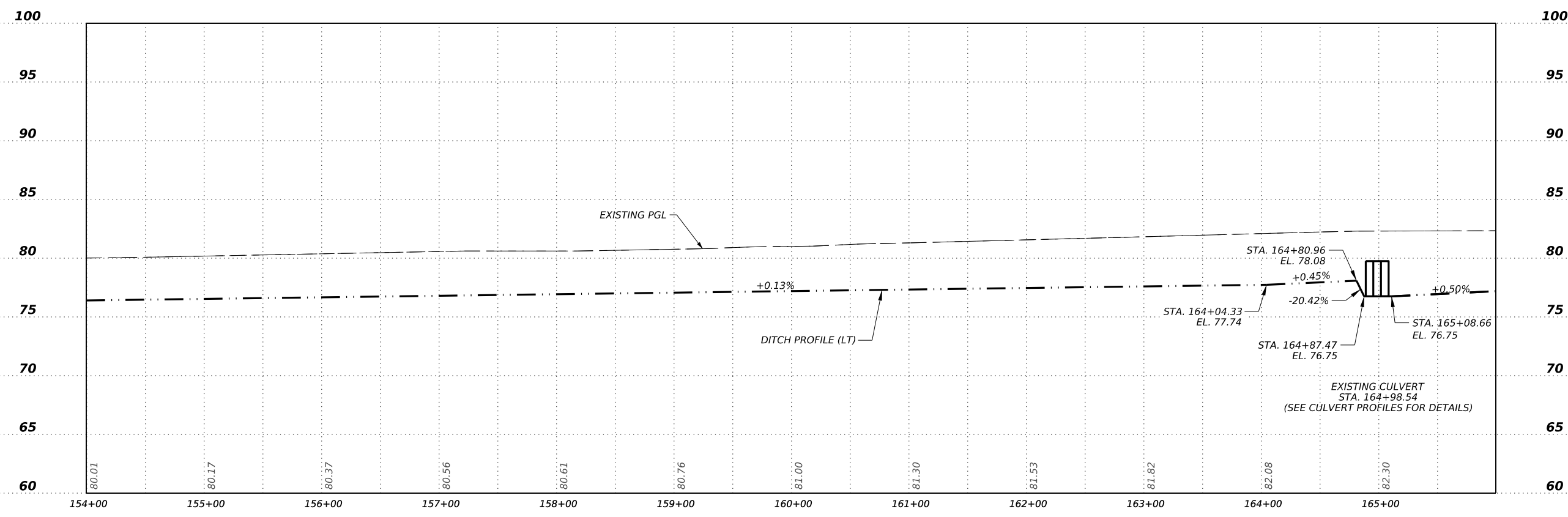
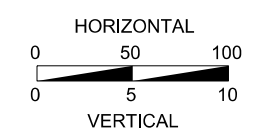
LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



EXISTING 18" x 44' RCP W/SET (6:1)
 TO BE REMOVED & REPLACED W/
 18" x 21' RCP W/ SET (TY II)(18 IN)(RCP)(6:1)(P)
 D.S STA. 159+74.51, 43.35' LT, FL EL=77.15
 U.S. STA. 159+95.67, 43.45' LT, FL EL=77.19

EXISTING CULVERT
 NBI # 16137003804006
 STA. 164+98.54
 EXISTING 3 - 6.5' x 3' MBC W/SET (LT. & RT.)
 EXTEND 10' LT W/ SET (TY I)
 (SEE CULVERT PROFILES FOR DETAILS)



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.

2023.07.27 22:53:00-05'00'
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Texas Department of Transportation

PLAN & PROFILE
 STA. 154+00 TO STA. 166+00

SHEET 6 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	071

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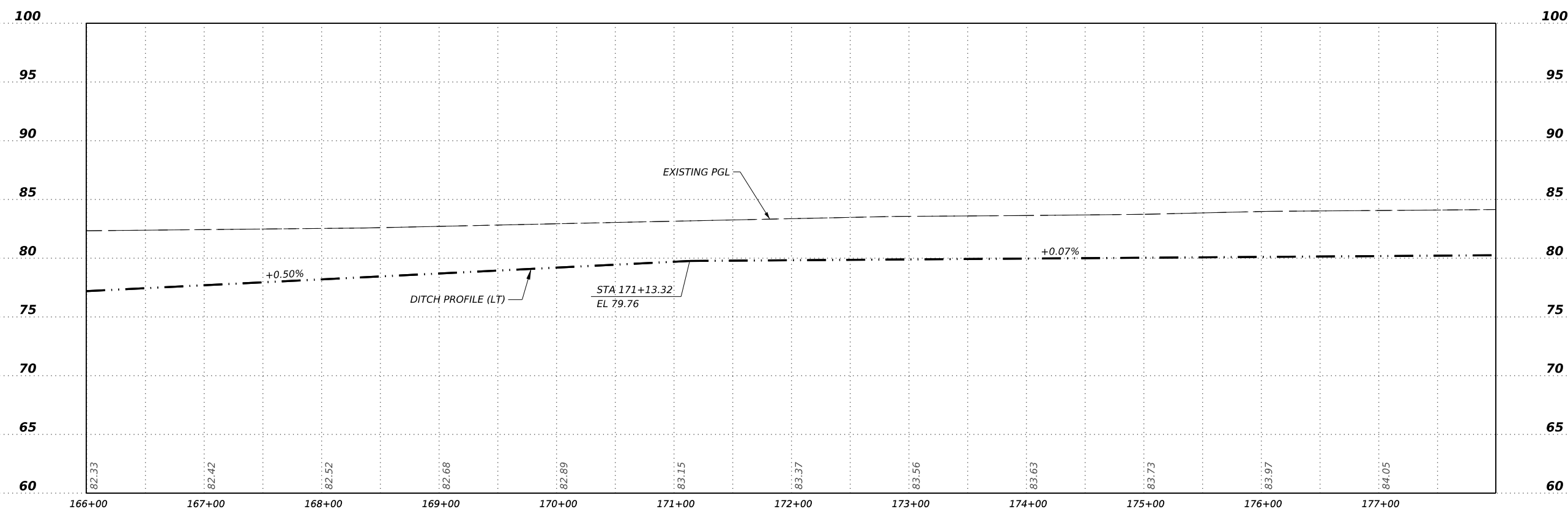
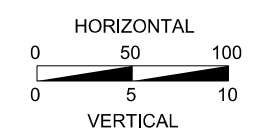
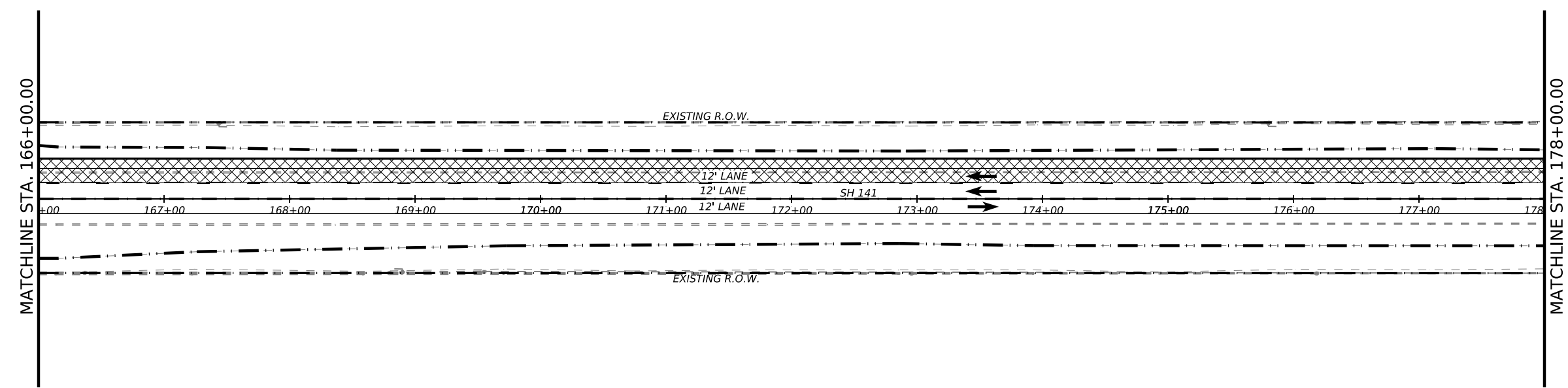
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.27 22:44:38-05'00'
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 TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 166+00 TO STA. 178+00

SHEET 7 OF 46

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	072

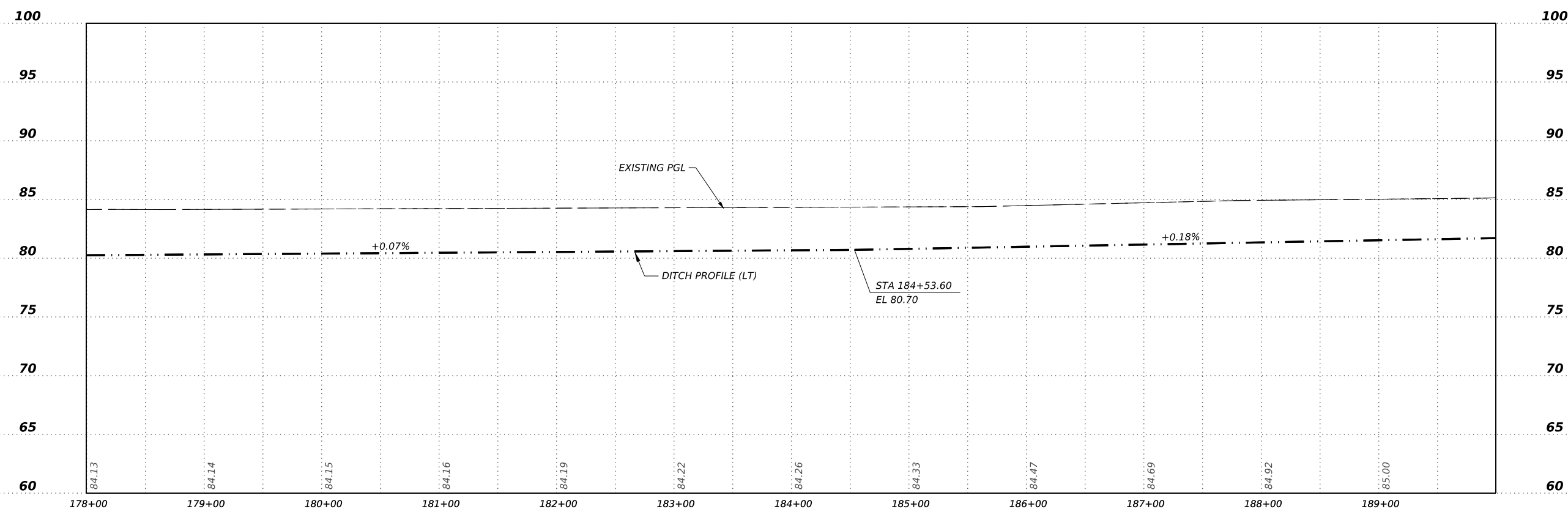
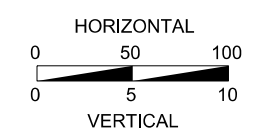
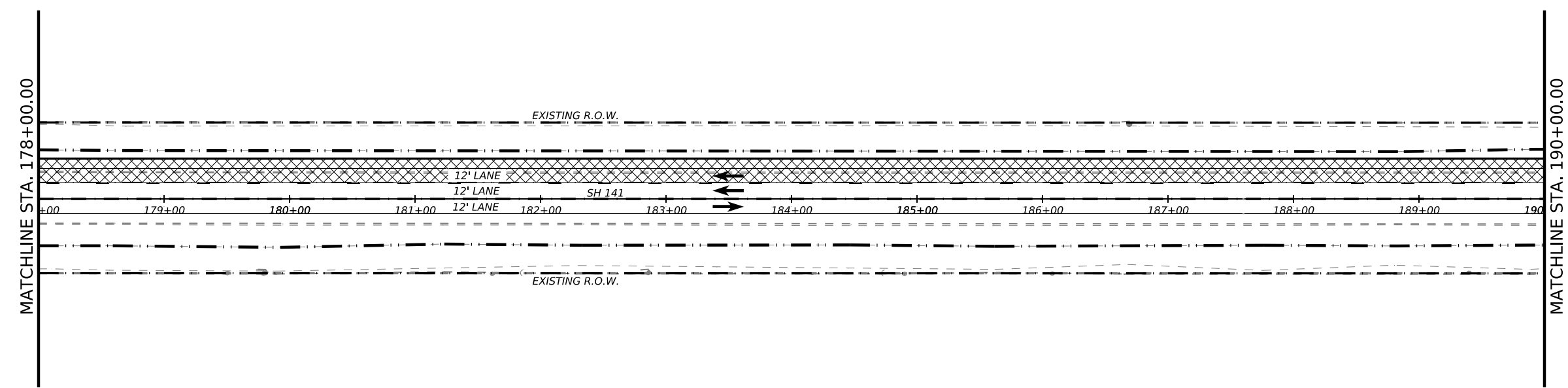
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.

2023.07.27 22:47:01-05'00'

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 TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 178+00 TO STA. 190+00

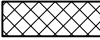




SHEET 8 OF 56			
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0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		073

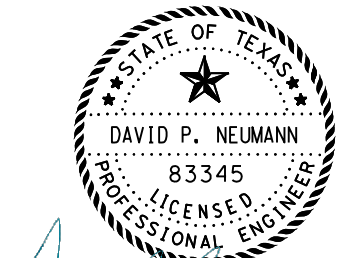
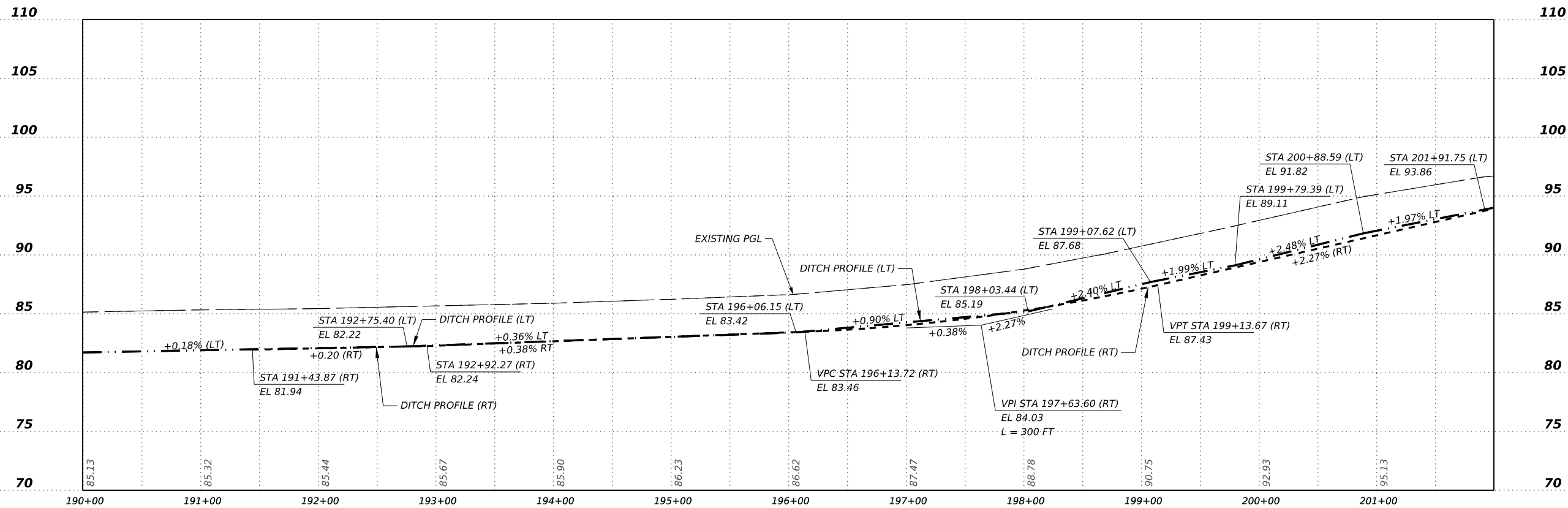
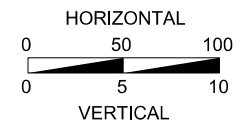
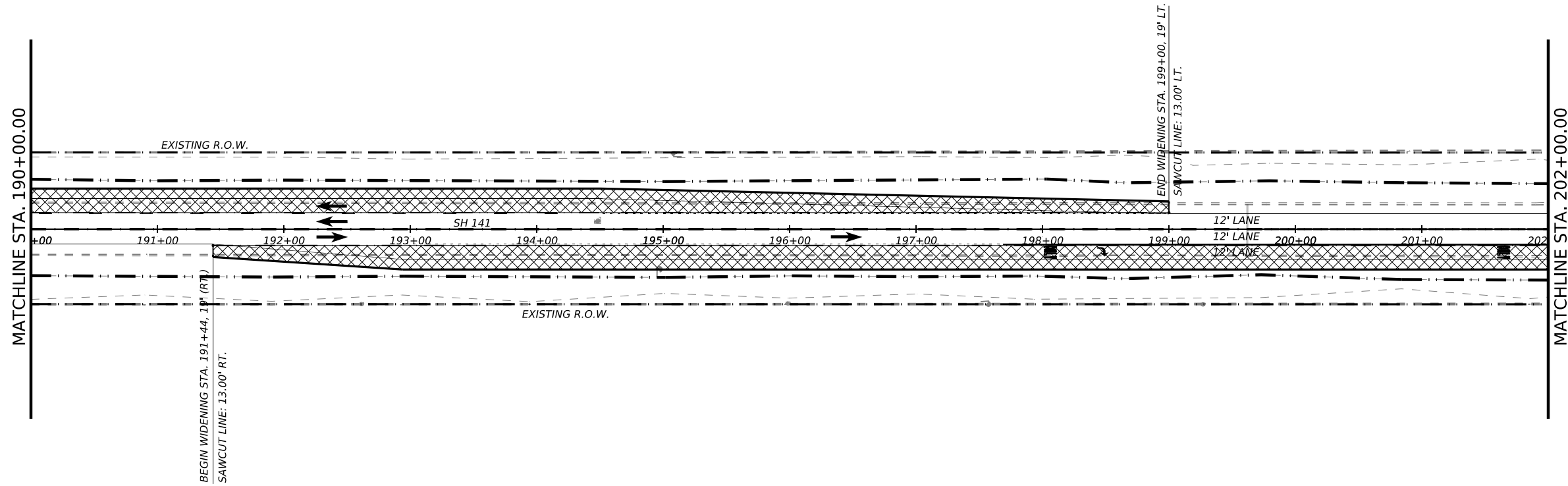
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



David P. Neumann, P.E.
2023.07.27 22:53:48-05'00'

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TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 190+00 TO STA. 202+00

SHEET 9 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	074







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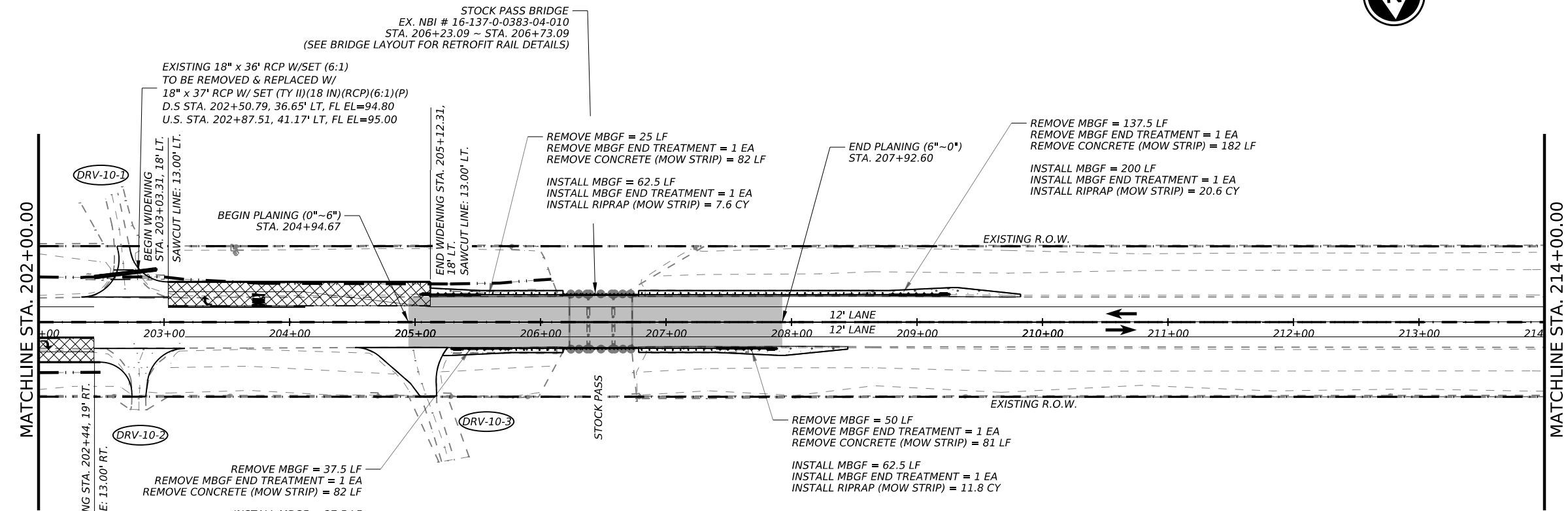
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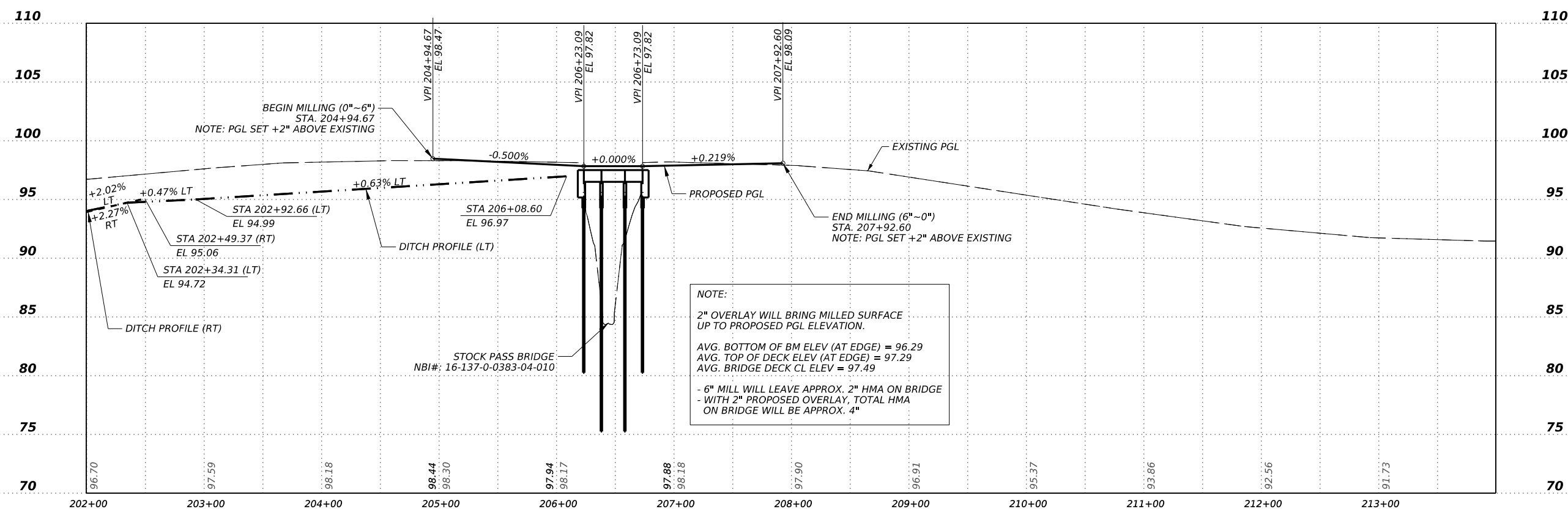
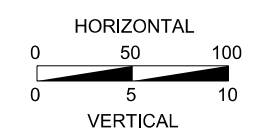
NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X
-  PLANE ASPH CONC PAV



NOTE:
INTENT OF MILLING IS TO MILL 6" OF EXISTING HMA FROM BRIDGE AND ADJUSTING APPROACHES FOR SMOOTH TRANSITION.
PROPOSED PGL IS SET 2" ABOVE THE 6" MILLING.



NOTE:
2" OVERLAY WILL BRING MILLED SURFACE UP TO PROPOSED PGL ELEVATION.
AVG. BOTTOM OF BM ELEV (AT EDGE) = 96.29
AVG. TOP OF DECK ELEV (AT EDGE) = 97.29
AVG. BRIDGE DECK CL ELEV = 97.49
- 6" MILL WILL LEAVE APPROX. 2" HMA ON BRIDGE
- WITH 2" PROPOSED OVERLAY, TOTAL HMA ON BRIDGE WILL BE APPROX. 4"

2023.07.27 22:57:25-05'00'
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PLAN & PROFILE
STA. 202+00 TO STA. 214+00

SHEET 10 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		075

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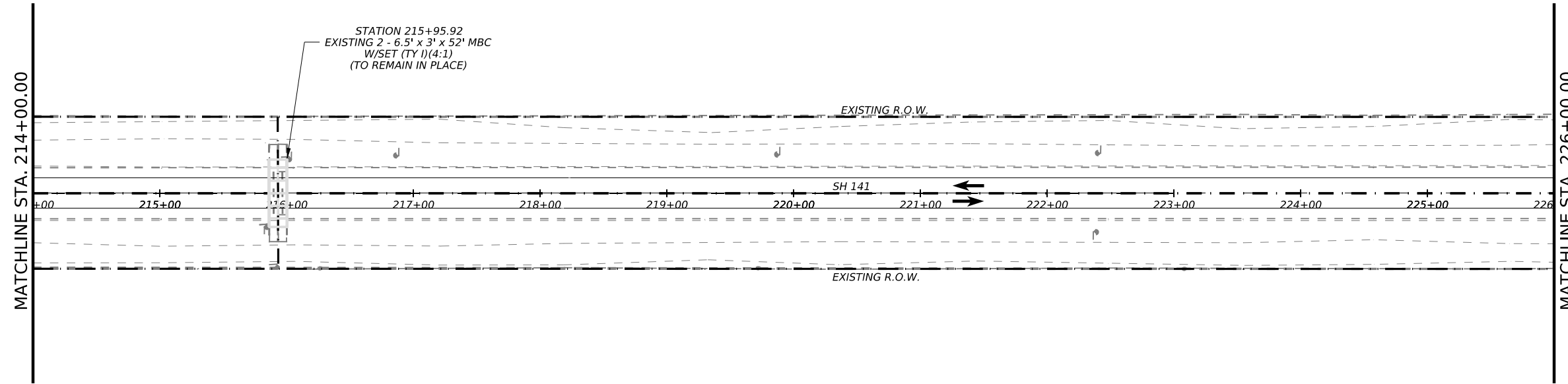
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 CK: _____



NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X

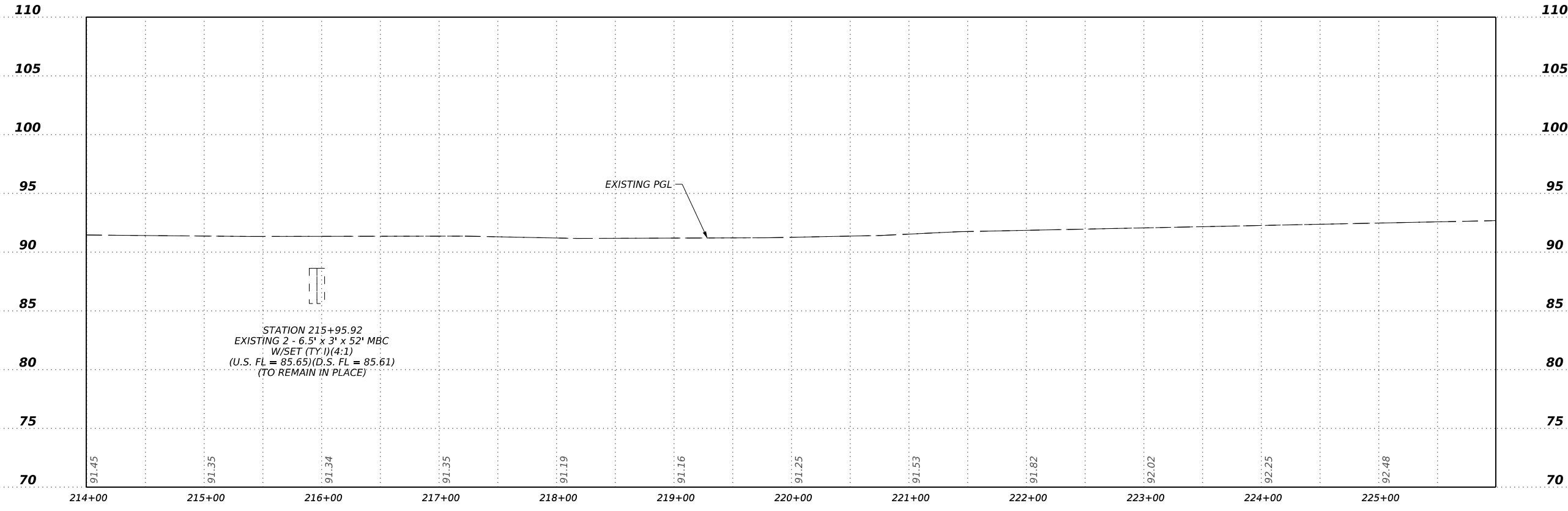
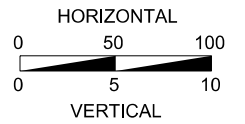


STATION 215+95.92
 EXISTING 2 - 6.5' x 3' x 52' MBC
 W/SET (TY 1)(4:1)
 (TO REMAIN IN PLACE)

EXISTING R.O.W.

SH 141

EXISTING R.O.W.



STATION 215+95.92
 EXISTING 2 - 6.5' x 3' x 52' MBC
 W/SET (TY 1)(4:1)
 (U.S. FL = 85.65)(D.S. FL = 85.61)
 (TO REMAIN IN PLACE)

EXISTING PGL



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.

2023.11.29 16:16:04-06'00'

LOCHNER
TBPE Firm Reg. No. 10488



Texas Department of Transportation

PLAN & PROFILE
 STA. 214+00 TO STA. 226+00

SHEET 11 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	076






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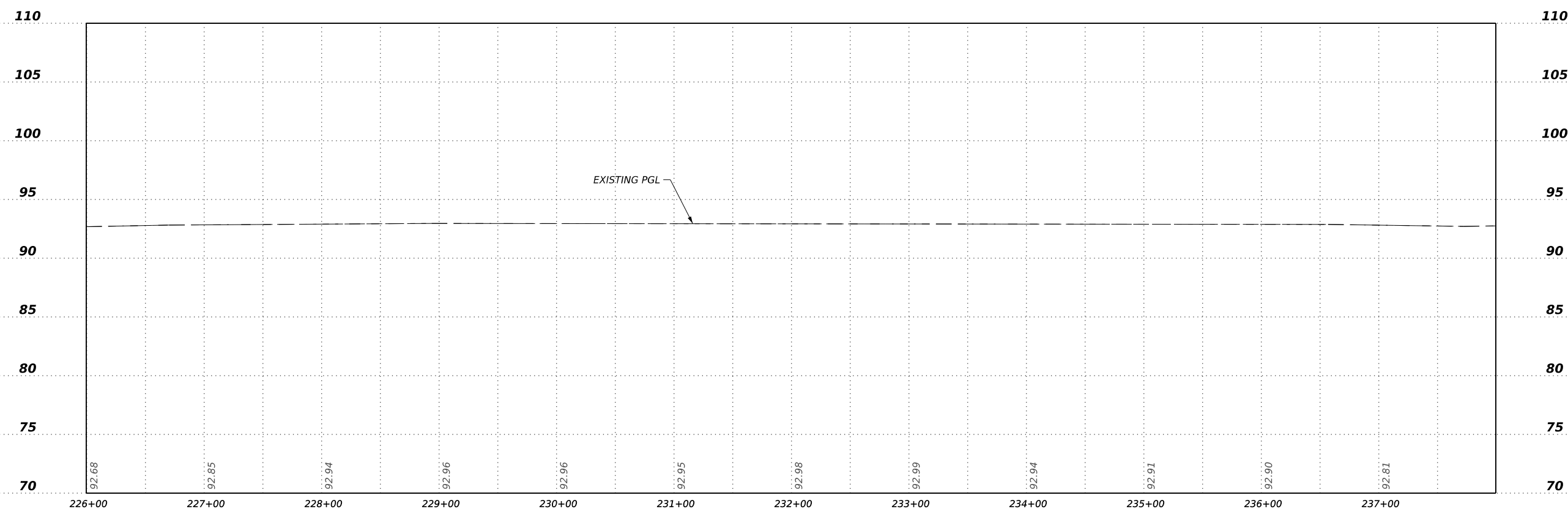
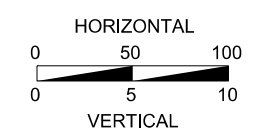
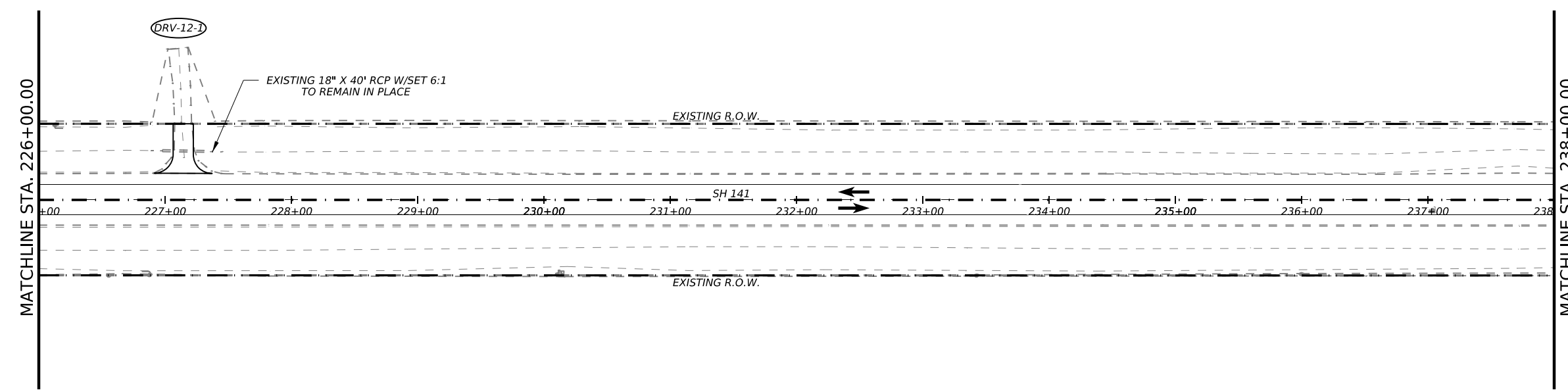
CK: DW: CK: DW:



NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



STATE OF TEXAS
DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.27 23:00:07-05'00'



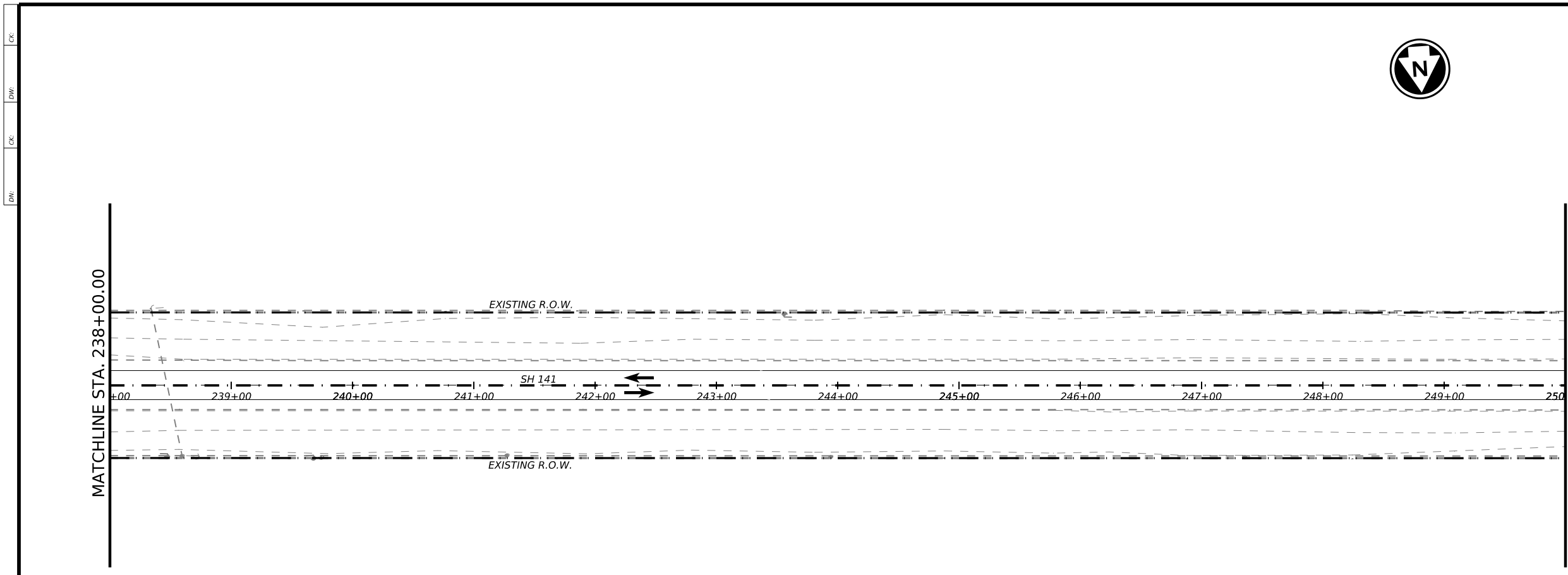
PLAN & PROFILE
STA. 226+00 TO STA. 238+00

SHEET 12 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	077

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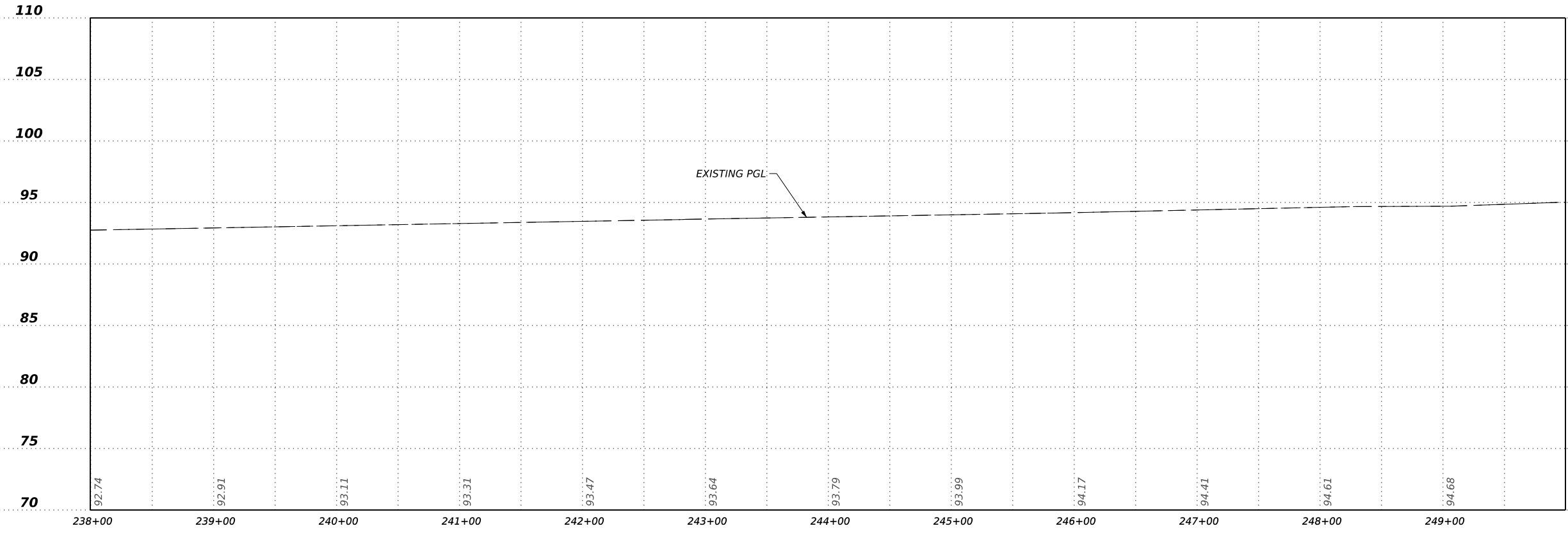
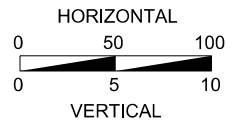
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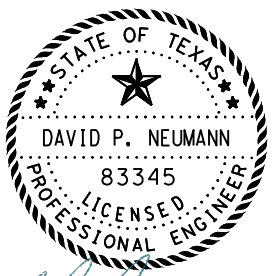


NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.
 2023.07.27 23:00:48-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

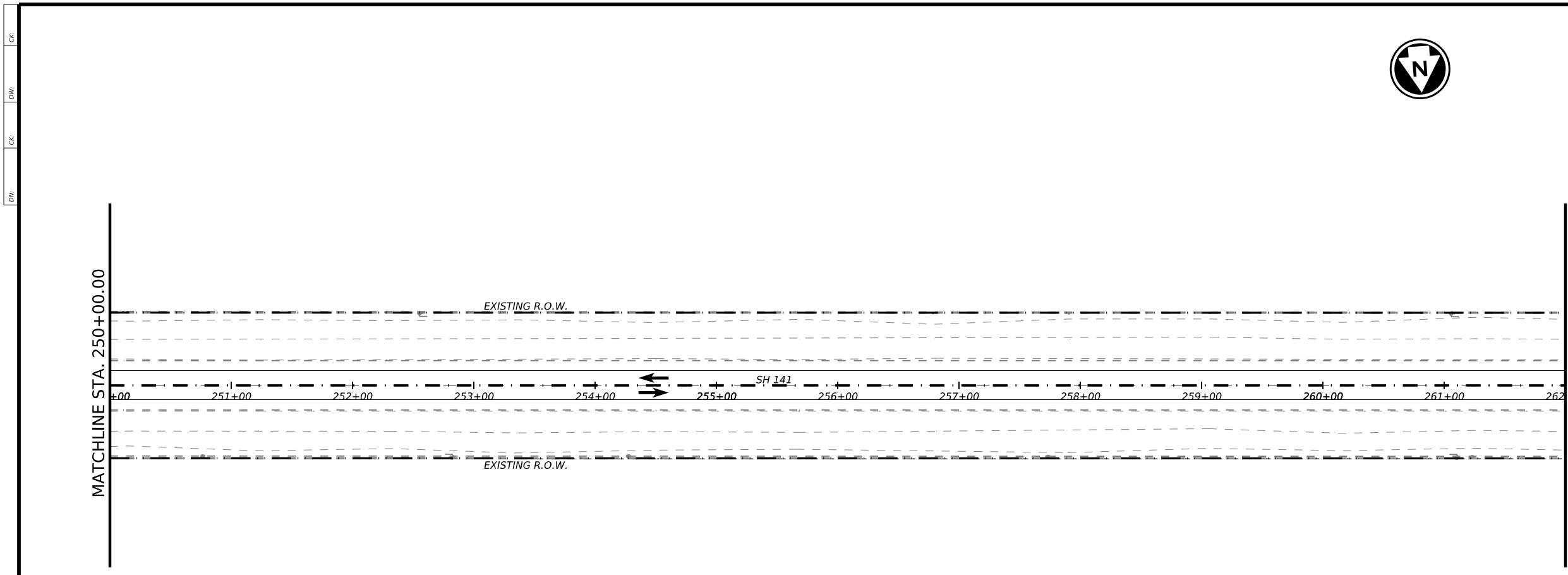


PLAN & PROFILE
 STA. 238+00 TO STA. 250+00

SHEET 13 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	078

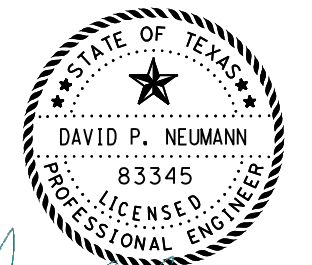
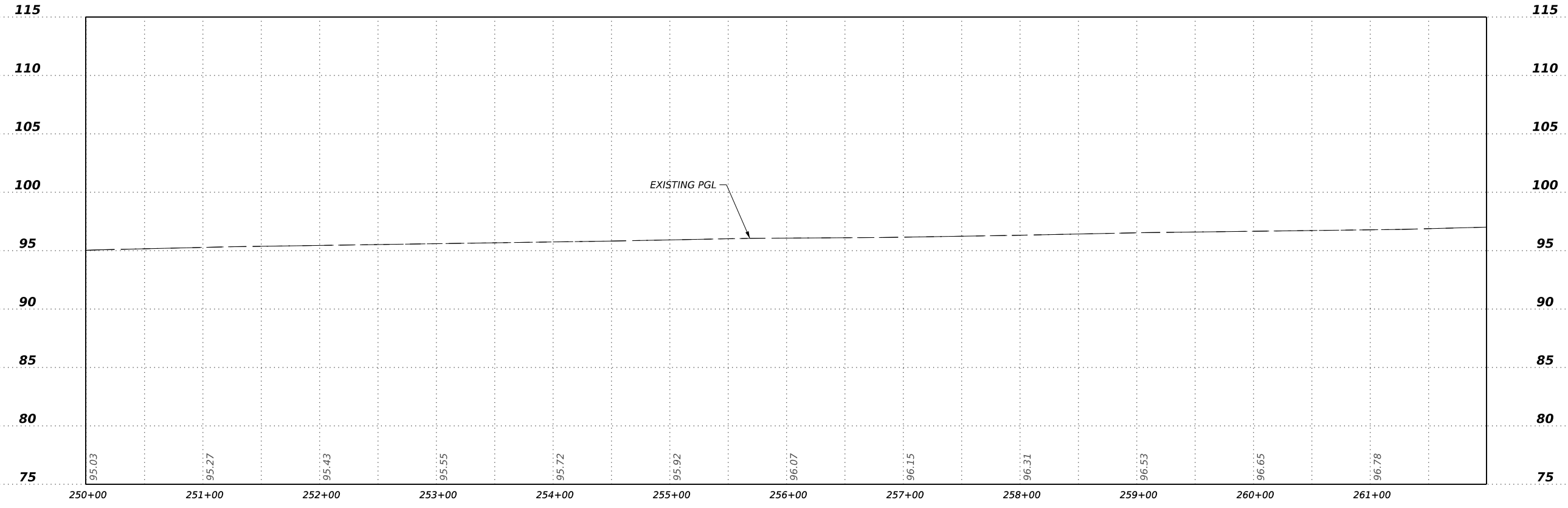
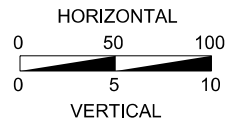
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.27 23:01:27-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 250+00 TO STA. 262+00

SHEET 14 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	079

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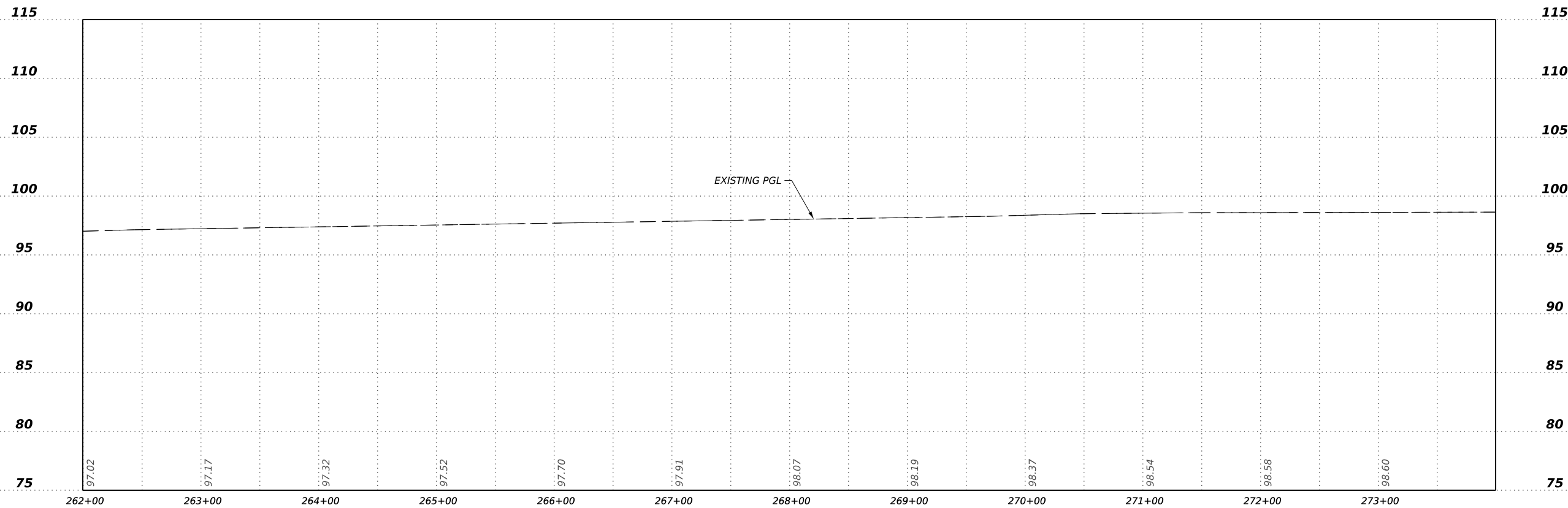
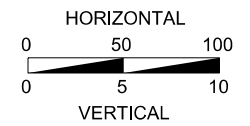
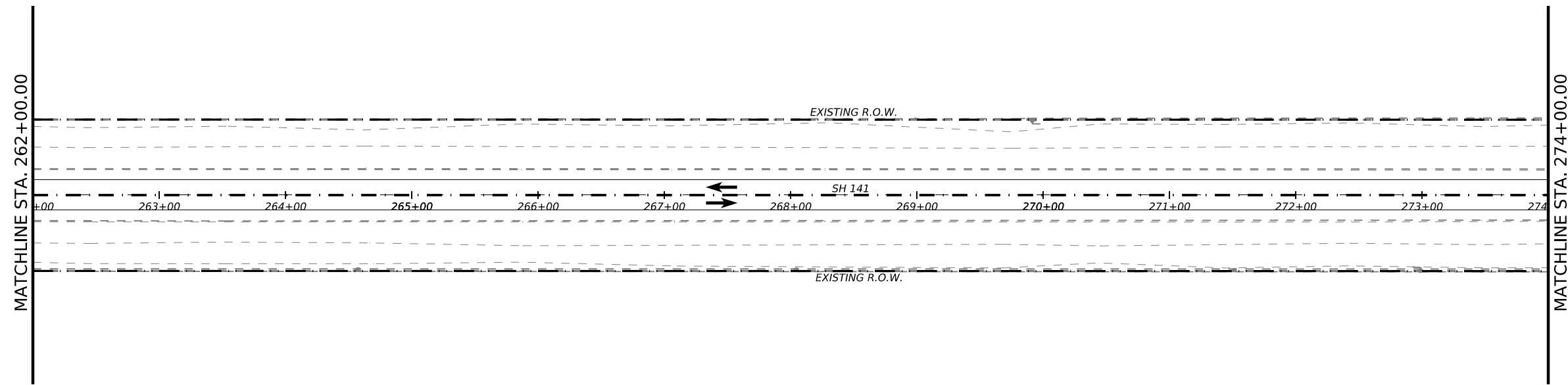
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 DN: _____



NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.
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LOCHNER
TBPE Firm Reg. No. 10488

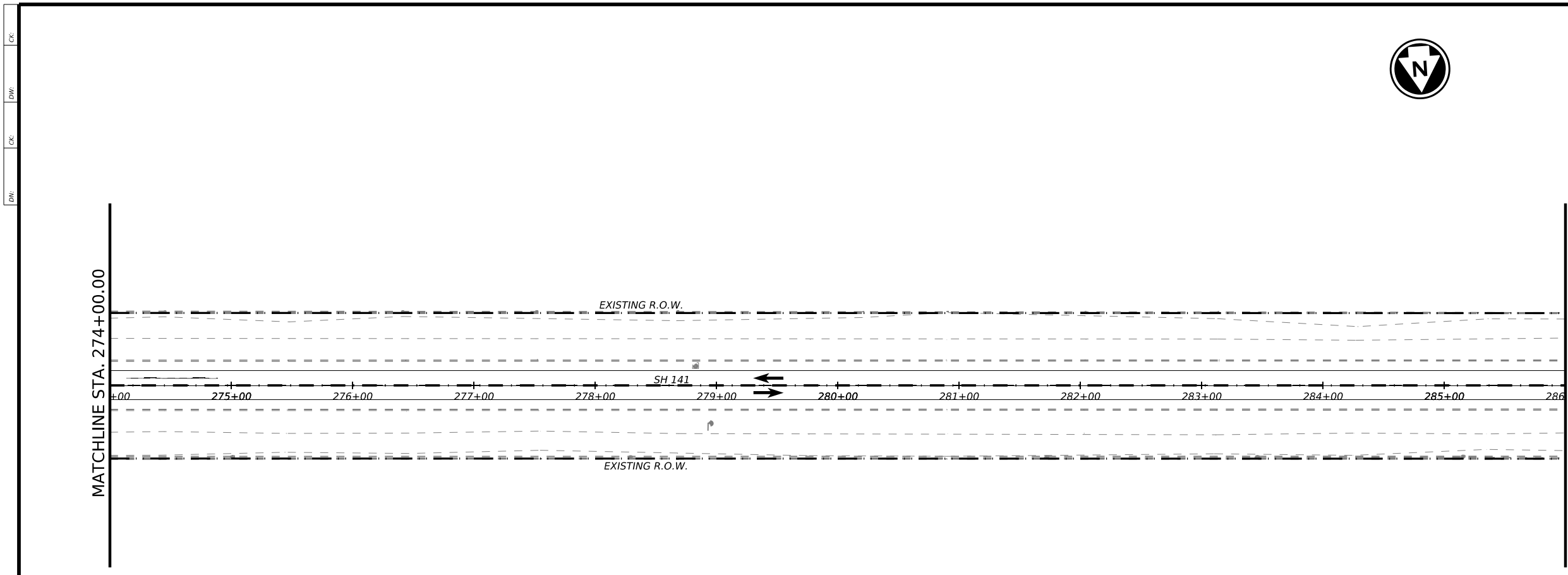


PLAN & PROFILE
 STA. 262+00 TO STA. 274+00

SHEET 15 OF 56

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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	080

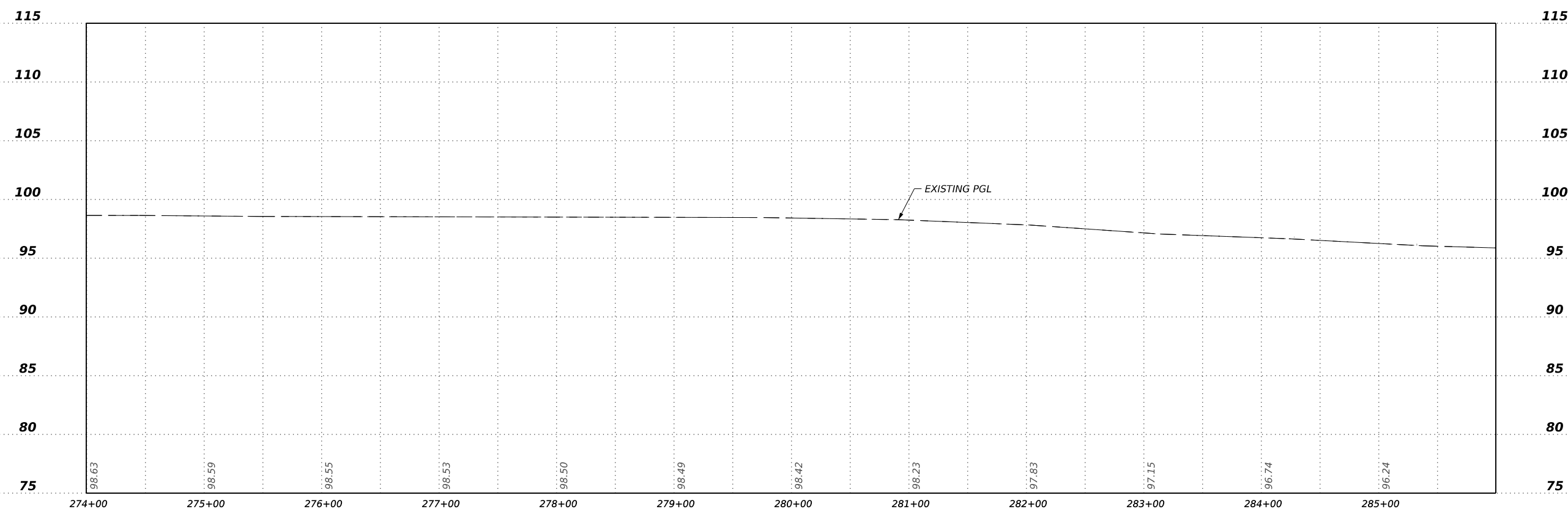
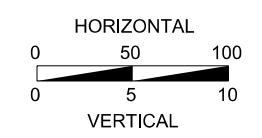
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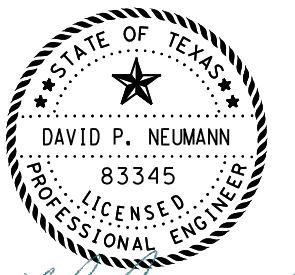


NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.
 2023.07.27 23:02:22-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 274+00 TO STA. 286+00

SHEET 16 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	081

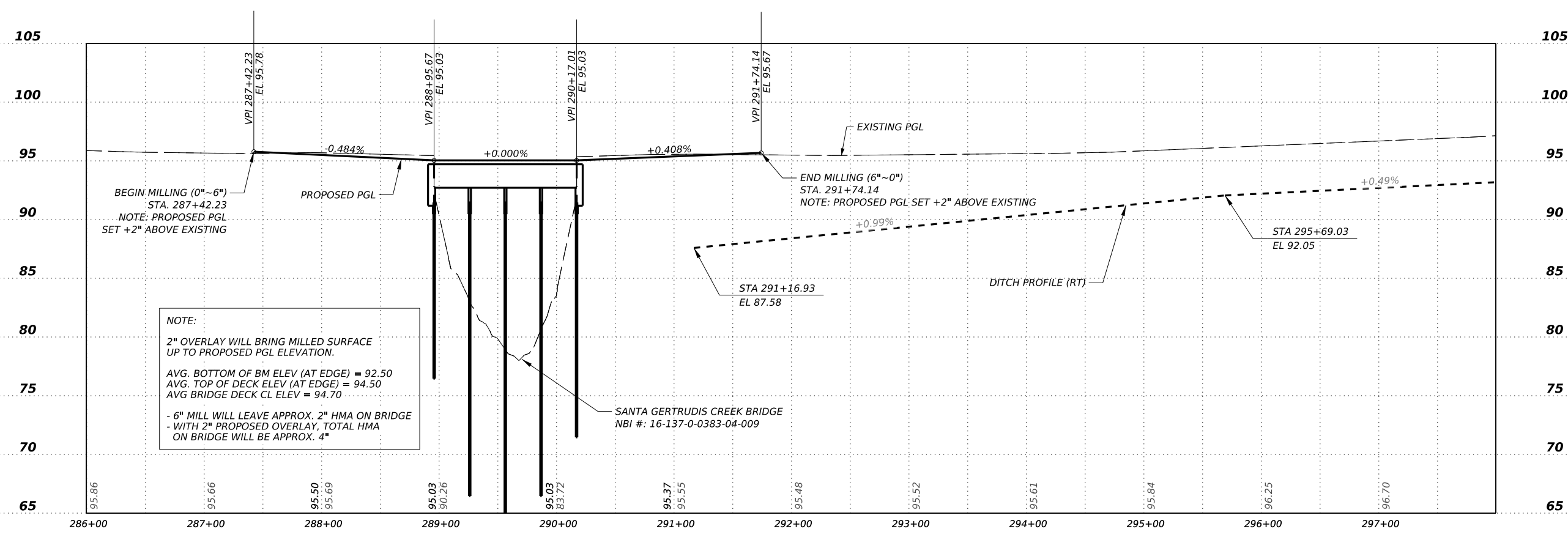
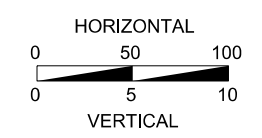
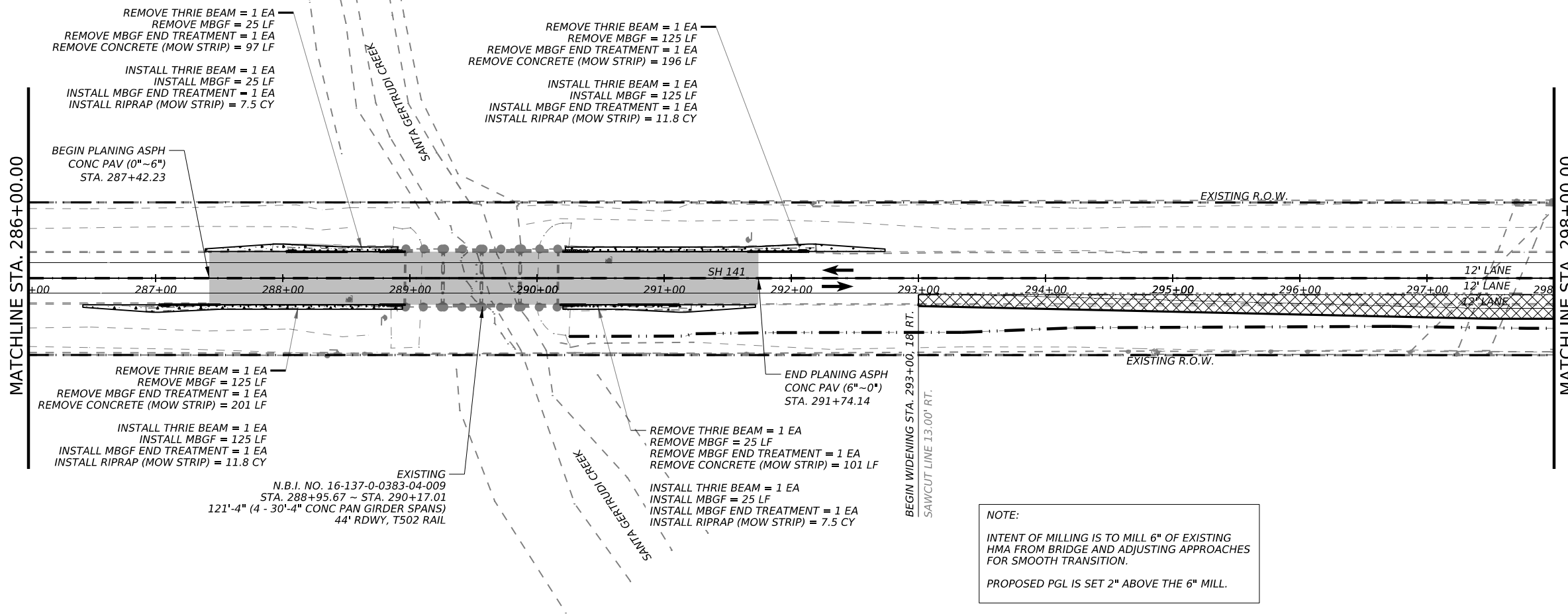
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X
- PLANING ASPH CONC PAV



DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.

2023.07.27 23:03:26-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
STA. 286+00 TO STA. 298+00

SHEET 17 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		082

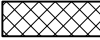




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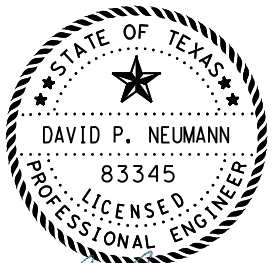
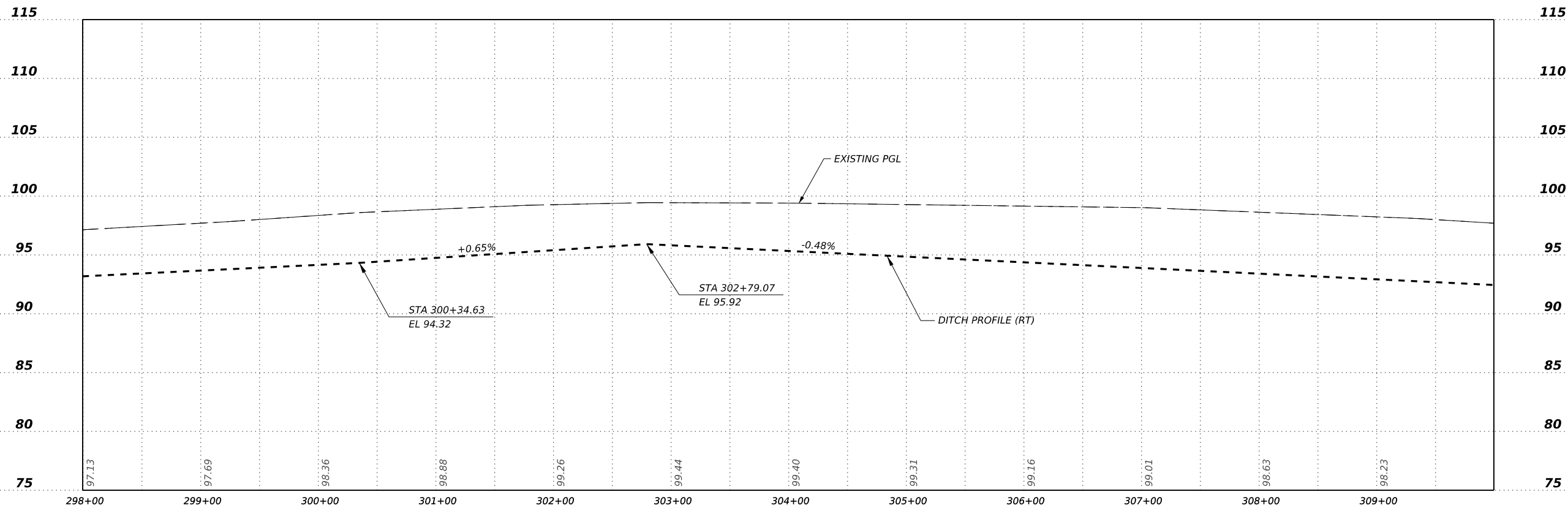
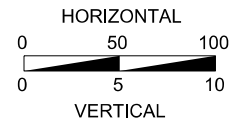
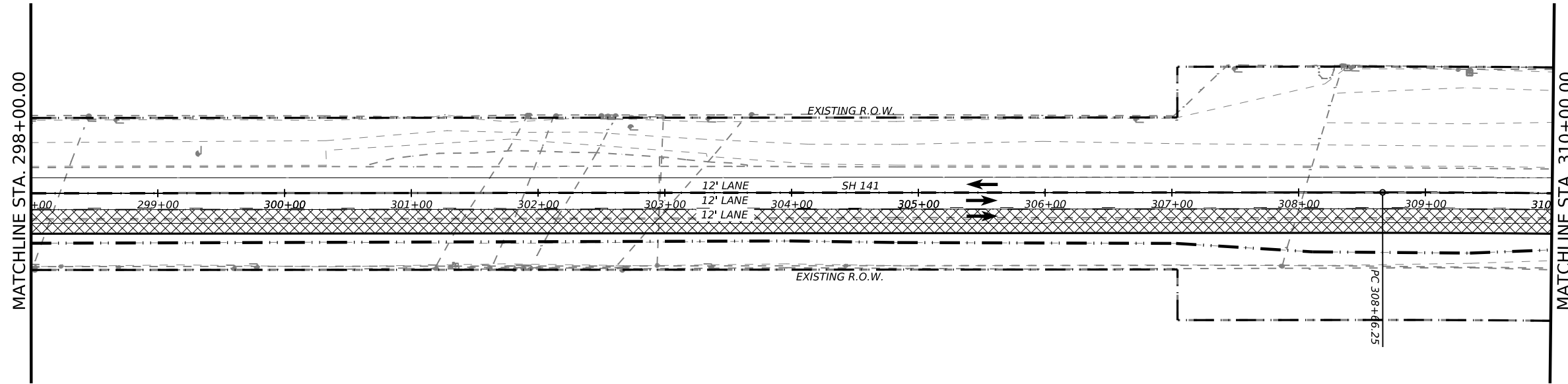
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



David P. Neumann, P.E.
2023.11.29 16:17:32-06'00'

LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 298+00 TO STA. 310+00

SHEET 18 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		083

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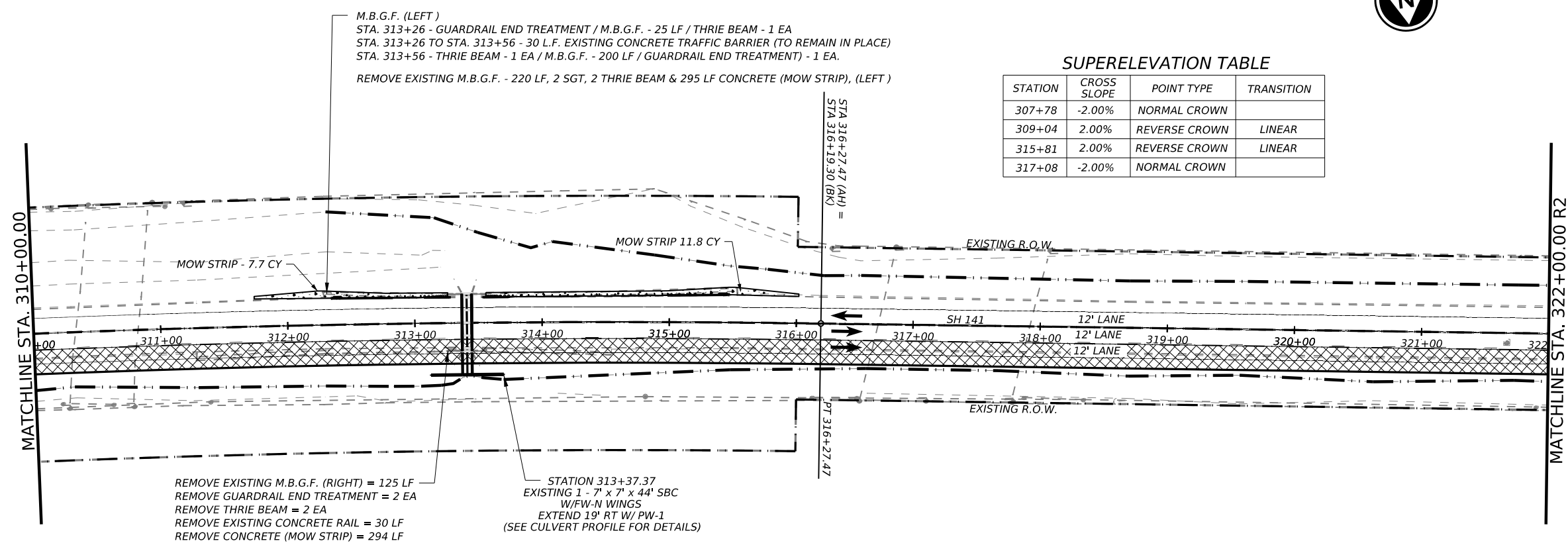
NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X

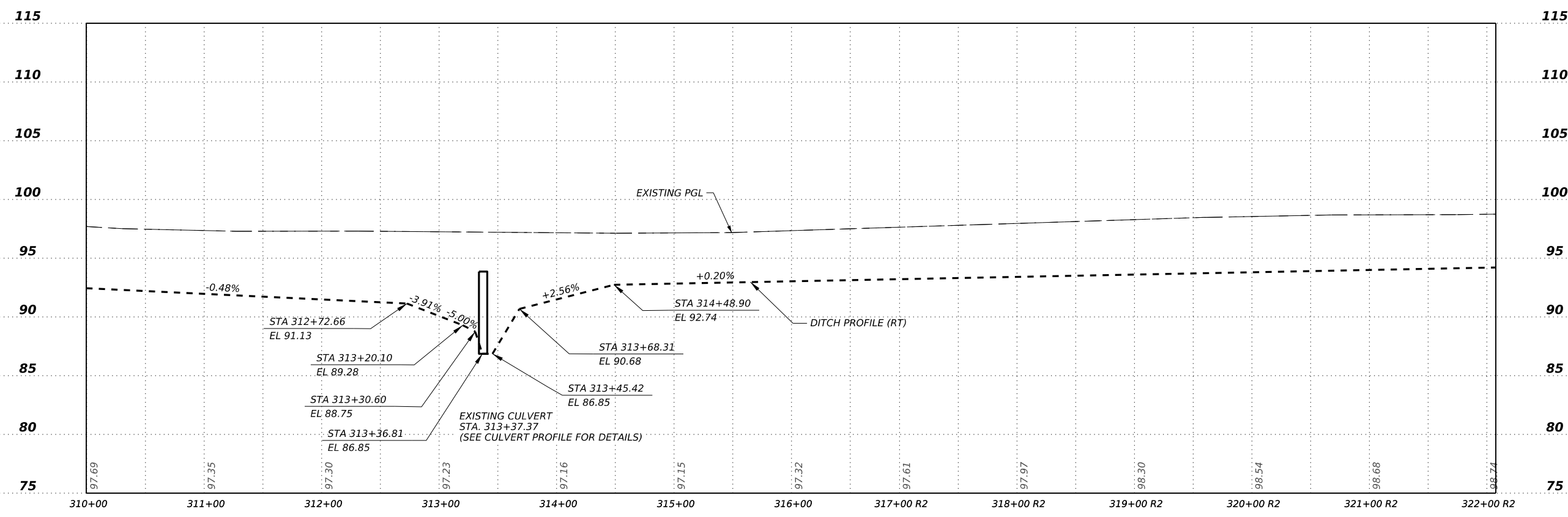
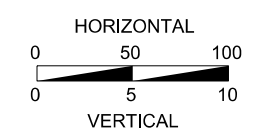
SUPERELEVATION TABLE

STATION	CROSS SLOPE	POINT TYPE	TRANSITION
307+78	-2.00%	NORMAL CROWN	
309+04	2.00%	REVERSE CROWN	LINEAR
315+81	2.00%	REVERSE CROWN	LINEAR
317+08	-2.00%	NORMAL CROWN	



REMOVE EXISTING M.B.G.F. (RIGHT) = 125 LF
 REMOVE GUARDRAIL END TREATMENT = 2 EA
 REMOVE THRIE BEAM = 2 EA
 REMOVE EXISTING CONCRETE RAIL = 30 LF
 REMOVE CONCRETE (MOW STRIP) = 294 LF

STATION 313+37.37
 EXISTING 1 - 7' x 7' x 44" SBC
 W/FW-N WINGS
 EXTEND 19' RT W/ PW-1
 (SEE CULVERT PROFILE FOR DETAILS)



STATE OF TEXAS
 DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.
 2023.07.27 23:36:17-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 310+00 TO STA. 322+00

SHEET 19 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	084	






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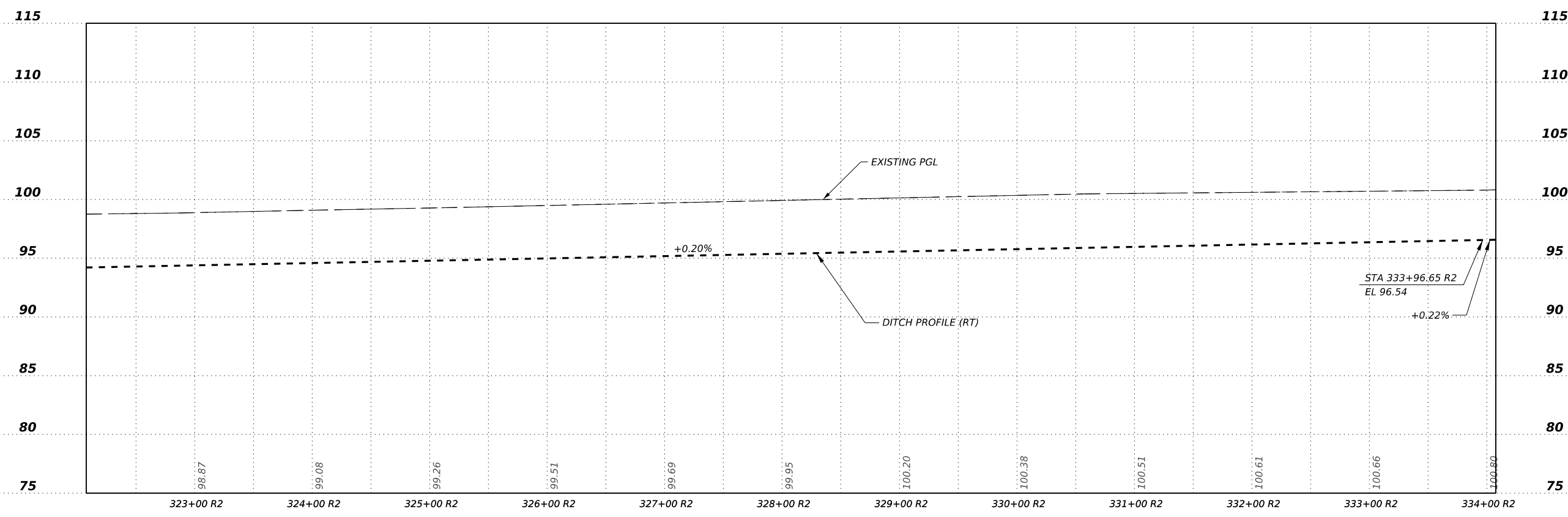
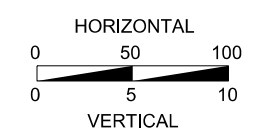
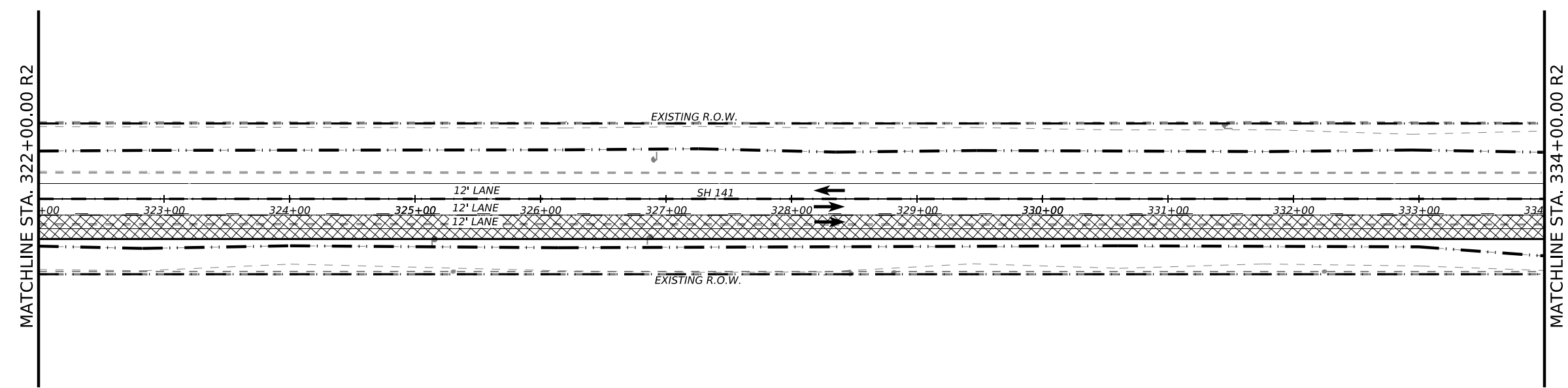
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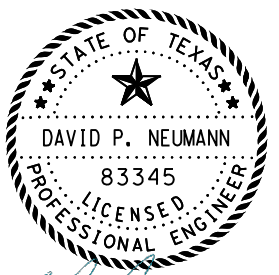


NOTES:
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LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X




 David P. Neumann, P.E.
 2023.07.27 23:40:40-05'00"
LOCHNER
 TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 322+00 TO STA. 334+00

SHEET 20 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		085






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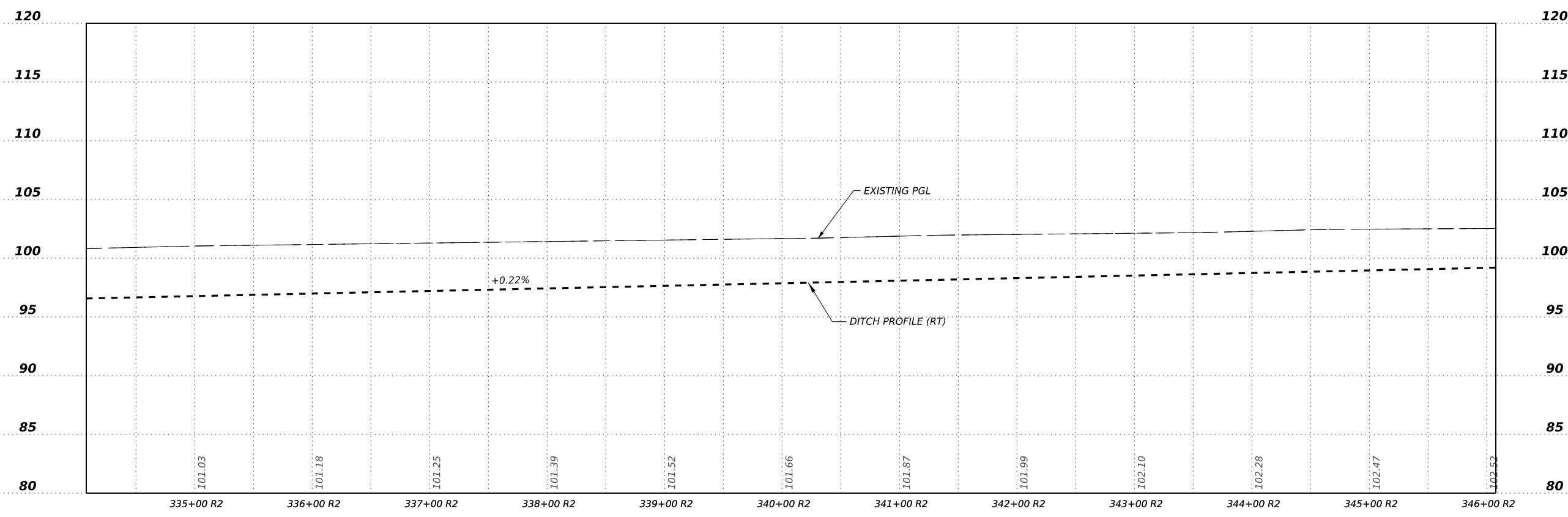
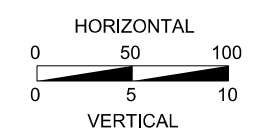
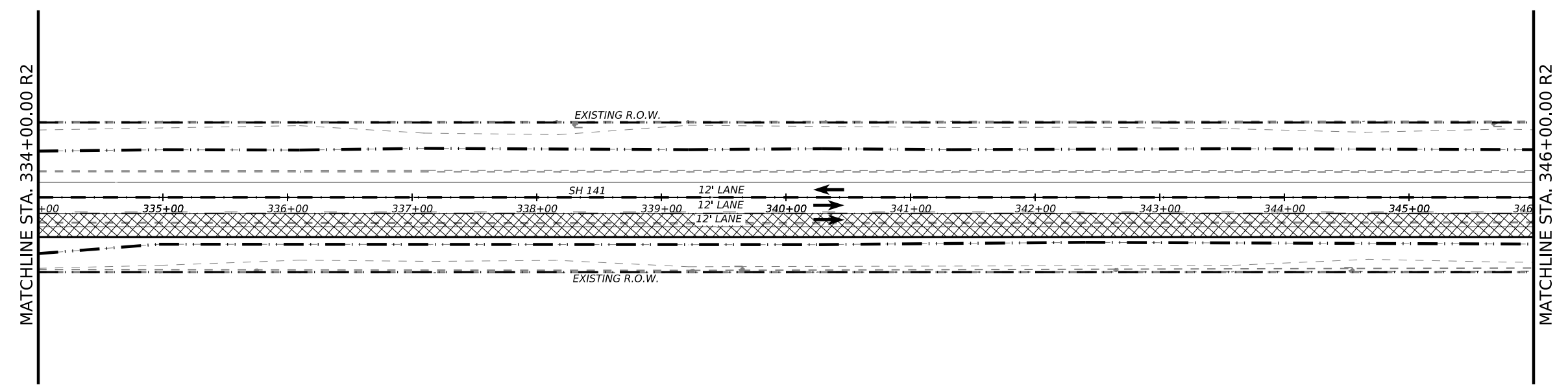
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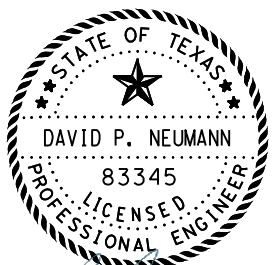


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





David P. Neumann, P.E.
2023.07.27 23:44:10-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 334+00 TO STA. 346+00

SHEET 21 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		086

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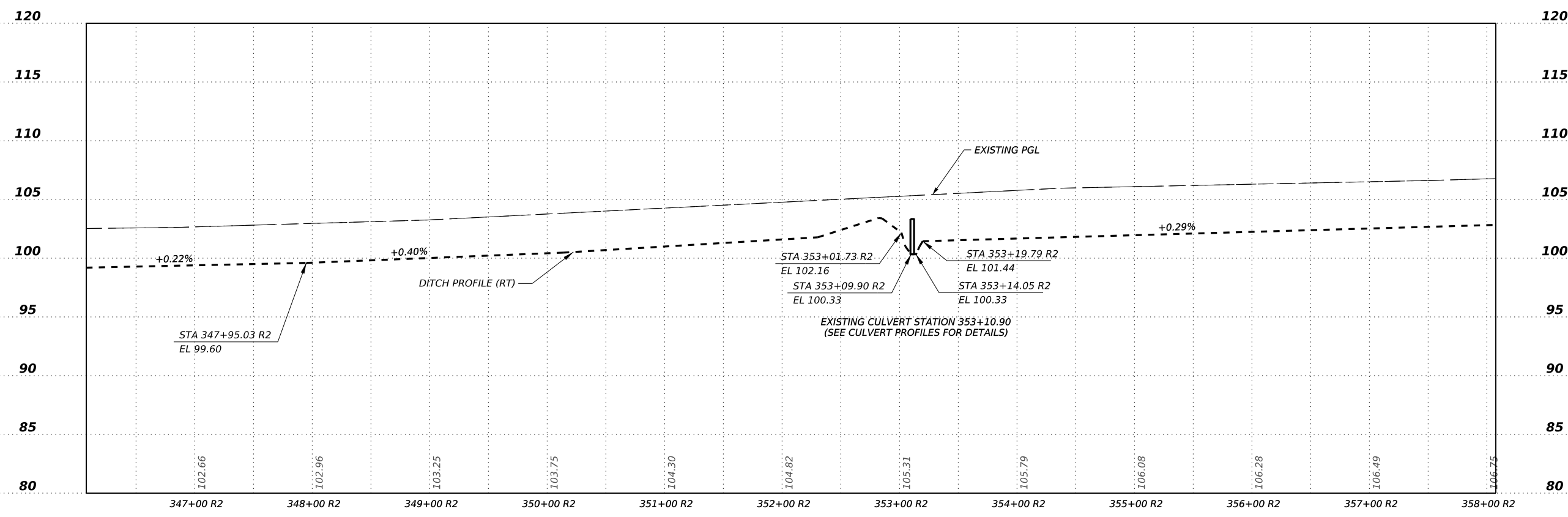
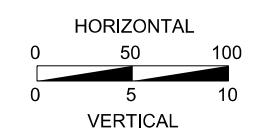
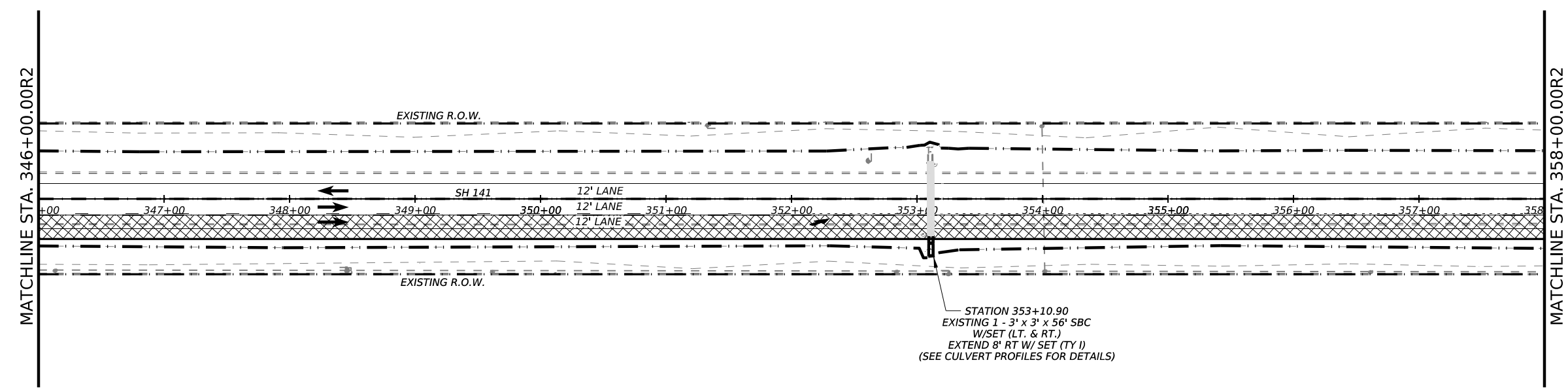
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 CK: _____
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 CK: _____



NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.

2023.07.27 23:52:32-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 346+00 TO STA. 358+00

SHEET 22 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		087

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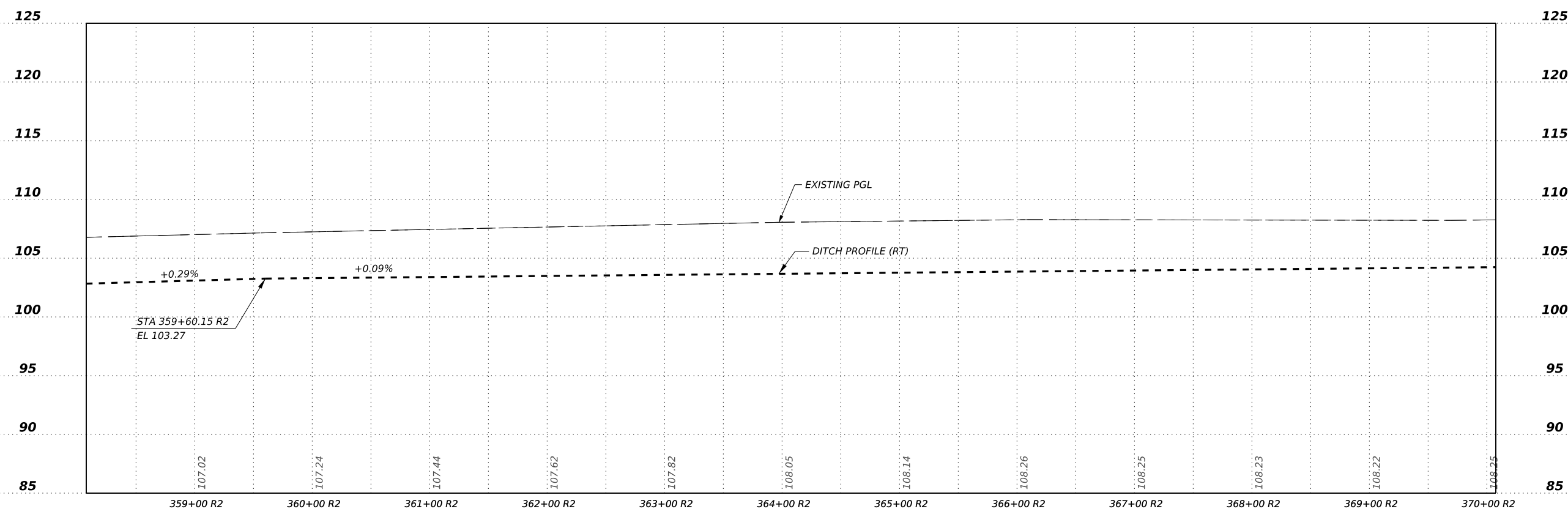
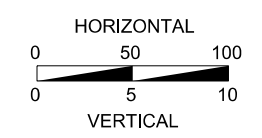
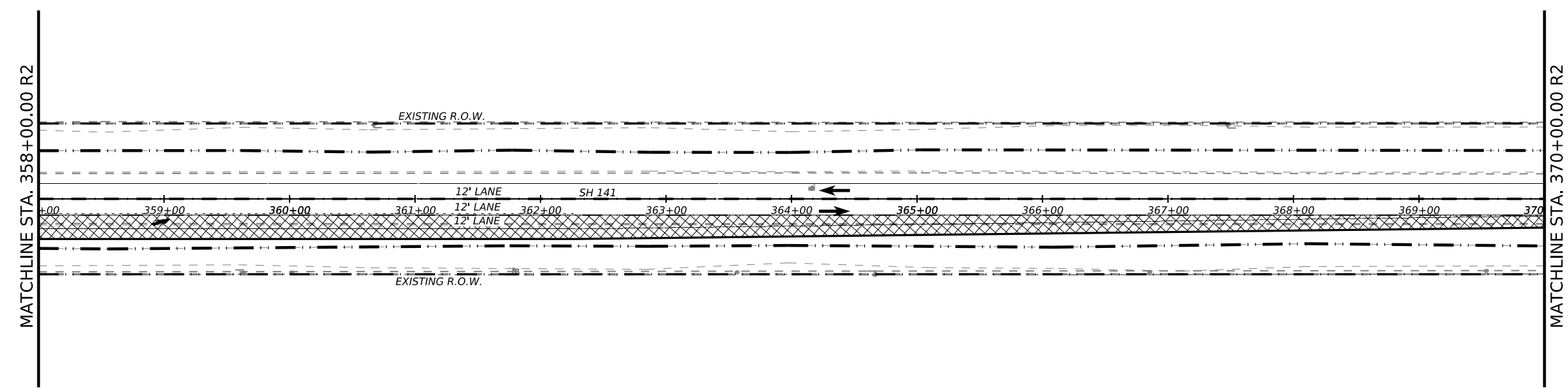
DW: _____
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.

2023.07.27 23:54:43-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 358+00 TO STA. 370+00

SHEET 23 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		088

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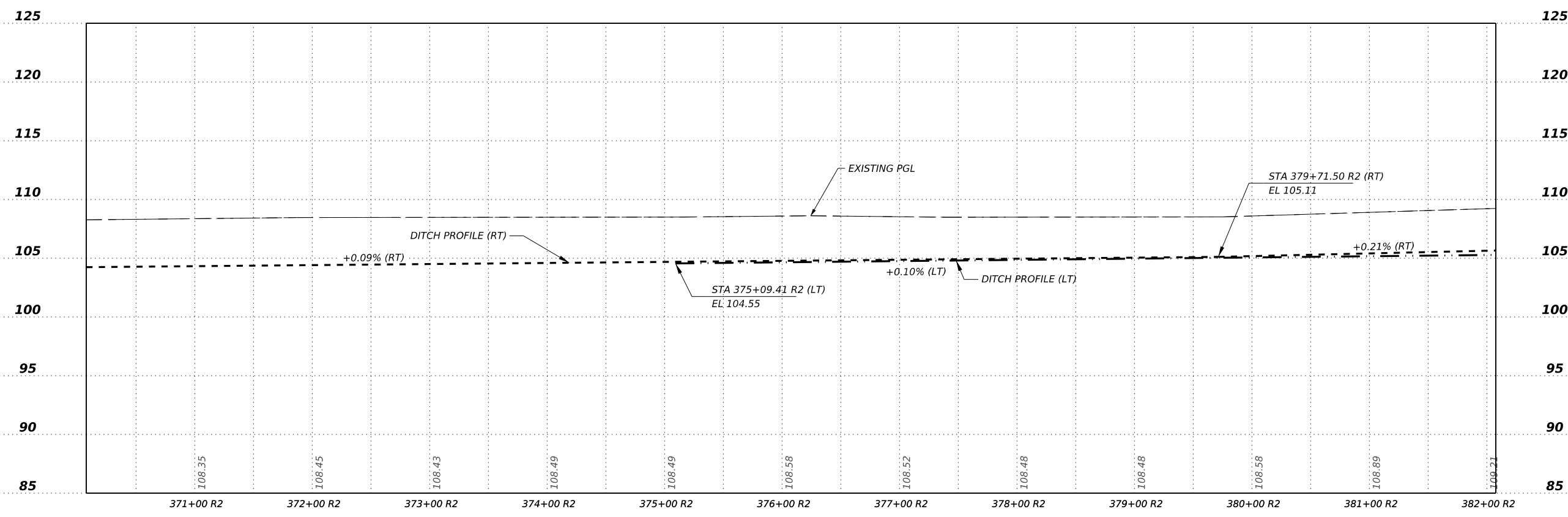
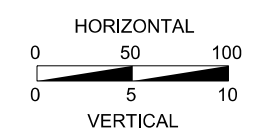
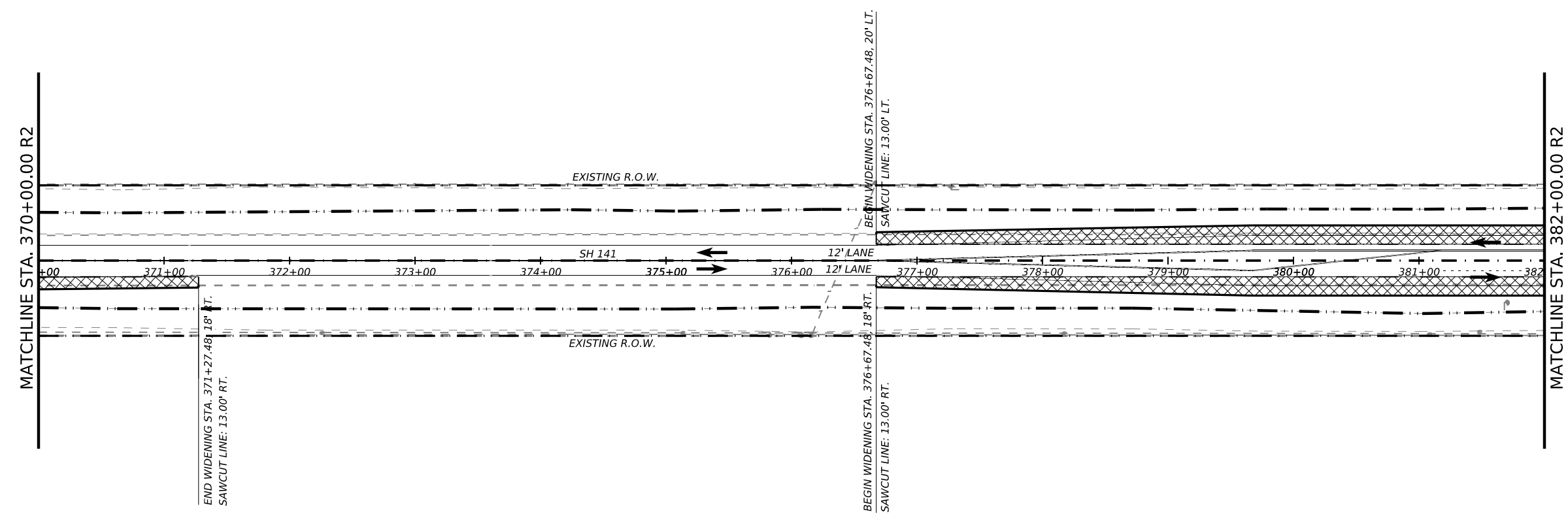
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.
 2023.07.27 23:57:42-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 370+00 TO STA. 382+00

SHEET 24 OF 56			
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		089






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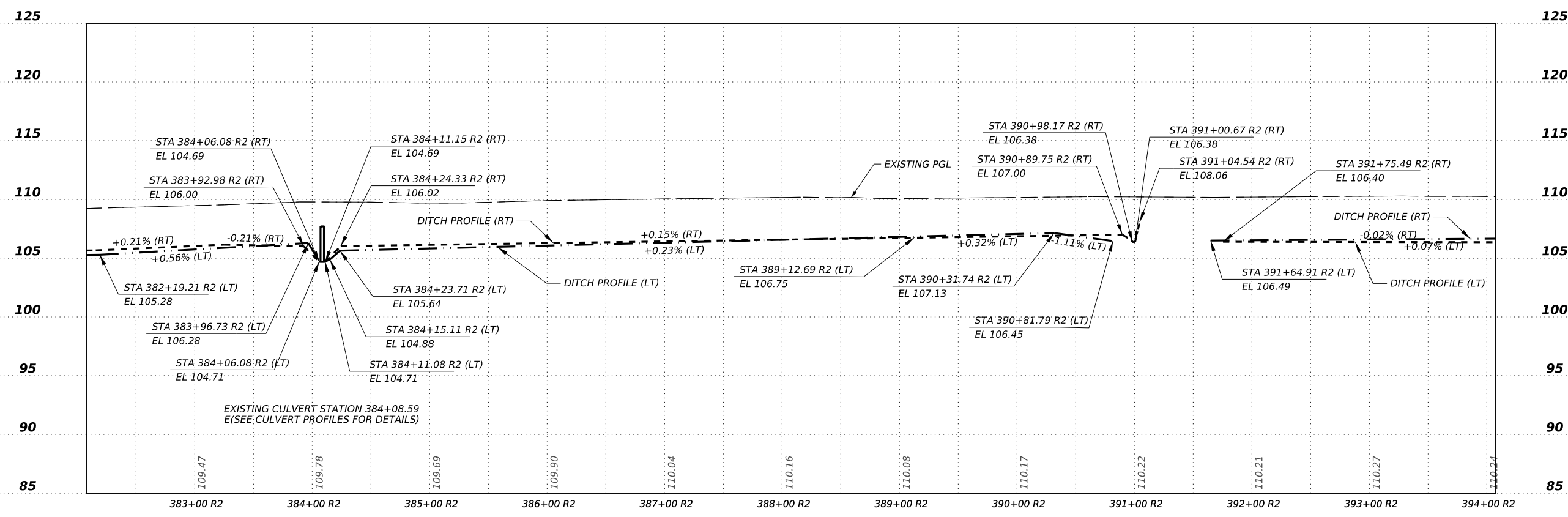
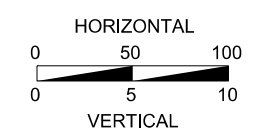
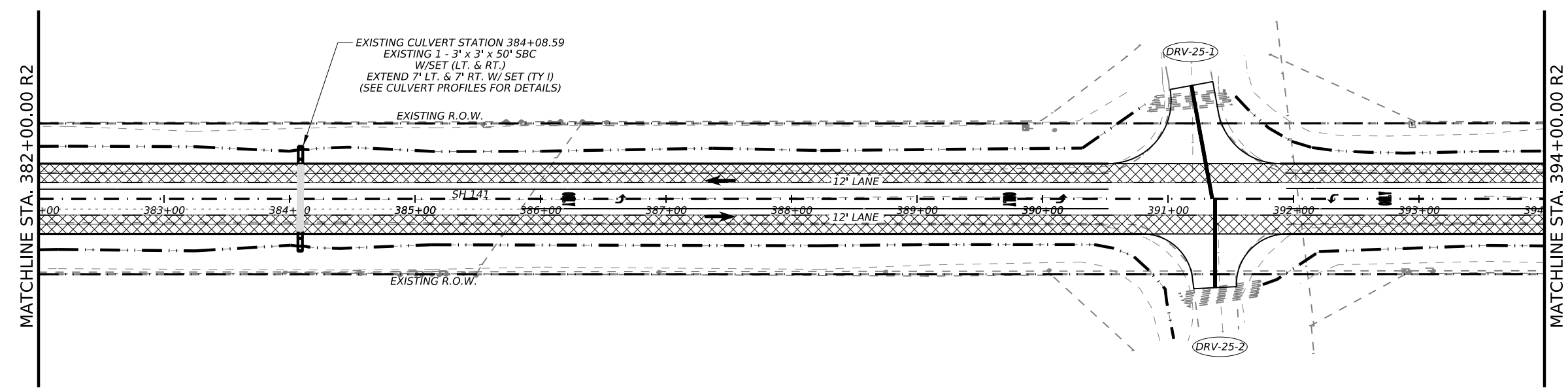
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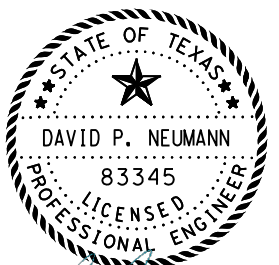


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





2023.07.28 00:03:50-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 382+00 TO STA. 394+00

SHEET 25 OF 56			
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	090

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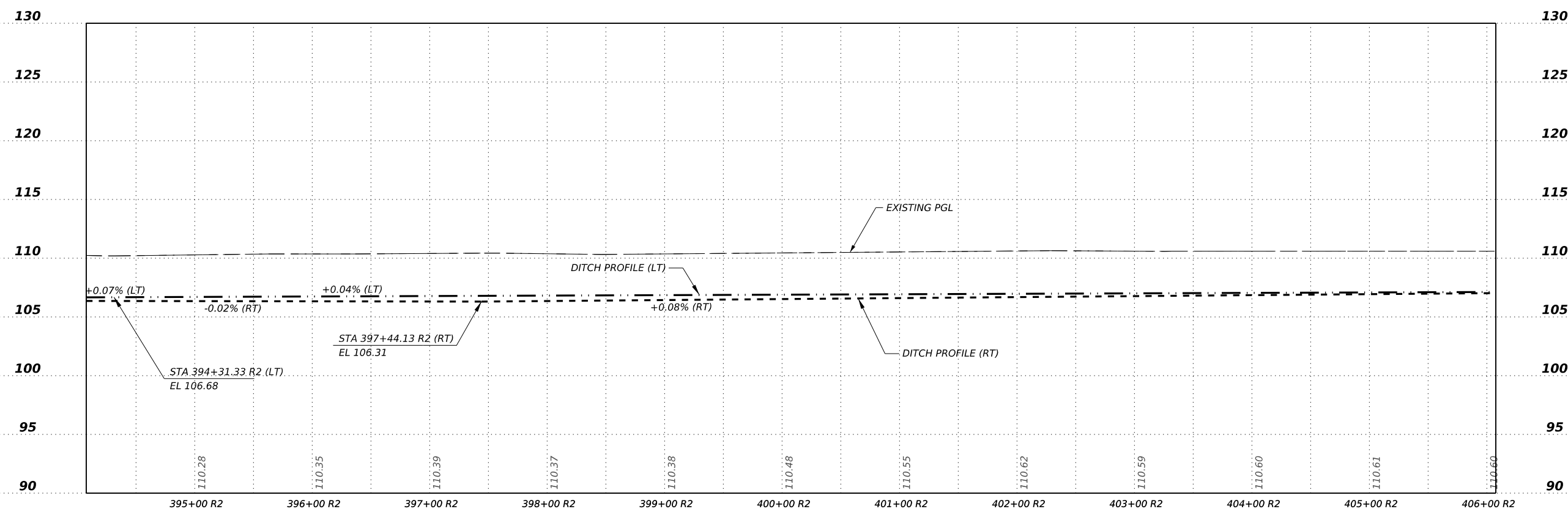
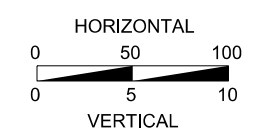
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.
 2023.07.27 23:06:40-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 394+00 TO STA. 406+00

SHEET 26 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		091

DATE: 7/26/2023 9:57:24 AM
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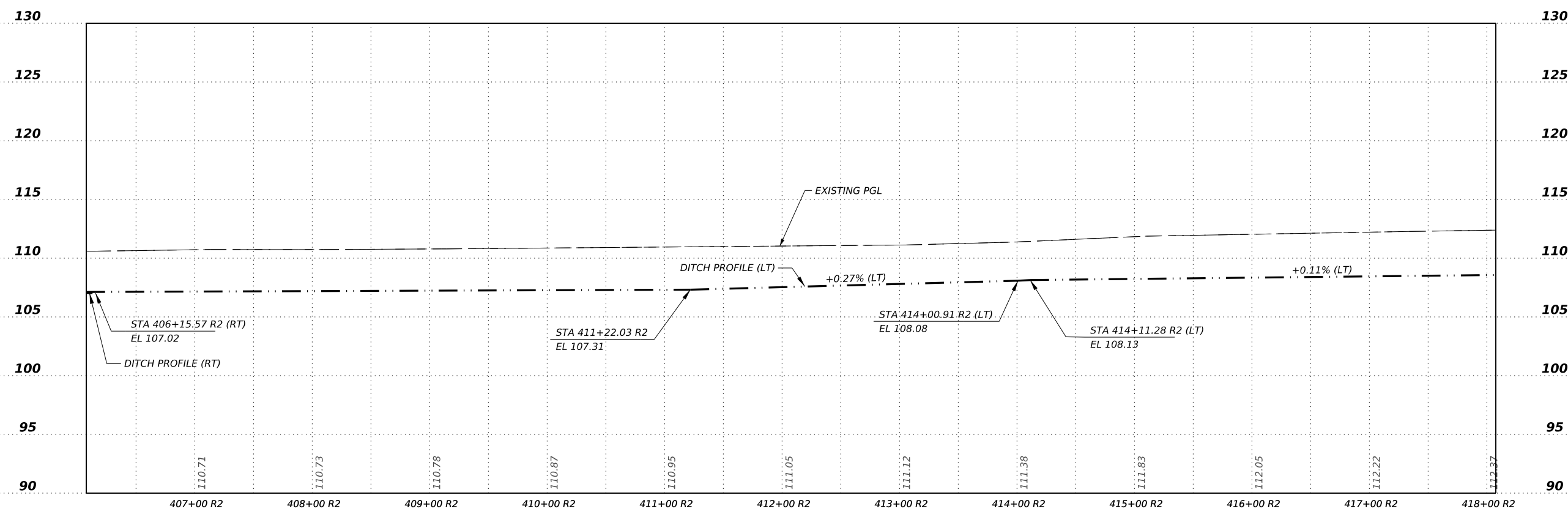
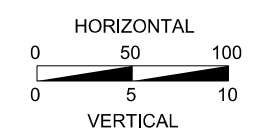
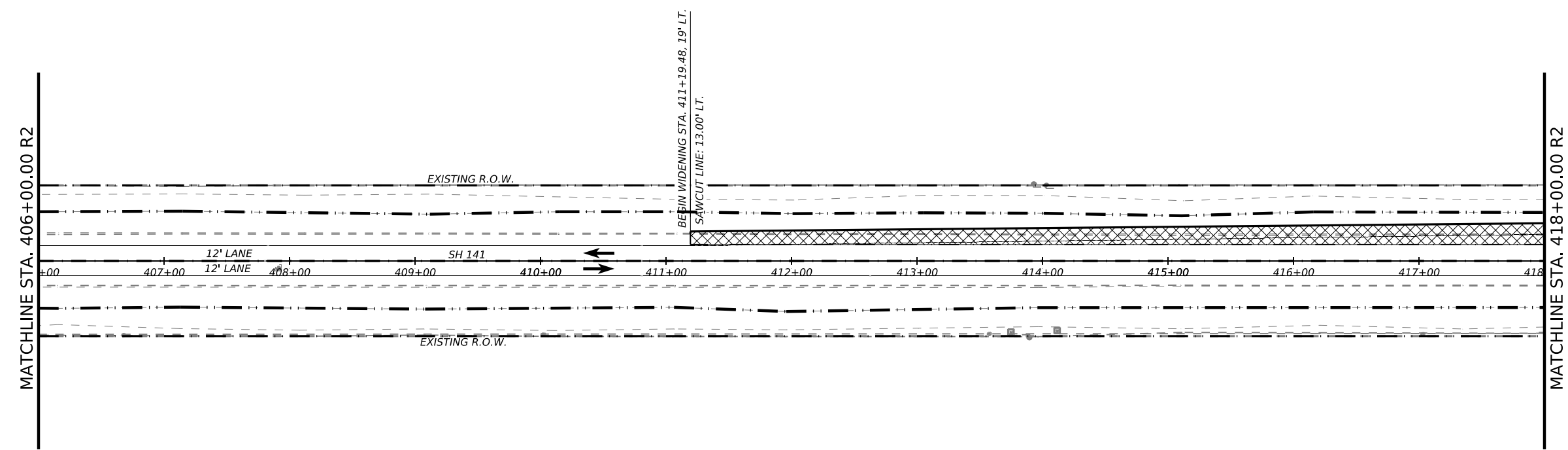
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.
 2023.07.28 00:08:16-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 406+00 TO STA. 418+00

SHEET 27 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		092

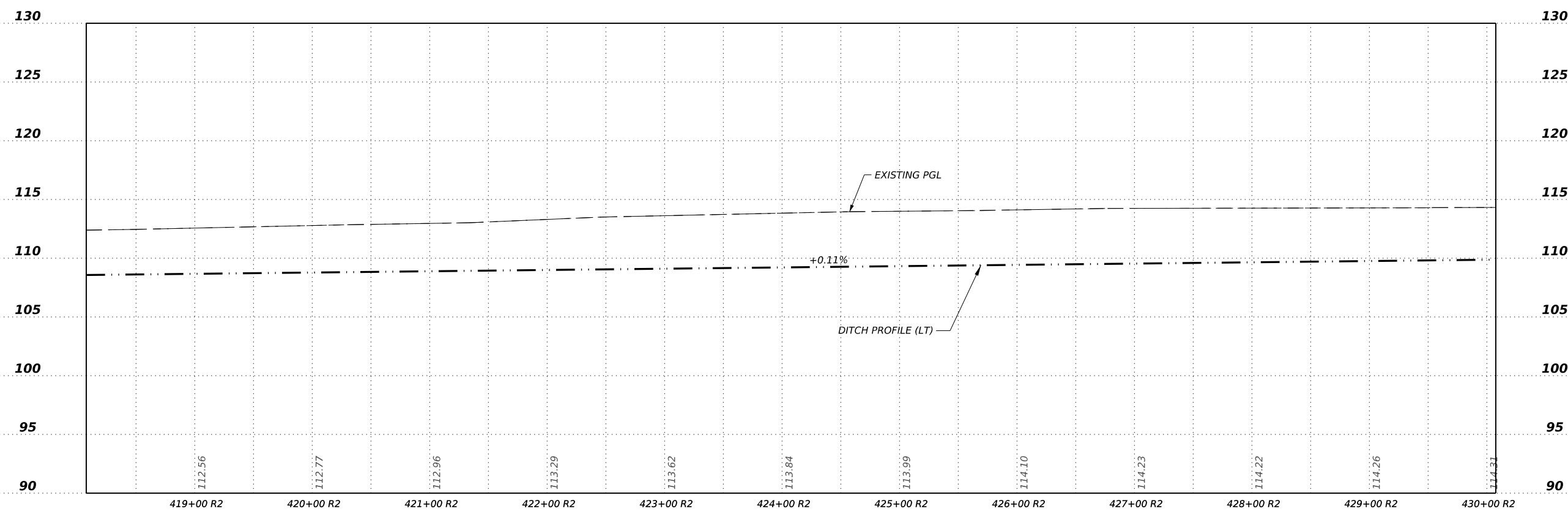
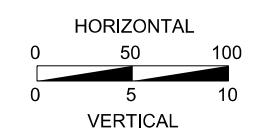
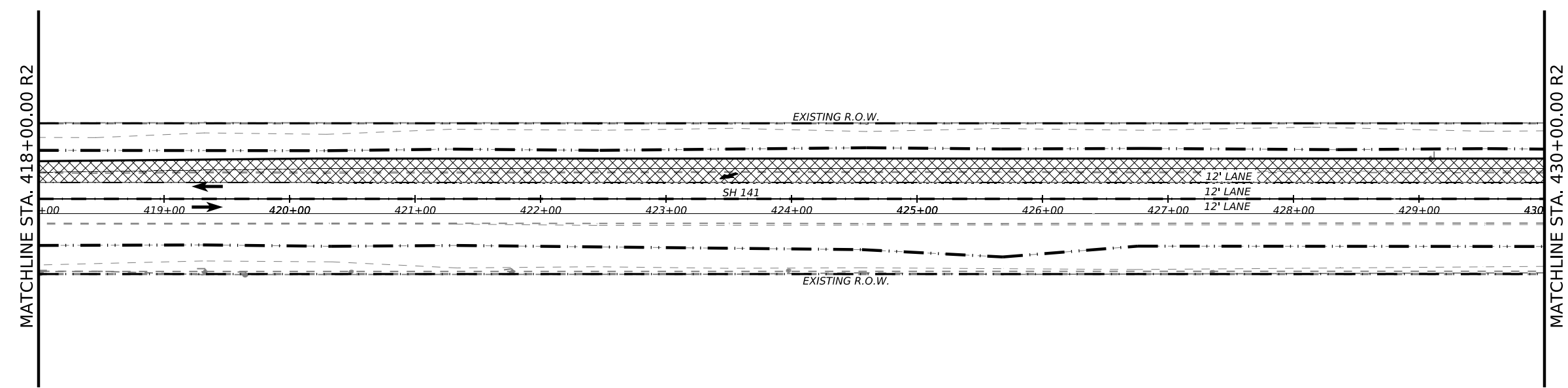
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.
 2023.07.27 23:11:09-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

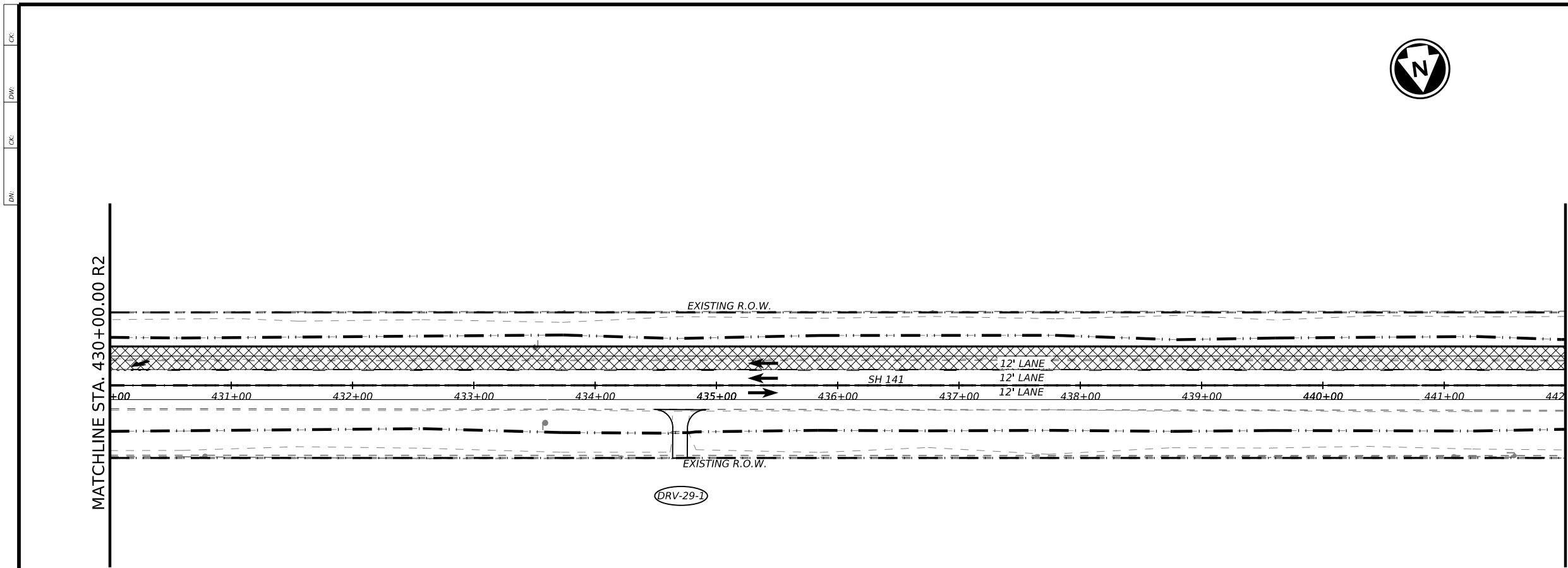


PLAN & PROFILE
 STA. 418+00 TO STA. 430+00

SHEET 28 OF 56

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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	093

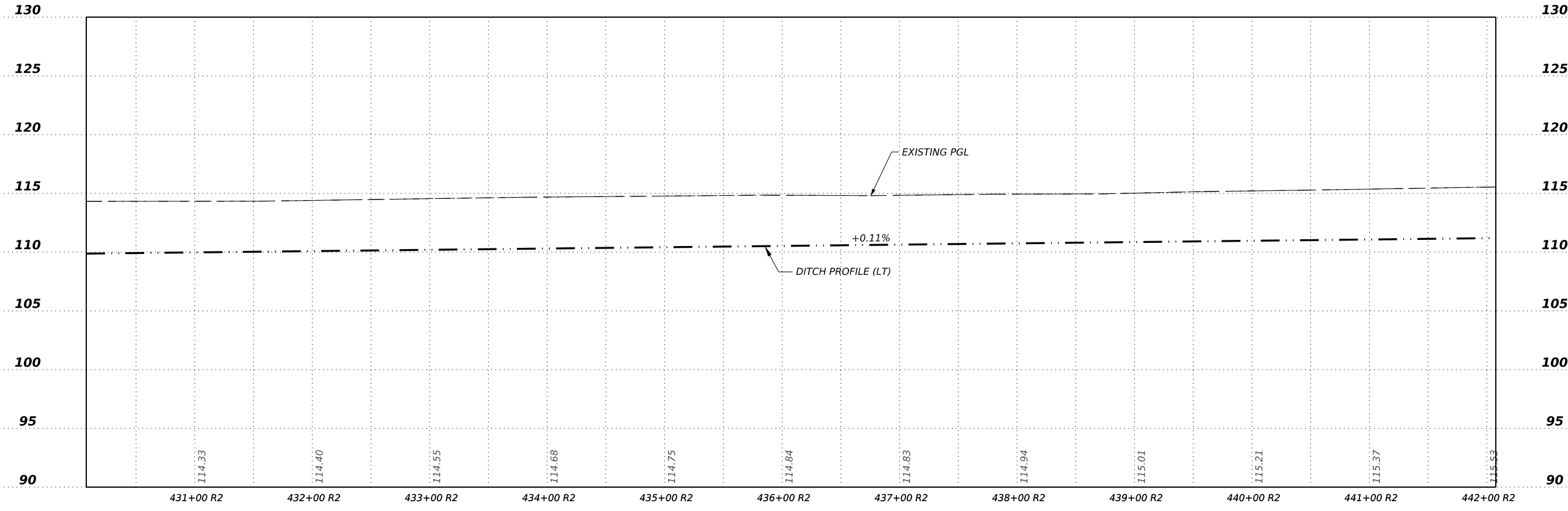
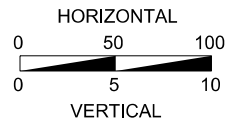
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.27 23:11:47-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 430+00 TO STA. 442+00

SHEET 29 OF 46

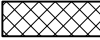




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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	094

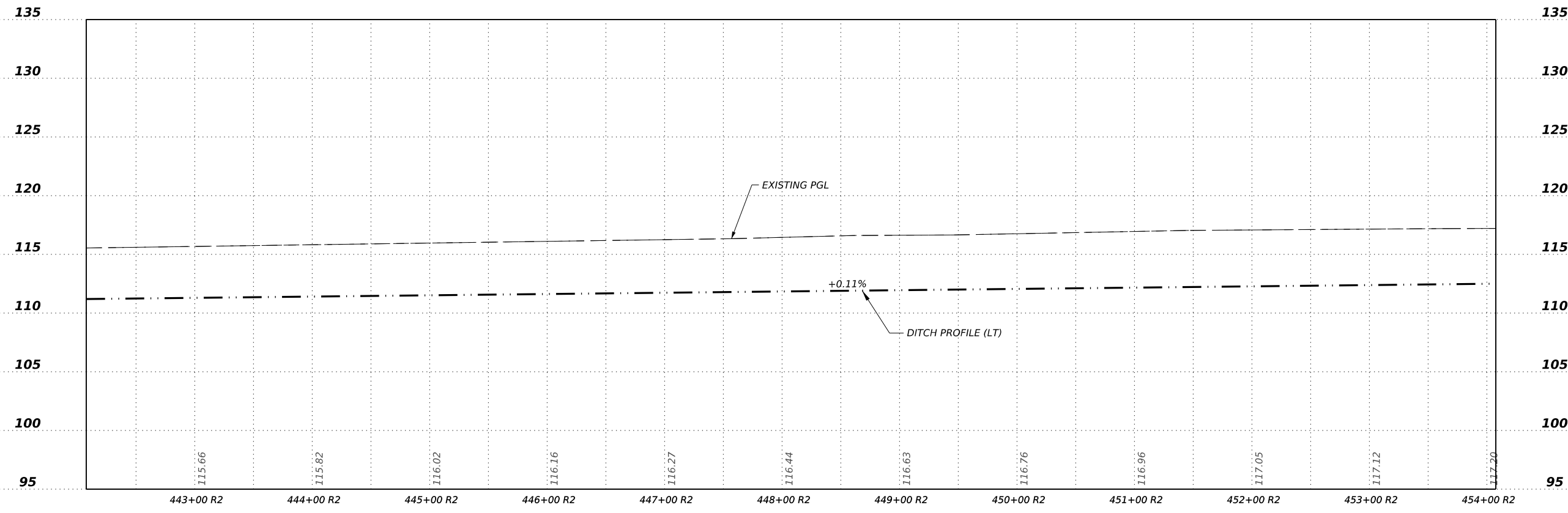
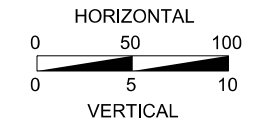
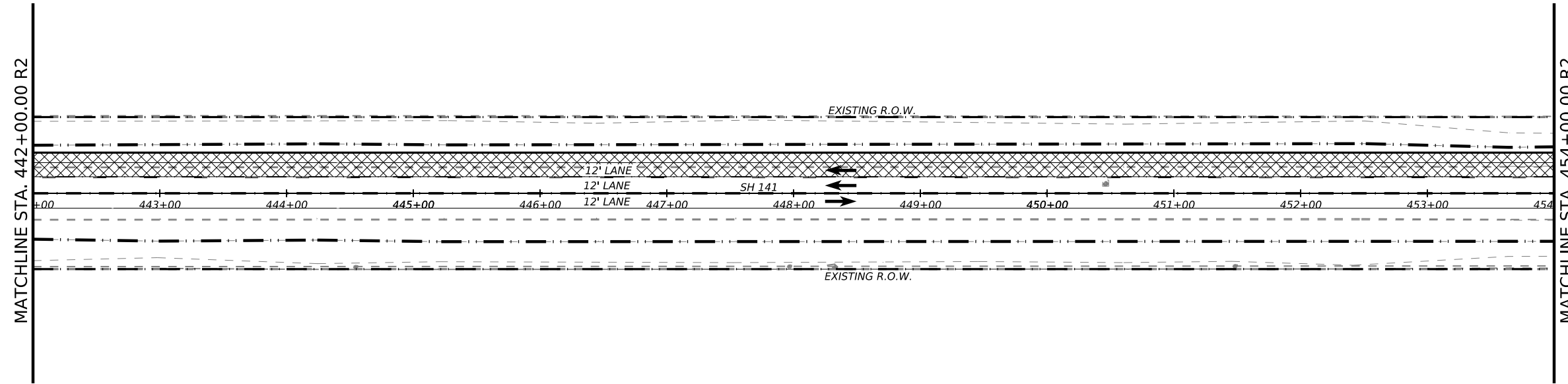
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



STATE OF TEXAS
DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.27 23:12:42-05'00'



PLAN & PROFILE
STA. 442+00 TO STA. 454+00

SHEET 30 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		095






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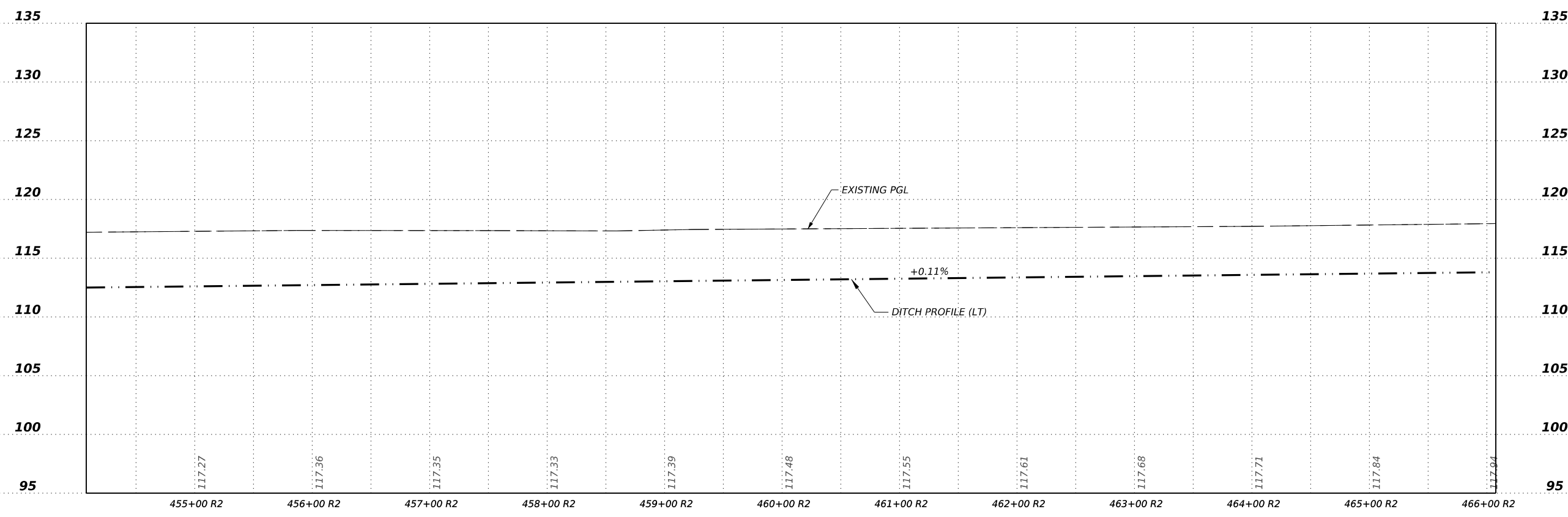
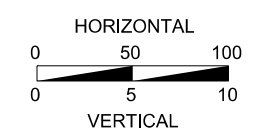
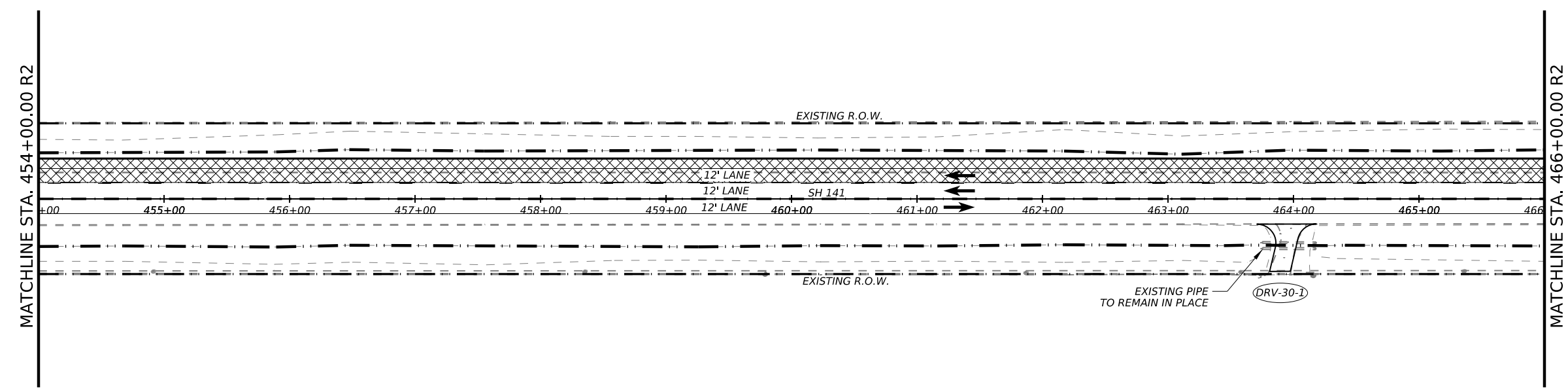
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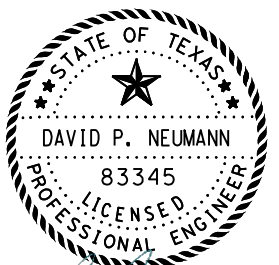


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





David P. Neumann, P.E.
2023.07.27 23:13:16-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 454+00 TO STA. 466+00

SHEET 31 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	096

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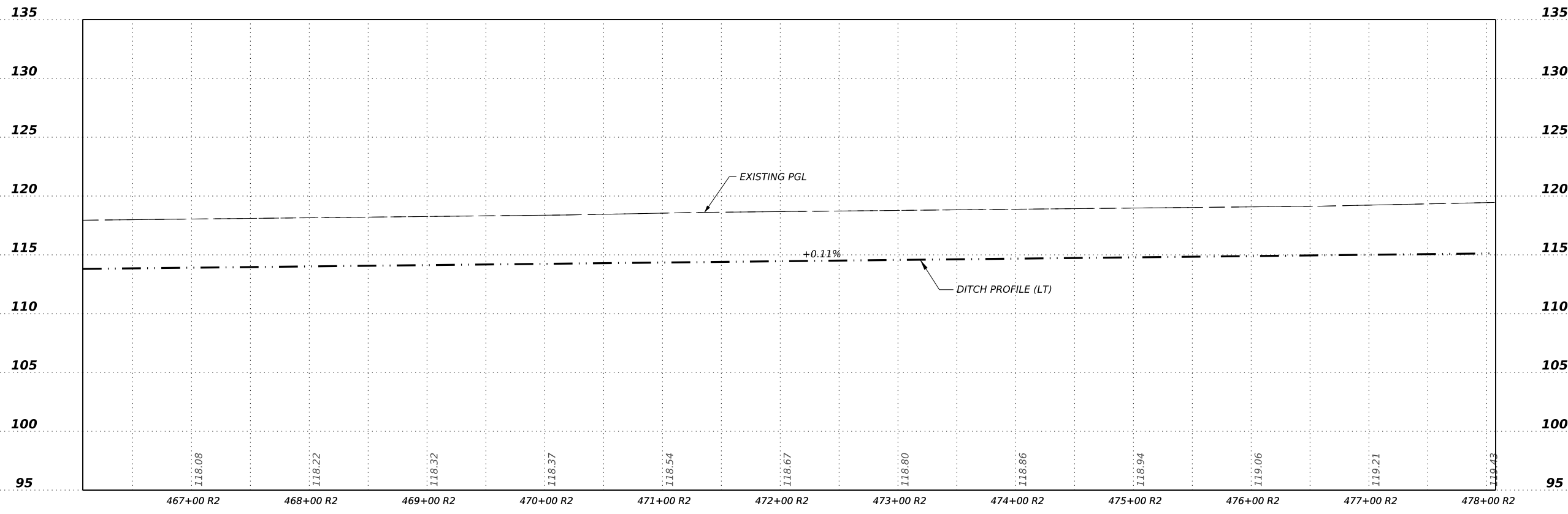
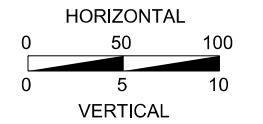
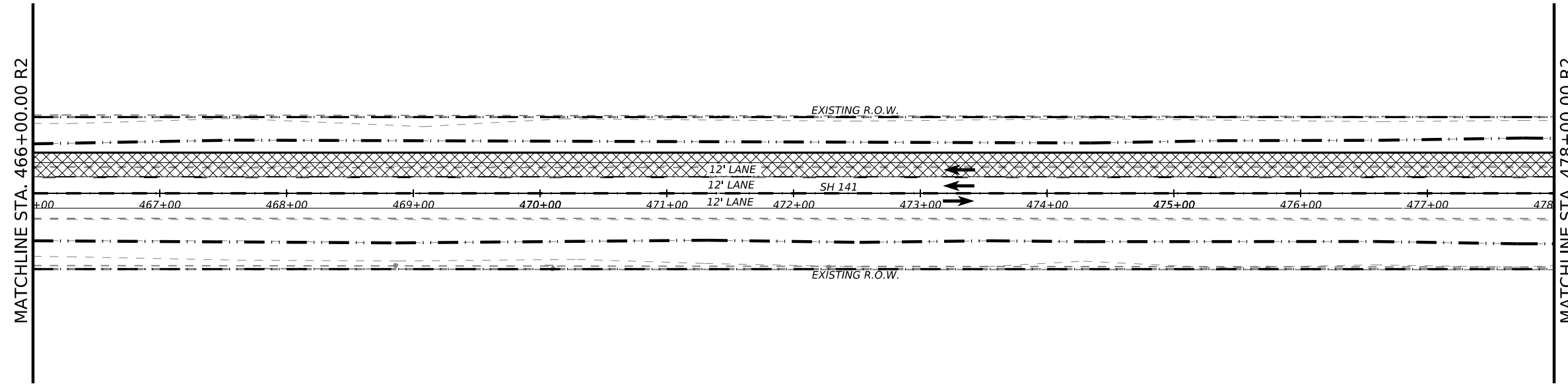
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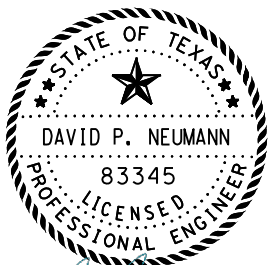


NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





2023.07.27 23:13:45-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

David P. Neumann, P.E.



PLAN & PROFILE
 STA. 466+00 TO STA. 478+00

SHEET 32 OF 56






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0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		097

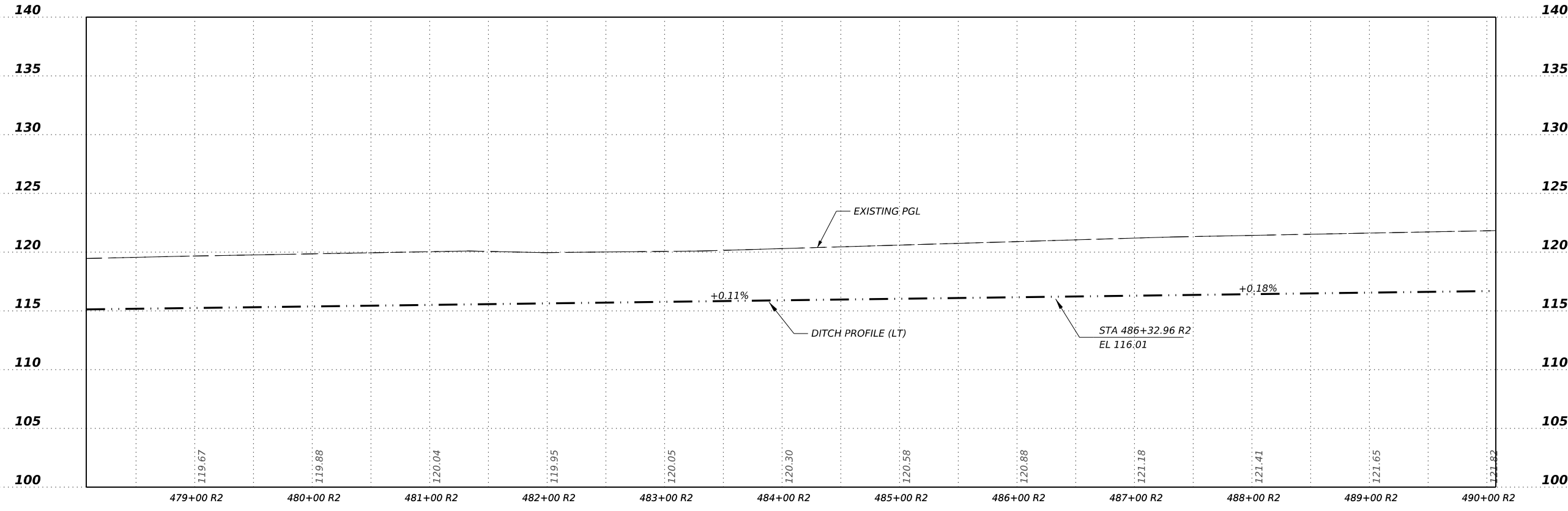
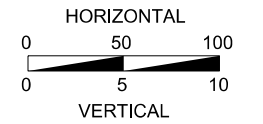
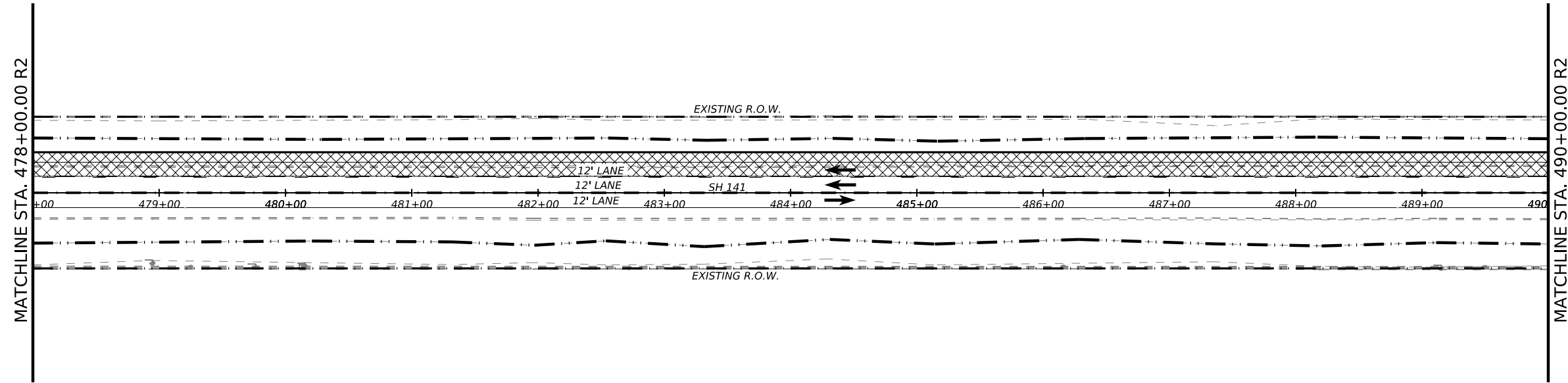
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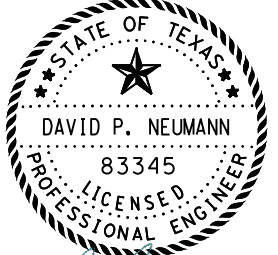


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.27 23:14:17-05'00'
LOCHNER
TBPE Firm Reg. No. 10488

 Texas Department of Transportation

PLAN & PROFILE
STA. 478+00 TO STA. 490+00

SHEET 33 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		098

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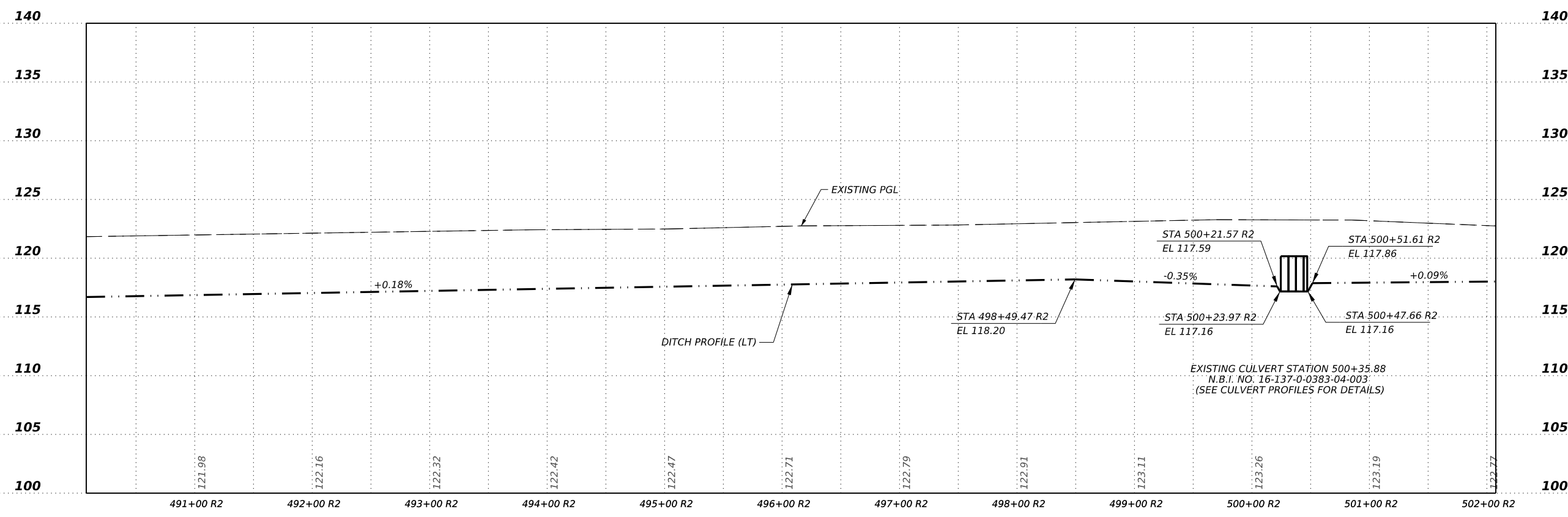
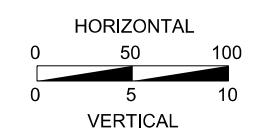
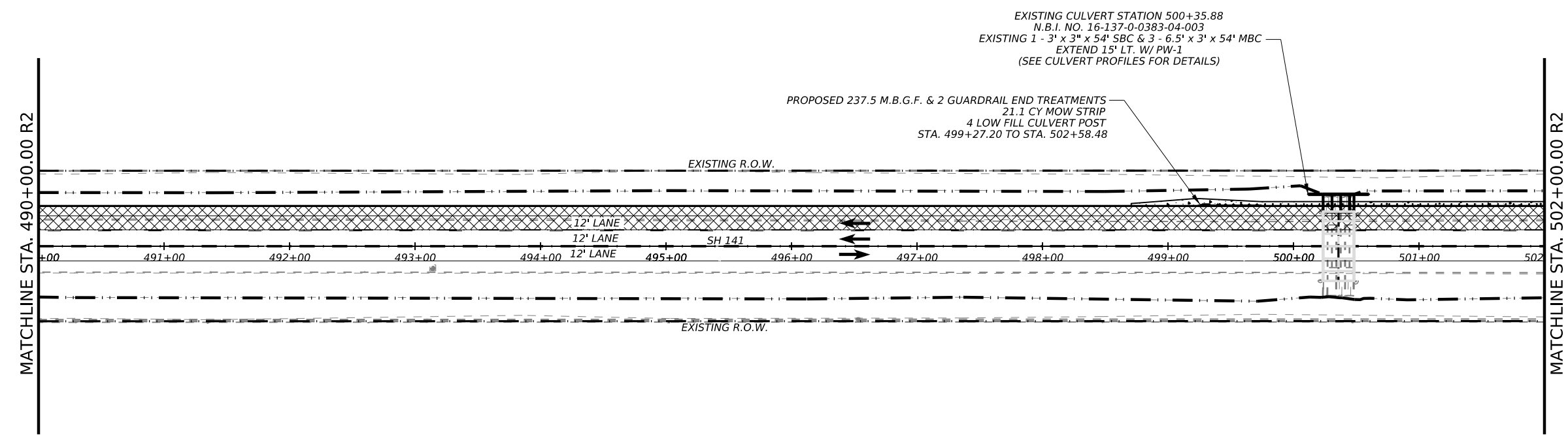
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.

2023.07.28 00:14:12-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 490+00 TO STA. 502+00

SHEET 34 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		099

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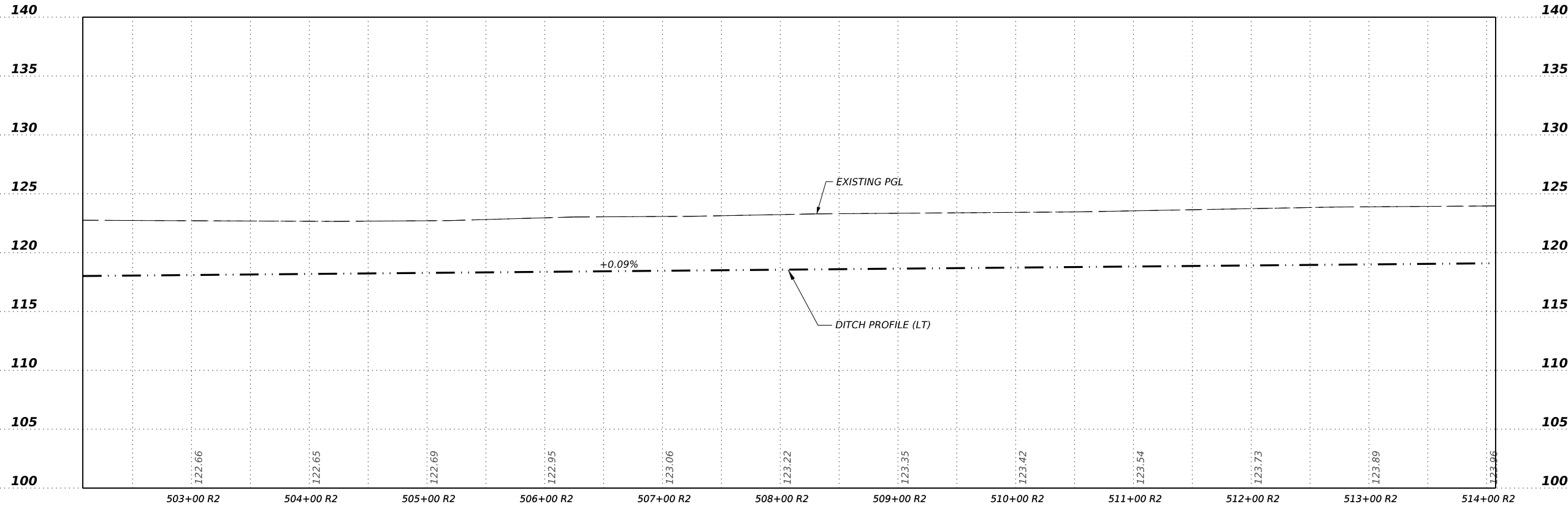
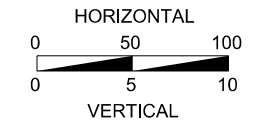
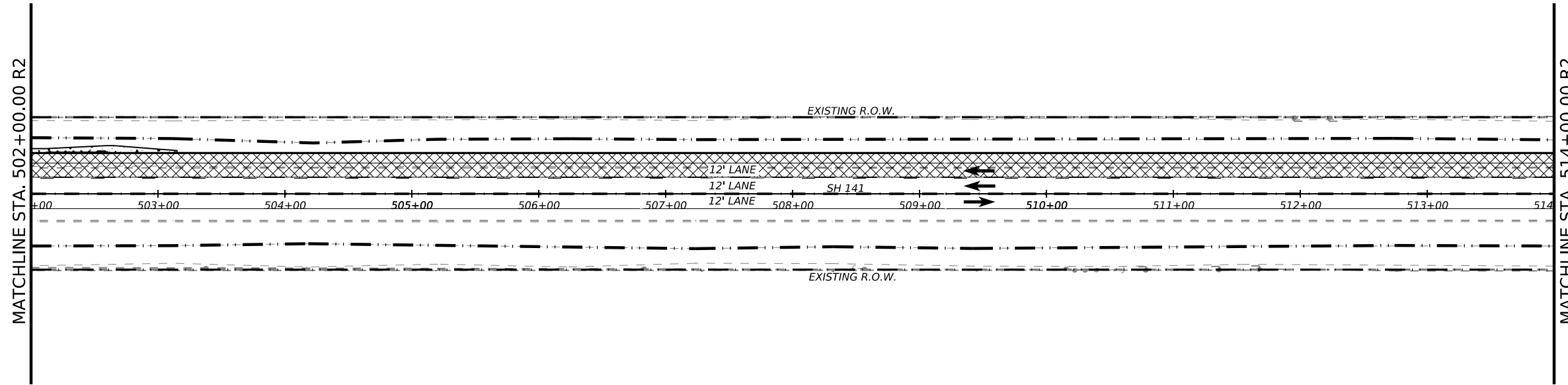
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.28 00:17:07-05'00'
LOCHNER
TBPE Firm Reg. No. 10488

PLAN & PROFILE
 STA. 502+00 TO STA. 514+00






SHEET 35 OF 56			
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	100

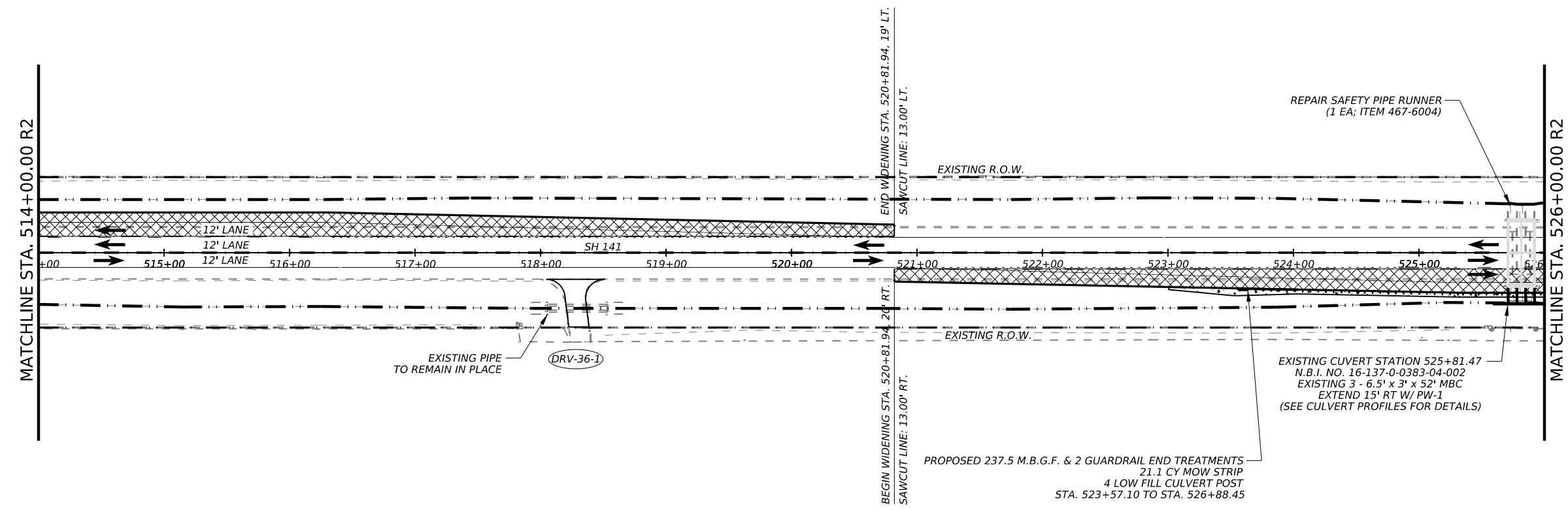
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

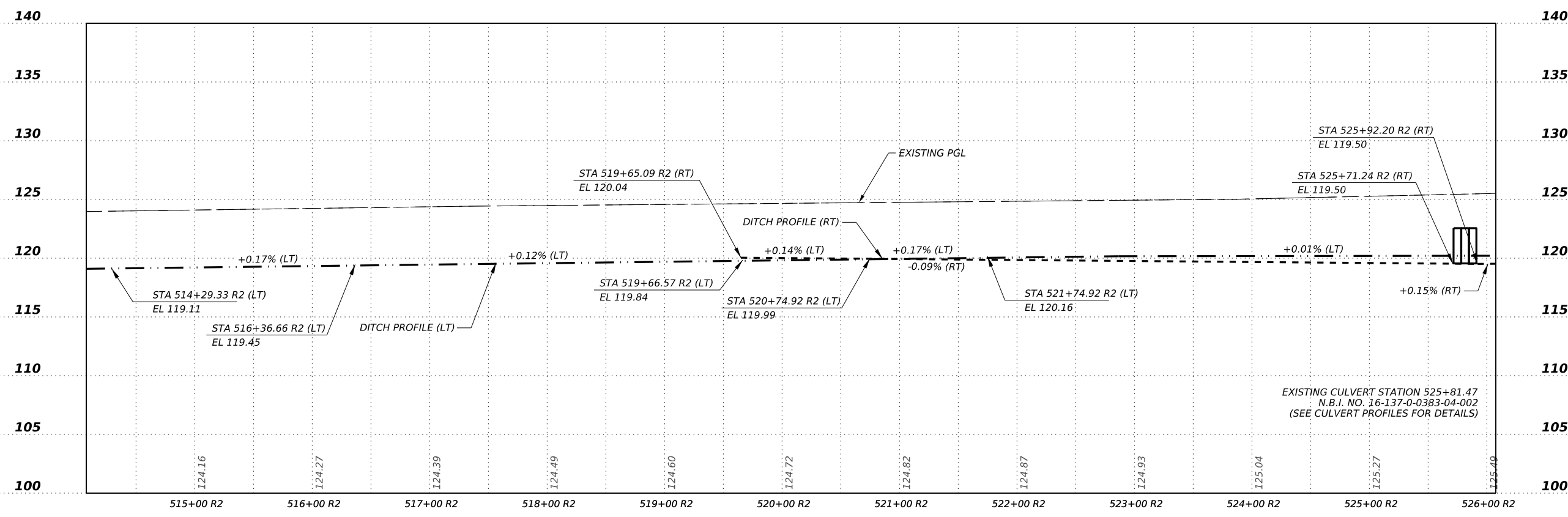
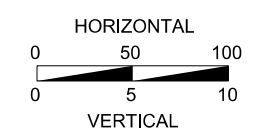
LEGEND

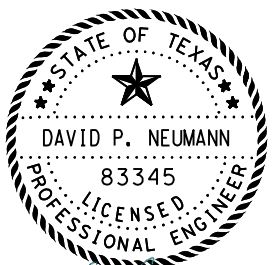
-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



PROPOSED 237.5 M.B.G.F. & 2 GUARDRAIL END TREATMENTS
21.1 CY MOW STRIP
4 LOW FILL CULVERT POST
STA. 523+57.10 TO STA. 526+88.45

EXISTING CULVERT STATION 525+81.47
N.B.I. NO. 16-137-0-0383-04-002
EXISTING 3 - 6.5' x 3' x 52' MBC
EXTEND 15' RT W/ PW-1
(SEE CULVERT PROFILES FOR DETAILS)




 2023.07.28 00:27:32-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

 Texas Department of Transportation

PLAN & PROFILE
STA. 514+00 TO STA. 526+00

SHEET 36 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		101

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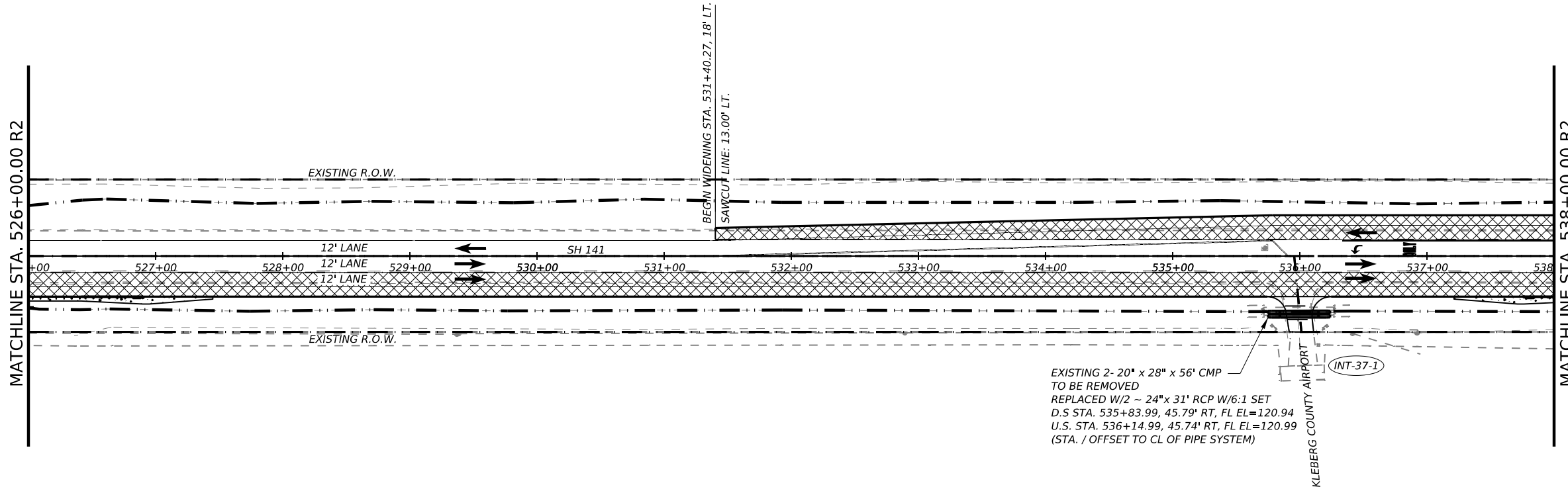
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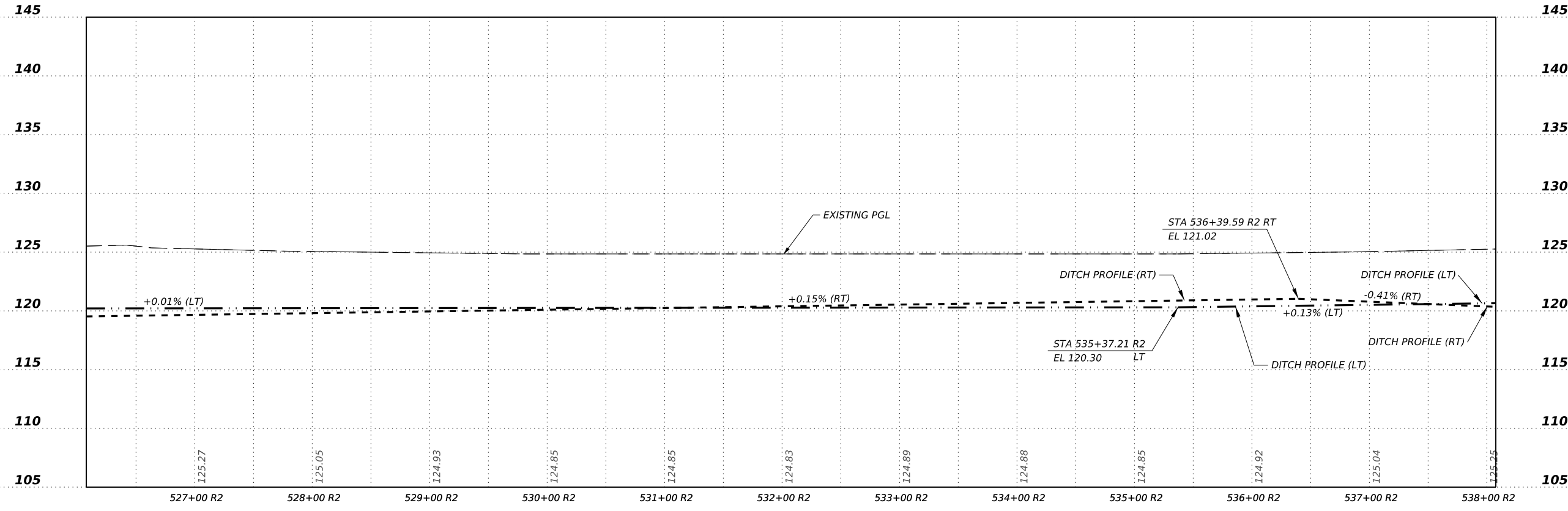
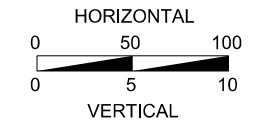
NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



EXISTING 2- 20" x 28" x 56' CMP
TO BE REMOVED
REPLACED W/2 ~ 24" x 31' RCP W/6:1 SET
D.S STA. 535+83.99, 45.79' RT, FL EL=120.94
U.S. STA. 536+14.99, 45.74' RT, FL EL=120.99
(STA. / OFFSET TO CL OF PIPE SYSTEM)



David P. Neumann, P.E.
 2023.11.29 16:17:53-06'00'
LOCHNER
 TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 526+00 TO STA. 538+00

SHEET 37 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		102






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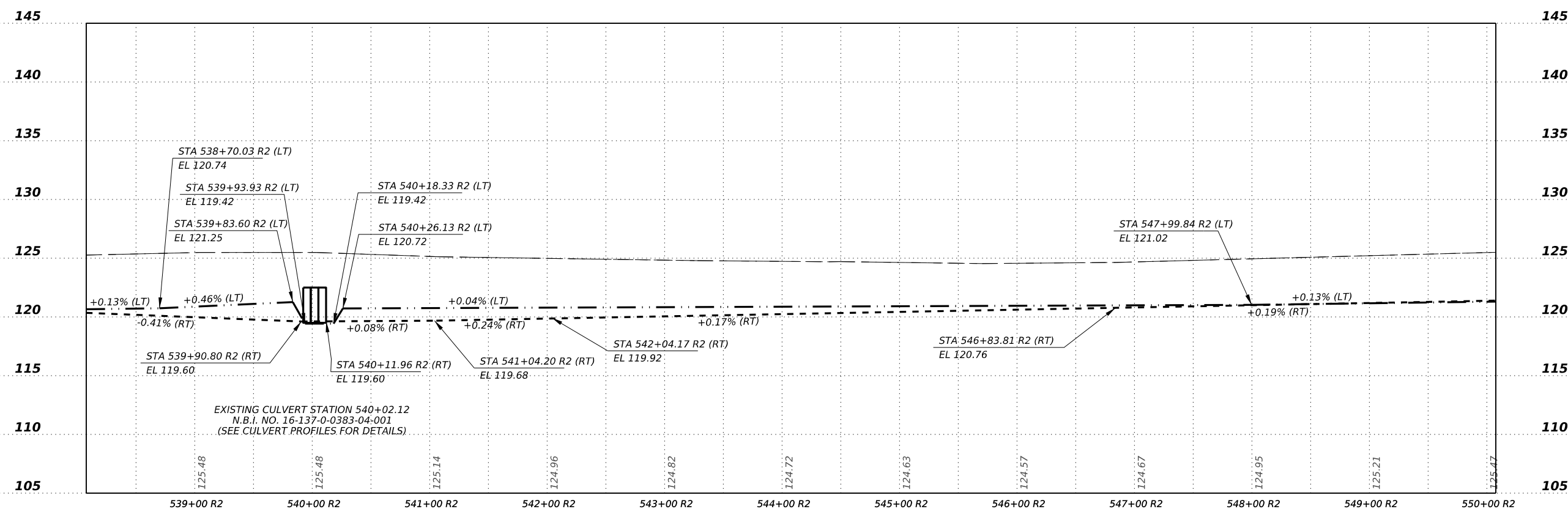
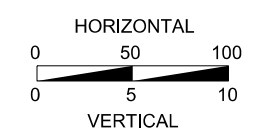
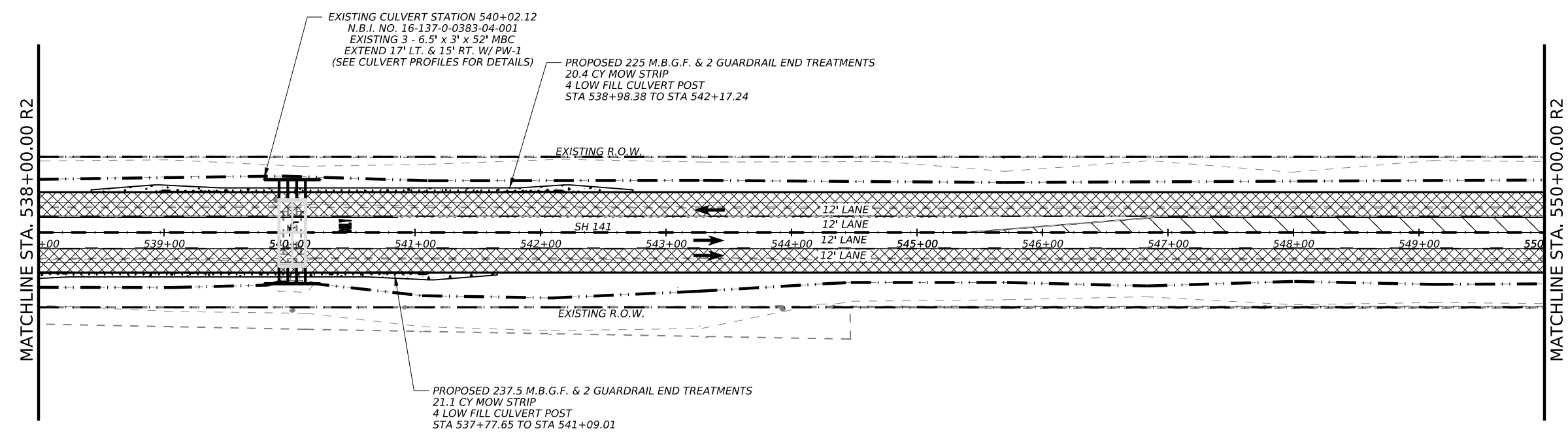
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



David P. Neumann, P.E.
2023.07.28 00:36:29-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 538+00 TO STA. 550+00

SHEET 38 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		103

DATE: 7/28/2023 12:35:37 AM
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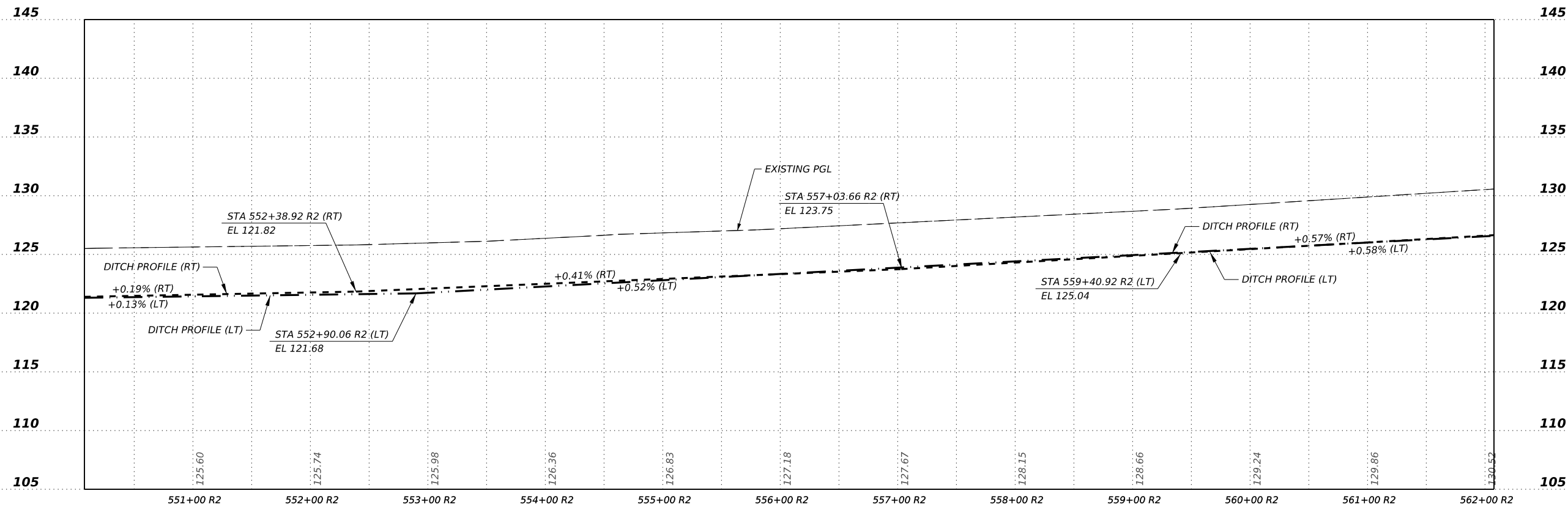
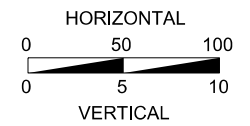
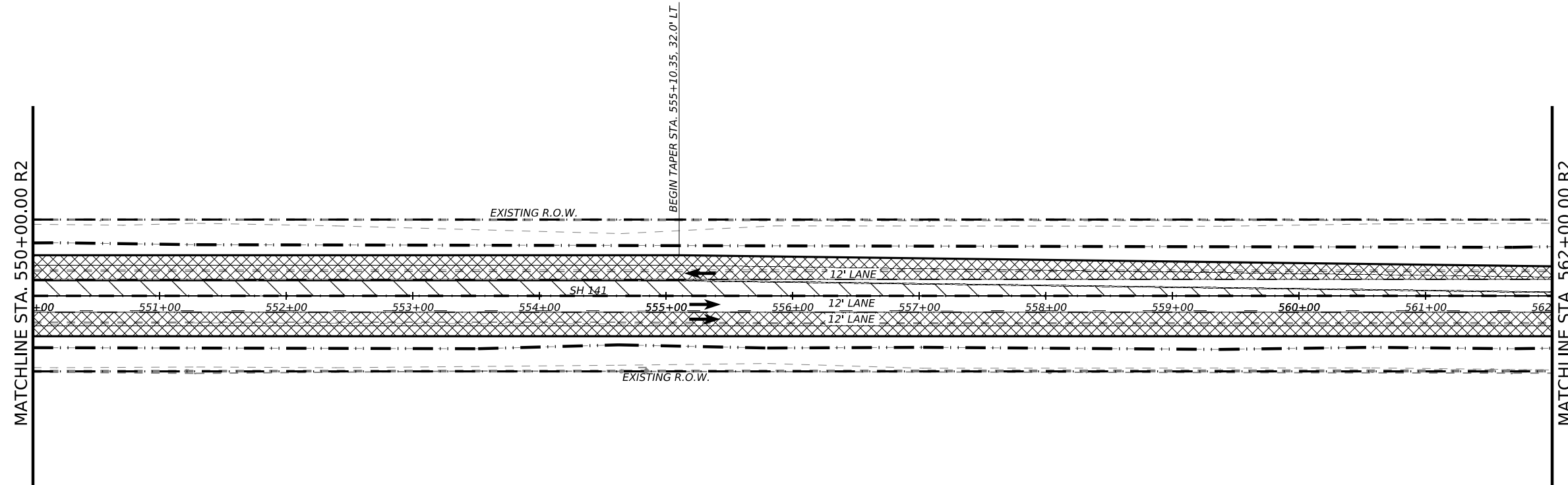
DW: _____
 CK: _____
 DW: _____
 CK: _____



NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.28 00:41:34-05'00'
LOCHNER
TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 550+00 TO STA. 562+00

SHEET 39 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		104

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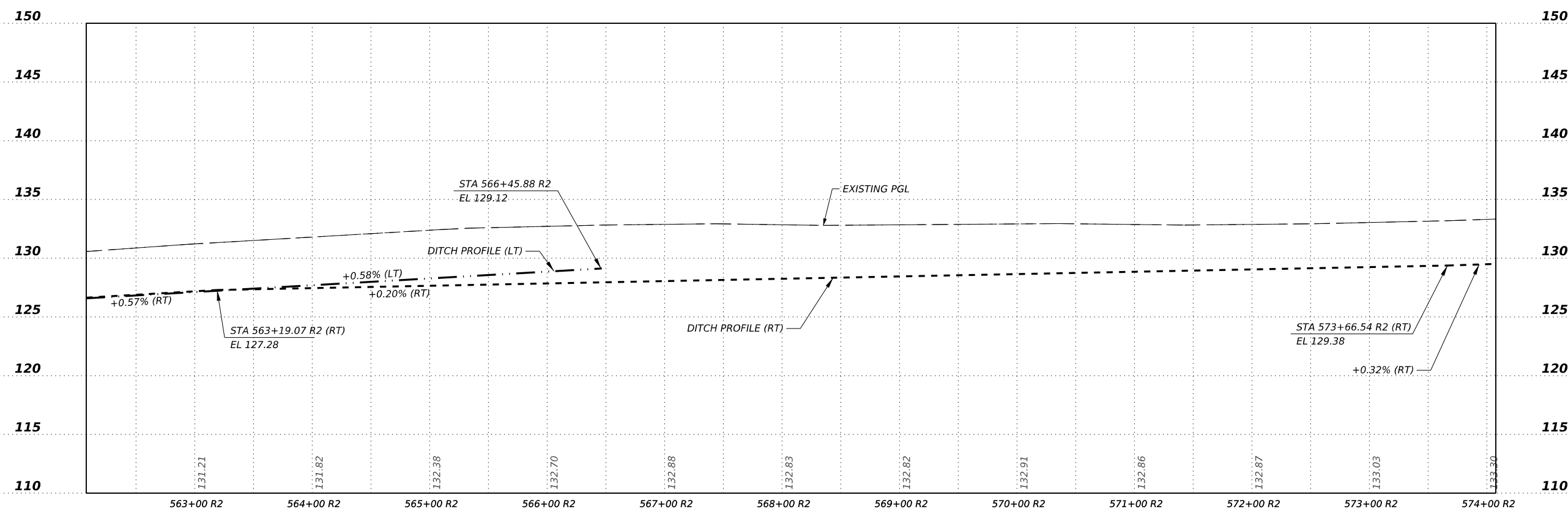
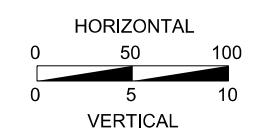
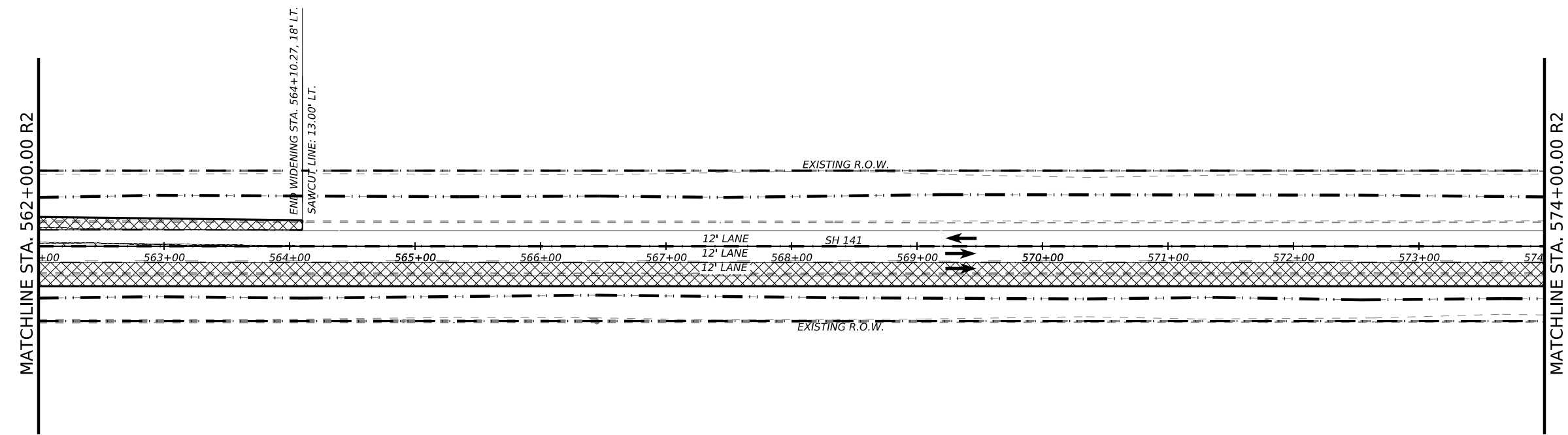
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.28 00:43:41-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 562+00 TO STA. 574+00






SHEET 40 OF 56			
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		105

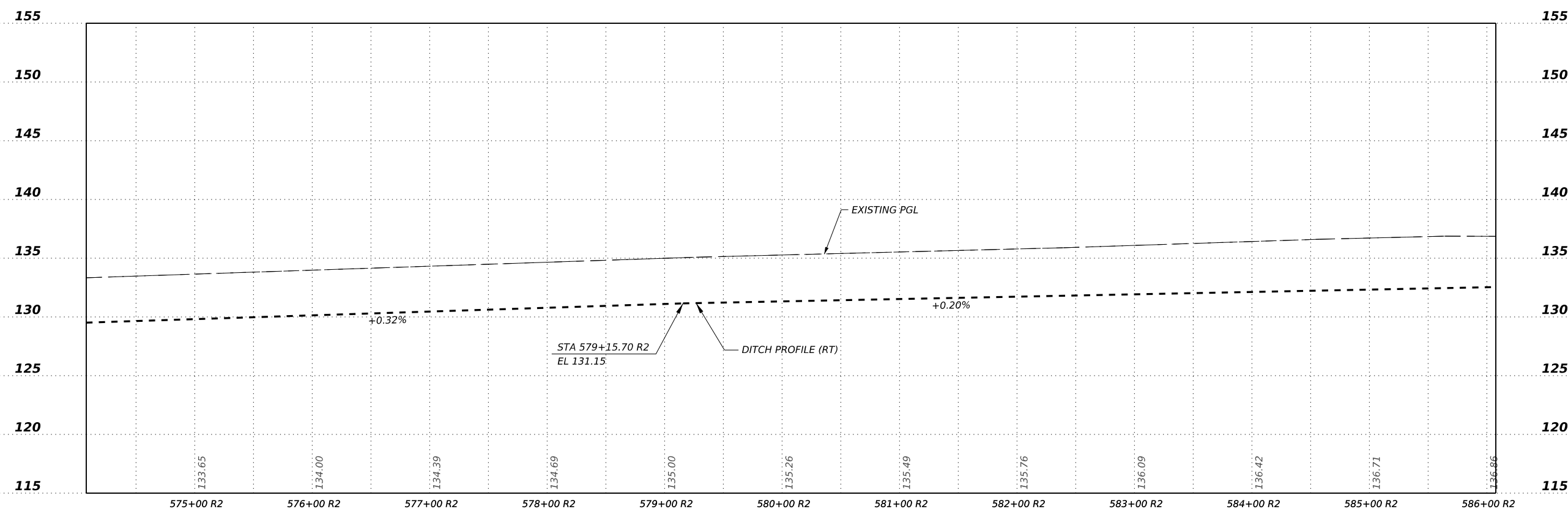
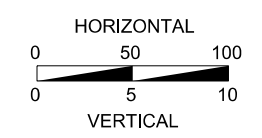
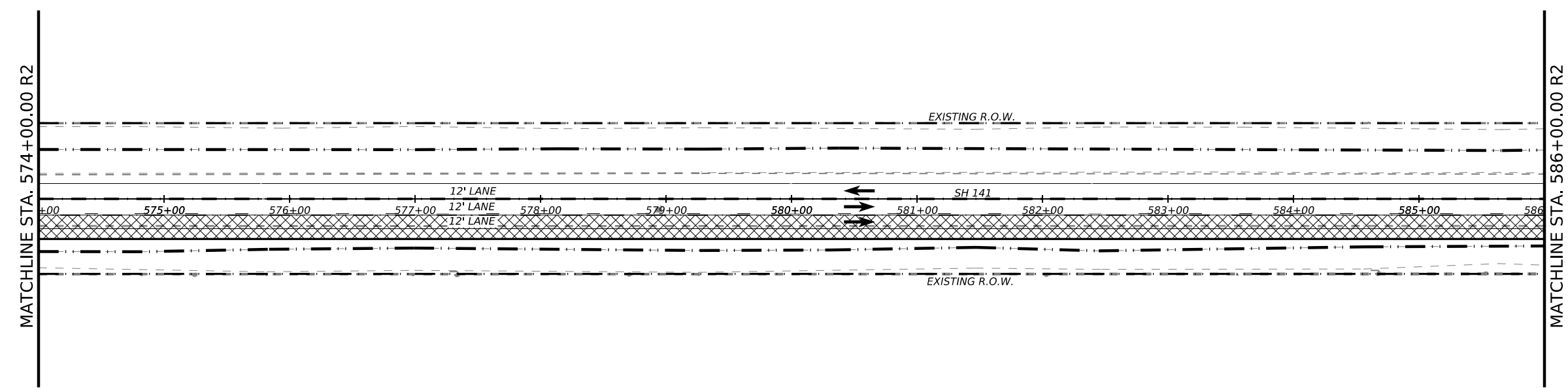
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CK:
DW:



NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.28 00:45:43-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



Texas Department of Transportation

PLAN & PROFILE
STA. 574+00 TO STA. 586+00

SHEET 41 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	106

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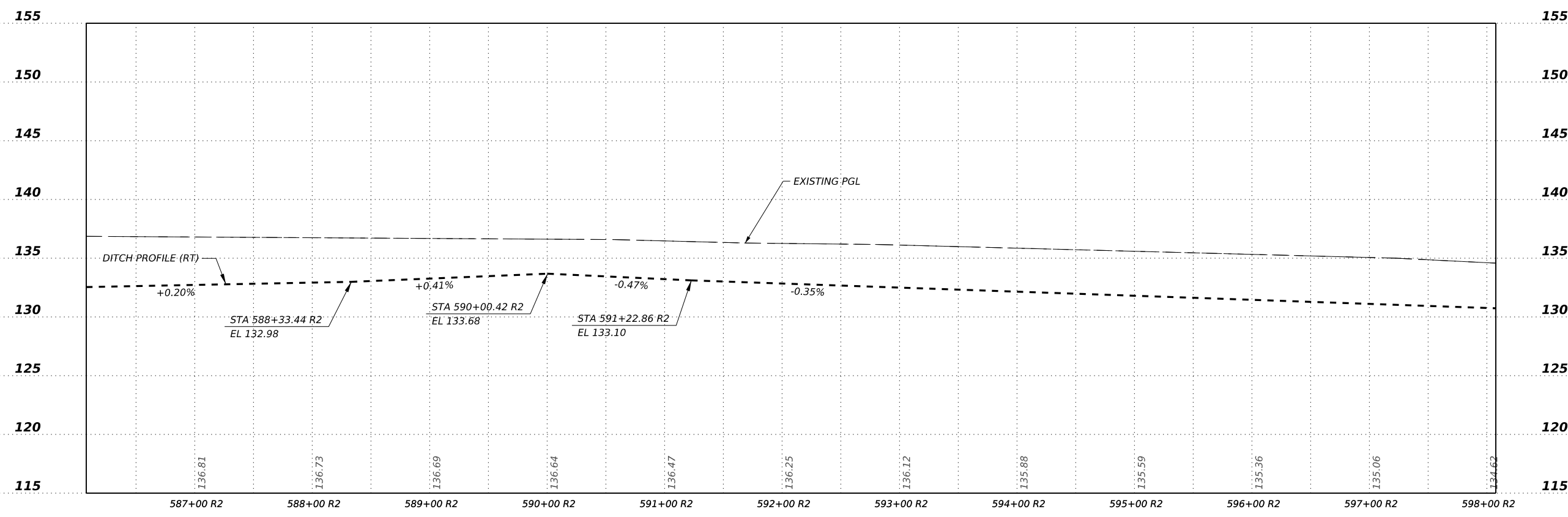
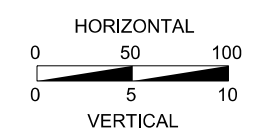
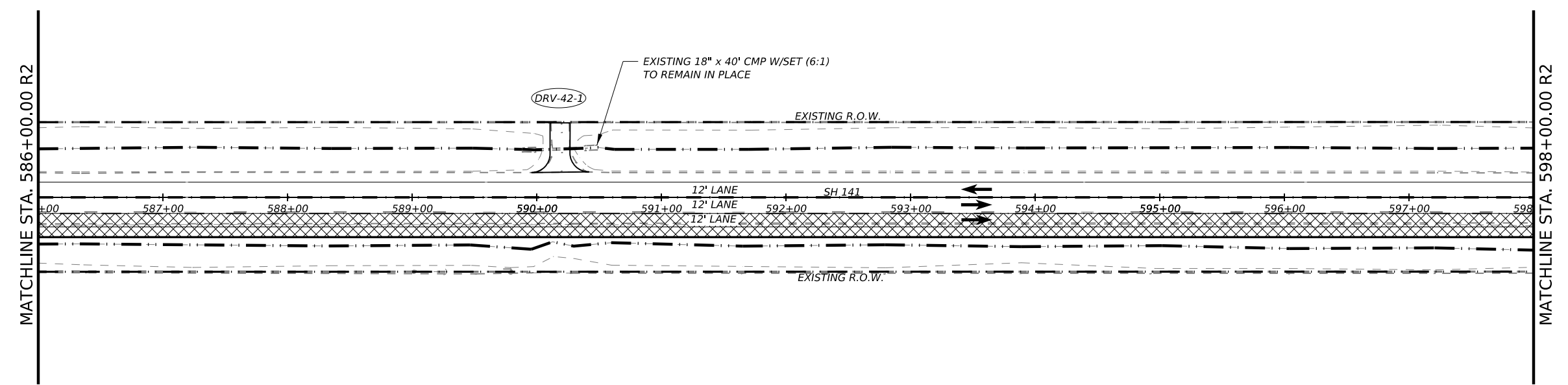
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.
 2023.07.28 00:48:39-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488



PLAN & PROFILE

STA. 586+00 TO STA. 598+00






SHEET 42 OF 56			
CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		107

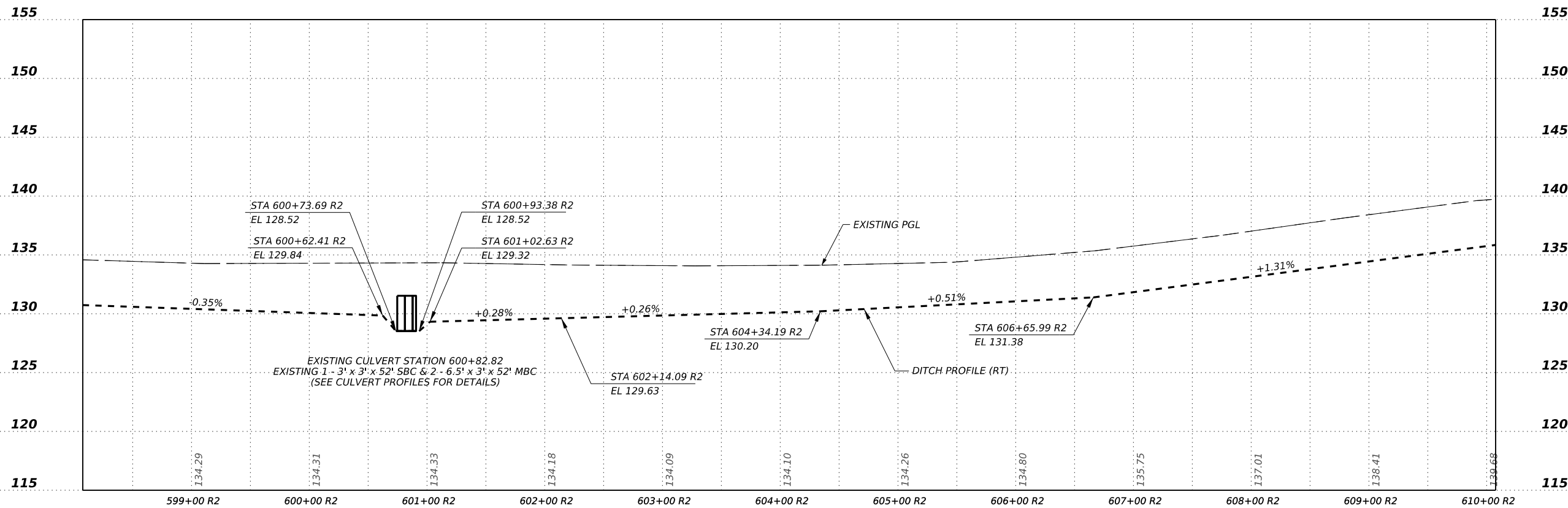
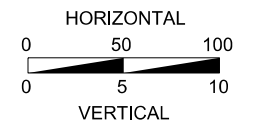
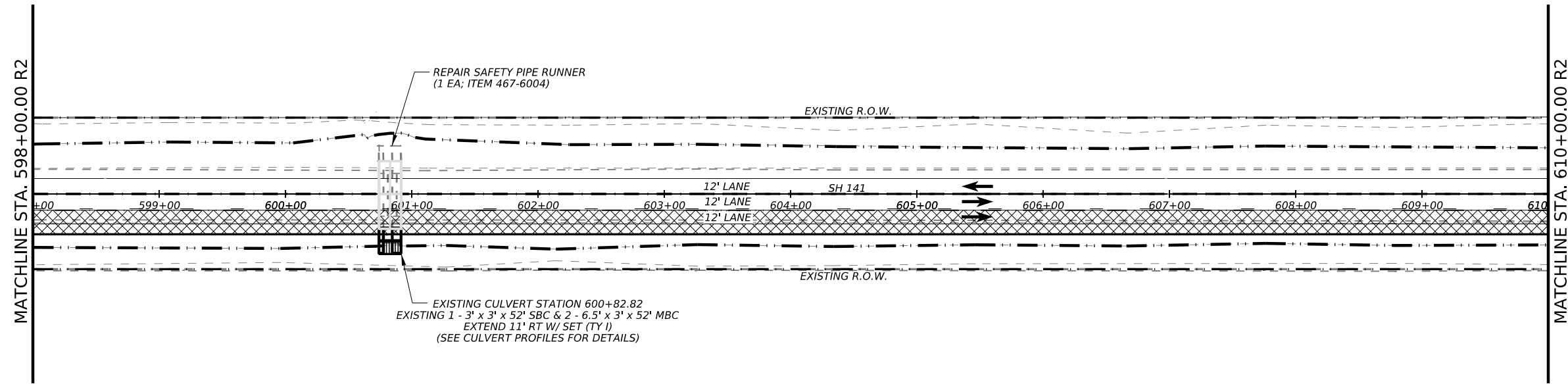
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



David P. Neumann, P.E.
2023.07.28 00:53:08-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 598+00 TO STA. 610+00

SHEET 43 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		108






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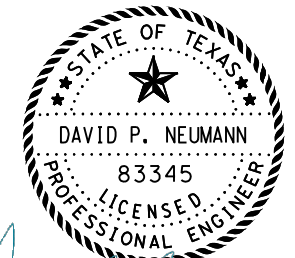
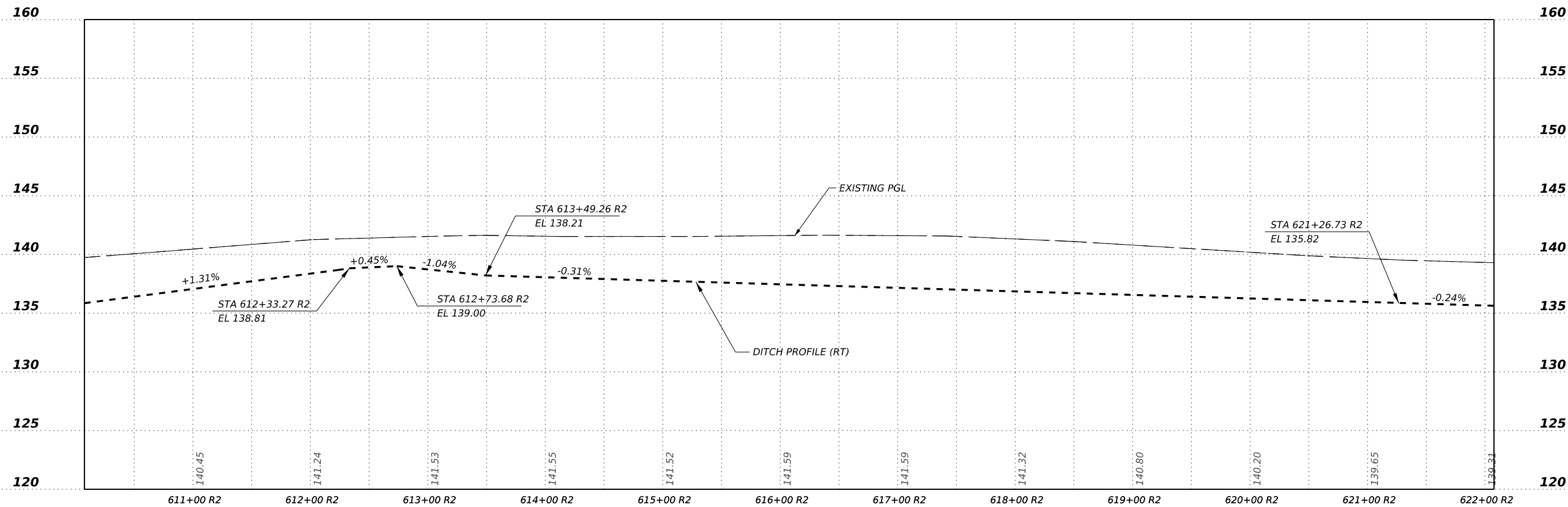
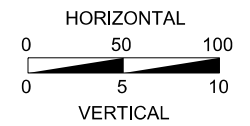
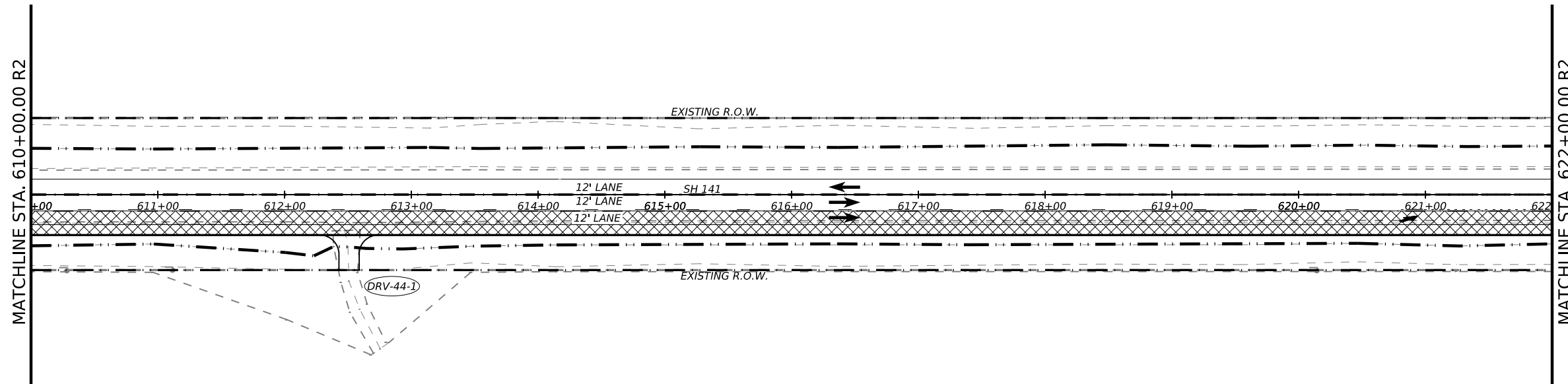
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DW:



NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



David P. Neumann, P.E.

