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FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	BR 2024(971)		1
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	ATASCOSA	
CONT.	SECT.	JOB	HIGHWAY NO.
0073	13	012	UA 281

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
PROJECT NO. BR 2024(971)
CSJ: 0073-13-012

ATASCOSA COUNTY
UA 281

LIMITS FROM: AT ATASCOSA RIVER
TO:

NET LENGTH OF ROADWAY = 307.00 FT = 0.058 MI
NET LENGTH OF BRIDGE = 580.00 FT = 0.110 MI
NET LENGTH OF PROJECT = 887.00 FT = 0.168 MI

FOR WORK CONSISTING OF: BRIDGE REPLACEMENT CONSISTING OF REPLACE BRIDGE AND APPROACHES

DESIGN SPEED = 60 MPH
AREA OF DISTURBED SOIL = 5.17 ACRES
ADT: 1400 (2025)
2300 (2045)

INDEX OF SHEETS

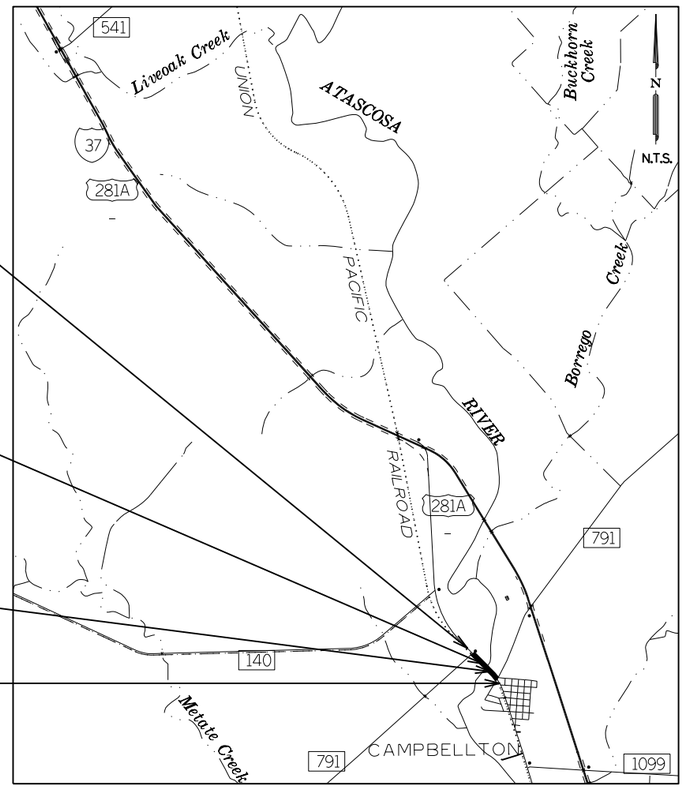
SEE SHEET 2 FOR INDEX OF SHEETS

BEGIN CONSTRUCTION
UA 281
STA 971+70

BEGIN PROJECT
UA 281
STA 976+63

END PROJECT
UA 281
STA 985+50

END CONSTRUCTION
UA 281
STA 990+71



SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, October 23, 2023)

EXCEPTIONS:
EQUATIONS:
R.R. CROSSINGS:

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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

SUBMITTED FOR LETTING	2/28/2024	RECOMMENDED FOR LETTING	2/28/2024
DocuSigned by: Andres Garza D8B8473ACDF446... DISTRICT ENGINEER		DocuSigned by: Clayton Ripps, P.E. 74F59AC9B83D4E9... DISTRICT ENGINEER	
REVIEWED FOR LETTING	2/28/2024	APPROVED FOR LETTING	2/29/2024
DocuSigned by: DCRogers, P.E. F29100BAA50849... TRANSPORTATION ENGINEER SUPERVISOR		DocuSigned by: Charles Benavides, P.E. 3BB8A8580ACF41C... DISTRICT ENGINEER	

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

LEVELS DISPLAYED
1

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

DESIGN: JH | DRAFT: JH | CHECK: AG

* STATE STANDARDS
** SAN ANTONIO DISTRICT STANDARDS

STATE OF TEXAS
LAURA M. ORTIZ
137207
LICENSED
PROFESSIONAL ENGINEER

Laura Ortiz 02/22/2024
P.E.
LAURA M. ORTIZ 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
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza 02/21/2024
P.E.
ANDRES GARZA DATE

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

Texas Department of Transportation

UA 281
INDEX OF SHEETS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		2

2/14/2024 4:47:23 PM
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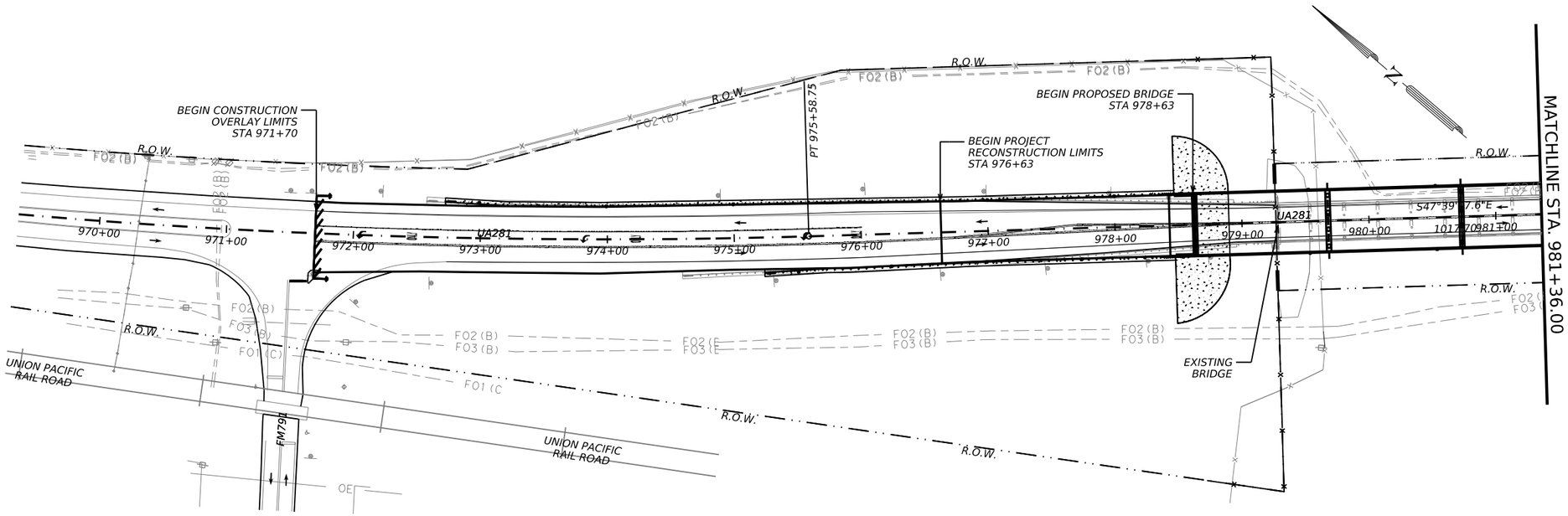

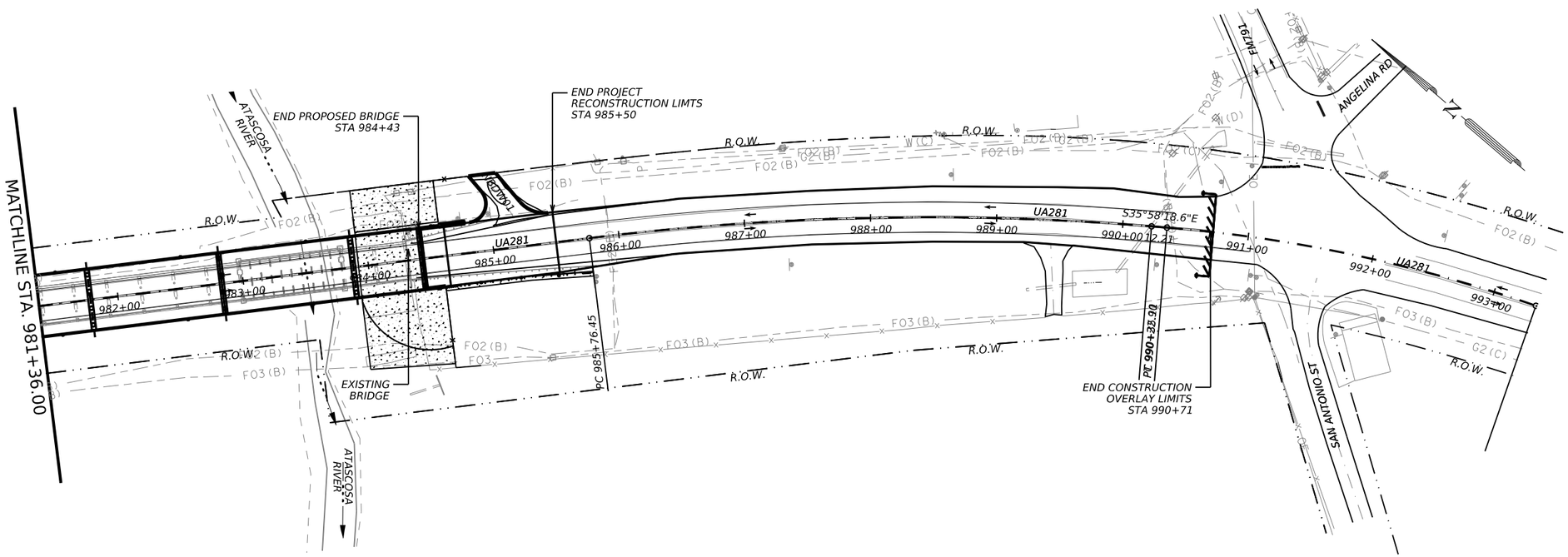

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=100'

Texas Department of Transportation

UA 281
PROJECT LAYOUT

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		3

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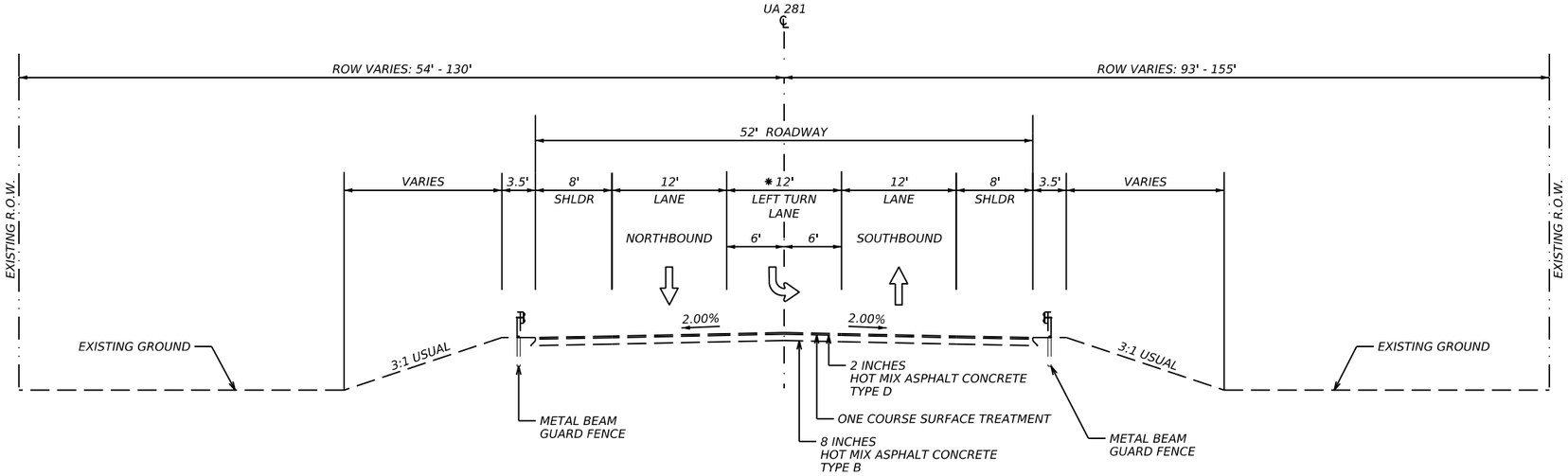
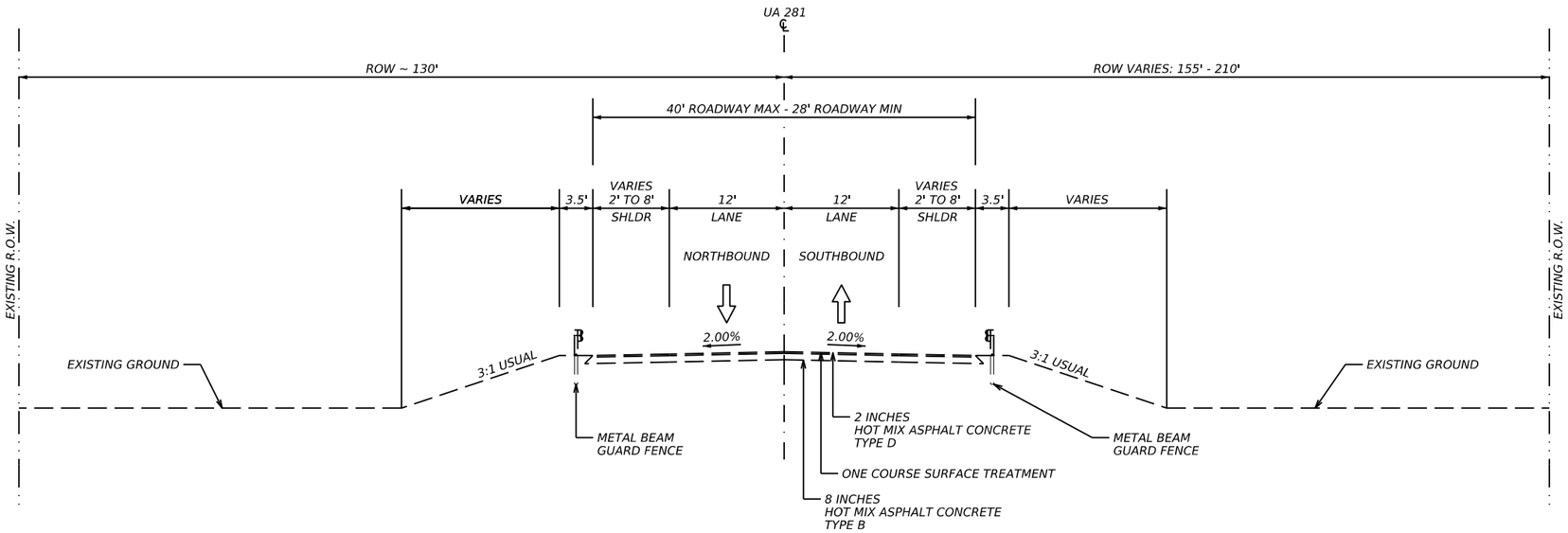


UA 281

STA 971+70 TO STA 976+00
* STA 976+00 TO STA 977+63
(LEFT TURN LANE TRANSITION)



UA 281

STA 977+63 TO STA 979+27.70

* LEFT TURN LANE TRANSITION
RDWY WIDTH TRANSITION FROM 52' TO 40'

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
EXISTING
TYPICAL SECTIONS

SHEET: 1 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		4

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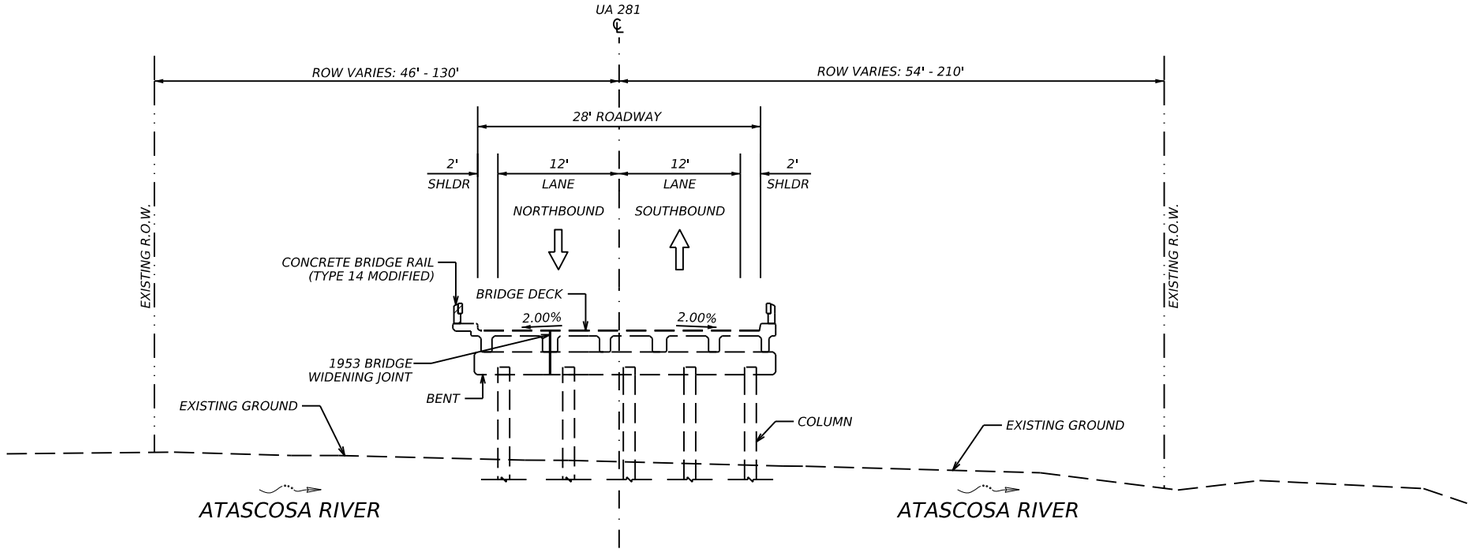
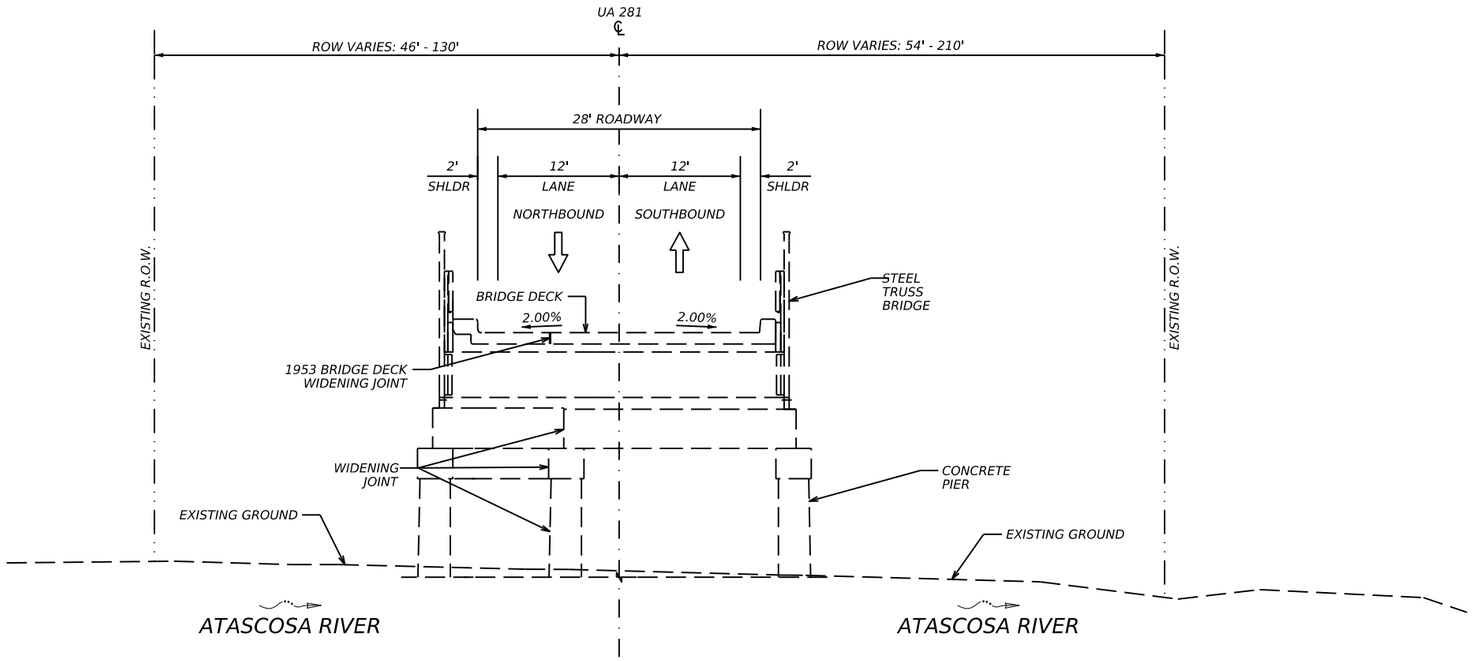


UA 281 - ATASCOSA RIVER BRIDGE

STA 979+27.70 TO STA 982+98.35
STA 983+79.31 TO STA 984+32.36



UA 281 - ATASCOSA RIVER BRIDGE STEEL TRUSS

STA 982+98.35 TO STA 983+79.31

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
EXISTING
TYPICAL SECTIONS

SHEET: 2 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		5

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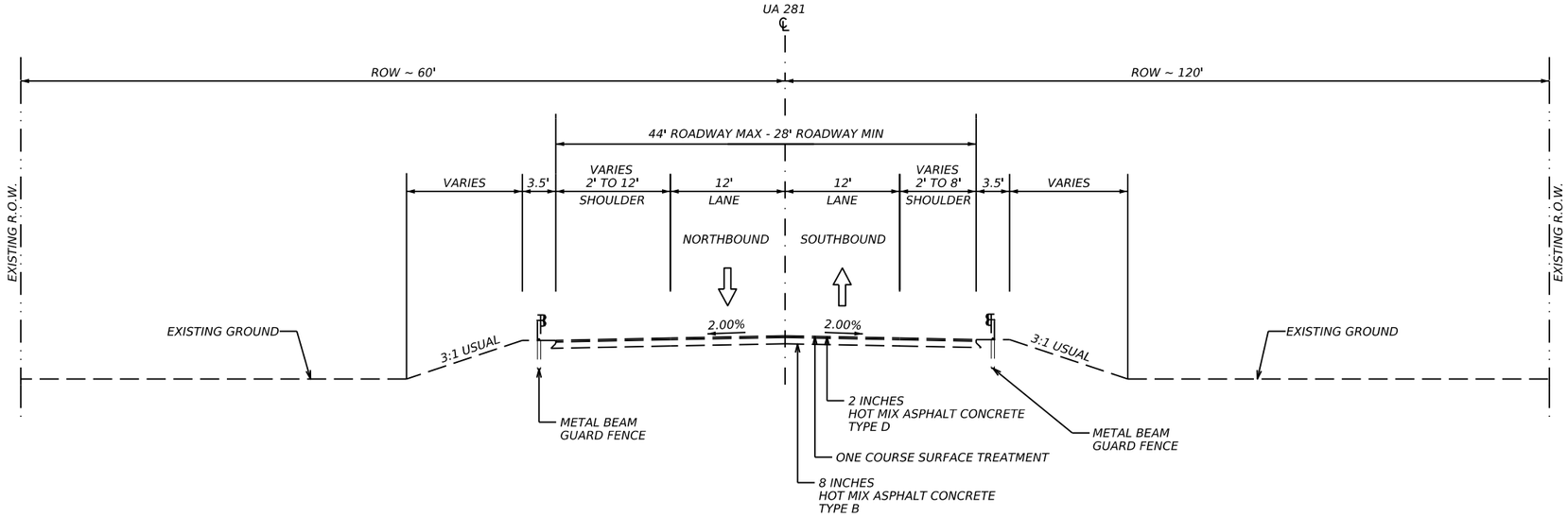
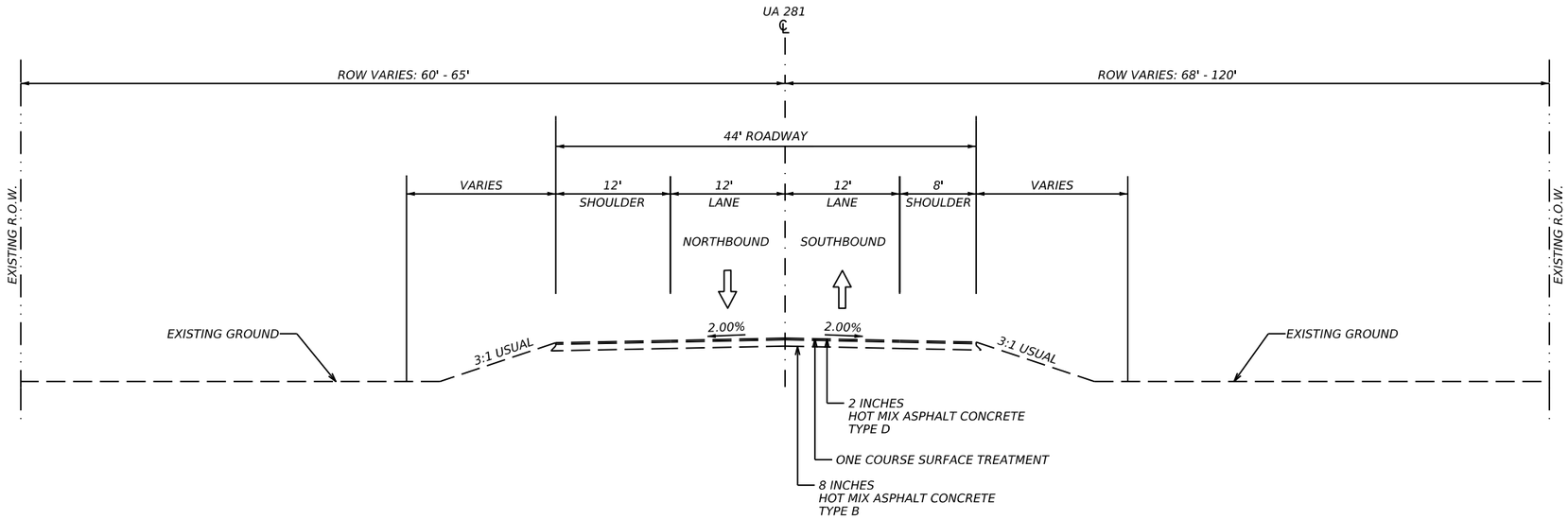


UA 281

STA 984+32.36 TO STA 986+40



UA 281

STA 986+40 TO STA 990+71

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
EXISTING
TYPICAL SECTIONS

SHEET: 3 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		6

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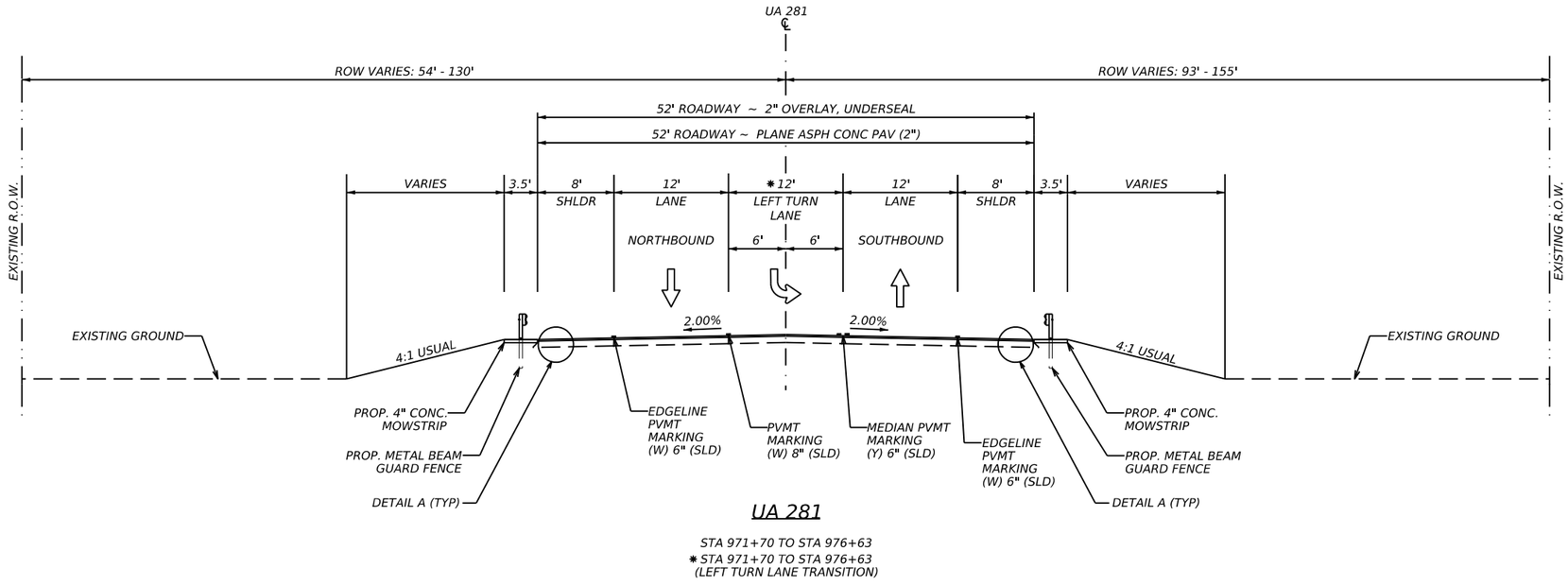
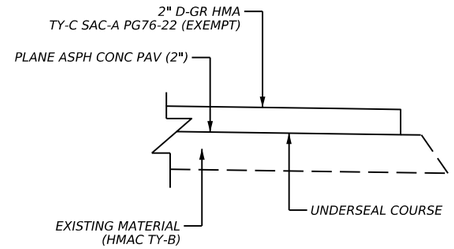
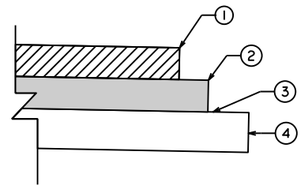


UA 281

STA 971+70 TO STA 976+63
* STA 971+70 TO STA 976+63 (LEFT TURN LANE TRANSITION)

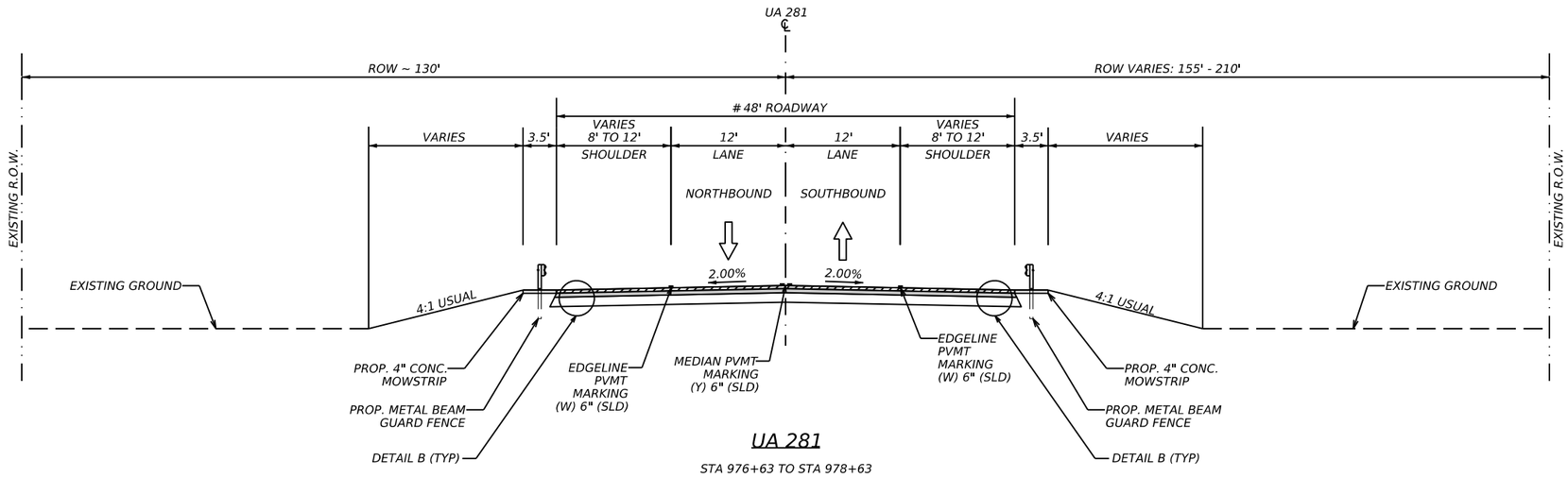


DETAIL A



DETAIL B

1. 4" D-GR HMA TY-C SAC-A (PG 76-22) (EXEMPT) PLACE TACK COAT BETWEEN HMA LAYERS
2. 5" D-GR HMA TY-B (PG 64-22) (EXEMPT)
3. PRIME COAT (MC-30 OR AE-P)
4. 12" FLEX BASE TYPE D, GRADE 1-2 OR 5 (COMP IN PLACE) (IN ACCORDANCE WITH ITEM 247)



UA 281

STA 976+63 TO STA 978+63

LEFT TURN LANE PVMT MARKING TRANSITION FROM STA 976+00 TO 978+95

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281 PROPOSED TYPICAL SECTIONS

SHEET: 1 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		7

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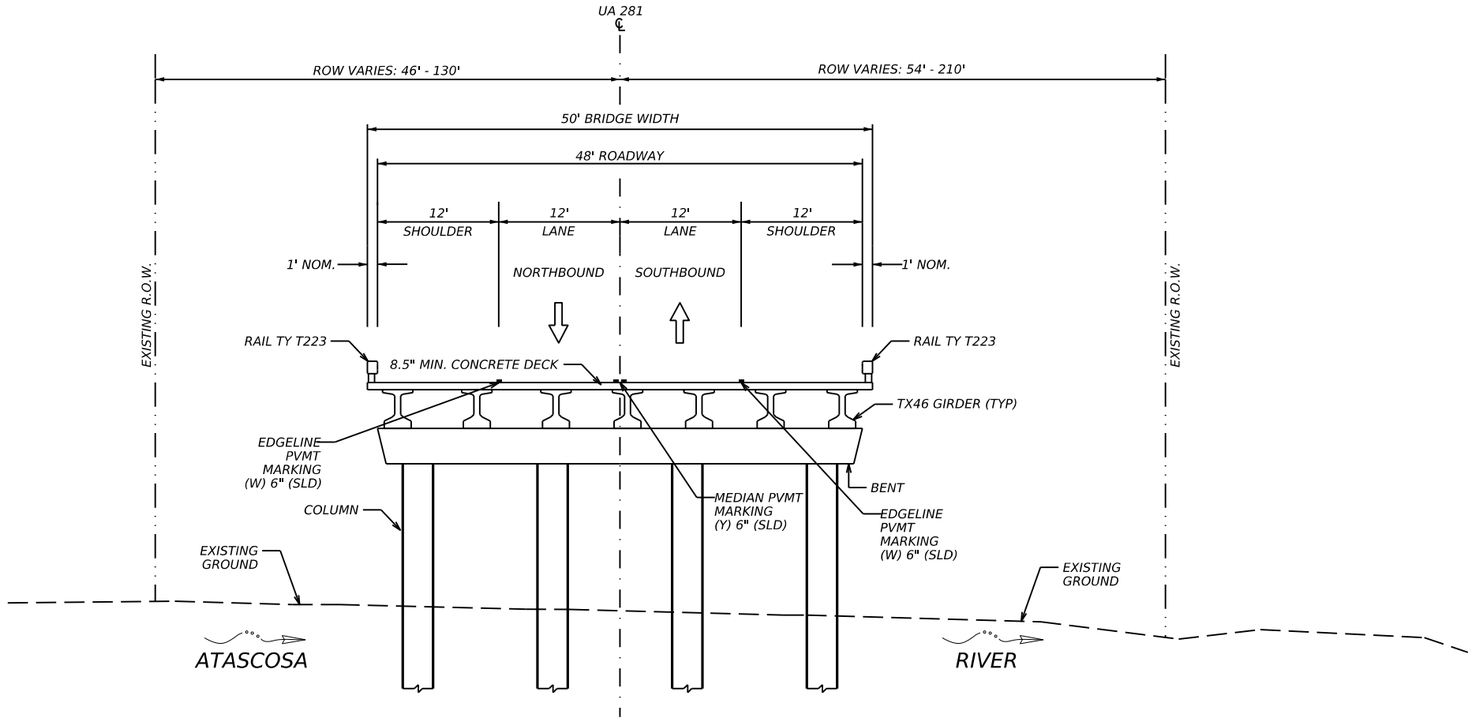
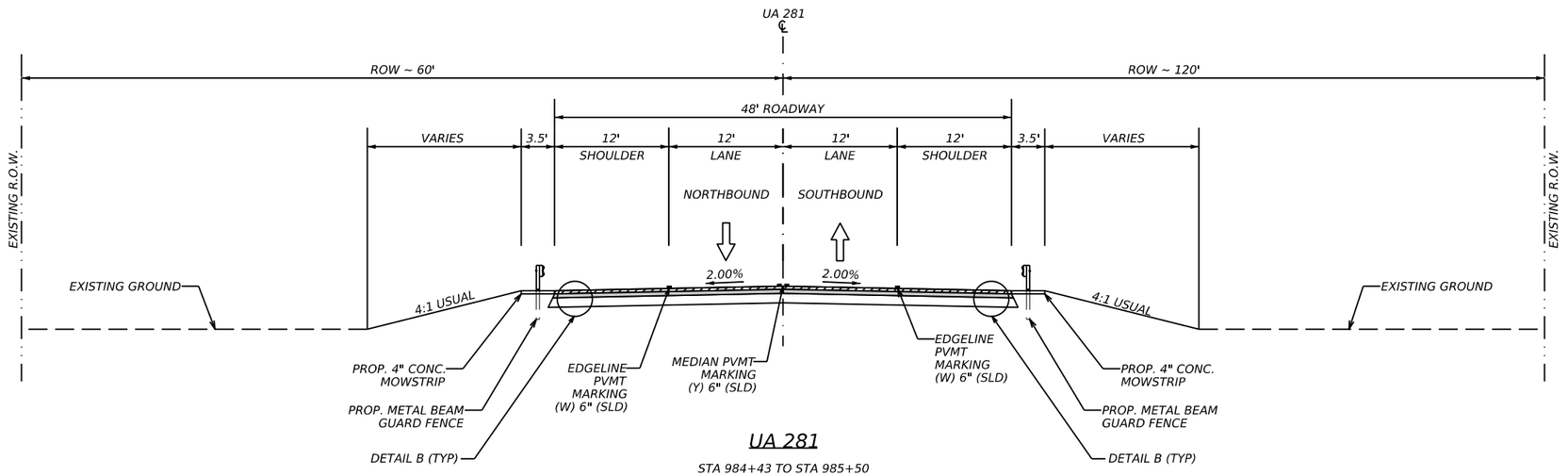


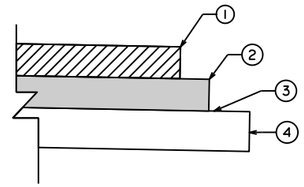
UA 281 - ATASCOSA RIVER BRIDGE

STA 978+63 TO STA 984+43



UA 281

STA 984+43 TO STA 985+50



DETAIL B

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2. 5" D-GR HMA TY-B (PG 64-22) (EXEMPT)
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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281 PROPOSED TYPICAL SECTIONS

SHEET: 2 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		8

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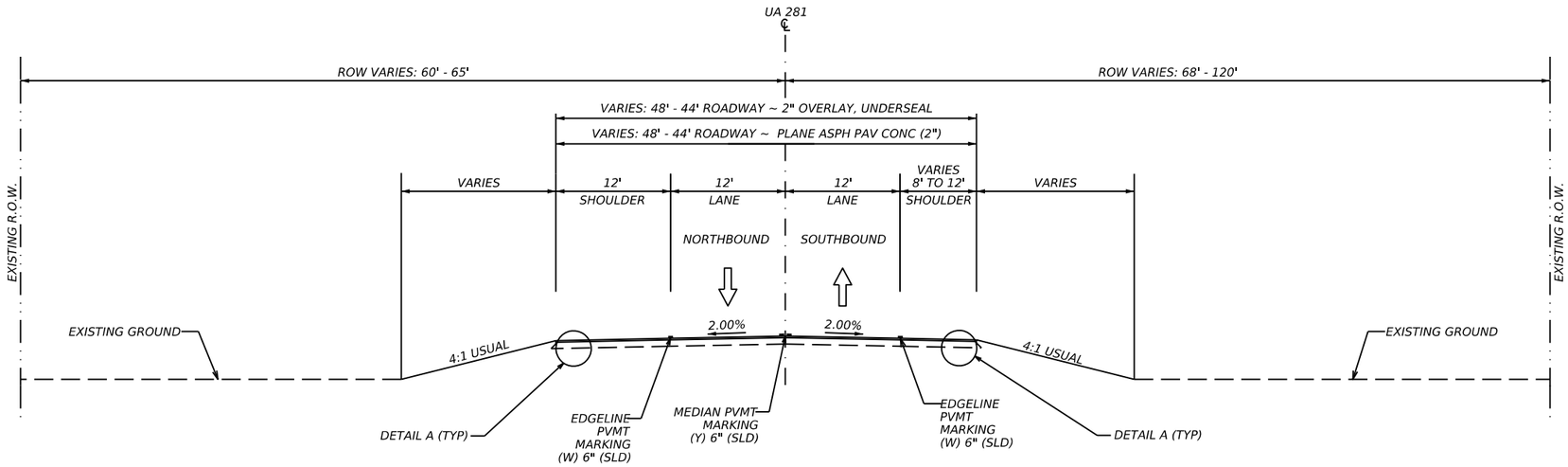
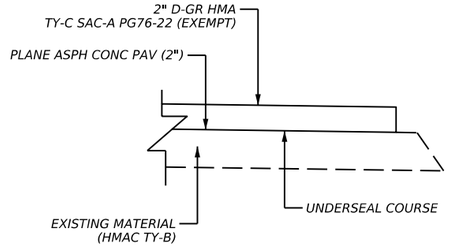


UA 281

STA 985+50 TO STA 990+71
(WIDENING FROM STA 985+50 TO STA 986+40)



DETAIL A

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
PROPOSED
TYPICAL SECTIONS

SHEET: 3 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		9

DESIGN: RG | DRAFT: RG | CHECK: RG

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

========== **Basis of Estimate** ==========

	UA 281 ROADWAY BASIS OF ESTIMATE						
	UA 281 MAINLANE RECONSTRUCTION						
	TYPE	DEPTH (in)	RATE	AREA (SF)	AREA (SY)	QUANTITY	
3076-6075	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT)	4	115 lbs/sy-in	12,824	1,425	328	TONS
3076-6075	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT)	2	115 lbs/sy-in	5,610	623	72	TONS
3077-6075	TACK COAT		.10 gal/sy	18,434	2,048	205	GAL
3076-6003	D-GR HMA TY-B SAC-A PG64-22 (EXEMPT)	5	115 lbs/sy-in	13,095	1,455	418	TONS
310-6027	PRIMECOAT (MC-30 OR AE-P)		.20 gal/sy	13,357	1,484	297	GAL
247-6475	FL BS(CIP)(TY D GR 1-2 OR 5)	12	135 lbs/cf	13,357	1,484	496	CY

	UA 281 MAINLANE OVERLAY						
	TYPE	DEPTH (in)	RATE	AREA (SF)	AREA (SY)	QUANTITY	
3076-6075	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT)	2	115 lbs/sy-in	48,996	5,444	626	TONS
3085-6001	UNDERSEAL COURSE		.20 gal/sy	48,996	5,444	1,089	GAL

--General--
The following State, District, Local and/or Utility Standards have been modified: <u>None were modified.</u>

Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Deface traffic signs so that they will not reappear in public as signs.

Any sign panels that are adjusted or removed and replaced, shall be done the same workday unless otherwise approved. This work shall be considered subsidiary to Item 502.

Notify the Engineer at least two weeks prior to a proposed traffic pattern change(s) that will require a revision to traffic signals.

Hurricane Evacuation

Hurricane Season is from June 1 thru November 30. As the closest metropolitan city inland from the Texas Coast, the City of San Antonio is a major shelter destination during mandatory hurricane evacuations. As such, planned work zone lane or road closures may be restricted and/or suspended during mandatory hurricane evacuation operations. The District will coordinate these restrictions at a minimum H-120 from any projected impact to the Texas Coast.

Control: 0073-13-012

County: ATASCOSA

Highway: UA 281

No time charges will be made if the Engineer determines that work on the project was impacted by the hurricane.

The Engineer may order changes in the Traffic Control Plan to accommodate evacuation traffic, and may suspend the work, all or in part, to ensure timely completion of this work. All work to implement changes in the Traffic Control Plan will be paid through existing bid prices or through Item 9.5, Force Account. However, the Department will not entertain any request for delay damages, loss of efficiency that may be attributed to the restriction or suspension of road or lane closures, or to changes in the Traffic Control Plan.

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.

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way. Call or email the TxDOT offices listed below for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages incurred to the above-mentioned utilities when working without having the utilities located prior to excavation.

For signal and ITS locates call TransGuide at 210-731-5136 or email sat_its_locates@txdot.gov for ITS locates and signal.request@txdot.gov for signal locates.

Contractor questions on this project are to be addressed to the following individual(s):
Area Engineer, Frances Merecka, P.E.: Frances.Merecka@txdot.gov
Assistant Area Engineer, Enrique Gonzalez, P.E.: Enrique.Manuel.Gonzalez@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.

The Contractor must measure the vertical clearance at each structure after the final surface of the roadway is completed and provide the vertical clearance measurement to the Engineer.

--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.

Steel Wrapped or Asbestos Utility Lines:

Existing steel wrapped natural gas and/or asbestos cement (AC) water lines that will no longer be in service are usually abandoned in place (AIP). However, if any of these lines have to be removed for whatever reason (in the way of other construction, to make tie-ins, etc.), comply with Item 6.

If removal of AC water lines is included in the construction contract, then notify the Engineer of proposed dates of removal of the AC water lines in accordance to Item 6. Excavate to the top of the AC water line to allow a separate contractor hired by the State to remove the AC water line. The excavation for the AC water line removal is subsidiary to the work that created the need for the removal (excavation for structures, roadway, a new line, tie-ins, etc.).

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a notarized 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.
https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

--Item 7--
The project's total disturbed area is **5.17 acres.** The disturbed area in all project locations and Contractor project specific locations (PSL's), within 1/4 mile of the project limits, will further establish the authorization requirements for storm water discharges. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any PSL's on or off the ROW. When the total area disturbed on the project and PSL's within 1/4 mile of the project exceeds 5 acres, provide a copy of the Contractor NOI

for PSL's to the Engineer (to the appropriate MS4 operator when the project is on an off-state system route).

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.

Roadway closures during the following key dates and/or special event are prohibited.
See the general notes under Item 502 for these dates.

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

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 **$16,000.00** per day.

Notes for Milestones

Substantial Completion of Work is defined in Special Provision to Item 8.

Milestone 1
Milestone 1 begins in Phase 2 once all advanced warning signs, detour signs, message boards, and barricades have been placed for the full roadway closure. Milestone 1 ends once the portable concrete barriers have been repositioned, pavement markings are installed, and traffic has completely shifted onto the newly constructed NB side of the proposed bridge for one-lane two-way traffic.

See below for a detailed description of the work included in Milestone 1.
Items of work:
1. Install detour signs, message boards, etc. for Full Road Closure.
2. Begin Milestone #1
3. Remove existing steel truss frame.
4. Remove existing concrete wall/pier.
5. Set proposed girders for NB spans 5-6.
6. Place panels and form bridge deck for NB spans 5-6.

7. Pour bridge deck for NB spans 5-6.
8. Form and pour bridge rail for NB spans 5-6.
9. Remove remaining existing MBGF on NB side.
10. Install proposed SGT and MBGF on NB side.
11. Install reusable narrow crash cushion.
12. Install/Move and reset portable concrete barrier and crash cushions for phase 3.
13. Move and reset traffic signals for one-way traffic control for phase 3.
14. Eliminate existing pavement markings.
15. Install work zone pavement markings for Phase 3.
16. Open NB side to traffic (one lane-two way).
17. End Milestone #1.

The daily road-user cost for incentive and disincentive for Milestone 1 will be $16,000 per day.

The contractor will have **37** working days for Substantial Completion of Work for Milestone 1.

Working day time charges for Milestone 1 will be computed and charged in accordance with Article 8.3.1.2 Six-Day Workweek.

The time charges for the purpose of computing incentive and disincentive for Milestone 1 will begin when traffic is moved to the lane arrangement shown in the TCP for Milestone 1.

The time charges for the purpose of computing incentive and disincentive for Milestone 1 will end with Substantial Completion of Work for Milestone 1.

The maximum number of working days for computing the incentive credit for Milestone 1 will be **8** days. The maximum credit allowable for early completion of Milestone 1 is $128,000.

Failure of Substantial Completion of Work for Milestone 1 within the established number of working days shown above will result in the assessment of disincentives using the daily road-user costs shown above for each working day more than those allowed for Milestone 1.

Milestone coordination on this project is to be addressed with the following individuals:

Chris Llamas #401
Fire Chief – Paisano Volunteer Fire Department
830-569-9895
paisanovfd1@gmail.com or nx2000emt@gmail.com

Devin Wilborn #720
Fire Marshal / Emergency Management Coordinator
830-769-2029
dwilborn@co.atascosa.tx.us

Kennard “Bubba” Riley
Commissioner Pct. #4
830-570-1147

Weldon Cude
Atascosa County Judge
830-769-3093

Sheriff Davis Soward
Atascosa County Sheriff’s Office
830-769-3434

Elizabeth Barnhouse
Director of Transportation (Pleasanton ISD)
830-569-1299
ebarnhouse@pisd.us

--Item 9--

When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Complete the daily tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take “Safe and Effective Use of Law Enforcement Personnel in Work Zones” (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

Certificates of completion should be available to all who finish the course. These should be kept by the officers to substantiate completion when reporting to the work site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case-by-case basis.

--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.

Removal and disposal of existing abandoned utilities that were unable to be identified before letting required to support this project’s construction shall be performed under the overall Preparing Right of Way. If you are uncertain whether the utility is active, contact the District Utility Section.

--Item 132--

ITEM	Description	Percent Retained-Sieve		PI	PI	Density Control	Density Contol
		2"	#200	Max	Min	Max	Min
132	Embankment (Density Control)(TY C)	0	30%	25	6	102% MDD*	98% MDD*
*and greater than the optimum moisture content as determined by Tex-114-E/Tex-113-E							

--Item 161--

Approximately **2,780 CY** of existing topsoil may be salvaged and windrowed or stockpiled (as approved) for later use as Compost Manufactured Topsoil (CMT). Place erosion control measures for the stockpile and/or windrow.

--Item 164--

Drill seeding of permanent grasses requires the use of approved grass seeding equipment capable of properly storing and metering the release of small seeds (such as Bermuda grass) separately from fluffy type seeds (such as bluestems). Equipment manufactured for planting grain crops is acceptable for planting temporary cool season seeds, but not for planting the permanent seed mix.

If performing a permanent seeding in an area with established temporary grass cover and mowing is performed instead of tilling, seed and fertilizer may be distributed simultaneously during “Broadcast Seeding” operations, provided each component is applied at the specified rate.

--Item 168--

Apply vegetative watering as needed to supplement natural rainfall during the vegetation establishment period. Plan quantity of irrigation water is based on the application of a total of 1.3 gal of water each week for each sq. yd. of area that is sodded or seeded. Establishment time

is estimated to be 12 weeks for both sod and permanent seed mixes. Temporary seeding will require less time for establishment. Provide a schedule and coordinate watering cycles and rates per cycle with the Engineer. Obtain approval if the quantity of water to be applied is expected to exceed the plan quantity. Adjust the amount of water applied with each cycle and the number of cycles each wk. according to actual site conditions. Drought or other conditions, as determined by the Engineer, may require the application of supplemental irrigation during hours other than normal working hours.

--Item 247--
There is no minimum PI requirement for this project.

--Item 302--
Previously tested aggregates found to contain excessive quantities of dust (more than 0.5 percent passing the No. 40 sieve) during precoating, stockpiling or hauling operations, may be rejected. Use Test Method Tex-200-F, Part I for testing.

Precoated Aggregate Type PE shall consist of crushed slag, crushed stone or natural limestone rock asphalt.

--Item 305--
All reclaimable asphalt pavement (RAP) material will be retained by the Contractor.

--Item 316--
Asphalt season will be year-round but meet temperature limitations specified in the standard specifications for Item 316.

Ensure that the asphalt for precoating the aggregate and the asphalt used for the surface treatment will not result in a reaction that may adversely affect the bonding of the aggregate and asphalt during the surface treatment operation.
Do not add bag house fines in the production of precoated material.

Clean all concrete curbs, islands, medians, etc. that get coated with asphalt.

--Item 320--
Construct all longitudinal ACP joints adjacent to a travel lane with a joint maker device that will create a 3:1 to 6:1 taper. For placement of 2 inches or more, the device shall provide a maximum ½ inch vertical edge. Taper outside edges (next to the grass) or backfill (shoulder-up) the same day.

Provide a material transfer device capable of providing a continuous flow of material to the paver. The material transfer device will consist of a windrow elevator or better.

Control: 0073-13-012

When placing Item 346 mixtures, use a self-propelled wheel mounted MTV capable of receiving mix from the haul trucks, separate from the paver. It shall have a minimum storage capacity of approximately 25 tons. It shall be equipped with a pivoting discharge conveyor and shall completely and thoroughly remix the material prior to placement. The effectiveness of the MTV's remixing ability is subject to the approval of the Engineer. In addition, the paver shall have a surge storage insert with a minimum capacity of 20 tons.

--Item 330-
If LRA is stockpiled where it might get contaminated with foreign materials, the bottom of the stockpile cannot be used. A set of standard truck scales will be used to determine the quantity of contaminated material that will be deducted. Unless approved, do not stockpile LRA more than 10 days prior to lay-down operations.

--Item 354--
Retain planed material.

Take precaution to avoid damage to existing bridge decks and armor joints. Repair any damage to the bridge decks and/or armor joints as approved. This work will not be paid directly but will be performed at the Contractor's expense.

--Item 401--
A shrinkage compensator is not required for when used for backfilling pipes.

--Item 420--
Mass concrete will be measured in place.

Pier and Bent Concrete will be paid for as "Plans Quantity".

--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 422--
For construction of approach slabs, longitudinal joints shall be placed on lane lines. Joints may be either a saw-cut crack control joint or a construction joint. Saw cut joints shall terminate 1'-0" before reaching the edge of the slab, must be saw cut as soon as possible after placement of concrete, and will be cut within 12 hours of concrete placement. Once sawing begins, it should be a continuous operation and should only be stopped if raveling occurs. Saw cut will be to a depth of 1.5" and filled with approved joint sealant.

--Item 427--
Provide concrete paint finish and form liner finishes to Surface Area IV (areas designated on the plans). Apply the base color shown in the plans to all surfaces unless otherwise noted. Apply the accent color shown in the plans on only the areas designated on the plans.

--Item 496--
The Contractor will submit a demolition plan for all structures to be replaced and/or removed in accordance with Item 496.

The structure(s) to be removed have surface coatings that contain hazardous materials as follows:
Lead-based paint

Provide for the safety and health of employees and abide by all OSHA Standards and Regulations. All costs incurred for proper management, shall be subsidiary to this Item.

--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.

If Nighttime work is required and work is not behind positive barrier then full Class 3 reflective gear is required to be worn by all workers, hard hat halos are required to be worn by the flaggers

at flagging stations, TY III barricades are required to be spaced at 500 ft, and a mandatory night work meeting is required.

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.

Temporary Rumble Strips are to be used according to WZ (RS)-22.

Use 2 number of rumble strip arrays.

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.

Lane and Ramp Closures and Detours

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.

For closures not listed in the TCP; the lane closures are limited to between the hours of **9:00 AM to 4:00 PM,** and at least one lane must remain open at all times.

At no time shall two consecutive intersecting roadways be closed at one time during construction.

At no time shall two consecutive ramps be closed at one time during construction or overlay operations.

Unless otherwise noted in the plans and/or as directed by the Engineer, daily lane closures shall be limited according to the following restrictions:
Nighttime: When Approved by Area Engineer (With uniformed off duty law enforcement officers)
Weekend closures when approved by the Area Engineer.
No lane closures will be permitted for the following dates and/or special events:
Between December 15 and January 1
Wednesday before Thanksgiving thru the Sunday after Thanksgiving
Saturday and Sunday before Memorial Day and Labor Day
Saturday or Sunday when July 4 falls on a Friday or Monday

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--
An Inspector will perform a regularly scheduled SWP3 inspection every 7 calendar days.

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 **0.32** miles.

For Pilot Car Method, additional flaggers other than the 2 required on each approach, when directed by the Engineer, will be measured by the Flagger Control Method. This may involve stationing additional flaggers at all intersections, public driveways, and commercial driveways as determined by the Engineer.

--Item 512--
CTB reflectors will not be paid for directly but will be considered subsidiary to the barrier.

--Item 540--
Guard fence posts placed in proposed and/or existing areas of riprap, sidewalks or other concrete shall have an 18 inch +/- (square or round) leave-out in the concrete as shown in the state standard for MBGF Mow Strip. After the posts are installed, fill the leave-outs with a Grout mixture as shown in the state standard for MBGF Mow Strip.

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding ½" from the edge of the hole.

--Item 545--
See the Crash Cushion Summary Sheet.

--Item 556--
Coarse Aggregate Grade 3 meeting requirements of Item 421, Table 4, is acceptable for Filter Material.

--Item 585--
Use Surface Test Type A for travel lanes.

--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.

--Item 666--
Use TY II markings (vs. an acrylic or epoxy) on asphalt surfaces as the sealer for the TY I markings, unless otherwise approved by the Engineer.

--Item 672--
Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

--Item 677--
Obtain approval before using the mechanical method for the elimination of existing thermoplastic pavement markings.

UA 281 Pavement Marking Strip Seal		326 SY
Asphalt – Rate (Gal/SY)	ASPH(AC-15P)	0.3GAL/SY = 100 GAL
Aggregate – Type/Grade		GR-4 TY-PB SAC-B
Aggregate – Rate (CY/SY)		1CY/110SY = 3 CY

--Item 730--
Mow full-width and hand trim the right of way, including newly seeded or sodded areas, when vegetation reaches a height of 16” or when directed. Removal of brush sprouts growing within guardrail, concrete barriers or at other locations where mowing or hand trimming is done within the limits of construction is required and subsidiary to this item. Mowing may be required more often in newly sodded or seeded areas than in other parts of the project because of the supplemental irrigation these areas receive and the resulting weed growth. Coordinate mowing to avoid rutting or compaction of the soil when mowing where supplemental irrigation is being used. Use mowing equipment that will not adversely affect soil retention blankets or mulches that have been applied. Work performed under this item does not replace the mowing required when placing permanent seeding in an area that has established temporary seeding as described in Article 164.3, Construction.

--Item 734--
Perform Litter Removal once a month or as directed by the Engineer.

During hurricane season (June-October), special attention should be given to remove and dispose of litter and debris from the right of way.

--Item 735--
Perform Debris Removal as directed by the Engineer.

During hurricane season (June-October), special attention should be given to keep center medians, mainlanes, HOV lanes, shoulders, frontage roads, entrance and exit ramps, and direct connector ramps clear of debris.

--Item 738--
Perform Cleaning and Sweeping Highways once a month or as directed by the Engineer.

During hurricane season (June-October), special attention should be given to keep center medians, mainlanes, HOV lanes, shoulders, frontage roads, entrance and exit ramps, and/or direct connector ramps clear of debris.

--Item 3076, 3077, 3079, 3080, 3081, & 3082 --

1. Table 10 in Item 3076 and Table 11in Item 3077, Hamburg Wheel Test Requirements tested in accordance with Tex-242-F are changed for PG 64-22 or lower and PG 70-22. Minimum number of passes at 12.55 mm Rut Depth, Tested at 50 degrees C will be 5,000 and 10,000 respectively.

2. Submit a copy of the Tex 233-F production charts on a weekly basis. At the end of the ACP work, provide all originals.

3. Crushing of aggregate for hot mix and immediate use for production of the mix is not allowed. Stockpile the aggregate until enough material is available for five days of production unless prior approval is provided.

4. Hold a pre-paving meeting one month prior to the placement of the hot mix. The date and time of pre-paving meeting should be coordinated with the Engineer prior to scheduling.

5. Do not use diesel or solvents as asphalt release agents in production, transportation, or construction. A list of approved asphalt release agents is available from the District Laboratory.

6. No more than one hot mix lot will be open for any specific type of hot mix, unless authorized. After a lot is open and the Contractor gets approval to change plants, the previous lot will be closed, and a new lot will be opened. The numbering for the lots produced at the new plant will start with No. 1. If allowed to switch back to the original or previous plant, the next lot from that plant will resume numbering sequentially from the last lot produced by that plant.

--Item 3084 & 3085 --
The minimum application rates are listed in Table UC/BC. The Engineer may adjust the application rates taking into consideration the existing pavement surface conditions.

County: ATASCOSA

Highway: UA 281

Table UC/BC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Hot Asphalt	0.15
Spray Applied Underseal Membrane	0.20
Seal Coat – Emulsion (CHFRS-2P, CRS-2P)	0.25
Seal Coat – Asphalt (AC-15P, AC-20-5TR, AC-20XP, AC10-2TR)	0.23
Aggregate for Seal Coat Options TY PB GR 4(AC) or TY B GR 4(Emulsion)	1 CY:120 SY

--Item 4171--
Install bridge identification numbers shown below for each of the following listed bridges in accordance with the special specification and San Antonio District Standard. Install the bridge identification number on two locations as shown on the plans, or as directed. For bridges in a two-way condition, install the bridge identification number on each outside beam on the upstream side of traffic. For bridges in a one-way condition, install the bridge identification number on each side, opposite corners on each outside beam. For culverts less than 5 ft. in height, install the bridge identification number on the headwall on upstream and downstream location. For culverts greater than 5 ft. in height, install the bridge identification number inside the first barrel on the upstream side of traffic and inside the last barrel on the opposite corner in the direction of traffic.

--Item 6001--
Portable Changeable Message Signs will be required for this project. 2 message boards will be measured and paid for by the EA. These message boards will be required throughout the duration of the project for advanced warning, lane closures, etc. or as needed. An additional 6 message boards will be required during the full roadway closure to complete Phase 2 work. These message boards will be measured and paid for by the DAY. Refer to the TCP Detour sheets for message board locations.

--Item 6185--
Two shadow vehicles with TMA will be required for this project. The TMA's will be measured and paid for by the DAY for each TMA/TA set up and operational on the worksite. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project. See TMA and TA Summary sheet in the plans.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0073-13-012 **DISTRICT** San Antonio **COUNTY** Atascosa
HIGHWAY UA 281

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0073-13-012**			
		PROJECT ID		**A00131335**			
		COUNTY		**Atascosa**			
		HIGHWAY		**UA 281**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	14.000		14.000	
	104-6009	REMOVING CONC (RIPRAP)	SY	674.000		674.000	
	104-6044	REMOVING CONC (FLUME)	SY	34.000		34.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	1,139.000		1,139.000	
	110-6001	EXCAVATION (ROADWAY)	CY	4,612.000		4,612.000	
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	2,039.000		2,039.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	25,017.000		25,017.000	
	164-6071	BROADCAST SEED (TEMP)(WARM OR COOL)	SY	25,017.000		25,017.000	
	168-6001	VEGETATIVE WATERING	MG	392.000		392.000	
	169-6006	SOIL RETENTION BLANKETS (CL 2) (TY F)	SY	25,017.000		25,017.000	
	216-6001	PROOF ROLLING	HR	16.000		16.000	
	247-6475	FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS	CY	496.000		496.000	
	310-6027	PRIME COAT(MC-30 OR AE-P)	GAL	297.000		297.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	6,068.000		6,068.000	
	400-6005	CEM STABIL BKFL	CY	232.000		232.000	
	403-6001	TEMPORARY SPL SHORING	SF	1,834.000		1,834.000	
	416-6001	DRILL SHAFT (18 IN)	LF	120.000		120.000	
	416-6004	DRILL SHAFT (36 IN)	LF	1,278.000		1,278.000	
	420-6013	CL C CONC (ABUT)	CY	70.500		70.500	
	420-6029	CL C CONC (CAP)	CY	111.500		111.500	
	420-6037	CL C CONC (COLUMN)	CY	69.000		69.000	
	422-6001	REINF CONC SLAB	SF	29,000.000		29,000.000	
	422-6015	APPROACH SLAB	CY	77.000		77.000	
	425-6038	PRESTR CONC GIRDER (TX46)	LF	4,039.000		4,039.000	
	432-6008	RIPRAP (CONC)(CL B)(RR8&RR9)	CY	215.000		215.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	54.000		54.000	
	450-6006	RAIL (TY T223)	LF	1,224.000		1,224.000	
	454-6018	SEALED EXPANSION JOINT (4 IN) (SEJ - M)	LF	196.000		196.000	
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1.000		1.000	
	496-6010	REMOV STR (BRIDGE 100 - 499 FT LENGTH)	EA	1.000		1.000	
	496-6043	REMOV STR (SMALL FENCE)	LF	588.000		588.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	16.000		16.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	450.000		450.000	
	506-6003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF	50.000		50.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	500.000		500.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	567.000		567.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0073-13-012 **DISTRICT** San Antonio **COUNTY** Atascosa
HIGHWAY UA 281

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0073-13-012**			
		PROJECT ID		**A00131335**			
		COUNTY		**Atascosa**			
		HIGHWAY		**UA 281**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	567.000		567.000	
	506-6034	CONSTRUCTION PERIMETER FENCE	LF	1,368.000		1,368.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,372.000		1,372.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,372.000		1,372.000	
	510-6002	ONE-WAY TRAF CONT (PILOT CAR)	HR	100.000		100.000	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	15.000		15.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	1,440.000		1,440.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	1,170.000		1,170.000	
	512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	1,440.000		1,440.000	
	530-6019	DRIVEWAYS (ACP)(TYPE 1)	SY	110.000		110.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	950.000		950.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000		4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	1,175.000		1,175.000	
	542-6005	RM MTL BM GD FEN TRANS (T101)	EA	4.000		4.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3.000		3.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4.000		4.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	2.000		2.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	6.000		6.000	
	545-6013	CRASH CUSH ATTEN (INSTL)(R)(N)(TL3)	EA	1.000		1.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	6.000		6.000	
	552-6003	WIRE FENCE (TY C)	LF	646.000		646.000	
	552-6005	GATE (TY 1)	EA	2.000		2.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	18.000		18.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	5.000		5.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	3.000		3.000	
	644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA	4.000		4.000	
	644-6035	IN SM RD SN SUP&AM TYS80(1)SA(U-2EXT)	EA	1.000		1.000	
	644-6037	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	EA	1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	34.000		34.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	14.000		14.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	13.000		13.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	572.000		572.000	
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	5,190.000		5,190.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	24.000		24.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	88.000		88.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	852.000		852.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	430.000		430.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0073-13-012 **DISTRICT** San Antonio **COUNTY** Atascosa
HIGHWAY UA 281

			CONTROL SECTION JOB		**0073-13-012**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00131335**		
			COUNTY		**Atascosa**		
			HIGHWAY		**UA 281**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	59.000		59.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	3.000		3.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3.000		3.000	
	666-6225	PAVEMENT SEALER 6"	LF	7,962.000		7,962.000	
	666-6226	PAVEMENT SEALER 8"	LF	430.000		430.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	3.000		3.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	3.000		3.000	
	666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	3,700.000		3,700.000	
	666-6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	4,262.000		4,262.000	
	672-6007	REFL PAV MRKR TY I-C	EA	22.000		22.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	124.000		124.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	4,089.000		4,089.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	287.000		287.000	
	730-6107	FULL - WIDTH MOWING	CYC	6.000		6.000	
	734-6002	LITTER REMOVAL	CYC	16.000		16.000	
	735-6001	DEBRIS REMOVAL (CNTR MEDIANS/MAINLANES)	CYC	16.000		16.000	
	738-6003	CLEANING / SWEEPING (OUTSIDE MAIN LANE)	CYC	16.000		16.000	
	752-6015	TREE AND BRUSH REMOVAL	AC	4.000		4.000	
	3076-6003	D-GR HMA TY-B PG64-22 (EXEMPT)	TON	418.000		418.000	
	3076-6075	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT)	TON	1,026.000		1,026.000	
	3077-6075	TACK COAT	GAL	205.000		205.000	
	3085-6001	UNDERSEAL COURSE	GAL	1,089.000		1,089.000	
	4171-6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	2.000		2.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	342.000		342.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	4.000		4.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	15.000		15.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

DESIGN: SG | DRAFT: SG | CHECK:

TCP PHASE 1

SHEET NO.	STATION TO STATION [U.S. 281 A]	0403-6001 TEMPORARY SPL SHORING	0502-6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	0506-6034 CONSTRUCTION PERIMETER FENCE	0510-6002 ONE-WAY TRAF CONT (PILOT CAR)	0510-6003 ONE-WAY TRAF CONT (PORT TRAF SIG)	0512-6001 PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	0545-6019 CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	0662-6037 WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	0662-6067 WK ZN PAV MRK REMOV (W)6"(SLD)	0662-6075 WK ZN PAV MRK REMOV (W)24"(SLD)	0672-6009 REFL PAV MRKR TY II-A-A	0677-6001 ELIM EXT PAV MRK & MRKS (4")	0677-6003 ELIM EXT PAV MRK & MRKS (8")
C.S.J. — 0073-13-012		SF	MO	LF	HR	MO	LF	EA	LF	LF	LF	EA	LF	LF
1 OF 8	BEGIN TO STA 964+00	0	0	0	0	0	0	0	0	0	0	0	0	0
2 OF 8	STA 964+00 TO STA 970+00	0	16	0	50	0	0	0	0	0	0	0	0	0
3 OF 8	STA 970+00 TO STA 976+00	0	0	0	0	7	95	1	344	232	12	10	860	287
4 OF 8	STA 976+00 TO STA 982+00	0	0	691	0	0	600	0	0	942	0	0	940	0
5 OF 8	STA 982+00 TO STA 988+00	0	0	677	0	0	354	4	0	931	0	0	1088	0
6 OF 8	STA 988+00 TO STA 994+00	0	0	0	0	0	61	1	228	22	12	6	542	0
7 OF 8	STA 994+00 TO STA 1000+00	0	0	0	0	0	0	0	0	0	0	0	0	0
8 OF 8	STA 1000+00 TO END	0	0	0	0	0	0	0	0	0	0	0	0	0
1 OF 1	TEMP. SHORING LAYOUT	1158	0	0	0	0	0	0	0	0	0	0	0	0
1 OF 1	TEMP. SHORING LAYOUT: ABUTS	313	0	0	0	0	0	0	0	0	0	0	0	0
PHASE 1 TOTALS		1471	16	1368	50	7	1110	6	572	2127	24	16	3430	287

TCP PHASE 2

SHEET NO.	STATION TO STATION [U.S. 281 A]	0512-6025 PORT CTB (MOVE)(SGL SLP)(TY 1)	0545-6005 CRASH CUSH ATTEN (REMOVE)
C.S.J. — 0073-13-012		LF	EA
1 OF 8	BEGIN TO STA 964+00	0	0
2 OF 8	STA 964+00 TO STA 970+00	0	0
3 OF 8	STA 970+00 TO STA 976+00	0	0
4 OF 8	STA 976+00 TO STA 982+00	0	0
5 OF 8	STA 982+00 TO STA 988+00	60	2
6 OF 8	STA 988+00 TO STA 994+00	0	0
7 OF 8	STA 994+00 TO STA 1000+00	0	0
8 OF 8	STA 1000+00 TO END	0	0
PHASE 2 TOTALS		60	2

TCP PHASE 3

SHEET NO.	STATION TO STATION [U.S. 281 A]	0403-6001 TEMPORARY SPL SHORING	0510-6002 ONE-WAY TRAF CONT (PILOT CAR)	0510-6003 ONE-WAY TRAF CONT (PORT TRAF SIG)	0512-6001 PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	0512-6025 PORT CTB (MOVE)(SGL SLP)(TY 1)	0512-6049 PORT CTB (REMOVE)(SGL SLP)(TY 1)	0545-6003 CRASH CUSH ATTEN (MOVE & RESET)	0545-6005 CRASH CUSH ATTEN (REMOVE)	0662-6067 WK ZN PAV MRK REMOV (W)6"(SLD)	0662-6109 WK ZN PAV MRK SHT TERM (TAB)TY W	0662-6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	0677-6001 ELIM EXT PAV MRK & MRKS (4")
C.S.J. — 0073-13-012		SF	HR	MO	LF	LF	LF	EA	EA	LF	EA	EA	LF
1 OF 8	BEGIN TO STA 964+00	0	0	0	0	0	0	0	0	0	0	0	0
2 OF 8	STA 964+00 TO STA 970+00	0	50	0	0	0	0	0	0	0	0	0	0
3 OF 8	STA 970+00 TO STA 976+00	0	0	8	0	217	217	1	1	557	44	86	295
4 OF 8	STA 976+00 TO STA 982+00	0	0	0	0	600	600	0	0	1200	0	166	63
5 OF 8	STA 982+00 TO STA 988+00	0	0	0	309	293	602	0	2	1208	0	120	251
6 OF 8	STA 988+00 TO STA 994+00	0	0	0	21	0	21	1	1	98	0	54	50
7 OF 8	STA 994+00 TO STA 1000+00	0	0	0	0	0	0	0	0	0	0	0	0
8 OF 8	STA 1000+00 TO END	0	0	0	0	0	0	0	0	0	0	0	0
1 OF 1	TEMP. SHORING LAYOUT: ABUTS	363	0	0	0	0	0	0	0	0	0	0	0
PHASE 3 TOTALS		363	50	8	330	1110	1440	2	4	3063	44	426	659

TCP PROJECT TOTALS

** 0316-6015 ASPH (AC-15P)	** 0316-6224 AGGR(TY-PB GR-4 SAC-B)	0403-6001 TEMPORARY SPL SHORING	0502-6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	0506-6034 CONSTRUCTION PERIMETER FENCE	0510-6002 ONE-WAY TRAF CONT (PILOT CAR)	0510-6003 ONE-WAY TRAF CONT (PORT TRAF SIG)	0512-6001 PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	0512-6025 PORT CTB (MOVE)(SGL SLP)(TY 1)	0512-6049 PORT CTB (REMOVE)(SGL SLP)(TY 1)	0545-6003 CRASH CUSH ATTEN (MOVE & RESET)	0545-6005 CRASH CUSH ATTEN (REMOVE)	0545-6019 CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	0662-6037 WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	0662-6067 WK ZN PAV MRK REMOV (W)6"(SLD)	0662-6075 WK ZN PAV MRK REMOV (W)24"(SLD)	# 0662-6109 WK ZN PAV MRK SHT TERM (TAB)TY W	# 0662-6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	0672-6009 REFL PAV MRKR TY II-A-A	* 0677-6001 ELIM EXT PAV MRK & MRKS (4")	* 0677-6003 ELIM EXT PAV MRK & MRKS (8")	6001-6001 PORTABLE CHANGEABLE MESSAGE SIGN	6001-6002 PORTABLE CHANGEABLE MESSAGE SIGN	6185-6002 TMA (STATIONARY)	6185-6005 TMA (MOBILE OPERATION)
GAL	CY	SF	MO	LF	HR	MO	LF	LF	LF	EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	LF	DAY	EA	DAY	DAY
100	3	1834	16	1368	100	15	1440	1170	1440	2	6	6	572	5190	24	88	852	16	4089	287	342	2	4	15

SW3P

SHEET NO.	STATION TO STATION [U.S. 281 A]	SW3P Summary 0161-6017 COMPOST MANUF TOPSOIL (4")	0164-6071 BROADCAST SEED (TEMP)(WARM OR COOL)	0168-6001 VEGETATIVE WATERING	0169-6006 SOIL RETENTION BLANKETS (CL 2) (TY F)	0506-6002 ROCK FILTER DAMS (INSTALL) (TY 2)	0506-6003 ROCK FILTER DAMS (INSTALL) (TY 3)	0506-6011 ROCK FILTER DAMS (REMOVE)	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)
C.S.J. — 0073-13-012		SY	SY	MG	SY	LF	LF	LF	SY	SY	LF	LF
1 OF 3	BEGIN TO STA 976+00	0	0	0	0	50	0	50	387	387	190	190
2 OF 3	STA 976+00 TO STA 982+00	0	0	0	0	100	0	100	0	0	674	674
3 OF 3	STA 982+00 TO END	25017	25017	392	25017	300	50	350	180	180	508	508
PROJECT TOTALS		25017	25017	392	25017	450	50	500	567	567	1372	1372

NOTES:

* ELIMINATE EXISTING PAVEMENT MARKINGS PAID BY LF. METHOD FOR ELIMINATING EXISTING PAVEMENT MARKINGS IS STRIP SEAL. STRIP SEAL FOR ELIMINATING EXISTING PAVEMENT MARKINGS IS CONSIDERED SUBSIDIARY TO ITEMS 0677-6001 AND 0677-6003.

** STRIP SEAL QUANTITIES FOR CONTRACTOR INFORMATION ONLY.

\# ITEM QUANTITIES WERE DOUBLED FOR THE PROJECT TOTAL. TOTAL PROJECT QUANTITIES ACCOUNT FOR THE USE OF WORK ZONE TABS TO PLACE TRAFFIC IN FINAL CONFIGURATION UPON THE COMPLETION OF PHASE 3 AND THE FINAL OVERLAY.

Texas Department of Transportation

UA 281 TRAFFIC CONTROL PLAN & SW3P SUMMARY

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		14

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* **

	Removal Summary	0100-6002	0104-6009	0104-6044	0104-6054	0105-6137	0354-6045	0496-6009	0496-6010	0496-6043	0542-6001	0542-6005	0544-6003	0752-6015
SHEET NO.	STATION TO STATION [U.S. 281 A]	PREPARING ROW	REMOVING CONC (RIPRAP)	REMOVING CONC (FLUME)	REMOVING CONCRETE(MOW STRIP)	REMOVE TRT BASE & ASPH PAV (12"-20")	PLANE ASPH CONC PAV (2")	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	REMOV STR (BRIDGE 100 - 499 FT LENGTH)	REMOV STR (SMALL FENCE)	REMOVE METAL BEAM GUARD FENCE	RM MTL BM GD FEN TRANS (T101)	GUARDRAIL END TREATMENT (REMOVE)	TREE AND BRUSH REMOVAL
C.S.J. — 0073-13-012		STA	SY	SY	LF	SY	SY	EA	EA	LF	LF	EA	EA	AC
1 OF 4	BEGIN TO STA 976+00	4	0	0	1139	0	2497	0	0	0	1050	2	2	0
2 OF 4	STA 976+00 TO STA 982+00	6	325	0	0	1140	770	0	0	366	0	0	0	0
3 OF 4	STA 982+00 TO 988+00	4	349	34	0	550	1421	1	1	222	125	2	2	4
4 OF 4	STA 988+00 TO END	0	0	0	0	0	1380	0	0	0	0	0	0	0
PROJECT TOTALS		14	674	34	1139	1690	6068	1	1	588	1175	4	4	4

* *FOR CONTRACTORS INFORMATION ONLY; TO BE PAID UNDER ITEM 110-6001*

** *QUANTITY INCLUDES 2" MILLING OF SACRIFICIAL LAYER FOR FINAL OVERLAY*

Texas Department of Transportation

UA 281 REMOVAL SUMMARY

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		15

DESIGN JH | DRAFT JH | CHECK

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DESIGN cs | DRAFT cs | CHECK

ROADWAY SUMMARY

	Roadway Summary	0110-6001	0132-6005	0216-6001	0247-6475	0310-6027	0432-6008	0432-6045	0530-6019	0540-6001	0540-6006	0544-6001	0545-6013	0552-6003	0552-6005	3076-6003	3076-6075	3077-6075	3085-6001
SHEET NO.	STATION TO STATION [U.S. 281A]	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(ORD COMP)(TY C)	PROOF ROLLING	FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS	PRIME COAT(MC-30 OR AE-P)	RIPRAP (CONC)(CLB)(RR8&RR9)	RIPRAP (MOW STRIP)(4 IN)	DRIVEWAYS (ACP)(TYPE 1)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	CRASH CUSH ATTEN (INSTL)(R)(N)(TL3)	WIRE FENCE (TY C)	GATE (TY 1)	D-GR HMA TY-B PG64-22 (EXEMPT)	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT)	TACK COAT	UNDERSEAL COURSE
C.S.J. --- 0073-13-012		CY	CY	HR	CY	SY	CY	CY	SY	LF	EA	EA	EA	LF	EA	SY	SY	SY	SY
1 of 5	BEGIN TO STA 972+53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	497	0	497
2 of 5	STA 972+53 TO 978+53	597	1819	8	334	1000	0	46	0	875	2	2	0	0	0	981	3731	1382	2349
3 of 5	STA 978+53 TO 984+53	3361	218	0	0	0	215	0	0	0	0	0	0	504	2	0	0	0	0
4 of 5	STA 984+53 TO 990+53	654	2	8	162	484	0	8	110	75	2	1	1	142	0	474	3160	666	2493
5 of 5	STA 990+53 TO END	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	0	105
PROJECT TOTALS		4612	2039	16	496	✱ 1484	215	54	110	950	4	3	1	646	2	✱ 1455	✱ 7493	✱ 2048	✱ 5444
						# 297										◇ 418	◇ 1026	# 205	# 1089

MAINTENANCE SUMMARY

Maintenance Summary		0730-6107	0734-6002	0735-6001	0738-6003
PERIOD	STATION TO STATION [U.S. 281A]	FULL - WIDTH MOWING	LITTER REMOVAL	DEBRIS REMOVAL (CNTR MEDIANS/MAINLANES)	CLEANING / SWEEPING (OUTSIDE MAIN LANE)
C.S.J. --- 0073-13-012		CYC	CYC	CYC	CYC
16 MONTHS	PROJECT WIDE LIMITS QUARTERLY	6	16	16	16

EARTHWORK QUANTITIES

Baseline		
Station		
	EXCAVATION	EMBANKMENT
97200.000 R1	0	0
97250.000 R1	0	0
97300.000 R1	3.044	23.374
97350.000 R1	6.83	80.91
97400.000 R1	10.727	132.619
97450.000 R1	12.438	123.765
97500.000 R1	11.102	87.347
97550.000 R1	8.836	87.257
97600.000 R1	5.951	117.01
97650.000 R1	5.324	174.434
97700.000 R1	96.894	253.594
97750.000 R1	184.1	268.561
97800.000 R1	169.645	226.092
97850.000 R1	81.637	243.129
97900.000 R1	874.173	142.367
97925.990 R1	911.802	70.625

97950.000 R1	946.566	4.345
98000.000 R1	74.194	0
98050.000 R1	0	0
98100.000 R1	0	0
98150.000 R1	0	0
98200.000 R1	0	0
98250.000 R1	0	0
98300.000 R1	0	0
98350.000 R1	0	0
98400.000 R1	173.409	0.01
98450.000 R1	380.15	0.255
98500.000 R1	384.8	0.818
98550.000 R1	204.756	0.573
98600.000 R1	45.002	1.006
98650.000 R1	20.62	0.909
98700.000 R1	0	0
98750.000 R1	0	0
98800.000 R1	0	0
98850.000 R1	0	0

98900.000 R1	0	0
98950.000 R1	0	0
99000.000 R1	0	0
99050.000 R1	0	0
99100.000 R1	0	0
Grand Total:	4612	2039

NOTES:
1. ✱ THESE ITEMS ARE QUANTIFIED ON THIS SHEET PER SY FOR CONTRACTOR INFORMATION ONLY. BID ITEMS ARE PAID FOR PER TON OR GALLON.
2. # DENOTES GALLONS PAY QUANTITY.
3. ◇ DENOTES TONS PAY QUANTITY.

Texas Department of Transportation

UA 281
ROADWAY QUANTITY SUMMARY

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		16

12/13/2023 3:43:05 PM
dw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/1. General/UA0281*GEN*SUM*RDW*01.dgn

Bridge Summary	0400-6005	0416-6001	0416-6004	0420-6013	0420-6029	0420-6037	0422-6001	0422-6015	0425-6038	0450-6006	0454-6018	4171-6001
STATION TO STATION [U.S. 281 A]	CEM STABIL BKFL	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC GIRDER (TX46)	RAIL (TY T223)	SEALED EXPANSION JOINT (4 IN) (SEJ - M)	INSTALL BRIDGE IDENTIFICATION NUMBERS
C.S.J. — 0073-13-012	CY	LF	LF	CY	CY	CY	SF	CY	LF	LF	LF	EA
PHASE 1	108	60	639	34	48	34.5	7980	28.9	1254	452	39	0
PHASE 2	0	0	0	0	0	0	3040	0	477	160	39	0
PHASE 3	124	60	639	36.5	63.5	34.5	17980	48.1	2308	612	118	2
PROJECT TOTALS	232	120	1278	70.5	111.5	69	29000	77	4039	1224	196	2

Texas Department of Transportation

UA 281 BRIDGE SUMMARY

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		17

DESIGN: DRAFT: CHECK:

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pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/1. General/UA0281*GEN*SUM*BRG*01.dgn

	Pavement Marking Summary	0644-6001	0644-6004	0644-6033	0644-6034	0644-6035	0644-6037	0644-6076	0658-6014	0658-6062	0666-6036	0666-6048	0666-6054	0666-6078	0666-6225	0666-6226	0666-6231	0666-6232	0666-6343	0666-6347	0672-6007	0672-6009
SHEET NO.	STATION TO STATION [U.S. 281A]	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA(U)	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	IN SM RD SN SUP&AM TYS80(1)SA(U-2EXT)	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD)(100MIL)	PAVEMENT SEALER 6"	PAVEMENT SEALER 8"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	REF PROF PAV MRK TY I(W)6"(SLD) (100MIL)	REF PROF PAV MRK TY I(Y)6"(SLD) (100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
C.S.J. -- 0073-13-012		EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	EA	EA	LF	LF	EA	EA	LF	LF	EA	EA
1 of 5	BEGIN TO STA 970+00	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 of 5	STA 970+00 TO STA 976+00	6	0	2	1	0	1	9	0	5	430	14	3	3	1617	430	3	3	757	860	22	22
3 of 5	STA 976+00 TO STA 982+00	5	2	0	0	0	0	9	8	5	0	0	0	0	2860	0	0	0	1200	1660	0	42
4 of 5	STA 982+00 TO STA 988+00	2	2	1	0	0	0	6	6	3	0	0	0	0	2400	0	0	0	1200	1200	0	30
5 of 5	STA 988+00 TO END	5	1	0	2	1	0	9	0	0	0	45	0	0	1085	0	0	0	543	542	0	14
PROJECT TOTALS		18	5	3	4	1	1	34	14	13	430	59	3	3	7962	430	3	3	3700	4262	22	108

Texas Department of Transportation

UA 281
SIGNING, PAVEMENT MARKING & DELINEATION (SPMD) SUMMARY

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		18

DESIGN: JH | DRAFT: JH | CHECK:

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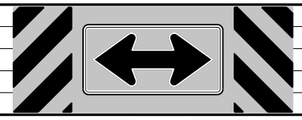
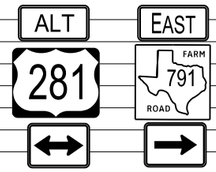
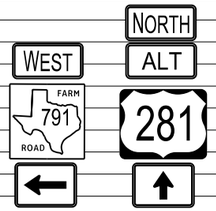
FILE: DOCUMENT NAME

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
1 OF 5												
1	1	M3-3 M4-1a M1-4 M3-2; M3-4 M1-6F; M1-6F M6-3; M6-1		24x12 24x12 30x24 24x12; 24x12 24x24; 24x24 21x15; 21x15			S80	1	SA	U	1EXT	
2 OF 5												
2	1	W1-7T		96x36	X		S80	1	SA	U	WC	
2	2	M4-1a; M3-2 M1-4; M1-6F M6-4; M6-1		24x12; 24x12 30x24; 24x24 21x15; 21x15			S80	1	SA	U		
2	3	M3-1 M3-4; M4-1a M1-6F; M1-4 M6-1; M6-3		24x12 24x12; 24x12 24x24; 30x24 21x15; 21x15			S80	1	SA	U	1EXT	
2	4	M3-1 M4-1a M1-4		24x12 24x12 30x24			10BWG	1	SA	P		
2	5	R1-1		36x36			10BWG	1	SA	P		
2	6	R8-8		24x30			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	0073	13	012	UA 281
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	Atascosa		19

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
2	7	R1-2; R5-1	YIELD / DO NOT ENTER	36x36x36; 36x36			S80	1	SA	U		
2	8	M3-3 M4-1a M1-4 M3-2 MI-6F	SOUTH / ALT / 281 / EAST / FARM 791 ROAD	24x12 24x12 30x24 24x12 24x24			10BWG	1	SA	P		
2	9	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36x36			10BWG	1	SA	P		
2	10	S3-1		36x36			10BWG	1	SA	P		
3 OF 5												
3	1	D1-1UP	Pleasanton	90x18			10BWG	1	SA	T		
3	2	R2-1	SPEED LIMIT 70	30x36			10BWG	1	SA	P		
3	3	M2-1 M1-6F	JCT / FARM 791 ROAD	21x15 24x24			10BWG	1	SA	P		
3	4	W10-3L		36x36			10BWG	1	SA	P		
3	5	R2-1	SPEED LIMIT 55	30x36			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"

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NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
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	0073	13	012	UA 281
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	Atascosa		20

18

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SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
3	7	M2-1 M1-6F	JCT FARM 791 ROAD	21x15 24x24			10BWG	1	SA	P		
3	8	I-3	Atascosa River	42x18			10BWG	1	SA	T		
4 OF 5												
4	1	I-3	Atascosa River	42x18			10BWG	1	SA	T		
4	2	R2-1	SPEED LIMIT 55	30x36			10BWG	1	SA	P		
4	3	I-2aT	Campbellton CITY LIMIT	90x24			S80	1	SA	U		
4	4	R2-1	SPEED LIMIT 50	30x36			10BWG	1	SA	P		
4	5	D21-2T (UP,L)	↑ Whitsett ← Falls City	66x24			10BWG	1	SA	T		
5 OF 5												
5	1	M3-1 M4-1a M1-4	NORTH ALT 281	24x12 24x12 30x24			10BWG	1	SA	P		
5	2	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36x36			10BWG	1	SA	P		
5	3	R1-1	STOP	36x36			10BWG	1	SA	P		
5	5	R1-1	STOP	36x36			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"

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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	0073	13	012	UA 281
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	Atascosa		21

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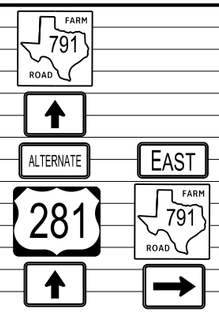
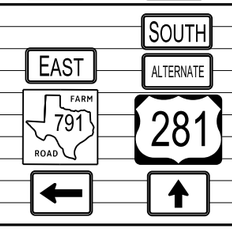
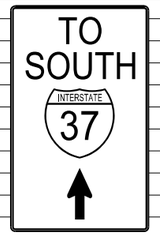
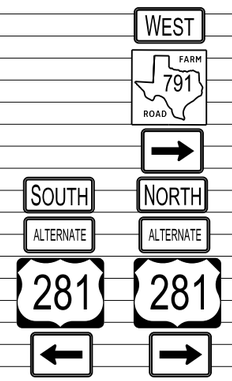
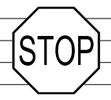
SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
5	6	M1-6F M6-3 M4-1:M3-2 M1-4; M1-6F M6-3:M6-1		24x24 21x15 24x12; 24x12 30x24; 24x24 21x15; 21x15			S80	1	SA	U	1EXT	
5	7	M3-3 M3-2; M4-1 M1-6F; M1-4 M6-1; M6-3		24x12 24x12; 24x12 24x24; 30x24 21x15; 21x15			S80	1	SA	U	1EXT	
5	8	D13-4T		36x60	X		10BWG	1	SA	T		
5	9	M3-4 M1-6F M6-1 M3-3; M3-1 M4-1; M4-1 M1-4; M1-4 M6-1; M6-1		24x12 24x24 21x15 24x12: 24x12 24x12: 24x12 30x24; 30x24 21x15; 21x15			S80	1	SA	U	2EXT	
5	11	R1-1		36x36			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"

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

SHEET: 4 OF 4

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS		0073	13	012	UA 281
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	Atascosa		22

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DATE: 10/19/2023 11:04 AM
FILE: DOCUMENT NAME

DESIGN: SG | DRAFT: SG | CHECK: AG

TRAFFIC CONTROL PLAN ITEMS•

	PROJECT LIMIT SIGNING														PHASE SIGNING												
LOCATION	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
	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																										
LOCATION	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 WHERE ON RED	DO NOT PASS	PILOT CAR FOLLOW ME	ONE LANE BRIDGE	ROAD CLOSED	ROAD CLOSED TO THRU TRAFFIC	XX M.P.H.			WORK ZONE	
	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	G20-5aP	TY III BARRICADE
1																										X	
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 DIMESIONS FOR SIGN AND PLAQUE SIZES (TMUTCD TABLE 6F-1)

TRAFFIC CONTROL PLAN ITEMS• *(CONTINUED)*

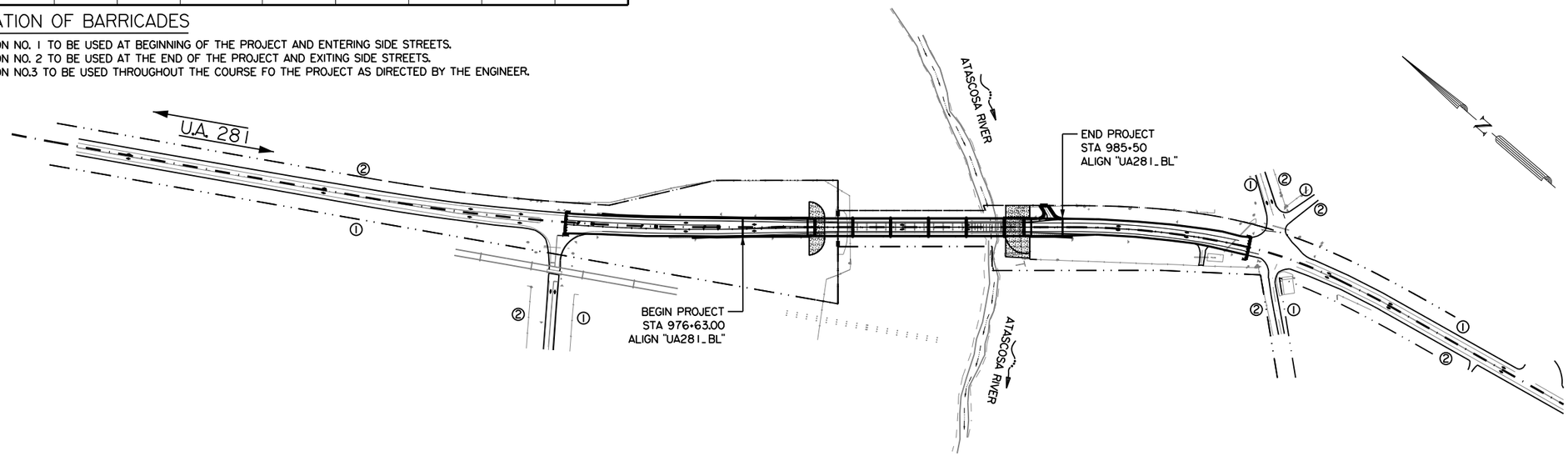
LOCATION									
	CW1-8(F)	VP(F)IR,L	BARRELS	RUMBLE STRIPS AHEAD CW17-2T	PCTB	ROAD CLOSED 500 FT CW20-3C	R3-1 24" x 24"	R3-2 24" x 24"	P.C.M.B.
1									
2									
3	X	X	X	X	X	X	X	X	X

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 N 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. UNLESS A BID ITEM HAS BEEN ESTABLISHED.

LOCATION OF BARRICADES

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



STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=350'

Texas Department of Transportation

UA 281
TRAFFIC CONTROL PLAN SCHEDULE OF BARRICADES

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		23

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DESIGN: SG | DRAFT: SG | CHECK: AG

TRAFFIC CONTROL PLAN SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN THREE PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, 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 PER THE PHASES 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) THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING WEIGHT LIMIT BRIDGE SIGN. CONTRACTOR EQUIPMENT AND VEHICLES MUST FOLLOW THE LOAD POSTING SIGN WHEN CROSSING EXISTING BRIDGE.**

(6) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

PHASE 1

THE INTENT OF PHASE 1 IS TO SHIFT TRAFFIC TO THE SOUTHBOUND SIDE OF ATASCOSA RIVER BRIDGE, REMOVE THE EXISTING NORTHBOUND SIDE OF BRIDGE, CONSTRUCT THE PROPOSED NORTHBOUND SECTION OF BRIDGE, AND RECONSTRUCT THE ROADWAY NORTH AND SOUTH OF ATASCOSA RIVER BRIDGE. THE EXISTING STEEL TRUSS SECTION IS TO REMAIN IN PLACE FOR PHASE 2 WORK.

1. MOBILIZATION
2. INSTALL WORK ZONE TRAFFIC CONTROL DEVICES AND SW3P 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 AND END TREATMENTS.
    c. INSTALL TRAFFIC SIGNALS FOR ONE-WAY TRAFFIC CONTROL.
    d. ELIMINATE EXISTING PAVEMENT MARKINGS (STRIP SEAL).
    e. INSTALL WORK ZONE PAVEMENT MARKINGS.
3. PREP ROW.
4. REMOVE SGT AND EXISTING MBGF WITHIN WORK ZONE LIMITS OF TCP PHASE 1.
5. SAWCUT BRIDGE AND PAVEMENT.
6. REMOVE PARTIAL EXISTING NORTHBOUND SECTION (REFER TO TCP PHASE 1 TYPICAL SECTIONS) OF ATASCOSA RIVER BRIDGE. REMOVE THE BRIDGE DECK, METAL RAILING, AND ABUTMENTS, PER APPROVED BRIDGE DEMOLITION PLAN. THE CONTRACTOR MUST PROVIDE A MINIMUM OF 30-DAY ADVANCE NOTICE, TO THE ENGINEER, PRIOR TO REMOVAL OF METAL BRIDGE RAIL AND DEMO OF EXISTING BRIDGE STRUCTURE. PROJECT ENGINEER TO CONTACT DISTRICT ENVIRONMENTAL OFFICE PRIOR TO REMOVING METAL BRIDGE RAIL. SEE EPIC SHEET FOR ADDITIONAL INFORMATION.
7. CONSTRUCT 19' (FROM BRIDGE CENTERLINE) OF PROPOSED NORTHBOUND SECTION OF ATASCOSA RIVER BRIDGE.
    a. ABUTMENT 1 AND 7 EMBANKMENT, GRADING, AND TEMPORARY SPECIAL SHORING
    b. DRILLED SHAFTS
    c. ABUTMENTS 1 AND 7 (HEADWALL, WINGWALL, CAPS)
    d. COLUMNS (BENTS 2-6)
    e. BENT CAPS (BENTS 2-6)
    f. GIRDERS 1-3 (ABUTMENT 1 TO BENT 5)
    g. DECK FROM STA 978+63 TO STA 982+83.
    h. APPROACH SLAB FROM STA 978+43.00 TO STA 978+63 AND 984+43 TO 984+63.
    i. T223 RAIL FROM STA 978+47 TO STA 982+83.
8. CONSTRUCT THE NORTHBOUND PAVEMENT SECTION, PER PROJECT RECONSTRUCTION LIMITS. STA 976+63 TO 978+63 AND FROM STA 984+43 TO 985+50.
    a. 12" FLEX BASE TYPE D, GRADE 1-2 OR 5 (COMP IN PLACE) IN ACCORDANCE WITH ITEM 247
    b. 5" D-GR HMA TY-B (PG 64-22)
    c. 4" D-GR HMA TY-C SAC-A (PG 76-22): (2" WILL BE CONSIDERED SACRIFICIAL AND WILL BE REMOVED FOR FINAL OVERLAY).
9. CONSTRUCT DRIVEWAY AS SHOWN IN THE PLANS. MAINTAIN ACCESS AT ALL TIMES.
10. CONSTRUCT MOWSTRIP AND RIP-RAP.
11. ESTABLISH VEGETATION.

PHASE 2

THE INTENT OF PHASE 2 IS TO PERFORM A COMPLETE BRIDGE CLOSURE OF ATASCOSA RIVER BRIDGE, REMOVE THE EXISTING STEEL TRUSS BRIDGE, CONSTRUCT THE PENDING BRIDGE DECK FOR THE PROPOSED NORTHBOUND SECTION OF BRIDGE, AND INSTALL MBGF ON THE NORTHBOUND SIDE OF ROADWAY. MILESTONE 1 BEGINS IN PHASE 2 ONCE ADVANCE WARNING SIGNS AND BARRICADES ARE PLACED FOR THE UA 281 FULL ROADWAY CLOSURE. MILESTONE 1 ENDS ONCE FULL BRIDGE CLOSURE IS PICKED UP, TRAFFIC SWITCH IS COMPLETED AND THE NORTHBOUND LANE IS OPEN TO TRAFFIC.

1. INSTALL WORK ZONE TRAFFIC CONTROL DEVICES AND SW3P AS SHOWN IN THE PLANS.
2. BEGIN MILESTONE. REFER TO TCP PHASE 2 LAYOUT.
3. REMOVE EXISTING STEEL TRUSS BRIDGE.
4. REMOVE REMAINING EXISTING MBGF ON NORTHBOUND SIDE.
5. SET GIRDERS 1-3 SPANNING FROM BENT 5 TO BENT 6 AND FROM BENT 6 TO ABUTMENT 7 (FROM STA 982+83 TO STA 984+43).
6. CONSTRUCT PENDING SECTION (STEEL TRUSS BRIDGE SECTION SKIPPED IN PHASE 1) BRIDGE DECK FROM STA 982+83 TO STA 984+43 AND RAIL FROM STA 982+83 TO STA 984+59 FOR THE NORTHBOUND SECTION OF THE BRIDGE.
7. CONSTRUCT MOWSTRIP.
8. INSTALL SGT AND MBGF ON NORTHBOUND SIDE. INSTALL CRASH CUSHION ATTENUATOR ON SOUTHBOUND SIDE.
9. INSTALL WORK ZONE TRAFFIC CONTROL DEVICES AND SW3P AS SHOWN IN THE PLANS FOR PHASE 3.
    a. INSTALL/MOVE AND RESET PORTABLE CONCRETE TRAFFIC BARRIER END TREATMENTS FOR PHASE 3.
    b. MOVE AND RESET TRAFFIC SIGNALS FOR ONE-WAY TRAFFIC CONTROL FOR PHASE 3.
    c. ELIMINATE EXISTING PAVEMENT MARKINGS (STRIP SEAL).
    d. INSTALL WORK ZONE PAVEMENT MARKINGS.
10. END MILESTONE. REFER TO TCP PHASE 2 LAYOUT.

PHASE 3

THE INTENT OF PHASE 3 IS TO REMOVE THE REMAINING EXISTING BRIDGE STRUCTURE, CONSTRUCT THE SOUTHBOUND SECTION OF PROPOSED BRIDGE, AND RECONSTRUCT THE ROADWAY NORTH AND SOUTH OF ATASCOSA RIVER BRIDGE.

1. REMOVE SGT AND EXISTING MBGF.
2. REMOVE THE REMAINING EXISTING COMPONENTS OF ATASCOSA RIVER BRIDGE (REFER TO TCP PHASE 3 TYPICAL SECTIONS). REMOVE THE BRIDGE DECK, METAL RAILING, AND ABUTMENTS, PER APPROVED BRIDGE DEMOLITION PLAN. THE CONTRACTOR MUST PROVIDE A MINIMUM OF 30-DAY ADVANCE NOTICE, TO THE ENGINEER, PRIOR TO REMOVAL OF METAL BRIDGE RAIL AND DEMO OF EXISTING BRIDGE STRUCTURE. PROJECT ENGINEER TO CONTACT DISTRICT ENVIRONMENTAL OFFICE PRIOR TO REMOVING METAL BRIDGE RAIL. SEE EPIC SHEET FOR ADDITIONAL INFORMATION.
3. CONSTRUCT REMAINING PROPOSED ATASCOSA RIVER BRIDGE (31' FROM BRIDGE CENTERLINE)
    a. ABUTMENT 1 AND 7 EMBANKMENT, GRADING, AND TEMPORARY SPECIAL SHORING
    b. DRILLED SHAFTS
    c. ABUTMENTS 1 AND 7 (HEADWALL, WINGWALL, CAPS)
    d. COLUMNS (BENTS 2-6)
    e. BENT CAPS (BENTS 2-6)
    f. GIRDERS 4-7 (FULL SPAN: ABUTMENT 1 TO ABUTMENT 7)
    g. DECK FROM STA 978+63 TO 984+43.
    h. APPROACH SLAB FROM STA 978+43 TO STA 978+63 AND 984+43 TO 984+63.
    i. T223 RAIL FROM STA 978+47 TO 984+59.
4. CONSTRUCT THE SOUTHBOUND PAVEMENT SECTION, PER PROJECT RECONSTRUCTION LIMITS. STA 976+63 TO 978+63 AND FROM STA 984+43 TO 985+50.
    a. 12" FLEX BASE TYPE D, GRADE 1-2 OR 5 (COMP IN PLACE) IN ACCORDANCE WITH ITEM 247
    b. 5" D-GR HMA TY-B (PG 64-22)
    c. 4" D-GR HMA TY-C SAC-A (PG 76-22)
5. CONSTRUCT MOWSTRIP AND RIP-RAP.
6. INSTALL MBGF
7. REMOVE PORTABLE CONCRETE TRAFFIC BARRIER AND OPEN BRIDGE (BOTH NORTHBOUND AND SOUTHBOUND LANES) TO TRAFFIC.
8. INSTALL WORK ZONE TABS TO PLACE TRAFFIC IN FINAL CONFIGURATION PRIOR TO FINAL OVERLAY.
9. PLACE FINAL OVERLAY. STA 971+70 TO STA 990+71.
    a. 2" MILL SACRIFICIAL LAYER FROM PHASE 1 RECONSTRUCTED SECTION
    b. 2" MILL OVERLAY LIMITS
    c. 2" DENSE GRADED TY-C SAC-A (PG 76-22)
    d. WORK ZONE TABS
10. INSTALL FINAL PAVEMENT MARKINGS AND FINAL SIGNS.
11. REMOVE EROSION CONTROL ITEMS FOR ENTIRE PROJECT AND ESTABLISH VEGETATION AS SHOWN IN THE PLANS. (70% VEGETATION MUST BE ESTABLISHED PRIOR TO REMOVAL OF SW3P ITEMS)

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Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

Texas Department of Transportation

UA 281
TRAFFIC CONTROL PLAN SEQUENCE OF WORK

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		24

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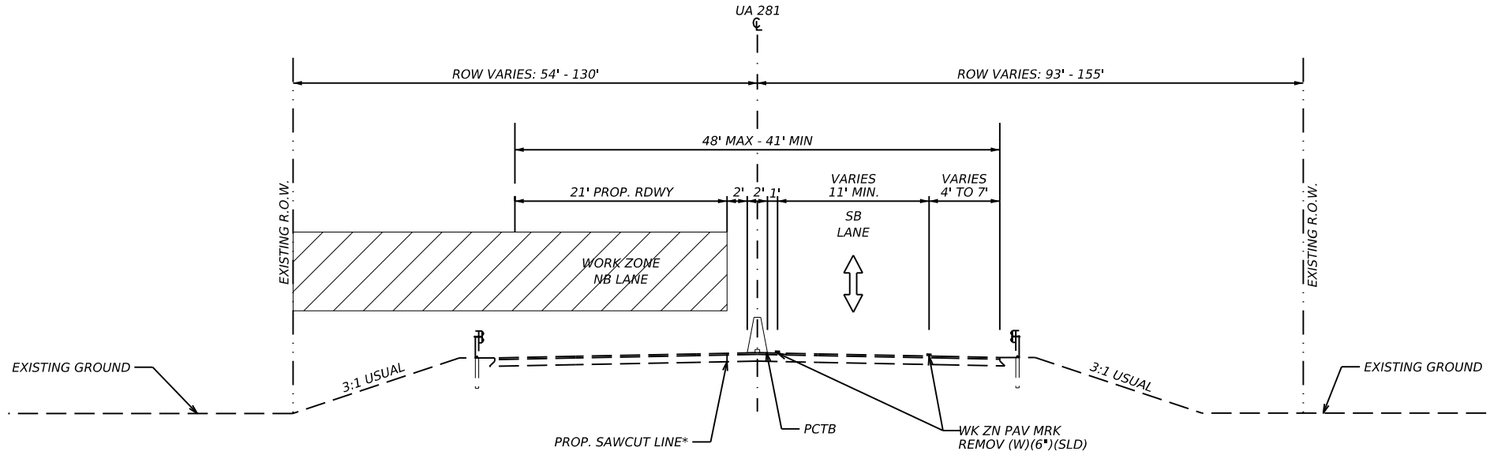
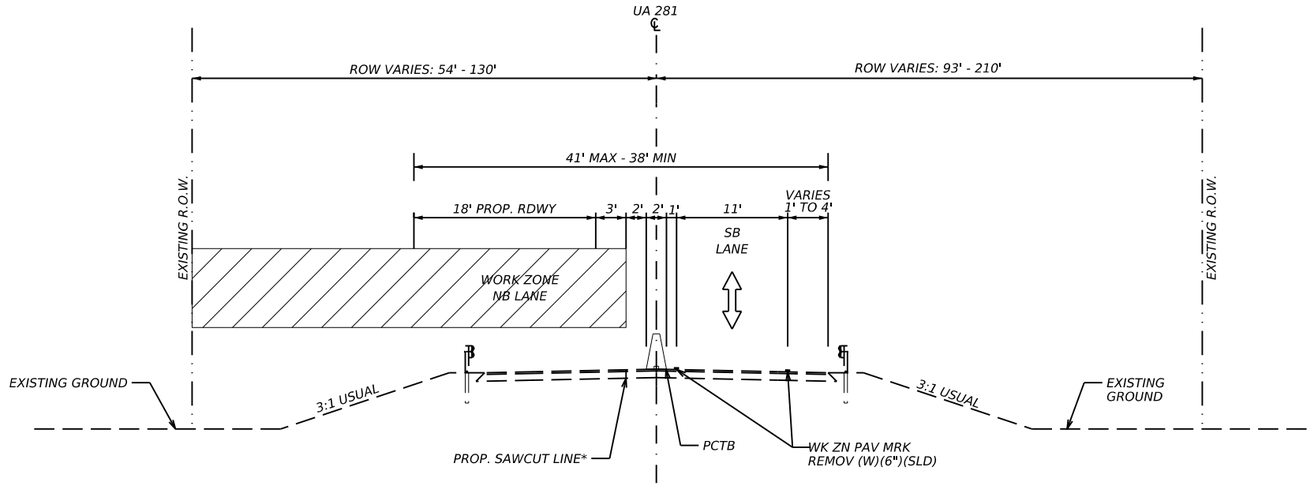


UA 281

STA 976+63 TO STA 978+43



UA 281

STA 978+43 TO STA 979+27.70

NOTE :

- 1. PROPOSED BRIDGE DECK AND CAP SAWCUT LINE 3' FROM CENTERLINE.
2. REMOVE EXISTING STEEL TRUSS BRIDGE SPAN IN PHASE 2.
3. REMOVE REMAINING EXISTING BRIDGE STRUCTURES IN PHASE 3.
4. PINNING CONCRETE BARRIER SHALL BE CONSIDERED SUBSIDIARY TO ITEM 0512-6001. REFER TO SSCB(5)-10 STANDARD.

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NOT TO SCALE

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UA 281
TCP PHASE 1
TYPICAL SECTIONS

SHEET: 1 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		25

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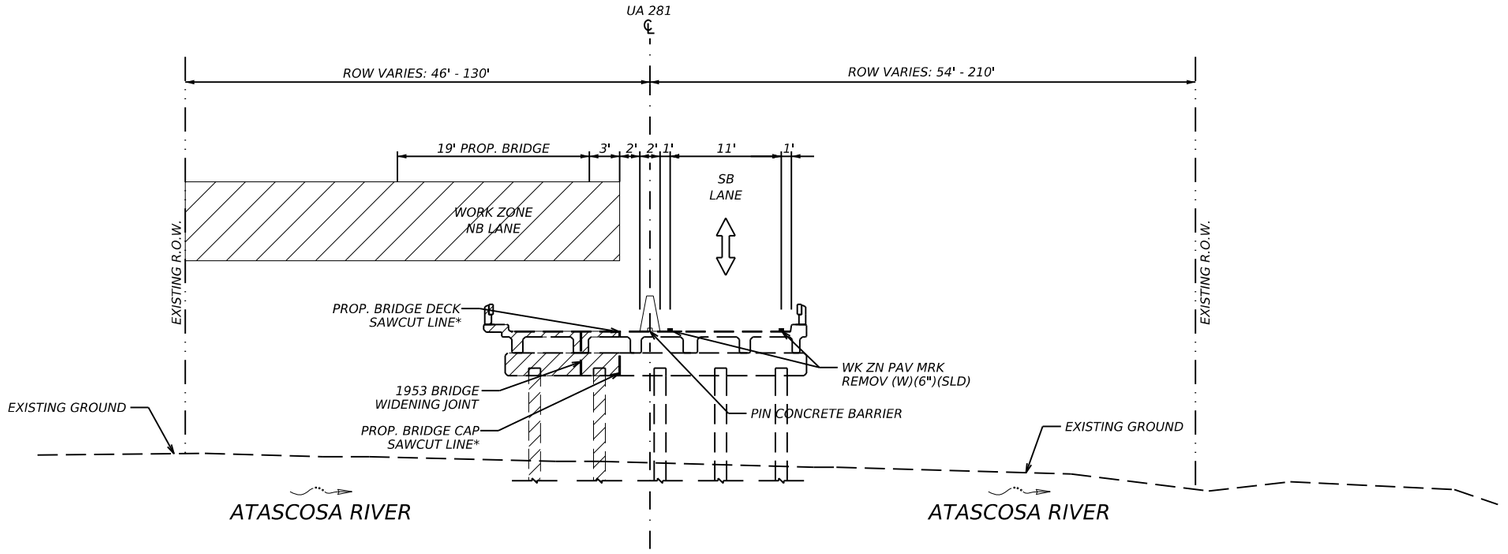
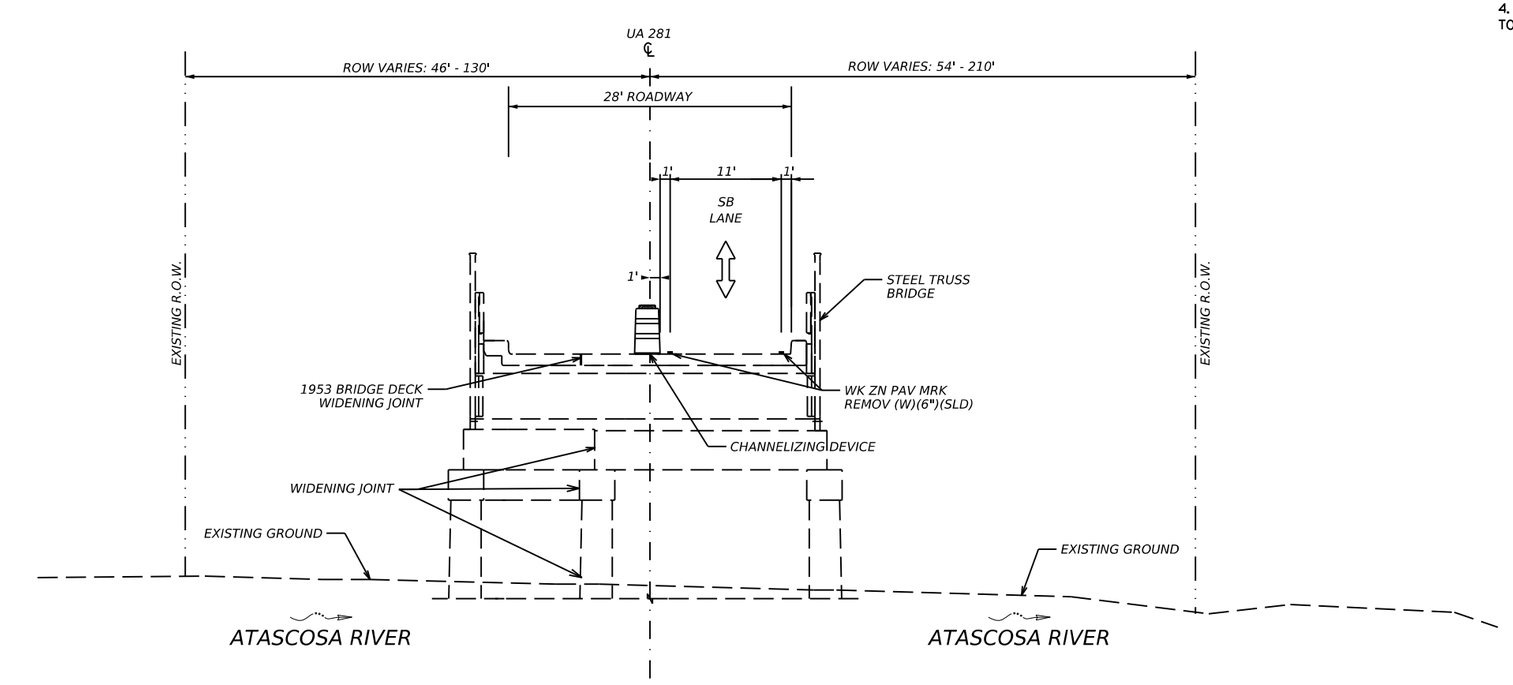


UA 281 - ATASCOSA RIVER BRIDGE

STA 979+27.70 TO STA 982+98.35
STA 983+79.31 TO STA 984+32.36



UA 281 - ATASCOSA RIVER BRIDGE STEEL TRUSS

STA 982+98.35 TO STA 983+79.31

NOTE :

1. PROPOSED SAWCUT LINE 3' FROM CENTERLINE.
2. REMOVE EXISTING STEEL TRUSS BRIDGE SPAN IN PHASE 2.
3. REMOVE REMAINING EXISTING BRIDGE STRUCTURES IN PHASE 3.
4. PINNING CONCRETE BARRIER SHALL BE CONSIDERED SUBSIDIARY TO ITEM 0512-6001. REFER TO SSCB(5)-10 STANDARD.

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UA 281
TCP PHASE 1
TYPICAL SECTIONS

SHEET: 2 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		26

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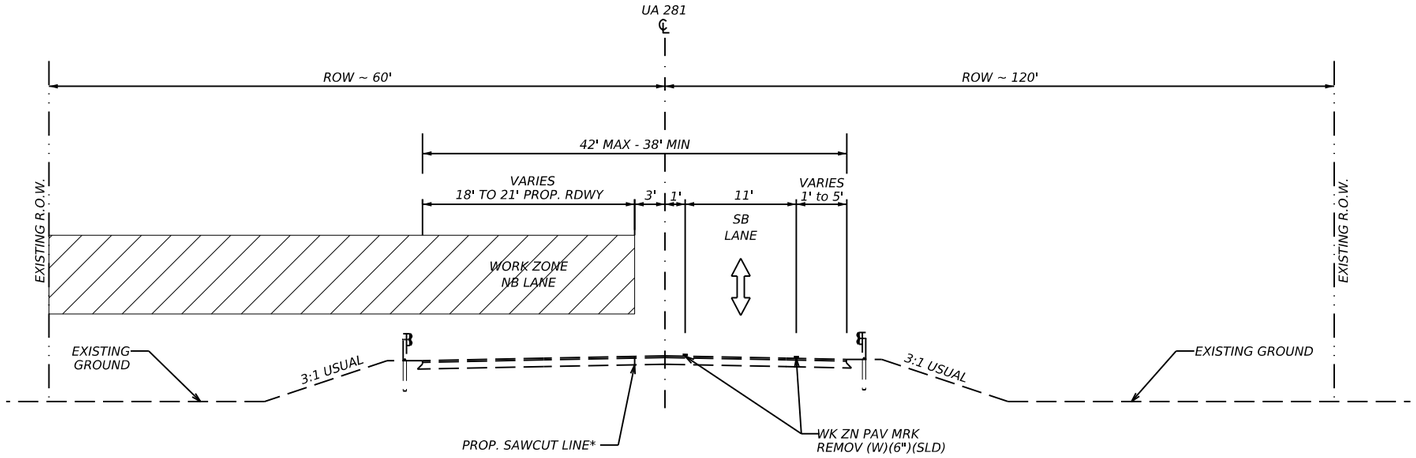

UA 281

STA 984+32.36 TO STA 985+50

NOTE :

- 1. PROPOSED SAWCUT LINE 3' FROM CENTERLINE.
2. REMOVE EXISTING STEEL TRUSS BRIDGE SPAN IN PHASE 2.
3. REMOVE REMAINING EXISTING BRIDGE STRUCTURES IN PHASE 3.
4. PINNING CONCRETE BARRIER SHALL BE CONSIDERED SUBSIDIARY TO ITEM 0512-6001. REFER TO SSCB(5)-10 STANDARD.

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Texas Department of Transportation

UA 281
TCP PHASE 1
TYPICAL SECTIONS

SHEET: 3 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		27

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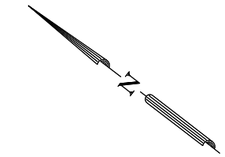
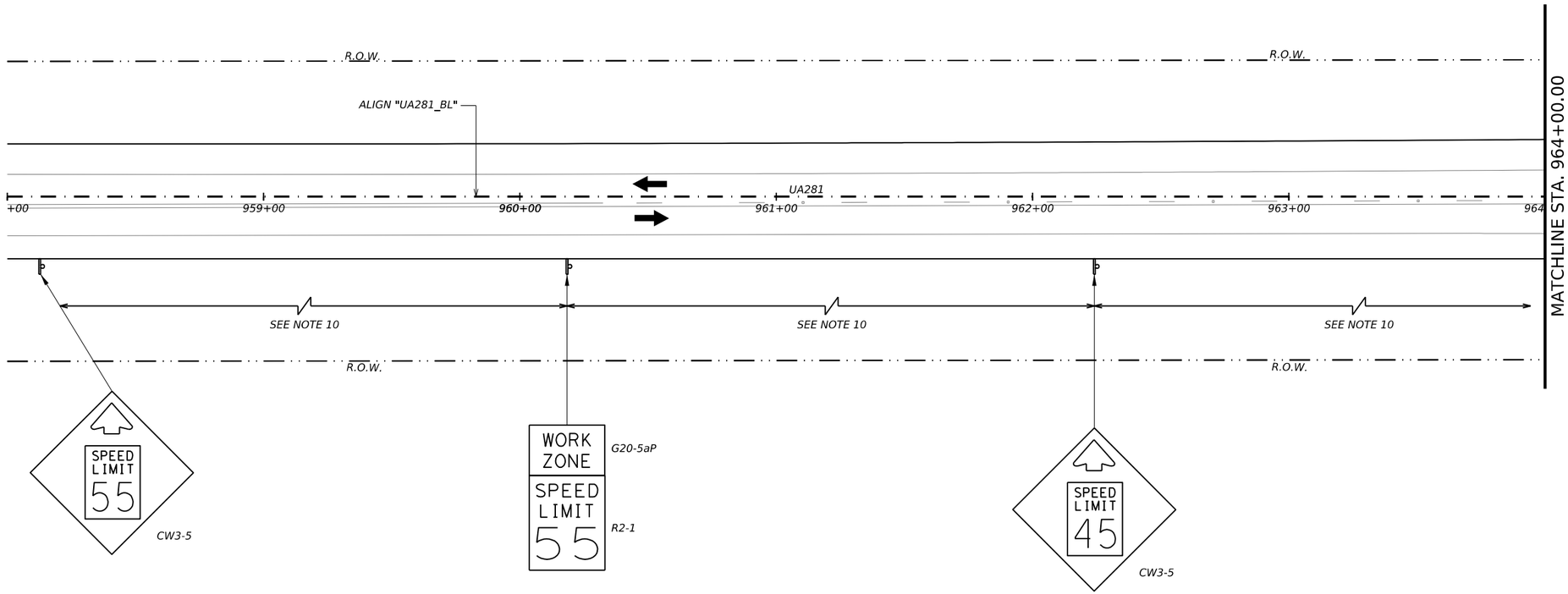
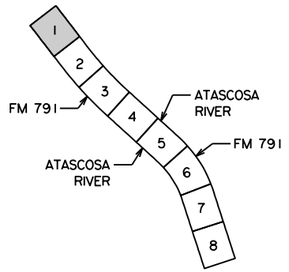




TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 1 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. REFER TO MISCELLANEOUS ROADWAY DETAILS FOR DRIVEWAY.
4. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
5. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
6. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
7. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
8. EXISTING STEEL TRUSS BRIDGE SPAN TO BE REMOVED IN PHASE 2.
9. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
10. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.

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ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

SHEET: 1 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		28

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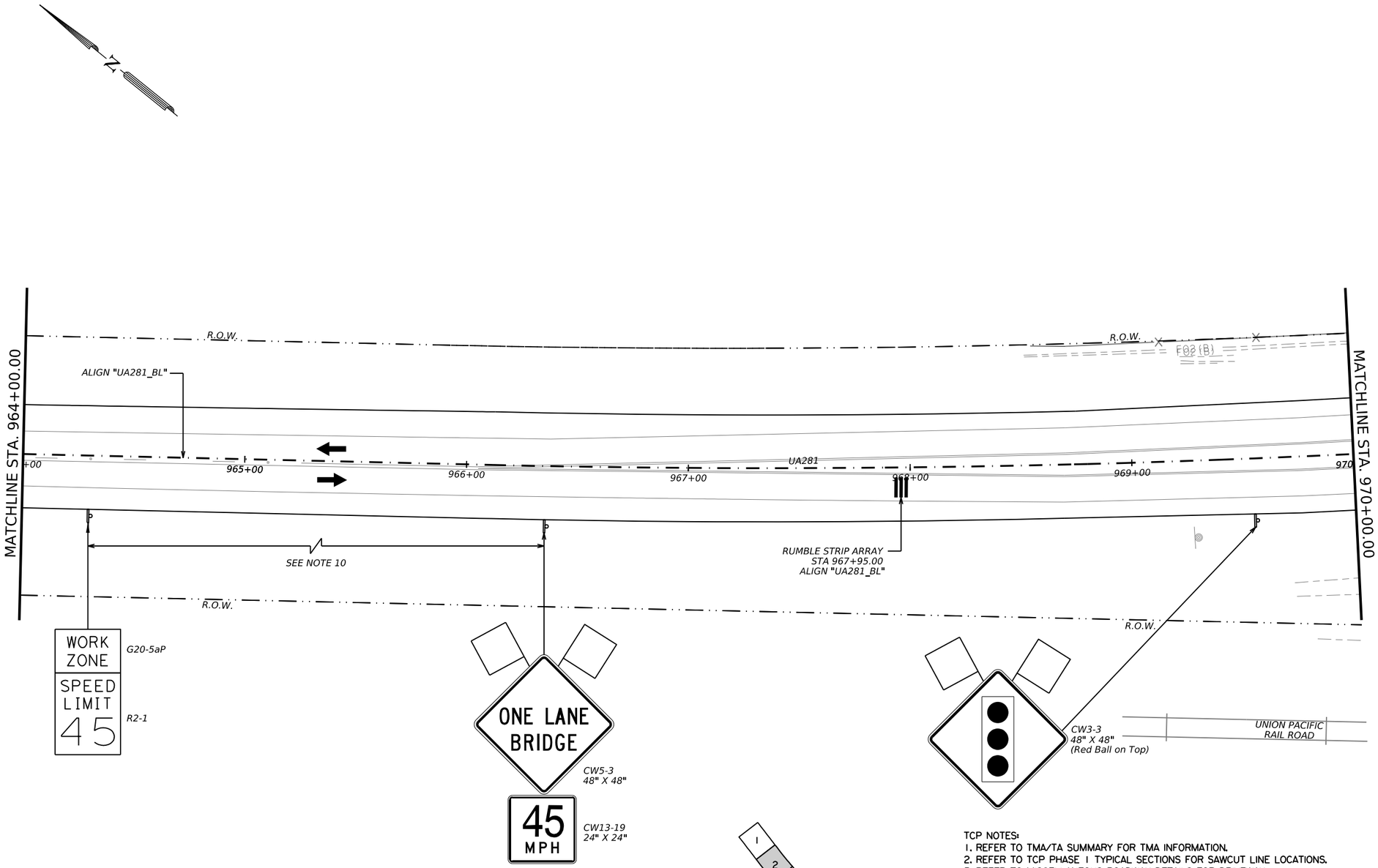
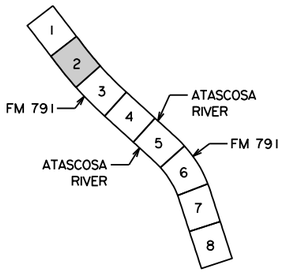
QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
0510-6002	ONE-WAY TRAF CONT (PILOT CAR)	HR	50



TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 1 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. REFER TO MISCELLANEOUS ROADWAY DETAILS FOR DRIVEWAY.
4. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
5. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
6. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
7. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
8. EXISTING STEEL TRUSS BRIDGE SPAN TO BE REMOVED IN PHASE 2.
9. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
10. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.

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SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

SHEET: 2 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		29

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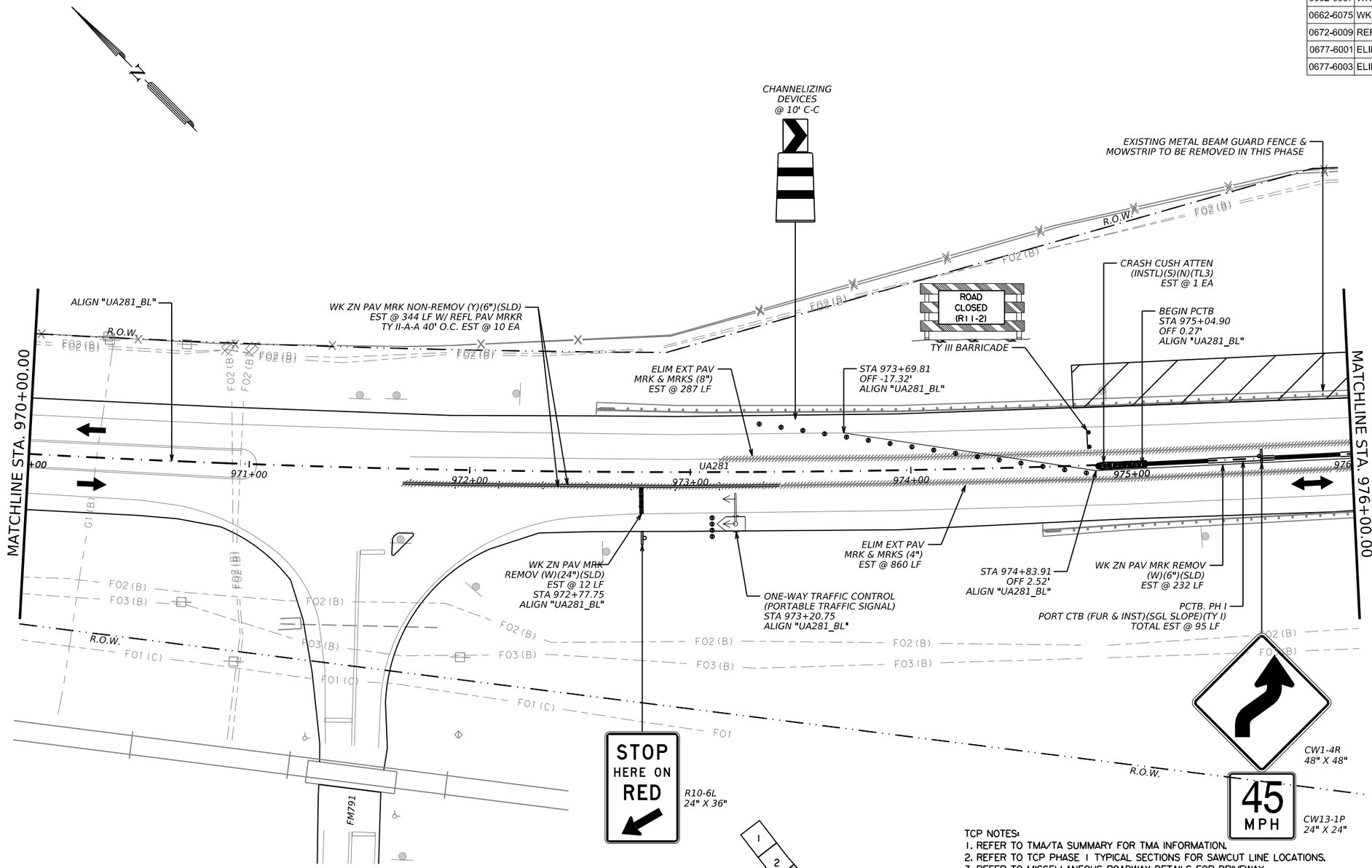
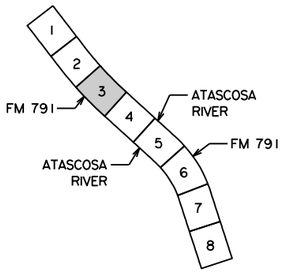
QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	7
0512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	95
0545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1
0662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	344
0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	232
0662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	12
0672-6009	REFL PAV MRKR TY II-A-A	EA	10
0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	860
0677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	287



TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 1 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. REFER TO MISCELLANEOUS ROADWAY DETAILS FOR DRIVEWAY.
4. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
5. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
6. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
7. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
8. EXISTING STEEL TRUSS BRIDGE SPAN TO BE REMOVED IN PHASE 2.
9. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
10. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

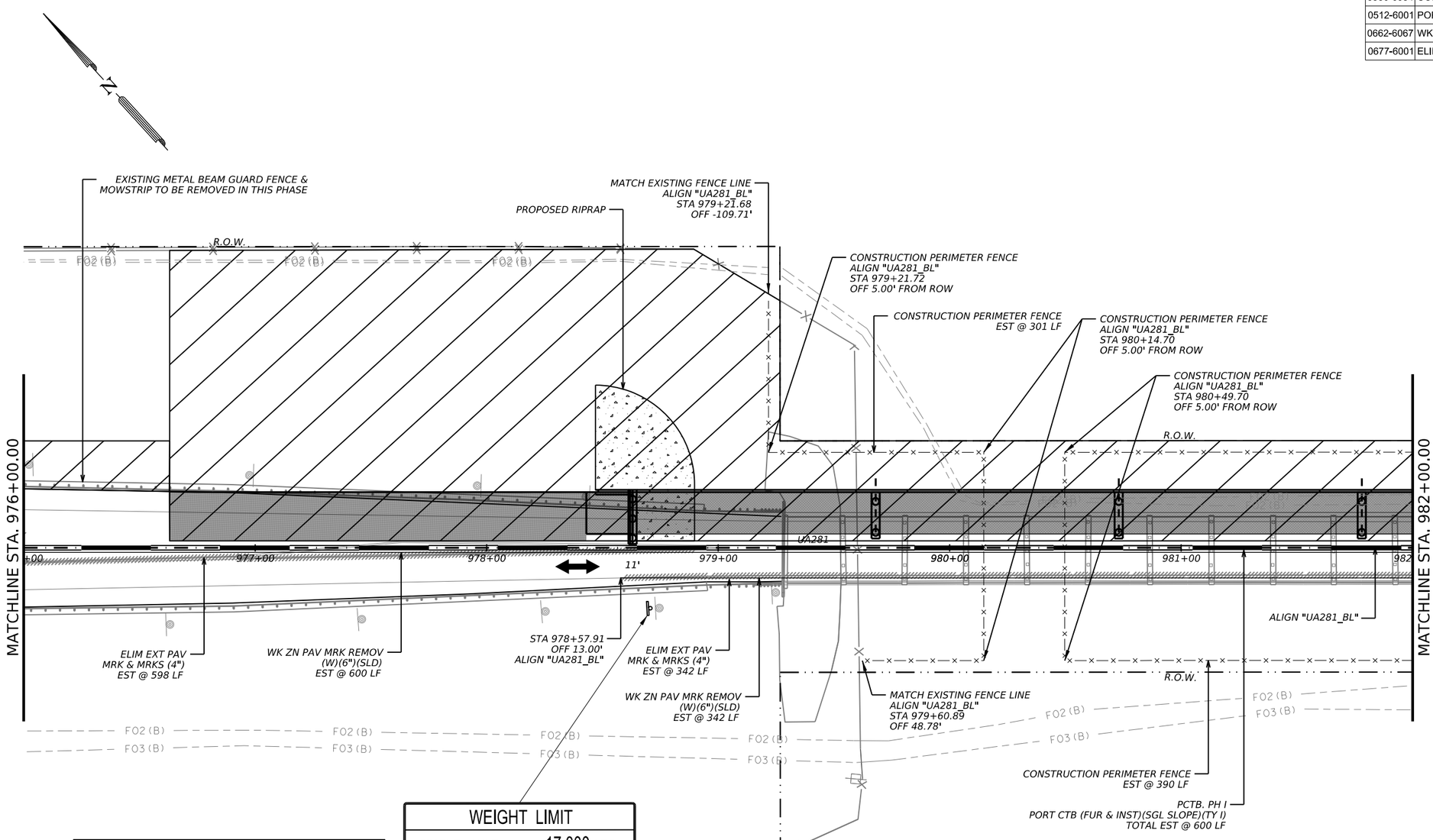
SHEET: 3 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		30

12/13/2023 2:23:40 PM
pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/2. TCP/Phase 1/UA0281*TCP*PH01*03.dgn

DESIGN: SG | DRAFT: SG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
0506-6034	CONSTRUCTION PERIMETER FENCE	LF	691
0512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	600
0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	942
0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	940



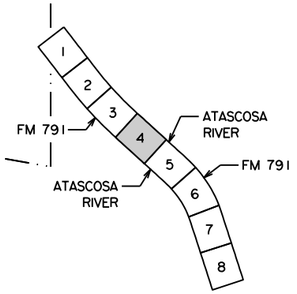
WEIGHT LIMIT	
SINGLE AXLE	17,000 LBS
TANDEM AXLE	21,000 LBS
SINGLE VEH	36,000 LBS
COMBINATION VEH	42,000 LBS

NOTE: THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING WEIGHT LIMIT BRIDGE SIGN. CONTRACTOR EQUIPMENT AND VEHICLES MUST FOLLOW THE LOAD POSTING SIGN WHEN CROSSING EXISTING BRIDGE.

** EXISTING SIGN TO BE USED AND PLACED ON TEMPORARY POSTS. SIGN IS SUBSIDIARY TO ITEM 502. REMOVAL OF WEIGHT LIMIT SIGN UPON COMPLETION OF PHASE 2 WORK IS PAID UNDER ITEM 0644-6076. SEE SPMD SHEETS FOR MORE INFORMATION.*

TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 1 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. REFER TO MISCELLANEOUS ROADWAY DETAILS FOR DRIVEWAY.
4. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
5. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
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7. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
8. EXISTING STEEL TRUSS BRIDGE SPAN TO BE REMOVED IN PHASE 2.
9. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
10. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

SHEET: 4 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		31

2/21/2024 10:45:35 AM
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DESIGN: SG | DRAFT: SG | CHECK: AG

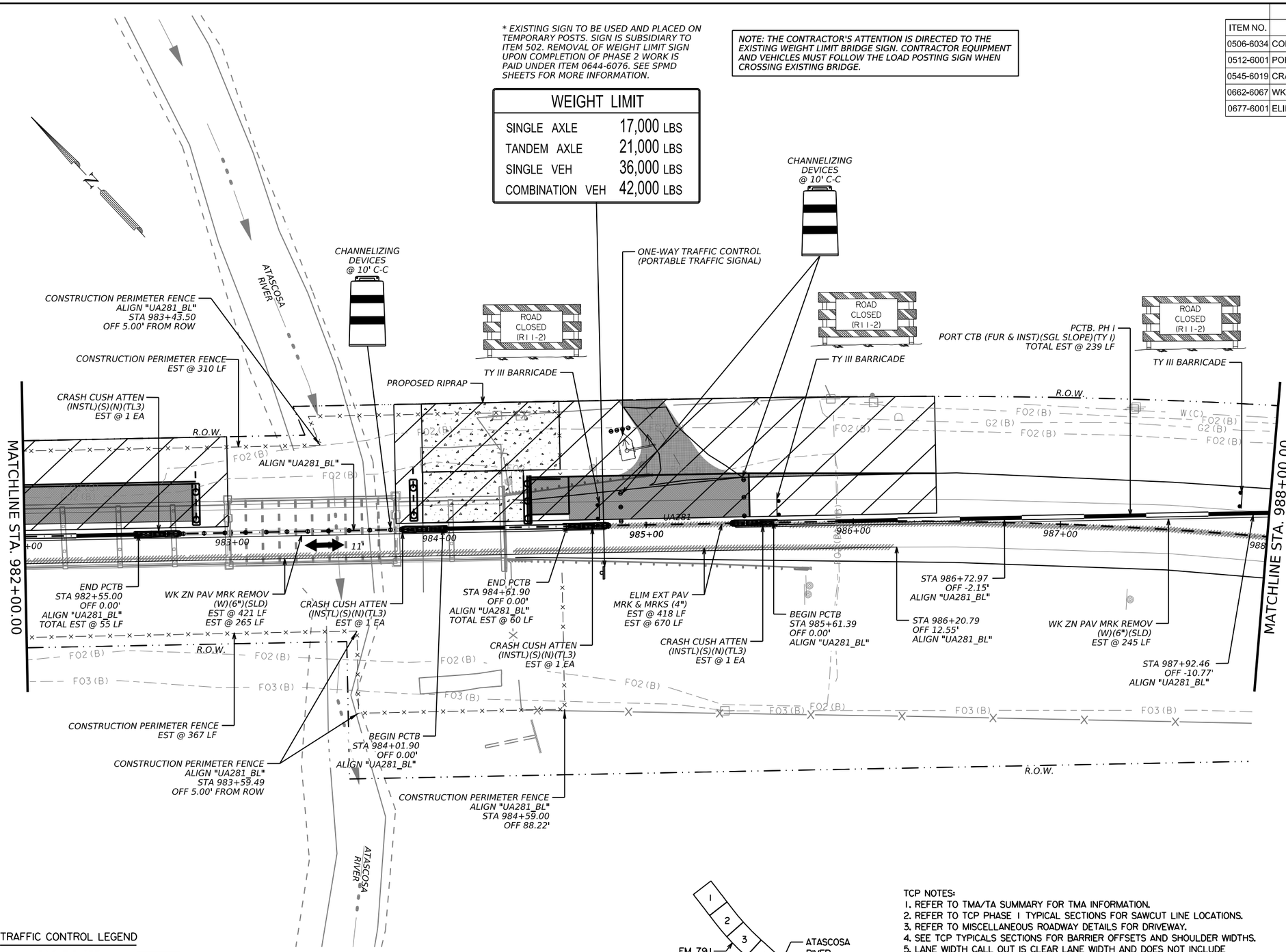
* EXISTING SIGN TO BE USED AND PLACED ON TEMPORARY POSTS. SIGN IS SUBSIDIARY TO ITEM 502. REMOVAL OF WEIGHT LIMIT SIGN UPON COMPLETION OF PHASE 2 WORK IS PAID UNDER ITEM 0644-6076. SEE SPMD SHEETS FOR MORE INFORMATION.

NOTE: THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING WEIGHT LIMIT BRIDGE SIGN. CONTRACTOR EQUIPMENT AND VEHICLES MUST FOLLOW THE LOAD POSTING SIGN WHEN CROSSING EXISTING BRIDGE.

WEIGHT LIMIT	
SINGLE AXLE	17,000 LBS
TANDEM AXLE	21,000 LBS
SINGLE VEH	36,000 LBS
COMBINATION VEH	42,000 LBS

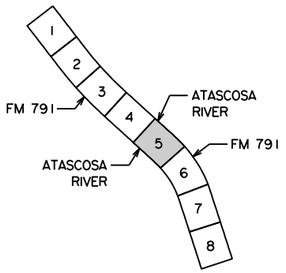
QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0506-6034	CONSTRUCTION PERIMETER FENCE	LF	677
0512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	354
0545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	4
0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	931
0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	1088



TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 1 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. REFER TO MISCELLANEOUS ROADWAY DETAILS FOR DRIVEWAY.
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10. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

SHEET: 5 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		32

2/21/2024 10:53:40 AM
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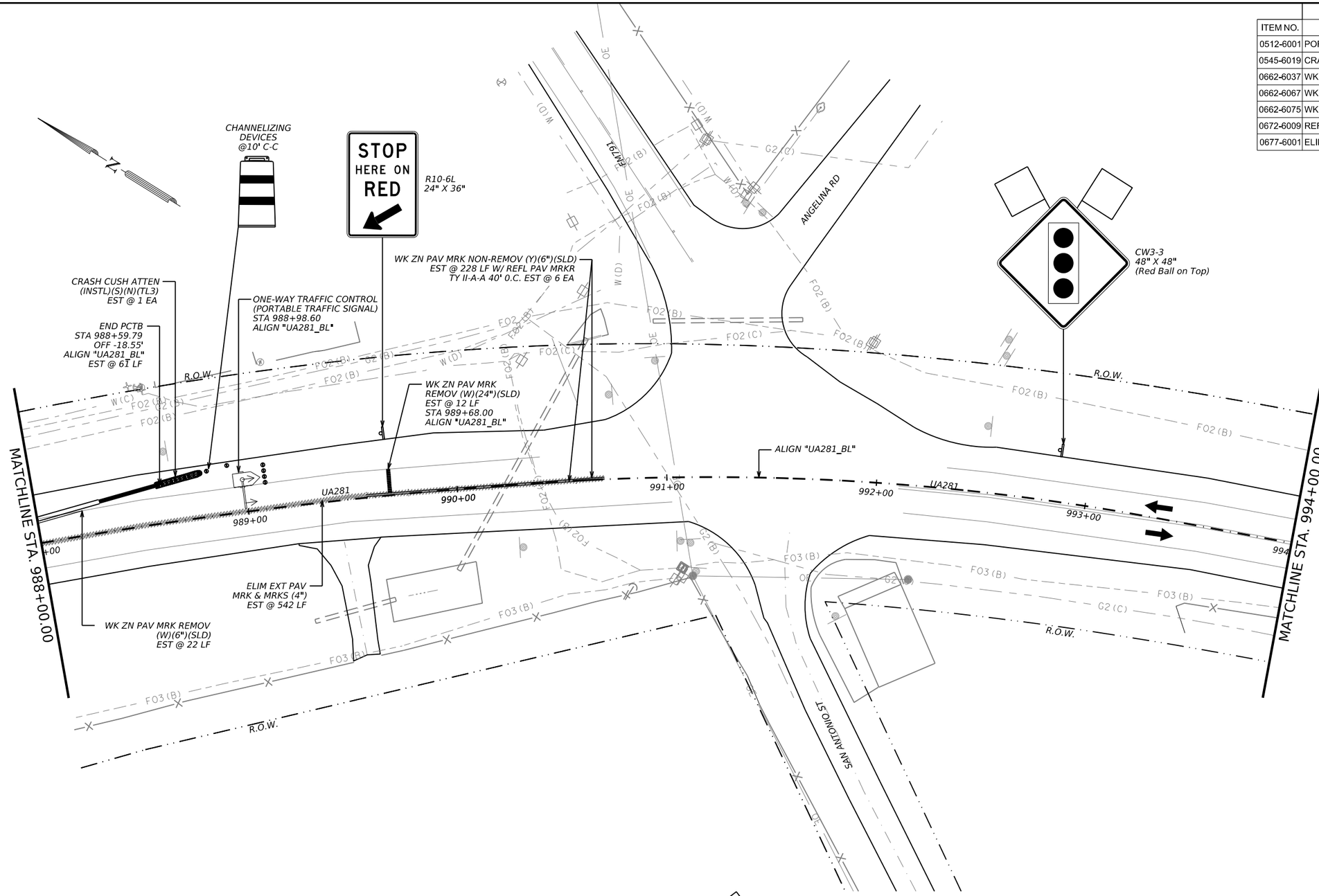
DESIGN: SG | DRAFT: SG | CHECK: AG

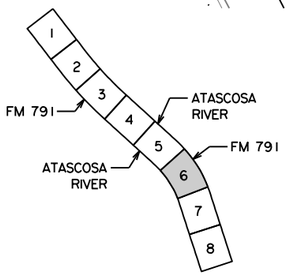
QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	61
0545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1
0662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	228
0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	22
0662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	12
0672-6009	REFL PAV MRKR TY II-A-A	EA	6
0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	542



TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE



TCP NOTES:
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3. REFER TO MISCELLANEOUS ROADWAY DETAILS FOR DRIVEWAY.
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7. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
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9. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
10. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

SHEET: 6 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		33

12/13/2023 2:24:10 PM
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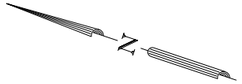
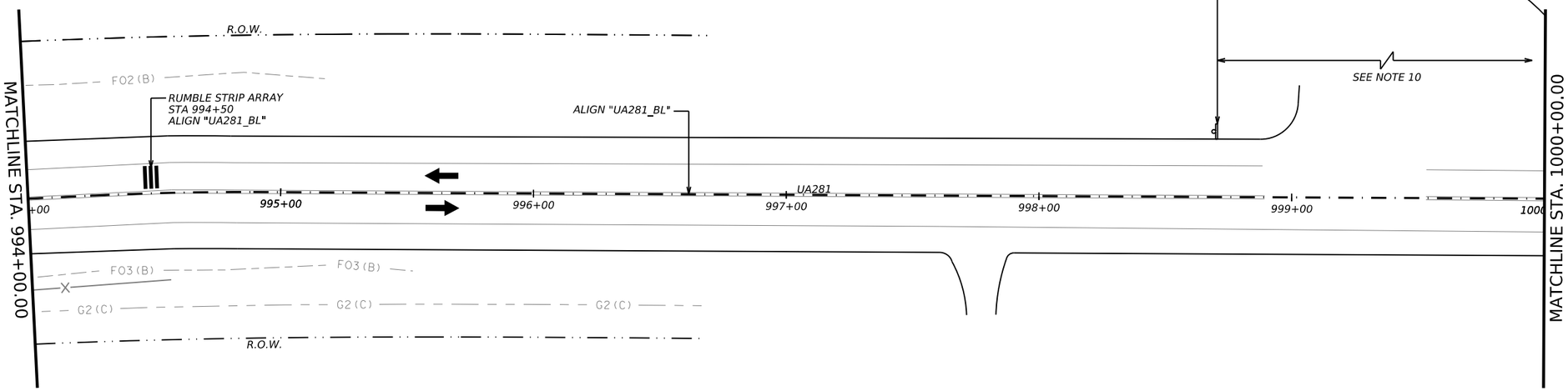
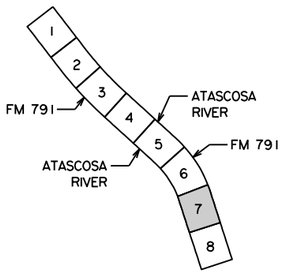




TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 1 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
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5. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
6. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
7. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
8. EXISTING STEEL TRUSS BRIDGE SPAN TO BE REMOVED IN PHASE 2.
9. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
10. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

SHEET: 7 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		34

DESIGN: SG | DRAFT: SG | CHECK: AG

12/13/2023 2:24:21 PM
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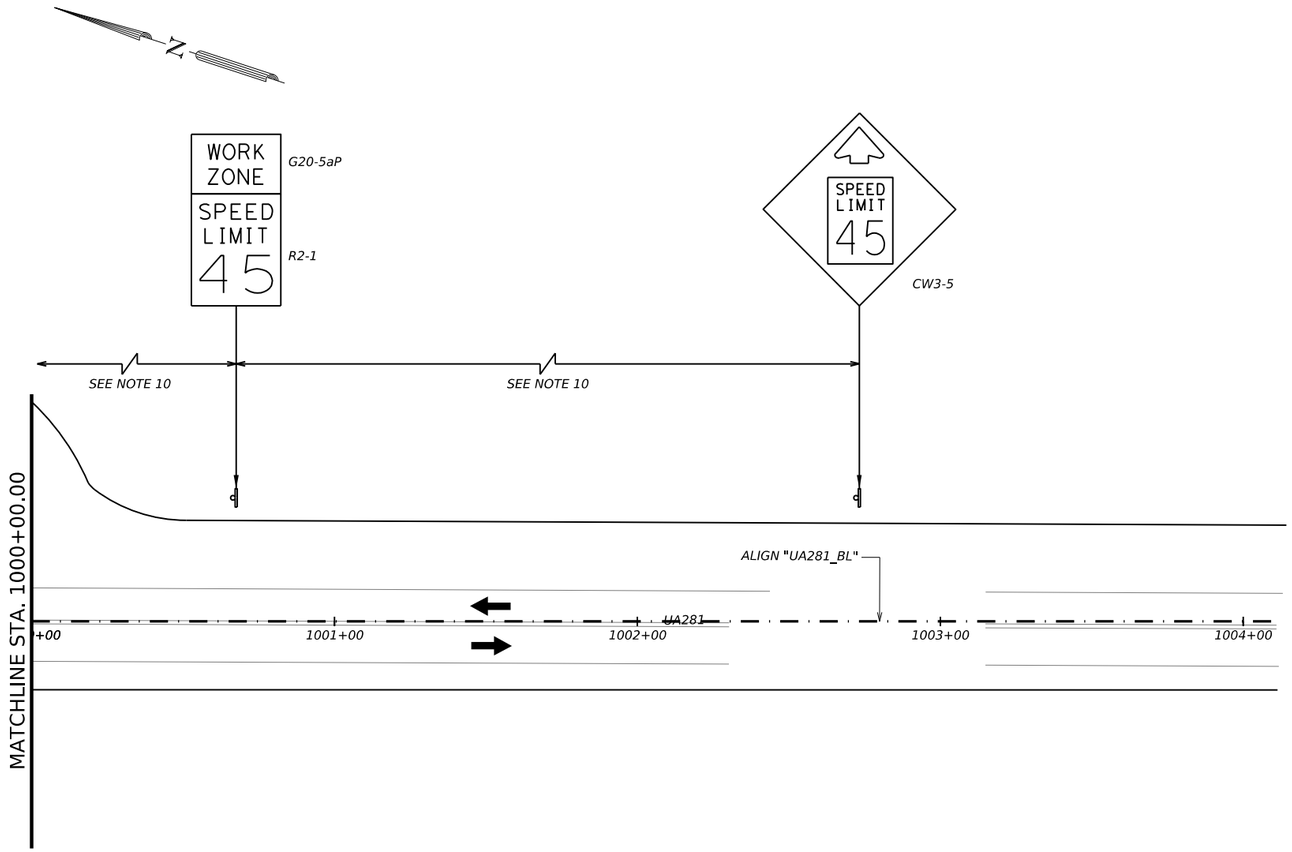
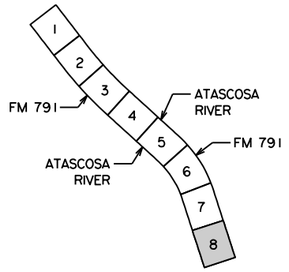
NO WORK THIS SHEET



TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE



TCP NOTES:
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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 1

SHEET: 8 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		35

DESIGN: SG | DRAFT: SG | CHECK: AG

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DESIGN: SG | DRAFT: SG | CHECK: AG

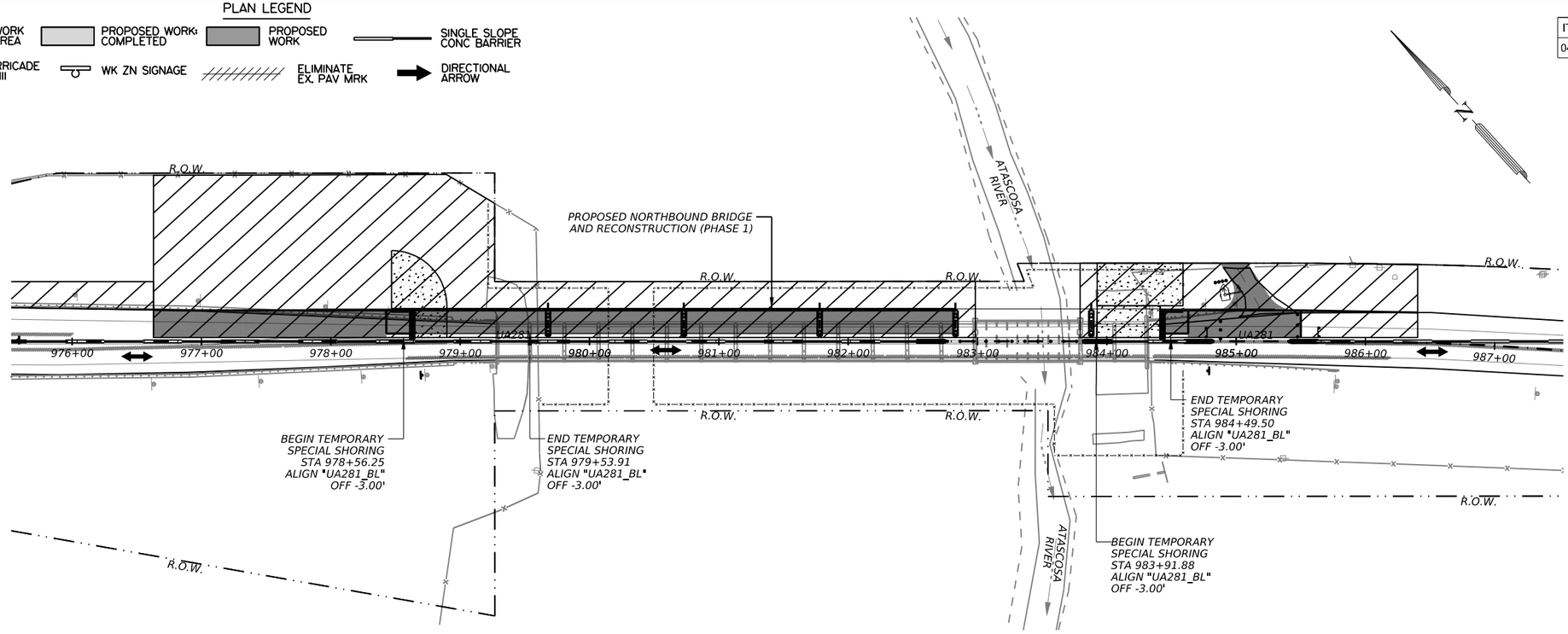
PLAN LEGEND

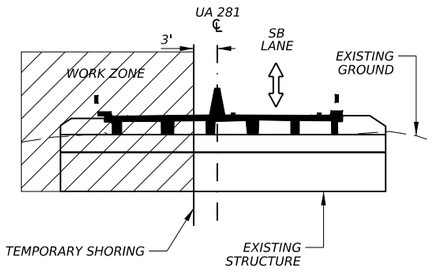
WORK AREA | PROPOSED WORK COMPLETED | PROPOSED WORK | SINGLE SLOPE CONC BARRICADE

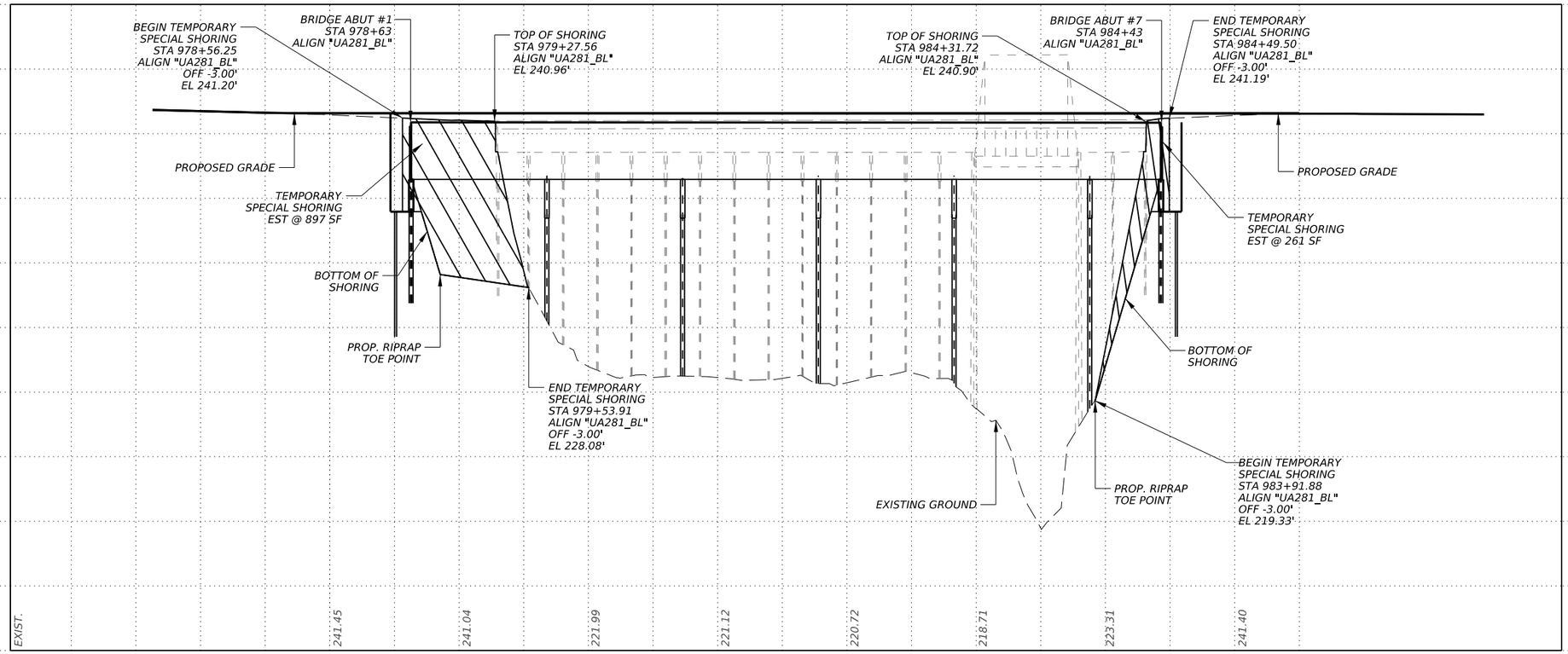
BARRICADE TY III | WK ZN SIGNAGE | ELIMINATE EX. PAV MRK | DIRECTIONAL ARROW

QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0403-6001	TEMPORARY SPL SHORING	SF	1158







STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=100' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
TEMPORARY SHORING LAYOUT
PHASE 1

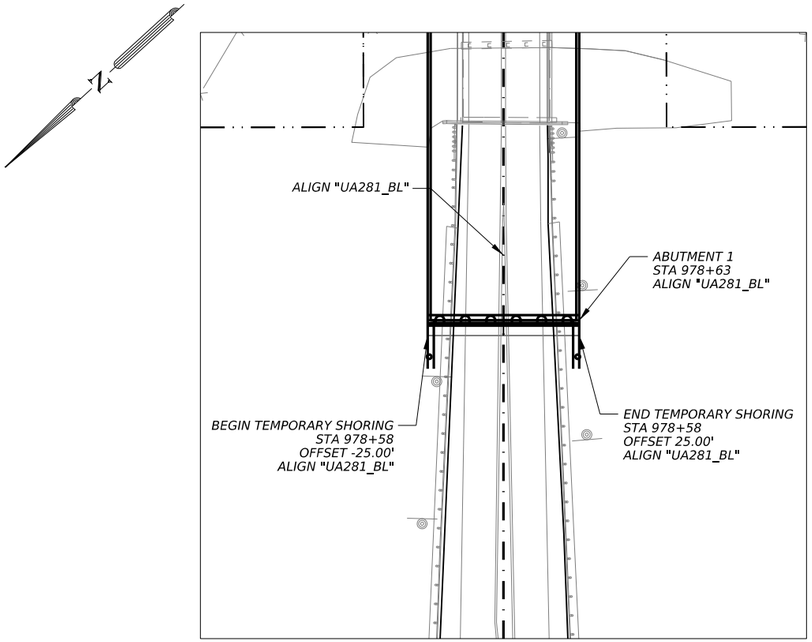
SHEET: 1 OF 1

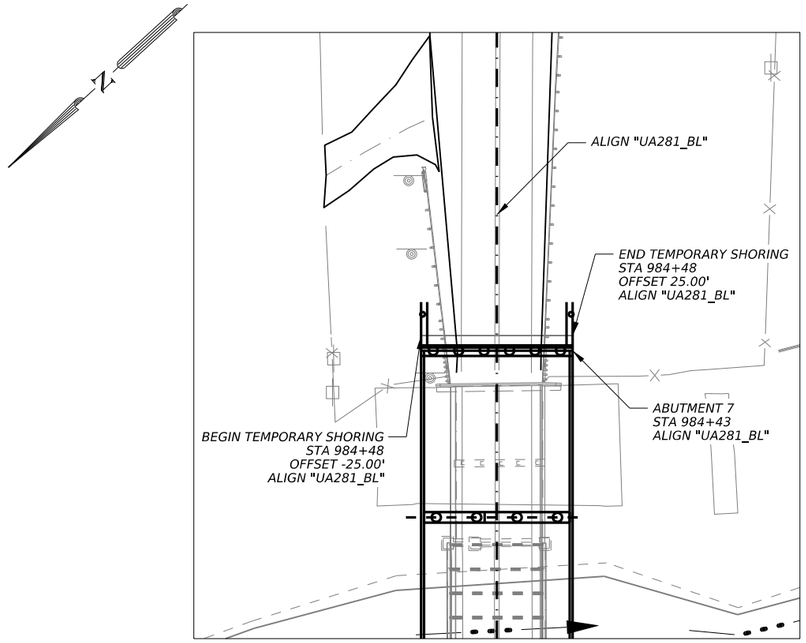
CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		36

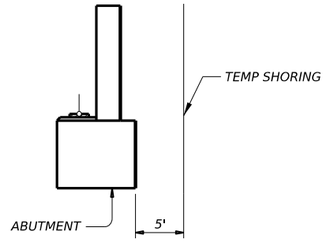
12/11/2023 10:36:16 AM
pw://txdot.projectwiseonline.com:TXD0T4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/2. TCP/UA0281*TSS*PH1*PP*01.dgn

DESIGN: SG | DRAFT: SG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
0403-6001	TEMPORARY SPL SHORING	SF	676



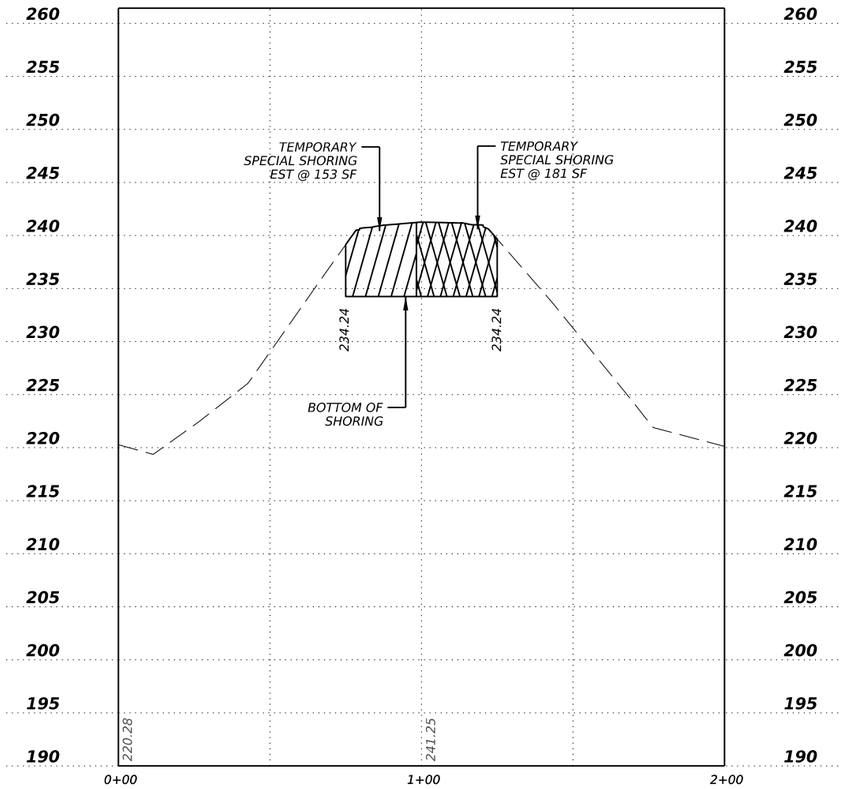


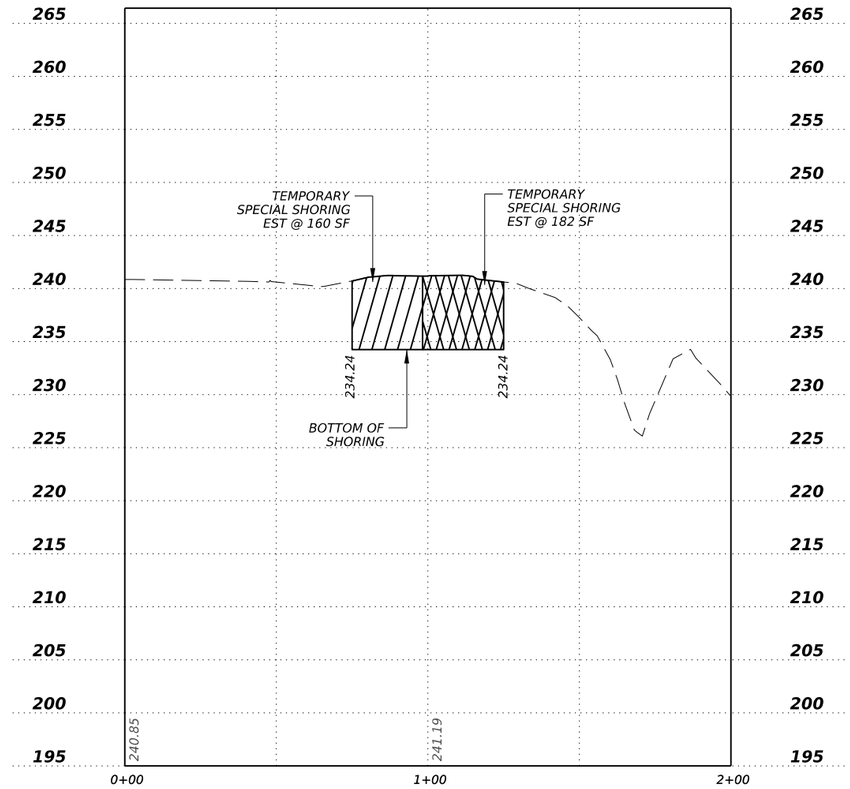


LEGEND

PHASE 1

PHASE 3





STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=50' VERTICAL: 1"=15'

Texas Department of Transportation

UA 281
TEMPORARY SHORING LAYOUT
ABUTMENTS 1 AND 7

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		37

12/11/2023 10:24:41 AM
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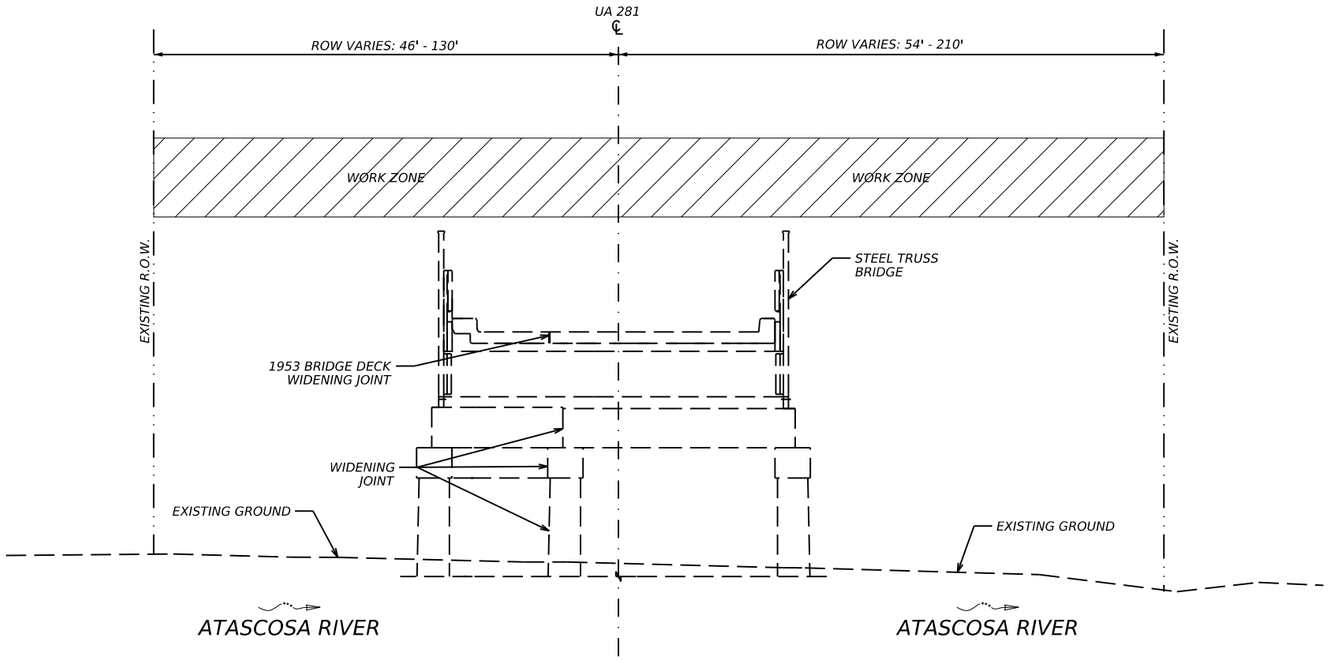

NOTE :

1. FULL BRIDGE CLOSURE DURING TCP PHASE 2. SEE DETOUR SHEETS.
2. REMOVE EXISTING STEEL TRUSS BRIDGE SPAN.
3. REMOVE REMAINING EXISTING BRIDGE STRUCTURES IN PHASE 3.

