FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6	C 0624-01-003			1
STATE	STATE DIST.	COUNTY		
TEXAS	SAT	UVALDE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0624	01	003	PR 29A	

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT
PROJECT NO. C 0624-01-003
CSJ: 0624-01-003

UVALDE
PR 29A

LIMITS FROM: ON PR 29A
TO: IN GARNER STATE PARK

NET LENGTH OF ROADWAY = 1035.00 FT = 0.196 MI
NET LENGTH OF BRIDGE = 0.00 FT = 0.000 MI
NET LENGTH OF PROJECT = 1035.00 FT = 0.196 MI

DESIGN SPEED = 20MPH
AREA OF DISTURBED SOIL < 1 ACRE
ADT: 323

ACCESSIBILITY STANDARDS = PROWAG

REGISTERED ACCESSIBILITY SPECIALIST INSPECTION REQUIRED
TDLR NO.

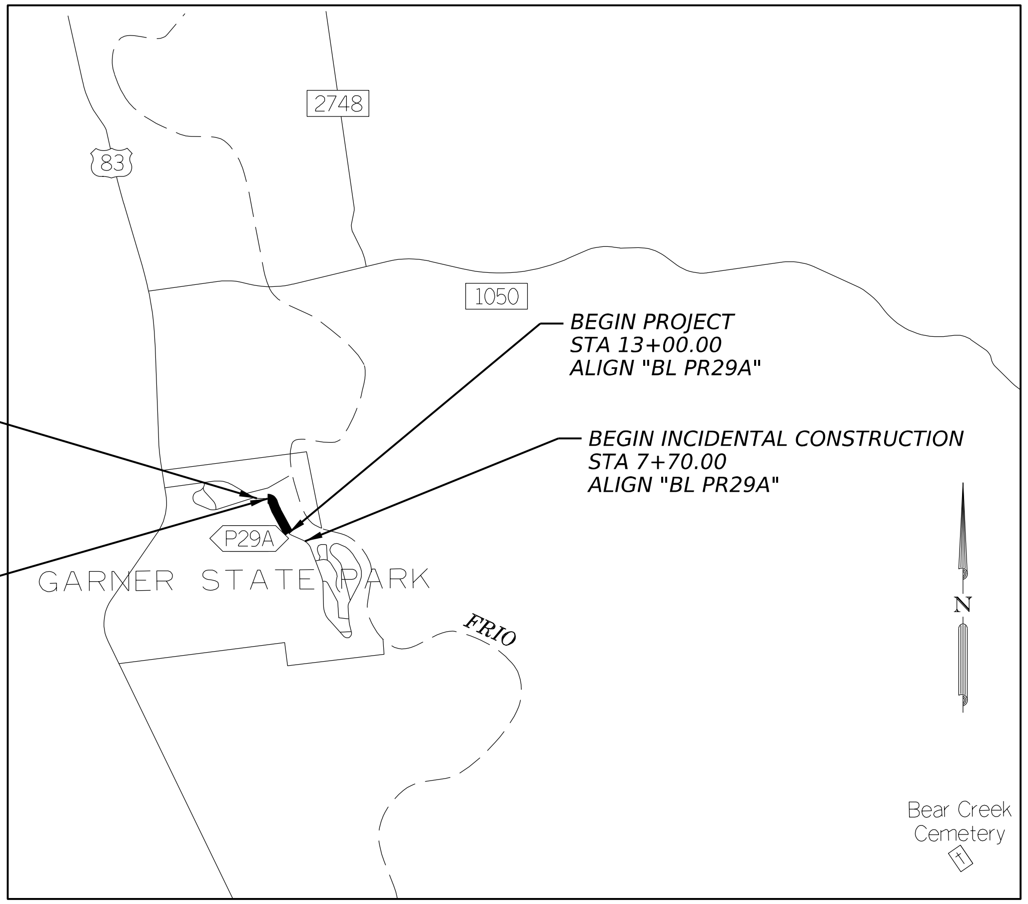
FOR WORK CONSISTING OF Repair Retaining Wall and Adjacent Pedestrian Walkway

END INCIDENTAL CONSTRUCTION
STA 29+86.00
ALIGN "BL PR29A"

BEGIN PROJECT
STA 13+00.00
ALIGN "BL PR29A"

BEGIN INCIDENTAL CONSTRUCTION
STA 7+70.00
ALIGN "BL PR29A"

END PROJECT
STA 23+35.00
ALIGN "BL PR29A"



SCALE: N.T.S.

FINAL PLANS

LETTING DATE: ______

DATE CONTRACTOR BEGAN WORK: ______

DATE WORK WAS ACCEPTED: ______

FINAL CONTRACT COST: $ ______

CONTRACTOR: ______

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED
IN ACCORDANCE WITH THE PLANS.

______ P.E. ______
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

FILE LOCATION AND NAME
T:\Engdata\Standards\Design\TITLESHEET-2014Specs.DGN

LEVELS DISPLAYED

COUNTY ______ PROJ. NO. ______
HWY. NO. ______ LETTING DATE ______
DATE ACCEPTED ______

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)

EXCEPTIONS: NONE
EQUATIONS: NONE
R.R. CROSSINGS: NONE

SUBMITTED FOR LETTING 2/28/2024
DocuSigned by: Deyton Riddle
TRANSPORTATION ENGINEER

RECOMMENDED FOR LETTING 2/29/2024
DocuSigned by: Clayton Ripps, P.E.
DEPUTY DISTRICT ENGINEER

REVIEWED FOR LETTING 2/28/2024
DocuSigned by: DCRoganis, P.E.
TRANSPORTATION ENGINEER SUPERVISOR

APPROVED FOR LETTING 3/1/2024
DocuSigned by: Charles Benavides
DISTRICT ENGINEER

DESIGN DR | DRAFT EL | CHECK:

GENERAL

	1	TITLE SHEET
	2	INDEX OF SHEETS
	3	PROJECT LAYOUT
	4	SITE MAP
	5	EXISTING TYPICAL SECTIONS
	6	PROPOSED TYPICAL SECTIONS
	7 - 7A	GENERAL NOTES
	8 - 8A	ESTIMATE & QUANTITY
	9	SUMMARIES
	10	SUMMARY OF SMALL SIGNS

TCP & SWP3

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	12	TCP SEQUENCE OF WORK
	13	TCP TYPICAL SECTIONS
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TCP & SWP3 STANDARDS

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$	31	*TCP(1-2)-18
$	32	*TCP(2-8)-23
$	33	*TCP(SC-1)-22
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$	35-36	*EC(1)-16, EC(3)-16

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	38	HORIZONTAL & VERTICAL CONTROL
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	46-50	BASELINE PLAN AND PROFILE
	51-53	"F" CURB PLAN AND PROFILE
	54-55	CIP PERMANENT CONCRETE BARRIER

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$	58-59	**MISCELLANEOUS CURB AND SIDEWALK DETAILS
$	60-62	*PRD-13
$	63-64	*PEDESTRIAN RAIL TYPE PR3 (MOD)
$	65-66	*HANDRAIL DETAILS FOR TYPE PR3 PEDESTRIAN RAIL (MOD)
$	67	*D&OM(1)-20
$	68	*D&OM(2)-20
$	69	*D&OM(6)-20
#	70	*GF(31)MS-19

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RETAINING WALL STANDARDS

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STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E. 2/26/2024
DEYTON RIDDLE DATE

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE ($), HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED PROFESSIONAL ENGINEER

P.E. 02/26/2024
JONATHAN WYATT HINSHAW DATE

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE (#), HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

* STATE STANDARD
** SAN ANTONIO DISTRICT STANDARD

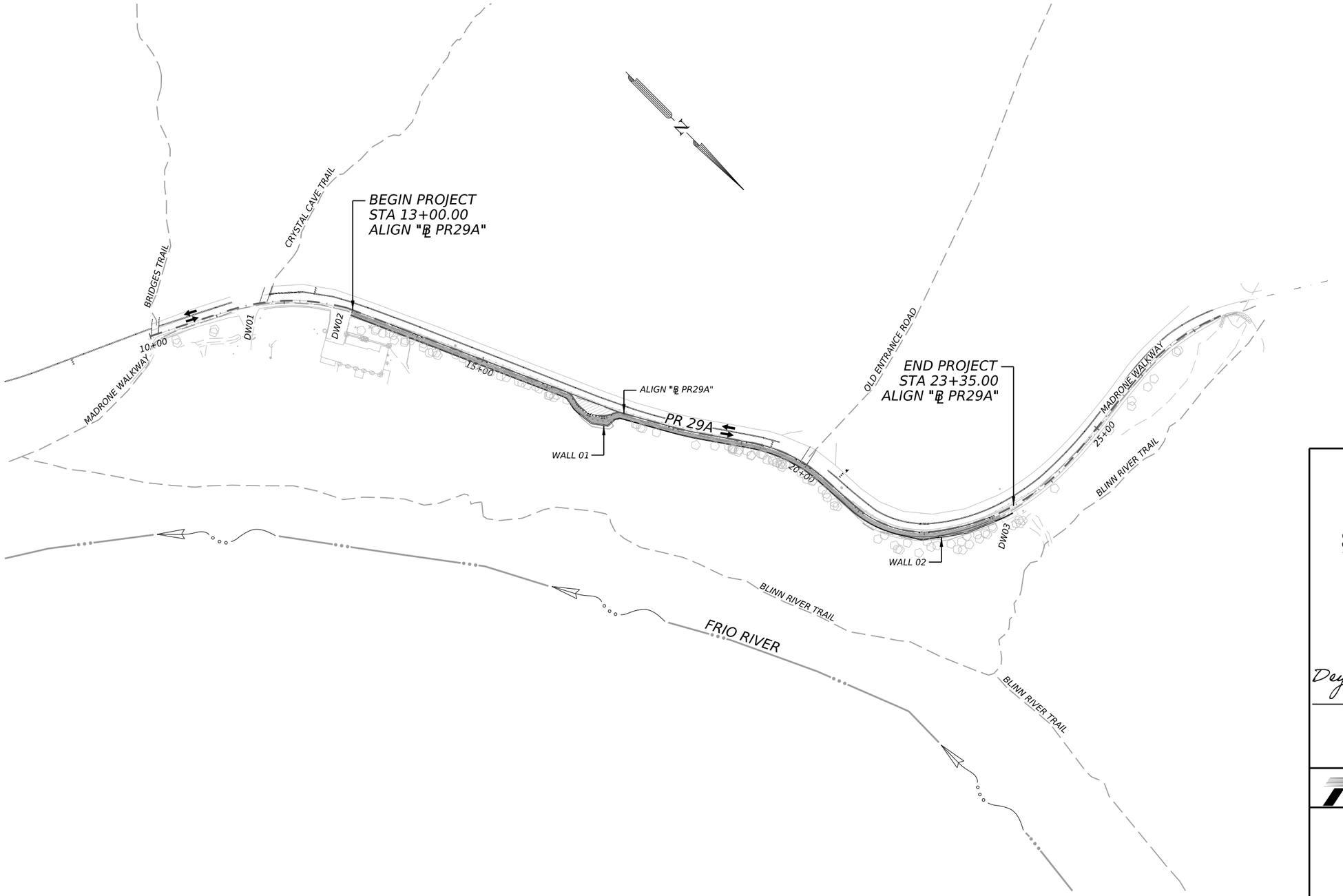
Texas Department of Transportation

PR 29A
INDEX OF SHEETS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		2

DESIGN: | DRAFT: | CHECK: DR



STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED
PROFESSIONAL ENGINEER

Deyton Riddle P.E. — 02/26/2024
DEYTON RIDDLE — DATE

SCALE: 1"=150'

Texas Department of Transportation

PR 29A PROJECT LAYOUT

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		3

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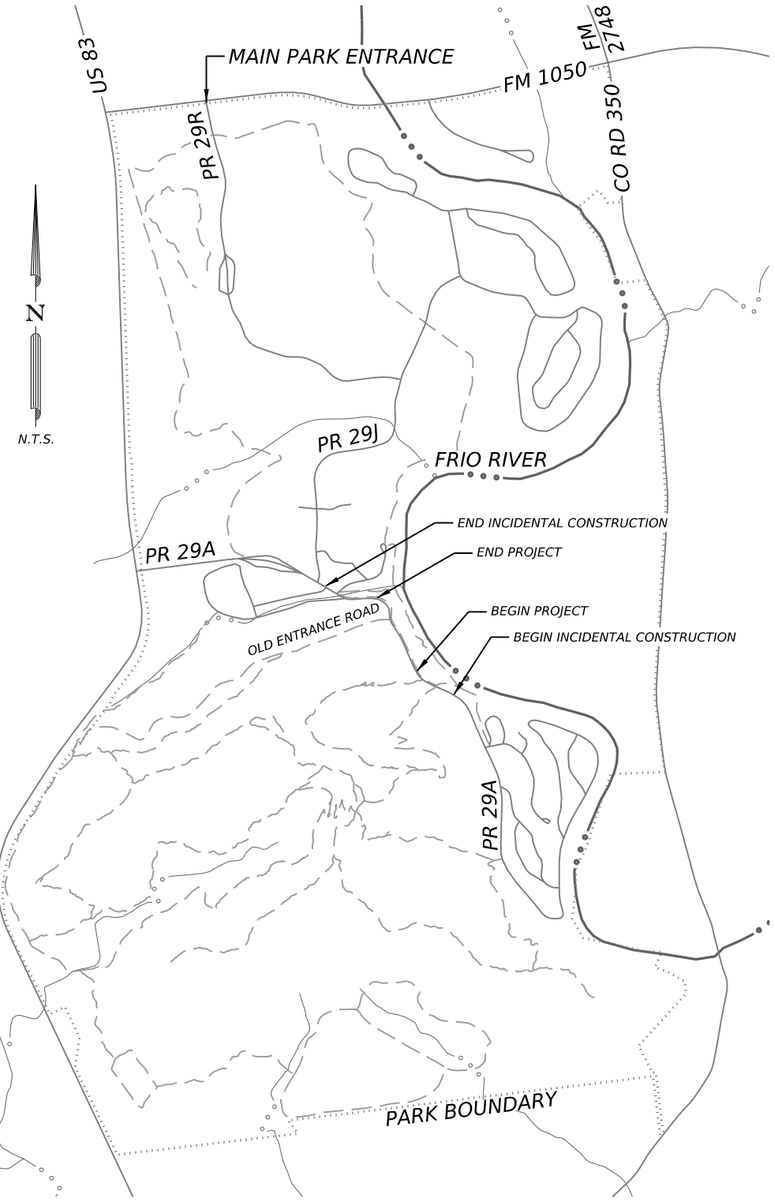

NOTE:
1. CONTRACTOR SHALL COORDINATE WITH TPWD AND PARK PERSONNEL PRIOR TO MOBILIZING AND STORING MATERIALS AND/OR EQUIPMENT

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

Texas Department of Transportation

PR 29A
SITE MAP

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		4

DESIGN: EL | DRAFT: EL | CHECK: DR

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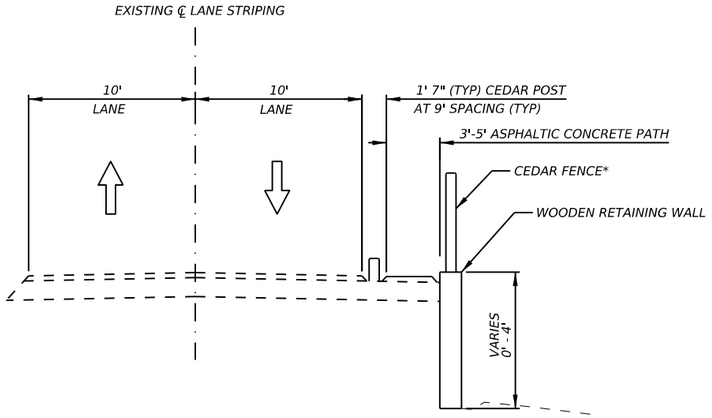
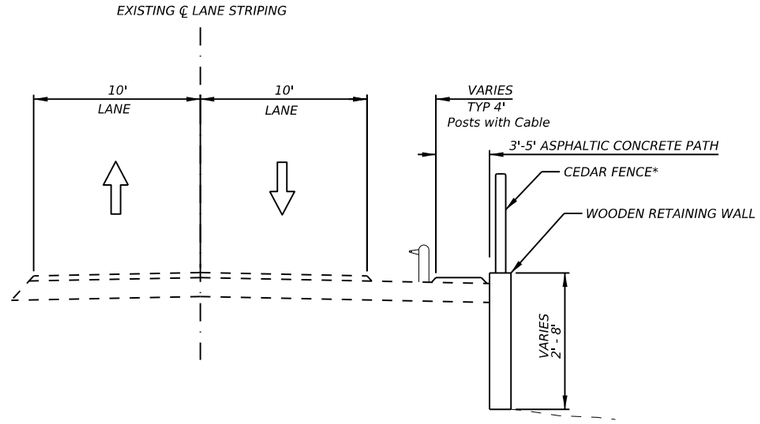
DESIGN: JH | DRAFT: JH | CHECK: DR

*FOR THESE LOCATIONS NO CEDAR FENCE IS PRESENT
STA 18+57 TO 19+39
STA 19+83 TO 20+10
STA 20+45 TO 21+66
STA 22+21 TO 23+35



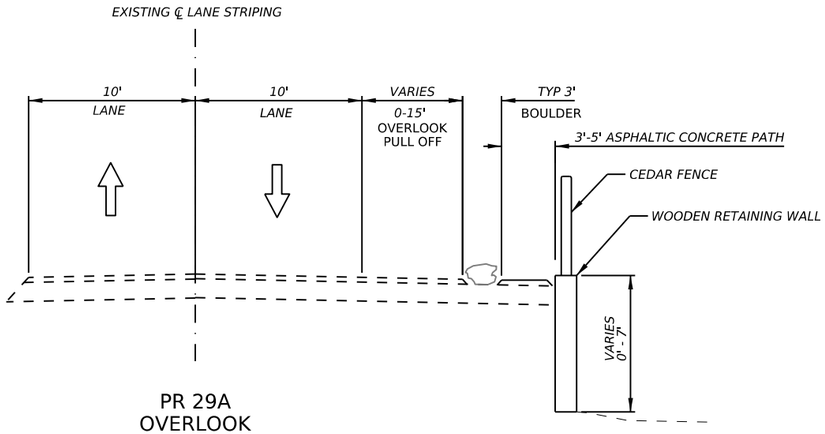
PR 29A

STA 13+00 TO STA 16+33.15
STA 17+21.35 TO 21+30.59
STA 22+93.66 TO 23+35



PR 29A

STA 21+30.59 TO STA 22+93.66



PR 29A
OVERLOOK

STA 16+33.15 TO STA 17+21.35

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED
PROFESSIONAL ENGINEER

Deyton Riddle
P.E.
DEYTON RIDDLE

02/26/2024
DATE

Texas Department of Transportation

PR 29A
EXISTING
TYPICAL SECTIONS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		5

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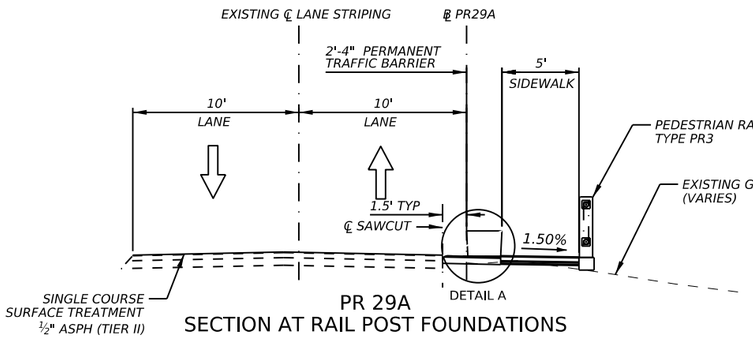
DESIGN: DR | DRAFT: DR | CHECK: DR

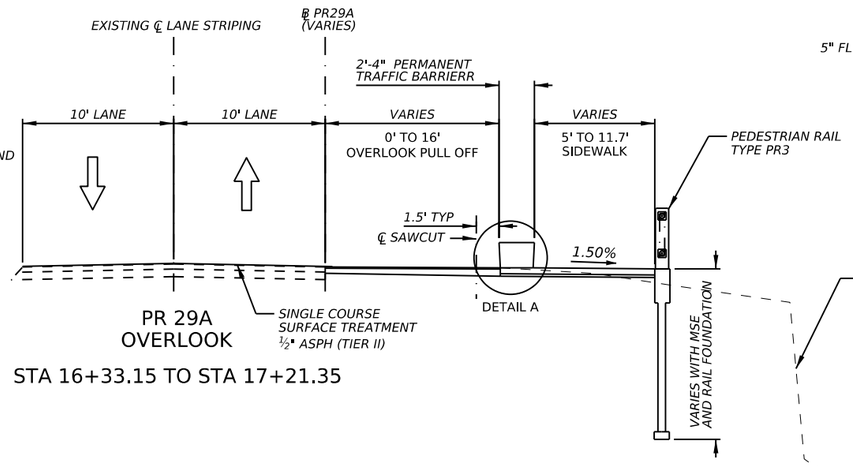
* FOR THESE LOCATIONS NO TRAFFIC BARRIER AND HANDRAIL WILL BE PLACED.

** FOR THESE LOCATIONS A 4:1 SLOPE TYING INTO EXISTING GROUND IS REQUIRED.



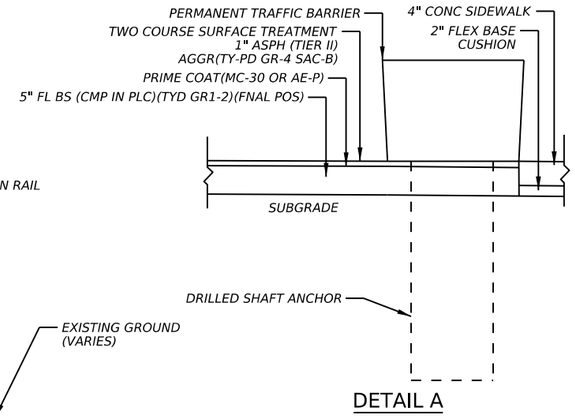
PR 29A
SECTION AT RAIL POST FOUNDATIONS

STA 13+00 TO STA 13+30
STA 16+28.68 TO STA 16+64.82
**STA 17+07.23 TO 17+10
STA 17+10 TO STA 17+40
STA 18+60.76 TO STA 19+90
**STA 19+90 TO STA 20+00
STA 20+00 TO STA 22+19.11
*STA 23+03.64 TO STA 23+35

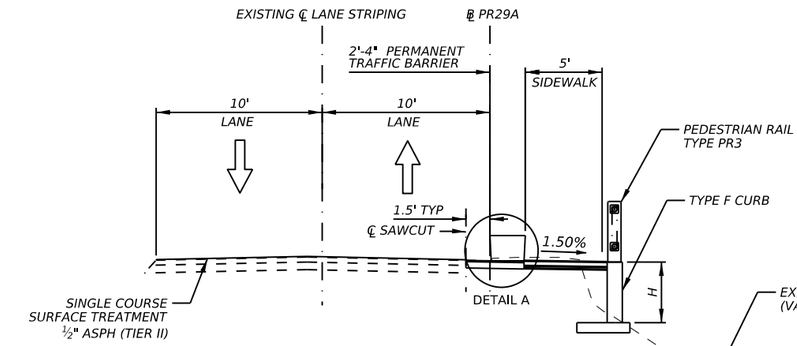


PR 29A
OVERLOOK

STA 16+33.15 TO STA 17+21.35

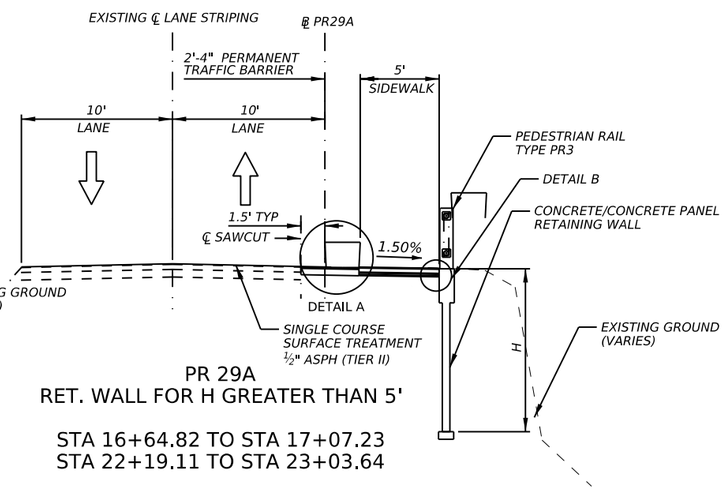


DETAIL A



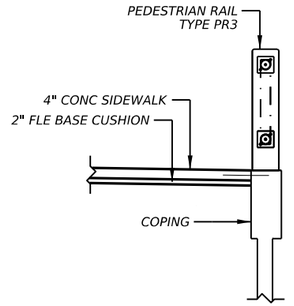
PR 29A
F CURB FOR H = 5' OR LESS

STA 13+30 TO STA 16+28.68
STA 17+31 TO STA 18+60.76



PR 29A
RET. WALL FOR H GREATER THAN 5'

STA 16+64.82 TO STA 17+07.23
STA 22+19.11 TO STA 23+03.64



DETAIL B

NOTE: SEE RETAINING WALL DETAILS AND RW(MSE) FOR REINFORCEMENT CONNECTION BETWEEN COPING AND SIDEWALK.

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle
P.E.
DEYTON RIDDLE

02/26/2024
DATE

Texas Department of Transportation

PR 29A
PROPOSED
TYPICAL SECTIONS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		6

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**********GENERAL NOTES**********
2014 Specification Book (Revised September 25, 2023)

========== Surface Treatment Data ==========

Description	Mainlanes	East of Sawcut
Area	4869 sy	611 sy
	-----See Bid Item-----	
Prime Coat-rate(gal/sy)		0.20/1= 123gal
Asphalt—rate (gal/sy)	0.32/1 = 1558gal	0.32/1 = 196gal (two courses)
Aggregate--type/gr	ty PD/gr 4	ty PD/gr 4
Aggregate—rate (cy/sy)	1/130 = 38cy	1/130 = 5 cy (two courses)

--General--
The following State, District, Local and/or Utility Standards have been modified: PR3, PR3-HD

In accordance with the Underground Facility Damage Prevention Act (One Call Bill) the phone number for a utility locator is 811. It is the Contractor's responsibility to plan for utility locators as needed.

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

Area Engineer-Andres Gonzalez, Andres.Gonzalez@txdot.gov
Assistant Area Engineer- Roberto Madrigal, Roberto.Madrigal@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.

--TPWD GENERAL NOTES—

Coordinate with the Texas Parks and Wildlife Department and adjust construction efforts with the daily operations of the park. Establishment of any material or equipment staging or storage areas other than those shown on the plans must be approved by the Engineer and the park superintendent prior to the start of work and thereafter if a change of location becomes necessary.

All trees indicated for removal in the plan set are juniperus, also called mountain cedar. If a tree that is not juniperus or one that is not indicated for removal, is required to be disturbed or removed then contact TPWD and the Engineer prior to action.

If seeding is to be performed then the following seed mixes must be used, depending on time of the year. From September 15th to June 15th use Little Bluestem Schizachyrium Scoparium (10 lbs/ac), Sideoats Grama Bouteloua Curtipendula (5 lbs/ac), Texas Grama Bouteloua Rigidiseta (2 lb/ac). From September 15th to February 15th, use the previously mentioned mix and include Cereal Rye Grain (13 PLS#/ac) and Canada Wildrye (6 PLS #/ac). If project is complete outside of this window, Cereal Rye Grain should be added at a rate of 25 PLS#/ac, followed-up with a biodegradable erosion-control mat, and watered through duration of project. Seed should be sourced from plant materials originating and grown in central Texas. Cereal Rye is the only acceptable temporary seeding.

Soil retention blankets used must be non-plastic bio-degradable coir blankets to reduce wildlife entrapment.

All work on the project must be completed after Labor Day of 2024 and before May 24th, 2025 (Memorial Day Weekend).

Cast in Place Permanent Concrete Barrier, outer faces of PR3 rail pilasters, outer face of F-Curb, and outer face of retaining wall panels shall have the Teton Dry Stack finish, as shown on the aesthetic details sheets. This work is subsidiary to Items 450, 529, and 423, respectively.

All steel components of handrails and gates shall have an appearance coat applied to the metal surface components. Stain the galvanizing items a rustic brown using Natina Steel Solution or Engineer & TPWD approved equivalent. Film-forming products are not allowed. Apply the Natina Steel Solution in accordance with the manufacturer's recommendations. Treat a sample item with the product and obtain Engineer & TPWD approval for the finish prior to proceeding with the work. Apply appearance coat to bolts, anchor rods, and similar hardware after installation. This work is subsidiary to Item 450.

Provide color mock-up example for park selection prior to performing work and ordering associated material.

--Item 5--
Taper ACP placed at curb inlets, traffic inlets and slotted drains.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, nests containing migratory birds must be avoided and no work will be performed in the nesting areas until the young birds have fledged.

Structures

Bridge and culvert construction operations cannot begin until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape, or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts. This work is subsidiary to the various bid items.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows.

Provide a non-intrusive back-up alarm system on all heavy equipment used in close proximity to residential areas. This item is subsidiary to various bid 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 6--
Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

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.
The Buy America Material Classification Sheet is located at the below link.
for clarification on material categorization.

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 total disturbed area within the project is anticipated at less than one (1) acre. Due to this type of construction, the project qualifies for exclusion under the Construction General Permit (CGP) issued by the Texas Commission on Environmental Quality (TCEQ). However, should the sum of the Engineer's anticipated disturbances and the Contractor's (On ROW and off ROW) PSL's equal or exceed the one (1) acre threshold; both TxDOT and the Contractor have project responsibilities under the CGP that reverts to non-exclusion status. Obtain approval for all non-depicted areas of disturbance that increases the initial soil and vegetation disturbed area estimates before work starts at these locations.

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

No significant traffic generators events identified.

--Item 8--
Working days will be computed and charged in accordance with Article 8.3.1.4 Standard work week.

The Start Work Date is 09/05/2024.

Create and maintain a CPM schedule.

The CPM schedule shall be created and maintained using software fully compatible with Primavera Project Planner version P6 Professional R15.2 .

Incentive using road-user cost or contract administration liquidated damage values and
disincentive using road-user cost will be paid in accordance with special provision 008---006.

The road-user cost liquidated damages shall be $1000 per day.

--Item 100--
Trim and remove brush and trees within the stations noted in the plans and as needed for construction operations. Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas to the ROW limits. Trim or remove to provide minimum of 5 ft. of horizontal clearance and 7 ft. of vertical clearance for the following: sidewalks, paths, guard fence, rails, signs, object markers, and structures. Trim to provide a minimum of 12 ft. vertical clearance under all trees.

Obtain approval for proposed method of tree and brush trimming and removal. Vertical flailing equipment is not allowed. Treat damaged or cut branches, roots and/or stumps of all oak trees with a commercial tree wound dressing. Disinfect all pruning tools with a solution of 70% alcohol before moving from one tree to another. Unless otherwise approved remove all resulting vegetative debris from the ROW within 24 hours. The Engineer can stop all construction operations if the dressing, cut and removal requirements are not followed.

--Item 421--
Use an automated ticket that contains the same information as shown in the standard specification. Submit the ticket for approval prior to use. The concrete producer will contact the District Laboratory or the Engineer's Office (outside the San Antonio area) to inform TxDOT of scheduled structural concrete batching. The Engineer may suspend concrete operations if ticket information is incomplete/incorrect.

Entrained air is allowed for Class P and Class HES concrete only. Air content testing is waived for all classes of concrete.

The curing facilities and strength testing equipment is not required for this project.

Poly-fiber reinforced concrete may be used as an option, with the approval by the Engineer, for riprap, sidewalk, curb/gutter, and mow strip. Use a TxDOT approved manufacturer or producer for the poly-fiber. The poly-fibers shall be combined with the concrete in proportions as recommended by the manufacturer. A concrete mix design must be approved by the Engineer.

--Item 423--
The backfill material for precast retaining walls shall be approved before placement. Build stockpile(s) in lifts not to exceed 2 feet and a minimum working face of not less than 10 feet, but not more than 20 feet.

Use the approved Mechanically Stabilized Earth (MSE) wall systems listed at: http://www.txdot.gov/business/resources/approved-systems/mse-wall.html

TxDOT does not allow the use of experimental systems on projects with over 50,000 square feet walls over 25 ft. tall, or walls supporting or immediately adjacent to interstate highways.

When proprietary wall systems are used, a qualified representative of the retaining wall manufacturer must be available upon request during wall construction. As requested, or required the manufacturer's representative must be on site to assist with the initial stages of wall construction, provide training to the Contractor wall crew and ensure proper interpretation of MSE wall shop drawings and details. Specific attention must be given to nonstandard wall installation details. The Contractor's wall crew foreman must be on site for the duration of wall construction. Any change to the wall crew foreman may require additional training by the wall supplier. The Contractor will ensure that the retaining walls are installed per the details presented in the construction drawings and as per the proprietary wall system requirements. The Engineer reserves the right to suspend wall construction activities due to any construction issue encountered.

Horizontal and vertical nail spacing on temp or permanent soil nail walls shall not exceed 4 ft.

Type DS material will be required on MSE walls in the area of the reinforcement mats.

--Item 500--
"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

--Item 502--
General

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.

Treat the pavement drop-offs as shown in the TCP.

Avoid placing stockpiles, equipment, and other construction materials within the roadway's horizontal clear zone or at any location that will constitute a hazard and will endanger traffic. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

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.

Mounting and moving the mailbox as needed for the various construction phases is subsidiary to Item 502.

Access to adjoining property must be maintained at all times.

Barricades, Signs, and Traffic Control Devices

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered subsidiary to the bid item.

After written notification, the time frame is provided on the Form 599 to provide properly maintained signs and barricades before considered in non-compliance with this item.

Moving an existing sign to a temporary location is subsidiary to Item 502. Installations with permanent supports at permanent locations will be paid for under the applicable bid item(s).

Cover permanent signs if not used. This is subsidiary to Item 502.

Notify the Engineer in writing 10 business days in advance of any temporary or permanent lane, ramp, connector, etc. closures/detours, restrictions to lane widths, alterations to vertical clearances, or modifications to radii. Any other modifications to the roadway that may adversely affect the mobility of oversized/overweight trucks also require 10 business days advance written notice to the Engineer. At least one lane must always remain open.

Hauling

The use of rubber-tired equipment will be required for moving dirt or other materials along or across pavement surfaces. Where the contractor desires to move any equipment not licensed for operation on public highways, on or across pavement, they shall protect the pavement from damage as directed/approved by the Engineer.

Throughout construction operations, the Contractor will be required to conduct their hauling operations in a manner such that vehicles will not haul over previously recompacted subgrade or compacted base material, except in short sections for dumping manipulations.

The Contractor shall keep the roadway clean and free of dirt or other materials during hauling operations. If the Contractor does not maintain a clean roadway, they shall cease all construction operations, when directed by the Engineer, to clean the roadway to the satisfaction of the Engineer.

--Item 506--
The Storm Water Pollution Prevention Plan (SWP3) consists of temporary erosion control measures needed and provided for under this Item. The disturbed area is less than one acre and use of erosion control measures is not anticipated. If physical conditions encountered at the job site require necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per Articles 4.4 and 9.7. An Inspector will perform a regularly scheduled SW3P inspection every 7 calendar days if erosion control measures are installed.

Failure to address items noted on the SW3P inspection report within two report cycles may result in the Department stopping all construction operations, exclusive of time charges, or withholding that month's estimate until the SW3P deficiencies are corrected unless the Engineer determines that the area is too wet to correct SW3P deficiencies.

Failure to correctly maintain daily monitoring reports and submitting to TxDOT on a daily/weekly basis may result in the monthly estimate being withheld.

--Item 510--
The length of the one-way traffic control section is limited to 1 mile.

--Item 512--
More than one shape type of CTB may be furnished on a project, although no mixing of CTB shape types will be permitted along a continuous segment of CTB.

CTB reflectors will not be paid for directly but will be considered subsidiary to the barrier.

--Item 644--
The wedge anchor system shown on State Standard Sheet SMD (TWT) is not allowed.

Triangular Slipbase Systems with set screws are not allowed.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0624-01-003 **DISTRICT** San Antonio **COUNTY** Uvalde
HIGHWAY PR 29A

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0624-01-003**			
		PROJECT ID		**A00191438**			
		COUNTY		**Uvalde**			
		HIGHWAY		**PR 29A**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	105-6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	1,312.000		1,312.000	
	110-6001	EXCAVATION (ROADWAY)	CY	439.000		439.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	1.000		1.000	
	169-6003	SOIL RETENTION BLANKETS (CL 1) (TY C)	SY	40.000		40.000	
	247-6053	FL BS (CMP IN PLC)(TYD GR1-2)(FNAL POS)	CY	83.000		83.000	
	310-6027	PRIME COAT(MC-30 OR AE-P)	GAL	121.000		121.000	
	316-6005	ASPH (TIER II)	GAL	1,945.000		1,945.000	
	316-6240	AGGR(TY-PD GR-4 SAC-B)	CY	48.000		48.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	50.000		50.000	
	403-6001	TEMPORARY SPL SHORING	SF	296.000		296.000	
	416-6001	DRILL SHAFT (18 IN)	LF	88.000		88.000	
	416-6004	DRILL SHAFT (36 IN)	LF	456.000		456.000	
	423-6001	RETAINING WALL (MSE)	SF	425.000		425.000	
	423-6007	RETAINING WALL (DRILL SHAFT) (FACIA)	SF	620.000		620.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	3.000		3.000	
	450-6045	RAIL (TY PR3)	LF	1,044.000		1,044.000	
	450-6080	RAIL (TY LOW PROF BR RAIL)	LF	964.000		964.000	
	466-6001	HEADWALL (CH - FW - 0) (DIA= 12 IN)	EA	1.000		1.000	
	496-6040	REMOV STR (RET WALL)	LF	698.000		698.000	
	496-6111	REMOV STR (WOOD FENCE & POSTS)	LF	707.000		707.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000		7.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	156.000		156.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	156.000		156.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,205.000		1,205.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,205.000		1,205.000	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	7.000		7.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	380.000		380.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	260.000		260.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	529-6016	CONC CURB (TY F1)	LF	41.000		41.000	
	529-6017	CONC CURB (TY F2)	LF	25.000		25.000	
	529-6018	CONC CURB (TY F3)	LF	359.000		359.000	
	531-6001	CONC SIDEWALKS (4")	SY	602.000		602.000	
	552-6005	GATE (TY 1)	EA	1.000		1.000	
	556-6008	PIPE UNDERDRAINS (TY 8) (6")	LF	93.000		93.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0624-01-003 **DISTRICT** San Antonio **COUNTY** Uvalde
HIGHWAY PR 29A

			CONTROL SECTION JOB		**0624-01-003**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00191438**		
			COUNTY		**Uvalde**		
			HIGHWAY		**PR 29A**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	624-6028	REMOVE GROUND BOX	EA	1.000		1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	2.000		2.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	5.000		5.000	
	658-6101	INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	11.000		11.000	
	662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	1,360.000		1,360.000	
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	20.000		20.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	880.000		880.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	70.000		70.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	40.000		40.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	3,632.000		3,632.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	40.000		40.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	3,632.000		3,632.000	
	668-6072	PREFAB PAV MRK TY C (W) (8") (SLD)	LF	150.000		150.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	12.000		12.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	60.000		60.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	4,512.000		4,512.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	1,360.000		1,360.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	150.000		150.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	20.000		20.000	
	677-6018	ELIM EXT PAV MRK & MRKS (18")(YLD TRI)	EA	12.000		12.000	
	734-6002	LITTER REMOVAL	CYC	7.000		7.000	
	752-6006	TREE REMOVAL (12" - 18" DIA)	EA	11.000		11.000	
	770-6056	REMOVE TIMBER POST	EA	97.000		97.000	
	1002-6029	LANDSCAPE AMENITY (BOULDER)	EA	12.000		12.000	
	08	CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000		1.000	

DESIGN JR | DRAFT EL | CHECK:

ROADWAY SUMMARY

SHEET NO.	STATION TO STATION PR 29	0105-6008 REMOVING STAB BASE AND ASPH PAV (6")	0110-6001 EXCAVATION (ROADWAY)	0132-6003 EMBANKMENT (FINAL)(ORD COMP)(TY B)	0247-6053 FL BS (CMP IN PLC)(TYD GR1-2)(FNAL POS)	0310-6027 PRIME COAT(MC-30 OR AE-P)	0316-6005 ASPH (TIER II)	0316-6240 AGGR(TY-PD GR-4 SAC-B)	0416-6001 DRILL SHAFT (18 IN)	0450-6045 RAIL (TY PR3)	0450-6080 RAIL (TY LOW PROF BR RAIL)	0496-6040 REMOV STR (RET WALL)	0496-6111 REMOV STR (WOOD FENCE & POSTS)	0500-6001 MOBILIZATION	0531-6001 CONC SIDEWALKS (4")	0552-6005 GATE (TY 1)	0624-6028 REMOVE GROUND BOX	0644-6001 IN SM RD SN SUP&AM TY10BWG(1)SA (P)	0644-6076 REMOVE SM RD SN SUP&AM	0658-6060 REMOVE DELIN & OBJECT MARKER ASSMS	0658-6101 INSTL OM ASSM (OM-2Z)(WFL X)SRF)SRF
CSJ: 0624-01-003		SY	CY	CY	CY	SY	SY	CY	LF	LF	LF	LF	LF	LS	SY	EA	EA	EA	EA	EA	EA
1 OF 5	BEGIN TO STA 15+40.00	247	439	1	14	601	6071	48	20	240	240	197	237	1	134	0	1	0	0	5	11
2 OF 5	STA 15+40.00 TO STA 17+80.00	345	0	0	26	0	0	0	24	247	210	195	256	0	154	0	0	0	0	0	0
3 OF 5	STA 17+80.00 TO STA 20+20.00	240	0	0	13	0	0	0	24	237	230	135	130	0	133	0	0	1	1	0	0
4 OF 5	STA 20+20.00 TO STA 22+60.00	375	0	0	19	0	0	0	16	249	240	127	84	0	149	0	0	1	1	0	0
5 OF 5	STA 22+60.00 TO END	105	0	0	11	0	0	0	4	71	44	44	0	0	32	1	0	0	0	0	0
PROJECT TOTAL		1312	439	1	83	• 601	•6071	48	88	1044	964	698	707	1	602	1	1	2	2	5	11
						$ 121	$1945														

ROADWAY SUMMARY (CONTINUED)

SHEET NO.	STATION TO STATION PR 29	0662-6008 WK ZN PAV MRK NON-REMOV (W)6"(SLD)	0662-6016 WK ZN PAV MRK NON-REMOV (W)24"(SLD)	0662-6034 WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	0662-6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	0666-6208 REFL PAV MRK TY II (Y) 6" (BRK)	0666-6210 REFL PAV MRK TY II (Y) 6" (SLD)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	0668-6072 PREFAB PAV MRK TY C (W) (8") (SLD)	0668-6091 PREFAB PAV MRK TY C (W) (18")(YLD TRI)	0672-6009 REFL PAV MRKR TY II-A-A	0677-6001 ELIM EXT PAV MRK & MRKS (4")	0677-6002 ELIM EXT PAV MRK & MRKS (6")	0677-6003 ELIM EXT PAV MRK & MRKS (8")	0677-6007 ELIM EXT PAV MRK & MRKS (24")	0677-6018 ELIM EXT PAV MRK & MRKS (18")(YLD TRI)	0752-6006 TREE REMOVAL (12" - 18" DIA)	0770-6056 REMOVE TIMBER POST	1002-6029 LANDSCAPE AMENITY (BOULDER)
CSJ: 0624-01-003		LF	LF	LF	EA	LF	LF	LF	LF	LF	EA	EA	LF	LF	LF	LF	EA	EA	EA	EA
1 OF 5	BEGIN TO STA 15+40.00	1360	20	880	70	40	3632	40	3632	150	12	60	4512	1360	150	20	12	4	28	0
2 OF 5	STA 15+40.00 TO STA 17+80.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	12	12
3 OF 5	STA 17+80.00 TO STA 20+20.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0
4 OF 5	STA 20+20.00 TO STA 22+60.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	21	0
5 OF 5	STA 22+60.00 TO END	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10	0
PROJECT TOTAL		1360	20	880	70	40	3632	40	3632	150	12	60	4512	1360	150	20	12	11	97	12

TCP & SWP3 SUMMARY

SHEET NO.	STATION TO STATION PR 29	0502-6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	0506-6020 CONSTRUCTION EXITS (INSTALL) (TY 1)	0506-6024 CONSTRUCTION EXITS (REMOVE)	0506-6038 TEMP SEDMT CONT FENCE (INSTALL)	0506-6039 TEMP SEDMT CONT FENCE (REMOVE)	0510-6003 ONE-WAY TRAF CONT (PORT TRAF SIG)	0512-6009 PORT CTB (FUR & INST)(LOW PROF)(TY 1)	0512-6010 PORT CTB (FUR & INST)(LOW PROF)(TY 2)	0512-6057 PORT CTB (REMOVE)(LOW PROF)(TY 1)	0512-6058 PORT CTB (REMOVE)(LOW PROF)(TY 2)	0734-6002 LITTER REMOVAL
CSJ: 0624-01-003		MO	SY	SY	LF	LF	MO	LF	LF	LF	LF	CYC
1 OF 5	BEGIN TO STA 14+95.00	7	78	78	195	195	7	0	0	0	0	7
2 OF 5	STA 14+95.00 TO STA 17+65.00	0	0	0	282	282	0	160	40	100	40	0
3 OF 5	STA 17+65.00 TO STA 20+35.00	0	0	0	264	264	0	0	0	0	0	0
4 OF 5	STA 20+35.00 TO STA 23+05.00	0	0	0	286	286	0	0	0	0	0	0
5 OF 5	STA 23+05.00 TO END	0	78	78	178	178	0	220	40	160	40	0
PROJECT TOTAL		7	156	156	1205	1205	7	380	80	260	80	7

WALL SUMMARY

SHEET NO.	STATION TO STATION PR 29A	0169-6003 SOIL RETENTION BLANKETS (CL 1) (TY C)	0402-6001 TRENCH EXCAVATION PROTECTION	0403-6001 TEMPORARY SPL SHORING	0416-6004 DRILL SHAFT (36 IN)	0423-6001 RETAINING WALL (MSE)	0423-6007 RETAINING WALL (DRILL SHAFT) (FACIA)	0432-6045 RIPRAP (MOW STRIP)(4 IN)	0466-6001 #HEADWALL (CH - FW - 0) (DIA= 12 IN)	0556-6008 PIPE UNDERDRAINS (TY 8) (6")
CSJ: 0624-01-003		SY	LF	SF	LF	SF	SF	CY	EA	LF
1 OF 1	WALL 01	40	50	0	0	425	0	1	1	93
1 OF 1	WALL 02	0	0	0	456	0	620	2	0	0
1 OF 1	TEMP WALL 01	0	0	296	0	0	0	0	0	0
PROJECT TOTAL		40	50	296	456	425	620	3	1	93

"F"CURB SUMMARY

SHEET NO.	STATION TO STATION PR29A	0529-6016 CONC CURB (TY F1)	0529-6017 CONC CURB (TY F2)	0529-6018 CONC CURB (TY F3)
CSJ: 0624-01-003		LF	LF	LF
1 OF 3	STA 13+00 TO STA 14+80	15	0	135
2 OF 3	STA 14+80 TO STA 16+63.95	0	0	149
3 OF 3	STA 17+25 TO STA 19+04.24	0	25	105
PROJECT TOTAL		15	25	389

EARTHWORK SUMMARY

BASELINE STATION	EXCAVATION VOLUME (CY)	EMBANKMENT VOLUME (CY)
13+00	0	0
13+50	16.806	0
14+00	30.509	0
14+50	25.065	0
15+00	22.369	0
15+50	22.332	0
16+00	22.595	0
16+50	17.14	1.86
17+00	18.2	0.201
17+50	21.59	0.201
18+00	19.84	0
18+50	25.873	0
19+00	13.923	0
19+50	0.713	0
20+00	0.631	0
20+50	0.764	0
21+00	1.101	0
21+50	2.34	0
22+00	2.479	0
22+50	14.429	0
23+00	22.784	0
23+35	6.543	0
GRAND TOTAL	308.026	2.262

• NOTE: THESE ITEMS ARE QUANTIFIED ON THIS SHEET PER S.Y. FOR CONTRACTOR INFORMATION ONLY. BID ITEMS ARE PAID FOR PER GALLON

$ NOTE: DENOTES GALLONS AS THE ACUTAL PAY QUANTITY.

FOR CONTRACTOR INFORMATION ONLY.

Texas Department of Transportation

PR 29A SUMMARIES

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		9

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pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/1. General/PR0029*GEN*SUM*ALL

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
3	1	R1-5L		36 x 36	X		10BWG	1	SA	P		
4	2	R1-5L		36 x 36	X		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0624	01	003	PR 29A
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	UVALDE		10

18

DATE: 2024/02/26 10:43:42 AM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/1. General/PR0029_GEN_SOSS.dgn

DESIGN: JH DRAFT: JH CHECK: DR

2/22/2024 1:36:58 PM
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TRAFFIC CONTROL PLAN ITEMS*

	PROJECT LIMIT SIGNING														PHASE SIGNING												
	SPEED LIMIT XX	ROAD WORK AHEAD	END ROAD WORK	ROAD WORK ⇐NEXT _ MILES NEXT _ MILES⇒	ROAD WORK NEXT _ MILES	END WORK ZONE	BEGIN ROAD WORK NEXT _ MILES	NAME ADDRESS CITY STATE CONTRACTOR	BEGIN WORK ZONE	STAY ALERT TALK OR TEXT LATER	SPEED LIMIT XX	OBEY WARNING SIGNS STATE LAW	TRAFFIC FINES DOUBLE	WHEN WORKERS ARE PRESENT			W1-8R 24x30		BE PREPARED TO STOP	ROAD NARROWS		BUMP	TRUCK CROSSING	LOOSE GRAVEL	UNEVEN LANES	M.P.H.	NO PASSING ZONE
LOCATION	CW3-5 30X30	CW20-1D 48 X 48	G20-2	G20-1aT	G20-1T	G20-2BT	G20-5T	G20-6T	G20-9TP	G20-10T	R2-1	R20-3T	R20-5	R20-5aTP	CW1-4L OR R	CW1-6A	CW1-8L OR R	CW3-3 48X48	CW3-4	CW5-1	CW6-3	CW8-1	CW8-6	CW8-7	CW8-11	CW13-1	CW14-3
1	X	X		X	X		X	X	X	X	X	X	X	X													
2			X			X					X																
3		X									X				X	X	X	X	X	X	X	X	X	X	X	X	X

TRAFFIC CONTROL PLAN ITEMS* *(CONTINUED)*

	PHASE SIGNING																										
	ROAD WORK 1500 FT	ROAD WORK 1000 FT	ROAD WORK 500 FT	DETOUR ½MILE	DETOUR 1 MILE	ROAD CLOSED 1000 FT	ROAD CLOSED AHEAD	ROAD CLOSED ½MILE	ONE LANE ROAD 500 FT	ONE LANE ROAD AHEAD		NARROW LANES AHEAD	Give Us A BRAKE	FRESH OIL	SURVEY CREW AHEAD	DO NOT ENTER	STOP HERE ON RED	DO NOT PASS	PILOT CAR FOLLOW ME	ONE LANE BRIDGE	ROAD CLOSED	ROAD CLOSED TO THRU TRAFFIC	XX M.P.H.				
LOCATION	CW20-1A	CW20-1B	CW20-1C	CW20-2E	CW20-2F	CW20-3B	CW20-3D	CW20-3E	CW20-4C	CW20-4D	CW20-7a	CW20-8T	CW21-1T	CW21-20	CW21-60	R5-1	R10-6 24"X36"	R4-2	G20-4	CW5-3 48"X48"	R11-2	R11-4	CW13-1P 24"X24"	TEMP/PORT TRF SIGNAL	ARROW BOARD	LPCTB	TY III BARRICADE
1																											
2																											
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

• DEFAULT TO CONVENTIONAL ROAD DIMENSIONS FOR SIGN AND PLAQUE SIZES (TMUTCD TABLE 6F-1)

TRAFFIC CONTROL PLAN ITEMS* *(CONTINUED)*

				RUMBLE STRIPS AHEAD		SIDEWALK CLOSED
LOCATION	CW1-8(F)	VP(F)IR,L	BARRELS	CW17-2T	PCTB	R9-9
1						X
2						X
3	X	X	X	X	X	

NOTES:

1. CERTAIN SIGNS MUST BE USED IN CONJUNCTION WITH OTHER SIGNS. EXAMPLE: "FLAGGER AHEAD" MUST HAVE A "BE PREPARED TO STOP".
2. BARRICADES AND WARNING SIGNS ON THIS SHEET ARE THE MINIMUM CONSTRUCTION ZONE. SIGNING, ADDITIONAL BARRICADES, WARNING SIGNS, ARROW PANELS, CONES, ETC. REQUIRED IN ACCORDANCE WITH CURRENT BC STANDARDS AND THE TEXAS MUTCD MAY BE REQUIRED IN AREAS OF ACTUAL CONSTRUCTION.
3. A DISTANCE PLAQUE IN FEET OR MILES MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
4. IMPLEMENT DETOURS IN ACCORDANCE WITH THE TEXAS MUTCD. USE CHANGEABLE MESSAGE BOARDS TO GUIDE MOTORISTS THROUGH THE DETOUR.
5. ALL BARRICADES, SIGNS, AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING.
6. INSTALL TY 3 BARR. & ROAD CLOSED SIGNS AT END OF INCIDENTAL CONSTRUCTION LIMITS UNTIL PROJECT COMPLETION OR IF MILESTONE IS NOT MET.

LOCATION OF BARRICADES

LOCATION NO. 1 TO BE USED AT BEGINNING OF THE INCIDENTAL CONSTRUCTION AND ENTERING SIDE STREETS.
LOCATION NO. 2 TO BE USED AT THE END OF THE INCIDENTAL CONSTRUCTION AND EXITING SIDE STREETS.
LOCATION NO. 3 TO BE USED THROUGHOUT THE COURSE OF THE PROJECT AS DIRECTED BY THE ENGINEER.

DEYTON RIDDLE
146399

Deyton Riddle

P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE: 1"=150'

Texas Department of Transportation

PR 29A
TCP
SCHEDULE OF
BARRICADES

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST		COUNTY	SHEET NO.
SAT		UVALDE	11

DESIGN JH | DRAFT JH | CHECK DR

TRAFFIC CONTROL PLAN SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN (1) PHASE. BEFORE THE COMMENCEMENT OF PHASE 1, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.

(2) PREPARING ROW / REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURING, AS NOTED BELOW.

(3) PLANING, SURFACE TREATMENTS AND OVERLAYS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC. BEGIN SURFACE CONSTRUCTION ON HIGH SIDE OF ROAD TO AVOID WATER PONDING ISSUES.

(4) THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC" AND ITEM 502, "BARRICADES, SIGNS, AND TRAFFIC HANDLING", OF THE STANDARD SPECIFICATIONS, AND TO THE GENERAL NOTES.

(5) A BRIEF DESCRIPTION OF PHASE 1 FOLLOWS:

PHASE 1

THE INTENT OF THIS PHASE IS TO SHIFT TRAFFIC TO THE SB SIDE OF THE ROADWAY WHILE OPERATING ONE-LANE TWO-WAY TRAFFIC CONTROL. THE RETAINING WALLS, SIDEWALK, AND PERMANENT BARRIER WILL ALL BE CONSTRUCTED DURING THIS PHASE.

(1) MOBILIZATION

(2) INSTALL WORK ZONE TRAFFIC CONTROL DEVICES AND SWP3 AS SHOWN IN THE PLANS
- a. PLACE PORTABLE CHANGEABLE MESSAGE SIGNS 10 DAYS IN ADVANCE OF CLOSURE TO ADVISE MOTORISTS.
- b. INSTALL PORTABLE CONCRETE TRAFFIC BARRIER.
- c. INSTALL TRAFFIC SIGNALS FOR ONE-LANE TWO-WAY TRAFFIC CONTROL PER TCP (2-8)-23.
- d. ELIMINATE EXISTING PAVEMENT MARKINGS.
- e. INSTALL WORK ZONE PAVEMENT MARKINGS.

(3) PREP ROW AND REMOVAL.

(4) EXCAVATION AND EMBANKEMENT AS SHOWN IN THE PLANS.

(5) CONSTRUCT RETAINING WALLS AND F CURBS.

(6) CONSTRUCT PEDESTRIAN RAIL.
- a. CONSTRUCT GATE PILASTERS AND MOUNT GATE.

(7) CONSTRUCT SIDEWALK.

(8) PLACE FLEXBASE AND 2 COURSE SURFACE TREATMENT.

(9) CONSTRUCT PERMANENT LOW PROFILE BARRIER.

(10) ADD AESTHETICS AND STRIPING AS SHOWN IN THE PLANS.

(11) REMOVE PORTABLE CONCRETE TRAFFIC BARRIER AND OPEN ROADWAY TO TRAFFIC IN BOTH DIRECTIONS.

(12) REMOVE EROSION CONTROL ITEMS FOR ENTIRE PROJECT AND ESTABLISH VEGETATION AS SHOWN IN THE PLANS. (70% VEGETATION MUST BE ESTABLISHED PRIOR TO REMOVAL OF SWP3 ITEMS).

