

21	CONT	SECT	JOB	HIGHWAY
0914	18	111, etc.	CR 290, etc.	
	DIST	COUNTY	SHEET NO.	
AUS	BASTROP		1	

STATE OF TEXAS

DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL PROJECT NUMBER
BR 2B20(289), etc.

CSJ: 0914-18-111, etc.

CSJ: 0914-18-111
DESIGN SPEED **A. D. T.**
MAIN LANES: Meet or Exceeds existing conditions 2020: CURRENT 88 VPD
2040: FUTURE 123 VPD

CSJ: 0914-18-112
DESIGN SPEED **A. D. T.**
MAIN LANES: Meet or Exceeds existing conditions 2020: CURRENT 19 VPD
2040: FUTURE 27 VPD

CSJ	ROADWAY LENGTH		BRIDGE LENGTH		TOTAL LENGTH	
	(FT)	(MI)	(FT)	(MI)	(FT)	(MI)
0914-18-111	290.00	0.054	50.00	0.009	340.00	0.063
0914-18-112	274.00	0.051	50.00	0.009	324.00	0.060
TOTAL	564.00	0.105	100.00	0.018	664.00	0.123

FINAL PLANS

DATE OF LETTING: _____
DATE WORK BEGAN: _____
DATE WORK COMPLETED AND ACCEPTED: _____
FINAL CONTRACT COST: \$ _____
CONTRACTOR: _____
LIST OF APPROVED CHANGE ORDERS: _____

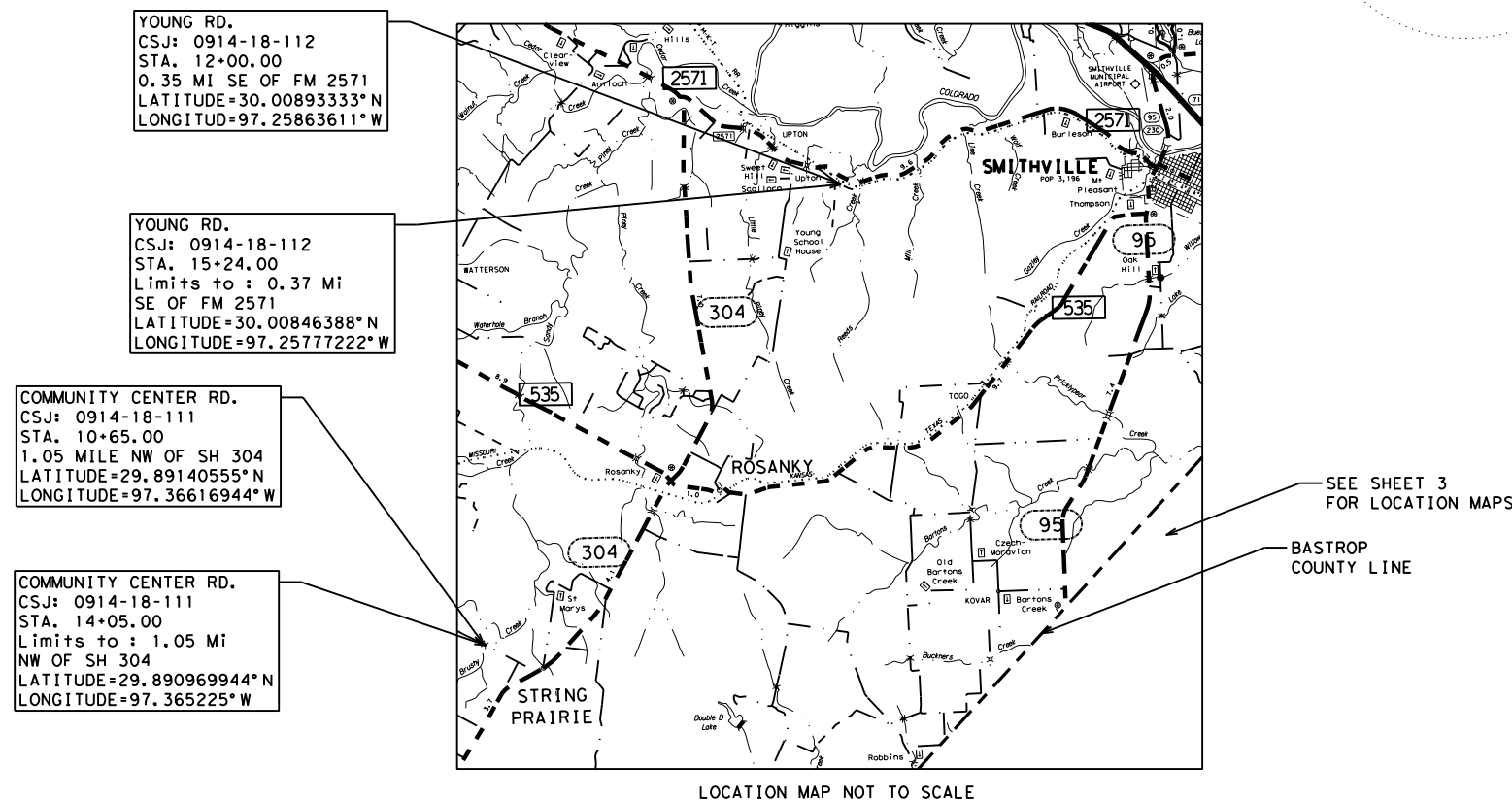
I CERTIFY THAT THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE FINAL AS-BUILT PLANS AND SPECIFICATIONS.

P. E. DATE

BASTROP COUNTY COMMUNITY CENTER RD

LIMITS FROM: 1.05 MILE NW OF SH 304, etc.
TO: STR# 14-011-0-AA02-90-001 AT BRUSHY CREEK, etc.

FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT
CONSISTING OF REPLACING BRIDGE AND APPROACHES



LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: EAST AND WEST UP CROSSING

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



SUBMITTED FOR LETTING: 3/28/2022

DocuSigned by:
Diana K. Schulzes P.E.
6775445255A3482...
AREA ENGINEER

RECOMMENDED FOR LETTING: 3/31/2022

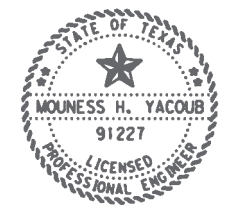
DocuSigned by:
Dwight M. Hillman, P.E.
198012497A804A0...
DISTRICT DESIGN ENGINEER

APPROVED FOR LETTING: 3/31/2022

DocuSigned by:
Heather Kelly-Nguyen
8912AF18F45A416...
DIRECTOR OF TRANSPORTATION
PLANNING & DEVELOPMENT

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	BRIDGE STANDARDS			
# 57	APSB-24			



>> THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

Mouness Yacoub P.E. P.E. 01/26/2022
 MOUNESS H. YACOUB, P. E. DATE



THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

DocuSigned by:
Hilina Shibeshi P.E. 1/26/2022
 HILINA SHIBESHI, P. E. DATE

**Austin District
Central Design**

Texas Department of Transportation

**COMMUNITY CENTER RD
INDEX OF SHEETS**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	DIST		COUNTY	SHEET NO.
	AUS		BASTROP	2

DATE: \$DATE\$ \$TIMES\$
FILE: \$FILES\$

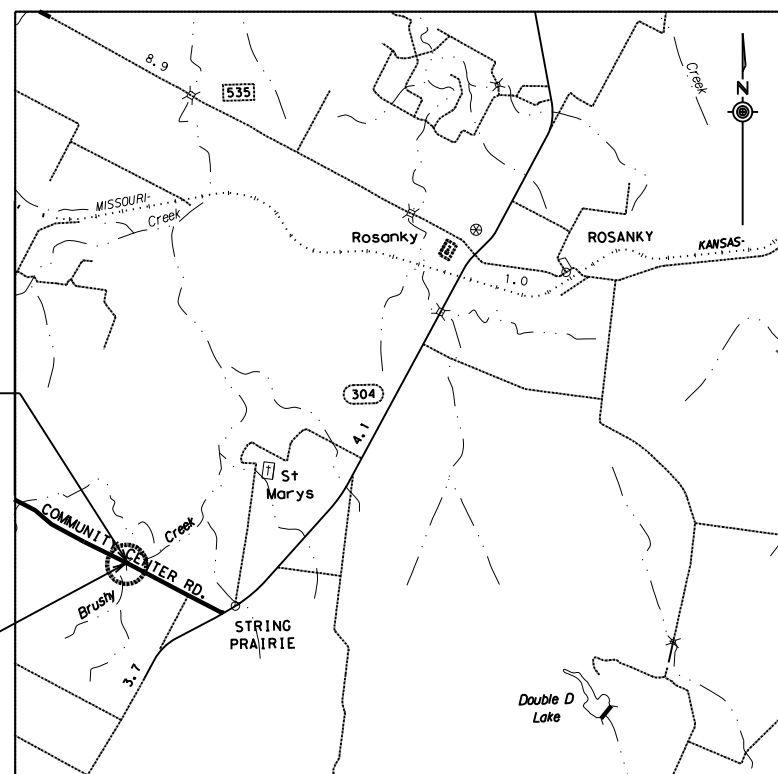
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FEDERAL PROJECT NUMBER
 BR 2B20(289), etc.
 PROJECT NUMBER
 CSJ: 0914-18-111, etc.