UA 281 - ATASCOSA RIVER BRIDGE STEEL TRUSS

STA 982+98.35 TO STA 983+79.31

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
TCP PHASE 2
TYPICAL SECTIONS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		38

DESIGN: SG | DRAFT: SG | CHECK: AG

11/27/2023 1:49:02 PM
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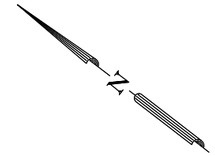
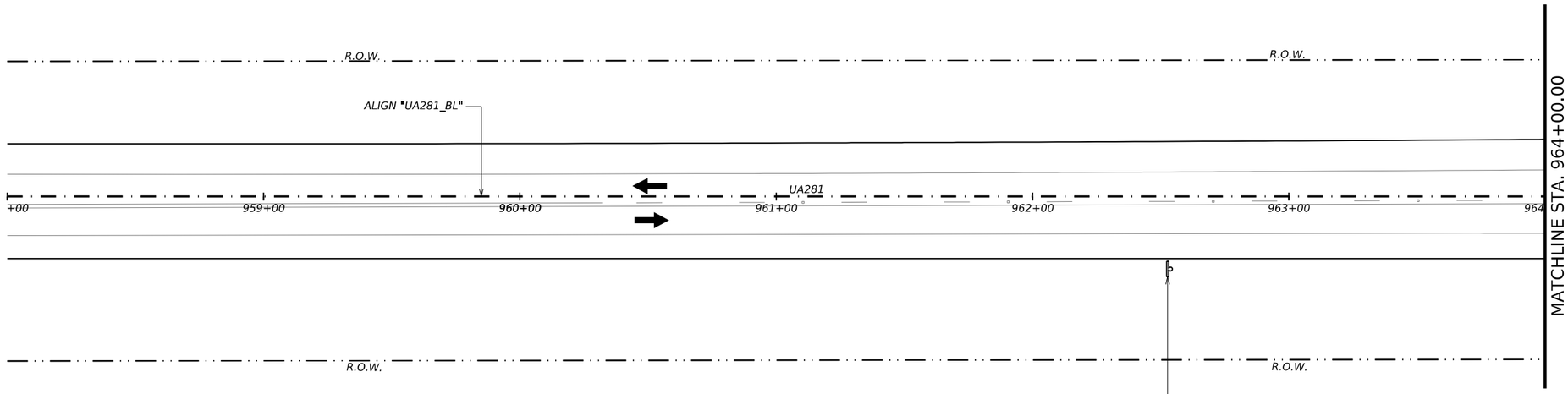
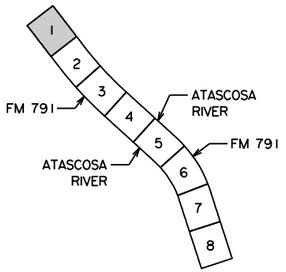




CW20-3B
48" X 48"

TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. THE WORK DURING PHASE 2 SHALL BE COMPLETED UNDER FULL ROAD CLOSURE CONDITIONS. THERE WILL BE A DETOUR ROUTE AVAILABLE FOR USE BY TRAFFIC; SEE THE DETOUR LAYOUT SHEETS FOR MORE INFORMATION.
2. THIS WORK WILL BE PART OF MILESTONE #1; SEE THE TRAFFIC CONTROL PLAN SEQUENCE OF WORK FOR MORE INFORMATION.
3. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
4. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
5. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
6. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
7. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
8. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

DESIGN: SG | DRAFT: SG | CHECK: AG

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

SHEET: 1 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		39

12/11/2023 10:46:06 AM
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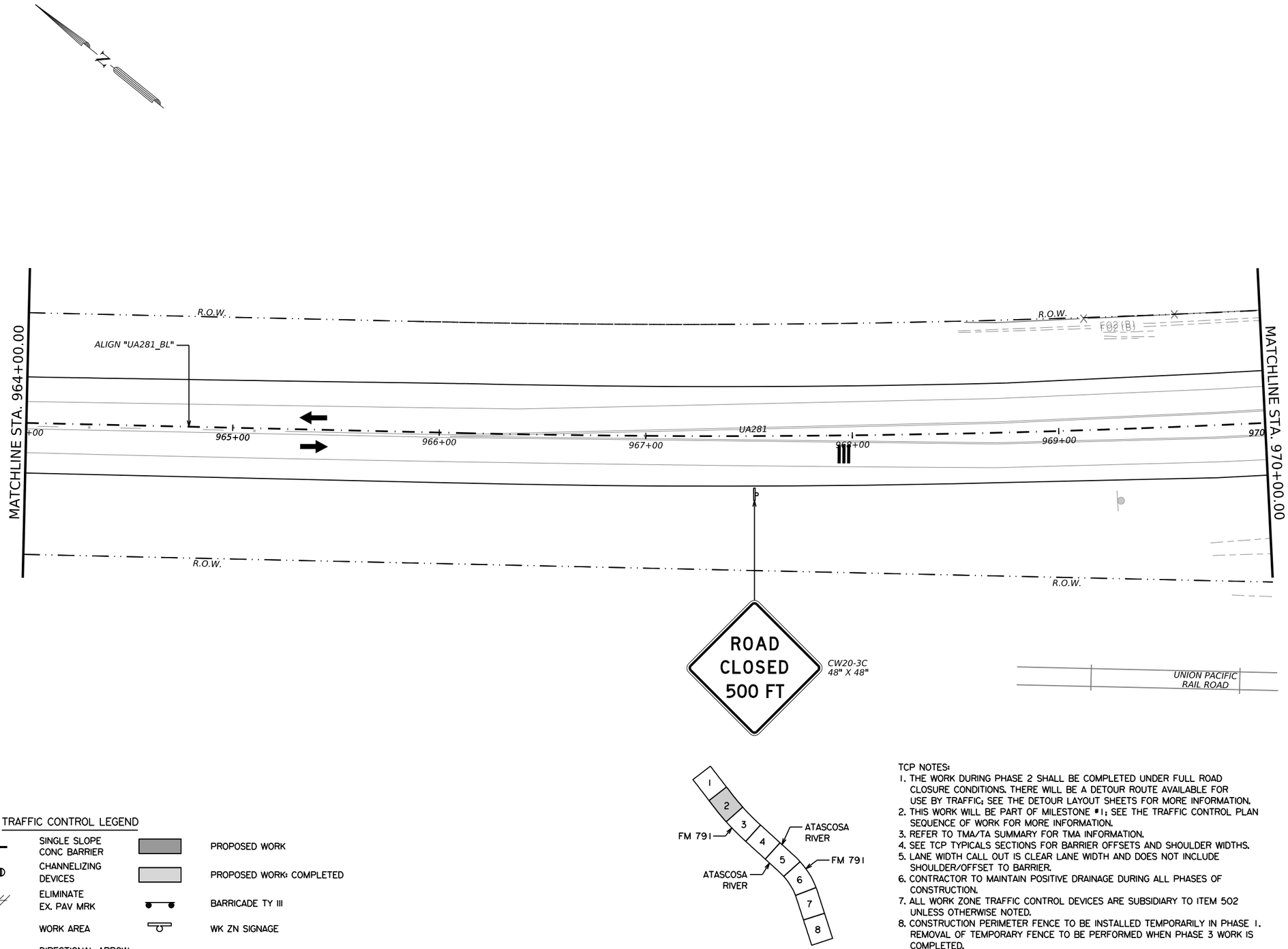

TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	

TCP NOTES:
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DESIGN: SG | DRAFT: SG | CHECK: AG

STATE OF TEXAS
ANDRES GARZA
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Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

SHEET: 2 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		40

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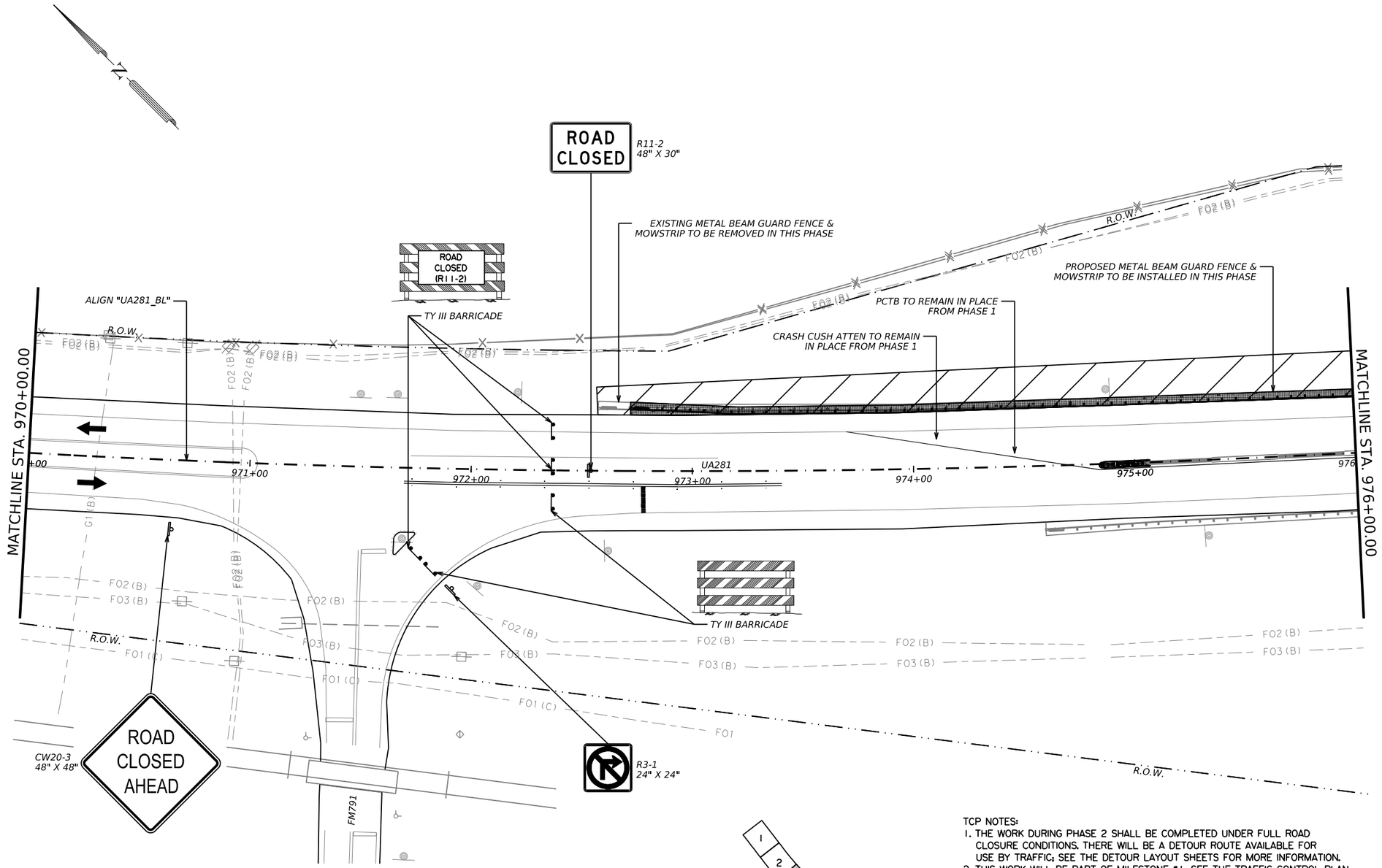
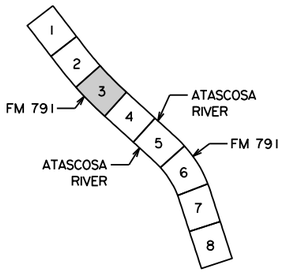


TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



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DESIGN: SG | DRAFT: SG | CHECK: AG

STATE OF TEXAS
ANDRES GARZA
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LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

SHEET: 3 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		41

12/11/2023 10:46:28 AM
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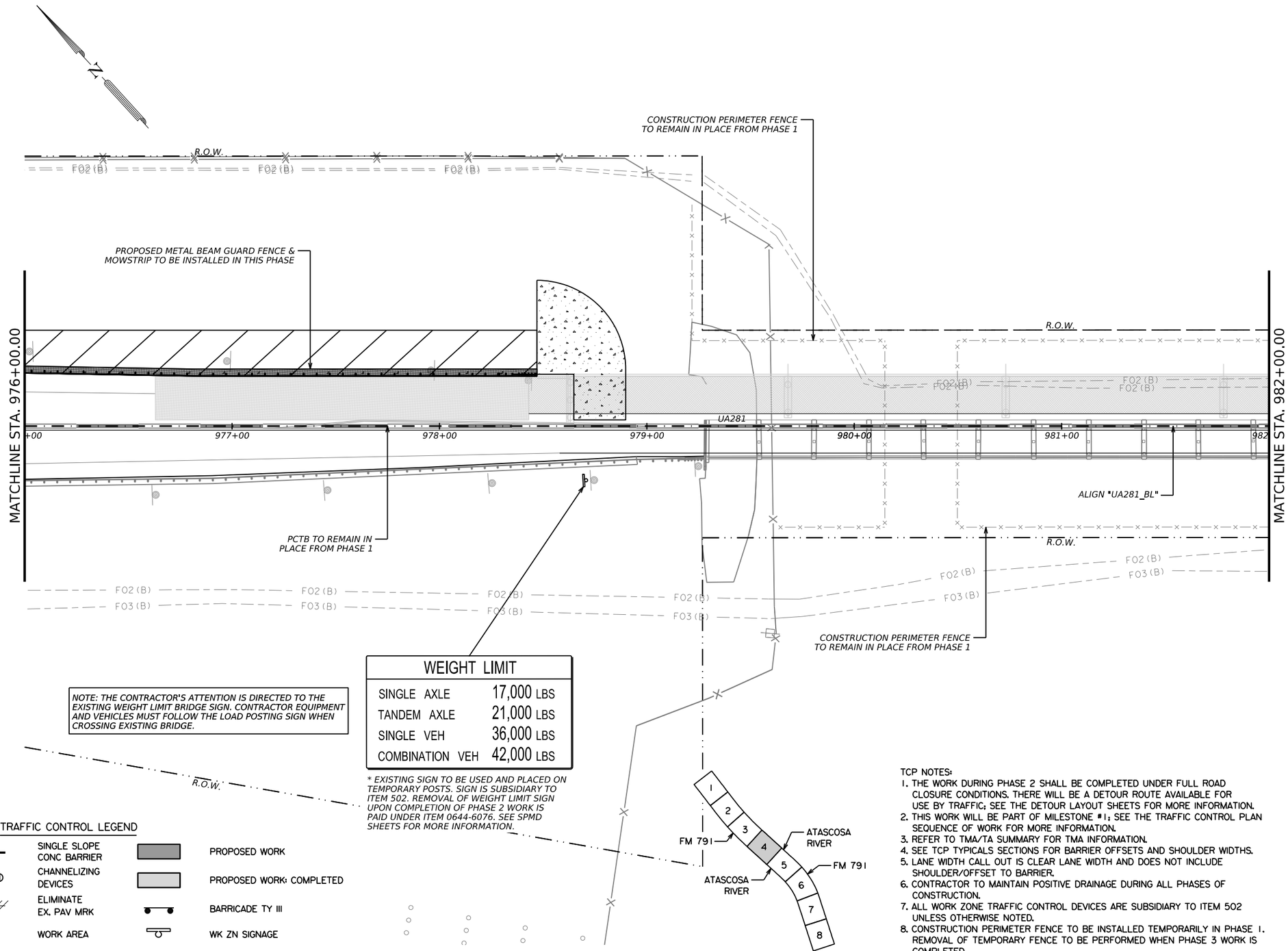

WEIGHT LIMIT	
SINGLE AXLE	17,000 LBS
TANDEM AXLE	21,000 LBS
SINGLE VEH	36,000 LBS
COMBINATION VEH	42,000 LBS

NOTE: THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING WEIGHT LIMIT BRIDGE SIGN. CONTRACTOR EQUIPMENT AND VEHICLES MUST FOLLOW THE LOAD POSTING SIGN WHEN CROSSING EXISTING BRIDGE.

** EXISTING SIGN TO BE USED AND PLACED ON TEMPORARY POSTS. SIGN IS SUBSIDIARY TO ITEM 502. REMOVAL OF WEIGHT LIMIT SIGN UPON COMPLETION OF PHASE 2 WORK IS PAID UNDER ITEM 0644-6076. SEE SPMD SHEETS FOR MORE INFORMATION.*

TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE

TCP NOTES:
1. THE WORK DURING PHASE 2 SHALL BE COMPLETED UNDER FULL ROAD CLOSURE CONDITIONS. THERE WILL BE A DETOUR ROUTE AVAILABLE FOR USE BY TRAFFIC; SEE THE DETOUR LAYOUT SHEETS FOR MORE INFORMATION.
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3. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
4. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
5. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
6. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
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9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

SHEET: 4 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		42

DESIGN: SG | DRAFT: SG | CHECK: AG

2/21/2024 11:03:11 AM
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DESIGN: SG | DRAFT: SG | CHECK: AG

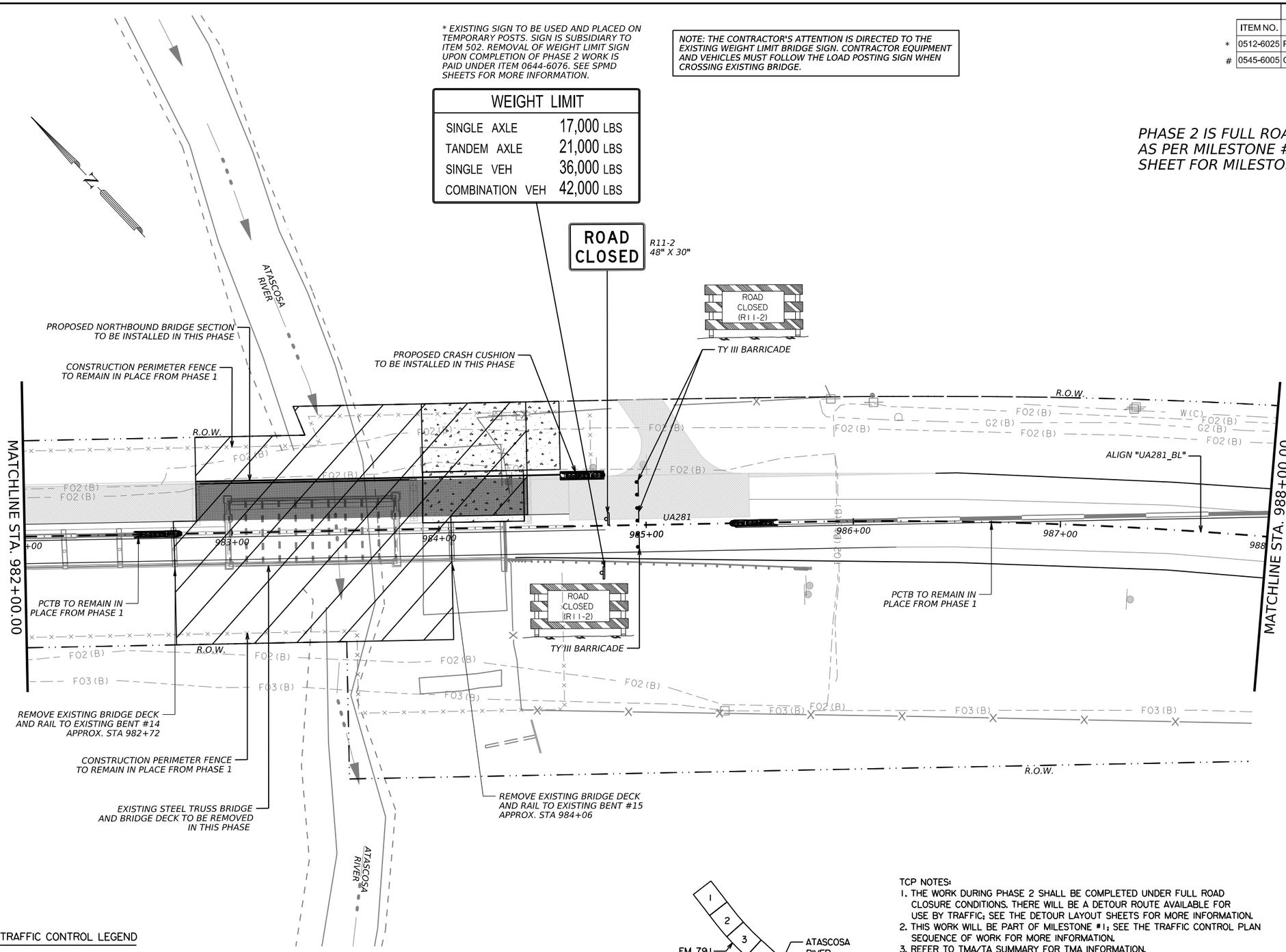
QUANTITY SUMMARY CSJ: 0073-13-012				
	ITEM NO.	ITEM	UNIT	QUANTITY
*	0512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	60
#	0545-6005	CRASH CUSH ATTEN (REMOVE)	EA	2

* TO BE MOVED TO TEMPORARY STORAGE AREA
\# REFER TO CRASH CUSHION SUMMARY SHEET

* EXISTING SIGN TO BE USED AND PLACED ON TEMPORARY POSTS. SIGN IS SUBSIDIARY TO ITEM 502. REMOVAL OF WEIGHT LIMIT SIGN UPON COMPLETION OF PHASE 2 WORK IS PAID UNDER ITEM 0644-6076. SEE SPMD SHEETS FOR MORE INFORMATION.

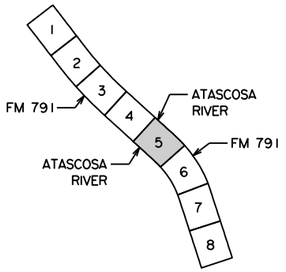
NOTE: THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING WEIGHT LIMIT BRIDGE SIGN. CONTRACTOR EQUIPMENT AND VEHICLES MUST FOLLOW THE LOAD POSTING SIGN WHEN CROSSING EXISTING BRIDGE.

PHASE 2 IS FULL ROADWAY CLOSURE WORK ONLY, AS PER MILESTONE #1. REFER TO SEQUENCE OF WORK SHEET FOR MILESTONE #1 DETAILS AND BREAKDOWN.



TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE



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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

SHEET: 5 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		43

2/21/2024 11:10:46 AM
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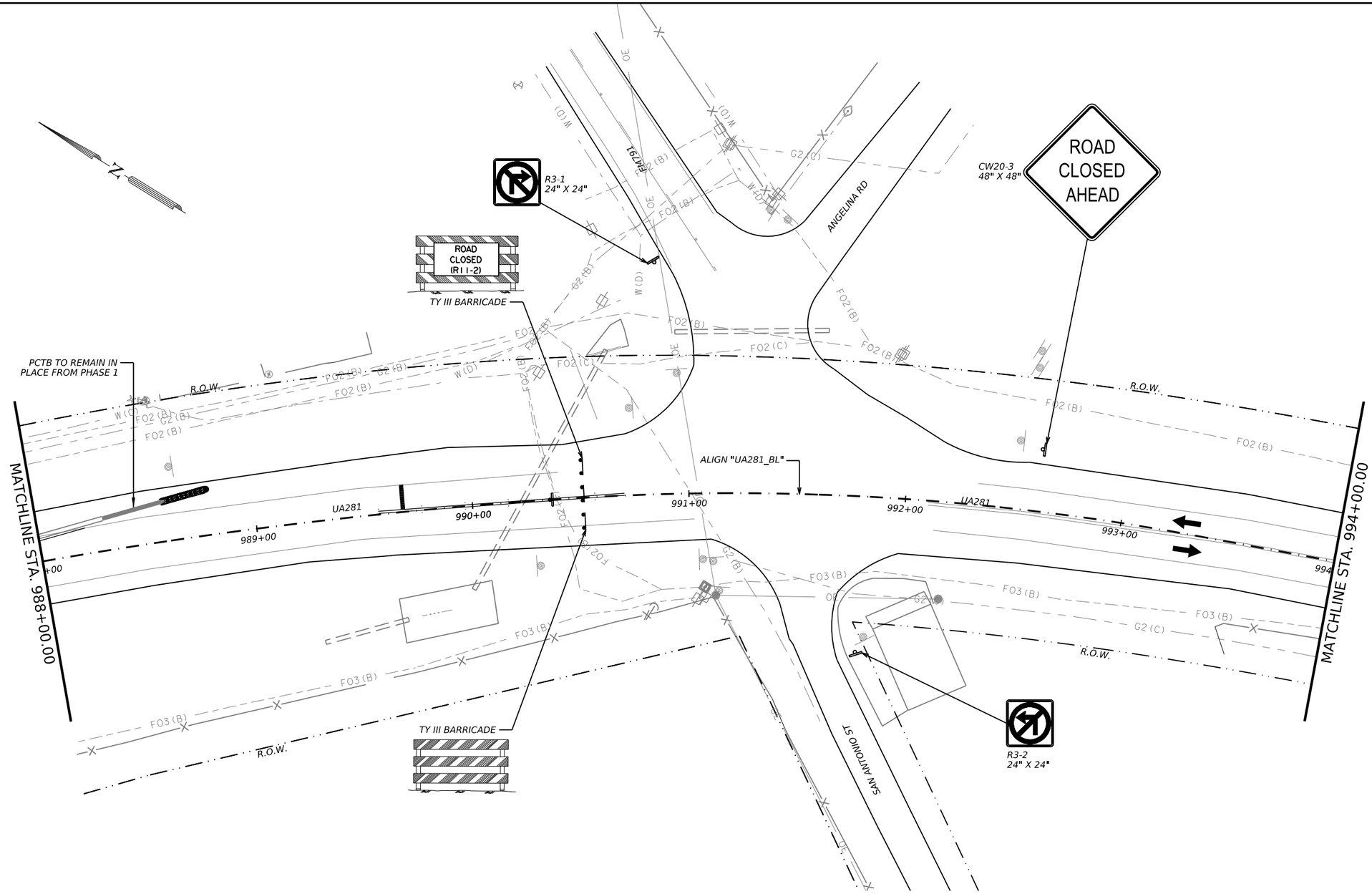
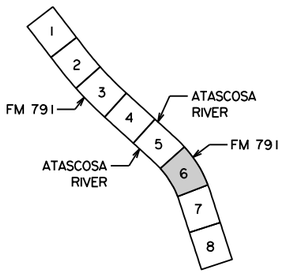


TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



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STATE OF TEXAS
ANDRES GARZA
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LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

SHEET: 6 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		44

DESIGN: SG | DRAFT: SG | CHECK: AG

12/11/2023 10:46:59 AM
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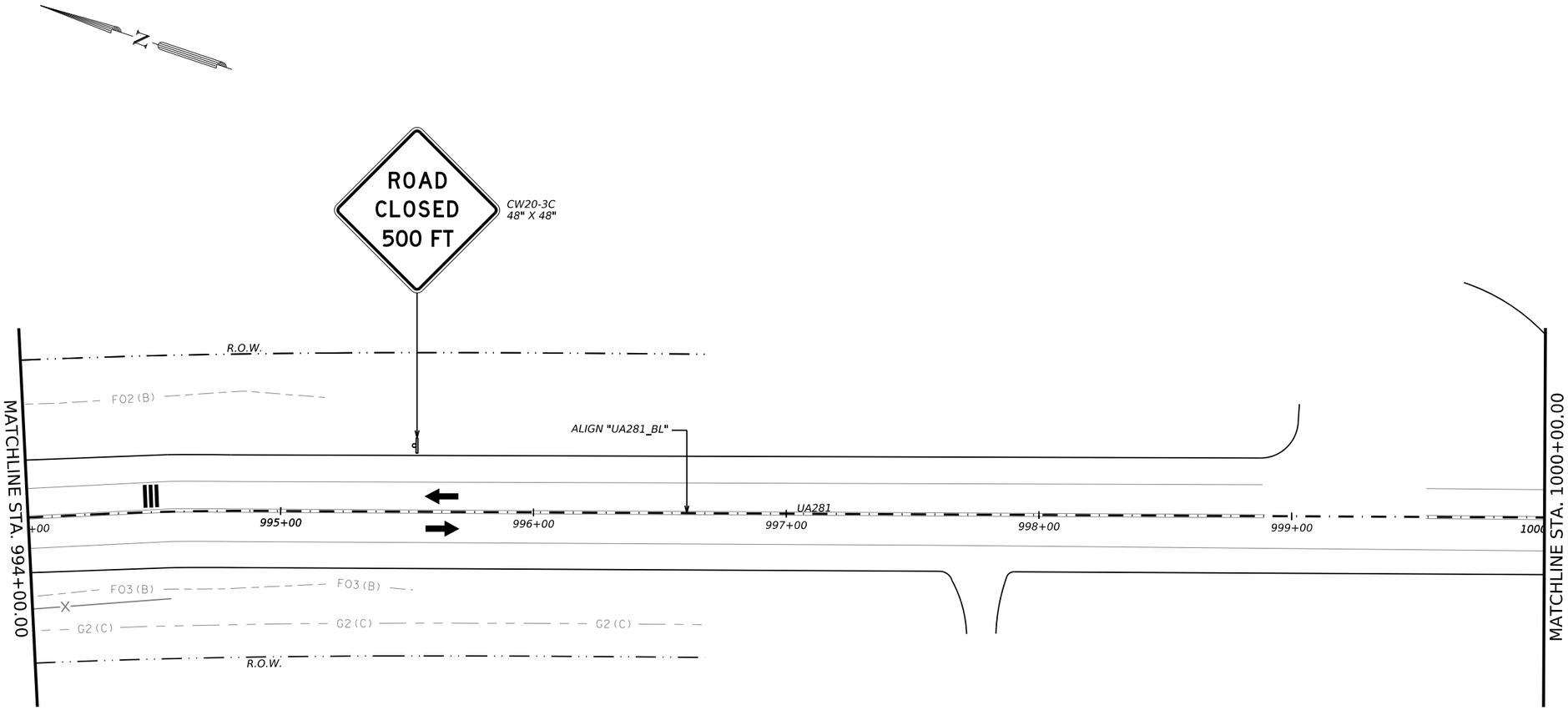
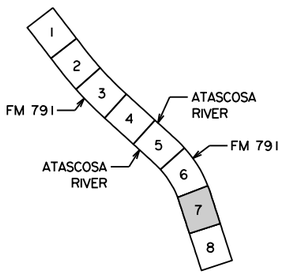
NO WORK THIS SHEET



TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



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STATE OF TEXAS
ANDRES GARZA
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LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

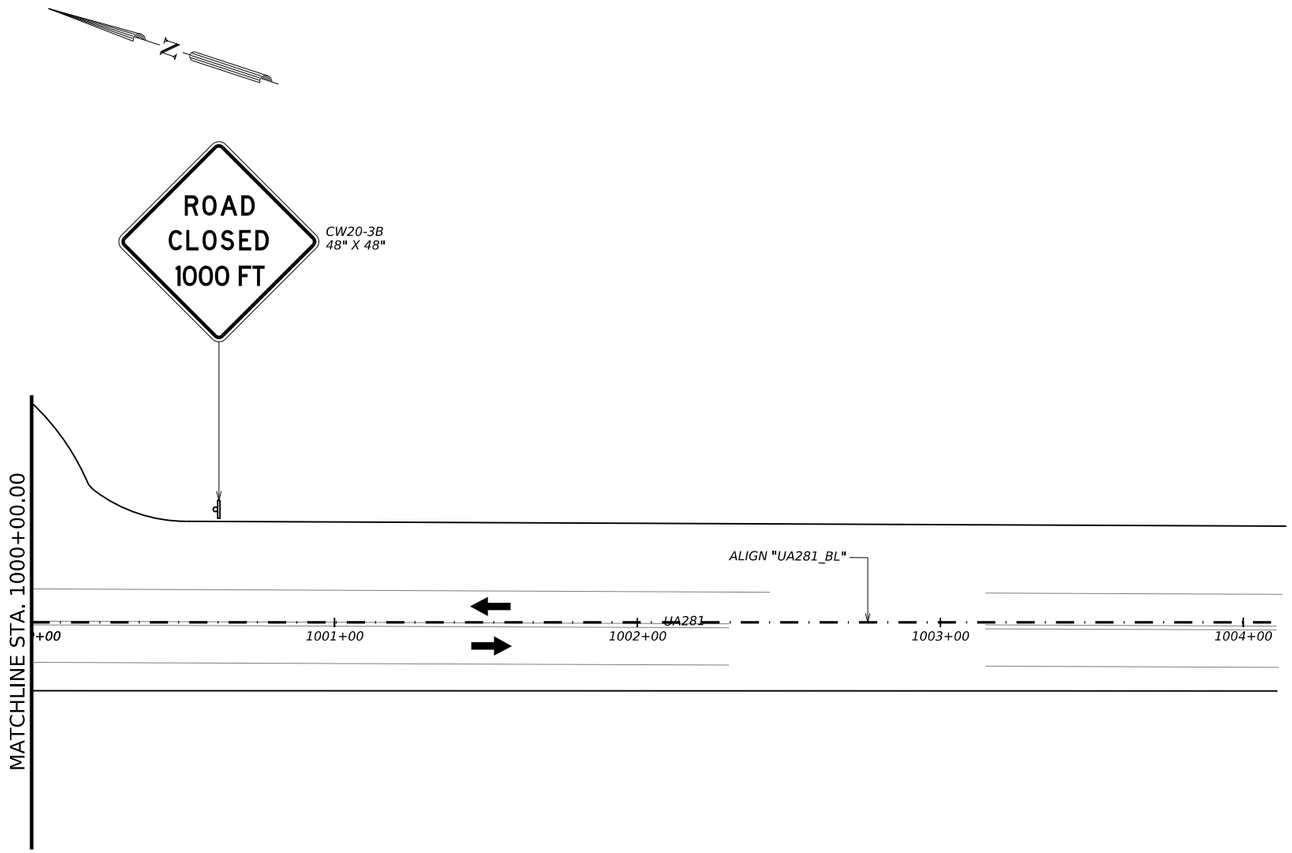
SHEET: 7 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		45

DESIGN: SG | DRAFT: SG | CHECK: AG

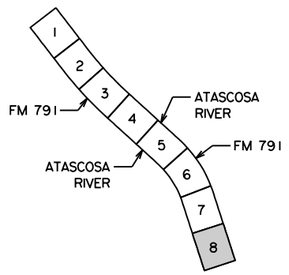
12/11/2023 10:47:10 AM
pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130 12/4 - Design/Plan Set/2. TCP/Phase 2/UA0281*TCP*PH02*07.dgn

NO WORK THIS SHEET



TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



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STATE OF TEXAS
ANDRES GARZA
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Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 2

SHEET: 8 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		46

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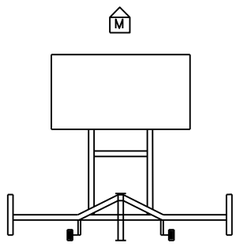
DESIGN: SG | DRAFT: SG | CHECK: AG

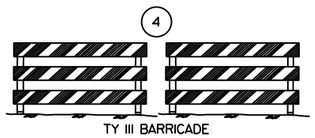
T.C.P. DETOUR LEGEND



1 — ROAD CLOSED — R11-2

2 — DETOUR AHEAD — CW20-2D

3 — END DETOUR — M4-8a



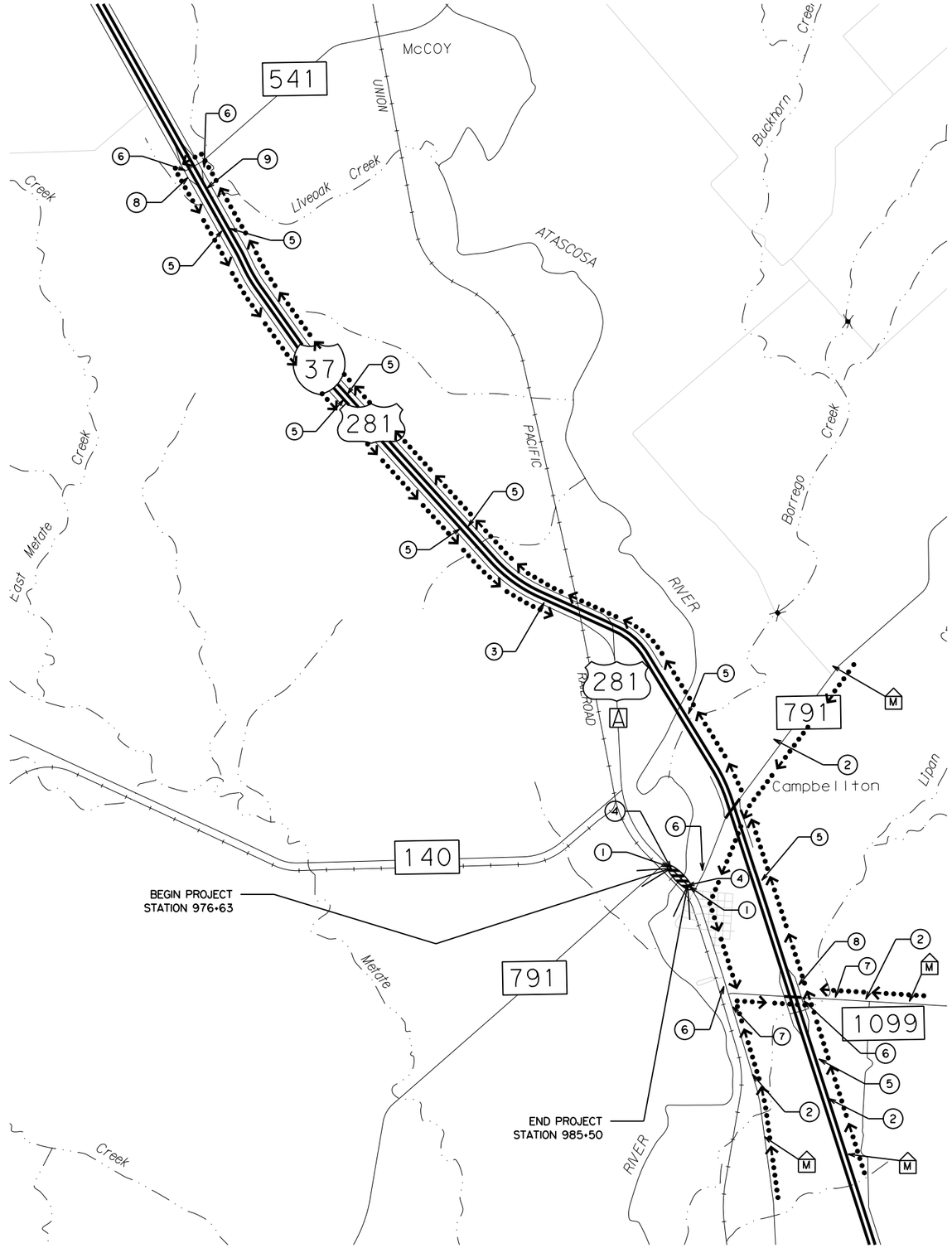
5
- DETOUR — M4-8 24x12
- NORTH — M3-1 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- M6-3 21x15

6
- DETOUR — M4-8 24x12
- NORTH — M3-1 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- M6-1 21x15

7
- DETOUR — M4-8 24x12
- NORTH — M3-1 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- M6-1 21x15

8
- DETOUR — M4-8 24x12
- NORTH — M3-1 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- M6-2L 21x15

9
- DETOUR — M4-8 24x12
- NORTH — M3-1 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- M6-2R 21x15



T.C.P. DETOUR LEGEND *(CONTINUED)*

WORK AREA

DETOUR ROUTE FM 140 WEST

ROUTES

NB UA 281 DETOUR - NB UA 281 TRAFFIC TO TURN RIGHT ONTO FM 1099. TRAFFIC TO THEN TURN LEFT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO EXIT IH 37 NORTH AND USE TURNAROUND AT FM 541. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT.

FM 791 WEST TO UA 281 NORTH DETOUR - WB FM 791 TRAFFIC TO TURN LEFT ONTO UA 281 SOUTH. TRAFFIC TO THEN TURN LEFT ONTO FM 1099. TRAFFIC TO TURN LEFT AT FM 1099 AND IH 37 INTERSECTION AND MERGE ONTO IH 37 NORTH. TRAFFIC TO PROCEED AND TAKE FM 541 EXIT AND TURNAROUND TO MERGE ONTO IH 37 SOUTH. TRAFFIC TO TAKE UA 281 EXIT.

EB FM 1099 TO UA 281 NORTH DETOUR - EB FM 1099 TRAFFIC TO TURN RIGHT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO EXIT IH 37 NORTH AND USE TURNAROUND AT FM 541. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT.

NOTES:

1. *THIS DETOUR SHALL BE USED DURING PHASE 2 OF THE TRAFFIC CONTROL PLAN, WHEN THE EXISTING STEEL TRUSS BRIDGE SECTION IS REMOVED FROM THE STRUCTURE.*

2. *ALL ITEMS SHOWN ON THIS DETOUR ARE SUBSIDIARY TO ITEM 502, WITH THE EXCEPTION OF THE PORTABLE CHANGEABLE MESSAGE SIGNS.*

3. *THIS WORK WILL BE PART OF MILESTONE #1; SEE THE TRAFFIC CONTROL PLAN NARRATIVE FOR MORE INFORMATION.*

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA — DATE

SCALE: 1"=6000'

Texas Department of Transportation

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
UA 281 NB

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		47

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DESIGN: SG | DRAFT: SG | CHECK: AG

T.C.P. DETOUR LEGEND

PORTABLE CHANGEABLE MESSAGE SIGN

1 — ROAD CLOSED — R11-2

2 — DETOUR AHEAD — CW20-2D

3 — END DETOUR — M4-8a

4 — TY III BARRICADE

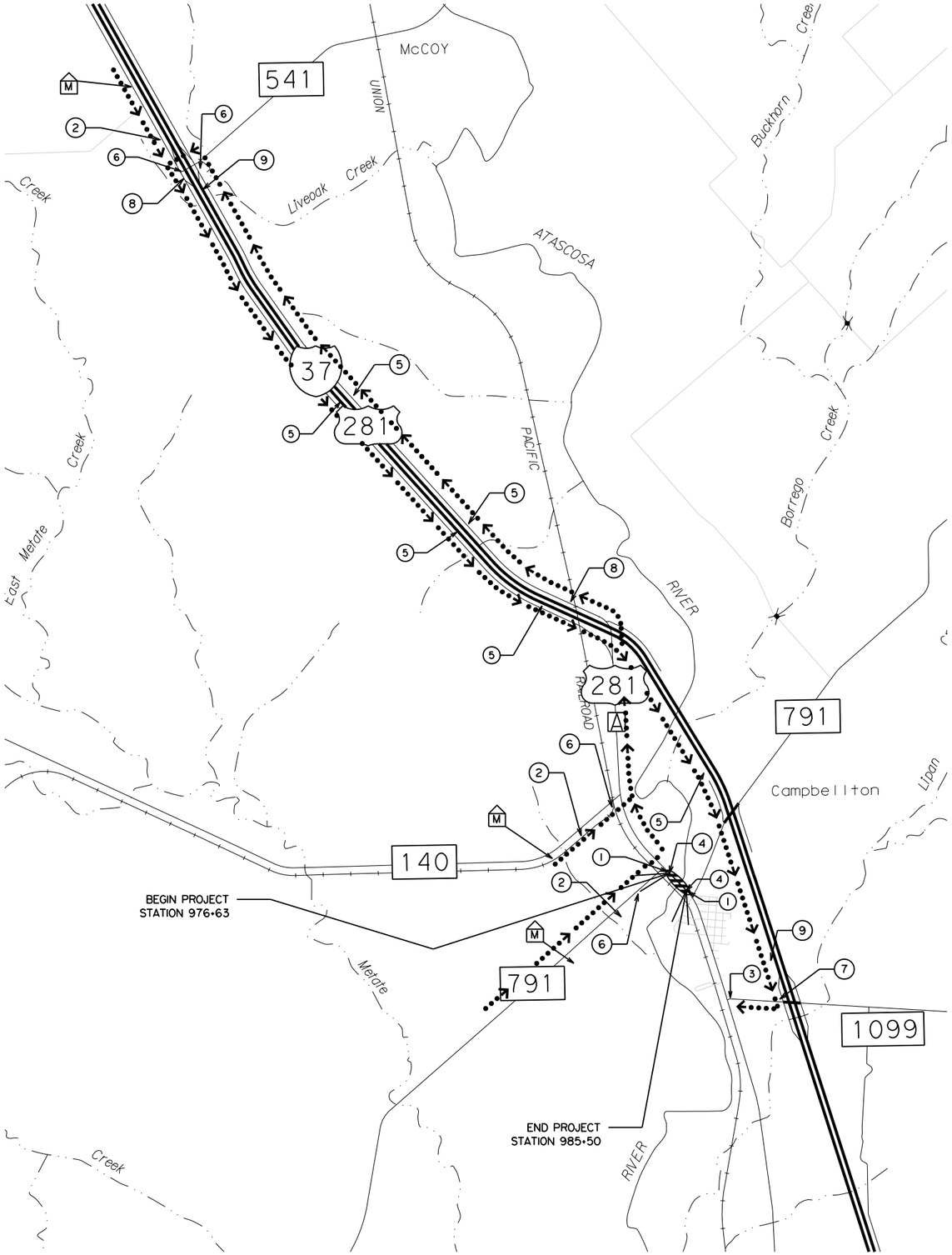
5
- DETOUR — M4-8 24x12
- SOUTH — M3-3 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- ⇧ — M6-3 21x15

6
- DETOUR — M4-8 24x12
- SOUTH — M3-3 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- ⇦ — M6-1 21x15

7
- DETOUR — M4-8 24x12
- SOUTH — M3-3 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- ⇨ — M6-1 21x15

8
- DETOUR — M4-8 24x12
- SOUTH — M3-3 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- ⇖ — M6-2L 21x15

9
- DETOUR — M4-8 24x12
- SOUTH — M3-3 24x12
- ALT — M4-1a 24x12
- 281 — M1-4 (3 dgt) 30x24
- ⇗ — M6-2R 21x15



T.C.P. DETOUR LEGEND *(CONTINUED)*

WORK AREA

DETOUR ROUTE FM 140 WEST

ROUTES

IH 37 SOUTH TO UA 281 SOUTH DETOUR - SB UA 281 TRAFFIC TO PROCEED ON IH 37 SOUTH. TRAFFIC TO TAKE FM 1099 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 1099.

FM 140 EAST TO UA 281 SOUTH DETOUR - EB FM 140 TRAFFIC TO TURN LEFT ONTO UA 281 NB. TRAFFIC TO PROCEED AND MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND TURNAROUND TO MERGE ONTO IH 37 SOUTH. TRAFFIC TO PROCEED AND TAKE FM 1099 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 1099.

FM 791 EAST TO UA 281 SOUTH DETOUR - EB FM 791 TRAFFIC TO TURN LEFT ONTO UA 281 NB. TRAFFIC TO PROCEED AND MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND TURNAROUND TO MERGE ONTO IH 37 SOUTH. TRAFFIC TO PROCEED AND TAKE FM 1099 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 1099.

NOTES:

1. THIS DETOUR SHALL BE USED DURING PHASE 2 OF THE TRAFFIC CONTROL PLAN, WHEN THE EXISTING STEEL TRUSS BRIDGE SECTION IS REMOVED FROM THE STRUCTURE.

2. ALL ITEMS SHOWN ON THIS DETOUR ARE SUBSIDIARY TO ITEM 502, WITH THE EXCEPTION OF THE PORTABLE CHANGEABLE MESSAGE SIGNS.

3. THIS WORK WILL BE PART OF MILESTONE #1; SEE THE TRAFFIC CONTROL PLAN NARRATIVE FOR MORE INFORMATION.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. — 02/21/2024

ANDRES GARZA — DATE

SCALE: 1"=6000'

Texas Department of Transportation

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
UA 281 SB

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		48

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T.C.P. DETOUR LEGEND

1 — ROAD CLOSED — R11-2

PORTABLE CHANGEABLE MESSAGE SIGN

2 — DETOUR AHEAD — CW20-2D

3 — END DETOUR — M4-8a

4 — TY III BARRICADE

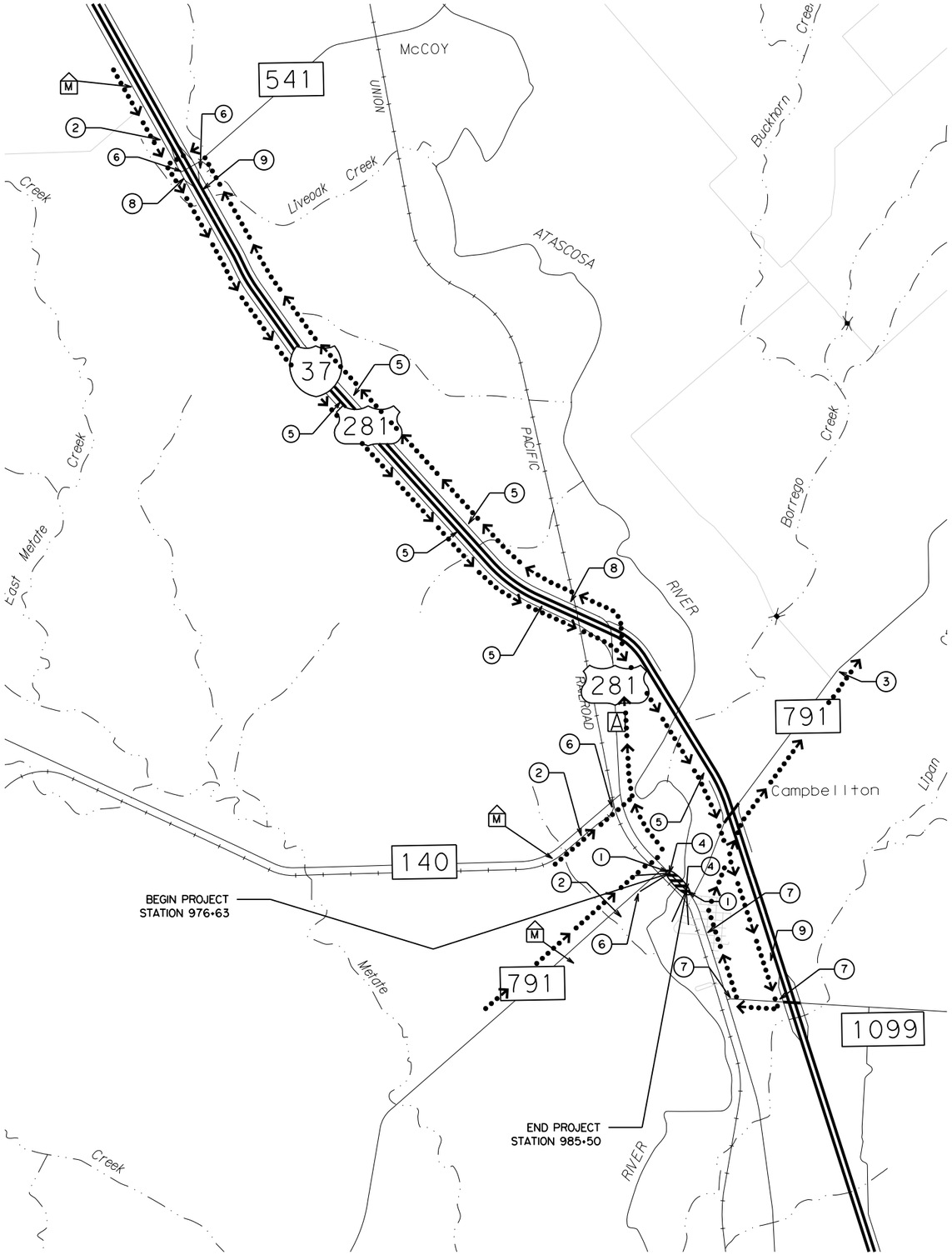
5
- DETOUR M4-8 24x12
- EAST M3-2 24x12
- FARM 791 ROAD M1-6F 24x24
- M6-3 21x15

6
- DETOUR M4-8 24x12
- EAST M3-2 24x12
- FARM 791 ROAD M1-6F 24x24
- M6-1B 21x15

7
- DETOUR M4-8 24x12
- EAST M3-2 24x12
- FARM 791 ROAD M1-6F 24x24
- M6-1 21x15

8
- DETOUR M4-8 24x12
- EAST M3-2 24x12
- FARM 791 ROAD M1-6F 24x24
- M6-2L 21x15

9
- DETOUR M4-8 24x12
- EAST M3-2 24x12
- FARM 791 ROAD M1-6F 24x24
- M6-2R 21x15



T.C.P. DETOUR LEGEND *(CONTINUED)*

WORK AREA

DETOUR ROUTE FM 140 WEST

ROUTES

IH 37 SOUTH TO FM 791 EAST DETOUR - SB UA 281 TRAFFIC TO PROCEED ON IH 37 SOUTH. TRAFFIC TO TAKE FM 1099 EXIT AND TURNAROUND. TRAFFIC TO PROCEED ON UA 281 NORTH AND TURN RIGHT ONTO FM 791 EAST.

FM 140 EAST TO FM 791 EAST DETOUR - EB FM 140 TRAFFIC TO TURN LEFT ONTO UA 281 NB. TRAFFIC TO PROCEED AND MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND TURNAROUND TO MERGE ONTO IH 37 SOUTH. TRAFFIC TO PROCEED AND TAKE FM 1099 EXIT AND TURNAROUND. TRAFFIC TO PROCEED ON UA 281 NORTH AND TURN RIGHT ONTO FM 791 EAST.

FM 791 EAST DETOUR - EB FM 791 TRAFFIC TO TURN LEFT ONTO UA 281 NB. TRAFFIC TO PROCEED AND MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND TURNAROUND TO MERGE ONTO IH 37 SOUTH. TRAFFIC TO PROCEED AND TAKE FM 1099 EXIT AND TURNAROUND. TRAFFIC TO PROCEED ON UA 281 NORTH AND TURN RIGHT ONTO FM 791 EAST.

NOTES:

1. THIS DETOUR SHALL BE USED DURING PHASE 2 OF THE TRAFFIC CONTROL PLAN, WHEN THE EXISTING STEEL TRUSS BRIDGE SECTION IS REMOVED FROM THE STRUCTURE.

2. ALL ITEMS SHOWN ON THIS DETOUR ARE SUBSIDIARY TO ITEM 502, WITH THE EXCEPTION OF THE PORTABLE CHANGEABLE MESSAGE SIGNS.

3. THIS WORK WILL BE PART OF MILESTONE #1; SEE THE TRAFFIC CONTROL PLAN NARRATIVE FOR MORE INFORMATION.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=6000'

Texas Department of Transportation

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
FM 791 EB

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		49

DESIGN: SG | DRAFT: SG | CHECK: AG
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T.C.P. DETOUR LEGEND

PORTABLE CHANGEABLE MESSAGE SIGN

1 — ROAD CLOSED — R11-2

2 — DETOUR AHEAD — CW20-2D

3 — END DETOUR — M4-8a

4 — TY III BARRICADE

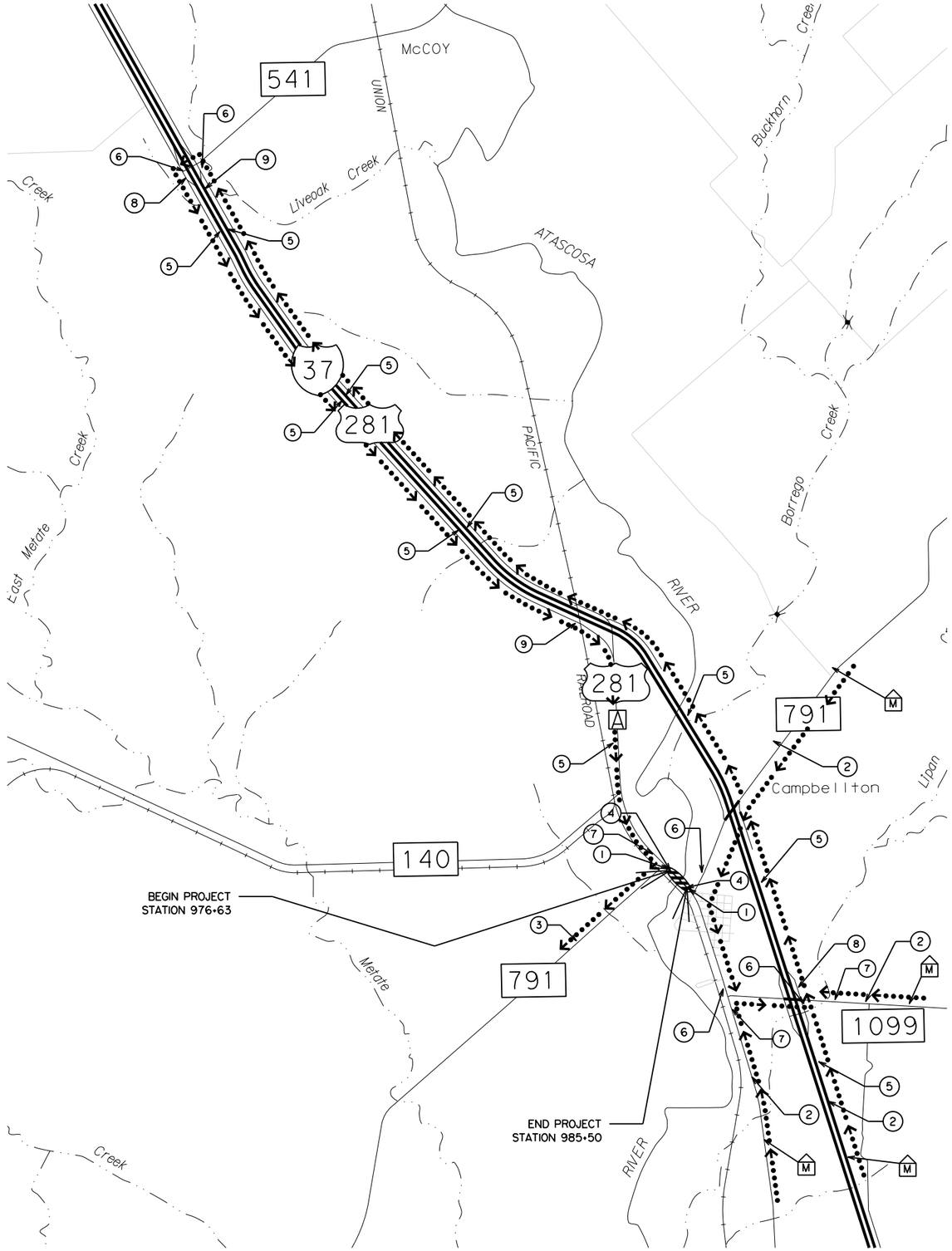
5
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 791 ROAD — M1-6F 24x24
- M6-3 21x15

6
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 791 ROAD — M1-6F 24x24
- M6-1 21x15

7
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 791 ROAD — M1-6F 24x24
- M6-1 21x15

8
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 791 ROAD — M1-6F 24x24
- M6-2L 21x15

9
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 791 ROAD — M1-6F 24x24
- M6-2R 21x15



T.C.P. DETOUR LEGEND (CONTINUED)

WORK AREA

DETOUR ROUTE FM 140 WEST

ROUTES

NB UA 281 TO FM 791 WEST DETOUR - NB UA 281 TRAFFIC TO TURN RIGHT ONTO FM 1099. TRAFFIC TO THEN TURN LEFT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO EXIT IH 37 NORTH AND USE TURNAROUND AT FM 541. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 791 WEST.

NB IH 37 TO FM 791 WEST DETOUR - NB IH 37 TRAFFIC TO TAKE FM 541 EXIT AND USE TURNAROUND. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 791 WEST.

WB FM 791 DETOUR - WB FM 791 TRAFFIC TO TURN LEFT ONTO UA 281 SOUTH. TRAFFIC TO PROCEED AND THEN TURN LEFT AND USE FM 1099 TURNAROUND. TRAFFIC TO THEN TURN LEFT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO EXIT IH 37 NORTH AND USE TURNAROUND AT FM 541. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 791 WEST.

EB FM 1099 TO FM 791 WEST DETOUR - EB FM 1099 TRAFFIC TO TURN RIGHT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND USE TURNAROUND. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 791 WEST.

NOTES:

1. THIS DETOUR SHALL BE USED DURING PHASE 2 OF THE TRAFFIC CONTROL PLAN, WHEN THE EXISTING STEEL TRUSS BRIDGE SECTION IS REMOVED FROM THE STRUCTURE.

2. ALL ITEMS SHOWN ON THIS DETOUR ARE SUBSIDIARY TO ITEM 502, WITH THE EXCEPTION OF THE PORTABLE CHANGEABLE MESSAGE SIGNS.

3. THIS WORK WILL BE PART OF MILESTONE #1; SEE THE TRAFFIC CONTROL PLAN NARRATIVE FOR MORE INFORMATION.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=6000'

Texas Department of Transportation

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
FM 791 WB

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		50

DESIGN: SG | DRAFT: SG | CHECK: AG
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T.C.P. DETOUR LEGEND

M

PORTABLE CHANGEABLE MESSAGE SIGN

1 — ROAD CLOSED — R11-2

2 — DETOUR AHEAD — CW20-2D

3 — END DETOUR — M4-8a

4 — TY III BARRICADE

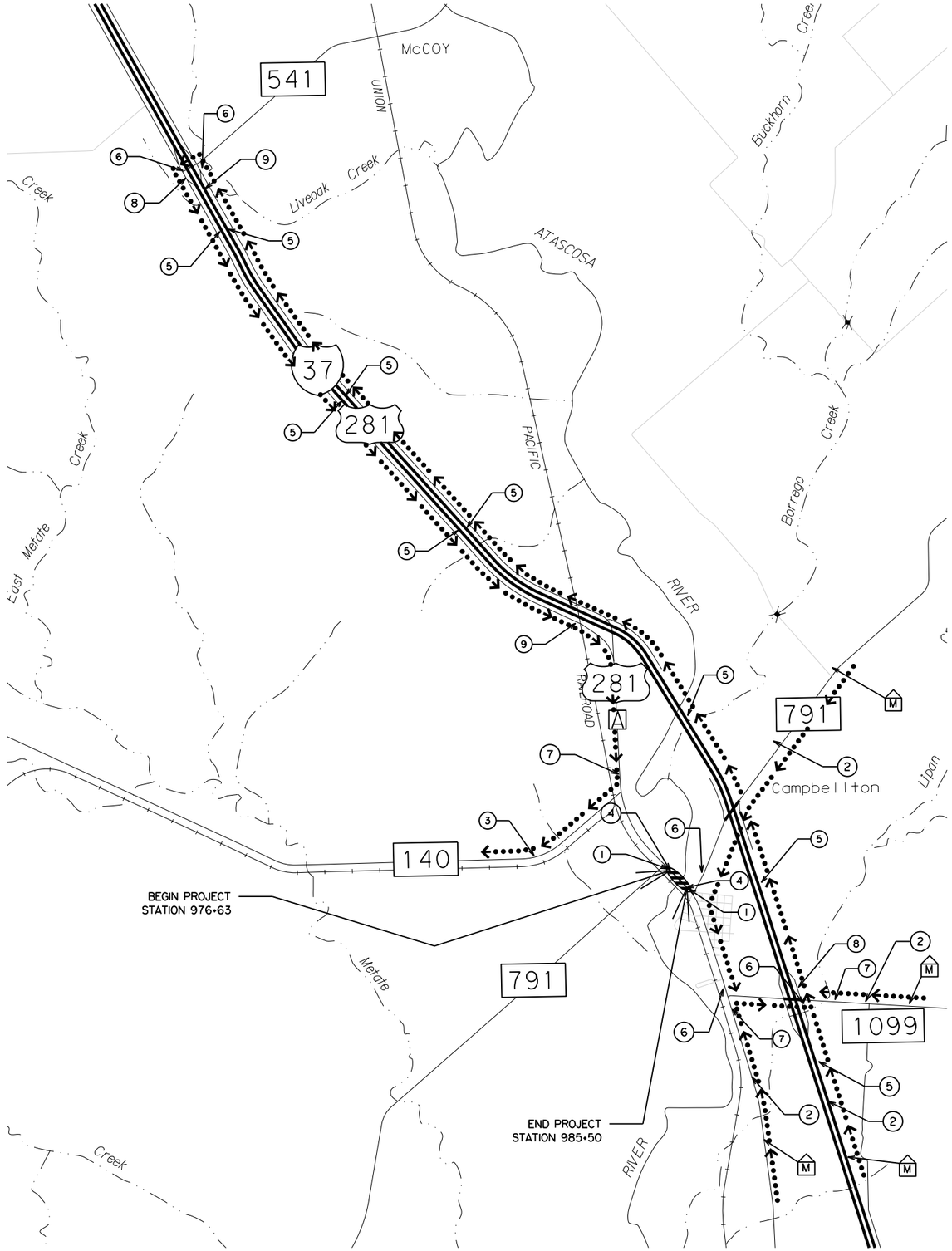
5
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 140 ROAD — M1-6F 24x24
- M6-3 21x15

6
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 140 ROAD — M1-6F 24x24
- M6-1 21x15

7
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 140 ROAD — M1-6F 24x24
- M6-1 21x15

8
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 140 ROAD — M1-6F 24x24
- M6-2L 21x15

9
- DETOUR — M4-8 24x12
- WEST — M3-4 24x12
- FARM 140 ROAD — M1-6F 24x24
- M6-2R 21x15



T.C.P. DETOUR LEGEND (CONTINUED)

WORK AREA

DETOUR ROUTE FM 140 WEST

ROUTES

NB UA 281 TO FM 140 WEST DETOUR - NB UA 281 TRAFFIC TO TURN RIGHT ONTO FM 1099. TRAFFIC TO THEN TURN LEFT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO EXIT IH 37 NORTH AND USE TURNAROUND AT FM 541. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 140 WEST.

NB IH 37 TO FM 140 WEST DETOUR - NB IH 37 TRAFFIC TO TAKE FM 541 EXIT AND USE TURNAROUND. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 140 WEST.

WB FM 791 TO FM 140 WEST DETOUR - WB FM 791 TRAFFIC TO TURN LEFT ONTO UA 281 SOUTH. TRAFFIC TO PROCEED AND THEN TURN LEFT AND USE FM 1099 TURNAROUND. TRAFFIC TO THEN TURN LEFT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO EXIT IH 37 NORTH AND USE TURNAROUND AT FM 541. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 140 WEST.

EB FM 1099 TO FM 140 WEST DETOUR - EB FM 1099 TRAFFIC TO TURN RIGHT ONTO ON-RAMP TO MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND USE TURNAROUND. TRAFFIC TO MERGE ONTO IH 37 SOUTH AND PROCEED UNTIL UA 281 EXIT. TRAFFIC TO TURN RIGHT ONTO FM 140 WEST.

NOTES:

1. THIS DETOUR SHALL BE USED DURING PHASE 2 OF THE TRAFFIC CONTROL PLAN, WHEN THE EXISTING STEEL TRUSS BRIDGE SECTION IS REMOVED FROM THE STRUCTURE.

2. ALL ITEMS SHOWN ON THIS DETOUR ARE SUBSIDIARY TO ITEM 502, WITH THE EXCEPTION OF THE PORTABLE CHANGEABLE MESSAGE SIGNS.

3. THIS WORK WILL BE PART OF MILESTONE #1; SEE THE TRAFFIC CONTROL PLAN NARRATIVE FOR MORE INFORMATION.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=6000'

Texas Department of Transportation

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
FM 140 WB

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		51

DESIGN: SG | DRAFT: SG | CHECK: AG
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T.C.P. DETOUR LEGEND

M

PORTABLE CHANGEABLE MESSAGE SIGN

1 — ROAD CLOSED — R11-2

2 — DETOUR AHEAD — CW20-2D

3 — END DETOUR — M4-8a

4 — TY III BARRICADE

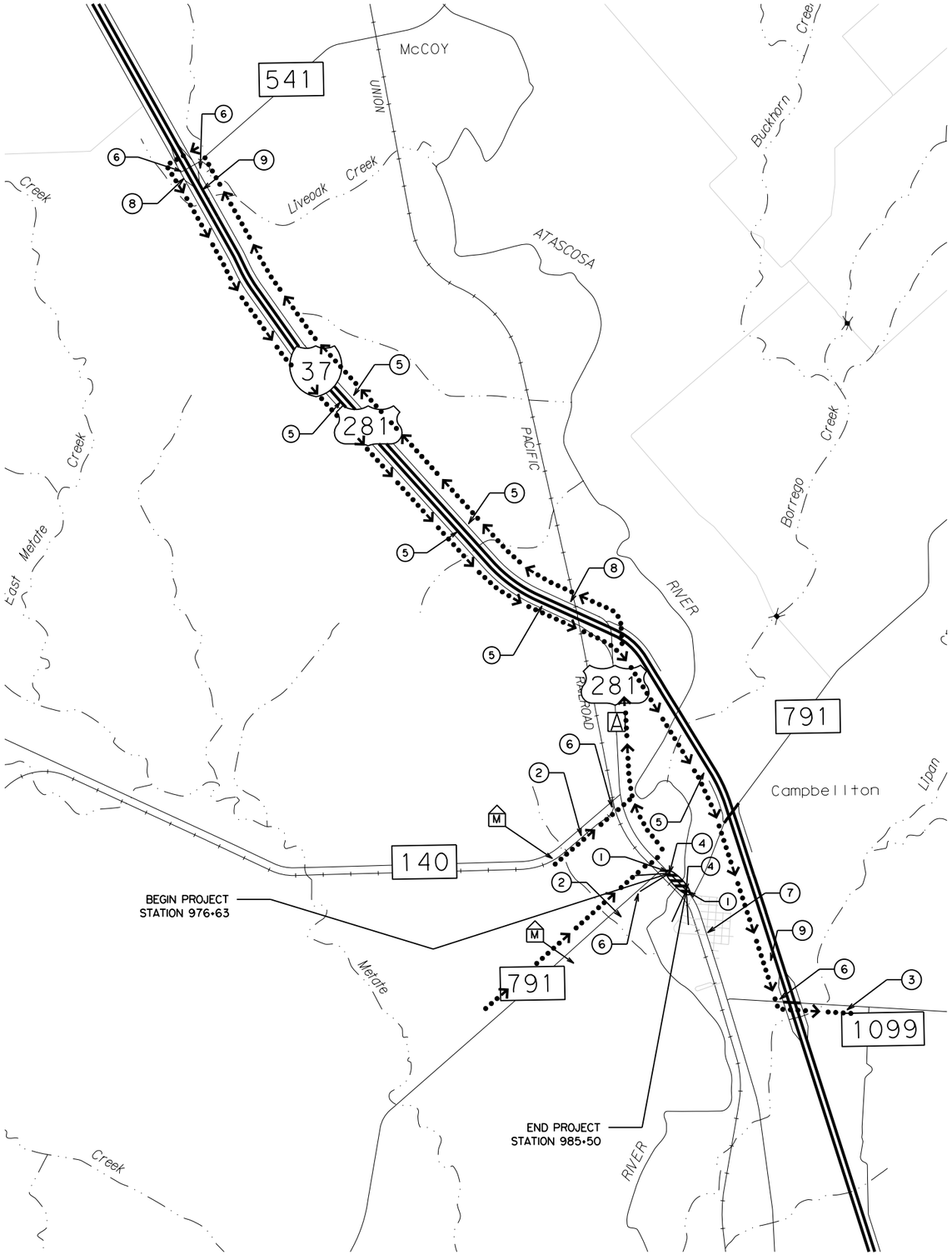
5
- DETOUR — M4-8 24x12
- EAST — M3-2 24x12
- FARM 1099 ROAD — M1-6F 24x24
- M6-3 21x15

6
- DETOUR — M4-8 24x12
- EAST — M3-2 24x12
- FARM 1099 ROAD — M1-6F 24x24
- M6-1 21x15

7
- DETOUR — M4-8 24x12
- EAST — M3-2 24x12
- FARM 1099 ROAD — M1-6F 24x24
- M6-1 21x15

8
- DETOUR — M4-8 24x12
- EAST — M3-2 24x12
- FARM 1099 ROAD — M1-6F 24x24
- M6-2L 21x15

9
- DETOUR — M4-8 24x12
- EAST — M3-2 24x12
- FARM 1099 ROAD — M1-6F 24x24
- M6-2R 21x15



T.C.P. DETOUR LEGEND *(CONTINUED)*

WORK AREA

DETOUR ROUTE FM 140 WEST

ROUTES

FM 140 EAST TO FM 1099 EAST DETOUR - EB FM 140 TRAFFIC TO TURN LEFT ONTO UA 281 NB. TRAFFIC TO PROCEED AND MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND TURNAROUND TO MERGE ONTO IH 37 SOUTH. TRAFFIC TO PROCEED AND TAKE FM 1099 EXIT AND TURN LEFT.

FM 791 EAST TO FM 1099 EAST DETOUR - EB FM 791 TRAFFIC TO TURN LEFT ONTO UA 281 NB. TRAFFIC TO PROCEED AND MERGE ONTO IH 37 NORTH. TRAFFIC TO TAKE FM 541 EXIT AND TURNAROUND TO MERGE ONTO IH 37 SOUTH. TRAFFIC TO PROCEED AND TAKE FM 1099 EXIT AND TURN LEFT.

NOTES:

1. THIS DETOUR SHALL BE USED DURING PHASE 2 OF THE TRAFFIC CONTROL PLAN, WHEN THE EXISTING STEEL TRUSS BRIDGE SECTION IS REMOVED FROM THE STRUCTURE.

2. ALL ITEMS SHOWN ON THIS DETOUR ARE SUBSIDIARY TO ITEM 502, WITH THE EXCEPTION OF THE PORTABLE CHANGEABLE MESSAGE SIGNS.

3. THIS WORK WILL BE PART OF MILESTONE #1; SEE THE TRAFFIC CONTROL PLAN NARRATIVE FOR MORE INFORMATION.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=6000'

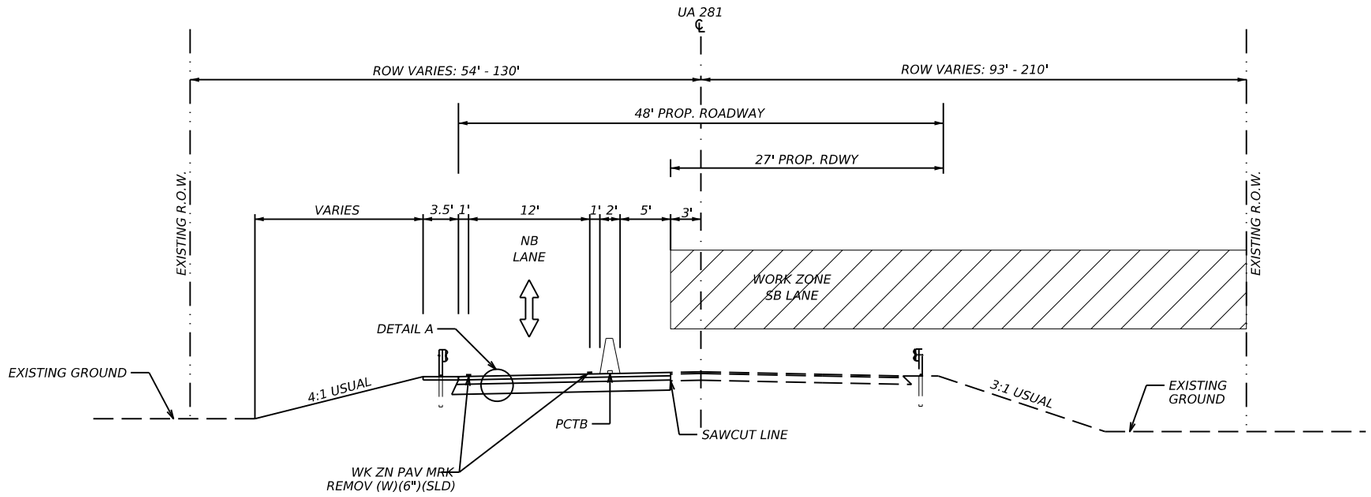
Texas Department of Transportation

TRAFFIC CONTROL PLAN
DETOUR LAYOUT
FM 1099 EB

SHEET: 1 OF 1

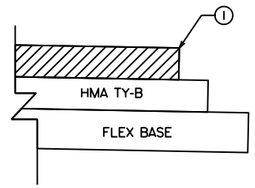
CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		52

DESIGN: SG | DRAFT: SG | CHECK: AG



UA 281

STA 976+63 TO STA 978+43



DETAIL A

(1) - 4" TY-C SAC-A (PG 76-22)
2" SACRIFICIAL FOR FINAL OVERLAY

NOTE :

- 1. REMAINING PROPOSED BRIDGE CONSTRUCTION TO BEGIN 6' FROM CENTERLINE.

UA 281

STA 978+43 TO STA 978+63
STA 984+43 TO STA 984+63

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

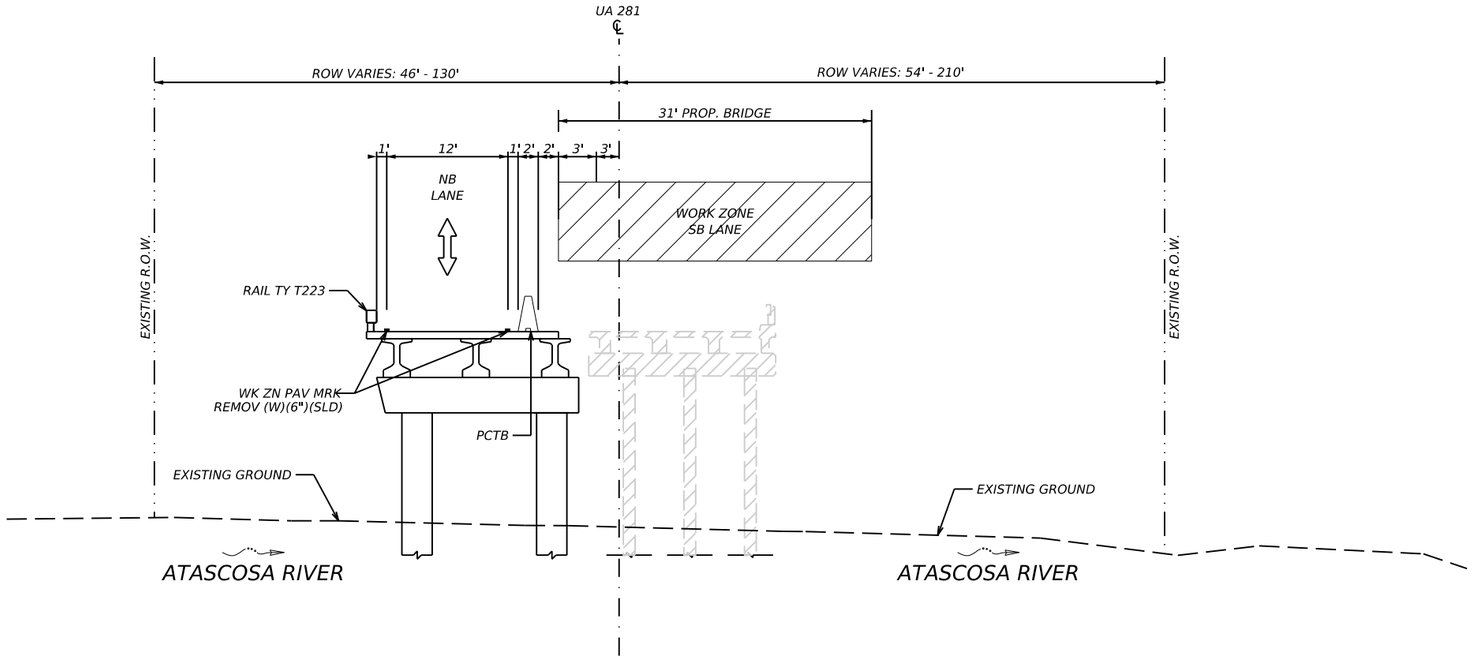
UA 281
TCP PHASE 3
TYPICAL SECTIONS

SHEET: 1 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		53

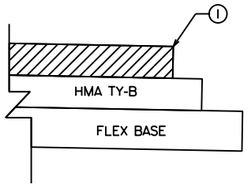
12/1/2023 2:40:05 PM
pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/00731012/4 - Design/Plan Set/2. TCP/UA0281*TCP*TYP*PH3*01.dgn

DESIGN: SG | DRAFT: SG | CHECK: AG



UA 281 - ATASCOSA RIVER BRIDGE

STA 978+63 TO STA 984+43

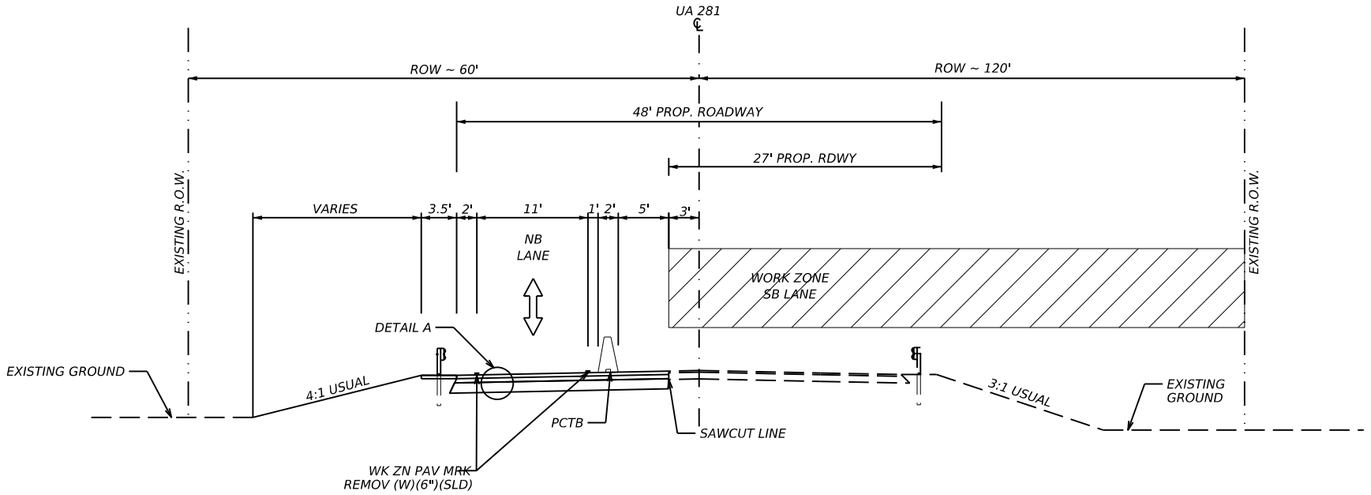


DETAIL A

(1) - 4" TY-C SAC-A (PG 76-22)
2" SACRIFICIAL FOR FINAL OVERLAY

NOTE :

- 1. REMAINING PROPOSED BRIDGE CONSTRUCTION TO BEGIN 6' FROM CENTERLINE.



UA 281

STA 984+63 TO STA 985+50

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
TCP PHASE 3
TYPICAL SECTIONS

SHEET: 2 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		54

12/14/2023 9:54:52 AM
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DESIGN: SG | DRAFT: SG | CHECK: AG

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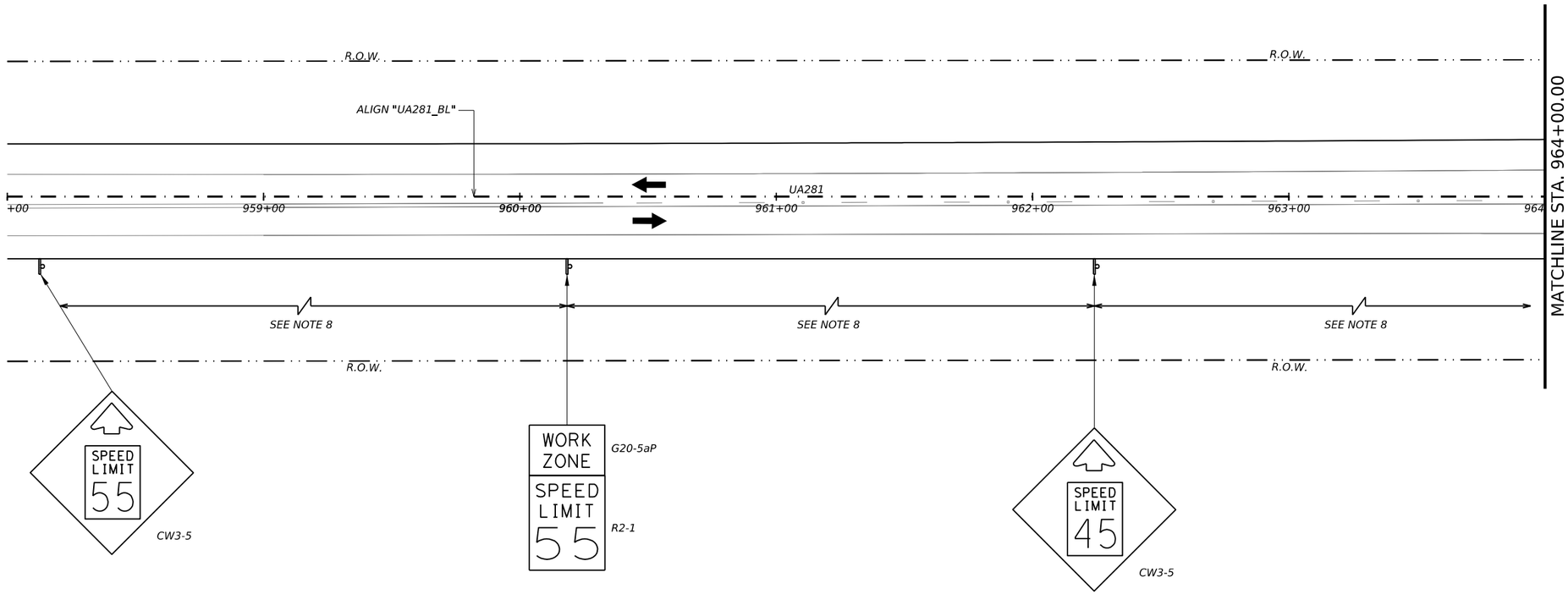
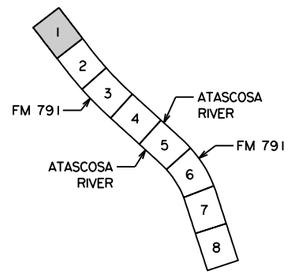


TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 3 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
4. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
7. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
8. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 1 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		55

12/13/2023 2:36:55 PM
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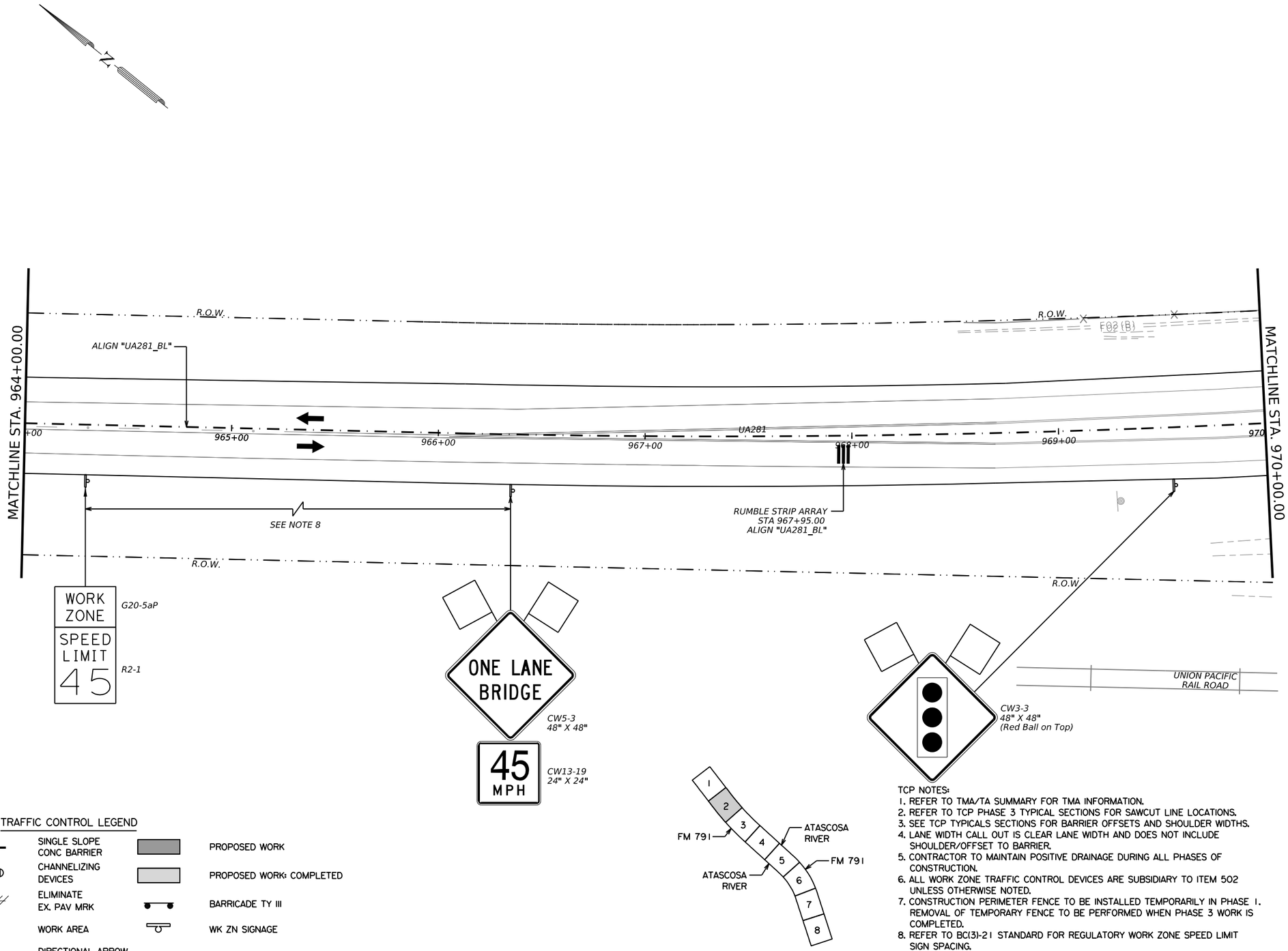
DESIGN: SG | DRAFT: SG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
0510-6002	ONE-WAY TRAF CONT (PILOT CAR)	HR	50



TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	

TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 3 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
4. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
7. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
8. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
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Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 2 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		56

12/13/2023 2:37:07 PM
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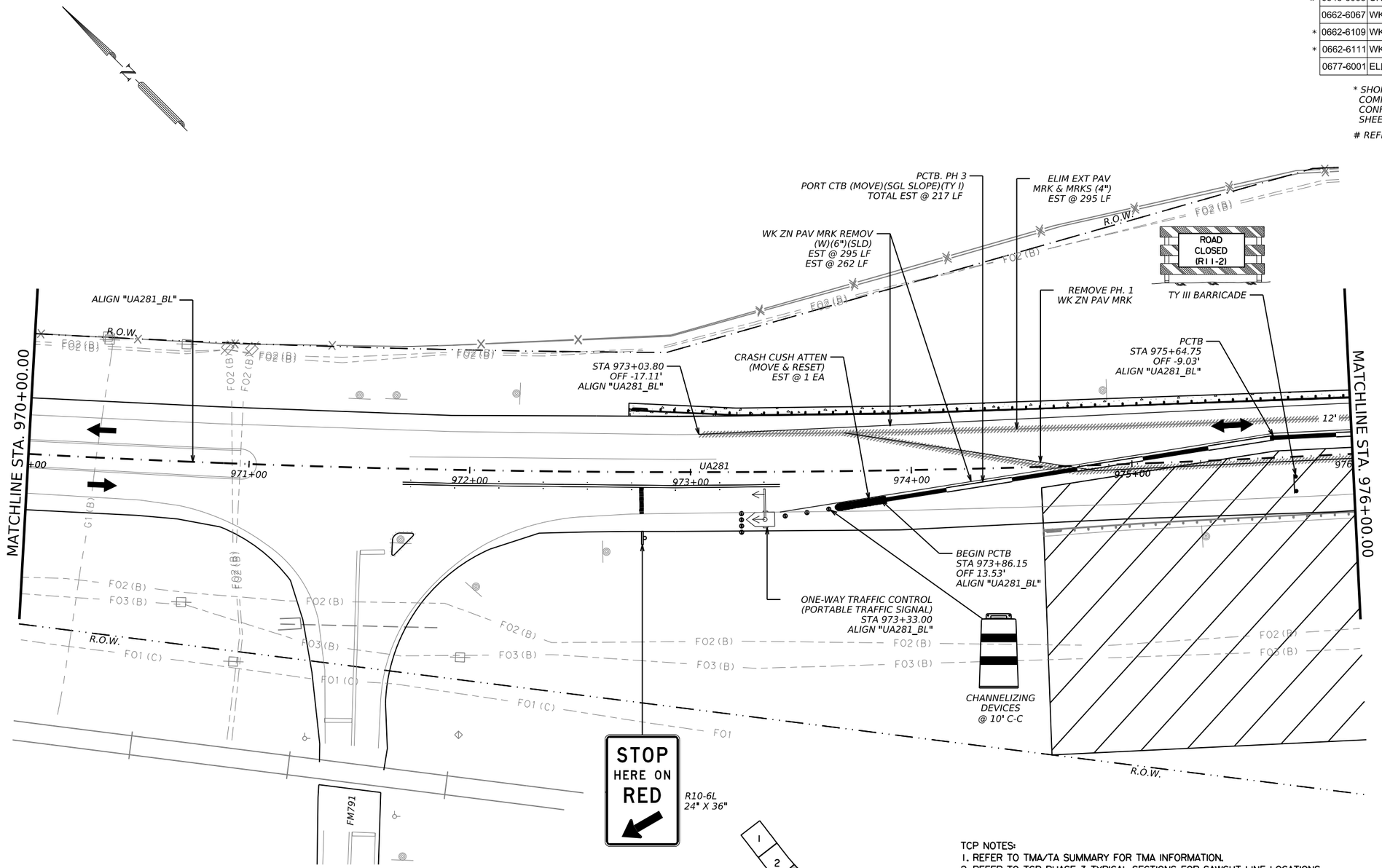
DESIGN: SG | DRAFT: SG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012

	ITEM NO.	ITEM	UNIT	QUANTITY
	0510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	8
	0512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	217
	0512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	217
#	0545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1
#	0545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1
	0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	557
*	0662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	44
*	0662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	86
	0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	295

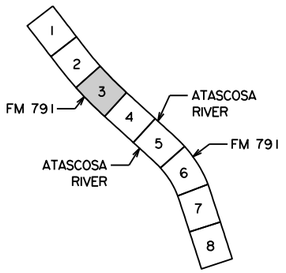
** SHORT TERM WORK ZONE TABS TO BE USED UPON THE COMPLETION OF PHASE 3 TO PLACE TRAFFIC IN FINAL CONFIGURATION PRIOR TO FINAL OVERLAY. REFER TO SPMD SHEETS FOR LAYOUT INFORMATION.*

 # REFER TO CRASH CUSHION SUMMARY SHEET



TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 3 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
4. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
7. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
8. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 3 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		57

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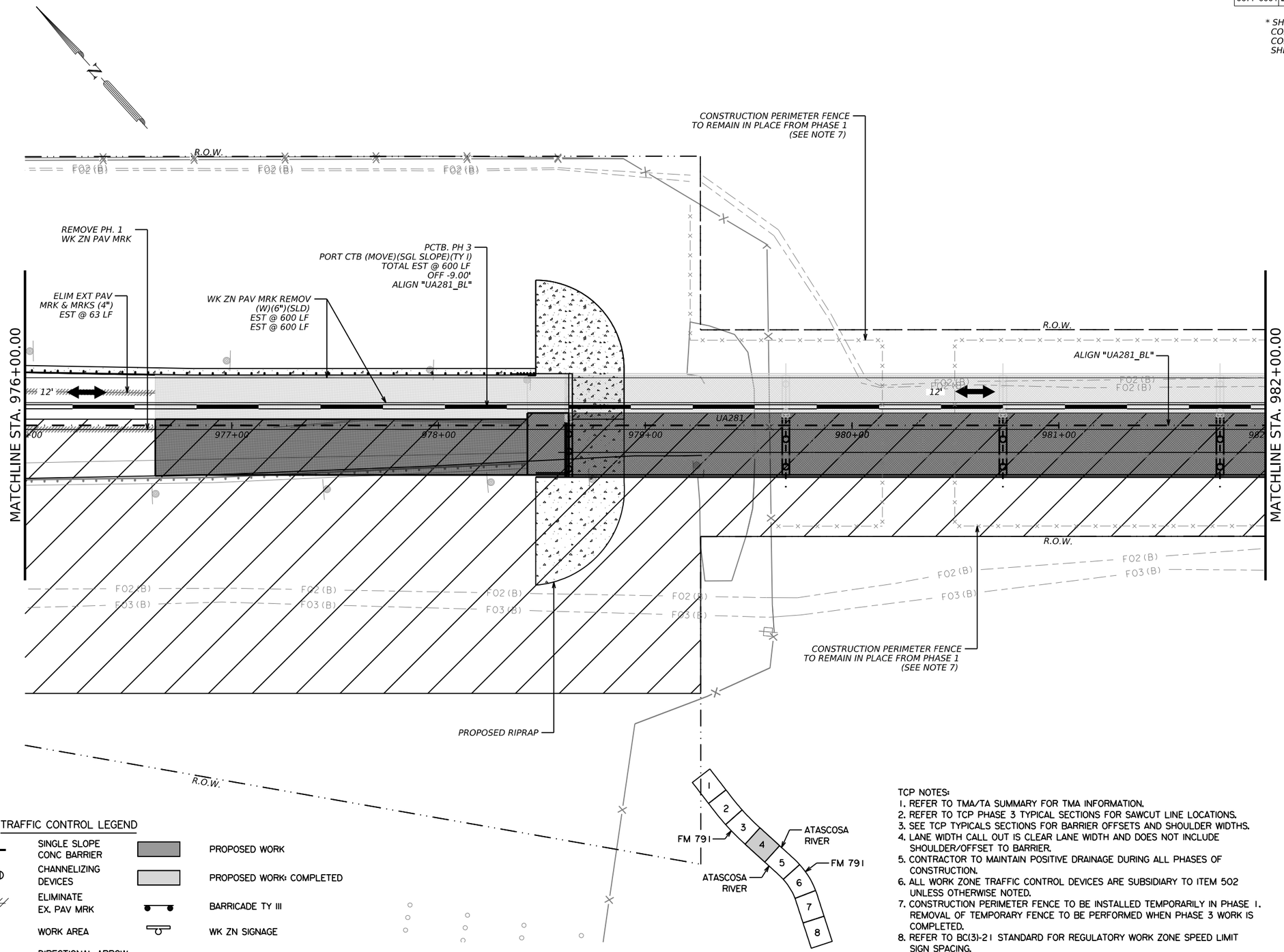
DESIGN: SG | DRAFT: SG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012

	ITEM NO.	ITEM	UNIT	QUANTITY
	0512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	600
	0512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	600
	0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1200
*	0662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	166
	0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	63

** SHORT TERM WORK ZONE TABS TO BE USED UPON THE COMPLETION OF PHASE 3 TO PLACE TRAFFIC IN FINAL CONFIGURATION PRIOR TO FINAL OVERLAY. REFER TO SPMD SHEETS FOR LAYOUT INFORMATION.*



TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE

TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 3 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
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4. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
7. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
8. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 4 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		58

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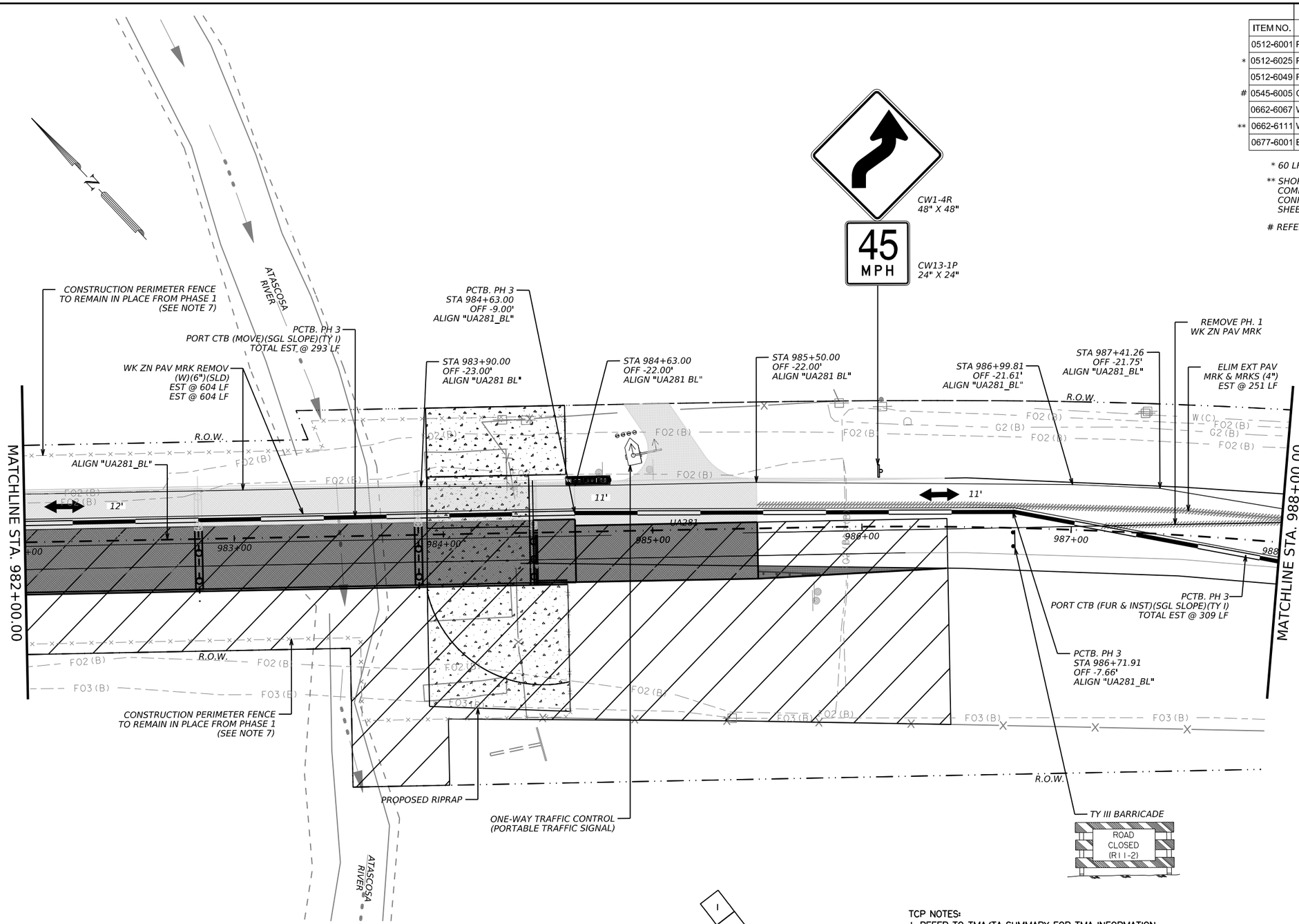
DESIGN: SG | DRAFT: SG | CHECK: AG



QUANTITY SUMMARY CSJ: 0073-13-012

	ITEM NO.	ITEM	UNIT	QUANTITY
	0512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	309
*	0512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	293
	0512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	602
#	0545-6005	CRASH CUSH ATTEN (REMOVE)	EA	2
	0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1208
**	0662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	120
	0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	251

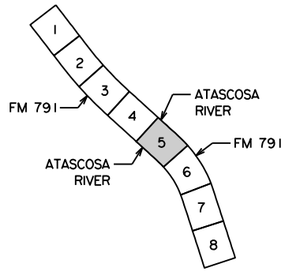
** 60 LF MOVED FROM TEMPORARY STORAGE AREA FOR PHASE 3*

*** SHORT TERM WORK ZONE TABS TO BE USED UPON THE COMPLETION OF PHASE 3 TO PLACE TRAFFIC IN FINAL CONFIGURATION PRIOR TO FINAL OVERLAY. REFER TO SPMD SHEETS FOR LAYOUT INFORMATION.*

 # REFER TO CRASH CUSHION SUMMARY SHEET

TRAFFIC CONTROL LEGEND

- SINGLE SLOPE CONC BARRIER
- CHANNELIZING DEVICES
- ELIMINATE EX. PAV MRK
- WORK AREA
- DIRECTIONAL ARROW
- PROPOSED WORK
- PROPOSED WORK: COMPLETED
- BARRICADE TY III
- WK ZN SIGNAGE



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 3 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
4. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
7. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
8. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 5 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		59

2/21/2024 9:43:12 AM
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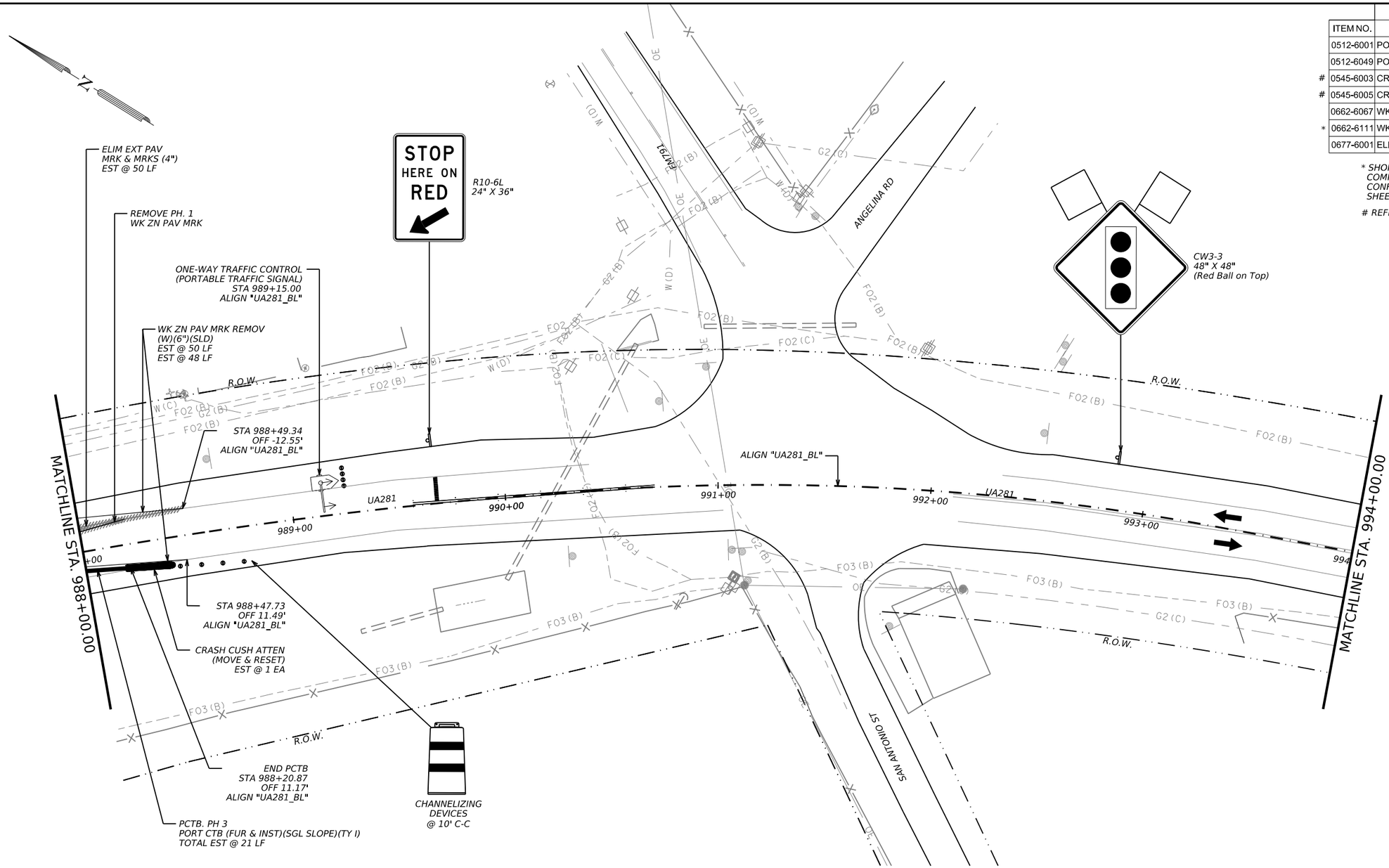
DESIGN: SG | DRAFT: SG | CHECK: AG



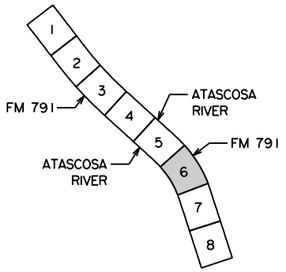
	QUANTITY SUMMARY CSJ: 0073-13-012		
ITEM NO.	ITEM	UNIT	QUANTITY
0512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	21
0512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	21
# 0545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1
# 0545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1
0662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	98
* 0662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	54
0677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	50

** SHORT TERM WORK ZONE TABS TO BE USED UPON THE COMPLETION OF PHASE 3 TO PLACE TRAFFIC IN FINAL CONFIGURATION PRIOR TO FINAL OVERLAY. REFER TO SPMD SHEETS FOR LAYOUT INFORMATION.*

 # REFER TO CRASH CUSHION SUMMARY SHEET

TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 3 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
4. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
7. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
8. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 6 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		60

2/21/2024 9:54:52 AM
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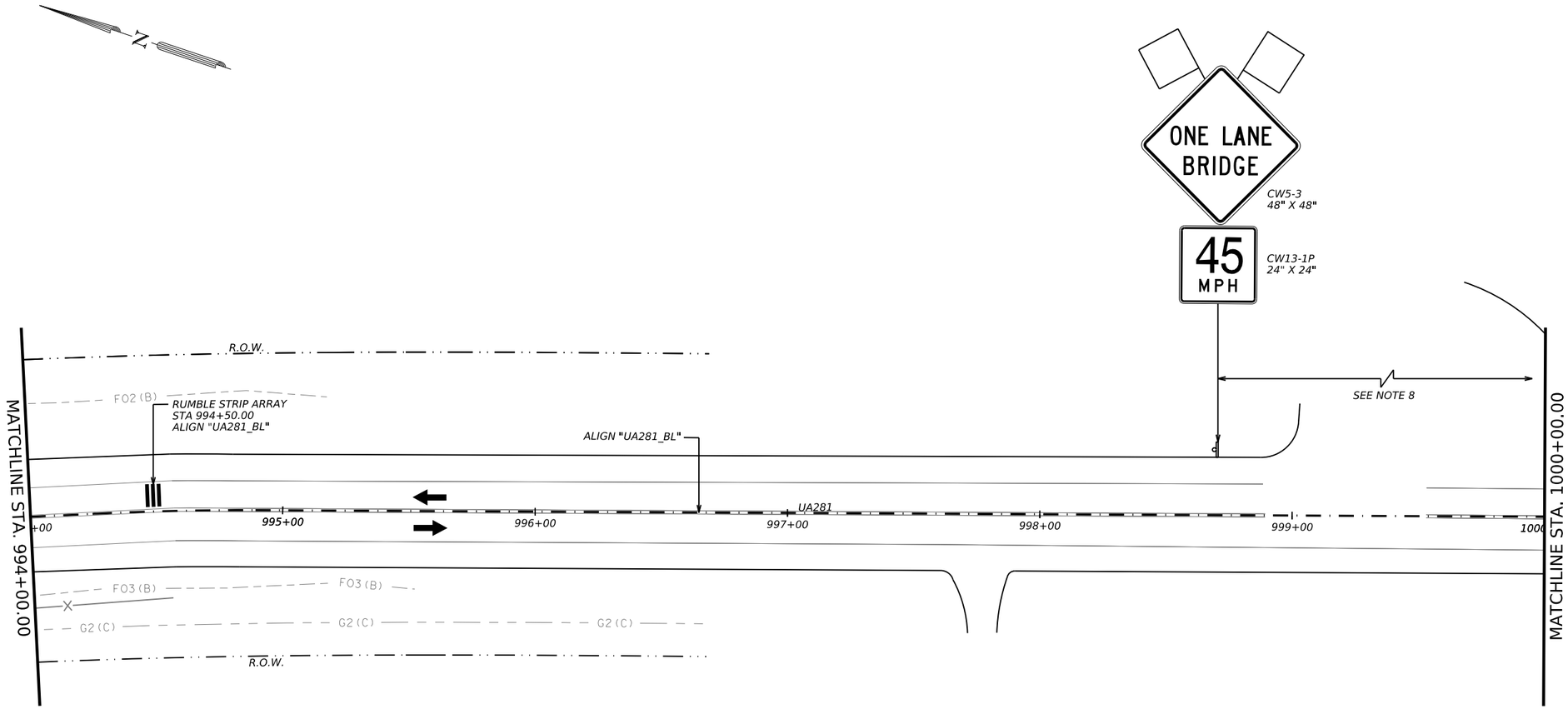
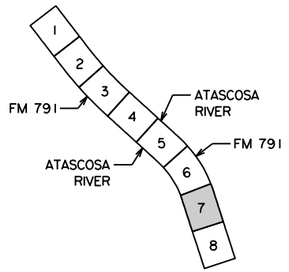


TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 7 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		61

DESIGN: SG | DRAFT: SG | CHECK: AG

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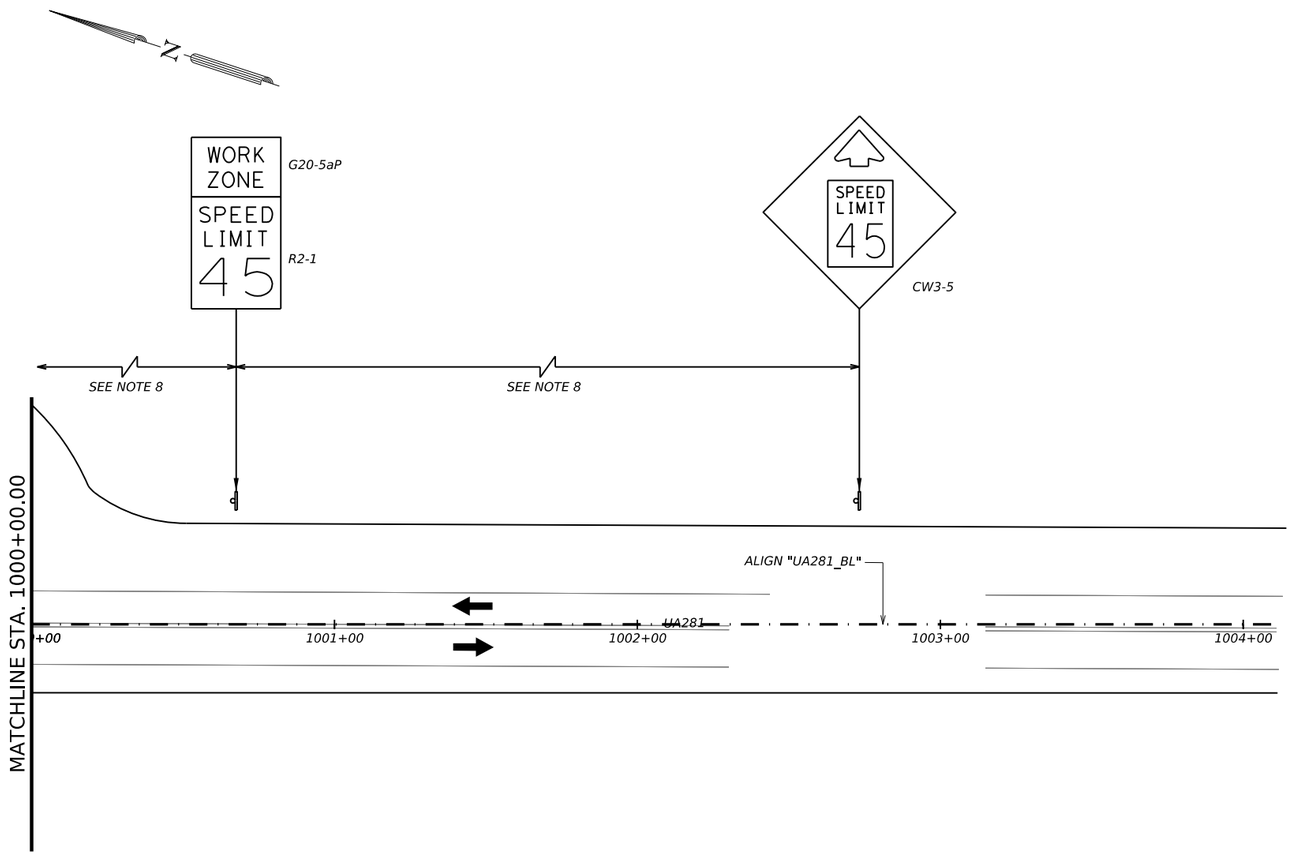
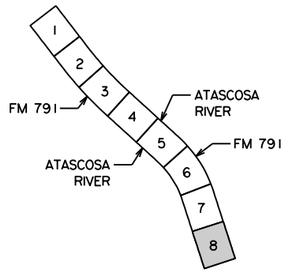
DESIGN: SG | DRAFT: SG | CHECK: AG

NO WORK THIS SHEET



TRAFFIC CONTROL LEGEND

SINGLE SLOPE CONC BARRIER	PROPOSED WORK
CHANNELIZING DEVICES	PROPOSED WORK: COMPLETED
ELIMINATE EX. PAV MRK	BARRICADE TY III
WORK AREA	WK ZN SIGNAGE
DIRECTIONAL ARROW	



TCP NOTES:
1. REFER TO TMA/TA SUMMARY FOR TMA INFORMATION.
2. REFER TO TCP PHASE 3 TYPICAL SECTIONS FOR SAWCUT LINE LOCATIONS.
3. SEE TCP TYPICALS SECTIONS FOR BARRIER OFFSETS AND SHOULDER WIDTHS.
4. LANE WIDTH CALL OUT IS CLEAR LANE WIDTH AND DOES NOT INCLUDE SHOULDER/OFFSET TO BARRIER.
5. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. ALL WORK ZONE TRAFFIC CONTROL DEVICES ARE SUBSIDIARY TO ITEM 502 UNLESS OTHERWISE NOTED.
7. CONSTRUCTION PERIMETER FENCE TO BE INSTALLED TEMPORARILY IN PHASE 1. REMOVAL OF TEMPORARY FENCE TO BE PERFORMED WHEN PHASE 3 WORK IS COMPLETED.
8. REFER TO BC(3)-21 STANDARD FOR REGULATORY WORK ZONE SPEED LIMIT SIGN SPACING.
9. CONTRACTOR TO COVER UP ANY UNUSED SIGNS FROM THE PREVIOUS PHASE.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
TCP
PHASE 3

SHEET: 8 OF 8

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		62

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LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	1	3	UA 281 NB LANE	975+04.90	3	BI	EXISTING HMA	12"	SSCB (TY-1)	24"	42"	30'	INSTALL								X	
2	1	5	UA 281 NB LANE	982+55.00	3	BI	EXISTING BRIDGE	7.5"	SSCB (TY-1)	24"	42"	25'	INSTALL								X	
3	1	5	UA 281 NB LANE	984+01.90	3	BI	EXISTING BRIDGE	7.5"	SSCB (TY-1)	24"	42"	25'	INSTALL								X	
4	1	5	UA 281 NB LANE	984+61.90	3	BI	EXISTING HMA	7.5"	SSCB (TY-1)	24"	42"	25'	INSTALL								X	
5	1	5	UA 281 NB LANE	985+61.39	3	BI	EXISTING HMA	7.5"	SSCB (TY-1)	24"	42"	25'	INSTALL								X	
6	1	6	UA 281 NB LANE	988+59.79	3	BI	EXISTING HMA	9.5"	SSCB (TY-1)	24"	42"	30'	INSTALL								X	
3	2	5	UA 281 NB LANE	984+01.90	3	BI	EXISTING BRIDGE	7.5"	SSCB (TY-1)	24"	42"	25'		REMOVE		3					X	
4	2	5	UA 281 NB LANE	984+61.90	3	BI	EXISTING HMA	7.5"	SSCB (TY-1)	24"	42"	25'		REMOVE		4					X	
2	3	5	UA 281 NB LANE	982+55.00	3	BI	EXISTING BRIDGE	7.5"	SSCB (TY-1)	24"	42"	25'		REMOVE		2					X	
5	3	5	UA 281 NB LANE	985+61.39	3	BI	EXISTING HMA	7.5"	SSCB (TY-1)	24"	42"	25'		REMOVE		5					X	
7	3	3	UA 281 SB LANE	973+86.15	3	BI	EXISTING HMA	12"	SSCB (TY-1)	24"	42"	30'			MOVE	1					X	
8	3	6	UA 281 SB LANE	988+20.87	3	BI	EXISTING HMA	9.5"	SSCB (TY-1)	24"	42"	30'			MOVE	6					X	
7	3	3	UA 281 SB LANE	973+86.15	3	BI	EXISTING HMA	12"	SSCB (TY-1)	24"	42"	30'		REMOVE		7					X	
8	3	6	UA 281 SB LANE	988+20.87	3	BI	EXISTING HMA	9.5"	SSCB (TY-1)	24"	42"	30'		REMOVE		8					X	
												TOTALS	6	6	2							

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyise.htm

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		
	SAT	ATASCOSA		
	FEDERAL AID PROJECT			SHEET NO.
	SEE TITLE SHEET			63

LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET					6185 6002	6185 6005
			FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	TMA (STATIONARY)	TMA (MOBILE OPERATION)
		SHEET NUMBER	EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
1	PH 1	TCP(1-2)-18	1		1	1	1	
2	PH 1	TCP(1-1)-18		1	1	2		2
3	PH 1	TCP(3-3)-14	1		1	1		1
4	PH 2	TCP(1-2)-18		1	1	1	1	
5	PH 3	TCP(1-2)-18		1	1	2	2	
6	PH 3	TCP(1-1)-18		1	1	6		6
7	PH 3	TCP(7-1)-13		1	1	4		4
8	PH 3	TCP(3-3)-14		1	1	2		2
		TOTALS	2				4	15

NOTE.
FURNISH TMA/TA - THE NUMBER OF ATTENUATORS BEING FURNISHED FOR THE SPECIFIC TCP.
RELOCATE/REUSE TMA/TA - THE NUMBER OF ATTENUATORS BEING REUSED FROM A PREVIOUS TCP FOR THE SPECIFIC TCP.
TOTAL TMA/TA PER SET UP = (FURNISH TMA/TA) + (RELOCATE/REUSE TMA/TA)
DURATION OF TMA/TA SET UP - THE NUMBER OF DAYS THE ATTENTUATORS WILL BE USED FOR THE SPECIFIC TCP.
TMA/TA (STATIONARY) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
TMA/TA (MOBILE OPERATION) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)

TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA) SUMMARY SHEET

FILE: tma.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS 3/2018	0073	13	012	UA 281
	DIST	COUNTY		
	SAT	ATASCOSA		
	FEDERAL AID PROJECT			SHEET NO.
	SEE TITLE SHEET			64

DESIGN: SG | DRAFT: SG | CHECK: AG

BARRIER SCHEDULE: TY 1 SINGLE SLOPE

STRING	**PHASE 1**
	(Install LF)
UA 281	
SSCB_PH1-1	750
SSCB_PH1-2	60
SSCB_PH1-3	300
COLUMN TOTAL	1110
NEED PER PHASE	1110
STOCK	0

STRING	**PHASE 2**	REMAIN PH2	MOVE PH2	MOVE TO TEMP. STORAGE AREA
	(Install LF)	LF	LF	LF
UA 281				
SSCB_PH2-1	0	750	0	0
SSCB_PH2-2	0	0	0	60
SSCB_PH2-3	0	300	0	0
COLUMN TOTAL	0	1050	0	60
NEED PER PHASE	**1050**			
STOCK			0	

STRING	**PHASE 3**	REMAIN PH3	MOVE PH3	MOVE TO TEMP. STORAGE AREA	REMOVE
	(Install LF)	LF	LF	LF	LF
UA 281					
SSCB_PH3-1	330	0	1110	0	1440
COLUMN TOTAL	330	0	1110	0	1440
NEED PER PHASE	**1440**				
STOCK			0		

GREATEST PHASE TOTAL = STOCKPILE	**1440**

TOTAL PROJECT MOVE	**1170**	TOTAL PROJECT REMOVE	**1440**

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

Texas Department of Transportation

UA 281
TRAFFIC CONTROL PLAN
BARRIER SCHEDULE

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		65

11/27/2023 2:23:10 PM
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FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/00731301 2/4 - Design/Plan Set/2. TCP/Standards/BC(1)-21 THRU BC(12)-21

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

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	0073	13	012	UA 281
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	SAT	ATASCOSA		66
5-10 5-21				

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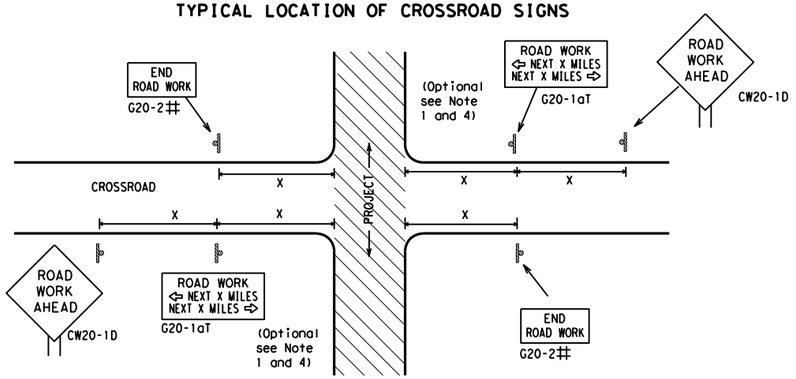
DATE: 12/15/2023 11:07:25 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/007301274 - Design Plan Set/2. TCP/Standards/BC(1)-21 THRU BC(12)-21

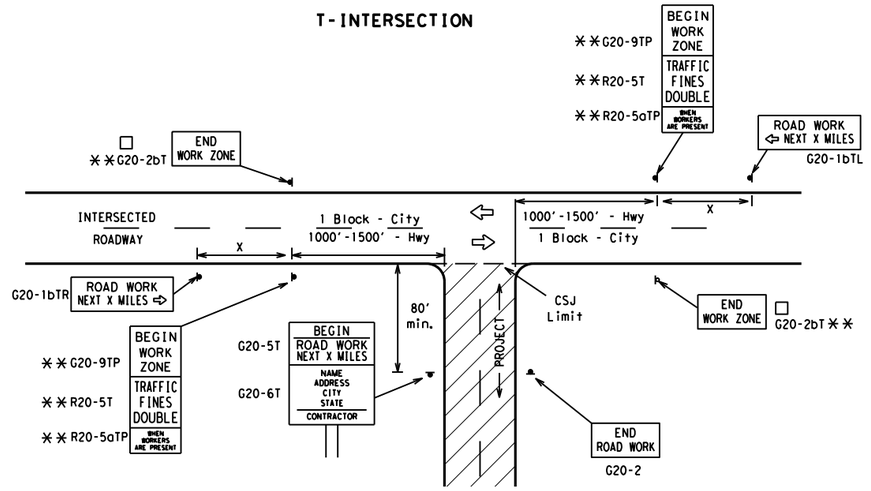
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

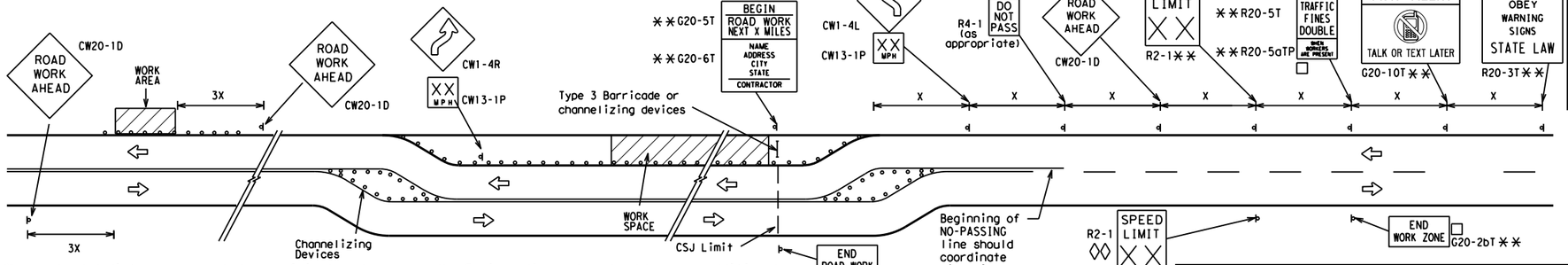
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

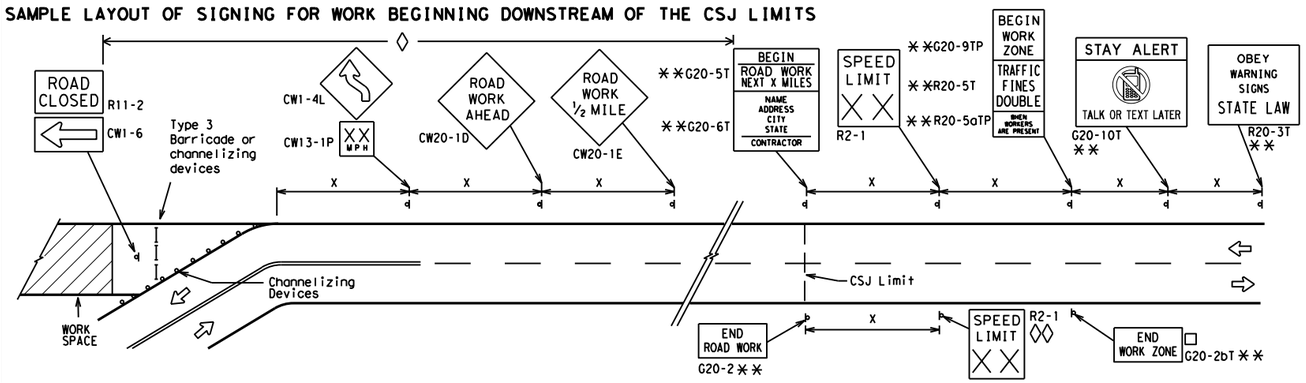
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

□ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

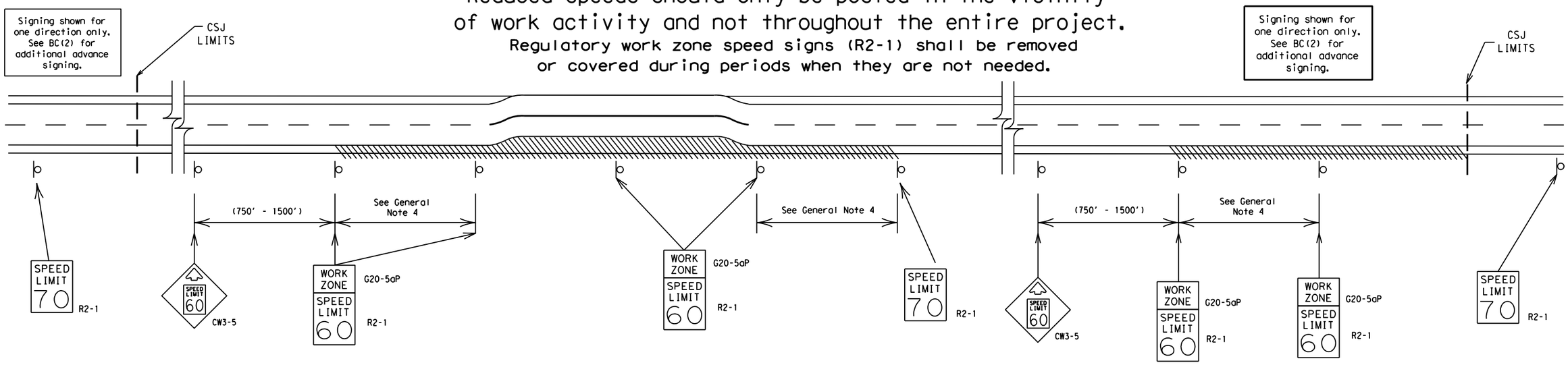
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	ATASCOSA		67

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.

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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 9-07 8-14 7-13 5-21	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		68

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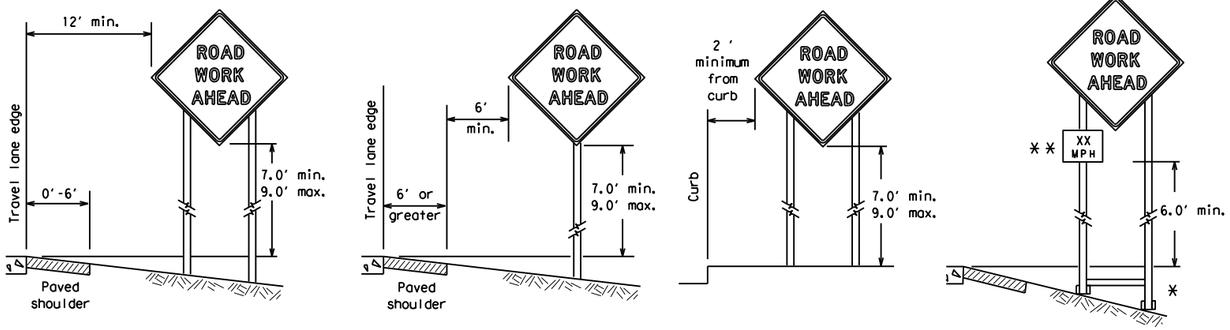
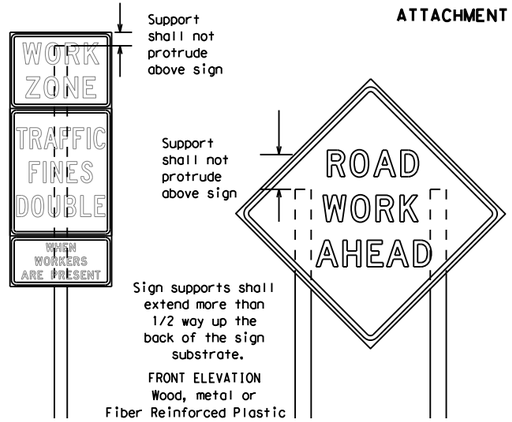
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

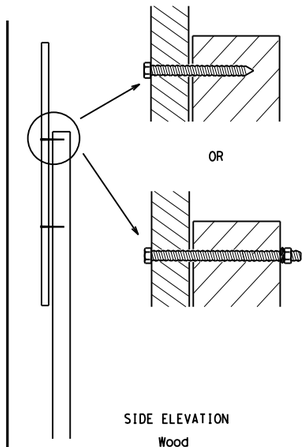


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





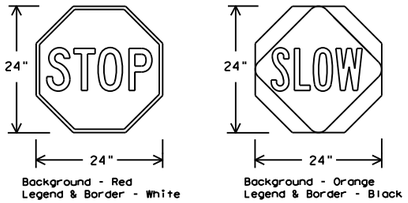
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
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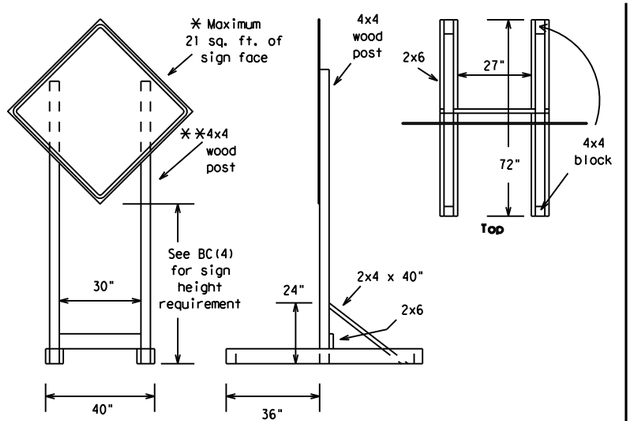
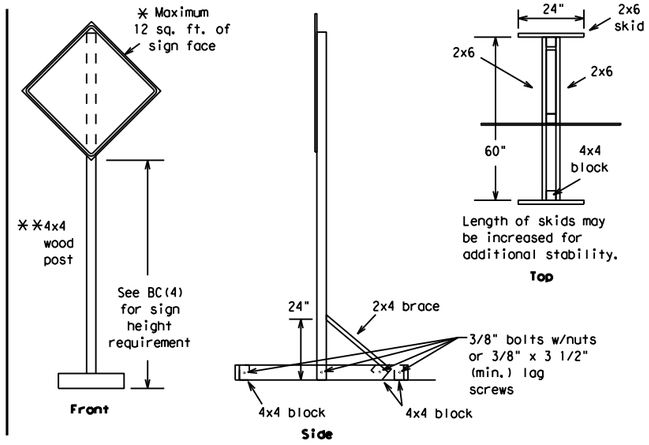
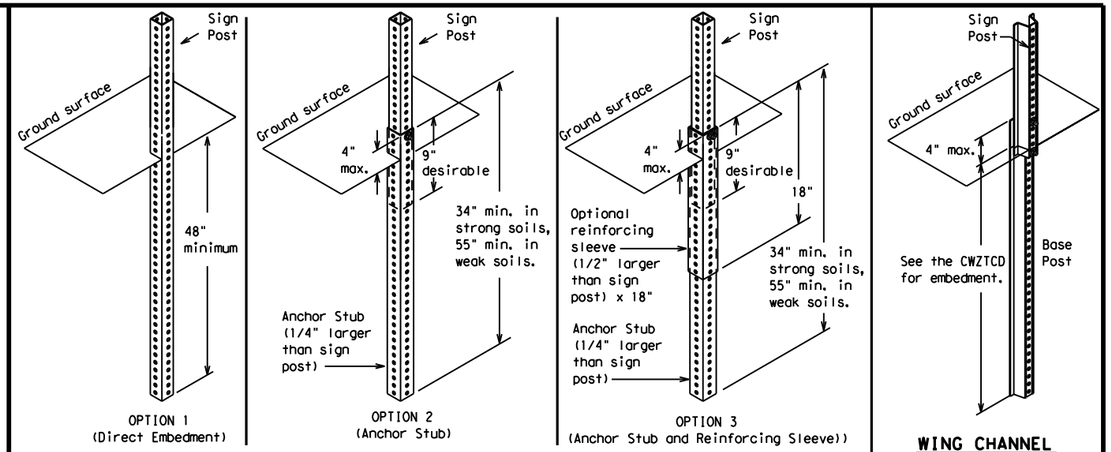




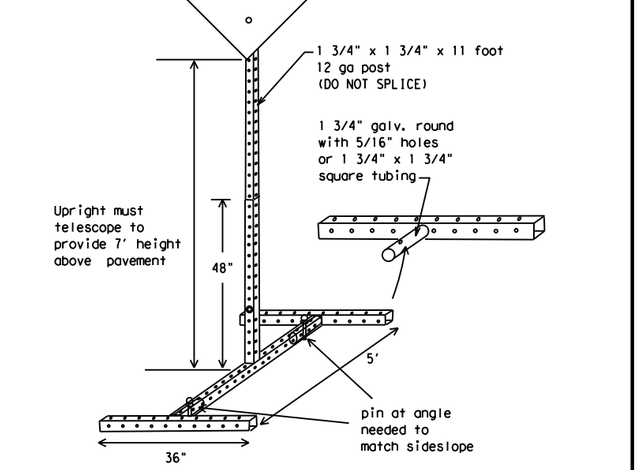
SKID MOUNTED WOOD SIGN SUPPORTS

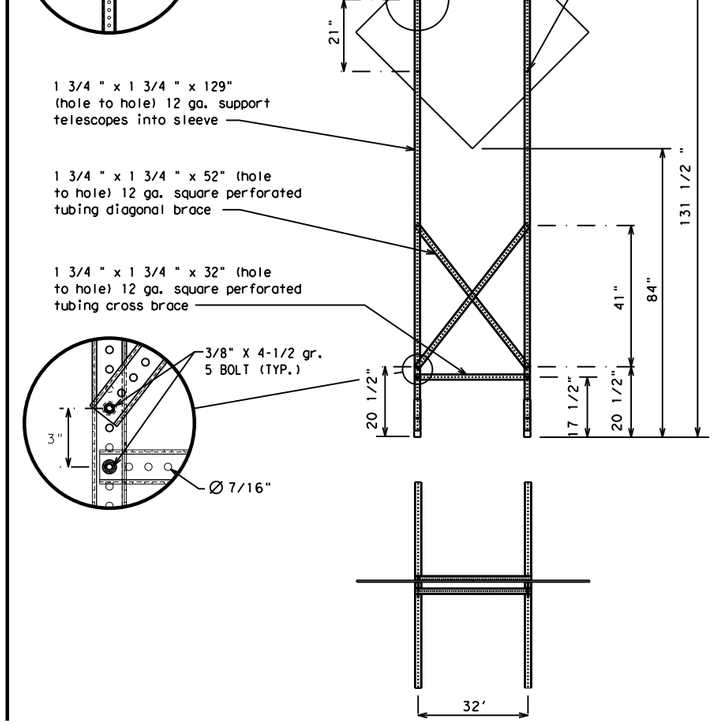
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

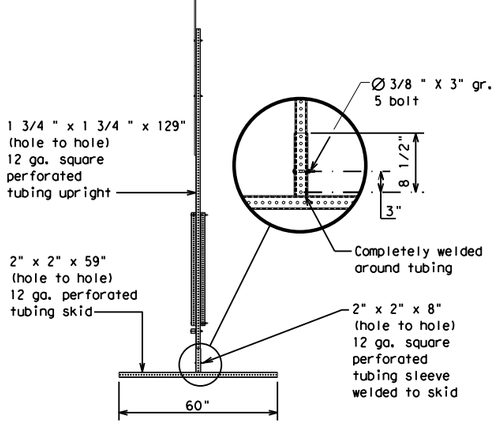


GROUND MOUNTED SIGN SUPPORTS

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		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

* 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		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

* 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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	ATASCOSA		71

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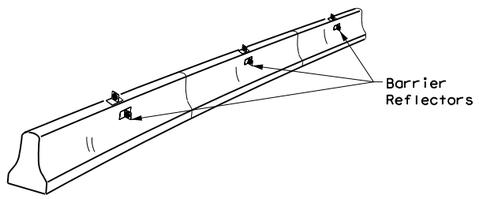
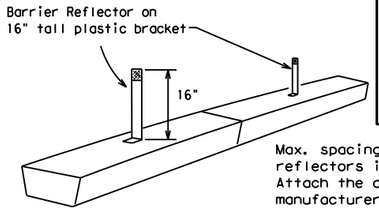
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/2. TCP/Standards/BC(1)-21 THRU BC(12)-21

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.