STATE OF TEXAS
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146399
LICENSED PROFESSIONAL ENGINEER

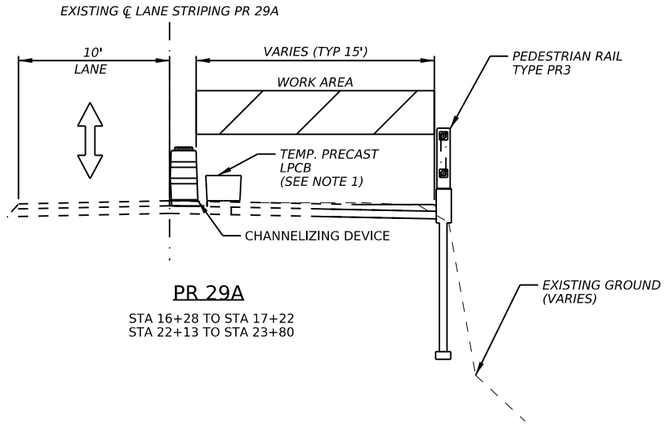
Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

Texas Department of Transportation

PR 29A
TCP
SEQUENCE OF WORK

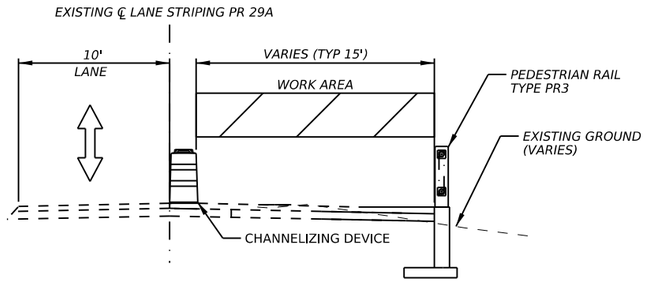
SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		12



PR 29A

STA 16+28 TO STA 17+22
STA 22+13 TO STA 23+80



PR 29A

STA 13+00 TO STA 16+28
STA 17+22 TO STA 22+13

NOTES:

1. TEMPORARY BARRIER (LPCB) IS ONLY REQUIRED WITHIN STATION RANGES PROVIDED.

STATE OF TEXAS
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02/26/2024
DATE

Texas Department of Transportation

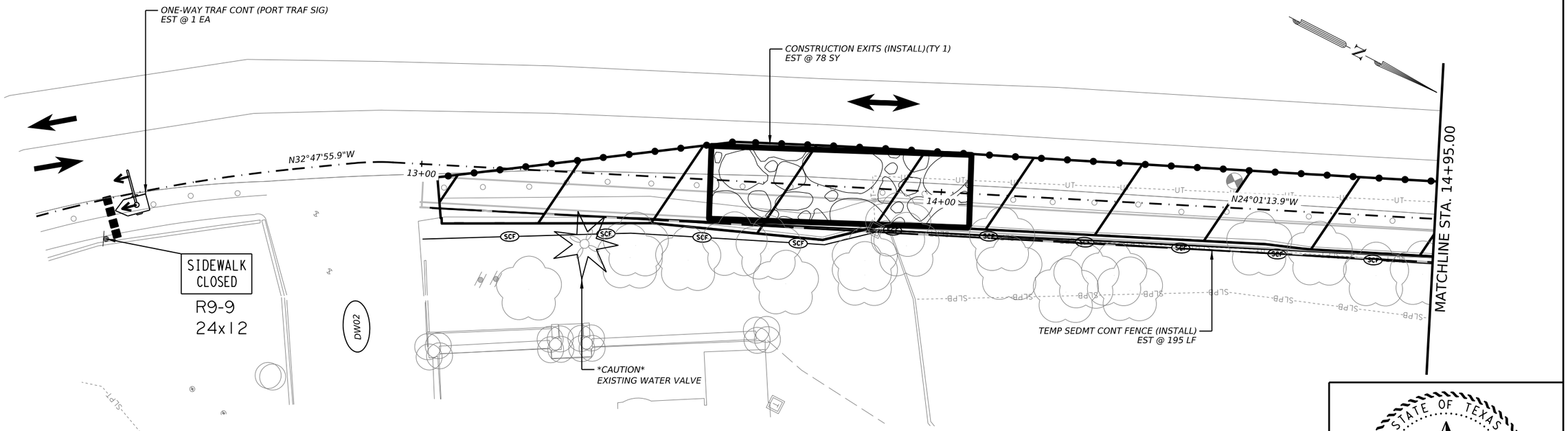
PR 29A
TCP
TYPICAL SECTIONS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		13

DESIGN: | DRAFT: | CHECK: DR

QUANTITY SUMMARY CSJ: 0624-01-003			
ITEM NO.	ITEM	UNIT	QUANTITY
0502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLIN	MO	7
0506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	78
0506-6024	CONSTRUCTION EXITS (REMOVE)	SY	78
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	195
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	195
0510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	7
0734-6002	LITTER REMOVAL	CYC	7



TRAFFIC CONTROL & SW3P LEGEND

PORTABLE TRAFFIC SIGNAL		CHANNELIZING DEVICES	
TEMPORARY SEDIMENT CONTROL FENCE	SCF	WORK AREA	
CONSTRUCTION EXIT		DIRECTION ARROW	

TCP & SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURES STANDARD SHEETS EC(1)-16 AND EC(3)-16 FOR ADDITIONAL BMP SYMBOLISM.
2. NOT ALL BMP'S ARE REQUIRED TO BE INSTALLED AT BEGINNING OF PROJECT/PHASE. INSTALL ACCORDINGLY WITH CONSTRUCTION ACTIVITIES, AS DIRECTED BY ENGINEER.
3. CORROBORATE THE PLACEMENT OF CONSTRUCTION EXITS AND PORTABLE TRAFFIC SIGNALS IN FIELD.
4. SEE TCP 2-8 FOR CHANNELIZING DEVICE TAPER LENGTH.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

STATE OF TEXAS
DEYTON RIDDLE
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PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A
TCP & SW3P
LAYOUTS

SHEET: 1 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		14

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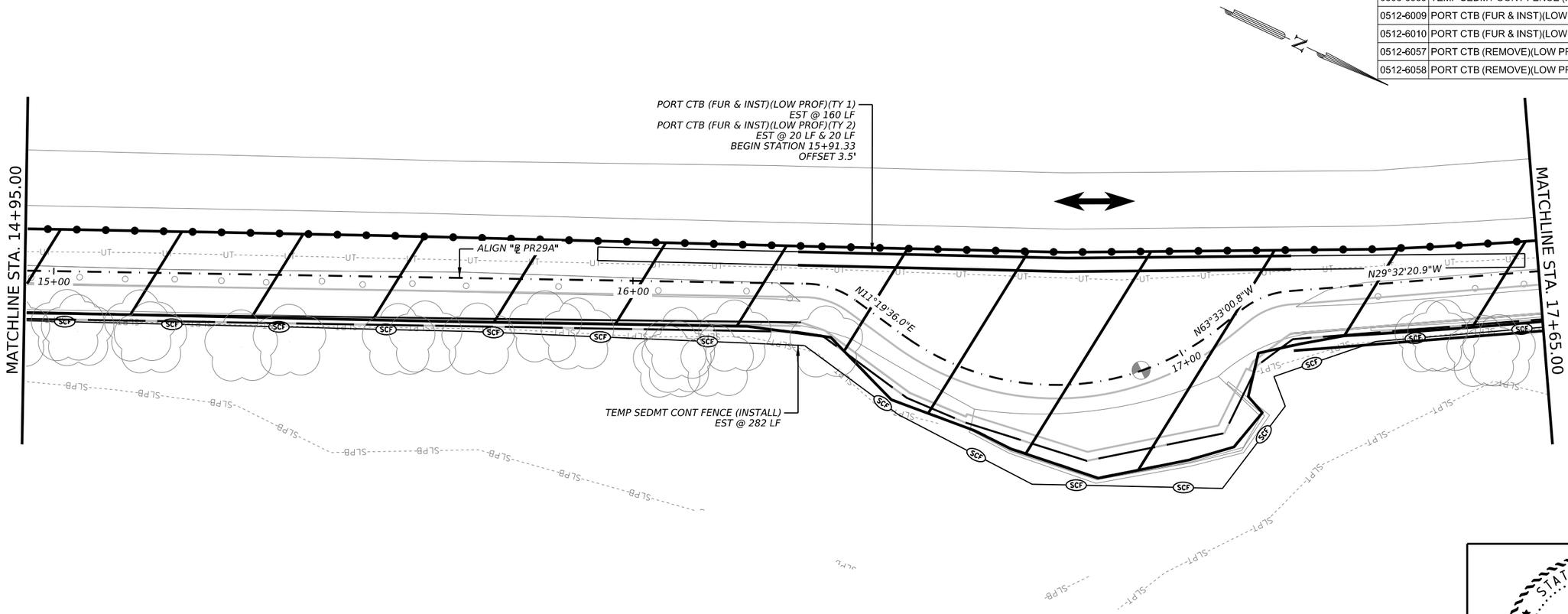
DESIGN: DR | DRAFT: DR | CHECK: DR

QUANTITY SUMMARY CSJ: 0624-01-003			
ITEM NO.	ITEM	UNIT	QUANTITY
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	282
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	282
0512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	160
0512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	40
0512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	100
0512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	40



TRAFFIC CONTROL & SW3P LEGEND

PORTABLE TRAFFIC SIGNAL		CHANNELIZING DEVICES	
TEMPORARY SEDIMENT CONTROL FENCE	SCF	WORK AREA	
CONSTRUCTION EXIT		DIRECTION ARROW	

TCP & SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURES STANDARD SHEETS EC(1)-16 AND EC(3)-16 FOR ADDITIONAL BMP SYMBOLISM.
2. NOT ALL BMP'S ARE REQUIRED TO BE INSTALLED AT BEGINNING OF PROJECT/PHASE. INSTALL ACCORDINGLY WITH CONSTRUCTION ACTIVITIES, AS DIRECTED BY ENGINEER.
3. CORROBORATE THE PLACEMENT OF CONSTRUCTION EXITS AND PORTABLE TRAFFIC SIGNALS IN FIELD.
4. SEE TCP 2-8 FOR CHANNELIZING DEVICE TAPER LENGTH.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

STATE OF TEXAS
DEYTON RIDDLE
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Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A
TCP & SW3P
LAYOUTS

SHEET: 2 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		15

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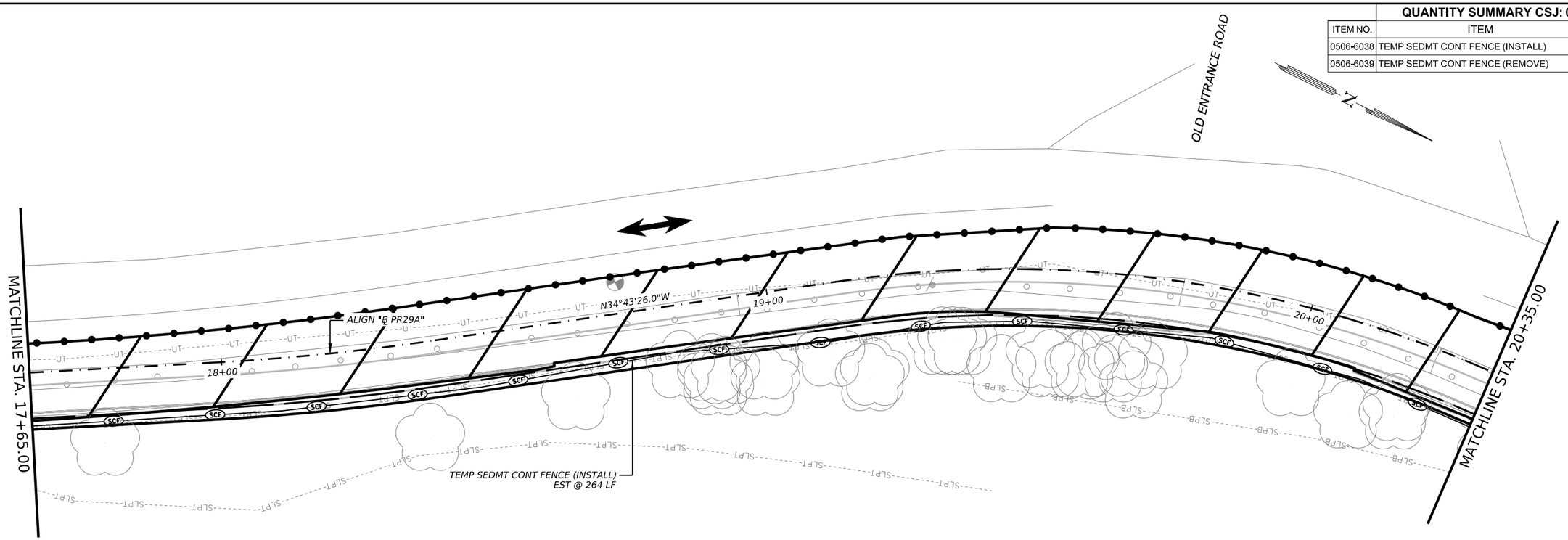
DESIGN: DR | DRAFT: DR | CHECK: DR

QUANTITY SUMMARY CSJ: 0624-01-003			
ITEM NO.	ITEM	UNIT	QUANTITY
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	264
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	264



TRAFFIC CONTROL & SW3P LEGEND

PORTABLE TRAFFIC SIGNAL		CHANNELIZING DEVICES	
TEMPORARY SEDIMENT CONTROL FENCE	SCF	WORK AREA	
CONSTRUCTION EXIT		DIRECTION ARROW	

TCP & SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURES STANDARD SHEETS EC(1)-16 AND EC(3)-16 FOR ADDITIONAL BMP SYMBOLISM.
2. NOT ALL BMP'S ARE REQUIRED TO BE INSTALLED AT BEGINNING OF PROJECT/PHASE. INSTALL ACCORDINGLY WITH CONSTRUCTION ACTIVITIES, AS DIRECTED BY ENGINEER.
3. CORROBORATE THE PLACEMENT OF CONSTRUCTION EXITS AND PORTABLE TRAFFIC SIGNALS IN FIELD.
4. SEE TCP 2-8 FOR CHANNELIZING DEVICE TAPER LENGTH.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A
TCP & SW3P LAYOUTS

SHEET: 3 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		16

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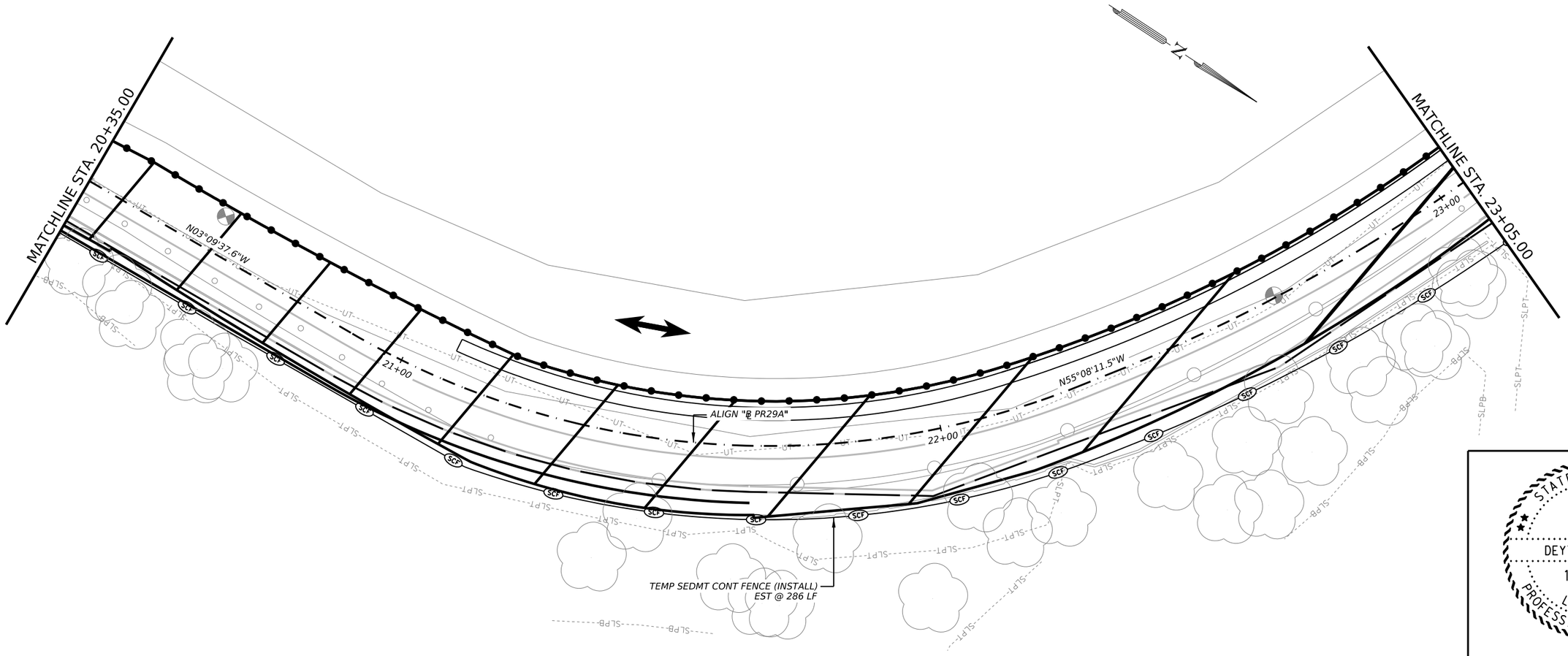
DESIGN: DR | DRAFT: DR | CHECK: DR

QUANTITY SUMMARY CSJ: 0624-01-003			
ITEM NO.	ITEM	UNIT	QUANTITY
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	286
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	286



TRAFFIC CONTROL & SW3P LEGEND

PORTABLE TRAFFIC SIGNAL		CHANNELIZING DEVICES	
TEMPORARY SEDIMENT CONTROL FENCE	SCF	WORK AREA	
CONSTRUCTION EXIT		DIRECTION ARROW	

TCP & SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURES STANDARD SHEETS EC(1)-16 AND EC(3)-16 FOR ADDITIONAL BMP SYMBOLISM.
2. NOT ALL BMP'S ARE REQUIRED TO BE INSTALLED AT BEGINNING OF PROJECT/PHASE. INSTALL ACCORDINGLY WITH CONSTRUCTION ACTIVITIES, AS DIRECTED BY ENGINEER.
3. CORROBORATE THE PLACEMENT OF CONSTRUCTION EXITS AND PORTABLE TRAFFIC SIGNALS IN FIELD.
4. SEE TCP 2-8 FOR CHANNELIZING DEVICE TAPER LENGTH.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

STATE OF TEXAS
DEYTON RIDDLE
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Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A
TCP & SW3P LAYOUTS

SHEET: 4 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		17

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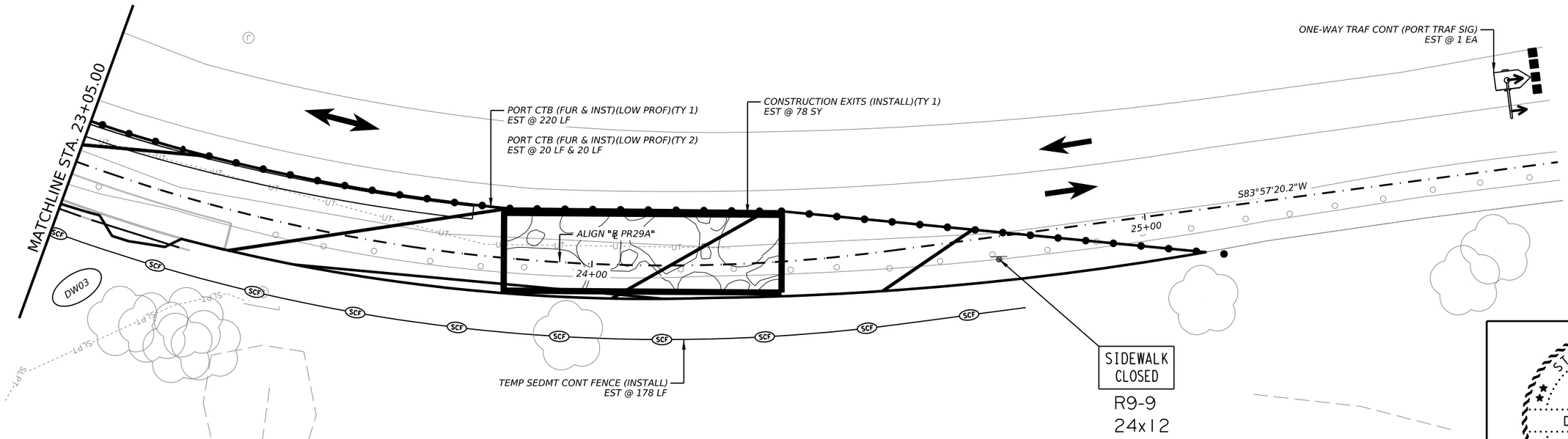
DESIGN: DR | DRAFT: DR | CHECK: DR

QUANTITY SUMMARY CSJ: 0624-01-003			
ITEM NO.	ITEM	UNIT	QUANTITY
0506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	78
0506-6024	CONSTRUCTION EXITS (REMOVE)	SY	78
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	178
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	178
0512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	220
0512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	40
0512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	160
0512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	40

N



TRAFFIC CONTROL & SW3P LEGEND

PORTABLE TRAFFIC SIGNAL		CHANNELIZING DEVICES	
TEMPORARY SEDIMENT CONTROL FENCE	SCF	WORK AREA	
CONSTRUCTION EXIT		DIRECTION ARROW	

TCP & SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURES STANDARD SHEETS EC(1)-16 AND EC(3)-16 FOR ADDITIONAL BMP SYMBOLISM.
2. NOT ALL BMP'S ARE REQUIRED TO BE INSTALLED AT BEGINNING OF PROJECT/PHASE. INSTALL ACCORDINGLY WITH CONSTRUCTION ACTIVITIES, AS DIRECTED BY ENGINEER.
3. CORROBORATE THE PLACEMENT OF CONSTRUCTION EXITS AND PORTABLE TRAFFIC SIGNALS IN FIELD.
4. SEE TCP 2-8 FOR CHANNELIZING DEVICE TAPER LENGTH.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

STATE OF TEXAS
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146399
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Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A
TCP & SW3P
LAYOUTS

SHEET: 5 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		18

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

SHEET 1 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	SAT	UVALDE		19
5-10 5-21				

DATE: 2/26/2024 5:26:44 PM
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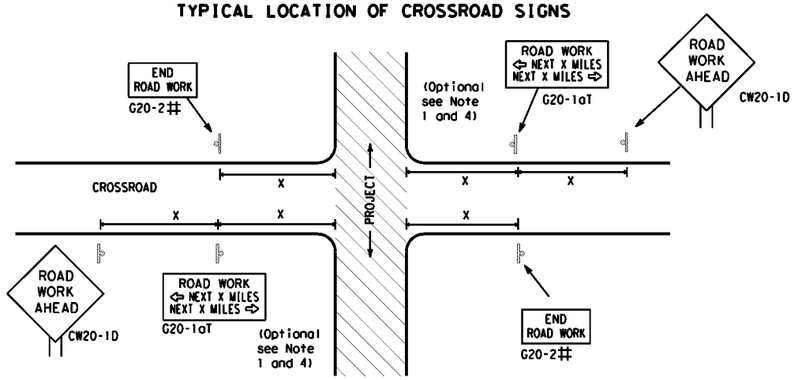
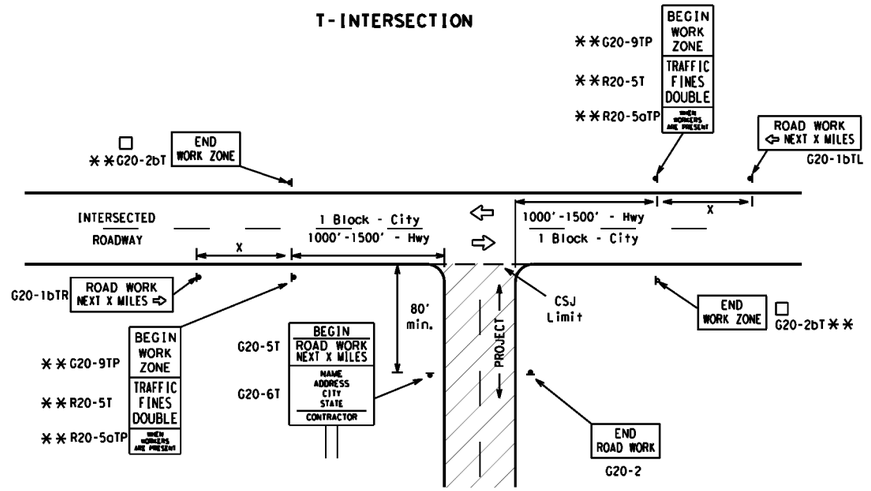
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	*[3]

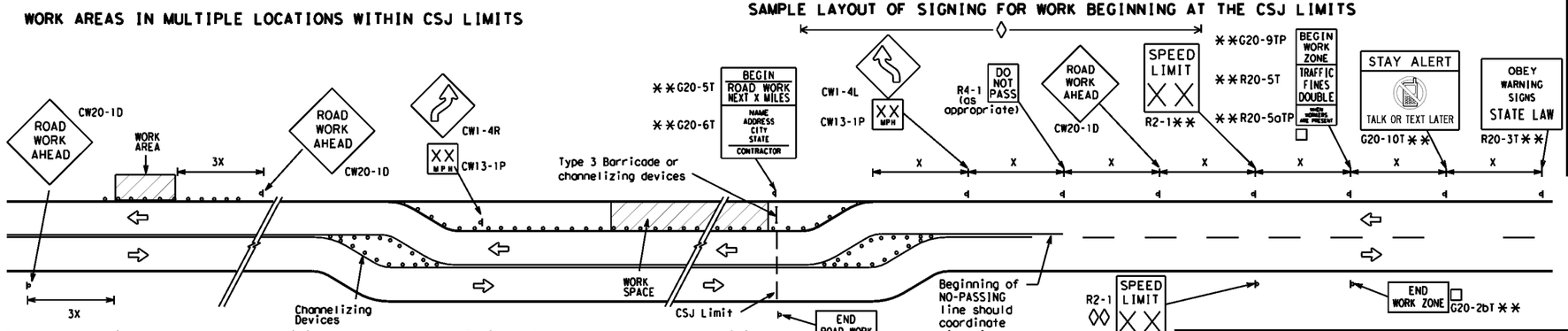
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

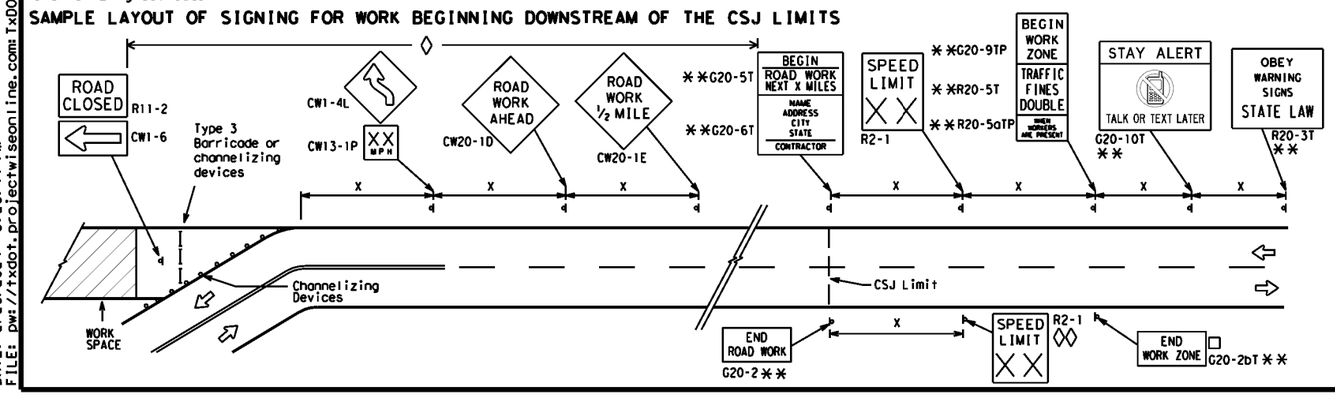
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING 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
o o o	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	UVALDE		20

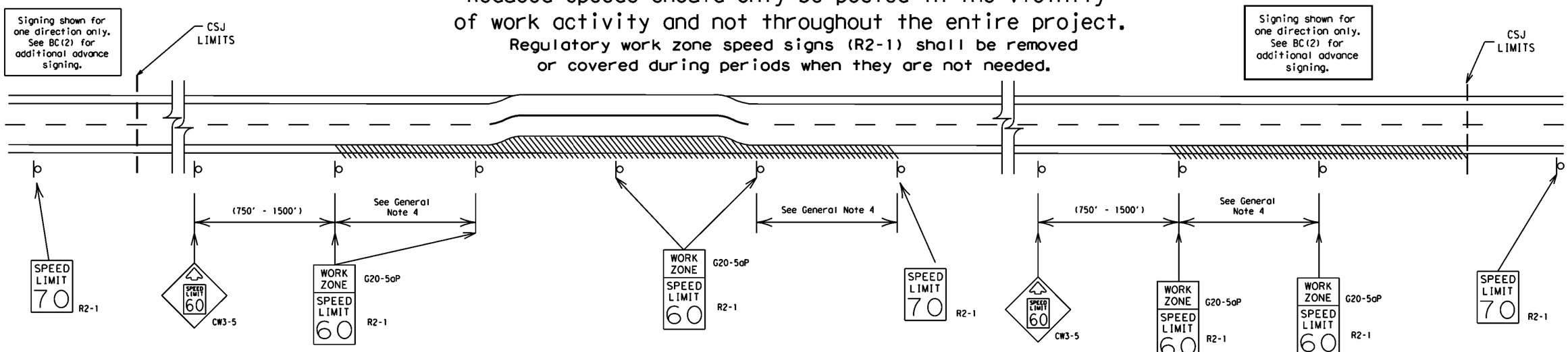
DATE: 2/26/2024 5:26:46 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0624010031/A - Design/PLANS or Set/2. TCP/Standards/BC-21.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

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

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	UVALDE		21

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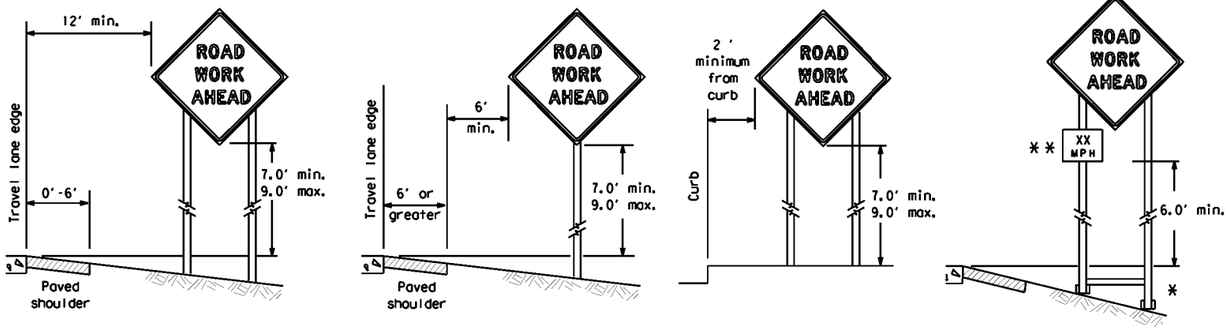
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/2. TCP/Standards/BC-21.dgn

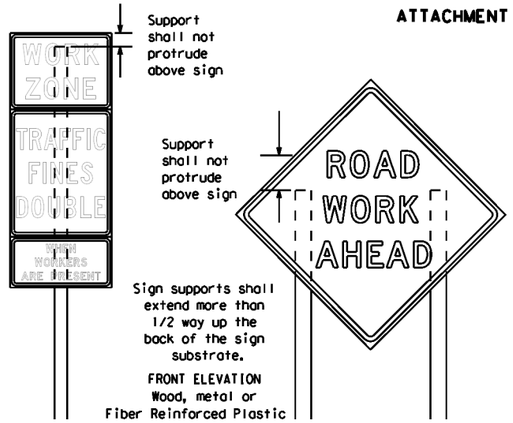
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

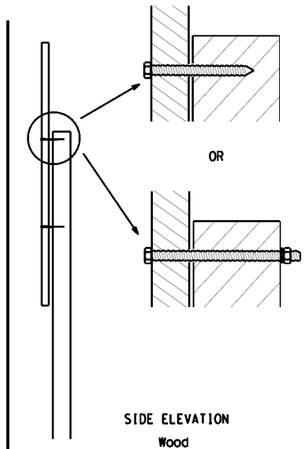


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS





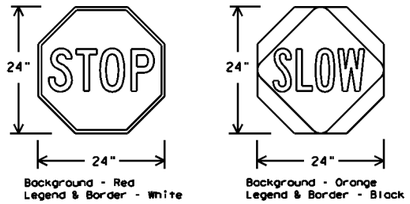
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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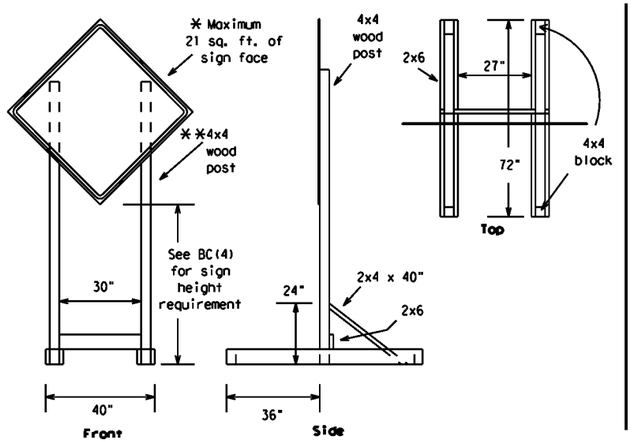
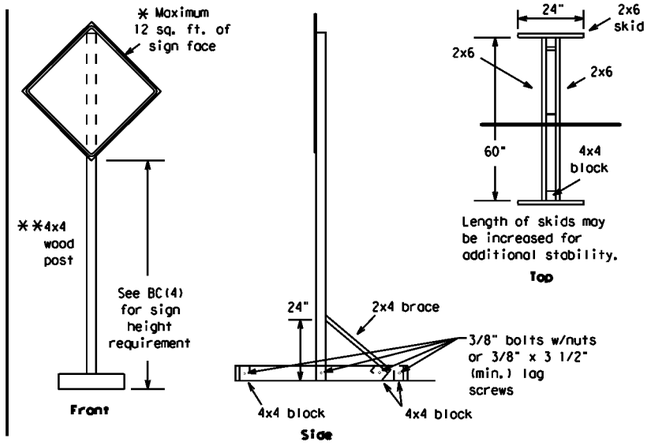
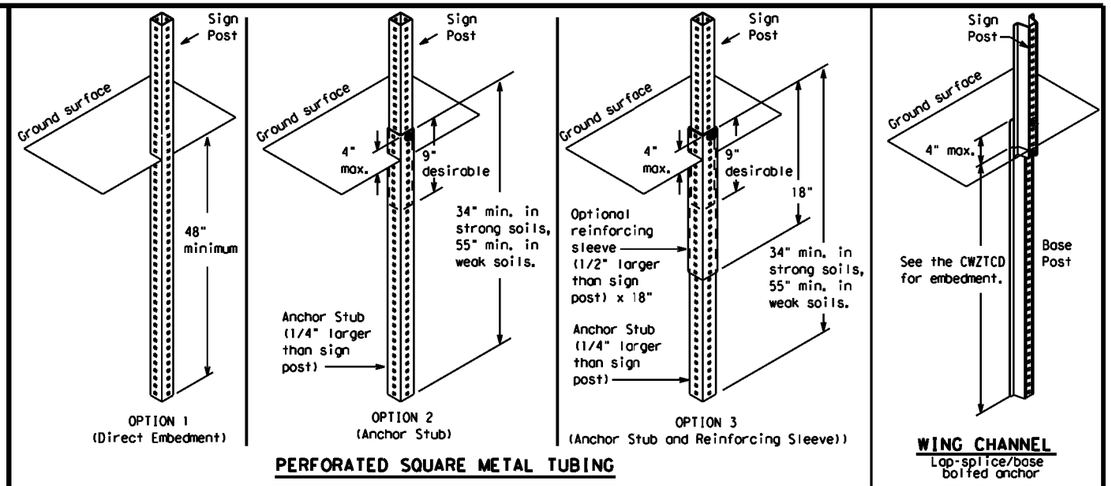




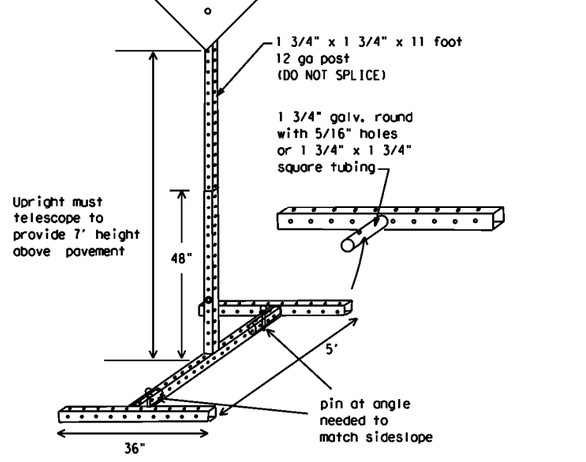
SKID MOUNTED WOOD SIGN SUPPORTS

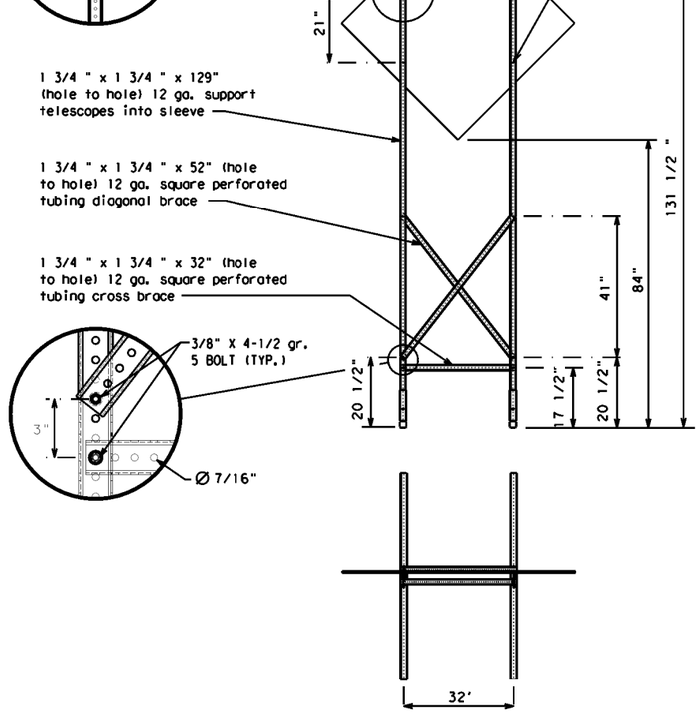
*** LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS**

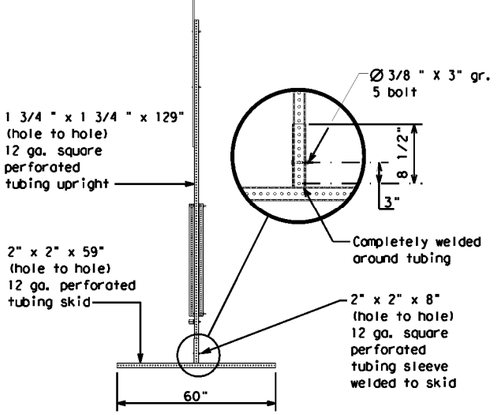


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

* See BC(4) for definition of "Work Duration."

** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- FORM X LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- WATCH FOR TRUCKS
- EXPECT DELAYS
- EXPECT DELAYS
- PREPARE TO STOP
- REDUCE SPEED XXX FT
- END SHOULDER USE
- USE OTHER ROUTES
- WATCH FOR WORKERS
- STAY IN LANE *

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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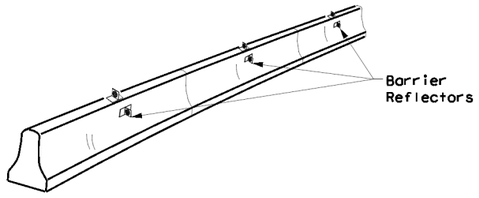
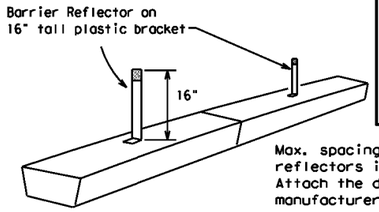
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

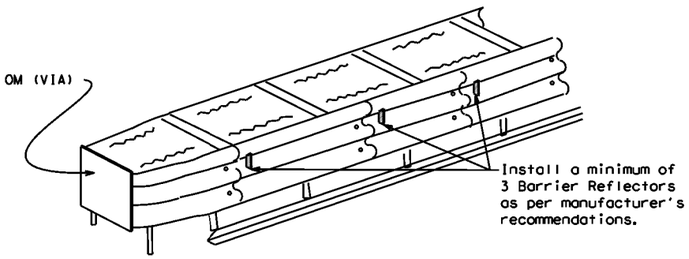


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

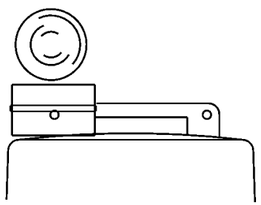


DELINEATION OF END TREATMENTS

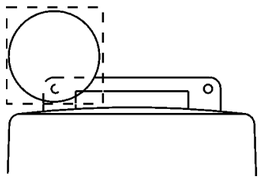
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

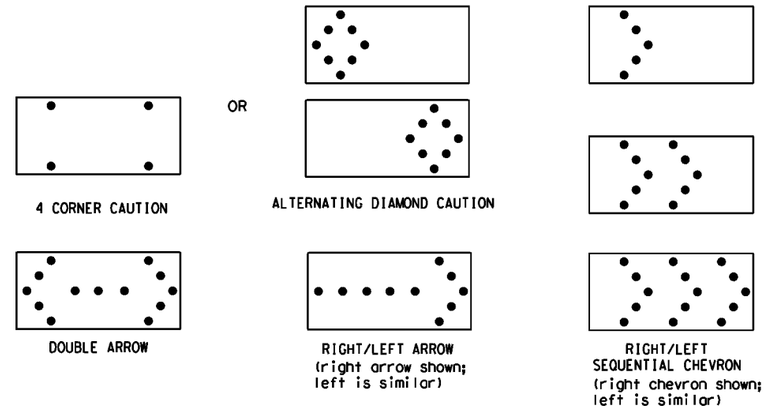
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is on extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

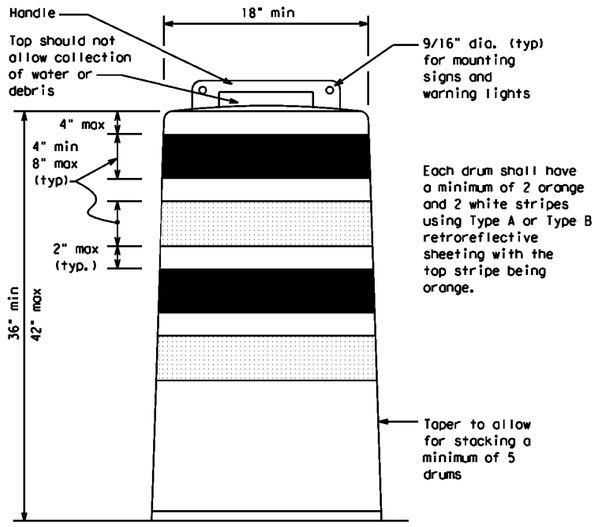
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

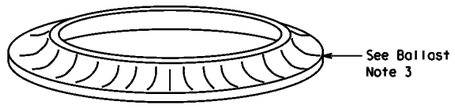
RETROREFLECTIVE SHEETING

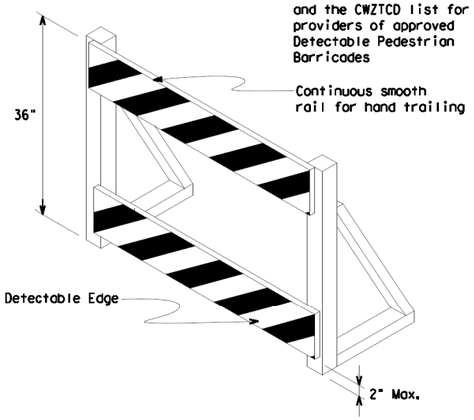
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Deportmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

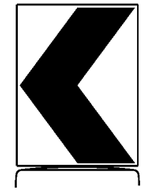




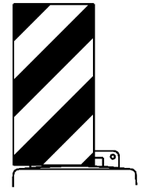


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0624	01	003	PR 29A
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	SAT	UVALDE		26
7-13				

DATE: 2/26/2024 5:27:00 PM
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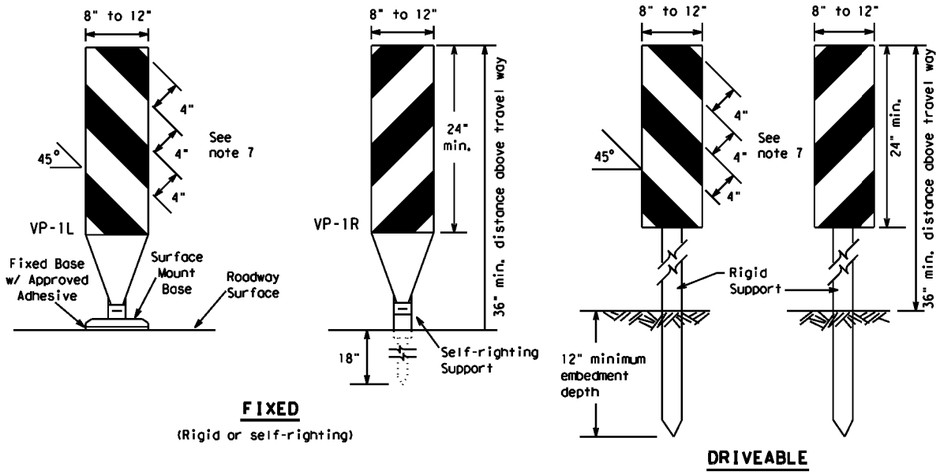
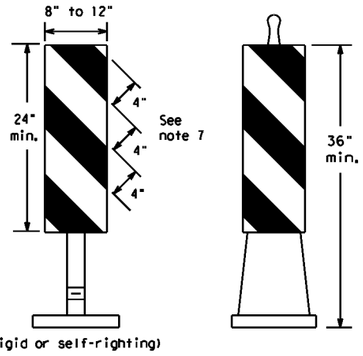


FIXED
(Rigid or self-righting)

DRIVEABLE

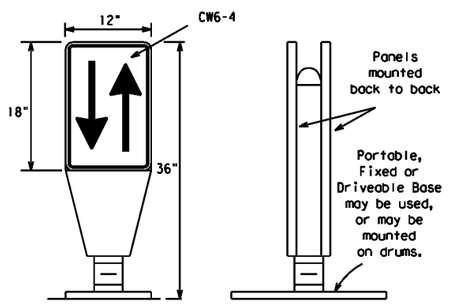


(Rigid or self-righting)

PORTABLE

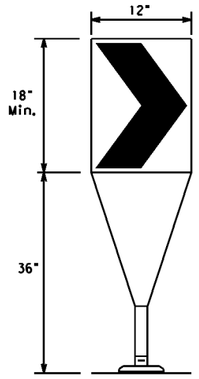
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



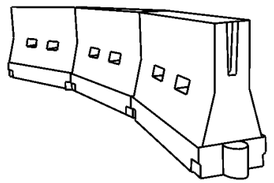
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L=WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

**Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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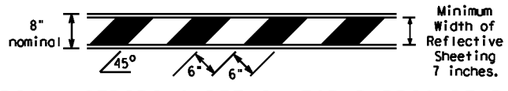
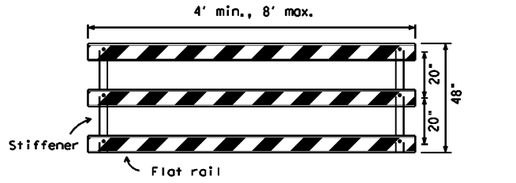
TYPE 3 BARRICADES

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 stocked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



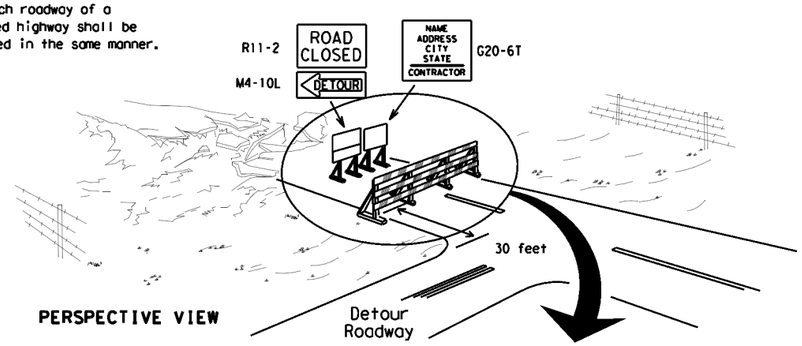
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

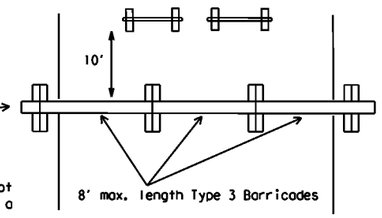
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

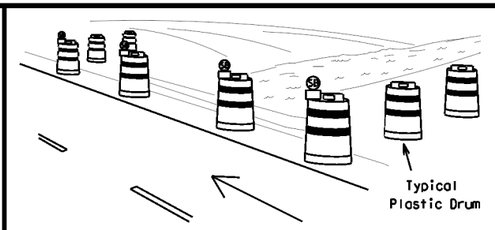
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

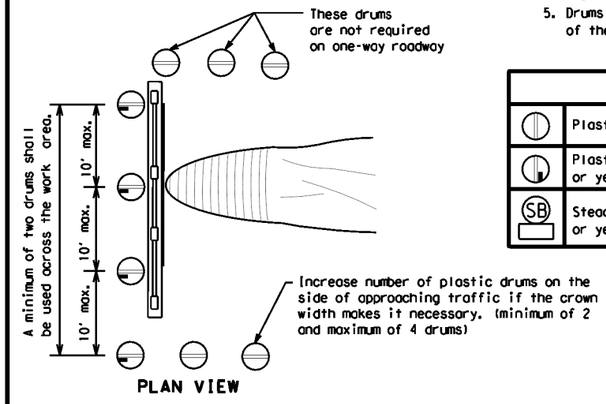
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

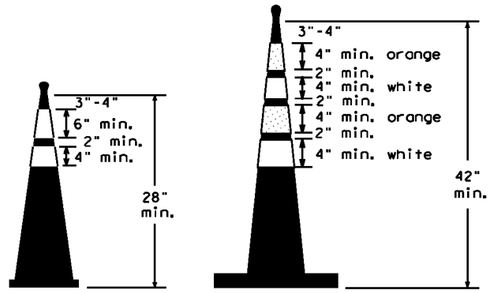
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



PLAN VIEW

LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

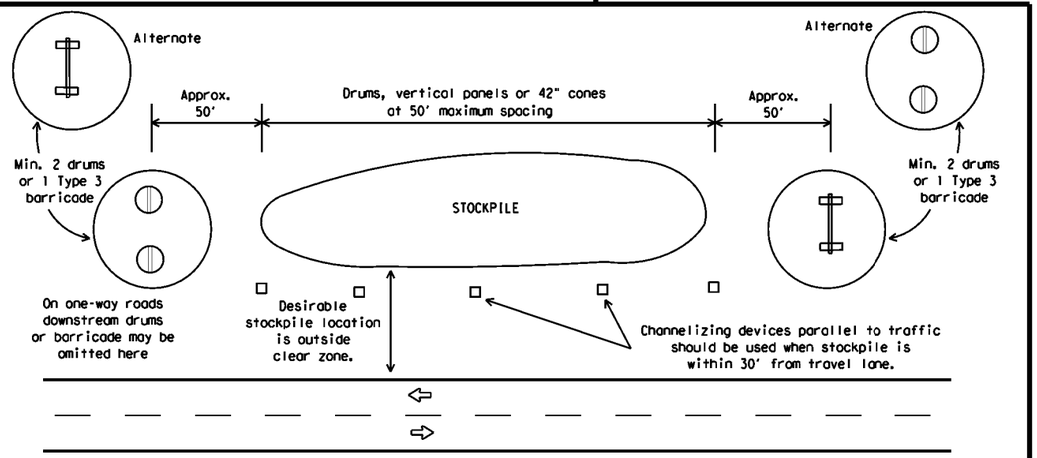
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	UVALDE		28

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

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

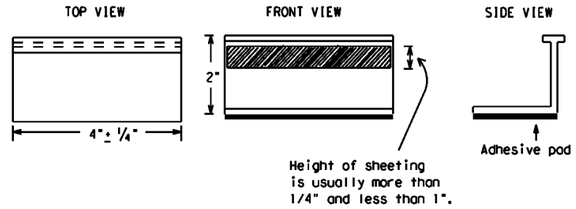
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation

Traffic Safety Division Standard

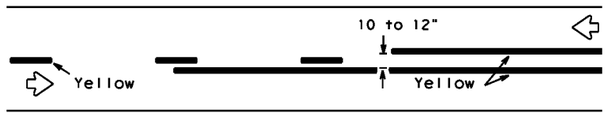
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

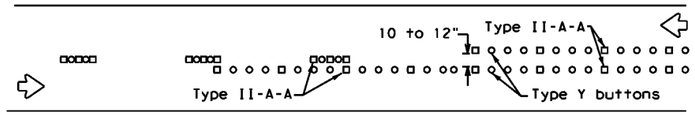
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	SAT	UVALDE		29
11-02 8-14				

DATE: 2/26/2024 5:27:05 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/2. TCP/Standards/BC-21.dgn

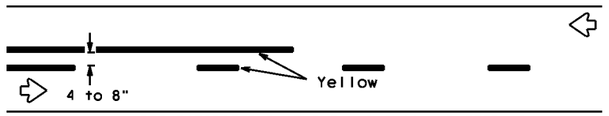
PAVEMENT MARKING PATTERNS



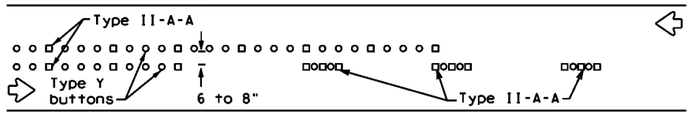
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



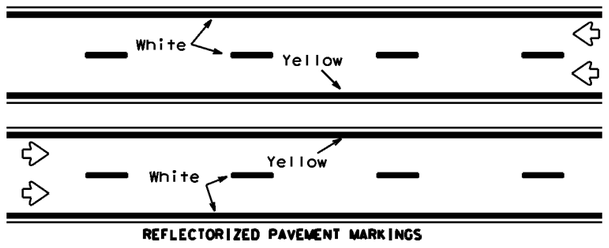
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



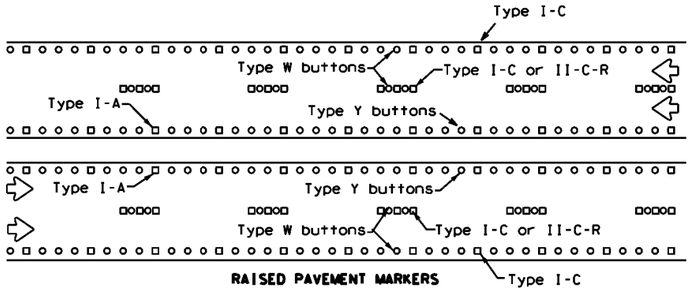
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

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



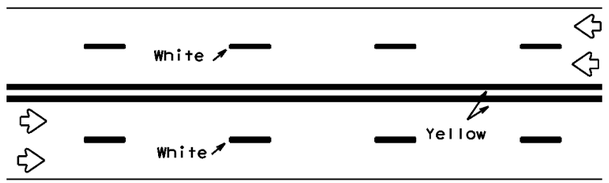
REFLECTORIZED PAVEMENT MARKINGS



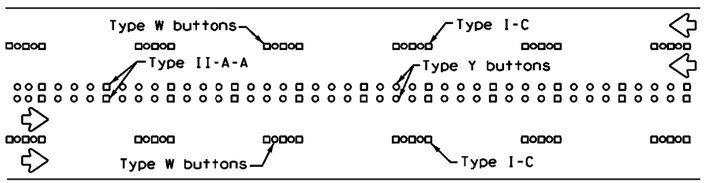
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



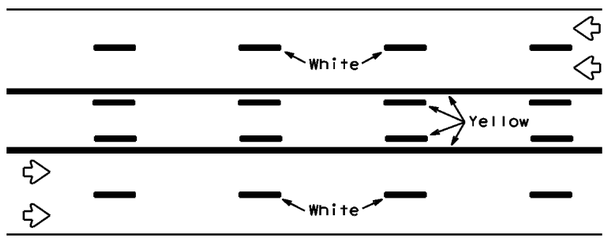
REFLECTORIZED PAVEMENT MARKINGS



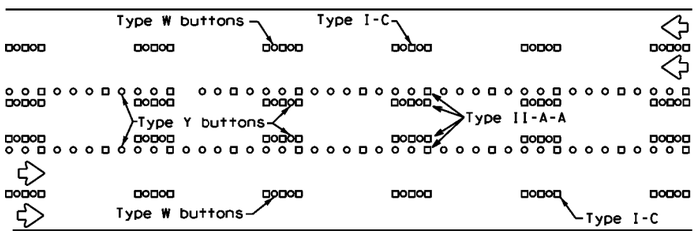
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

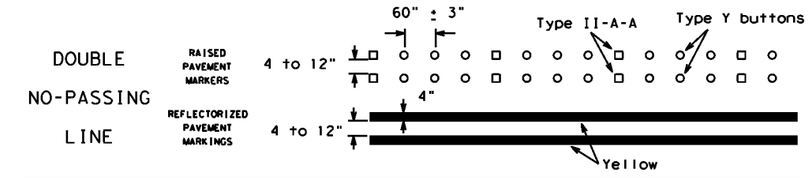
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

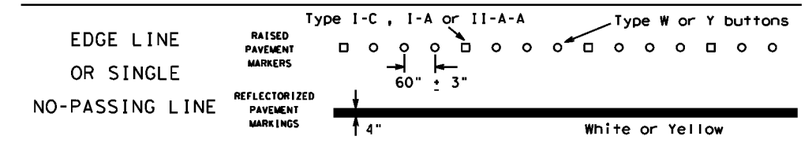
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

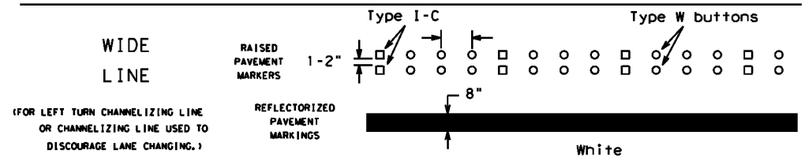


EDGE LINE OR SINGLE NO-PASSING LINE



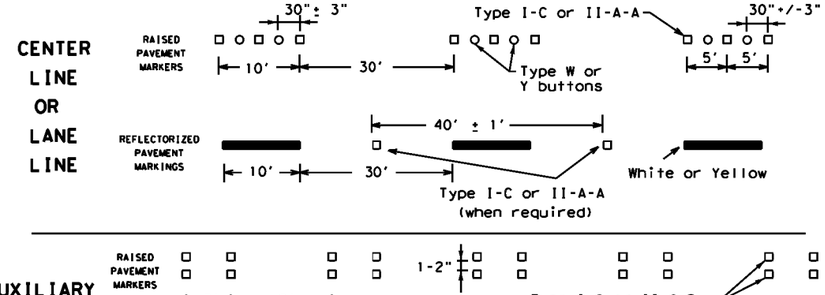
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

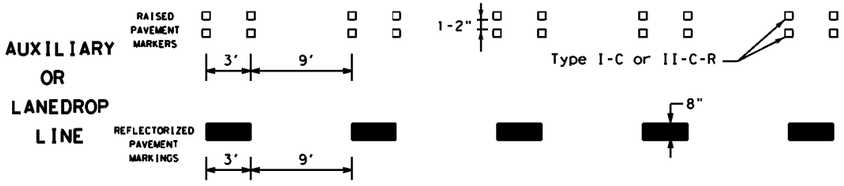


BROKEN LINES

CENTER LINE OR LANE LINE

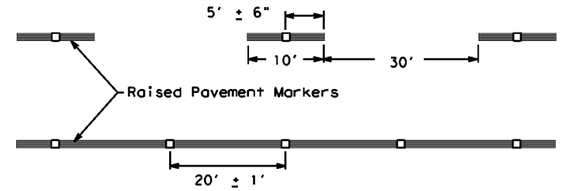


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

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

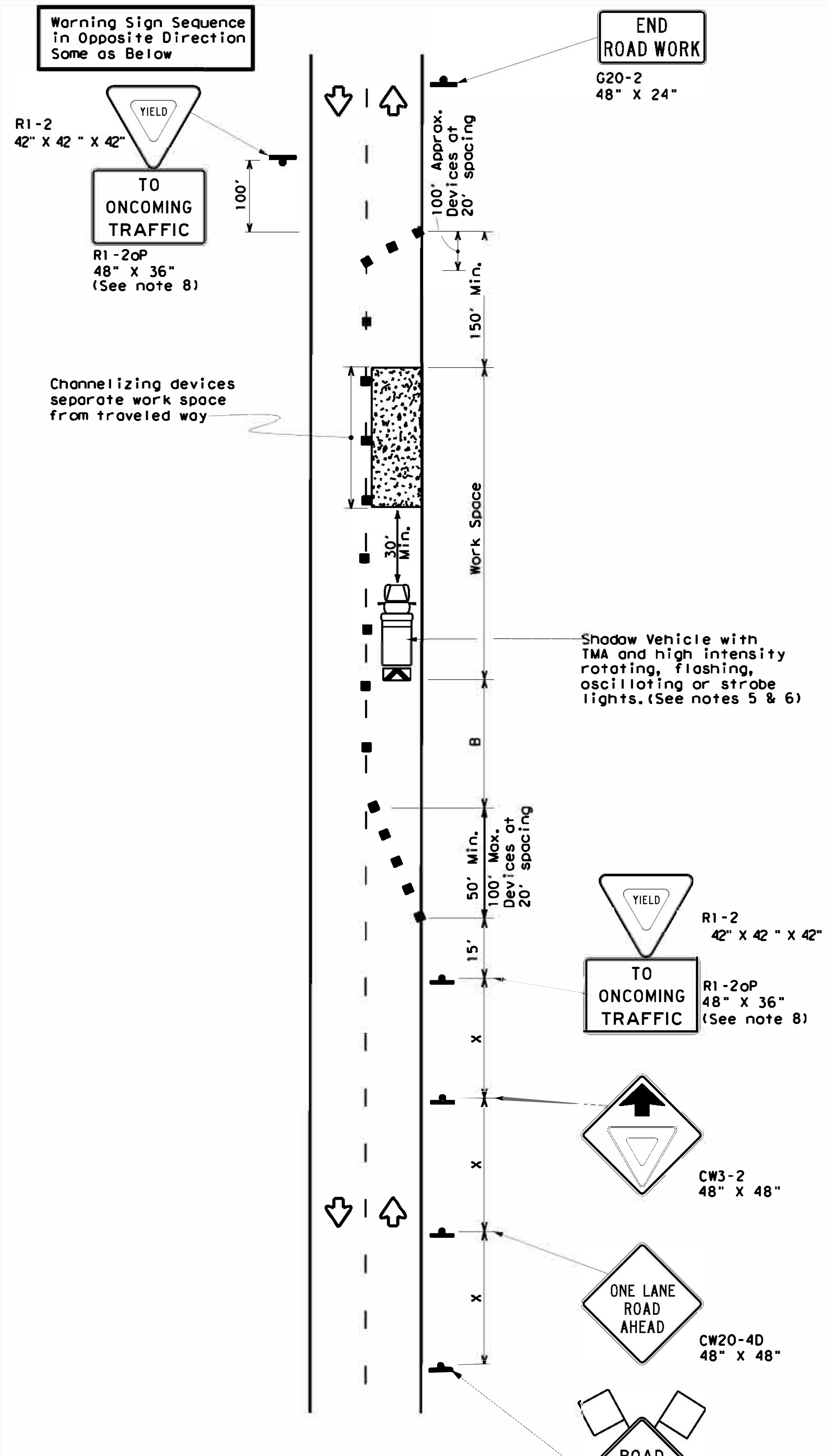
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