NET LENGTH OF PROJECT = 340.00 FEET = 0.064 MILES
 ROADWAY = 290.00 FEET = 0.055 MILES
 BRIDGE = 50.00 FEET = 0.009 MILES

**BASTROP COUNTY
 CR 290
 COMMUNITY CENTER RD**

LIMITS FROM: 1 MILE NW OF SH 304
 TO: STR# 14-011-0-AA02-90-001 AT BRUSHY CREEK
 FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT
 CONSISTING OF REPLACING BRIDGE AND APPROACHES



BEGIN PROJECT
 CSJ: 0914-18-111
 STA. 10+65.00
 1 MILE NW OF SH 304
 LATITUDE=29.89140555°N
 LONGITUDE=97.36616944°W

END PROJECT
 CSJ: 0914-18-111
 STA. 14+05.00
 Limits to: 1.05 MI
 NW OF SH 304
 LATITUDE=29.89096944°N
 LONGITUDE=97.365225°W

N. T. S.

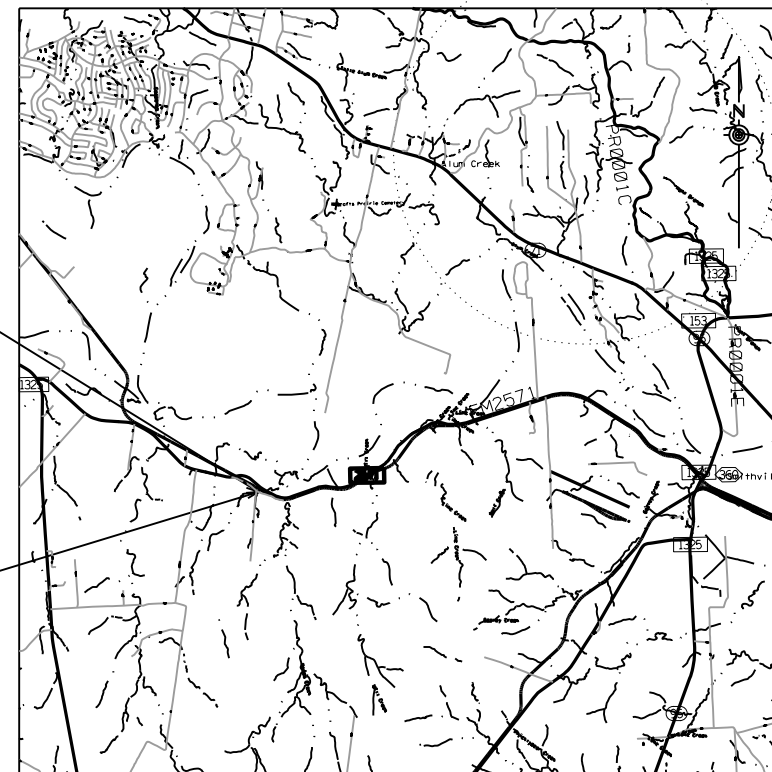
FEDERAL AID PROJECT NUMBER
 BR 2B20(285)
 PROJECT NUMBER
 0914-18-112

NET LENGTH OF PROJECT = 324.00 FEET = 0.061 MILES
 ROADWAY = 274.00 FEET = 0.052 MILES
 BRIDGE = 50.00 FEET = 0.009 MILES

**BASTROP COUNTY
 YOUNG RD**

LIMITS FROM: 0.35 MI SOUTHEAST OF FM 2571
 TO: STR # 14-011-0-AA01-97-001

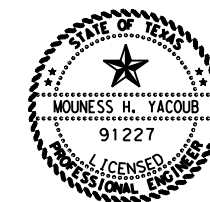
FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT
 CONSISTING OF REPLACING BRIDGE AND APPROACHES



BEGIN PROJECT
 CSJ: 0914-18-112
 STA 12+00.00
 0.35 MI SE OF FM 2571
 LATITUDE=30.00893333°N
 LONGITUDE=97.25863611°W

END PROJECT
 CSJ: 0914-18-112
 STA 15+24.00
 0.37 MI SE OF FM 2571
 LATITUDE=30.00846388°N
 LONGITUDE=97.25777222°W

N. T. S.



Mouness Yacoub P.E.

01/26/2022

Austin District
 Central Design



CSJ: 0914-18-111
 CSJ: 0914-18-112

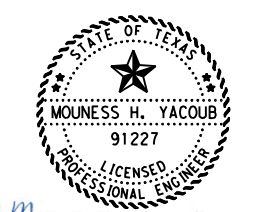
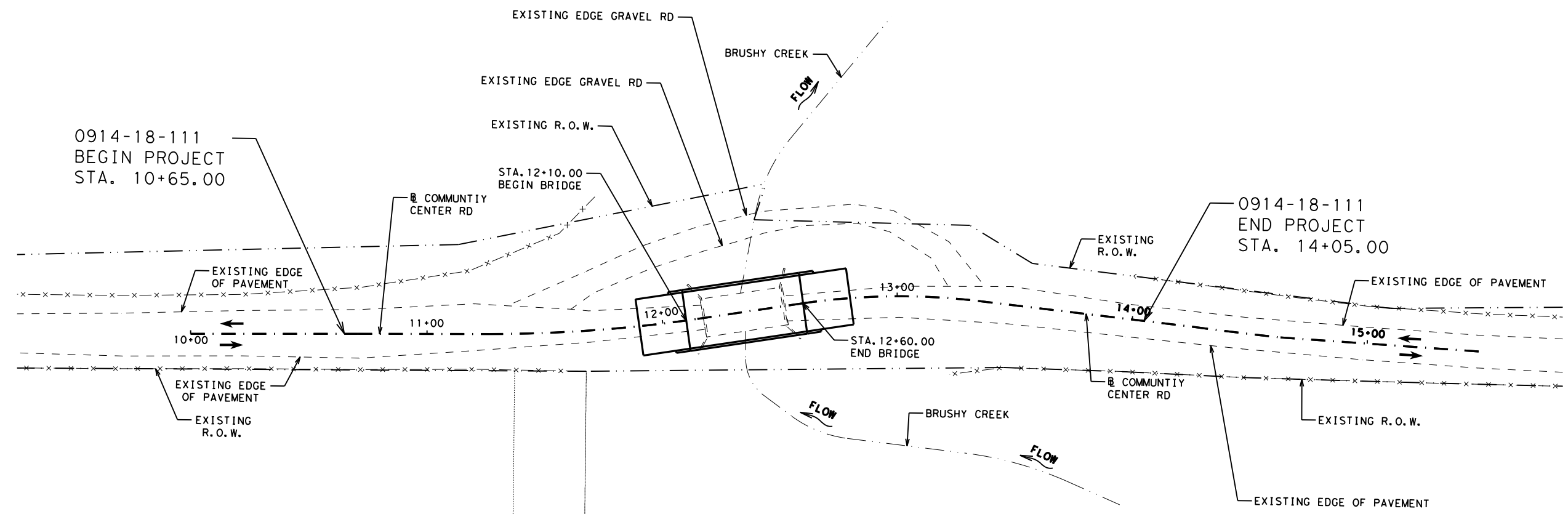
LOCATION MAPS

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
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Mouness Yacoub P.E.