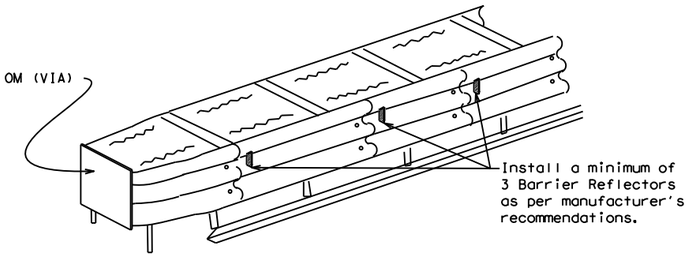


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

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)

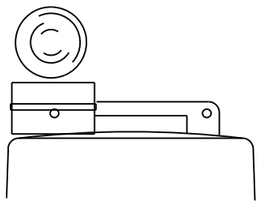


DELINEATION OF END TREATMENTS

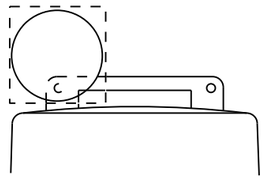
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

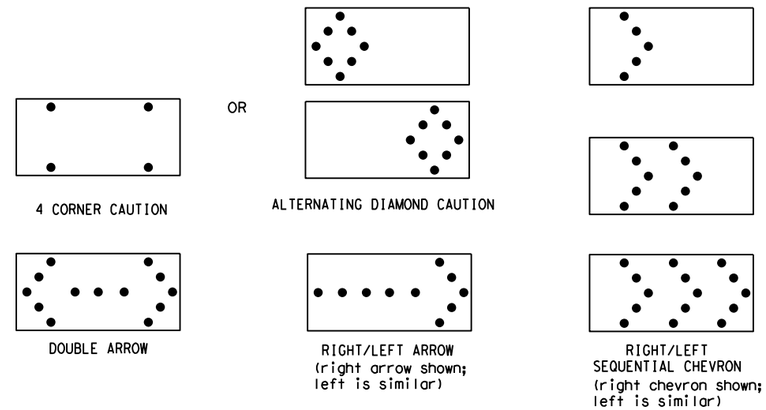
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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 an extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	ATASCOSA		72

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

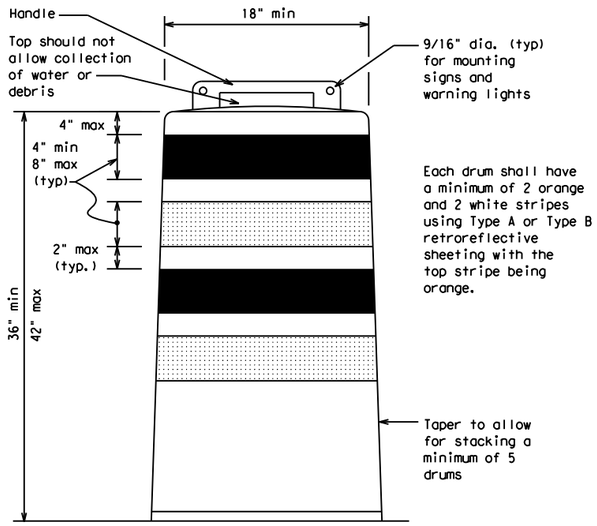
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

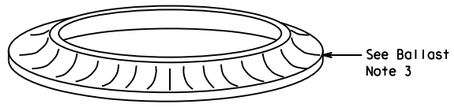
RETROREFLECTIVE SHEETING

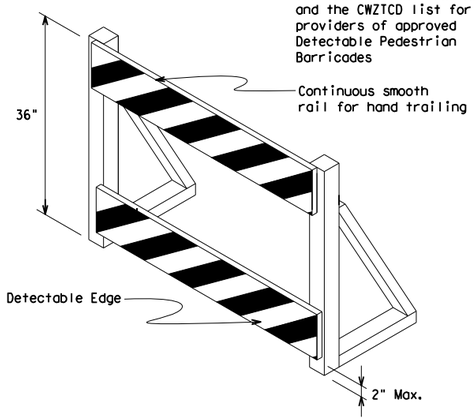
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

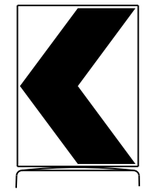




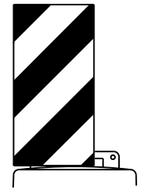


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	SAT	ATASCOSA		73
7-13				

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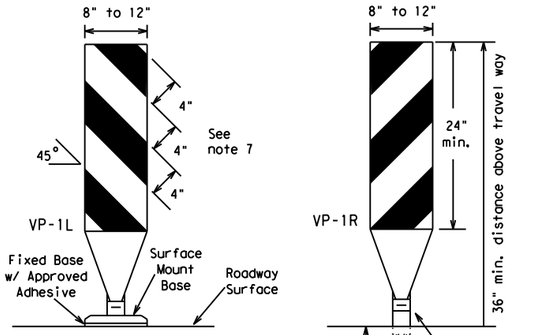
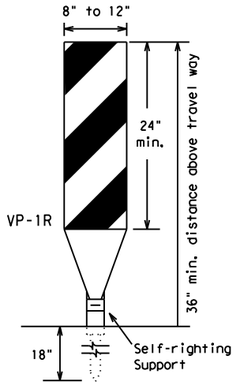
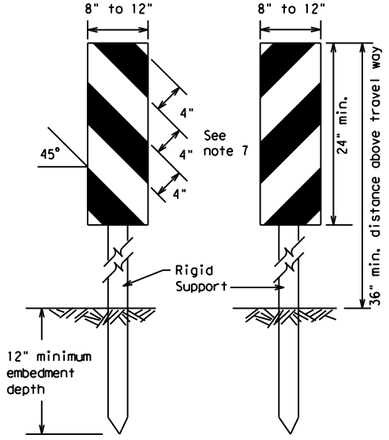
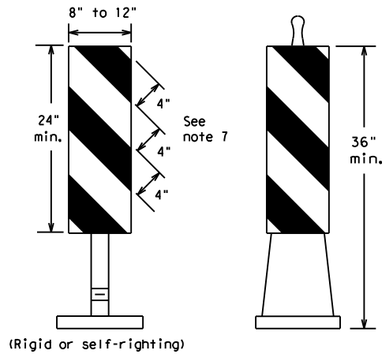






FIXED
(Rigid or self-righting)

DRIVEABLE

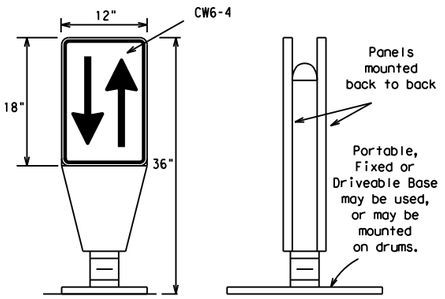


(Rigid or self-righting)

PORTABLE

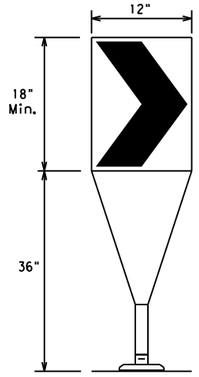
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



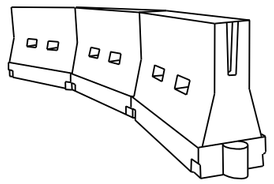
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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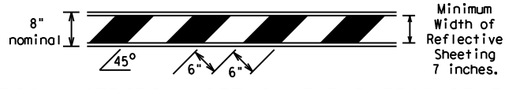
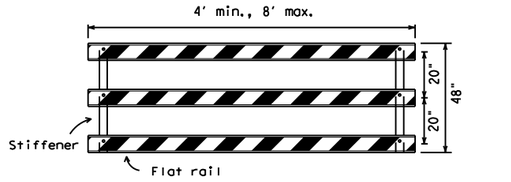
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



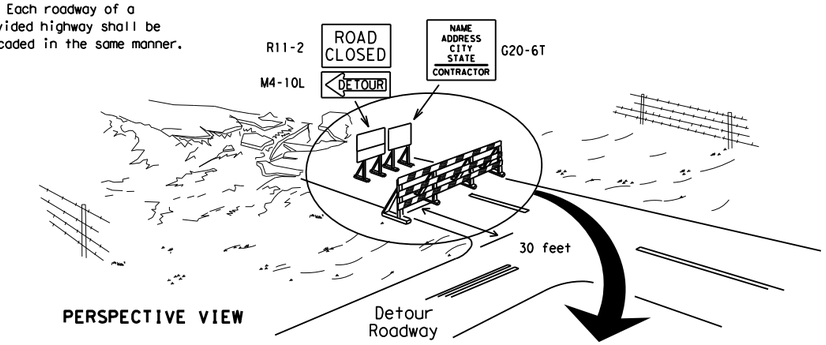
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

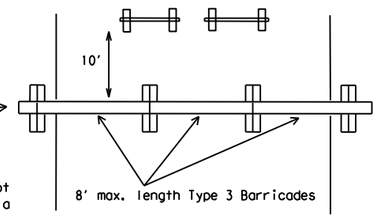
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

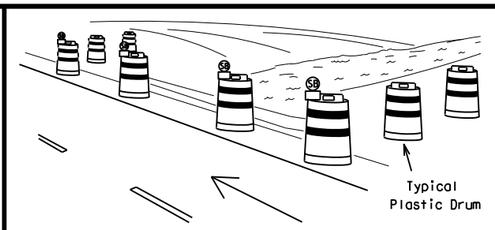
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

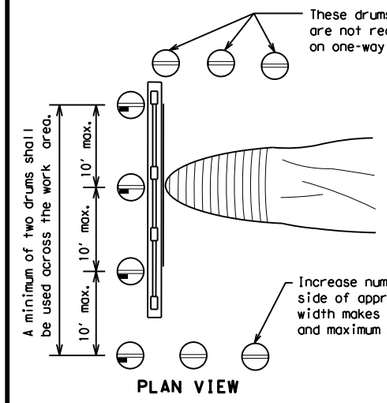
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

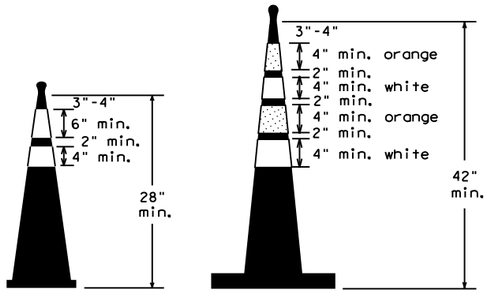
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

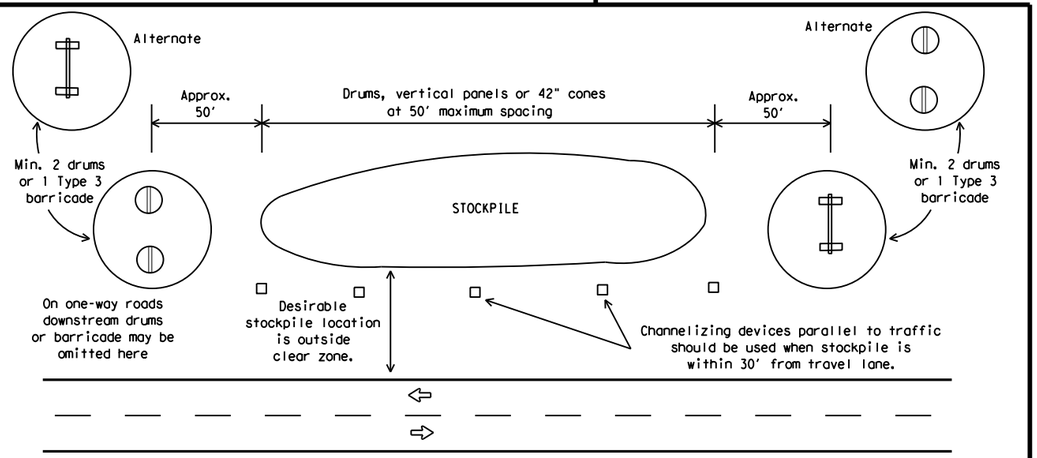
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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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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.

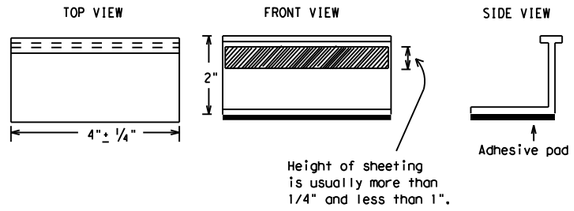
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

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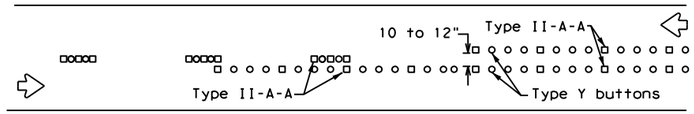
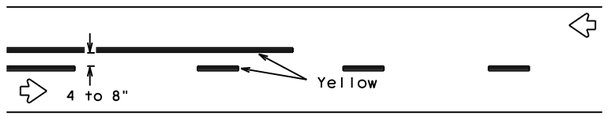
PAVEMENT MARKING PATTERNS

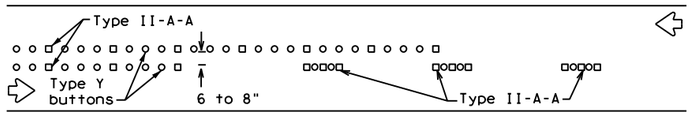
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



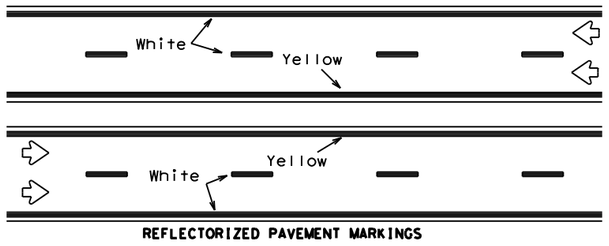
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



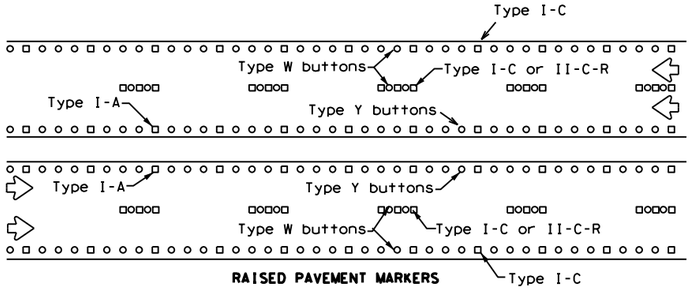
RAISED PAVEMENT MARKERS - PATTERN B

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

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



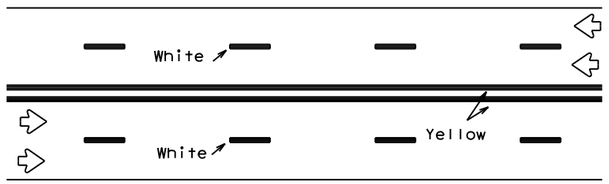
REFLECTORIZED PAVEMENT MARKINGS



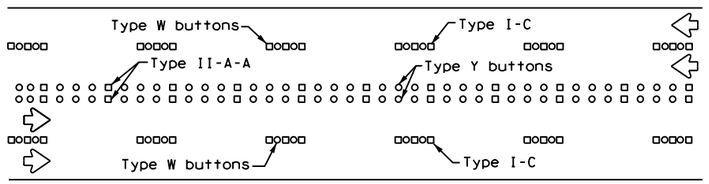
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



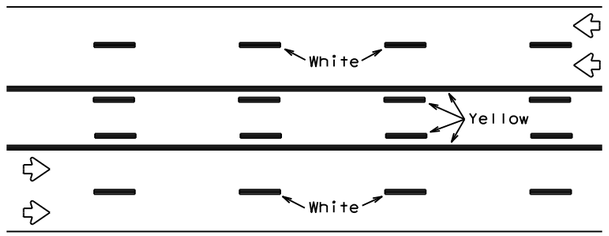
REFLECTORIZED PAVEMENT MARKINGS



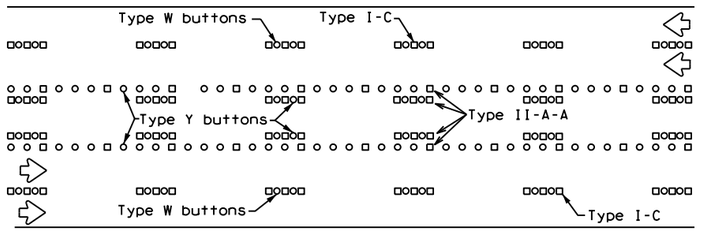
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

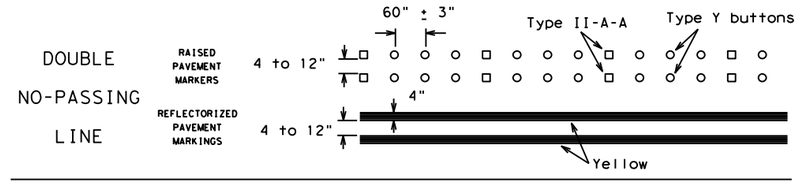
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

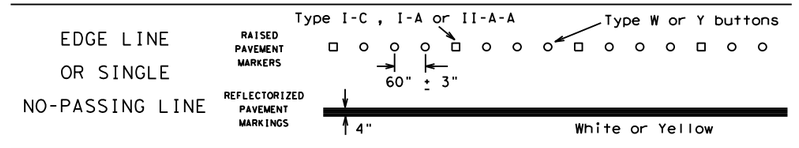
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

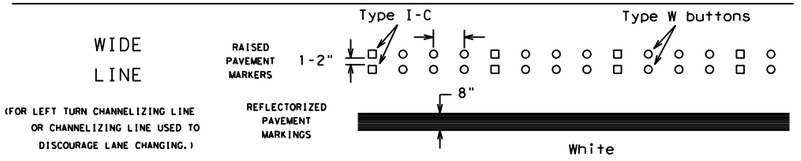


EDGE LINE OR SINGLE NO-PASSING LINE



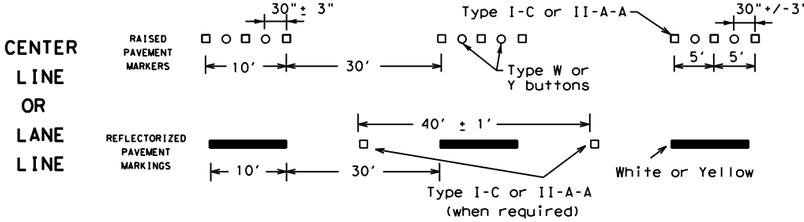
WIDE LINE

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

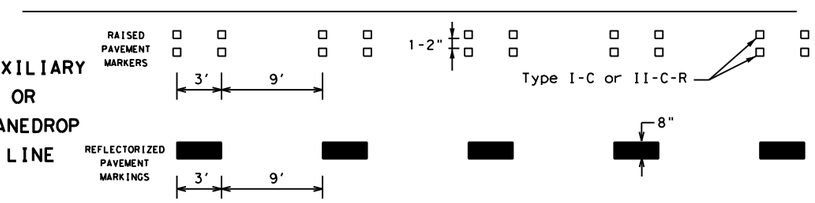


BROKEN LINES

CENTER LINE OR LANE LINE

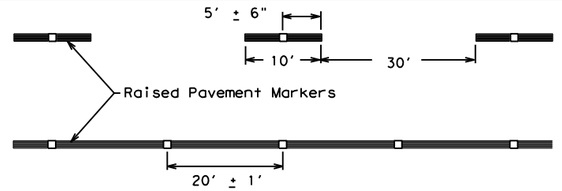


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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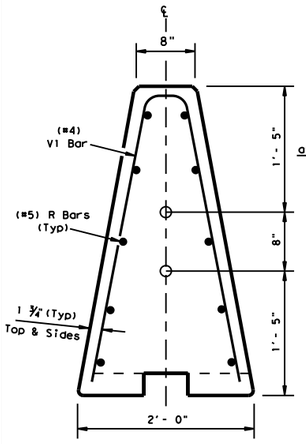
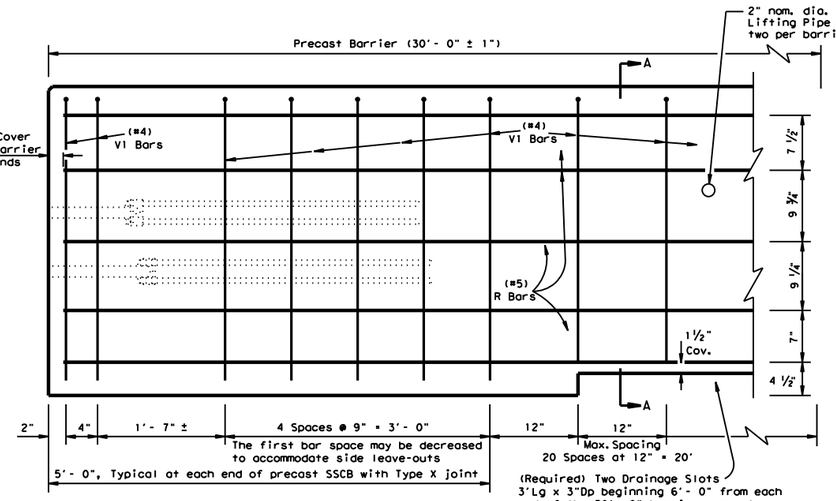


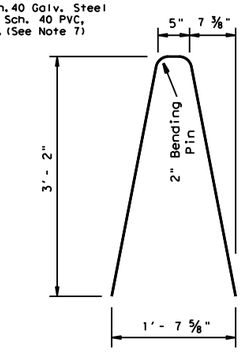
End View
Precast Barrier

Pipe locations for Joint Type X connection



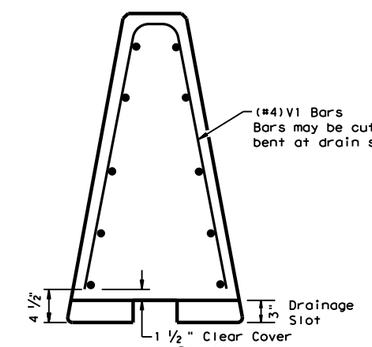
Reinforcement for Precast (SSCB)
Single Slope Concrete Barrier (Type 1)

Showing reinforcement for Joint Connection (Type X)



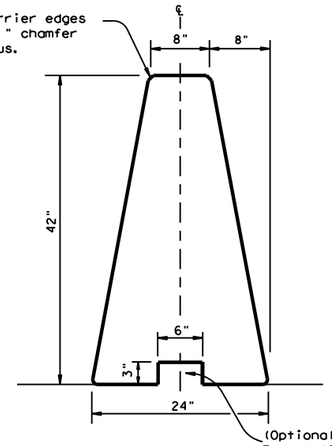
V1 Bar
#4 Rebar

Note:
V1 Bars above the drainage slots may bent to accomadate 1 ½" clear cover as directed by the Engineer.



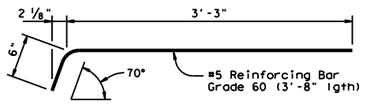
Section A-A
Steel Placement at (Required) Drainage Slots

All precast barrier edges shall have a ¾" chamfer or tooled radius.



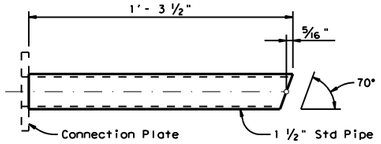
Single Slope Concrete Traffic Barrier

Precast SSCB barrier may be connected to cast-in-place SSBC. The joint connection "Types" may be used in the cast-in-place barrier, to match the precast barrier connection.



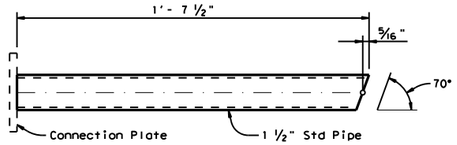
DEFORMED BAR ANCHOR DETAILS

Two (2) Bars required per assembly.
Eight (8) required per Joint.



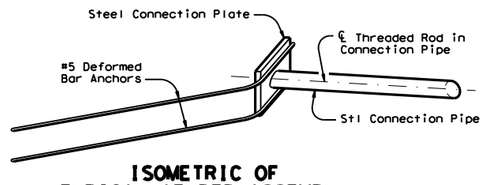
UPPER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Upper Assembly.
Two (2) required per Joint.



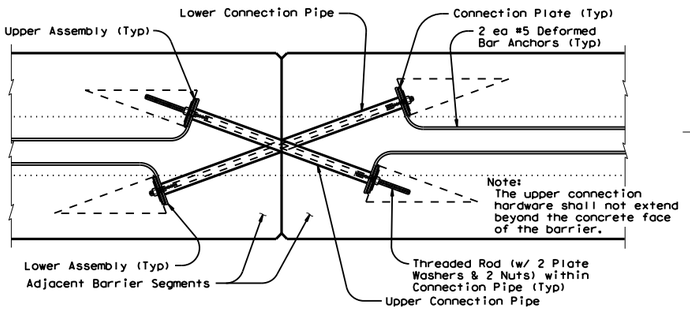
LOWER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Lower Assembly.
Two (2) required per Joint.



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) [2 Upper & 2 Lower] Assemblies required per Joint.



TYPE X JOINT INSTALLATION DETAIL

Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

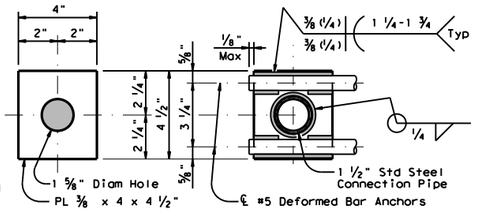
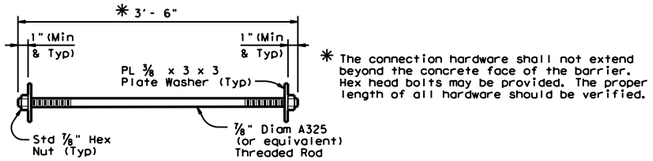


PLATE DIMENSIONS **WELDING DETAILS**

CONNECTION PLATE DETAILS

One (1) Plate required per assembly.
Four (4) required per Joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.



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

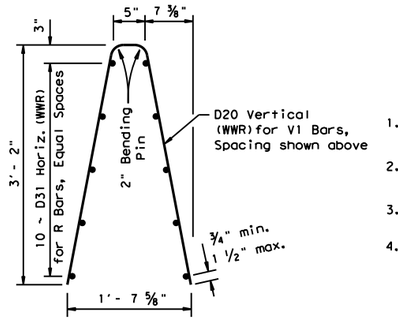
CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts)
(w/ Two (2) PL ⅜ x 3 x 3 Plate Washers & Two (2) Std Hex Nuts)
required per Joint.

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

General Notes

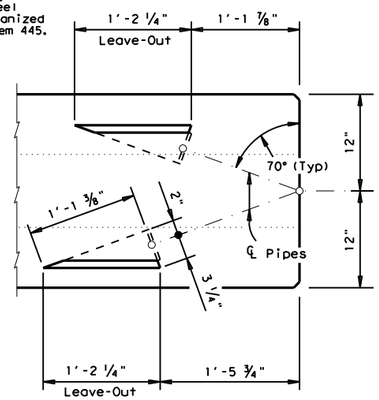
1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a ¾" chamfer or a tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items.
9. All steel assemblies shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."



Welded Wire Reinforcement (WWR) Option for Bars R and V1

(WWR) General Notes

1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".



BARRIER PLAN AT JOINT

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER (TYPE 1)

SSCB(2)-10

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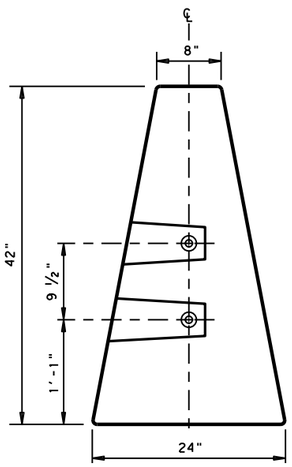
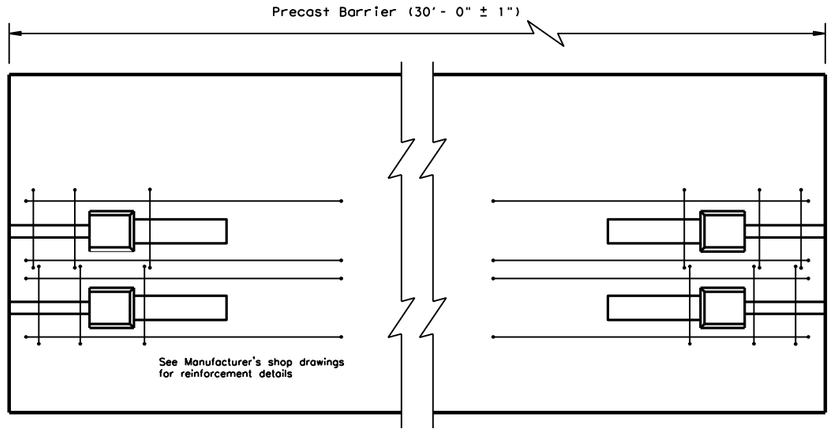
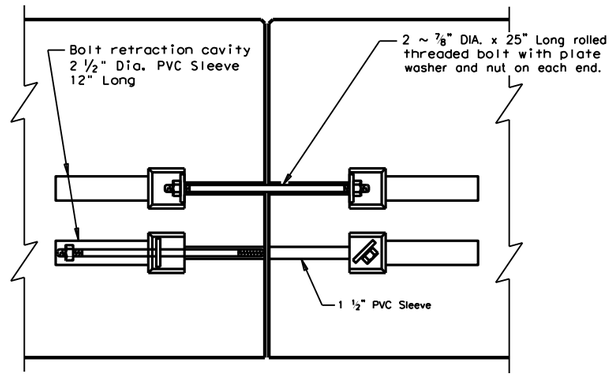


END VIEW
"QUICK-BOLT" POCKET LOCATIONS



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



ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

Joint Connection (Type Q)

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

VIEW FROM ABOVE
J-J HOOK CONNECTION

END VIEW

Proprietary Joint Connections (SSCB)

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

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

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

SECTION A-A
Showing (Type R) Rebar Grid

ELEVATION
V1 Bars (See Sheet 1)

TOP VIEW
JOINT CONNECTION
Typical at both ends of barrier segment

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

WELDED REBAR GRID

Joint Connection (Type R)

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER
(TYPE 1)

SSCB(2)-10

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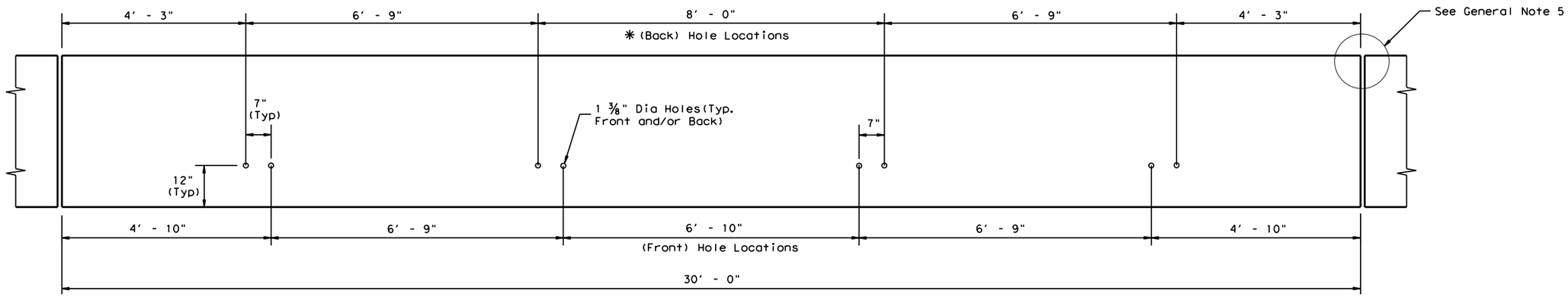
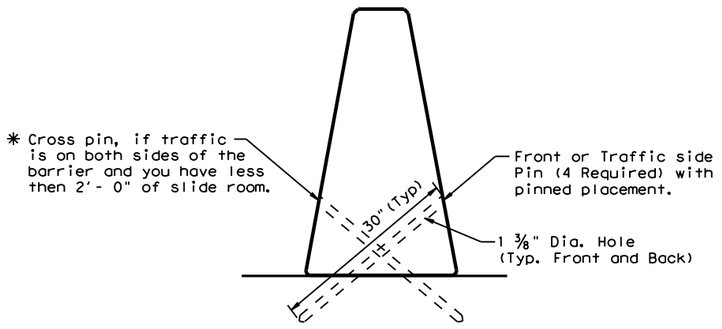


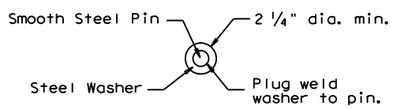
DETAIL 1

Precast SSCB(42")
Showing hole locations

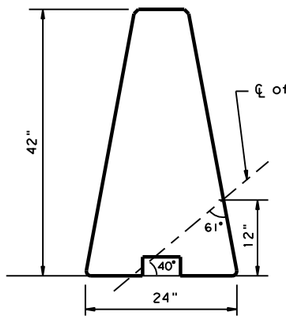


DETAIL 2

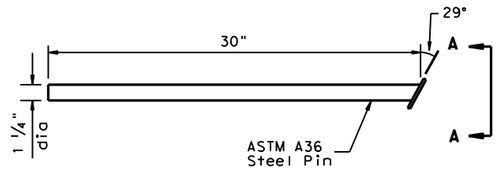
Placement on (ACP)
Asphalt Conc. Pavement
or Treated Base Material
(30" Pin required)



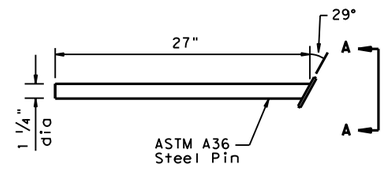
VIEW A-A



HOLE LOCATION DETAIL



(30") PIN DETAIL
See Detail 2

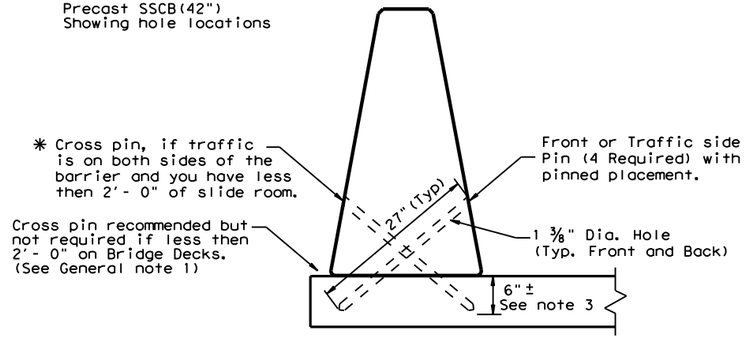


(27") PIN DETAIL
See Detail 3

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

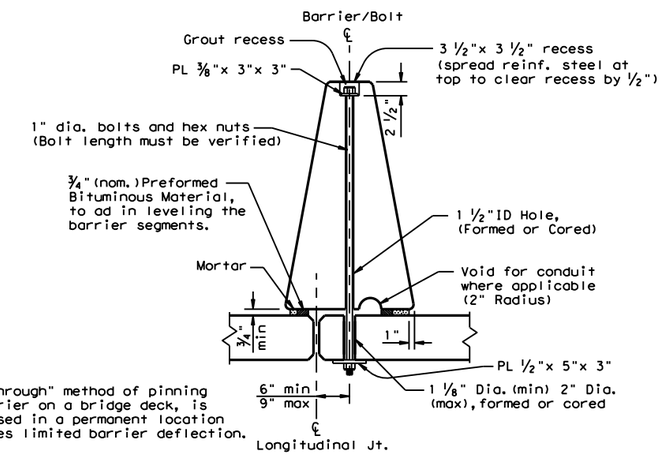
DETAIL 3

Bridge Deck or CRCP
(27" Pin required).



CORE DRILLING EXISTING BARRIER

Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete exceeding ½" shall be patched.



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

PRECAST SSCB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER (TYPE 1) PINNED PLACEMENT

SSCB(5)-10

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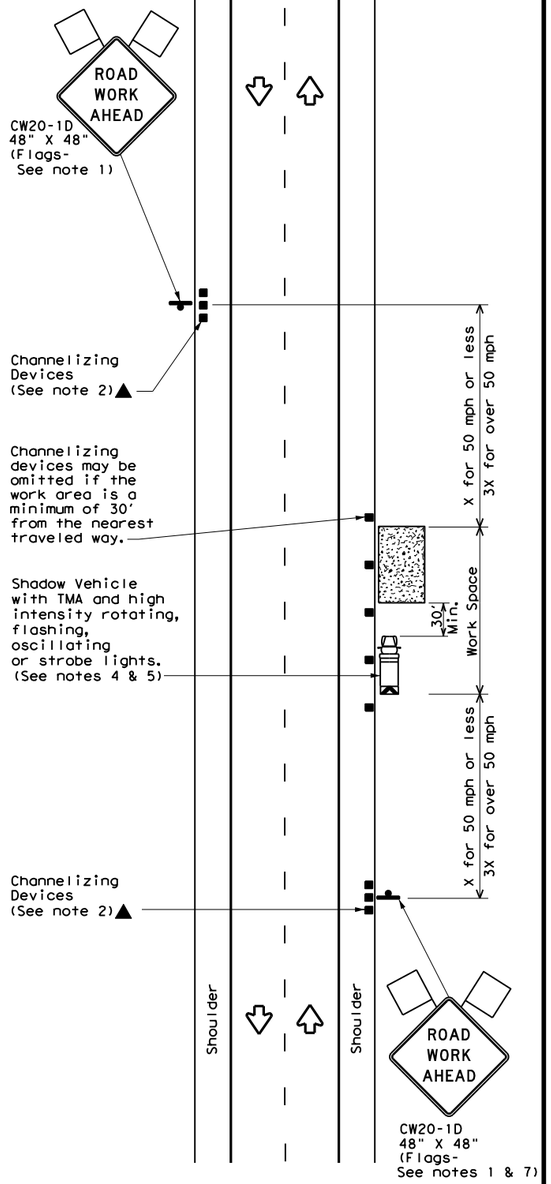
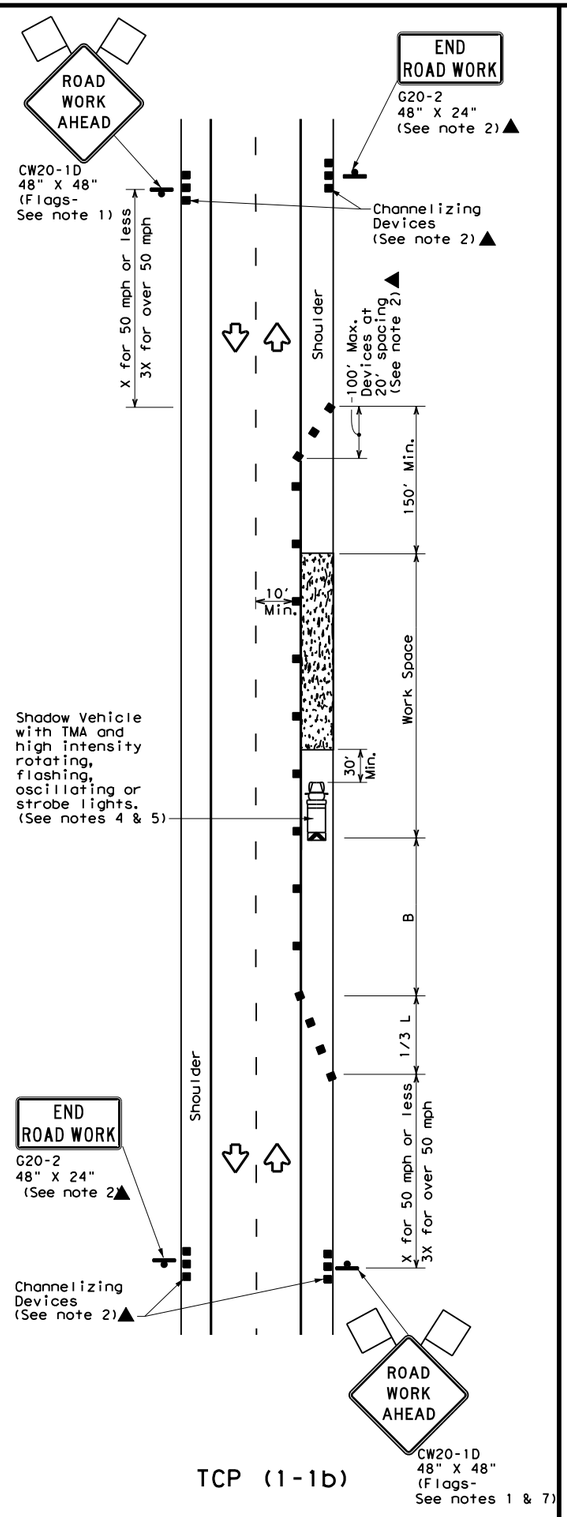


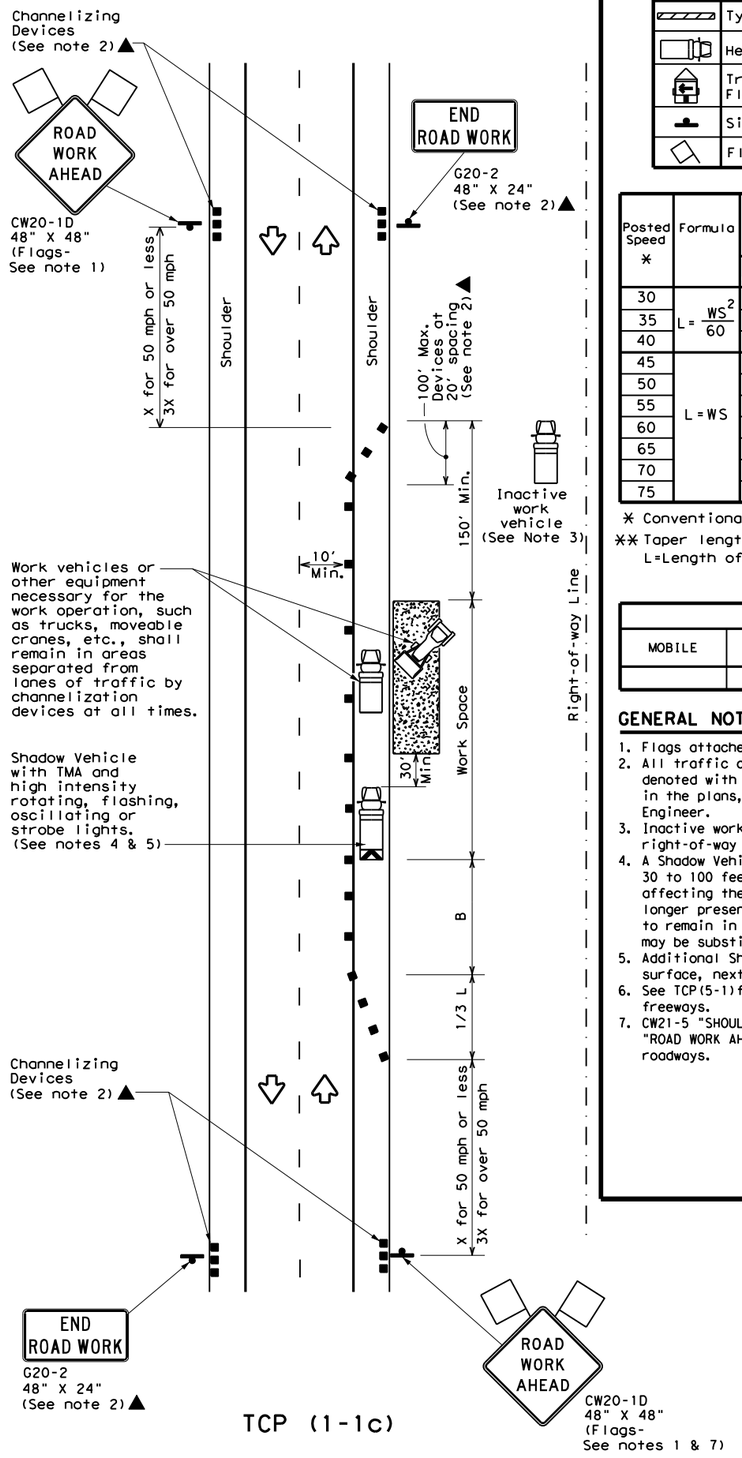
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98	0073	13	012	UA 281
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	SAT	ATASCOSA		81

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DATE: 11/27/2023 2:34:50 PM
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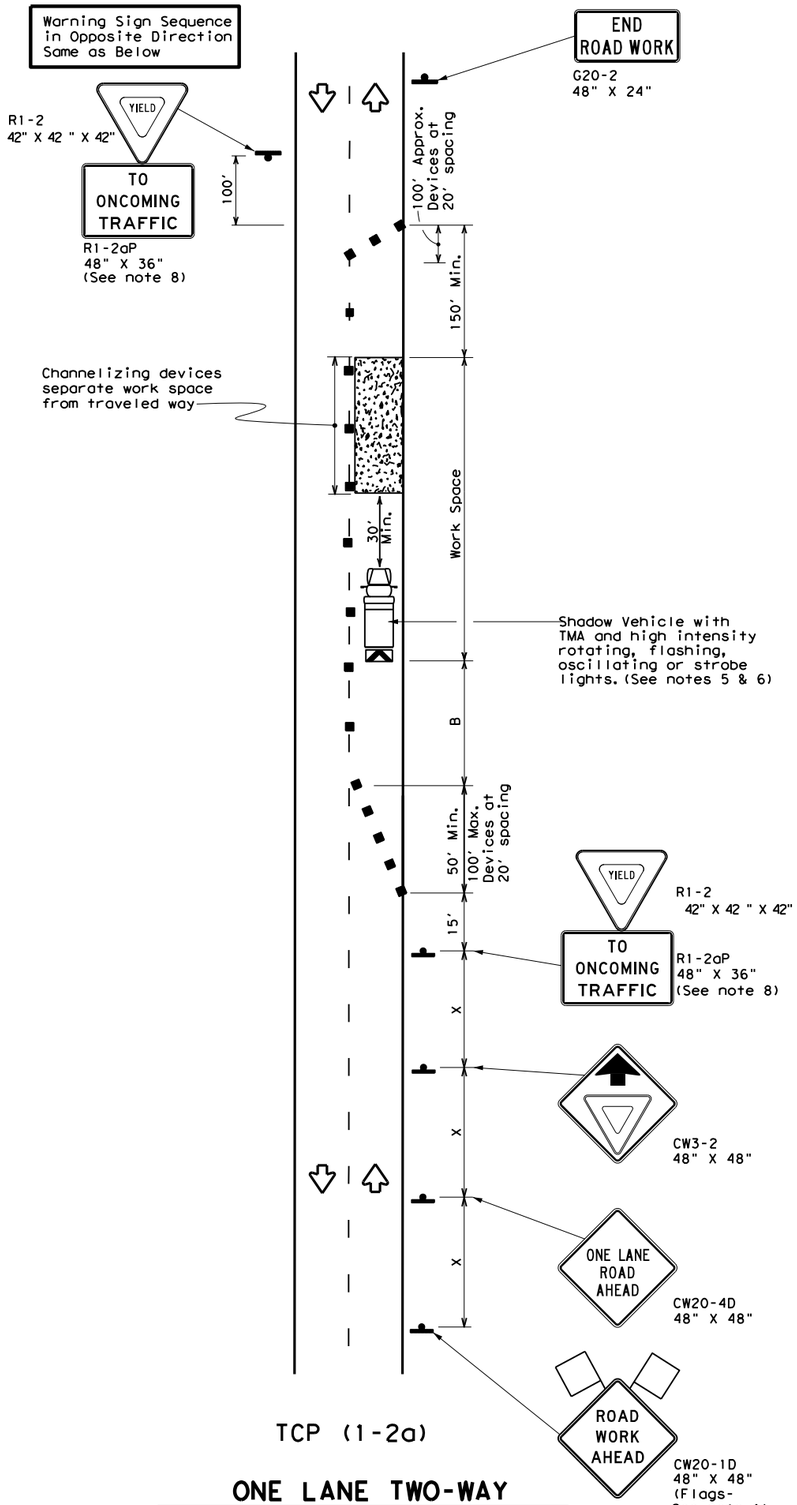
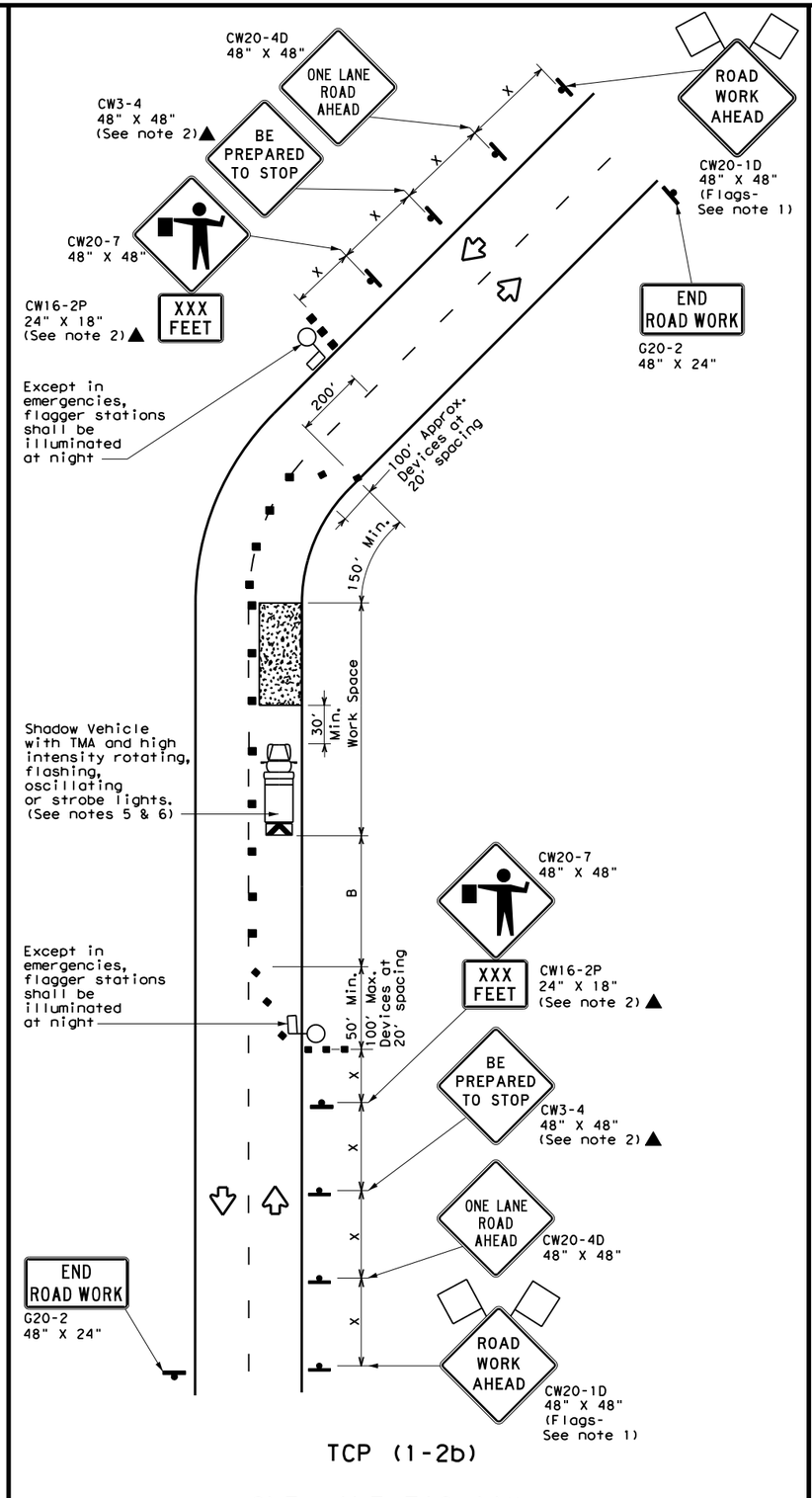


TCP (1-2a)

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	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	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 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 R1-2aP "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

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		82

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DATE: 11/27/2023 2:34:59 PM
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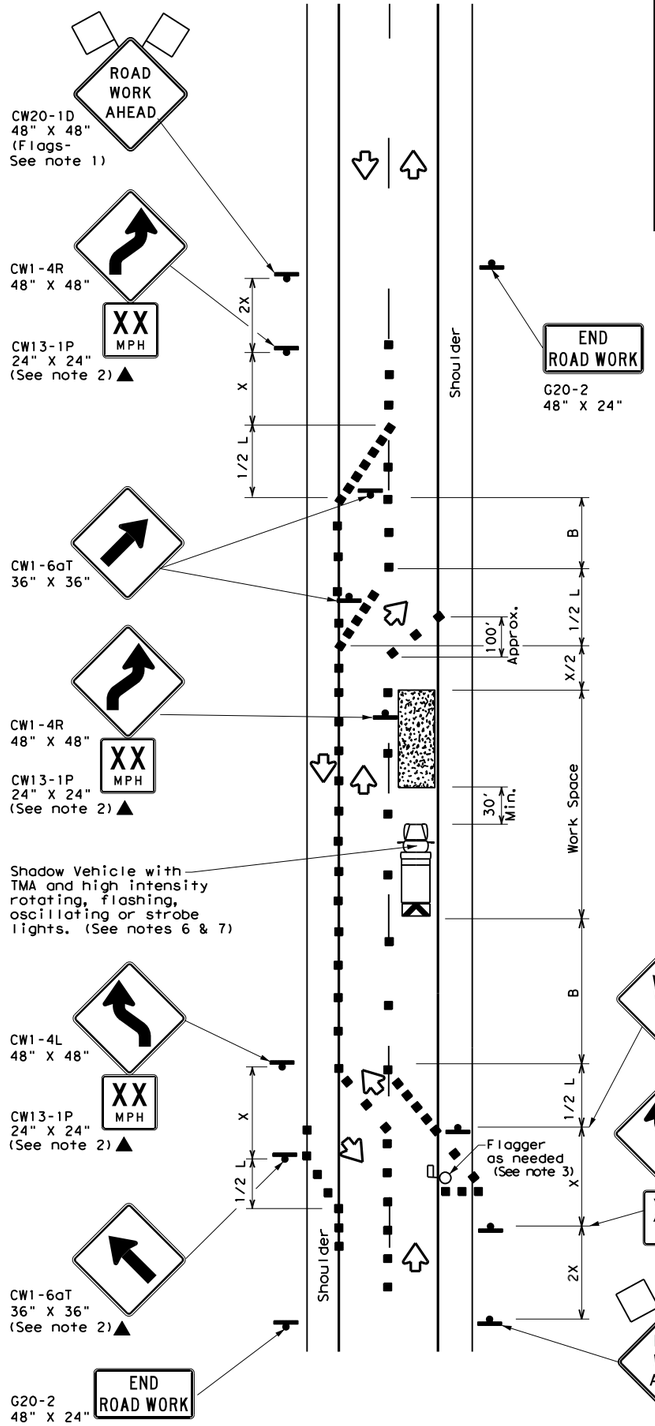
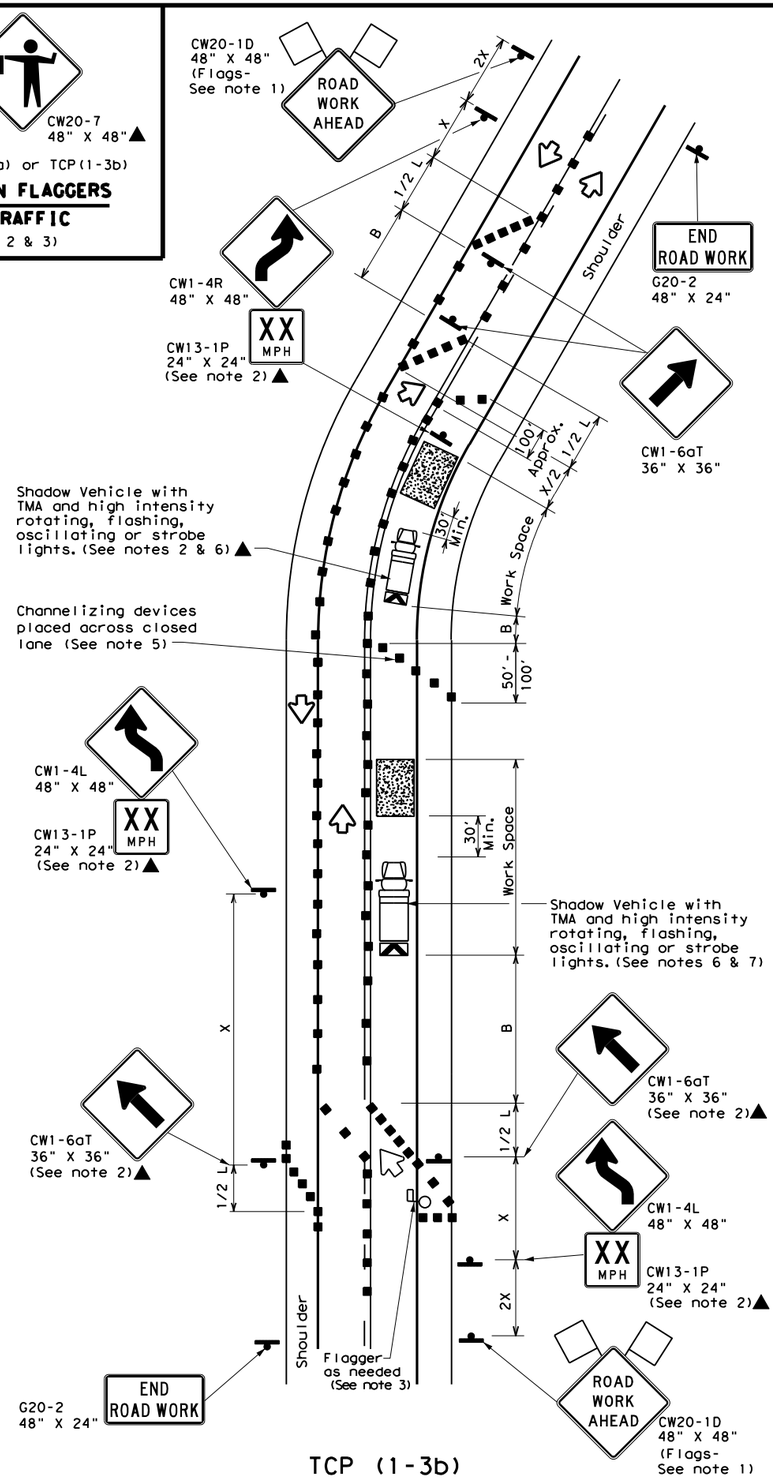


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

BE PREPARED TO STOP
CW3-4 48" X 48"
CW20-7 48" X 48"
For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC
(See Notes 2 & 3)



TCP (1-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
8. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SAT	ATASCOSA		83
1-97 2-18				

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DATE: 11/27/2023 2:35:08 PM
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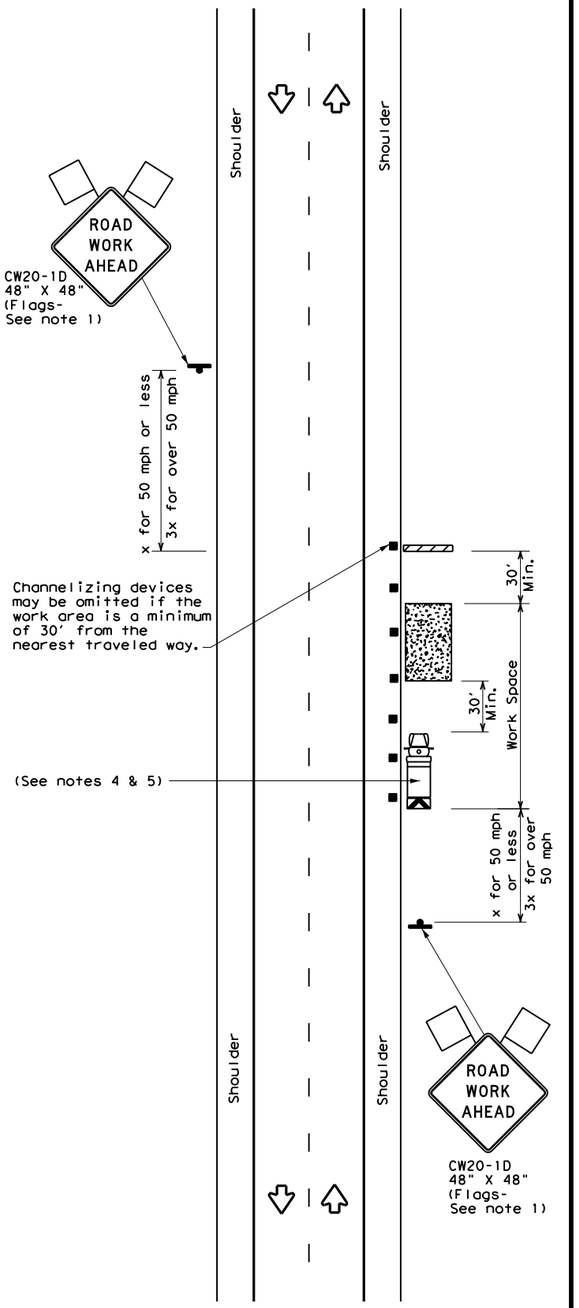
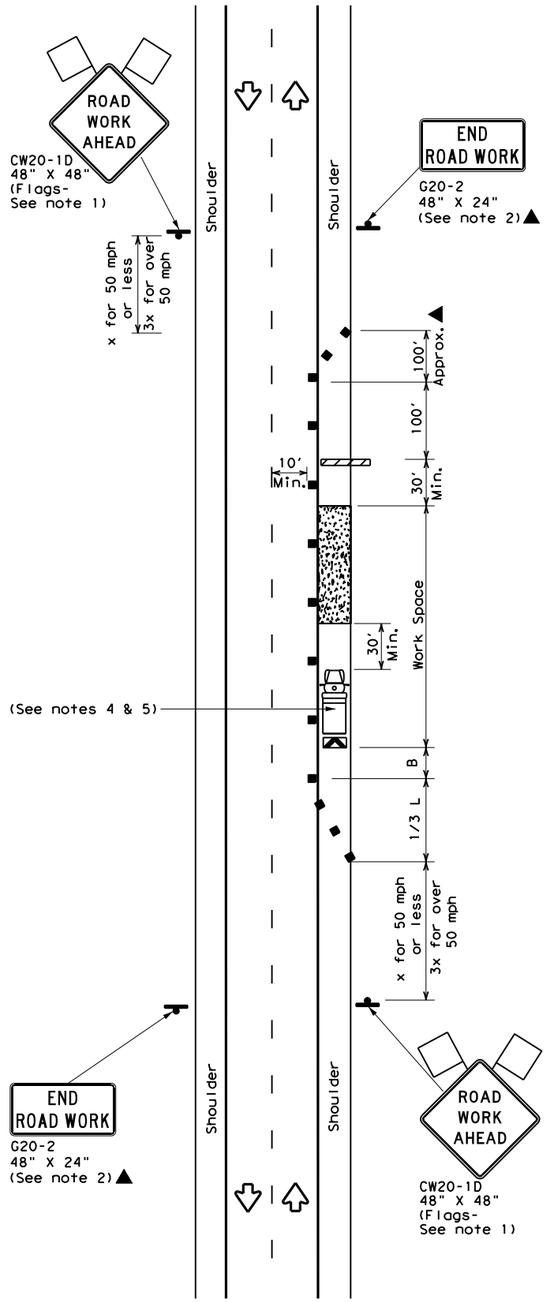


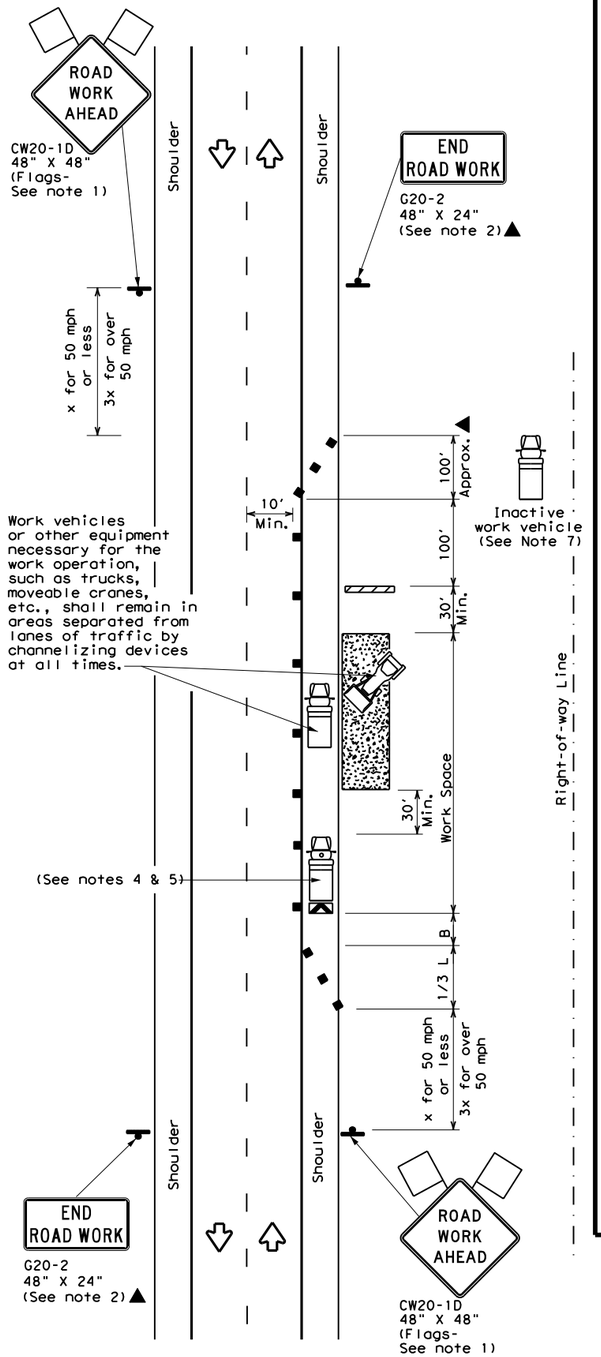
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SAT	ATASCOSA		84
1-97 2-18				

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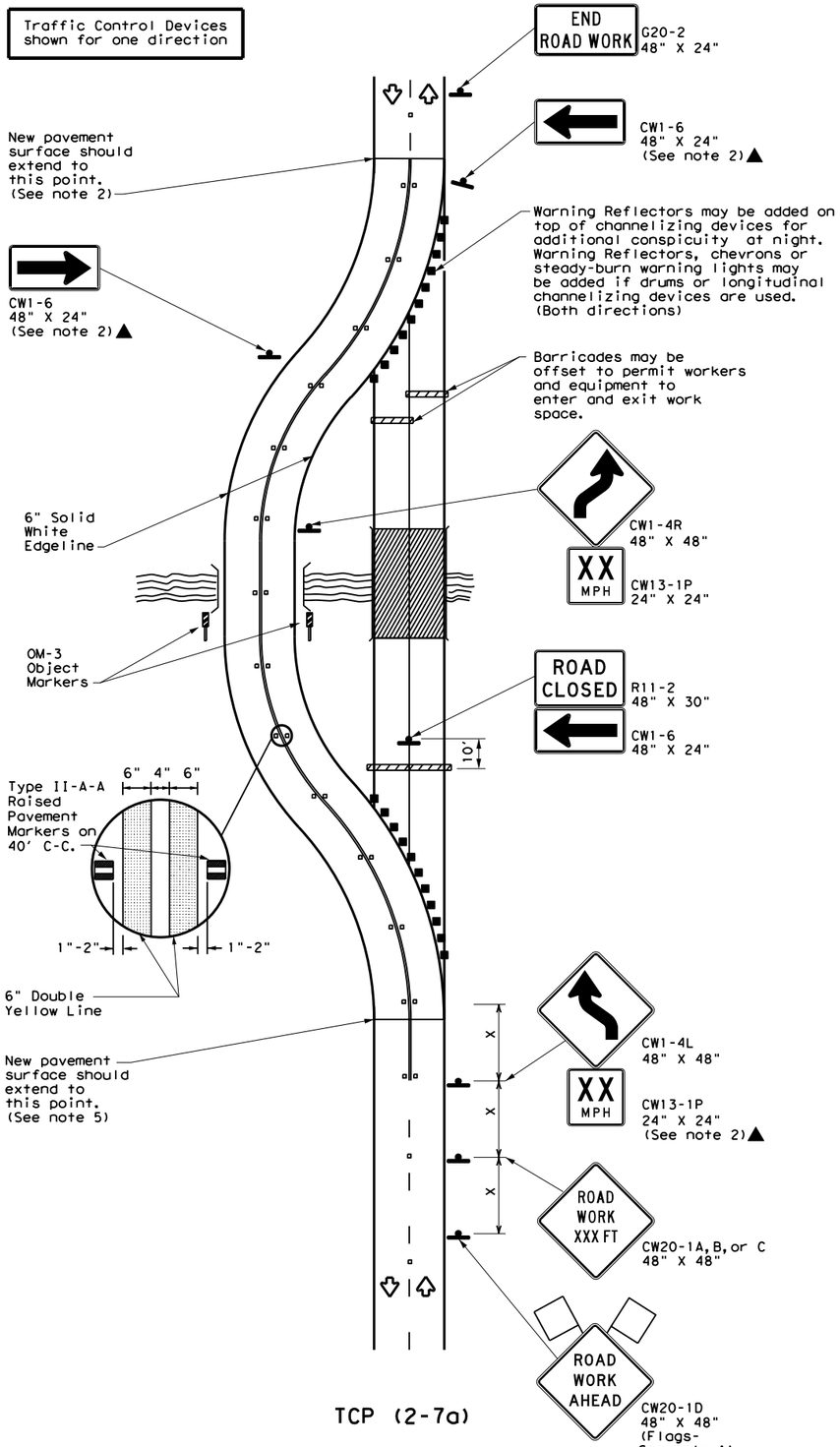
DATE: 11/27/2023 2:35:18 PM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/07590904 2704 attes\tcp2-7-23.dgn

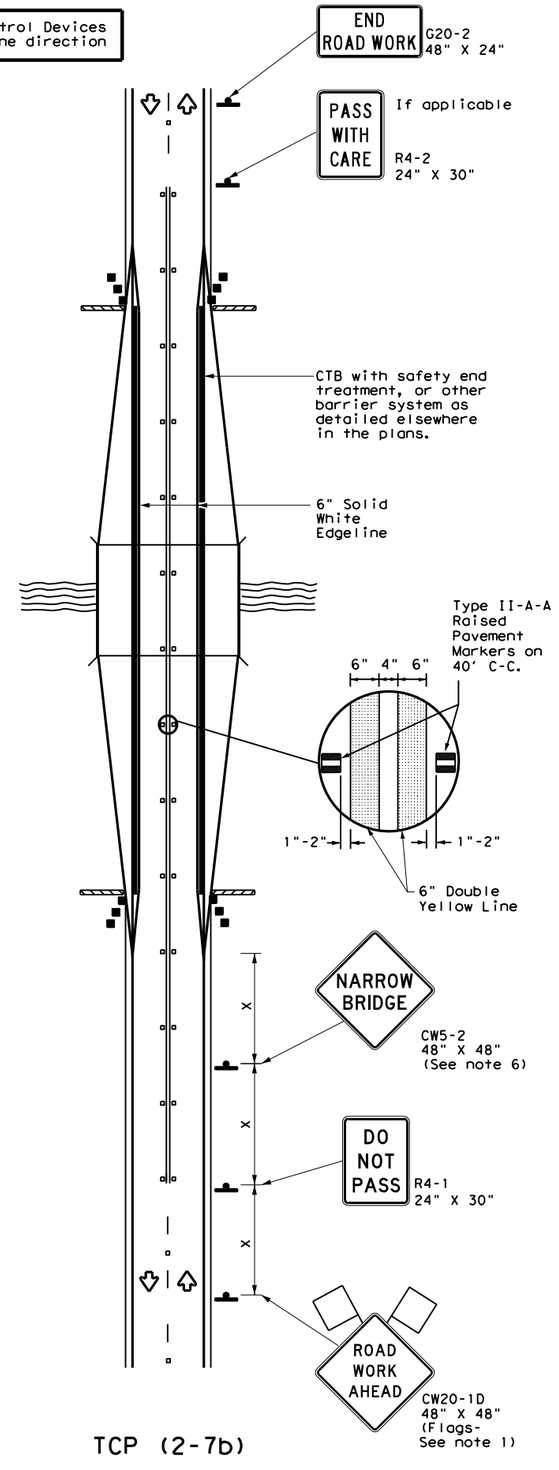
Traffic Control Devices shown for one direction



TCP (2-7a)

ROADWAY DIVERSION

Traffic Control Devices shown for one direction



TCP (2-7b)

BRIDGE WIDENING

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-7a)

3. Raised pavement markers shall be placed 40 feet c-c on centerline throughout project.
4. Roadway diversion design requirements should be based on posted speed limit or prevailing speed.
5. New pavement surface should be extended across existing roadway edge to a point where existing pavement markings left in place during project do not conflict with construction area pavement marking.

TCP (2-7b)

6. The CW5-2 "Narrow Bridge" sign may be omitted if lane and shoulder widths are maintained.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN DIVERSIONS AND NARROW BRIDGES

TCP(2-7)-23

FILE: tcp2-7-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18 8-95 3-03 4-23 1-97 2-12	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		85

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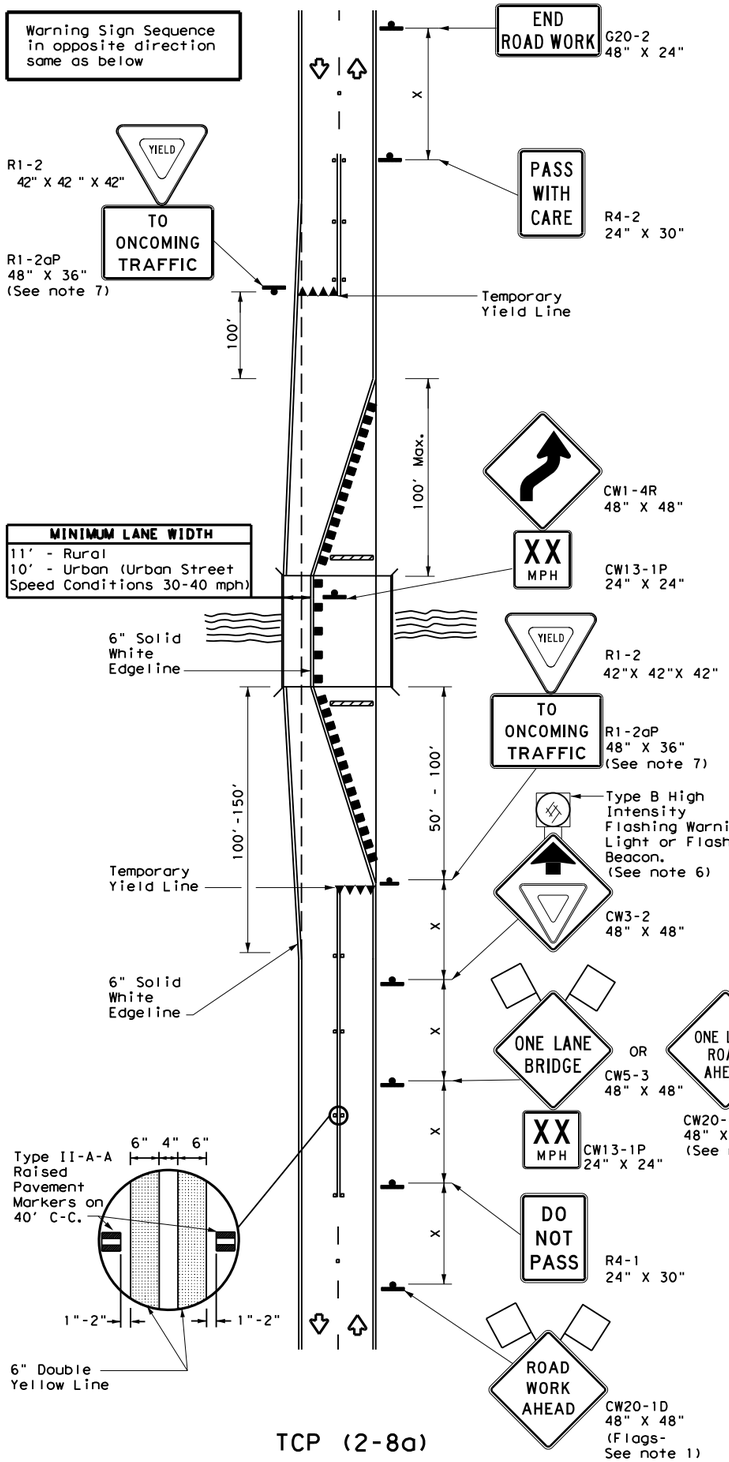
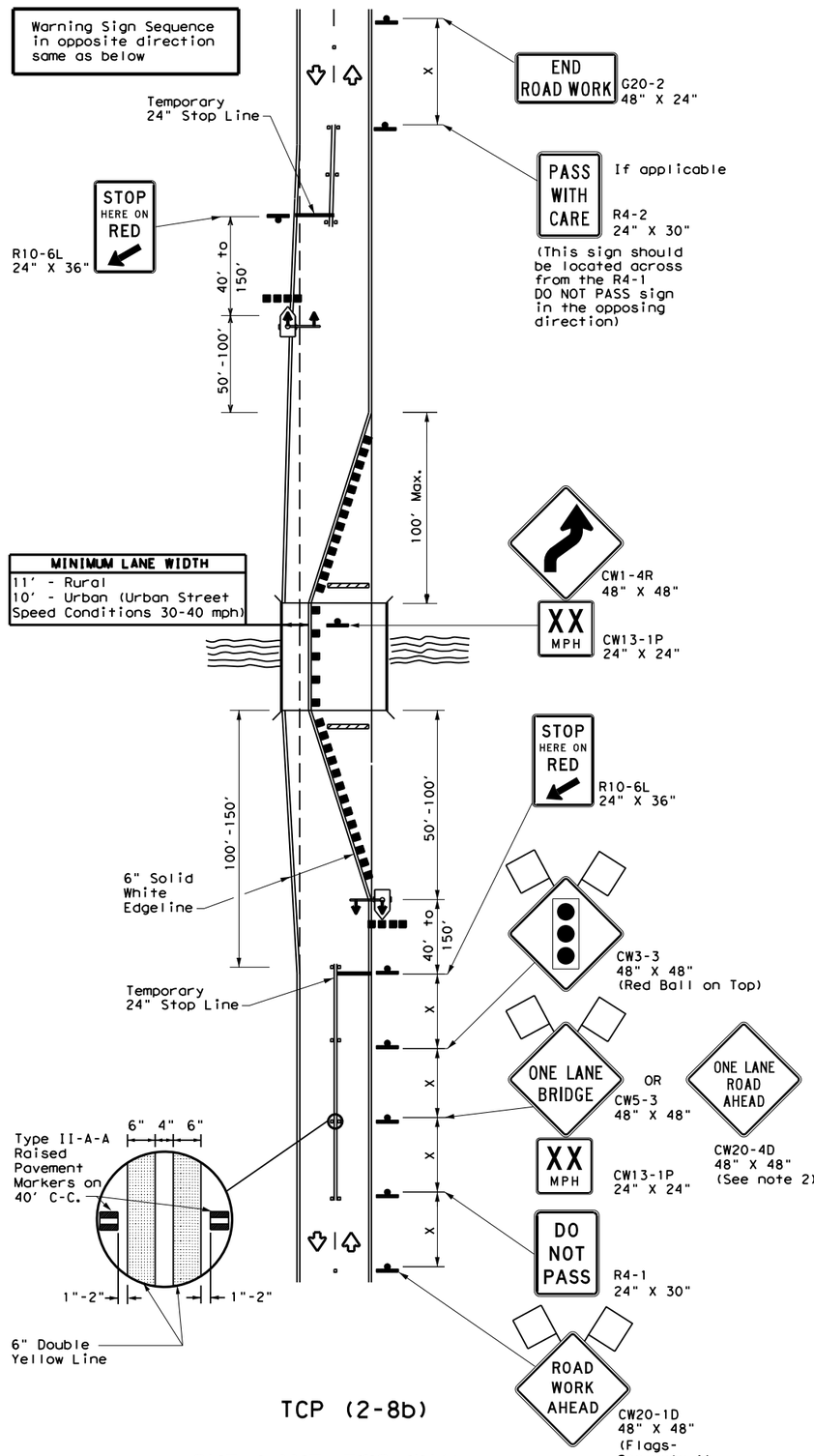


TCP (2-8a)

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
REVISIONS 12-85 4-98 2-18 8-95 3-03 4-23 1-97 2-12	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		86

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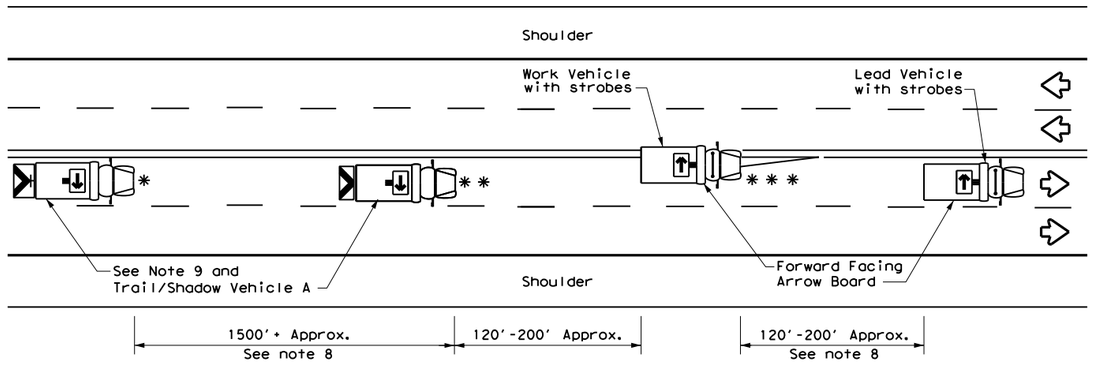
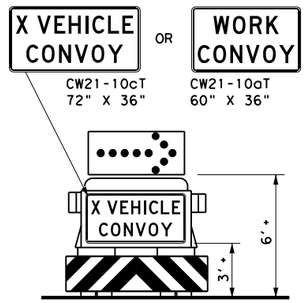


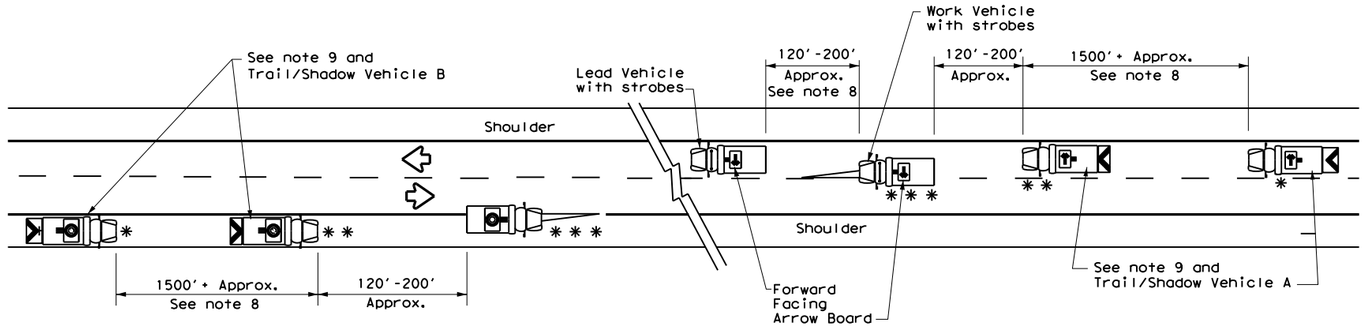
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

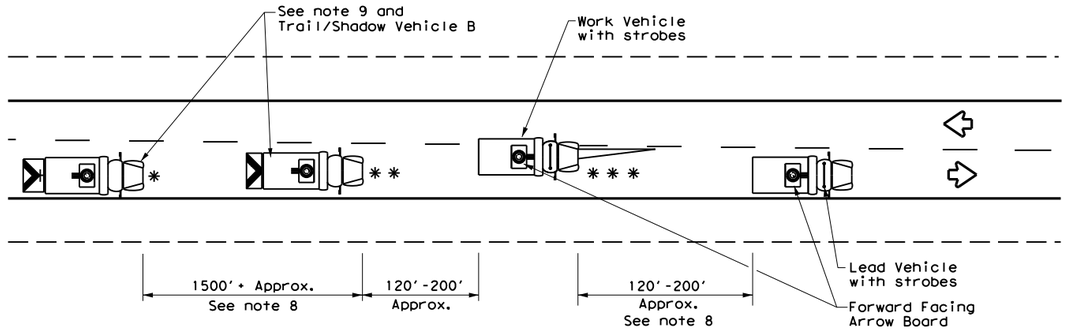


WORK ON SHOULDER

WORK ON TRAVEL LANE

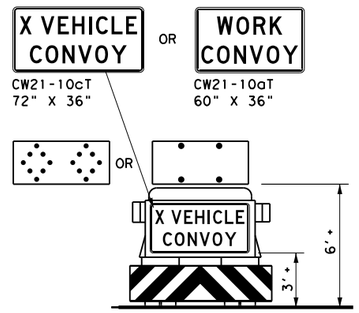
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

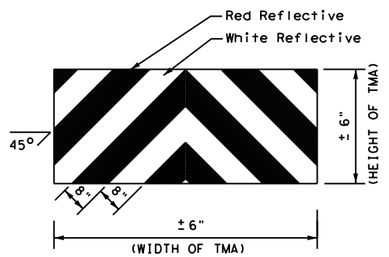
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		87

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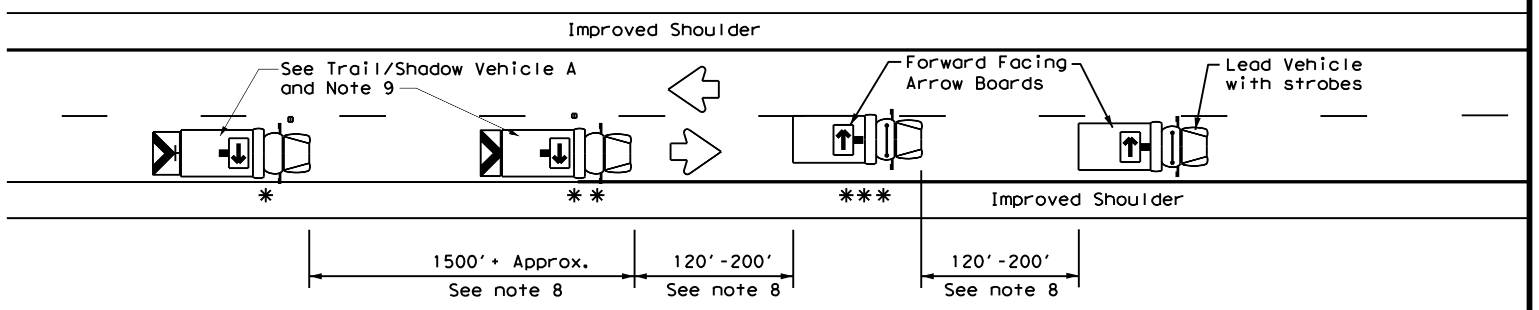
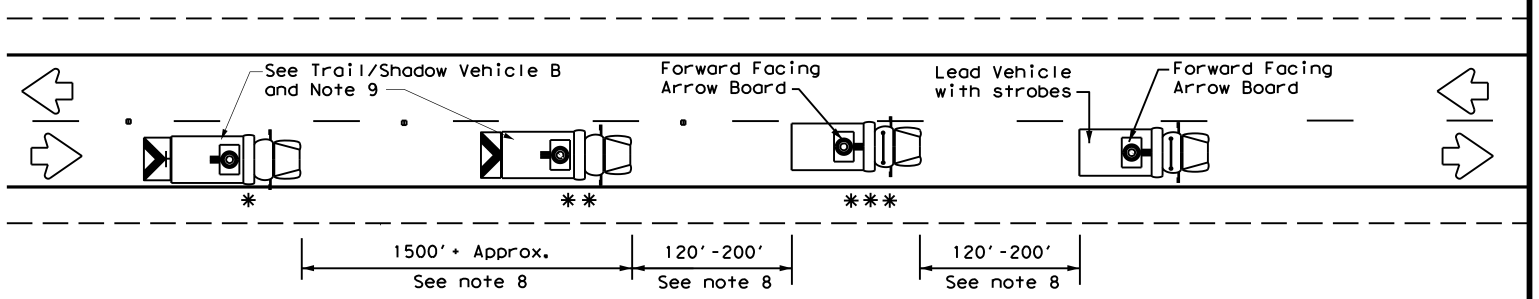


TCP (3-3a)
TWO LANE HIGHWAY WITH PAVED SHOULDERS
(WORK ON TRAVEL LANE)



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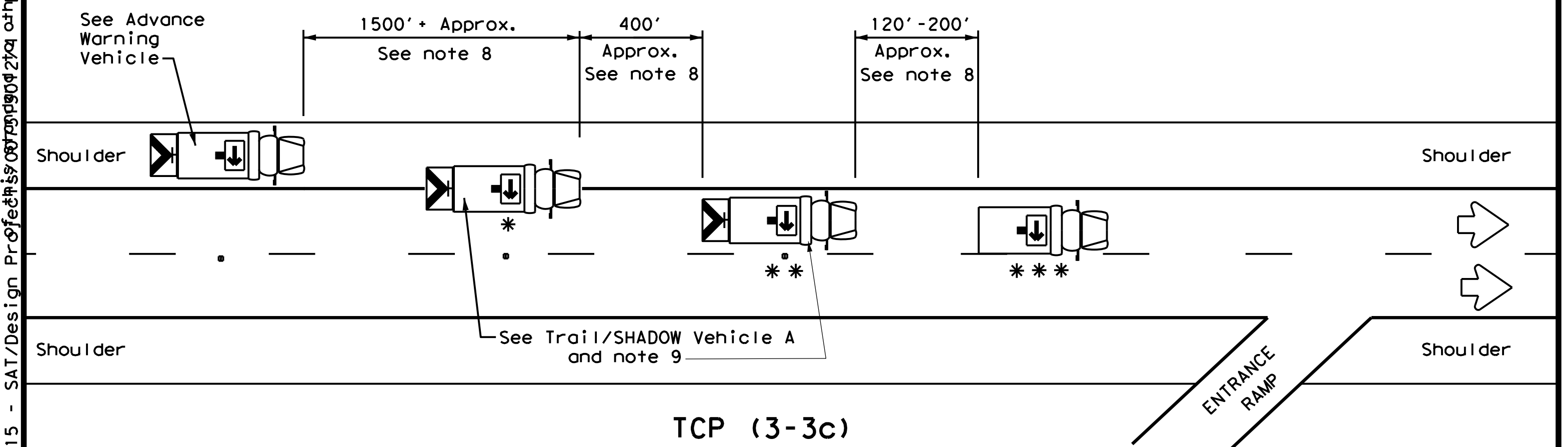
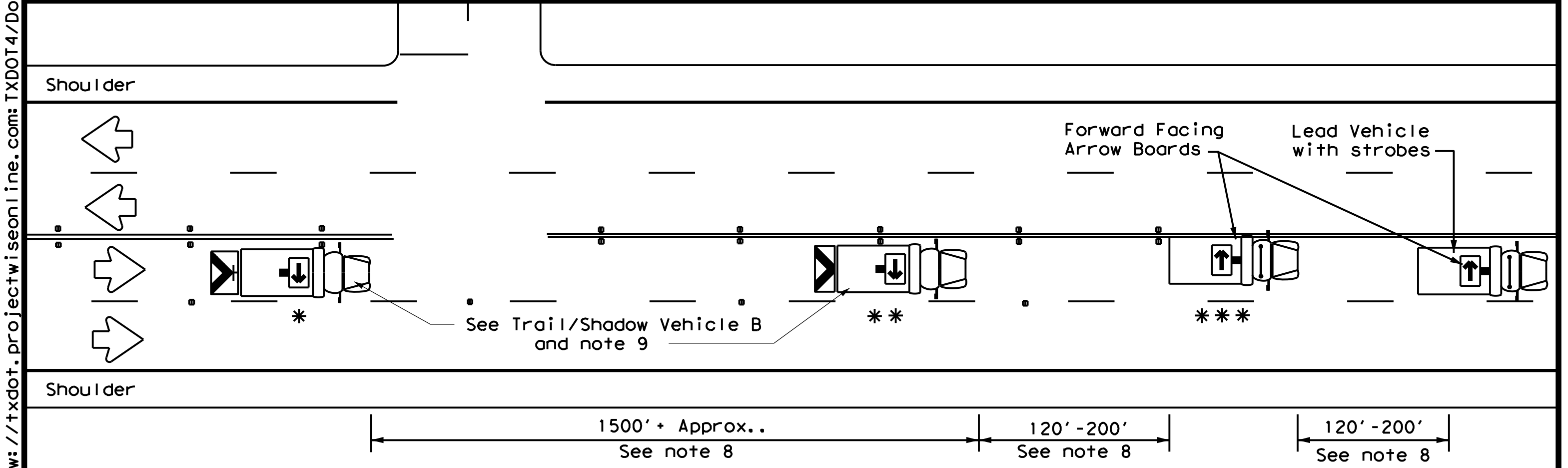
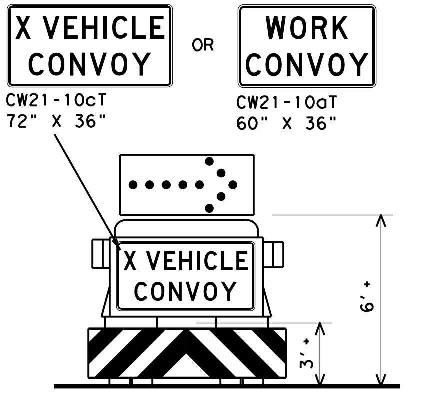
TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS
(WORK ON TRAVEL LANE)



TCP (3-3c)
DIVIDED MULTILANE HIGHWAY

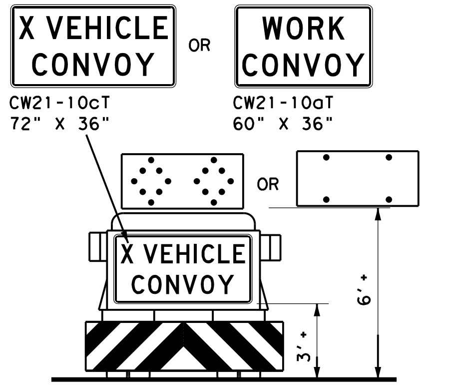


TCP (3-3d)
UNDIVIDED MULTILANE HIGHWAY



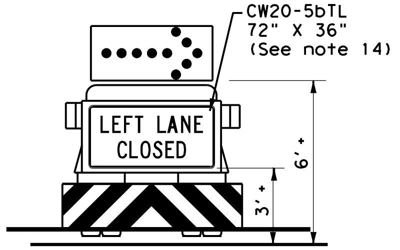
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

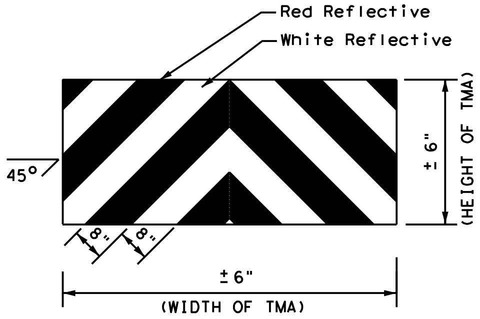


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND

		ARROW BOARD DISPLAY	
*	Trail Vehicle		
**	Shadow Vehicle		
***	Work Vehicle	➡	RIGHT Directional
▭	Heavy Work Vehicle	⬅	LEFT Directional
▲	Truck Mounted Attenuator (TMA)	⬌	Double Arrow
⇦	Traffic Flow	◉	CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

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

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	SAT	ATASCOSA			88	

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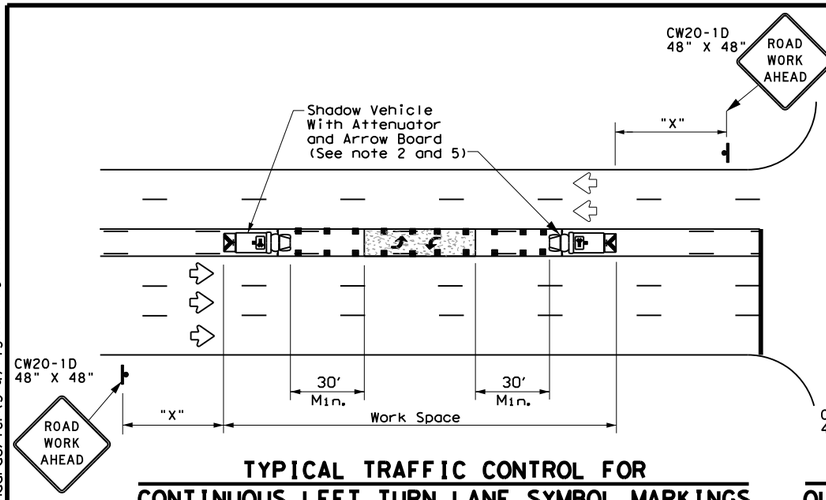
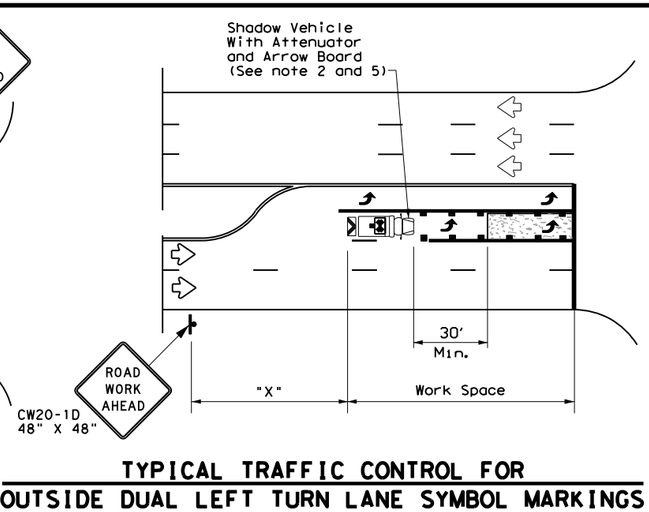
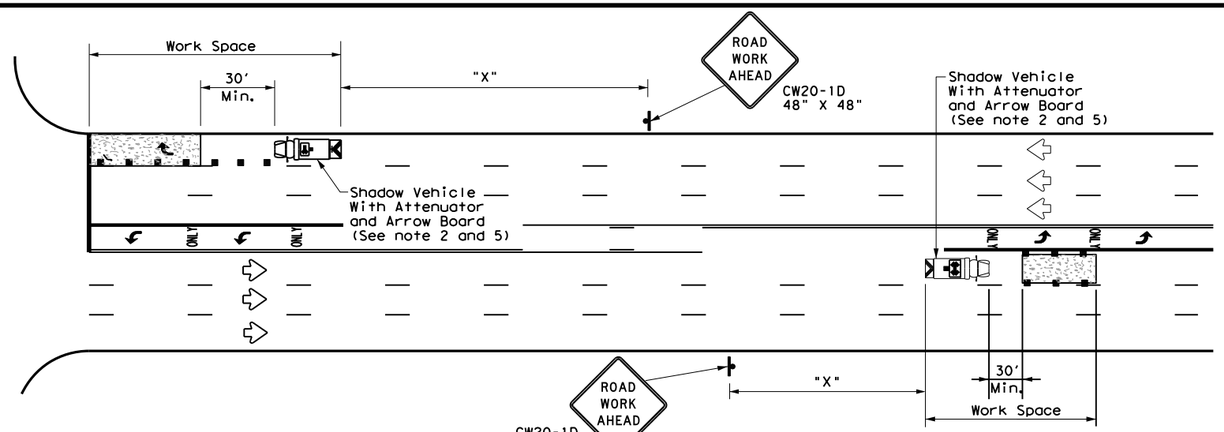


TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

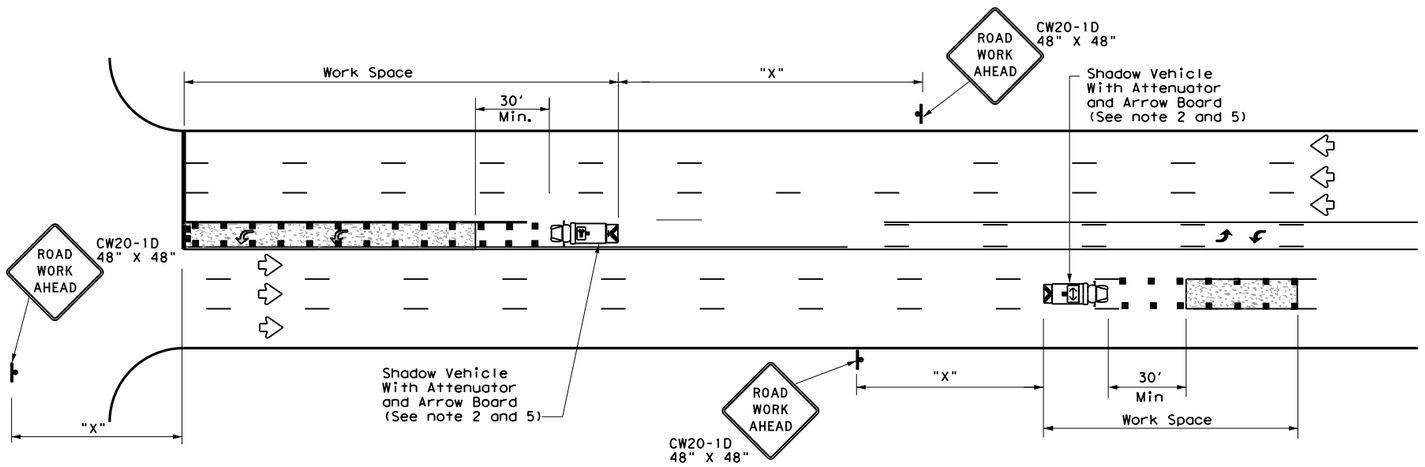


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR CENTER LANE MARKINGS

LEGEND

*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		Channelizing Devices

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

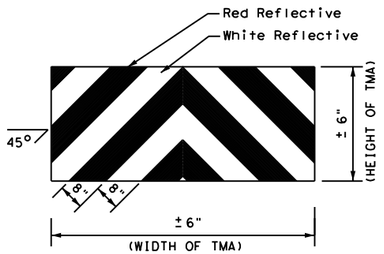
* Conventional Roads Only

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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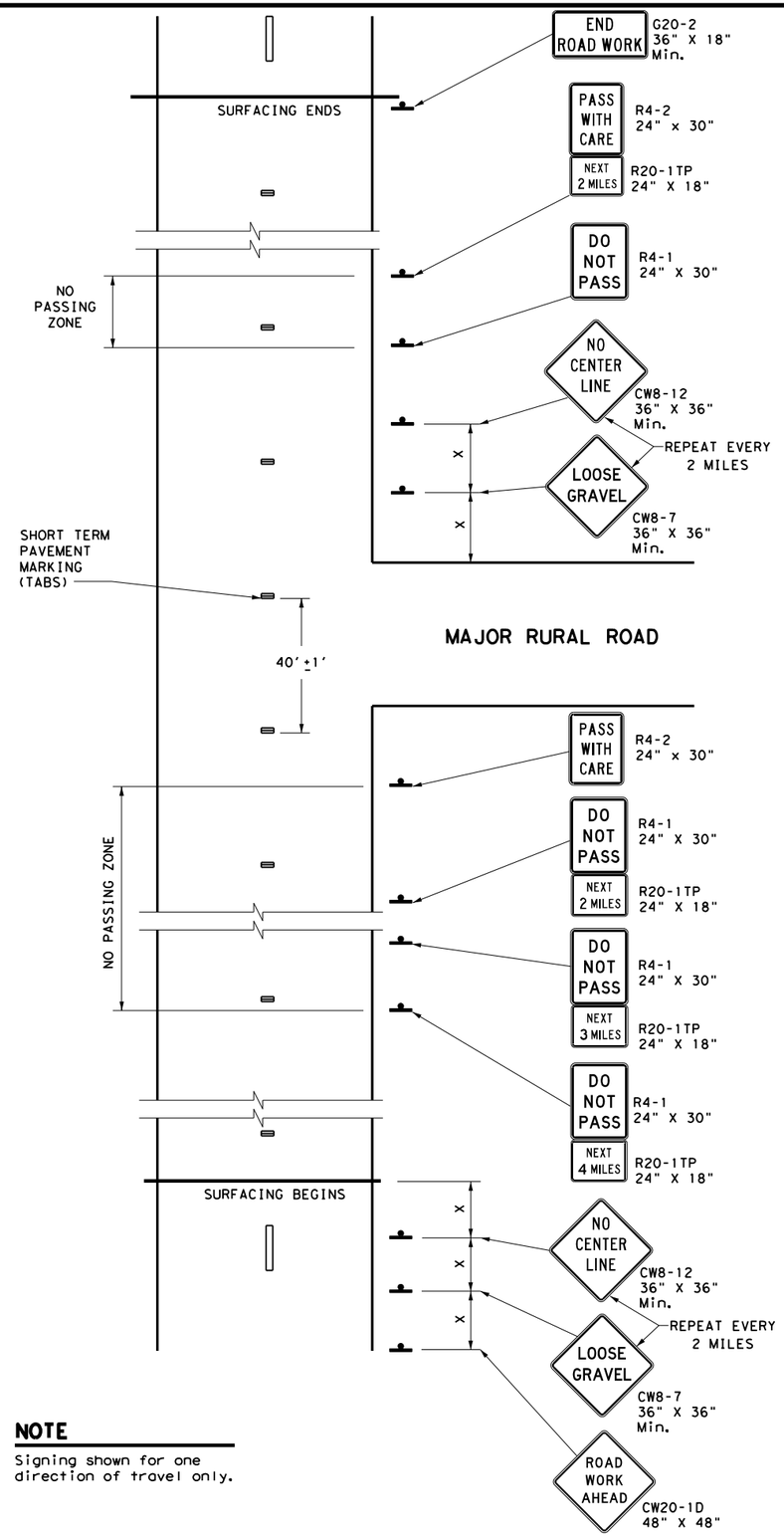
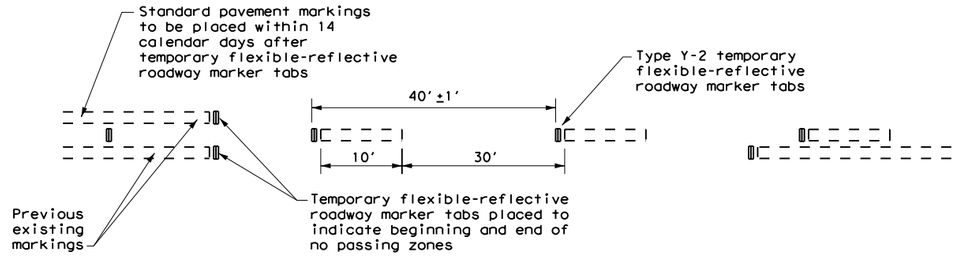


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.

B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.

C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.

D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.

B. At the time construction activity obliterates the existing center line markings(low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.

C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.

B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement
no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.

B. Tabs shall not be used to simulate edge lines.

C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.

B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T)sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE:	tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	March 1991	CONT	SECT	JOB	HIGHWAY
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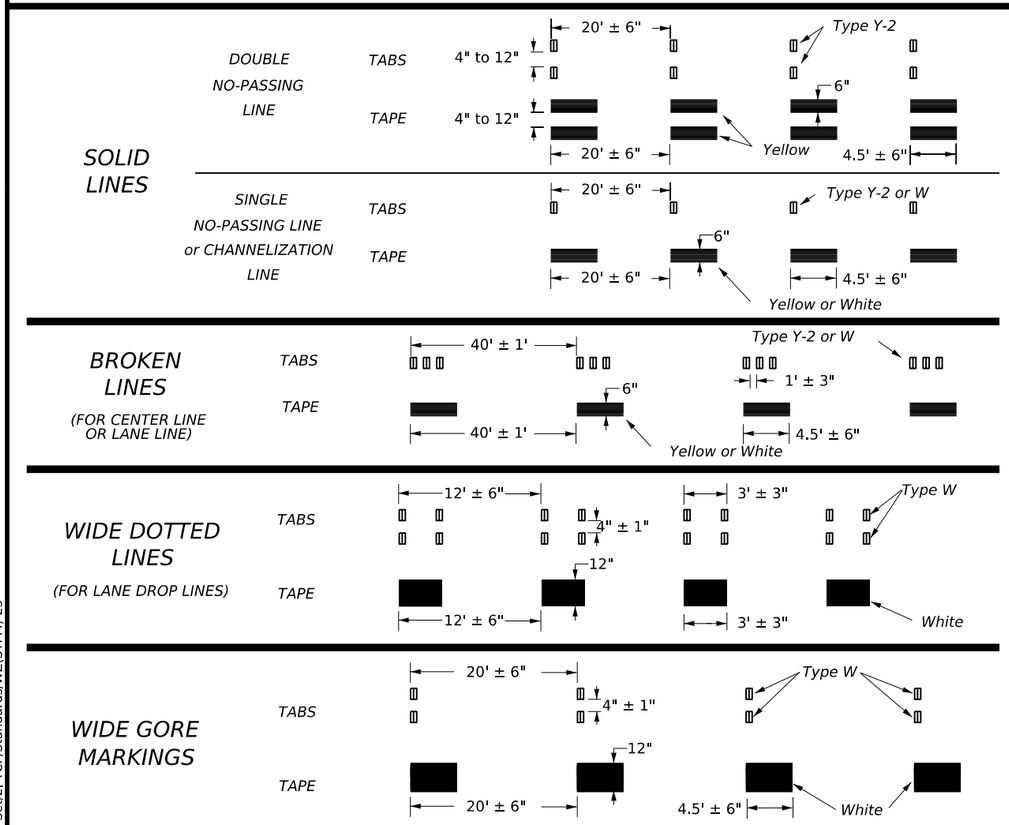
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



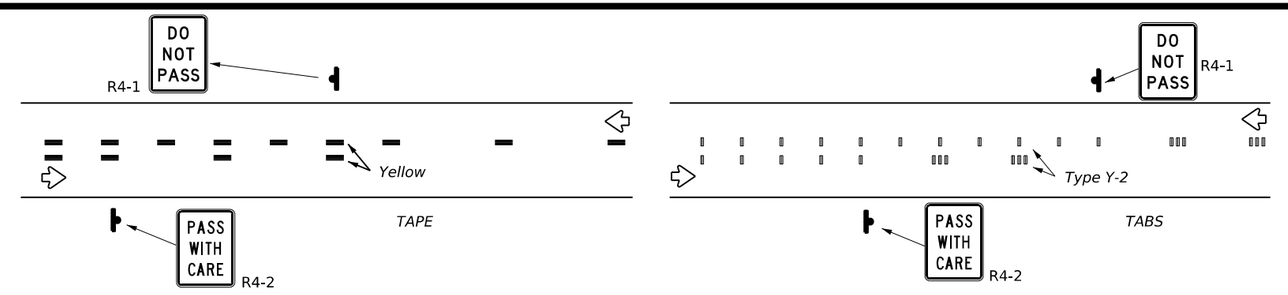
NOTES:

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

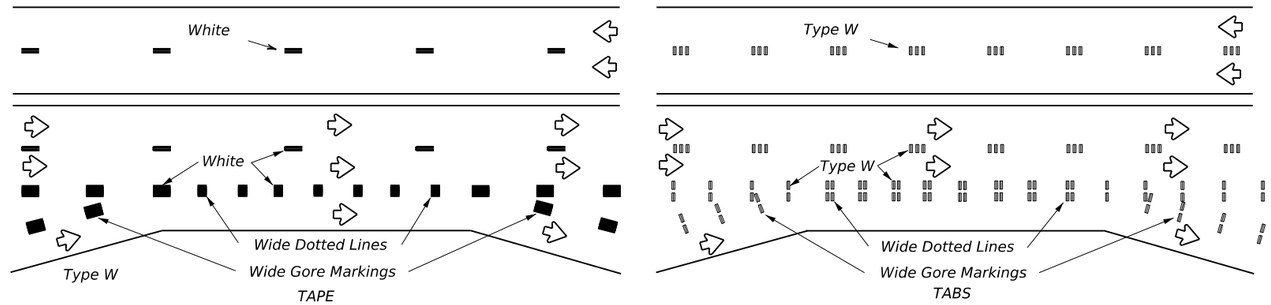
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. 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.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

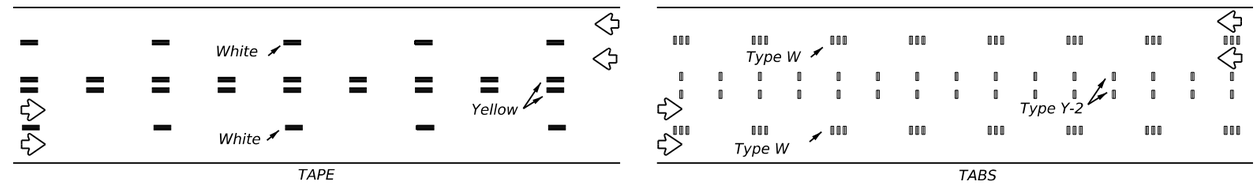
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



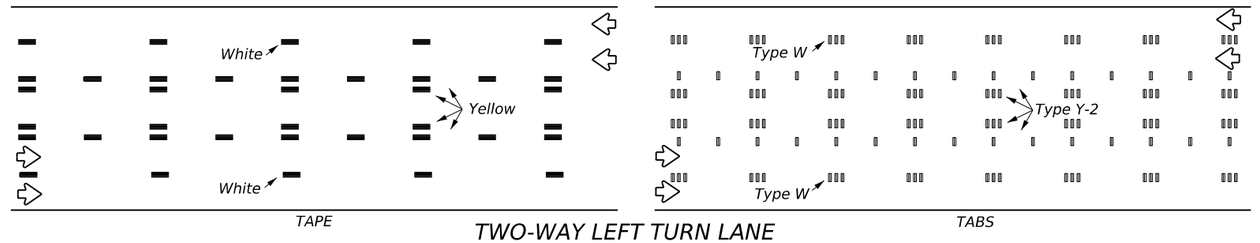
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



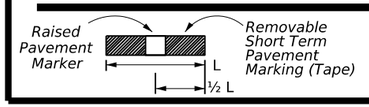
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
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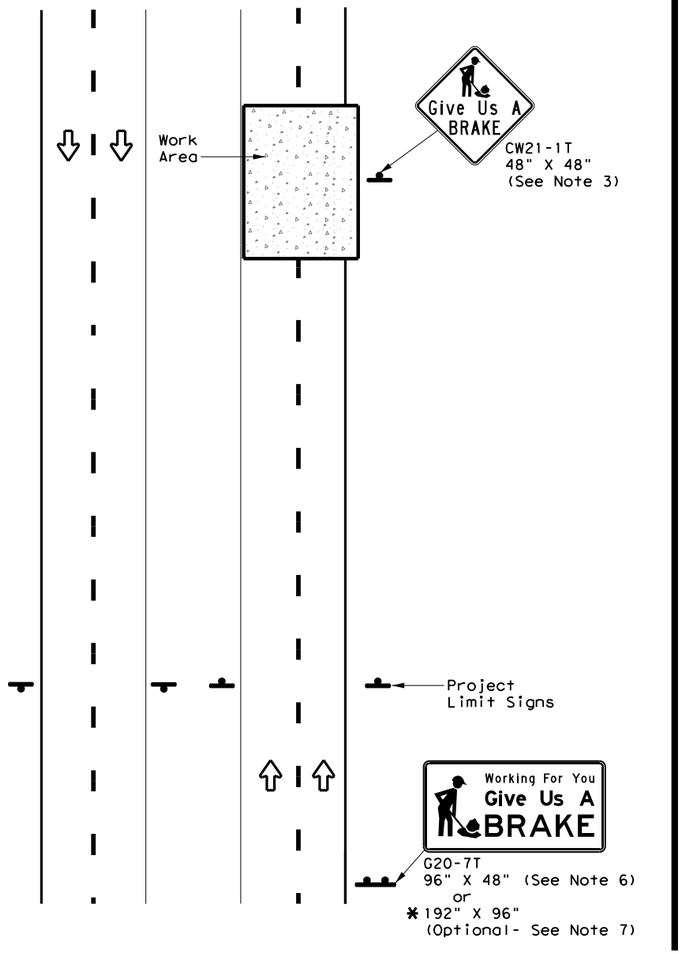
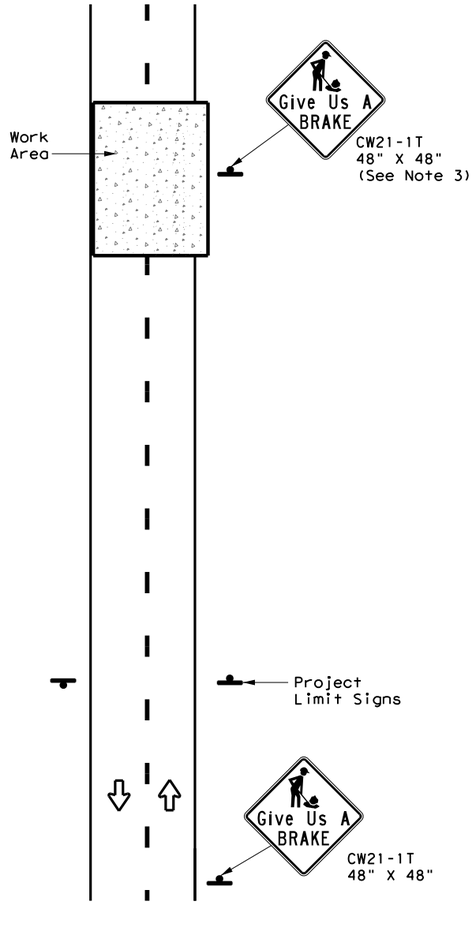


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL Size	GALVANIZED STRUCTURAL STEEL (LF) ①	GALVANIZED STRUCTURAL STEEL (LF) ②	DRILLED SHAFT 24" DIA. (LF)
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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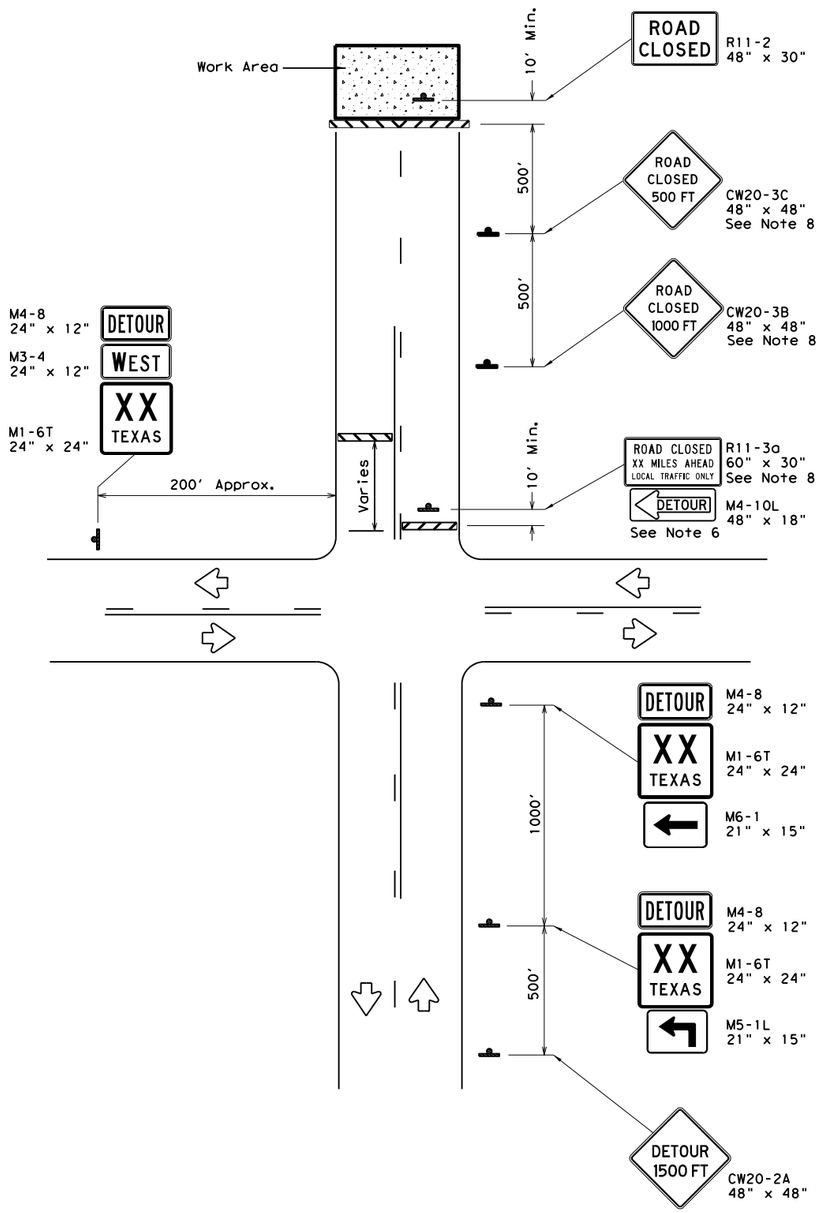
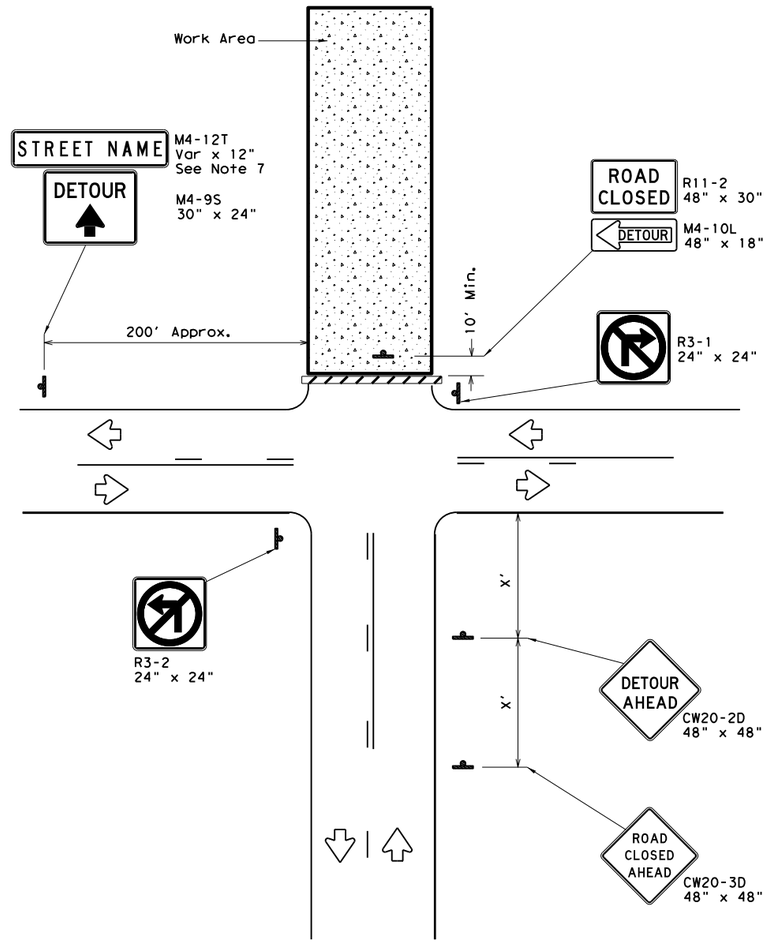


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

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

* Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

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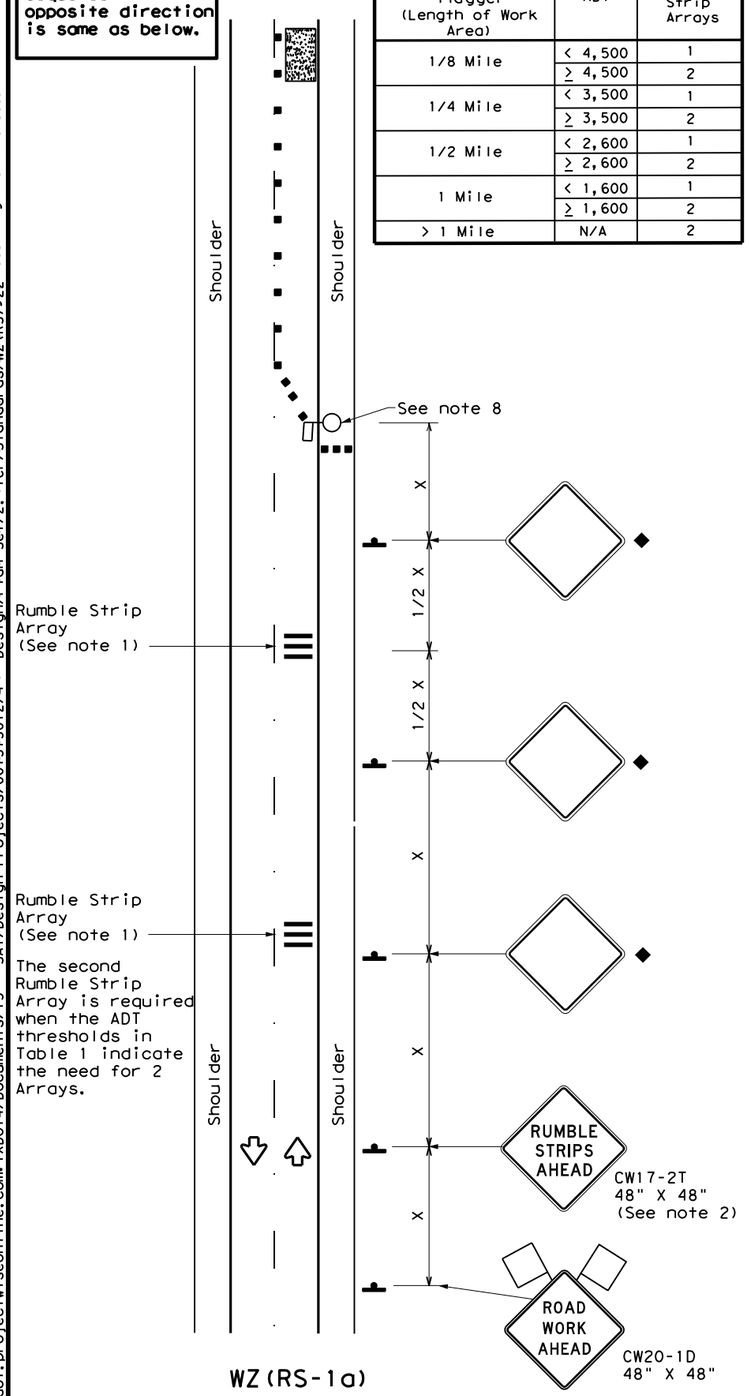
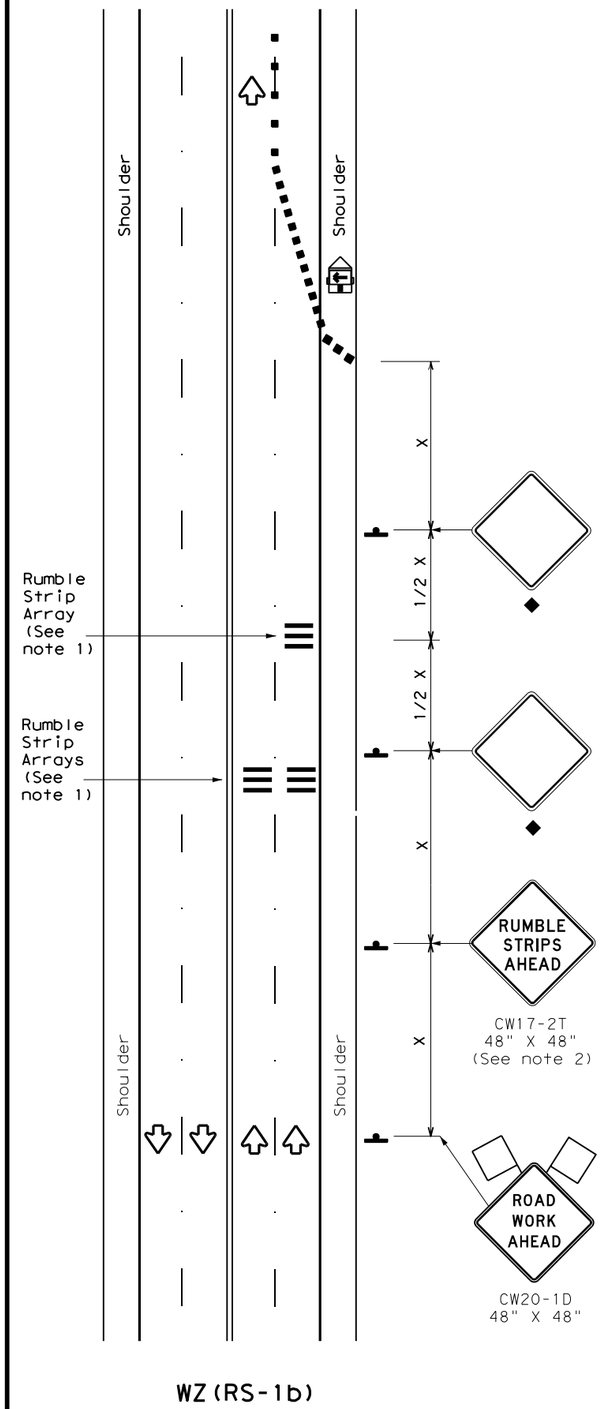
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

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

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

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

TABLE 2	
Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

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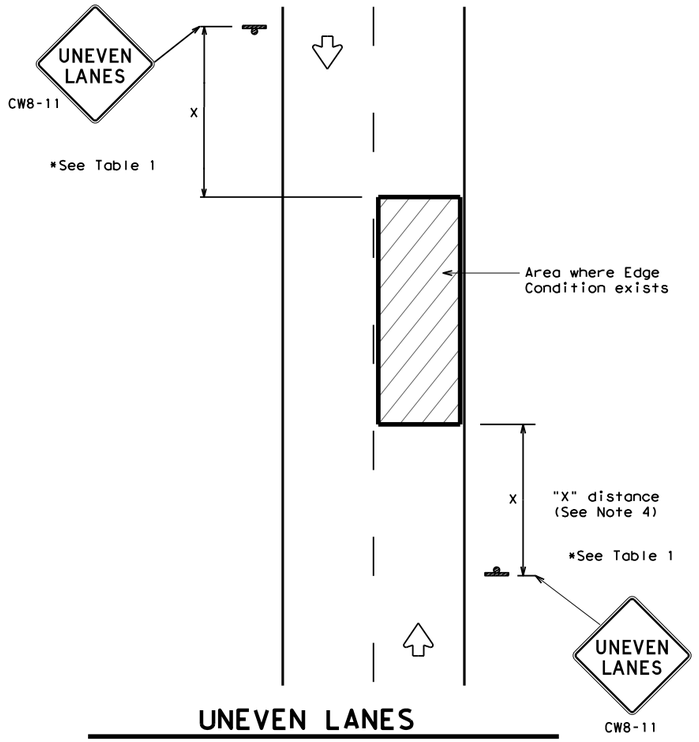
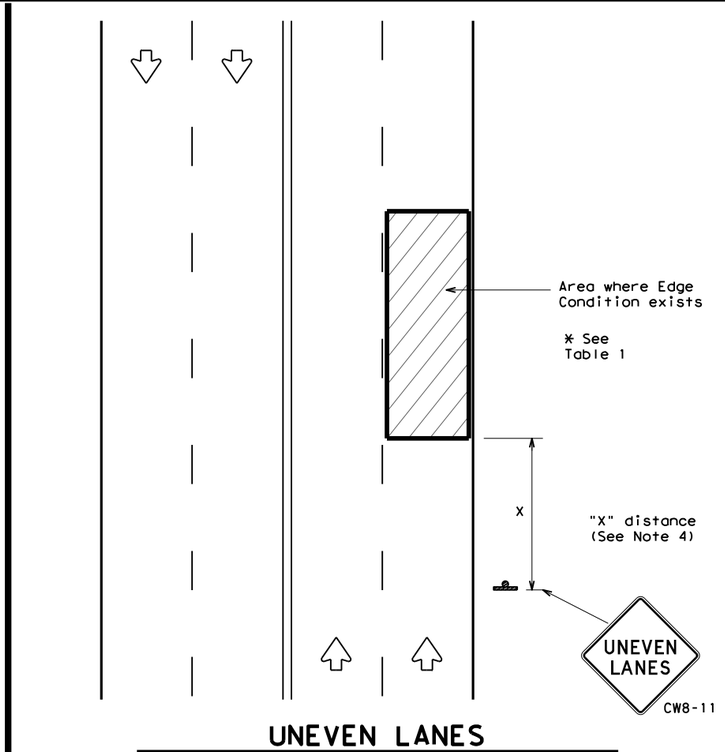
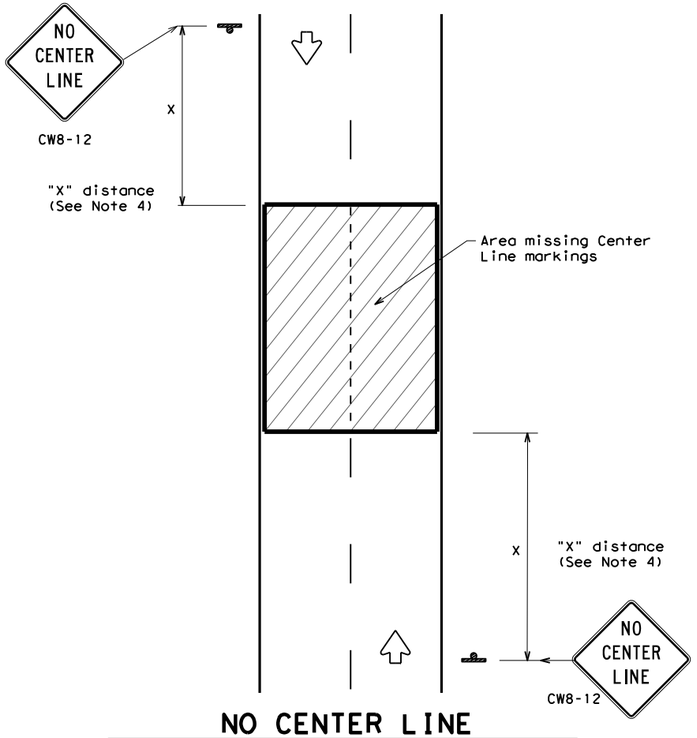


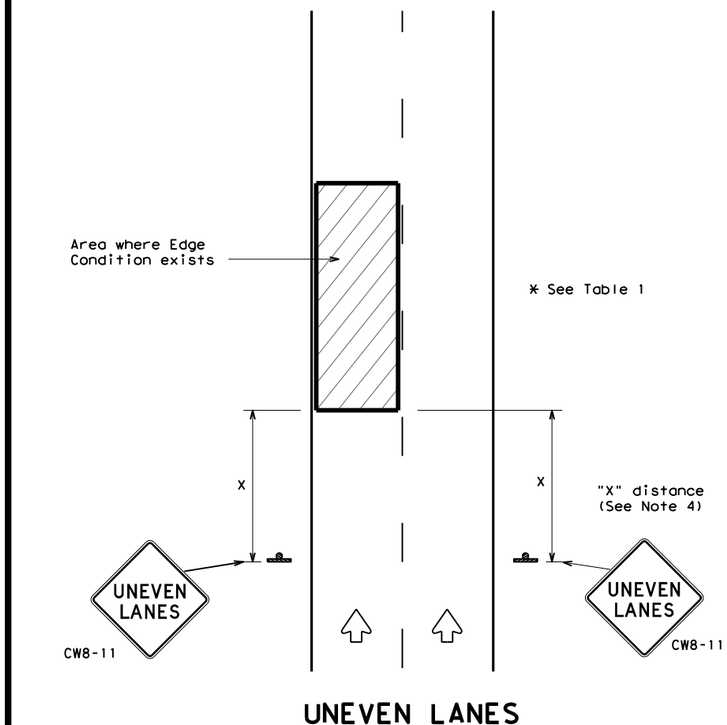
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

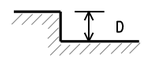
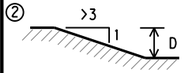
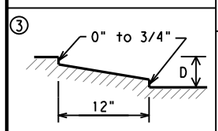
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

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

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

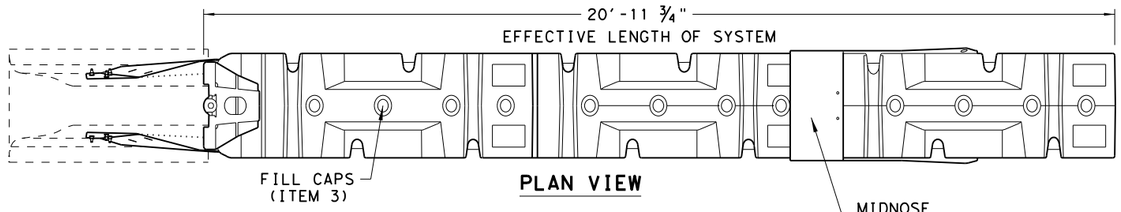
WZ(UL)-13

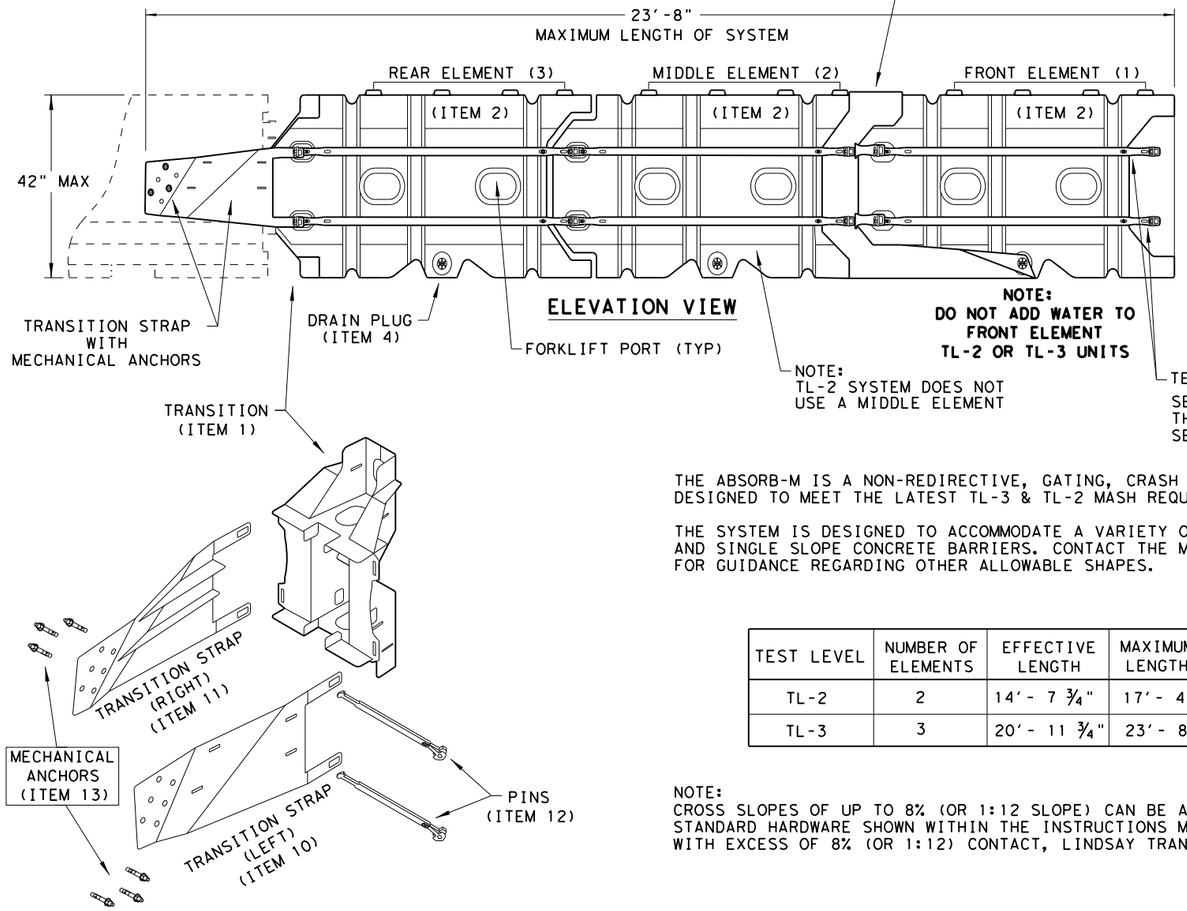
FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	SAT	ATASCOSA		95

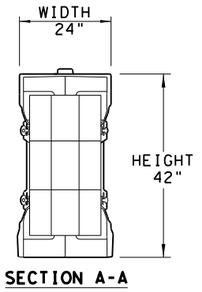
DISCLAIMER:
THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE: 11/27/2023
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/00731301 2/4 - Design/Plan Set/2. TCP/Standards/ABSORB(M)-19

SYSTEM SHOWN - ABSORB-M TL-3







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

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

TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14'- 7 3/4"	17'- 4"
TL-3	3	20'- 11 3/4"	23'- 8"

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

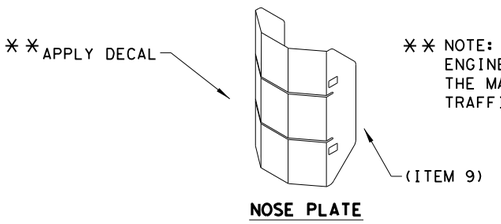
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
4. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
5. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
6. THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
7. THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
8. DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
* 2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
* 3	BSI-4004598	FILL CAPS	8	12
* 4	BSI-4004599	DRAIN PLUGS	2	3
* 5	BSI-1809053-00	TENSION STRAP-(GALV)	8	12
* 6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
* 7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE-(GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE



** NOTE: (PROVIDED BY OTHERS)
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

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

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Texas Department of Transportation — Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB(M)-19

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		96

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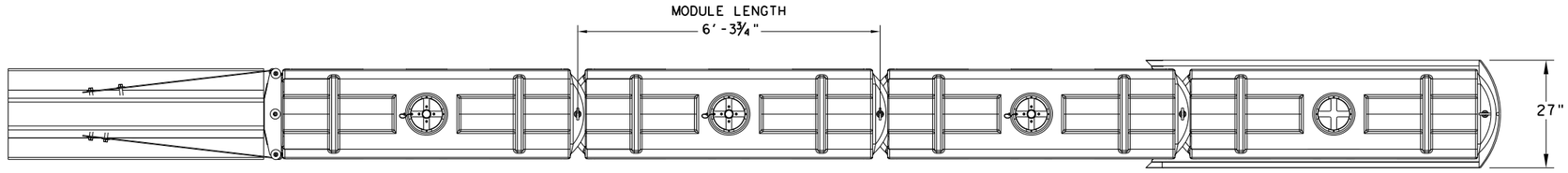
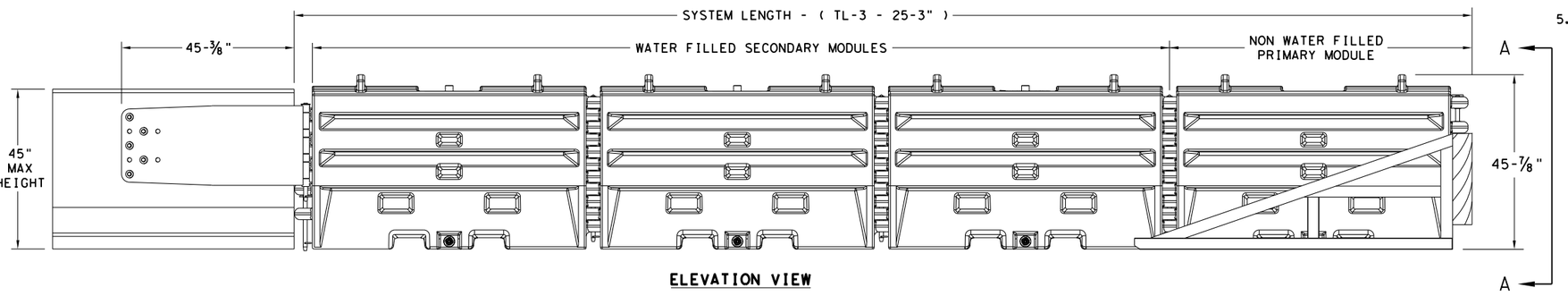
DATE: 11/27/2023
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073013012/4 - Design/Plan Set/2. TCP/Standards/SLED-19.dgn



PLAN VIEW



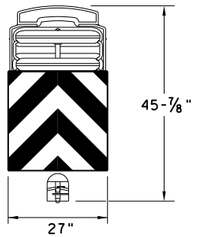
ELEVATION VIEW

GENERAL NOTES

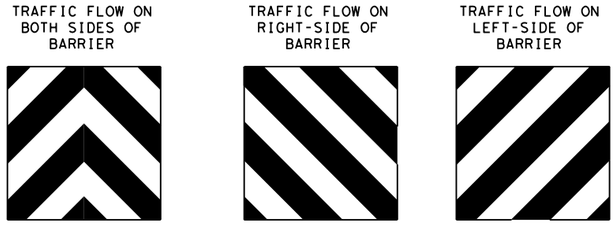
1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES) (14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:

- CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
- STEEL BARRIER
- PLASTIC BARRIER
- CONCRETE BRIDGE ABUTMENTS
- W-BEAM GUARD RAIL
- THRIE BEAM GUARD RAIL

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



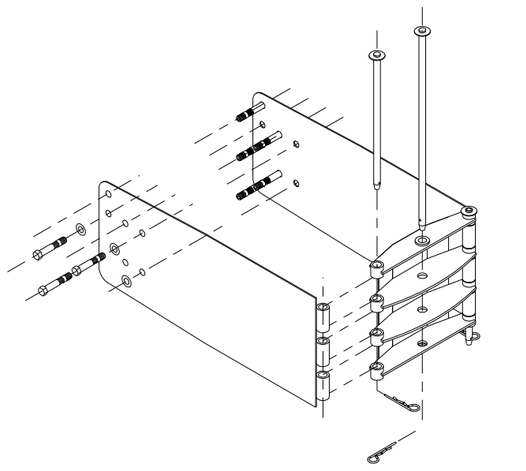
SECTION A-A



NOSE SHEETING PANEL DELINEATION

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

BILL OF MATERIAL		
PART NUMBER	DESCRIPTION	QTY: TL-3
45131	TRANSITION FRAME, GALVANIZED	1
45150	TRANSITION PANEL, GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

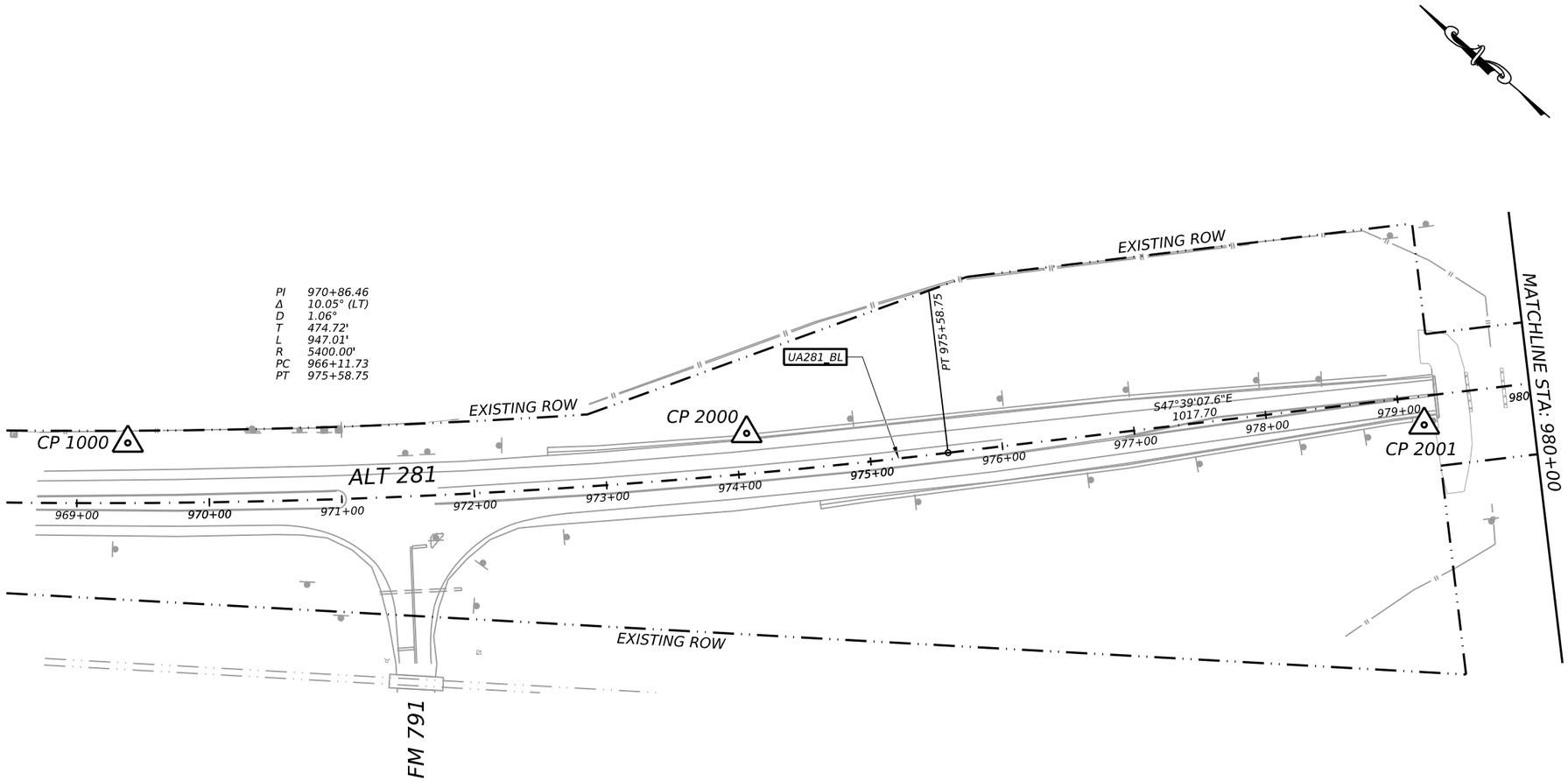
SACRIFICIAL

Texas Department of Transportation

Design Division Standard

SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		97



FROM	TO	DIRECTION	DISTANCE
CP 1000	CP 2000	S 41°44'07" E	466.79'
CP 2000	CP 2001	S 41°33'38" E	511.07'

POINT	NORTH	EAST	ELEVATION	STATION	OFFSET	DESCRIPTION
CP 1000	13,459,759.67	2,190,428.02	240.55'	969+38.72	-45.42'	5/8" IRON ROD W/ALUMINUM CAP DRIVEN TO REFUSAL "DEEP ROD"
CP 2000	13,459,411.33	2,190,738.76	241.21'	974+08.73	-30.49'	5/8" IRON ROD W/ALUMINUM TXDOT CAP
CP 2001	13,459,028.92	2,191,077.81	240.39'	979+17.78	21.67'	5/8" IRON ROD W/ALUMINUM TXDOT CAP

NOTES:

1.ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE TXDOT VRS NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000130.

2.ALL HORIZONTAL VALUES WERE DERIVED AND VERIFIED BY GPS (RTK) OBSERVATION USING THE TXDOT RTN NETWORK.

3.PROJECT ELEVATIONS ARE BASED ON NAVD88, UTILIZING GEOID18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 240.548 FEET ON CP 1000.

4.THE CONTROL POINTS SHOWN HEREIN WAS DETERMINED BY SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

5.ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
REGISTERED
JAMES A. WOODS
5333
PROFESSIONAL
LAND SURVEYOR

SIGNED: James A Woods
JAMES A. WOODS
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 5333

0' 25' 50' 100'
SCALE: 1"=100'

REV. NO.	DATE	DESCRIPTION	BY

CivilCorp
ENGINEERS - SURVEYORS
801 LIPAN ST., CORPUS CHRISTI, TEXAS 78401, PHONE# 361-371-5380
TXSURV FIRM #100576-00 TXENG FIRM #10283

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
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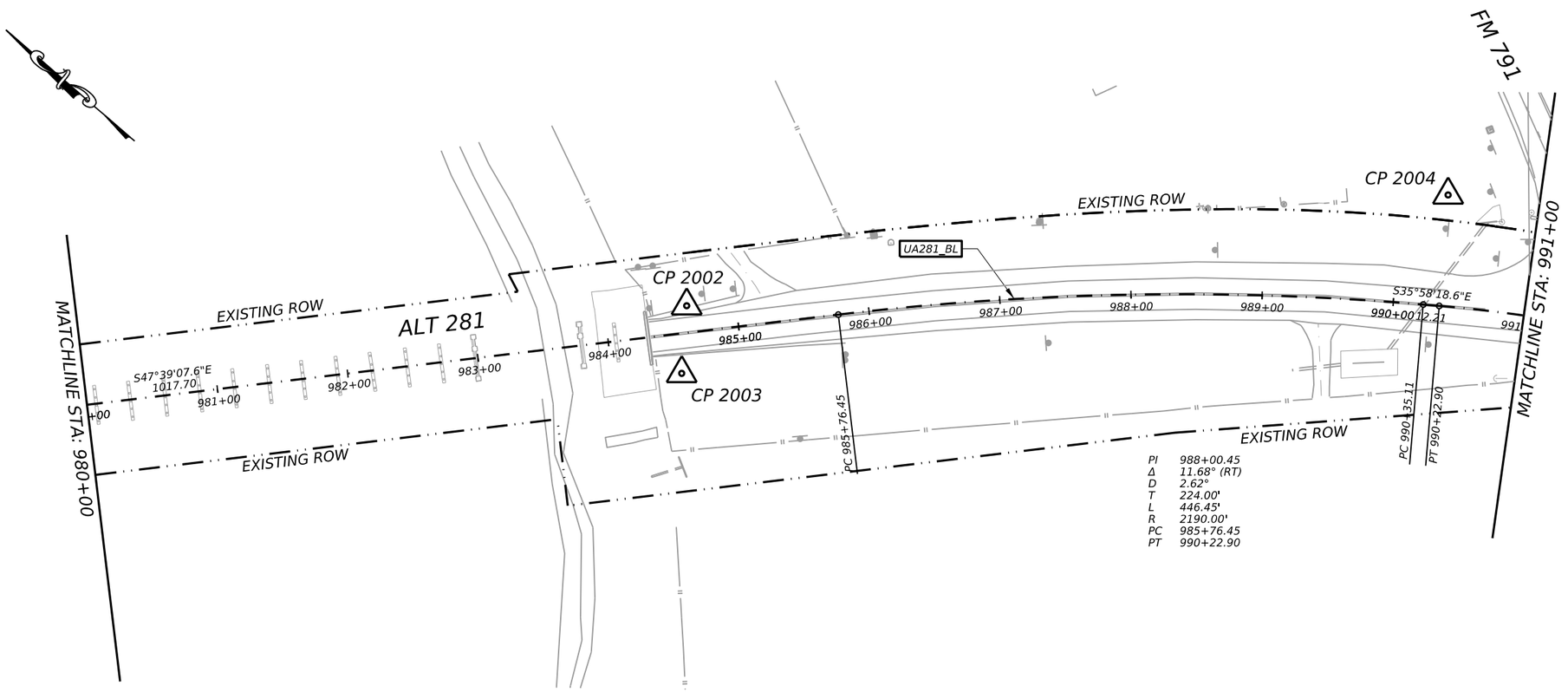
UA 281

SURVEY INDEX CONTROL SHEET

SHEET 1 OF 3

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
15	ATASCOSA	0073	13	012	98

$$$$$$SYSTIME$$$$$$ $DATE$
$$$$$$DGNSPECIFICATION$$$$$$



FROM	TO	DIRECTION	DISTANCE
CP 2001	CP 2003	S 46°44'15" E	534.97'
CP 2003	CP 2002	N 53°23'45" E	51.64'
CP 2002	CP 2004	S 49°05'51" E	586.20'

POINT	NORTH	EAST	ELEVATION	STATION	OFFSET	DESCRIPTION
CP 2002	13,458,693.08	2,191,508.84	240.98'	984+62.57	-20.47'	5/8" IRON ROD W/ALUMINUM TXDOT CAP
CP 2003	13,458,662.29	2,191,467.38	240.61'	984+52.68	30.21'	5/8" IRON ROD W/ALUMINUM TXDOT CAP
CP 2004	13,458,309.25	2,191,951.90	239.76'	990+34.75	-84.76'	5/8" IRON ROD W/ALUMINUM TXDOT CAP

NOTES:

1.ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE TXDOT VRS NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000130.

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5.ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
REGISTERED
JAMES A. WOODS
5333
PROFESSIONAL
LAND SURVEYOR

SIGNED: James A Woods
JAMES A. WOODS
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 5333

0' 25' 50' 100'
SCALE: 1"=100'

REV. NO.	DATE	DESCRIPTION	BY

CivilCorp
ENGINEERS • SURVEYORS
801 LIPAN ST., CORPUS CHRISTI, TEXAS 78401. PHONE# 361-371-5380
TXSURV FIRM #100576-00 TXENG FIRM #10283

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
2024

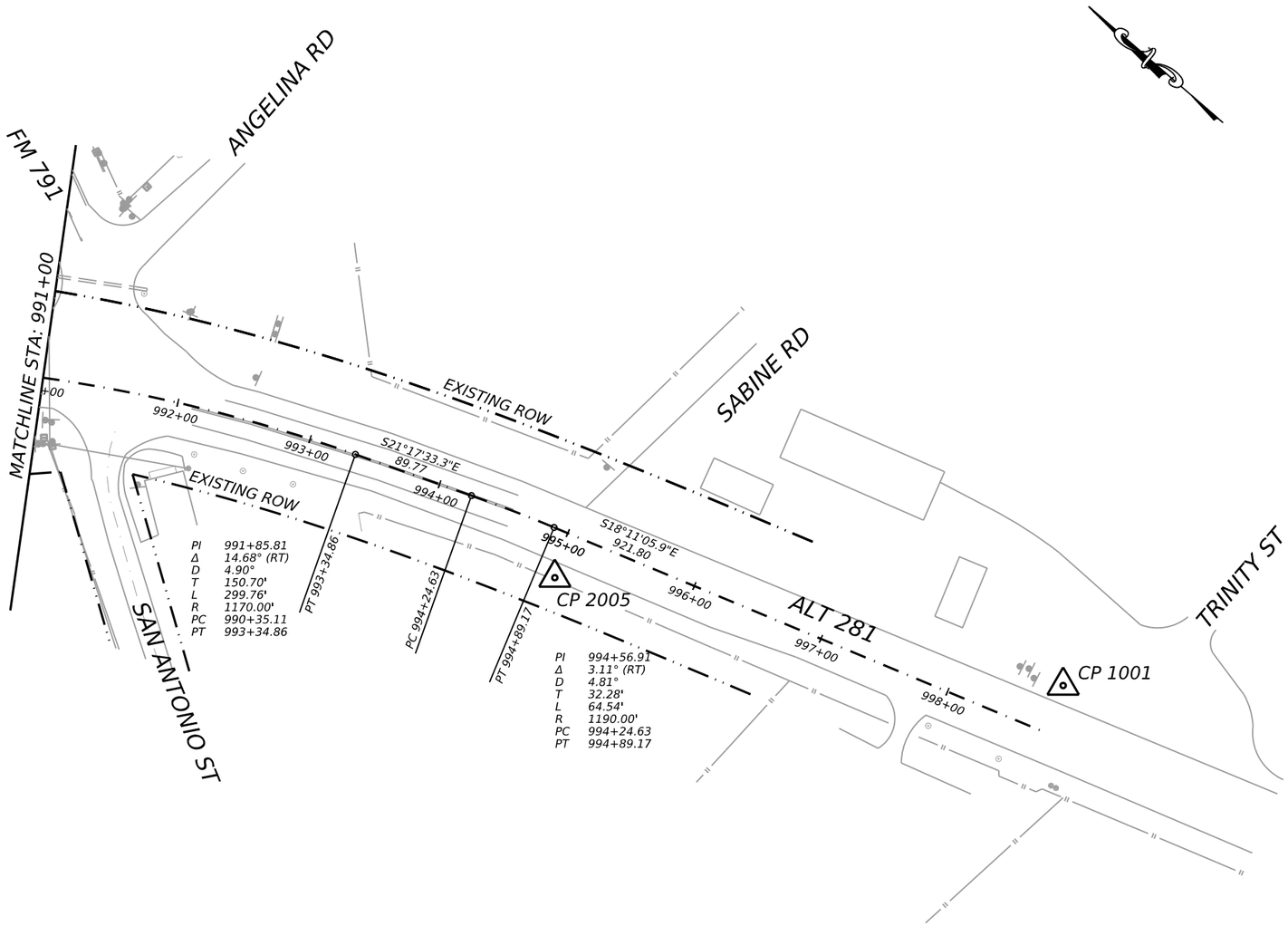
UA 281

SURVEY INDEX CONTROL SHEET

SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
15	ATASCOSA	0073	13	012	99

$$$$$$SYSTIME$$$$$$ $$DATE$$
$$$$$$DGN$$SPECIFICATION$$$$$$



FROM	TO	DIRECTION	DISTANCE
CP 2004	CP 2005	S 11°57'20" E	491.83'
CP 2005	CP 1001	S 28°50'57" E	378.84'

POINT	NORTH	EAST	ELEVATION	STATION	OFFSET	DESCRIPTION
CP 2005	13,457,828.09	2,192,053.78	238.30'	995+03.74	33.59'	5/8" IRON ROD W/ALUMINUM TXDOT CAP
CP 1001	13,457,496.27	2,192,236.57	237.33'	998+76.03	-36.52'	5/8" IRON ROD DRIVEN TO REFUSAL "DEEP ROD"

$$$$$$SYSTIME$$$$$$ $DATE$
$$$$$$DGNSPECIFICATION$$$$$$

NOTES:

1.ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE TXDOT VRS NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000130.