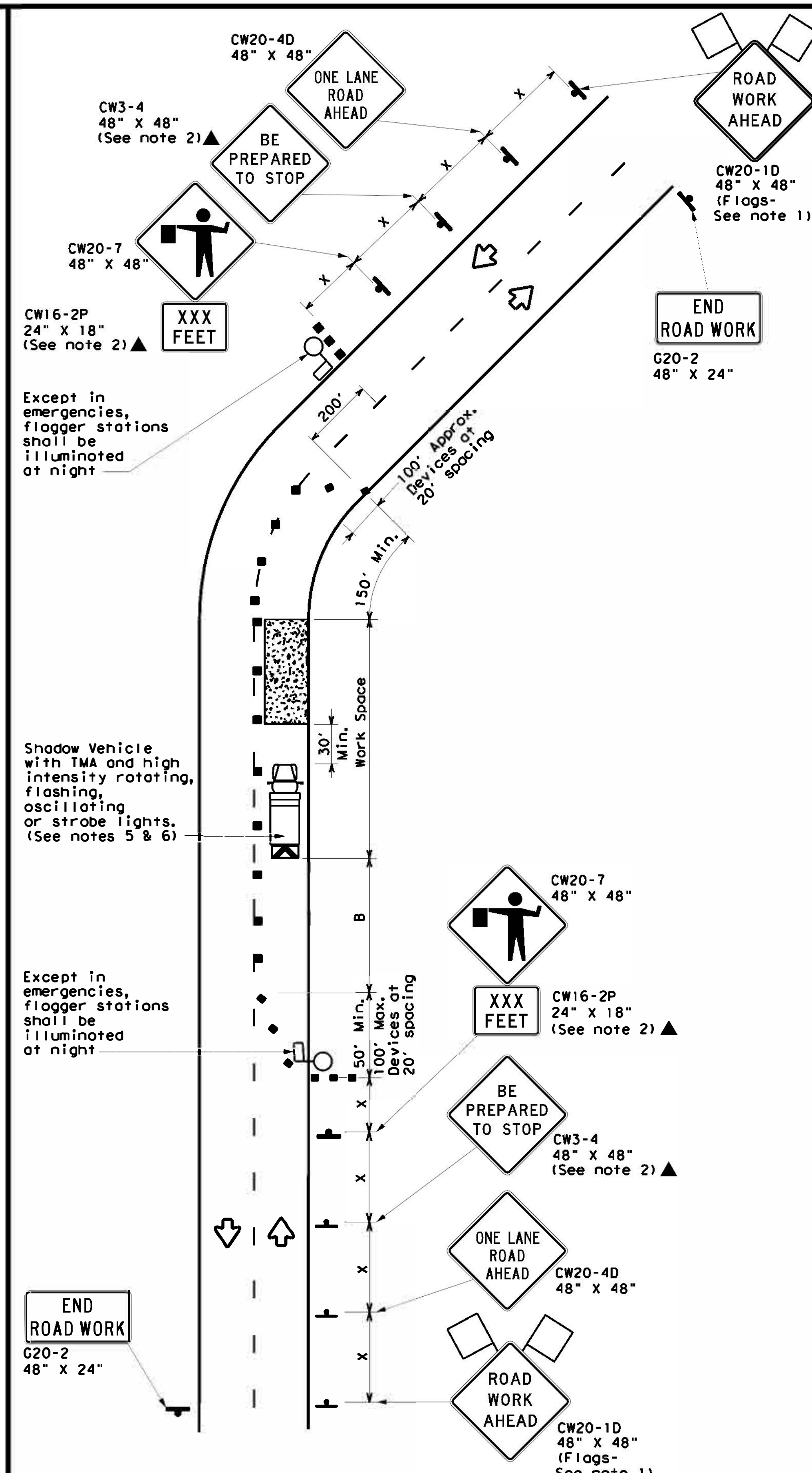
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		30



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

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	$L = \frac{WS^2}{60}$	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

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
8. R1-2 "YIELD" sign with R1-2oP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. 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(1-2)-18

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REVISIONS: 4-90, 4-98, 2-94, 2-12, 1-97, 2-18

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0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		31

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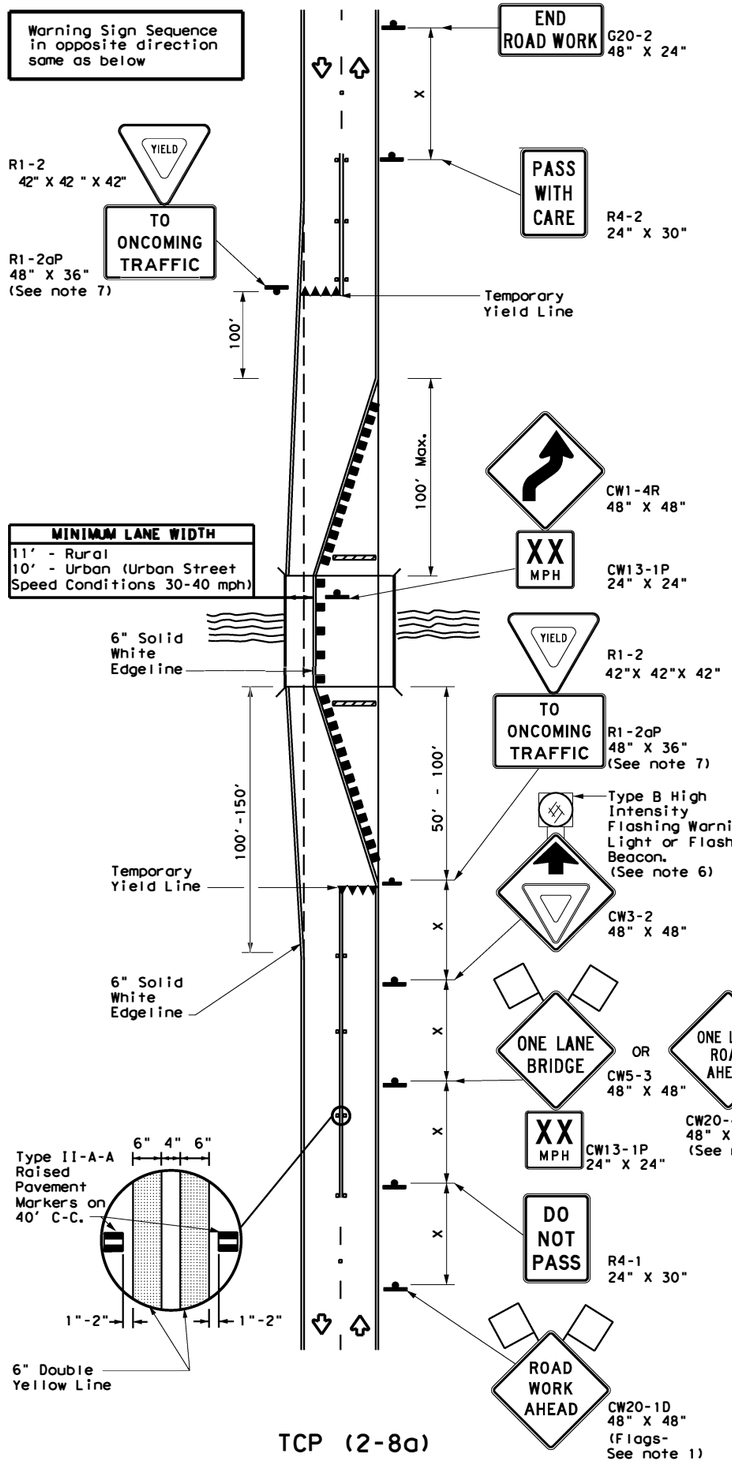
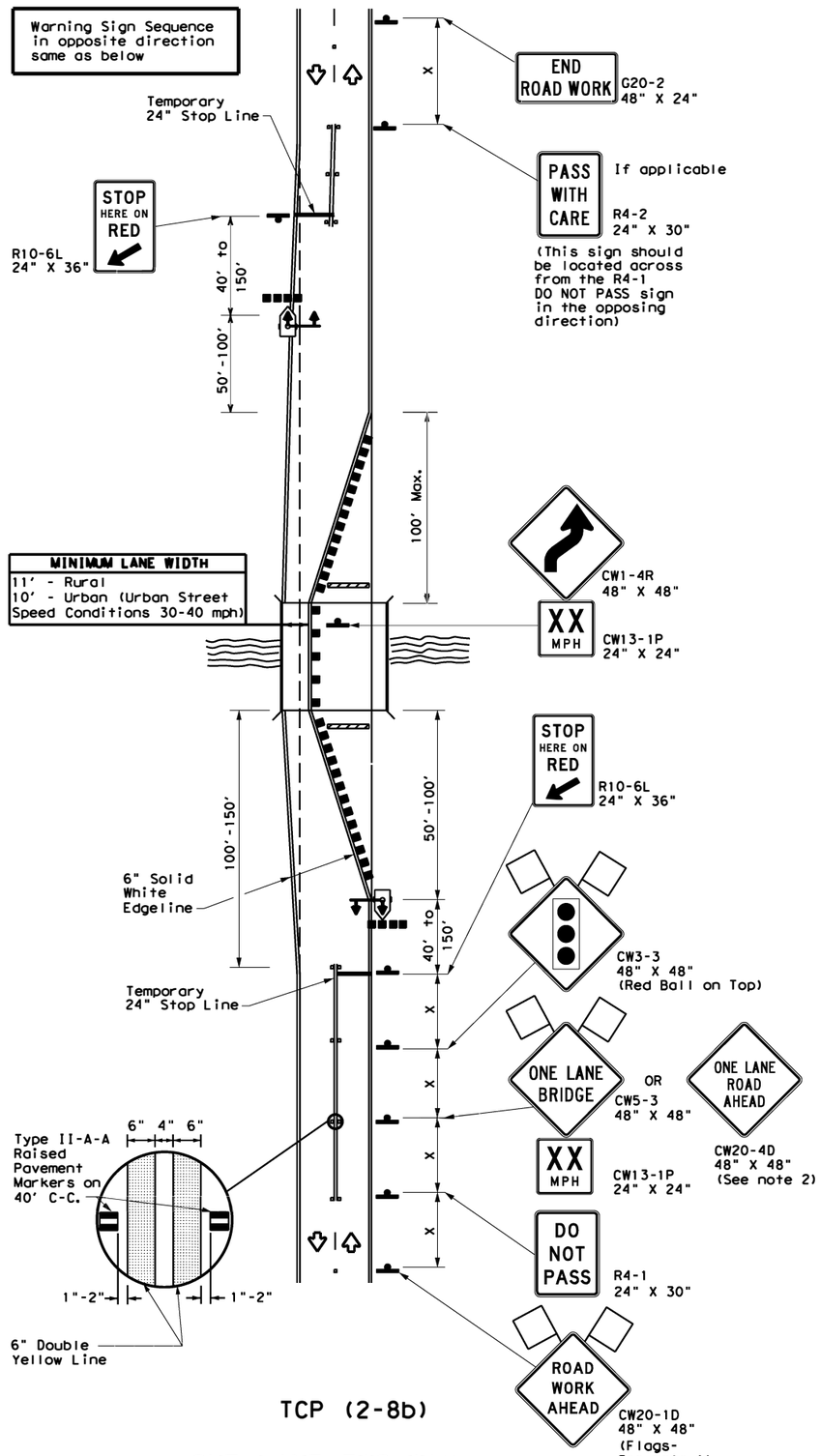


TCP (2-8a)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH YIELD SIGNS
(Less Than 2000 ADT-See Note 5)



TCP (2-8b)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH TRAFFIC SIGNAL

LEGEND

	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

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

1. Flags attached to signs where shown are REQUIRED.
2. When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
3. Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
4. For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TCP (2-8a)

5. Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
6. If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
7. The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

TCP (2-8b)

8. A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
9. Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN LONG TERM ONE-LANE TWO-WAY CONTROL

TCP(2-8)-23

FILE: tcp2-8-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		32

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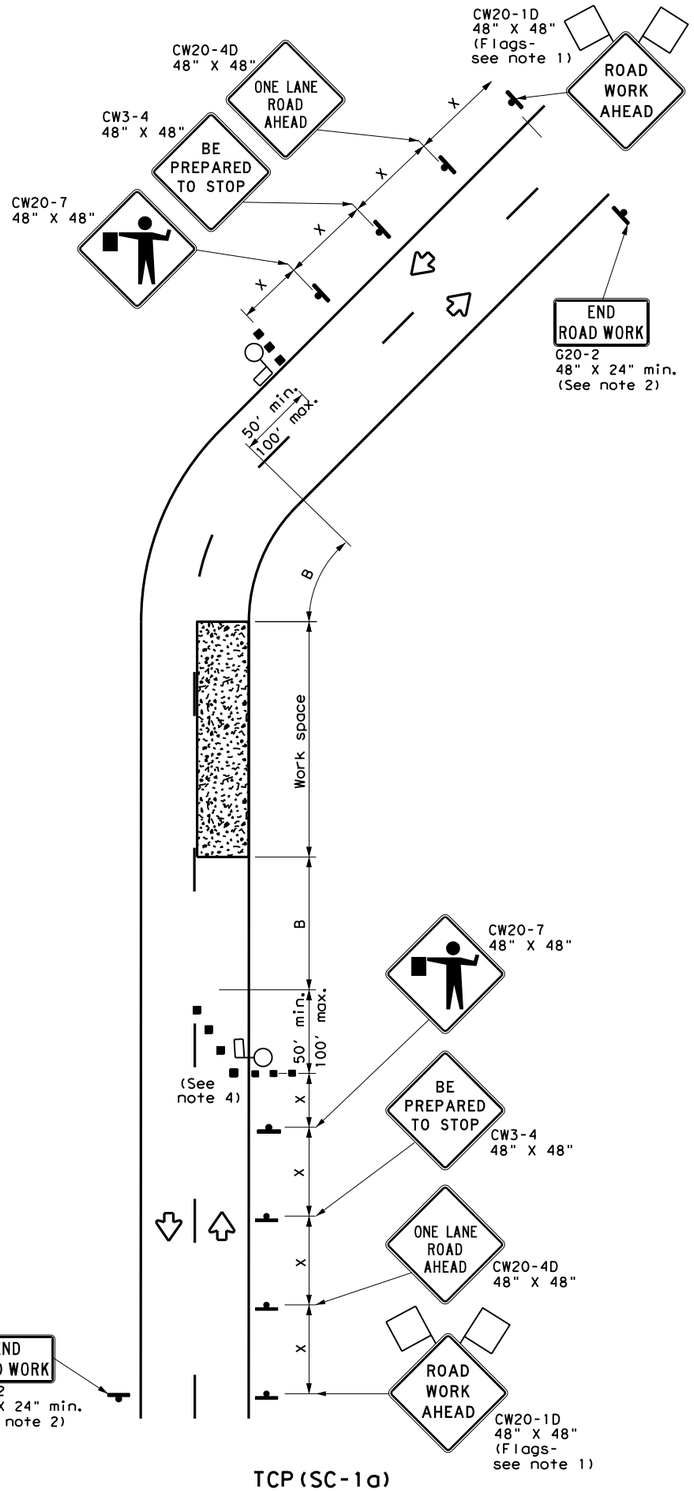
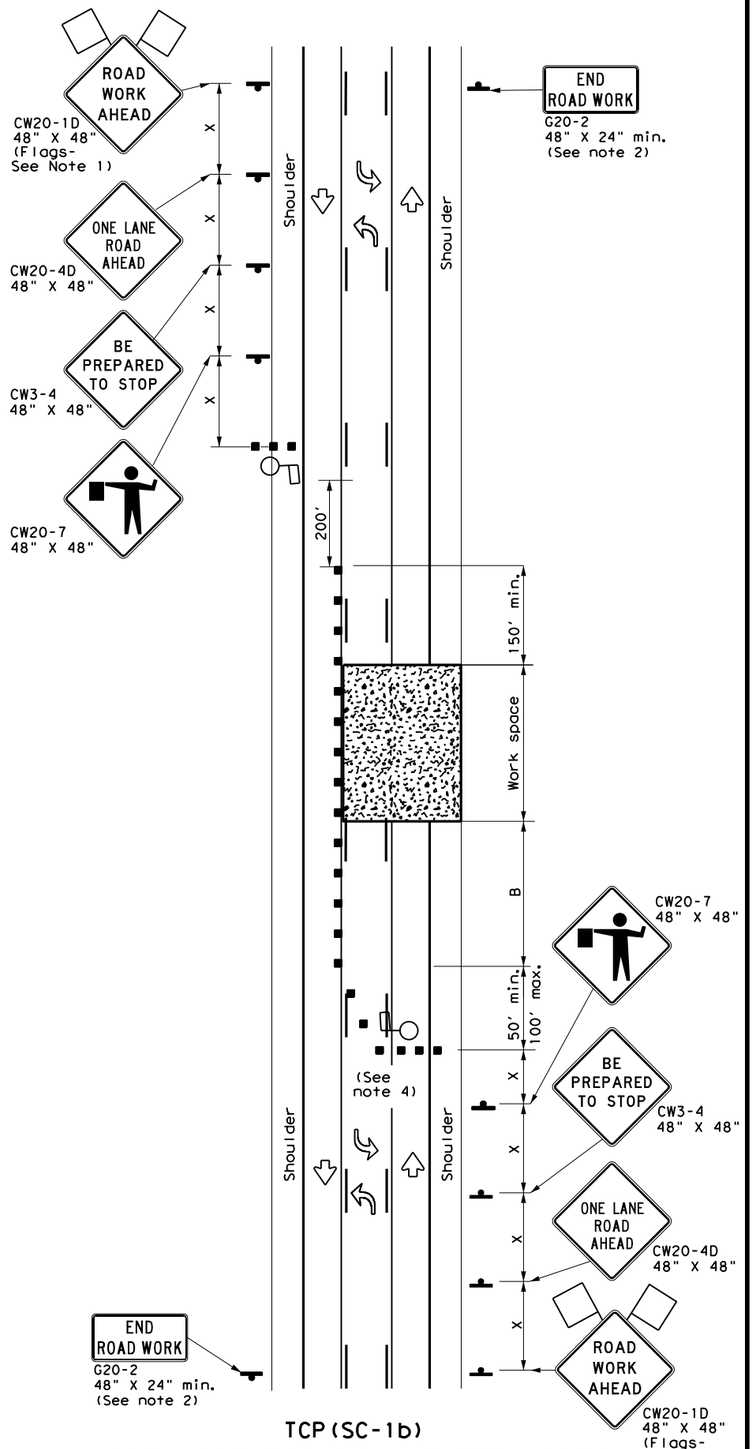


TCP(SC-1a)

ONE LANE TWO-WAY (TWO LANES) CONTROL WITH PILOT VEHICLE



TCP(SC-1b)

ONE LANE TWO-WAY (THREE LANES) CONTROL WITH PILOT VEHICLE AND CHANNELIZING DEVICES

LEGEND

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

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

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. Sign spacing may be increased or an additional ROAD WORK AHEAD (CW20-1D) sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.
4. Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.
5. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.
6. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
7. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.
8. Temporary rumble strips are not required on seal coat operations.
9. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

TCP (SC-1a)

1. Channelizing devices on the centerline are not required when a pilot car is leading traffic, unless directed by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

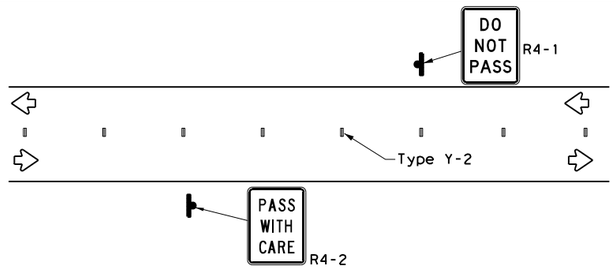
TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS ONE-LANE TWO-WAY

TCP(SC-1)-22

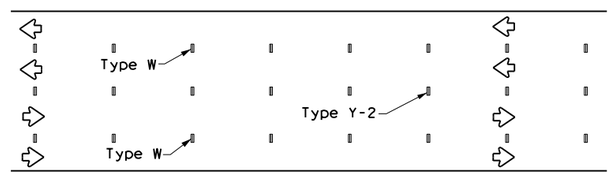
FILE: tcpsc-1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		33

DATE: 2024/02/26
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0624010034 - Design/Plan Set/2. TCP/Standards/TCP(SC-7)-22

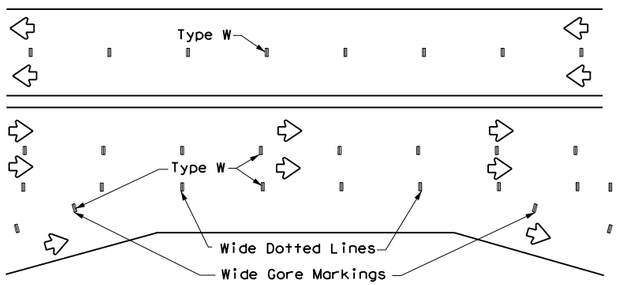
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



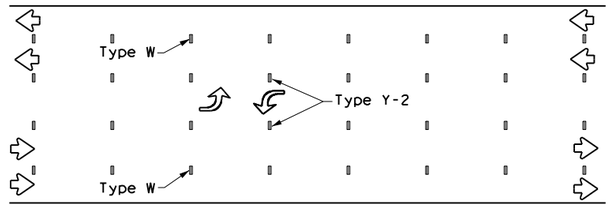
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

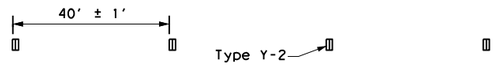
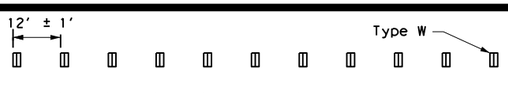


LANE LINES FOR DIVIDED HIGHWAY

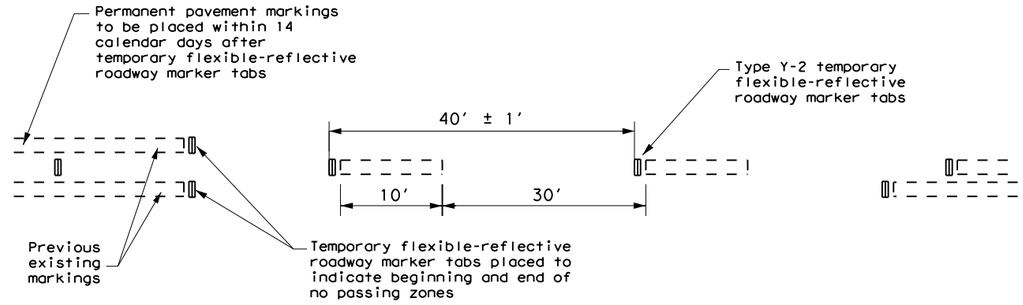


TWO-WAY LEFT TURN LANE

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

SOLID LINES	DOUBLE NO-PASSING LINE	
	SINGLE NO-PASSING LINE or CHANNELIZATION LINE	
	8" WIDE SOLID LINE	
BROKEN LINES (FOR CENTER LINE OR LANE LINE)		
WIDE DOTTED LINES (FOR LANE DROP LINES)		
WIDE GORE MARKINGS		

TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS



TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS

1. Temporary markings for surfacing projects shall be Temporary Flexible-Reflective Roadway Marker Tabs with protective cover 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 days before the surfacing is applied. After the surfacing is rolled and swept, the protective cover over the reflective strip shall be removed.
2. Temporary Flexible-Reflective Roadway Marker Tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with a 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).
3. Temporary Flexible-Reflective Roadway Marker Tabs will require normal maintenance replacement when used on roadways with an Average Daily Traffic (ADT) per lane of up to 7500 vehicles with no more than 10% truck mix. When roadway volumes exceed these values, additional maintenance replacement of these devices should be planned for.
4. 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.
5. 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 4.
6. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
7. Tabs shall NOT be used to simulate edge lines.

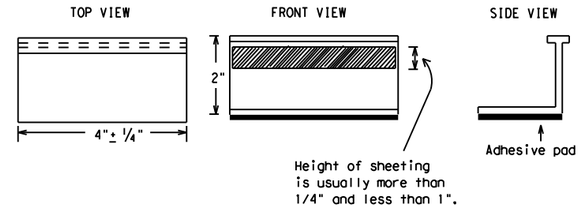
NOTES:

1. 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.
2. 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 acceptable.
3. 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.

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

1. DMSs referenced above may be found along with embedded links to their respective MPLs at the following website: http://www.txdot.gov

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS



Texas Department of Transportation

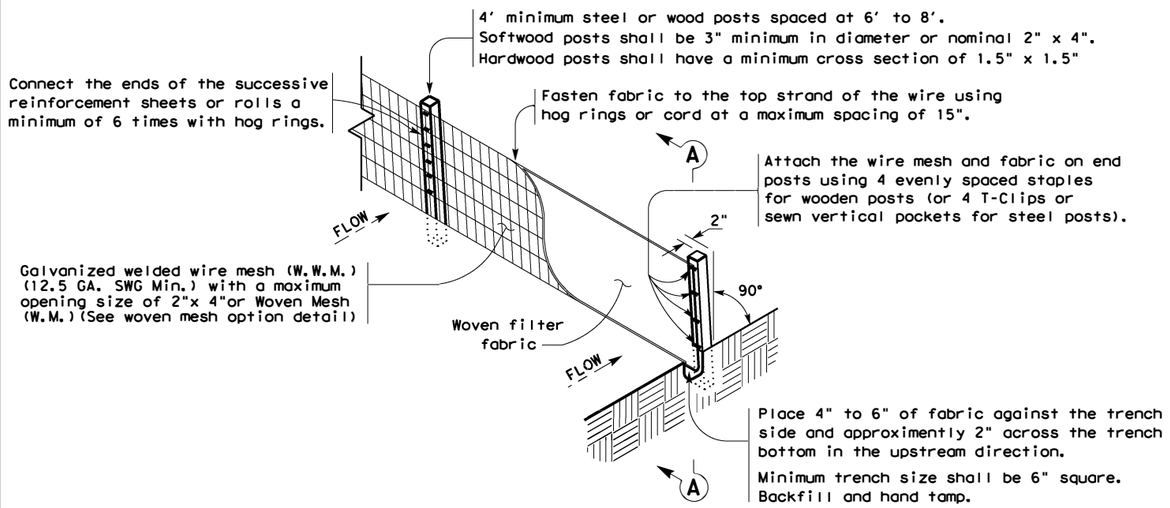
Traffic Safety Division Standard

TEMPORARY PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-7)-22

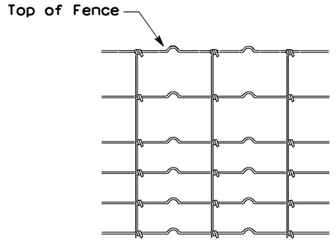
FILE: tcpsc-7-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
4-21	DIST	COUNTY		SHEET NO.
10-22	SAT	UVALDE		34

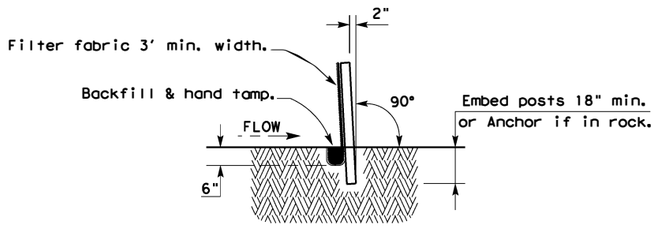
8/8/2023
pw:\\txdot.projectwiseonline.com:TxDOT4\Documents\15 - SAT/Design Projects\062401003\4 - Design/Plan Set/9. Environmental/Standards/EC116.dgn



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

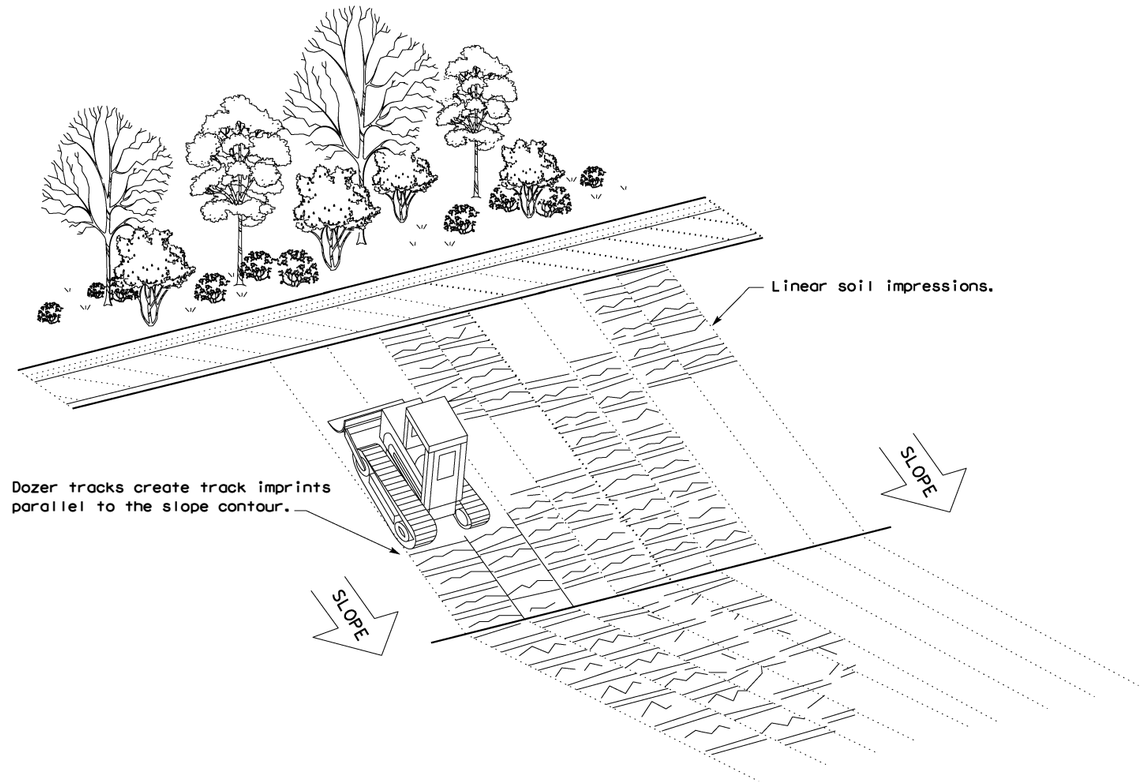
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

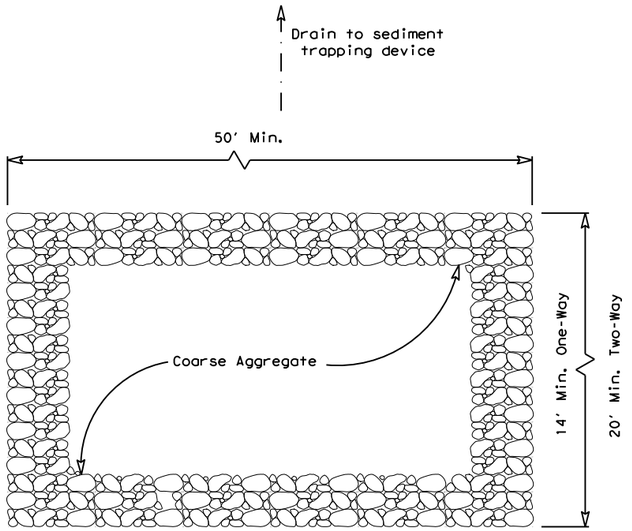
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

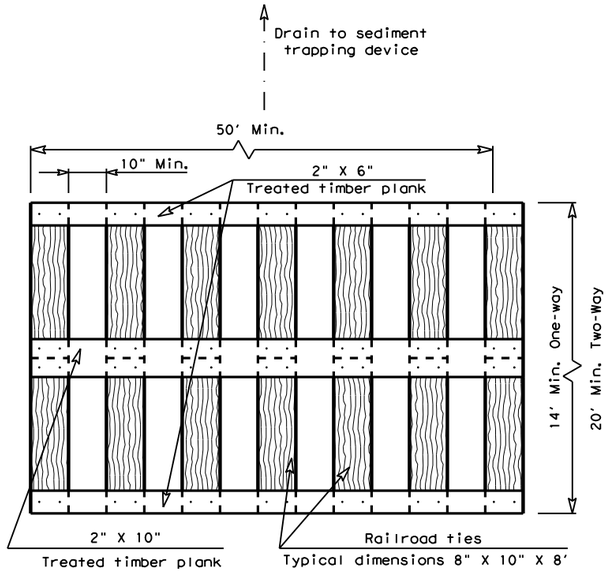
EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM	DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0624	01	003		PR 29A	
	DIST	COUNTY				SHEET NO.
	SAT	UVALDE				35

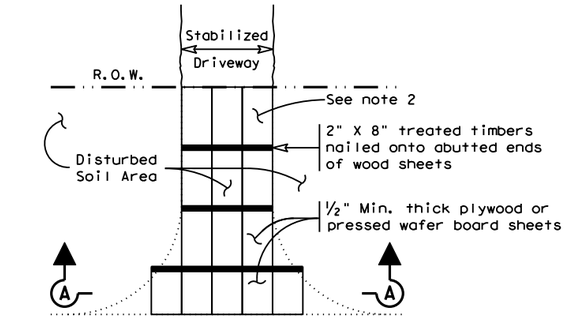
DATE: 2/15/2024
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/9. Environmental/Standards/EC316.dgn



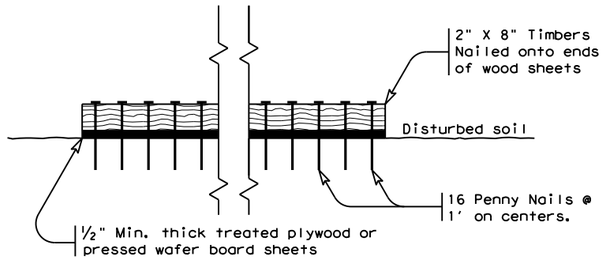
PLAN VIEW



PLAN VIEW



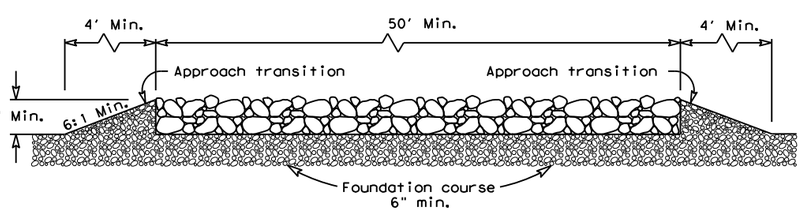
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



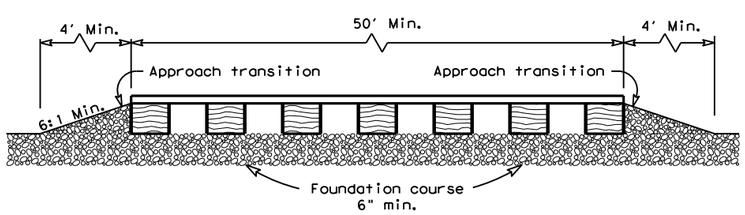
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

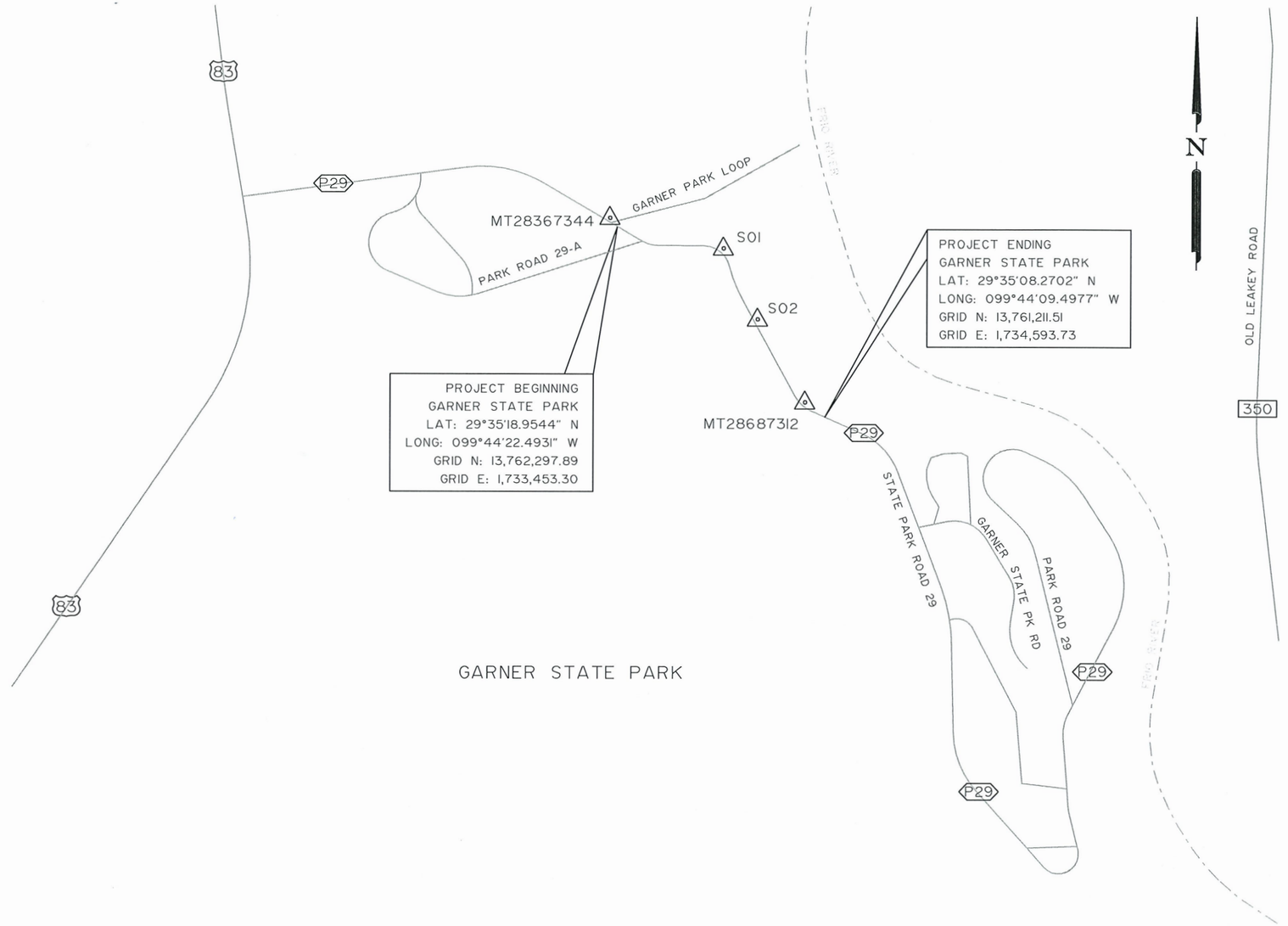
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		36



NOTES:

1. ALL BEARINGS ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE (NAD83, 2011 ADJUSTMENT, EPOCH 2010.00). ESTABLISHED BY GPS OBS (RTN), HELD HORIZONTAL MONUMENT "LEAKEY BASE STATION".

2. ALL DISTANCES AND COORDINATES ARE IN US SURVEY FEET DISPLAYED IN SURFACE VALUES WITH THE TxDOT SURFACE ADJUSTMENT FACTOR OF 1.000170.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) USING GEOID12B. ESTABLISHED BY DIGITAL LEVEL, HELD VERTICAL MONUMENT "MT28367344".

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

STATE OF TEXAS REGISTERED DAVID H. SPRADLEY 6035 PROFESSIONAL LAND SURVEYOR

4/18/23

David H. Spradley

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION IN APRIL 2023.

TRAVERSE TABLE

FROM	TO	BEARING	DISTANCE
MT28367344	S01	S 77°23'57" E	607.50'
S01	S02	S 23°55'40" E	472.77'
S02	MT28687312	S 29°17'08" E	544.42'

POINT INFO TABLE

POINT No.	LATITUDE (N)	LONGITUDE (W)	GRID NORTHING	GRID EASTING	SURFACE NORTHING	SURFACE EASTING	ELEVATION	DESCRIPTION
MT28367344	29°35'19.3358"	099°44'22.9441"	13,762,336.66	1,733,413.73	13,764,676.25	1,733,708.41	1,395.11'	CP 3.25" TACC IN CONCRETE
MT28687312	29°35'09.1117"	099°44'10.9679"	13,761,297.32	1,734,464.48	13,763,636.74	1,734,759.34	1,434.39'	CP 3.25" TACC IN CONCRETE
S01	29°35'18.0609"	099°44'16.2202"	13,762,204.15	1,734,006.50	13,764,543.72	1,734,301.28	1,418.30'	CP 3.25" TACC IN DIRT
S02	29°35'13.7953"	099°44'14.0177"	13,761,772.08	1,734,198.22	13,764,111.58	1,734,493.03	1,467.32'	CP 3.25" TACC IN DIRT

11x17 - SCALE: 1" = NOT TO SCALE
22x34 - SCALE: 1" = NOT TO SCALE

Texas Department of Transportation 2017

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. 10046100
2322 W. Grand Parkway North, Suite 150 • Katy, Texas 77449 • 832.913.4000

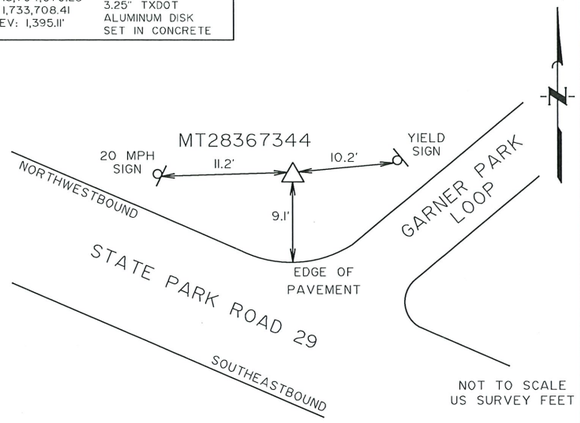
SURVEY
CONTROL INDEX SHEET
GARNER STATE PARK
PAGE 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
06			37
STATE	DIST.	COUNTY	
TEXAS	15	UVALDE	
CONT.	SECT.	JOB	HIGHWAY
0624	01	003	STATE PARK ROAD 29

MT28367344

N: 13,764,676.25
E: 1,733,708.41
ELEV: 1,395.11'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN CONCRETE

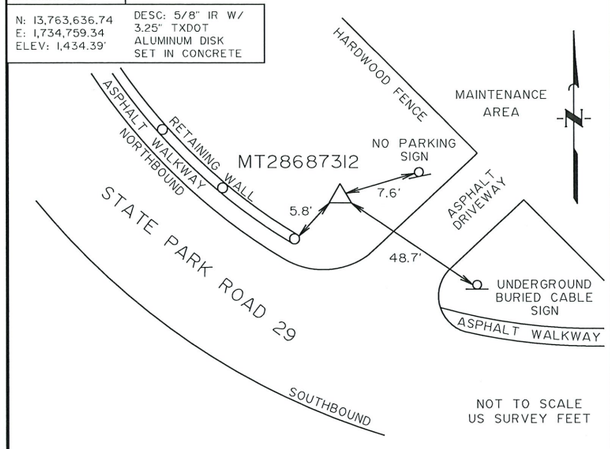


CONTROL POINT MT28367344 IS A 3.25" TXDOT ALUMINUM DISK SET IN CONCRETE, ON THE NORTHEAST SIDE OF STATE PARK ROAD 29, LOCATED APPROXIMATELY 2,480' EAST OF U.S. HIGHWAY 83.

MT28687312

N: 13,763,636.74
E: 1,734,759.34
ELEV: 1,434.39'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN CONCRETE

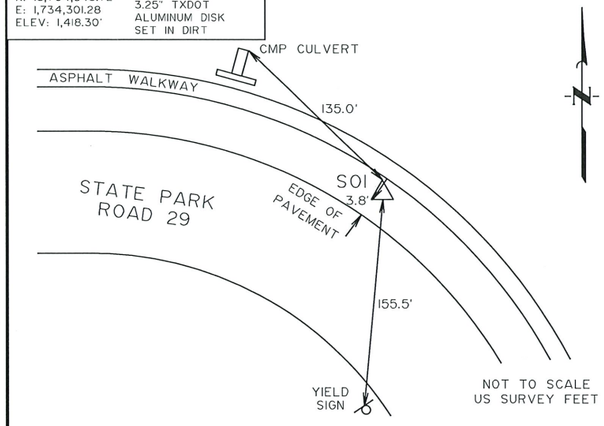


CONTROL POINT MT28687312 IS A 3.25" TXDOT ALUMINUM DISK SET IN CONCRETE, ON THE NORTHEAST SIDE OF STATE PARK ROAD 29, LOCATED APPROXIMATELY 4,160' EAST OF U.S. HIGHWAY 83.

SOI

N: 13,764,543.72
E: 1,734,301.28
ELEV: 1,418.30'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN DIRT

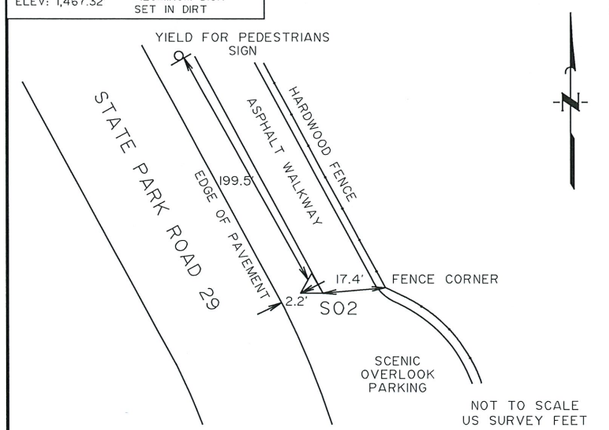


CONTROL POINT SOI IS A 3.25" TXDOT ALUMINUM DISK SET IN DIRT, ON THE NORTHEAST SIDE OF STATE PARK ROAD 29, LOCATED APPROXIMATELY 3,110' EAST OF U.S. HIGHWAY 83.

SO2

N: 13,764,111.58
E: 1,734,493.03
ELEV: 1,467.32'

DESC: 5/8" IR W/ 3.25" TXDOT ALUMINUM DISK SET IN DIRT



CONTROL POINT SO2 IS A 3.25" TXDOT ALUMINUM DISK SET IN DIRT, ON THE NORTHEAST SIDE OF STATE PARK ROAD 29, LOCATED APPROXIMATELY 3,600' EAST OF U.S. HIGHWAY 83.

NOTES:

1. ALL BEARINGS ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE (NAD83, 2011 ADJUSTMENT, EPOCH 2010.00). ESTABLISHED BY GPS OBS (RTN), HELD HORIZONTAL MONUMENT "LEAKEY BASE STATION".

2. ALL DISTANCES AND COORDINATES ARE IN US SURVEY FEET DISPLAYED IN SURFACE VALUES WITH THE TxDOT SURFACE ADJUSTMENT FACTOR OF 1.000170.

3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) USING GEOID12B. ESTABLISHED BY DIGITAL LEVEL, HELD VERTICAL MONUMENT "MT28367344".

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

STATE OF TEXAS
REGISTERED
DAVID H. SPRADLEY
6035
PROFESSIONAL
LAND SURVEYOR

4/18/23

David H. Spradley

THE CONTROL POINTS HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION IN APRIL 2023.

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HORIZONTAL & VERTICAL CONTROL SHEET GARNER STATE PARK

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
06			38
STATE	DIST.	COUNTY	
TEXAS	15	UVALDE	
CONT.	SECT.	JOB	HIGHWAY
0624	01	003	STATE PARK ROAD 29

DESIGN JR | DRAFT JR | CHECK JR

BL PR29A

HORIZONTAL ALIGNMENT REPORT

Alignment name: BL PR29A
Alignment description:
Report Created: Wednesday, September 20, 2023
Time: 10:39:39 AM

	STATION	X	Y
POT	1000.000 R1	1734896.703	13763546.164
PC	1116.175 R1	1734793.060	13763598.650
Tangential Direction:	N63.142°W		
Tangential Length:	116.175		
PC	1116.175 R1	1734793.060	13763598.650
PI	1197.523 R1	1734720.488	13763635.402
CC		1734928.596	13763866.288
PT	1275.050 R1	1734676.422	13763703.781
Radius:	300.000		
Delta:	30.343° Right		
Degree of Curvature(Arc):	19.099°		
Length:	158.875		
Tangent:	81.348		
Chord:	157.025		
Middle Ordinate:	10.456		
External:	10.834		
Tangent Back Direction:	N63.142°W		
Radial Direction:	N26.858°E		
Chord Direction:	N47.970°W		
Radial Direction:	N57.201°E		
Tangent Ahead Direction:	N32.799°W		
PT	1275.050 R1	1734676.422	13763703.781
PC	1286.748 R1	1734670.086	13763713.614
Tangential Direction:	N32.799°W		
Tangential Length:	11.698		
PC	1286.748 R1	1734670.086	13763713.614
PI	1290.586 R1	1734668.007	13763716.840
CC		1734712.115	13763740.699
PT	1294.409 R1	1734666.445	13763720.345
Radius:	50.000		
Delta:	8.778° Right		
Degree of Curvature(Arc):	114.592°		
Length:	7.661		
Tangent:	3.838		
Chord:	7.653		
Middle Ordinate:	0.147		
External:	0.147		
Tangent Back Direction:	N32.799°W		
Radial Direction:	N57.201°E		
Chord Direction:	N28.410°W		
Radial Direction:	N65.979°E		
Tangent Ahead Direction:	N24.021°W		
PT	1294.409 R1	1734666.445	13763720.345
PC	1629.856 R1	1734529.896	13764026.743
Tangential Direction:	N24.021°W		
Tangential Length:	335.447		
PC	1629.856 R1	1734529.896	13764026.743
PI	1634.636 R1	1734527.950	13764031.109
CC		1734543.597	13764032.849
PT	1639.110 R1	1734528.889	13764035.795
Radius:	15.000		
Delta:	35.347° Right		
Degree of Curvature(Arc):	21.972°		
Length:	9.254		
Tangent:	4.779		
Chord:	9.108		
Middle Ordinate:	0.708		
External:	0.743		
Tangent Back Direction:	N24.021°W		
Radial Direction:	N65.979°E		
Chord Direction:	N6.347°W		
Radial Direction:	S78.673°E		
Tangent Ahead Direction:	N11.327°E		
PT	1639.110 R1	1734528.889	13764035.795
PC	1648.978 R1	1734530.827	13764045.471
Tangential Direction:	N11.327°E		
Tangential Length:	9.868		
PC	1648.978 R1	1734530.827	13764045.471
PI	1683.431 R1	1734537.594	13764079.253
CC		1734486.704	13764054.309
PT	1707.787 R1	1734506.747	13764094.599
Radius:	45.000		
Delta:	74.877° Left		
Degree of Curvature(Arc):	127.324°		
Length:	58.808		
Tangent:	34.453		
Chord:	54.712		
Middle Ordinate:	9.270		
External:	11.675		
Tangent Back Direction:	N11.327°E		
Radial Direction:	S78.673°E		
Chord Direction:	N26.112°W		
Radial Direction:	N26.450°E		
Tangent Ahead Direction:	N63.550°W		
PT	1707.787 R1	1734506.747	13764094.599
PC	1712.861 R1	1734502.204	13764096.859
Tangential Direction:	N63.550°W		
Tangential Length:	5.075		
PC	1712.861 R1	1734502.204	13764096.859
PI	1717.449 R1	1734498.096	13764098.903
CC		1734508.885	13764110.289
PT	1721.765 R1	1734495.835	13764102.894
Radius:	15.000		
Delta:	34.011° Right		
Degree of Curvature(Arc):	21.972°		
Length:	8.904		
Tangent:	4.588		
Chord:	8.774		
Middle Ordinate:	0.656		
External:	0.686		
Tangent Back Direction:	N63.550°W		
Radial Direction:	N26.450°E		
Chord Direction:	N46.545°W		
Radial Direction:	N60.461°E		
Tangent Ahead Direction:	N29.539°W		
PT	1721.765 R1	1734495.835	13764102.894
PC	1798.288 R1	1734458.108	13764169.470
Tangential Direction:	N29.539°W		
Tangential Length:	76.523		
PC	1798.288 R1	1734458.108	13764169.470
PI	1818.662 R1	1734448.063	13764187.196
CC		1734066.599	13763947.612
PT	1839.009 R1	1734436.457	13764203.942
Radius:	450.000		
Delta:	5.185° Left		
Degree of Curvature(Arc):	12.732°		
Length:	40.721		
Tangent:	20.374		
Chord:	40.707		
Middle Ordinate:	0.461		
External:	0.461		
Tangent Back Direction:	N29.539°W		
Radial Direction:	N60.461°E		
Chord Direction:	N32.132°W		
Radial Direction:	N55.276°E		
Tangent Ahead Direction:	N34.724°W		
PT	1839.009 R1	1734436.457	13764203.942
PC	1913.203 R1	1734394.195	13764264.922
Tangential Direction:	N34.724°W		
Tangential Length:	74.194		
PC	1913.203 R1	1734394.195	13764264.922
PI	1973.968 R1	1734359.582	13764314.865
CC		1734570.904	13764387.391
PT	2031.643 R1	1734356.231	13764375.538
Radius:	215.000		
Delta:	31.563° Right		
Degree of Curvature(Arc):	26.649°		
Length:	118.441		
Tangent:	60.765		
Chord:	116.949		
Middle Ordinate:	8.104		
External:	8.422		
Tangent Back Direction:	N34.724°W		
Radial Direction:	N55.276°E		
Chord Direction:	N18.942°W		
Radial Direction:	N86.840°E		
Tangent Ahead Direction:	N3.160°W		
PT	2031.643 R1	1734356.231	13764375.538
PC	2089.916 R1	1734353.019	13764433.722
Tangential Direction:	N3.160°W		
Tangential Length:	58.273		
PC	2089.916 R1	1734353.019	13764433.722
PI	2163.038 R1	1734348.987	13764506.732
CC		1734203.247	13764425.452
PT	2225.990 R1	1734288.990	13764548.530
Radius:	150.000		
Delta:	51.976° Left		
Degree of Curvature(Arc):	38.197°		
Length:	136.073		
Tangent:	73.121		
Chord:	131.455		
Middle Ordinate:	15.167		
External:	16.873		
Tangent Back Direction:	N3.160°W		
Radial Direction:	N86.840°E		
Chord Direction:	N29.148°W		
Radial Direction:	N34.863°E		
Tangent Ahead Direction:	N55.137°W		
PT	2225.990 R1	1734288.990	13764548.530
PC	2232.867 R1	1734283.348	13764552.461
Tangential Direction:	N55.137°W		
Tangential Length:	6.877		
PC	2232.867 R1	1734283.348	13764552.461
PI	2348.487 R1	1734188.479	13764618.552
CC		1734106.144	13764298.101
PT	2454.200 R1	1734073.502	13764606.377
Radius:	310.000		
Delta:	40.908° Left		
Degree of Curvature(Arc):	18.483°		
Length:	221.333		
Tangent:	115.620		
Chord:	216.662		
Middle Ordinate:	19.544		
External:	20.860		
Tangent Back Direction:	N55.137°W		
Radial Direction:	N34.863°E		
Chord Direction:	N75.590°W		
Radial Direction:	N6.044°W		
Tangent Ahead Direction:	S83.956°W		

STATE OF TEXAS
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02/26/2024
DATE

Texas Department of Transportation

PR 29A HORIZONTAL ALIGNMENT DATA

SHEET: 1 OF 2

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		39

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BL PR29A

PT	2454.200 R1	1734073.502	13764606.377
PC	2592.730 R1	1733935.741	13764591.790
Tangential Direction:	S83.956°W		
Tangential Length:	138.531		

PC	2592.730 R1	1733935.741	13764591.790
PI	2664.272 R1	1733864.597	13764584.257
CC		1733904.152	13764890.123
PT	2733.191 R1	1733797.710	13764609.641
Radius:	300.000		
Delta:	26.826° Right		
Degree of Curvature(Arc):	19.099°		
Length:	140.461		
Tangent:	71.542		
Chord:	139.181		
Middle Ordinate:	8.183		
External:	8.412		
Tangent Back Direction:	S83.956°W		
Radial Direction:	N6.044°W		
Chord Direction:	N82.631°W		
Radial Direction:	N20.782°E		
Tangent Ahead Direction:	N69.218°W		

PT	2733.191 R1	1733797.710	13764609.641
POT	2743.807 R1	1733787.784	13764613.407
Tangential Direction:	N69.218°W		
Tangential Length:	10.616		

DESIGN JH | DRAFT JH | CHECK DR

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

Texas Department of Transportation

PR 29A HORIZONTAL ALIGNMENT DATA

SHEET: 2 OF 2

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		40

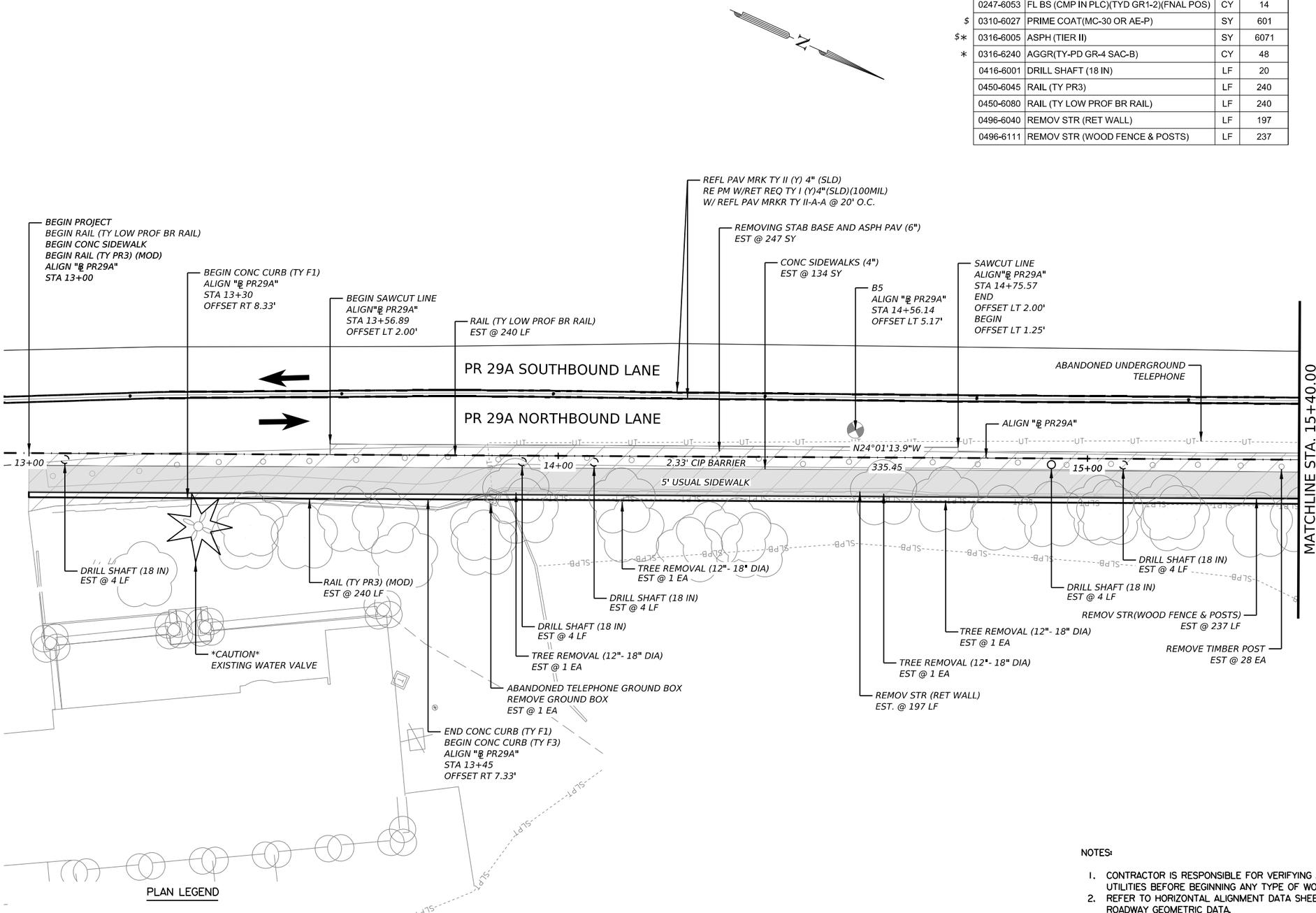
DESIGN DR | DRAFT EL | CHECK DR

QUANTITY SUMMARY CSJ: 0624-01-003

	ITEM NO.	ITEM	UNIT	QUANTITY
	0105-6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	247
*	0110-6001	EXCAVATION (ROADWAY)	CY	439
*	0132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	1
	0247-6053	FL BS (CMP IN PLC)(TYD GR1-2)(FNAL POS)	CY	14
$	0310-6027	PRIME COAT(MC-30 OR AE-P)	SY	601
$*	0316-6005	ASPH (TIER II)	SY	6071
*	0316-6240	AGGR(TY-PD GR-4 SAC-B)	CY	48
	0416-6001	DRILL SHAFT (18 IN)	LF	20
	0450-6045	RAIL (TY PR3)	LF	240
	0450-6080	RAIL (TY LOW PROF BR RAIL)	LF	240
	0496-6040	REMOV STR (RET WALL)	LF	197
	0496-6111	REMOV STR (WOOD FENCE & POSTS)	LF	237

QUANTITY SUMMARY CSJ: 0624-01-003

	ITEM NO.	ITEM	UNIT	QUANTITY
	0531-6001	CONC SIDEWALKS (4")	SY	134
	0624-6028	REMOVE GROUND BOX	EA	1
*	0658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	5
*	0658-6101	INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	11
*	0662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	1360
*	0662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	20
*	0662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	880
*	0662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	70
*	0666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	40
*	0666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	3632
*	0666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	40
*	0666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	3632
*	0668-6072	PREFAB PAV MRK TY C (W) (8") (SLD)	LF	150
*	0668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	12
*	0672-6009	REFL PAV MRKR TY II-A-A	EA	60
*	0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	4512
*	0677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	1360
*	0677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	150
*	0677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	20
*	0677-6018	ELIM EXT PAV MRK & MRKS (18")(YLD TRI)	EA	12
	0752-6006	TREE REMOVAL (12" - 18" DIA)	EA	4
	0770-6056	REMOVE TIMBER POST	EA	28



* QUANTITY REPRESENTS ITEM USE THROUGHOUT PROJECT LIMITS

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
3. SEE "F" CURB PLAN AND PROFILE SHEETS FOR PAYMENT OF "F" CURB.