01/26/2022



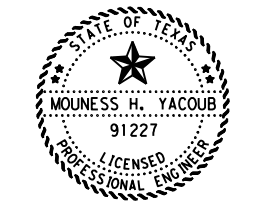
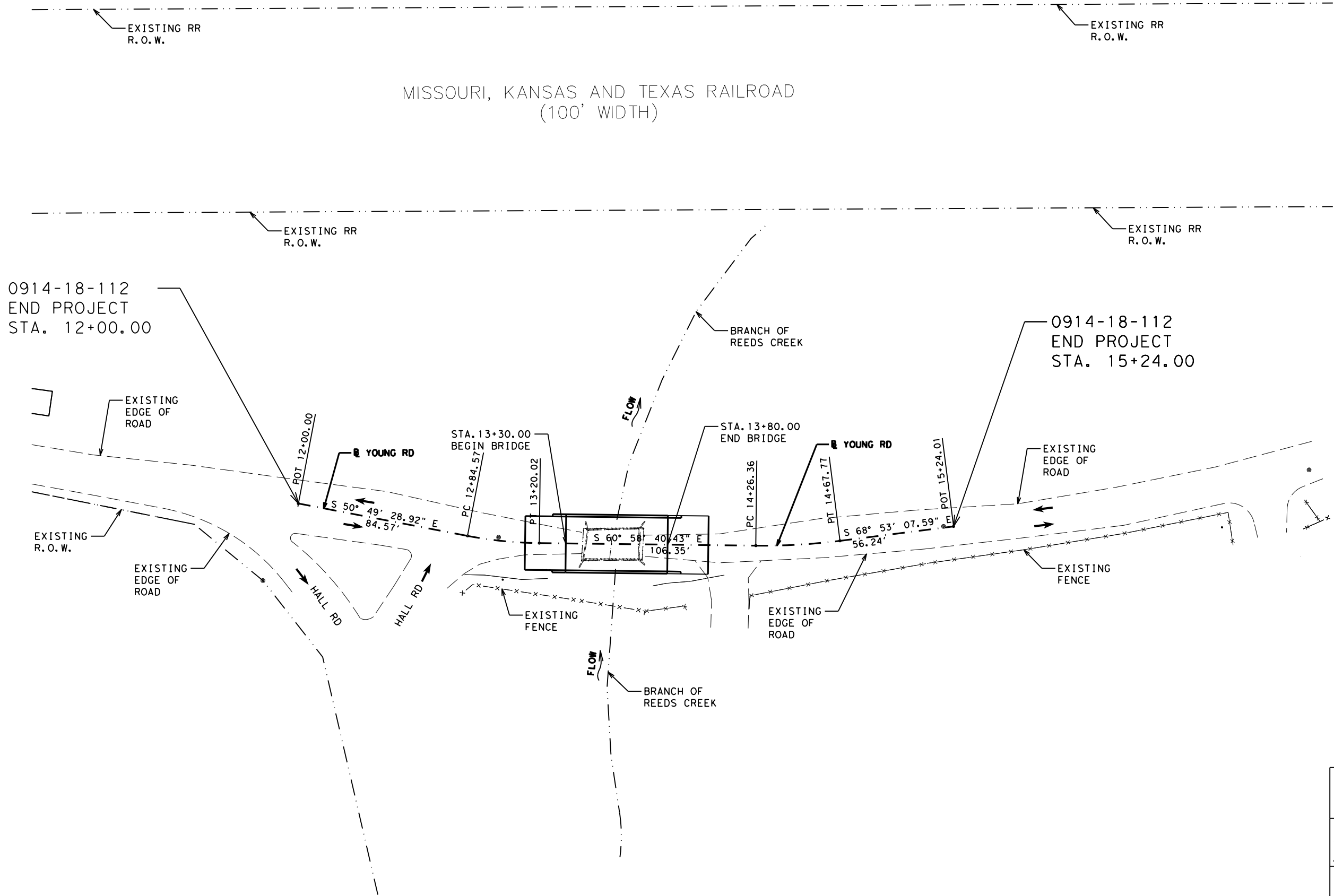
**Austin District
Central Design**

**COMMUNITY CENTER RD
PROJECT LAYOUT**

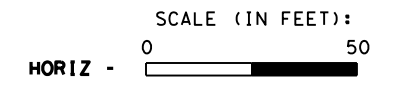
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Mouness Yacoub P.E.
01/26/2022



**Austin District
Central Design**

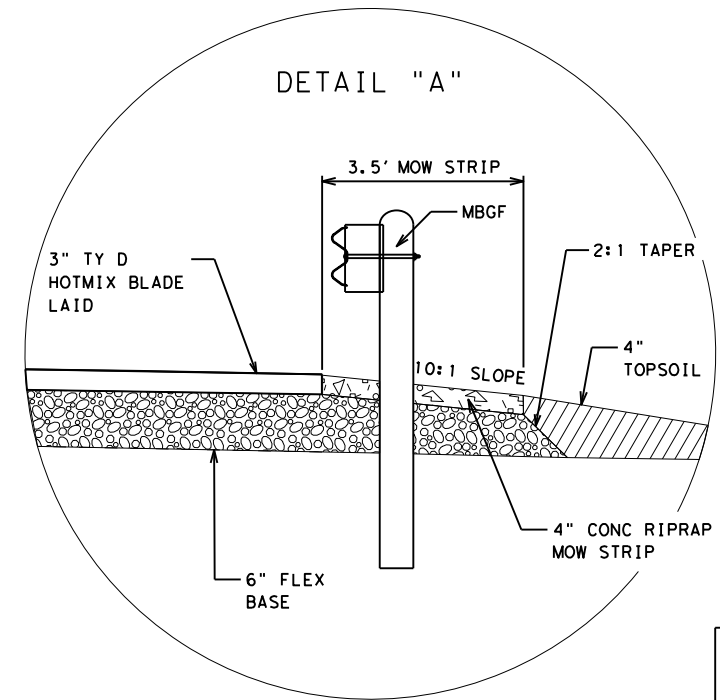
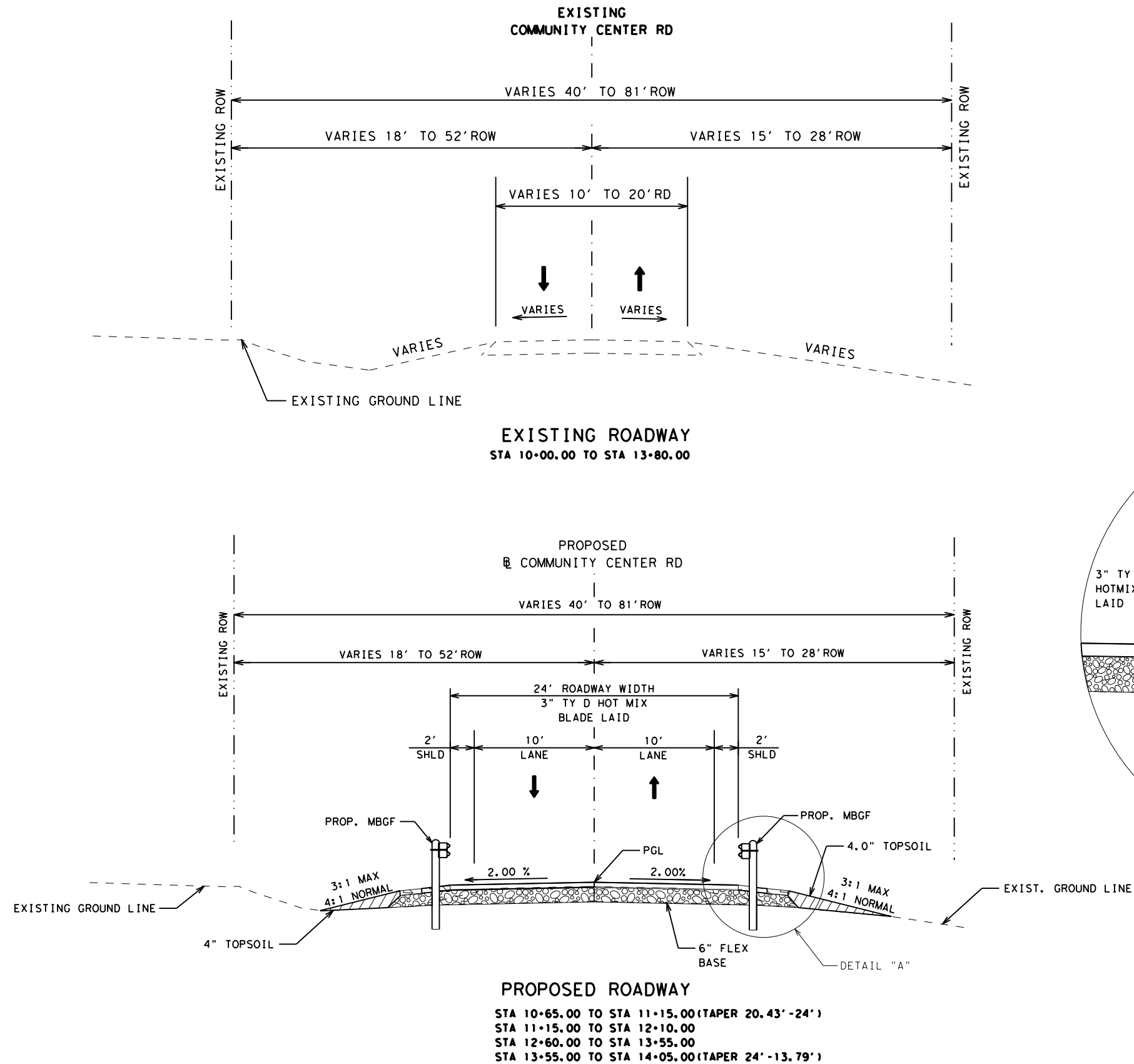
Texas Department of Transportation