2023.07.28 00:55:28-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 610+00 TO STA. 622+00

SHEET 44 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	109






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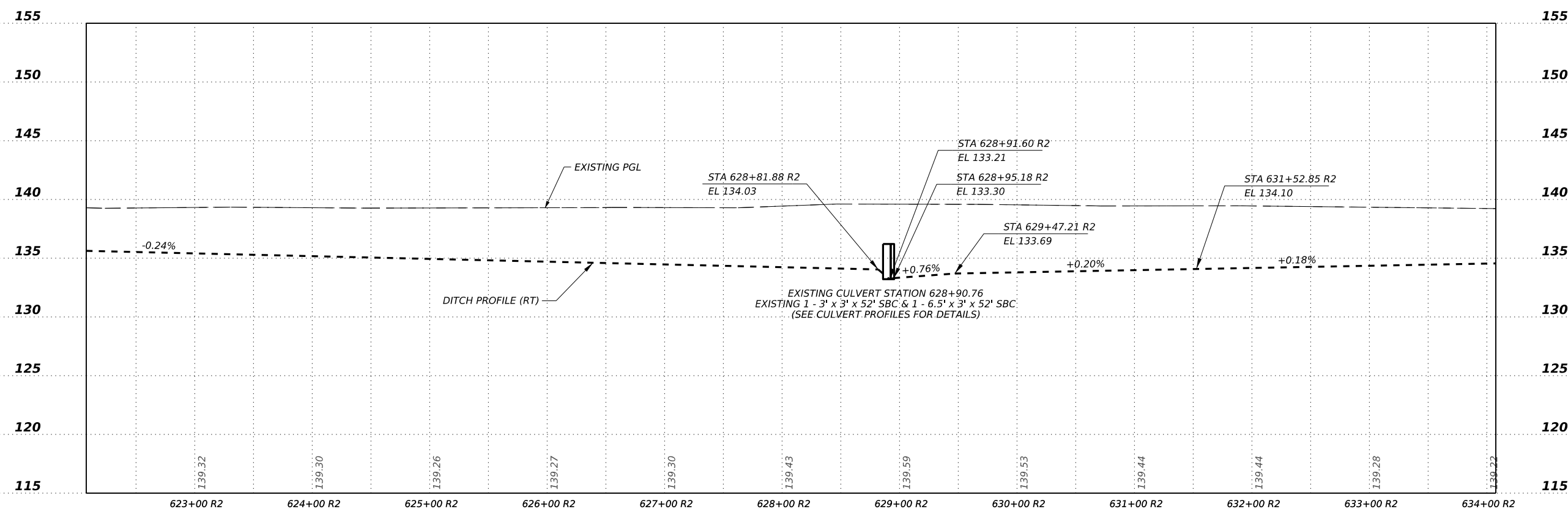
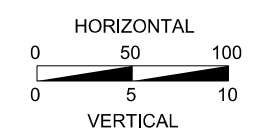
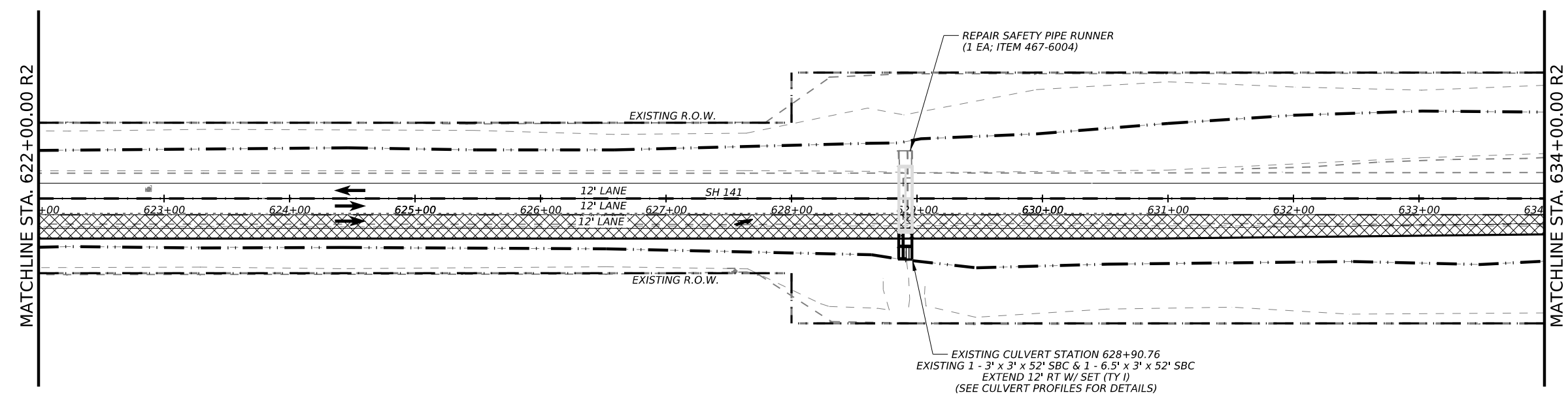
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DW:



NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



David P. Neumann, P.E.
2023.07.28 00:59:20-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



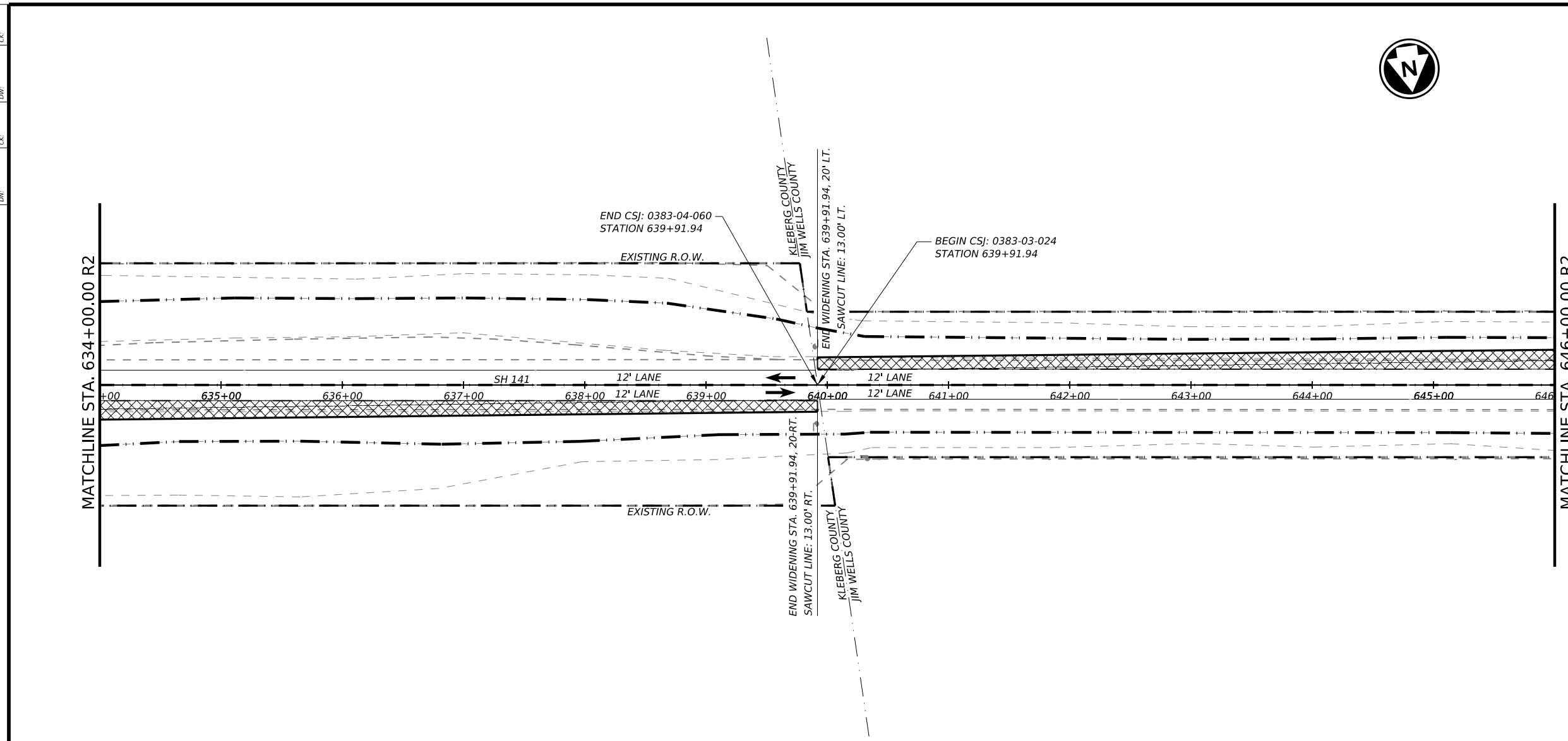
PLAN & PROFILE
STA. 622+00 TO STA. 634+00

SHEET 45 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		110

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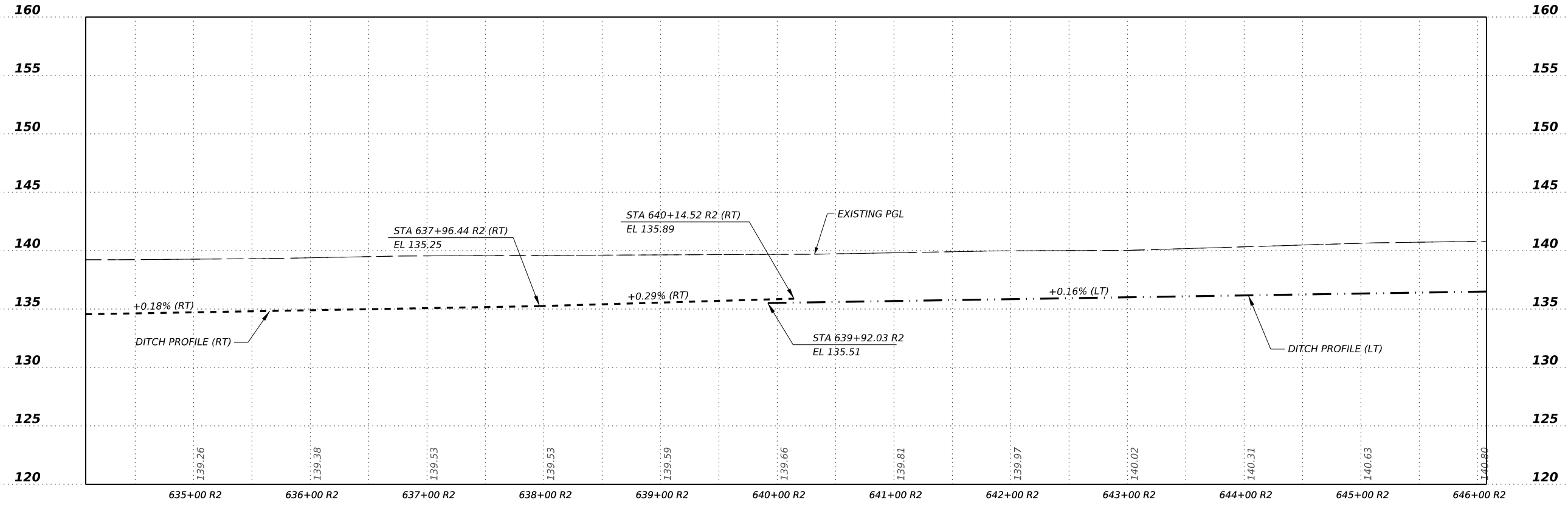
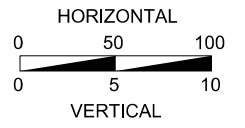
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.28 01:01:47-05'00"
LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 634+00 TO STA. 646+00

SHEET 46 OF 56






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0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		111

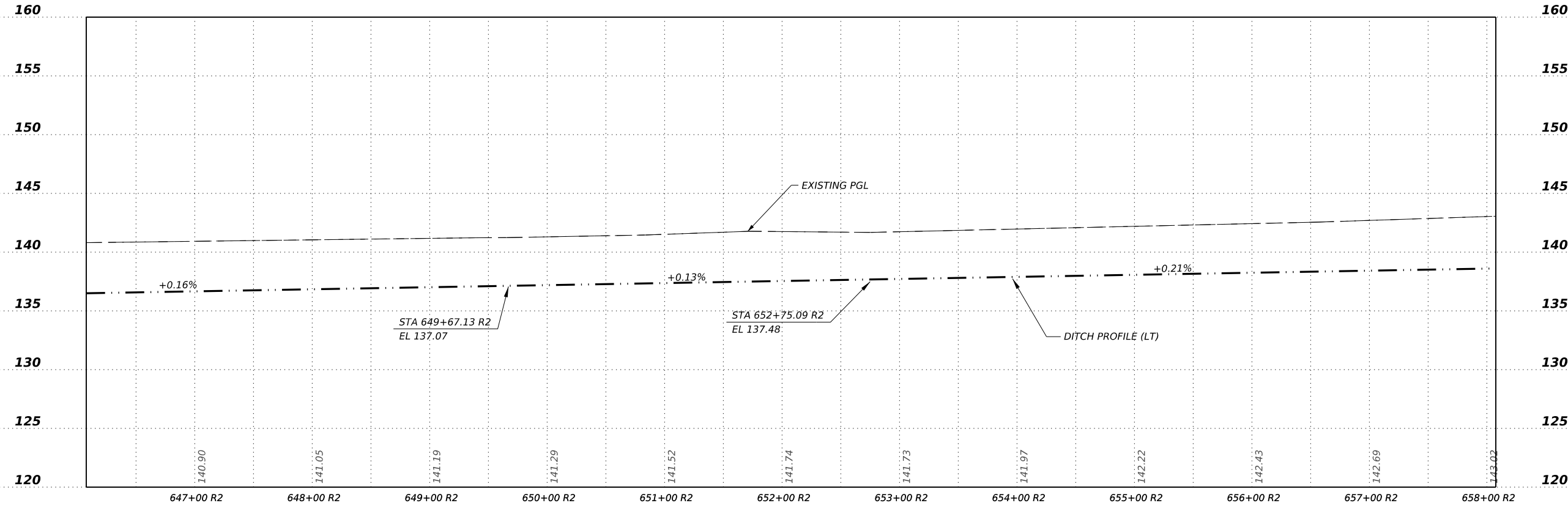
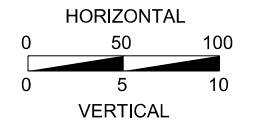
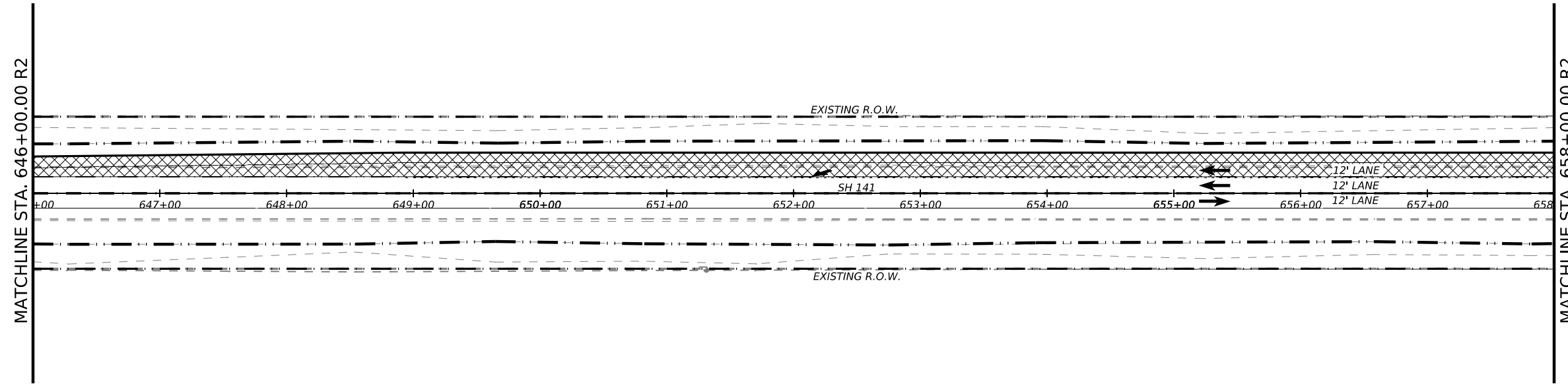
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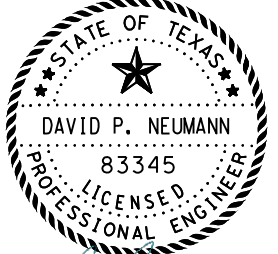


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND


-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





David P. Neumann, P.E.
2023.07.28 01:01:14-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



PLAN & PROFILE
STA. 646+00 TO STA. 658+00

SHEET 47 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	112

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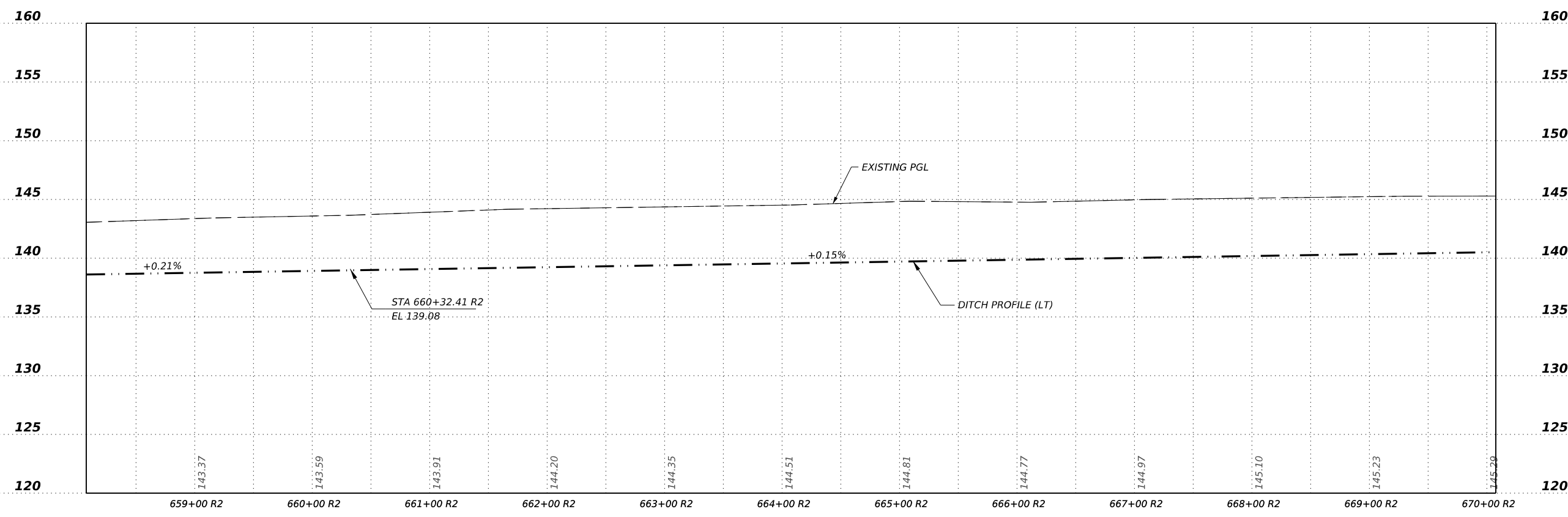
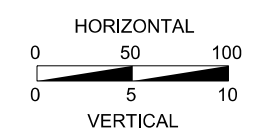
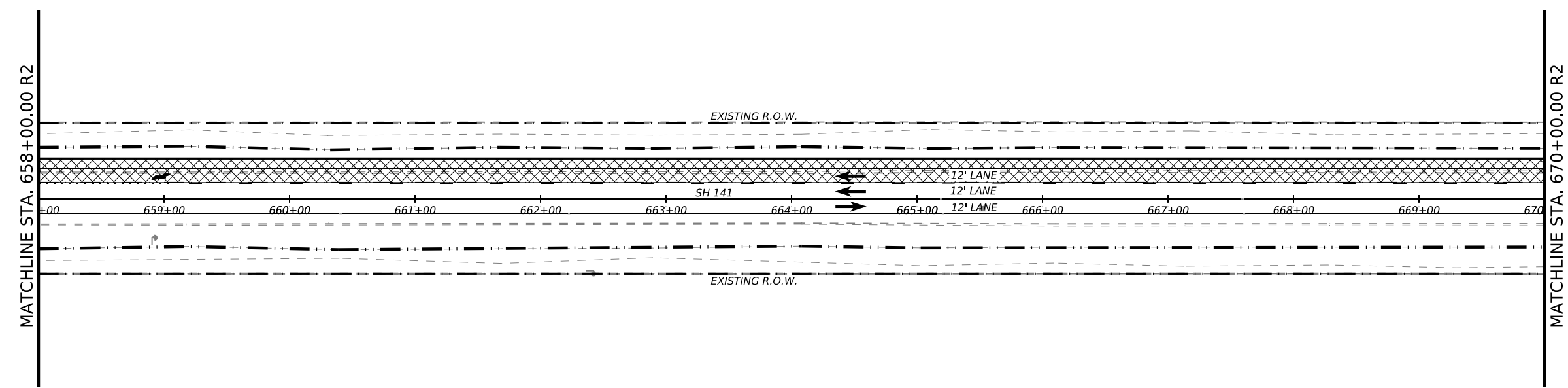
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X





David P. Neumann, P.E.
 2023.07.28 01:08:40-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 658+00 TO STA. 670+00

SHEET 48 OF 56






CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	113

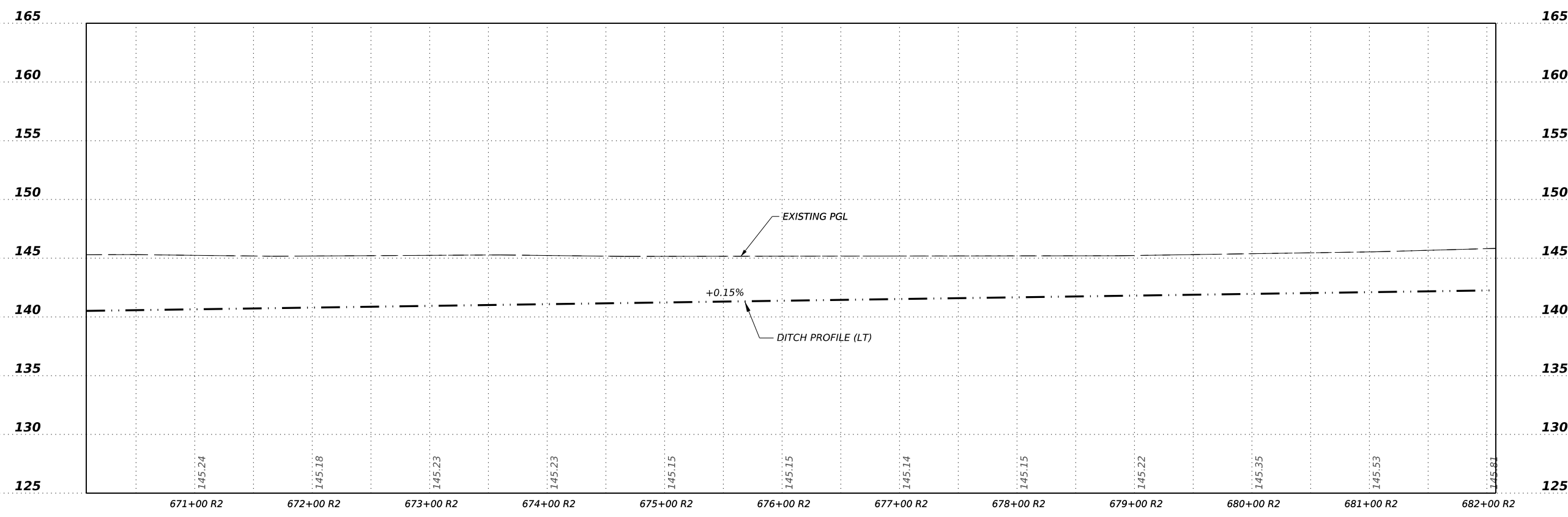
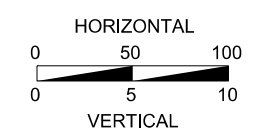
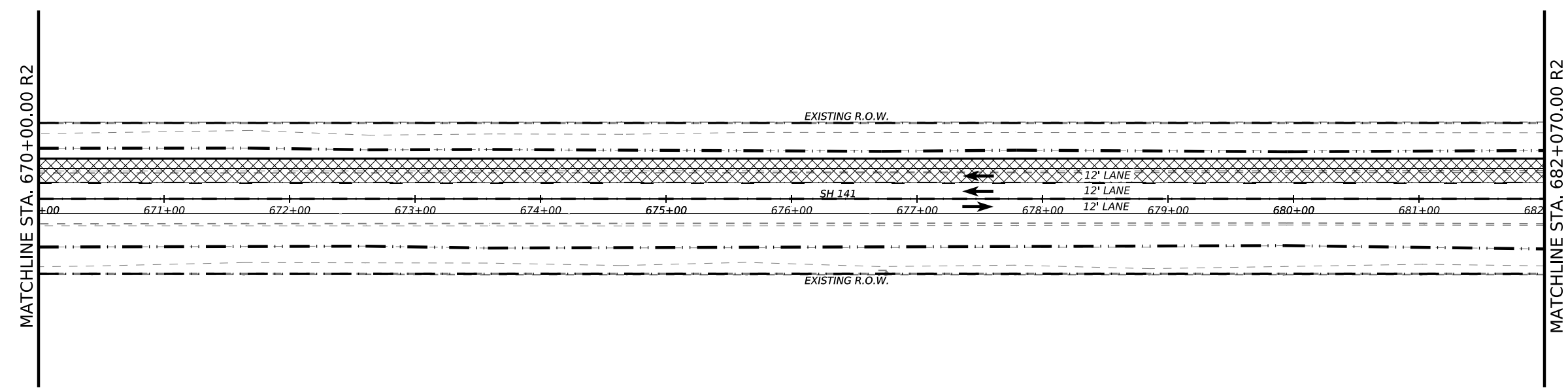
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DW:

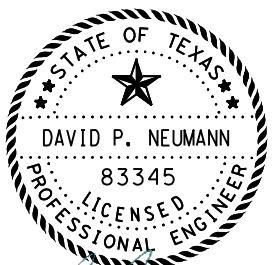


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.28 01:08:26-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

 Texas Department of Transportation

PLAN & PROFILE
STA. 670+00 TO STA. 682+00

SHEET 49 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	114






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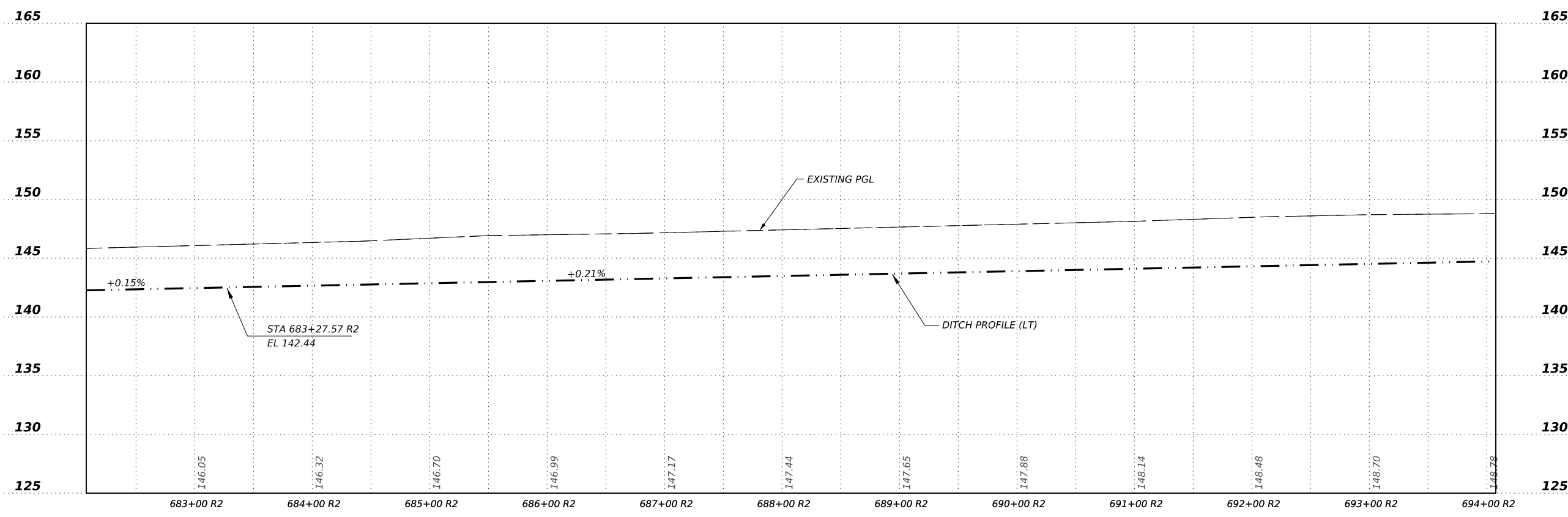
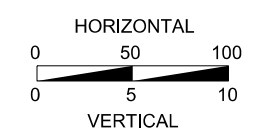
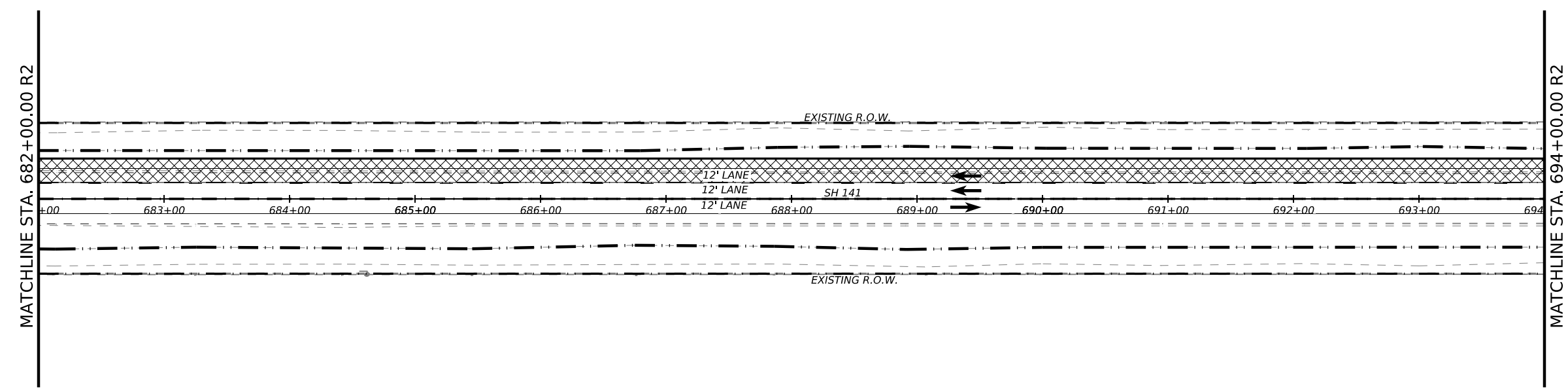
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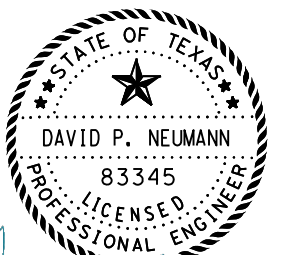


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X





DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.28 01:08:11-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

 Texas Department of Transportation

PLAN & PROFILE
STA. 682+00 TO STA. 694+00

SHEET 50 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		115

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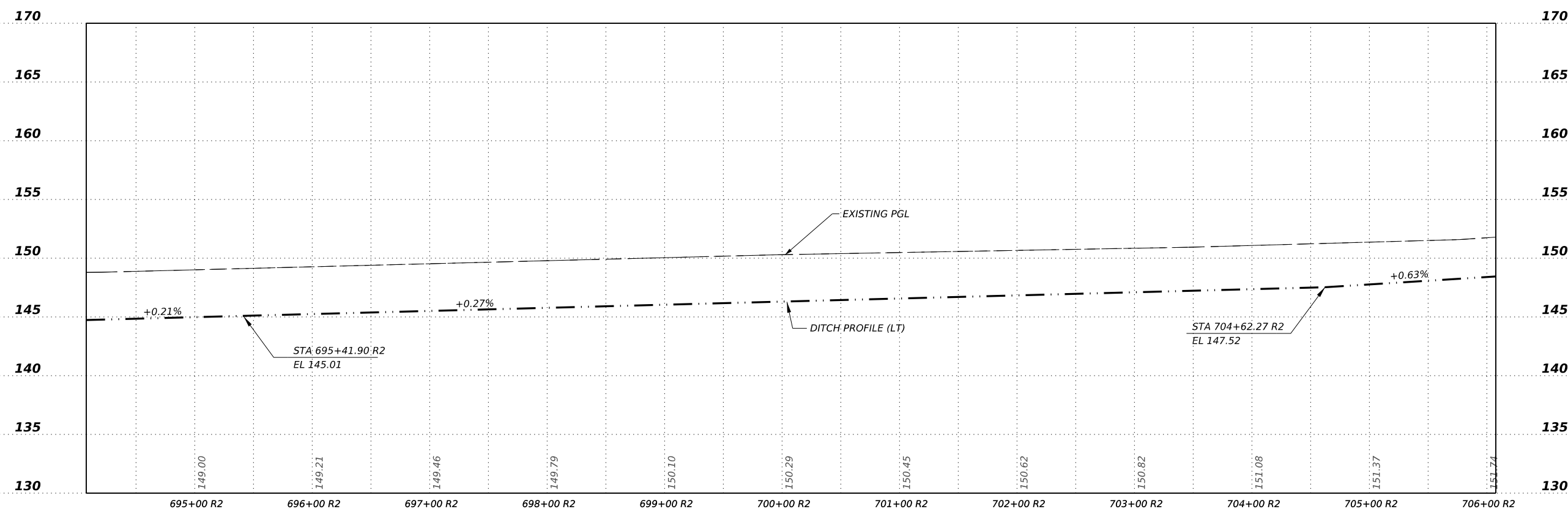
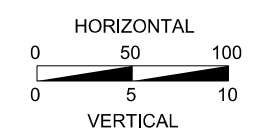
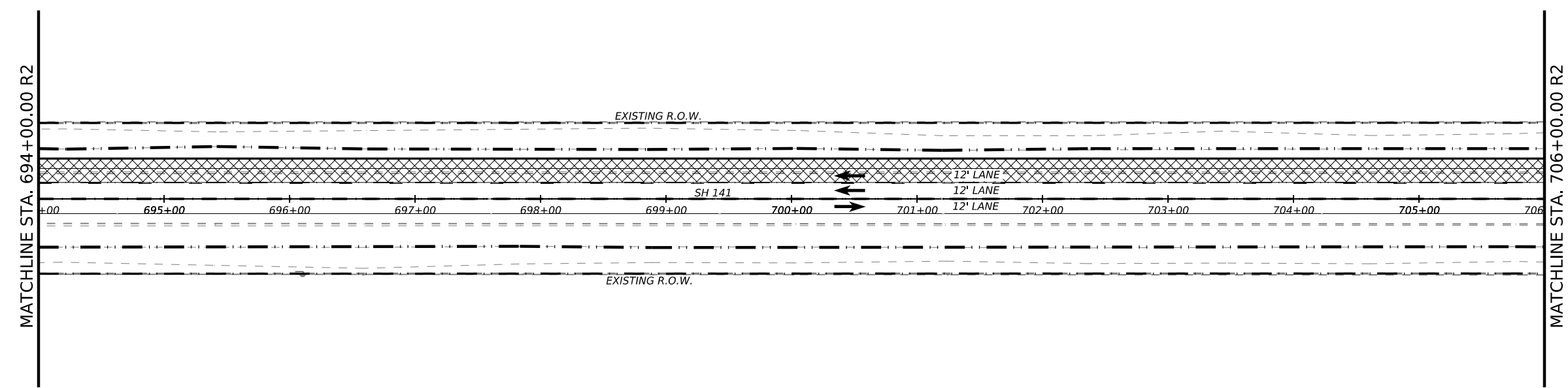
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.
 2023.07.28 01:07:59-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 694+00 TO STA. 706+00

SHEET 51 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		116

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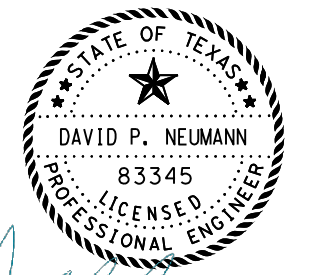
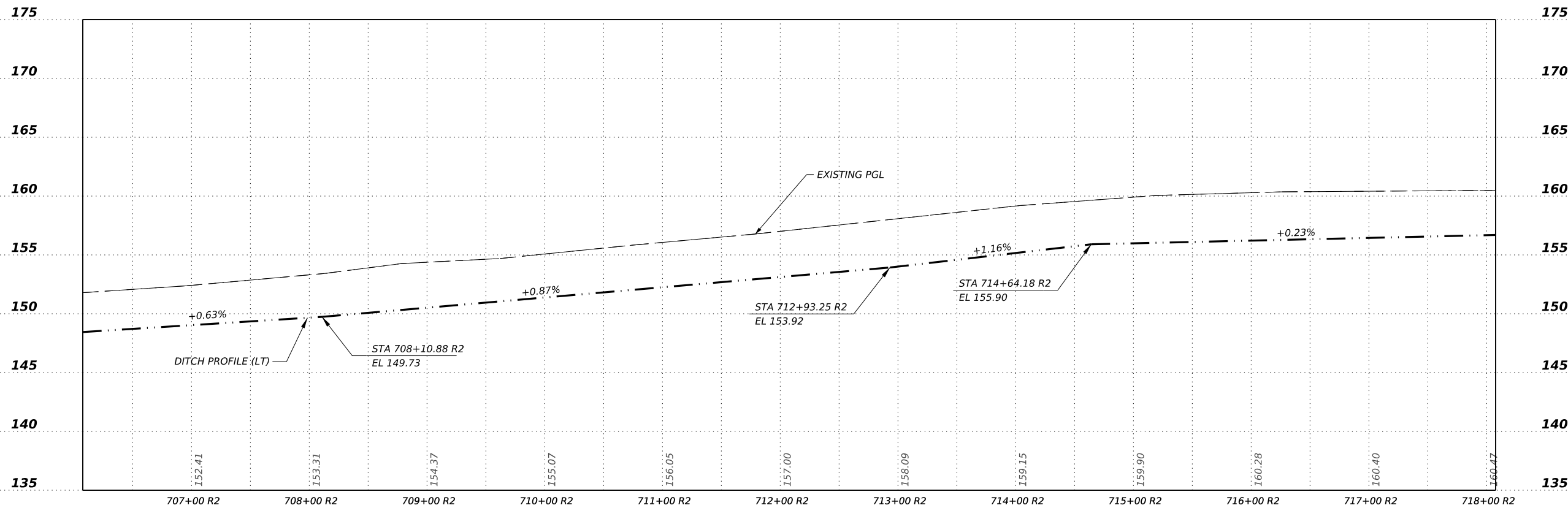
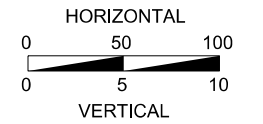
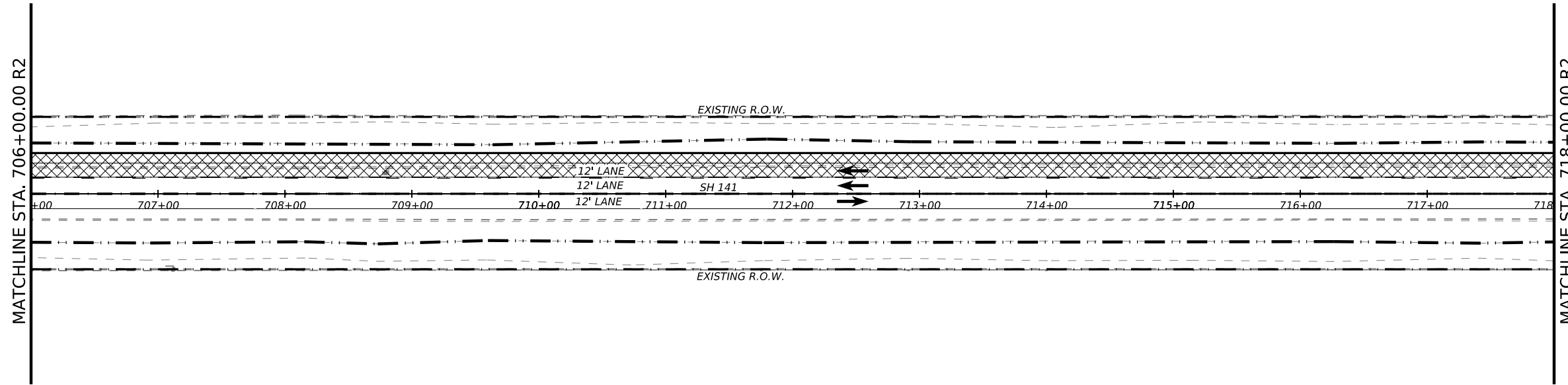
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.28 01:07:45-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



PLAN & PROFILE
 STA. 706+00 TO STA. 718+00

SHEET 52 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		117

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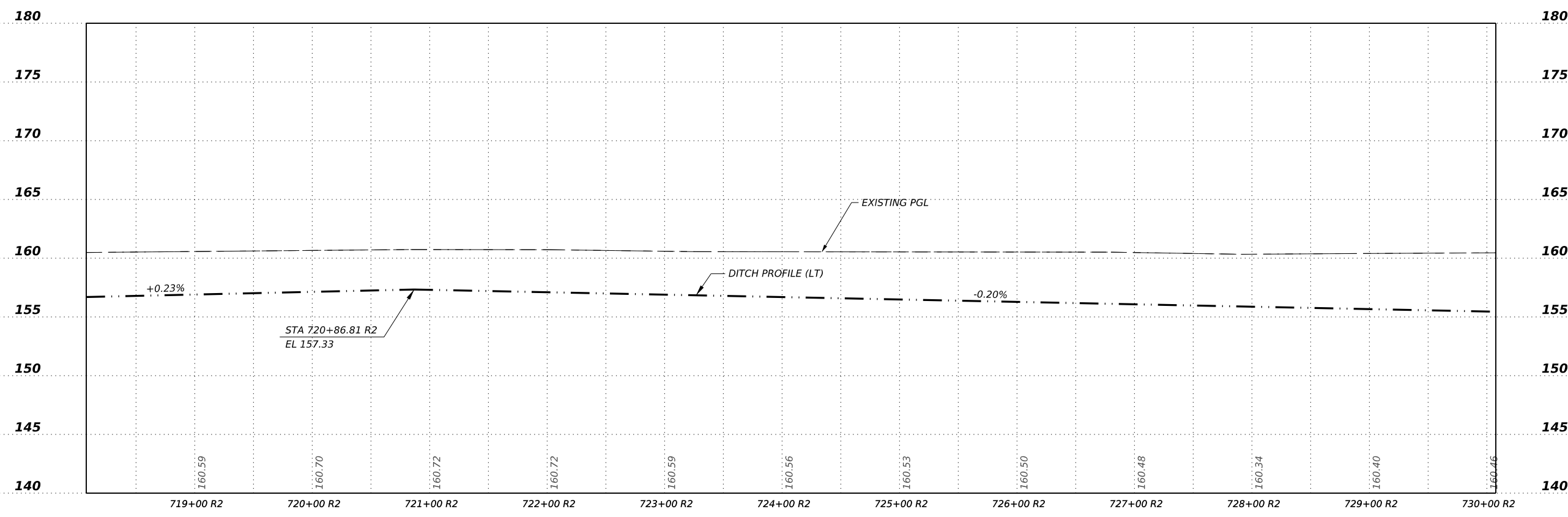
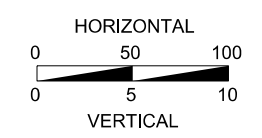
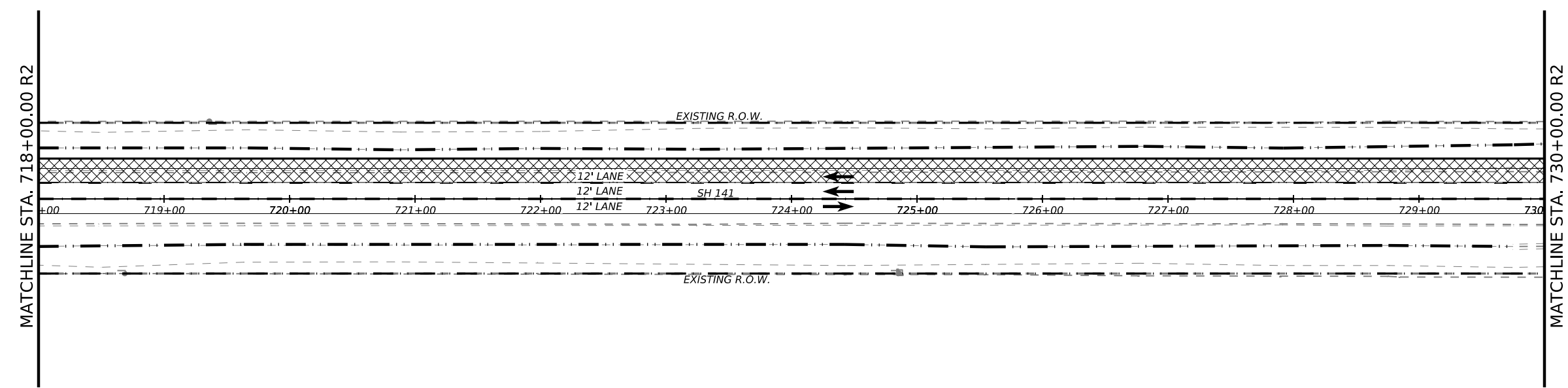
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



David P. Neumann, P.E.
 2023.07.28 01:07:31-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

PLAN & PROFILE
 STA. 718+00 TO STA. 730+00

SHEET 53 OF 56			
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	118

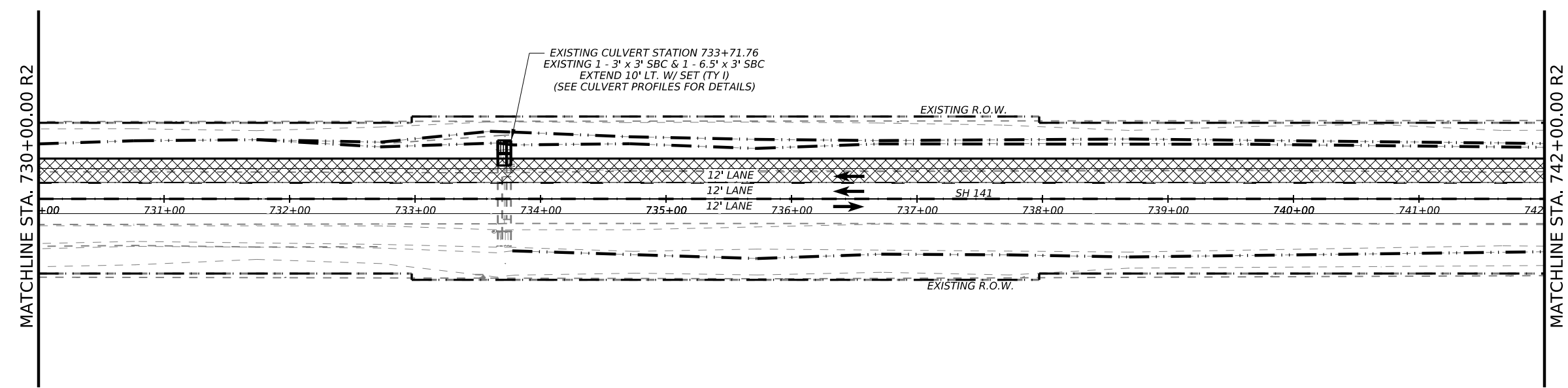
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



EXISTING CULVERT STATION 733+71.76
 EXISTING 1 - 3' x 3' SBC & 1 - 6.5' x 3' SBC
 EXTEND 10' LT. W/ SET (TY I)
 (SEE CULVERT PROFILES FOR DETAILS)

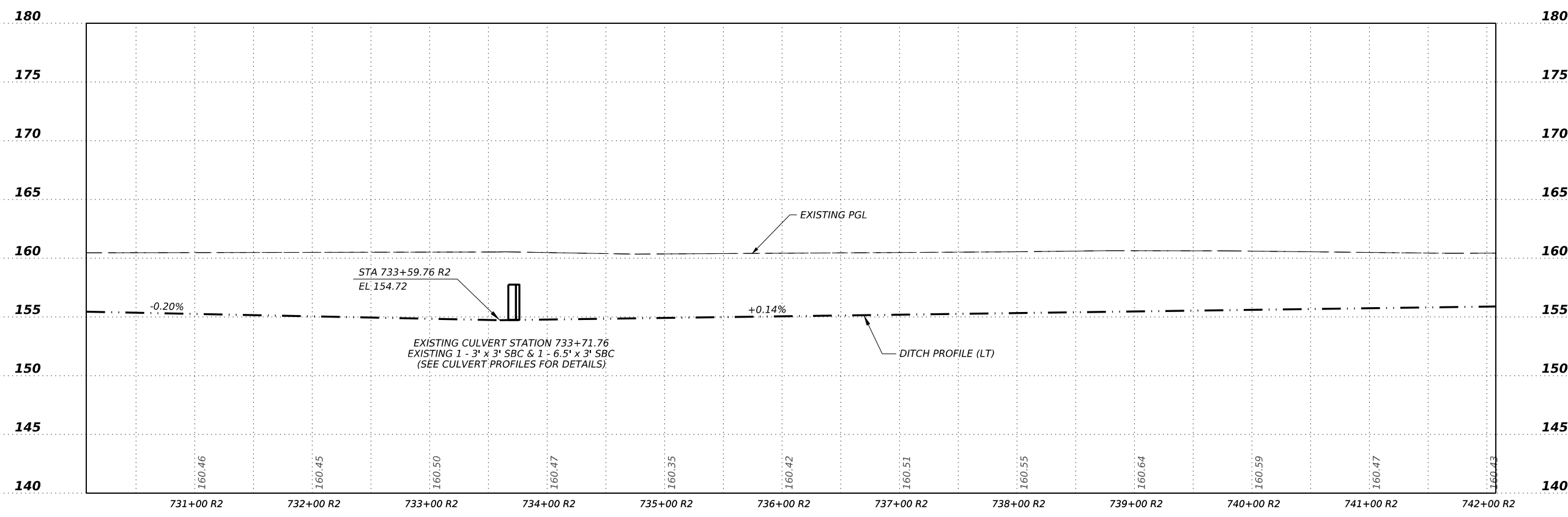
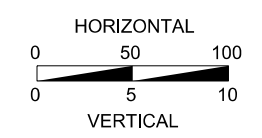
EXISTING R.O.W.

12' LANE

12' LANE

SH 141

EXISTING R.O.W.



STA 733+59.76 R2
 EL: 154.72

EXISTING PGL

EXISTING CULVERT STATION 733+71.76
 EXISTING 1 - 3' x 3' SBC & 1 - 6.5' x 3' SBC
 (SEE CULVERT PROFILES FOR DETAILS)

DITCH PROFILE (LT)

DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.
 2023.07.28 01:10:20-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
 STA. 730+00 TO STA. 742+00

SHEET 54 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		119






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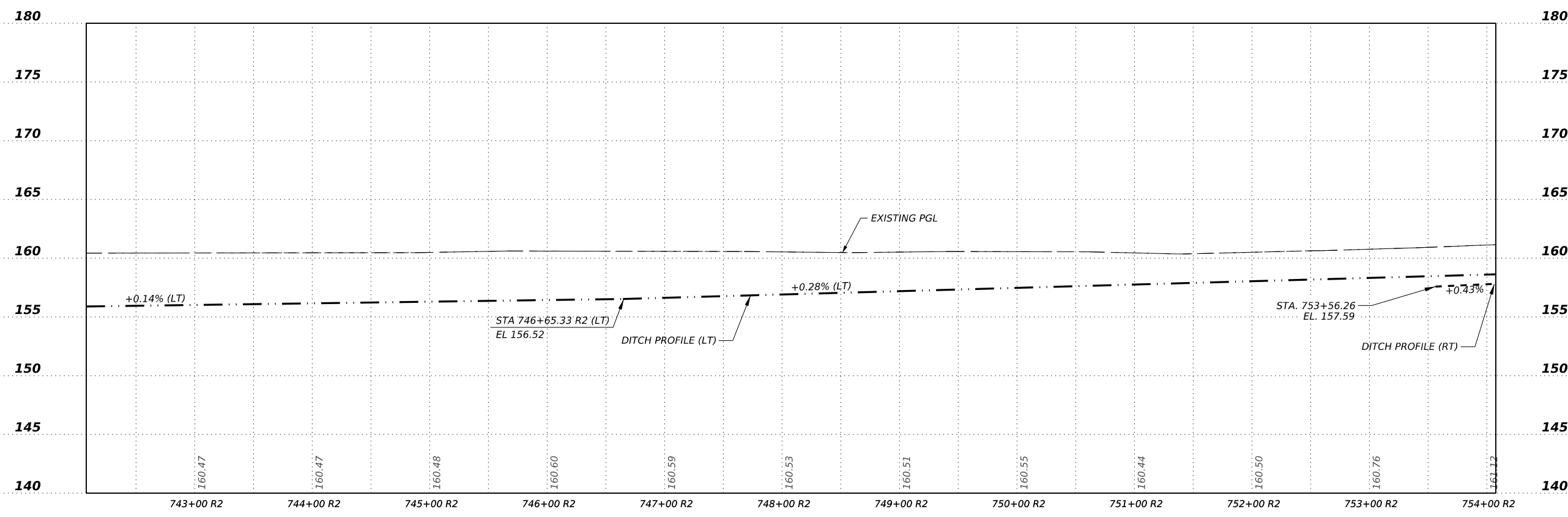
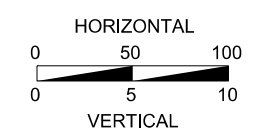
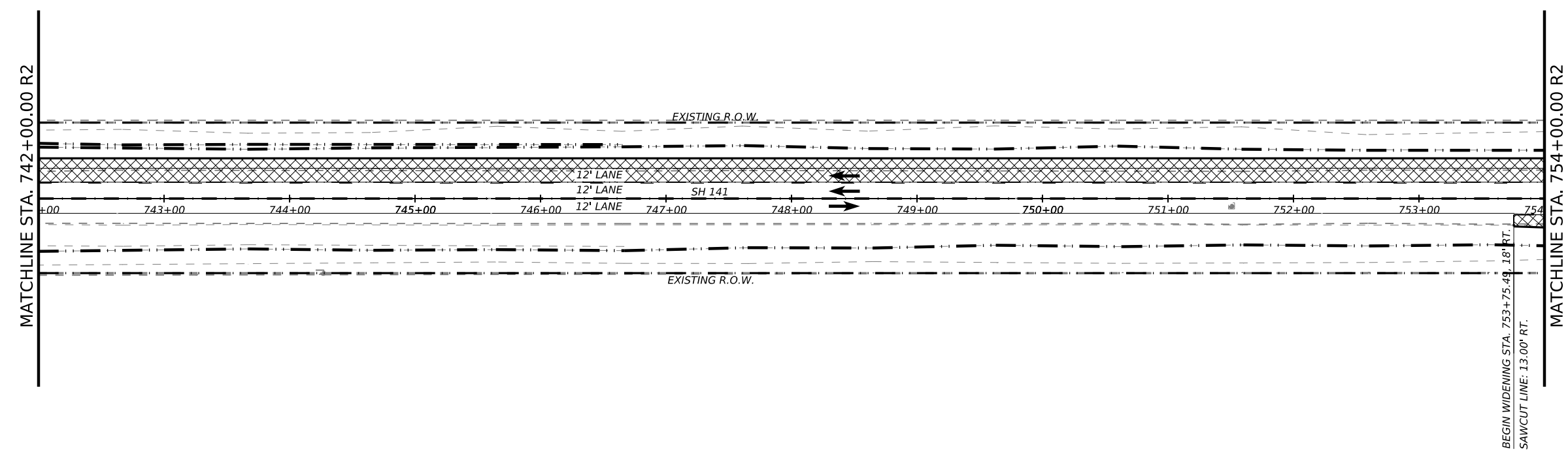
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

-  PAVEMENT WIDENING
-  DIRECTIONAL TRAFFIC FLOW ARROWS
-  EXISTING RIGHT OF WAY
-  DRIVEWAY X-X
-  INTERSECTION X-X



DAVID P. NEUMANN
83345
PROFESSIONAL ENGINEER

David P. Neumann, P.E.
2023.07.28 01:18:36-05'00'

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TBPE Firm Reg. No. 10488

Texas Department of Transportation

PLAN & PROFILE
STA. 742+00 TO STA. 754+00

SHEET 55 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		120

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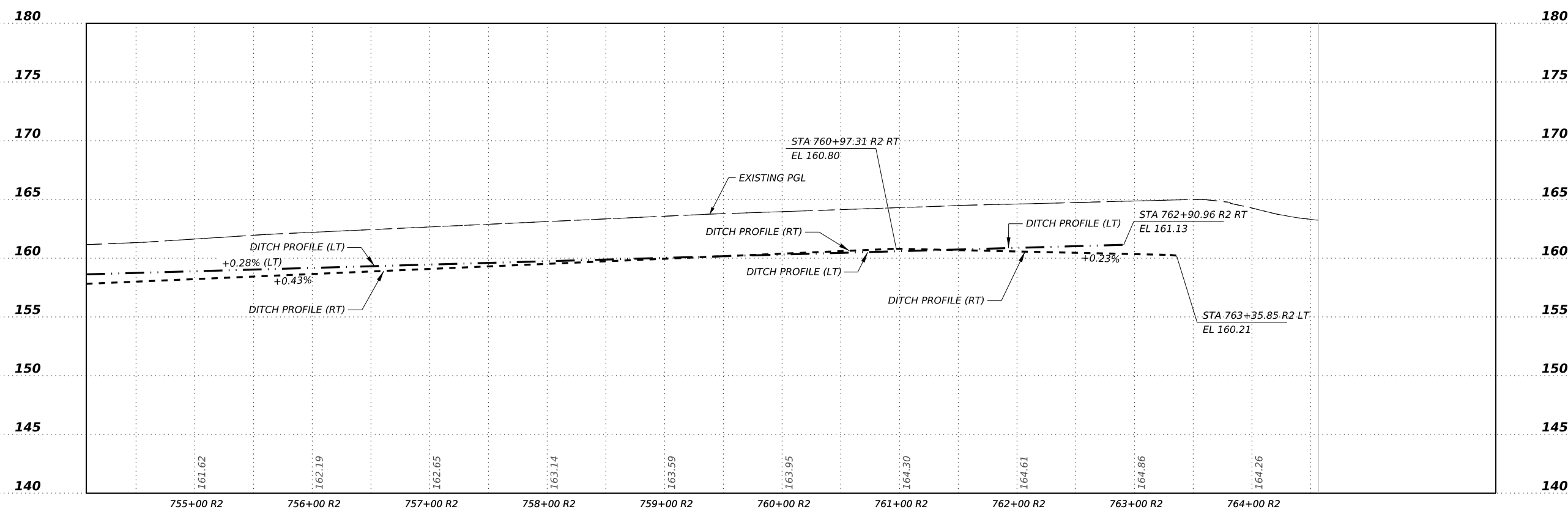
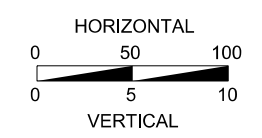
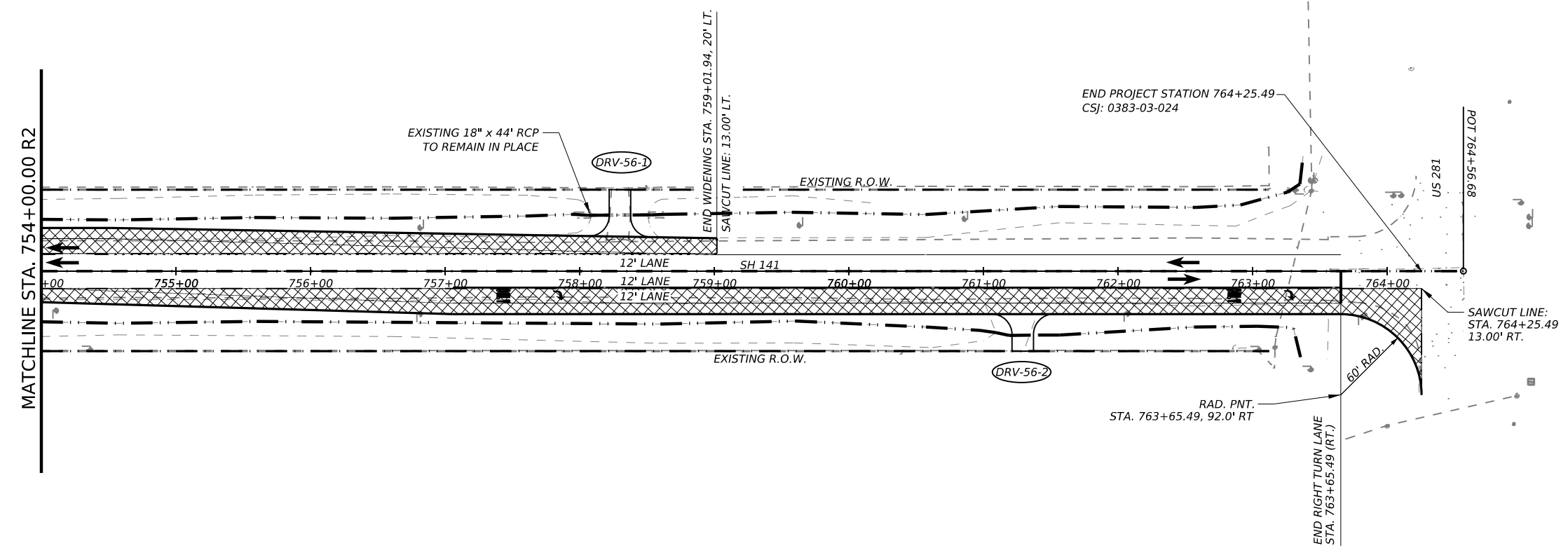
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- PAVEMENT WIDENING
- DIRECTIONAL TRAFFIC FLOW ARROWS
- EXISTING RIGHT OF WAY
- DRIVEWAY X-X
- INTERSECTION X-X



DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.
 2023.07.28 01:17:54-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation

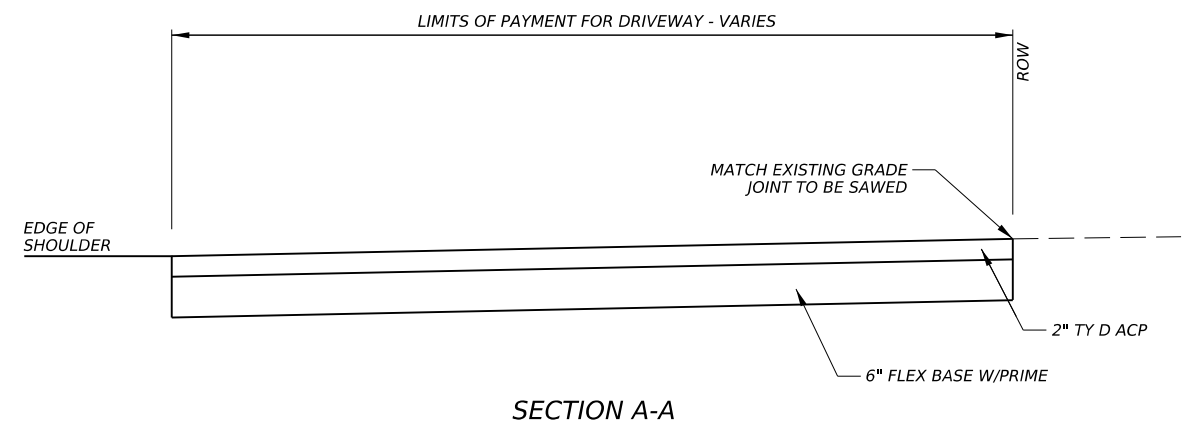
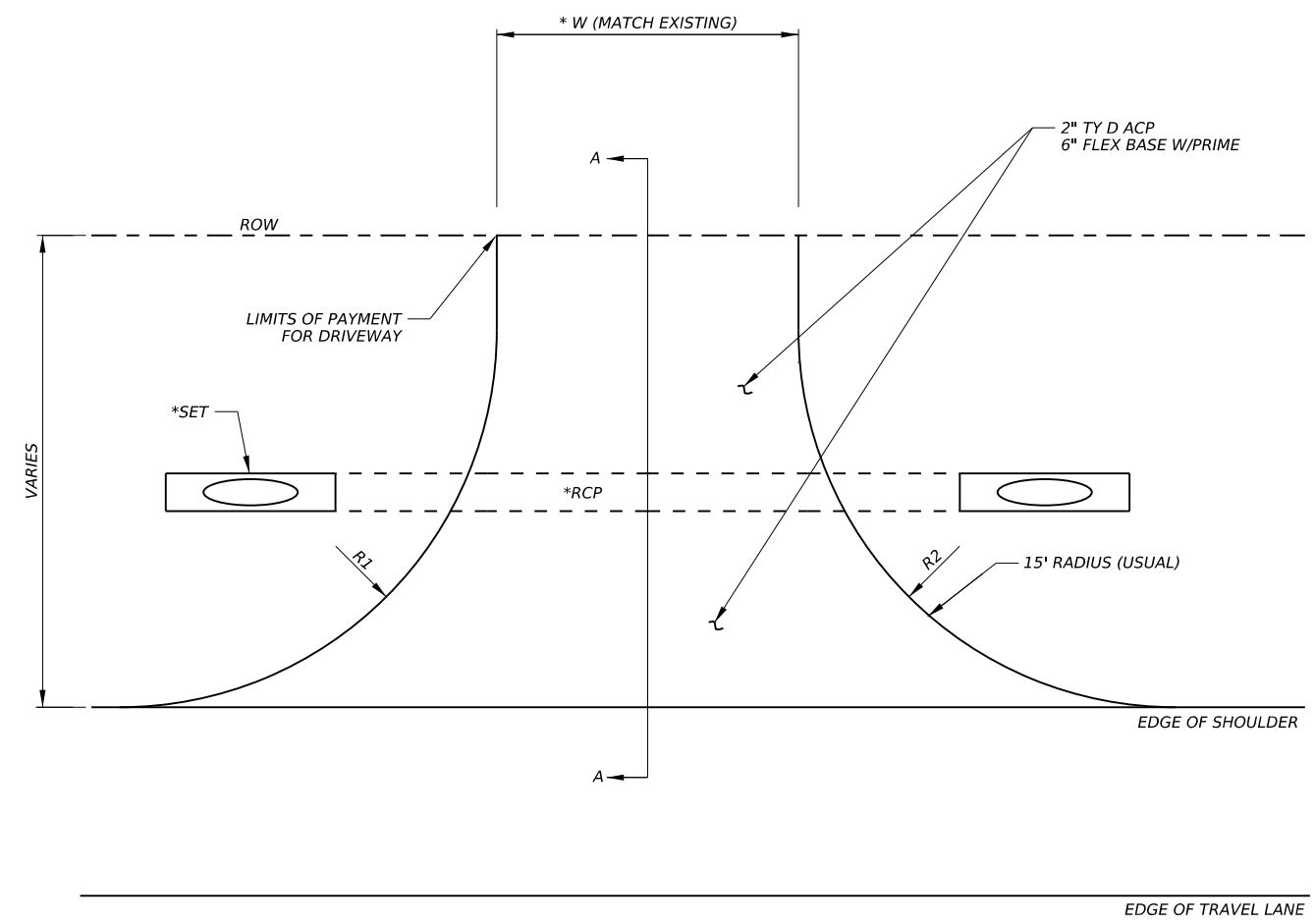
PLAN & PROFILE
 STA. 754+00 TO STA. 764+25.49

SHEET 56 OF 56

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		121

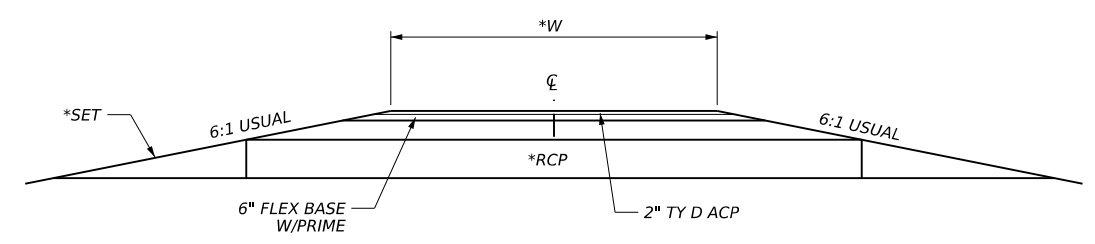
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CK:
DN:



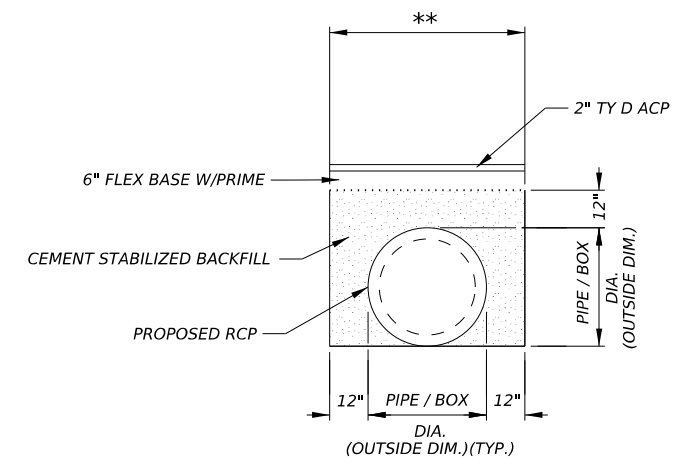
DRIVEWAYS / INTERSECTION (ACP)

DRIVEWAYS INTERSECTIONS (ACP) WILL CONSIST OF: BLADING AND RESHAPING THE SUBGRADE, ANY EXTRA EMBANKMENT MATERIAL NECESSARY TO ACHIEVE THE PROPER SUBGRADE WIDTH AND PLACEMENT OF 2° TY D ACP AND 6° FLEX BASE W/PRIME (MC-30).



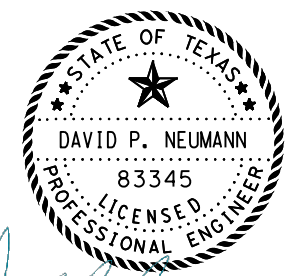
DRIVEWAY / INTERSECTION TYPICAL SECTION

* SEE SUMMARY OF DRIVEWAYS FOR: LOCATION, DIMENSION "W" AND RCP/SET DETAILS (IF REQ'D)



INTERSECTION BACKFILL DETAIL

* BACKFILL WITH CEMENT STAB. BACKFILL UP TO 12 INCHES ABOVE PROPOSED STRUCTURE.
** WIDTH MAY VARY DUE TO REMOVAL OF EXISTING PIPE AND THE ADJUSTMENT OF PROPOSED PIPE. CUT & RESTORE AS FROM DETAIL AND AS DIRECTED.



David P. Neumann, P.E.

2023.07.28 01:12:38-05'00'

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TBPE Firm Reg. No. 10488



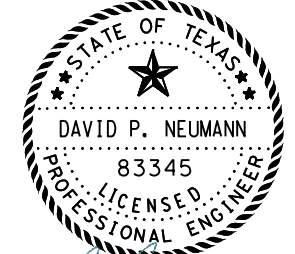
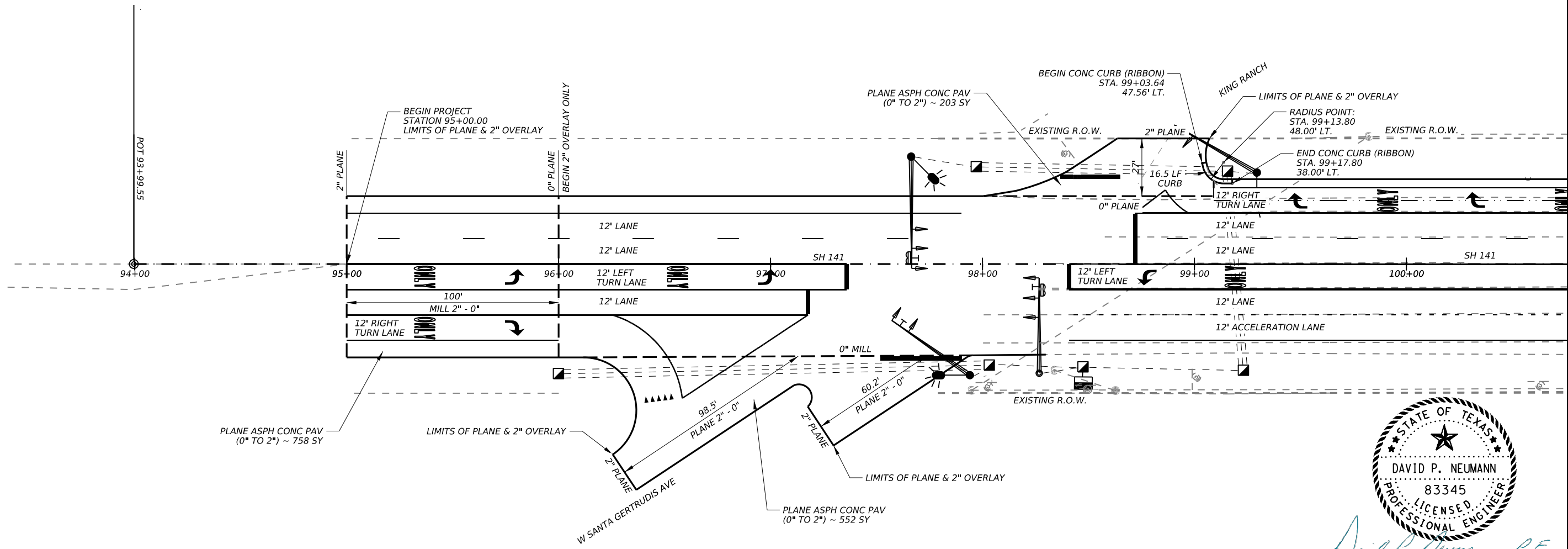
DRIVEWAY AND INTERSECTION DETAILS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		122

DATE: 7/26/2023 10:04:40 AM
FILE: c:\pw_working\lochner-pw-01\dms37361\SH141_DRIVEWAY_DETAILS.dgn

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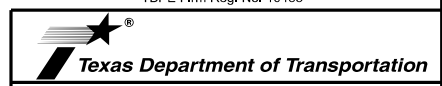


David P. Neumann, P.E.

2023.07.28 01:17:17-05'00'

SCALE: 1" = 100'

LOCHNER
TBPE Firm Reg. No. 10488

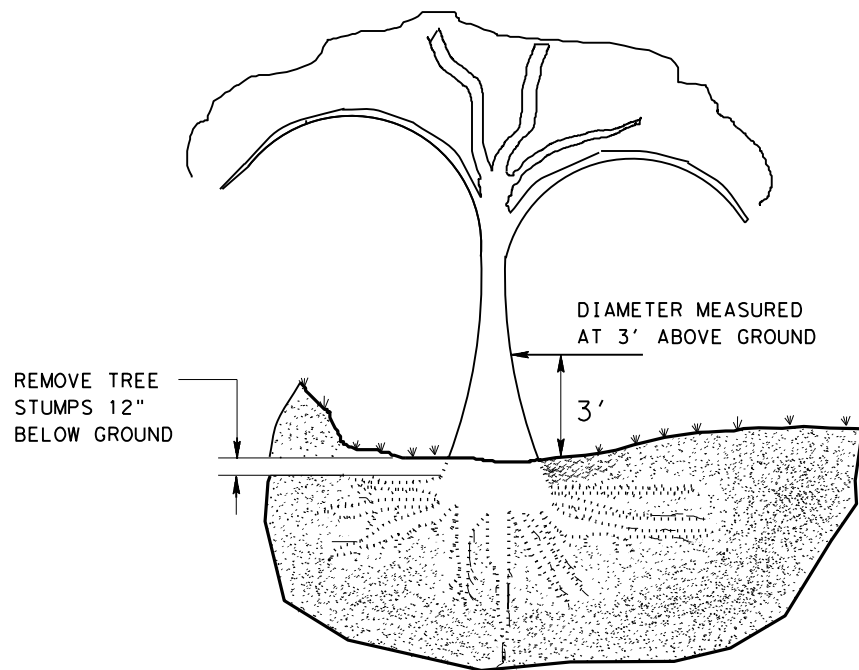


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INTERSECTION LAYOUT

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		123

DATE: 7/26/2023 10:05:00 AM
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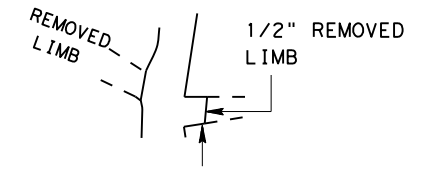


TREE REMOVAL

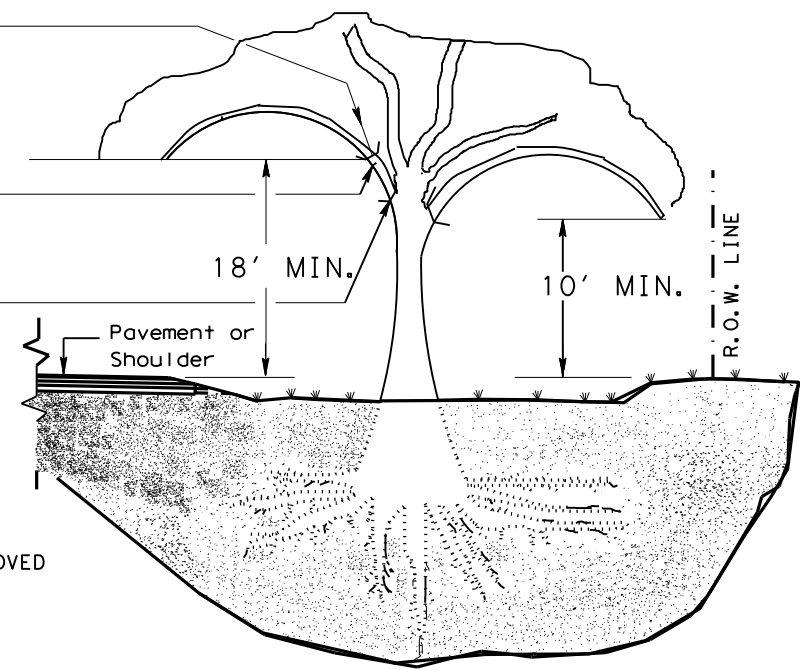
STEP 1:
CUT 1/3 WAY THROUGH BOTTOM OF LIMB 8" TO 12" ABOVE MAIN STEM (OR TRUNK).

STEP 2:
REMOVE LIMB 4" TO 6" BEYOND THE FIRST CUT

STEP 3:
REMOVE STUB WITH A SMOOTH CUT SO THAT TRACE COLLAR OF THE REMOVED LIMB PROTRUDES APPROXIMATELY 1/2" FROM THE MAIN STEM

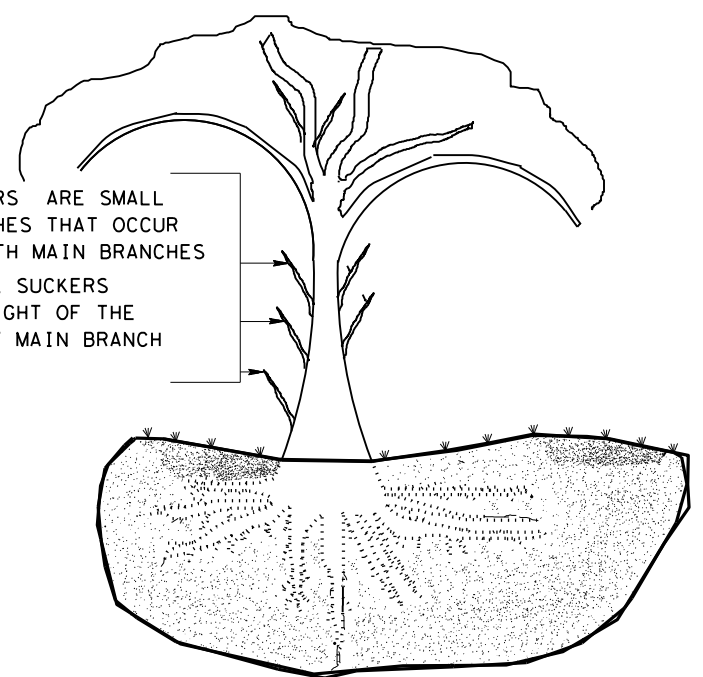


EXAMPLE 1/2" PROTRUDING COLLAR

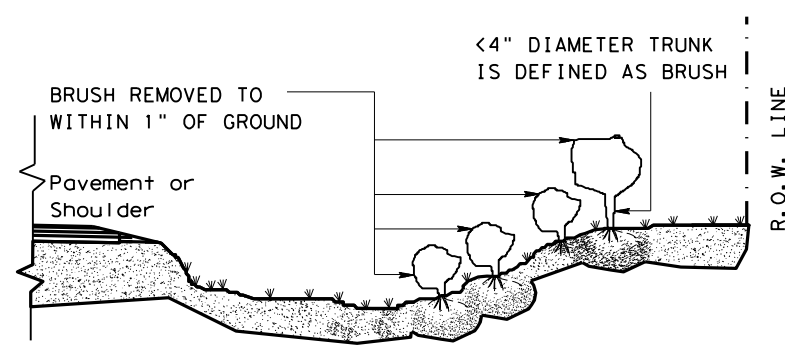


TREE TRIMMING

SUCKERS ARE SMALL BRANCHES THAT OCCUR BENEATH MAIN BRANCHES REMOVE SUCKERS TO HEIGHT OF THE LOWEST MAIN BRANCH



STEPS 1, 2 AND 3 APPLY WHEN REMOVING LIMBS 2" IN DIAMETER OR LARGER.



BRUSH REMOVAL

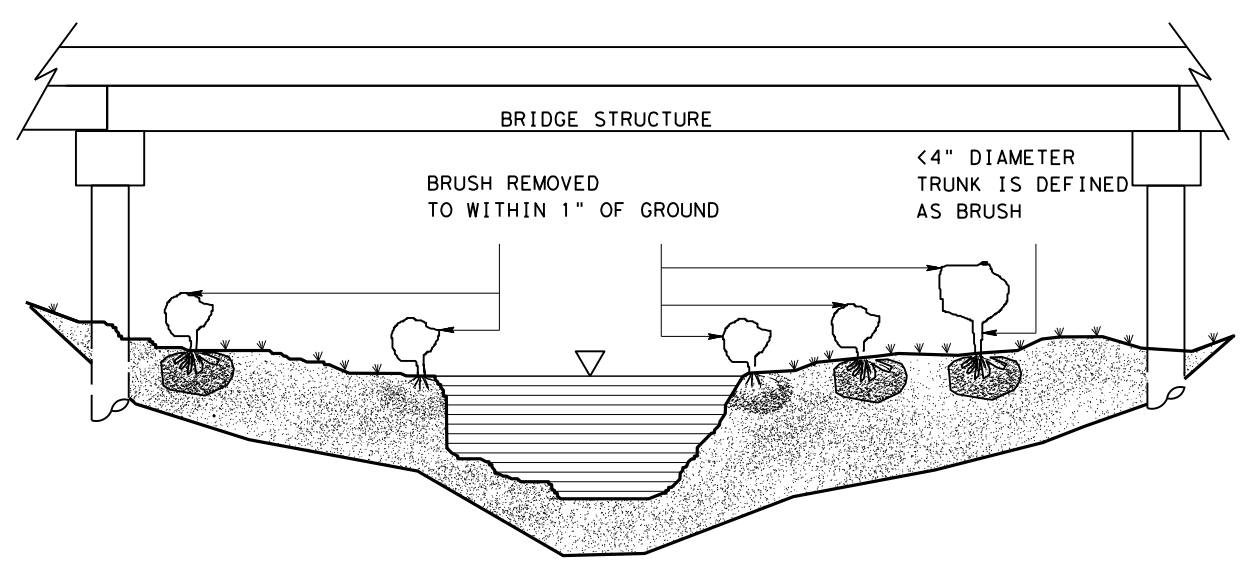
GENERAL NOTES:

TREE TRIMMING

1. TRIM AND REMOVE ALL TREE LIMBS ON THE PAVEMENT SIDE OF THE TRUNK 18' ABOVE THE PAVEMENT OR BRIDGE DECK ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.
2. TRIM AND REMOVE ALL TREE LIMBS BETWEEN THE TRUNK AND R.O.W. LINE 10' ABOVE NATURAL GROUND, TERRAIN OR OTHER STRUCTURE ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.

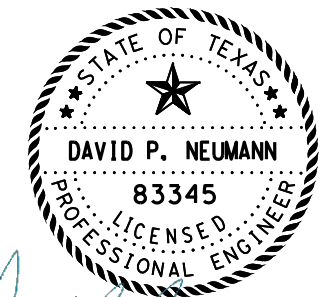
TREE REMOVAL

3. NO TREE REMOVAL IS PROPOSED.



BRUSH REMOVAL UNDER BRIDGE AND IN CHANNEL

2023.08.04 14:44:19-05'00'



David P. Neumann, P.E.

LOCHNER
TBPE Firm Reg. No. 10488



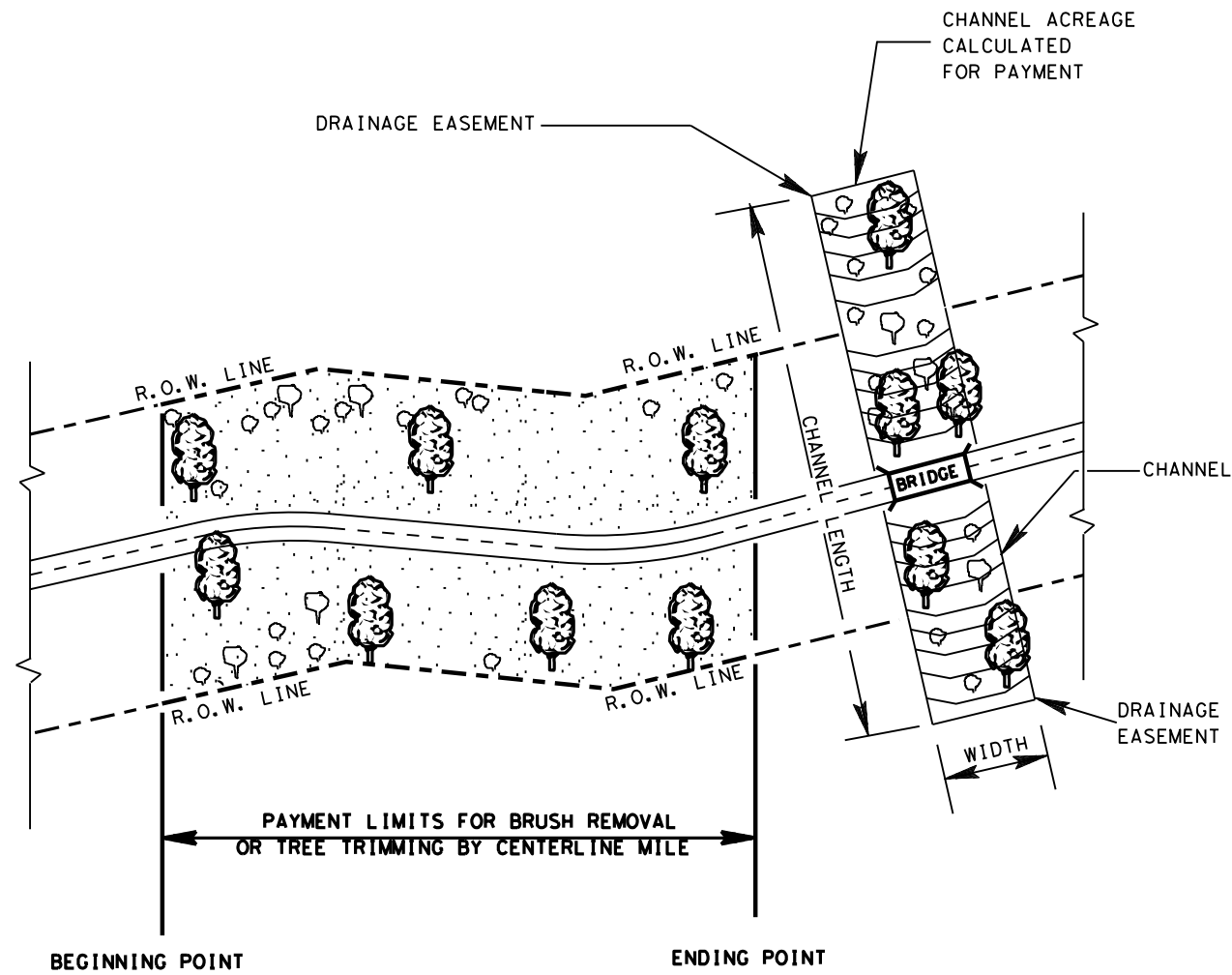
TREE AND BRUSH REMOVAL

TRB-15(1) (MOD)

SHEET 1 OF 2

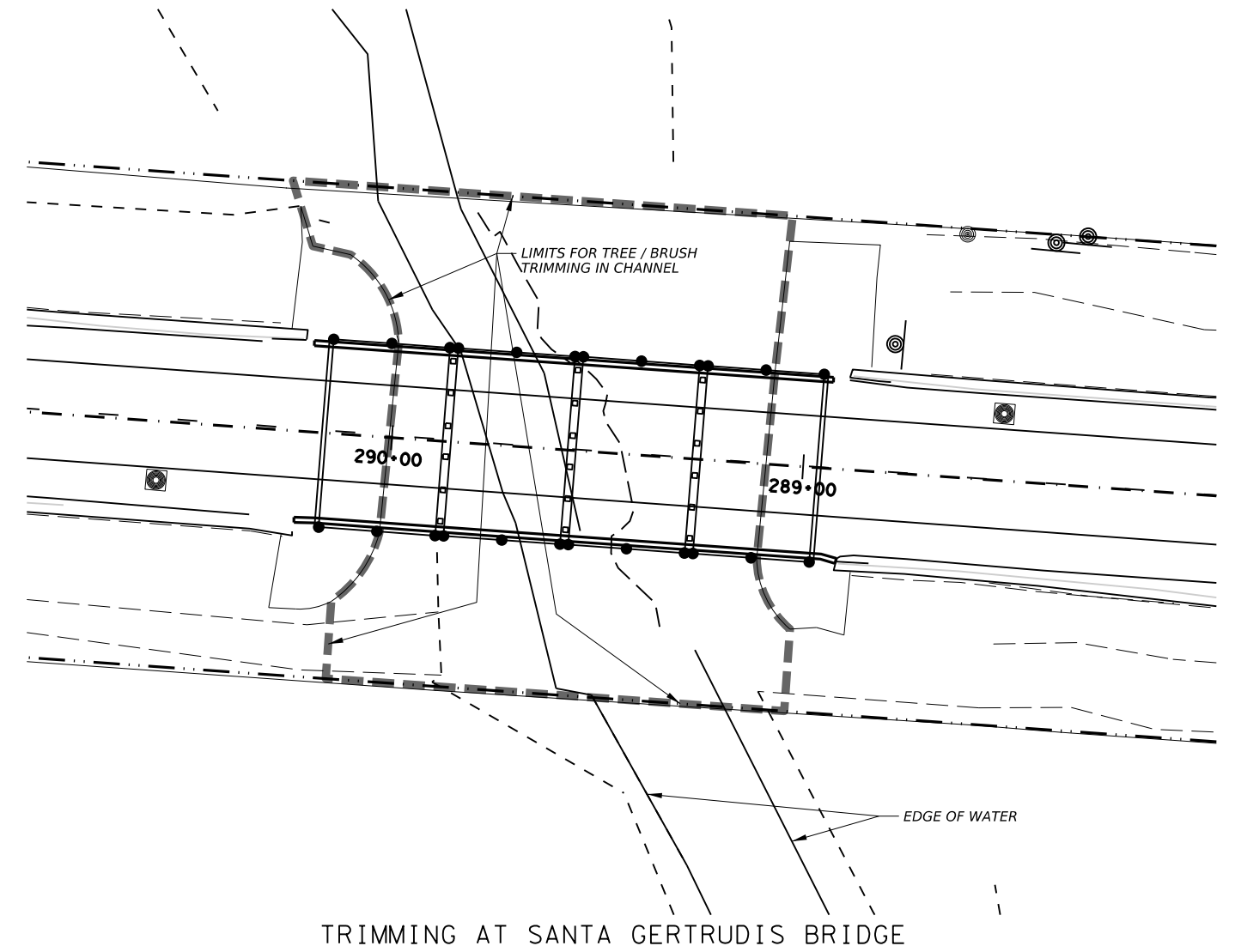
FILE:	DN: JEO	CK: LJB	DW: JEO	CK:
© TXDOT 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
Revised table 1 to 2014 Specification	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	123A	

DATE: 2/16/2022
FILE: c:\pw_working\lochner-pw-01\dms37361\Tree Trimming Details.dgn



BRUSH REMOVED TO WITHIN 1" OF GROUND <4" DIAMETER TRUNK IS DEFINED AS BRUSH UNLESS OTHERWISE DIRECTED

EXAMPLE: UNDIVIDED HIGHWAY



TRIMMING AT SANTA GERTRUDIS BRIDGE

TREE TRIMMING AND BRUSH REMOVAL

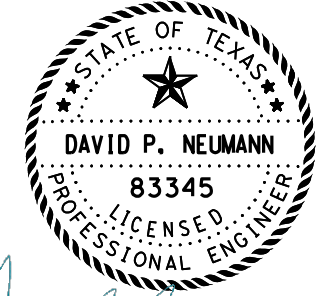
	STA. ~ STA.	ITEM	ITEM
		752-6003	752-6003
		TREE TRIMMING / BRUSH REMOVAL	TREE TRIMMING / BRUSH REMOVAL (CHANNELS)
CSJ:		MI	AC
0383-04-060	95+00 ~ 639+91.94	* 10.27	0.3
0383-03-024	639+91.94 ~ 764+25.49	2.35	0

* LENGTH FOR SANTA GERTRUDIS BRIDGE WAS REMOVED

GENERAL NOTES:

TREE TRIMMING AND BRUSH REMOVAL

- PAYMENT BY THE CENTERLINE MILE IS MADE TO THE NEAREST 1/100 (0.01) MILE.
- LIMITS OF WORK ARE SHOWN AS DISTANCES FROM STATION TO STATION.
- PAY ITEMS BY THE CENTERLINE MILE INCLUDE ALL TREE TRIMMING OR BRUSH REMOVAL IN THE RIGHT OF WAY ON BOTH SIDES OF THE HIGHWAY.
- BRUSH REMOVAL AND TREE TRIMMING UNDER BRIDGES, IN AND ALONG CHANNELS AND EASEMENTS ARE PAID FOR BY THE ACRE FOR AREAS DESIGNATED ON THE PLANS.



David P. Neumann, P.E.

2023.08.04 14:44:38-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

NOT TO SCALE



TREE AND BRUSH REMOVAL
TRB-15(2) (MOD)

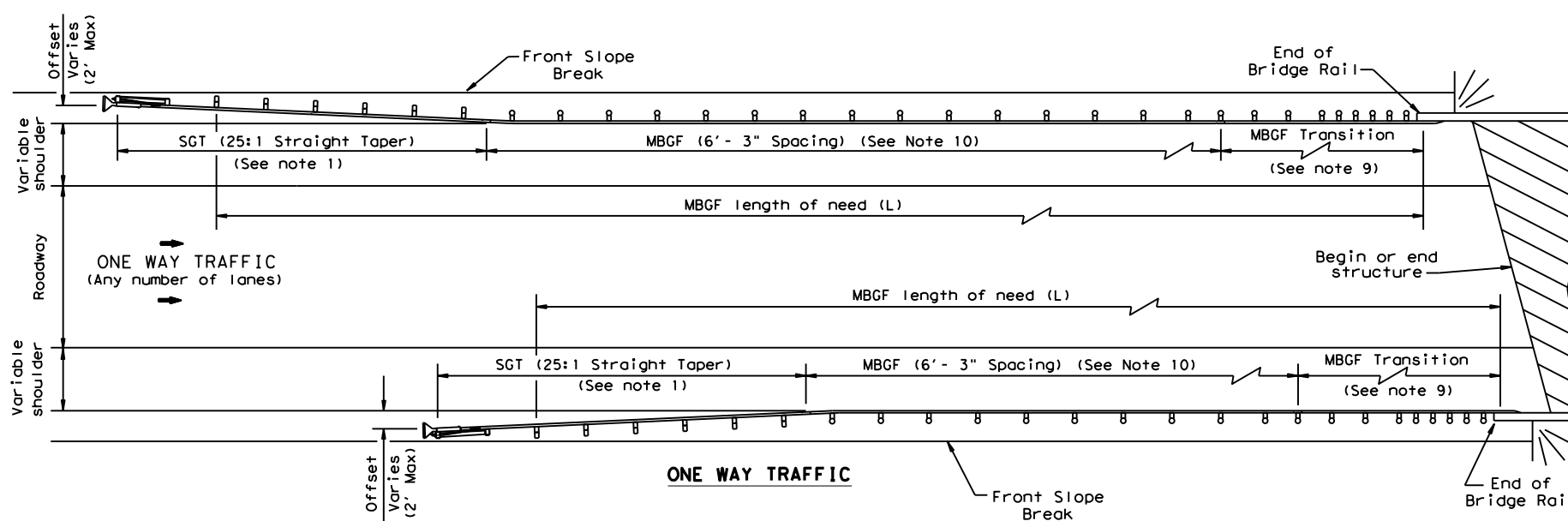
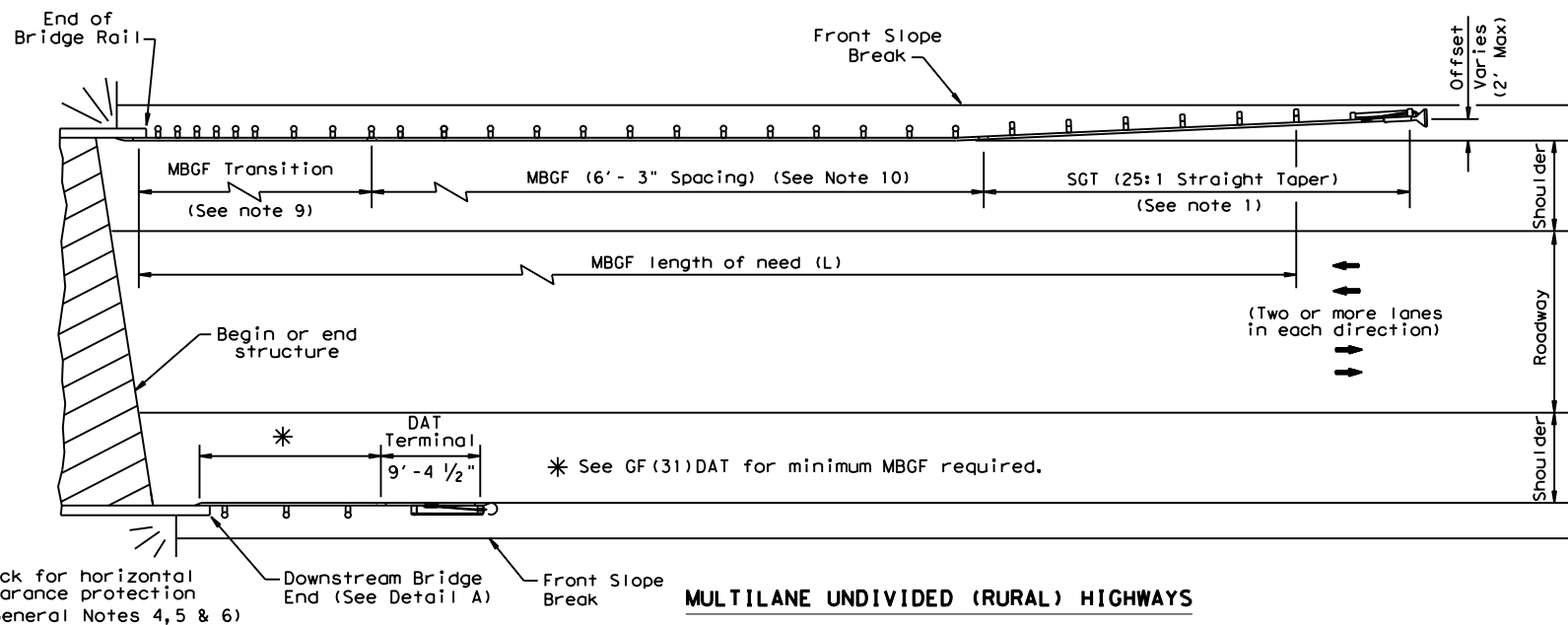
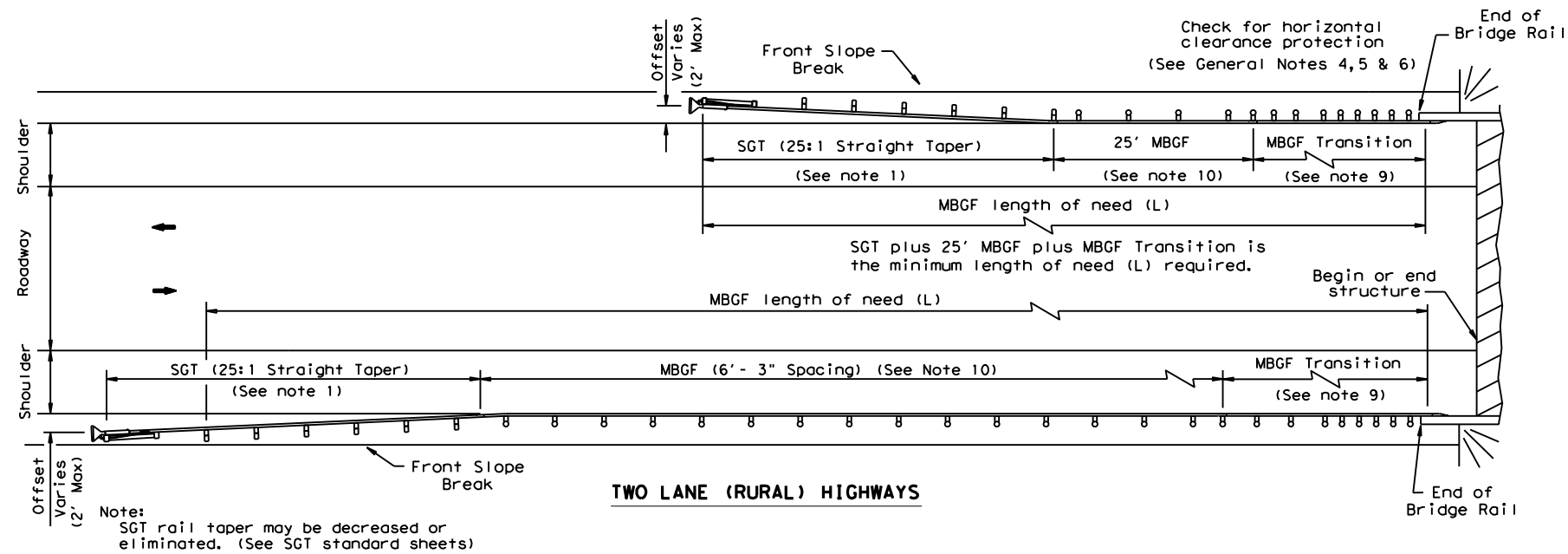
SHEET 2 OF 2

FILE:	DN: JEO	CK: LJB	DW: JEO	CK:
© TXDOT 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
Revised table 1 to 2014 Specification	DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.		123B	

DATE: 2/16/2022
FILE: c:\pwworking\lochner-pw-01\dms27361\Tree Trimming Details.dgn

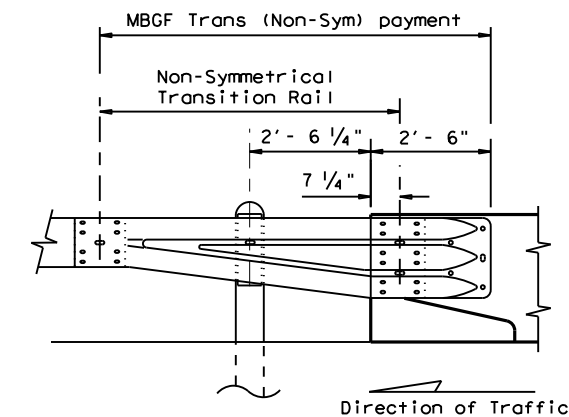
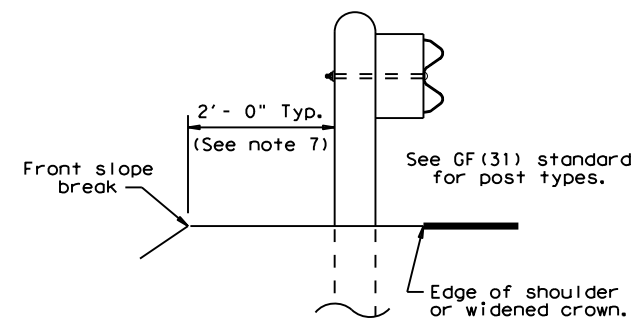
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DATE:
FILE:



GENERAL NOTES

1. For more detail: See GF(31), SGT()31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. 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.
4. 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.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. 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)
7. 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).
8. 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.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.

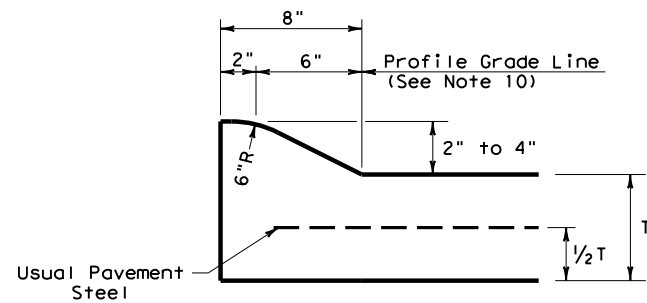


Note: All rail elements shall be lapped in the direction of adjacent traffic.

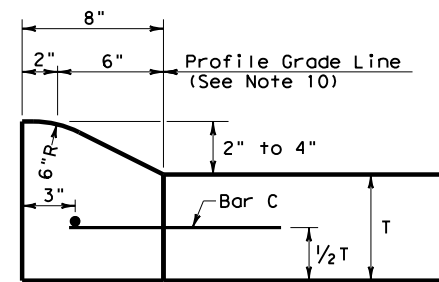
		Design Division Standard	
BRIDGE END DETAILS (METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS) BED-14			
FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP
© TxDOT: December 2011	CONT	SECT	JOB
REVISED APRIL 2014	0383	03	024, ETC.
SEE (MEMO 0414)	DIST	COUNTY	SHEET NO.
	CRP	JIM WELLS, ETC.	124

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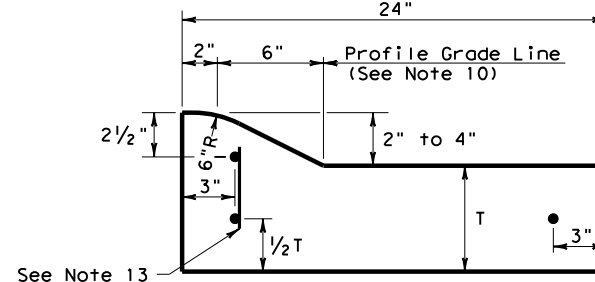
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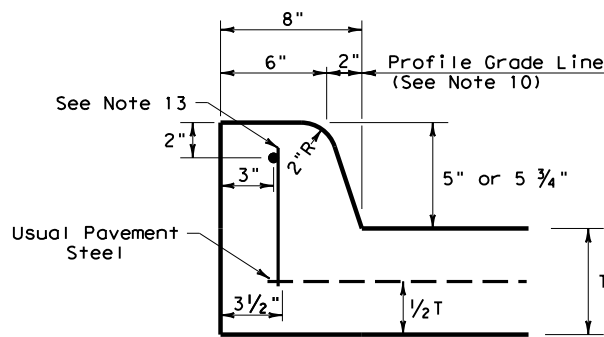
**TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT**



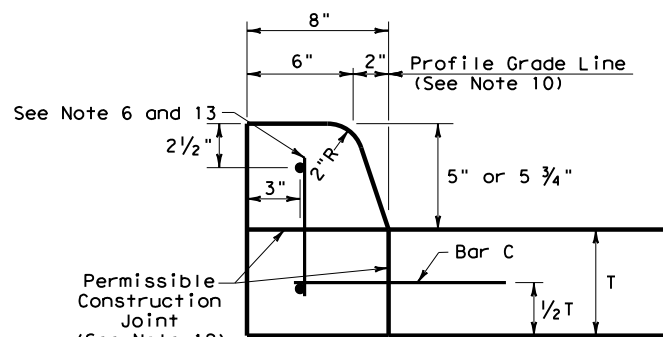
**TYPE I CURB
2" - 4" HEIGHT**



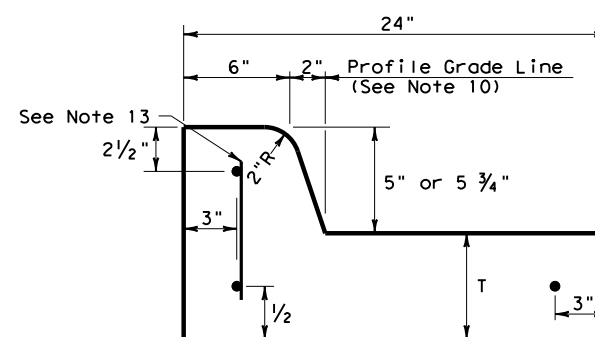
**TYPE I CURB AND GUTTER
2" - 4" HEIGHT**



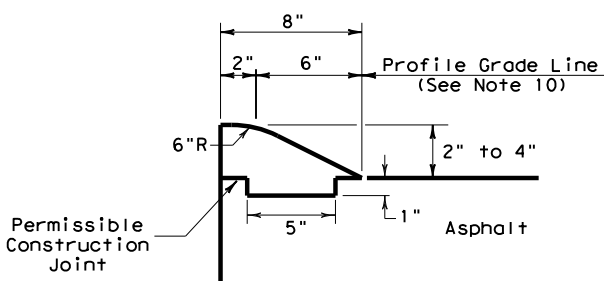
**TYPE II CURB (MONOLITHIC)
5" - 5 3/4" HEIGHT**



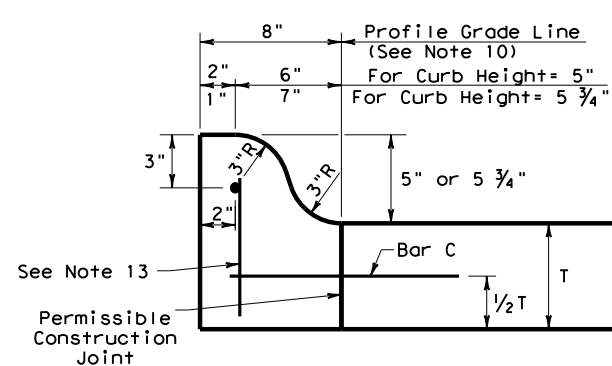
**TYPE II CURB
5" - 5 3/4" HEIGHT**



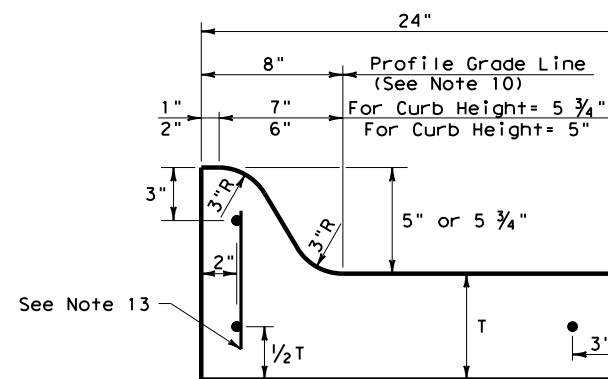
**TYPE II CURB AND GUTTER
5" - 5 3/4" HEIGHT**



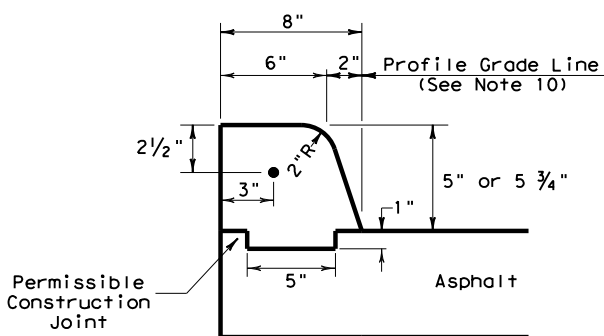
**TYPE III CURB (KEYED)
2" - 4" HEIGHT**



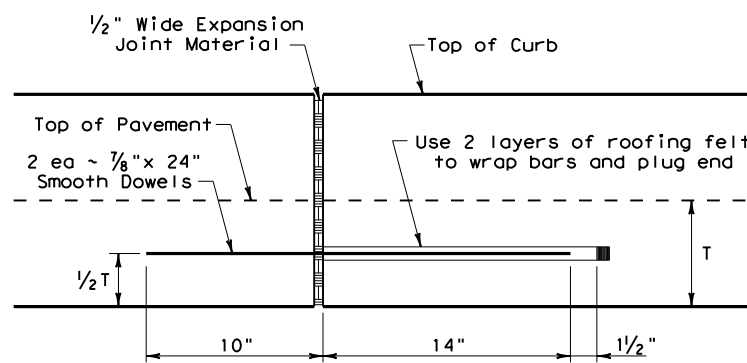
**TYPE IIa CURB
5" - 5 3/4" HEIGHT**



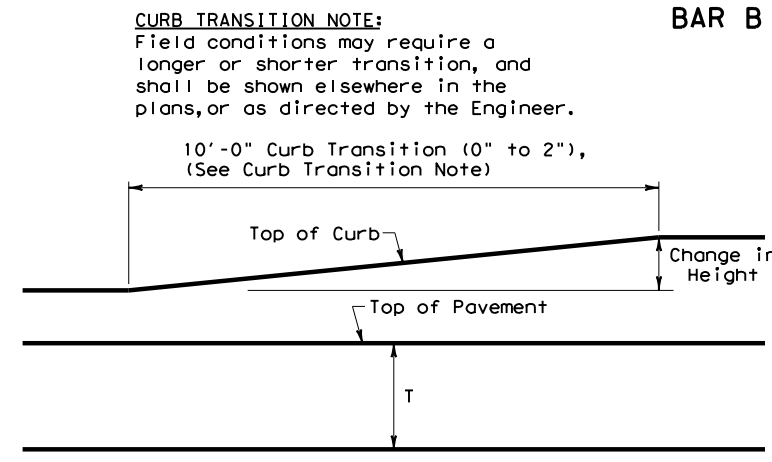
**TYPE IIa CURB AND GUTTER
5" - 5 3/4" HEIGHT**



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



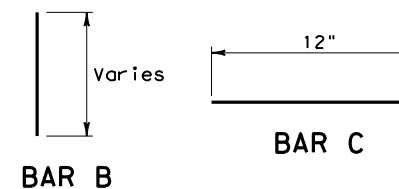
EXPANSION JOINT DETAIL



CURB TRANSITION
Note: To be paid for as Highest Curb

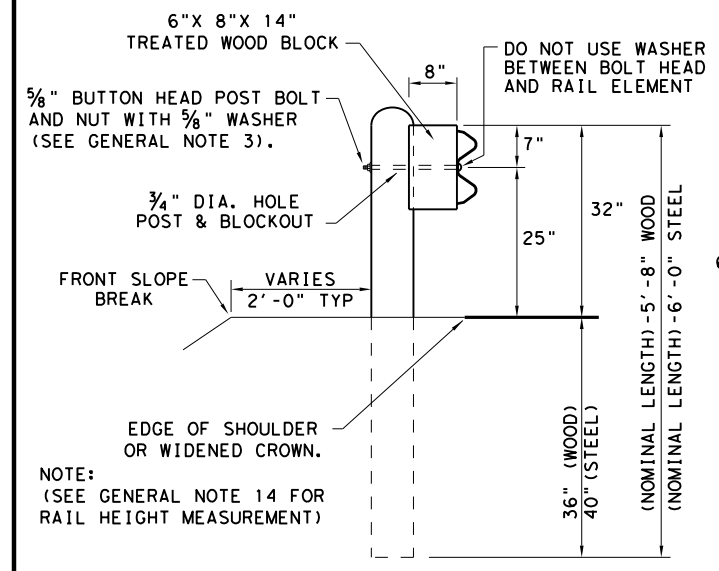
GENERAL NOTES

- 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 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 placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.

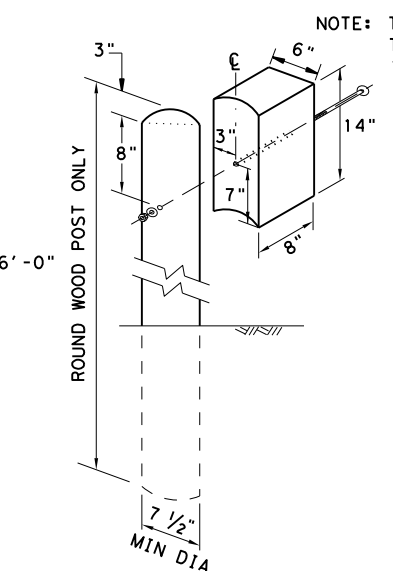


		Design Division Standard	
<h2>CONCRETE CURB AND GUTTER</h2> <h3>CCCG-22</h3>			
FILE: cccg21.dgn	DW: TxDOT	CK: AN	DW: CS
© TxDOT: JUNE 2022	CONT: 0383	SECT: 03	JOB: 024, ETC.
REVISIONS	DIST: CRP	COUNTY: JIM WELLS, ETC.	SHEET NO.: 125

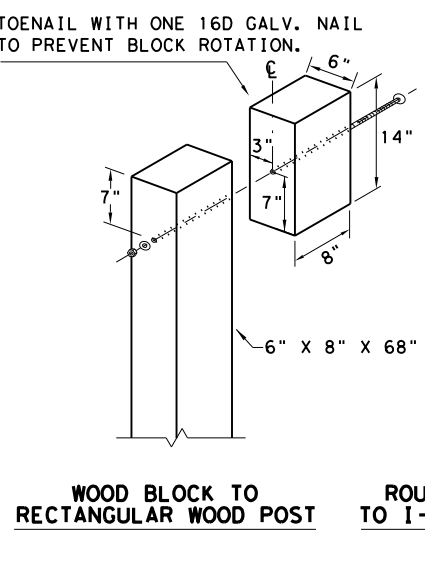
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



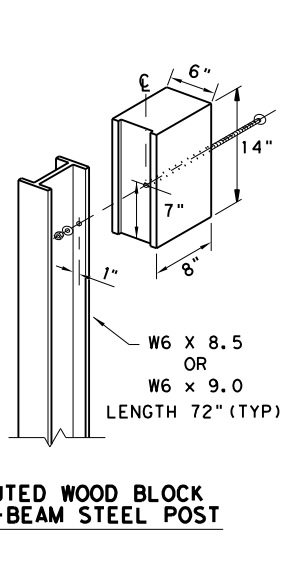
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

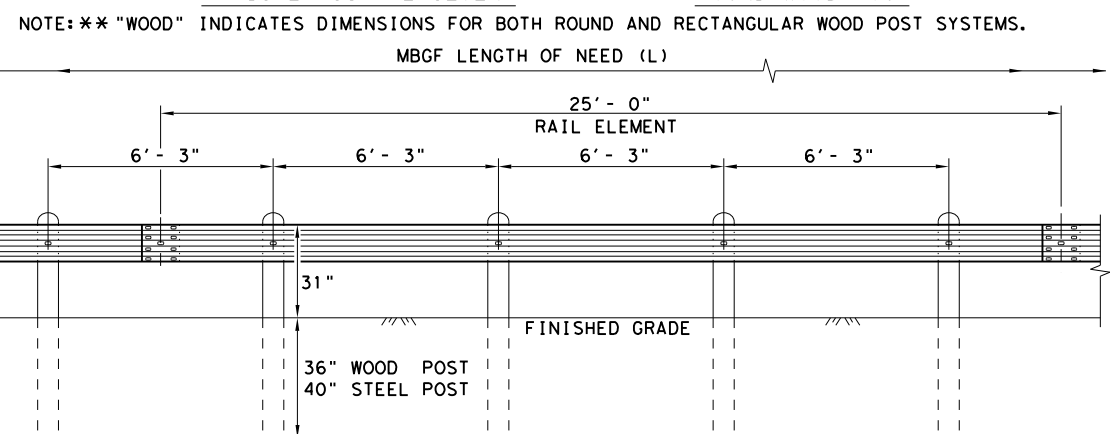


WOOD BLOCK TO RECTANGULAR WOOD POST



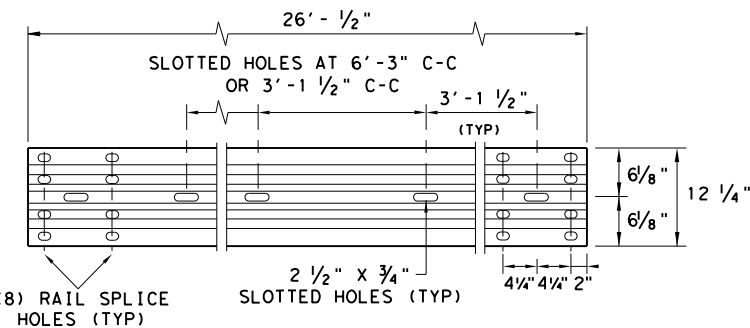
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

- 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 MBSG 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 (FWC16G) 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

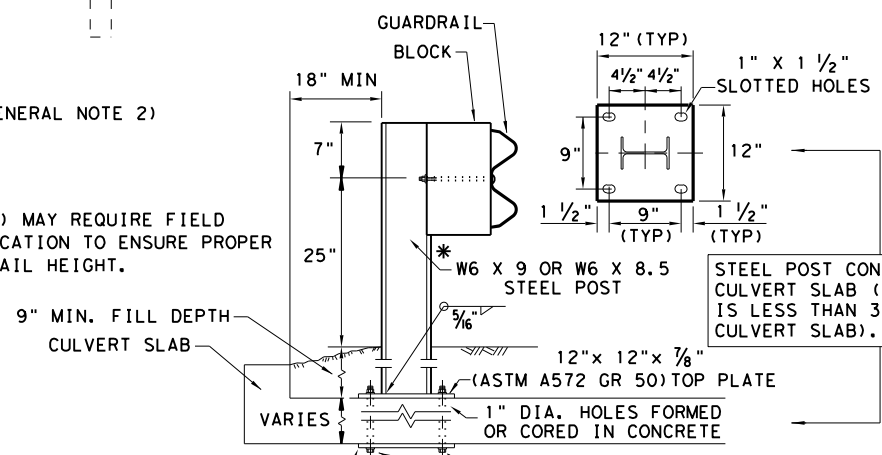
NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



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

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

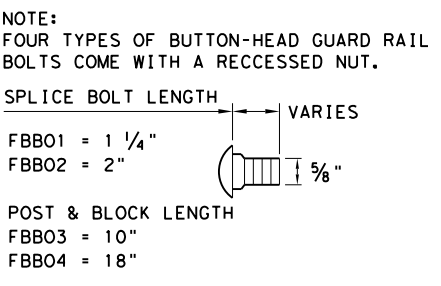
* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



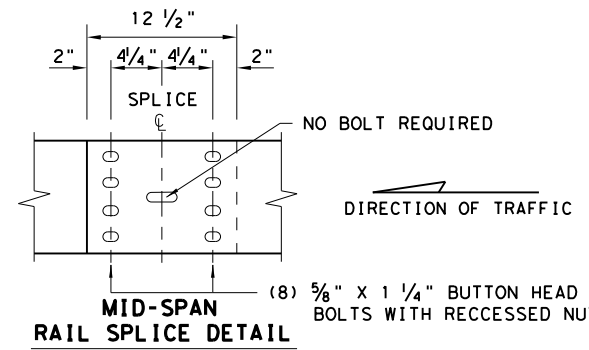
LOW FILL CULVERT POST

- 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.



BUTTON HEAD BOLT



MID-SPAN RAIL SPLICE DETAIL

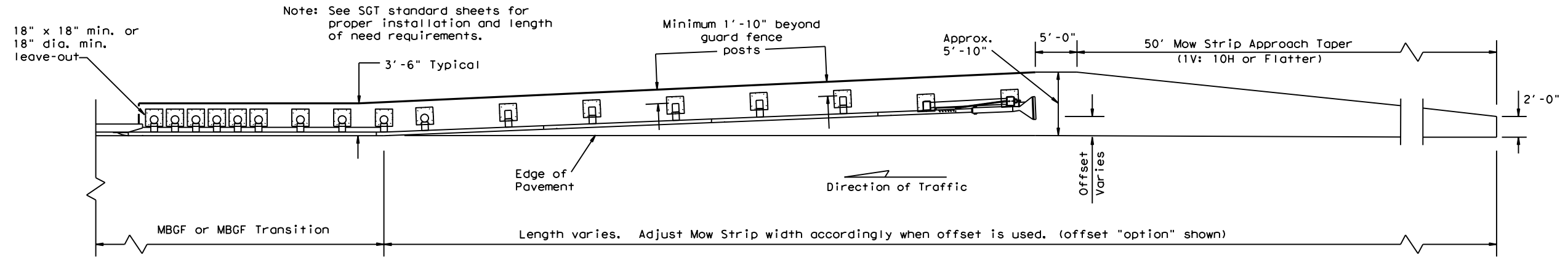
NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.

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

				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
REVISIONS	0383	03	024, ETC.	SH 141
	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	126	

DATE:
FILE:

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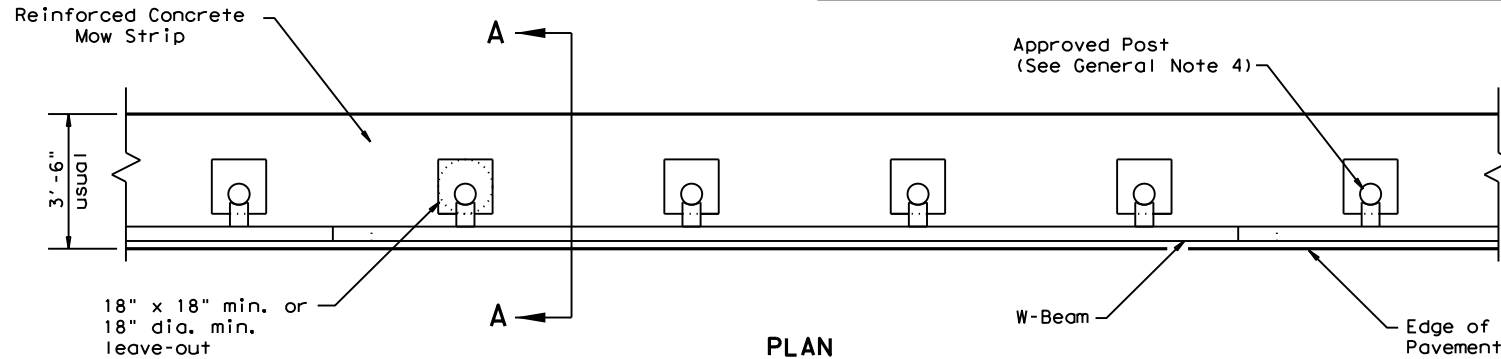
Note: See SGT standard sheets for proper installation and length of need requirements.

GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

Note: Site Condition(s)
 Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.
 Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

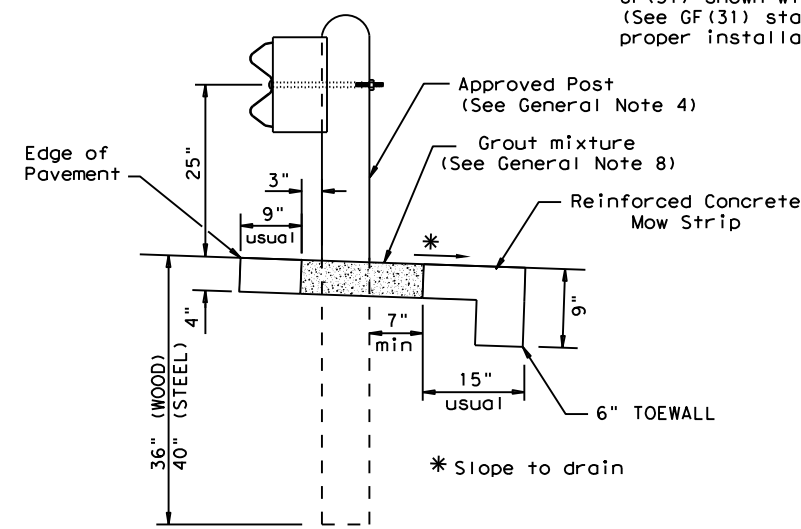
GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBSGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be asphaltic pavement or reinforced concrete (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Asphaltic pavement shall meet the requirements of the item, and be placed in accordance with the pertinent bid item as shown in the plans. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 1/2" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for asphaltic pavement or reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type I or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

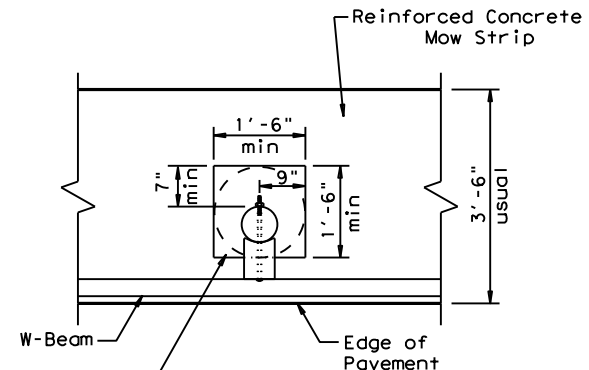


PLAN

GF(31) shown with Mow Strip (See GF(31) standard sheet for proper installation)

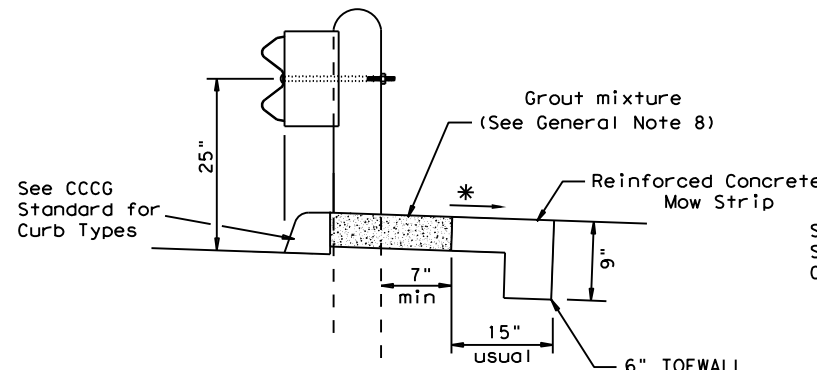


SECTION A-A
Typical



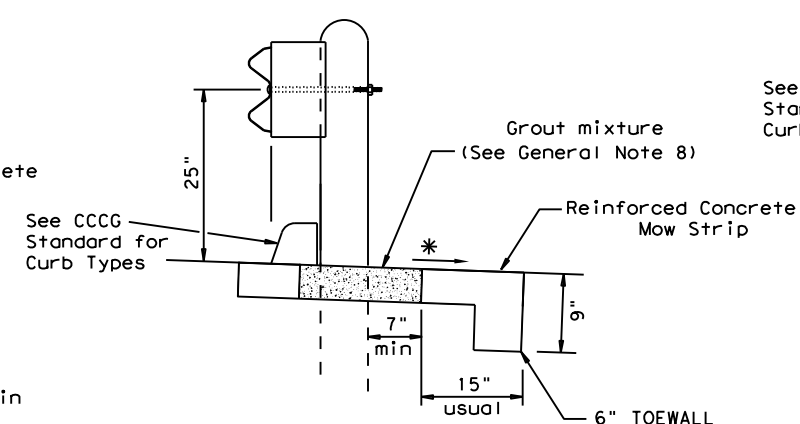
MOW STRIP DETAIL

Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.



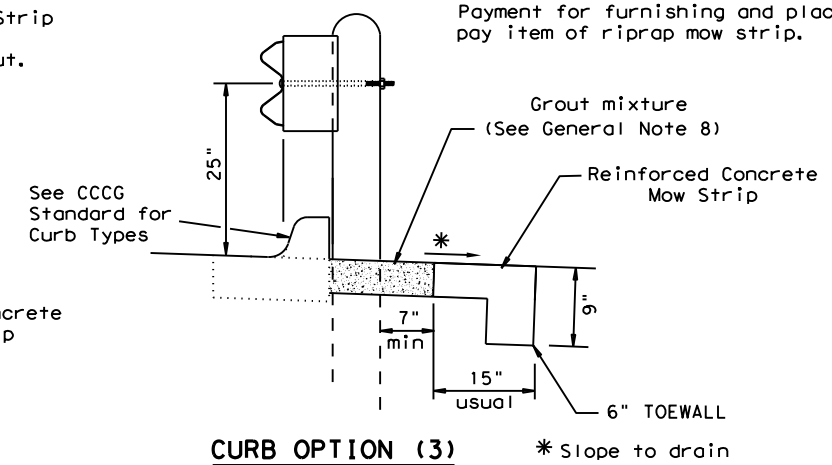
CURB OPTION (1)

This option will increase the post embedment through out the system.



CURB OPTION (2)

Curb shown on top of mow strip * Slope to drain



CURB OPTION (3)

* Slope to drain

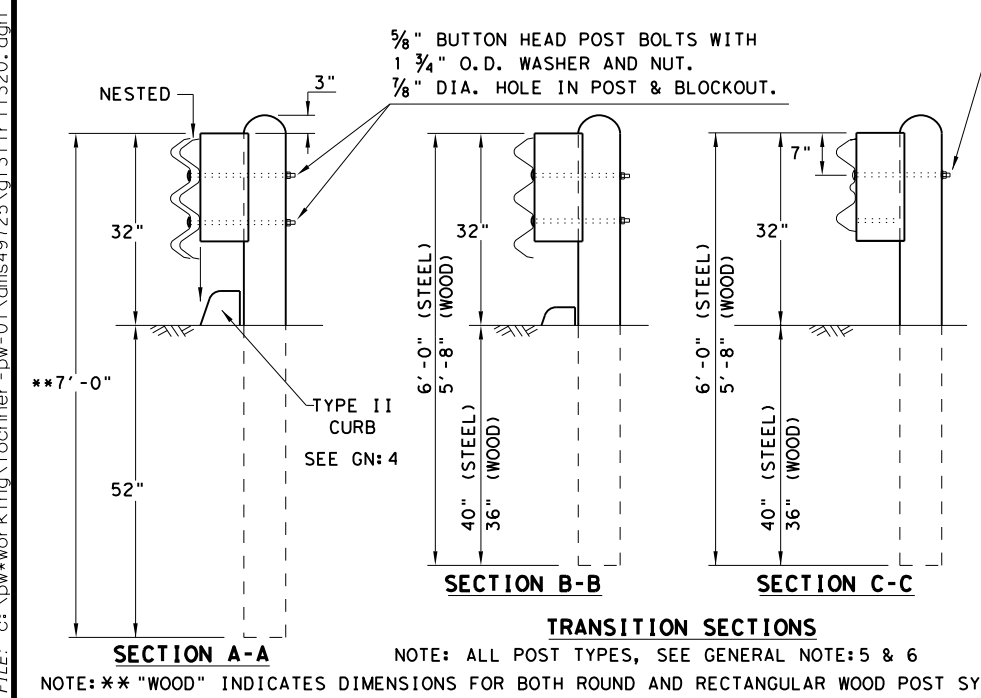
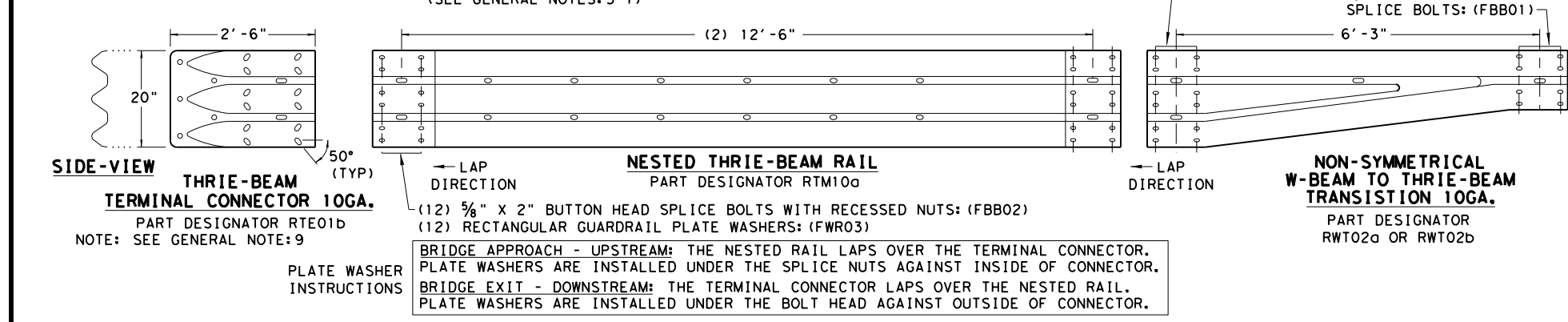
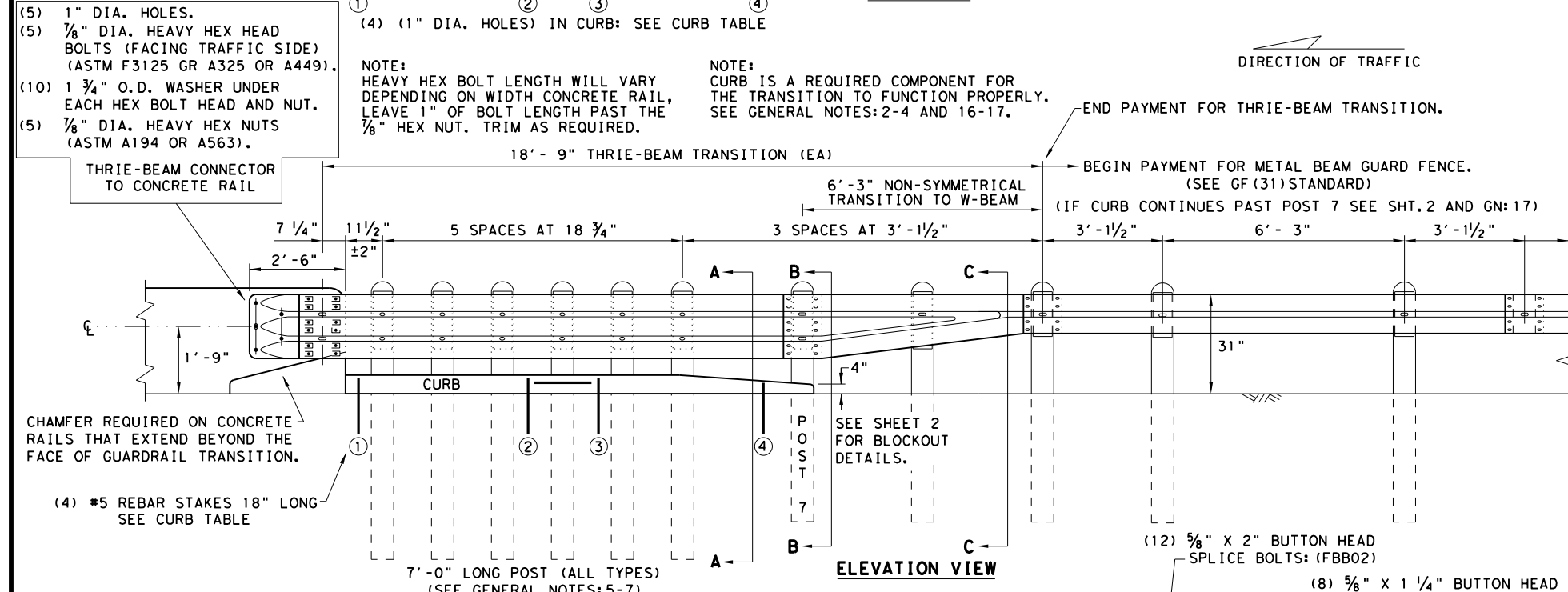
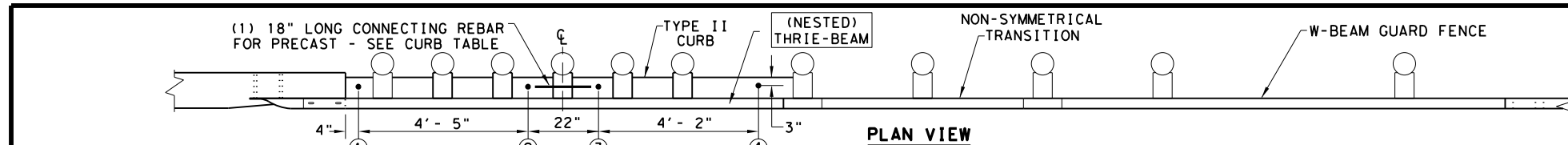


METAL BEAM GUARD FENCE (MOW STRIP) CRP-GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
Revised 11, 2019 KM	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	127	

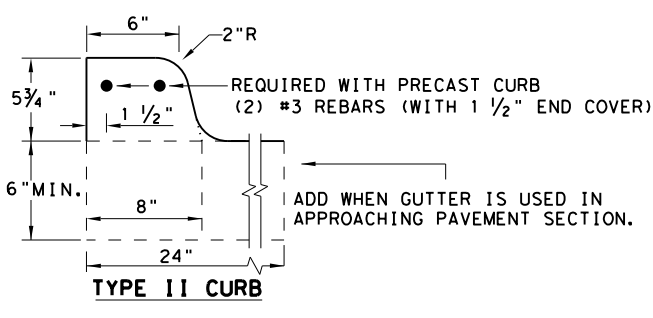
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THRIE-BEAM TERMINAL - CURB TABLE	
PRECAST CURB FULL LENGTH EQUALS 12' - 2"	
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.	
CURB (1) LENGTH	5' - 8"
CURB (2) LENGTH	6' - 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7	
CONNECTING PRECAST CURB SECTIONS (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

- CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
- 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.
- 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.
- 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.
- FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
- 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.
- 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.
- POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
- 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.
- 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.
- FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
- CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
- WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
- 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.
- REFER TO GF (31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
- 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.
- 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

FILE: gf31tr+1320.dgn	DN:TxDOT	CK:KM	DW:VP	CK:CGL/AG
©TXDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	128	

DATE: 2/16/2022
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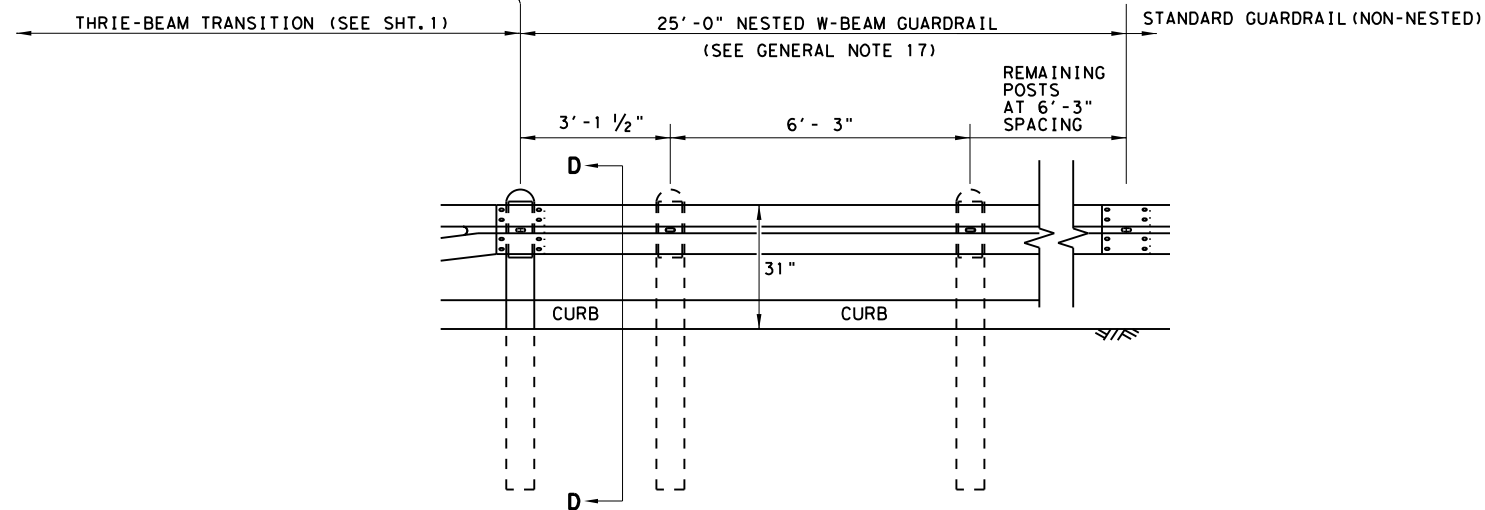
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TxDOT FOR ANY PURPOSE WHATSOEVER. TxDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

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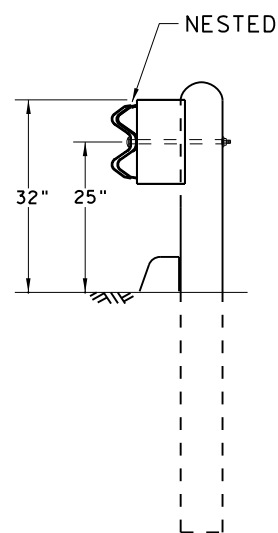
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)

END PAYMENT FOR METAL BEAM GUARD FENCE TRANSITION.
 BEGIN PAYMENT FOR METAL BEAM GUARD FENCE.

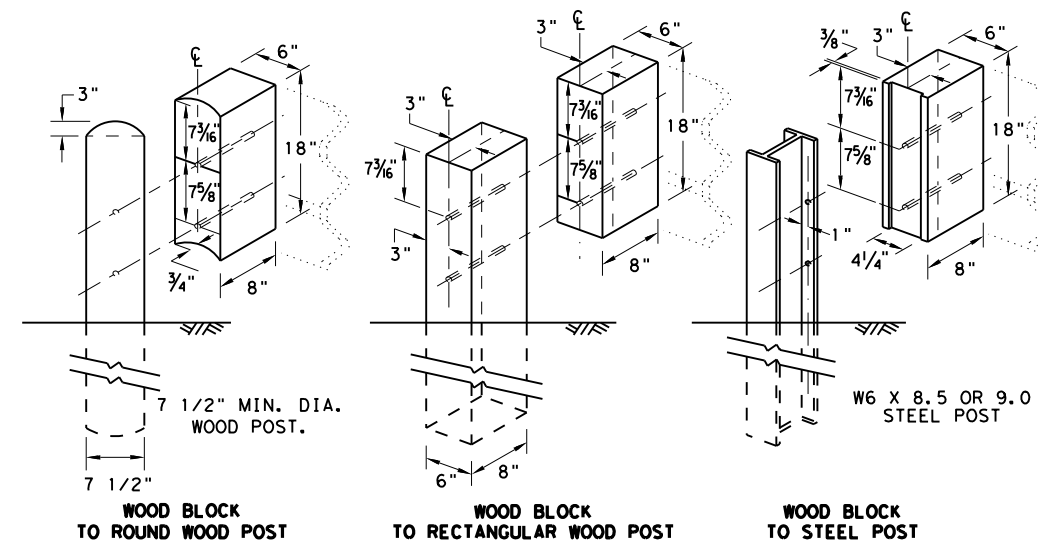
(SEE GF (31) STANDARD SHEET)



ELEVATION VIEW



SECTION D-D



THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

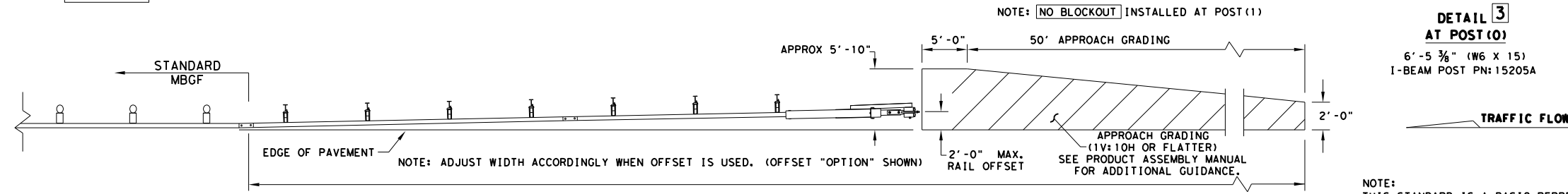
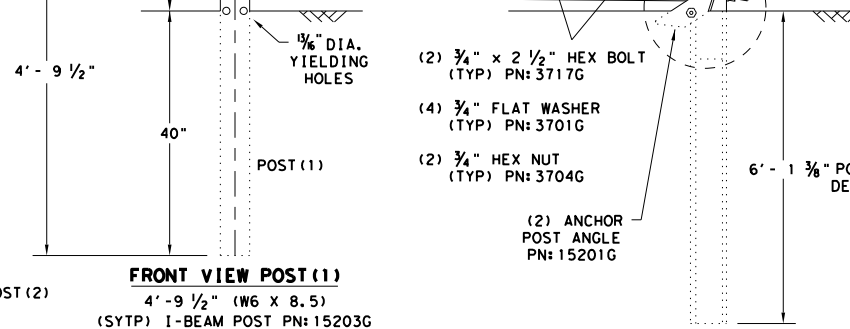
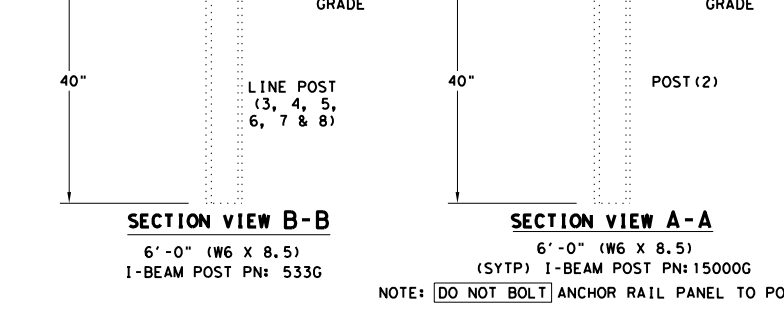
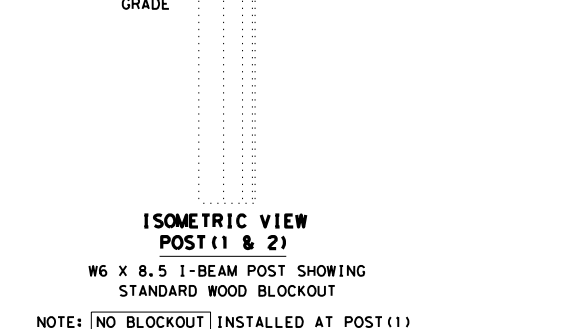
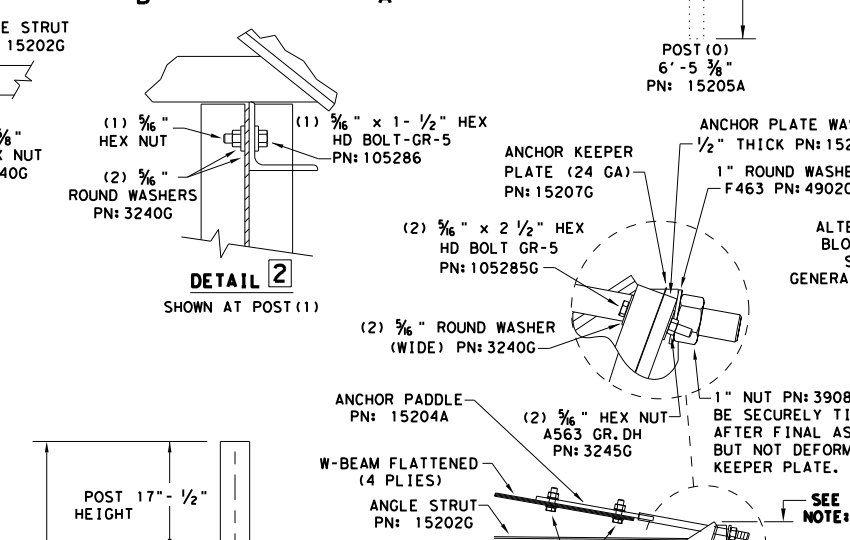
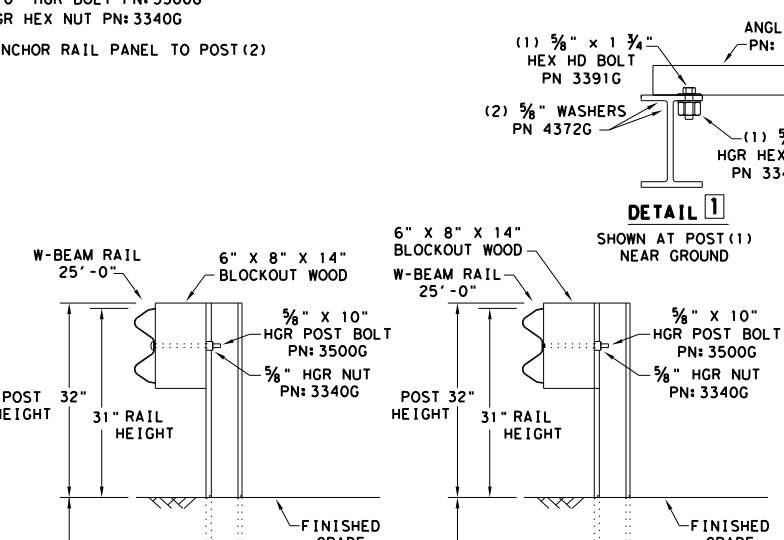
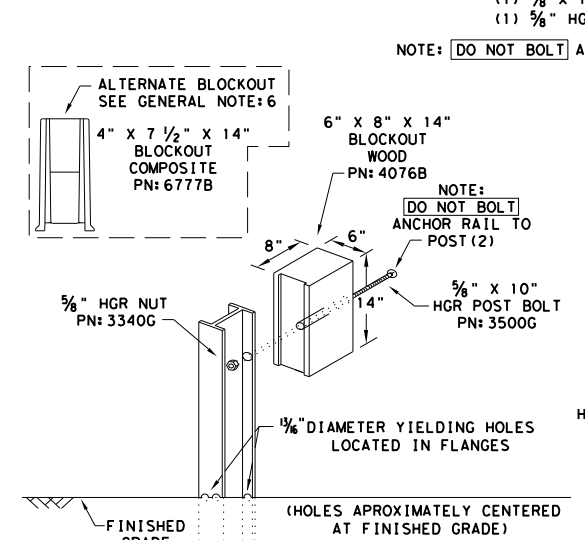
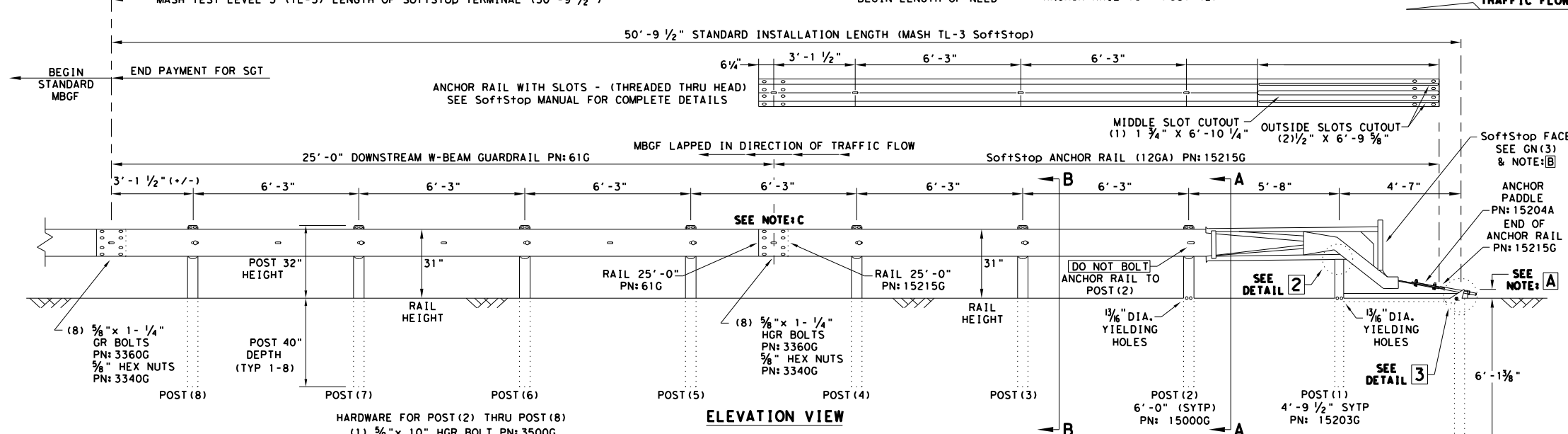
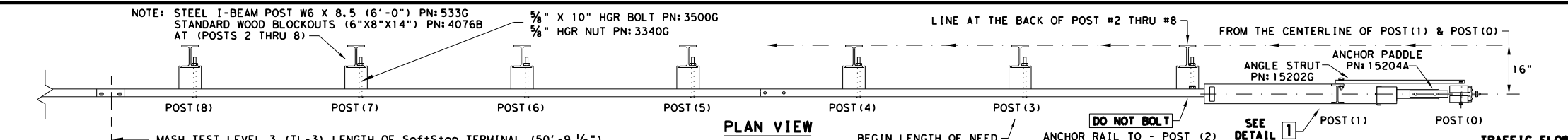
SHEET 2 OF 2



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
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REVISIONS	0383	03	024, ETC.	SH 141
	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS, ETC.		129



- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374, 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN:620237B
 - 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.
 - A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
 - IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MGBF STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
 - DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
 - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRoACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.

NOTE: B PART PN:5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN:5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)

NOTE: C W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN:61G ANCHOR RAIL 25'-0" PN:15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25' - 0")
15205A	1	POST #0 - ANCHOR POST (6' - 5 3/8")
15203G	1	POST #1 - (SYTP) (4' - 9 1/2")
15000G	1	POST #2 - (SYTP) (6' - 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6' - 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDL
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
HARDWARE		
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

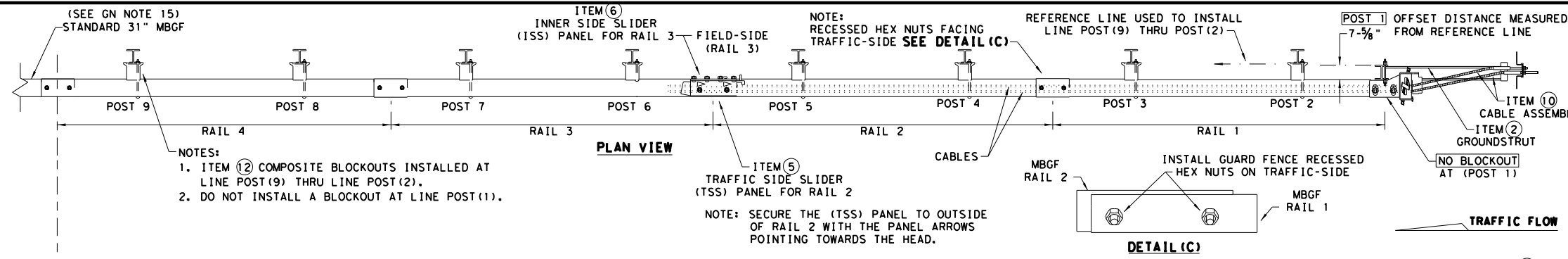
Texas Department of Transportation
Design Division Standard

**TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT (10S) 31-16**

FILE: sgt10s3116	DW: TXDOT	CK: KM	DW: VP	CK: MB/VP
© TXDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY	SHEET NO.		
CRP	JIM WELLS, ETC.	130		

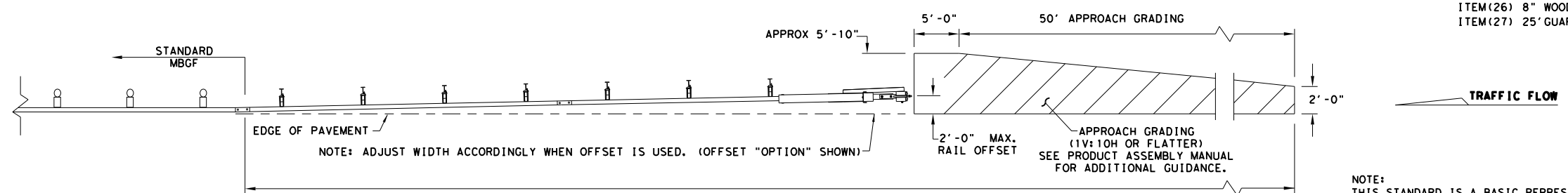
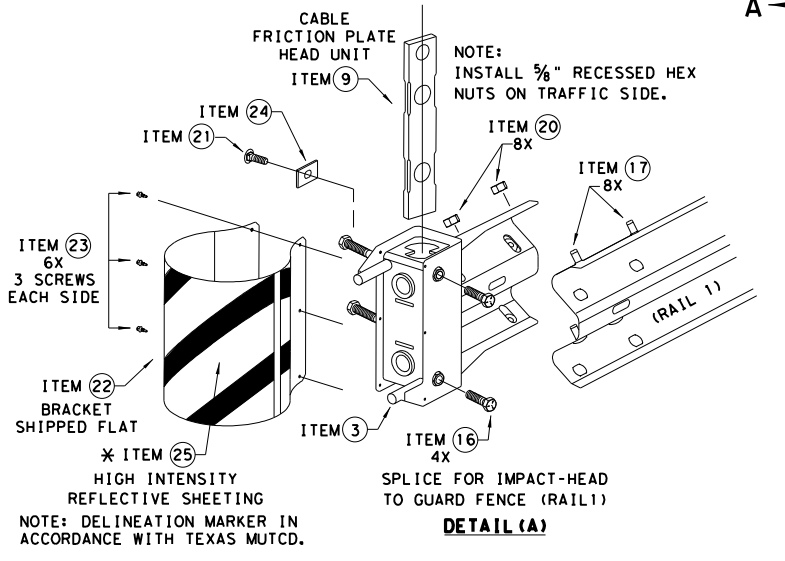
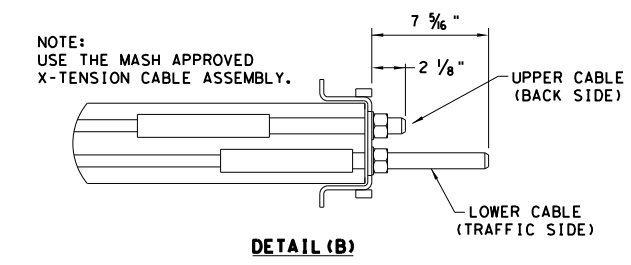
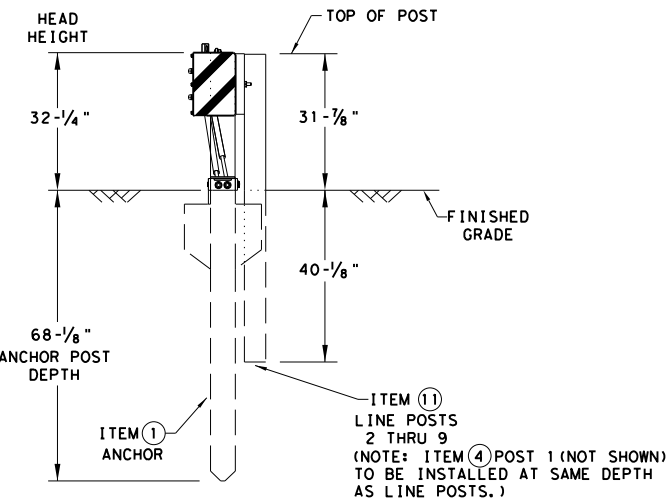
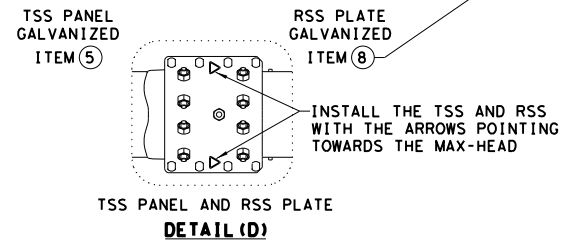
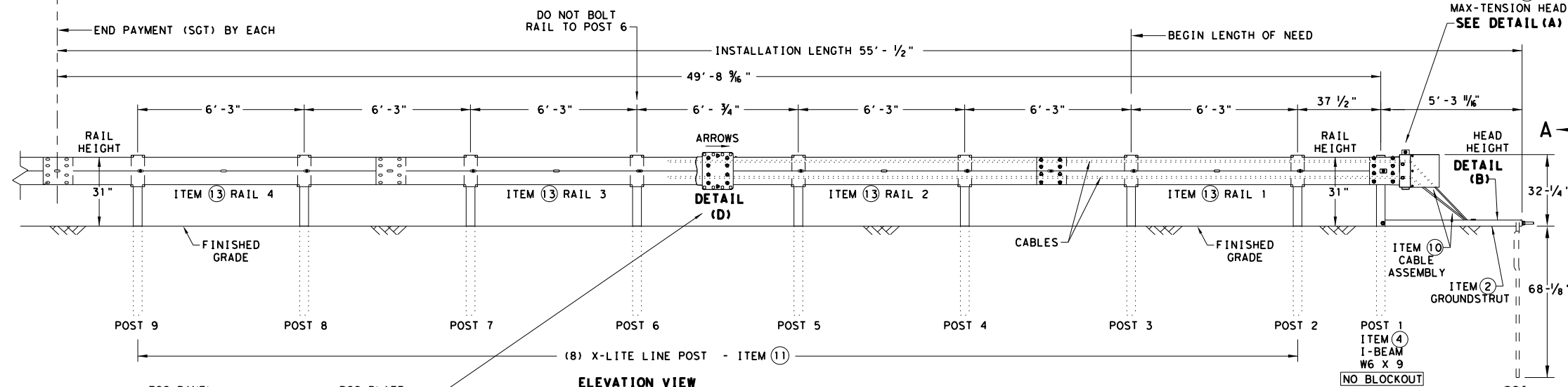
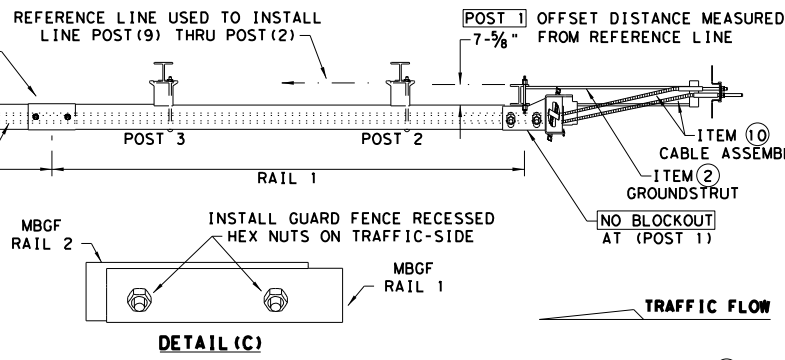
NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

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.



- NOTES:
- ITEM (2) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (9) THRU LINE POST (2).
 - DO NOT INSTALL A BLOCKOUT AT LINE POST (1).

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.



NOTE: TxDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

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	3/8" 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	3/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	3/8" 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

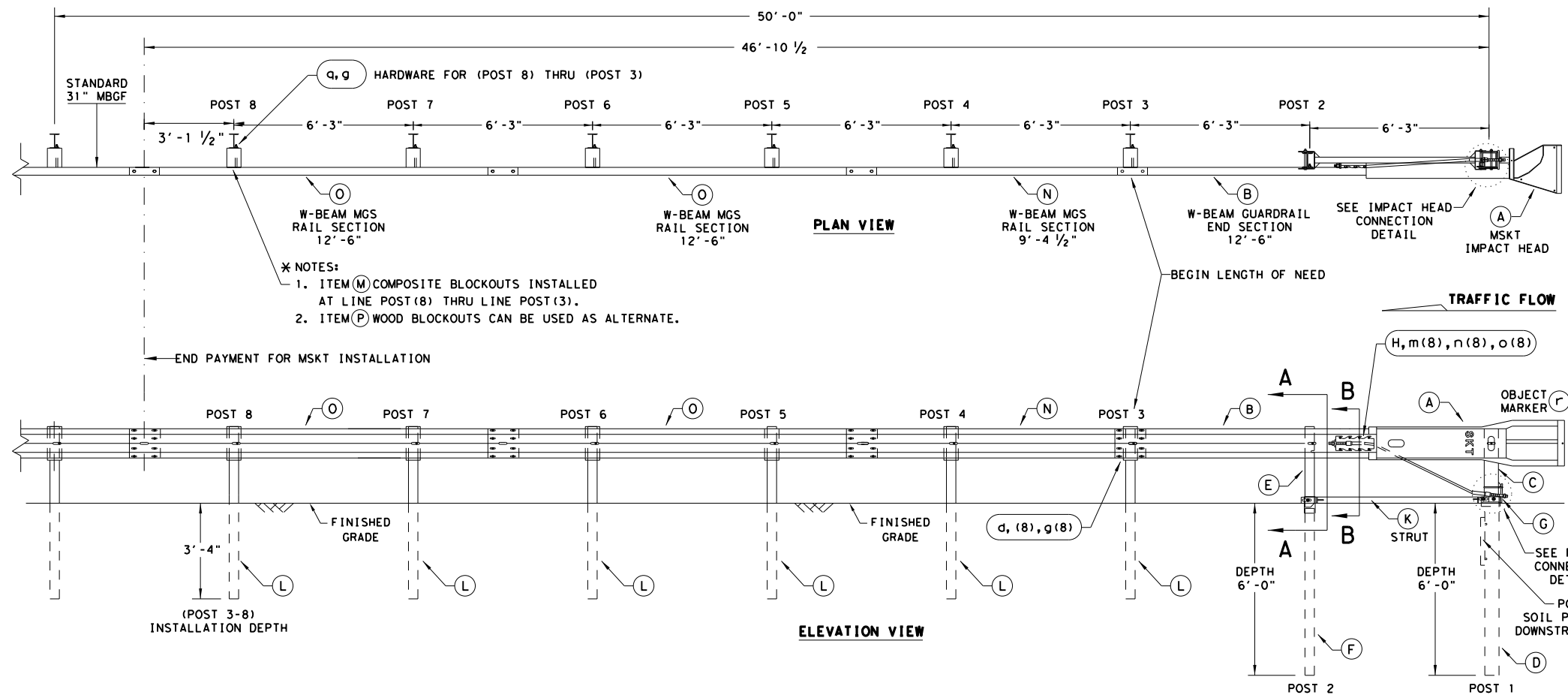
MASH - TL-3

SGT (11S) 31-18

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 REVISIONS 0383 03 024, ETC. SH 141
 DIST COUNTY SHEET NO.
 CRP JIM WELLS, ETC. 131

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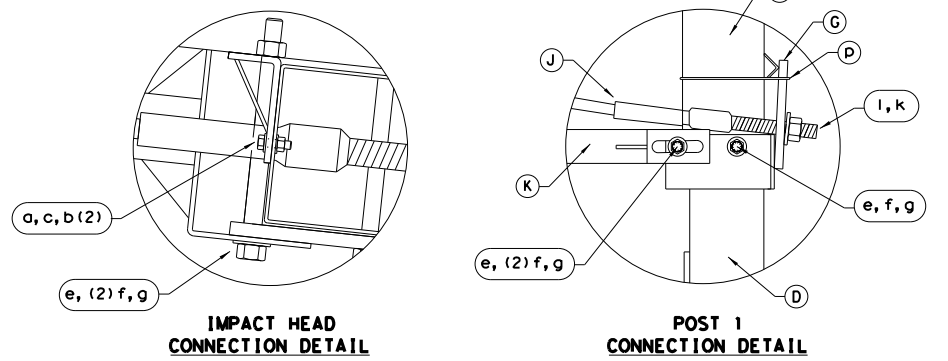
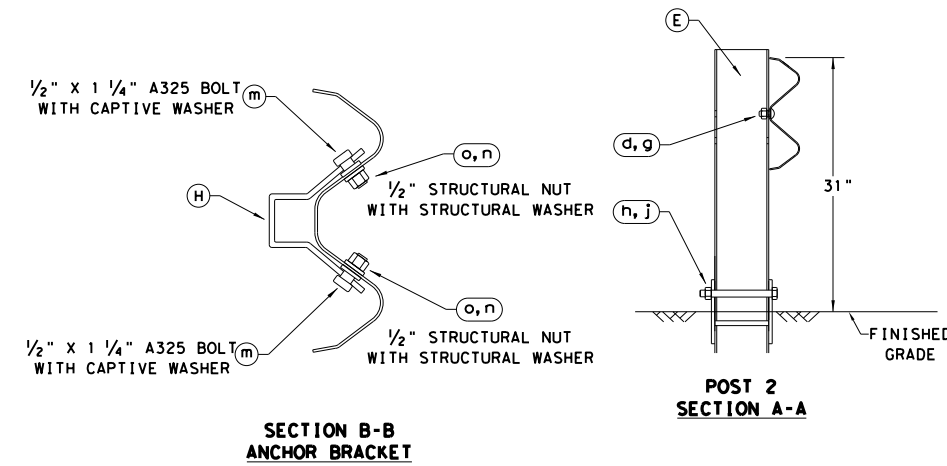
DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



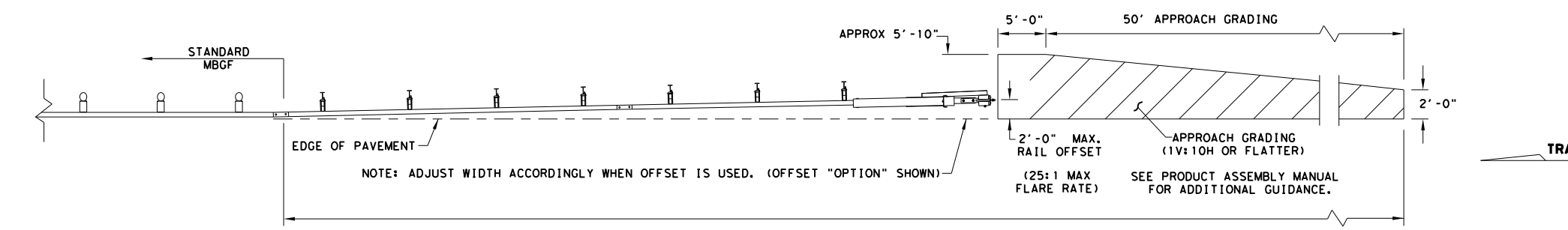
- * NOTES:**
- ITEM (M) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (8) THRU LINE POST (3).
 - ITEM (P) WOOD BLOCKOUTS CAN BE USED AS ALTERNATE.

- 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 ENCRoACHING 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	3/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	3/8" WASHER	W0516
c	2	3/8" HEX NUT	N0516
d	25	3/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	3/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	3/8" WASHER	W050
g	33	3/8" 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	3/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



ALTERNATIVE ITEMS NOT SHOWN. *
 * ITEM (P) 8" WOOD-BLOCKOUT
 ** ITEM (Q) 25' GUARD FENCE PANEL



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

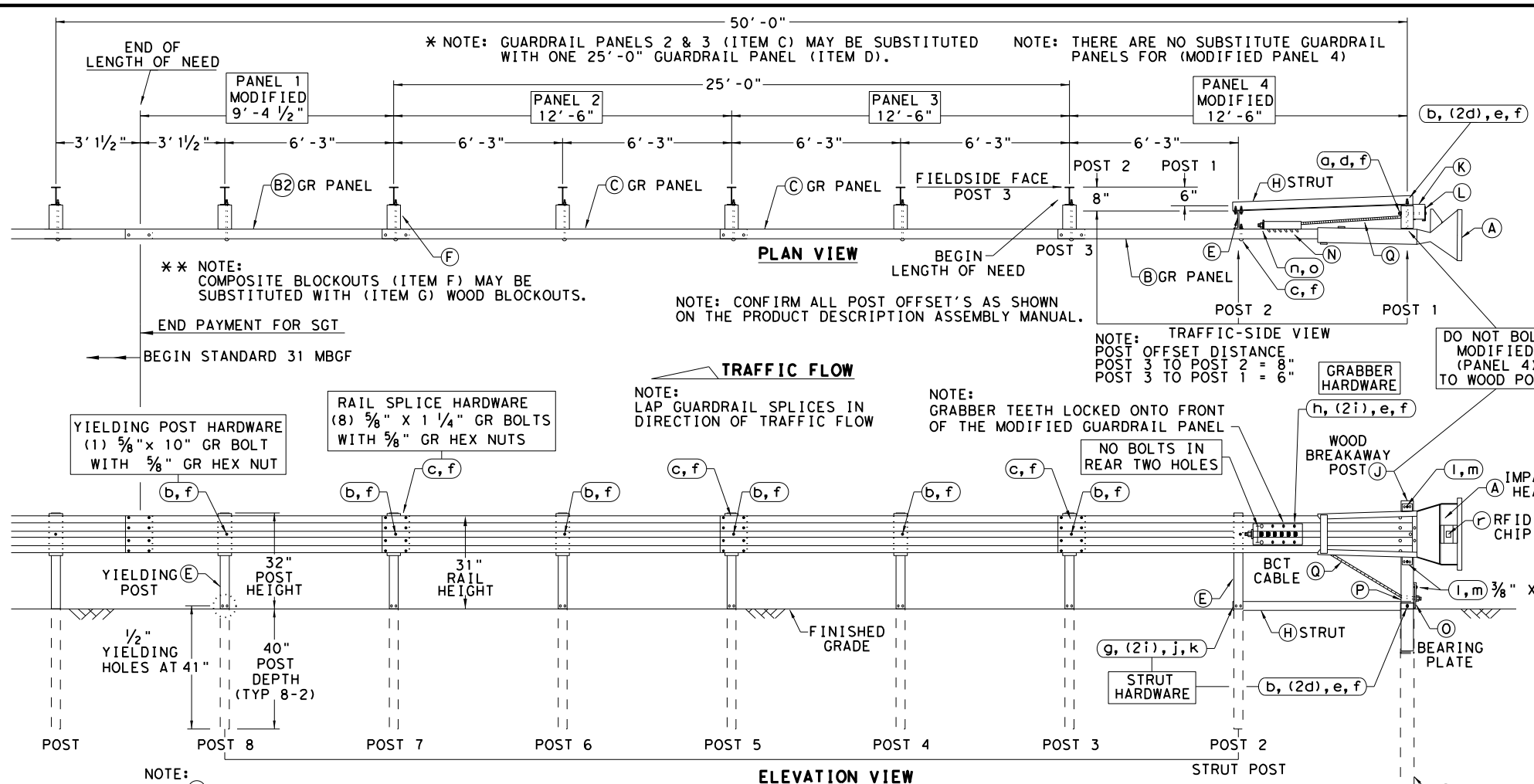
MSKT-MASH-TL-3

SGT (12S) 31-18

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© TxDOT: APRIL 2018	CONT SECT	JOB	HIGHWAY	
REVISIONS	0383 03	024, ETC.	SH 141	
DIST	COUNTY		SHEET NO.	
CRP	JIM WELLS, ETC.		132	

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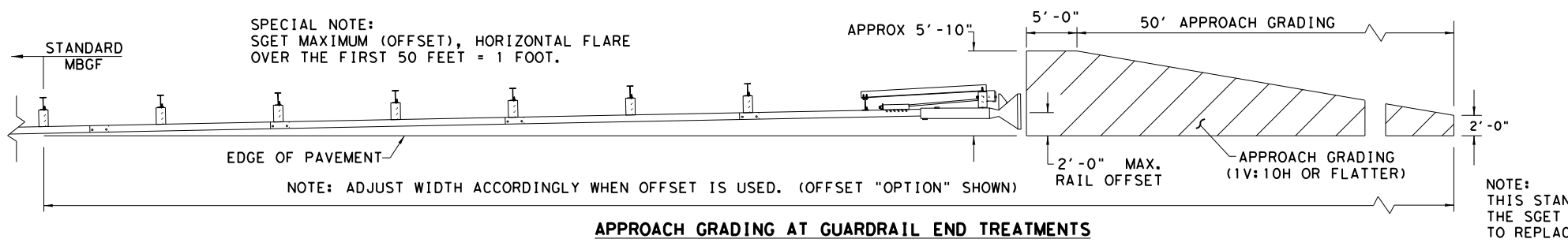
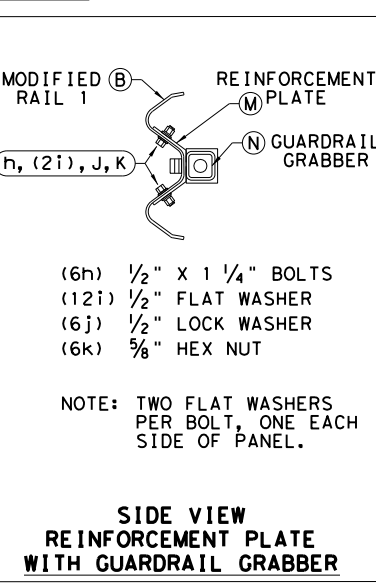
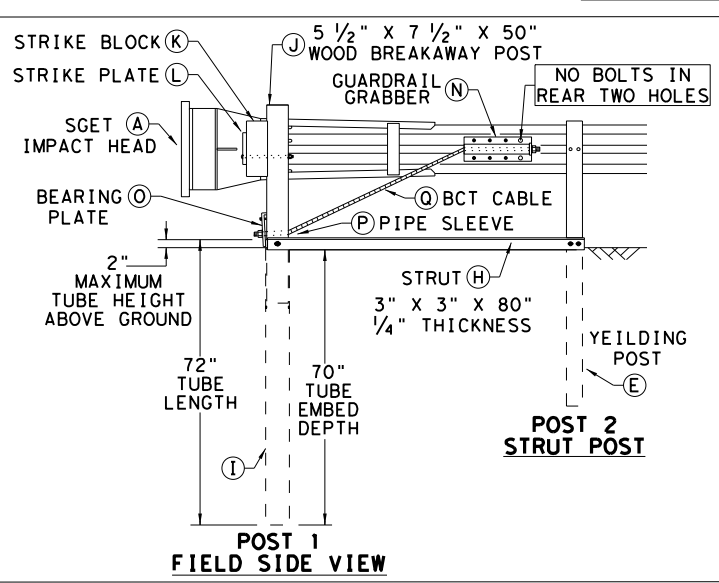
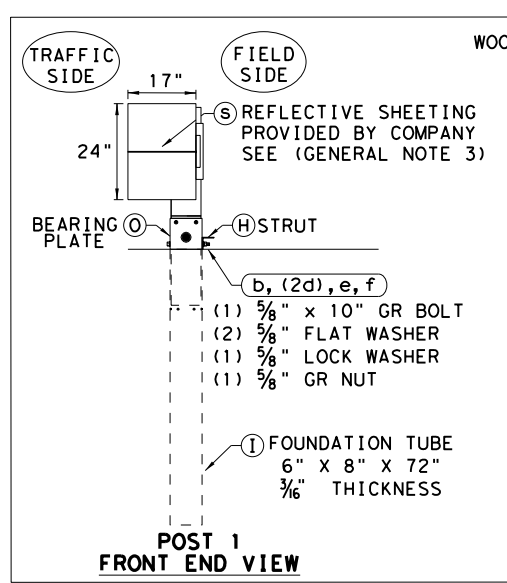
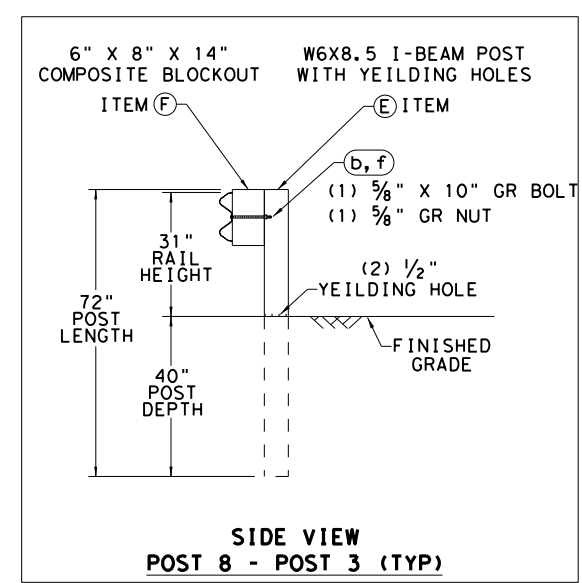
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



- ### 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"	CB08
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 3/8"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" X 7 1/2" X 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGRI17
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 HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M



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

Texas Department of Transportation
Design Division Standard

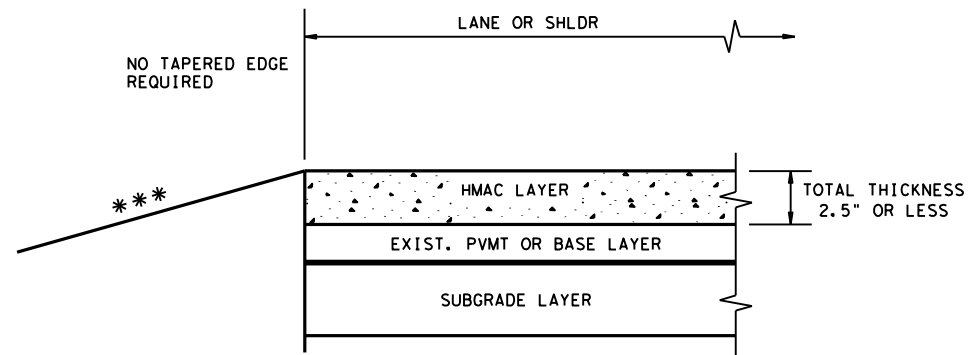
SPIG INDUSTRY, LLC SINGLE GUARDRAIL TERMINAL SGET - TL-3 - MASH SGT (15) 31-20

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	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	133	

DATE: FILE:

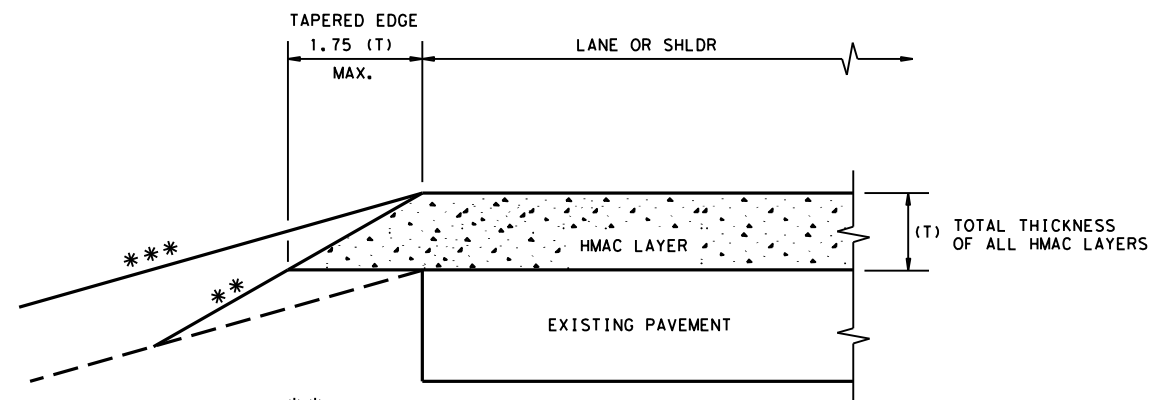
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*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

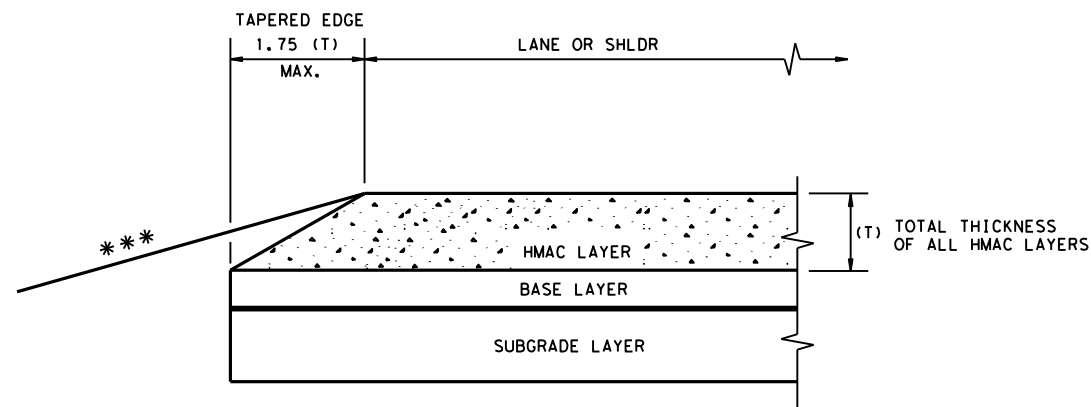
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY
WITH THICKNESS OF 2.5" OR LESS



** 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.

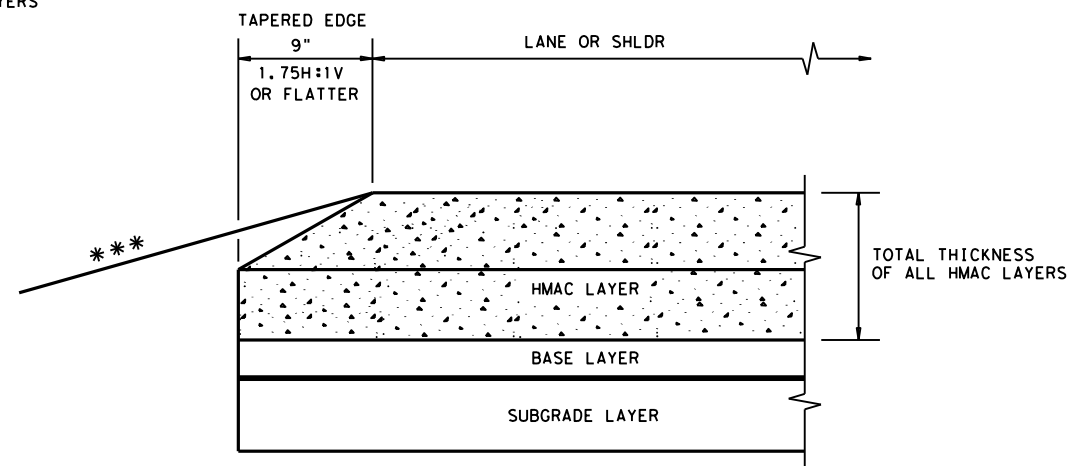
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

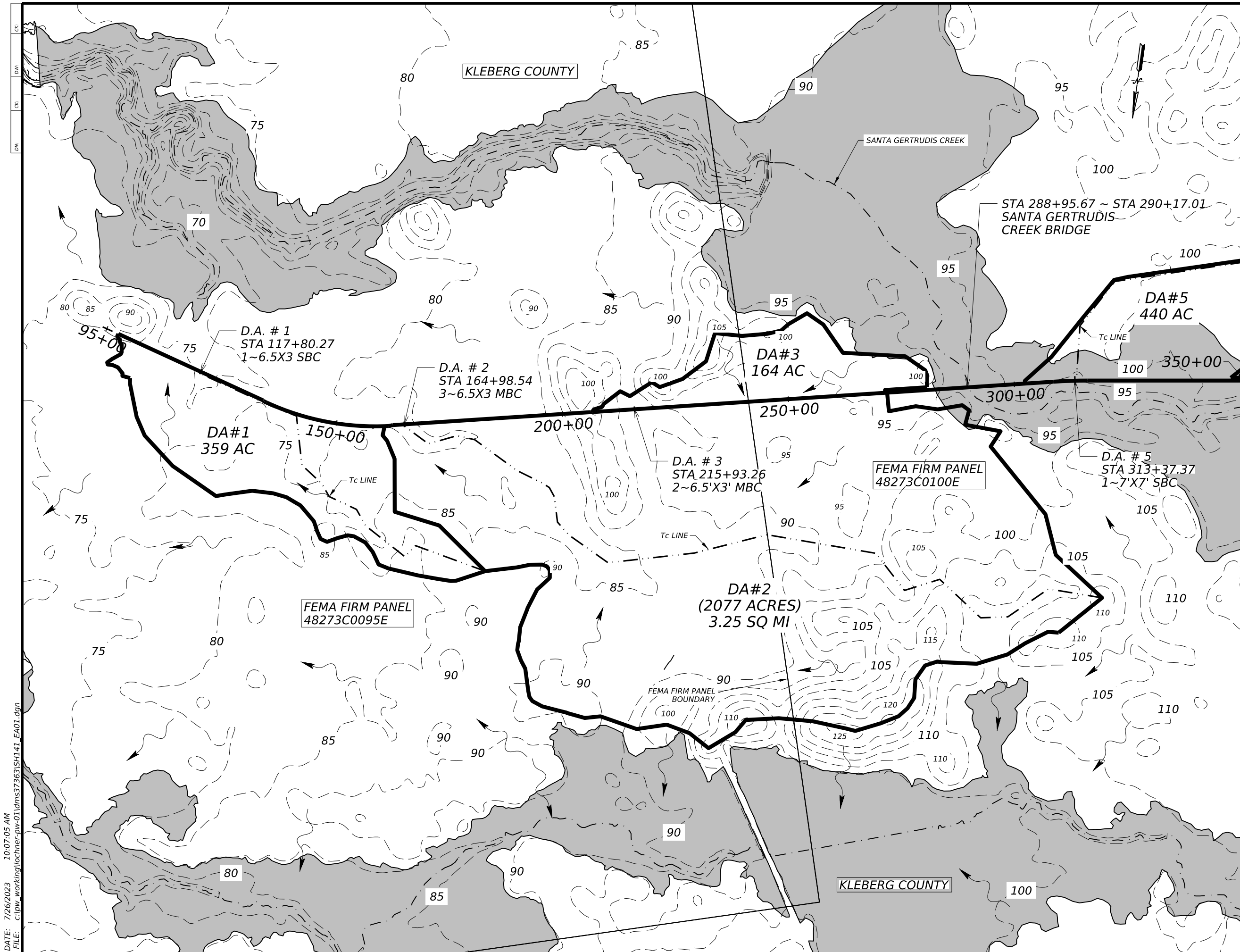
CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 5" OR GREATER

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.