$4. THESE ITEMS ARE QUANTIFIED ON THIS SHEET PER SY FOR CONTRACTOR INFORMATION ONLY. BID ITEMS ARE PAID FOR PER GALLON.

STATE OF TEXAS
DEYTON RIDDLE
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Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A PLAN LAYOUTS

SHEET: 1 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		41

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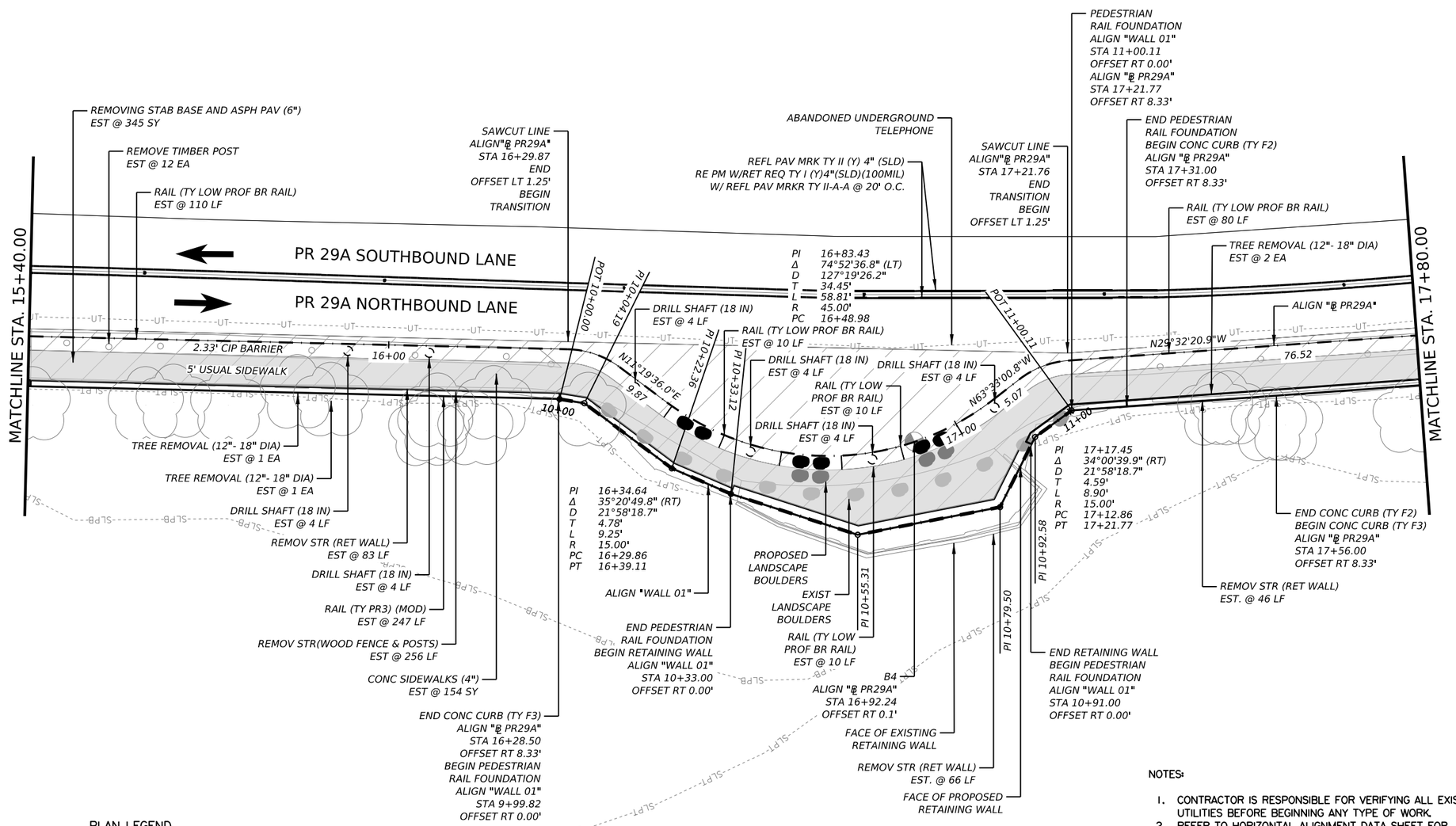
DESIGN DR | DRAFT EL | CHECK DR

QUANTITY SUMMARY CSJ: 0624-01-003

ITEM NO.	ITEM	UNIT	QUANTITY
0105-6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	345
0247-6053	FL BS (CMP IN PLC)(TYD GR1-2)(FNAL POS)	CY	26
0416-6001	DRILL SHAFT (18 IN)	LF	24
0450-6045	RAIL (TY PR3)	LF	247
0450-6080	RAIL (TY LOW PROF BR RAIL)	LF	210
0496-6040	REMOV STR (RET WALL)	LF	195
0496-6111	REMOV STR (WOOD FENCE & POSTS)	LF	256
0531-6001	CONC SIDEWALKS (4")	SY	154
0752-6006	TREE REMOVAL (12" - 18" DIA)	EA	4
0770-6056	REMOVE TIMBER POST	EA	12
1002-6029	LANDSCAPE AMENITY (BOULDER)	EA	12



PLAN LEGEND

- DIRECTIONAL ARROW
- REMOVE STAB BASE AND ASPH PAV
- PROPOSED SIDEWALK

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
3. SEE "F" CURB PLAN AND PROFILE SHEETS FOR PAYMENT OF "F" CURB.
4. THESE ITEMS ARE QUANTIFIED ON THIS SHEET PER SY FOR CONTRACTOR INFORMATION ONLY. BID ITEMS ARE PAID FOR PER GALLON.
5. PLACE 10 ' GAPS IN PERMANENT BARRIER CENTERED AT STATIONS 16+55, 16+75, 16+95, AND THE PEDESTRIAN CROSSWALK. 12 (TWELVE) BOULDERS LOCATED AT THE OVERLOOK, APPROX STA. 16+30 TO 17+20, SHALL BE SALAVGED AND SHALL BE PLACED WITHIN THE BARRIER GAPS.

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DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A PLAN LAYOUTS

SHEET: 2 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		42

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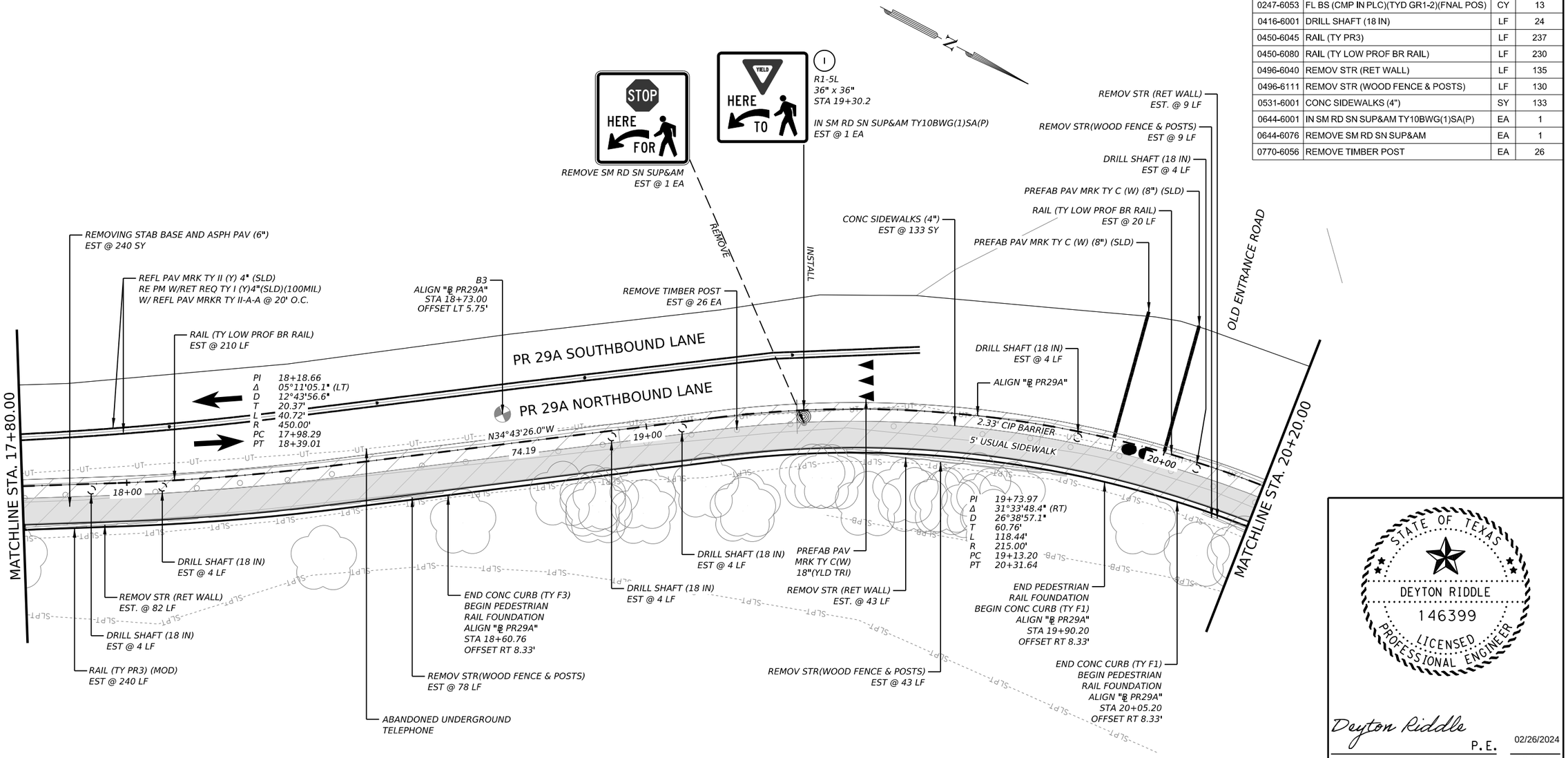
DESIGN DR | DRAFT EL | CHECK DR

QUANTITY SUMMARY CSJ: 0624-01-003

ITEM NO.	ITEM	UNIT	QUANTITY
0105-6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	240
0247-6053	FL BS (CMP IN PLC)(TYD GR1-2)(FNAL POS)	CY	13
0416-6001	DRILL SHAFT (18 IN)	LF	24
0450-6045	RAIL (TY PR3)	LF	237
0450-6080	RAIL (TY LOW PROF BR RAIL)	LF	230
0496-6040	REMOV STR (RET WALL)	LF	135
0496-6111	REMOV STR (WOOD FENCE & POSTS)	LF	130
0531-6001	CONC SIDEWALKS (4")	SY	133
0644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
0644-6076	REMOVE SM RD SN SUP&AM	EA	1
0770-6056	REMOVE TIMBER POST	EA	26



PLAN LEGEND

- DIRECTIONAL ARROW
- REMOVE STAB BASE AND ASPH PAV
- PROPOSED SIDEWALK

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
3. SEE "F" CURB PLAN AND PROFILE SHEETS FOR PAYMENT OF "F" CURB.

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DEYTON RIDDLE DATE

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PR 29A PLAN LAYOUTS

SHEET: 3 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		43

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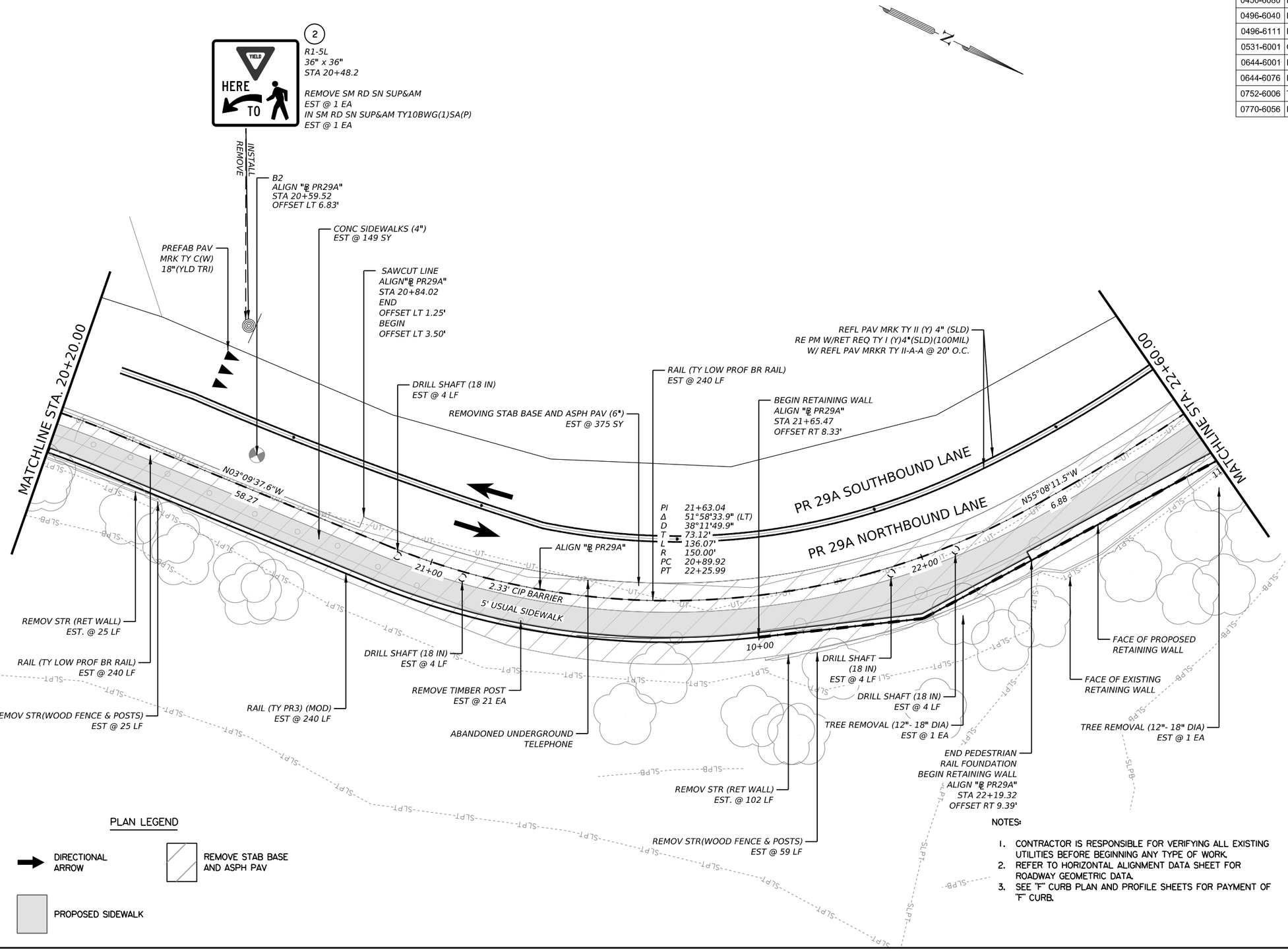
DESIGN DR | DRAFT EL | CHECK DR

QUANTITY SUMMARY CSJ: 0624-01-003

ITEM NO.	ITEM	UNIT	QUANTITY
0105-6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	375
0247-6053	FL BS (CMP IN PLC)(TYD GR1-2)(FNAL POS)	CY	19
0416-6001	DRILL SHAFT (18 IN)	LF	16
0450-6045	RAIL (TY PR3)	LF	249
0450-6080	RAIL (TY LOW PROF BR RAIL)	LF	240
0496-6040	REMOV STR (RET WALL)	LF	127
0496-6111	REMOV STR (WOOD FENCE & POSTS)	LF	84
0531-6001	CONC SIDEWALKS (4")	SY	149
0644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
0644-6076	REMOVE SM RD SN SUP&AM	EA	2
0752-6006	TREE REMOVAL (12" - 18" DIA)	EA	21
0770-6056	REMOVE TIMBER POST		



PLAN LEGEND

- DIRECTIONAL ARROW
- REMOVE STAB BASE AND ASPH PAV
- PROPOSED SIDEWALK

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
3. SEE "F" CURB PLAN AND PROFILE SHEETS FOR PAYMENT OF "F" CURB.

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DEYTON RIDDLE DATE

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PR 29A PLAN LAYOUTS

SHEET: 4 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		44

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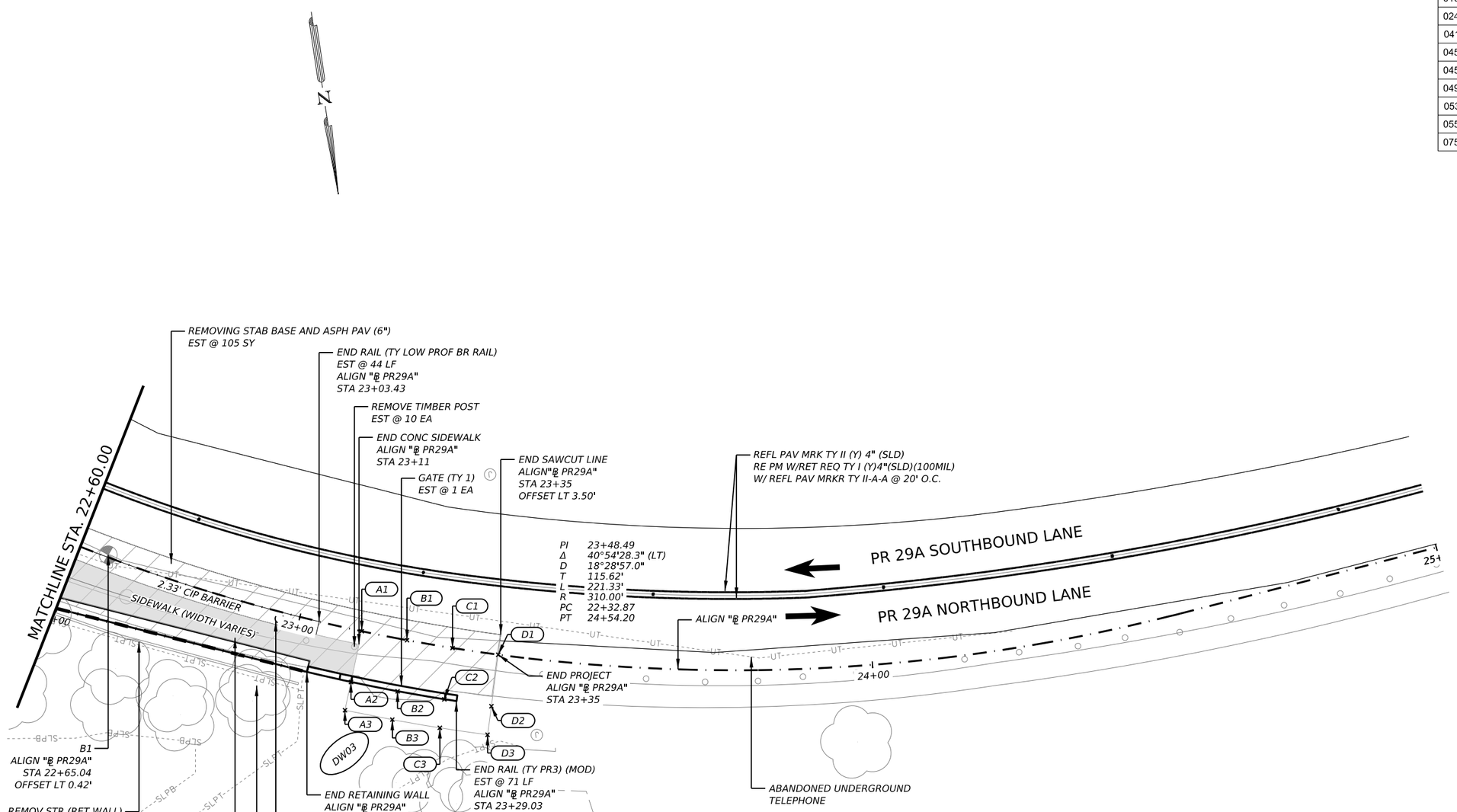
DESIGN DR | DRAFT EL | CHECK DR

QUANTITY SUMMARY CSJ: 0624-01-003

ITEM NO.	ITEM	UNIT	QUANTITY
0105-6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	105
0247-6053	FL BS (CMP IN PLC)(TYD GR1-2)(FNAL POS)	CY	11
0416-6001	DRILL SHAFT (18 IN)	LF	4
0450-6045	RAIL (TY PR3)	LF	71
0450-6080	RAIL (TY LOW PROF BR RAIL)	LF	44
0496-6040	REMOV STR (RET WALL)	LF	44
0531-6001	CONC SIDEWALKS (4")	SY	32
0552-6005	GATE (TY 1)	EA	1
0752-6006	TREE REMOVAL (12" - 18" DIA)	EA	1



PLAN LEGEND

- DIRECTIONAL ARROW
- REMOVE STAB BASE AND ASPH PAV
- PROPOSED SIDEWALK

POINT	STATION	OFFSET(RT) (FT)	ELEVATION(FT)
A1	23+11	0.00	1408.526
A2	23+11	9.00	1408.391
A3	23+11	14.00	1405.697
B1	23+19	0.00	1407.74
B2	23+19	9.00	1407.605
B3	23+19	14.00	1405.796
C1	23+27	0.00	1406.954
C2	23+27	9.00	1406.819
C3	23+27	14.00	1405.737
D1	23+35	0.00	1406.168
D2	23+35	9.00	1406.033
D3	23+35	14.00	1405.249

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
3. SEE "F" CURB PLAN AND PROFILE SHEETS FOR PAYMENT OF "F" CURB.
4. GATE SHALL BE INSTALLED BETWEEN TWO PILASTERS OF THE TYPE PR3 PEDESTRIAN RAIL WITH GATE-FACING SIDES LOCATED AT STA 23+11.00 AND STA 23+27.06.

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DEYTON RIDDLE — DATE

SCALE: 1"=20'

Texas Department of Transportation

PR 29A PLAN LAYOUTS

SHEET: 5 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		45

2024/02/26 3:24:32 PM
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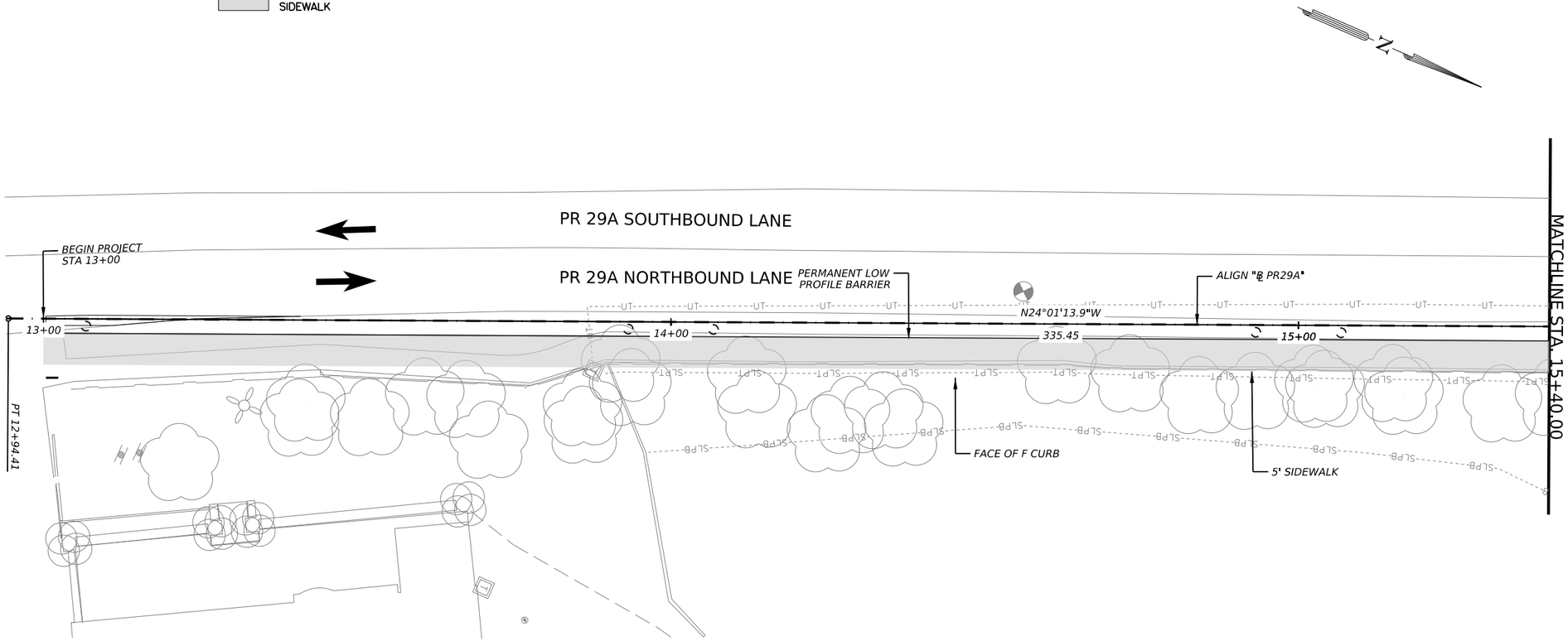
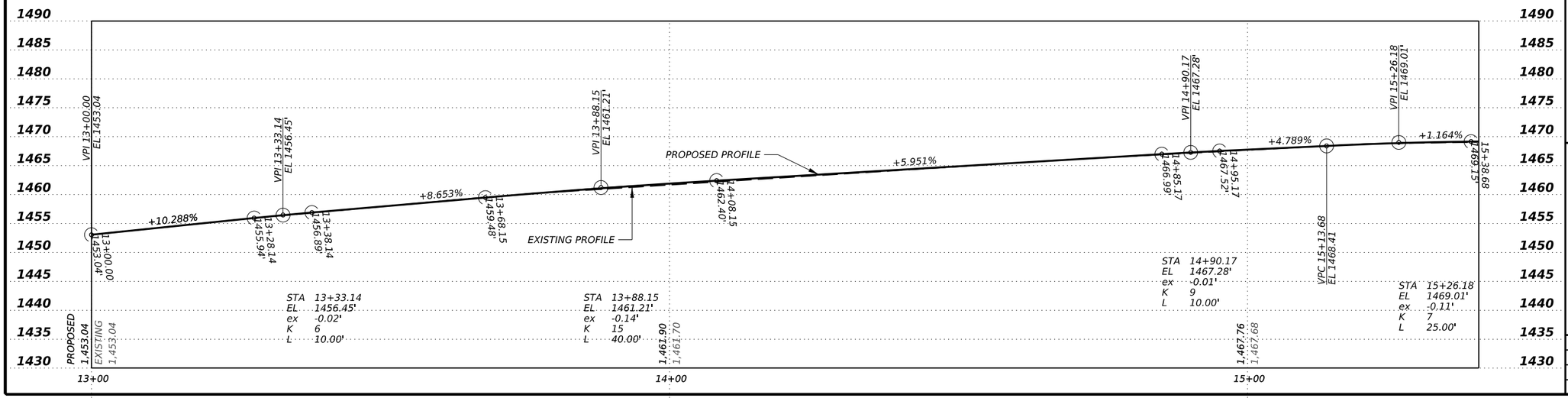
DESIGN: BG | DRAFT: BG | CHECK: BD

PLAN LEGEND

CONCRETE SIDEWALK



NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.



STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle
P.E.
DEYTON RIDDLE

02/26/2024
DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=20'

Texas Department of Transportation

PR 29A
BASELINE
PLAN AND PROFILE

SHEET: 1 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		46

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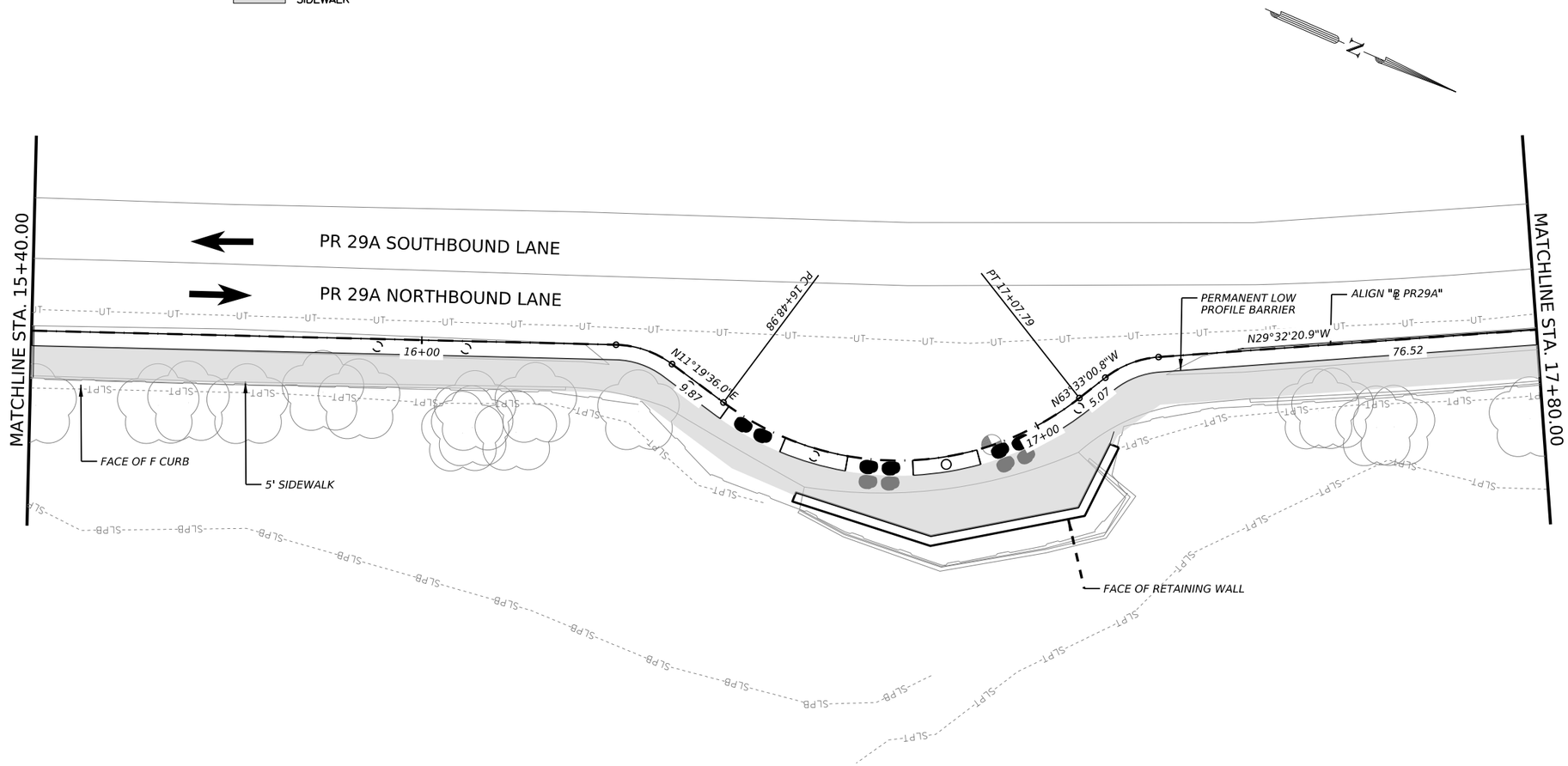
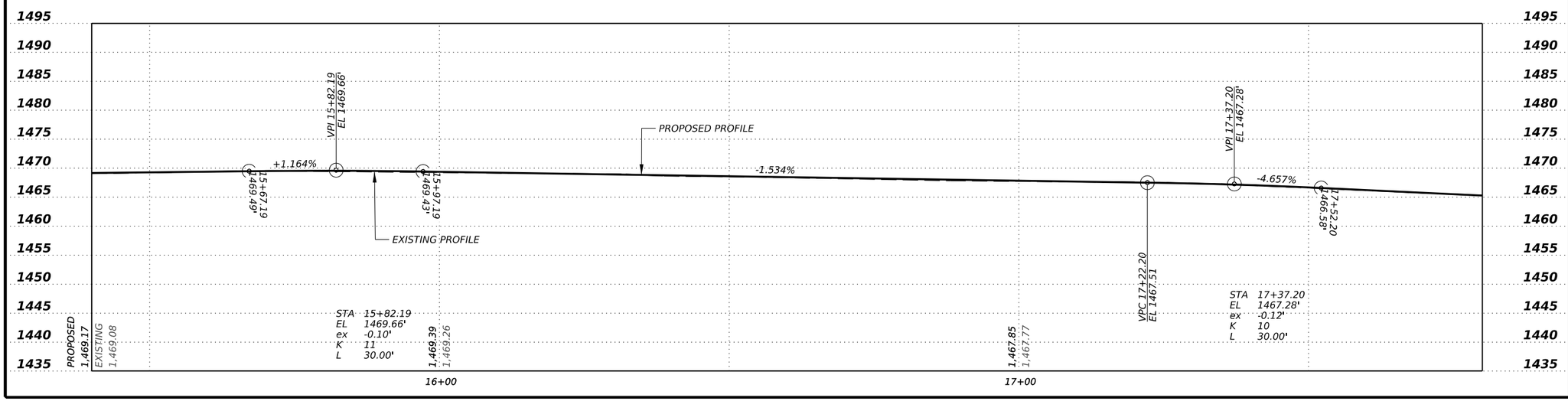
DESIGN: DRAFT: CHECK:

PLAN LEGEND

CONCRETE SIDEWALK





NOTES:
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2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.

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146399
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Deyton Riddle
P.E.
DEYTON RIDDLE

02/26/2024
DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=20'

Texas Department of Transportation

PR 29A
BASELINE
PLAN AND PROFILE

SHEET: 2 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		47

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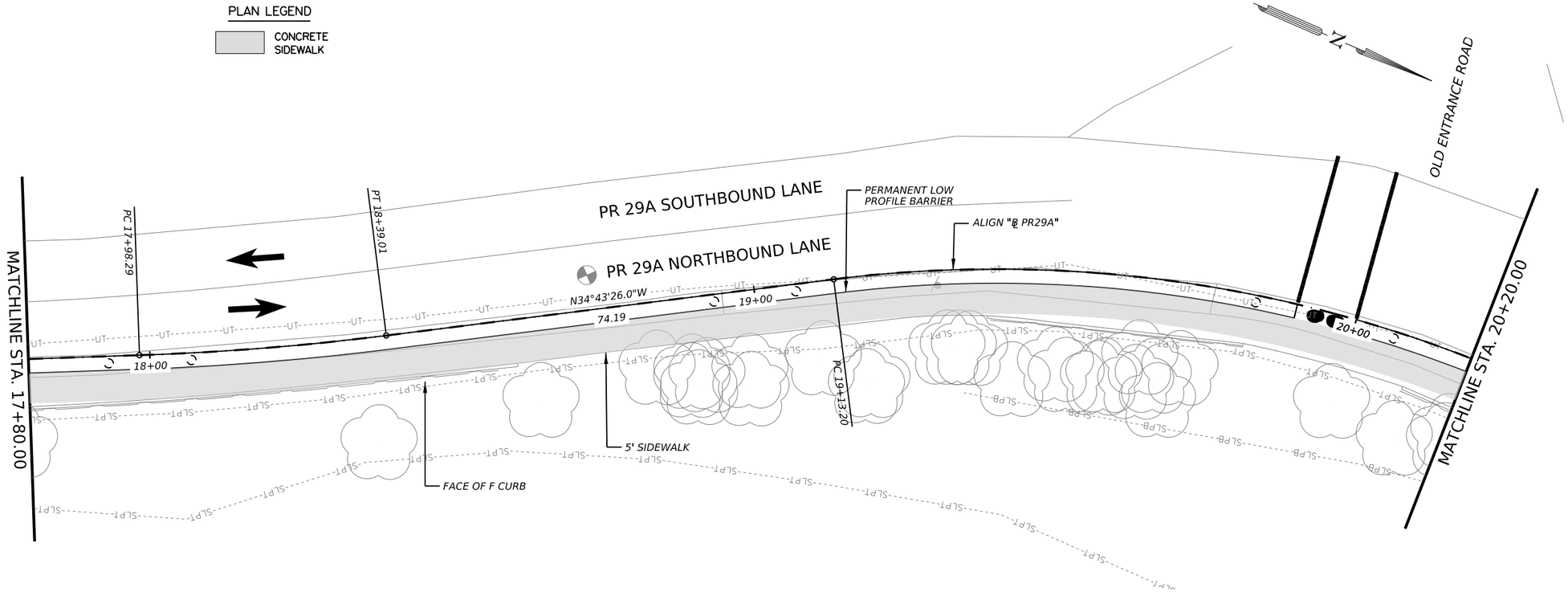
PLAN LEGEND

CONCRETE SIDEWALK



NOTES:
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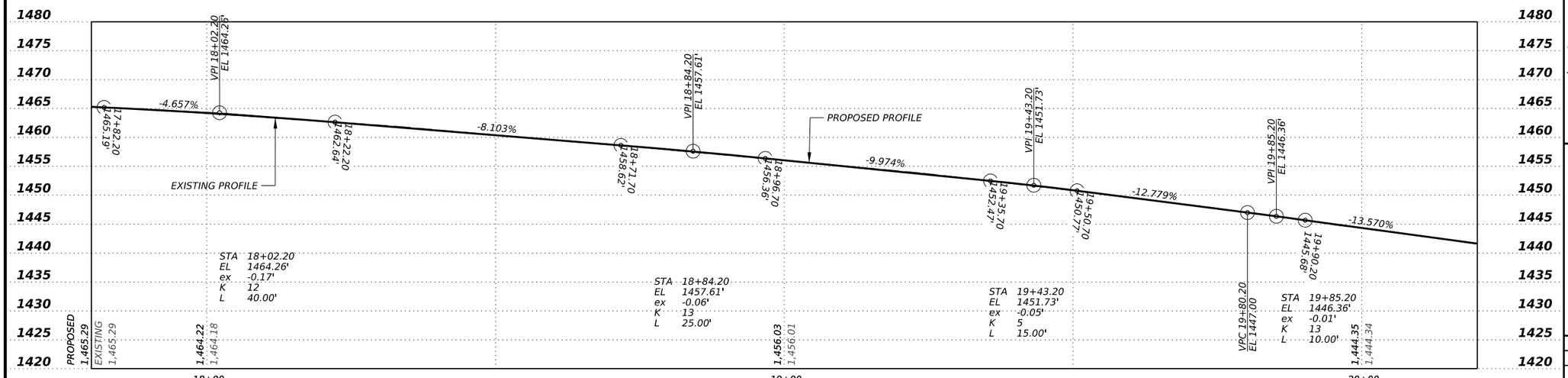
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.



STATE OF TEXAS
DEYTON RIDDLE
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Deyton Riddle
P.E.
DEYTON RIDDLE

02/26/2024
DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=20'

Texas Department of Transportation

PR 29A
BASELINE
PLAN AND PROFILE

SHEET: 3 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		48

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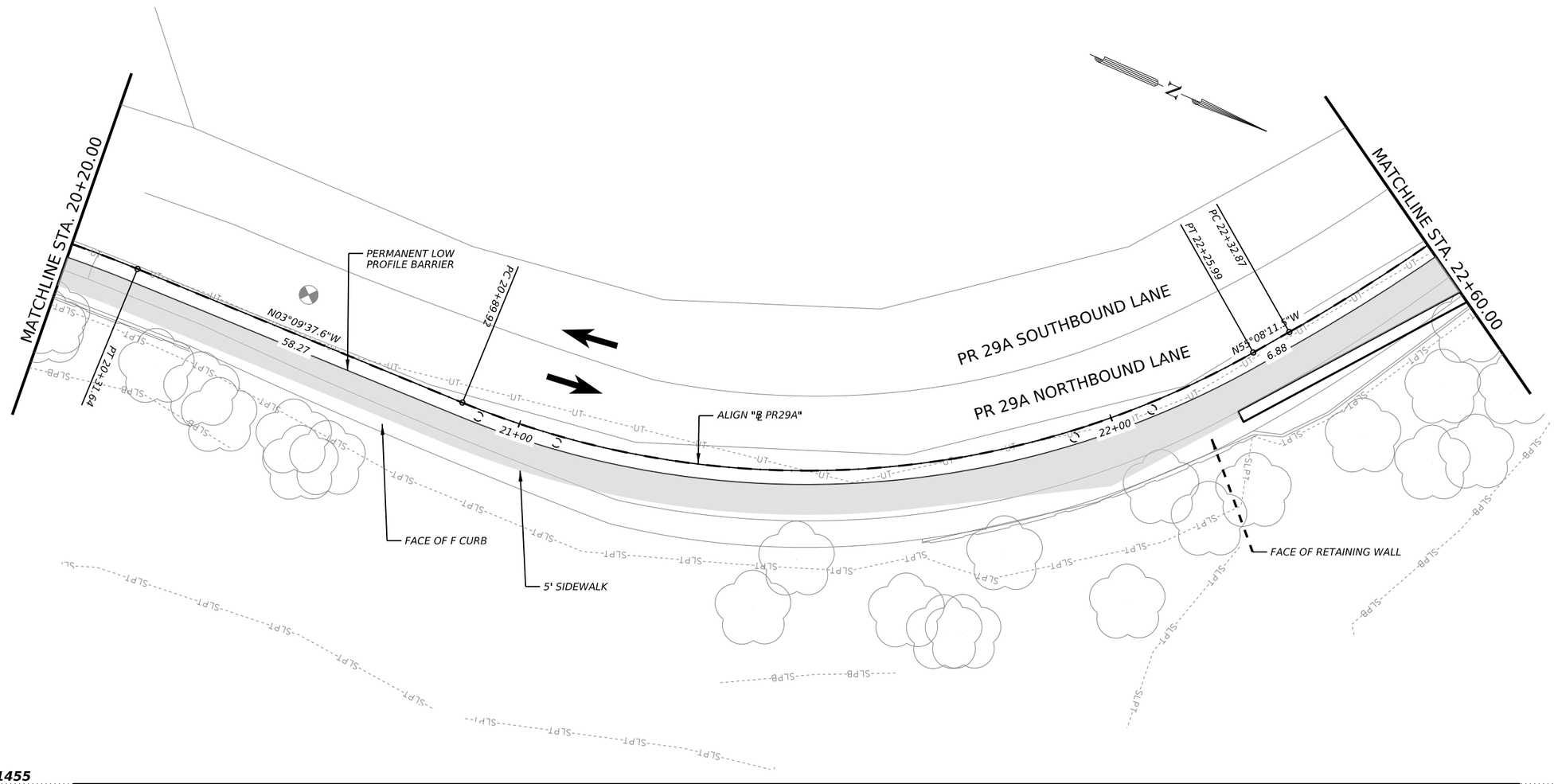
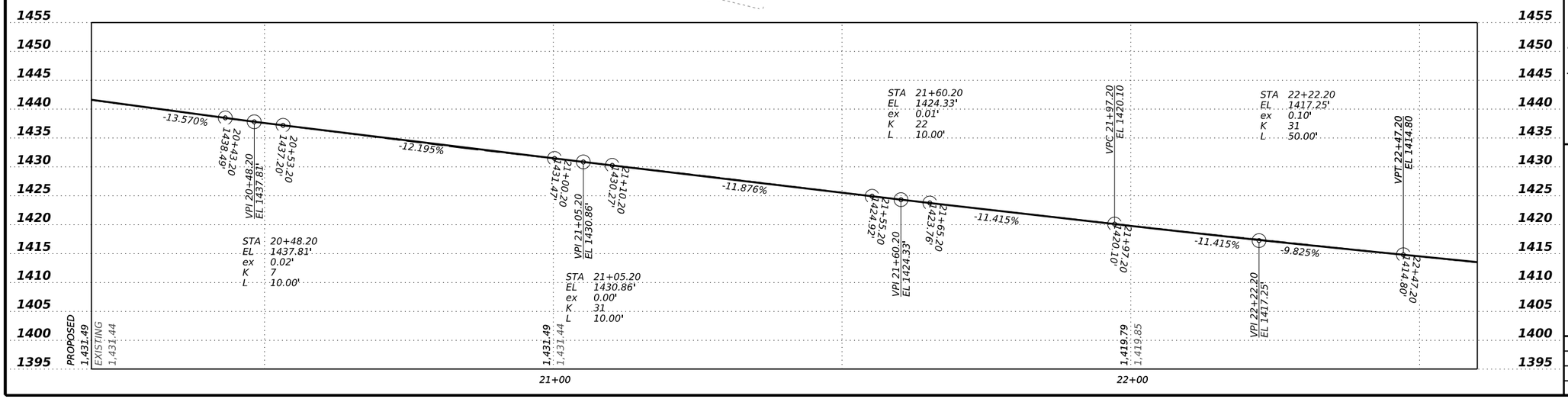
PLAN LEGEND

CONCRETE SIDEWALK





NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=20'

Texas Department of Transportation

PR 29A
BASELINE
PLAN AND PROFILE

SHEET: 4 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		49

2/22/2024 4:13:22 PM
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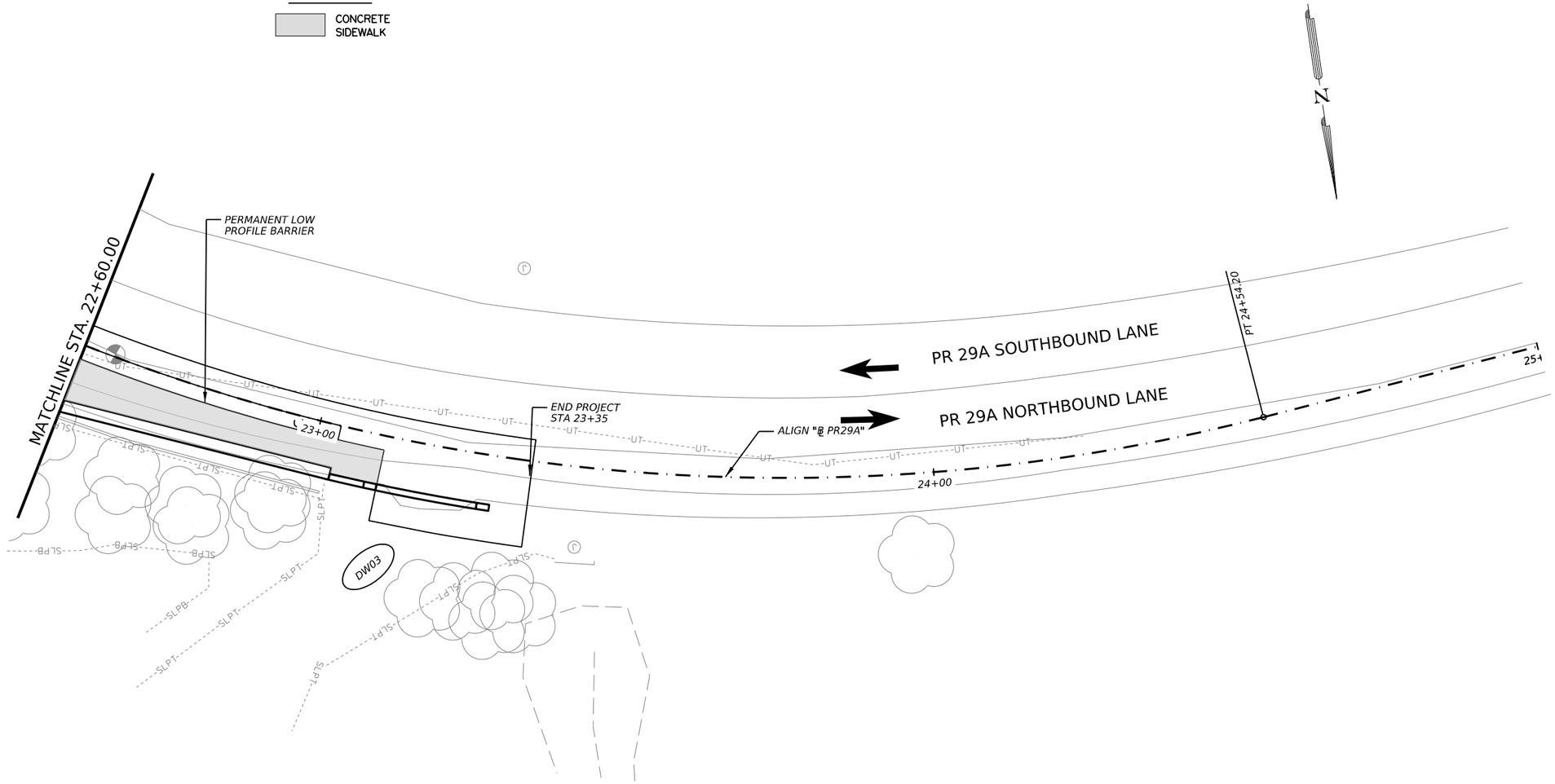
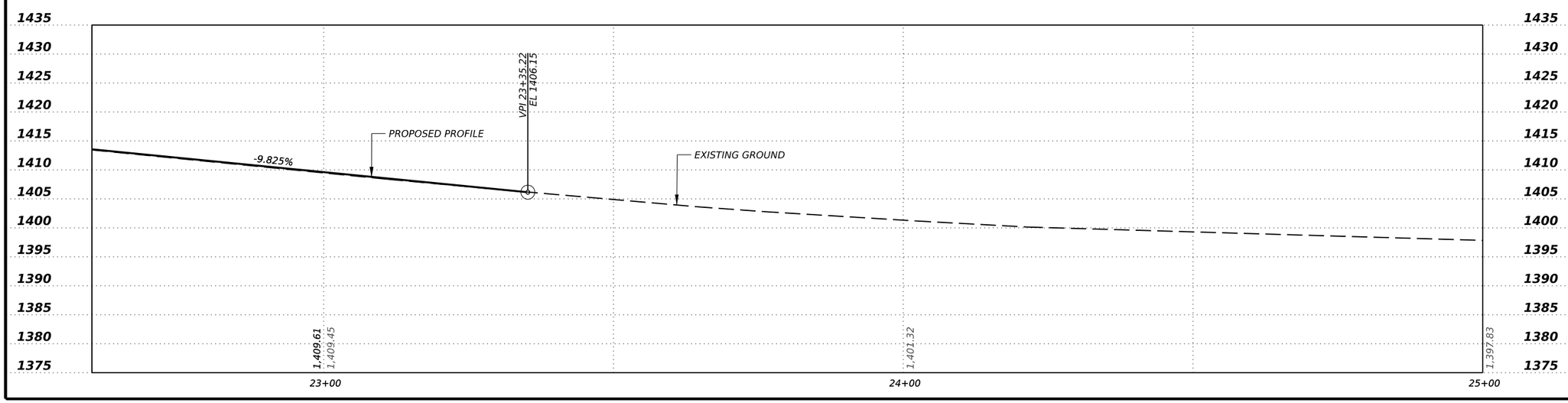
DESIGN: JH | DRAFT: JH | CHECK:

PLAN LEGEND

CONCRETE SIDEWALK





NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=20'

Texas Department of Transportation

PR 29A
BASELINE
PLAN AND PROFILE

SHEET: 5 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		50

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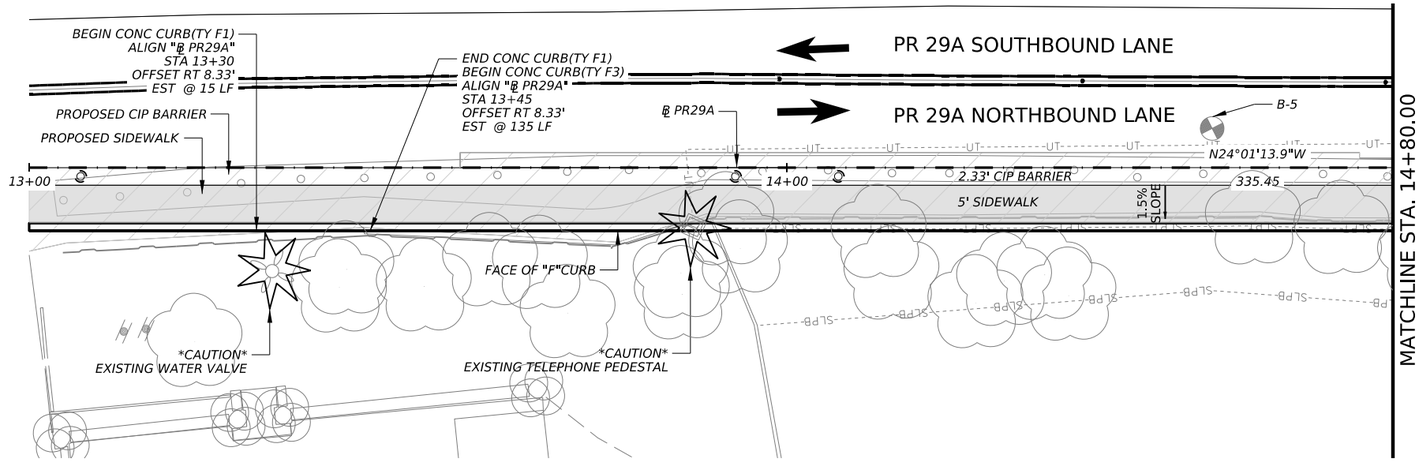
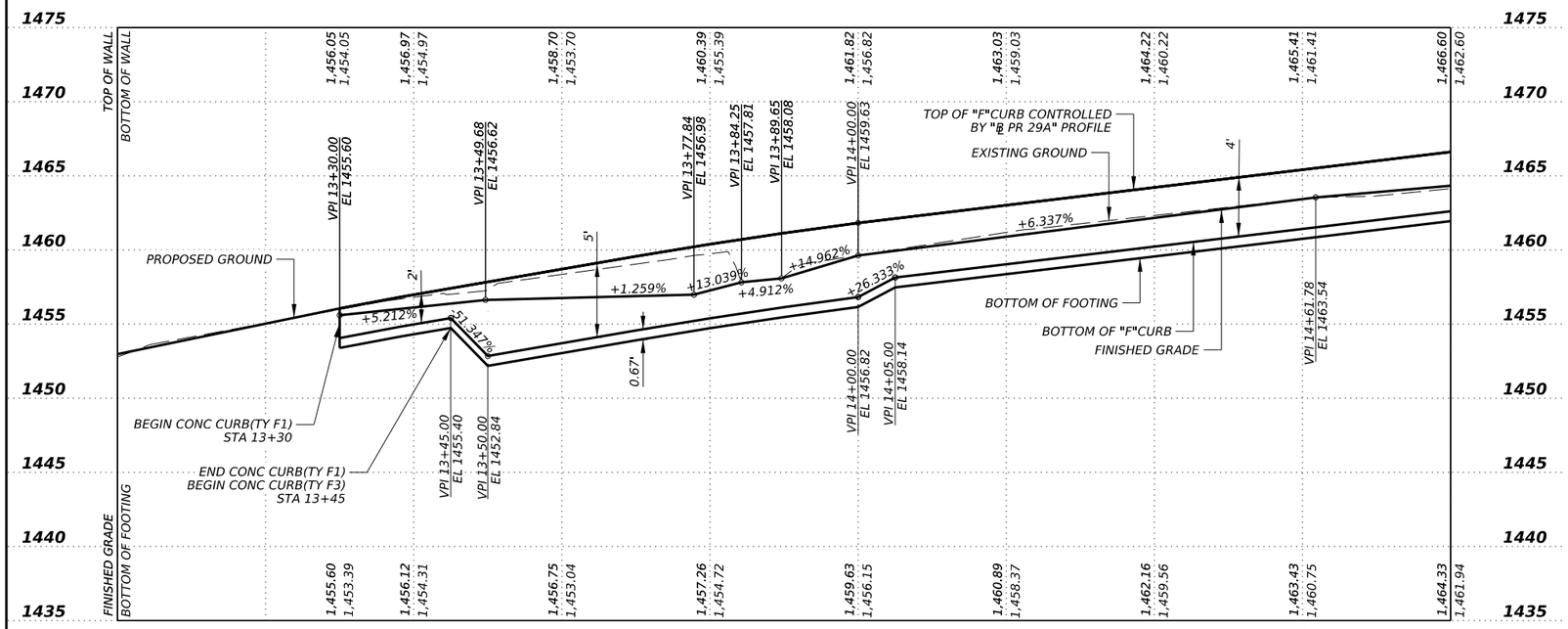
	QUANTITY SUMMARY CSJ: 0624-01-003		
ITEM NO.	ITEM	UNIT	QUANTITY
0529-6016	CONC CURB (TY F1)	LF	15
0529-6018	CONC CURB (TY F3)	LF	135





NOTES:
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2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
3. SEE MISCELLANEOUS CURB AND SIDEWALK DETAILS FOR "F" CURB CONSTRUCTION.
4. SEE ROADWAY PLAN LAYOUT SHEETS FOR REMOVAL OF EXISTING WALL PAYMENT.
5. SEE DRILLING LOG SHEETS FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED PROFESSIONAL ENGINEER

P.E. 02/26/2024

JONATHAN WYATT HINSHAW DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=10'

Texas Department of Transportation

PR 29A
"F" CURB
PLAN AND PROFILE

SHEET: 1 OF 3

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		51

DESIGN: JH | DRAFT: JH | CHECK: JH

2/16/2024 11:01:59 AM
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DESIGN: JH | DRAFT: JH | CHECK: JH