**YOUNG RD
PROJECT LAYOUT**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
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		AUS	BASTROP	5

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STATE OF TEXAS
 MOUNESS H. YACOUB
 91227
 LICENSED PROFESSIONAL ENGINEER
 Mouness Yacoub P.E.
 01/27/2022

NOT TO SCALE

**Austin District
 Central Design**

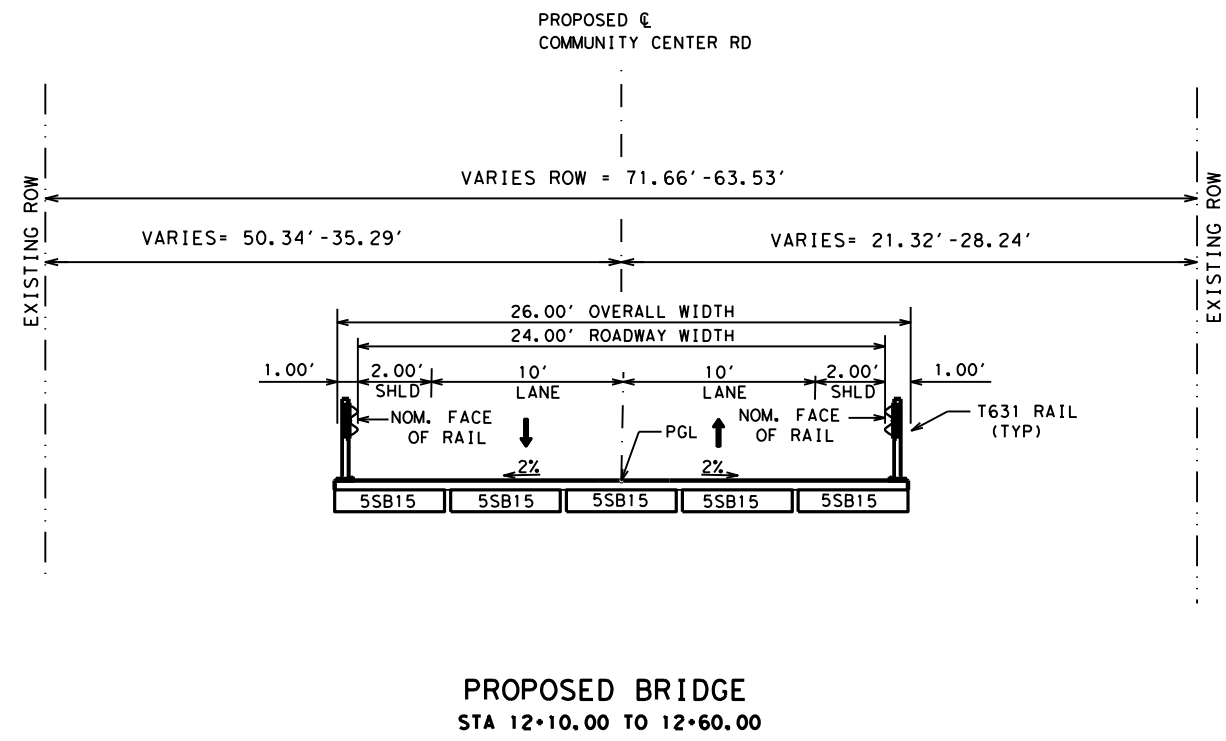
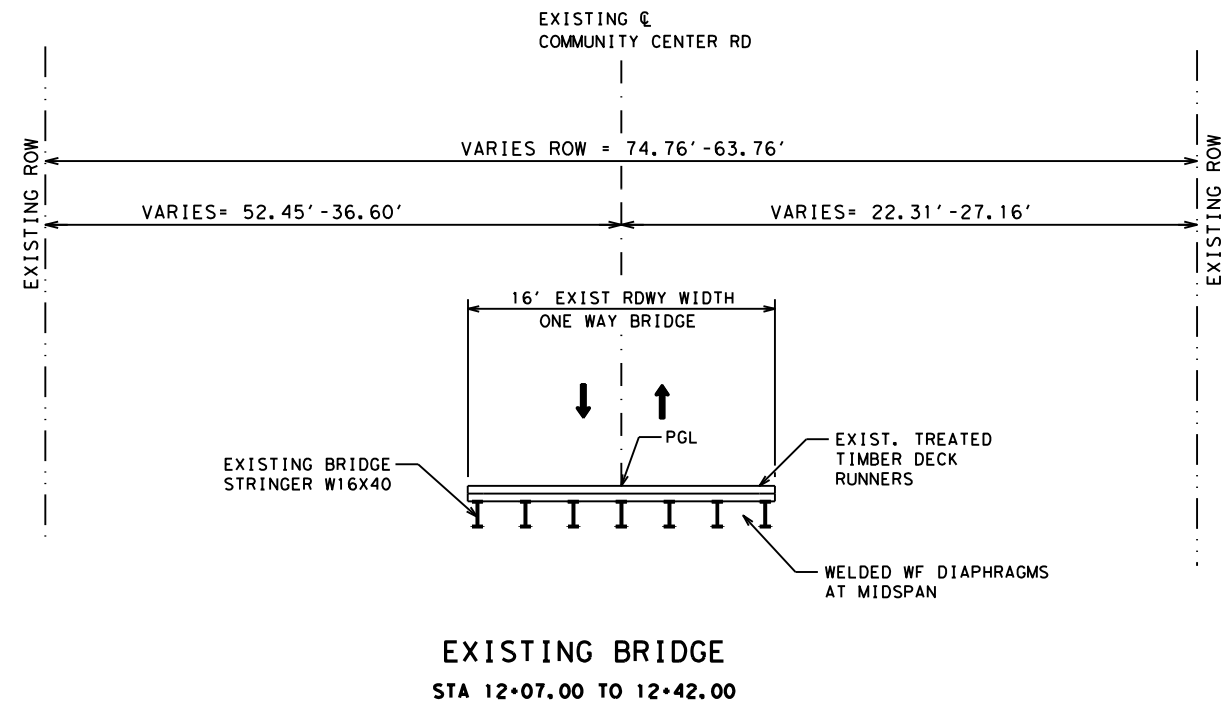
Texas Department of Transportation

**COMMUNITY CENTER RD
 TYPICAL SECTIONS**

NOT TO SCALE SHEET 1 OF 2

DSF	CR:	CONT	SECT	JOB	HIGHWAY
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STATE OF TEXAS
 MOUNESS H. YACOUB
 91227
 LICENSED PROFESSIONAL ENGINEER
Mouness Yacoub P.E.
 01/26/2022

NOT TO SCALE

**Austin District
Central Design**

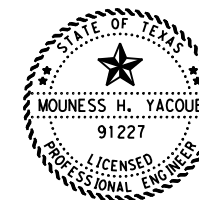
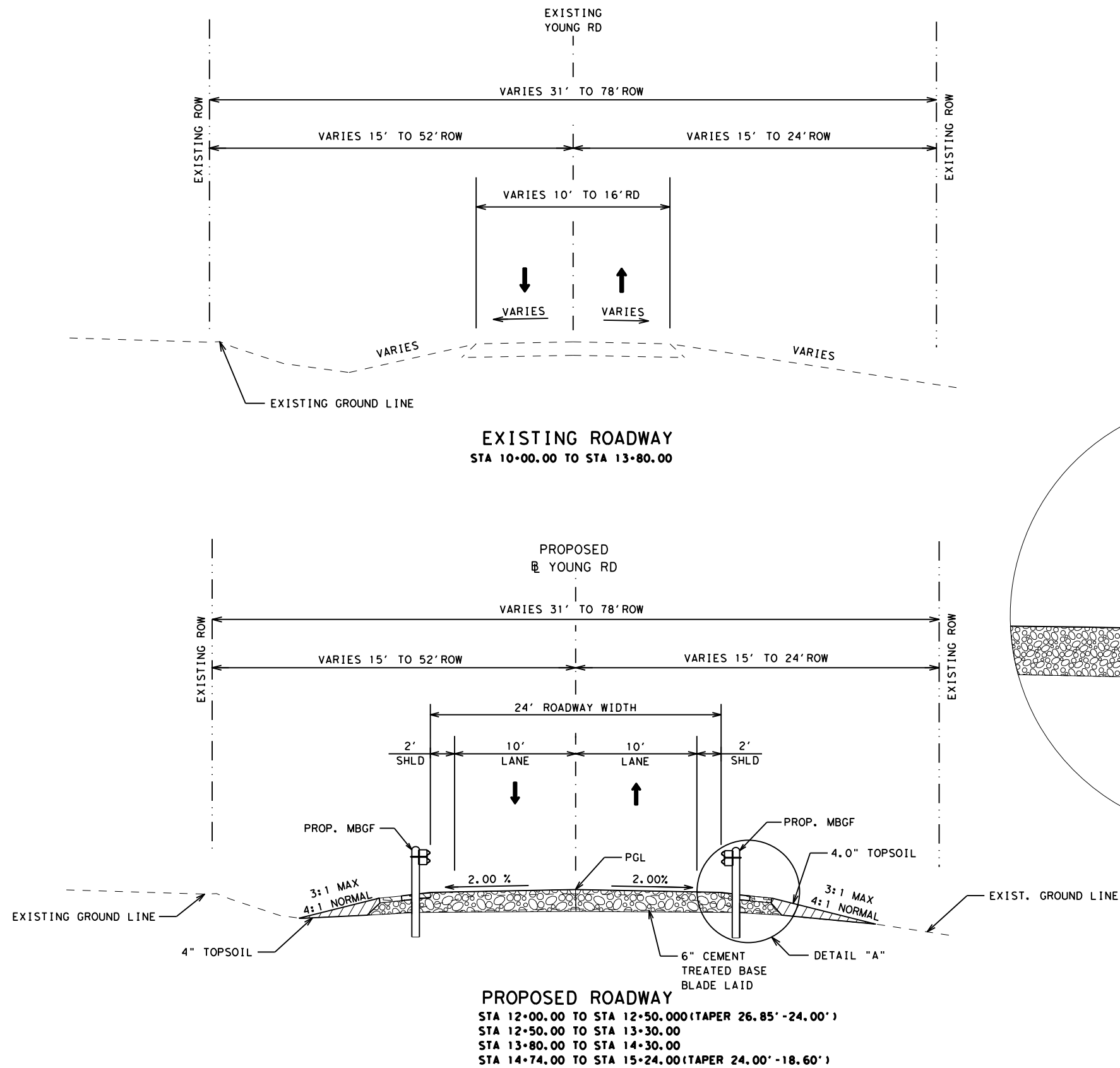
Texas Department of Transportation