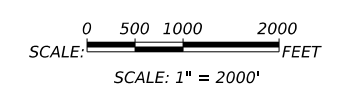
(NOT TO SCALE)

				Design Division Standard	
TAPERED EDGE DETAILS HMAC PAVEMENT					
TE (HMAC) - 11					
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© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0383	03	024, ETC.	SH 141	
	DIST	COUNTY		SHEET NO.	
	CRP	JIM WELLS, ETC.		134	



LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- TIME OF CONCENTRATION PATH
- CONTOUR ELEVATIONS
- FLOW ARROW
- DRAINAGE AREA NUMBER
- DRAINAGE AREA (SQ MILES)
- FEMA - ZONE A



NOTES:

THE PORTION OF THE PROJECT SHOWN THIS SHEET IS LOCATED IN KLEBERG COUNTY, FEMA FIRM MAPS 48273C0095E AND 48273C0100E, EFFECTIVE MARCH 17, 2014. A FEMA ZONE "A" AREA IS LOCATED ON FIRM MAP 48273C0100E FOR SANTA GERTRUDIS CREEK. NO CHANGES ARE TAKING PLACE THAT IMPACT THE FEMA ZONE "A" AREA.

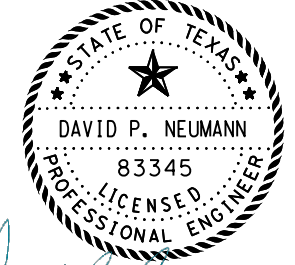
LETTERS WILL BE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR INFORMING THEM OF THE PROJECT AND AVAILABLE DATA.

ELEVATIONS SHOWN ARE FROM THE USGS TOPO MAP VECTOR DATA (7.5X7.5 MIN QUAD AT 1:24,000 SCALE; 5 FT CONTOUR INTERVALS).

CROSS-SECTIONS WERE DEVELOPED FROM SITE SURVEY BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 WITH A SURFACE ADJUSTMENT FACTOR OF 1.000063. ALL ELEVATIONS BASED ON NAVD88 (GEOID12A). FOR AREAS OUTSIDE THE EXISTING SURVEY, USGS 3D ELEVATION PROGRAM (3DEP) LIDAR DATA (1/3 ARC-SECOND DEMs) WAS USED FOR ADDITIONAL DATA.

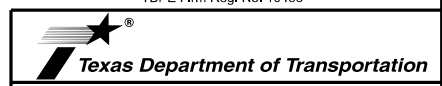
HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3) FOR BRIDGE CLASS STRUCTURES AND HY-8 (V7.6) FOR NON-BRIDGE CLASS CULVERTS.

FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.



David P. Neumann, P.E.
2023.07.28 01:21:14-05'00'

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TBPE Firm Reg. No. 10488

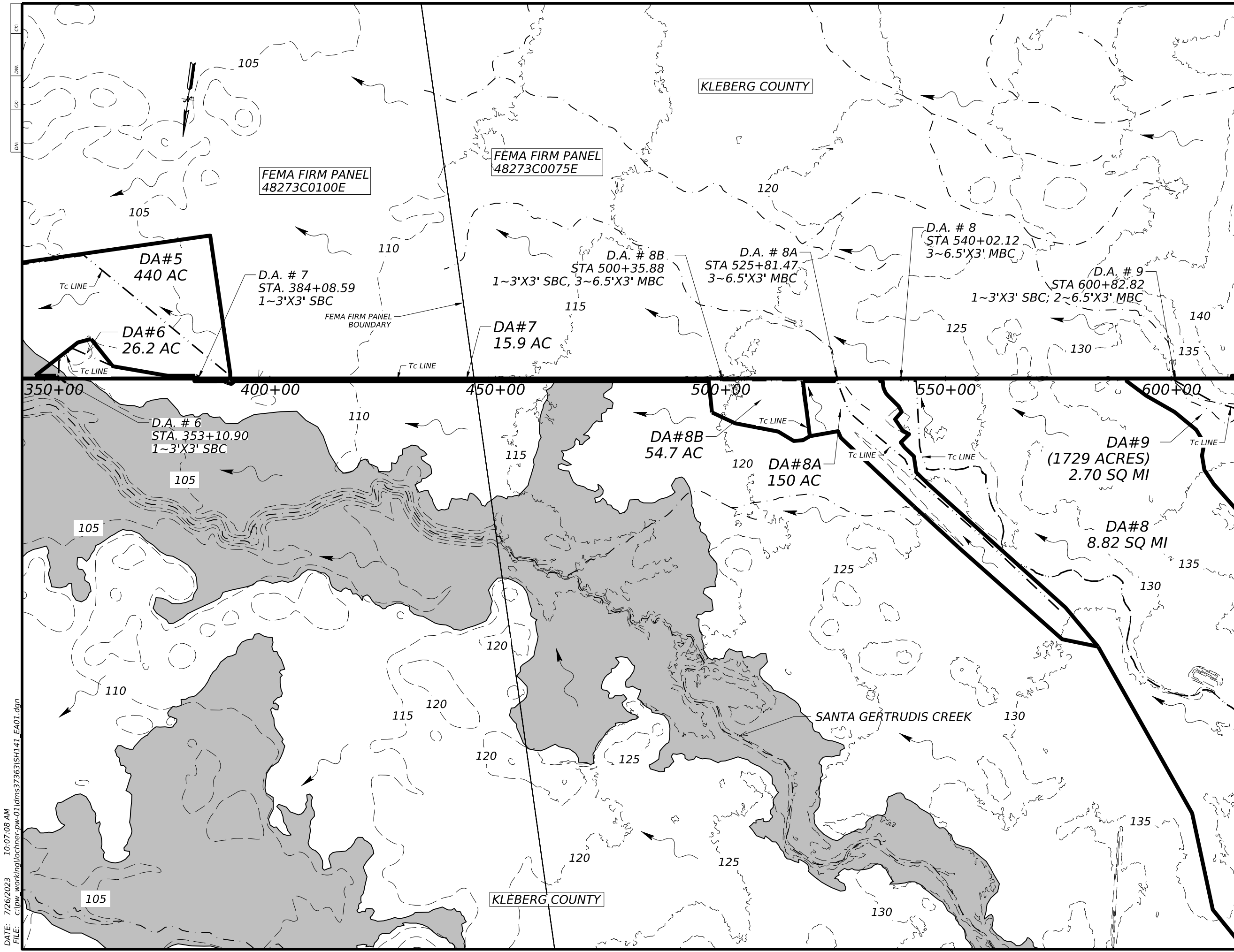


DRAINAGE AREA SHEETS

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY	SHEET NO.	
CRP	KLEBERG	135	

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LEGEND

- DRAINAGE AREA BOUNDARY
 - STREAM CENTERLINE
 - TIME OF CONCENTRATION PATH
 - CONTOUR ELEVATIONS
 - FLOW ARROW
 - DRAINAGE AREA NUMBER
 - DRAINAGE AREA (SQ MILES)
 - FEMA - ZONE A
- SCALE: 1" = 2000'

NOTES:

THE PORTION OF THE PROJECT SHOWN THIS SHEET IS LOCATED IN KLEBERG COUNTY, FEMA FIRM MAPS 48273C0075E AND 48273C0100E, EFFECTIVE MARCH 17, 2014. A FEMA ZONE "A" AREA IS SHOWN FOR SANTA GERTRUDIS CREEK. NO CHANGES ARE TAKING PLACE THAT IMPACT THE FEMA ZONE "A" AREA.

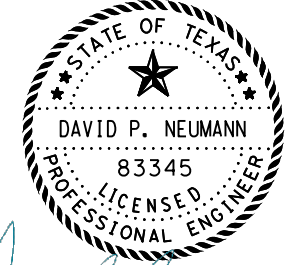
LETTERS WILL BE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR INFORMING THEM OF THE PROJECT AND AVAILABLE DATA.

ELEVATIONS SHOWN ARE FROM THE USGS TOPO MAP VECTOR DATA (7.5X7.5 MIN QUAD AT 1:24,000 SCALE; 5 FT CONTOUR INTERVALS).

CROSS-SECTIONS WERE DEVELOPED FROM SITE SURVEY BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 WITH A SURFACE ADJUSTMENT FACTOR OF 1.000063. ALL ELEVATIONS BASED ON NAVD88 (GEOID12A). FOR AREAS OUTSIDE THE EXISTING SURVEY, USGS 3D ELEVATION PROGRAM (3DEP) LIDAR DATA (1/3 ARC-SECOND DEMs) WAS USED FOR ADDITIONAL DATA.

HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3) FOR BRIDGE CLASS STRUCTURES AND HY-8 (V7.6) FOR NON-BRIDGE CLASS CULVERTS.

FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.



David P. Neumann, P.E.

2023.07.28 01:20:59-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

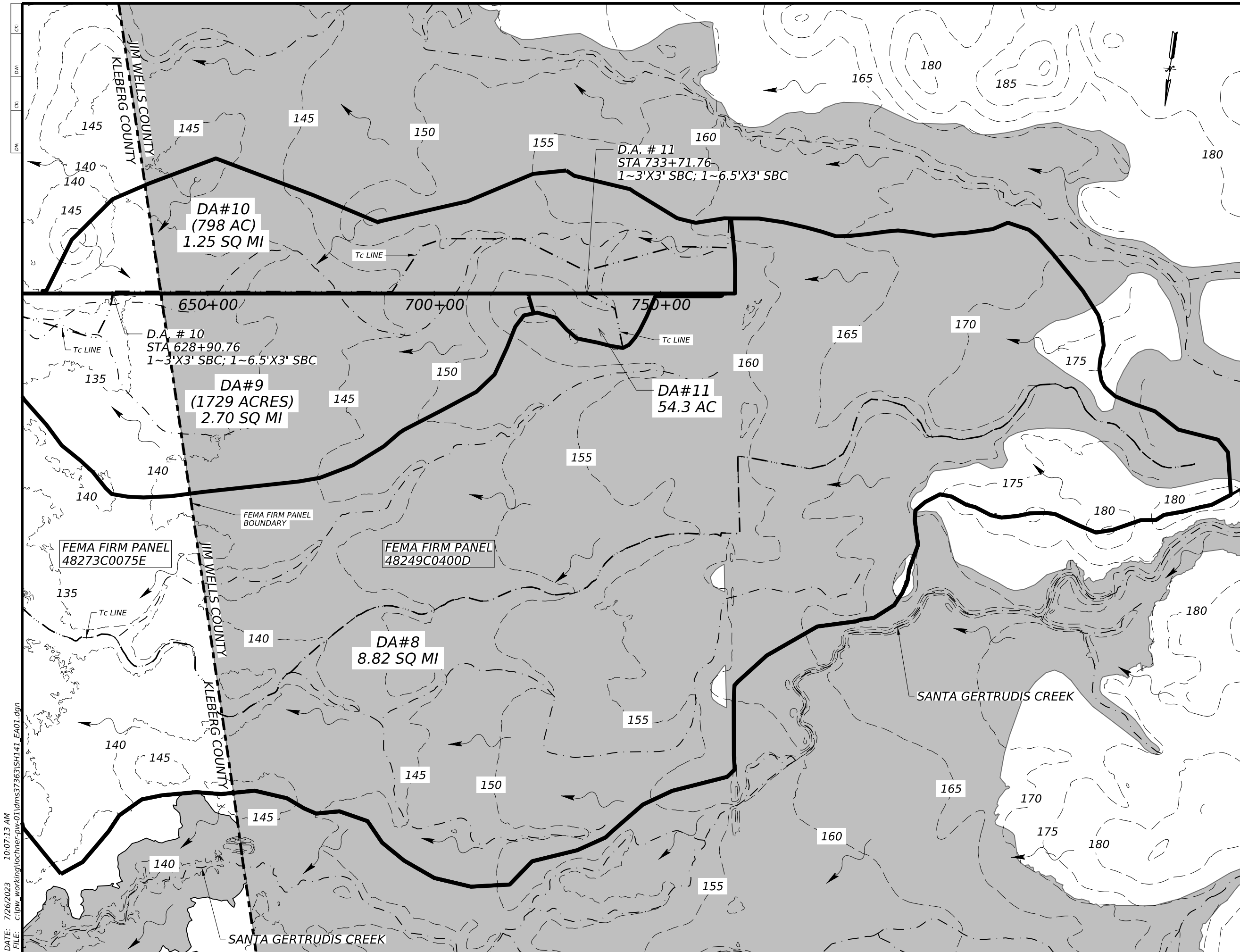


DRAINAGE AREA SHEETS

SHEET 2 OF 3

COUNT	SECT	JOB	HIGHWAY
0383	04	060	SH 141
DIST		COUNTY	SHEET NO.
CRP		KLEBERG	136

DATE: 7/26/2023 10:07:08 AM
 FILE: c:\pw_working\lochner-pw-01\dms37363\SH141_EA01.dgn



LEGEND

- DRAINAGE AREA BOUNDARY
 - STREAM CENTERLINE
 - TIME OF CONCENTRATION PATH
 - CONTOUR ELEVATIONS
 - FLOW ARROW
 - DRAINAGE AREA NUMBER
 - DRAINAGE AREA (SQ MILES)
 - FEMA - ZONE A
- SCALE: 0 500 1000 2000 FEET
SCALE: 1" = 2000'

NOTES:

THE PORTION OF THE PROJECT SHOWN THIS SHEET IS LOCATED IN KLEBERG & JIM WELLS COUNTY, FEMA FIRM MAPS 48273C0075E (EFFECTIVE MARCH 17, 2014) AND 48249C0400D (EFFECTIVE AUGUST 15, 2017), RESPECTIVELY. A FEMA ZONE "A" AREA IS SHOWN FOR JIM WELLS COUNTY.

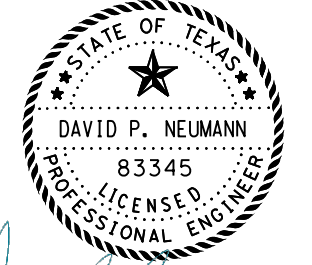
LETTERS WILL BE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR INFORMING THEM OF THE PROJECT AND AVAILABLE DATA.

ELEVATIONS SHOWN ARE FROM THE USGS TOPO MAP VECTOR DATA (7.5X7.5 MIN QUAD AT 1:24,000 SCALE; 5 FT CONTOUR INTERVALS).

CROSS-SECTIONS WERE DEVELOPED FROM SITE SURVEY BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 WITH A SURFACE ADJUSTMENT FACTOR OF 1.000063. ALL ELEVATIONS BASED ON NAVD88 (GEOID12A). FOR AREAS OUTSIDE THE EXISTING SURVEY, USGS 3D ELEVATION PROGRAM (3DEP) LIDAR DATA (1/3 ARC-SECOND DEMs) WAS USED FOR ADDITIONAL DATA.

HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3) FOR BRIDGE CLASS STRUCTURES AND HY-8 (V7.6) FOR NON-BRIDGE CLASS CULVERTS.

FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.



David P. Neumann, P.E.

2023.07.28 01:20:40-05'00'

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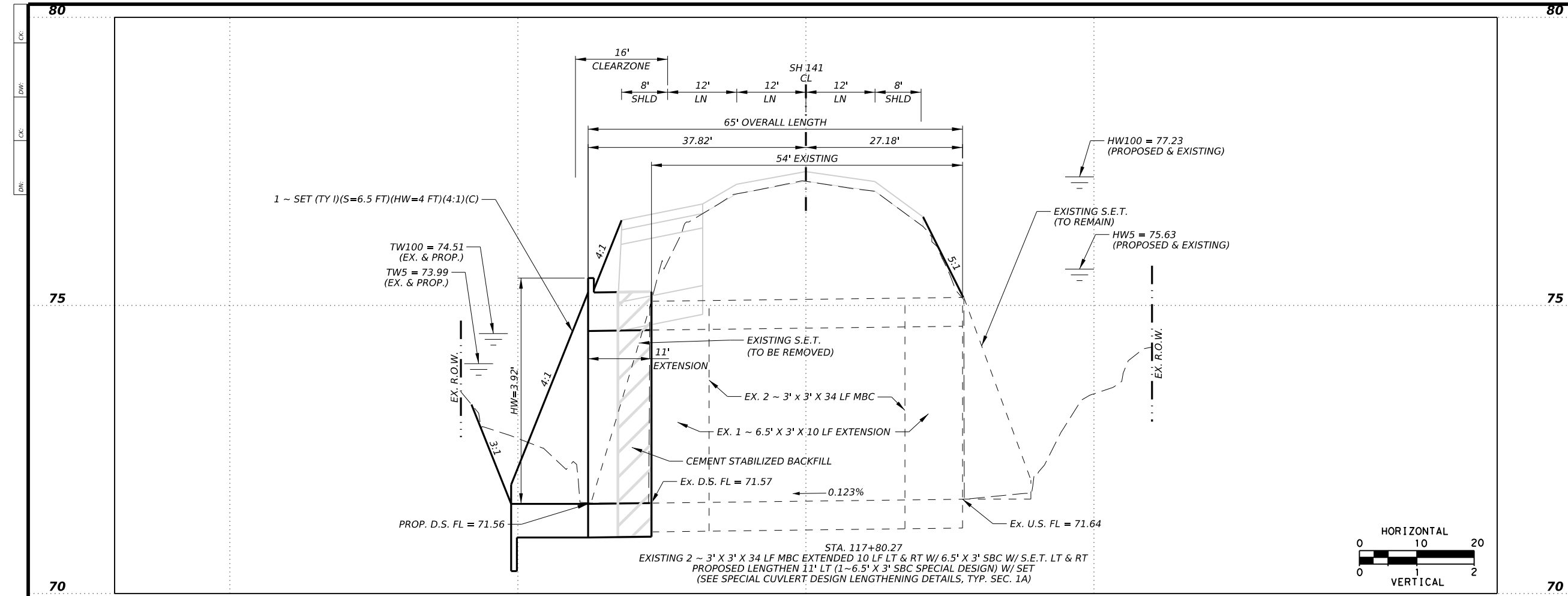
Texas Department of Transportation

DRAINAGE AREA SHEETS

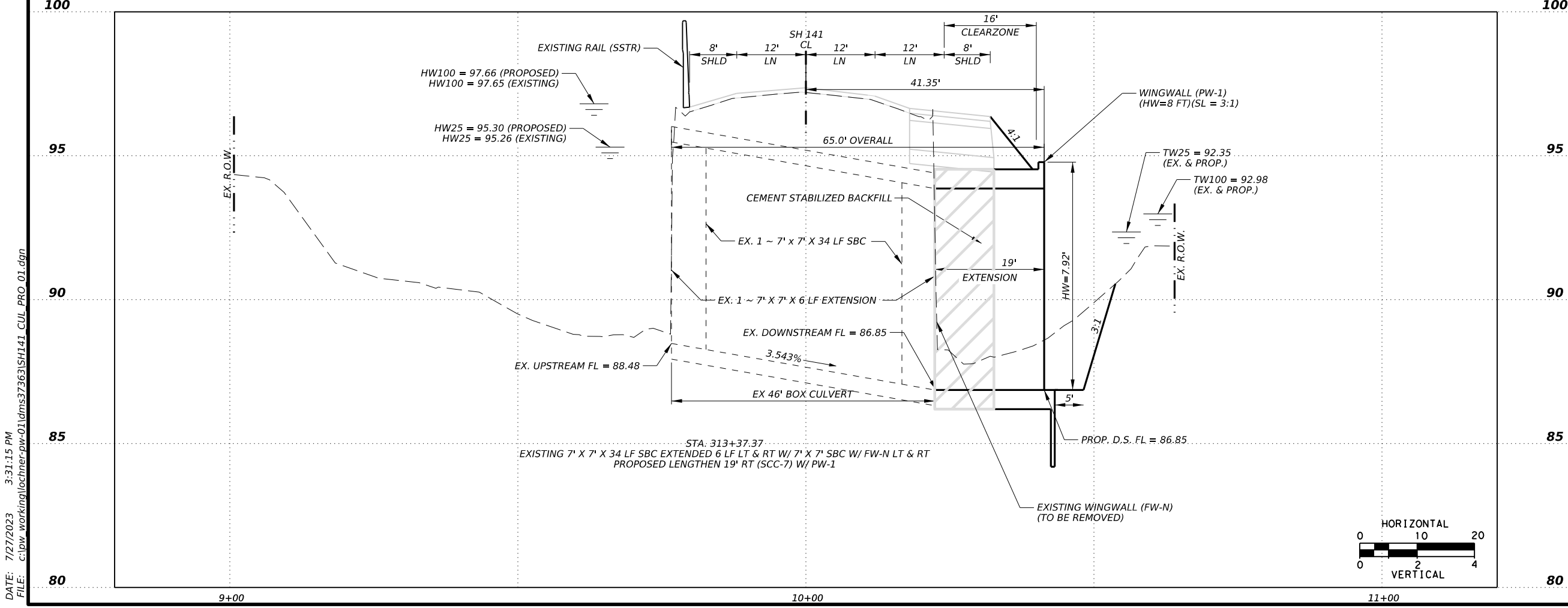
SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	137

DATE: 7/26/2023 10:07:13 AM
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NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.



STATE OF TEXAS
 DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER
 2023.07.27 23:20:46-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488



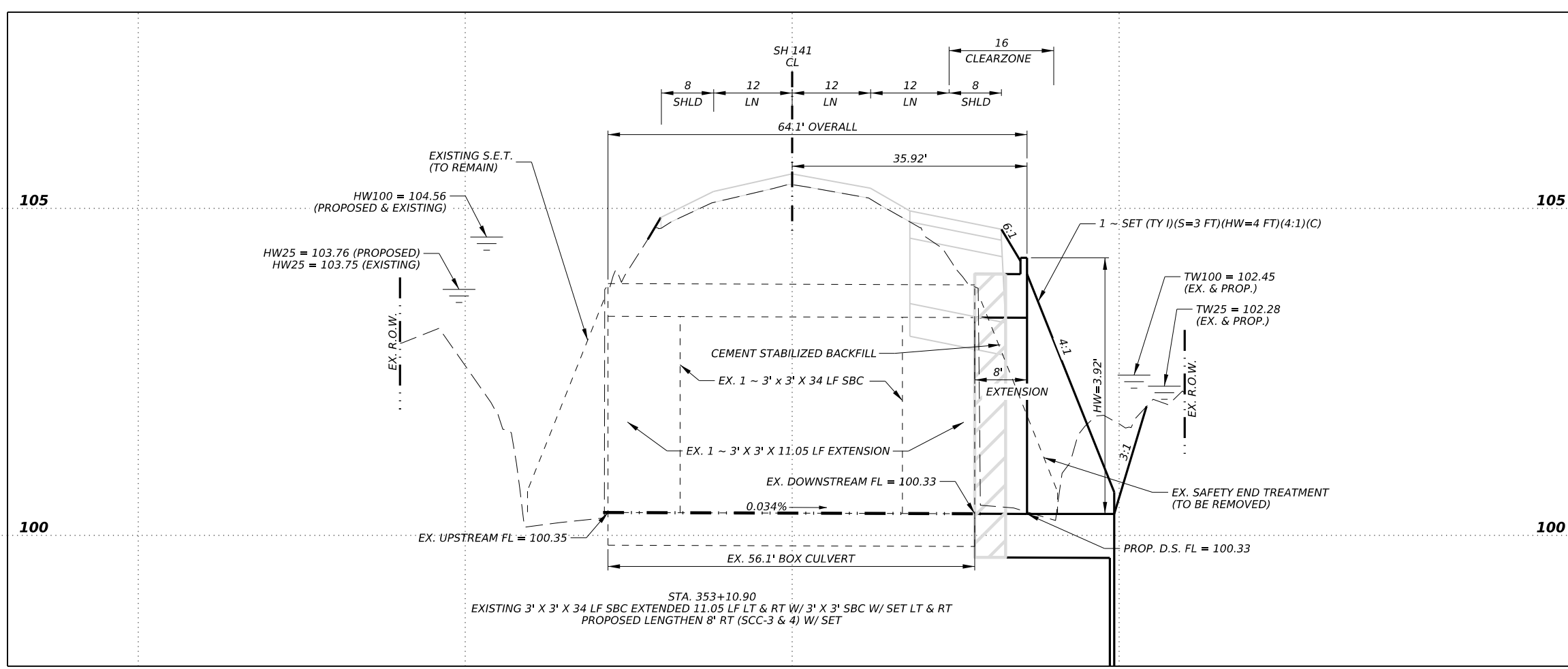
CULVERT PROFILES

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		139

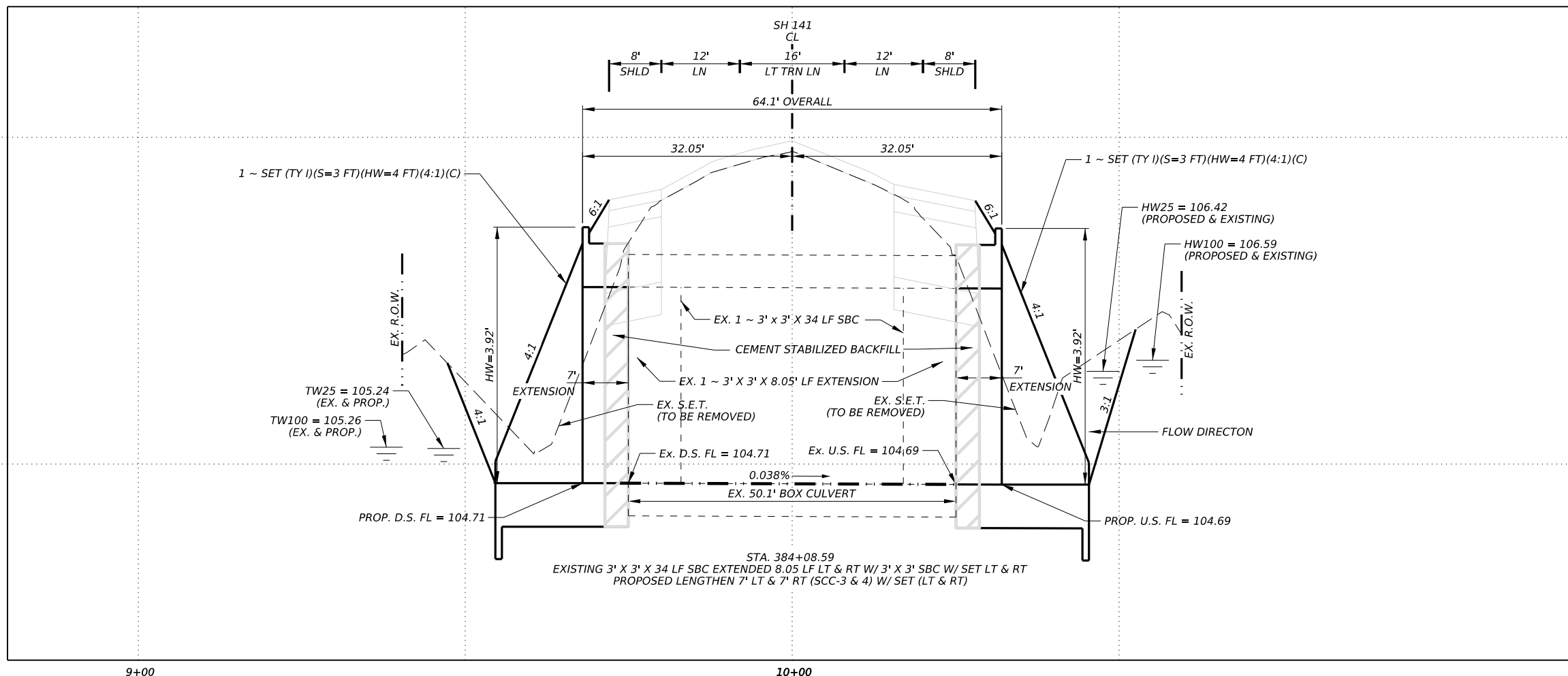
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DW:
CK:
DN:



9+00

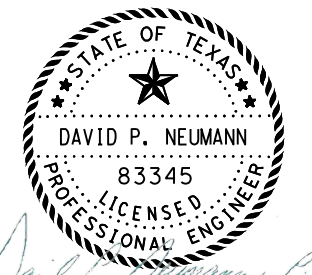
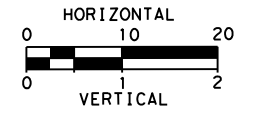
10+00



9+00

10+00

NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.



2023.07.28 00:02:11-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



CULVERT PROFILES

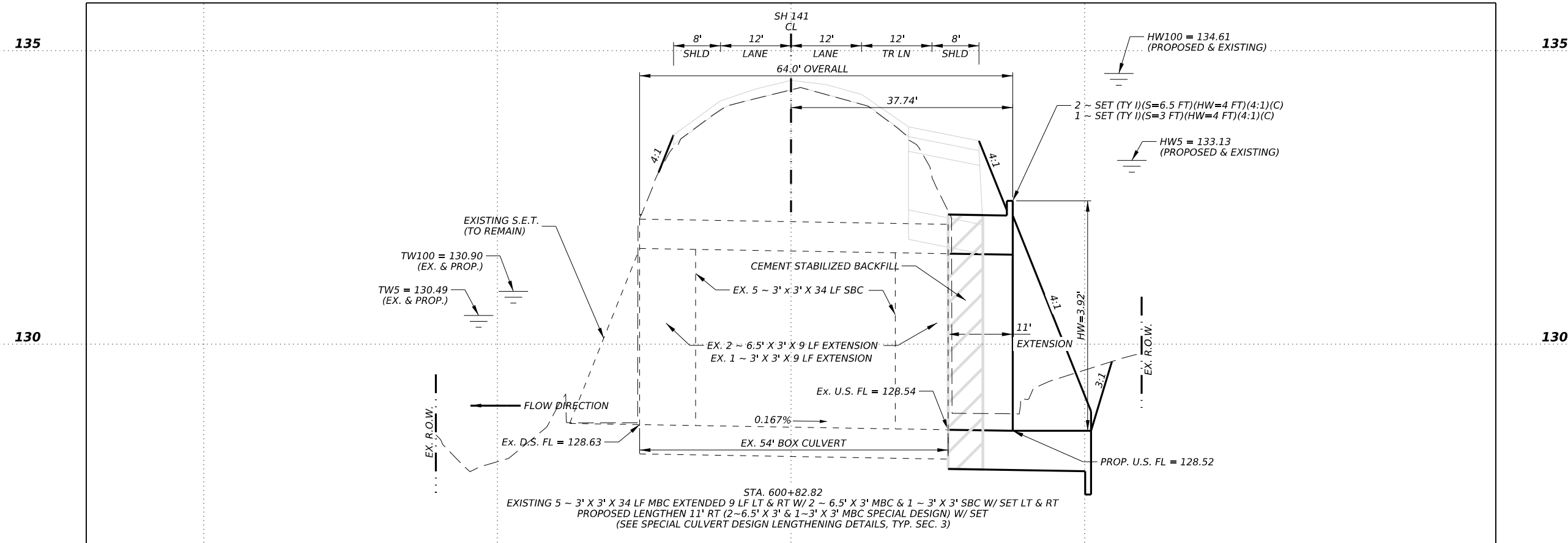
SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		140

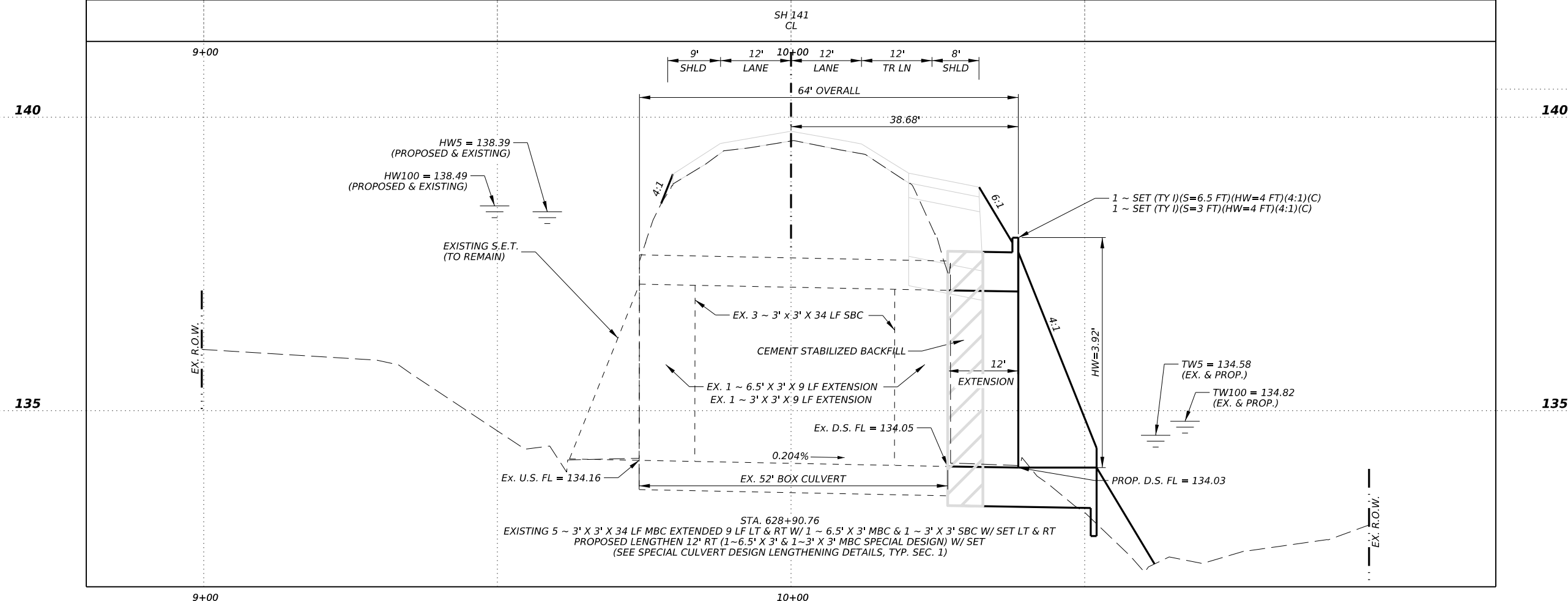
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CK: DW: DN:

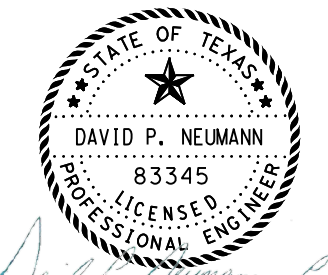
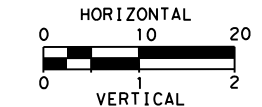
NOTES:
 1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.



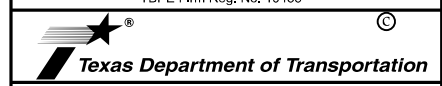
STA. 600+82.82
 EXISTING 5 ~ 3' X 3' X 34 LF MBC EXTENDED 9 LF LT & RT W/ 2 ~ 6.5' X 3' MBC & 1 ~ 3' X 3' SBC W/ SET LT & RT
 PROPOSED LENGTHEN 11' RT (2 ~ 6.5' X 3' & 1 ~ 3' X 3' MBC SPECIAL DESIGN) W/ SET
 (SEE SPECIAL CULVERT DESIGN LENGTHENING DETAILS, TYP. SEC. 3)



STA. 628+90.76
 EXISTING 5 ~ 3' X 3' X 34 LF MBC EXTENDED 9 LF LT & RT W/ 1 ~ 6.5' X 3' MBC & 1 ~ 3' X 3' SBC W/ SET LT & RT
 PROPOSED LENGTHEN 12' RT (1 ~ 6.5' X 3' & 1 ~ 3' X 3' MBC SPECIAL DESIGN) W/ SET
 (SEE SPECIAL CULVERT DESIGN LENGTHENING DETAILS, TYP. SEC. 1)



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 TBPE Firm Reg. No. 10488

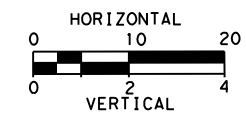
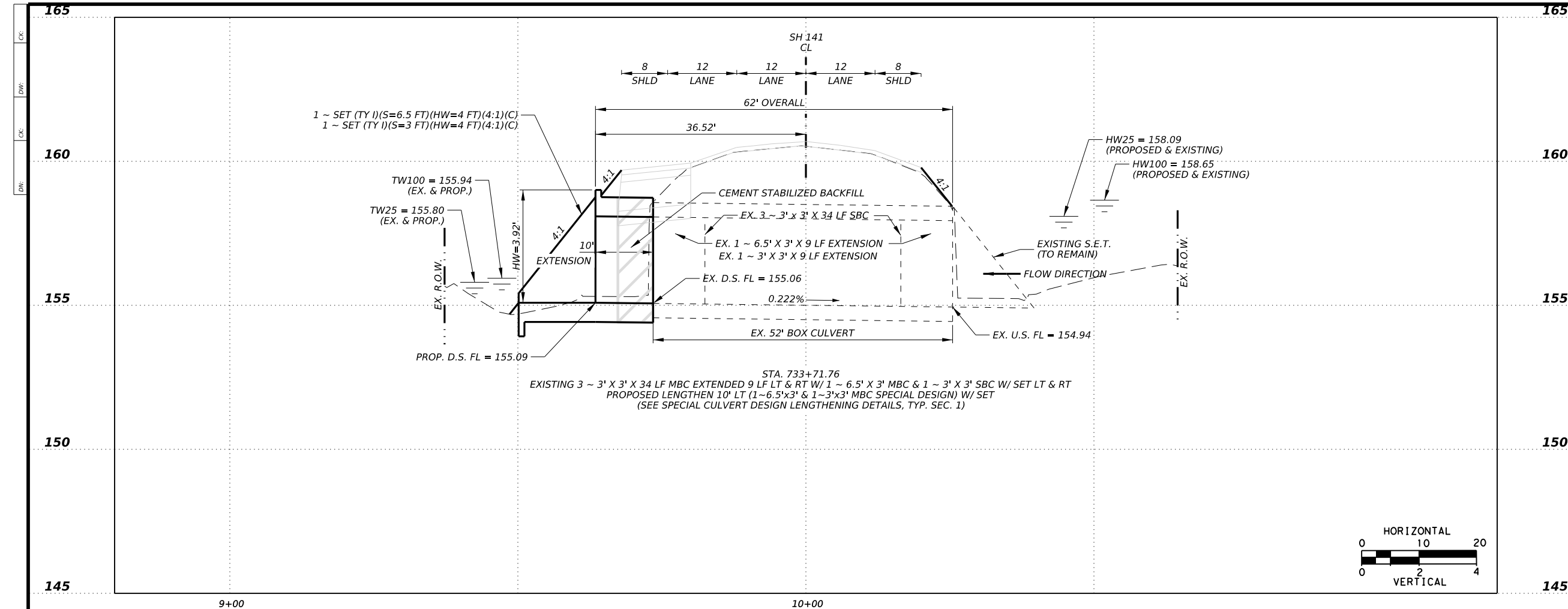


CULVERT PROFILES

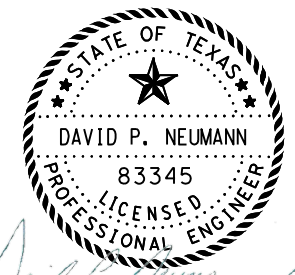
SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		141

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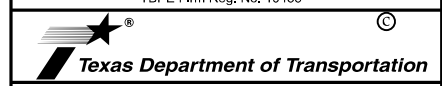


NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.



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2023.07.28 01:07:17-05'00'

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CULVERT
PROFILES

SHEET 4 OF 4

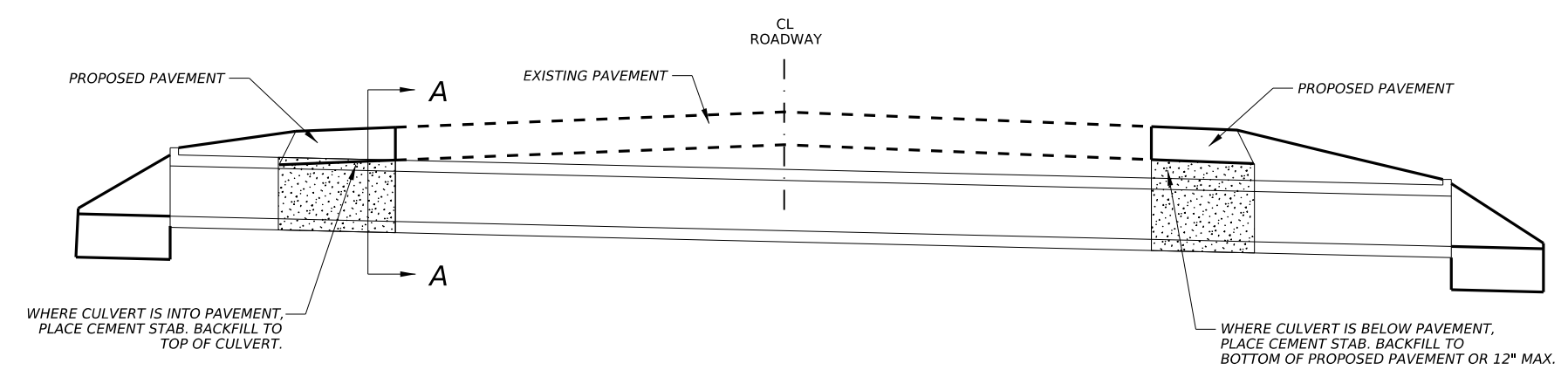
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CRP	JIM WELLS, ETC.	142	

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CK:
DW:
CK:
DW:

GENERAL NOTES:

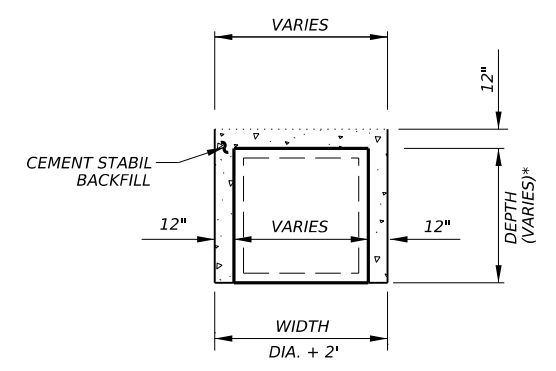
1. PAYMENT FOR CEMENT STABILIZED BACKFILL WILL BE ITEM 400-6005 "CEM STABIL BKFL" BY THE C.Y.



WHERE CULVERT IS INTO PAVEMENT,
PLACE CEMENT STAB. BACKFILL TO
TOP OF CULVERT.

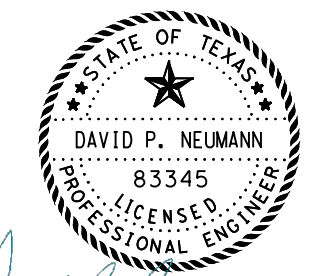
WHERE CULVERT IS BELOW PAVEMENT,
PLACE CEMENT STAB. BACKFILL TO
BOTTOM OF PROPOSED PAVEMENT OR 12" MAX.

**CEMENT STABILIZED
BACKFILL DETAIL**
SCALE: N.T.S.



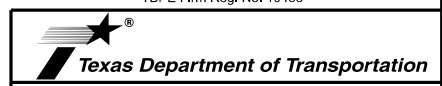
CEMENT STABILIZED BACKFILL DETAIL A-A (TYP)

* BACKFILL WITH CEMENT STAB. BACKFILL
UP TO 12 INCHES ABOVE PROPOSED STRUCTURE.



David P. Neumann, P.E.
2023.07.28 01:23:08-05'00'

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**DRAINAGE BACKFILL
DETAILS**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	143	

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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 Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (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 (CY)	Class "C" Conc (Curb) (CY) (2)	Class "C" Conc (Wingwall) (CY) (3)	Total Wingwall Area (SF)
STA. 117+80.27 (Lt)	2 ~ 3' x 3'	3'	MC-3-23	SETB-CD	0°	4:1	8"	7"	0.250'	3.667'	N/A	N/A	13.333'	N/A	7.750'	0.0	0.1	4.2	N/A
STA. 164+90.00 (Lt)	6 ~ 3' x 3'	2'	MC-3-23	SETB-CD	0°	4:1	8"	7"	0.250'	3.667'	N/A	N/A	13.333'	N/A	22.083'	0.0	0.2	11.0	N/A
STA. 313+30.00 (Rt)	1 ~ 7' x 7'	2.5'	SCC-7	PW-1	0°	3:1	8"	7"	0.250'	7.917'	N/A	N/A	23.750'	8.167'	N/A	0.0	0.1	23.6	376
STA. 353+10.90 (Rt)	1 ~ 3' x 3'	1.7'	SCC-3&4	SETB-CD	0°	4:1	8"	7"	0.250'	3.667'	N/A	N/A	13.333'	N/A	4.167'	0.0	0.0	2.5	N/A
STA. 384+08.59 (Both)	1 ~ 3' x 3'	2'	SCC-3&4	SETB-CD	0°	4:1	8"	7"	0.250'	3.667'	N/A	N/A	13.333'	N/A	4.167'	0.0	0.0	5.0	N/A
STA. 500+35.88 (Lt)	7 ~ 3' x 3'	2.5'	MC-3-23	PW-1	0°	3:1	8"	7"	0.250'	3.917'	N/A	N/A	11.750'	25.667'	N/A	0.0	0.2	8.1	92
STA. 525+81.47 (Rt)	6 ~ 3' x 3'	2.5'	MC-3-23	PW-1	0°	3:1	8"	7"	0.250'	3.917'	N/A	N/A	11.750'	22.083'	N/A	0.0	0.2	7.8	92
STA. 540+02.12 (Both)	6 ~ 3' x 3'	2.5'	MC-3-23	PW-1	0°	3:1	8"	7"	0.250'	3.917'	N/A	N/A	11.750'	22.083'	N/A	0.0	0.4	15.6	184
STA. 600+82.82 (Rt)	5 ~ 3' x 3'	2'	MC-3-23	SETB-CD	0°	4:1	8"	7"	0.250'	3.667'	N/A	N/A	13.333'	N/A	18.500'	0.0	0.2	9.3	N/A
STA. 628+90.76 (Rt)	3 ~ 3' x 3'	2'	MC-3-23	SETB-CD	0°	4:1	8"	7"	0.250'	3.667'	N/A	N/A	13.333'	N/A	11.333'	0.0	0.1	5.9	N/A
STA. 733+71.76 (Lt)	3 ~ 3' x 3'	2'	MC-3-23	SETB-CD	0°	4:1	8"	7"	0.250'	3.667'	N/A	N/A	13.333'	N/A	11.333'	0.0	0.1	5.9	N/A

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.

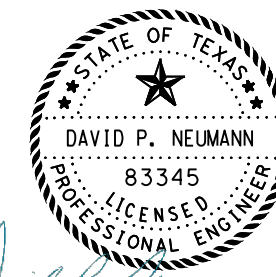
An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.



Bridge Division Standard

BOX CULVERT SUPPLEMENT WINGS AND END TREATMENTS

BCS



David P. Neumann, P.E.

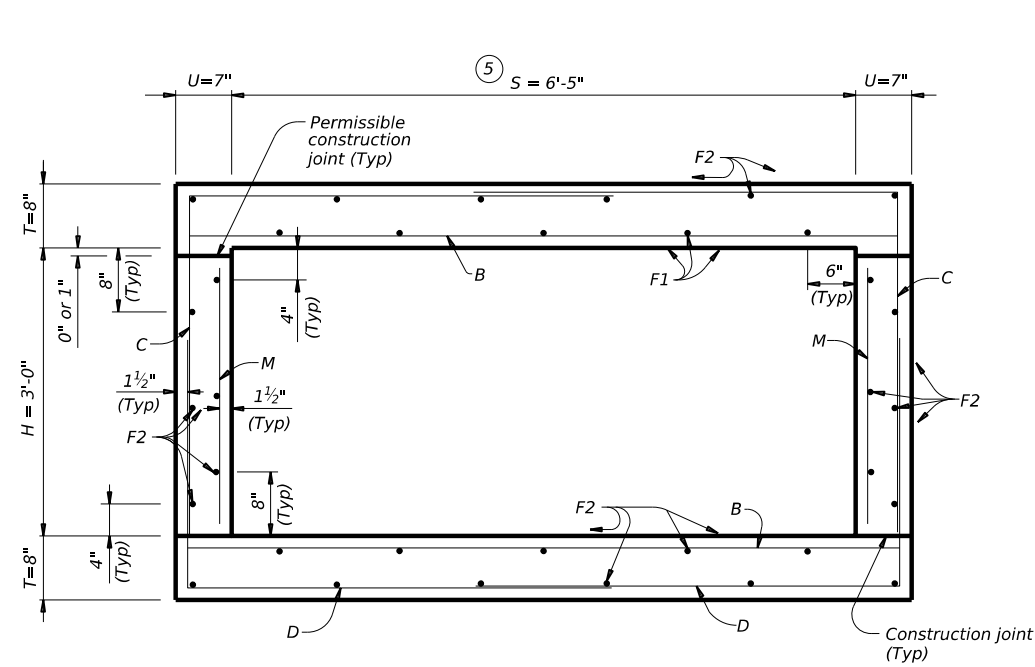
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©TxDOT February 2020	CONT 0383	SECT 03	JOB 024, ETC.	HIGHWAY SH 141
REVISIONS	DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.		144	

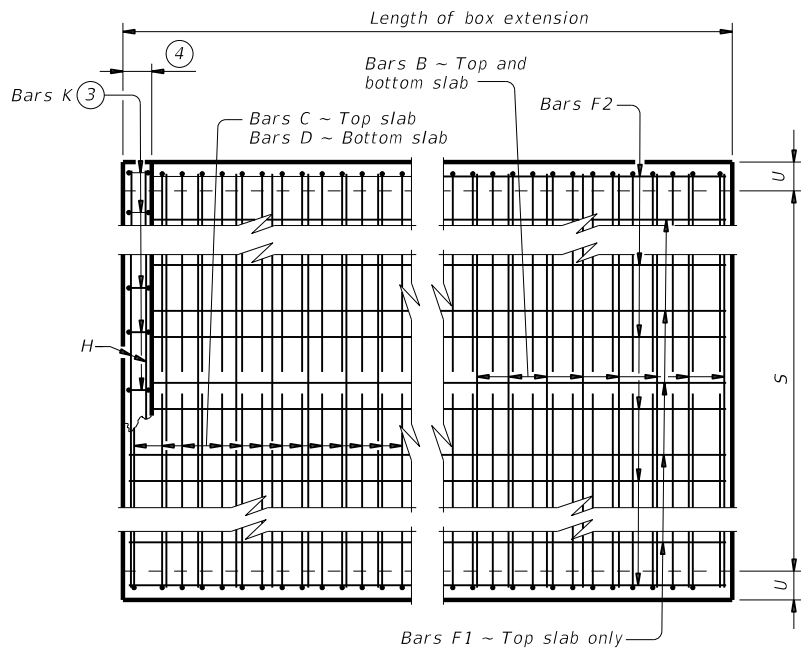
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5 TYPICAL SECTION: 1A ~ 6'-5" SINGLE BOX CULVERT



PLAN OF REINF STEEL

- 1 0" Min to 1'-0" Max. Estimated curb heights are shown elsewhere in the plans.
- 2 For vehicle safety, the following requirements must be met:
 · For structures without bridge rail, construct curbs no more than 3" above 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.
- 5 Box sizes are shown as either 6'-6" or 3'-0" for labeling and bidding purposes. Actual box dimensions are reduced to accommodate for change in wall thickness - see Typical Wall Transition detail on Sheet 2 of 2.

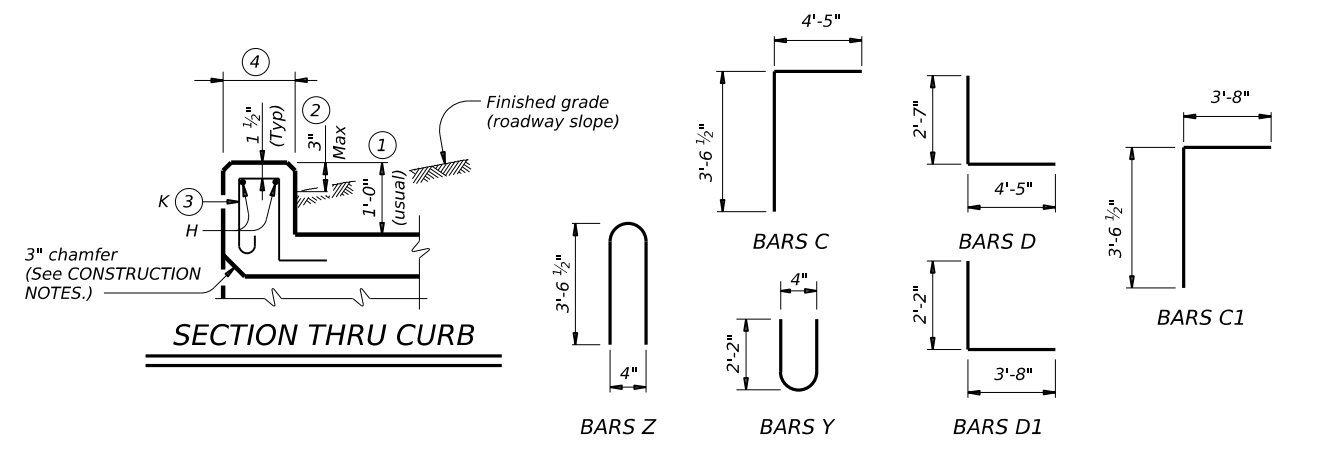
The Contractor may replace Bars B, C, C1, D, D1, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, 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.

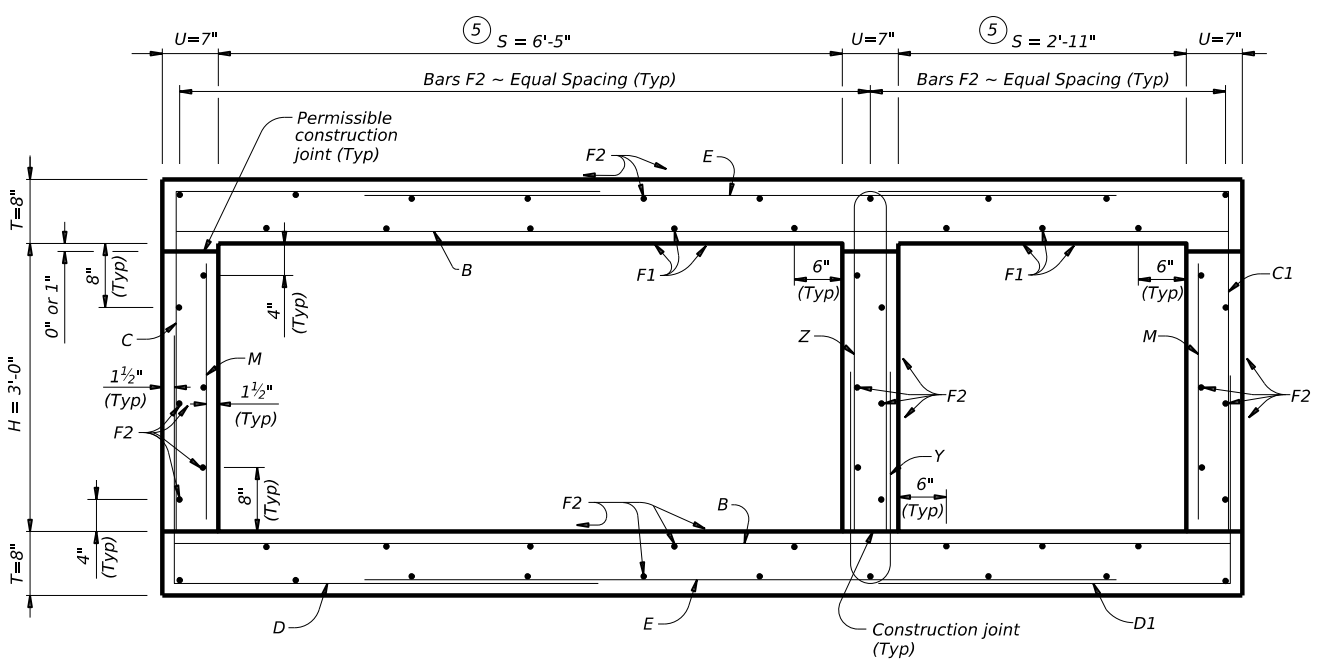
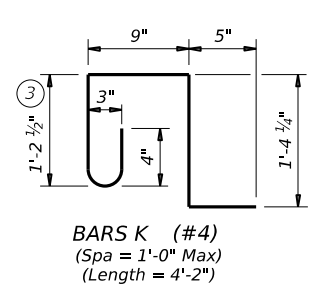
MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions:
 provide Class S concrete (f'c = 4,000 psi) for top slabs of:
 · culverts 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 Single Box Culverts Cast-in-Place Miscellaneous Details (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening of the single box culvert shown or the Multiple Box Culverts Cast-in-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening for the multiple box culverts shown.

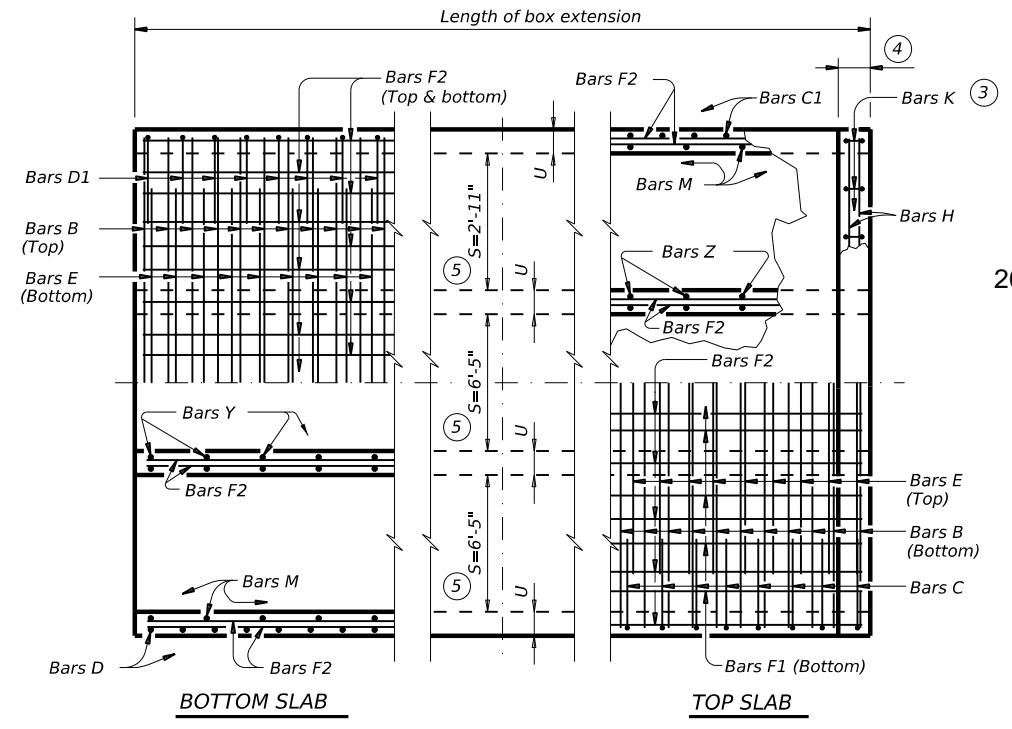


SECTION THRU CURB

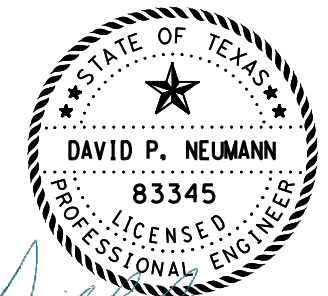
Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.



5 TYPICAL SECTION: 1 ~ 6'-6" & 1 ~ 3'-0" MULTIPLE BOX CULVERT



PART PLANS
 5 (Illustrating 3 span with 2~6'-6" & 1~3'-0" boxes)



2023.07.28 01:22:36-05'00'
 David P. Neumann, P.E.

LOCHNER
 TBPE Firm Reg. No. 10488

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

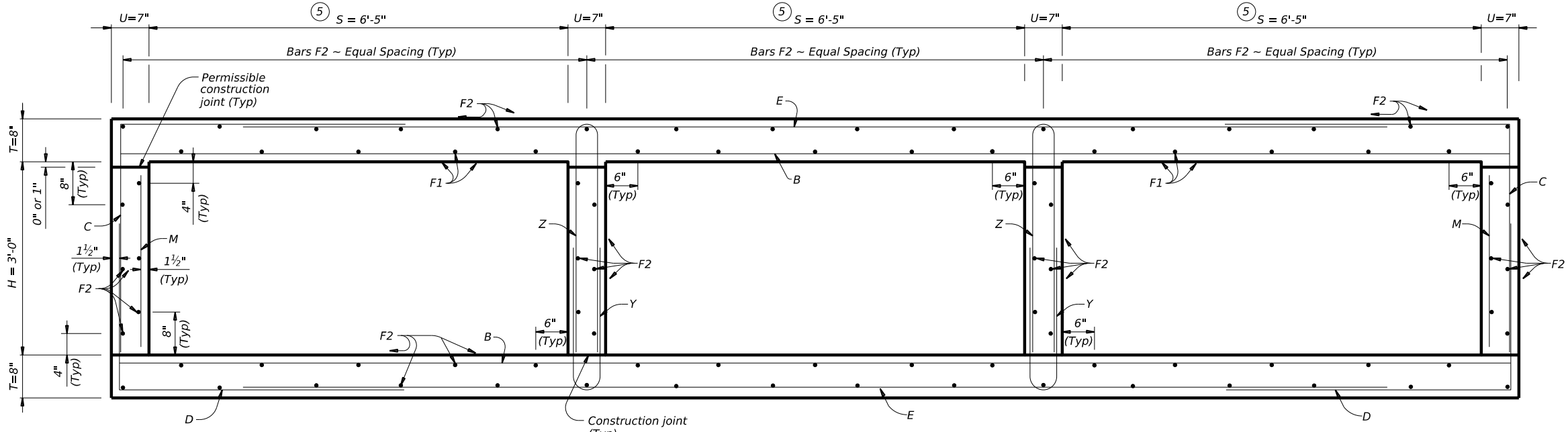
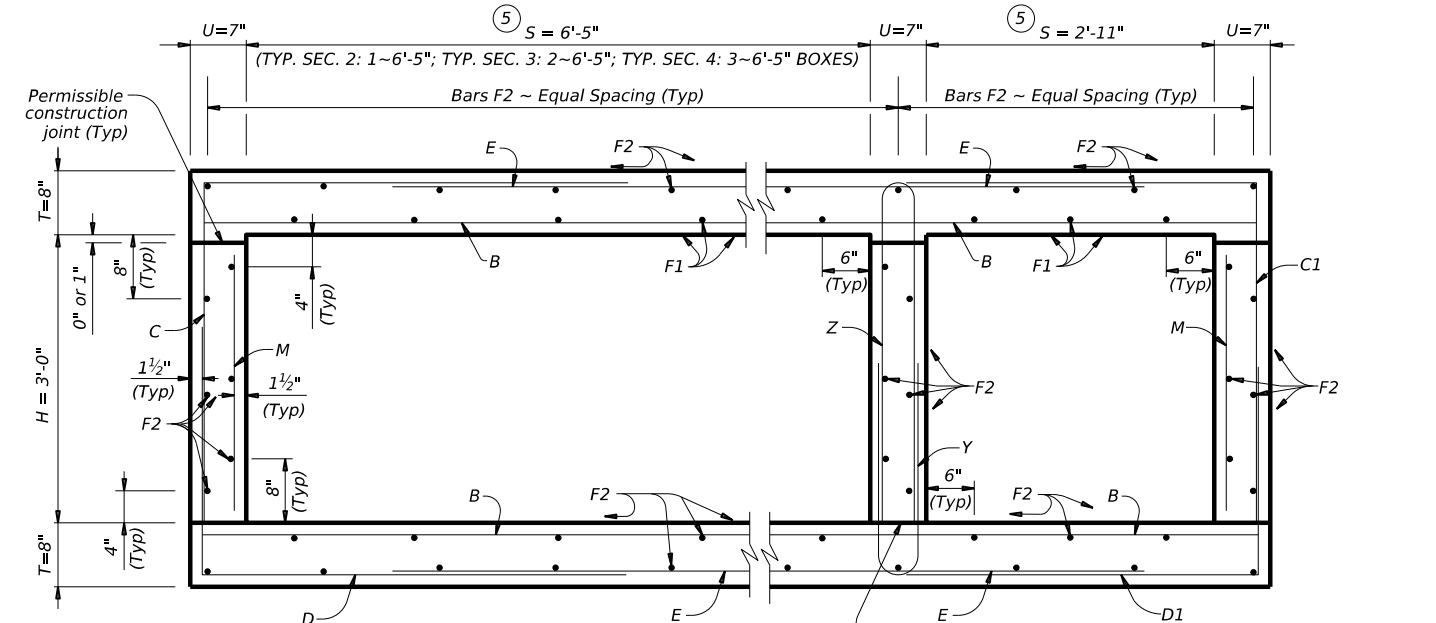
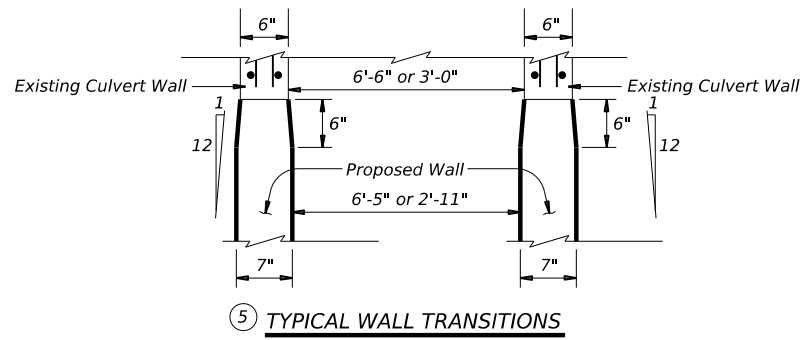
SPECIAL CULVERT DESIGN LENGTHENING DETAILS
6'-6" X 3'-0" BOX CULVERTS
 (0' TO 10' FILL)

FILE:	DN:	CK:	DW: HWL	CK: HWL
REVISIONS	CONT	SECT	JOB	HIGHWAY
	0383	03	024, ETC.	SH 141
	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	145	

BILLS OF REINFORCING STEEL (For Box Length = 10 feet with one headwall)

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 10 feet with one headwall)																																														
					Bars B				Bars C & D				Bars C1 & D1				Bars E		Bars F1 ~ #4		Bars F2 ~ #4		Bars M ~ #4		Bars Y & Z ~ #4				Bars H 4 ~ #4		Bars K																				
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bars C		Bars D		No.	Size	Spa	Bars C1		Bars D1		No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Bars Y		Bars Z		Length	Wt	No.	Wt					
1	6'-5"	3'-0"	8"	7"	26	#6	9"	7' - 4"	286	40	#5	6"	7' - 11"	330	7' - 0"	292																																			
3	6'-5"	3'-0"	8"	7"	26	#6	9"	21' - 4"	834	40	#5	6"	7' - 11"	330	7' - 0"	292									26	#6	9"	17' - 9"	693	15	18"	9' - 9"	98	71	18"	9' - 9"	462	26	9"	3' - 0"	52	26	9"	4' - 7"	80	7' - 3"	126	21' - 4"	29	22	61
2	1-6'-5" 1-2'-11"	3'-0"	8"	7"	26	#6	9"	10' - 10"	424	20	#5	6"	7' - 11"	165	7' - 0"	146	20	#5	6"	7' - 2"	150	5' - 10"	122	26	#6	9"	7' - 9"	303	8	18"	9' - 9"	52	46	18"	9' - 9"	300	26	9"	3' - 0"	52	13	9"	4' - 7"	40	7' - 3"	63	10' - 10"	15	11	31	
3	2-6'-5" 1-2'-11"	3'-0"	8"	7"	26	#6	9"	17' - 10"	696	20	#5	6"	7' - 11"	165	7' - 0"	146	20	#5	6"	7' - 2"	150	5' - 10"	122	26	#6	9"	14' - 9"	576	13	18"	9' - 9"	85	67	18"	9' - 9"	436	26	9"	3' - 0"	52	26	9"	4' - 7"	80	7' - 3"	126	17' - 10"	24	18	50	
4	3-6'-5" 1-2'-11"	3'-0"	8"	7"	26	#6	9"	24' - 10"	970	20	#5	6"	7' - 11"	165	7' - 0"	146	20	#5	6"	7' - 2"	150	5' - 10"	122	26	#6	9"	21' - 9"	849	18	18"	9' - 9"	117	88	18"	9' - 9"	573	26	9"	3' - 0"	52	39	9"	4' - 7"	120	7' - 3"	189	24' - 10"	33	25	70	

NUMBER OF SPANS	SECTION DIMENSIONS				QUANTITIES					
					Per Foot of Barrel		Curb		Total	
	S	H	T	U	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
1	6'-5"	3'-0"	8"	7"	0.504	118.2	0.3	32	5.3	1,214
3	6'-5"	3'-0"	8"	7"	1.325	296.7	0.8	90	14.0	3,057
2	1-6'-5" 1-2'-11"	3'-0"	8"	7"	0.742	181.7	0.4	46	7.8	1,863
3	2-6'-5" 1-2'-11"	3'-0"	8"	7"	1.152	263.4	0.7	74	12.2	2,708
4	3-6'-5" 1-2'-11"	3'-0"	8"	7"	1.563	359.9	0.9	103	16.5	3,702



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2023.07.28 01:22:15-05'00'

DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER

David P. Neumann, P.E.

LOCHNER
 TBPE Firm Reg. No. 10488
 HL93 LOADING SHEET 2 OF 2

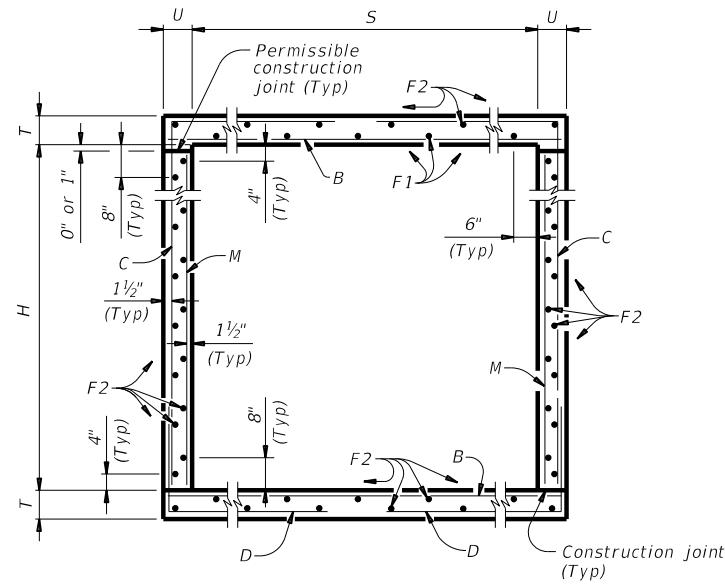
Texas Department of Transportation
SPECIAL CULVERT DESIGN LENGTHENING DETAILS
 6'-6" X 3'-0" BOX CULVERTS
 (0' TO 10' FILL)

FILE:	DN:	CK:	DW: HWL	CK: HWL
REVISIONS	CONT	SECT	JOB	HIGHWAY
	0383	03	024, ETC.	SH 141
	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS, ETC.		146

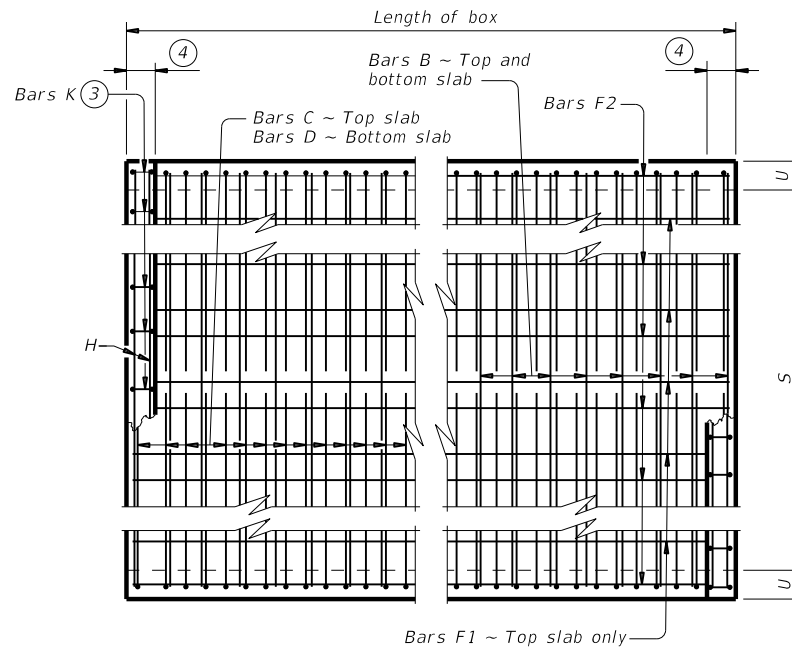
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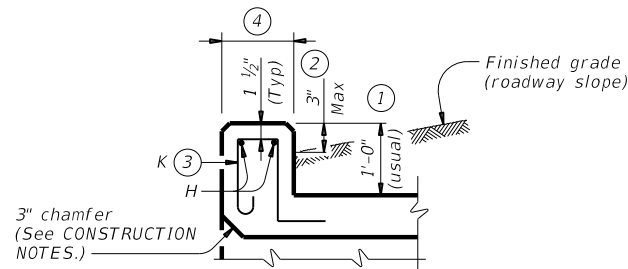
DATE: FILE:



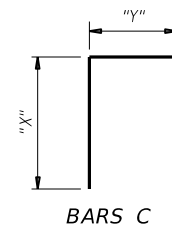
TYPICAL SECTION



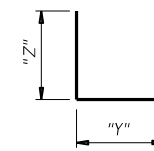
PLAN OF REINF STEEL



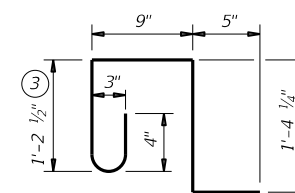
SECTION THRU CURB



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.



**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	0383	03	024, ETC.	SH 141
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	147	

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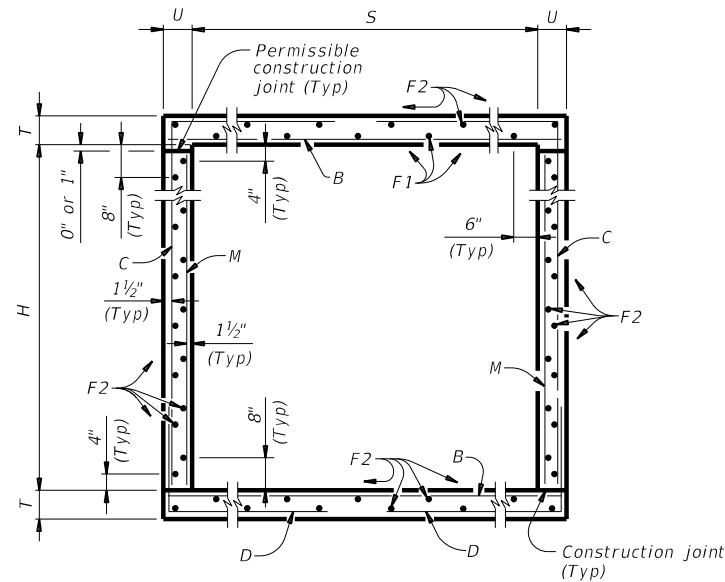
SECTION DIMENSIONS				FILL HEIGHT ⁵	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B				Bars C				Bars D				Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total								
					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)
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.

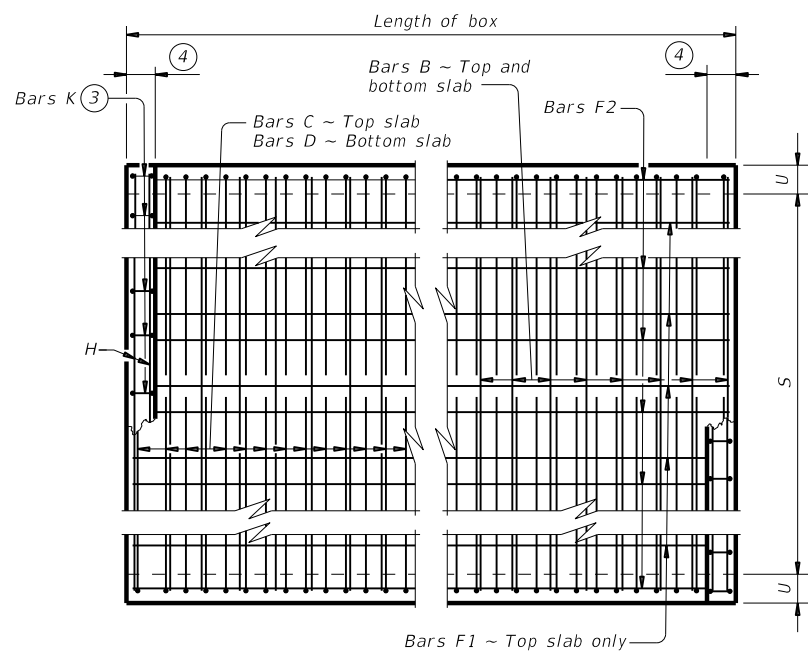
				Bridge Division Standard	
SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL					
SCC-3 & 4					
FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0383	03	024, ETC.	SH 141	
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.	
	CRP	JIM WELLS, ETC.		148	

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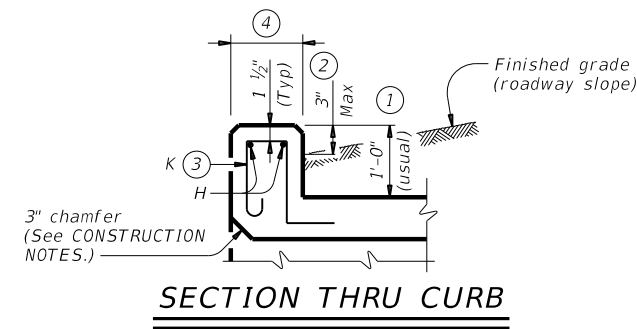
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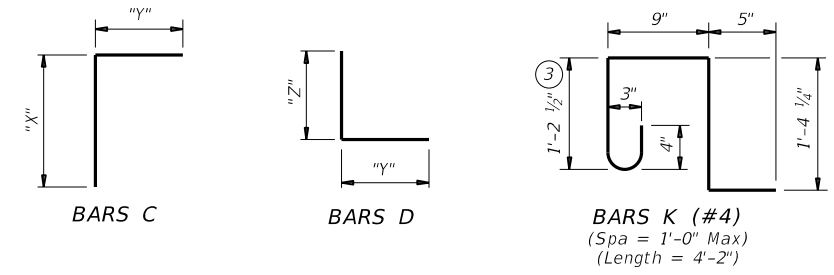
TYPICAL SECTION



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.
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- 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.
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 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).

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- 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

Texas Department of Transportation Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL

SCC-7


FILE: scc07ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.			149

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DATE:
 FILE:

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)
7'-0"	3'-0"	8"	7"	16'	108	#6	9"	7'-11"	1,284	162	#5	6"	7'-11"	1,338	3'-6"	4'-5"	162	#5	6"	7'-1"	1,197	4'-5"	2'-8"	108	9"	3'-0"	216	5	39'-9"	133	31	39'-9"	823	7'-11"	21	18	50	0.533	124.8	0.6	71	21.9	5,062
7'-0"	3'-0"	9"	7"	20'	108	#6	9"	7'-11"	1,284	162	#5	6"	8'-0"	1,352	3'-7"	4'-5"	162	#5	6"	7'-2"	1,211	4'-5"	2'-9"	108	9"	3'-0"	216	5	39'-9"	133	31	39'-9"	823	7'-11"	21	18	50	0.583	125.5	0.6	71	23.9	5,090
7'-0"	3'-0"	10"	8"	23'	108	#6	9"	8'-1"	1,311	162	#5	6"	8'-2"	1,380	3'-8"	4'-6"	162	#5	6"	7'-4"	1,239	4'-6"	2'-10"	82	12"	3'-0"	164	5	39'-9"	133	31	39'-9"	823	8'-1"	22	20	56	0.663	126.3	0.6	78	27.1	5,128
7'-0"	3'-0"	11"	8"	30'	108	#6	9"	8'-1"	1,311	162	#5	6"	8'-3"	1,394	3'-9"	4'-6"	162	#5	6"	7'-5"	1,253	4'-6"	2'-11"	82	12"	3'-0"	164	5	39'-9"	133	31	39'-9"	823	8'-1"	22	20	56	0.714	127.0	0.6	78	29.2	5,156
7'-0"	4'-0"	8"	7"	16'	108	#6	9"	7'-11"	1,284	162	#5	6"	8'-11"	1,507	4'-6"	4'-5"	162	#5	6"	7'-1"	1,197	4'-5"	2'-8"	108	9"	4'-0"	289	5	39'-9"	133	31	39'-9"	823	7'-11"	21	18	50	0.576	130.8	0.6	71	23.6	5,304
7'-0"	4'-0"	9"	7"	20'	108	#6	9"	7'-11"	1,284	162	#5	6"	9'-0"	1,521	4'-7"	4'-5"	162	#5	6"	7'-2"	1,211	4'-5"	2'-9"	108	9"	4'-0"	289	5	39'-9"	133	31	39'-9"	823	7'-11"	21	18	50	0.627	131.5	0.6	71	25.7	5,332
7'-0"	4'-0"	10"	8"	23'	108	#6	9"	8'-1"	1,311	162	#5	6"	9'-2"	1,549	4'-8"	4'-6"	162	#5	6"	7'-4"	1,239	4'-6"	2'-10"	82	12"	4'-0"	219	5	39'-9"	133	31	39'-9"	823	8'-1"	22	20	56	0.712	131.9	0.6	78	29.1	5,352
7'-0"	4'-0"	11"	8"	30'	162	#6	6"	8'-1"	1,967	162	#5	6"	9'-3"	1,563	4'-9"	4'-6"	162	#5	6"	7'-5"	1,253	4'-6"	2'-11"	82	12"	4'-0"	219	5	39'-9"	133	31	39'-9"	823	8'-1"	22	20	56	0.763	149.0	0.6	78	31.1	6,036
7'-0"	5'-0"	8"	7"	16'	108	#6	9"	7'-11"	1,284	162	#5	6"	9'-11"	1,676	5'-6"	4'-5"	162	#5	6"	7'-1"	1,197	4'-5"	2'-8"	108	9"	5'-0"	361	5	39'-9"	133	35	39'-9"	929	7'-11"	21	18	50	0.619	139.5	0.6	71	25.4	5,651
7'-0"	5'-0"	9"	7"	20'	108	#6	9"	7'-11"	1,284	162	#5	6"	10'-0"	1,690	5'-7"	4'-5"	162	#5	6"	7'-2"	1,211	4'-5"	2'-9"	108	9"	5'-0"	361	5	39'-9"	133	35	39'-9"	929	7'-11"	21	18	50	0.670	140.2	0.6	71	27.4	5,679
7'-0"	5'-0"	10"	8"	23'	108	#6	9"	8'-1"	1,311	162	#5	6"	10'-2"	1,718	5'-8"	4'-6"	162	#5	6"	7'-4"	1,239	4'-6"	2'-10"	82	12"	5'-0"	274	5	39'-9"	133	35	39'-9"	929	8'-1"	22	20	56	0.761	140.1	0.6	78	31.1	5,682
7'-0"	5'-0"	11"	8"	30'	162	#6	6"	8'-1"	1,967	162	#5	6"	10'-3"	1,732	5'-9"	4'-6"	162	#5	6"	7'-5"	1,253	4'-6"	2'-11"	82	12"	5'-0"	274	5	39'-9"	133	35	39'-9"	929	8'-1"	22	20	56	0.813	157.2	0.6	78	33.1	6,366
7'-0"	6'-0"	8"	7"	16'	108	#6	9"	7'-11"	1,284	162	#5	6"	10'-11"	1,845	6'-6"	4'-5"	162	#5	6"	7'-1"	1,197	4'-5"	2'-8"	108	9"	6'-0"	433	5	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	50	0.663	148.2	0.6	71	27.1	5,999
7'-0"	6'-0"	9"	7"	20'	108	#6	9"	7'-11"	1,284	162	#5	6"	11'-0"	1,859	6'-7"	4'-5"	162	#5	6"	7'-2"	1,211	4'-5"	2'-9"	108	9"	6'-0"	433	5	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	50	0.713	148.9	0.6	71	29.1	6,027
7'-0"	6'-0"	10"	8"	23'	108	#6	9"	8'-1"	1,311	162	#5	6"	11'-2"	1,887	6'-8"	4'-6"	162	#5	6"	7'-4"	1,239	4'-6"	2'-10"	82	12"	6'-0"	329	5	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	56	0.811	148.4	0.6	78	33.1	6,013
7'-0"	6'-0"	11"	8"	30'	162	#6	6"	8'-1"	1,967	162	#5	6"	11'-3"	1,901	6'-9"	4'-6"	162	#5	6"	7'-5"	1,253	4'-6"	2'-11"	82	12"	6'-0"	329	5	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	56	0.862	165.5	0.6	78	35.1	6,697
7'-0"	7'-0"	8"	7"	16'	108	#6	9"	7'-11"	1,284	162	#5	6"	11'-11"	2,014	7'-6"	4'-5"	162	#5	6"	7'-1"	1,197	4'-5"	2'-8"	108	9"	7'-0"	505	5	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	50	0.706	154.2	0.6	71	28.8	6,240
7'-0"	7'-0"	9"	7"	20'	108	#6	9"	7'-11"	1,284	162	#5	6"	12'-0"	2,028	7'-7"	4'-5"	162	#5	6"	7'-2"	1,211	4'-5"	2'-9"	108	9"	7'-0"	505	5	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	50	0.756	154.9	0.6	71	30.8	6,268
7'-0"	7'-0"	10"	8"	23'	108	#6	9"	8'-1"	1,311	162	#5	6"	12'-2"	2,056	7'-8"	4'-6"	162	#5	6"	7'-4"	1,239	4'-6"	2'-10"	108	9"	7'-0"	505	5	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	56	0.860	157.0	0.6	78	35.0	6,358
7'-0"	7'-0"	11"	8"	30'	162	#6	6"	8'-1"	1,967	162	#5	6"	12'-3"	2,070	7'-9"	4'-6"	162	#5	6"	7'-5"	1,253	4'-6"	2'-11"	108	9"	7'-0"	505	5	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	56	0.912	174.1	0.6	78	37.1	7,042

⑤ For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

				Bridge Division Standard	
SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL					
SCC-7					
FILE: scc07ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0383	03	024, ETC.	SH 141	
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.	
CRP	JIM WELLS, ETC.			150	

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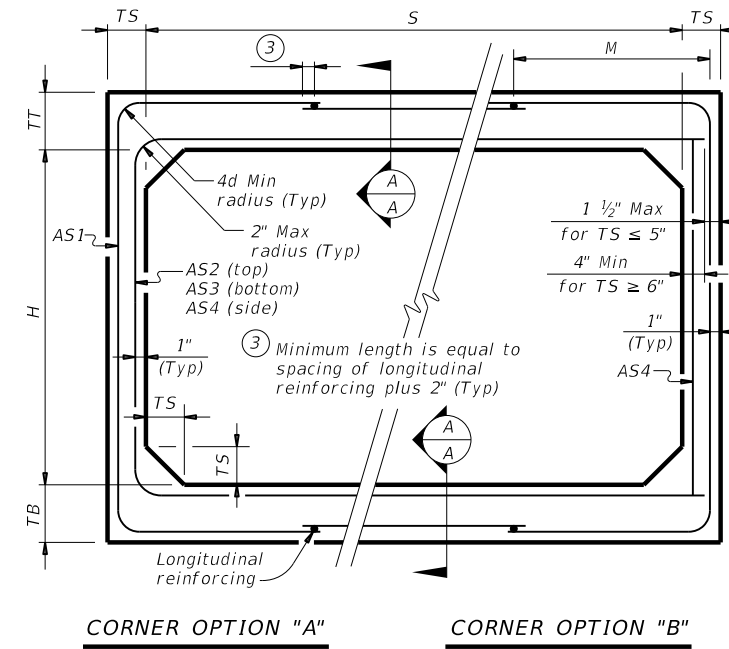
DATE:
FILE:

BOX DATA

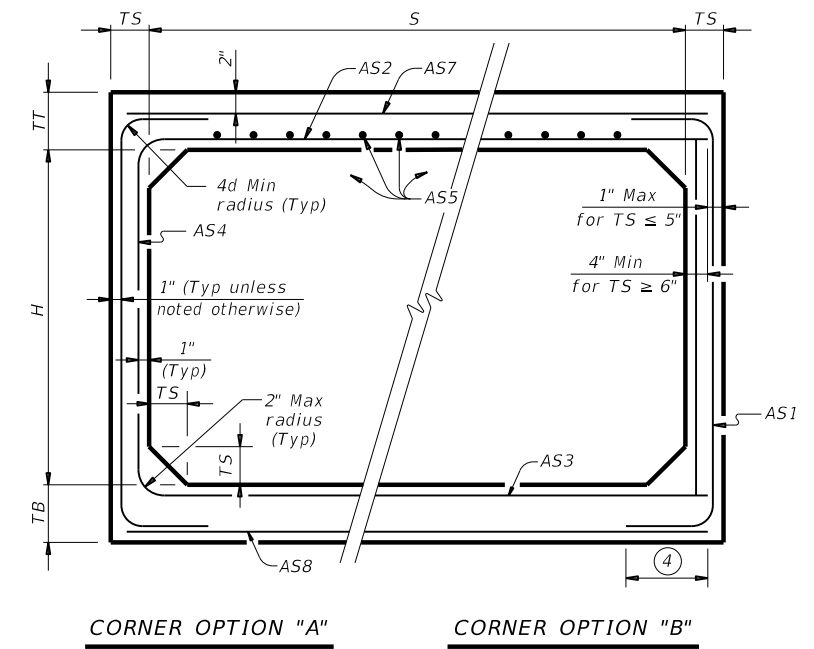
SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ^②							① Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	AS8	
7	3	8	8	8	< 2	-	0.23	0.31	0.22	0.19	0.19	0.19	0.19	9.6
7	3	8	8	8	2 < 3	47	0.27	0.25	0.24	0.19	-	-	-	9.6
7	3	8	8	8	3 - 5	43	0.19	0.19	0.19	0.19	-	-	-	9.6
7	3	8	8	8	10	43	0.21	0.20	0.21	0.19	-	-	-	9.6
7	3	8	8	8	15	43	0.28	0.26	0.27	0.19	-	-	-	9.6
7	3	8	8	8	20	43	0.36	0.34	0.35	0.19	-	-	-	9.6
7	3	8	8	8	25	43	0.45	0.42	0.43	0.19	-	-	-	9.6
7	3	8	8	8	30	43	0.54	0.50	0.51	0.19	-	-	-	9.6
7	4	8	8	8	< 2	-	0.21	0.34	0.25	0.19	0.19	0.19	0.19	10.4
7	4	8	8	8	2 < 3	43	0.23	0.28	0.28	0.19	-	-	-	10.4
7	4	8	8	8	3 - 5	43	0.19	0.22	0.19	0.19	-	-	-	10.4
7	4	8	8	8	10	43	0.19	0.23	0.23	0.19	-	-	-	10.4
7	4	8	8	8	15	41	0.24	0.30	0.30	0.19	-	-	-	10.4
7	4	8	8	8	20	41	0.31	0.38	0.39	0.19	-	-	-	10.4
7	4	8	8	8	25	41	0.38	0.47	0.48	0.19	-	-	-	10.4
7	4	8	8	8	30	41	0.46	0.57	0.57	0.19	-	-	-	10.4
7	5	8	8	8	< 2	-	0.19	0.36	0.27	0.19	0.19	0.19	0.19	11.2
7	5	8	8	8	2 < 3	47	0.21	0.31	0.31	0.19	-	-	-	11.2
7	5	8	8	8	3 - 5	43	0.19	0.24	0.21	0.19	-	-	-	11.2
7	5	8	8	8	10	43	0.19	0.25	0.26	0.19	-	-	-	11.2
7	5	8	8	8	15	41	0.21	0.32	0.33	0.19	-	-	-	11.2
7	5	8	8	8	20	41	0.27	0.41	0.42	0.19	-	-	-	11.2
7	5	8	8	8	25	41	0.33	0.51	0.52	0.19	-	-	-	11.2
7	5	8	8	8	30	41	0.40	0.61	0.62	0.19	-	-	-	11.2
7	6	8	8	8	< 2	-	0.19	0.38	0.30	0.19	0.19	0.19	0.19	12.0
7	6	8	8	8	2 < 3	59	0.19	0.33	0.34	0.19	-	-	-	12.0
7	6	8	8	8	3 - 5	47	0.19	0.25	0.23	0.19	-	-	-	12.0
7	6	8	8	8	10	43	0.19	0.26	0.27	0.19	-	-	-	12.0
7	6	8	8	8	15	41	0.19	0.34	0.35	0.19	-	-	-	12.0
7	6	8	8	8	20	41	0.24	0.43	0.45	0.19	-	-	-	12.0
7	6	8	8	8	25	41	0.29	0.53	0.55	0.19	-	-	-	12.0
7	6	8	8	8	30	41	0.35	0.64	0.65	0.19	-	-	-	12.0
7	7	8	8	8	< 2	-	0.19	0.40	0.33	0.19	0.19	0.19	0.19	12.8
7	7	8	8	8	2 < 3	59	0.19	0.36	0.37	0.19	-	-	-	12.8
7	7	8	8	8	3 - 5	59	0.19	0.27	0.25	0.19	-	-	-	12.8
7	7	8	8	8	10	47	0.19	0.27	0.29	0.19	-	-	-	12.8
7	7	8	8	8	15	43	0.19	0.35	0.37	0.19	-	-	-	12.8
7	7	8	8	8	20	43	0.22	0.44	0.46	0.19	-	-	-	12.8
7	7	8	8	8	25	43	0.27	0.54	0.57	0.19	-	-	-	12.8
7	7	8	8	8	30	41	0.32	0.65	0.67	0.19	-	-	-	12.8

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.

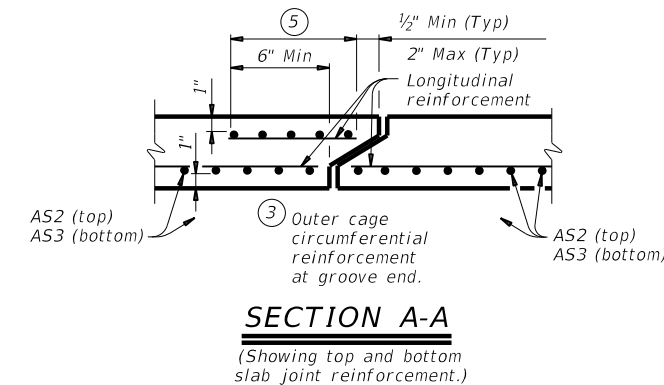


FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



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:

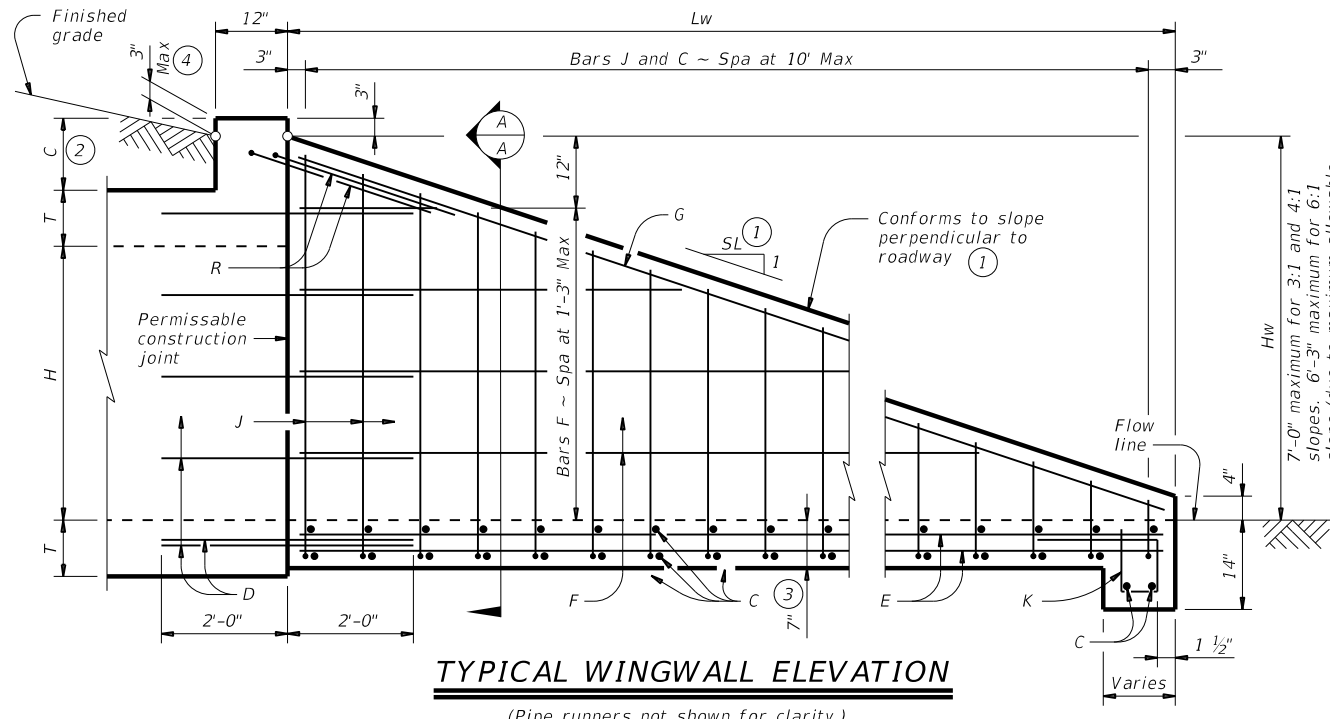
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design 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)".

HL93 LOADING

		Bridge Division Standard	
<h2>SINGLE BOX CULVERTS PRECAST</h2> <h3>7'-0" SPAN</h3>			
<h1>SCP-7</h1>			
FILE: scp07sts-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT	REVISIONS	0383 03	024, ETC. SH 141
DIST: CRP	COUNTY: JIM WELLS, ETC.	SHEET NO. 151	

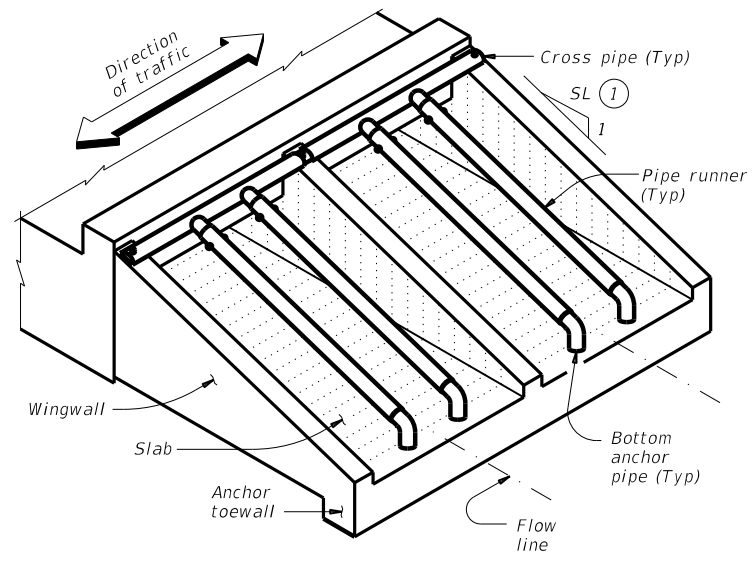
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DATE: FILE:



TYPICAL WINGWALL ELEVATION

(Pipe runners not shown for clarity.)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

WING DIMENSION CALCULATIONS:

$$Hw = H + T + C - 0.250'$$

$$Lw = (Hw - 0.333') (SL)$$

For cast-in-place culverts:
 $Atw = (N) (S) + (N + 1) (U)$

For precast culverts:
 $Atw = (N) (2U + S) + (N - 1) (0.500')$

$$\text{Total Wingwall Area (SF)} = (0.5) (Hw + 0.333') (Lw) (N + 1)$$

$$\text{Total Concrete Volume (CY)} = [(Wingwall Area) (0.583') + (Lw) (Atw) (0.583') + (Atw) (1.167') (1.167' - 0.583')] \div (27)$$

PIPE RUNNER DIMENSION CALCULATIONS:

$$\text{Pipe Runner Length} = (Lw) (K1) - (1.917')$$

$$\text{Total Reinforcing (Lb)} = (1.55) (Lw) (Atw) + (4.43) (Atw) + (K2) (Hw) (N + 1) (\sqrt{Lw})$$

C = Height of curb above top of top slab (feet)
 Hw = Height of wingwall (feet)
 K = Constant value for use in formulas

Slope SL:1	K1	K2
3:1	~ 1.054	~ 7.45
4:1	~ 1.031	~ 8.49
6:1	~ 1.014	~ 10.30

Atw = Anchor toewall length (feet)
 Lw = Length of wingwall (feet)
 N = Number of culvert barrels
 SL:1 = Side slope ratio (horizontal : 1 vertical)

See applicable box culvert standard for H, S, T, and U values.

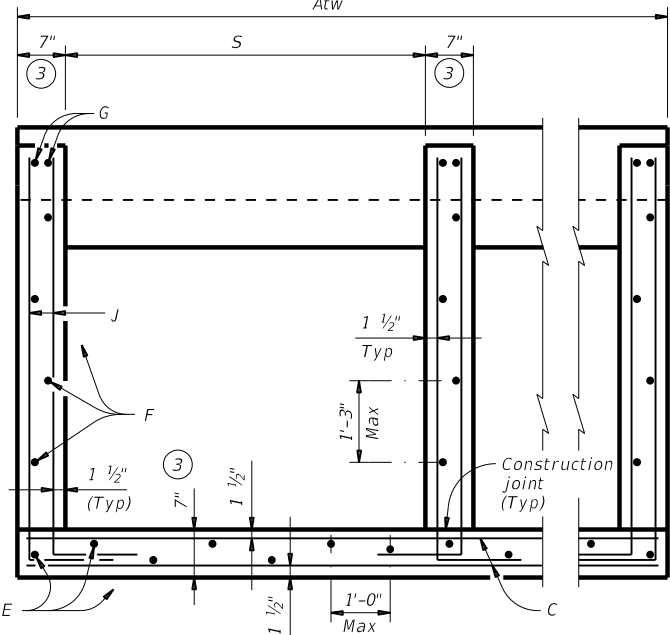
MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Adjust reinforcing as necessary to provide a minimum clear cover of 1 1/2".
 Provide Class "C" concrete (f'c = 3,600 psi).
 Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
 Provide ASTM A307 bolts.
 Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.
 Repair galvanizing damaged during transport or construction in accordance with the Item 445, "Galvanizing".

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.
 Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.
 The quantities for pipe runners, reinforcing steel, and concrete resulting from the formulas given herein are for Contractor's information only.
 See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
 Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

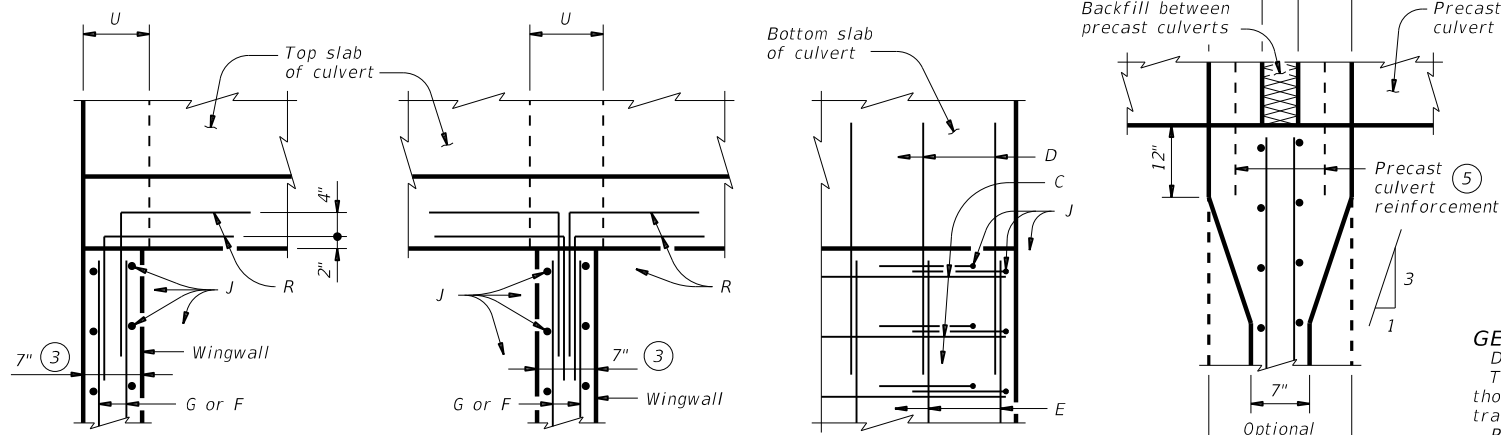
SHEET 1 OF 2

		Bridge Division Standard	
SAFETY END TREATMENT FOR 0° SKEW BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ CROSS DRAINAGE			
SETB-CD			
FILE: setbcdse-20.dgn	DN: GAF	CK: CAT	DW: TxDOT
©TxDOT February 2020	CONT SECT	JOB	HIGHWAY
REVISIONS	0383 03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	152	



SECTION A-A

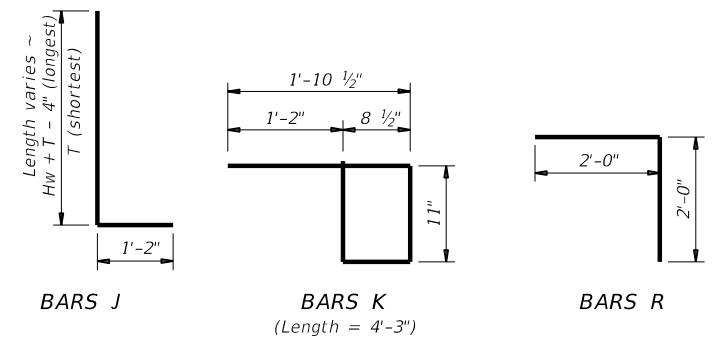
(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)



PLAN VIEWS OF CORNER DETAILS

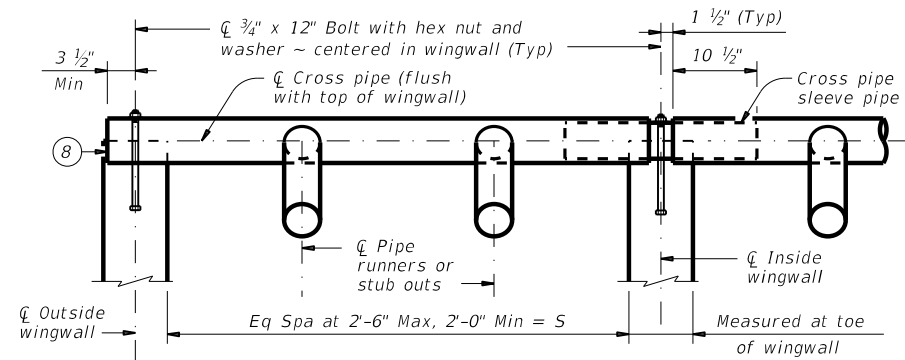
- Recommended values of slope are: 3:1, 4:1, and 6:1. Provide 3:1 or flatter slope.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet.
- Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.
- For vehicle safety, reduce curb height, if necessary, to provide a maximum 3" projection. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall Bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.

Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'-0" Max
F	#4	1'-3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'-0" Max
R	#4	As shown



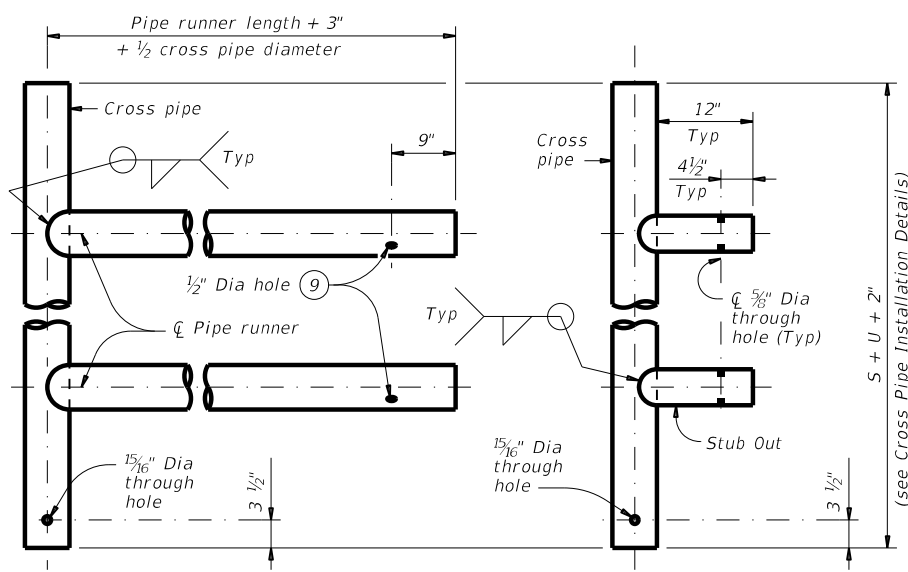
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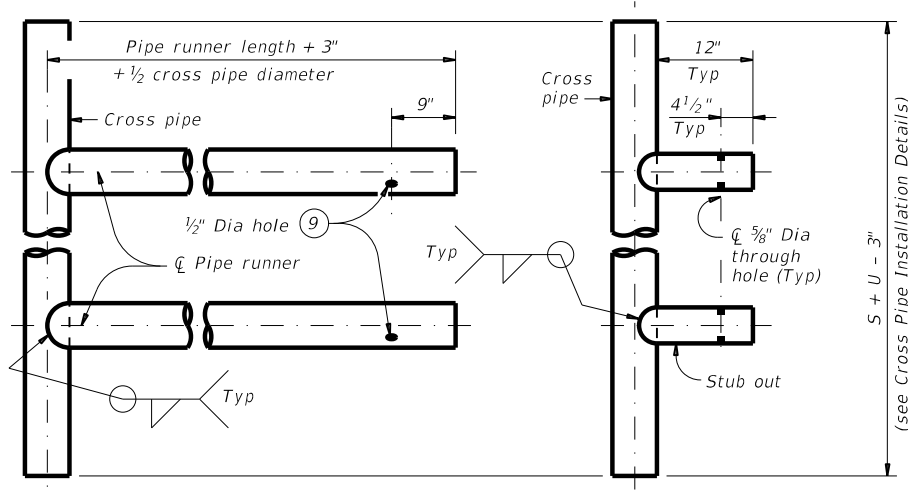


NOTE: At Contractor's option, make the cross pipe continuous across the inside wingwalls. If option is selected, omit the sleeve pipe and make a 15/16 inch diameter through hole in the cross pipe to accept the anchor bolt at the centerline of each inside wingwall.

CROSS PIPE INSTALLATION DETAILS

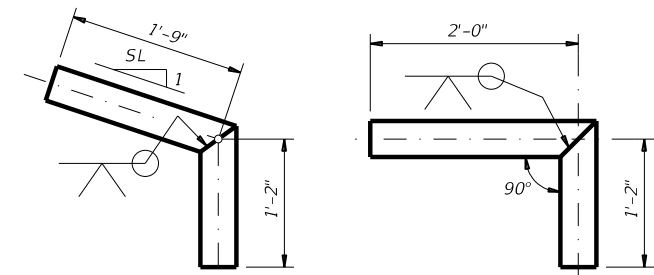


OPTION A2 **OPTION A1**
FOR USE IN OUTSIDE CULVERT BAY

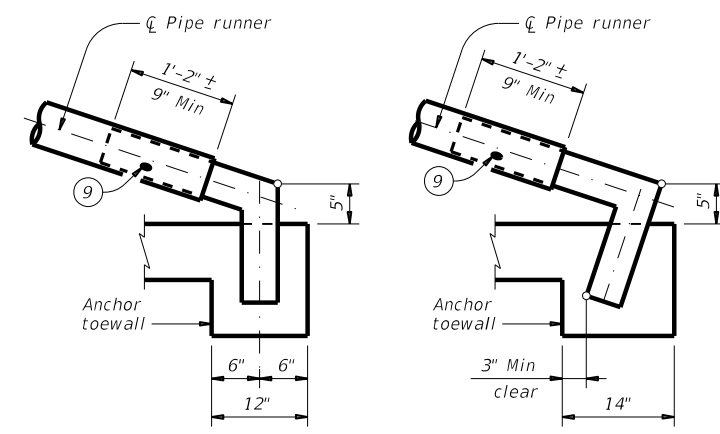


OPTION A2 **OPTION A1**
FOR USE IN INSIDE CULVERT BAY

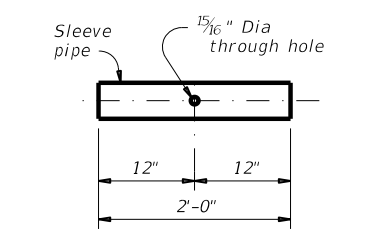
CROSS PIPE AND CONNECTIONS DETAILS



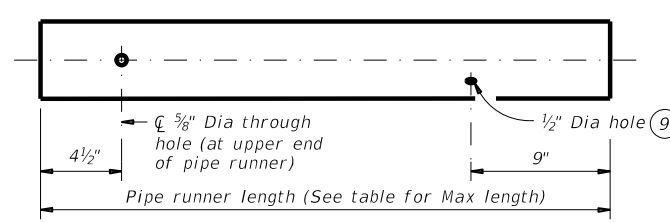
OPTION A **OPTION B**
BOTTOM ANCHOR PIPE DETAILS



OPTION B1 **OPTION B2**
BOTTOM ANCHOR TOEWALL DETAILS
(Wingwall not shown for clarity.)



CROSS PIPE SLEEVE PIPE DETAILS



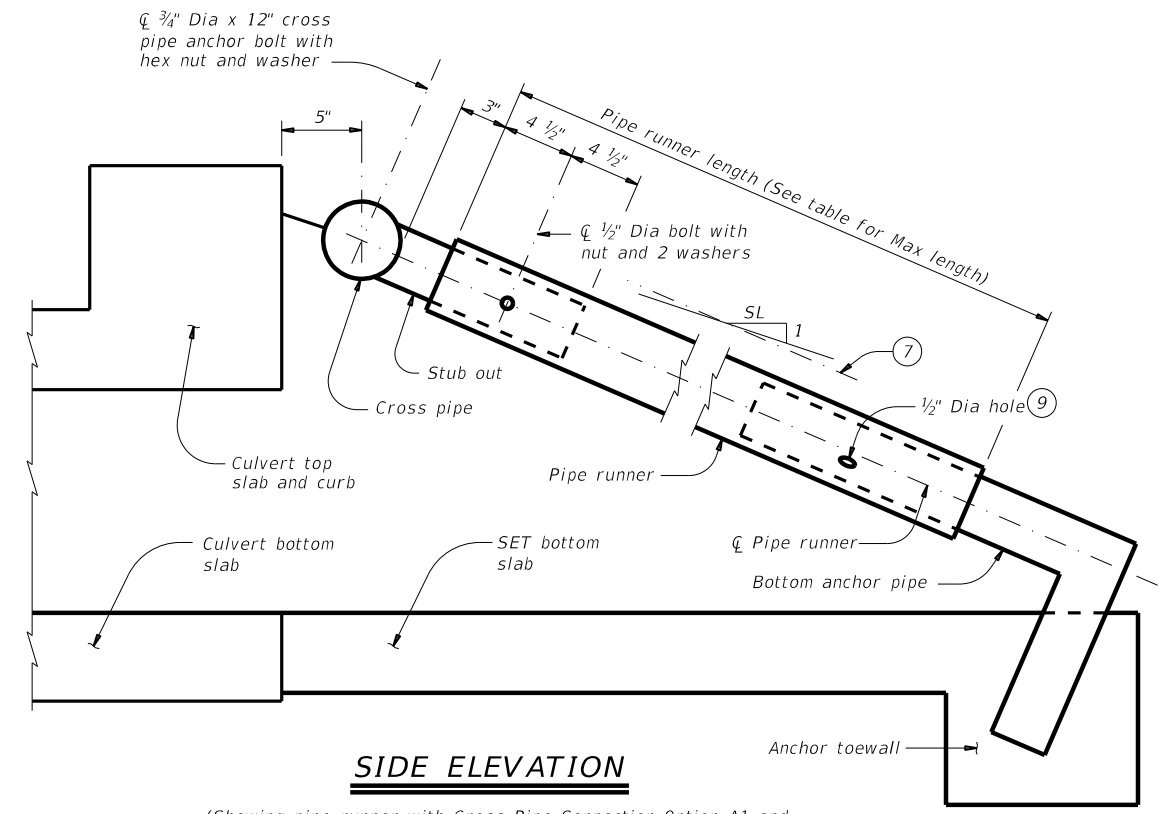
NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

- ⑥ Cross pipe is the same size as the pipe runner. Cross pipe stub out is the same size as the anchor pipe.
- ⑦ Note that actual slope of safety pipe runner may vary slightly from side slope.
- ⑧ Take care to ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.
- ⑨ After installation, inspect the 1#2" hole to ensure that the lap of the safety pipe runner with the bottom anchor pipe is adequate.
- ⑩ At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

MAXIMUM PIPE RUNNER LENGTHS AND REQUIRED PIPE RUNNER AND ANCHOR PIPE SIZES

Maximum Pipe Runner Length	Required Pipe Runner Size			Required Anchor Pipe Size		
	Pipe Size	Pipe O.D.	Pipe I.D.	Pipe Size	Pipe O.D.	Pipe I.D.
10'-0"	3" STD	3.500"	3.068"	2" STD	2.375"	2.067"
19'-8"	4" STD	4.500"	4.026"	3" STD	3.500"	3.068"
34'-2"	5" STD	5.563"	5.047"	4" STD	4.500"	4.026"



SIDE ELEVATION
(Showing pipe runner with Cross Pipe Connection Option A1 and Bottom Anchor Toewall Option B2. Wingwall not shown for clarity.)

Texas Department of Transportation
Bridge Division Standard

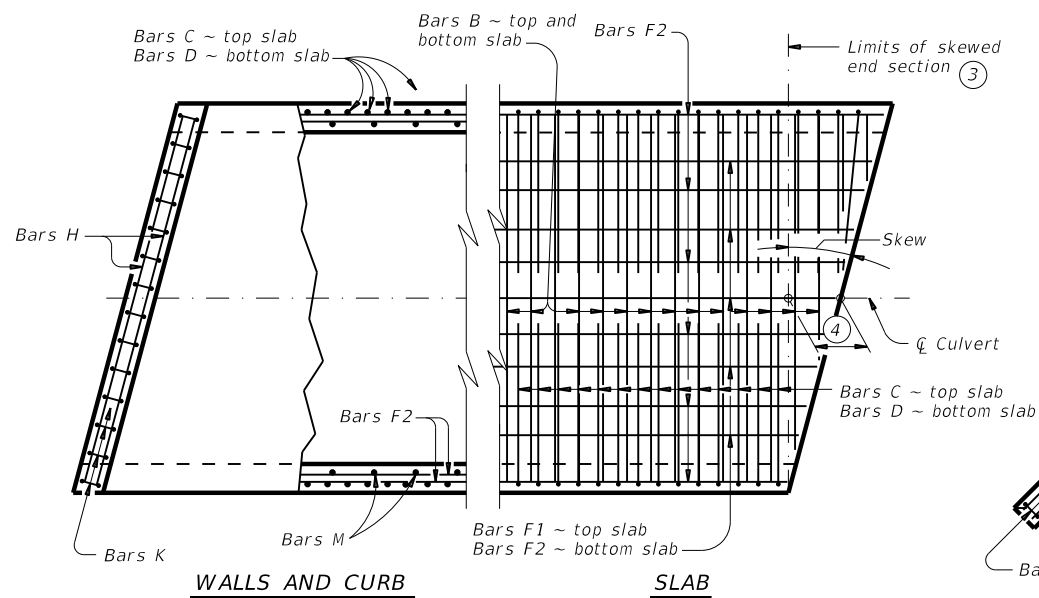
SAFETY END TREATMENT FOR 0° SKEW BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ CROSS DRAINAGE

SETB-CD

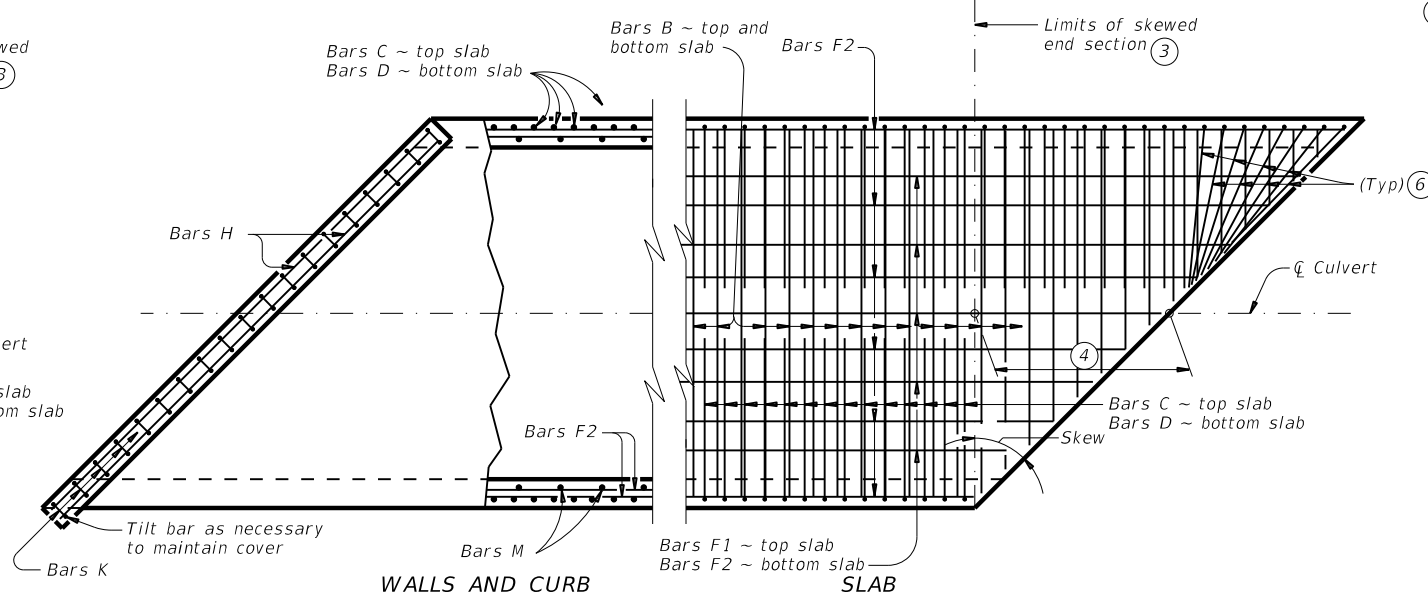
FILE: setbcdse-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
0383	03	024, ETC.	SH 141	
DIST: CRP	COUNTY: JIM WELLS, ETC.	SHEET NO: 153		

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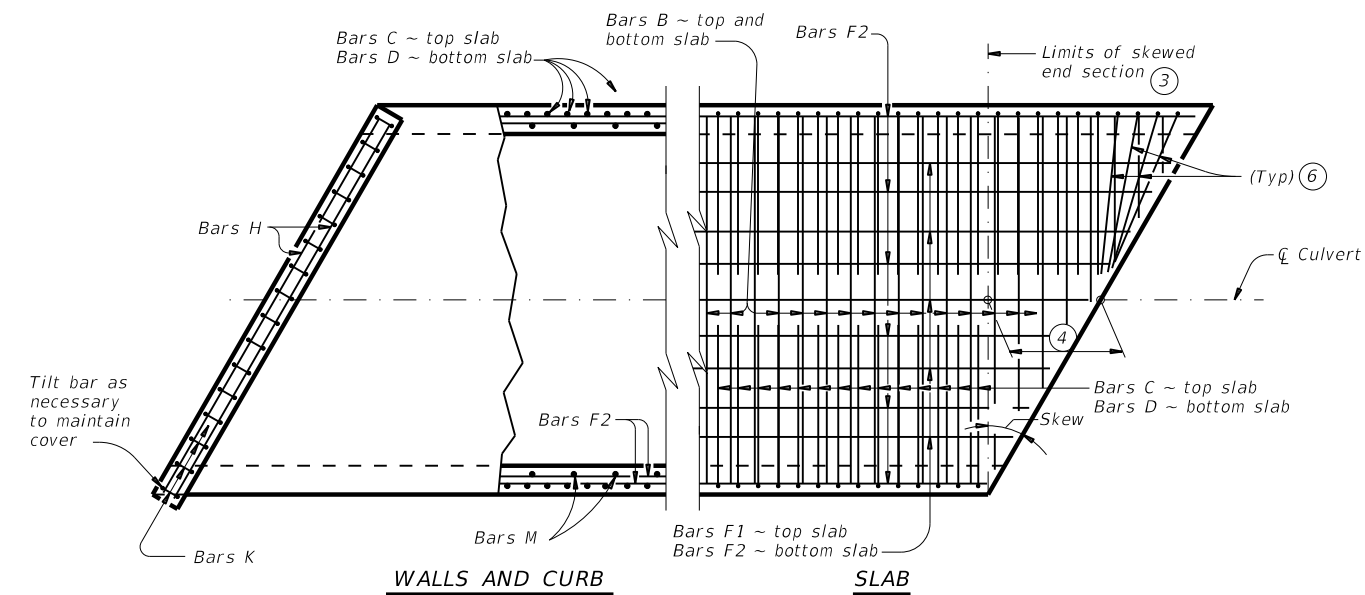
DATE: FILE:



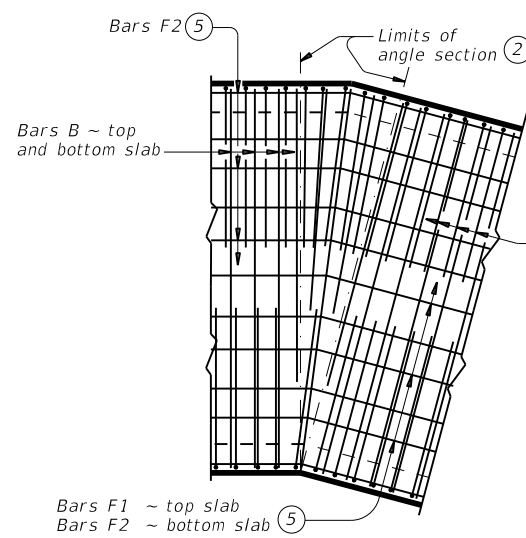
PLAN OF SKEWED ENDS ~ FROM 0° TO 15°



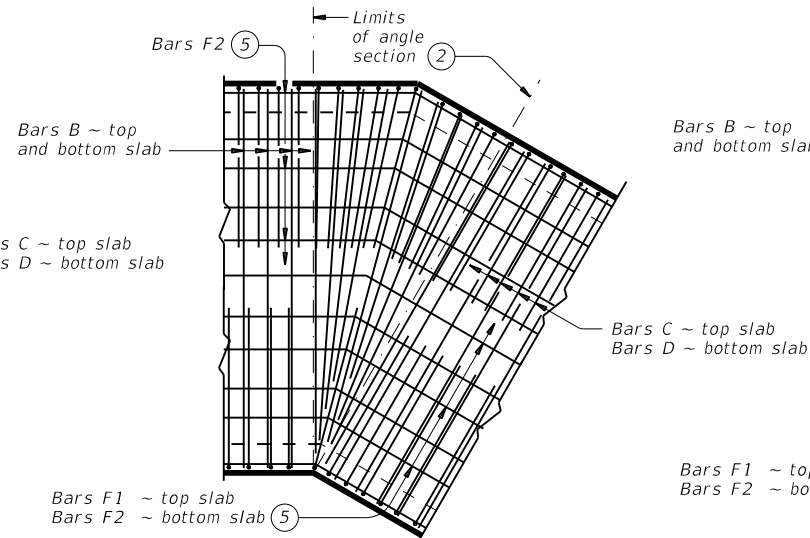
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



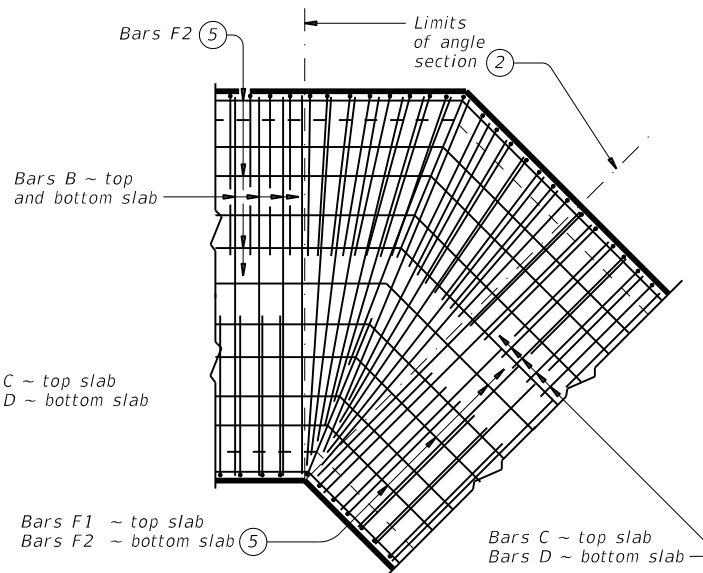
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



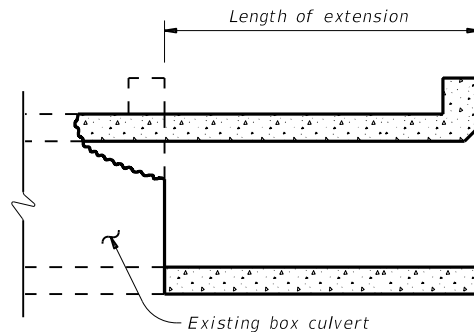
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°



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.

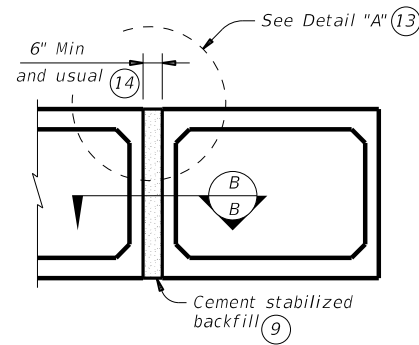
Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

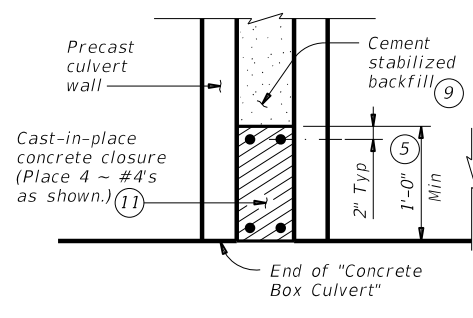
		Bridge Division Standard	
SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS			
SCC-MD			
FILE: sccmdste-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT February 2020	CONT 0383	SECT 03	JOB 024, ETC.
REVISIONS	COUNTY		HIGHWAY SH 141
	DIST		SHEET NO. 154
	CRP		JIM WELLS, ETC.

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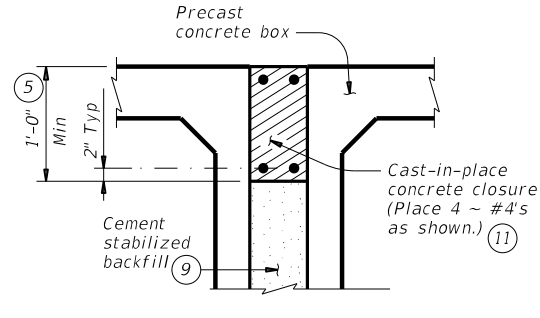
DATE: FILE:



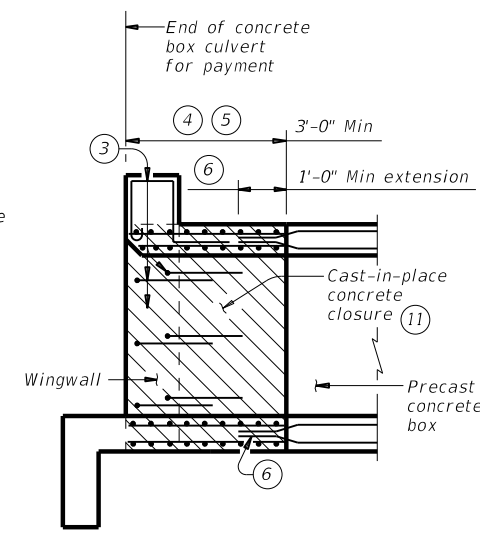
MULTIPLE UNIT PLACEMENT



SECTION B-B

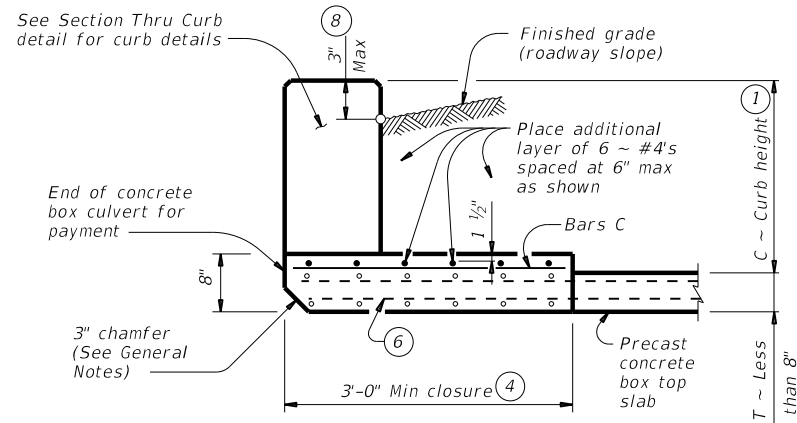


DETAIL "A" (13)

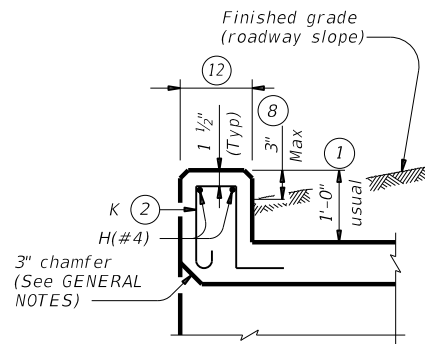


WINGWALL CONNECTION

(Also applies to safety end treatment.)

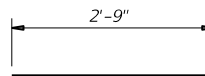


SECTION THRU TOP SLABS LESS THAN 8"

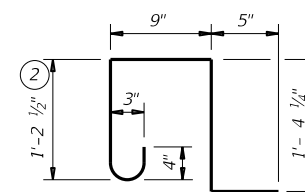


SECTION THRU CURB

QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



BARS C (#4)
(Spa = 1'-0" Max)



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

- 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.

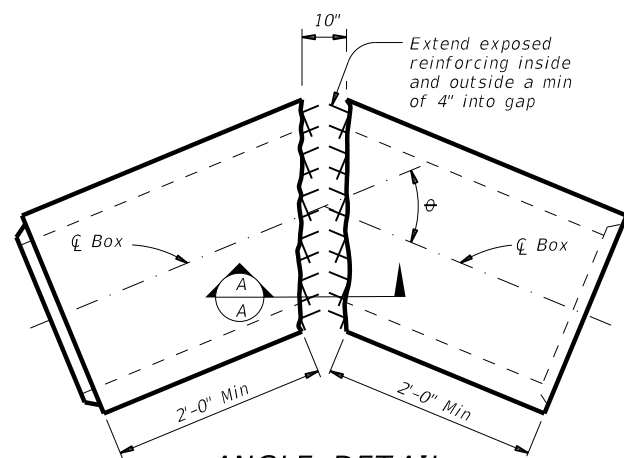
MATERIAL NOTES:

- 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.

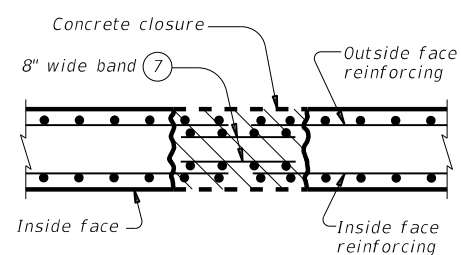
GENERAL NOTES:

- 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.

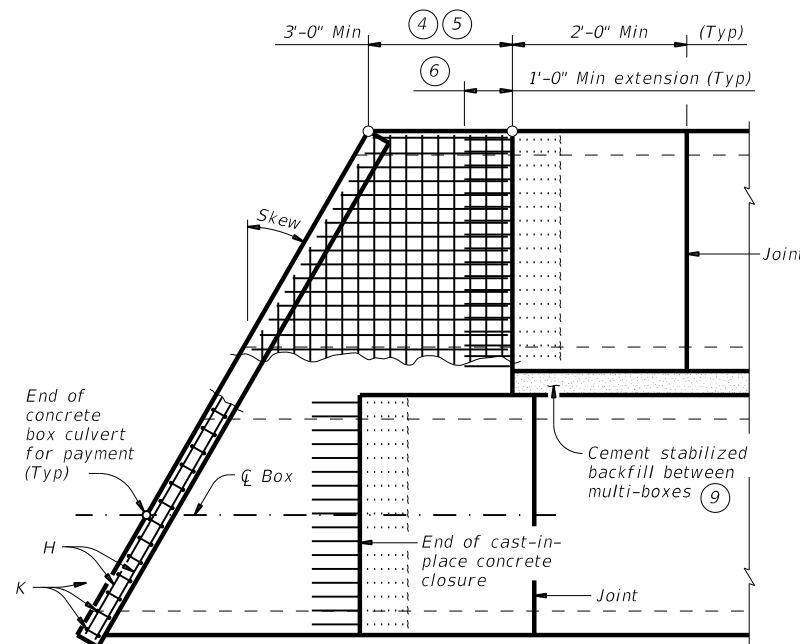
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bars dimensions are out-to-out of bars.



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

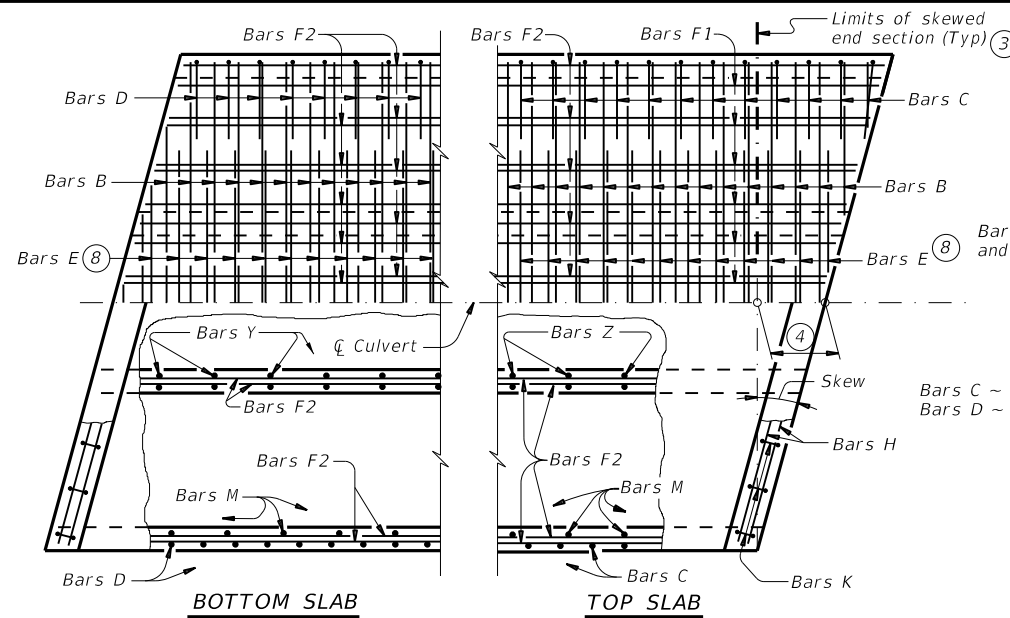
(Showing multi-box placement.)

HL93 LOADING

		Bridge Division Standard	
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS			
SCP-MD			
FILE: scpmdsts-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT
REVISIONS	CONT	SECT	JOB
0383 03	February 2020	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	155	

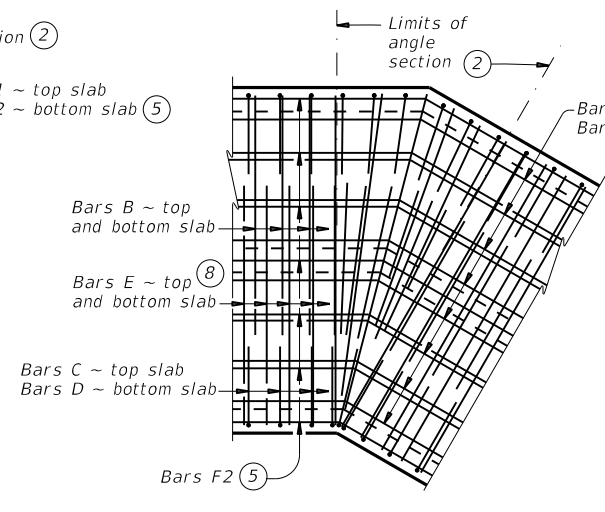
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:

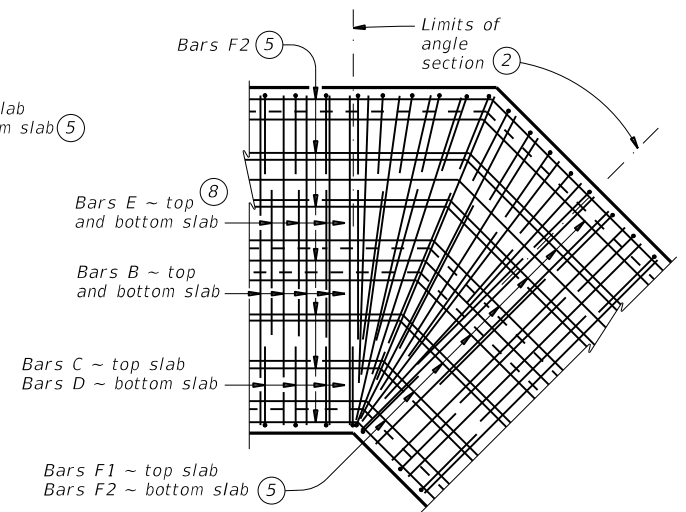


PLAN OF SKEWED ENDS ~ FROM 0° TO 15°

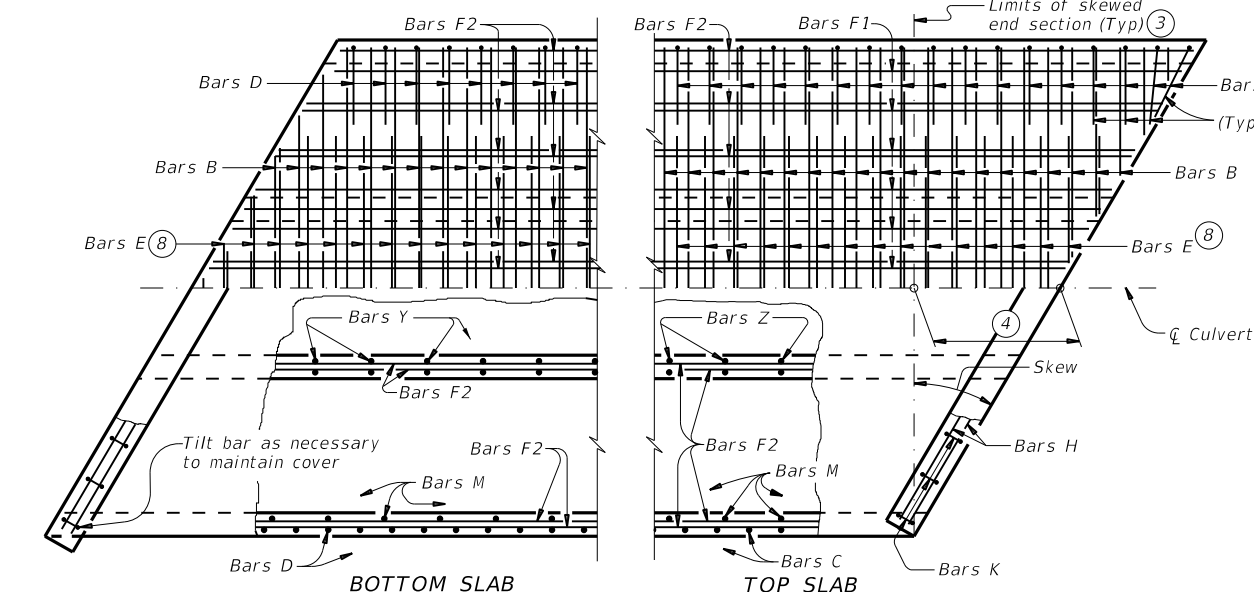
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

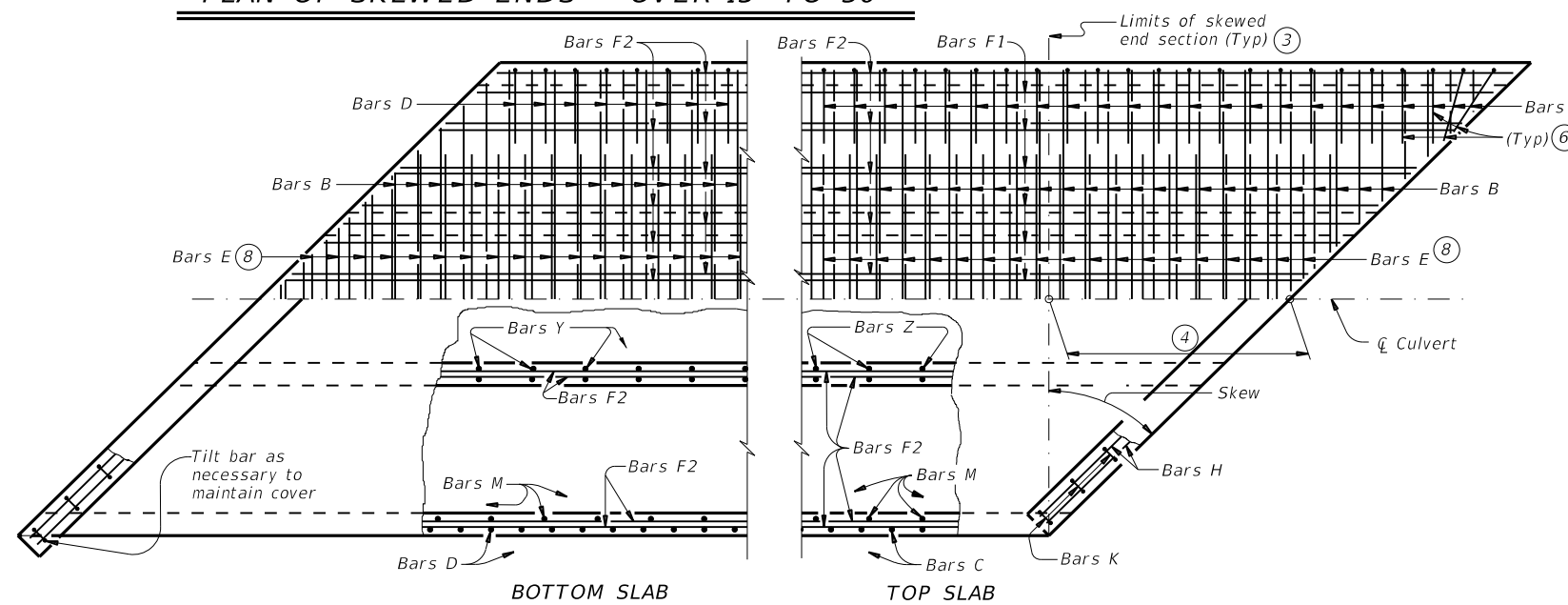


PLAN OF SKEWED ENDS ~ OVER 15° TO 30°

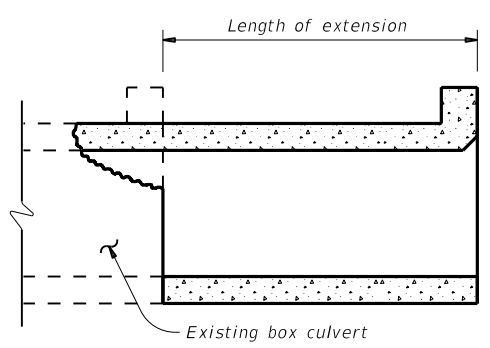
- ① For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth 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

Texas Department of Transportation
Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

MC-MD

FILE: mc-mdste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
0383	03	024, ETC.	SH 141	
DIST	COUNTY	SHEET NO.		
CRP	JIM WELLS, ETC.	156		

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DATE: FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

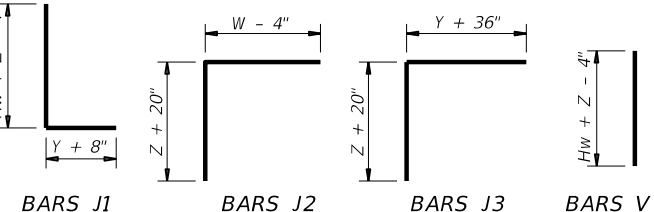
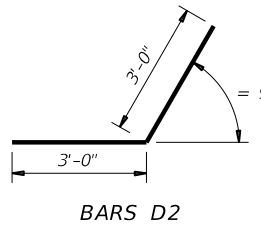
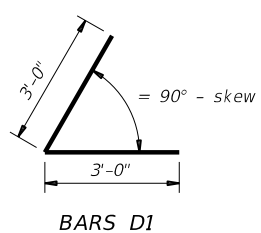
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-wings) (4)		Estimated Quantities per ft of Toewall (1-toewall)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa				
2'-6"	2'-10"	10"	1'-0"	7"	#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 $Hw \ge 4'$
 $= (Hw - 0.5')(SL) \div \cosine(\theta)$ for Type PW-2 and $Hw < 4'$

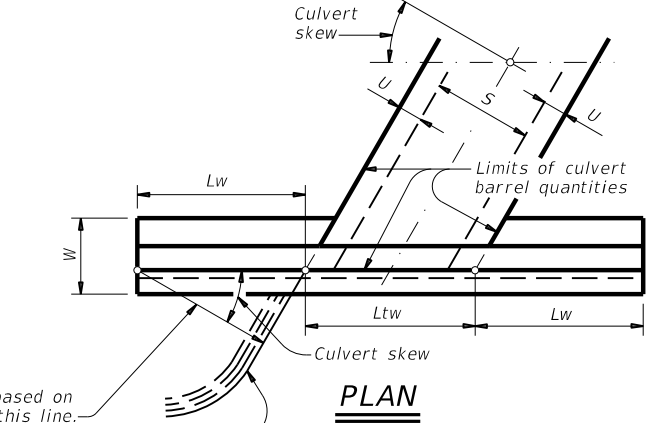
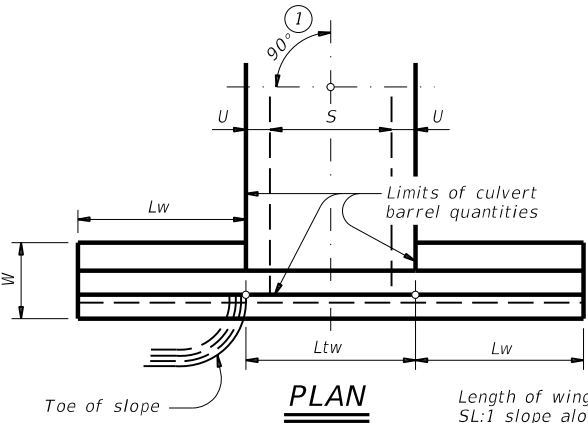
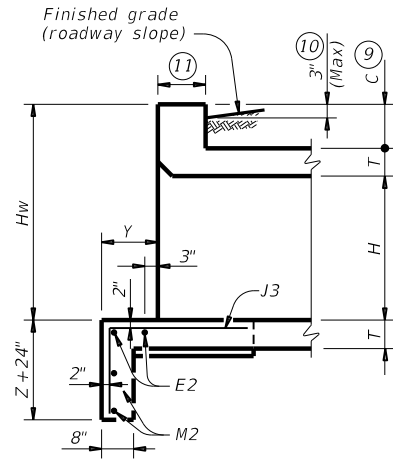
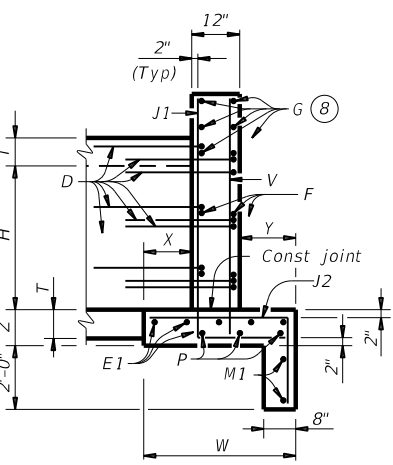
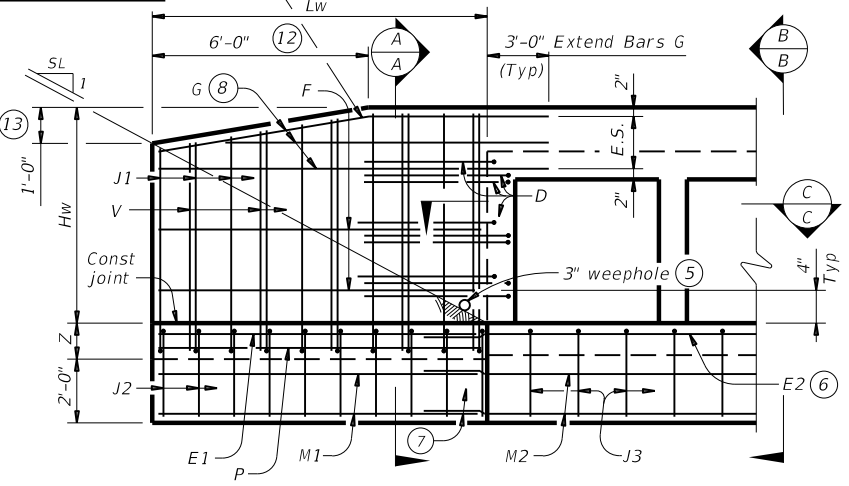
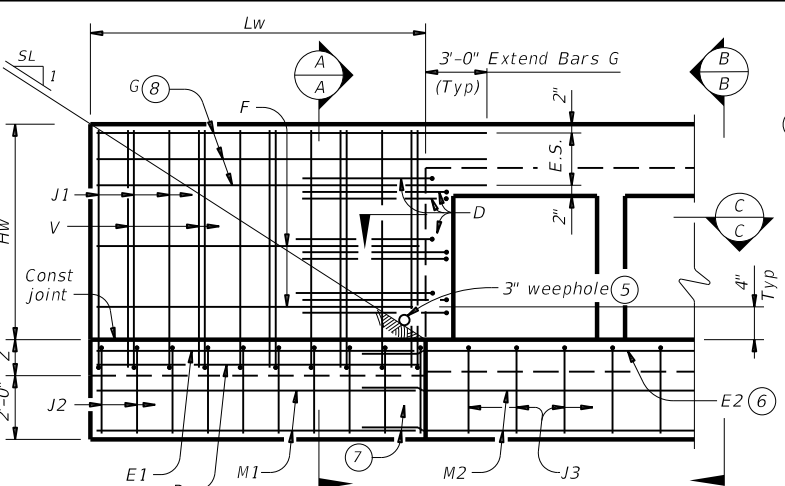
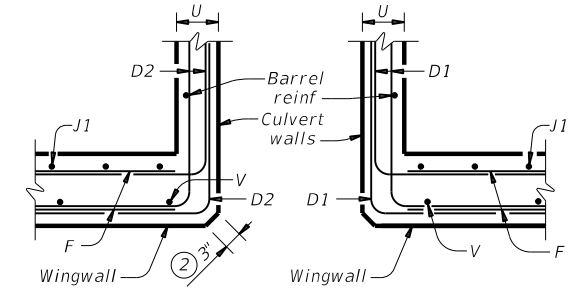
For cast-in-place culverts:
 $Ltw = [(N)(S) + (N + 1)(U)] \div \cosine(\theta)$

For precast culverts:
 $Ltw = [(N)(2U + S) + (N - 1)(0.5')] \div \cosine(\theta)$
 Total Wingwall Area (two wings ~ SF)
 $= (2)(Hw)(Lw)$ for Type PW-1
 $= (2)(Hw)(Lw) - 6 SF$ for Type PW-2 and $Hw \ge 4'$
 $= (2)(Hw)(Lw) - 1.5 SF$ 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'.



DETAILS FOR NON-SKEWED BOX CULVERTS

DETAILS FOR SKEWED BOX CULVERTS

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.

Texas Department of Transportation Bridge Division Standard

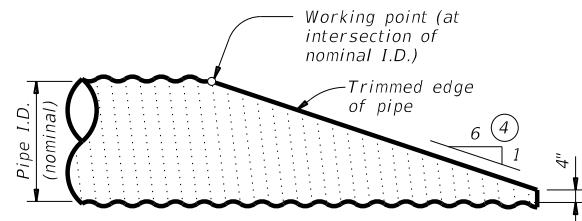
CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

FILE: pwstde01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141	
DIST	COUNTY	SHEET NO.		
CRP	JIM WELLS, ETC.	157		

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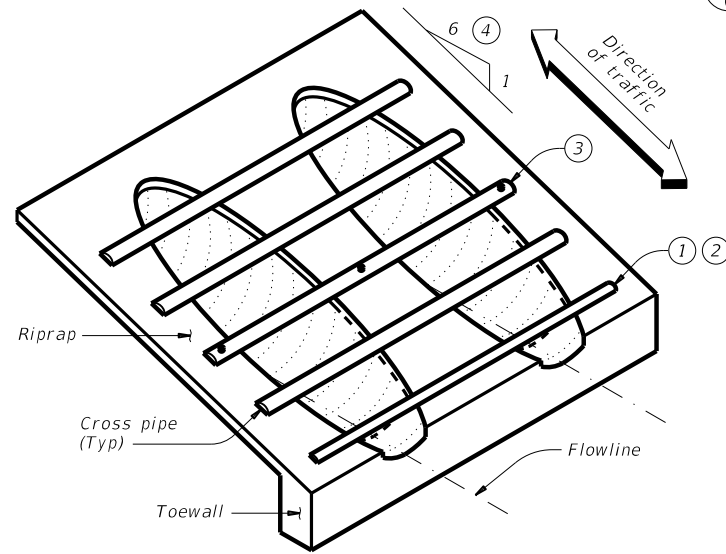
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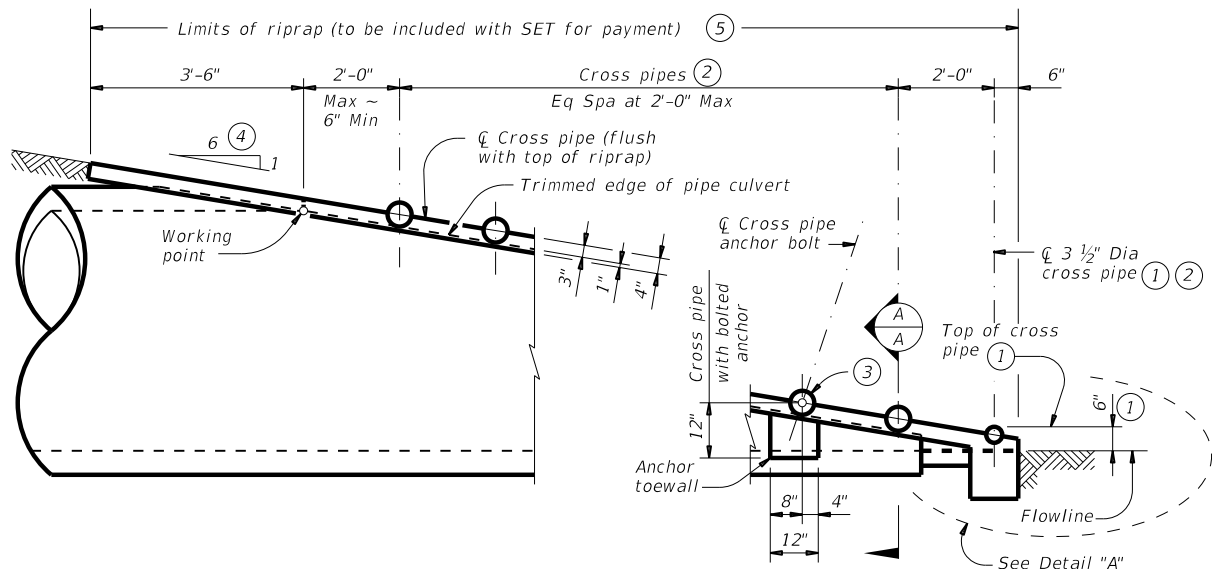
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

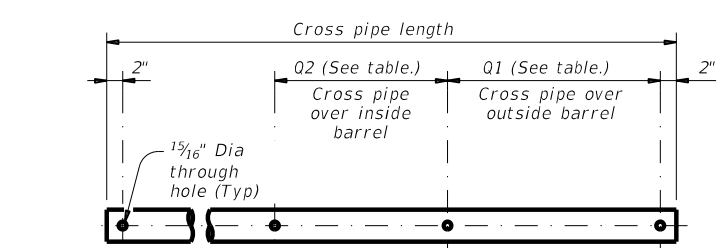


ISOMETRIC VIEW OF TYPICAL INSTALLATION

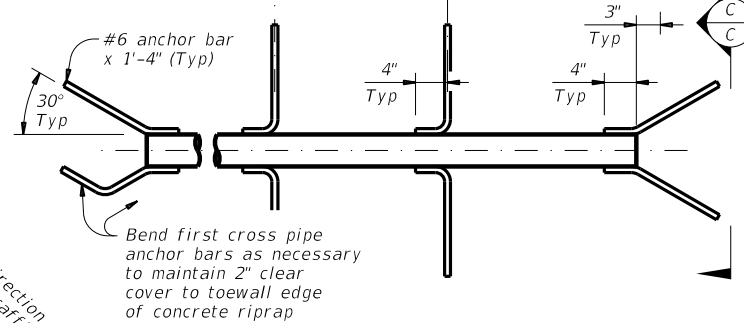


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

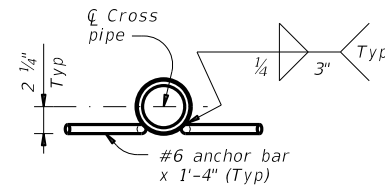
(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

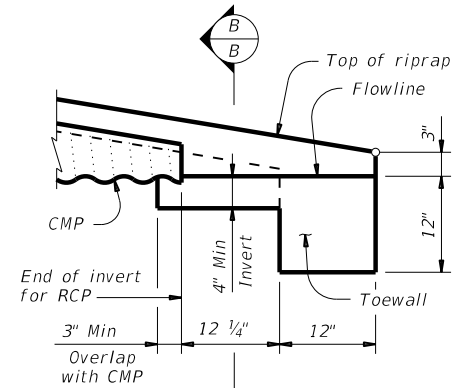


PIPE WITH ANCHOR BARS



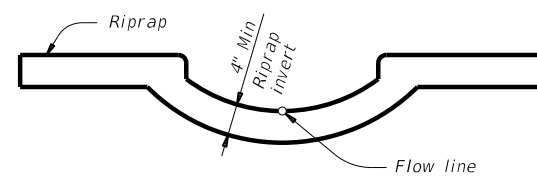
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

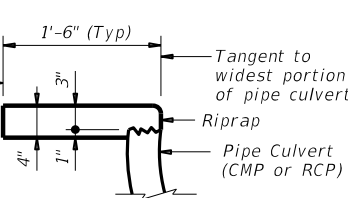
(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



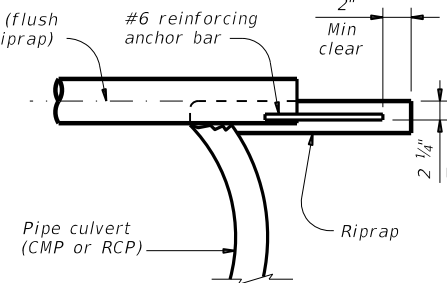
SECTION B-B

(Cross pipes not shown for clarity.)

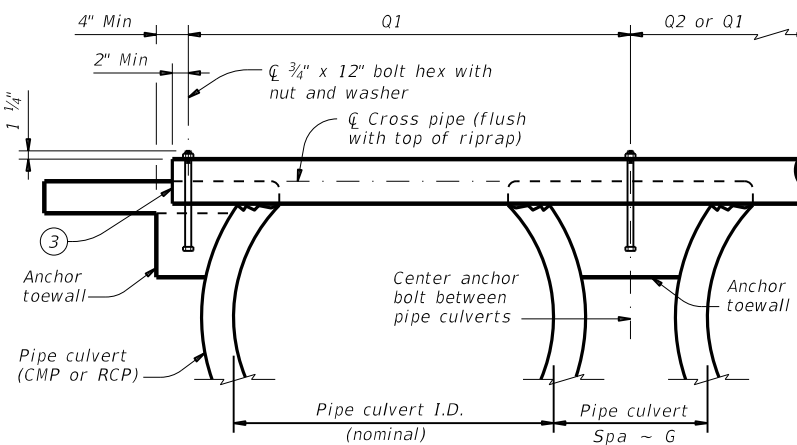
Limits of riprap (to be included with SET for payment) ⑤



SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

Nominal Culvert I.D.	Conc Riprap (CY) ⑥	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	2 or more pipe culverts	
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	All pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	4" Std (4.500" O.D.)
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"	All pipe culverts	5" Std (5.563" O.D.)
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"	All pipe culverts	
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"	All pipe culverts	
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"	All pipe culverts	
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"	All pipe culverts	

- The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
- Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
- Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
- Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
- Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".
- Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52. Provide ASTM A307 bolts and nuts. Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

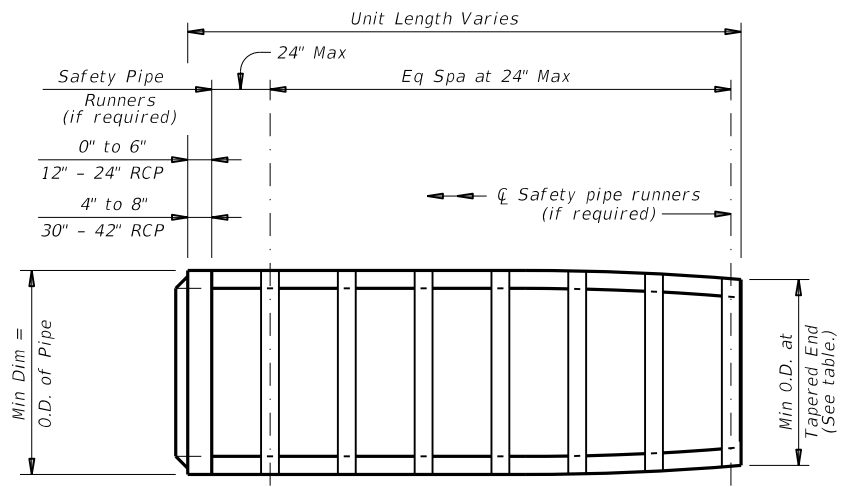
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981. Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes. Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap". Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

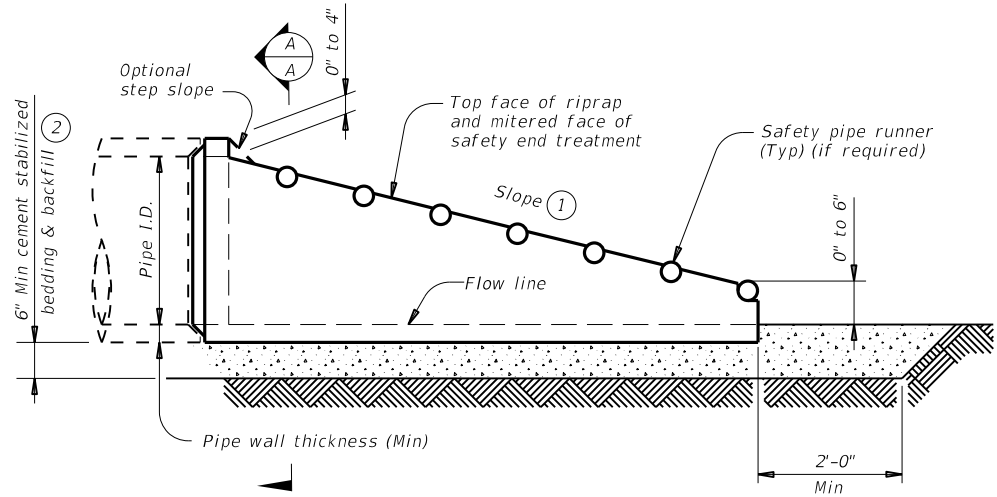
				Bridge Division Standard	
SAFETY END TREATMENT FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE					
SETP-PD					
FILE:	setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
	REVISIONS	0383	03	024, ETC.	SH 141
		DIST	COUNTY	SHEET NO.	
		CRP	JIM WELLS, ETC.	158	

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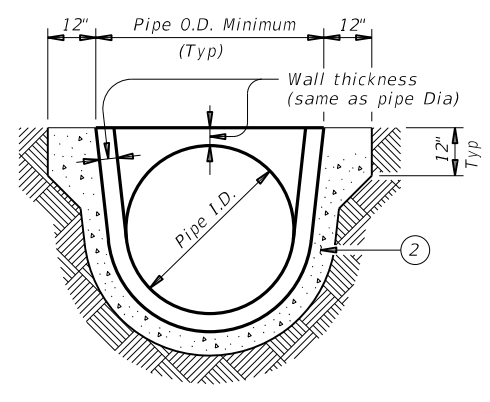
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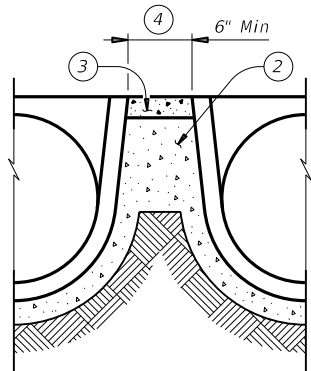
PLAN VIEW - 12" THRU 24"
(Showing spigot end connection.)



LONGITUDINAL ELEVATION - 12" THRU 24"
(Showing spigot end connection.)

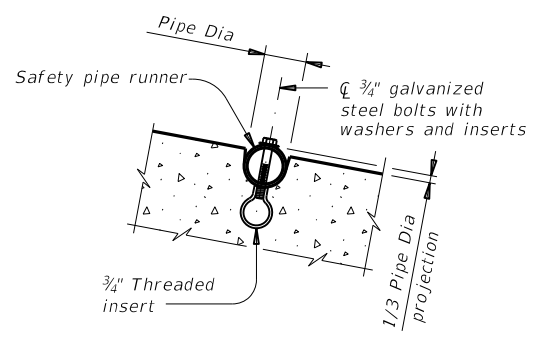


SECTION A-A

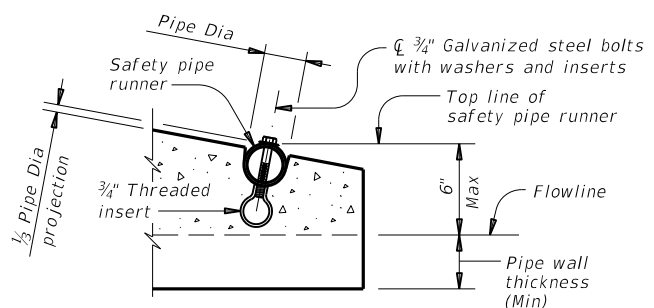


MULTIPLE PIPE INSTALLATION

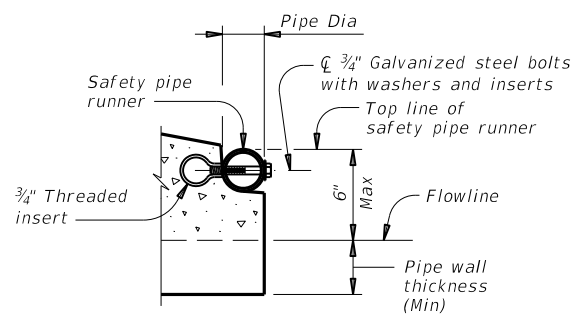
- ① Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.
- ② Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- ③ Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
- ④ Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- ⑤ Safety pipe runners are required for multiple pipe culverts with more than two pipes.



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS
(If required)



OPTION A



OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS
(If required)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4'-0"	No	⑤	3" STD	3.500"	3.068"
15"	2 1/4"	19 1/2"	19"	0.07 Circ.	6:1	5'-8"	No	⑤	3" STD	3.500"	3.068"
18"	2 1/2"	23"	21 1/2"	0.07 Circ.	6:1	7'-3"	No	⑤	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10'-6"	No	⑤	3" STD	3.500"	3.068"
30"	3 1/2"	37"	31"	0.18 Circ.	6:1	12'-1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15'-4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 1/2"	51"	41 1/2"	0.23 Ellip.	6:1	18'-7"	Yes	Yes	4" STD	4.500"	4.026"

MATERIAL NOTES:
 Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
 Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
 Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:
 Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".
 When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.
 Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.
 Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.
 Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.
 Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Texas Department of Transportation Bridge Division Standard

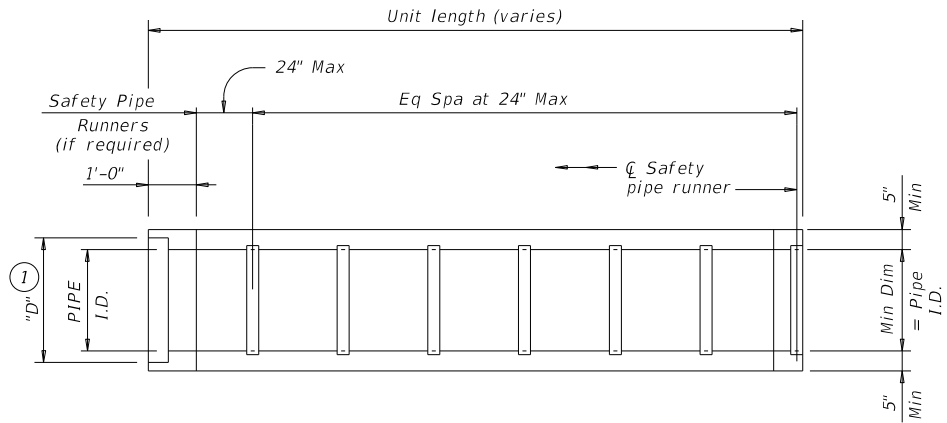
PRECAST SAFETY END TREATMENT TYPE II ~ PARALLEL DRAINAGE

PSET-RP

FILE: psetrpss-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT 0383	SECT 03	JOB 024, ETC.	HIGHWAY SH 141
REVISIONS	DIST CRP	COUNTY JIM WELLS, ETC.	SHEET NO. 159	

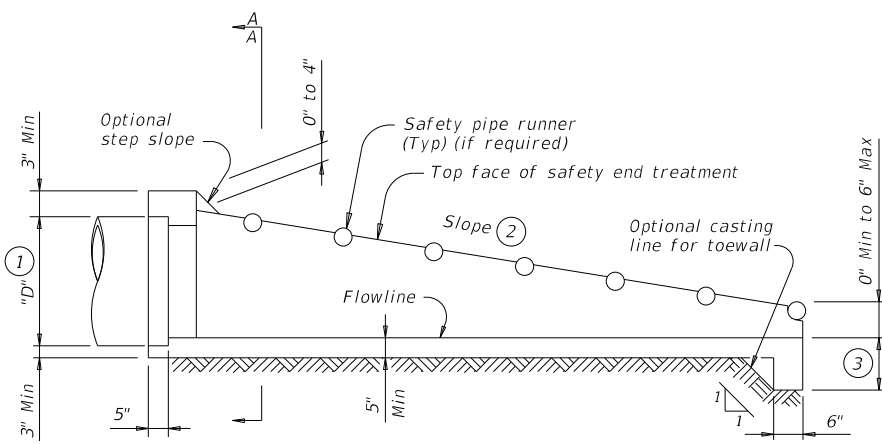
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DATE: FILE:



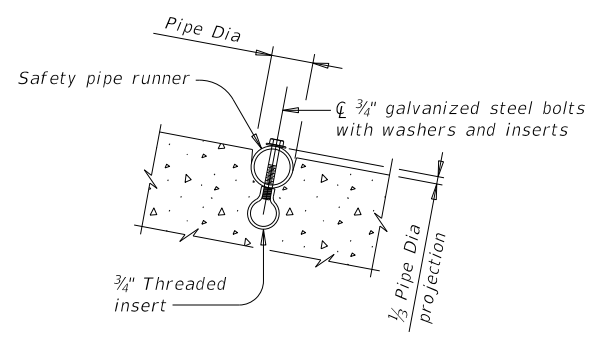
PLAN

(Showing bell end connection.)



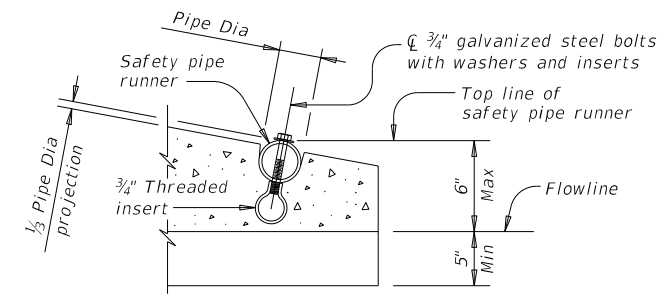
LONGITUDINAL ELEVATION

(Showing bell end connection.)

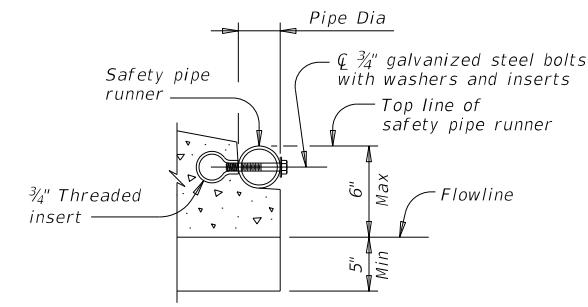


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



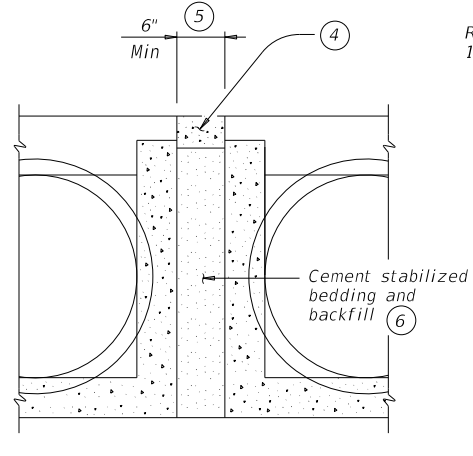
OPTION A



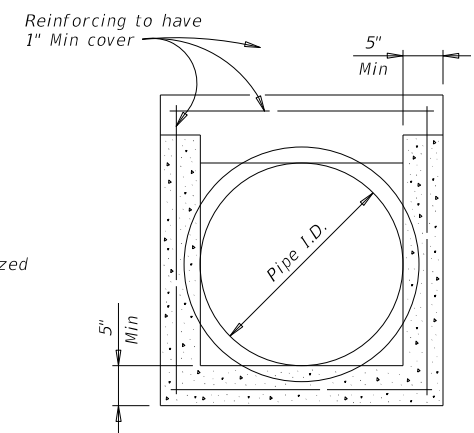
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

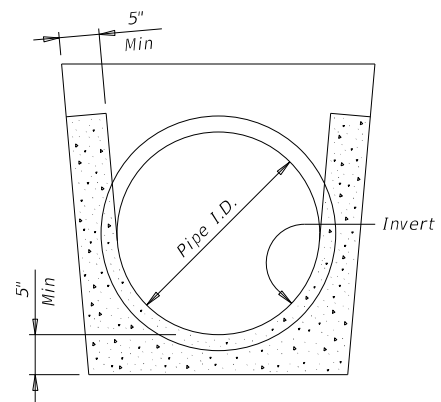


MULTIPLE PIPE INSTALLATION

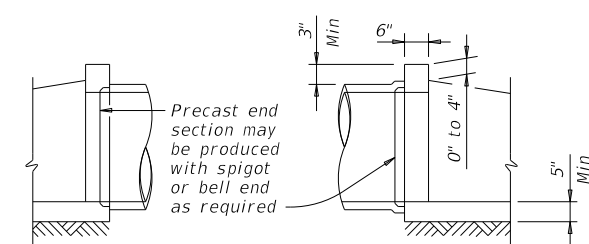


OPTION WITH SQUARE BOTTOM

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	Min 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"	2.7"	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 Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation
 Bridge Division Standard

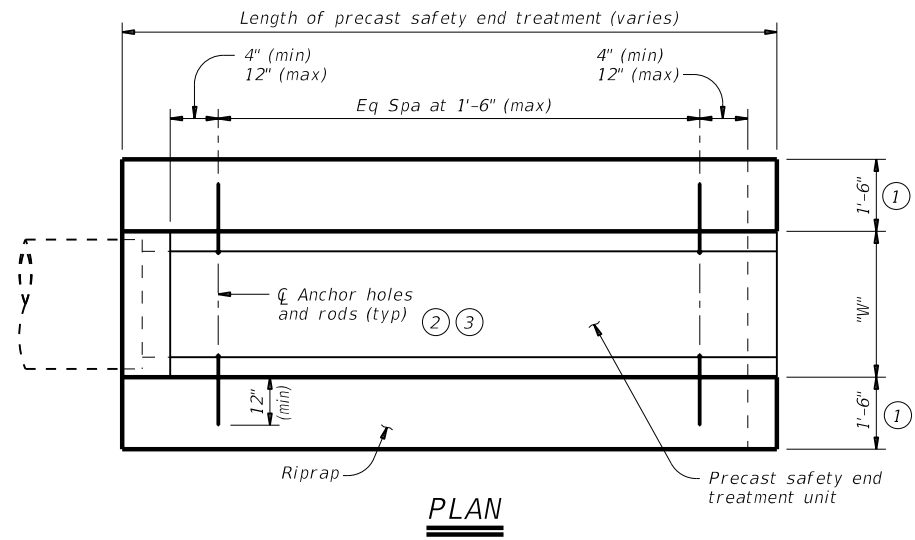
PRECAST SAFETY END TREATMENT TYPE II ~ PARALLEL DRAINAGE

PSET-SP

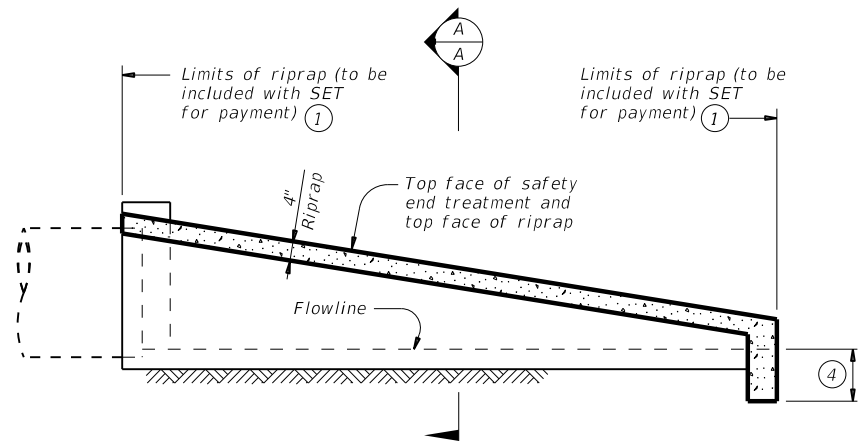
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 0383 03	024, ETC.	SH 141		
12-21: Added 42" TP	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	160	

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.

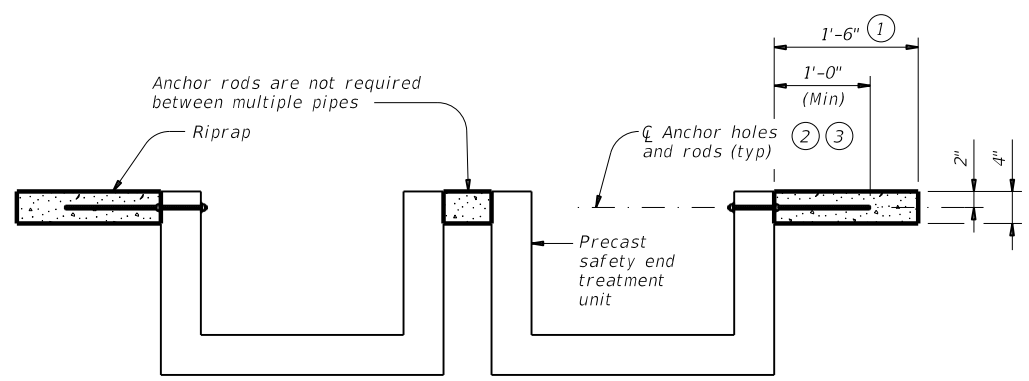
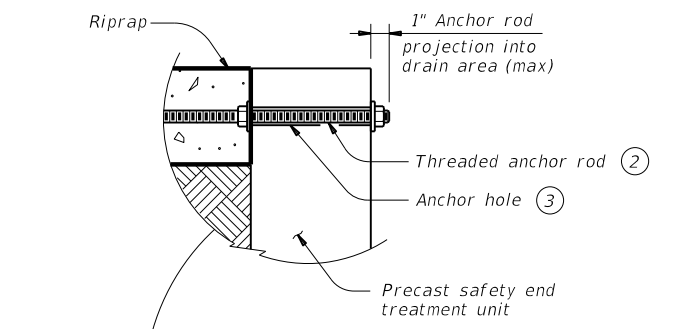
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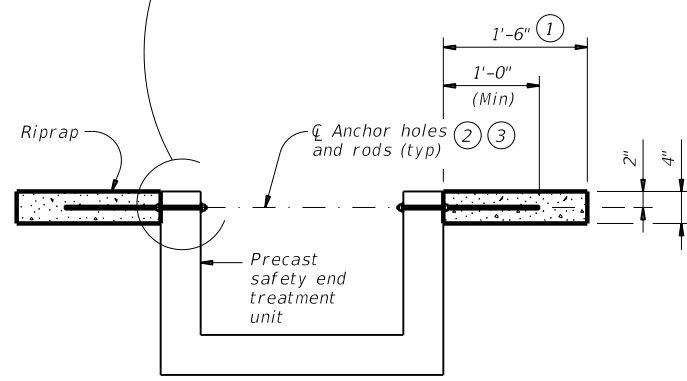
PLAN



LONGITUDINAL ELEVATION



MULTIPLE PIPE INSTALLATION



SINGLE PIPE INSTALLATION

SECTION A-A

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY)

Nominal Culvert (Pipe) I.D.	PSET-SC and PSET-SP Standards					PSET-RC and PSET-RP Standards		
	Unit Width "W"	Side Slope			Unit Width "W"	Side Slope		
		3:1	4:1	6:1		3:1	4:1	6:1
12"	23.0"	0.1	0.2	0.2	16.0"	0.1	0.1	0.2
15"	26.5"	0.2	0.2	0.3	19.5"	0.1	0.2	0.2
18"	30.0"	0.2	0.2	0.3	23.0"	0.2	0.2	0.3
24"	37.0"	0.3	0.3	0.5	30.0"	0.2	0.3	0.4
30"	44.5"	0.3	0.4	0.6	37.0"	0.3	0.3	0.5
36"	51.5"	0.4	0.5	0.7	44.0"	0.3	0.4	0.6
42"	58.5"	0.5	0.6	0.8	51.0"	0.4	0.5	0.7

- ① Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap". When riprap is cast integrally with the precast safety end treatment, this dimension is 1'-0" minimum.
- ② 1#2" Dia ASTM A307 Gr A threaded anchor rod with 2 nuts and 2 washers. Galvanize all components in accordance with Item 445, "Galvanizing". Repair galvanizing that is damaged during transport or construction in accordance with the specifications.
- ③ 3#4" through holes in walls of safety end treatment for riprap anchor rods may be drilled with rotary (coring or masonry) type drilling equipment or may be formed. Do not use percussive (star) type drilling equipment. If holes are drilled, patch spalls in the inside face of the wall exceeding 1#2" from the holes.
- ④ Provide riprap toe wall when dimension is shown elsewhere in the plans or when field conditions require a toe wall.
- ⑤ Quantities shown are for one end of one reinforced concrete pipe culvert. For multiple pipe culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only. Quantities are based on the minimum unit lengths shown on the Precast Safety End Treatment (SET) standard sheets.