	QUANTITY SUMMARY CSJ: 0624-01-003		
ITEM NO.	ITEM	UNIT	QUANTITY
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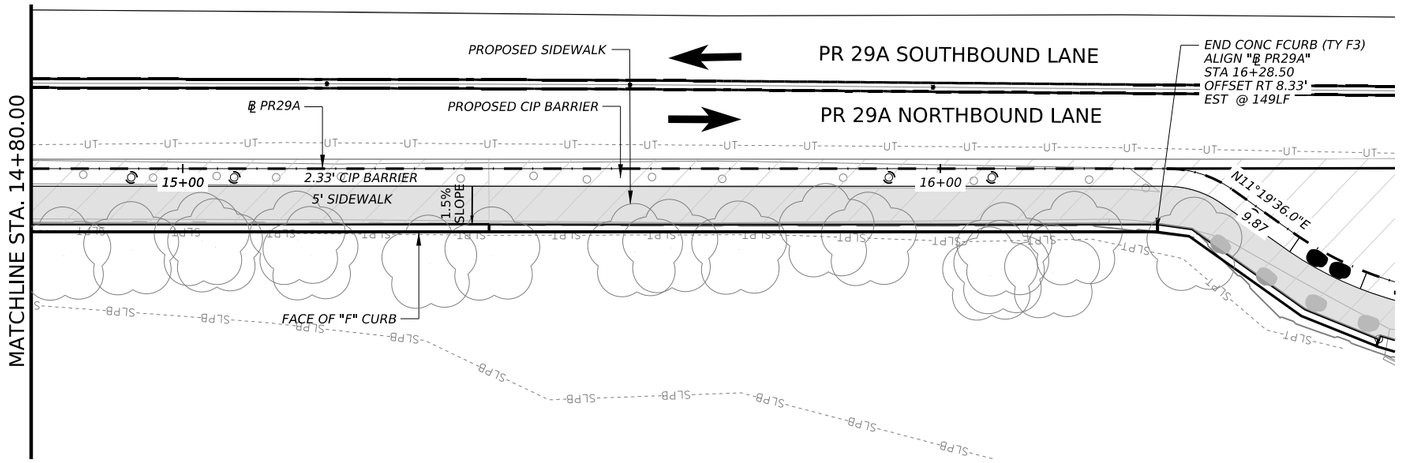

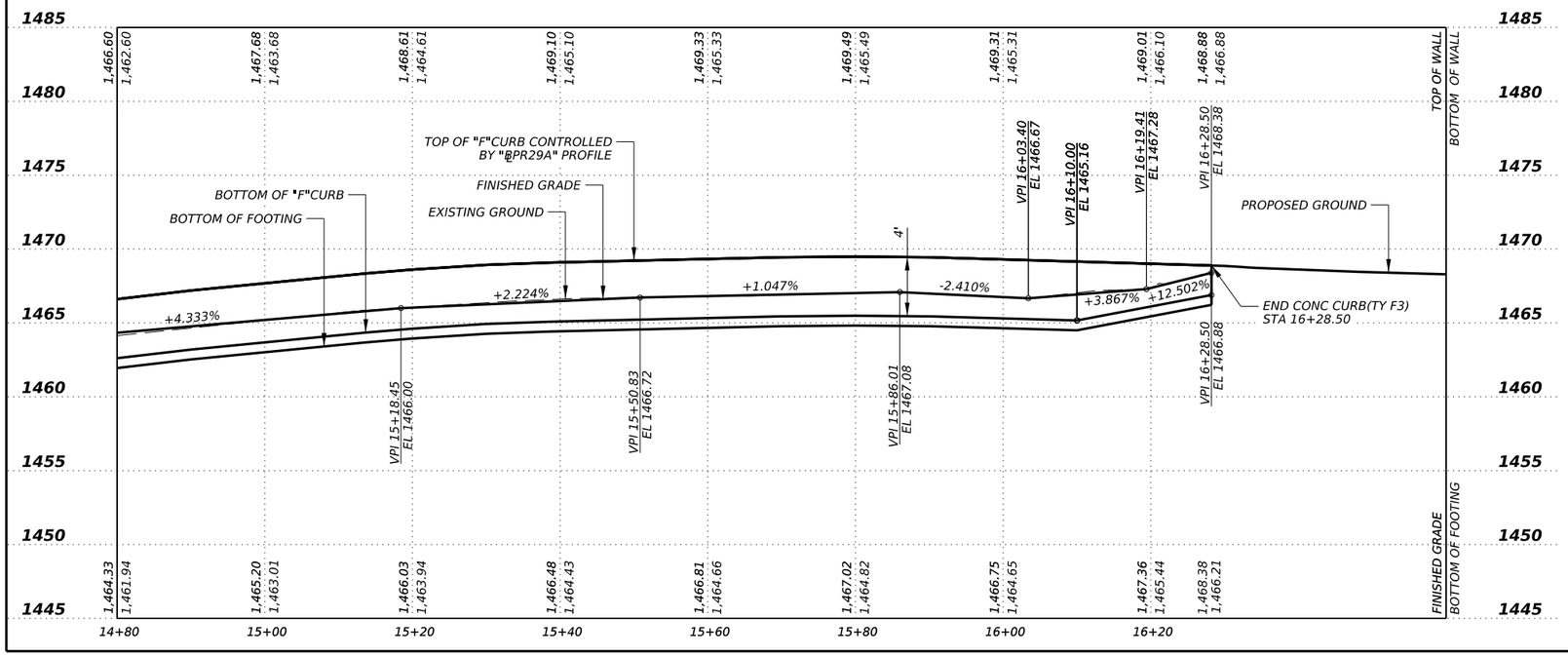

NOTES:
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2. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
3. SEE MISCELLANEOUS CURB AND SIDEWALK DETAILS FOR "F" CURB CONSTRUCTION.
4. SEE ROADWAY PAN LAYOUT SHEETS FOR REMOVAL OF EXISTING WALL PAYMENT.
5. SEE DRILLING LOG SHEETS FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED PROFESSIONAL ENGINEER

P.E. 02/26/2024

JONATHAN WYATT HINSHAW DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=10'

Texas Department of Transportation

PR 29A
"F" CURB
PLAN AND PROFILE

SHEET: 2 OF 3

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		52

2/26/2024 3:37:46 PM
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	QUANTITY SUMMARY CSJ: 0624-01-003		
ITEM NO.	ITEM	UNIT	QUANTITY
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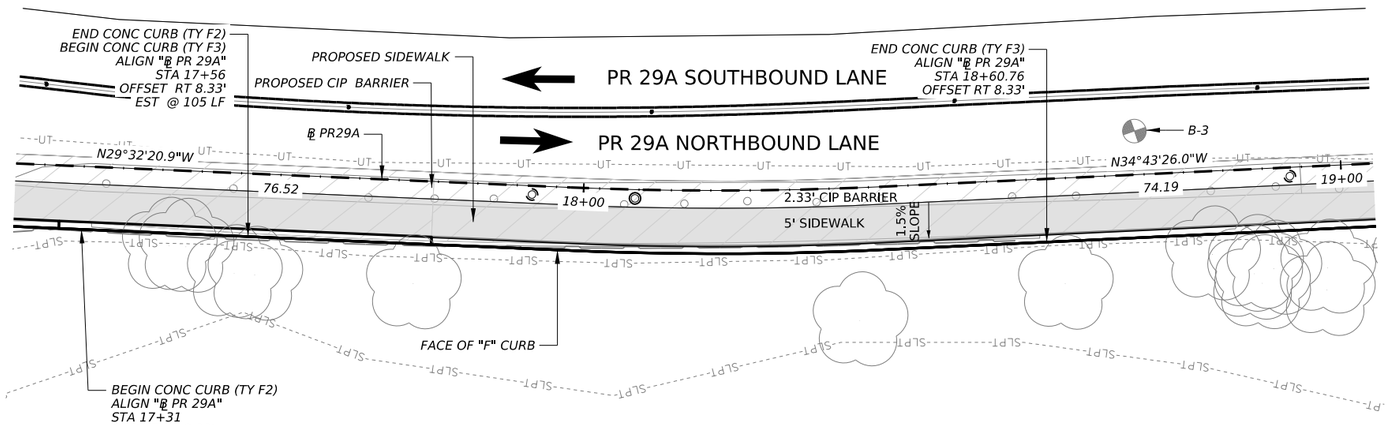
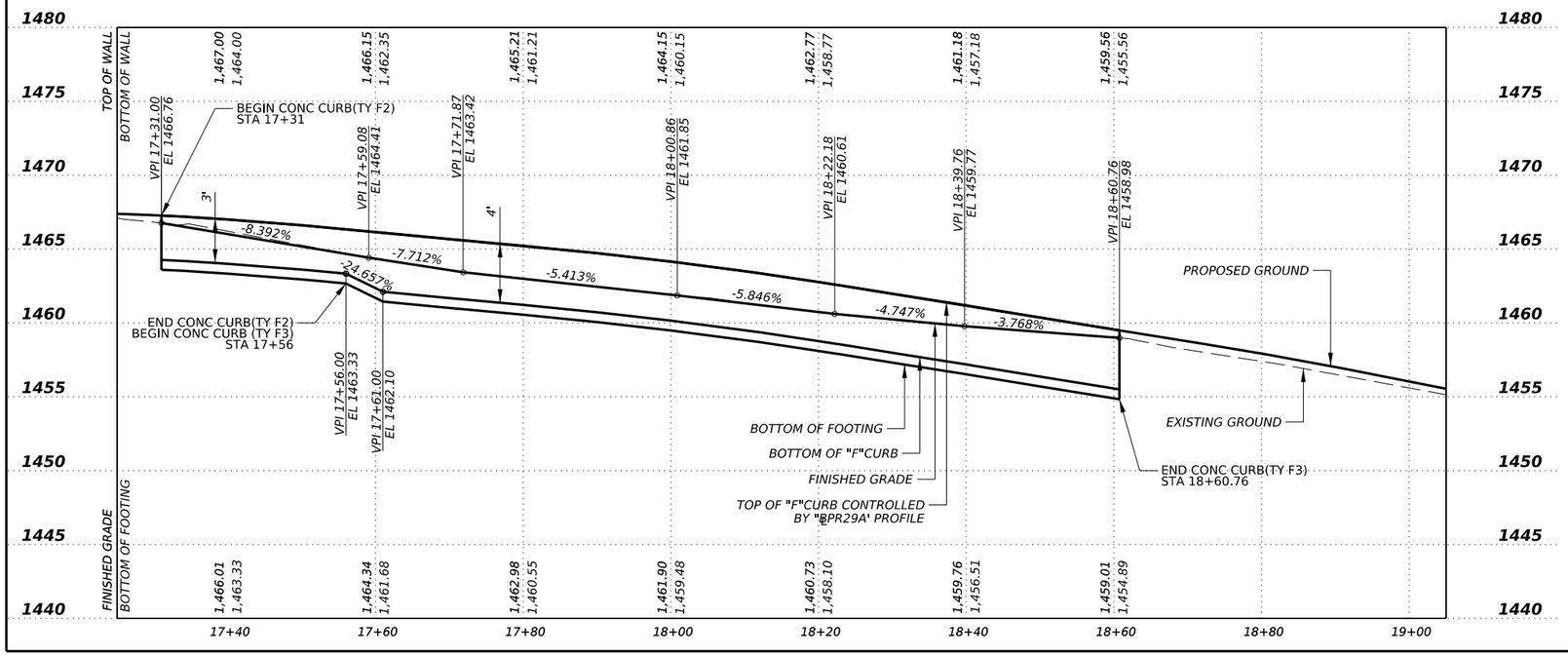
0529-6018	CONC CURB (TY F3)	LF	105





NOTES:
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3. SEE MISCELLANEOUS CURB AND SIDEWALK DETAILS FOR "F" CURB CONSTRUCTION.
4. SEE ROADWAY PLAN LAYOUT SHEETS FOR REMOVAL OF EXISTING WALL PAYMENT.
5. SEE DRILLING LOG SHEETS FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED PROFESSIONAL ENGINEER

P.E. 02/26/2024

JONATHAN WYATT HINSHAW DATE

SCALE
HORIZONTAL: 1"=20' VERTICAL: 1"=10'

Texas Department of Transportation

PR 29A
"F" CURB
PLAN AND PROFILE

SHEET: 3 OF 3

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		53

DESIGN: JH | DRAFT: JH | CHECK: JH

2/16/2024 11:08:36 AM
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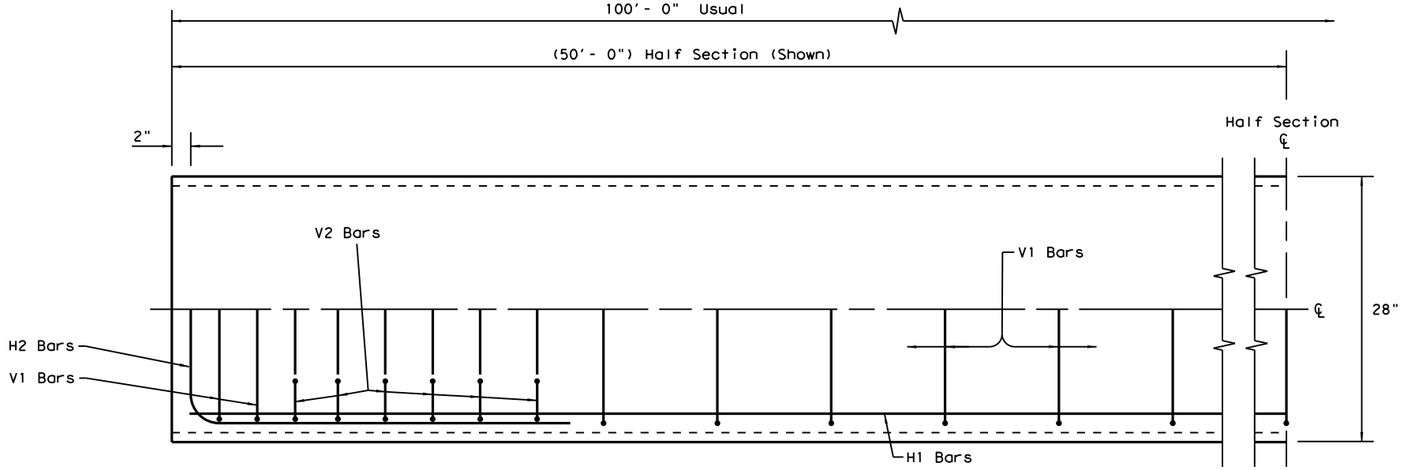
2/26/2024
pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/3. Roadway/PR0029_CIP_LOW_PROFILE_BARRIER



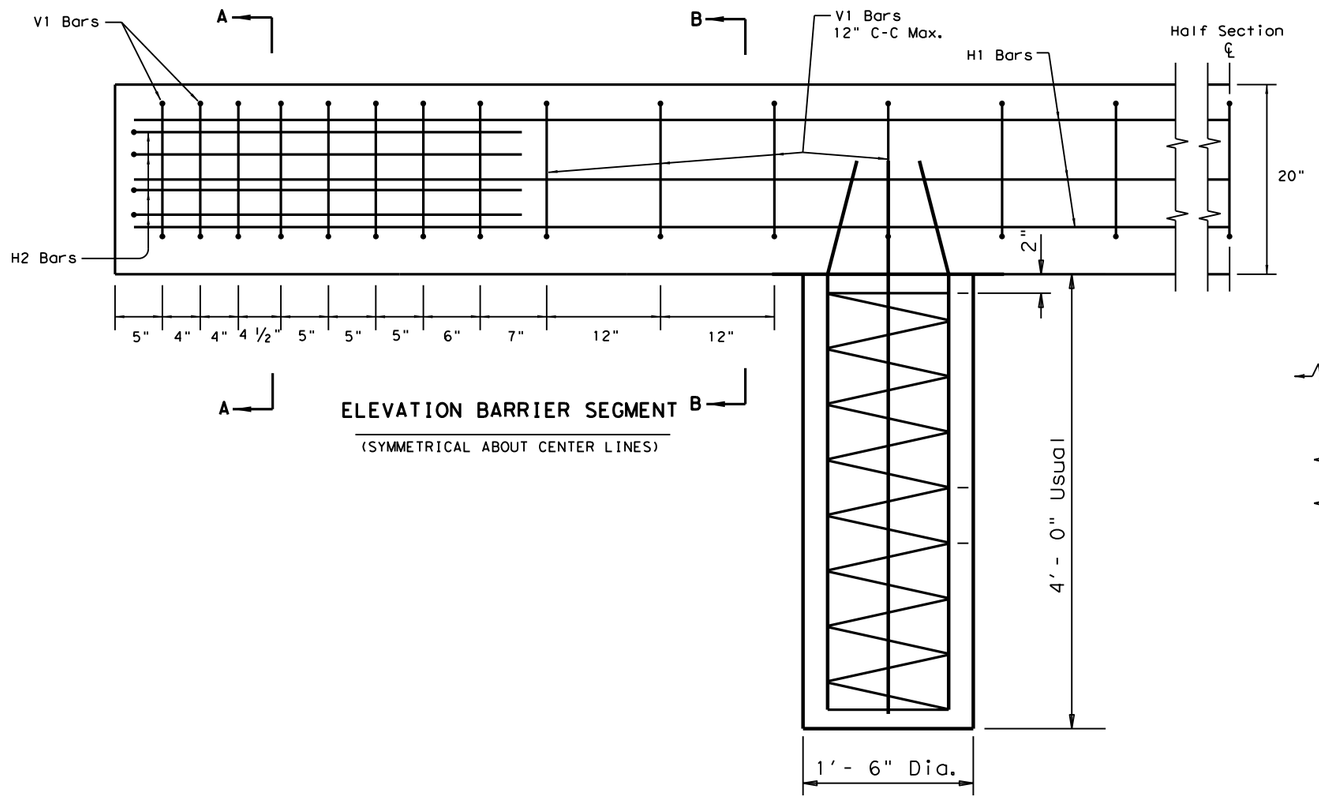
PLAN BARRIER SEGMENT

(SYMMETRICAL ABOUT CENTER LINES)

NOTE: CONCRETE ON BOTTOM HALF OF PLAN VIEW IS REMOVED IN ORDER TO SHOW DETAILS. DRILLED SHAFT NOT SHOWN FOR CLARITY.

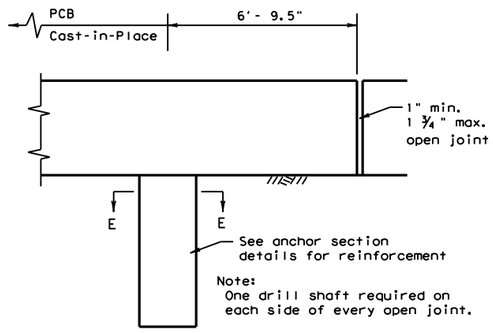
GENERAL NOTES

1. Concrete shall be Class C for barrier with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. All barrier edges shall have ¾" chamfer or a tooled radius.
4. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
5. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445,"Galvanizing."
6. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.
7. Axis of cast-in-place barrier shall be vertical, except where roadway is superelevated, then axis is normal to roadway surface.
8. Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchor bars. The reinforcement cage may rest on top of the finished grade.
9. Barrier shall have Teton Dry Stack finish, as shown on aesthetic detail sheets. This work is subsidiary to Item 450 Rail.



ELEVATION BARRIER SEGMENT

(SYMMETRICAL ABOUT CENTER LINES)



DRILLED SHAFT ANCHOR LOCATION DETAIL

STATE OF TEXAS
DEYTON RIDDLE
146399
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Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

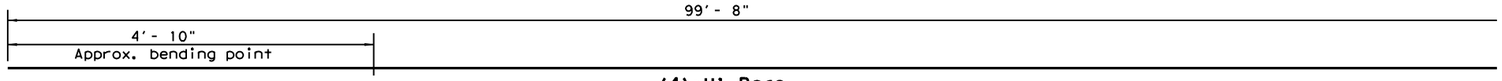
Texas Department of Transportation

PR 29A
CIP PERMANENT CONCRETE BARRIER

SHEET 1 OF 2

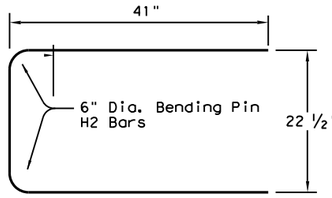
CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		54

DR EL DR

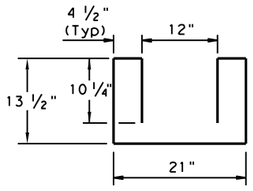


Note: Bends on H1 bars are slight and do not require formal bends.

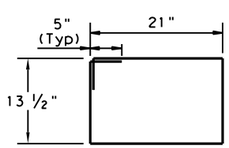
(4)~H1 Bars
(#5) Bar



(8)~H2 Bars
(#5) Bars



(12)~V2 Bars
(#4) Bars

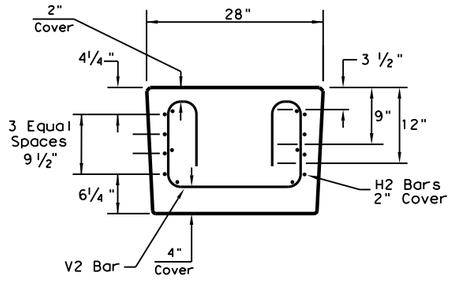


(17)~V1 Bars
(#4) Bars

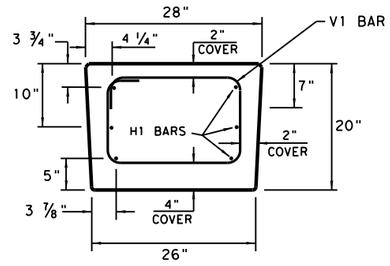
REINFORCING STEEL DETAILS

TYPE 1 - BARRIER SEGMENT

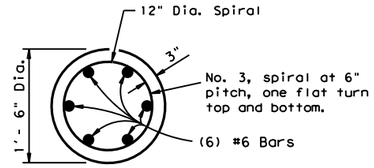
Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



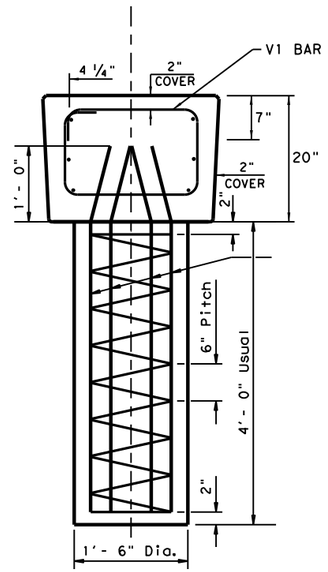
SECTION B-B

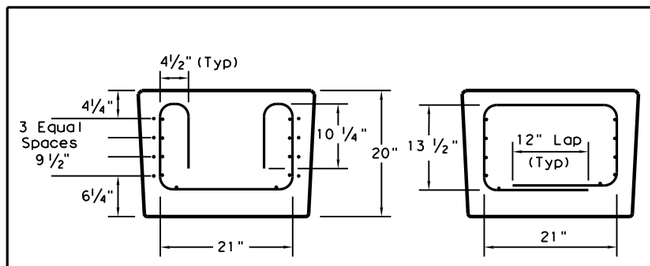


SECTION E-E
DRILLED SHAFT ANCHOR

See drilled shaft anchor location detail

SECTION AT DRILLED SHAFT





SECTION A-A **SECTION B-B**

(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING

STATE OF TEXAS
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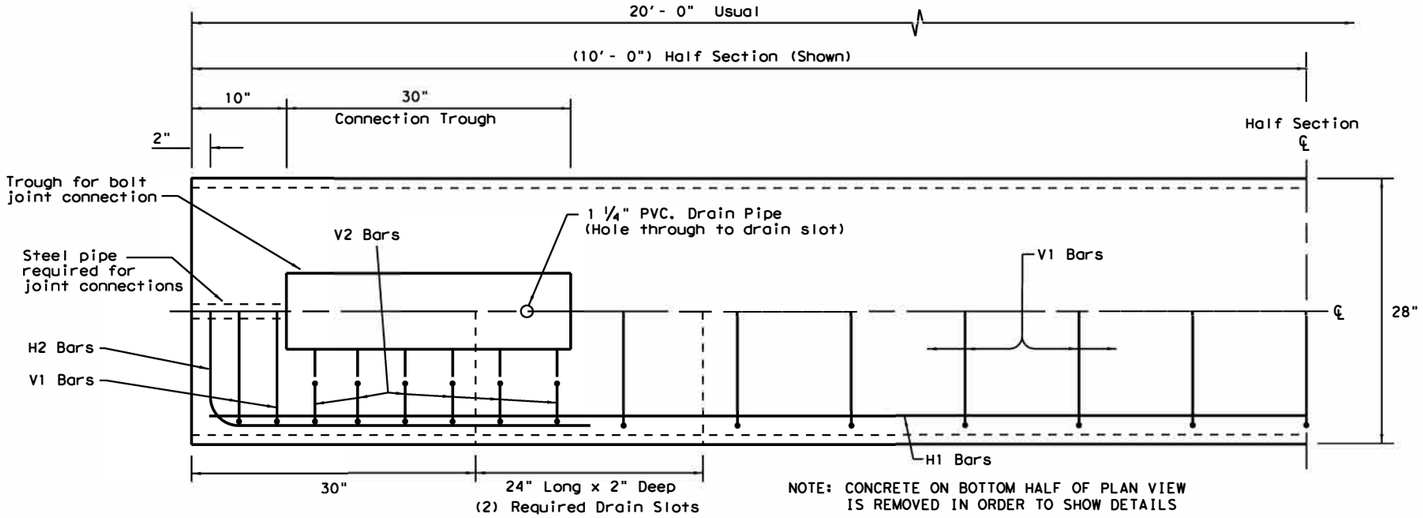
Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

Texas Department of Transportation

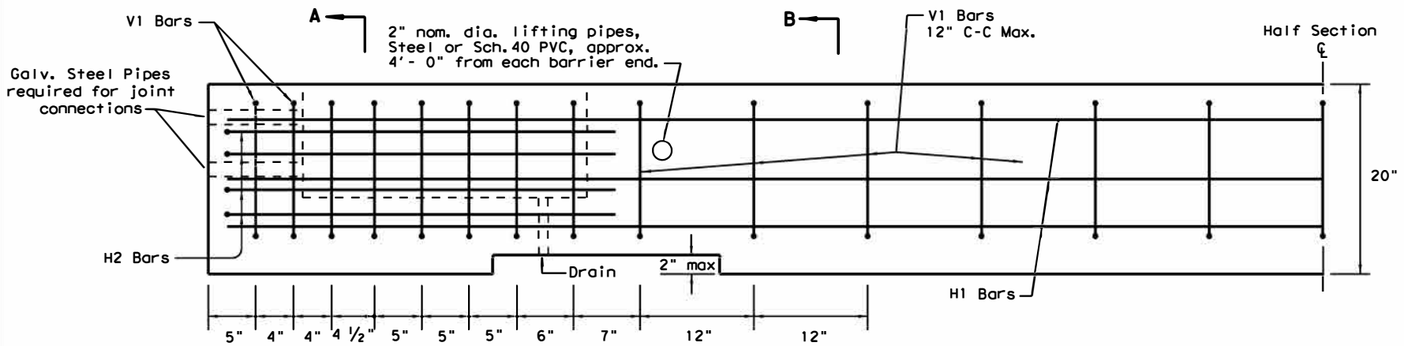
PR 29A
CIP PERMANENT CONCRETE BARRIER

SHEET 2 OF 2

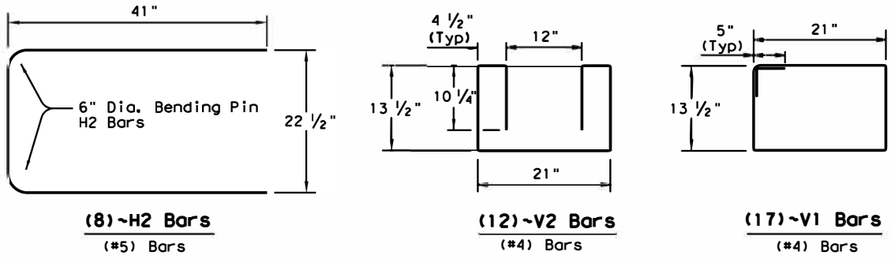
CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		55



PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

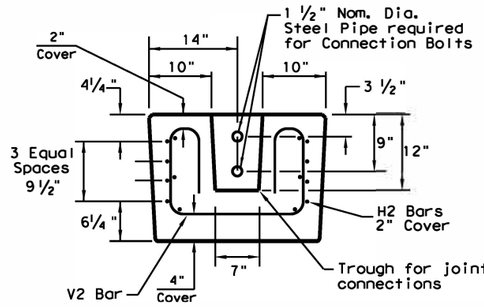


ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

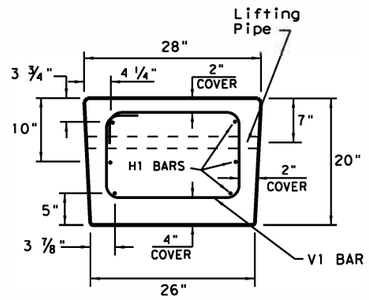


REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



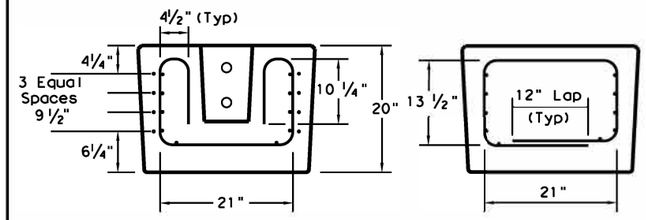
SECTION B-B

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have ¾" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



SECTION A-A SECTION B-B

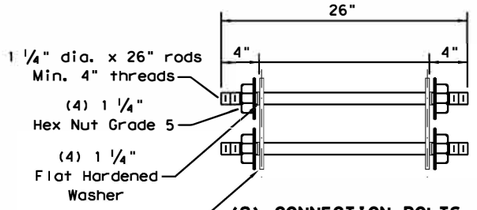
(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR) - OPTIONAL REINFORCING



(2) CONNECTION BOLTS
ASTM A36

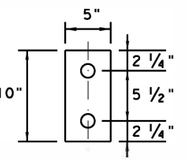


PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		56

8/4/2023
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8/4/2023
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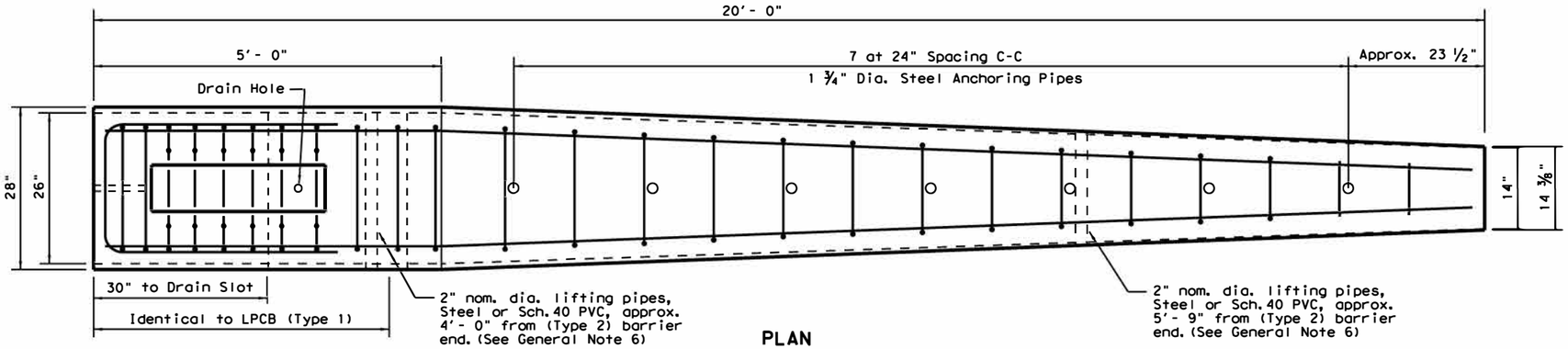
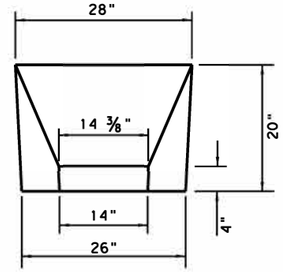
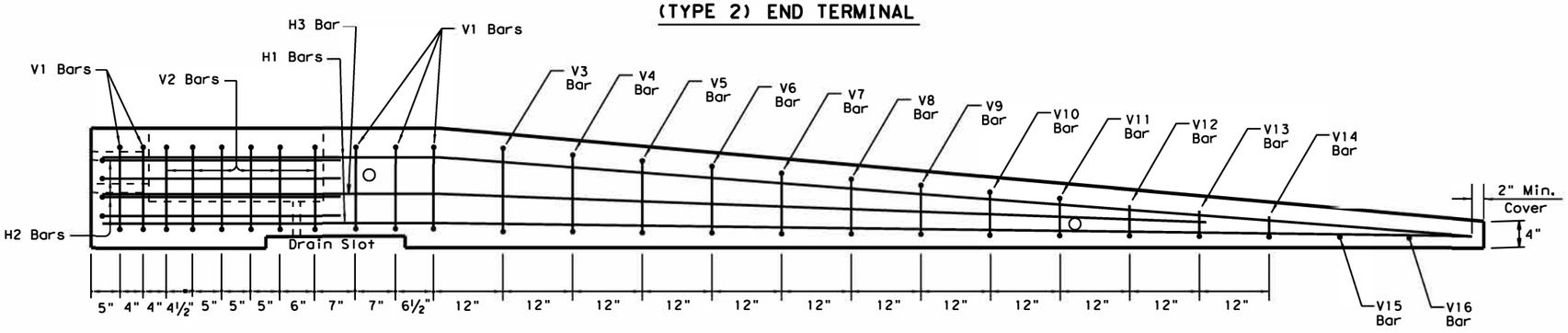


PLAN
(TYPE 2) END TERMINAL



APPROACH VIEW

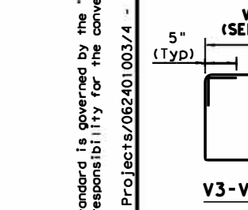


ELEVATION
(TYPE 2) END TERMINAL

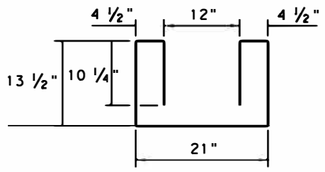
Note:
Anchoring pipes not shown in Elevation View

TYPE 2 - NOTES

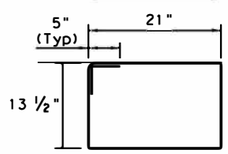
1. Welded wire reinforcment (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.



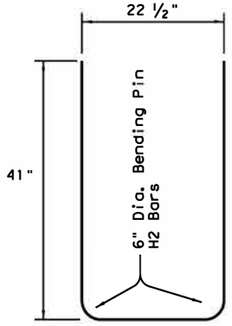
V3-V14 Bars



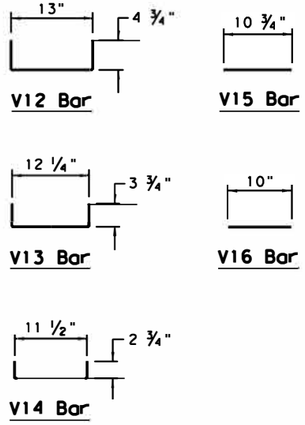
(6)~V2 Bars



(5)~V1 Bars



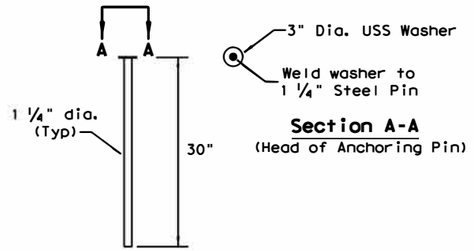
(4)~H2 Bars
(#5) Bars



Note: All V Bars are (#4)

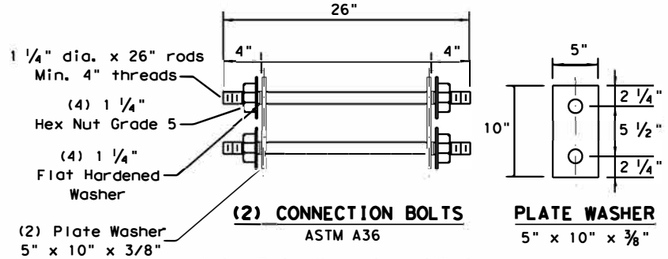
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL



Section A-A
(Head of Anchoring Pin)

(7) Anchor Pins (See Note 3)
ASTM A36 Steel

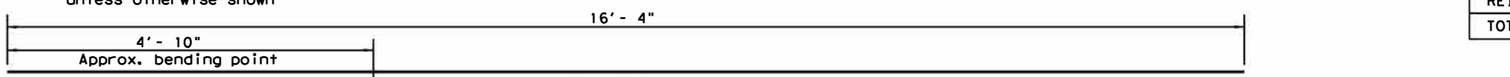


(2) CONNECTION BOLTS
ASTM A36

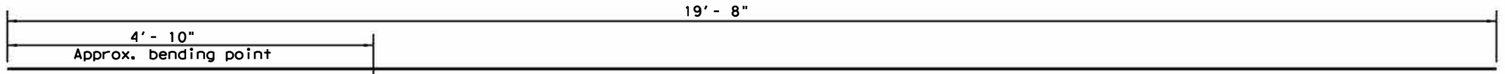
PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

Note: Use 2" Dia. Bending Pin, unless otherwise shown



(2)~H3 Bars
(#5) Bar



Note: Bends on H1 and H3 bars are slight and do not require formal bends.

(4)~H1 Bars
(#5) Bar

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 2)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
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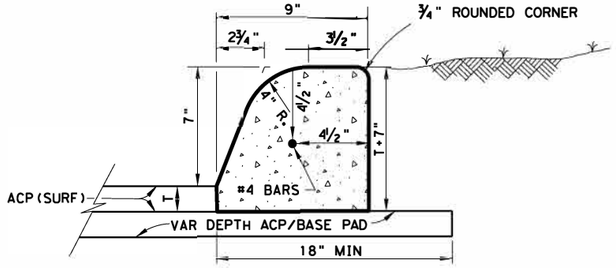
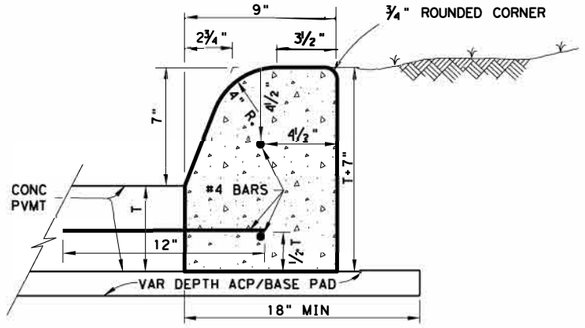
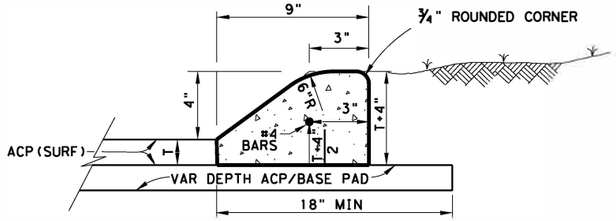
	SAT	UVALDE		57



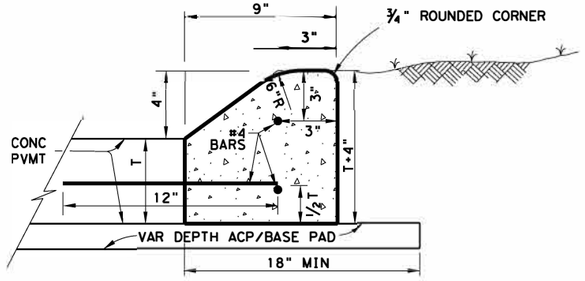
CONCRETE CURB (TYPE 1)
W/ ACP



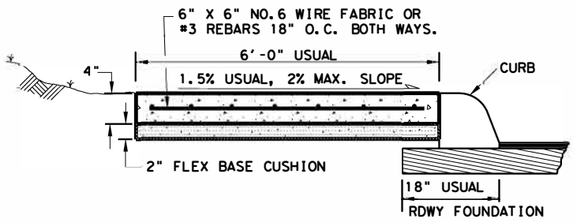
CONCRETE CURB (TYPE 1)
W/ CONC PAVEMENT



CONCRETE CURB (TYPE 2)
W/ ACP

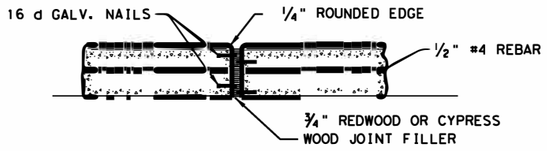


CONCRETE CURB (TYPE 2)
W/ CONC PAVEMENT



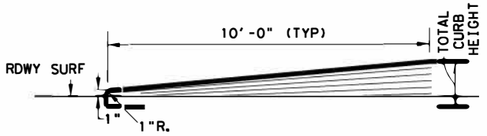
TYPICAL SIDEWALK SECTION

GROOVED JOINTS IN THE SIDE WALK SHALL BE AT A MAX. SPACING OF 10 FT. AND SHALL HAVE ¾" EXPANSION JOINTS AT A MAX. SPACING OF 60' AND TO COINSIDE WITH THE CURB EXP. JOINTS.



TYPICAL CURB EXPANSION JOINT DETAIL

EXPANSION JOINTS TO BE PLACED AT BEGINNING AND END OF CURVES, DRIVEWAYS WHEELCHAIR RAMPS, INLETS, ILLUMINATION/ SIGNAL FOUNDATIONS AND OTHER FIXED OBJECTS.

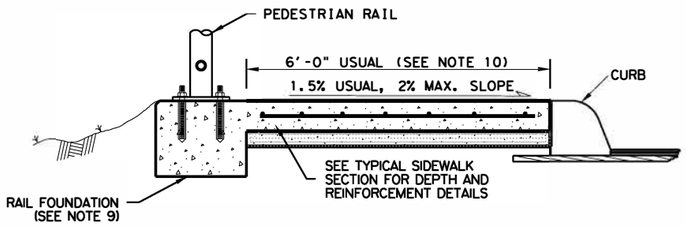


TRANSITION FOR CONCRETE CURB ENDS

SEE CURB DETAIL FOR REINFORCEMENT

GENERAL NOTES:

1. CONCRETE CURB TYPE 1 AND 2 SHOWN SHALL MEET THE MINIMUM SPECIFICATION REQUIREMENTS OF CLASS "A" CONCRETE PER ITEM 529 AND 421.
2. ALL REINFORCING STEEL SHALL BE GRADE 60
3. WHERE CONCRETE CURB IS PLACED ON EXISTING CONCRETE PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE REINFORCING BARS GROUTED IN PLACE.
4. 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.
5. VERTICAL AND HORIZONTAL DOWEL BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4 FEET C-C, UNLESS OTHERWISE SHOWN.
6. ONE-HALF INCH EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB OR CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP. THIS IS SUBSIDIARY TO THE CURB, ITEM 529.
7. LAYDOWN CURB AT DRIVEWAYS WILL BE PAID AS SUBSIDIARY TO ITEM 530.
8. FOR SIDEWALK DETAILS AT DRIVEWAYS, SEE SAN ANTONIO DISTRICT STANDARD "DRIVEWAY DETAILS".
9. SEE PEDESTRIAN HANDRAIL DETAILS STANDARD "PRD" FOR MORE INFORMATION. CONCRETE RAIL FOUNDATION TO BE POURED WITH THE SIDEWALK BUT PAYMENT IS SUBSIDIARY TO ITEM 450 "RAILING".
10. CLEAR SIDEWALK WIDTH EXCLUDING THE PEDESTRIAN RAIL FOUNDATION SHALL BE 6' UNLESS OTHERWISE SPECIFIED IN THE PLANS



TYPICAL SIDEWALK SECTION WITH PEDESTRIAN RAIL

Texas Department of Transportation
San Antonio District

MISCELLANEOUS CURB AND SIDEWALK DETAILS

San Antonio District Standard
Sheet (1 of 2)

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09-01-08	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
10-10-17 sidewalk width equals 6' usual	UVALDE		0624	01	003	PR 29A
07-22-20 9" curb + curb w/ conc pvmt det.						

10:37:45 AM
8/4/2023
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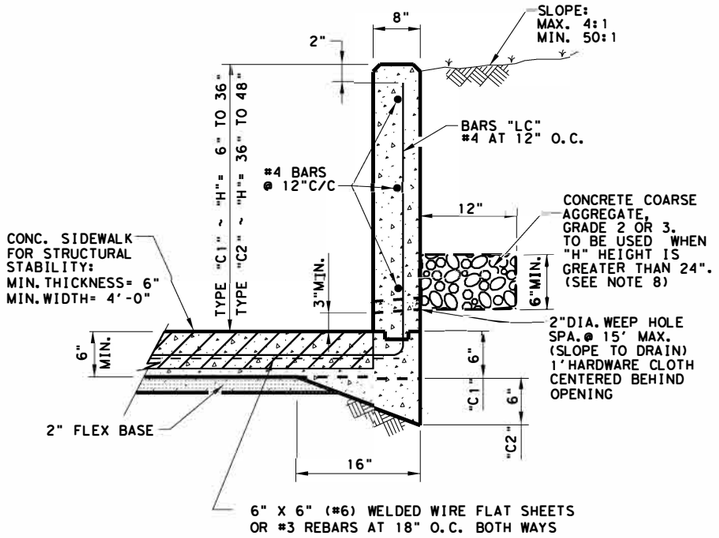
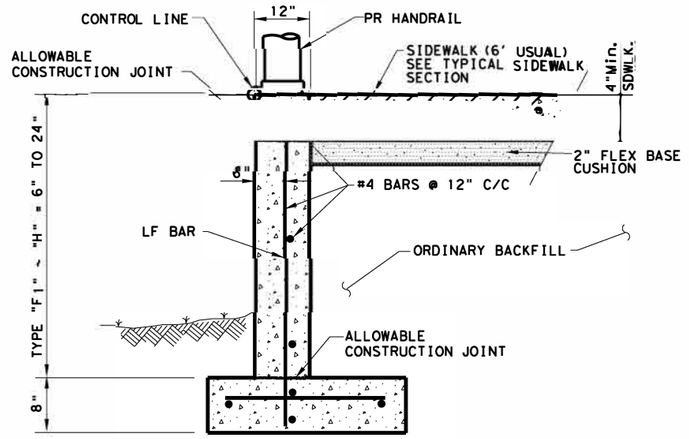


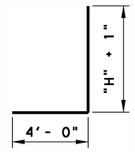
TYPE "C1" & "C2" CURB



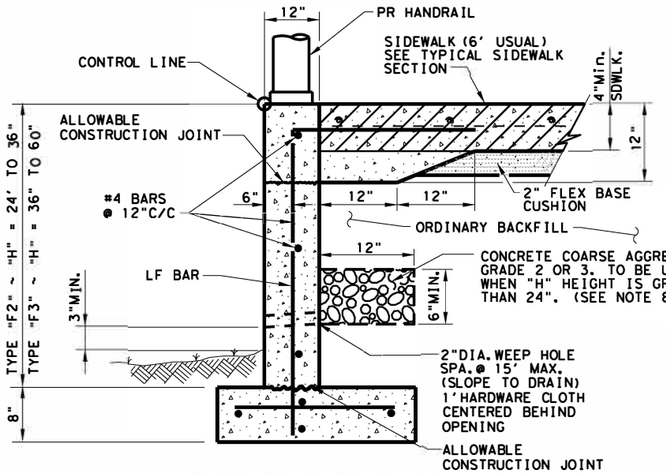
TYPE "F1" CURB

GENERAL NOTES:

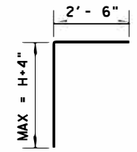
1. CONCRETE FOR CURB TYPE F AND C SHOWN SHALL MEET THE MINIMUM SPECIFICATION REQUIREMENTS OF CLASS "C" CONCRETE PER ITEM 421
2. ALL REINFORCING STEEL SHALL BE GRADE 60
3. EXPANSION AND CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH PAVEMENT JOINITS IN ALL CURBS AND CURB AND GUTTER ADJACENT TO JOINTED 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.
4. VERTICAL AND HORIZONTAL DOWEL BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4 FEET C-C, UNLESS OTHERWISE SHOWN.
5. UNTIL THE SIDEWALK IS COMPLETE, LATERAL SUPPORT FOR THE "F" CURBS WILL BE REQUIRED.
6. IF AGGREGATE IS REQUIRED PER THE DETAIL, IT IS PAID AS SUBSIDIARY TO THE CURB, ITEM 529.



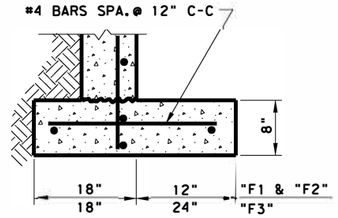
BAR "LC"



TYPE "F2" & "F3" CURB



BAR "LF"



FOOTING DETAIL

DESIGN SOIL PARAMETERS:
Soil Unit Wt. = 120 pcf
Phi = 30 Degrees
Cohesion = 50 psf
Min. PI = 15
Max. PI = 30
SURCHARGE:
TYPE F CURB q = 2' Adjacent to sidewalk
Max. slope behind TYPE C Curb = 4:1
Min. Factor of Safety against sliding is 1.5.
Designed in accordance with current AASHTO Standards and Interim Specifications.

CLASS C CONCRETE PAID UNDER ITEM 531, SIDEWALK. (NOTE. ADDITIONAL CONCRETE TO MEET THE THICKENED SECTIONS REQUIRED BY THESE DETAILS IS SUBSIDIARY TO ITEM 531, CURB.)

Texas Department of Transportation
San Antonio District

MISCELLANEOUS CURB AND SIDEWALK DETAILS

San Antonio District Standard
Sheet (2 of 2)

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10-10-17 sidewalk width equals 6' usual	UVALDE		0624	01	03PR29A
07-22-20 9" curb + curb w/ conc pvmt det.					

DATE: 7/28/2023
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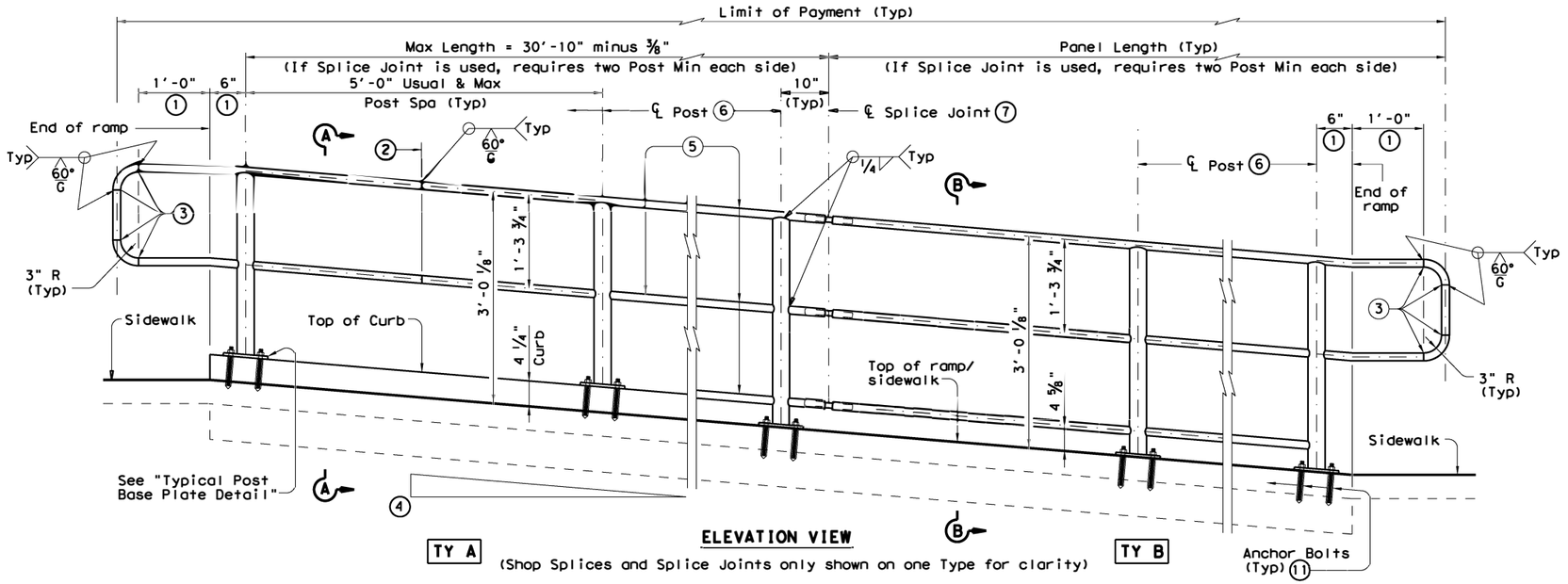
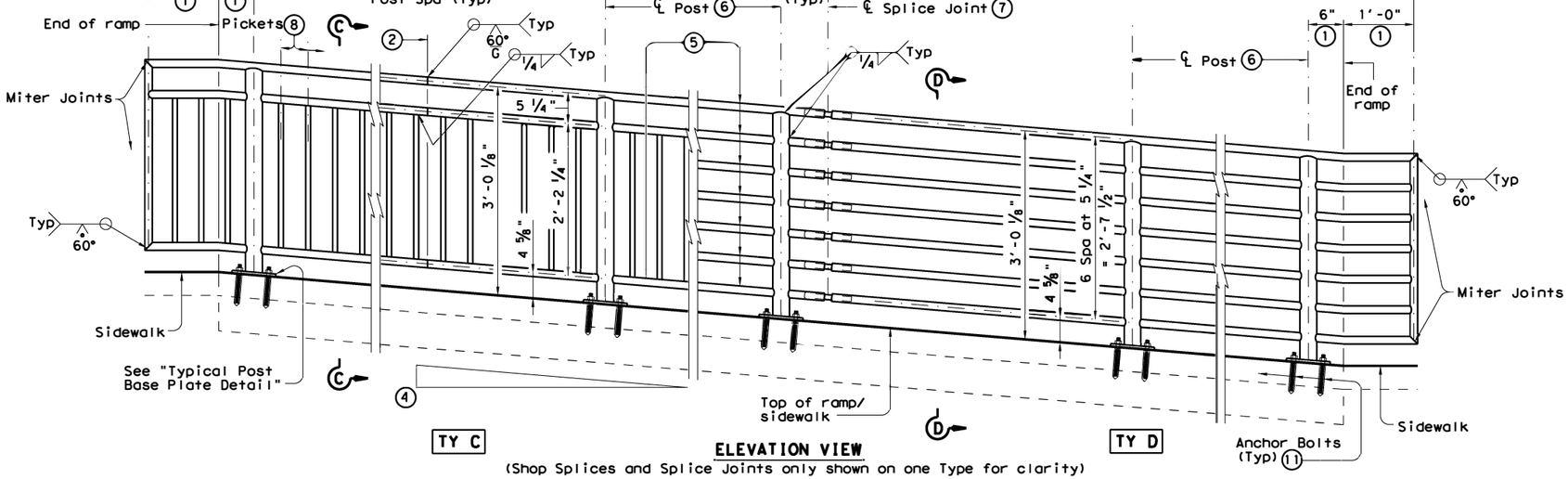


ELEVATION VIEW

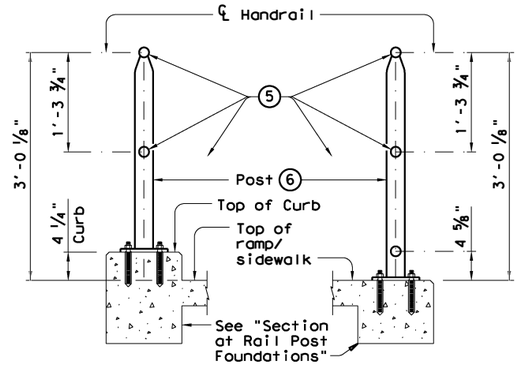
(Shop Splices and Splice Joints only shown on one Type for clarity)



ELEVATION VIEW

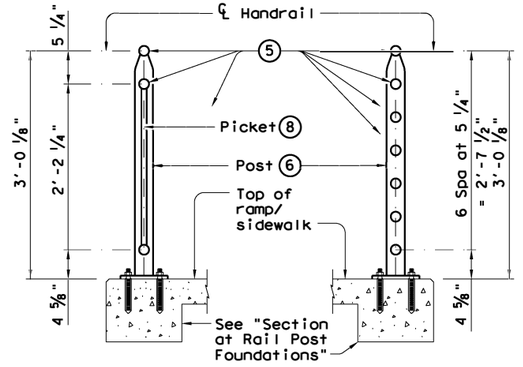
(Shop Splices and Splice Joints only shown on one Type for clarity)

RECOMMENDED USAGE ⑨⑩	
Dropoff Height/ Condition	Recommended Rail Options
<30" dropoff	TY A, TY B, TY C, or TY D
≥ 30" dropoff, or along Bike Path	TY E or TY F



SECTION A-A
(Showing Handrail **TY A**)

SECTION B-B
(Showing Handrail **TY B**)



SECTION C-C
(Showing Handrail **TY C**)

SECTION D-D
(Showing Handrail **TY D**)

1. Parallel to ground.
2. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
3. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
5. 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
7. See "Handrail Fabrication Details" for Splice Joints.
8. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
9. When needed for accessibility (grade > 5 percent) or as needed for pedestrian safety.
10. Not to be used on bridges.
11. See "General Notes" for anchor bolt information.