2.ALL HORIZONTAL VALUES WERE DERIVED AND VERIFIED BY GPS (RTK) OBSERVATION USING THE TXDOT RTN NETWORK.

3.PROJECT ELEVATIONS ARE BASED ON NAVD88, UTILIZING GEOID18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 240.548 FEET ON CP 1000.

4.THE CONTROL POINTS SHOWN HEREIN WAS DETERMINED BY SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

5.ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
REGISTERED
JAMES A. WOODS
5333
PROFESSIONAL
LAND SURVEYOR

SIGNED: James A Woods
JAMES A. WOODS
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 5333

0' 25' 50' 100'
SCALE: 1"=100'

REV. NO.	DATE	DESCRIPTION	BY

CivilCorp
ENGINEERS • SURVEYORS
801 LIPAN ST., CORPUS CHRISTI, TEXAS 78401. PHONE# 361-371-5380
TXSURV FIRM #100576-00 TXENG FIRM #10283

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation

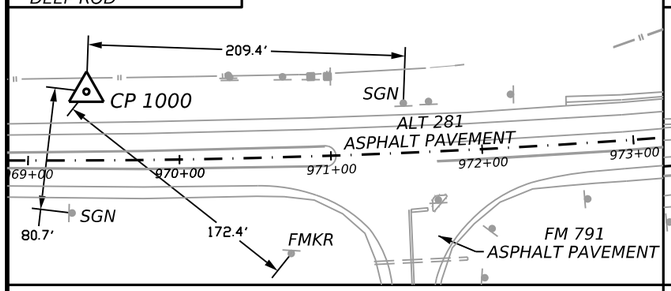
UA 281

SURVEY INDEX CONTROL SHEET

SHEET 3 OF 3

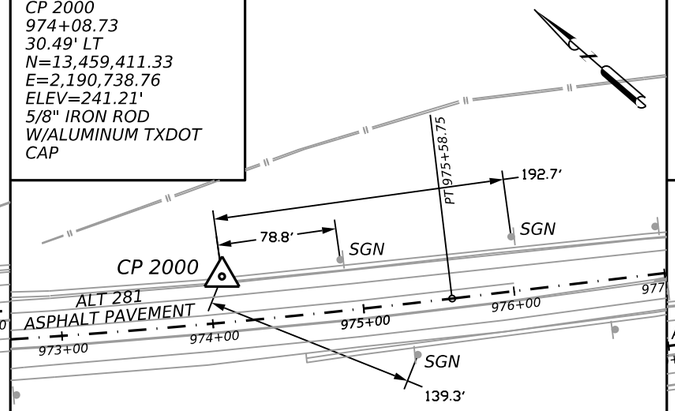
FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
15	ATASCOSA	0073	13	012	100

CP 1000
969+38.72
45.42' LT
N=13,459,759.67
E=2,190,428.02
ELEV=240.55'
5/8" IRON ROD
W/ALUMINUM CAP
DRIVEN TO REFUSAL
"DEEP ROD"



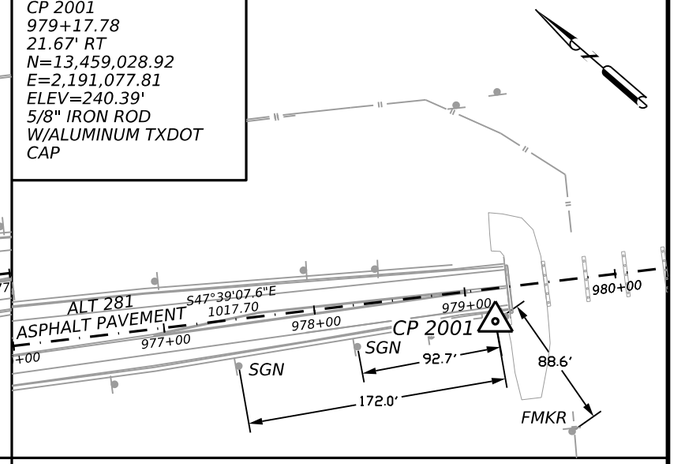
SITUATED ON THE NORTHEAST SIDE OF ALT 281
APPROXIMATELY 220 FEET NORTH OF FM 791

CP 2000
974+08.73
30.49' LT
N=13,459,411.33
E=2,190,738.76
ELEV=241.21'
5/8" IRON ROD
W/ALUMINUM TXDOT
CAP



SITUATED ON THE NORTHEAST SIDE OF ALT 281
APPROXIMATELY 260 FEET SOUTHEAST OF FM 791

CP 2001
979+17.78
21.67' RT
N=13,459,028.92
E=2,191,077.81
ELEV=240.39'
5/8" IRON ROD
W/ALUMINUM TXDOT
CAP



SITUATED ON THE SOUTHWEST SIDE OF ALT 281
APPROXIMATELY 760 FEET SOUTHEAST OF FM 791

NOTES:

1.ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD 83 (2011), EPOCH 2010.00 AS DETERMINED BY GPS OBSERVATIONS USING THE TXDOT VRS NETWORK. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.000130.

2.ALL HORIZONTAL VALUES WERE DERIVED AND VERIFIED BY GPS (RTK) OBSERVATION USING THE TXDOT RTN NETWORK.

3.PROJECT ELEVATIONS ARE BASED ON NAVD88, UTILIZING GEOID18 AND WERE DERIVED FROM DIGITAL LEVEL LOOPS HOLDING ELEVATION 240.548 FEET ON CP 1000.

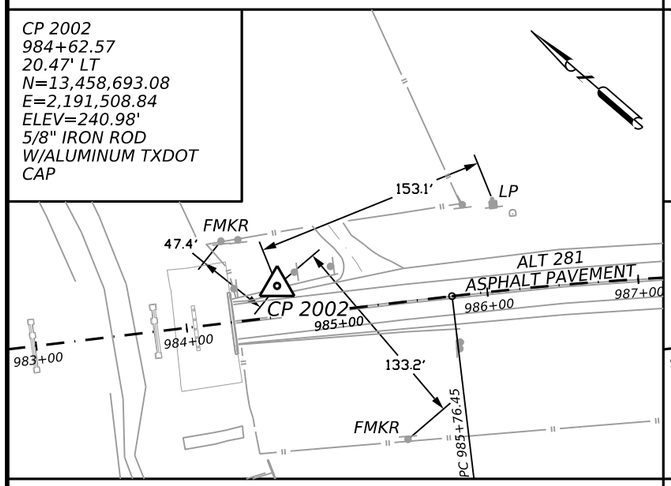
4.THE CONTROL POINTS SHOWN HEREIN WAS DETERMINED BY SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

5.ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
REGISTERED
JAMES A. WOODS
5333
PROFESSIONAL
LAND SURVEYOR

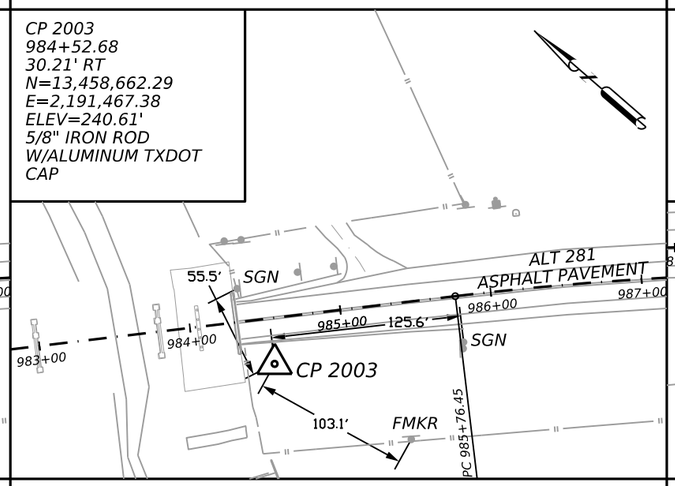
SIGNED: James A Woods
JAMES A. WOODS
REGISTERED PROFESSIONAL
LAND SURVEYOR TEXAS No. 5333

CP 2002
984+62.57
20.47' LT
N=13,458,693.08
E=2,191,508.84
ELEV=240.98'
5/8" IRON ROD
W/ALUMINUM TXDOT
CAP



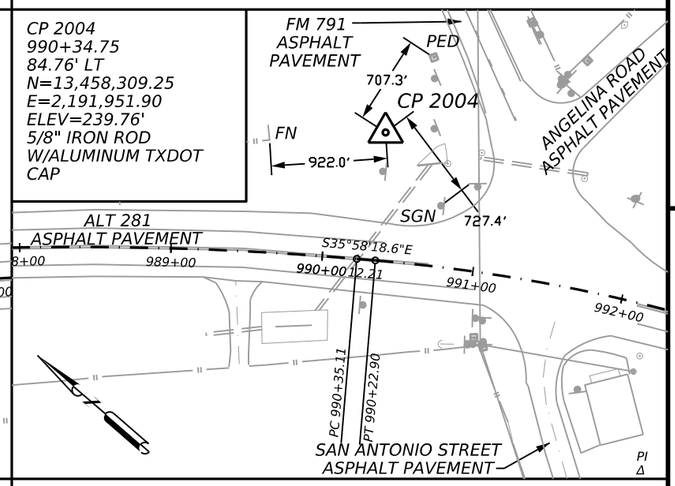
SITUATED ON THE NORTHEAST SIDE OF ALT 281
APPROXIMATELY 670 FEET NORTHWEST OF FM 791

CP 2003
984+52.68
30.21' RT
N=13,458,662.29
E=2,191,467.38
ELEV=240.61'
5/8" IRON ROD
W/ALUMINUM TXDOT
CAP



SITUATED ON THE SOUTHWEST SIDE OF ALT 281
APPROXIMATELY 690 FEET NORTHWEST OF SAN ANTONIO STREET

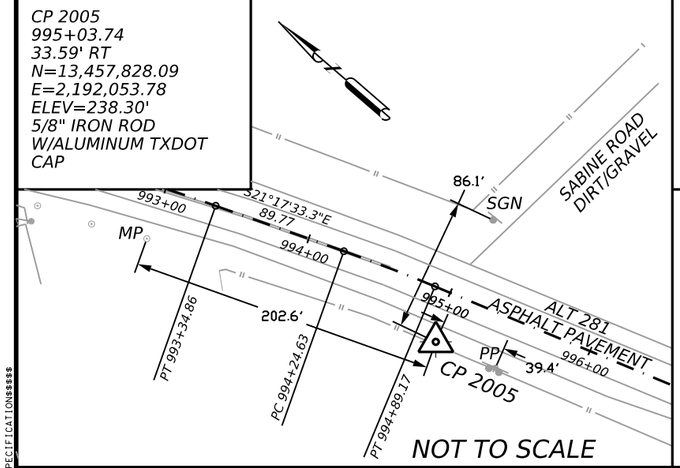
CP 2004
990+34.75
84.76' LT
N=13,458,309.25
E=2,191,951.90
ELEV=239.76'
5/8" IRON ROD
W/ALUMINUM TXDOT
CAP



SITUATED ON THE NORTHEAST SIDE OF ALT 281
APPROXIMATELY 90 FEET NORTHWEST OF FM 791

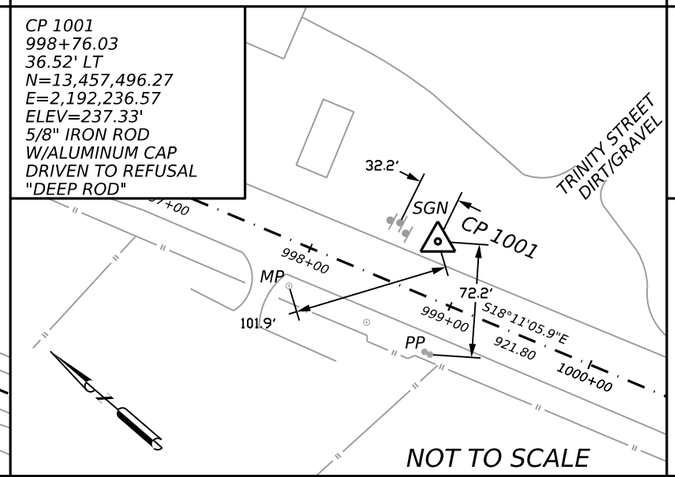
0' 25' 50' 100'
SCALE: 1"=100'

CP 2005
995+03.74
33.59' RT
N=13,457,828.09
E=2,192,053.78
ELEV=238.30'
5/8" IRON ROD
W/ALUMINUM TXDOT
CAP



SITUATED ON THE SOUTHWEST SIDE OF ALT 281
APPROXIMATELY 80 FEET WEST OF SABINE ROAD

CP 1001
998+76.03
36.52' LT
N=13,457,496.27
E=2,192,236.57
ELEV=237.33'
5/8" IRON ROD
W/ALUMINUM CAP
DRIVEN TO REFUSAL
"DEEP ROD"



SITUATED AT THE INTERSECTION OF THE NORTHEAST ROW
OF ALT 281 AND THE NORTH ROW OF TRINITY STREET

REV. NO.	DATE	DESCRIPTION	BY

CivilCorp
ENGINEERS - SURVEYORS
801 LIPAN ST., CORPUS CHRISTI, TEXAS 78401, PHONE# 361-371-5380
TXSURV FIRM #100576-00 TXENG FIRM #10283

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
2024

UA 281

HORIZONTAL AND
VERTICAL CONTROL

SHEET 1 OF 1

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
15	ATASCOSA	0073	13	012	101

$$$$$$SYSTIME$$$$$ $DATE$
$$$$$$DGNSPECIFICATION$$$$$$

Alignment Name:		UA281_BL		
Alignment Description:				
Alignment Style:		Alignment\Baseline		
		Station	Northing	Easting
Element: Linear				
POT	( )	89997.950 R1	13466147.87	2188377.371
PC	( )	92197.070 R1	13463950.46	2188463.877
Tangential Direction:		S2.254°E		
Tangential Length:		2199.12		
Element: Circular				
PC	( )	92197.070 R1	13463950.46	2188463.877
PI	( )	94022.927 R1	13462126.01	2188535.7
CC	( )		13464175.85	2194189.307
PT	( )	95732.206 R1	13460679.48	2189649.839
Radius:		5729.864		
Delta:		35.350°	Left	
Degree of Curvature (Arc):		1.000°		
Length:		3535.136		
Tangent:		1825.856		
Chord:		3479.334		
Middle Ordinate:		270.477		
External:		283.878		
Back Tangent Direction:		S2.254°E		
Back Radial Direction:		S87.746°W		
Chord Direction:		S19.929°E		
Ahead Radial Direction:		S52.396°W		
Ahead Tangent Direction:		S37.604°E		
Element: Linear				
PT	( )	95732.206 R1	13460679.48	2189649.839
PC	( )	96611.734 R1	13459982.68	2190186.527
Tangential Direction:		S37.604°E		
Tangential Length:		879.528		
Element: Circular				
PC	( )	96611.734 R1	13459982.68	2190186.527
PI	( )	97086.458 R1	13459606.58	2190476.204
CC	( )		13463277.76	2194464.661
PT	( )	97558.748 R1	13459286.79	2190827.057
Radius:		5400		
Delta:		10.048°	Left	
Degree of Curvature (Arc):		1.061°		
Length:		947.014		
Tangent:		474.724		
Chord:		945.801		
Middle Ordinate:		20.747		
External:		20.827		
Back Tangent Direction:		S37.604°E		

Back Radial Direction:		S52.396°W		
Chord Direction:		S42.628°E		
Ahead Radial Direction:		S42.348°W		
Ahead Tangent Direction:		S47.652°E		
Element: Linear				
PT	( )	97558.748 R1	13459286.79	2190827.057
PC	( )	98576.449 R1	13458601.24	2191579.208
Tangential Direction:		S47.652°E		
Tangential Length:		1017.701		
Element: Circular				
PC	( )	98576.449 R1	13458601.24	2191579.208
PI	( )	98800.451 R1	13458450.34	2191744.761
CC	( )		13456982.68	2190103.958
PT	( )	99022.901 R1	13458269.06	2191876.338
Radius:		2190		
Delta:		11.680°	Right	
Degree of Curvature (Arc):		2.616°		
Length:		446.452		
Tangent:		224.002		
Chord:		445.679		
Middle Ordinate:		11.367		
External:		11.426		
Back Tangent Direction:		S47.652°E		
Back Radial Direction:		S42.348°W		
Chord Direction:		S41.812°E		
Ahead Radial Direction:		S54.028°W		
Ahead Tangent Direction:		S35.972°E		
Element: Linear				
PT	( )	99022.901 R1	13458269.06	2191876.338
PC	( )	99035.107 R1	13458259.18	2191883.507
Tangential Direction:		S35.972°E		
Tangential Length:		12.206		
Element: Circular				
PC	( )	99035.107 R1	13458259.18	2191883.507
PI	( )	99185.810 R1	13458137.21	2191972.028
CC	( )		13457571.94	2190936.619
PT	( )	99334.862 R1	13457996.8	2192026.753
Radius:		1170		
Delta:		14.679°	Right	
Degree of Curvature (Arc):		4.897°		
Length:		299.755		
Tangent:		150.703		
Chord:		298.936		
Middle Ordinate:		9.587		
External:		9.666		
Back Tangent Direction:		S35.972°E		

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

Texas Department of Transportation

UA 281
ALIGNMENT & PROFILE DATA

SHEET: 1 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		102

DESIGN: AG | DRAFT: AG | CHECK: AG

11/27/2023 3:43:38 PM
pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/3. Roadway/UA0281*ALIGN*DATA.dgn

Back Radial Direction:		S54.028°W		
Chord Direction:		S28.632°E		
Ahead Radial Direction:		S68.707°W		
Ahead Tangent Direction:		S21.293°E		
Element: Linear				
PT	( )	99334.862 R1	13457996.8	2192026.753
PC	( )	99424.631 R1	13457913.16	2192059.351
Tangential Direction:		S21.293°E		
Tangential Length:		89.768		
Element: Circular				
PC	( )	99424.631 R1	13457913.16	2192059.351
PI	( )	99456.911 R1	13457883.08	2192071.073
CC	( )		13457481.03	2190950.582
PT	( )	99489.174 R1	13457852.41	2192081.147
Radius:		1190		
Delta:		3.108°	Right	
Degree of Curvature (Arc):		4.815°		
Length:		64.544		
Tangent:		32.28		
Chord:		64.536		
Middle Ordinate:		0.438		
External:		0.438		
Back Tangent Direction:		S21.293°E		
Back Radial Direction:		S68.707°W		
Chord Direction:		S19.739°E		
Ahead Radial Direction:		S71.815°W		
Ahead Tangent Direction:		S18.185°E		
Element: Linear				
PT	( )	99489.174 R1	13457852.41	2192081.147
POT	( )	100410.979 R1	13456976.65	2192368.829
Tangential Direction:		S18.185°E		
Tangential Length:		921.805		

Horizontal Alignment:	UA281_BL	
Horizontal Description:		
Horizontal Style:	Alignment\Baseline	
Vertical Alignment:	UA281PROP	
Vertical Description:		
Vertical Style:	Alignment\Baseline	
	Station	Elevation
Element: Linear		
POT	97663.000 R1	241.834
VPI	97763.328 R1	241.584
Tangent Grade:	-0.002	
Tangent Length:	100.328	
Element: Linear		
VPI	97763.328 R1	241.584
POT	98550.000 R1	241.576
Tangent Grade:	0	
Tangent Length:	786.672	

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

Texas Department of Transportation

UA 281
ALIGNMENT & PROFILE DATA

SHEET: 2 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		103

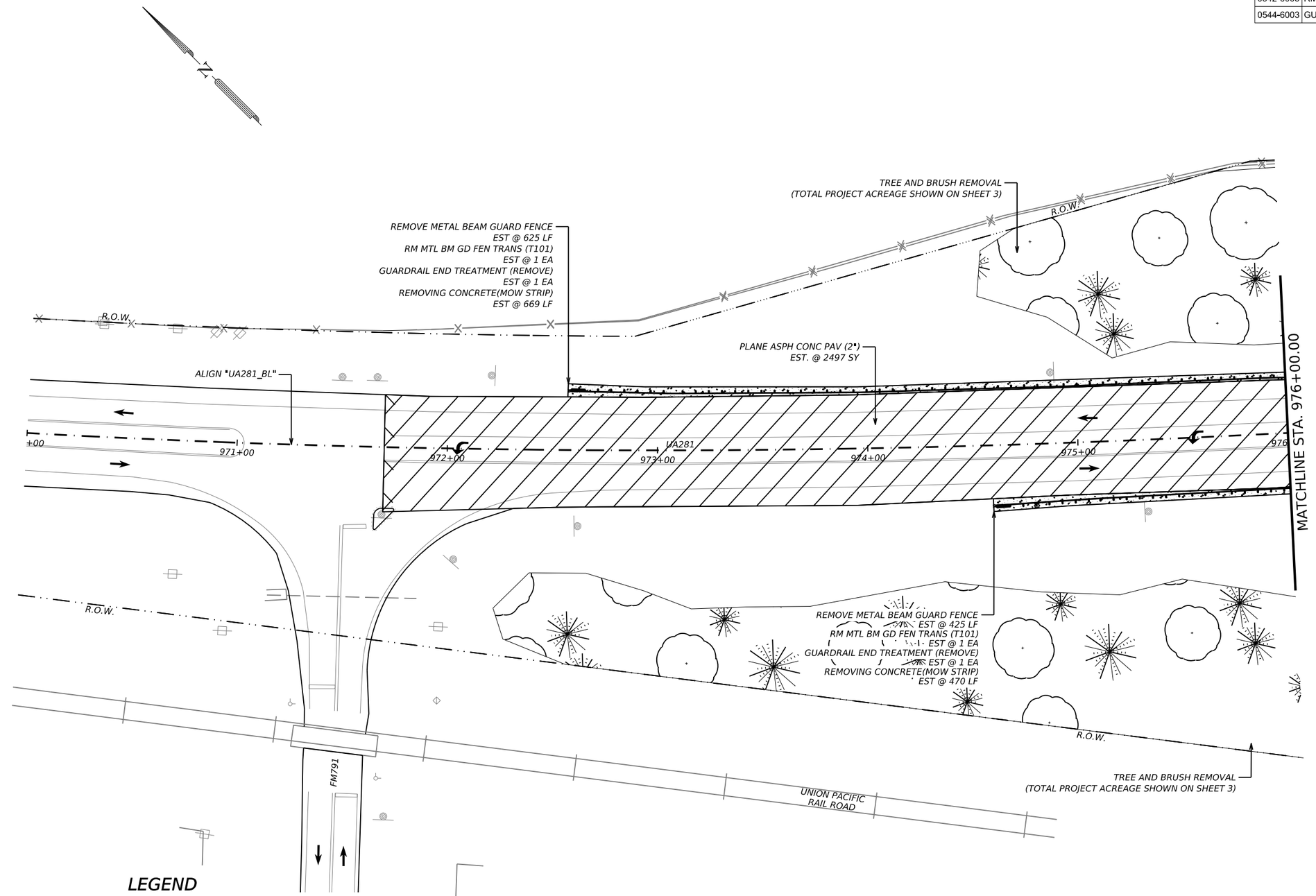
DESIGN: AG | DRAFT: AG | CHECK: AG

11/27/2023 3:45:01 PM
pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/3. Roadway/UA0281*ALIGN*DATA*02.dgn

DESIGN: RS | DRAFT: RS | CHECK: RD

QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0100-6002	PREPARING ROW	STA	4
0104-6054	REMOVING CONCRETE(MOW STRIP)	LF	1139
0354-6045	PLANE ASPH CONC PAV (2")	SY	2497
0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	1050
0542-6005	RM MTL BM GD FEN TRANS (T101)	EA	2
0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2



LEGEND

- PAVEMENT REMOVAL (2")
- REMOVE BASE AND PAVEMENT
- REMOVE STR (CONC BRIDGE)
- REMOVE STR (TRUSS BRIDGE)
- DIRECTIONAL ARROW
- REMOVE RIPRAP
- REMOVE TREE & BRUSH
- REMOVE WIRE FENCE
- LIMITS OF OVERLAY

NOTES:

1. *SEE PLAN AND PROFILE LAYOUTS FOR CONSTRUCTION & RECONSTRUCTION LIMITS.*
2. *"TREE AND BRUSH REMOVAL" TOTAL FOR THE ENTIRE PROJECT IN ACRES ON SHEET 3.*
3. *SEE SIGNING LAYOUTS FOR SMALL SIGN REMOVAL.*
4. *EXISTING CONCRETE FLUME IS IN ROUGH, WASHED-OUT CONDITION.*
5. *ITEM 0496-6043 IS FOR THE REMOVAL OF THE BARBED WIRE FENCE ONLY. REPLACEMENT OF WIRE FENCE COVERED UNDER ITEM 552-6003.*

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281 REMOVAL LAYOUT

SHEET: 1 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		104

11/6/2023 1:29:09 PM
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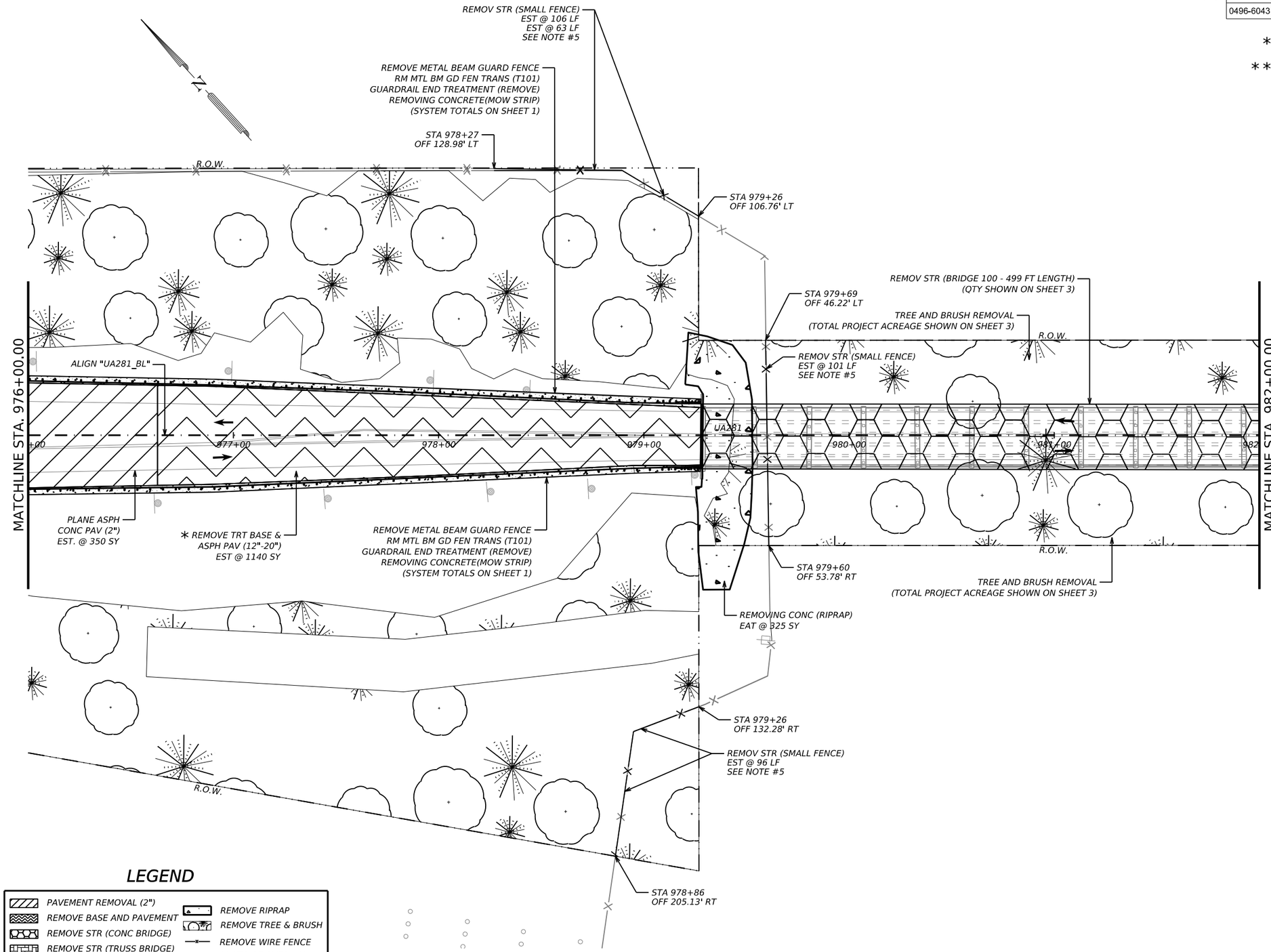
DESIGN BG | DRAFT BG | CHECK BD

QUANTITY SUMMARY CSJ: 0073-13-012

	ITEM NO.	ITEM	UNIT	QUANTITY
	0100-6002	PREPARING ROW	STA	6
	0104-6009	REMOVING CONC (RIPRAP)	SY	325
*	0105-6137	REMOVE TRT BASE & ASPH PAV (12"-20")	SY	1140
**	0354-6045	PLANE ASPH CONC PAV (2")	SY	770
	0496-6043	REMOV STR (SMALL FENCE)	LF	366

* *FOR CONTRACTORS INFORMATION ONLY; TO BE PAID UNDER ITEM 110-6001*

** *QUANTITY INCLUDES 2" MILLING OF SACRIFICIAL LAYER FOR FINAL OVERLAY*



NOTES:

1. *SEE PLAN AND PROFILE LAYOUTS FOR CONSTRUCTION & RECONSTRUCTION LIMITS.*
2. *"TREE AND BRUSH REMOVAL" TOTAL FOR THE ENTIRE PROJECT IN ACRES ON SHEET 3.*
3. *SEE SIGNING LAYOUTS FOR SMALL SIGN REMOVAL.*
4. *EXISTING CONCRETE FLUME IS IN ROUGH, WASHED-OUT CONDITION.*
5. *ITEM 0496-6043 IS FOR THE REMOVAL OF THE BARBED WIRE FENCE ONLY. REPLACEMENT OF WIRE FENCE COVERED UNDER ITEM 552-6003.*

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281 REMOVAL LAYOUT

SHEET: 2 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		105

2/20/2024 9:30:58 AM
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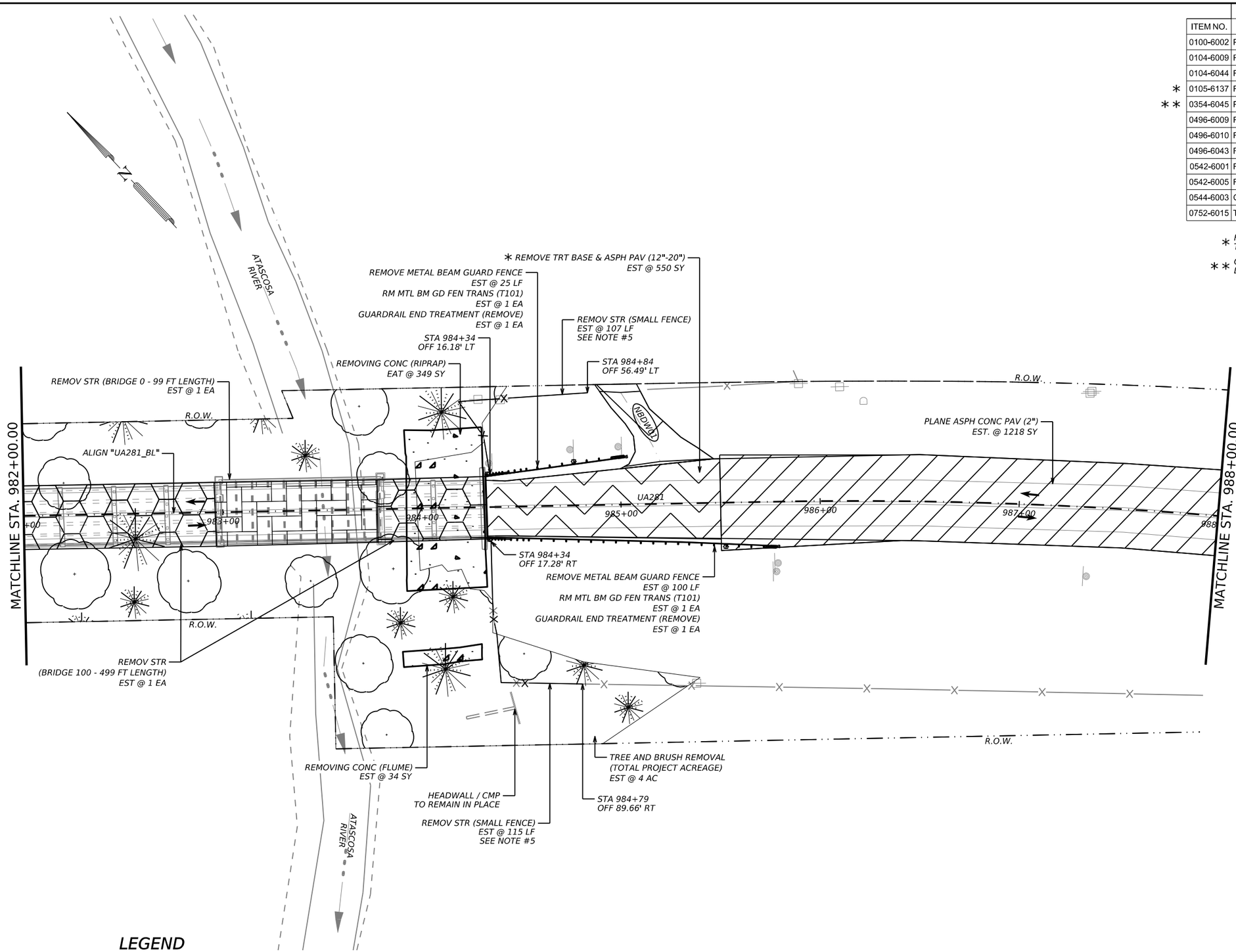
DESIGN: RG | DRAFT: RG | CHECK: RD

QUANTITY SUMMARY CSJ: 0073-13-012

	ITEM NO.	ITEM	UNIT	QUANTITY
	0100-6002	PREPARING ROW	STA	4
	0104-6009	REMOVING CONC (RIPRAP)	SY	349
	0104-6044	REMOVING CONC (FLUME)	SY	34
*	0105-6137	REMOVE TRT BASE & ASPH PAV (12"-20")	SY	550
**	0354-6045	PLANE ASPH CONC PAV (2")	SY	1421
	0496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1
	0496-6010	REMOV STR (BRIDGE 100 - 499 FT LENGTH)	EA	1
	0496-6043	REMOV STR (SMALL FENCE)	LF	222
	0542-6001	REMOVE METAL BEAM GUARD FENCE	LF	125
	0542-6005	RM MTL BM GD FEN TRANS (T101)	EA	2
	0544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2
	0752-6015	TREE AND BRUSH REMOVAL	AC	4

* *FOR CONTRACTORS INFORMATION ONLY; TO BE PAID UNDER ITEM 110-6001*

** *QUANTITY INCLUDES 2" MILLING OF SACRIFICIAL LAYER FOR FINAL OVERLAY*



LEGEND

- PAVEMENT REMOVAL (2")
- REMOVE BASE AND PAVEMENT
- REMOVE STR (CONC BRIDGE)
- REMOVE STR (TRUSS BRIDGE)
- DIRECTIONAL ARROW
- REMOVE RIPRAP
- REMOVE TREE & BRUSH
- REMOVE WIRE FENCE
- LIMITS OF OVERLAY

NOTES:

1. *SEE PLAN AND PROFILE LAYOUTS FOR CONSTRUCTION & RECONSTRUCTION LIMITS.*
2. *"TREE AND BRUSH REMOVAL" TOTAL FOR THE ENTIRE PROJECT IN ACRES ON SHEET 3.*
3. *SEE SIGNING LAYOUTS FOR SMALL SIGN REMOVAL.*
4. *EXISTING CONCRETE FLUME IS IN ROUGH, WASHED-OUT CONDITION.*
5. *ITEM 0496-6043 IS FOR THE REMOVAL OF THE BARBED WIRE FENCE ONLY. REPLACEMENT OF WIRE FENCE COVERED UNDER ITEM 552-6003.*

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. — 02/20/2024

ANDRES GARZA — DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281 REMOVAL LAYOUT

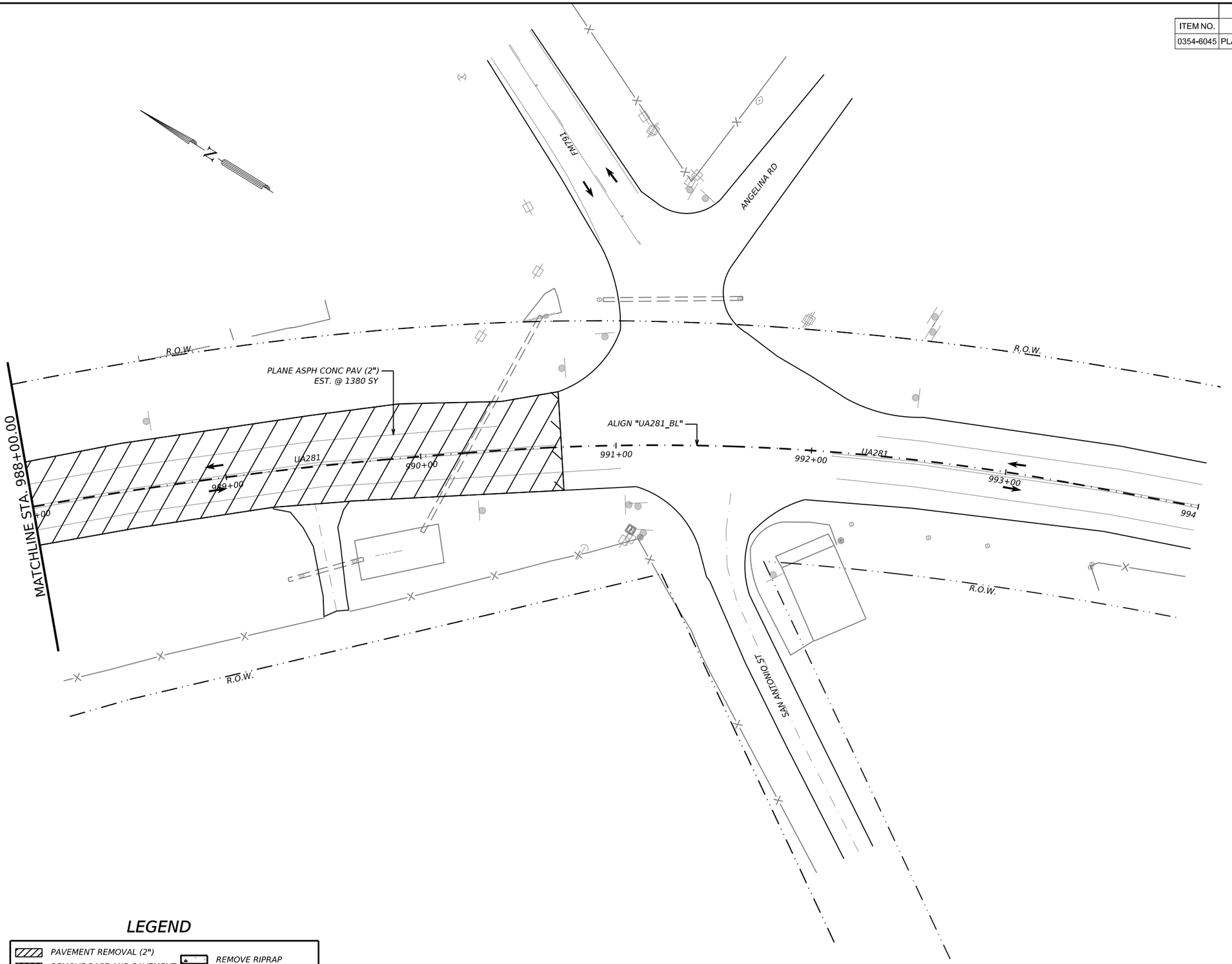
SHEET: 3 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		106

2/15/2024 9:59:30 AM
pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/3. Roadway/Removal/UA0281*RDW*RMV*3.dgn

DESIGN: RG | DRAFT: RG | CHECK: RD

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
0354-6045	PLANE ASPH CONC PAV (2")	SY	1380



NOTES:

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2. *"TREE AND BRUSH REMOVAL" TOTAL FOR THE ENTIRE PROJECT IN ACRES ON SHEET 3.*
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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281 REMOVAL LAYOUT

LEGEND

- *PAVEMENT REMOVAL (2")*
- *REMOVE BASE AND PAVEMENT*
- *REMOVE STR (CONC BRIDGE)*
- *REMOVE STR (TRUSS BRIDGE)*
- *DIRECTIONAL ARROW*
- *REMOVE RIPRAP*
- *REMOVE TREE & BRUSH*
- *REMOVE WIRE FENCE*
- *LIMITS OF OVERLAY*

SHEET: 4 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		107

11/6/2023 2:37:17 PM
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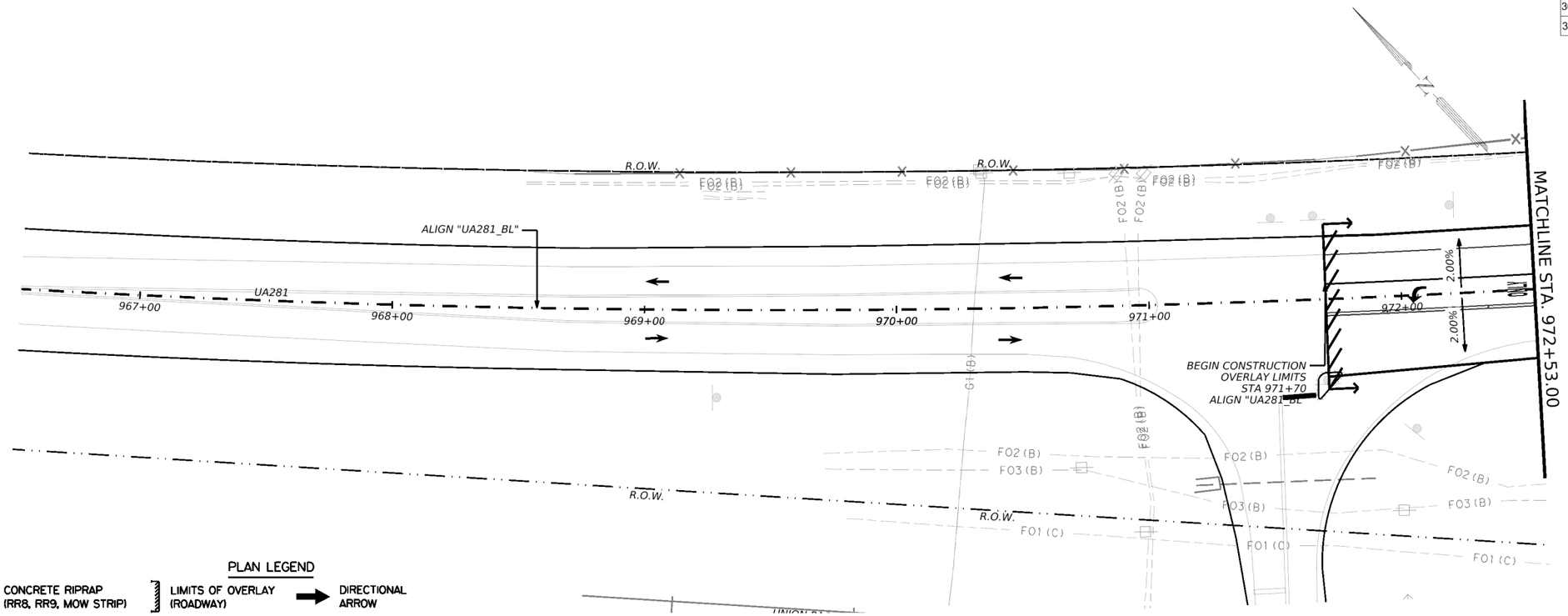
DESIGN: AG | DRAFT: AG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
3076-6075	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT	SY	497
3085-6001	UNDERSEAL COURSE	SY	497

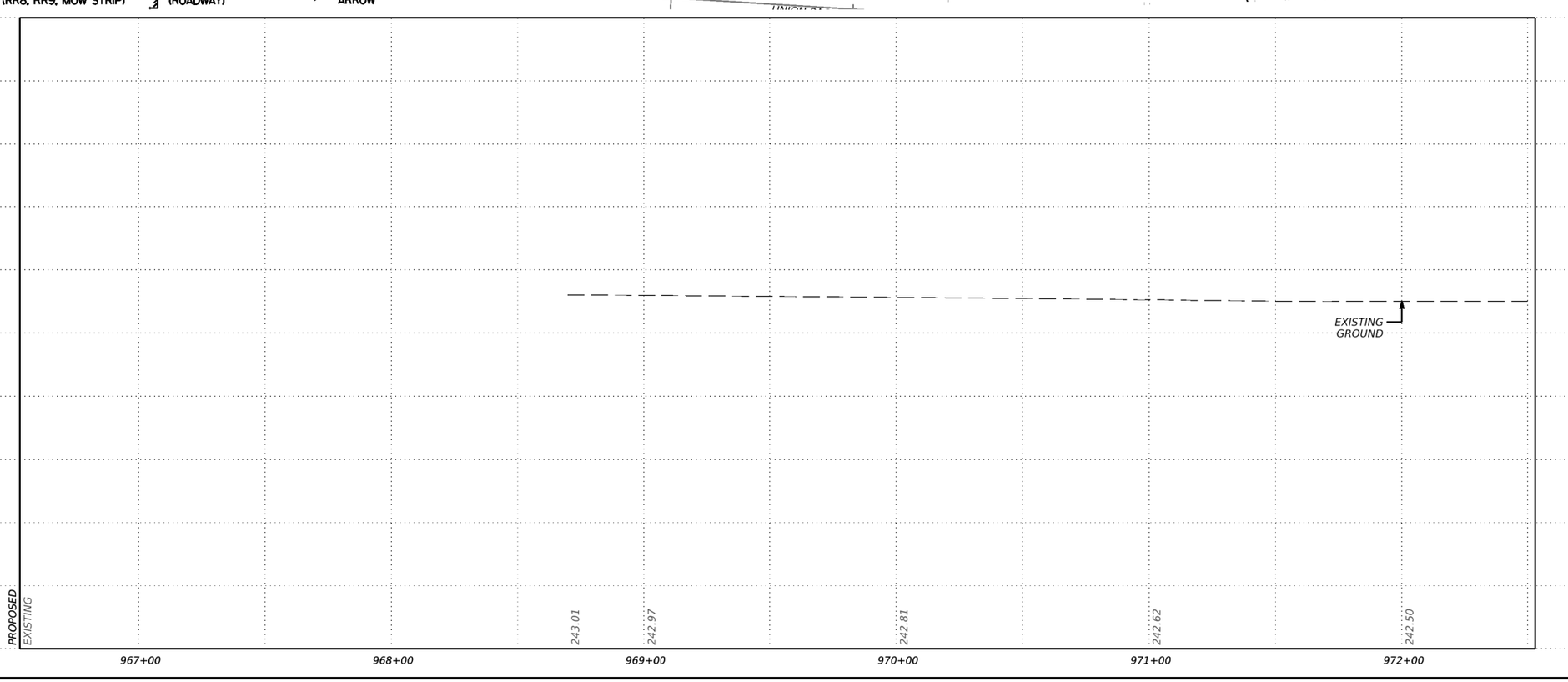


PLAN LEGEND

CONCRETE RIPRAP (RR8, RR9, MOW STRIP)

LIMITS OF OVERLAY (ROADWAY)

DIRECTIONAL ARROW



NOTES:
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2. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING ANY TYPE OF WORK.
3. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR ROADWAY GEOMETRIC DATA.
4. ALL OFFSETS AND DIMENSIONS ARE RELATIVE TO FACE OF RAIL OR EDGE OF PAVEMENT UNLESS OTHER-WISE NOTED.
5. SEE GRADING SHEET FOR MORE INFORMATION.
6. SEE PROJECT LAYOUT FOR PROPOSED R.O.W. LIMITS.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=50' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
PLAN AND PROFILE LAYOUT

SHEET: 1 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		108

12/13/2023 3:38:40 PM
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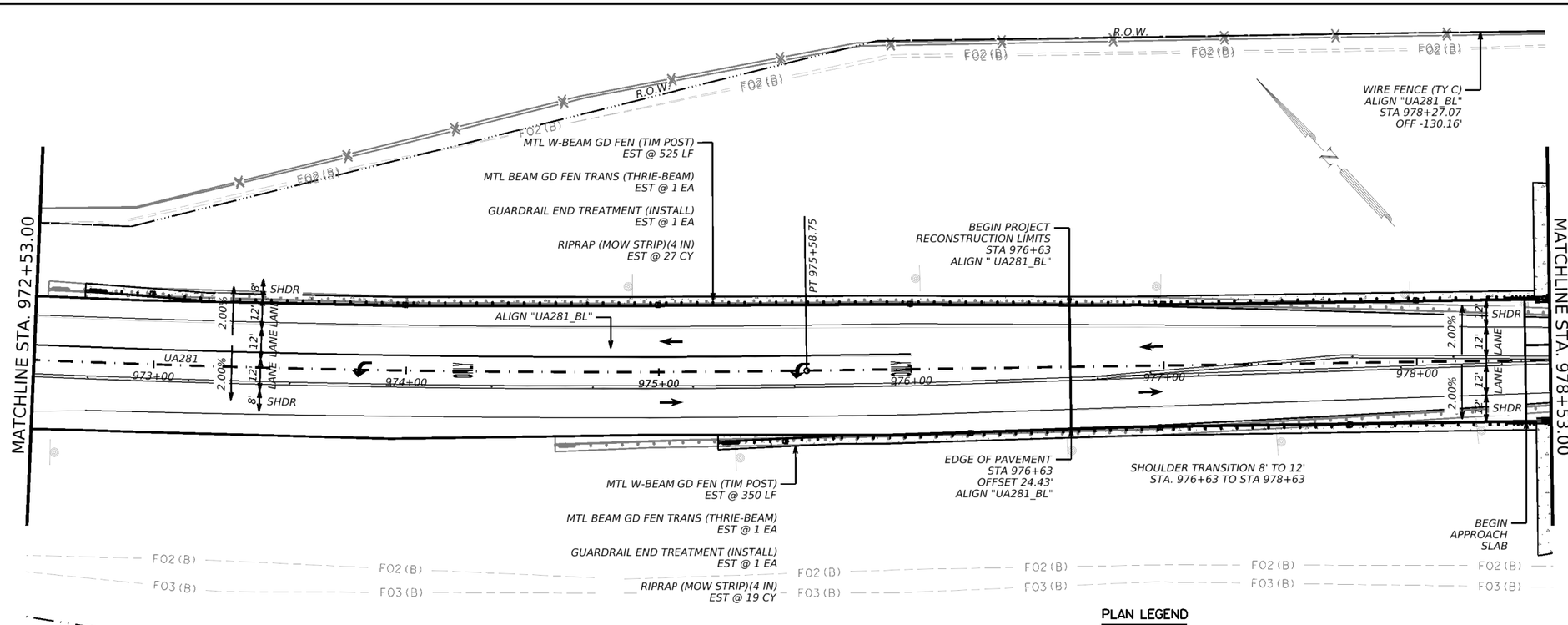
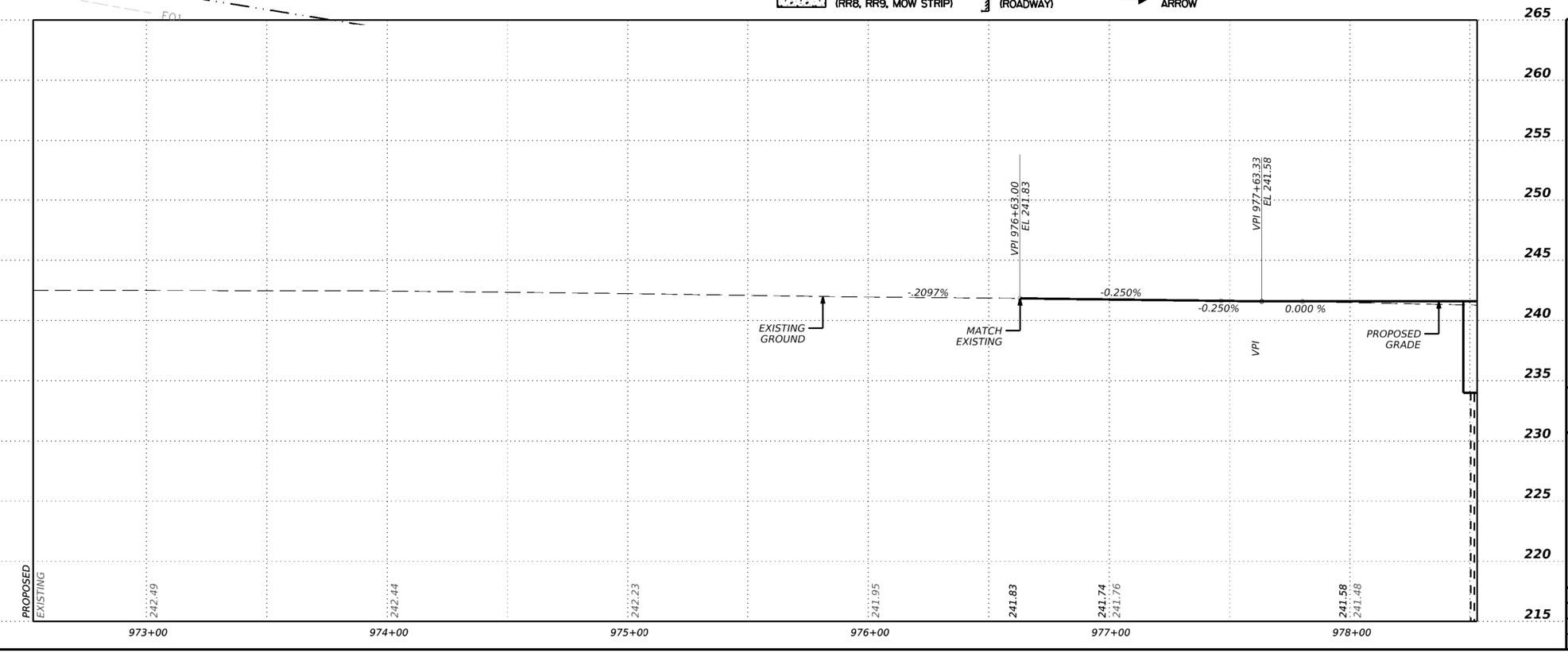
DESIGN AG | DRAFT AG | CHECK AG



PLAN LEGEND

CONCRETE RIPRAP (RR8, RR9, MOW STRIP) | LIMITS OF OVERLAY (ROADWAY) | DIRECTIONAL ARROW



QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0110-6001	EXCAVATION (ROADWAY)	CY	597
0132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C	CY	1819
0216-6001	PROOF ROLLING	HR	8
0247-6475	FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS	CY	334
0310-6027	PRIME COAT(MC-30 OR AE-P)	SY	1000
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	46
0540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	875
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
3076-6003	D-GR HMA TY-B PG64-22 (EXEMPT)	SY	981
3076-6075	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT	SY	3731
3077-6075	TACK COAT	SY	1382
3085-6001	UNDERSEAL COURSE	SY	2349

NOTES:
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5. SEE GRADING SHEET FOR MORE INFORMATION.
6. SEE PROJECT LAYOUT FOR PROPOSED R.O.W. LIMITS.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=50' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
PLAN AND PROFILE LAYOUT

SHEET: 2 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		109

12/13/2023 3:39:01 PM
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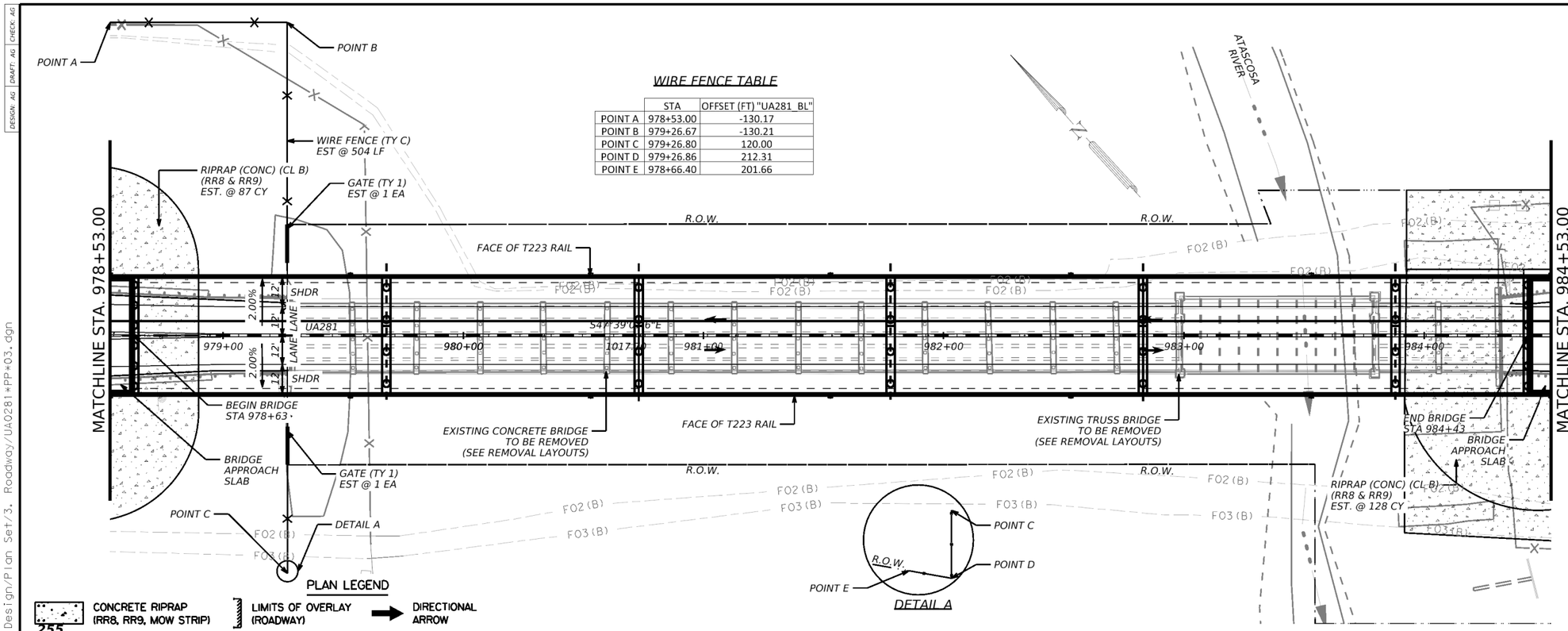
DESIGN: AG | DRAFT: AG | CHECK: AG



WIRE FENCE TABLE

	STA	OFFSET (FT) "UA281_BL"
POINT A	978+53.00	-130.17
POINT B	979+26.67	-130.21
POINT C	979+26.80	120.00
POINT D	979+26.86	212.31
POINT E	978+66.40	201.66

QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0110-6001	EXCAVATION (ROADWAY)	CY	3361
0132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C	CY	218
0432-6008	RIPRAP (CONC)(CL B)(RR8&RR9)	CY	215
0552-6003	WIRE FENCE (TY C)	LF	504
0552-6005	GATE (TY 1)	EA	2

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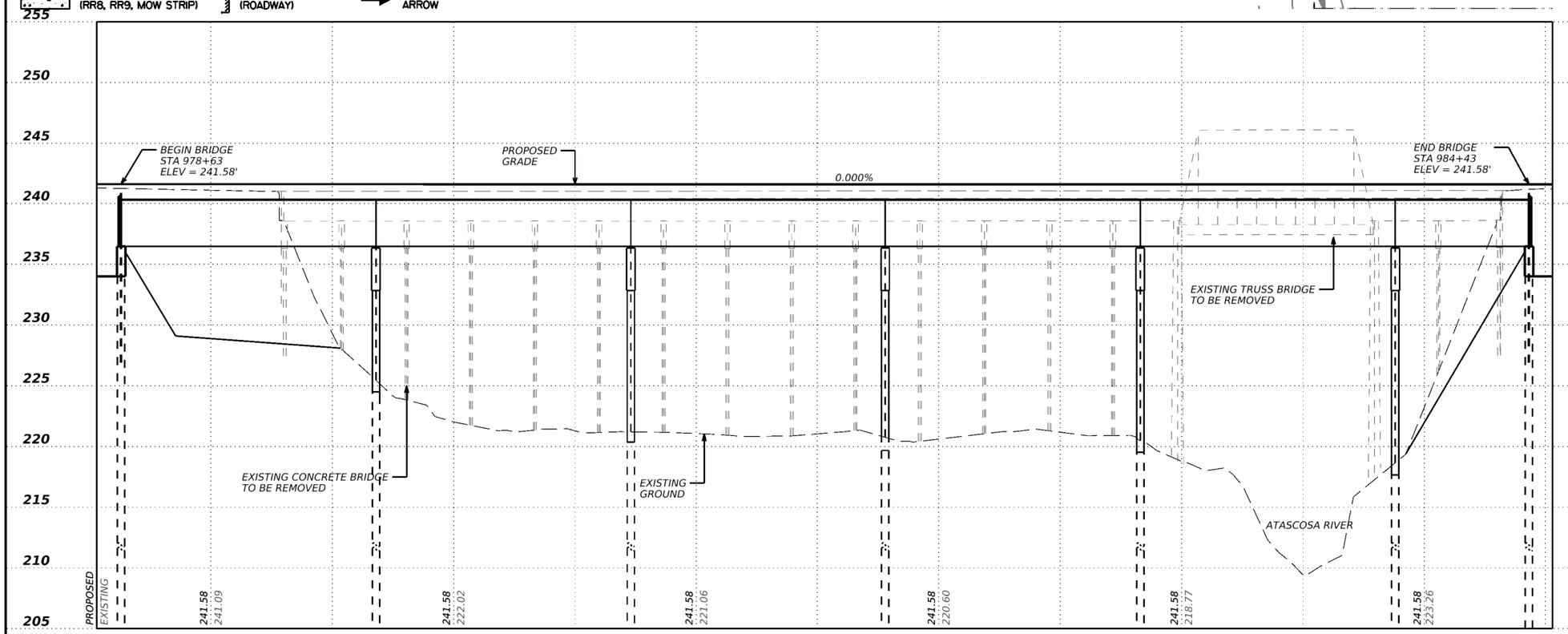
PLAN LEGEND

CONCRETE RIPRAP (RR8, RR9, MOW STRIP) | LIMITS OF OVERLAY (ROADWAY) | DIRECTIONAL ARROW



STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=50' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
PLAN AND PROFILE LAYOUT

SHEET: 3 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		110

12/13/2023 3:39:21 PM
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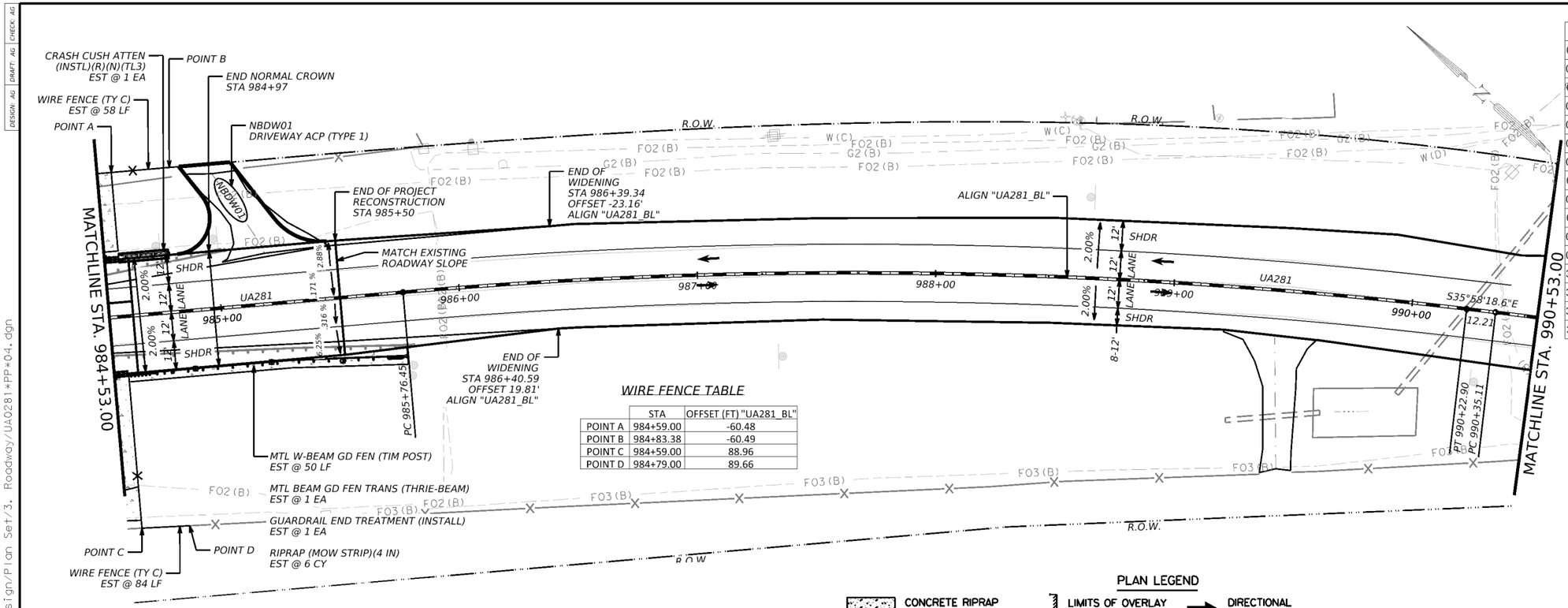
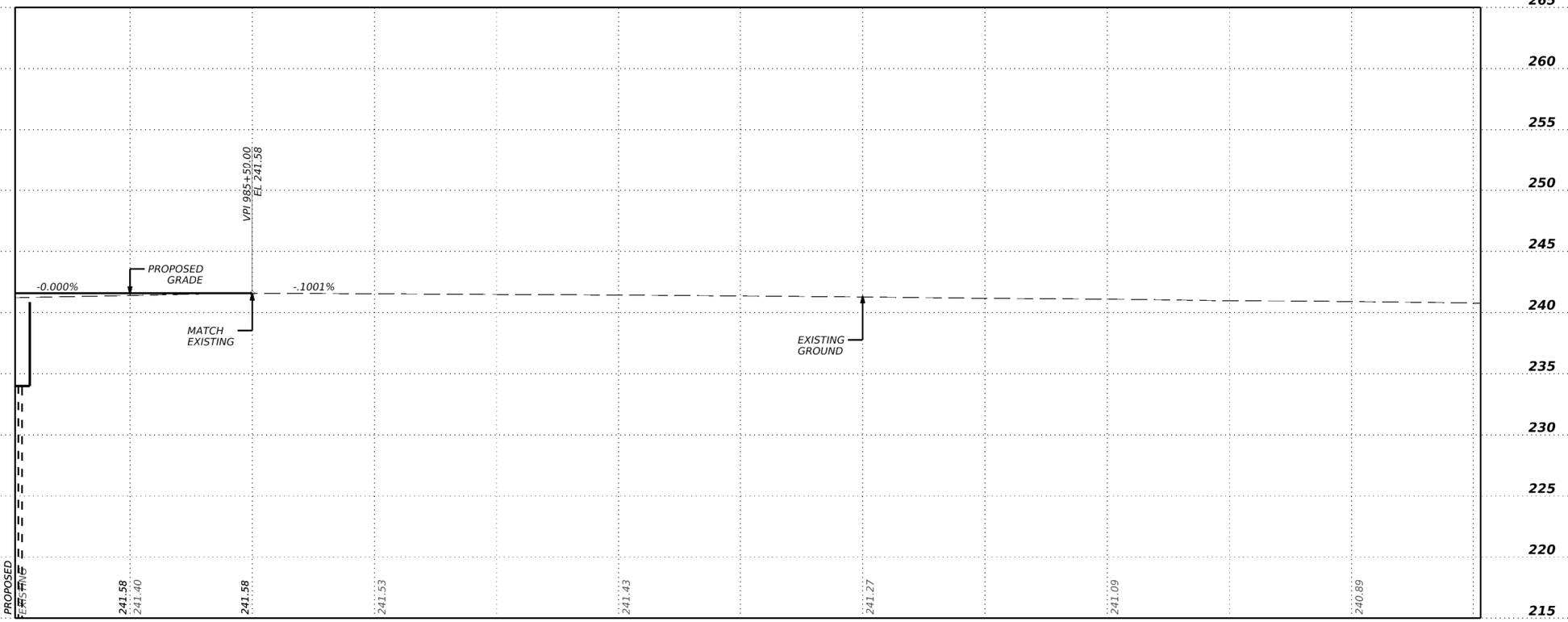


WIRE FENCE TABLE

	STA	OFFSET (FT) "UA281_BL"
POINT A	984+59.00	-60.48
POINT B	984+83.38	-60.49
POINT C	984+59.00	88.96
POINT D	984+79.00	89.66

PLAN LEGEND

CONCRETE RIPRAP (RR8, RR9, MOW STRIP) | LIMITS OF OVERLAY (ROADWAY) | DIRECTIONAL ARROW



QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0110-6001	EXCAVATION (ROADWAY)	CY	654
0132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C	CY	2
0216-6001	PROOF ROLLING	HR	8
0247-6475	FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS	CY	162
0310-6027	PRIME COAT(MC-30 OR AE-P)	SY	484
0432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	8
0530-6019	DRIVEWAYS (ACP)(TYPE 1)	SY	110
0540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	75
0540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
0544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0545-6013	CRASH CUSH ATTEN (INSTL)(R)(N)(TL3)	EA	1
0552-6003	WIRE FENCE (TY C)	LF	142
3076-6003	D-GR HMA TY-B PG64-22 (EXEMPT)	SY	474
3076-6075	D-GR HMA TY-C SAC-A PG76-22 (EXEMPT	SY	3160
3077-6075	TACK COAT	SY	666
3085-6001	UNDERSEAL COURSE	SY	2493

NOTES:
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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=50' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
PLAN AND PROFILE LAYOUT

SHEET: 4 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		111

2/12/2024 2:58:58 PM
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DESIGN: AG | DRAFT: AG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
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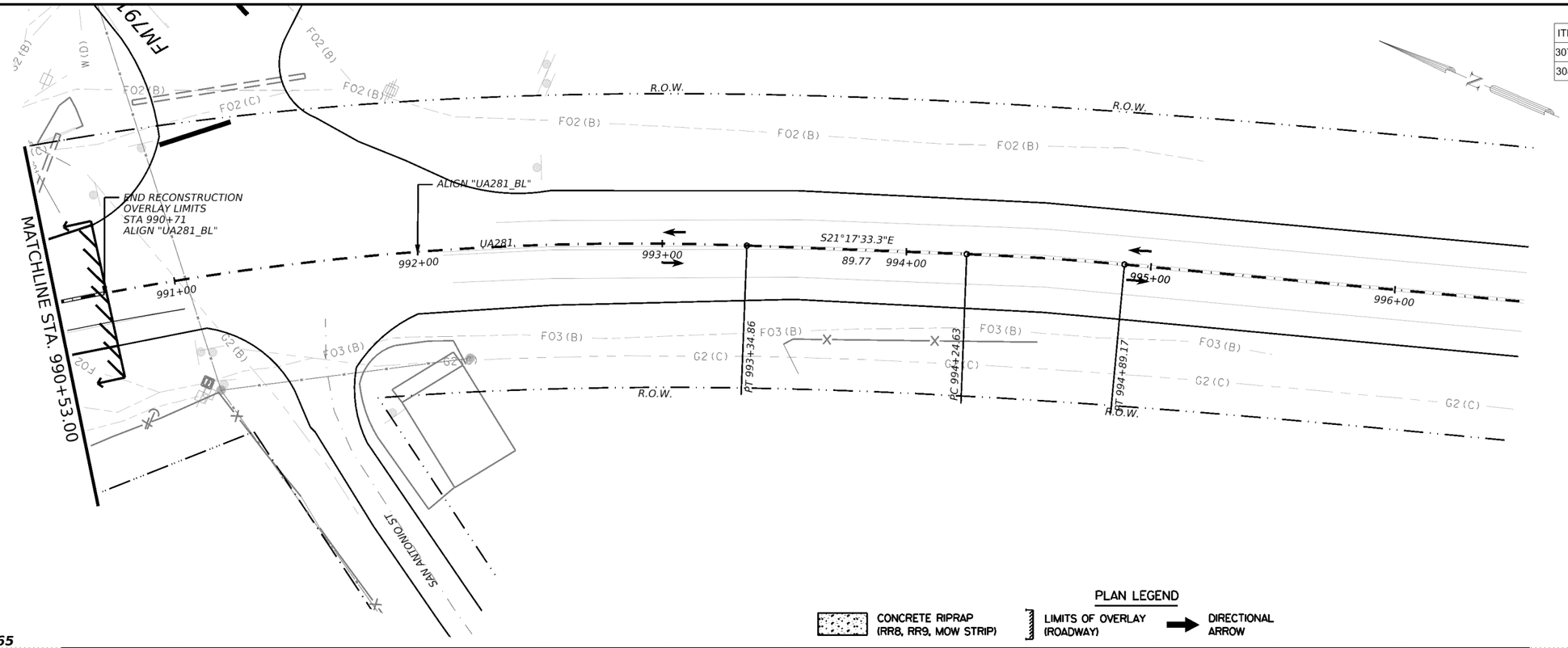
3085-6001	UNDERSEAL COURSE	SY	105



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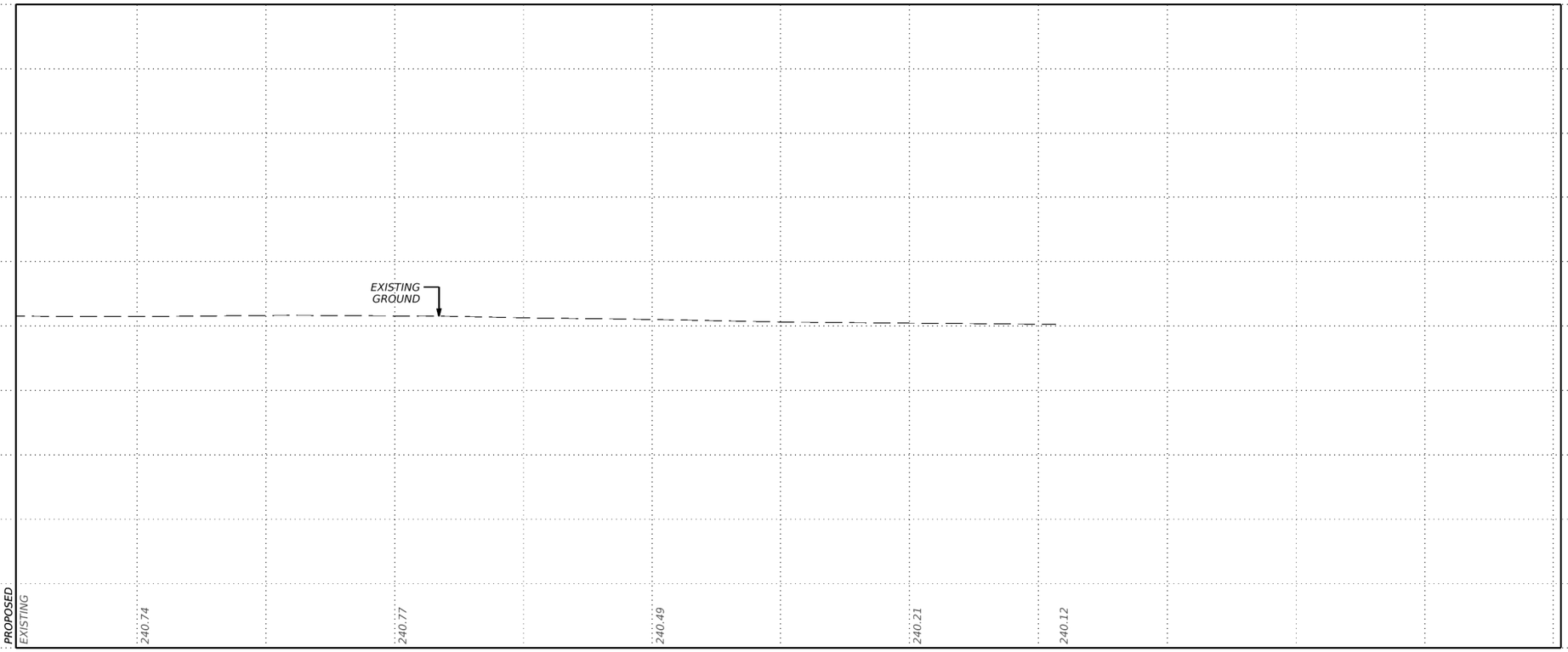
PLAN LEGEND

CONCRETE RIPRAP (RR8, RR9, MOW STRIP) | LIMITS OF OVERLAY (ROADWAY) | DIRECTIONAL ARROW



STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=50' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
PLAN AND PROFILE LAYOUT

SHEET: 5 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		112

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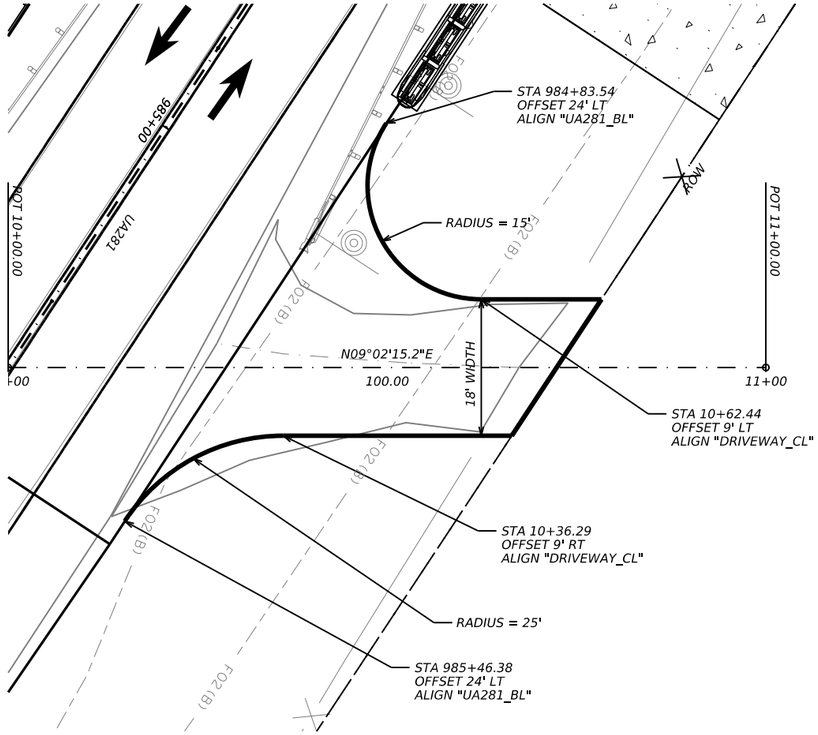

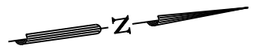

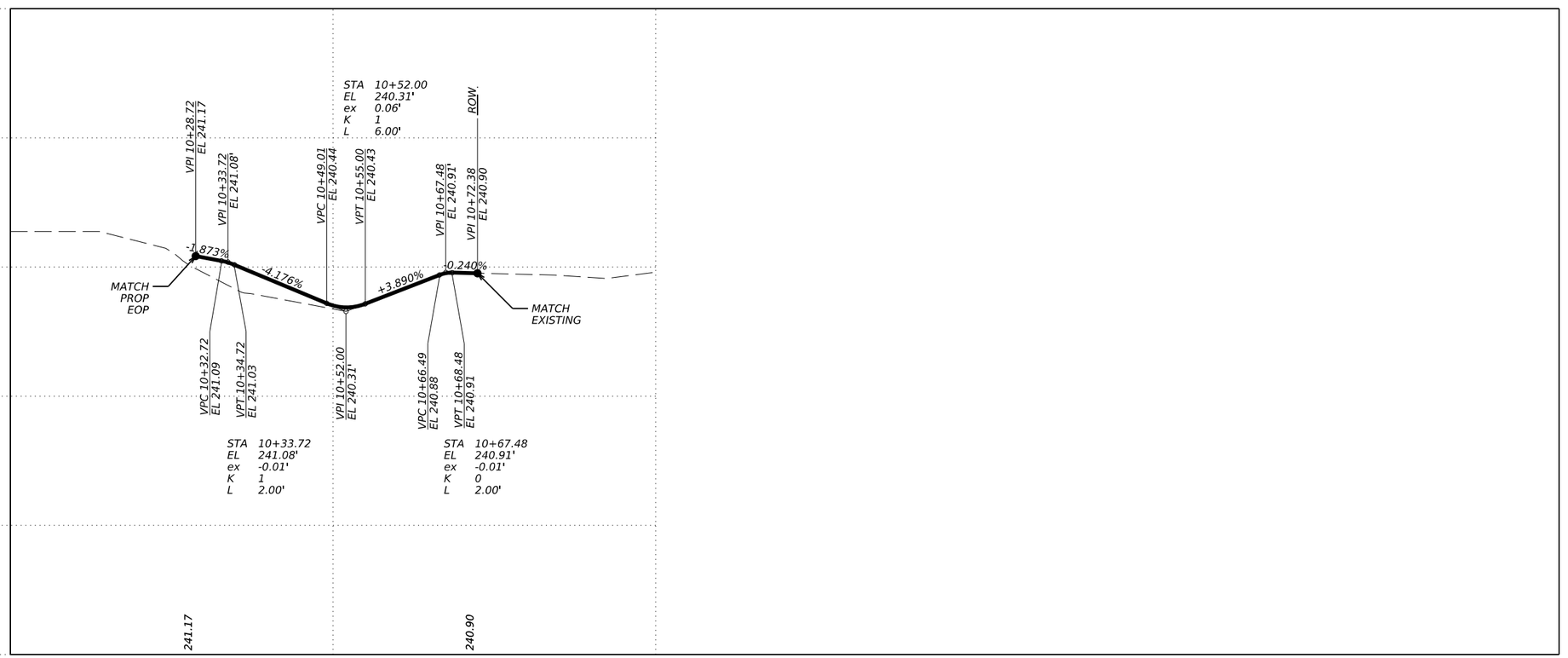

NOTE:
PAID FOR AS DRIVEWAY ACP (TYPE 1)
QUANTIFIED ON ROADWAY
PLAN AND PROFILE SHEETS
REFER TO DRIVEWAY DETAILS STANDARD
FOR MORE INFORMATION.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE
HORIZONTAL: 1" = 20' VERTICAL: 1" = 2'

Texas Department of Transportation

UA 281
DRIVEWAY
LAYOUT
NBDW01

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		113

11/27/2023 4:06:39 PM
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LOC NO.	ROADWAY	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	PLAN & PROFILE	4	UA 281 NB LANE	984+59.00	3	UNI	CONC.	9"	T223 BRIDGE RAIL	1'-3 1/2"	2'-8"	24.5'	INSTALL						N			
												TOTALS	1									

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyise.htm

ROADWAY CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT / JOB	HIGHWAY
REVISIONS	0073	13 / 012	UA 281
	DIST	COUNTY	
	SAT	ATASCOSA	
	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		114

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DATE: 11/29/2023 10:18:56 AM
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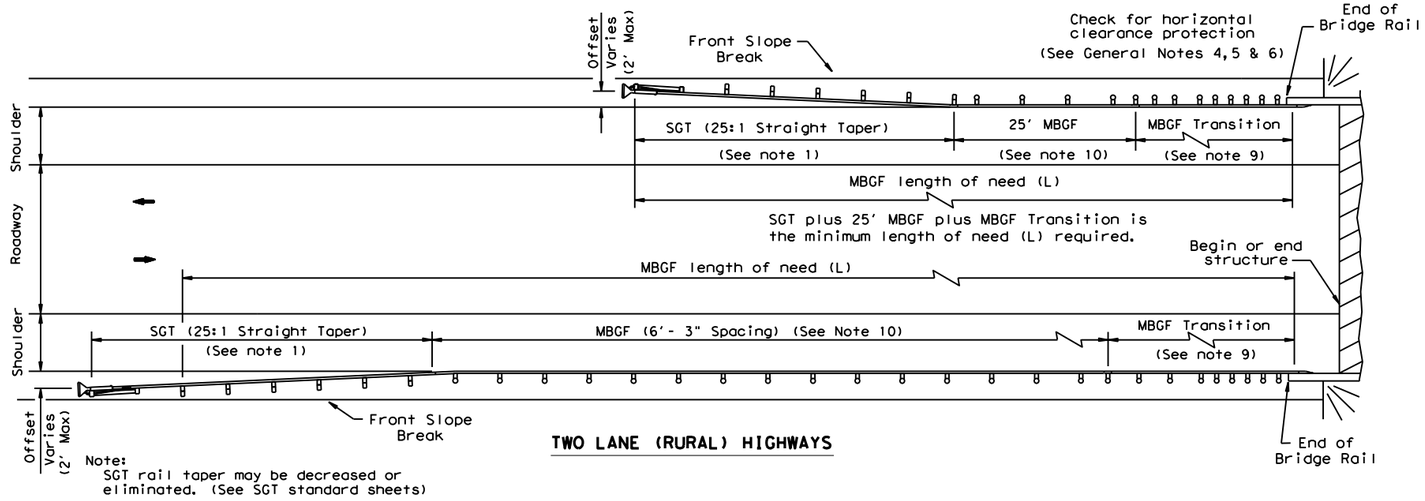
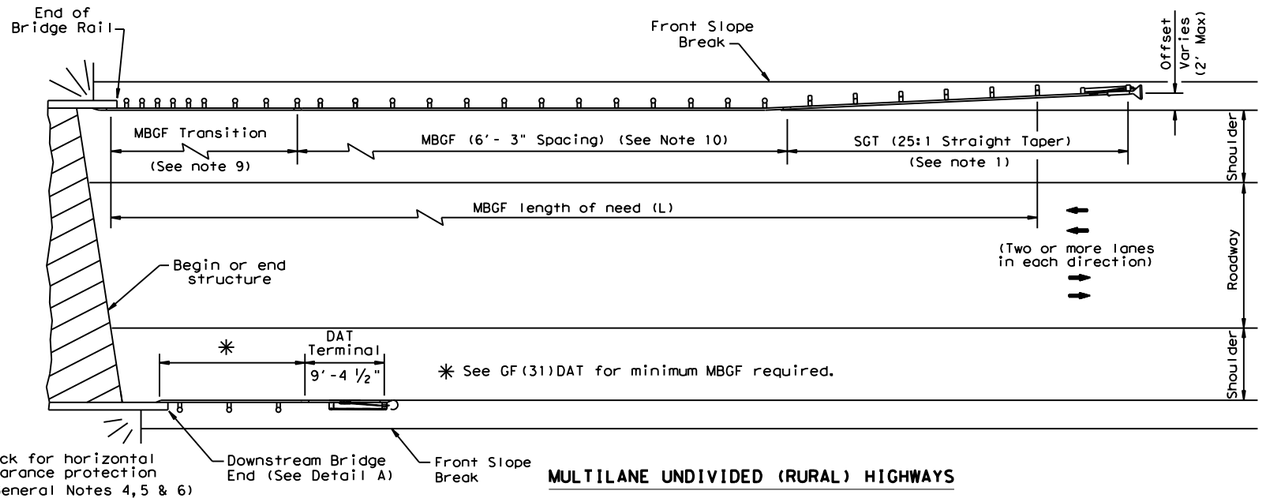
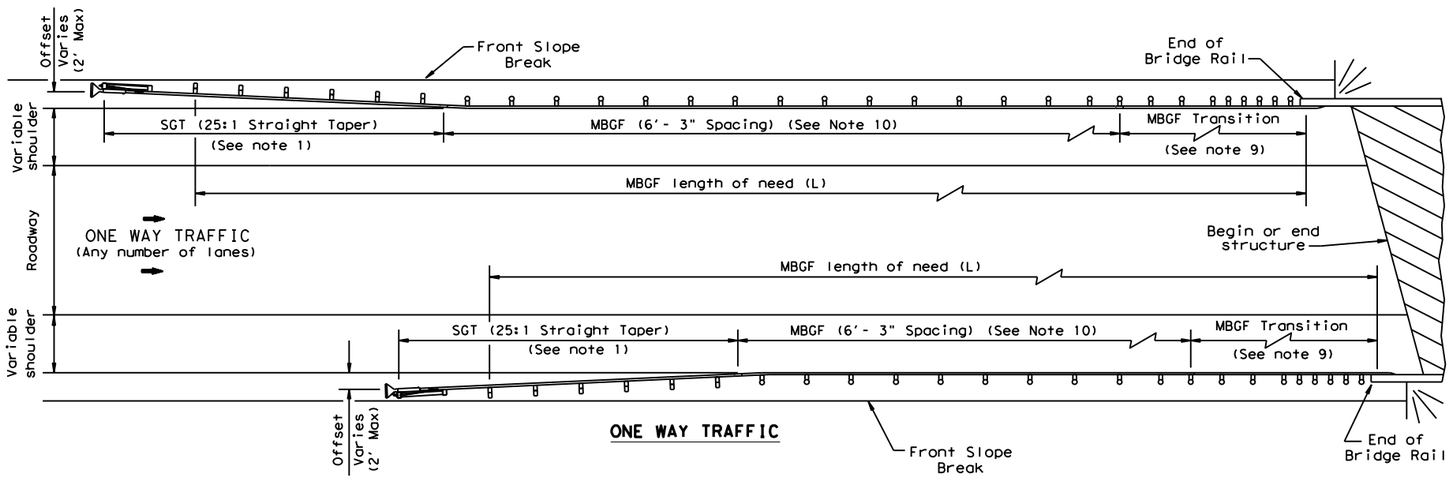


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



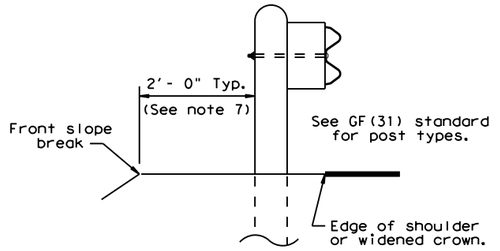
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC

GENERAL NOTES

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



TYPICAL CROSS SECTION AT MBGF

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

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation

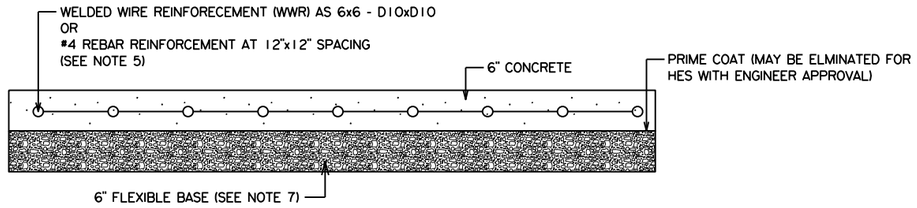
Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

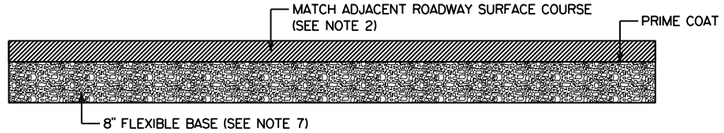
BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		115



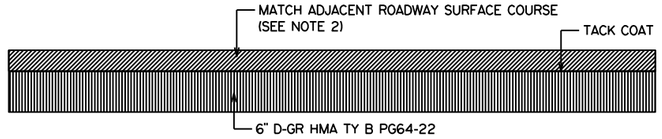
TYPICAL CONCRETE DRIVEWAY

• NOTE: STEEL SHALL BE CENTERED VERTICALLY IN CONCRETE.
PAID AS 'DRIVEWAYS CONC (HES)' OR 'DRIVEWAYS (CONC)'



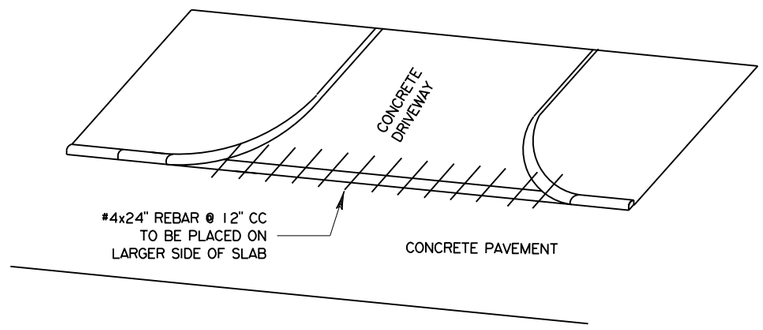
TYPICAL ROADWAY DRIVEWAY (TYPE 1)

PAID AS DRIVEWAYS ACP (TYPE 1)

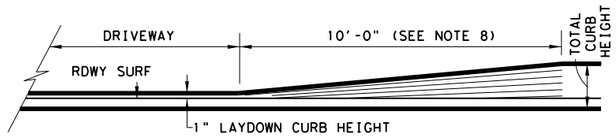


TYPICAL ROADWAY DRIVEWAY (TYPE 2)

PAID AS DRIVEWAYS ACP (TYPE 2)



TIE BAR PLACEMENT WITH CRCP



LAYDOWN CURB AT DRIVEWAYS DETAIL

NOTES:

1. USE CLASS A CONCRETE UNLESS OTHERWISE NOTED.
2. DENSE GRADED HMA MAY BE USED WHEN APPROVED BY THE ENGINEER IF THE ROADWAY SURFACE COURSE IS A PERFORMANCE MIX.
3. REFER TO PLAN SHEETS FOR GEOMETRIC DESIGN DETAILS.
4. FOR CONCRETE DRIVEWAYS, PROVIDE EXPANSION JOINT 20 FT C-C FOR WIDTH OR LENGTH OVER 25 FT.
5. FIBER REINFORCEMNT IS NOT ALLOWED.
6. MACHINE LAID HMA IS REQUIRED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
7. FURNISH BASE MEETING THE REQUIREMENTS FOR ANY TYPE OF GRADE IN ACCORDANCE WITH ITEM 247. FLEXIBLE BASE COMPRESSIVE STRENGTHS ARE WAIVED. BASE IS SUBSIDIARY TO THE ITEM.
8. WHERE SIDEWALK IS PRESENT, SLOPE AND LENGTH OF CURB TRANSITION SHOULD MATCH THE SIDEWALK AND MEET ADA REQUIREMENTS.
9. IF ROOTS ARE ENCOUNTERED VERIFY WITH THE ENGINEER PRIOR TO ACCOMODATING OR REMOVING 2 IN. DIAMETER OR LARGER ROOTS. ROOT REMOVAL MUST BE IN ACCORDANCE WITH ITEM 752.4.2. ROOTS MAY REMAIN IN THE BASE. FOR IMPROVEMENTS WITHIN 6 IN. OF A ROOT, THE CONCRETE THICKNESS MAY BE REDUCED BY 1 IN. AND THE BASE INCREASED BY 1 IN. TO MINIMIZE THE IMPACT TO THE ROOTS. ADJUST BASE AND SURFACE PROFILE TO PROVIDE A 1 IN. BASE CUSHION AROUND THE ROOTS. THE SURFACE PROFILE MAY BE ADJUSTED TO THE EXTENT ALLOWED BY ADA. THIS WORK IS SUBSIDIARY.

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Texas Department of Transportation
San Antonio District

DRIVEWAY DETAILS

San Antonio District Standard
Sheet (1 of 1)

T:Engdata/Standards/Drivewaydetails.dgn	PREPARED BY AND FOR USE OF TxDoT.					
ORIGINAL DRAWING DATE: 8/1/2020	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #			SHEET
REVISIONS	SAT	6	SEE TITLE SHEET			116
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	ATASCOSA		0073	13	012	UA 281

DATE: 11/29/2023 10:20:16 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130122/4 - Design/Plan Set/3. Roadway/Standards/DRIVEWAY DETAILS.dgn

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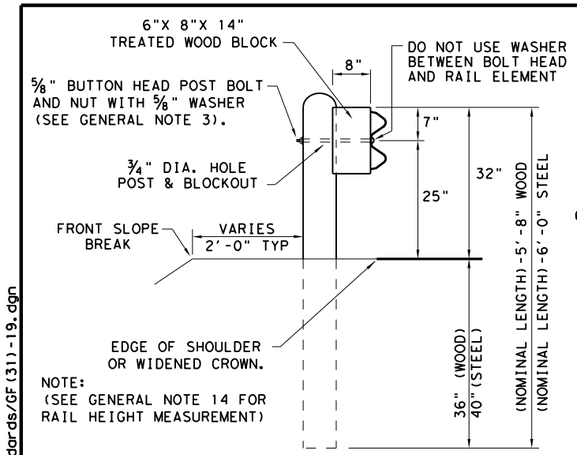
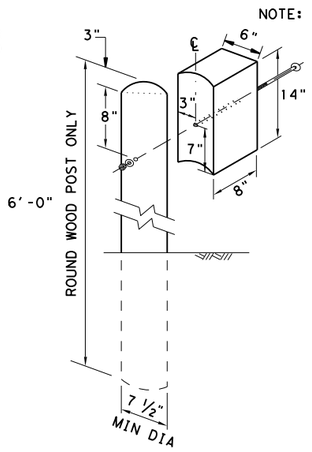
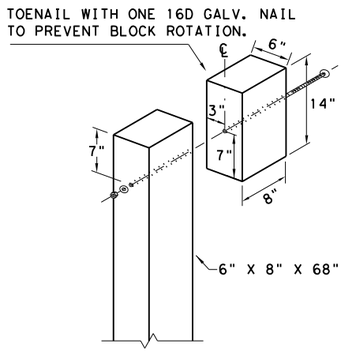


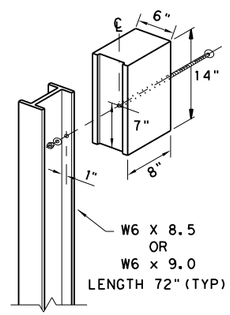
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

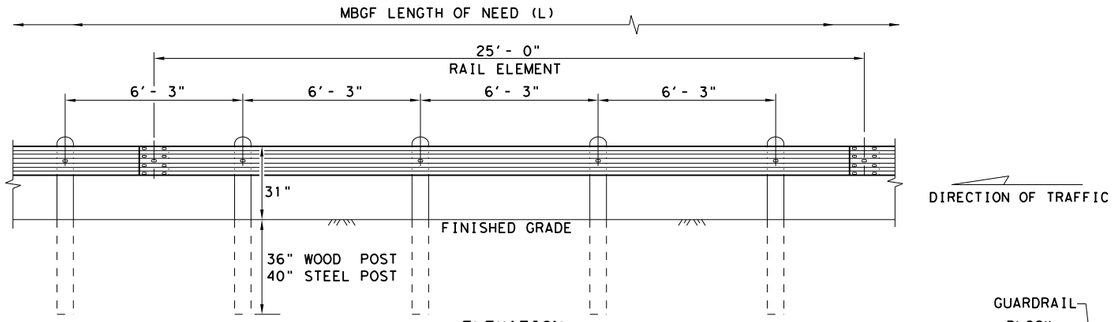


WOOD BLOCK TO RECTANGULAR WOOD POST



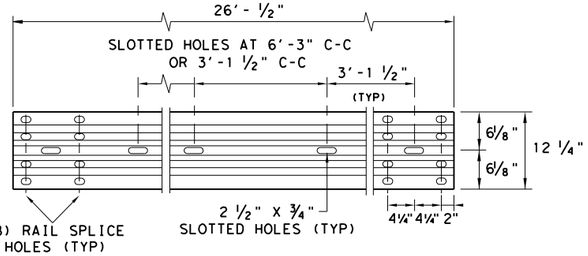
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

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



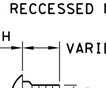
ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

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

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL
BOLTS COME WITH A RECCESSED NUT.

SPLICE BOLT LENGTH → VARIES

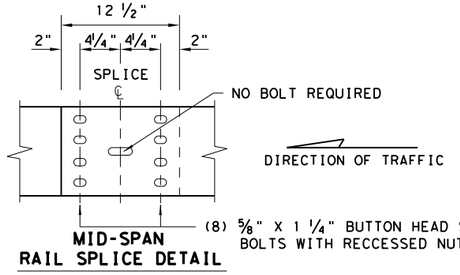
FBB01 = 1 ¼"
FBB02 = 2"



POST & BLOCK LENGTH
FBB03 = 10"
FBB04 = 18"

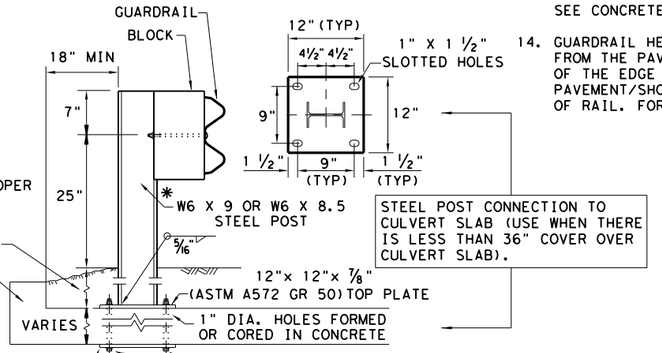
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

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

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		117

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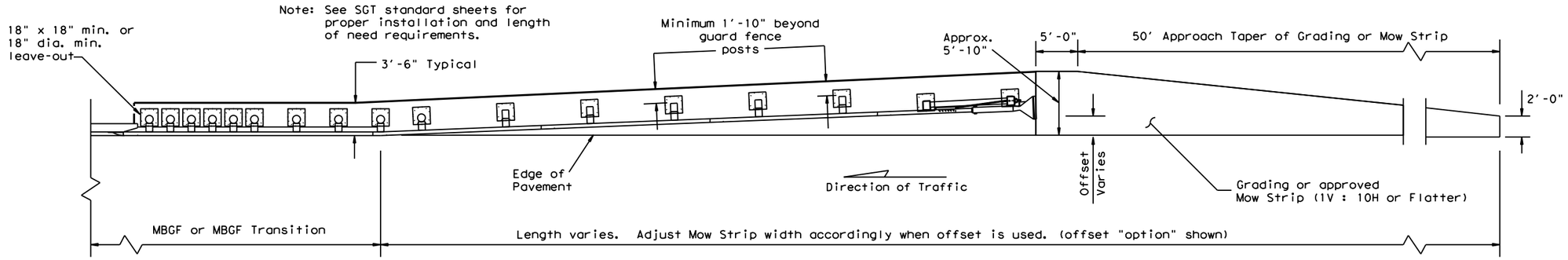
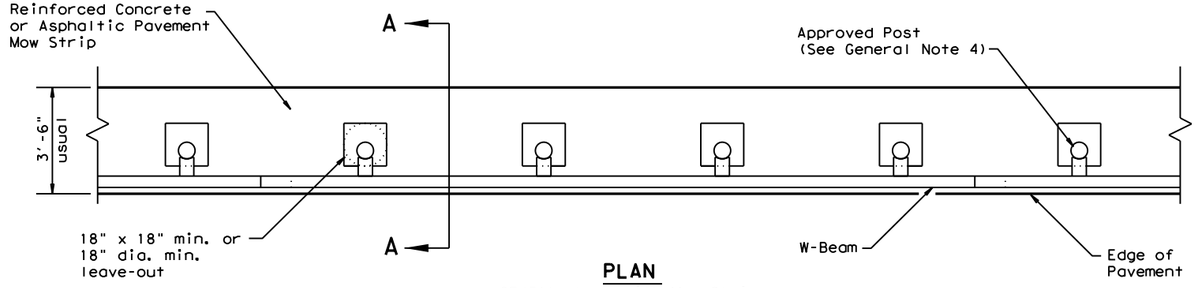


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



PLAN

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

SECTION A-A

Typical

MOW STRIP DETAIL

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

CURB OPTION (1)

This option will increase the post embedment throughout the system.

CURB OPTION (2)

Curb shown on top of mow strip

CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		118

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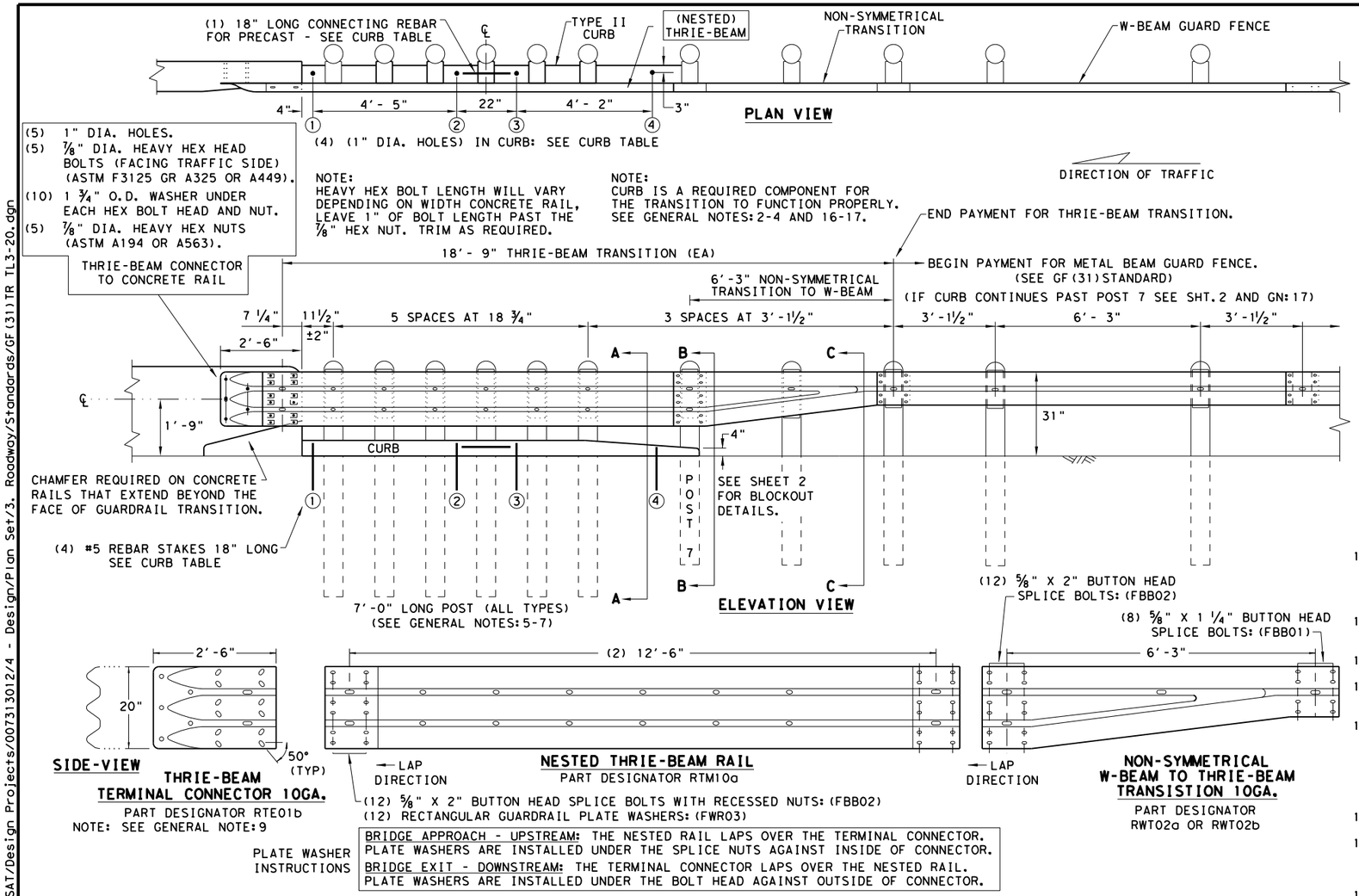


GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED) (TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED) (STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

THRIE-BEAM TERMINAL - CURB TABLE

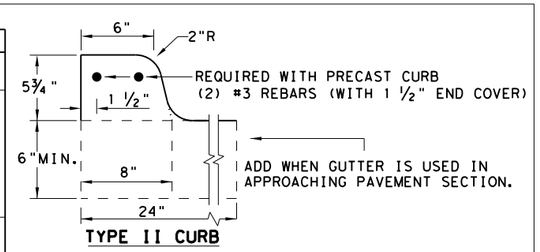
PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.



TYPE II CURB

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

TYPE II CURB DETAILS

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0073	13	012	UA 281	
	DIST	COUNTY		SHEET NO.	
	SAT	ATASCOSA		119	

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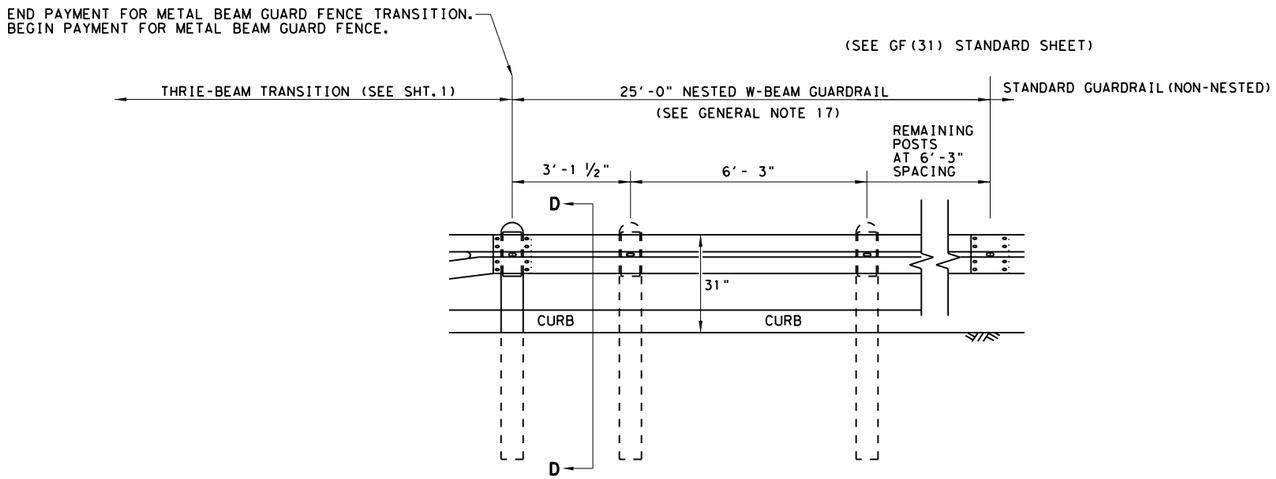
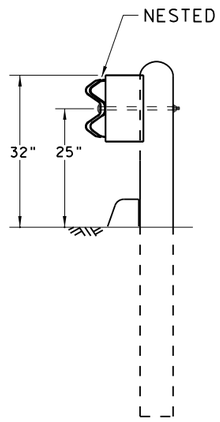
DATE: 12/1/2023
FILE: dw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/3. Roadway/Standards/GF(31)TR TL3-20.dgn

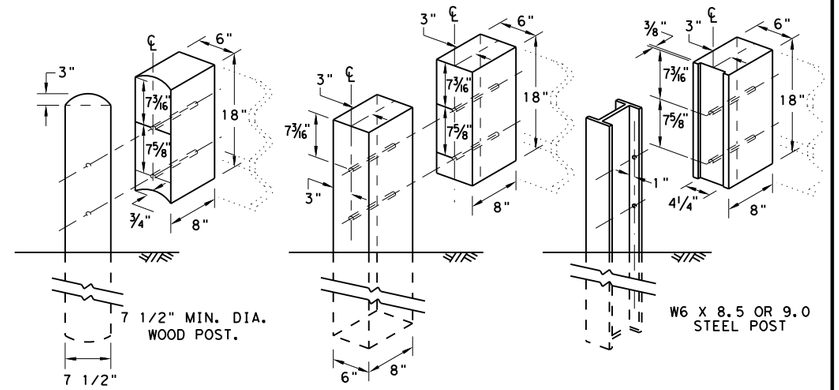
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0073	13	012	UA 281	
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NOTE: STEEL I-BEAM POST W6 X 8.5 (6'-0") PN: 533G
STANDARD WOOD BLOCKOUTS (6"X8"X14") PN: 4076B
AT (POSTS 2 THRU 8)

⅝" X 10" HGR BOLT PN: 3500G
⅝" HGR NUT PN: 3340G

LINE AT THE BACK OF POST #2 THRU #8

FROM THE CENTERLINE OF POST(1) & POST(0)

ANCHOR PADDLE PN: 15204A

ANGLE STRUT PN: 15202G

16"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3)

DO NOT BOLT ANCHOR RAIL TO - POST (2)

SEE DETAIL 1

POST(1) POST(0)

TRAFFIC FLOW

PLAN VIEW

MASH TEST LEVEL 3 (TL-3) LENGTH OF SoftStop TERMINAL (50'-9 ½")

BEGIN LENGTH OF NEED

50'-9 ½" STANDARD INSTALLATION LENGTH (MASH TL-3 SoftStop)

BEGIN STANDARD MBGF

END PAYMENT FOR SGT

6¼" 3'-1 ½" 6'-3" 6'-3"

ANCHOR RAIL WITH SLOTS - (THREADED THRU HEAD)
SEE SoftStop MANUAL FOR COMPLETE DETAILS

MIDDLE SLOT CUTOUT
(1) 1 ¾" X 6'-10 ¼"

OUTSIDE SLOTS CUTOUT
(2)½" X 6'-9 ⅝"

MBGF LAPPED IN DIRECTION OF TRAFFIC FLOW

25'-0" DOWNSTREAM W-BEAM GUARDRAIL PN: 61G

SoftStop ANCHOR RAIL (12GA) PN: 15215G

SoftStop FACE SEE GN(3) & NOTE:B

3'-1 ½"(+/-) 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 5'-8" 4'-7"

ANCHOR PADDLE PN: 15204A

END OF ANCHOR RAIL PN: 15215G

SEE NOTE:A

SEE NOTE:C

POST 32" HEIGHT

31"

RAIL HEIGHT

RAIL 25'-0" PN: 61G

RAIL 25'-0" PN: 15215G

(8) ⅝"x 1- ¼" GR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST 40" DEPTH (TYP 1-8)

(8) ⅝"x 1- ¼" HGR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

DO NOT BOLT ANCHOR RAIL TO POST(2)

SEE DETAIL 2

SEE DETAIL 3

13/16" DIA. YIELDING HOLES

13/16" DIA. YIELDING HOLES

6'-1⅜"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3)

POST(2) 6'-0" (SYTP) PN: 15000G

POST(1) 4'-9 ½" SYTP PN: 15203G

POST(0) 6'-5 ⅜" PN: 15205A

ELEVATION VIEW

HARDWARE FOR POST(2) THRU POST(8)
(1) ⅝"x 10" HGR BOLT PN: 3500G
(1) ⅝" HGR HEX NUT PN: 3340G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

(1) ⅝" x 1 ¾" HEX HD BOLT PN 3391G

ANGLE STRUT PN: 15202G

(2) ⅝" WASHERS PN 4372G

(1) ⅝" HGR HEX NUT PN 3340G

DETAIL 1

SHOWN AT POST(1) NEAR GROUND

(1) ⅝" HEX NUT

(1) ⅝" x 1- ½" HEX HD BOLT-GR-5 PN: 105286

(2) ⅝" ROUND WASHERS PN: 3240G

DETAIL 2

SHOWN AT POST(1)

ANCHOR KEEPER PLATE (24 GA) PN: 15207G

ANCHOR PLATE WASHER ½" THICK PN: 15206G

1" ROUND WASHER F463 PN: 4902G

(2) ⅝" x 2 ½" HEX HD BOLT GR-5 PN: 105285G

ALTERNATE BLOCKOUT SEE GENERAL NOTE:6

(2) ⅝" ROUND WASHER (WIDE) PN: 3240G

ANCHOR PADDLE PN: 15204A

(2) ⅝" HEX NUT A563 GR.DH PN: 3245G

1" NUT PN: 3908G SHALL BE SECURELY TIGHTENED AFTER FINAL ASSEMBLY, BUT NOT DEFORMING THE KEEPER PLATE.

W-BEAM FLATTENED (4 PLIES)

ANGLE STRUT PN: 15202G

SEE NOTE:A

(2) ¾" x 2 ½" HEX BOLT (TYP) PN: 3717G

(4) ¾" FLAT WASHER (TYP) PN: 3701G

(2) ¾" HEX NUT (TYP) PN: 3704G

(2) ANCHOR POST ANGLE PN: 15201G

6'-1 ⅜" POST DEPTH

DETAIL 3 AT POST(0)

6'-5 ⅜" (W6 X 15) I-BEAM POST PN: 15205A

TRAFFIC FLOW

ALTERNATE BLOCKOUT SEE GENERAL NOTE:6

4" X 7 ½" X 14" BLOCKOUT COMPOSITE PN: 6777B

6" X 8" X 14" BLOCKOUT WOOD PN: 4076B

NOTE: DO NOT BOLT ANCHOR RAIL TO POST(2)

8" 6" 14"

⅝" HGR NUT PN: 3340G

⅝" X 10" HGR POST BOLT PN: 3500G

13/16" DIAMETER YIELDING HOLES LOCATED IN FLANGES

FINISHED GRADE

(HOLES APROXIMATELY CENTERED AT FINISHED GRADE)

ISOMETRIC VIEW POST(1 & 2)

W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

LINE POST (3, 4, 5, 6, 7 & 8)

FINISHED GRADE

SECTION VIEW B-B

6'-0" (W6 X 8.5) I-BEAM POST PN: 533G

6" X 8" X 14" BLOCKOUT WOOD

W-BEAM RAIL 25'-0"

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

POST(2)

FINISHED GRADE

SECTION VIEW A-A

6'-0" (W6 X 8.5) (SYTP) I-BEAM POST PN: 15000G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

POST 17"- ½" HEIGHT

4'- 9 ½"

13/16" DIA. YIELDING HOLES

40"

POST(1)

FRONT VIEW POST(1)

4'-9 ½" (W6 X 8.5) (SYTP) I-BEAM POST PN: 15203G

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

2'-0"

STANDARD MBGF

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX. RAIL OFFSET

APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE:A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-¾" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE:B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE:C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 ⅜")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR.DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅝" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

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

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
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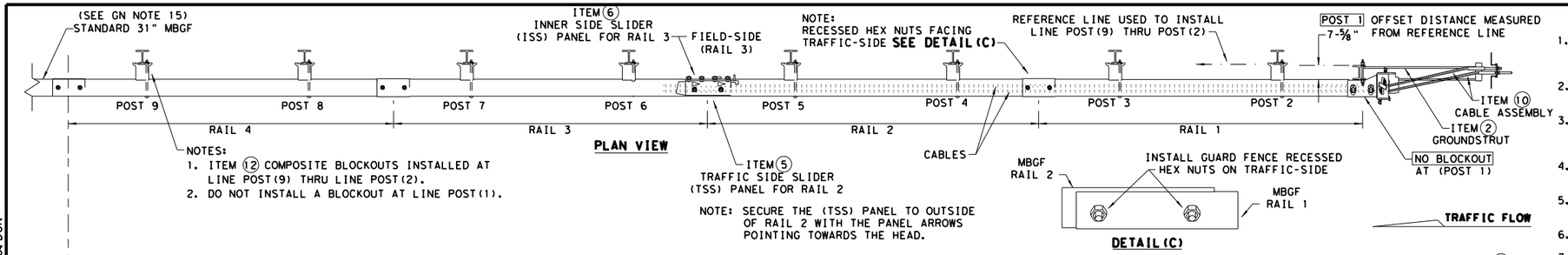

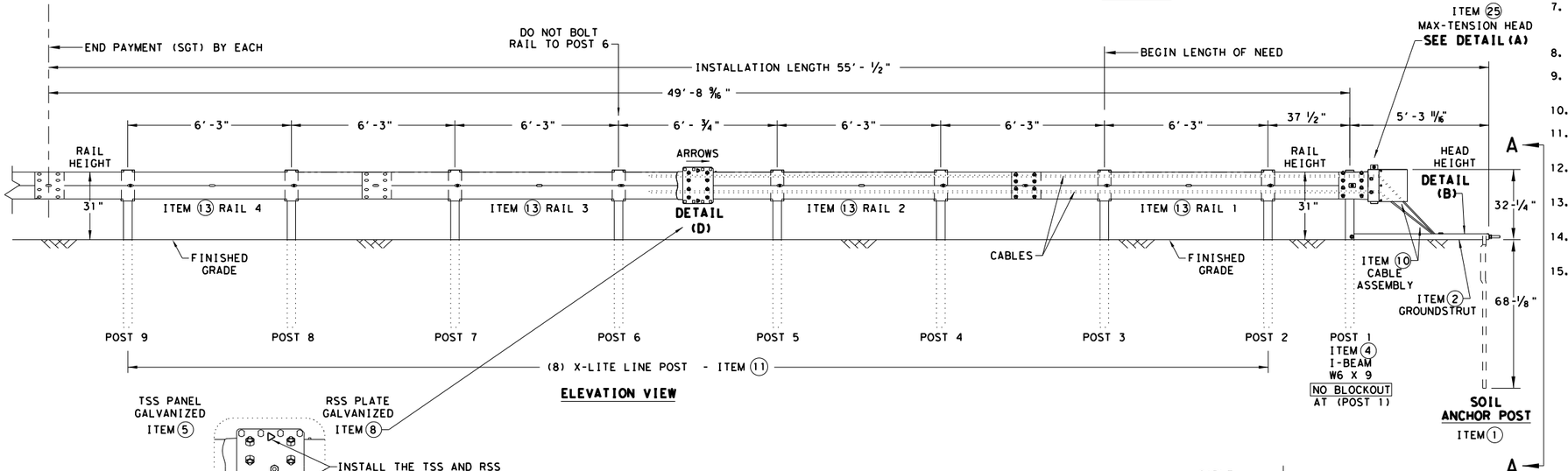

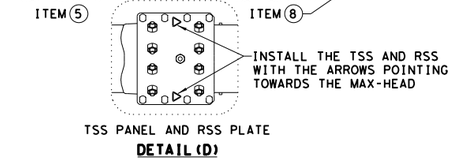

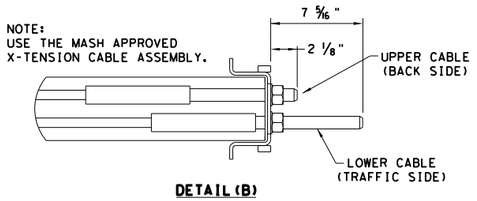

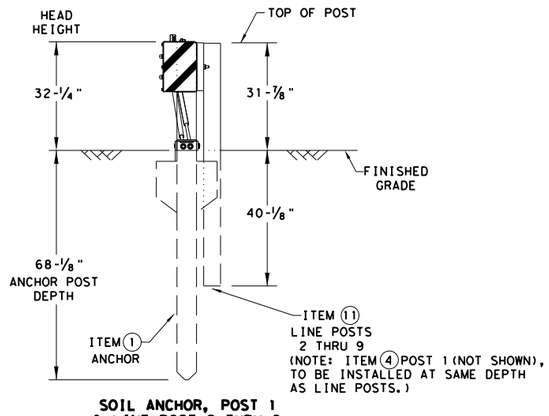

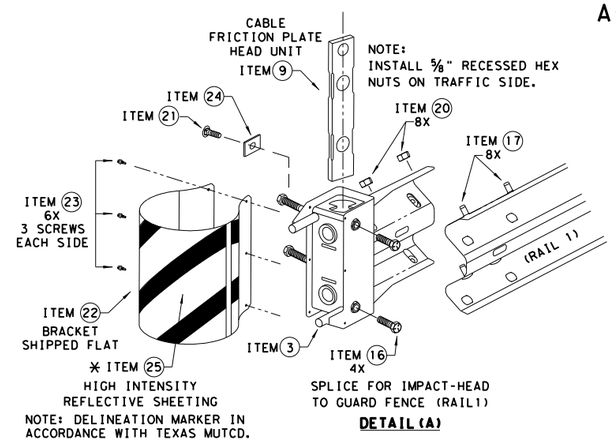

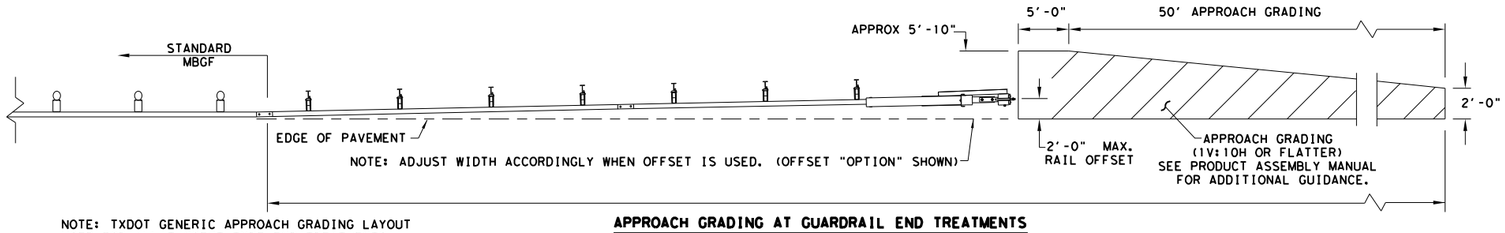

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

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

Texas Department of Transportation

Design Division Standard

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

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
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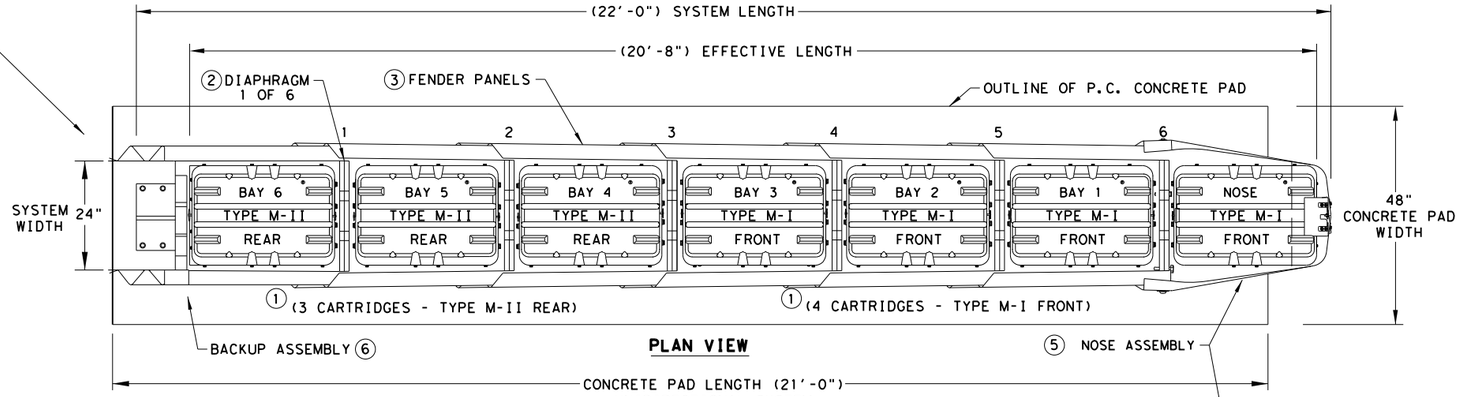
DATE: 12/5/2023
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/3. Roadway/Standards/QGUARD(M10)(N)-20.dgn

NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD M10 TO THE OBJECT BEING SHIELDED.

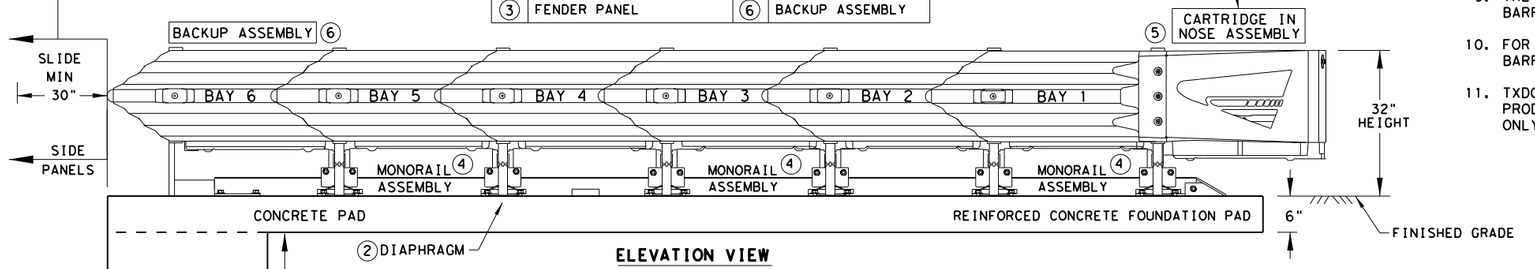
QUADGUARD M10 24" WIDE 6-BAY SYSTEM



PLAN VIEW

KEY		KEY	
(1)	QUADGUARD CARTRIDGE	(4)	MONORAILS
(2)	DIAPHRAGM	(5)	NOSE ASSEMBLY
(3)	FENDER PANEL	(6)	BACKUP ASSEMBLY

NOTE:
PROVISION SHALL BE MADE FOR REAR FENDER SIDE PANELS TO SLIDE REARWARD UPON IMPACT, 30" MIN.



ELEVATION VIEW
LEFT SIDE

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.

A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD M10 (N) INSTALATION AND DETAILED INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY FOR THE REQUIRED TRANSITION WILL BE PROVIDED TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.

8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

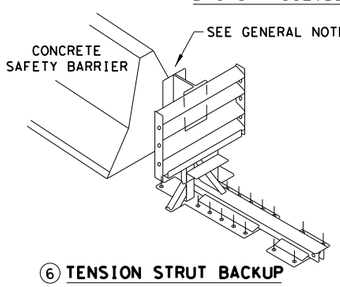
CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:
THE QUADGUARD M10 24" WIDE 6-BAY - NARROW SYSTEM HAS BEEN TESTED TO MASH TEST LEVEL 3.

TL-3 MODEL #	QM10024	CARTRIDGE TYPES IN BAYS		
BAYS	6	TYPE-MII	TYPE-MI	TYPE-MI
DIAPHRAGMS	6	3	3	1
WIDTH	24"	REAR	FRONT	NOSE

TL-2 MODEL #	QM7024	CARTRIDGE TYPES IN BAYS		
BAYS	3	TYPE-MII	TYPE-MI	TYPE-MI
DIAPHRAGMS	3	1	2	1
WIDTH	24"	REAR	FRONT	NOSE

BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS



⑥ TENSION STRUT BACKUP

SYSTEM TRANSITIONS TYPES	
1	QUAD-BEAM TO CONCRETE SAFETY BARRIER
2	QUAD-BEAM TO CONCRETE BRIDGE RAIL
3	QUAD-BEAM TO CONCRETE END SHOE
4	QUAD-BEAM TO THRIE-BEAM RAIL
5	QUAD-BEAM TO W-BEAM RAIL

NOTE:
TRANSITION ASSEMBLIES FOR THE QUADGUARD M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:

ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION INC. AT 1(888)323-6374.
2. SEE THE RECENT QUADGUARD M10 PRODUCT DESCRIPTION ASSEMBLY MANAUAL FOR IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITIONS AND THE DRAWING PACKAGE FOR THE NARROW 24" SYSTEM BEFORE INSTALLING THE QUADGUARD M10 SYSTEM AT ANY GIVEN LOCATION.
3. FOR BI-DIRECTIONAL TRAFFIC: THE PLACEMENT OF THE QUADGUARD M10 IS RESTRICTED. AS BI-DIRECTIONAL TRAFFIC APPROACHES THE REAR OF THE QUADGUARD M10 THE CRASH CUSHION MUST BE PLACED SUCH THAT THE TRAFFIC SIDE OF CRASH CUSHION IS AT LEAST AS FAR FROM ADJACENT TRAVEL LANE LINE AS THE TRAFFIC SIDE OF BARRIER/OBJECT BEING SHIELDED.
4. SYSTEM TRANSITION: APPROPRIATE TRANSITION PANELS OR SIDE PANELS WILL BE REQUIRED FOR PROPER IMPACT PERFORMANCE. THE CORRECT PANEL(S) TO USE WILL DEPEND ON THE DIRECTION OF TRAFFIC FLOW AND WHAT TYPE OF BARRIER OR ROAD FEATURE THE QUADGUARD M10 SYSTEM IS SHIELDING. SEE THE QUADGUARD M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL FOR FURTHER DETAILS.
5. COMPONENTS FOR THE QUADGUARD M10 BACKUP AND REINFORCING DETAILS ARE SHOWN ON THE QUADGUARD M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL.
6. CONCRETE PAD SHALL BE 6" MIN. REINFORCED 28MPa [4,000 PSI] (P.C.) OR 8" MIN. NON-REINFORCED 28MPa [4,000 PSI] CONCRETE ROADWAY MEASURING AT LEAST 12'-0" WIDE BY 50'-0" LONG. ANCHOR BLOCK IS NOT REQUIRED WHEN USING 8" CONCRETE PAD INSTALLED AGAINST AN IMMOVABLE STRUCTURE, E.G. CONCRETE WALL.
7. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
8. THE INSTALLATION AREA SHOULD BE FREE OF CURBS, ELEVATED OBJECTS,OR DEPRESSIONS.
9. THE QUADGUARD M10 SYSTEM SHOULD BE INSTALLED APPROXIMATELY PARALLEL WITH THE BARRIER.
10. FOR THE TENSION STRUT BACKUP THE DISTANCE BETWEEN THE BACK OF BACKUP AND THE BARRIER WALL SHOULD NOT EXCEED 7" IN ANY CASE.
11. TXDOT HAS ONLY APPROVED THE 24" WIDE QUADGUARD M10 SYSTEM. THE QUADGUARD M10 PRODUCT DESCRIPTION AND ASSEMBLEY MANUAL INCLUDES SYSTEM WIDTH OF 24". ONLY THE 24" SYSTEM IS ALLOWED TO BE INSTALLED ON TEXAS ROADWAYS.

FOUNDATION & ANCHORING REQUIREMENTS FOUNDATION TYPES: A, B, C, & D	
FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE

KEY:
ASPHALT CONCRETE (A.C.)
COMPACTED SUBBASE (C.S.)
PORTLAND CEMENT CONCRETE (P.C.C.)

NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.

IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

TENSION STRUT BACKUP MAY BE USED IN CONSTRUCTION ZONES ON ASPHALT CONCRETE (A.C.) FOR TEMPORARY USE ONLY.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE QUADGUARD M10 SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

REUSABLE

Texas Department of Transportation — Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD M10 (MASH TL-3 & TL-2 NARROW-24"ONLY)

QGUARD(M10)(N)-20

FILE: qguardm10n20.dgn	DN: TxDOT	CK: KM	DW: VP	CK: AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
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DATE: 12/5/2023
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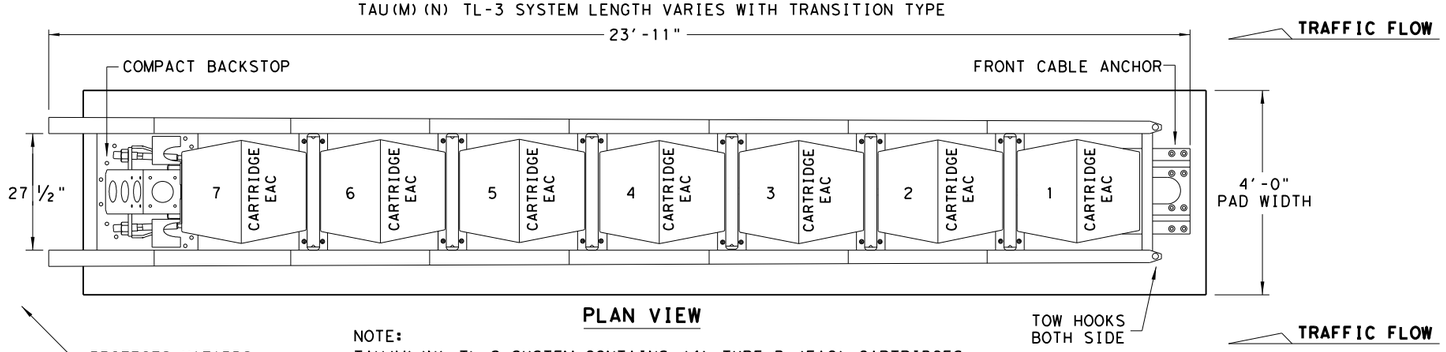
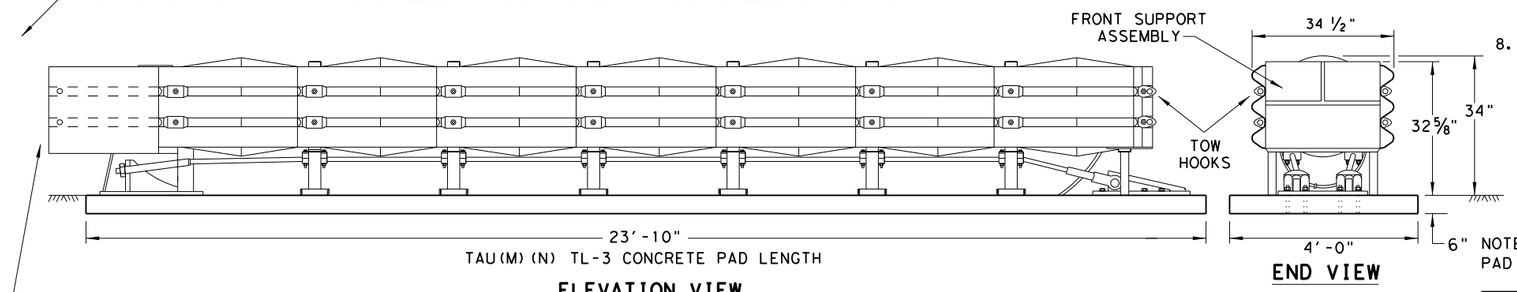
TAU(M)(N) TL-3 SYSTEM LENGTH VARIES WITH TRANSITION TYPE



PLAN VIEW

NOTE:
TAU(M)(N) TL-2 SYSTEM CONTAINS (4) TYPE B (EAC) CARTRIDGES. INSTALLED ON ROADWAYS WITH MAXIMUM SPEEDS OF 45 MPH.



ELEVATION VIEW

END VIEW

NOTE:
PAD THICKNESS VARIES - SEE FOUNDATION OPTIONS

NOTES:
TRANSITIONS AND ATTACHMENTS TO VARIOUS BARRIER SHAPES, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL FOR ADDITIONAL TRANSITION DETAILS.

NOTE:
CONCRETE FOUNDATION PAD LENGTH VARIES WITH TL-3 AND TL-2 SYSTEMS, SEE SYSTEM & FOUNDATION LENGTH TABLE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE
8" UNREINFORCED CONCRETE
ASPHALT OVER CONCRETE WITH MINIMUM 6" EMBEDMENT IN CONCRETE
* 6" ASPHALT OVER 6" COMPACT SUBBASE
* 8" MINIMUM ASPHALT

SYSTEM & FOUNDATION LENGTH TABLE	
SYSTEM LENGTH	FOUNDATION LENGTH
TL-2 = 15'-5"	TL-2 = 15'-4"
TL-3 = 23'-11"	TL-3 = 23'-10"

* NOTE:
REQUIRES AN ASPHALT ANCHORAGE PACKAGE: INCLUDES ADDITIONAL BRACES FOR THE FRONT CABLE ANCHOR AND THE COMPACT BACKSTOP, AND ASPHALT HARDWARE KIT. THE TL-3 ASPHALT CONFIGURATION ALSO REQUIRES NESTED SLIDER PANELS AND SHIMS AT THE LAST TWO BAYS. SEE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL FOR DETAILS.

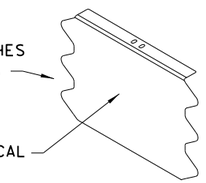
NOTE:
SEE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL FOR FOUNDATION SPECIFICATIONS THAT INCLUDE, STONE AGGREGATE MIX, COMPRESSION STRENGTH, STEEL SIZE, ANCHOR SIZE, AND EMBEDMENT DEPTH.

TRANSITION OPTIONS	
USE THE COMPACT BACKSTOP	VERTICAL WALL
	CONCRETE TRAFFIC BARRIERS
	W-BEAM GUARDRAIL
	THRIE BEAM GUARDRAIL

NOTE:
FOR BI-DIRECTIONAL TRANSITION PANELS AND BRIDGE RAIL END SHOE DETAILS. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL.

** NOTE:
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
DELINEATION BRACKET ATTACHES TO FRONT SUPPORT ASSEMBLY.



DELINEATION BRACKET

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

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. REFER TO THE LATEST (LTS) INSTALLATION INSTRUCTION MANUAL FOR IMPORATANT SAFETY MESSAGES, COMPLETE SYSTEM ASSEMBLY, AND ANCHOR INSTALLATION REQUIREMENTS FOR THE NINE (9) DIFFERENT SITE TRANSITIONS.
3. INSTALLATION DETAILS FOR THE COMPACT BACKSTOP, FRONT CABLE ANCHOR AND FOUNDATION OPTIONS ARE SHOWN ON THE INSTALLATION INSTRUCTION MANUAL FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I.
5. IF THE CROSS-SLOPES VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE TAU(M)(N) SYSTEM SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTER LINE OF MERGING BARRIERS.
8. THIS DRAWING REPRESENTS THE UNIVERSAL TAU(M)(N) TL-3 SYSTEM, A RE-DIRECTIVE NON-GATING CRASH CUSHION THAT CAN PROTECT HAZARDS UP TO 30-INCHES IN WIDTH. ALSO AVAILABLE IN TL-2 CONFIGURATION.

BILL OF MATERIALS FOR TAU(M)(N) TL-3 & TL-2 SYSTEMS		QUANTITIES	
PART NUMBER	PART DESCRIPTION	TL-3 SYSTEM	TL-2 SYSTEM
BSI-1708019-00	SLIDING PANEL GALVANIZED TAU(M)(N)	14	8
BSI-1708030-00	END PANEL, THRIE BEAM, GALV, TAU(M)(N)	2	2
BSI-1706001-00	CABLE ASSEMBLY, 7 BAY, TAU(M)(N)	2	-
BSI-1805036-00	CABLE ASSEMBLY, 4 BAY, TAU(M)(N)	-	2
BSI-1708018-00	FRONT CABLE ANCHOR	1	1
BSI-1707034-00	COMPACT BACKSTOP	1	1
B030703	MIDDLE SUPPORT ASSEMBLY	6	3
B030704	FRONT SUPPORT	1	1
B010722	ENERGY ABSORBING CARTRIDGE, TYPE B	7	4
K001005	TAU-II FRONT SUPPORT LEG KIT	1	1
BSI-1709083-KT	TETHER KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1809041-KT	SLIDER KIT (INCLUDES ALL HARDWARE)	7	4
BSI-1808033-KT	CABLE GUIDE KIT (INCLUDES ALL HARDWARE)	6	3
BSI-1809040-KT	TOW HOOK KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808034-KT	DELINEATION BRACKET KIT(INCLUDES ALL HARDWARE)	1	1
BSI-1808035-KT	END PANEL MOUNT KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808036-KT	CONCRETE ANCHORING KIT	1	1
** SEE NOTE	HIGH REFLECTIVE DECAL	1	1
ECN 3883	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

NOTES:
UPGRADE KITS ARE AVAILABLE TO RETROFIT EXISTING NCHRP 350 TAU-II SYSTEMS TO MASH COMPLIANT SYSTEMS. SEE MANUFACTURER'S PRODUCT INFORMATION.

THE TAU(M)(N) UNIDIRECTIONAL SYSTEM IS FREE STANDING AND IS NOT REQUIRED TO BE CONNECTED TO THE HAZARD.

TRANSITIONS TO GUARD FENCE, BRIDGE RAILS AND ROADSIDE BARRIERS SHALL BE IN ACCORDANCE WITH TxDOT'S POLICY.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE UNIVERSAL TAU(M)(N) SYSTEM, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTION MANUAL.

REUSABLE

Texas Department of Transportation — Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS

UNIVERSAL CRASH CUSHION (MASH TL-3 & TL-2)

TAU(M)(N)-19

FILE: taumn19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: APRIL 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
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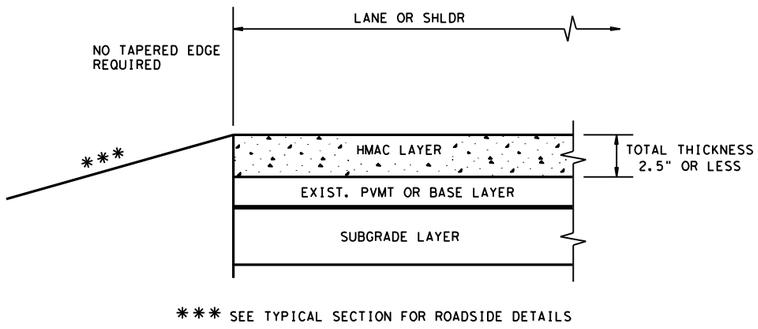
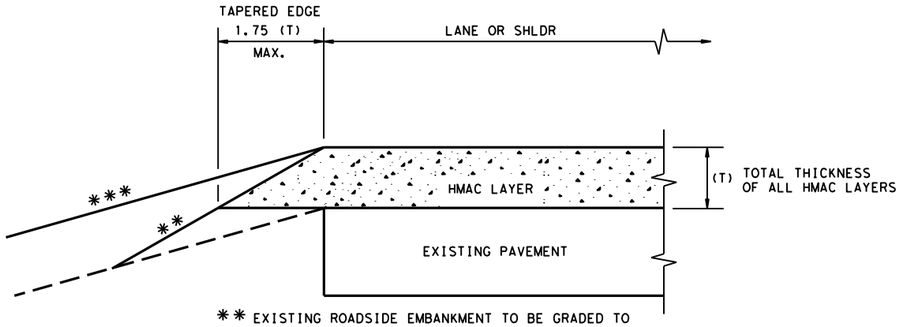


*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

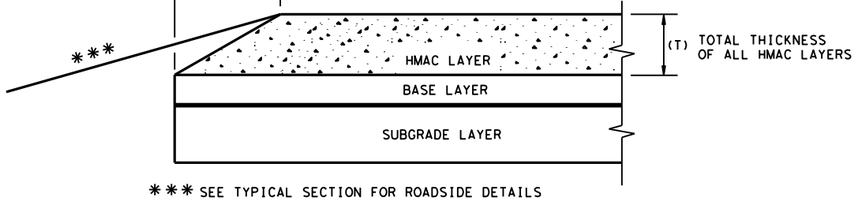
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



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

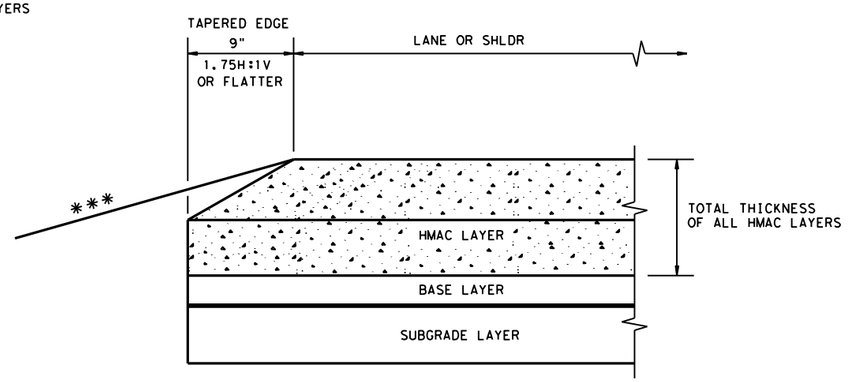
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

(NOT TO SCALE)

GENERAL NOTES

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

Texas Department of Transportation | Design Division Standard

TAPERED EDGE DETAILS
HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
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REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
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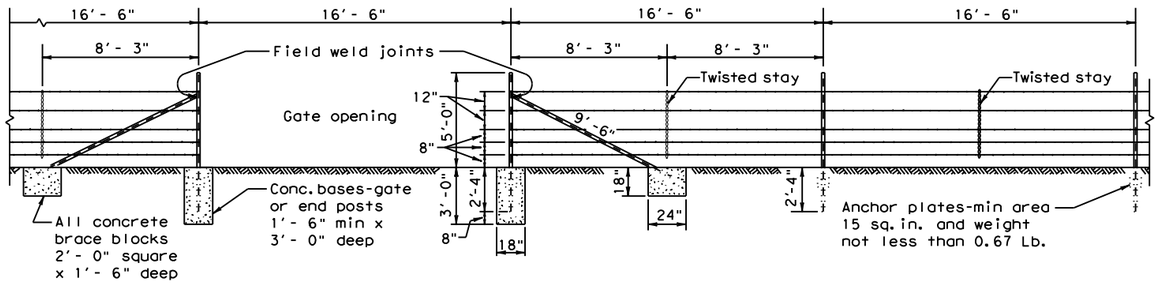
DATE: 12/5/2023
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130l2/4 - Design/Plan Set/3. Roadway/Standards/WF(2)-10.dgn



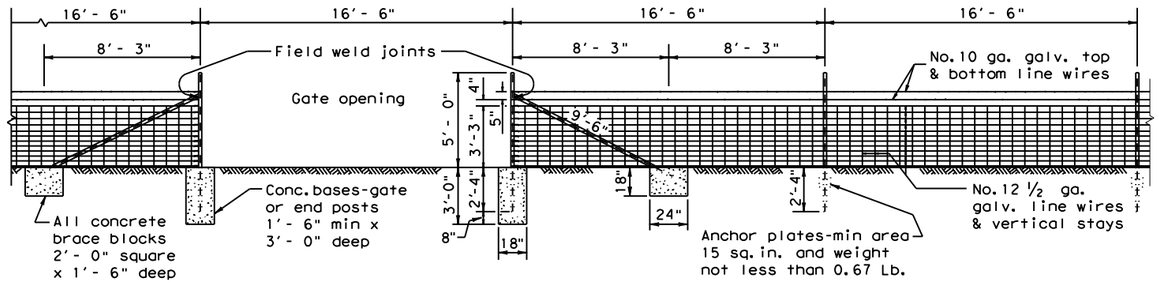
SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS

BRACING DETAIL USED AT ENDS AND GATES

TYPE "C" FENCE

(See General Note 8)

Note:
For Steel pipe and T-Post requirements. (See General Notes 6 & 7)

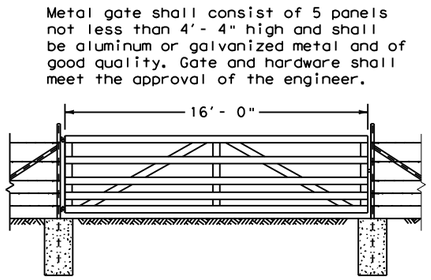


SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS

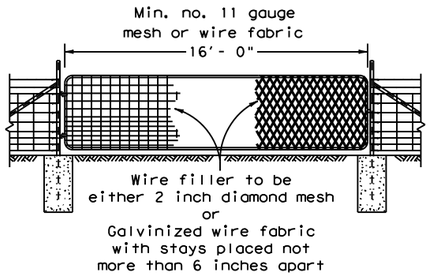
BRACING DETAIL USED AT ENDS AND GATES

TYPE "D" FENCE

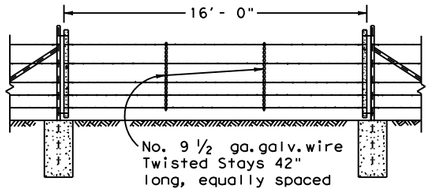
(See General Note 8)



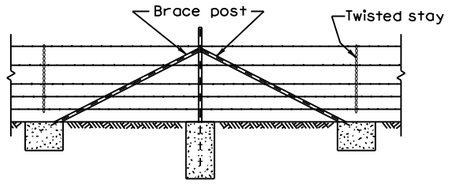
DETAIL TYPE 1 GATE



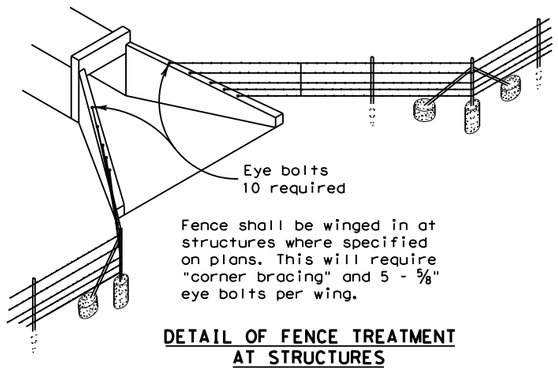
DETAIL TYPE 2 GATE



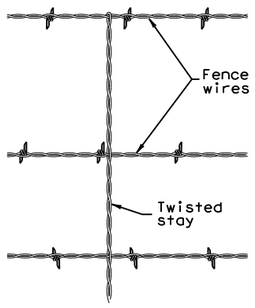
DETAIL TYPE 3 GATE



CORNER OR PULL POST ASSEMBLY

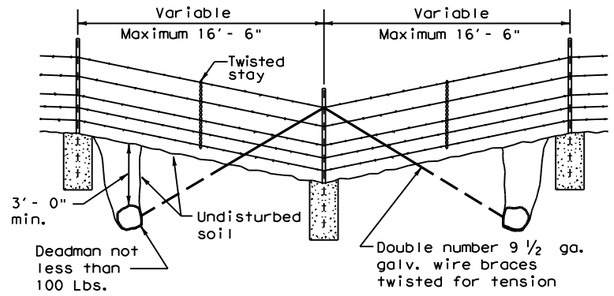


DETAIL OF FENCE TREATMENT AT STRUCTURES

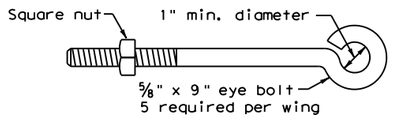


DETAIL OF STAY

(Barbed Wire Fence)



DETAIL OF FENCE SAG



DETAIL OF EYE BOLT

GENERAL NOTES

1. Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
2. Latches for Type 1 and Type 2 gates shall be good commercial quality and design latch of the spring, fork or chain type. All latches shall be suitable to the gate and shall be approved by the Engineer.
3. Hinges for Type 2 gates shall be a commercial design approved by the Engineer suitable for post and gate.
4. Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
5. Steel anchor plates shall be of a design and thickness sufficient to prevent turning of the post in firm soil.
6. Steel pipe end posts, corner and pull posts shall be a minimum of 2" Std. pipe (2.375" O.D., 0.154" wall thickness) with a 1¼" Std. pipe brace (1.660" O.D., 0.140" wall thickness), with a 2"x2"x1/4" angle, or other as approved by the Engineer. Fasteners for securing barbed wire or woven wire fence to metal posts shall be a minimum of 11 gauge galvanized steel wire. Tubular posts shall be fitted with water malleable iron caps.
7. If Steel pipe is used for posts and braces, use standard pipe in accordance with ASTM A 53, Class B or A 501. For T-Posts use steel that meets ASTM A 702. Metal line posts shall be not less than 6'-6" in length and shall weigh not less than (1.33 lbs./lin.ft.). These Items shall be in accordance with Item 552, "Wire Fence."
8. Barbed Wire shall be in accordance with ASTM A 121, Class 1 Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.

   Woven Wire Fence (Type D) shall be in accordance with ASTM A 116, Class 1 No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
9. The location of gates and corner posts will be as indicated elsewhere in these plans.