MATERIAL NOTES:

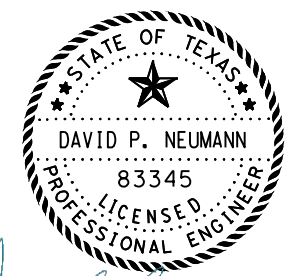
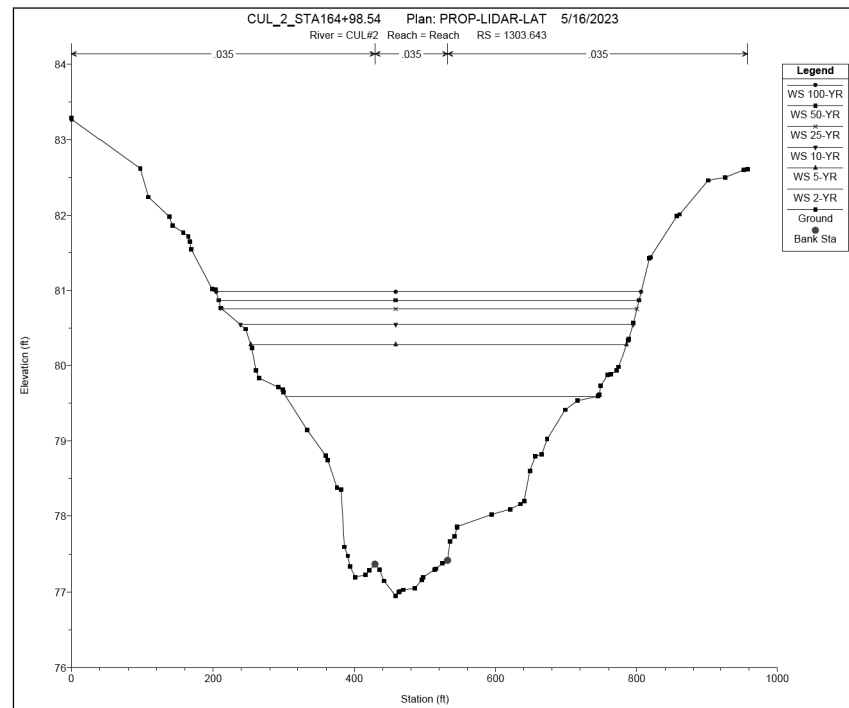
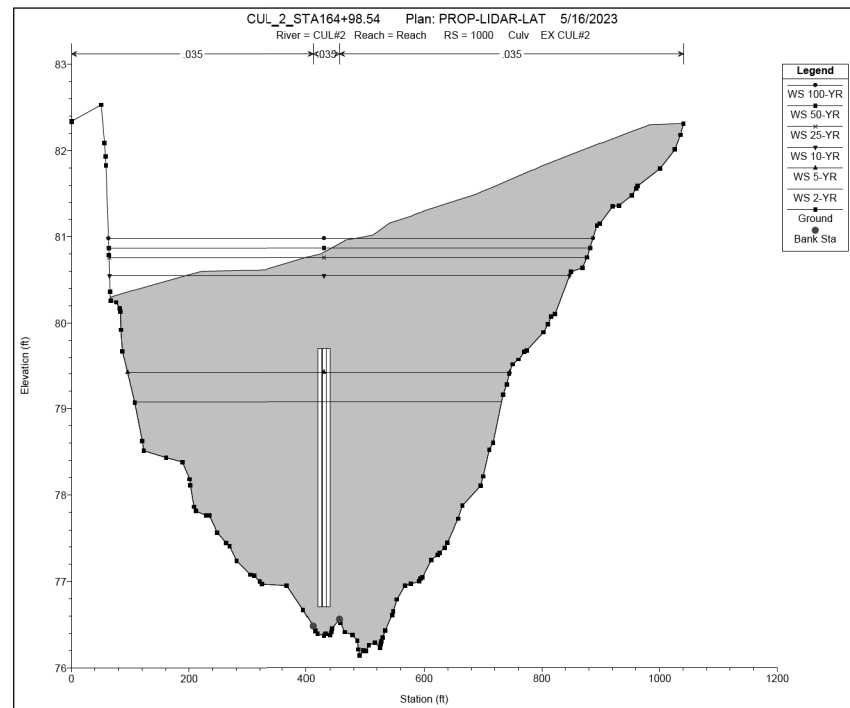
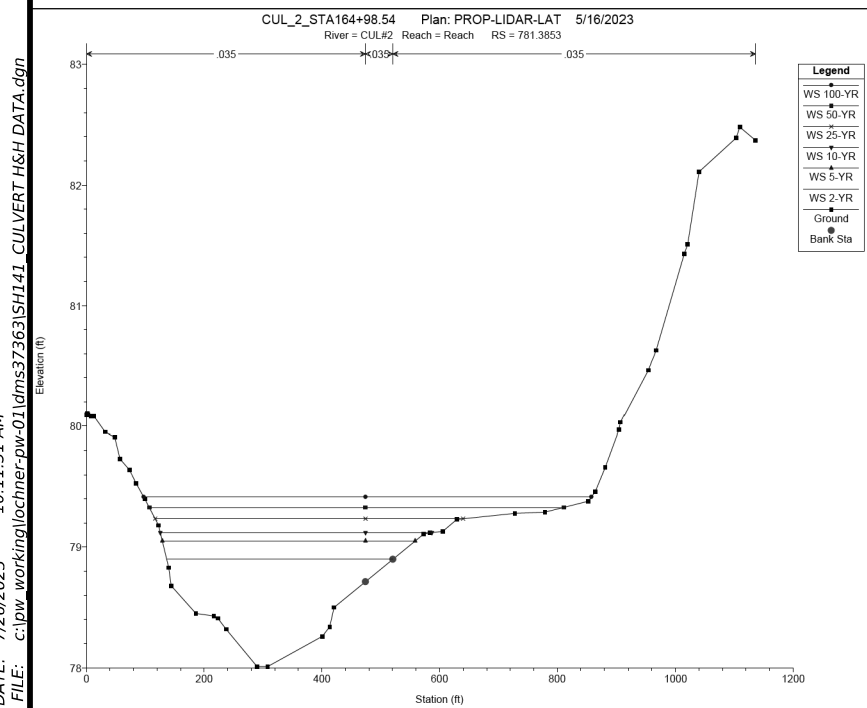
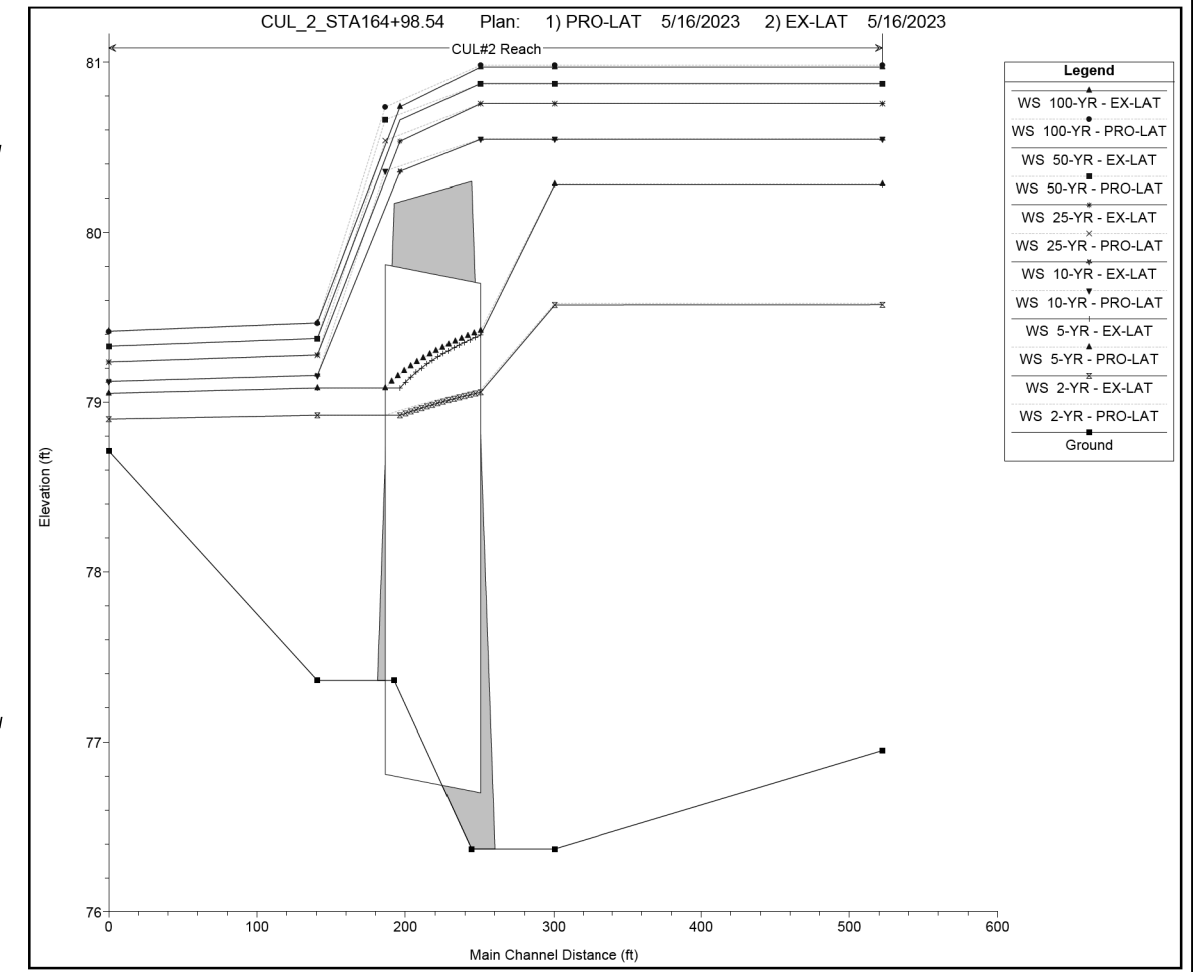
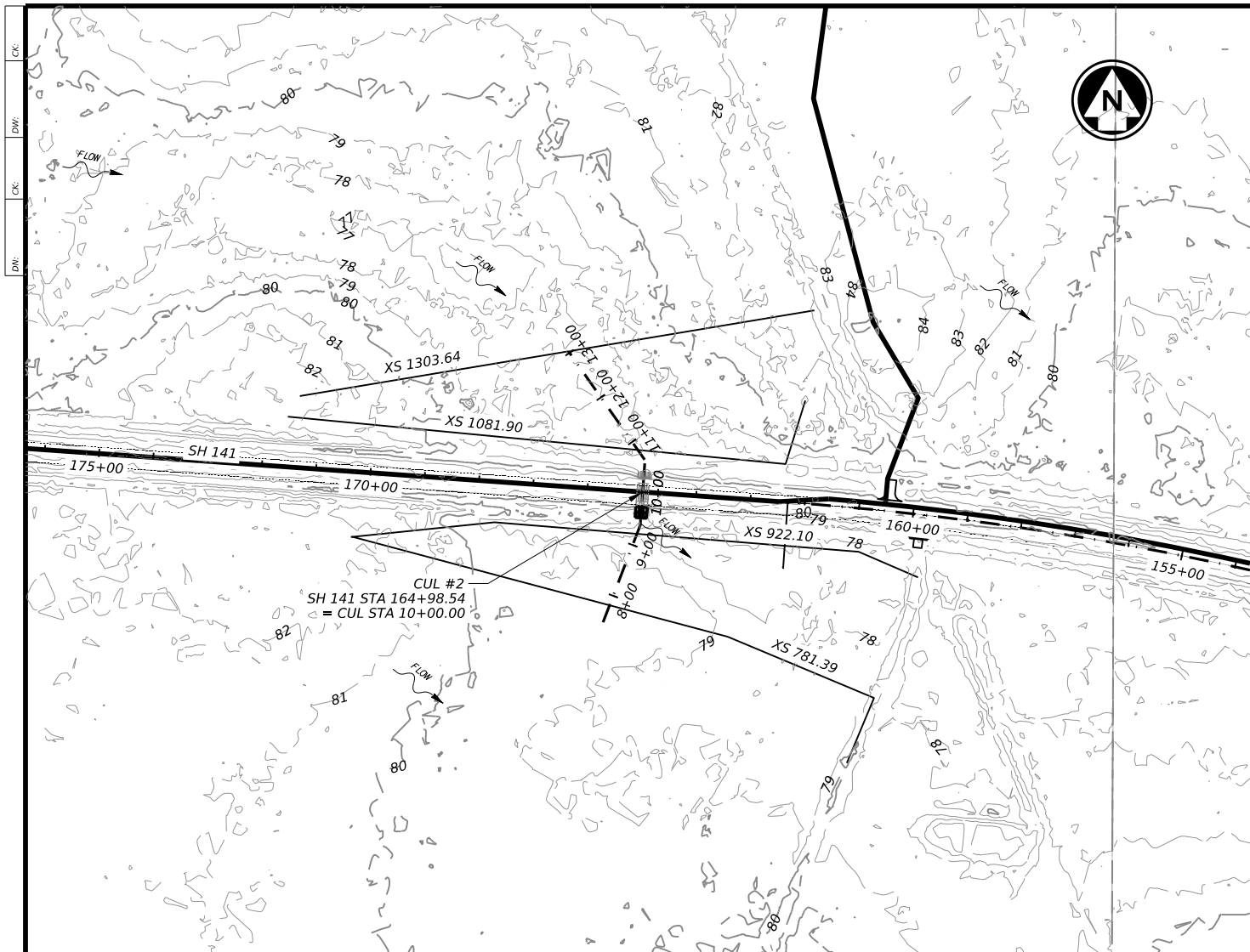
Provide Class "B" riprap in accordance with Item 432, "Riprap". Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. The anchor rods shown are always required.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment". Refer to PSET-SC or PSET-SP standard sheets for details of square safety end treatments not shown. Refer to PSET-RC or PSET-RP standard sheets for details of round safety end treatments not shown. For precast units with integrally cast riprap, substitute reinforcing steel in the amount on 0.26 in./ft. minimum for the threaded anchor rods shown. When requested, submit sealed engineering drawings for approval prior to construction. Shop drawings will not be required. Note that a proprietary precast unit with integral riprap is available from L&R Precast Concrete Works, Inc. (956) 583-6293 or www.lrpccast.com. Payment for riprap and toewalls is included in the price bid for each safety end treatment.

These riprap details are only applicable when notes that require placement of riprap with precast safety end treatments are shown elsewhere in the plans.
 Precast units with integrally cast riprap are permitted unless noted otherwise on the plans.

				Bridge Division Standard	
PRECAST SAFETY END TREATMENT TYPE II RIPRAP DETAILS PSET-RR					
FILE: psetrrse-20.dgn	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0383	03	024, ETC.	SH 141	
	DIST	COUNTY		SHEET NO.	
	CRP	JIM WELLS, ETC.		161	



David P. Neumann, P.E.

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LOCHNER

TBPE Firm Reg. No. 10488



HYDRAULIC DATA SHEET
(CULVERT # 2, STA 164+98.54)
(NBI#:16-137-0-0383-04-006)

SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	162	

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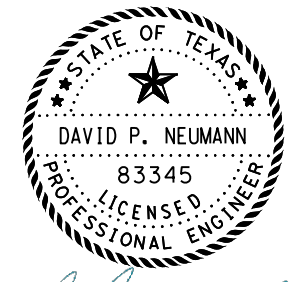
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HEC-RAS River: CUL#2 Reach: Reach													
Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach	1303.643	2-YR	PRO-LAT	203.00	76.95	79.58	77.60	79.58	0.000033	0.44	615.01	438.02	0.05
Reach	1303.643	2-YR	EX-LAT	203.00	76.95	79.57	77.60	79.58	0.000033	0.44	611.44	433.44	0.05
Reach	1303.643	5-YR	PRO-LAT	344.00	76.95	80.28	77.77	80.28	0.000028	0.48	963.78	532.16	0.05
Reach	1303.643	5-YR	EX-LAT	344.00	76.95	80.28	77.77	80.28	0.000028	0.48	961.43	531.84	0.05
Reach	1303.643	10-YR	PRO-LAT	453.00	76.95	80.55	77.87	80.55	0.000033	0.55	1107.12	555.93	0.05
Reach	1303.643	10-YR	EX-LAT	453.00	76.95	80.55	77.87	80.55	0.000033	0.55	1106.13	555.65	0.05
Reach	1303.643	25-YR	PRO-LAT	604.00	76.95	80.76	78.05	80.76	0.000045	0.67	1226.11	587.83	0.06
Reach	1303.643	25-YR	EX-LAT	604.00	76.95	80.76	78.05	80.76	0.000045	0.67	1225.76	587.74	0.06
Reach	1303.643	50-YR	PRO-LAT	723.00	76.95	80.87	78.18	80.88	0.000055	0.75	1294.41	595.57	0.07
Reach	1303.643	50-YR	EX-LAT	723.00	76.95	80.87	78.18	80.88	0.000055	0.75	1296.38	595.76	0.07
Reach	1303.643	100-YR	PRO-LAT	856.00	76.95	80.98	78.27	80.99	0.000067	0.85	1360.54	601.69	0.08
Reach	1303.643	100-YR	EX-LAT	856.00	76.95	80.97	78.27	80.98	0.000068	0.85	1353.76	601.07	0.08
Reach	1082			Lat Struct									
Reach	1081.896	2-YR	PRO-LAT	203.00	76.37	79.58	76.78	79.58	0.000004	0.19	1416.64	672.10	0.02
Reach	1081.896	2-YR	EX-LAT	203.00	76.37	79.57	76.78	79.57	0.000004	0.19	1411.14	670.94	0.02
Reach	1081.896	5-YR	PRO-LAT	303.27	76.37	80.28	76.91	80.28	0.000004	0.21	1921.68	766.31	0.02
Reach	1081.896	5-YR	EX-LAT	304.00	76.37	80.28	76.92	80.28	0.000004	0.21	1918.29	766.02	0.02
Reach	1081.896	10-YR	PRO-LAT	356.91	76.37	80.55	76.94	80.55	0.000004	0.22	2126.60	782.32	0.02
Reach	1081.896	10-YR	EX-LAT	357.64	76.37	80.55	76.94	80.55	0.000004	0.22	2125.21	782.21	0.02
Reach	1081.896	25-YR	PRO-LAT	452.27	76.37	80.76	77.08	80.76	0.000005	0.26	2293.22	812.79	0.02
Reach	1081.896	25-YR	EX-LAT	453.84	76.37	80.76	77.08	80.76	0.000005	0.26	2292.73	812.75	0.02
Reach	1081.896	50-YR	PRO-LAT	538.96	76.37	80.87	77.14	80.87	0.000007	0.30	2387.33	818.56	0.02
Reach	1081.896	50-YR	EX-LAT	539.66	76.37	80.87	77.14	80.88	0.000007	0.30	2390.03	818.72	0.02
Reach	1081.896	100-YR	PRO-LAT	635.72	76.37	80.98	77.20	80.98	0.000008	0.34	2478.14	824.05	0.03
Reach	1081.896	100-YR	EX-LAT	638.43	76.37	80.97	77.21	80.97	0.000008	0.34	2468.83	823.49	0.03
Reach	1000			Culvert									
Reach	922.1047	2-YR	PRO-LAT	203.00	77.36	78.92		78.92	0.000009	0.16	1145.97	795.12	0.02
Reach	922.1047	2-YR	EX-LAT	203.00	77.36	78.92		78.92	0.000009	0.16	1145.97	795.12	0.02
Reach	922.1047	5-YR	PRO-LAT	303.27	77.36	79.08		79.08	0.000015	0.22	1275.73	834.81	0.03
Reach	922.1047	5-YR	EX-LAT	304.00	77.36	79.08		79.08	0.000015	0.22	1276.66	835.10	0.03
Reach	922.1047	10-YR	PRO-LAT	356.91	77.36	79.16		79.16	0.000018	0.25	1338.30	841.61	0.03
Reach	922.1047	10-YR	EX-LAT	357.64	77.36	79.16		79.16	0.000018	0.25	1339.12	841.64	0.03
Reach	922.1047	25-YR	PRO-LAT	452.27	77.36	79.28		79.28	0.000024	0.30	1439.53	849.48	0.04
Reach	922.1047	25-YR	EX-LAT	453.84	77.36	79.28		79.28	0.000024	0.30	1441.23	849.72	0.04
Reach	922.1047	50-YR	PRO-LAT	538.96	77.36	79.37		79.38	0.000029	0.34	1523.58	857.01	0.04
Reach	922.1047	50-YR	EX-LAT	539.66	77.36	79.38		79.38	0.000029	0.34	1524.19	857.03	0.04
Reach	922.1047	100-YR	PRO-LAT	635.72	77.36	79.47		79.47	0.000034	0.38	1601.14	859.53	0.05
Reach	922.1047	100-YR	EX-LAT	638.43	77.36	79.47		79.47	0.000035	0.38	1603.16	859.60	0.05
Reach	781.3853	2-YR	PRO-LAT	203.00	78.71	78.90	78.50	78.92	0.001302	0.32	196.29	384.61	0.18
Reach	781.3853	2-YR	EX-LAT	203.00	78.71	78.90	78.50	78.92	0.001302	0.32	196.29	384.61	0.18
Reach	781.3853	5-YR	PRO-LAT	303.27	78.71	79.05	78.60	79.07	0.001302	0.60	257.86	429.78	0.21
Reach	781.3853	5-YR	EX-LAT	304.00	78.71	79.05	78.59	79.07	0.001301	0.60	258.30	430.09	0.21
Reach	781.3853	10-YR	PRO-LAT	356.91	78.71	79.12	78.64	79.15	0.001301	0.71	288.98	461.65	0.22
Reach	781.3853	10-YR	EX-LAT	357.64	78.71	79.12	78.64	79.15	0.001302	0.71	289.40	463.63	0.22
Reach	781.3853	25-YR	PRO-LAT	452.27	78.71	79.24	78.70	79.26	0.001301	0.87	345.43	523.42	0.23
Reach	781.3853	25-YR	EX-LAT	453.84	78.71	79.24	78.70	79.27	0.001301	0.87	346.44	527.40	0.23
Reach	781.3853	50-YR	PRO-LAT	538.96	78.71	79.33	78.75	79.36	0.001302	0.99	404.25	704.84	0.24
Reach	781.3853	50-YR	EX-LAT	539.66	78.71	79.33	78.75	79.36	0.001302	1.00	404.73	705.47	0.24
Reach	781.3853	100-YR	PRO-LAT	635.72	78.71	79.42	78.81	79.45	0.001301	1.10	468.30	761.01	0.25
Reach	781.3853	100-YR	EX-LAT	638.43	78.71	79.42	78.81	79.45	0.001301	1.10	470.01	761.60	0.25

NOTES:

HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3).

FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.

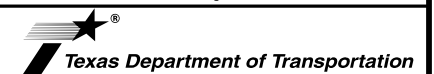


David P. Neumann, P.E.

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LOCHNER

TBPE Firm Reg. No. 10488



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HYDRAULIC DATA SHEET

(CULVERT # 2, STA 164+98.54)
(NBI#:16-137-0-0383-04-006)

SHEET 2 OF 8

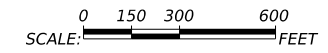
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		163

HEC-RAS River: CUL#2 Reach: Reach

Reach	River Sta	Profile	Plan	Q US (cfs)	Q Leaving Total (cfs)	Q DS (cfs)	Q Weir (cfs)	Q Gates (cfs)	Wt Top Wdth (ft)	Weir Max Depth (ft)	Weir Avg Depth (ft)	Min El Weir Flow (ft)	E.G. US. (ft)	W.S. US. (ft)	E.G. DS. (ft)	W.S. DS. (ft)
Reach	1082	2-YR	PRO-LAT	203.00	0.00	203.00	0.00						79.83	79.58	79.58	79.58
Reach	1082	2-YR	EX-LAT	203.00	0.00	203.00	0.00						79.83	79.57	79.57	79.57
Reach	1082	5-YR	PRO-LAT	344.00	41.36	303.27	41.36		97.04	0.45	0.35		79.83	80.29	80.28	80.28
Reach	1082	5-YR	EX-LAT	344.00	40.62	304.00	40.62		96.84	0.45	0.35		79.83	80.28	80.28	80.28
Reach	1082	10-YR	PRO-LAT	453.00	95.51	356.91	95.51		108.63	0.72	0.56		79.83	80.55	80.55	80.55
Reach	1082	10-YR	EX-LAT	453.00	95.09	357.64	95.09		108.57	0.72	0.56		79.83	80.55	80.55	80.55
Reach	1082	25-YR	PRO-LAT	604.00	150.66	452.27	150.66		115.71	0.93	0.73		79.83	80.76	80.76	80.76
Reach	1082	25-YR	EX-LAT	604.00	150.49	453.84	150.49		115.69	0.93	0.73		79.83	80.76	80.76	80.76
Reach	1082	50-YR	PRO-LAT	723.00	185.70	538.96	185.70		119.63	1.04	0.82		79.83	80.88	80.87	80.87
Reach	1082	50-YR	EX-LAT	723.00	186.75	539.66	186.75		119.74	1.04	0.82		79.83	80.88	80.87	80.87
Reach	1082	100-YR	PRO-LAT	856.00	222.22	635.72	222.22		123.39	1.15	0.90		79.83	80.99	80.98	80.98
Reach	1082	100-YR	EX-LAT	856.00	218.36	638.43	218.36		123.00	1.14	0.89		79.83	80.98	80.97	80.97

LEGEND

- DRAINAGE AREA BOUNDARY
- - - - - STREAM CENTERLINE
- TIME OF CONCENTRATION PATH
- ~ CONTOUR ELEVATIONS



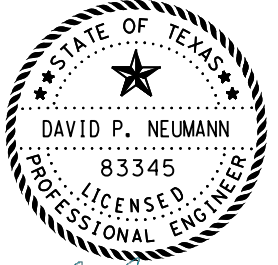
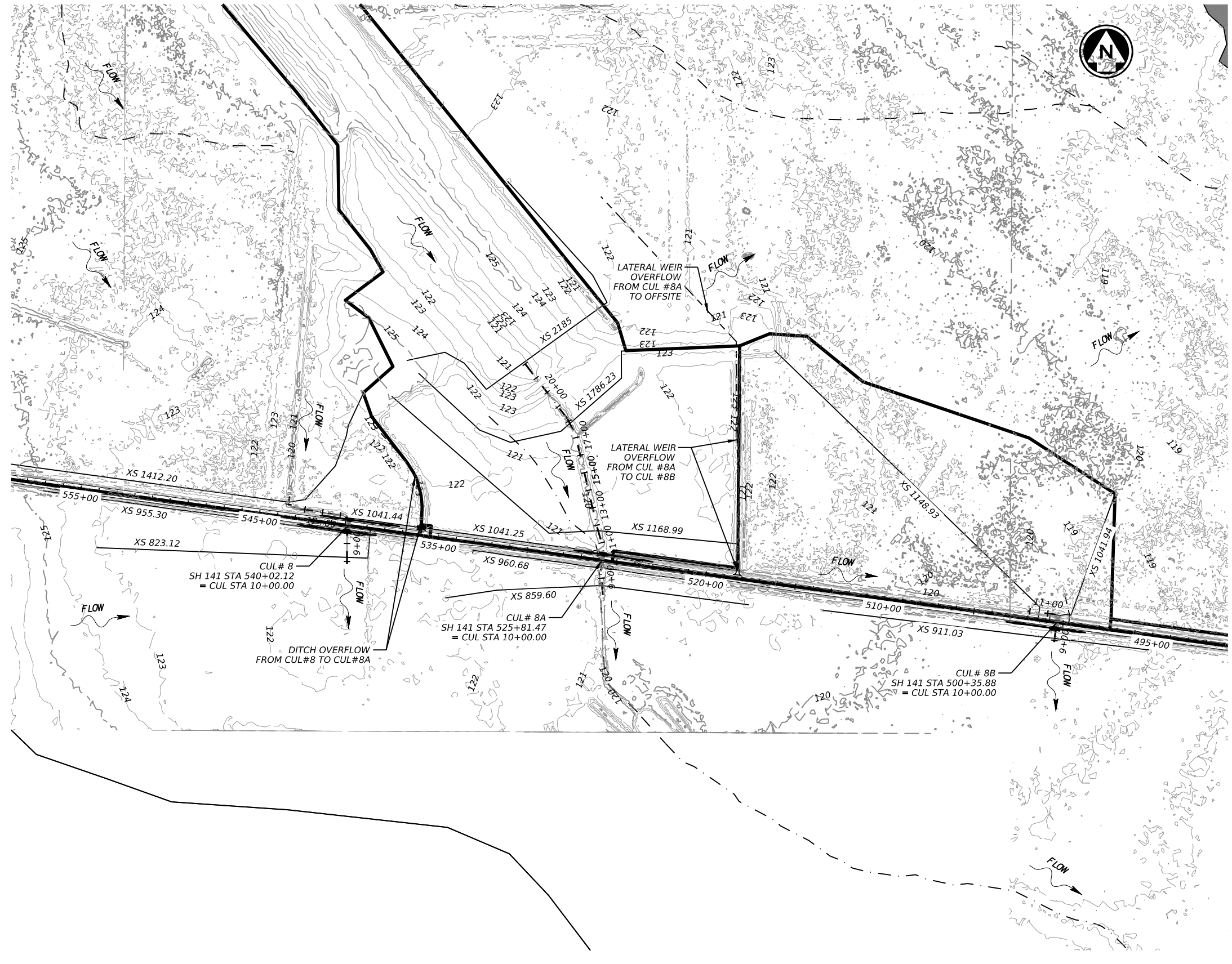
NOTES:

ELEVATIONS SHOWN ARE FROM USGS 3D ELEVATION PROGRAM (3DEP) LIDAR DATA (1/3 ARC-SECOND DEMs).

CROSS-SECTIONS WERE DEVELOPED FROM SITE SURVEY BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4205) NAD 83 WITH A SURFACE ADJUSTMENT FACTOR OF 1.000063. ALL ELEVATIONS BASED ON NAVD88 (GEOID12A). FOR AREAS OUTSIDE THE EXISTING SURVEY, THE USGS 3D ELEVATION LIDAR DATA WAS USED FOR ADDITIONAL DATA.

HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3).

FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.



David P. Neumann, P.E.

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 TBPE Firm Reg. No. 10488

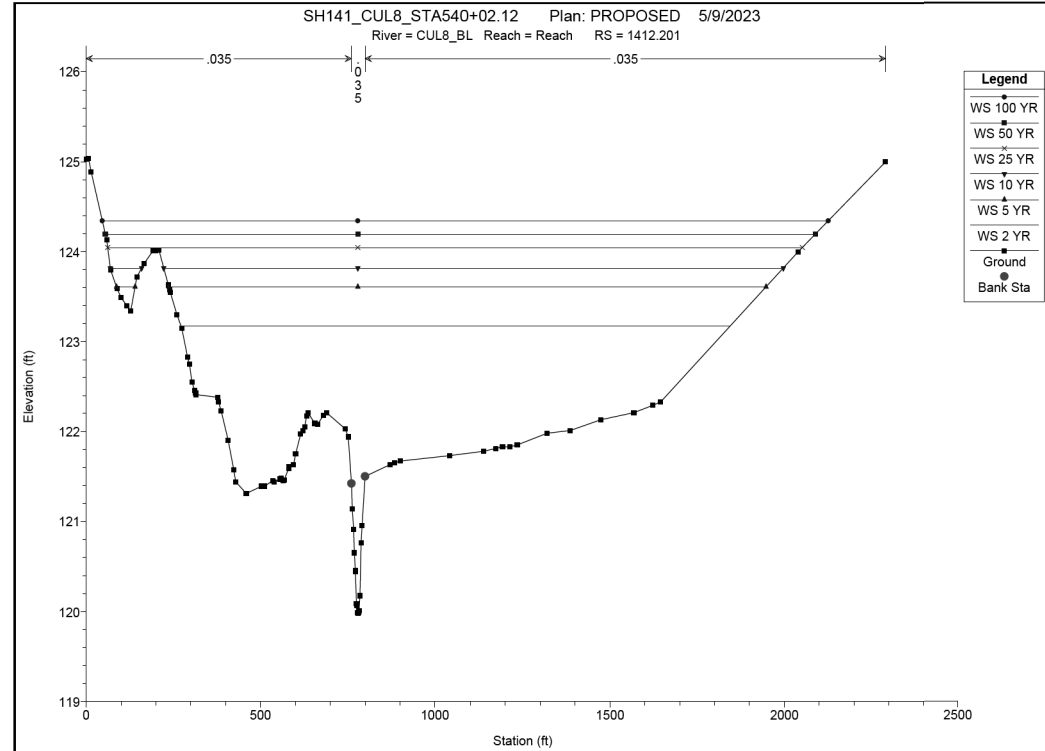
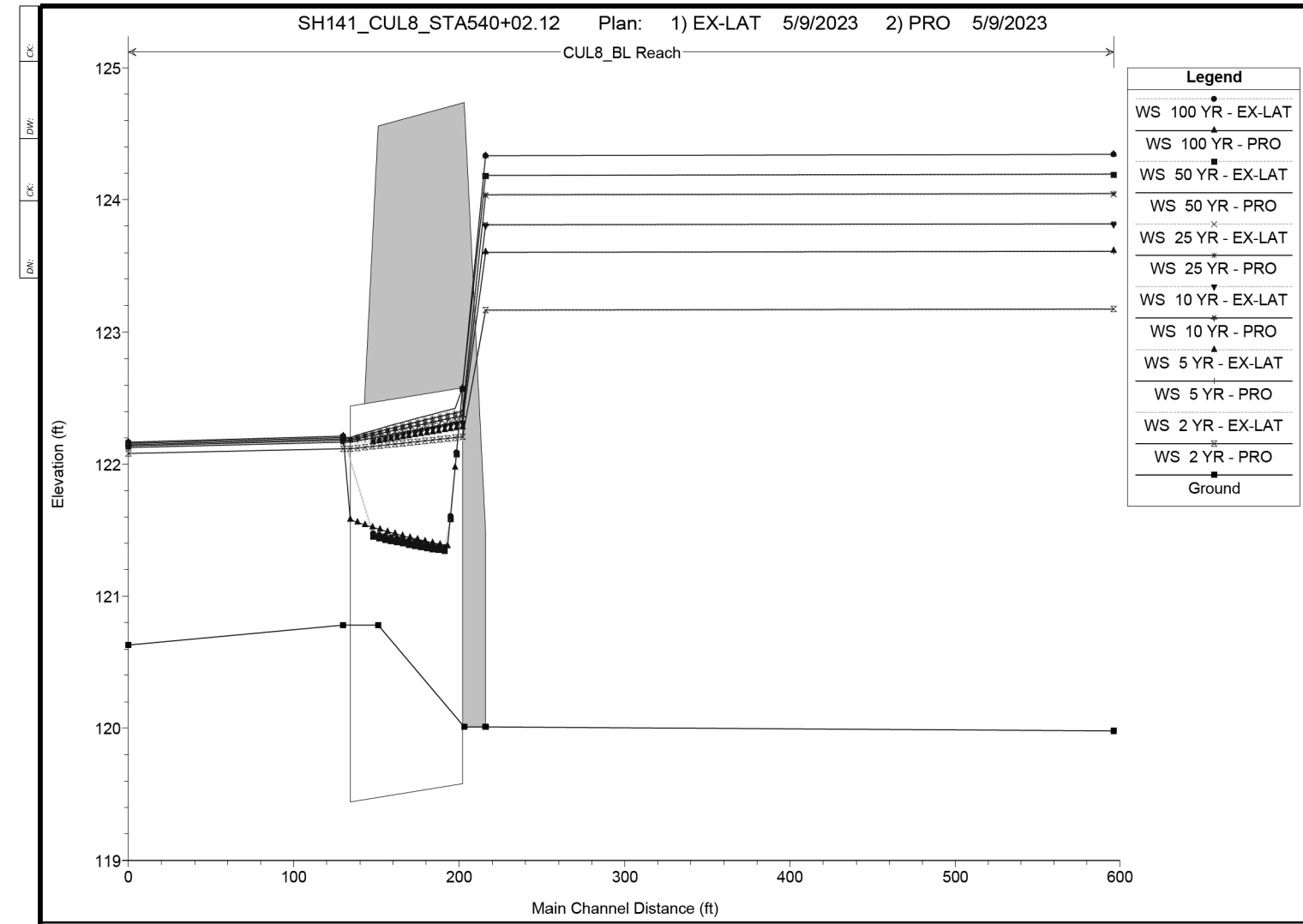


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**HYDRAULIC DATA SHEET
 (CULVERTS # 8, 8A, & 8B)**

SHEET 3 OF 8

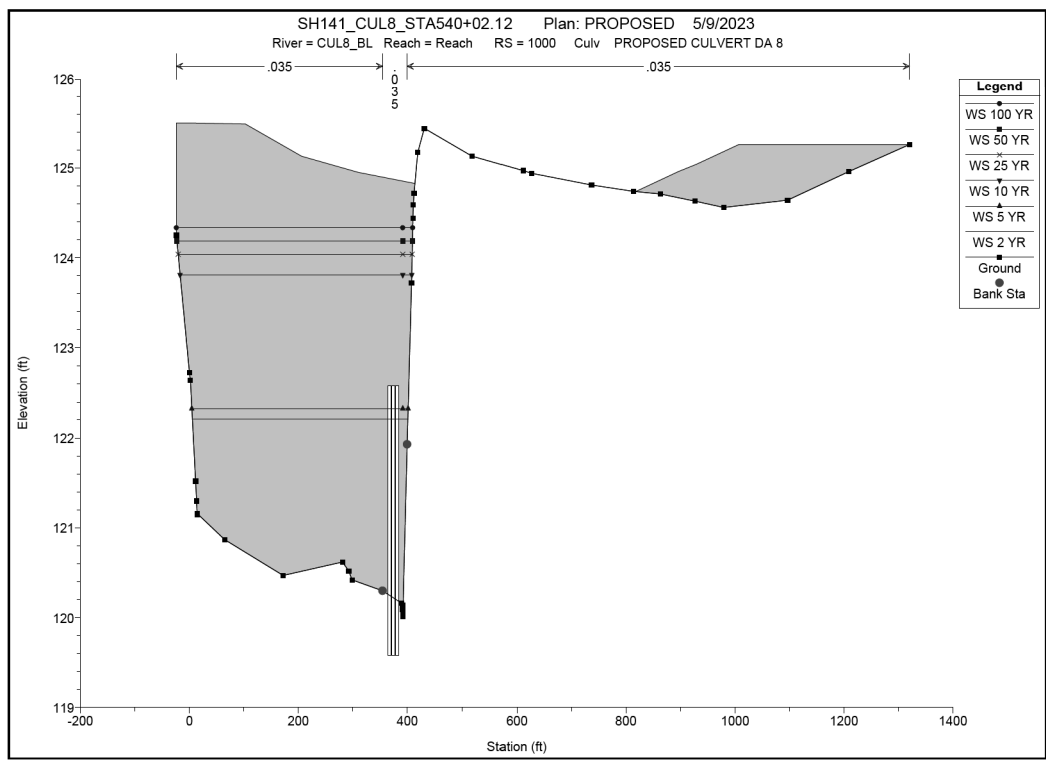
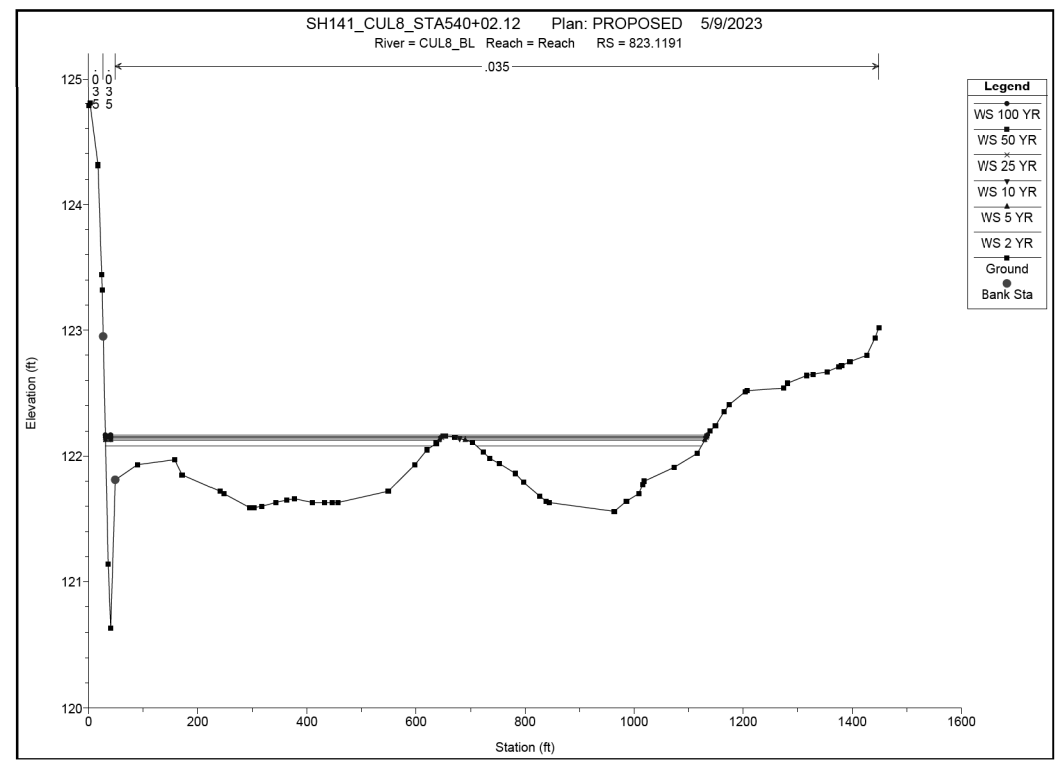
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	164	



NOTES:

HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3).

FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.



STATE OF TEXAS

DAVID P. NEUMANN

83345

PROFESSIONAL ENGINEER

David P. Neumann, P.E.

2023.07.28 01:25:47-05'00'

LOCHNER

TBPE Firm Reg. No. 10488

Texas Department of Transportation

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HYDRAULIC DATA SHEET

(CULVERT # 8, STA 540+02.12)

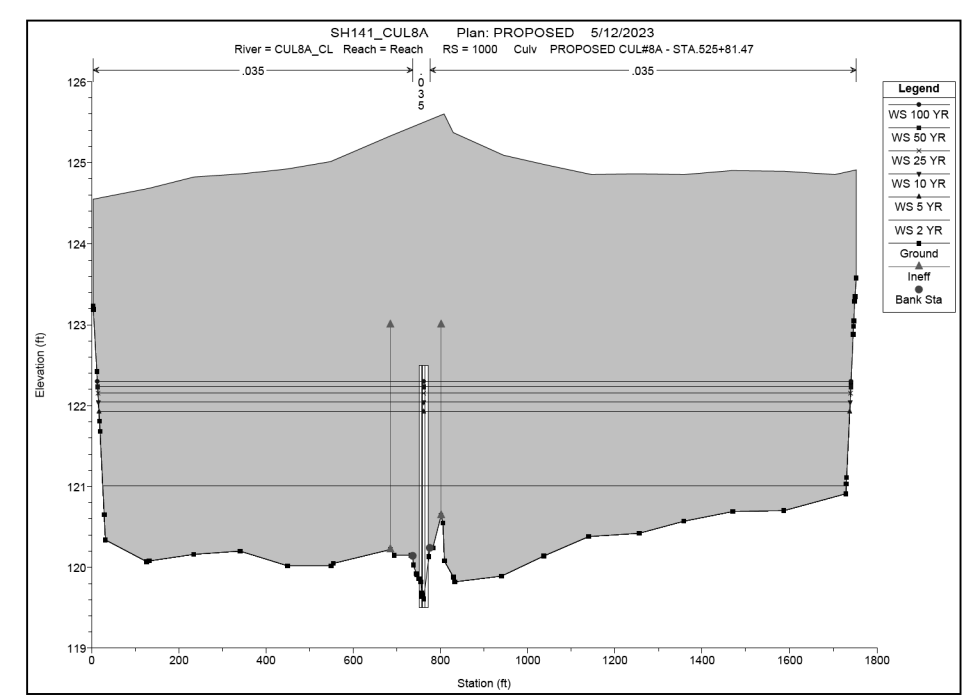
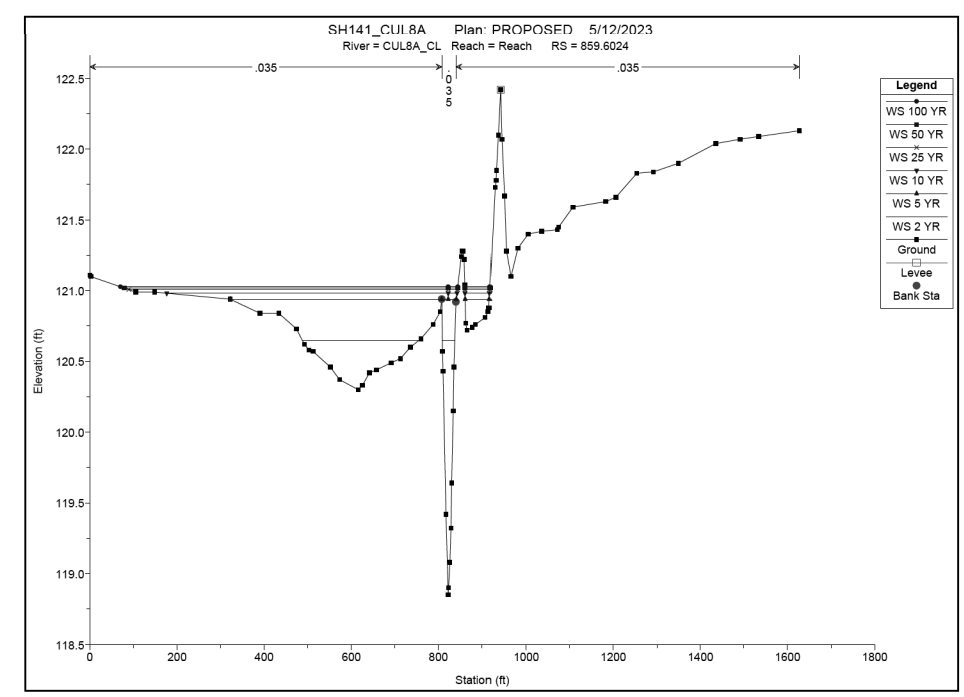
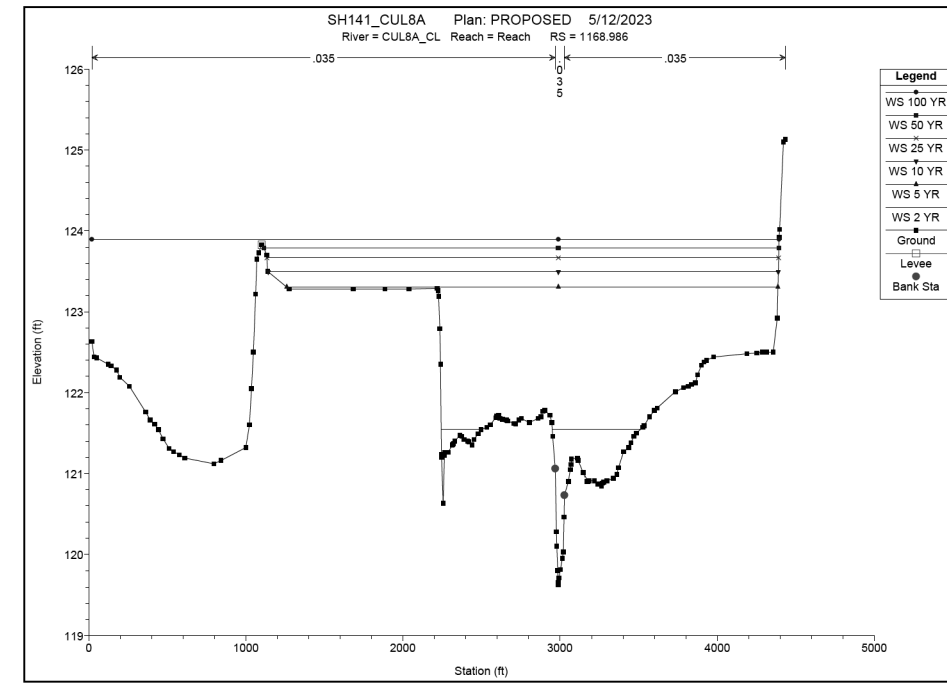
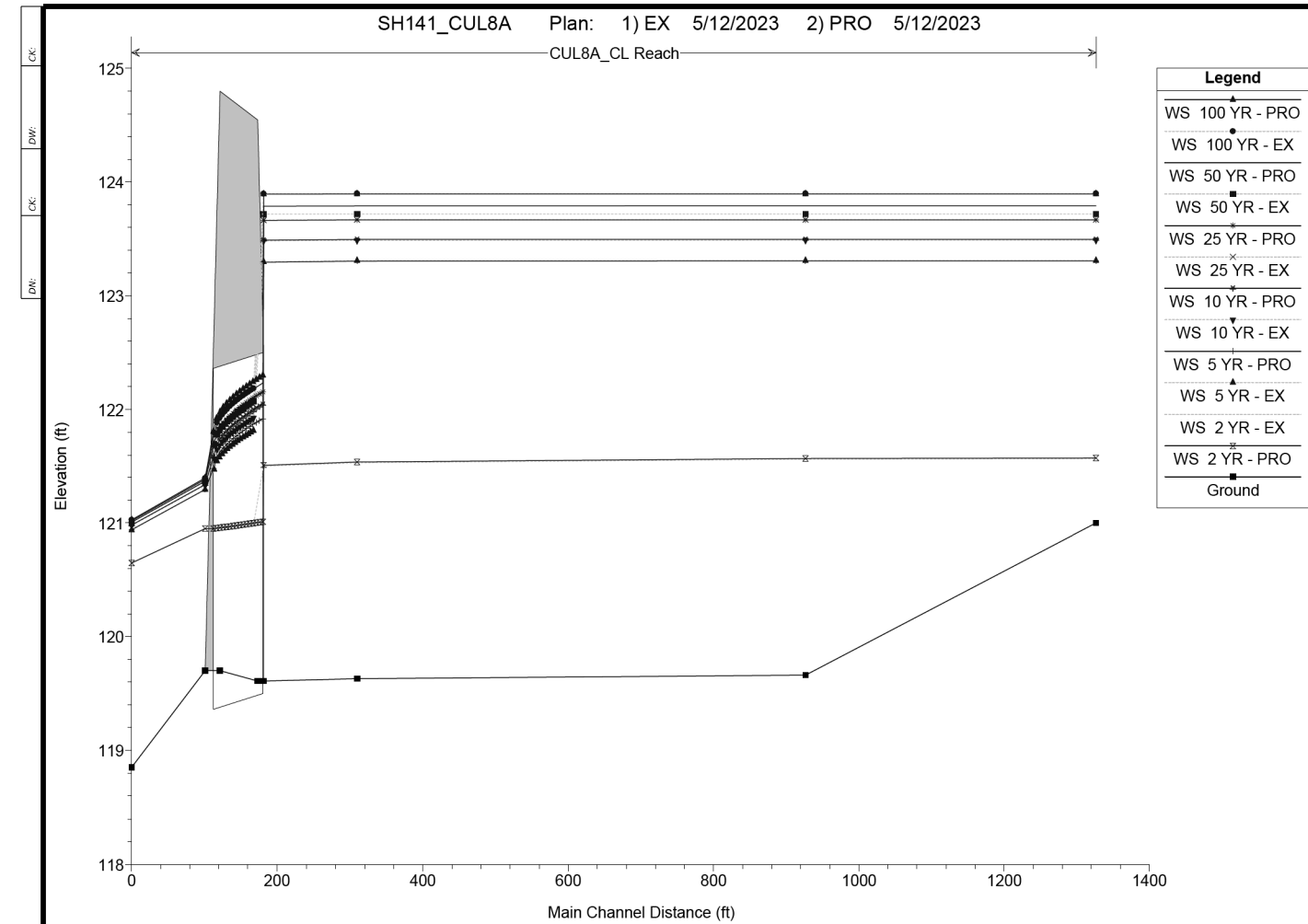
(NBI #: 16-137-0-0383-04-001)

SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	165	

DATE: 7/26/2023 10:11:53 AM

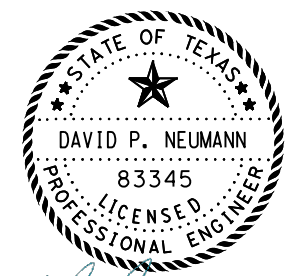
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NOTES:

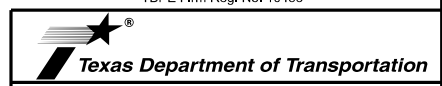
HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3).

FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.



David P. Neumann, P.E.
2023.07.28 01:26:09-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



HYDRAULIC DATA SHEET
(CULVERT # 8A, STA 525+81.47)
(NBI #: 16-137-0-0383-04-002)

SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		167

DATE: 7/26/2023 10:12:07 AM
FILE: c:\pw_working\lochner-pw-01\dms37363\SH141_CULVERT H&H DATA.dgn

HEC-RAS OUTPUT

Table with columns: Reach, River Sta, Profile, Plan, Q Total, Min Ch El, W.S. Elev, Crit W.S., E.G. Elev, E.G. Slope, Vel Chnl, Flow Area, Top Width, Froude # Chl. Contains multiple rows of data for various reaches and profiles.

HEC-RAS OUTPUT (LATERAL OUTFLOW)

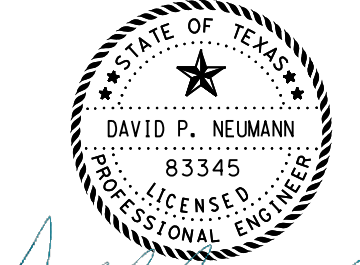
Table with columns: Reach, River Sta, Profile, Plan, Q US, Q Leaving Total, Q DS, Q Weir, Q Gates, Wr Top Width, Weir Max Depth. Contains data for lateral outflow reaches.

Table with columns: Reach, River Sta, Profile, Plan, Weir Avg Depth, Min El Weir Flow, E.G. US, W.S. US, E.G. DS, W.S. DS. Contains data for weir flow characteristics.

Table with columns: Reach, River Sta, Profile, Plan, Weir Avg Depth, Min El Weir Flow, E.G. US, W.S. US, E.G. DS, W.S. DS. Continuation of weir flow data for different reaches.

NOTES: HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3). FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.

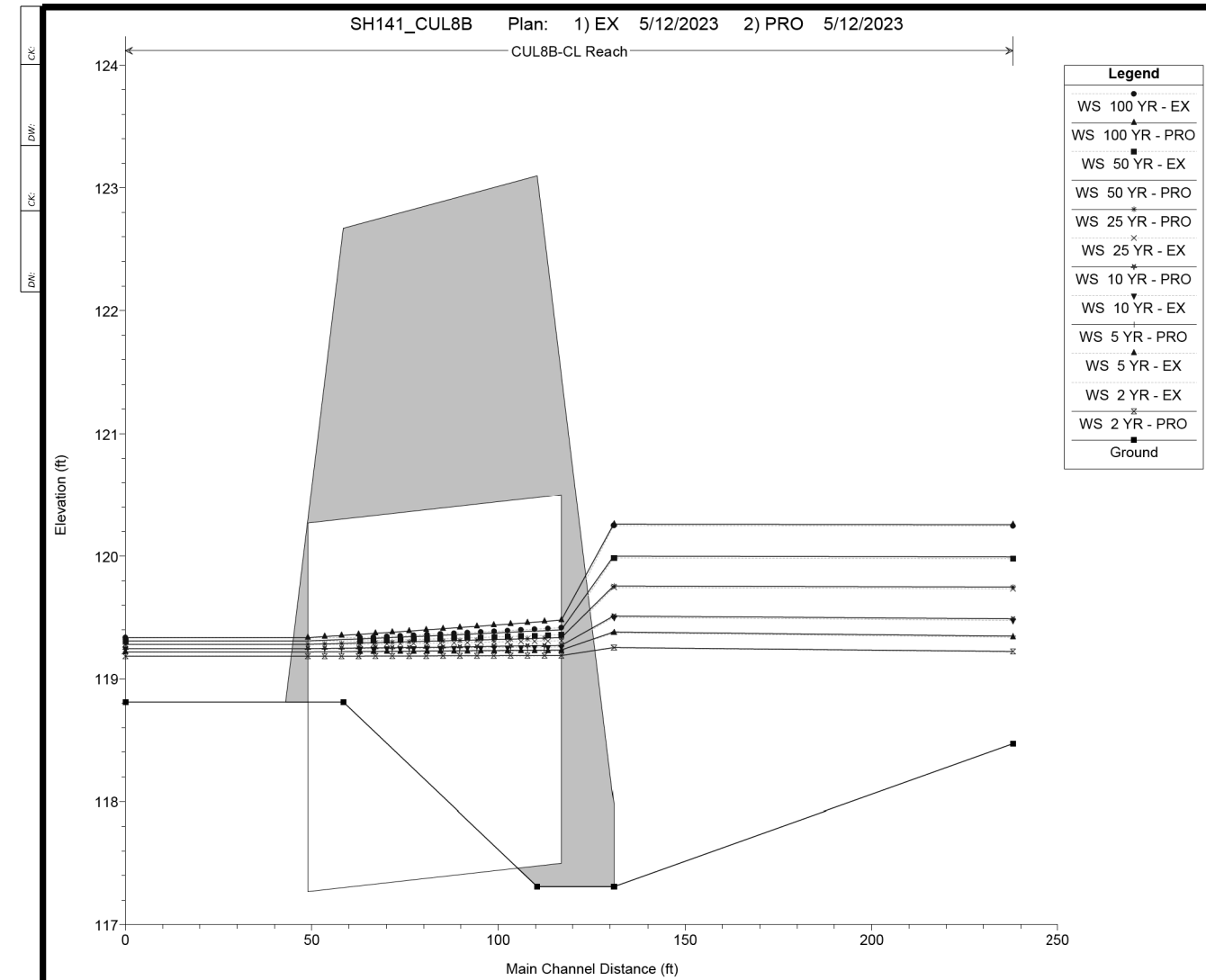
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2023.07.28 01:26:20-05'00'



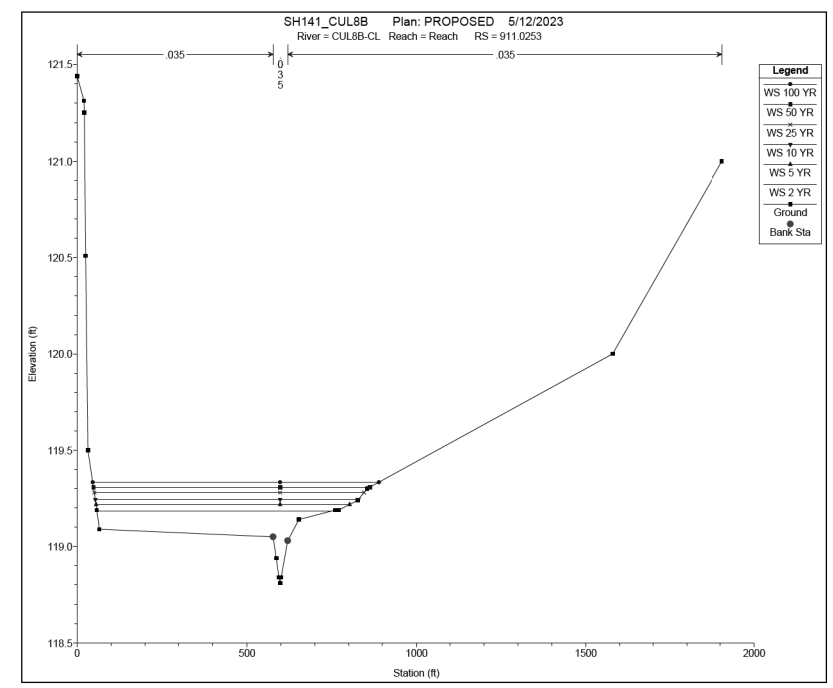
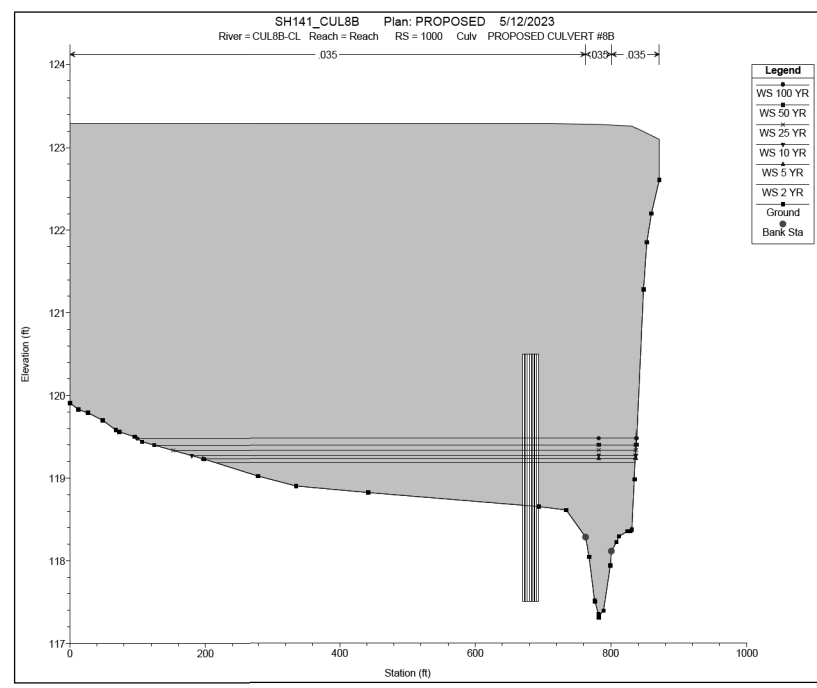
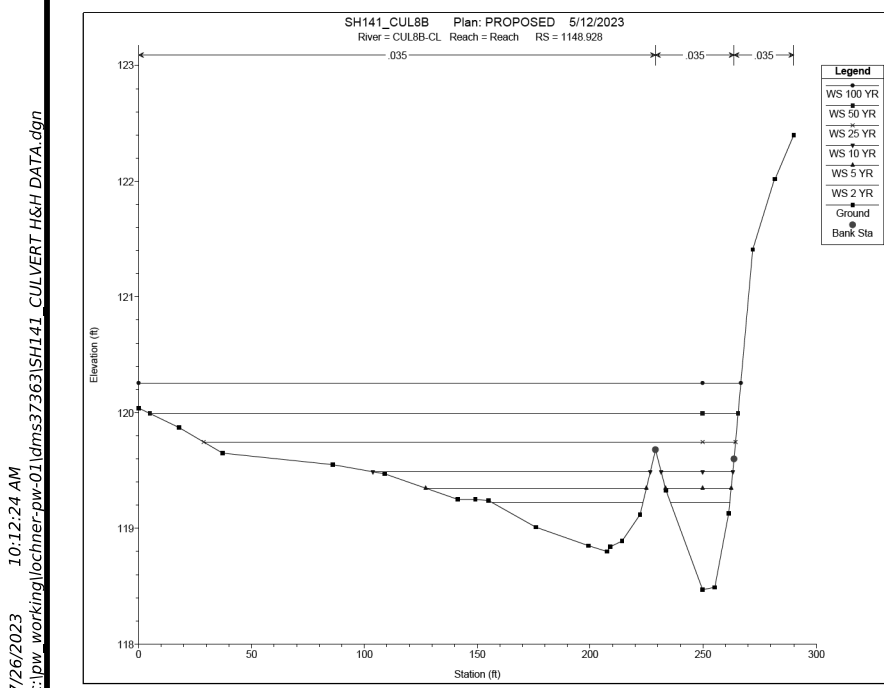
HYDRAULIC DATA SHEET (CULVERT # 8A, STA 525+81.47) (NBI #: 16-137-0-0383-04-002) SHEET 7 OF 8. Includes project details table with columns: CONT, SECT, JOB, HIGHWAY, DIST, COUNTY, SHEET NO., CRP.



HEC-RAS OUTPUT

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach	1148.928	2 YR	EX	56.00	118.47	119.22	119.15	119.29	0.009975	2.49	27.91	92.44	0.65
Reach	1148.928	2 YR	PRO	56.00	118.47	119.22	119.15	119.29	0.009646	2.46	28.26	92.93	0.64
Reach	1148.928	5 YR	EX	86.00	118.47	119.34	119.22	119.42	0.009487	2.68	41.35	125.43	0.65
Reach	1148.928	5 YR	PRO	86.00	118.47	119.35	119.22	119.42	0.008886	2.61	42.40	126.91	0.63
Reach	1148.928	10 YR	EX	112.00	118.47	119.48	119.33	119.54	0.006029	2.37	60.23	150.59	0.53
Reach	1148.928	10 YR	PRO	112.00	118.47	119.49	119.33	119.54	0.005611	2.31	62.17	154.65	0.52
Reach	1148.928	25 YR	EX	154.00	118.47	119.73	119.40	119.77	0.002640	1.88	111.20	234.37	0.37
Reach	1148.928	25 YR	PRO	154.00	118.47	119.75	119.40	119.78	0.002415	1.82	114.57	235.89	0.35
Reach	1148.928	50 YR	EX	190.00	118.47	119.98	119.45	120.00	0.001106	1.45	171.94	259.04	0.25
Reach	1148.928	50 YR	PRO	190.00	118.47	119.99	119.45	120.01	0.001039	1.42	175.68	260.63	0.24
Reach	1148.928	100 YR	EX	226.00	118.47	120.25	119.50	120.26	0.000527	1.17	242.71	266.76	0.18
Reach	1148.928	100 YR	PRO	226.00	118.47	120.26	119.50	120.27	0.000508	1.15	245.51	266.81	0.18
Reach	1041.942	2 YR	EX	56.00	117.31	119.25	118.04	119.25	0.000028	0.30	338.58	647.84	0.04
Reach	1041.942	2 YR	PRO	56.00	117.31	119.25	118.04	119.26	0.000027	0.30	340.51	649.15	0.04
Reach	1041.942	5 YR	EX	86.00	117.31	119.37	118.22	119.38	0.000037	0.37	421.37	701.90	0.05
Reach	1041.942	5 YR	PRO	86.00	117.31	119.38	118.22	119.38	0.000036	0.36	425.75	704.85	0.05
Reach	1041.942	10 YR	EX	112.00	117.31	119.50	118.38	119.50	0.000037	0.38	513.06	742.62	0.05
Reach	1041.942	10 YR	PRO	112.00	117.31	119.51	118.38	119.51	0.000035	0.38	520.02	746.16	0.05
Reach	1041.942	25 YR	EX	154.00	117.31	119.74	118.53	119.74	0.000029	0.37	700.74	801.08	0.05
Reach	1041.942	25 YR	PRO	154.00	117.31	119.76	118.53	119.76	0.000028	0.36	711.56	804.44	0.04
Reach	1041.942	50 YR	EX	190.00	117.31	119.98	118.59	119.98	0.000021	0.34	900.44	840.46	0.04
Reach	1041.942	50 YR	PRO	190.00	117.31	120.00	118.59	120.00	0.000020	0.33	912.37	840.54	0.04
Reach	1041.942	100 YR	EX	226.00	117.31	120.25	118.80	120.25	0.000015	0.30	1123.60	841.93	0.03
Reach	1041.942	100 YR	PRO	226.00	117.31	120.26	118.80	120.26	0.000014	0.30	1132.38	841.99	0.03
Reach	1000												
Reach	911.0253	2 YR	EX	56.00	118.81	119.18	119.14	119.19	0.005006	1.22	74.36	686.66	0.42
Reach	911.0253	2 YR	PRO	56.00	118.81	119.18	119.14	119.19	0.005006	1.22	74.36	686.66	0.42
Reach	911.0253	5 YR	EX	86.00	118.81	119.22	119.17	119.23	0.005001	1.33	100.24	747.25	0.43
Reach	911.0253	5 YR	PRO	86.00	118.81	119.22	119.17	119.23	0.005001	1.33	100.24	747.25	0.43
Reach	911.0253	10 YR	EX	112.00	118.81	119.24	119.18	119.26	0.005001	1.41	120.05	775.72	0.44
Reach	911.0253	10 YR	PRO	112.00	118.81	119.24	119.18	119.26	0.005001	1.41	120.05	775.72	0.44
Reach	911.0253	25 YR	EX	154.00	118.81	119.28	119.20	119.30	0.005007	1.51	148.30	795.14	0.45
Reach	911.0253	25 YR	PRO	154.00	118.81	119.28	119.20	119.30	0.005007	1.51	148.30	795.14	0.45
Reach	911.0253	50 YR	EX	190.00	118.81	119.31	119.22	119.33	0.005003	1.59	170.53	814.81	0.45
Reach	911.0253	50 YR	PRO	190.00	118.81	119.31	119.22	119.33	0.005003	1.59	170.53	814.81	0.45
Reach	911.0253	100 YR	EX	226.00	118.81	119.33	119.23	119.36	0.005002	1.66	191.84	843.62	0.46
Reach	911.0253	100 YR	PRO	226.00	118.81	119.33	119.23	119.36	0.005002	1.66	191.84	843.62	0.46

NOTES:
 HYDRAULIC DESIGN PERFORMED UTILIZING HEC-RAS (V6.1.3).
 FLOW REGIME IS SUBCRITICAL. THE STARTING TAILWATER ELEVATION BOUNDARY CONDITION WAS BASED ON NORMAL DEPTH AT THE MOST DOWNSTREAM CROSS-SECTION. THE INITIAL SLOPE UTILIZED WAS THE CHANNEL SLOPE ADJUSTED TO BE REPRESENTATIVE OF THE ENERGY GRADE LINE.



STATE OF TEXAS
 DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER
 David P. Neumann, P.E.
 2023.07.28 01:26:30-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488
 Texas Department of Transportation
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HYDRAULIC DATA SHEET
 (CULVERT # 8B, STA 500+35.88)
 (NBI #: 16-137-0-0383-04-003)
 SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		169

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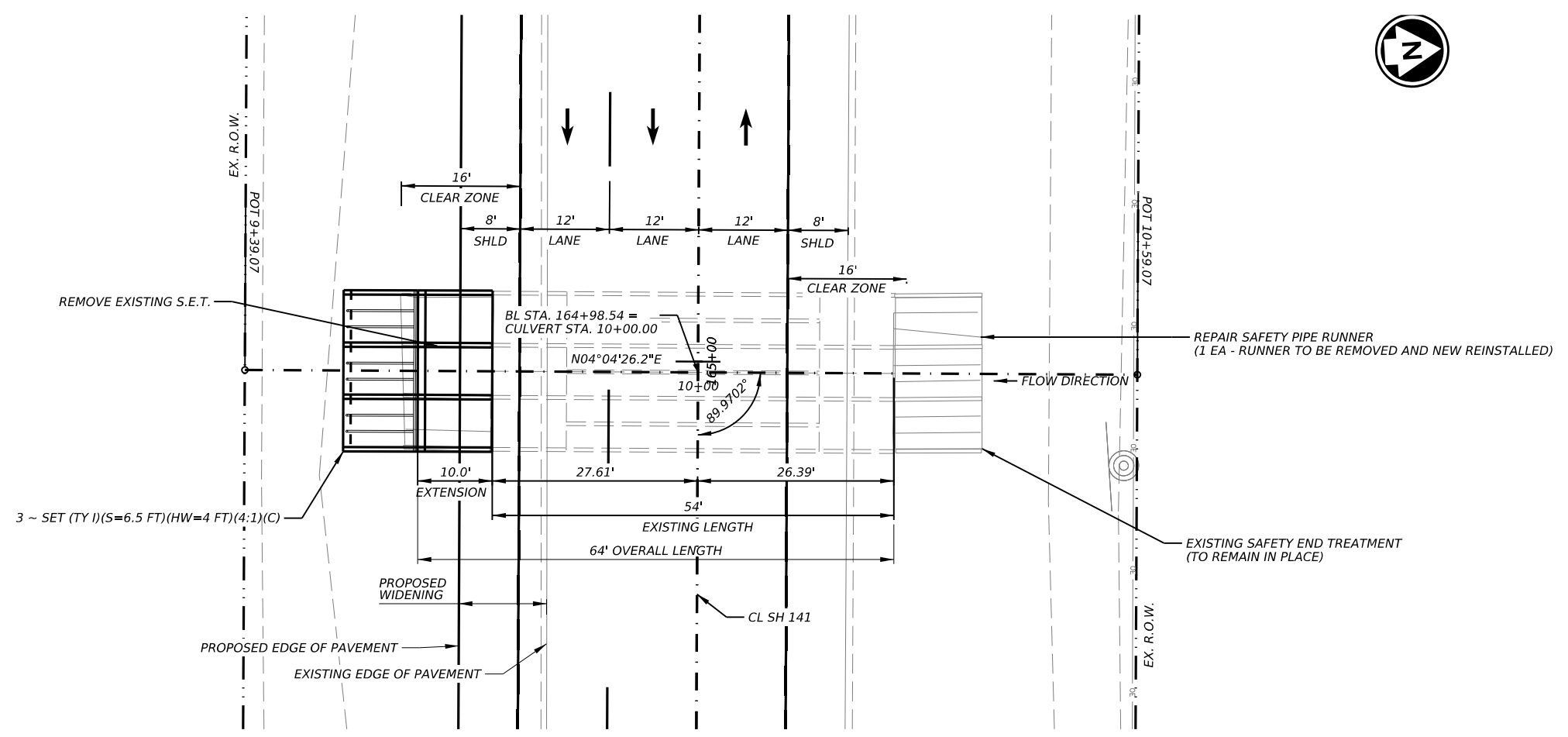
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

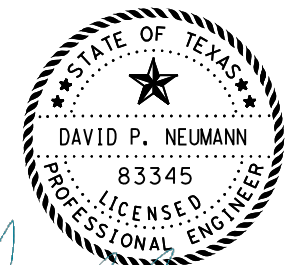
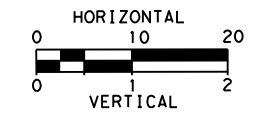
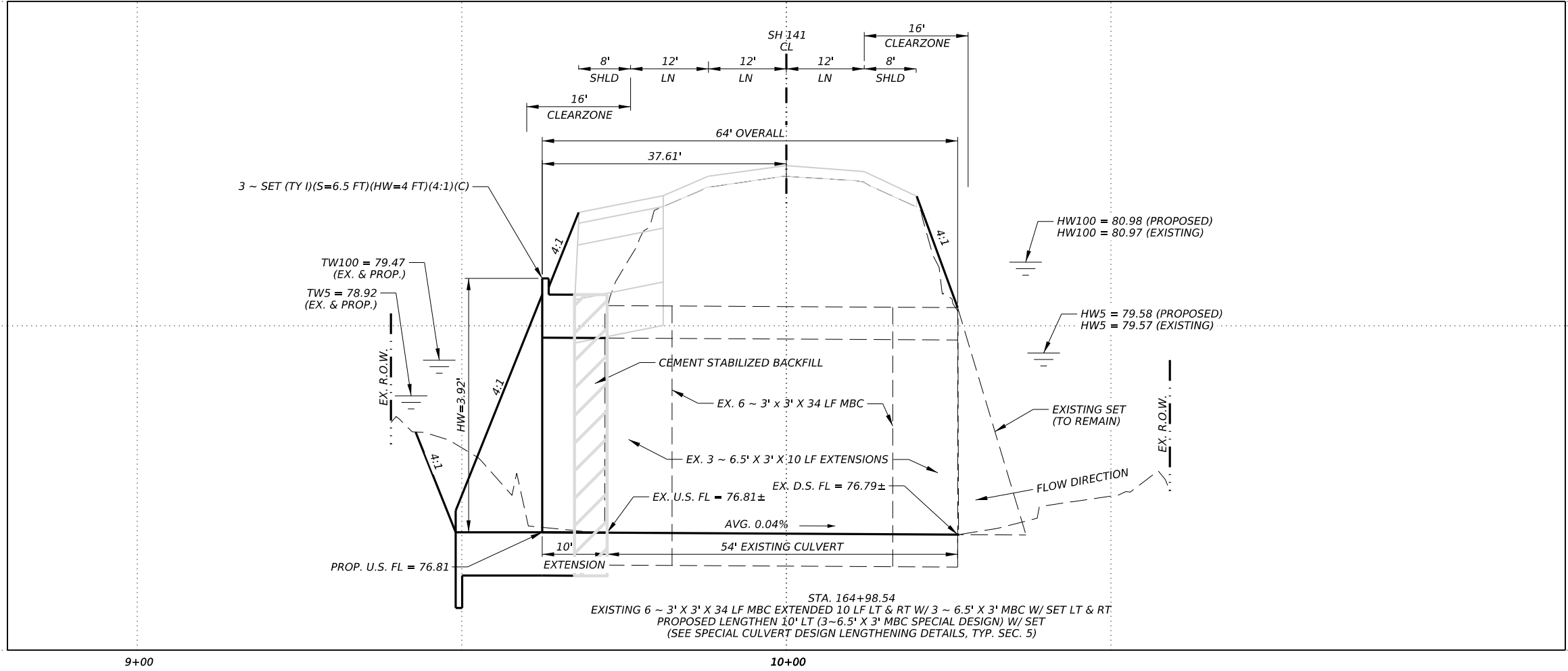
- ← DIRECTIONAL TRAFFIC FLOW ARROWS
- - - EXISTING RIGHT OF WAY



NBI #: 16-137-0-0383-04-006
ORIG. DESIGN LOADING: H-20

85

85



David P. Neumann, P.E.
2023.07.28 00:17:58-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



**CULVERT
PLAN & PROFILE
(STA. 164+98.54)**

N.B.I. NO. 16-137-0-0383-04-006

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	170	

DATE: 7/28/2023 12:16:49 AM
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75

75

9+00

10+00

STA. 164+98.54
EXISTING 6' x 3' x 3' x 34 LF MBC EXTENDED 10' LF LT & RT W/ 3' x 6.5' x 3' MBC SET LT & RT
PROPOSED LENGTHEN 10' LT (3' x 6.5' x 3' MBC SPECIAL DESIGN) W/ SET
(SEE SPECIAL CULVERT DESIGN LENGTHENING DETAILS, TYP. SEC. 5)

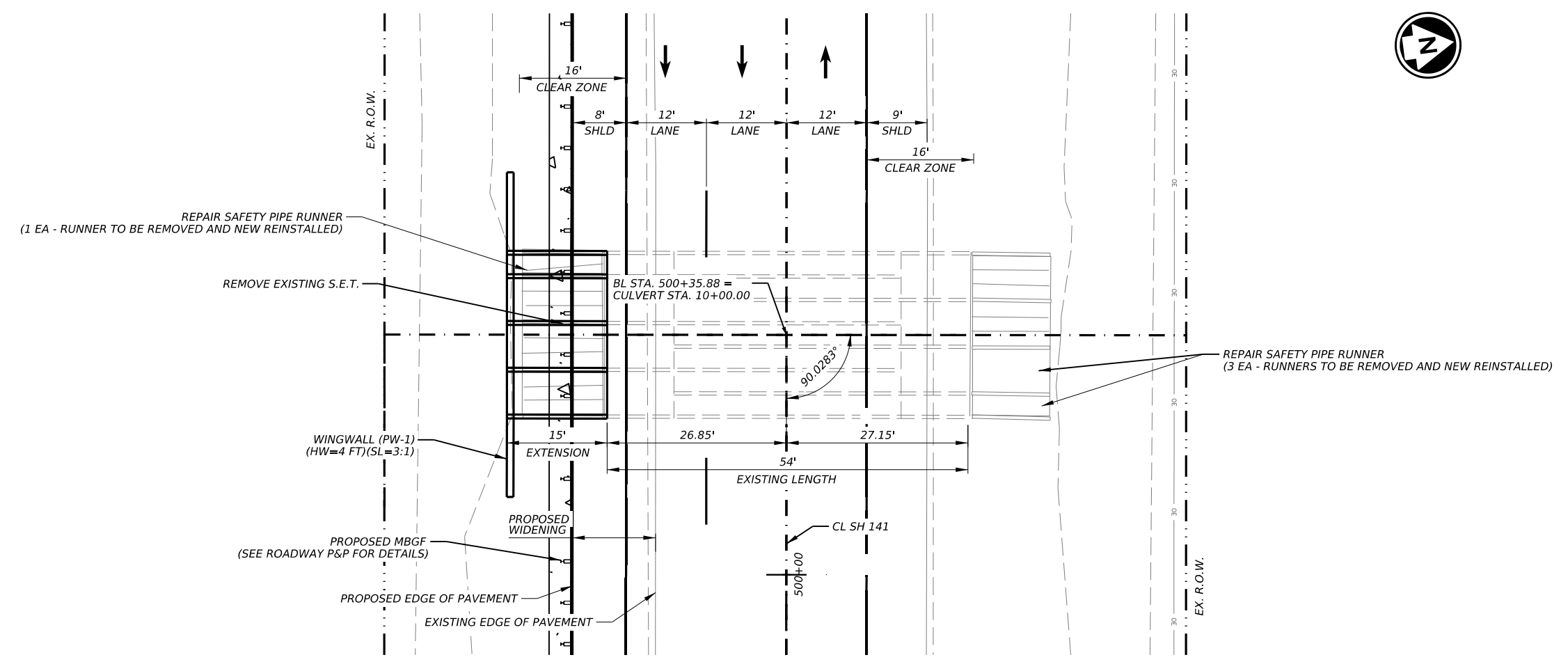
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NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- ← DIRECTIONAL TRAFFIC FLOW ARROWS
- - - EXISTING RIGHT OF WAY



NBI #: 16-137-0-0383-04-003
ORIG. DESIGN LOADING: H-20

130

130

125

125

120

120

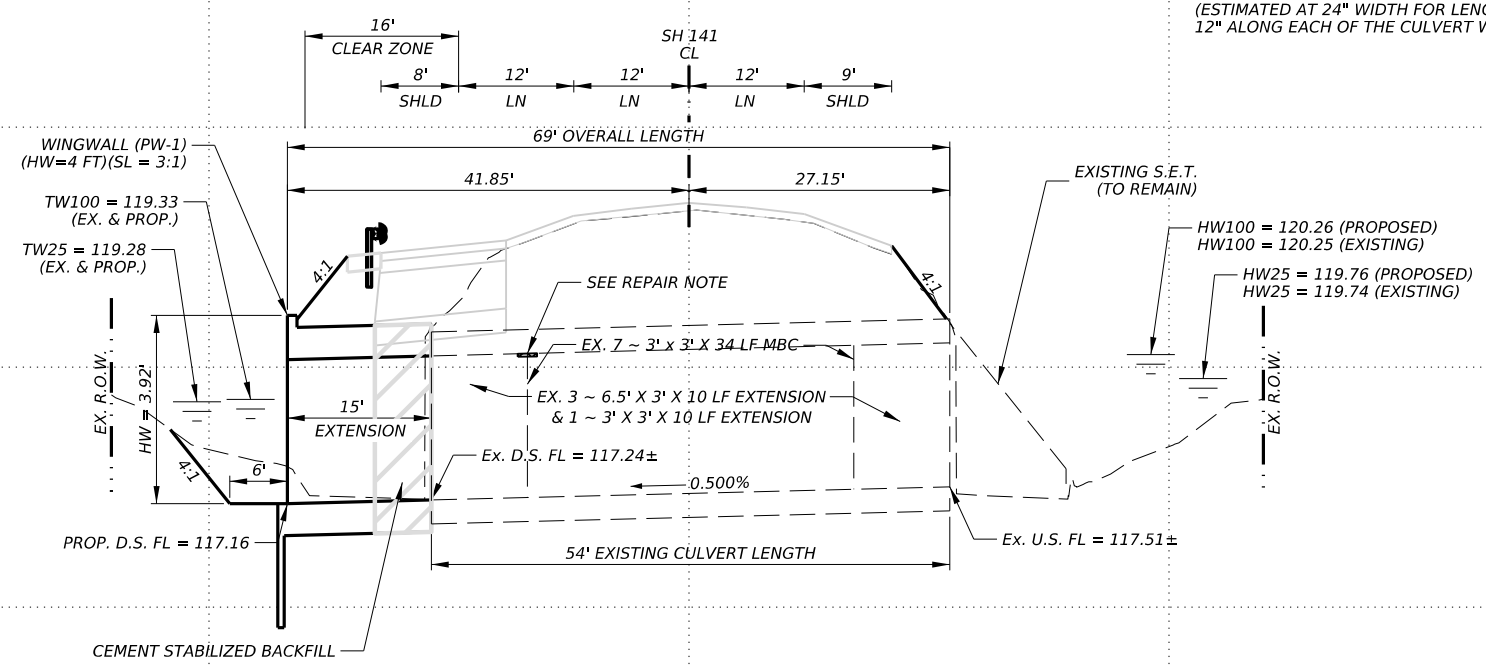
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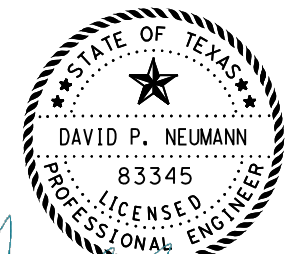
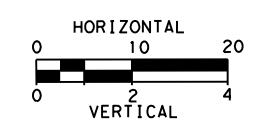
110

110

REPAIR NOTE:
REPAIR MINOR DELAMINATION OF UNDERSIDE OF THE TOP SLAB AT THE EXISTING JOINT FROM A PREVIOUS WIDENING. REPAIR WILL BE BY ITEM 786-6001 "CARBON FIBER REINFORCED POLYMER PROTECTION" FOR 70 SF. (ESTIMATED AT 24" WIDTH FOR LENGTH OF TOP SLAB EXTENDING DOWN 12" ALONG EACH OF THE CULVERT WALLS.)

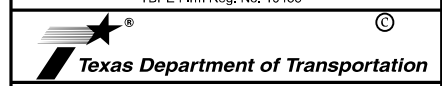


STA. 500+35.88
EXISTING 7 ~ 3' X 3' X 34 LF MBC EXTENDED 10 LF LT & RT W/ 3 ~ 6.5' X 3' MBC & 1 ~ 3' X 3' SBC W/ SET LT & RT
PROPOSED LENGTHEN 15' LT (3 ~ 6.5' X 3' & 1 ~ 3' X 3' MBC SPECIAL DESIGN) W/ PW-1
(SEE SPECIAL CULVERT DESIGN LENGTHENING DETAILS, TYP. SEC. 4)



David P. Neumann, P.E.
2023.07.28 00:12:48-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



**CULVERT
PLAN & PROFILE
(STA. 500+35.88)**

N.B.I. NO. 16-137-0-0383-04-003

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		171

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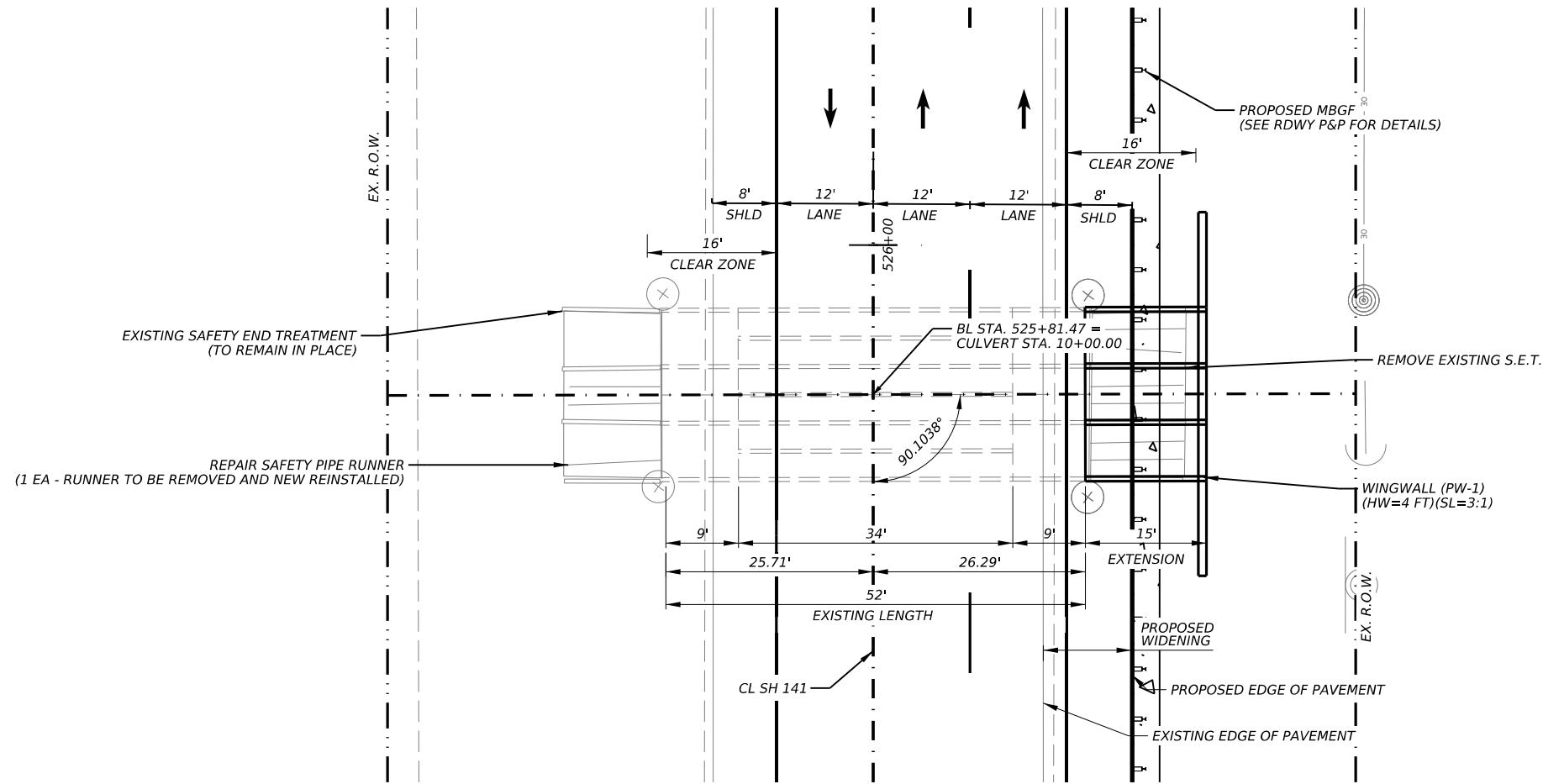
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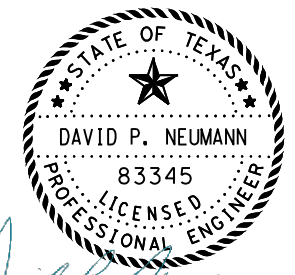
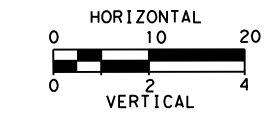
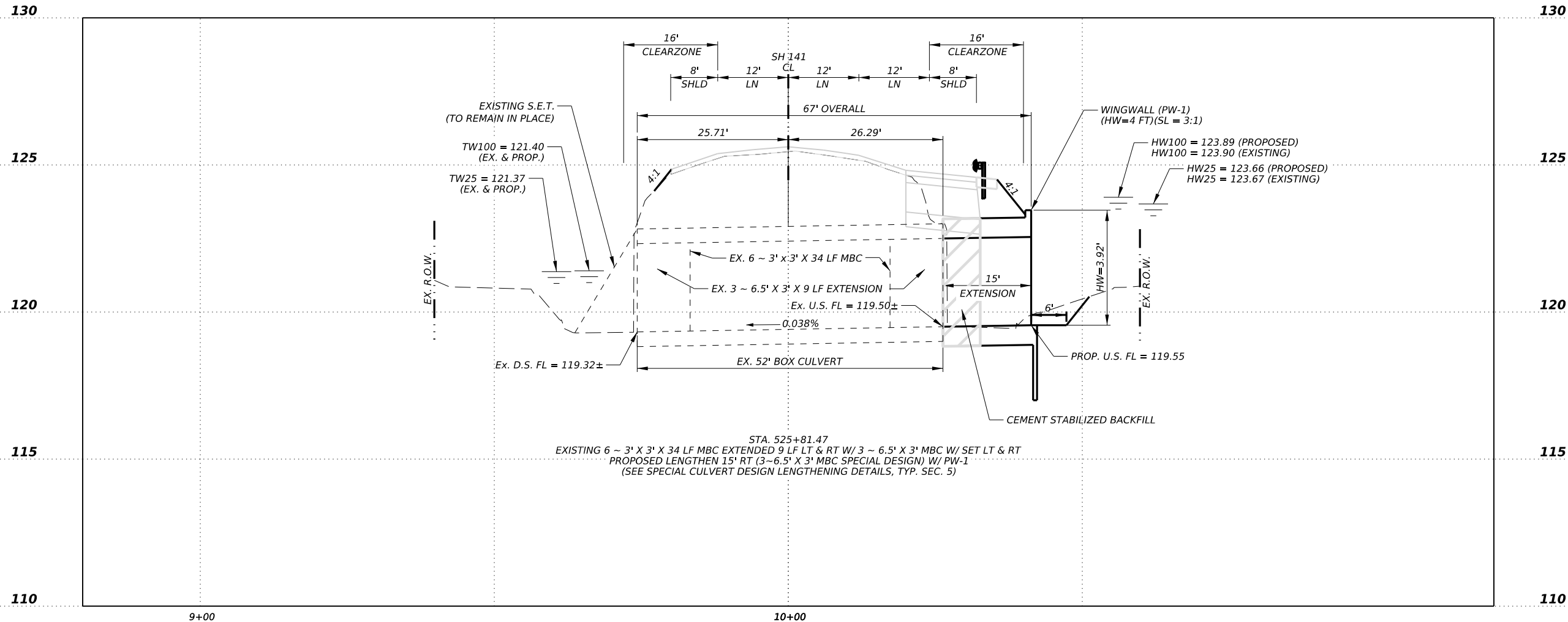
NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

- ← DIRECTIONAL TRAFFIC FLOW ARROWS
- - - EXISTING RIGHT OF WAY

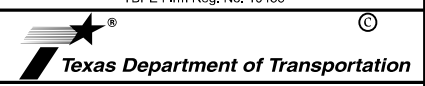


NBI #: 16-137-0-0383-04-002
ORIG. DESIGN LOADING: H-20



David P. Neumann, P.E.
2023.07.28 00:20:38-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



**CULVERT
PLAN & PROFILE
(STA. 525+81.47)**

N.B.I. NO. 16-137-0-0383-04-002

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	172	

DATE: 7/28/2023 12:20:10 AM
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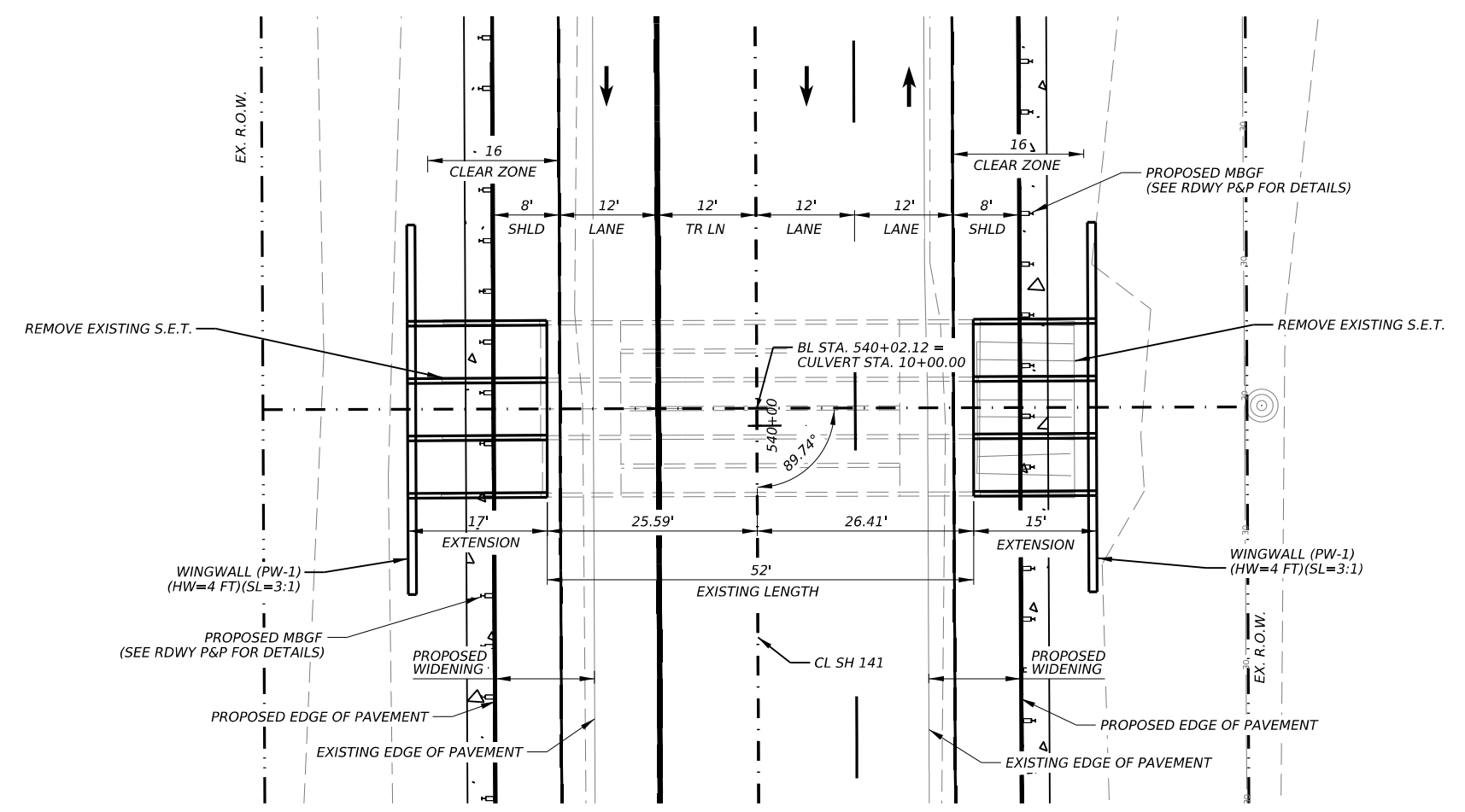
CK: DW: CK: DW: CK: DW: CK: DW:



NOTES:
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

LEGEND

← DIRECTIONAL TRAFFIC FLOW ARROWS
- - - EXISTING RIGHT OF WAY



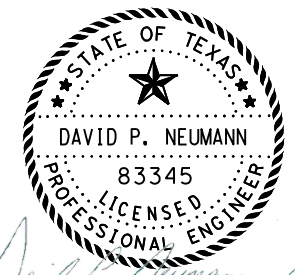
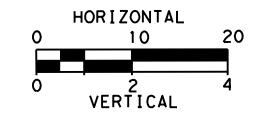
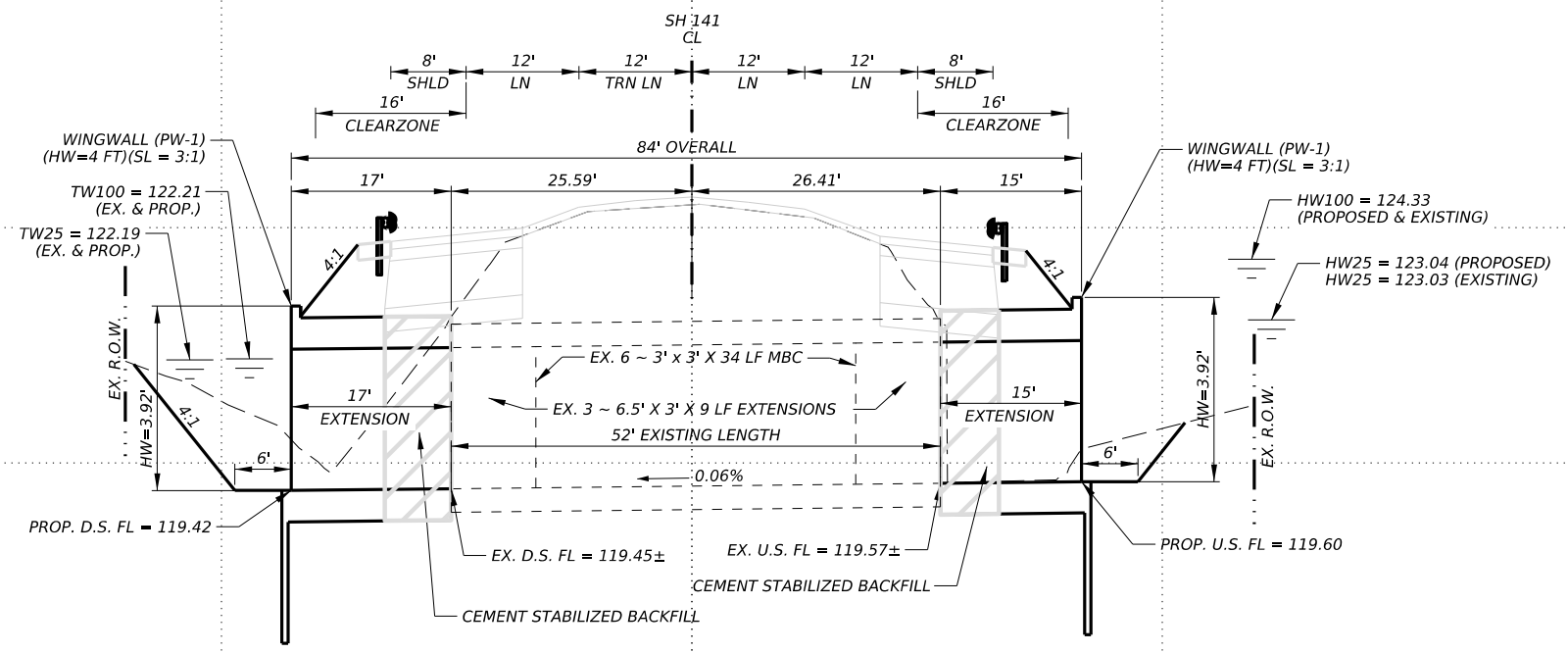
130

130

NBI #: 16-137-0-0383-04-001
ORIG. DESIGN LOADING: H-20

125
120
115
110

125
120
115
110



2023.07.28 00:18:35-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



**CULVERT
PLAN & PROFILE
(STA. 540+02.12)**

N.B.I. NO. 16-137-0-0383-04-001

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	173	

DATE: 7/27/2023 4:12:29 PM
FILE: c:\pw_working\lochner-pw-01\dms37363\SH141_CUL_PP_04.dgn

9+00

10+00

STA. 540+02.12
EXISTING 6 ~ 3' X 3' X 34 LF MBC EXTENDED 10 LF LT & RT W/ 3 ~ 6.5' X 3' MBC W/ SET LT & RT
PROPOSED LENGTHEN 17' LT & 15' RT (3 ~ 6.5' X 3' MBC SPECIAL DESIGN) W/ PW-1 LT & RT
(SEE SPECIAL CULVERT DESIGN LENGTHENING DETAILS, TYP. SEC. 5)



NOTES:

1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.

THE EXISTING BRIDGE IS AN 3 SPAN (15'-20'-15') SLAB SPAN WITH AN OVERALL LENGTH OF 50'-0" CONSTRUCTED IN 1957.

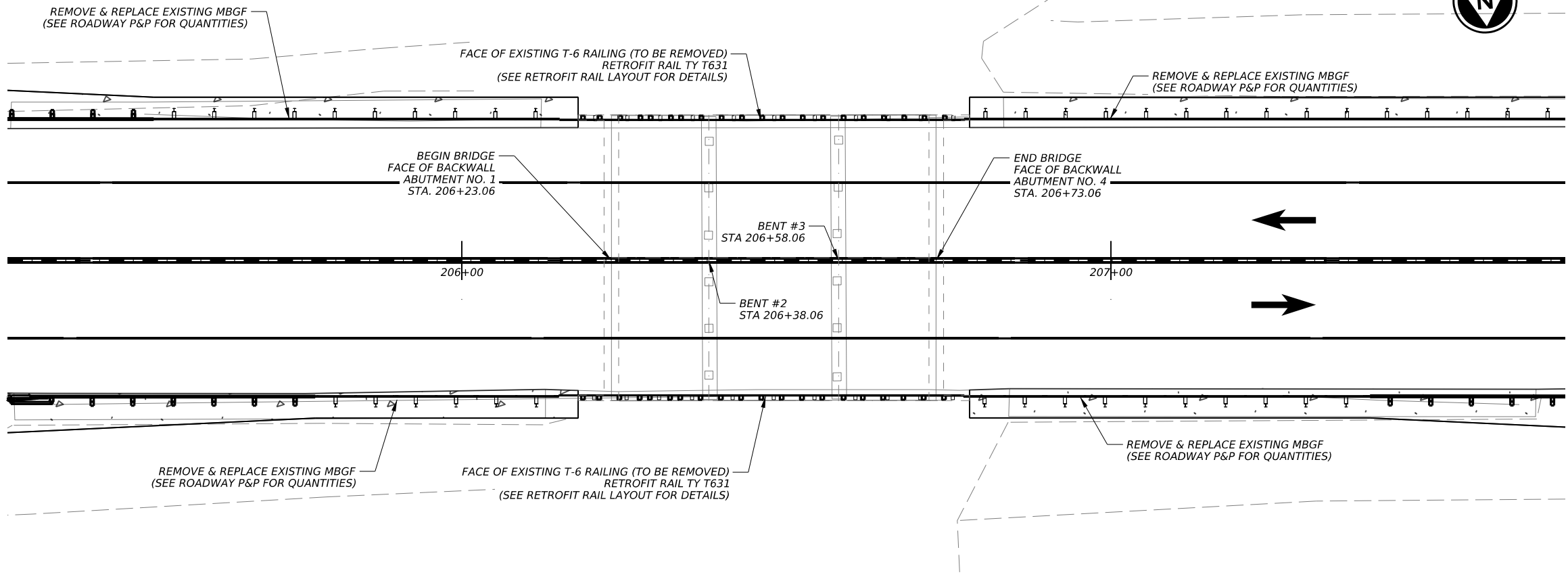
OVERALL WIDTH IS 44'-0" WITH A 42'-0" ROADWAY.

STATIONS PROVIDED ARE BASED ON SITE SURVEY. FIELD VERIFY ALL DIMENSIONS AND LOCATIONS PRIOR TO ORDERING MATERIALS.

EXISTING BRIDGE PLANS CAN BE PROVIDED UPON REQUEST.

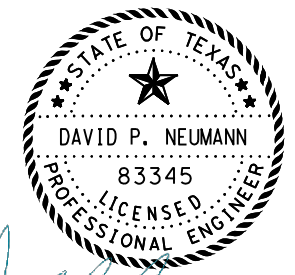
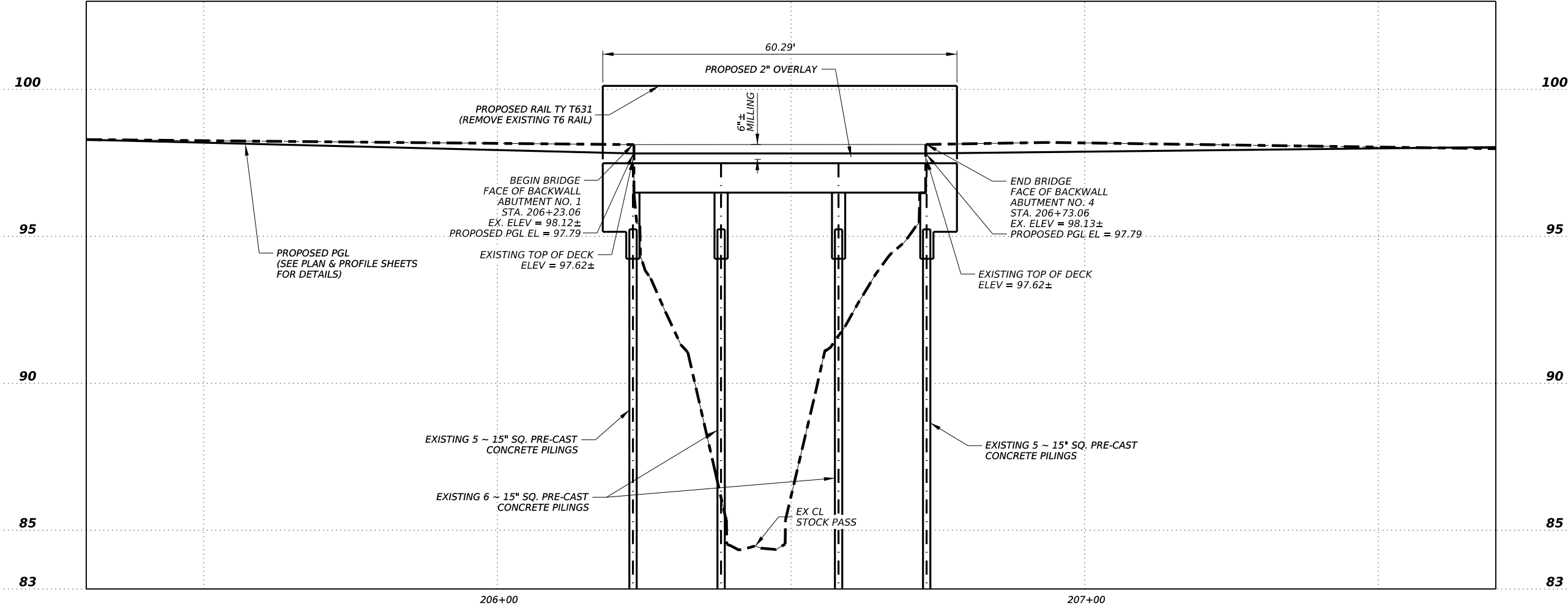
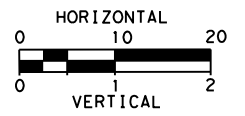
ORIGINAL DESIGN LOADING WAS H-20.

NBI #: 16-137-0-0383-04-010



LEGEND

← → DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.
 2023.07.28 01:28:19-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488



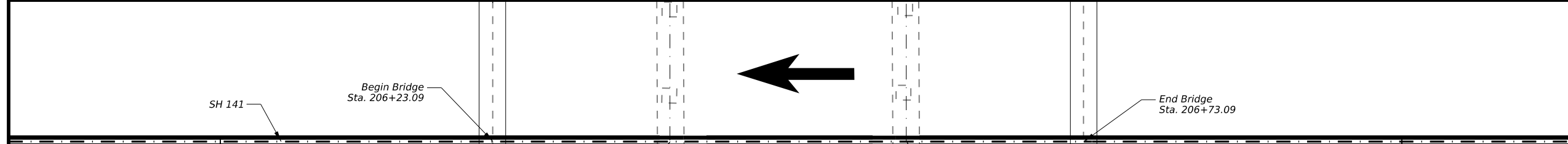
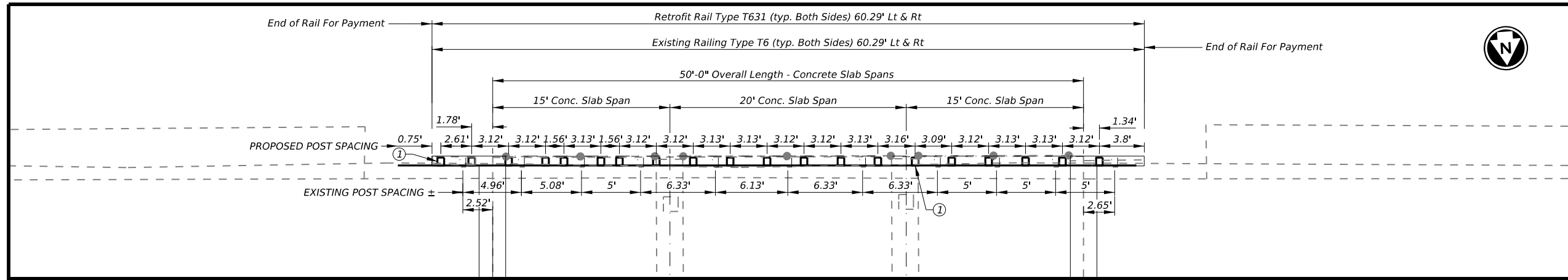
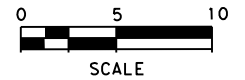
BRIDGE REPAIR LAYOUT

SH141 AT STOCK PASS

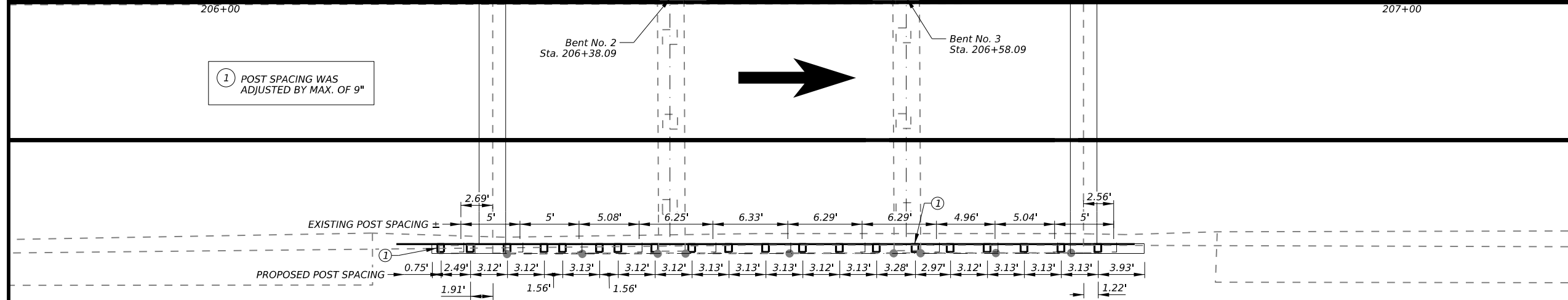
N.B.I. NO. 16-137-0-0383-04-010

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		174

DATE: 7/26/2023 10:13:27 AM
 FILE: c:\pw_working\lochner-pw-01\dms37365\SH141_GB01.dgn



① POST SPACING WAS ADJUSTED BY MAX. OF 9"

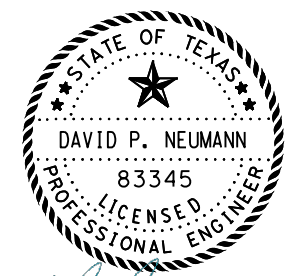


Note:
See Standards GF(31)-19
For Additional Details Not Shown.

SH 141 STOCK PASS BRIDGE

(NBI # 16-137-0-0383-04-010)

SH 141 Stock Pass Bridge
The Existing Bridge is an 3-Span Concrete Slab Span Unit
with a 50'-0" Overall Length Constructed In 1957.
(15'-0" - 20'-0" - 15'0")
42'-0" Clear Roadway; Overall width of 44'-0"



David P. Neumann, P.E.
2023.07.28 01:27:50-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



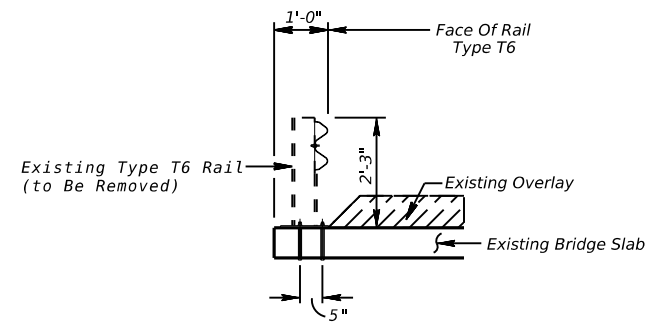
RETROFIT RAIL LAYOUT

SH141 AT STOCK PASS

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		175

ESTIMATED QUANTITIES			
ITEM	0451-6019	* EXISTING RAIL (REMOVAL)	
LOCATION	RETROFIT RAIL (TY T631)	L.F.	L.F.
SH141 @ STOCK PASS	120.58	120.58	
TOTAL	120.58	120.58	

* FOR CONTRACTORS INFORMATION ONLY
Note:
Stockpile All Bridge Rail And Post That Are Deemed Salvageable At Sites
On The Right Of Way Or As Directed.
Existing Rail And Posts Will Become Property Of The State.

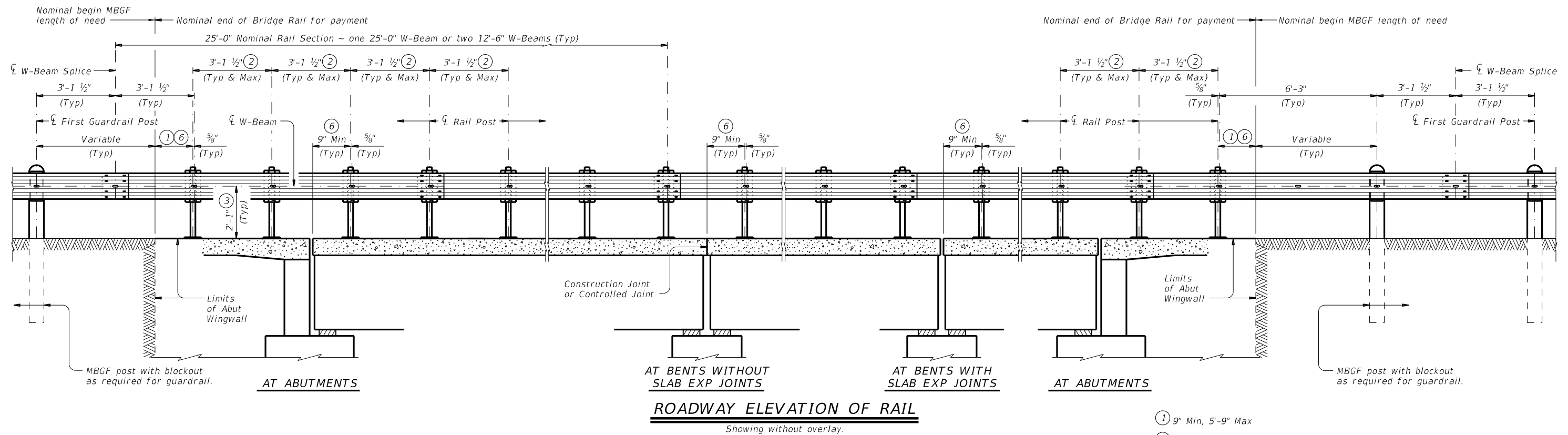


SECTION THRU EXISTING RAIL
(SHOWING TYPE T6 RAIL - TO BE REMOVED)

General Notes:
Use of these details will result in a railing acceptable for Test Level 3 regardless of the higher ratings that may be indicated on the rail standard.
Rail strength test have been performed on the epoxied (#6) anchor bar system which have demonstrated that the ultimate strength can be developed in the anchorage system.
Removal of existing rail is included in the unit bid price per LF for rail (TY T631). Shop drawings will not be required for this rail.
Average weight of railing with no overlay is 20 plf.

DATE: 7/26/2023 3:41:14 PM
FILE: c:\pw_working\lochner-pw-01\dms37365\SH141_GD01.dgn

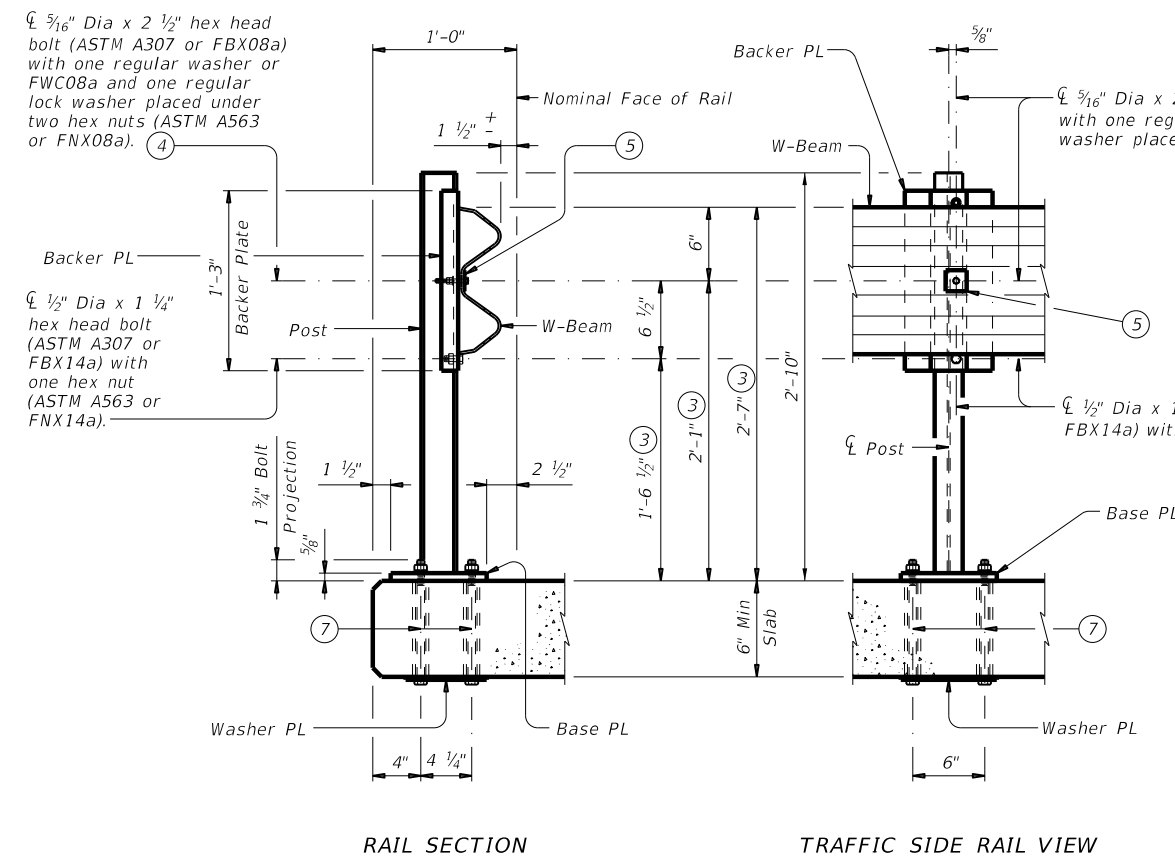
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



ROADWAY ELEVATION OF RAIL

Showing without overlay.

- ① 9" Min, 5'-9" Max
- ② Maintain 3'-1 1/2" Rail Post spacing wherever possible for use with nominal 25'-0" or 12'-6" W-Beam sections. Symmetry of post spacing on both sides and along the structure is not necessary.
- ③ Increase 2" for structures with overlay.
- ④ Tighten the first hex nut by hand until the top and bottom edges of the W-Beam engage the Backer Plate (Backer Plate should be snug against the post). Then tighten hex nut one revolution with wrench and secure with the second hex nut.
- ⑤ PL 1/8" x 1 3/4" x 1 3/4" with 3/8" Dia Hole centered in PL (ASTM A36). Square Guardrail Washer (FWR01).
- ⑥ The post nearest to a slab joint or end of structure may be shifted up to 9" in order to satisfy the minimum offset dimension. Drill a new 3/4" Dia hole in the centerline of W-beam for shifted post. Paint hole with two coats of zinc-rich paint conforming to the Item "Galvanizing". All other posts must remain on the typical spacing.
- ⑦ 7/8" Dia formed holes for 5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ATSM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod. See "Cast-In-Place & Formed Hole Anchor Bolt Options".
- ⑧ 5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ATSM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod. See "Cast-In-Place & Formed Hole Anchor Bolt Options".

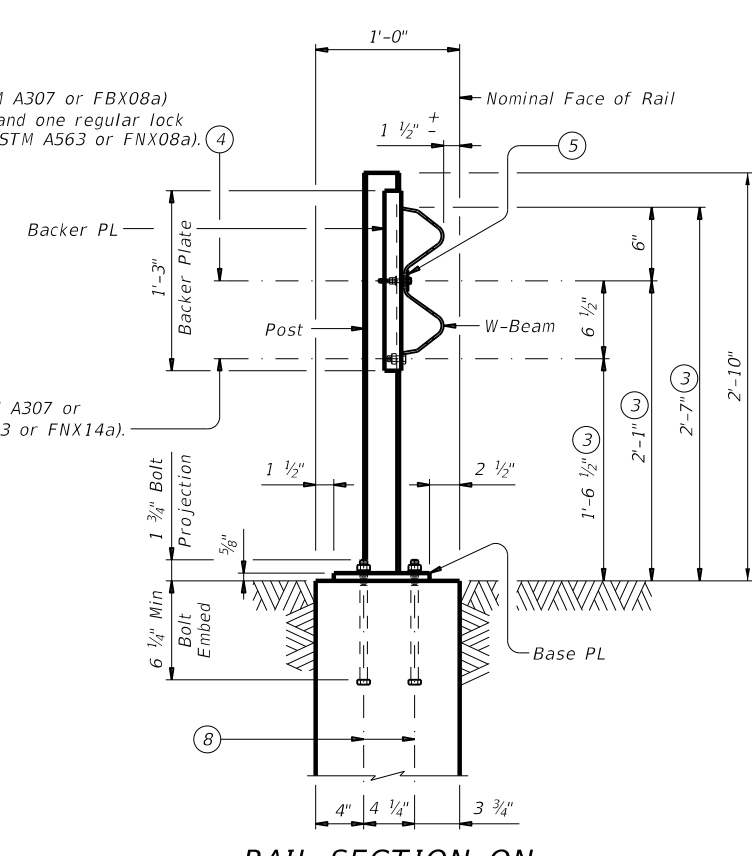


RAIL SECTION

TRAFFIC SIDE RAIL VIEW

RAIL DETAILS ON BRIDGE SLAB

Showing without overlay.



RAIL SECTION ON ABUTMENT WINGWALL

Showing without overlay.

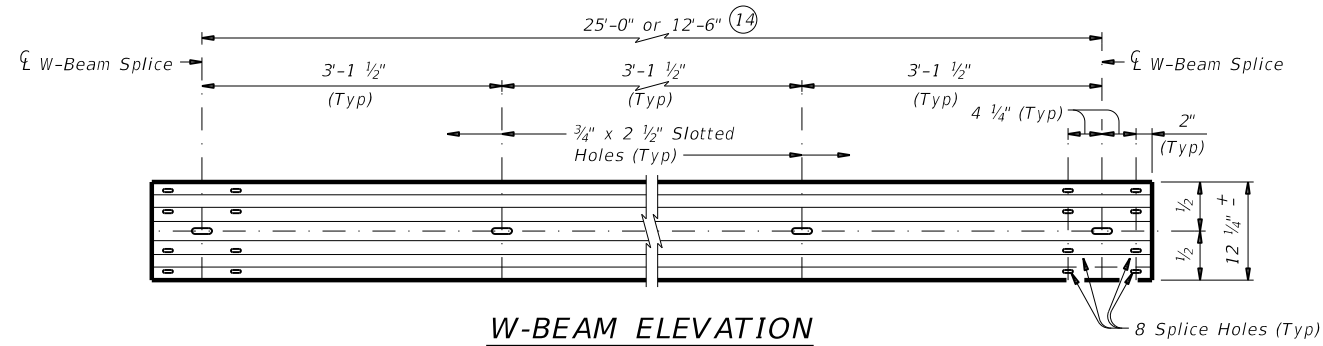
SHEET 1 OF 2

		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T631</h2>			
FILE: r1std038-20.dgn	DN: TxDOT	CK: AES	DW: JTR
©TxDOT September 2019	CONT: 0383	SECT: 03	JOB: 024, ETC.
REVISIONS	0383	03	SH 141
07-20: Allowing 9'-4 1/2" or 6'-3" W-Beam sections.	DIST: CRP	COUNTY: JIM WELLS, ETC.	SHEET NO: 176

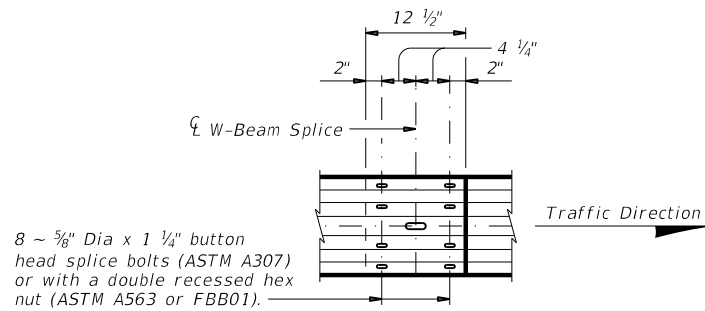
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DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

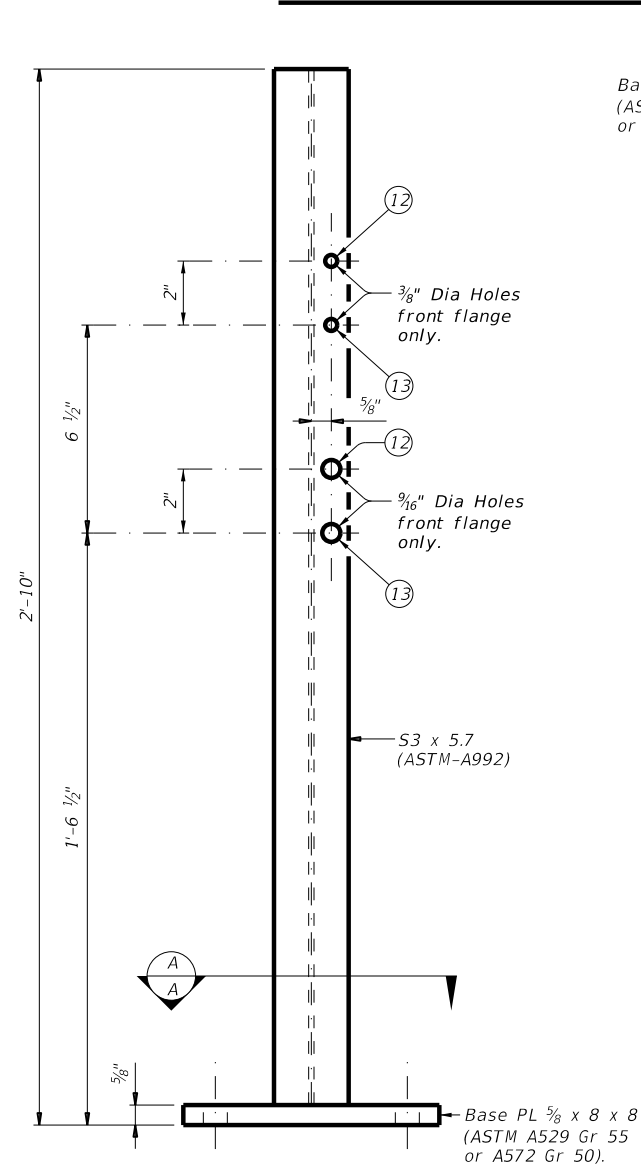
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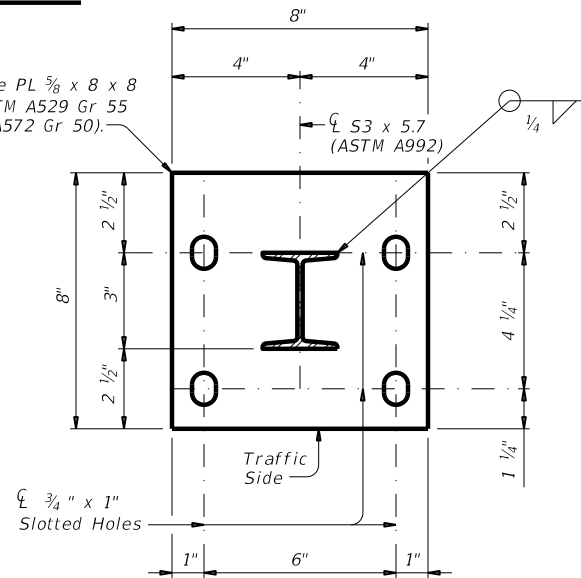
W-BEAM ELEVATION



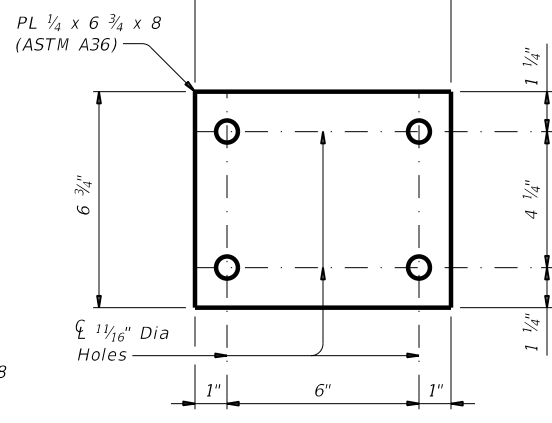
W-BEAM SPLICE ELEVATION



POST ELEVATION

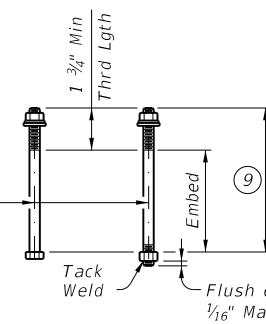


SECTION A-A



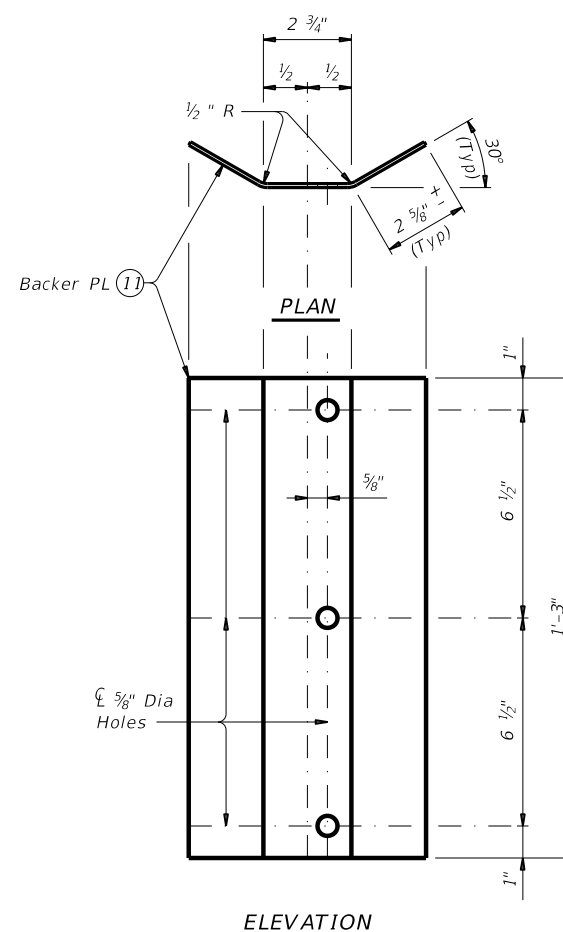
WASHER PLATE DETAIL

5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ASTM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod.



CAST-IN-PLACE & FORMED HOLE ANCHOR BOLT OPTIONS (10)

- 9 See "Rail Details On Bridge Slab" and/or "Rail Section On Abutment Wingwall".
- 10 See "Material Notes" for anchor bolt information.
- 11 Backer PL 1/4" x 8 x 1'-3" (ASTM A1011 CS or SS Gr 33, or A1008 CS or SS Gr 33 (11 Gage acceptable)).
- 12 Used for structures with overlay.
- 13 Used for structures without overlay.
- 14 At the nominal end of the bridge rail for payment, one 9'-4 1/2" or 6'-3" W-beam section is permitted in order to achieve the required W-Beam splice location on the MBGF.



BACKER PLATE

MBGF AND END TREATMENT NOTES:

This traffic railing must be anchored by metal beam guard fence (MBGF) and guard fence end treatments. Determine MBGF length of need in accordance with the Roadway Design Manual, unless otherwise specified. The minimum MBGF length of need required for anchoring the railing is 25' of MBGF plus the appropriate end treatment.

CONSTRUCTION NOTES:

Face of rail post must be plumb unless otherwise approved by the Engineer. Post must be perpendicular to adjacent roadway grade. Use epoxy mortar under post base plates if gaps larger than 1/16" exist.

Fully anchored guardrail must be attached to each end of rail. A metal beam guard fence transition is not used with this rail.

At the Contractor's option anchor bolts may be an adhesive anchor system. See "Material Notes".

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.

It is recommended to show a Rail Layout with rail posts and W-beam splices. Fabricator must submit erection drawings to the Engineer for approval.

Round or chamfer exposed edges of rail post and backer plate to approximately 1/16" by grinding.

Shop drawings are not required for this rail.

MATERIAL NOTES:

Galvanize all steel components.

Anchor bolts for base plate must be 5/8" Dia ASTM F3125 Gr A325 or A449 bolts (or ASTM A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each) 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.

Optional adhesive anchorage system must be 5/8" 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".

W-beam must 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" (Nominal) lengths and a single rail element of 9'-4 1/2" or 6'-3" (Nominal) length. W-Beam must have slotted holes at 3'-1 1/2".

Some part numbers from the "Task Force 13" Guide to Standardized Highway Barrier Hardware have been furnished for quick reference.

GENERAL NOTES:

This railing has been successfully evaluated by full-scale crash test to meet MASH TL-3 criteria. This railing can be used for speeds of 50 mph and greater.

This rail is designed to deflect approximately 4' to 4'-6" as it contains and redirects the errant vehicle. This rail may not be installed on top of or behind curbs that project above finished grade, on bridges with expansion joints providing more than 5" movement, on retaining walls, or on grade separations and interchanges.

Repairs to impact-damaged post and base plate unit are not permitted. Replace all impact-damaged posts with a new post and base plate unit.

Average weight of railing with no overlay: 20 plf total.

SHEET 2 OF 2

		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T631</h2>			
FILE: r1st038-20.dgn	DN: TxDOT	CK: AES	DW: JTR
REVISIONS	CONT	SECT	JOB
0383	03	024, ETC.	SH 141
07-20: Allowing 9'-4 1/2" or 6'-3" W-Beam sections.	DIST	COUNTY	SHEET NO.
CRP	JIM WELLS, ETC.		177

DATE: \$DATE\$ TIME: \$TIME\$
 FILE: \$FILE\$

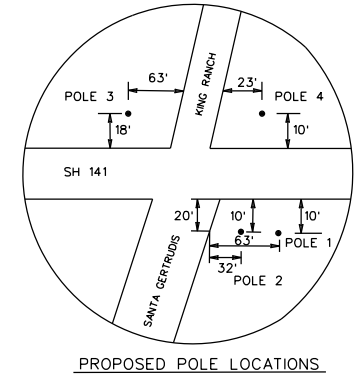
ELECTRICAL CHART

ITEM	TOTAL QTY.	RUN NUMBER RUN LENGTH(FT)	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
			10	80	35	120	85	15	95	75	55	45	15	65	25	30	15	210	15
POWER	90'	1/C-#6														2	2		
GROUND	45'	1/C-#6 INSULATED														1	1		
	410'	1/C-#8 INSULATED																	
SIGNAL CABLE	655'	16/C-#14			1	1		1	1	1		1			1		4		1
	730'	4/C-#12 TRAY			1	1	1	1	1	1	1	1					3		1
	445'	7/C-#14	1	2				1											
	1490'	RVDS CABLE	1	2	2	2	1	1	3	3	1	1	1	1	2		6		1
CONDUIT	120'	ITS COM CBL(ETHERNET)									1	1					1		1
	200'	2" PVC			1						1	1				1	1		
	215'	2" PVC BORE				1			1										
	225'	4" PVC			1				1		1	1			1		2		
	425'	4" PVC BORE				1			1										*1

TOTAL QUANTITIES INCLUDE QUANTITIES IN POLES.
 * FOR FUTURE USE

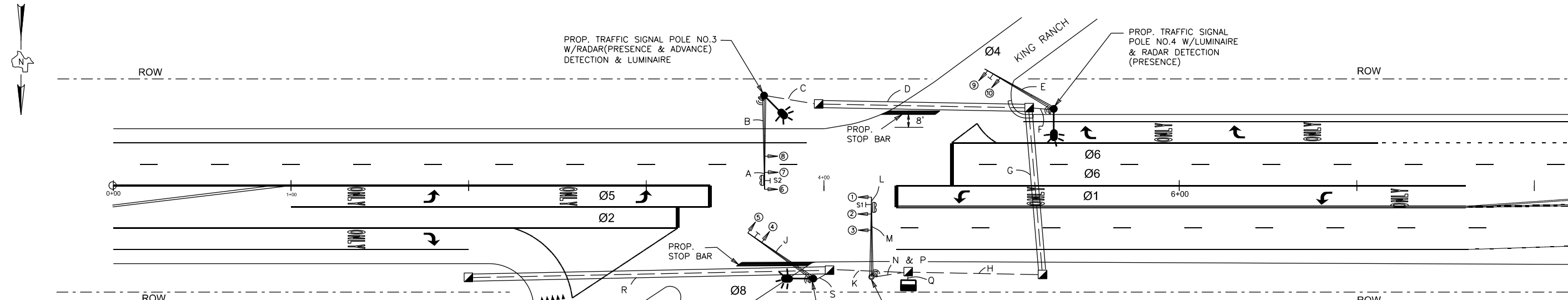
TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	SH141	KING RANCH	SH141	SANTA GERTRUDIS				
MOVEMENT	NBLT	WB	WBLT	NB	SBLT	EB	EBLT	SB
MIN. GREEN	8	15		8	8	15		8
EXTENSION	2	2		2	2	2		2
MAX. GREEN	15	25		15	15	25		15
YELLOW	4	4		4	4	4		4
ALL RED	2	2		2	2	2		2
WALK	-	-		-	-	-		-
DON'T WALK	-	-		-	-	-		-
RECALL	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

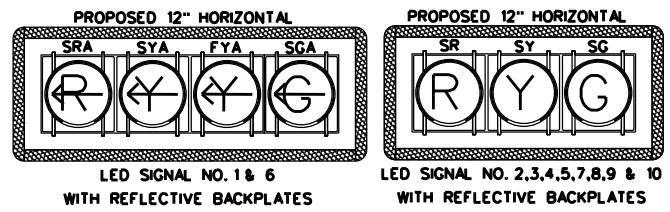


LEGEND

- ◀ PROP. 12" SIGNAL HEADS
- ⓑ PROP. RADAR ADVANCE DETECTOR DEVICE (RADD)
- ⓐ PROP. RADAR PRESENCE DETECTOR DEVICE (RPDD)
- ▣ PROP. GROUND BOX W/ APRON (TYPE D)
- PROP. PVC CONDUIT
- ≡≡≡ PROP. PVC CONDUIT (BORE)
- Ⓜ PROP. GROUND MOUNTED TRAFFIC SIGNAL CONTROLLER CABINET W/SLAB & FOUNDATION
- ☀ PROP. LUMINAIRE
- Ⓜ PROP. 12" HORIZONTAL MAST ARM MOUNTED SIGNAL HEAD



- #### NOTES
- THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW FULL TRAFFIC ACTUATED CONTROLLER, NEW LED TRAFFIC SIGNAL HEADS, FLASHING YELLOW ARROW(FYA)CAPABLE CONTROLLER UNIT COMPATIBLE WITH CENTRAC, NEW CONDUIT, CABLES, SIGNS, PRESENCE DETECTION (STOP BAR), ADVANCE DETECTION, GROUND BOXES & CONTROLLER FOUNDATION.
 - THE LOCATION SHOWN FOR CONDUIT RUNS & GROUND BOXES IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
 - LOCATION OF UNDERGROUND AND ABOVEGROUND SIGNAL RELATED ITEMS AND UTILITIES ARE APPROXIMATE.
 - VERIFY ALL UTILITIES LOCATIONS PRIOR TO CONSTRUCTION.
 - CONTRACTOR TO STAKE DRILL SHAFT LOCATIONS. ENGINEER TO FIELD VERIFY PRIOR TO DRILLING.
 - CONTRACTOR SHALL CONNECT FIELD WIRING TO CONTROLLER.
 - SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
 - TRAY CABLE SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE
 - LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY; ORIENT THEM AS DIRECTED BY THE ENGINEER. LUMINAIRES TO BE DIRECTED PERPENDICULAR TO ROADWAY.
 - CONTRACTOR SHALL FURNISH AND DELIVER TS2 TYPE2 CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING FOR TWO WEEKS IN ADVANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CARLOS CARRILLO AT 361-946-5079.
 - ALL TRAFFIC SIGNAL HEADS SHALL HAVE NEW REFLECTIVE BACKPLATES.
 - REMOVE EXISTING OVERHEAD FLASHING BEACON. RETURN SALVAGEABLE FLASHING BEACON POLES TO CORPUS CHRISTI DISTRICT TRAFFIC SIGNAL SHOP.

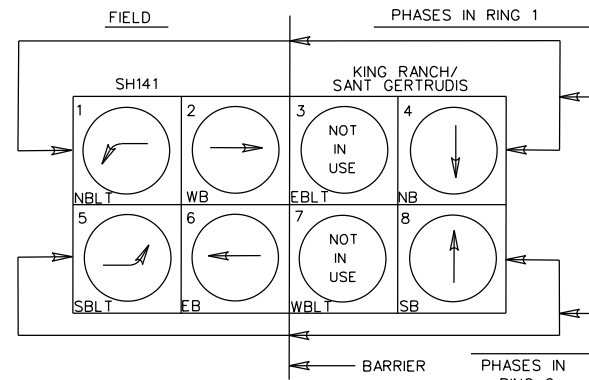


SIGNAL HEAD ARRANGEMENT



TRAFFIC SIGNAL POLES

POLE NUMBER	QUANTITY	SIGNAL POLE DESIGNATION	FOUNDATION TYPE	FOUNDATION DEPTH
1 & 3	2	50L-100	48-A	22'
2 & 4	2	44L-100	36-B	15'



PHASING DIAGRAM
 CONFLICT FLASH: RED ALL PHASES

ELECTRICAL SERVICE DATA

Electrical Service Description	Service Conduit x 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
ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	3"	3/#6	N/A	2P/60	N/A	100	TRAFFIC SIGNAL	1P/50	40	6
							ILLUMINATION	2P/15	2	



SH 141 TRAFFIC SIGNAL PROPOSED LAYOUT

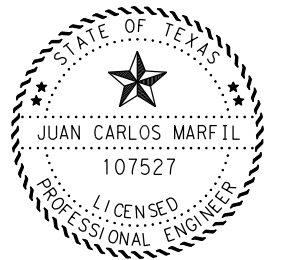
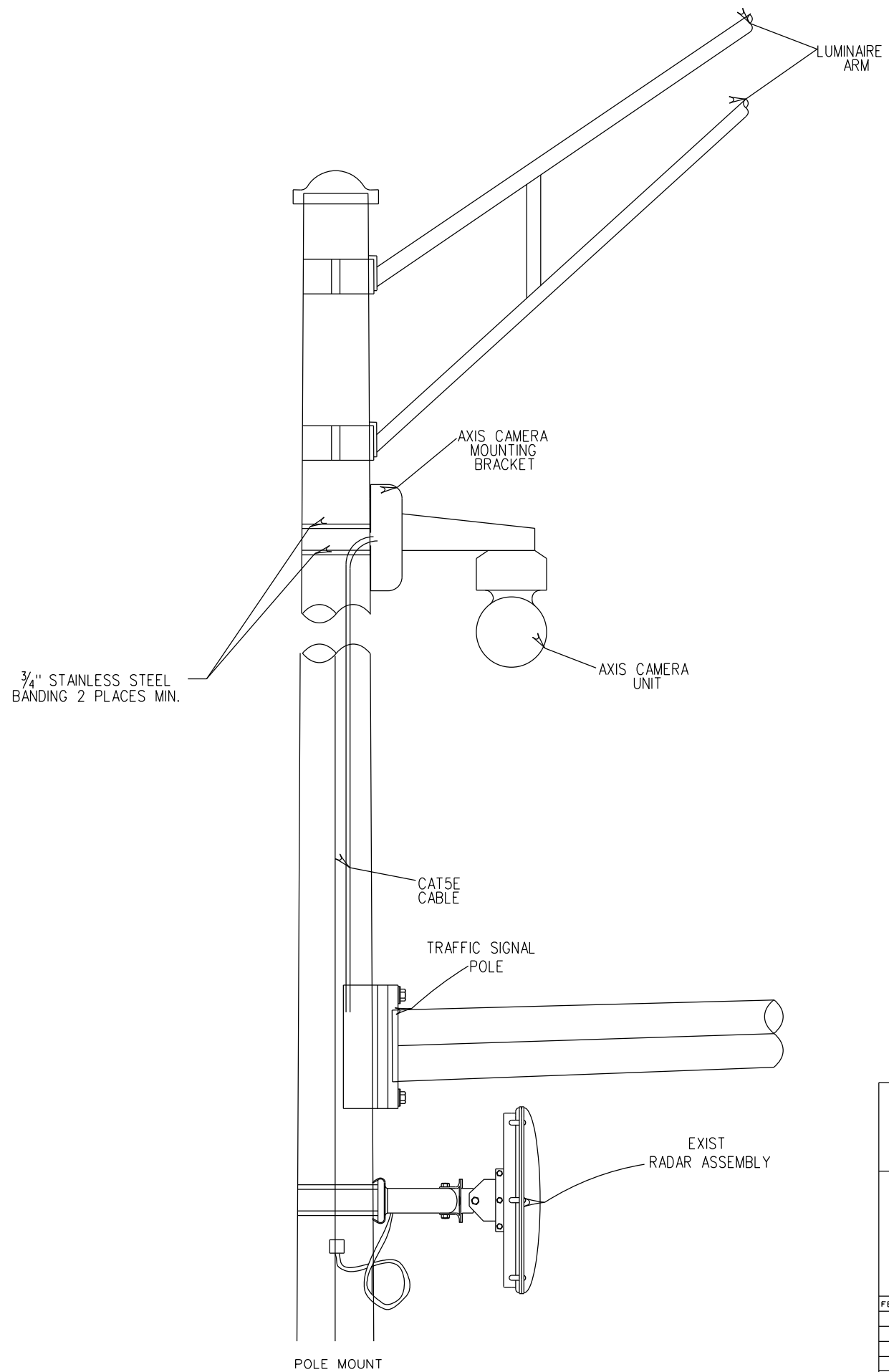
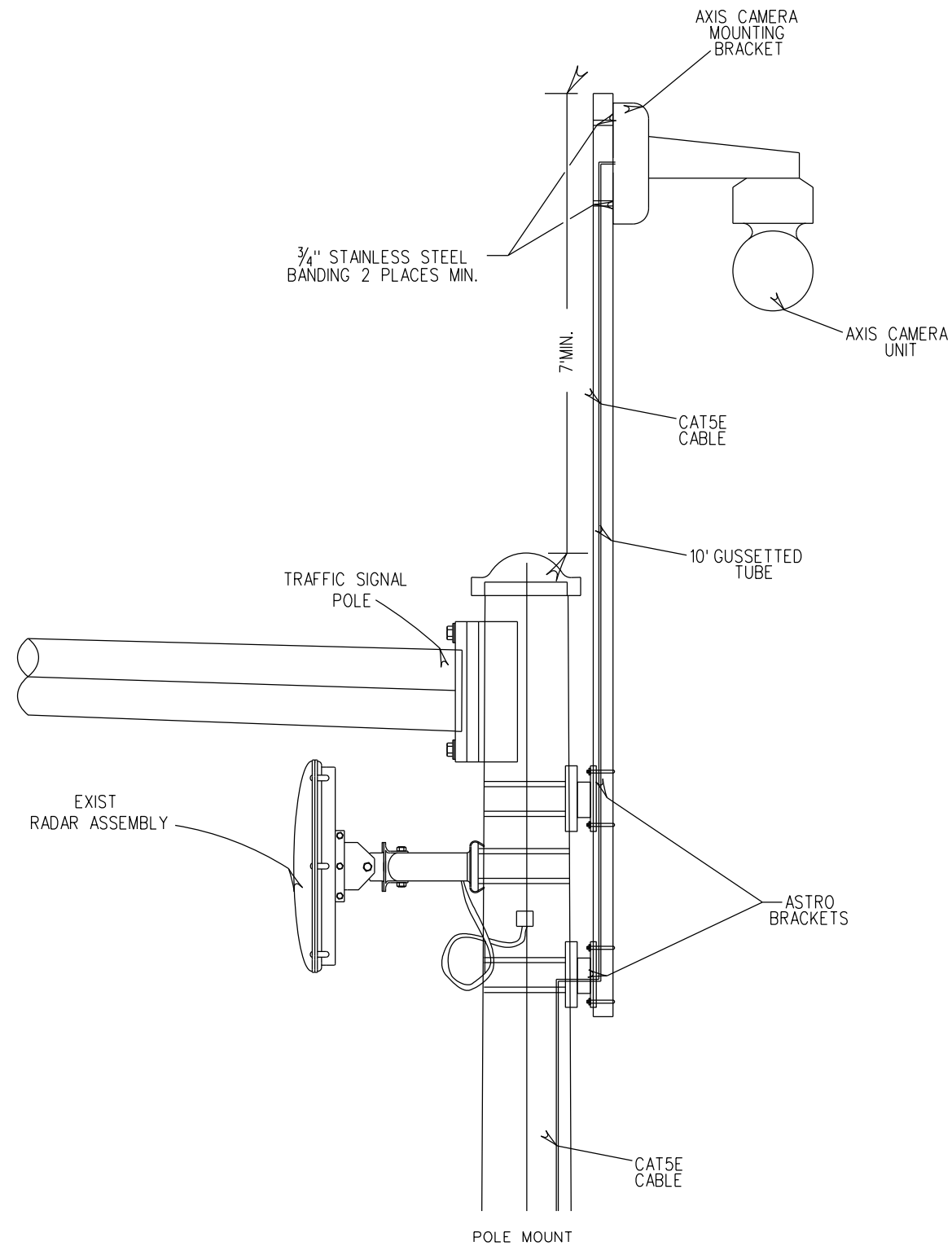
SCALE: 1" = 60' SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0383	03	024.ETC.	SH141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	178	

NOTES :

AXIS CAMERA

1. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MATERIALS NOT SUPPLIED BY TXDOT THAT IS NECESSARY FOR THE INSTALLATION OF THE AXIS CAMERA. ALL MATERIALS PROVIDED BY THE CONTRACTOR MUST BE NEW AND CONSIDER SUBSIDIARY TO BID ITEM 6010.
2. AXIS CAMERA UNIT, MOUNTING BRACKET, GUSSETED TUBE AND ASTRO BRACKET SHALL BE INSTALLED AS DETAILED
3. 3/4" STAINLESS STEEL BANDING MATERIAL SHALL BE USED TO INSTALL THE AXIS MOUNTING BRACKET
4. ALL CABLE ENTRY AND EXIT POINTS IN THE MAST ARM, POLES AND/OR GUSSETED TUBES SHALL BE WATER TIGHT.
5. THE LOCATION AND ORIENTATION OF AXIS CAMERA UNIT SHALL BE PLACED AS DIRECTED BY THE ENGINEER IN THE FIELD AND MANUFACTURES RECOMMENDATION.



JC Marfil P.E.
7/13/2023

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CCTV MOUNTING DETAIL

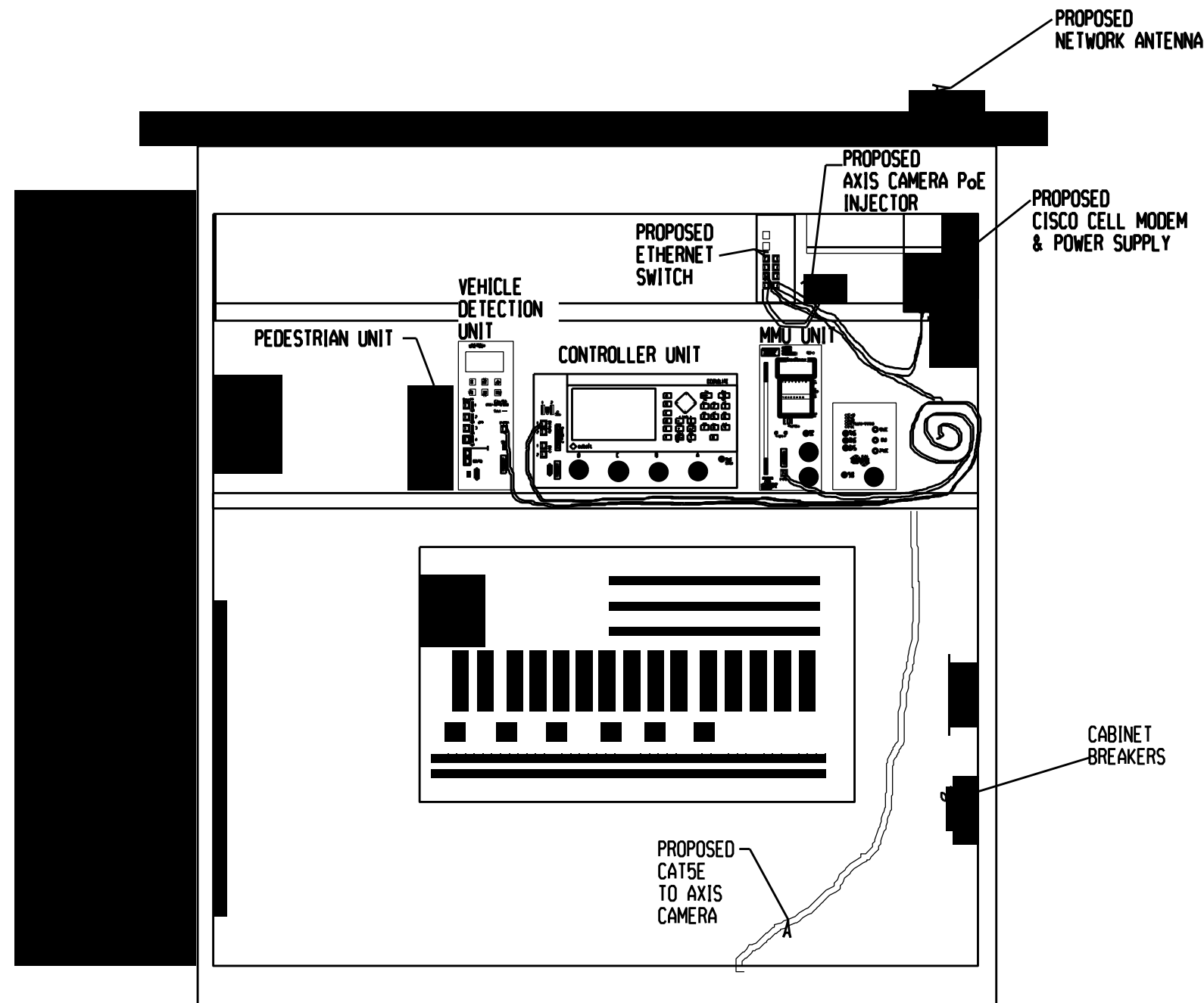
FED. RD. DIV. NO.	STATE PROJECT NO.		SHEET NUMBER
6			179
STATE	DISTRICT	COUNTY	
TEXAS	CRP	JIM WELLS	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0383	03	024	SH141

Note:

1. The Contractor and TXDOT will work together to make sure that all existing and installed equipment by the contractor are in full operation and are transmitting and communicating to TXDOT's Centracos software.
2. The Contractor is Responsible to provide all materials not supplied by TXDOT that is necessary for the operation and installation of the Ethernet Switch, Network Antenna, Axis Camera, Axis Camera PoE injector, Cisco Cell modem and power supply. The Cisco cell modem and power supply are to be mounted to the cabinet din rail. All materials provided by the contractor must be new and is consider subsidiary to bid items.

The Contractor is responsible to provide following Cat5e patch cables and will be paid under item 6004. Each device will have a set color coded Cat5e patch cable Connecting the devices to the Ethernet Switch.

- | | |
|----------------------------------|-------------|
| 1. Controller Unit | ---- Blue |
| 2. Pedestrian Unit | ---- Yellow |
| 3. MMU Unit | ---- Green |
| 4. Axis Camera PoE Injector Unit | ---- Purple |
| 5. Cisco cell modem | ---- White |
| 6. Vehicle Detection Unit | ---- Black |
| 7. Battery Backup Unit | ---- Red |



NOTE:
THE CONTRACTOR CAN CONTACT THE CORPUS CHRIST TRAFFIC SIGNAL SHOP AT CRP_Utility-Locate@txdot.gov or CALL(361-739-6044) FOR TRAFFIC SIGNAL LINE LOCATES.

IT'S THE CONTRACTORS RESPONSIBILITY TO LOCATE AND EXPOSE ANY GROUND BOXES TO BE ABLE TO PULL ANY COMMUNICATION CABLES FROM THE TRAFFIC SIGNAL POLE TO THE TRAFFIC SIGNAL CABINET.

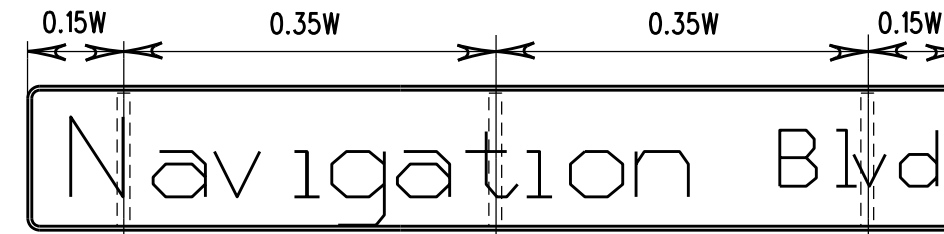
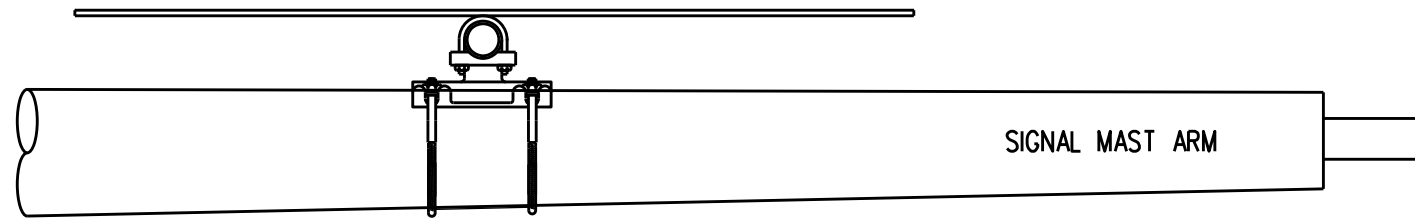


JC Marfil P.E.
7/13/2023

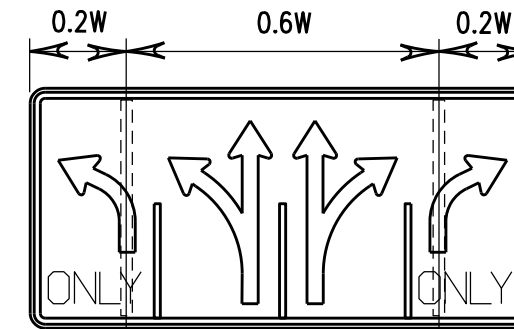
**ITS COMMUNICATION
TRAFFIC SIGNAL
CABINET LAYOUT**

SHEET 1 OF 1

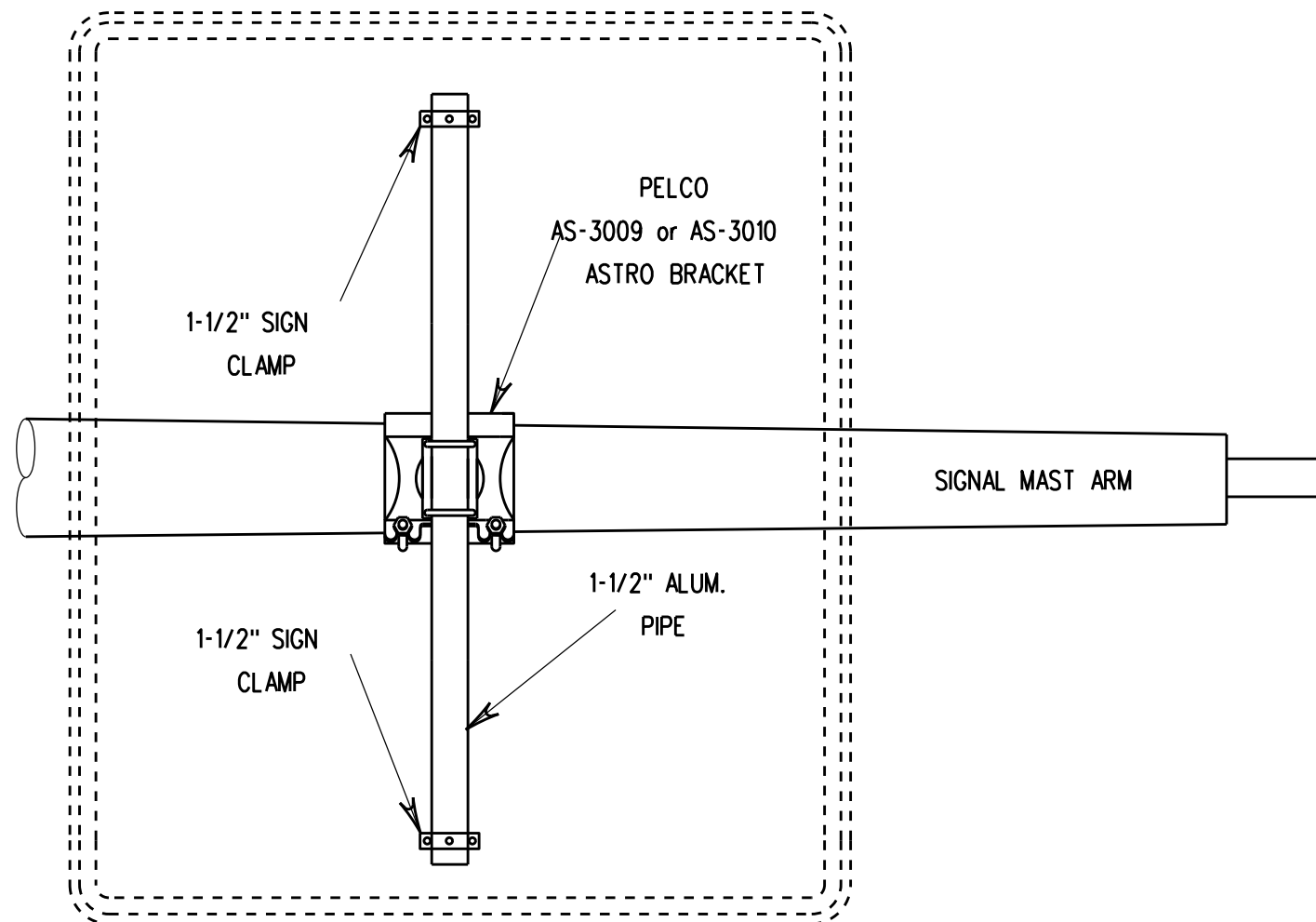
		CONT	SECT	JOB	HIGHWAY
		0383	03	024	SH141
DIST	COUNTY			SHEET NO.	
CRP	JIM WELLS			180	



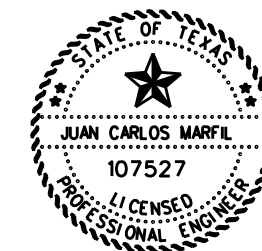
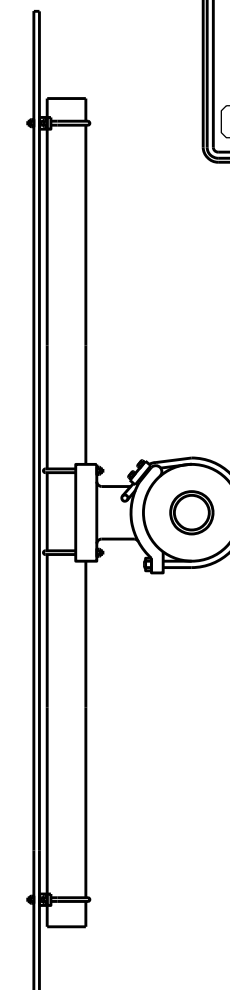
Sign Width greater than 6 ft. use three Astro Brackets



Sign Width is 3 ft. to 6 ft.
use two Astro Brackets



Sign Width is less than 3 ft. use one Astro Bracket



J.C. Marfil P.E.

07/13/2023

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SIGN MOUNT FOR TRAFFIC SIGNAL MAST ARMS

SCALE: NONE
SHEET 1 OF 1

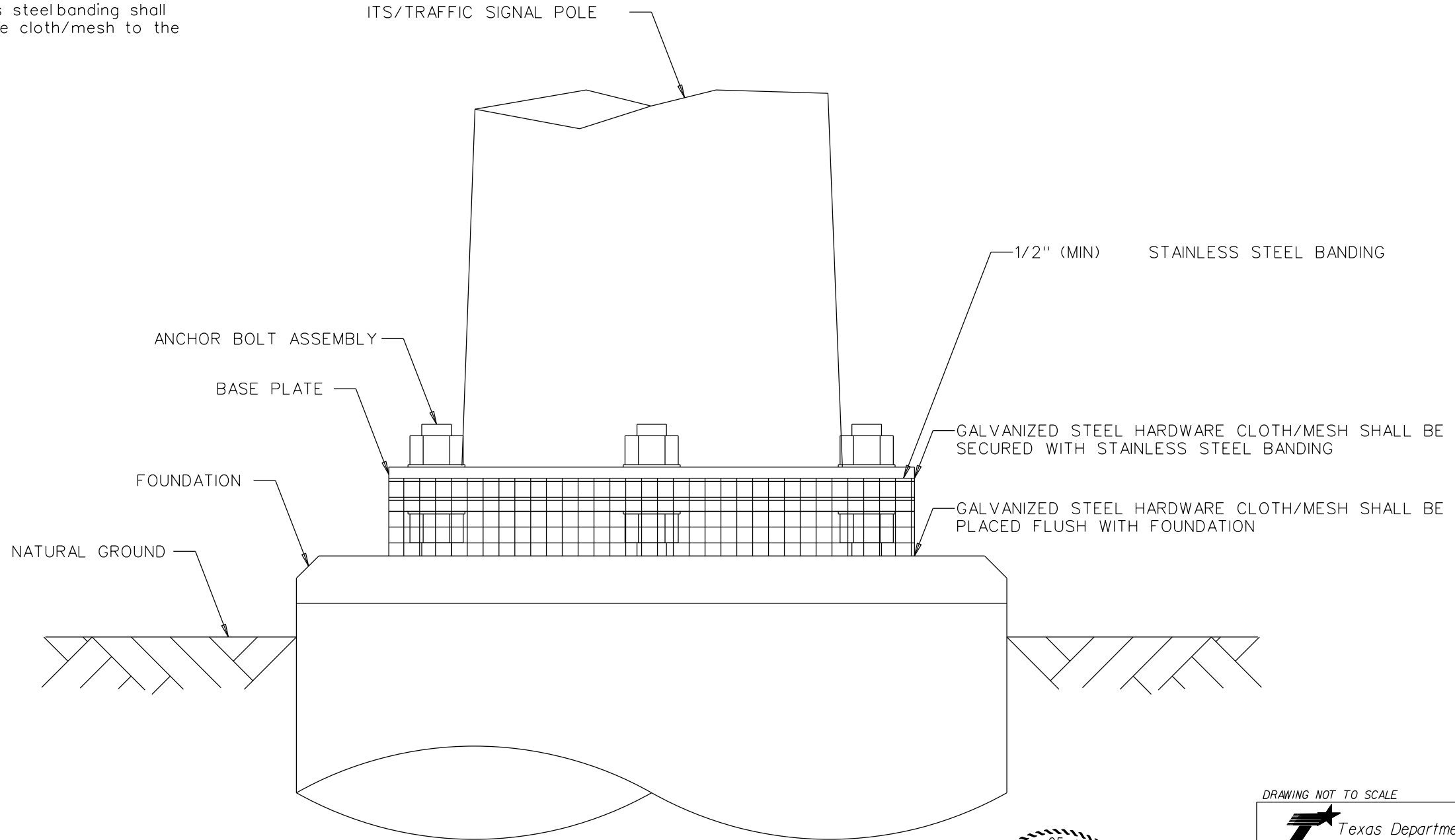
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NUMBER	
6		181	
STATE	DISTRICT	COUNTY	
TEXAS	CRP	JW WELLS, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0383	03	024	SH141

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DATE: **SDATES**
FILE: **SFILES**
STIMES

NOTES:

- ① Wire cloth/mesh shall be placed flush with the foundation, firmly secured around the baseplate with a minimum 6" overlap, and secured with stainless steelbanding
- ② 1/4" Opening space (max), 14 Gauge (min) Galvanized Hardware Cloth or Galvanized Wire Mesh shall be used
- ③ Minimum 1/2" stainless steelbanding shall be used to secure wire cloth/mesh to the baseplate



JC Marfil P.E.
07/13/2023

DRAWING NOT TO SCALE



ITS/TRAFFIC SIGNAL POLE
RODENT DETERRENT DETAILS

REVISIONS	DN:	CK:	DW:	CK:
	XX	XX	XX	XX
	CONT	SECT	JOB	HIGHWAY
	0383	03	024	SH141
	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS		182

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DATE: FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

- The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.
- 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.
- 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.
- 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.
- 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.
- 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

- 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.
- Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
- 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"

- 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.
- 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.
- 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.
- Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

- 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.
- 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.
- 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

- 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.
- 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.
- Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
- 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.
- 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."
- Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
- 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.
- 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.
- 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.
- 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.
- At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
- 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).
- 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.
- File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

 Texas Department of Transportation				Traffic Operations Division Standard	
<h1>ELECTRICAL DETAILS CONDUITS & NOTES</h1>					
<h2>ED(1) - 14</h2>					
FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0383	03	024, ETC.	SH 141
		DIST	COUNTY		SHEET NO.
		CRP	JIM WELLS, ETC.		183

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS) 11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.
2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.
3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.
4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.
2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.
3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.
4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.
6. Support conductors in illumination poles with a J-hook at the top of the pole.
7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.
8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.
11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.
4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.
5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

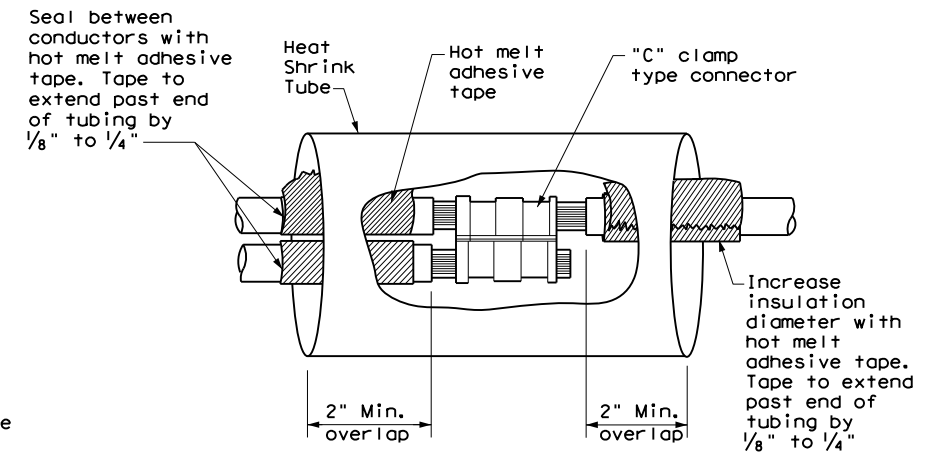
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

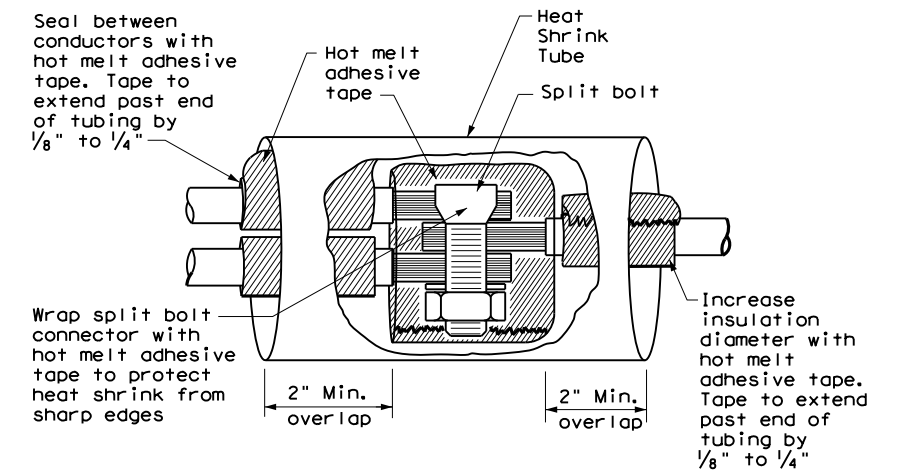
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

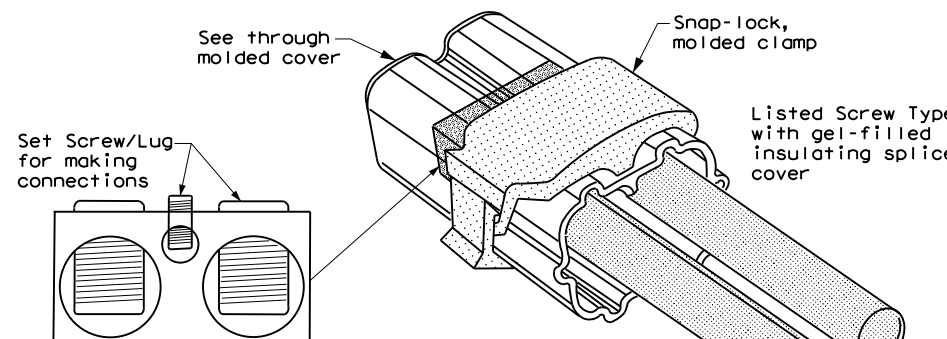
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
2. Do not place ground rods in the same drilled hole as a timber pole.
3. Install ground rods so the imprinted part number is at the upper end of the rod.
4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.
6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



**SPLICE OPTION 1
Compression Type**



**SPLICE OPTION 2
Split Bolt Type**



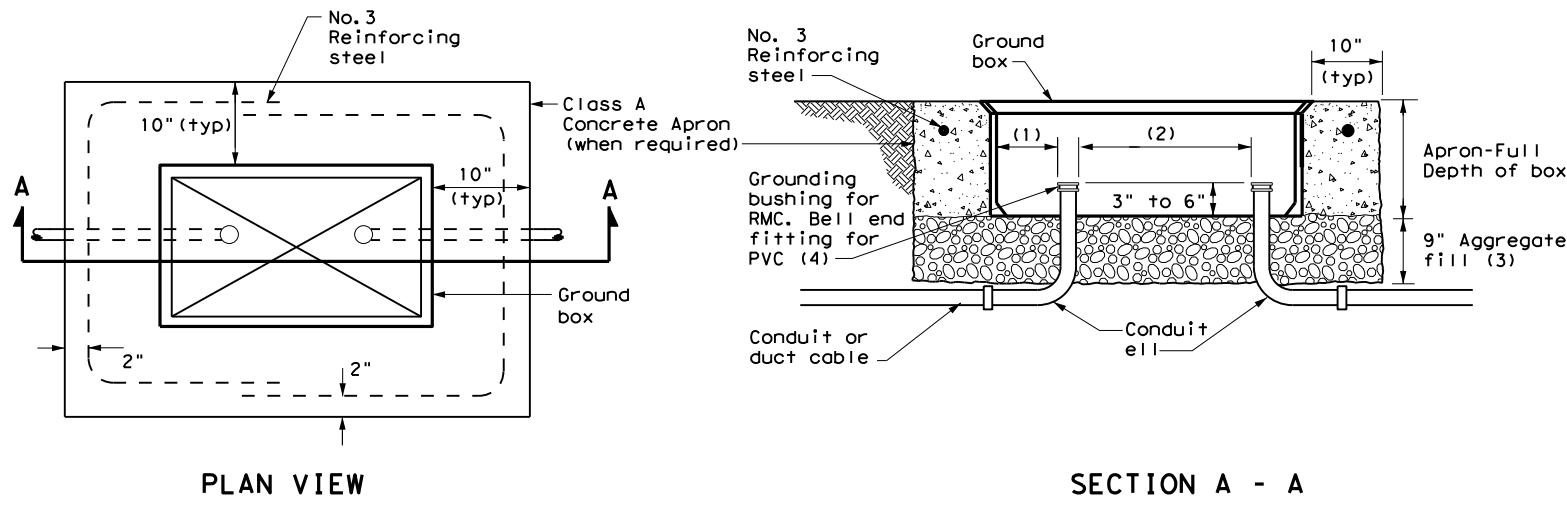
**SPLICE OPTION 3
Listed Screw Type**

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DATE: FILE:

		Texas Department of Transportation		Traffic Operations Division Standard	
<h1>ELECTRICAL DETAILS CONDUCTORS</h1>					
<h2>ED(3) - 14</h2>					
FILE: ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT	
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0383	03	024, ETC.	SH 141	
	DIST	COUNTY		SHEET NO.	
	CRP	JIM WELLS, ETC.		184	

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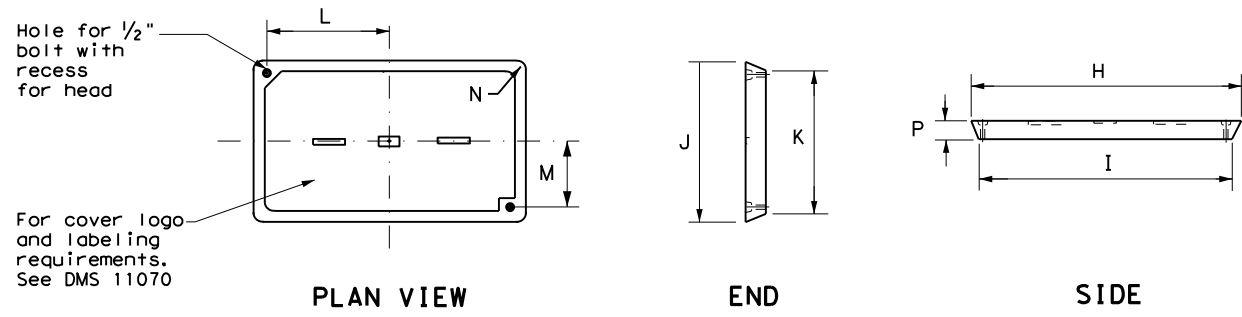


APRON FOR GROUND BOX

- (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>					
<h3>ED(4) - 14</h3>					
FILE:	ed4-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	0383	SECT:	03
REVISIONS		JOB:	024, ETC.		HIGHWAY:
		DIST:	COUNTY		SHEET NO.
		CRP:	JIM WELLS, ETC.		185

DATE: FILE:

ELECTRICAL SERVICES NOTES

- 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.
- 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.
- Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
- 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.
- 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.
- 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.
- When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
- 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.
- 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.
- 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.
- 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.
- Ensure all mounting hardware and installation details of services conform to utility company specifications.
- 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.
- 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.
- 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

- Provide threaded hub for all conduit entries into the top of enclosure.
- 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 photoceII or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
- 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.
- 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

- Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
- 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.

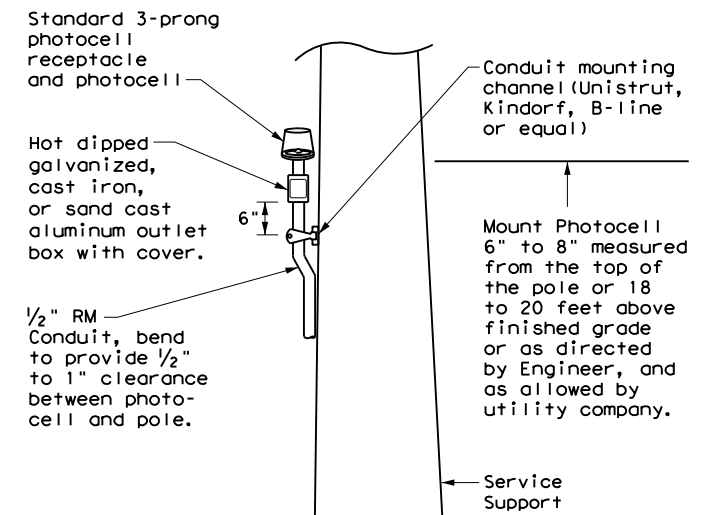
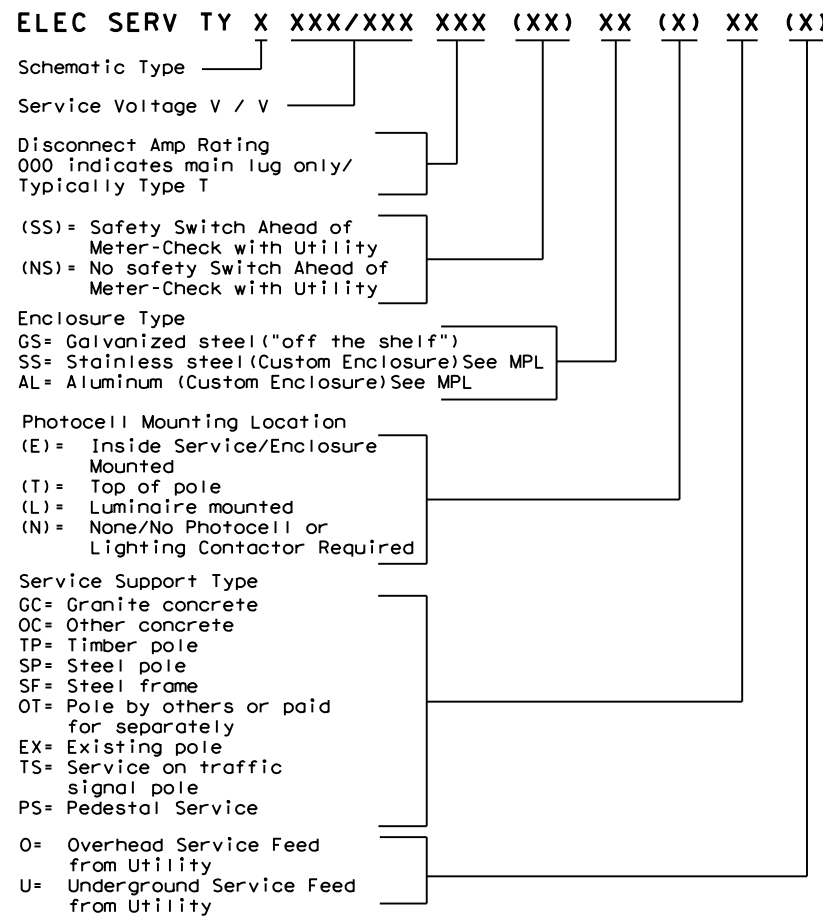
PHOTOELECTRIC CONTROL

- Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA												
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 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



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation
 Traffic Operations Division Standard

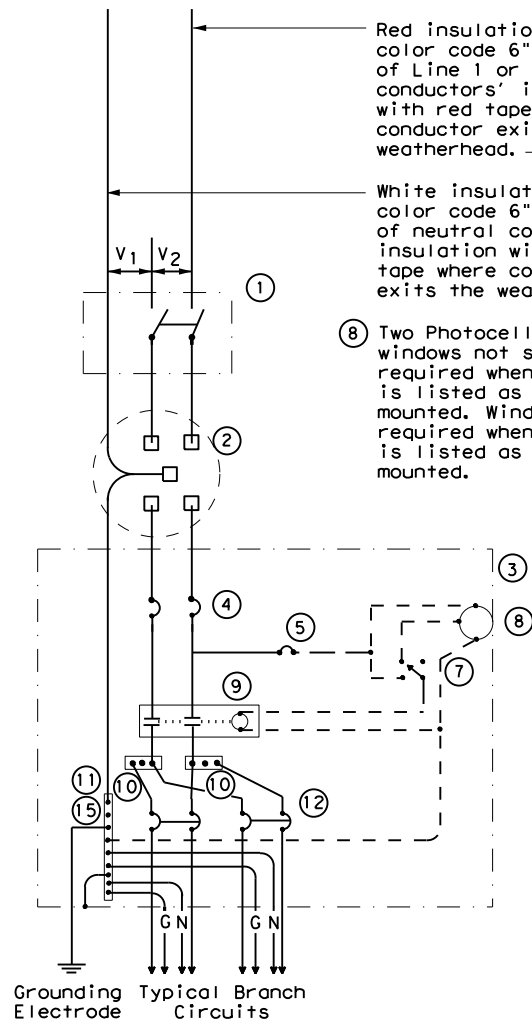
ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5) - 14

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.	
CRP	JIM WELLS, ETC.		186	

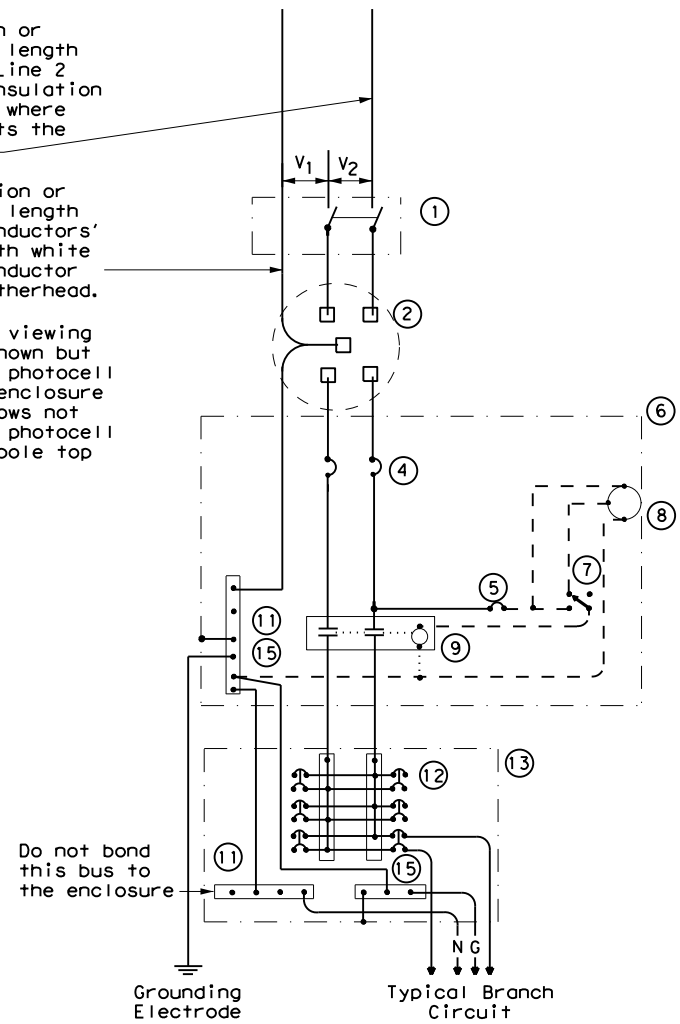
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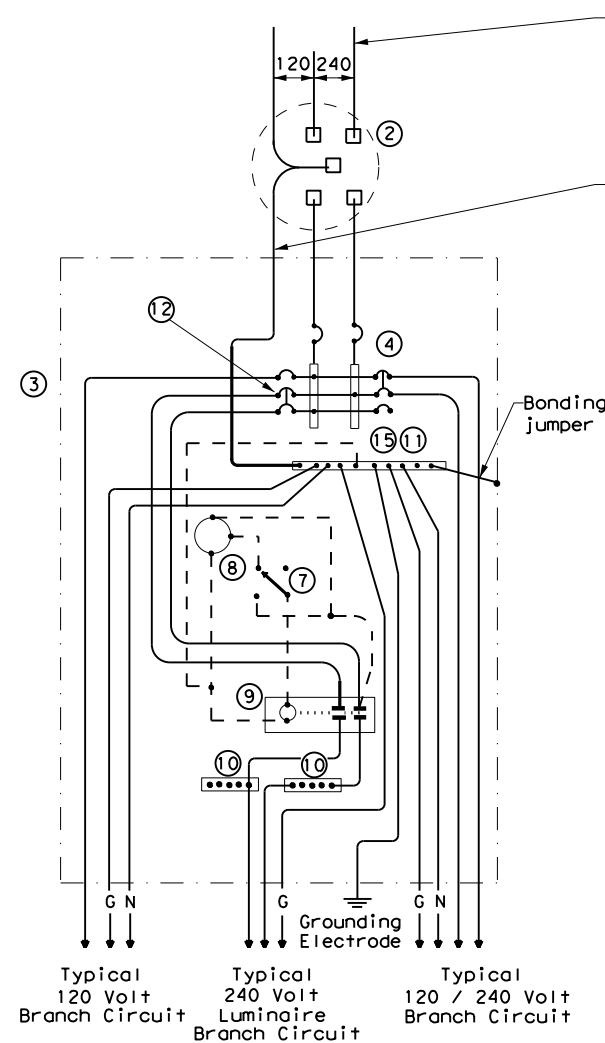


**SCHEMATIC TYPE A
THREE WIRE**

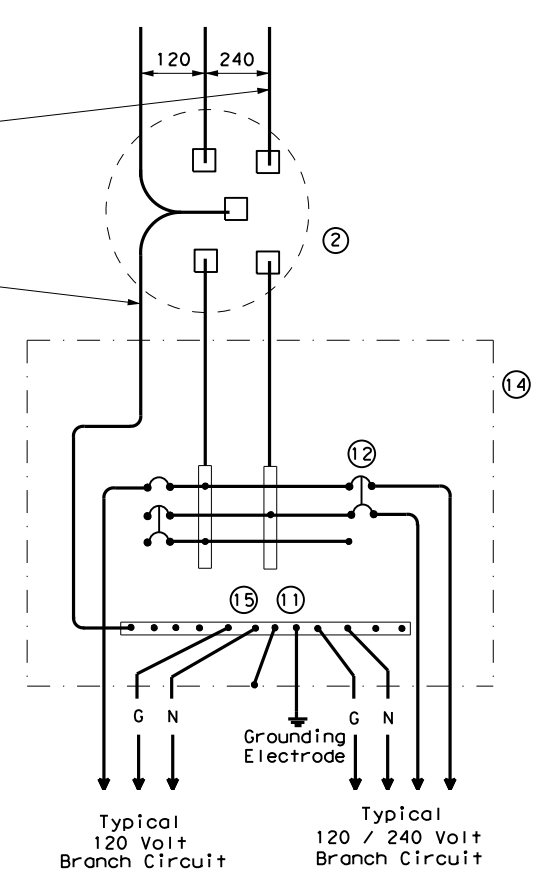
WIRING LEGEND	
————	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required



**SCHEMATIC TYPE C
THREE WIRE**



**SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE**



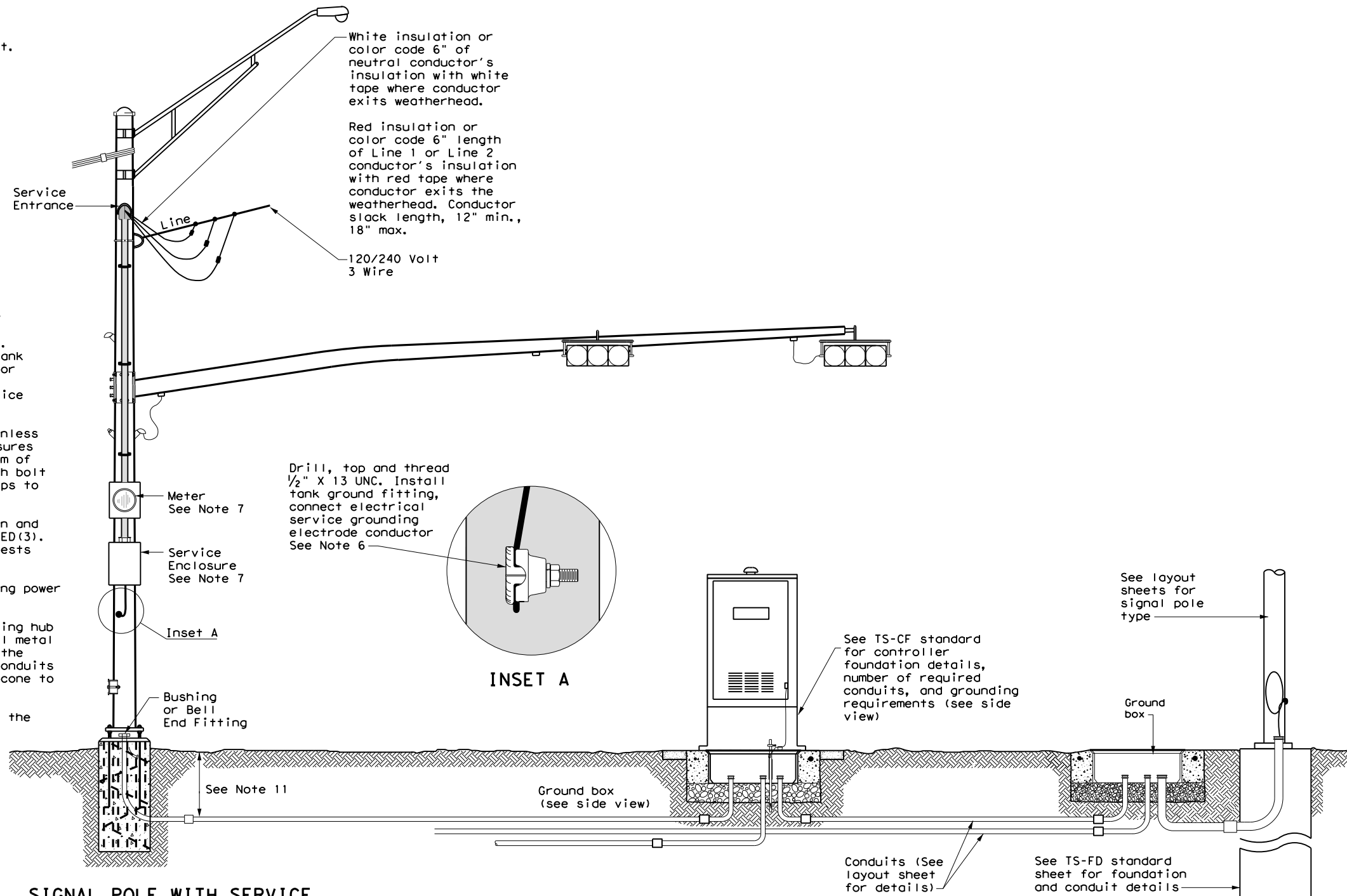
**SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE**
Galvanized steel - "Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

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	DW: TxDOT
© TxDOT October 2014	CONT: 0383	SECT: 03	JOB: 024, ETC.
REVISIONS		HIGHWAY: SH 141	
DIST: CRP	COUNTY: JIM WELLS, ETC.	SHEET NO.: 187	

TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for 1/2 in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of 3/4 in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".