**COMMUNITY CENTER RD
TYPICAL SECTIONS**

SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
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		AUS	BASTROP	7

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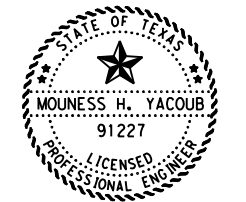
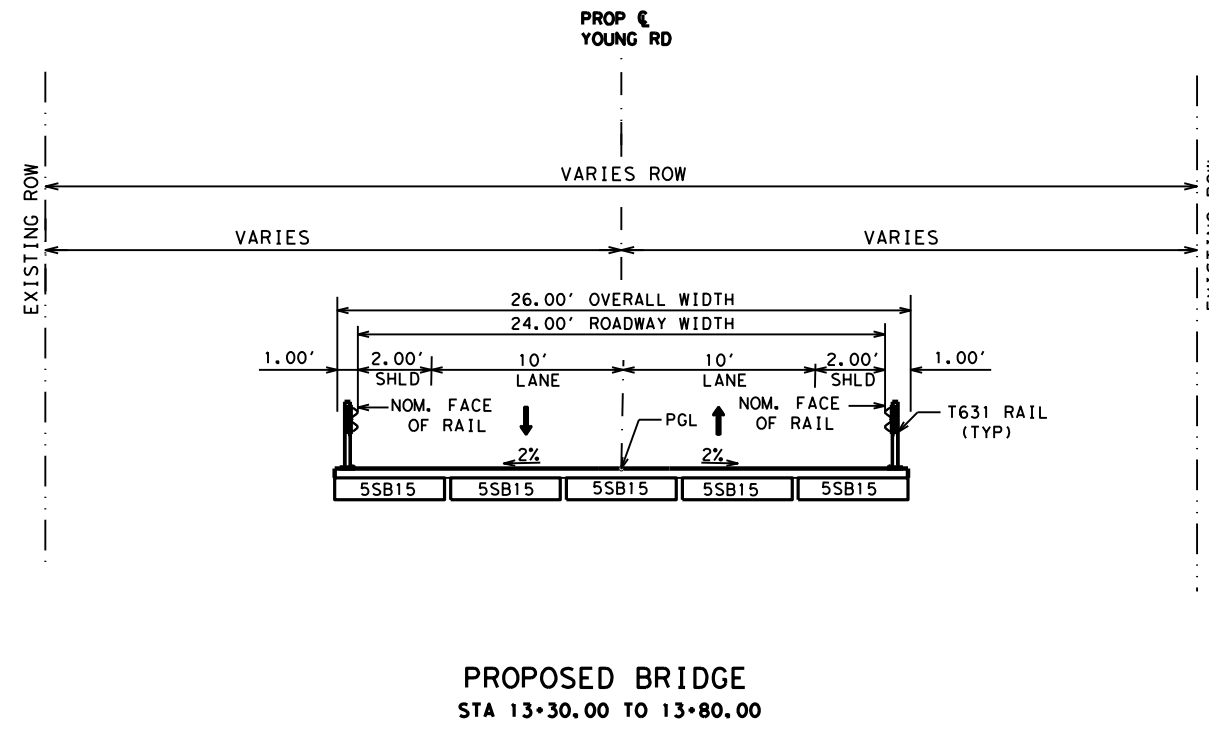
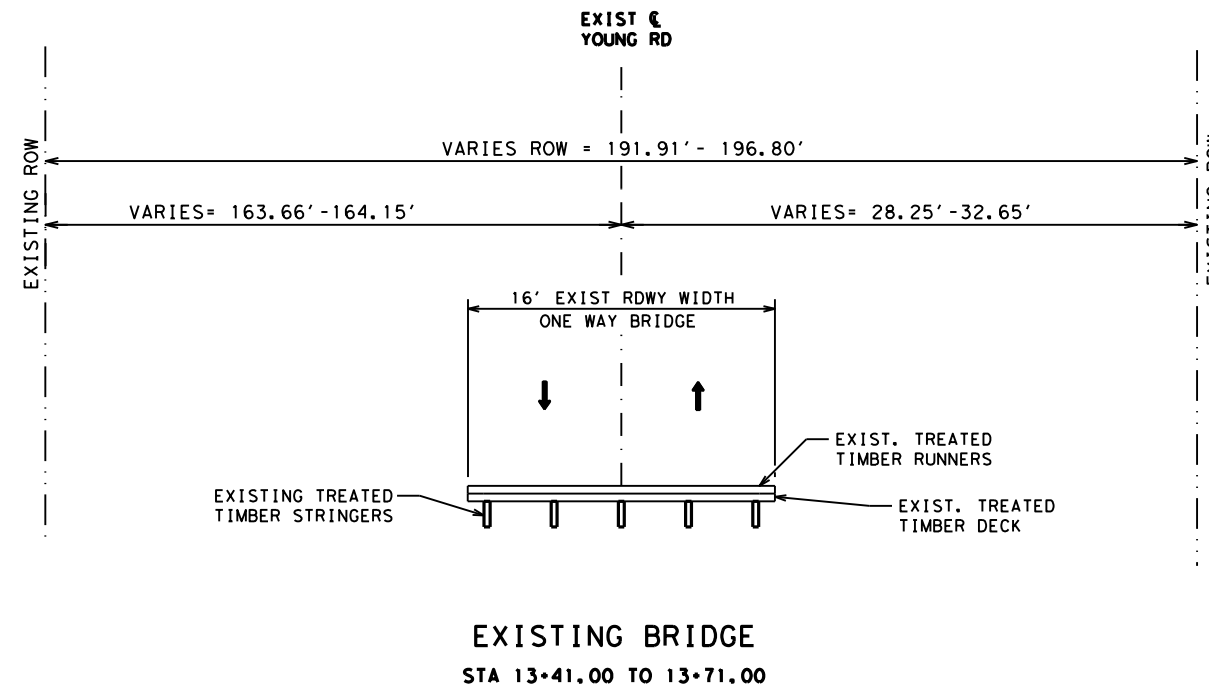


Mouness Yacoub P.E.
 01/27/2022

NOT TO SCALE

Austin District Central Design			
Texas Department of Transportation			
YOUNG RD TYPICAL SECTIONS			
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Mouness Yacoub P.E.

01/26/2022

NOT TO SCALE

**Austin District
 Central Design**

Texas Department of Transportation

**YOUNG RD
 TYPICAL SECTIONS**

SHEET 2 OF 2

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	18	111, etc.	CR290, etc.
DW:	CK:	DIST		COUNTY	SHEET NO.
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County: Bastrop
Highway: CR 190, Etc

Sheet:
Control: 0914-18-111, Etc.