SHEET 1 OF 3

Texas Department of Transportation — Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		60

DATE: 7/28/2023
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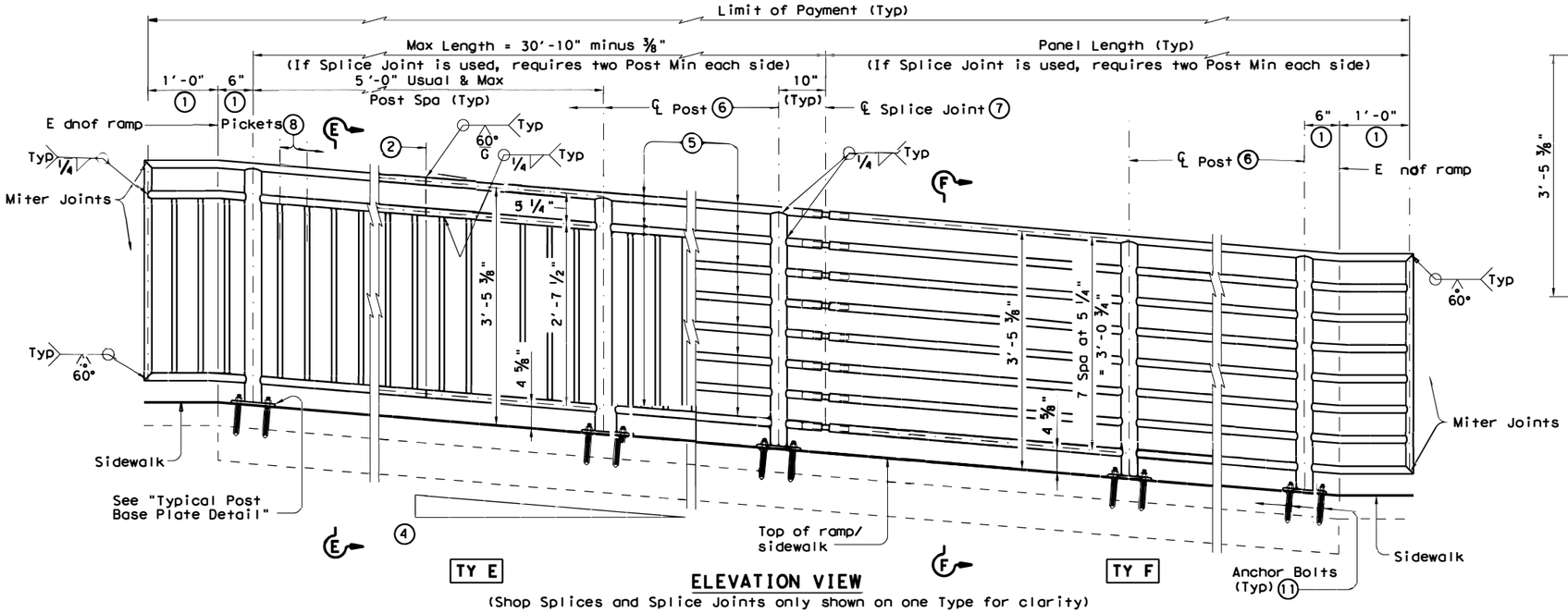
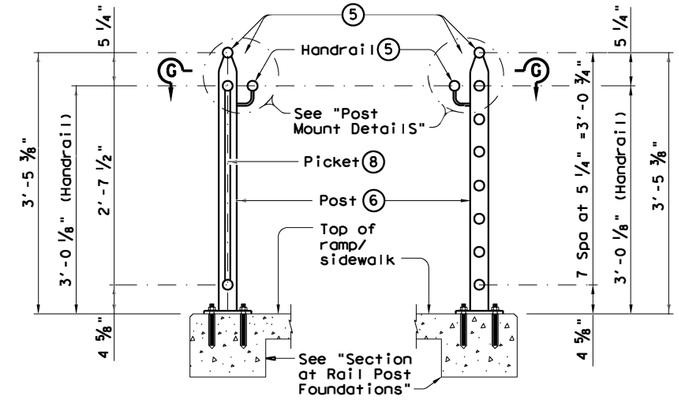


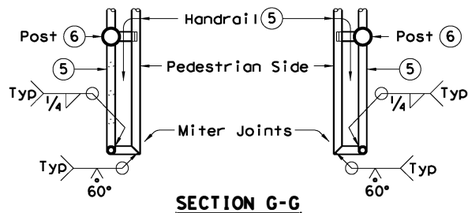
ELEVATION VIEW

(Shop Splices and Splice Joints only shown on one Type for clarity)

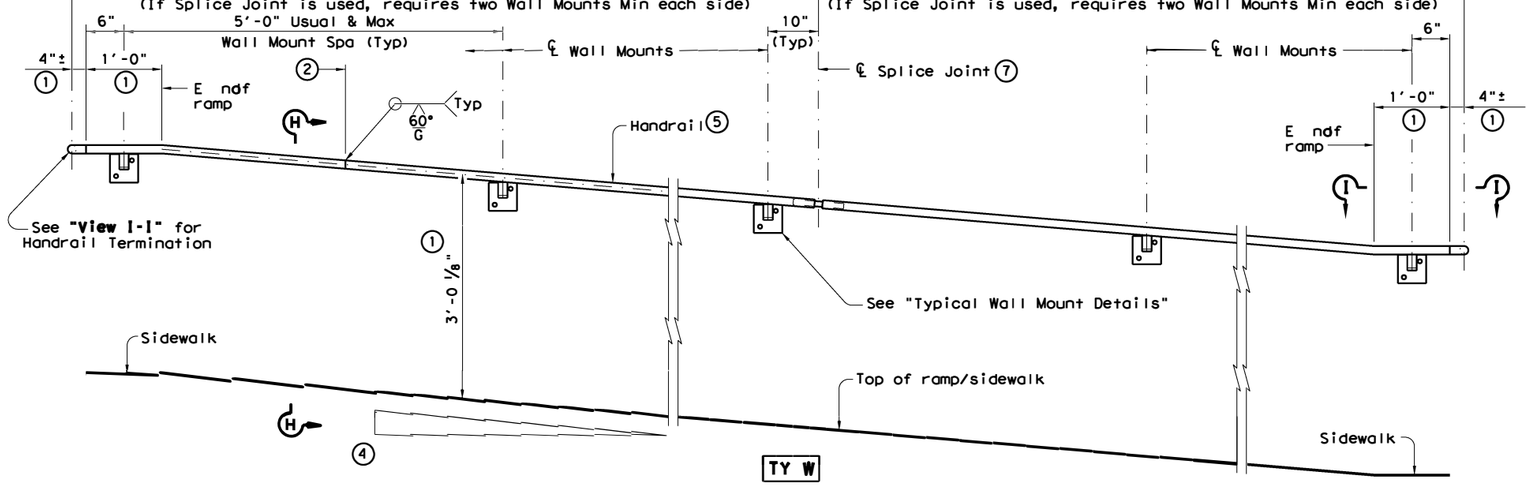


SECTION E-E
(Showing Handrail TY E)

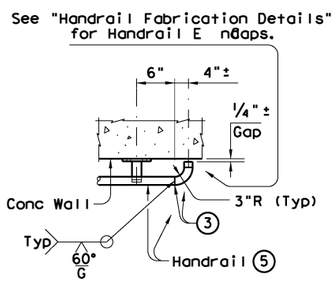
SECTION F-F
(Showing Handrail TY F)



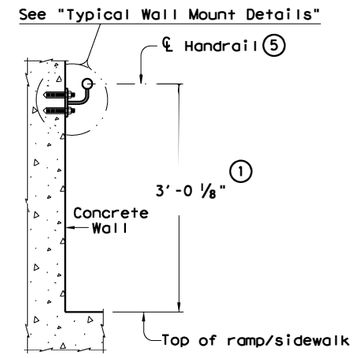
SECTION G-G
(Showing Handrail Termination)



ELEVATION VIEW



VIEW I-I
(Showing Handrail Termination)



SECTION H-H
(Showing Handrail TY W)

1. Parallel to ground.
2. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
3. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
5. 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
7. See "Handrail Fabrication Details" for Splice Joints.
8. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
11. See "General Notes" for anchor bolt information.

SHEET 2 OF 3

Texas Department of Transportation — Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		61

DATE: 7/28/2023
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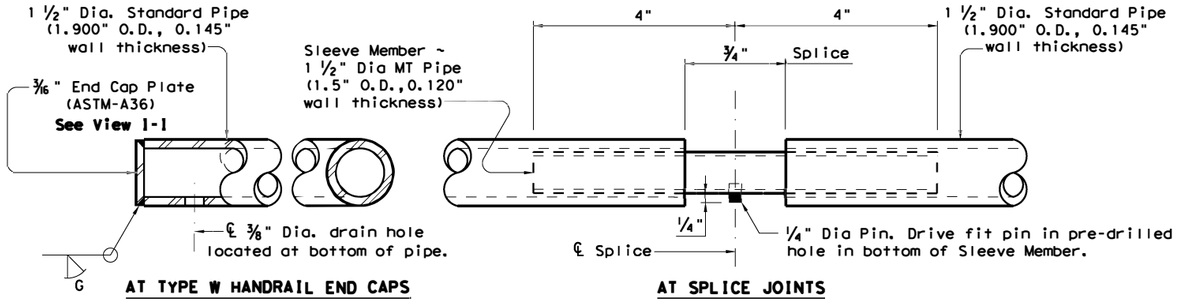
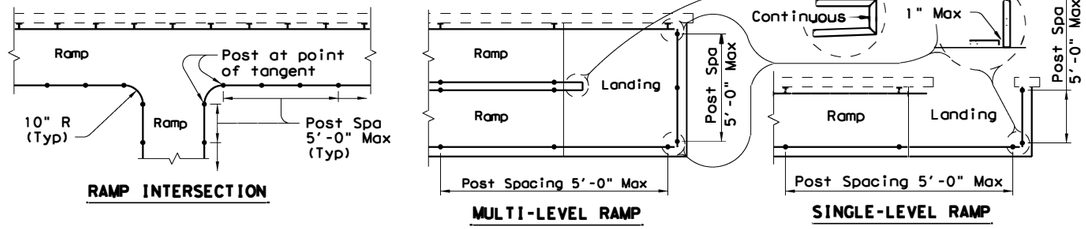
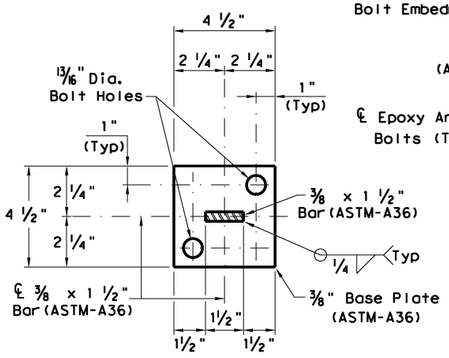


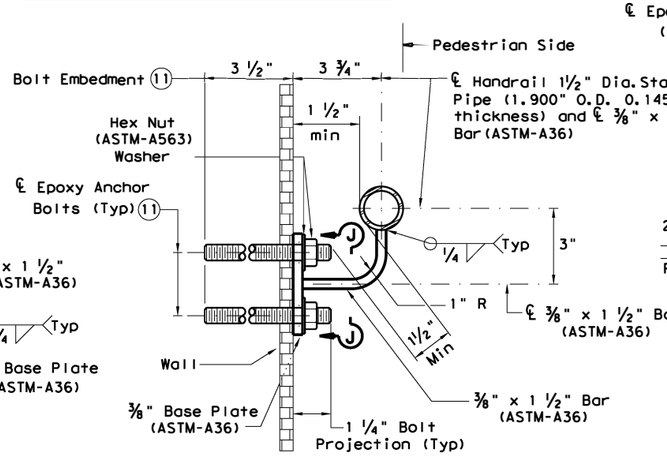


PLAN SHOWING RAIL AT RAMP CONDITIONS

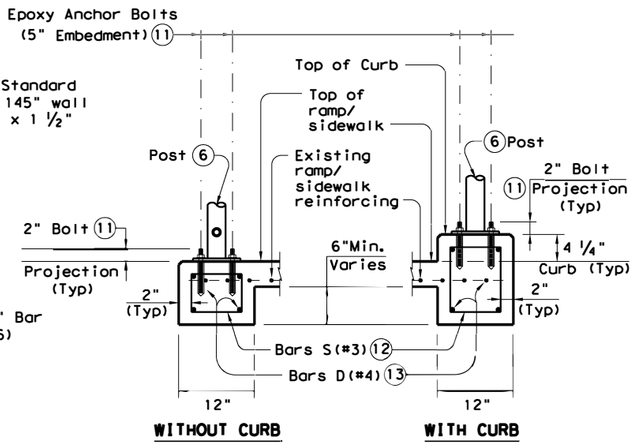
HANDRAIL FABRICATION DETAILS



SECTION J-J
(Anchor Bolts not shown for clarity)



SECTION AT WALL MOUNT



SECTION AT RAIL POST FOUNDATIONS

GENERAL NOTES

Designed according to ADAAG, Texas Accessibility Standards, Uniform Building Code, and AASHTO LRFD Specifications.

Handrail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Pipe will conform to ASTM-A53 Grade B or A500 Grade B. Steel plates and steel bars will conform to ASTM-A36. Mechanical tubing (MT) will conform to ASTM A513 Grade 1015 or higher. Galvanize all steel components except reinforcing steel unless noted otherwise.

Concrete for foundations will be in accordance with Item 531 "Sidewalks". All reinforcing steel must be Grade 60. Bar laps, where required, will be as follows: Uncoated ~ #4 = 1'-5" Epoxy coated ~ #4 = 2'-1"

When the plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Cleaning and Painting Steel". Sleeve Members will receive galvanization and only get field painted after installation unless directed otherwise by Engineer.

Epoxy Anchor bolts for wall mount and post base plate will be ⅝" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. ⅝" Dia. threaded rod embedment depth for wall mounts is 3 ½" and embedment depth for post base plate is 5".

Embed threaded rods into concrete with a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxies and Adhesives". Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system. Core drill holes (percussion drilling not permitted).

At the contractor's option the post base plate anchor bolts may be cast with the Ramp/Sidewalk (See Cast-in-Place Anchor Bolt Options).

Optional cast-in-place anchor bolts will be ⅝" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Embedment depth of cast-in-place bolt will be 8" for post base plate.

Handrails and any wall or other surface adjacent to them will be free of any sharp or abrasive elements.

Submit shop drawings to the Engineer unless otherwise noted. For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

For all handrails, erection drawings will be submitted to the Engineer for approval to ensure proper installation.

Drawings will show handrail mount locations with bolts setting, spacing, ramp slope, and/or splice joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

Payment for concrete sidewalks or curb ramps will be paid for in accordance with Item 531 "Sidewalks".

Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

All exposed edges will be rounded or chamfered to approximately ⅛" by grinding.

TYPICAL WALL MOUNT DETAILS

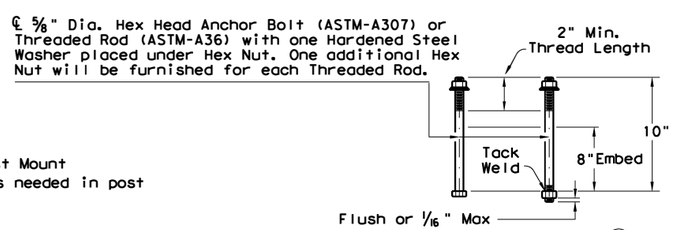
(5) 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.

(6) 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diamenter of top rail. Provide holes as needed in post for galvanizing drainage and venting.

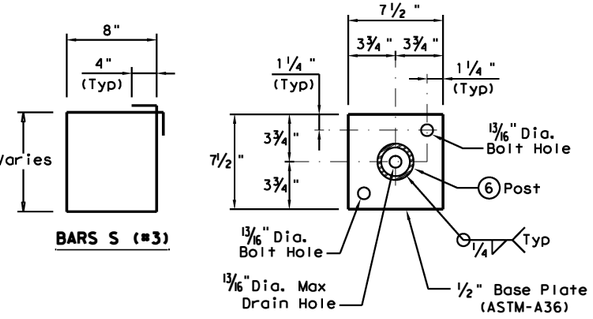
(11) See "General Notes" for anchor bolt information.

(12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).

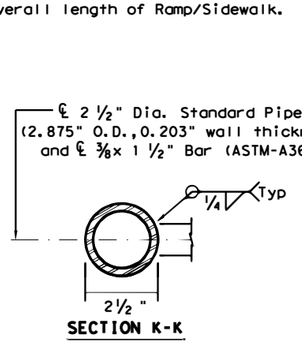
(13) Provide 1 ½" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.



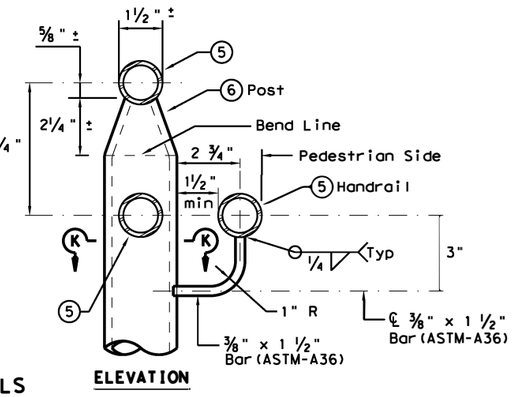
CAST-IN-PLACE ANCHOR BOLT OPTIONS
(Used for Post Base Plate only)



TYPICAL POST BASE PLATE DETAIL



SECTION K-K



ELEVATION

POST MOUNT DETAILS

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

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©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
REVISED MAY, 2013 (VP)	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		62

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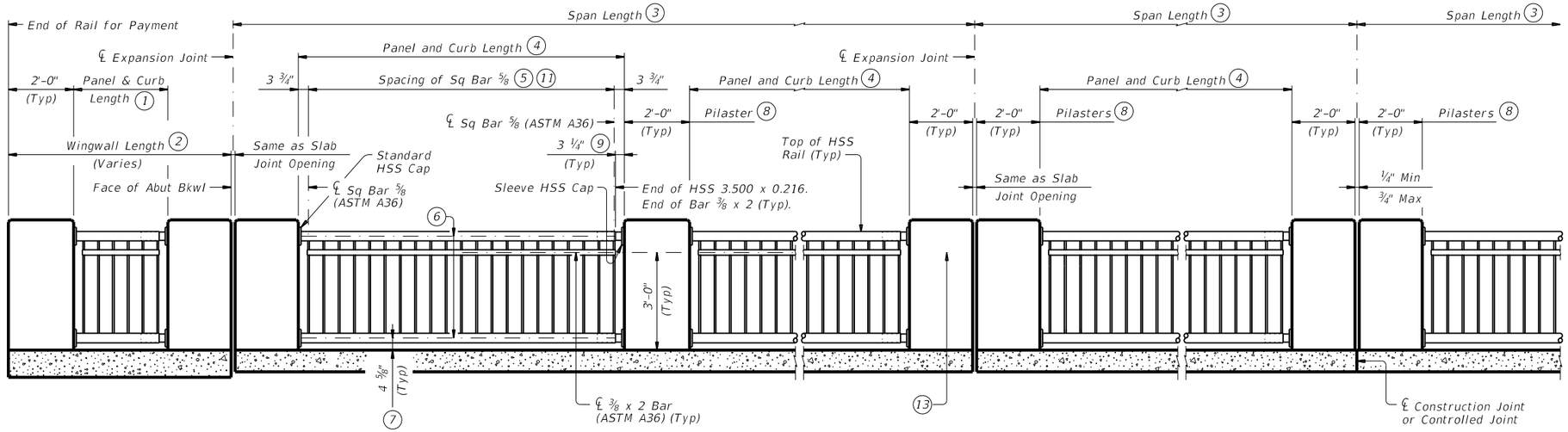
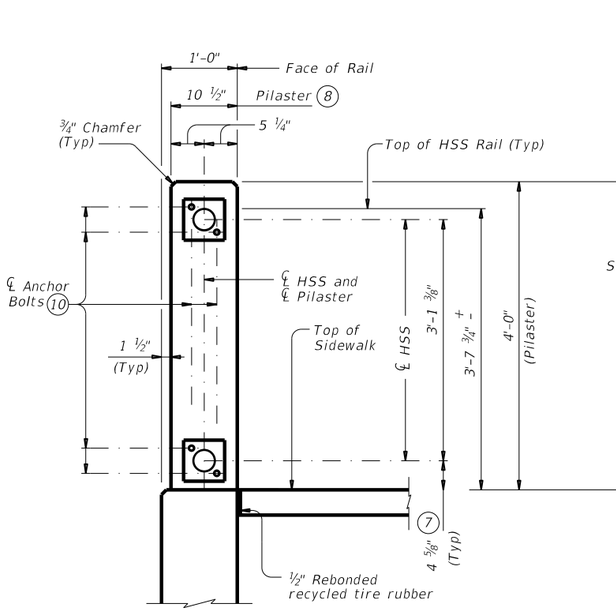


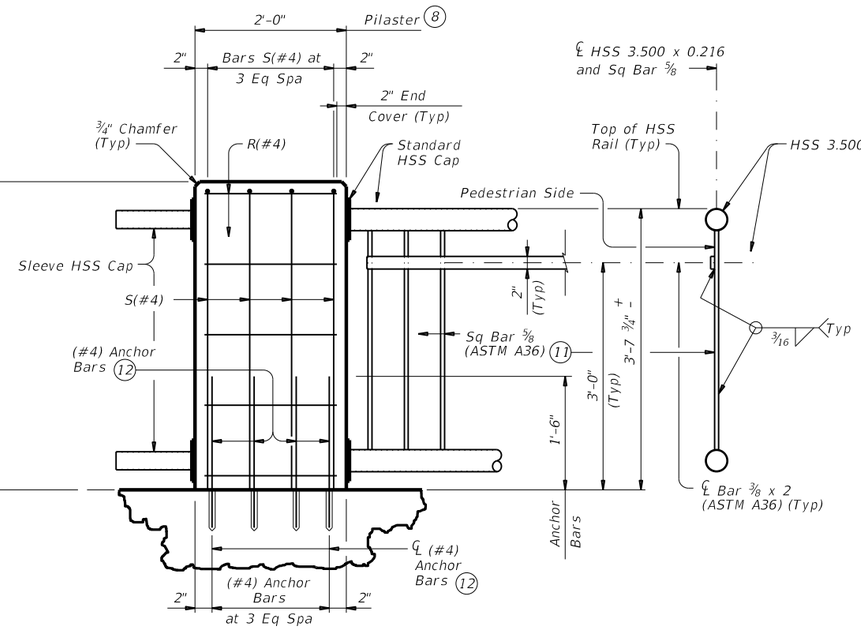
ELEVATION OF RAIL

1. 10'-0" Max Panel and Curb Length.
2. Wingwall will have pilasters at each end (Typ).
3. Span will have a pilaster at each end (Typ).
4. 10'-0" Usual and Max Panel and Curb Length.
5. Space Sq Bar ⅝ Equally at 5 ¾" Max along center of HSS 3.500 x 0.216 (Typ).
6. ℄ HSS 3.500 x 0.216 (Typ).
7. Parallel to top of sidewalk (Typ).
8. Pilasters will be plumb on all sides (Typ).
9. Terminate HSS 3.500 x 0.216 as shown on one end only of each HSS Rail Panel. This allows for future repairs and/or replacement. Terminate Bar ⅜ x 2 as shown on each end of HSS Rail Panel.
10. See "Material Notes" for anchor bolt information.
11. Sq Bar ⅝ will be Plumb.
12. Embed (#4) adhesive anchor bars 5" Min. See "Material Notes" for adhesive anchor requirements.
13. Outer faces of pilasters shall have a Teton Dry Stack finish as shown in the aesthetic Standards. Dimensions of stone finish shall be similar to photo of the existing rock pilaster shown on sheet 2. Areas where handrail base plates are attached to the pilaster will not have a rough finish to allow for proper installation & mounting to the pilaster.



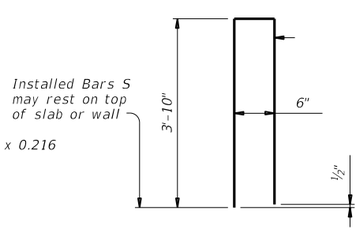
END VIEW OF PILASTER ON CIP RETAINING WALLS

Showing placement of HSS Caps on Pilaster (Sq Bar ⅝ not shown for clarity.)



PILASTER ELEVATION

HSS RAIL SECTION



BARS S(#4)

Pedestrian Side

ELEVATION OF TYPICAL REINFORCING WITH HSS RAIL AND PILASTER CONNECTION

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

PEDESTRIAN RAIL (MOD)

TYPE PR3

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		063

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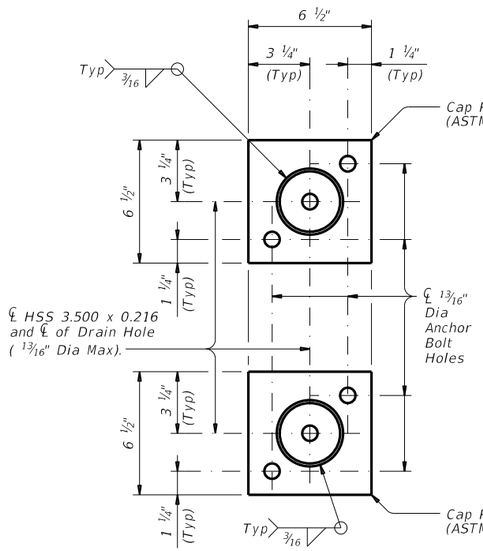
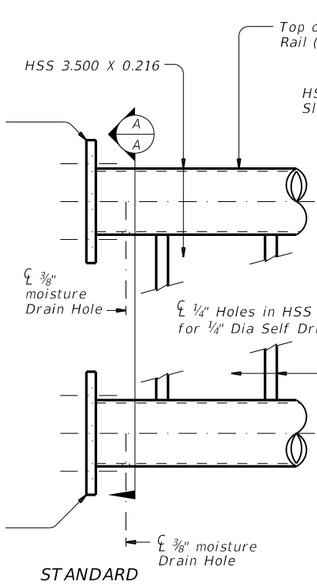
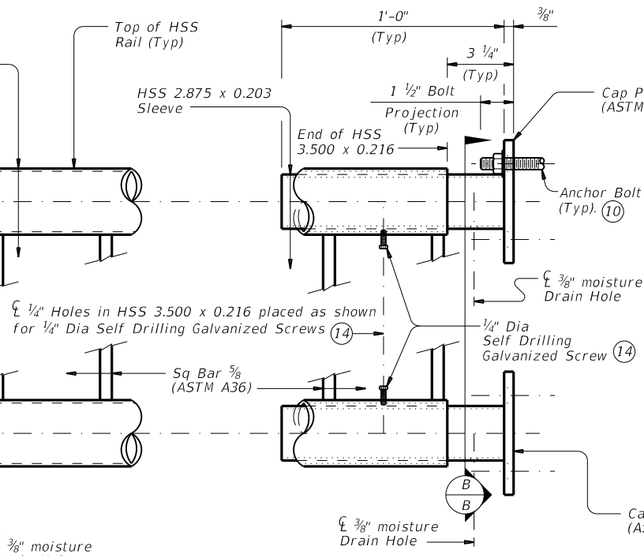


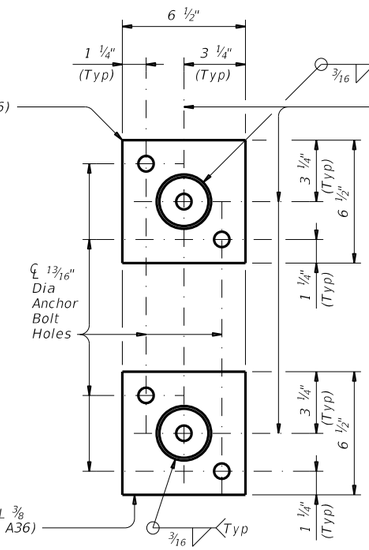
SECTION A-A



STANDARD HSS CAP ENDS



SLEEVE HSS CAP ENDS



SECTION B-B

(8) Pilasters will be plumb on all sides (Typ).

(10) See "Material Notes" for anchor bolt information.

(12) Embed (#4) adhesive anchor bars 5" Min. See "Material Notes" for adhesive anchor requirements.

(14) Firmly tighten Self Drilling Screws after pipe rail has been attached to Pilasters.

(15) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk)

(16) Provide 1 ½" end cover to Bars D(#4) from outside edge of overall length of Sidewalk

CONSTRUCTION NOTES:

Pilasters must be plumb on all sides.

For curved railing applications, fabricate the rail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

Round or Chamfer exposed edges of HSS rail and HSS caps to approximately 1⁄16" by grinding.

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.

Chamfer all exposed concrete corners.

MATERIAL NOTES:

Provide ASTM A500 Gr B, A1085 or A53 Gr B for all HSS.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel." Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized. (#4) anchor bar used for the adhesive anchorage system must not be epoxy coated for the embedded portion.

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Chamfer all exposed concrete corners.

Anchor bolts must be ⅝" Dia ASTM A307 Grade A fully threaded rods with one hex head nut and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed threaded rods into pilasters with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 3 ½". Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

Embed (#4) anchor bars with a Type III, Class C, D, E, or F anchor adhesive. Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 12 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".

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

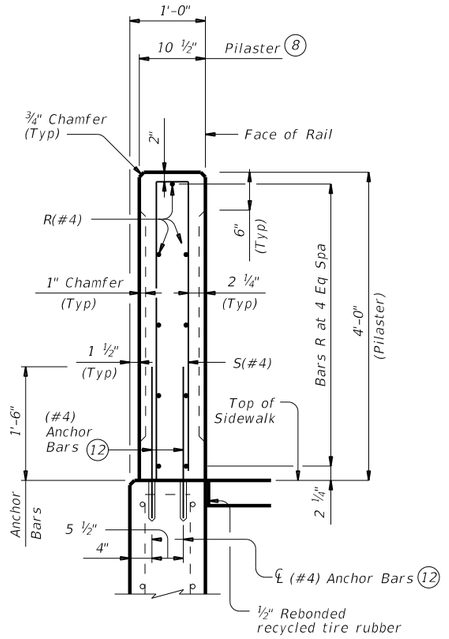
Do not use this railing on bridges with expansion joints providing more than 5" movement.

Shop drawings are not required unless otherwise noted.

For all rails, submit erection drawings for approval to ensure proper installation. Drawings must show pilaster spacing, sleeve HSS cap locations on pilasters, and panel lengths with identification showing where each panel goes on the layout.

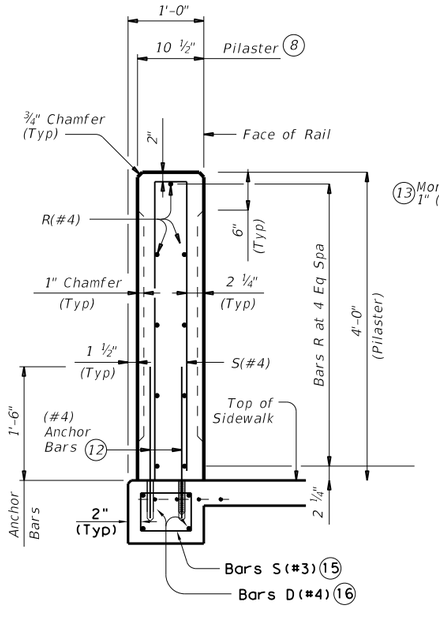
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

HSS RAIL DETAILS

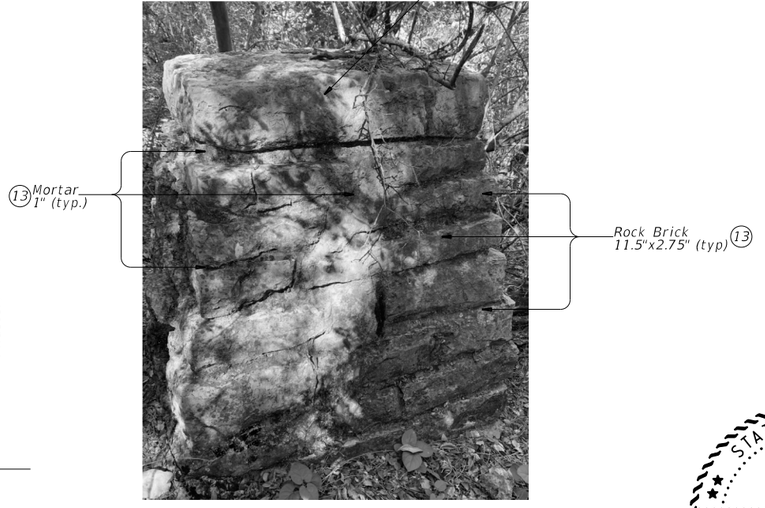


ON CIP RETAINING WALLS

SECTION THRU PILASTER



SECTION AT RAIL POST FOUNDATION



EXISTING ROCK PILASTER

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E.
DEYTON RIDDLE

02/26/2024
DATE

SHEET 2 OF 2

Texas Department of Transportation

PEDESTRIAN RAIL (MOD)

TYPE PR3

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		64

DATE: 2/26/2024 7:43:03 PM
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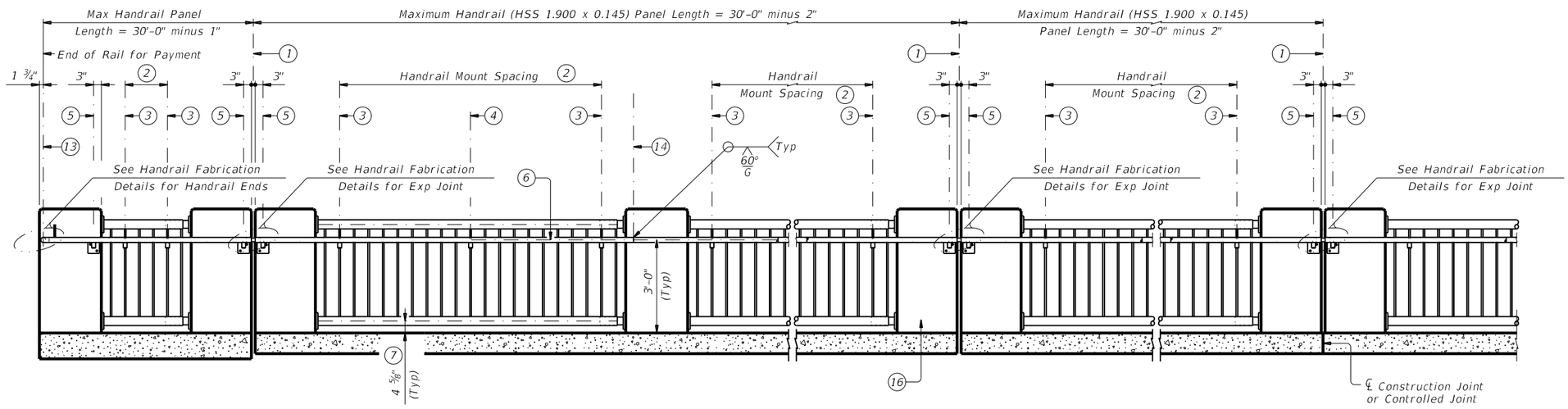
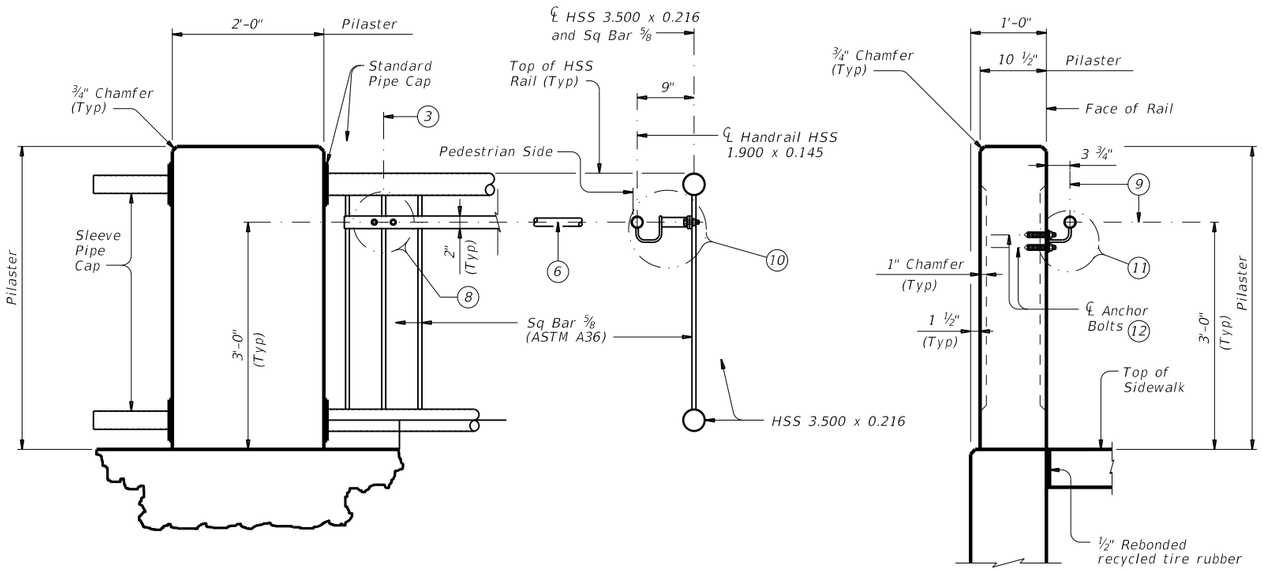


ELEVATION OF RAIL

(Showing handrail length, placement and handrail mount locations.)

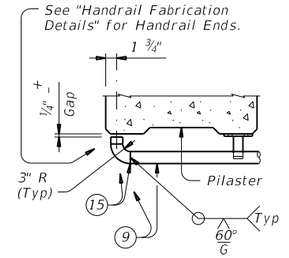


PILASTER ELEVATION — HSS RAIL SECTION — ON CIP RETAINING WALLS

ELEVATION OF TYPICAL PILASTER WITH HSS RAIL

SECTIONS THRU PILASTER

1. ℄ Rail Expansion Joint and ℄ Handrail Expansion Joint.
2. Steel Panel Handrail Mount Spacing 4'-3" Max.
3. ℄ Sq Bar ⅝ and ℄ Steel Panel Handrail Mount (Handrail Mount place as shown).
4. ℄ Steel Panel Handrail Mount.
5. ℄ Pilaster Handrail Mount (Handrail Mount place as shown).
6. ℄ Bar ⅜ x 2 (ASTM A36) and ℄ Handrail HSS 1.900 x 0.145.
7. Parallel to top of sidewalk (Typ).
8. Steel Panel Handrail Mount not shown for clarity. See Detail "A" for bolt holes location and spacing to accommodate Steel Panel Handrail Mount.
9. ℄ Handrail HSS 1.900 x 0.145.
10. See "Steel Panel Handrail Mount Details."
11. See "Pilaster Handrail Mount Details."
12. See "Material Notes" for anchor bolt information.
13. See "Plan of Typical Handrail Termination."
14. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single V groove. Grind smooth.
15. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single V groove. Grind smooth.
16. Outer faces of pilasters shall have a Teton Dry Stack finish as shown in the aesthetic Standards. Dimensions of stone finish shall be similar to photo of the existing rock pilaster shown on PRD-13 (MOD). Areas where handrail base plates are attached to the pilaster will not have a rough finish to allow for proper installation & mounting to the pilaster.



PLAN OF TYPICAL HANDRAIL TERMINATION

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle P.E.
DEYTON RIDDLE

02/26/2024
DATE

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

HANDRAIL DETAILS FOR TYPE PR3 PEDESTRIAN RAIL (MOD)

PR3-HD

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		65

DATE: 2/26/2024 7:42:11 PM
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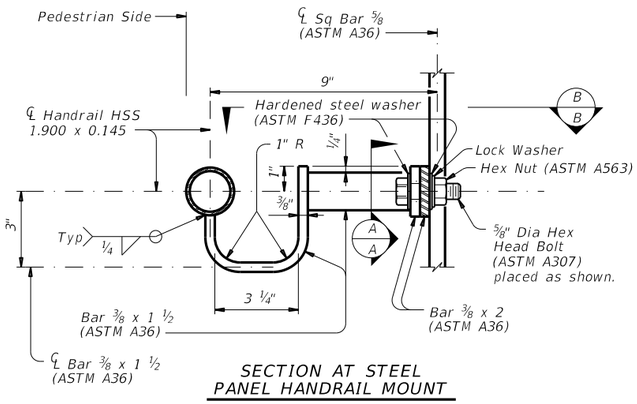
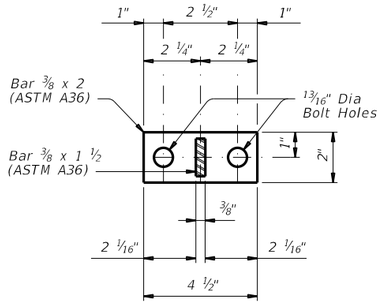
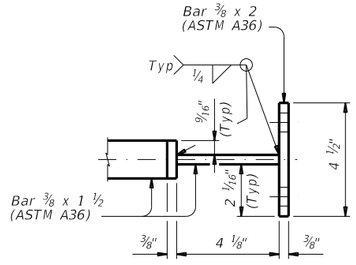


SECTION AT STEEL PANEL HANDRAIL MOUNT



SECTION A-A

(Bolts and Sq Bar ⅝ not shown for clarity)

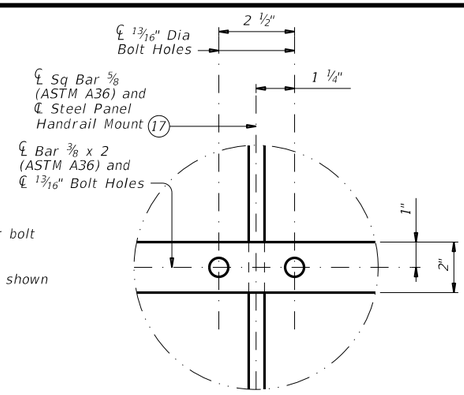


VIEW B-B

(View only showing steel panel handrail mount for clarity.)

(12) See "Material Notes" for anchor bolt information.

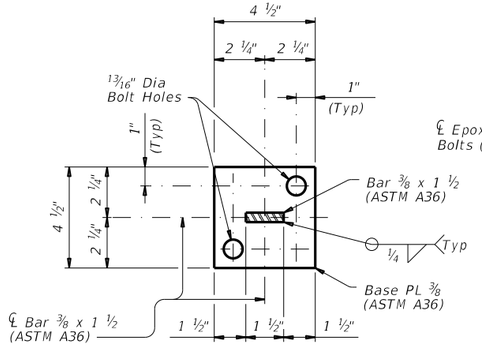
(17) Steel Panel Handrail Mount not shown for clarity.



DETAIL "A"

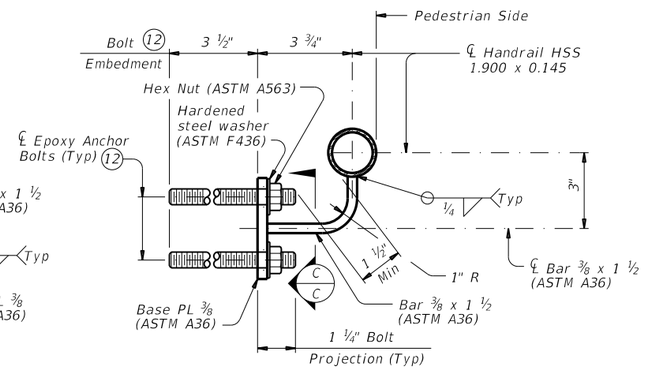
(Only the mid section of the Steel Panel will sometimes not have Sq Bar ⅝ centered between bolt holes)

STEEL PANEL HANDRAIL MOUNT DETAILS



SECTION C-C

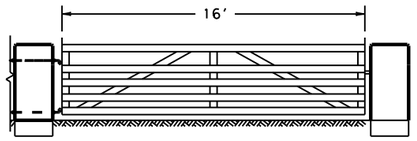
(Anchor Bolts not shown for clarity)



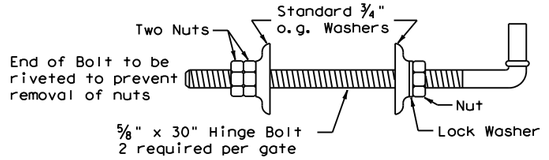
SECTION AT PILASTER HANDRAIL MOUNT

PILASTER HANDRAIL MOUNT DETAILS

Metal gate shall consist of 5 panels 4'high and shall be galvanized metal and of good quality. Gate and hardware shall meet the approval of the Engineer.



DETAIL TYPE 1 GATE



DETAIL OF GATE HINGE BOLT ASSEMBLY

CONSTRUCTION NOTES:

Handrails and any wall or other surface adjacent to them must be free of any sharp or abrasive elements.

Round or chamfer exposed edges of HSS rail and HSS caps to approximately ⅛" by grinding.

For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

MATERIAL NOTES:

Provide ASTM A1085, A500 Gr B or A533 Gr B for HSS 1.900 x 0.145.

Provide ASTM A513 Grade MT 1015 or greater for MT 1.500 x 0.120.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel." Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Hex head bolts must be ⅝" Dia ASTM A307 with one hex nut and two hardened steel washers (ASTM F436) and one lock washer each. Nuts must conform to ASTM A563 requirements.

Anchor bolts must be ⅝" Dia ASTM A307 Grade A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed threaded rods into pilasters with a Type III, Class C, D, E, or F, anchor adhesive. Minimum adhesive anchor embedment depth is 3 ½". Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Handrail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

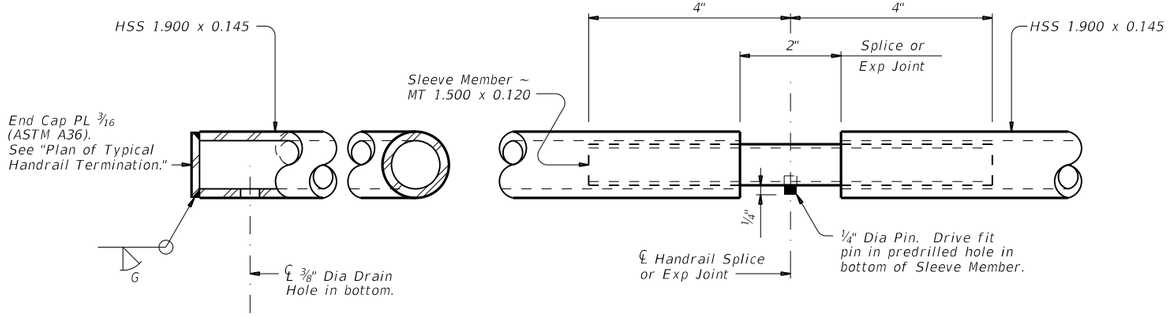
Shop drawings are not required unless otherwise noted.

For all handrails, submit erection drawings to the Engineer for approval to ensure proper installation. Drawings must show handrail mount locations and/or spacing, splice or expansion joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

Average weight of handrail: 4 plf total.

Latches for Type 1 gate shall be good commercial quality and design latches of the spring, fork or chain type. All latches shall be suitable for the gate and shall be approved by the Engineer and TPWD.



HANDRAIL ENDS

AT SPLICE OR EXPANSION JOINTS

HANDRAIL FABRICATION DETAILS

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle
P.E.
DEYTON RIDDLE

02/26/2024
DATE

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

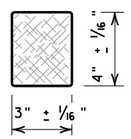
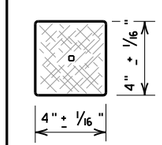
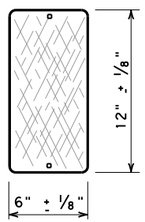
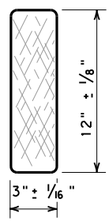
HANDRAIL DETAILS FOR TYPE PR3 PEDESTRIAN RAIL (MOD)

PR3-HD

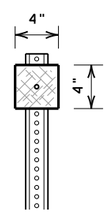
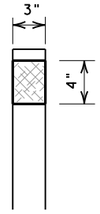
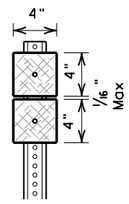
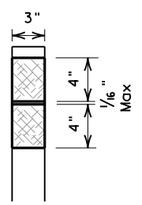
FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		66

DATE: 2/26/2024 7:03:12 PM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/3. Roadway/Standards/D&OM(1)-20.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

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

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

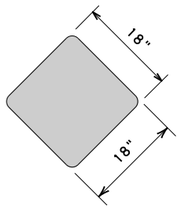
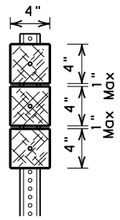
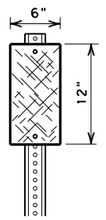
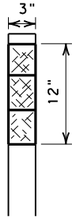
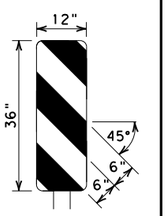
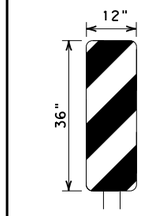
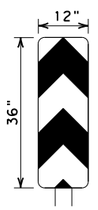
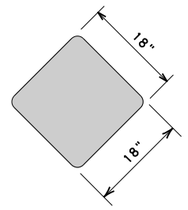
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

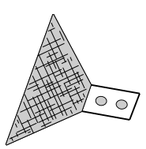
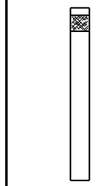
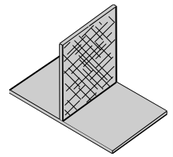
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

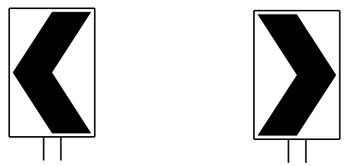
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



W1-8

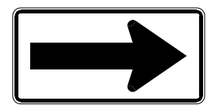
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

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).

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

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.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	UVALDE		67

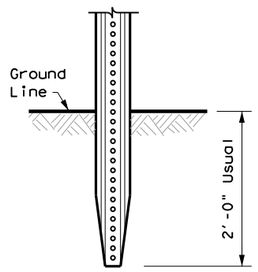
20A

DATE: 2/26/2024 7:05:58 PM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/3. Roadway/Standards/D&OM(2)-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

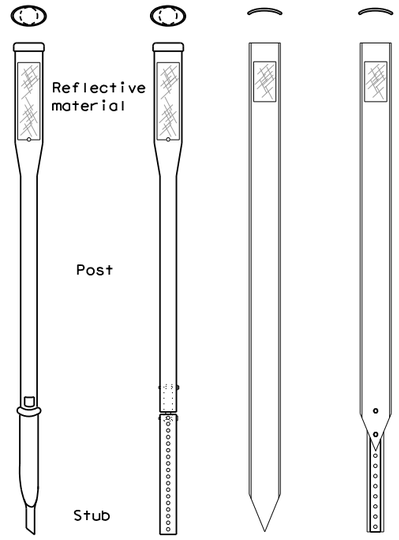


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

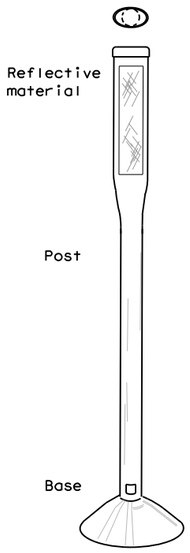
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



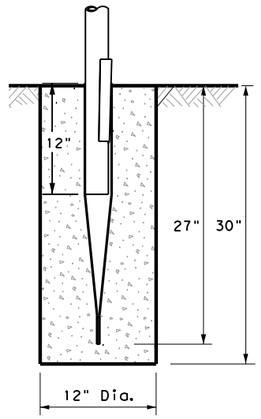
SURFACE MOUNT

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.

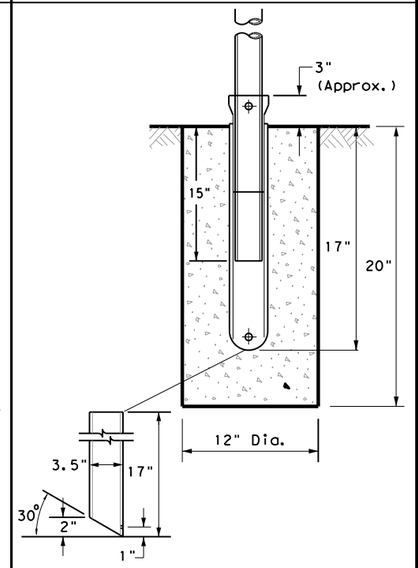
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

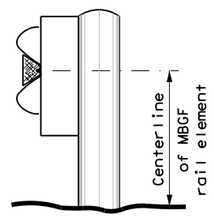
NOTE

1. Install per manufacturer's recommendations.

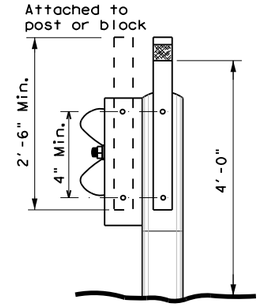
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

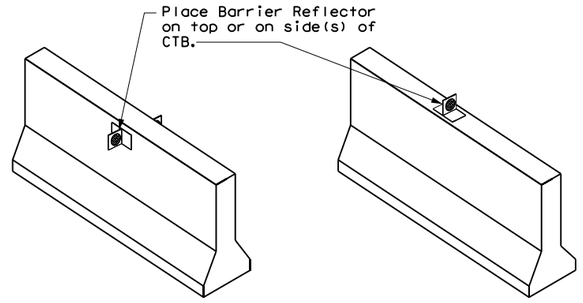
GF1



GF2



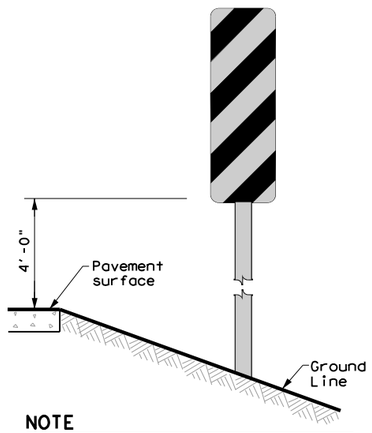
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

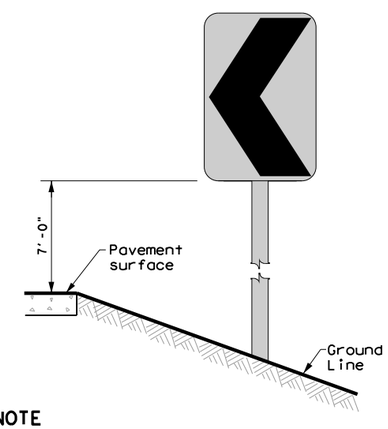
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

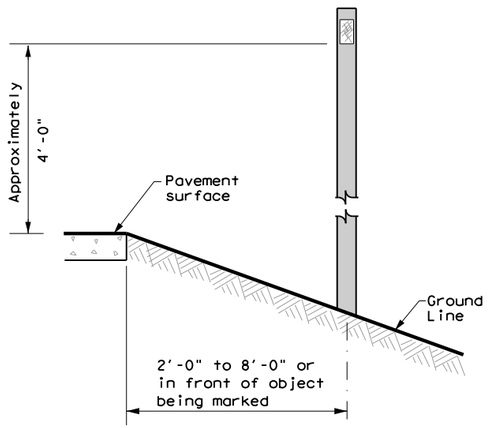
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

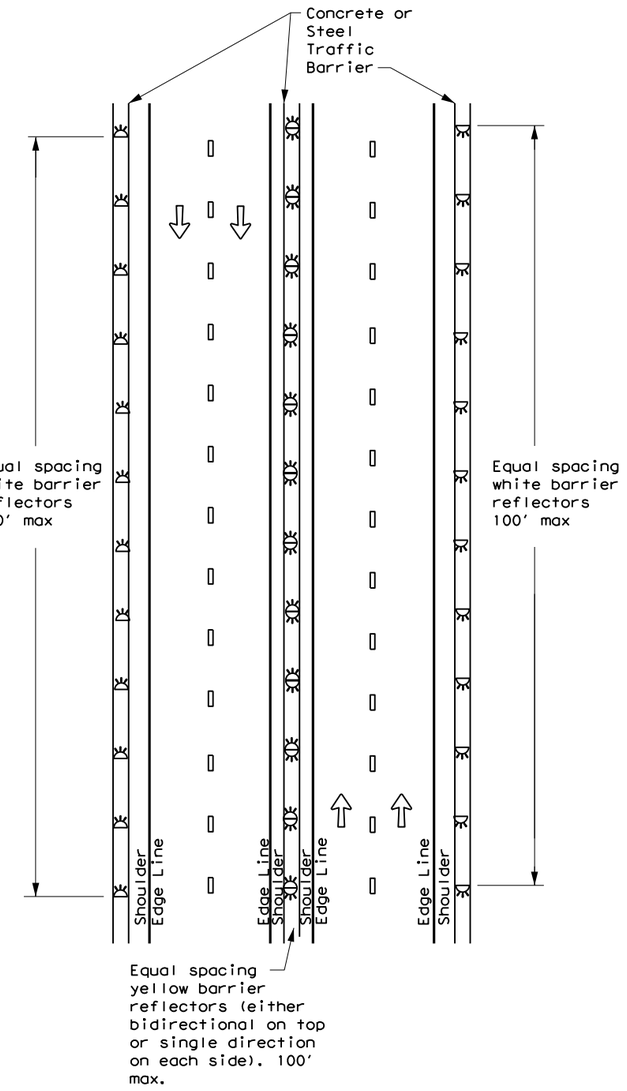
D & OM(2)-20

FILE: dgm2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	UVALDE		68

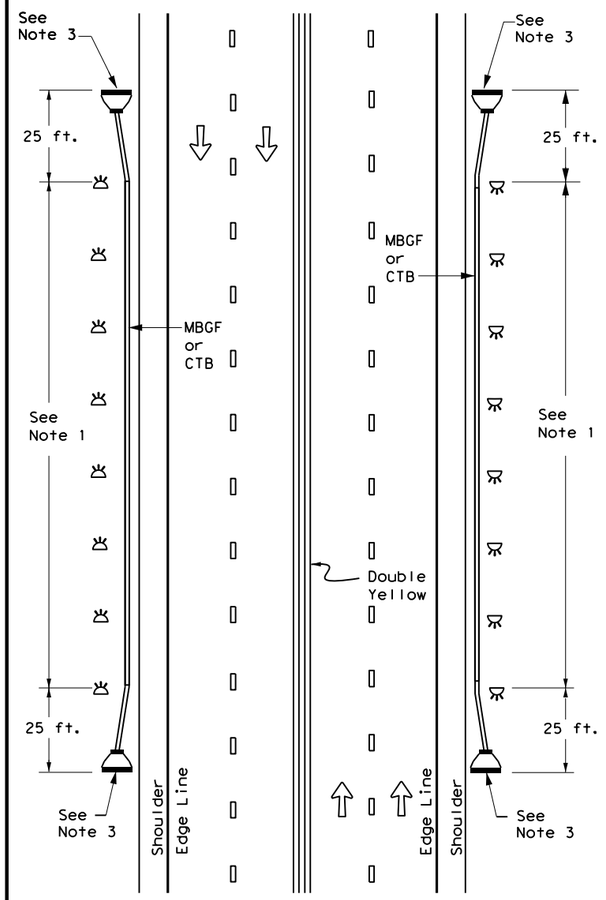
20B

DATE: 2/26/2024 7:08:23 PM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/3. Roadway/Standards/D&OM(6)-20.dgn

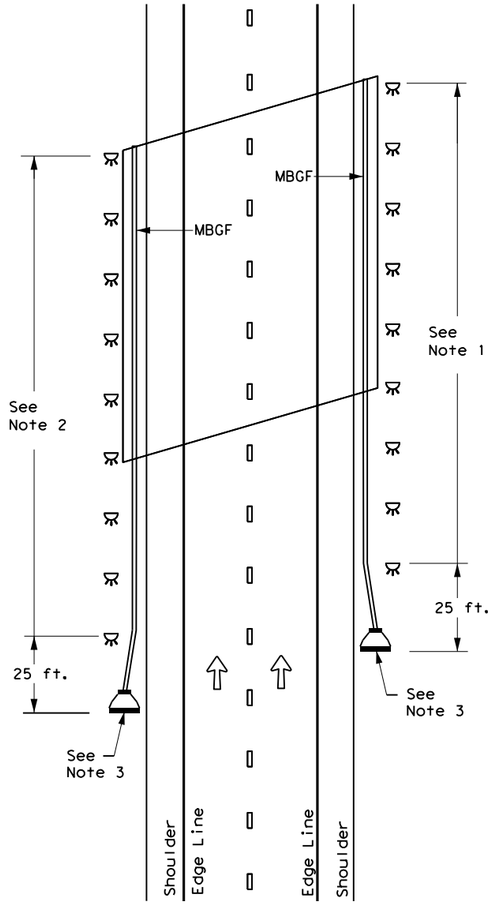
CONTINUOUS CONCRETE OR STEEL BARRIER



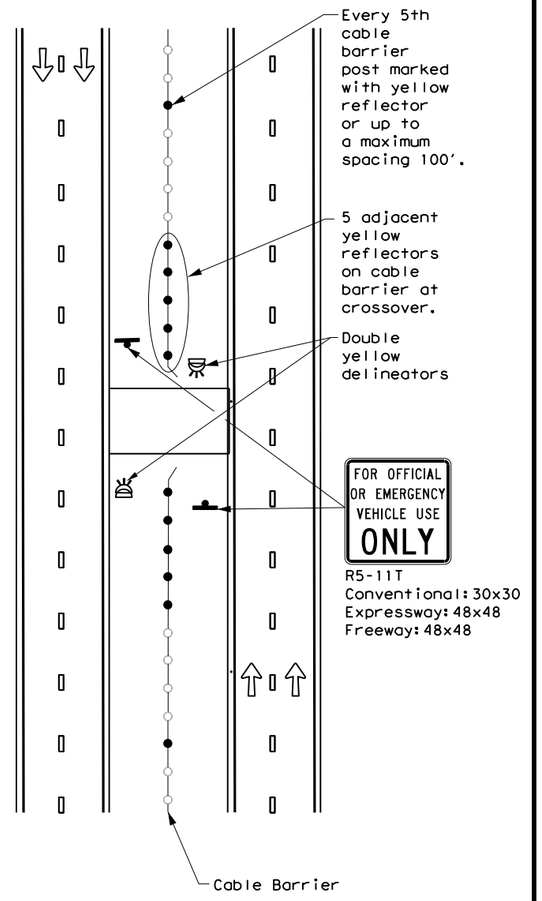
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100′ max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100′ max.)
2. Equal spacing (100′ max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

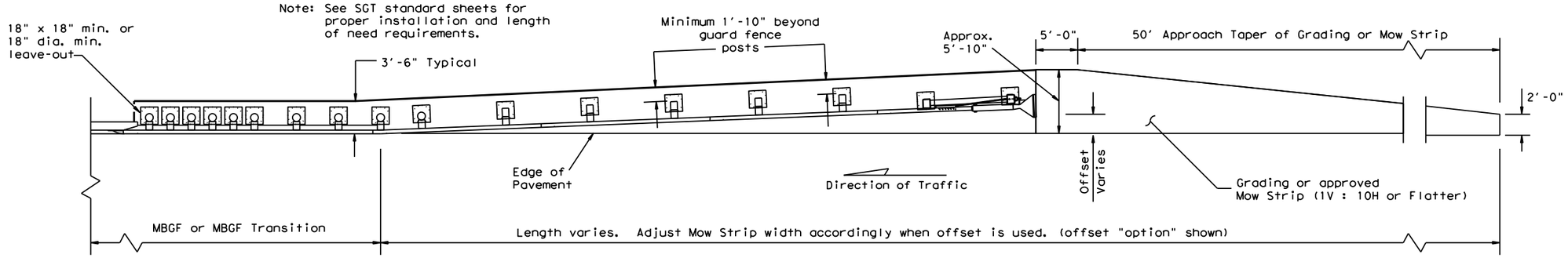
Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

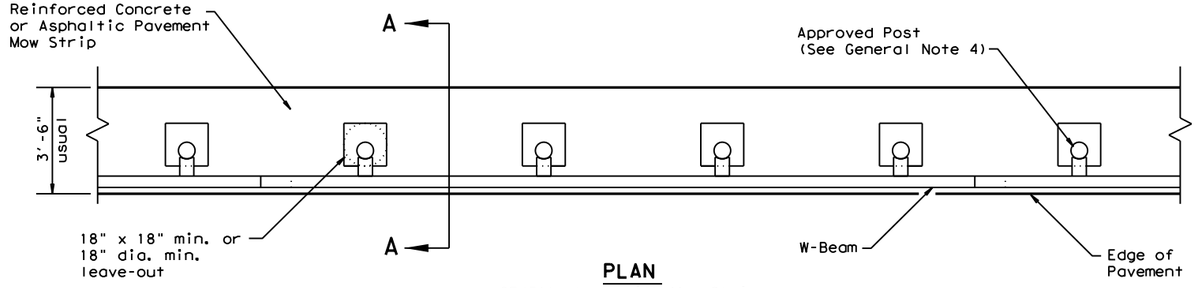
D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
7-20	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		69

DATE:
FILE:

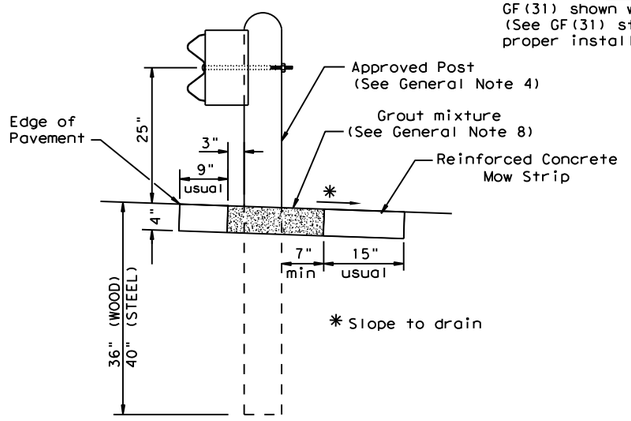


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



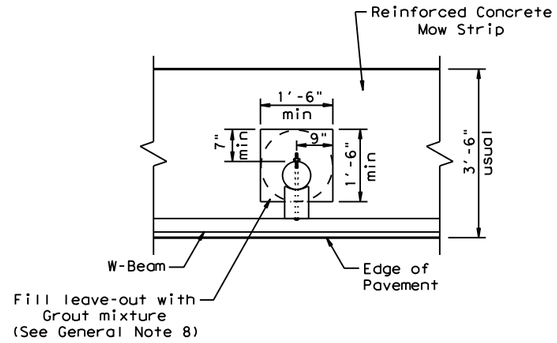
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



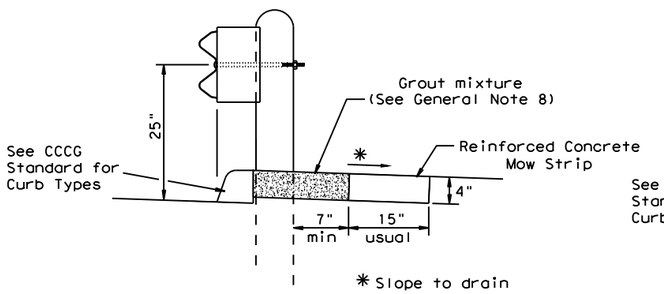
SECTION A-A

Typical



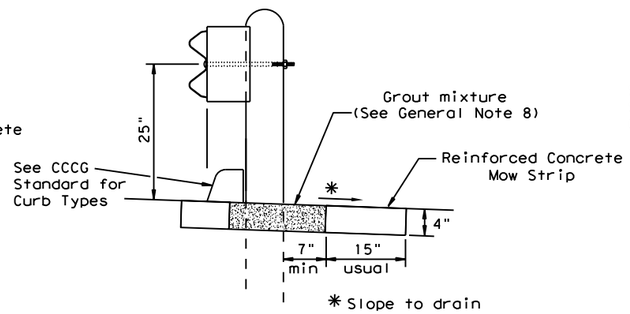
MOW STRIP DETAIL

Reinforced Concrete Mow Strip
with 18" x 18" Square or
18" Dia. minimum leave-out.