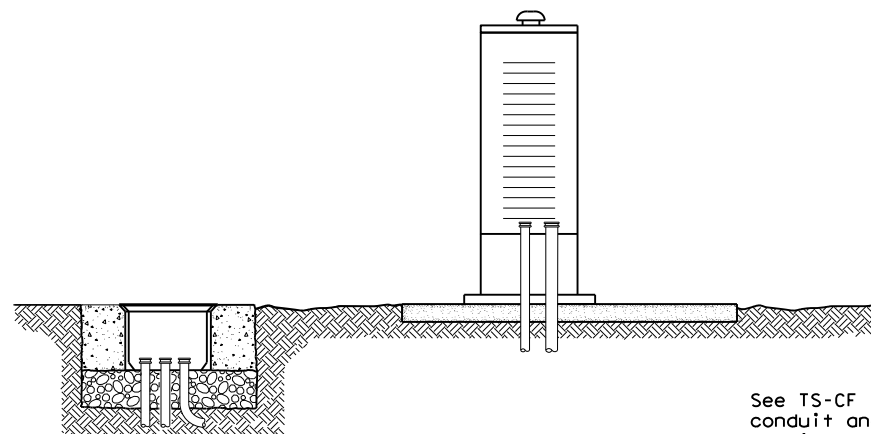


SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

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		Texas Department of Transportation		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS</h2> <h2>TYPICAL TRAFFIC SIGNAL</h2> <h2>SYSTEM DETAILS</h2> <h3>ED(8) - 14</h3>					
FILE:	ed8-14.dgn	DN:	TxDOT	CK:	TxDOT
© TXDOT	October 2014	CON:	0383	SECT:	03
REVISIONS		JOB:	024, ETC.		HIGHWAY:
		SHEET NO.:	SH 141		
		DIST:	COUNTY		SHEET NO.
		CRP:	JIM WELLS, ETC.		188

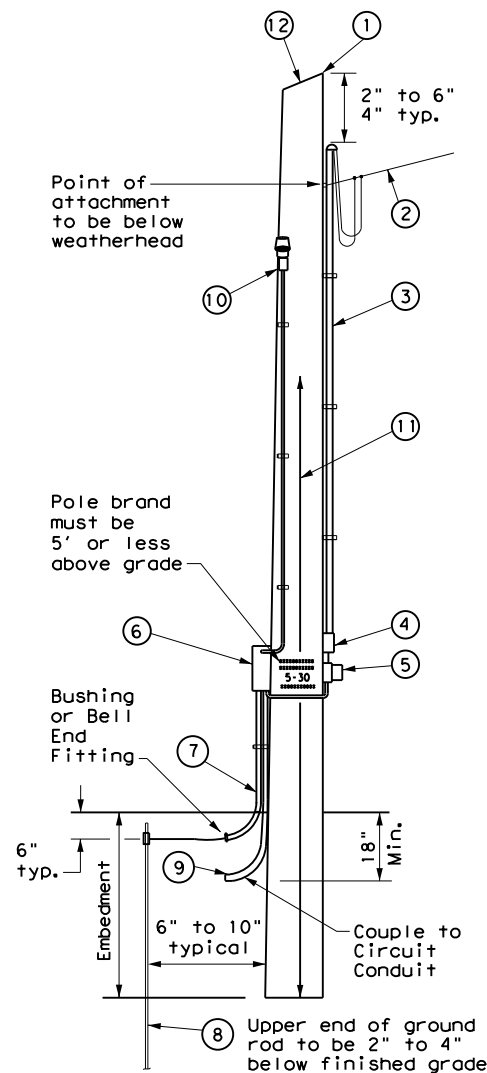
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TIMBER POLE (TP) SERVICE SUPPORT NOTES

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 $\frac{3}{8}$ in. max. depth and $1\frac{1}{8}$ 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 $3\frac{3}{4}$ in. maximum depth, and $1\frac{1}{2}$ in. to $1\frac{5}{8}$ 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, $\frac{1}{4}$ in. minimum diameter by $1\frac{1}{2}$ 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 $\frac{1}{2}$ in. PVC to ground rod - extend $\frac{1}{2}$ in. PVC 6 in. underground.
- 8 $\frac{5}{8}$ 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.

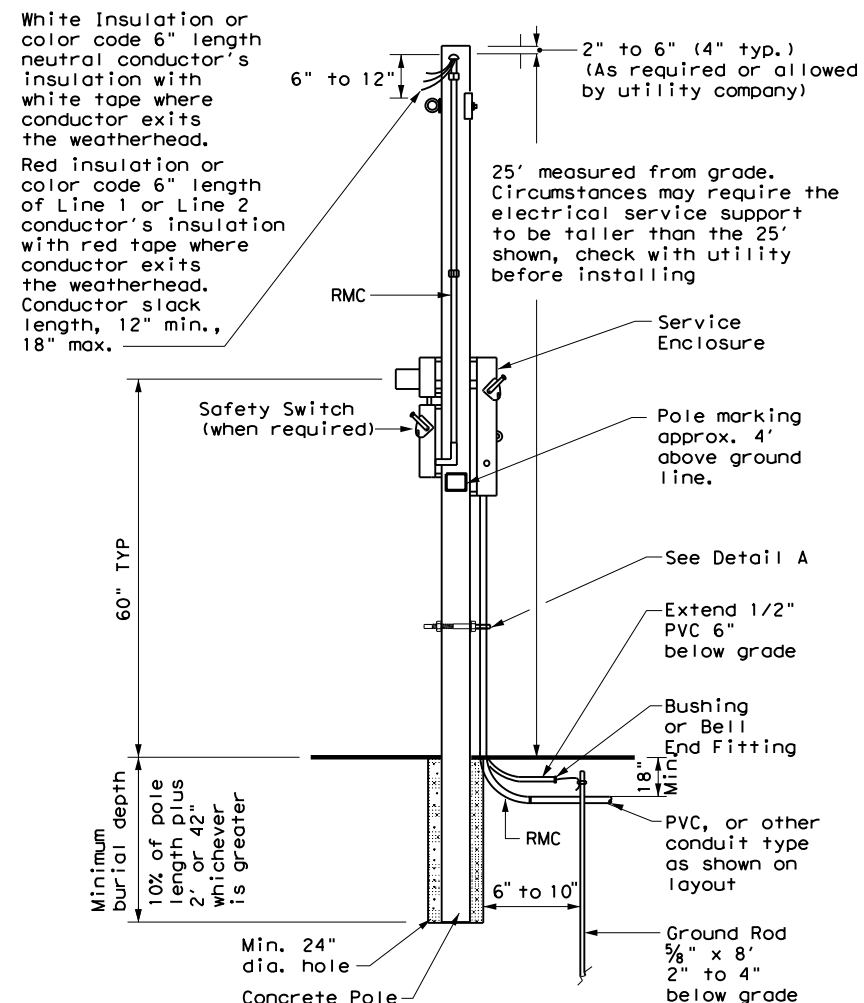


SERVICE SUPPORT TYPE TP (O)

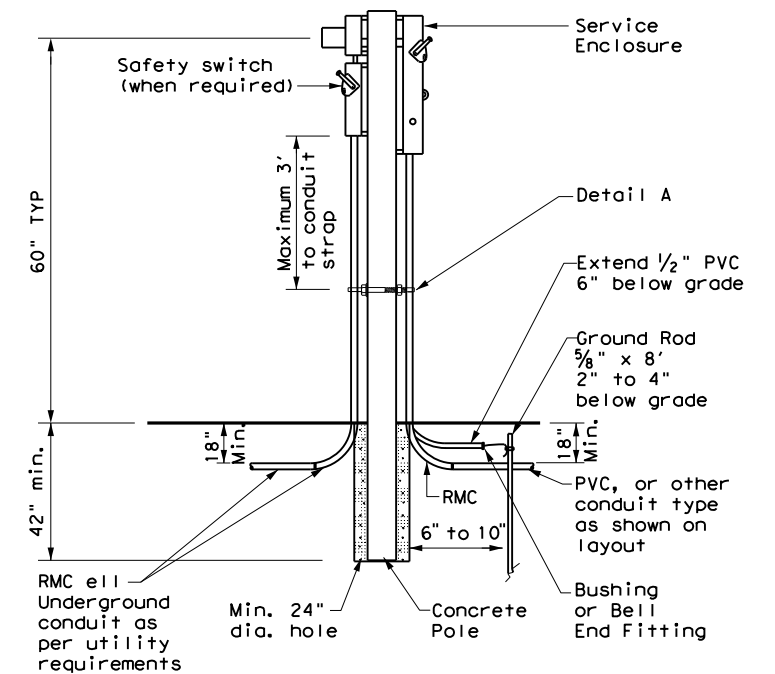
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

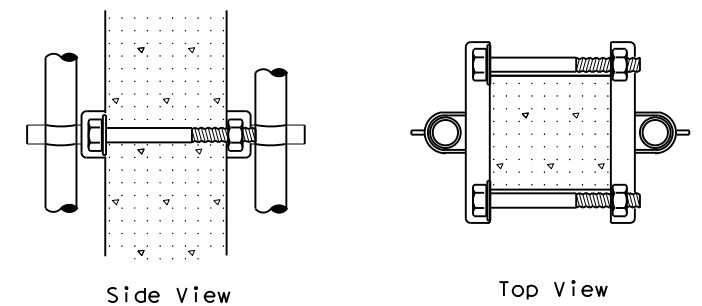
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' 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 $1\frac{1}{2}$ in. or $1\frac{3}{8}$ in. wide by 1 in. up to $3\frac{3}{4}$ 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)



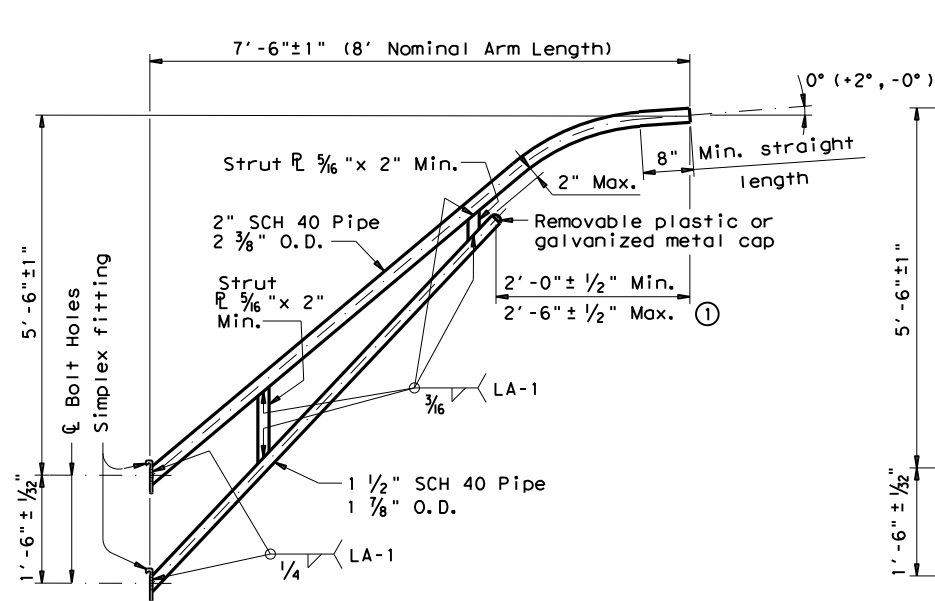
DETAIL A

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.

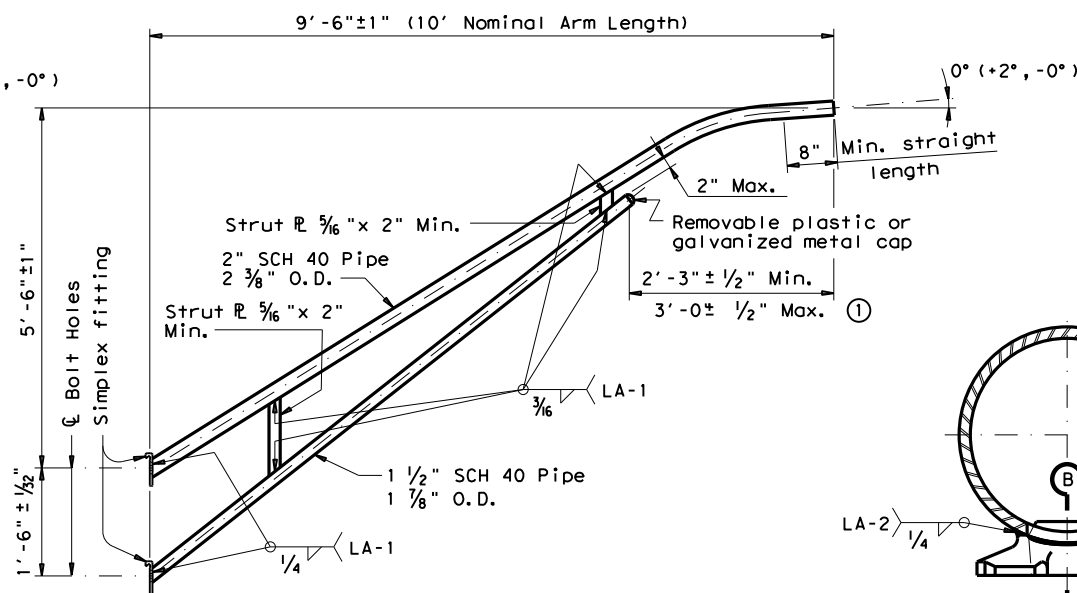
<h2>ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP</h2>			
<h3>ED(10)-14</h3>			
FILE: ed10-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT	SECT	JOB
REVISIONS	0383	03	024, ETC.
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	CRP	JIM WELLS, ETC.	189

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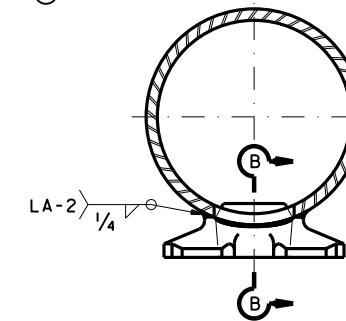
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8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr. 65-35 or A148 Gr. 80-50, A576 Gr. 1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr. B, A501, A1008 HSLAS-F Gr. 50 (4), or A1011 HSLAS-F Gr. 50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr. 50 (4), or A588
Misc.	ASTM designations as noted

- 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.
- Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- 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.
- ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

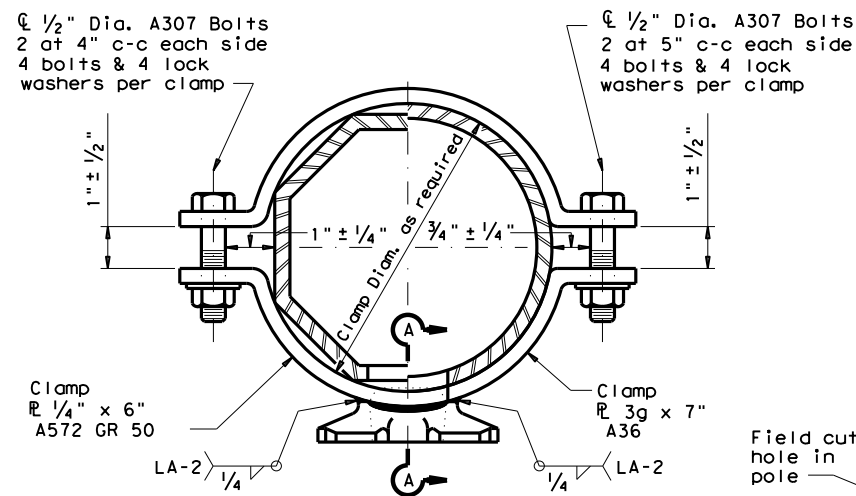
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified Fabricator tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

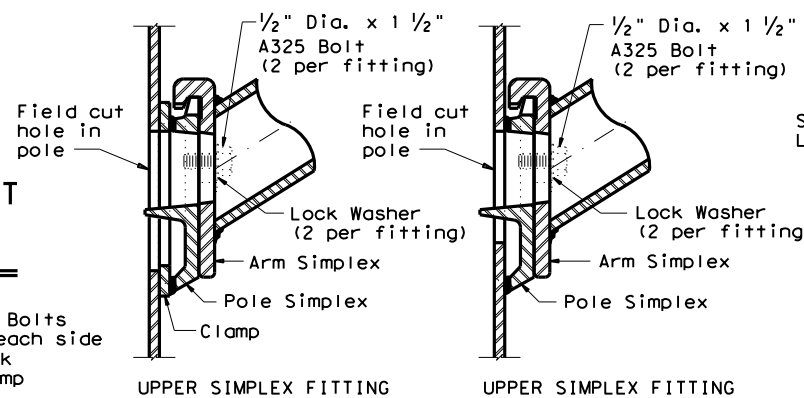
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



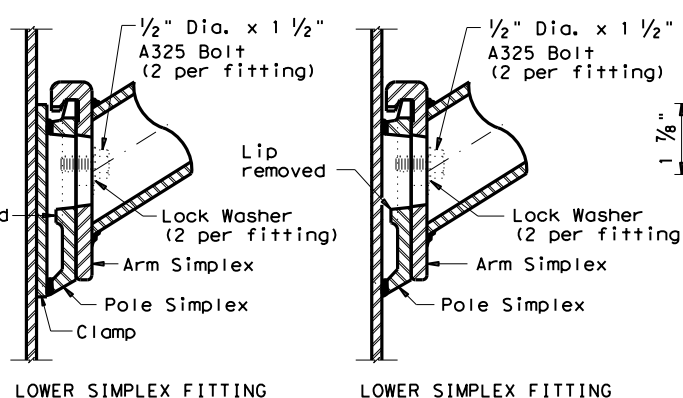
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



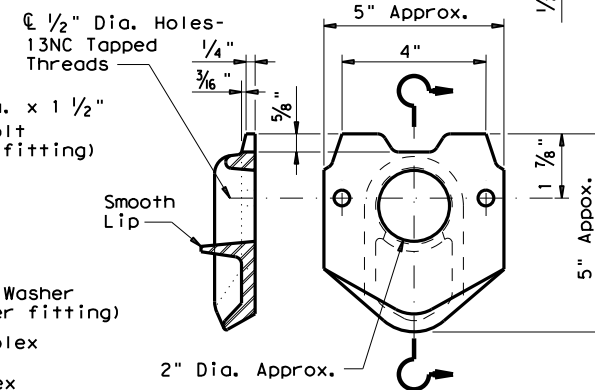
UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING

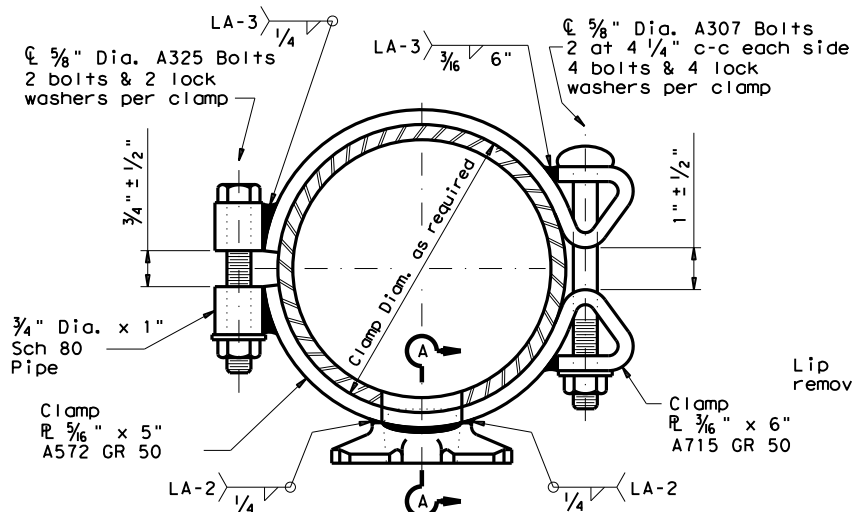


SECTION A-A

SECTION B-B

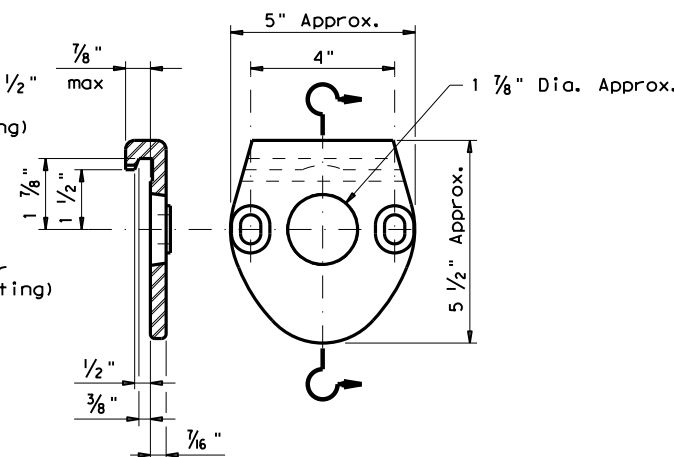


POLE SIMPLEX DETAIL



CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



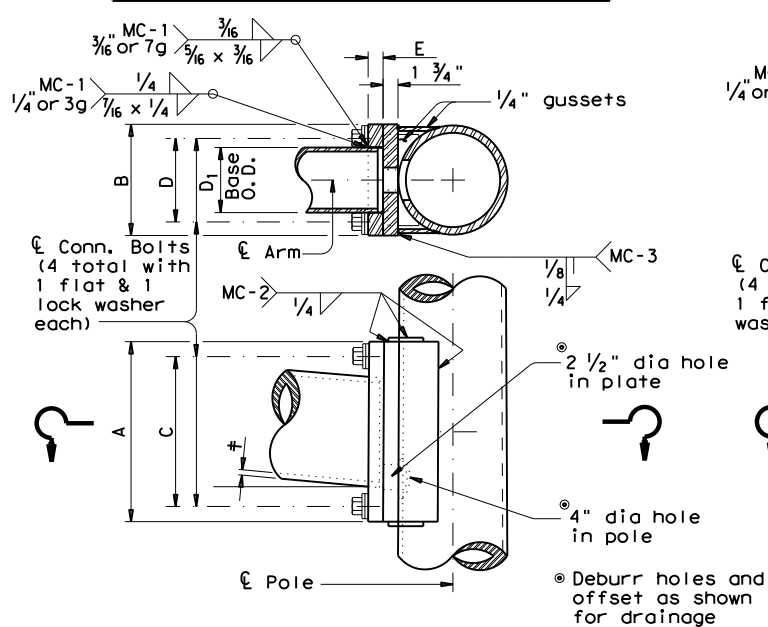
ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division
STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES
ARM DETAILS
LUM-A-12

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5-96	REVISIONS	CONT	SECT	JOB	HIGHWAY
1-99		0383	03	024, ETC.	SH 141
1-12		DIST	COUNTY	SHEET NO.	
		CRP	JIM WELLS, ETC.	190	

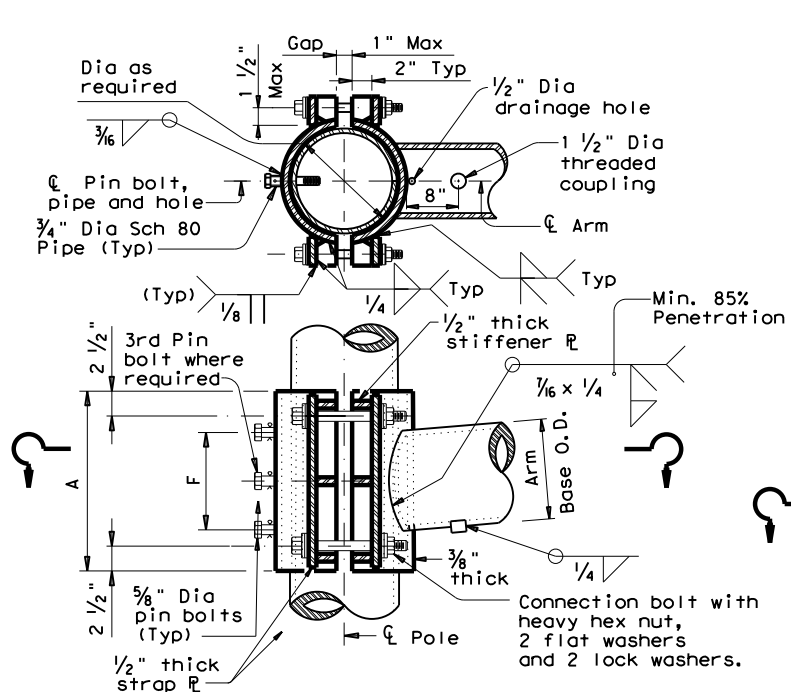
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ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	ϕ	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15	9	2	1 1/4
10.5	.239	18	13	15	10	3	1 1/2
11.0	.239	18	13	15	10	3	1 1/2



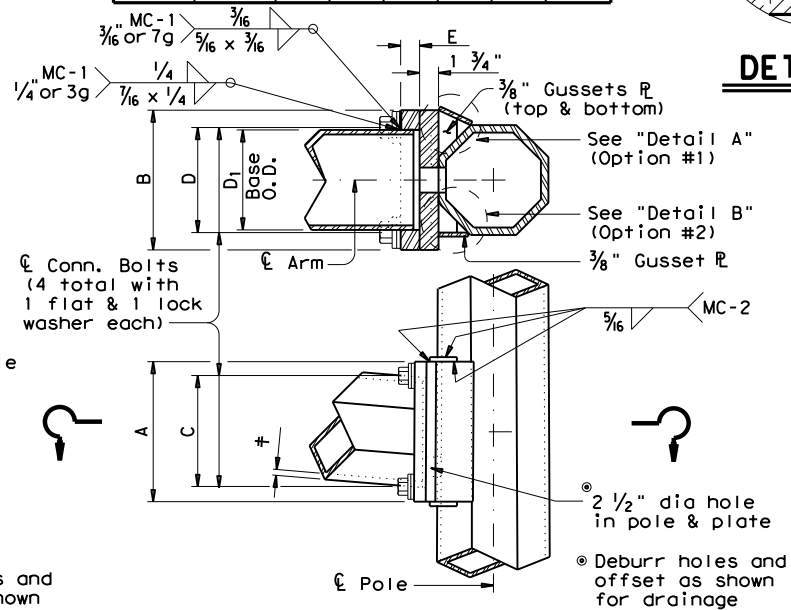
FIXED MOUNT DETAIL 1

ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	ϕ	in.	in.	No.	Dia	No.	Dia
6.5	.179	12	6	4	1/2	2	5/8
7.5	.179	14	8	4	1/2	2	5/8
8.0	.179	14	8	4	1/2	2	5/8
9.0	.179	16	10	4	1/2	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8



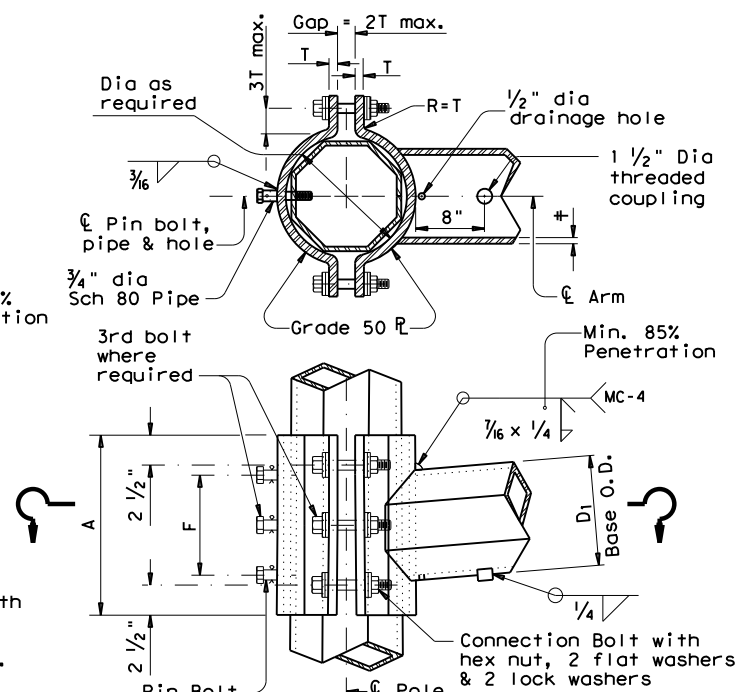
CLAMP-ON DETAIL 1

ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	ϕ	in.	in.	in.	in.	in.	in.
7.0	.179	11	11	8	8	1 3/4	1 1/4
7.5	.179	11	11	8	8	1 3/4	1 1/4
8.0	.179	11	11	8	8	2	1 1/4
9.0	.179	13	13	10	10	2	1 1/4
10.0	.179	13	13	10	10	2	1 1/4
9.5	.239	13	13	10	10	2	1 1/4
10.0	.239	14	14	11	11	2	1 1/2
11.0	.239	14	14	11	11	3	1 1/2
11.5	.239	14	14	11	11	3	1 1/2

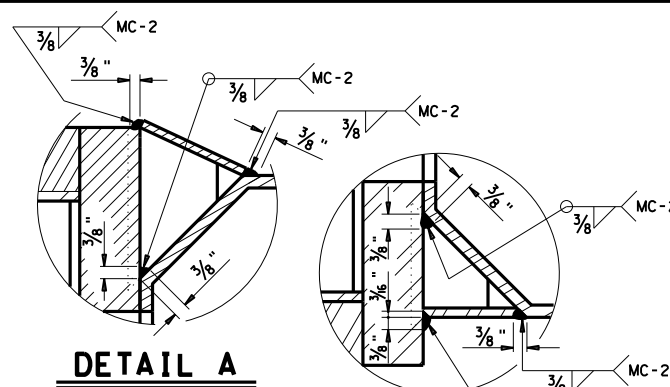


FIXED MOUNT DETAIL 2

ARM SIZE		A	F	T	CONN. BOLTS		PIN BOLTS	
D ₁	ϕ	in.	in.	in.	No.	Dia	No.	Dia
7.0	.179	12	6	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8

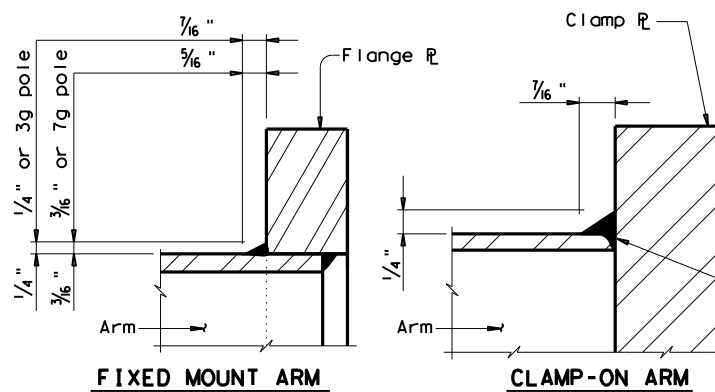


CLAMP-ON DETAIL 2



DETAIL A

DETAIL B

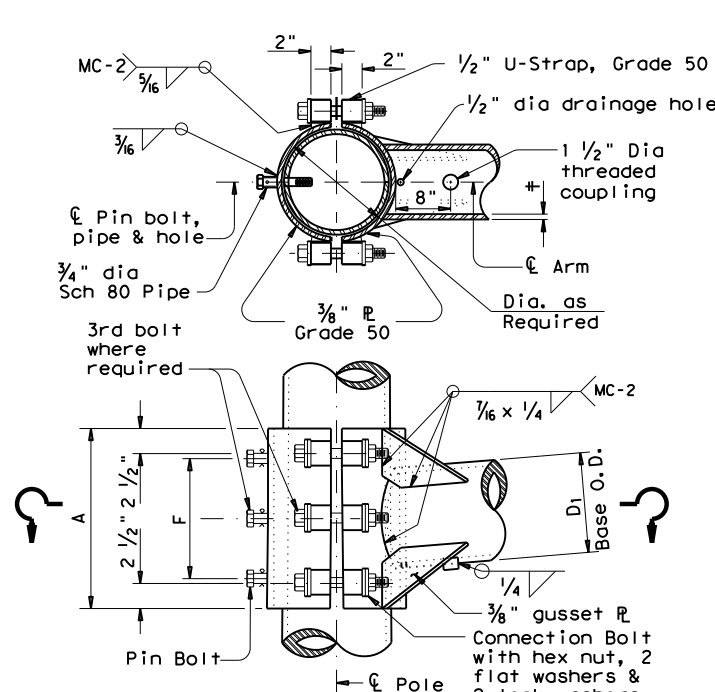


FIXED MOUNT ARM

CLAMP-ON ARM

ARM BASE WELD DETAILS

ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	ϕ	in.	in.	No.	Dia	No.	Dia
6.5	.179	12	6	4	1/2	2	5/8
7.5	.179	14	8	4	1/2	2	5/8
8.0	.179	14	8	4	1/2	2	5/8
9.0	.179	16	10	4	1/2	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8



CLAMP-ON DETAIL 3

MATERIALS	
Round Shafts or Polygonal Shafts ^①	ASTM A595 Gr. A, A588, A1008 HSLAS Gr. 50 Class 2, A1011 HSLAS Gr. 50 Class 2, A572 Gr. 50 or A1011 SS Gr. 50 ^②
Plates ^①	ASTM A36, A588, or A572 Gr. 50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ^①	ASTM A53 Gr. B, A501, A1008 HSLAS-F Gr. 50, A1011 HSLAS-F Gr. 50
Misc. Hardware	Galvanized steel or stainless steel or as noted

- ① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.
- ② ASTM A1011 SS Gr. 50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 1/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

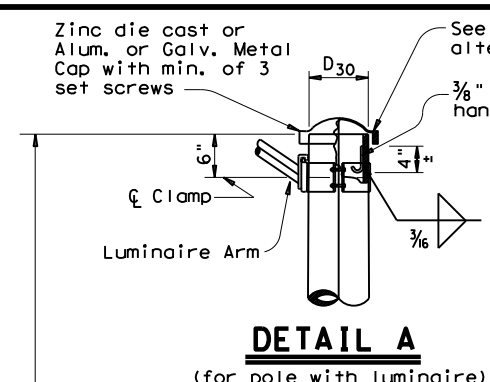
Texas Department of Transportation
Traffic Operations Division

**STANDARD ASSEMBLY
FOR TRAFFIC SIGNAL
SUPPORT STRUCTURES
MAST ARM CONNECTIONS
MA-C-12**

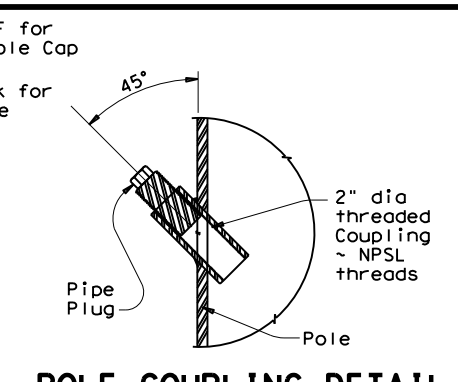
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REVISIONS	CONT	SECT	JOB	HIGHWAY
5-96 5-09 1-12	0383	03	024, ETC.	SH 141
	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS, ETC.		191

DATE: FILE:

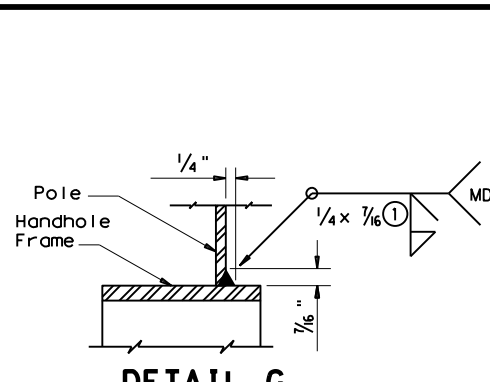
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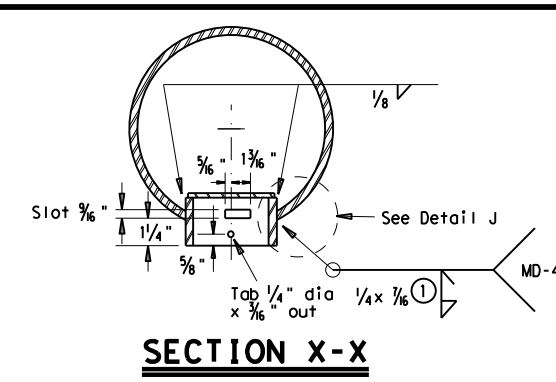
DETAIL A
(for pole with luminaire)



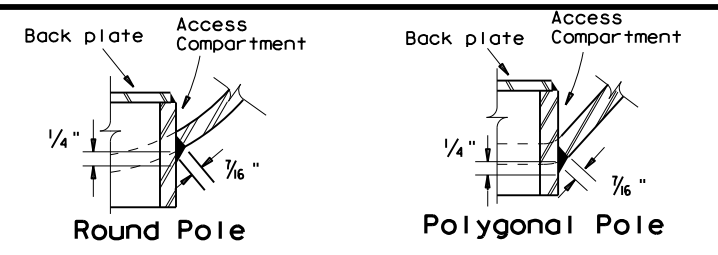
POLE COUPLING DETAIL



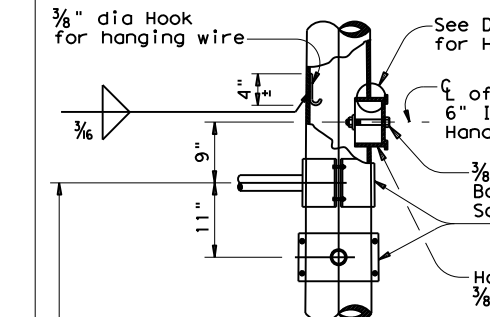
DETAIL G



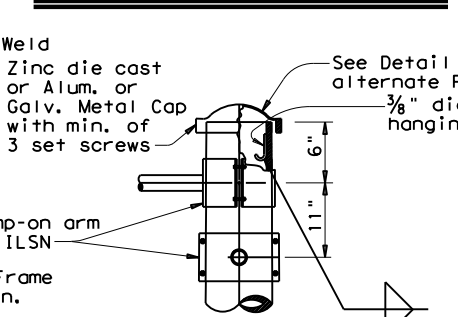
SECTION X-X



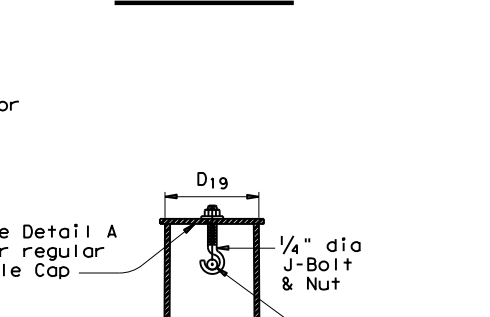
DETAIL J



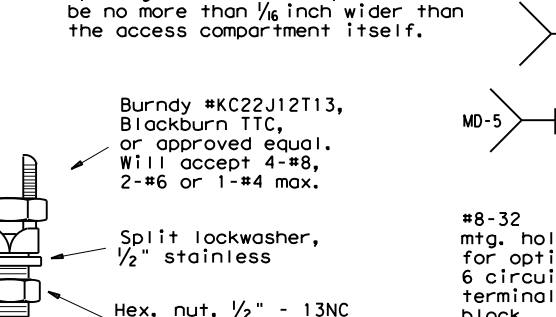
DETAIL B
(If ILSN applied)



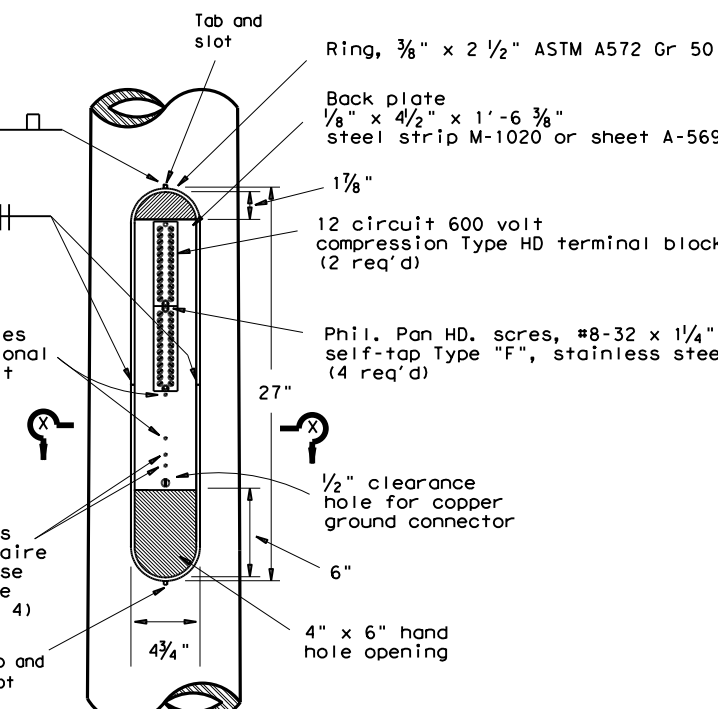
DETAIL C



SECTION Y-Y



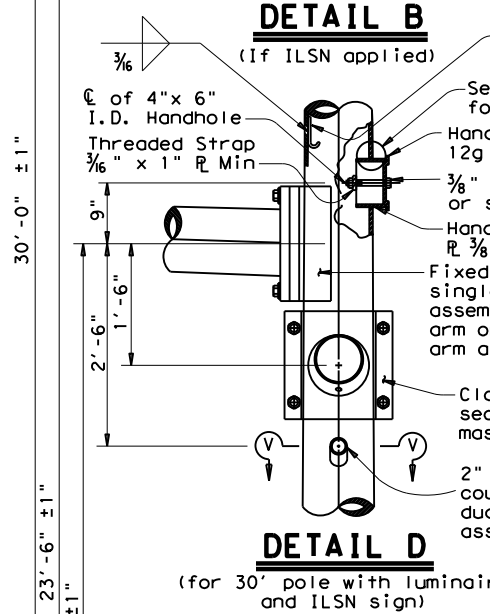
COPPER GROUND CONNECTOR



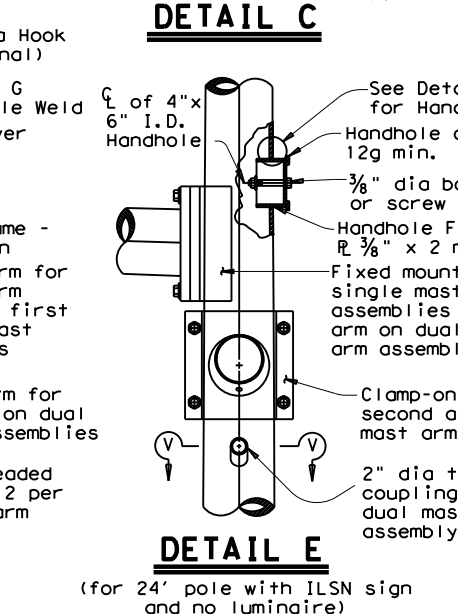
ACCESS COMPARTMENT

NOTES:

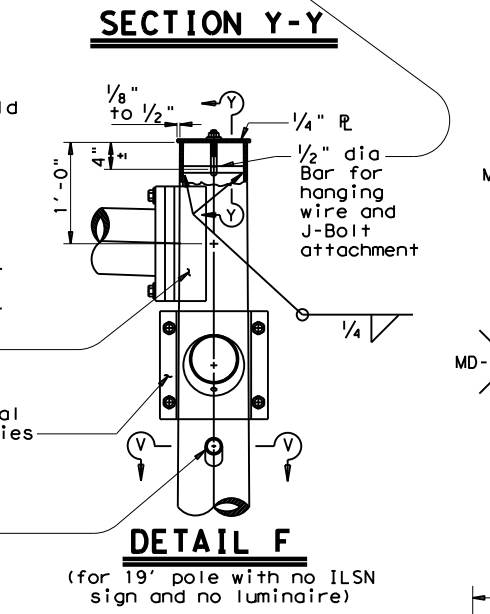
- The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
- The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4 self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilco SSS-5). The traffic signal contractor shall install the kit items in the field.
- The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
- Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.



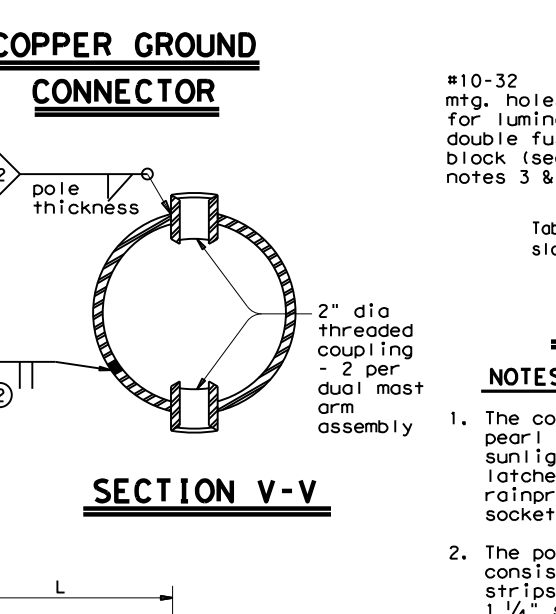
DETAIL D
(for 30' pole with luminaire and ILSN sign)



DETAIL E
(for 24' pole with ILSN sign and no luminaire)

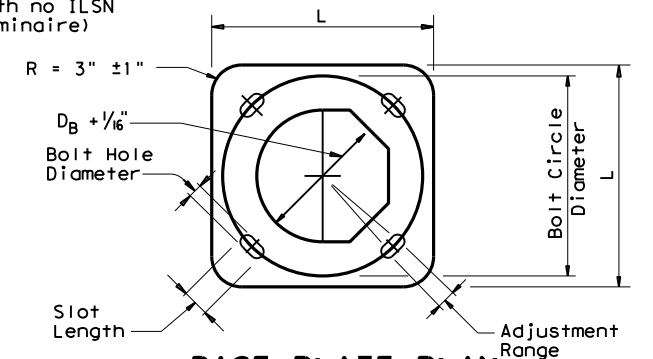


DETAIL F
(for 19' pole with no ILSN sign and no luminaire)

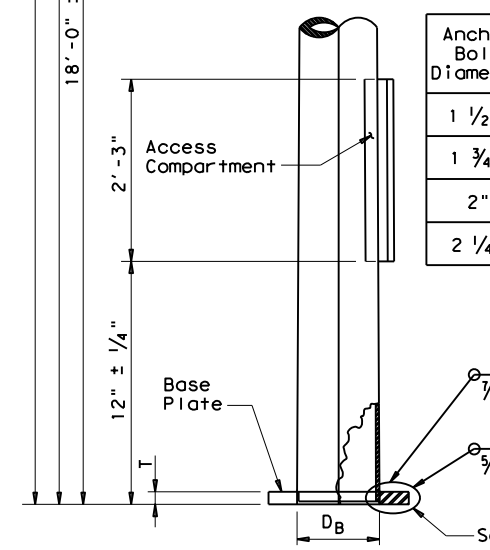


SECTION V-V

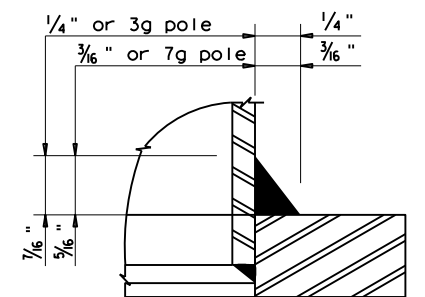
Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base R Dim. L x T	Adjust. Range
1 1/2"	1 3/4"	3 1/2"	17"	18" x 1 1/2"	13.4°
1 3/4"	2"	4"	19"	20" x 1 3/4"	13.5°
2"	2 1/4"	4 1/2"	21"	22" x 2"	13.6°
2 1/4"	2 1/2"	5"	23"	24" x 2 1/4"	13.7°



BASE PLATE PLAN



POLE ELEVATION



DETAIL H

- 85% Min. penetration
- 60% Min. penetration
100% penetration within 6" of circumferential base welds.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

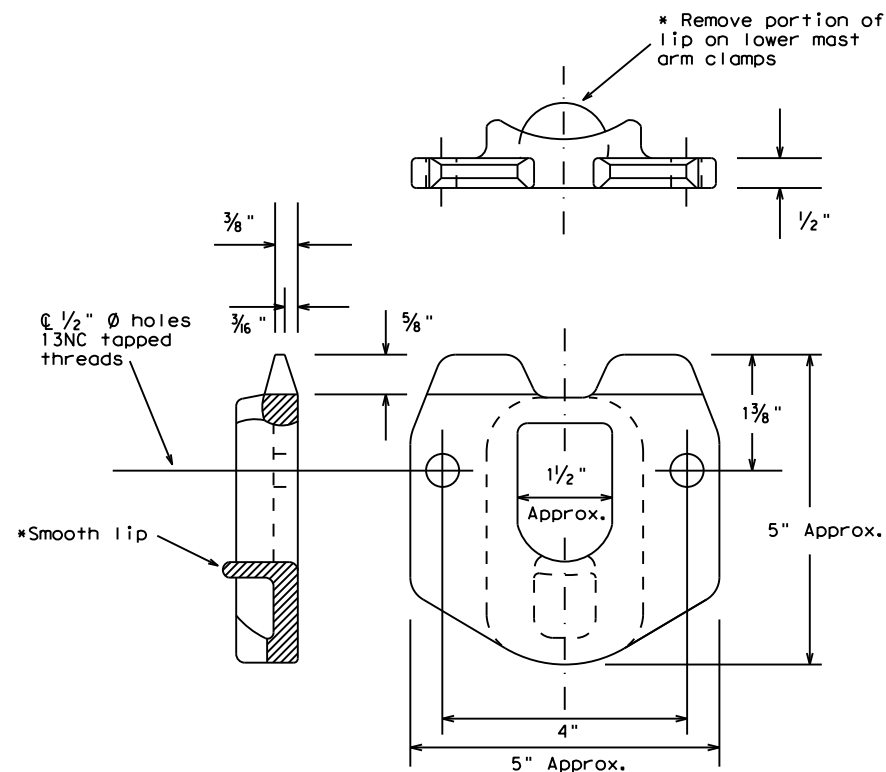
MA-D-12

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1-12		0383	03	024, ETC.	SH 141
		DIST	COUNTY		SHEET NO.
		CRP	JIM WELLS, ETC.		192

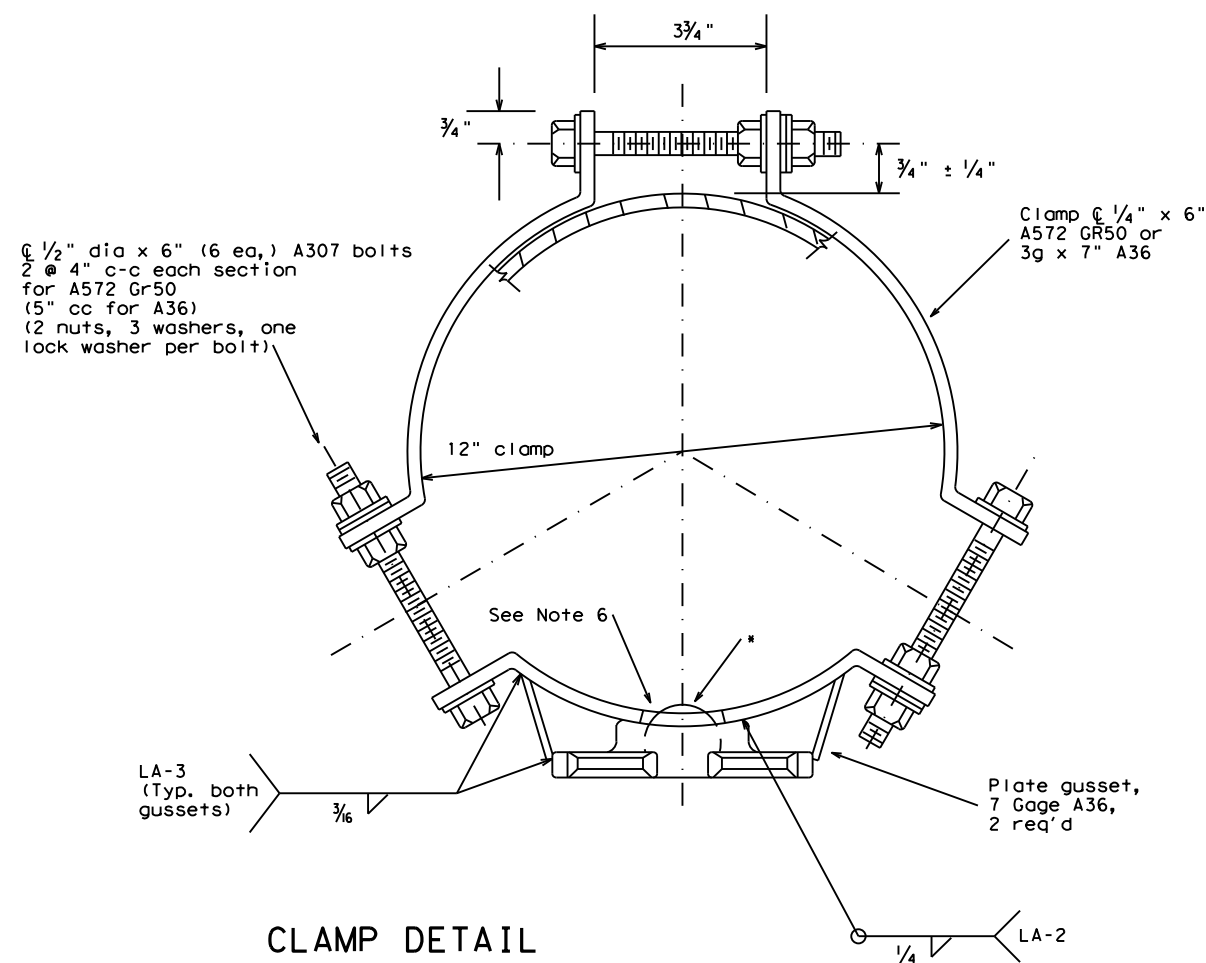
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FILE:

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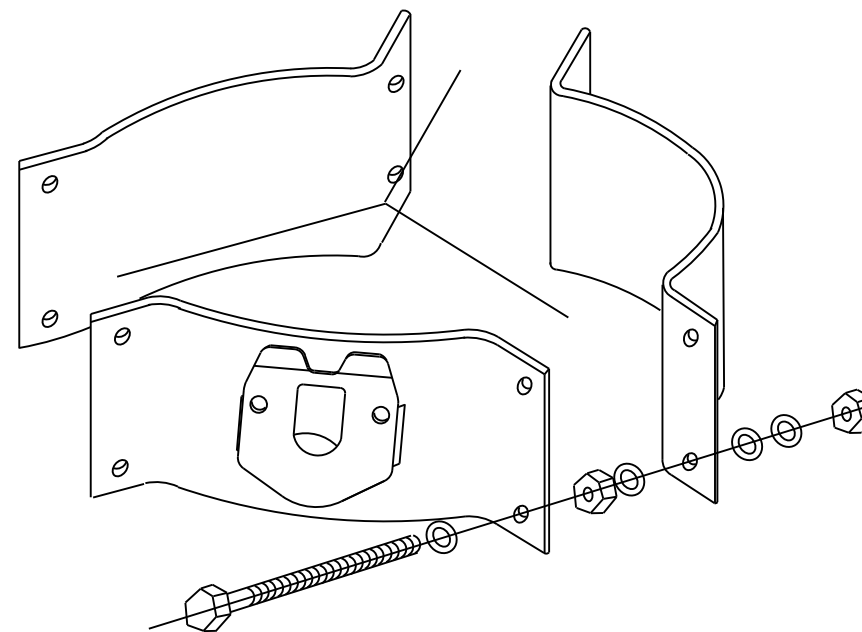
DATE:
FILE:



POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

For 8.9 - 12 inch diameter Signal Poles
(Two req'd for each mast arm)

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, 1/2 in. x 1 1/2 in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft., 12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.

Texas Department of Transportation
Traffic Operations Division

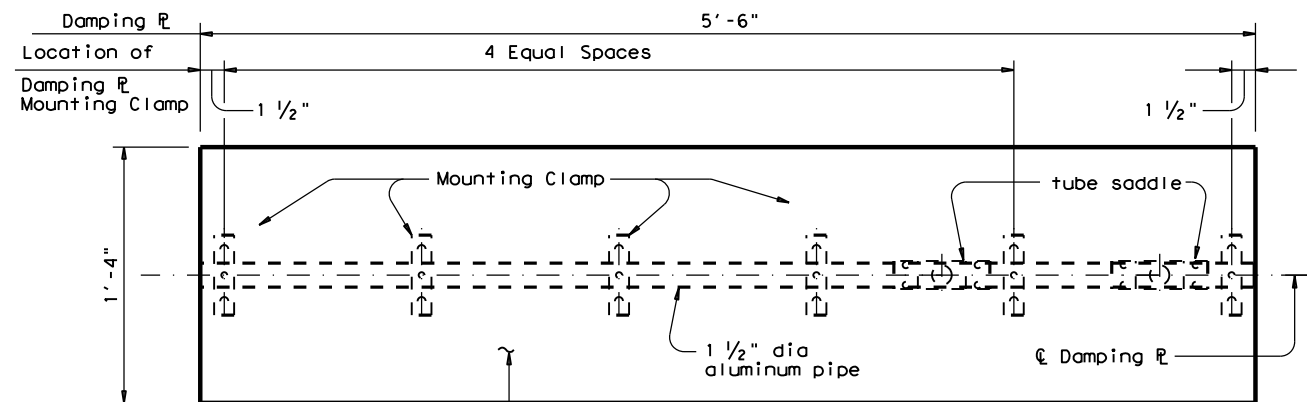
CLAMP ON
FITTING ASSEMBLY FOR
LUMINAIRE MAST ARM

CFA-12

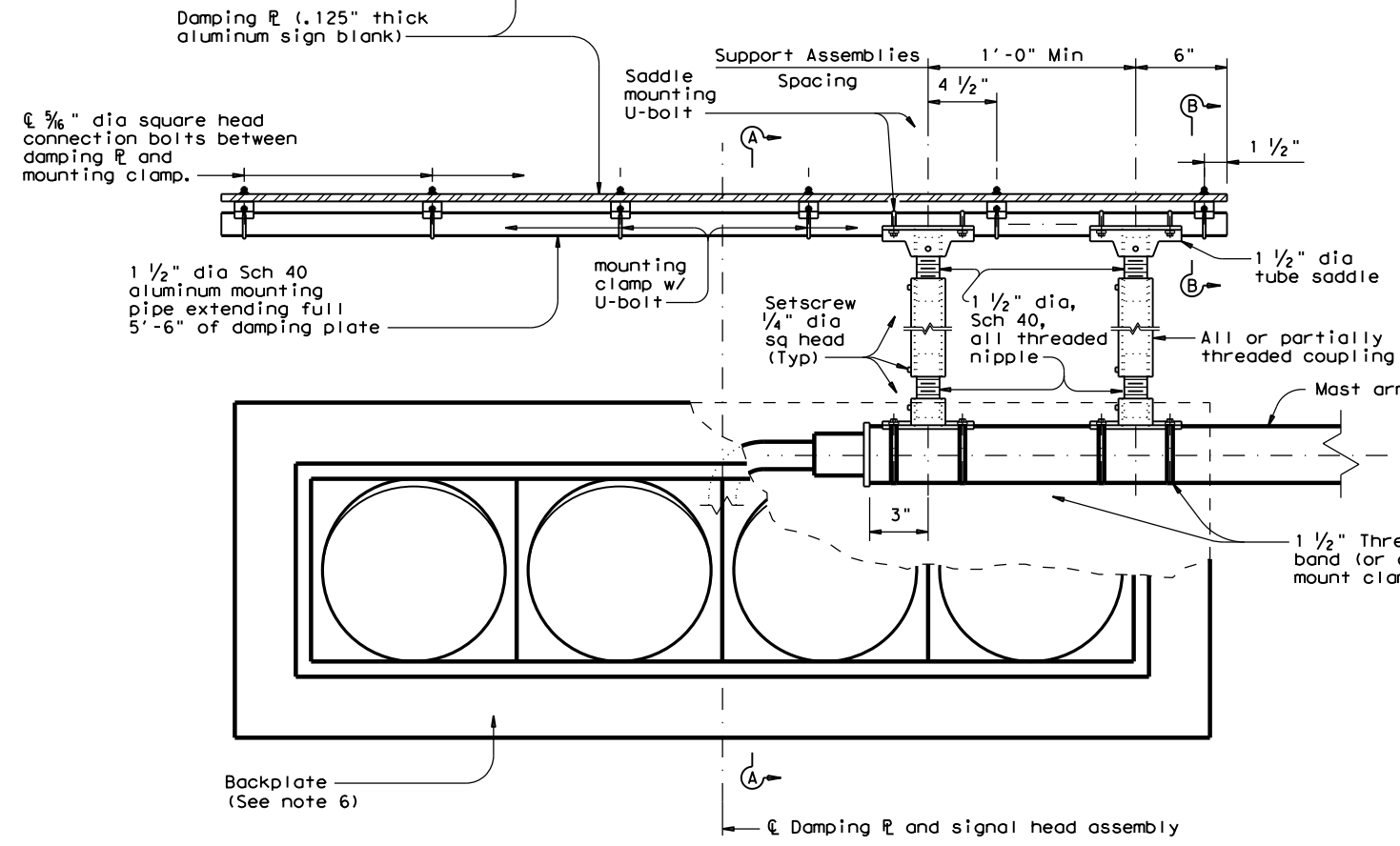
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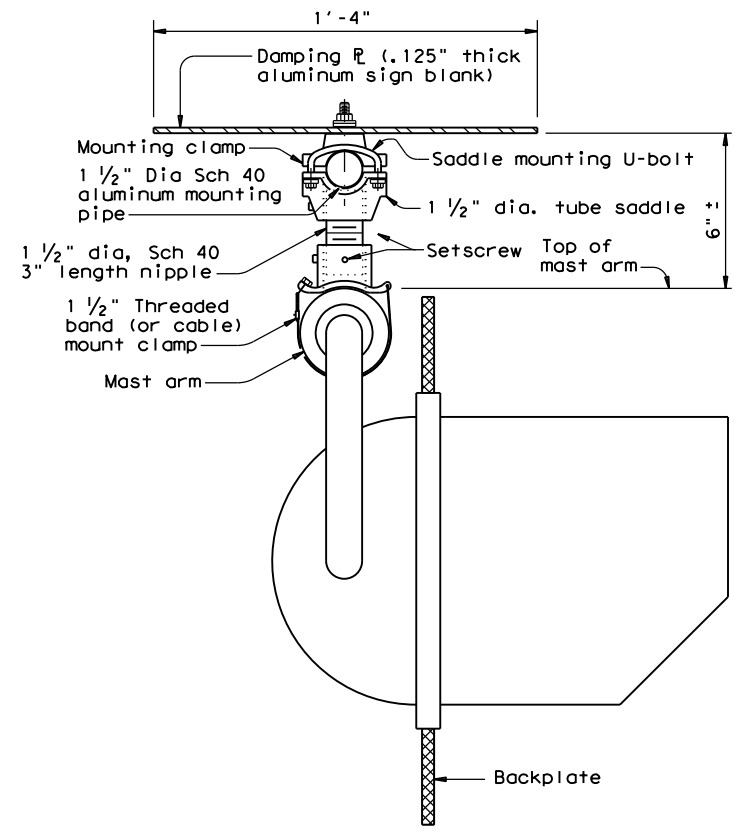
PLAN



ELEVATION

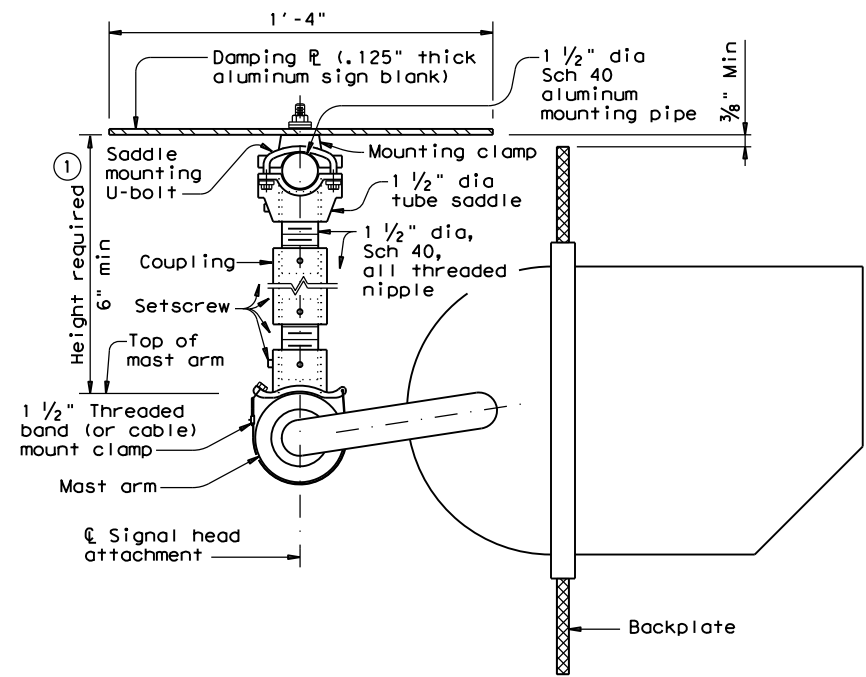
DAMPING PLATE MOUNTING DETAILS

(Showing alternate placement of signal head)



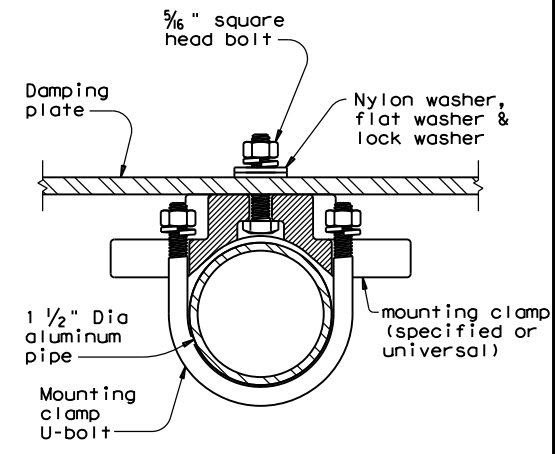
SECTION A-A

(Showing standard placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A

(Showing alternate placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.
2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and U-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.
3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate) and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.
4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
5. Contractor will verify applicable field dimensions before the installation.
6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type BFL or CFL retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

① Recommended supporting assemblies to achieve required height for horizontal section heads

Height required	One nipple each length	Two nipples each length plus One coupling each length
6"-6 3/4"	3"	-
7"-8 1/2"	4"	-
9"-10 1/2"	6"	-
11"-15 1/2"	-	4" 5"
16"-24"	-	6" 10"

Texas Department of Transportation
Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CR: TxDOT
 © TxDOT January 2012 | CONT: 0383 | SECT: 03 | JOB: 024, etc. | HIGHWAY: SH 141
 REVISIONS | DIST: COUNTY | SHEET NO.: 194
 6-20 | CRP: JIM WELLS, etc.

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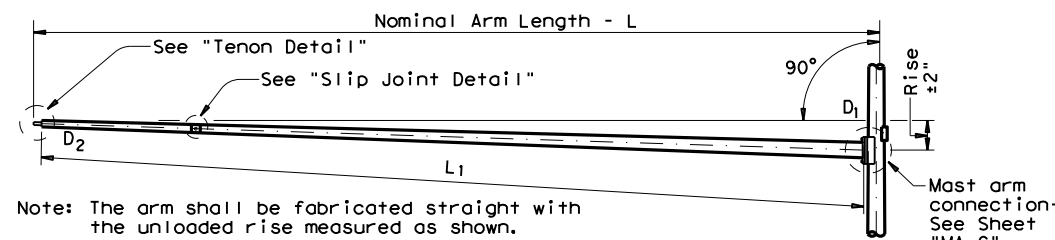
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Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
24	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	36-A
28	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
32	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
40	14.0	11.3	10.6	9.8	.239	16.0	13.0	12.2	11.3	.239	36-B
44	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	① thk	Rise	L ₁	D ₁	② D ₂	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

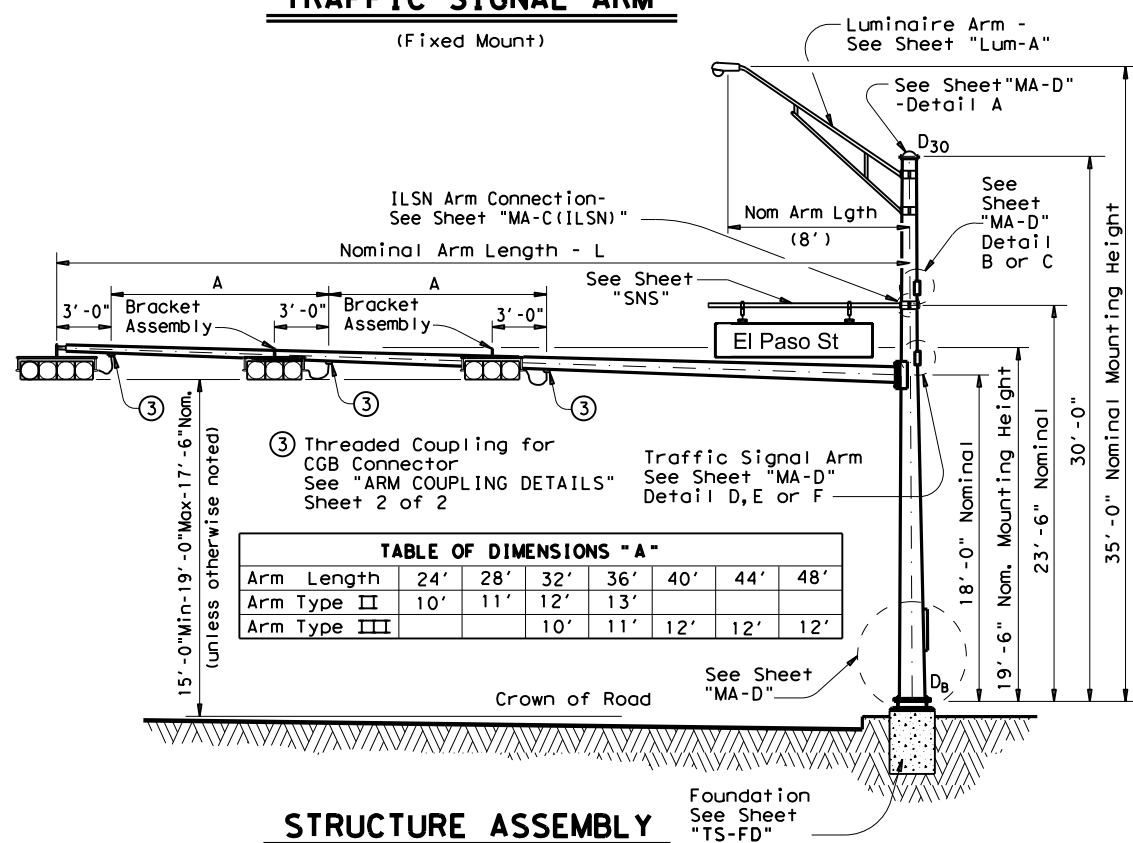
D_B = Pole Base O.D.
D₁₉ = Pole Top O.D. with no Luminaire and no ILSN
D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
D₃₀ = Pole Top O.D. with Luminaire
D₁ = Arm Base O.D.
D₂ = Arm End O.D.
L₁ = Shaft Length
L = Nominal Arm Length

- ① Thickness shown are minimums, thicker materials may be used.
- ② D₂ may be increased by up to 1" for polygonal arms.



TRAFFIC SIGNAL ARM

(Fixed Mount)



Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
ft						
20	20L-100		20S-100		20-100	
24	24L-100		24S-100		24-100	
28	28L-100		28S-100		28-100	
32	32L-100		32S-100		32-100	
36	36L-100		36S-100		36-100	
40	40L-100		40S-100		40-100	
44	44L-100		44S-100		44-100	

Traffic Signal Arms (1 per pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
ft						
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers


Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	
1 3/4"	3'-10"	
2"	4'-3"	

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

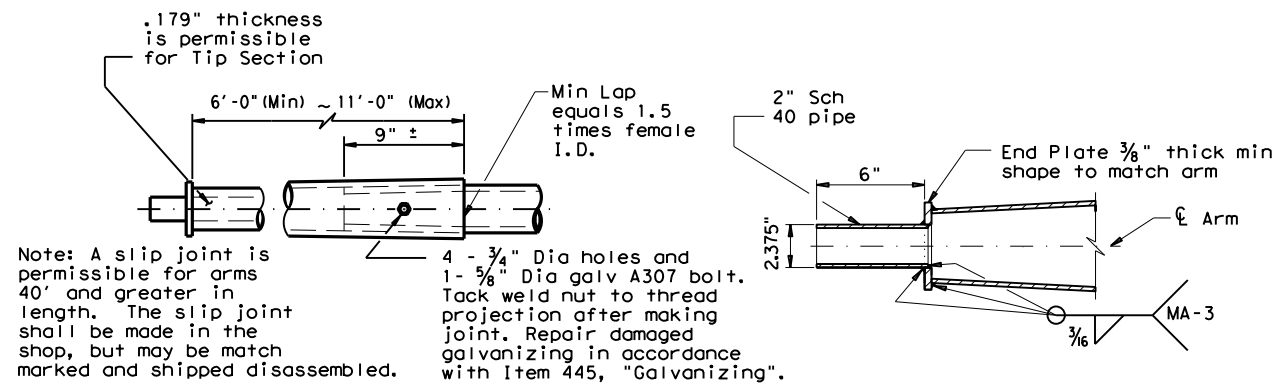
Templates may be removed for shipment.


Texas Department of Transportation
 Traffic Operations Division
TRAFFIC SIGNAL SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(100 MPH WIND ZONE)
SMA-100(1)-12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96		0383	03	024, ETC.	SH 141
11-99		DIST		COUNTY	SHEET NO.
1-12		CRP		JIM WELLS, ETC.	195

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DATE: FILE:



SLIP JOINT DETAIL

TENON DETAIL

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backplates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 1/2" Dia Threaded Coupling.

BRACKET ASSEMBLY

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor.

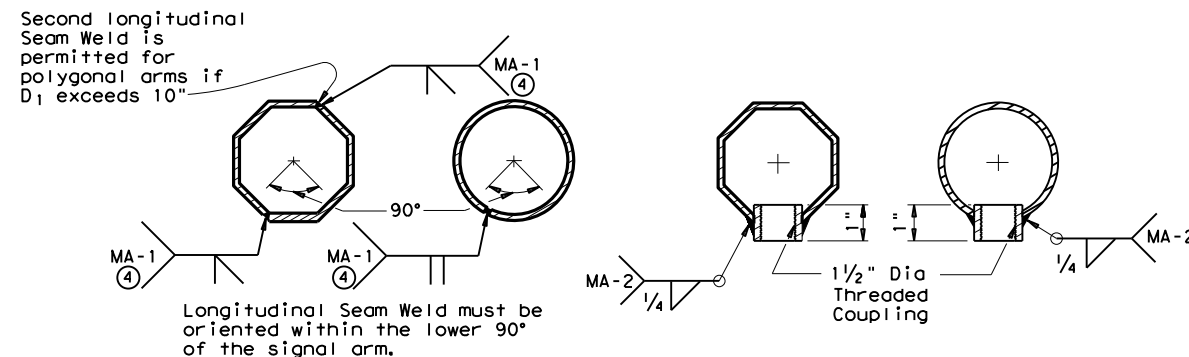
Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.



ARM WELD DETAIL

ARM COUPLING DETAILS

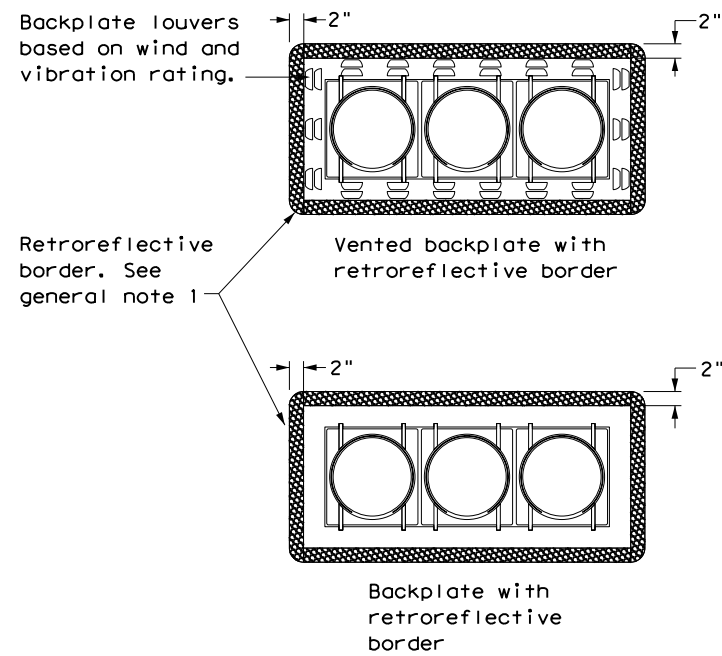
④ 60% Min. penetration
 100% penetration within 6" of circumferential base welds.

Texas Department of Transportation
 Traffic Operations Division
TRAFFIC SIGNAL SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(100 MPH WIND ZONE)
SMA-100(2)-12

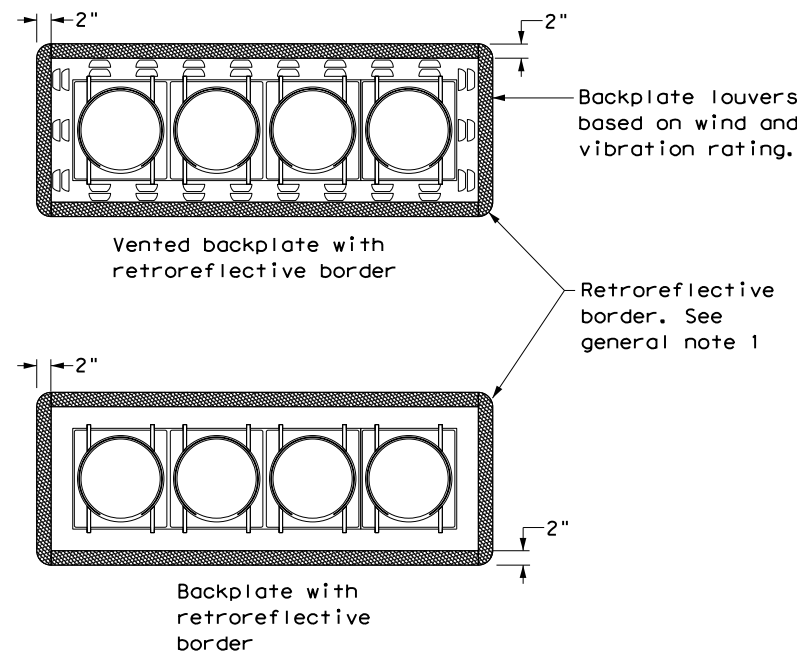
© TxDOT August 1995		DN: MS	CK: JSY	DW: MMF	CK: JSY
REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96 1-12		0383	03	024, ETC.	SH 141
		DIST	COUNTY		SHEET NO.
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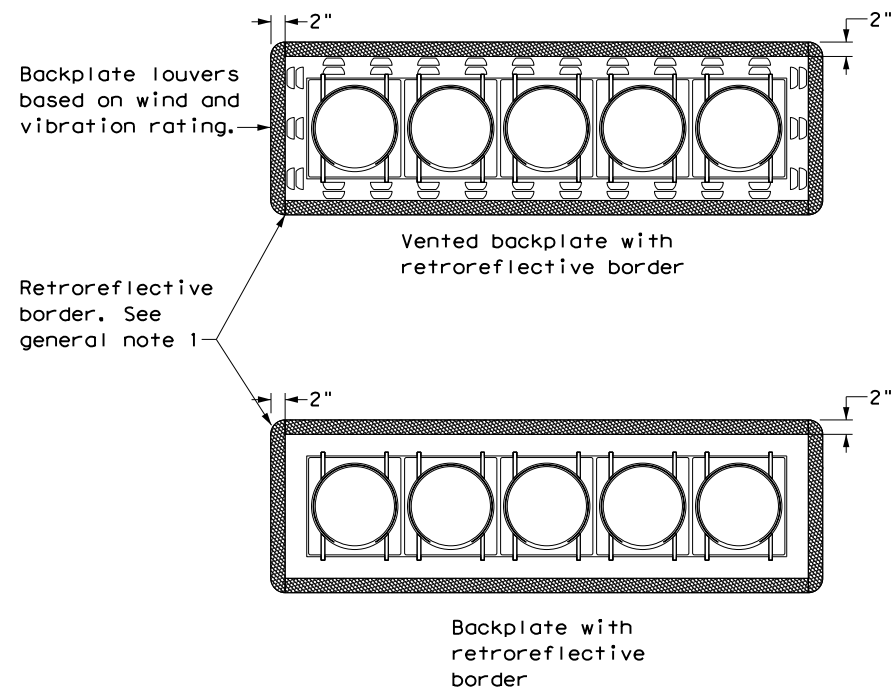
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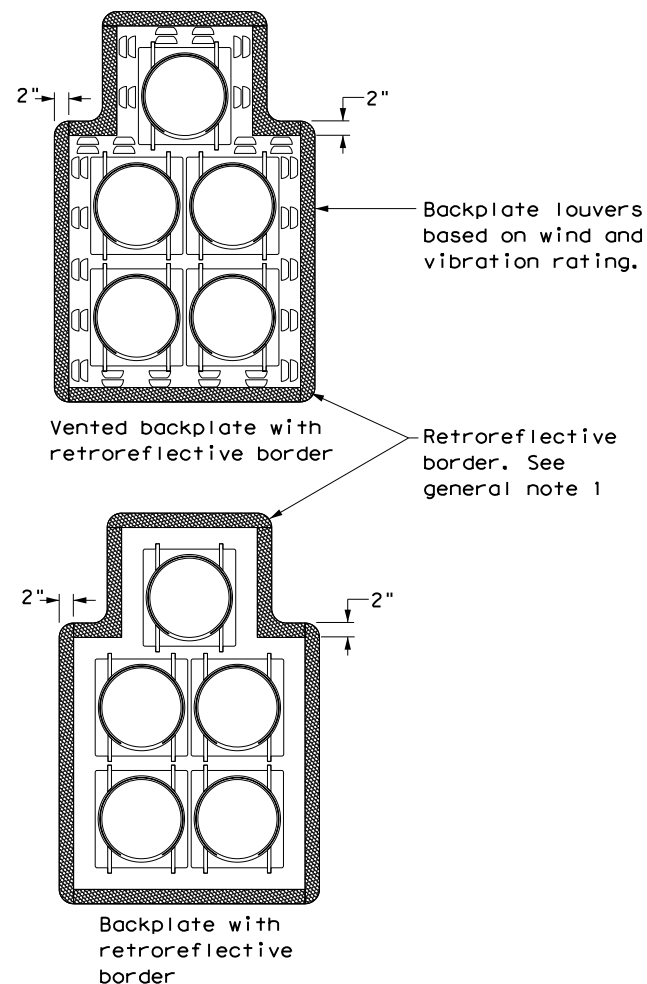
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



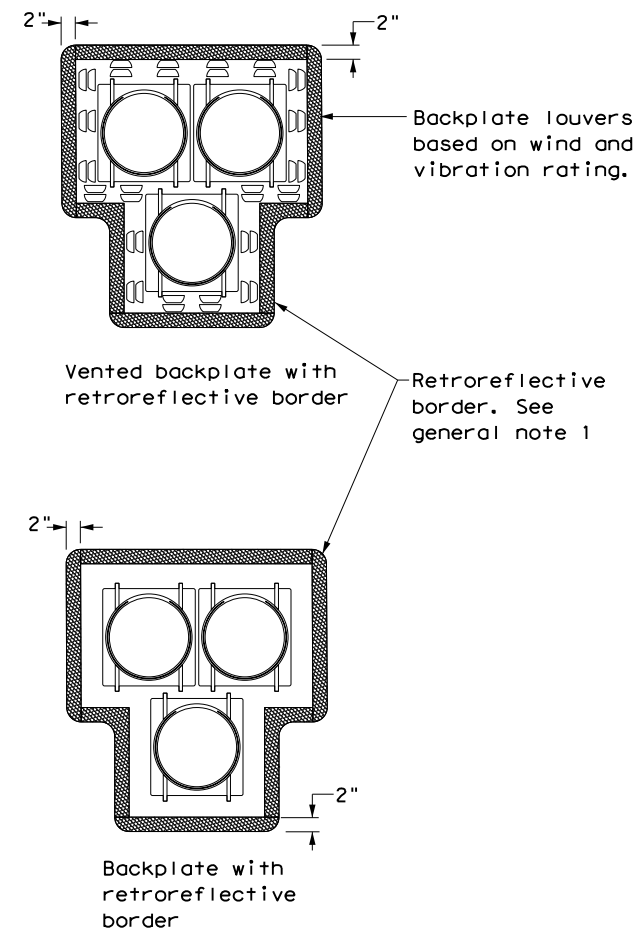
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



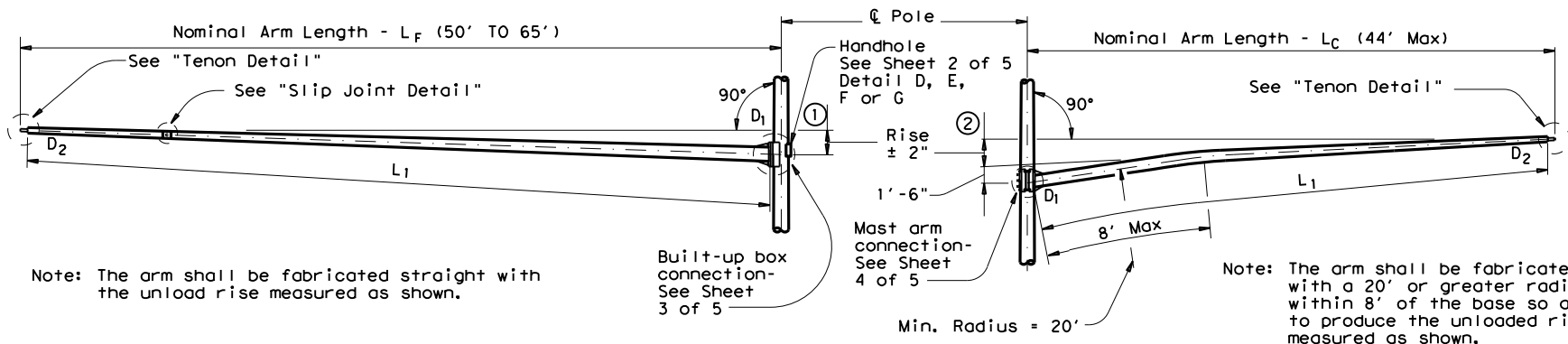
PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatibility must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
 - Pole mounted
 - Overhead mounted
 - Span wire mounted
 - Mast arm mounted
 - Vertical signal heads
 - Horizontal signal heads
 - Clustered signal heads
 - Pedestrian hybrid beacons

				Traffic Safety Division Standard	
TRAFFIC SIGNAL HEAD WITH BACKPLATE TS-BP-20					
FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0383	03	024, ETC.	SH 141	
	DIST	COUNTY		SHEET NO.	
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Note: The arm shall be fabricated straight with the unload rise measured as shown.

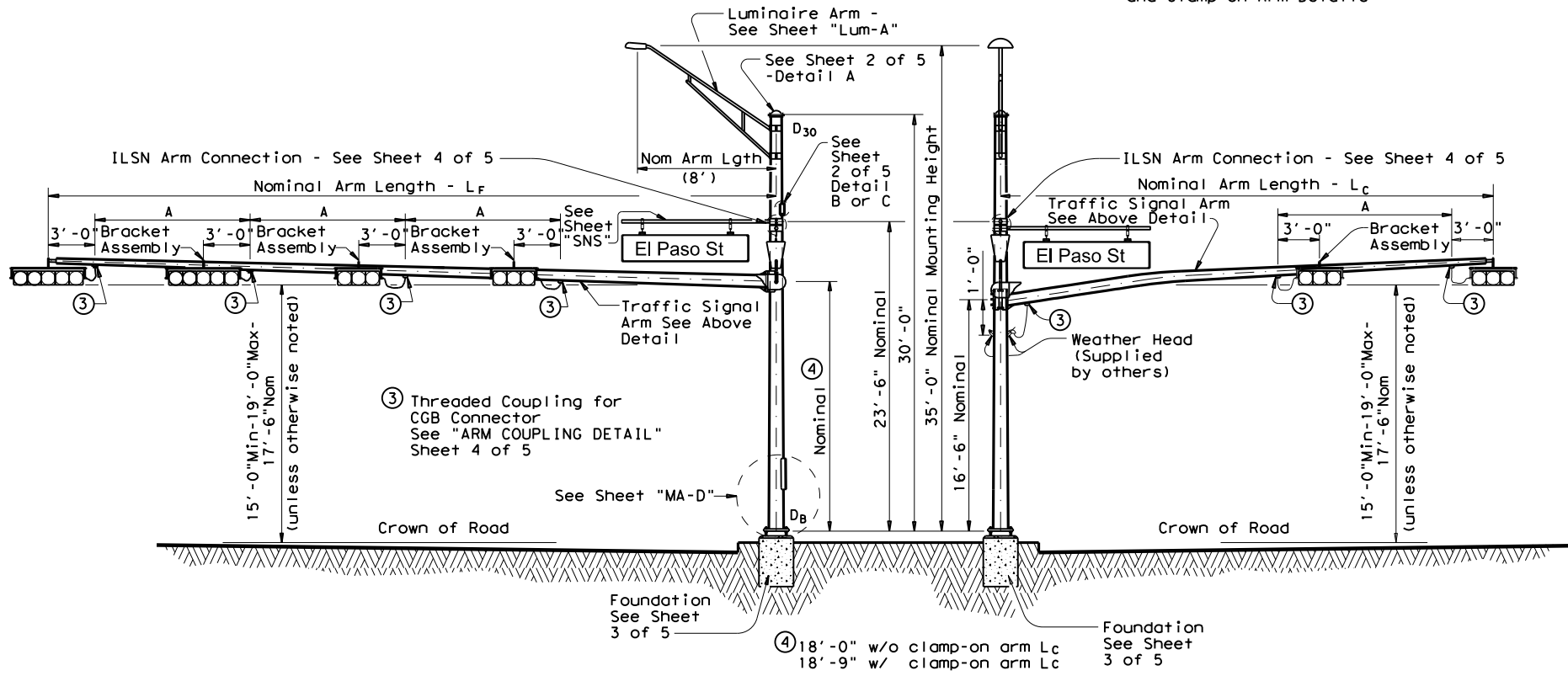
Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

① See Sheet 3 of 5 for Arm Rise

CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

② See Sheet 4 of 5 for Arm Rise and Clamp-on Arm Details



ELEVATION

(Showing fixed mount arm)

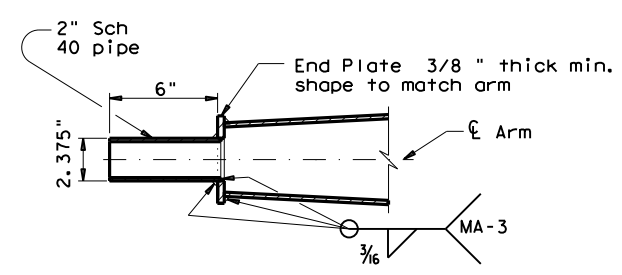
STRUCTURE ASSEMBLY

ELEVATION

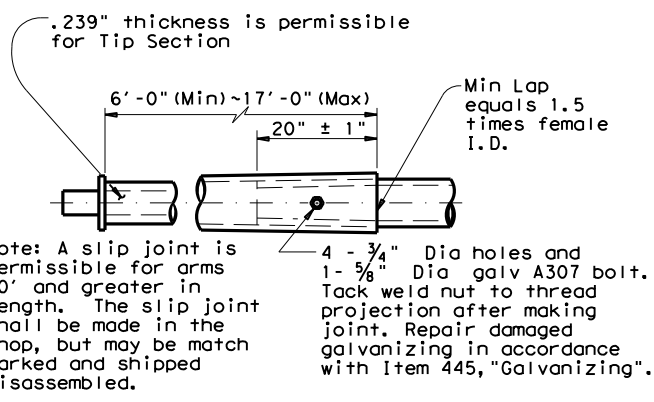
(Showing clamp-on arm)

TABLE OF DIMENSIONS "A"

Arm Length	24'	28'	32'	36'	40'	44'	50'	55'	60'	65'
Arm Type II	10'	11'	12'	13'						
Arm Type III			10'	11'	12'	12'				
Arm Type IV							12'	12'	12'	12'



TENON DETAIL



SLIP JOINT DETAIL (FIXED MOUNT ARM)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL ⑤	WL EPA ⑤⑥
8' Luminaire Arm	Luminaire 60 lbs	1.6 sq ft
9' ILSN Arm	Sign 85 lbs	11.5 sq ft
50' to 65' Fixed Mount Arm	Signal Loads 310 lbs	52 sq ft
Up to 44' Clamp-on Arm	Signal Loads 180 lbs	32.4 sq ft

⑤ Equivalent dead load plus horizontal wind load applied at the end of arm except ILSN arm, which applied 4.5' from the centerline of the pole.

⑥ Effective projected area (actual area times drag coefficient) for the application of horizontal wind load.

Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "MA-D" for pole details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Material, fabrication tolerances, and shipping practices shall also meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing" after fabrication.

Deviations from the details and dimensions shown herein require submission of shop drawings in accordance with the Item 441, "Steel Structures". Alternate designs are not acceptable.

Installation of damping plate for the long mast arm is not recommended.

Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY
(50 TO 65 FT)
(80 AND 100 MPH WIND ZONE)
LMA(1)-12

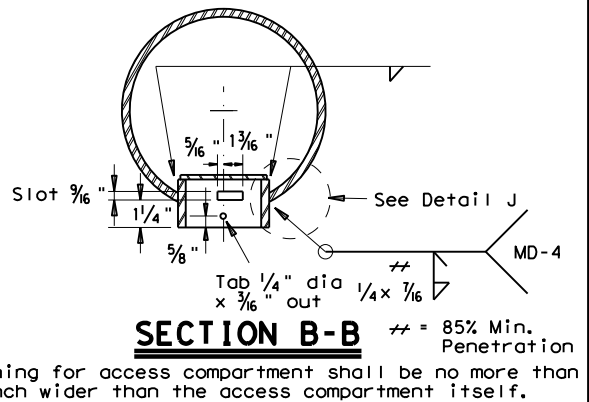
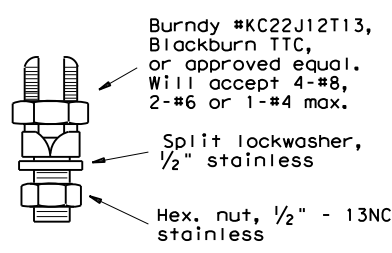
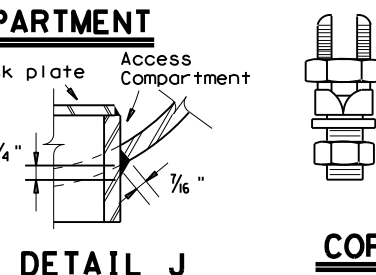
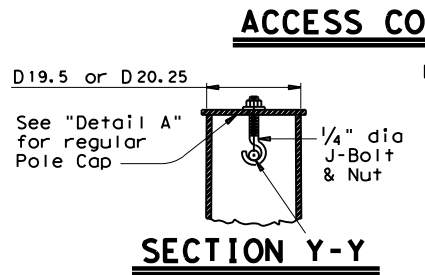
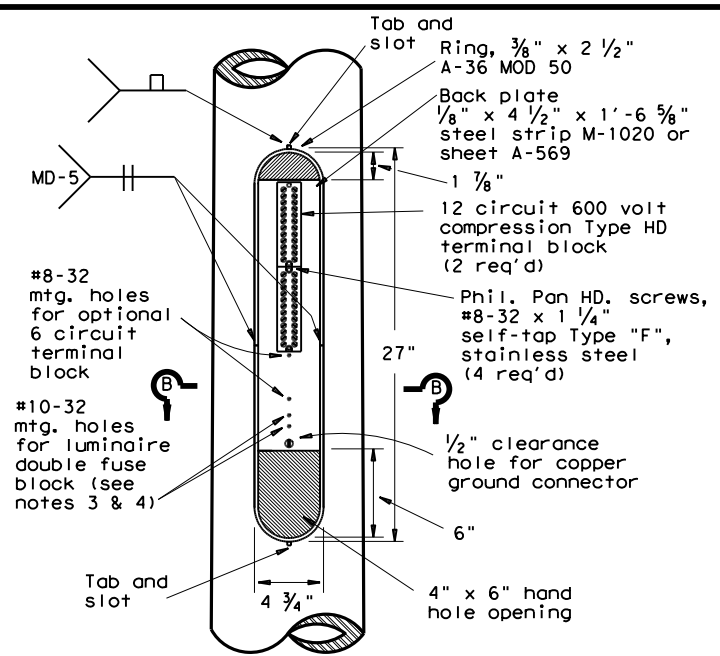
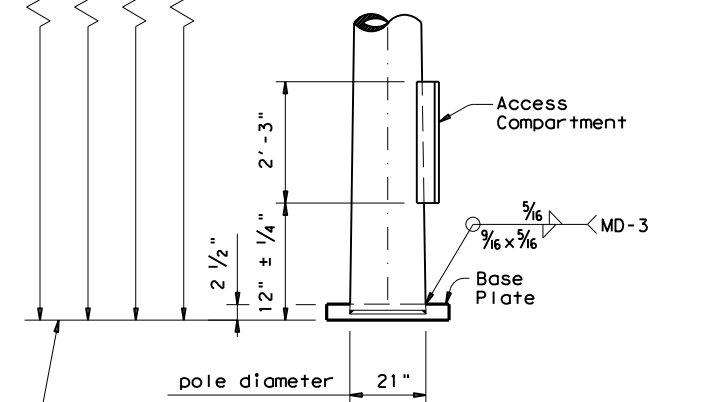
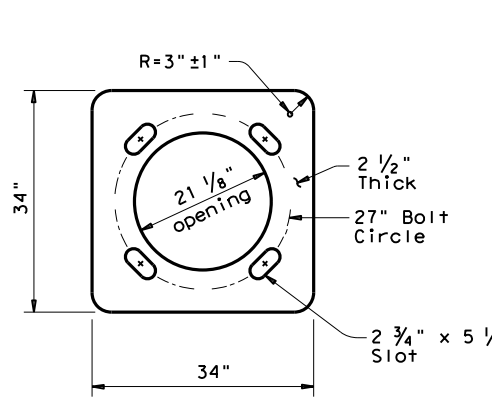
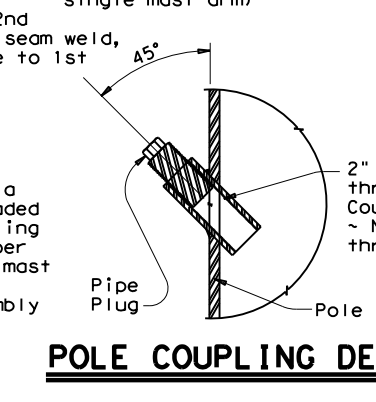
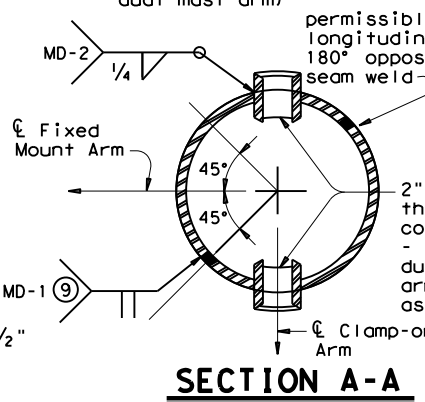
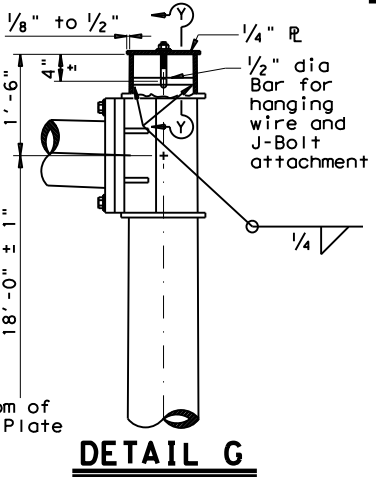
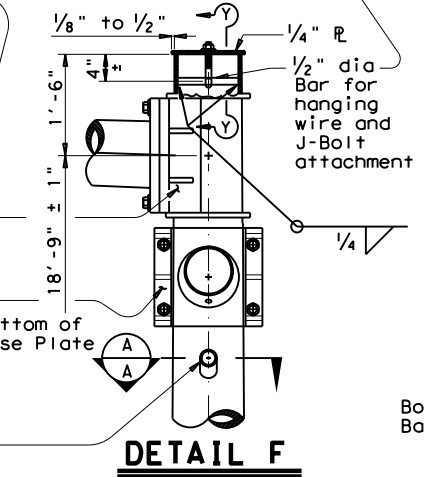
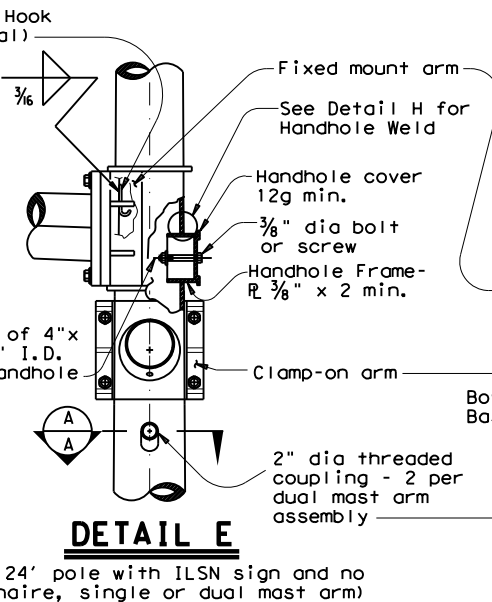
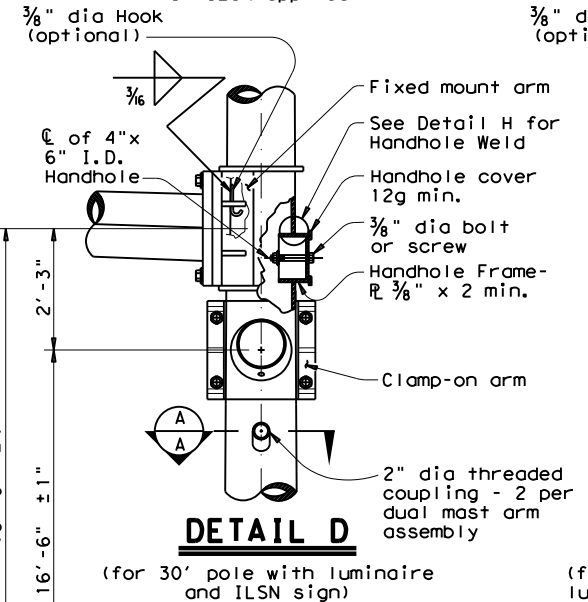
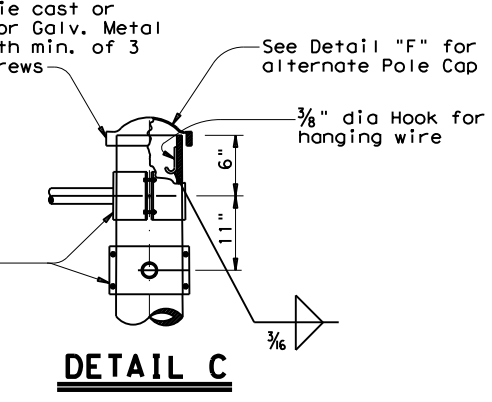
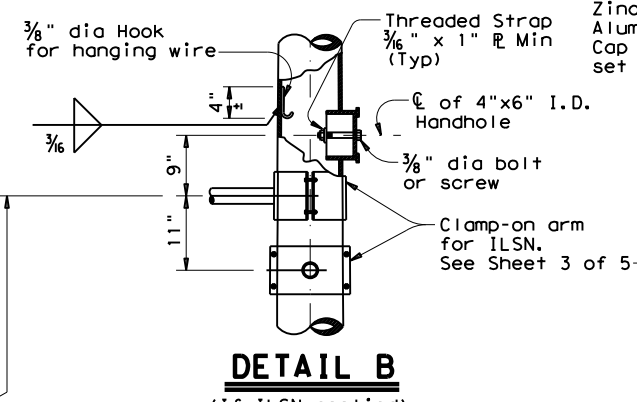
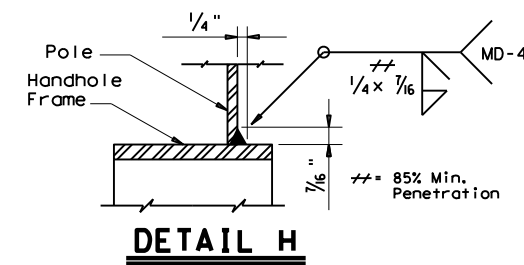
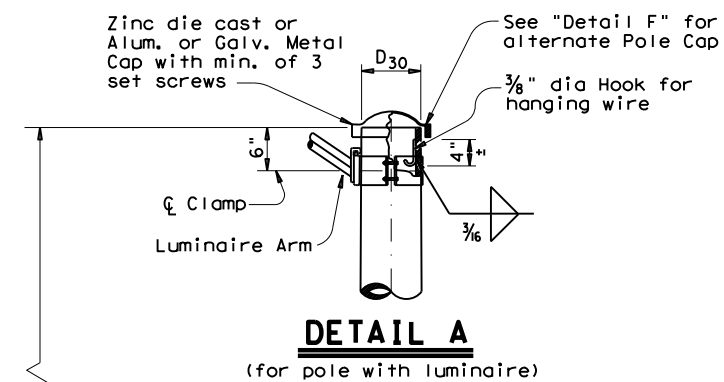
Sheet 1 of 5

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	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	198	

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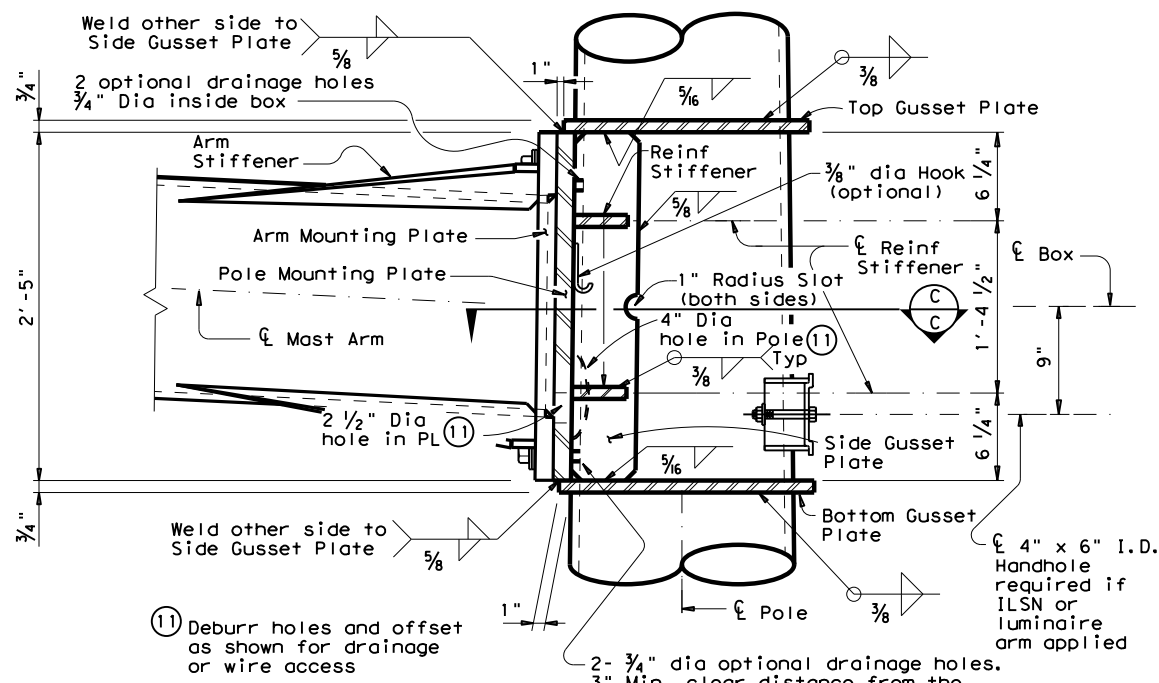


- ACCESS COMPARTMENT NOTES:**
- The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
 - The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilco SSS-5). The traffic signal contractor shall install the kit items in the field.
 - The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
 - Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

MATERIALS	
Round Shafts or Polygonal Shafts (7)	ASTM A595 Gr. A, A588, A1008 HSLAS Gr. 50 Class 2, A1011 HSLAS Gr. 50 Class 2, A572 Gr. 50 or A1011 SS Gr. 50 (8)
Plates (7)	ASTM A36, A588, or A572 Gr. 50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr. B, A501, A1008 HSLAS-F Gr. 50, A1011 HSLAS-F Gr. 50
Misc. Hardware	Galvanized steel or stainless steel or as noted

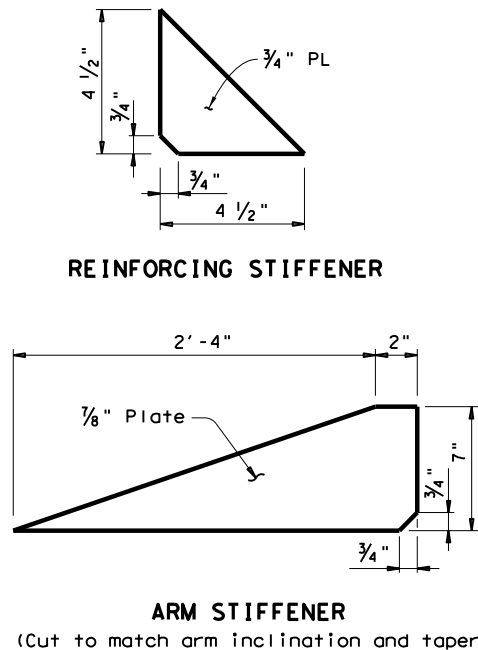
- (7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.
- (8) ASTM A1011 SS Gr. 50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

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BUILT-UP BOX CONNECTION

REINFORCING STIFFENER

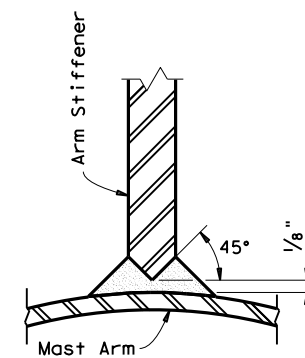


ARM STIFFENER

(Cut to match arm inclination and taper)

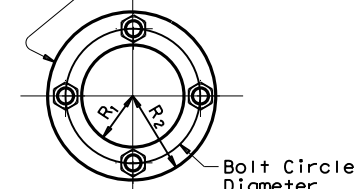
Provide Detail shown in SECTION F-F or equivalent 100% complete joint penetration weld from both sides.

DETAIL "K"



SECTION F-F

Steel Template with holes 1/16" greater than bolt diameter



TEMPLATE DETAIL

Fixed Mount Arm L F	ROUND POLES (13)					Foundation Type
	D _B	D _{19.5} or D _{20.25}	D ₂₄	D ₃₀	(12)thk	
ft.	in.	in.	in.	in.	in.	
50', 55', 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L F	ROUND ARMS (13)				
	L ₁	D ₁	D ₂	(12)thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'-3"
55	54	18.5	11.0	.3125	3'-7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'-4"

D_B = Pole Base O.D.
D_{19.5} = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
D_{20.25} = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
D₃₀ = Pole Top O.D. with Luminaire
D₁ = Arm Base O.D.
D₂ = Arm End O.D.
L₁ = Shaft Length
L F = Fixed Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

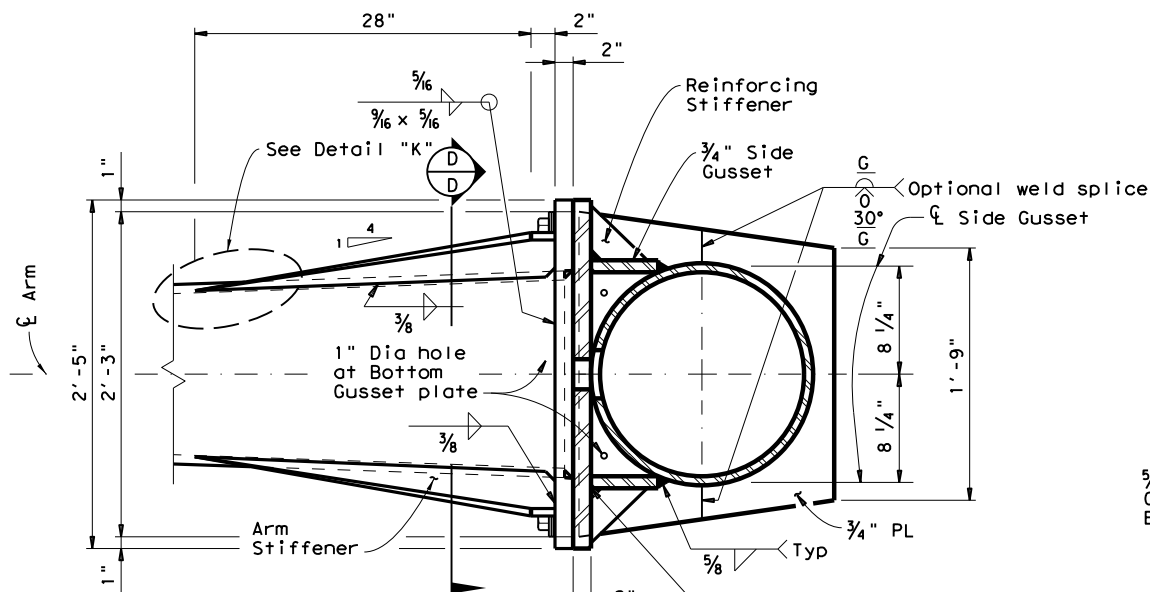
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.

GENERAL NOTES:

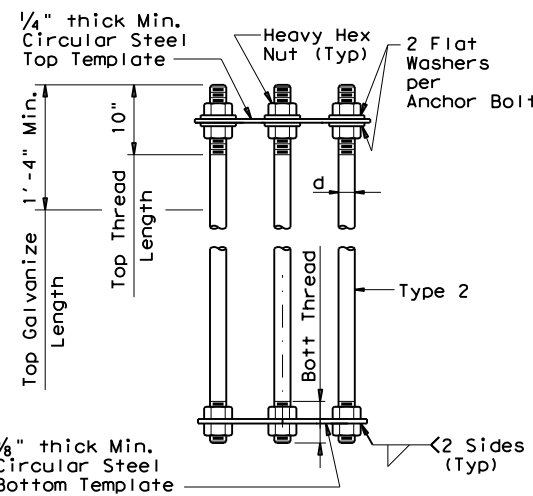
Built-up Box Connection: For the welded arm-to-pole connection as a built-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 1/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

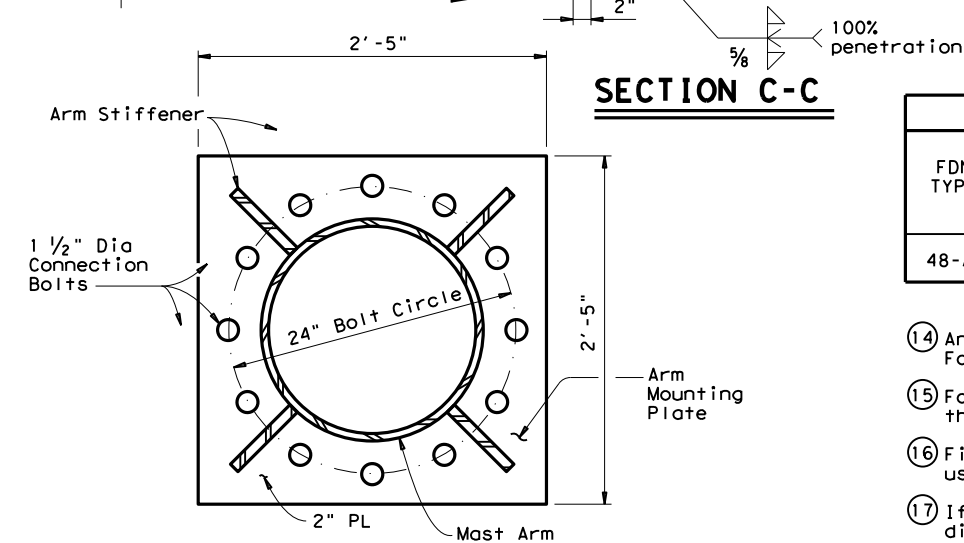
Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.



SECTION C-C



ANCHOR BOLT ASSEMBLY



SECTION D-D

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (16), (17), (18)			ANCHOR BOLT DESIGN (14)			FOUNDATION DESIGN LOAD (15)		TYPICAL APPLICATION	
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	F _y (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
				10	15	40							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	50' to 65' Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

- (14) Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
- (15) Foundation Design Loads are the allowable moments and shears at the base of the structure.
- (16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
- (17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
- (18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length #	Top Thread	Bottom Thread	Bolt Circle	R ₂	R ₁
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

*Min dimension given, longer bolts are acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)
Sheet 3 of 5 **LMA (3) - 12**

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4-20-01 1-12	REVISIONS		CONT	SECT	JOB	HIGHWAY
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			DIST	COUNTY		SHEET NO.
		CRP	JIM WELLS, ETC.		200	

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Shipping Parts List							
Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.							
Nominal Arm Length	30' Poles with Luminaire		24' Poles with ILSN		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN		
	See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		See note above plus one small hand hole		See note above		
Single Mast Arm							
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity	Quantity
50	50L		50S		50		
55	55L		55S		55		
60	60L		60S		60		
65	65L		65S		65		
Dual Mast Arm							
Lf ft.	Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet) 48-A
Total Drill Shaft Length			

- Notes
- ** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
 - *** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Abbreviations
Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44' Max.)

Shipping Parts List							
Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm with listed equipment attached							
Nominal Arm Length	Type IV Arm (4 Signals) 3 Bracket Assembly and 4 CGB Connectors			Luminaire Arms (1 per 30' pole)			
ft.	Designation	Quantity	Designation	Quantity	Nominal Arm Length	Quantity	Quantity
50	50IV				8' Arm		
55	55IV				ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers		
60	60IV				Nominal Arm Length	Quantity	Quantity
65	65IV				7' Arm		
					9' Arm		
Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached							
Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers		
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity	Quantity
20	20I-80						
24	24I-80			24II-80			
28	28I-80			28II-80			
32				32II-80			32III-80
36				36II-80			36III-80
40							40III-80
44							44III-80
Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached							
Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp		
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity	Quantity
20	20I-100						
24	24I-100			24II-100			
28	28I-100			28II-100			
32				32II-100			32III-100
36				36II-100			36III-100
40							40III-100
44							44III-100
Anchor Bolt Assemblies (1 per pole) Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.							
Anchor Bolt Diameter	Anchor Bolt Length	Quantity					
2 1/2 "	5' - 3"						



**LONG MAST
ARM ASSEMBLY
PARTS LIST**

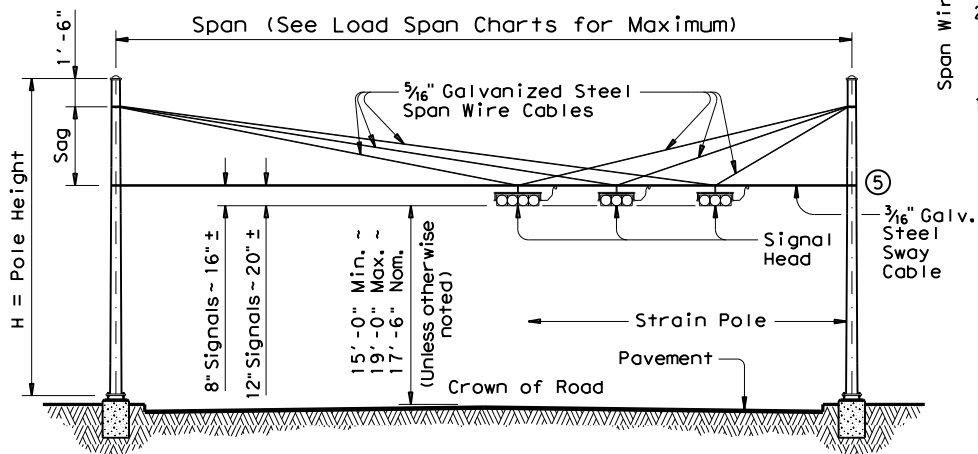
LMA (5) - 12

Sheet 5 of 5				
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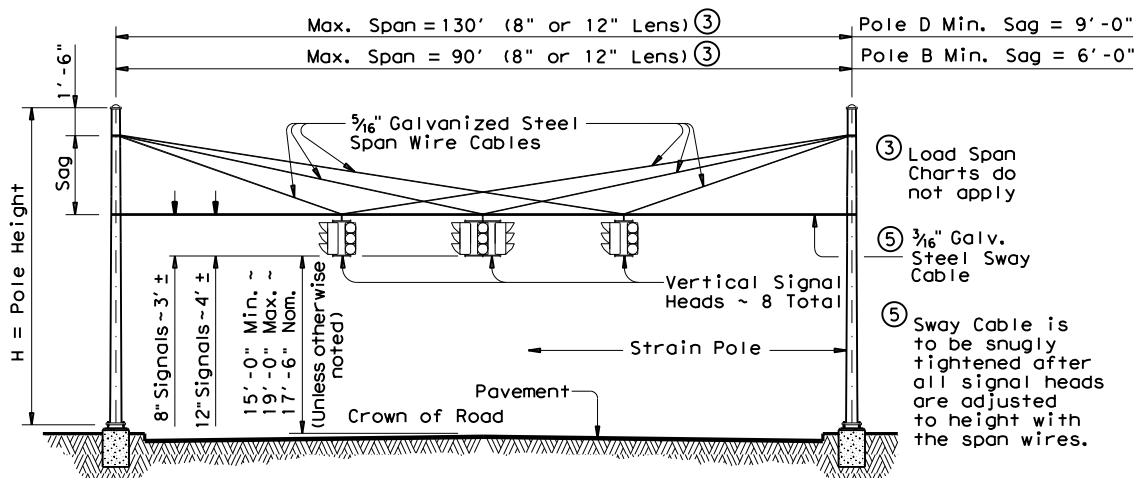
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STRAIN POLE DESCRIPTION	Pole Type	Foundation Type	Maximum Permissible Span Wire Load (lbs.)
26' Pole	A	36-A	4900
30' Pole	B	36-A	4300
30' Pole with Lum.	B	36-A	4000
30' Pole with 20' Mast Arm	C	36-B	4400
30' Pole with 24' Mast Arm	C	36-B	4000
30' Pole with 28' Mast Arm	C	36-B	3600
30' Pole with 32' Mast Arm	C	36-B	3300
30' Pole with 36' Mast Arm	C	36-B	2900
30' Pole with 20' Mast Arm & Lum.	C	36-B	4100
30' Pole with 24' Mast Arm & Lum.	C	36-B	3800
30' Pole with 28' Mast Arm & Lum.	C	36-B	3400
30' Pole with 32' Mast Arm & Lum.	C	36-B	3000
30' Pole with 36' Mast Arm & Lum.	C	36-B	2500
34' Pole	D	36-B	5200
34' Pole with Lum.	D	36-B	4900

② Numbers on Load Span Charts indicate the number of signal heads on the span. The total span wire design load is based on one 5-section head and one or more additional 3-section head(s). Design wind pressures on cables are assumed as 1.6 lb/ft. Weight of span wire cables (one per signal head) is assumed as 0.65 lb/ft which includes an allowance for conductor cables and miscellaneous hardware. The effect of the sway cable on load distribution is ignored as it is assumed to break at design wind conditions. When a pole supports 2 spans, the span wire design loads for both spans should be added vectorially to determine the design load for that pole.

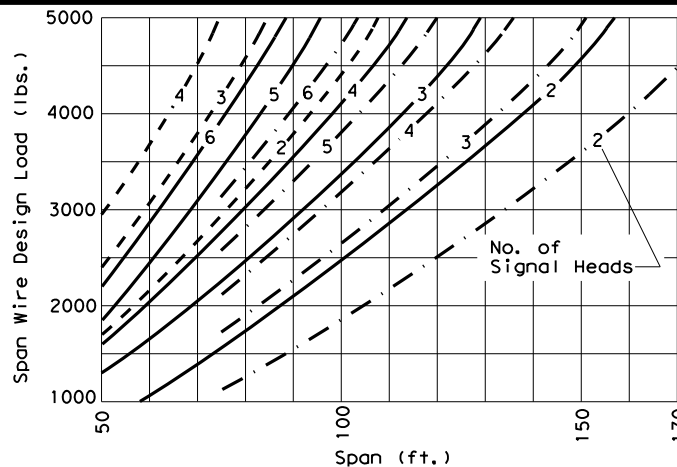


STRAIN POLE ELEVATIONS HORIZONTAL SIGNALS

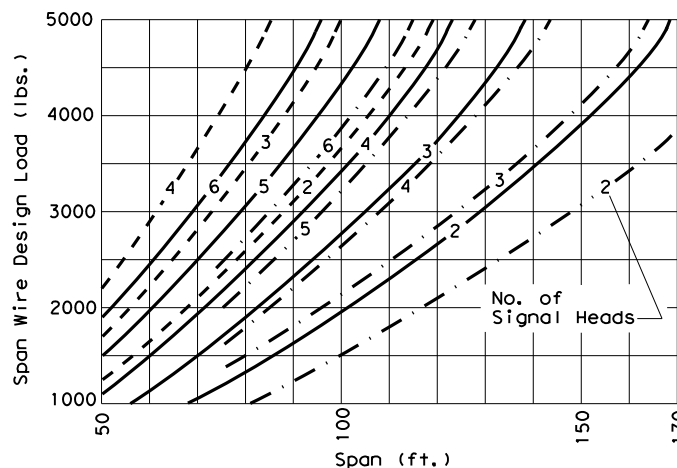


STRAIN POLE ELEVATIONS VERTICAL SIGNALS

(Mast arms are not used with vertical signals)



② SIGNALS WITH 12-INCH LENS



② SIGNALS WITH 8-INCH LENS

Signal Head Type	Wt. Per Head	Wind Area
5-Section, 12" Lens	125 lbs	9.6 sq. ft.
5-Section, 8" Lens	70 lbs	4.8 sq. ft.
3-Section, 12" Lens	75 lbs	5.64 sq. ft.
3-Section, 8" Lens	45 lbs	3.0 sq. ft.

◆ Effective projected design wind area (actual area times drag coefficient)

- Sag = 4'-6" (26' or 30' Pole)
- Sag = 8'-0" (30' or 34' Pole)
- - - - - Sag = 11'-6" (34' Pole)

Pole Type	ROUND POLES				POLYGONAL POLES			
	D _B in.	D _T in.	(4)thk in.	H ft.	D _B in.	D _T in.	(4)thk in.	H ft.
A	12.5	8.9	.239	26	13.0	9.0	.239	26
B	13.5	9.3	.239	30	14.0	9.0	.239	30
C	15.5	11.3	.239	30	16.0	11.0	.239	30
D	15.5	10.7	.239	34	16.0	11.0	.239	34

D_B = Pole Base O.D. D_T = Pole Top O.D. H = Pole Height

④ Thickness shown are minimum, thicker materials may be used.

SHIPPING PARTS LIST

Poles (Without Traffic Signal Arm)						
Pole Type	Strain poles with Luminaire			Strain poles without Luminaire		
	Description	Designation	Quantity	Description	Designation	Quantity
A				26' Strain Pole	SP 26 A-100	
B	30' Strain Pole	SPL 30 B-100		30' Strain Pole	SP 30 B-100	
D	34' Strain Pole	SPL 34 D-100		34' Strain Pole	SP 34 D-100	

Poles (With Traffic Signal Arm)						
Pole Type	Strain poles with Luminaire			Strain poles without Luminaire		
	Description	Designation	Quantity	Description	Designation	Quantity
C	30' SPw/TS Arm	SPL 30 C-100		30' SPw/TS Arm	SP 30 C-100	

Traffic Signal Arms (For Type C poles)						
Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	Description	Quantity	Description	Quantity	Description	Quantity
20	20I-100					
24	24I-100		24 II-100			
28	28I-100		28 II-100			
32			32 II-100		32 III-100	
36			36 II-100		36 III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 3/4"	3'-10"	
2"	4'-3"	

Luminaire Arms

Nominal Arm Length	Quantity
8' Arm	

Each Anchor Bolt Assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

① See Sheet "DMA-100"

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(100 MPH WIND ZONE)

SP-100(1)-12

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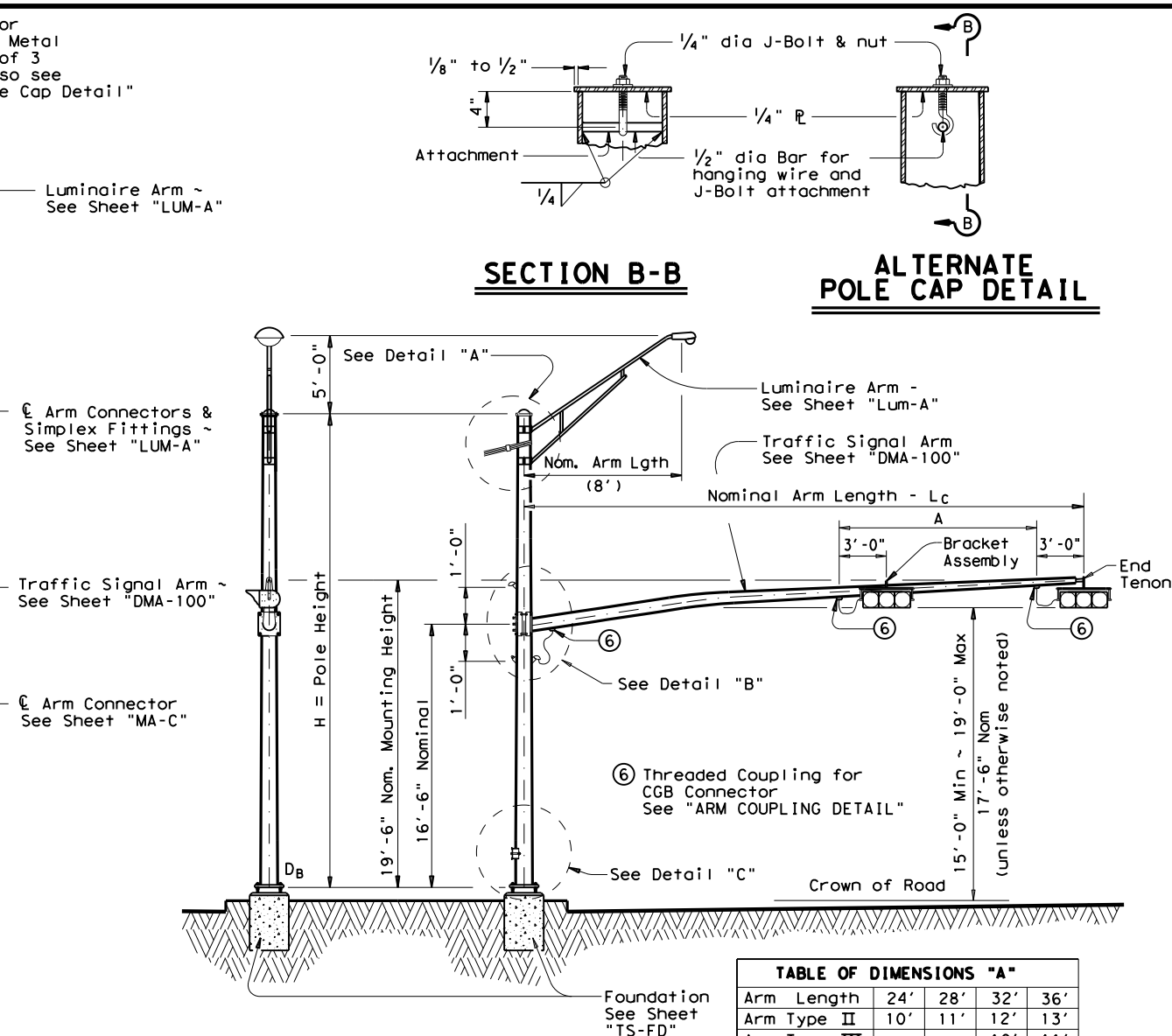
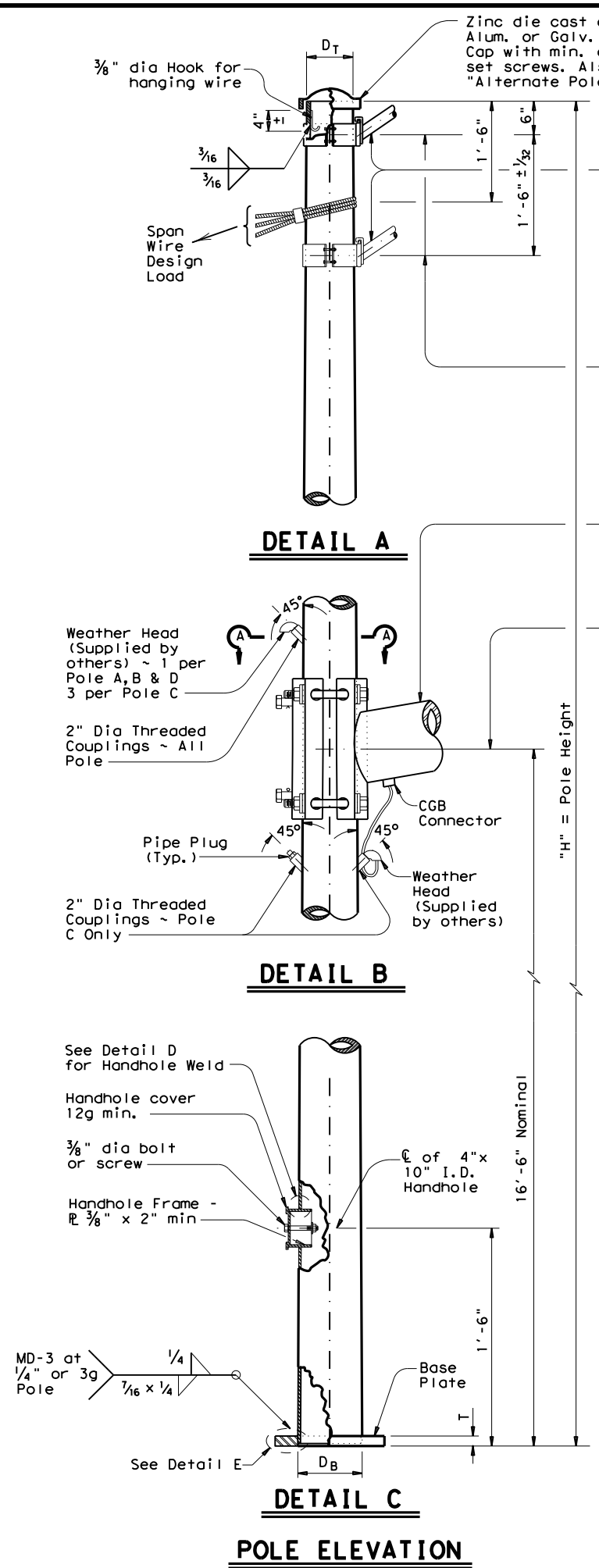
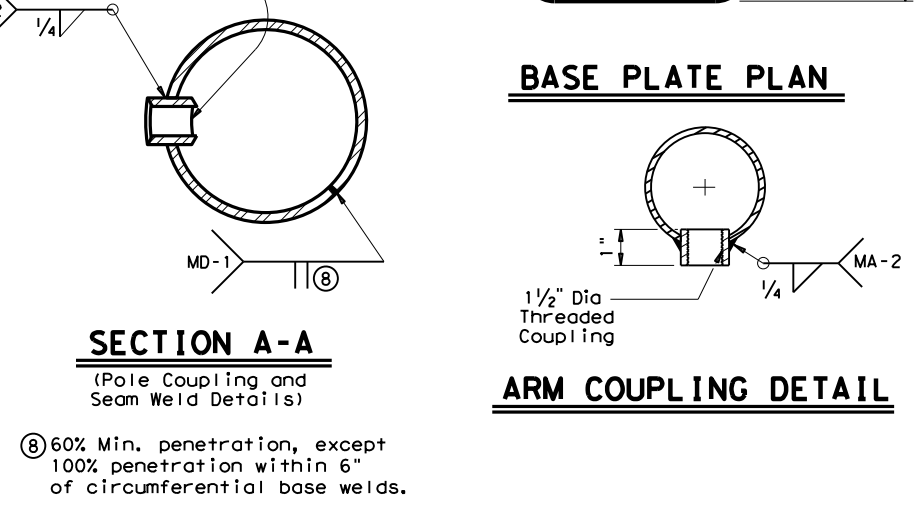
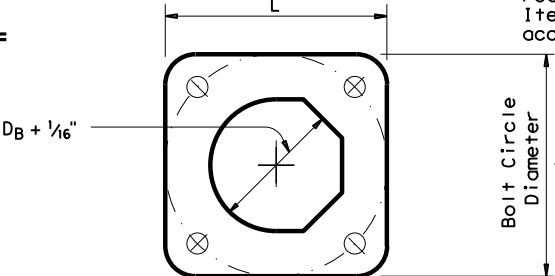
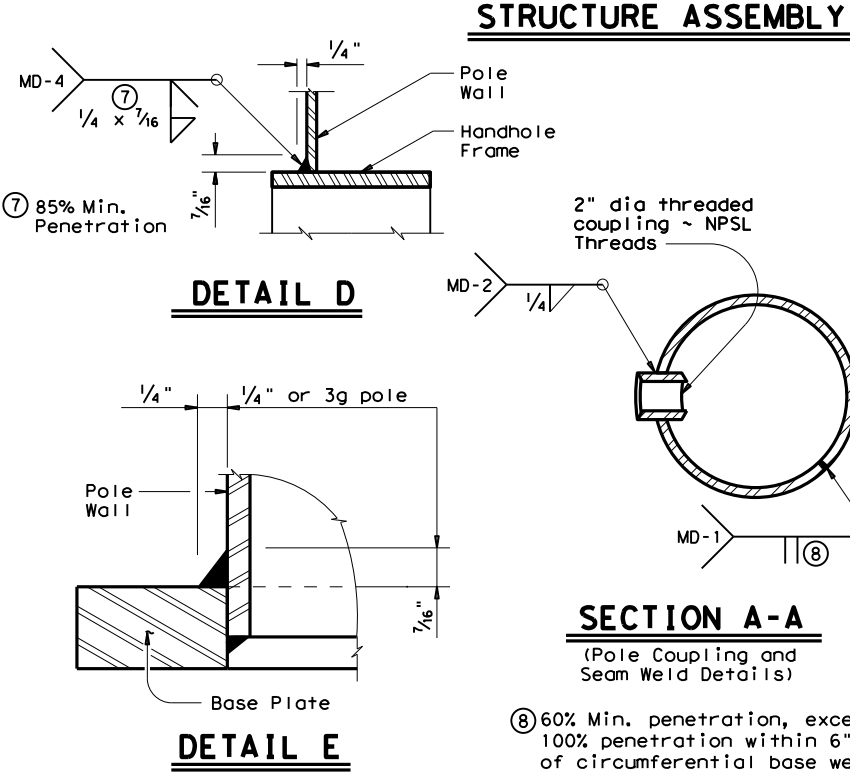


TABLE OF DIMENSIONS "A"

Arm Length	24'	28'	32'	36'
Arm Type II	10'	11'	12'	13'
Arm Type III			10'	11'



MATERIALS

Round Shafts or Polygonal Shafts ⁹	ASTM A595 Gr. A, A588, A1008 HSLAS Gr. 50 Class 2, A1011 HSLAS Gr. 50 Class 2, A572 Gr. 50 or A1011 SS Gr. 50 ¹⁰
Plates ⁹	ASTM A36, A588, or A572 Gr. 50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe ⁹	ASTM A53 Gr. B, A501, A1008 HSLAS-F Gr. 50, A1011 HSLAS-F Gr. 50
Steel Cable	ASTM A475, 7 Wire Utilities Grade
Misc. Hardware	Galvanized steel or stainless steel or as noted

⁹ ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

¹⁰ ASTM A1011 SS Gr. 50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor. The maximum permissible span wire design loads tabulated are calculated at a stress load of 1.4 times the basic allowable stress. A simultaneous wind on the pole, mast arm, and luminaire is also included.

See standard sheet "DMA-100" for details of clamp-on traffic signal arms, sheet "MA-C" for traffic signal arm connection details, sheet "LUM-A" for luminaire arm and connection details, and sheet "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Foundation Type	Anchor Bolt Diameter	Bolt Hole Diameter	Bolt Circle Diameter	Base Pl. Dim. L x T
36-A	1 3/4"	2"	19"	19" x 1 3/4"
36-B	2"	2 1/4"	21"	21" x 2"

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES
(100 MPH WIND ZONE)
SP-100(2)-12

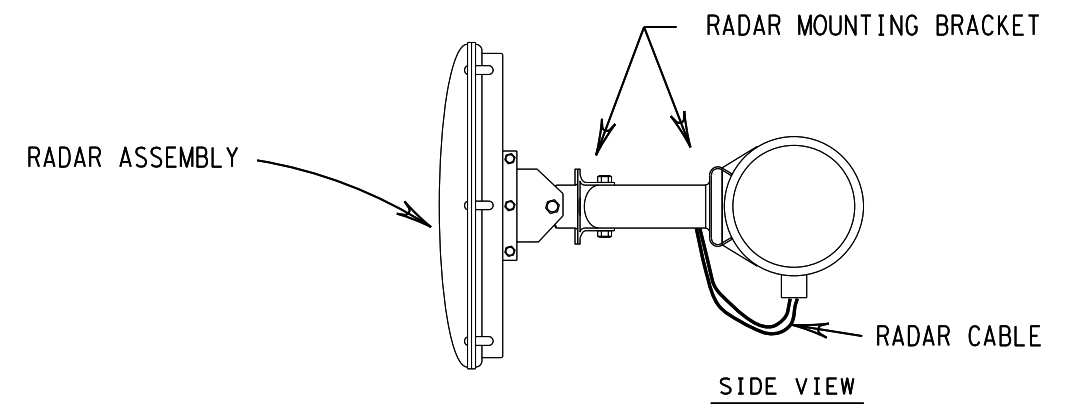
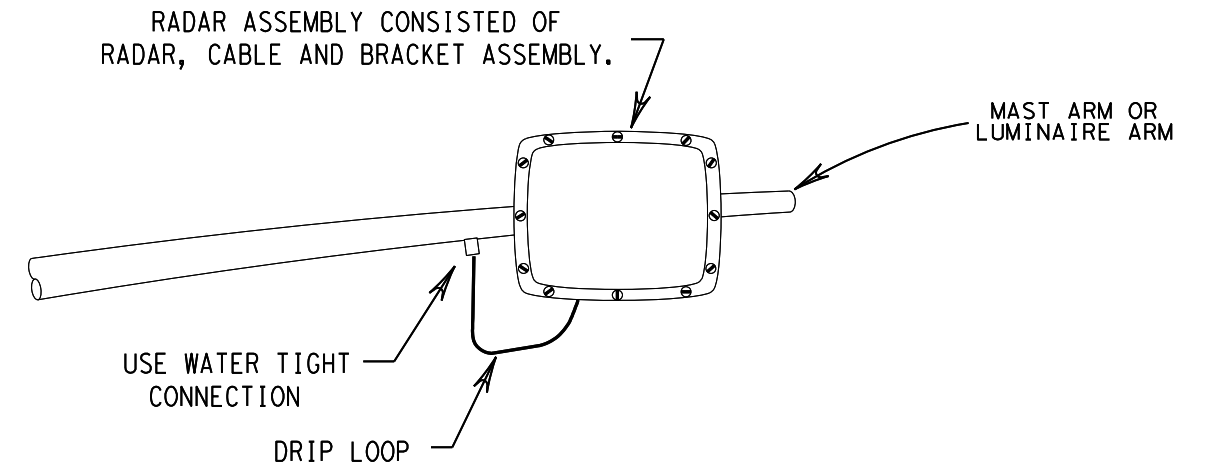
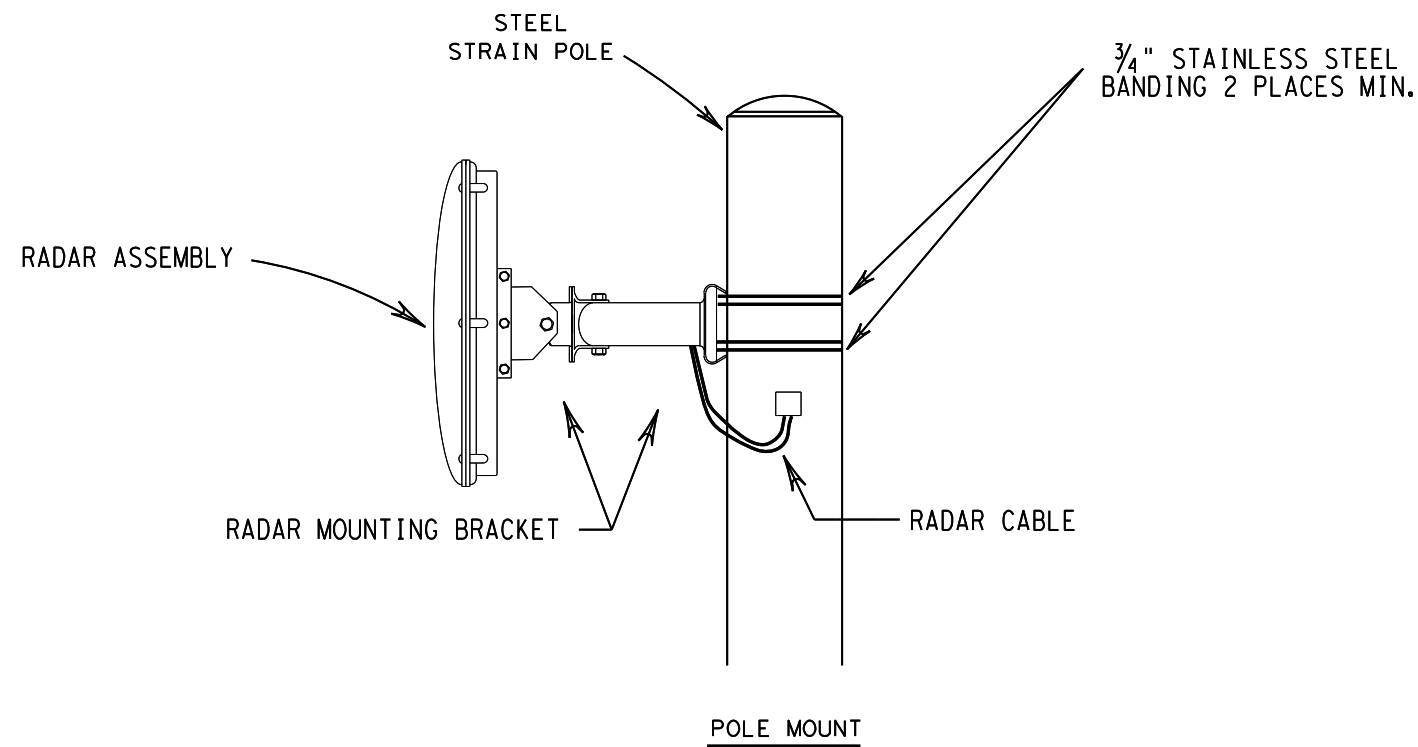
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6-96	0383	03	024, ETC.	SH 141
1-12	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS, ETC.		204

121B


NOTES :

RADAR (MATRIX OR RADD) DETECTION

1. RADAR DETECTION INTERFACE UNIT SHALL BE INSTALLED INSIDE CONTROLLER CABINET.
2. RADAR DETECTION UNIT & BRACKET SHALL BE INSTALLED AS DETAILED OR AS DIRECTED BY THE RADAR DETECTION SUPPLIER.
3. 3/4" STAINLESS STEEL BANDING MATERIAL SHALL BE USED TO INSTALL RADAR MOUNTS.
4. RADAR ENCLOSURE ASSEMBLY SHALL BE ROTATABLE AFTER INSTALLATION TO PROVIDE PROPER ALIGNMENT.
5. ALL CABLE ENTRY AND EXIT POINTS IN THE MAST ARM AND/OR POLES SHALL BE WATER TIGHT.

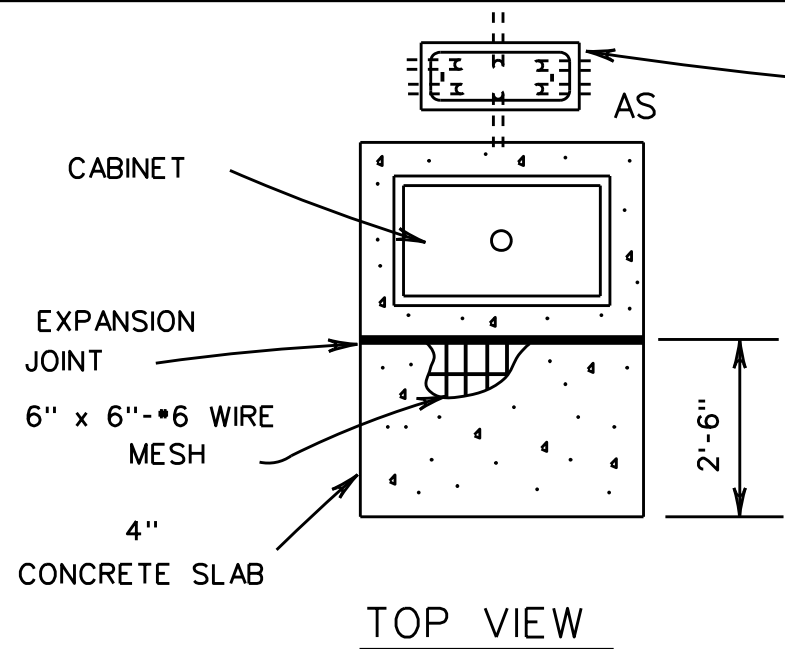


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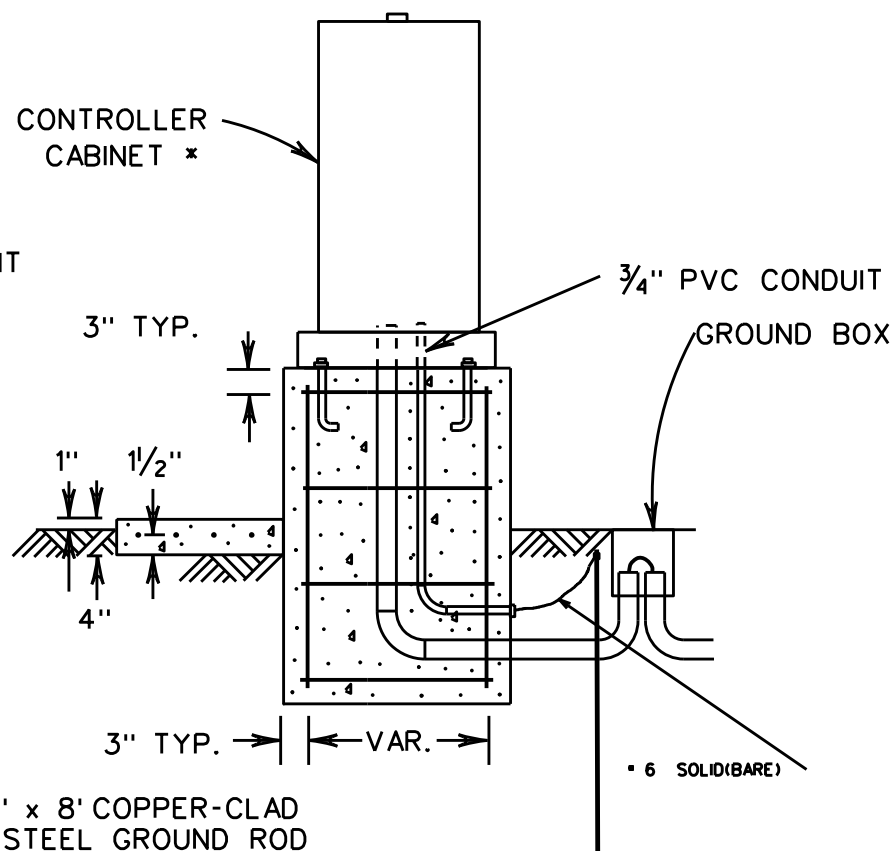
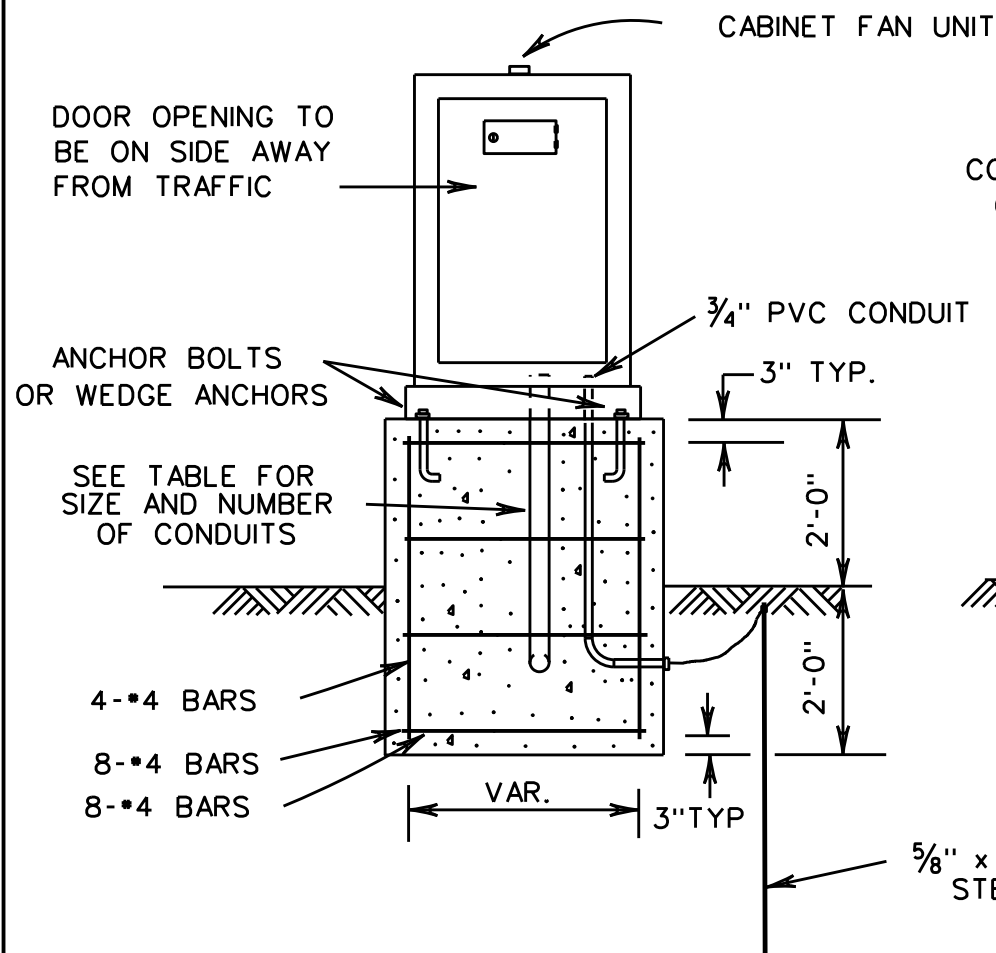
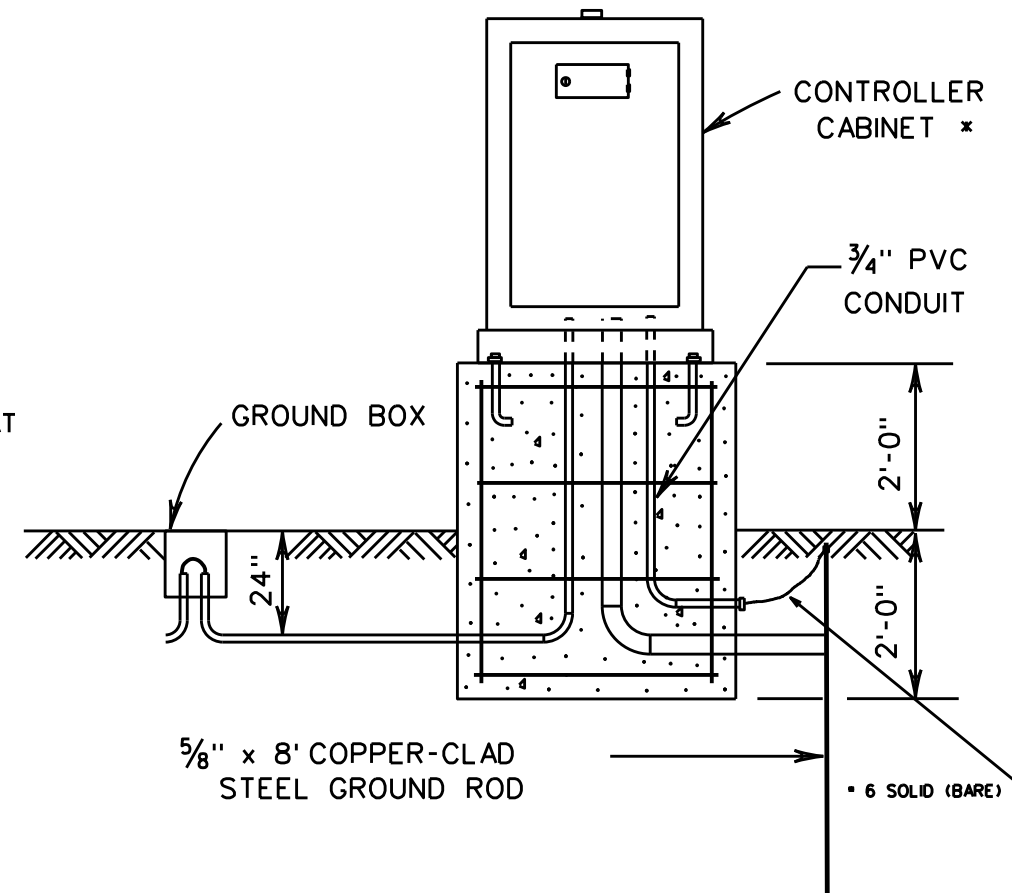
**RADAR DETAIL SHEET
 (CC DIST. STANDARD)**

FED. RD. DIV. NO.	STATE PROJECT NO.		SHEET NUMBER
6			205
STATE	DISTRICT	COUNTY	
TEXAS	CRP	JIM WELLS, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0383	03	024, ETC.	SH 141



NOTES:

- 1 THE CONTROLLER CABINET SHALL BE SEALED BETWEEN CABINET AND FOUNDATION WITH A SILICONE SEALING COMPOUND AS APPROVED BY THE ENGINEER. THE SEALING COMPOUND USED SHALL HAVE A MELTING POINT OF NOT LESS THAN TWO HUNDRED (200) DEGREES FAHRENHEIT, AND SHALL NOT BE ADVERSELY AFFECTED BY THE SURROUNDING ATMOSPHERE OR MOISTURE.
- 2 CONDUIT TERMINATING IN THE CONTROLLER FOUNDATION SHALL EXTEND VERTICALLY APPROXIMATELY 2 INCHES ABOVE THE FOUNDATION.
- 3 AFTER ALL WIRING IS COMPLETE, CONDUIT TERMINATING IN THE CONTROLLER SHALL BE SEALED WITH A SEALANT TO BE MADE OF A POLYURETHANE OR EQUIVALENT MATERIAL COMPOSITION THAT WILL CURE IN THE PRESENCE OF MOISTURE.
- 4 FINAL PLACEMENT OF GROUND ROD TO BE APPROVED BY ENGINEER.



ALL CONCRETE FOR CONTROLLER FOUNDATIONS SHALL BE CLASS A. CONTROLLER FOUNDATIONS SHALL BE POURED IN PLACE. PRECAST FOUNDATIONS WILL NOT BE PERMITTED.

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**CONTROLLER FOUNDATION
DETAILS
CORPUS CHRISTI DIST. STANDARD**

FED. RD. DIV. NO.	STATE PROJECT NO.	SHEET NUMBER
6		108
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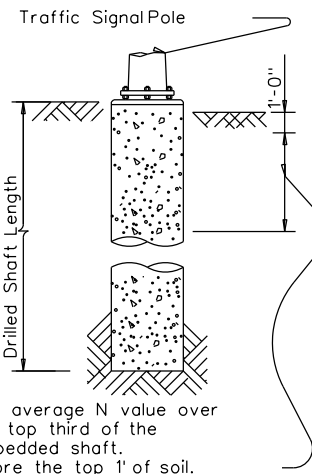
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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④ ⑤ ⑥			ANCHOR BOLT DESIGN ①			FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION	
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	F _y (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	1	Pedestal pole, pedestal mounted controller.	
30-A	30"	8- #8	#3 at 6"	11.3	10.3	8.0	1½"	55	17"	2	3	Mast arm assembly. (see Selection Table)	
36-A	36"	10- #8	#3 at 6"	13.2	12.0	9.4	1¾"	55	19"	2	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.	
36-B	36"	12- #8	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm	
42-A	42"	14- #8	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	9	Mast arm assembly. (see Selection Table)	

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

WIND SPEED	MAX SINGLE ARM LENGTH	FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
		80 MPH	32'	48'	
80 MPH	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'			
			32' X 32'		
			36' X 36'		
			40' X 36'		
100 MPH	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		44' X 28'	44' X 36'	
			24' X 24'		
			28' X 28'		
			32' X 24'		
				32' X 32'	
		36' X 36'			
		40' X 24'		40' X 36'	
				44' X 36'	



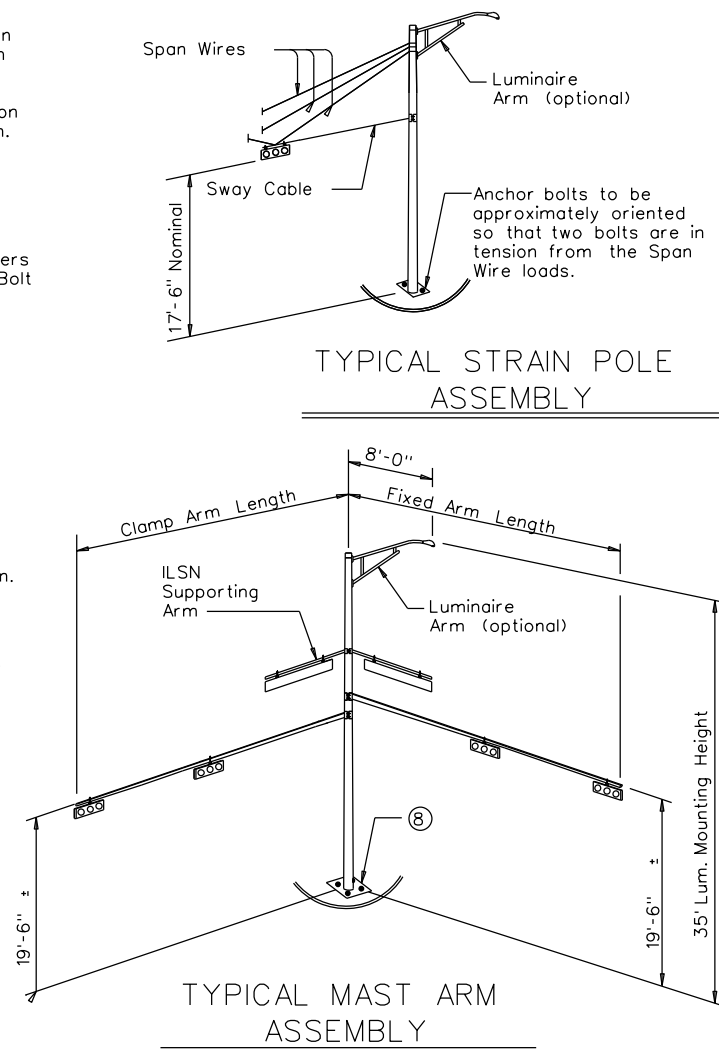
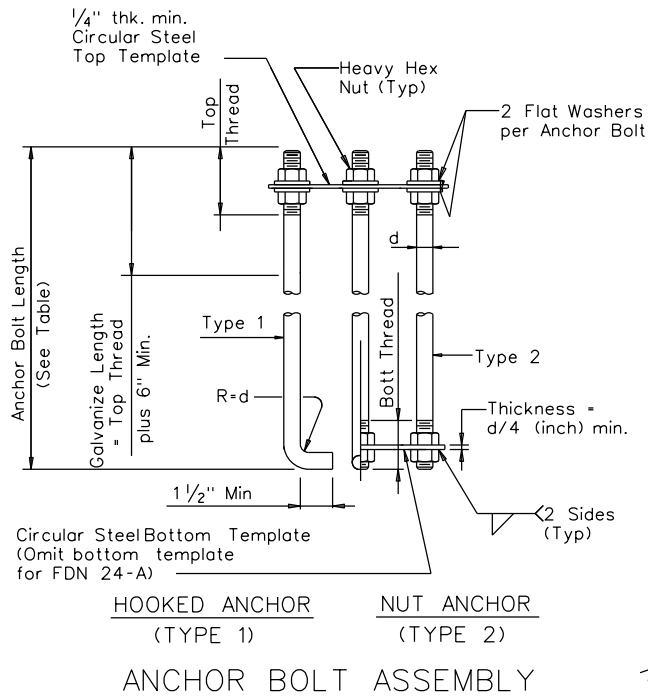
ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

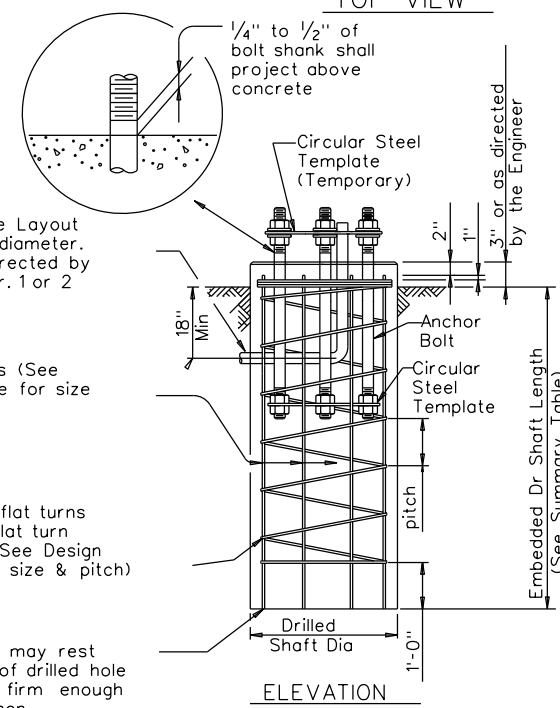
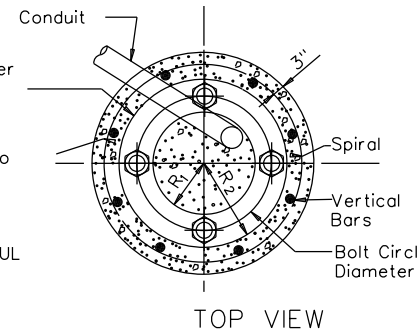
EXAMPLE:

- For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
- For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



Steel Template with holes ⅛" greater than bolt diameter

Bond anchor bolts to rebar cage, two locations using #3 bar or #6 copper jumper. Mechanical connectors shall be UL Listed for concrete encasement.



Conduit (See Layout Sheets for diameter. Orient as directed by the Engineer. 1 or 2 required)

Vertical Bars (See Design Table for size & number).

Spiral, 3 flat turns top & 1 flat turn bottom. (See Design Table for size & pitch)

Vertical bars may rest on bottom of drilled hole if materials firm enough to do so when concrete is placed.

FOUNDATION DETAILS

NOTES:

- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
- Foundation Design Loads are the allowable moments and shears at the base of the structure.
- Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
- Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
- If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
- Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (FEET) ⑥				
				24-A	30-A	36-A	36-B	48-A
SH141 - POLE 1	10	48-A	1					22
SH141 - POLE 2	10	36-B	1				15.2	
SH141 - POLE 3	10	48-A	1					22
SH141 - POLE 4	10	36-B	1				15.2	
TOTAL DRILLED SHAFT LENGTHS							30.4	44

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

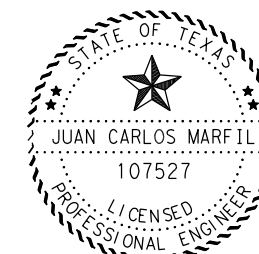
Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of BUN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".



JC Marfil P.E.
07/13/2023

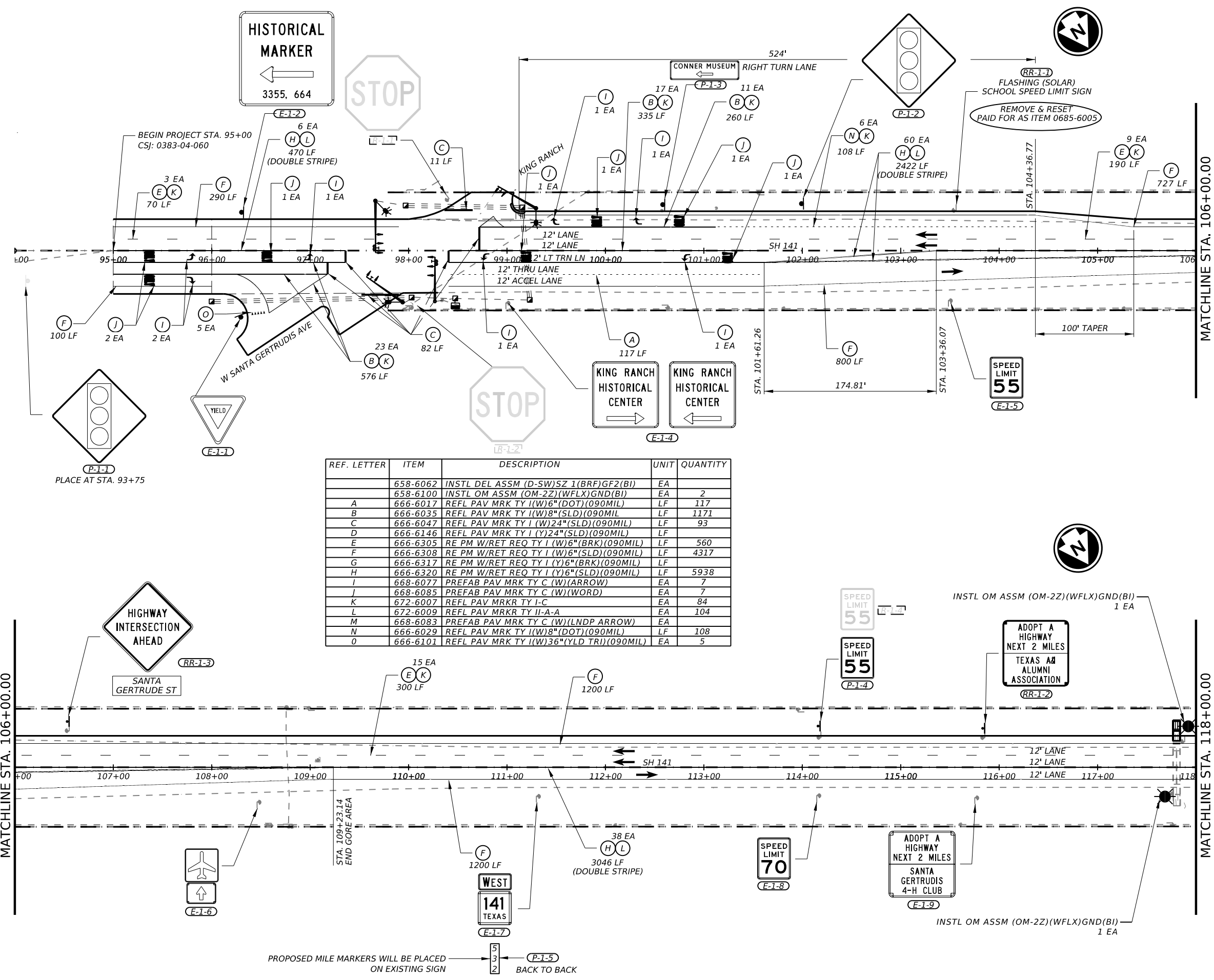
Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12
(MOD)

© TxDOT August 1995		DN: MS	CK: JSY	DW: MAD/MMF	CK: JSY/TEB
REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96		0383	03	024	SH141
11-99		DIST	COUNTY		SHEET NO.
1-02		CRP	JIM WELLS		207

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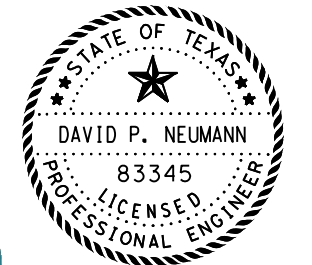
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- (B) REFL PAV MRK TY I (W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I (W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I (W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- (R-1-1) REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- (E-1-2) EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- (RR-1-2) EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- (P-1-2) PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



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B	666-6035	REFL PAV MRK TY I (W)8*(SLD)(090MIL)	LF	1171
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	93
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	560
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4317
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	5938
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	7
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	7
K	672-6007	REFL PAV MRKR TY I-C	EA	84
L	672-6009	REFL PAV MRKR TY II-A-A	EA	104
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	
N	666-6029	REFL PAV MRK TY I (W)8*(DOT)(090MIL)	LF	108
O	666-6101	REFL PAV MRK TY I (W)36*(YLD TRI)(090MIL)	EA	5



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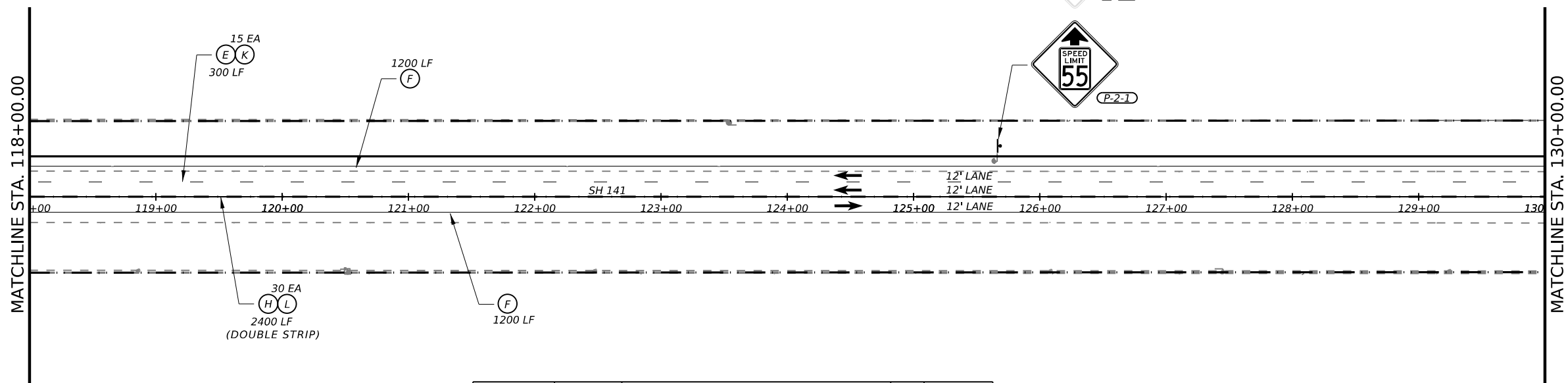
SIGNING & PAVEMENT MARKERS

STA. 94+00 TO STA. 118+00

SHEET 1 OF 28

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DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		208

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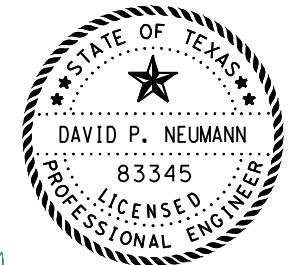
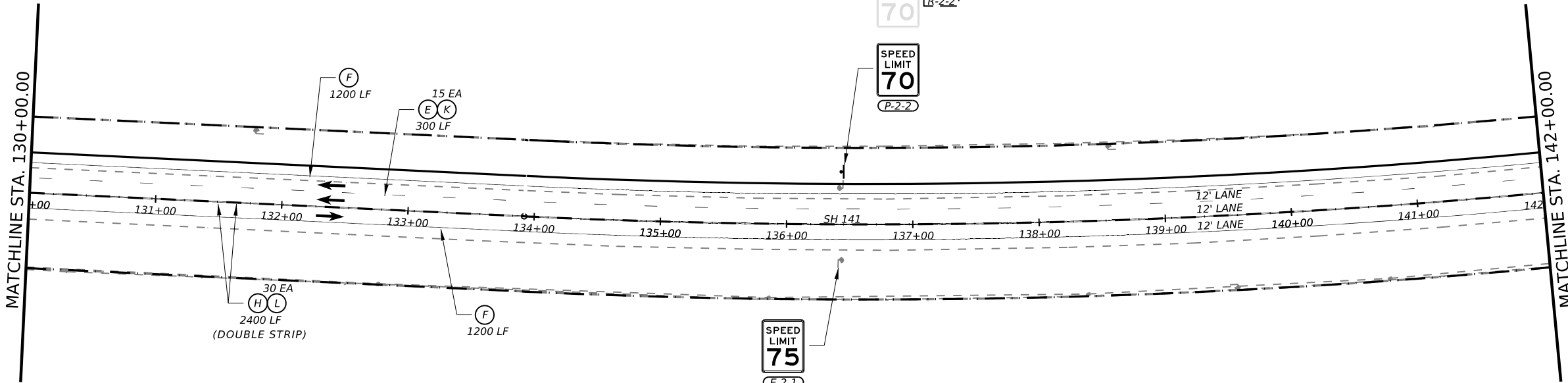
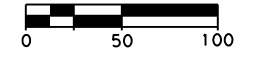
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B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

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- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



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STA. 118+00 TO STA. 142+00

SHEET 2 OF 28

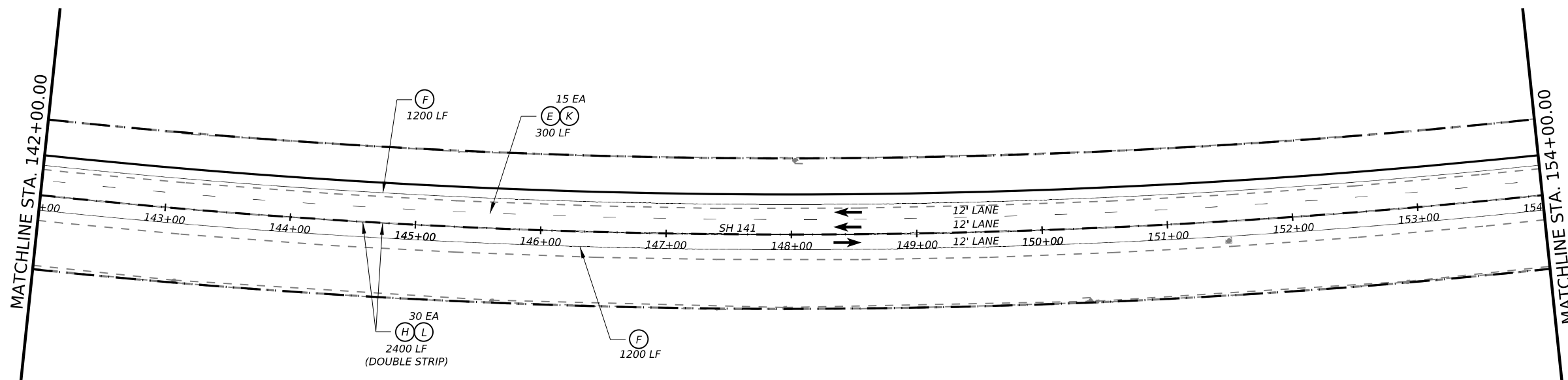
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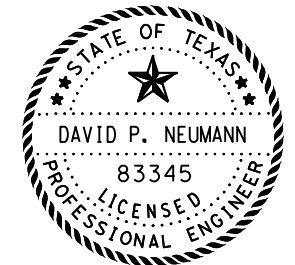
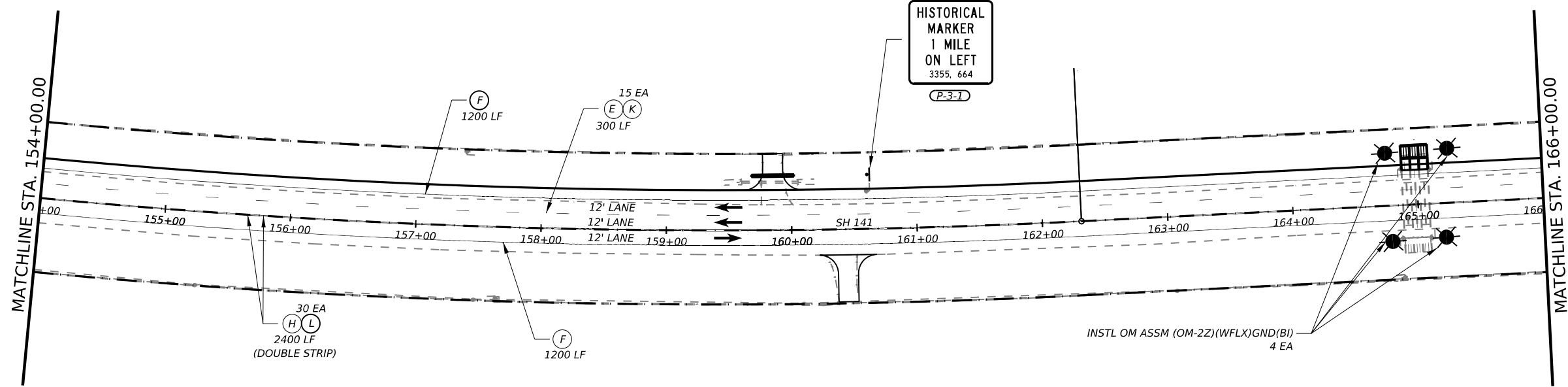
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- (I) PREFAB PAV MRK TY C(W)(ARROW)
- (J) PREFAB PAV MRK TY C(W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C(W)(LNDRP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
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- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



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B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I(W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I(Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1(W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY 1(W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1(Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1(Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C(W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C(W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C(W)(LNDRP ARROW)	EA	

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[R-3-1]

HISTORICAL MARKER
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3355, 664
[P-3-1]



David P. Neumann, P.E.
2023.07.28 01:38:07-05'00'

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STA. 142+00 TO STA. 166+00

SHEET 3 OF 28

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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	210

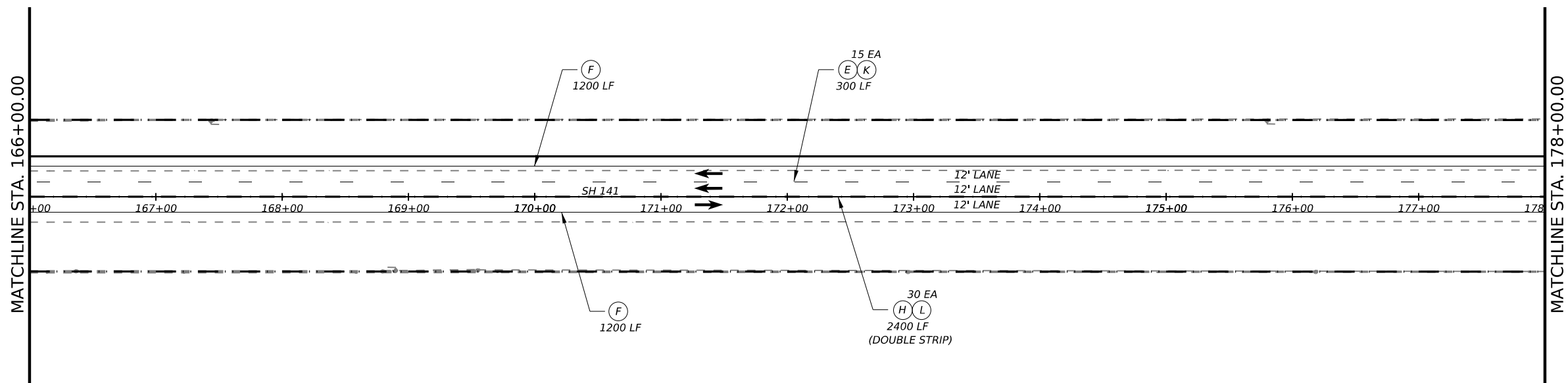
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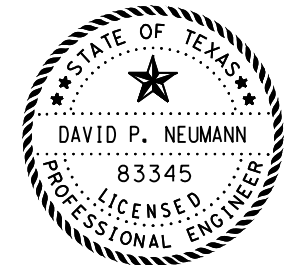
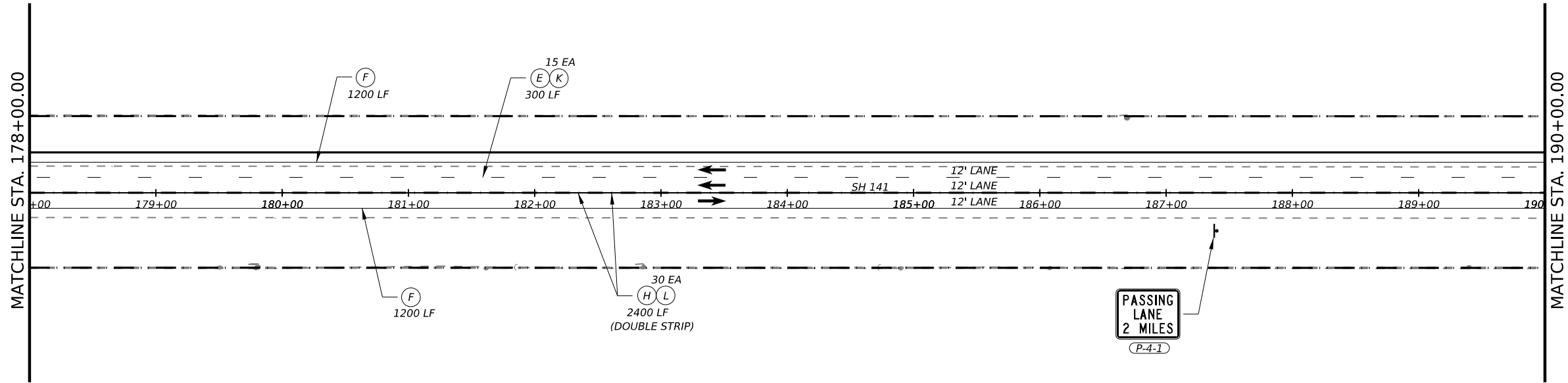


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- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
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	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
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B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	



David P. Neumann, P.E.