Texas Department of Transportation

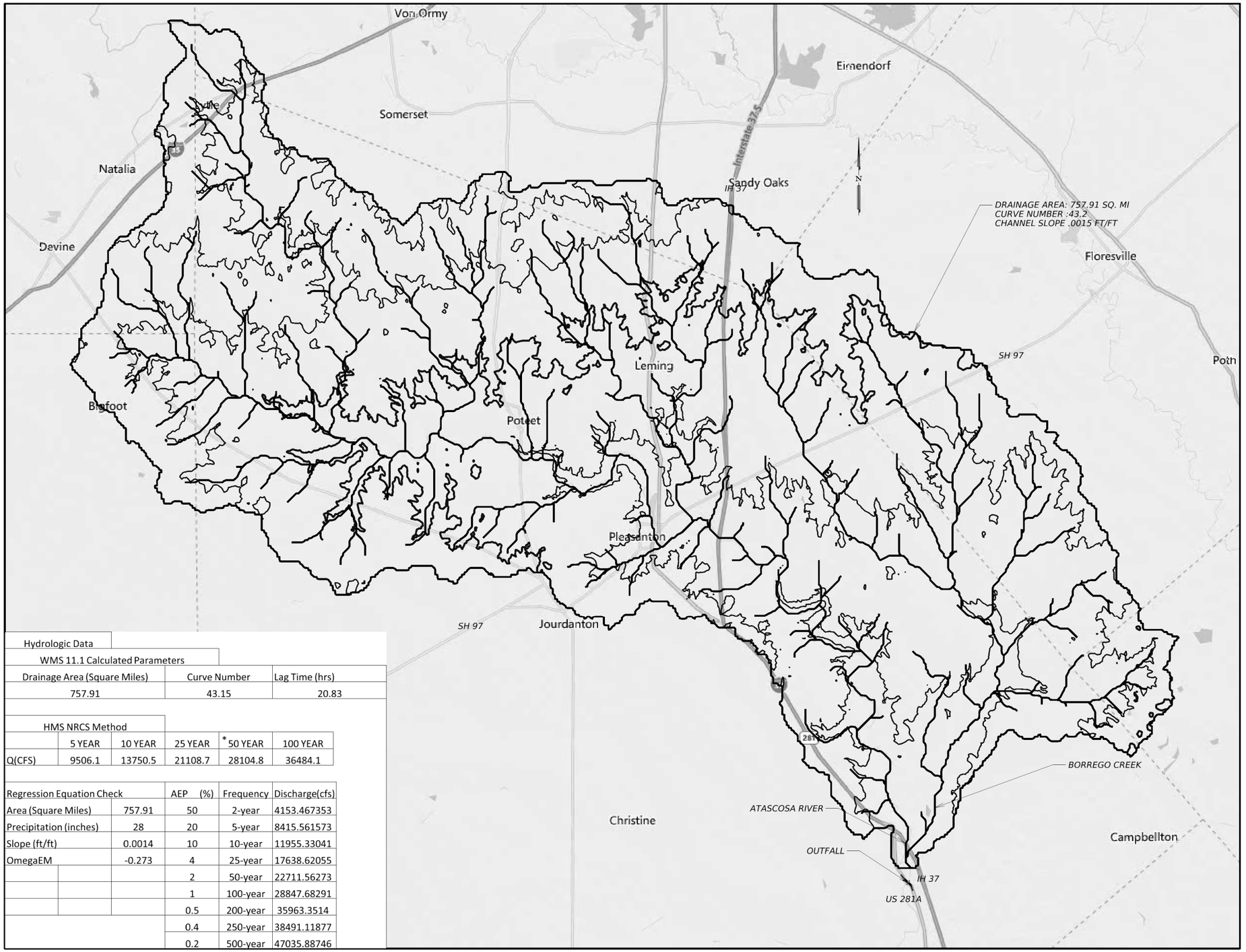
Design Division Standard

BARBED WIRE AND WOVEN WIRE FENCE (STEEL POSTS)

WF(2)-10

FILE: wf210.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT 1996	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		126

DESIGN: AG | DRAFT: AG | CHECK: AG



Hydrologic Data					
WMS 11.1 Calculated Parameters					
Drainage Area (Square Miles)		Curve Number		Lag Time (hrs)	
757.91		43.15		20.83	
HMS NRCS Method					
	5 YEAR	10 YEAR	25 YEAR	*50 YEAR	100 YEAR
Q(CFS)	9506.1	13750.5	21108.7	28104.8	36484.1

Regression Equation Check		AEP (%)	Frequency	Discharge(cfs)
Area (Square Miles)	757.91	50	2-year	4153.467353
Precipitation (inches)	28	20	5-year	8415.561573
Slope (ft/ft)	0.0014	10	10-year	11955.33041
OmegaEM	-0.273	4	25-year	17638.62055
		2	50-year	22711.56273
		1	100-year	28847.68291
		0.5	200-year	35963.3514
		0.4	250-year	38491.11877
		0.2	500-year	47035.88746

NOTES:

ATASCOSA RIVER IN FEMA ZONE A
FEMA MAP PANEL 48013C0525C
FLOOD INSURANCE STUDY 48013CV000A

FEMA HEC-RAS MODEL 12110100 ATASCOSA RIVER
DOWNLOADED FROM FEMA ESTIMATED
BASE FLOOD ELEVATION WEBSITE

https://webapps.usgs.gov/infrm/estBFE/

LOCAL FLOODPLAIN ADMINISTRATOR WAS
NOTIFIED BY LETTER ON 11/29/2023

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE: 1"= 5.5 Miles

Texas Department of Transportation

UA 281
DRAINAGE AREA MAP

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		127

12/13/2023 2:48:51 PM
pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0073130122/4 - Design/Plan Set/5. Drainage/UA0281*DRAINAGE*AREA*MAP.dgn
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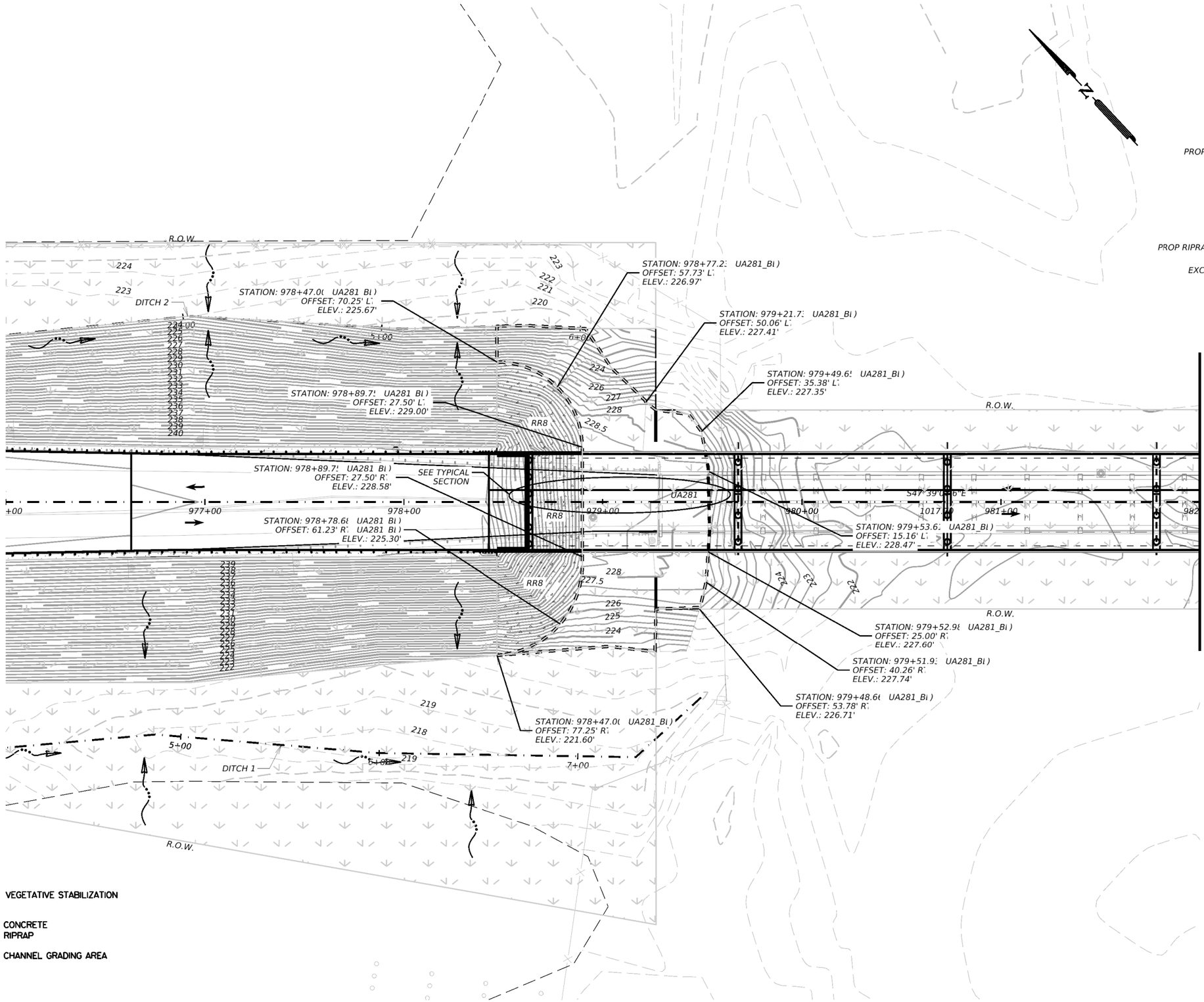
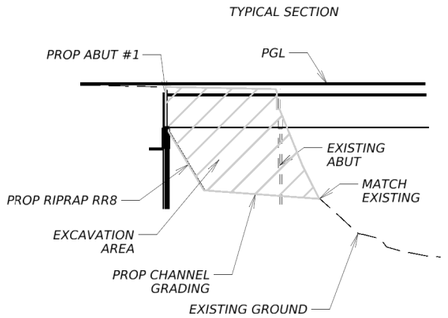
DESIGN: AG | DRAFT: AG | CHECK: AG



TYPICAL SECTION



NOTE: EXCAVATION AREA IS PAID UNDER EARTHWORK EXCAVATION QUANTITIES.

LEGEND

- VEGETATIVE STABILIZATION
- CONCRETE RIPRAP
- CHANNEL GRADING AREA

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
ATASCOSA RIVER CHANNEL IMPROVEMENTS

SHEET: 1 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		128

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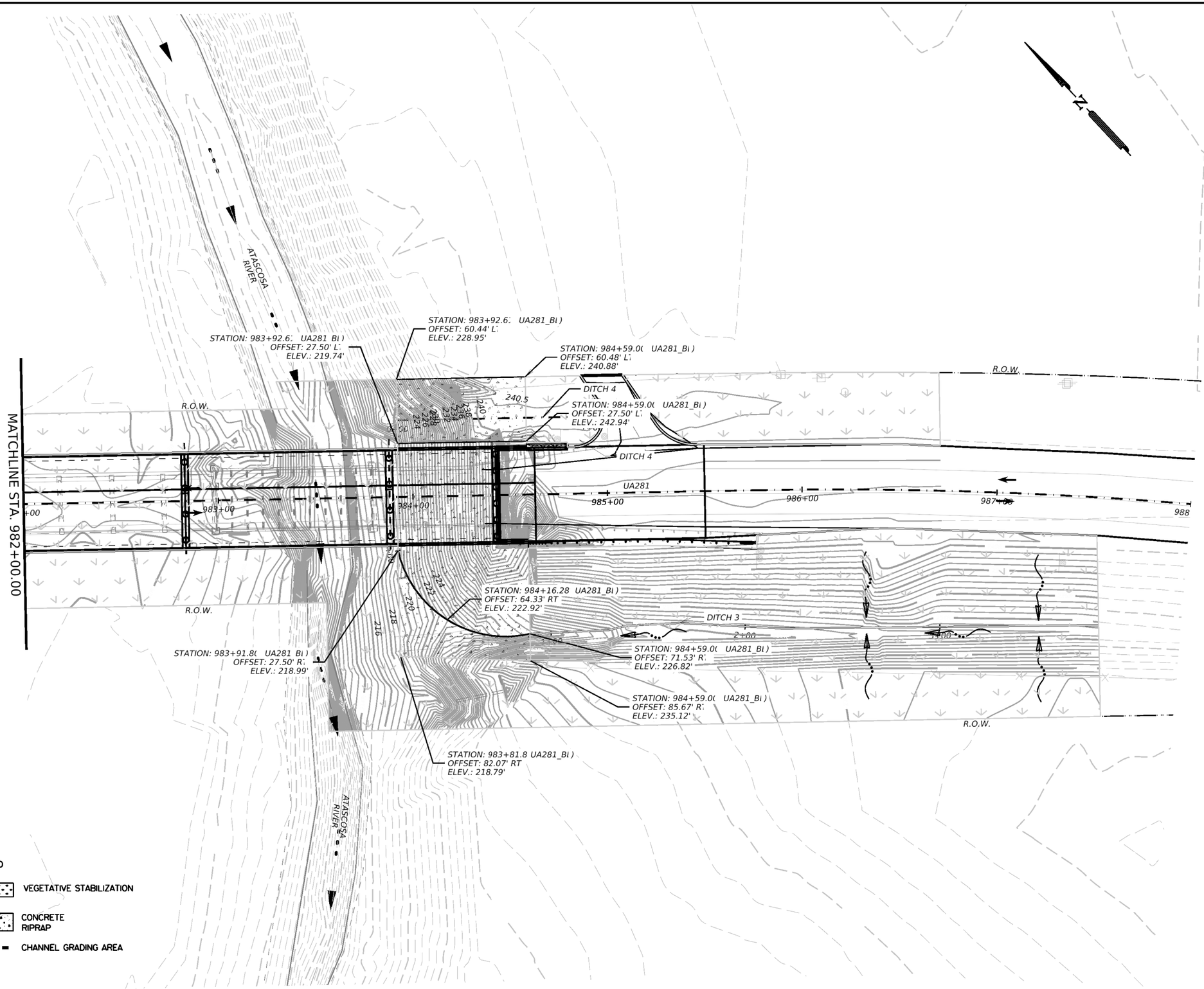

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281

ATASCOSA RIVER CHANNEL IMPROVEMENTS

SHEET: 2 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		129

12/27/2023 3:51:50 PM
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DESIGN: DRAFT: CHECK: AG

AREA ID	COMPOSITE C VALUE	AREA (ac)	TIME OF CONCENTRATION (min)	INTENSITY 10 YR (IN/HR)	DISCHARGE 10 YR (CFS)
AREA 1	0.21	2.16	10	7.26	3.29
AREA 2	0.26	1.61	10	7.26	3.04
AREA 3	0.24	1.6	10	7.26	2.79
AREA 4	0.6	0.127	10	7.26	0.55

								UPSTREAM			DOWNSTREAM													
DITCH	DEPTH OF FLOW (FT)	FORESLOPE (1:H)	BACKSLOPE (1:H)	TOP WIDTH (FT)	BOTTOM WIDTH (FT)	DITCH MATERIAL	ALIGN	STATION	OFFSET (FT)	FLOW LINE ELEV. (FT)	STATION	OFFSET (FT)	FLOW LINE ELEV. (FT)	CONTROLLING TOP DITCH ELEVAT	LENGTH (FT)	SLOPE (FT/FT)	n	A	R	PEAK FLOW 10 YR (CFS)	DITCH CAPACITY CFS	VELOCITY (FT/S)	SHEAR STRESS LB/SF	WATER SURFACE ELEV	FREE BOARD (FT)
DITCH 1	0.42	3	13	44	68	GRASS	DITCH 1	0	0	234.54	0+52.00	0	231.87	239.82	52.00	0.0513	0.05	23.5200	0.1795	3.29	50.40	2.15	1.35	234.96	4.86
DITCH 1	0.53	3	6	43	44	GRASS	DITCH 1	0+52.00	0	231.87	1+73.00	0	226.29	239.23	121.00	0.0461	0.05	23.06	0.27	3.29	60.98	2.65	1.53	232.40	6.83
DITCH 1	0.78	3	11	53	59	GRASS	DITCH 1	1+73.00	0	226.29	2+95.00	0	225.99	231.56	122.00	0.0025	0.05	43.68	0.38	3.29	33.87	0.78	0.12	227.07	4.49
DITCH 1	0.51	3	7	43	15	GRASS	DITCH 1	2+95.00	0	225.99	3+97.00	0	221.27	228.18	102.00	0.0463	0.05	29.00	1.52	3.29	244.65	8.46	1.47	226.50	1.68
DITCH 1	0.49	3	11	96	29	GRASS	DITCH 1	3+97.00	0	221.27	4+87.00	0	218.68	223.8	90.00	0.0288	0.05	30.63	1.86	3.29	233.59	7.64	0.88	221.76	2.04
DITCH 1	0.42	3	30	89	22	GRASS	DITCH 1	4+87.00	0	218.68	6+04.00	0	217.28	219.65	117.00	0.0120	0.05	23.31	1.96	3.29	118.66	5.10	0.31	219.10	0.55
DITCH 1	0.73	3	4	99	16	GRASS	DITCH 1	6+04.00	0	217.28	7+29.00	0	218.75	221.53	125.00	0.0118	0.05	41.98	2.91	3.29	275.76	6.58	0.54	218.01	3.52
DITCH 2	0.37	3	25	51	12	GRASS	DITCH 2	1+02.70	0	227.33	2+00.29	0	224.507	228.7	97.59	0.0289	0.05	11.66	1.76	3.04	85.81	7.38	0.67	227.70	1.00
DITCH 2	0.36	3	31	50	33	GRASS	DITCH 2	2+00.29	0	224.507	3+00.27	0	222.41	225.57	99.98	0.0210	0.05	14.94	1.05	3.04	66.57	4.47	0.47	224.87	0.70
DITCH 2	0.68	3	12	53	46	GRASS	DITCH 2	3+00.27	0	222.41	4+02.83	0	222.04	226.23	102.56	0.0036	0.05	33.66	0.98	3.04	59.14	1.76	0.15	223.09	3.14
DITCH 2	0.56	3	7	66	37	GRASS	DITCH 2	4+02.83	0	222.04	5+10.69	0	219.512	226.54	107.86	0.0234	0.05	28.84	1.25	3.04	152.44	5.30	0.82	222.60	3.94
DITCH 2	0.7	3	9	59	42	GRASS	DITCH 2	5+10.69	0	219.512	6+02.64	0	219.99	224.07	91.95	0.0052	0.05	35.35	1.09	3.04	80.19	2.27	0.23	220.21	3.86
DITCH 3	0.63	3	15	46	108	GRASS	DITCH 3	3+79.00	0	233.69	2+69.00	0	233.33	240.78	110.00	0.0033	0.05	48.51	0.68	2.79	63.87	1.32	0.13	234.32	6.46
DITCH 3	0.62	3	4.5	51	22	GRASS	DITCH 3	2+69.00	0	233.33	2+19.00	0	232.29	238.35	50.00	0.0208	0.05	22.63	1.41	2.79	122.17	5.41	0.80	233.95	4.40
DITCH 3	0.59	3	4	48	20	GRASS	DITCH 3	2+19.00	0	232.29	1+67.00	0	230.62	237.28	52.00	0.0321	0.05	20.06	1.43	2.79	135.68	6.78	1.18	232.88	4.40
DITCH 3	0.67	3	3	40	22	GRASS	DITCH 3	1+67.00	0	230.62	1+30.00	0	229.78	236.14	37.00	0.0227	0.05	20.77	1.21	2.79	105.59	5.10	0.95	231.29	4.85
DITCH 3	0.59	3	1.75	40	18	GRASS	DITCH 3	1+30.00	0	229.78	0+89.00	0	226.82	235.66	41.00	0.0722	0.05	17.11	1.35	2.79	166.97	9.78	2.66	230.37	5.29
DITCH 3	0.13	3	222	48	15	GRASS	DITCH 3	0+89.00	0	226.82	0+00.00	0	219	235.16	89.00	0.0879	0.05	4.10	1.04	2.79	37.08	9.08	0.71	226.95	8.21
DITCH 4	0.22	44	5	21	14	GRASS	DITCH 4	0+60.00	0	240.2	1+00.00	0	240.4	240.97	40.00	0.0050	0.05	3.85	0.30	0.55	3.64	0.95	0.07	240.42	0.55

Texas Department of Transportation

UA 281
DITCH DATA

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		130

12/27/2023 3:52:09 PM
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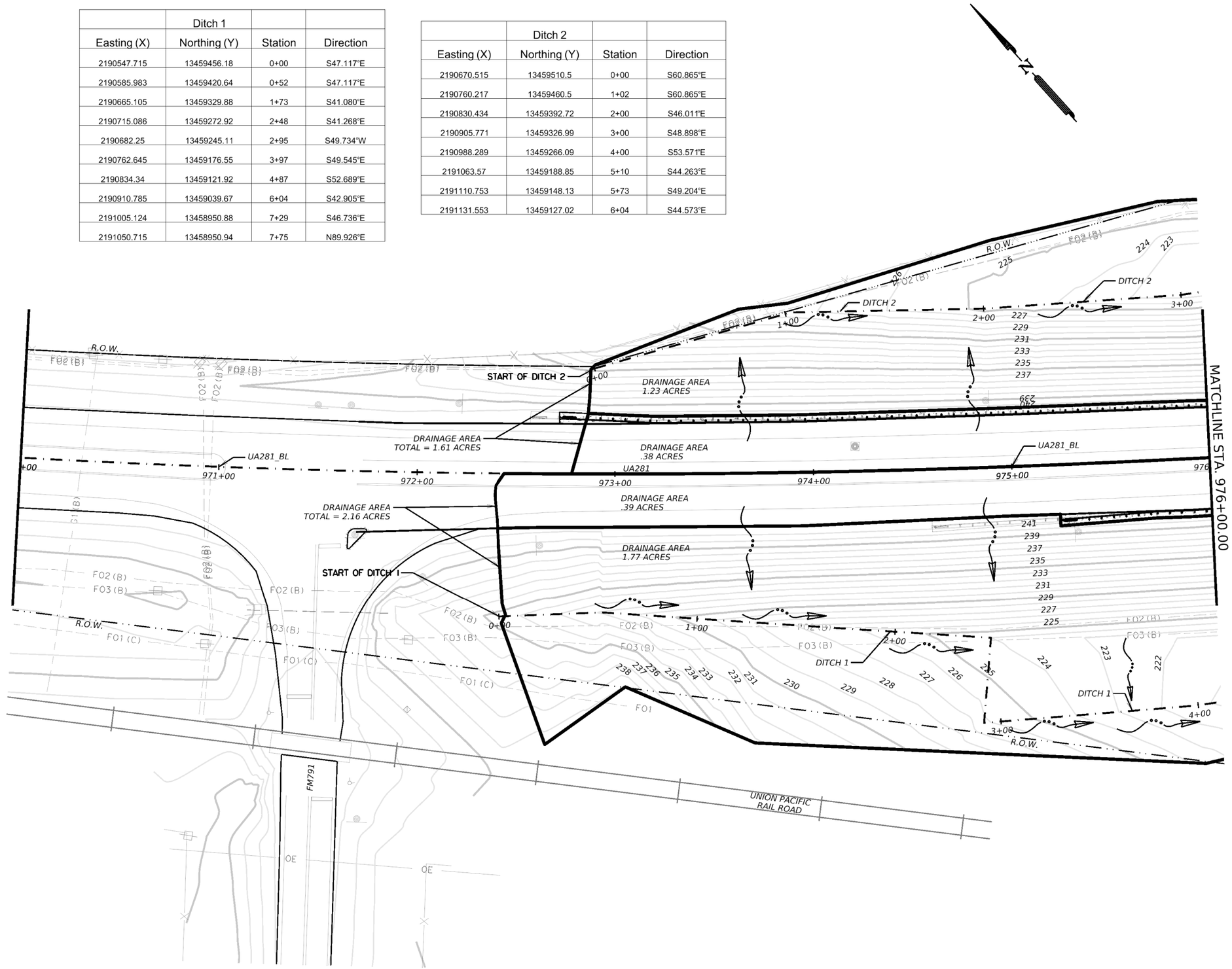
Ditch 1			
Easting (X)	Northing (Y)	Station	Direction
2190547.715	13459456.18	0+00	S47.117°E
2190585.983	13459420.64	0+52	S47.117°E
2190665.105	13459329.88	1+73	S41.080°E
2190715.086	13459272.92	2+48	S41.268°E
2190682.25	13459245.11	2+95	S49.734°W
2190762.645	13459176.55	3+97	S49.545°E
2190834.34	13459121.92	4+87	S52.689°E
2190910.785	13459039.67	6+04	S42.905°E
2191005.124	13458950.88	7+29	S46.736°E
2191050.715	13458950.94	7+75	N89.926°E

Ditch 2			
Easting (X)	Northing (Y)	Station	Direction
2190670.515	13459510.5	0+00	S60.865°E
2190760.217	13459460.5	1+02	S60.865°E
2190830.434	13459392.72	2+00	S46.011°E
2190905.771	13459326.99	3+00	S48.898°E
2190988.289	13459266.09	4+00	S53.571°E
2191063.57	13459188.85	5+10	S44.263°E
2191110.753	13459148.13	5+73	S49.204°E
2191131.553	13459127.02	6+04	S44.573°E



STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
DITCH LAYOUT

SHEET: 1 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		131

12/27/2023 3:52:34 PM
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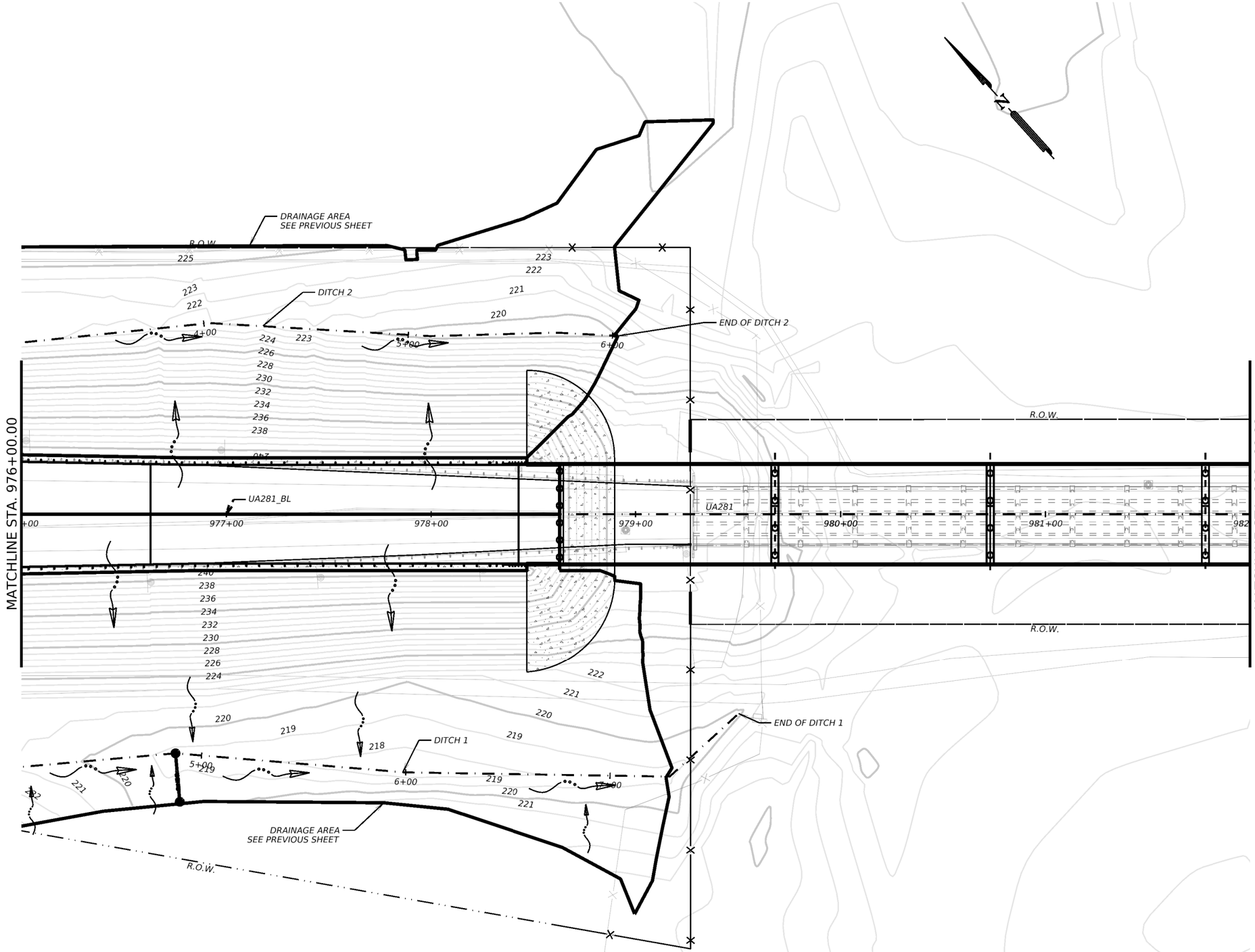

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
DITCH LAYOUT

SHEET: 2 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		132

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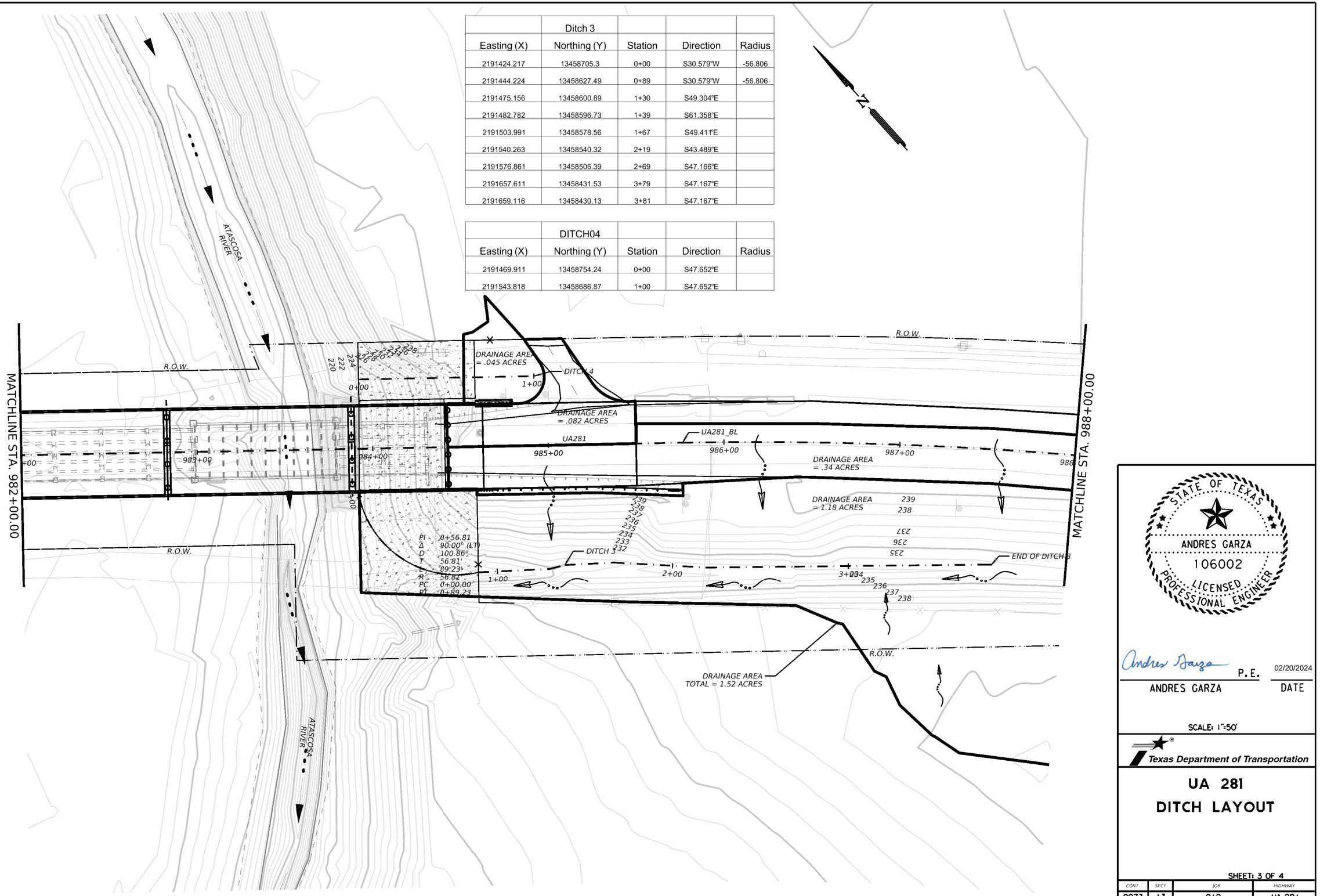
	Ditch 3			
Easting (X)	Northing (Y)	Station	Direction	Radius
2191424.217	13458705.3	0+00	S30.579°W	-56.806
2191444.224	13458627.49	0+89	S30.579°W	-56.806
2191475.156	13458600.89	1+30	S49.304°E	
2191482.782	13458596.73	1+39	S61.358°E	
2191503.991	13458578.56	1+67	S49.411°E	
2191540.263	13458540.32	2+19	S43.489°E	
2191576.861	13458506.39	2+69	S47.166°E	
2191657.611	13458431.53	3+79	S47.167°E	
2191659.116	13458430.13	3+81	S47.167°E	

	DITCH04			
Easting (X)	Northing (Y)	Station	Direction	Radius
2191469.911	13458754.24	0+00	S47.652°E	
2191543.818	13458686.87	1+00	S47.652°E	



STATE OF TEXAS
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106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
DITCH LAYOUT

SHEET: 3 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		133

DESIGN: JG DRAFT: JG CHECK: JG

12/27/2023 3:53:16 PM
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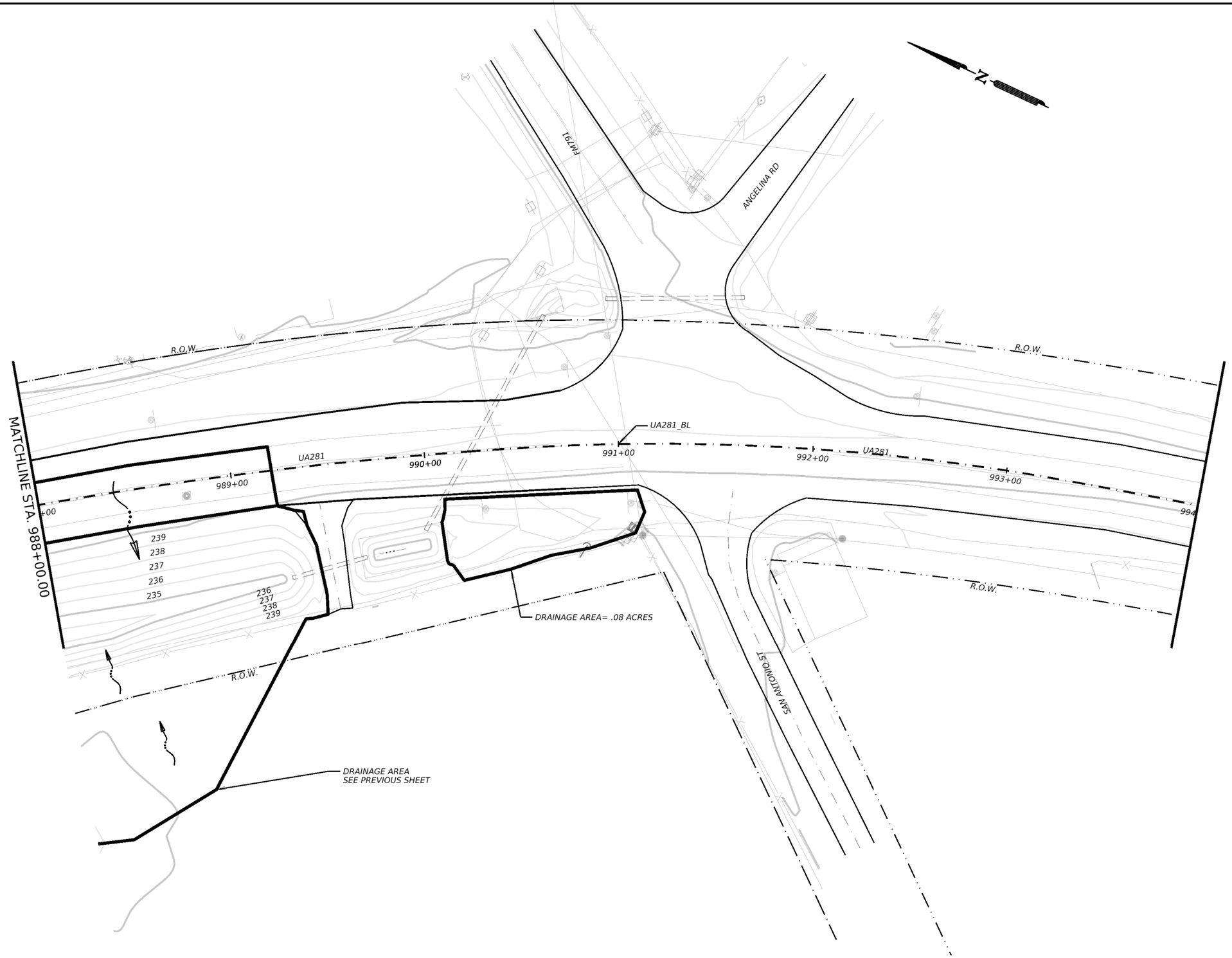
DESIGN: BG | DRAFT: BG | CHECK: AG



STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA — DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
DITCH LAYOUT

SHEET: 4 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		134

12/27/2023 3:53:38 PM
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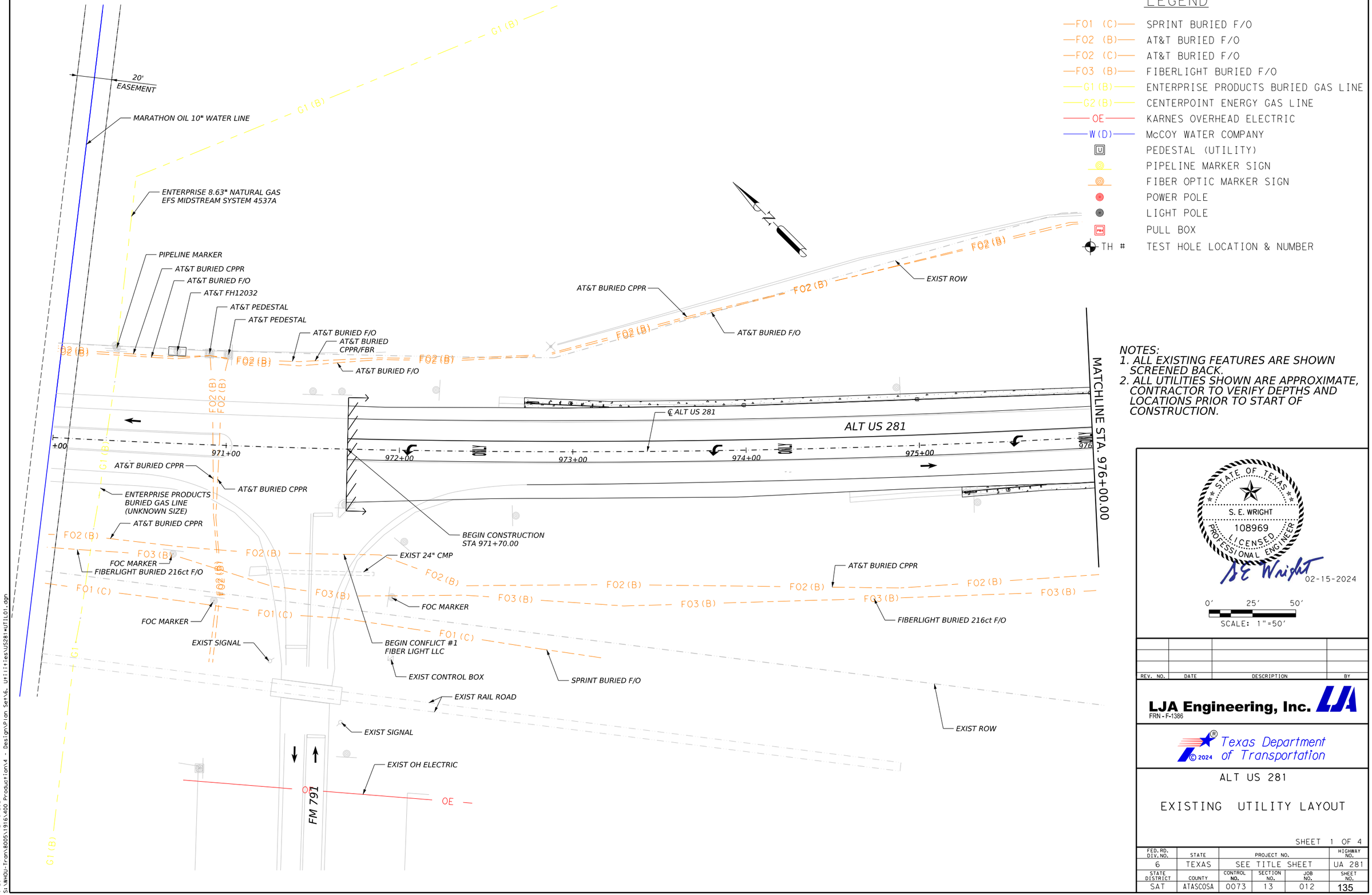

LEGEND

FO1 (C)	SPRINT BURIED F/O
FO2 (B)	AT&T BURIED F/O
FO2 (C)	AT&T BURIED F/O
FO3 (B)	FIBERLIGHT BURIED F/O
G1 (B)	ENTERPRISE PRODUCTS BURIED GAS LINE
G2 (B)	CENTERPOINT ENERGY GAS LINE
OE	KARNES OVERHEAD ELECTRIC
W (D)	McCOY WATER COMPANY
U	PEDESTAL (UTILITY)
	PIPELINE MARKER SIGN
	FIBER OPTIC MARKER SIGN
	POWER POLE
	LIGHT POLE
PB	PULL BOX
TH #	TEST HOLE LOCATION & NUMBER

NOTES:
1. *ALL EXISTING FEATURES ARE SHOWN SCREENED BACK.*
2. *ALL UTILITIES SHOWN ARE APPROXIMATE, CONTRACTOR TO VERIFY DEPTHS AND LOCATIONS PRIOR TO START OF CONSTRUCTION.*

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED PROFESSIONAL ENGINEER
02-15-2024

0′ 25′ 50′
SCALE: 1"=50′

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

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Texas Department of Transportation

ALT US 281

EXISTING UTILITY LAYOUT

SHEET 1 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	135

6:20:44 PM 2/15/2024
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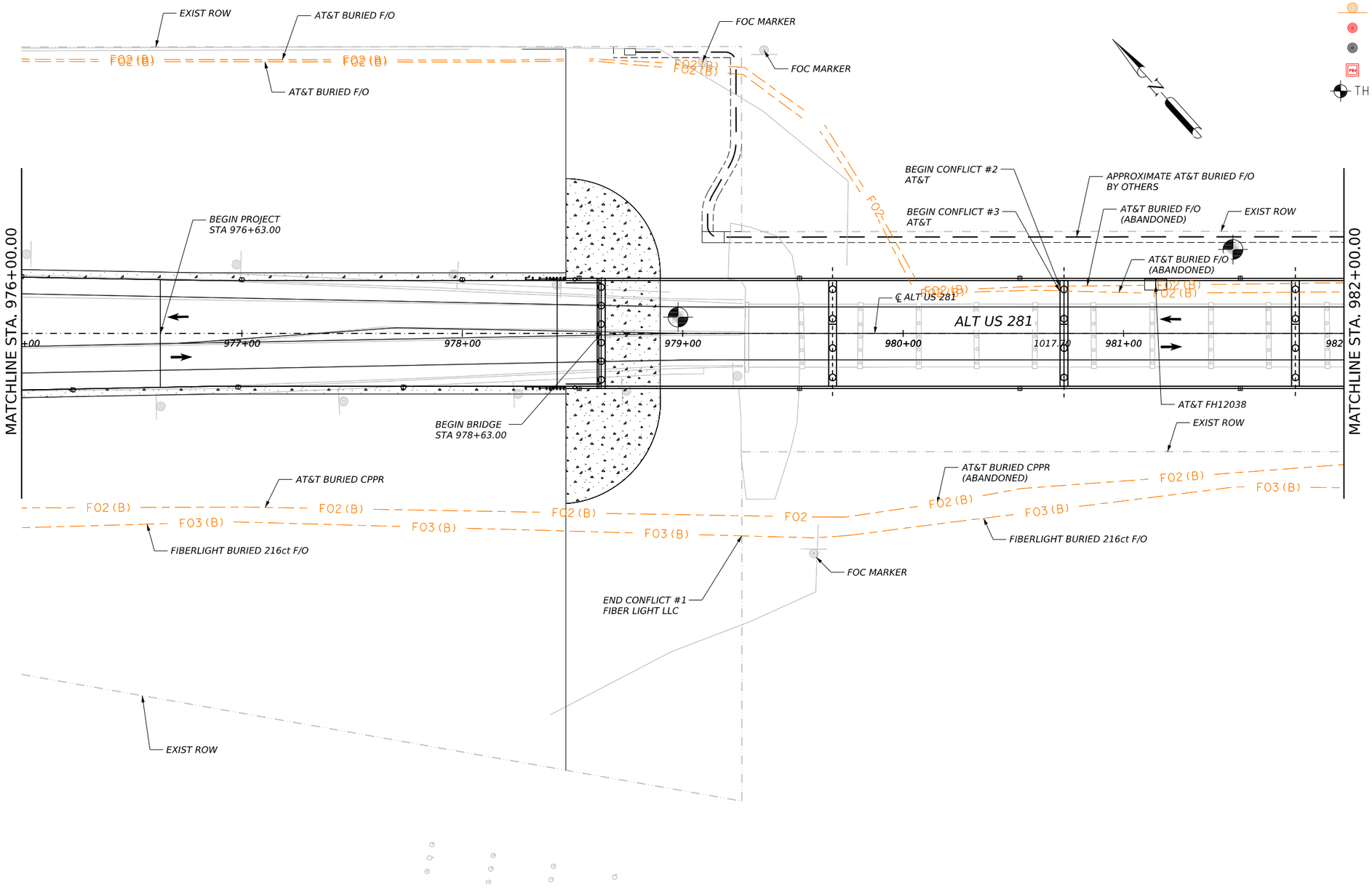
LEGEND

—FO1 (C)—	SPRINT BURIED F/O
—FO2 (B)—	AT&T BURIED F/O
—FO2 (C)—	AT&T BURIED F/O
—FO3 (B)—	FIBERLIGHT BURIED F/O
—G1(B)—	ENTERPRISE PRODUCTS BURIED GAS LINE
—G2(B)—	CENTERPOINT ENERGY GAS LINE
—OE—	KARNES OVERHEAD ELECTRIC
—W(D)—	McCOY WATER COMPANY
	PEDESTAL (UTILITY)
	PIPELINE MARKER SIGN
	FIBER OPTIC MARKER SIGN
	POWER POLE
	LIGHT POLE
	PULL BOX
TH #	TEST HOLE LOCATION & NUMBER



NOTES:
1. *ALL EXISTING FEATURES ARE SHOWN SCREENED BACK.*
2. *ALL UTILITIES SHOWN ARE APPROXIMATE, CONTRACTOR TO VERIFY DEPTHS AND LOCATIONS PRIOR TO START OF CONSTRUCTION.*

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
02-15-2024

0′ 25′ 50′
SCALE: 1"=50′

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

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ALT US 281

EXISTING UTILITY LAYOUT

SHEET 2 OF 4

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	136

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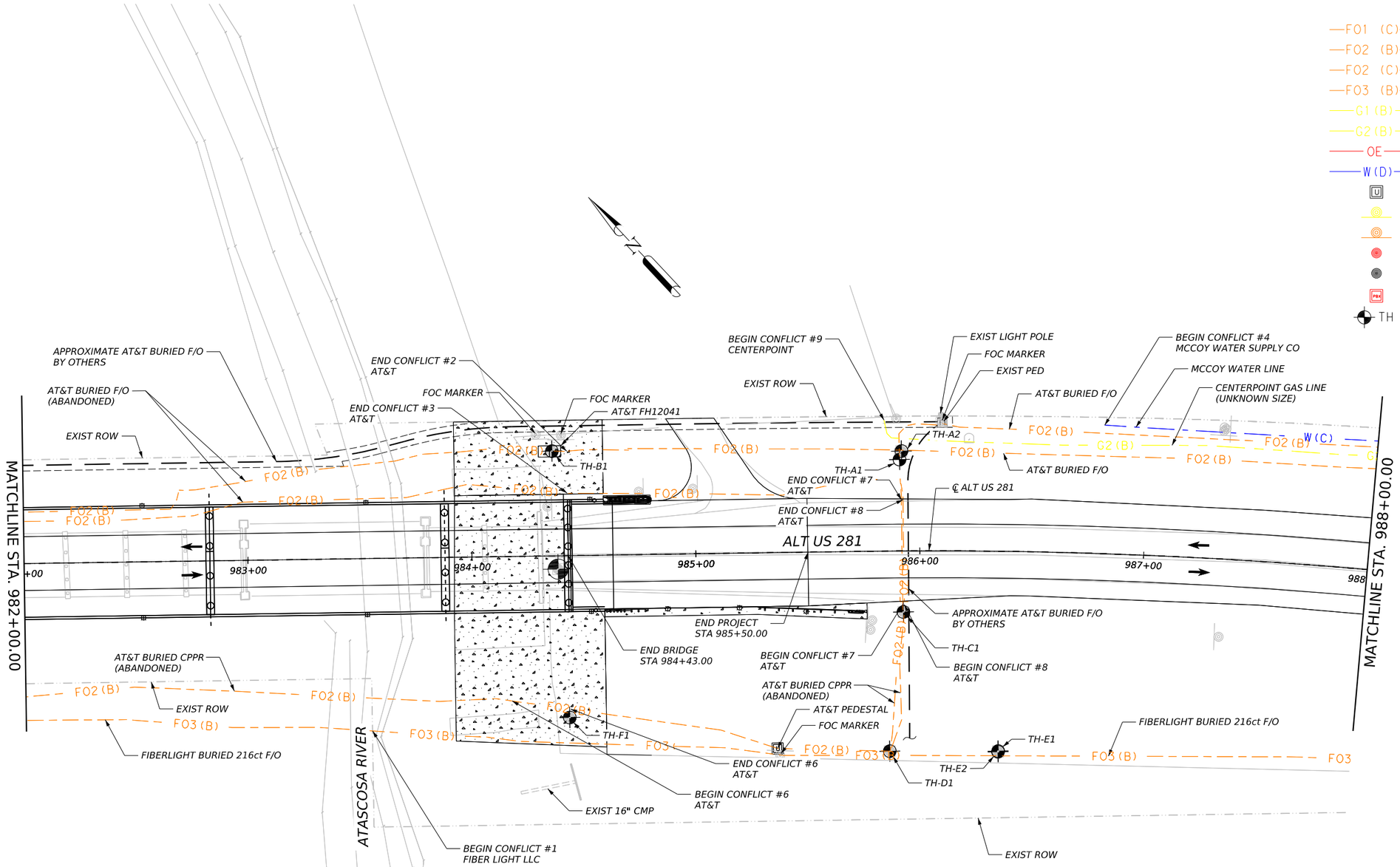
LEGEND

- FO1 (C) — SPRINT BURIED F/O
- FO2 (B) — AT&T BURIED F/O
- FO2 (C) — AT&T BURIED F/O
- FO3 (B) — FIBERLIGHT BURIED F/O
- G1 (B) — ENTERPRISE PRODUCTS BURIED GAS LINE
- G2 (B) — CENTERPOINT ENERGY GAS LINE
- OE — KARNES OVERHEAD ELECTRIC
- W (D) — McCOY WATER COMPANY
- PEDESTAL (UTILITY)
- PIPELINE MARKER SIGN
- FIBER OPTIC MARKER SIGN
- POWER POLE
- LIGHT POLE
- PULL BOX
- TH # — TEST HOLE LOCATION & NUMBER



NOTE: RESULTS FROM SUBSURFACE UTILITY ENGINEERING PERFORMED BY THE CIVIL CORP SHOWN IN TABLE BELOW

BL	CONFLICT #	SHEET	TH #	SURFACE ELEV (FT)	TOP OF UTIL ELEV (FT)	DEPTH (FT)	NOTE	DATE ISSUED	NORTHING (Y)	EASTING (X)	STA	OFFSET	fiber,telephone, water, gas
US 281 ALT	8	3 OF 4	TH-A1	243.79	240.37	3.42	2" AT&T CONDUIT (UTILITY MATERIAL: METALLIC)	4/12/2023	13,458,622.91	2,191,619.70	985+92.03	43.18' LT	CONDUIT
US 281 ALT	7	3 OF 4	TH-A2	242.71	240.40	2.31	3/4" AT&T TELECOMMUNICATIONS (UTILITY MATERIAL: F/O)	4/12/2023	13,458,623.38	2,191,621.06	985+92.71	44.45' LT	TELECOMMUNICATIONS
US 281 ALT	2	3 OF 4	TH-B1	242.85	240.42	2.43	3/4" AT&T TELECOMMUNICATIONS (UTILITY MATERIAL: F/O)	4/12/2023	13,458,730.17	2,191,507.18	984+37.08	46.30' LT	TELECOMMUNICATIONS
US 281 ALT	8	3 OF 4	TH-C1	244.64	240.43	4.21	2" AT&T CONDUIT (UTILITY MATERIAL: METALLIC)	4/12/2023	13,458,570.37	2,191,572.54	985+93.29	27.41' RT	CONDUIT
US 281 ALT	7	3 OF 4	TH-D1	240.34	236.24	4.10	1.5" AT&T TELECOMMUNICATIONS (UTILITY MATERIAL: F/O)	4/12/2023	13,458,529.23	2,191,525.56	985+86.82	89.83' RT	TELECOMMUNICATIONS
US 281 ALT	1	3 OF 4	TH-E1	239.64	236.68	2.96	1.5" FIBERLIGHT (UTILITY MATERIAL: F/O)	4/12/2023	13,458,496.15	2,191,560.86	986+36.09	89.53' RT	TELECOMMUNICATIONS
US 281 ALT	1	3 OF 4	TH-E2	239.63	236.82	2.81	1.5" FIBERLIGHT (UTILITY MATERIAL: F/O)	4/12/2023	13,458,495.95	2,191,560.62	986+36.05	89.84' RT	TELECOMMUNICATIONS
US 281 ALT	6	3 OF 4	TH-F1	235.85	226.28	9.57	AT&T UNKNOWN SIZE, UNKNOWN MATERIAL	4/12/2023	13,458,637.96	2,191,431.64	984+43.30	72.74' RT	TELECOMMUNICATIONS

NOTES:
1. *ALL EXISTING FEATURES ARE SHOWN SCREENED BACK.*
2. *ALL UTILITIES SHOWN ARE APPROXIMATE, CONTRACTOR TO VERIFY DEPTHS AND LOCATIONS PRIOR TO START OF CONSTRUCTION.*

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED PROFESSIONAL ENGINEER
02-15-2024

0' 25' 50'
SCALE: 1"=50'

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

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ALT US 281

EXISTING UTILITY LAYOUT

SHEET 3 OF 4

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	137

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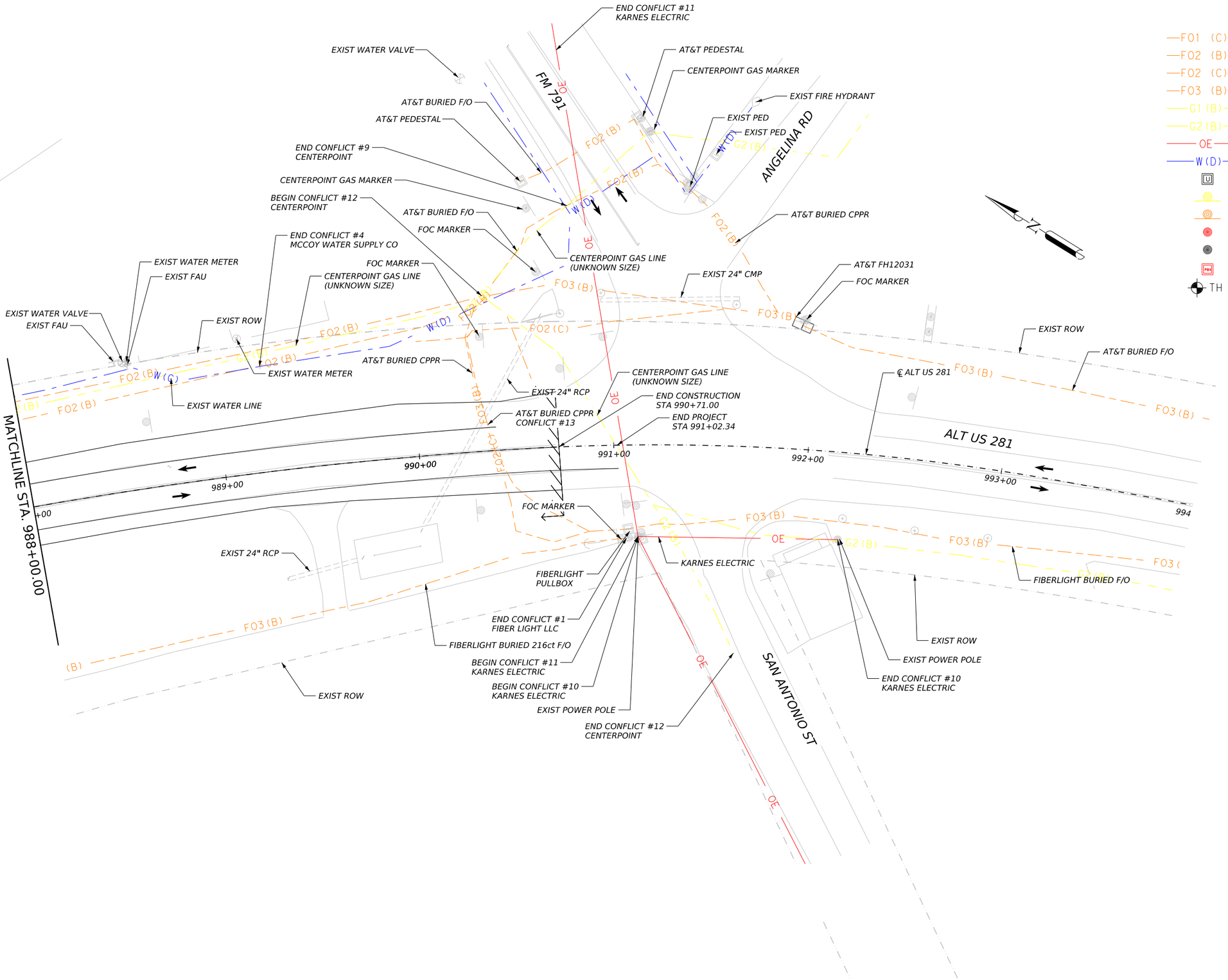

LEGEND

- FO1 (C) — SPRINT BURIED F/O
- FO2 (B) — AT&T BURIED F/O
- FO2 (C) — AT&T BURIED F/O
- FO3 (B) — FIBERLIGHT BURIED F/O
- G1 (B) — ENTERPRISE PRODUCTS BURIED GAS LINE
- G2 (B) — CENTERPOINT ENERGY GAS LINE
- OE — KARNES OVERHEAD ELECTRIC
- W (D) — McCOY WATER COMPANY
- PEDESTAL (UTILITY)
- PIPELINE MARKER SIGN
- FIBER OPTIC MARKER SIGN
- POWER POLE
- LIGHT POLE
- PULL BOX
- TH # — TEST HOLE LOCATION & NUMBER

NOTES:
1. *ALL EXISTING FEATURES ARE SHOWN SCREENED BACK.*
2. *ALL UTILITIES SHOWN ARE APPROXIMATE, CONTRACTOR TO VERIFY DEPTHS AND LOCATIONS PRIOR TO START OF CONSTRUCTION.*

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
SE Wright 02-15-2024

0′ 25′ 50′
SCALE: 1"=50′

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
© 2024

ALT US 281

EXISTING UTILITY LAYOUT

SHEET 4 OF 4

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	138

6:20:49 PM 2/15/2024
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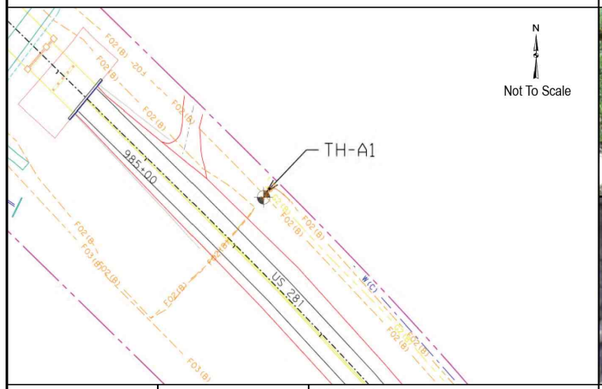
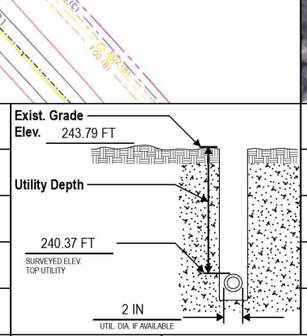
TEST HOLE DATA SHEET

Test Hole Number:	TH-A1	CivilCorp ENGINEERS • SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71001
Location Plan			**Photo ID:**	71001_bd, 71001_dh



Utility Found?	YES	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	GOOD	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	243.79 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	CONDUIT	**Top of Util. Elev:**	240.37 FT
Utility Size: (EX: 24", 8", ETC.)	2 IN	**Utl. Depth to Top:**	3.42 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	METALLIC	**Utility Owner/Operator:**	AT&T



Prepared by: T. HAYS

Checked by: M. TIMMERMAN

Test Hole Located by: J. BORDERS

Sta/Off: 985+92.03, 43.18' LT

Coordinates: N = 13,458,622.91
E = 2,191,619.70

Benchmark Location:

BM: CP-2002

Description: 5/8" IR W/ALUMINUM DISK

N= 13,458,693.08

E= 2,191,508.84

Elev.= 240.98 FT

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED
PROFESSIONAL ENGINEER

4/12/2023

SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:

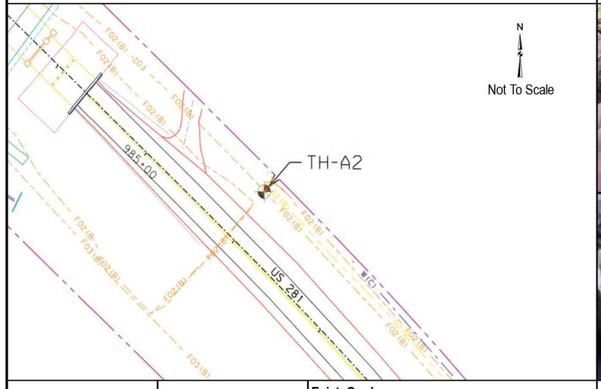
THIS ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN GENERAL ACCORDANCE WITH ASCE STANDARD 38-22. ALL OTHER INFORMATION HEREON HAS BEEN APPROVED BY OTHERS AND IS NOT PART OF THIS CERTIFICATION.

FIELD NOTES OR COMMENTS:

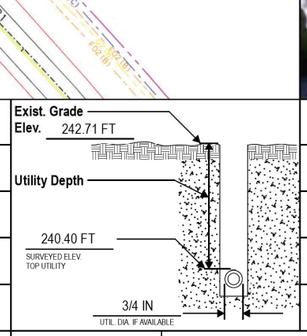
1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
2. ALL PROJECT ELEVATIONS ARE DERIVED FROM GPS OBSERVATION MEANS, REFERENCING NAVD88, GEOID18 USING THE RTK BASE/ROVER SYSTEM AT THE TIME OF SURVEY.
3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

TEST HOLE DATA SHEET

Test Hole Number:	TH-A2	CivilCorp ENGINEERS • SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71002
Location Plan			**Photo ID:**	71002_bd, 71002_dh



Utility Found?	YES	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	GOOD	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	242.71 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	TELECOM	**Top of Util. Elev:**	240.40 FT
Utility Size: (EX: 24", 8", ETC.)	3/4 IN	**Utl. Depth to Top:**	2.31 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	FIBER	**Utility Owner/Operator:**	AT&T



Prepared by: T. HAYS

Checked by: M. TIMMERMAN

Test Hole Located by: J. BORDERS

Sta/Off: 985+92.71, 44.45' LT

Coordinates: N = 13,458,623.38
E = 2,191,621.06

Benchmark Location:

BM: CP-2002

Description: 5/8" IR W/ALUMINUM DISK

N= 13,458,693.08

E= 2,191,508.84

Elev.= 240.98 FT

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED
PROFESSIONAL ENGINEER

4/12/2023

SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:

THIS ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN GENERAL ACCORDANCE WITH ASCE STANDARD 38-22. ALL OTHER INFORMATION HEREON HAS BEEN APPROVED BY OTHERS AND IS NOT PART OF THIS CERTIFICATION.

FIELD NOTES OR COMMENTS:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
2. ALL PROJECT ELEVATIONS ARE DERIVED FROM GPS OBSERVATION MEANS, REFERENCING NAVD88, GEOID18 USING THE RTK BASE/ROVER SYSTEM AT THE TIME OF SURVEY.
3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
02-15-2024

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
© 2024

ALT US 281

TEST HOLE DATA SHEET

SHEET 1 OF 4

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	139

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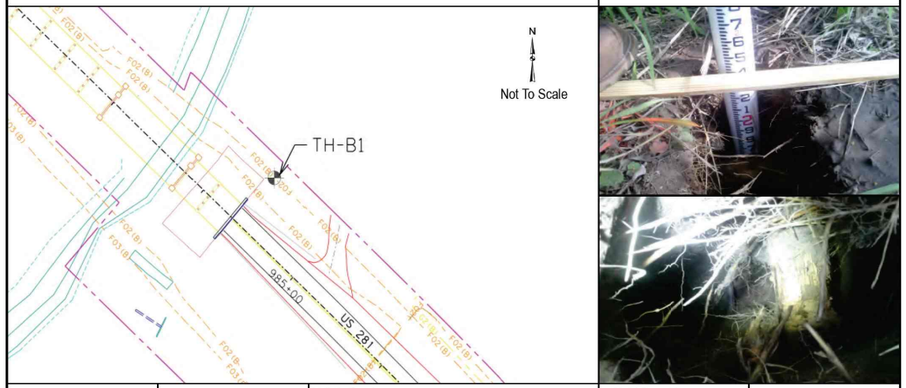
TEST HOLE DATA SHEET

Test Hole Number:	TH-B1	CivilCorp ENGINEERS • SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71003
Location Plan			**Photo ID:**	71003_bd, 71003_dh



Utility Found?	YES	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	GOOD	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	242.85 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	TELECOM	**Top of Util. Elev:**	240.42 FT
Utility Size: (EX: 24", 8", ETC.)	3/4 IN	**Utl. Depth to Top:**	2.43 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	FIBER	**Utility Owner/Operator:**	AT&T

Exist. Grade
Elev. 242.85 FT
Utility Depth
240.42 FT
SURVEYED ELEV. TOP UTILITY
3/4 IN
UTIL. DIA. IF AVAILABLE

Prepared by: T. HAYS
Checked by: M. TIMMERMAN
Test Hole Located by: J. BORDERS

Sta/Off: 984+37.08, 46.30' LT

Coordinates: N = 13,458,730.17
E = 2,191,507.18

Benchmark Location:
BM: CP-2002
Description: 5/8" IR W/ALUMINUM DISK
N= 13,458,693.08
E= 2,191,508.84
Elev.= 240.98 FT

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED
PROFESSIONAL ENGINEER
4/12/2023

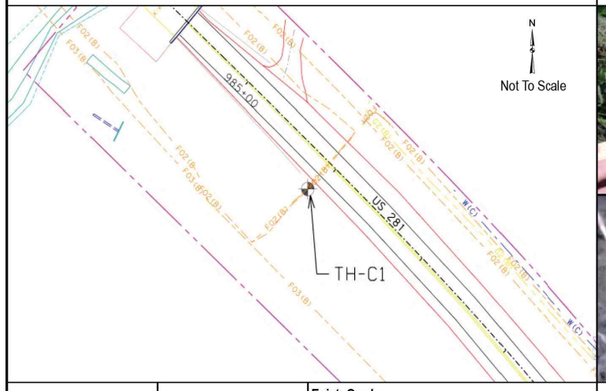
SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:
THIS ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN GENERAL ACCORDANCE WITH ASCE STANDARD 38-22. ALL OTHER INFORMATION HEREON HAS BEEN APPROVED BY OTHERS AND IS NOT PART OF THIS CERTIFICATION.

FIELD NOTES OR COMMENTS:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
2. ALL PROJECT ELEVATIONS ARE DERIVED FROM GPS OBSERVATION MEANS, REFERENCING NAVD88, GEOID18 USING THE RTK BASE/ROVER SYSTEM AT THE TIME OF SURVEY.
3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

TEST HOLE DATA SHEET

Test Hole Number:	TH-C1	CivilCorp ENGINEERS • SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71004
Location Plan			**Photo ID:**	71004_bd, 71004_dh



Utility Found?	YES	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	GOOD	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	244.64 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	CONDUIT	**Top of Util. Elev:**	240.43 FT
Utility Size: (EX: 24", 8", ETC.)	2 IN	**Utl. Depth to Top:**	4.21 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	METALLIC	**Utility Owner/Operator:**	AT&T

Exist. Grade
Elev. 244.64 FT
Utility Depth
240.43 FT
SURVEYED ELEV. TOP UTILITY
2 IN
UTIL. DIA. IF AVAILABLE

Prepared by: T. HAYS
Checked by: M. TIMMERMAN
Test Hole Located by: J. BORDERS

Sta/Off: 985+93.29, 27.41' RT

Coordinates: N = 13,458,570.37
E = 2,191,572.54

Benchmark Location:
BM: CP-2003
Description: 5/8" IR W/ALUMINUM DISK
N= 13,458,662.29
E= 2,191,467.38
Elev.= 240.61 FT

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED
PROFESSIONAL ENGINEER
4/12/2023

SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:
THIS ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN GENERAL ACCORDANCE WITH ASCE STANDARD 38-22. ALL OTHER INFORMATION HEREON HAS BEEN APPROVED BY OTHERS AND IS NOT PART OF THIS CERTIFICATION.

FIELD NOTES OR COMMENTS:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
2. ALL PROJECT ELEVATIONS ARE DERIVED FROM GPS OBSERVATION MEANS, REFERENCING NAVD88, GEOID18 USING THE RTK BASE/ROVER SYSTEM AT THE TIME OF SURVEY.
3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
02-15-2024

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
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ALT US 281

TEST HOLE DATA SHEET

SHEET 2 OF 4

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	140

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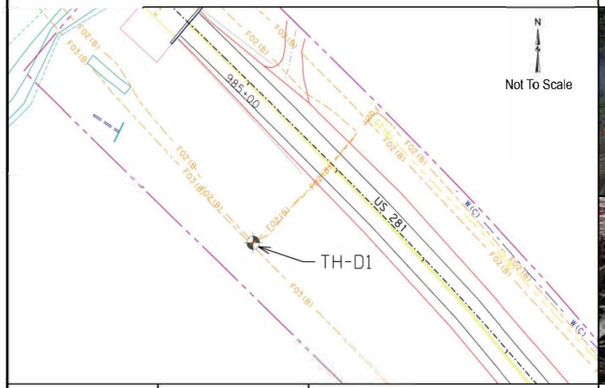
TEST HOLE DATA SHEET

Test Hole Number:	TH-D1	CivilCorp ENGINEERS • SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71005
Location Plan			**Photo ID:**	71005_bd, 71005_dh



Utility Found?	YES	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	GOOD	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	240.34 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	TELECOM	**Top of Util. Elev:**	236.24 FT
Utility Size: (EX: 24", 8", ETC.)	1.5 IN	**Utl. Depth to Top:**	4.10 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	FIBER	**Utility Owner/Operator:**	AT&T

Exist. Grade
Elev. 240.34 FT
Utility Depth
236.24 FT
SURVEYED ELEV. TOP UTILITY
1.5 IN
UTIL. DIA. IF AVAILABLE

Prepared by: T. HAYS
Checked by: M. TIMMERMAN
Test Hole Located by: J. BORDERS

Sta/Off: 985+86.82, 89.83' RT

Coordinates: N = 13,458,529.23
E = 2,191,525.56

Benchmark Location:
BM: CP-2003
Description: 5/8" IR W/ALUMINUM DISK
N= 13,458,662.29
E= 2,191,467.38
Elev.= 240.61 FT

FIELD NOTES OR COMMENTS:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
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3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED
PROFESSIONAL ENGINEER

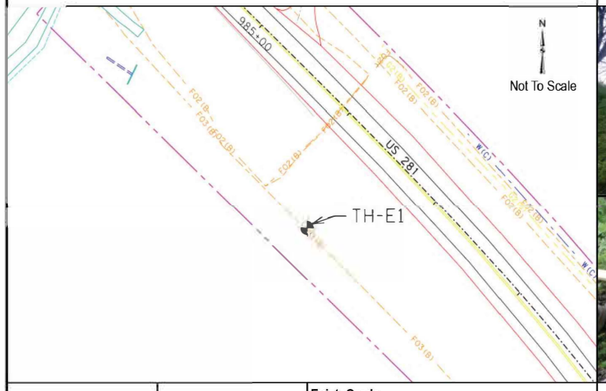
4/12/2023

SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:

THIS ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN GENERAL ACCORDANCE WITH ASCE STANDARD 38-22. ALL OTHER INFORMATION HEREON HAS BEEN APPROVED BY OTHERS AND IS NOT PART OF THIS CERTIFICATION.

TEST HOLE DATA SHEET

Test Hole Number:	TH-E1	CivilCorp ENGINEERS • SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71006
Location Plan			**Photo ID:**	71006_bd, 71006_dh



Utility Found?	YES	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	GOOD	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	239.64 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	TELECOM	**Top of Util. Elev:**	236.68 FT
Utility Size: (EX: 24", 8", ETC.)	1.5 IN	**Utl. Depth to Top:**	2.96 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	FIBER	**Utility Owner/Operator:**	FIBERLIGHT

Exist. Grade
Elev. 239.64 FT
Utility Depth
236.68 FT
SURVEYED ELEV. TOP UTILITY
1.5 IN
UTIL. DIA. IF AVAILABLE

Prepared by: T. HAYS
Checked by: M. TIMMERMAN
Test Hole Located by: J. BORDERS

Sta/Off: 986+36.09, 89.53' RT

Coordinates: N = 13,458,496.15
E = 2,191,560.86

Benchmark Location:
BM: CP-2003
Description: 5/8" IR W/ALUMINUM DISK
N= 13,458,662.29
E= 2,191,467.38
Elev.= 240.61 FT

FIELD NOTES OR COMMENTS:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
2. ALL PROJECT ELEVATIONS ARE DERIVED FROM GPS OBSERVATION MEANS, REFERENCING NAVD88, GEOID18 USING THE RTK BASE/ROVER SYSTEM AT THE TIME OF SURVEY.
3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED
PROFESSIONAL ENGINEER

4/12/2023

SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:

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STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
02-15-2024

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
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ALT US 281

TEST HOLE DATA SHEET

SHEET 3 OF 4

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	141

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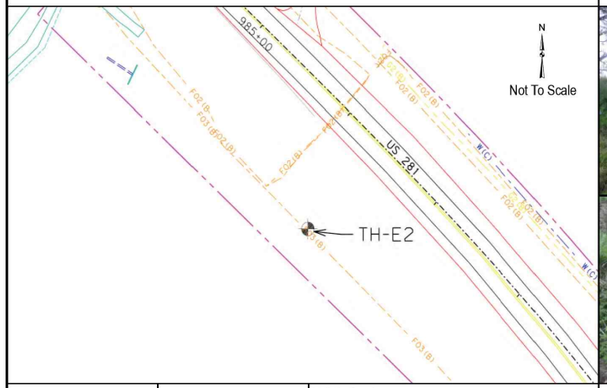
TEST HOLE DATA SHEET

Test Hole Number:	TH-E2	CivilCorp ENGINEERS ★ SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71007
Location Plan			**Photo ID:**	71007_bd, 71007_dh



Utility Found?	YES	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	GOOD	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	239.63 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	TELECOM	**Top of Util. Elev:**	236.82 FT
Utility Size: (EX: 24", 8", ETC.)	1.5 IN	**Utl. Depth to Top:**	2.81 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	FIBER	**Utility Owner/Operator:**	FIBERLIGHT

Exist. Grade
Elev. 239.63 FT
Utility Depth
236.82 FT
SURVEYED ELEV. TOP UTILITY
1.5 IN
UTIL. DIA. IF AVAILABLE

Prepared by: T. HAYS
Checked by: M. TIMMERMAN
Test Hole Located by: J. BORDERS

Sta/Off: 986+36.05, 89.84' RT
Coordinates: N = 13,458,495.95
E = 2,191,560.62

Benchmark Location:
BM: CP-2003
Description: 5/8" IR W/ALUMINUM DISK
N= 13,458,662.29
E= 2,191,467.38
Elev.= 240.61 FT

FIELD NOTES OR COMMENTS:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
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3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED PROFESSIONAL ENGINEER
4/12/2023

SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:
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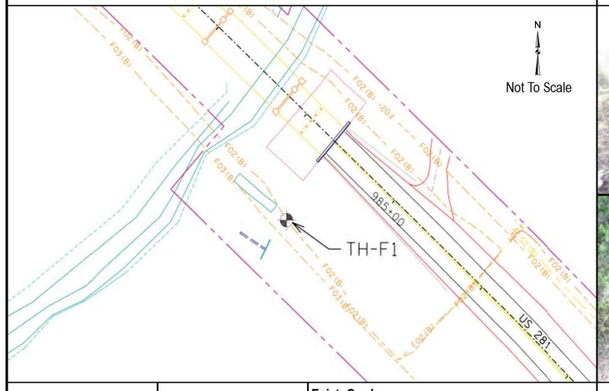
TEST HOLE DATA SHEET

Test Hole Number:	TH-F1	CivilCorp ENGINEERS ★ SURVEYORS 29255 FM 1093, SUITE 7A, FULSHEAR, TX 77441 T: 832-252-8100 TXENG FIRM #10283 TXSURV FIRM #10193783	**Date Excavated:**	3/8/2023
SUE Crew:	BADGER		**City:**	CAMPBELLTON
CSJ:	0073-13-012		**County:**	ATASCOSA
CivilCorp Project No.	19-079-03	US 281	**Survey Pts:**	71010
Location Plan			**Photo ID:**	71010_bd, 71010_dh



Utility Found?	NO	**Field Condition:** (EX: HEAVY RDWY TRAFFIC, LIGHT RAIN, FOG, ETC.)	GOOD
Utility Condition: (EX: GOOD, BAD, FAIR, POOR)	UNKNOWN	**Surface Type:** PAVEMENT THICKNESS IF AVAILABLE (EX: NAT. GROUND, CONC. PVMT., ETC.)	NATURAL GROUND
Soil Type/Conditions: (EX: SOFT CLAY, FIRM CLAY, ETC.)	CLAY	**Surface Elev:**	235.85 FT
Utility Type: (EX: WATER LINE, GAS PIPELINE, ETC.)	TELECOM	**Bottom Trench Elev:**	226.28 FT
Utility Size: (EX: 24", 8", ETC.)	UNKNOWN	**Trench Depth:**	9.57 FT
Utility Material: (EX: PVC, POLY, STEEL, ETC.)	UNKNOWN	**Utility Owner/Operator:**	AT&T

Exist. Grade
Elev. 235.85 FT
Trench Depth
226.28 FT
SURVEYED ELEV. BOTTOM TRENCH

Prepared by: T. HAYS
Checked by: M. TIMMERMAN
Test Hole Located by: J. BORDERS

Sta/Off: 984+43.30, 72.74' RT
Coordinates: N = 13,458,637.96
E = 2,191,431.64

Benchmark Location:
BM: CP-2003
Description: 5/8" IR W/ALUMINUM DISK
N= 13,458,662.29
E= 2,191,467.38
Elev.= 240.61 FT

FIELD NOTES OR COMMENTS:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2001 ADJ.; EPOCH 2010) AS DETERMINED BY GPS OBSERVATIONS USING TXDOT VRS SYSTEM. ALL COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.00013.
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3. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

STATE OF TEXAS
LARRY H. WENGER, JR.
87937
LICENSED PROFESSIONAL ENGINEER
4/12/2023

SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION:
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STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED PROFESSIONAL ENGINEER
02-15-2024

REV. NO.	DATE	DESCRIPTION	BY

LJA Engineering, Inc.
FRN - F-1386

Texas Department of Transportation
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ALT US 281

TEST HOLE DATA SHEET

SHEET 4 OF 4

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	142

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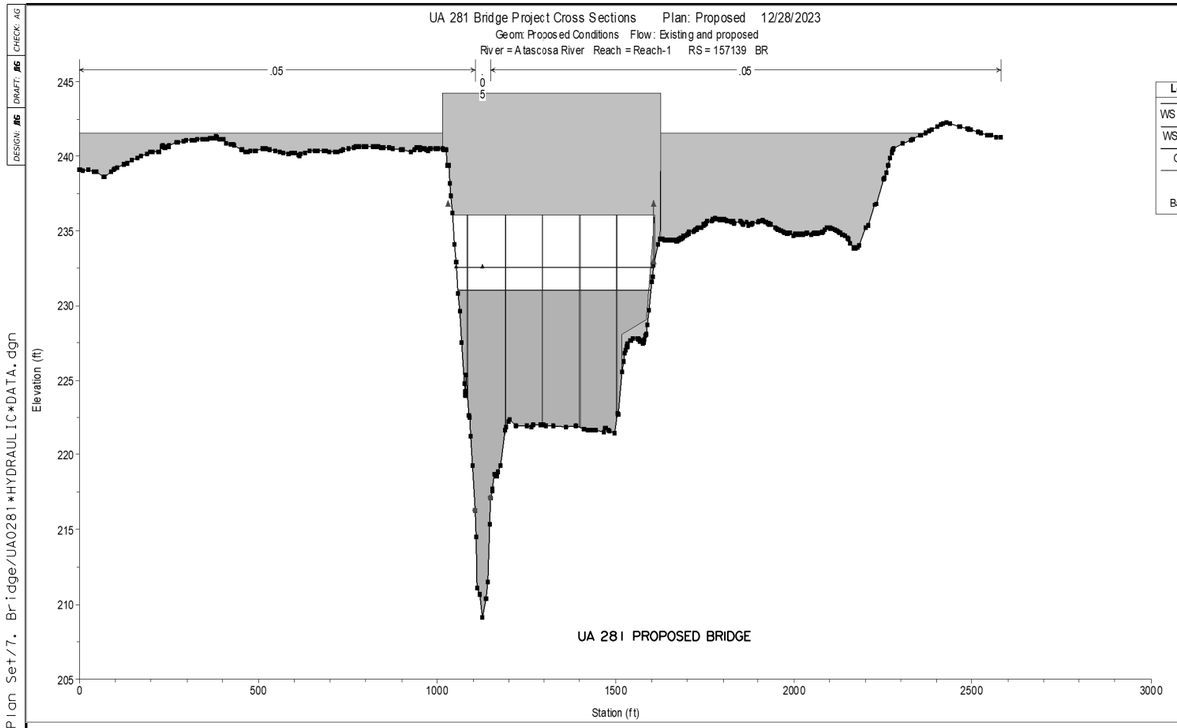

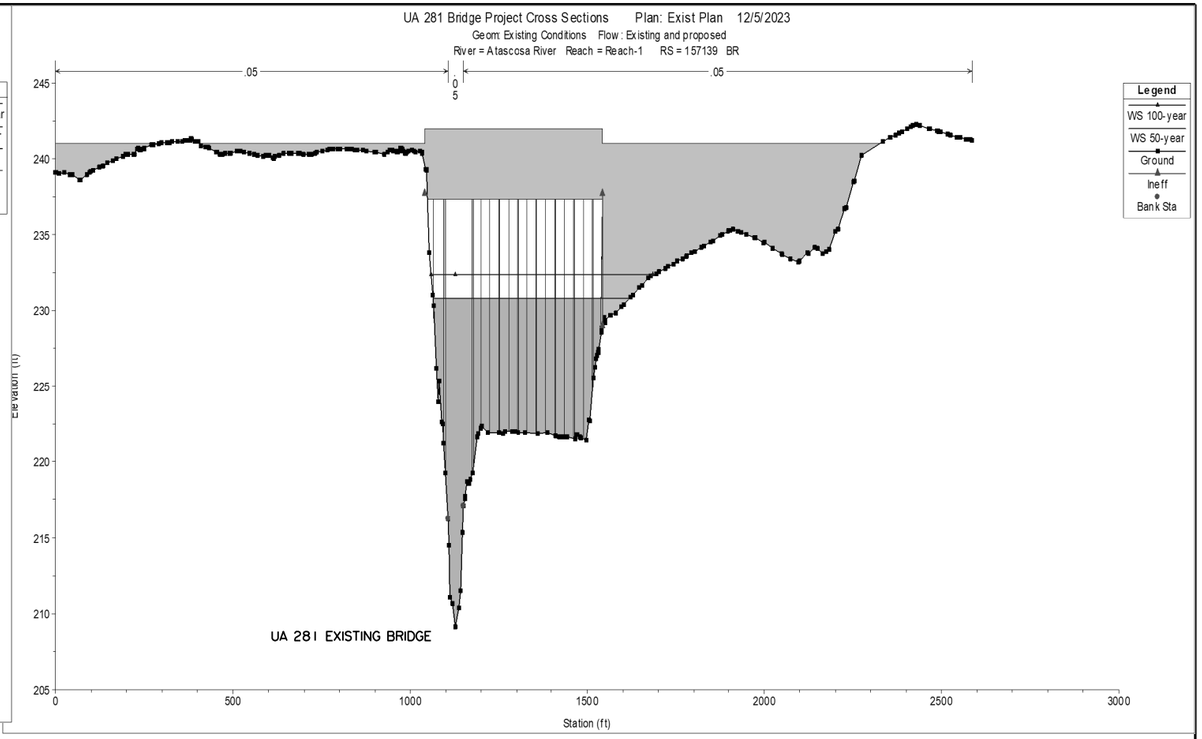

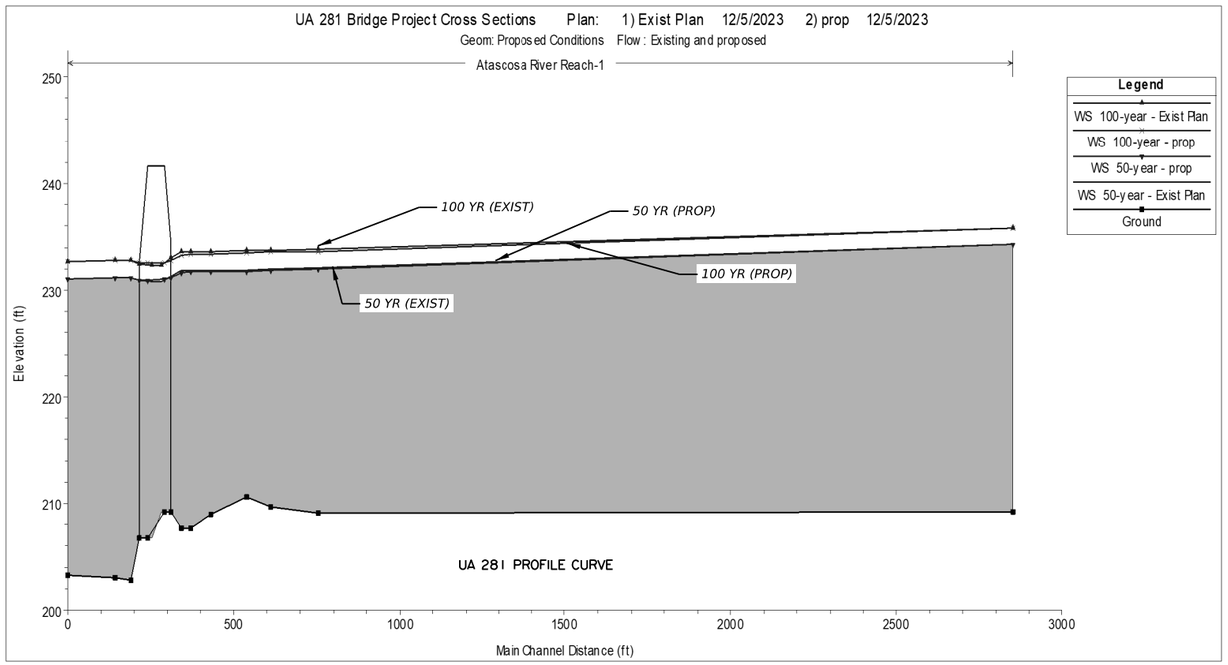

River Reach-1 RS: 157139	Profile: 50-year			
E.G. US. (ft)	231.74	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	231.17	E.G. Elev (ft)	231.69	231.57
Q Total (cfs)	28104.8	W.S. Elev (ft)	231	230.94
Q Bridge (cfs)	28104.8	Crit W.S. (ft)	226.69	226.58
Q Weir (cfs)		Max Chl Dpth (ft)	21.85	24.22
Weir Sta Lft (ft)		Vel Total (ft/s)	5.98	5.86
Weir Sta Rgt (ft)		Flow Area (sq ft)	4702.31	4796.7
Weir Submerg		Froude # Chl	0.37	0.36
Weir Max Depth (ft)		Specif Force (cu ft)	31767.38	31527.26
Min El Weir Flow (ft)	241.59	Hydr Depth (ft)	9.05	8.87
Min El Prs (ft)	241.58	W.P. Total (ft)	618.82	644.68
Delta EG (ft)	0.26	Conv. Total (cfs)	607126.2	598366.5
Delta WS (ft)	0.21	Top Width (ft)	519.78	541.71
BR Open Area (sq ft)	7402.95	Frctn Loss (ft)	0.11	0.05
BR Open Vel (ft/s)	5.98	C & E Loss (ft)	0.02	0.03
BR Sluice Coef		Shear Total (lb/sq ft)	1.02	1.02
BR Sel Method	Energy only	Power Total (lb/ft s)	6.08	6

River Reach-1 RS: 157139	Profile: 100-year			
E.G. US. (ft)	233.44	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	232.77	E.G. Elev (ft)	233.39	233.25
Q Total (cfs)	36484.1	W.S. Elev (ft)	232.57	232.5
Q Bridge (cfs)	36484.1	Crit W.S. (ft)	227.66	227.53
Q Weir (cfs)		Max Chl Dpth (ft)	23.42	25.78
Weir Sta Lft (ft)		Vel Total (ft/s)	6.61	6.46
Weir Sta Rgt (ft)		Flow Area (sq ft)	5523.7	5649.6
Weir Submerg		Froude # Chl	0.39	0.38
Weir Max Depth (ft)		Specif Force (cu ft)	42126.25	41963.41
Min El Weir Flow (ft)	241.59	Hydr Depth (ft)	10.42	10.3
Min El Prs (ft)	241.58	W.P. Total (ft)	645.11	668.63
Delta EG (ft)	0.29	Conv. Total (cfs)	757062.8	751411.7
Delta WS (ft)	0.23	Top Width (ft)	529.95	549.99
BR Open Area (sq ft)	7402.95	Frctn Loss (ft)	0.12	0.05
BR Open Vel (ft/s)	6.61	C & E Loss (ft)	0.02	0.04
BR Sluice Coef		Shear Total (lb/sq ft)	1.24	1.24
BR Sel Method	Energy only	Power Total (lb/ft s)	8.2	8.03

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

Texas Department of Transportation

UA 281 BRIDGE HYDRAULIC DATA

SHEET: 1 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		143

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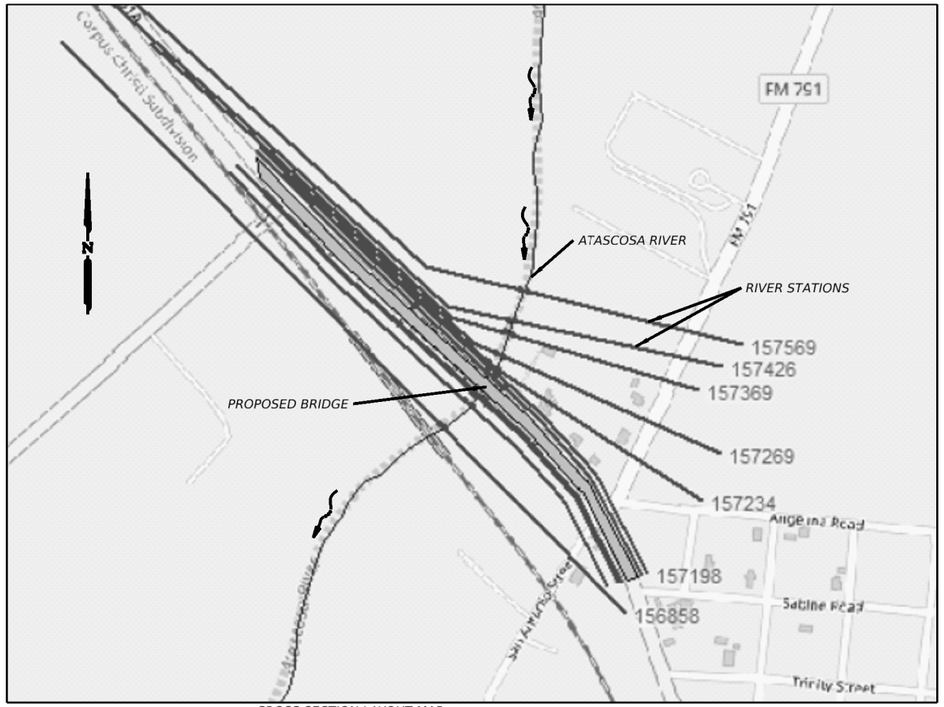
CROSS SECTION LAYOUT MAP



CROSS SECTION LAYOUT MAP

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA — DATE

SCALE: 1"=40'

Texas Department of Transportation

UA 281
BRIDGE HYDRAULIC DATA

SHEET: 2 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		144

DESIGN: JH | DRAFT: JH | CHECK: AG

12/13/2023 2:52:49 PM
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Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	159541	50-year	Exist Plan	28104.8	209.17	234.31		234.9	0.003391	7.75	6351.78	1490.32	0.28
Reach-1	159541	50-year	prop	28104.8	209.17	234.28	227.33	234.87	0.003425	7.78	6323.55	1484.07	0.29
Reach-1	159541	100-year	Exist Plan	36484.1	209.17	235.86		236.54	0.00383	8.61	7597.04	1786.52	0.31
Reach-1	159541	100-year	prop	36484.1	209.17	235.77	229.58	236.46	0.00392	8.69	7471.44	1771.21	0.31
Reach-1	157569	50-year	Exist Plan	28104.8	209.02	232.13		232.27	0.000599	5.11	10138.28	1436.04	0.19
Reach-1	157569	50-year	prop	28104.8	209.02	231.95		232.1	0.000645	5.27	9880.12	1426.21	0.2
Reach-1	157569	100-year	Exist Plan	36484.1	209.02	233.89		234.03	0.000525	5.04	12746.99	1531.85	0.18
Reach-1	157569	100-year	prop	36484.1	209.02	233.62		233.78	0.000575	5.23	12347.01	1517.56	0.19
Reach-1	157426	50-year	Exist Plan	28104.8	209.64	232.06		232.19	0.00057	4.97	10354.42	1427.96	0.19
Reach-1	157426	50-year	prop	28104.8	209.64	231.87		232.01	0.000615	5.13	10089.33	1420.56	0.2
Reach-1	157426	100-year	Exist Plan	36484.1	209.64	233.82		233.96	0.000494	4.88	12938.06	1497.96	0.18
Reach-1	157426	100-year	prop	36484.1	209.64	233.55		233.7	0.000543	5.08	12537.35	1487.29	0.19
Reach-1	157369	50-year	Exist Plan	28104.8	210.62	231.94		232.13	0.000727	5.81	8959.69	1230.98	0.23
Reach-1	157369	50-year	prop	28104.8	210.62	231.75		231.95	0.000786	6	8720.15	1223.37	0.23
Reach-1	157369	100-year	Exist Plan	36484.1	210.62	233.72		233.91	0.000642	5.76	11206.18	1300.58	0.21
Reach-1	157369	100-year	prop	36484.1	210.62	233.44		233.65	0.000706	5.99	10845.73	1289.69	0.22
Reach-1	157269	50-year	Exist Plan	28104.8	208.99	231.91		232.06	0.000513	4.82	9727.52	1133.11	0.18
Reach-1	157269	50-year	prop	28104.8	208.99	231.71		231.87	0.000552	4.96	9504.61	1130.3	0.19
Reach-1	157269	100-year	Exist Plan	36484.1	208.99	233.68		233.84	0.000481	4.92	11755.81	1158.09	0.18
Reach-1	157269	100-year	prop	36484.1	208.99	233.4		233.57	0.000525	5.1	11431.16	1154.14	0.19
Reach-1	157234	50-year	Exist Plan	28104.8	207.63	231.89		232.03	0.000438	4.28	10156.52	1121.27	0.17
Reach-1	157234	50-year	prop	28104.8	207.63	231.7		231.84	0.000469	4.4	9934.96	1118.46	0.18
Reach-1	157234	100-year	Exist Plan	36484.1	207.63	233.66		233.82	0.000423	4.46	12163.8	1146.62	0.17
Reach-1	157234	100-year	prop	36484.1	207.63	233.38		233.54	0.00046	4.6	11841.03	1142.58	0.18
Reach-1	157198	50-year	Exist Plan	28104.8	207.7	231.84		232.01	0.000573	5.03	9390.35	1141.57	0.19
Reach-1	157198	50-year	prop	28104.8	207.7	231.61		231.81	0.000721	5.6	8707.99	1137.75	0.22
Reach-1	157198	100-year	Exist Plan	36484.1	207.7	233.62		233.8	0.000528	5.1	11444.99	1170.65	0.19
Reach-1	157198	100-year	prop	36484.1	207.7	233.31		233.52	0.000657	5.63	10663.9	1165.56	0.21
Reach-1	157169	50-year	Exist Plan	28104.8	209.15	231.33	226.59	231.94	0.001626	8.23	4739.58	578.63	0.32
Reach-1	157169	50-year	prop	28104.8	209.15	231.17	226.6	231.74	0.001721	8.43	5008.9	542.49	0.33
Reach-1	157169	100-year	Exist Plan	36484.1	209.15	232.97	227.53	233.72	0.001734	8.96	5463.85	680.49	0.34
Reach-1	157169	100-year	prop	36484.1	209.15	232.77	227.36	233.44	0.001777	9.01	5886.46	554.09	0.34
Reach-1	157139			Bridge									
Reach-1	157071	50-year	Exist Plan	28104.8	206.72	230.86		231.52	0.001907	8.61	4485.72	587.7	0.34
Reach-1	157071	50-year	prop	28104.8	206.72	230.96		231.48	0.001763	8.31	5142.05	605.95	0.33
Reach-1	157071	100-year	Exist Plan	36484.1	206.72	232.39		233.22	0.002058	9.39	5148.61	709.53	0.36
Reach-1	157071	100-year	prop	36484.1	206.72	232.54		233.15	0.001752	8.71	6059.73	719.14	0.33

DESIGN JH | DRAFT JH | CHECK AG

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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

Texas Department of Transportation

UA 281
BRIDGE HYDRAULIC DATA

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		145

Reach-1	157049	50-year	Exist Plan	28104.8	202.8	231.17		231.35	0.000851	5.17	8511.16	1158.87	0.2	
Reach-1	157049	50-year	prop	28104.8	202.8	231.16		231.35	0.000909	5.34	8299.84	1146.16	0.21	
Reach-1	157049	100-year	Exist Plan	36484.1	202.8	232.8		233	0.000817	5.33	10543.63	1339.4	0.2	
Reach-1	157049	100-year	prop	36484.1	202.8	232.79		233.01	0.000873	5.51	10319.62	1334.49	0.2	
Reach-1	156999	50-year	Exist Plan	28104.8	203.03	231.19		231.3	0.00037	3.88	10589	1072.86	0.15	
Reach-1	156999	50-year	prop	28104.8	203.03	231.19		231.3	0.00037	3.88	10589.02	1072.88	0.15	
Reach-1	156999	100-year	Exist Plan	36484.1	203.03	232.81		232.96	0.00039	4.19	12367.81	1115.96	0.16	
Reach-1	156999	100-year	prop	36484.1	203.03	232.81		232.96	0.00039	4.19	12367.83	1115.96	0.16	
Reach-1	156858	50-year	Exist Plan	28104.8	203.22	231.07	225.73	231.23	0.00061	5.17	9245.55	1144.25	0.19	
Reach-1	156858	50-year	prop	28104.8	203.22	231.07	225.73	231.23	0.00061	5.17	9245.55	1144.25	0.19	
Reach-1	156858	100-year	Exist Plan	36484.1	203.22	232.7	226.35	232.88	0.00061	5.42	11199.31	1284.84	0.2	
Reach-1	156858	100-year	prop	36484.1	203.22	232.7	226.35	232.88	0.00061	5.42	11199.31	1284.84	0.2	

DESIGN: JH | DRAFT: JH | CHECK: AG

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

Texas Department of Transportation

UA 281
BRIDGE HYDRAULIC DATA

SHEET: 4 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		146

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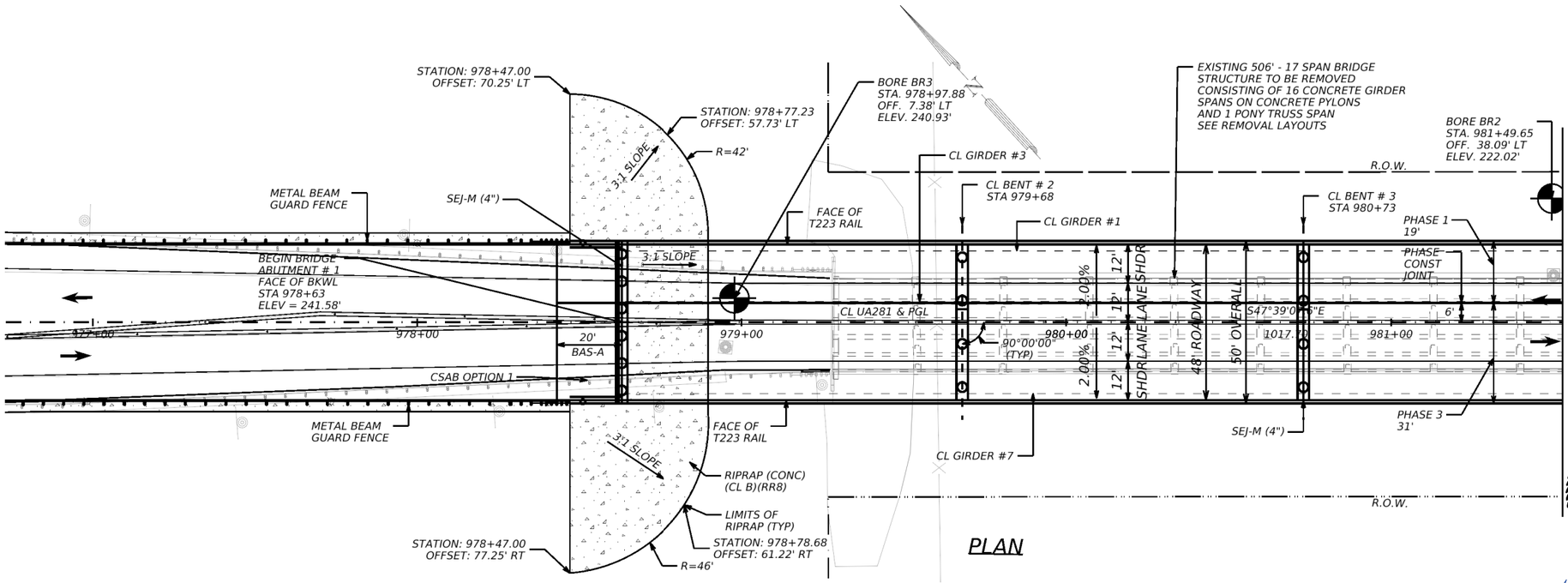
DESIGN AG | DRAFT AG | CHECK: LD



NOTES :

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 2020, 9TH EDITION, AND TxDOT BRIDGE DESIGN MANUAL, JANUARY 2023
2. EXISTING NBI = 15-007-0-0073-13-014
   PROPOSED NBI = 15-007-0-0073-13-356
3. US 281A DATA:
   ADT (2025) = 1,400
   ADT (2045) = 2,300
   DESIGN SPEED = 60 MPH
   FUNCTIONAL CLASS = RURAL COLLECTOR
4. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING THE ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
5. SEE GEOTECHNICAL BORE DATA SHEETS FOR TEST HOLE DATA
6. UTILITIES SHOWN ARE IN APPROXIMATE LOCATIONS. CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF ALL UTILITES PRIOR TO CONSTRUCTION.
7. ALL BENTS AND ABUTMENTS ON APPROXIMATE BEARING S 42° 20' 52.4" W.
8. DRILLED SHAFTS WILL BE FOUNDED AT THE ELEVATIONS SHOWN OR DEEPER TO OBTAIN A MINIMUM PENETRATION OF ONE SHAFT DIAMETER INTO HARD MUDSTONE.
9. EXTERIOR GIRDER END CONDITIONS: (D)-DENOTES DOWEL, BLANK- DENOTES NO DOWEL
10. SEE TCP SHEETS FOR PHASING SEQUENCE
11. PROVIDE SHEAR KEYS AT THE END OF EVERY GIRDER SPAN.

STATE OF TEXAS
ALEXIS BARRON
148028
LICENSED PROFESSIONAL ENGINEER

FOUNDATION DESIGN

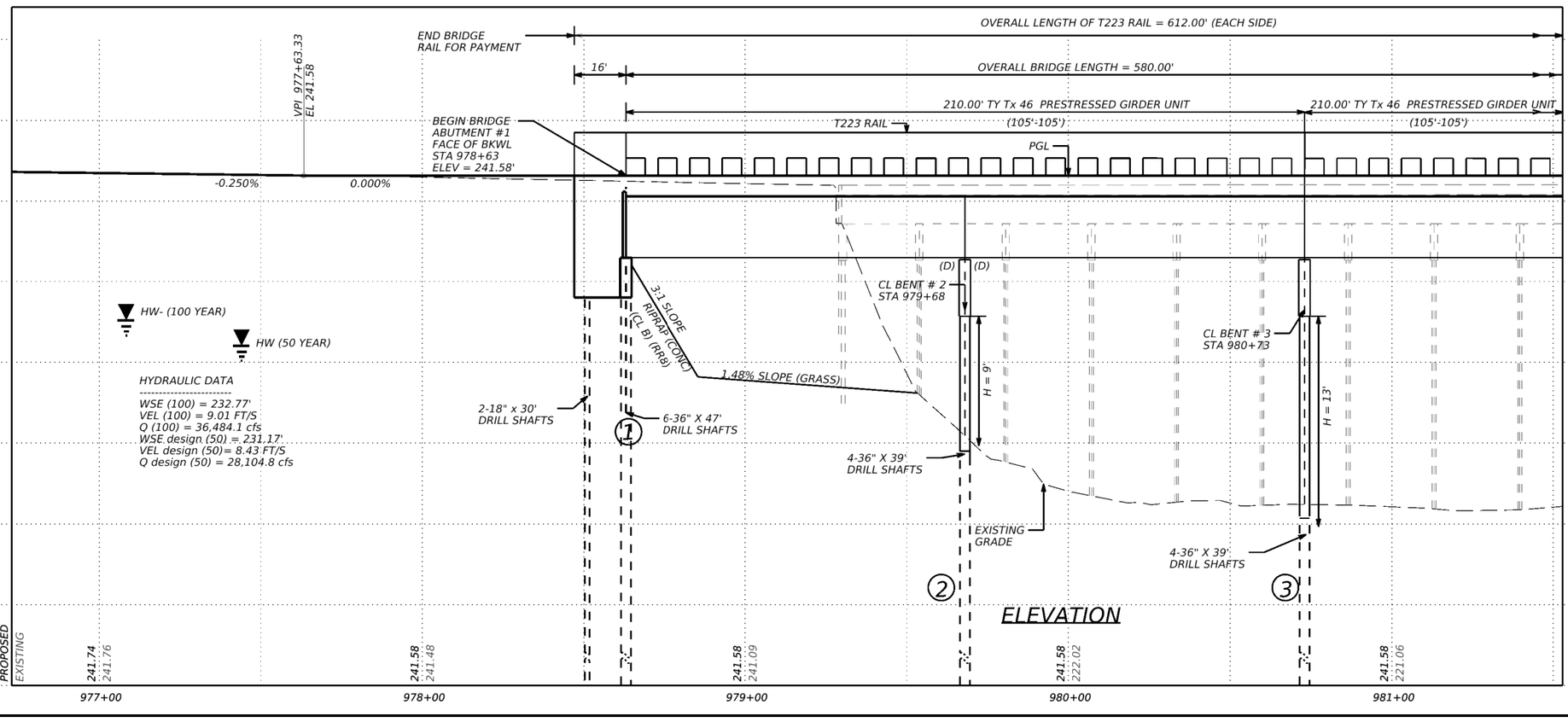
ALEXIS BARRON P.E. 12/22/2023 DATE

STATE OF TEXAS
LAURA M. ORTIZ
137207
LICENSED PROFESSIONAL ENGINEER

BRIDGE DESIGN

LAURA M. ORTIZ P.E. 12/22/2023 DATE

HL93 LOADING
SUPERSTRUCTURE INV/OPR
RATINGS: 1.08/1.95



ELEVATION

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

ROADWAY DESIGN

ANDRES GARZA P.E. 02/20/2024 DATE

SCALE
HORIZONTAL: 1"=40' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
BRIDGE LAYOUT
ATASCOSA RIVER
NBI NO. 15-007-0-0073-13-356

SHEET: 1 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		147

12/19/2023 4:20:18 PM
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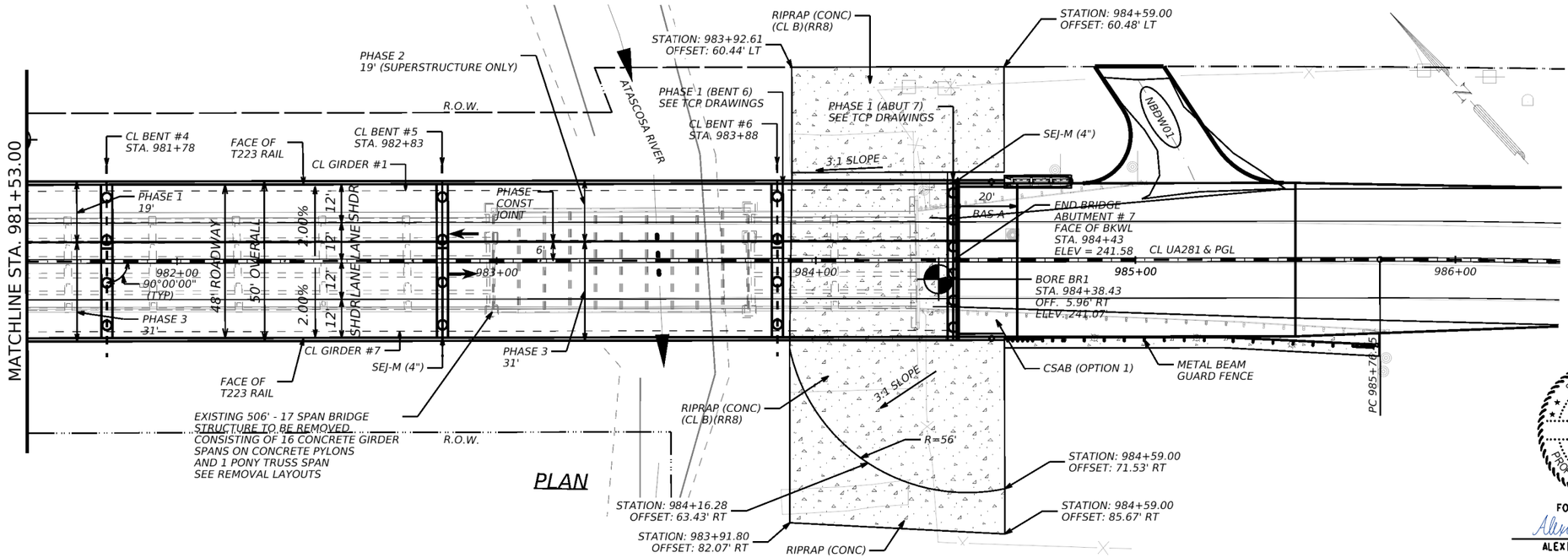

NOTES :

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 2020, 9TH EDITION, AND TxDOT BRIDGE DESIGN MANUAL, JANUARY 2023
2. EXISTING NBI = 15-007-0-0073-13-014
   PROPOSED NBI = 15-007-0-0073-13-356
3. US 281A DATA:
   ADT (2025) = 1,400
   ADT (2045) = 2,300
   DESIGN SPEED = 60 MPH
   FUNCTIONAL CLASS = RURAL COLLECTOR
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8. DRILLED SHAFTS WILL BE FOUNDED AT THE ELEVATIONS SHOWN OR DEEPER TO OBTAIN A MINIMUM PENETRATION OF ONE SHAFT DIAMETER INTO HARD MUDSTONE.
9. EXTERIOR GIRDER END CONDITIONS: (D)-DENOTES DOWEL, BLANK- DENOTES NO DOWEL
10. SEE TCP SHEETS FOR PHASING SEQUENCE
11. PROVIDE SHEAR KEYS AT THE END OF EVERY GIRDER SPAN.

STATE OF TEXAS
ALEXIS BARRON
148028
LICENSED PROFESSIONAL ENGINEER

FOUNDATION DESIGN

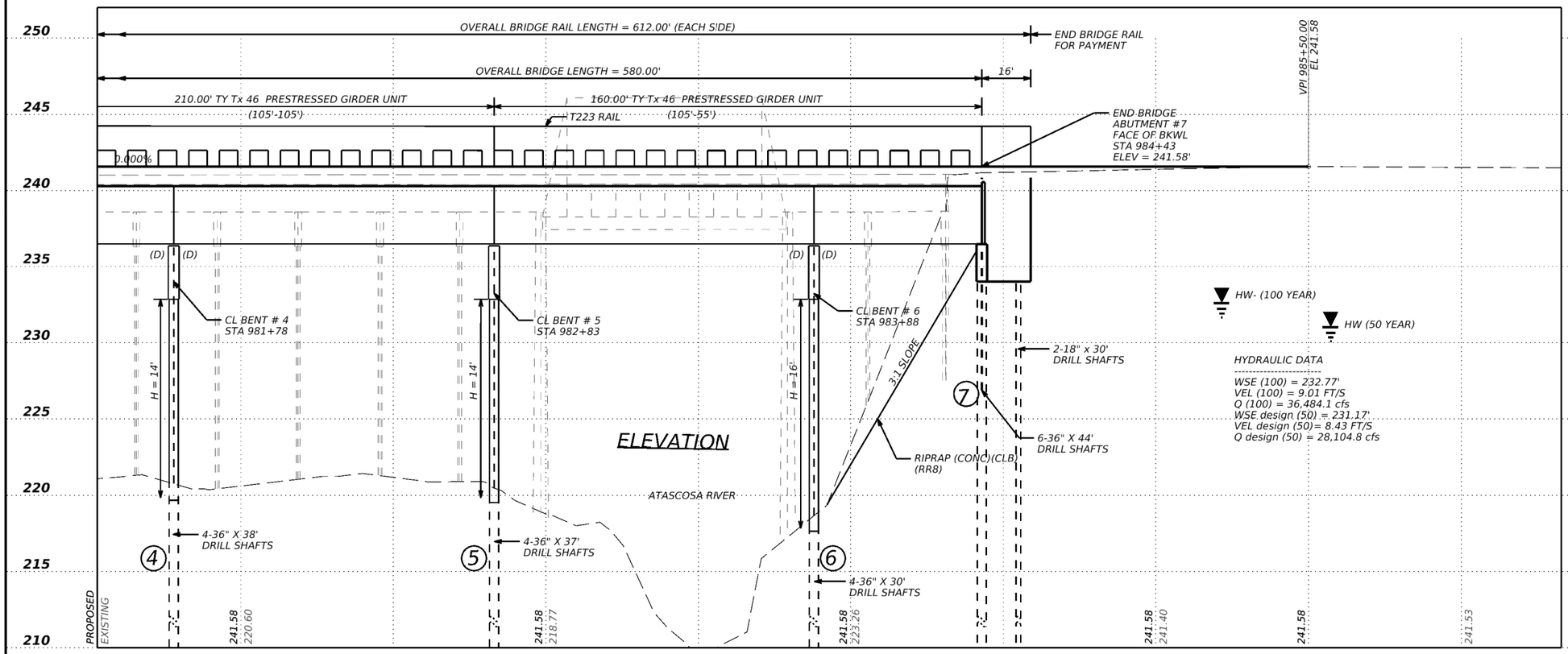
Alexis B. P.E. 12/22/2023
ALEXIS BARRON DATE

STATE OF TEXAS
LAURA M. ORTIZ
137207
LICENSED PROFESSIONAL ENGINEER

BRIDGE DESIGN

Laura Ortiz P.E. 12/22/2023
LAURA M. ORTIZ DATE

HL93 LOADING
SUPERSTRUCTURE INV/OPR
RATINGS: 1.08/1.95



HYDRAULIC DATA

WSE (100) = 232.77'
VEL (100) = 9.01 FT/S
Q (100) = 36,484.1 cfs
WSE design (50) = 231.17'
VEL design (50)= 8.43 FT/S
Q design (50) = 28,104.8 cfs

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

ROADWAY DESIGN

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE
HORIZONTAL: 1"=40' VERTICAL: 1"=10'

Texas Department of Transportation

UA 281
BRIDGE LAYOUT
ATASCOSA RIVER
NBI NO. 15-007-0-0073-13-356

SHEET: 2 OF 2

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		148

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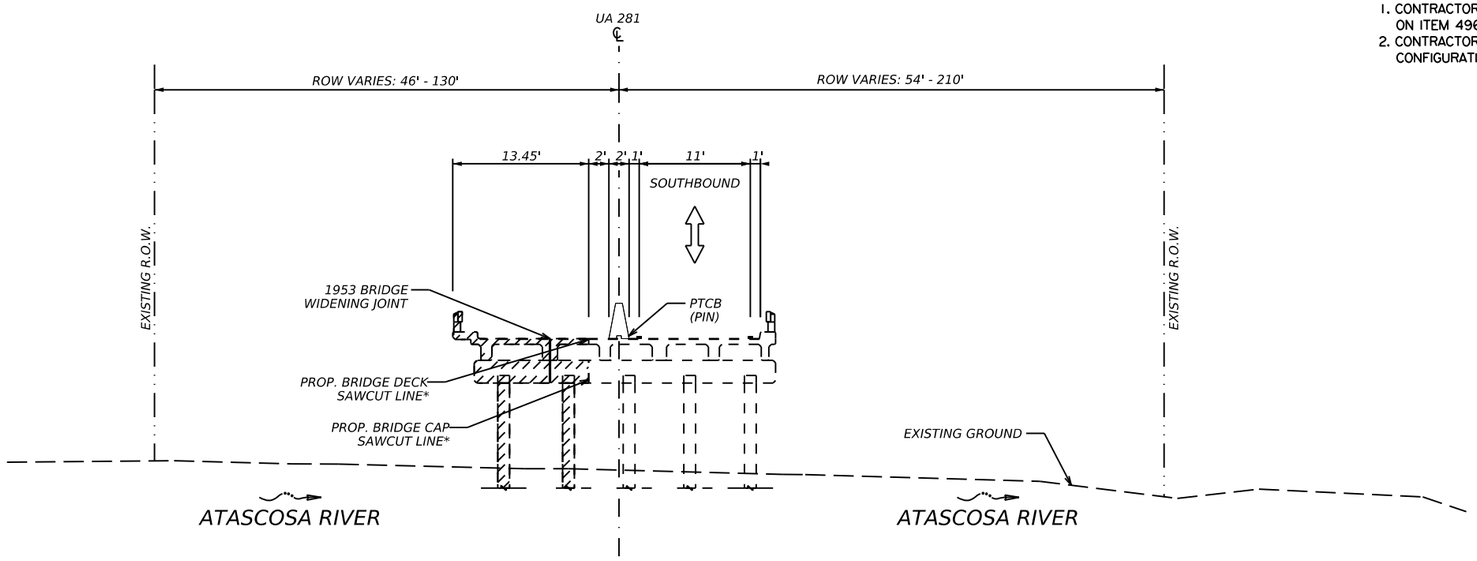
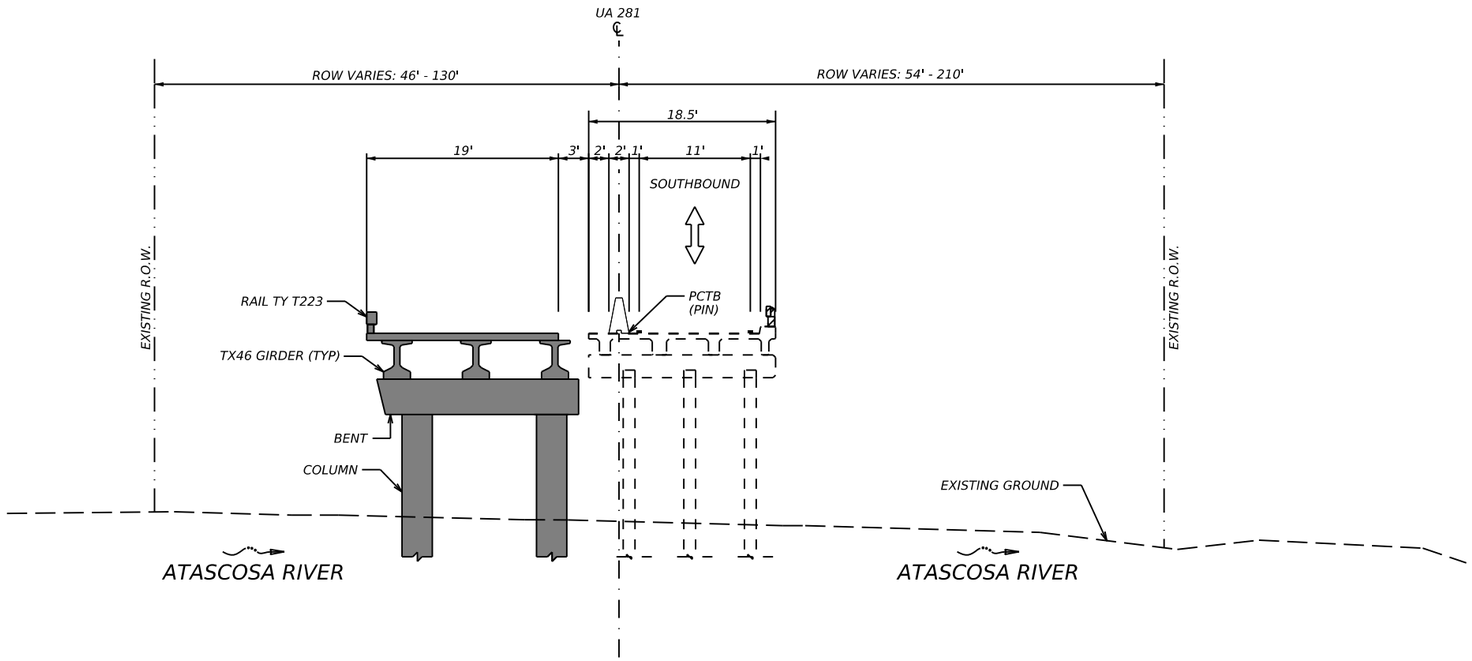
DESIGN: SG | DRAFT: SG | CHECK: AG

NOTES:
1. CONTRACTOR SHOULD SUBMIT A DEMOLITION PLAN AS INDICATED ON ITEM 496.
2. CONTRACTOR TO REFER TO TCP TYPICALS FOR PHASE LANE CONFIGURATION AND PAVEMENT MARKING DETAILS.



UA 281 - ATASCOSA RIVER BRIDGE (PHASE 1)



UA 281 - ATASCOSA RIVER BRIDGE (PHASE 1)

BRIDGE PHASING LEGEND

- EXISTING BRIDGE DEMOLITION
- PROPOSED WORK
- PROPOSED WORK: COMPLETED

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
BRIDGE PHASING

SHEET: 1 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		149

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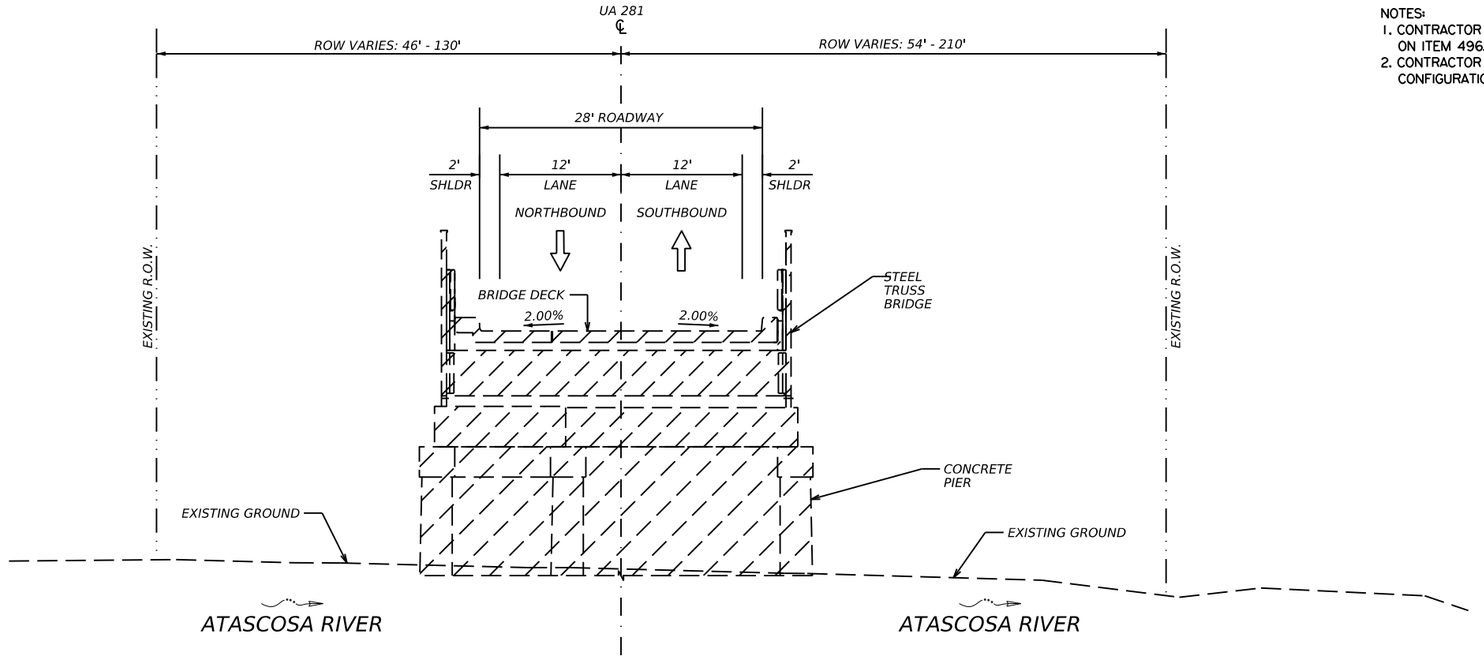
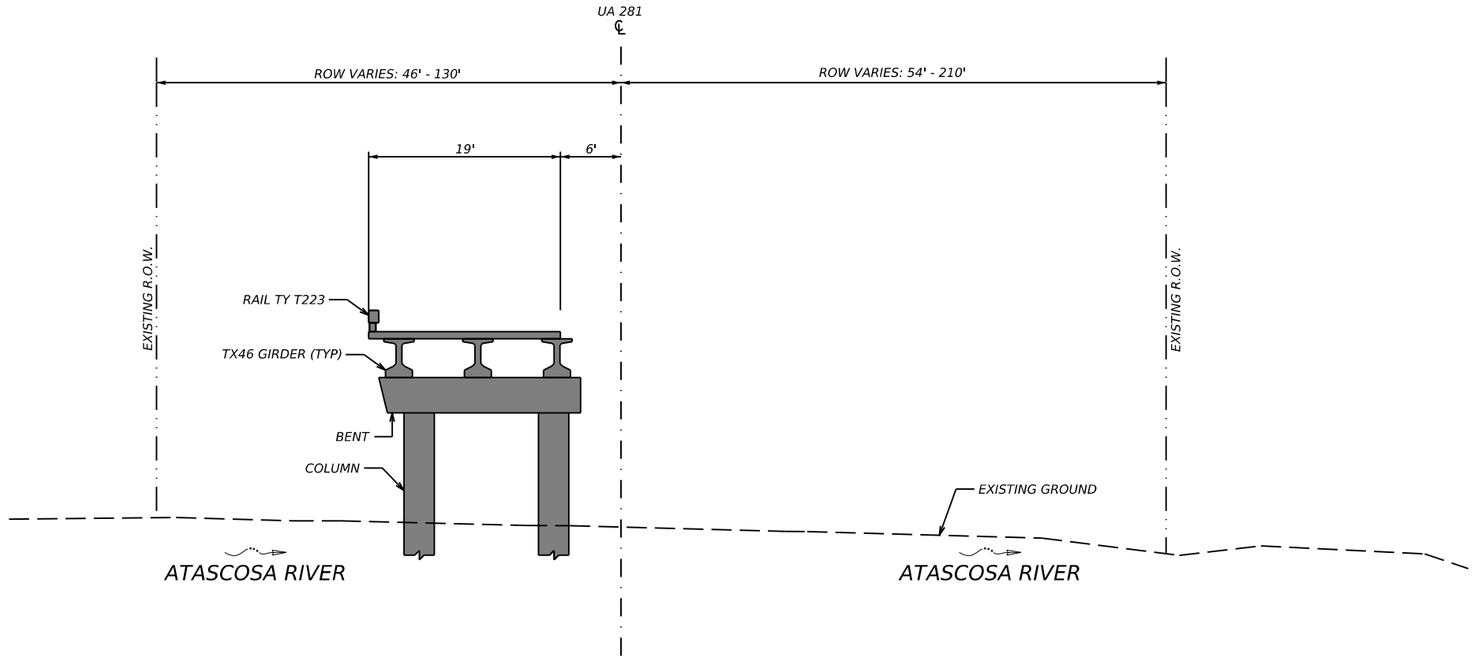
DESIGN: SG | DRAFT: SG | CHECK: AG



UA 281 - ATASCOSA RIVER BRIDGE STEEL TRUSS (PHASE 2)



UA 281 - ATASCOSA RIVER BRIDGE (PHASE 2)

BRIDGE PHASING LEGEND

- EXISTING BRIDGE DEMOLITION
- PROPOSED WORK
- PROPOSED WORK: COMPLETED

NOTES:
1. CONTRACTOR SHOULD SUBMIT A DEMOLITION PLAN AS INDICATED ON ITEM 496.
2. CONTRACTOR TO REFER TO TCP TYPICALS FOR PHASE LANE CONFIGURATION AND PAVEMENT MARKING DETAILS.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
BRIDGE PHASING

SHEET: 2 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		150

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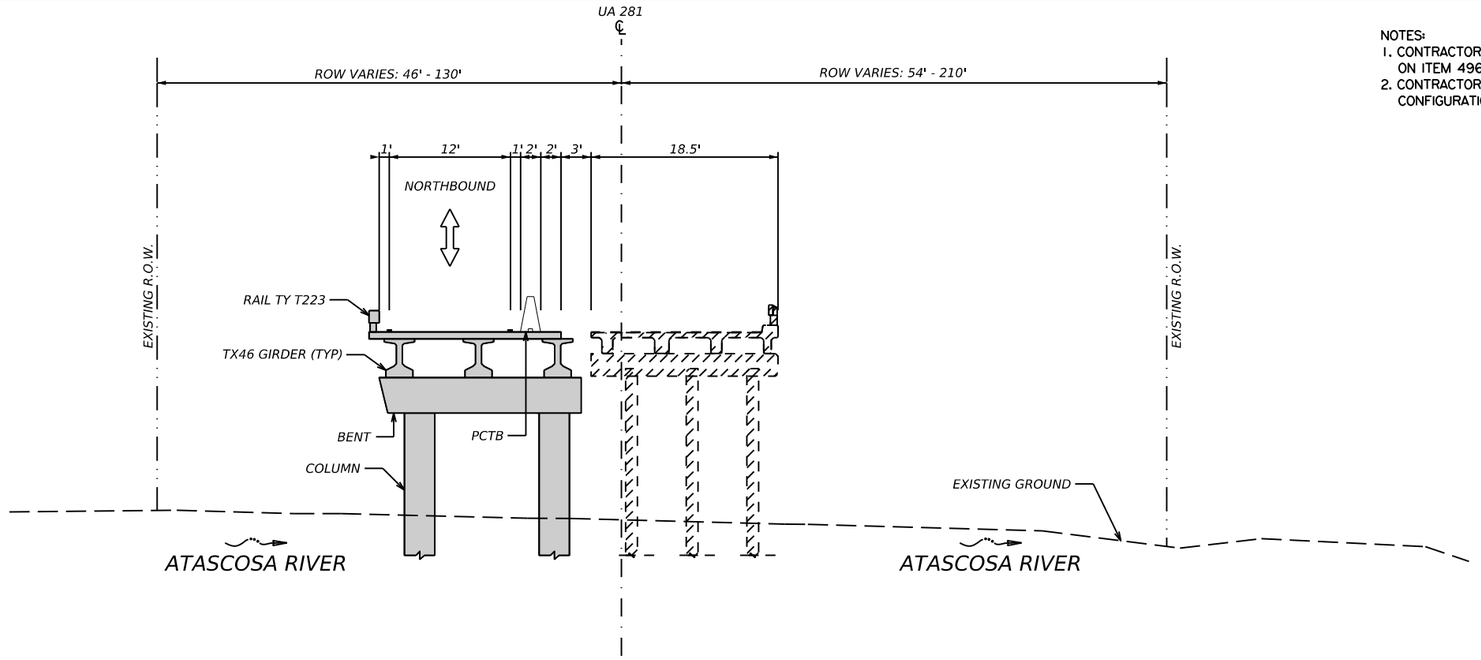
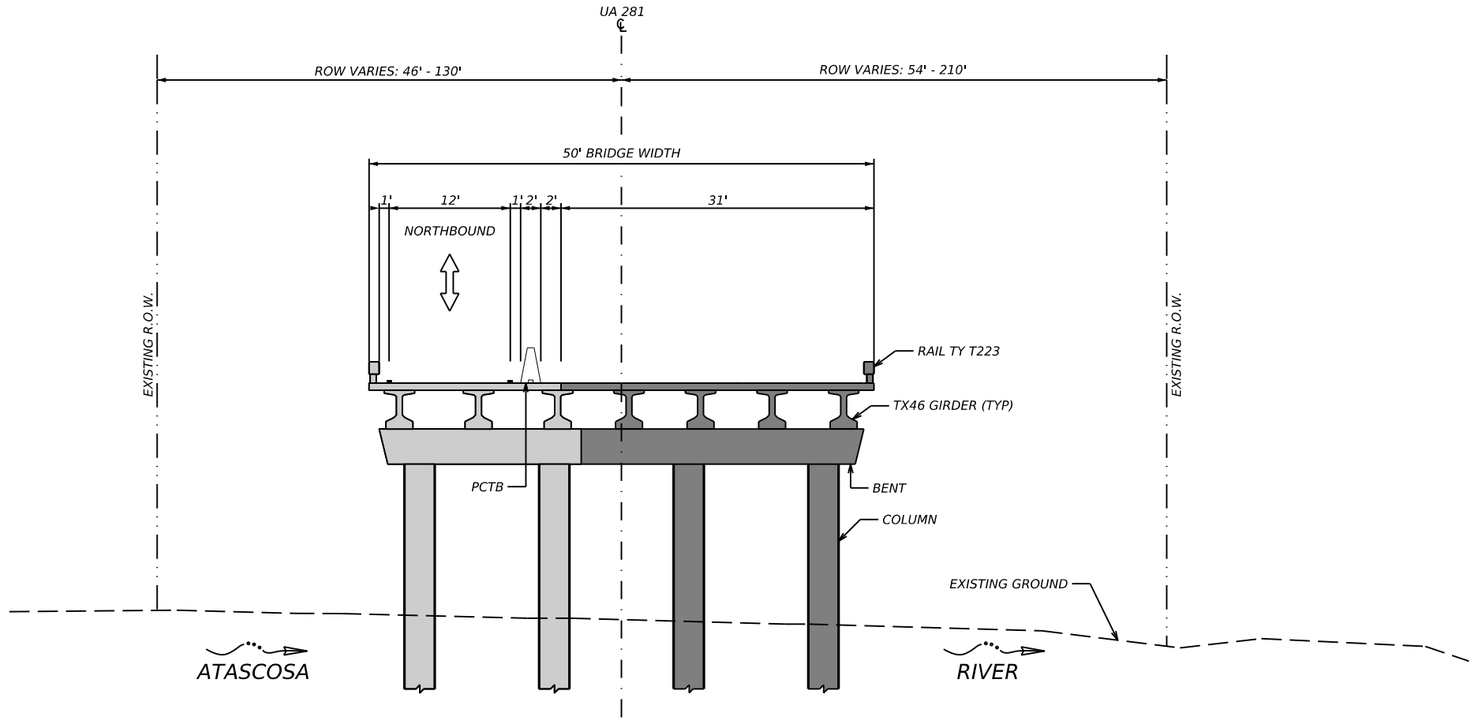
DESIGN: SG | DRAFT: SG | CHECK: AG



UA 281 - ATASCOSA RIVER BRIDGE (PHASE 3)



UA 281 - ATASCOSA RIVER BRIDGE (PHASE 3)

BRIDGE PHASING LEGEND

- EXISTING BRIDGE DEMOLITION
- PROPOSED WORK
- PROPOSED WORK: COMPLETED

NOTES:
1. CONTRACTOR SHOULD SUBMIT A DEMOLITION PLAN AS INDICATED ON ITEM 496.
2. CONTRACTOR TO REFER TO TCP TYPICALS FOR PHASE LANE CONFIGURATION AND PAVEMENT MARKING DETAILS.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
BRIDGE PHASING

SHEET: 3 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		151

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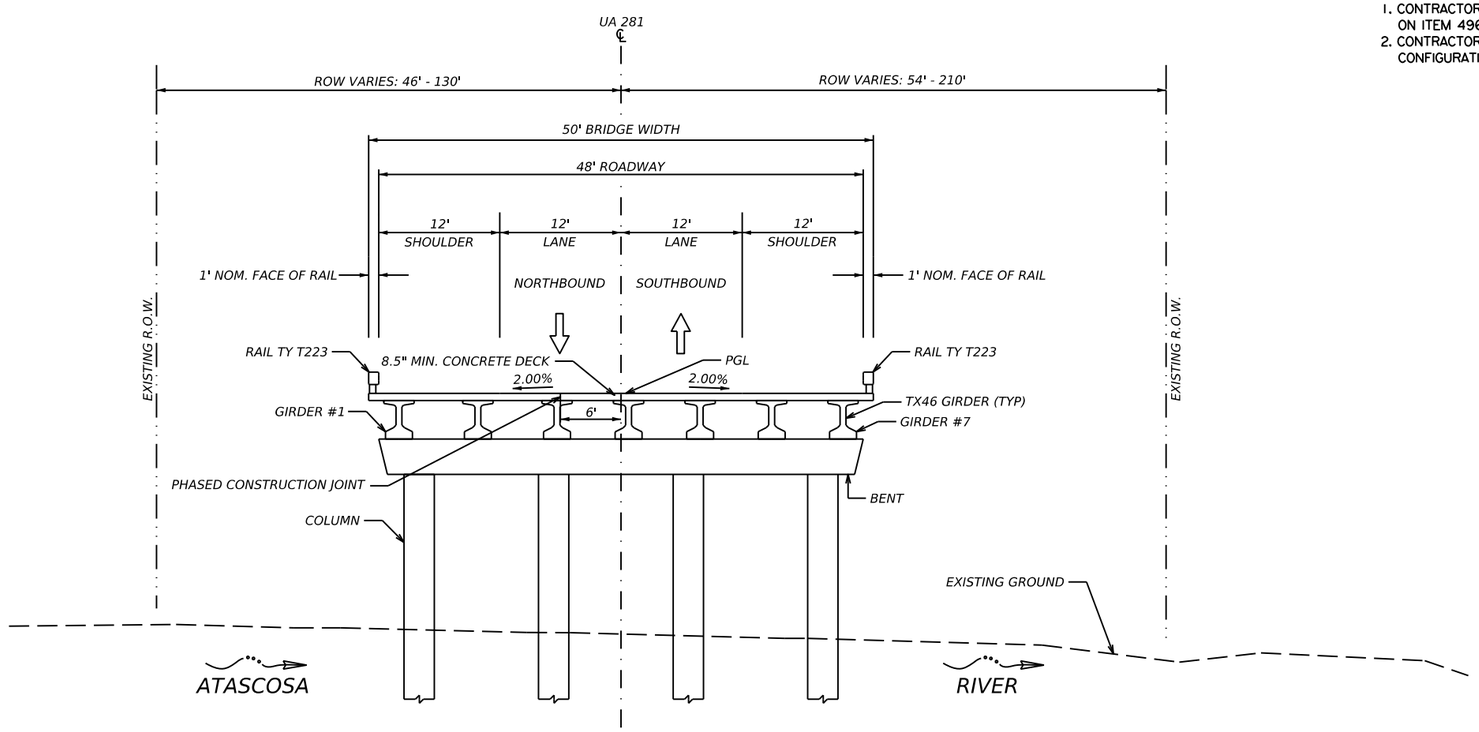
DESIGN: SG | DRAFT: SG | CHECK: AG

NOTES:
1. CONTRACTOR SHOULD SUBMIT A DEMOLITION PLAN AS INDICATED ON ITEM 496.
2. CONTRACTOR TO REFER TO TCP TYPICALS FOR PHASE LANE CONFIGURATION AND PAVEMENT MARKING DETAILS.



UA 281 - PROPOSED ATASCOSA RIVER BRIDGE

BRIDGE PHASING LEGEND

- EXISTING BRIDGE DEMOLITION
- PROPOSED WORK
- PROPOSED WORK: COMPLETED

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

NOT TO SCALE

Texas Department of Transportation

UA 281
BRIDGE PHASING

SHEET: 4 OF 4

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		152

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SUMMARY OF ESTIMATED QUANTITIES

	BID ITEM / BID CODE	0400 6005	0416 6001	0416 6004	0420 6013	0420 6029	0420 6037	0422 6001	0422 6015	0425 6038	0450 6006	0454 6018
	BID ITEM DESCRIPTION / BRIDGE ELEMENT	CEM STABIL BKFL	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC GIRDER (TX46)	RAIL (TY T223)	SEALED EXPANSION JOINT (4 IN) (SEJ – M)
		CY	LF	LF	CY	CY	CY	SF	CY	LF	LF	LF
PHASE I	2 - ABUTMENTS	108	60	273	34.0				28.9		32.0	
	5 - INTERIOR BENTS			366		48.0	34.5					
	2 - 210.00' PRESTR CONC GIRDER UNIT							7980		1254.00	420.0	39
	PHASE 1 SUBTOTAL:	108	60	639	34.0	48.0	34.5	7980	28.9	1254.00	452.0	39
PHASE II	1 - 160.00' PRESTR CONC GIRDER UNIT							3040		477.00	160.0	39
	PHASE 2 SUBTOTAL:							3040		477.00	160.0	39
PHASE III	2 - ABUTMENTS	124	60	273	36.5				48.1		32.0	
	5 - INTERIOR BENTS			366		63.5	34.5					
	2 - 210.00' PRESTR CONC GIRDER UNIT							13020		1672.00	420.0	59
	1 - 160.00' PRESTR CONC GIRDER UNIT							4960		636.00	160.0	59
	PHASE 3 SUBTOTAL:	124	60	639	36.5	63.5	34.5	17980	48.1	2308.00	612.0	118
	OVERALL TOTALS:	232	120	1278	70.5	111.5	69.0	29000	77.0	4039.00	1224.0	196 (1)

(1) Quantity includes 1'-0" extension of SEJ from Phase 1 (Spans 1-4) & Phase 2 (Spans 5-6) into Phase 3.

BEARING SEAT ELEVATIONS

	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7
BENT 1 (FWD)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
BENT 2 (BK)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
(FWD)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
BENT 3 (BK)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
(FWD)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
BENT 4 (BK)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
(FWD)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
BENT 5 (BK)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
(FWD)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
BENT 6 (BK)	236.036	236.193	236.349	236.461	236.319	236.178	236.036
(FWD)	236.203	236.360	236.516	236.628	236.486	236.345	236.203
BENT 7 (BK)	236.203	236.360	236.516	236.628	236.486	236.345	236.203

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Texas Department of Transportation — Bridge Division

ESTIMATED QUANTITIES AND BEARING SEAT ELEVATIONS

ATASCOSA RIVER BRIDGE

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©TxDOT SEPTEMBER 2023	CONT	SECT	JOB	HIGHWAY
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	SAT	ATASCOSA		153

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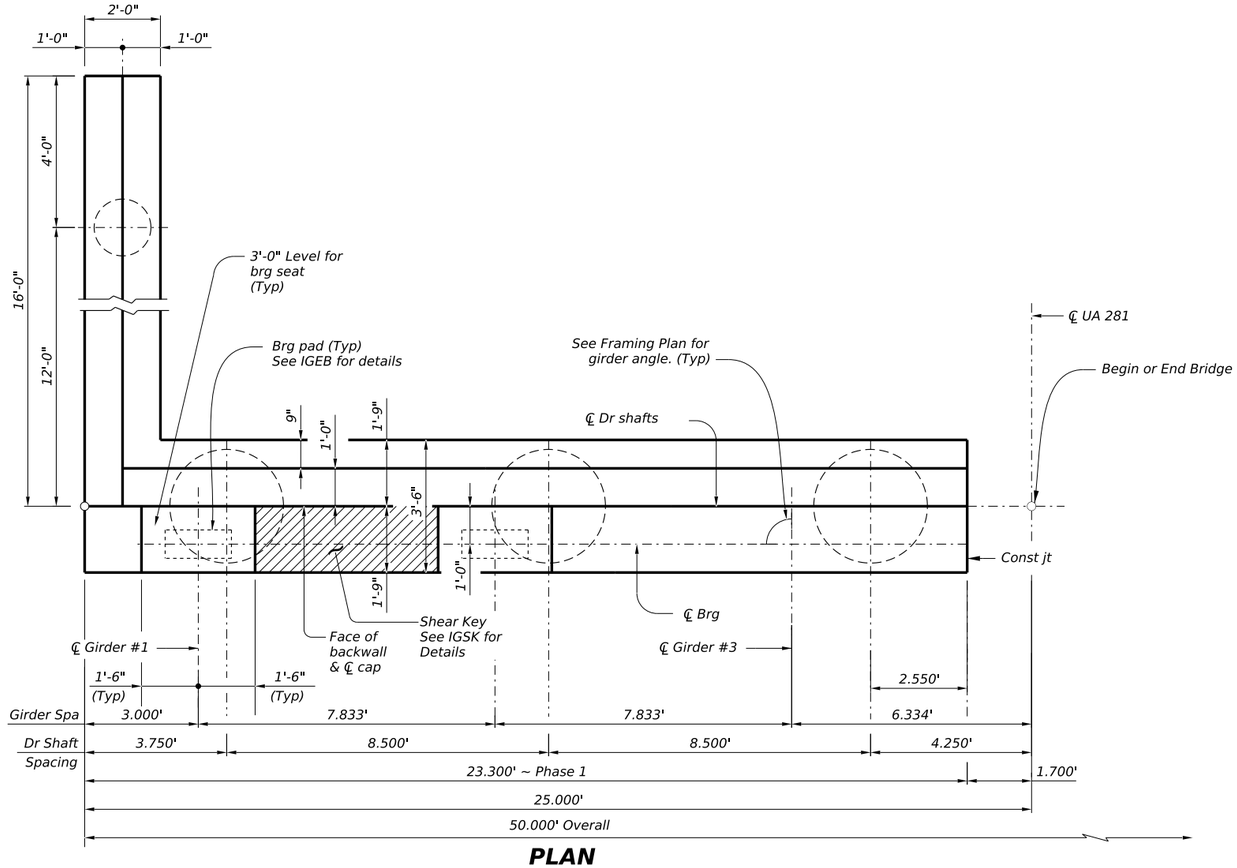
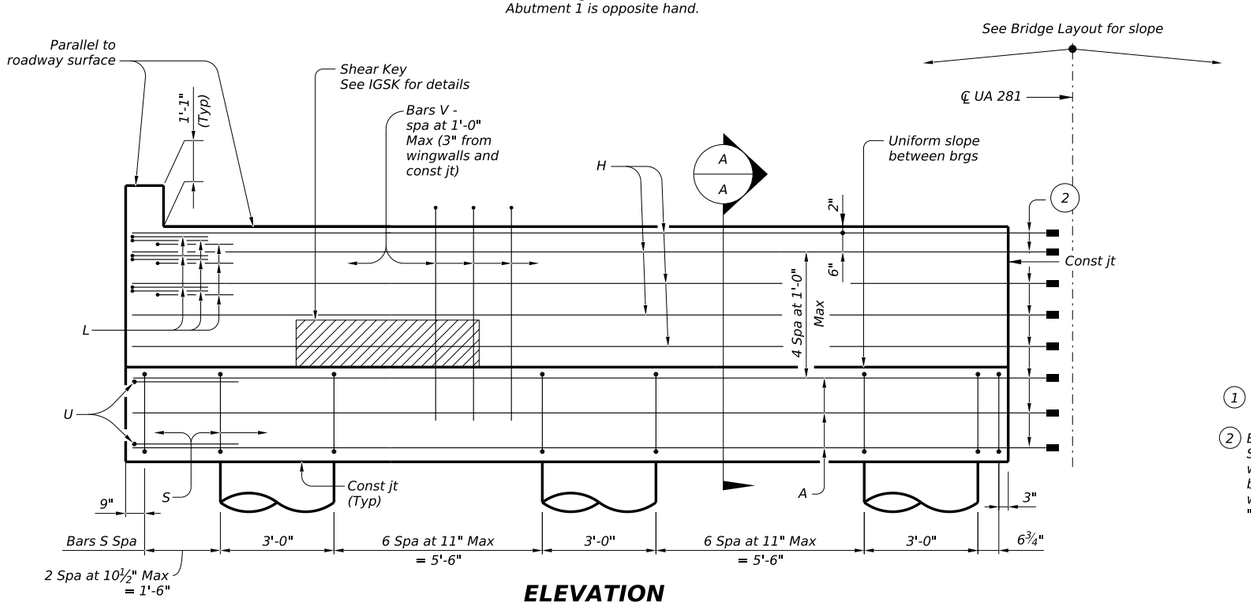


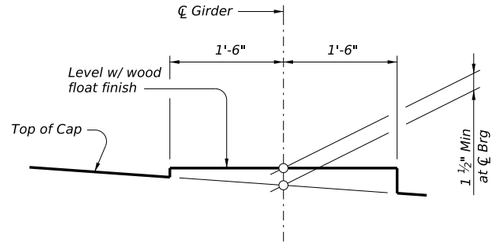
PLAN

Showing Abutment 7.
Abutment 1 is opposite hand.



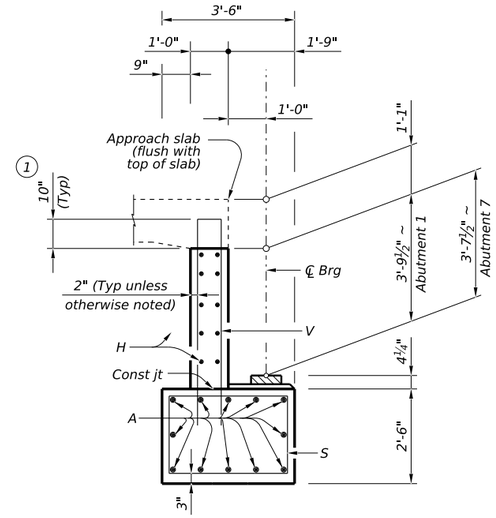
ELEVATION

Showing Abutment 7.
Abutment 1 is opposite hand.



BEARING SEAT DETAIL

Remove all loose material and clean the bearing surface before placing the bearing pad.



SECTION A-A

1. Increase as required to maintain 3" from finished grade.
2. Extend bars 1'-0" into Phase 3 Construction. Splice Bars A & H by welding in accordance with Item 448, "Structural Field Welding" or by using mechanical couplers in accordance with current special provisions to Item 440, "Reinforcement for Concrete."

HL93 LOADING **SHEET 1 OF 2**

Texas Department of Transportation | Bridge Division

ABUTMENT NO. 1 OR 7 (PHASE 1)

ATASCOSA RIVER BRIDGE

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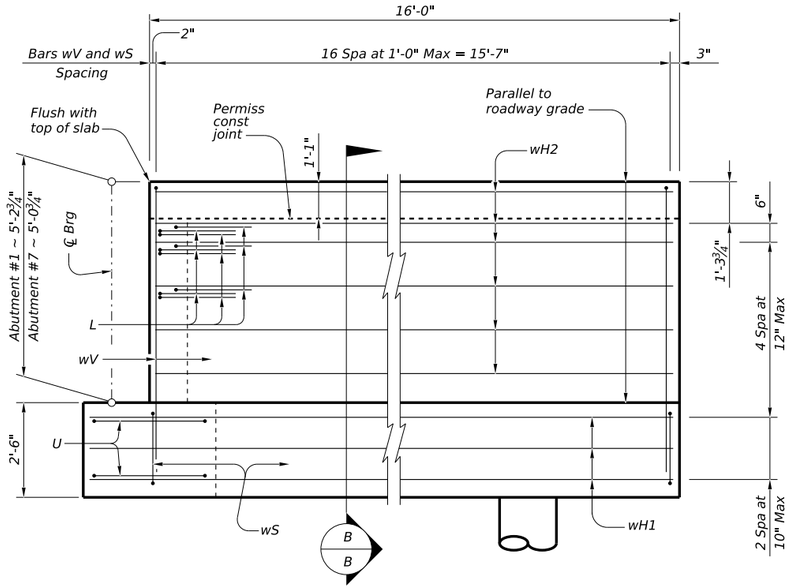
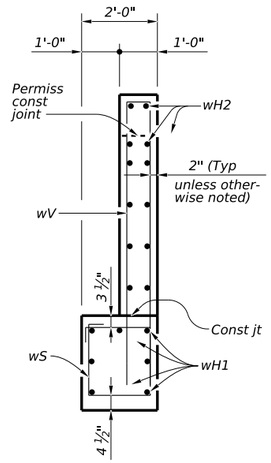
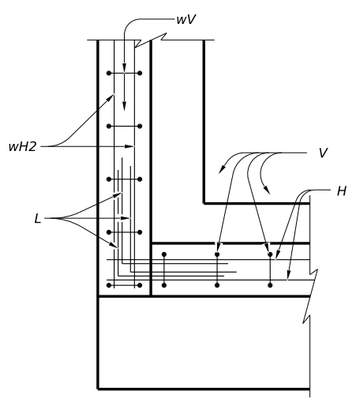


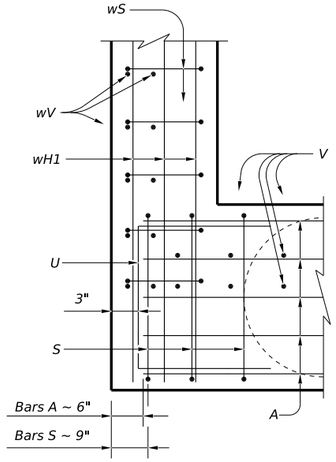
WINGWALL ELEVATION



SECTION B-B



BACKWALL



CAP

CORNER DETAILS

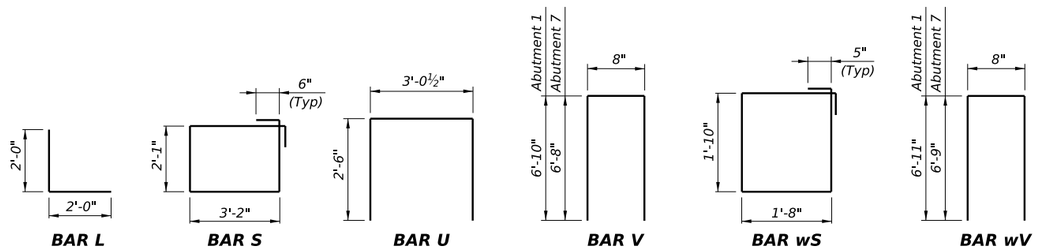


TABLE OF ESTIMATED QUANTITIES (3)

Bar	No.	Size	Length	Weight
A	12	#11	23'–10"	1,520
H	10	#6	24'–2"	363
L	9	#6	4'–0"	54
S	19	#5	11'–6"	228
U	2	#6	8'–1"	24
V (5)	23	#5	14'–4"	344
wH1	7	#6	17'–5"	183
wH2	12	#6	15'–8"	282
wS	17	#4	7'–10"	89
wV (5)	17	#5	14'–6"	257
Reinforcing Steel			Lb	3,344
Class "C" Concrete (Abut) (4) (6)			CY	17.1

(3) Quantities shown are for one abutment only.

(4) Deduct 0.2 CY for Abutment No. 7.

(5) For Abutment 7, deduct 8 lbs. from Bars V and 6 lbs. from Bars wV.

(6) Quantity includes 0.3 CY for Shear Key concrete.

MATERIAL NOTES:

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

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).

See Bridge Layout for header slope and foundation type, size and length.

See Common Foundation Details (FD) standard sheet for all foundation details and notes.

See Concrete Riprap (CRR) standard sheet for riprap attachment details.

See T223 Standard for rail anchorage in wingwalls.

Calculated foundation load for Abutment #1 = 90 tons/dr shaft.

Calculated foundation load for Abutment #7 = 60 tons/dr shaft.