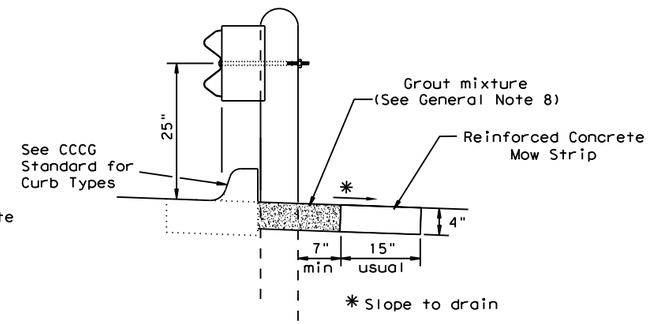
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

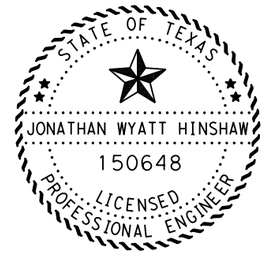
GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		70

DESIGN: JH | DRAFT: JH | CHECK: JH

RETAINING WALL NOTES

1. *CONSTRUCTION PLANS FOR RETAINING WALLS SHALL BE PROVIDED TO TXDOT SAN ANTONIO BRIDGE OFFICE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION OF RETAINING WALLS.*
2. *ALL RETAINING WALL PLAN AND PROFILE SHEETS SHOW THE FRONT OF THE WALLS.*
3. *SEE BORING LOG SHEETS FOR ADDITIONAL INFORMATION.*
4. *SEE RETAINING WALL ALIGNMENT DATA SHEET FOR INFORMATION.*
5. *SEE AESTHETIC DETAIL SHEETS FOR ADDITIONAL INFORMATION.*
6. *SEE RETAINING WALL MISCELLANEOUS DETAILS FOR INFORMATION.*
7. *FOR MSE WALL, TYPE DS BACKFILL IS REQUIRED UNLESS SHOWN OTHERWISE IN THE PLANS.*
8. *ENSURE POSITIVE DRAINAGE.*
9. *PAINTING OF PROPOSED RETAINING WALLS AS PER AESTHETIC DETAILS IS SUBSIDIARY TO ITEM 0423-6001,RETAINING WALL (MSE) AND 0423-6007, RETAINING WALL (DRILL SHAFT)(FACIA).*
10. *CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINING ANY TYPE OF WORK.*
11. *SEE PLAN LAYOUT FOR PAYMENT OF PEDESTRIAN RAIL TYPE PR3.*
12. *DO NOT INCLUDE THE TEXAS EMBLEM FOR WALL AESTHETIC.*
13. *SEE ROADWAY PLAN LAYOUT SHEETS FOR PAYMENT OF EXISTING WALL REMOVAL.*
14. *SEE ROADWAY PLAN LAYOUT SHEETS FOR PAYMENT OF TREE REMOVALS.*
15. *EXTEND TY-C MATERIAL FOR UNDERDRAIN VERTICALLY UNTIL CONTACT WITH TYPE DS BACKFILL IS MADE WITHIN RETAINING WALL LIMITS.*
16. *SEE ROADWAY PLAN LAYOUT SHEETS FOR EXCAVATION AND EMBANKMENT QUANTITIES AND PAYMENT.*
17. *SEE SHEET RW (MSE) DD AND RETAINING WALL DETAILS FOR RETAINING WALL DESIGN PARAMETERS.*
18. *PLACE UNDERDRAINS TO PROVIDE POSITIVE DRAINAGE TO THE OUTFALL. FEILD VERIFY TIE-IN ELEVATIONS AND ADJUST AS NECESSARY TO MEET THE FEILD CONDITIONS. SEE STANDARD RW (MSE) FOR HORIZONTAL PLACEMENT AND ADDITIONAL DETAILS. USE PERFORATED PIPE IN AREAS TO BE DRAINED AND USE NON-PERFORATED PIPE BETWEEN PERFORATED PIPE AND OUTFALL. UNDERDRAINS ARE SUBSIDIARY TO ITEM 0423 6001 RETAINING WALL (MSE).*



P.E. 02/26/2024

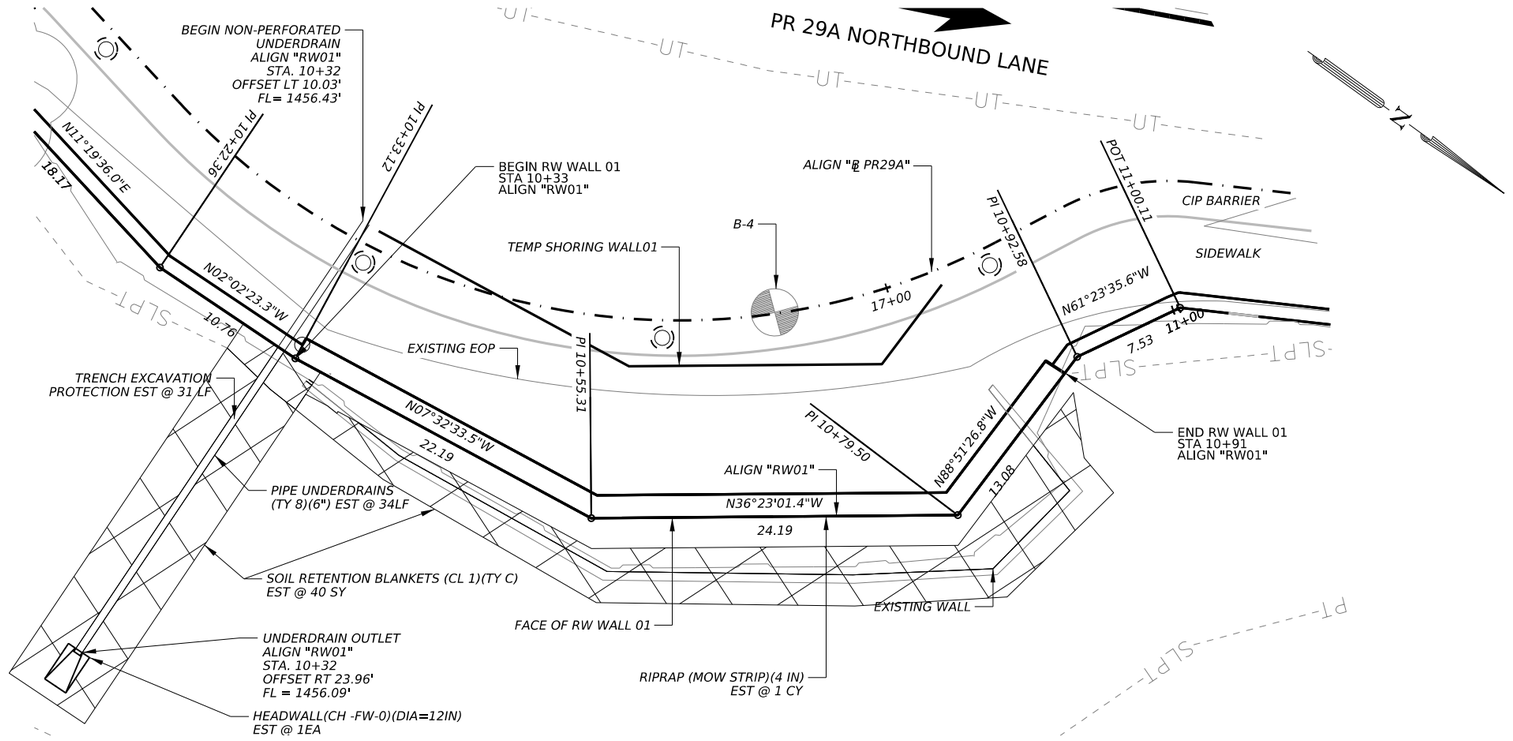
JONATHAN WYATT HINSHAW DATE

Texas Department of Transportation

PR 29A
RETAINING WALL
NOTES

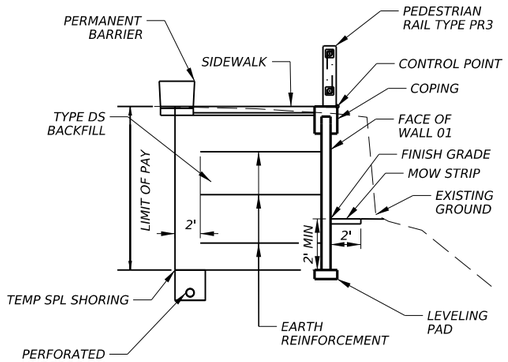
SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		71

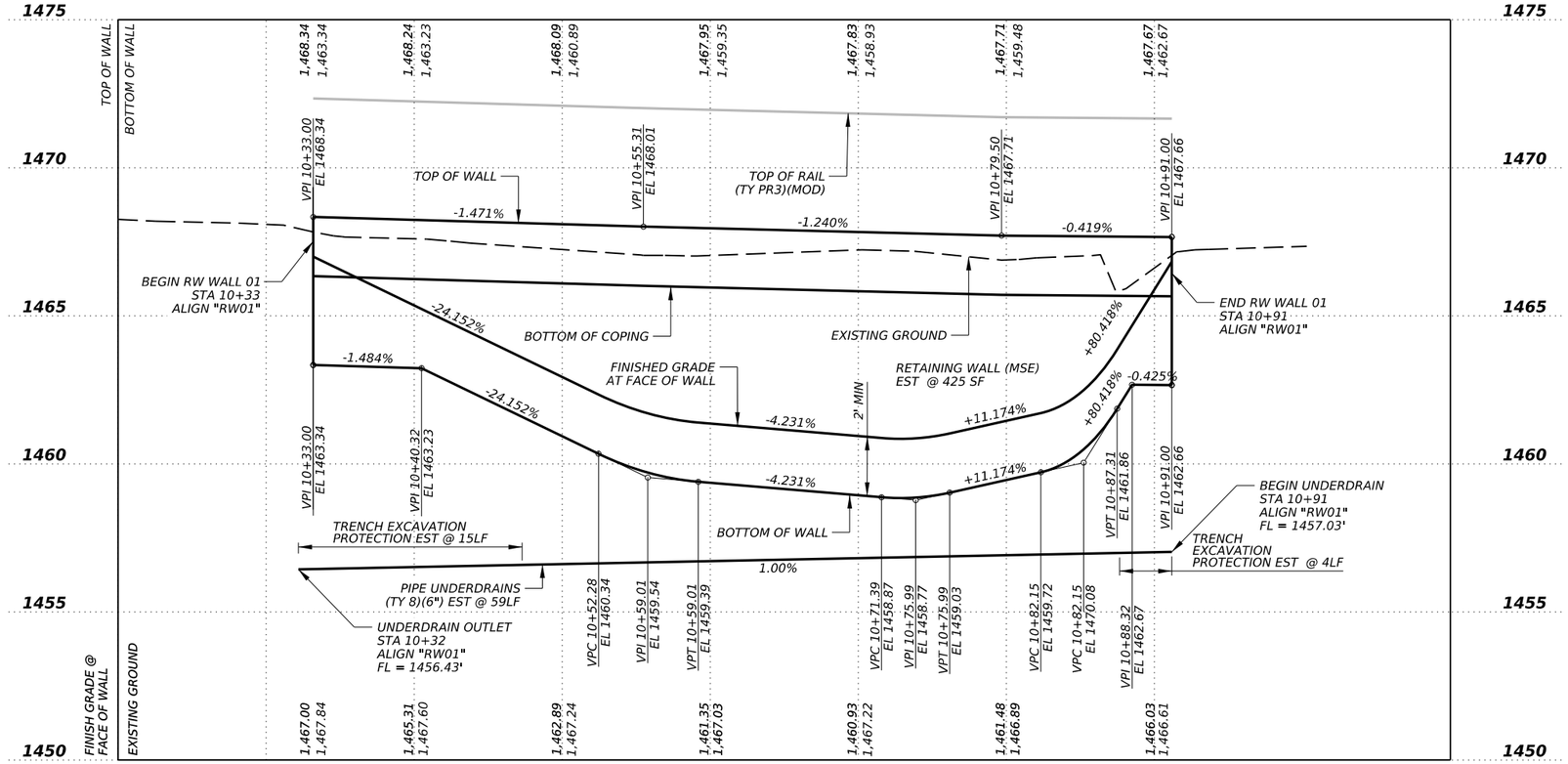


	QUANTITY SUMMARY CSJ: 0624-01-003		
ITEM NO.	ITEM	UNIT	QUANTITY
0169-6003	SOIL RETENTION BLANKETS (CL 1) (TY C)	SY	40
0402-6001	TRENCH EXCAVATION PROTECTION	LF	50
0423-6001	RETAINING WALL (MSE)	SF	425
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	1
0466-6001	HEADWALL (CH - FW - 0) (DIA= 12 IN)	EA	1
* 0556-6008	PIPE UNDERDRAINS (TY 8) (6")	LF	93

* FOR CONTRACTOR INFORMATION ONLY.



RW 01 TYPICAL SECTION
N.T.S.



STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED PROFESSIONAL ENGINEER

P.E. 02/26/2024

JONATHAN WYATT HINSHAW DATE

SCALE
HORIZONTAL: 1"=10' VERTICAL: 1"=5'

Texas Department of Transportation

PR 29A RETAINING WALL PLAN AND PROFILE WALL 01

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		72

DESIGN: JH | DRAFT: JH | CHECK: JH

2/16/2024 10:57:30 AM
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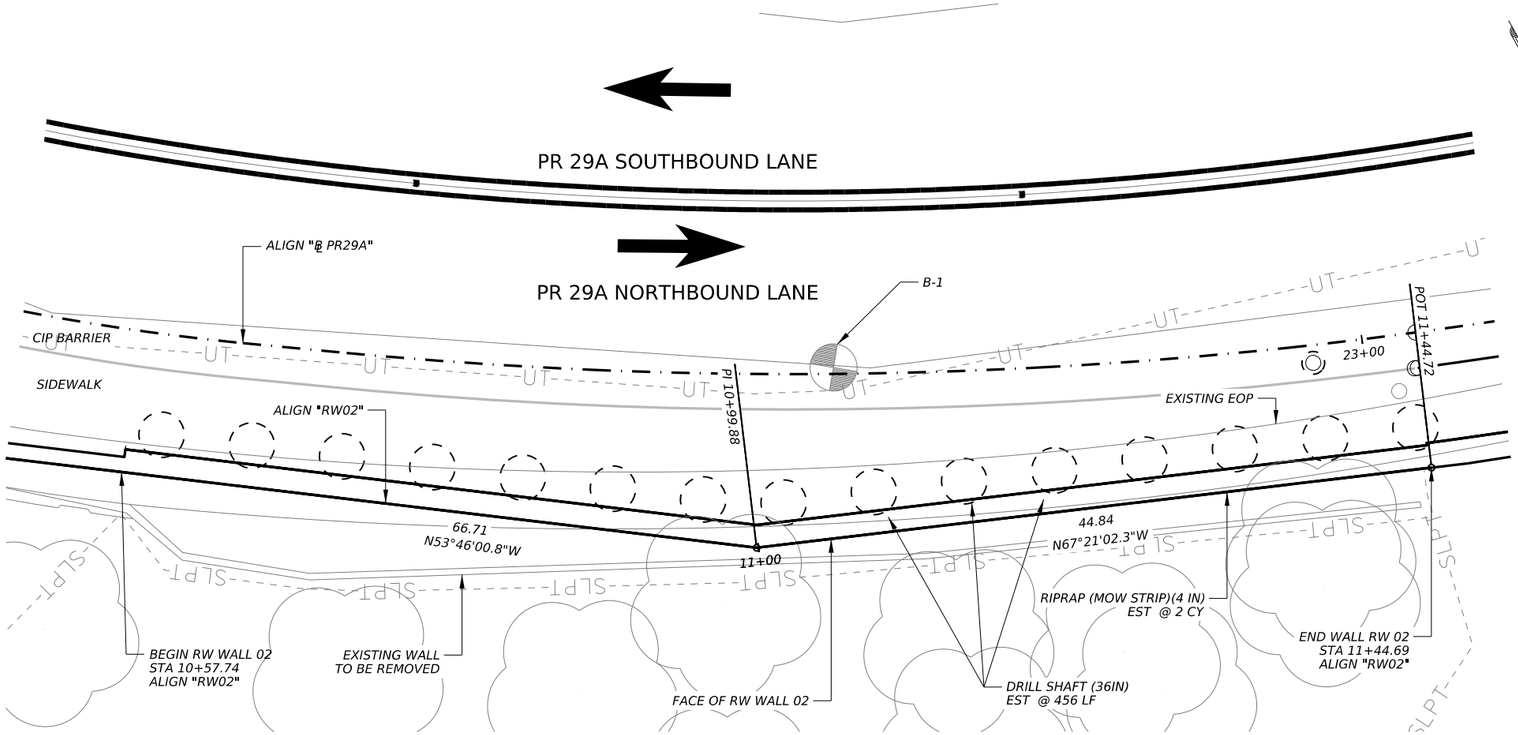
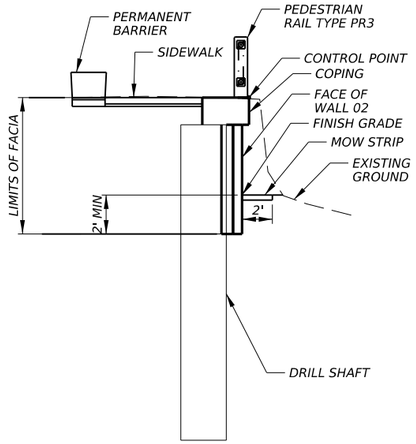
DESIGN: JH | DRAFT: JH | CHECK: JH

	QUANTITY SUMMARY CSJ: 0624-01-003		
ITEM NO.	ITEM	UNIT	QUANTITY
0416-6004	DRILL SHAFT (36 IN)	LF	456
0423-6007	RETAINING WALL (DRILL SHAFT) (FACIA)	SF	620
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	2





RW 02 TYPICAL SECTION
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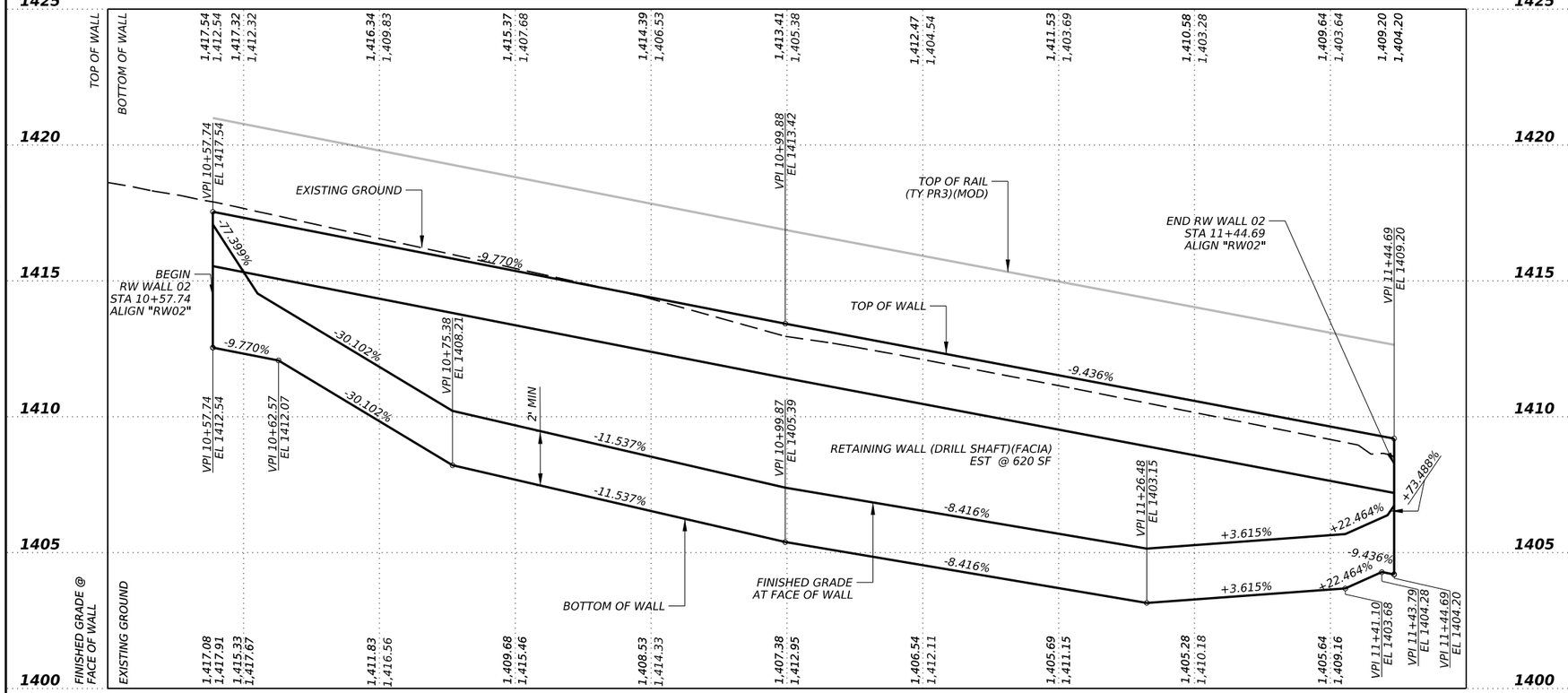

STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED PROFESSIONAL ENGINEER

P.E. 2/26/2024

JONATHAN WYATT HINSHAW DATE

SCALE
HORIZONTAL: 1"=10' VERTICAL: 1"=5'

Texas Department of Transportation

PR 29A RETAINING WALL PLAN AND PROFILE WALL 02

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		73

2/16/2024 10:53:37 AM
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DESIGN: JH | DRAFT: JH | CHECK: JH

RETAINING WALL 01

HORIZONTAL ALIGNMENT REPORT

Alignment name: WALL01
Alignment description:
Report Created: Monday, February 26, 2024
Time: 2:12:36 PM

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POT	999.819 R1	1734538.059	13764028.897
PI	1004.191 R1	1734536.848	13764033.097
Tangential Direction:	N16.092°W		
Tangential Length:	4.372		
PI	1004.191 R1	1734536.848	13764033.097
PI	1022.357 R1	1734540.416	13764050.910
Tangential Direction:	N11.327°E		
Tangential Length:	18.166		
PI	1022.357 R1	1734540.416	13764050.910
PI	1033.116 R1	1734540.033	13764061.662
Tangential Direction:	N2.040°W		
Tangential Length:	10.759		
PI	1033.116 R1	1734540.033	13764061.662
PI	1055.311 R1	1734537.119	13764083.665
Tangential Direction:	N7.543°W		
Tangential Length:	22.195		
PI	1055.311 R1	1734537.119	13764083.665
PI	1079.497 R1	1734522.772	13764103.136
Tangential Direction:	N36.384°W		
Tangential Length:	24.186		
PI	1079.497 R1	1734522.772	13764103.136
PI	1092.575 R1	1734509.696	13764103.397
Tangential Direction:	N88.857°W		
Tangential Length:	13.079		
PI	1092.575 R1	1734509.696	13764103.397
POT	1100.106 R1	1734503.085	13764107.002
Tangential Direction:	N61.393°W		
Tangential Length:	7.531		

RETAINING WALL 02

HORIZONTAL ALIGNMENT REPORT

Alignment name: WALL02
Alignment description:
Report Created: Tuesday, July 25, 2023
Time: 10:25:20 AM

	STATION	X	Y
POT	1000.000 R1	1734337.495	13764509.398
PI	1033.170 R1	1734319.909	13764537.523
Tangential Direction:	N32.018°W		
Tangential Length:	33.170		
PI	1033.170 R1	1734319.909	13764537.523
PI	1099.880 R1	1734266.099	13764576.953
Tangential Direction:	N53.767°W		
Tangential Length:	66.710		
PI	1099.880 R1	1734266.099	13764576.953
POT	1144.724 R1	1734224.714	13764594.222
Tangential Direction:	N67.351°W		
Tangential Length:	44.844		

RETAINING WALL 01

VERTICAL ALIGNMENT REPORT

Alignment name: MSE finish grade
Alignment description:
Report Created: Tuesday, November 14, 2023
Time: 1:53:03 PM

	STATION	ELEVATION
POT	1033.000 R1	1466.998
VPC	1052.277 R1	1462.342
Tangent Grade:	-0.242	
Tangent Length:	19.277	
VPC	1052.277 R1	1462.342
VPI	1055.599 R1	1461.539
PVCC	1060.494 R1	1496.364
VPT	1059.014 R1	1461.395
Radius:	-35.000	
Length:	6.737	
Entrance Grade:	-0.242	
Exit Grade:	-0.042	
VPT	1059.014 R1	1461.395
VPC	1071.394 R1	1460.871
Tangent Grade:	-0.042	
Tangent Length:	12.380	
VPC	1071.394 R1	1460.871
VPI	1073.700 R1	1460.773
PVCC	1072.663 R1	1490.844
VPT	1075.994 R1	1461.030
VLP	1072.663 R1	1460.844
Radius:	-30.000	
Length:	4.600	
Entrance Grade:	-0.042	
Exit Grade:	0.112	
VPT	1075.994 R1	1461.030
VPC	1082.155 R1	1461.718
Tangent Grade:	0.112	
Tangent Length:	6.161	
VPC	1082.155 R1	1461.718
VPI	1085.045 R1	1462.041
PVCC	1081.044 R1	1471.656
VPT	1087.311 R1	1463.864
Radius:	-10.000	
Length:	5.156	
Entrance Grade:	0.112	
Exit Grade:	0.804	
VPT	1087.311 R1	1463.864
POT	1091.000 R1	1466.830
Tangent Grade:	0.804	
Tangent Length:	3.689	

STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED
PROFESSIONAL ENGINEER

P.E. 02/26/2024

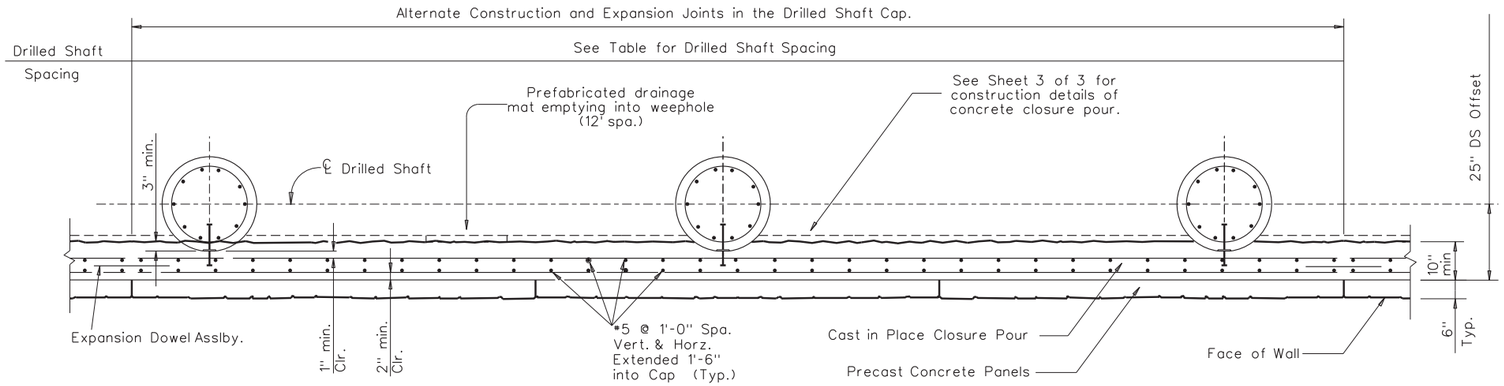
JONATHAN WYATT HINSHAW DATE

Texas Department of Transportation

PR 29A
RETAINING WALL
ALIGNMENT DATA

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		74



Expansion Joint

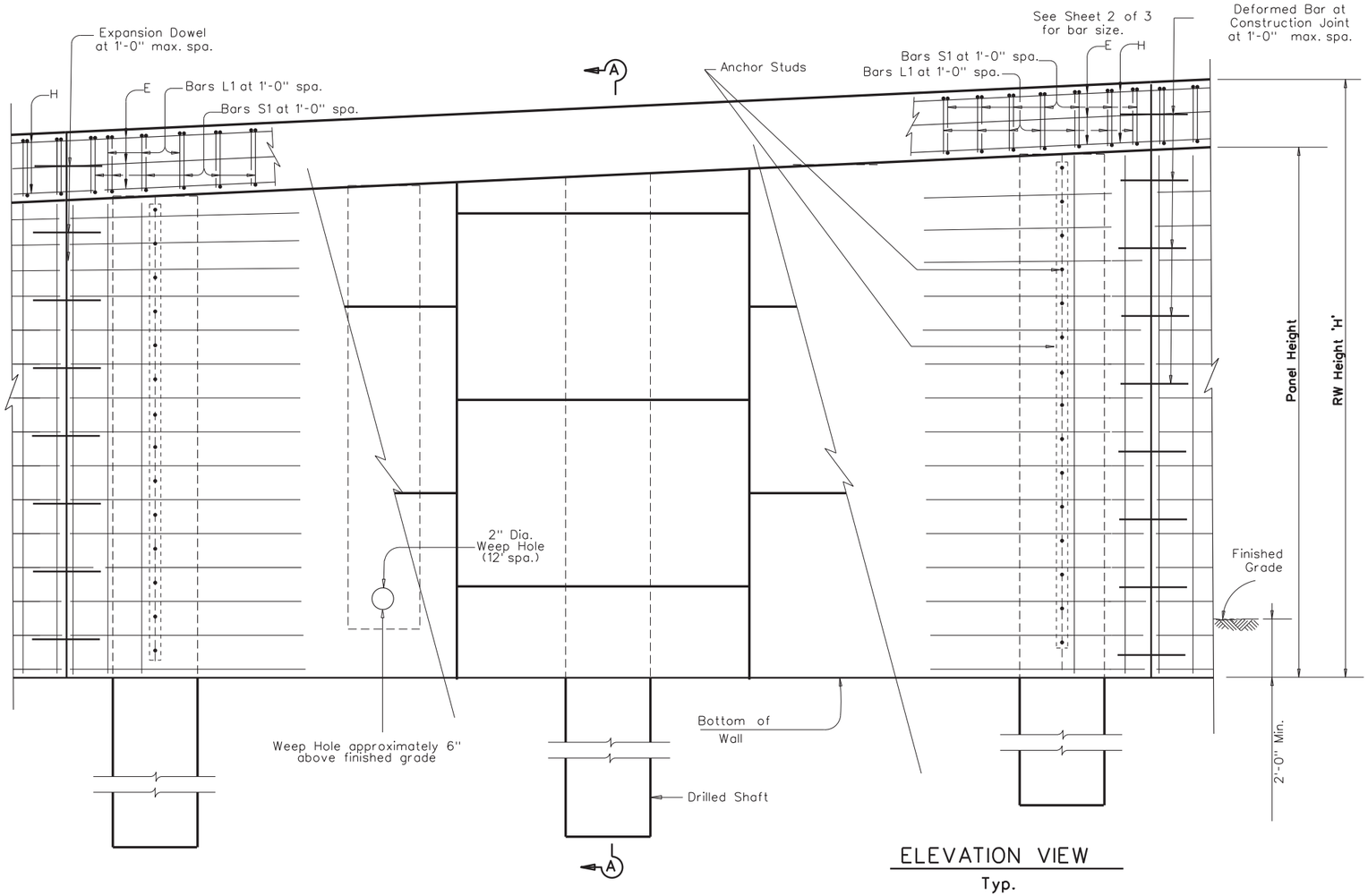
Expansion Joints shall be placed at 60 feet maximum spacing. Location of joints to correspond to edge of precast top panel.

HORIZONTAL SECTION THRU WALL

(NTS)

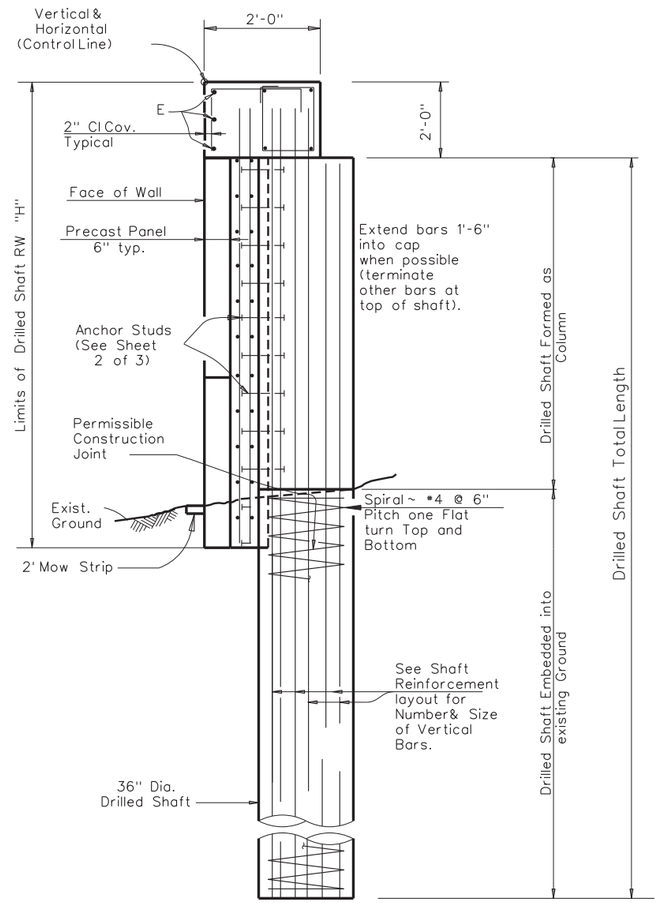
Construction Joint

Location of joints to correspond to edge of top panel.



ELEVATION VIEW

Typ.



SECTION A-A

(NTS)

SHEET 1 OF 3

STATE OF TEXAS
SHARAD R. DUMRE
142073
LICENSED PROFESSIONAL ENGINEER

Sharad Dumre

02/21/2024

Texas Department of Transportation

Bridge Division

Retaining Wall Details

RW 02

FILE:	DN:SD	CK:RE	DW:SD	CK:AB
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		75

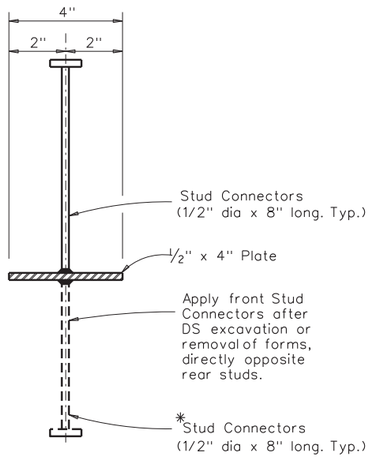
RW 02 DRILLED SHAFT DETAIL DATA

Drilled Shaft Number Range	Starting Drilled Shaft center (RW Station) (1)	Ending Drilled Shaft center (RW Station) (1)	Drilled Shaft Diameter (in)	Drilled Shaft Spacing (ft)	Drilled Shaft Length (ft)	Wall Design Height "H" (ft) (2)
1 to 3	10+60	10+72	36	6.0	28	5.0-8.0
4 to 12	10+78	11+26	36	6.0	32	8.0
13 to 15	11+32	11+44	36	6.0	28	5.0-8.0

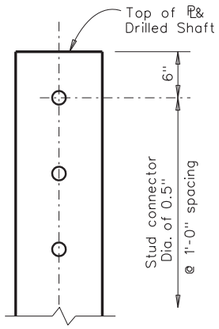
(1) Starting and Ending Drilled Shaft station is based on wall station.

(2) For Contractor's information only.

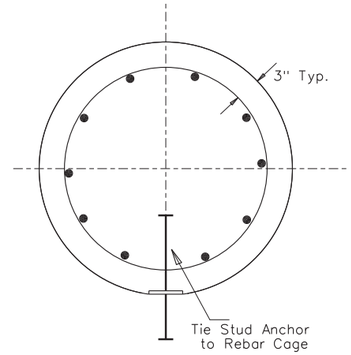
* If Drilled Shafts are misaligned, stud length shall be adjusted to provide approximately 3" cover from back of precast wall panel to the stud head.



STUD ANCHOR DETAILS

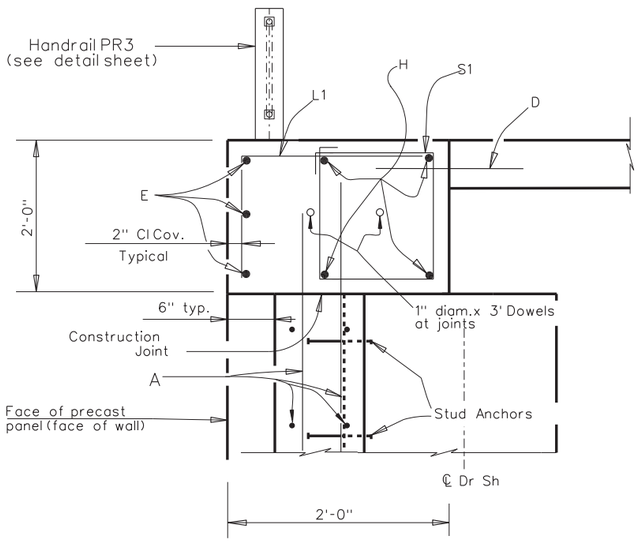


STUD CONNECTOR LOCATION DETAILS



Typical Reinforcement Layout
& Stud Anchors for Shaft
Size 36" (w/10-#9's)

SHAFT REINFORCEMENT LAYOUT

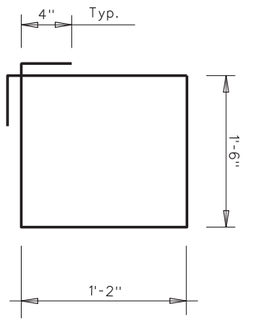


Bar Sizes

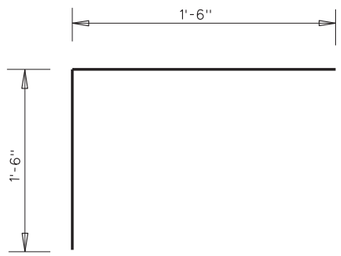
A	#5
E	#4
H	#6
L1	#4 @ 12" Spacing
S1	#4 @ 12" Spacing
D	#5 @ 12" Spacing

CAP DETAIL (NTS)

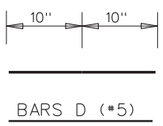
NOTE: Provide two dowels in Cap at construction and expansion joints. See construction and expansion joint details. Cap dowels are longer than the dowels in closure pour.



BARS S1 (#4)



BARS L1 (#4)



BARS D (#5)

WORKING DRAWINGS:

Prior to beginning work the Contractor shall submit to the Engineer the Precast Panel Supplier's details and procedures for Panel/c.i.p. wall connection for approval by the Engineer.

Panel layout may be modified as necessary to accommodate wall suppliers panels and meet the minimum embedment criteria of 2.0 feet. Contractor will not be compensated for additional square feet area generated from these modifications.

GENERAL NOTES:

All Concrete to be Class C.

All Reinforcing Steel to be Grade 60. All Structural Steel including casing shall conform to ASTM A572, Grade 50.

It is the Contractor's responsibility to maintain the stability of the opening for the drilled shafts throughout the duration of installation.

Drilled shaft precast panel to match park aesthetics requirement. Refer to aesthetic sheet for details.

At all times during construction, tree and rock along slope is to be maintained & ensure the stability of slope.

Cap, Stud anchors, closure pour, associated reinforcement and hardware are subsidiary to Item 423 Retaining Walls.

Front stud anchors shall be field welded. Weld shall be complete fusion fillet welds along full stud perimeter. Work will be subsidiary to Item 423.

Closure pour joints shall be located at least 1 foot from drilled shaft anchors.

STATE OF TEXAS
SHARAD R. DUMRE
142073
LICENSED PROFESSIONAL ENGINEER

Sharad Dumre

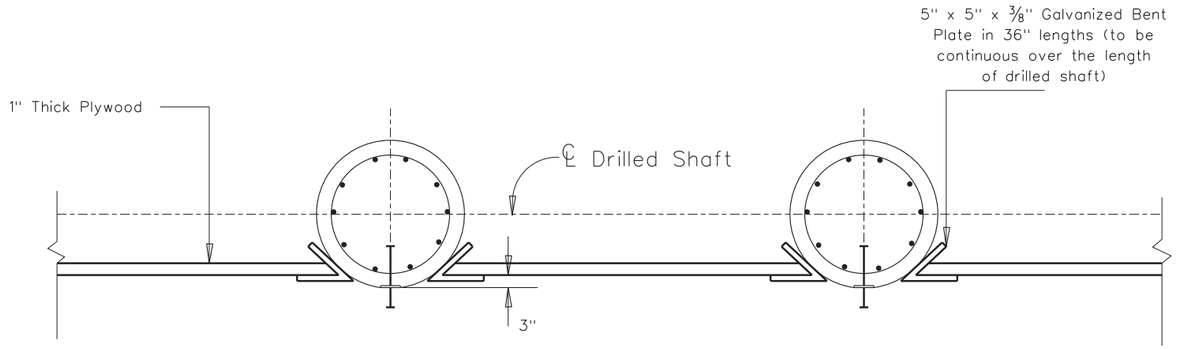
02/21/2024

Texas Department of Transportation | Bridge Division

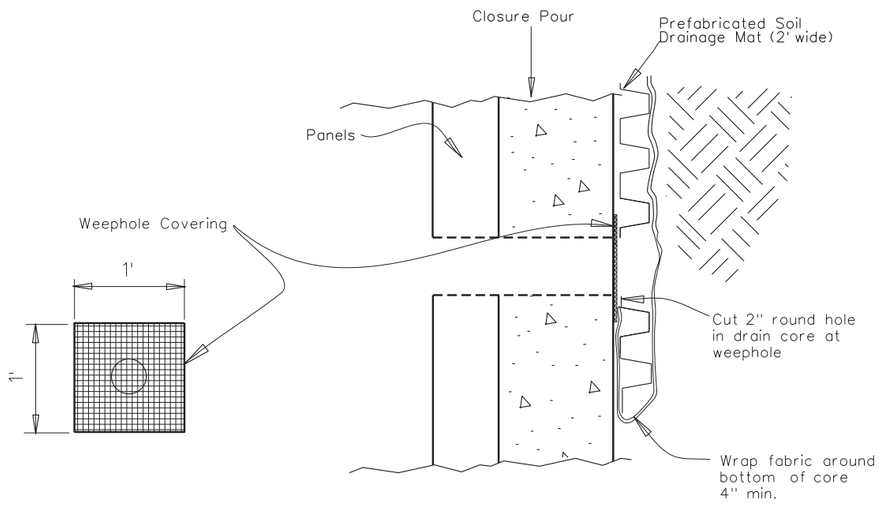
Retaining Wall Details

RW 02

FILE:	DN:SD	CK:RE	DW:SD	CK:AB
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		76

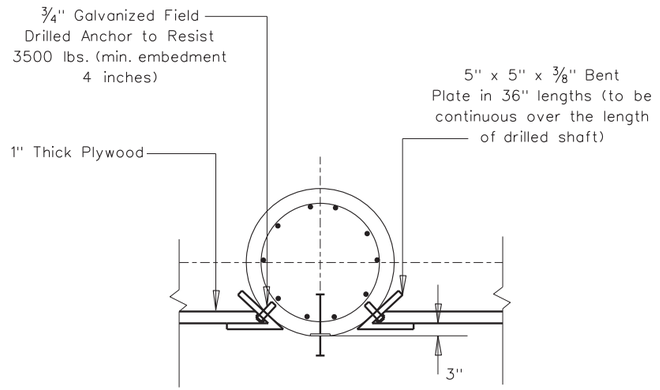


HORIZONTAL SECTION THRU WALL DURING CONSTRUCTION (NTS)

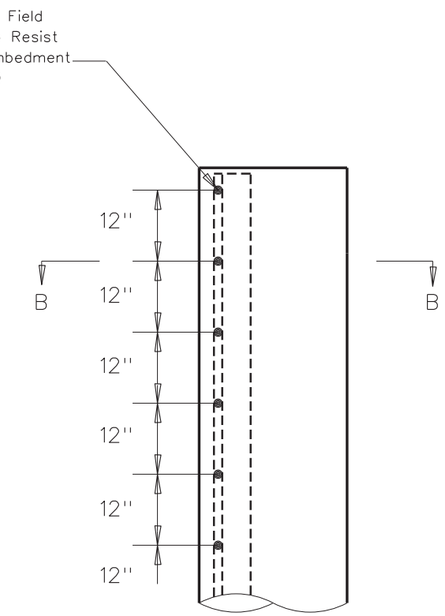


WEEPHOLE DETAIL (NTS)

(maximum weep hole c/c spacing is 12 feet)

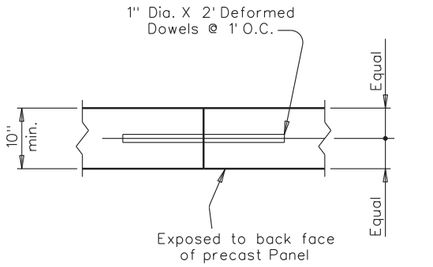


SECTION B-B

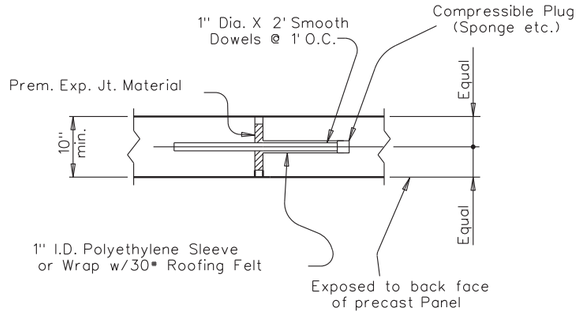


DETAIL B

(Section thru drilled shaft showing anchor spacing)



TYPICAL CONSTRUCTION JOINT DETAIL



EXPANSION JOINT

STATE OF TEXAS
SHARAD R. DUMRE
142073
LICENSED PROFESSIONAL ENGINEER

Sharad Dumre

02/21/2024

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division

Retaining Wall Details

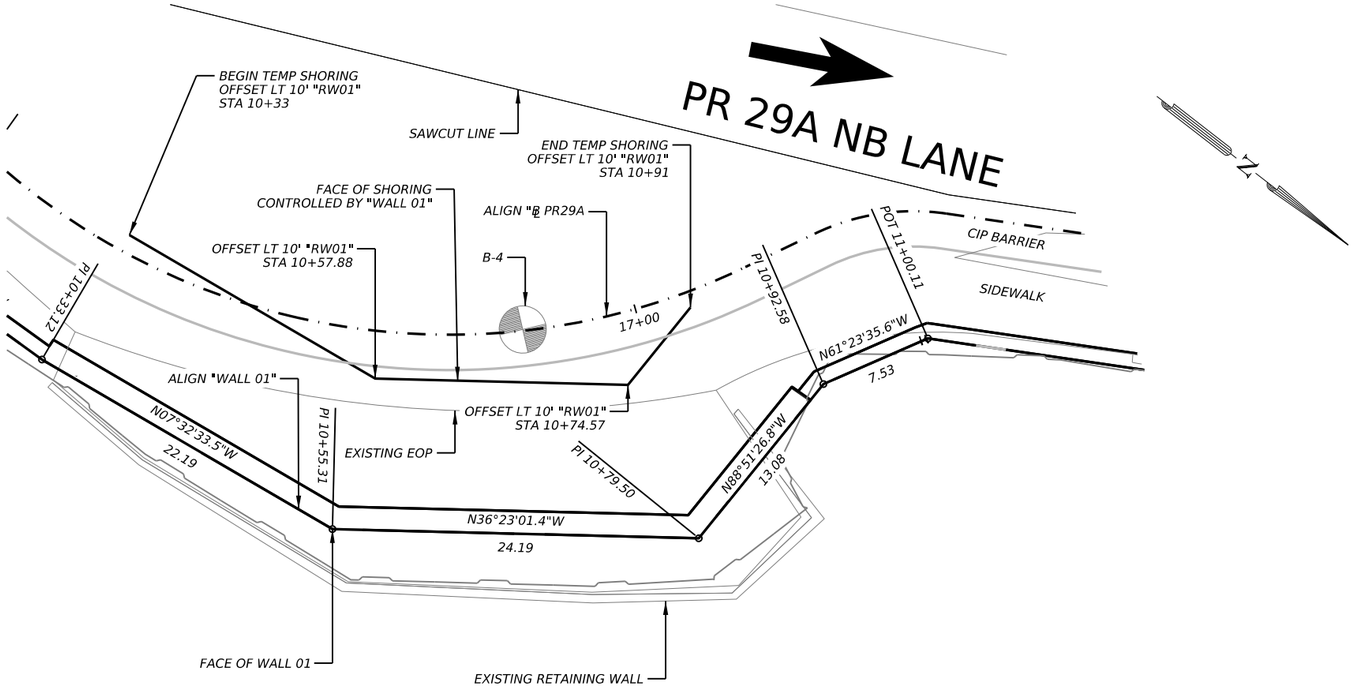
RW 02

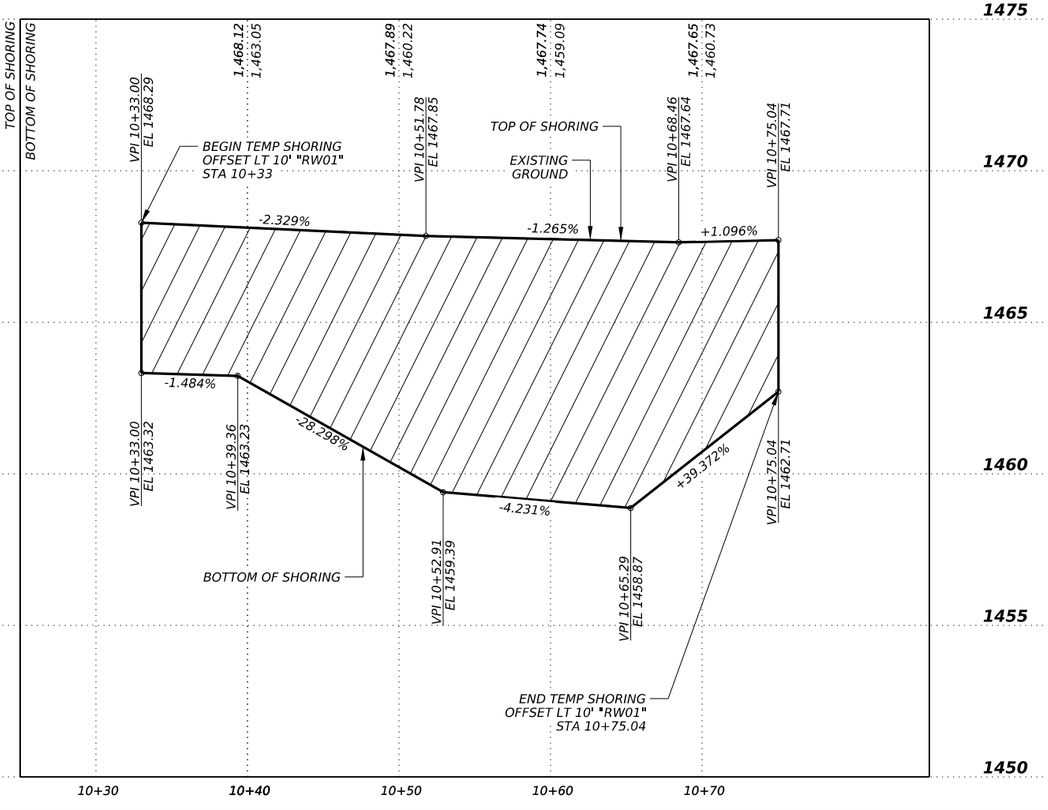
FILE:	DN:SD	CK:RE	DW:SD	CK:AB
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		77

DESIGN: JH | DRAFT: JH | CHECK: JH

- Design/Plan Set/4. Wall/PR0029*P&P*WALL01*SHORING*.dgn

2/16/2024 11:13:26 AM
pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/4. Wall/PR0029*P&P*WALL01*SHORING*.dgn

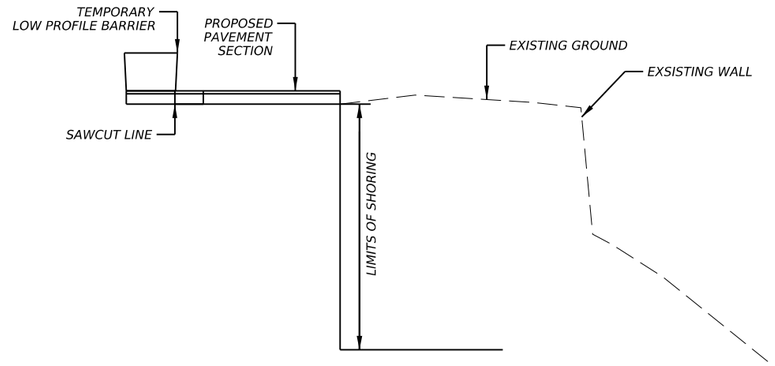




QUANTITY SUMMARY CSJ: 0624-01-003

ITEM NO.	ITEM	UNIT	QUANTITY
0403-6001	TEMPORARY SPL SHORING	SF	296

NOTES:
1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR GEOMETRIC DATA.
2. SEE ROADWAY PLAN LAYOUTS FOR EXISTING WALL REMOVAL PAYMENT.



TMP RW01 TYPICAL SECTION

N.T.S.

PLAN LEGEND

LIMITS OF SHORING

STATE OF TEXAS
JONATHAN WYATT HINSHAW
150648
LICENSED PROFESSIONAL ENGINEER

JONATHAN WYATT HINSHAW P.E. 02/26/2024
DATE

SCALE
HORIZONTAL: 1"=10' VERTICAL: 1"=5'

Texas Department of Transportation

PR 29A TEMPORARY WALL PLAN AND PROFILE WALL 01

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		78

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-1	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/22/23
CSJ	0624-01-003	Station	22+64.84	Grnd. Elev.	1416.00 ft
		Offset	RT 0.5'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
1415.6			PAVEMENT, 5" Asphaltic Concrete.							
			SAND, slightly compact, slightly moist, tan and brown, clayey, with gravel and asphalt fragments. [Fill] (SC)							SS: 13-13-12
										SS: 7-8-13
						4	34	13		Passing No. 200 Sieve = 24%
										SS: 13-17-15
						4.1				
		13 (6) 20 (6)								
5										
										SS: 8-7-5
1408.5						6.9				Passing No. 200 Sieve = 38%
			SAND, slightly compact to compact, brown to tan, clayey with asphalt fragments and gravel. [Fill] (SC)							SS: 8-13-10
						2.7				
		20 (6) 24 (6)								
10										SS: 2-25-24
1401.0		21 (6) 29 (6)								
15			GRAVEL, compact to slightly compact, slightly moist, tan and brown, clayey with sand and limestone fragments, calcareous. [Quaternary Deposits] (GC)							SS: 9-26-38
										Sulfate = 586 ppm
						3				Passing No. 200 Sieve = 29%
		16 (6) 18 (6)								
20										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 25' and from 35' to 60', Rock Coring between 25' and 35'. No Groundwater encountered during drilling.

(Northing, Easting: 13762238.258, 1733945.038). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-1	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/22/23
CSJ	0624-01-003	Station	22+64.84	Grnd. Elev.	1416.00 ft
		Offset	RT 0.5'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			GRAVEL, compact to slightly compact, slightly moist, tan and brown, clayey with sand and limestone fragments, calcareous. [Quaternary Deposits] (GC)							SS: 8-13-14
1391.0		50 (4.5) 50 (0.3)								
25			LIMESTONE, soft, tan, moderately to highly weathered, moderately to highly fractured, with chert and trace calcite. [Glen Rose]							RUN: 25'-30'
				0	2609	1.2			155.4	REQ: 43%, RQD: 33%
1386.0		50 (3) 50 (2)								
30			LIMESTONE, soft, tan and brown, highly weathered, highly fractured, with clay layers, chert and ledges of limestone. [Glen Rose]							RUN: 30'-35'
										REQ: 12%, RQD: 0%
1381.0		36 (6) 45 (6)								
35			LIMESTONE, soft, tan, highly weathered, with clay layers and iron stains. [Glen Rose]			0.4				Passing No. 200 Sieve = 3%
										SS: 33-50/4"
										partially cemented lean clay layers from 35' to 40'
		50 (4.5) 50 (4)								
40										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 25' and from 35' to 60', Rock Coring between 25' and 35'. No Groundwater encountered during drilling.