GENERAL NOTES: Version: February 9, 2022

Item	Description	**Rate
247	Flexible Base (CMP IN PLC)	132 LB/CF
310	Prime Coat	0.20 GAL/SY
3076	Dense-Graded Hot-Mix Asphalt and Superpave	110 LB/SY/IN

** For Informational Purposes Only

GENERAL

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

Bastrop Area Diana.Schulze@txdot.gov
Bastrop Area Tanli.Sun@txdot.gov

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

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

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

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed will be free of organic material prior to placing any section of the pavement structure.

Contact the supervisor for the passenger facility at Capital Metro and request the relocation of Capital Metro signs. Contact the supervisor at (512) 385-0190.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Intelligent Transportation Systems (ITS) Infrastructure may exist within the limits of this project and that the system must remain operational throughout construction. The exact location of ITS Infrastructure is not known. Contact the TxDOT Area Engineer's or Inspection Team's Office for the location(s) at least 48 hours before commencing any work that might affect present ITS Infrastructure. Use caution if working in these areas to avoid damaging or interfering with existing facilities. Repair any damage to this system within 8 hours of occurrence at no cost to

County: Bastrop
Highway: CR 190, Etc

Sheet: 10
Control: 0914-18-111, Etc.

the Department. In the event of system damage, notify TxDOT/CTECC at (512) 974-0883 within one hour of occurrence. Failure of the Contractor to repair damage to any infrastructure that conveys any corridor information to TxDOT/CTECC will result in the Contractor being billed for the full cost of emergency repairs.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Construct all manholes/valves to final pavement elevations prior to the placement of final surface. If the manholes/valves are going to be exposed to traffic, place temporary asphalt around the manhole/valve to provide a 50:1 taper. The asphalt taper is subsidiary to the ACP work.

Use a self-contained vacuum broom to sweep the roadway and keep it free of sediment as directed. The contractor will be responsible for any sweeping above and beyond the normal maintenance required to keep fugitive sediment off the roadway as directed by the Engineer.

Damage to existing pipes and SET's due to Contractor operations will be repaired at Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

Coordinate and obtain approval for all bridgework over existing roadways.

Bridge Vertical Clearance and Traffic Handling.

Notify TxDOT project staff and the local bridge engineer 10 business days prior to the following: change in vertical clearance, placing beams/girders over traffic, opening or removing traffic from a bridge or portion of a bridge, and completion of bridge work. This requirement includes bridge class culverts. Provide vertical clearance for all structures (including signal mast arms, span wires, and overhead sign bridge structures) within the project limit. Submit information and notices to local bridge engineer at [AUS BRG Notify@txdot.gov](mailto:AUS_BRG_Notify@txdot.gov).

During evacuation periods for Hurricane events the Contractor will cooperate with Department for the restricting of Lane Closures and arranging for Traffic Control to facilitate Coastal Evacuation Efforts.

ITEM 5 – CONTROL OF THE WORK

Place construction or silt fence 2 ft. inside TxDOT ROW along the Railroad ROW. If work is to be performed inside the Railroad ROW, then the Contractor will coordinate with the Railroad for a Railroad Flagger. This work is subsidiary.

County: Bastrop
Highway: CR 190, Etc

Sheet:
Control: 0914-18-111, Etc.

Place construction stakes at intervals of no more than 100 ft. This work is subsidiary. Provide a 72 hour advance email notice to AUS_Locate@TxDOT.gov to request illumination, traffic signal, ITS, or toll equipment utility locates. Provide AUS_Locate@TxDOT.gov an electronic pdf of as-builts within 21 calendar days of illumination, traffic signal, ITS, or toll equipment being placed into operation. As-built shall include GPS coordinates of manholes and junction boxes. Include final version of RFI's and revised plan sheets.

Precast Alternate Proposals.

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

Electronic Shop Drawing Submittals.

Submit electronic shop drawing submittals according to the current [Guide to Electronic Shop Drawing Submittal](#) <https://www.txdot.gov/business/resources/specifications/shop-drawings.html> (TxDOT.gov Business > Resources - General > Shop Drawings). Pre-approved producers can be found online at TxDOT.gov > Business > Resources - Material Producer List. Use the following contact list for all submittals that are not required to be sent to Bridge Division and to copy the Engineer for all submittals to the Bridge Division.

Submittal Contact List

Bastrop Area Diana.Schulze@txdot.gov AUS_BA-ShopReview@txdot.gov

Alignment and Profile.

Unless shown in the plans, profile and alignment data for roadways being overlaid or widened are for design verification only. Provide survey and construct the roadway in accordance with the typical section. Bid items and data may be provided to adjust cross slope and super elevations.

ITEM 6 - CONTROL OF MATERIALS

Give a minimum of 1 business day notice for materials, which require inspection at the Plant.

For structures with paint containing hazardous materials, provide locations of material removal 60 days prior to begin removal. For metal elements to be removed, mechanical shear or unbolting for removal and disposal does not require paint abatement but requires 60 day advance notice.

For removal, tie, or tap of asbestos concrete (AC) pipe, contact TxDOT and the local utility company 60 days prior to performing the work. Expose the AC pipe to provide a minimum of 1 ft. of clearance around the top and sides. A minimal amount of soil may remain around the AC pipe to avoid disturbance. The local utility company will be responsible for the demo notice to DSHS and removal of the AC pipe. Tie or tap into existing AC pipe may require removing an entire section of pipe from collar to collar and replacement of pipe with new pipe using existing bid items.

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ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES

Roadway closures during key dates and/or special events are prohibited. See notes for Item 502 for the key dates and/or special events.

Refer to the Environmental Permits, Issues and Commitments (EPIC) plan sheets for additional requirements and permits.

When any abandoned well is encountered, cease construction operations in this area and notify the Engineer who will coordinate the proper plugging procedures. A water well driller licensed in the State of Texas must be used to plug a well.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

Locate aboveground storage tanks kept on-site for construction purposes in a contained area as to not allow any exposure to soils. The containment will be sized to capture 150% of the total capacity of the storage tanks.

PSL in Edwards Aquifer Recharge and Contributing Zone.

Obtain written approval from the Engineer for all on or off right of way PSLs not specifically addressed in the plans. Provide a signed sketch of the location 30 business days prior to use of the PSL. Include a list of materials, equipment and portable facilities that will be stored at the PSL. TxDOT will coordinate with the necessary agencies. Approval of the PSL is not guaranteed. Un approved PSL is not a compensable impact.

Work within a USACE Jurisdictional Area.

Do not initiate activities within a U.S. Army Corps of Engineers (USACE) jurisdictional area that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Obtain written approval from the Engineer for activities not specifically addressed in the plans. Provide a signed sketch and description of the location 60 business days prior to begin work at the location. Complete and return any forms provided by TxDOT. Approval of the work is not guaranteed. Un approved work is not a compensable impact.

Work over or near Bodies of Water (lakes, rivers, ponds, creeks, dry waterways, etc.).

Keep on site a universal spill kit adequate for the body of water and the work being performed. Debris is not allowed to fall into the ordinary high-water level (OHWL). Debris that falls into the

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OHWL must be removed at the end of each work day. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event. Install and maintain traffic control devices to maintain a navigable corridor for water traffic, except during bridge demo and beam placement. This work is subsidiary.

Obtain written approval from the Engineer for temporary fill or crossings not specifically addressed in the plans. Provide a signed sketch of the location 60 business days prior to begin work at the location. Complete and return any forms provided by TxDOT. Approval of the work is not guaranteed. Unapproved work is not a compensable impact.

DSHS Asbestos and Demolition Notification.

Complete and provide the Texas Department of State Health Services (DSHS) notification form to the Engineer and email to [AUS BRG Notify@txdot.gov](mailto:AUS_BRG_Notify@txdot.gov) at least 30 calendar days prior to bridge removal or renovation for each phase or step of work. Notify the Engineer via email of any changes to the work start and end dates.

Migratory Birds and Bats.

Migratory birds and bats may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16 and February 28. Prevent migratory birds from re-nesting between March 1 and September 15. Prevention shall include all areas within 25 ft. of proposed work. All methods used for the removal of old nesting areas and the prevention of re-nesting must be submitted to TxDOT 30 business days prior to begin work. This work is subsidiary.

If active nests are encountered on-site during construction, all construction activity within 25 ft. of the nest must stop. Contact the Engineer to determine how to proceed.

Tree and Brush Trimming and Removal.

Work will be conducted September 16 thru February 28. Work conducted outside this timeframe will require a bird survey. Submit a survey request to TxDOT 30 business days prior to begin work.

No extension of time or compensation will be granted for a delay or suspension due to the above bird, bat and tree/brush requirements.

Law Enforcement Personnel.

Submit charge summary and invoices using the Department forms.

Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site. A minimum number of hours is not guaranteed.

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Payment is for work performed. If the Contractor has a field office, provide an office location for a supervisory officer when event requires a supervising officer. This work is subsidiary.