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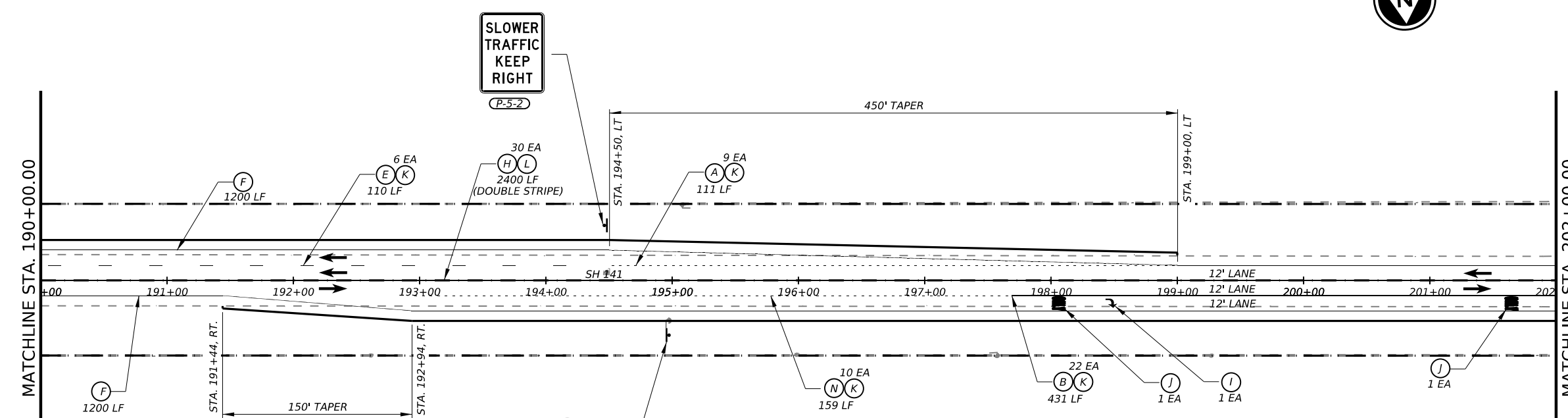
SIGNING & PAVEMENT MARKERS
 STA. 166+00 TO STA. 190+00

SHEET 4 OF 28

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CRP		JIM WELLS, ETC.	211

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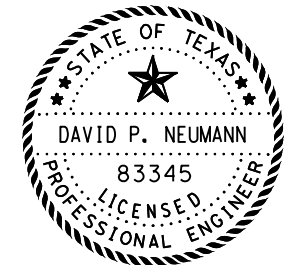
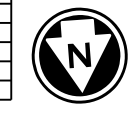
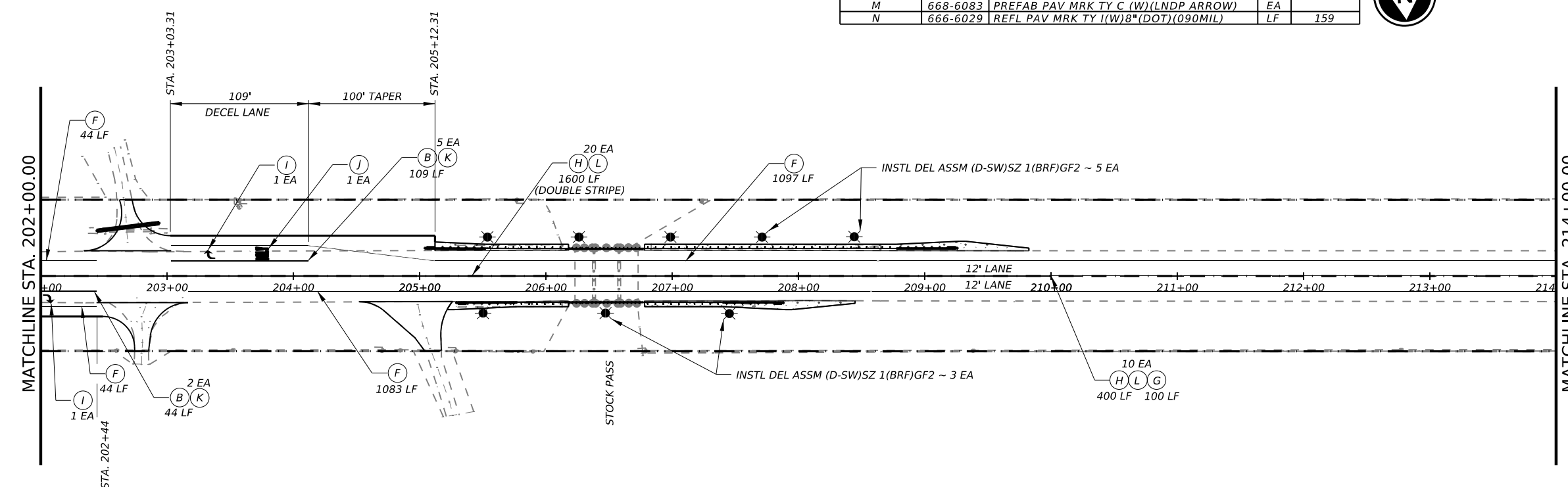
CK: DW: CK: DN:



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	8
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	111
A	666-6017	REFL PAV MRK TY I (W)6*(DOT)(090MIL)	LF	584
B	666-6035	REFL PAV MRK TY I (W)8*(SLD)(090MIL)	LF	4668
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	110
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	4800
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	3
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	3
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	54
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	60
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	3
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	54
K	672-6007	REFL PAV MRKR TY I-C	EA	60
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	159
N	666-6029	REFL PAV MRK TY I (W)8*(DOT)(090MIL)	LF	

LEGEND

- (A) REFL PAV MRK TY I (W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I (W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I (W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I (W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:37:37-05'00'

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STA. 190+00 TO STA. 214+00

SHEET 5 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		212

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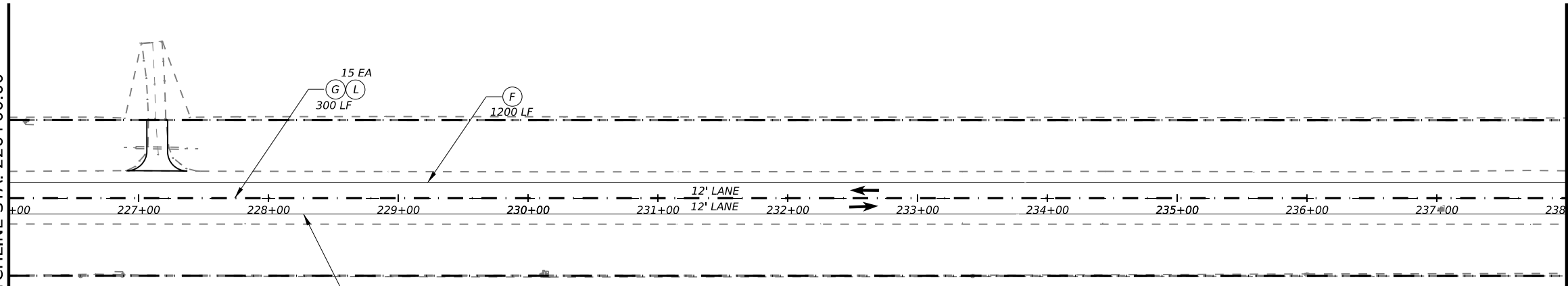
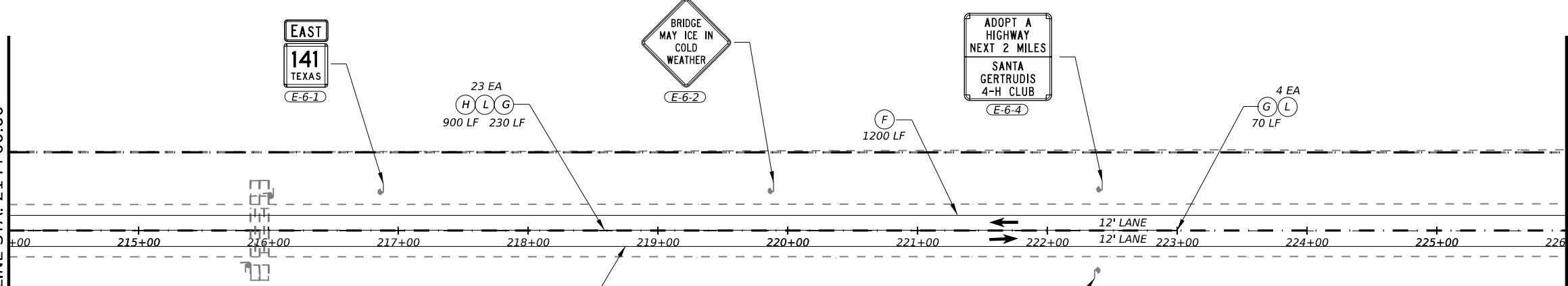
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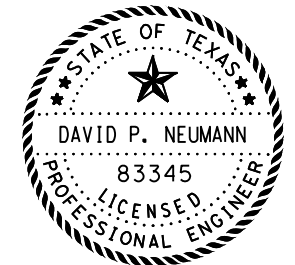
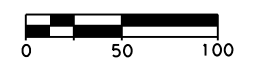
MATCHLINE STA. 238+00.00



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTR DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTR OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I(W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I(Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I(W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY I(W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I(Y)6*(BRK)(090MIL)	LF	640
H	666-6320	RE PM W/RET REQ TY I(Y)6*(SLD)(090MIL)	LF	900
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	
L	672-6009	REFL PAV MRKR TY II-A-A	EA	42
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I(W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I(Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY I(W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY I(W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY I(Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY I(Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:37:24-05'00'

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TBPE Firm Reg. No. 10488



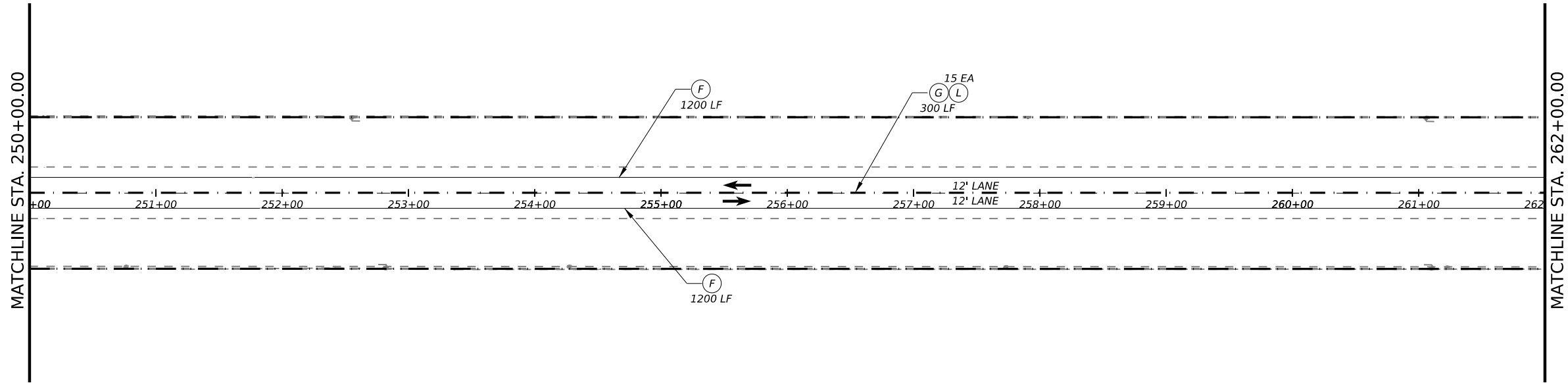
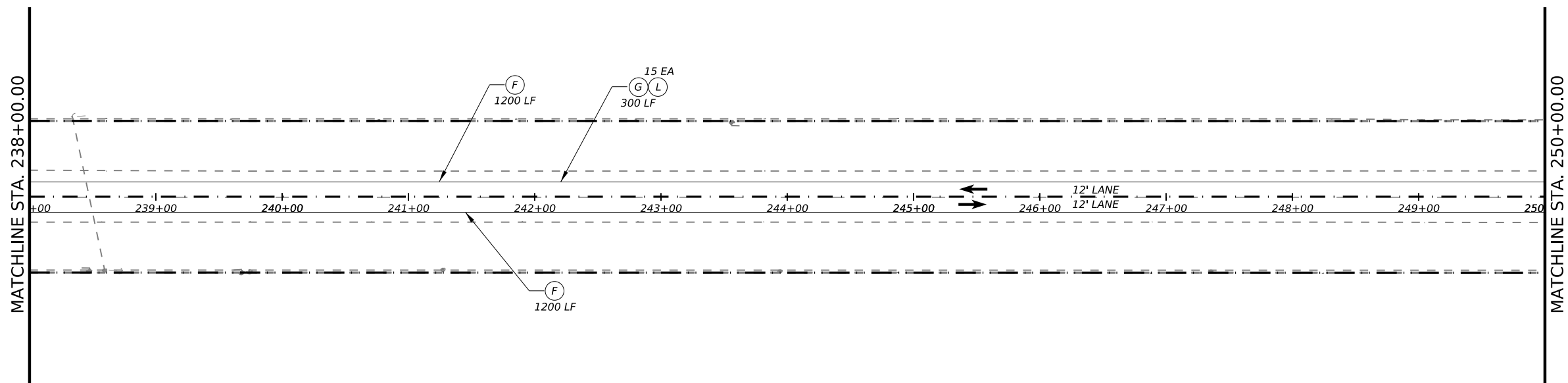
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STA. 214+00 TO STA. 238+00

SHEET 6 OF 28			
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		213

DATE: 7/26/2023 10:18:39 AM
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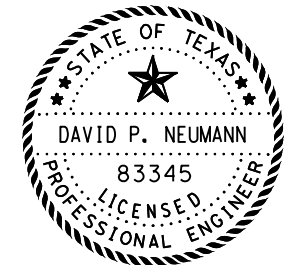
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REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	600
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	
L	672-6009	REFL PAV MRKR TY II-A-A	EA	30
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:37:11-05'00'

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TBPE Firm Reg. No. 10488



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SIGNING & PAVEMENT MARKERS

STA. 238+00 TO STA. 262+00

SHEET 7 OF 28			
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	214

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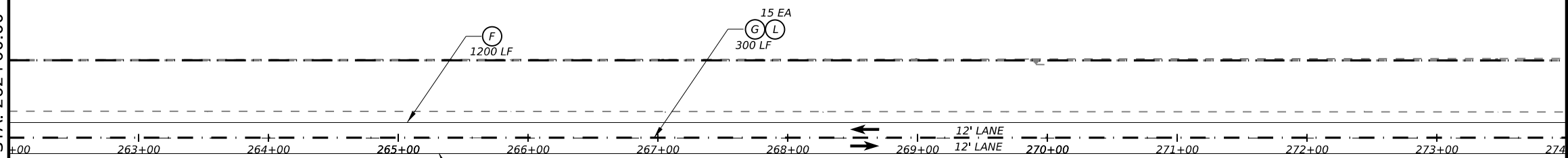
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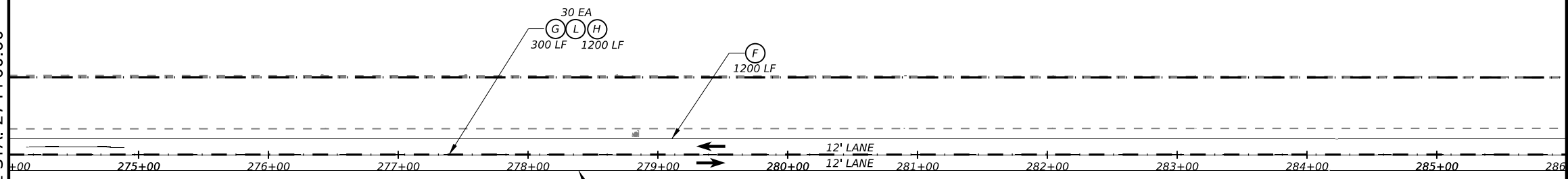
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MATCHLINE STA. 274+00.00

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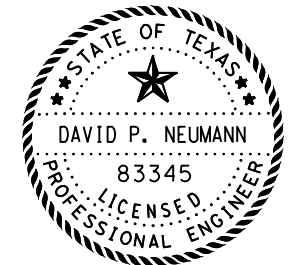
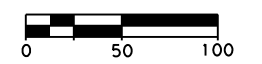


REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	600
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	1200
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	
L	672-6009	REFL PAV MRKR TY II-A-A	EA	45
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	



LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:36:58-05'00'

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 TBPE Firm Reg. No. 10488

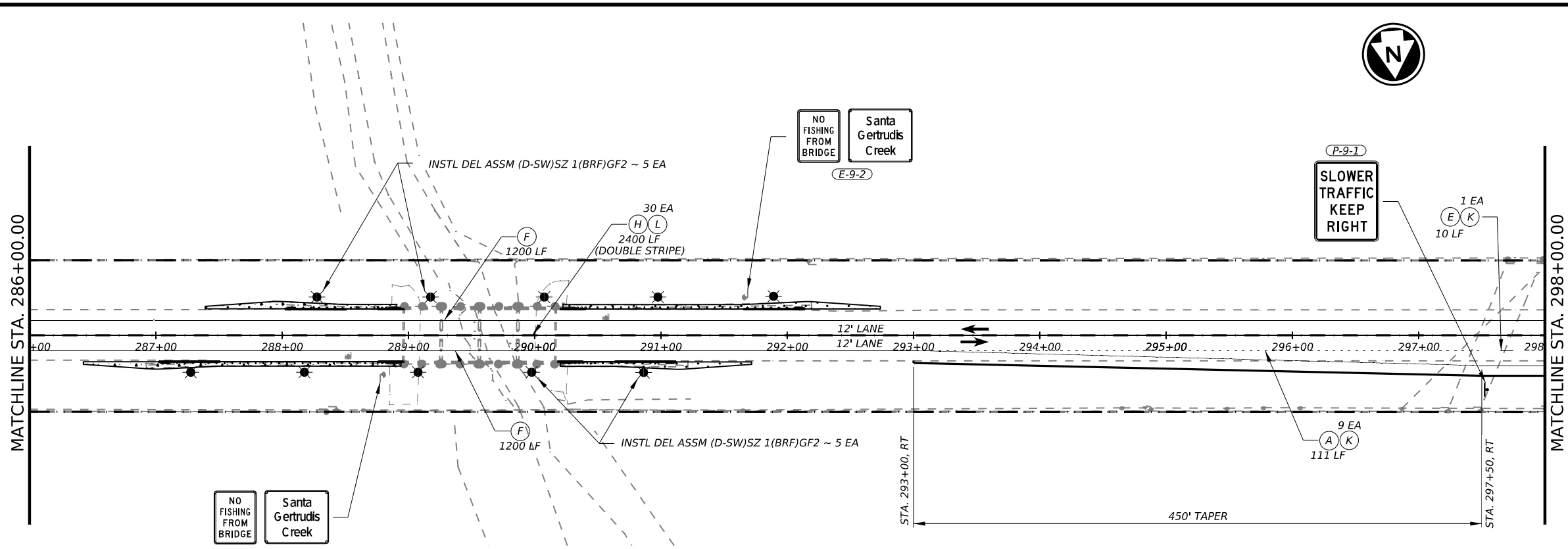


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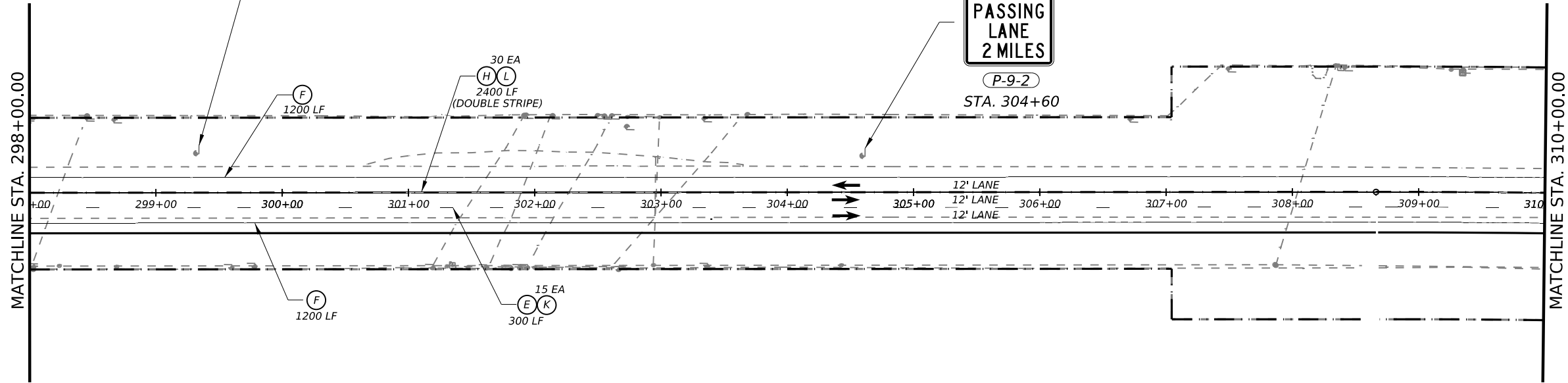
SHEET 8 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	215	

CK: DW: CK: DN:



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTR DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	10
	658-6100	INSTR OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	111
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I(W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I(Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I(W)6*(BRK)(090MIL)	LF	310
F	666-6308	RE PM W/RET REQ TY I(W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I(Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I(Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C(W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C(W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	25
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C(W)(LNDP ARROW)	EA	

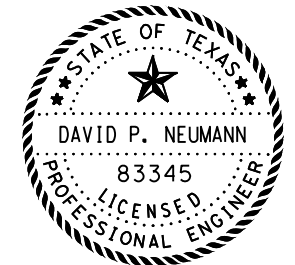
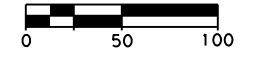


LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I(W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I(Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1(W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1(W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1(Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1(Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C(W)(ARROW)
- (J) PREFAB PAV MRK TY C(W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C(W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:36:46-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



SIGNING & PAVEMENT MARKERS

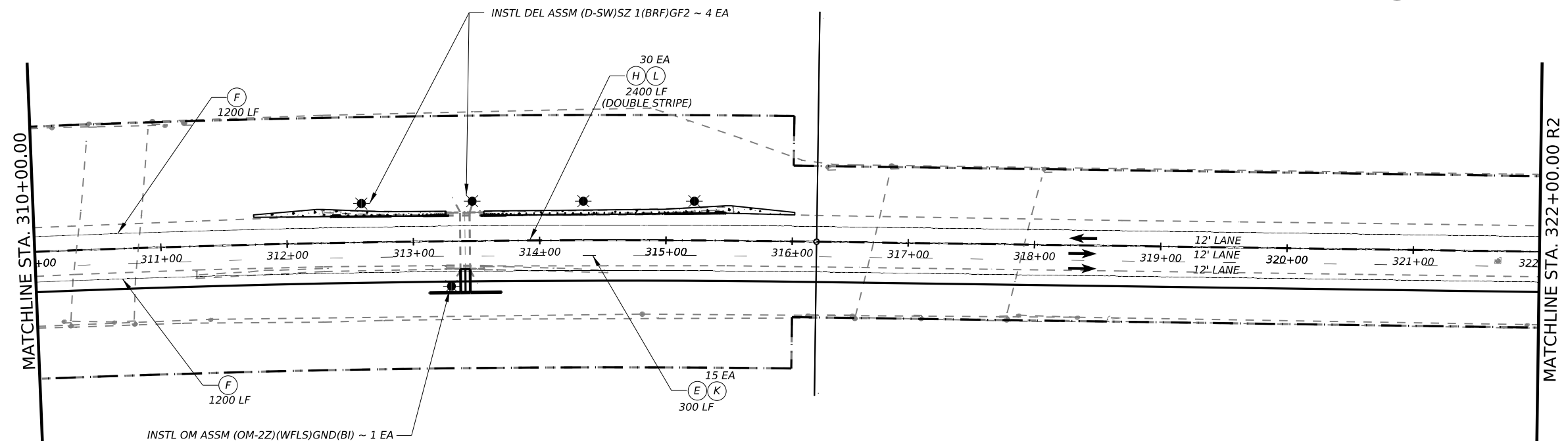
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SHEET 9 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		216

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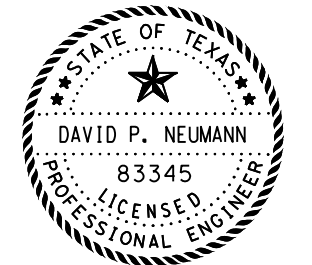
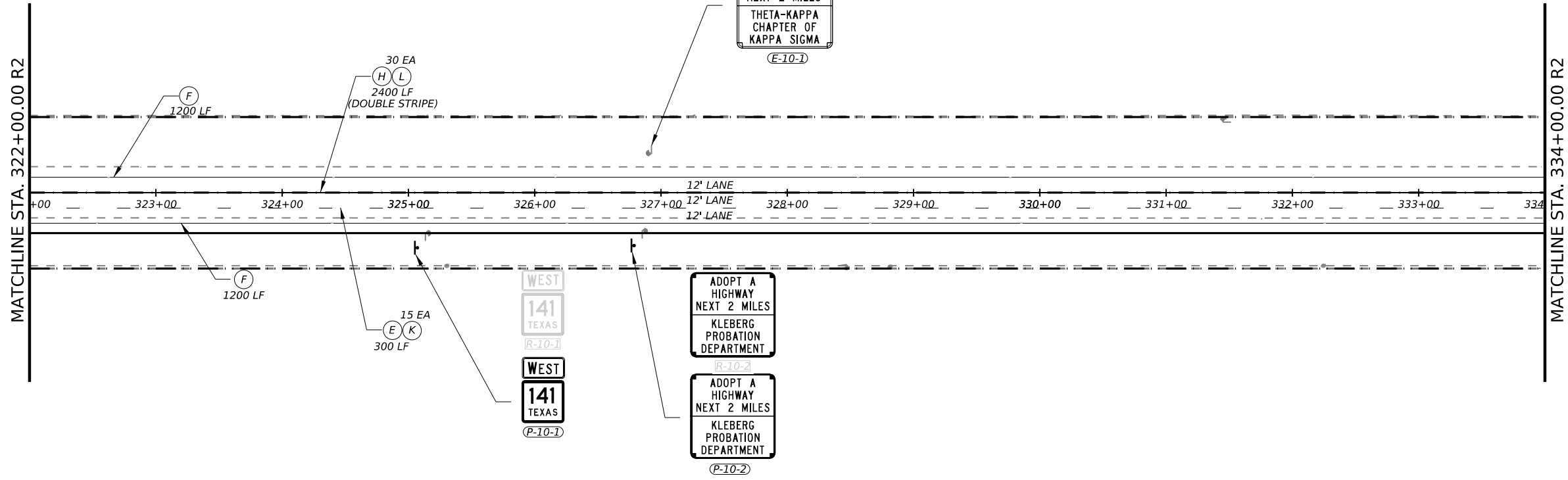
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REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	5
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	1
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:36:34-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



SIGNING & PAVEMENT MARKERS

STA. 310+00 TO STA. 334+00

SHEET 10 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		217

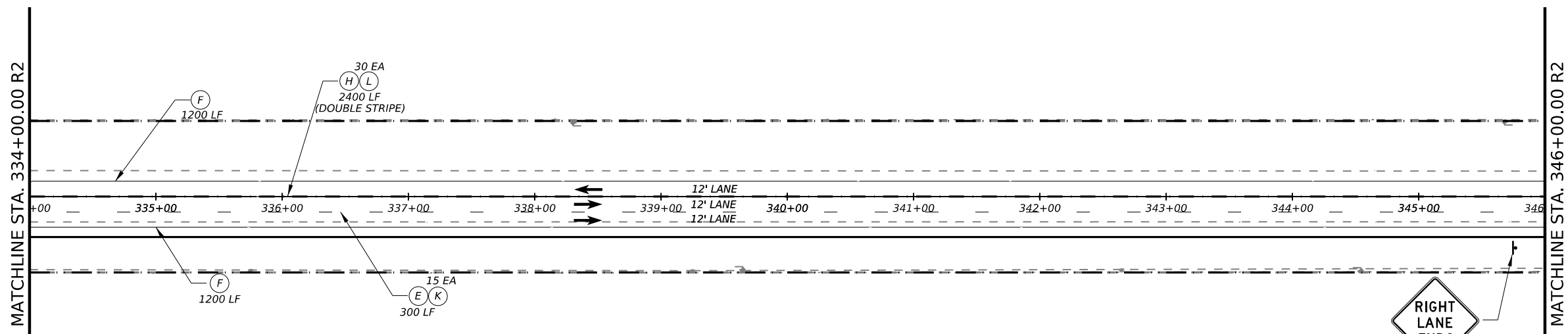
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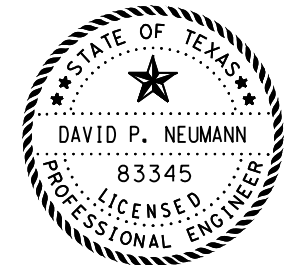
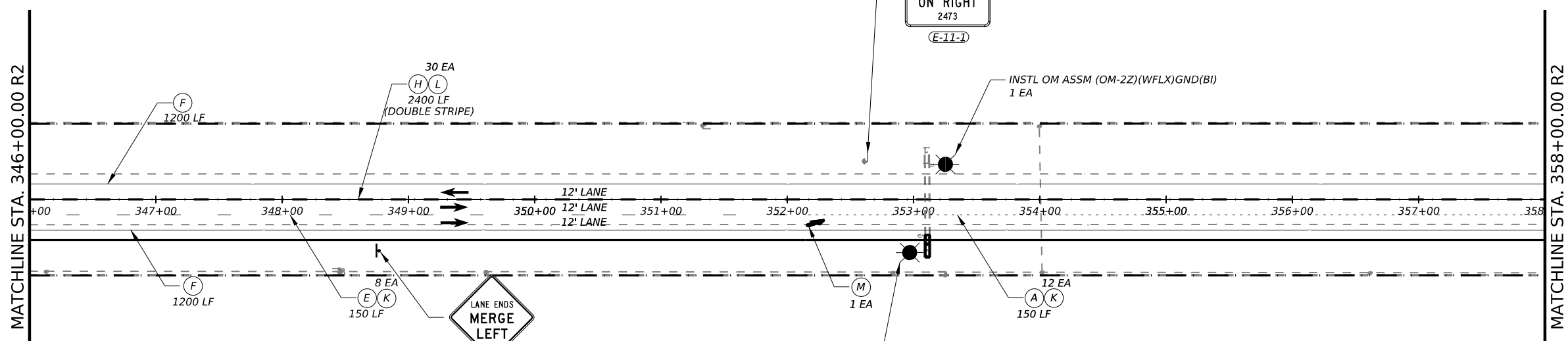


LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I(W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I(Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- (R-1-1) REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- (E-1-2) EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- (RR-1-2) EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- (P-1-2) PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



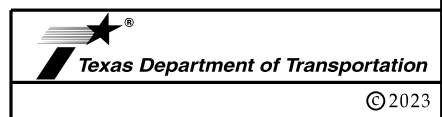
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
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	658-6100	IN STL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	2
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	150
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I(W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I(Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	450
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	35
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	1



David P. Neumann, P.E.

2023.07.28 01:36:21-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



SIGNING & PAVEMENT MARKERS

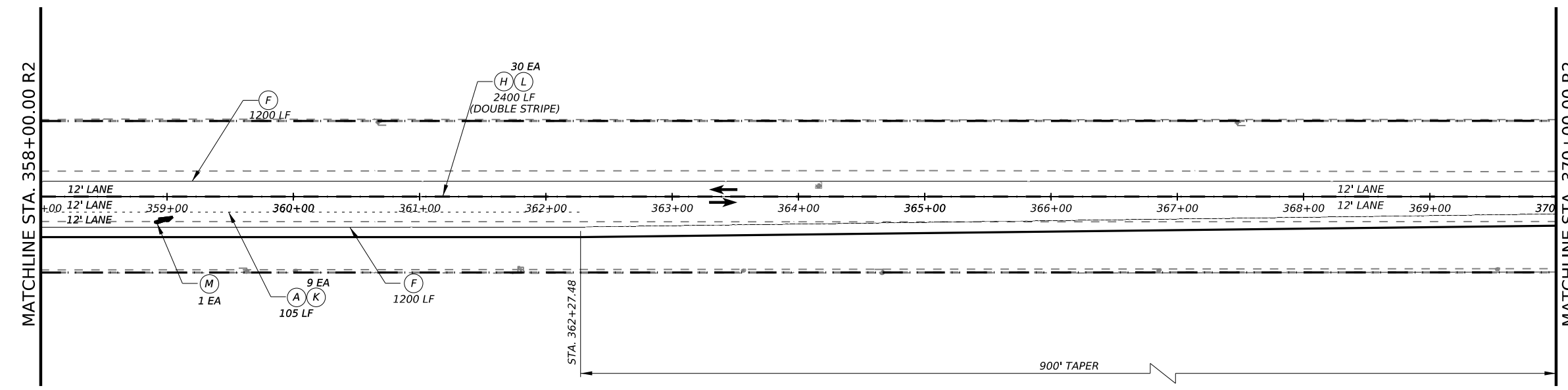
STA. 334+00 TO STA. 358+00

SHEET 11 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	218

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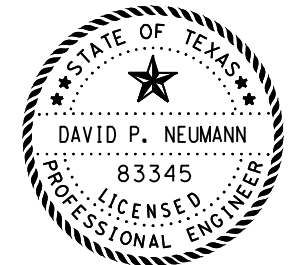
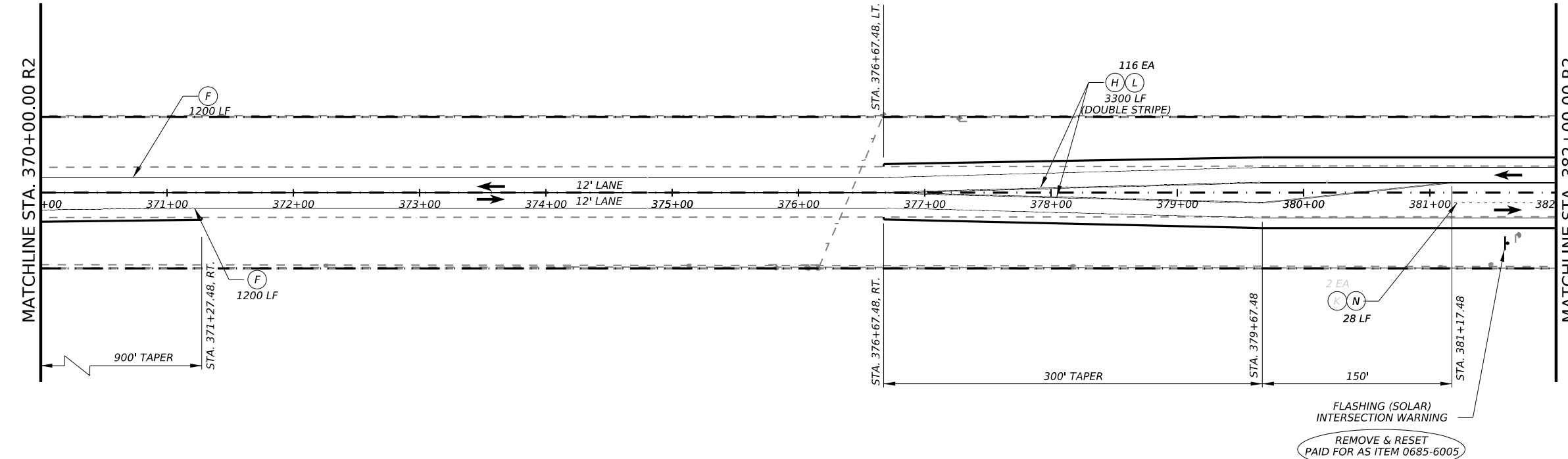
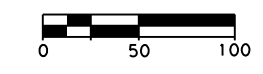
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTR DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTR OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	105
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	5700
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	11
L	672-6009	REFL PAV MRKR TY II-A-A	EA	146
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	1
N	666-6029	REFL PAV MRK TY I(W)8*(DOT)(090MIL)	LF	28

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:36:07-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

Texas Department of Transportation

SIGNING & PAVEMENT MARKERS

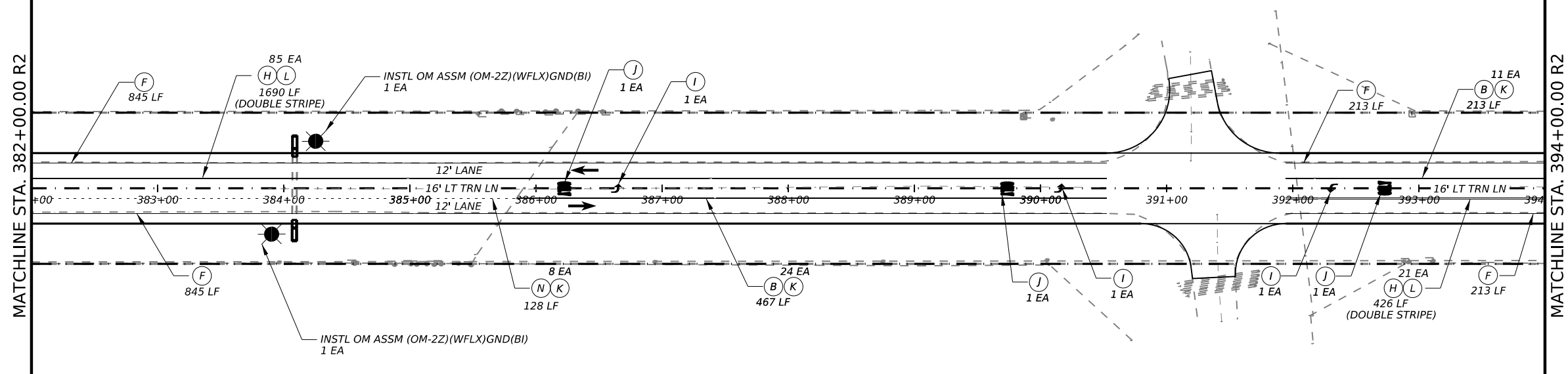
STA. 358+00 TO STA. 382+00

SHEET 12 OF 28

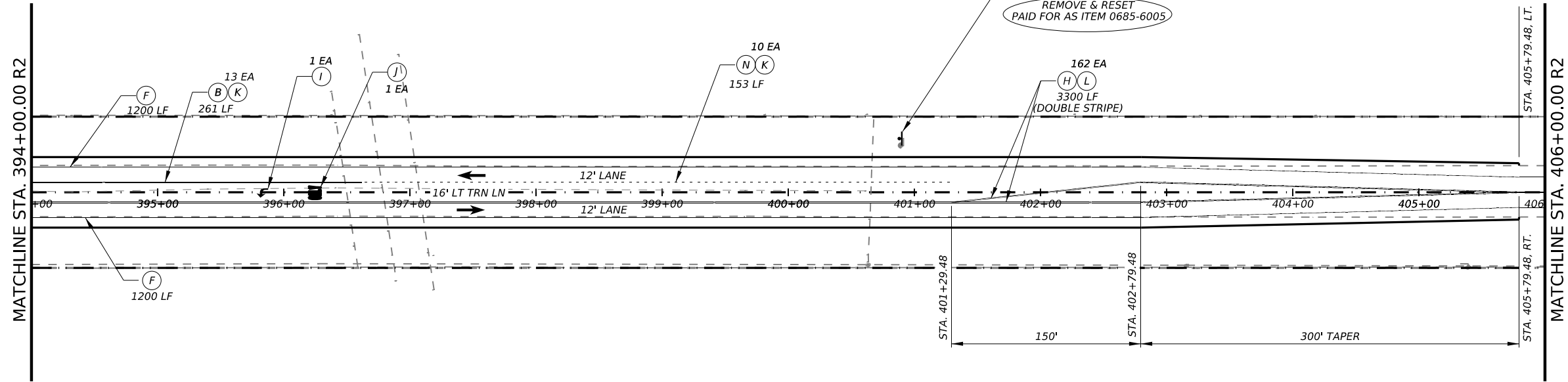
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0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	219	

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REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	2
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	941
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4516
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	5416
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	4
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	4
K	672-6007	REFL PAV MRKR TY I-C	EA	66
L	672-6009	REFL PAV MRKR TY II-A-A	EA	268
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	
N	666-6029	REFL PAV MRK TY I(W)8*(DOT)(090MIL)	LF	281

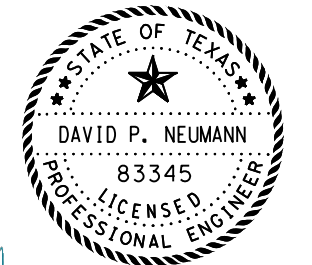


LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- (R-1-1) REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- (E-1-2) EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- (RR-1-2) EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- (P-1-2) PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:35:55-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



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SIGNING & PAVEMENT MARKERS

STA. 382+00 TO STA. 406+00

SHEET 13 OF 28

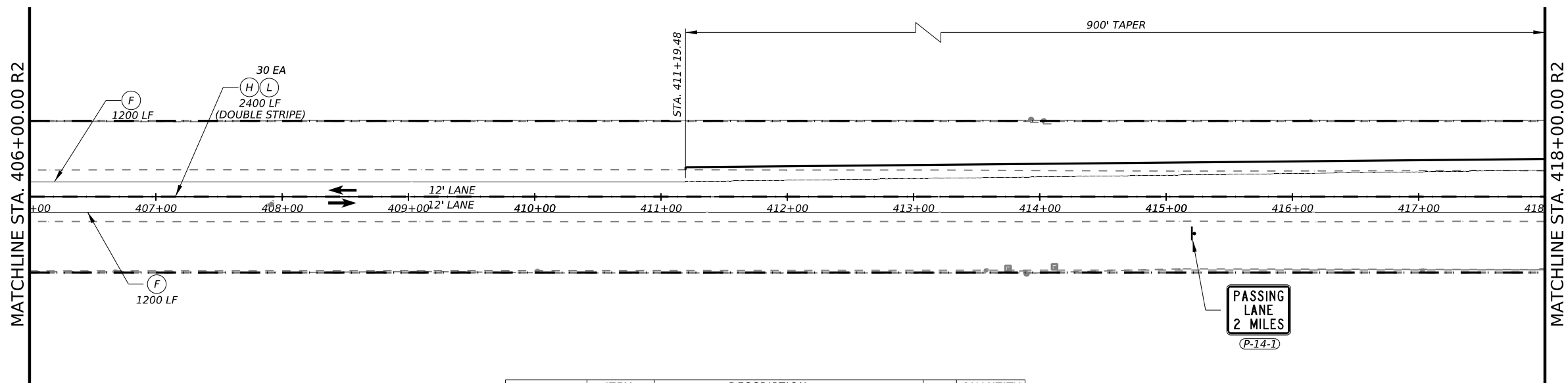
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0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		220

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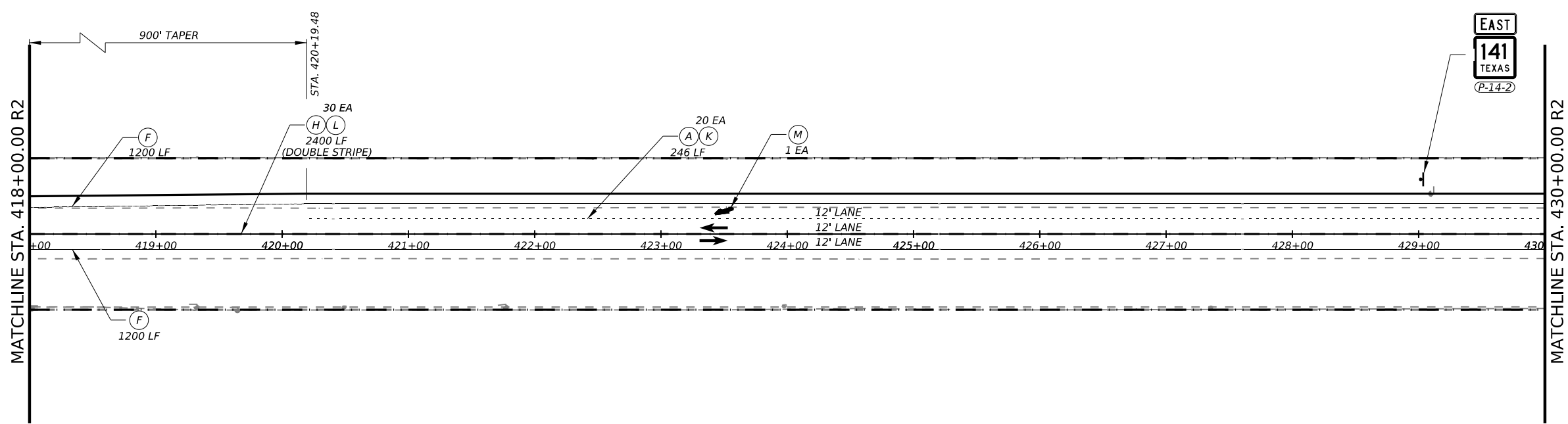


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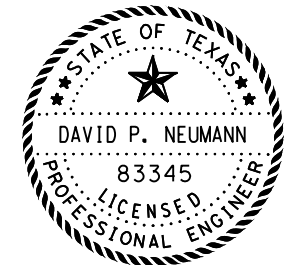
- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- ~~R-1-1~~ REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- ~~E-1-2~~ EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- ~~RR-1-2~~ EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- ~~P-1-2~~ PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTR DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTR OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	246
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	20
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	1



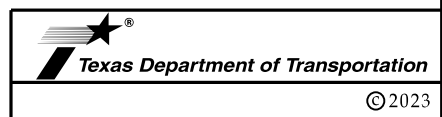
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EAST
141
TEXAS
P-14-2



David P. Neumann, P.E.

2023.07.28 01:35:41-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



SIGNING & PAVEMENT MARKERS

STA. 406+00 TO STA. 430+00

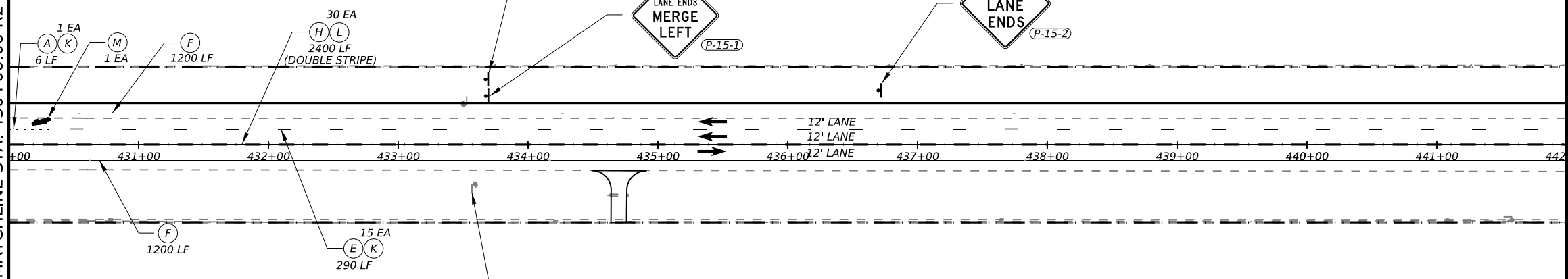
SHEET 14 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	221	

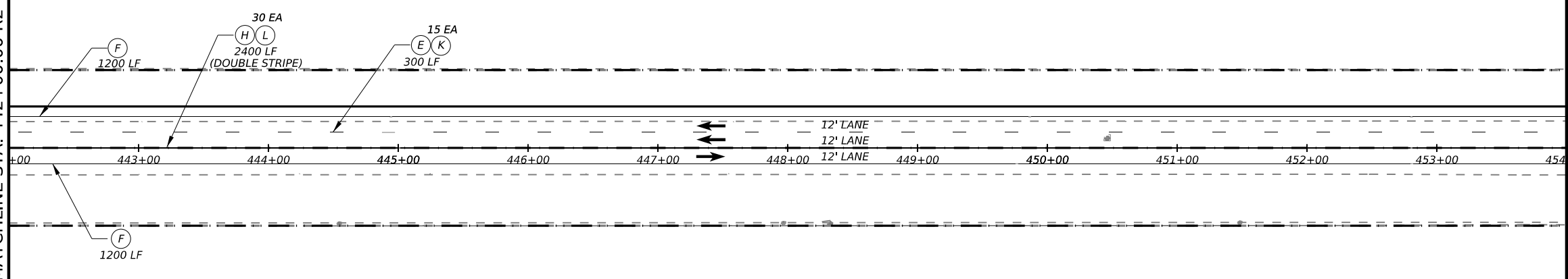
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MATCHLINE STA. 430+00.00 R2



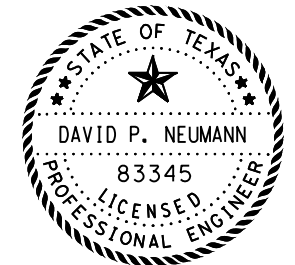
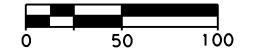
MATCHLINE STA. 442+00.00 R2



LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- (R-1-1) REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- (E-1-2) EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- (RR-1-2) EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- (P-1-2) PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS

REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	6
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	590
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	31
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	1



David P. Neumann, P.E.

2023.07.28 01:35:29-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



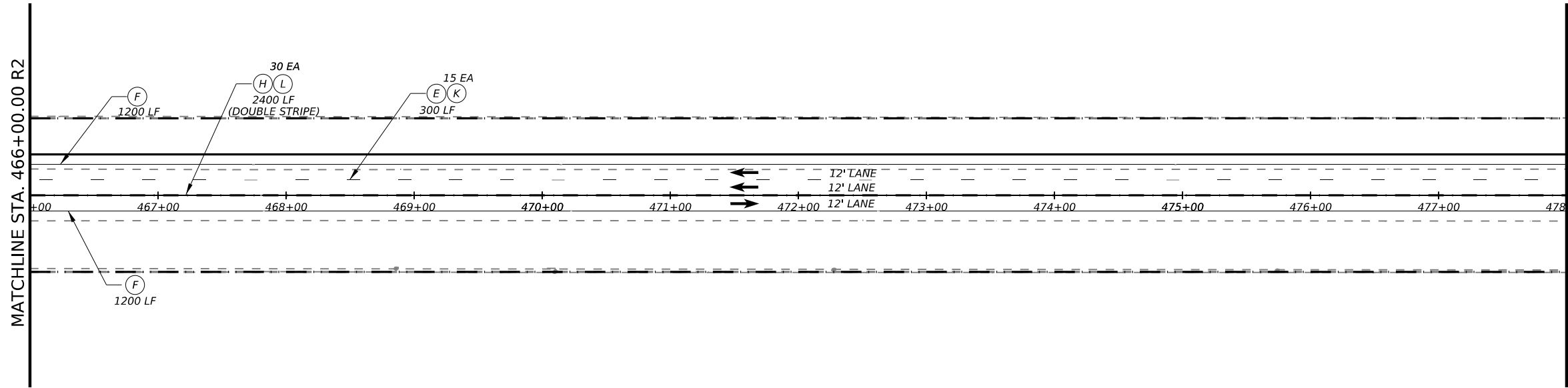
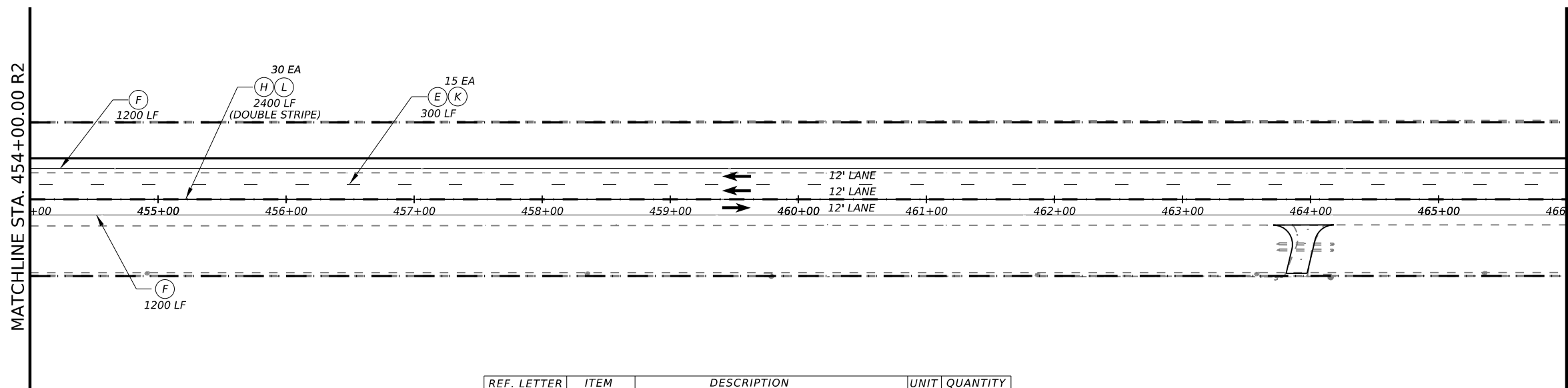
SIGNING & PAVEMENT MARKERS
STA. 430+00 TO STA. 454+00

SHEET 15 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	222	

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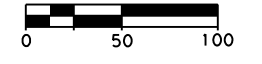
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

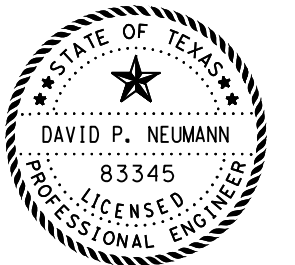
- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



DATE: 7/26/2023 10:20:36 AM
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David P. Neumann, P.E.

2023.07.28 01:35:12-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



SIGNING & PAVEMENT MARKERS

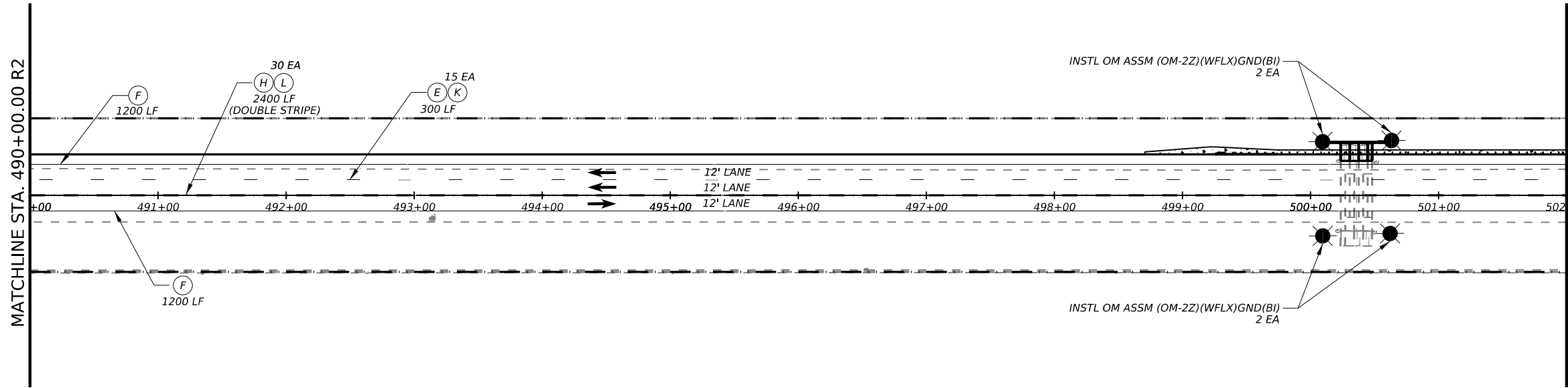
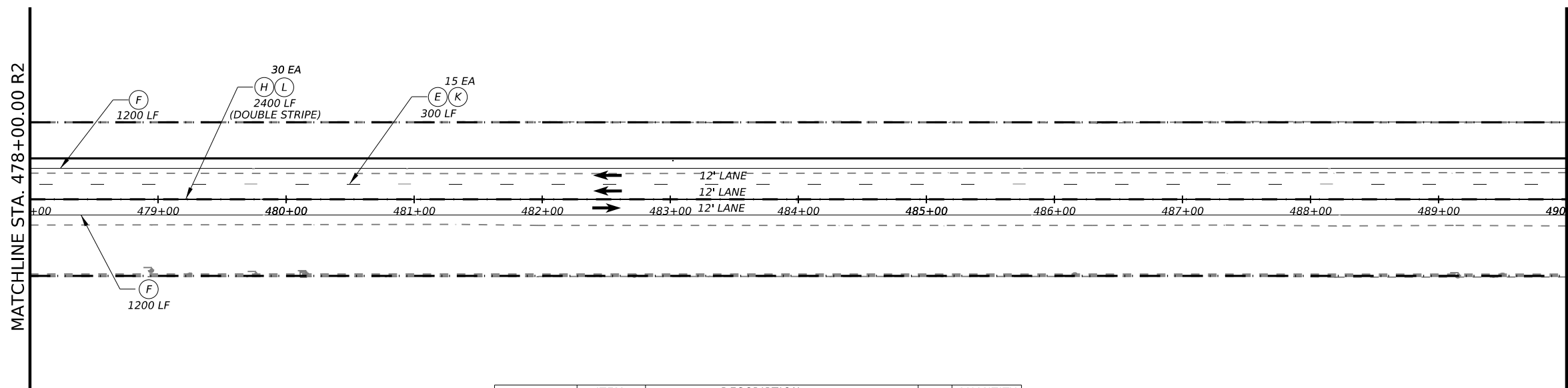
STA. 454+00 TO STA. 478+00

SHEET 16 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	223	

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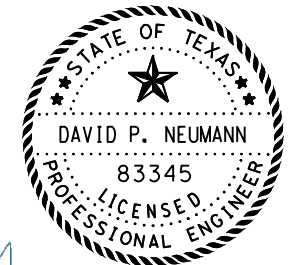
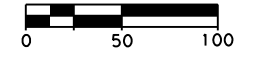
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	4
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

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LOCHNER
 TBPE Firm Reg. No. 10488



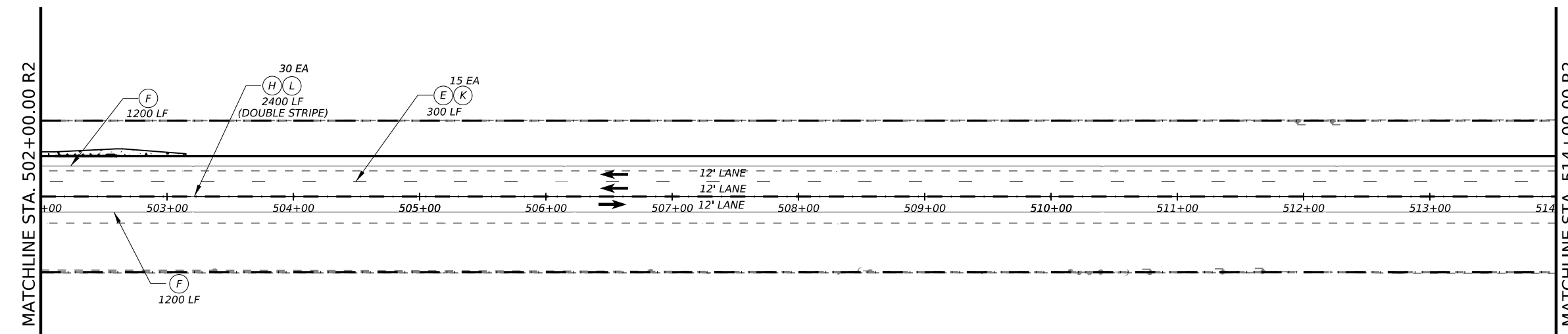
SIGNING & PAVEMENT MARKERS

STA. 478+00 TO STA. 502+00

SHEET 17 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	224

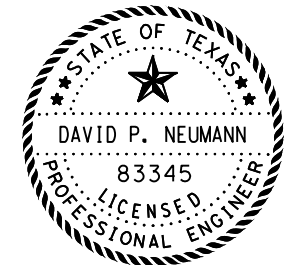
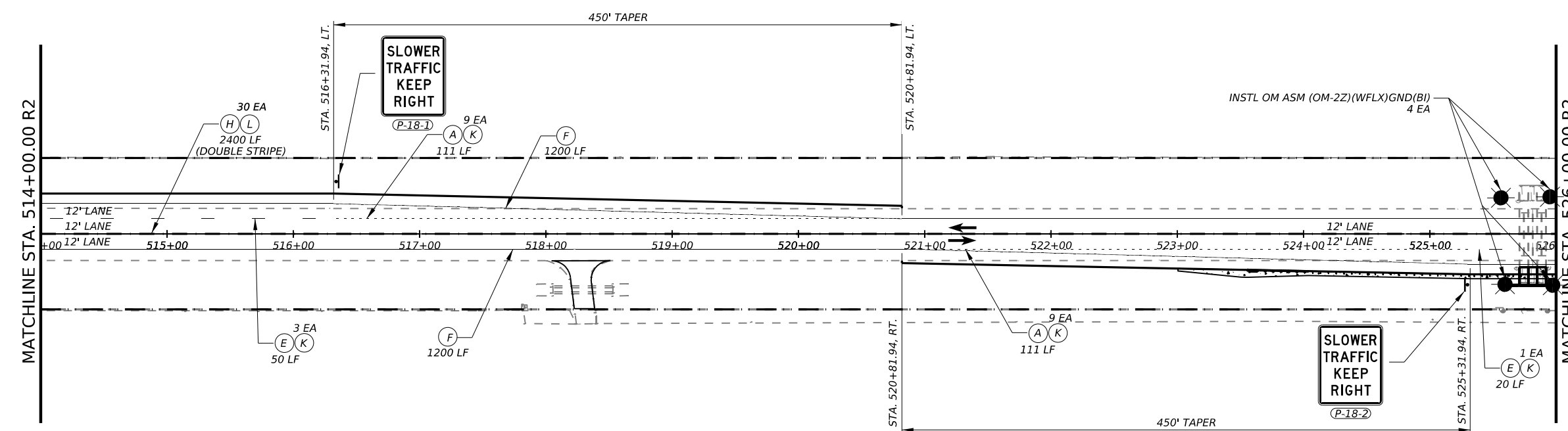
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REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	4
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	222
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	370
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	37
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.
 2023.07.28 01:32:06-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation
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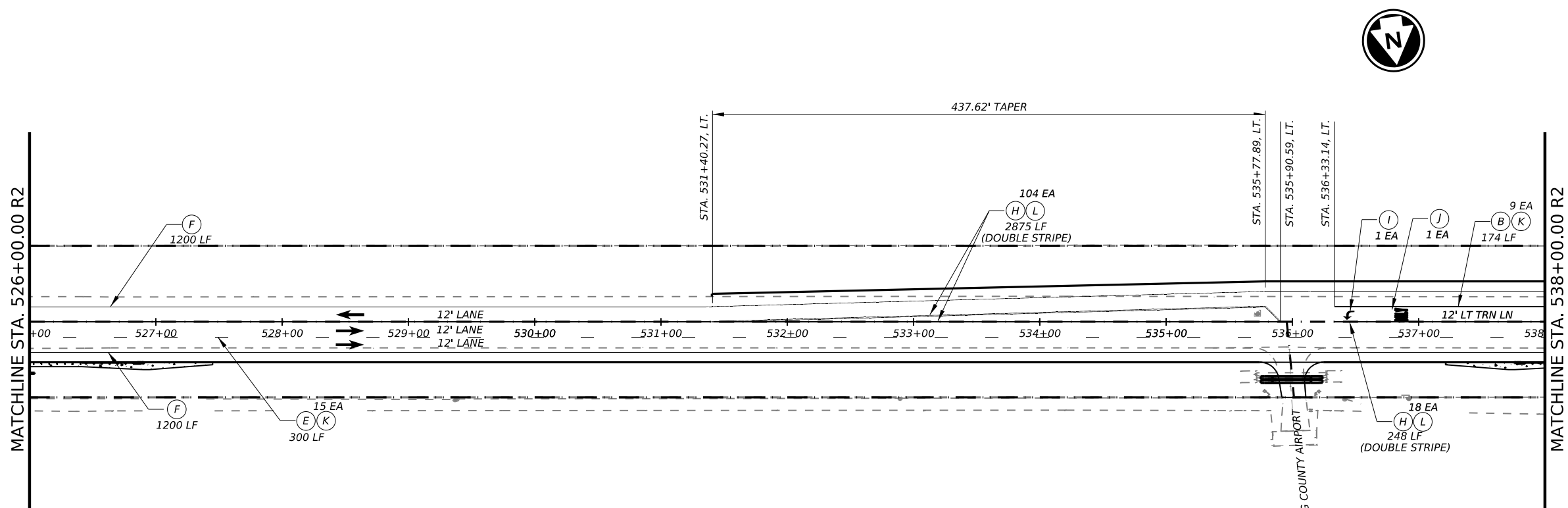
SIGNING & PAVEMENT MARKERS
 STA. 502+00 TO STA. 526+00

SHEET 18 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		225

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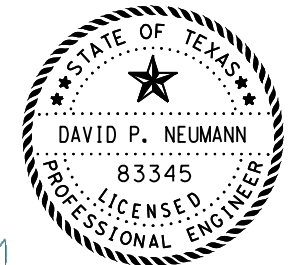
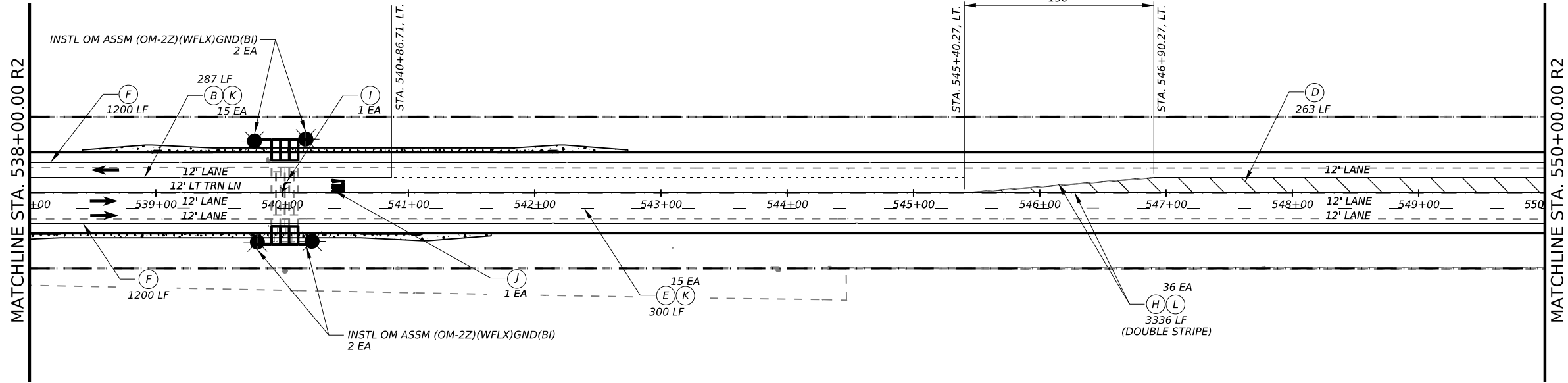
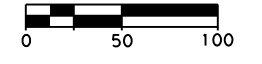
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REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	4
A	666-6017	REFL PAV MRK TY I(W)6"(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8"(SLD)(090MIL)	LF	461
C	666-6047	REFL PAV MRK TY I(W)24"(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I(Y)24"(SLD)(090MIL)	LF	263
E	666-6305	RE PM W/RET REQ TY I(W)6"(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY I(W)6"(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I(Y)6"(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I(Y)6"(SLD)(090MIL)	LF	6459
I	668-6077	PREFAB PAV MRK TY C(W)(ARROW)	EA	2
J	668-6085	PREFAB PAV MRK TY C(W)(WORD)	EA	2
K	672-6007	REFL PAV MRKR TY I-C	EA	54
L	672-6009	REFL PAV MRKR TY II-A-A	EA	158
M	668-6083	PREFAB PAV MRK TY C(W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6"(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8"(SLD)(090MIL)
- (C) REFL PAV MRK TY I(W)24"(SLD)(090MIL)
- (D) REFL PAV MRK TY I(Y)24"(SLD)(090MIL)
- (E) RE PM W/RET REQ TY I(W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY I(W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY I(Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY I(Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C(W)(ARROW)
- (J) PREFAB PAV MRK TY C(W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C(W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8"(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36"(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:34:46-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



SIGNING & PAVEMENT MARKERS

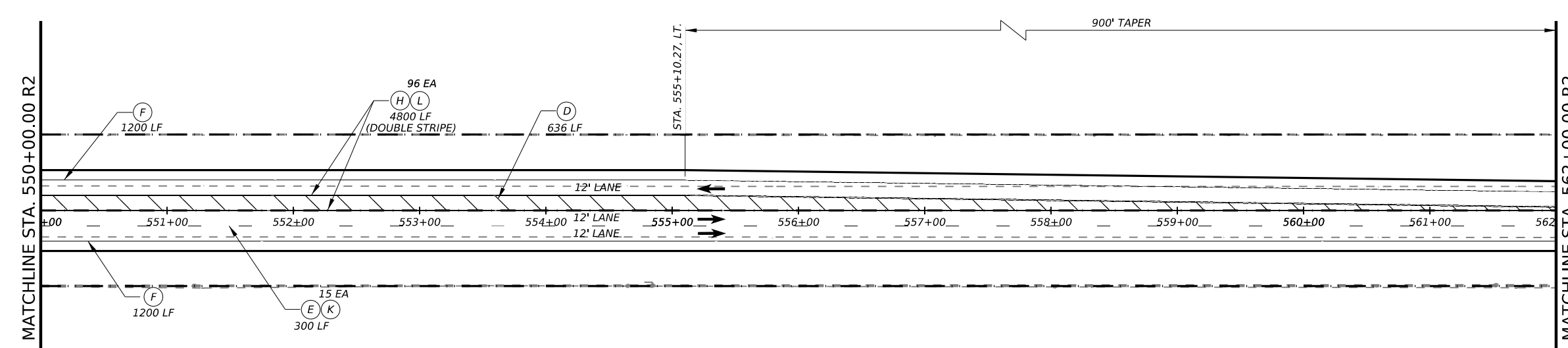
STA. 526+00 TO STA. 550+00

SHEET 19 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	226

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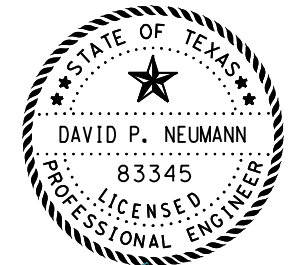
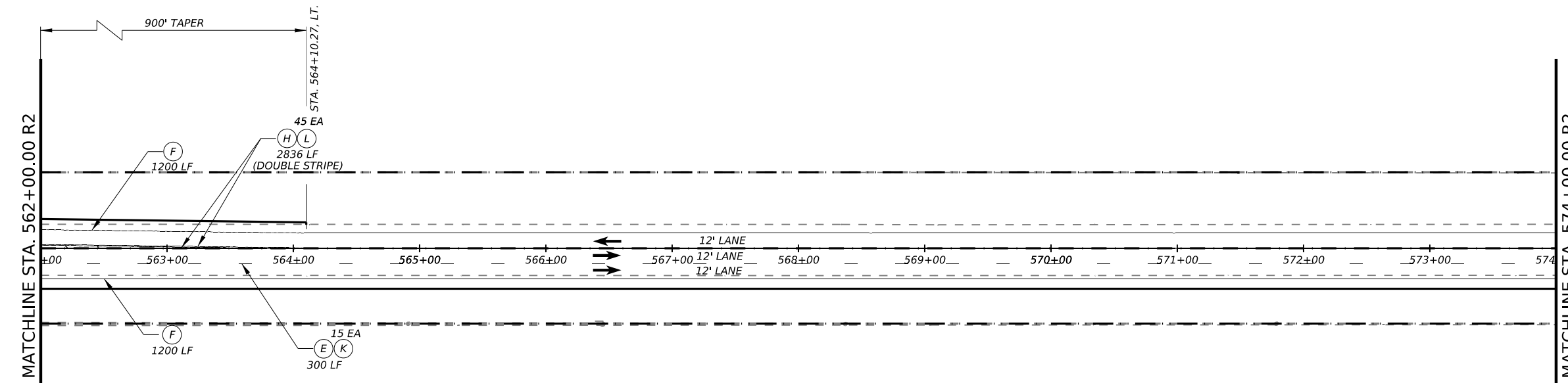
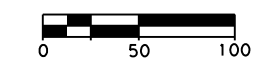
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6"(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8"(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I(W)24"(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I(Y)24"(SLD)(090MIL)	LF	636
E	666-6305	RE PM W/RET REQ TY 1(W)6"(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY 1(W)6"(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1(Y)6"(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1(Y)6"(SLD)(090MIL)	LF	7636
I	668-6077	PREFAB PAV MRK TY C(W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C(W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	141
M	668-6083	PREFAB PAV MRK TY C(W)(LNDRP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6"(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8"(SLD)(090MIL)
- (C) REFL PAV MRK TY I(W)24"(SLD)(090MIL)
- (D) REFL PAV MRK TY I(Y)24"(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1(W)6"(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1(W)6"(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1(Y)6"(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1(Y)6"(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C(W)(ARROW)
- (J) PREFAB PAV MRK TY C(W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C(W)(LNDRP ARROW)
- (N) REFL PAV MRK TY I(W)8"(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36"(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:34:33-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

Texas Department of Transportation
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SIGNING & PAVEMENT MARKERS

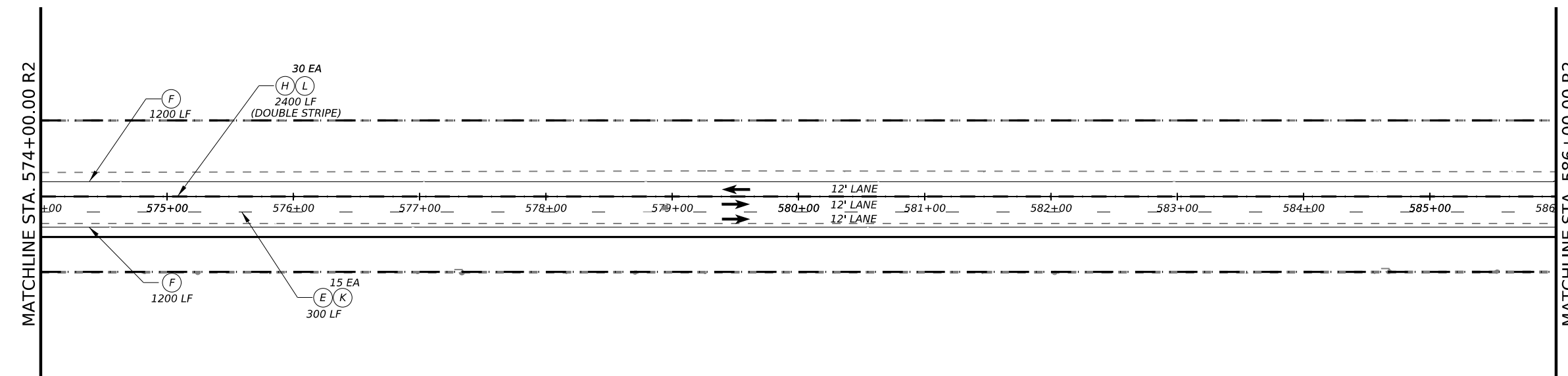
STA. 550+00 TO STA. 574+00

SHEET 20 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	227

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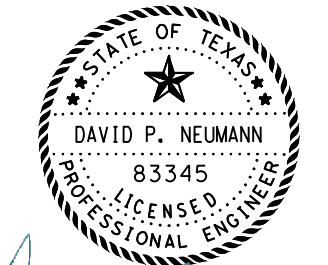
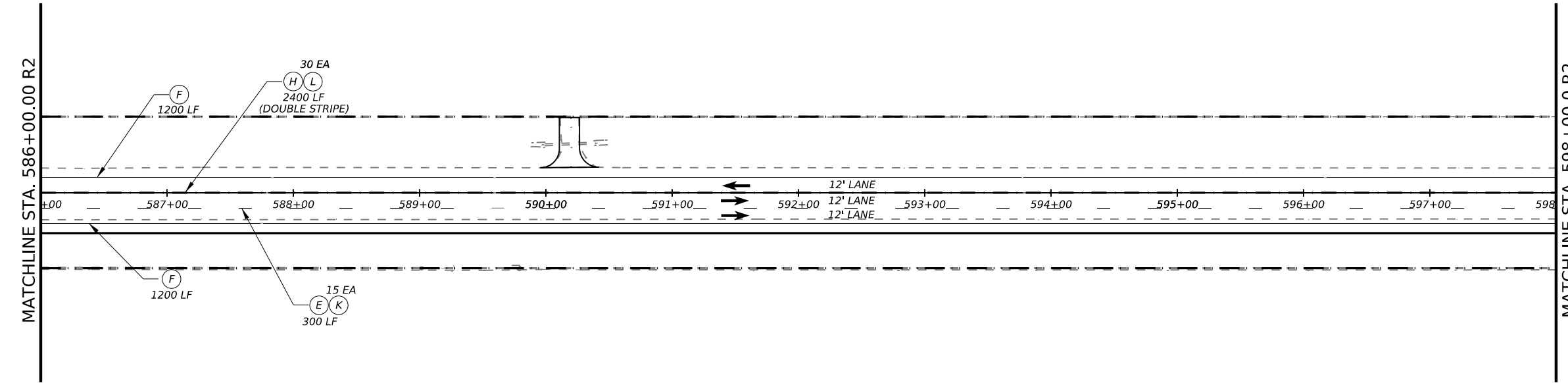
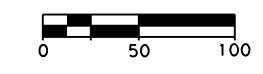
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- ⊙ BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.
 2023.07.28 01:34:20-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



SIGNING & PAVEMENT MARKERS

STA. 574+00 TO STA. 598+00

SHEET 21 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	228	

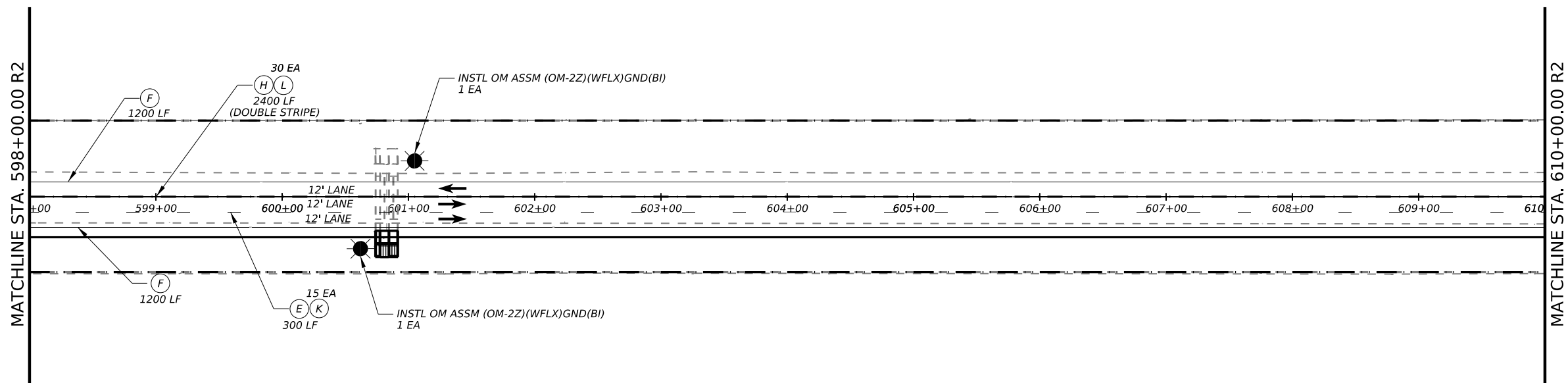
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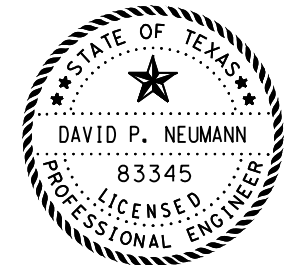
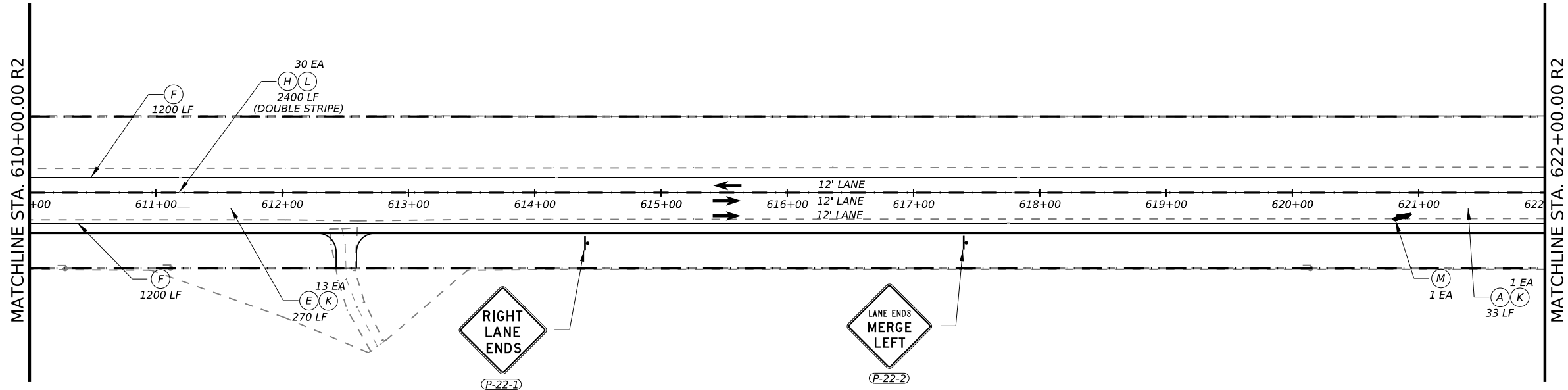


LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	2
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	33
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	570
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	29
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	1



David P. Neumann, P.E.

2023.07.28 01:33:34-05'00'

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STA. 598+00 TO STA. 622+00

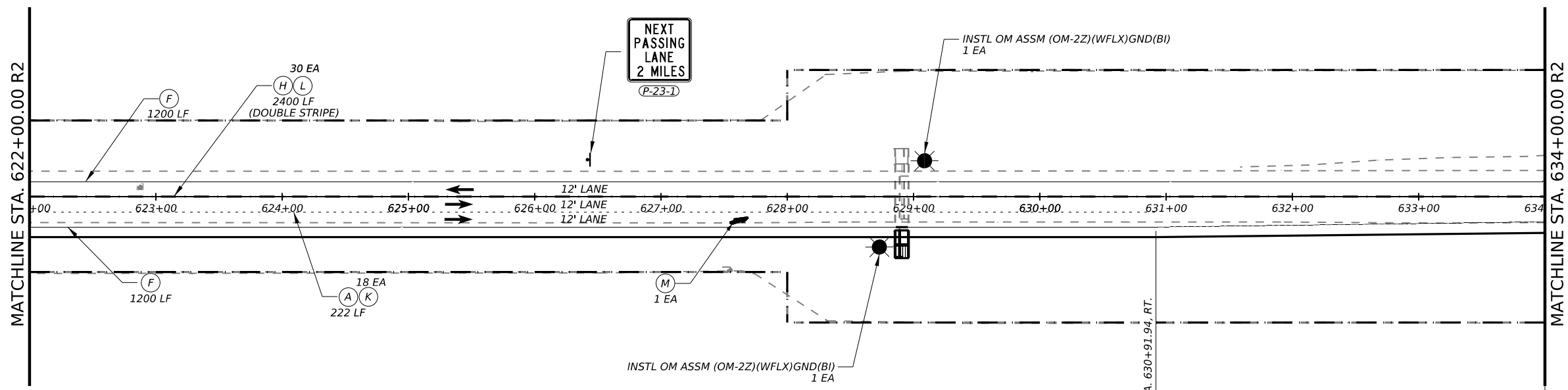
SHEET 22 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	229

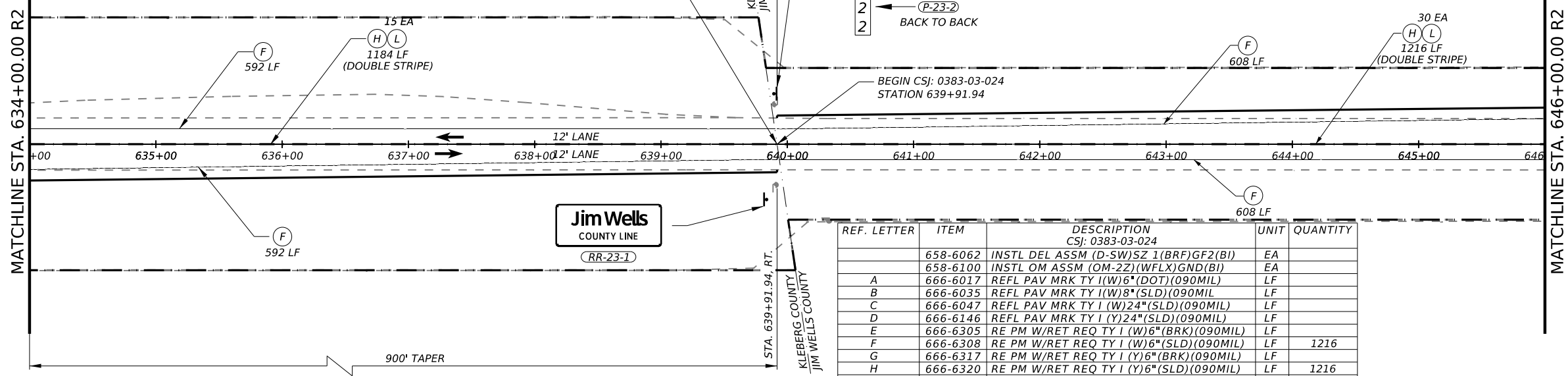
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REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	222
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	3584
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	3584
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	18
L	672-6009	REFL PAV MRKR TY II-A-A	EA	45
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	1



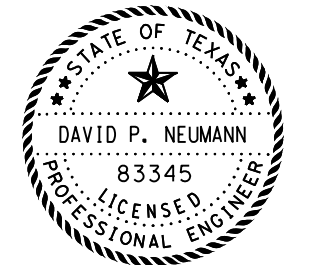
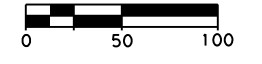
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	1216
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	1216
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	
L	672-6009	REFL PAV MRKR TY II-A-A	EA	30
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:33:18-05'00'

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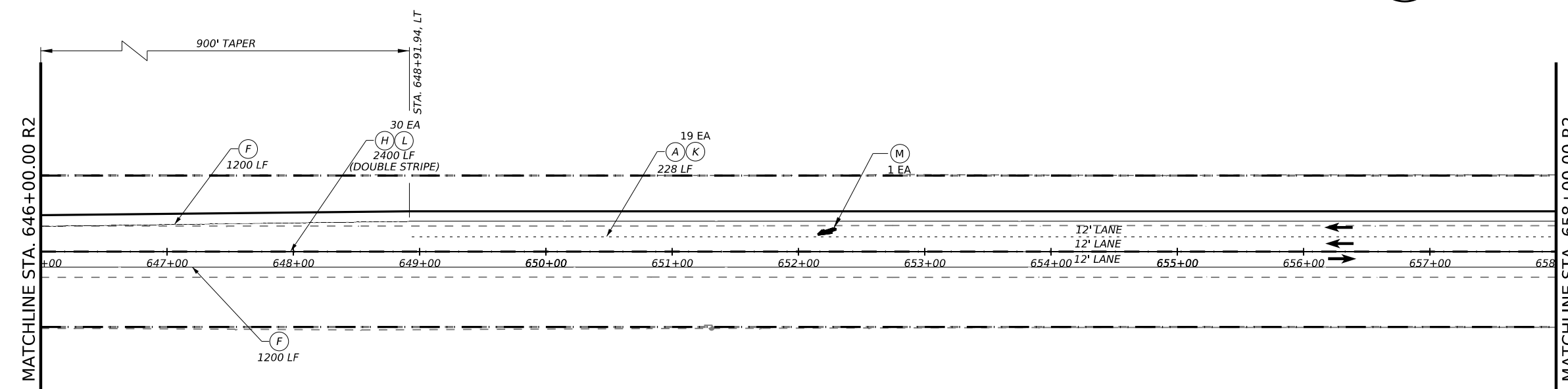
SIGNING & PAVEMENT MARKERS

STA. 622+00 TO STA. 646+00

SHEET 23 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	230	

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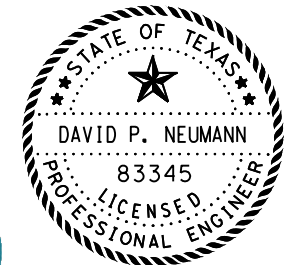
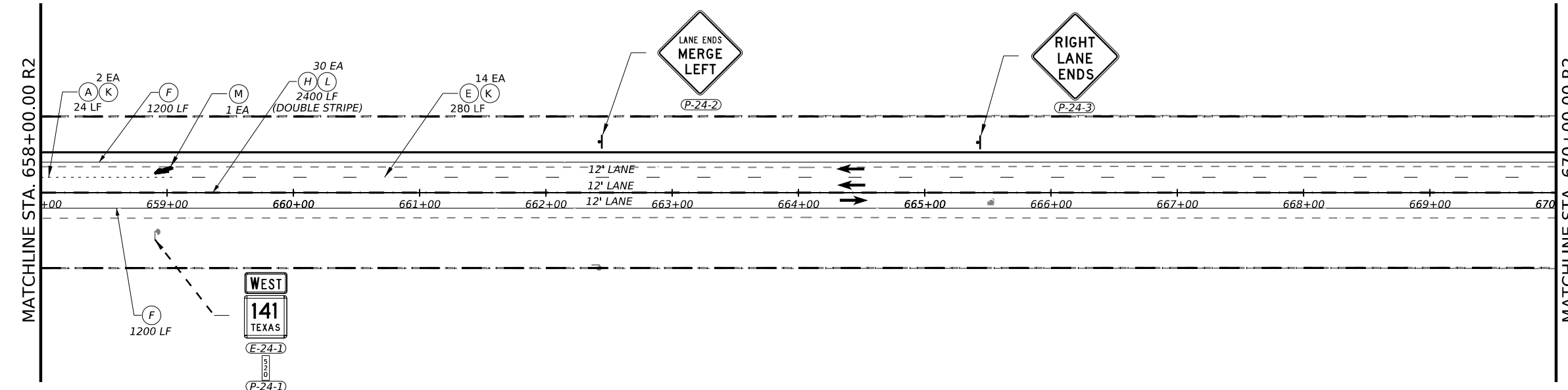
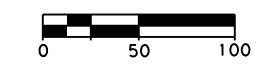
REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	252
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	280
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	35
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	2

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:33:06-05'00'

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TBPE Firm Reg. No. 10488

Texas Department of Transportation

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SIGNING & PAVEMENT MARKERS

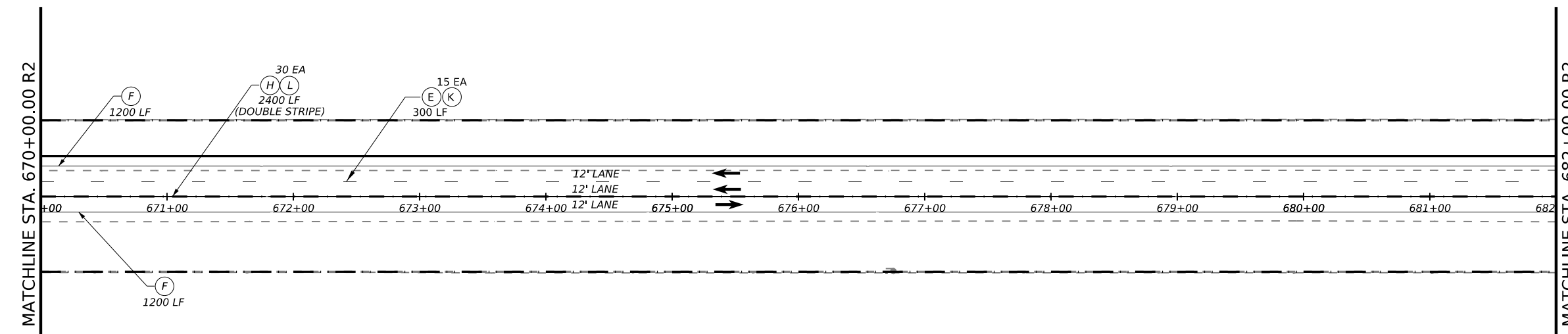
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SHEET 24 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		231

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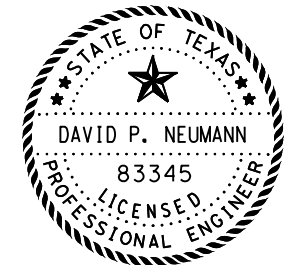
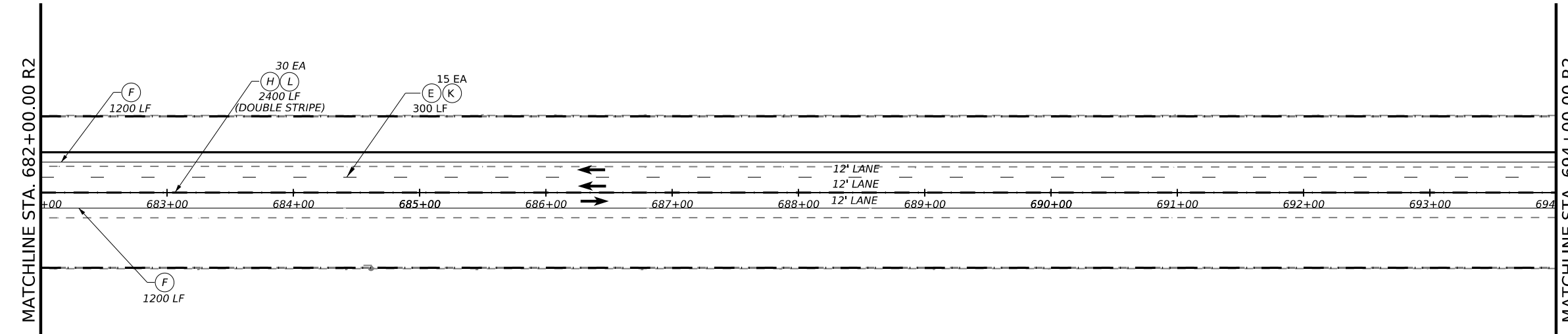
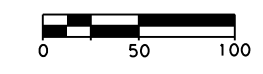


REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.
 2023.07.28 01:32:53-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



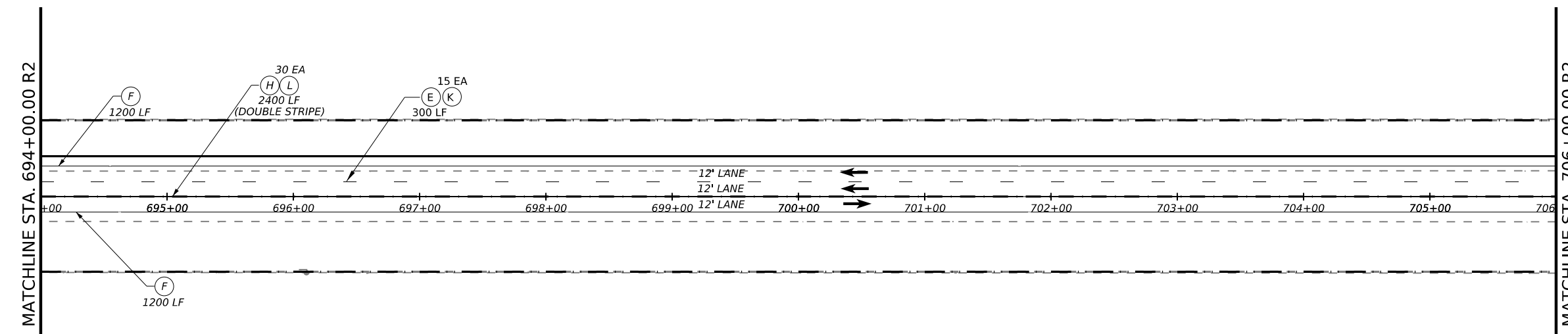
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SIGNING & PAVEMENT MARKERS
 STA. 670+00 TO STA. 694+00

SHEET 25 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		232

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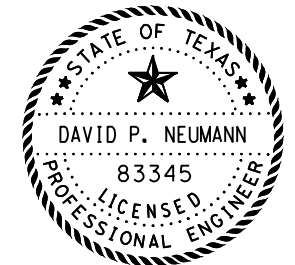
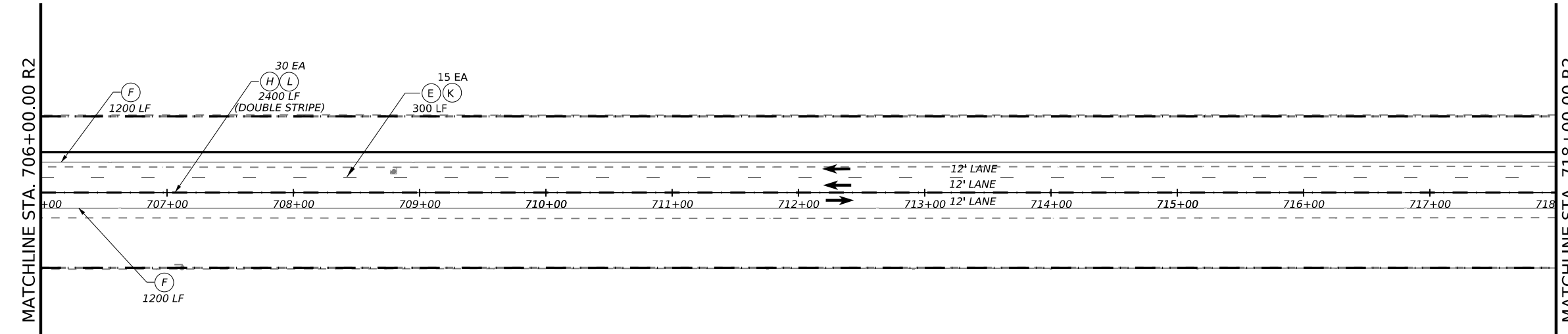
CK: DW: CK: DN:



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1 (BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY I (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY I (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY I (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY I (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

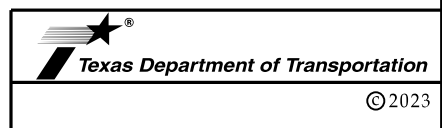
- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 01:32:40-05'00'

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SIGNING & PAVEMENT MARKERS

STA. 694+00 TO STA. 718+00

SHEET 26 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		233

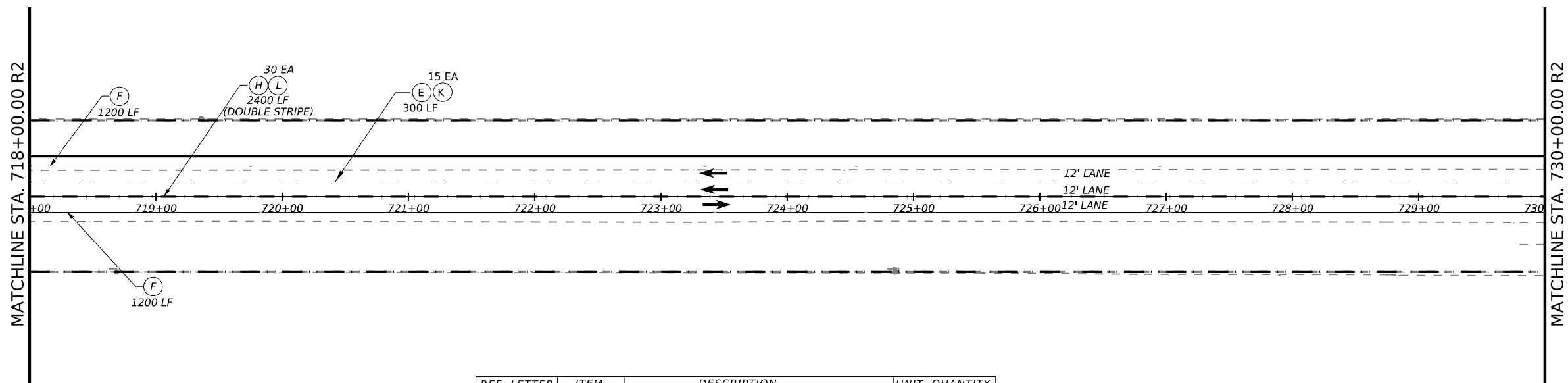
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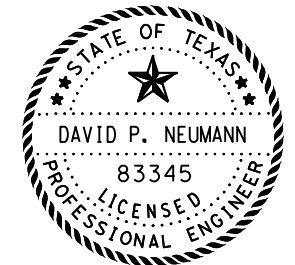
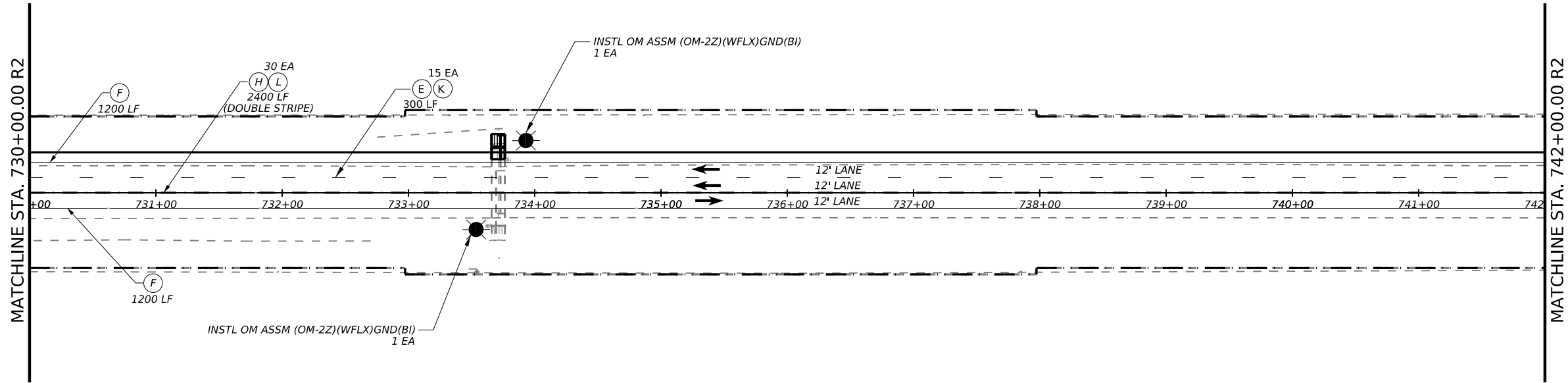


LEGEND

- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I(W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I(Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)
- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)
- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	2
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	
C	666-6047	REFL PAV MRK TY I(W)24*(SLD)(090MIL)	LF	
D	666-6146	REFL PAV MRK TY I(Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	600
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4800
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4800
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	
K	672-6007	REFL PAV MRKR TY I-C	EA	30
L	672-6009	REFL PAV MRKR TY II-A-A	EA	60
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	



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2023.07.28 01:32:25-05'00'

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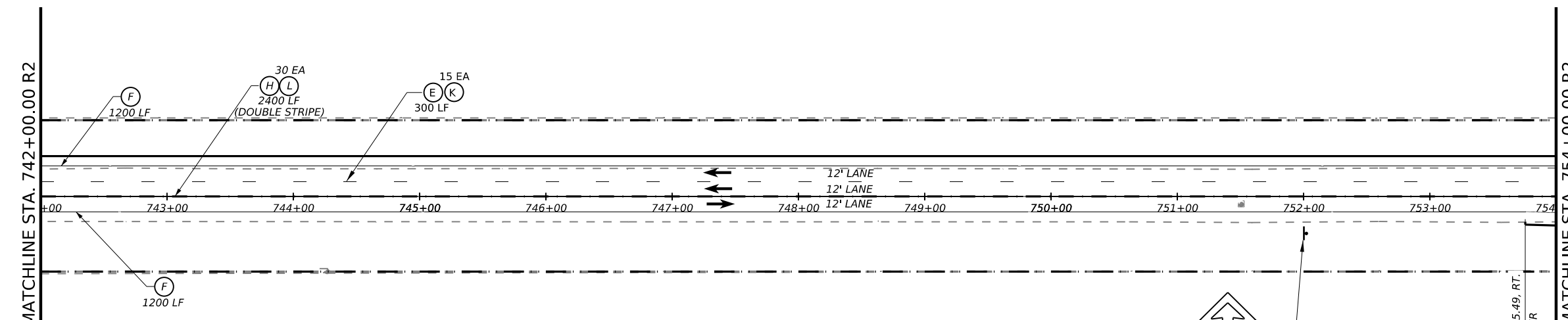
STA. 718+00 TO STA. 742+00

SHEET 27 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	234	

DATE: 7/26/2023 10:22:53 AM
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CK: DW: CK: DN:



REF. LETTER	ITEM	DESCRIPTION	UNIT	QUANTITY
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	
	658-6100	INSTL OM ASSM (OM-ZZ)(WFLX)GND(BI)	EA	
A	666-6017	REFL PAV MRK TY I(W)6*(DOT)(090MIL)	LF	
B	666-6035	REFL PAV MRK TY I(W)8*(SLD)(090MIL)	LF	660
C	666-6047	REFL PAV MRK TY I (W)24*(SLD)(090MIL)	LF	24
D	666-6146	REFL PAV MRK TY I (Y)24*(SLD)(090MIL)	LF	
E	666-6305	RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)	LF	310
F	666-6308	RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)	LF	4452
G	666-6317	RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)	LF	
H	666-6320	RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)	LF	4452
I	668-6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	2
J	668-6085	PREFAB PAV MRK TY C (W)(WORD)	EA	2
K	672-6007	REFL PAV MRKR TY I-C	EA	57
L	672-6009	REFL PAV MRKR TY II-A-A	EA	54
M	668-6083	PREFAB PAV MRK TY C (W)(LNDP ARROW)	EA	

LEGEND

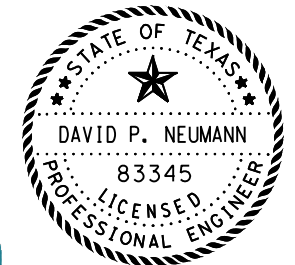
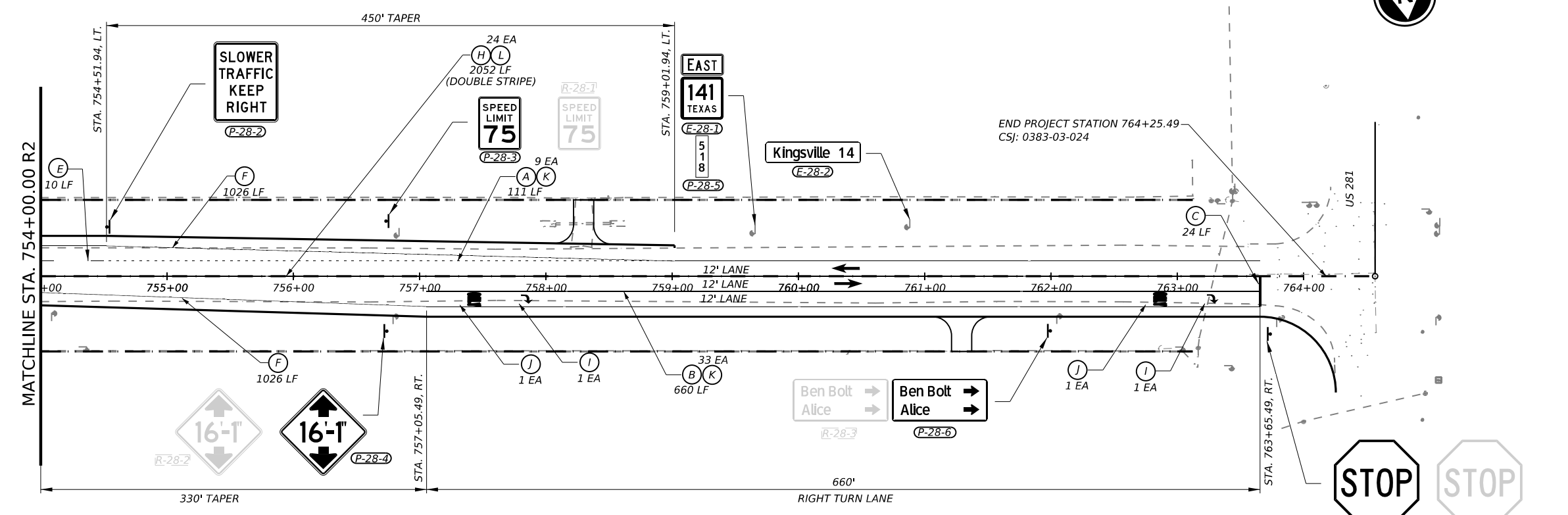
- (A) REFL PAV MRK TY I(W)6*(DOT)(090MIL)
- (B) REFL PAV MRK TY I(W)8*(SLD)(090MIL)
- (C) REFL PAV MRK TY I (W)24*(SLD)(090MIL)
- (D) REFL PAV MRK TY I (Y)24*(SLD)(090MIL)
- (E) RE PM W/RET REQ TY 1 (W)6*(BRK)(090MIL)
- (F) RE PM W/RET REQ TY 1 (W)6*(SLD)(090MIL)
- (G) RE PM W/RET REQ TY 1 (Y)6*(BRK)(090MIL)
- (H) RE PM W/RET REQ TY 1 (Y)6*(SLD)(090MIL)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(WORD)
- (K) REFL PAV MRKR TY I-C
- (L) REFL PAV MRKR TY II-A-A
- (M) PREFAB PAV MRK TY C (W)(LNDP ARROW)
- (N) REFL PAV MRK TY I(W)8*(DOT)(090MIL)
- (O) REFL PAV MRK TY I(W)36*(YLD TRI)(090MIL)

- SIGN POST
- BI-DIRECTIONAL DELINEATOR ASSM
- OBJECT MARKER TY 2 (OM-2)

- [R-1-1] REMOVE EXISTING SMALL SIGN - SHEET # - SIGN #
- [E-1-2] EXISTING SIGN TO REMAIN - SHEET # - SIGN #
- [RR-1-2] EXISTING SMALL SIGN REMOVE & RELOCATE - SHEET # - SIGN #
- [P-1-2] PROPOSED SMALL SIGN - SHEET # - SIGN #
- DIRECTIONAL TRAFFIC FLOW ARROWS



DATE: 7/28/2023 2:59:26 AM
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David P. Neumann, P.E.

2023.07.28 03:11:23-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488

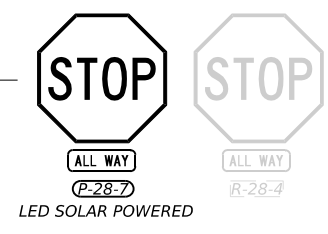
Texas Department of Transportation
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SIGNING & PAVEMENT MARKERS

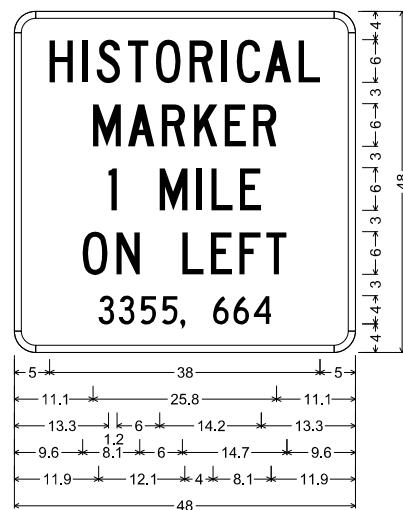
STA. 742+00 TO STA. 764+25.49

SHEET 28 OF 28

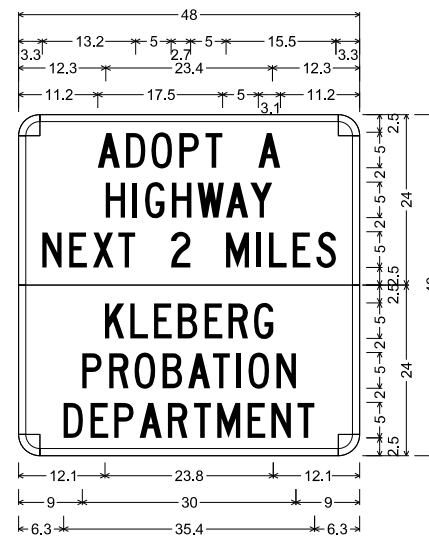
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		235



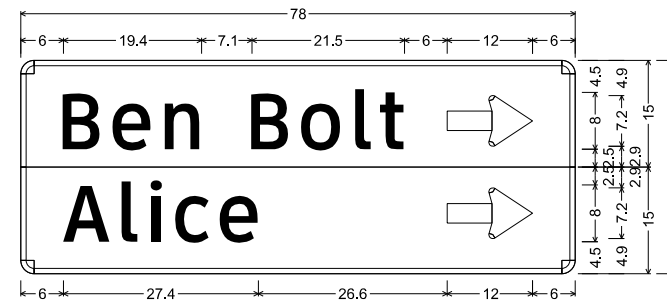
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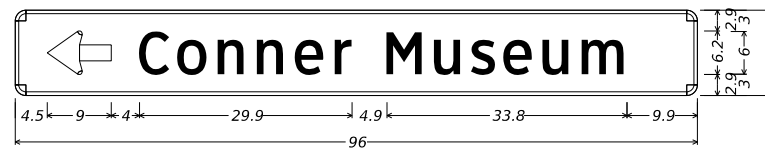
D7-6aTL_48x48;
 3.0" Radius, 1.0" Border, White on Brown;
 "HISTORICAL", C; "MARKER", C;
 "1 MILE", C; "ON LEFT", C;
 "3355, 664", C;



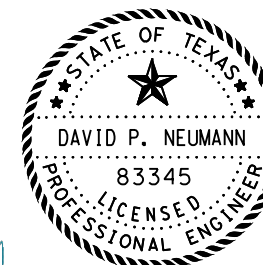
D14-4T-3_48x48;
 3.0" Radius, 1.0" Border, White on Blue;
 "ADOPT A", C; "HIGHWAY", C;
 "NEXT 2 MILES", C;
 3.0" Radius, 1.0" Border, White on Blue;
 "KLEBERG", C; "PROBATION", C;
 "DEPARTMENT", C;



D1-2 8in RT-RT;
 1.9" Radius, 0.8" Border, White on Green;
 "Ben Bolt", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0";
 1.9" Radius, 0.8" Border, White on Green;
 "Alice", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0";



D7-1TL_VARx12;
 1.5" Radius, 0.5" Border, White on, Brown;
 Standard Arrow Custom 9.0" X 6.1" 180"; "Conner Museum", ClearviewHwy-3-W;



David P. Neumann, P.E.

2023.07.28 03:08:02-05'00'

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SMALL SIGN DETAILS

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		236

SUMMARY OF SMALL SIGNS

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: FILE:

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		
										PREFABRICATED		1EXT or 2EXT = # of Ext
			CSJ: 0383-04-060									
208	P-1-1	W3-3	SIGNAL AHEAD	48" X 48"	X		S80	1	SA	P		
208	P-1-2	W3-3	SIGNAL AHEAD	48" X 48"	X		S80	1	SA	P		
208	RR-1-3	W2-1aT	HIGHWAY INTERSECTION AHEAD SANTA GERTRUDIS ST	48" X 48" 36" X 16"	X X		S80	1	SA	P		
208	P-1-4	R2-1	SPEED LIMIT 55	30" X 36"	X		S80	1	SA	P		
208	P-1-5	D10-7aT	MILE MARKER 532 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X							
		D10-7aT	MILE MARKER 532 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X							
208	RR-1-1	S5-1	SCHOOL SPEED LIMIT SIGN 35 WHEN FLASHING	24" X 48"	X							
		S7-1T	CELL PHONE USE PROHIBITED US TO \$200 FINE	24" X 18"	X							
208	RR-1-2	D14-4T	ADOPT A HIGHWAY NEXT 2 MILES TEXAS A&I ALUMNI ASSOCIATION	48" X 24" 48" X 24"	X X		S80	1	SA	U		
208	P-1-3	D7-1TL	<-- CONNER MUSEUM	96" X 12"	X		S80	1	SA	T		
209	P-2-1	W3-5	REDUCED SPEED LIMIT AHEAD 55	36" X 36"	X		S80	1	SA	P		
209	P-2-2	R2-1	SPEED LIMIT 70	30" X 36"	X		S80	1	SA	P		
209	P-3-1	D7-6aT	HISTORICAL MARKER 1 MILE ON LEFT 3355, 664	XX" X XX"	X		S80	1	SA	T		
211	P-4-1	D15-10T	PASSING LANE 2 MILES	54" X 48"	X		S80	1	SA	U	EXAL	
212	P-5-1	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36" X 36"	X		S80	1	SA	P		
212	P-5-2	R4-3	SLOWER TRAFFIC KEEP RIGHT	24" X 30"	X		S80	1	SA	P		
216	P-9-1	R4-3	SLOWER TRAFFIC KEEP RIGHT	24" X 30"	X		S80	1	SA	P		
216	P-9-2	D15-11T	NEXT PASSING LANE 2 MILES	54" X 48"	X		S80	1	SA	U	EXAL	
217	P-10-1	M3-4	WEST	24" X 12"	X		S80	1	SA	P		
		M1-6T	STATE ROUTE SIGN (TEXAS 144)	24" X 24"	X							
217	RR-10-1	D14-4T	ADOPT A HIGHWAY NEXT 2 MILES KLEBERG PROBATION DEPARTMENT	48" X 24" 48" X 24"	X X		S80	1	SA	U		
218	P-11-1	W9-1R	RIGHT LANE ENDS	36" X 36"	X		S80	1	SA	P		
218	P-11-2	W9-2LT	LANE ENDS MERGE LEFT	36" X 36"	X		S80	1	SA	P		
219	RR-12-1	W2-1	INTERSECTION WARNING	36" X 36"	X		S80	1	SA	P		
220	RR-13-1	W2-1	INTERSECTION WARNING	36" X 36"	X		S80	1	SA	P		
221	P-14-1	D15-10T	PASSING LANE 2 MILES	54" X 48"	X		S80	1	SA	U	EXAL	
221	P-14-2	M3-2	EAST	24" X 12"	X		S80	1	SA	P		
		M1-6T	STATE ROUTE SIGN (TEXAS 144)	24" X 24"	X							
222	P-15-1	W9-2LT	LANE ENDS MERGE LEFT	36" X 36"	X		S80	1	SA	P		
222	P-15-2	W9-1R	RIGHT LANE ENDS	36" X 36"	X		S80	1	SA	P		
222	RR-15-1	D14-4T	ADOPT A HIGHWAY NEXT 2 MILES KLEBERG PROBATION DEPARTMENT	48" X 24" 48" X 24"	X X		S80	1	SA	U		

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).



SUMMARY OF SMALL SIGNS

SOSS SHEET 1 OF 2

FILE: SLMS16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
4-16	DIST	COUNTY	SHEET NO.	
8-16	CRP	JIM WELLS, ETC.	237	

SUMMARY OF SMALL SIGNS

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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		
										PREFABRICATED		1EXT or 2EXT = # of Ext
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
225	P-18-1	R4-3	SLOWER TRAFFIC KEEP RIGHT	24" X 30"	X		S80	1	SA	P		
225	P-18-2	R4-3	SLOWER TRAFFIC KEEP RIGHT	24" X 30"	X		S80	1	SA	P		
229	P-22-1	W9-1R	RIGHT LANE ENDS	36" X 36"	X		S80	1	SA	P		
229	P-22-2	W9-2LT	LANE ENDS MERGE LEFT	36" X 36"	X		S80	1	SA	P		
230	P-23-1	D15-10T	NEXT PASSING LANE 2 MILES	54" X 48"	X		S80	1	SA	U	EXAL	
230	RR-23-1	I-2dT	JIM WELLS COUNTY LINE	78"X24"			S80	1	SA	T		
230	RR-23-2	I-2dT	KLEBERG COUNTY LINE	60"X24"			S80	1	SA	T		
230	P-23-2	D10-7aT	MILE MARKER 522 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X							
			D10-7aT	MILE MARKER 522 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X						
			CSJ: 0383-03-024									
231	P-24-2	W9-2LT	LANE ENDS MERGE LEFT	36" X 36"	X		S80	1	SA	P		
231	P-24-3	W9-1R	RIGHT LANE ENDS	36" X 36"	X		S80	1	SA	P		
231	P-24-1	D10-7aT	MILE MARKER 520 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X							
			D10-7aT	MILE MARKER 520 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X						
235	P-28-1	W3-1A	STOP AHEAD SIGN	48" X 48"	X		S80	1	SA	P		
235	P-28-2	R4-3	SLOWER TRAFFIC KEEP RIGHT	24" X 30"	X		S80	1	SA	P		
235	P-28-3	R2-1	SPEED LIMIT 75	30" X 36"	X		S80	1	SA	P		
235	P-28-4	W12-2	LOW CLEARANCE (WITH ARROWS) - 16'-1"	36" X 36"	X		S80	1	SA	P		
235	P-28-5	D10-7aT	MILE MARKER 518 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X							
			D10-7aT	MILE MARKER 518 ~ TO BE PLACE ON EXISTING SIGN	3" X 10"	X						
235	P-28-6	D1-2	BEN BOLT ----> ALICE ---->	VARIES X 30"	X		S80	1	SA	T		
235	P-28-7	R1-1	STOP SIGN (SOLAR POWERED LED ROADSIDE SIGN)	36" X 36"	X		S80	1	SA	T		
			R1-3P	ALL WAY	18" X 6"	X						

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
<http://www.txdot.gov/>

- NOTE:**
- 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).



SUMMARY OF SMALL SIGNS

SOSS SHEET 2 OF 2

FILE: SLMS16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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8-16	CRP	JIM WELLS, ETC.	238	

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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 BRF = 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 NOTE 1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (fix). 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.			
SHEETING Yellow, White or Red Type B or C reflective sheeting				SHEETING Yellow, White or Red Type B or C Reflective Sheeting					
NOTE				POST TYPE WC YFLX, WFLX WC YFLX, WFLX				MOUNT TYPE GND GND, SRF GND 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 units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector units (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
						SHEETING Yellow-Type B or C Sheeting FL FL Yellow - Type B or C Sheeting Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting Red -Type B _{FL} or C _{FL} Sheeting POST TYPE TWT WC WC WFLX TWT TWT MOUNT TYPE WAS, WAP GND GND GND, SRF WAS, WAP WAS, WAP			

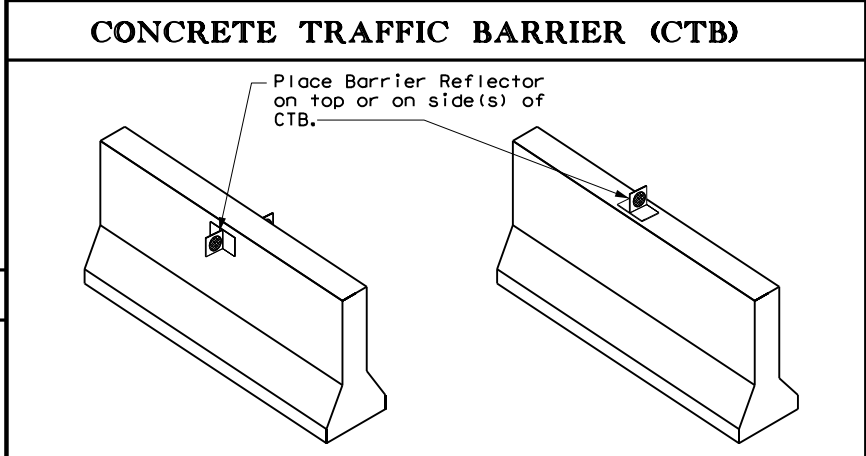
DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

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 SHEETING Yellow, White, Red 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.	DEVICE SIZE (W x L) 18"x 24" (Conventional) 24"x 30" (Conventional Oversize) 30"x 36" (Expressway) 36" x 48" (Freeway) MOUNTING HEIGHT 4'-0" or 7'-0" 7'-0" Only 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).				DEVICE SIZE (W x L) 48" x 24" (Conventional) 60" x 30" (Expressway & Freeway) MOUNTING HEIGHT 7'-0"		Texas Department of Transportation Traffic Safety Division Standard		
DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION D & OM(1)-20			FILE: dom1-20.dgn DNE: TXDOT CK: TXDOT DW: TXDOT CK: TXDOT © TXDOT August 2004 CONT SECT JOB HIGHWAY REVISIONS 0383 03 024, ETC. SH 141 10-09 3-15 DIST COUNTY SHEET NO. 4-10 7-20 CRP JIM WELLS, ETC. 239						

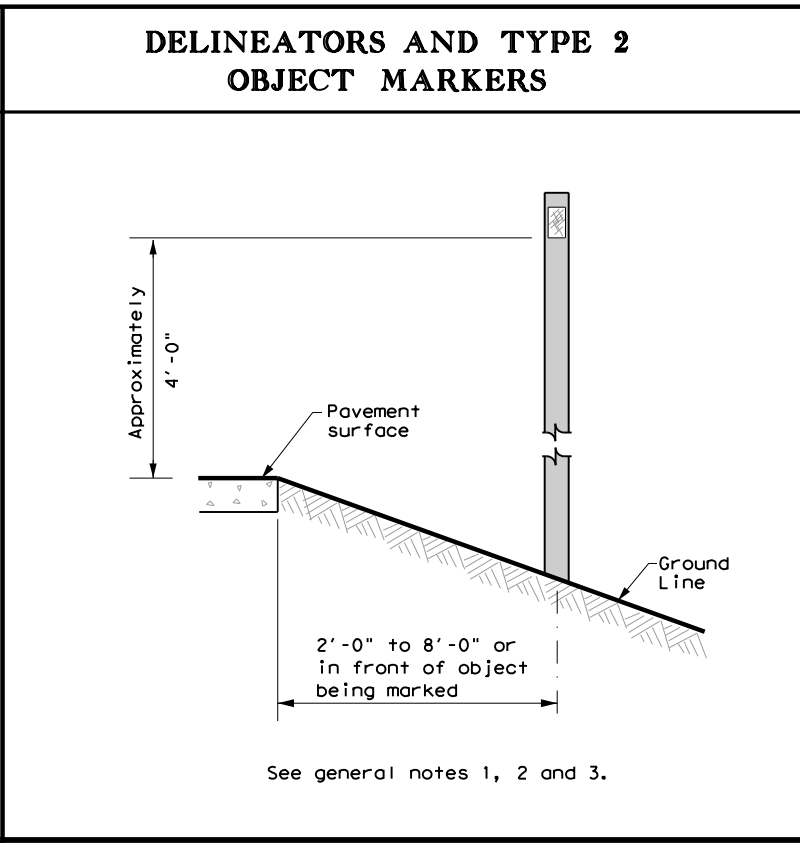
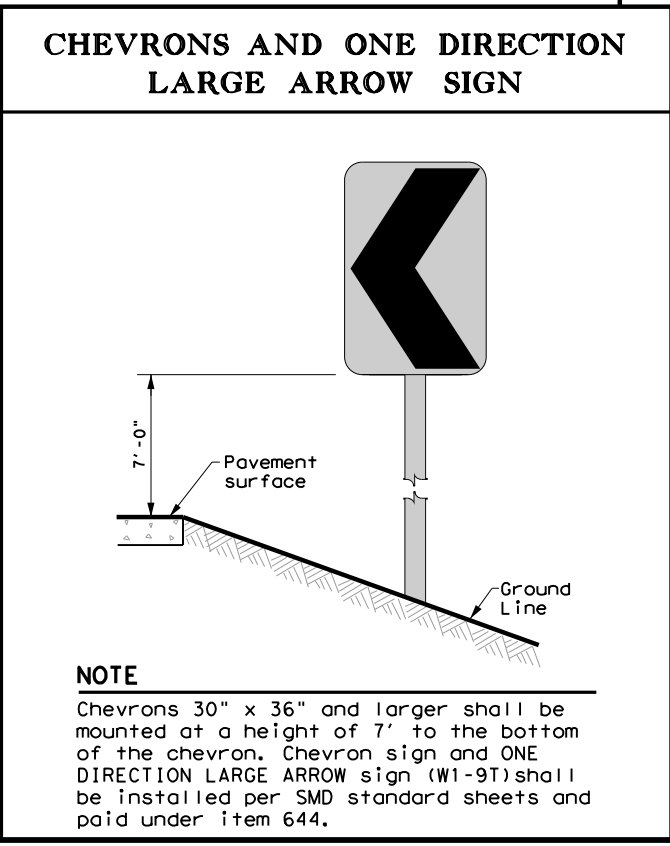
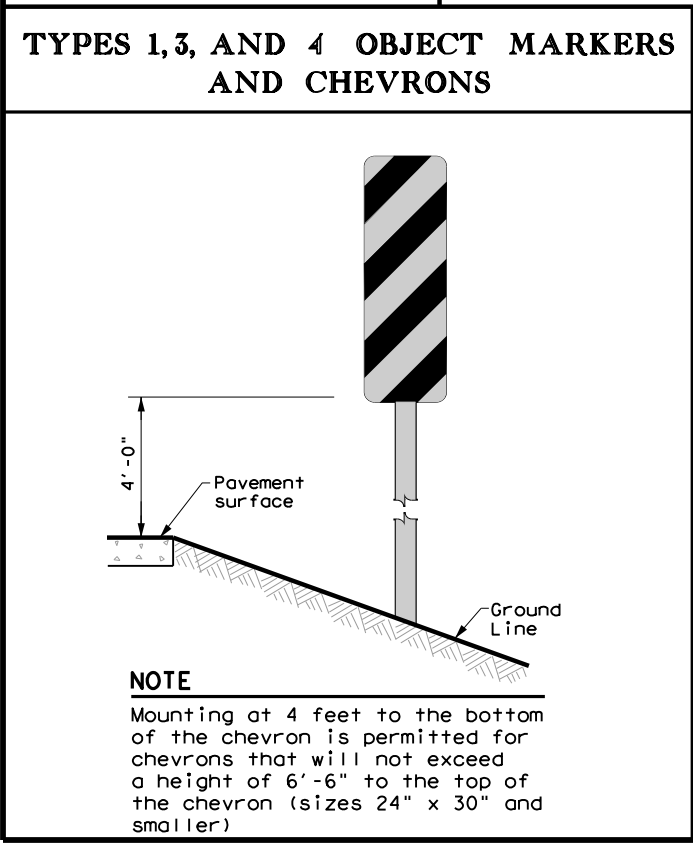
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POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS	
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT
GND	GND	SRF	WAS	WAP	GF 1
<p>Ground Line</p> <p>2'-0" Usual</p>	<p>Reflective material</p> <p>Post</p> <p>Stub</p>	<p>Reflective material</p> <p>Post</p> <p>Base</p>	<p>12" Dia.</p> <p>12" 27" 30"</p>	<p>3" (Approx.)</p> <p>15" 17" 20"</p> <p>12" Dia.</p> <p>3.5" 17" 30° 2" 1"</p>	<p>Centerline of MGBF rail element</p>
	EMBEDDED		SURFACE MOUNT	STEEL	PLASTIC
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.		

TYPE OF BARRIER MOUNTS	
GUARD FENCE ATTACHMENT	
GF 1	GF 2
<p>Centerline of MGBF rail element</p>	<p>Attached to post or block</p> <p>2'-6" Min.</p> <p>4" Min.</p> <p>4'-0"</p>



- GENERAL NOTES**
- Place delineators on a section of roadway at a consistent distance from the edge of pavement.
 - Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
 - 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.
 - Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
 - Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
 - Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.



Texas Department of Transportation
 Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION
 D & OM(2)-20

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4-10 7-20	CRP	JIM WELLS, ETC.	240	

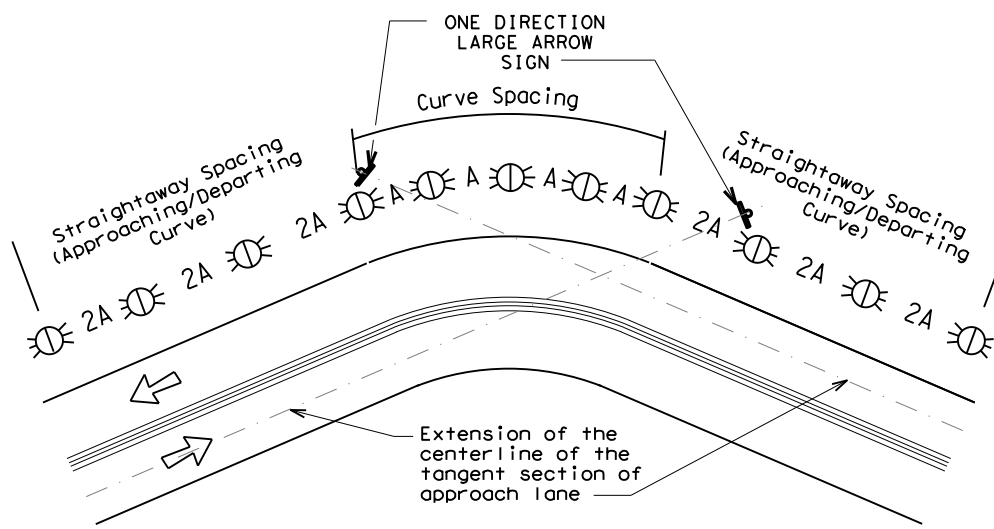
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MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

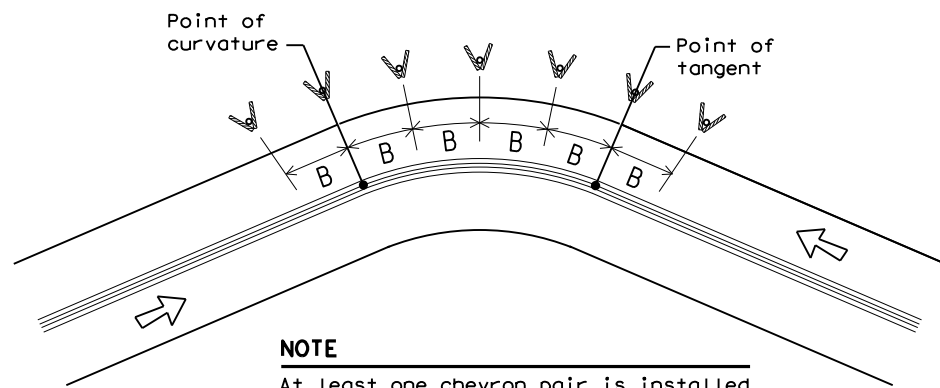
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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



DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

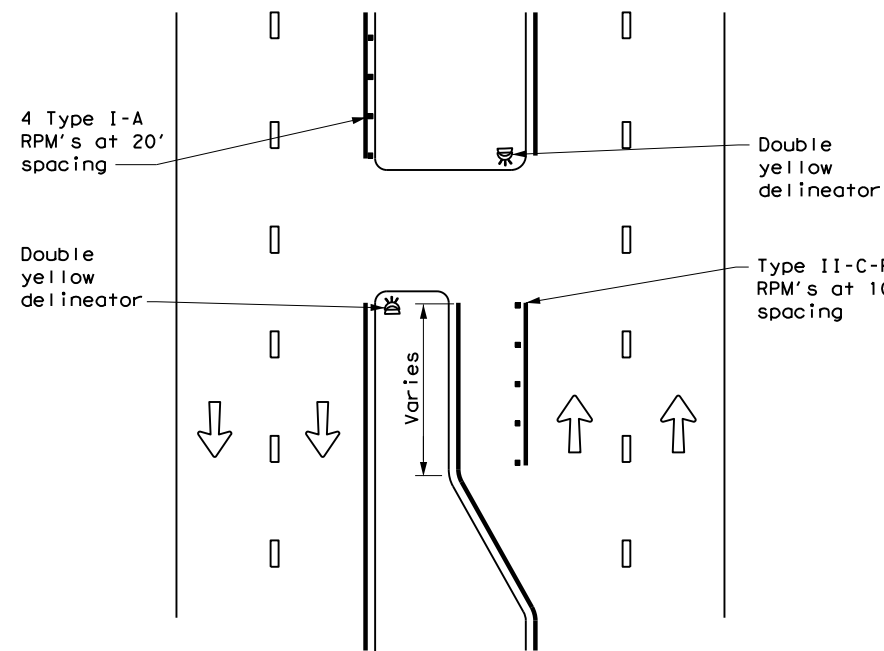
D & OM(3)-20

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3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	CRP	JIM WELLS, ETC.	241	

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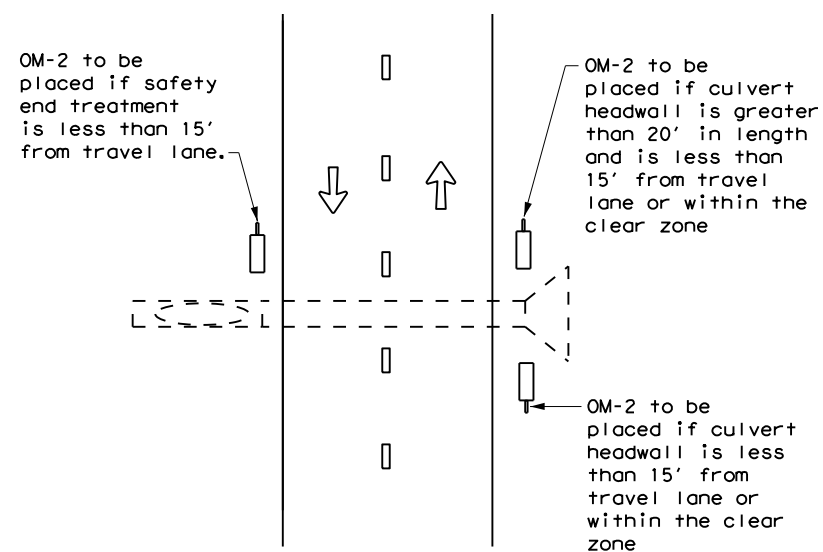
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CROSSOVERS



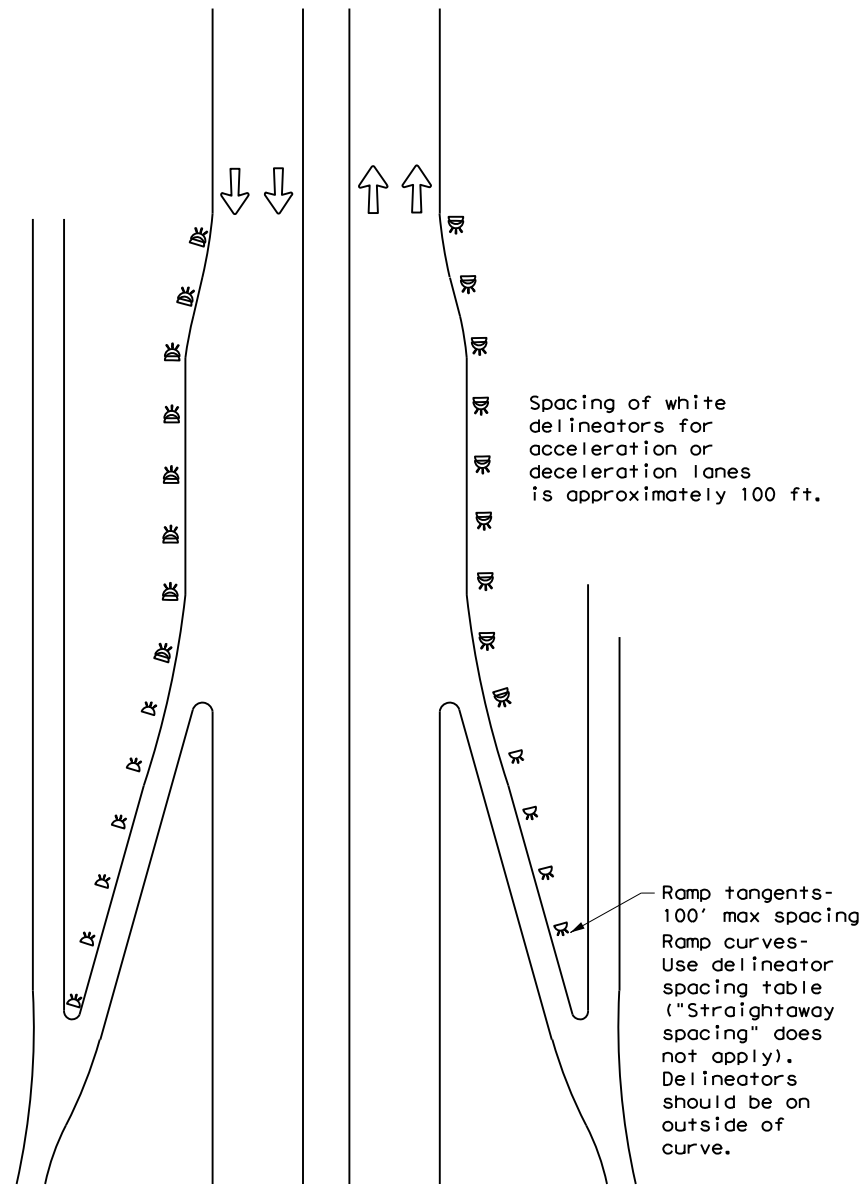
DETAIL 1

FOR CULVERTS WITHOUT MBGF



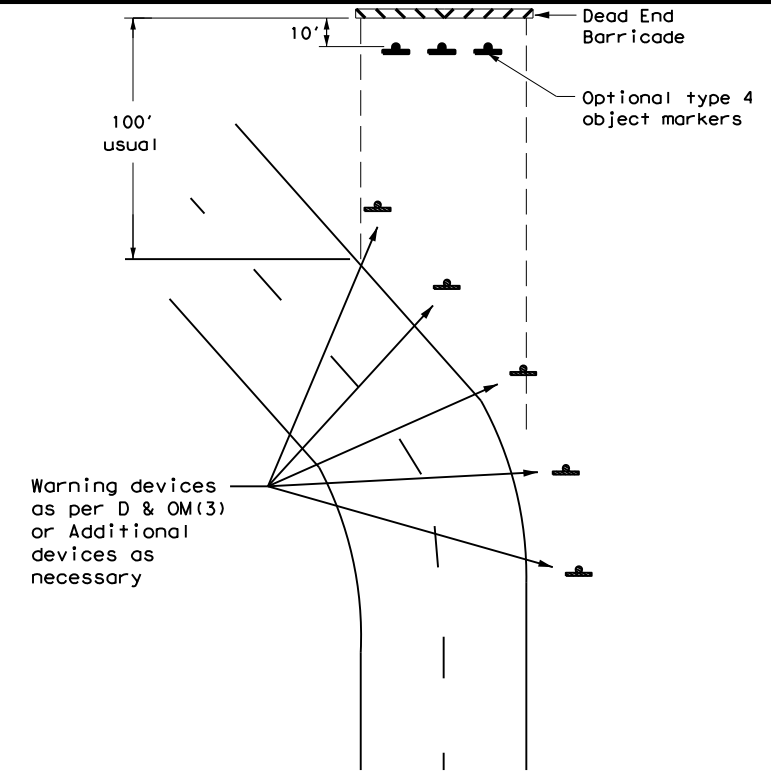
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



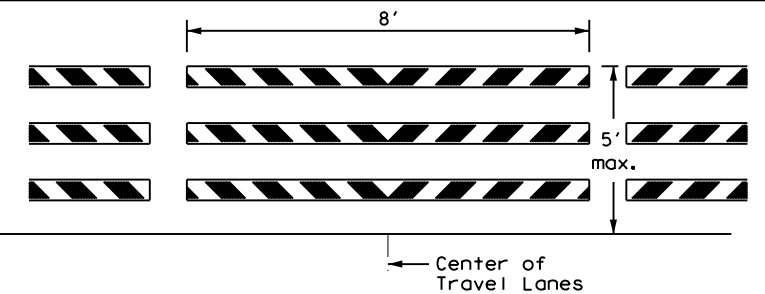
DETAIL 3

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

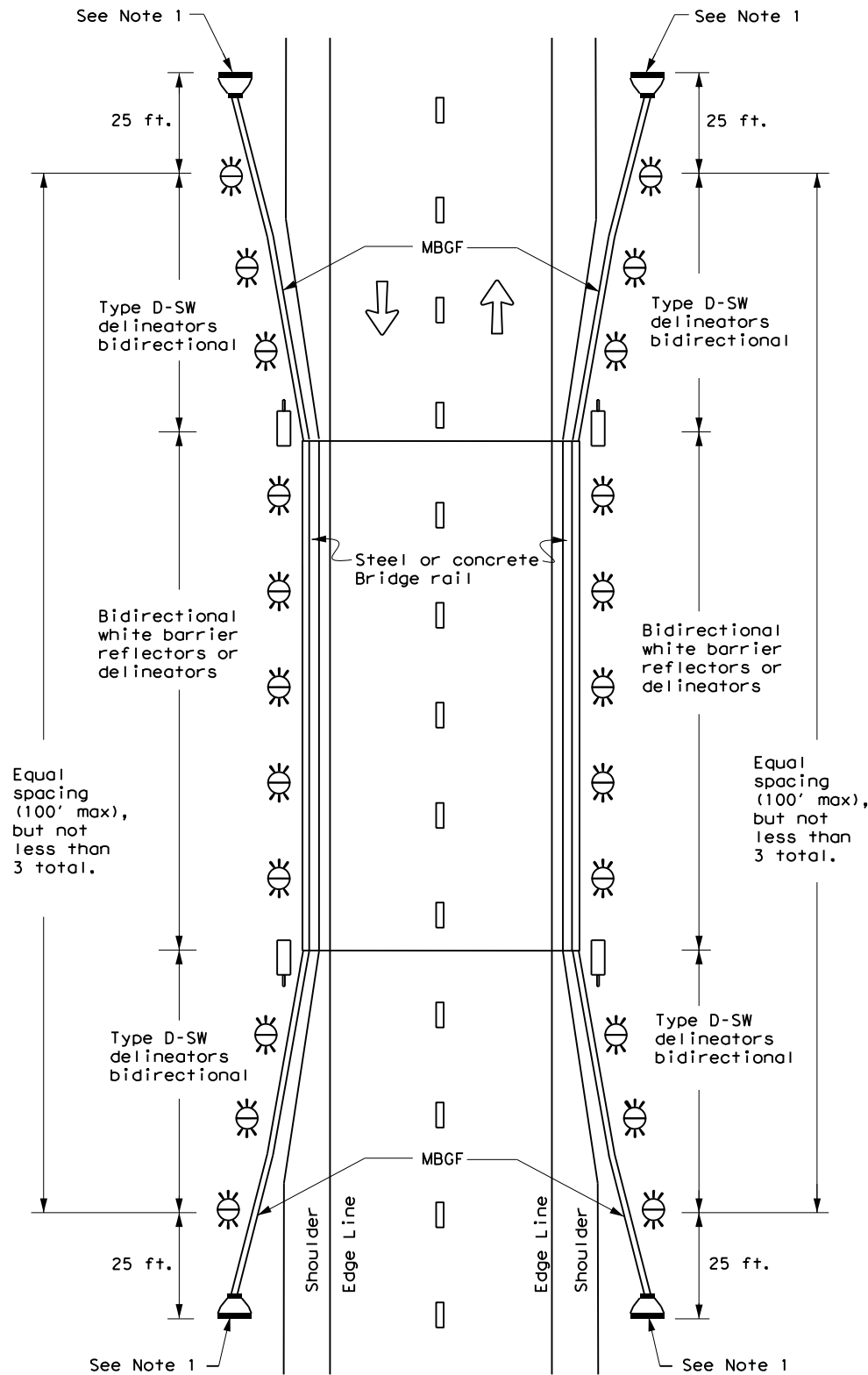


DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4) - 20

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7-20	CRP	JIM WELLS, ETC.	242	

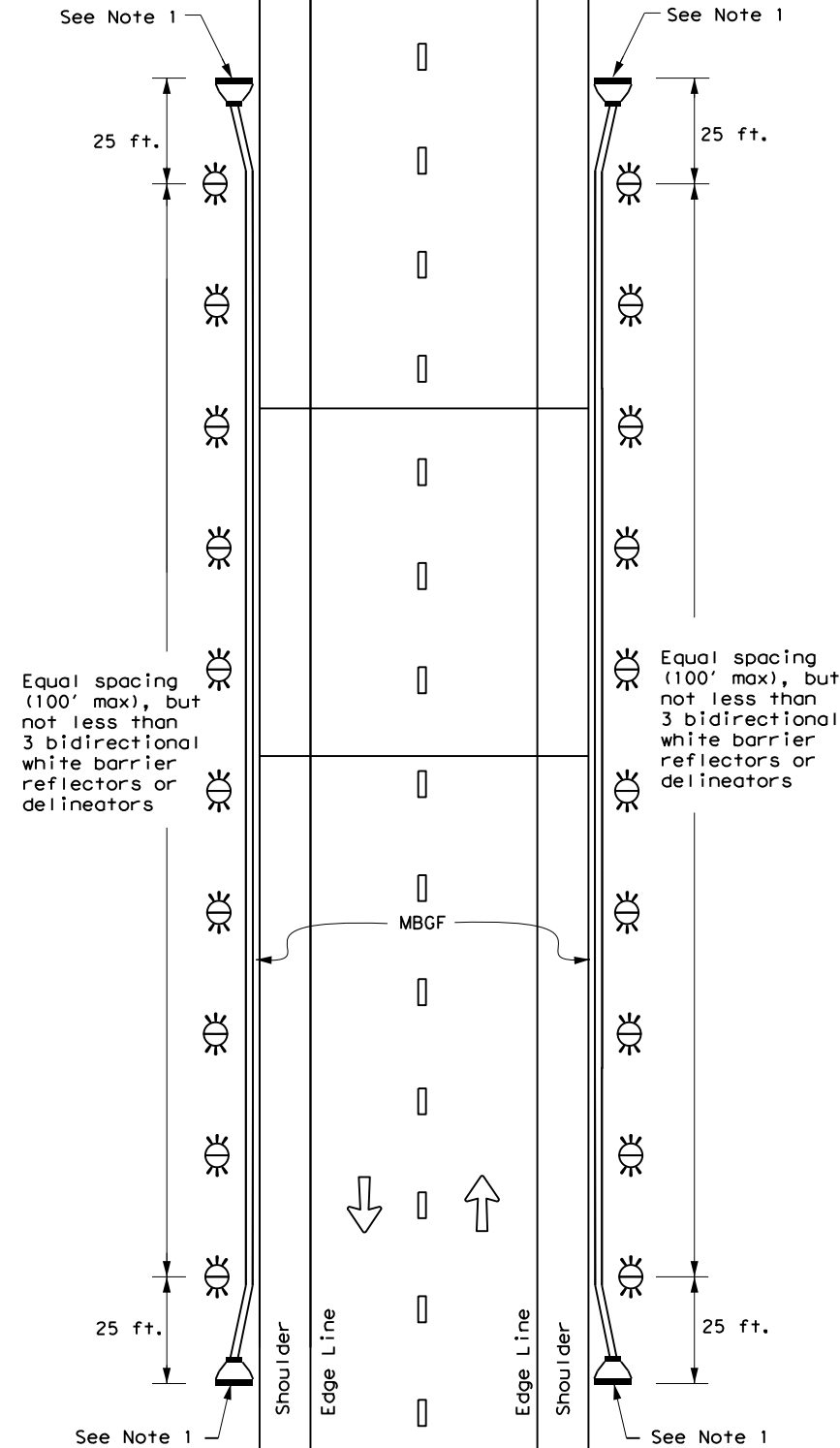
**TWO-WAY, TWO LANE ROADWAY
WITH REDUCED WIDTH APPROACH RAIL**



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

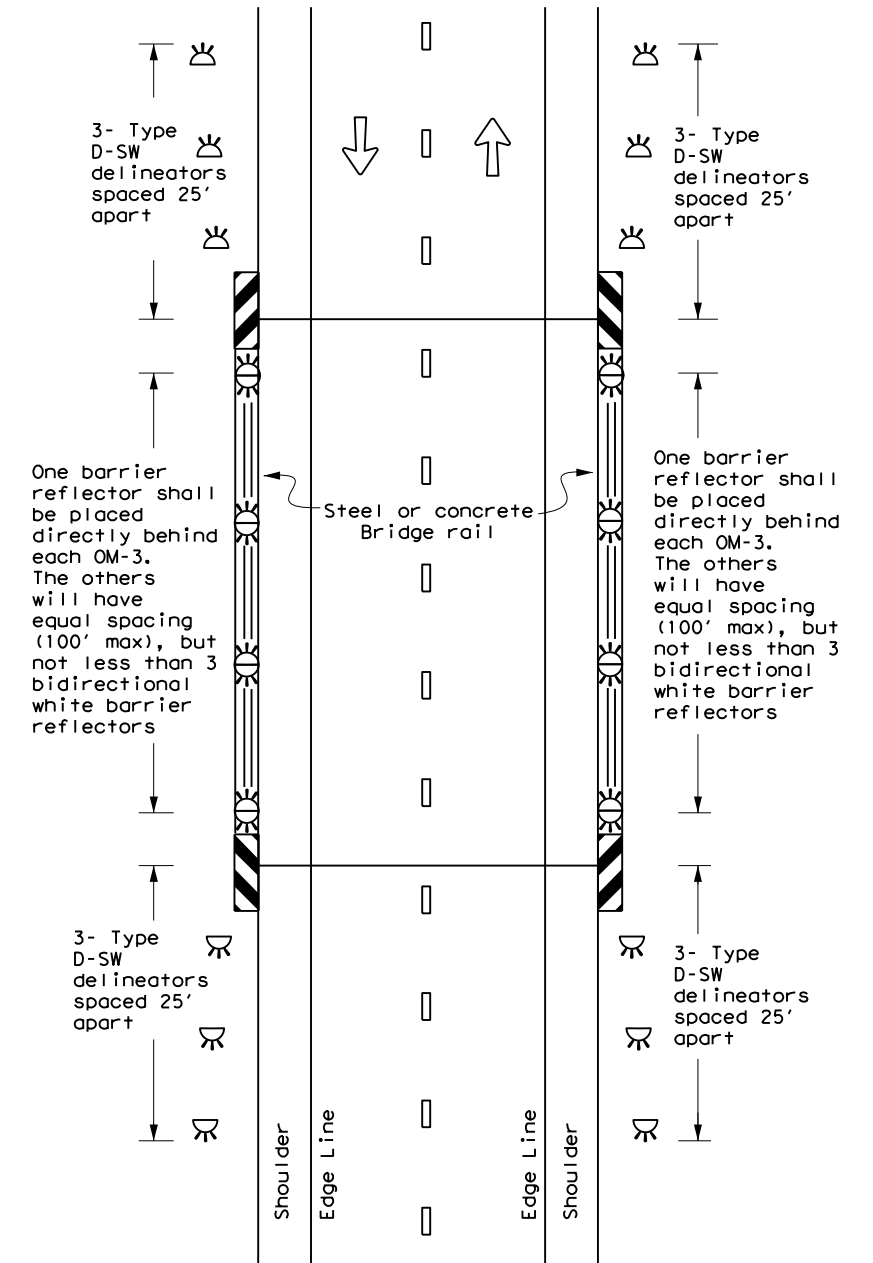
**TWO-WAY, TWO LANE ROADWAY
WITH METAL BEAM GUARD FENCE (MBGF)**



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

**TWO-WAY, TWO LANE ROADWAY
BRIDGE WITH NO APPROACH RAIL**



LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow



**DELINEATOR &
OBJECT MARKER
PLACEMENT DETAILS**

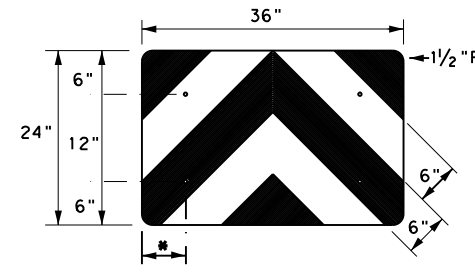
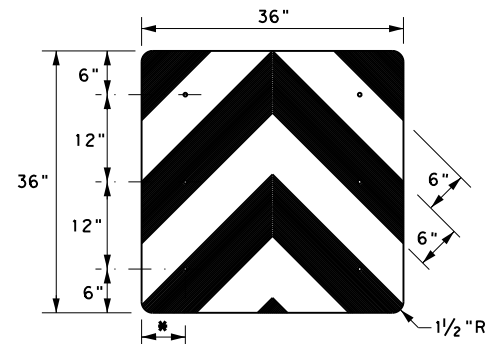
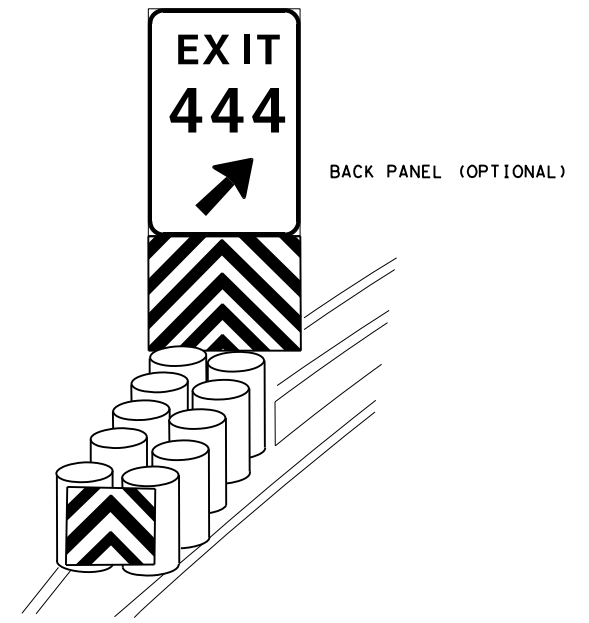
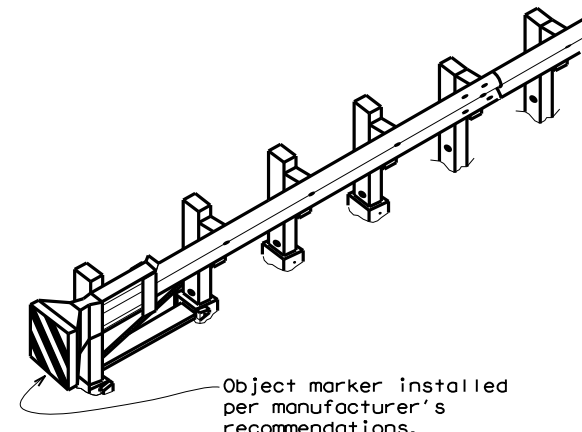
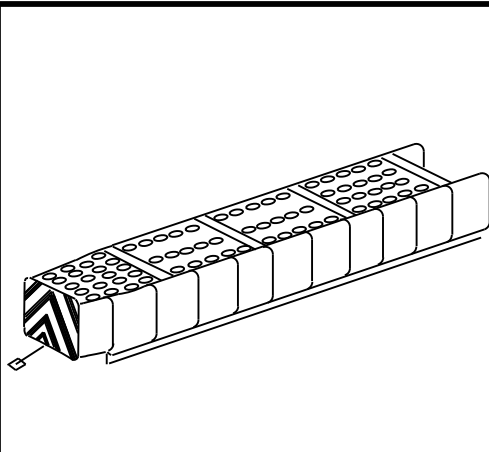
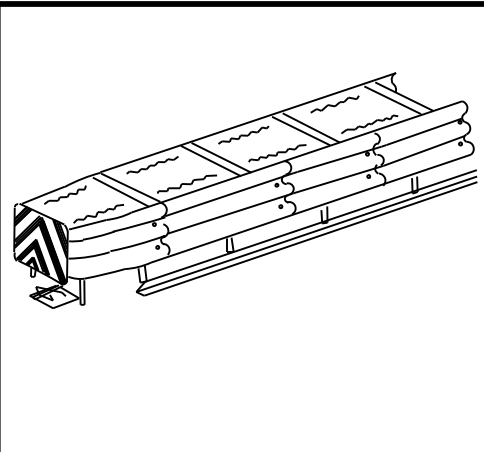
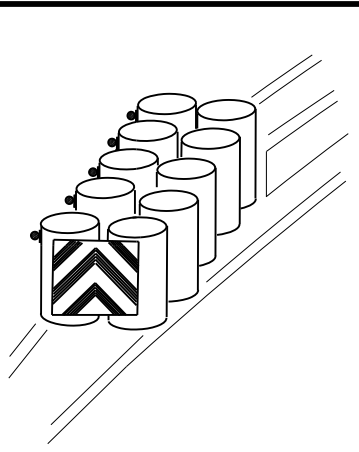
D & OM(5) - 20

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	CRP	JIM WELLS, ETC.	243	

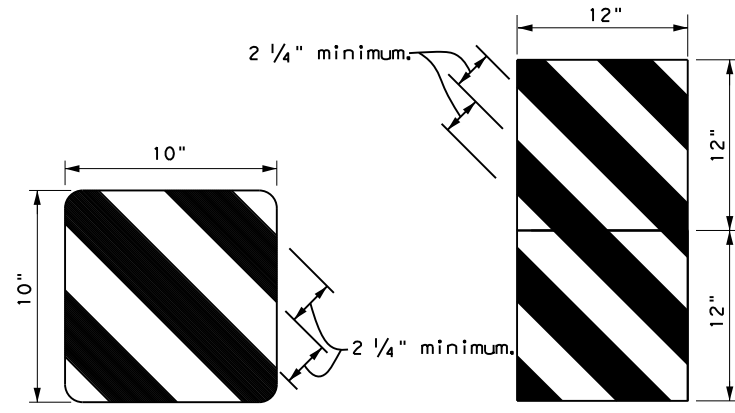
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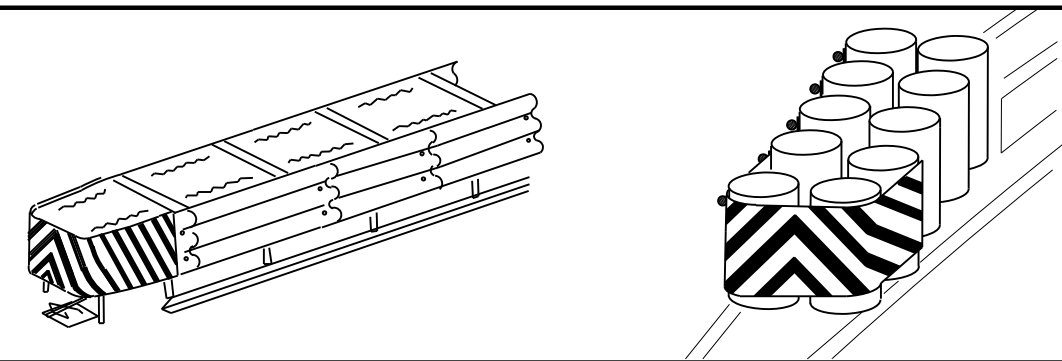
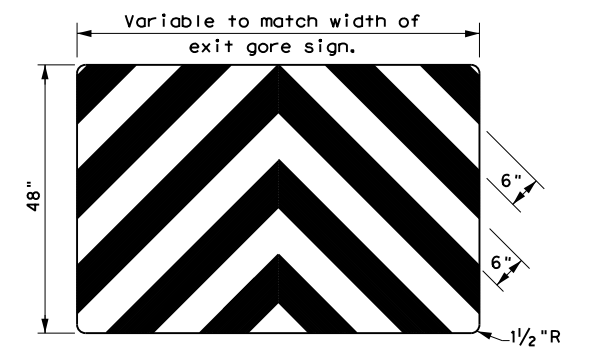
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

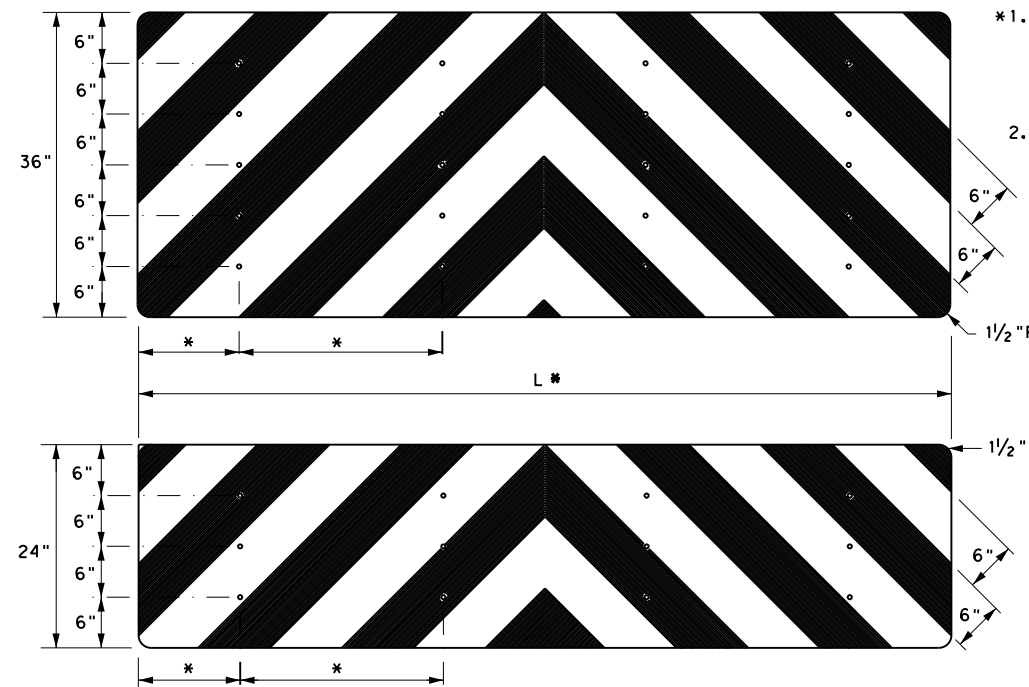


OBJECT MARKERS SMALLER THAN 3 FT²



NOTES

- *1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturer's recommendation, or as directed by the Engineer.
- 2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".



NOTES

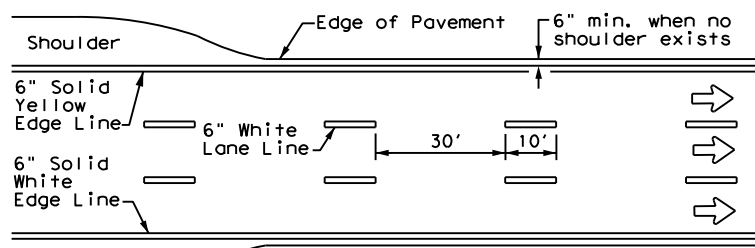
1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
2. Object Markers may be fabricated from adhesive backed reflective 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.
3. 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".
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.
5. Object Marker at nose of attenuator is subsidiary to the attenuator.
6. See D & OM (1-4) for required barrier reflectors.

		Traffic Safety Division Standard	
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA) -20			
FILE: domv1a20.dgn	DW: TxDOT	CK: TxDOT	DR: TxDOT
© TxDOT December 1989	CONT: 0383	SECT: 03	JOB: 024, ETC.
REVISIONS		HIGHWAY: SH 141	
4-92 8-04	DIST: COUNTY		SHEET NO.
8-95 3-15	CRP: JIM WELLS, ETC.		244
4-98 7-20			
20G			

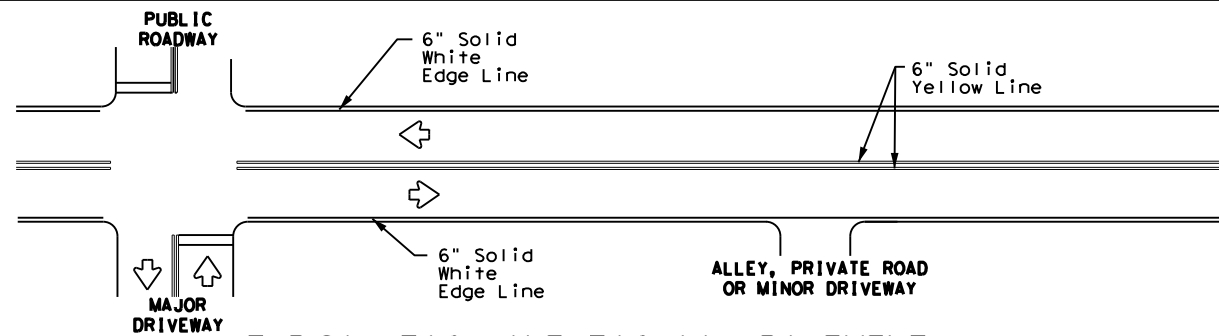
DATE:
FILE:

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.

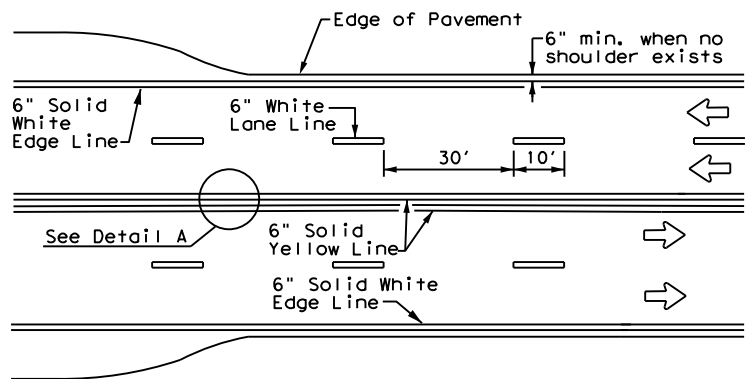
DATE: FILE:



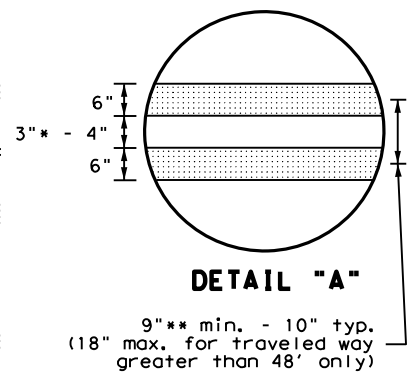
**EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



**TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



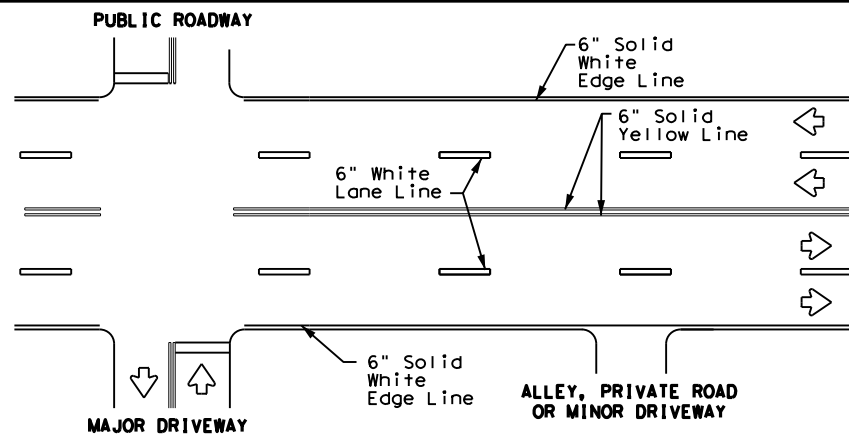
**CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



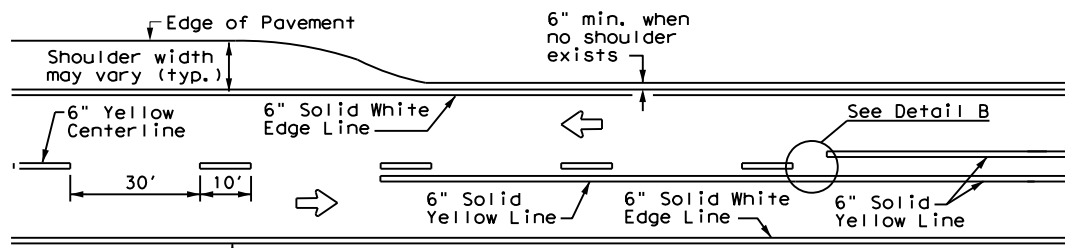
DETAIL "A"

9" ** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

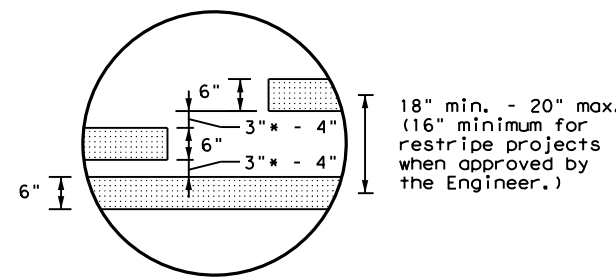
* 2" minimum for restripe projects when approved by the Engineer.
** 8" minimum for restripe projects when approved by the Engineer.



**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**

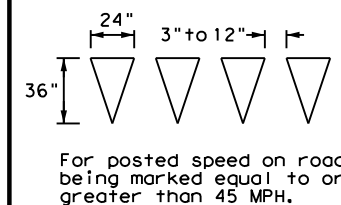


**TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



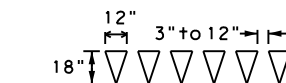
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.



YIELD LINES

For posted speed on road being marked equal to or greater than 45 MPH.



For posted speed on road being marked equal to or less than 40 MPH.

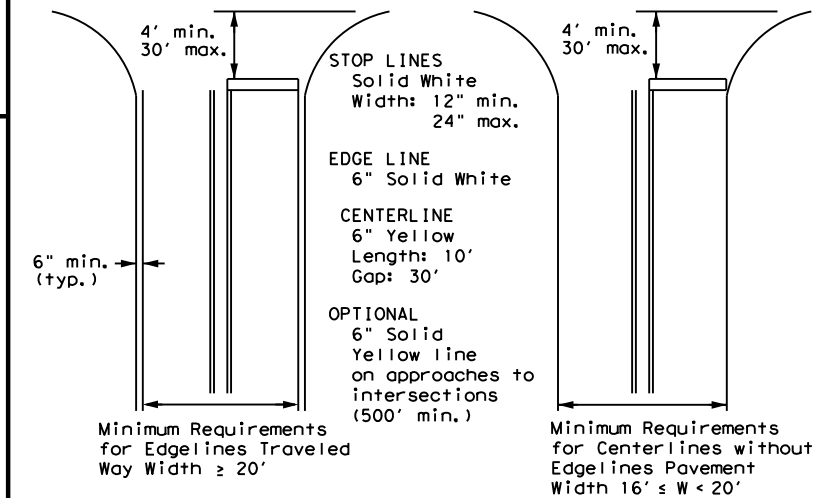
GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



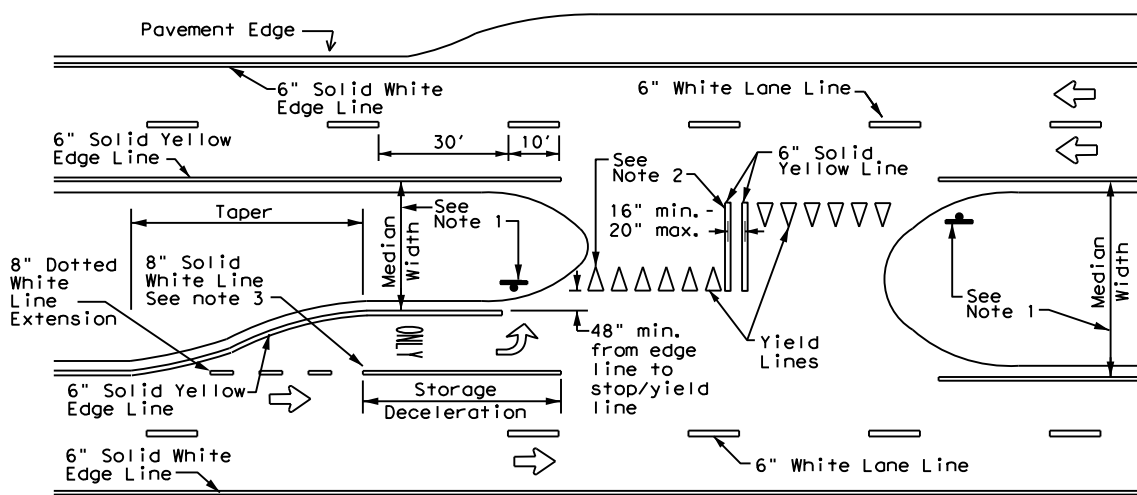
NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

**GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Roadways

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.



FOUR LANE DIVIDED ROADWAY CROSSOVERS



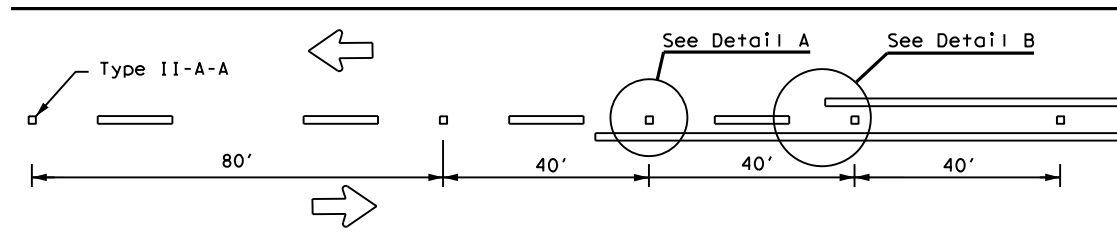
**TYPICAL STANDARD
PAVEMENT MARKINGS**

PM(1)-22

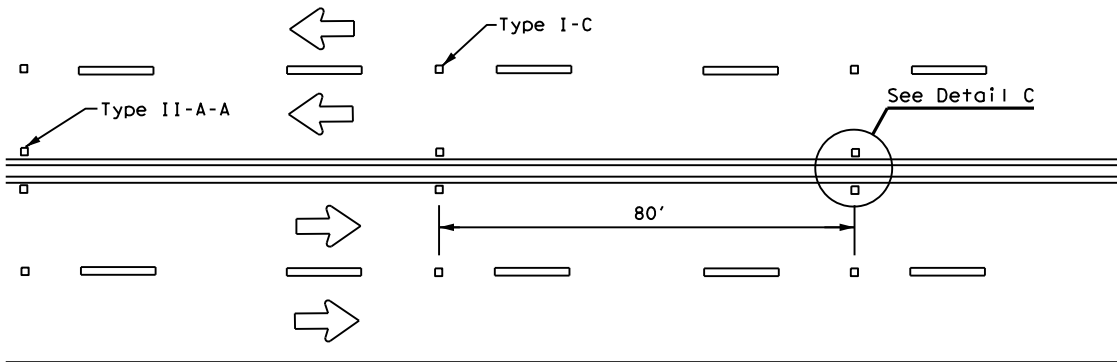
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
11-78 8-00 6-20	DIST	COUNTY	SHEET NO.	
8-95 3-03 12-22	CRP	JIM WELLS, ETC.	245	
5-00 2-12				

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

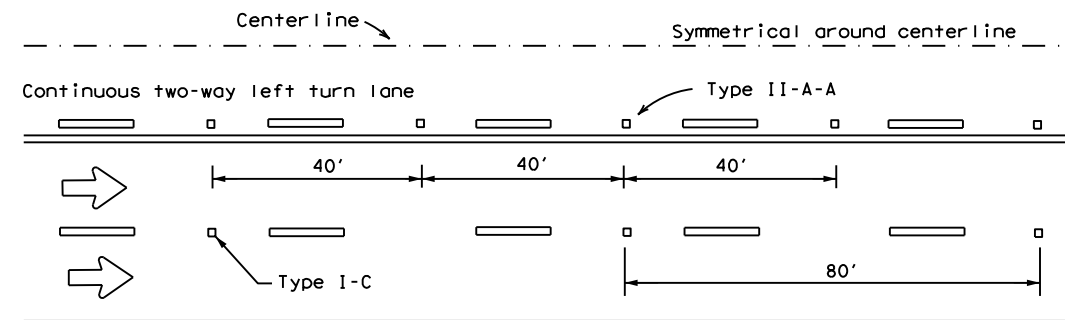
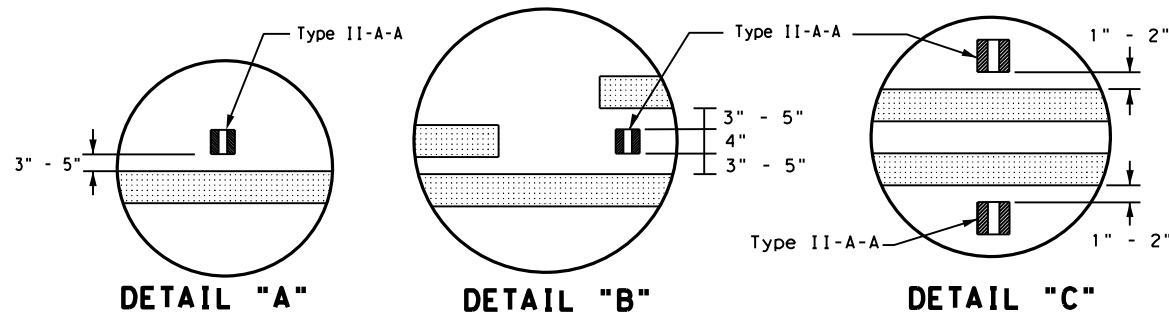
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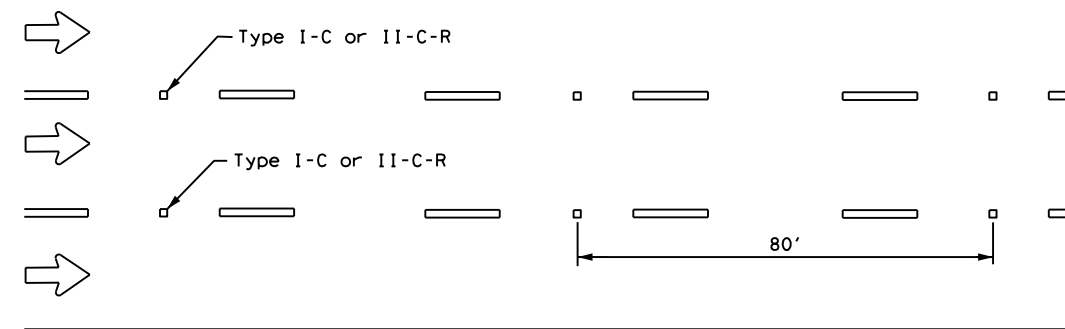
CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



**CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY ROADWAYS**

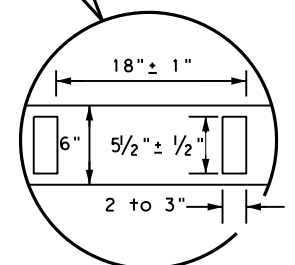
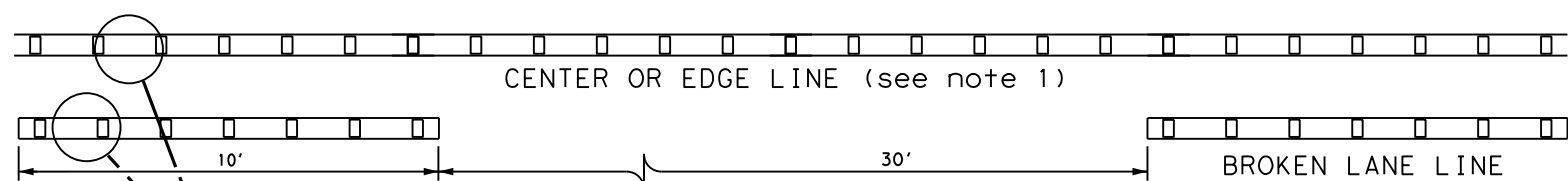


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

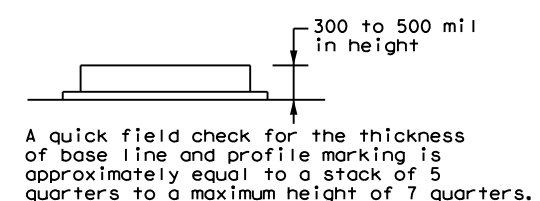


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.
 See Note 3.



**REFLECTORIZED PROFILE
PATTERN DETAIL**
USING REFLECTIVE PROFILE PAVEMENT MARKINGS

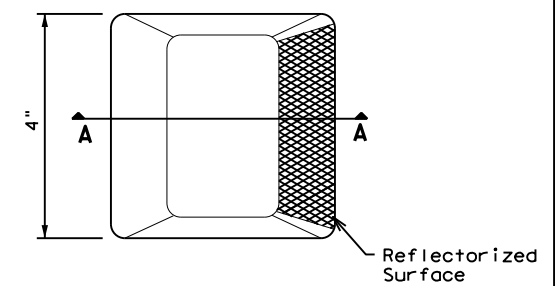


A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

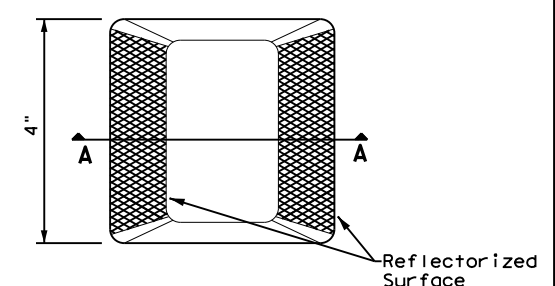
- NOTES**
- Edge lines should typically be 6" wide and the materials shall be specified in the plans.
 - Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

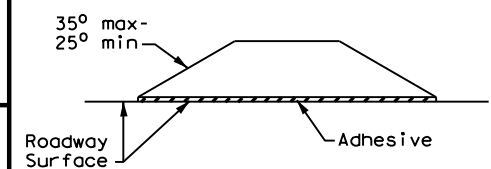
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



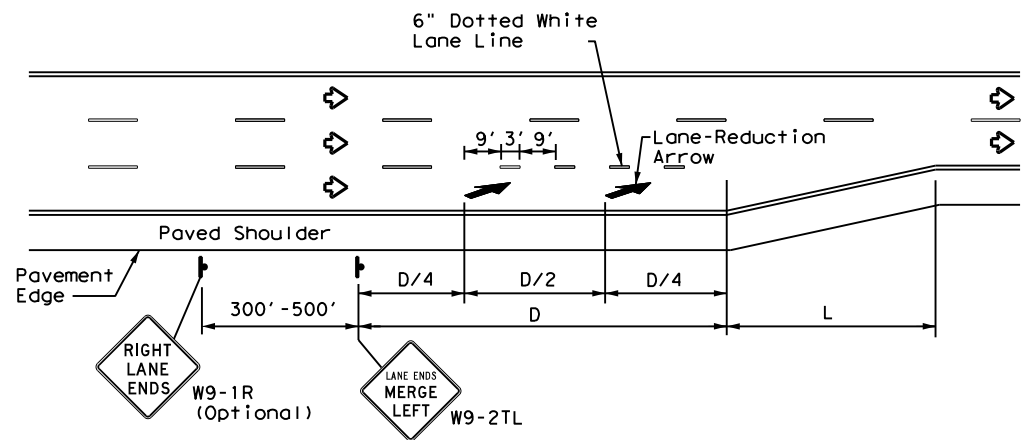
POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2) - 22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
4-77 8-00 6-20	0383	03	024, ETC.	SH 141
4-92 2-10 12-22	DIST	COUNTY	SHEET NO.	
5-00 2-12	CRP	JIM WELLS, ETC.	246	

DATE: FILE:

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DATE: FILE:



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 RIGHT LANE ENDS (W9-1R) 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.

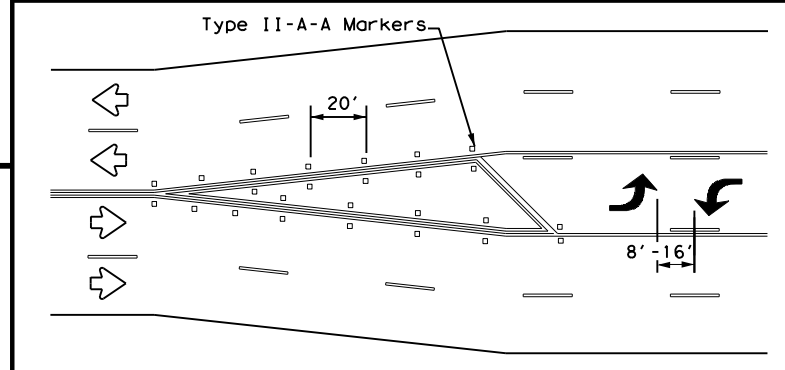
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

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. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

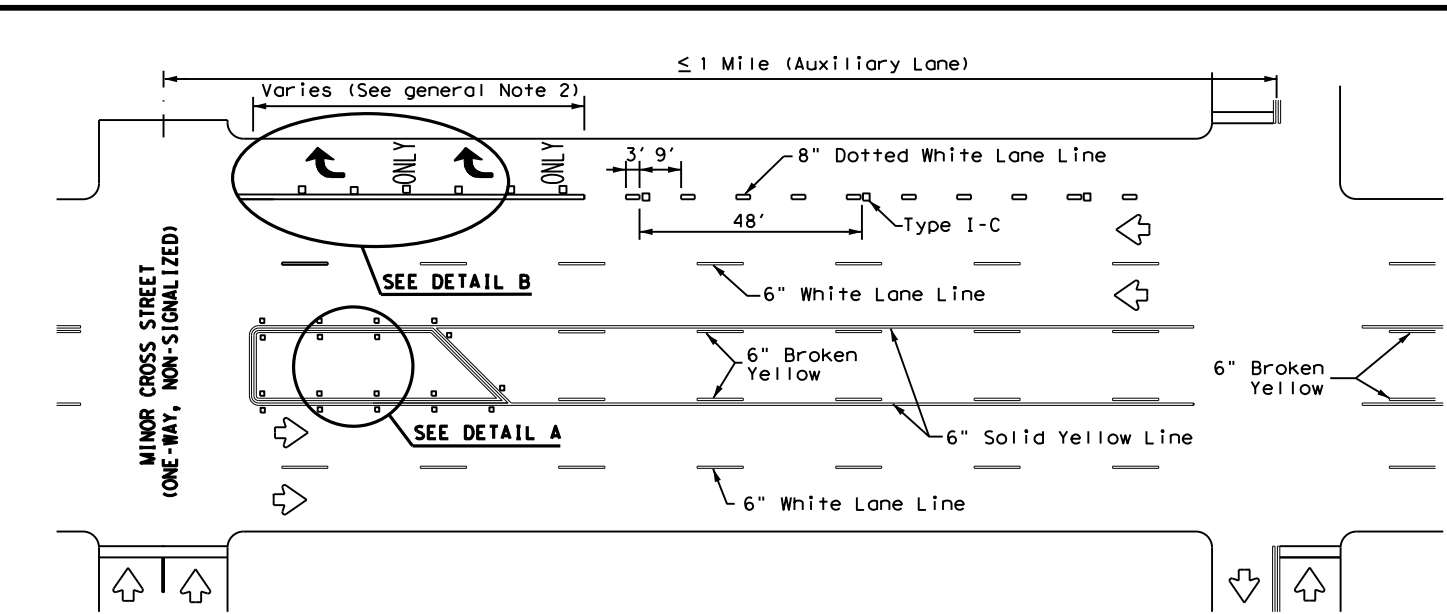
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

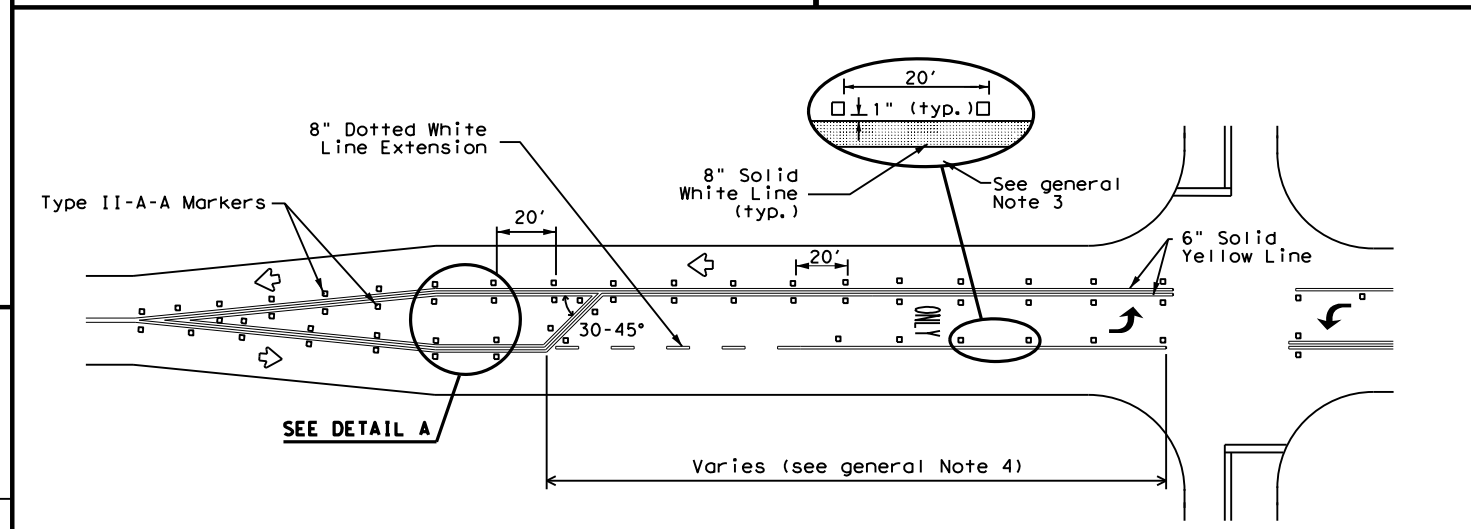


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

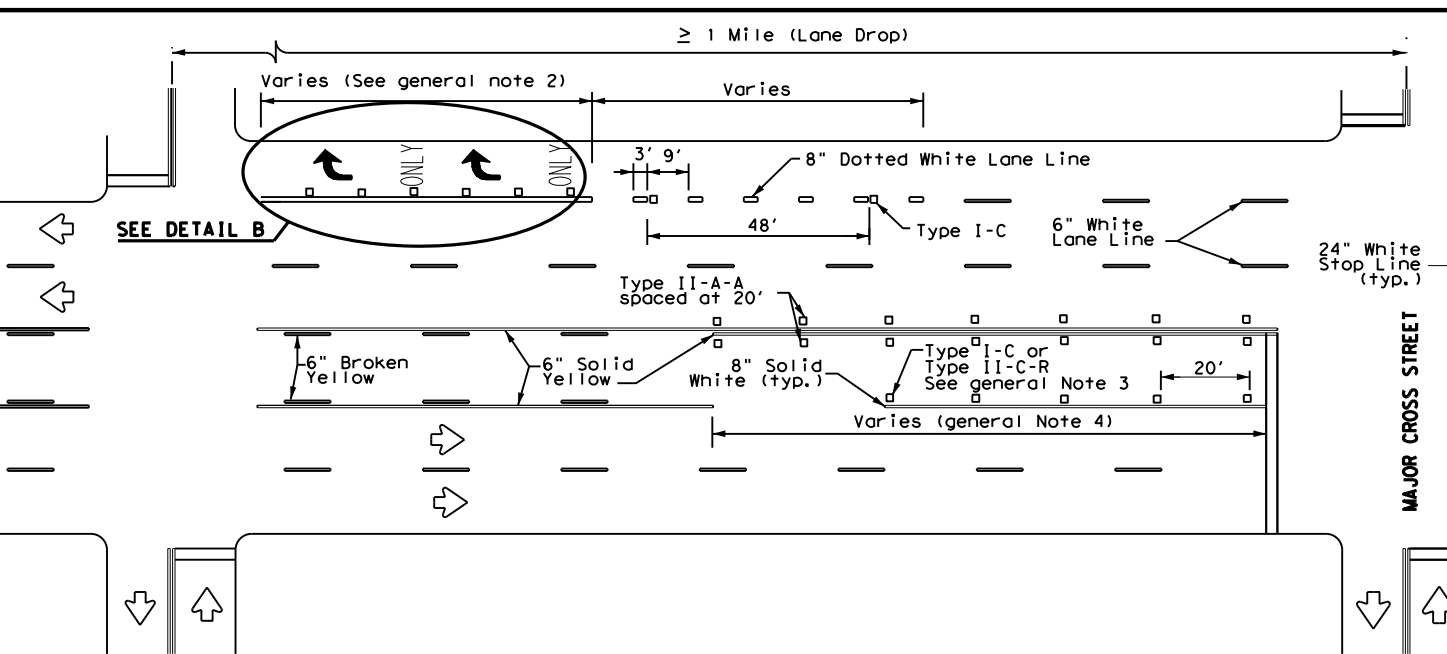
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



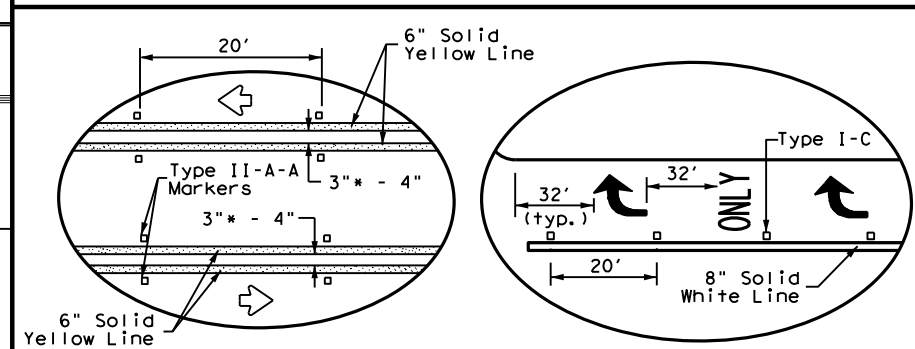
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



DETAIL A

DETAIL B

* 2" minimum allowed for restripe projects when approved by the Engineer.

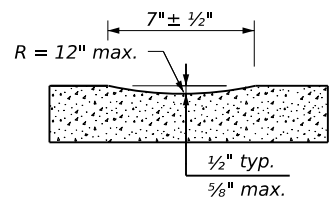
Texas Department of Transportation
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3) - 22

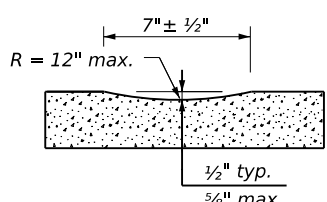
FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
4-98 3-03 6-20	DIST	COUNTY	SHEET NO.	
5-00 2-10 12-22	CRP	JIM WELLS, ETC.	247	
8-00 2-12				

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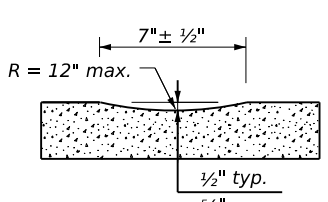
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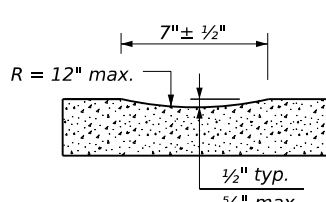
PROFILE VIEW
OPTION 1



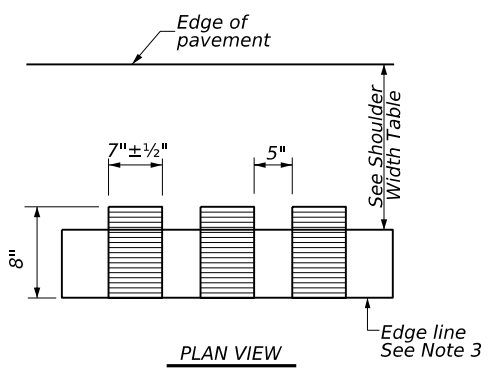
PROFILE VIEW
OPTION 2



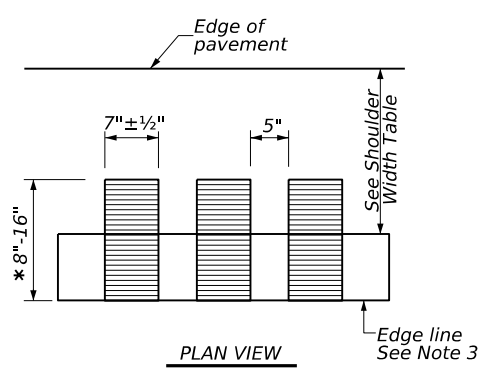
PROFILE VIEW
OPTION 3



PROFILE VIEW
OPTION 4

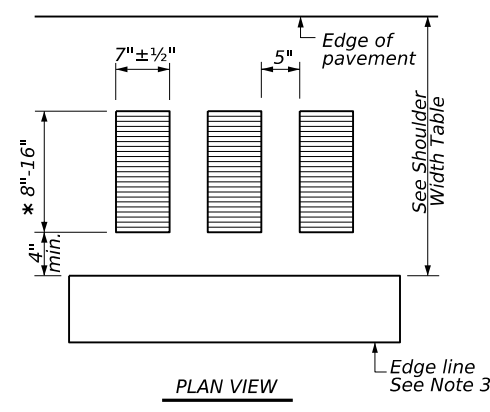


PLAN VIEW



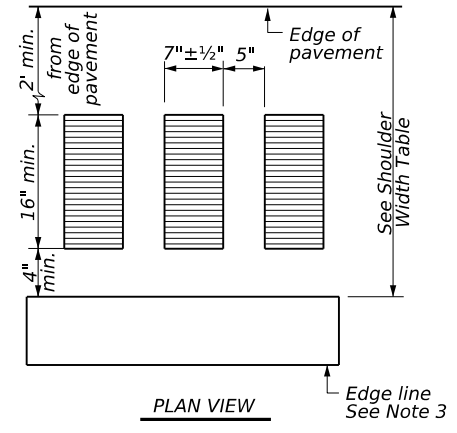
PLAN VIEW

* This distance may vary based on width of shoulder



PLAN VIEW

* This distance may vary based on width of shoulder



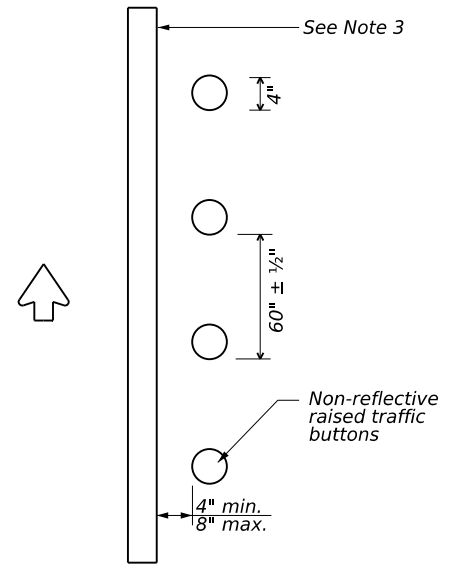
PLAN VIEW

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

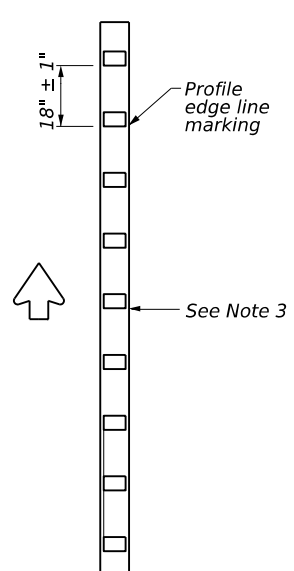
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



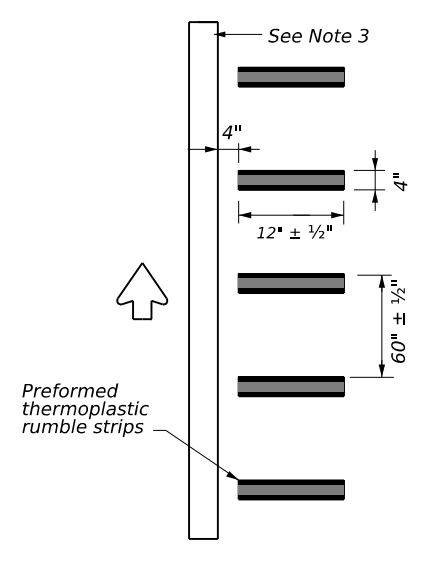
PLAN VIEW
OPTION 5

RAISED EDGE LINE (Rumble Strips)



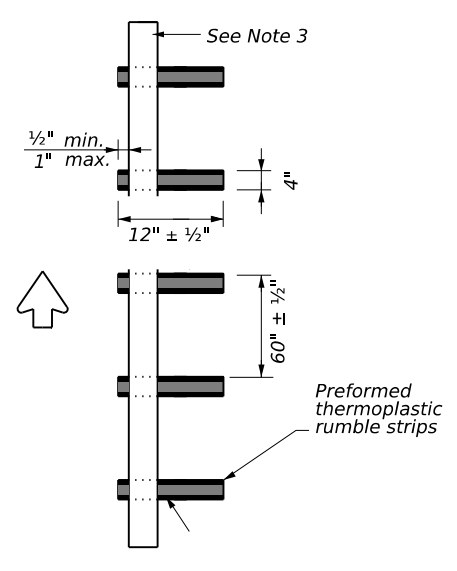
PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS (Rumble Strips)



PLAN VIEW
OPTION 7

PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)



PLAN VIEW
OPTION 8

PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)

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) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
- See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
- Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
- Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
- Consideration should be given to noise levels when edgeline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
- Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

- See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
- Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble strip.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE 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 edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line 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.
- The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
- Raised profile thermoplastic markings used as edge lines may substitute for buttons.