(Northing, Easting: 13762238.258, 1733945.038). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

STATE OF TEXAS
LEO RUIZ
97291
REGISTERED
PROFESSIONAL ENGINEER

12/26/2023

HVJ ASSOCIATES
4201 Freidrich Lane, Suite 110
Austin, Texas 78744
512-447-9081 Ph
512-443-3442 Fax
Texas Firm Registration No. F-18091

Texas Department of Transportation

PR 29A GEOTECHNICAL BORE DATA

SHEET: 1 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		79

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-1	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/22/23
CSJ	0624-01-003	Station	22+64.84	Grnd. Elev.	1416.00 ft
		Offset	RT 0.5'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			LIMESTONE, soft, tan, highly weathered, with clay layers and iron stains. [Glen Rose]							SS: 39-50/6"
										significant clay from 40' to 45' with limestone fragments
45		50 (3) 49 (6)				14				Passing No. 200 Sieve = 18% completely weathered with occasional higly weathered limstone below 45'
										SS: 14-16-13
50		16 (6) 14 (6)				12.4				SS: 13-23-12
1361.0		30 (6) 26 (6)				21.5	37	21		
55			**CLAY, very stiff to stiff, moist, dark gray, lean, with completely weathered limestone fragments. [Infill Soil] (CL)**							SS: 4-6-10
1356.0		15 (6) 17 (6)				17.6				
60										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 25' and from 35' to 60', Rock Coring between 25' and 35'. No Groundwater encountered during drilling.

(Northing, Easting: 13762238.258, 1733945.038). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore **Logger:** CP **Organization:** HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-2	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/21/23
CSJ	0624-01-003	Station	20+59.34	Grnd. Elev.	1437.00 ft
		Offset	RT 6.85'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
1436.7			**PAVEMENT, 4" Asphaltic Concrete.**							SS: 27-28-28
			CLAY, stiff, moist, tan and brown, lean, sandy, with trace gravel. [Quaternary Deposits] (CL)							SS: 13-13-15
										SS: 13-28-14
1432.0		13 (6) 13 (6)				9.1				Passing No. 200 Sieve = 21%
5			**GRAVEL, slightly compact, moist, tan and brown, clayey with sand. [Quaternary Deposits] (GC)**							SS: 20-17-21
						3.9	28	5		
										SS: 15-18-18
1427.0		31 (6) 26 (6)				9				Passing No. 200 Sieve = 44%
10			**SAND, compact, moist, tan and brown, clayey with gravel, partially cemented. [Quaternary Deposits] (SC)**							17-18-34
						7.3				
1422.0		44 (6) 50 (6)				8.9				Passing No. 200 Sieve = 55%
15			**CLAY, hard, slightly moist, light brown, lean, sandy, with limestone fragments, partially cemented. [Quaternary Deposits] (CL)**							SS-17-18-21
1417.0		40 (6) 50 (4)								possible limestone at 20'
20										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, Air Rotary from 0' to 20'. No Groundwater encountered during drilling.

(Northing, Easting: 13762074.228, 1734065.728). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore **Logger:** CP **Organization:** HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

STATE OF TEXAS
LEO RUIZ
97291
REGISTERED PROFESSIONAL ENGINEER

12/26/2023

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512-443-3442 Fax
Texas Firm Registration No. F-18091

Texas Department of Transportation

PR 29A GEOTECHNICAL BORE DATA

SHEET: 2 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		80

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-3	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/23/23
CSJ	0624-01-003	Station	18+72.80	Grnd. Elev.	1466.00 ft
		Offset	RT 5.85'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
1465.4			PAVEMENT, 1" Asphaltic Concrete over 3" Base.							
			LIMESTONE, hard, tan, highly weathered, completely fractured, predominantly gravel size due to weathering. [Glen Rose]							SS: 50/6"
1462.5			LIMESTONE, hard, tan, highly weathered. [Glen Rose]							SS: 50/3"
5		50 (2) 50 (1)				4.8				Passing No. 200 Sieve = 19% SS: 50/3"
						4.7				SS: 50/2.5"
10		50 (2.5) 50 (1.8)				5.5				SS: 50/3"
15		50 (1.5) 50 (1.3)				6				SS: 50/2.5"
1446.0										
20		50 (2) 50 (1)								

Remarks: SS: Split Spoon Sampling with 170-lb hammer, Air Rotary from 0' to 20'. No Groundwater encountered during drilling.

(Northing, Easting: 13761904.699, 1734135.851). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-4	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/23/23
CSJ	0624-01-003	Station	16+92.24	Grnd. Elev.	1472.00 ft
		Offset	RT 0.1'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
1471.4			PAVEMENT, 1" Asphaltic Concrete over 4" Base.							
			GRAVEL, loose to slightly compact, light brown to gray, sandy with clay. [Quaternary Deposits] (GP-GC)							SS: 6-6-6
						9.4				SS: 4-5-9
										SS: 4-10-15
1467.0		6 (6) 7 (6)				6.6				
5			CLAY, soft, brown, lean, sandy with gravel. [Quaternary Deposits] (CL)							SS: 50/5"
						8.6				Passing No. 200 Sieve = 55%
1464.0			LIMESTONE, hard, tan, moderately to highly weathered, highly fractured, with interbedded clay seams and iron stains. [Glen Rose]							SS: 50/2"
10		50 (2) 50 (1)								RUN: 10'-15' REQ: 23%, RQD: 0%
1457.0		50 (5) 50 (5)				0.1				
15			LIMESTONE, soft to very hard, tan and brown, highly weathered, with interbedded completely weathered layers. [Glen Rose]							SS: 12-19-36 completely weathered to abundantly fragmented from 16' to 20' Passing No. 200 Sieve = 38%
						3.2				
1452.0		41 (6) 50 (5)								
20										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 25', Rock Coring between 25' and 65'. No Groundwater encountered during drilling.

(Northing, Easting: 13761744.880, 1734223.198). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

STATE OF TEXAS
LEO RUIZ
97291
REGISTERED
PROFESSIONAL ENGINEER

12/26/2023

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512-443-3442 Fax
Texas Firm Registration No. F-18091

Texas Department of Transportation

PR 29A GEOTECHNICAL BORE DATA

SHEET: 3 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		81

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-4	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/23/23
CSJ	0624-01-003	Station	16+92.24	Grnd. Elev.	1472.00 ft
		Offset	RT 0.1'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	Properties LL	Properties PI	Properties Wet Den. (pcf)	Additional Remarks
			LIMESTONE, soft to very hard, tan and brown, highly weathered, highly fragmented, with interbedded completely weathered layers. [Glen Rose]							SS: 27-50/3" no recovery at 21'
1447.0		50 (0.5) 50 (0)								
25			**LIMESTONE**, very hard, tan and brown, highly weathered, highly fragmented, with interbedded clay and chert layers and iron stains. [Glen Rose]							RUN: 25'-30' REQ: 50%, RQD: 0%
						8.6				Sulfate = 920 ppm
30		50 (0.1) 50 (0)								RUN: 30'-35' REQ: 73%, RQD: 0%
						6				predominantly fragmented due to weathering between 30' and 40'
35		50 (0.1) 50 (0)								RUN: 35'-40' REQ: 28%, RQD: 0%
1432.0		50 (0.5) 50 (0.3)								
40										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 25', Rock Coring between 25' and 65'. No Groundwater encountered during drilling.

(Northing, Easting: 13761744.880, 1734223.198). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvjalgint\hg21 10082.gpj

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-4	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/23/23
CSJ	0624-01-003	Station	16+92.24	Grnd. Elev.	1472.00 ft
		Offset	RT 0.1'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	Properties LL	Properties PI	Properties Wet Den. (pcf)	Additional Remarks
			LIMESTONE, very hard, tan and brown, moderately to highly weathered, moderately to highly fractured, with interbedded clay layers and iron stains. [Glen Rose]			5.4				RUN: 55'-60' REQ: 92%, RQD: 50% occasional interbedded soft layers
45		50 (0.3) 50 (0.1)				10.3				Passing No. 200 Sieve = 63% RUN: 45'-50' REQ: 100%, RQD: 10%
50		50 (0.8) 50 (0.3)				10.2				RUN: 50'-55' REQ: 85%, RQD: 7%
55		50 (0.3) 50 (0.1)				9.1				RUN: 55'-60' REQ: 40%, RQD: 7%
1412.0		50 (0.1) 50 (0)								
60										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 25', Rock Coring between 25' and 65'. No Groundwater encountered during drilling.

(Northing, Easting: 13761744.880, 1734223.198). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvjalgint\hg21 10082.gpj

STATE OF TEXAS
LEO RUIZ
97291
REGISTERED PROFESSIONAL ENGINEER

12/26/2023

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Texas Firm Registration No. F-18091

Texas Department of Transportation

PR 29A GEOTECHNICAL BORE DATA

SHEET: 4 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		82

DESIGN: JH | DRAFT: JH | CHECK: JH

dw:///txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/062401003/4 - Design/Plan Set/4. Wall/PR0029*WALL*GEOTECH*LOGS*4.dgn
12/22/2023 11:20:19 AM

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-4	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/23/23
CSJ	0624-01-003	Station	16+92.24	Grnd. Elev.	1472.00 ft
		Offset	RT 0.1'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	Properties LL	Properties PI	Properties Wet Den. (pcf)	Additional Remarks
			LIMESTONE, very hard to soft, tan, highly weathered, highly fractured, with interbedded clay seams and iron stains. [Glen Rose]			10.4				RUN: 60'-65'
										REQ: 40%, RQD: 0% predominantly fragmented below 60' due to complete weathering
65		47 (6) 50 (5)								
										SS: 8-50/5"
						9.4				Passing No. 200 Sieve = 41%
1402.0		50 (4.5) 50 (3)								
70										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 25', Rock Coring between 25' and 65'. No Groundwater encountered during drilling.

(Northing, Easting: 13761744.880, 1734223.198). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

DRILLING LOG

WinCore Version 3.1

County	Uvalde	Hole	B-5	District	San Antonio
Highway	PR 29 (Garner State Park)	Structure	Retaining Wall	Date	03/22/23
CSJ	0624-01-003	Station	14+55.77	Grnd. Elev.	1476.00 ft
		Offset	RT 5.5'	GW Elev.	N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	Properties LL	Properties PI	Properties Wet Den. (pcf)	Additional Remarks
1475.4			PAVEMENT, 1" Asphaltic Concrete over 4" Base.							SS: 50/3"
			LIMESTONE, hard to very hard, tan, highly weathered, highly fractured, with interbedded clay layers. [Glen Rose]							SS: 50/2"
										SS: 50/2.5"
5		50 (1) 50 (0)								SS: 50/2"
										completely weathered layer from 7' to 10'
						7.1				Passing No. 200 Sieve = 34%
										SS: 50/1"
1466.0		50 (0.1) 50 (0.1)								
10			LIMESTONE, very hard to hard, tan to light brown, moderately weathered, moderately to highly fractured, with interbedded clay seams. [Glen Rose]							RUN: 10'-15'
										REQ: 58%, RQD: 38%
15		50 (0.3) 50 (0.1)								
						4.6				RUN: 15'-20'
										REQ: 67%, RQD: 0%
1456.0		50 (2.5) 50 (2)								
20										

Remarks: SS: Split Spoon Sampling with 170-lb hammer, REQ: Recovery, RQD: Rock Quality Designation, Air Rotary from 0' to 10', Rock Coring between 10' and 20'. No Groundwater encountered during drilling.

(Northing, Easting: 13761533.434, 1734309.267). Surface elevation estimated from Google Earth.

Driller: Texas Geo-Bore Logger: CP Organization: HVJ SCTX

\\central\dfs\hvjcomp_data\franchise\hvj shared common\austin\austin projects\2021\2023sg_hg 21 10082.6 txdot san antonio (#4697) pr 29 gsp, uvalde co. hvja\gint\hg21 10082.gpj

STATE OF TEXAS
LEO RUIZ
97291
REGISTERED PROFESSIONAL ENGINEER

12/26/2023

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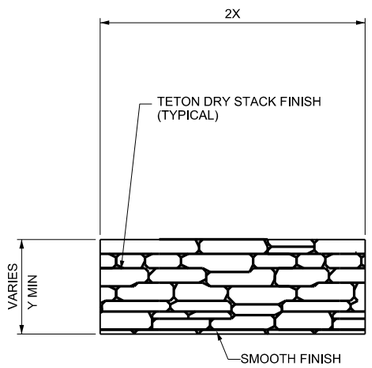
Texas Firm Registration No. F-18091

Texas Department of Transportation

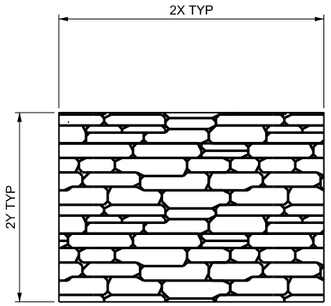
PR 29A GEOTECHNICAL BORE DATA

SHEET: 5 OF 5

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		83



Type A NTS



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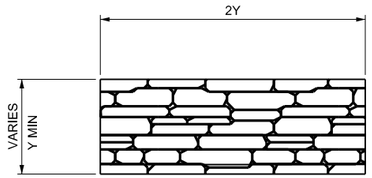
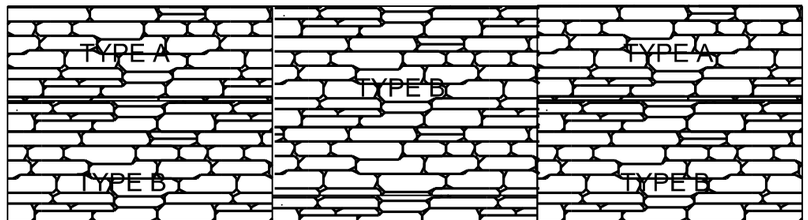


Type J NTS



Elevation NTS

NOTES:

1. PROVIDE THREE VARIATIONS OF THE TETON DRY STACK FINISH TO ACHIEVE A RANDOM EFFECT.
2. REFER TO TXDOT STANDARD 'RW(MSE)-MECHANICALLY STABILIZED EARTH RETAINING WALL' FOR PANEL DIMENSIONS.
3. KEEP VARIABLE DISTANCE FROM WALL COPING OR FINISH GRADE CONSISTENT WITHIN AN INDIVIDUAL WALL.

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED
PROFESSIONAL ENGINEER

Deyton Riddle P.E. 02/26/2024
DEYTON RIDDLE DATE

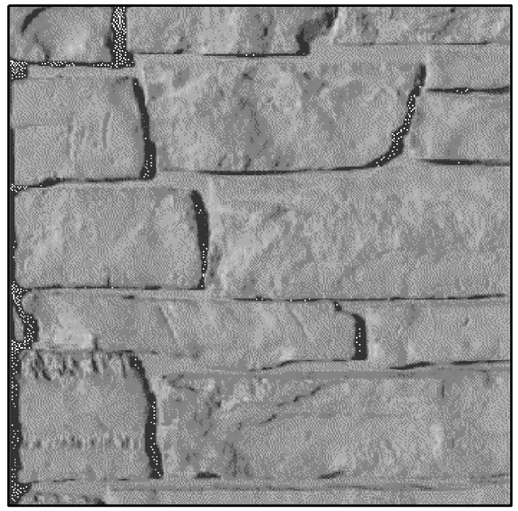
Texas Department of Transportation

PR 29A

HILL COUNTRY REGION RETAINING WALL PANEL TYPES

SAN ANTONIO DISTRICT AESTHETIC GUIDELINES

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		84



FORM LINER FINISH 'A'
(TETON DRY STACK)

Scott System #189 Teton Dry Stack
(303-373-2500) or approved equal.

BASE COLOR
SHERWIN WILLIAMS
SW 6142 'MACADAMIA' OR APPROVED EQUAL

Base color to be applied to all surfaces unless otherwise noted.

ACCENT COLOR #1
SHERWIN WILLIAMS
SW 6179 'ARTICHOKE' OR APPROVED EQUAL

ACCENT COLOR #2
SHERWIN WILLIAMS
SW 6152 'SUPERIOR BRONZE' OR APPROVED EQUAL

STATE OF TEXAS
DEYTON RIDDLE
146399
LICENSED PROFESSIONAL ENGINEER

Deyton Riddle 02/26/2024

P.E.
DEYTON RIDDLE DATE

Texas Department of Transportation

PR 29A
HILL COUNTRY REGION
FINISHES & TEXTURES

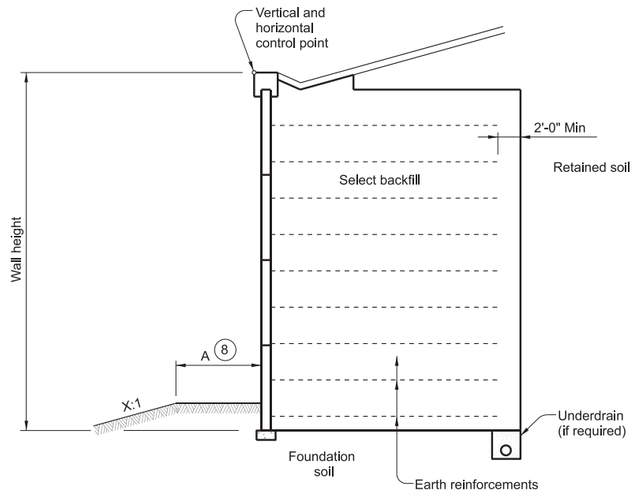
SAN ANTONIO DISTRICT
AESTHETIC GUIDELINES

CONT	SECT	JOB	HIGHWAY
0624	01	003	PR 29A
DIST	COUNTY		SHEET NO.
SAT	UVALDE		85

DATE:
FILE:

WALL SUMMARY

MSE Retaining Wall	Begin Station (1)	End Station (1)	Retained Soil Friction Angle (2)	Foundation Soil Friction Angle (2)	Ground Improvement (3)	Min Earth Reinf. Length (4)	Min Wall Embedment (5)	Underdrain Required (6)	Drawdown Analysis (7)	Bench Width (8)
RETAINING WALL 01	10+33	10+91	30 deg.	30 deg.	N/A	8'-0" or 0.7H	2'	YES	N/A	SEE NOTE 8



TYPICAL SECTION

(1) Indicate limits for which the stated soil design requirements and assumptions are applicable.

(2) Base the listed retained and foundation friction angle on local experience or measured/correlated long term strength values.

(3) Indicate if ground improvement is required or not required. If shown as required, refer to ground improvement detail(s) shown elsewhere in the plans for additional information.

(4) Indicate on table both the minimum length and length ratio required. The minimum default length of earth reinforcements is either 8 feet or 70% of the wall height, whichever is greater. Wall height and design wall height may differ depending on project geometry and loading conditions. Note: Wall height at bridge abutments is equal to the distance between the top of leveling pad and finished grade at the bridge abutment backwall.

(5) Guidance to wall designer of record for determination of minimum wall embedment. Unless noted elsewhere in the plans, provide a minimum embedment from the top of leveling pad to finish grade of
- 1 foot for level ground where there is no potential for erosion or future excavation, or
- 2 feet for sloping ground (4.0H:1.0V or steeper) or where there is potential for removal of soil in front of the wall.

(6) Indicate if underdrain is required or not required.

(7) Indicate if rapid drawdown analysis is required.

(8) Horizontal bench width at base of wall varies. Use the following criteria to establish base width:
A = 2-foot Min for X > 4 or
A = 4-foot Min for X ≤ 4
Applicable to both drawdown and dry condition.

SPECIAL NOTES:
This sheet is to be filled out by the wall designer of record at time of plan preparation to provide soil strength parameters for the design of the specified walls.
The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

STATE OF TEXAS
SHARAD R. DUMRE
142073
LICENSED PROFESSIONAL ENGINEER

Sharad Dumre

02/22/2024

Texas Department of Transportation

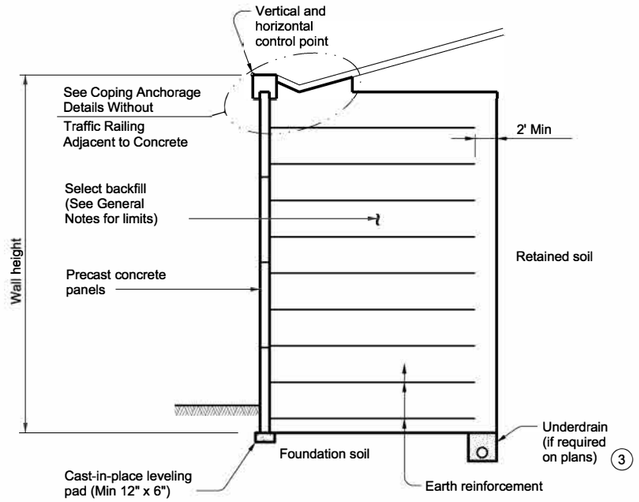
Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW(MSE)DD

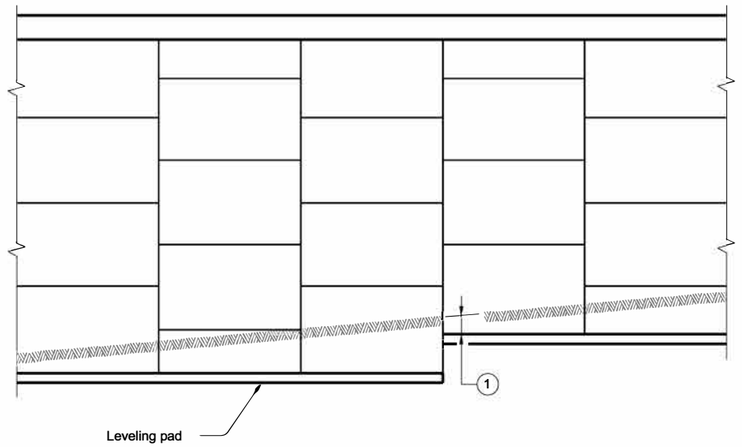
FILE:	DN: TxDOT	CK: RLE	DW: JER	CK: RLE
©TxDOT June 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		86

DATE: 8/4/2023 10:53:14 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0624010003/4 - Design/Plan Set/4. Wall/Stronger ds/RW-MSE-22.dgn



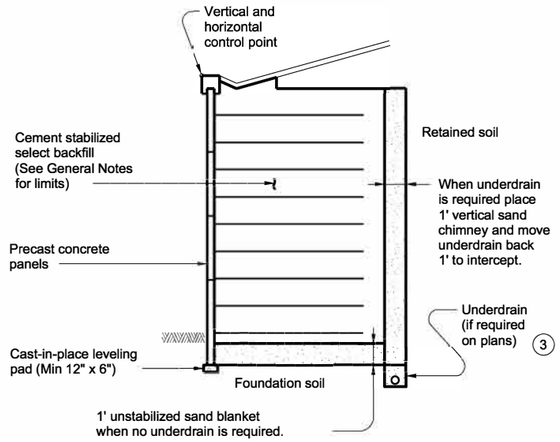
TYPICAL SECTION

(Wall at bottom of slope.)



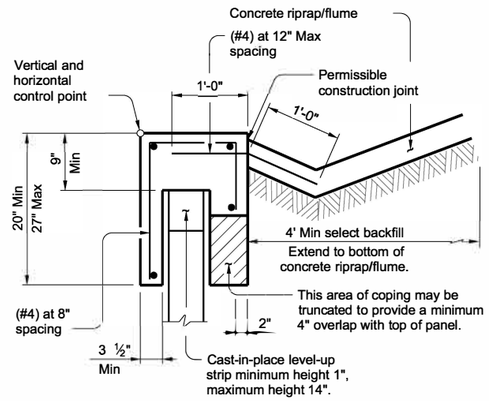
ELEVATION

1. Minimum embedment conforming to values given on the RW(MSE)DD standard.
2. Form map of Texas emblem into a wall panel next to each bridge abutment. Submit the exact location of each emblem to the Engineer for approval. The cost of forming the emblems will not be paid for directly, but is subsidiary to Item 423, "Retaining Walls." Inset the map of Texas a minimum of ¾" into the face of the panel with a smooth finish. Finish the inset area in a contrasting color as approved by the Engineer.
3. Provide underdrain pipe and filter material in accordance with Item 556, "Pipe Underdrains."
4. Anchor precast coping to prevent rotation or displacement. Use these details to develop custom anchorage for precast copings. Provide details that include coping reinforcement. Concrete flume (if required) is paid for separately from Item 423, "Retaining Walls."



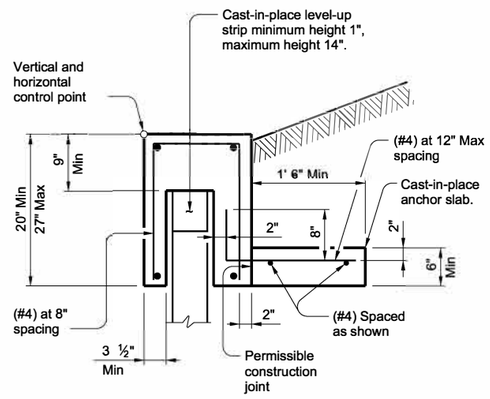
SPECIAL DRAINAGE PROVISIONS

(When cement stabilized backfill is used.)



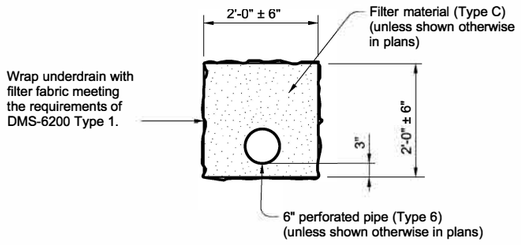
ADJACENT TO CONCRETE

(Excluding concrete pavement)

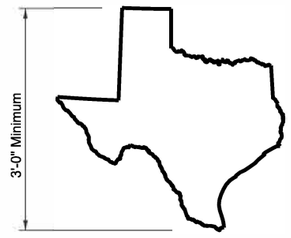


ADJACENT TO SOIL

COPING ANCHORAGE DETAILS WITHOUT TRAFFIC RAILING (4)



UNDERDRAIN DETAIL (3)



MAP OF TEXAS EMBLEM (2)

SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

FILE: RW-MSE-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE
©TxDOT June 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		87

DATE: 8/4/2023 10:54:37 AM
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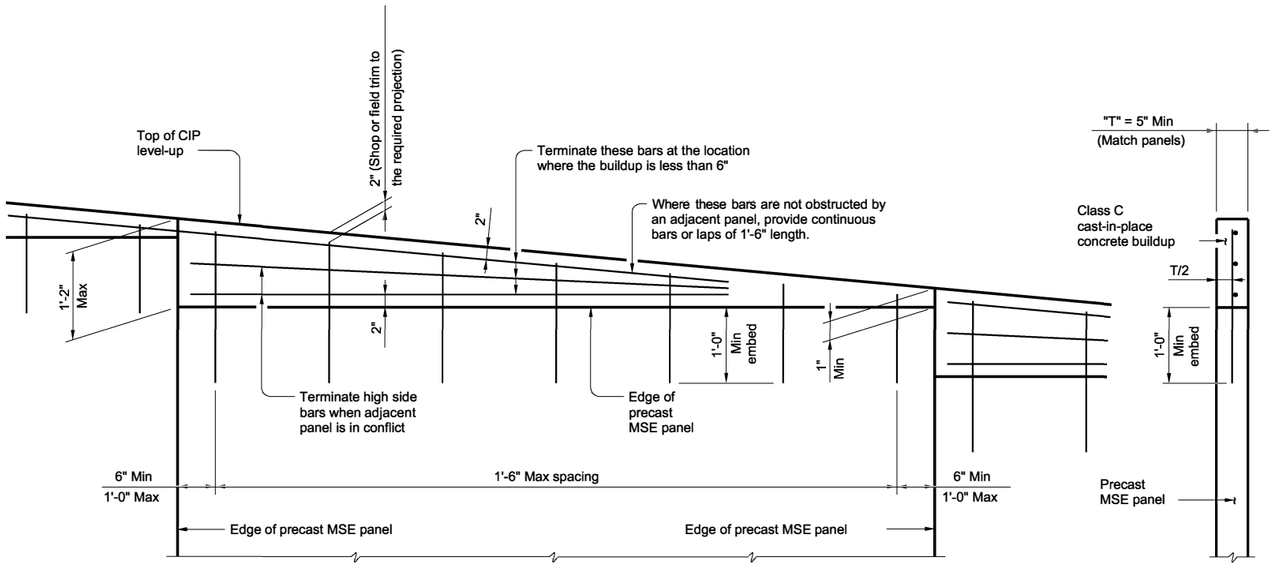


LEVEL UP DETAIL (5)

(5) Cast vertical bars into the top of panels. At Contractor's option vertical bars may be embedded 4 inches with a Type III Class C epoxy anchorage system. Follow manufacturer's directions for installing the epoxy vertical bars.

(6) Soil design parameters must be based on long term soil strength. Design parameters must be listed on the RW(MSE)DD standard.

(7)

SELECT BACKFILL UNIT WEIGHT			
Type AS, BS & DS	Unit Weight	Internal Stability	External Stability
	105 PCF	Pullout	Sliding, Overturning, Eccentricity
	125 PCF	Rupture	Bearing

DESIGN CRITERIA NOTES:

Design Parameters:
Base design of retaining walls on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf ϕ= (6) C = 0 psf
Foundation Soil	ϕ= (6) C = 0 psf
Select Backfill	Unit Weight = See Table (7) ϕ= 34° C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf ϕ= 45° C = 0 psf

Limit stress in steel and concrete in accordance with current AASHTO Standard Specifications for Highway Bridges and Interim Specifications.
The minimum length of earth reinforcement are as shown on the Mechanically Stabilized Earth Retaining Wall Design Data (RW[MSE]DD) standard.

Stability Criteria:
Stability criteria applies to both dry and drawdown analysis. Base design on the following factors of safety.

Sliding along the base of the structure	Factor of Safety ≥ 1.5
Overturning	Factor of Safety ≥ 2.0
Pullout of Earth Reinforcement at each level	Factor of Safety ≥ 1.5

Design the wall such that the base pressure resultant falls within the middle third of the retaining wall.
Determine pullout resistance from test data evaluated at ¾ inch strain.

Corrosion Criteria:
Design the earth reinforcement elements to have a minimum design life of 75 years, using current AASHTO corrosion rates.
Perform stress calculations (rupture) on the calculated earth reinforcement section remaining after 75 years. Pullout calculations may be based on non-corroded section.

PRECAST COPINGS:

Wall supplier is to maximize lengths of precast coping. Provide precast coping in 10-foot minimum lengths (typical.) To optimize coping lengths at radiuses, ends of runs, or other wall geometric conditions favorable to shorter coping sections, shorter lengths may be used pending approval by the Engineer. This applies only to coping without railing.

JOINT SEALANT:

Seal joints between coping segments in accordance with Item 438, "Cleaning and Sealing Joints." Provide Class 4 joint seal. Place sealant flush with coping surface. The purpose of the joint sealing is to reduce surface drainage infiltration into the retaining wall backfill. Sealing coping joint is considered subsidiary to other items.

EARTH REINFORCEMENT:

Place the uppermost earth reinforcement no more than 3 feet below the top of wall.
Place the lowest level of earth reinforcement no more than 2 feet above the top of the leveling pad.
Provide earth reinforcement with a minimum wire size of W7.0. If different longitudinal and cross wires are used in an earth reinforcement mesh, the smaller wire must be at least 50% of the cross sectional area of the larger wire.
A maximum of four wire mesh configurations (wire sizes) will be allowed on a project. Provide unique transverse bar spacing for each mesh configuration, differing from other configurations by a minimum of 3 inches. Step earth reinforcement lengths in increments no finer than 12 inches.

PANELS:

Fabricate standard precast concrete panels to a maximum height of 6 feet and a maximum surface area of 50 sq ft. Top and bottom panels may exceed these limitations as necessary to achieve required wall grades. Maximum height of any panel must not exceed 7 ft.-6 in. Provide a minimum panel thickness of 5 inches. Arrange panels to provide offset horizontal joints.
Provide an open joint around the perimeter of the concrete panels. Configure joints such that 1) the filter fabric and/or pad materials are not exposed at the wall face and 2) the design opening is between ⅜" and ¾".
Provide a one-piece corner panel for wall angle changes of greater than 30 degrees. Butting of chamfered panels will be allowed for angle changes of 30 degrees or less.

MATERIAL NOTES:

Provide Class C concrete for reinforced concrete and precast coping.
Provide Class H concrete for precast concrete panels.
Provide Class A concrete for unreinforced concrete.
Provide Grade 60 reinforcing steel.

GENERAL NOTES:

Section and elevation shown is for informational purposes only. Determine specific geometry based on wall layouts and other plan information.
Extend select backfill specified for use within the mechanically stabilized earth volume horizontally from the back of the panels a minimum 2 feet beyond the end of the earth reinforcement. Extend select backfill vertically to the top of the panels from either the top of the leveling pad, or from 4 inches below the lowest earth reinforcement, whichever is lower.
Provide concrete coping along the top of wall, at the vertical steps at bridge backwalls, and at other vertical steps along the top of wall.
Provide details and calculations that establish support for panels that are affected when obstructions (inlets, drilled shafts, piling, etc.) prevent placement of soil reinforcement in their normal locations. Furnish the same earth reinforcement coverage as that required in the absence of the obstruction. For skewed (rotated) earth reinforcement, no adjustment in length is needed for skew angles less than or equal to 10 degrees. Adjust the length of earth reinforcement to provide a cosine length of the reinforcement equivalent to the stated design length for the section of wall when skew angles are greater than 10 degrees. Provide calculations that justify any alterations made to the soil reinforcement or modifications to their normal placement. Do not use panels without any soil reinforcement connected to them unless they are connected with galvanized hardware to adjacent panels which do have supporting soil reinforcement attached to them and as approved by the Engineer.
Coping and anchor slabs are considered subsidiary to the Item 423, "Retaining Walls."
Use these details in conjunction with the retaining wall layout, the Mechanically Stabilized Earth Retaining Wall Design Data (RW[MSE]DD) standard and other applicable standards.

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

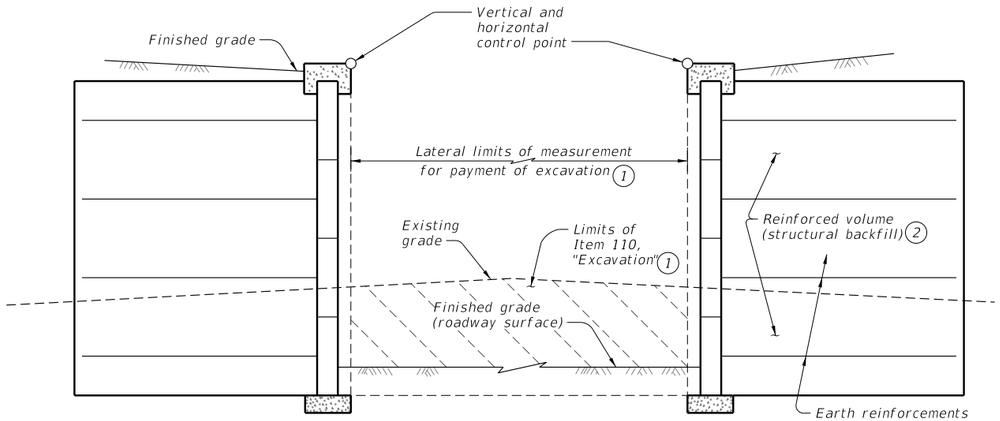
Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

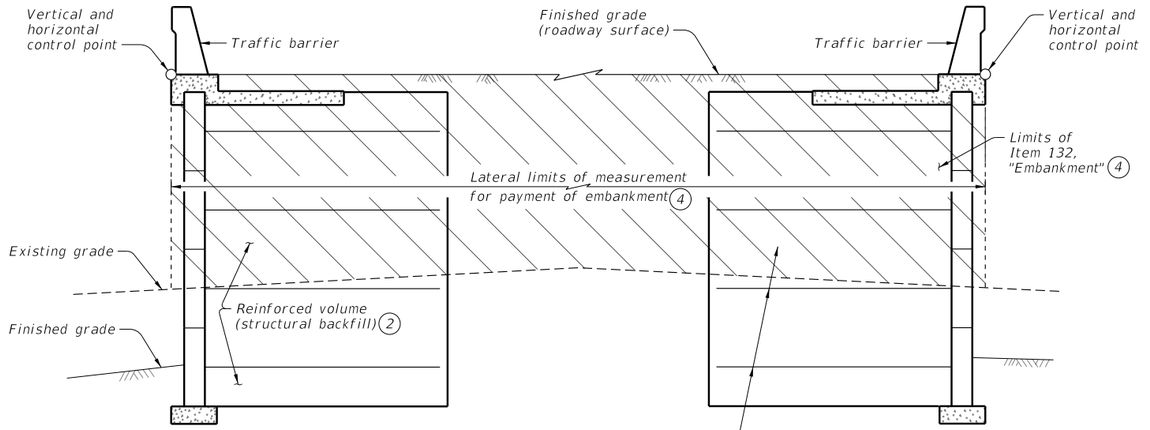
FILE: RW-MSE-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE			
©TxDOT June 2022	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0624	01	003		PR 29A		
	DIST	COUNTY			SHEET NO.		
	SAT	UVALDE			88		

DATE:
FILE:



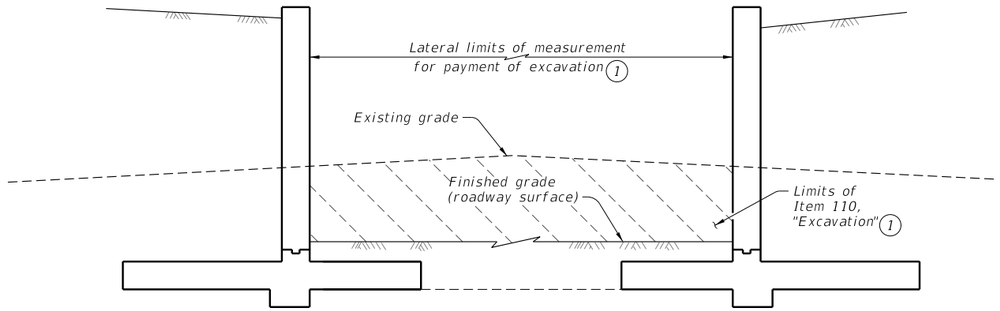
TYPICAL SECTION

(Excavation between MSE retaining walls.) (3)



TYPICAL SECTION

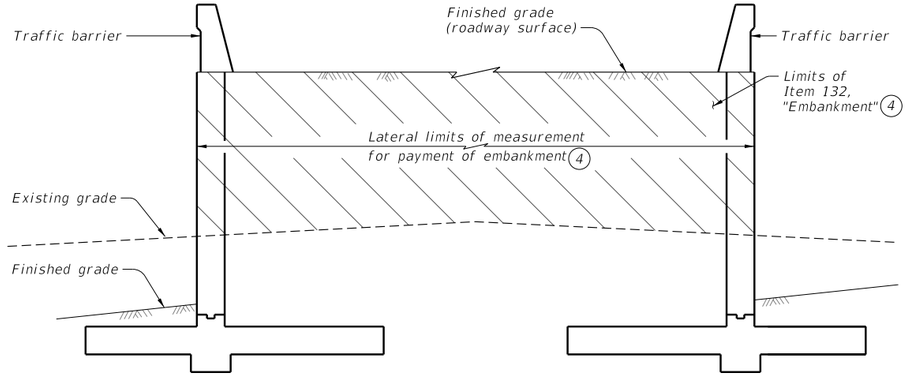
(Embankment between MSE retaining walls.) (3)



TYPICAL SECTION

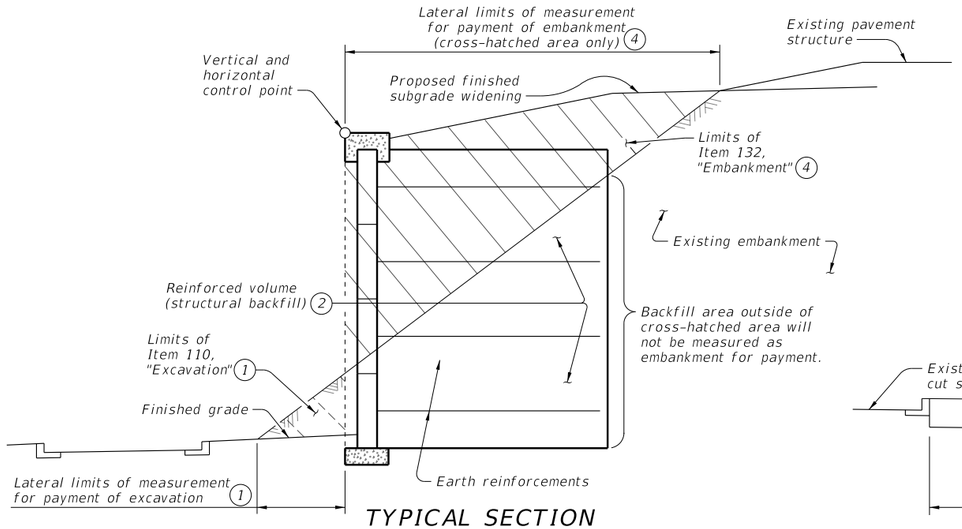
(Excavation between conventional retaining walls.)

1. Only the excavation above the proposed subgrade elevation will be measured for payment.
2. Meeting requirements for Item 423, "Retaining Walls."
3. Earthwork measurement with other retaining wall types will be made to the outside finished face in the same manner.
4. Only the embankment above the existing ground line will be measured for payment.



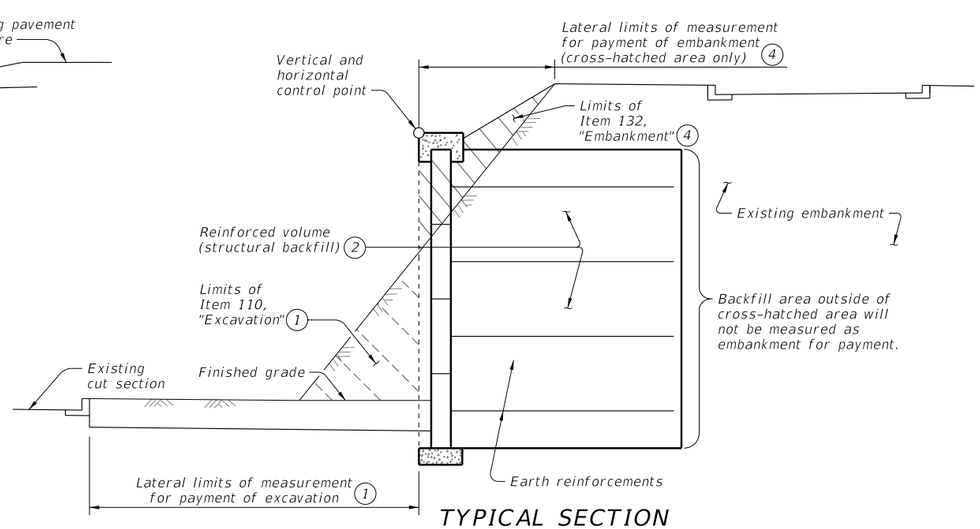
TYPICAL SECTION

(Embankment between conventional retaining walls.)



TYPICAL SECTION

(Widening embankment with MSE retaining walls.) (3)



TYPICAL SECTION

(Widening cut section with MSE retaining walls.) (3)

Texas Department of Transportation

Bridge Division Standard

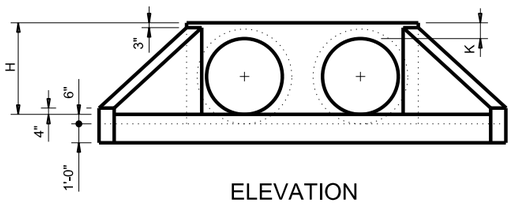
EARTHWORK MEASUREMENT AT RETAINING WALL

RW(EM)

FILE: RW-EM-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE
©TxDOT June 2022	CONT.	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		89

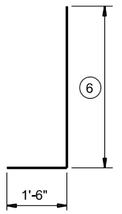
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

Slope	Dia of Pipe (D)	Values for One Pipe W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	Values to be Added for Each Addt'l Pipe X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	4' - 7 ½"	2' - 6"	2' - 10"	3' - 3 ¼"	88	0.6	1' - 9"	20	0.2
	15"	5' - 5 ¾"	2' - 9 ½"	3' - 4"	3' - 10 ¼"	103	0.7	2' - 2"	24	0.3
	18"	6' - 4 ¼"	3' - 1"	3' - 10"	4' - 5"	124	0.9	2' - 8"	32	0.3
	21"	7' - 2 ¾"	3' - 4 ½"	4' - 4"	5' - 0"	143	1.1	3' - 1"	43	0.4
	24"	8' - 2 ½"	3' - 9 ½"	4' - 10"	5' - 7"	164	1.3	3' - 7"	50	0.5
	27"	9' - 1"	4' - 1"	5' - 4"	6' - 2"	179	1.5	3' - 11"	56	0.6
	30"	9' - 11 ½"	4' - 4 ½"	5' - 10"	6' - 8 ¾"	203	1.7	4' - 4"	65	0.8
	33"	10' - 10"	4' - 8"	6' - 4"	7' - 3 ¾"	224	2.0	4' - 8"	71	0.9
	36"	11' - 8 ¼"	4' - 11 ½"	6' - 10"	7' - 10 ¾"	249	2.2	5' - 1"	81	1.0
	42"	13' - 5 ¼"	5' - 6 ½"	7' - 10"	9' - 0 ½"	298	2.8	5' - 10"	97	1.3
	48"	15' - 9"	6' - 1 ½"	9' - 4"	10' - 9 ¼"	360	3.8	6' - 7"	117	1.7
	54"	17' - 5 ¾"	6' - 8 ½"	10' - 4"	11' - 11 ¼"	427	4.5	7' - 6"	151	2.1
	60"	19' - 2 ¾"	7' - 3 ½"	11' - 4"	13' - 1"	481	5.3	8' - 3"	174	2.5
	66"	20' - 11 ½"	7' - 10 ½"	12' - 4"	14' - 3"	544	6.2	8' - 9"	194	2.9
	72"	22' - 8 ½"	8' - 5 ½"	13' - 4"	15' - 4 ¾"	601	7.1	9' - 4"	213	3.3
3:1	12"	6' - 3"	2' - 6"	4' - 3"	4' - 11"	118	0.8	1' - 9"	22	0.2
	15"	7' - 5"	2' - 9 ½"	5' - 0"	5' - 9 ¼"	137	1.1	2' - 2"	28	0.3
	18"	8' - 6 ¾"	3' - 1"	5' - 9"	6' - 7 ¾"	170	1.3	2' - 8"	37	0.5
	21"	9' - 8 ¾"	3' - 4 ½"	6' - 6"	7' - 6"	195	1.6	3' - 1"	48	0.6
	24"	11' - 0"	3' - 9 ½"	7' - 3"	8' - 4 ½"	227	2.0	3' - 7"	58	0.7
	27"	12' - 2"	4' - 1"	8' - 0"	9' - 2 ¾"	251	2.3	3' - 11"	67	0.8
	30"	13' - 4"	4' - 4 ½"	8' - 9"	10' - 1 ¼"	293	2.7	4' - 4"	77	1.0
	33"	14' - 5 ¾"	4' - 8"	9' - 6"	10' - 11 ¾"	318	3.1	4' - 8"	84	1.2
	36"	15' - 7 ¾"	4' - 11 ½"	10' - 3"	11' - 10"	351	3.5	5' - 1"	96	1.4
	42"	17' - 11 ½"	5' - 6 ½"	11' - 9"	13' - 6 ¾"	432	4.5	5' - 10"	119	1.7
	48"	21' - 1 ¾"	6' - 1 ½"	14' - 0"	16' - 2"	537	6.1	6' - 7"	146	2.3
	54"	23' - 5 ½"	6' - 8 ½"	15' - 6"	17' - 10 ¾"	630	7.3	7' - 6"	186	2.9
	60"	25' - 9 ¼"	7' - 3 ½"	17' - 0"	19' - 7 ½"	719	8.7	8' - 3"	219	3.4
	66"	28' - 1"	7' - 10 ½"	18' - 6"	21' - 4 ¼"	811	10.1	8' - 9"	242	3.9
	72"	30' - 4 ¾"	8' - 5 ½"	20' - 0"	23' - 1 ¼"	924	11.7	9' - 4"	272	4.4
4:1	12"	7' - 10 ¾"	2' - 6"	5' - 8"	6' - 6 ½"	148	1.1	1' - 9"	24	0.3
	15"	9' - 4"	2' - 9 ½"	6' - 8"	7' - 8 ½"	181	1.5	2' - 2"	32	0.4
	18"	10' - 9 ½"	3' - 1"	7' - 8"	8' - 10 ¼"	221	1.9	2' - 8"	42	0.5
	21"	12' - 2 ¾"	3' - 4 ½"	8' - 8"	10' - 0"	260	2.3	3' - 1"	57	0.7
	24"	13' - 9 ½"	3' - 9 ½"	9' - 8"	11' - 2"	301	2.8	3' - 7"	67	0.9
	27"	15' - 3"	4' - 1"	10' - 8"	12' - 3 ¾"	334	3.3	3' - 11"	77	1.0
	30"	16' - 8 ¼"	4' - 4 ½"	11' - 8"	13' - 5 ¾"	385	3.8	4' - 4"	89	1.3
	33"	18' - 1 ¾"	4' - 8"	12' - 8"	14' - 7 ½"	425	4.5	4' - 8"	101	1.4
	36"	19' - 7"	4' - 11 ½"	13' - 8"	15' - 9 ¼"	472	5.1	5' - 1"	115	1.7
	42"	22' - 5 ¾"	5' - 6 ½"	15' - 8"	18' - 1"	583	6.5	5' - 10"	141	2.1
	48"	26' - 6 ¼"	6' - 1 ½"	18' - 8"	21' - 6 ¾"	730	8.9	6' - 7"	175	2.8
	54"	29' - 5"	6' - 8 ½"	20' - 8"	23' - 10 ¼"	875	10.7	7' - 6"	226	3.6
	60"	32' - 3 ¾"	7' - 3 ½"	22' - 8"	26' - 2"	996	12.7	8' - 3"	264	4.3
	66"	35' - 2 ½"	7' - 10 ½"	24' - 8"	28' - 5 ¾"	1,140	14.9	8' - 9"	300	4.9
	72"	38' - 1 ¼"	8' - 5 ½"	26' - 8"	30' - 9 ½"	1,297	17.3	9' - 4"	334	5.6
6:1	12"	11' - 2"	2' - 6"	8' - 6"	9' - 9 ¾"	224	1.9	1' - 9"	28	0.4
	15"	13' - 2 ¼"	2' - 9 ½"	10' - 0"	11' - 6 ½"	268	2.5	2' - 2"	37	0.5
	18"	15' - 2 ½"	3' - 1"	11' - 6"	13' - 3 ¼"	330	3.2	2' - 8"	50	0.7
	21"	17' - 2 ¾"	3' - 4 ½"	13' - 0"	15' - 0 ¼"	387	3.9	3' - 1"	69	0.9
	24"	19' - 4 ½"	3' - 9 ½"	14' - 6"	16' - 9"	453	4.8	3' - 7"	80	1.2
	27"	21' - 4 ¾"	4' - 1"	16' - 0"	18' - 5 ¾"	512	5.7	3' - 11"	96	1.4
	30"	23' - 5 ¼"	4' - 4 ½"	17' - 6"	20' - 2 ½"	593	6.7	4' - 4"	110	1.7
	33"	25' - 5 ½"	4' - 8"	19' - 0"	21' - 11 ¼"	675	7.8	4' - 8"	127	2.0
	36"	27' - 5 ¾"	4' - 11 ½"	20' - 6"	23' - 8"	735	9.0	5' - 1"	144	2.3
	42"	31' - 6 ¼"	5' - 6 ½"	23' - 6"	27' - 1 ½"	922	11.5	5' - 10"	179	3.0
	48"	37' - 3 ½"	6' - 1 ½"	28' - 0"	32' - 4"	1,191	15.9	6' - 7"	231	4.0
	54"	41' - 4 ¼"	6' - 8 ½"	31' - 0"	35' - 9 ½"	1,424	19.2	7' - 6"	300	5.0
	60"	45' - 4 ¾"	7' - 3 ½"	34' - 0"	39' - 3"	1,631	22.9	8' - 3"	353	6.0

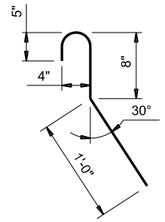


ELEVATION

(Showing dimensions.)



BARS V



BARS CL

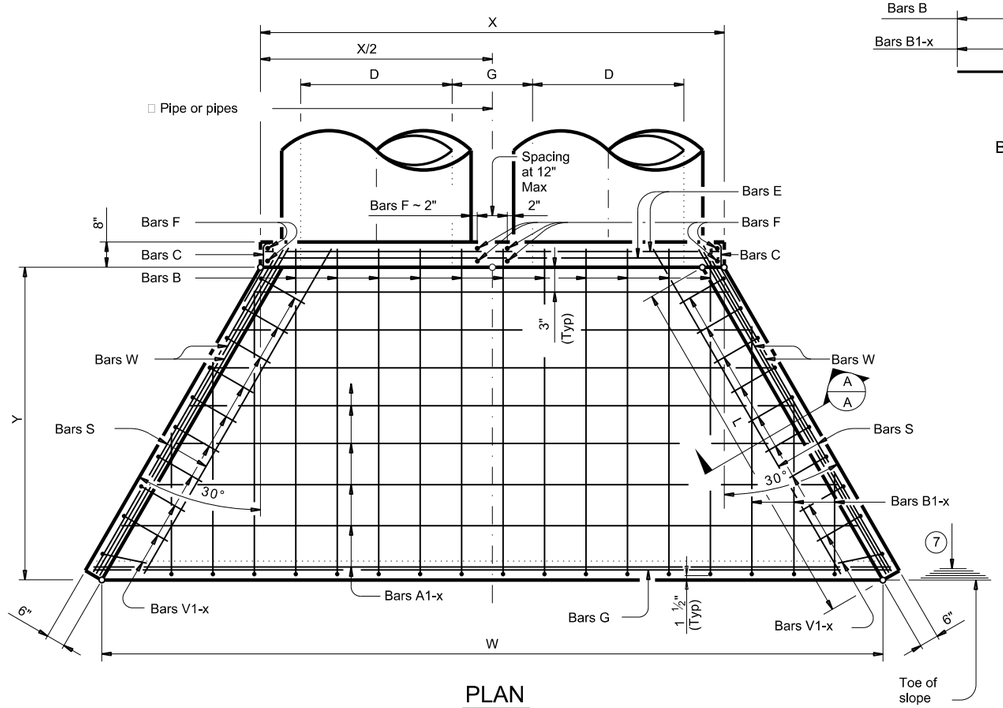
(Length = 2'-5")

TABLE OF REINFORCING STEEL (5)

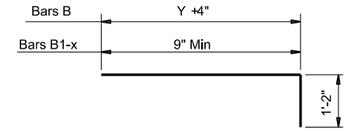
Bar	Size	Spa	No.
A	#4	1' - 0"	~
B	#3	1' - 6"	~
C	#4	1' - 0"	~
D	#3	1' - 0"	~
E	#5	~	4
F	#5	~	~
G	#3	~	2
S	#4	~	6
V	#4	1' - 0"	~
W	#5	~	4

TABLE OF CONSTANT DIMENSIONS

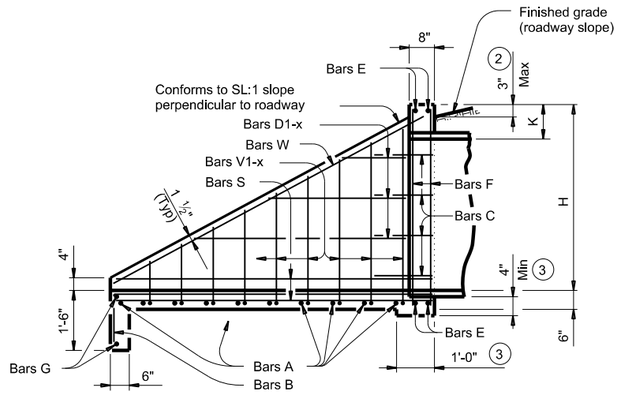
Dia of Pipe (D)	G	K (4)	H
12"	0' - 9"	1' - 0"	2' - 0"
15"	0' - 11"	1' - 0"	2' - 3"
18"	1' - 2"	1' - 0"	2' - 6"
21"	1' - 4"	1' - 0"	2' - 9"
24"	1' - 7"	1' - 0"	3' - 0"
27"	1' - 8"	1' - 0"	3' - 3"
30"	1' - 10"	1' - 0"	3' - 6"
33"	1' - 11"	1' - 0"	3' - 9"
36"	2' - 1"	1' - 0"	4' - 0"
42"	2' - 4"	1' - 0"	4' - 6"
48"	2' - 7"	1' - 3"	5' - 3"
54"	3' - 0"	1' - 3"	5' - 9"
60"	3' - 3"	1' - 3"	6' - 3"
66"	3' - 3"	1' - 3"	6' - 9"
72"	3' - 4"	1' - 3"	7' - 3"



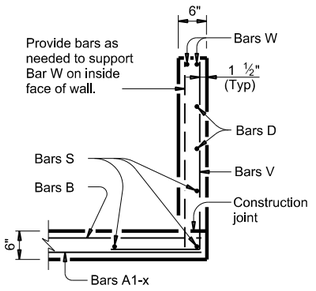
PLAN



BARS B and B1-x



TYPICAL WING ELEVATION



SECTION A-A

1. Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
2. For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
3. Provide a 1'-0" footing as shown where required to maintain 4" minimum cover for pipes.
4. Dimensions shown are usual and maximum.
5. Quantities shown are for one structure end only (one headwall).
6. Min Length = 6" 3" x $\left(\frac{12 \times H \ 7-}{12 \times L}\right)$

   Max Length = 12 x H 3" x - $\left(\frac{12 \times H \ 7-}{12 \times L}\right)$ -
7. Lengths of wings based on SL:1 slope along this line.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation

Bridge Division Standard

CONCRETE HEADWALLS
WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

CH-FW-0

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		90

DATE: 1/2/2024 2:36:23 PM
FILE: dw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0624010034/Design/Plan Set/4. Wall/Standards/CD-CH-FW0-20.dgn

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0624-01-003

1.2 PROJECT LIMITS:

From: On PR 29A

To:In Garner State Park

1.3 PROJECT COORDINATES:

BEGIN: (Lat)29.586111° (N),(Long) 99.736710° (W)

END: (Lat) 29.588483° (N),(Long) 99.738539° (W)

1.4 TOTAL PROJECT AREA (Acres): _____

1.5 TOTAL AREA TO BE DISTURBED (Acres): <1 Acre

1.6 NATURE OF CONSTRUCTION ACTIVITY:

Repair Retaining Wall and Adjacent Pedestrian Walkway

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Orif Soils 0 to 3% slopes	Well drained, Very low rate of runoff
Riverwash & Dev Soils 0 to 3%	Excessively drained, Negligible rate of runoff
RRE 5 to 70% slopes	Low rate of runoff

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

☒ 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: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☒ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☒ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☒ Contaminated water from excavation or dewatering pump-out water
☒ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☒ Long-term stockpiles of material and waste
☒ Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____
☐ Other: _____

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	0624-01-003		91
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	UVALDE	
CONT.	SECT.	JOB	HIGHWAY NO.
0624	01	003	PR 29A

STORMWATER POLLUTION PRVENTION 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

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
No permanent controls are planned		

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
- ☐ Daily street sweeping
- ☐ 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
Vegetated buffer zones are not planned		

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 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	0624-01-003		92
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	UVALDE	
CONT.	SECT.	JOB	HIGHWAY NO.
0624	01	003	PR 29A

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) required for projects with 1 or more acres distrubed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

☒ 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 Storm Water Pollution Prevention Plan (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 Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required: ☐Yes ☐No

Note: If amount of soil disturbance changes, permit requirements may change.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

The Contractor shall adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required

☐ Nationwide Permit 14 - PCN Required

☐ 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 (BMPs) planned to control erosion, sedimentation and post-project total suspended solids (TSS).

1.

2.

3.

4.

401 Best Management Practices: (Not applicable if no USACE permit)

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Sedimentation Chambers
		☐ 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.

4.

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.

2.

3.

4.

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. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

   A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

   B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.

3. Golden cheeked Warbler habitat is present in the project limits, all tree trimming shall be conducted outside of the nesting season March 1st through September 30th to avoid impacts to the species.

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 immediated area, and contact the Engineer immediately.

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 follwing 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

Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Does the project involve the demolition of a span bridge?

☐ Yes ☒ No (No further action required)

If "Yes", a pre- demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
©TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0624	01	003	PR 29A
	DIST	COUNTY		SHEET NO.
	SAT	UVALDE		93