A maximum combined rate of \$70 per hour for the law enforcement personnel and the patrol vehicle will be allowed. Any scheduling fee is subsidiary per Standard Specification 502.4.2.

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or "show up" fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual "show up" time to the event site due to cancellation will be on a case by case basis at a maximum of 2 hours per officer.

Alterations to the cancellation and maximum rate must be approved by the Engineer or pre-determined by official policy of the officers governing authority.

ITEM 8 – PROSECUTION AND PROGRESS

Electronic versions of schedules will be saved in Primavera P6 format.

Working days will be charged in accordance with 8.3.1.4, "Standard Workweek."

Only one detour may be in use at a time. Substantially complete Community Center bridge before beginning work on Young Road bridge.

ITEM 100 - PREPARING RIGHT OF WAY

Prep ROW must not begin until accessible trees designated for preservation have been protected, items listed in the EPIC have been addressed, and SW3P controls installed in accessible areas.

Backfill material will be Type B Embankment using ordinary compaction.

Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush.

Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas within 30 ft. of edge of pavement under construction. 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 14 ft. vertical clearance under all trees. This work is subsidiary.

ITEM 110 – EXCAVATION

The Engineer will define unsuitable material.

ITEM 132 – ALL EMBANKMENT

At no time will the retaining wall backfill material exceed the adjacent embankment operation by more than one lift. At no time will the embankment adjacent to the retaining wall backfill exceed the wall backfill by any elevation. Embankment placed over the area of MSE backfill must meet the same backfill requirements for the type specified under Item 423.

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The Engineer will define unsuitable material. Material which the Contractor might deem to be unsuitable due to moisture content will not be considered unsuitable material.

Prior to begin embankment of existing area, correct or replace unstable material to a depth of 6 in. below existing grade. Embankment areas will be inspected prior to beginning work.

Rock or broken concrete produced by the project is allowed in earth embankments. The size of the rock or broken concrete will not exceed the layer thickness requirements in Section 132.3.4., "Compaction Methods." The material will not be placed vertically within 5 ft. of the finished subgrade elevation.

Embankment placed vertically within 5 ft. of the finished subgrade elevation or within the edges of the subgrade and treated with lime, cement, or other calcium based additives must have a sulfate content less than 3000 ppm. Allow 5 business days for testing. Treatment of sulfate material 3000 ppm to 7000 ppm requires 7 days of mellowing and continuous water curing, in accordance TxDOT guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures (9/2005). Material over 7000 ppm is not allowed.

ITEM 160 - TOPSOIL

Off-site topsoil will have a minimum PI of 25.

No Sandy Loam allowed.

Obtain approval of the actual depth of the topsoil sources for both on-site and off-site sources. Construct topsoil stockpiles of no more than five (5) feet in height.

It is permissible to use topsoil dikes for erosion control berms within the right of way, as directed.

Seed or track slopes within 14 days of placement.

Salvage topsoil from sites of excavation and embankment. Maximum salvage depth is 6 inches.

Windrowing of topsoil obtained from the Right of Way (ROW) is not allowed.

ITEM 168 – VEGETATIVE WATERING

Water all areas of project to be seeded or sodded.

Maintain the seedbed in a condition favorable for the growth of grass. Watering can be postponed immediately after a rainfall on the site of ½ inch or greater, but will be resumed before the soil dries out. Continue watering until final acceptance.

Vegetative watering rates and quantities are based on ¼ inch of watering per week over a 3-month watering cycle. The actual rates used and paid for will be as directed and will be based on prevailing weather conditions to maintain the seedbed.

Obtain water at a source that is metered (furnish a current certification of the meter being used) or furnish the manufacturer's specifications showing the tank capacity for each truck used.

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Notify the Engineer, each day that watering takes place, before watering, so that meter readings or truck counts can be verified.

ITEM 169 – SOIL RETENTION BLANKETS

Type A blankets containing straw fibers are not allowed. Type B and D blankets shall be a spray type blanket.

ITEM 247 - FLEXIBLE BASE

The layer thickness will be 4 in. to 6 in. unless shown on the plans. Placing in a single layer is allowed when total thickness of base is 8 in. or less. When placed in multiple layers, compact the bottom and middle layers to at least 95% and 98% of the maximum dry density, respectively. When placed in a single layer or the final layer, compact to at least 100%.

Correction of subgrade soft spots is subsidiary.

Complete per plans the subgrade, ditches, slopes, and drainage structures prior to the placement of base.

Do not use a vibratory roller to compact base placed directly on top of a drainage structure.

ITEMS 260 THRU 276 – SUBGRADE TREATMENTS AND BASE

Use ordinary compaction for subgrade treatment.

Three weeks prior to treatment, provide a sample of soil or flexible base to be treated.

ITEM 275 – CEMENT TREATMENT (ROAD-MIXED)

Apply 51.3 pounds per square yard.

Unless shown on the plans flexible base will be as follows: Type A Grade 4 or 5, microcracked, and 7-day unconfined compressive strength of 150 psi.

ITEM 300s – SURFACE COURSES AND PAVEMENTS

Asphalt season is May 1 thru September 15. Emulsified Asphalt season is April 1 thru October 15. The latest work start date for asphalt season is August 1.

If an under seal is not provided, furnish a tack coat. Apply tack coat at 0.08 GAL/SY (residual). Apply non-tracking tack coat using manufacturer recommend rates.

ITEM 316 – SEAL COAT

Ensure that all underseals are covered by HMA CP before exposing to traffic for roadways listed in Table 1 of Item 502 or ADT greater than 5,000.

Aggregates (Multi Option) for seal coats not exposed to traffic and underseals shall be Type E, PA, PB, A or B. The Grade shall range between 4 and 5.

Use a medium pneumatic roller in accordance with Item 210.

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Surface all transitions, tapers, climbing lanes and intersections to the limits as directed.

Remove and dispose of off the ROW the audible/profile markings, reflectorized markings, and raised markers. Blade pavement edges to remove vegetation. Any areas with excessive asphalt or aggregate will be removed. Continue sweeping excess aggregate off the roadway, riprap, and shoulder up to two weeks after completing the work. This work is subsidiary.

ITEMS 3076 THRU 3082 - HOT-MIX ASPHALT PAVEMENT

Core holes may be filled with an Asphaltic patching material meeting the requirements of DMS-9203 or with SCM meeting requirements of DMS-9202.

Install transverse butt joints with 50 ft. H: 1 in. V transition from the new ACP to the existing surface. Install a butt joint with 24 in. H: 1 in. V transition from the new ACP to a driveway, pullout or intersection. Saw cut the existing pavement at the butt joints. This work is subsidiary.

Use a device to create a maximum 3H:1V notched wedge joint on all longitudinal joints of 2 in. or greater. This work is subsidiary.

Prior to milling, core the existing pavement to verify thickness. This work is subsidiary.

Ensure placement sequence to avoid excess distance of longitudinal joint lap back not to exceed one day's production rates.

Submit any proposed adjustments or changes to a JMF before production of the new JMF.

Tack every layer. Do not dilute tack coat. Apply it evenly through a distributor spray bar.

Provide a minimum transition of 10' for intersections, 10' for commercial driveways, and 6' for residential driveways unless otherwise shown on the plans.

Irregularities will require the replacement of a full lane width using an asphalt paver. Replace the entire subplot if the irregularities are greater than 40% of the subplot area.

Lime or an approved anti-stripping agent must be used when crushed gravel is utilized to meet a SAC "A" requirement.

When using RAP or RAS, include the management methods of processing, stockpiling, and testing the material in the QCP submitted for the project. If RAP and RAS are used in the same mix, the QCP must document that both of these materials have dedicated feeder bins for each recycled material. Blending of RAP and RAS in one feeder bin or in a stockpile is not permitted.

Asphalt content and binder properties of RAP and RAS stockpiles must be documented when recycled asphalt content greater than 20% is utilized.

No RAS is allowed in surface courses.

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Department approved warm-mix additives is required for all surface mix application when RAP is used. Dosage rates will be approved during JMF approval.

The Hamburg Wheel Test will have a minimum rut depth of 3mm.

ITEMS 3076 & 3078 - DENSE-GRADED HOT-MIX ASPHALT

Use the SGC for design and production testing of all mixtures. Design all Dense-Graded Type D mixtures as a surface mix, maximum 15% RAP and no RAS.

When using substitute binders, mold specimens for mix design and production at the temperature required for the substitute binder used to produce the HMA.

The Hamburg Wheel minimum number of passes for PG 64 or lower is reduced to 7,000. The Engineer may accept Hamburg Wheel test results for production and placement if no more than 1 of the 5 most recent tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.