Calculated foundation load for each Wingwall = 10 tons/dr shaft.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING **SHEET 2 OF 2**

Texas Department of Transportation | Bridge Division

ABUTMENT NO. 1 OR 7 (PHASE 1)

ATASCOSA RIVER BRIDGE

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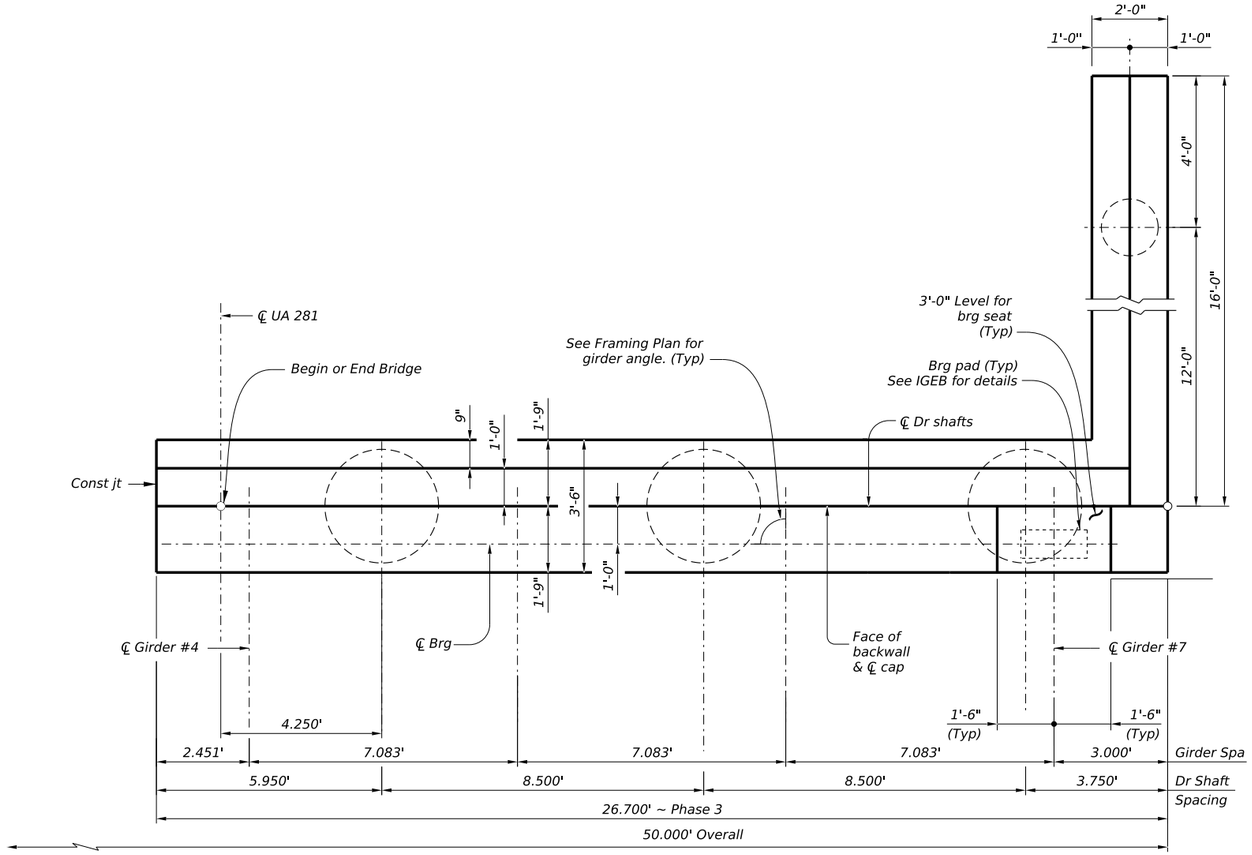
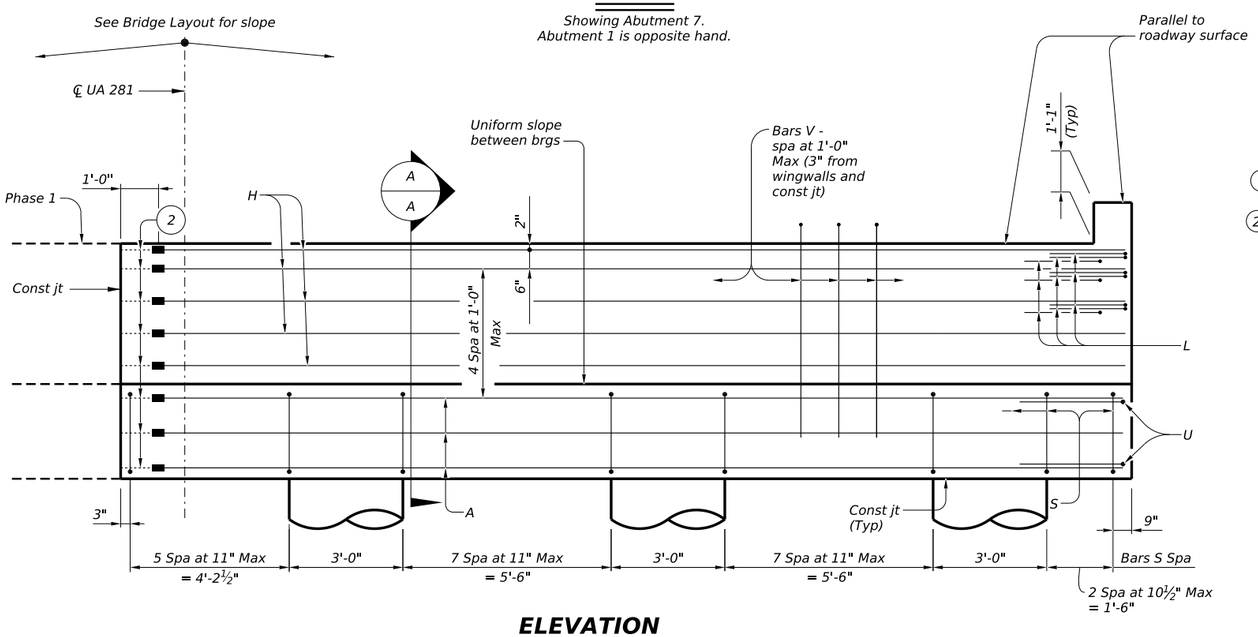


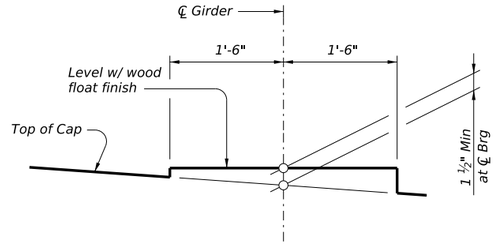
PLAN

Showing Abutment 7.
Abutment 1 is opposite hand.



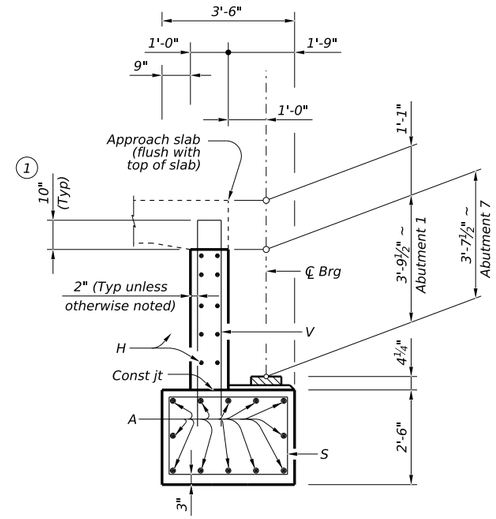
ELEVATION

Showing Abutment 7.
Abutment 1 is opposite hand.



BEARING SEAT DETAIL

Remove all loose material and clean the bearing surface before placing the bearing pad.



SECTION A-A

1. Increase as required to maintain 3" from finished grade.
2. Connect Bars A and H from Phase 1 to Bars A and H in Phase 3 with a mechanical coupler. Refer to the current special provision Item 440 "Reinforcement to Concrete" for additional guidance.

HL93 LOADING

SHEET 1 OF 2

Texas Department of Transportation — Bridge Division

ABUTMENT NO. 1 OR 7 (PHASE 3)

ATASCOSA RIVER BRIDGE

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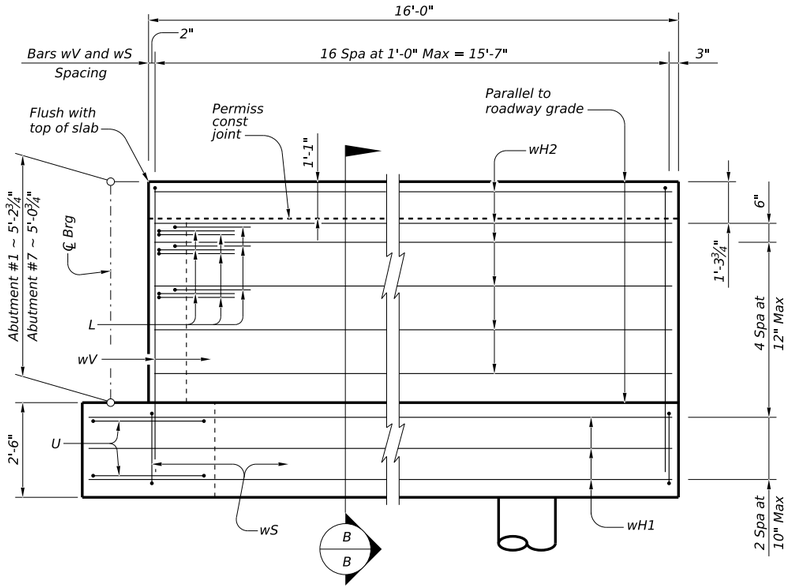
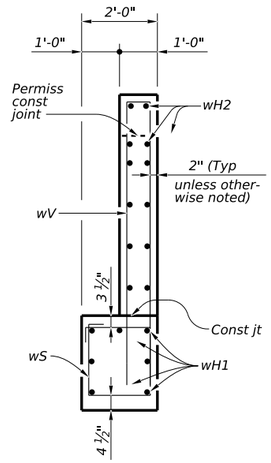


WINGWALL ELEVATION



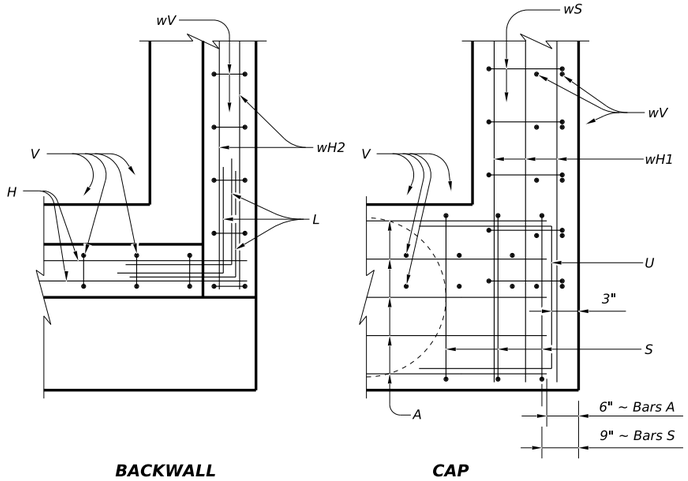
SECTION B-B

TABLE OF ESTIMATED QUANTITIES (PHASE 3) (3)				
Bar	No.	Size	Length	Weight
A	12	#11	26'–3"	1,674
H	10	#6	26'–7"	399
L	9	#6	4'–0"	54
S	23	#5	11'–6"	276
U	2	#6	8'–1"	24
V (5)	27	#5	14'–4"	404
wH1	7	#6	17'–5"	183
wH2	12	#6	15'–8"	282
wS	17	#4	7'–10"	89
wV (5)	17	#5	14'–6"	257
Reinforcing Steel			Lb	3,642
Class "C" Concrete (Abut) (4)			CY	18.4

(3) Quantities shown are for one abutment only.

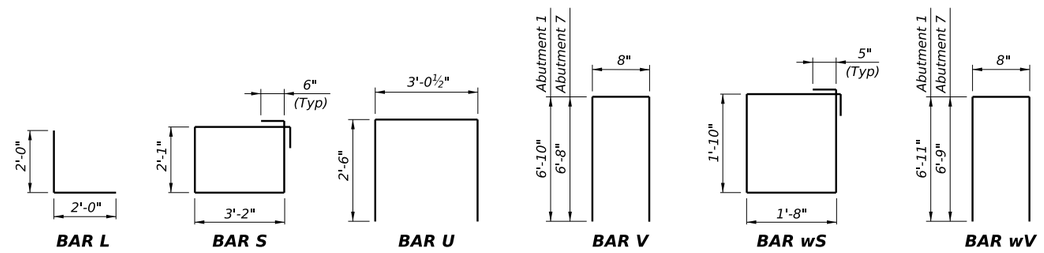
(4) Deduct 0.3 CY for Abutment No. 7.

(5) For Abutment 7, deduct 9 lbs. from Bars V and 6 lbs. from Bars wV.



BACKWALL **CAP**

CORNER DETAILS



MATERIAL NOTES:

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

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).

See Bridge Layout for header slope and foundation type, size and length.

See Common Foundation Details (FD) standard sheet for all foundation details and notes.

See Concrete Riprap (CRR) standard sheet for riprap attachment details.

See T223 Standard for rail anchorage in wingwalls.

Calculated foundation load for Abutment #1 = 90 tons/dr shaft.

Calculated foundation load for Abutment #7 = 60 tons/dr shaft.

Calculated foundation load for each Wingwall = 10 tons/dr shaft.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING **SHEET 2 OF 2**

12/22/2023

Texas Department of Transportation — Bridge Division

ABUTMENT NO. 1 OR 7 (PHASE 3)

ATASCOSA RIVER BRIDGE

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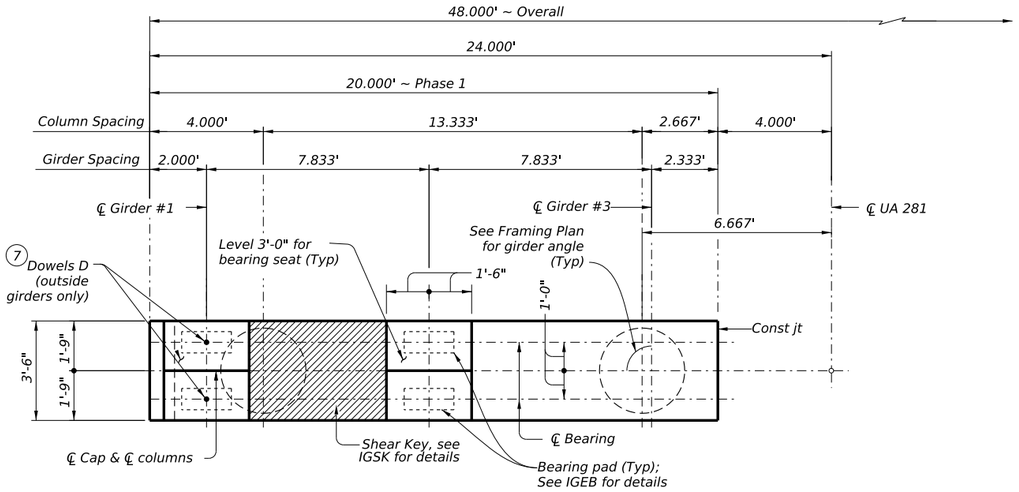
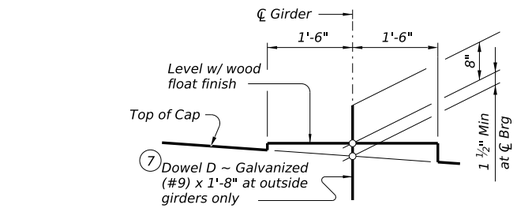
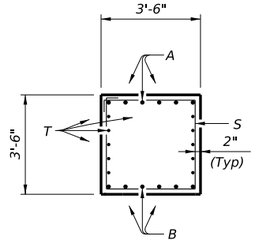


PLAN

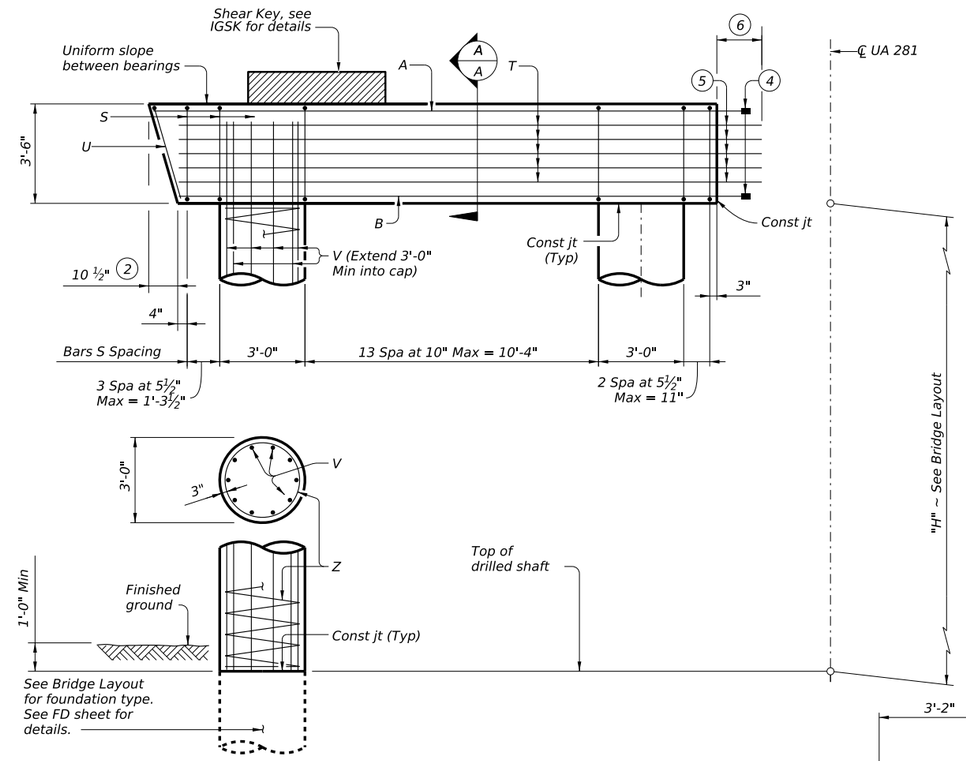


BEARING SEAT DETAIL

Remove all loose material and clean the bearing surface before placing the bearing pad.



SECTION A-A



ELEVATION

TABLE OF ESTIMATED QUANTITIES (PHASE 1) (3)

Bar	No.	Size	Length	Weight
A (8)	6	#11	20'–10"	664
B	6	#11	20'–0"	638
D (7)	2	#9	1'–8"	11
S	21	#5	13'–8"	299
T (8)	10	#5	20'–10"	217
U	1	#5	9'–8"	10
Reinforcing Steel			Lb	4,866
Class "C" Concrete (Cap) (9)			CY	9.6

TABLE OF COLUMN QUANTITIES (PHASE 1) (1)

Bent	"H"	Bars V 20 ~ #9		Bars Z 2 ~ #4		Reinf Steel	Class "C" Conc (Col)
No.	Height	Length	Weight	Length	Weight	Lb	CY
2	9'	12'–0"	816	296' – 0 ½"	396	1212	4.7
3	13'	16'–0"	1088	421' – 9 ½"	564	1652	6.8
4	14'	17'–0"	1156	453' – 2 ¾"	606	1762	7.3
5	14'	17'–0"	1156	453' – 2 ¾"	606	1762	7.3
6	16'	19'–0"	1292	516' – 1 ¼"	690	1982	8.4

(1) For each linear foot variation in "H" value, make the following adjustments:
Bars V length, 1'-0"
Bars Z length, 31'-5¼"
Reinforcing steel, 55 lbs. per Col
Class "C" conc (col), 0.26 CY per Col

(2) Measured parallel to top of cap cross-slope.

(3) Quantities shown are for one bent only.

(4) Extend Bars A and Bars B 1'-0" into Phase 3 Construction.

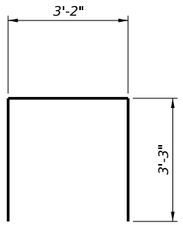
(5) Extend Bars T 1'-10" into Phase 3 Construction.

(6) Splice Bars A, B, & T by welding in accordance with Item 448, "Structural Field Welding" or by using mechanical couplers in accordance with current special provisions to Item 440, "Reinforcement to Concrete."

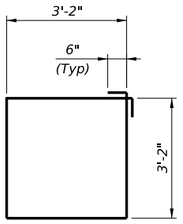
(7) Omit Dowels D at Bent 3 and 5. Deduct 5.72 lbs. per reinforcing bar.

(8) Lap distance going into next phase included in length.

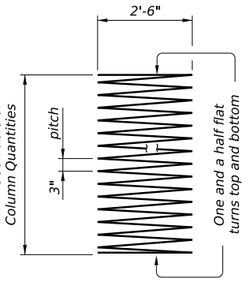
(9) Quantity includes 0.5 CY for shear key.



BARS U



BARS S



BARS Z

MATERIAL NOTES:

Provide Class C concrete ($f'c$ = 3,600 psi).
Provide Grade 60 reinforcing steel.
Galvanize dowel bars D.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).
See Bridge Layout for foundation type, size and length.
See Common Foundation Details (FD) standard sheet for all foundation details and notes.
Calculated foundation load for Bent #2 thru 5 = 225 tons/dr shaft.
Calculated foundation load for Bent #6 = 185 tons/dr shaft.

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

HL93 LOADING

Texas Department of Transportation — Bridge Division

INTERIOR BENT NOS. 2 - 6 (PHASE 1)

ATASCOSA RIVER BRIDGE

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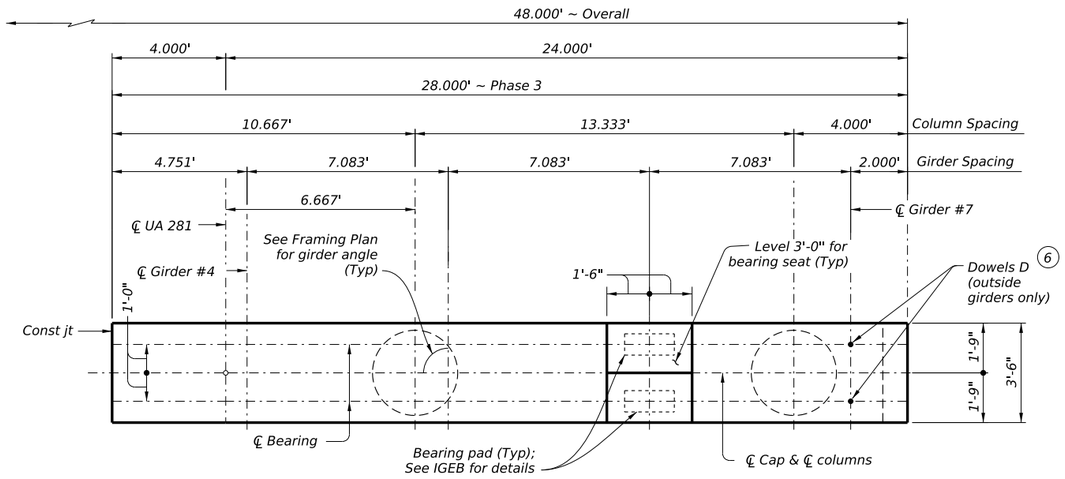

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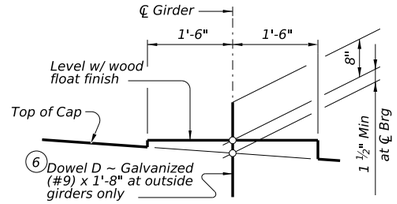
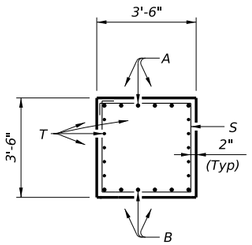


BEARING SEAT DETAIL

Remove all loose material and clean the bearing surface before placing the bearing pad.



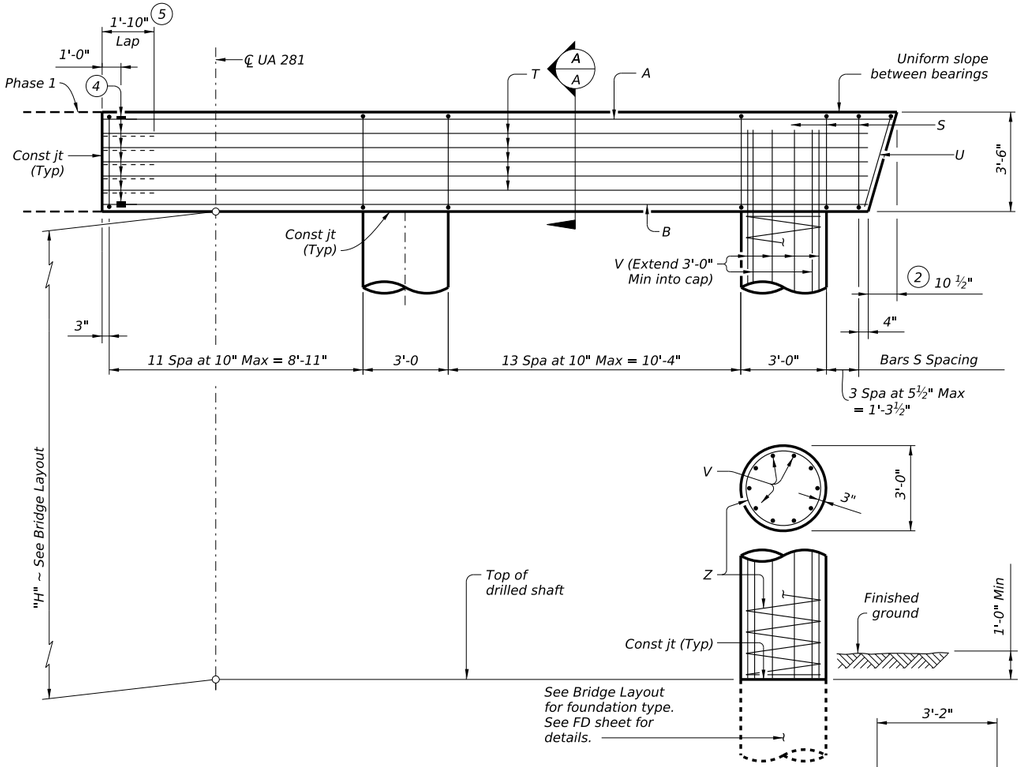
SECTION A-A

TABLE OF ESTIMATED QUANTITIES (PHASE 3) 3

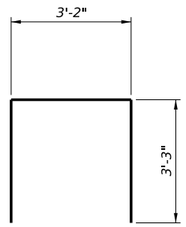
Bar	No.	Size	Length	Weight
A	6	#11	26'–10"	855
B	6	#11	26'–0"	829
D 6	2	#9	1'–8"	11
S	30	#5	13'–8"	428
T	10	#5	27'–0"	282
U	1	#5	9'–8"	10
Reinforcing Steel		Lb	5,442	
Class "C" Concrete (Cap)		CY	12.7	

TABLE OF COLUMN QUANTITIES (PHASE 3) 1

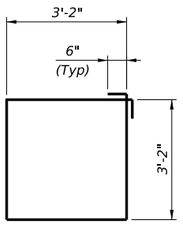
Bent	"H"	Bars V 20 ~ #9		Bars Z 2 ~ #4		Reinf Steel	Class "C" Conc (Col)
No.	Height	Length	Weight	Length	Weight	Lb	CY
2	9'	12'–0"	816	296' – 0 ½"	396	1212	4.7
3	13'	16'–0"	1088	421' – 9 ½"	564	1652	6.8
4	14'	17'–0"	1156	453' – 2 ¾"	606	1762	7.3
5	14'	17'–0"	1156	453' – 2 ¾"	606	1762	7.3
6	16'	19'–0"	1292	516' – 1 ¼"	690	1982	8.4



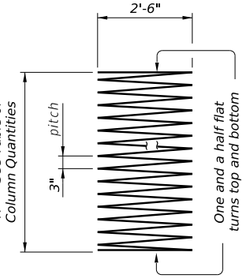
ELEVATION



BARS U



BARS S



BARS Z

1 For each linear foot variation in "H" value, make the following adjustments:
Bars V length, 1'-0"
Bars Z length, 31'-5¼"
Reinforcing steel, 55 lbs. per Col
Class "C" conc (col), 0.26 CY per Col

2 Measured parallel to top of cap cross-slope.

3 Quantities shown are for one bent only.

4 Connect Bars A and B from Phase 1 or 2 to Phase 3 using a mechanical coupler. Refer to current special provisions Item 440, "Reinforcement of Concrete" for additional guidance.

5 Lap Bars T in Phase 3 with Bars T in Phase 1 or 2.

6 Omit Dowels D at Bent 3 and 5. Deduct 5.72 lbs. per reinforcing bar.

MATERIAL NOTES:

Provide Class C concrete (f'c = 3,600 psi).
Provide Grade 60 reinforcing steel.
Galvanize dowel bars D.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).
See Bridge Layout for foundation type, size and length.
See Common Foundation Details (FD) standard sheet for all foundation details and notes.
Calculated foundation load for Bent #2 thru 5 = 225 tons/dr shaft.
Calculated foundation load for Bent #6 = 185 tons/dr shaft.

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

HL93 LOADING

Texas Department of Transportation — Bridge Division

INTERIOR BENT NOS. 2 - 6 (PHASE 3)

ATASCOSA RIVER BRIDGE

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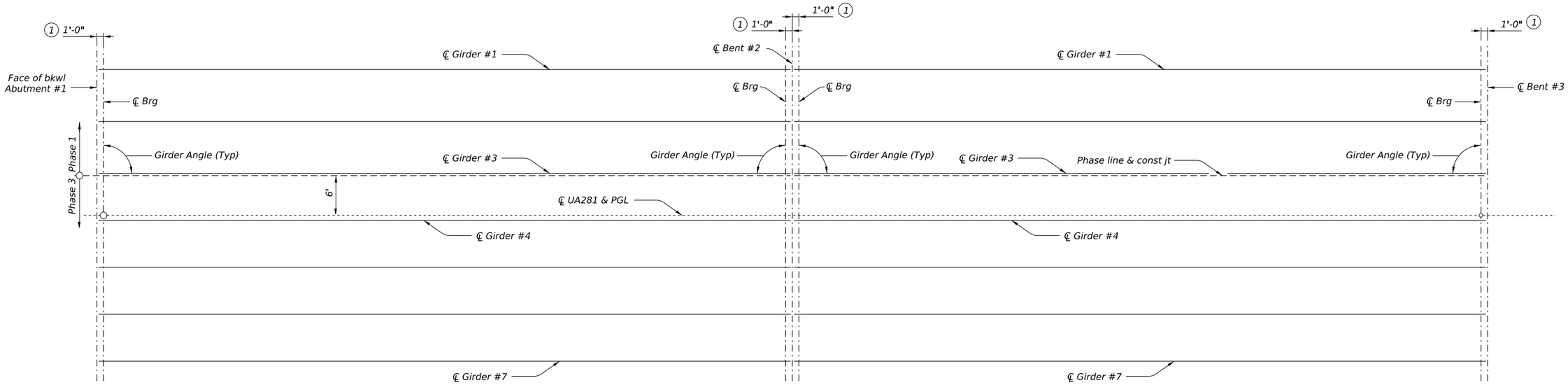

SPAN 1

Tx46 (Typ)
Phase 1 & Phase 3

SPAN 2

Tx46 (Typ)
Phase 1 & Phase 3

(1) See Elastomeric Bearing & Girder End Details (IGEB) Standard for orientation of dimensions.

(2) Girder lengths shown are bottom girder flange with adjustments made for girder slope.

BENT REPORT

BENT NO. 1 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 2 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 2 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 3 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL C-C BENT	DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	105.000	103.000	104.50	0.0000
BEAM 2	105.000	103.000	104.50	0.0000
BEAM 3	105.000	103.000	104.50	0.0000
BEAM 4	105.000	103.000	104.50	0.0000
BEAM 5	105.000	103.000	104.50	0.0000
BEAM 6	105.000	103.000	104.50	0.0000
BEAM 7	105.000	103.000	104.50	0.0000

BEAM REPORT, SPAN 2

	HORIZONTAL C-C BENT	DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	105.000	103.000	104.50	0.0000
BEAM 2	105.000	103.000	104.50	0.0000
BEAM 3	105.000	103.000	104.50	0.0000
BEAM 4	105.000	103.000	104.50	0.0000
BEAM 5	105.000	103.000	104.50	0.0000
BEAM 6	105.000	103.000	104.50	0.0000
BEAM 7	105.000	103.000	104.50	0.0000

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Texas Department of Transportation | Bridge Division

FRAMING PLAN
UNIT 1
(SPANS 1 & 2)

ATASCOSA RIVER BRIDGE

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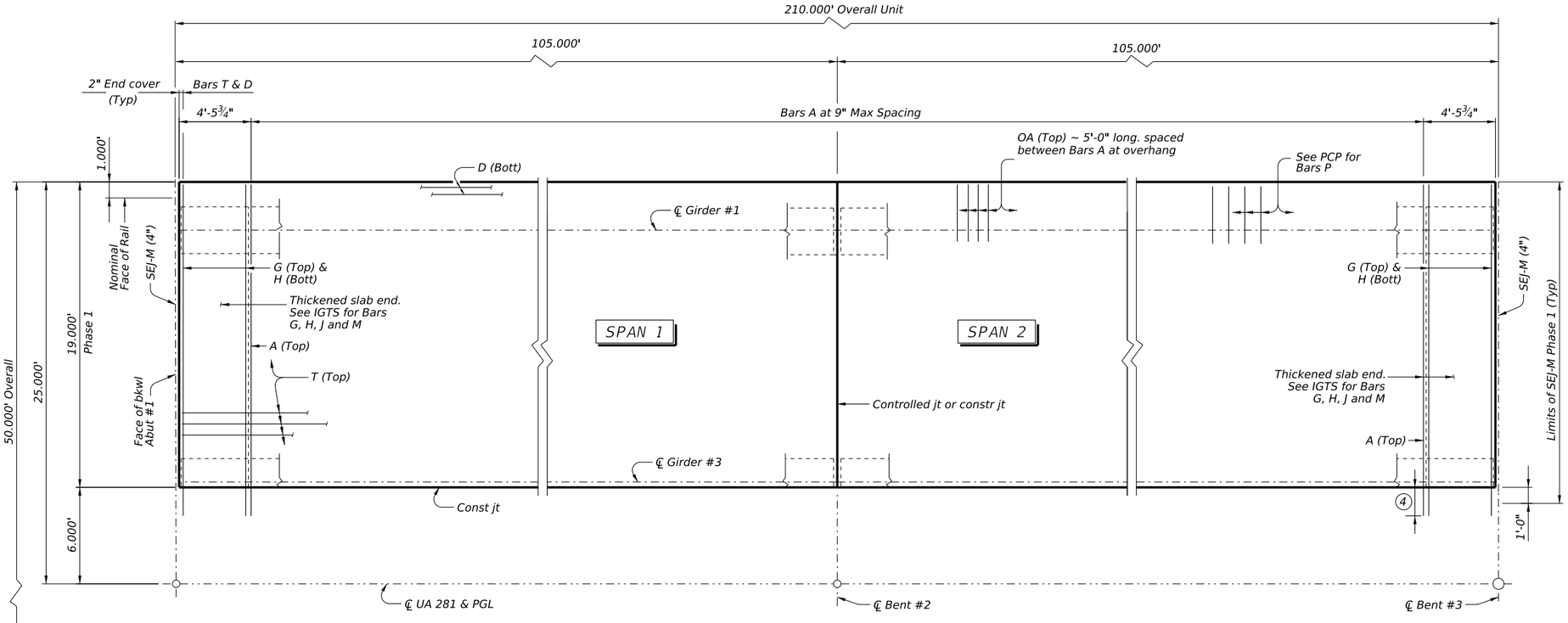
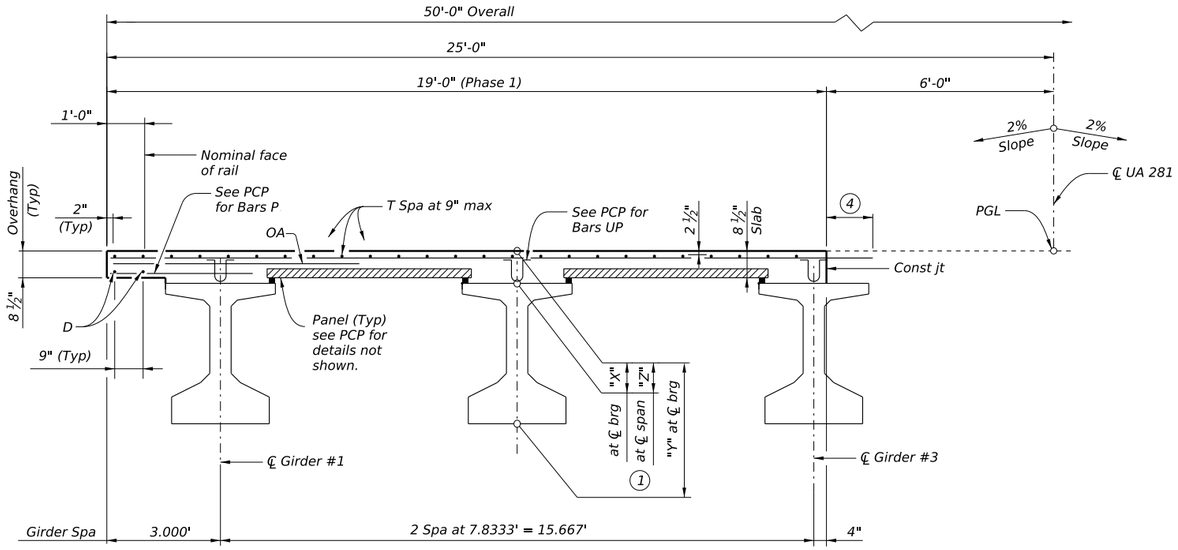
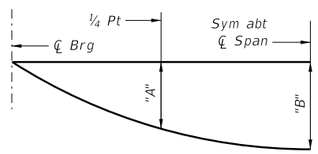


PLAN



TYPICAL TRANSVERSE SECTION



Note: Deflections shown are due to prestressed concrete panels and cast-in-place slab only (Ec = 5000 ksi). These values may require field verification.

DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEAD LOAD DEFLECTIONS

Span No.	Girder No.	"A" Ft	"B" Ft
1	1	0.110'	0.157'
	2	0.125'	0.177'
	3 (5)	0.068'	0.096'
2	1	0.110'	0.157'
	2	0.125'	0.177'
	3 (5)	0.068'	0.096'

(5) Deflections shown for Girder No. 3 are due to Phase 1 prestressed concrete panels and cast-in-place slab only.

BAR TABLE

BAR	SIZE
A	#4
D	#4
G	#4
H	#4
J	#4
M	#4
OA	#5
P	#4
T	#4
UP	#4

TABLE OF ESTIMATED QUANTITIES (PHASE 1)

Span No.	Reinf Conc Slab SF	Prestr Conc Girders (Tx 46) LF (2)	Total Reinf Steel Lb (3)
1	1995	313.50	4589
2	1995	313.50	4589
Total	3990	627.00	9178

TABLE OF SECTION DEPTHS

Span No.	Girder No.	"X" at ℄ Brg.	"Y" at ℄ Brg.	"Z" at (1) ℄ Span
1	1	1' - 0 ½"	4' - 10 ½"	10 ¼"
	2	1' - 0 ½"	4' - 10 ½"	10 ½"
	3	1' - 0 ½"	4' - 10 ½"	9 5/8"
2	1	1' - 0 ½"	4' - 10 ½"	10 ¼"
	2	1' - 0 ½"	4' - 10 ½"	10 ½"
	3	1' - 0 ½"	4' - 10 ½"	9 5/8"

(1) Theoretical dimension.

(2) Lengths shown are bottom girder flange lengths with adjustment made for girder slope. See Framing Plan sheet for girder lengths.

(3) Reinforcing steel weight is calculated using an approximate factor of 2.3 lb/sf.

(4) Extend Phase 1 bars A, G & H 1'-11" into Phase 3 construction.

MATERIAL NOTES:

Provide Class S concrete (f'c = 4,000 psi).
Provide Grade 60 reinforcing steel.
Provide bar laps, where requires, as follows:
Uncoated - #4 = 1'-7"
Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, D, OA, P or T unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).

See Thickened Slab End Details (IGTS) standard for Thickened Slab End Details and quantity adjustments.

See Prestressed Concrete Panels (PCP) and Prestressed Concrete Panel Fabrication Details (PCP-FAB) for panel details not shown.

See Miscellaneous Slab Details (IGMS) standard for miscellaneous details.

See Traffic Rail (T223) Standard for rail anchorage in slab.

See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation — Bridge Division

210.00' PRESTRESSED CONCRETE GIRDER

UNIT 1 PHASE 1

ATASCOSA RIVER BRIDGE

12/22/2023

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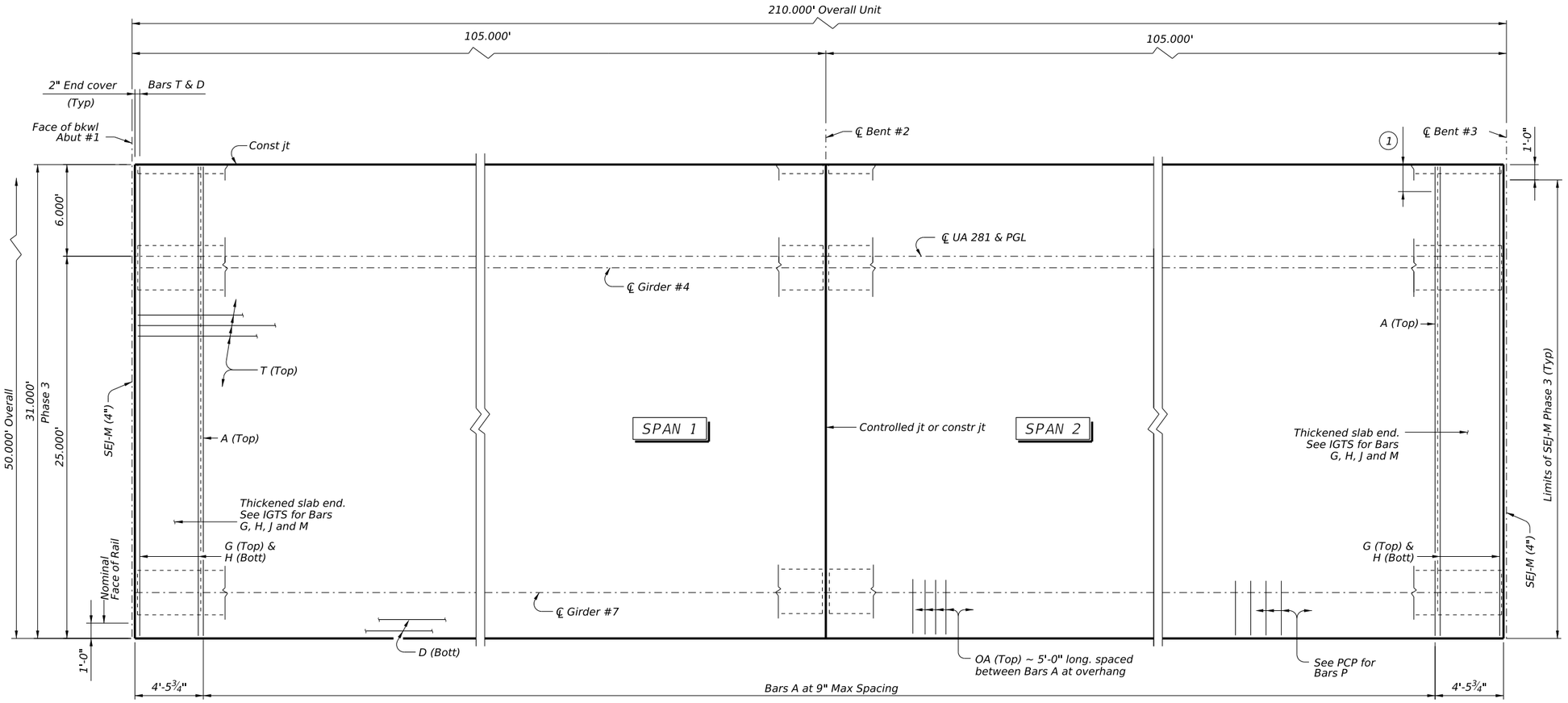
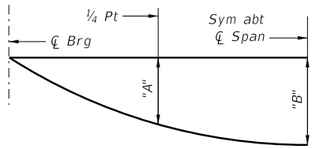


(1) Lap Phase 3 bars A, G & H 1'-11" with Phase 1 bars A, G, & H.



Note: Deflections shown are due to prestressed concrete panels and cast-in-place slab only (Ec = 5000 ksi). These values may require field verification.

DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEAD LOAD DEFLECTIONS

Span No.	Girder No.	"A" Ft	"B" Ft
1	4-6	0.113'	0.160'
	7	0.104'	0.148'
2	4-6	0.113'	0.160'
	7	0.104'	0.148'

12/22/2023

HL93 LOADING **SHEET 1 OF 2**

Texas Department of Transportation | Bridge Division

210.00' PRESTRESSED CONCRETE GIRDER

UNIT 1 PHASE 3

ATASCOSA RIVER BRIDGE

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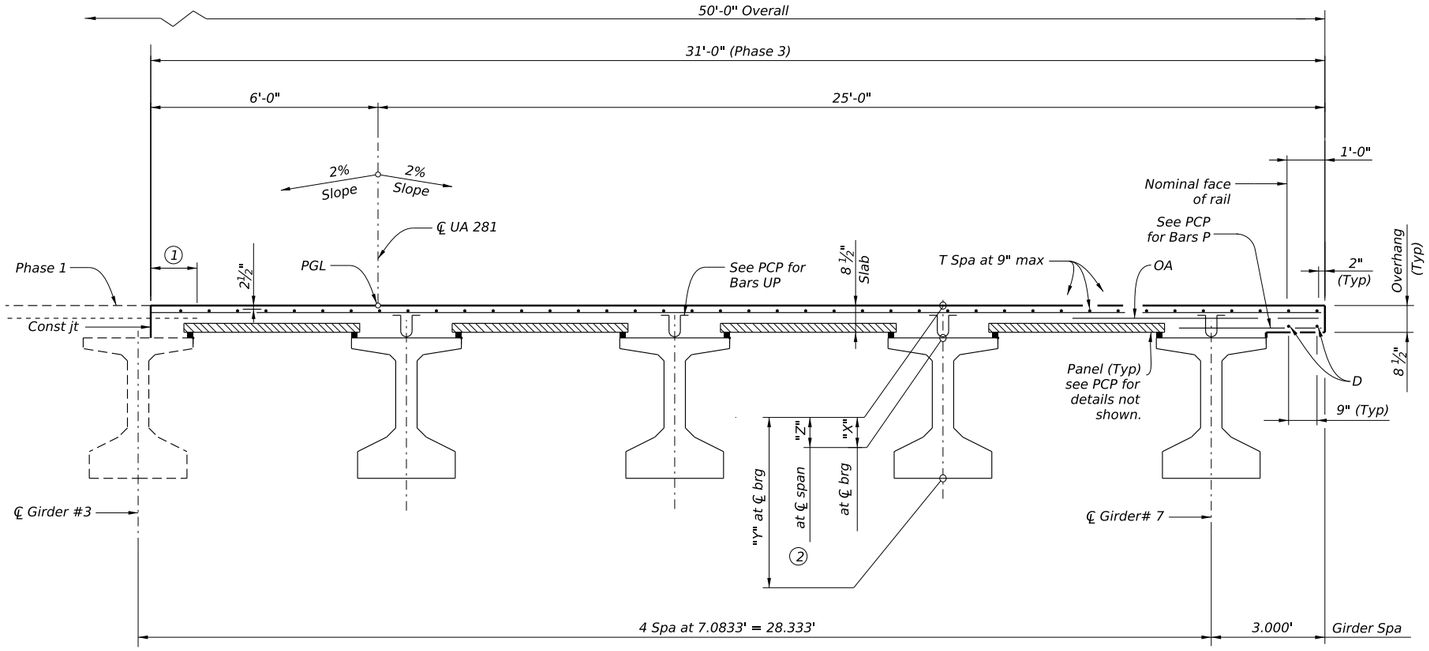

TYPICAL TRANSVERSE SECTION

BAR TABLE

BAR	SIZE
A	#4
D	#4
G	#4
H	#4
J	#4
M	#4
OA	#5
P	#4
T	#4
UP	#4

TABLE OF ESTIMATED QUANTITIES (PHASE 3)

Span No.	Reinf Conc Slab	Prestr Conc Girders (Tx 46)	Total Reinf Steel
	SF	LF (3)	Lb (4)
1	3255	418.00	7487
2	3255	418.00	7487
Total	6510	836.00	14974

TABLE OF SECTION DEPTHS

Span No.	Girder No.	"X" at ℄ Brg.	"Y" at ℄ Brg.	"Z" at (2) ℄ Span
1	4–6	1' – 0 ½"	4' – 10 ½"	10 ¼"
	7	1' – 0 ½"	4' – 10 ½"	10 ⅛"
2	4–6	1' – 0 ½"	4' – 10 ½"	10 ¼"
	7	1' – 0 ½"	4' – 10 ½"	10 ⅛"

(1) Lap Phase 3 bars A, G & H 1'-11" with Phase 1 bars A, G, & H.

(2) Theoretical dimension.

(3) Lengths shown are bottom girder flange lengths with adjustment made for girder slope. See Framing Plan sheet for girder lengths.

(4) Reinforcing steel weight is calculated using an approximate factor of 2.3 lb/sf.

MATERIAL NOTES:

Provide Class S concrete (f'c = 4,000 psi).
Provide Grade 60 reinforcing steel.
Provide bar laps, where requires, as follows:
Uncoated - #4 = 1'-7"
Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, D, OA, P or T unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).
See Thickened Slab End Details (IGTS) standard for Thickened Slab End Details and quantity adjustments.
See Prestressed Concrete Panels (PCP) and Prestressed Concrete Panel Fabrication Details (PCP-FAB) for panel details not shown.
See Miscellaneous Slab Details (IGMS) standard for miscellaneous details.
See Traffic Rail (T223) Standard for rail anchorage in slab.
See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING **SHEET 2 OF 2**

Texas Department of Transportation — Bridge Division

210.00' PRESTRESSED CONCRETE GIRDER

UNIT 1 PHASE 3

ATASCOSA RIVER BRIDGE

12/22/2023

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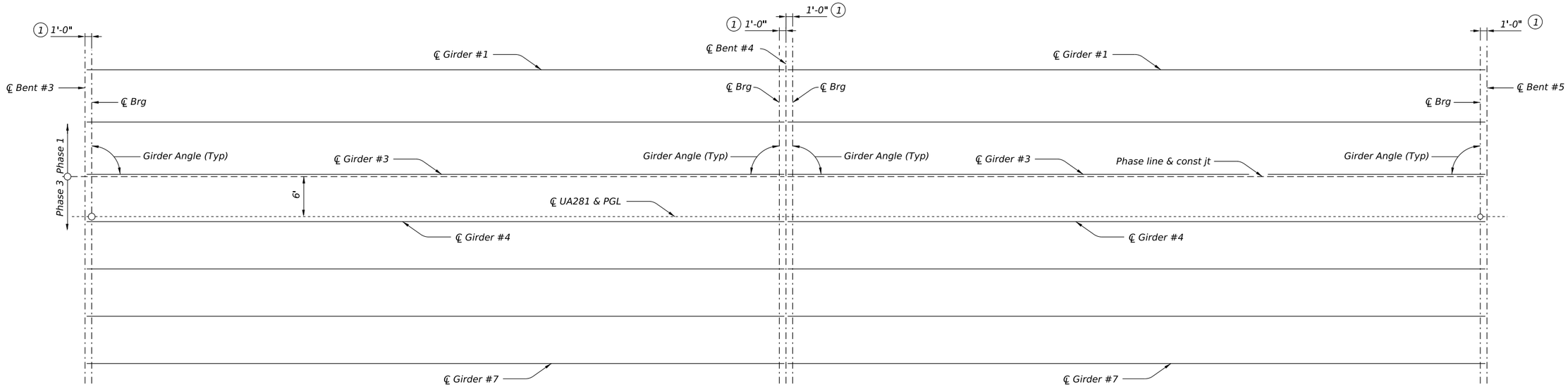

SPAN 3

Tx46 (Typ)
Phase 1 & Phase 3

SPAN 4

Tx46 (Typ)
Phase 1 & Phase 3

BENT REPORT

BENT NO. 3 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 4 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 4 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 4	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 5 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 4	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BEAM REPORT

BEAM REPORT, SPAN 3

	HORIZONTAL C-C BENT	DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	105.000	103.000	104.50	0.0000
BEAM 2	105.000	103.000	104.50	0.0000
BEAM 3	105.000	103.000	104.50	0.0000
BEAM 4	105.000	103.000	104.50	0.0000
BEAM 5	105.000	103.000	104.50	0.0000
BEAM 6	105.000	103.000	104.50	0.0000
BEAM 7	105.000	103.000	104.50	0.0000

BEAM REPORT, SPAN 4

	HORIZONTAL C-C BENT	DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	105.000	103.000	104.50	0.0000
BEAM 2	105.000	103.000	104.50	0.0000
BEAM 3	105.000	103.000	104.50	0.0000
BEAM 4	105.000	103.000	104.50	0.0000
BEAM 5	105.000	103.000	104.50	0.0000
BEAM 6	105.000	103.000	104.50	0.0000
BEAM 7	105.000	103.000	104.50	0.0000

(1) See Elastomeric Bearing & Girder End Details (IGEB) Standard for orientation of dimensions.

(2) Girder lengths shown are bottom girder flange with adjustments made for girder slope.

HL93 LOADING

12/22/2023

Texas Department of Transportation | Bridge Division

FRAMING PLAN
UNIT 2
(SPANS 3 & 4)

ATASCOSA RIVER BRIDGE

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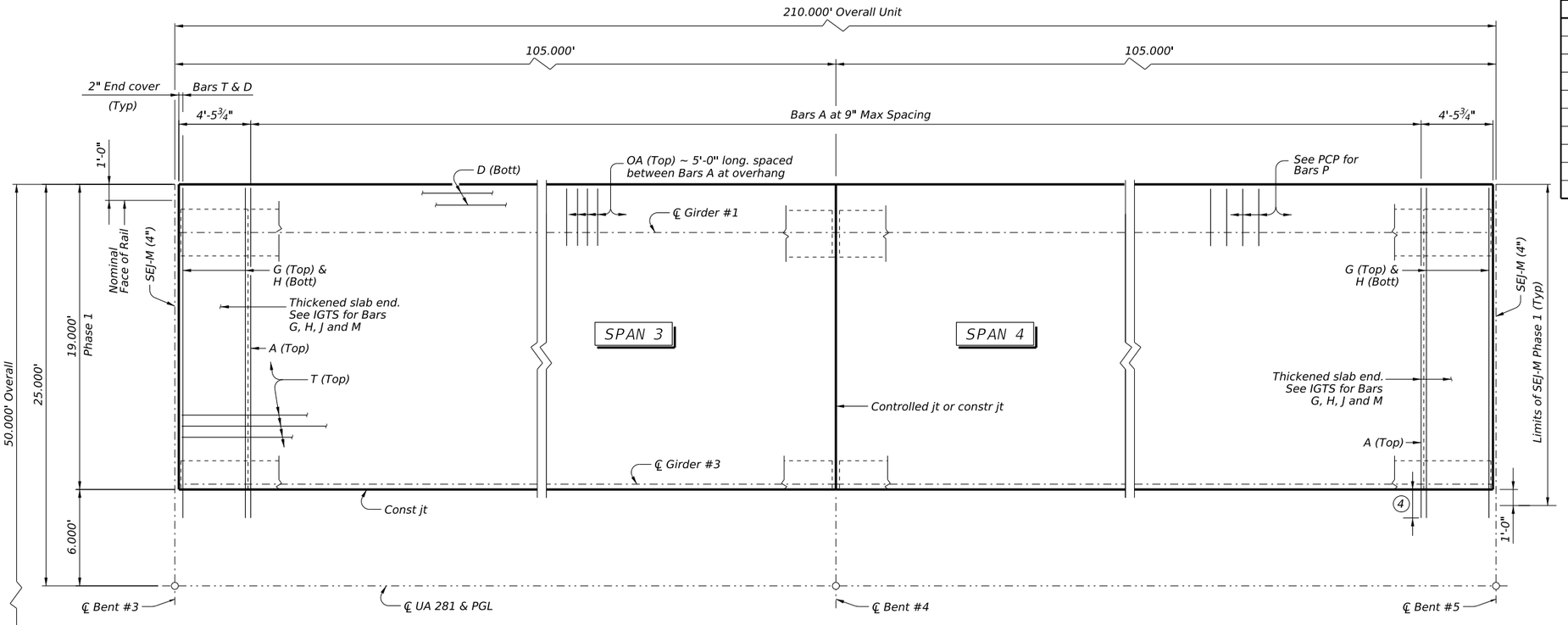
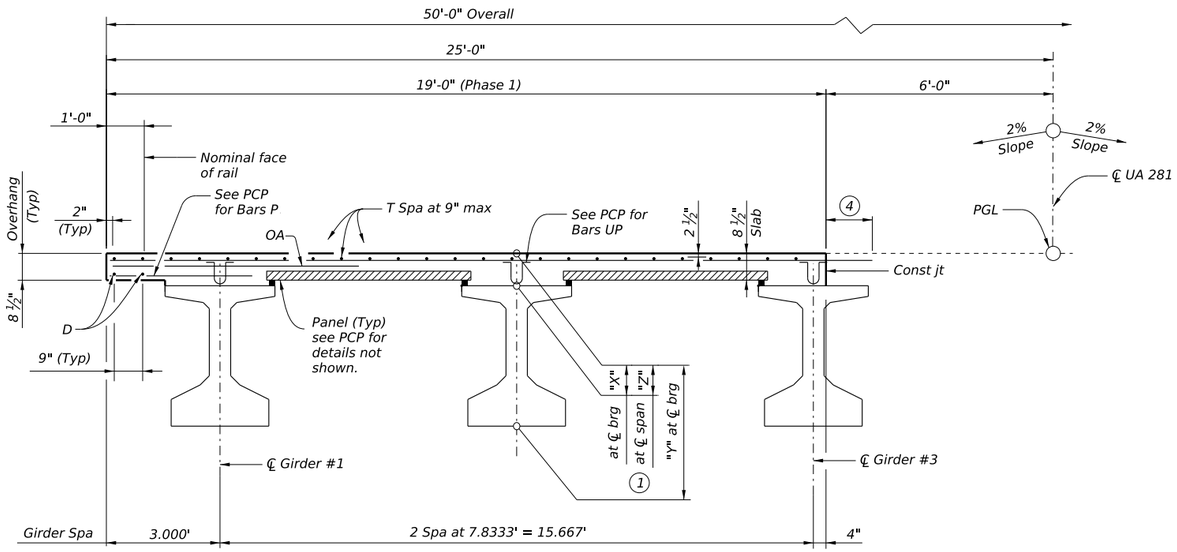
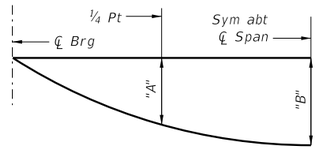


PLAN



TYPICAL TRANSVERSE SECTION



Note: Deflections shown are due to prestressed concrete panels and cast-in-place slab only (Ec = 5000 ksi). These values may require field verification.

DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEAD LOAD DEFLECTIONS

Span No.	Girder No.	"A" Ft	"B" Ft
3	1	0.110'	0.157'
	2	0.125'	0.177'
	3 (5)	0.068'	0.096'
4	1	0.110'	0.157'
	2	0.125'	0.177'
	3 (5)	0.068'	0.096'

(5) Deflections shown for Girder No. 3 are due to Phase 1 prestressed concrete panels and cast-in-place slab only.

BAR TABLE

BAR	SIZE
A	#4
D	#4
G	#4
H	#4
J	#4
M	#4
OA	#5
P	#4
T	#4
UP	#4

TABLE OF ESTIMATED QUANTITIES (PHASE 1)

Span No.	Reinf Conc Slab SF	Prestr Conc Girders (Tx 46) LF (2)	Total Reinf Steel Lb (3)
3	1995	313.50	4589
4	1995	313.50	4589
Total	3990	627.00	9178

TABLE OF SECTION DEPTHS

Span No.	Girder No.	"X" at ℄ Brg.	"Y" at ℄ Brg.	"Z" at ℄ Span (1)
3	1	1' – 0 ½"	4' – 10 ½"	10 ¼"
	2	1' – 0 ½"	4' – 10 ½"	10 ½"
	3	1' – 0 ½"	4' – 10 ½"	9 5/8"
4	1	1' – 0 ½"	4' – 10 ½"	10 ¼"
	2	1' – 0 ½"	4' – 10 ½"	10 ½"
	3	1' – 0 ½"	4' – 10 ½"	9 5/8"

(1) Theoretical dimension.

(2) Lengths shown are bottom girder flange lengths with adjustment made for girder slope. See Framing Plan sheet for girder lengths.

(3) Reinforcing steel weight is calculated using an approximate factor of 2.3 lb/sf.

(4) Extend Phase 1 bars A, G & H 1'-11" into Phase 3 construction.

MATERIAL NOTES:

Provide Class S concrete (f'c = 4,000 psi).
Provide Grade 60 reinforcing steel.
Provide bar laps, where requires, as follows:
Uncoated - #4 = 1'-7"
Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, D, OA, P or T unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).

See Thickened Slab End Details (IGTS) standard for Thickened Slab End Details and quantity adjustments.

See Prestressed Concrete Panels (PCP) and Prestressed Concrete Panel Fabrication Details (PCP-FAB) for panel details not shown.

See Miscellaneous Slab Details (IGMS) standard for miscellaneous details.

See Traffic Rail (T223) Standard for rail anchorage in slab.

See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation — Bridge Division

210.00' PRESTRESSED CONCRETE GIRDER

UNIT 2 PHASE 1

ATASCOSA RIVER BRIDGE

12/22/2023

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©TxDOT SEPTEMBER 2023	CONT	SECT	JOB	HIGHWAY
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	SAT	ATASCOSA		165

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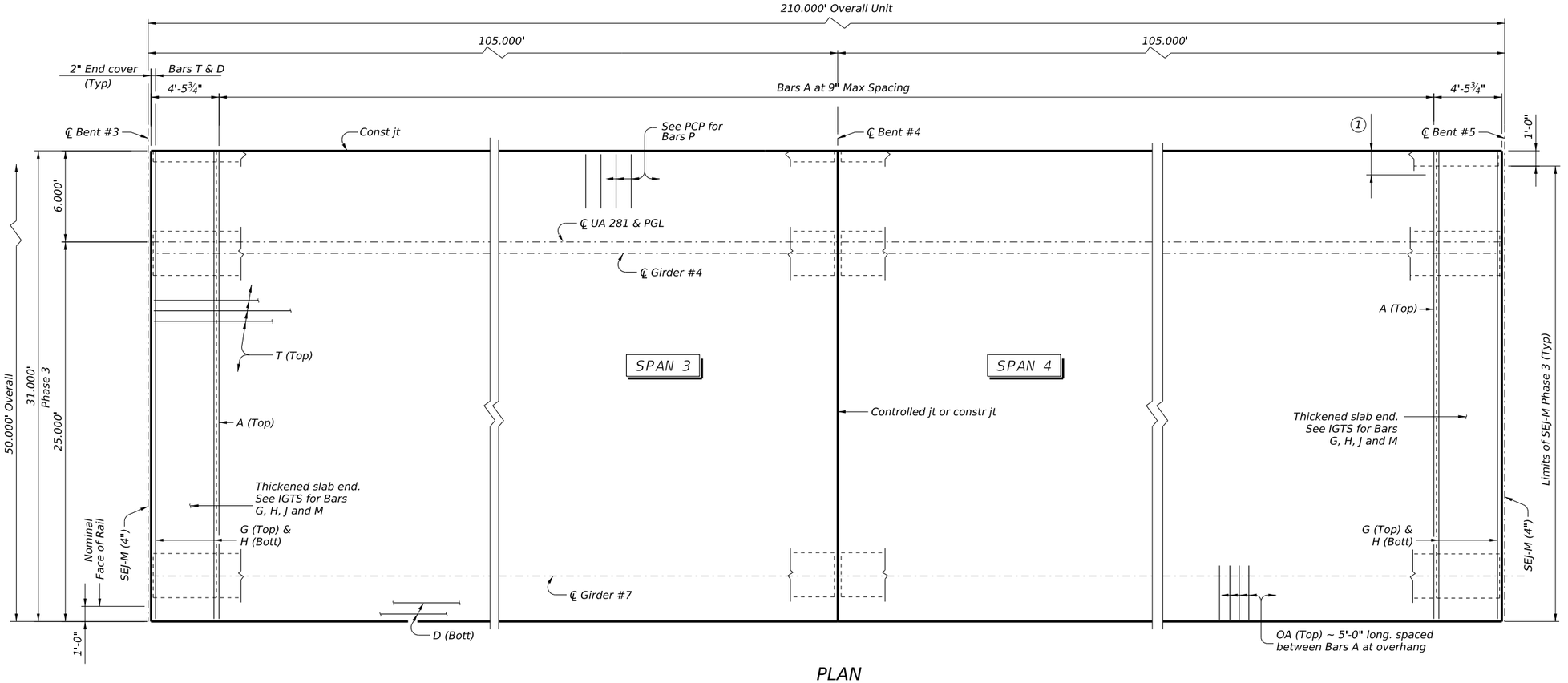
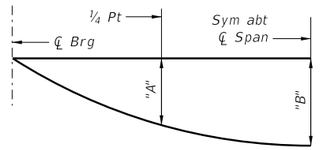


PLAN

1 Lap Phase 3 Bars A, G & H 1'-11" with Phase 1 Bars A, G & H.



Note: Deflections shown are due to prestressed concrete panels and cast-in-place slab only (Ec = 5000 ksi). These values may require field verification.

DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEAD LOAD DEFLECTIONS

Span No.	Girder No.	"A" Ft	"B" Ft
3	4-6	0.113'	0.160'
	7	0.104'	0.148'
4	4-6	0.113'	0.160'
	7	0.104'	0.148'

HL93 LOADING **SHEET 1 OF 2**

Texas Department of Transportation — Bridge Division

210.00' PRESTRESSED CONCRETE GIRDER

UNIT 2 PHASE 3

ATASCOSA RIVER BRIDGE

FILE: UA0281_BRG_8239cg04.dgn	DN: LMO	CK: EFC	DW: LJC / JEB	CK: LMO
©TxDOT SEPTEMBER 2023	CONT	SECT	JOB	HIGHWAY
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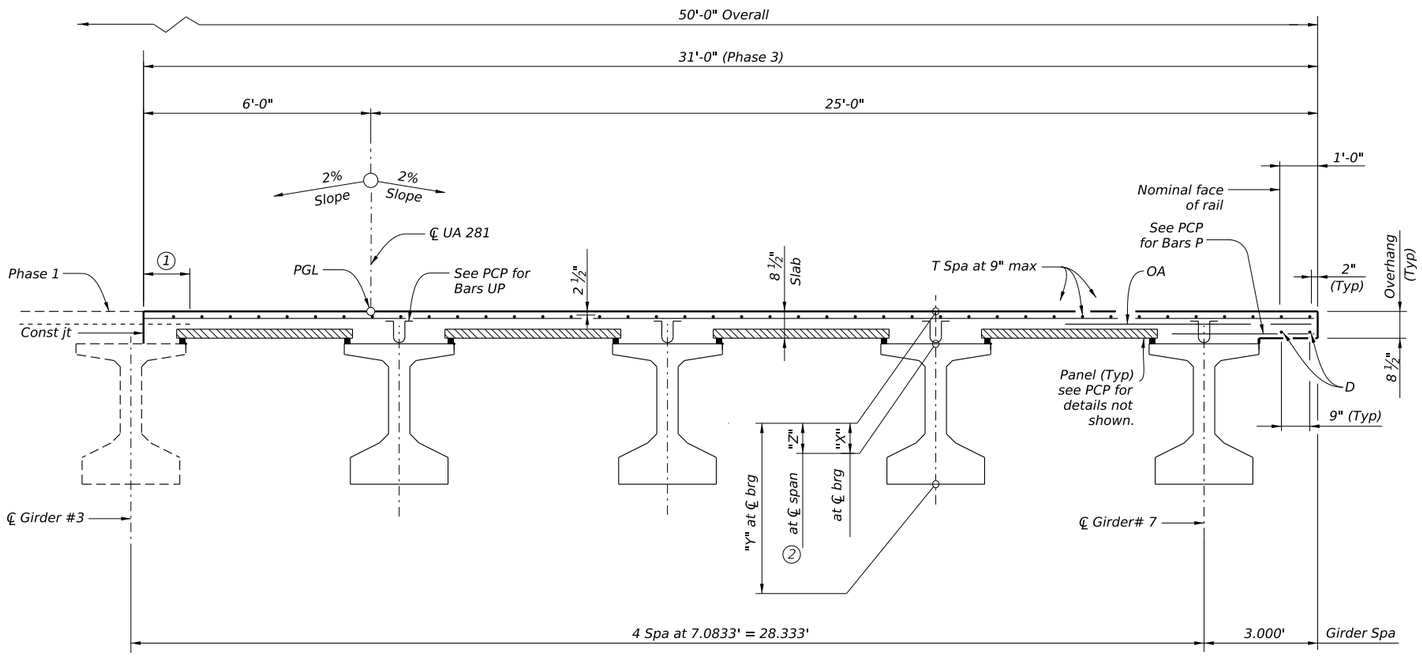
BAR TABLE	
BAR	SIZE
A	#4
D	#4
G	#4
H	#4
J	#4
M	#4
OA	#5
P	#4
T	#4
UP	#4

TABLE OF ESTIMATED QUANTITIES (PHASE 3)

Span No.	Reinf Conc Slab	Prestr Conc Girders (Tx 46)	Total Reinf Steel
	SF	LF (3)	Lb (4)
3	3255	418.00	7487
4	3255	418.00	7487
Total	6510	836.00	14974

TABLE OF SECTION DEPTHS

Span No.	Girder No.	"X" at ℄ Brg.	"Y" at ℄ Brg.	"Z" at (2) ℄ Span
3	4-6	1' – 0 ½"	4' – 10 ½"	10 ¼"
	7	1' – 0 ½"	4' – 10 ½"	10 ⅛"
4	4-6	1' – 0 ½"	4' – 10 ½"	10 ¼"
	7	1' – 0 ½"	4' – 10 ½"	10 ⅛"



TYPICAL TRANSVERSE SECTION

(1) Lap Phase 3 bars A, G & H 1'-11" into Phase 1 Bars A, G & H.

(2) Theoretical dimension.

(3) Lengths shown are bottom girder flange lengths with adjustment made for girder slope. See Framing Plan sheet for girder lengths.

(4) Reinforcing steel weight is calculated using an approximate factor of 2.3 lb/sf.

MATERIAL NOTES:

Provide Class S concrete ($f'c$ = 4,000 psi).
Provide Grade 60 reinforcing steel.
Provide bar laps, where requires, as follows:
Uncoated - #4 = 1'-7"
Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, D, OA, P or T unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).
See Thickened Slab End Details (IGTS) standard for Thickened Slab End Details and quantity adjustments.
See Prestressed Concrete Panels (PCP) and Prestressed Concrete Panel Fabrication Details (PCP-FAB) for panel details not shown.
See Miscellaneous Slab Details (IGMS) standard for miscellaneous details.
See Traffic Rail (T223) Standard for rail anchorage in slab.
See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING **SHEET 2 OF 2**

Texas Department of Transportation | Bridge Division

210.00' PRESTRESSED CONCRETE GIRDER

UNIT 2 PHASE 3

ATASCOSA RIVER BRIDGE

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12/22/2023

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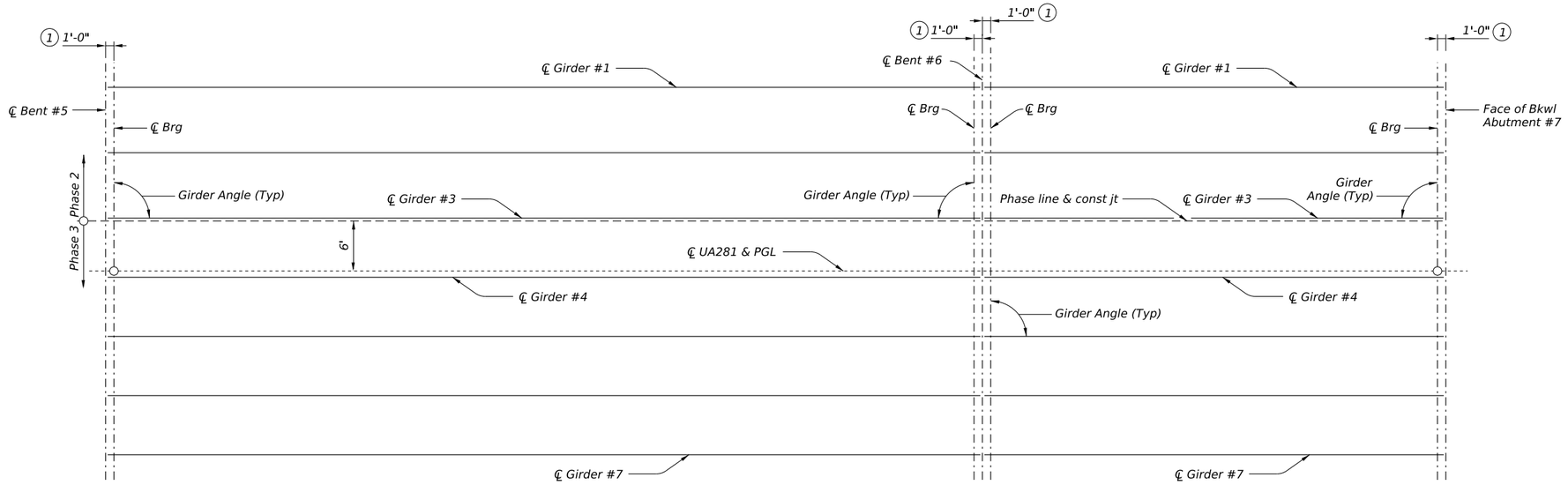

SPAN 5

Tx46 (Typ)
Phase 2 and Phase 3

SPAN 6

Tx46 (Typ)
Phase 2 and Phase 3

BENT REPORT

BENT NO. 5 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 5	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 6 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 5	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 6 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 6	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BENT NO. 6 (S 42 20 52.40 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 22.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 6	BEAM	1	0.000	90	0	0
	BEAM	2	7.833	90	0	0
	BEAM	3	7.833	90	0	0
	BEAM	4	7.083	90	0	0
	BEAM	5	7.083	90	0	0
	BEAM	6	7.083	90	0	0
	BEAM	7	7.084	90	0	0
	TOTAL		44.000			

BEAM REPORT

BEAM REPORT, SPAN 5

	HORIZONTAL C-C BENT	DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	105.000	103.000	104.50	0.0000
BEAM 2	105.000	103.000	104.50	0.0000
BEAM 3	105.000	103.000	104.50	0.0000
BEAM 4	105.000	103.000	104.50	0.0000
BEAM 5	105.000	103.000	104.50	0.0000
BEAM 6	105.000	103.000	104.50	0.0000
BEAM 7	105.000	103.000	104.50	0.0000

BEAM REPORT, SPAN 6

	HORIZONTAL C-C BENT	DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	55.000	53.000	54.50	0.0000
BEAM 2	55.000	53.000	54.50	0.0000
BEAM 3	55.000	53.000	54.50	0.0000
BEAM 4	55.000	53.000	54.50	0.0000
BEAM 5	55.000	53.000	54.50	0.0000
BEAM 6	55.000	53.000	54.50	0.0000
BEAM 7	65.000	53.000	54.50	0.0000

(1) See Elastomeric Bearing & Girder End Details (IGEB) Standard for orientation of dimensions.

(2) Girder lengths shown are bottom girder flange with adjustments made for girder slope.

HL93 LOADING

12/22/2023

Texas Department of Transportation | Bridge Division

FRAMING PLAN
UNIT 3
(SPANS 5 & 6)

ATASCOSA RIVER BRIDGE

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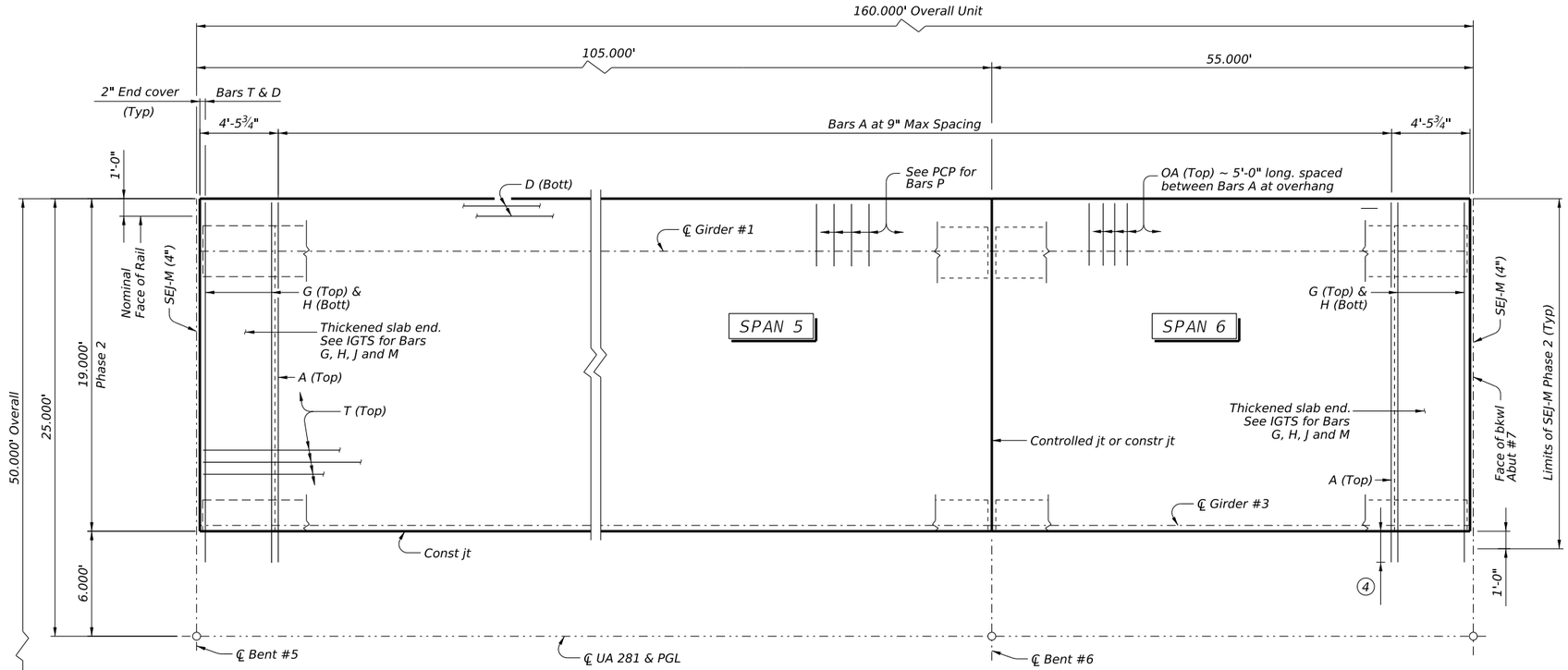
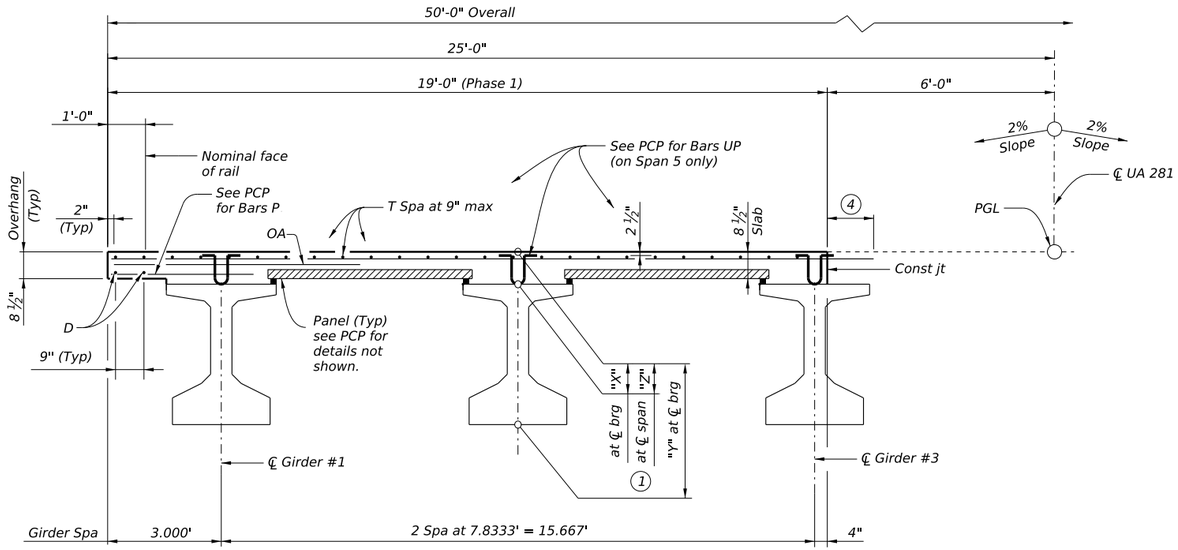
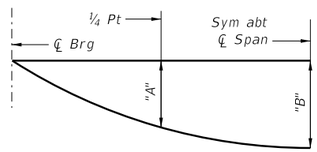


PLAN



TYPICAL TRANSVERSE SECTION



Note: Deflections shown are due to prestressed concrete panels and cast-in-place slab only (Ec = 5000 ksi). These values may require field verification.

DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEAD LOAD DEFLECTIONS

Span No.	Girder No.	"A" Ft	"B" Ft
5	1	0.110'	0.157'
	2	0.125'	0.177'
	3 (5)	0.068'	0.096'
6	1	0.008'	0.011'
	2	0.009'	0.012'
	3 (5)	0.005'	0.007'

(5) Deflections shown for Girder No. 3 are due to Phase 2 prestressed concrete panels and cast-in-place slab only.

BAR TABLE

BAR	SIZE
A	#4
D	#4
G	#4
H	#4
J	#4
M	#4
OA	#5
P	#4
T	#4
UP	#4

TABLE OF ESTIMATED QUANTITIES

Span No.	Reinf Conc Slab SF	Prestr Conc Girders (Tx 46) LF (2)	Total Reinf Steel Lb (3)
5	1995	313.50	4589
6	1045	163.50	2404
Total	3040	477.00	6993

TABLE OF SECTION DEPTHS

Span No.	Girder No.	"X" at ℄ Brg.	"Y" at ℄ Brg.	"Z" at ℄ Span (1) (1)
5	1	1' – 0 ½"	4' – 10 ½"	10 ¼"
	2	1' – 0 ½"	4' – 10 ½"	10 ½"
	3	1' – 0 ½"	4' – 10 ½"	9 5/16"
6	1	10 ½"	4' – 8 ½"	10"
	2	10 ½"	4' – 8 ½"	10"
	3	10 ½"	4' – 8 ½"	10"

(1) Theoretical dimension.

(2) Lengths shown are bottom girder flange lengths with adjustment made for girder slope. See Framing Plan sheet for girder lengths.

(3) Reinforcing steel weight is calculated using an approximate factor of 2.3 lb/sf.

(4) Extend Phase 2 bars A, G & H 1'-11" into Phase 3 construction.

MATERIAL NOTES:

Provide Class S concrete (f'c = 4,000 psi).
Provide Grade 60 reinforcing steel.
Provide bar laps, where requires, as follows:
Uncoated - #4 = 1'-7"
Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, D, OA, P or T unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).
See Thickened Slab End Details (IGTS) standard for Thickened Slab End Details and quantity adjustments.
See Prestressed Concrete Panels (PCP) and Prestressed Concrete Panel Fabrication Details (PCP-FAB) for panel details not shown.
See Miscellaneous Slab Details (IGMS) standard for miscellaneous details.
See Traffic Rail (T223) Standard for rail anchorage in slab.
See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation — Bridge Division

160.00' PRESTRESSED CONCRETE GIRDER

UNIT 3 PHASE 2

ATASCOSA RIVER BRIDGE

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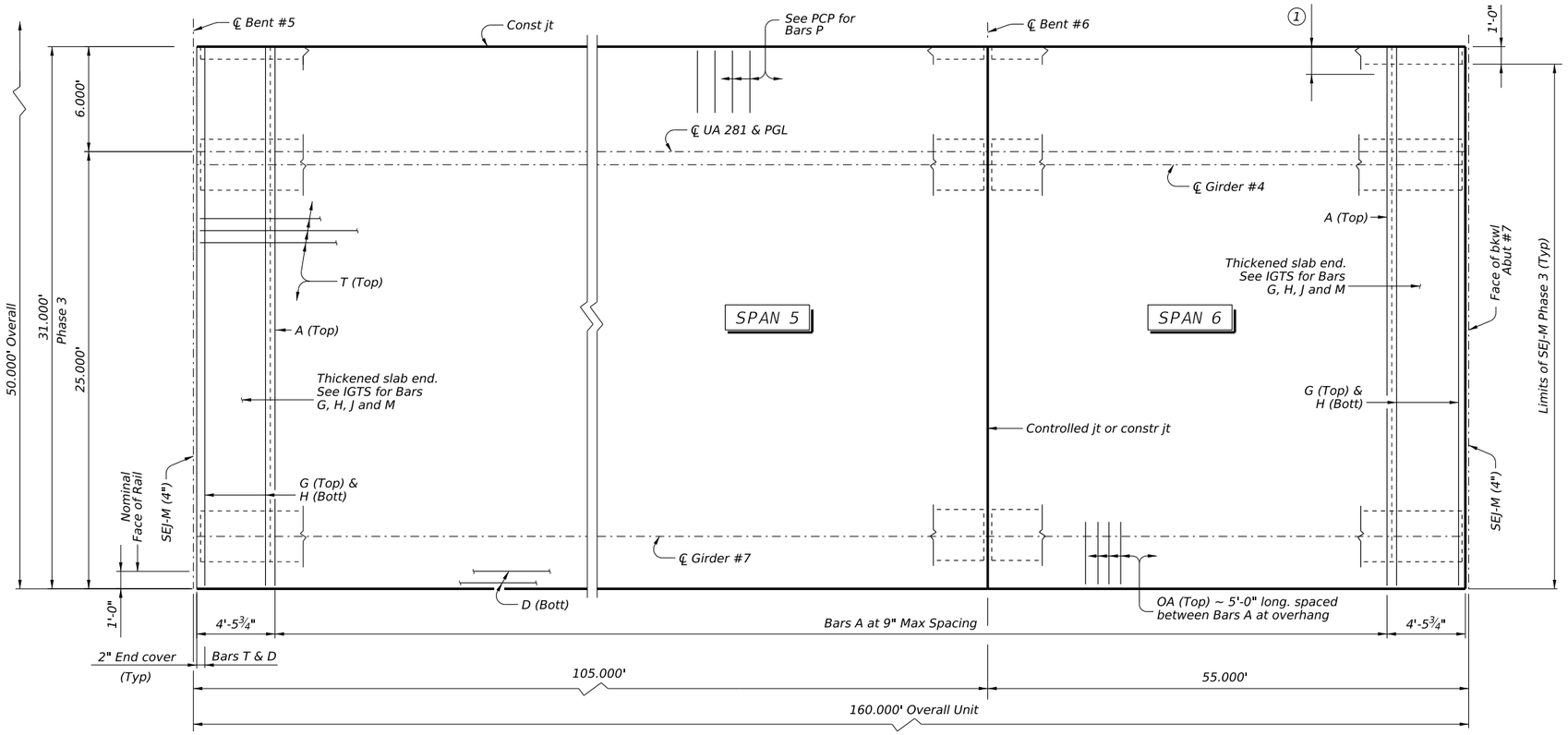
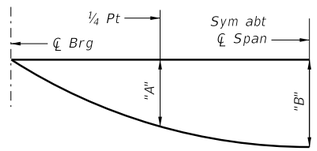


PLAN

1 Lap Phase 3 Bars A, G & H 1'-11" with Phase 2 A, G & H.



Note: Deflections shown are due to prestressed concrete panels and cast-in-place slab only (Ec = 5000 ksi). These values may require field verification.

DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEAD LOAD DEFLECTIONS

Span No.	Girder No.	"A" Ft	"B" Ft
5	4-6	0.113'	0.160'
	7	0.104'	0.148'
6	4-6	0.008'	0.011'
	7	0.007'	0.010'

12/22/2023

HL93 LOADING **SHEET 1 OF 2**

Texas Department of Transportation — Bridge Division

160.00' PRESTRESSED CONCRETE GIRDER

UNIT 3 PHASE 3

ATASCOSA RIVER BRIDGE

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©TxDOT SEPTEMBER 2023	CONT	SECT	JOB	HIGHWAY
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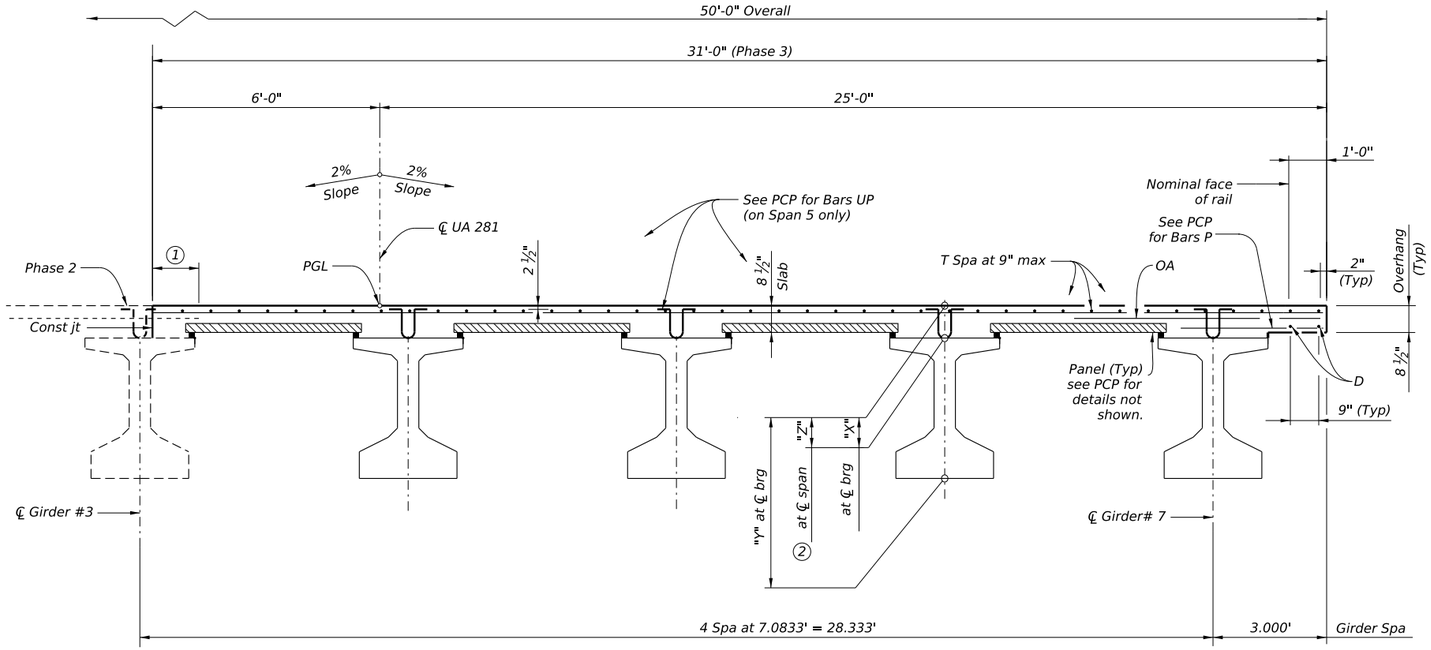

TYPICAL TRANSVERSE SECTION

BAR TABLE

BAR	SIZE
A	#4
D	#4
G	#4
H	#4
J	#4
M	#4
0A	#5
P	#4
T	#4
UP	#4

TABLE OF ESTIMATED QUANTITIES (PHASE 3)

Span No.	Reinf Conc Slab	Prestr Conc Girders (Tx 46)	Total Reinf Steel
	SF	LF (3)	Lb (4)
5	3255	418.00	7487
6	1705	218.00	3922
Total	4960	636.00	11409

TABLE OF SECTION DEPTHS

Span No.	Girder No.	"X" at ℄ Brg.	"Y" at ℄ Brg.	"Z" at ℄ Span (2)
5	4-6	1' - 0 ½"	4' - 10 ½"	10 ¼"
	7	1' - 0 ½"	4' - 10 ½"	10 ⅛"
6	4-6	10 ½"	4' - 8 ½"	10"
	7	10 ½"	4' - 8 ½"	10"

(1) Lap Phase 3 Bars A, G, & H 1'-11" with Phase 2 A, G & H.

(2) Theoretical dimension.

(3) Length shown are bottom girder flange lengths with adjustment made for girder slope. See Framing Plan sheet for girder lengths.

(4) Reinforcing steel weight is calculated using an approximate factor of 2.3 lb/sf.

MATERIAL NOTES:

Provide Class S concrete (f'c = 4,000 psi).
Provide Grade 60 reinforcing steel.
Provide bar laps, where requires, as follows:
Uncoated - #4 = 1'-7"
Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, D, OA, P or T unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Jan 2023).
See Thickened Slab End Details (IGTS) standard for Thickened Slab End Details and quantity adjustments.
See Prestressed Concrete Panels (PCP) and Prestressed Concrete Panel Fabrication Details (PCP-FAB) for panel details not shown.
See Miscellaneous Slab Details (IGMS) standard for miscellaneous details.
See Traffic Rail (T223) Standard for rail anchorage in slab.
See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING **SHEET 2 OF 2**

Texas Department of Transportation | Bridge Division

160.00' PRESTRESSED CONCRETE GIRDER

UNIT 3 PHASE 3

ATASCOSA RIVER BRIDGE

12/22/2023

FILE: UA0281_BRG_8239cg05.dgn	DN: LMO	CK: EFC	DW: LJC / JEB	CK: LMO
©TxDOT SEPTEMBER 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		171

DATE: 12/21/2023 7:47:23 PM
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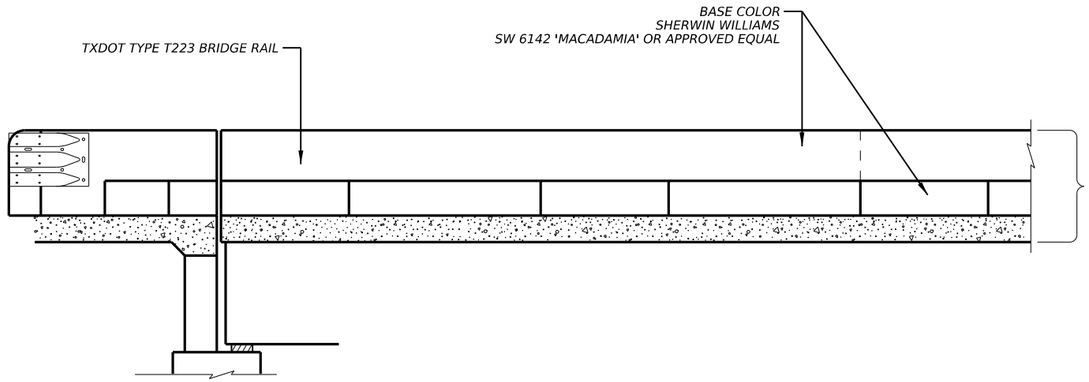
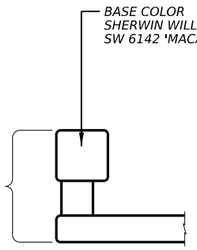
12/5/2023 1:50:07 PM
pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/7. Bridge/Standards/TYPE T223 AESTHETIC DETAILS.dgn

DESIGN: | DRAFT: | CHECK: AG





TYPE T223 BRIDGE RAIL AESTHETIC DETAILS

NOTES :

1. RAIL TYPE WILL BE PAID AS ITEM 0450-6006 RAIL (TY T223). SEE PLAN LAYOUTS FOR PLACEMENT AND QUANTITIES. SEE APPLICABLE STANDARDS FOR DETAILS.
2. USE BASE COLOR FOR ALL SURFACES UNLESS OTHERWISE NOTED. REFER TO M25 - MISSION REGION FINISHES AND TEXTURES STANDARD. PAYMENT FOR SURFACE FINISH OF CONCRETE SHALL BE CONSIDERED SUBSIDIARY TO ITEM 0450-6006.
3. PROVIDE SMOOTH FINISH ON ALL SURFACES.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

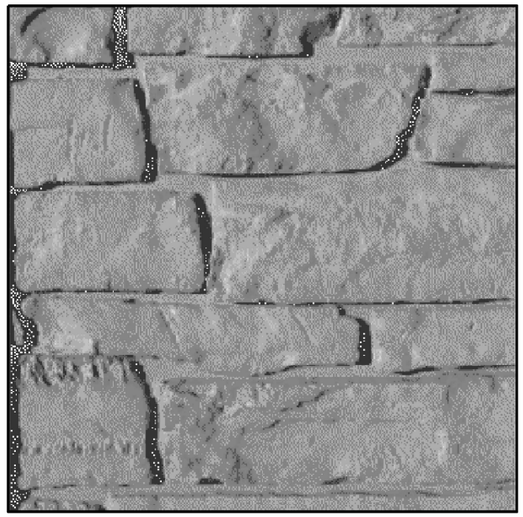
SCALE: N.T.S.

Texas Department of Transportation

UA 281
TYPE T223 BRIDGE RAIL AESTHETIC DETAILS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		172

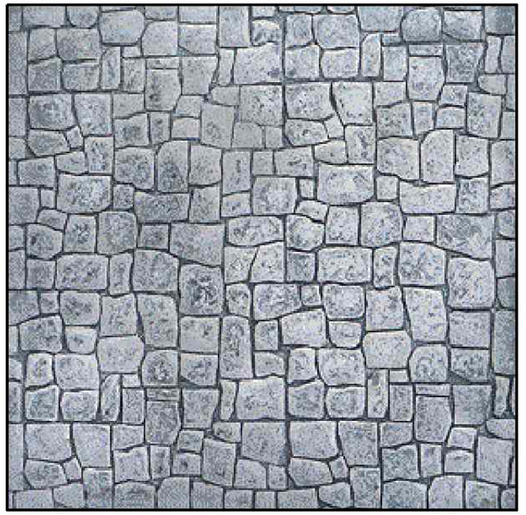


FORM LINER FINISH 'A'
(TETON DRY STACK)

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

FORM LINER FINISH 'B'
(RANDOM STONE)

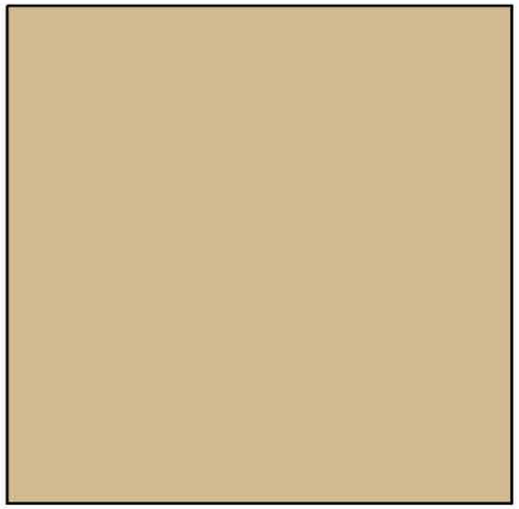
Scott System #177 Random Stone
(303-373-2500) or approved equal.



COLORED TEXTURED CONCRETE
NATURAL STONE- (SCULPTURED GRANITE PATTERN)

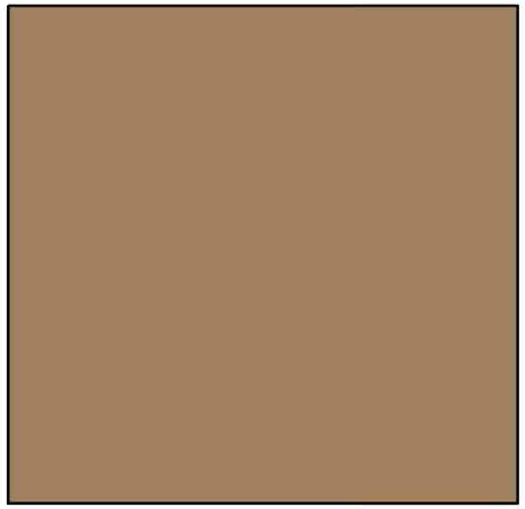
Lithochrome R Color Hardener 1037 Chalk Blue
Lithochrome R Antquing Release 1101 Classic Gray
(800-800-9900)(By Scofield or approved equal)

SEE SHEET M22 FOR PATTERN DETAILS



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

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



ACCENT COLOR
SHERWIN WILLIAMS
SW 6125 'CRAFT PAPER' OR APPROVED EQUAL

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza 02/20/2024

ANDRES GARZA P.E. — DATE

HNTB
Engineers Architects Planners

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Texas Department of Transportation
SAN ANTONIO DISTRICT
AESTHETIC GUIDELINES

MISSION REGION
FINISHES AND TEXTURES

M25

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STRUCTURE	DESIGNED GIRDERS									DEPRESSED STRAND PATTERN		CONCRETE		OPTIONAL DESIGN					LOAD RATING FACTORS				
	SPAN NO.	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS						NO.	TO END (in)	RELEASE STRGTH (1) f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR (2)		STRENGTH I		SERVICE III
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" ℄ (in)	"e" END (in)								Moment	Shear	Inv	Opr	Inv
UA281 over Atascosa River	1-5	1-7	Tx46		40	0.6	270	15.704	10.304	6	42.5	6.000	8.000	4.128	-4.430	6498	0.615	0.803	1.70	2.27	1.08
	6	1-7	Tx46		12	0.6	270	17.604	17.604			4.000	5.000	1.139	-1.329	2774	0.735	0.803	1.51	1.96	2.05

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications. Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.

Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

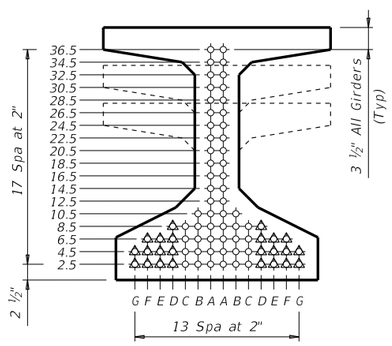
Strand debonding must comply with Item 424.4.2.2.2.4. Full-length debonded strands are only permitted in positions marked △. Double wrap full-length debonded strands in outer most position of each row.

When shown on this sheet, the Fabricator has the option of furnishing either the designed girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

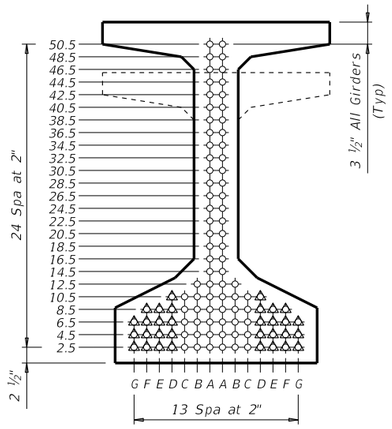
Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

DEPRESSED STRAND DESIGNS:

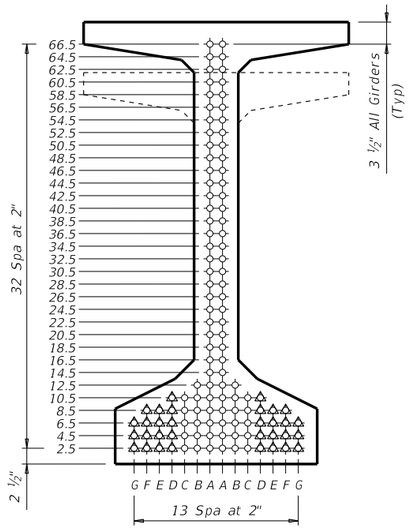
Locate strands for the designed girder as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.



TYPE Tx28, Tx34 & Tx40



TYPE Tx46 & Tx54



TYPE Tx62 & Tx70

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

12/22/2023

FILE: IG-IGND-22.dgn	DN: TxDOT	CK: TxDOT	DW: EFC	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-19: Modified for depressed strands only. 3-22: Added Load Rating.	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		174

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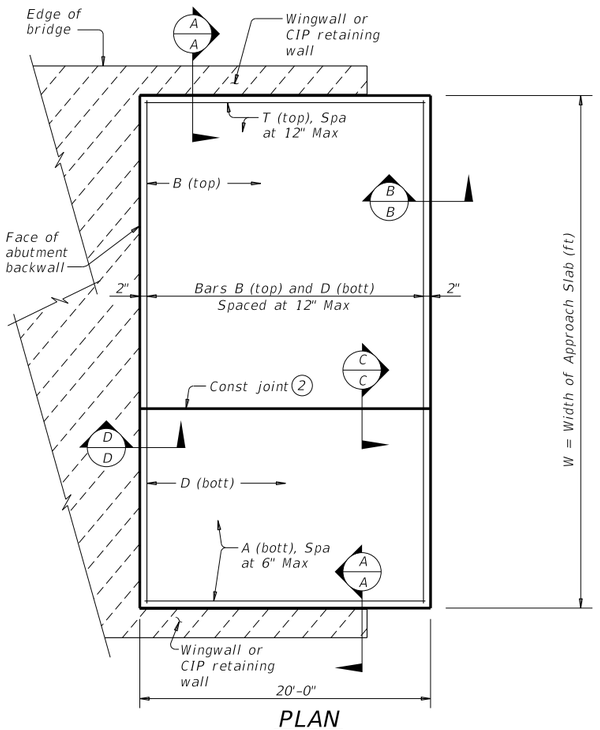
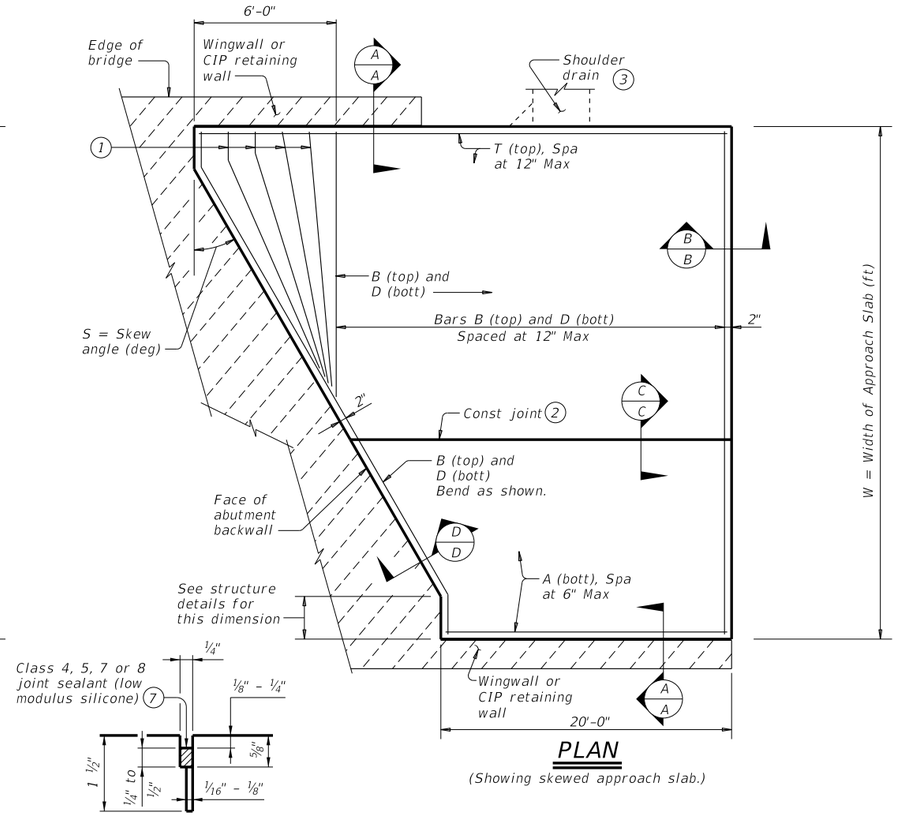


PLAN

(Showing non-skewed approach slab.)



PLAN

(Showing skewed approach slab.)

LONGITUDINAL SAW CUT JOINT DETAIL

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
T	#5

APPROXIMATE QUANTITIES (4)

Reinf steel weight = 8.5 Lbs/SF of Approach Slab

Volume of Appr Slab Conc (CY) = $0.802W + 0.02W^2 \tan S$

W = Width of Approach Slab (ft)

S = Skew Angle (deg)

(1) Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.

(2) Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.

(3) See details elsewhere in plans for shoulder drain location and details.

(4) For Contractor's information only. Quantities shown are for one approach slab.

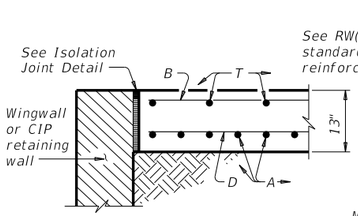
(5) Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.

(6) See details elsewhere in plans for required cross-slope.

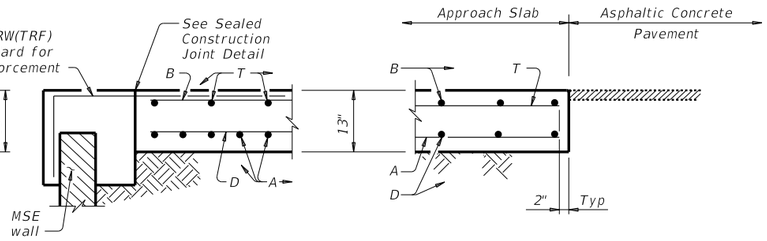
(7) Place in accordance with Item 438.

(8) Provide backer rod that is 25% larger than joint opening and compatible with the sealant.

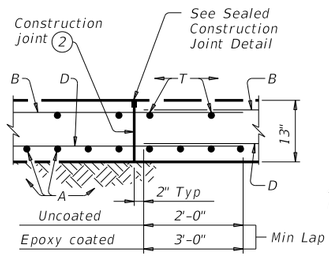
(9) If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

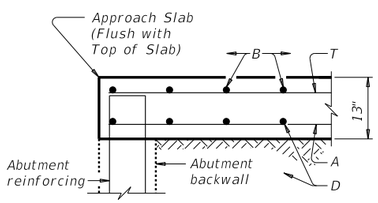


SHOWING WINGWALL OR CIP RETAINING WALL



SHOWING MSE WALL



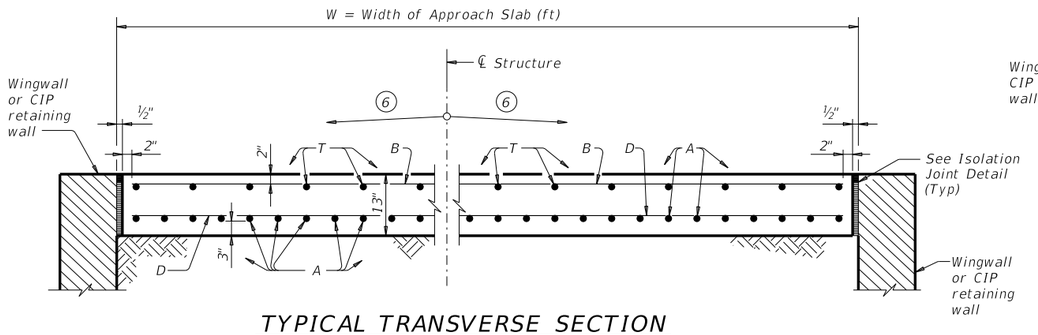


SECTION A-A

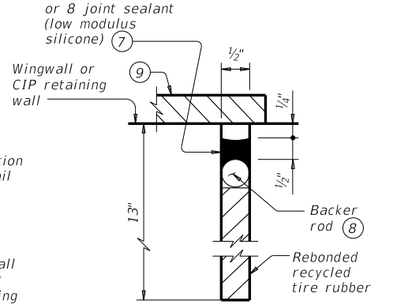
SECTION B-B

SECTION C-C (5)

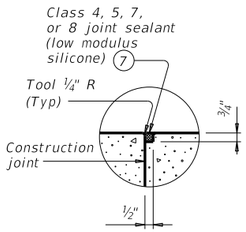
SECTION D-D



TYPICAL TRANSVERSE SECTION



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers."

Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

Cure for 4 days using water or membrane curing per Item 422.

All details shown herein are subsidiary to bridge approach slab.

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

Bridge Division Standard

BRIDGE APPROACH SLAB

ASPHALTIC CONCRETE PAVEMENT

BAS-A

FILE: basaste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
02-20: Removed stress relieving pad.	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		175

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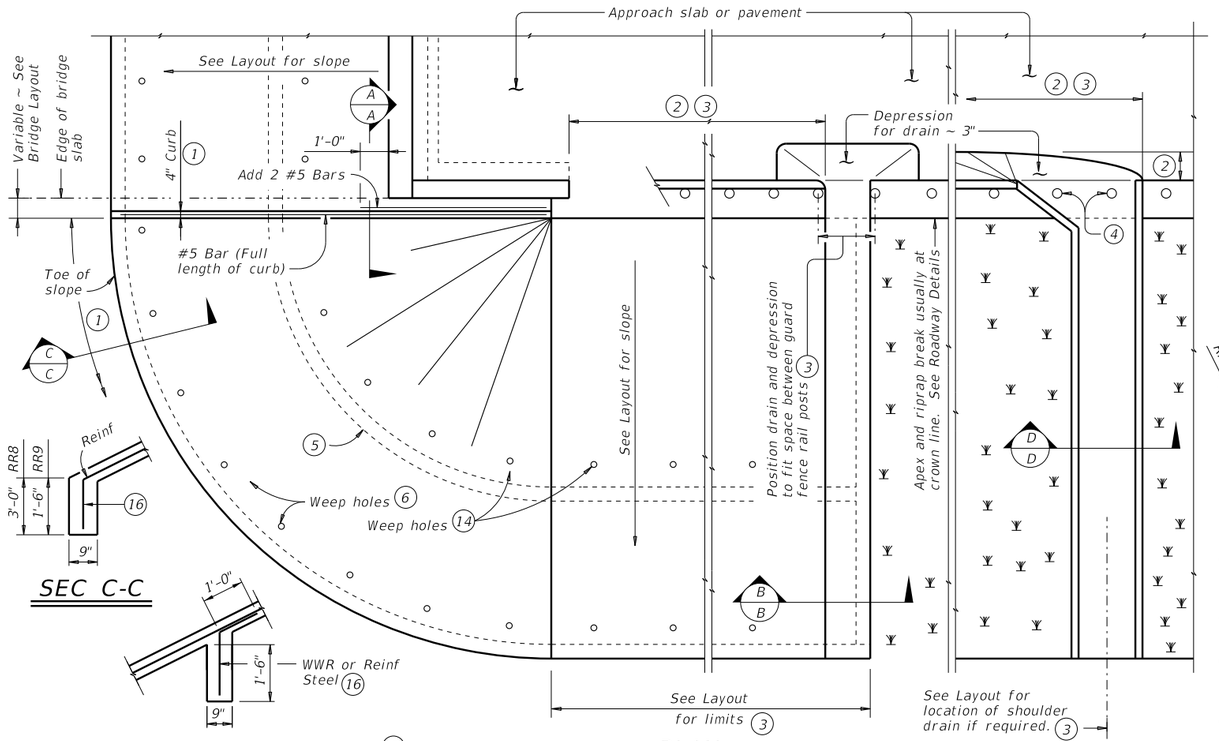
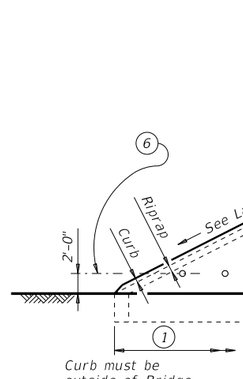
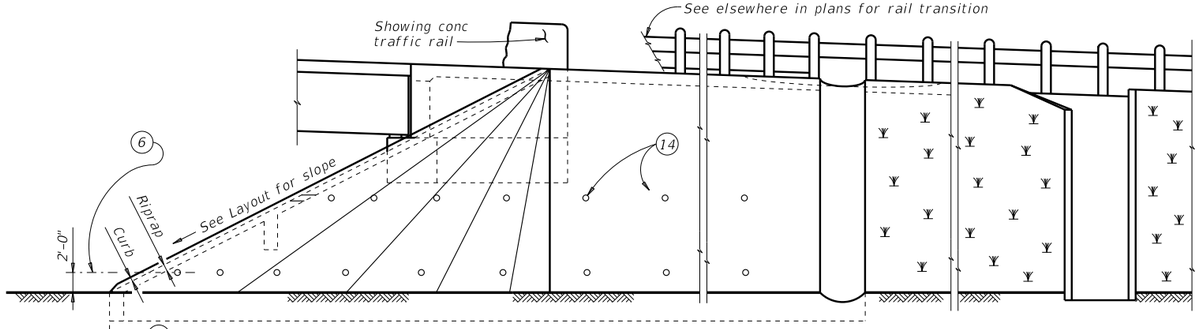


PLAN

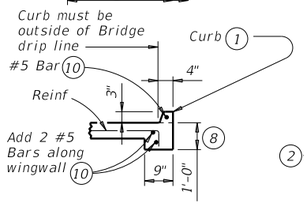


SEC C-C

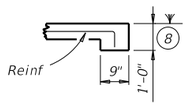
INTERMEDIATE TOEWALL (5)



ELEVATION

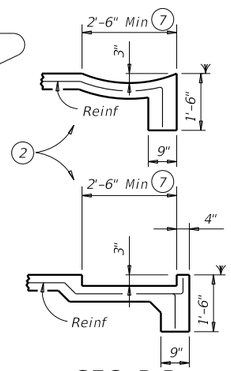


SEC A-A



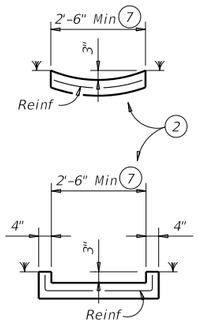
SEC B-B

(No drain)



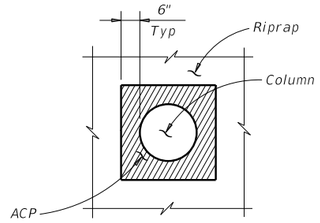
SEC B-B

(Shoulder drain integral with riprap)



SEC D-D

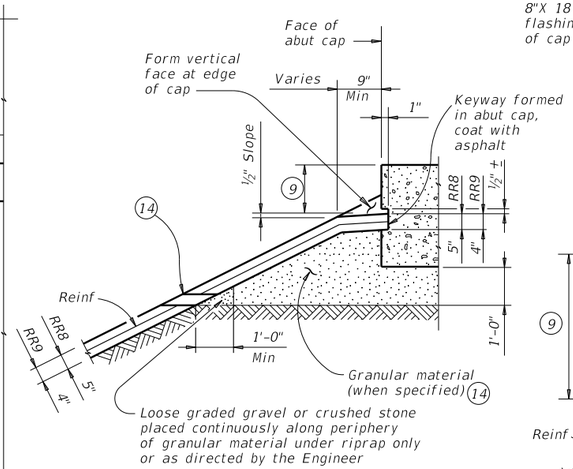
(Shoulder drain)



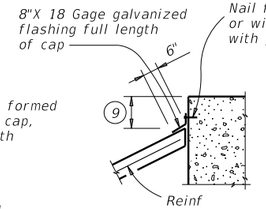
Riprap blockout to be filled with ACP. (Subsidiary to riprap)

RIPRAP DETAIL AT COLUMNS

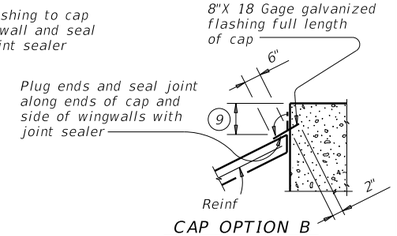
(As directed by the Engineer)



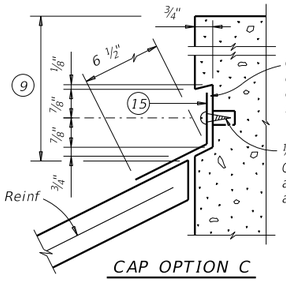
SHOWING KEYWAY OPTION



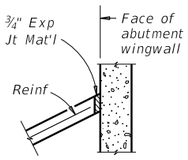
CAP OPTION A



CAP OPTION B

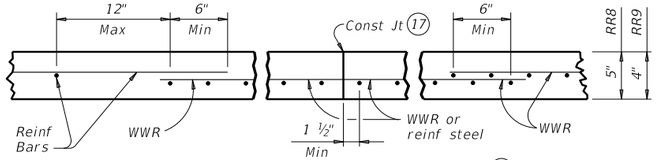


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



REINFORCEMENT DETAILS (13)

See General Notes for optional synthetic fiber reinforcement.

1. When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
2. Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
3. Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.
4. See details elsewhere in plans for installation of guard fence posts through concrete riprap.
5. Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.
6. Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.
7. Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.
8. Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.
9. Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.
10. #5 bars shown are required even when synthetic fiber reinforcing option is selected.
11. Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.
12. Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.
13. Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.
14. If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.
15. 8" x 18 Gage Galv Sheet Metal
16. Provide WWR or #3 bars, with 1'-0" extension into slope.
17. WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#3 Reinf at 18" c-c = 0.501 Lbs/SF
6x6-D3xD3 = 0.408 Lbs/SF

GENERAL NOTES:

Provide Class "B" concrete (f'c = 2,000 psi) unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

Bridge Division Standard

CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

CRR

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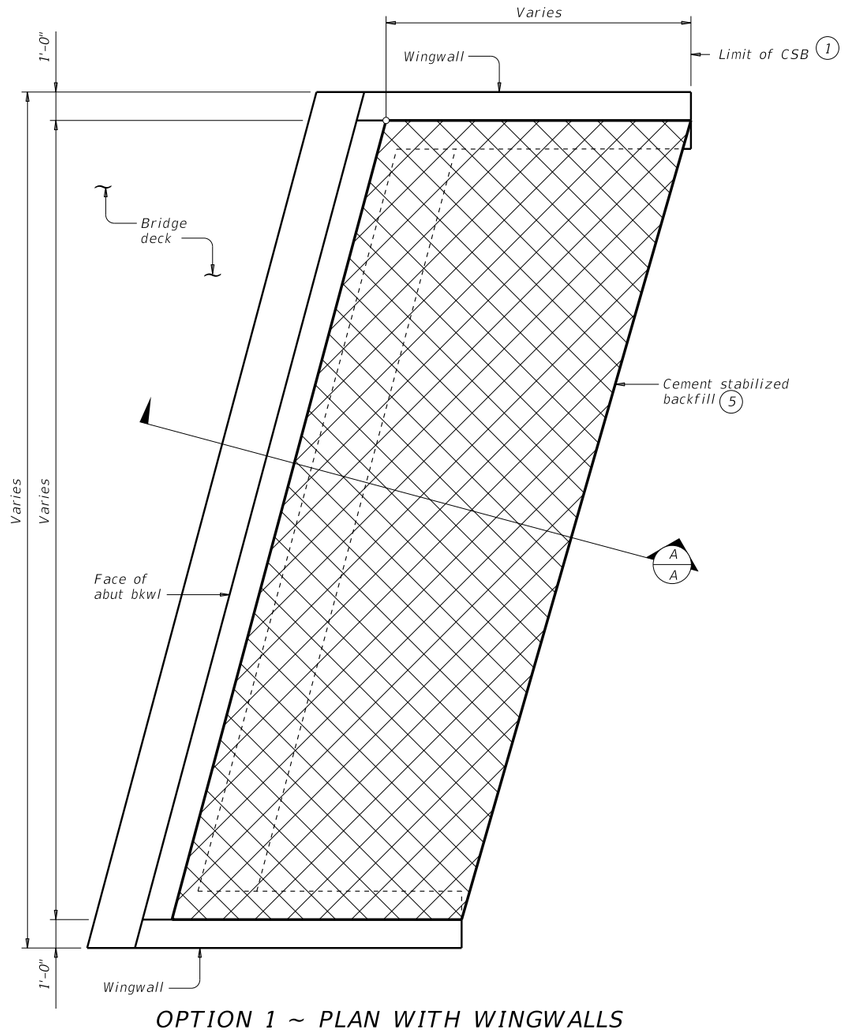
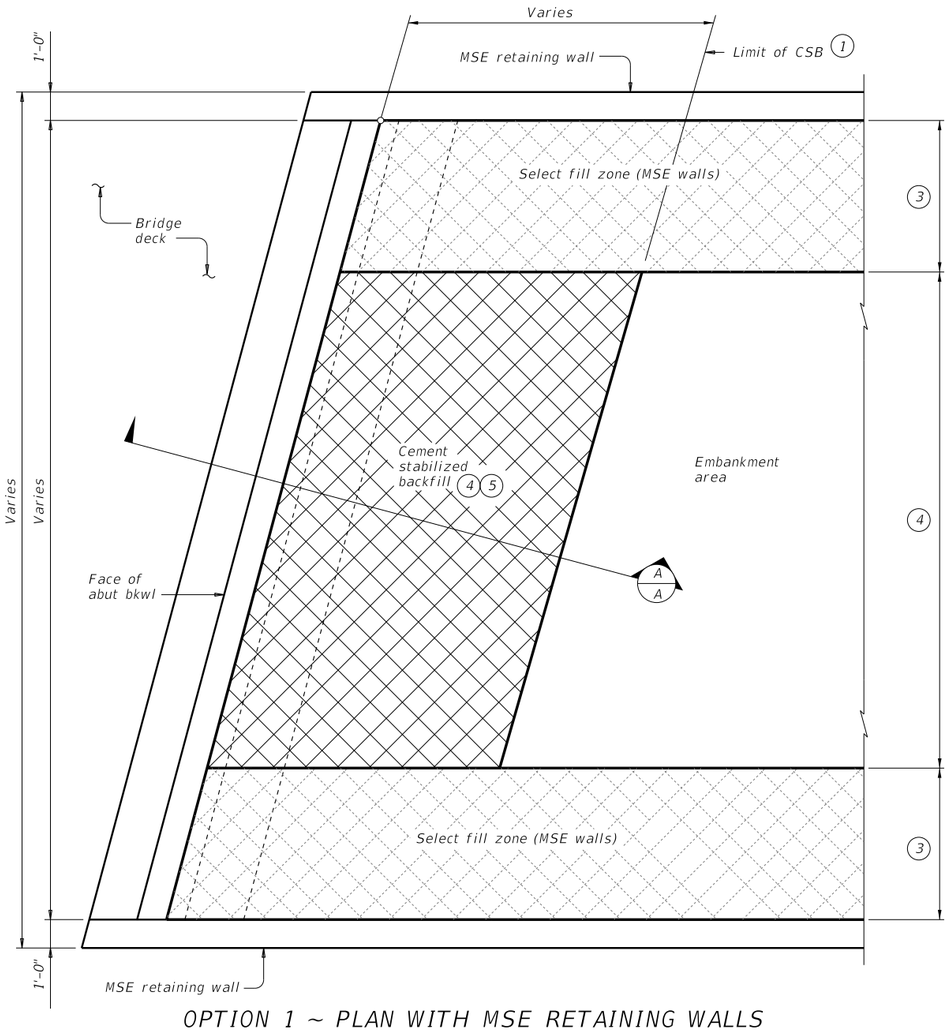


OPTION 1 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.



OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

(1) Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.

(2) Bench backfill as shown with 12" (approximate) bench depths.

(3) Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.

(4) When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.

(5) If shown in the plans, flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
a). If flowable backfill is to be placed over MSE backfill, then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
b). Place flowable fill in lifts not exceeding 2 feet in height. Place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

GENERAL NOTES:

See the Bridge Layout for selected Option. Option 1 is intended for construction only requiring plasticity index (PI) controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment. Option 2 is intended for new construction requiring high plasticity embankment fill with a PI greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays.

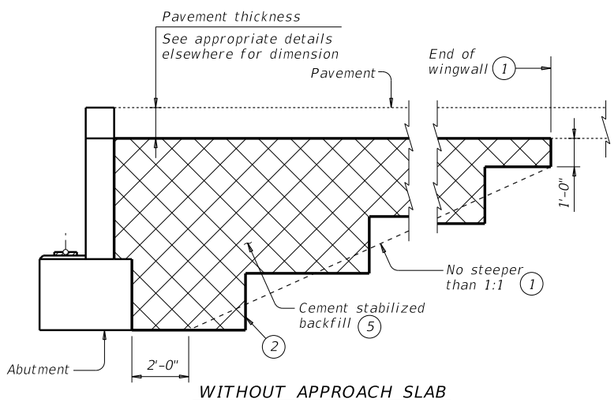
Construct abutment backfill in accordance with Item 400, "Excavation and Backfill for Structures".

Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.

If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", to the limits shown at bridge abutments.

Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.

These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.



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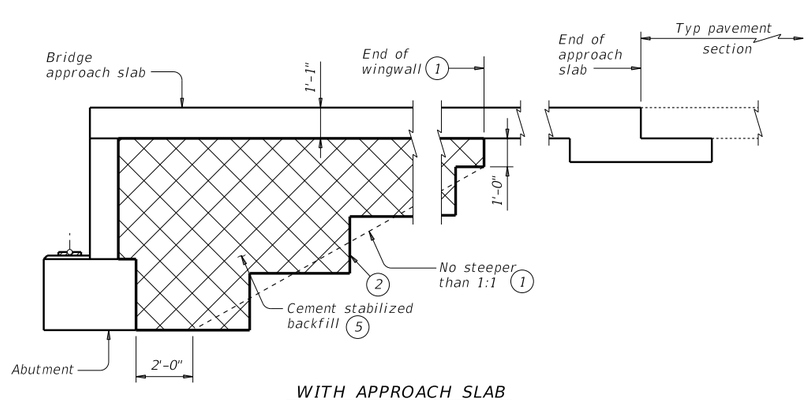

WITH APPROACH SLAB

(Showing BAS-C, BAS-A similar.)

SECTION A-A

Texas Department of Transportation

Bridge Division Standard

CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

CSAB

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REVISIONS	0073	13	012	UA 281
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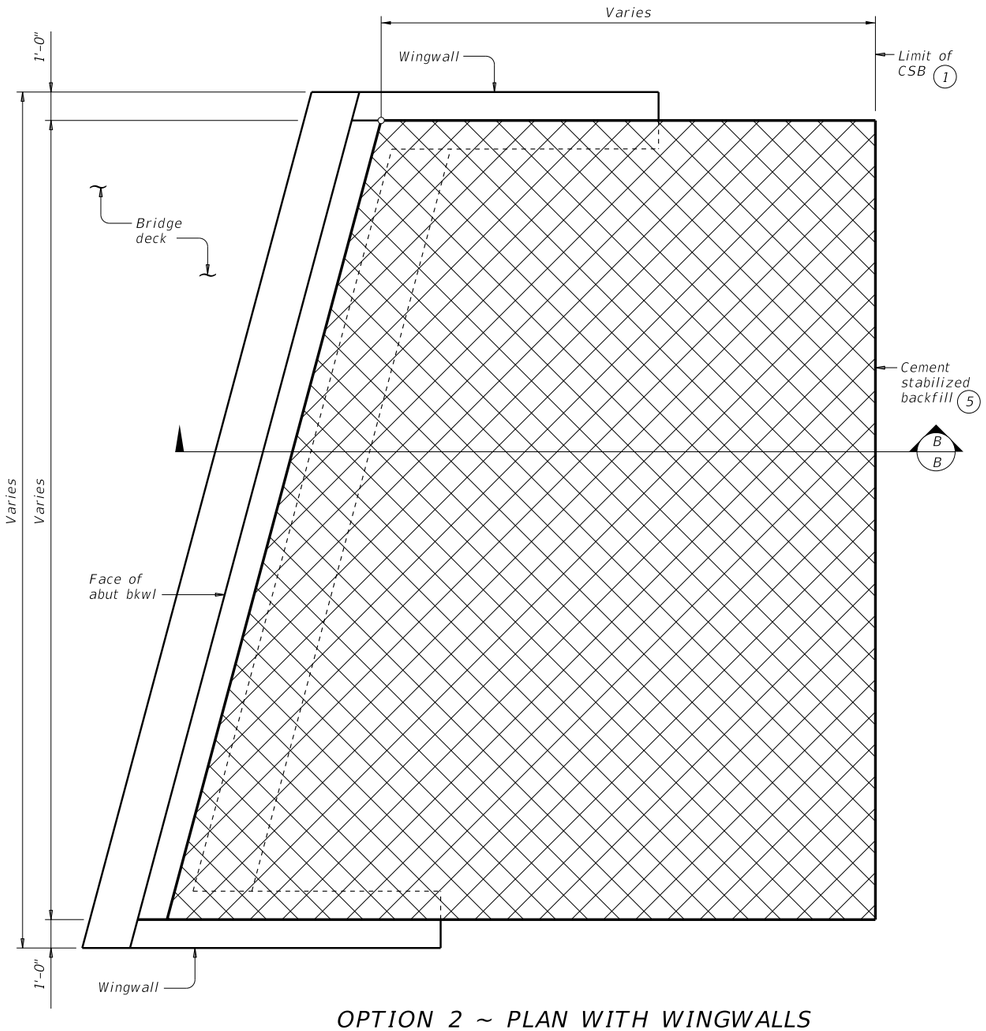
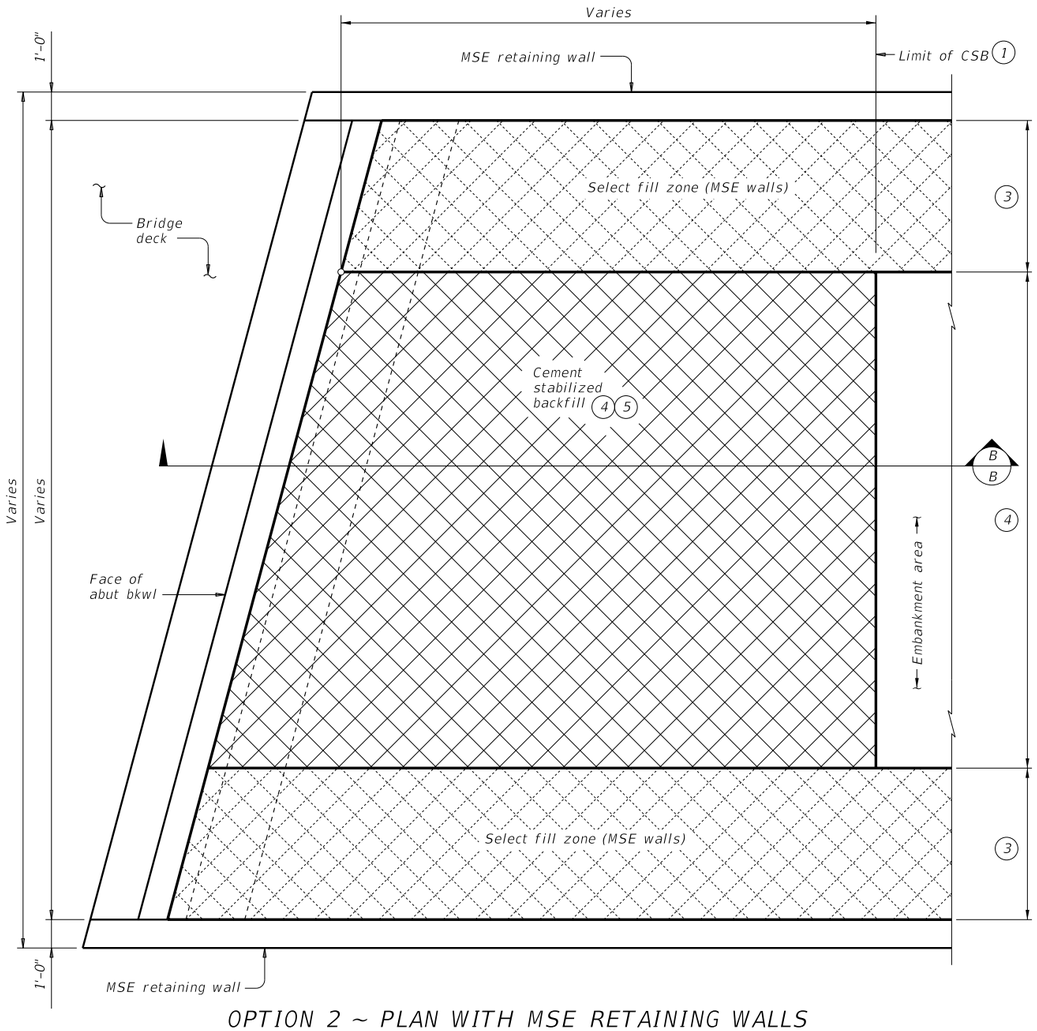


OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.



OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

(1) Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.

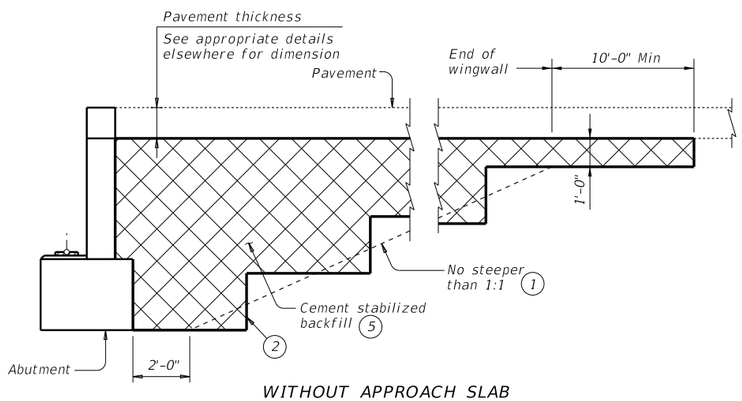
(2) Bench backfill as shown with 12" (approximate) bench depths.

(3) Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.

(4) When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.

(5) If shown in the plans, flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
a). If flowable backfill is to be placed over MSE backfill, then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
b). Place flowable fill in lifts not exceeding 2 feet in height. Place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

(6) 1'-0" for BAS-A
1'-10" for BAS-C



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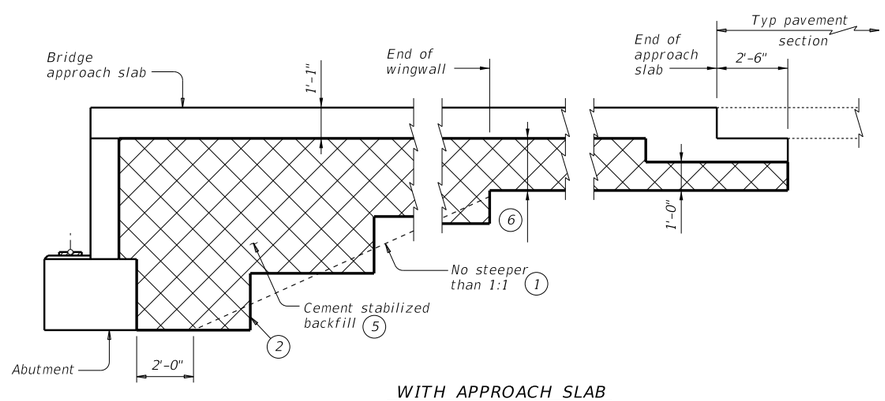

WITH APPROACH SLAB

(Showing BAS-C, BAS-A similar.)

SECTION B-B

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

CSAB

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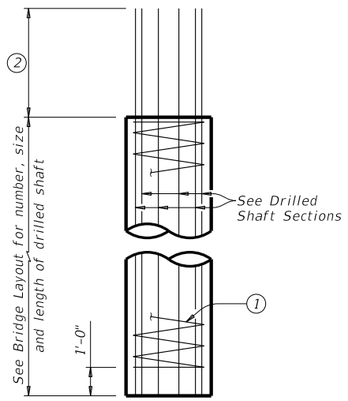
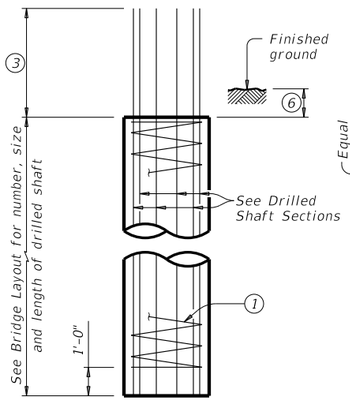
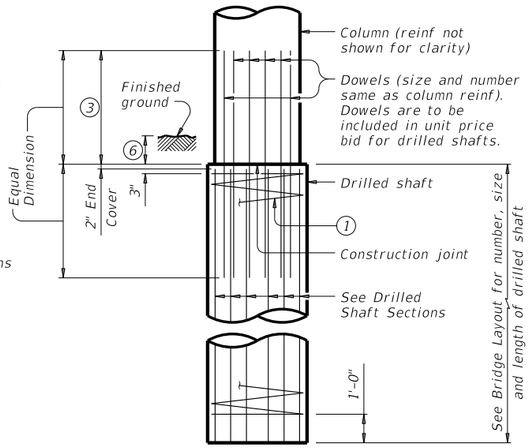


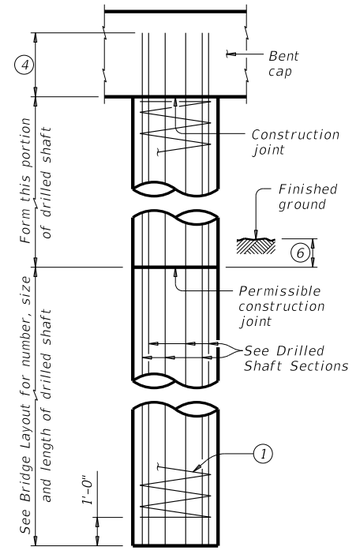
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



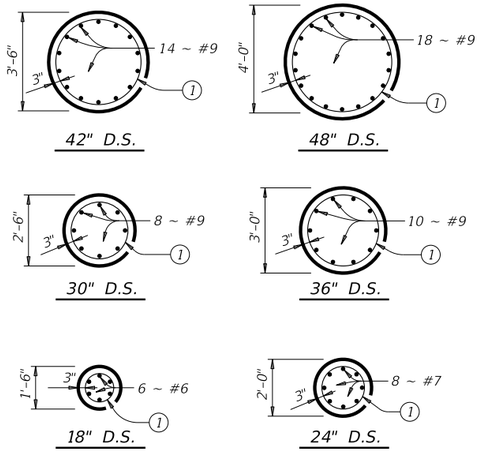
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

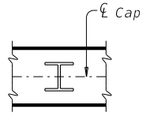


DRILLED SHAFT SECTIONS

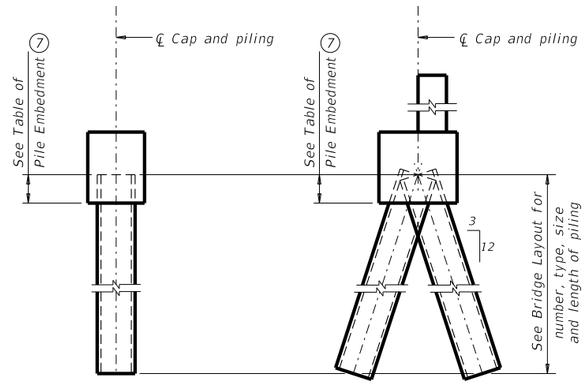
DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

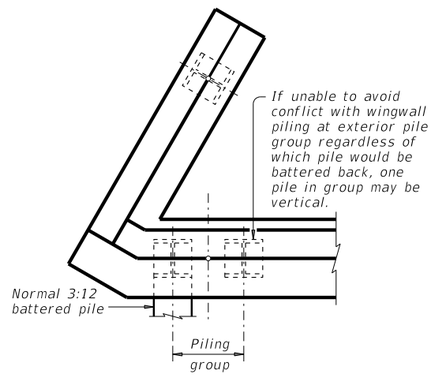


ORIENTATION OF STEEL H-PILING

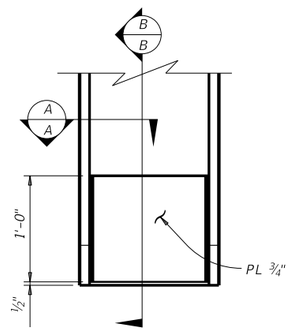


VERTICAL PILE BATTERED PILE

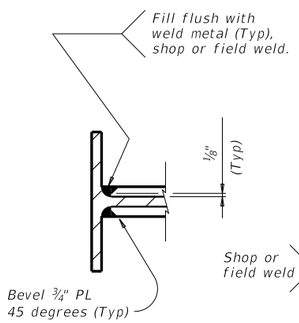
PILING DETAILS
(Concrete or steel H)



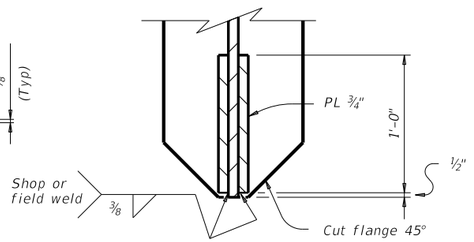
DETAIL "A"
(Showing plan view of a 30° skewed abutment)



ELEVATION



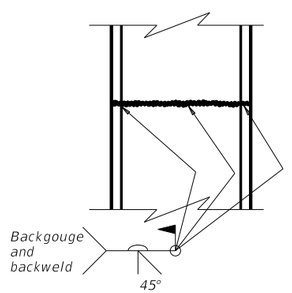
SECTION A-A

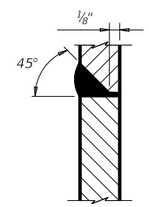


SECTION B-B

STEEL H-PILE TIP REINFORCEMENT

See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.





SECTION THRU FLANGE OR WEB

STEEL H-PILE SPLICE DETAIL

Use when required.

(1) #3 spiral at 6" pitch (one and a half flat turns top and bottom).

(2) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"

(3) Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(4) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"

(5) Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

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Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

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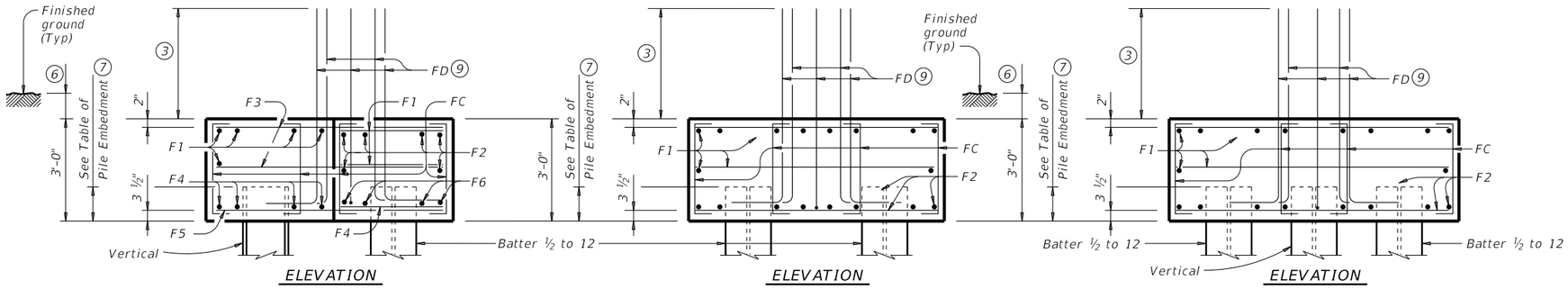
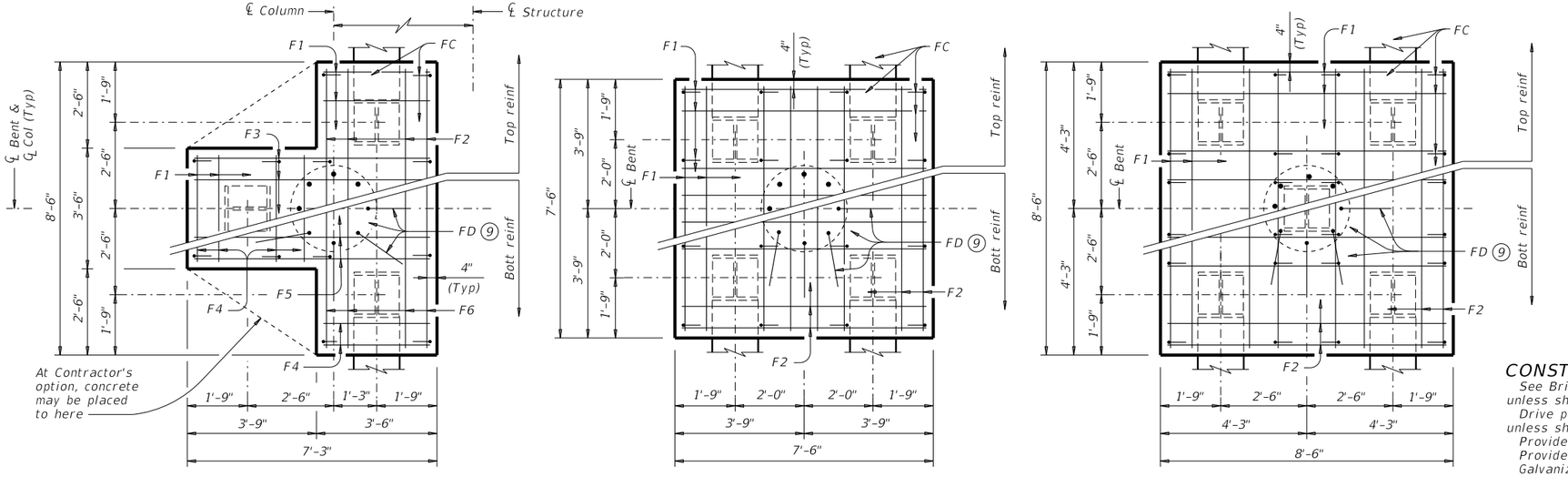




THREE PILE FOOTING (8)

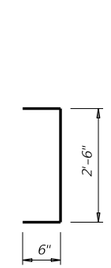
For 36" Dia and smaller columns.

FOUR PILE FOOTING (8)

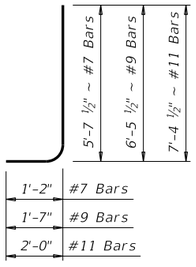
For 42" Dia and smaller columns.

FIVE PILE FOOTING (8)

For 42" Dia and smaller columns.



BARS FC



BARS FD (9)

(3) Min lap with column reinforcing:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

(8) See Bridge Layout for type, size and length of piling.

(9) Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.

(10) Adjust FD quantity, size and weight as needed to match column reinforcing.

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	11	#4	3'- 2"	23
F2	6	#4	8'- 2"	33
F3	6	#4	6'- 11"	28
F4	8	#9	3'- 2"	86
F5	4	#9	6'- 11"	94
F6	4	#9	8'- 2"	111
FC	12	#4	3'- 6"	28
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	623
Class "C" Concrete			CY	4.8

ONE 4 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	7'- 2"	96
F2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	659
Class "C" Concrete			CY	6.3

ONE 5 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	8'- 2"	109
F2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	829
Class "C" Concrete			CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.

Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.

Provide Class C Concrete (f'c = 3,600 psi), unless shown otherwise.

Provide Grade 60 reinforcing steel.

Galvanize reinforcing if shown elsewhere in the plans.

Provide bar laps for drilled shaft reinforcing, where required, as follows:

Uncoated or galvanized (#6) ~ 2'-6"
Uncoated or galvanized (#7) ~ 2'-11"
Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

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

DESIGNER NOTES:

Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.

Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.

Maximum allowable pile loads for the footings shown are:

72 Tons/Pile with 24" Dia Columns
80 Tons/Pile with 30" Dia Columns
100 Tons/Pile with 36" Dia Columns
120 Tons/Pile with 42" Dia Columns

Texas Department of Transportation

Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

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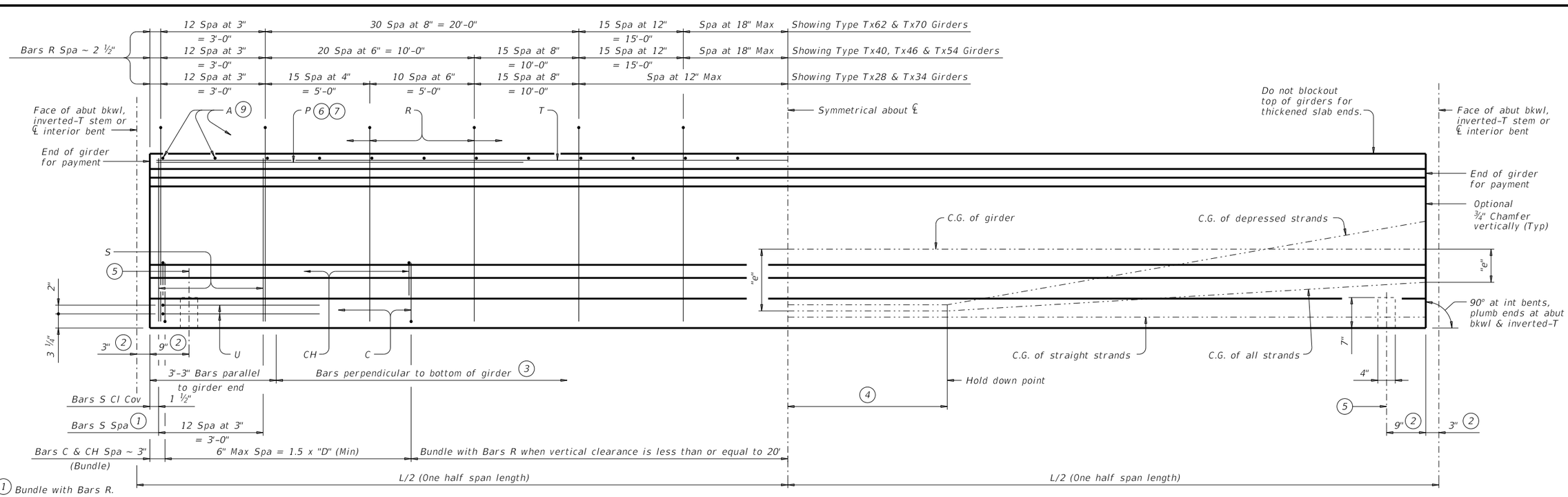


(1) Bundle with Bars R.

(2) Measured along ℄ Girder at interior bents; perpendicular to abutment bkwl or inverted-T stem.

(3) The average of the top and bottom spacing of Bars R cannot exceed the required spacing.

(4) L/20, but not less than 5'-0" (-0,+2').

(5) ℄ 4" x 1 ½" Vertical Slotted Hole at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details. Anchorage holes may be tapered (4 ¾" x 1 ⅝") at base. If holes are formed with sheet metal, forms may be left in place.

GIRDER ELEVATION

(6) Bars P (#6 x 15'-0") required in Tx62 and Tx70 girders. At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.

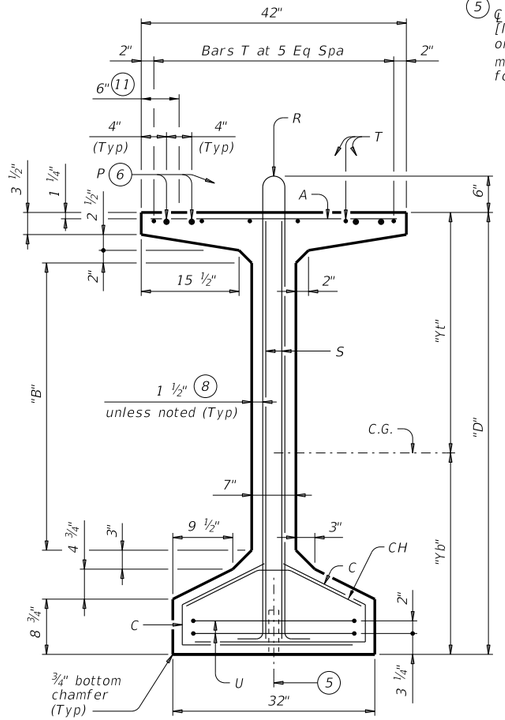
(7) Bars P (#6 x 15'-0") are only required in Tx28, Tx34, Tx40, Tx46, and Tx54 girders when "e" at girder ends exceeds 0.25 x "D". At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.

(8) 1 ⅜" Clear Cover to Bars S.

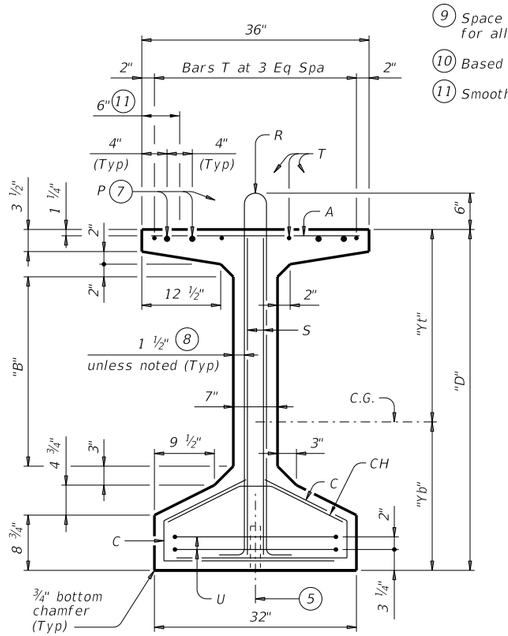
(9) Space Bars A at 6" Max for girders requiring overhang bracket hangers. Space at 12" Max for all other girders. Tie to Bars R as necessary. See standard IGMS for "Deck Forming Notes".

(10) Based on 155 pcf total weight of concrete and reinforcing steel.

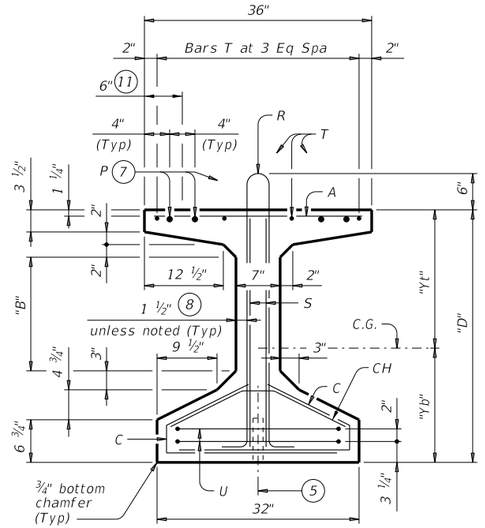
(11) Smooth trowel finish on the slab overhang side of exterior girder.



TYPE Tx62 & Tx70



TYPE Tx46 & Tx54



TYPE Tx28, Tx34 & Tx40

GIRDER DIMENSIONS AND SECTION PROPERTIES

Girder Type	"D" (in.)	"B" (in.)	"Yt" (in.)	"Yb" (in.)	Area (in.²)	"Ix" (in.⁴)	"Iy" (in.⁴)	Weight (10) (plf)
Tx28	28	6	15.02	12.98	585	52,772	40,559	630
Tx34	34	12	18.49	15.51	627	88,355	40,731	675
Tx40	40	18	21.90	18.10	669	134,990	40,902	720
Tx46	46	22	25.90	20.10	761	198,089	46,478	819
Tx54	54	30	30.49	23.51	817	299,740	46,707	880
Tx62	62	37 ½"	33.72	28.28	910	463,072	57,351	980
Tx70	70	45 ½"	38.09	31.91	966	628,747	57,579	1,040

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Provide Class H concrete.
Provide Grade 60 reinforcing steel.
An equal area of deformed Welded Wire Reinforcement (WWR) (ASTM A1064) may be substituted for Bars A, C, R or T unless otherwise noted.
It is permissible for bars or strands to come in contact with materials used in forming anchor holes.
When vertical clearance of the span is less than or equal to 20', provide additional Bars C and CH in every girder of that span.