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, 6 or 8	Option 1, 2, 3, 5, 6 or 7	Option 2, 4, 5, 6 or 7

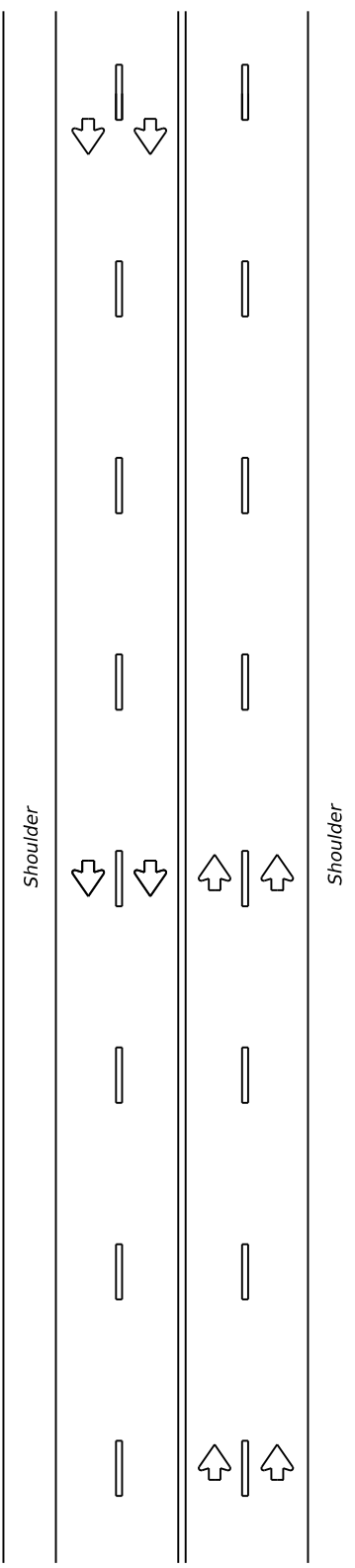
Texas Department of Transportation
Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(2)-23

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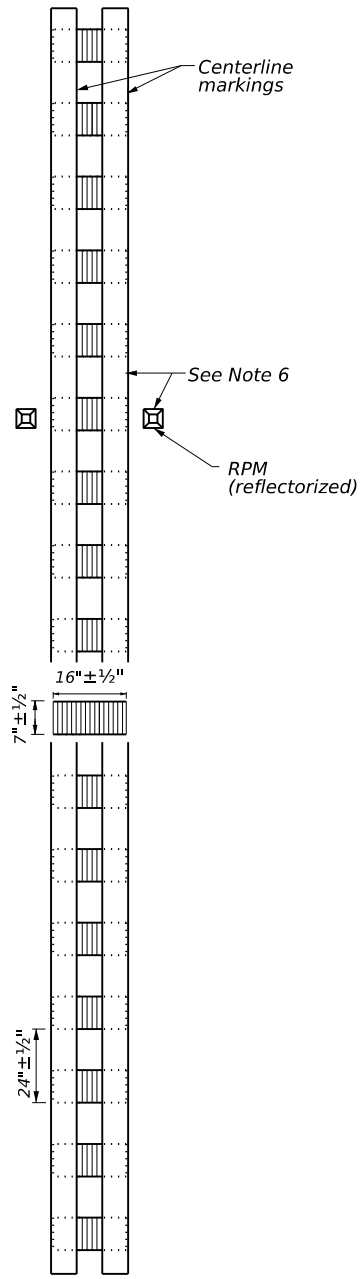
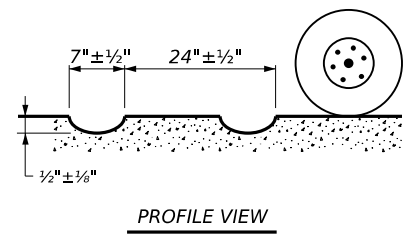
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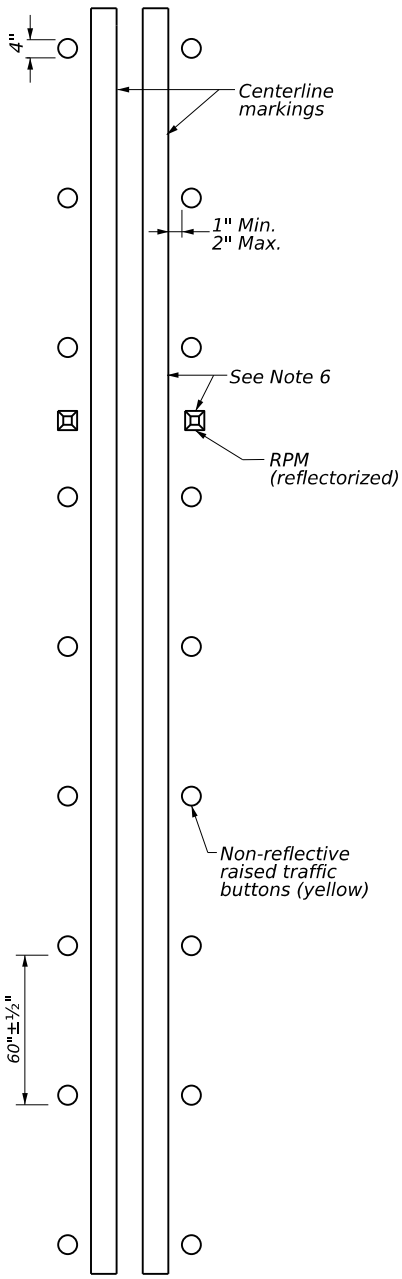
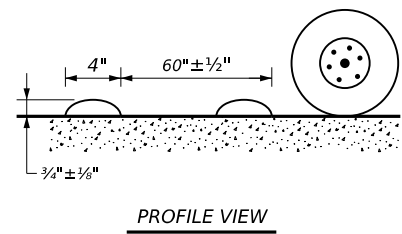


MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

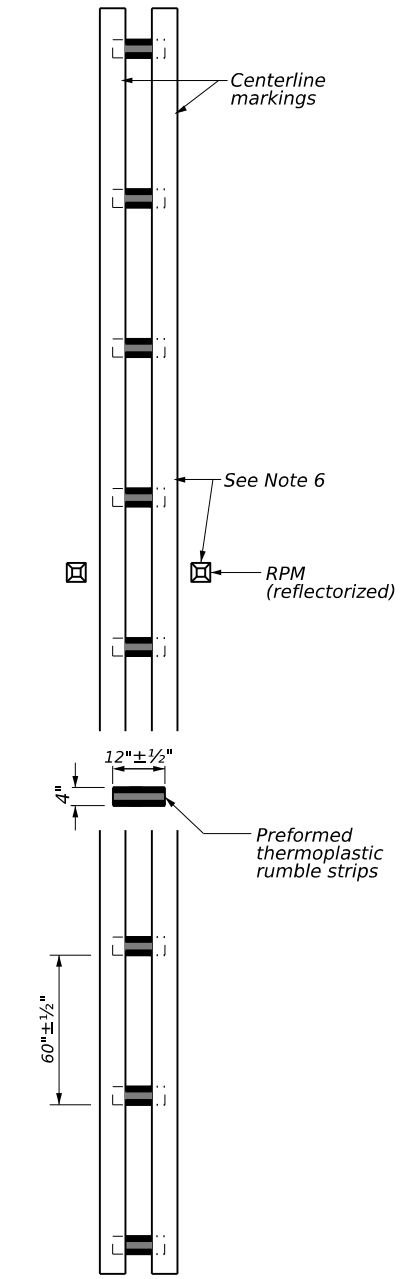
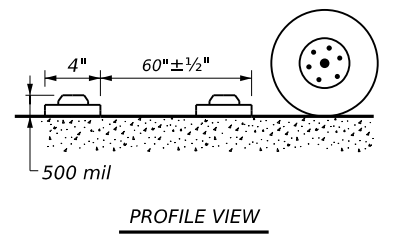
CENTERLINE RUMBLE STRIPS



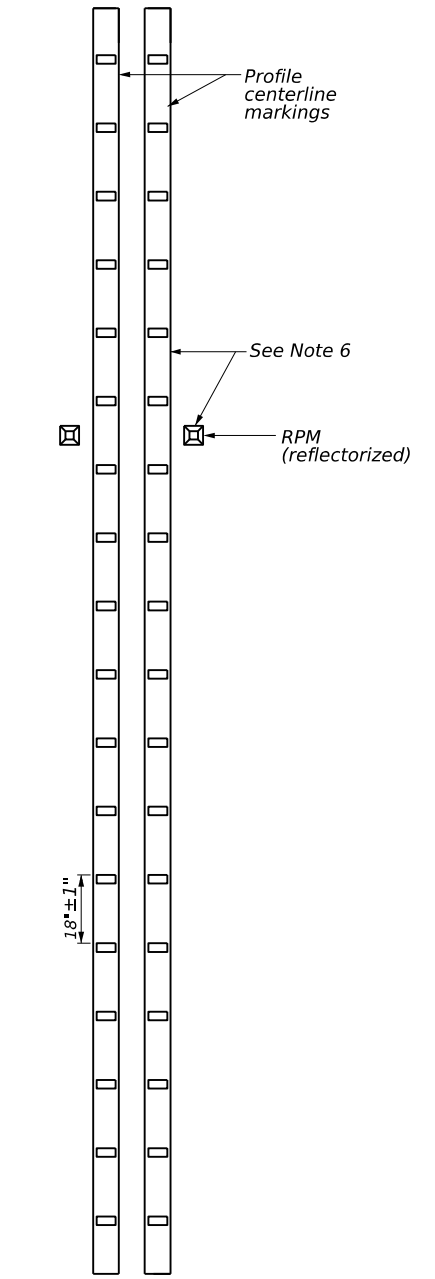
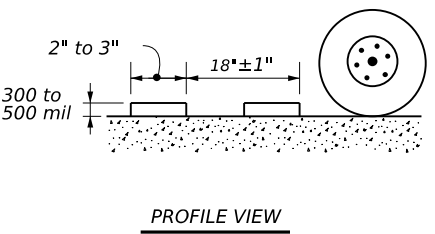
MILLED CENTERLINE RUMBLE STRIPS



RAISED CENTERLINE RUMBLE STRIPS



PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. 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.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. 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 manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

12. See standard sheet RS(2).



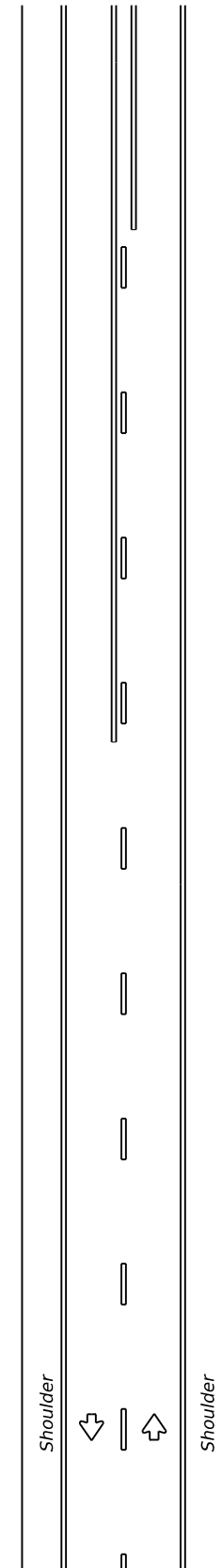
CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS RS(3)-23

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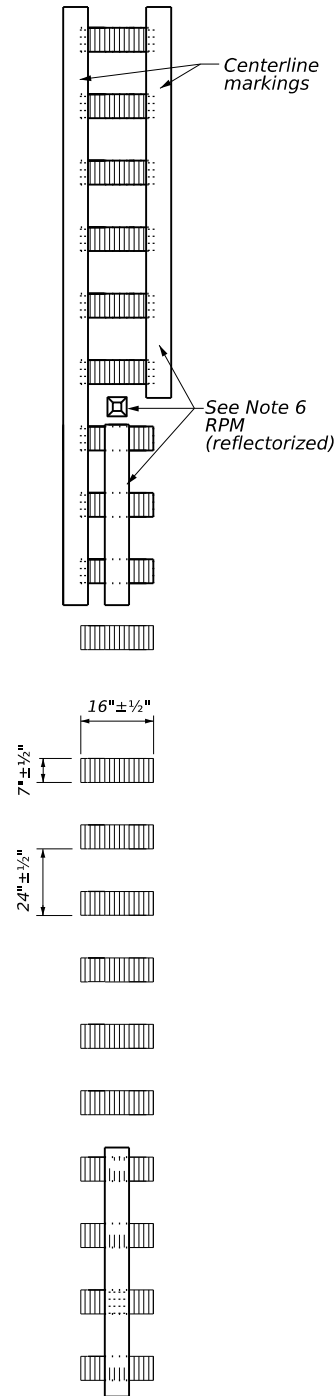
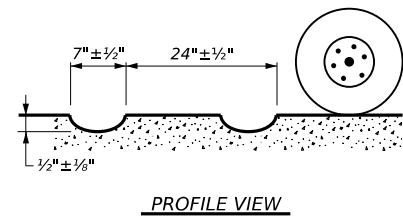
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CENTERLINE RUMBLE STRIPS

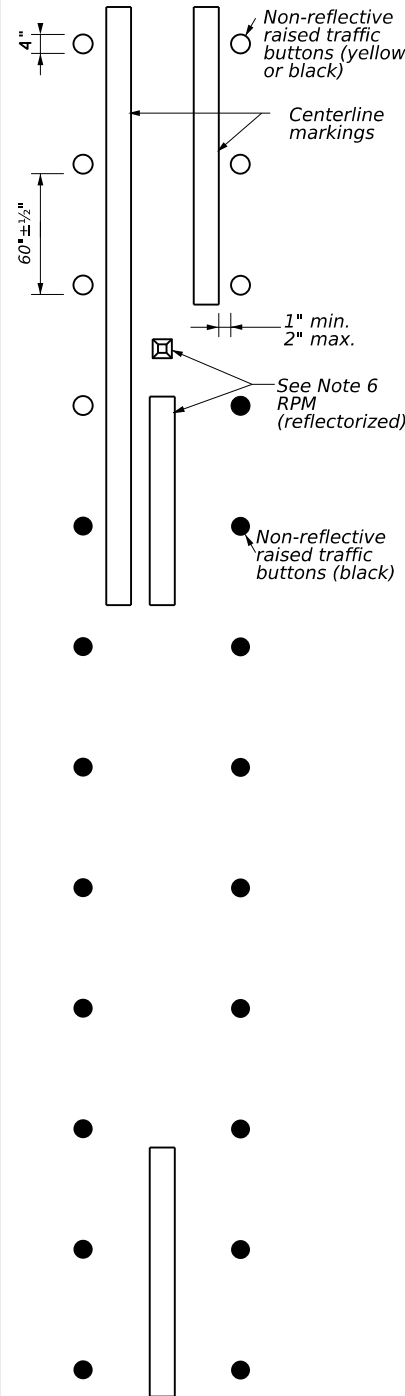
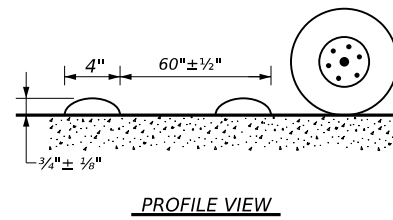


TWO LANE TWO-WAY HIGHWAYS



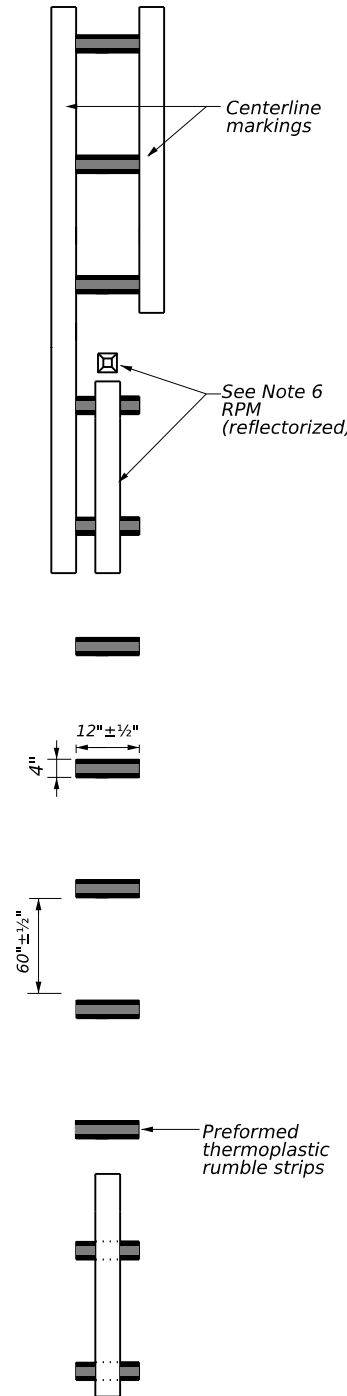
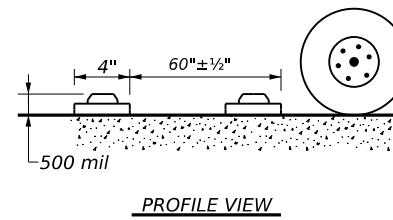
PLAN VIEW OPTION 1

MILLED CENTERLINE RUMBLE STRIPS



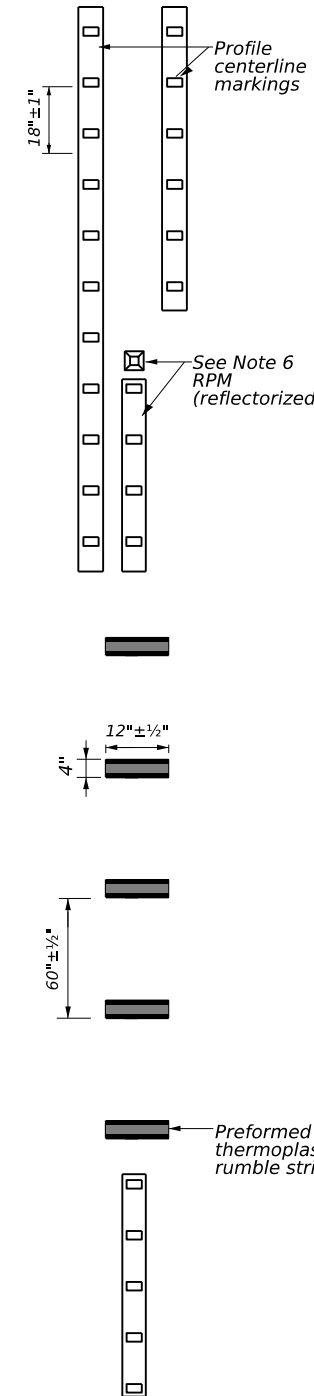
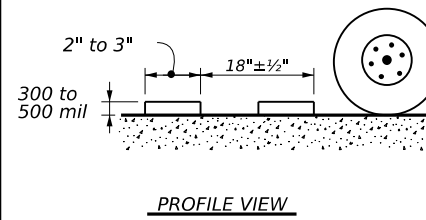
PLAN VIEW OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PLAN VIEW OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PLAN VIEW OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. 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.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
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WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

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11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

13. See standard sheet RS(2).

<h3>CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23</h3>			
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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)

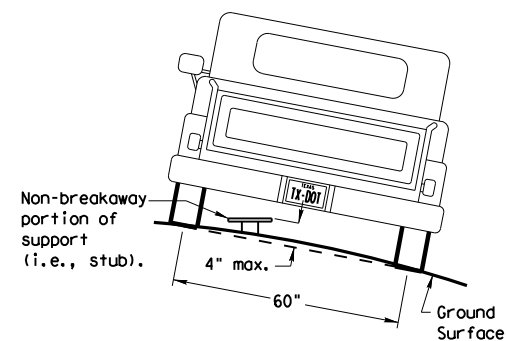
Anchor Type

- 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))

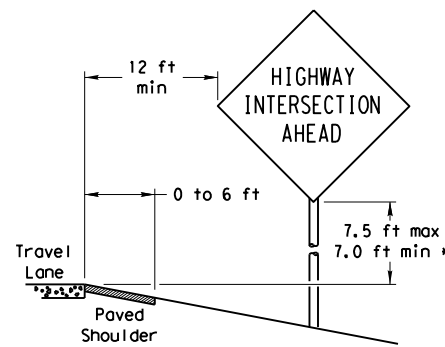
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

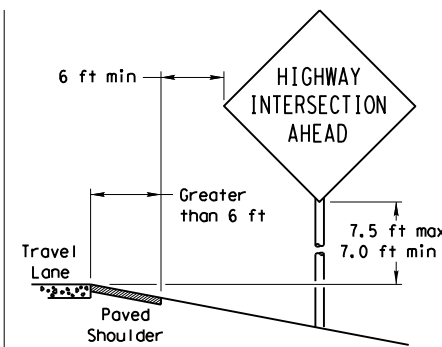
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

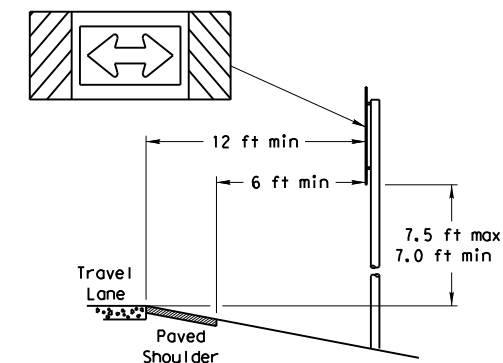
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

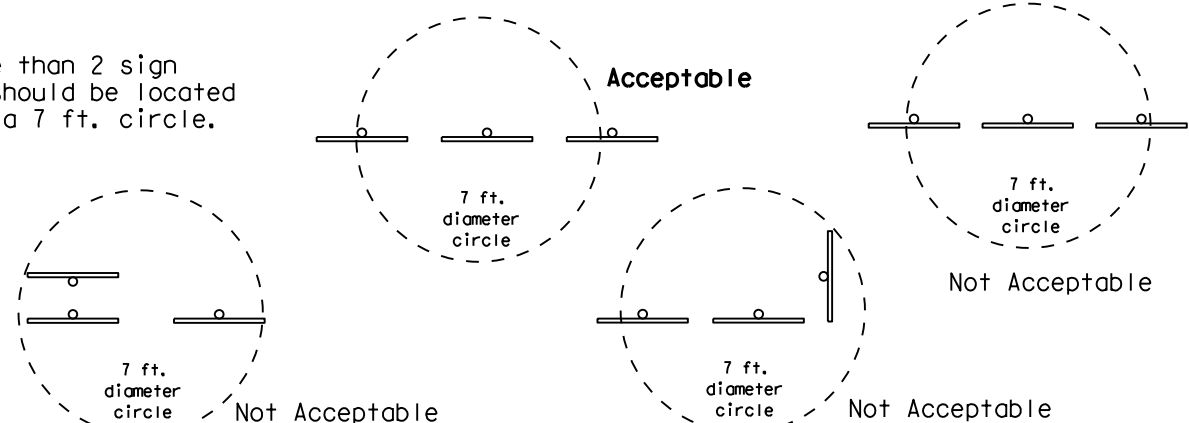
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

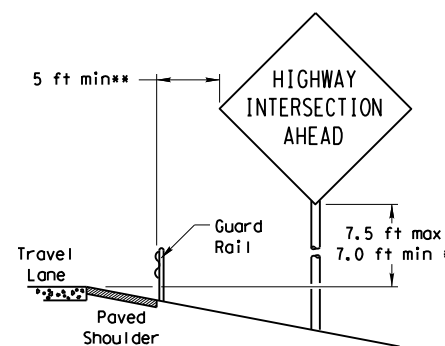


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

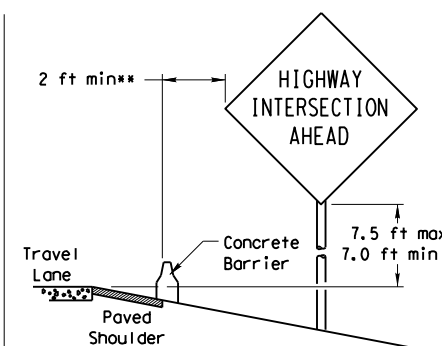
No more than 2 sign posts should be located within a 7 ft. circle.



BEHIND BARRIER



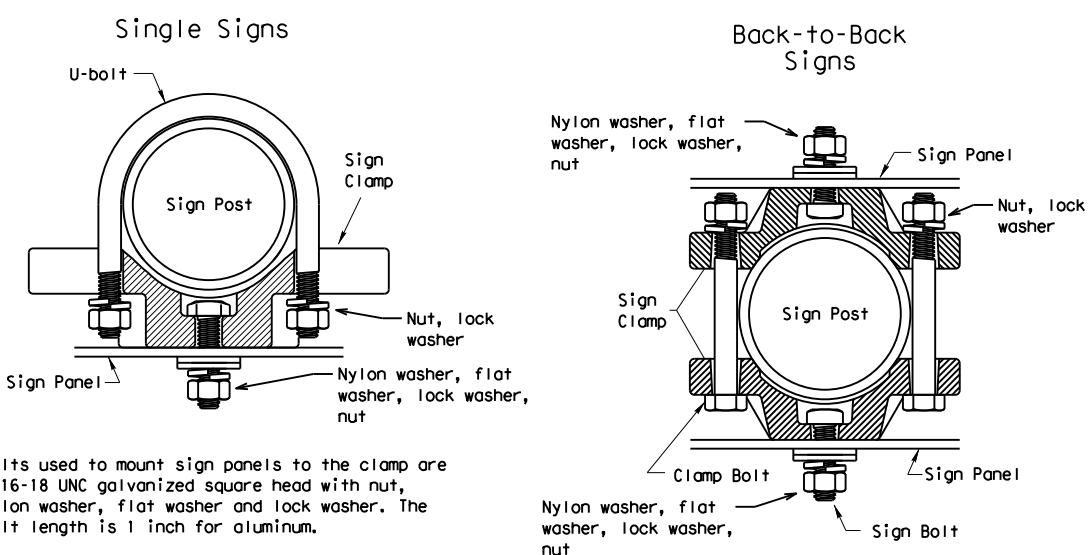
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

TYPICAL SIGN ATTACHMENT DETAIL



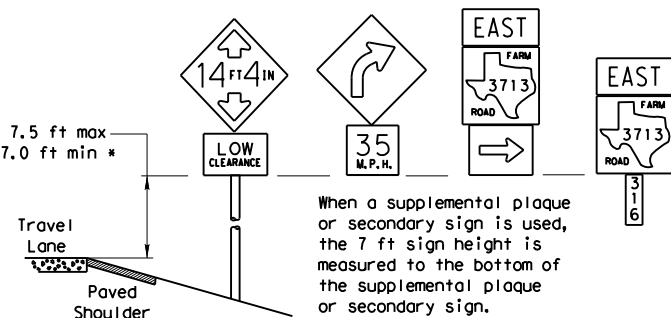
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

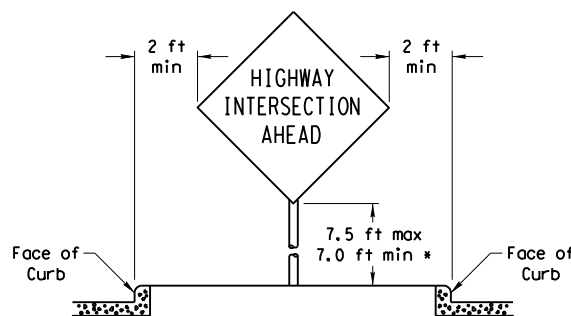
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

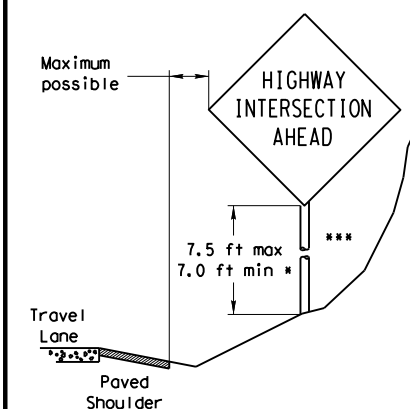


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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

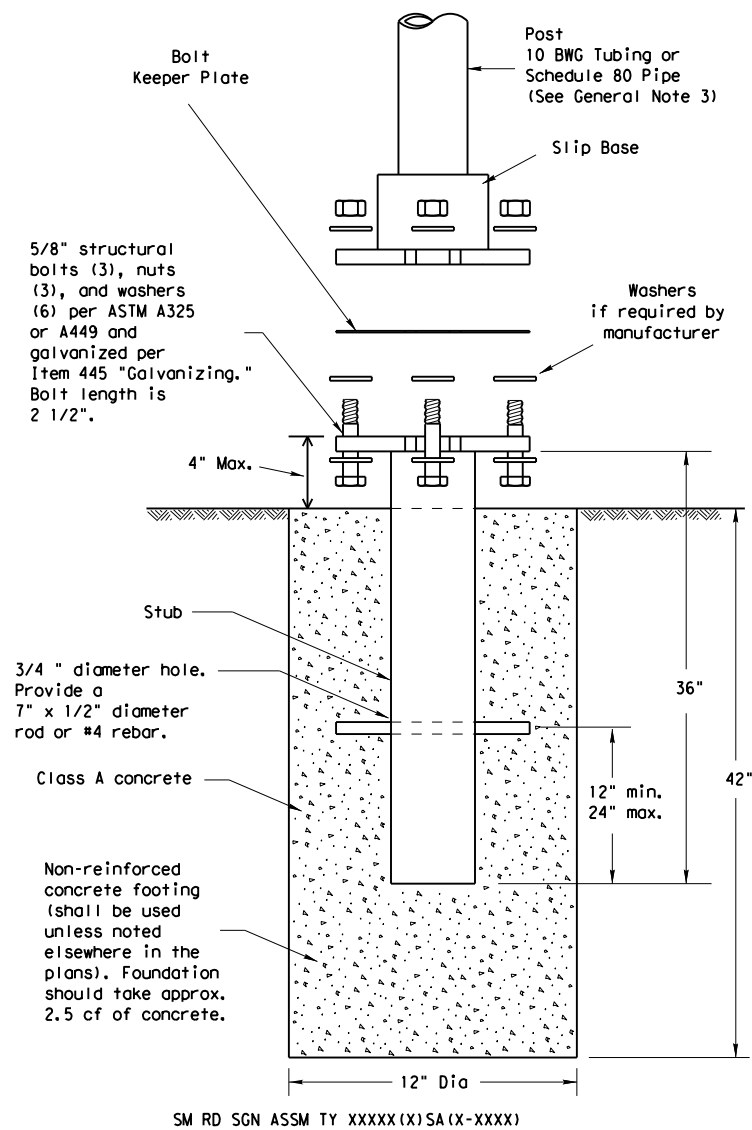
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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

- 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

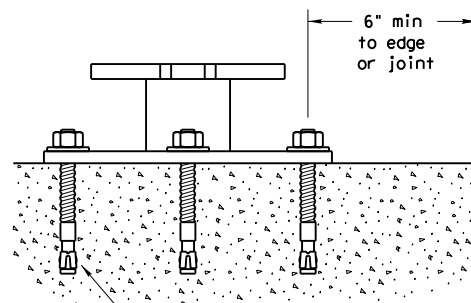
Foundation

- 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



5/8" diameter Concrete Anchor - 8 places (embed a minimum of 5 1/2" and torque to min. of 50 ft-lbs). Anchor may be expansion or adhesive type.

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

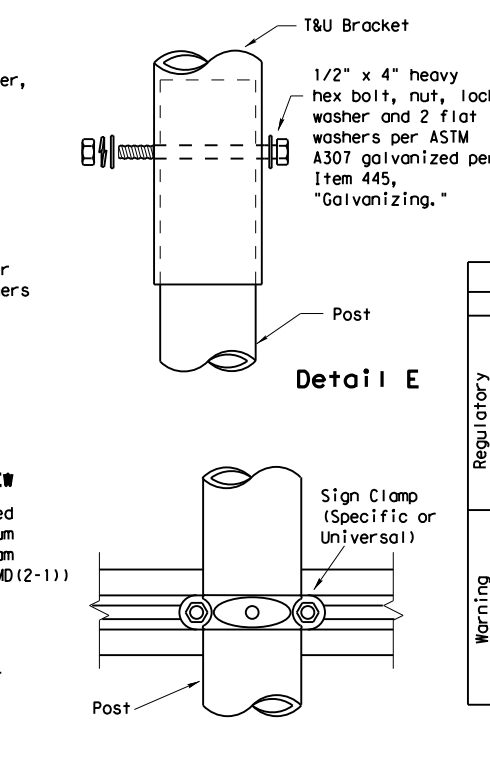
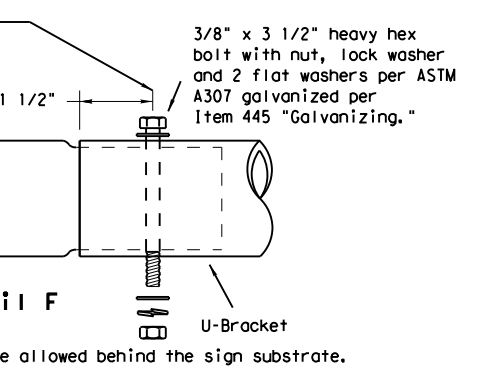
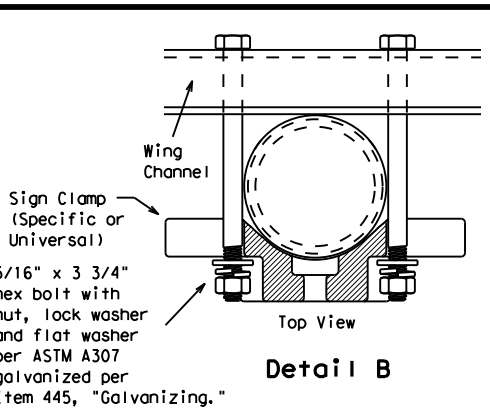
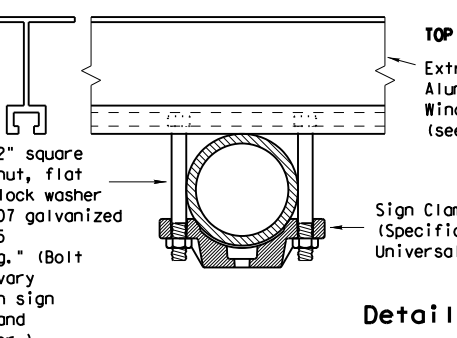
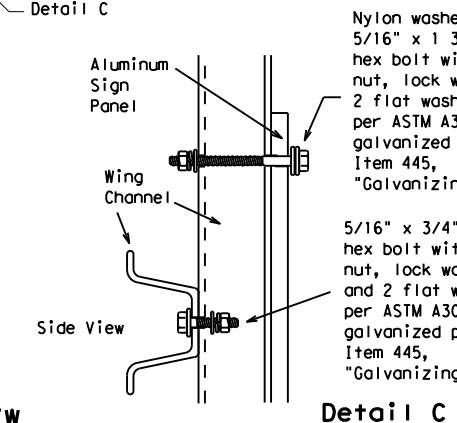
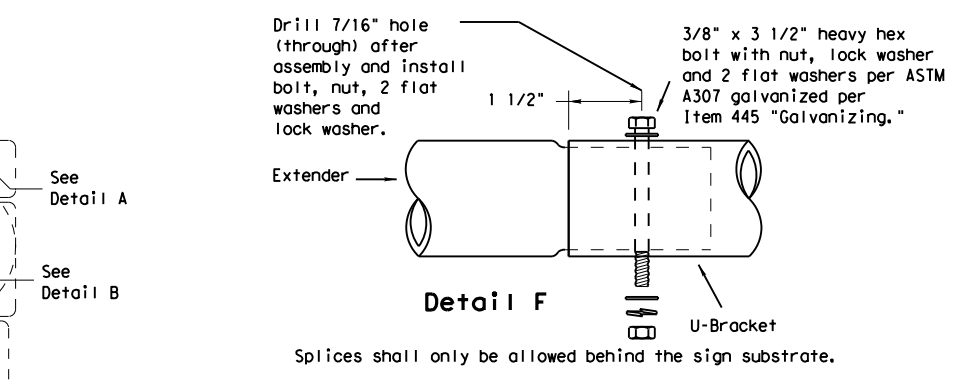
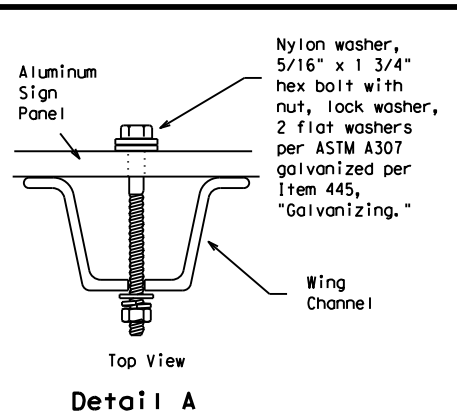
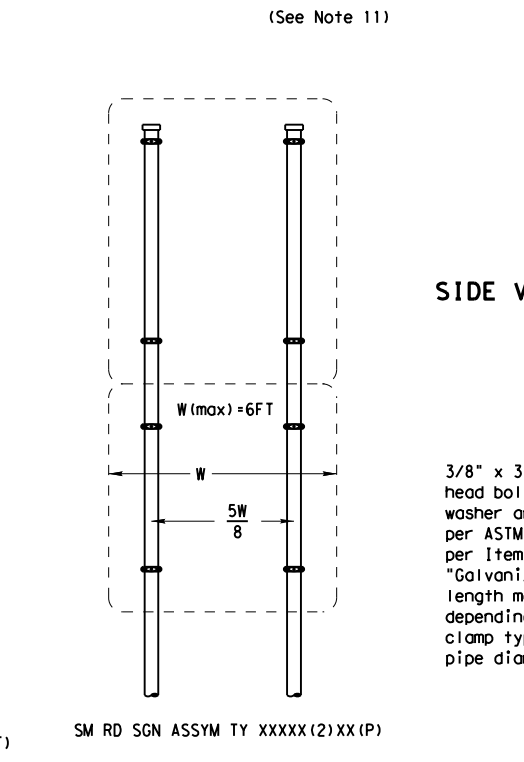
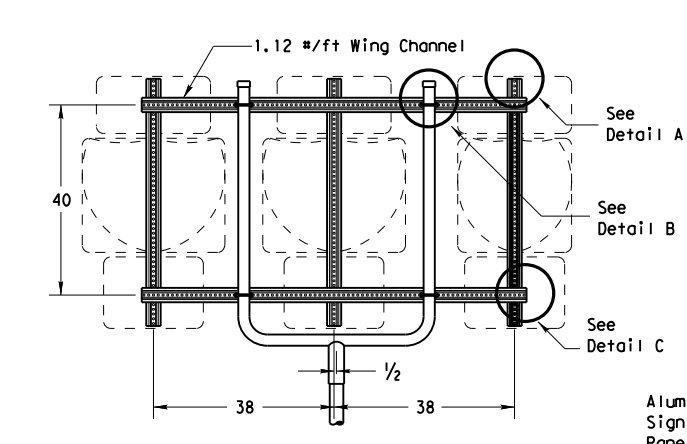
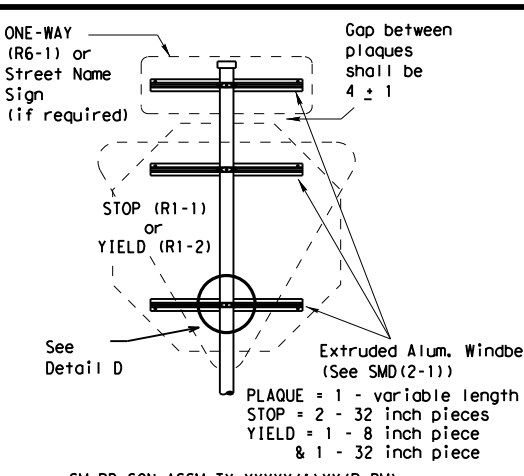
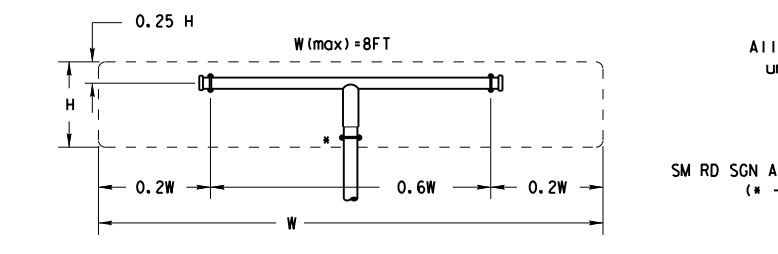
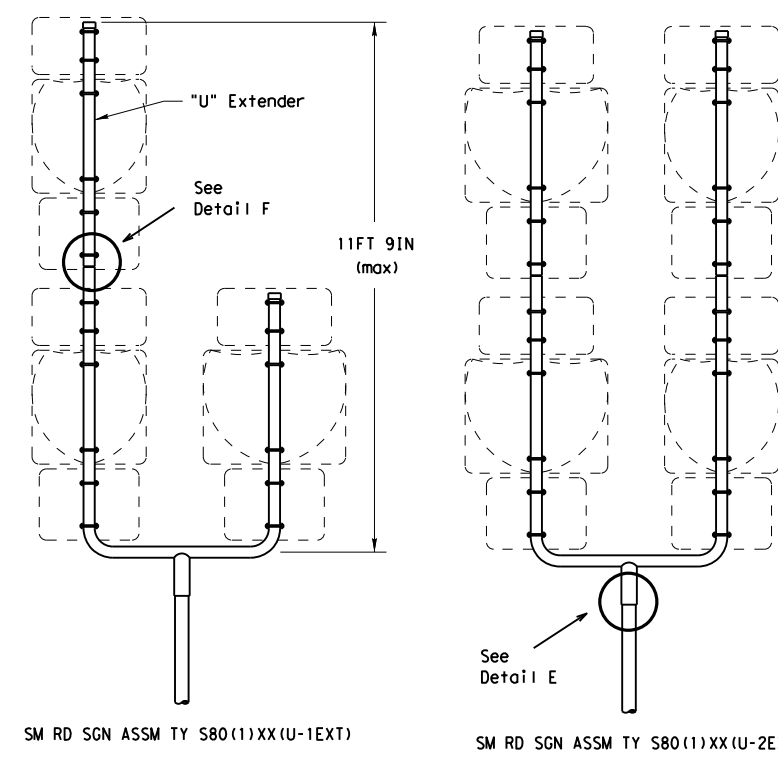
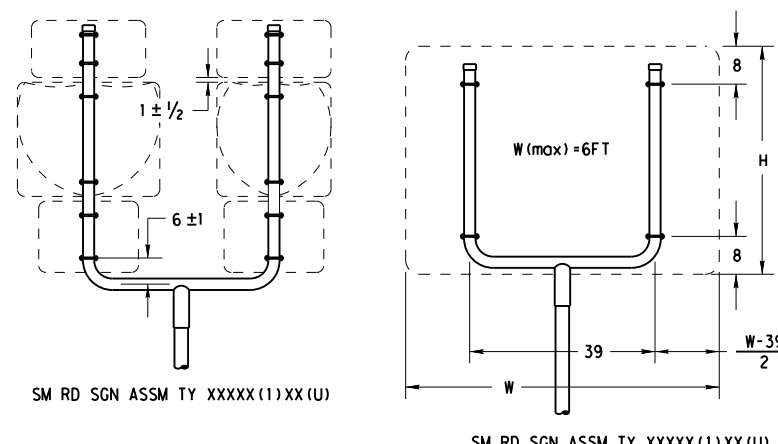
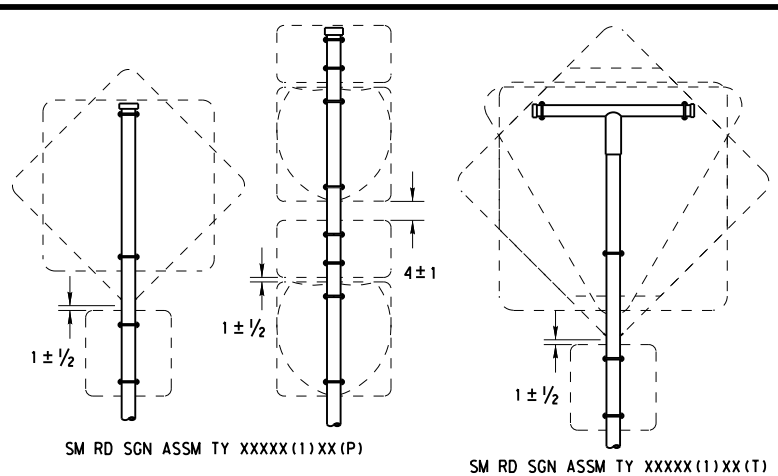
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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		CRP	JIM WELLS, ETC.		252

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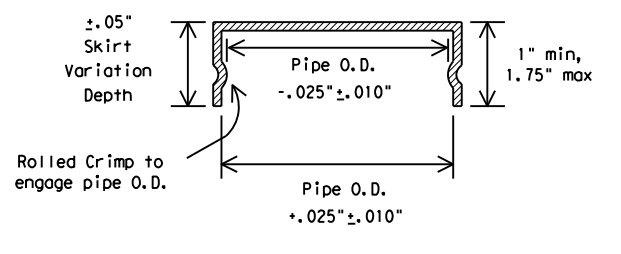
GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA

10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
SIGN DESCRIPTION	SUPPORT	
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Warning	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	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)	

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.

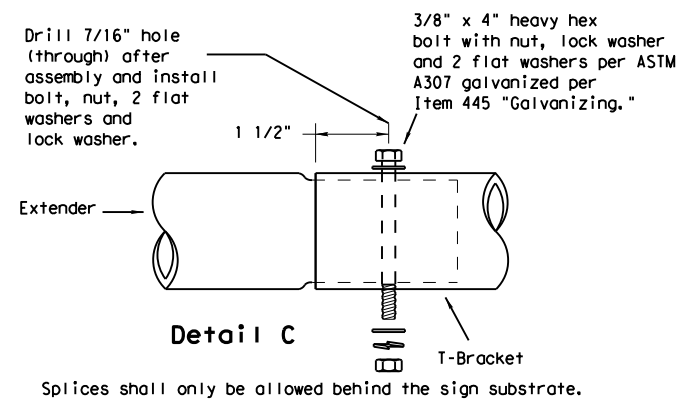
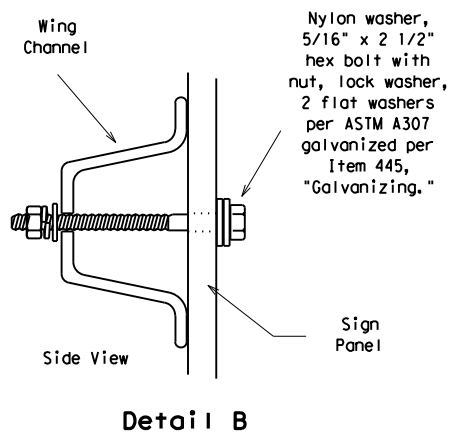
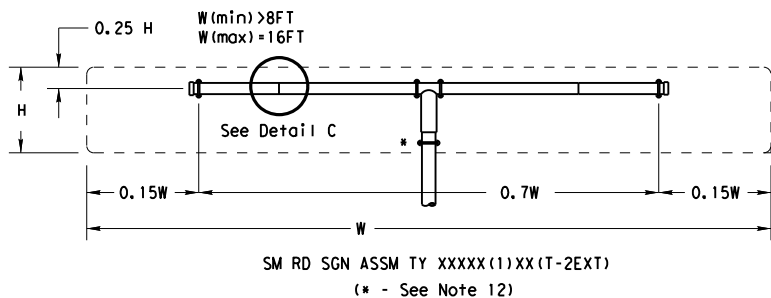


SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-2)-08

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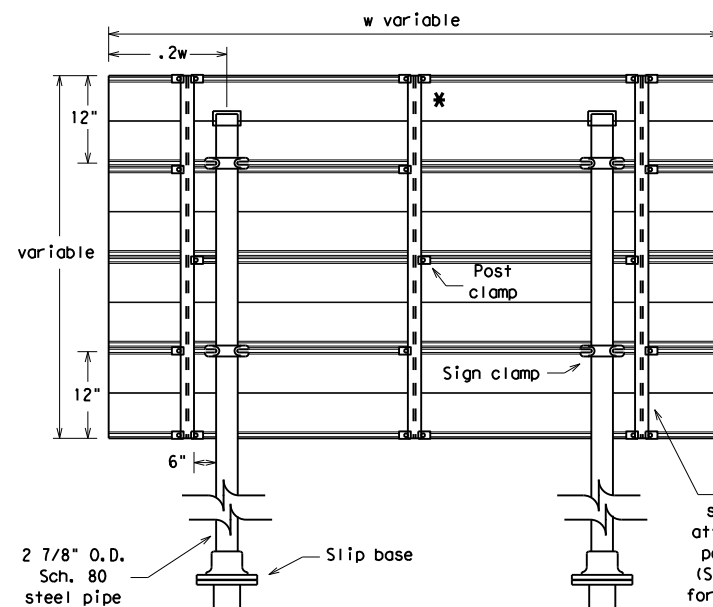
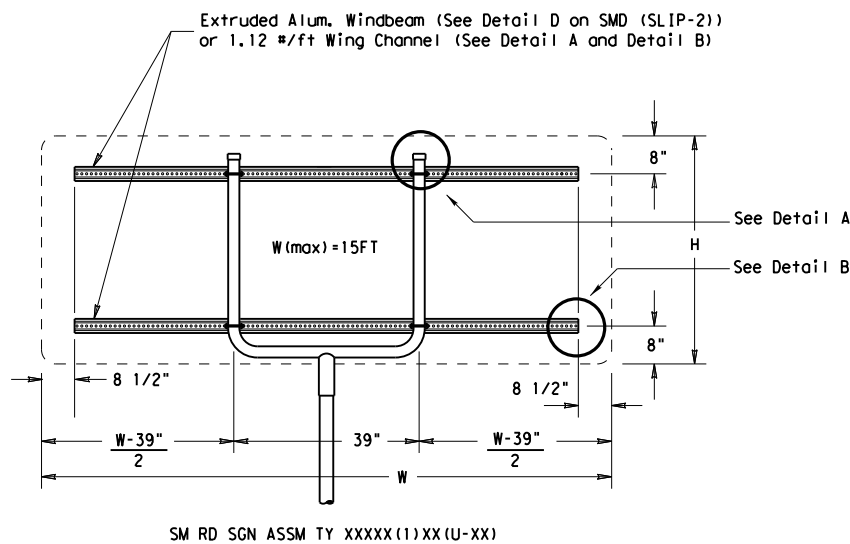
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FILE:



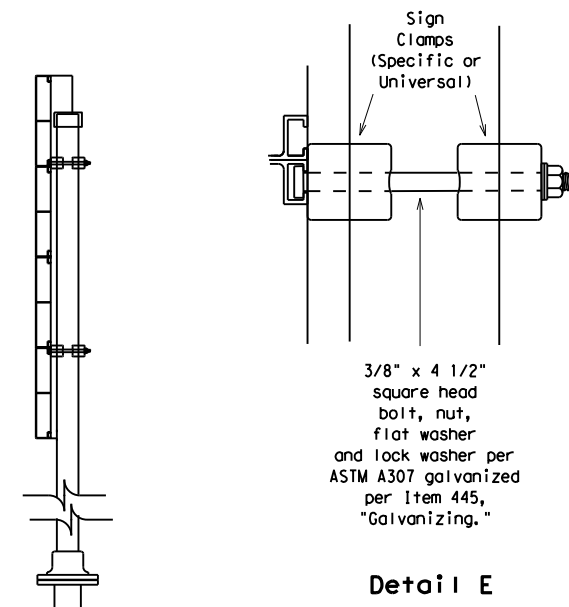
Splices shall only be allowed behind the sign substrate.

GENERAL NOTES:

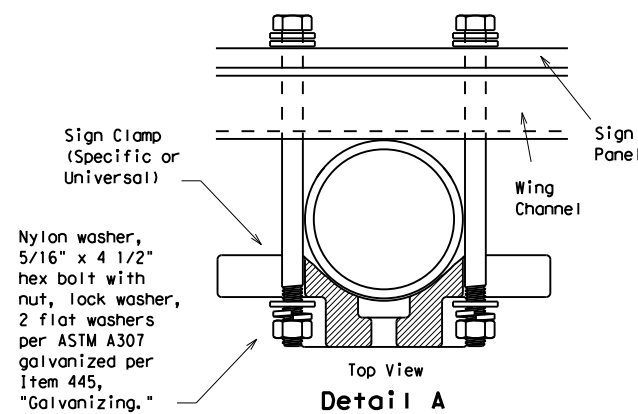
- | SIGN SUPPORT | # OF POSTS | MAX. SIGN AREA |
|--------------|------------|----------------|
| 10 BWG | 1 | 16 SF |
| 10 BWG | 2 | 32 SF |
| Sch 80 | 1 | 32 SF |
| Sch 80 | 2 | 64 SF |
- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally 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.



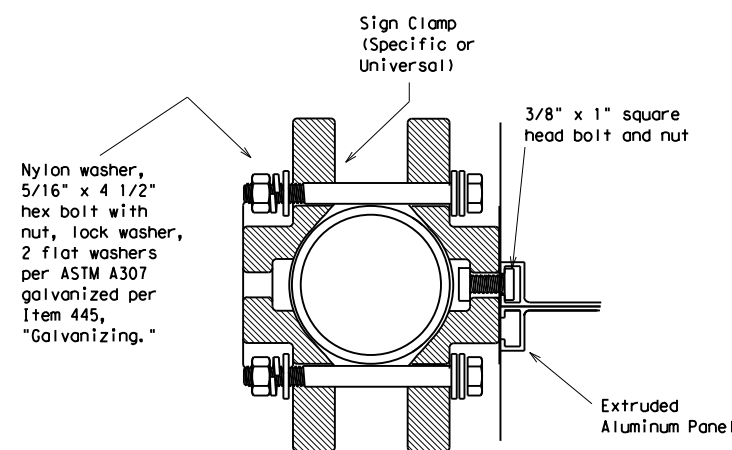
Typical Sign Mount
SM RD SGN ASSM TY S80(2)XX(IP-EXAL)
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



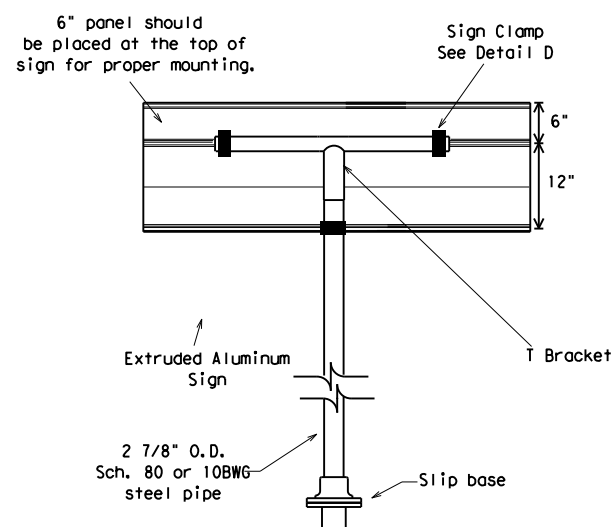
Detail E



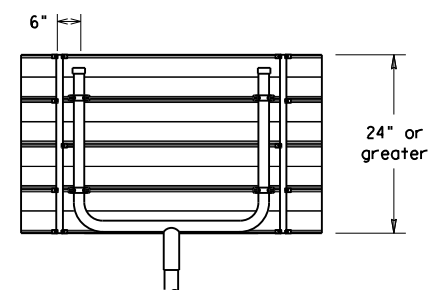
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign With T Bracket



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details
See Detail E for clamp installation

		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)	

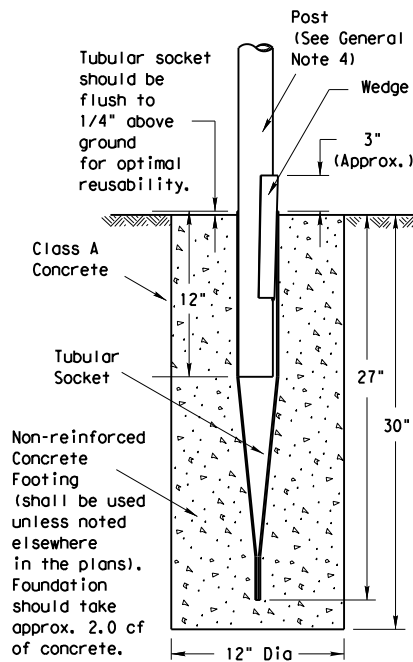
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Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-3)-08

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		DIST	COUNTY		SHEET NO.
		CRP	JIM WELLS, ETC.		254

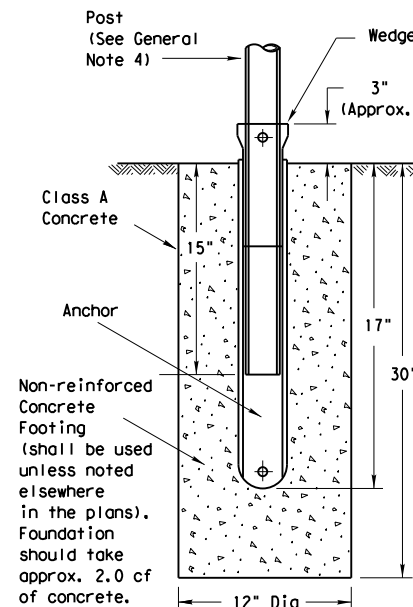
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Wedge Anchor Steel System



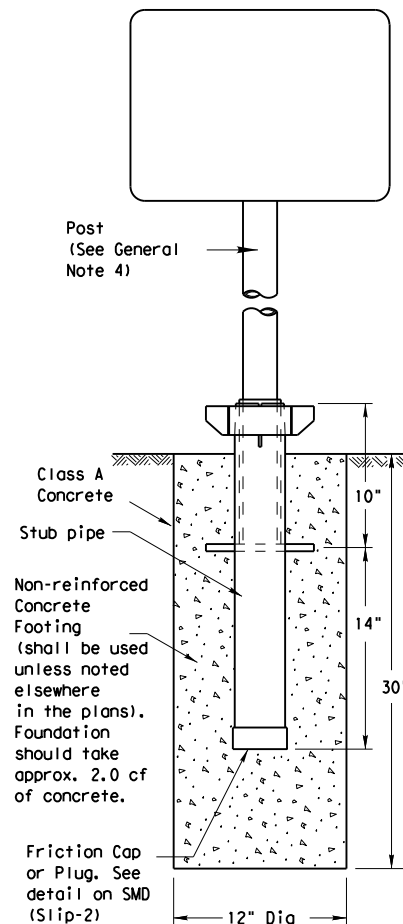
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

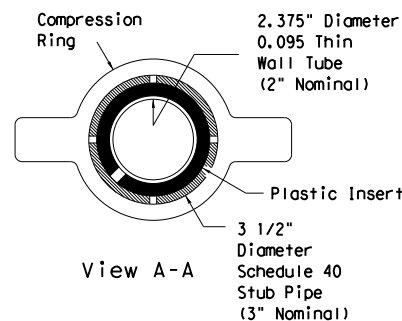
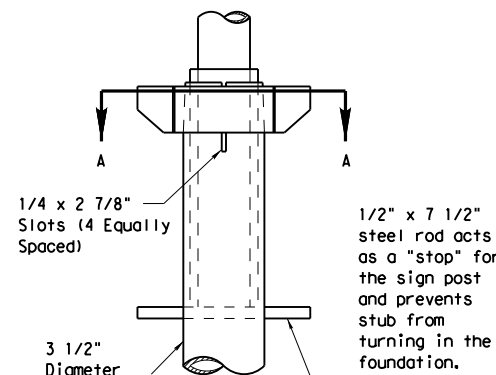


SMD RD SGN ASSM TY TWT(X)WP(X)

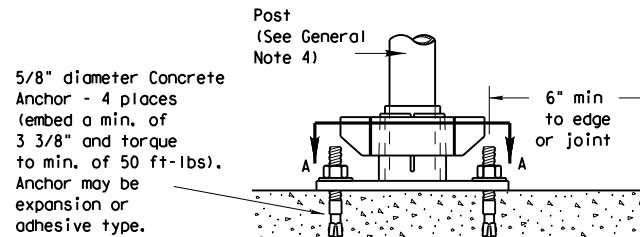
Universal Anchor System with Thin-Walled Tubing Post



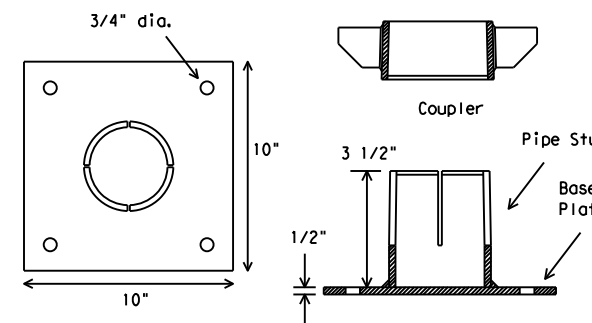
SM RD SGN ASSM TY TWT(X)UA(P)



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\"/>

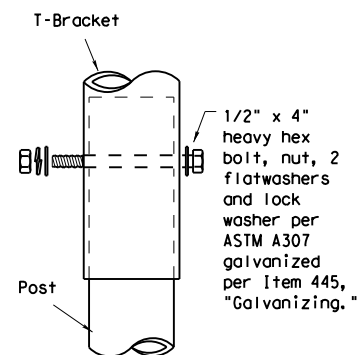
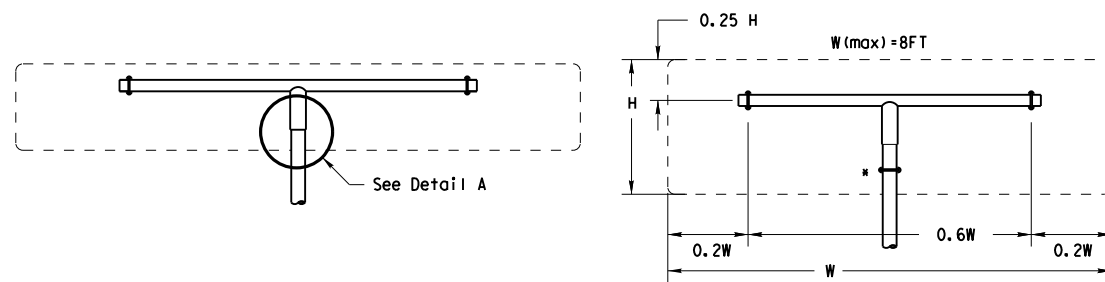


Concrete anchor consists of 5/8\"/>



SM RD SGN ASSM TY TWT(X)UB(P)

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



Detail A

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\"/>

- 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\"/>

- 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\"/>

Texas Department of Transportation
Traffic Operations Division

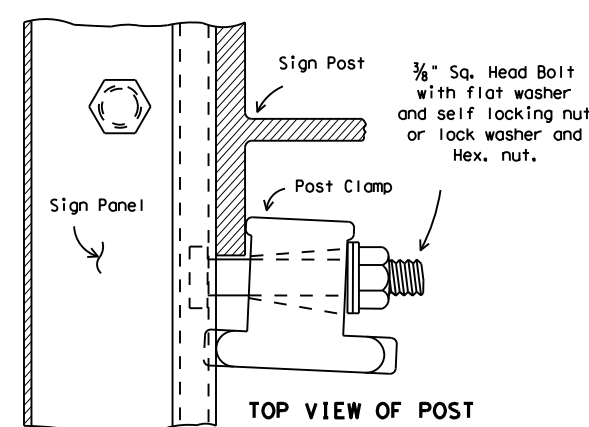
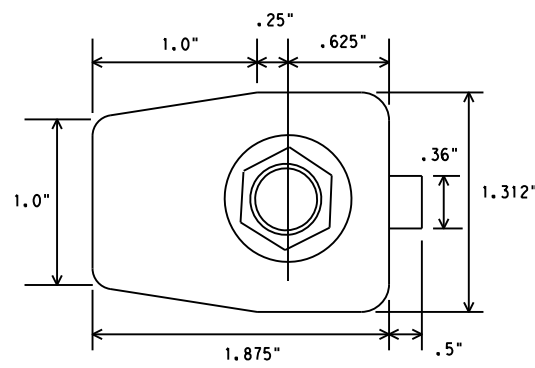
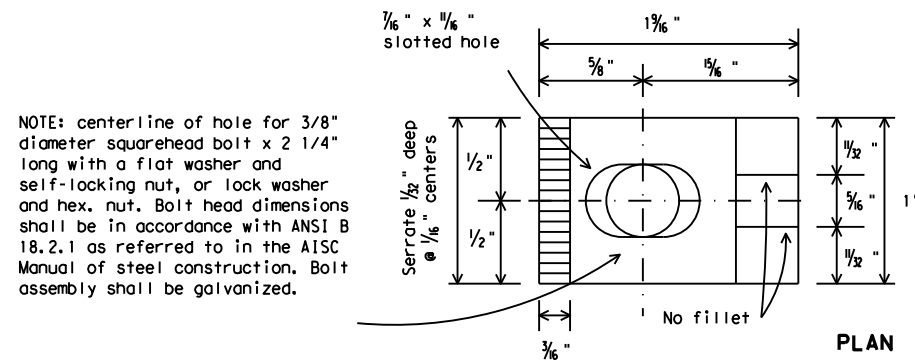
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST SMD(TWT) - 08

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		DIST	COUNTY		SHEET NO.
		CRP	JIM WELLS, ETC.		255

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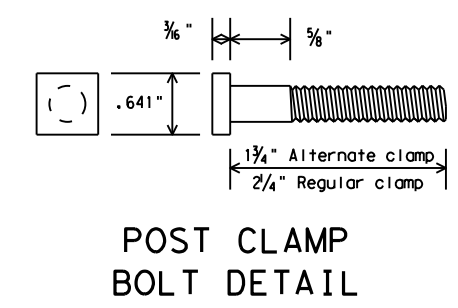
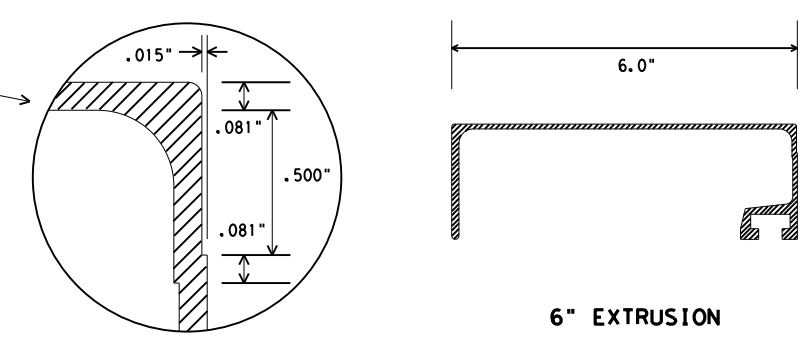
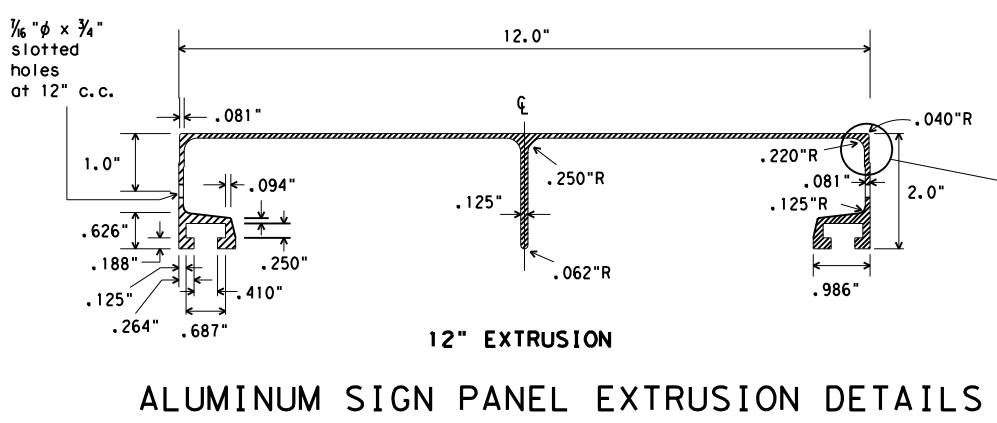
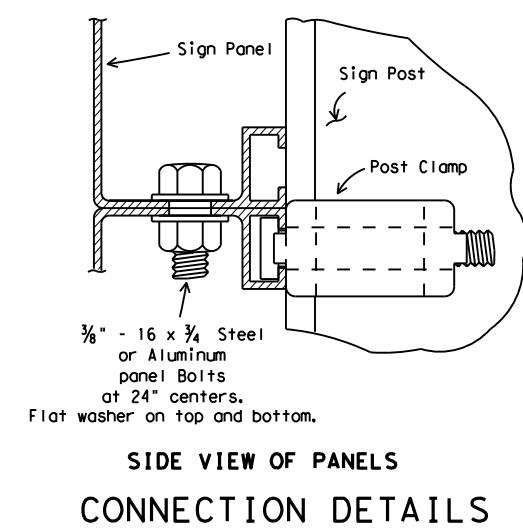
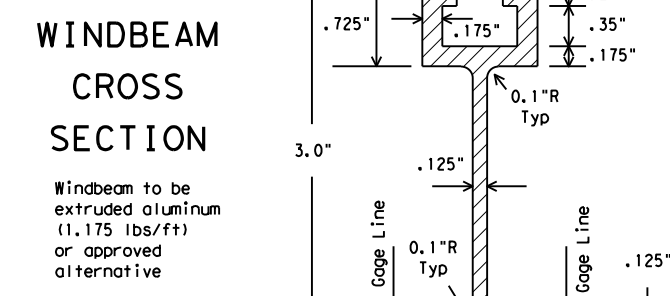
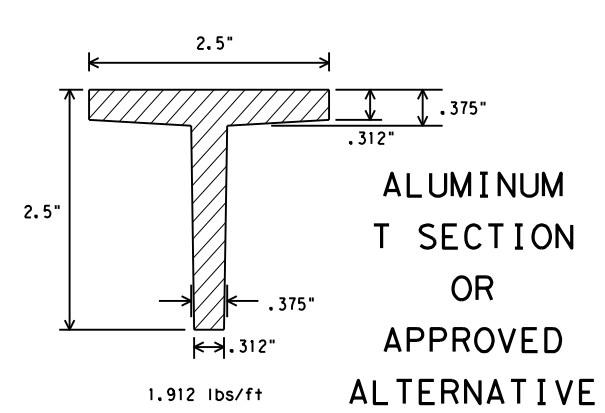
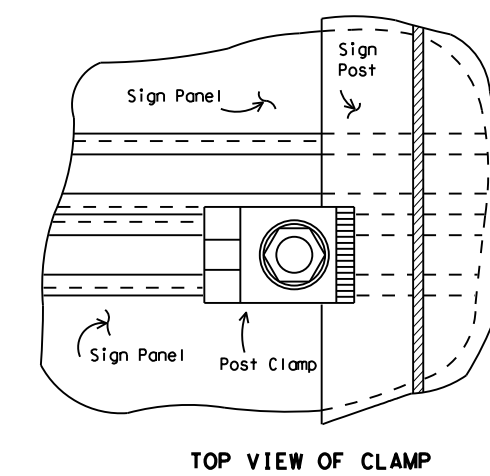
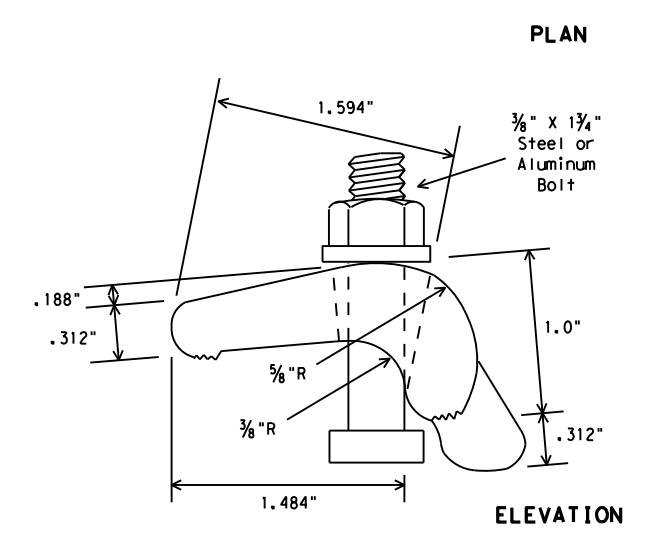
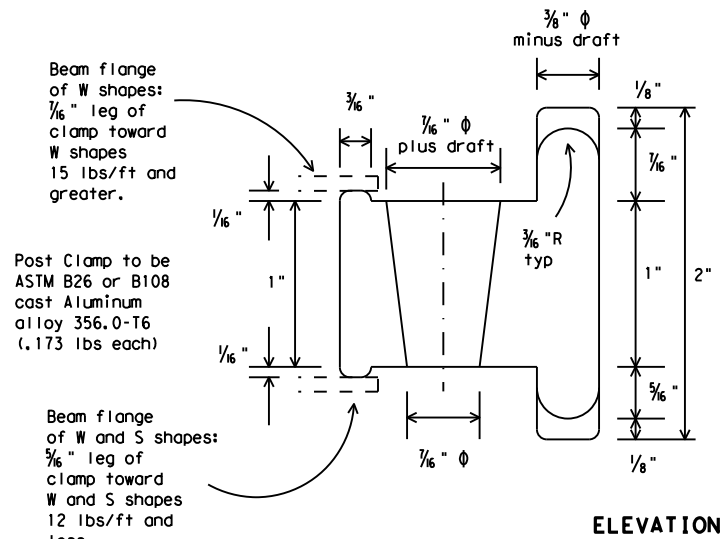
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DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN HARDWARE	DMS-7120

- GENERAL NOTES:
1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
 2. Materials and fabrication shall conform to the requirements of the Department material specifications.
 3. Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal For Structures."
 4. For fiberglass substrate connection details, see manufacturer's recommendations.



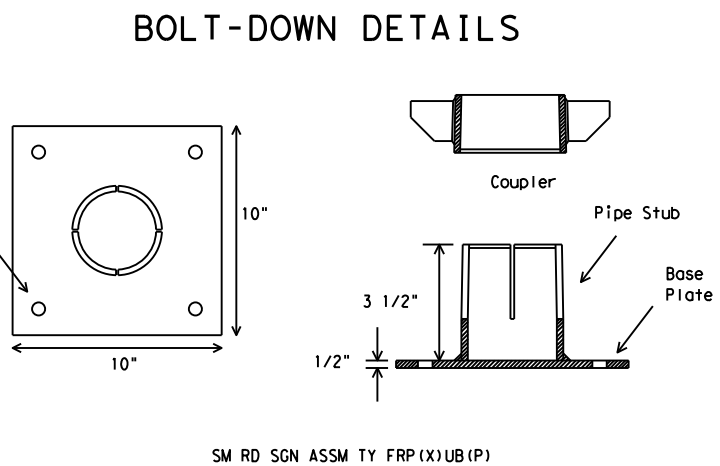
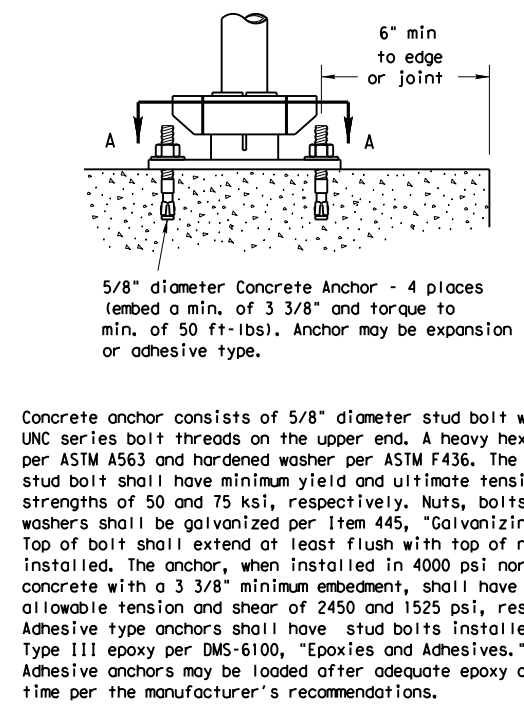
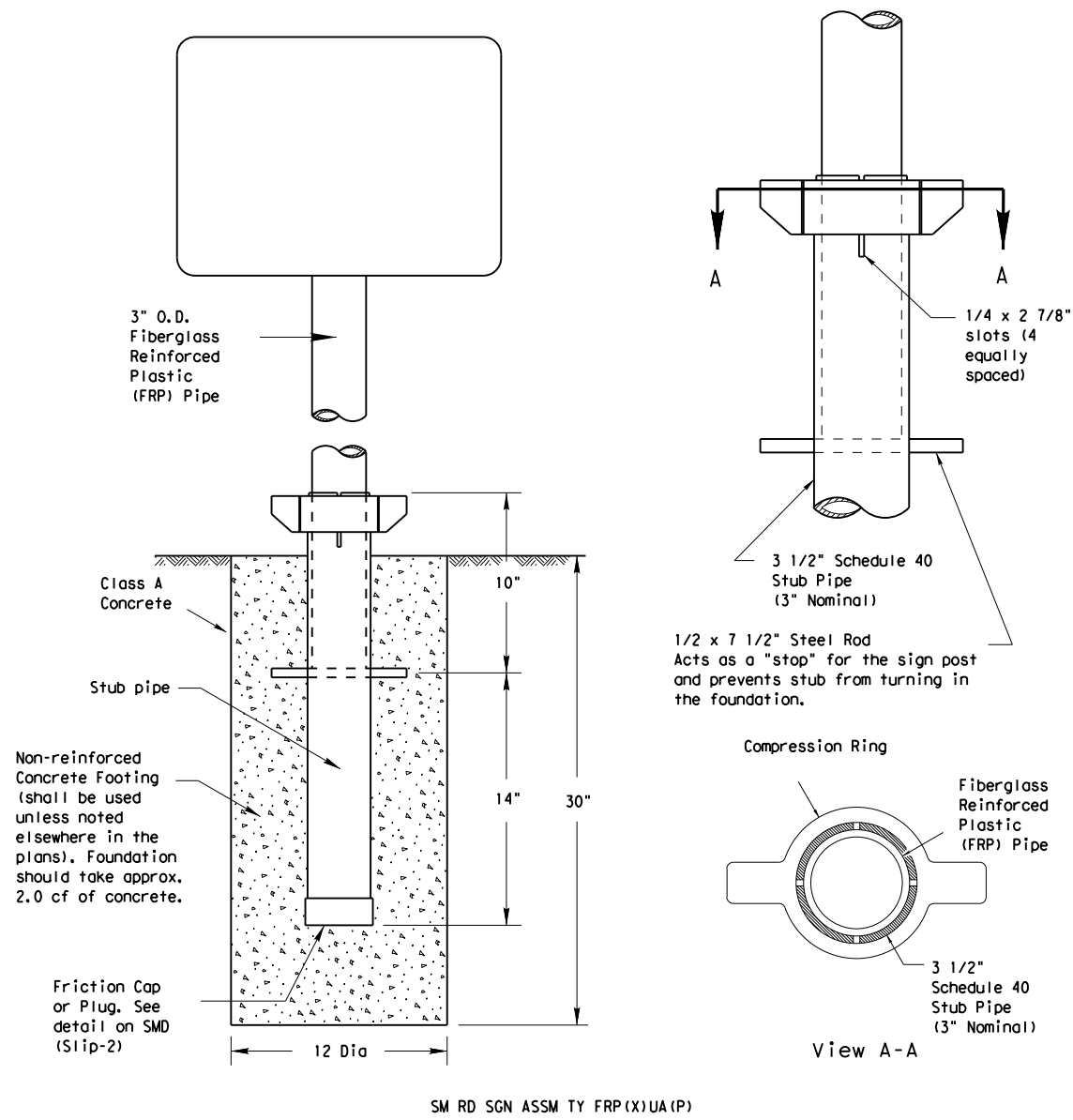
Texas Department of Transportation
Traffic Operations Division

**SIGN MOUNTING DETAILS-
EXTRUDED ALUMINUM
SIGN PANELS & HARDWARE**

SMD(2-1)-08

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		DIST: CRP	COUNTY: JIM WELLS, ETC.	SHEET NO.: 256	

Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



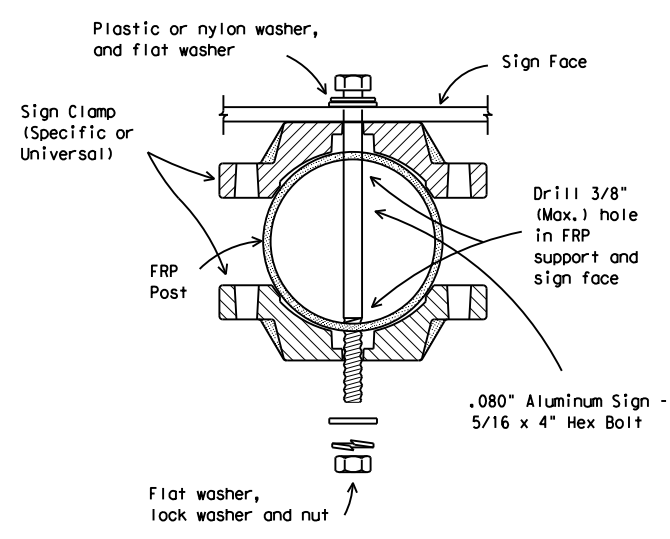
- GENERAL NOTES:**
- FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
 - All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
 - See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is:
<http://www.txdot.gov/publications/traffic.htm>

- FRP POST REQUIREMENTS**
- Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
 - Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
 - FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
Texas Department of Transportation
Traffic Operations Division
125 East 11th Street
Austin, Texas 78701-2483

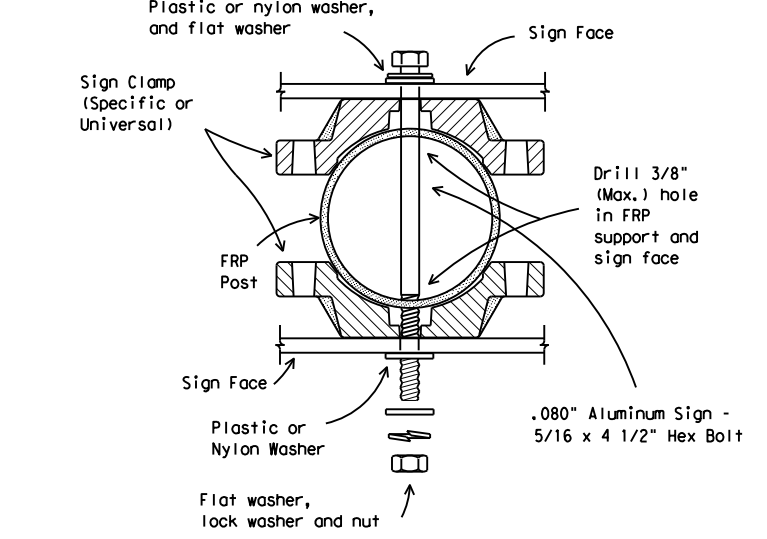
- UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES**
- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
 - 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.
 - Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
 - Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
 - Attach sign to FRP post.
 - Insert sign post into base post. Lower until the post comes to rest on the steel rod.
 - Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
 - Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

- BOLT DOWN SIGN SUPPORT**
- Position base plate with coupler on existing concrete.
 - Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
 - Attach sign to FRP post.
 - Insert bottom of sign post into pipe stub.
 - Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
 - Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

**SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
UNIVERSAL ANCHOR SYSTEM
WITH FRP POST**

SMD (FRP) -08

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		CRP	JIM WELLS, ETC.		257

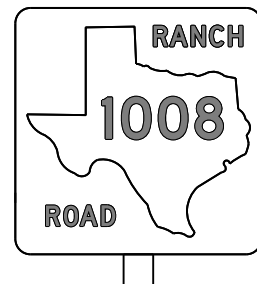
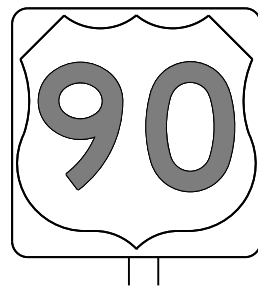
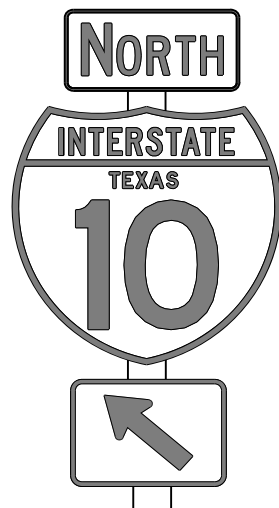
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DATE: FILE:

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

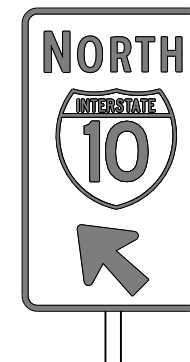
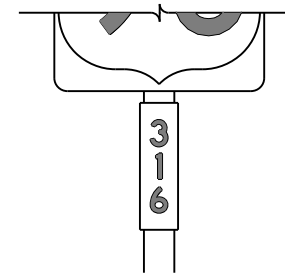
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



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 (i.e. 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

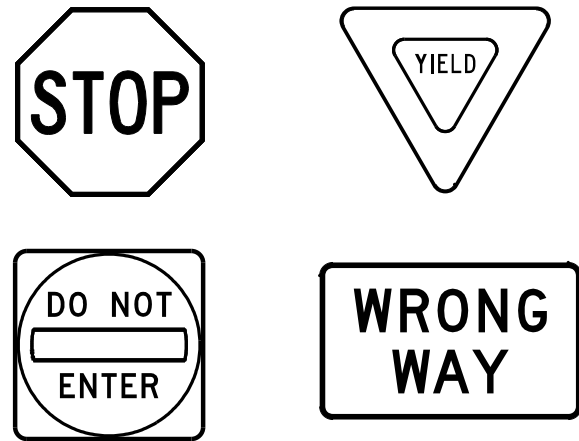
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	CRP	JIM WELLS, ETC.	258	

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DATE: FILE:

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

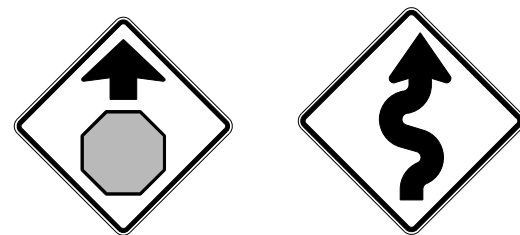
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



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

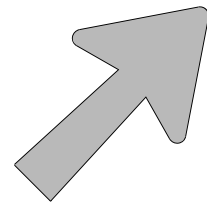
The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>

				<i>Texas Department of Transportation</i>		<i>Traffic Operations Division Standard</i>	
<h2>TYPICAL SIGN REQUIREMENTS</h2>							
<h3>TSR(4) - 13</h3>							
FILE:	tsr4-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY		
REVISIONS		0383	03	024, ETC.		SH 141	
12-03	7-13	DIST	COUNTY	SHEET NO.			
9-08		CRP	JIM WELLS, ETC.	259			

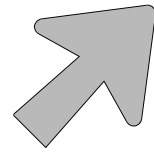
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ARROW DETAILS

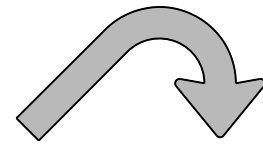
for Large Ground-Mounted and Overhead Guide Signs



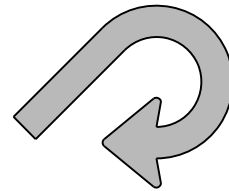
Type A



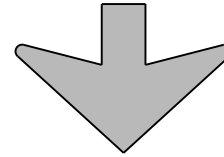
Type B



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.
E-3	E5-1aT
E-4	E5-1bT

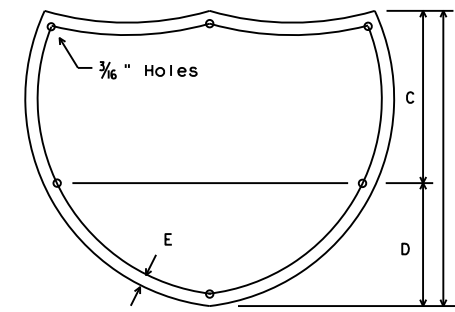
NOTE

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.

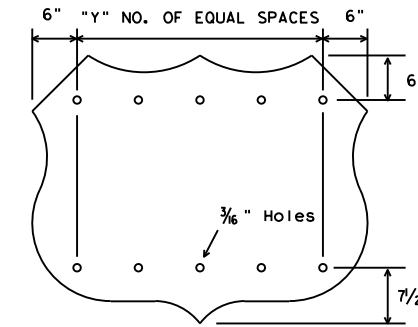
<http://www.txdot.gov/>

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)



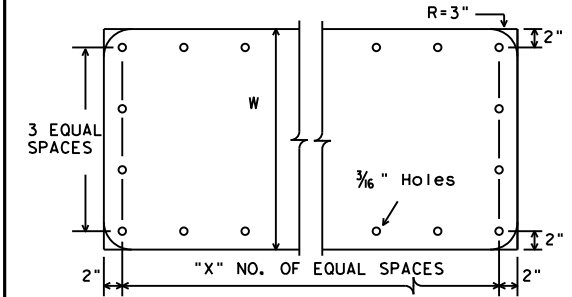
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4



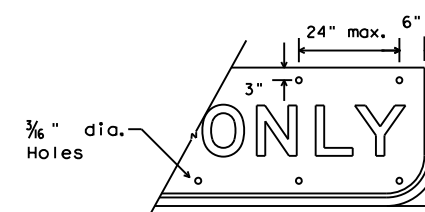
U.S. ROUTE MARKERS

Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



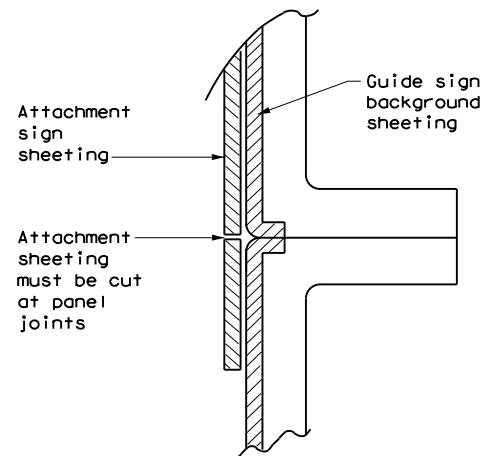
STATE ROUTE MARKERS

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

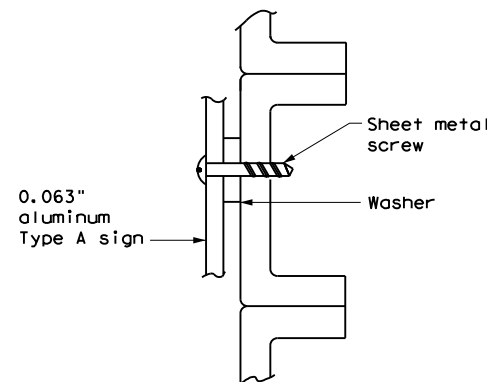
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



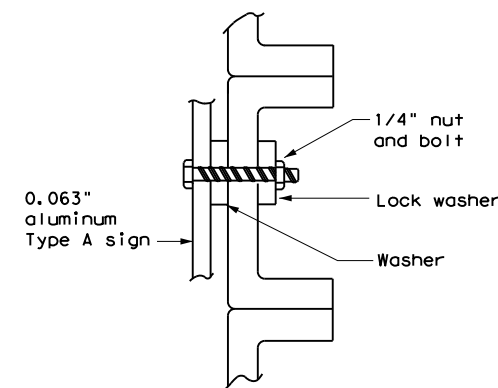
DIRECT APPLIED ATTACHMENT

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

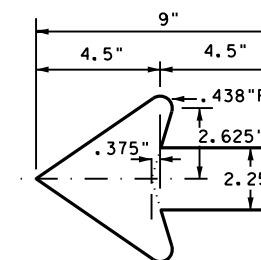


NUT/BOLT ATTACHMENT

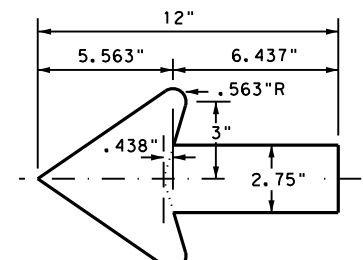
NOTE:

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

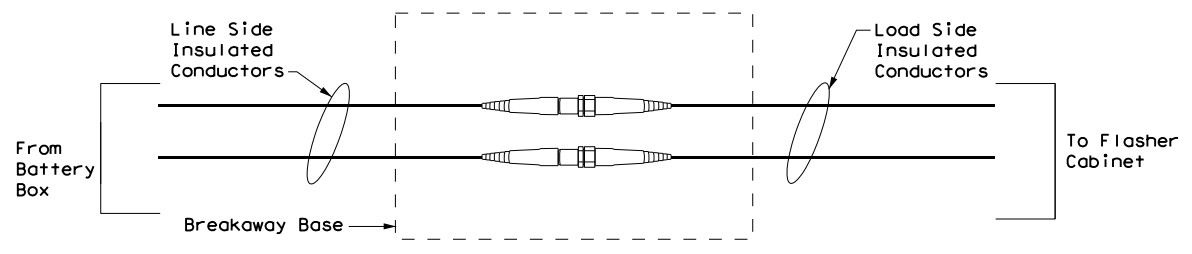
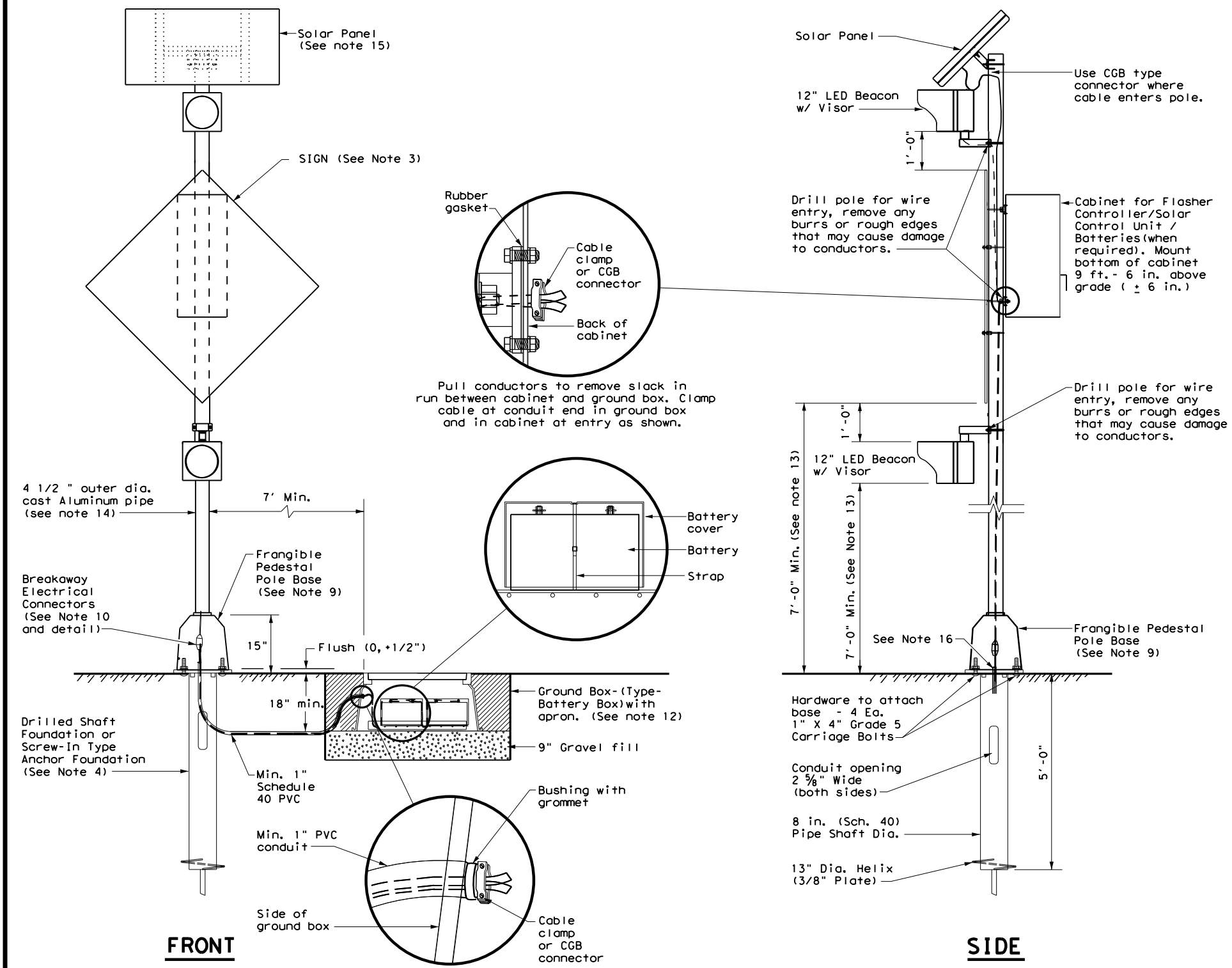
FILE: tsr5-13.dgn	DW: TxDOT	CK: TxDOT	DN: TxDOT	CR: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	CRP	JIM WELLS, ETC.	260	

DATE: FILE:

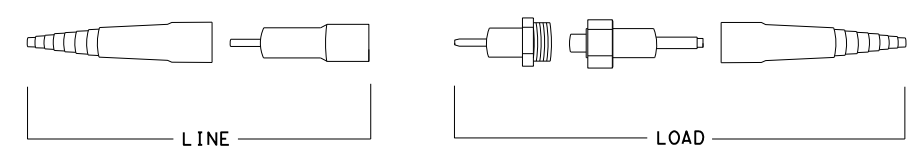
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GENERAL NOTES:

- Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
- See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
- See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
- Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
- When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
- Use materials specifically designed for attaching cabinets, beacon heads, solar panels, etc., to poles.
- Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
- Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
- Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.
- Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug. For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
- Install the batteries in a battery box. Place the batteries on a 3/16" thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16" plastic sheet are subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies." When required, install batteries in the flasher cabinet. Wire batteries according to manufacturer's recommendations. Provide the number of batteries as required by the manufacturer.
- See standard sheet Electrical Details (ED) for additional requirements regarding the installation of ground boxes/battery boxes, conduit, and cabinets.
- Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
- Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
- Orient solar panel for optimum exposure to sunlight (face to the south). Prior to installation, check the location to ensure there is no overhead obstruction that would block the solar panel from receiving full sunlight. Unless specified elsewhere, mount a minimum of 14' above grade.
- Ensure height of conduit is below top of anchor bolts.



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



**NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW**

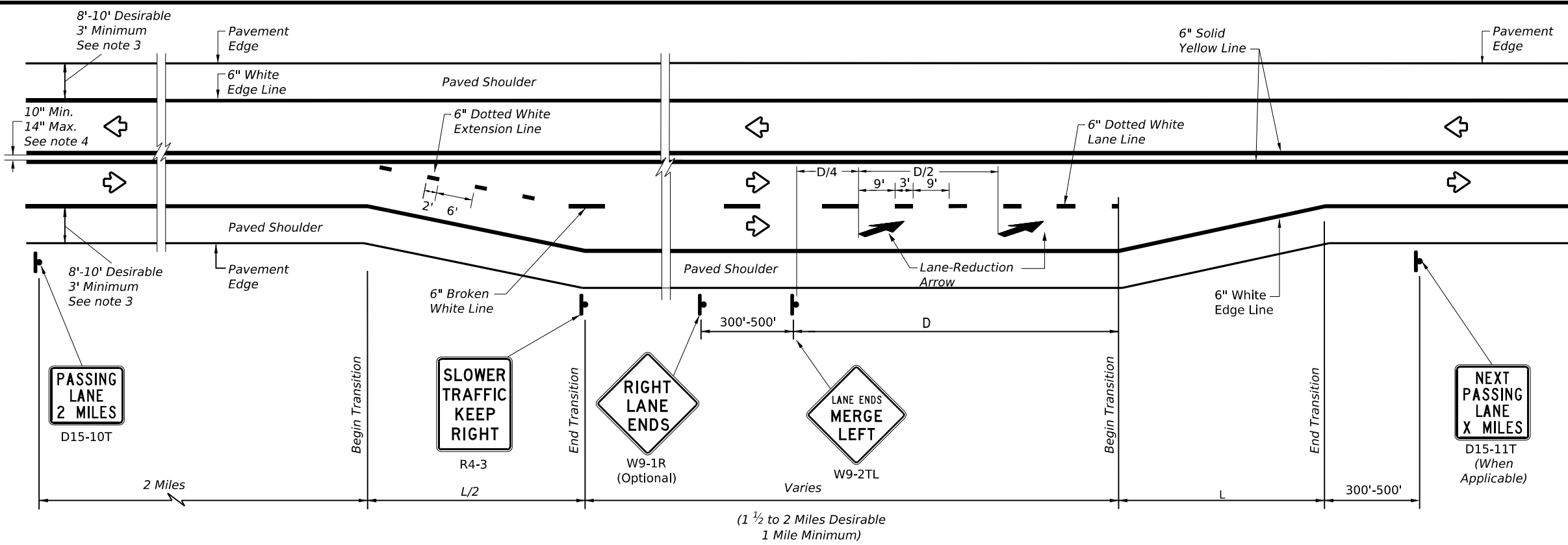
SOLAR POWERED ROADSIDE FLASHING BEACON ASSEMBLY DETAILS
SPRFBA (1) - 13

FILE: spb1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
12-04	DIST	COUNTY	SHEET NO.	
3-13	CRP	JIM WELLS, ETC.	261	

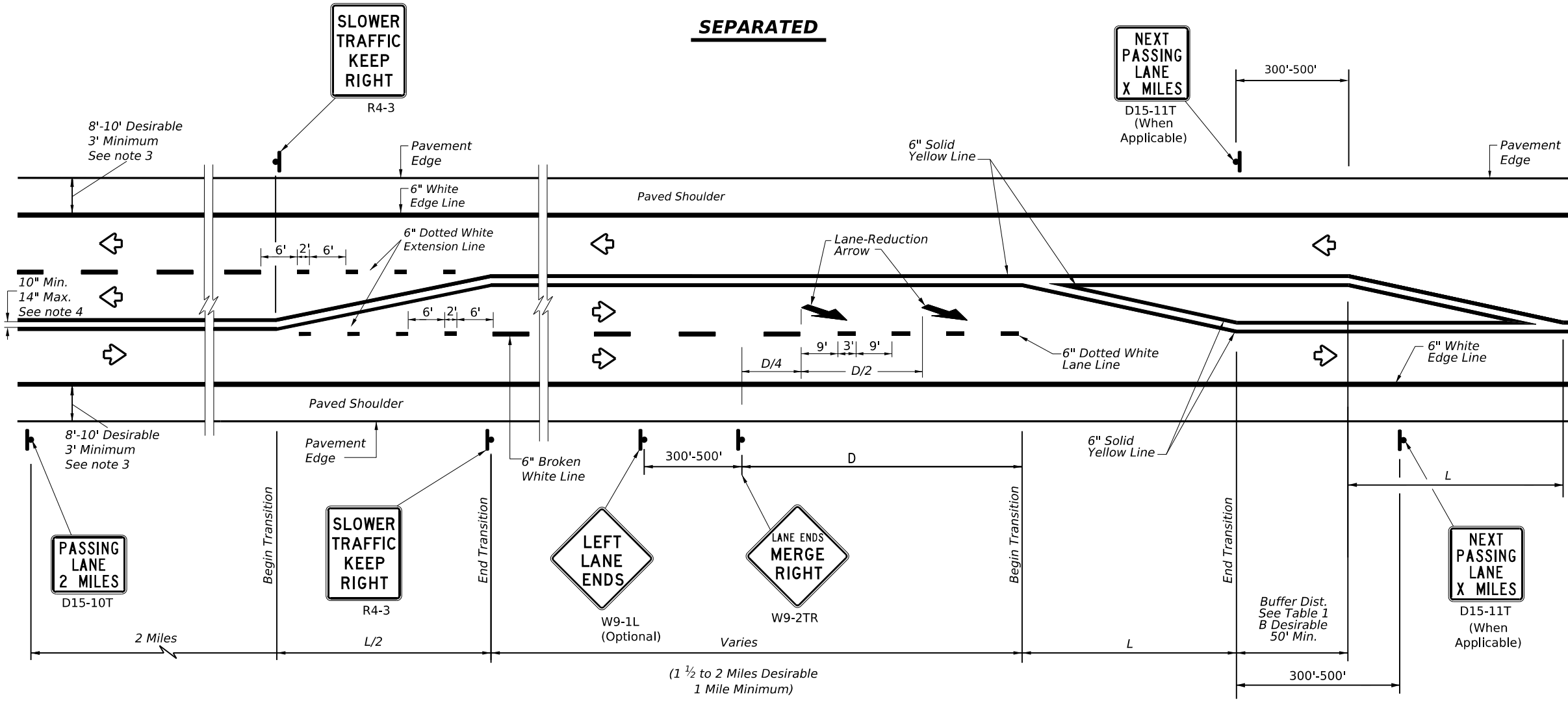
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DATE: FILE:



SEPARATED



ALTERNATING

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	$L = WS$

* Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)
 W=Width of Offset (FT)
 S=Posted Speed (MPH)

EXAMPLE
 A 12 foot lane is added on a 70 mph roadway.
 The length of the transition should be:
 $L = 12 \times 70 = 840$ ft

TABLE 1 ADVANCE WARNING SIGN DISTANCE (D) AND BUFFER DISTANCE (B)		
Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

GENERAL NOTES

- For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
- For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2) - Centerline for All Two Lane Two-Way Roadways. Note that RPMs are not recommended on the 6" dotted white extension lines.
- For rumble strip options available for the designed shoulder width, see Rumble Strip Standard sheet RS(2).
- For pavement marking details, see Pavement Marking Standard sheet PM(1).



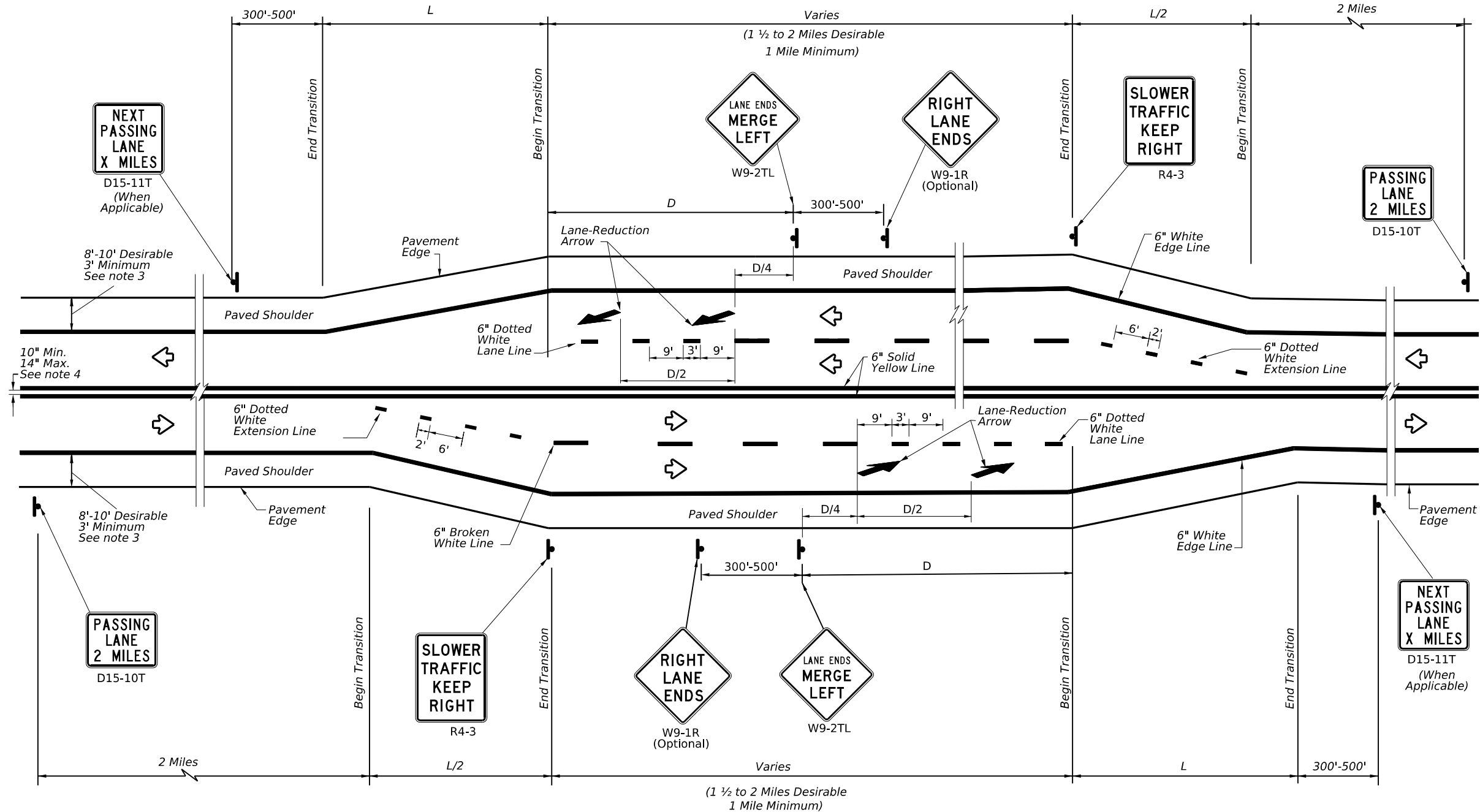
**TEXAS SUPER 2
PASSING LANES**

TS2(PL-1)-23

FILE: ts2-1-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
5-10 3-18	DIST	COUNTY	SHEET NO.	
2-12 2-23	CRP	JIM WELLS, ETC.	262	
3-12				

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DATE:
FILE:



SIDE BY SIDE PASSING LANES

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	$L = WS$

* Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)
W=Width of Offset (FT)
S=Posted Speed (MPH)

EXAMPLE
A 12 foot lane is added on a 70 mph roadway.
The length of the transition should be:
 $L=12 \times 70=840$ ft

TABLE 1 ADVANCE WARNING SIGN DISTANCE (D)	
Posted Speed	D (FT)
40	670
45	775
50	885
55	990
60	1100
65	1200
70	1250
75	1350

GENERAL NOTES

- For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
- For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2) - Centerline for All Two Lane Two-Way Roadways. Note that RPMs are not recommended on the 6" dotted white extension lines.
- For rumble strip options available for the designed shoulder width, see Rumble Strip Standard sheet RS(2).
- For pavement marking details, see Pavement Marking Standard sheet PM(1).



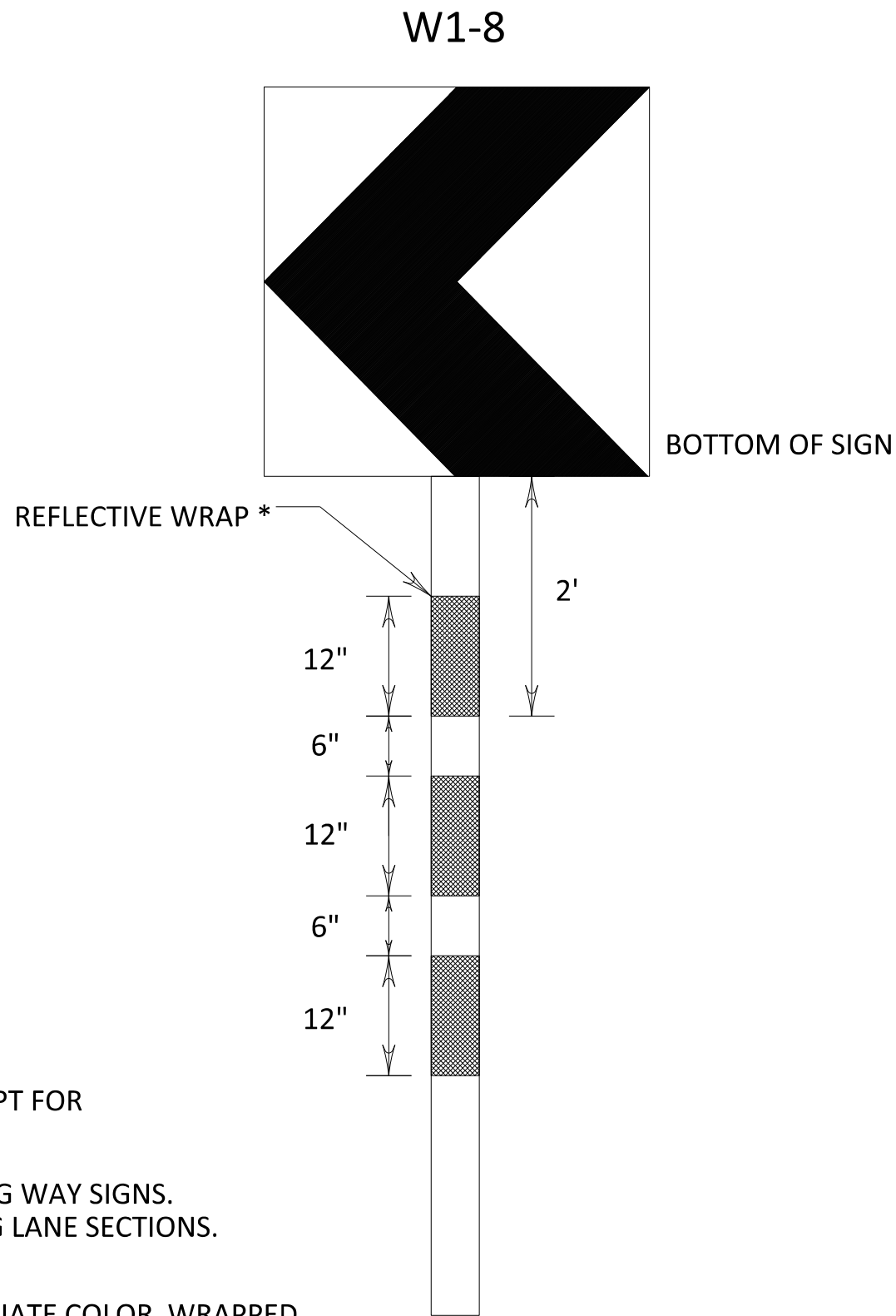
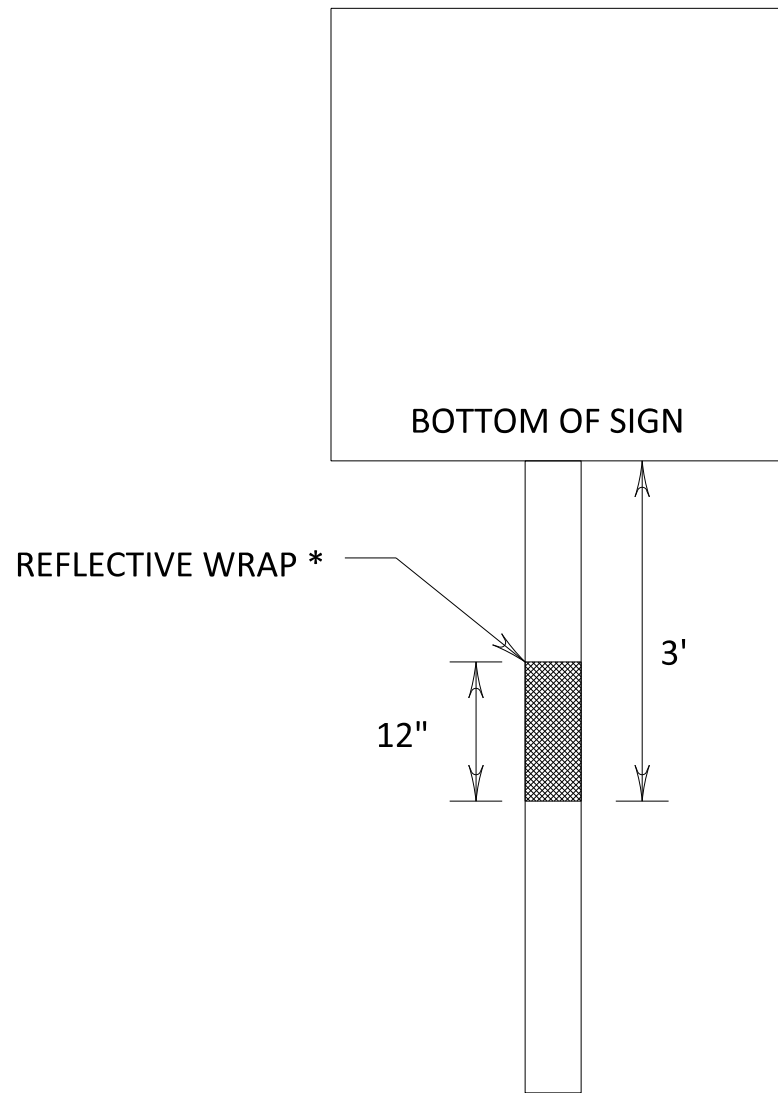
**TEXAS SUPER 2
PASSING LANES**

TS2(PL-2)-23

FILE: ts2-2-23.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
5-10 3-18	DIST	COUNTY	SHEET NO.	
2-12 2-23	CRP	JIM WELLS, ETC.	263	
3-12				

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DATE:
FILE:



REFLECTIVE WRAP COLOR SHALL MATCH THE BACKGROUND OF THE SIGN, EXCEPT FOR STOP AND YIELD SIGNS, WHICH WILL BE RED.

APPLY WRAP TO ALL WARNING SIGNS, STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS. ADDITIONALLY, APPLY WRAP TO THE W9-1R AND W9-2TL SIGNS IN THE PASSING LANE SECTIONS. PLEASE DIRECT ANY QUESTIONS REGARDING THE WRAPS TO THE ENGINEER.

WRAP WILL CONSIST OF A 12" STRIP OF REFLECTIVE MATERIAL OF THE APPROPRIATE COLOR WRAPPED AROUND THE SIGN POST SO THAT THE BOTTOM OF THE STRIP IS POSITIONED 3 FEET FROM THE BOTTOM OF THE SIGN. THE BOTTOM OF THE STRIP WILL BE POSITION 2 FEET FROM THE BOTTOM OF THE SIGN FOR CHEVRON SIGNS (W1-8 SIGNS)

WRAPS WILL BE FURNISHED BY THE CONTRACTOR AND SHALL BE SUBSIDIARY TO ITEM 644.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
<http://www.txdot.gov/>

SHEET 1 OF 1



REFLECTIVE WRAP DETAIL

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT July 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
	DIST	COUNTY		SHEET NO.
	CRP	JIM WELLS, ETC.		264

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept in the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0383-03-024, ETC.

1.2 PROJECT LIMITS:

From: W. SANTA GERTRUDIS ST.

To: US 281

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 27.534447, (Long) -97.534447

END: (Lat) 27.330224, (Long) -98.055080

1.4 TOTAL PROJECT AREA (Acres): 187.21

1.5 TOTAL AREA TO BE DISTURBED (Acres): 43.88

1.6 NATURE OF CONSTRUCTION ACTIVITY:

Project consist of constructing Super 2 passing lanes, which consist of Excavation, Embankment, Grading and Culvert extensions, along with Temporary and Permanent Seeding.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Papalote Fine Sandy Loam	0 to 1 percent slopes
Cranell Sandy Clay Loam	0 to 1 percent slopes
Opelika Fine Sandy Loam	0 to 1 percent slopes
Gertrudis Fine Sandy Loam	0 to 3 percent slopes

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

- Mobilization
- Install sediment and erosion controls
- Blade existing topsoil into windrows, prep ROW, clear and grub
- Remove existing pavement
- Grading operations, excavation, and embankment
- Excavate and prepare subgrade for proposed pavement widening
- Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
- Install proposed pavement per plans
- Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
- Place flex base
- Rework slopes, grade ditches
- Blade windrowed material back across slopes
- Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures

- Other: _____
- Other: _____
- Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Other: _____
- Other: _____
- Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Santa Gertrudi Creek	Stream Segement no. 22 of the Nueces-Rio Grand River Basin

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

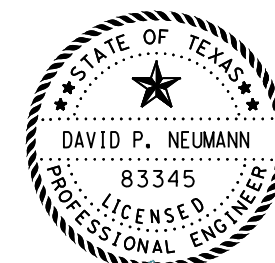
- Development of plans and specifications
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years
- Other: _____
- Other: _____
- Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- Day To Day Operational Control
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years
- Other: _____
- Other: _____
- Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity



David P. Neumann, P.E.

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STORMWATER POLLUTION PREVENTION PLAN (SWP3)



Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
	SEE TITLE SHEET		265
STATE	STATE DIST.	COUNTY	
TEXAS	CRP	JIM WELLS, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0383	03	024, ETC.	SH 141

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams
- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: _____
- Other: _____
- Other: _____
- Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips
- Other: _____
- Other: _____
- Other: _____
- Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- Sediment Trap
 - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
 - 3,600 cubic feet of storage per acre drained
- Sedimentation Basin
 - Not required (<10 acres disturbed)
 - Required (>10 acres) and implemented.
 - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
 - 3,600 cubic feet of storage per acre drained
 - Required (>10 acres), but not feasible due to:
 - Available area/Site geometry
 - Site slope/Drainage patterns
 - Site soils/Geotechnical factors
 - Public safety
 - Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Other: _____
- Other: _____
- Other: _____
- Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: _____
- Other: _____
- Other: _____
- Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

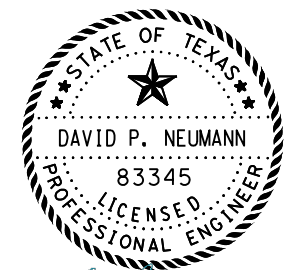
- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3 .

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.



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STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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Sheet 2 of 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
	SEE TITLE SHEET		266
STATE	STATE DIST.	COUNTY	
TEXAS	CRP	JIM WELLS, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0383	03	024, ETC.	SH 141

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DATE: 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. None

2.

No Action Required Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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. No equipment is allowed in any stream channel below the ordinary High Water Mark except on approved temporary stream crossings or drill pads.

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. Escondido Creek (Segment 1901A)
- 2.
- 3.

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 checked="" 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 type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input 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.

- 1.
- 2.
- 3.

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.

1. See Sheet 2 of 2
- 2.
- 3.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

No Action Required Required Action

Action No.

1. See Sheet 2 of 2
- 2.
- 3.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: 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.

- 1.

VII. OTHER ENVIRONMENTAL ISSUES


(includes regional issues such as Edwards Aquifer District, etc.)

No Action Required Required Action

Action No.

1. Water Quality
 - a. Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
 - b. When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

SHEET 1 OF 2

 Texas Department of Transportation		<i>Design Division Standard</i>	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS			
EPIC			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
©TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 (DS) REVISIONS	0383 03 024, ETC.		SH 141
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.	CRP	JIM WELLS, ETC.	

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DATE: FILE:

IV. VEGETATION RESOURCES

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

Amphibians

- a. Be advised of the potential occurrence of the black-spotted newt in the project area. This species prefers warm shallow watered areas with vegetative cover such as arroyos, canals, ditches, or even shallow depressions. During dry seasons the newt lays dormant underground. Ensure that SW3Pand 401 BMPs are implemented and maintained during construction. Avoid harming this species if encountered.
- b. Be advised of the potential occurrence of sheep frog in the project area. This species prefers subterranean burrows, such as those of pack rats. They will also burrow under fallen tree limbs. Although this species will remain in its burrow for most of the year, they may emerge with heavy rains in the late summer season. Breeding takes place in August and September. Ensure that SW3P and 401 BMPs are implemented and maintained during construction. Avoid harming this species if encountered.
- c. Be advised of the potential occurrence of the South Texas siren in the project area. This species usually burrows in mud within marshes and streams. It will occasionally venture onto dry land. The South Texas siren has a characteristic eel-like body with a large head and small lidless eyes. This amphibian has an olive to dark gray or brown coloration with small black spots on the top of its body with light colored spots on the underside of its body. The siren has two reduced limbs behind a large set of external gills. Avoid harming this species if encountered.
- d. Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats. Maintain hydrologic regime and connections between wetlands and other aquatic features. Use silt fencing (barrier) to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
- e. Consider applying hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
- f. Project Specific Locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features. When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crawfish burrows), where feasible. Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible.

Birds

- g. The Federal Migratory Bird Treaty Act (MBTA) states that it is unlawful to pursue, hunt, take, kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit. This project does not have a federal permit; therefore, in accordance with this regulation, the Contractor will avoid disturbing, destroying, removing, or relocating migratory birds and active nests found in trees, culverts, bridges, on the ground, etc. Typical breeding season occurs from March through August; therefore, tree trimming and other vegetation clearing activities that may disturb breeding birds should be done in the non-breeding season (September-February), when possible. If work must be performed during the breeding season, the Contractor shall have a qualified biologist conduct a survey of the right of way to determine if bird nests are present. In the event that active nests are encountered on-site during construction, the Contractor shall notify the Engineer and measures shall be taken to avoid disturbance of these birds, their occupied nest, eggs, and/or young, in accordance with the MBTA. Phasing of work during construction may be necessary to stay in compliance with the MBTA. The Contractor can discuss other preventative measures with the Project Engineer and/or District Environmental Staff.

Insects

- h. Be advised of the potential occurrence of Monarch Butterfly in the project area. At the time of environmental clearance, the monarch butterfly was a federal candidate species under the Endangered Species Act. In the event the monarch butterfly become federally listed prior to or during construction, additional restrictions or activities may be required (ex: additional seeding, fenced or restricted areas, etc.). Avoid harming this species if encountered.

Reptiles

- i. Be advised of the potential occurrence of Texas Scarlet snake in the project area. This species prefers scrub brush areas with sandy soils (easy to burrow). Markings of red and black are next to each other (friend of Jack) and yellow. Active during April - September. Avoid harming this species and unnecessary impacts to burrows if encountered.
- c. Be advised of the potential occurrence of Texas Tortoise in the project area. The Texas tortoise has yellowish orange, "horned" scutes (plates) on its shell and cylindrical and columnar hind legs, like those of an elephant. Range extends from South-Central Texas in the United States southward into the Mexican states of Coahuila, Nuevo Leon, and Tamaulipas. Allow species to safely leave the project area. Avoid harming the species if encountered.
- d. Due to increased activity (mating) of reptiles during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged.
- e. When designing roads with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
- f. If Texas Tortoises are present in a project area, they should be removed from the area. After removal of the tortoises, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude tortoises and other reptiles. The exclusion fence should be constructed and maintained as follows:
 - The exclusion fence should be constructed with metal flashing or drift fence material.
 - Rolled erosion control mesh material should not be used.
 - The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
 - The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.
- g. Avoid or minimize disturbance of downed trees, stumps, and leaf litter, where feasible.
- h. Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species.
- i. If the construction of the project requires the use of open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.

Water Quality


- j. Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- k. When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

Other

- l. Do not attempt to handle or catch any of these species. Report all sightings and/or impacts to the TxDOT Corpus Christ District Environmental Section.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
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MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
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NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

 Texas Department of Transportation		Design Division Standard		
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC				
FILE: epic.dgn	DN: TxDOT	CK: RG	DN: VP	CK: AR
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12-12-2011 (DS) REVISIONS	0383	03	024, ETC.	SH 141
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.	CRP	JIM WELLS		

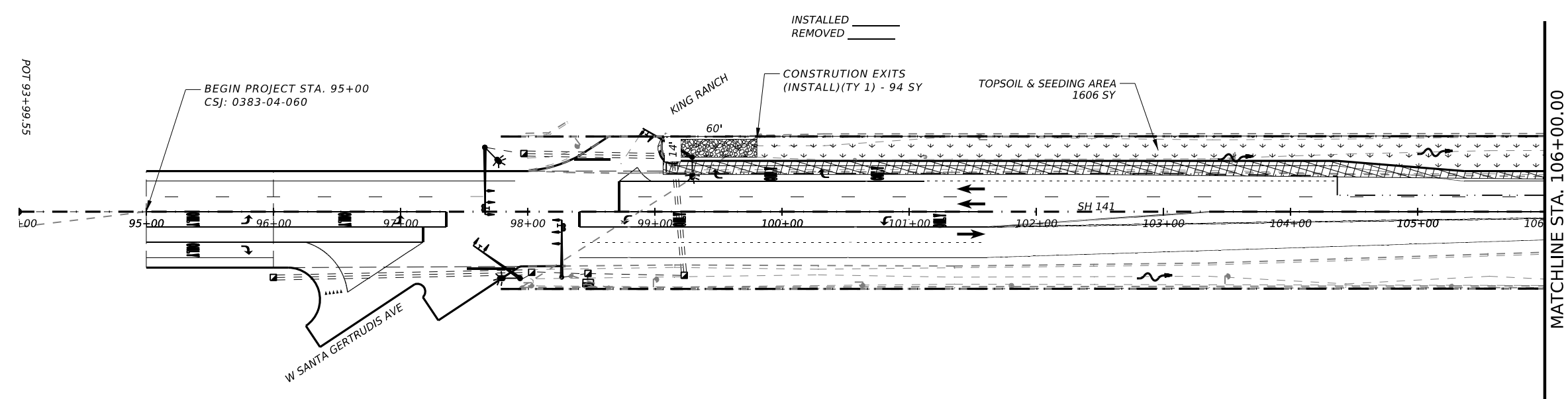
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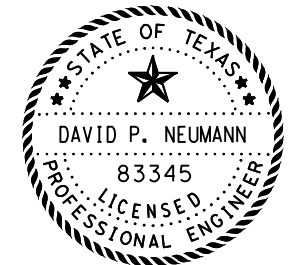
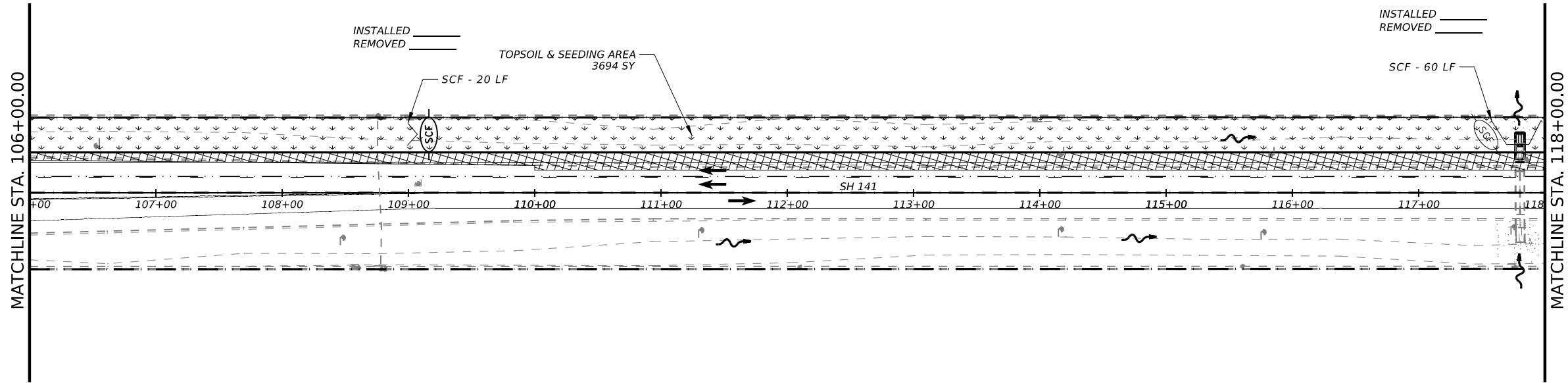
NOTES:

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EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	5300 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	5300 SY
168-6001	VEGETATIVE WATERING	96.6 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	94 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	94 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF



David P. Neumann, P.E.

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EROSION CONTROL LAYOUT

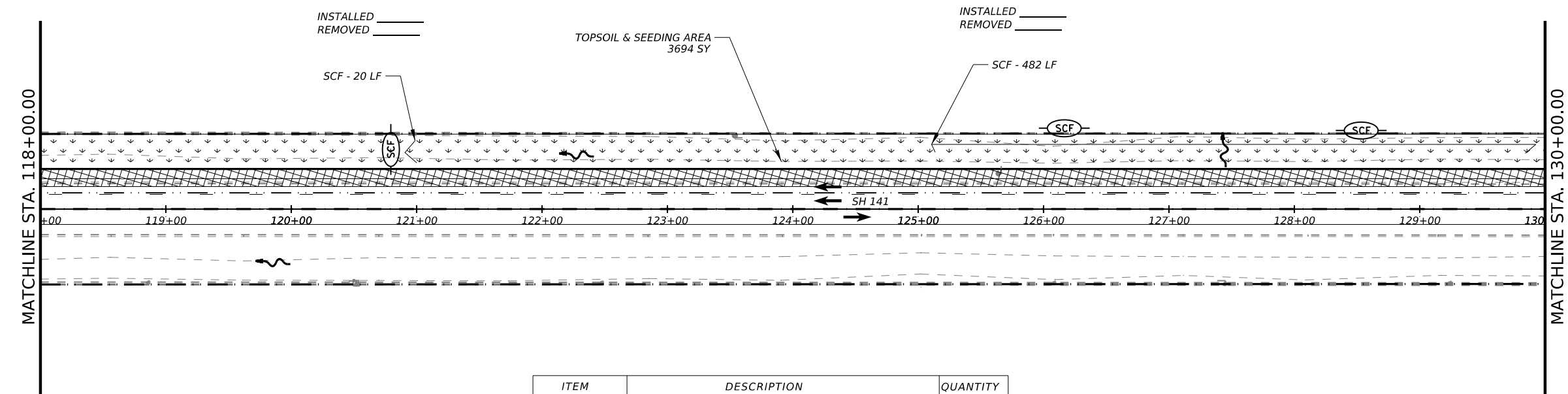
STA. 98+00 TO STA. 118+00

SHEET 1 OF 28

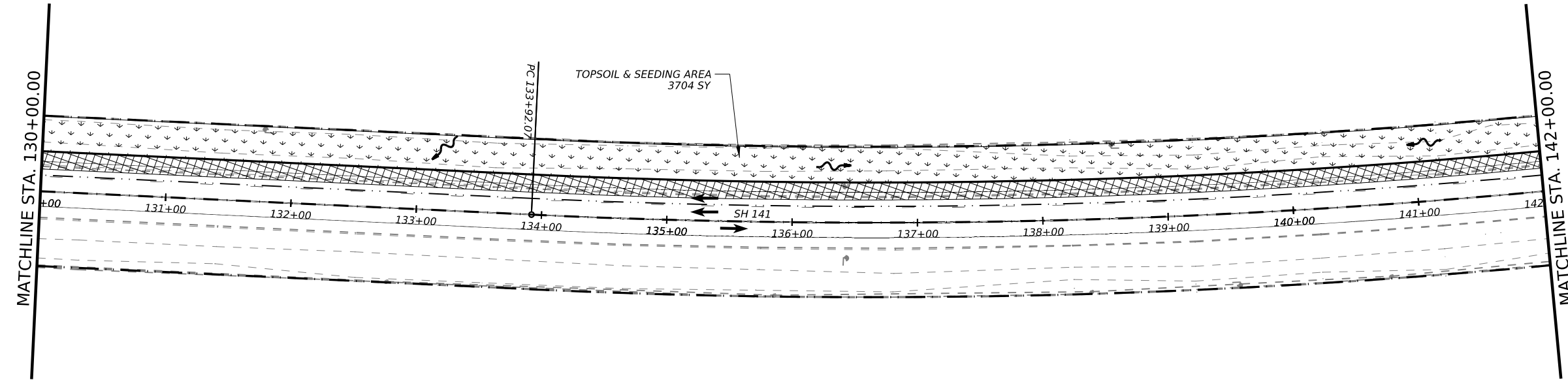
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0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	269	

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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7398 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7398 SY
168-6001	VEGETATIVE WATERING	134.8 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	502 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	502 LF

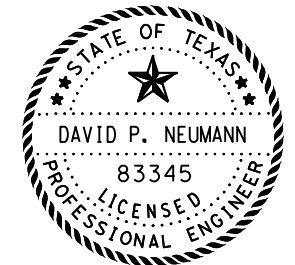
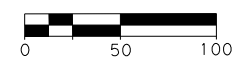


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- LEGEND**
- WORK AREA
 - SEEDING AREA
 - SOIL RETENTION BLANKET
 - SEDIMENT CONTROL FENCE
 - ROCK FILTER DAM TYPE 1
 - DRAINAGE FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 03:15:09-05'00'

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EROSION CONTROL LAYOUT

STA. 118+00 TO STA. 142+00

SHEET 2 OF 28

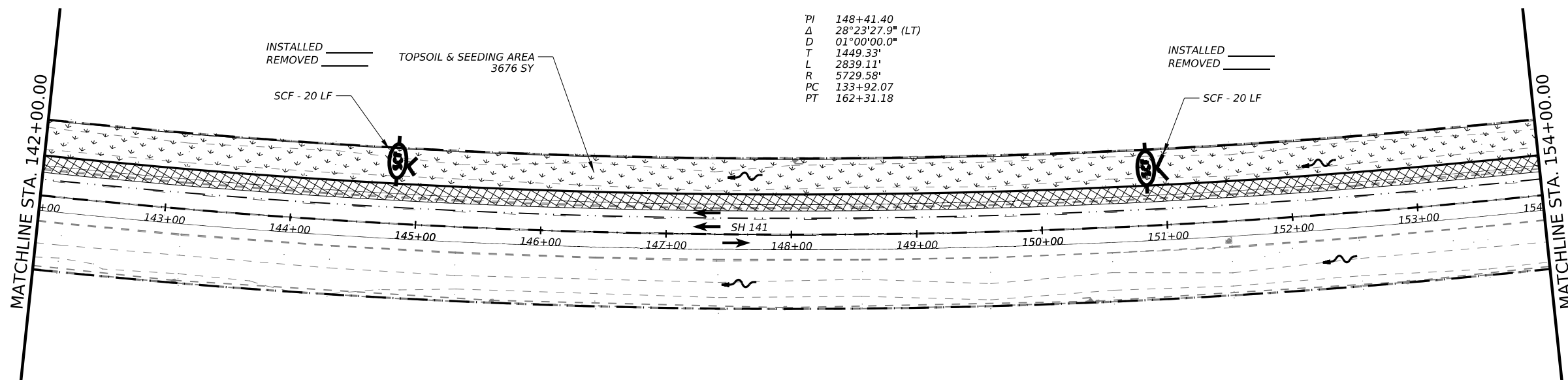
CONT	SECT	JOB	HIGHWAY
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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	270

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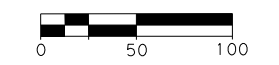
- NOTES:**
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
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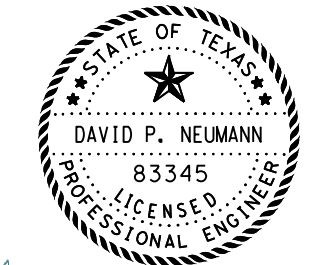
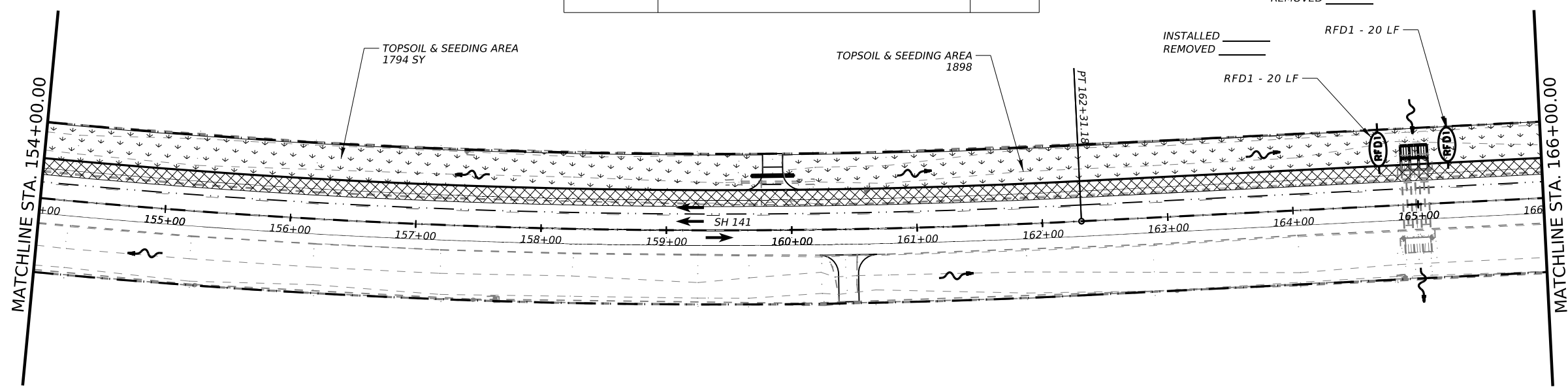
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 T 1449.33'
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 R 5729.58'
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 PT 162+31.18

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SCF - SEDIMENT CONTROL FENCE
- RFD1 - ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7368 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7368 SY
168-6001	VEGETATIVE WATERING	134.3 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	40 LF
506-6011	ROCK FILTER DAMS (REMOVE)	40 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	40 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	40 LF



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EROSION CONTROL LAYOUT

STA. 142+00 TO STA. 166+00

SHEET 3 OF 28

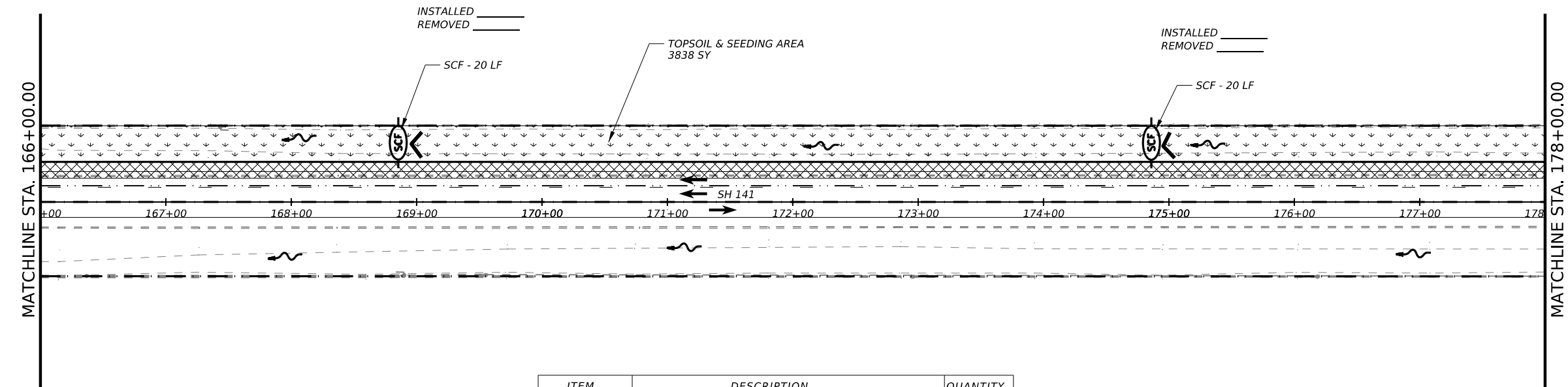
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DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	271	

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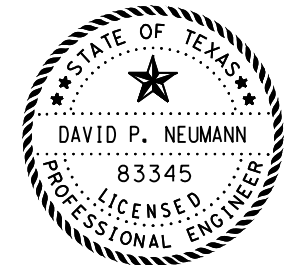
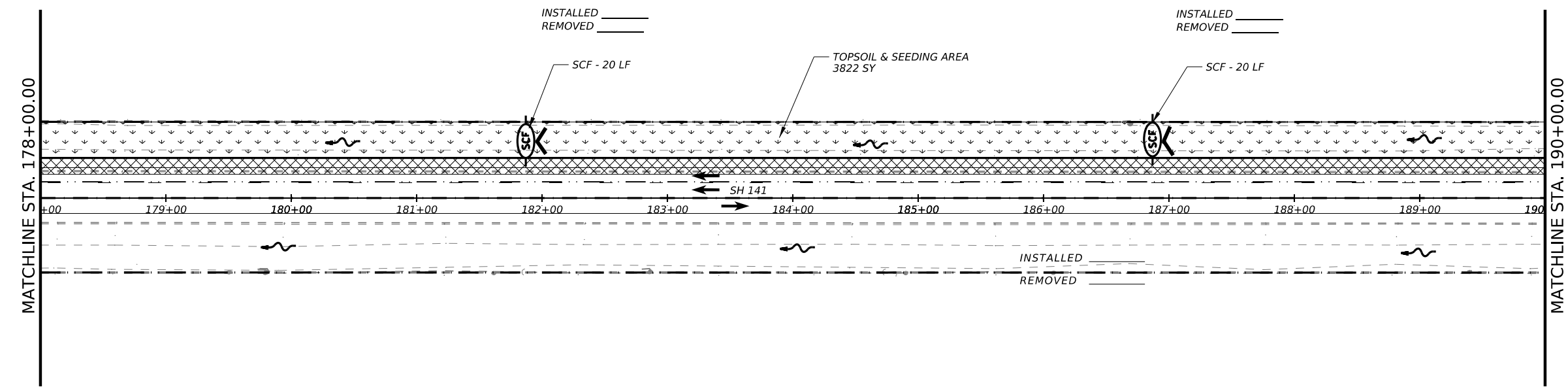
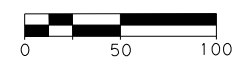


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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7660 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7660 SY
168-6001	VEGETATIVE WATERING	139.6 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF

- LEGEND**
- WORK AREA
 - SEEDING AREA
 - SOIL RETENTION BLANKET
 - SEDIMENT CONTROL FENCE
 - ROCK FILTER DAM TYPE 1
 - DRAINAGE FLOW ARROWS



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2023.07.28 03:14:41-05'00'

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EROSION CONTROL LAYOUT

STA. 166+00 TO STA. 190+00

SHEET 4 OF 28

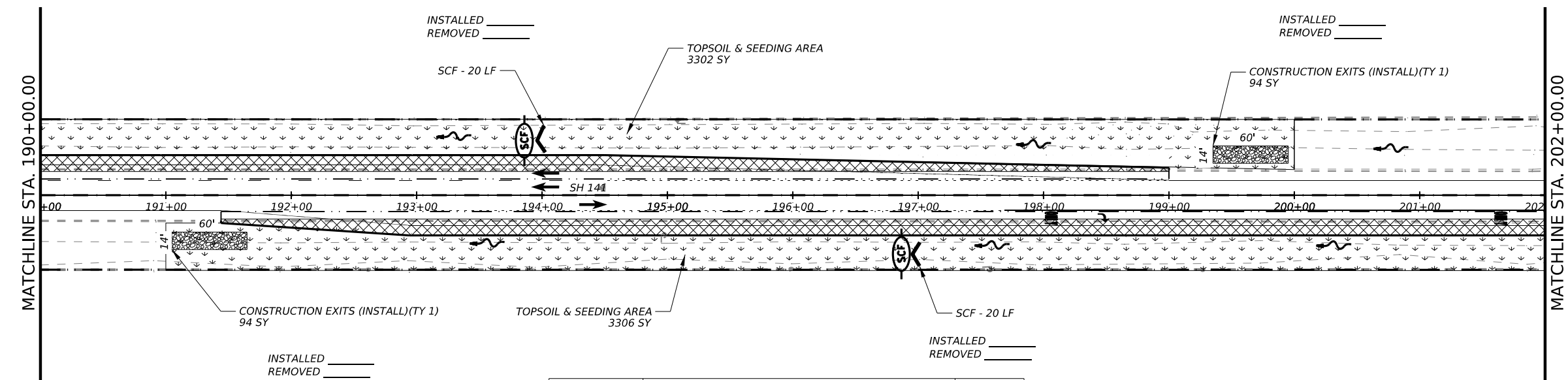
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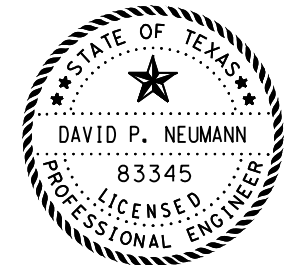
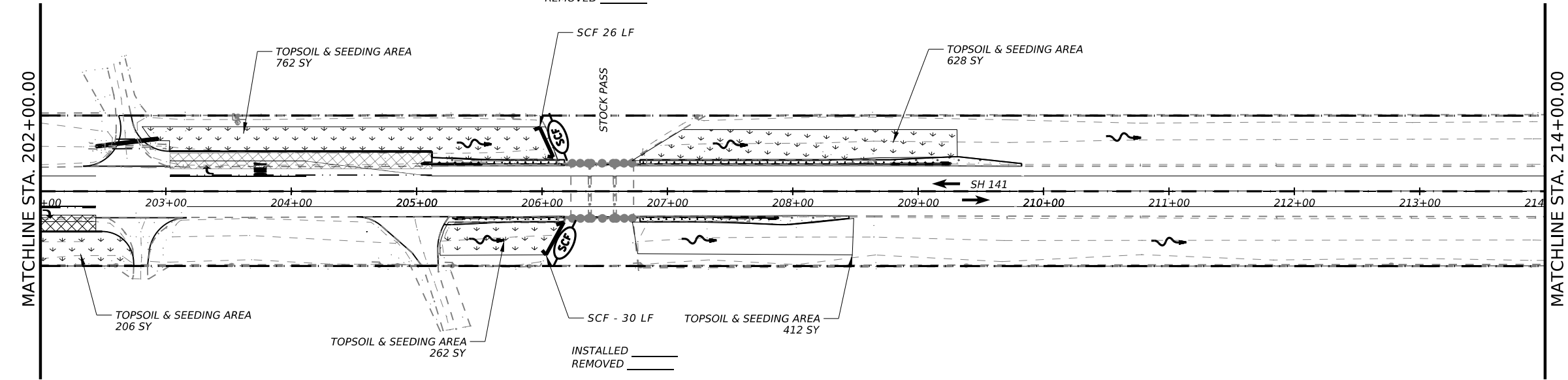
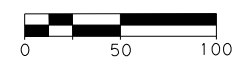


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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	8878 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	8878 SY
168-6001	VEGETATIVE WATERING	161.8 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	188 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	188 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	96 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	96 LF

- LEGEND**
- WORK AREA
 - SEEDING AREA
 - SOIL RETENTION BLANKET
 - SEDIMENT CONTROL FENCE
 - ROCK FILTER DAM TYPE 1
 - DRAINAGE FLOW ARROWS



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2023.07.28 03:14:20-05'00'

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TBPE Firm Reg. No. 10488

Texas Department of Transportation

EROSION CONTROL LAYOUT

STA. 190+00 TO STA. 214+00

SHEET 5 OF 28

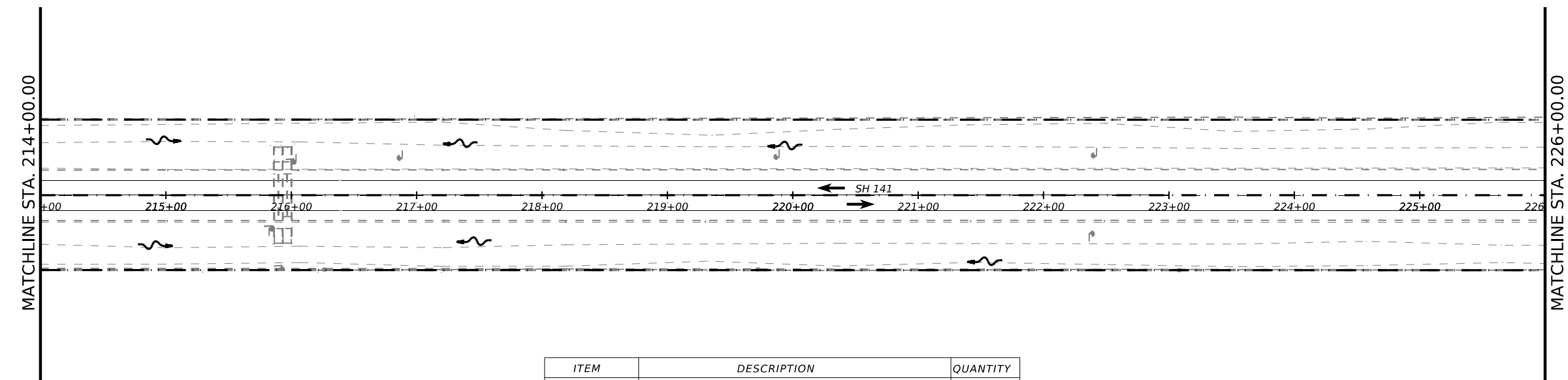
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CRP	JIM WELLS, ETC.		273

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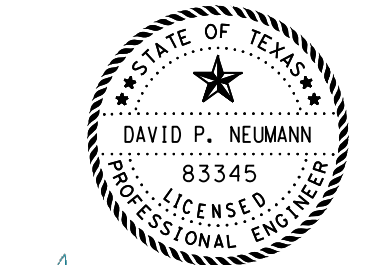
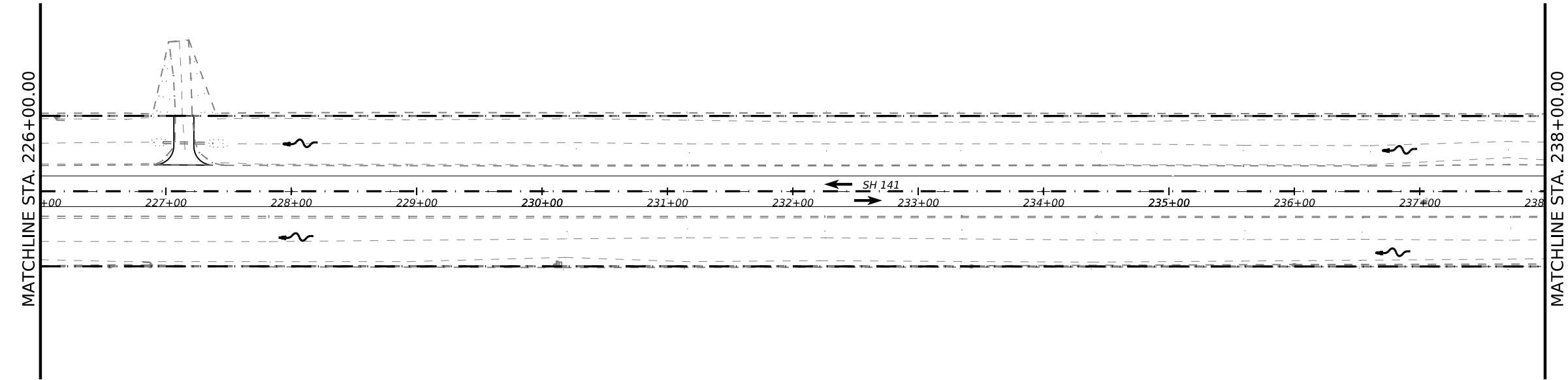
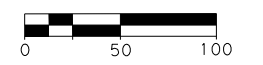


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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	
168-6001	VEGETATIVE WATERING	
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	

- LEGEND**
- WORK AREA
 - SEEDING AREA
 - SOIL RETENTION BLANKET
 - SEDIMENT CONTROL FENCE
 - ROCK FILTER DAM TYPE 1
 - DRAINAGE FLOW ARROWS



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EROSION CONTROL LAYOUT

STA. 214+00 TO STA. 238+00

SHEET 6 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	274	

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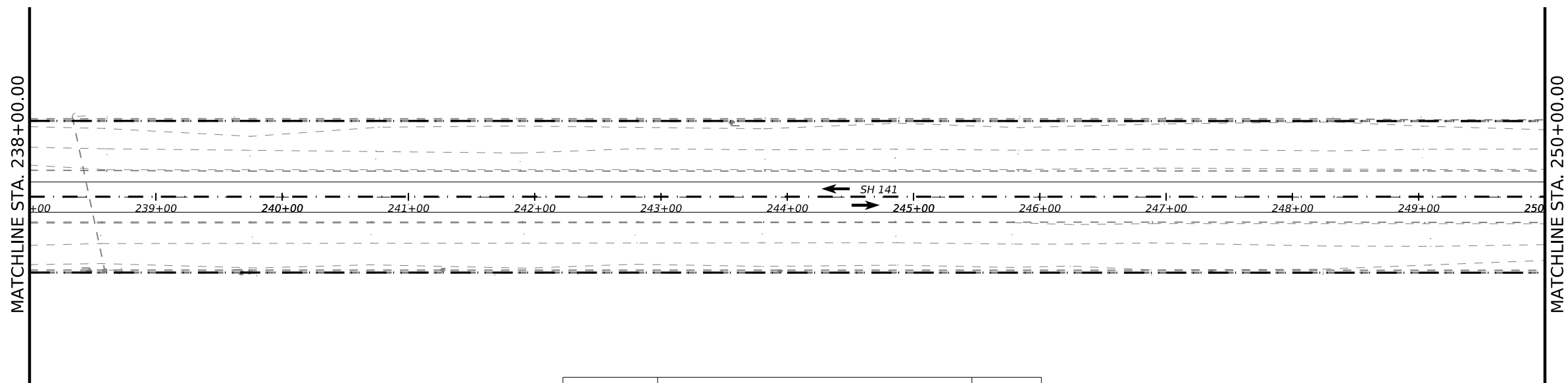
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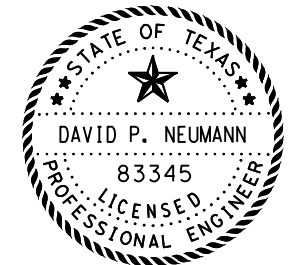
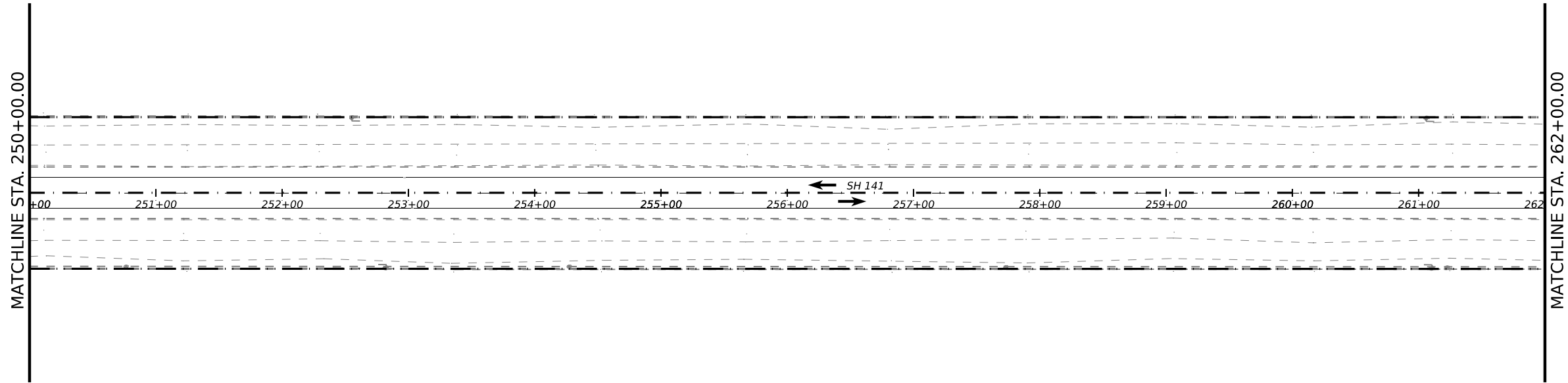
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	
168-6001	VEGETATIVE WATERING	
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	



David P. Neumann, P.E.
 2023.07.28 03:13:51-05'00'

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EROSION CONTROL LAYOUT
 STA. 238+00 TO STA. 262+00

SHEET 7 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		275

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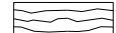



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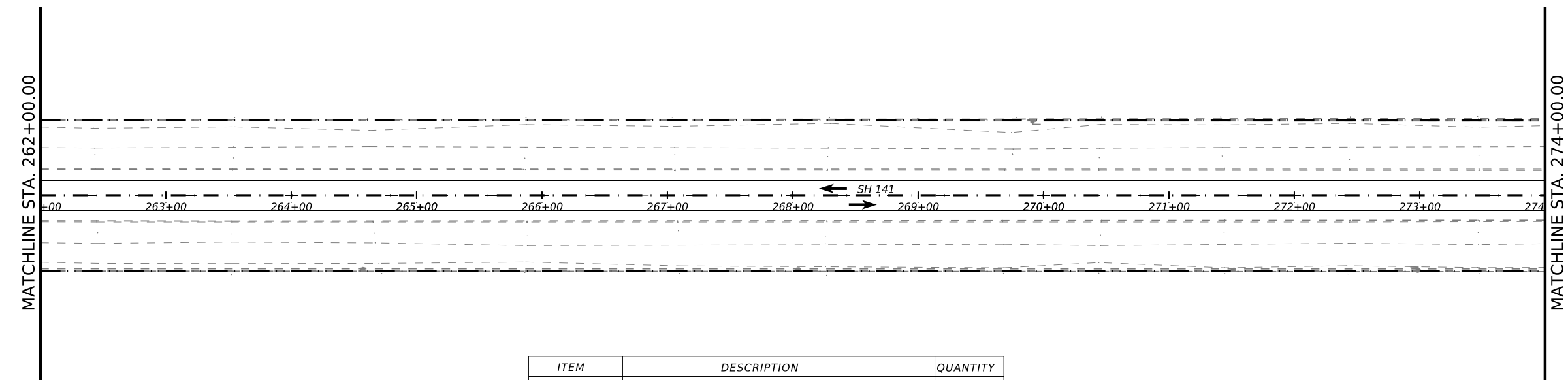
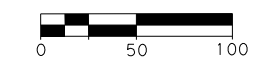


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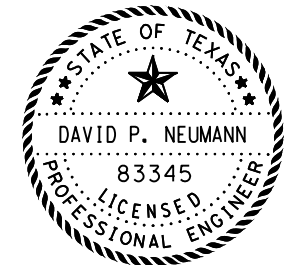
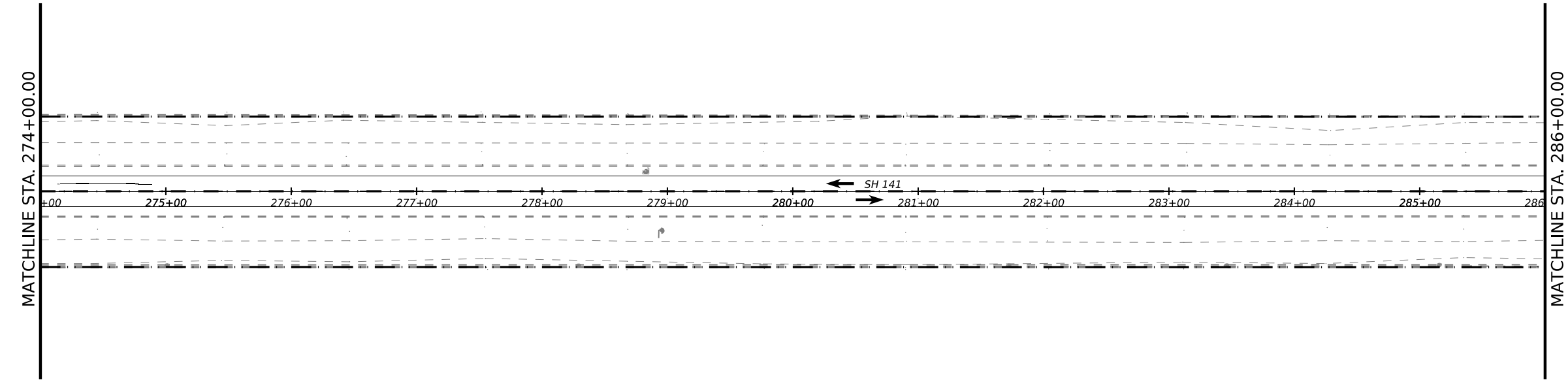
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LEGEND

-  WORK AREA
-  SEEDING AREA
-  SOIL RETENTION BLANKET
-  SEDIMENT CONTROL FENCE
-  ROCK FILTER DAM TYPE 1
-  DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	
168-6001	VEGETATIVE WATERING	
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	



David P. Neumann, P.E.

2023.07.28 03:13:36-05'00'

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EROSION CONTROL LAYOUT

STA. 262+00 TO STA. 286+00

SHEET 8 OF 28

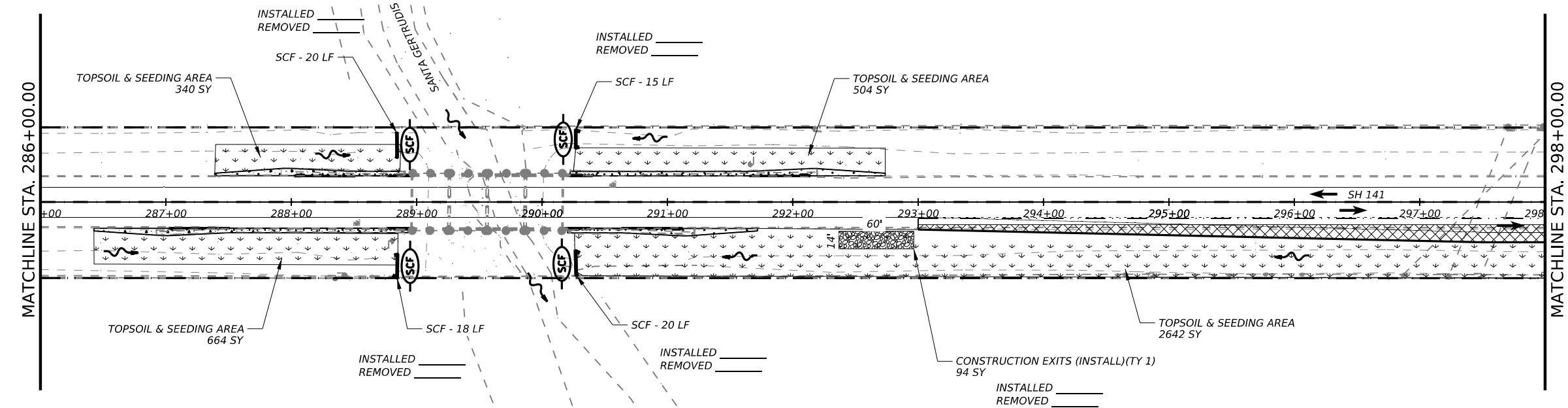
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DIST	COUNTY		SHEET NO.
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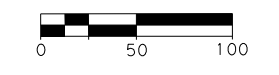


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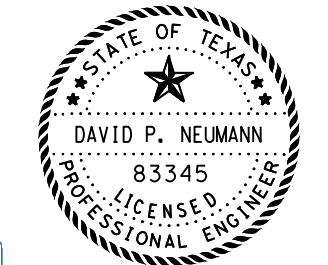
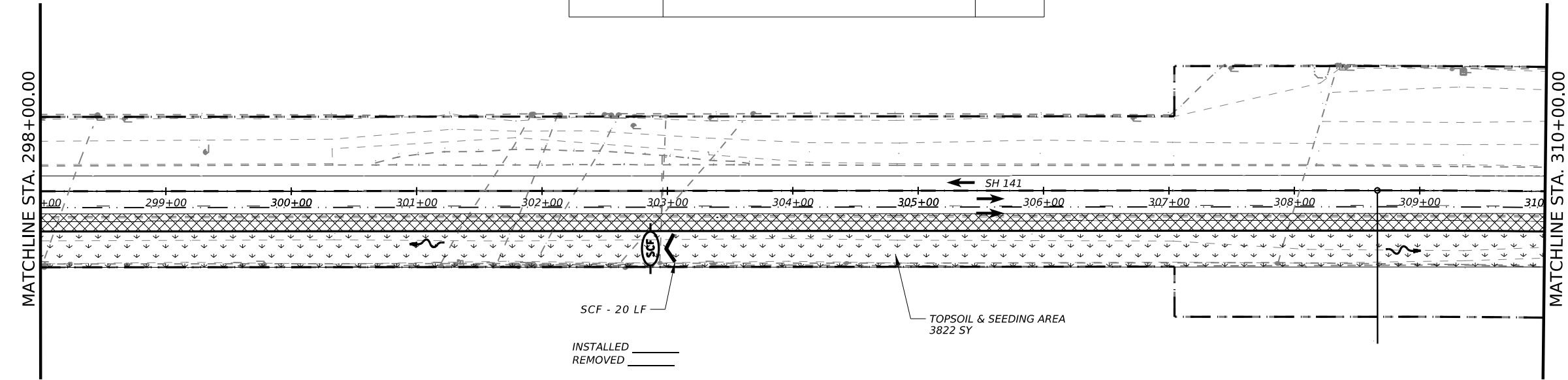


LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7972 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7972 SY
168-6001	VEGETATIVE WATERING	145.3 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	94 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	94 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	93 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	93 LF



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2023.07.28 03:13:21-05'00'

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EROSION CONTROL LAYOUT

STA. 286+00 TO STA. 310+00

SHEET 9 OF 28

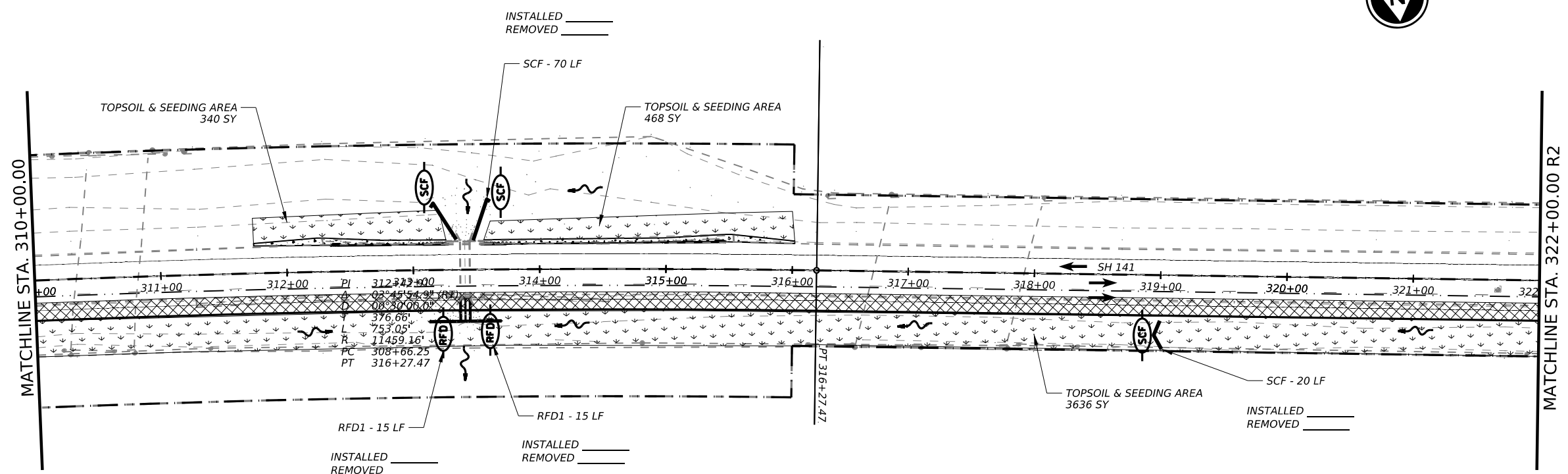
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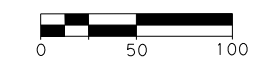


- NOTES:**
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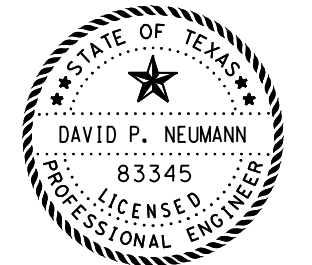
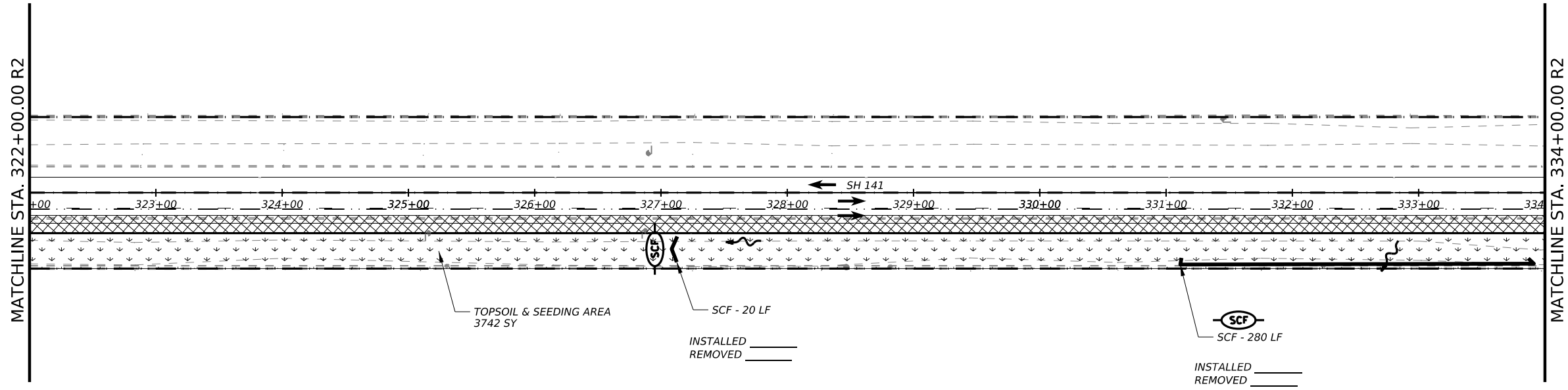


LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	8186 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	8186 SY
168-6001	VEGETATIVE WATERING	149.2 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	30 LF
506-6011	ROCK FILTER DAMS (REMOVE)	30 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	390 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	390 LF



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EROSION CONTROL LAYOUT

STA. 322+00 TO STA. 334+00

SHEET 10 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		278

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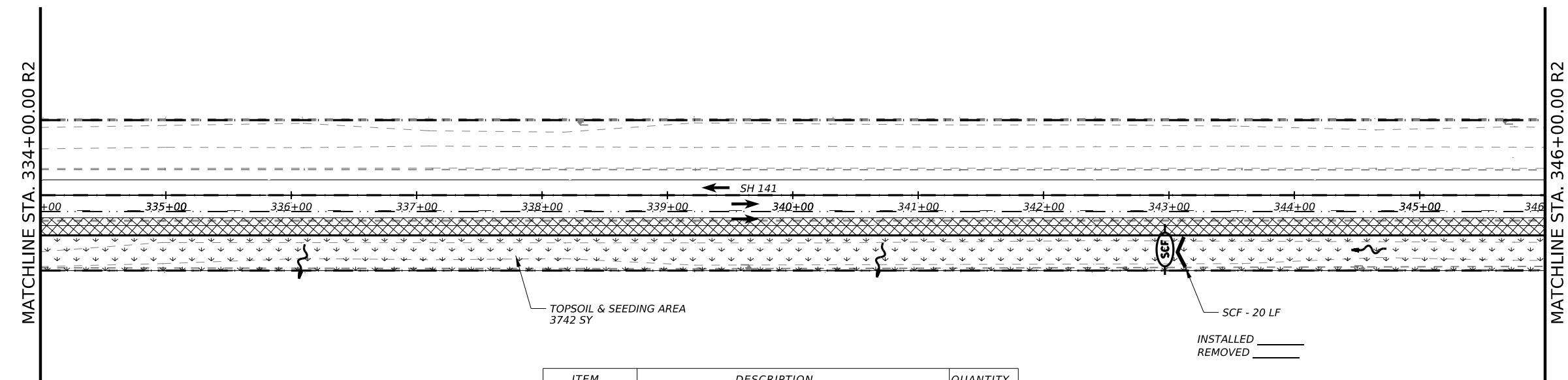
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NOTES:

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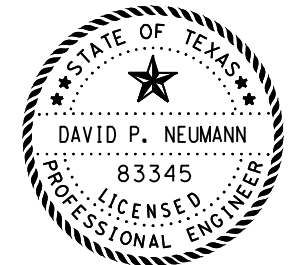
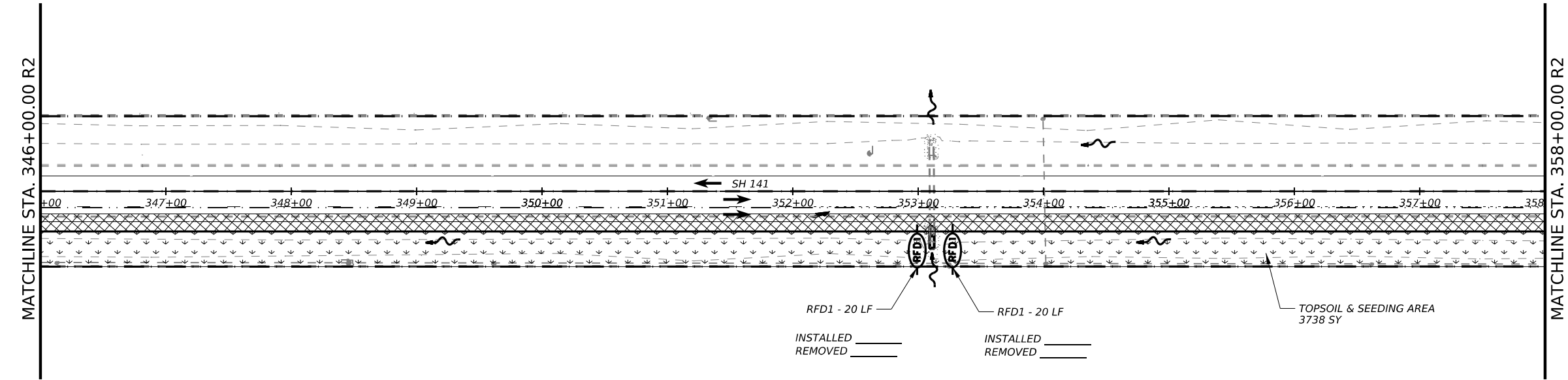
EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7520 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7520 SY
168-6001	VEGETATIVE WATERING	137.1 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	40 LF
506-6011	ROCK FILTER DAMS (REMOVE)	40 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	20 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	20 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



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EROSION CONTROL LAYOUT

STA. 334+00 TO STA. 358+00

SHEET 11 OF 28

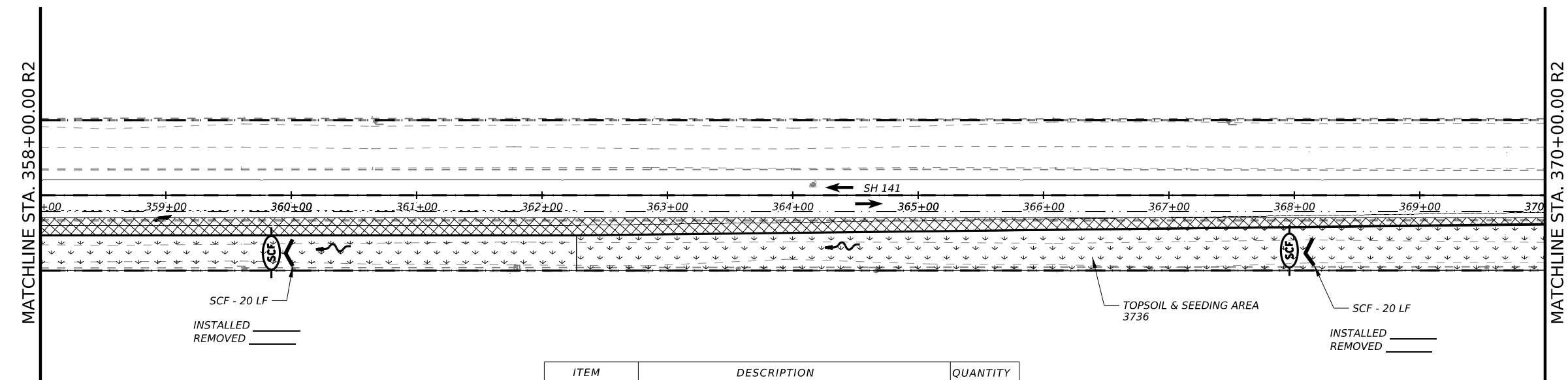
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0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		279

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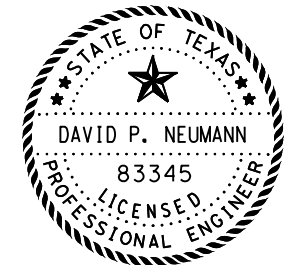
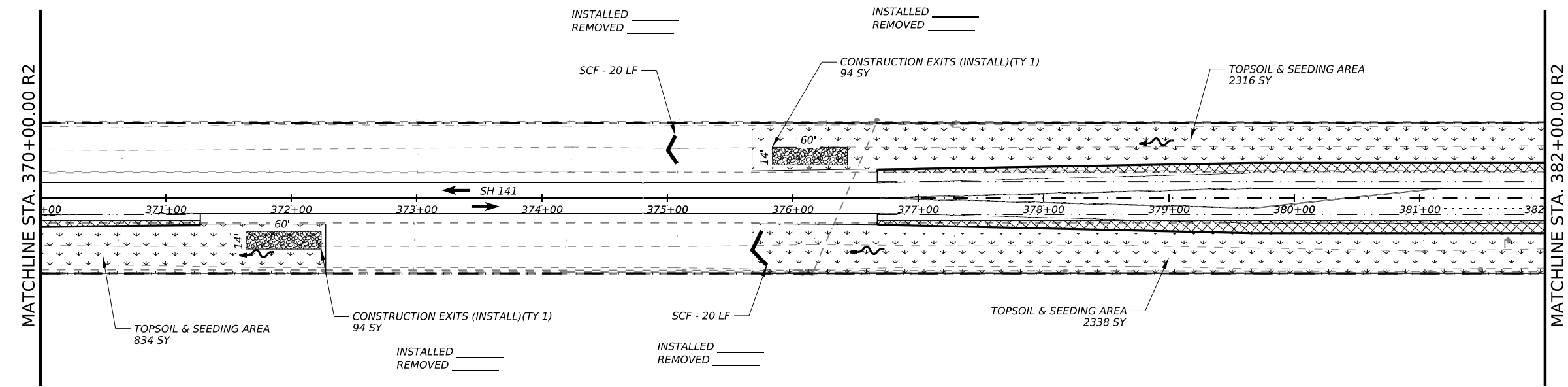
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4*)	9224 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	9224 SY
168-6001	VEGETATIVE WATERING	168.1 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	188 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	188 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



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2023.07.28 03:12:36-05'00'

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EROSION CONTROL LAYOUT

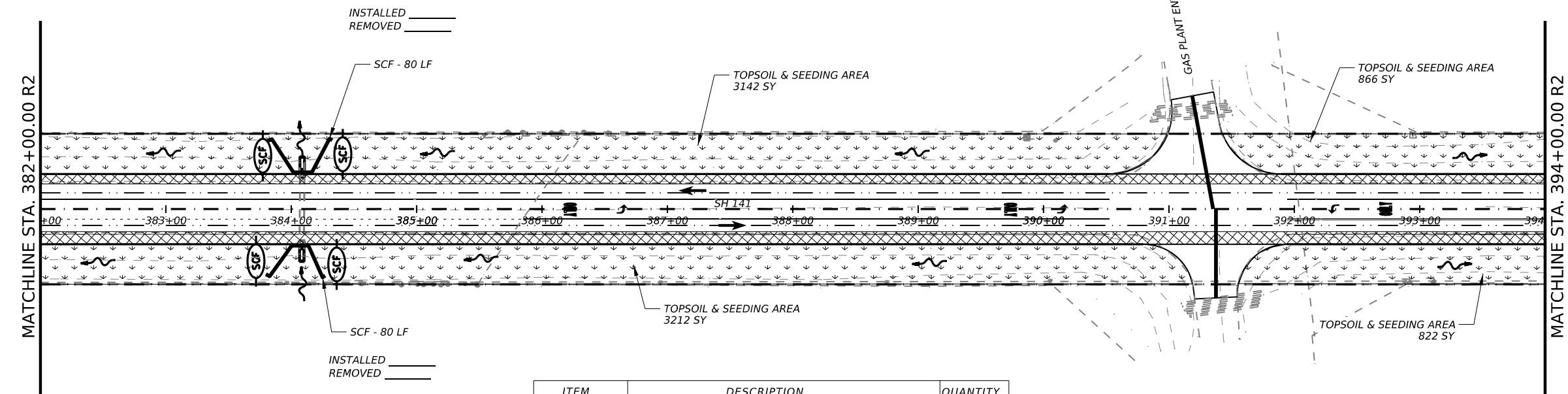
STA. 358+00 TO STA. 382+00

SHEET 12 OF 28

CONT	SECT	JOB	HIGHWAY
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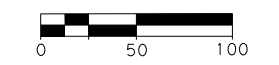
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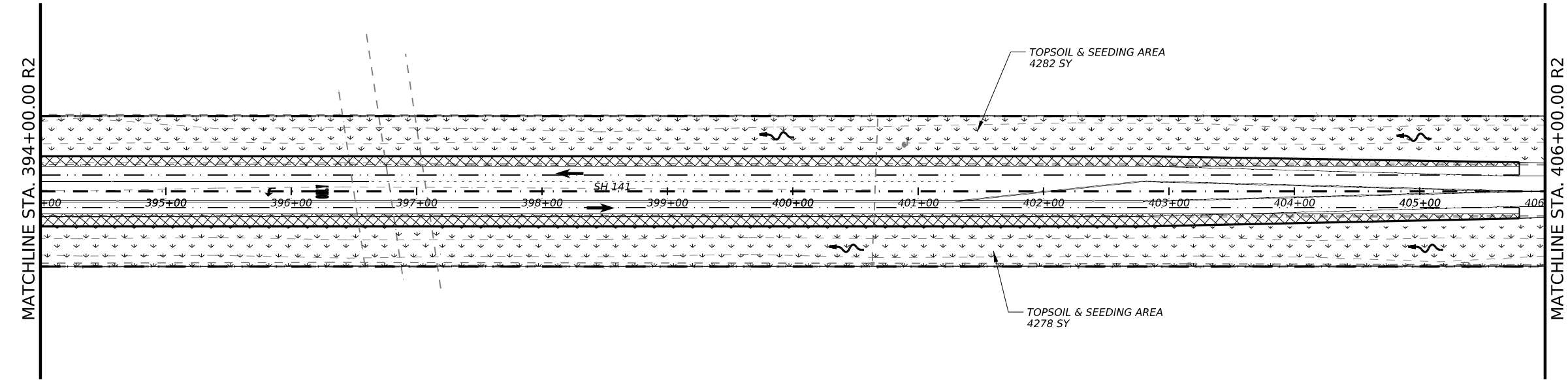
EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4*)	16602 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	16602 SY
168-6001	VEGETATIVE WATERING	302.6 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	160 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	160 LF



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EROSION CONTROL LAYOUT
STA. 382+00 TO STA. 406+00

SHEET 13 OF 28

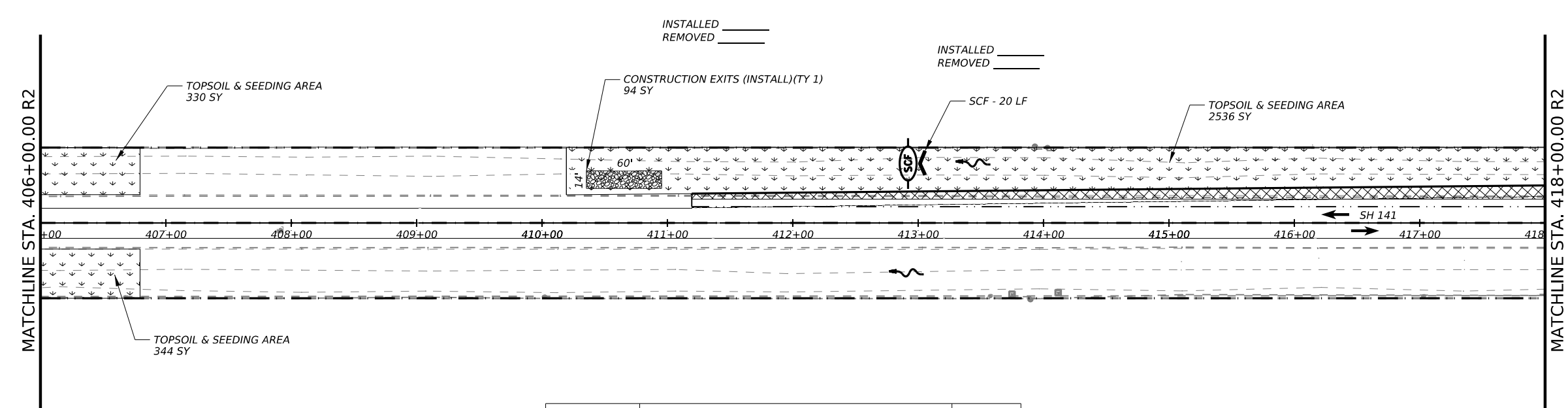
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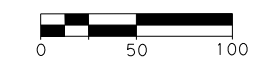


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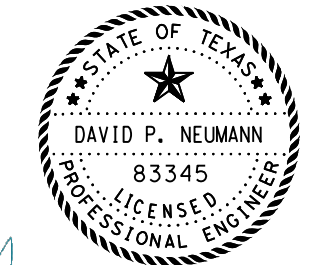
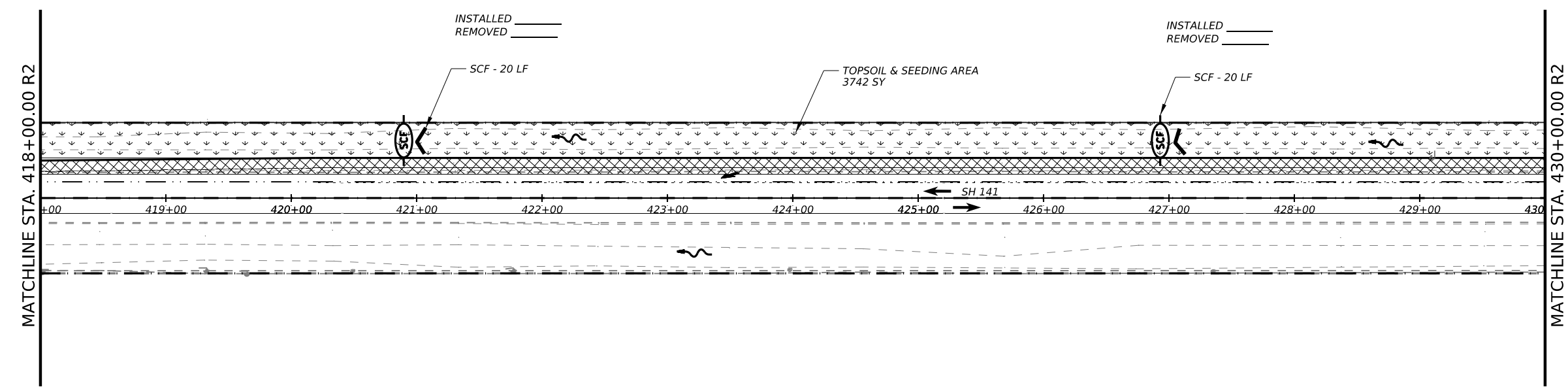


LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	6952 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	6952 SY
168-6001	VEGETATIVE WATERING	126.7 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	94 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	94 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	60 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	60 LF



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EROSION CONTROL LAYOUT

STA. 406+00 TO STA. 430+00

SHEET 14 OF 28

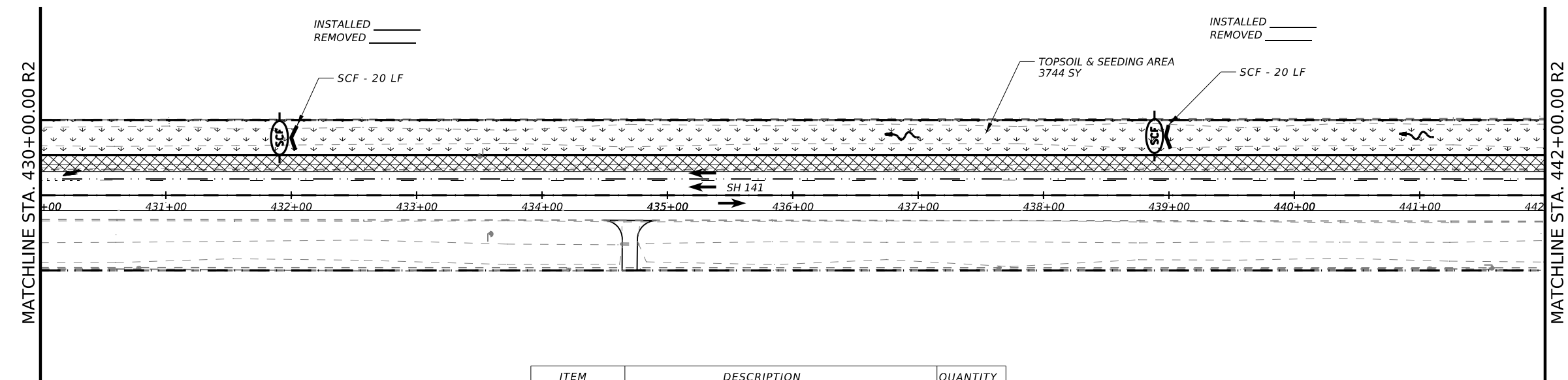
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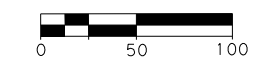