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

HL93 LOADING

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

FILE: IG-IGD-23.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-19: Added Bars C and CH full length for VC<= 20' 3-23: Clarified C and CH requirement	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		181

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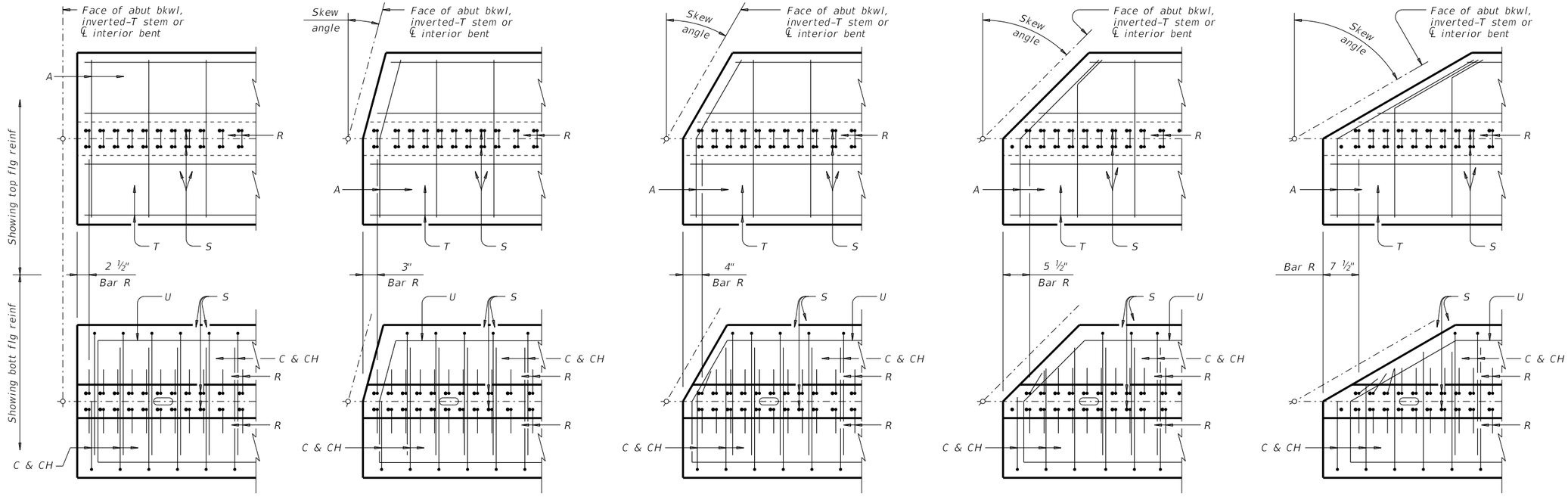
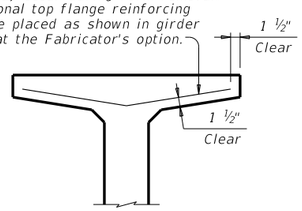
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set7. Bridge/IG-IGD-23.dgn

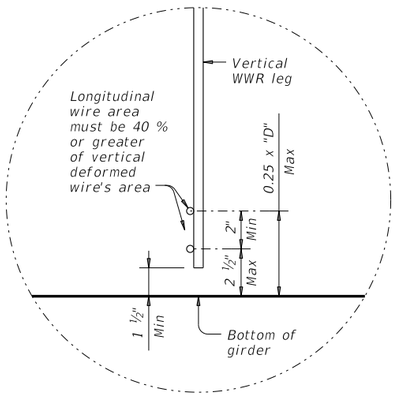


PLAN OF GIRDER ENDS (12)

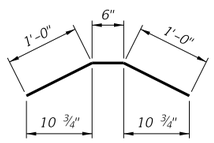
To control top flange cracking that may occur during form removal, additional top flange reinforcing may be placed as shown in girder ends at the Fabricator's option.



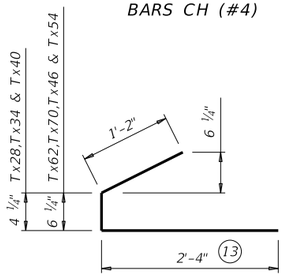
OPTIONAL TOP FLANGE REINFORCING DETAIL



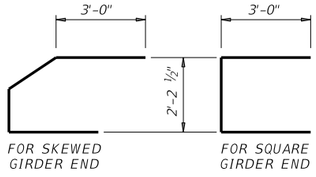
OPTIONAL WELDED WIRE REINFORCEMENT (WWR) DETAIL



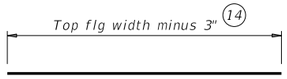
BARS CH (#4)



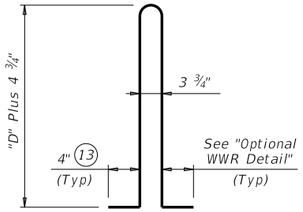
BARS C (#4)



BARS U (#5)

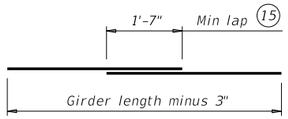


BARS A (#3)



BARS R (#4) (16)

BARS S (#6)



BARS T (#4)

(12) Reinforcing patterns shown are provided as guides to determine reinforcement placement in skewed ends. Place Bars S as close to girder end as cover requirements permit, which may prevent them to be bundled with Bars R.

(13) Bars may be cut or bent at skewed end as required.

(14) Increase as necessary for bars at skewed end.

(15) No portion of bar less than 10 ft.

(16) For Welded Wire Reinforcement (WWR) option, area of Bars R may be reduced in proportion to the increase in reinforcement yield strength over 60 ksi. Yield strength of WWR is limited to 75 ksi.

HL93 LOADING — SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

FILE: IG-IGD-23.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
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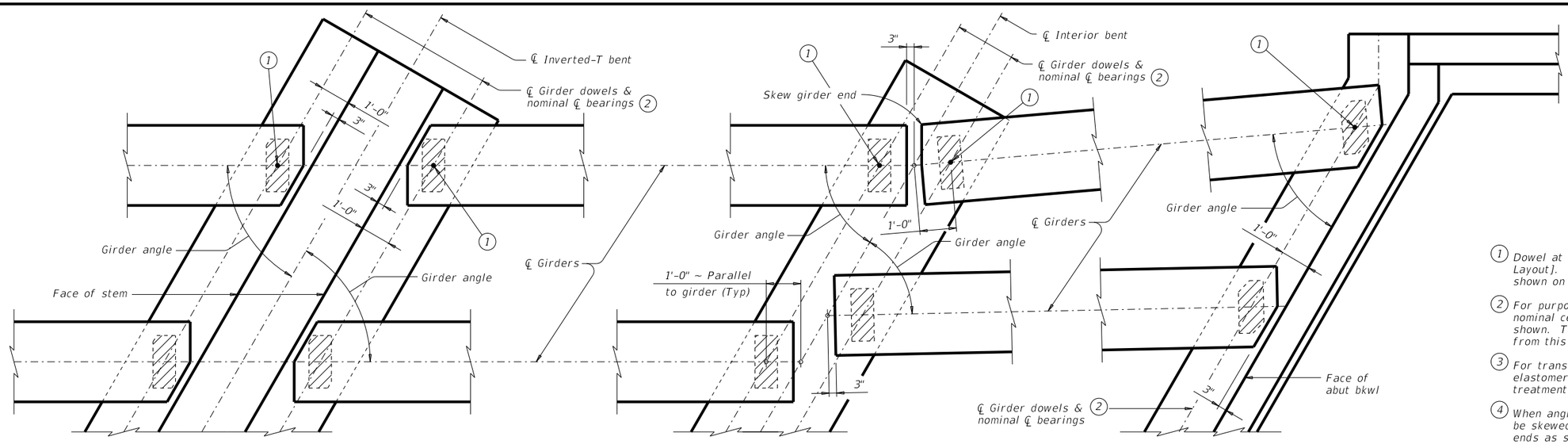
REVISIONS	0073	13	012	UA 281
10-19: Added Bars C and CH full length for VC<= 20'	DIST	COUNTY		SHEET NO.
3-23: Clarified C and CH requirement	SAT	ATASCOSA		182



AT INVERTED-T BENT W/SKEW

AT CONVENTIONAL INTERIOR BENT W/SKEW

AT ABUTMENT W/SKEW (3)

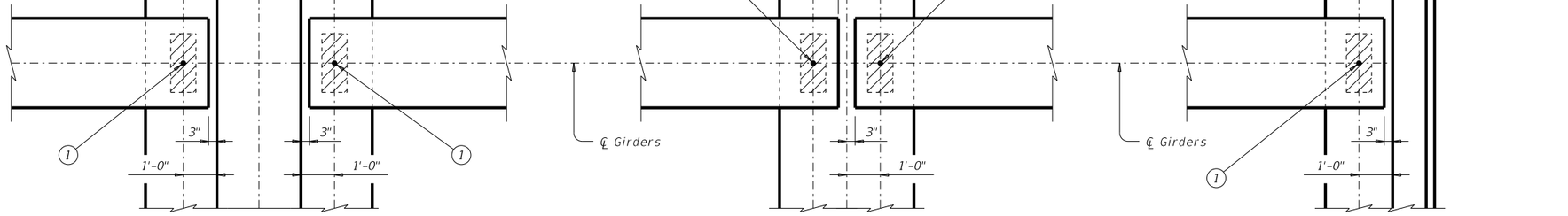
(1) Dowel at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details.

(2) For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.

(3) For transition bents with backwall, girder and elastomeric bearings must receive the same treatment as shown for abutments.

(4) When angle exceeds 0°, one or both girders ends must be skewed to maintain the clearance between girder ends as shown in view.

(5) See Table of Bearing Pad Dimensions for bearing size. Girder end skew angles in Table not applicable for this situation. Table reflects girder conflicts of this type on radial bents only.

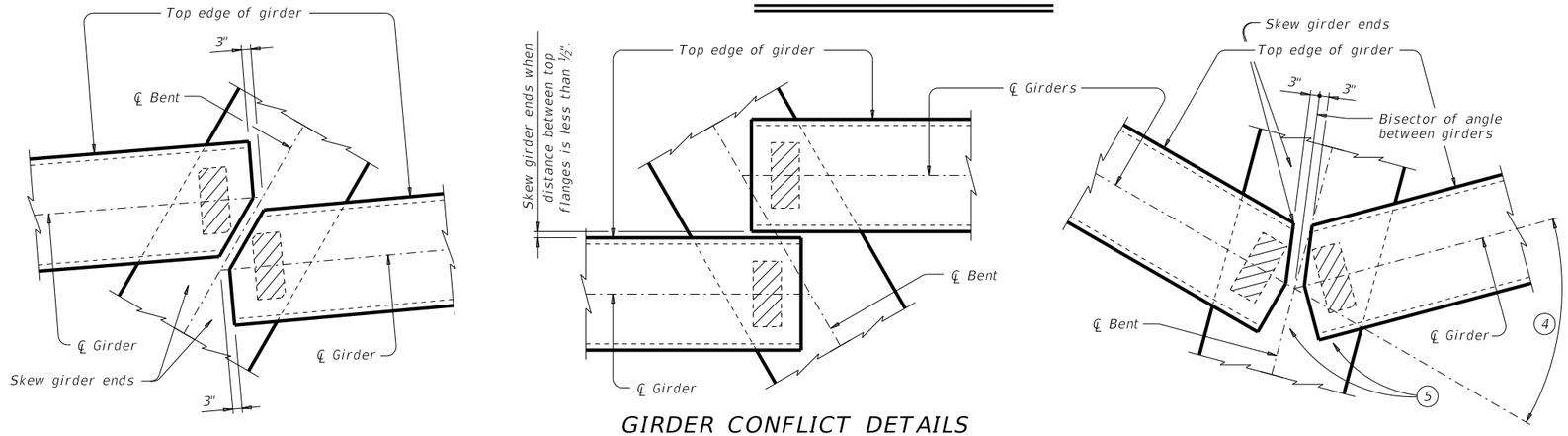


AT INVERTED-T BENT

AT CONVENTIONAL INTERIOR BENT

AT ABUTMENT (3)

GIRDER END DETAILS



GIRDER CONFLICT DETAILS

GENERAL NOTES:

These details accommodate skew angles up to 60°.

Shop drawings for approval are required.

A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer.

Cost of furnishing and installing elastomeric bearings, including beveled and embedded steel plates, must be included in unit price bid for "Prestressed Concrete Girders".

HL93 LOADING SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS

PRESTR CONCRETE I-GIRDERS

IGEB

FILE: IG-IGEB-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
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REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		183

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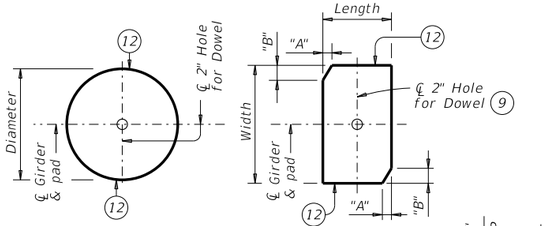
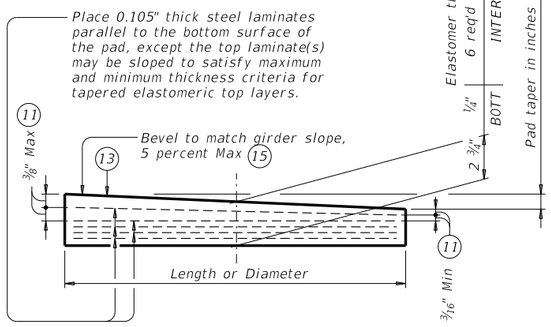


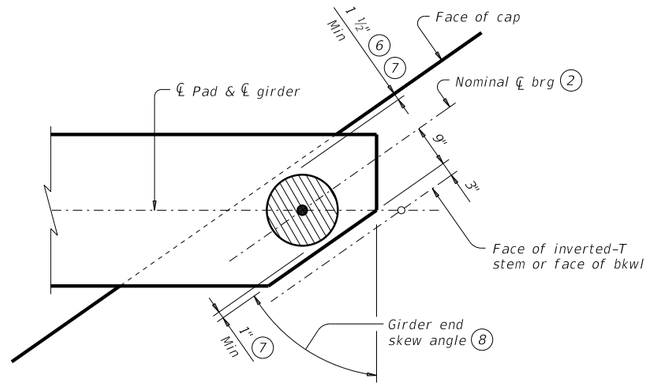
PLANS (10)



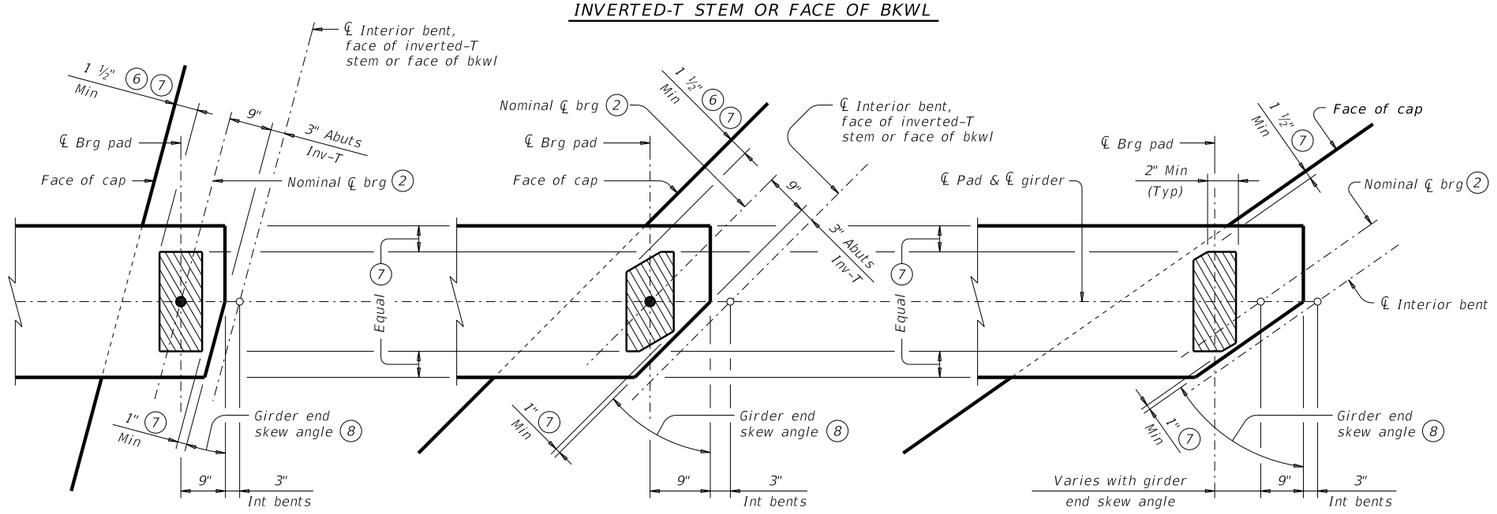
ELEVATION

LAMINATED ELASTOMERIC BEARING PAD

(50 DUROMETER)



ROUND BEARINGS FOR SKEWED GIRDER ENDS AT FACE OF INVERTED-T STEM OR FACE OF BKWL



SKEWED GIRDER ENDS AT INT BENTS, FACE OF INVERTED-T STEM OR FACE OF BKWL

SKEWED GIRDER ENDS AT CONVENTIONAL INTERIOR BENTS (16)

(NO GIRDER DOWELS)

BEARING PAD PLACEMENT DIAGRAMS

TABLE OF MINIMUM SUBSTRUCTURE DIMENSIONS (14)

Girder Type	Abutments: Face of Bkwl to Face of Cap	Int Bents: Overall Cap Width	Inv-T Bents: Corbel Width
Tx28 thru Tx54	1'-9"	3'-6"	1'-10 ½"
Tx62 & Tx70	2'-0"	4'-0"	2'-1 ½"

TABLE OF BEARING PAD DIMENSIONS

Bent Type	Girder Type	Bearing Type (13)	Girder End Skew Angle Range	Pad Size Lgth x Wdth	Pad Clip Dimensions "A"	Pad Clip Dimensions "B"
ABUTMENTS, INVERTED-T AND TRANSITION BENTS WITH BACKWALLS	Tx28,Tx34, Tx40,Tx46 & Tx54	G-1-"N"	0° thru 21°	8" x 21"	---	---
		G-2-"N"	21°+ thru 30°	8" x 21"	1 ½"	2 ½"
		G-3-"N"	30°+ thru 45°	9" x 21"	4 ½"	4 ½"
		G-4-"N"	45°+ thru 60°	15" Dia	---	---
	Tx62 & Tx70	G-5-"N"	0° thru 21°	9" x 21"	---	---
		G-6-"N"	21°+ thru 30°	9" x 21"	1 ½"	2 ½"
		G-7-"N"	30°+ thru 45°	10" x 21"	4 ½"	4 ½"
		G-8-"N"	45°+ thru 60°	10" x 21"	7 ¼"	4 ¼"
CONVENTIONAL INTERIOR BENTS	Tx28,Tx34, Tx40,Tx46 & Tx54	---	---	---	---	---
		---	---	---	---	---
		G-1-"N"	0° thru 60°	8" x 21"	---	---
	Tx62 & Tx70	G-5-"N"	0° thru 60°	9" x 21"	---	---
CONVENTIONAL INTERIOR BENTS WITH SKEWED GIRDER ENDS (GIRDER CONFLICTS) (16)	Tx28,Tx34, Tx40,Tx46 & Tx54	G-1-"N"	0° thru 18°	8" x 21"	---	---
		G-2-"N"	18°+ thru 30°	8" x 21"	1 ½"	2 ½"
		G-9-"N"	30°+ thru 45°	8" x 21"	3"	3"
		G-10-"N"	45°+ thru 60°	9" x 21"	6"	3 ½"
	Tx62 & Tx70	G-5-"N"	0° thru 18°	9" x 21"	---	---
		G-5-"N"	18°+ thru 30°	9" x 21"	---	---
		G-11-"N"	30°+ thru 45°	9" x 21"	1 ½"	1 ½"
		G-12-"N"	45°+ thru 60°	9" x 21"	3"	1 ¾"

(2) For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.

(6) 3" for inverted-T.

(7) Place centerline pad as near nominal centerline bearing as possible between limits shown.

(8) Girder end skew angle is equal to 90° minus the girder angle except at some conflicting girders.

(9) Provide 2" dia hole only at locations required. See Substructure details for location.

(10) See Table of Bearing Pad Dimensions for dimensions.

(11) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.

(12) Locate Permanent Mark here.

(13) Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in ⅛" increments) in this mark.
Examples: N=0, (for 0" taper)
N=1, (for ⅛" taper)
N=2, (for ¼" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan girder slope by more than $\left(\frac{0.0625"}{\text{Length or Dia}}\right)$ IN/IN.

(14) Substructure dimensions must satisfy the minimums provided to accommodate the elastomeric bearings shown on this standard.

(15) See sheet 3 of 3 for beveled plate use when slopes exceed 5 percent.

(16) If girder end is skewed for a girder conflict at an interior bent and a beveled sole plate is required, use bearing type for abutments at this location. Location of bearing centerline is to be set as for abutments in this case.

HL93 LOADING SHEET 2 OF 3

Texas Department of Transportation | Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS

PRESTR CONCRETE I-GIRDERS

IGEB

FILE: IG-IGEB-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
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	DIST	COUNTY		SHEET NO.
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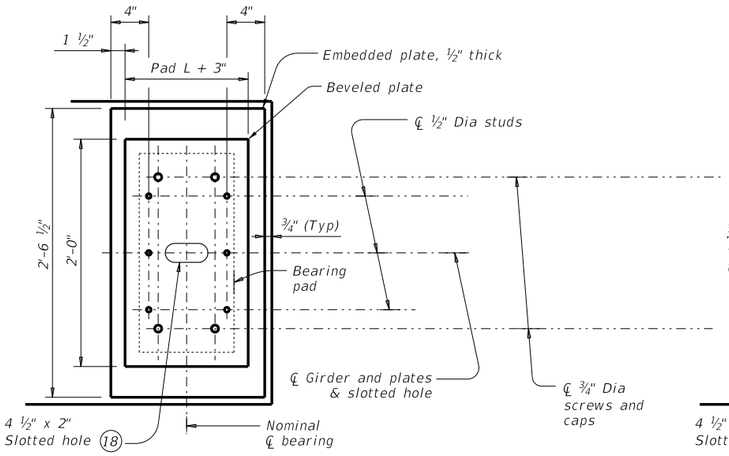
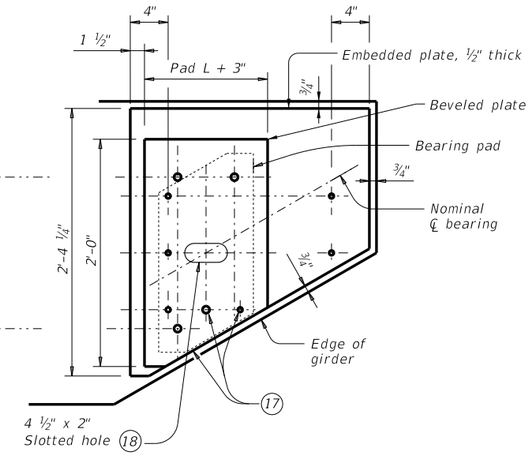
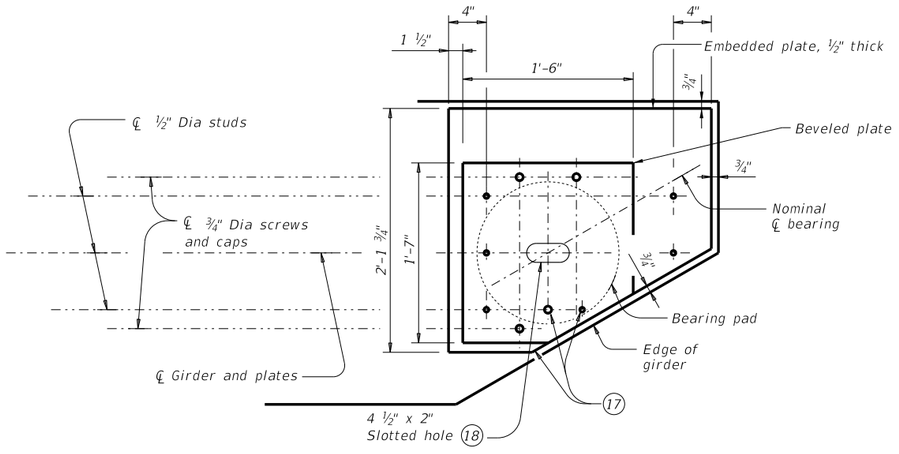


NORMAL GIRDER END
RECTANGULAR BEARING PAD

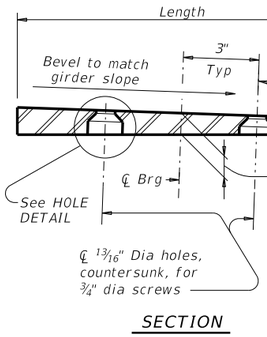


SKEWED GIRDER END
CLIPPED RECTANGULAR BEARING PAD

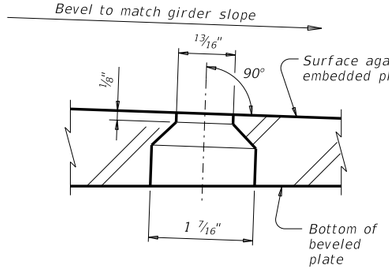


SKEWED GIRDER END
15" DIA BEARING PAD

PLAN VIEW OF SOLE PLATE DETAILS



SECTION



HOLE DETAIL

(17) Cut beveled and embedded plates to match girder end skew. Adjust location of screw and stud as shown when necessary.

(18) Slotted hole is required at doweled girder end locations.

SOLE PLATE NOTES:

Provide constant thickness elastomeric bearings with beveled and embedded steel sole plates in accordance with these details when the girder slope exceeds 5 percent or if otherwise required in the plans. Provide for all girders in the span.

On the shop drawings, dimension sole plates to the nearest 1/16" based on required thickness at centerline of bearing and slope of girder. Thickness tolerance variation from the approved shop drawings is 1/16"+/-, except variation from a plane parallel to the theoretical top surface can not exceed 1/16" total. Bearing surface tolerances listed in Item 424 apply to embedded and beveled plates.

Steel plate must conform to ASTM A36, A572 Gr 50, or A709 Gr 36 or Gr 50. Hot dip galvanize both the embedded plate and beveled sole plate after fabrication. Seal weld caps to embedded plate before galvanizing.

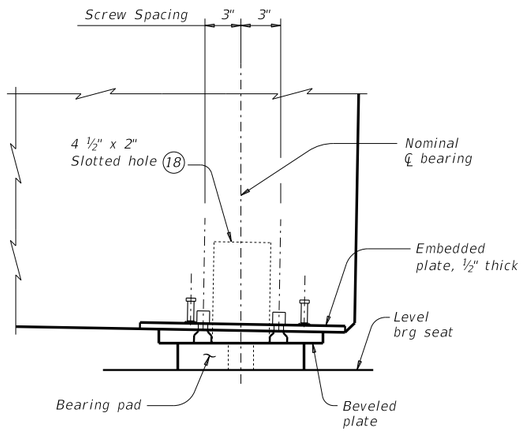
When determining if relocation of screw holes and studs are necessary for skewed girder ends, minimum clearance from screw or stud centerline to plate edge is 1.25".

Tap threads in the embedded plate only. Drill and tap prior to galvanizing.

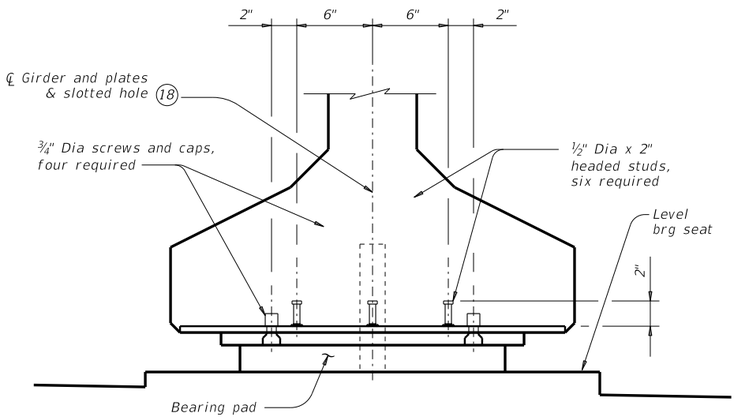
¾" Dia screws must be electroplated, socket flat head countersunk cap screws conforming to ASTM F835. Electroplating must conform to ASTM B633, SC 2, Type I. Provide screws long enough to maintain a ¾" minimum embedment into the embedded plate and galvanized cap. Provide galvanized steel caps (16 ga Min) with a nominal 1" inside diameter and deep enough to accommodate the screws, but not less than ½" deep or deeper than 1".

Install beveled sole plates prior to shipping girders. Installed screw heads must not protrude below the bottom of the beveled plate.

BEVELED PLATE DETAILS



SIDE ELEVATION



END ELEVATION
Showing normal girder end.

GIRDER DETAILS

HL93 LOADING SHEET 3 OF 3

Texas Department of Transportation | Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS
PRESTR CONCRETE I-GIRDERS

IGEB

FILE: IG-IGEB-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
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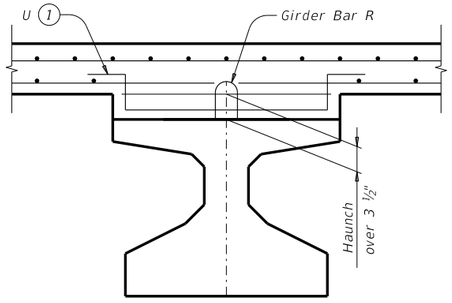
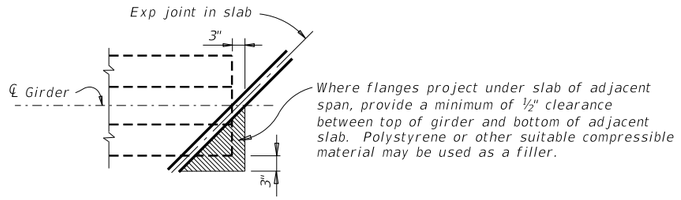
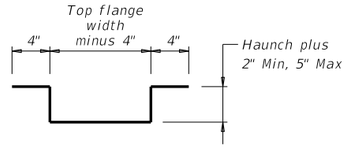
	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		185



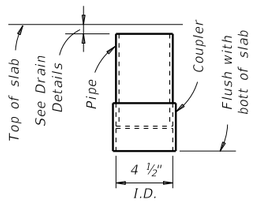
HAUNCH REINFORCING DETAIL



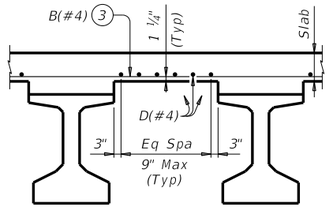
TREATMENT AT GIRDER END FOR SKEWED SPANS



BARS U (#4)

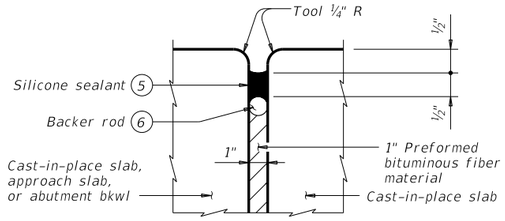


C-I-P DRAIN DETAIL (2)

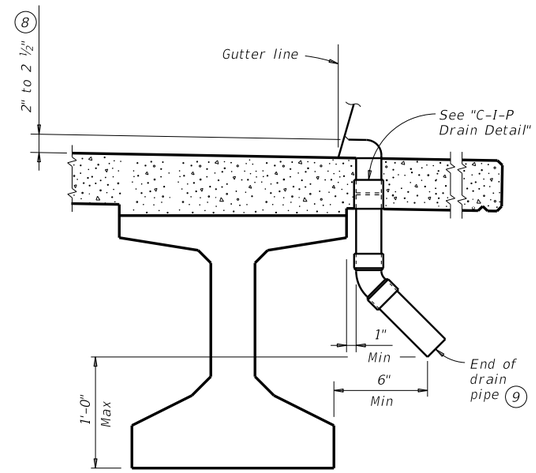


TYPICAL PART TRANSVERSE SLAB SECTION WITHOUT PCP (4)

Top reinforcing steel not shown for clarity.



TYPE A JOINT DETAIL (7)



DRAIN DETAIL (10)

1. Space Bars U with girder Bars R in all areas where measured haunch exceeds 3 ½".
2. Roughen outside of PVC with coarse rasp or equal to ensure bond with cast-in-place concrete.
3. Bars B(#4) spaced at 9" Max with 2" end cover. Overhang option, Contractor's may end alternating bars B(#4) at centerline outside girder.
4. Provide Grade 60 reinforcing steel. Provide bar laps, where required, as follows:
   Uncoated ~ #4 = 1'-7"
   Epoxy coated ~ #4 = 2'-5"
5. Class 7 silicone sealant that conforms to DMS-6310. Install when ambient temperature is between 55°F and 85°F and rising. Engineer to determine allowable hours for sealant application.
6. 1 ¼" backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
7. The maximum distance between Type A expansion joints is 100'. See Bridge Layout for location of joints.
8. Drain entrance formed in rail or sidewalk.
9. Water may not be discharged onto girders.
10. All drain pipe and fittings to be 4" diameter (Sch 40) PVC. See Item 481 "Pipe for Drains" for pipe, connections and solvent welding. Bend reinforcing steel to clear PVC 1". Drain length and location is as directed by the Engineer. Drains are not permitted over roadways or railways, or within 10'-0" of bent caps. Degrease outside of exposed PVC, apply acrylic water base primer, then coat with same surface finishing material as used for outside girder face. Variations of the above designs, as required for the type of rail used and its location on the structure, may be installed with the approval and direction of the Engineer.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Payment for Type A joint will be as per Item 454, "Bridge Expansion Joints."

All other items (reinforcing steel, drains, etc.) shown on this sheet are subsidiary to other bid items.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

DECK FORMWORK NOTES:

Overhang bracket hangers are limited to a safe working load of 3,600 lbs, applied to and along the axis of a coil rod at 45 degrees from vertical, regardless of higher loads permitted by hanger manufacturers. Do not place a hanger less than 12" from girder end. Space hangers accordingly.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS

PRESTR CONCRETE I-GIRDERS

IGMS

FILE: igmssts1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
10-19: Modified Note 7. Type A now a pay item.	DIST	COUNTY		SHEET NO.
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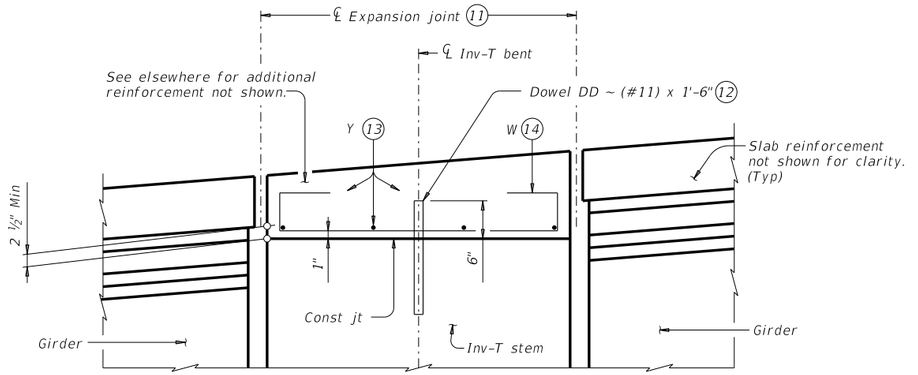
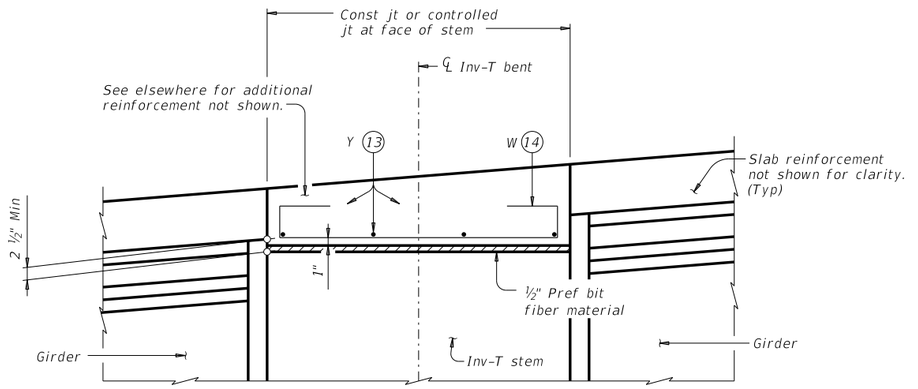
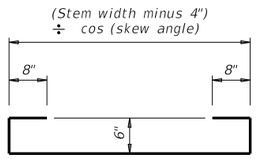


SHOWING EXPANSION JOINTS

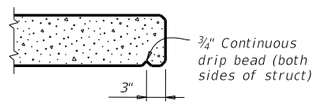


SHOWING CONST JTS OR CONTROLLED JTS

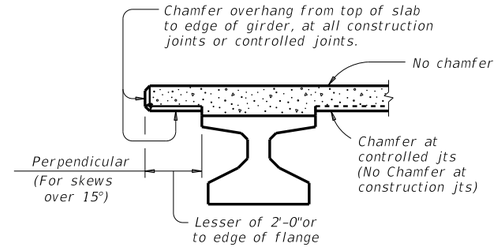
REINFORCEMENT OVER INV-T BENTS



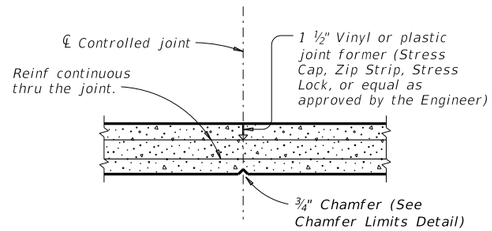
BARS W (#4)



DRIP BEAD DETAIL



CHAMFER LIMITS DETAIL (15)



CONTROLLED JOINT DETAIL

(Saw-cutting is not allowed)

(11) See Layout for joint type.

(12) Dowels DD (#11) spaced at 5 Ft Max. See Inv-T bents for quantity and location.

(13) Space Bars Y (#4) at 12" Max. Use 2" end cover. Number of Bars Y must satisfy spacing limit. Place parallel to bent.

(14) Space Bars W at 12" Max (3" from end of cap). Tilt if necessary to maintain cover requirements. Place parallel to longitudinal slab reinforcement.

(15) See Span details for type of joint and joint locations.

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SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

MISCELLANEOUS SLAB DETAILS
PRESTR CONCRETE I-GIRDERS

IGMS

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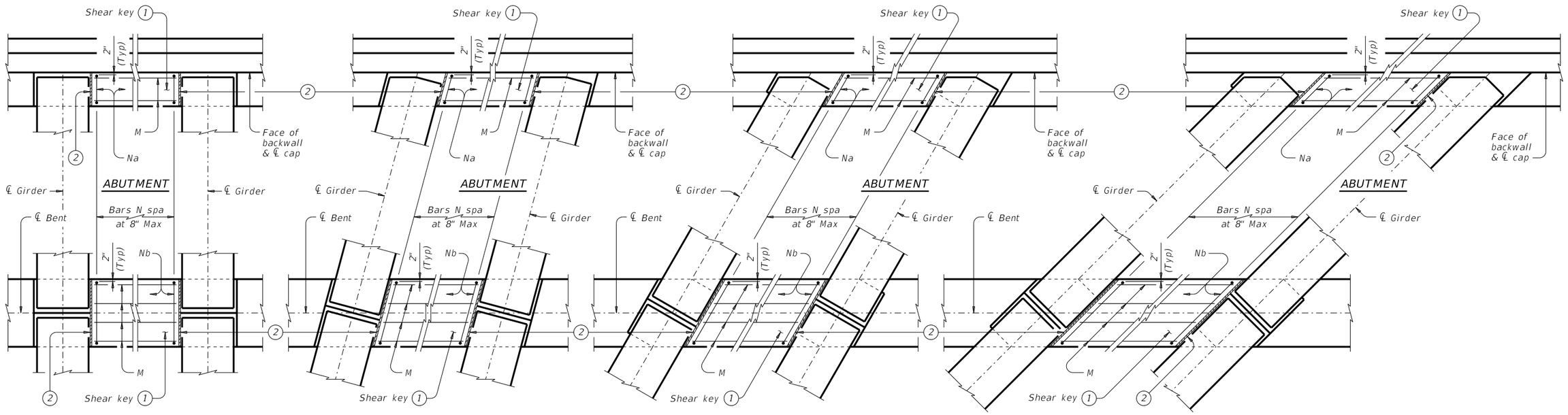


INTERIOR BENT

PARTIAL PLANS WITH NO SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

INTERIOR BENT

PARTIAL PLANS WITH 15° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

INTERIOR BENT

PARTIAL PLANS WITH 30° SKEW

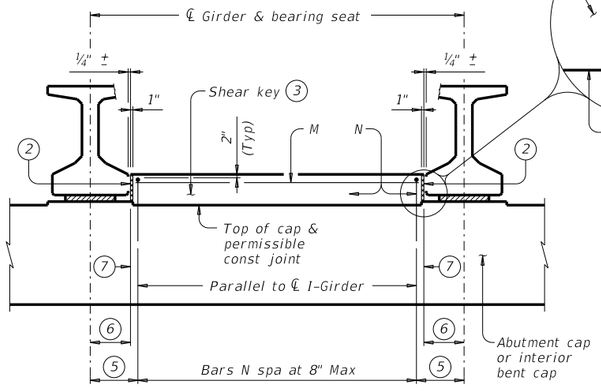
Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

INTERIOR BENT

PARTIAL PLANS WITH 45° SKEW

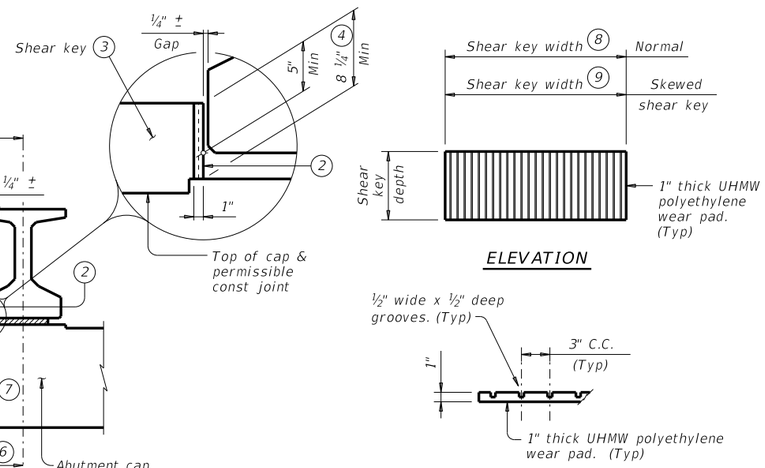
Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

1. Place shear keys on the upstream side of structure between outside girder and next adjacent girder, unless shown otherwise on plans.
2. UHMW polyethylene wear pad. (Typ)
3. Leave a ¼" gap plus or minus between girder and face of wear pad. Cast wear pad with shear key, smooth side facing girder. Care must be taken to keep concrete from flowing under girder. Slope top of shear keys in accordance with Item 420.4.9, "Treatment and Finishing of Horizontal Surfaces."
4. Measure at higher bearing seat elevation forward or back. Dimension based on typical bearing pad and bearing seat. Increase as necessary to maintain 5" overlap.
5. With No Skew = 1'-8 ¼", measured along ℄ cap.
   With Skew = 1'-8 ¼" ∓ Cos Skew, measured along ℄ cap.
6. With No Skew = 1'-4 ¼", measured along ℄ cap.
   With Skew = 1'-4 ¼" ∓ Cos Skew, measured along ℄ cap.
7. Face of UHMW polyethylene wear pad. Smooth side of pad facing girder.
8. Abutments = ½ Cap width.
   Interior bents = Cap width.
9. Abutments = ½ Cap width ∓ Cos Skew.
   Interior bents = Cap width ∓ Cos Skew.

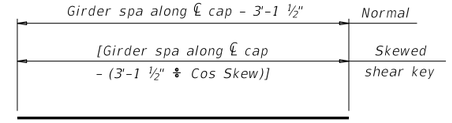


PARTIAL ELEVATION OF ABUTMENT OR INTERIOR BENT CAP (1)

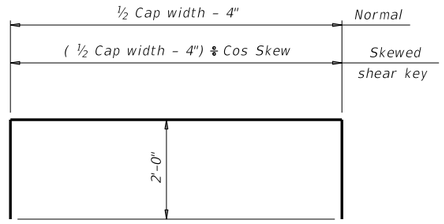
Showing shear key with girder Type Tx46.
Other I-Girder types similar.



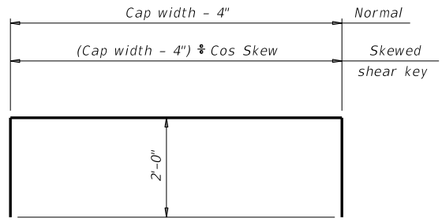
ULTRA HIGH MOLECULAR WEIGHT (UHMW) POLYETHYLENE WEAR PAD DETAILS



BARS M (#5)



BARS Na (#5)
(For abutments)



BARS Nb (#5)
(For interior bents)

CONSTRUCTION NOTES:

Provide Class "C" concrete (f'c = 3,600 psi). Provide Class "C" (HPC) if shown elsewhere on the plans.
Provide Grade 60 reinforcing steel.
Provide epoxy coated reinforcing steel for shear key if abutment or interior bent reinforcing steel is epoxy coated.
Provide Ultra High Molecular Weight (UHMW) polyethylene wear pads in accordance with ASTM D6712.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Details showing skew are drawn showing right forward skew. See Bridge Layout for actual skew direction.
These details are limited to bridges skewed 45 degrees and less.
This standard is only applicable for I-Girders.
Modify details for bearing conditions, and girder spacing not shown on this standard. Details do not account for sole plate or pedestal bearing seat.
Include shear key concrete in abutment or bent concrete for payment.
UHMW polyethylene wear pads are subsidiary to Class "C" concrete.

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

Texas Department of Transportation

Bridge Division Standard

SHEAR KEY DETAILS
PRESTR CONCRETE I-GIRDERS

IGSK

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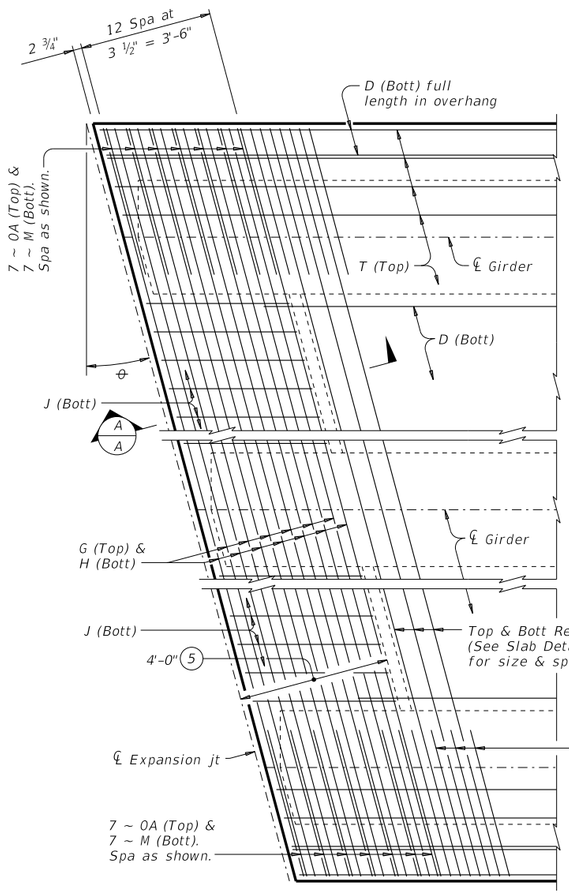
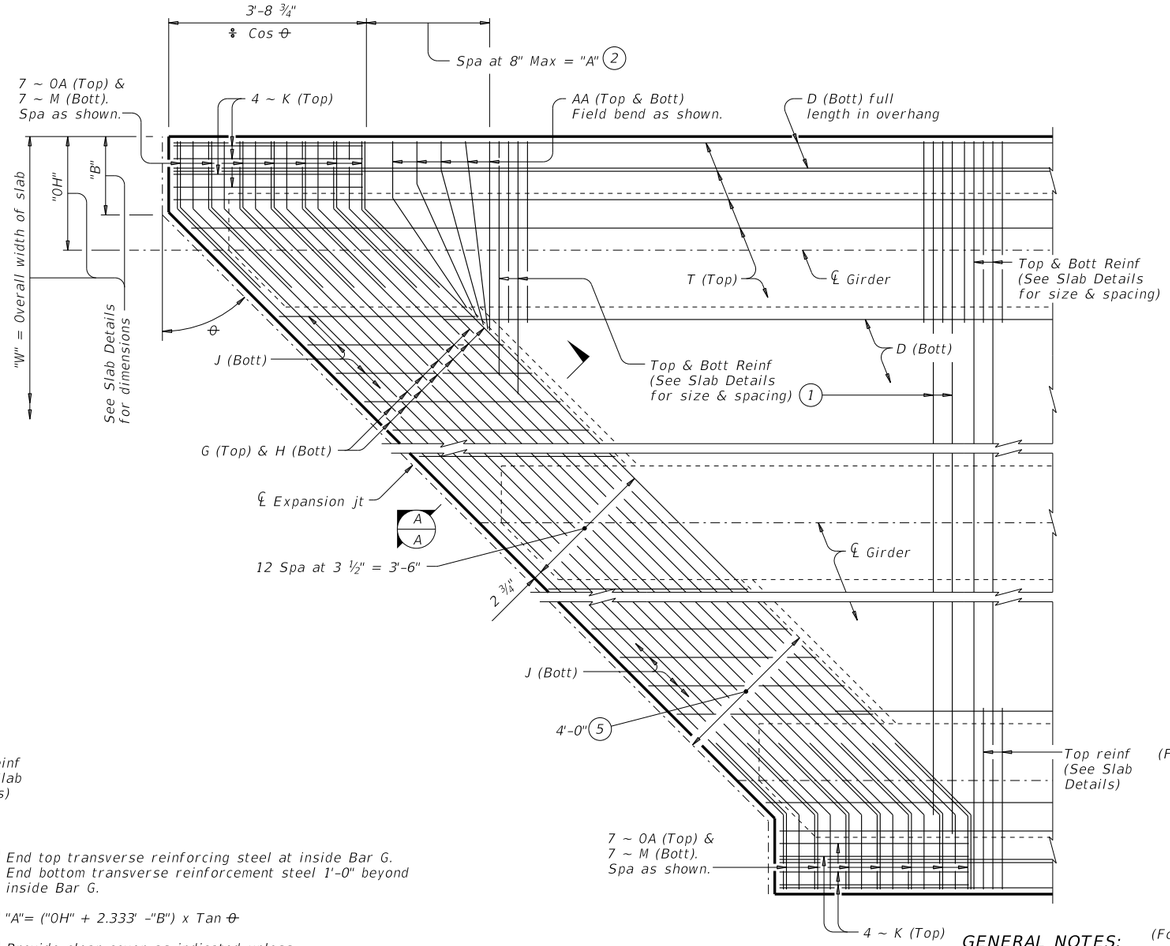


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



PARTIAL PLAN FOR SLABS WITH BREAKBACK

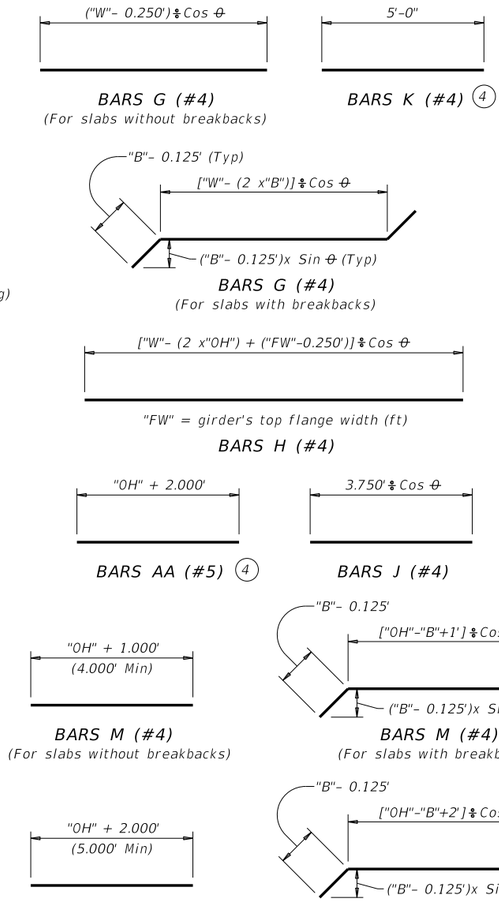
(1) End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.

(2) "A"= ("0H" + 2.333' -"B") x Tan θ

(3) Provide clear cover as indicated unless otherwise shown on Span Details.

(4) Only required on slabs with breakbacks.

(5) Thickened slab end dimensioned perpendicular to face of bkwl, centerline interior bent or face of inverted-T stem.



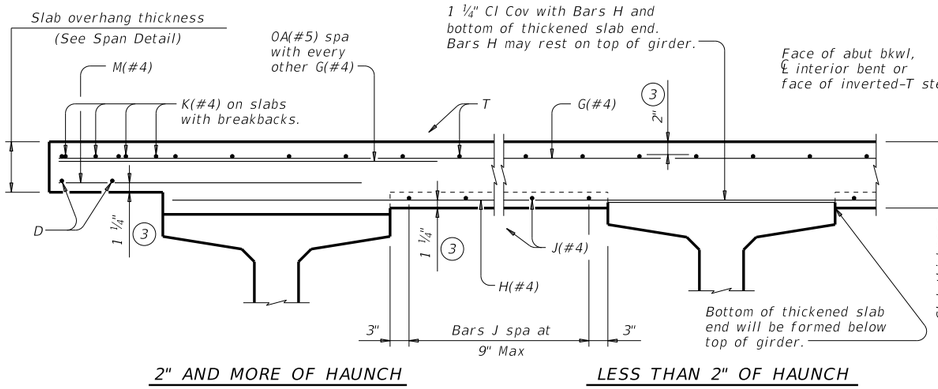
GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
These details are restricted to Prestressed Concrete I-Girder Spans.
These details are to be used in conjunction with the Span Details and PCP standard (if prestressed concrete panels are used).
When Option 2 from PCP standard is used, provide Bars AA, G, K and OA in the slab.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
If slab reinforcing steel is shown on the Slab Details to be epoxy coated, then Bars AA, G, K, H, J, M and OA must be epoxy coated.
Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"
Epoxy Coated ~ #4 = 2'-5"

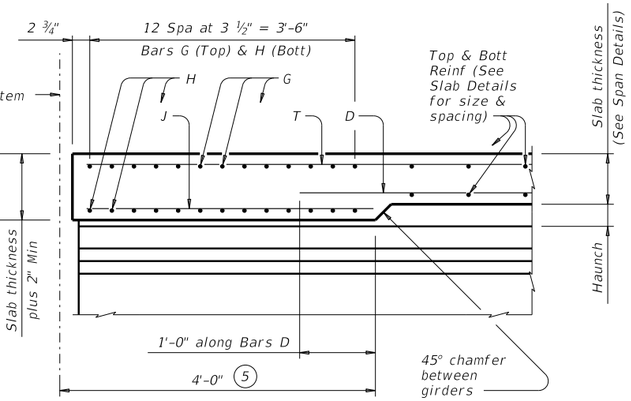
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



2" AND MORE OF HAUNCH — LESS THAN 2" OF HAUNCH

TYPICAL TRANSVERSE SECTION

(Showing Prestressed Conc I-Girders at ℄ Brg)



SECTION A-A

(Showing with 2" and more of haunch)

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

THICKENED SLAB END DETAILS

PRESTRESSED CONCRETE I-GIRDER SPANS

IGTS

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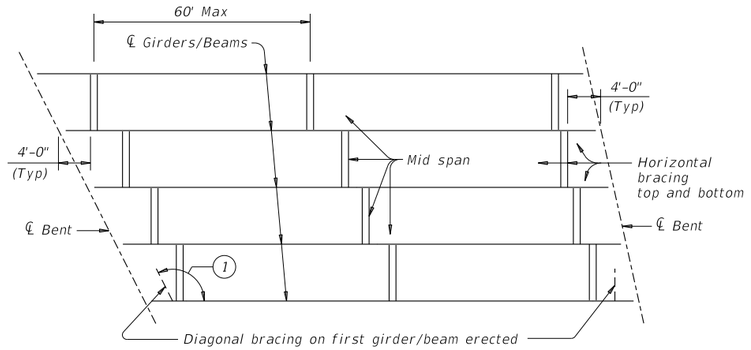
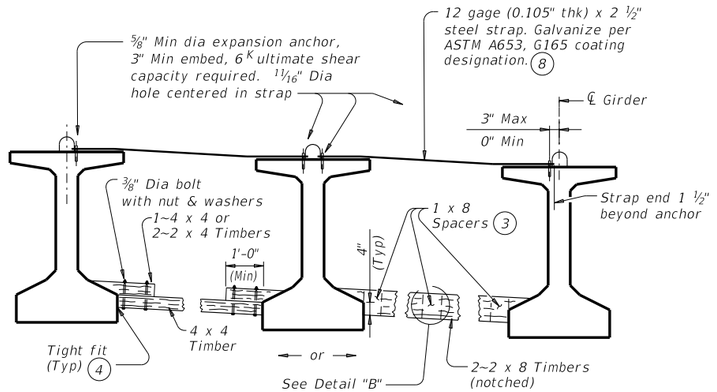
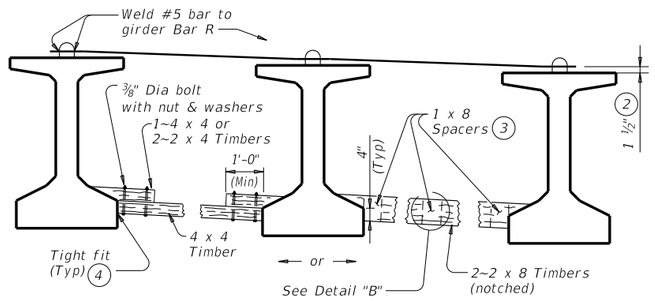


ERECTION BRACING



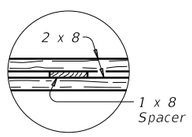
FOR ERECTION BRACING, OPTION 1

(This option is not allowed when slab is formed with PMDF or plywood.)



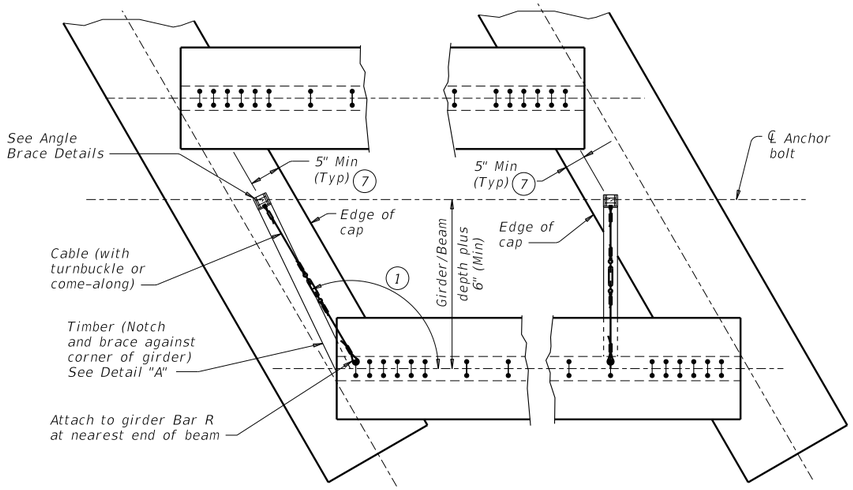
FOR ERECTION BRACING, OPTION 2

HORIZONTAL BRACING DETAILS (5)



PLAN

DETAIL "B"



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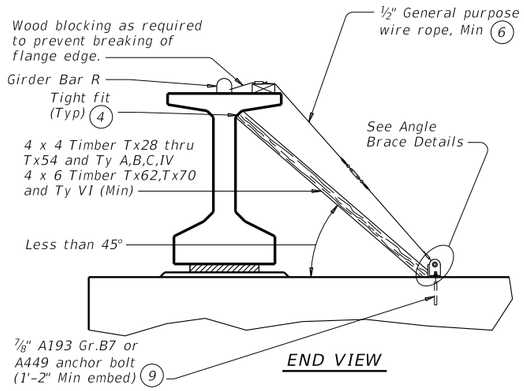
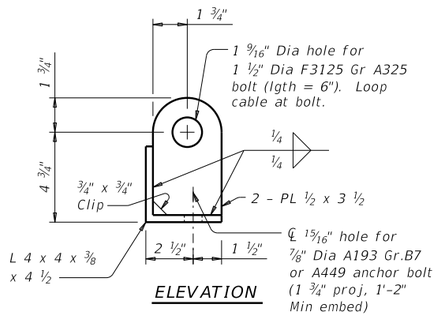


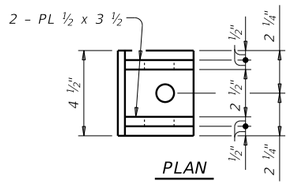
END VIEW

DIAGONAL BRACING DETAILS (5)

(To be used on both ends of the first girder/beam erected in the span in each phase.)



ELEVATION



PLAN

ANGLE BRACE DETAILS

HAULING & ERECTION:

The Contractor's attention is directed to the possible lateral instability of prestressed concrete girders and beams over 130' long, especially during hauling and erection. The use of the following methods to improve stability is encouraged: Locate lifting devices at the maximum practical distance from girder ends; use external lateral stiffening devices during hauling and erection; lift with vertical lines using two machines; and take care in handling to minimize inertial and impact forces.

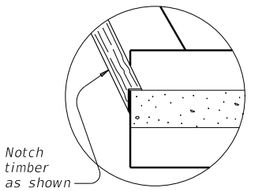
ERECTION BRACING:

Erection bracing details shown are considered the minimum for fulfilling the bracing requirements of Item 425.

Required erection bracing must be placed immediately after erection of each girder and remain in place until additional bracing as required for slab placement is in place. This standard is needed in all cases to meet requirements for Slab Placement Bracing.

PHASED CONSTRUCTION:

Place erection and slab placement bracing for all girders in a phase as shown in these details. For phases after first, also place erection and slab placement bracing between outer girder of completed phase and adjacent girder of current phase. When the phase construction joint is between girders, top bracing can be omitted.



DETAIL "A"

(1) If angle shown exceeds 120 degrees, move diagonal brace to other side of girder/beam and place square to girder/beam. This may prevent exterior girder from being erected first.

(2) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R (See Sheet 2 of 2).

(3) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.

(4) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.

(5) Pressure treated landscape timbers can not be used.

(6) All hardware used with cable must be able to develop a minimum 25 kips breaking strength. Use thimbles at all loops in cable. Install cable clamps with saddles bearing against the live end and U-bolts bearing aginst the dead end.

(7) It is acceptable to tie anchor bolts to cap reinforcement.

(8) Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.

(9) Anchor bolt may be drilled and epoxied in place. Provide 25k minimum pullout. Core drill hole.

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS

PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

MEBR(C)

FILE: IG-MEBR(C)-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		190

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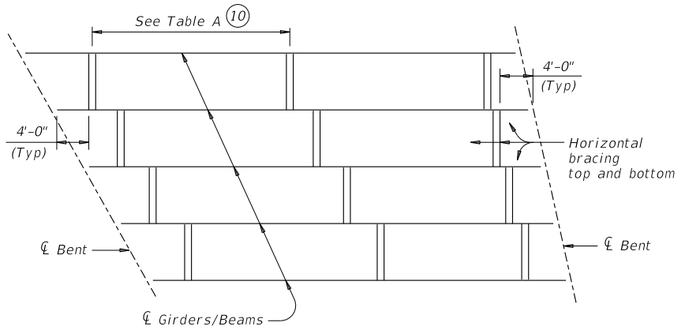


SLAB PLACEMENT BRACING

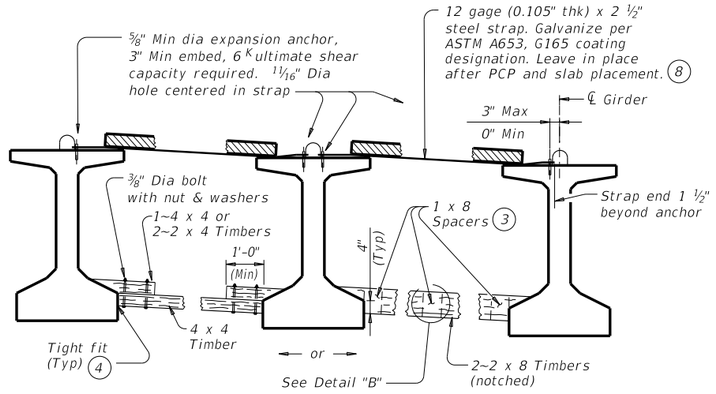
TABLE A

OPTION 1-RIGID BRACING (STEEL STRAP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	¼ points
Tx34	¼ points	¼ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	⅛ points	⅛ points
B	⅛ points	⅛ points
C	⅛ points	⅛ points
IV	¼ points	⅛ points
VI	¼ points	⅛ points

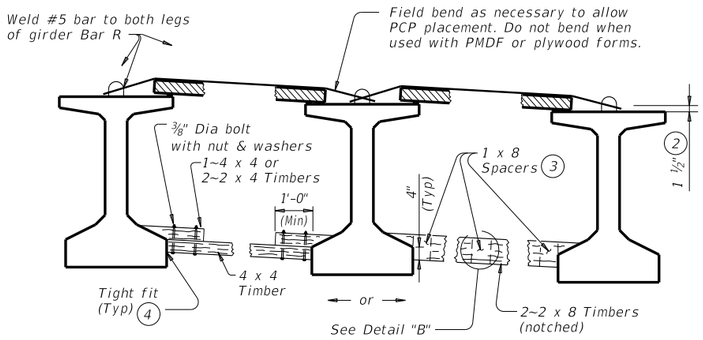
OPTION 2-FLEXIBLE BRACING (NO. 5 OVER PCP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	⅛ points
Tx34	¼ points	⅛ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	2.0 ft	1.5 ft
B	3.0 ft	2.0 ft
C	4.5 ft	2.0 ft
IV	¼ points	4.0 ft
VI	¼ points	4.0 ft



FOR SLAB PLACEMENT BRACING, OPTION 1 - RIGID

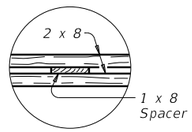
(Showing slab formed with PCP. This option is not allowed when slab is formed with PMDF or plywood.)



FOR SLAB PLACEMENT BRACING, OPTION 2 - FLEXIBLE

(Showing slab formed with PCP.)

HORIZONTAL BRACING DETAILS (5)



PLAN

DETAIL "B"

(2) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R.

(3) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.

(4) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.

(5) Pressure treated landscape timbers can not be used.

(8) Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.

(10) Bracing spacing (¼ and ⅛ points) measured between first and last typical brace location.

(11) Measure slab overhang from centerline of girder or beam. When overhang varies in span, determine bracing spacing based on largest overhang.

SLAB PLACEMENT BRACING:

The details for slab placement bracing are considered minimum for fulfilling the requirements of Specification Items 422 and 425.

Required slab placement bracing must remain in place until slab concrete has attained a compressive strength of 3000 psi.

GENERAL NOTES:

Bracing details for spans longer than 150' are not provided. The Contractor must submit proposed bracing details for such conditions to the Engineer for approval prior to erection.

Systems equal to or better than those shown may be used provided details of such systems are submitted to and approved by the Engineer prior to erection.

Use of these systems or details does not relieve the Contractor of the responsibility for the adequacy of the bracing and the safety of the structure.

Removal of bracing for short periods of time to align girders and beams is permissible.

All turn-buckles, come-alongs, anchors and other connections must be capable of developing the full strength of the cable shown.

Furnish anchor bolts and nuts in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS

PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

MEBR(C)

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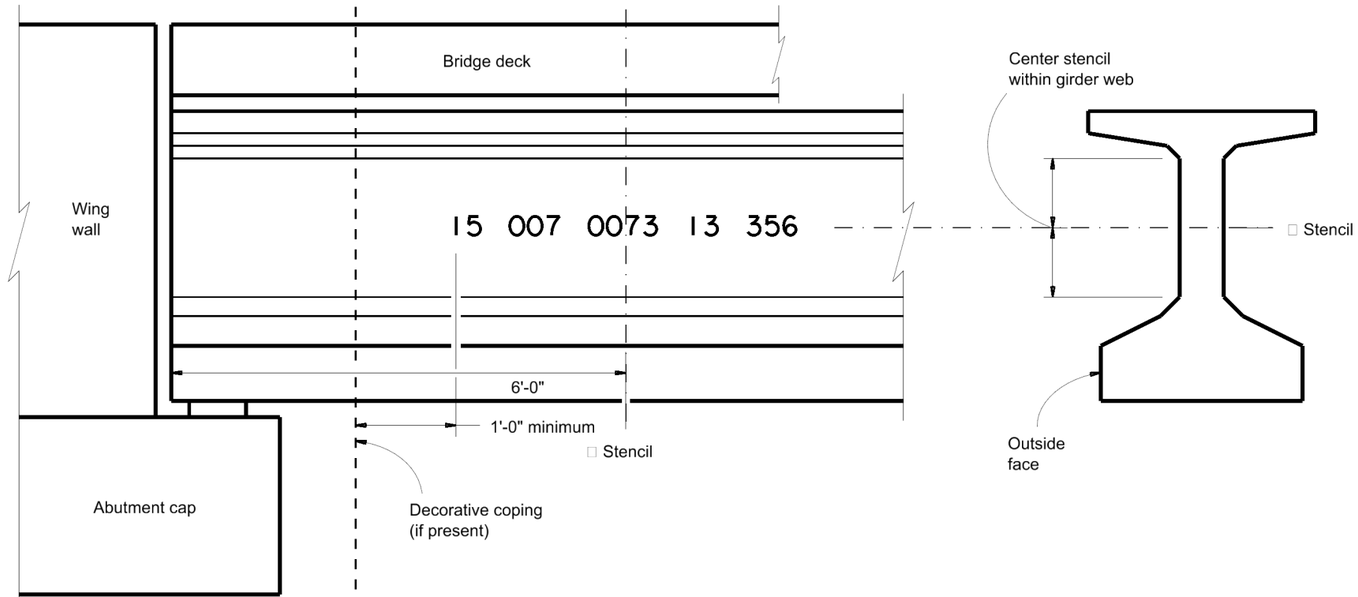
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		191

15 007 0073 13 356

San Antonio District designation | County designation | Control number | Section number | Structure number

PAINTED STRUCTURE NUMBER DETAIL



TYPICAL BRIDGE CORNER (ELEVATION)

SAN ANTONIO DISTRICT COUNTY DESIGNATIONS

Atascosa 007
Bandera 010
Bexar 015
Comal 046
Frio 083
Guadalupe 095
Kendall 131
Kerr 133
McMullen 162
Medina 163
Uvalde 232
Wilson 247

GENERAL NOTES:
Apply stucture number in accordance with Special Specification for Stenciling Permanent Structure Numbers.

SAN ANTONIO DISTRICT STANDARD

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Texas Department of Transportation
San Antonio District (Structural Design)
Prepared by and for the use of TxDOT

BRIDGE NBI NUMBER STENCIL

DN: BCL	CK: XXX	FILENAME: 000000000 SA District Stencil.dgn		
DW: SRF	CK: XXX	ORIGINAL DRAWING DATE: August 2019		
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SAT	6	BR 2024(971)		ATASCOSA
CONTROL	SECTION	JOB	SHEET NO.	ROUTE
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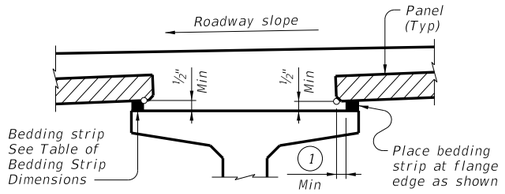
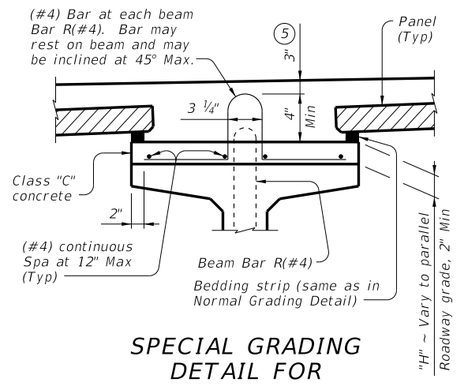


NORMAL GRADING DETAIL (3)

Showing prestressed concrete I-girders. (Other beam types similar)



SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

Showing prestressed concrete I-girders. (Other beam types similar)

TABLE OF BEDDING STRIP DIMENSIONS		
WIDTH	HEIGHT (4)	
	Min	Max
1" (Min)	½"	2"
1 ¼"	½"	2 ½"
1 ½"	½"	3"
1 ¾"	½"	3 ½"
2"	½"	4"
2 ¼"	½"	4 ½" (2)
2 ½"	½"	5" (2)
2 ¾"	½"	5 ½" (2)
3" (Max)	½"	6" (2)

(1) 2" Min for I-girders, 1 ½" Min for all other beam types.

(2) Allowed for prestressed concrete I-girders, not allowed on other beam types.

(3) To reduce the quantity of cast-in-place concrete, bedding strip thickness may be increased in ¼" increments. Bedding strips must be comprised of one layer. Bond bedding strips to the beams with an adhesive compatible with bedding strips. Bedding strips over 2.5" high may need to be bonded to panels. The same thickness strip must be used under any one panel edge and the maximum change in thickness between adjacent panels is ¼". Alternatively, bedding strips may be cut to grade. Panels may be supported by an alternate method, using a commercial product, if approved by the Engineer of Bridge Design, Bridge Division. If bedding strips exceed 6" high for I-Girders, 4" high for all other beam types, use Special Grading Detail for Concrete Beams or submit an alternate method to the Bridge Division for approval.

(4) Height must not exceed twice the width.

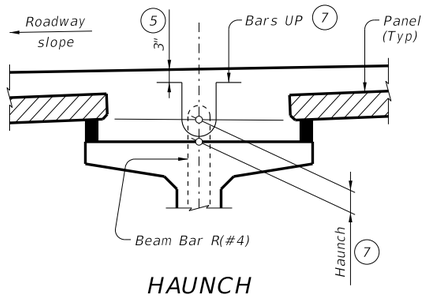
(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(7) Space Bars UP(#4) with Beam Bars R(#4) in all areas where measured haunch exceeds 3 ½" with I-girders, and 3" for all other beam types. Epoxy coating for Bars UP is not required.

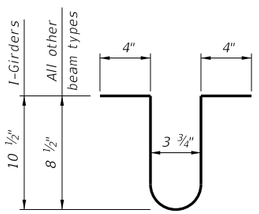
(8) Do not locate construction joints on top of a panel.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

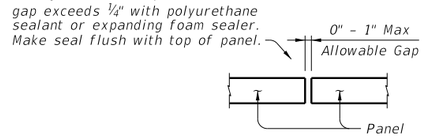


HAUNCH REINFORCING DETAIL

Showing prestressed concrete I-girders. (Other beam types similar)

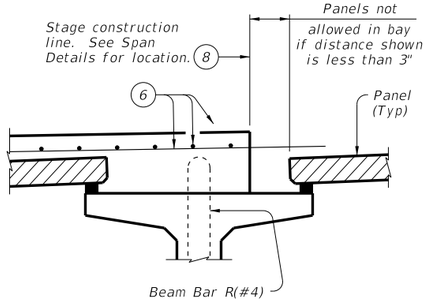


BARS UP (#4) (7)

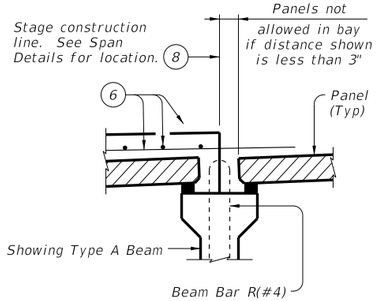


PANEL JOINTS

(Panel reinforcing not shown for clarity. The gap cannot be considered as a panel fabrication tolerance. Adjust panel placement to minimize joint openings.)



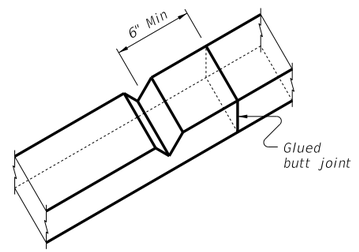
PRESTR CONC I-GIRDERS



PRESTR CONC I-BEAMS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)



BEDDING STRIP DETAIL (9)

CONSTRUCTION NOTES:

Erected panels must bear uniformly on bedding strips of extruded polystyrene placed along top flange edges.

Placing panels to minimize joint openings is recommended.

If additional blocking is needed, special grading details for supporting the panels and extra reinforcing between beam and slab will be considered subsidiary to deck construction.

Bars U, shown on PCP-FAB, may be bent over or cut off if necessary.

Care must be taken to ensure proper cleaning of construction debris and consolidation of concrete material under the edges of the panels. Bedding strips must be placed at beam flange edges so that adequate space is provided for the mortar to flow a minimum of 1 ½" under the panels as the slab concrete is placed.

To allow the proper amount of mortar to flow between beam and panel, the minimum vertical opening must be at least ½". Roadway cross-slope reduces the opening available for entry of the mortar. Bedding strips varying in thickness across the beam are therefore required.

For clear span between U-beams less than or equal to 18", see Permissible Slab Forming Detail on Miscellaneous Slab Detail sheets, UBMS.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel in the cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement.

If the top and bottom layer of reinforcing steel is shown on the Span Details to be epoxy coated, then the D, E, P, & Z bars must be epoxy coated.

Provide bar Laps, where required, as follows:

Uncoated ~ #4 = 1'-7"
Epoxy Coated ~ #4 = 2'-5"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Panel placement may follow either Option 1 or Option 2 except Option 1 must be used if the skew exceeds 45 degrees.

Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use.

These details are to be used in conjunction with the Span Details, PCP-FAB and other applicable standard drawings.

When panel support (bedding strips) deviates from what is shown herein, provide details signed and sealed by a professional Engineer.

Any additional reinforcement or concrete required on this standard is considered subsidiary to the bid Item "Reinforced Concrete Slab".

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 4

Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

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REVISIONS	0073	13	012	UA 281
3/2023: Removed top flange tension limit.	DIST	COUNTY		SHEET NO.
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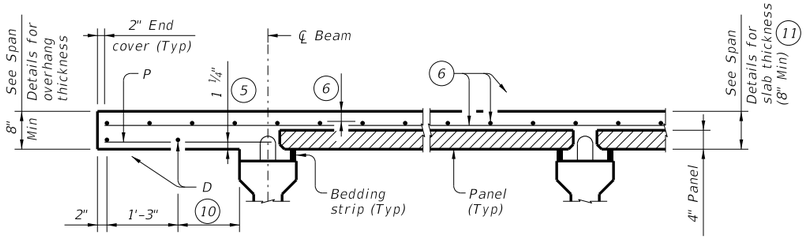
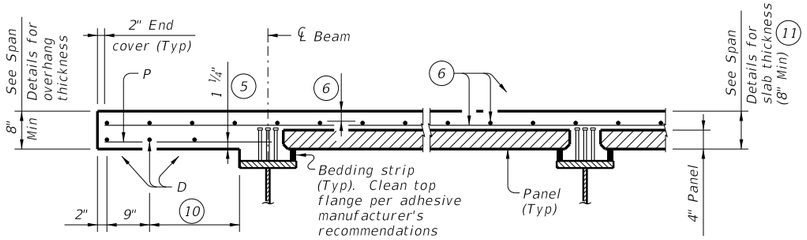
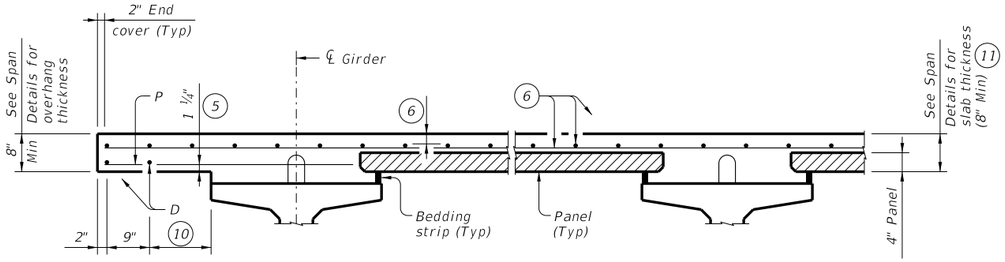


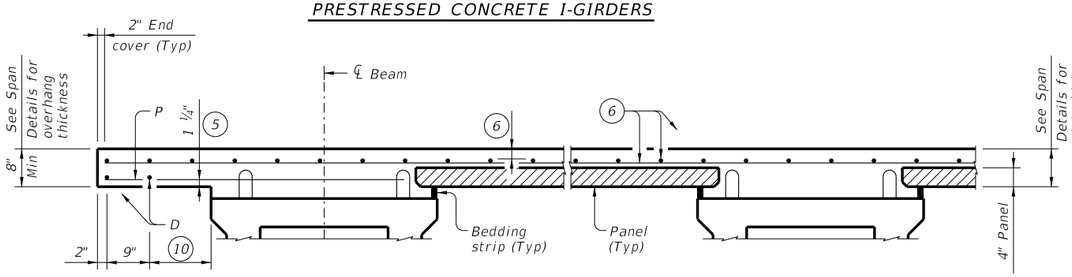
PRESTRESSED CONCRETE I-BEAMS



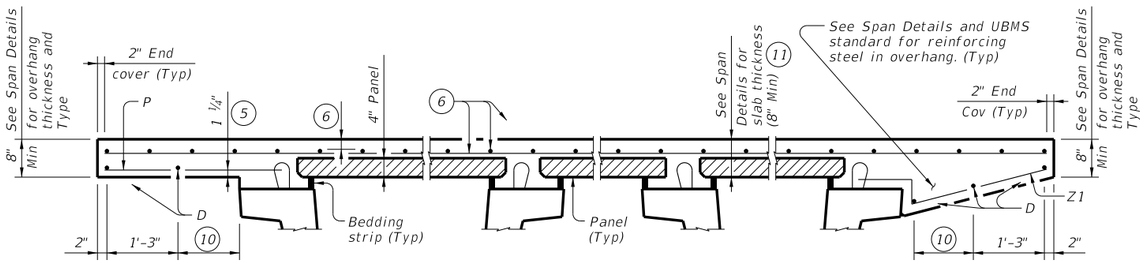
STEEL BEAMS (13)



PRESTRESSED CONCRETE I-GIRDERS



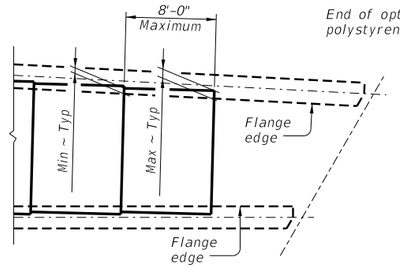
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

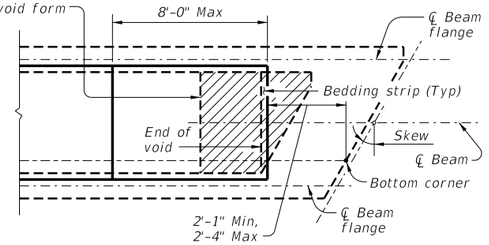
SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

TYPICAL PART TRANSVERSE SECTIONS



AT FLARED BEAMS OR GIRDERS

See PCP-FAB standard for Min and Max dimensions based on beam/girder type.



OVER CONC U-BEAMS

PART PLANS OF PANEL PLACEMENT

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

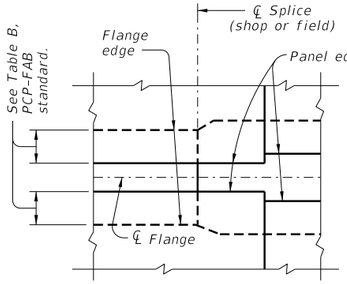
(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

(10) Equally space additional bar if more than 1'-3" Max.

(11) The actual thickness constructed may exceed the slab thickness shown on the Span Details but the extra thickness may be no more than 2" (1" for prestressed concrete U-beams and steel beams). Bearing seat elevations or finished grade may be adjusted.

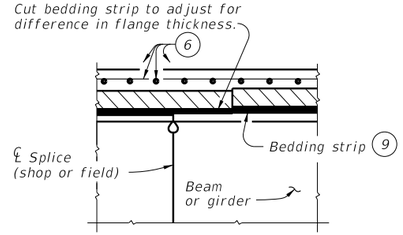
(12) Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.

(13) Panels are allowed over top tension flanges, as approved by the Engineer. See Span Details for additional top mat reinforcement required in tension zones. Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.



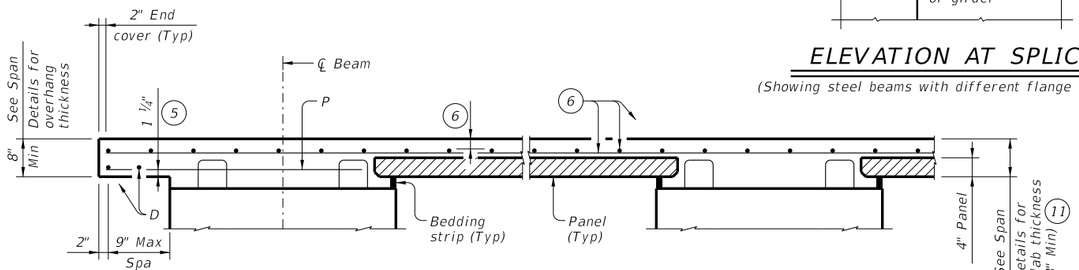
PLAN AT SPLICE

(Showing steel beams with flange width transition)



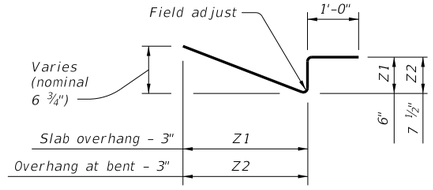
ELEVATION AT SPLICE

(Showing steel beams with different flange thickness)



PRESTRESSED CONCRETE SPREAD SLAB BEAMS

Bars P over exterior beams are still required when no overhang is used. In this case, only one Bar D, 2" from slab edge, is required.



BARS Z (#4) (12)

HL93 LOADING SHEET 2 OF 4

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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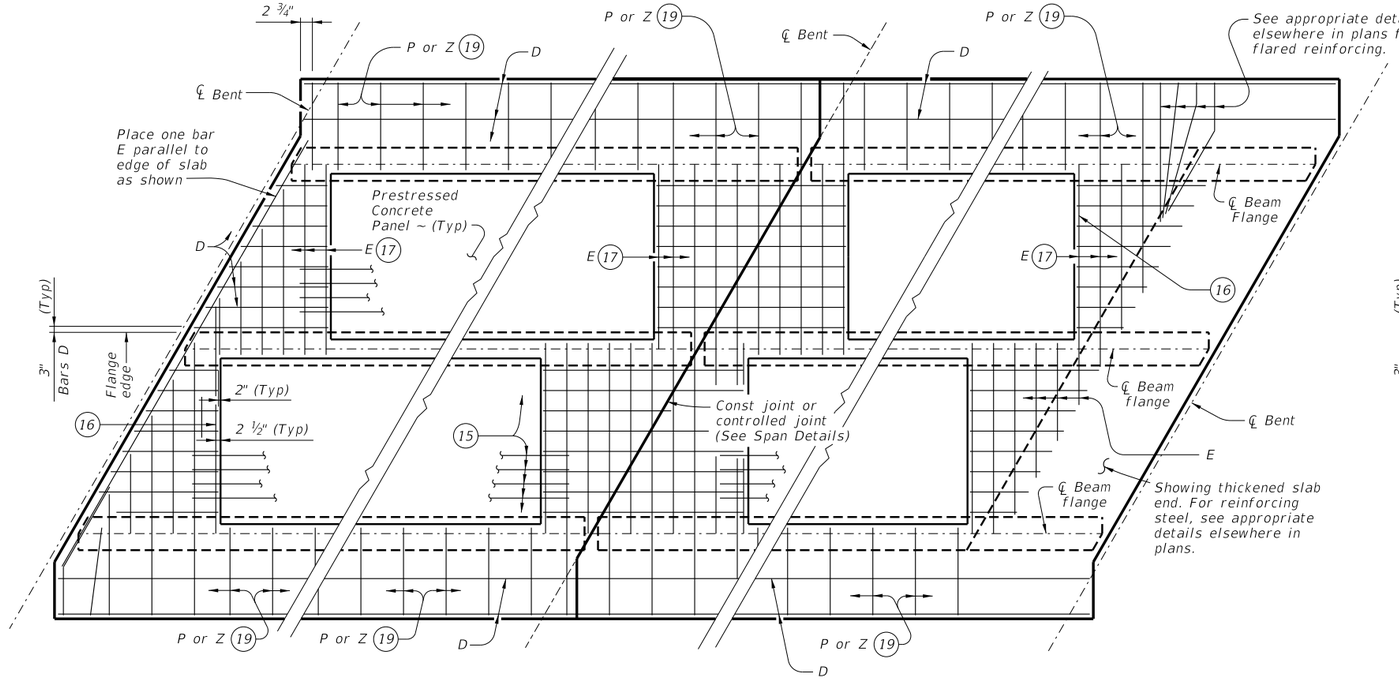
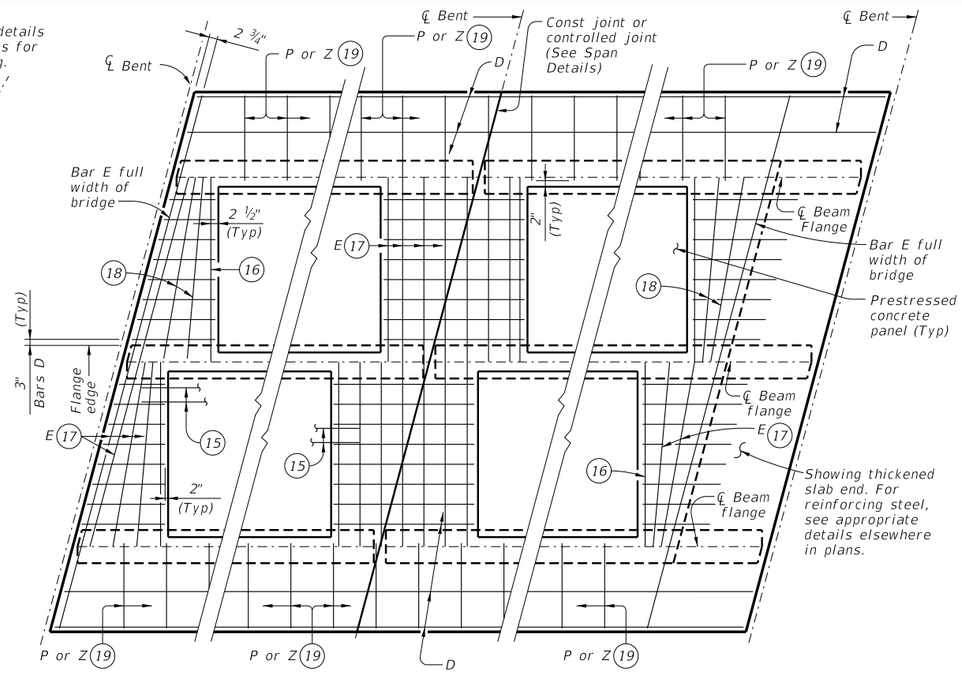


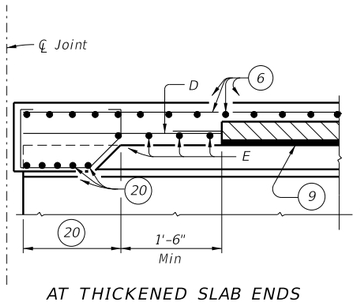
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

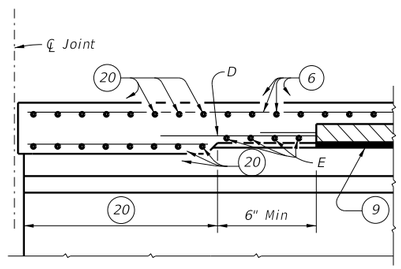


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

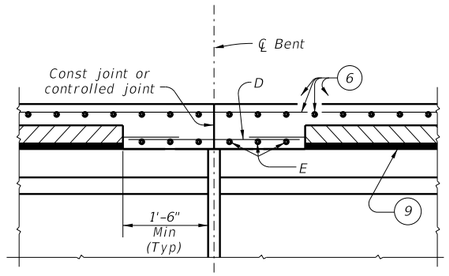
OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT



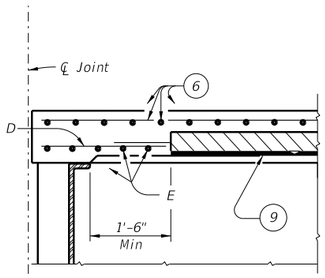
AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS



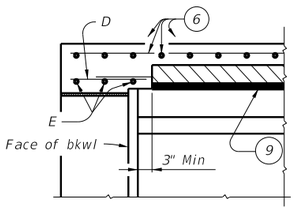
AT THICKENED SLAB ENDS FOR PRESTR CONC I-BMS AND STEEL BMS



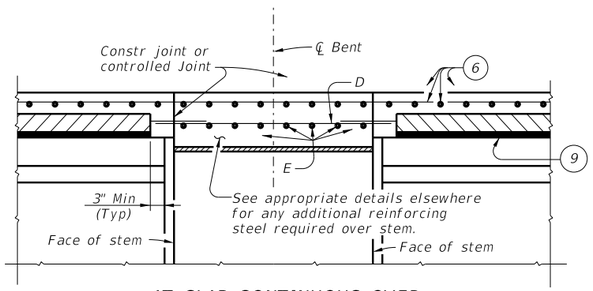
AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS



AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BMS



AT SLAB OVER ABUTMENT BACKWALL FOR ALL BMS



AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BMS

OPTION 1 ~ ELEVATIONS AT BEAM ENDS

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c.

(14) Max Spacing as listed unless otherwise shown.

(15) At connection with cast-in-place slab, extend longitudinal panel reinforcement. See PCP-FAB for details.

(16) Maintain one Bar E(#4) parallel to panel ends (Typ).

(17) Bars E(#4) not continuous over beam flanges must overlap beam flange 6" Min.

(18) Add flared Bars E(#4) (Min Spa = 6", Max Spa = 12") as required at panel ends.

(19) Where possible, Bars E(#4) may be extended into overhangs to replace Bars P(#4). Bars Z(#4) are required for sloped overhangs with U-Beams.

(20) See appropriate thickened slab end details for reinforcing and limits of thickened slab end.

TABLE OF REINFORCING STEEL (14)

BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS DECK DETAILS

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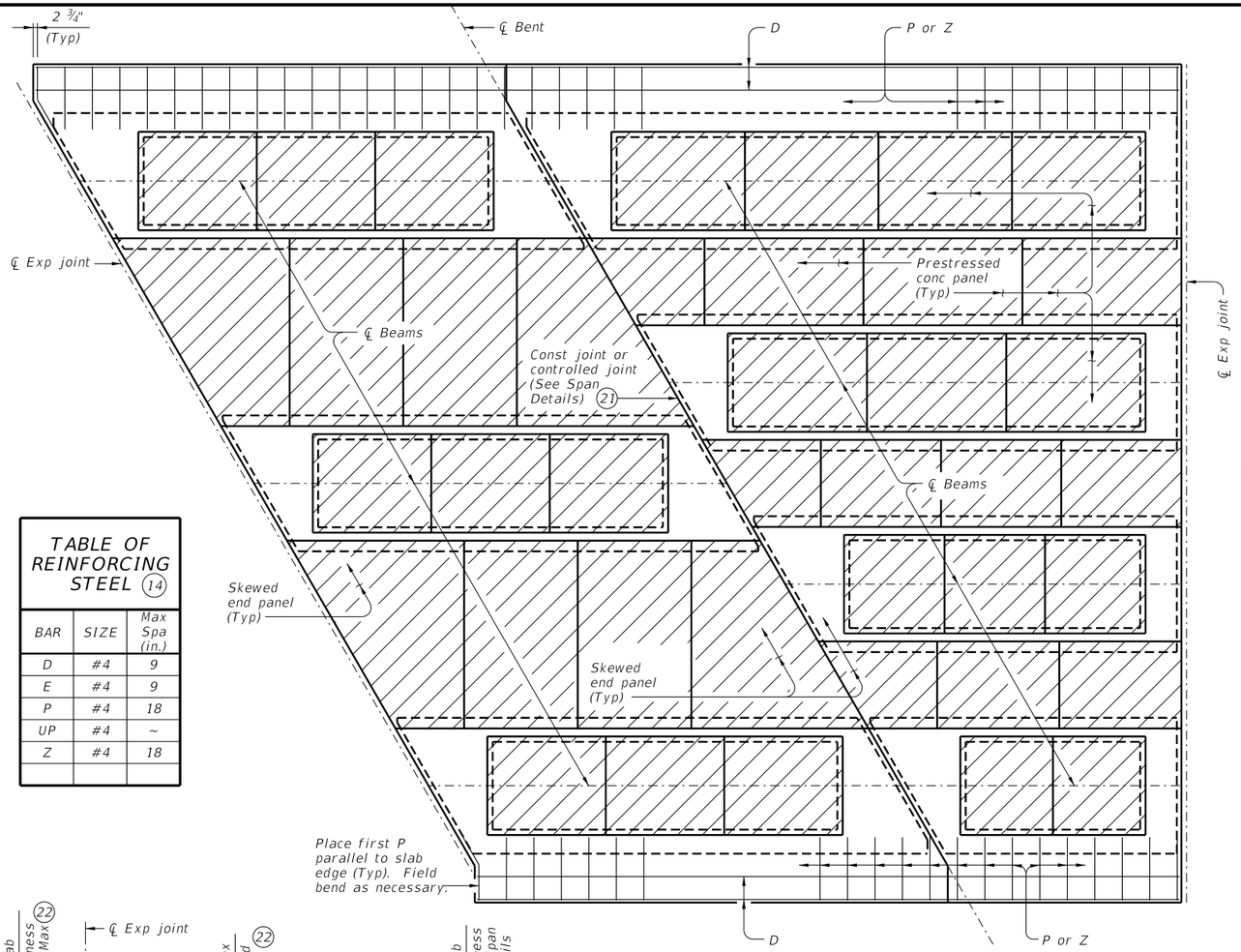
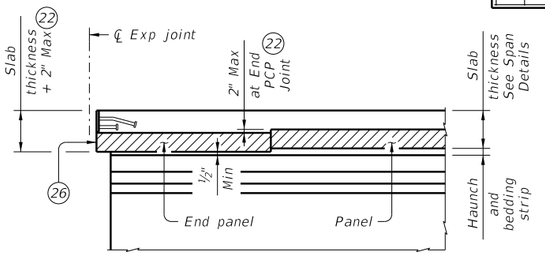


TABLE OF REINFORCING STEEL (14)

BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18	

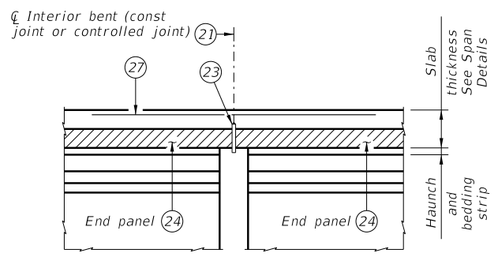
OPTION 2 ~ PLAN OF SLAB

(Showing U-Beams; other beams similar)



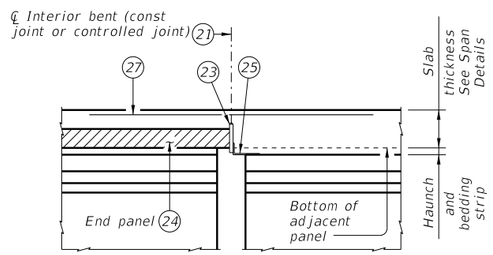
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)

For SEJ-B, SEJ-M, SEJ-S(0), AJ, and Type A expansion joints only.



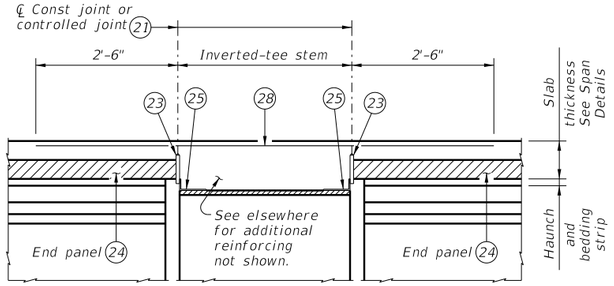
CONVENTIONAL INTERIOR BENT

Panel against panel between beams/girders.



CONVENTIONAL INTERIOR BENT

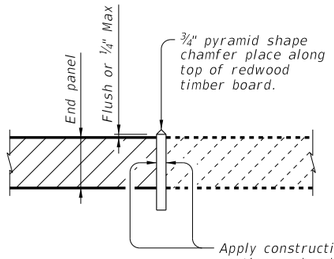
Panel against beam/girder end in adjacent span.



INVERTED-T BENT

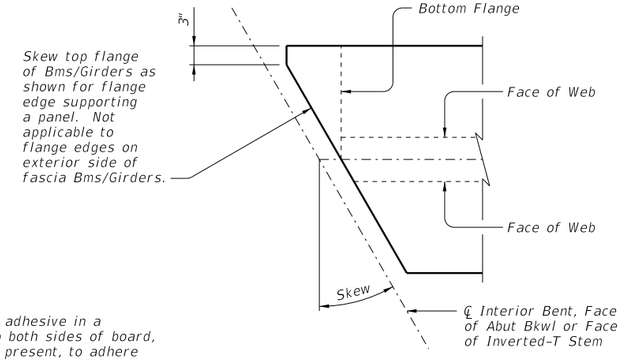
Panels against inverted-tee stem

OPTION 2 ~ ELEVATIONS AT BEAM ENDS (6)



ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD (23)

See "Option 2 ~ Elevation At Beam Ends".



OPTION 2 ~ SHOWING MODIFICATION TO BEAM/GIRDER TOP FLANGE FOR SKEWS OVER 5°

Showing I-Beam/I-Girder, U-Beams and Steel Beams similar.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(14) Max Spacing as listed unless otherwise shown.

(21) 1 ½" Vinyl or plastic joint former at controlled joints (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

(22) End panel may be set up to 2" lower to accommodate expansion joint hardware, provided bedding strip is not less than ½" thick.

(23) ¾" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within ¼" Max above panel. Place ¾" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within ¼" of centerline of bent or face of inverted-tee, across bridge width and end board at exterior flange edge of fascia beams/girders. Do not extend into overhang.

(24) Place panel within ½" of ¾" thick board.

(25) Permanent galvanized steel sheet form. Removable formwork is acceptable.

(26) Place end panel within ½" of expansion joint opening. End panel cannot encroach on required expansion joint opening.

(27) Place additional (#4) bar 5'-0" in length between every slab Bars T. Center (#4) bar on Joint.

(28) Place additional (#4) bar continuous 2'-6" beyond each side of Inverted-T Stem between every slab bars T.

SPECIAL OPTION 2 CONSTRUCTION NOTES:

When Option 2 is chosen bottom mat of thickened end slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.

Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels to fit is acceptable when approved by the Engineer. Minimum distance from a saw cut edge to a panel strand is 1 ½".

Do not extend the longitudinal panel reinforcement into the cast-in-place slab.

Top flanges of beams and girders on skewed bridges must be modified as shown on this drawing. The Contractor is responsible for coordinating this modification with the beam fabricator prior to submitting shop drawings for approval.

Fabricator may optionally skew the whole end. When electing to skew whole end, girder end details and bearing type at conventional interior bent must be changed to use condition at abutment. Fabricator must coordinate change in bearing type, bearing centerline location, and dowel location with Engineer and Contractor. Show appropriate changes on girder and bearing shop drawings.

Bending of anchor studs of expansion joints shown on standards AJ, SEJ-B, SEJ-M, and SEJ-S(0) is permissible if necessary to clear top of end panels. The Contractor is responsible for coordinating modifications with the joint fabricator. Submit shop drawings for approval when modifications to expansion joint hardware are made.

Bedding strips under skewed end panels must conform to the requirements of Item 422 except their minimum compressive strength must be 60 psi.

Provide Bars AA, G, K and OA from standard IGTS in the slab.

HL93 LOADING SHEET 4 OF 4

Texas Department of Transportation | Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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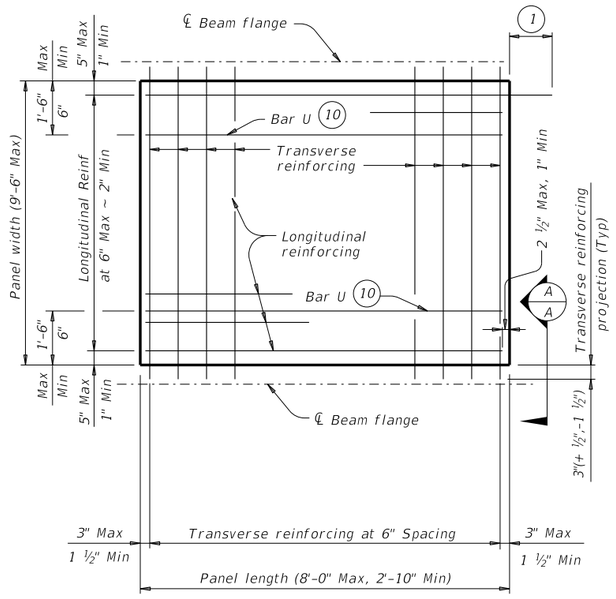
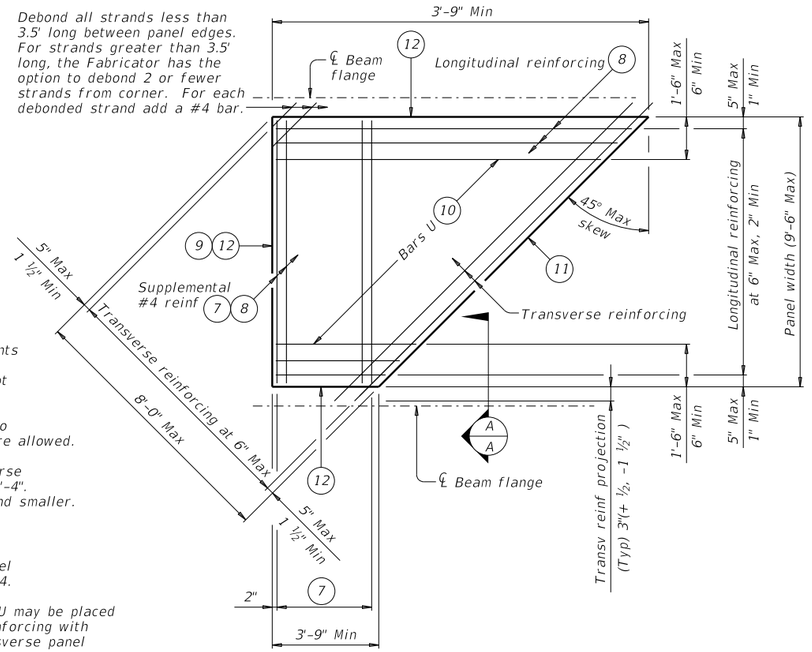


TYPICAL NON-SKEWED PANEL PLAN



TYPICAL SKEWED END PANEL PLAN

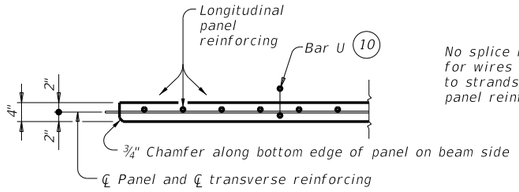
(Only to be used with details shown elsewhere in the plans.)

1. At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2",-0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.
2. Four loops required per panel.
3. Four loops required per panel. ⅜" or ½" strands may be used.
4. Normal dimensions must be used on spans with parallel beams. Maximum and Minimum dimensions apply only to spans with flared beams.
5. See Normal Grading Detail on PCP standard for lap requirements and bedding strip dimensions. Some laps shown in tables cannot utilize all bedding strip widths.
6. One Splice allowed per panel. No more than two sheets of WWR are allowed.
7. Provide (#4) bars under transverse reinforcing, 10 Spaces at 4" = 3'-4". Omit for 5 degree (1:12) skew and smaller.
8. End Cover 2 ½" Max, 1" Min.
9. Recess strands on indicated panel edge in accordance with Item 424.
10. At the fabricator's option, Bars U may be placed parallel to transverse panel reinforcing with horizontal legs in plane of transverse panel reinforcing.
11. Use length of indicated panel edge as panel width for purpose of determining type of transverse reinforcing.
12. Timber form work permissible this edge.

Debond all strands less than 3.5' long between panel edges. For strands greater than 3.5' long, the Fabricator has the option to debond 2 or fewer strands from corner. For each debonded strand add a #4 bar.

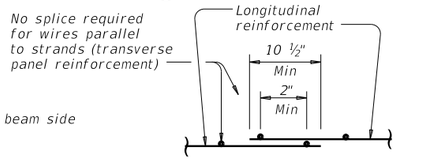
TABLE A (4) (5)			
Beam Type	Normal (In.)	Min (In.)	Max (In.)
A	3	2 ½	3 ½
B	3	2 ½	3 ½
C	4	3	4 ½
IV	6	4	7 ½
VI	6 ½	4 ½"	8 ½
U40 – 54	5 ½	5 ½	7
Tx28-70	6	5	7 ½
XB20 – 40	4	3	4 ½
XSB12 – 15	4	3	4 ½

TABLE B (4) (5)			
Top Flange Width	Normal (In.)	Min (In.)	Max (In.)
11" to 12"	2 ¾	2 ½	2 ¾
Over 12" to 15"	3 ¼	3	3 ¼
Over 15" to 18"	4	3	4 ¾
Over 18"	5	3 ½	6 ¼

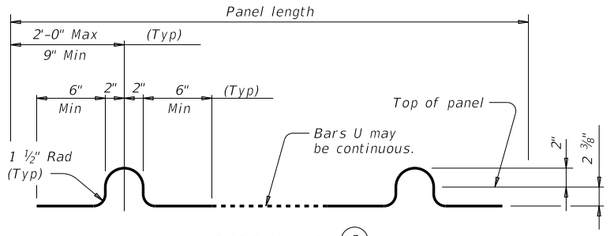


SECTION A-A

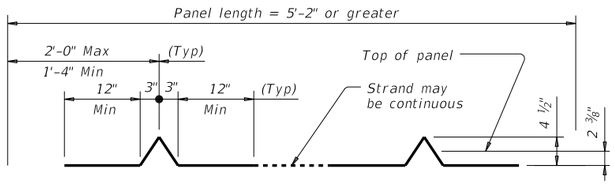
(Not showing supplemental #4 bars for skewed end panels.)



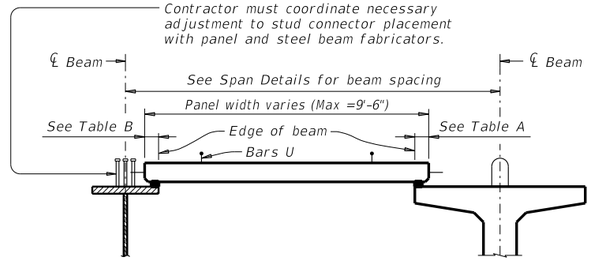
WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (6)



BARS U (#3) (2)



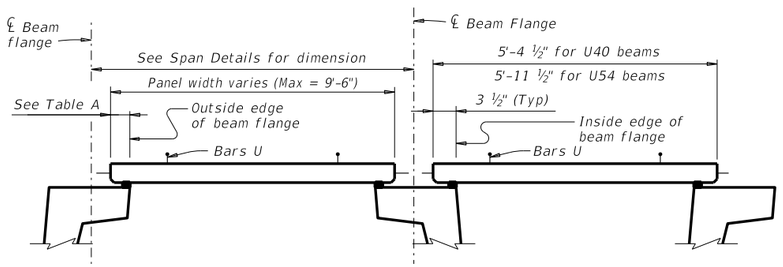
OPTIONAL STRAND FOR BARS U (3)



STEEL BEAMS

PRESTRESSED CONCRETE BEAMS OR GIRDERS

Typ unless noted otherwise



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

GENERAL NOTES:

Provide Class H concrete for panels. Release strength f'ci=3,500 psi. Minimum 28 day strength f'c=5,000 psi.

Provide ¾" chamfer along bottom edge of panel on beam side.

Do not use epoxy-coated reinforcing steel bar or strand in panels.

Remove laitance from top panel surface.

Finish top of panel to a roughness between a No. 6 and No. 9 concrete surface profile, inclusive, as specified by the International Concrete Repair Institute (ICRI).

Shop drawings for the fabrication of panels will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

A panel layout which identifies location of each panel must be developed by the Fabricator. Permanently mark each panel in accordance with the panel layout. A copy of the layout is to be provided to the Engineer.

TRANSVERSE PANEL REINFORCEMENT:

For panel widths over 5', use ⅜" or ½" Dia (270k) prestressing strands with a tension of 14.4 kips per strand.

For panel widths over 3'-6" up to and including 5', use ⅜" or ½" Dia (270k) prestressing strands with a tension of 14.4 kip per strand. Optionally, (#4) Grade 60 reinforcing bars may be used in lieu of prestressed strands.

For panel widths up to 3'-6", use (#4) Grade 60 reinforcing bars (prestressed strands alone are not allowed).

Place transverse panel reinforcement at panel centroid and space at 6" Max.

LONGITUDINAL PANEL REINFORCEMENT:

Any of the following options may be used for longitudinal panel reinforcement:

1. (#3) Grade 60 reinforcing steel at 6" Max Spacing. No splices allowed.
2. ⅜" Dia prestressing strands at 4 ½" Max Spacing (unstressed). No splices allowed.
3. ½" Dia prestressing strands at 6" Max Spacing (unstressed). No splices allowed.
4. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) providing 0.22 sq in per foot of panel width. Wires larger than D11 not permitted. Provide transverse wires to ensure proper handling of reinforcing. One splice per panel is allowed. See WWR Splice Detail.

No combination of longitudinal reinforcement options in a panel is allowed.

Place longitudinal panel reinforcement above or below transverse panel reinforcement. Must be placed above transverse panel reinforcement for skewed end panels with supplemental (#4) reinforcement.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANEL FABRICATION DETAILS

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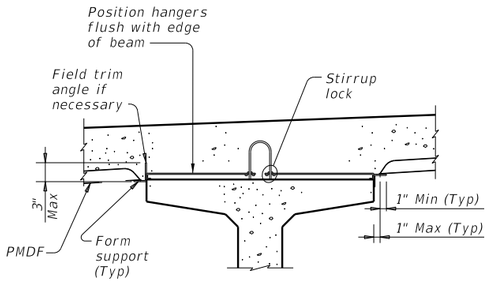
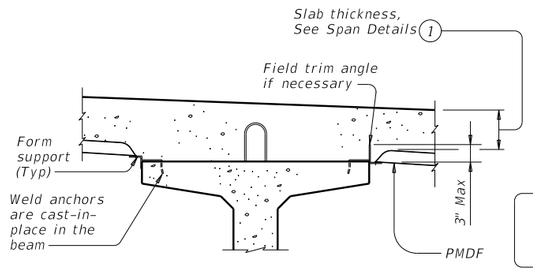
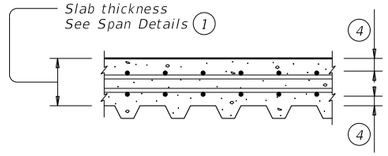


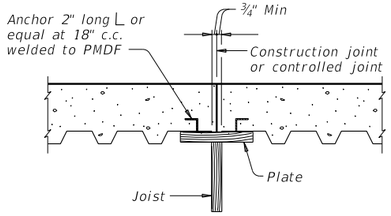
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS

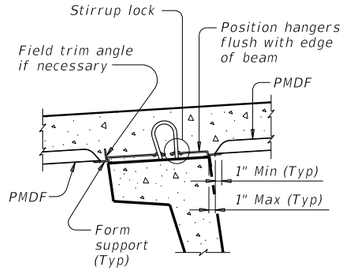


TYP LONGITUDINAL SLAB SECTION

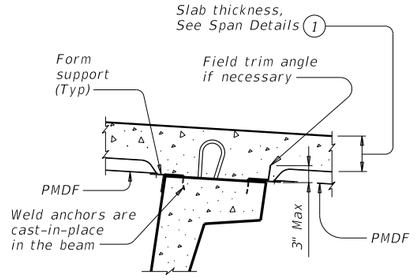


Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

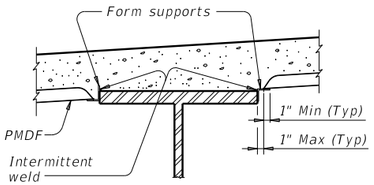
SECTION THRU CONSTRUCTION JOINT



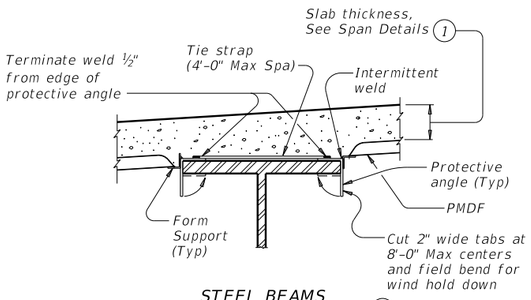
U-BEAMS WITH STIRRUP LOCKS



U-BEAMS WITH WELD ANCHORS

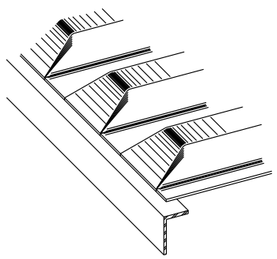


STEEL BEAMS AT COMPRESSION FLANGES

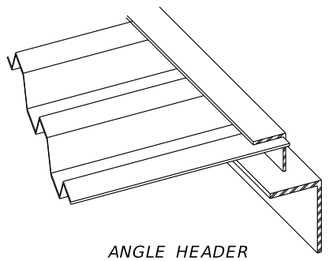


STEEL BEAMS AT TENSION FLANGES (2)

TYPICAL TRANSVERSE SECTIONS



PRECLOSED



ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES

SIDE LAP DETAILS

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars.

(2) Welding of form supports to tension flanges will not be permitted. Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.

(3) The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.

(4) See Span details for cover requirements.

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.

Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.

The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.

All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

FOR PRESTR CONC U-BEAM AND STEEL GIRDER BRIDGES:
Unless shown elsewhere in the plans, size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5. Bottom mat reinforcement and additional concrete is subsidiary to Item 422 "Concrete Superstructures."

FOR PRESTR CONC TX-GIRDER BRIDGES:
See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.

DESIGN NOTES:

As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.

Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.

1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.

1/240 of the form design span, but not more than 0.75", for all design spans of railroad overpass bridge spans fully or partially over railroad right-of-way, and for all bridge spans of railroad underpass structures.

The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".

CONSTRUCTION NOTES:

Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.

All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.

Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.

All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.

Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.

Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.

A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE: pmdfste1-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
12-21: Updated max deflection for RR.	SAT	ATASCOSA		198

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DATE: 12/21/2023 7:48:44 PM
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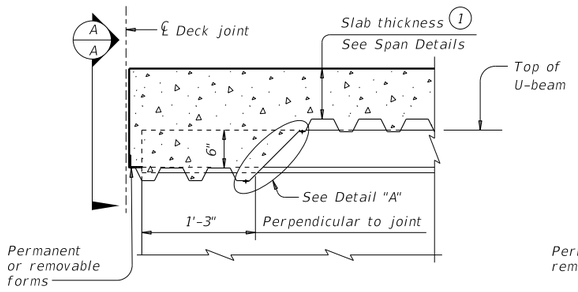
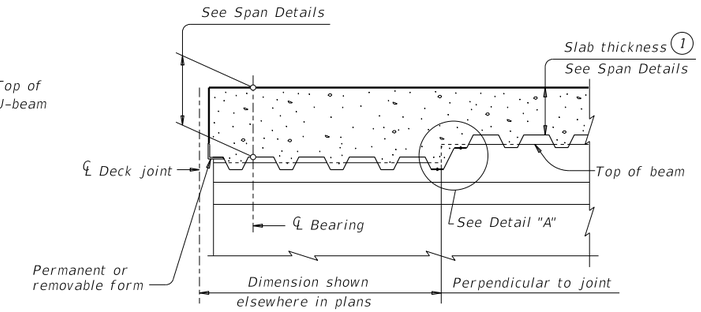
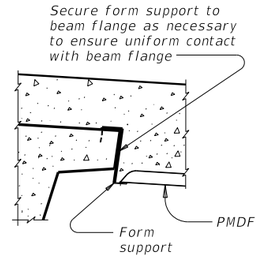


AT THICKENED SLAB END FOR U-BEAMS

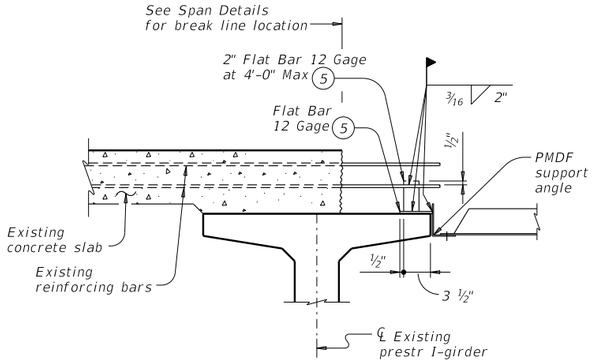


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

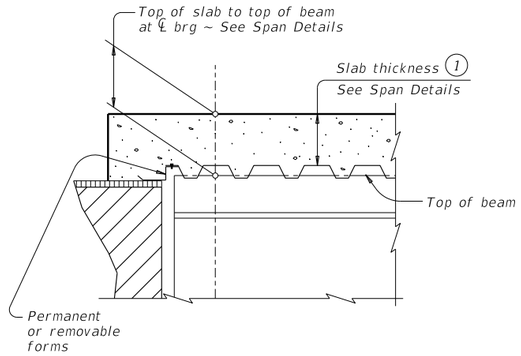
Showing I-beam block-out. No block-out for I-girders or steel beams.



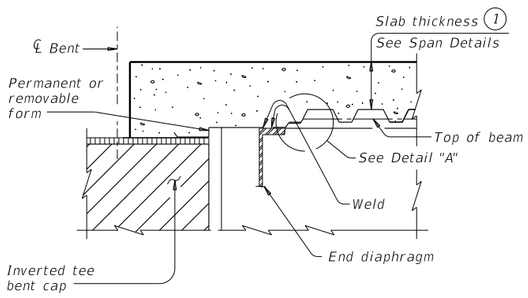
SECTION A-A



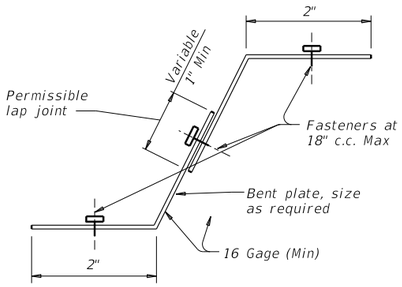
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



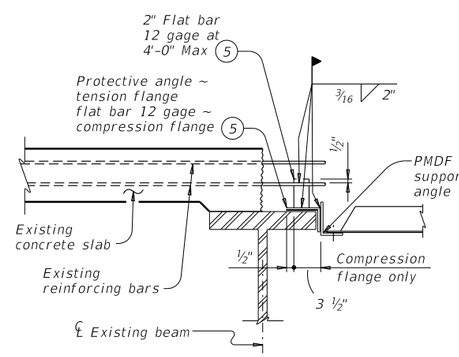
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

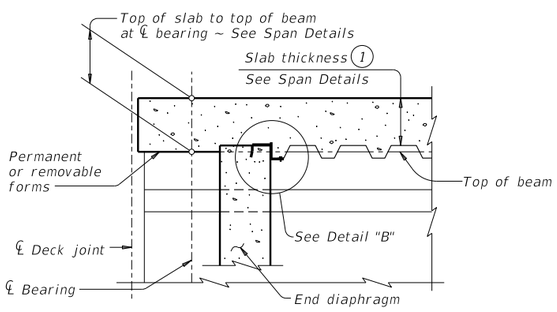


DETAIL "A"

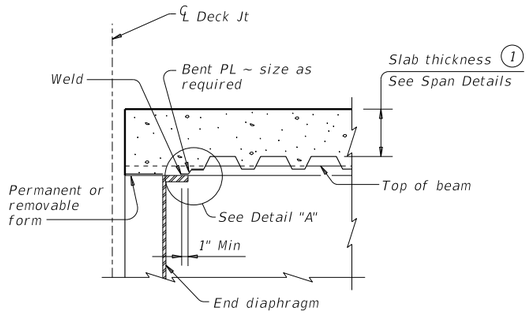


SHOWING STEEL BEAMS

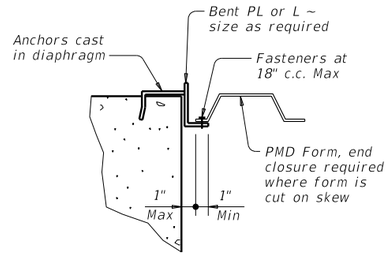
WIDENING DETAILS



AT CONC END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars

(5) Minimum yield stress of 12 gage bars shall be 40 ksi

DETAILS AT ENDS OF BEAMS

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE: pmdfste1-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
12-21: Updated max deflection for RR.	SAT	ATASCOSA		199

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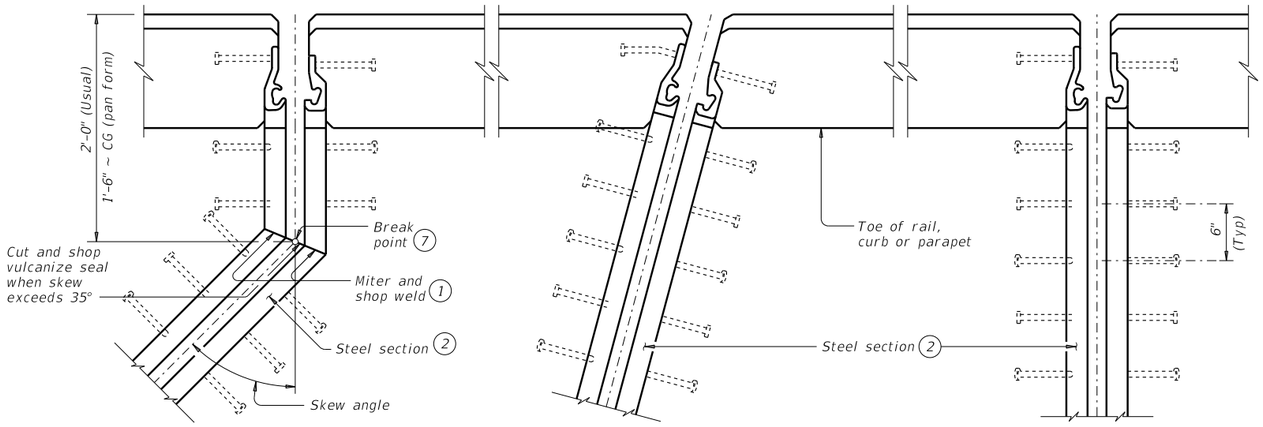
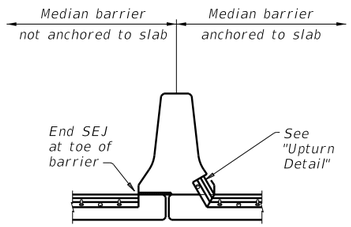
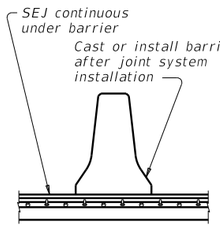


SHOWING SKEWS WITH SLAB BREAKBACKS | SHOWING SKEWS WITHOUT SLAB BREAKBACKS | SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

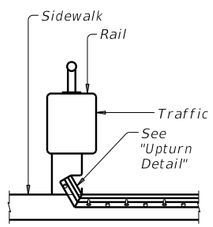
PLANS OF END CONDITIONS



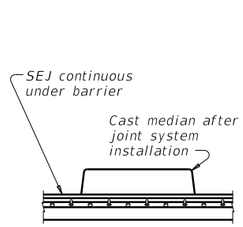
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



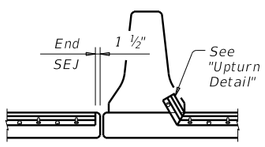
AT MEDIAN BARRIER



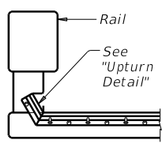
AT SIDEWALK BEHIND BRIDGE RAIL



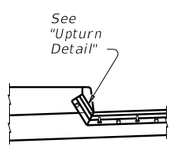
AT RAISED MEDIAN



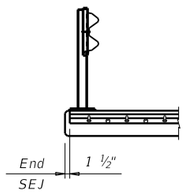
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

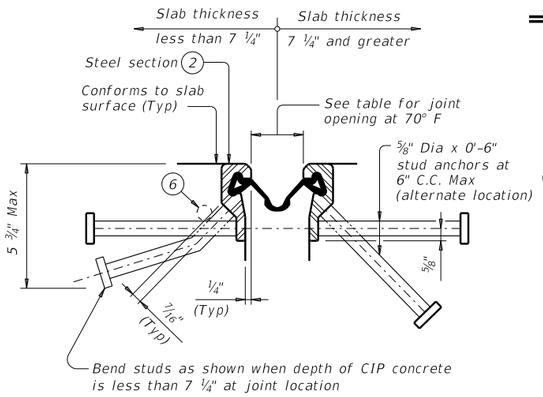


AT SIDEWALK

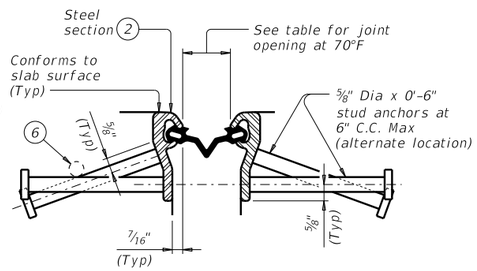


AT STEEL POST BRIDGE RAIL

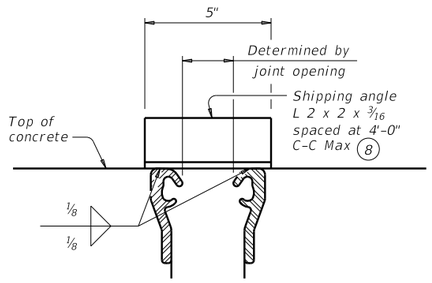
TYPICAL SECTIONS (5)



SECTION THRU WATSON BOWMAN ACME (SE-400 OR SE-500) JOINTS



SECTION THRU D.S. BROWN (A2R-400 OR A2R-XTRA) JOINTS



SHOWING D.S. BROWN (Ty SSCM2)
(All joints are similar.) (Studs are not shown for clarity.)

SHIPPING ANGLE

An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

TABLE OF SEALED EXPANSION JOINT INFORMATION

MANUFACTURER	STEEL SECTION (2)	STRIP SEAL			
		4" JOINT		5" JOINT	
		Seal Type	Joint Opening (3)	Seal Type	Joint Opening (3)
D.S. Brown	Type SSCM2	A2R-400	1 ¾"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 ¾"	SE-500	2"

REDUCED LONGITUDINAL MOVEMENT RANGE

SKEW (deg)	JOINT SIZE	
	4"	5"
0	4.0"	5.0"
15	4.0"	5.0"
30	3.5"	4.3"
45	2.8"	3.5"

DESIGN NOTES:

Joints installed on a skew have reduced ability to accommodate longitudinal movement. Use table values to determine the correct joint size for skewed installations.

For other skews over 25 degrees, calculate reduced movement range by multiplying joint size by cosine (skew).

(1) Remove all burrs which will be in contact with seal prior to making splice.

(2) Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.

(3) These openings are also the recommended minimum installation openings.

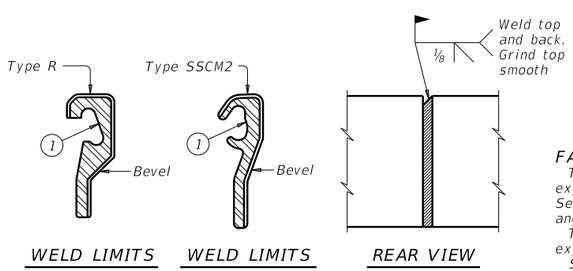
(4) Reduce for sidewalk or parapet heights less than 6".

(5) Other conditions affecting the joint profile should be noted elsewhere.

(6) Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.

(7) See Span details for location of break point.

(8) Align shipping angle perpendicular to joint.



WELD LIMITS | WELD LIMITS | REAR VIEW

FIELD SPLICE DETAIL

FABRICATION NOTES:

Temporarily shop assemble corresponding sections of sealed expansion joints (SEJ), check for fit, and match mark for shipment. Secure corresponding sections together for shipment with shipping angle. Do not use erection bolts.

The seal must be continuous and included in the price bid for sealed expansion joint.

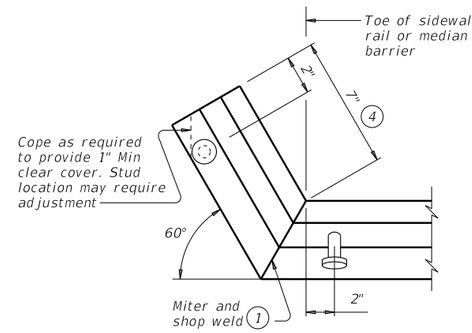
Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max.

Weld studs in accordance with AWS D1.1.

Butt weld all shop and field splices and grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop.

Paint the entire steel section with System II or IV primer in accordance with Item 446, "Field Cleaning and Painting Steel", unless required to galvanize when shown in the plans. Provide galvanizing in accordance with Item 445, "Galvanizing". Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4.

Shop drawings for the fabrication of sealed expansion joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.



UPTURN DETAIL

CONSTRUCTION NOTES:

Secure the sealed expansion joint in position and place to the proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for sealed expansion joint.

Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

Clean and prepare seal cavity for seal installation as per the Manufacturer's installation procedures.

GENERAL NOTES:

Provide sealed expansion joints in the size and at locations shown on the plans.

Minimum slab and overhang thickness required for the use of SEJ-M is 6 ½".

Texas Department of Transportation

Bridge Division Standard

SEALED EXPANSION JOINT TYPE M
WITHOUT OVERLAY

SEJ-M

FILE: sejmste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
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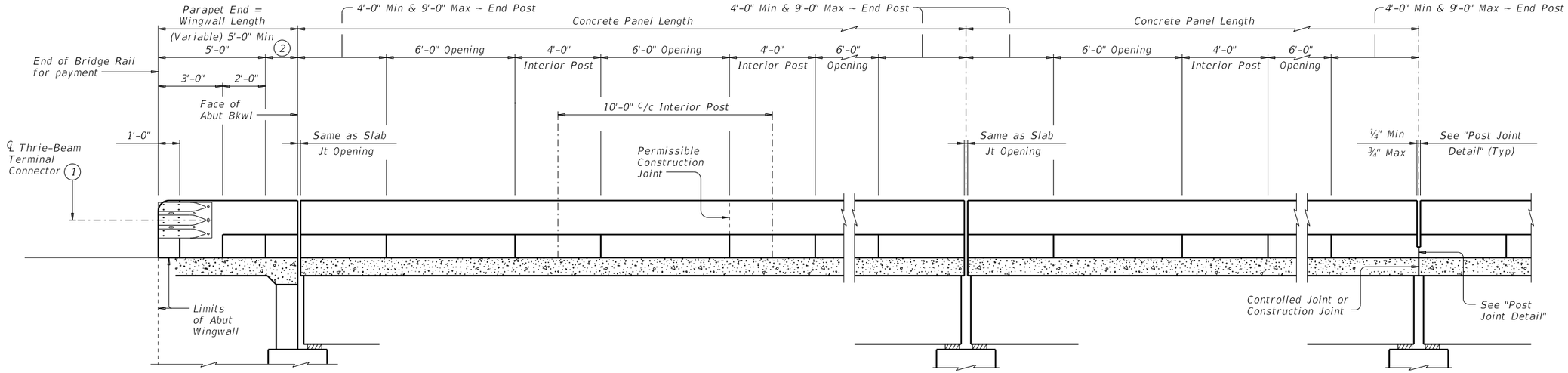
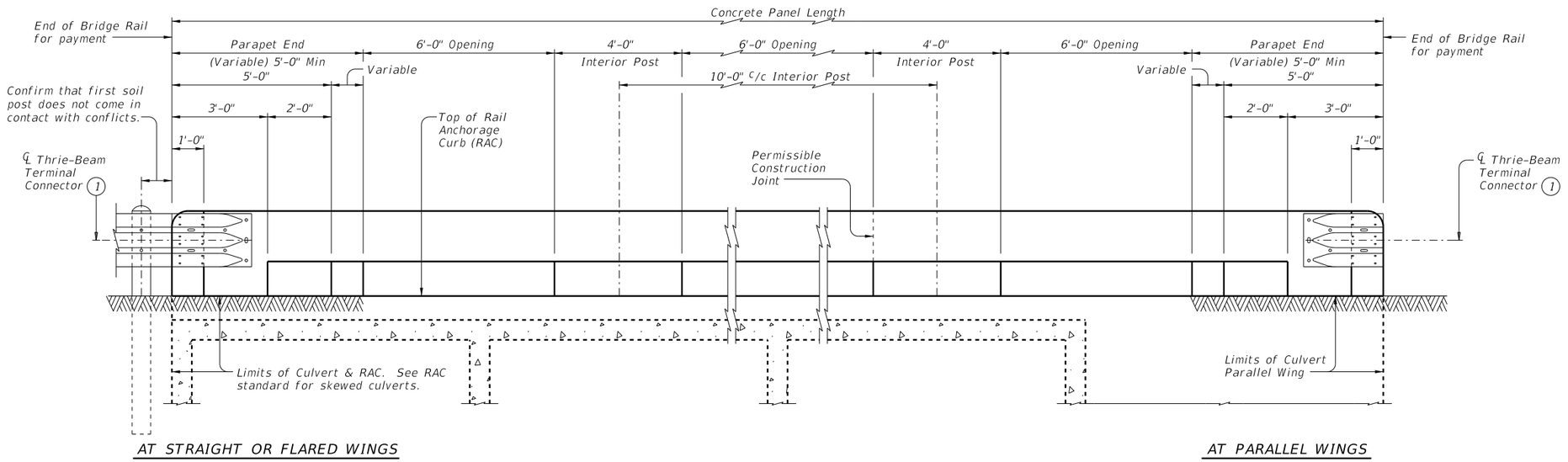
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		200



ROADWAY ELEVATION OF RAIL ON BRIDGE



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown. Vertical joints in concrete rail are not required, unless shown elsewhere.

(1) *Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.*

(2) *Wingwall Length minus 5'-0" (Varies)*

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SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		201

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DATE: 12/22/2023 9:59:10 AM
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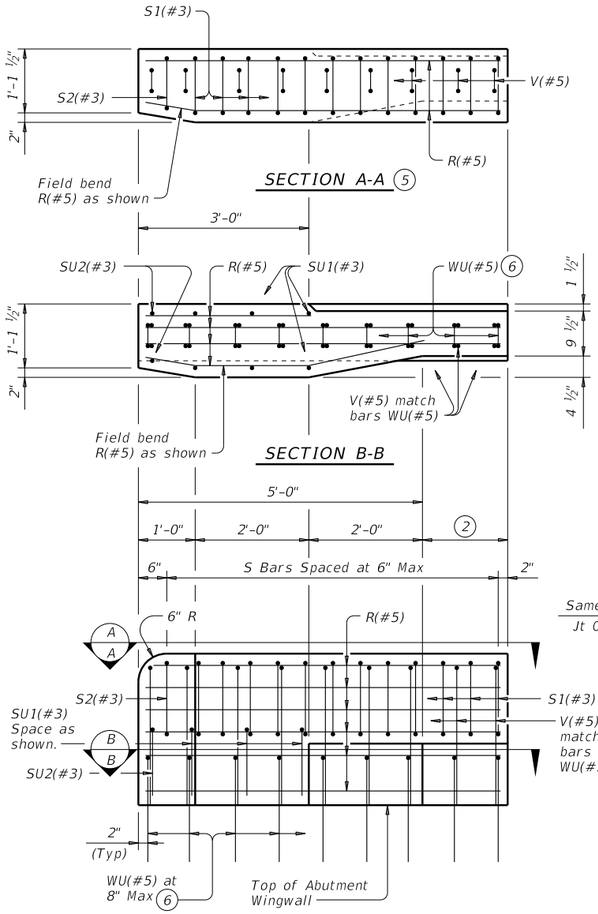
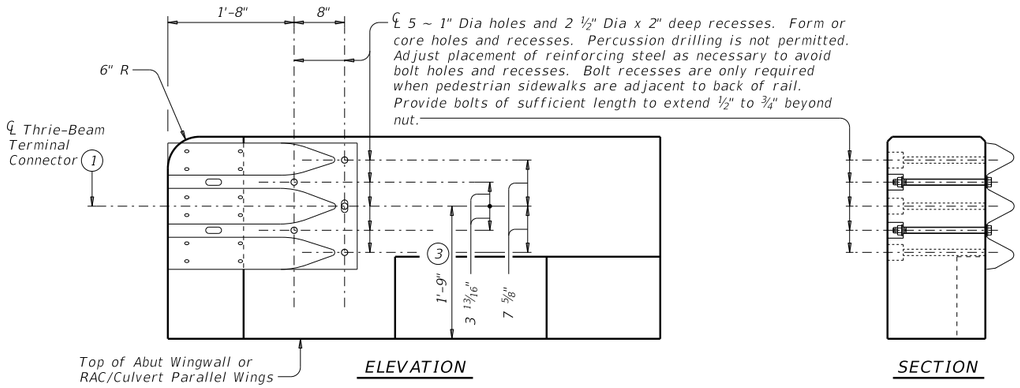
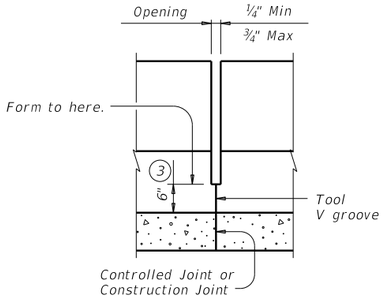


PARAPET END AT ABUT WINGWALL (6)

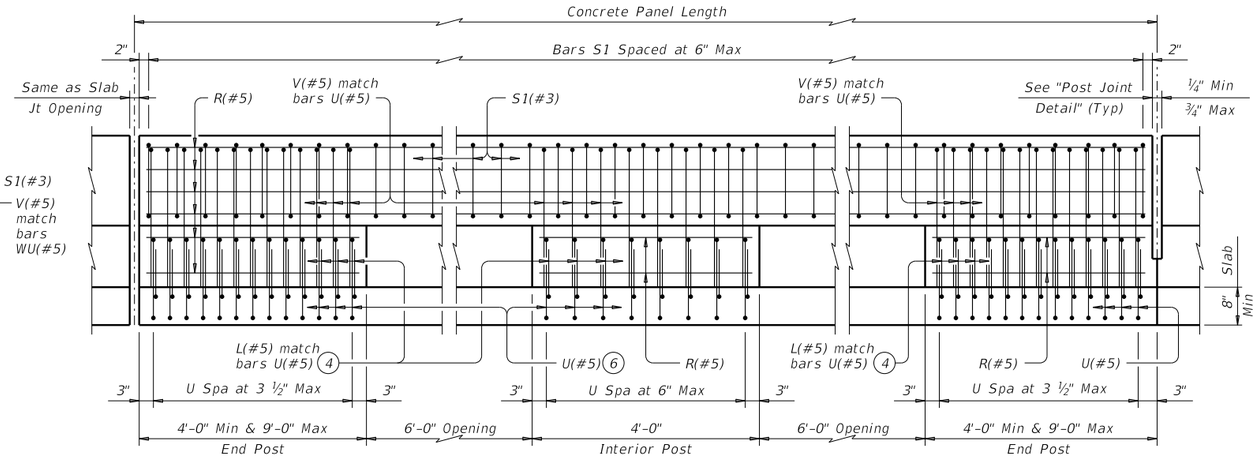


TERMINAL CONNECTION DETAILS



POST JOINT DETAIL

Provide at all interior bents without slab expansion joints.



AT SLAB EXPANSION JOINTS

AT 4' INTERIOR POST

AT BENTS WITHOUT SLAB EXPANSION JOINTS

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab. Rail on box culvert similar.

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

(3) Increase 2" for structures with overlay.

(4) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(5) Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.

(6) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on achorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		202

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DATE: 12/22/2023 9:59:10 AM
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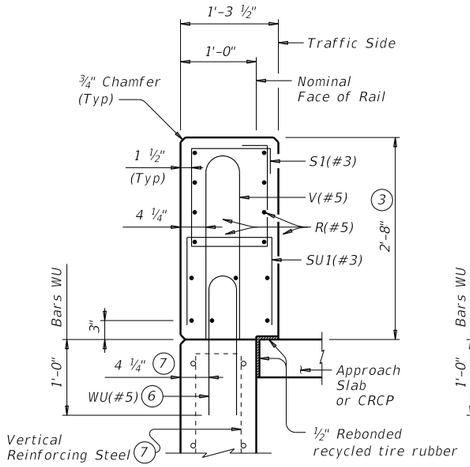
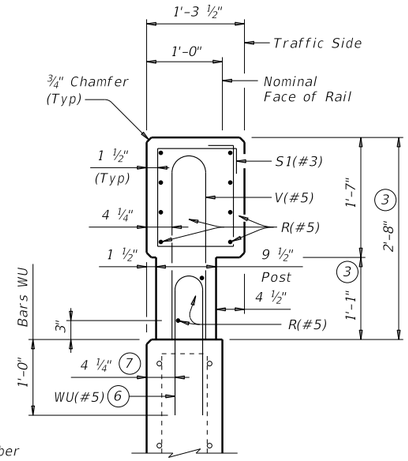
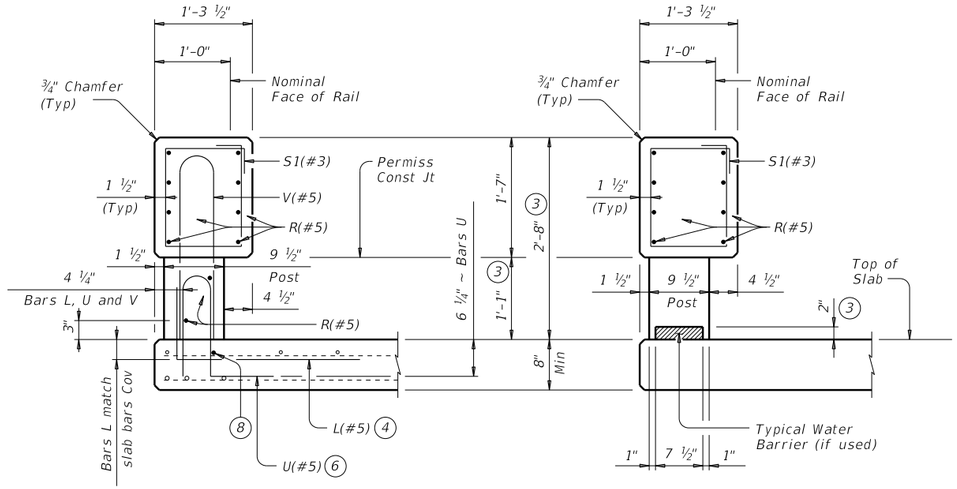


SECTION C-C
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

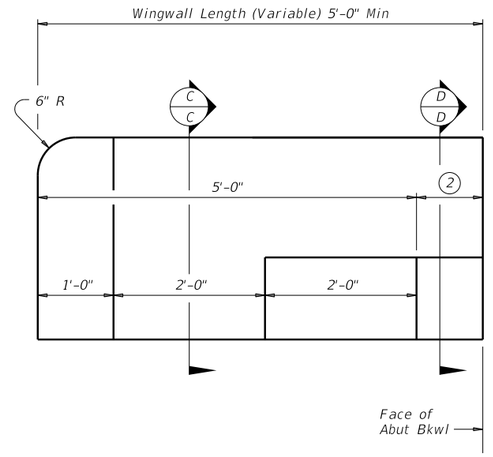


AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

SECTIONS THRU RAIL

Sections on box culverts similar.



ELEVATION AT ABUTMENT WINGWALL

Box culvert parallel wings or rail anchorage curb similar.

(2) Wingwall Length minus 5'-0" (Varies)

(3) Increase 2" for structures with overlay.

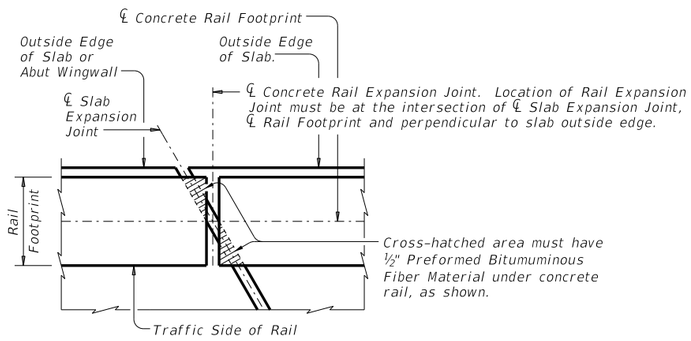
(4) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(6) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

(7) When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.

(8) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(9) At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 ¼" above the roadway surface without overlay.



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

CONSTRUCTION NOTES:

Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer.

Provide water barriers at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.

Chamfer all exposed corners.

MATERIAL NOTES:

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

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

This rail has been evaluated by full-scale crash test to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

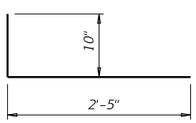
Do not use this railing on bridges with expansion joints providing more than 5" movement.

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

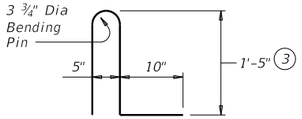
Shop drawings are not required for this rail.

Average weight of railing with no overlay is 358 plf.

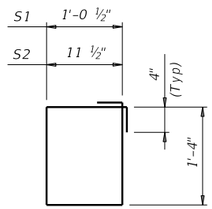
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



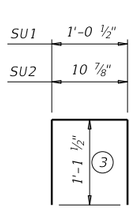
BARS L (#5)



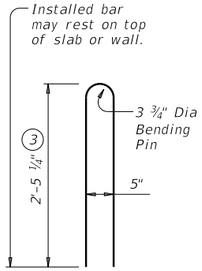
BARS U (#5) (9)



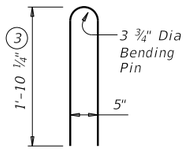
BARS S (#3)



BARS SU (#3)



BARS V (#5) (9)



BARS WU (#5)

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		203

DESIGN: AG | DRAFT: AG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
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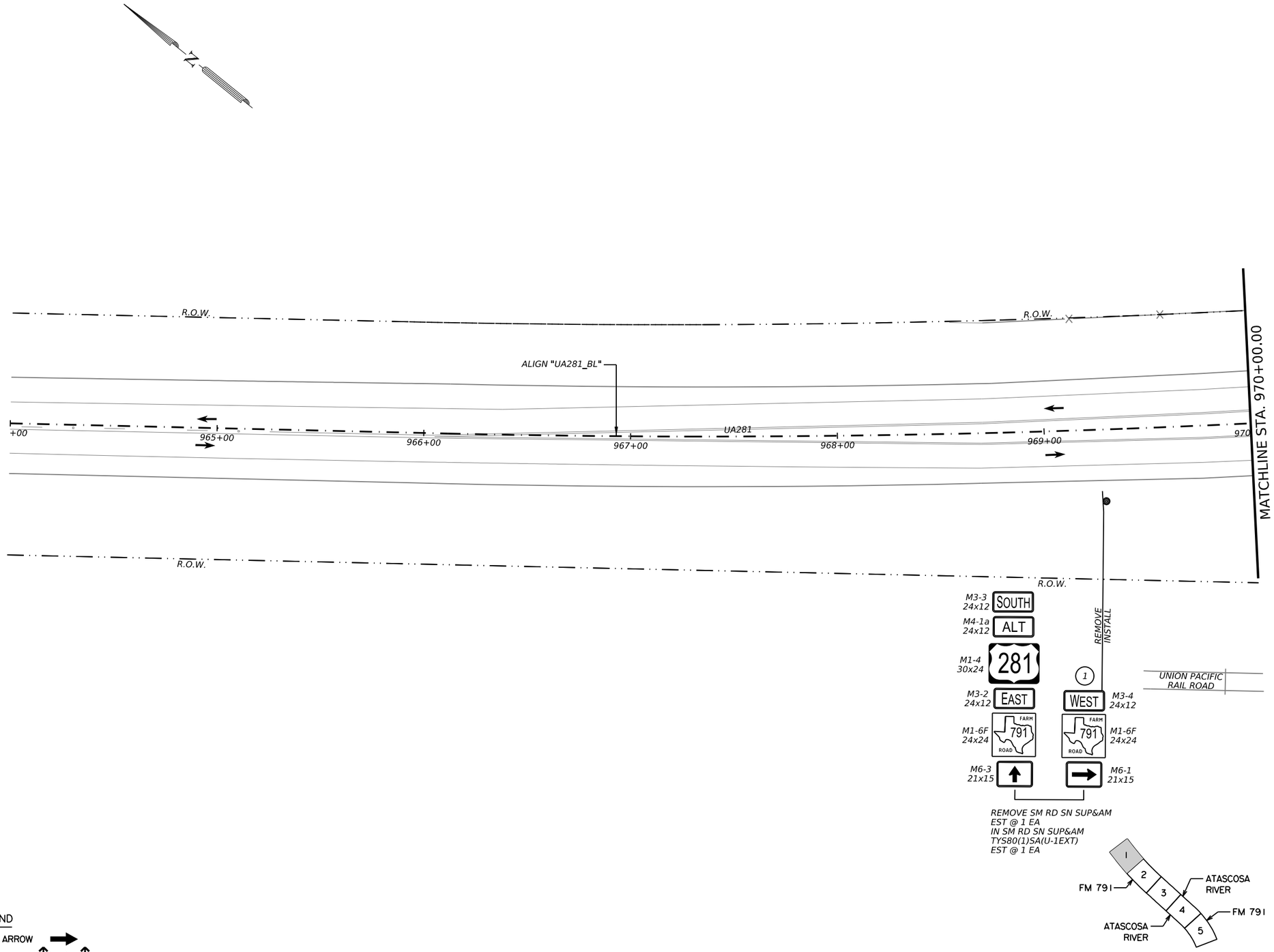
0644-6076	REMOVE SM RD SN SUP&AM	EA	1



LEGEND

DIRECTIONAL ARROW

LIMITS OF OVERLAY

NOTES:

1. SEE SIGNING DETAILS SHEET FOR MORE INFO.
2. WEIGHT LIMIT SIGNS CAN ONLY BE REMOVED FOLLOWING COMPLETION OF PHASE 2 WORK.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
SIGNING, PAVEMENT MARKING & DELINEATION (SPMD) LAYOUT

SHEET: 1 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		204

2/13/2024 3:28:36 PM
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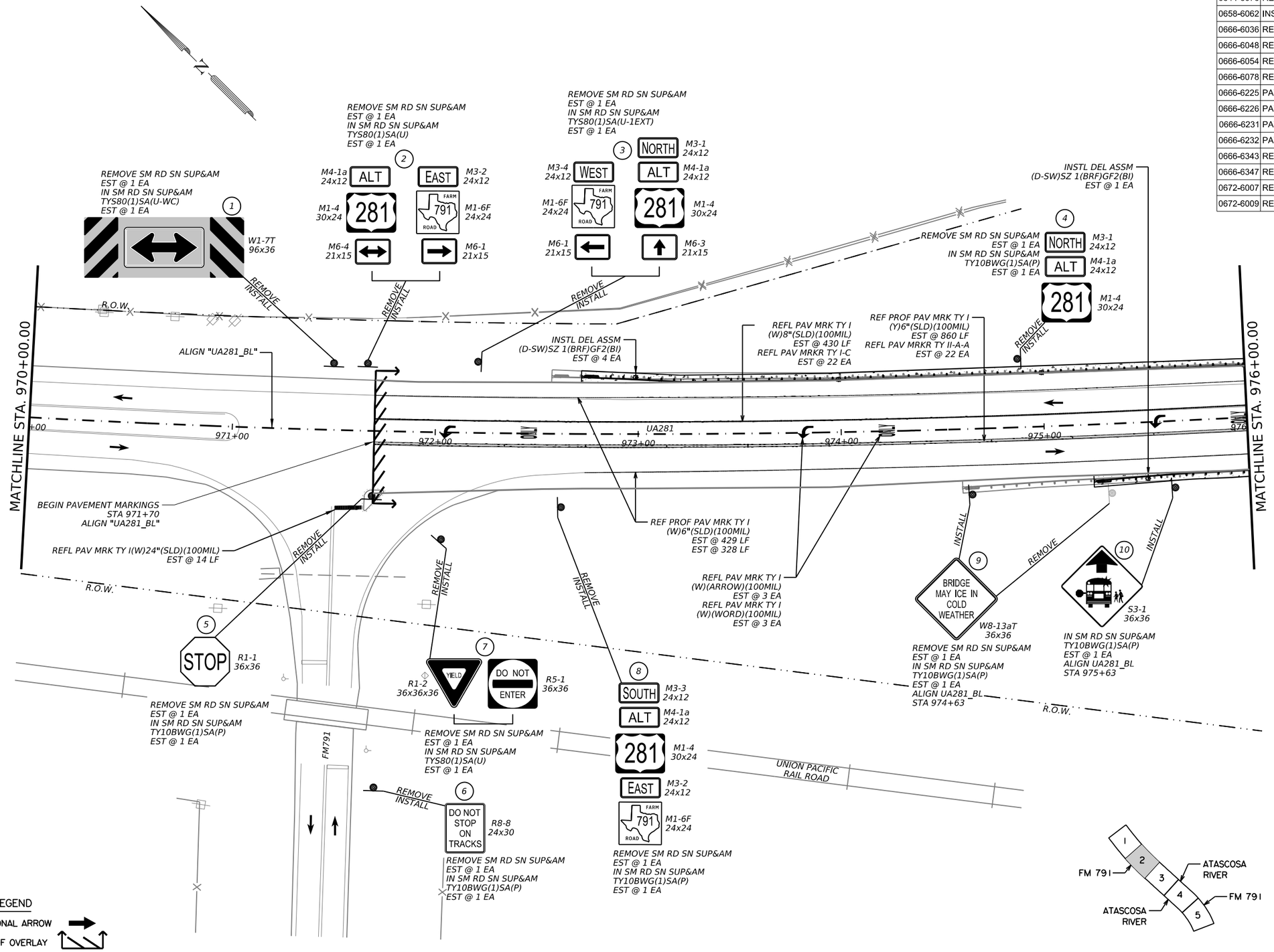

QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
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0644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	2
0644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA	1
0644-6037	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	EA	1
0644-6076	REMOVE SM RD SN SUP&AM	EA	9
0658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	5
0666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	430
0666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	14
0666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	3
0666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3
0666-6225	PAVEMENT SEALER 6"	LF	1617
0666-6226	PAVEMENT SEALER 8"	LF	430
0666-6231	PAVEMENT SEALER (ARROW)	EA	3
0666-6232	PAVEMENT SEALER (WORD)	EA	3
0666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	757
0666-6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	860
0672-6007	REFL PAV MRKR TY I-C	EA	22
0672-6009	REFL PAV MRKR TY II-A-A	EA	22

NOTES:

1. SEE SIGNING DETAILS SHEET FOR MORE INFO.
2. WEIGHT LIMIT SIGNS CAN ONLY BE REMOVED FOLLOWING COMPLETION OF PHASE 2 WORK.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED
PROFESSIONAL ENGINEER

Andres Garza
P.E. 02/20/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
SIGNING, PAVEMENT MARKING & DELINEATION (SPMD) LAYOUT

SHEET: 2 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		205

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DESIGN: RG | DRAFT: RG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
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0644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
0644-6076	REMOVE SM RD SN SUP&AM	EA	9
0658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	8
0658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	5
0666-6225	PAVEMENT SEALER 6"	LF	2860
0666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	1200
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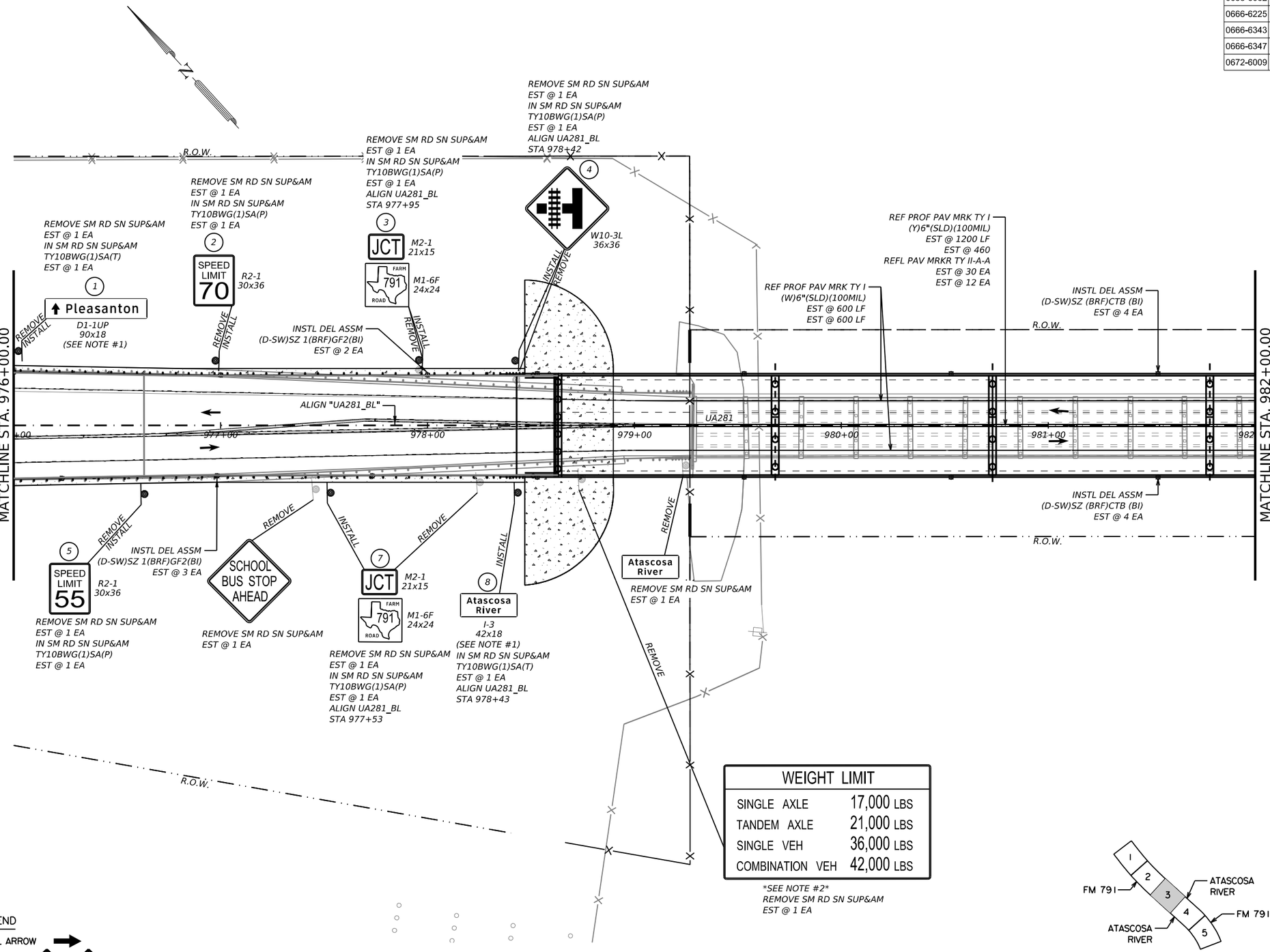

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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281 SIGNING, PAVEMENT MARKING & DELINEATION (SPMD) LAYOUT

SHEET: 3 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		206

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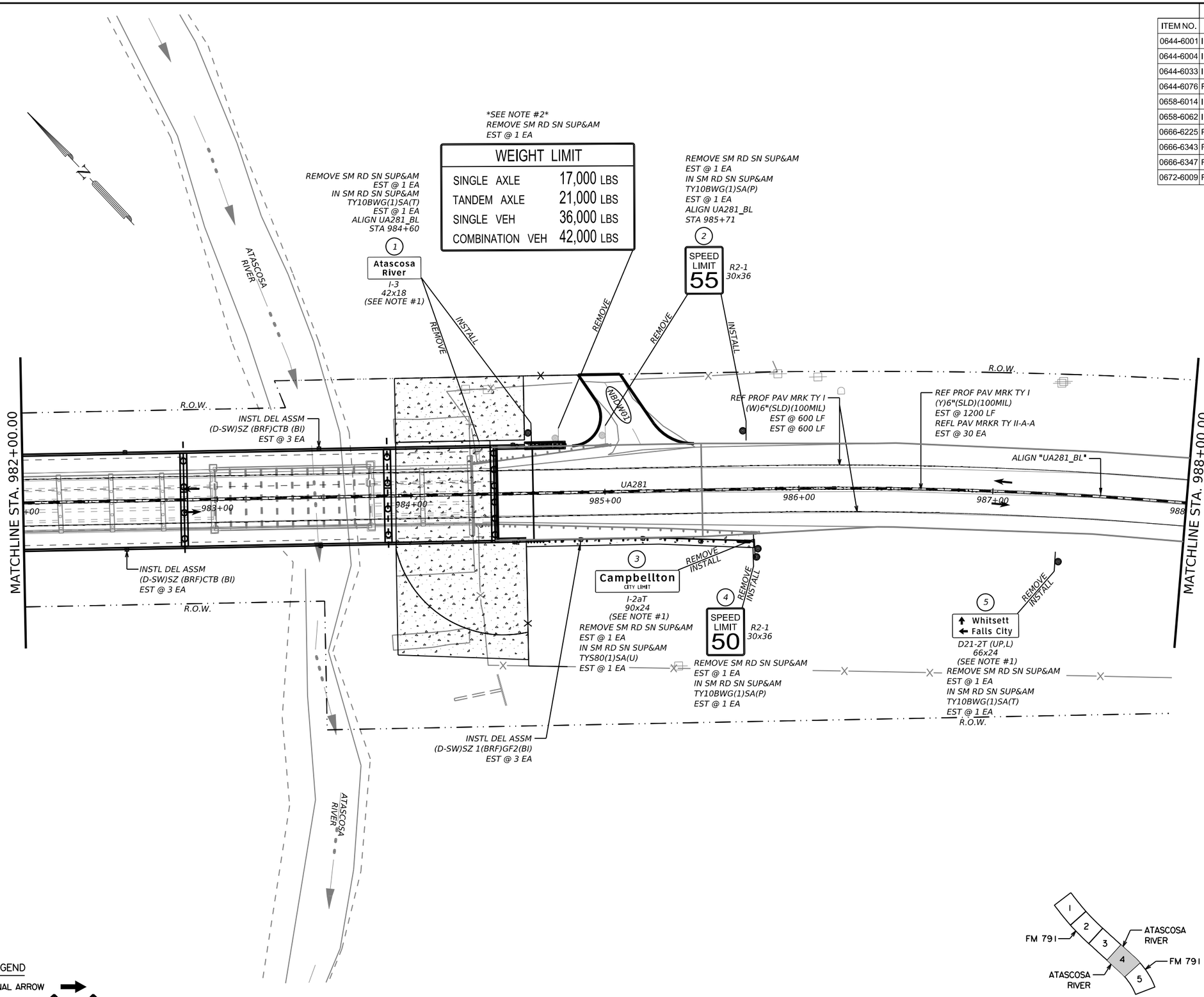
0644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
0644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	1
0644-6076	REMOVE SM RD SN SUP&AM	EA	6
0658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	6
0658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	3
0666-6225	PAVEMENT SEALER 6"	LF	2400
0666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	1200
0666-6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	1200
0672-6009	REFL PAV MRKR TY II-A-A	EA	30



NOTES:

1. SEE SIGNING DETAILS SHEET FOR MORE INFO.
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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281 SIGNING, PAVEMENT MARKING & DELINEATION (SPMD) LAYOUT

SHEET: 4 OF 5

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
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DESIGN: BG | DRAFT: BG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
0644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	5
0644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
0644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA	2
0644-6035	IN SM RD SN SUP&AM TYS80(1)SA(U-2EXT)	EA	1
0644-6076	REMOVE SM RD SN SUP&AM	EA	9
0666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	45
0666-6225	PAVEMENT SEALER 6"	LF	1085
0666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	543
0666-6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	542
0672-6009	REFL PAV MRKR TY II-A-A	EA	14

N

Angelina St

EXIST SIGN TO REMAIN

FM791

ANGELINA RD

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TY10BWG(1)SA(P)
EST @ 1 EA

5 STOP R1-1 36x36

REMOVE INSTALL

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TY10BWG(1)SA(P)
EST @ 1 EA

3 STOP R1-1 36x36

REMOVE INSTALL

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TY10BWG(1)SA(P)
EST @ 1 EA

1 NORTH M3-1 24x12
ALT M4-1a 24x12
281 M1-4 30x24

REMOVE INSTALL

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TY10BWG(1)SA(P)
EST @ 1 EA

2 BRIDGE MAY ICE IN COLD WEATHER W8-13aT 36x36

REMOVE INSTALL

REFL PAV MRK TY I
(W)24"(SLD)(100MIL)
EST @ 31 LF
EST @ 14 LF

M1-6F 24x24
FARM 791 ROAD
M6-3 21x15
6
M4-1 24x12 ALTERNATE
EAST M3-2 24x12
M1-4 30x24 281
FARM 791 ROAD M1-6F 24x24
M6-3 21x15
M6-1 21x15

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TYS80(1)SA(U-1EXT)
EST @ 1 EA

REMOVE INSTALL

R.O.W.