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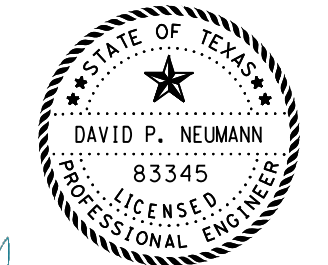
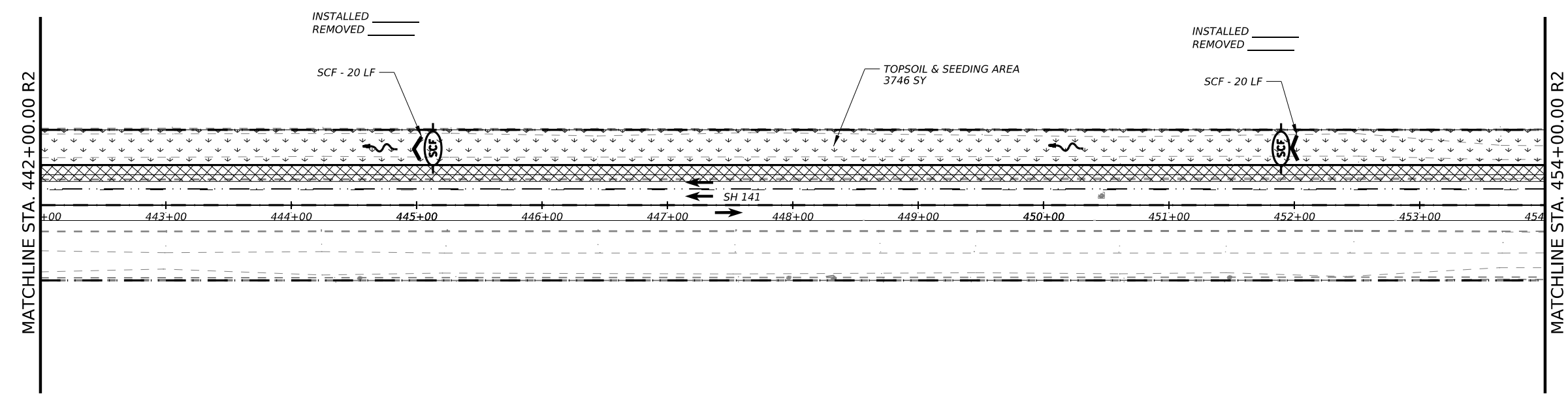


LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7490 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7490 SY
168-6001	VEGETATIVE WATERING	136.5 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF



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2023.07.28 03:11:59-05'00'

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EROSION CONTROL LAYOUT

STA. 430+00 TO STA. 454+00

SHEET 15 OF 28

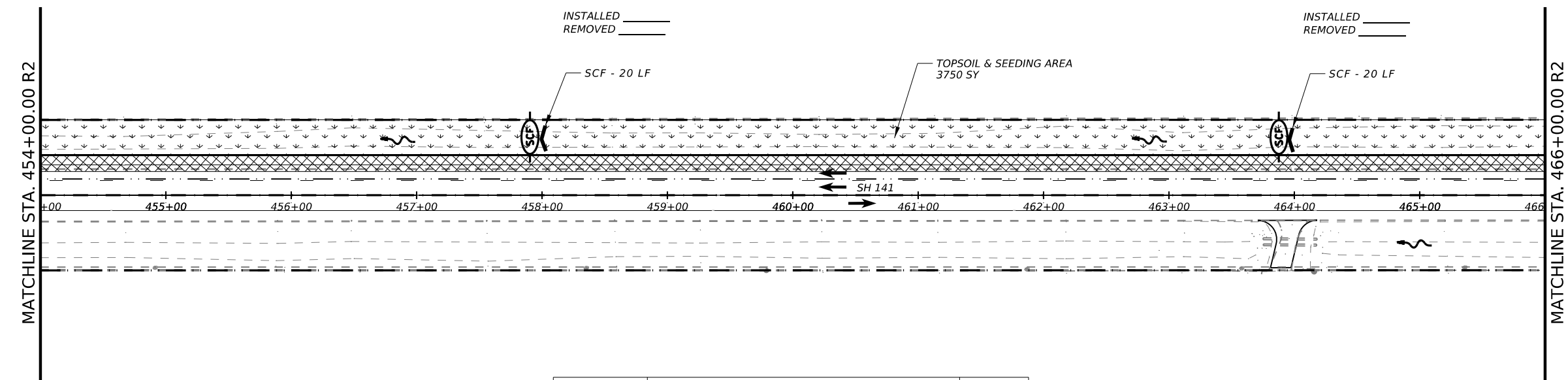
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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	283

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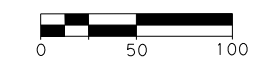


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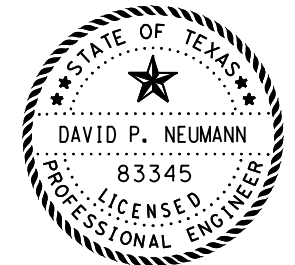
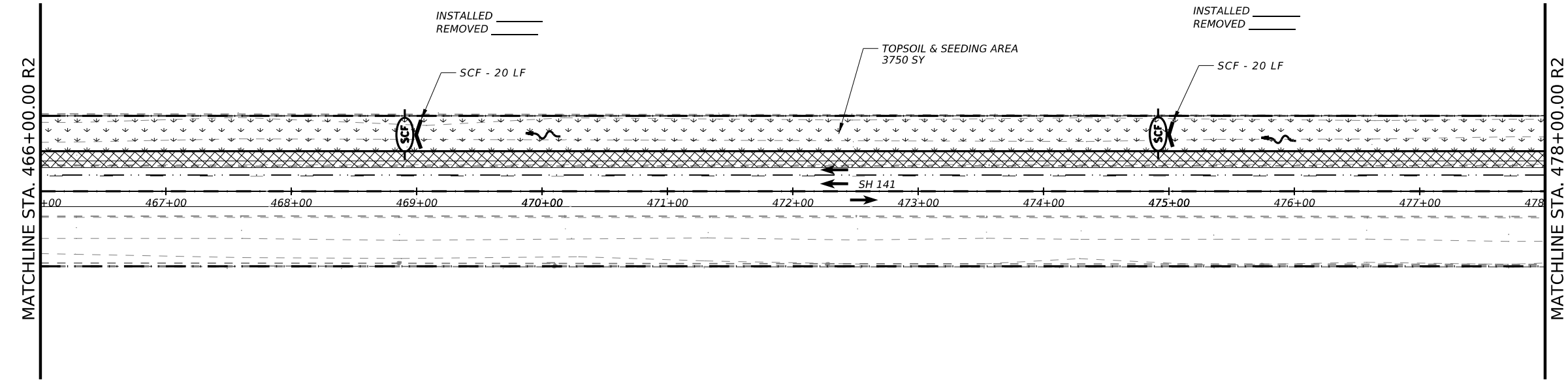


LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7500 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7500 SY
168-6001	VEGETATIVE WATERING	136.7 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF



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2023.07.28 03:11:05-05'00'

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EROSION CONTROL LAYOUT

STA. 454+00 TO STA. 478+00

SHEET 16 OF 28

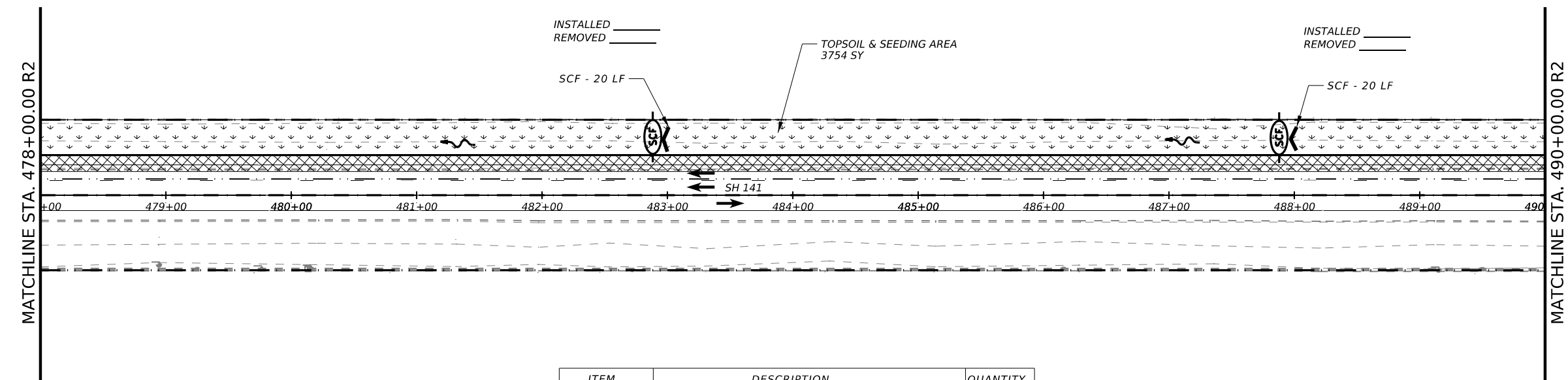
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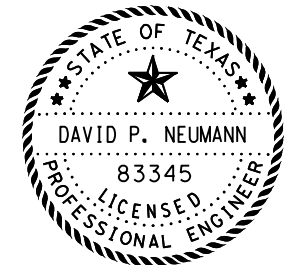
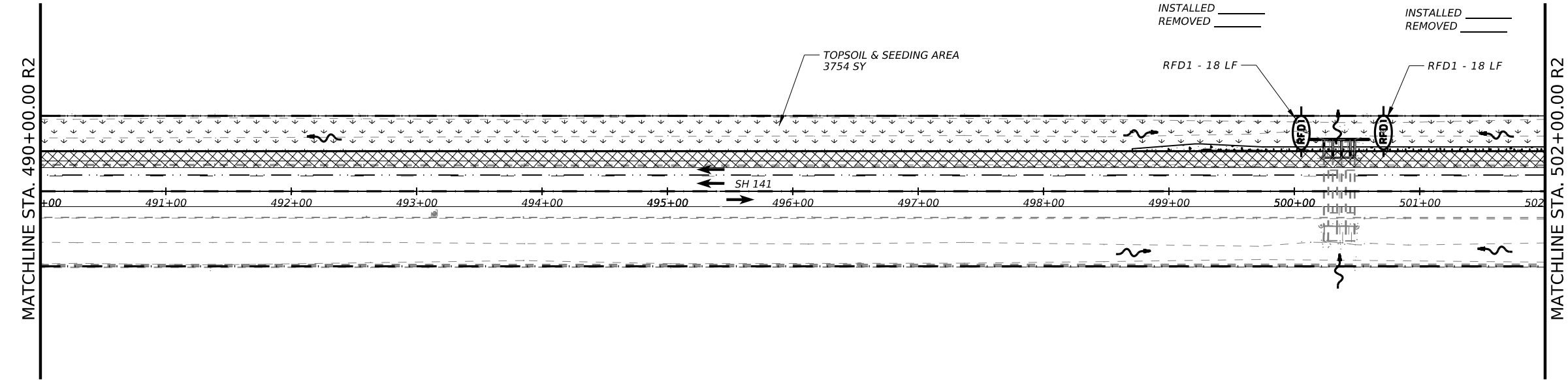
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7508 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7508 SY
168-6001	VEGETATIVE WATERING	136.8 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	273.7 LF
506-6011	ROCK FILTER DAMS (REMOVE)	36 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	36 LF
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	40 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	40 LF



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SHEET 17 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
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CRP	JIM WELLS, ETC.		285

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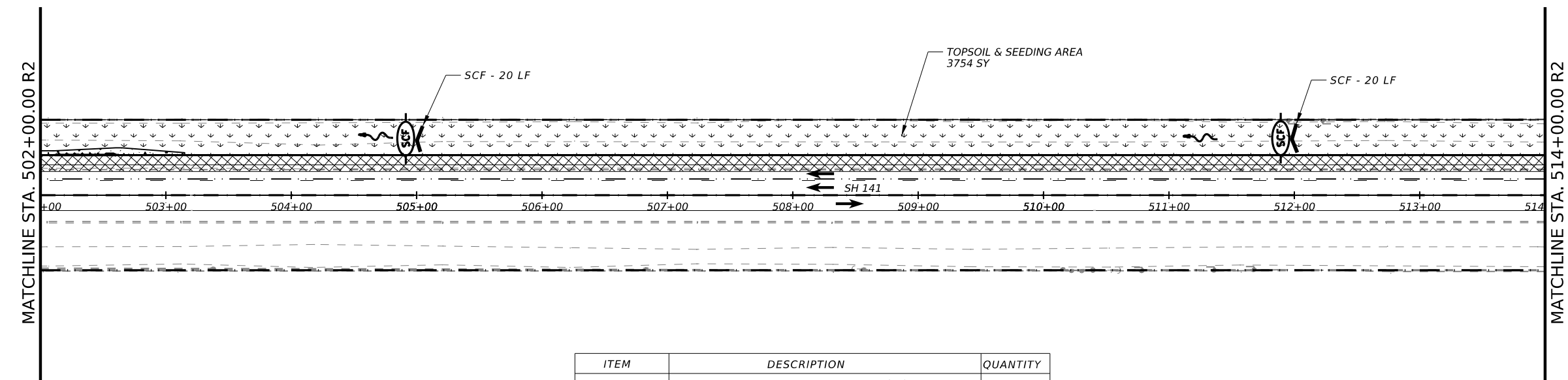
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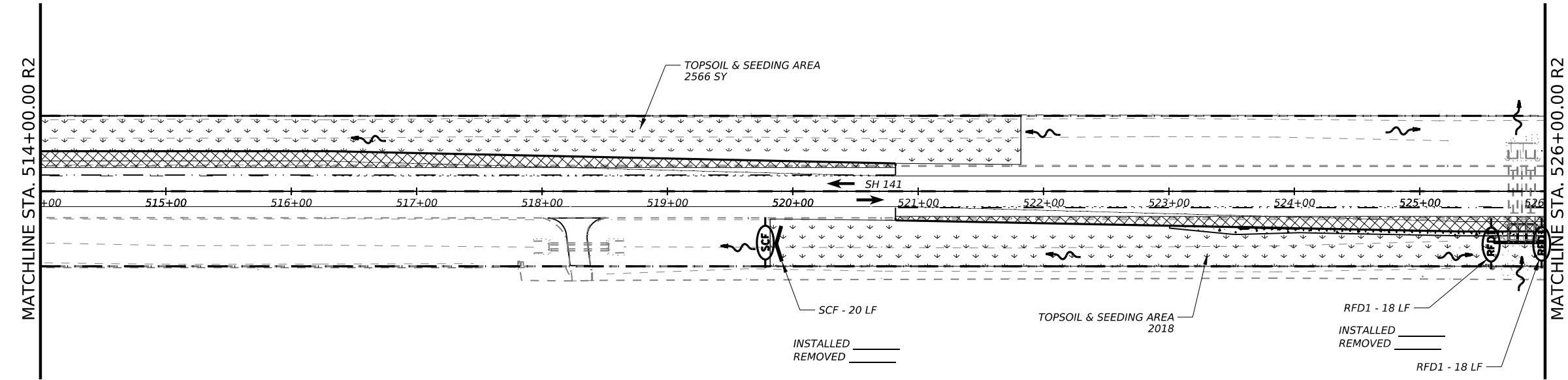
EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4*)	8338 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	8338 SY
168-6001	VEGETATIVE WATERING	152.0 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	304.0 LF
506-6011	ROCK FILTER DAMS (REMOVE)	36 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	36 LF
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	60 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	60 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



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EROSION CONTROL LAYOUT
STA. 502+00 TO STA. 526+00

SHEET 18 OF 28

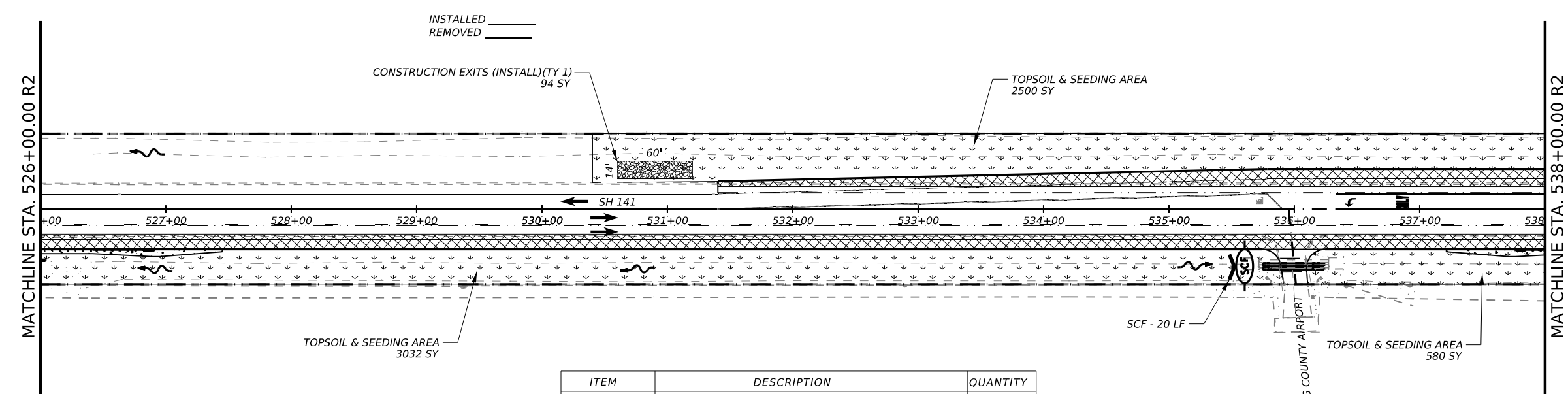
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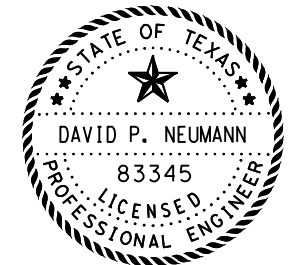
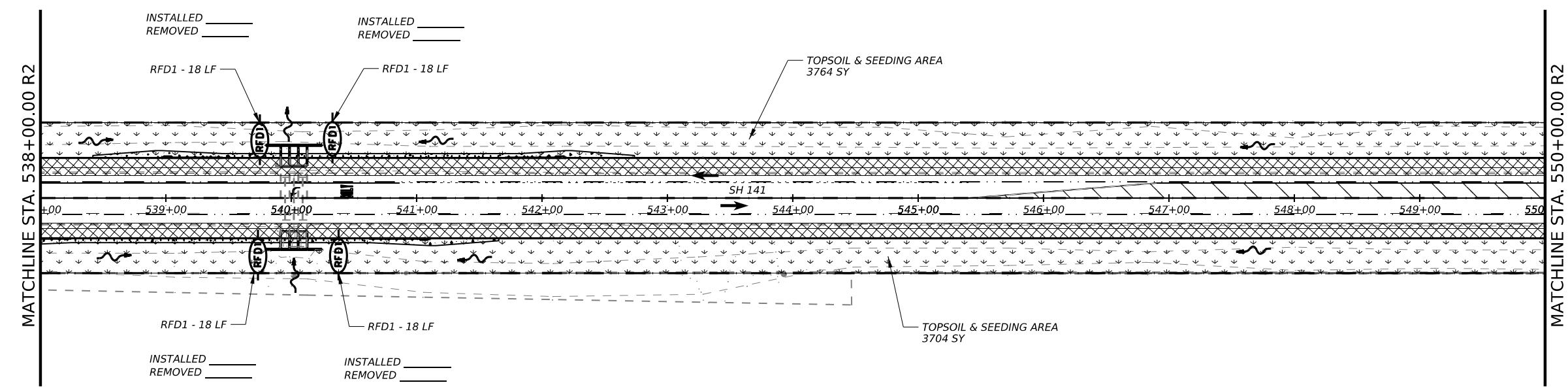
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	13580 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	13580 SY
168-6001	VEGETATIVE WATERING	247.5 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	72 LF
506-6011	ROCK FILTER DAMS (REMOVE)	72 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	94 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	94 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	20 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	20 LF



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STA. 526+00 TO STA. 550+00

SHEET 19 OF 28

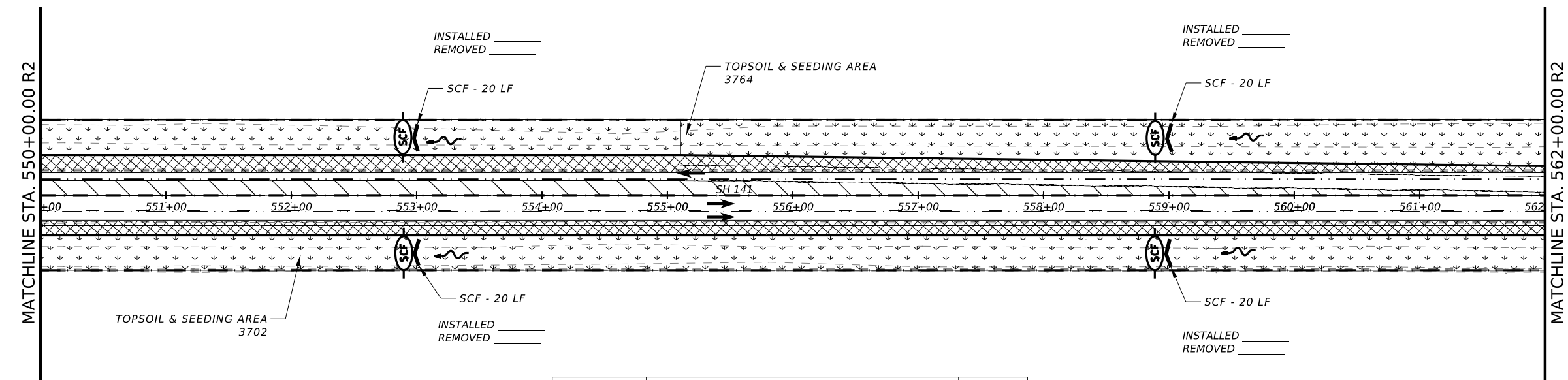
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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	287

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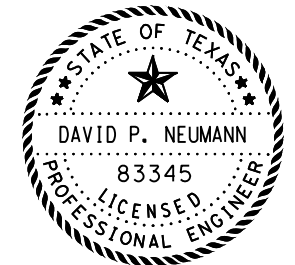
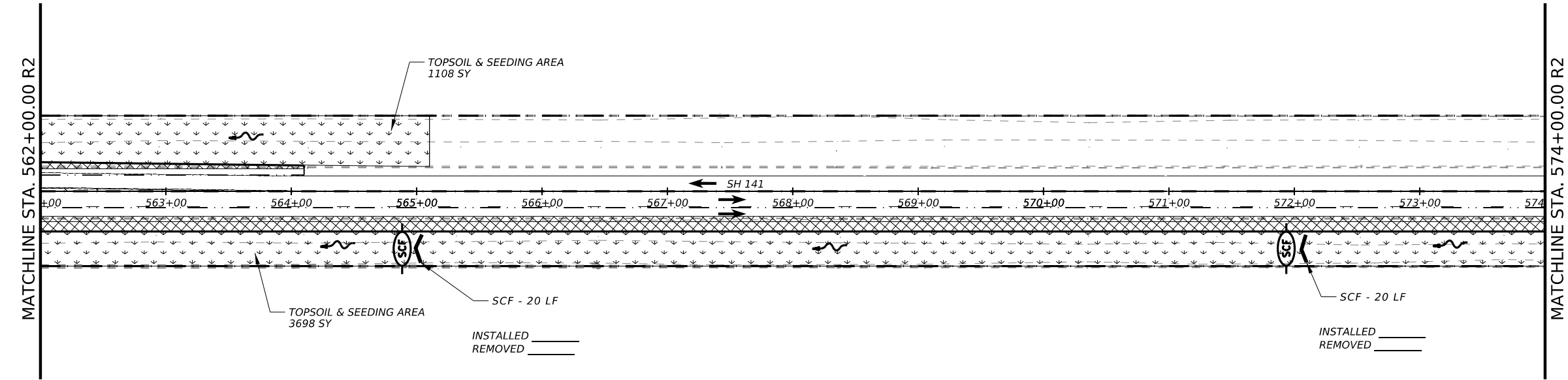
- NOTES:**
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
 2. AREAS NOT SHOWN BY SEEDING OR AREAS CONSIDERED TO BE VEGETATION BUFFERS AND MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	12272 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	12272 SY
168-6001	VEGETATIVE WATERING	223.7 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	120 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	120 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



David P. Neumann, P.E.
2023.07.28 03:10:14-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



EROSION CONTROL LAYOUT
STA. 554+00 TO STA. 574+00

SHEET 20 OF 28

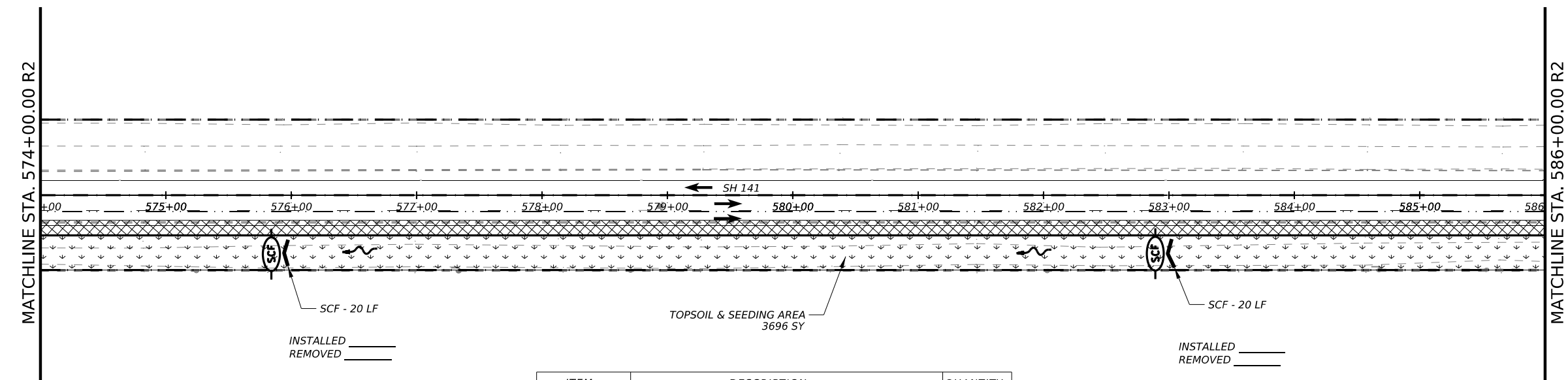
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0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		288

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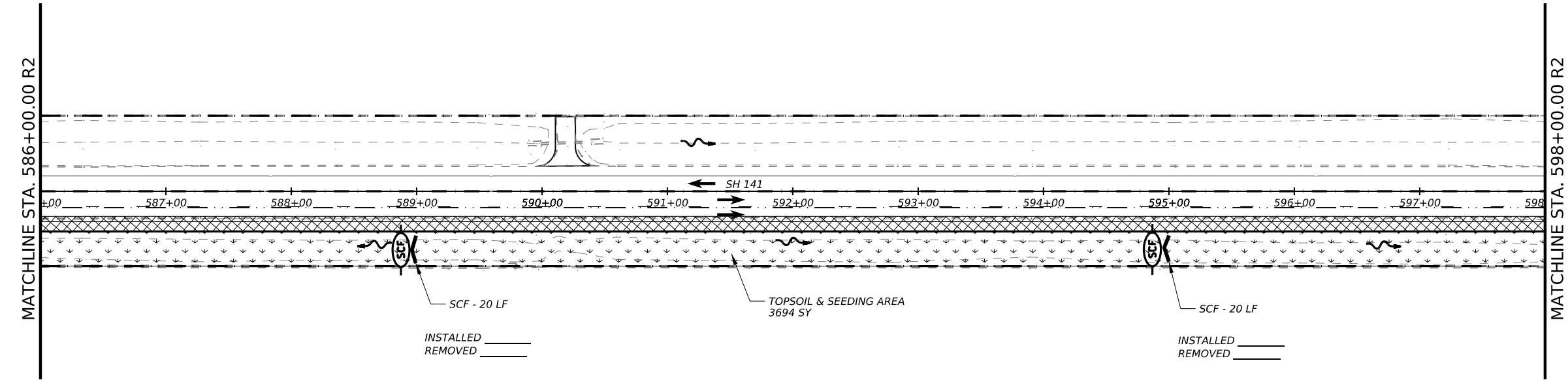
- NOTES:**
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7390 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7390 SY
168-6001	VEGETATIVE WATERING	134.7 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



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EROSION CONTROL LAYOUT
STA. 574+00 TO STA. 598+00

SHEET 21 OF 28

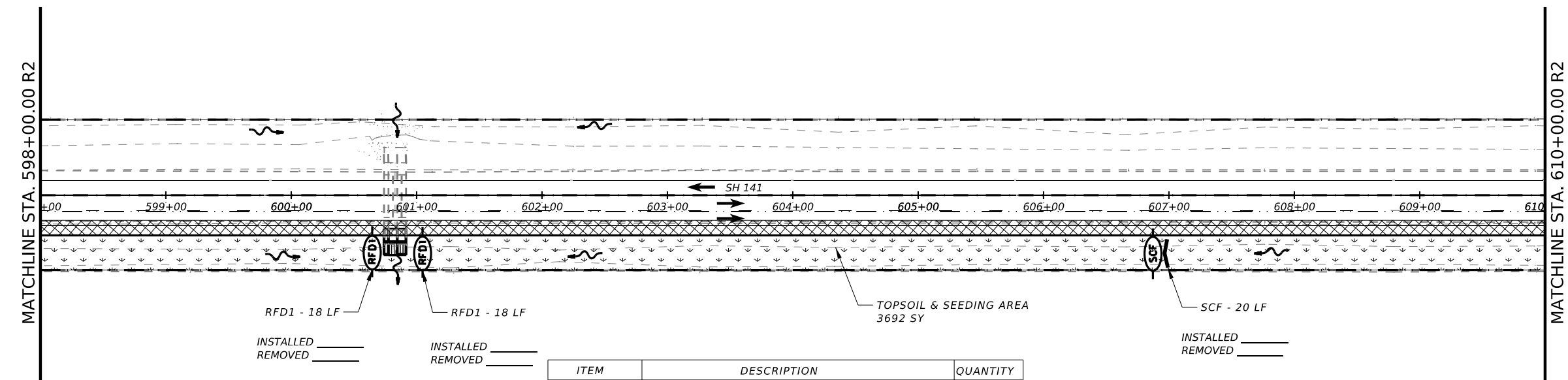
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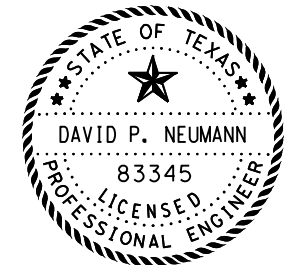
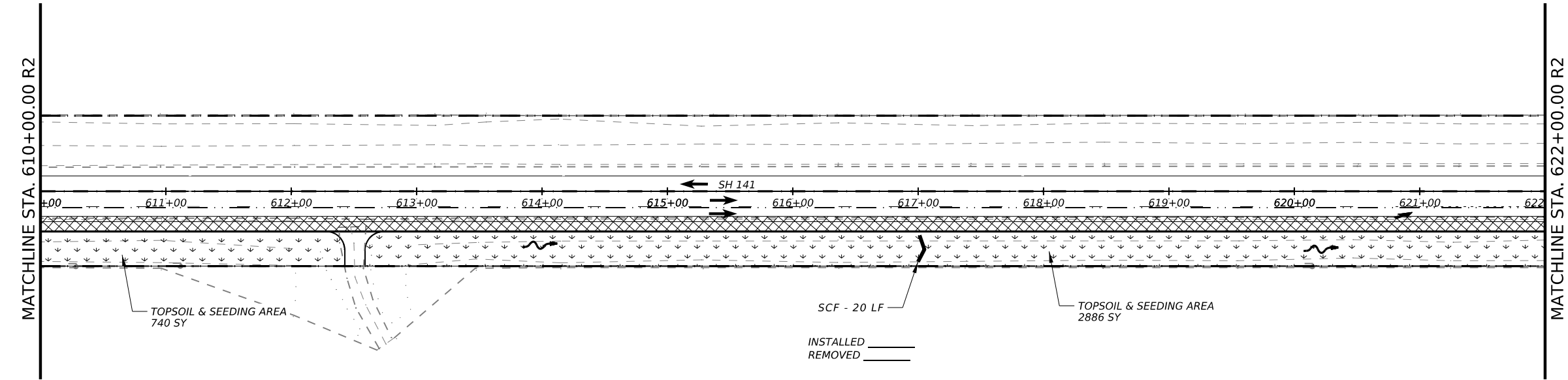
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7318 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7318 SY
168-6001	VEGETATIVE WATERING	133.4 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	266.8 LF
506-6011	ROCK FILTER DAMS (REMOVE)	36 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	36 LF
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	40 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	40 LF



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STA. 598+00 TO STA. 622+00

SHEET 22 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	290	

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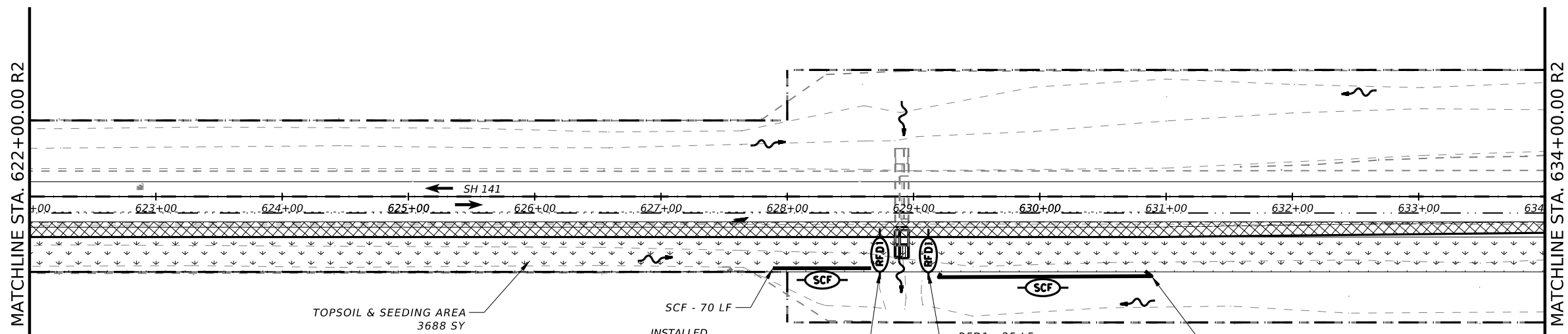
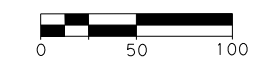
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LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS

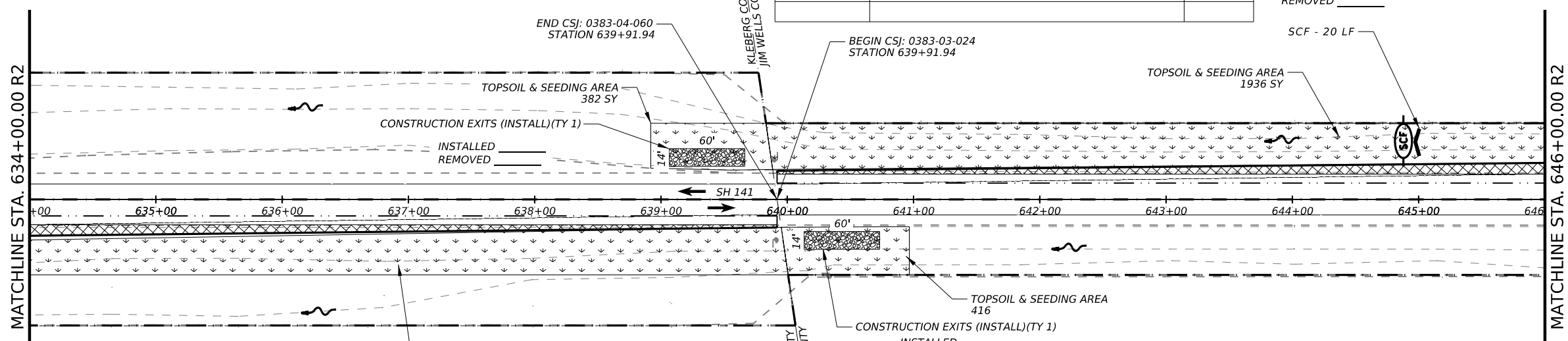


CSJ: 0383-04-060

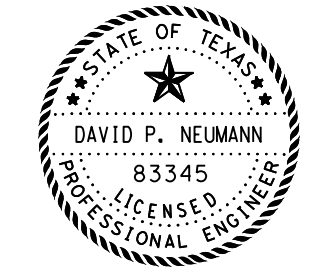
ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	5910 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	5910 SY
168-6001	VEGETATIVE WATERING	107.7 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	50 LF
506-6011	ROCK FILTER DAMS (REMOVE)	50 LF
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	94 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	94 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	250 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	250 LF

CSJ: 0383-03-024

ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	2352 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	2352 SY
168-6001	VEGETATIVE WATERING	42.8 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	94 SY
506-6024	CONSTRUCTION EXISTS (REMOVE)	94 SY
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	20 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	20 LF



INSTALLED
REMOVED



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EROSION CONTROL LAYOUT
STA. 622+00 TO STA. 646+00

SHEET 23 OF 28

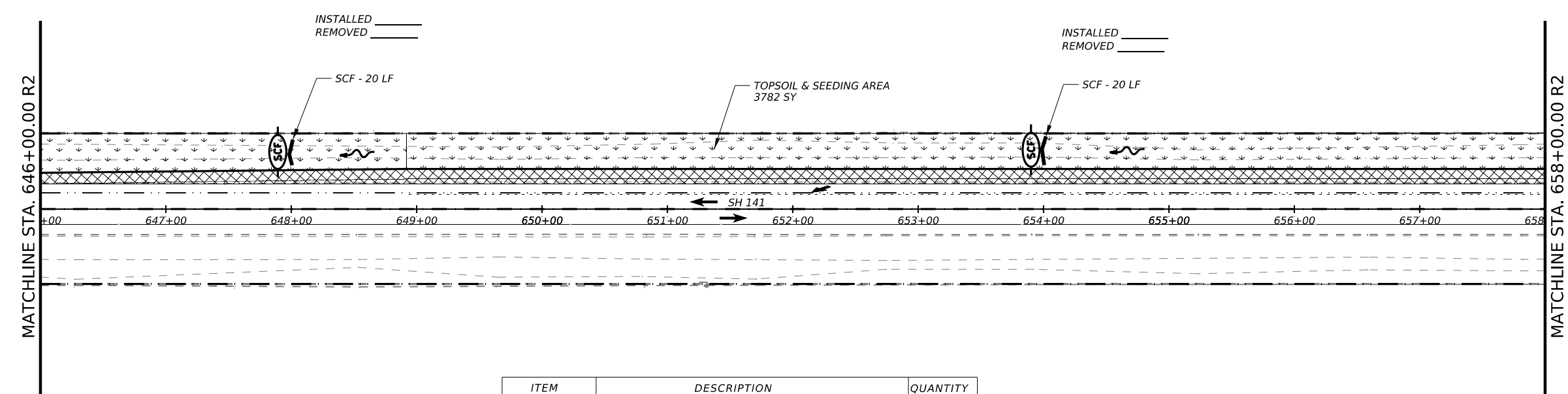
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CRP	JIM WELLS, ETC.	291	

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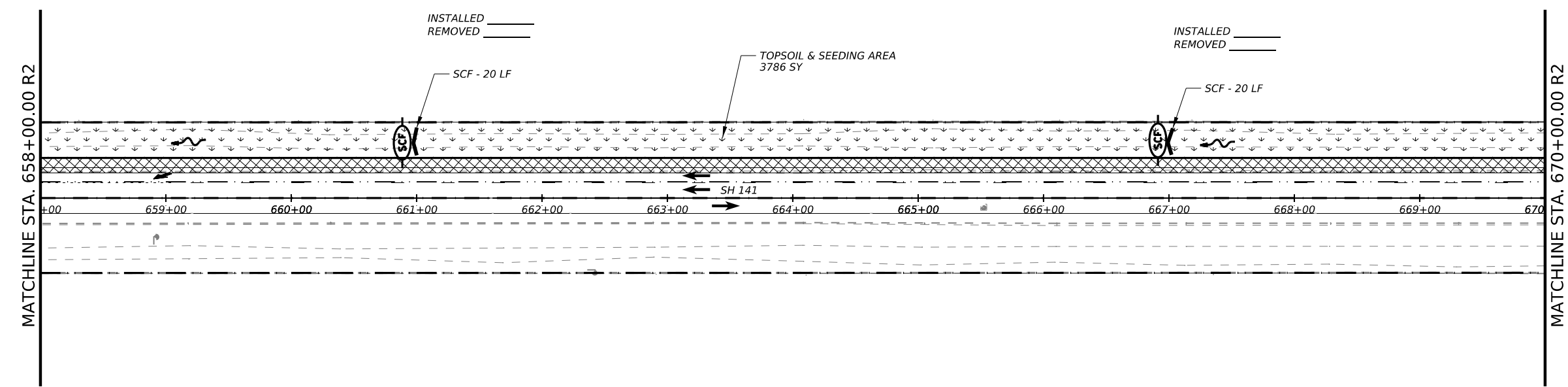
- NOTES:**
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7568 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7568 SY
168-6001	VEGETATIVE WATERING	137.9 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



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2023.07.28 03:09:18-05'00'

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TBPE Firm Reg. No. 10488

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EROSION CONTROL LAYOUT
STA. 646+00 TO STA. 670+00

SHEET 24 OF 28

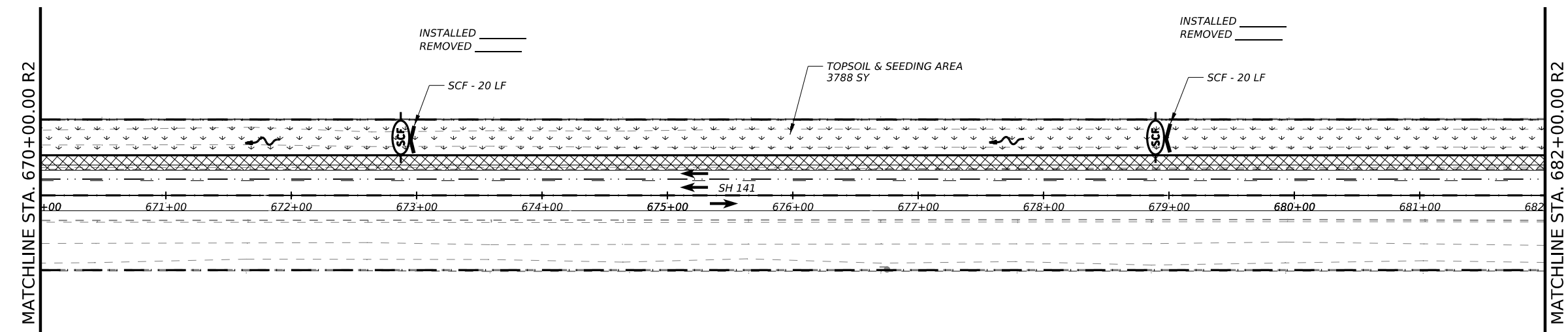
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DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	292	

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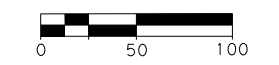


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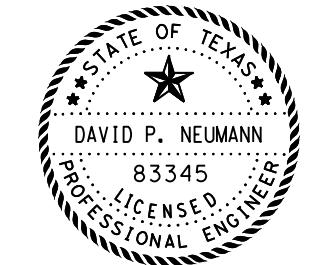
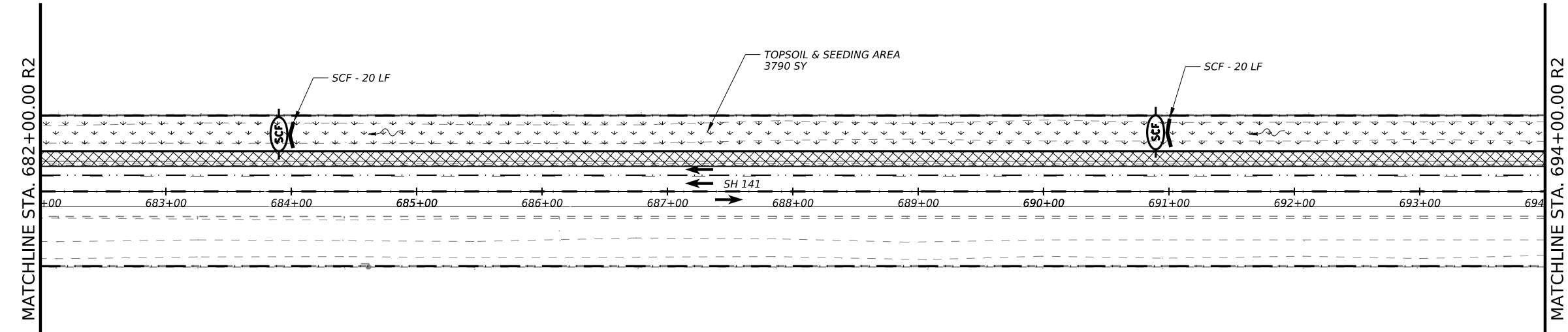


LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7578 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7578 SY
168-6001	VEGETATIVE WATERING	138.1 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF



David P. Neumann, P.E.

2023.07.28 03:09:04-05'00'

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EROSION CONTROL LAYOUT

STA. 670+00 TO STA. 694+00

SHEET 25 OF 28

CONT	SECT	JOB	HIGHWAY
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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	293

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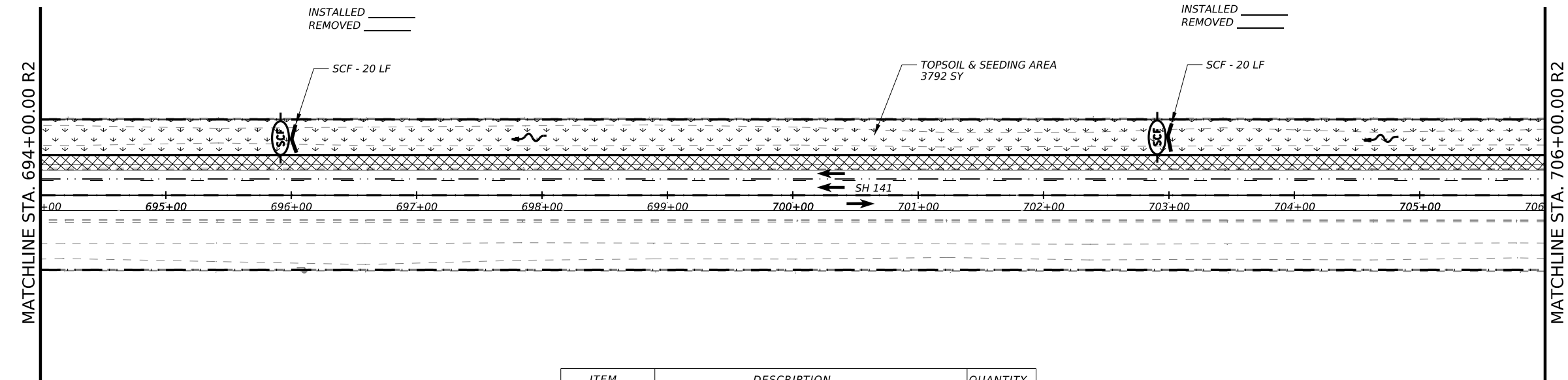
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NOTES:

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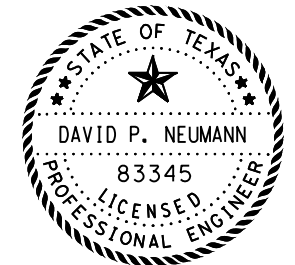
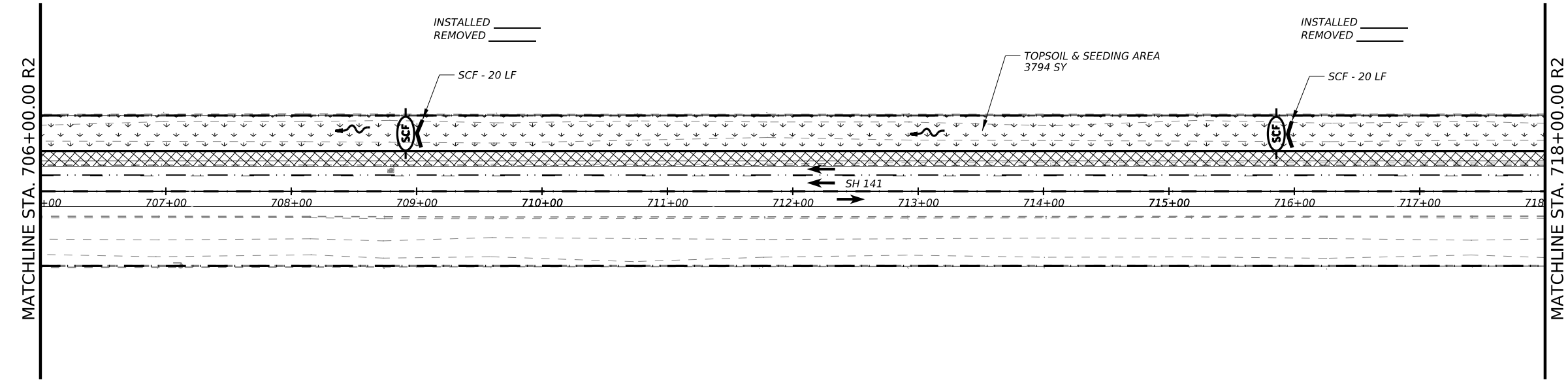
EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7586 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7586 SY
168-6001	VEGETATIVE WATERING	138.3 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	80 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	80 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



David P. Neumann, P.E.

2023.07.28 03:08:50-05'00'
LOCHNER
TBPE Firm Reg. No. 10488



EROSION CONTROL LAYOUT
STA. 694+00 TO STA. 718+00

SHEET 26 OF 28

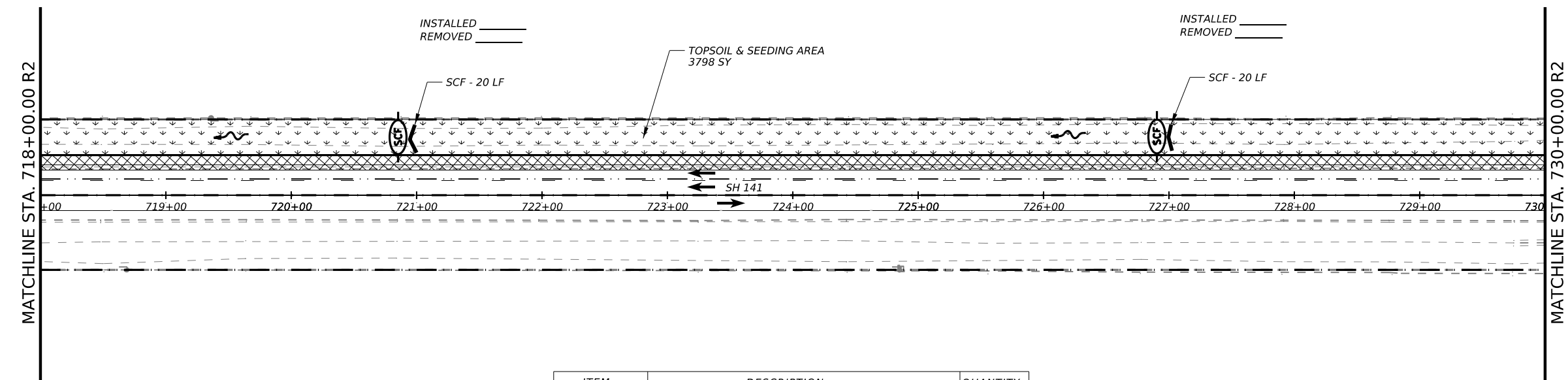
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CRP		JIM WELLS, ETC.	294

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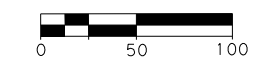


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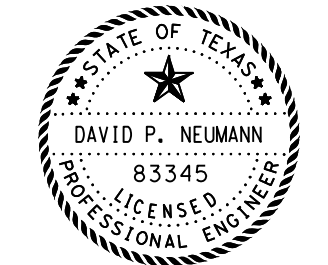
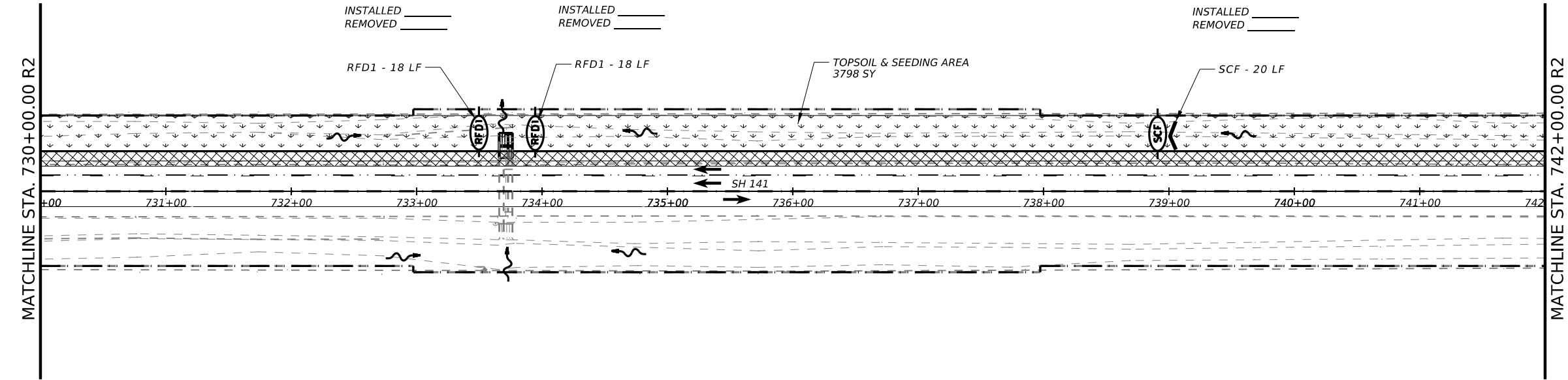


LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	7596 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	7596 SY
168-6001	VEGETATIVE WATERING	138.4 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	36 LF
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	60 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	60 LF



David P. Neumann, P.E.

2023.07.28 03:08:36-05'00'

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 TBPE Firm Reg. No. 10488



EROSION CONTROL LAYOUT

STA. 718+00 TO STA. 742+00

SHEET 27 OF 28

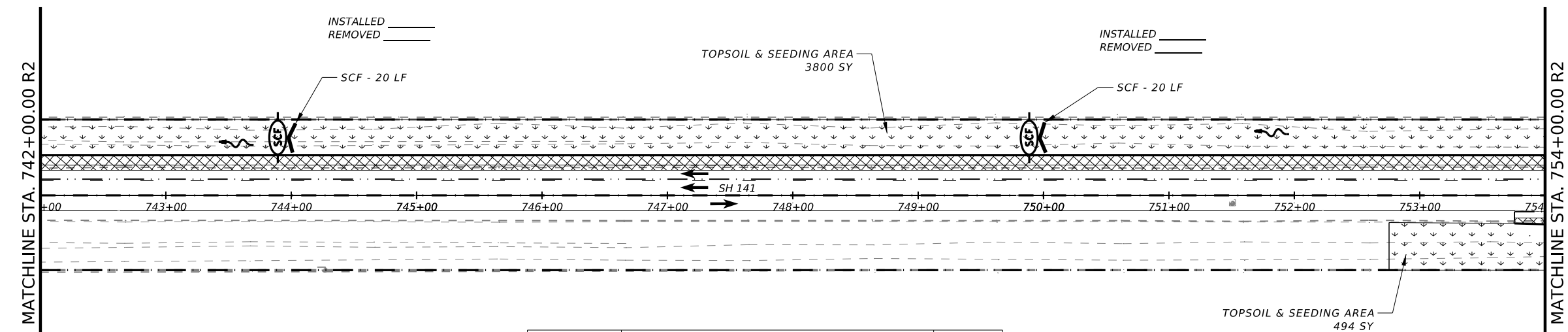
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DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	295

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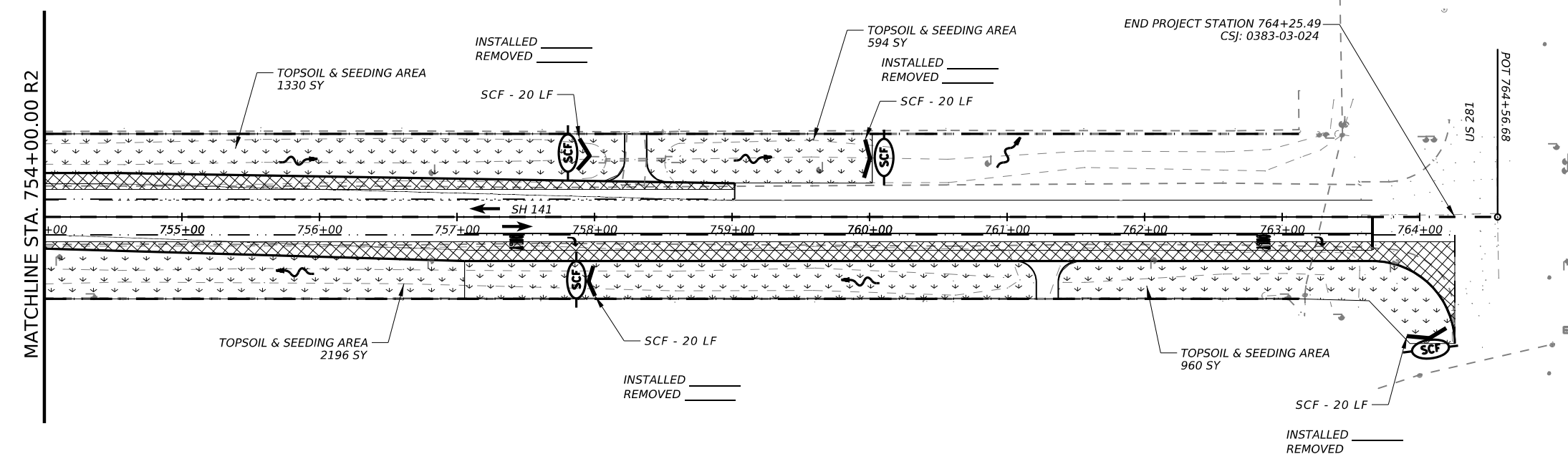
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ITEM	DESCRIPTION	QUANTITY
160-6003	FURNISHING AND PLACING TOPSOIL (4")	9374 SY
164-6033	DRILL SEEDING (PERM)(RURAL)(SANDY)	9374 SY
168-6001	VEGETATIVE WATERING	170.9 MG
506-6001	ROCK FILTER DAMS (INSTALL)(TY 1)	
506-6011	ROCK FILTER DAMS (REMOVE)	
506-6020	CONSTRUCTION EXISTS (INSTALL)(TY 1)	
506-6024	CONSTRUCTION EXISTS (REMOVE)	
506-6038	TEMP SEDMT CONTROL FENCE (INSTALL)	120 LF
506-6039	TEMP SEDMT CONTROL FENCE (REMOVE)	120 LF

LEGEND

- WORK AREA
- SEEDING AREA
- SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM TYPE 1
- DRAINAGE FLOW ARROWS



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2023.07.28 03:08:20-05'00'

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EROSION CONTROL LAYOUT

STA. 742+00 TO STA. 764+25.49

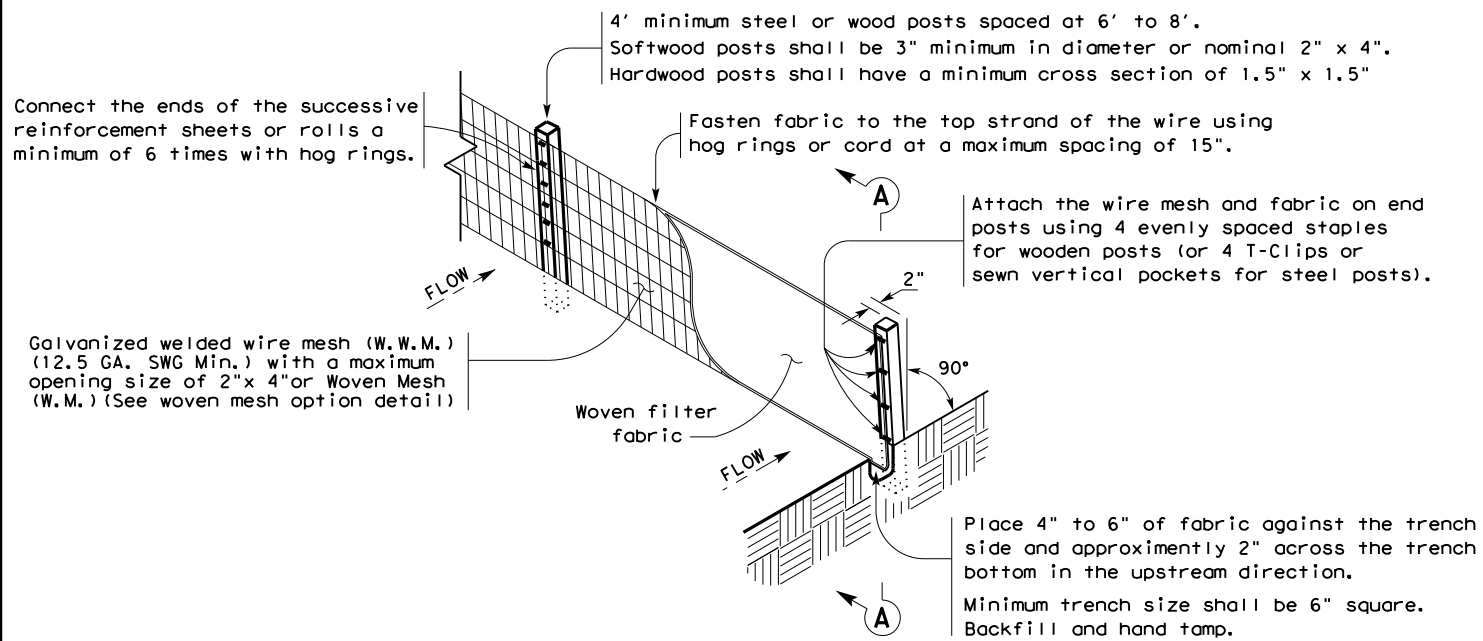
SHEET 28 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	296

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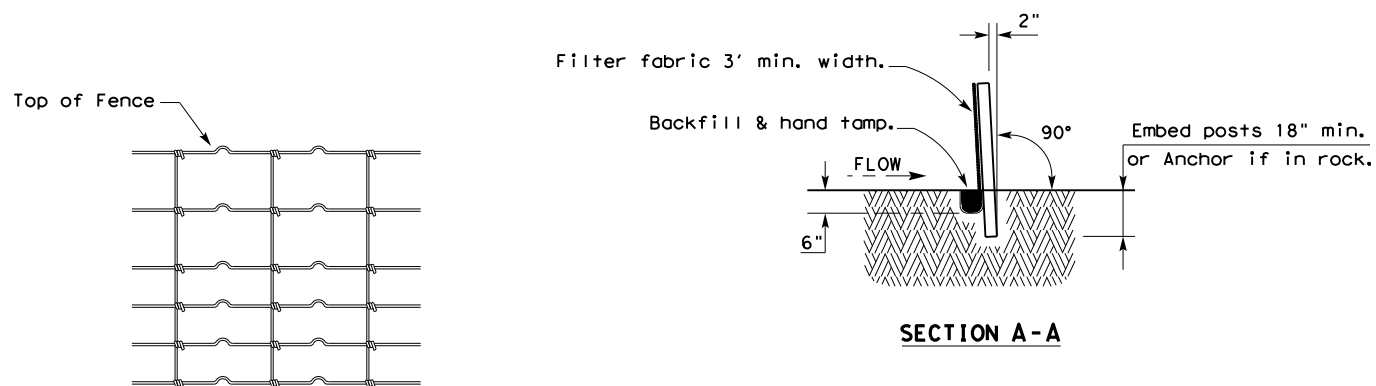
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DATE
FILE



TEMPORARY SEDIMENT CONTROL FENCE

SCF



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.

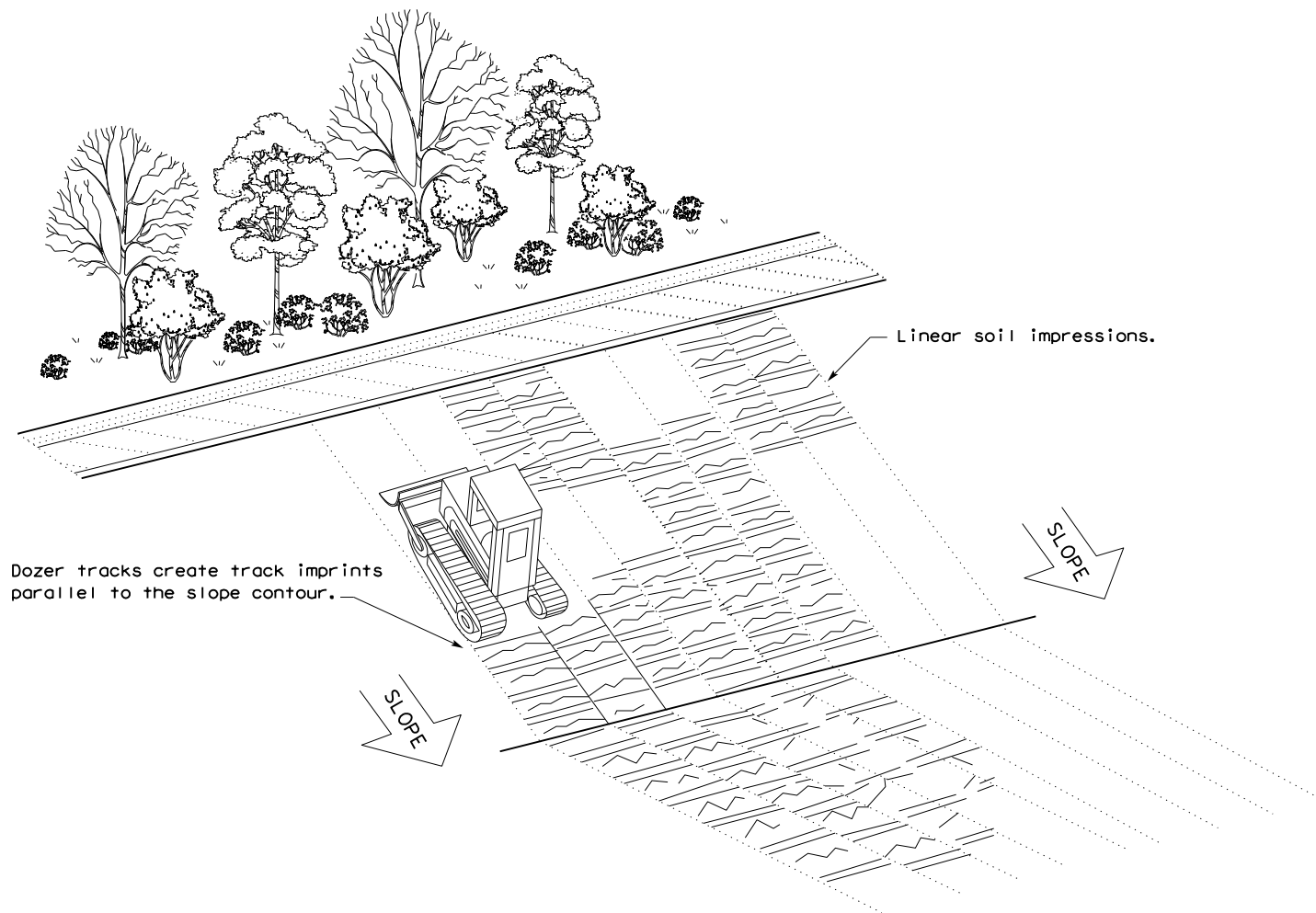
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

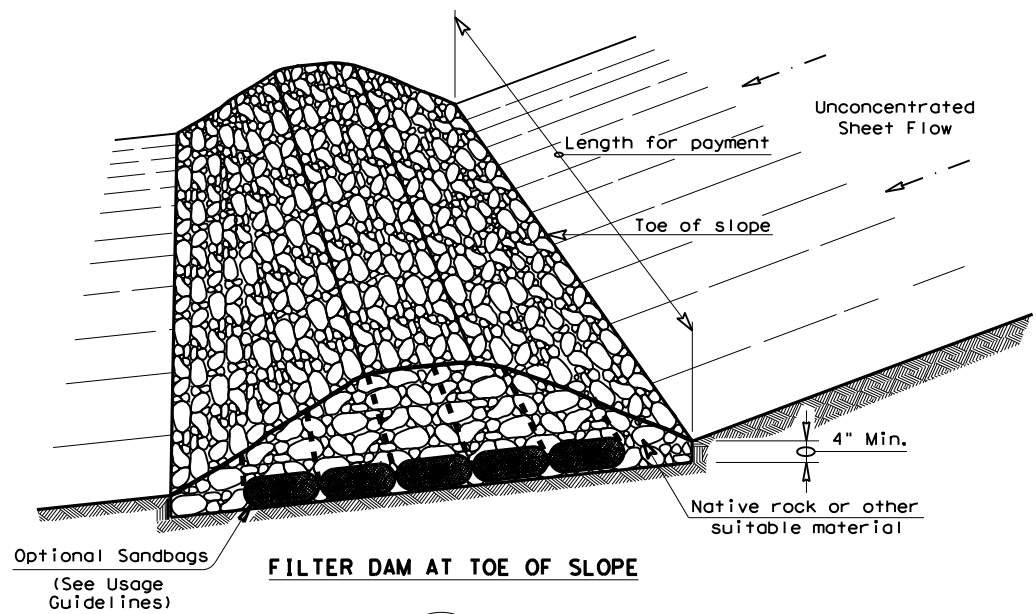


TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	297	

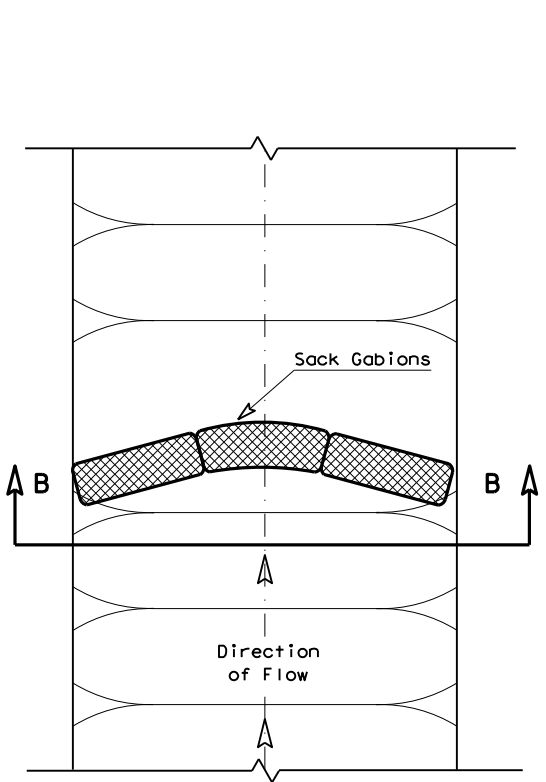
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DATE: FILE:

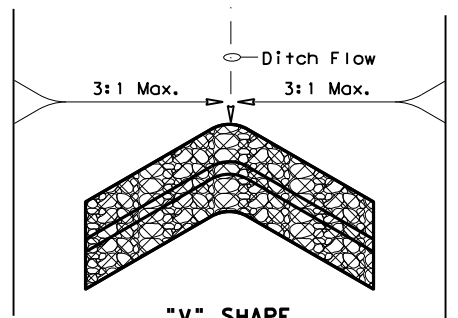


FILTER DAM AT TOE OF SLOPE

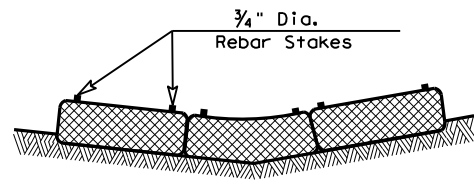
(RFD1)



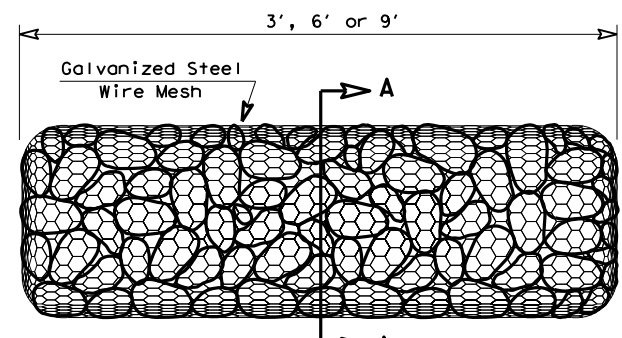
PLAN VIEW



"V" SHAPE PLAN VIEW

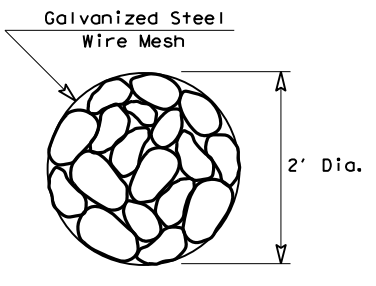


SECTION B-B

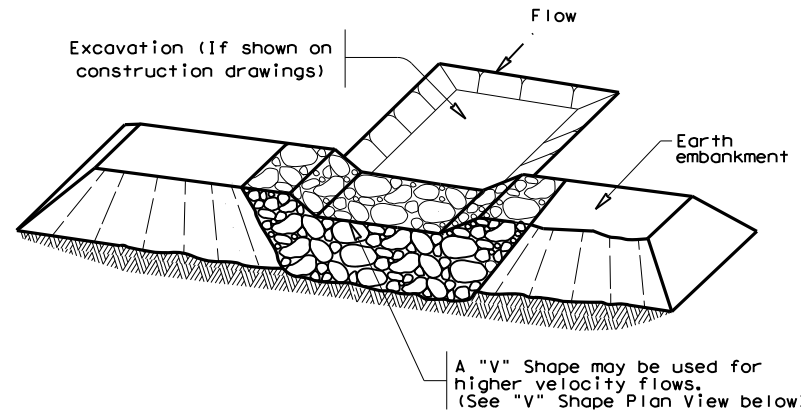


TYPE 4 (SACK GABIONS)

(RFD4)

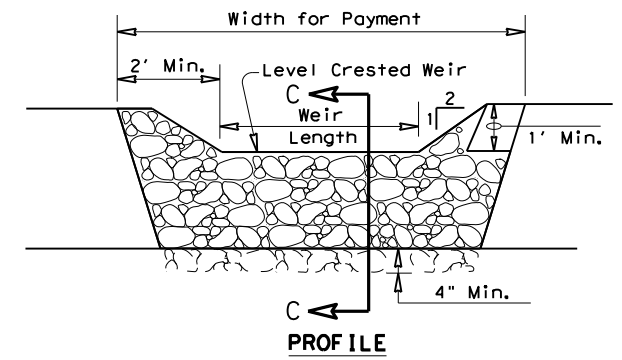


SECTION A-A

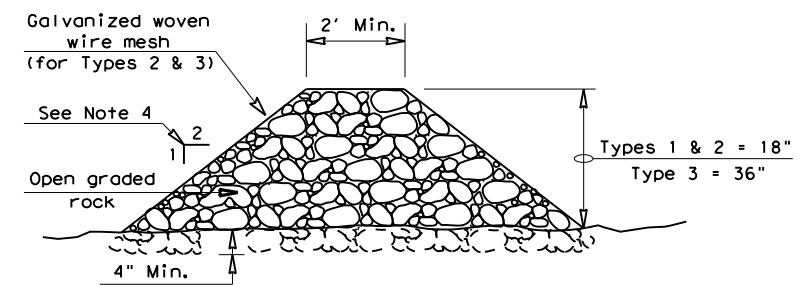


FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)



PROFILE



SECTION C-C

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.

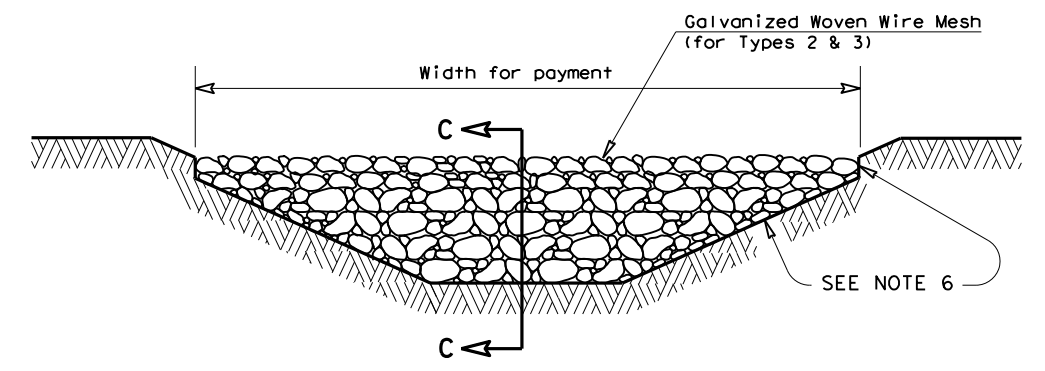
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity 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.



FILTER DAM AT CHANNEL SECTIONS

(RFD1) OR (RFD2) OR (RFD3)

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.

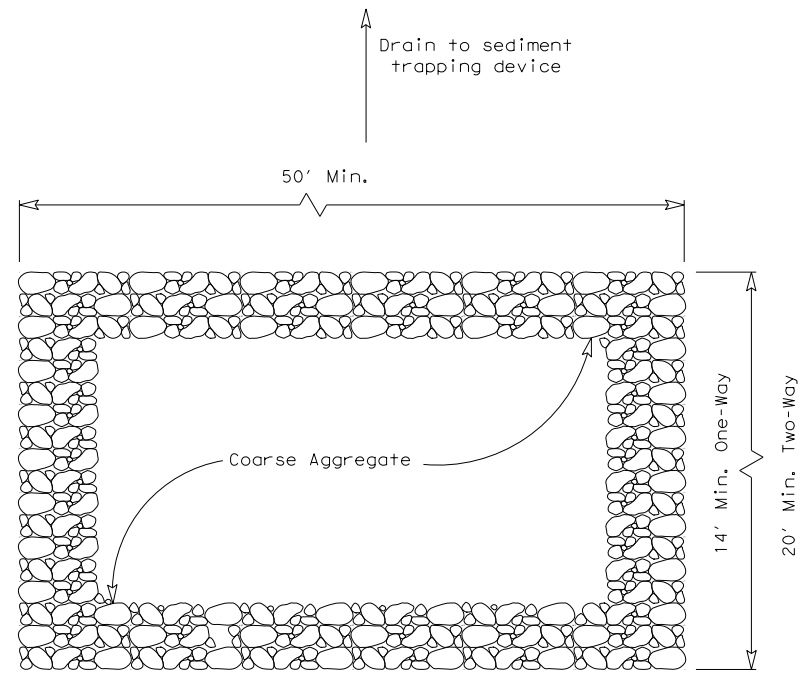
PLAN SHEET LEGEND

- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)

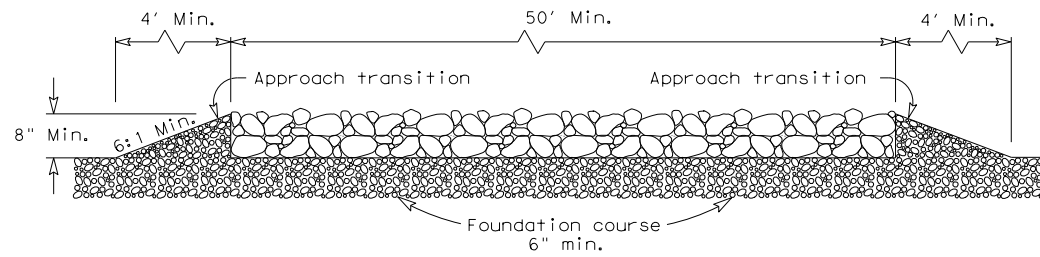
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC(2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0383	03	024, ETC.
	DIST	COUNTY	SHEET NO.
	CRP	JIM WELLS, ETC.	298

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DATE: 7/26/2023
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PLAN VIEW

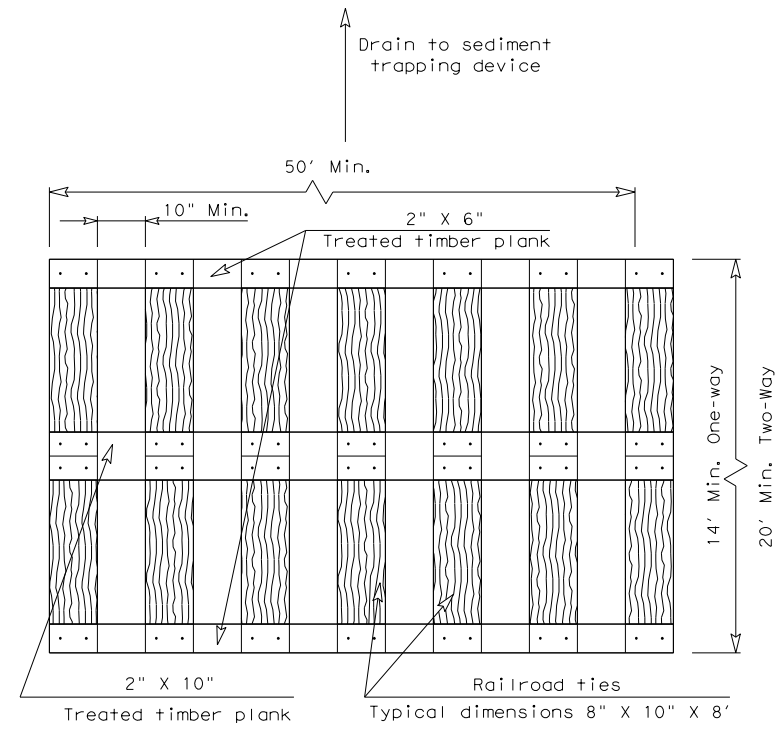


ELEVATION VIEW

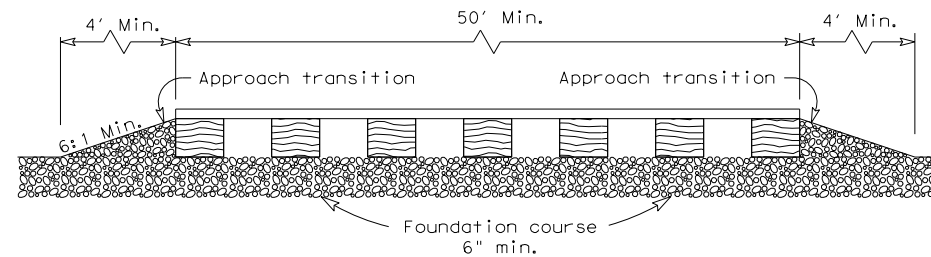
CONSTRUCTION EXIT (TYPE 1)
ROCK CONSTRUCTION (LONG TERM)

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

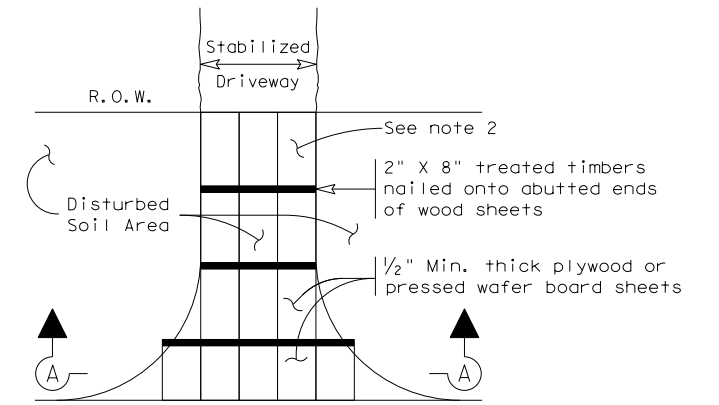


ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)
TIMBER CONSTRUCTION (LONG TERM)

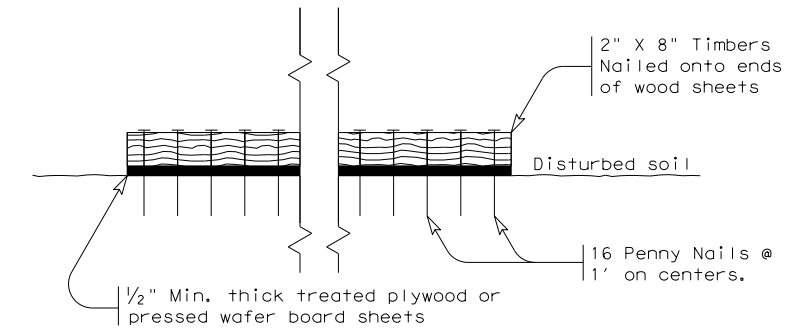
GENERAL NOTES (TYPE 2)

- 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.



Paved Roadway

PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)
SHORT TERM

GENERAL NOTES (TYPE 3)

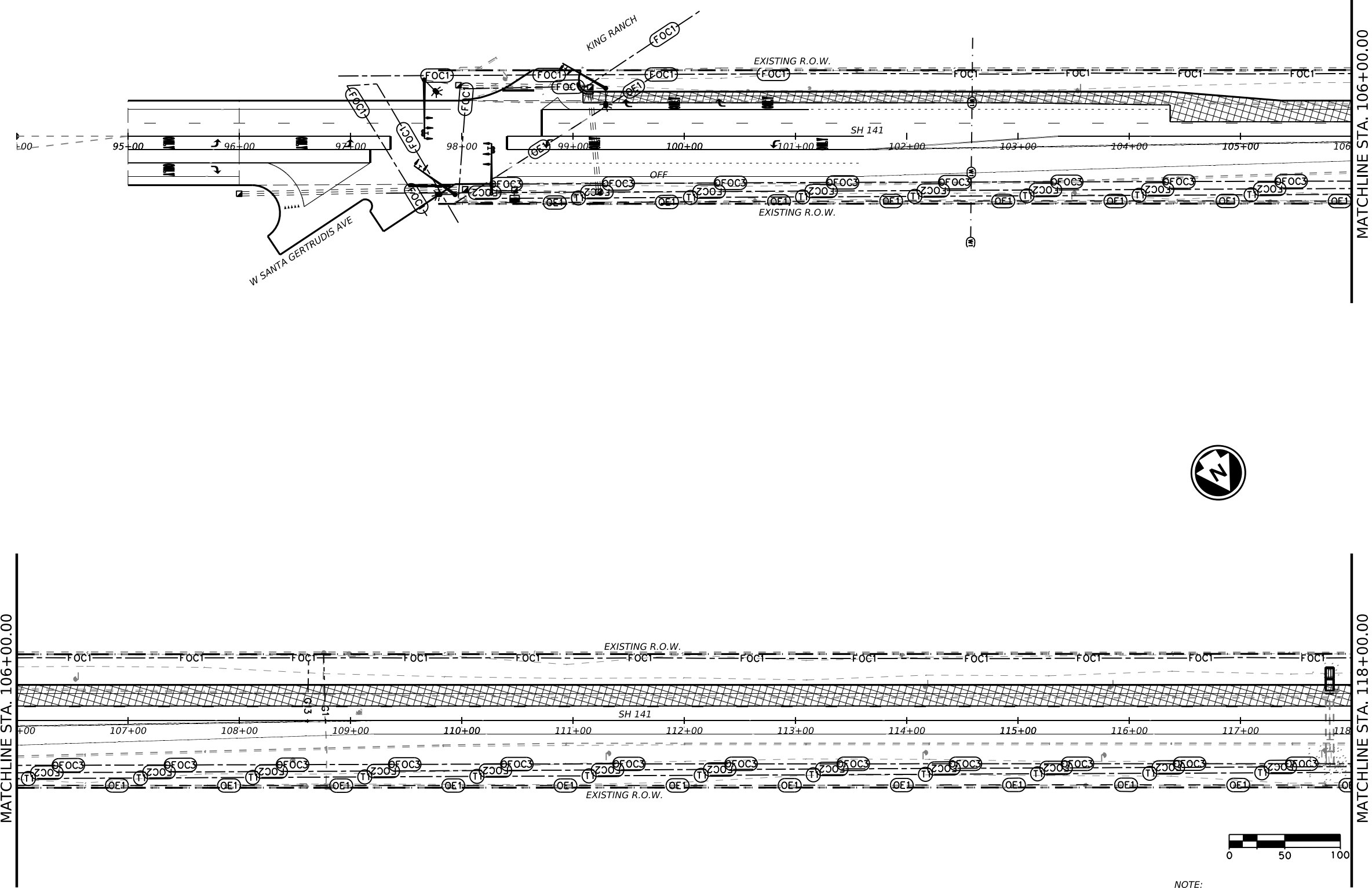
- The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
- The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
- The treated timber 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.



TEMPORARY EROSION,
 SEDIMENT AND WATER
 POLLUTION CONTROL MEASURES
 CONSTRUCTION EXITS
 EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0383	03	024, ETC.	SH 141
	DIST	COUNTY	SHEET NO.	
	CRP	JIM WELLS, ETC.	299	

CK:
DW:
CK:
DN:



LEGEND OF UTILITY TYPES

COMMUNICATIONS

AT&T (COPPER) QL "B" T1

AT&T (FOC) FOC1

VTX FOC2

AT&T (COPPER) QL "D" T1

AT&T (FOC) FOC1

VTX FOC2

SMARTCOM (AERIAL) FOC3

WATER

KING RANCH QL "D" W1

GAS

TICONA POLYMER QL "B" G1

ENTERPRISE PROD G2

TENNESSEE GAS G3

NUSTAR G4

ENERFIN G5

ENERGY TRANSFER G6

KOCH G7

SEADRIFT G8

TRANSCO G9

KINDER MORGAN G10

HUMBLE G11

NET MEXICO G12

UNKNOWN OWNERS G13

ENERFIN QL "D" E2

ENERGY TRANSFER E3

EXXON E4

ELECTRIC/POWER

AEP TEXAS (UG) QL "B" E1

AEP TEXAS (OVH) QL "D" OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE *

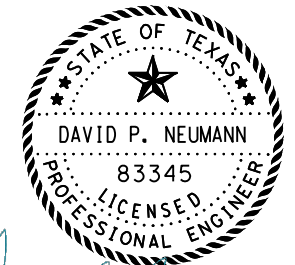
LOST CONNECTION W

TELEPHONE PEDESTAL T

FIBER OPTIC MARKER F

POWER POLE P

GUY ANCHOR A



David P. Neumann, P.E.

2023.07.28 03:21:32-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

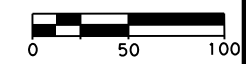


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EXISTING UTILITY LAYOUT

SHEET 1 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		300

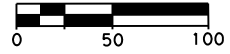
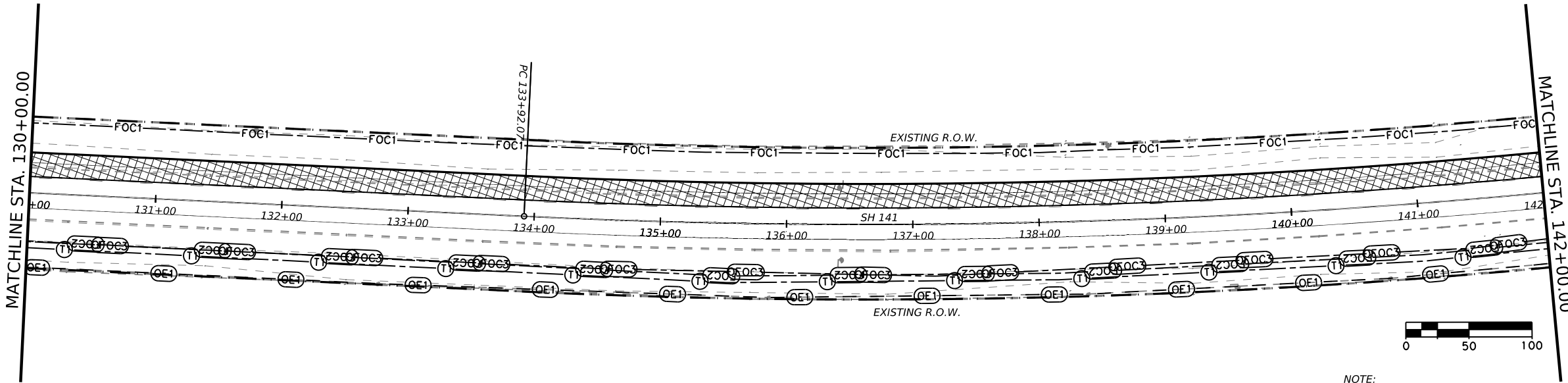
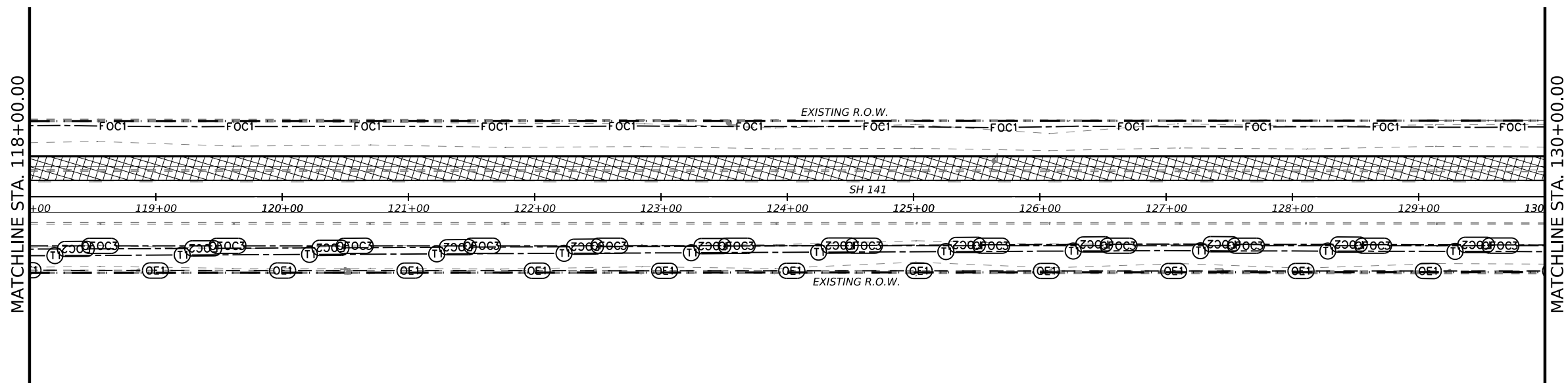


NOTE:
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

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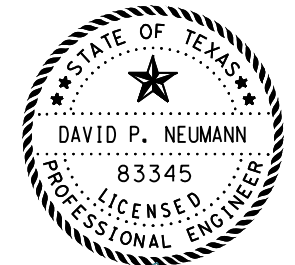
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LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:21:44-05'00'

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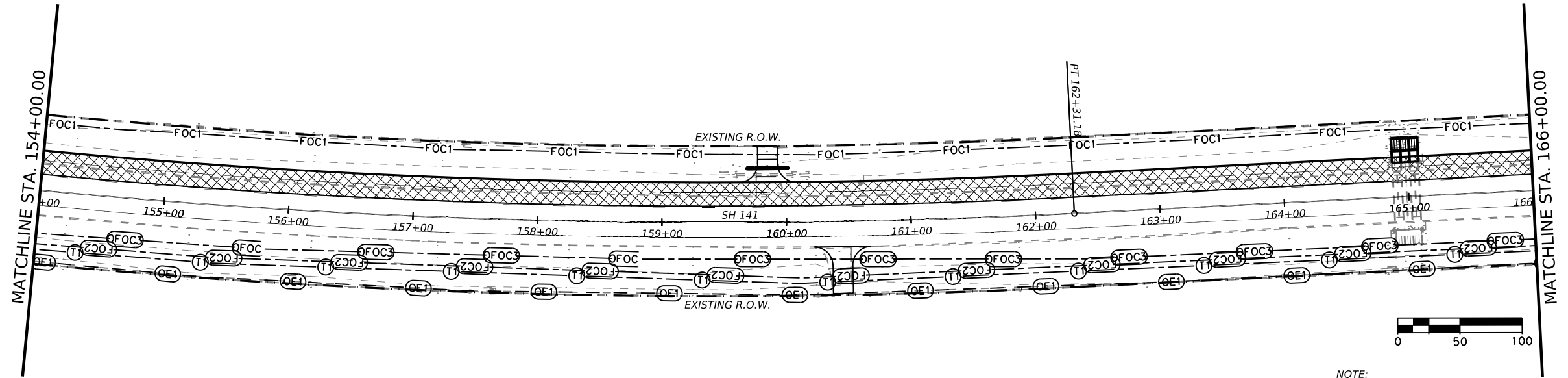
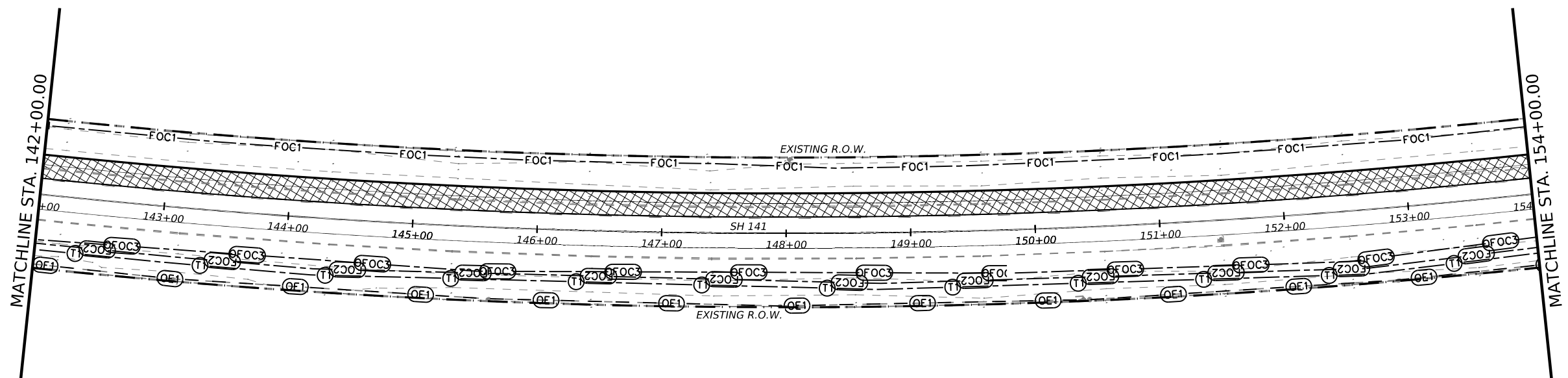
EXISTING UTILITY LAYOUT

SHEET 2 OF 28

CONT	SECT	JOB	HIGHWAY
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DIST		COUNTY	SHEET NO.
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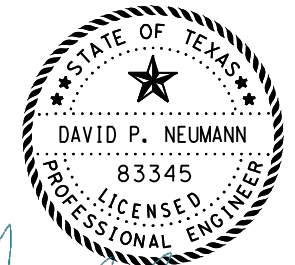


LEGEND OF UTILITY TYPES

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AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



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2023.07.28 03:21:54-05'00'

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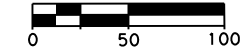
SHEET 3 OF 28

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DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	302	

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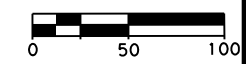
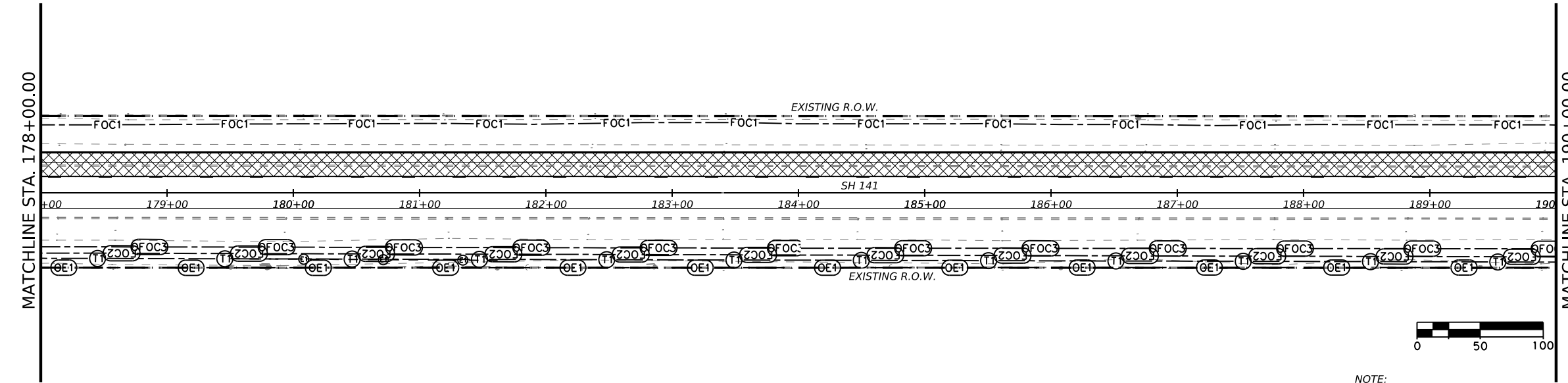
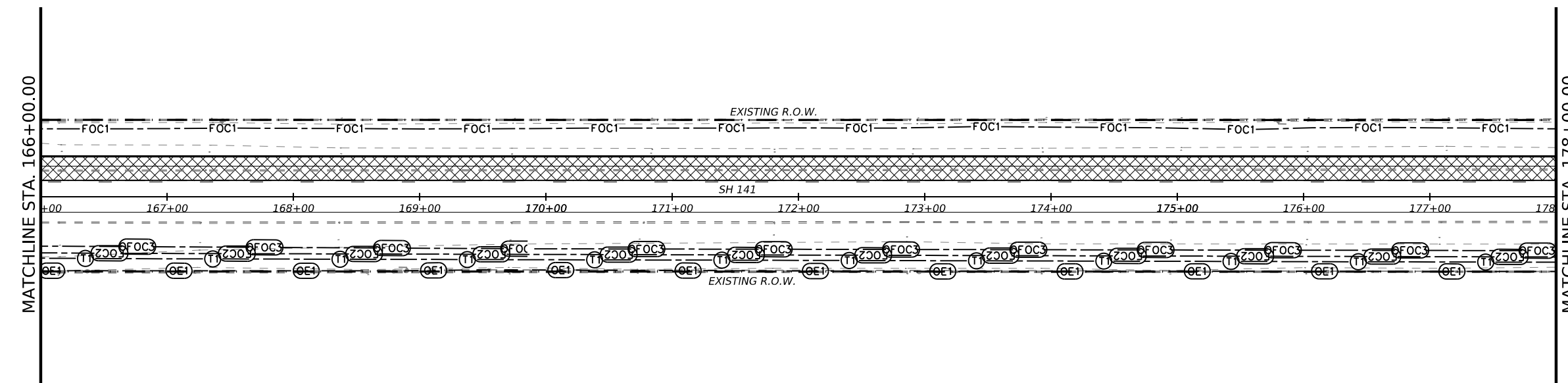
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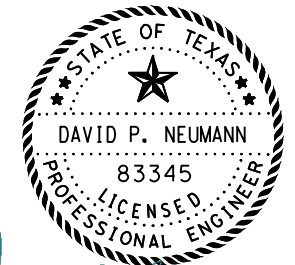
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LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	F
POWER POLE	P
GUY ANCHOR	A



David P. Neumann, P.E.

2023.07.28 03:22:03-05'00'

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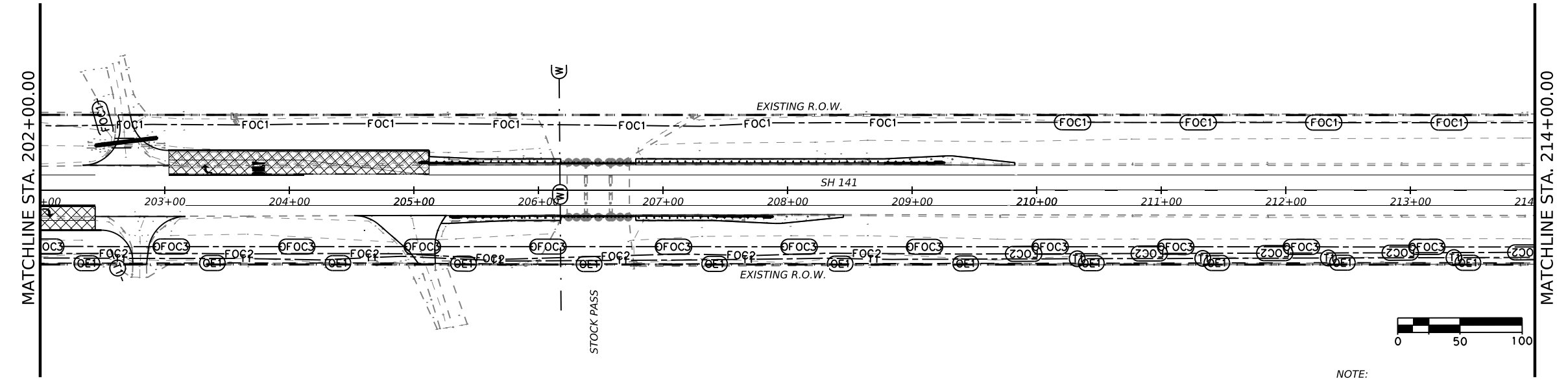
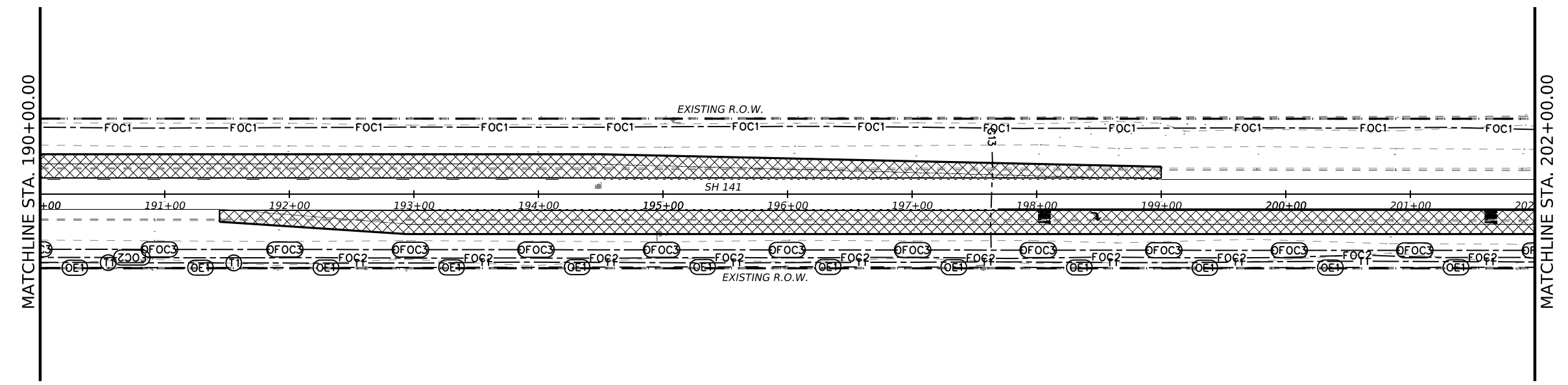
EXISTING UTILITY LAYOUT

SHEET 4 OF 28

CONT	SECT	JOB	HIGHWAY
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CRP		JIM WELLS, ETC.	303

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CK: DW: CK: DN:



LEGEND OF UTILITY TYPES

COMMUNICATIONS

QL "B"

AT&T (COPPER) T1

AT&T (FOC) FOC1

VTX FOC2

QL "D"

AT&T (COPPER) T1

AT&T (FOC) FOC1

VTX FOC2

SMARTCOM (AERIAL) FOC3

WATER

QL "D"

KING RANCH W1

GAS

QL "B"

TICONA POLYMER G1

ENTERPRISE PROD G2

TENNESSEE GAS G3

NUSTAR G4

ENERFIN G5

ENERGY TRANSFER G6

KOCH G7

SEADRIFT G8

TRANSCO G9

KINDER MORGAN G10

HUMBLE G11

NET MEXICO G12

UNKNOWN OWNERS G13

QL "D"

ENERFIN G5

ENERGY TRANSFER G6

EXXON G14

ELECTRIC/POWER

QL "B"

AEP TEXAS (UG) E1

QL "D"

AEP TEXAS (OVH) OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE *

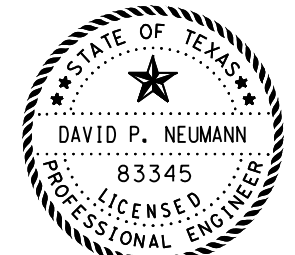
LOST CONNECTION W

TELEPHONE PEDESTAL T

FIBER OPTIC MARKER F

POWER POLE P

GUY ANCHOR A



David P. Neumann, P.E.

2023.07.28 03:22:13-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



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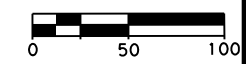
EXISTING UTILITY LAYOUT

SHEET 5 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		304

NOTE:
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

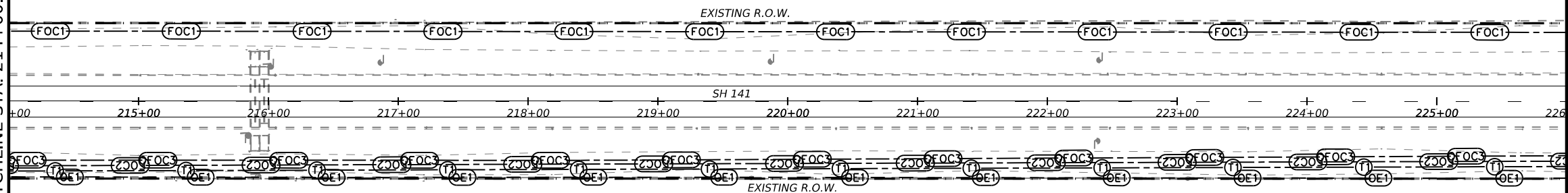
ANY CONFLICTS NOTED BETWEEN EXISTING UTILITIES AND PROPOSED ROADWAY WORK ARE SUBJECT TO VERIFICATION BY THE ENGINEER AND UTILITY OWNER. CONTRACTOR SHALL VERIFY ALL UTILITIES PRIOR TO ANY CONSTRUCTION.



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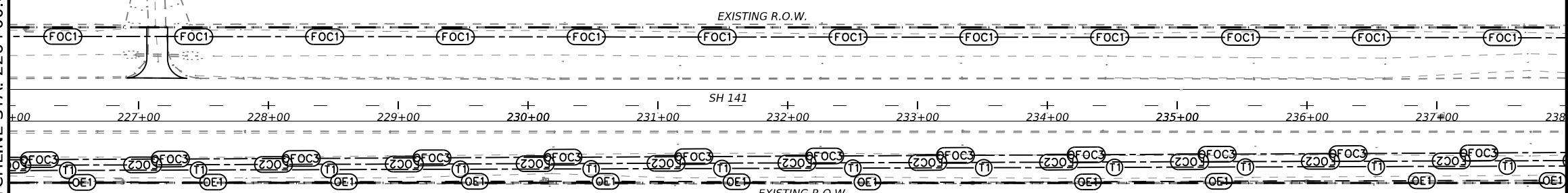
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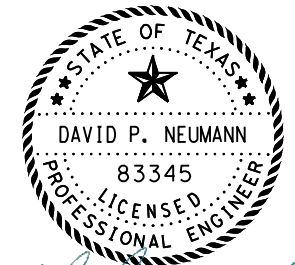
MATCHLINE STA. 226+00.00



MATCHLINE STA. 238+00.00

LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:22:22-05'00'

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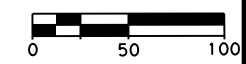


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EXISTING UTILITY LAYOUT

SHEET 6 OF 28

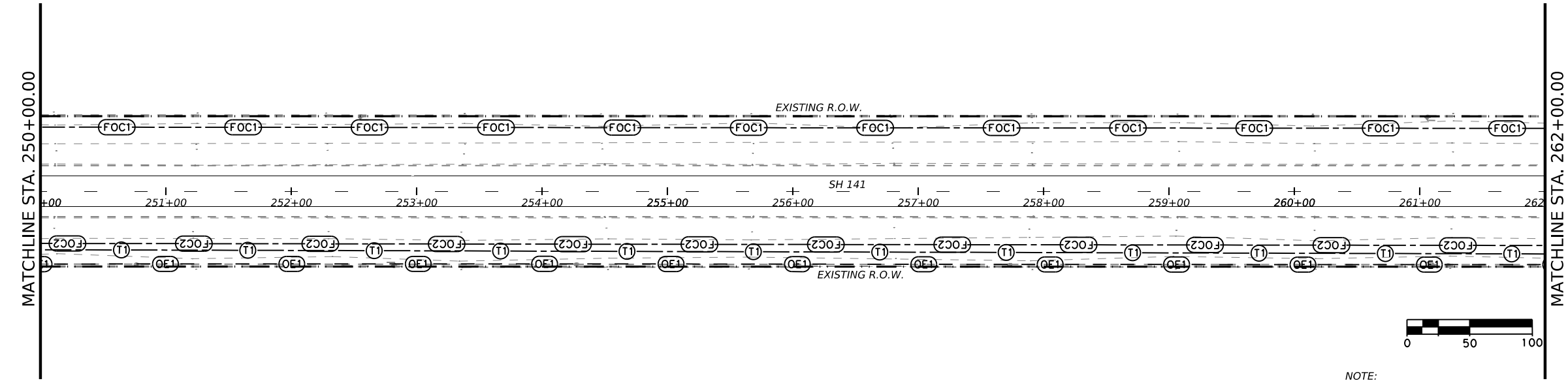
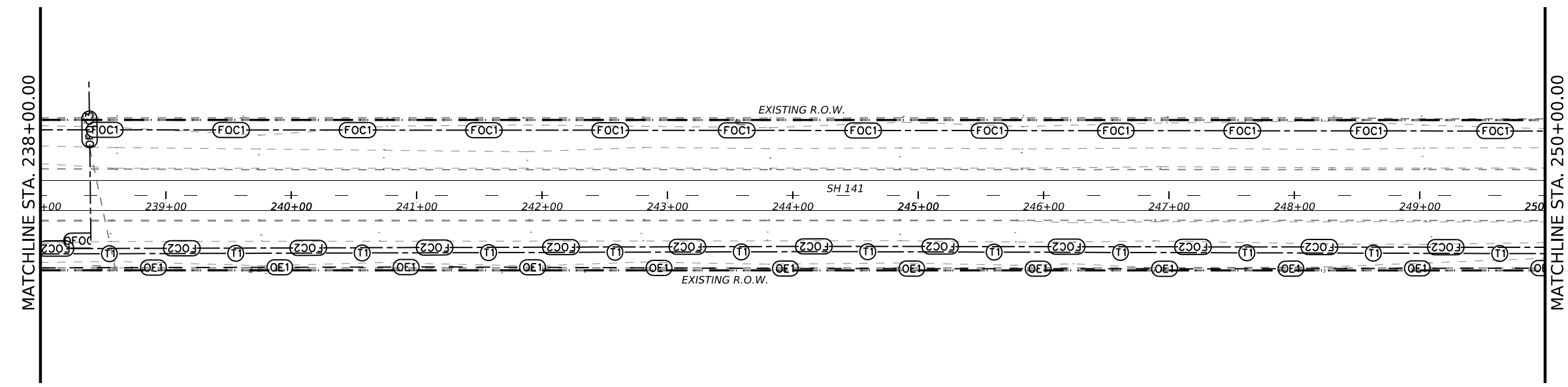
CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	305



NOTE:
 UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.
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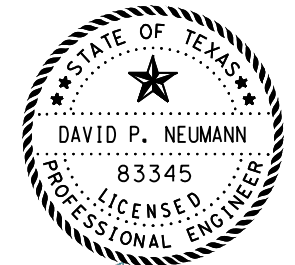


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	◎
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:22:32-05'00'

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TBPE Firm Reg. No. 10488

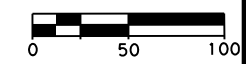


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**EXISTING
UTILITY LAYOUT**

SHEET 7 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		306

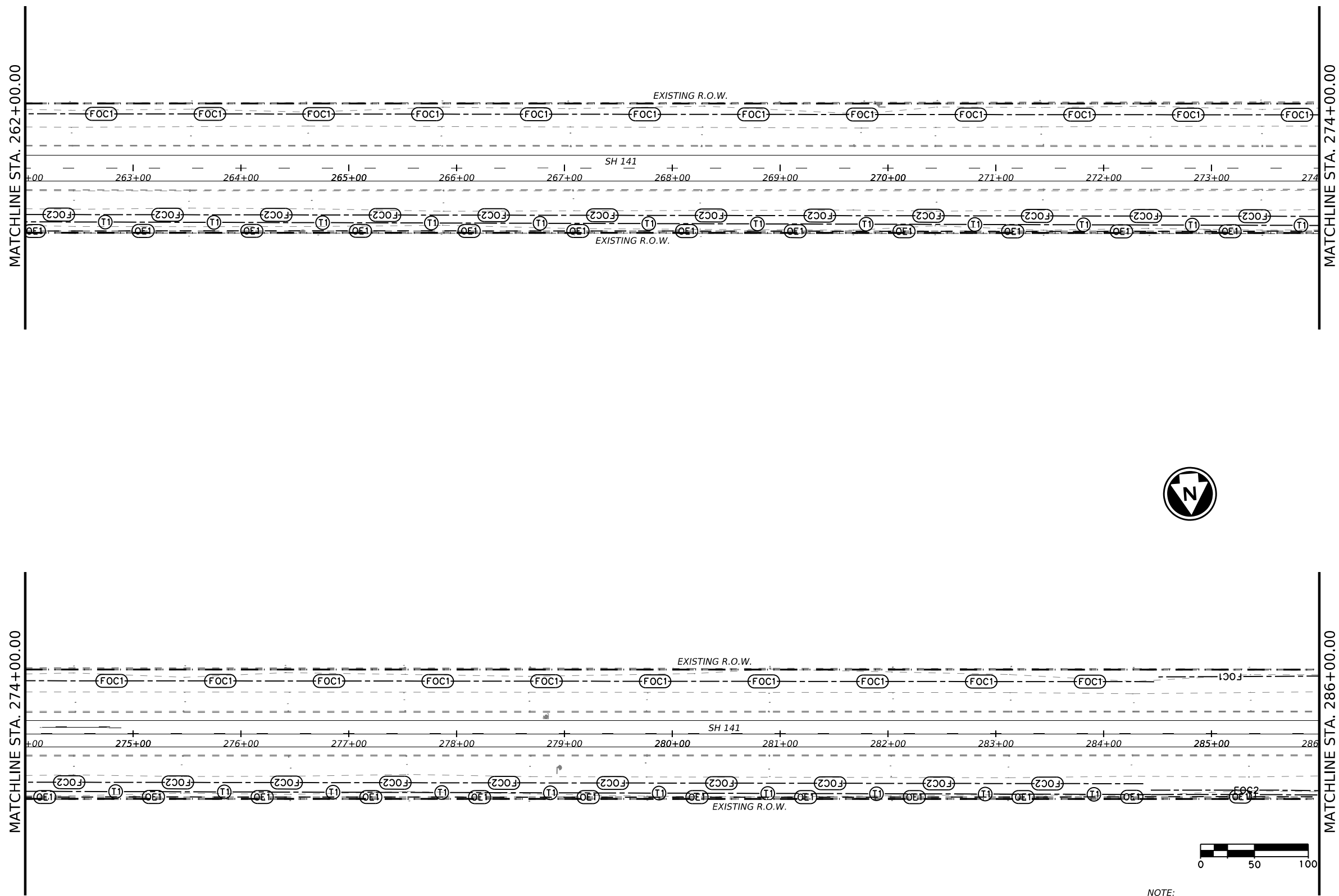


NOTE:
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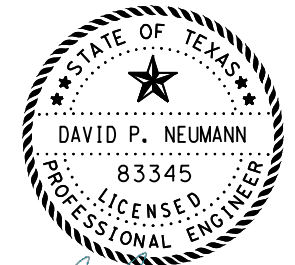
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LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:22:41-05'00'

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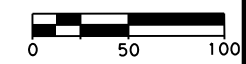


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EXISTING UTILITY LAYOUT

SHEET 8 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	307

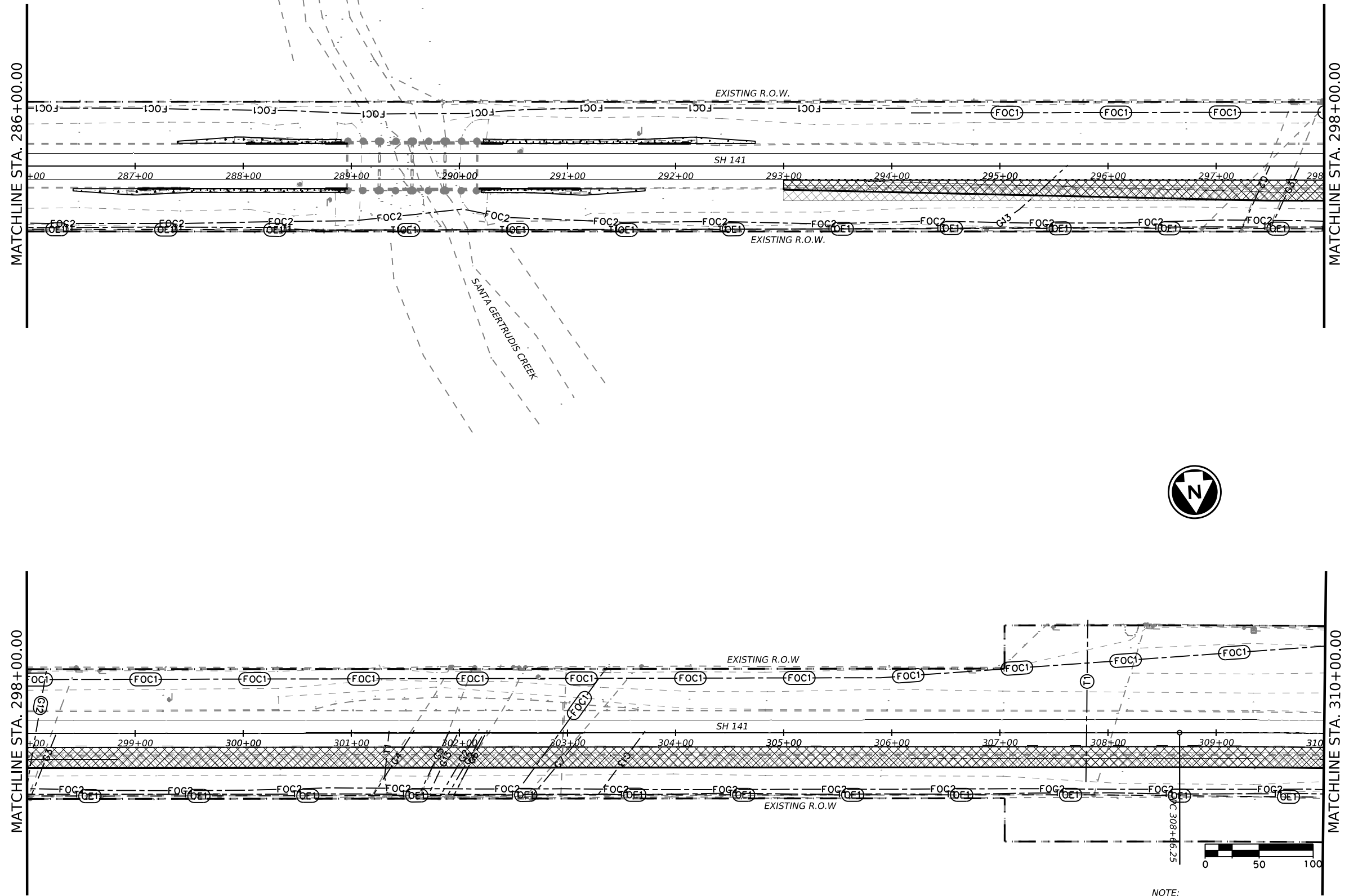


NOTE:
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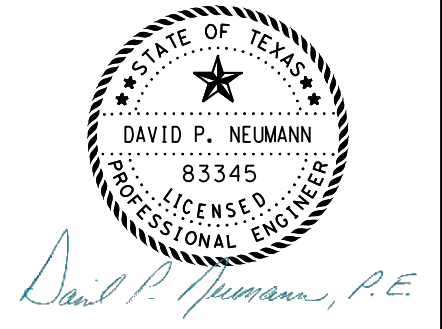
LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→

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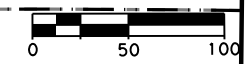


EXISTING UTILITY LAYOUT

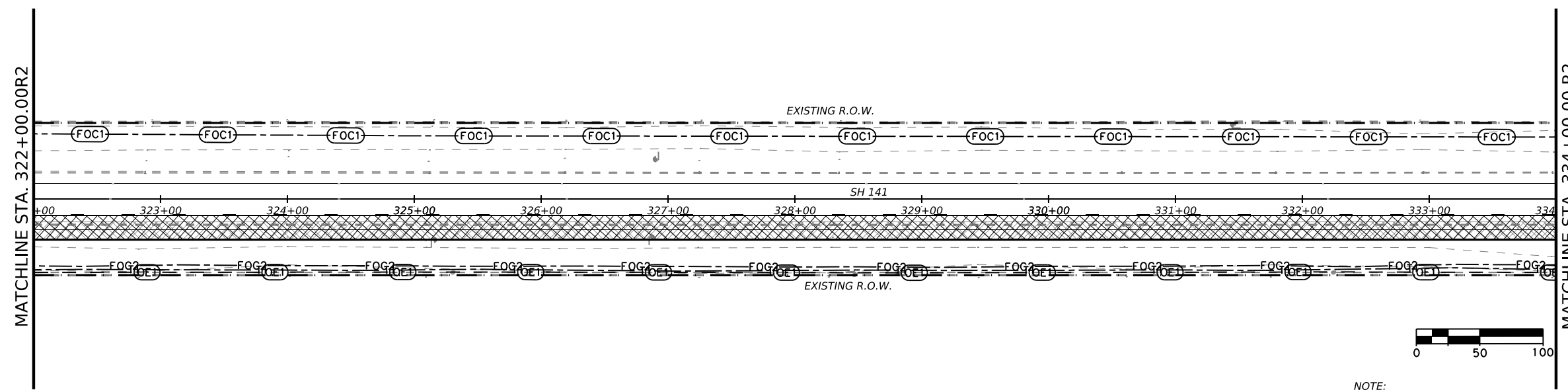
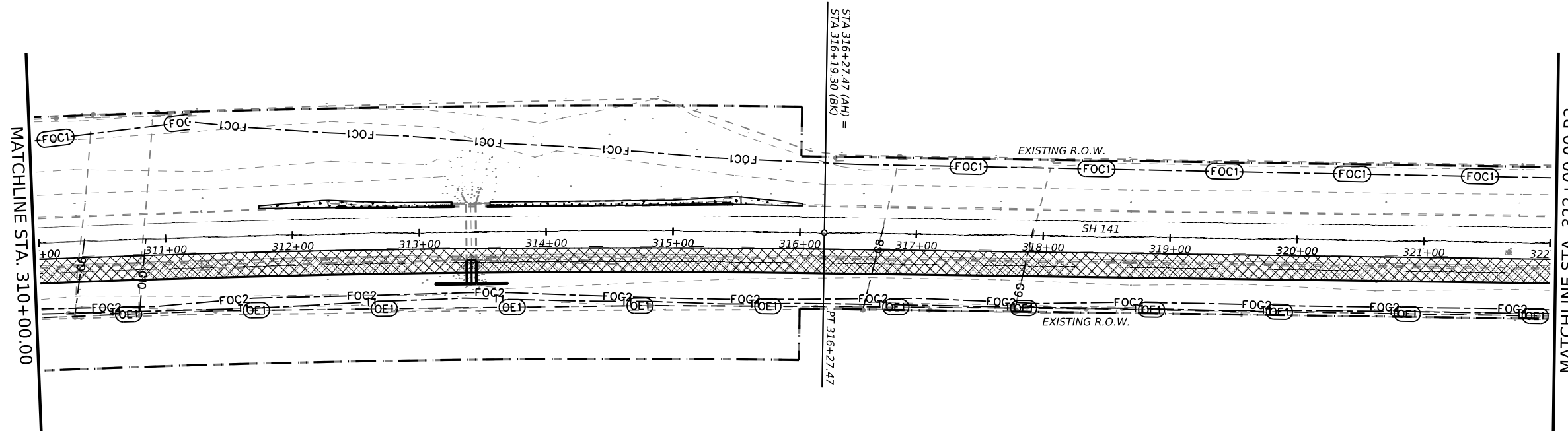
SHEET 9 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	308	

NOTE:
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.
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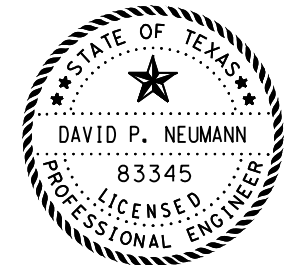


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:22:58-05'00'

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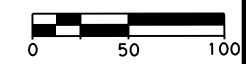


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EXISTING UTILITY LAYOUT

SHEET 10 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	309	

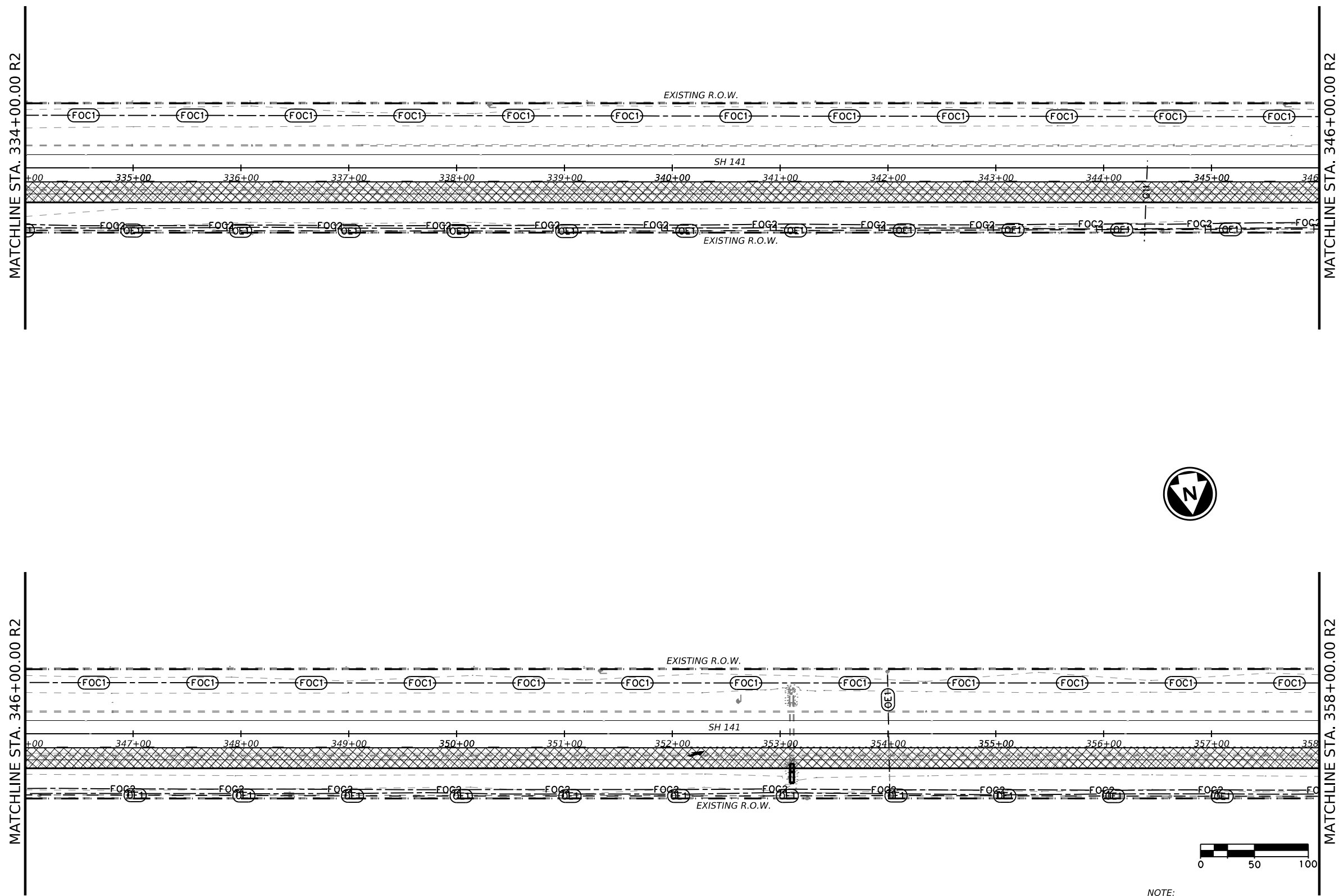


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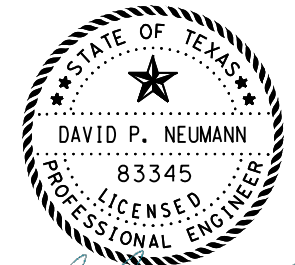


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊞
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:23:06-05'00'

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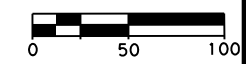


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EXISTING UTILITY LAYOUT

SHEET 11 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	310	



NOTE:
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

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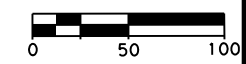
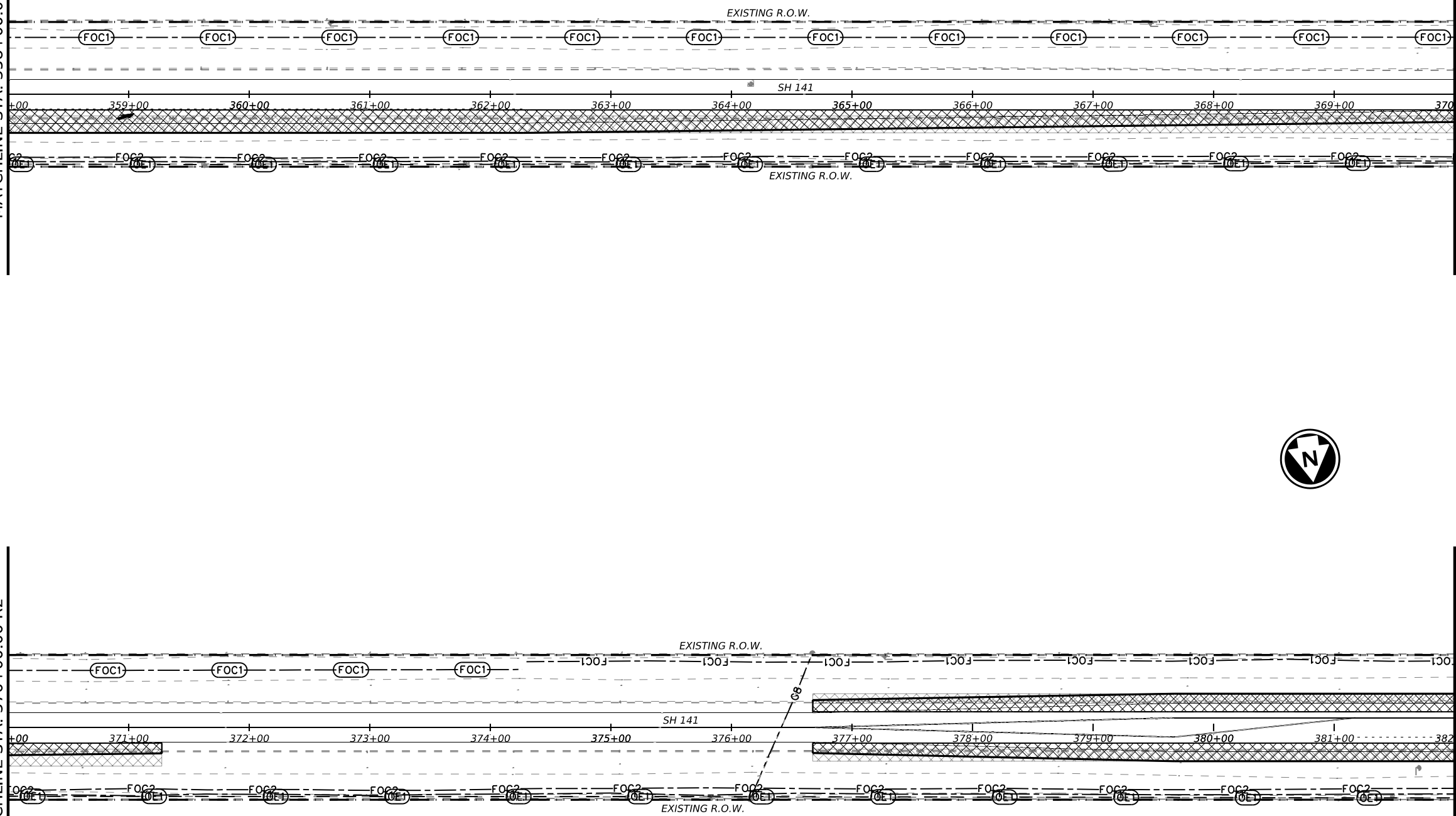
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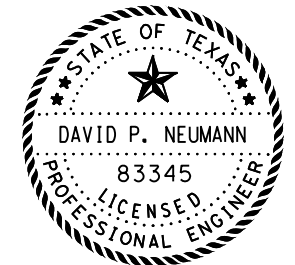
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NOTE:
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LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:23:16-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



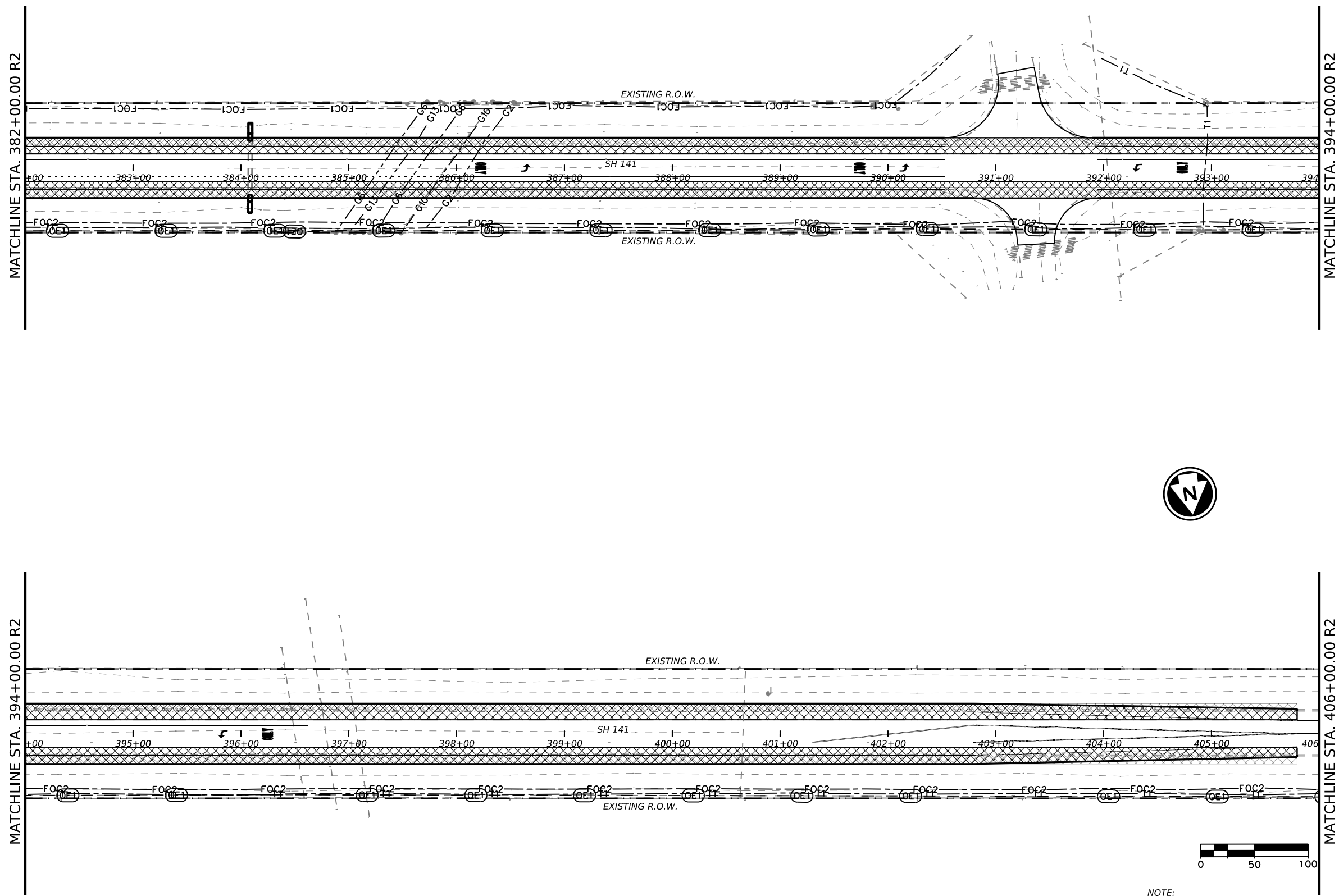
EXISTING UTILITY LAYOUT

SHEET 12 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	311

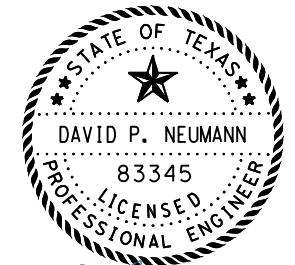
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LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:23:25-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

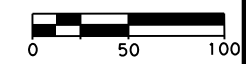


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EXISTING UTILITY LAYOUT

SHEET 13 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	312



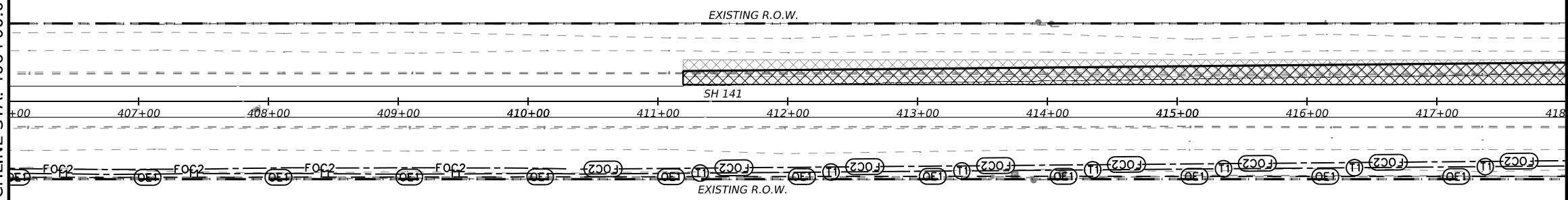
NOTE:
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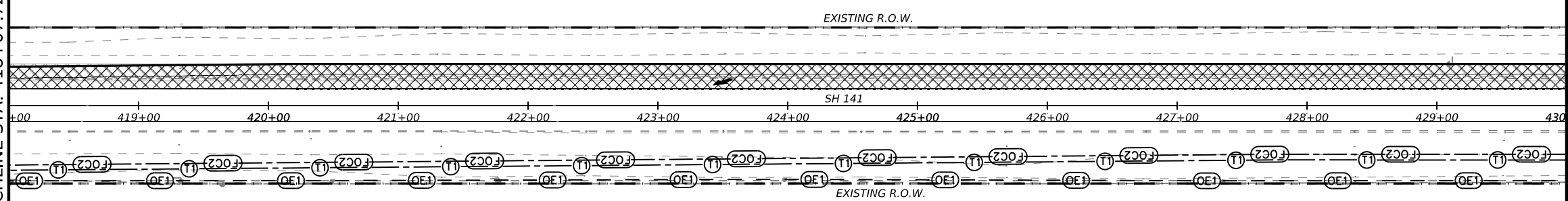
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MATCHLINE STA. 418+00.00 R2

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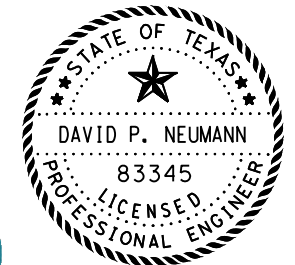


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:23:35-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

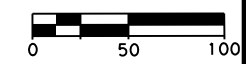


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EXISTING UTILITY LAYOUT

SHEET 14 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	313



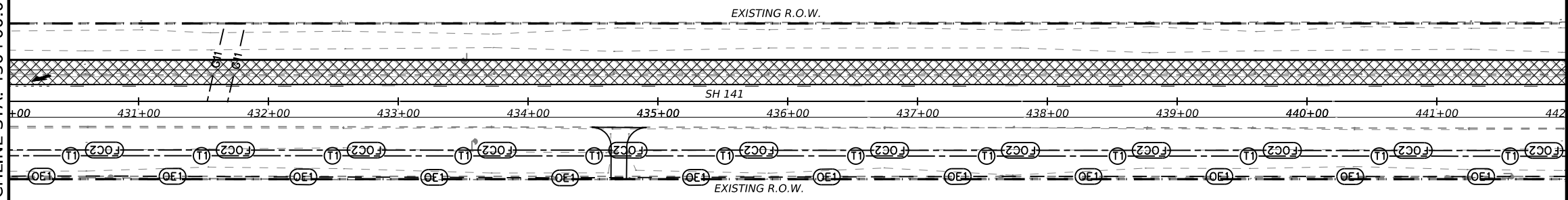
NOTE:
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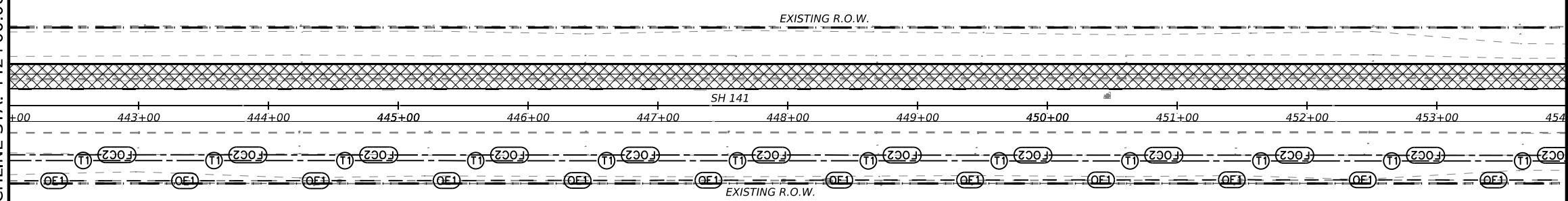
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MATCHLINE STA. 442+00.00 R2

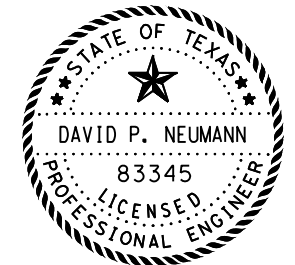


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:23:45-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

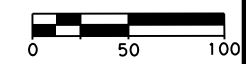


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EXISTING UTILITY LAYOUT

SHEET 15 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	314



NOTE:
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

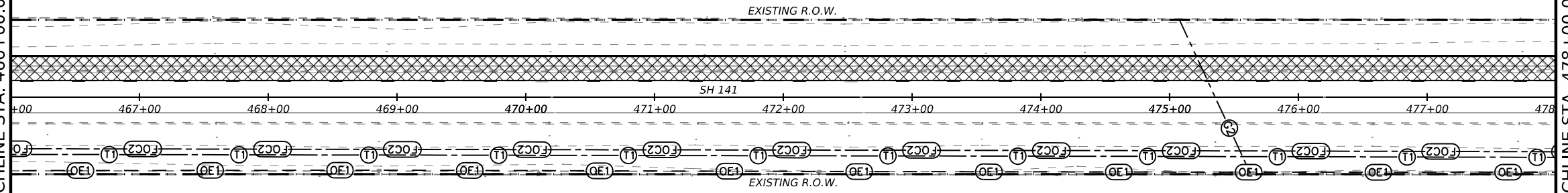
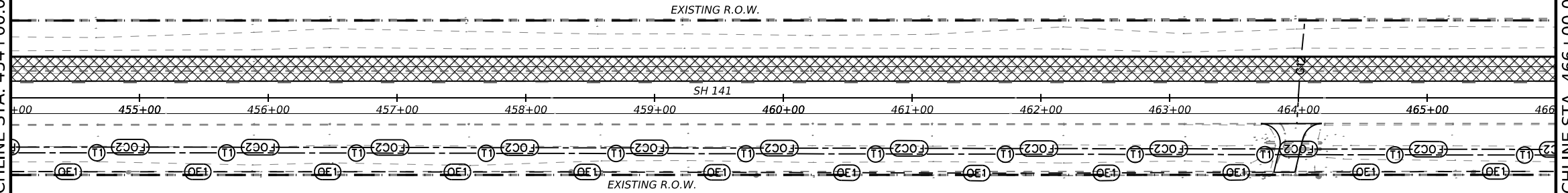
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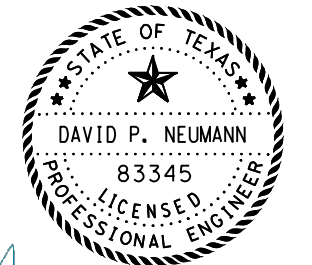


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
WATER	
KING RANCH	QL "D" W1
GAS	
TICONA POLYMER	QL "B" G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
MUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
ELECTRIC/POWER	
AEP TEXAS (UG)	QL "B" E1
AEP TEXAS (OVH)	QL "D" OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:23:54-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



EXISTING UTILITY LAYOUT

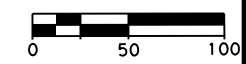
SHEET 16 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	315	

NOTE:

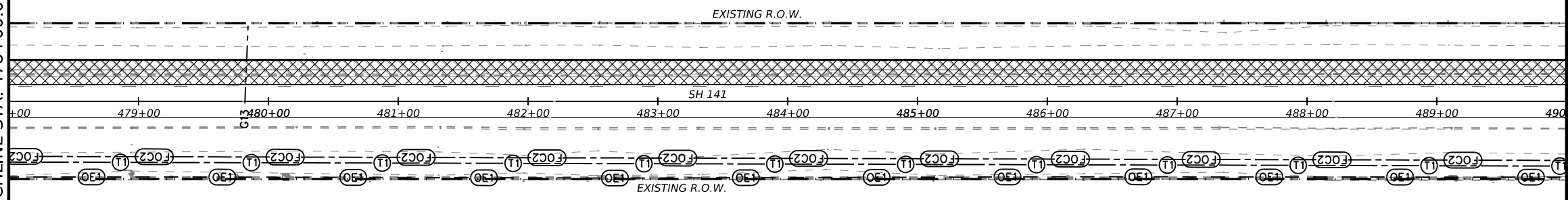
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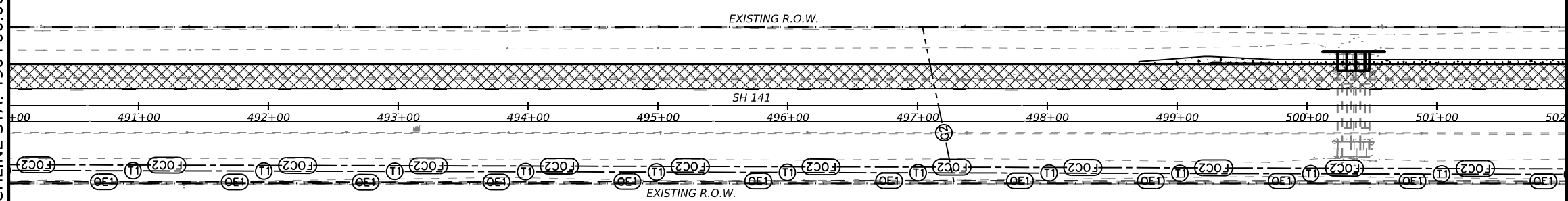


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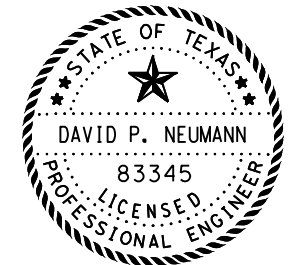


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
MUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:24:04-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

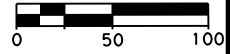


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EXISTING UTILITY LAYOUT

SHEET 17 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	316	

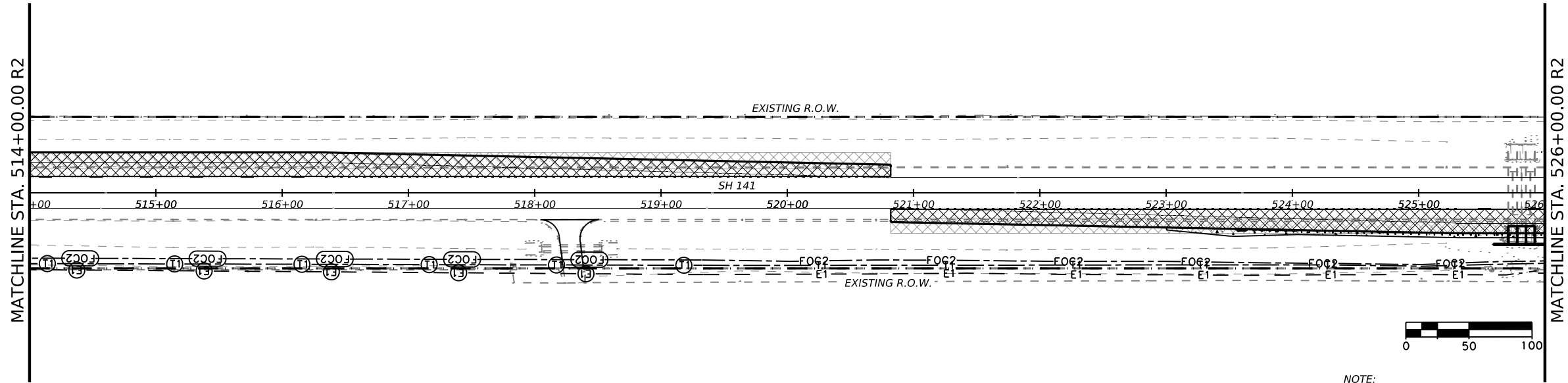
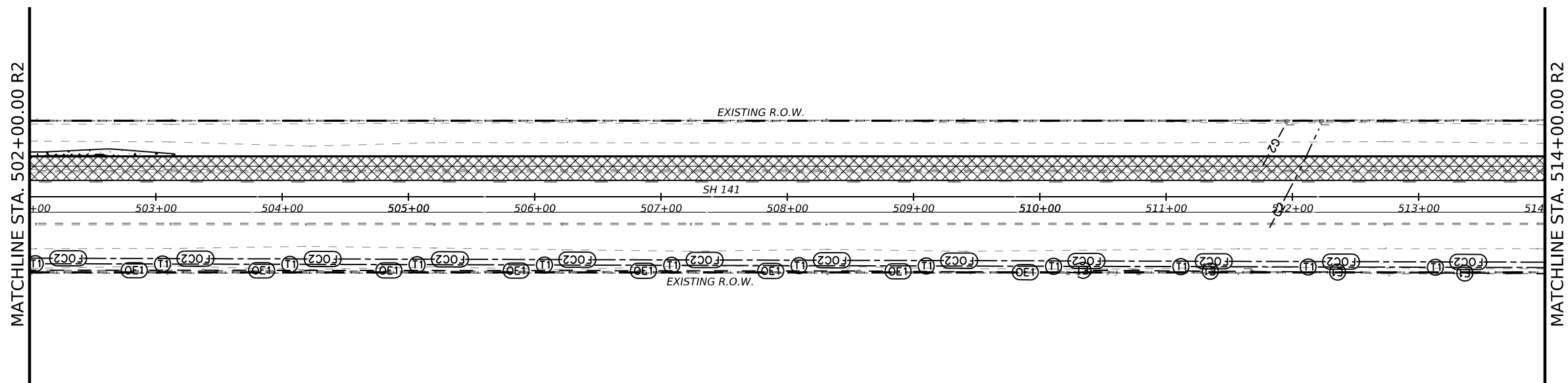


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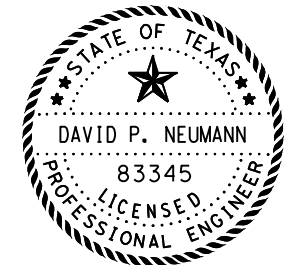
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LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:20:30-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



EXISTING UTILITY LAYOUT

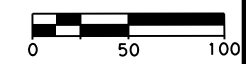
SHEET 18 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	317

NOTE:

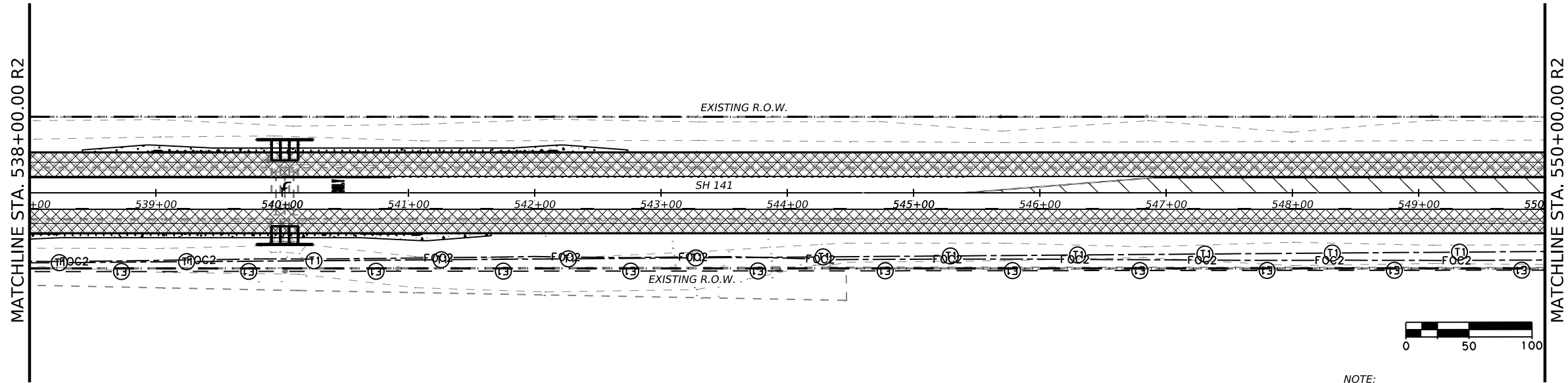
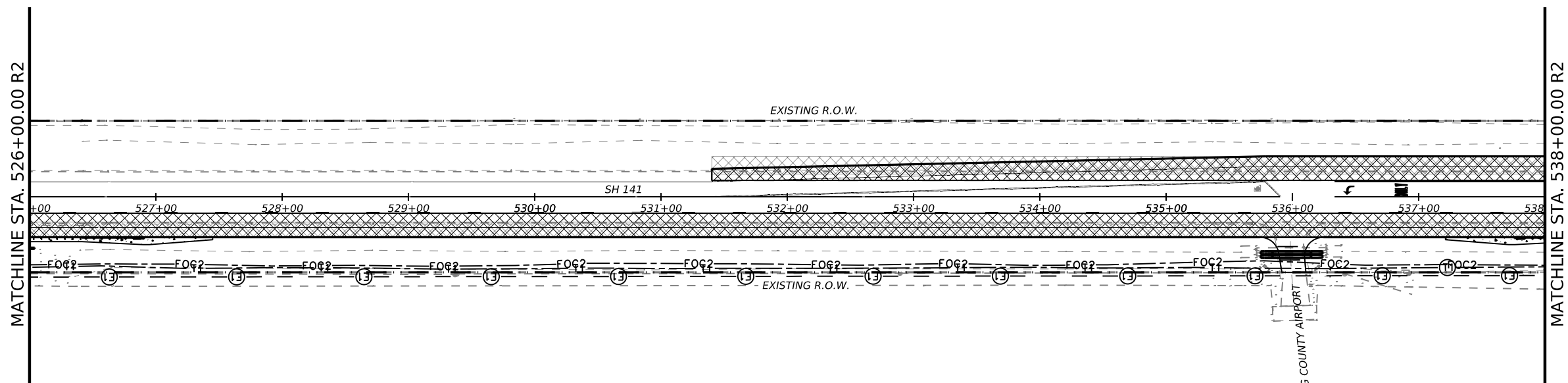
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LEGEND OF UTILITY TYPES

COMMUNICATIONS

QL "B"

AT&T (COPPER) T1

AT&T (FOC) FOC1

VTX FOC2

QL "D"

AT&T (COPPER) T1

AT&T (FOC) FOC1

VTX FOC2

SMARTCOM (AERIAL) FOC3

WATER

QL "D"

KING RANCH W1

GAS

QL "B"

TICONA POLYMER G1

ENTERPRISE PROD G2

TENNESSEE GAS G3

NUSTAR G4

ENERFIN G5

ENERGY TRANSFER G6

KOCH G7

SEADRIFT G8

TRANSCO G9

KINDER MORGAN G10

HUMBLE G11

NET MEXICO G12

UNKNOWN OWNERS G13

QL "D"

ENERFIN G5

ENERGY TRANSFER G6

EXXON G14

ELECTRIC/POWER

QL "B"

AEP TEXAS (UG) E1

QL "D"

AEP TEXAS (OVH) OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE *

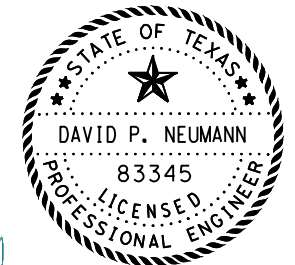
LOST CONNECTION W

TELEPHONE PEDESTAL T

FIBER OPTIC MARKER F

POWER POLE P

GUY ANCHOR A



David P. Neumann, P.E.

2023.07.28 03:20:16-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



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**EXISTING
UTILITY LAYOUT**

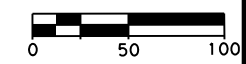
SHEET 19 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY		SHEET NO.
CRP	JIM WELLS, ETC.		318

NOTE:

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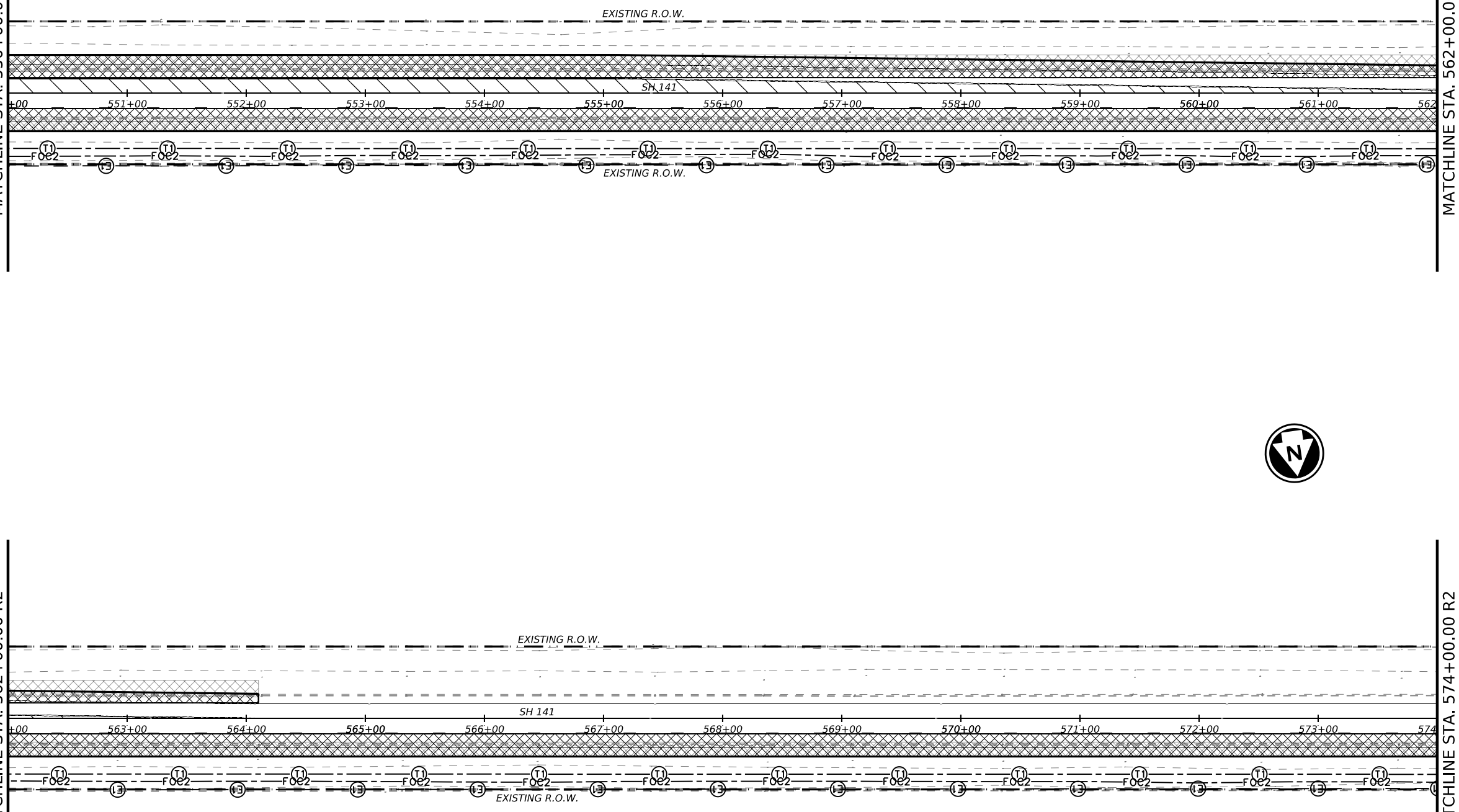


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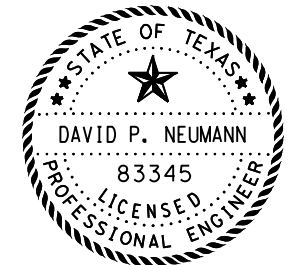
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MATCHLINE STA. 550+00.00 R2

MATCHLINE STA. 562+00.00 R2



LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1
LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:20:03-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

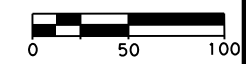


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EXISTING UTILITY LAYOUT

SHEET 20 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	319



NOTE:
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

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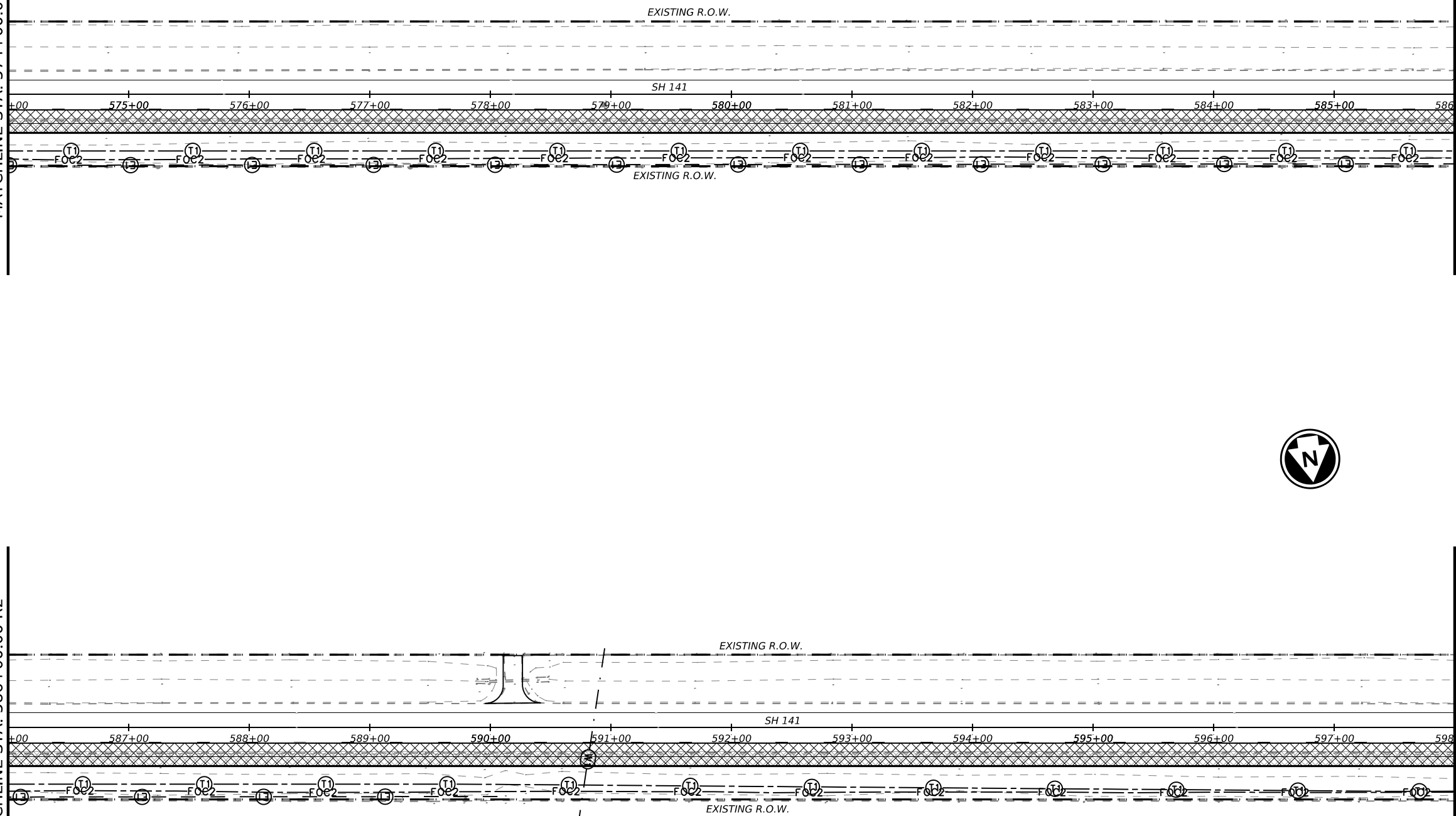
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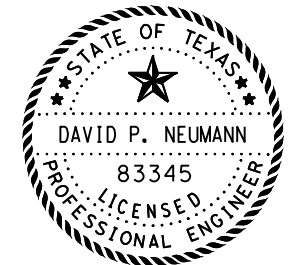


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:19:50-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

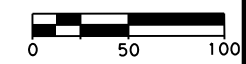


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EXISTING UTILITY LAYOUT

SHEET 21 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	320	



NOTE:

UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

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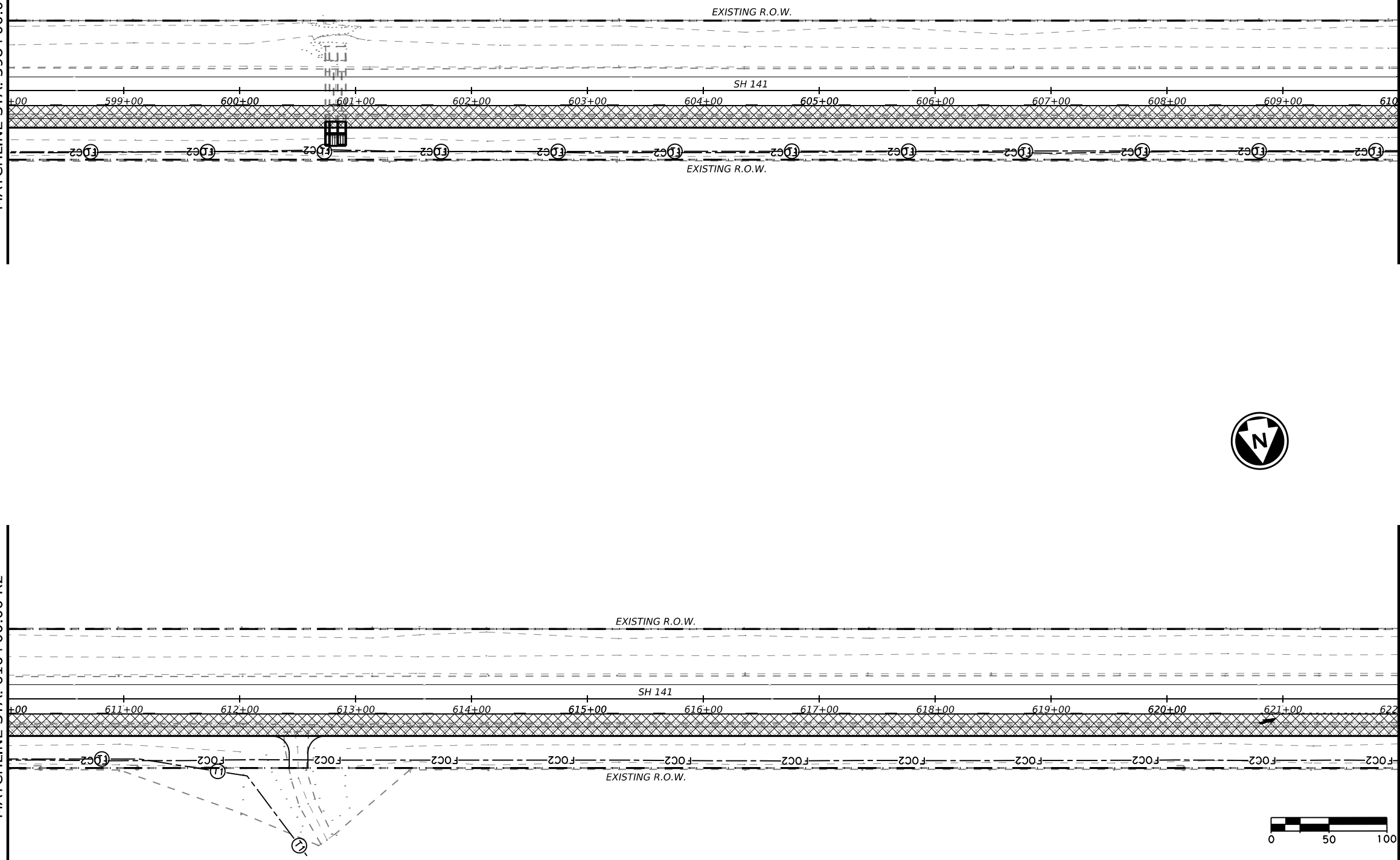
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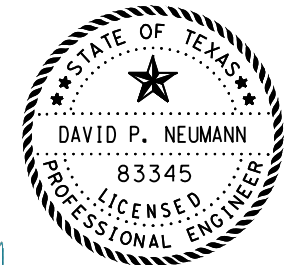


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	T
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:19:38-05'00'

LOCHNER
TBPE Firm Reg. No. 10488



EXISTING UTILITY LAYOUT

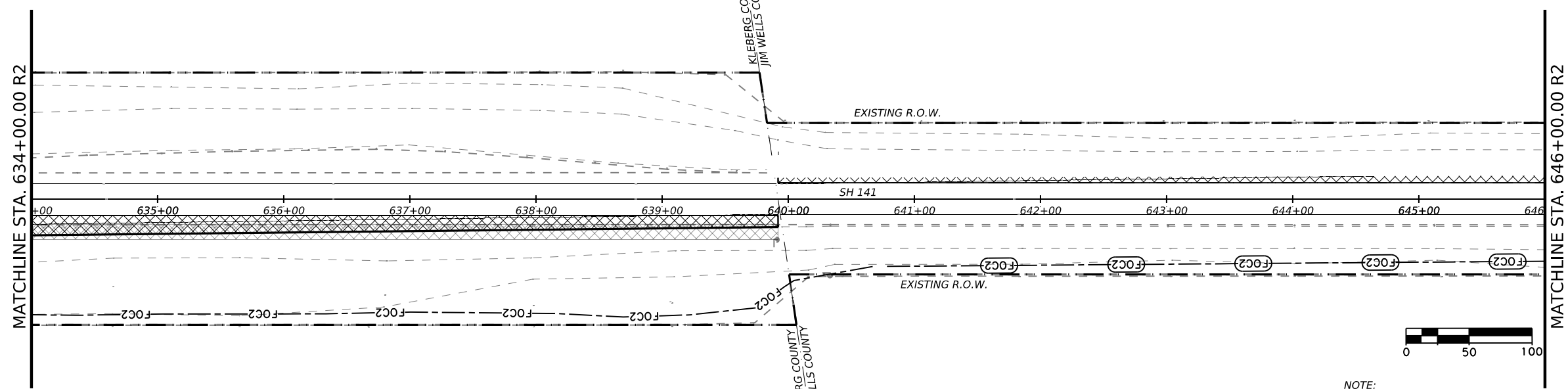
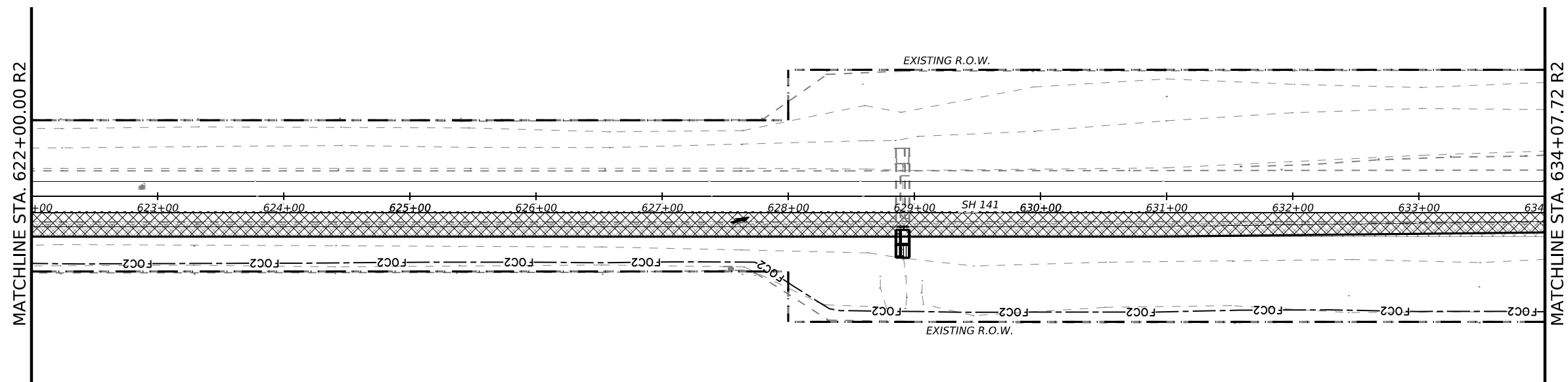
SHEET 22 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	321	

NOTE:
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.
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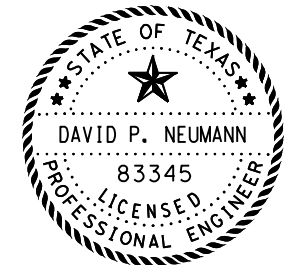


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:19:26-05'00'

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TBPE Firm Reg. No. 10488



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EXISTING UTILITY LAYOUT

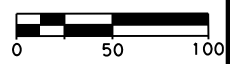
SHEET 23 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	322

NOTE:

UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

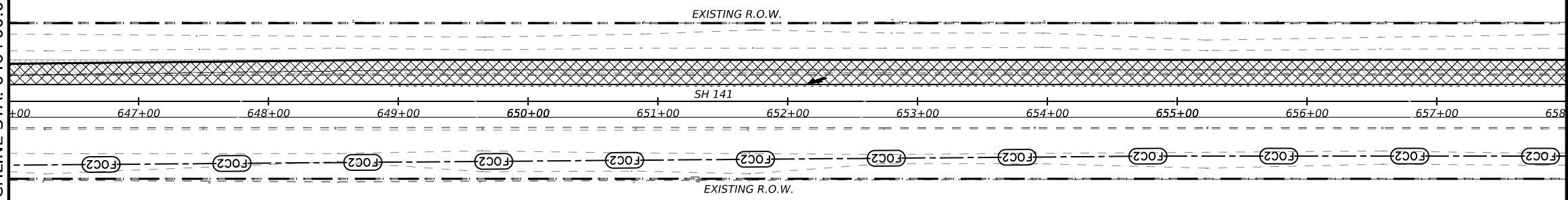
ANY CONFLICTS NOTED BETWEEN EXISTING UTILITIES AND PROPOSED ROADWAY WORK ARE SUBJECT TO VERIFICATION BY THE ENGINEER AND UTILITY OWNER. CONTRACTOR SHALL VERIFY ALL UTILITIES PRIOR TO ANY CONSTRUCTION.



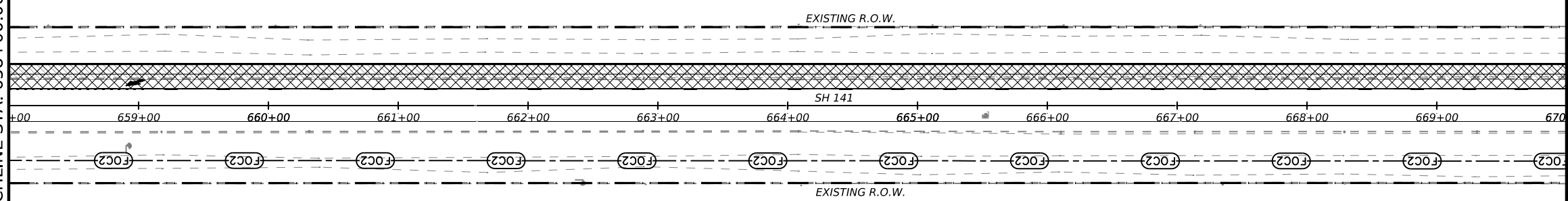
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MATCHLINE STA. 658+00.00 R2

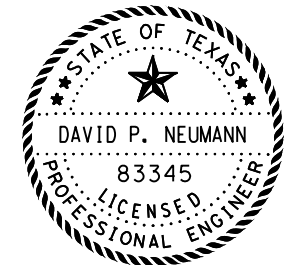


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:19:13-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

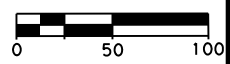


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EXISTING UTILITY LAYOUT

SHEET 24 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	323	



NOTE:

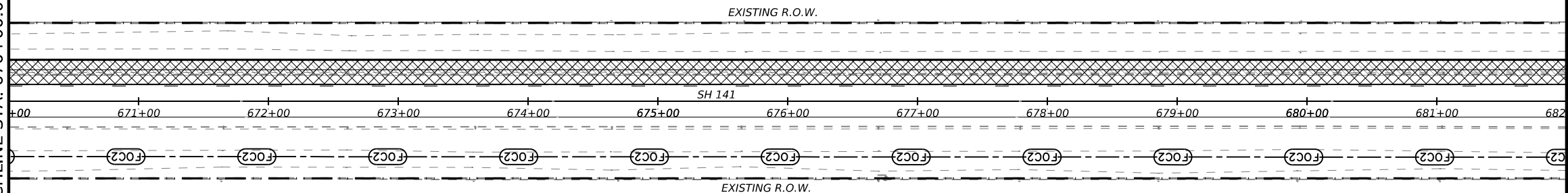
UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.

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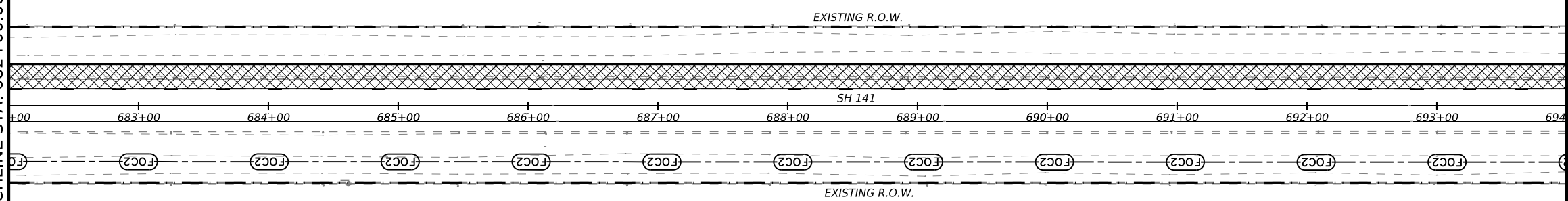
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MATCHLINE STA. 682+00.00 R2

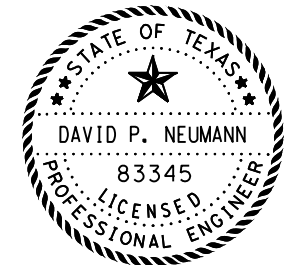


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
MUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:19:01-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

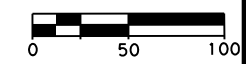


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EXISTING UTILITY LAYOUT

SHEET 25 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	324	



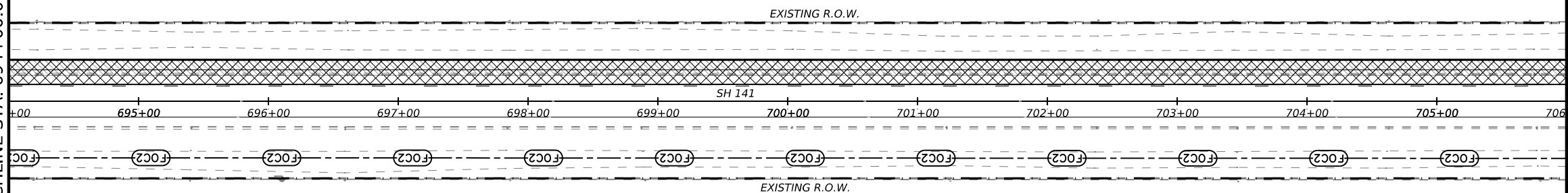
NOTE:
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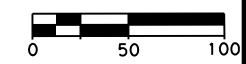
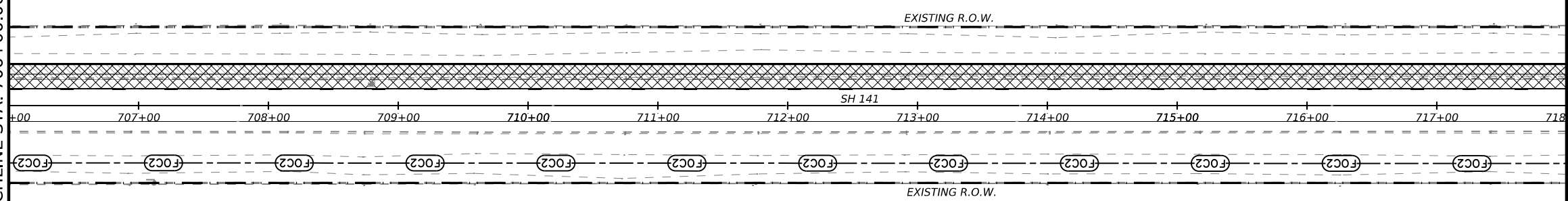
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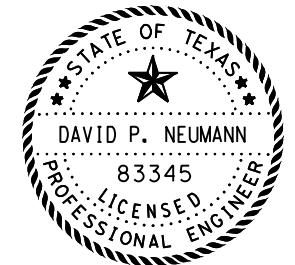
MATCHLINE STA. 706+00.00 R2



NOTE:
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LEGEND OF UTILITY TYPES	
COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS	
LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:18:48-05'00'

LOCHNER
 TBPE Firm Reg. No. 10488



EXISTING UTILITY LAYOUT

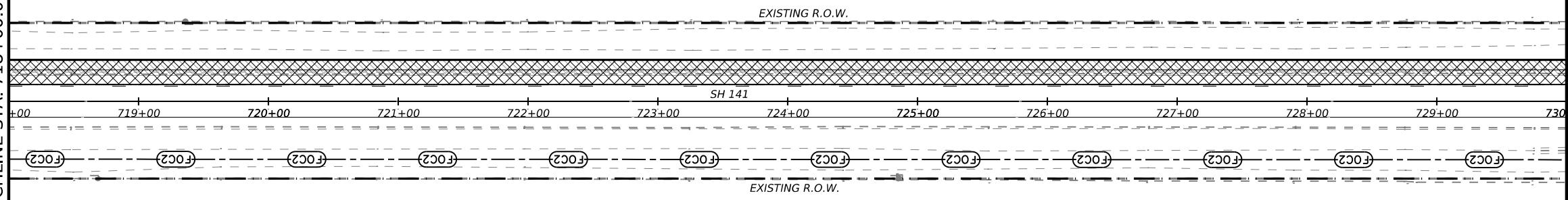
SHEET 26 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	325

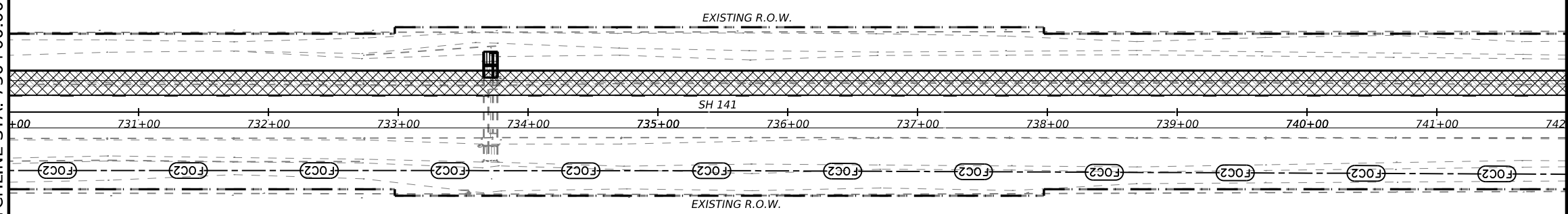
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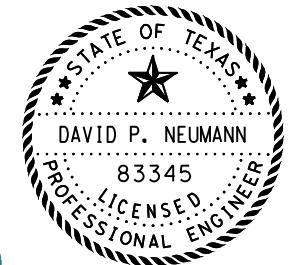


LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
QL "D"	
KING RANCH	W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→



David P. Neumann, P.E.

2023.07.28 03:18:33-05'00'

LOCHNER
TBPE Firm Reg. No. 10488

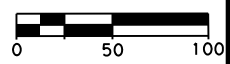


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EXISTING UTILITY LAYOUT

SHEET 27 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST	COUNTY	SHEET NO.	
CRP	JIM WELLS, ETC.	326	

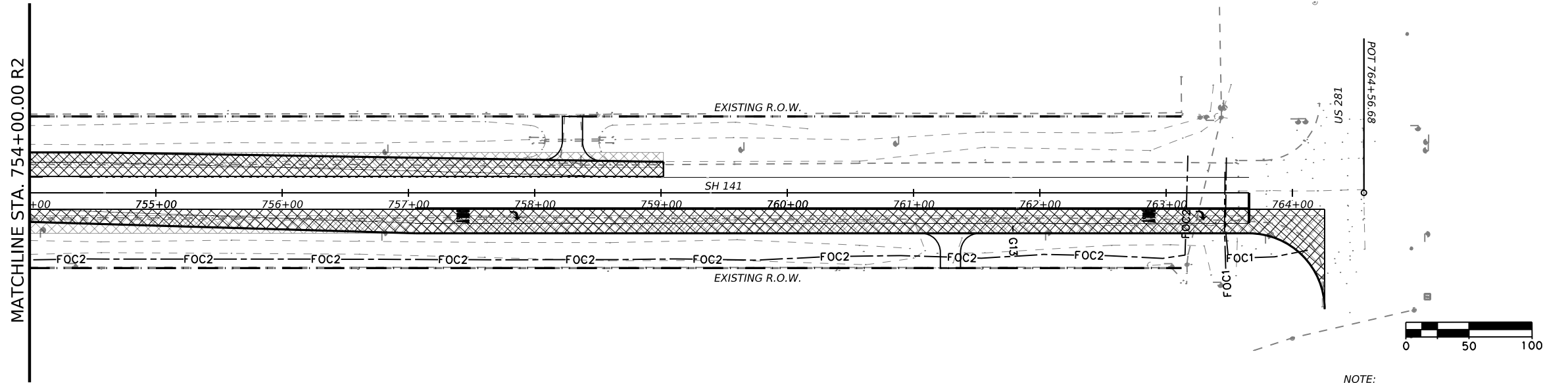
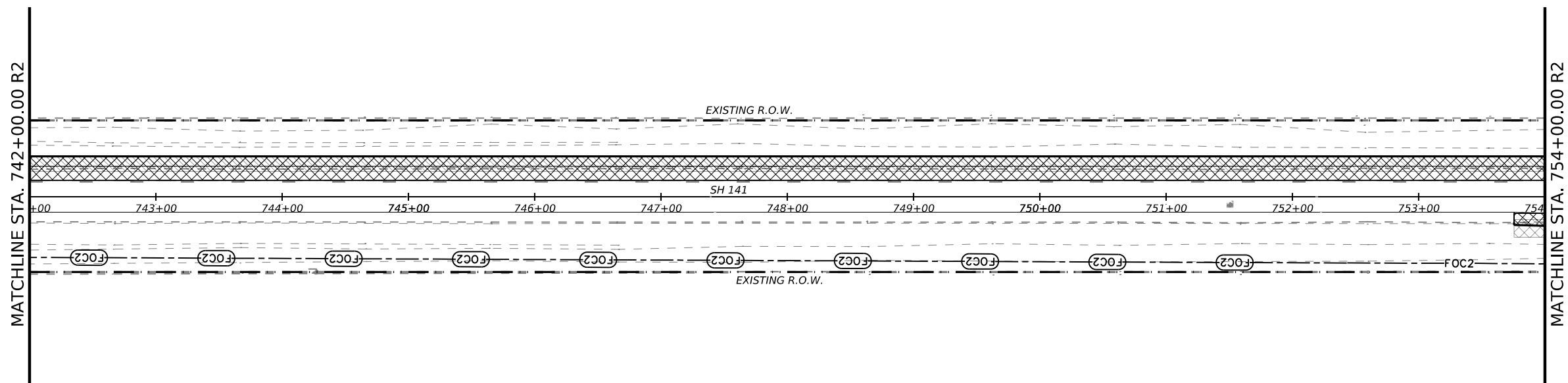


NOTE:
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FILE: c:\pw_working\lochner-pw-01\dms7242\SH141_SUE-52.dgn

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LEGEND OF UTILITY TYPES

COMMUNICATIONS	
AT&T (COPPER)	QL "B" T1
AT&T (FOC)	FOC1
VTX	FOC2
QL "D"	
AT&T (COPPER)	T1
AT&T (FOC)	FOC1
VTX	FOC2
SMARTCOM (AERIAL)	FOC3
WATER	
KING RANCH	QL "D" W1
GAS	
QL "B"	
TICONA POLYMER	G1
ENTERPRISE PROD	G2
TENNESSEE GAS	G3
NUSTAR	G4
ENERFIN	G5
ENERGY TRANSFER	G6
KOCH	G7
SEADRIFT	G8
TRANSCO	G9
KINDER MORGAN	G10
HUMBLE	G11
NET MEXICO	G12
UNKNOWN OWNERS	G13
QL "D"	
ENERFIN	G5
ENERGY TRANSFER	G6
EXXON	G14
ELECTRIC/POWER	
QL "B"	
AEP TEXAS (UG)	E1
QL "D"	
AEP TEXAS (OVH)	OE1

LEGEND OF UTILITY SYMBOLS

LEVEL STATUS CHANGE	*
LOST CONNECTION	W
TELEPHONE PEDESTAL	⊠
FIBER OPTIC MARKER	⊙
POWER POLE	●
GUY ANCHOR	→

STATE OF TEXAS
 DAVID P. NEUMANN
 83345
 LICENSED PROFESSIONAL ENGINEER
David P. Neumann, P.E.

2023.07.28 03:18:19-05'00'
LOCHNER
 TBPE Firm Reg. No. 10488

Texas Department of Transportation
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EXISTING UTILITY LAYOUT

SHEET 28 OF 28

CONT	SECT	JOB	HIGHWAY
0383	03	024, ETC.	SH 141
DIST		COUNTY	SHEET NO.
CRP		JIM WELLS, ETC.	327

NOTE:
 UTILITIES SHOWN ARE BASED ON VISUAL OBSERVATIONS AND DESIGN SURVEYS AND MAY NOT INCLUDE ALL EXISTING UTILITIES LOCATED ALONG PROJECT.
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