REF PROF PAV MRK TY I
(W)6"(SLD)(100MIL)
EST @ 301 LF
EST @ 242 LF

END PAVEMENT MARKINGS
STA 990+71
ALIGN "UA281_BL"

MATCHLINE STA. 988+00.00

UA281

988+00

989+00

990+00

991+00

992+00

993+00

994

ALIGN "UA281_BL"

REF PROF PAV MRK TY I
(Y)6"(SLD)(100MIL)
EST @ 542 LF
REFL PAV MRKR TY II-A-A
EST @ 14 EA

REMOVE INSTALL

REMOVE

R.O.W.

7 SOUTH M3-3 24x12
ALTERNATE M4-1 24x12
EAST M3-2 24x12
FARM 791 ROAD M1-6F 24x24
281 M1-4 30x24
M6-1 21x15
M6-3 21x15

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TYS80(1)SA(U-1EXT)
EST @ 1 EA

TO SOUTH INTERSTATE 37

REMOVE SM RD SN SUP&AM
EST @ 1 EA

9
WEST M3-4 24x12
FARM 791 ROAD M1-6F 24x24
M6-1 21x15
M3-3 24x12 SOUTH
NORTH M3-1 24x12
M4-1 24x12 ALTERNATE
ALTERNATE M4-1 24x12
M1-4 30x24 281
281 M1-4 30x24
M6-1 21x15
M6-1 21x15

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TYS80(1)SA(U-2EXT)
EST @ 1 EA

EXIST SIGN TO REMAIN

Commerce
San Antonio

SAN ANTONIO ST

REMOVE INSTALL

R.O.W.

11 STOP R1-1 36x36

REMOVE SM RD SN SUP&AM
EST @ 1 EA
IN SM RD SN SUP&AM
TY10BWG(1)SA(P)
EST @ 1 EA

INSTALL

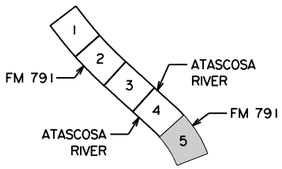
8 TO SOUTH INTERSTATE 37

D13-4T
36x60
IN SM RD SN SUP&AM
TY10BWG(1)SA(T)
EST @ 1 EA
ALIGN UA281 BL
STA 993+51

LEGEND

DIRECTIONAL ARROW

LIMITS OF OVERLAY



NOTES:

1. SEE SIGNING DETAILS SHEET FOR MORE INFO.
2. WEIGHT LIMIT SIGNS CAN ONLY BE REMOVED FOLLOWING COMPLETION OF PHASE 2 WORK.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

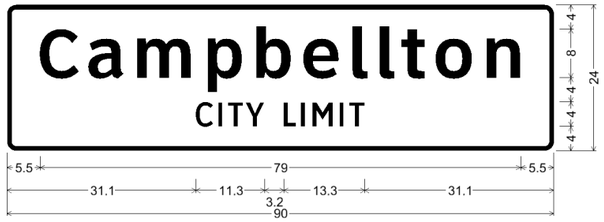
UA 281
SIGNING, PAVEMENT MARKING & DELINEATION (SPMD) LAYOUT

SHEET: 5 OF 5

CONT.	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		208

2/13/2024 3:41:26 PM
pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/8. Traffic/UA0281*TRF*SPMD*5.dgn

DESIGN: JH | DRAFT: JH | CHECK: AG



I-2aT 8in;
Sign # : 3;
Sheet # : 4;
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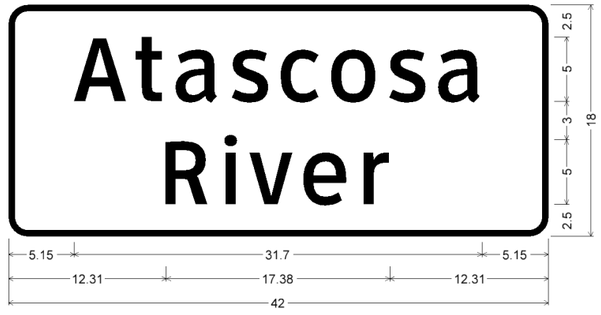
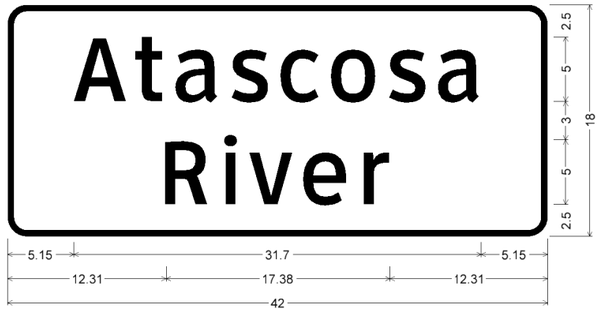
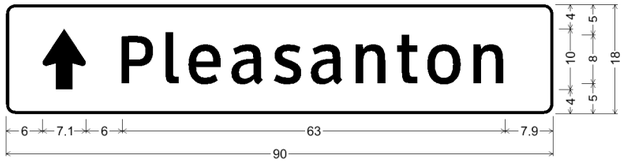


I-3 5in;
Sign # : 8;
Sheet # : 3;
1.50" Radius, 0.50" Border, White on Green;
"Atascosa" ClearviewHwy-3-W; "River", ClearviewHwy-3-W;



I-3 5in;
Sign # : 1;
Sheet # : 4;
1.50" Radius, 0.50" Border, White on Green;
"Atascosa", ClearviewHwy-3-W; "River", ClearviewHwy-3-W;

D21-2T (UP, L);
Sign # : 5;
Sheet # : 4;
1.5" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 8.0" X 6.1" 90°; "Whitsett", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 180°;
"Falls City", ClearviewHwy-3-W;



D1-1 8in UP;
Sign # : 1;
Sheet # : 3;
1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°; "Pleasanton", ClearviewHwy-3-W;

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

Texas Department of Transportation

UA 281 SIGNING DETAILS

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		209

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FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/007313012/4 - Design/Plan Set/8. Traffic/Standards/SMD(GEN)-08.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

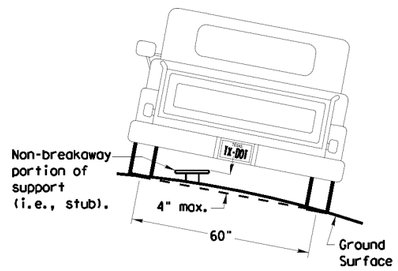
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

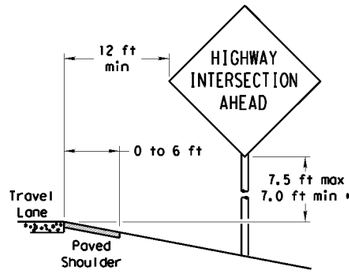
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

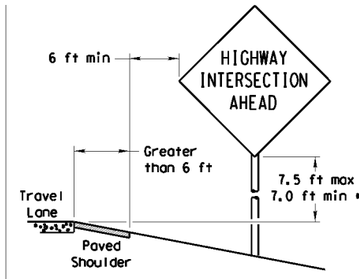
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

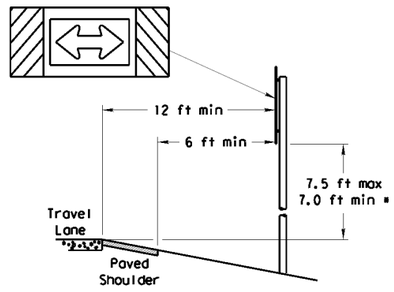
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



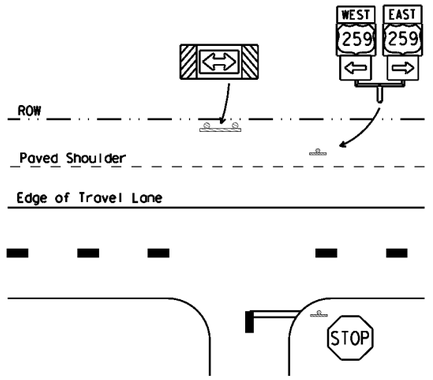
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

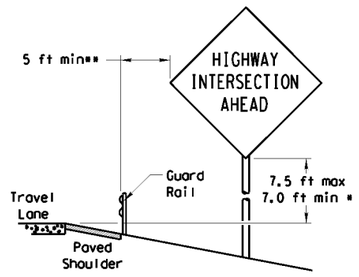
T-INTERSECTION



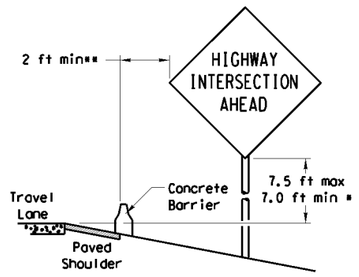
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

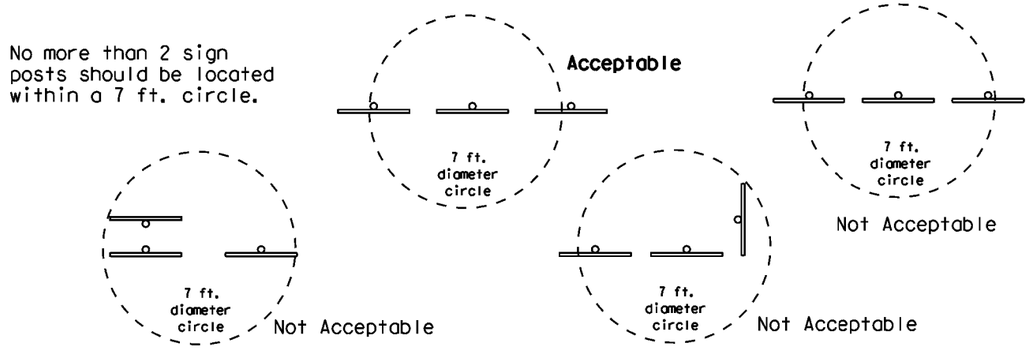
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

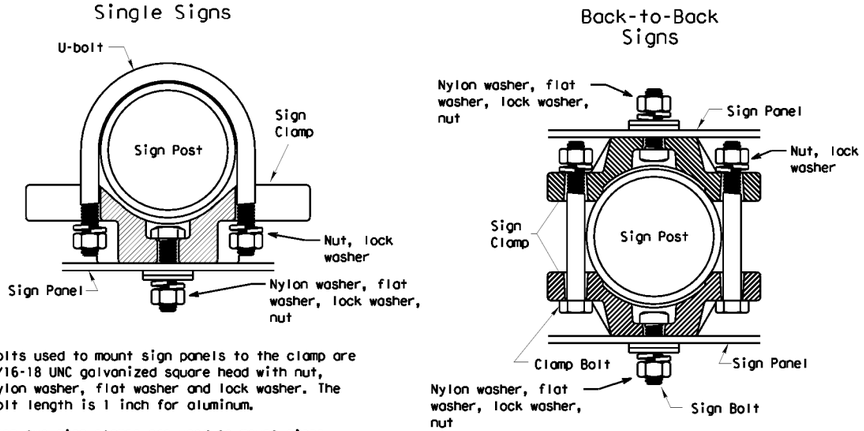
The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm



TYPICAL SIGN ATTACHMENT DETAIL



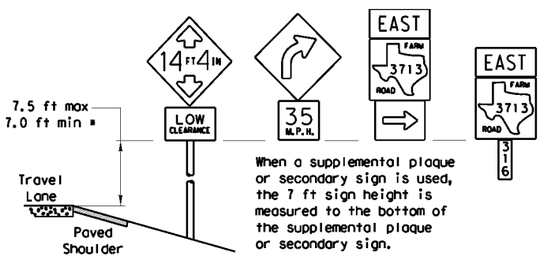
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

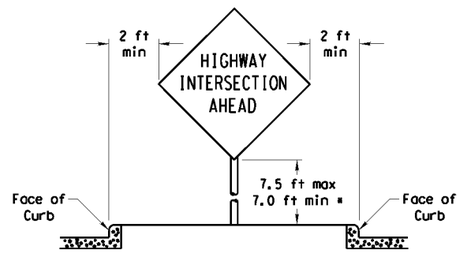
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



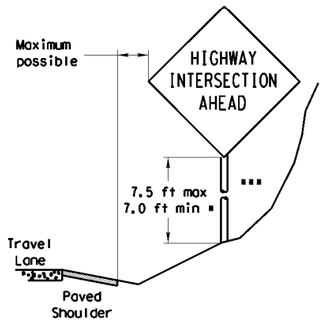
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		210

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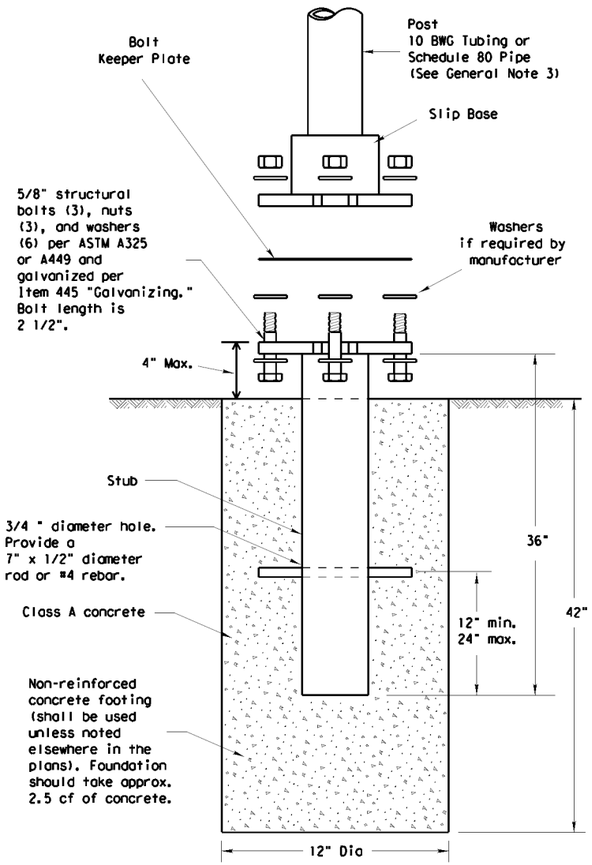
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

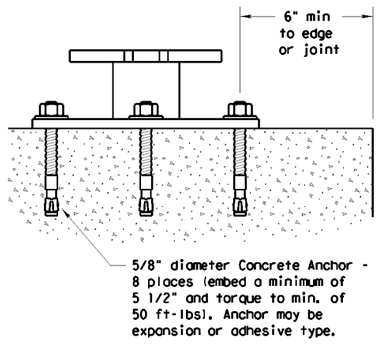
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281

DIST	COUNTY	SHEET NO.
SAT	ATASCOSA	211

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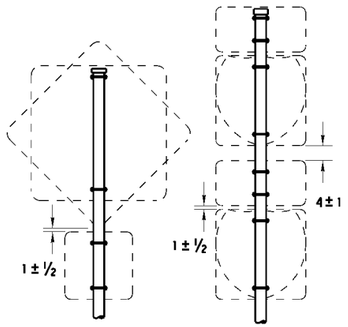
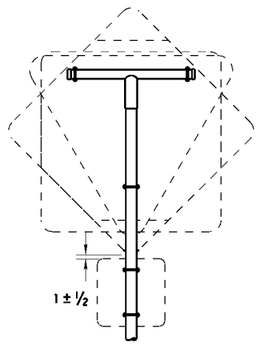


SM RD SGN ASSM TY XXXXX(1)XX(P)



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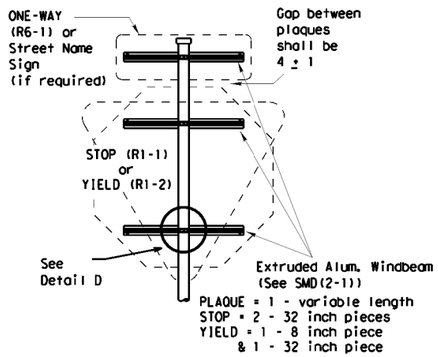

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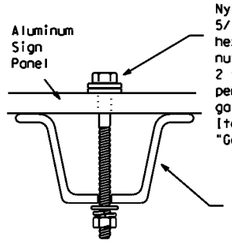
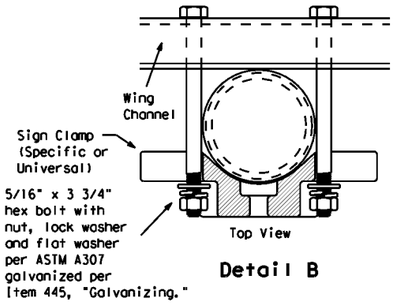
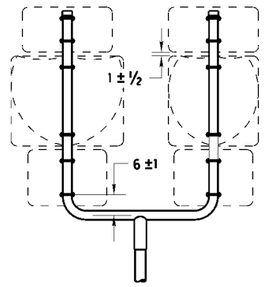


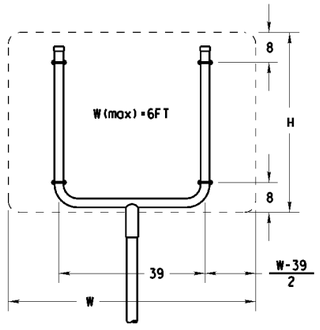
Detail A



Detail B



SM RD SGN ASSM TY XXXXX(1)XX(U)



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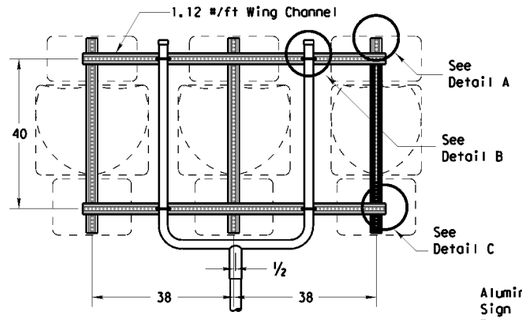
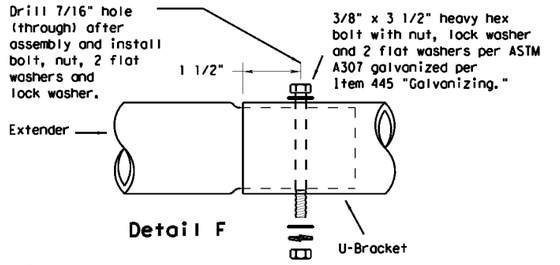
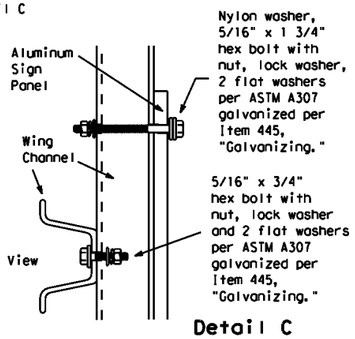


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

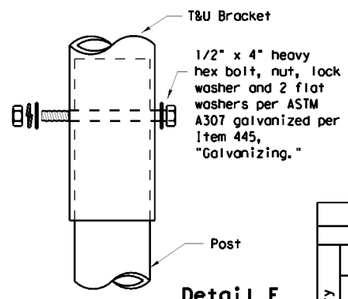


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



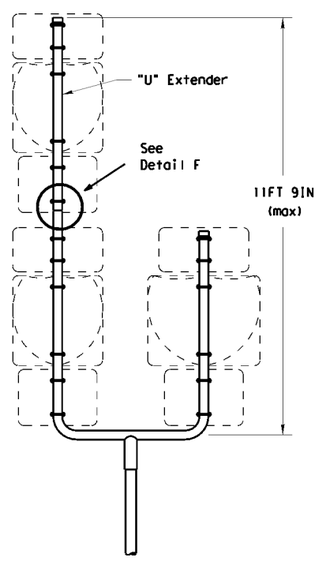
Detail E

GENERAL NOTES:

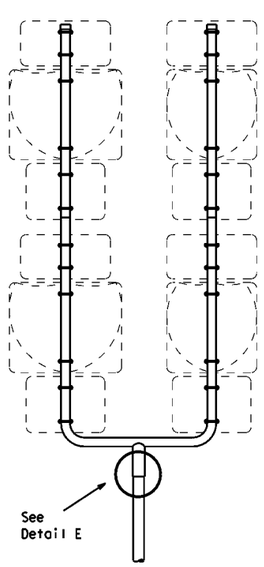
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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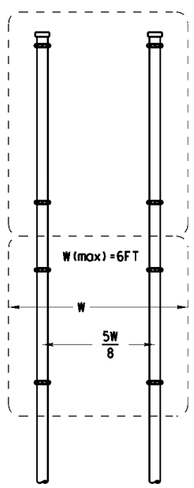

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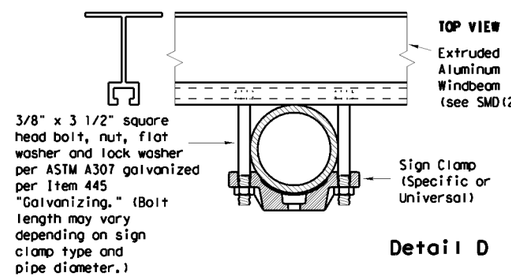
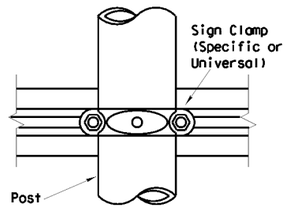
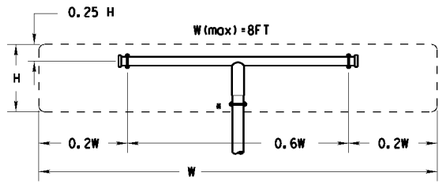


Detail D



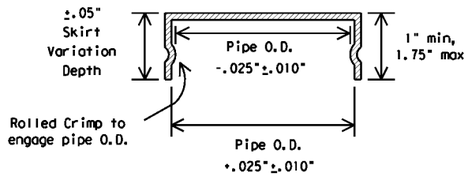
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		212

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DATE: 12/27/2023 11:10:48 AM
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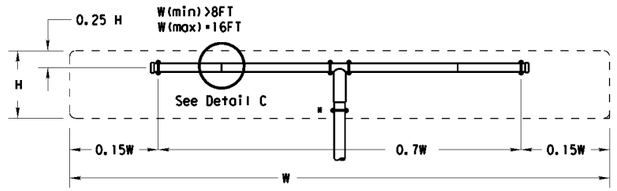
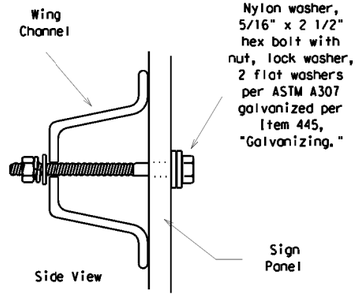
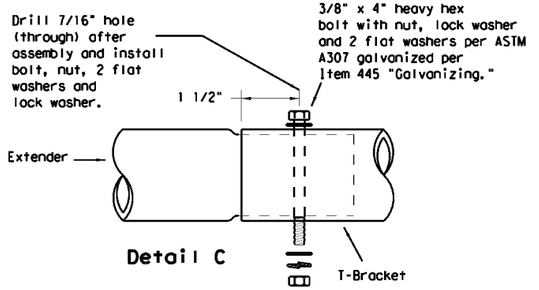


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
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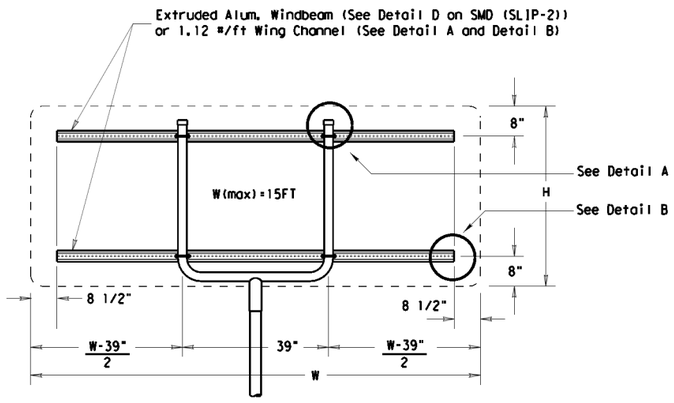
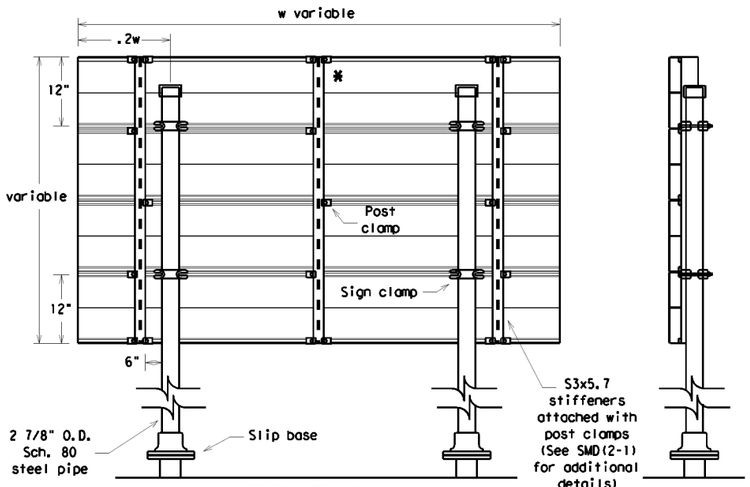
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.



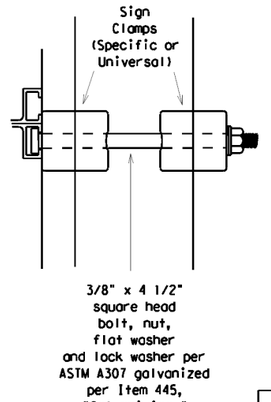
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



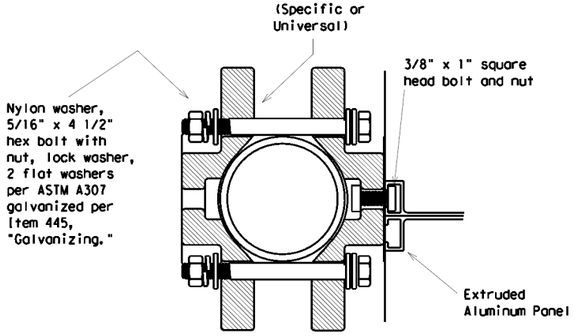
Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

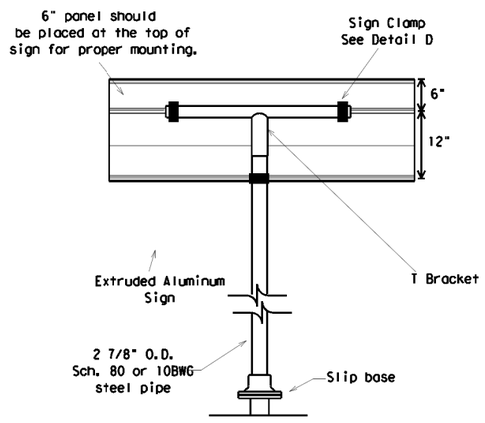
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



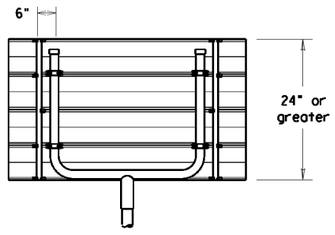
Detail E



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		213

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DATE: 12/27/2023 11:07:44 AM
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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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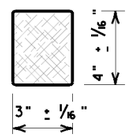
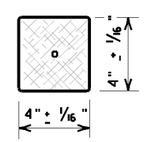
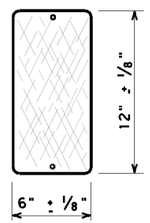
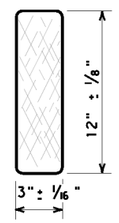
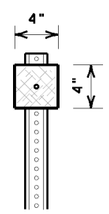
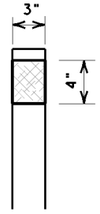
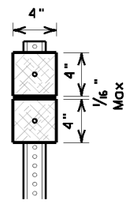
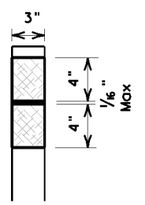
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

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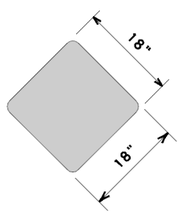
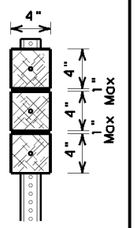
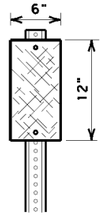
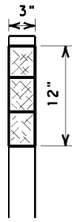
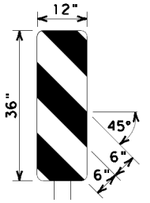
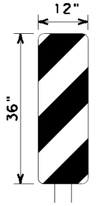
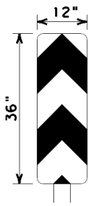
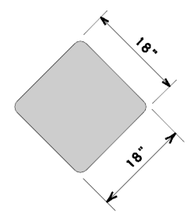
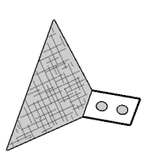
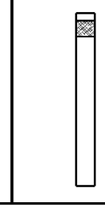
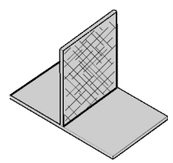
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL}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

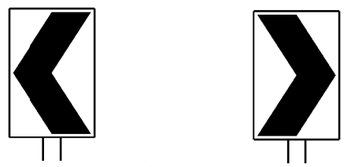
DEPARTMENTAL MATERIAL SPECIFICATIONS

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	0073	13	012	UA 281
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	ATASCOSA		214

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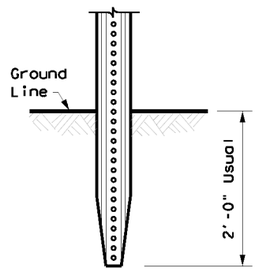
DATE: 12/27/2023 11:08:00 AM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/dom2-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

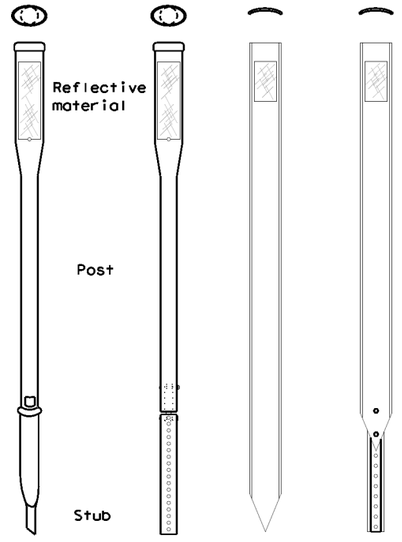


NOTES

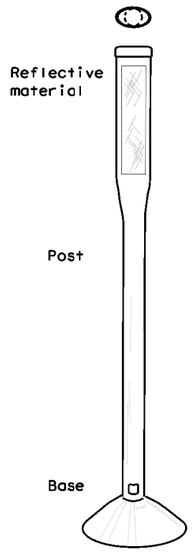
1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

FLEXIBLE POSTS (YFLX, WFLX)

GND



SRF



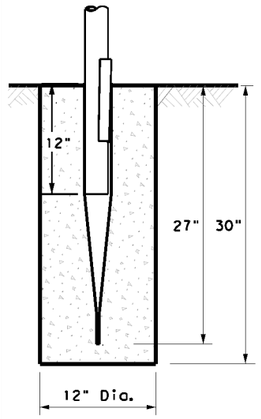
EMBEDDED | SURFACE MOUNT

NOTES

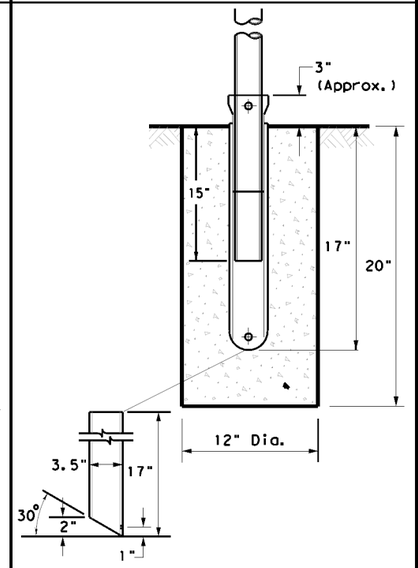
1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

WEDGE ANCHOR SYSTEMS

WAS



WAP



STEEL | PLASTIC

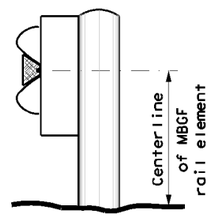
NOTE

1. Install per manufacturer's recommendations.

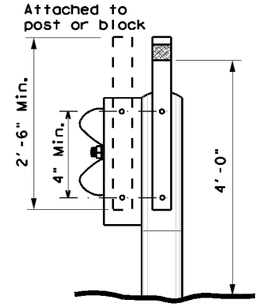
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

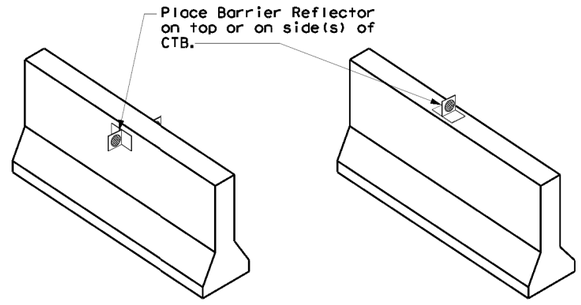
GF1



GF2



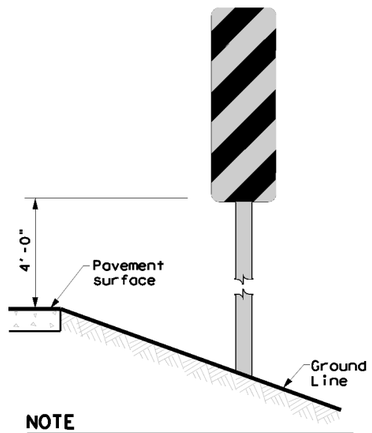
CONCRETE TRAFFIC BARRIER (CTB)



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.

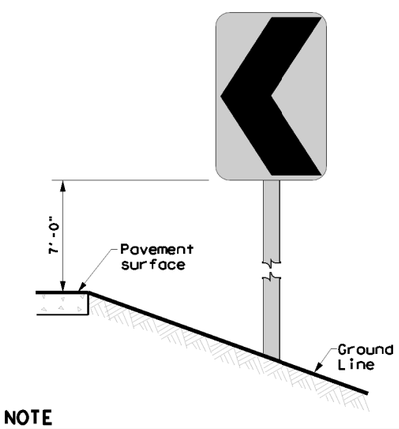
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

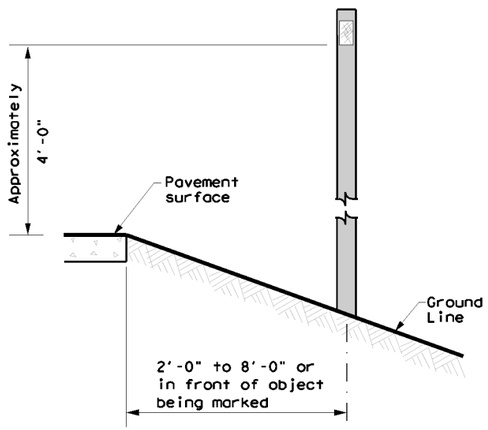
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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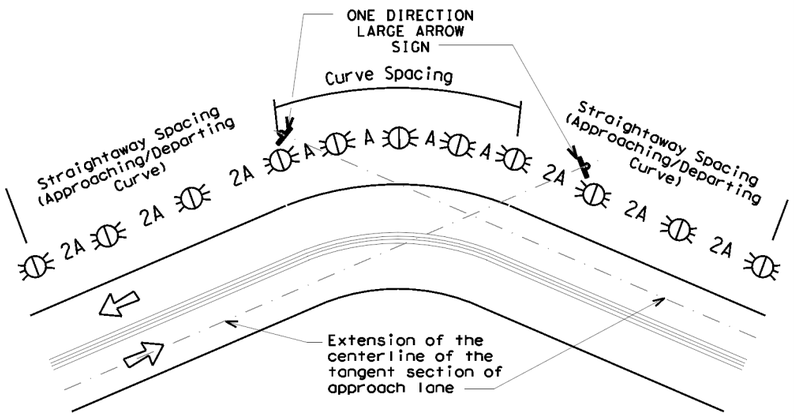
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

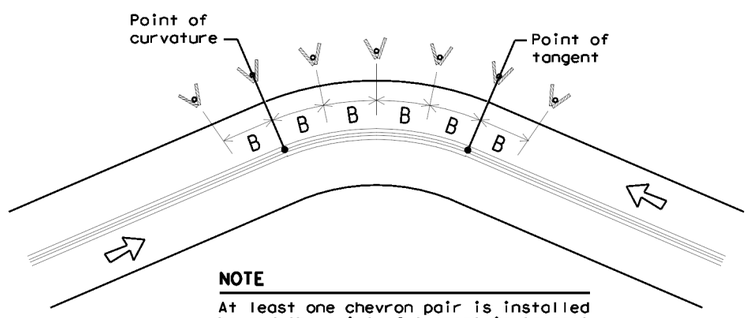
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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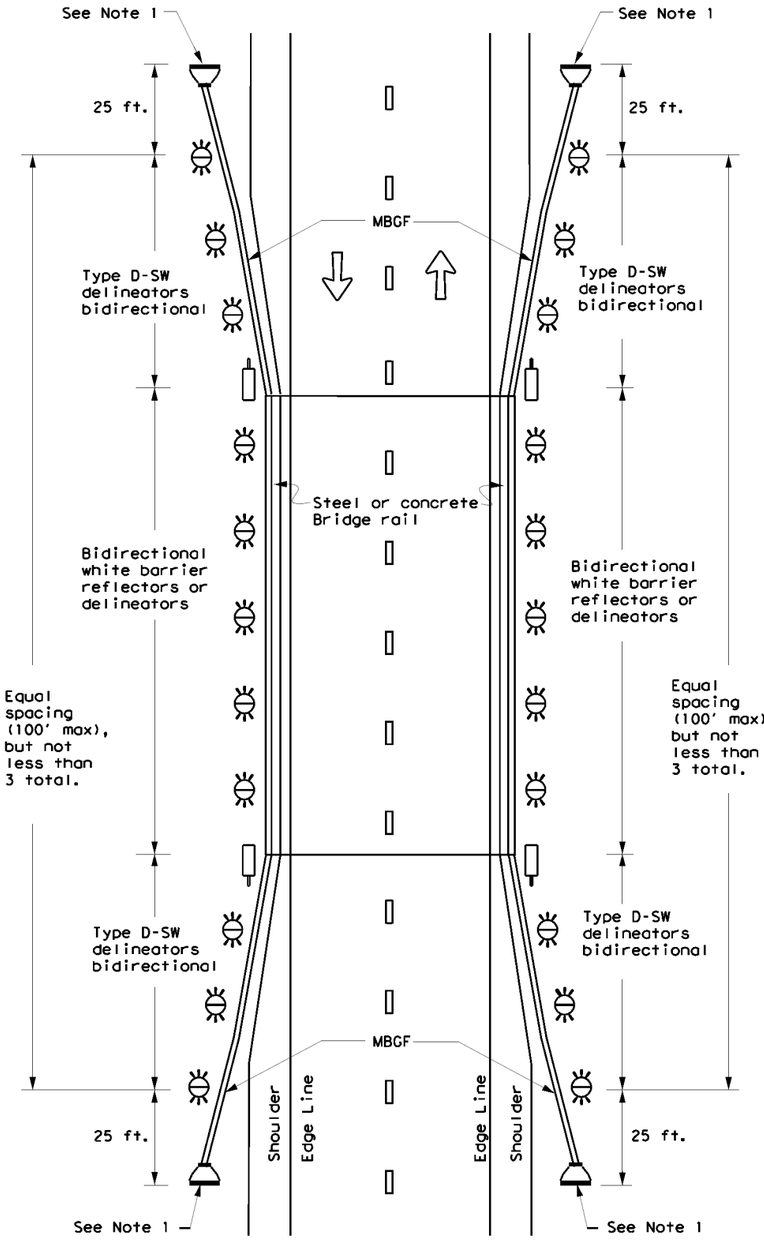
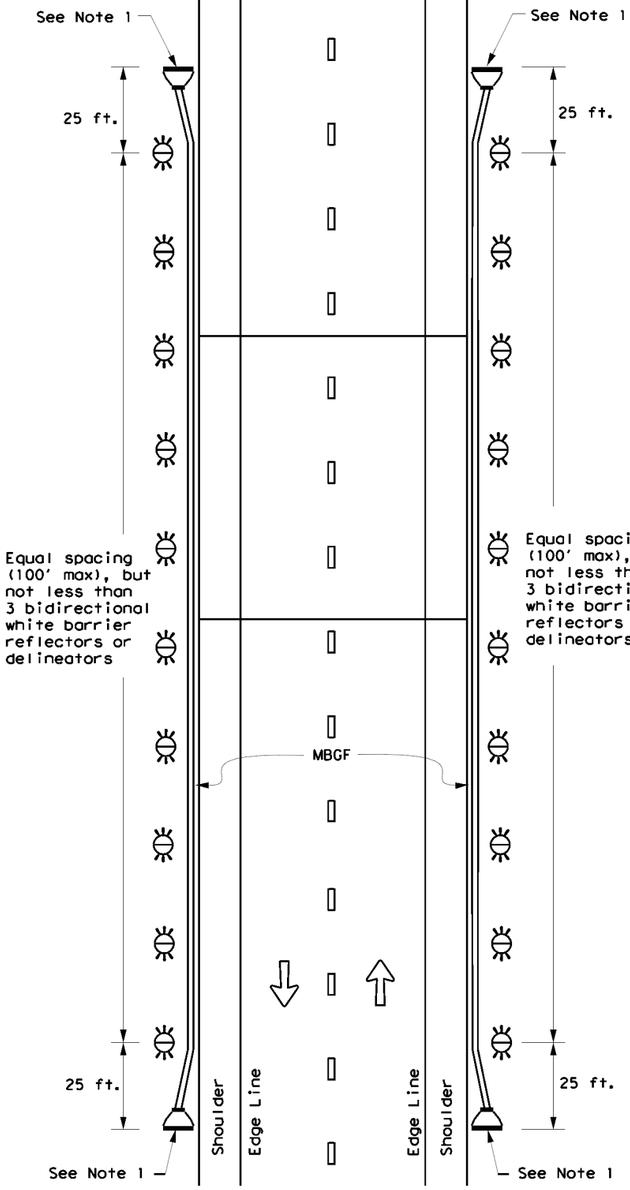
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

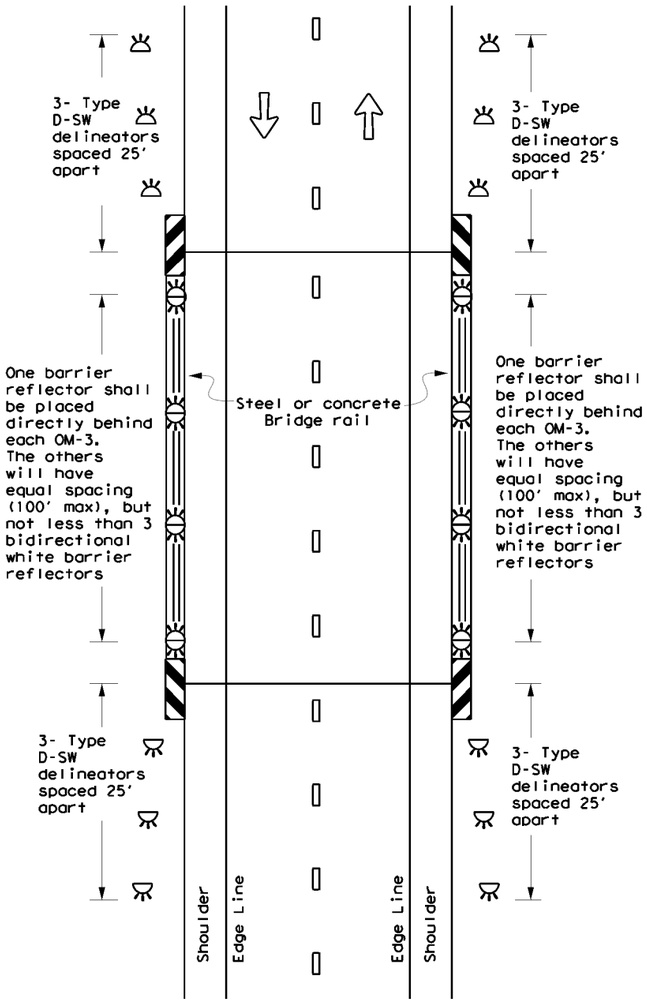
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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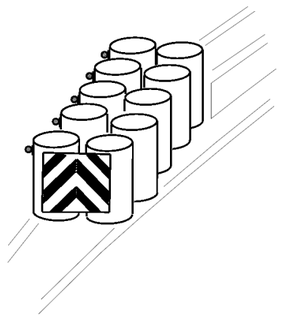
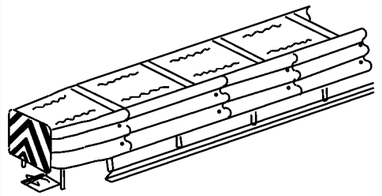
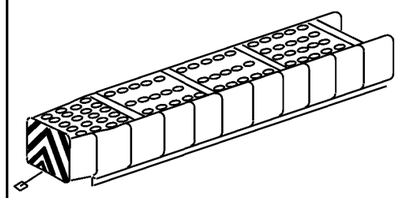
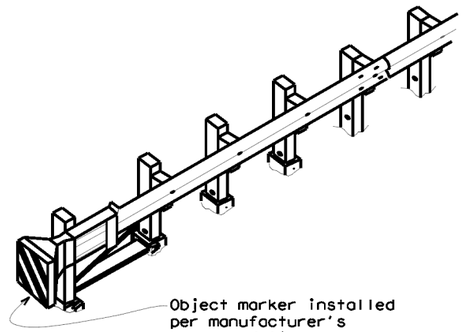
	SAT	ATASCOSA		217

20E

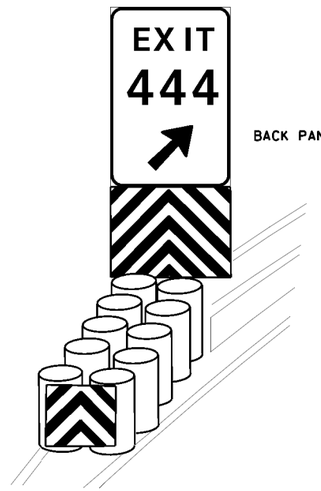




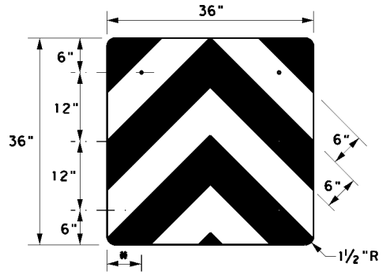


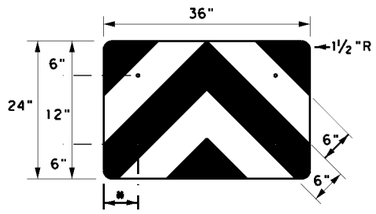


Object marker installed per manufacturer's recommendations.

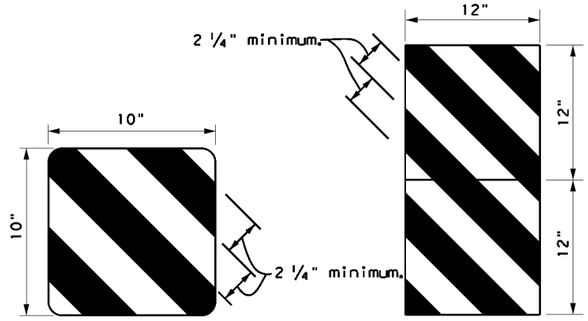


BACK PANEL (OPTIONAL)

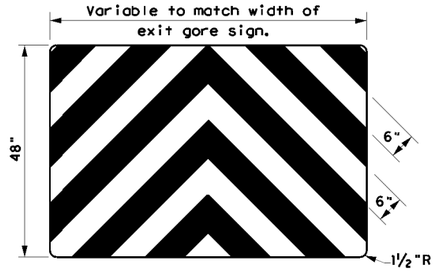


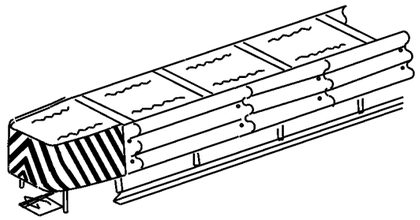


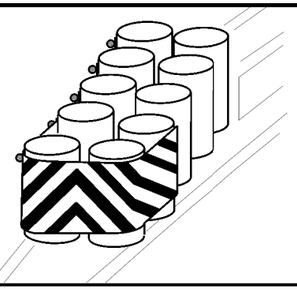
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

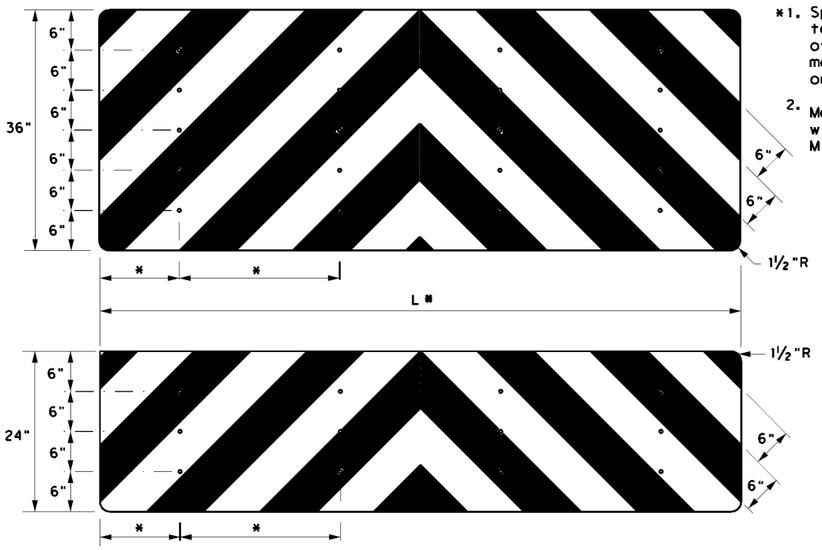


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	SAT	ATASCOSA		218
4-98 7-20				

20G

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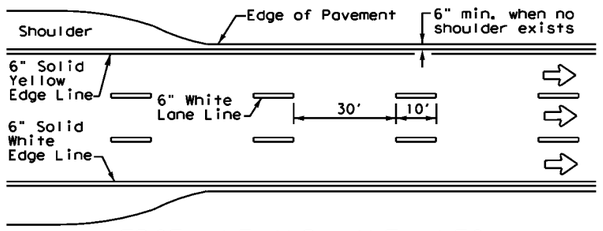
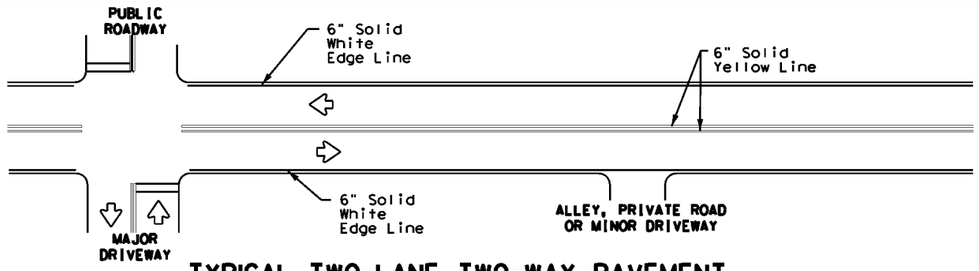
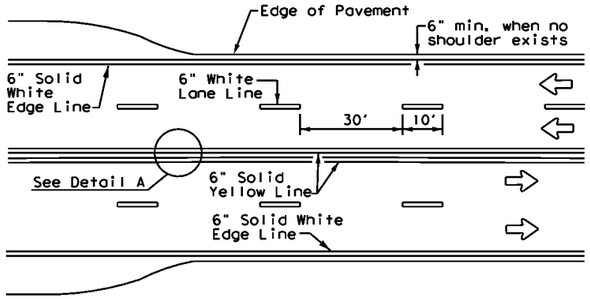
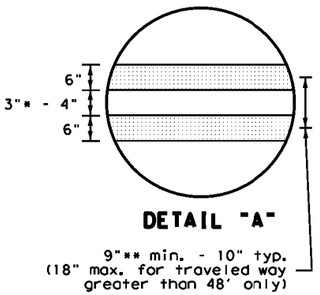


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

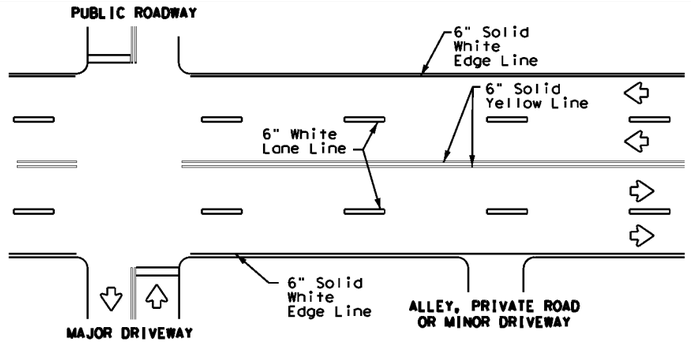




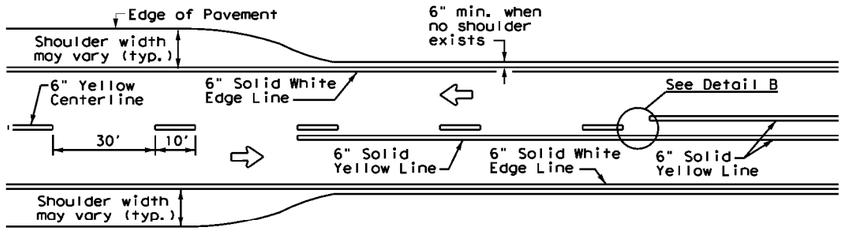
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

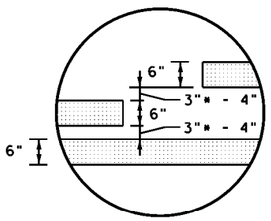
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

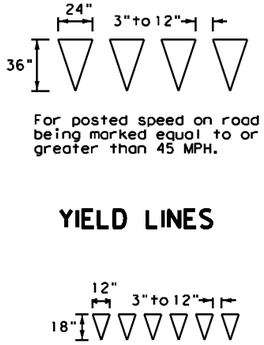


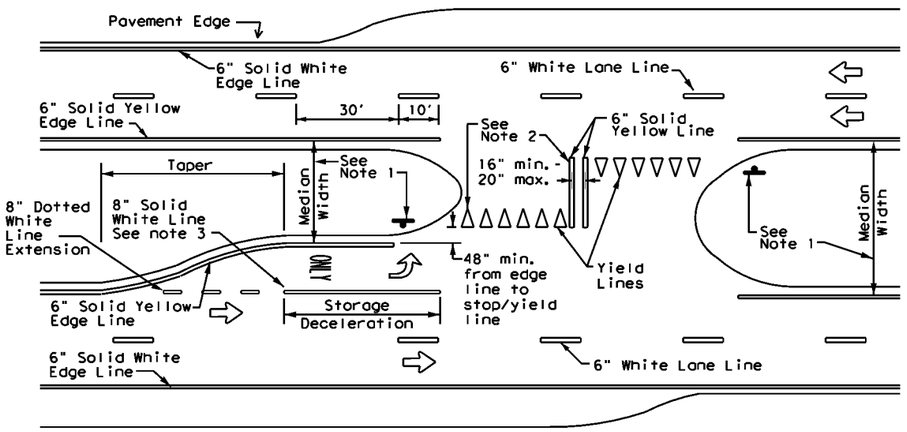
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

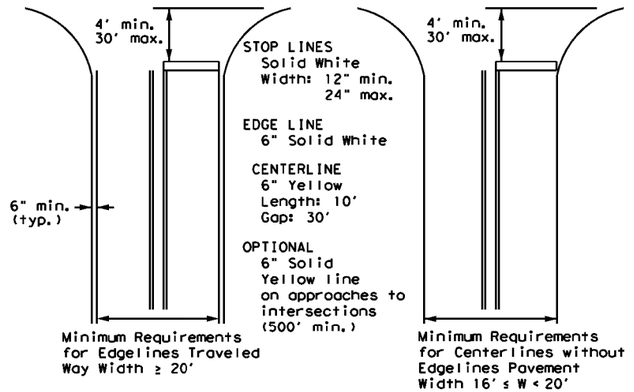
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

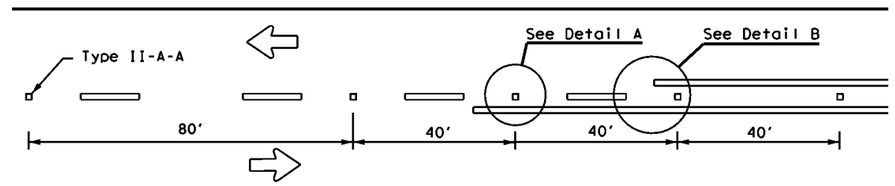
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

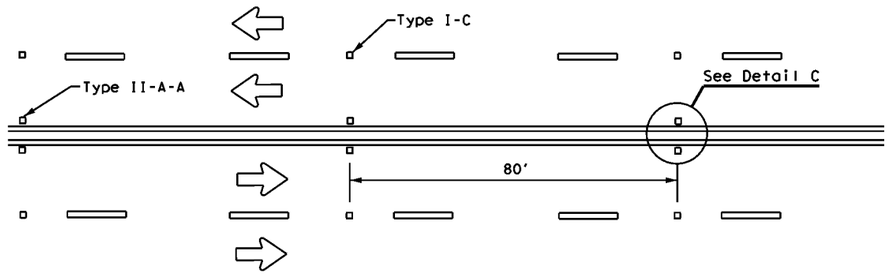
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	SAT	ATASCOSA		219
5-00 2-12				

22A

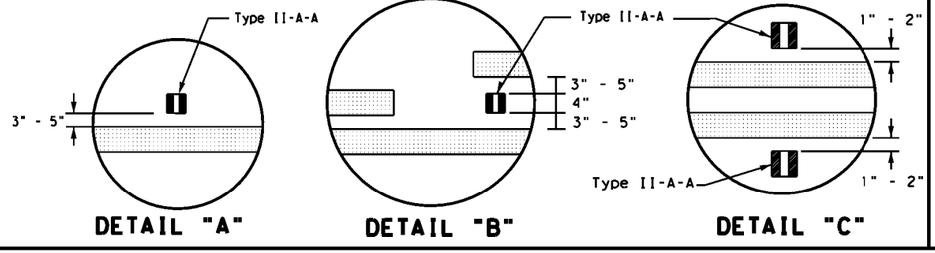
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

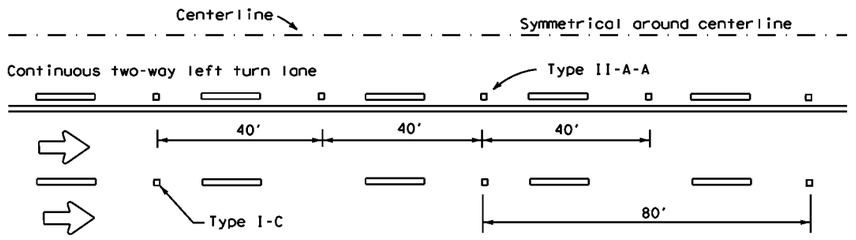


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

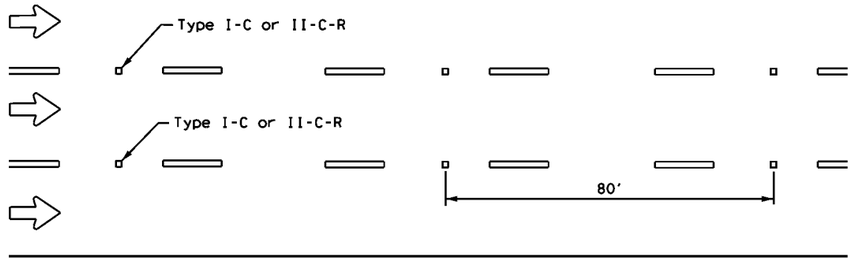


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



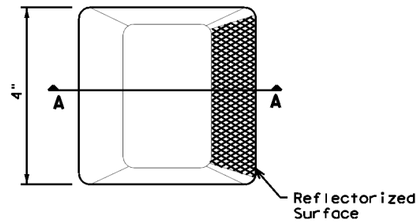
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

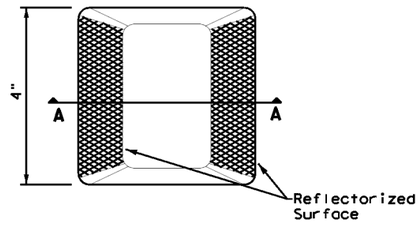
See Note 3.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

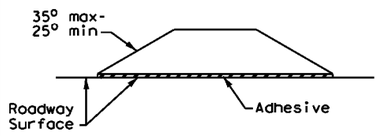
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

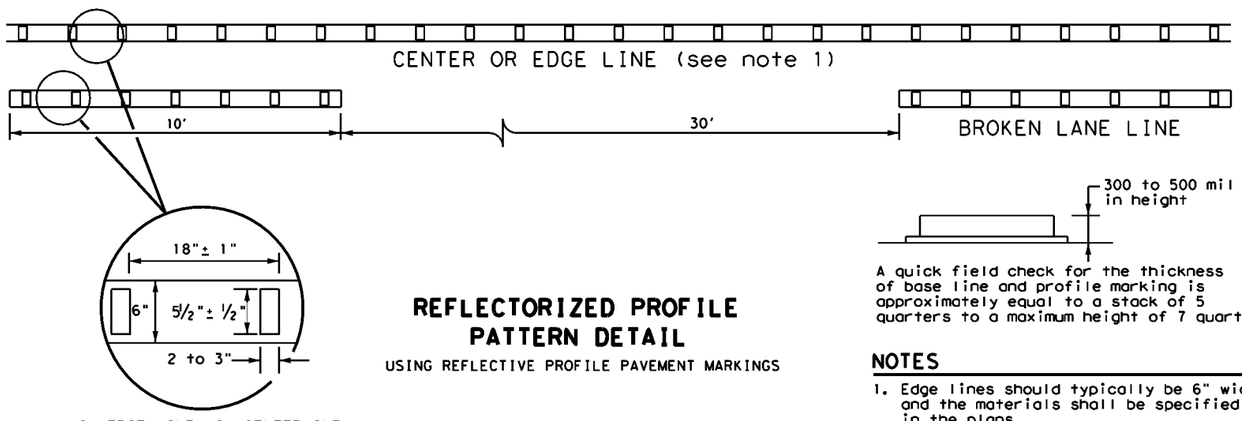


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		220

22B

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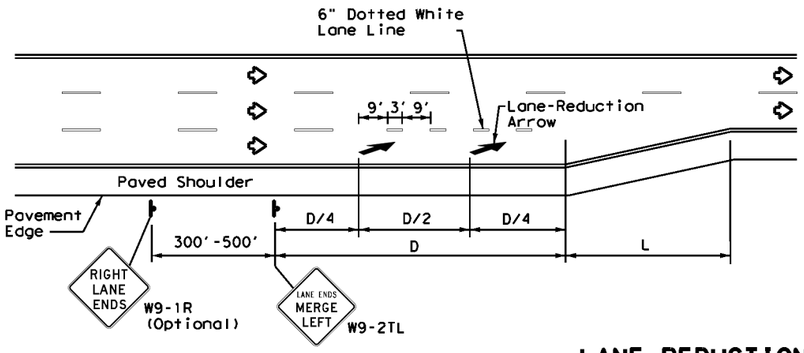


LANE REDUCTION

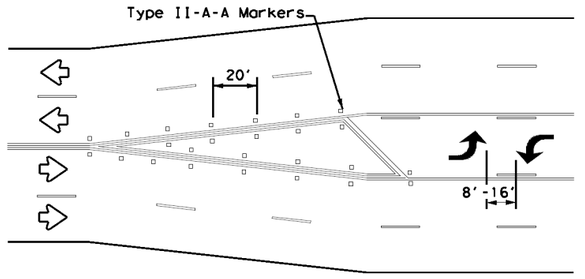
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

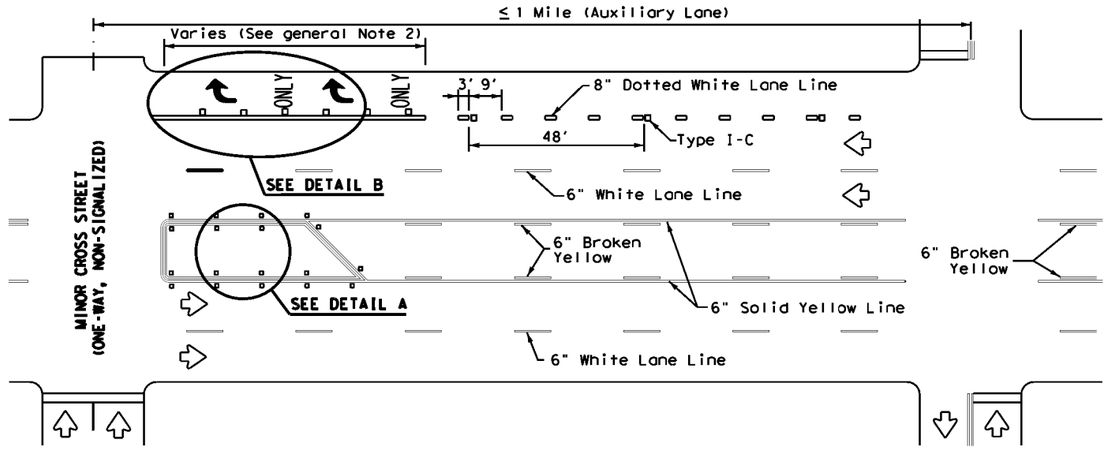


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

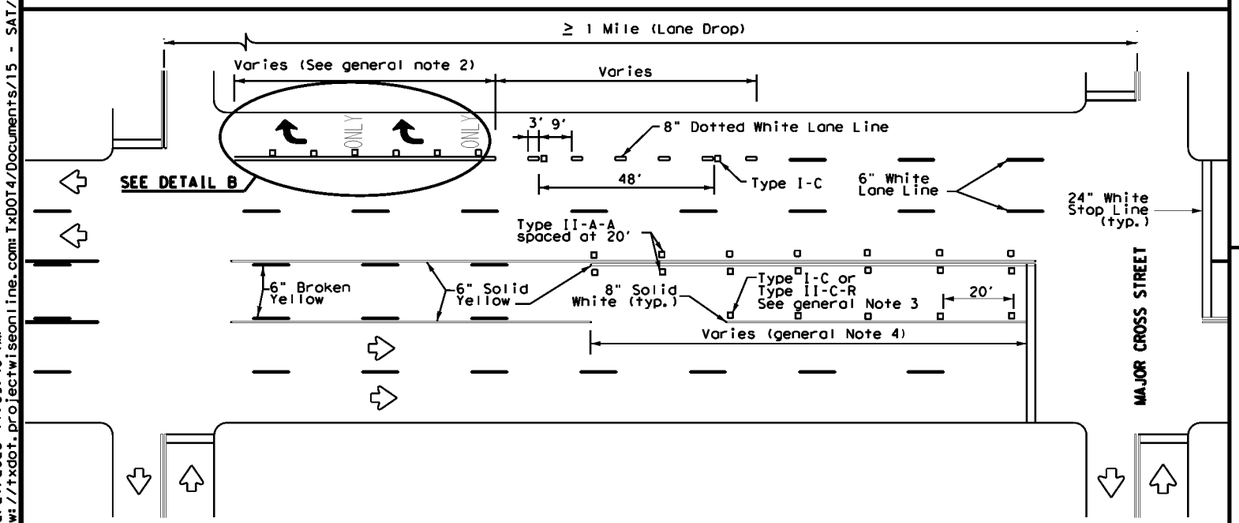
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

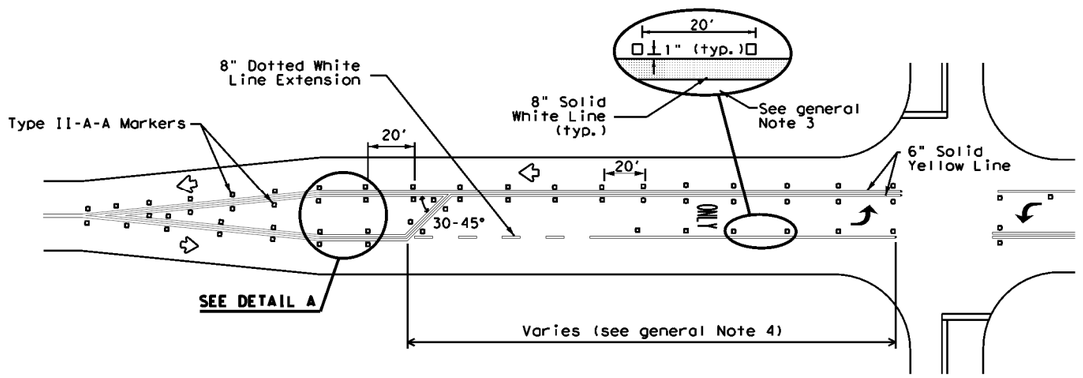
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



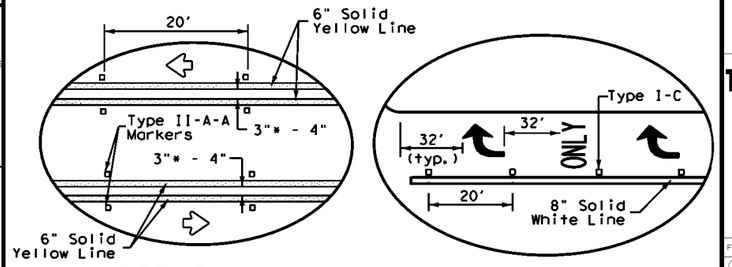
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0073	13	012	UA 281
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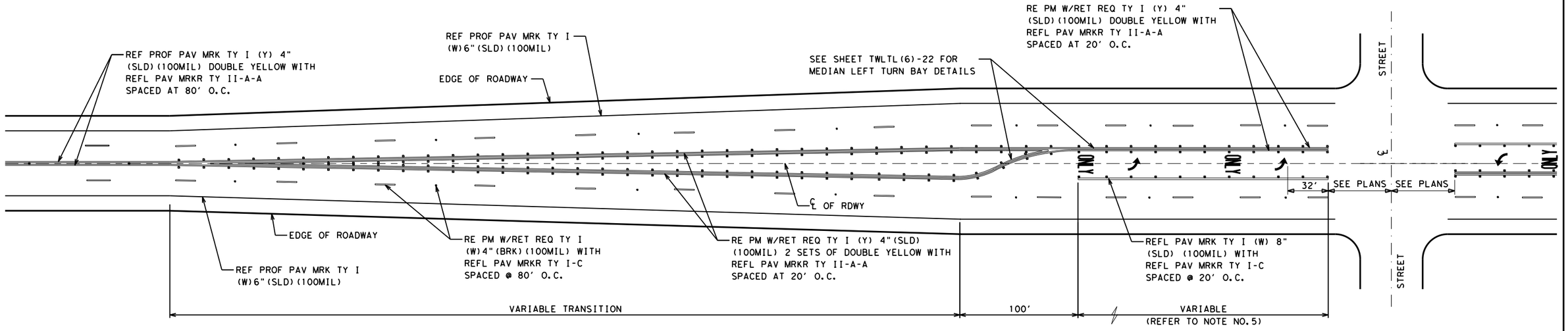
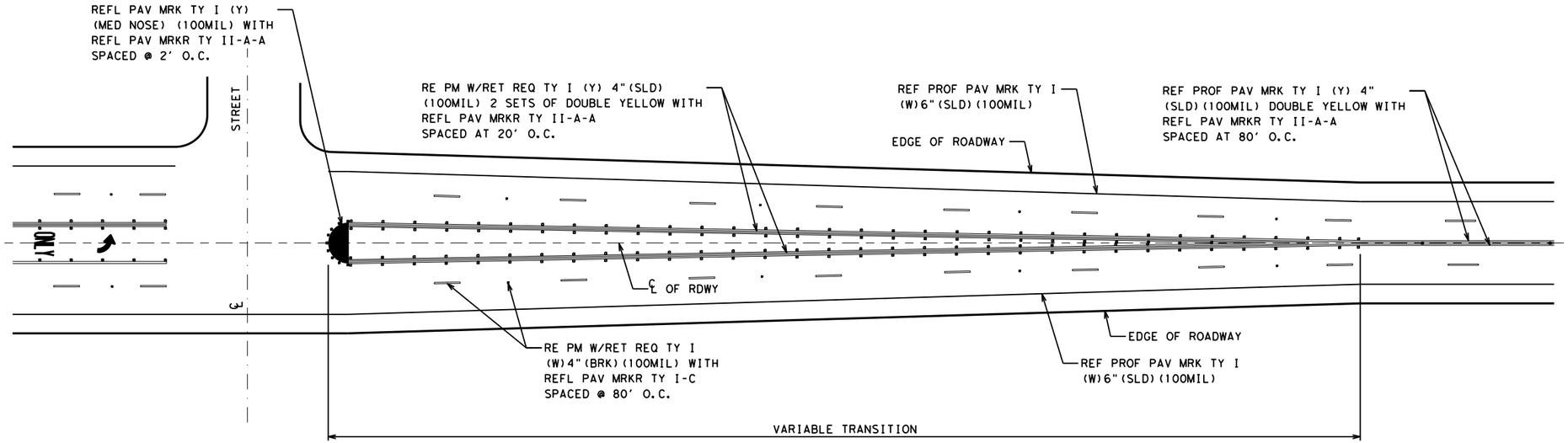
	SAT	ATASCOSA		221

22C



TYPICAL MEDIAN LEFT TURN BAY (FOR USE ON RURAL ROADS)

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
WITH LEFT TURN BAY

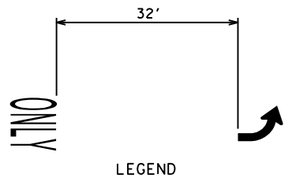


TYPICAL TRANSITION

LEFT TURN BAY END CONDITION AND ROADWAY TRANSITION

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
4. REFER TO TXDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
5. REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.



LEGEND

TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-20)

Texas Department of Transportation
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San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - RURAL ROADS

SCALE: NS — **TWLTL(1)-22**

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
MAY 2010 MAY 2018 MAY 2022	6	BR 2024(971)		222
	STATE	DIST.	COUNTY	
	TEXAS	SAT	ATASCOSA	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0073	13	012	UA 281

pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/00731302/4 - Design/TWLTL(1)-22.dgn REVISED BY: G.G./DMG REVISED BY: JD03 DRAWN BY: TED

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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 435728B
Crossing Type: PUBLIC, AT-GRADE
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 54.43
RR Subdivision: Corpus Christi
City: Three Rivers
County: Atascosa
CSJ at this Crossing: 0073-13-012
Latitude: 28.7511727
Longitude: -98.3082606

Scope of Work, including any TCP, to be performed by State Contractor:

Replace Bridge and approaches off of RR ROW.
TCP to include one-way traffic control and full closure of bridge over Atascosa River
Impacts to Railroad may include heavier traffic back-ups at crossing due to detour routes.
Non-invasive work.
Any contraflow must be approved in writing by the railroad.

Scope of Work to be performed by Railroad Company:

none

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 21

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad
Railroad Emergency Line at: 1800-848-8715
Location: DOT 435728B
RR Milepost: 54.43
Subdivision: Corpus Christi

RRD Review Only
Initials: _____
Date: 09/12/2023

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf	DN: TxDOT	CK:	DW:	CK:		
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0073	13	012	UA 281		
6/2023	DIST	COUNTY		SHEET NO.		
	15	Atascosa		223		

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 435729H
Crossing Type: PUBLIC, AT-GRADE
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 53.66
RR Subdivision: Corpus Christi
City: Three Rivers
County: Atascosa
CSJ at this Crossing: 0073-13-012
Latitude: 28.7610437
Longitude: -98.3143717

Scope of Work, including any TCP, to be performed by State Contractor:

Replace Bridge and approaches off of RR ROW.
TCP to include one-way traffic control and full closure of bridge over Atascosa River
Impacts to Railroad may include heavier traffic back-ups at crossing due to detour routes.
Non-invasive work.
Any contraflow must be approved in writing by the railroad.

Scope of Work to be performed by Railroad Company:

none

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 21

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

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Contact Information for Flagging:

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Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

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Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

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Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

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☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

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In Case of Railroad Emergency
Call: Union Pacific Railroad
Railroad Emergency Line at: 1800-848-8715
Location: DOT 435729H
RR Milepost: 53.66
Subdivision: Corpus Chisti

RRD Review Only
Initials: _____
Date: 09/12/2023

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY
REVISIONS		0073	13	012		UA 281
6/2023		DIST	COUNTY			SHEET NO.
		15	Atascosa			224

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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 435730C
Crossing Type: Public, RR UNDER
RR Company Operating Track at Crossing: Union Pacific Railroad Company
RR Company Owning Track at Crossing: Union Pacific Railroad Company
RR MP: 51.980
RR Subdivision: Corpus Christi
City: Campbellton
County: Atascosa
CSJ at this Crossing: 0073-13-012
Latitude: 28.7844674
Longitude: -98.3199572

Scope of Work, including any TCP, to be performed by State Contractor:

Replace Bridge and approaches off of RR ROW.
TCP to include one-way traffic control and full closure of bridge over Atascosa River
Impacts to Railroad may include heavier traffic back-ups at crossing due to detour routes.
Non-invasive work.
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none

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No. of Days of Railroad Flagging Expected: 21

On this project, night or weekend flagging is:

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☑ Not Expected

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Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

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Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

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☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

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VII. RAILROAD SAFETY ORIENTATION

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Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad
Railroad Emergency Line at: 1800-848-8715
Location: DOT 435730C
RR Milepost: 51.980
Subdivision: Corpus Christi

RRD Review Only
Initials: MG
Date: 09/12/2023

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS	6/2023	0073	13	012		UA 281	
		DIST	COUNTY			SHEET NO.	
		15	Atascosa			225	

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		226

DATE: 12/27/2023 11:43:41 AM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Correspondence/Railroad/Non Bridge-Projects (2).dgn

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of $\frac{1}{4}$ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		227

DATE: 12/27/2023 11:44:29 AM
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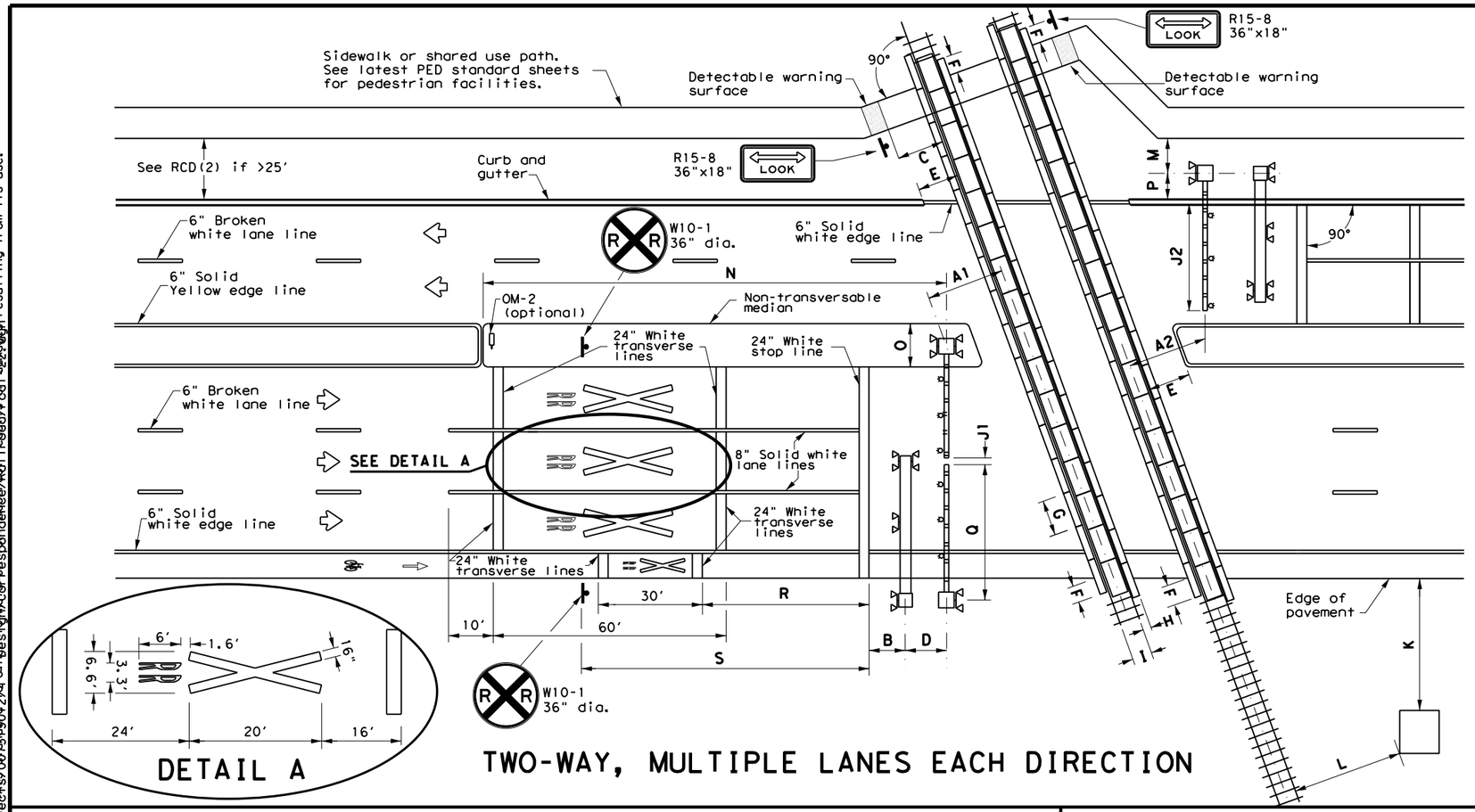


NOTES

A1: Center of RR mast to center of rail: 12' minimum, 15' typical.

A2: Tip of gate to center of rail: 12' minimum, 15' typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).

C: Near edge of detectable warning surface to nearest rail: 12' minimum.

D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8' typical.

H: Width of field panel: 2' typical (check with railroad company).

I: Distance between rails: 4'- 8'1/2".

J1: Tip of gate to tip of gate: 2' maximum.

J2: 90% of traveled roadway to be covered by gate.

K: Nearest edge of RR cabinet from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabinet from nearest rail: 25' typical.

M: Center of RR mast to edge of sidewalk: 6' minimum.

N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60'will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.

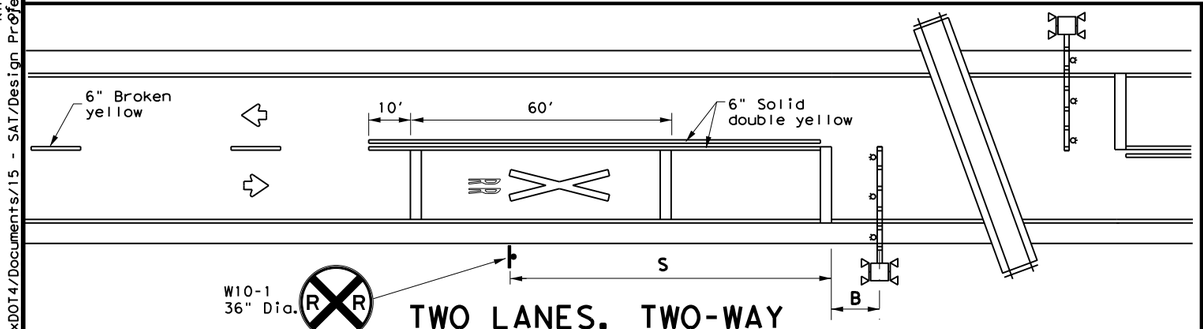
O: Width of median for RR gate assembly: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 5'-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 7' minimum.
Center of RR mast to edge of pavement (no shoulder): 9'-3" minimum.
NOTE: Final location determined by the railroad company.

Q: Gate length: 28' or less typical, but railroad company may allow up to 32' under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.



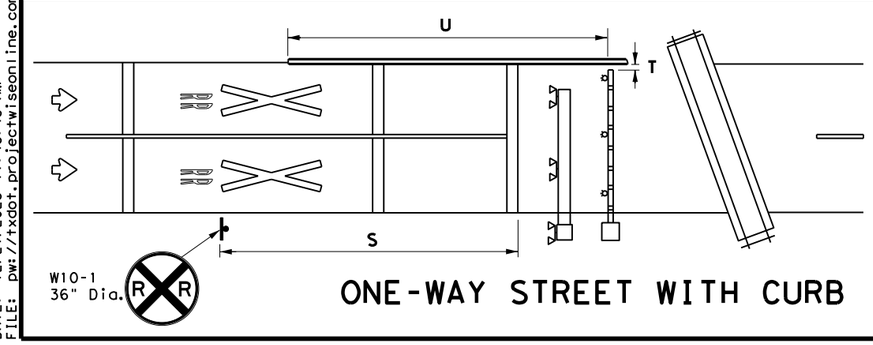
TWO LANES, TWO-WAY

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

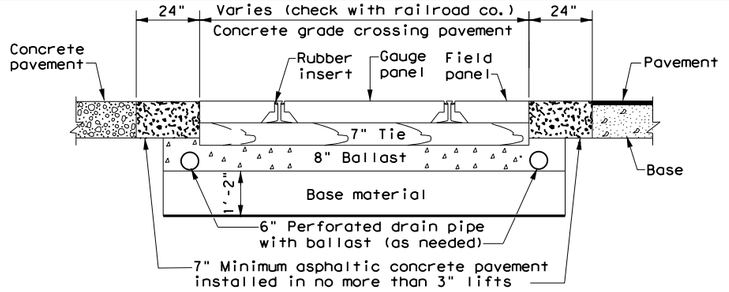


ONE-WAY STREET WITH CURB

NOTES

T: Tip of gate to edge of curb: 1' maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.

U: Non-traversable curb length from gate: 100' minimum for a Quiet Zone SSM, 10' minimum for all other locations.



CROSSING SURFACE CROSS SECTION

Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-22

FILE: rcd1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
2-16 11-22	DIST	COUNTY		SHEET NO.
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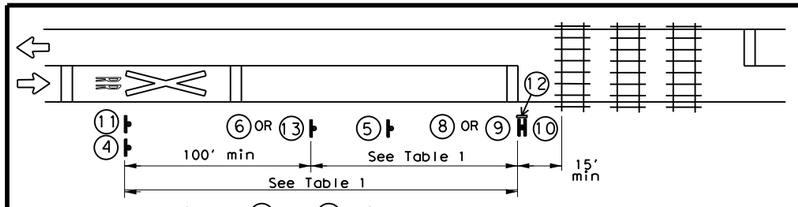
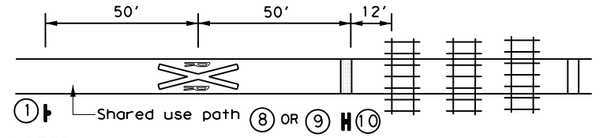


(if no (6) or (13) sign used)

PASSIVE CROSSING

NOTES

1. STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for further details about sign mounting arrangements.



NOTES

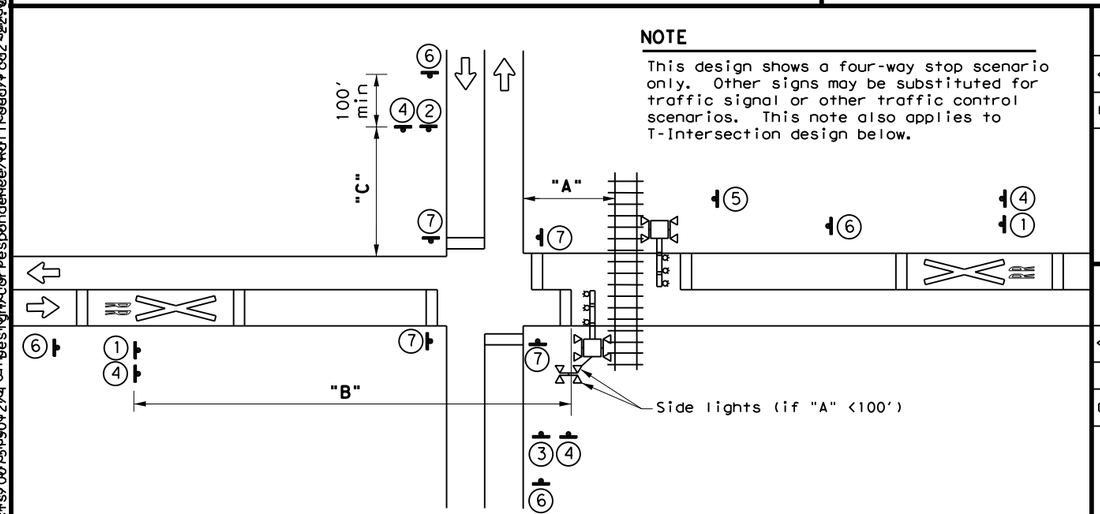
1. A shared use path is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS (R15-2P) plaque (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

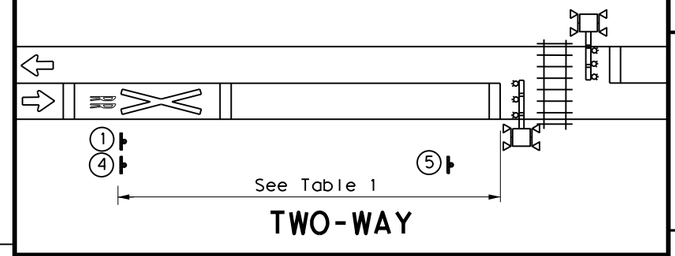


NOTE

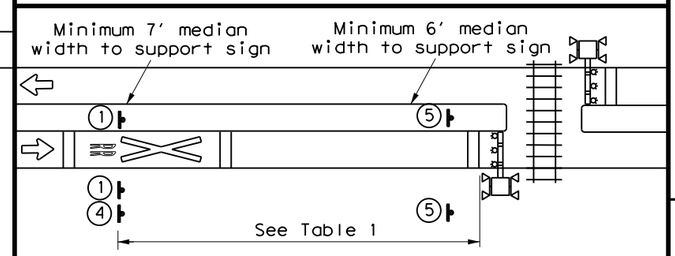
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

	"A" <100'	"A" ≥100'
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

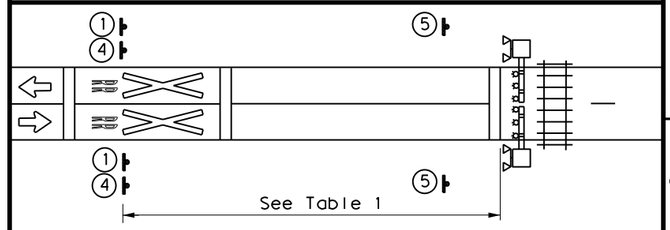
GRADE CROSSING NEAR A PARALLEL STREET



TWO-WAY



TWO-WAY WITH MEDIAN



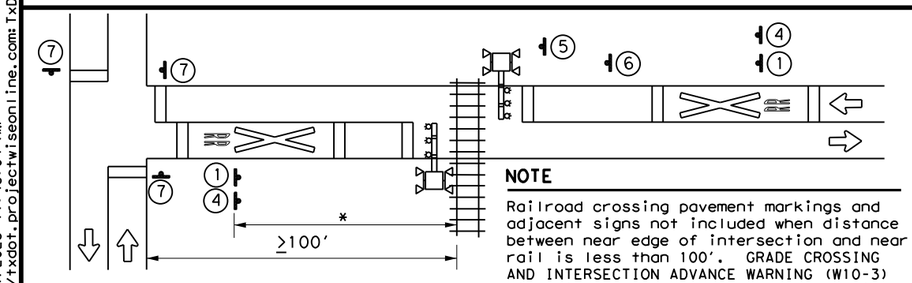
ONE-WAY

SIGNS

** R R — 1 W10-1 36" Dia.	** — 2 W10-2L 36" X 36"	** — 3 W10-2R 36" X 36"	IF NEEDED — 4 W10-5 36" X 36"; LOW GROUND CLEARANCE W10-5P 30" X 24"
IF NEEDED — DO NOT STOP ON TRACKS — 5 R8-8 24" X 30"	IF NEEDED — 6 W3-1 30" X 30"	7 STOP R1-1 36" X 36"; ALL WAY R1-3P 18" X 6"	RAIL CROSSING ROAD 3 TRACKS R15-1 48" X 9"; R15-2P 27" X 18"; STOP R1-1 36" X 36" — 8
RAIL CROSSING ROAD 3 TRACKS R15-1 48" X 9"; R15-2P 27" X 18"; YIELD — 9 R1-2 48" X 48" X 48"	RAIL CROSSING ROAD 3 TRACKS R15-1 48" X 9"; R15-2P 27" X 18" — 10	R R W10-1 36" Dia.; NO GATES OR LIGHTS W10-13P 30" X 24" — 11 **	REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H — Sign may be placed perpend. to travel lanes. — 12 I-13 15" X 9"
IF NEEDED — 13 W3-2 30" X 30"			

** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

NO TRAIN HORN W10-9P 30" X 24"

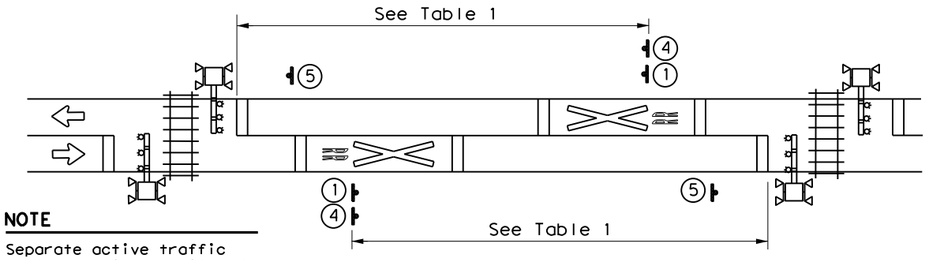


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100'. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.

TWO ADJACENT CROSSINGS

Texas Department of Transportation — Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-22

FILE: rcd2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
2-16 11-22	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		229

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

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

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0073-13-012

1.2 PROJECT LIMITS:
From: AT ATASCOSA RIVER

To:

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 28.750469° (N) ,(Long) 98.306797° (W)

END: (Lat) 28.748803° (N) ,(Long) 98.304739° (W)

1.4 TOTAL PROJECT AREA (Acres): 8.17

1.5 TOTAL AREA TO BE DISTURBED (Acres): 5.17

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Bridge replacement consisting of replace bridge and approaches.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Alluviam (Qal)	Generally composed of unconsolidated gravel, sand, silt, and clay. Has high clay content.
Fluviate Terrace Deposits (Qt)	Primarily composed of sand, silt, clay, and gravel.
Manning, Wellborn, Caddell Formations Undivided (Emwc) - Clay	Consists of the Manning Formation: clay, tuff and sandstone. Wellborn Sandstone: fine to coarse grained, tuffaceous and light gray. Cadell Formation: mostly tuffaceous and blocky siltstone, bentonitic and fossiliferous clay and very fine grained, light gray to olive sandstone.
Manning, Wellborn, Caddell Formations Undivided (Emwc) - Mudstone	

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

☒ Mobilization
☒ Install sediment and erosion controls
☒ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☒ Grading operations, excavation, and embankment
☒ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☒ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☒ Install mow strip, MBGF, bridge rail
☒ Place flex base
☒ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
	ATASCOSA RIVER SEGMENT 2107

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	BR 2024(971)		230
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	ATASCOSA	
CONT.	SECT.	JOB	HIGHWAY NO.
0073	13	012	UA 281

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- [X] [X] Protection of Existing Vegetation
- [ ] [ ] Vegetated Buffer Zones
- [X] [ ] Soil Retention Blankets
- [ ] [ ] Geotextiles
- [ ] [ ] Mulching/ Hydromulching
- [ ] [ ] Soil Surface Treatments
- [X] [ ] Temporary Seeding
- [ ] [ ] Permanent Planting, Sodding or Seeding
- [ ] [ ] Biodegradable Erosion Control Logs
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Vertical Tracking
- [ ] [ ] Interceptor Swale
- [ ] [X] Riprap
- [ ] [ ] Diversion Dike
- [ ] [ ] Temporary Pipe Slope Drain
- [X] [X] 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
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Sandbag Berms
- [X] [ ] Sediment Control Fence
- [X] [ ] Stabilized Construction Exit
- [ ] [ ] Floating Turbidity Barrier
- [ ] [ ] Vegetated Buffer Zones
- [ ] [ ] Vegetated Filter Strips
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- [ ] [ ] Sediment Trap
  - [ ] Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - [ ] 3,600 cubic feet of storage per acre drained
- [ ] [ ] Sedimentation Basin
  - [X] Not required (<10 acres disturbed)
  - [ ] Required (>10 acres) and implemented.
    - [ ] Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - [ ] 3,600 cubic feet of storage per acre drained
  - [ ] Required (>10 acres), but not feasible due to:
    - [ ] Available area/Site geometry
    - [ ] Site slope/Drainage patterns
    - [ ] Site soils/Geotechnical factors
    - [ ] Public safety
    - [ ] Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
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:

- [X] Excess dirt/mud on road removed daily
- [X] Haul roads dampened for dust control
- [X] Loaded haul trucks to be covered with tarpaulin
- [X] Stabilized construction exit
- [ ] Daily street sweeping
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- [X] Chemical Management
- [X] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [X] Dust Control
- [X] Sanitary Facilities
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
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:

- [X] Fire hydrant flushings
- [X] Irrigation drainage
- [X] Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- [X] Potable water sources
- [X] Springs
- [X] Uncontaminated groundwater
- [X] Water used to wash vehicles or control dust
- [X] Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

© 2023

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	BR 2024(971)		231
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	ATASCOSA	
CONT.	SECT.	JOB	HIGHWAY NO.
0073	13	012	UA 281

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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. Atascosa River
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.
4.

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 appropiate 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. Based on the age of the truss bridge on this project, non-galvanized bridge members are assumed to contain lead-based paint. The torching, grinding, or mechanical cutting of the bridge members is not recommended without the use of proper personal protective equipment (i.e. respirators). The removal of the paint system must comply with Item 446 "Field Cleaning and Painting Steel" in TxDOT's Standard Specification Book 2014. The contractor shall contact TxDOT's Project Engineer 30 days in advance of removal work. TxDOT's Specialty Contractor will abate the lead paint from the torch cut points prior to removal of the bridge (if requested by the Contractor).

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

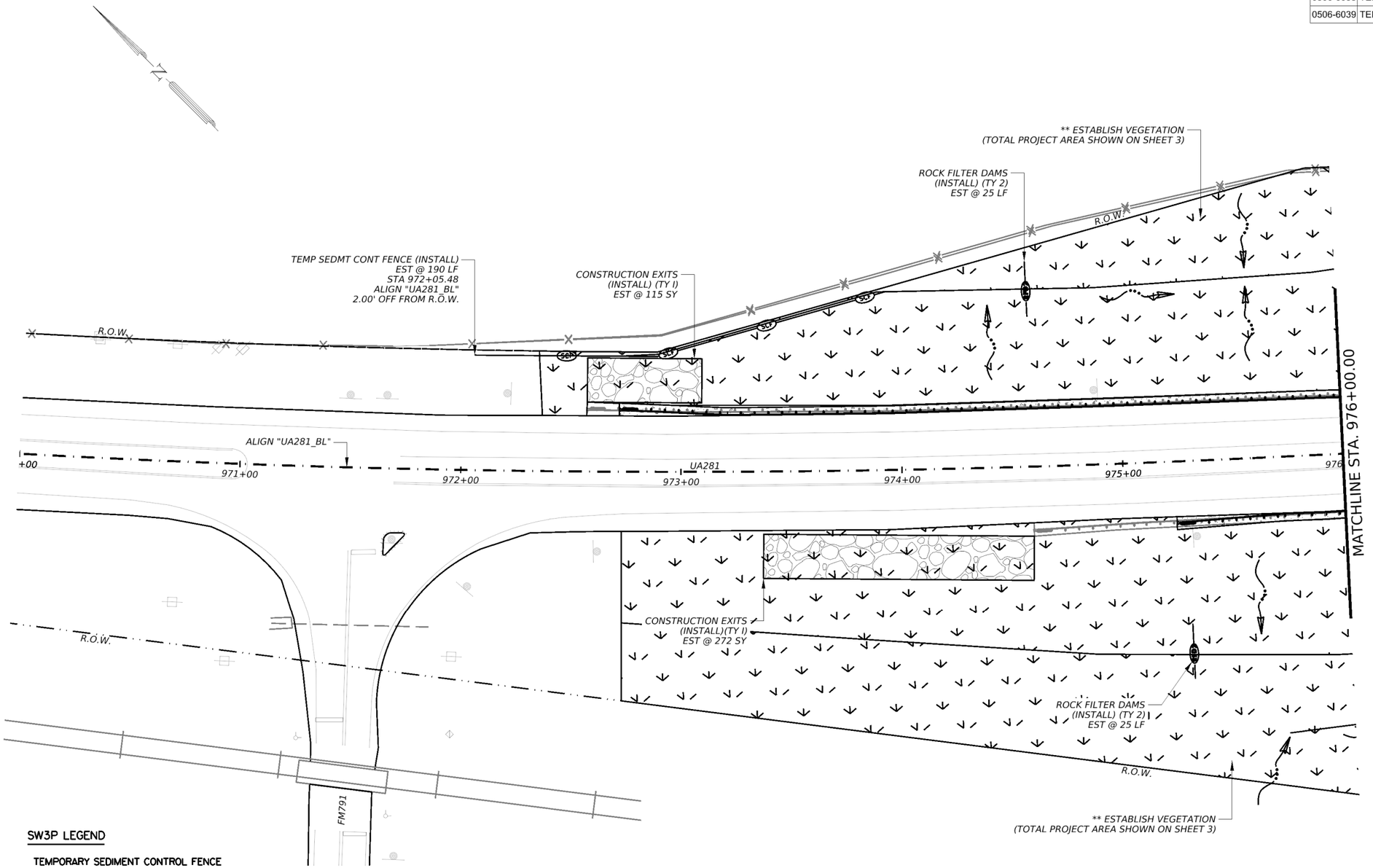
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
©TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		232

DESIGN: SG | DRAFT: SG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
0506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	50
0506-6011	ROCK FILTER DAMS (REMOVE)	LF	50
0506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	387
0506-6024	CONSTRUCTION EXITS (REMOVE)	SY	387
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	190
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	190



SW3P LEGEND

- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM (TYPE 2)
- RFD3 — ROCK FILTER DAM (TYPE 3)
- FLOWLINE
- CONSTRUCTION EXIT
- VEGETATIVE STABILIZATION

SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURES STANDARD SHEETS EC(1)-16 THRU EC(9)-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. **ESTABLISH VEGETATION:
   FOR THIS SHEET, THE AREA CALCULATION CORRELATES TO THE FOLLOWING ESTIMATE BID ITEMS: 0161, 0164, 0166, 0168, AND 0169.
   ALL ESTABLISHMENT AREAS TO RECEIVE:
   TEMPORARY SEEDING, 4" OF COMPOST, PERMANENT SEEDING, FERTILIZER, & WATER.
   REFER TO GENERAL NOTES AND 2014 SPEC. BOOK FOR ADDITIONAL INFO.
4. COLLABORATE THE PLACEMENT OF CONSTRUCTION EXITS IN FIELD.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
SW3P
LAYOUT

SHEET: 1 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		233

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DESIGN: SG | DRAFT: SG | CHECK: AG

QUANTITY SUMMARY CSJ: 0073-13-012			
ITEM NO.	ITEM	UNIT	QUANTITY
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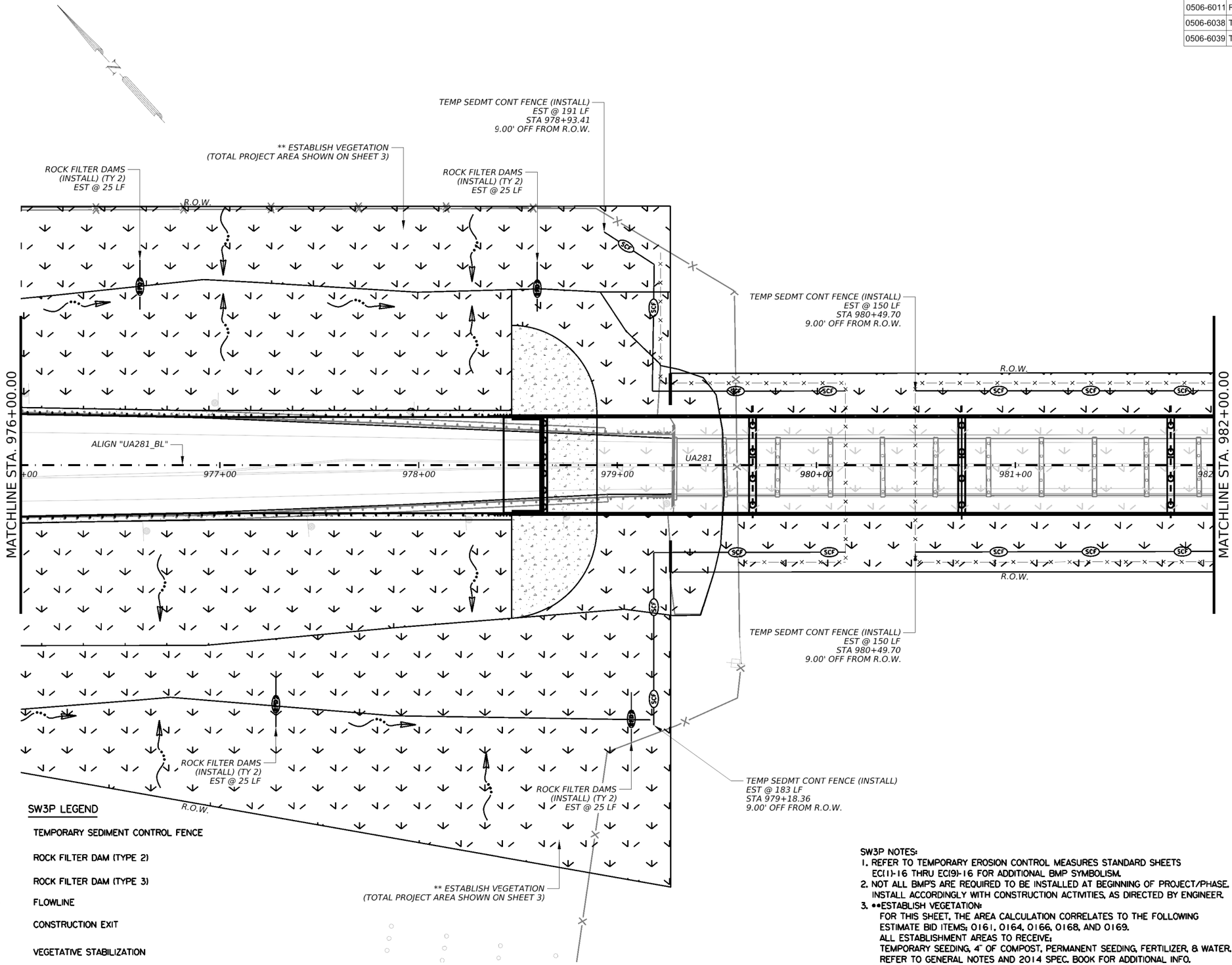
0506-6011	ROCK FILTER DAMS (REMOVE)	LF	100
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	674
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	674



SW3P LEGEND

- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM (TYPE 2)
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- FLOWLINE
- CONSTRUCTION EXIT
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4. COLLABORATE THE PLACEMENT OF CONSTRUCTION EXITS IN FIELD.

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024
ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
SW3P
LAYOUT

SHEET: 2 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		234

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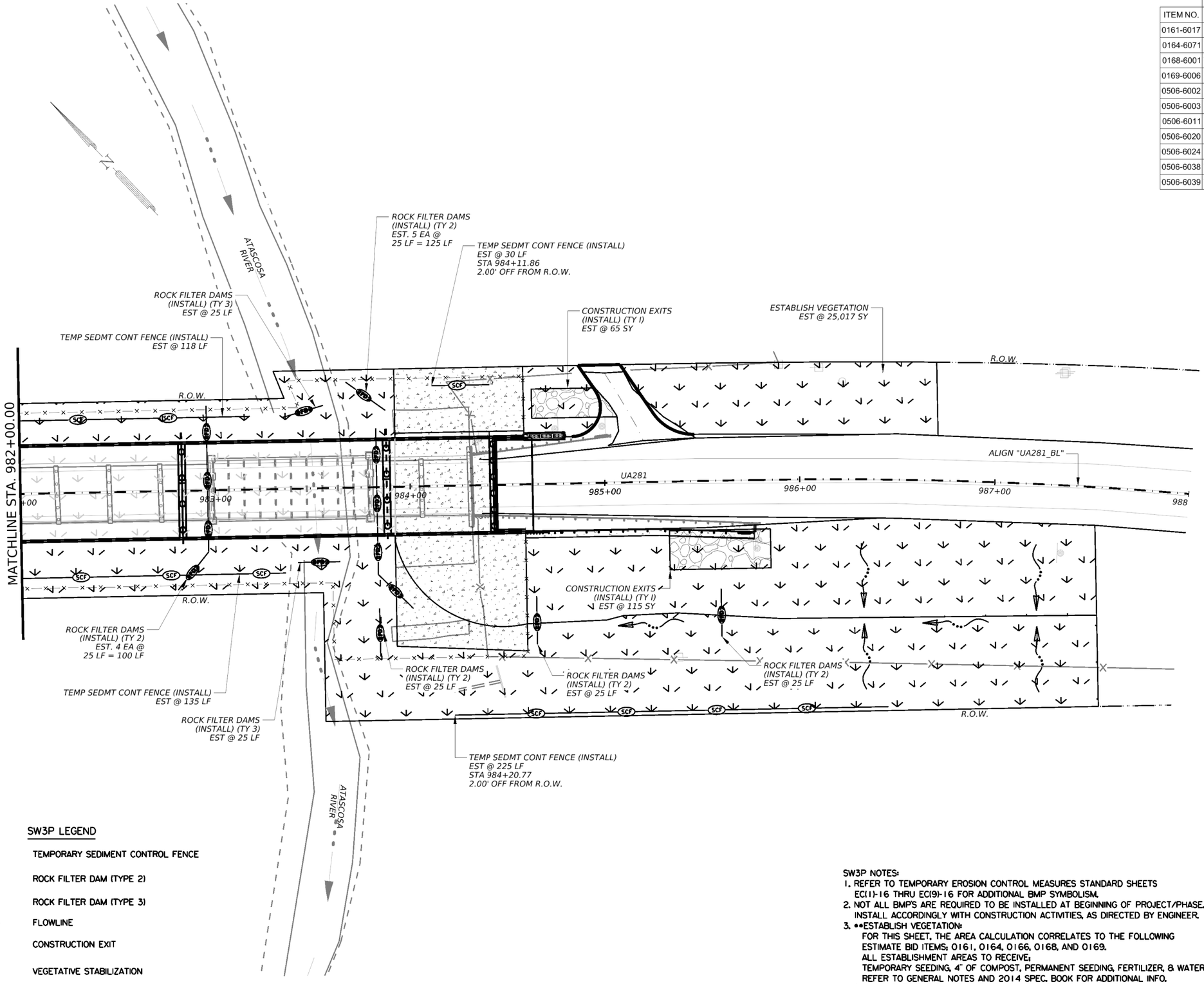

QUANTITY SUMMARY CSJ: 0073-13-012

ITEM NO.	ITEM	UNIT	QUANTITY
0161-6017	COMPOST MANUF TOPSOIL (4")	SY	25017
0164-6071	BROADCAST SEED (TEMP)(WARM OR COOL	SY	25017
0168-6001	VEGETATIVE WATERING	MG	392
0169-6006	SOIL RETENTION BLANKETS (CL 2) (TY F)	SY	25017
0506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	300
0506-6003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF	50
0506-6011	ROCK FILTER DAMS (REMOVE)	LF	350
0506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	180
0506-6024	CONSTRUCTION EXITS (REMOVE)	SY	180
0506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	508
0506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	508

SW3P LEGEND

- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM (TYPE 2)
- RFD3 — ROCK FILTER DAM (TYPE 3)
- FLOWLINE
- CONSTRUCTION EXIT
- VEGETATIVE STABILIZATION

SW3P NOTES:

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STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/21/2024

ANDRES GARZA DATE

SCALE: 1"=50'

Texas Department of Transportation

UA 281
SW3P
LAYOUT

SHEET: 3 OF 3

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		235

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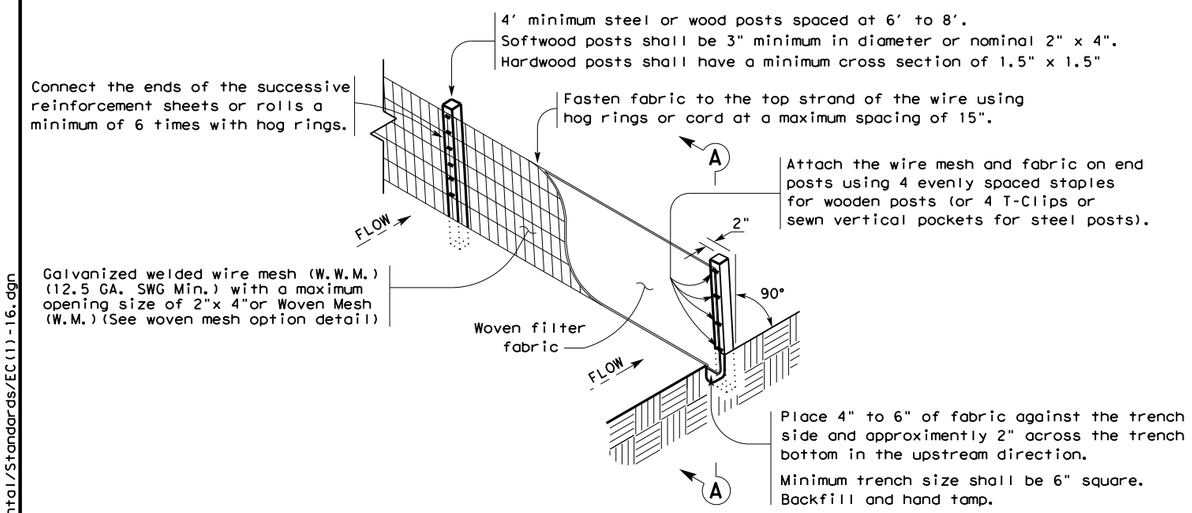
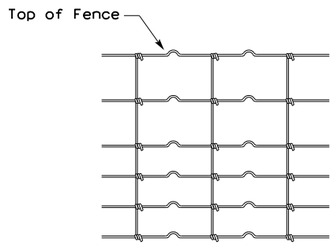
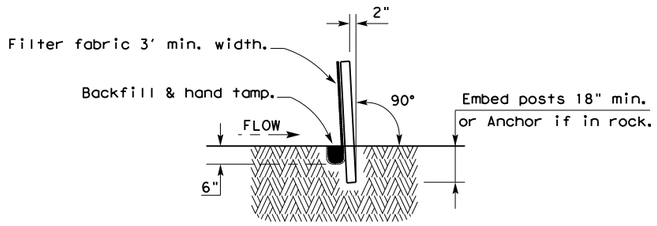


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

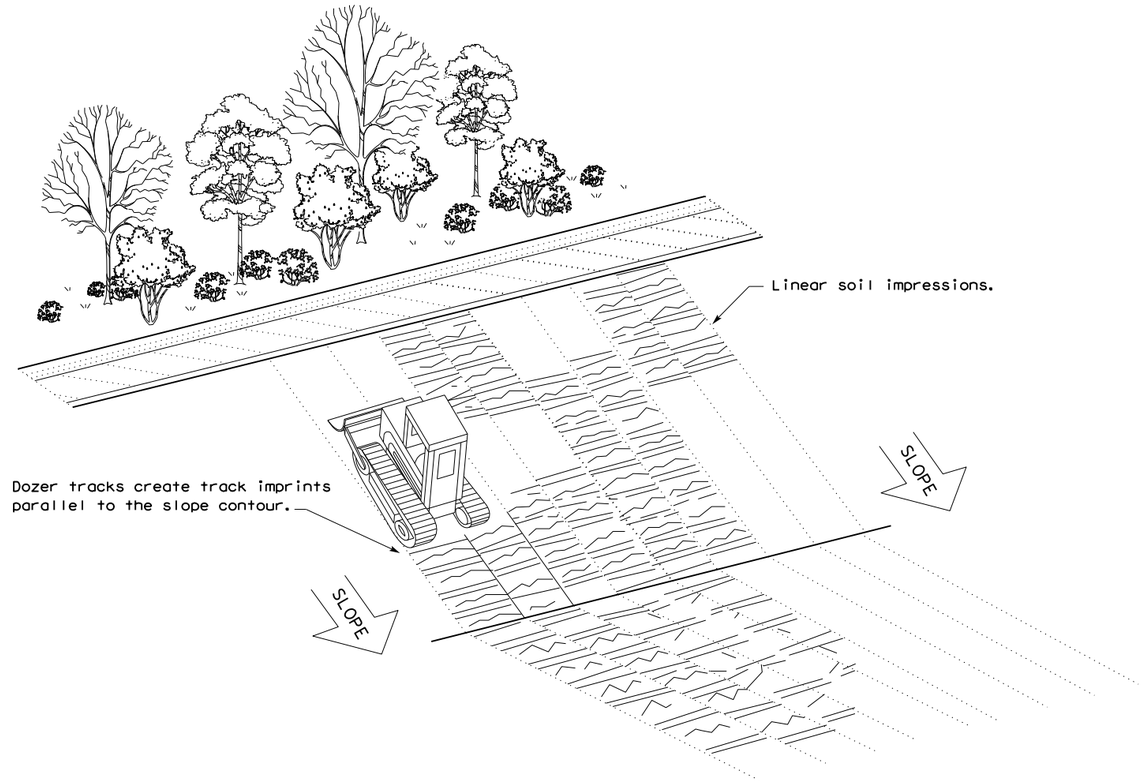
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		236

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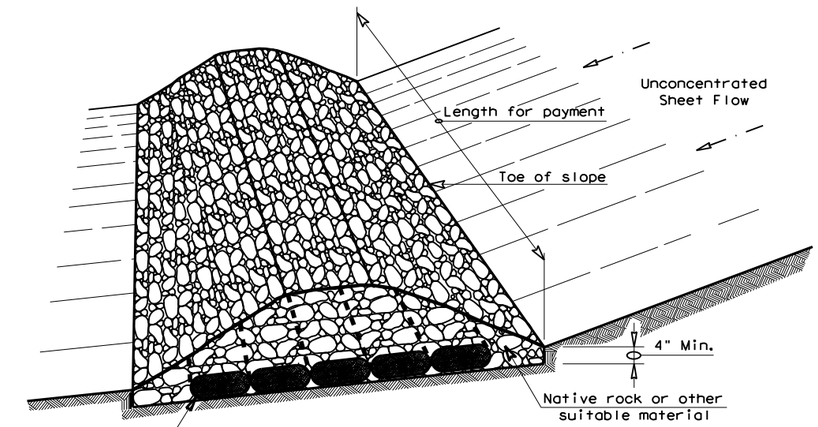
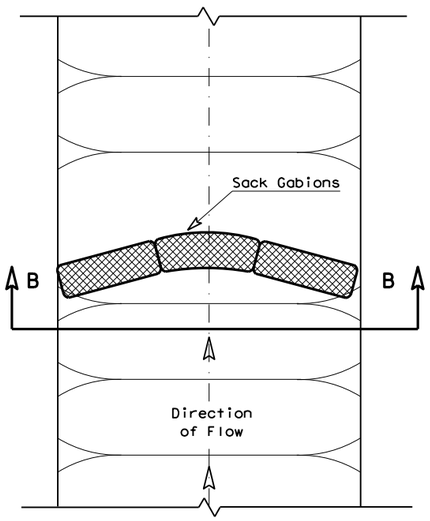
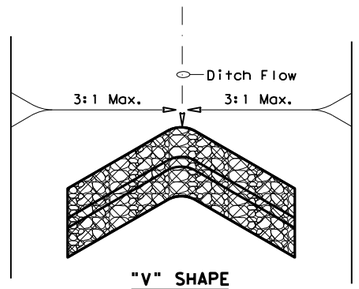


FILTER DAM AT TOE OF SLOPE

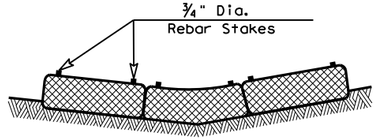
RFD1



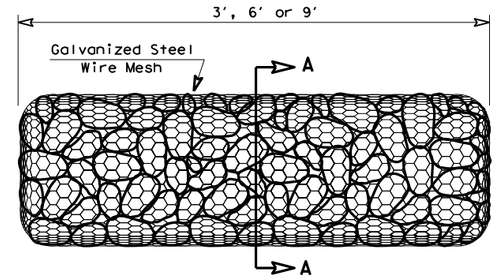
PLAN VIEW



"V" SHAPE PLAN VIEW

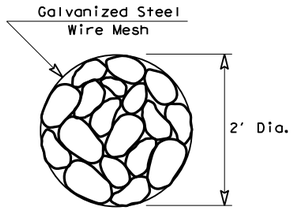


SECTION B-B

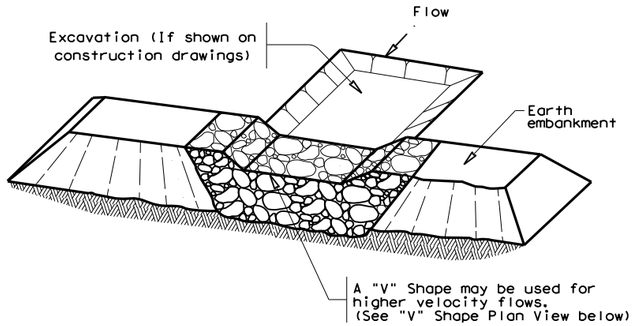


TYPE 4 (SACK GABIONS)

RFD4

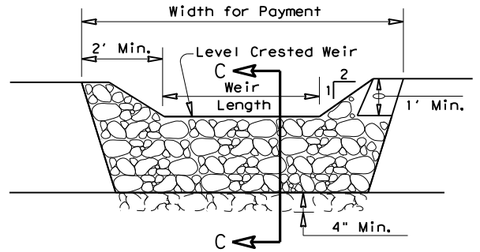


SECTION A-A

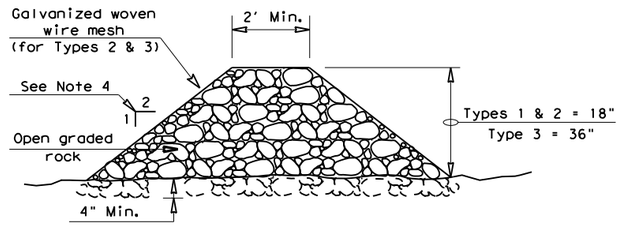


FILTER DAM AT SEDIMENT TRAP

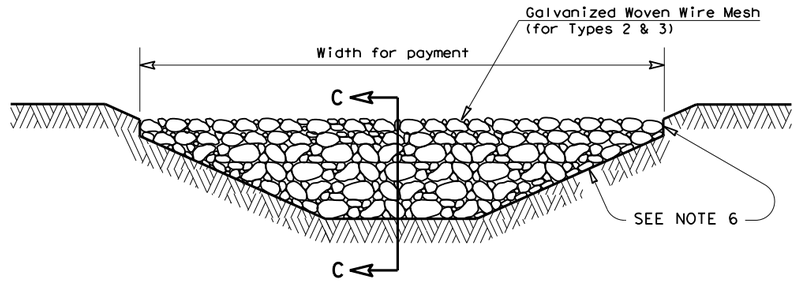
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

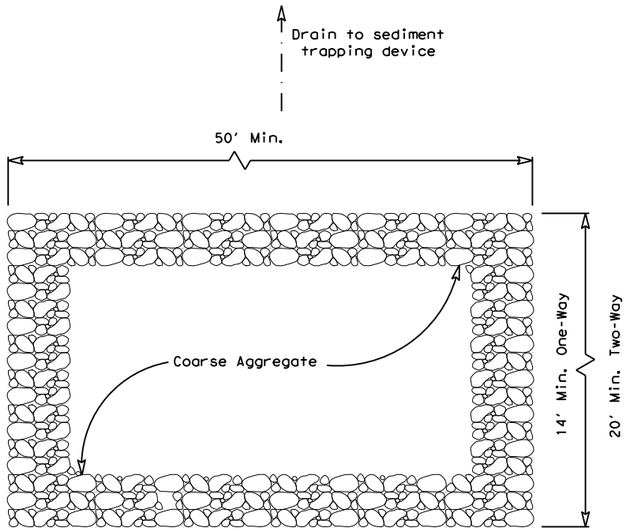
ROCK FILTER DAMS

EC(2)-16

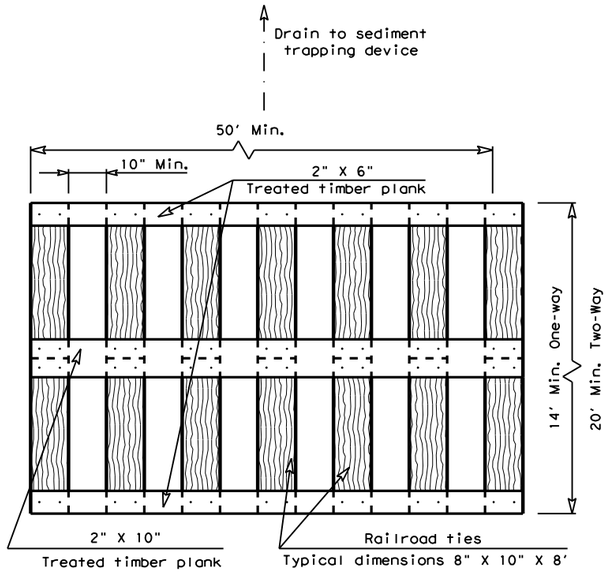
FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		237

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

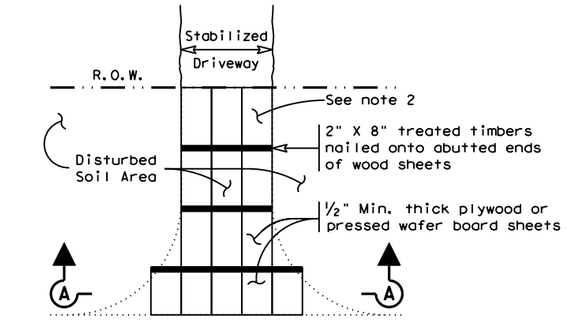
DATE: 12/27/2023
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/15 - SAT/Design Projects/0073130124 - Design/Plan Set/9. Environmental/Standards/EC(3)-16.dgn



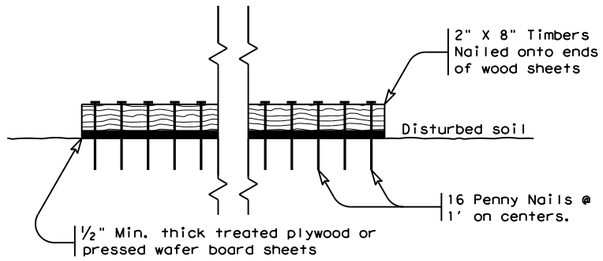
PLAN VIEW



PLAN VIEW



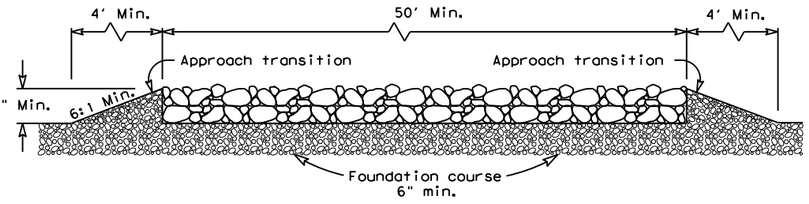
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

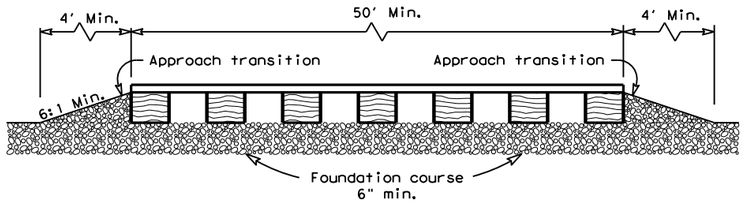
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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

GENERAL NOTES (TYPE 2)

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

GENERAL NOTES (TYPE 3)

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

Texas Department of Transportation

Design Division Standard

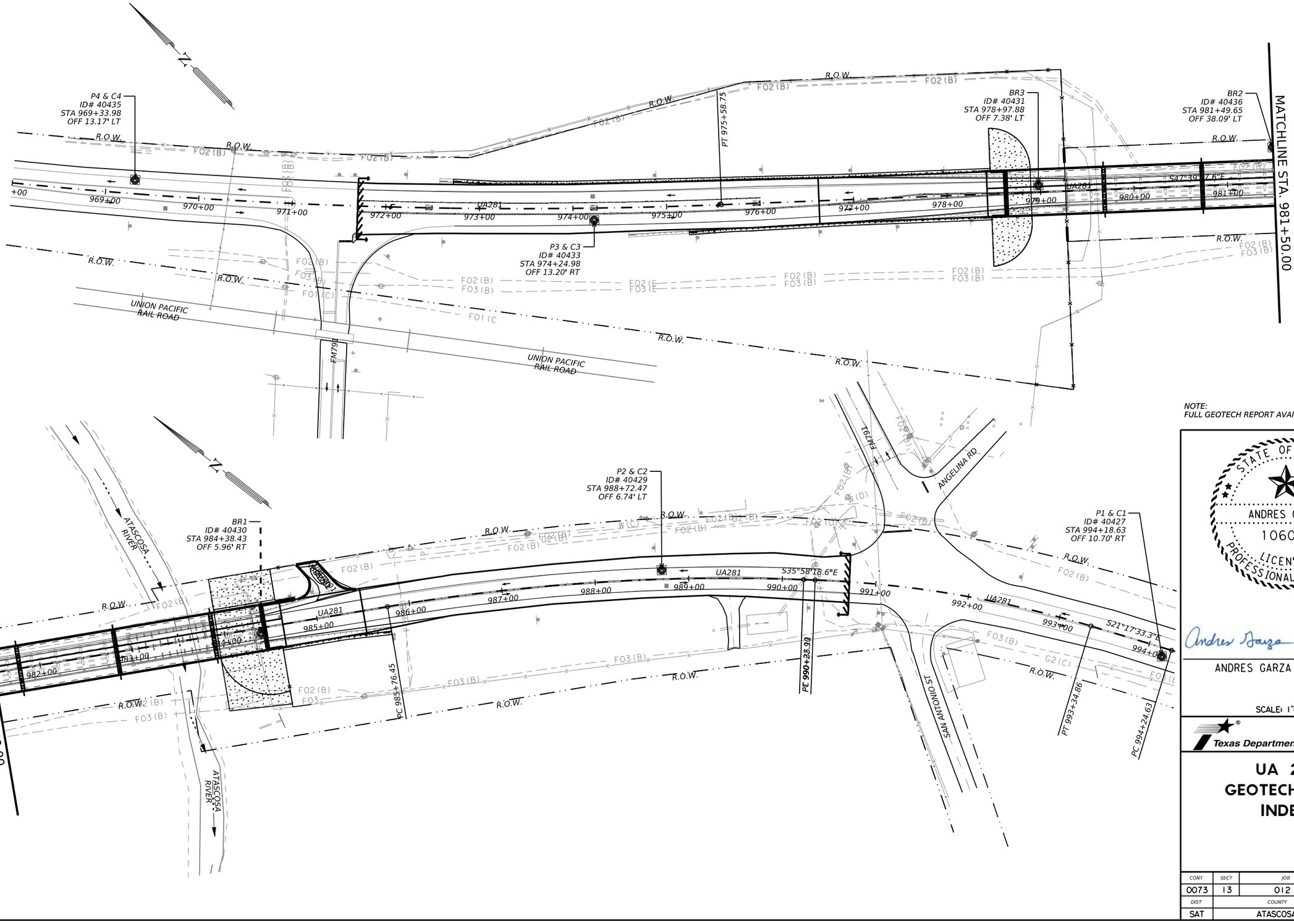
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	13	012	UA 281
	DIST	COUNTY		SHEET NO.
	SAT	ATASCOSA		238

DESIGN: JH | DRAFT: JH | CHECK: AG



NOTE:
FULL GEOTECH REPORT AVAILABLE UPON REQUEST

STATE OF TEXAS
ANDRES GARZA
106002
LICENSED PROFESSIONAL ENGINEER

Andres Garza P.E. 02/20/2024
ANDRES GARZA DATE

SCALE: 1"=100'

Texas Department of Transportation

UA 281 GEOTECHNICAL INDEX

SHEET: 1 OF 1

CONT	SECT	JOB	HIGHWAY
0073	13	012	UA 281
DIST	COUNTY		SHEET NO.
SAT	ATASCOSA		239

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	BR-1	District	San Antonio
Highway	US 281	Structure	Bridge	Date	03/15/23
CSJ	0073-13-012	Station	984+38.43	Grnd. Elev.	241.10 ft
		Offset	5.96' RT	GW Elev.	208.10 ft

Elev. (ft)	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
239.6		PAVEMENT, 7.5" asphaltic concrete, 10" tan to brown flex. base							
		SAND, dense, light brown to dark brown, moist, clayey. [Alluvium] (SC)			3.4				SS:22-27-26 Passing No. 200 Sieve= 14%
	40 (6) 43 (6)								SS:17-13-15
5					1.2				SS:14-15-14 -layer of poorly graded sand with clay (SP-SC) from 6-8 ft. Passing No. 200 Sieve= 9%
	36 (6) 50 (3.5)								SS:7-9-10
10					5.7				SS:31-23-21 Passing No. 200 Sieve= 35%
	31 (6) 50 (3)								
15									SS:40-35-30
222.1	50 (3.5) 50 (4)	CLAY, hard, brown, moist, lean, with sand. [Alluvium] (CL)			15.7	45	31		SS:30-22-30 Passing No. 200 Sieve= 80%
20									
217.1	50 (4) 50 (5.3)	SAND, dense, light brown brown and gray, moist, clayey. [Alluvium] (SC)			10.2				SS:20-23-23 Passing No. 200 Sieve= 37%
25									
	46 (6) 42 (6)								
30					21.9	30	14		SS:13-19-24 Passing No. 200 Sieve= 29%
	50 (2.3) 50 (3)								
35					21.8				-with gravel at 37' SS:25-40-50/3" Passing No. 200 Sieve= 43%
202.1	50 (5.3) 50 (3)								
40									

Remarks: Split-Spoon values are not standard (170-lb hammer 24-in drop). Boring advanced by dry drilling techniques to 70 ft.
Groundwater was encountered during drilling at 33 feet below existing ground surface elevation.
(N,E)= (13458689.8, 2191473.2)

Driller: Tero Drilling Logger: SCH Organization: HVJ SCTX

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	BR-1	District	San Antonio
Highway	US 281	Structure	Bridge	Date	03/15/23
CSJ	0073-13-012	Station	984+38.43	Grnd. Elev.	241.10 ft
		Offset	5.96' RT	GW Elev.	208.10 ft

Elev. (ft)	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
		CLAY, hard to very hard, light gray, moist, with sand. [Manning Wellborn Caddell Undivided] (CH)							SS:37-50/5"
196.1	50 (0.3) 50 (1)								
45		MUDSTONE, very hard, light gray to gray, slightly weathered, moderately fractured. [Manning Wellborn Caddell Undivided]							SS:50/2.5"
	50 (0) 50 (0)								
50					31.5				SS:50/4.5" Passing No. 200 Sieve= 92%
	50 (0) 50 (0)								
55									SS:50/1.5"
	50 (0) 50 (0)								
60									SS:50/1.5"
	50 (1) 50 (0)								
65					28.4				SS:50/4" Passing No. 200 Sieve= 67%
171.1	50 (0.3) 50 (0.3)								
70									

Remarks: Split-Spoon values are not standard (170-lb hammer 24-in drop). Boring advanced by dry drilling techniques to 70 ft.
Groundwater was encountered during drilling at 33 feet below existing ground surface elevation.
(N,E)= (13458689.8, 2191473.2)

Driller: Tero Drilling Logger: SCH Organization: HVJ SCTX

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STATE OF TEXAS
LEO RUIZ
97291
LICENSED PROFESSIONAL ENGINEER

08/23/2023

REV. NO.	DATE	DESCRIPTION	BY

HVJ ASSOCIATES

Texas Department of Transportation

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ALT US 281
BORING LOG

SHEET 1 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	240

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	BR-2	District	San Antonio
Highway	US 281	Structure	Bridge	Date	03/28/23
CSJ	0073-13-012	Station	981+49.65	Grnd. Elev.	222.00 ft
		Offset	38.09' LT	GW Elev.	207.00 ft

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
			SAND, loose to slightly compact, light brown, moist, poorly graded, with clay. [Alluvium] (SP-SC)			1.1				SS:7-5-5
										Passing No. 200 Sieve= 4%
		9 (6) 9 (6)								SS:5-5-4
5										
										SS:4-4-3
		15 (6) 14 (6)				4.1				SS:5-7-7
10										Passing No. 200 Sieve= 11%
										SS:1-2-3
		7 (6) 4 (6)								
15										
205.0			SAND, compact, light brown, moist, clayey. [Alluvium] (SC)			26.9				SS:4-6-6
										Passing No. 200 Sieve= 33%
		23 (6) 23 (6)								
20										
200.0			CLAY, hard to very hard, brown with gray mottling and dark gray to gray, moist. [Manning Wellborn Caddell Undivided] (CH)							SS:11-17-23
		36 (6) 46 (6)								
25						31.9	80	51		SS:14-22-37
										Passing No. 200 Sieve= 92%
		50 (3.3) 50 (2)								
30										
						29				SS:20-35-50/6"
188.0										Passing No. 200 Sieve= 81%
		50 (1) 50 (0.8)	MUDSTONE, hard to very hard, gray to dark gray, slightly weathered, moderately fractured. [Manning Wellborn Caddell Undivided]							-with sand below 33 ft.
35										
										SS:24-27-29
		50 (1) 50 (0.3)								
40										

Remarks: Split-Spoon values are not standard (170-lb hammer 24-in drop). Boring advanced by dry drilling techniques to 15 ft.
Groundwater was encountered during drilling at 15 feet below existing ground surface elevation.
(N,E)= (13458916.9, 2191289.4)

Driller: Tero Drilling Logger: SCH Organization: HVJ SCTX

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	BR-2	District	San Antonio
Highway	US 281	Structure	Bridge	Date	03/28/23
CSJ	0073-13-012	Station	981+49.65	Grnd. Elev.	222.00 ft
		Offset	38.09' LT	GW Elev.	207.00 ft

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
			MUDSTONE, hard to very hard, gray to dark gray, slightly weathered, moderately fractured. [Manning Wellborn Caddell Undivided]							
						28.1	74	46		SS:29-33-46
		50 (1.3) 50 (0.8)								Passing No. 200 Sieve= 70%
45										
										SS:35-42-48
		50 (1.3) 50 (0.5)								
50										
										SS:44-50/4"
		50 (1.3) 50 (0.3)								
55										
						32.5				SS:32-36-50/5.5"
										Passing No. 200 Sieve= 61%
		50 (1.5) 50 (1.5)								-sandy seam at 58-59 ft.
60										
										SS:30-34-50/5.5"
		50 (1.5) 50 (0.5)								
65										
										SS:37-50/5.75"
		50 (0.3) 50 (0.3)								
70										
						32.3				SS:50/5"
		50 (0.5) 50 (0.3)								Passing No. 200 Sieve= 91%
75										
										SS:50/5"
142.0		50 (1) 50 (0.8)								
80										

Remarks: Split-Spoon values are not standard (170-lb hammer 24-in drop). Boring advanced by dry drilling techniques to 15 ft.
Groundwater was encountered during drilling at 15 feet below existing ground surface elevation.
(N,E)= (13458916.9, 2191289.4)

Driller: Tero Drilling Logger: SCH Organization: HVJ SCTX

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STATE OF TEXAS
LEO RUIZ
97291
LICENSED PROFESSIONAL ENGINEER

08/20/2023

REV. NO.	DATE	DESCRIPTION	BY

HVJ ASSOCIATES

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ALT US 281
BORING LOG

SHEET 2 OF 5

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	241

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	BR-3	District	San Antonio
Highway	US 281	Structure	Bridge	Date	03/13/23
CSJ	0073-13-012	Station	978+97.88	Grnd. Elev.	240.90 ft
		Offset	7.38' LT	GW Elev.	208.40 ft

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
239.3			PAVEMENT, 11.5" asphaltic concrete, 8" tan to brown flex. base							
			SAND, compact, light brown, moist, clayey. [Fill] (SC)			6.4				SS:27-28-35 Passing No. 200 Sieve= 23%
		34 (6) 31 (6)								SS:18-21-20
5						5.3				SS:18-12-12 Passing No. 200 Sieve= 28%
		30 (6) 23 (6)								SS:15-13-14
10						5.5				SS:13-10-12 Passing No. 200 Sieve= 28%
		17 (6) 50 (5)								SS:19-19-15
15										
220.9		7 (6) 36 (6)	SAND, compact, light brown to brown and gray, moist, clayey. [Alluvium] (SC)			8.2				SS:10-10-15 Passing No. 200 Sieve= 36%
216.9		39 (6) 35 (6)	CLAY, very stiff, light brown and brown, moist, sandy [Alluvium] (CL)							
25						28.3				SS:7-9-13 Passing No. 200 Sieve= 53%
212.9			SAND, slightly compact, light brown to brown and gray, moist, clayey. [Alluvium] (SC)							
30		16 (6) 18 (6)				21.1	31	18		SS:20-18-22 Passing No. 200 Sieve= 38%
206.9		50 (4) 50 (5.5)	CLAY, hard, light brown and gray, moist, fat, with sand. [Manning Wellborn Caddell Undivided] (CH)							SS:26-26-30
35										
		50 (5.8) 50 (5.8)								
40										

Remarks: Split-Spoon values are not standard (170-lb hammer 24-in drop). Boring advanced by dry drilling techniques to 80 ft.
Groundwater was encountered during drilling at 32.5 feet below existing ground surface elevation.
(N,E)= (13459063.8, 2191082.7)

Driller: Tero Drilling Logger: SCH Organization: HVJ SCTX

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	BR-3	District	San Antonio
Highway	US 281	Structure	Bridge	Date	03/13/23
CSJ	0073-13-012	Station	978+97.88	Grnd. Elev.	240.90 ft
		Offset	7.38' LT	GW Elev.	208.40 ft

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
			CLAY, hard, light brown and gray, moist, fat, with sand. [Manning Wellborn Caddell Undivided] (CH)			38				SS:26-36-50/5.5" Passing No. 200 Sieve= 83%
45		50 (2.5) 50 (4)								
193.9			MUDSTONE, hard to very hard, gray, slightly weathered, moderately fractured. [Manning Wellborn Caddell Undivided]							SS:50/4.5"
50		50 (1) 50 (0.5)								SS:50/3.5"
55		50 (4) 50 (0.5)								-soft to hard at 53-57 ft.
										SS:50/5"
60		50 (1) 50 (0.5)				30.6				SS:50/3" Passing No. 200 Sieve= 82%
65		50 (0.3) 50 (0)								SS:50/4"
70		50 (0.3) 50 (0.3)								SS:50/3.5"
75		48 (6) 33 (6)				27				-soft 73-77 ft. SS:50/1.25" Passing No. 200 Sieve= 82%
160.9		50 (1) 50 (0.3)								
80										

Remarks: Split-Spoon values are not standard (170-lb hammer 24-in drop). Boring advanced by dry drilling techniques to 80 ft.
Groundwater was encountered during drilling at 32.5 feet below existing ground surface elevation.
(N,E)= (13459063.8, 2191082.7)

Driller: Tero Drilling Logger: SCH Organization: HVJ SCTX

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STATE OF TEXAS
LEO RUIZ
97291
LICENSED PROFESSIONAL ENGINEER
08/23/2023

REV. NO.	DATE	DESCRIPTION	BY

HVJ ASSOCIATES

Texas Department of Transportation
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ALT US 281
BORING LOG

SHEET 3 OF 5

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	242

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	P-1	District	San Antonio
Highway	US 281	Structure	Pavement	Date	03/13/23
CSJ	0073-13-012	Station	994+18.63'	Grnd. Elev.	239.50 ft
		Offset	10.70' RT	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
238.0			PAVEMENT, 7" asphaltic concrete, 11" tan to brown flex base.							
			SAND, loose to compact, dark brown to light brown, moist, clayey. [Fluviatile Terrace Deposits] (SC)			7.2	22	11		SPT:25-26-24 Passing No. 200 Sieve= 28%
										SPT:18-9-14
5						8.2	22	10		SPT:7-4-4 Passing No. 200 Sieve= 29%
										SPT:3-3-4
						9.4				SPT:4-8-9 Passing No. 200 Sieve= 28%
229.5										
10										

Remarks: Split-Spoon values are standard (140-lb hammer 30-in drop). Boring advanced by dry drilling techniques to 10 ft. Groundwater was not encountered during drilling activities.
(N,E)= (13457915.7, 2192048.6)

Driller: Tero Drilling **Logger: SCH** **Organization: HVJ SCTX**

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DRILLING LOG

WinCore Version 3.1

County	Atascosa	Hole	P-2	District	San Antonio
Highway	US 281	Structure	Pavement	Date	03/13/23
CSJ	0073-13-012	Station	988+72.47	Grnd. Elev.	241.40 ft
		Offset	6.74' LT	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
239.7			PAVEMENT, 9.5" asphaltic concrete, 12.5" tan to brown flex. base							
			SAND, loose, dark brown to light brown, moist, clayey. [Fluviatile Terrace Deposits] (SC)			5.8				Passing No. 200 Sieve= 17% SPT:16-49-50/5.5"
						11.8				SPT:6-6-10 Passing No. 200 Sieve= 42%
5										SPT:9-9-8
				0	71	12.8	31	19	134	PP = 4.5+ tsf Passing No. 200 Sieve= 46%
										PP = 4.5+ tsf
231.4										
10										

Remarks: Split-Spoon values are standard (140-lb hammer 30-in drop). Boring advanced by dry drilling techniques to 10 ft. Groundwater was not encountered during drilling activities.
(N,E)= (13458393.6, 2191790.7)

Driller: Tero Drilling **Logger: SCH** **Organization: HVJ SCTX**

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STATE OF TEXAS
LEO RUIZ
97291
LICENSED PROFESSIONAL ENGINEER

08/23/2023

REV. NO.	DATE	DESCRIPTION	BY

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ALT US 281
BORING LOG

SHEET 4 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	243

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DRILLING LOG

1 of 1

WinCore Version 3.1

County	Atascosa	Hole	P-3	District	San Antonio
Highway	US 281	Structure	Pavement	Date	03/13/23
CSJ	0073-13-012	Station	974+24.98	Grnd. Elev.	242.50 ft
		Offset	13.20' RT	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
240.9			PAVEMENT, 12" asphaltic concrete, 7" tan to brown flex. base							Passing No. 200 Sieve= 22%
			CLAY, soft, dark brown to light brown, moist, sandy. [Fill] (CL)			7.6				SPT:28-38-31
										SPT:9-7-7
5						14.6	30	19		SPT:8-7-8 Passing No. 200 Sieve= 51%
235.5			SAND, loose, to slightly compact, dark brown to light brown, moist, clayey. [Fluviatile Terrace Deposits] (SC)							SPT:9-14-21
						9.9				SPT:8-14-16 Passing No. 200 Sieve= 41%
232.5										
10										

Remarks: Split-Spoon values are standard (140-lb hammer 30-in drop). Boring advanced by dry drilling techniques to 10 ft. Groundwater was not encountered during drilling activities. (N,E)= (13459368.6, 2190720.2)

Driller: Tero Drilling **Logger: SCH** **Organization: HVJ SCTX**

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DRILLING LOG

1 of 1

WinCore Version 3.1

County	Atascosa	Hole	P-4	District	San Antonio
Highway	US 281	Structure	Pavement	Date	03/13/23
CSJ	0073-13-012	Station	969+33.98	Grnd. Elev.	242.50 ft
		Offset	13.17' LT	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
241.0			PAVEMENT, 11.25" asphaltic concrete, 6.75" tan to brown flex. base							
			SAND, loose to slightly ompact, dark brown to light brown, moist, clayey. [Fluviatile Terrace Deposits] (SC)			16	34	20		SPT:7-10-22 Passing No. 200 Sieve= 42%
										SPT:12-9-9
5										SPT:5-5-6
				0	22	12.7	24	13	137	PP = 2.75 tsf Passing No. 200 Sieve= 32%
						7.2				SPT:7-6-8 Passing No. 200 Sieve= 18%
232.5										
10										

Remarks: Split-Spoon values are standard (140-lb hammer 30-in drop). Boring advanced by dry drilling techniques to 10 ft. Groundwater was not encountered during drilling activities. (N,E)= (13459742, 2190400.6)

Driller: Tero Drilling **Logger: SCH** **Organization: HVJ SCTX**

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STATE OF TEXAS
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ALT US 281
BORING LOG

SHEET 5 OF 5

FED.RD. DIV.NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			UA 281
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
SAT	ATASCOSA	0073	13	012	244

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