ITEM 400 - EXCAVATION AND BACKFILL FOR STRUCTURES

Unless shown on the plans, the following backfill will apply to cutting and restoring flexible pavement. Backfill with cement-stabilized backfill. The cement-stabilized backfill is subsidiary. Cap the backfill with Type B hot-mix to a depth equal to the adjacent hot-mix. At locations where the backfill surface is final, place 1-1/2 in. Type D for the surface. The minimum hot-mix depth will be 4 in.

Saw-cut the pavement at the edge of the excavation. This work is subsidiary.

Backfill the bridge ends in accordance with the limits shown on TxDOT "CSAB" Standard. Use material in accordance with "CSAB" or Item 423, Type BS. The "CSAB" optional bond breaker materials are allowed. This work is subsidiary.

ITEMS 420, 425, 441, & 462 - STRUCTURES

Bridge Vertical Clearance and Traffic Handling.

Notify TxDOT project staff and the local bridge engineer 10 business days prior to the following: change in vertical clearance, placing beams/girders over traffic, opening or removing traffic from a bridge or portion of a bridge, and completion of bridge work. This requirement includes bridge class culverts. Provide vertical clearance for all structures (including signal mast arms, span wires, and overhead sign bridge structures) within the project limit. Submit information and notices to local bridge engineer at [AUS BRG Notify@txdot.gov](mailto:AUS_BRG_Notify@txdot.gov).

ITEM 420 – CONCRETE SUBSTRUCTURES

Do not use PMDF in areas where a "Free Joint" is indicated in the plans.

Check the sign plans for locations of clearance signs and brackets on structures, which will require inserts in the pre-stressed beams.

Where Retaining Walls are integral parts of the abutment header, do not place the abutment cap prior to backfilling the wall and the abutment area up to the elevation of the bottom of the abutment cap.

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Mass placements are defined as placements with a least dimension greater than or equal to 5 ft., or designated elsewhere on the plans.
The "H" values shown on Bridge Layouts are estimated column heights. Calculate the actual column heights based on field conditions.

Perform work during good weather unless otherwise directed. If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by the weather, the Contractor is responsible for all costs associated with repairs/replacement.

Upon completion of the structure, stencil the National Bridge Inventory (NBI) number (structure number) using black paint and 4 in. tall numbers at 4 locations designated by TxDOT. This work is subsidiary.

Bonding agents are required at construction joints. Do not use membrane curing for structural concrete as defined in Item 421, Table 8.

Remove all loose Formwork and other Materials from the floodplain or drainage areas daily.

ITEM 425 - PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS

Conduct a pre-placement meeting for the erection of structural members.

ITEM 432 - RIPRAP

Mow strip riprap will be 4 in. and all other riprap will be 5 in. unless otherwise shown on the plans or in the pay items. Mow strip for cable barrier may be placed monolithically with the barrier foundations if using concrete in accordance with Item 543. Fiber reinforcement is not allowed except in mow strip for cable barrier if foundation and mow strip are placed monolithically.

Saw-cut existing riprap then epoxy 12 in. long No. 3 or No. 4 bars 6 in. deep at a maximum spacing of 18 in. in each direction to tie new riprap to existing riprap. This work is subsidiary.

For cement-stabilized riprap, provide Type A Grade 5 flexible base. Compressive strengths for Item 247 are waived.

SGT approach taper, paid using mow strip item, shall be installed using concrete, flexible base coated with SS-1 at a rate of 0.12 GAL/SY, or HMA Type B/C/D. Placement shall be ordinary compaction and does not require placement using an asphalt paver.

ITEM 450 - RAILING

Use the elliptical tube option for rails T401, T402, and C402.

ITEM 496 - REMOVING STRUCTURES

Submit a demolition plan to the Engineer. Have the plan signed and sealed by a licensed professional engineer when the structure will continue to accommodate traffic after removal has begun and the removal impacts any part of the structure below the deck or riding surface. If applicable, the plan must detail requirements for meeting the U.S. Army Corps of Engineers' Section 404 Permit. The demolition plan must detail handling of roadway and waterway traffic. Waterway traffic must be maintained at all times unless a closure is approved by the Engineer.

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No debris is allowed to fall into a body of water. Debris that falls into the water must be removed at the end of each work day. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event.

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING

Table 1

Roadway	Limits	Allowable Closure Time
All	Within 200' of a signalized intersection	9 P to 5 A
All	All (Full Closure, see allowable work below)	11 P to 4 A

Table 2

Roadway	Limits	Allowable Closure Time
N/A	N/A	N/A

Table 3 (Mobile Operations)

Roadway	Allowable Sun Night thru Fri Noon	Allowable Sat thru Sun Morn
Within Austin City Limits	10 A to 2 P and 7 P to 6 A	7 P to 10 A
Outside Austin City Limits	9 A to 3 P and 7 P to 7 A	6 P to 11 A
IH 35 main lanes	10 P to 5 A	9 P to 9 A
AADT over 50,000	8 P to 6 A	8 P to 10 A

For roadways without defined allowable closure times, nighttime lane closures will be allowed from 7 P to 6 A. Unless stated, daytime or Friday night lane closures will not be allowed and one lane in each direction will remain open at all times for all roadways.

Two lanes closed on IH 35 allowed to begin at 9 P for main lane (shoulder work not included) hotmix overlay or pavement repair operations (does not include bridge joint work).

Full closures only allowed Friday night thru Monday morning for bridge beam installation, bridge demolition, or OSB truss removal/installation. Full closures only allowed for roadways with frontage roads or if a designated detour route is provided in the plans.

No closures will be allowed on the weekends, working day prior, and working day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend. Closures the Sunday of the Super Bowl will not be allowed from 1 P to 11 P. No closures will be allowed on Friday and the weekends for projects within 20 miles of Formula 1 at COTA, ACL Fest, SXSW, ROT Rally, UT home football games (includes games not on a Friday or weekend), sales tax holiday, Dell Match Play (includes Thursday) or other special events that could be impacted by the construction. All lanes will be open by noon of the day before these special events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed.

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Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal.

Provide 2 hour notice prior to implementation and immediately upon removal of the closure.

For roadways listed in Table 1: Submit the request 96 hours prior to implementation.

For roadways not listed in Table 1: Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday. For all roadways: Submit request for traffic detours and full roadway closures 168 hours prior to implementation. Submit request for nighttime work 96 hours to implementation date.

Cancellations of accepted closures (not applicable to full closures or detours) due to weather will not require resubmission in accordance with the above restrictions if the work is completed during the next allowable closure time.

Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Cover, relocate or remove existing signs that conflict with traffic control. Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify traffic control, if at any time the queue becomes greater than 20 minutes. Have a contingency plan of how modification will occur. Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Place a 28-inch cone, meeting requirements of BC (10), on top of foundations that have protruding studs. This work is subsidiary.

Edge condition treatment types must be in accordance with the TxDOT standard. Installation and removal of a safety slope is subsidiary.

To determine a speed limit or an advisory speed limit, submit a request to TxDOT 60 business days prior to manufacture of the sign.

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

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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.

ITEM 504 - FIELD OFFICE AND LABORATORY

All labs and offices will include cleaning at least once a week. The cleaning will include sweeping and mopping of floors, cleaning the toilet and lavatory, and emptying wastebaskets. Space heaters are not considered adequate heating.

Projects with HMAC, furnish a Type D structure for the Engineer's exclusive use. The structure will include high speed internet service with WIFI signal, one desk, two chairs, and one file cabinet. Provide a minimum of three 120-volt circuits with 20-amp breakers and at most two grounded convenience outlets per circuit.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS

If SW3P plan sheets are not provided, place the control measures as directed.

Install, maintain, remove control measures in areas of the right of way utilized by the Contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

Erosion control measures must be initiated immediately in areas where construction activities have ceased and will not resume for a period exceeding 14 calendar days. Vertical track all exposed soil, stockpiles, and slopes. Re-track after each rain event or every 14 days, whichever occurs first. Sheep foot roller is allowed for vertical tracking. This work is subsidiary.

Unless a specific pay item is provided in the plans, the installation of the 6:1 or flatter for RFD side slopes in the safety zone will be subsidiary to pertinent bid items.

ITEM 508 - CONSTRUCTING DETOURS

Detour typical section must match the adjacent roadway section, unless shown on the plans.

Flexible base will be Type A Grade 5 placed using ordinary compaction. Base compressive strengths are waived for roadways not listed in Item 502, Table 1.

Contractor to deliver pipes used for detour to Bastrop Maintenance Yard upon project completion.

ITEMS 540, 542, & 544 - METAL BEAM GUARD FENCE AND GUARDRAIL END TREATMENTS

Furnish round timber posts for guard fence. Steel posts for low fill culverts are subsidiary. Stake the locations for approval prior to installation. Adjust the limits of the fence to meet field conditions. Install delineators before opening the road to traffic.

Retain all materials. Contractor may reuse all existing materials that are structurally sound and dent free. All reused material shall be from this project and in compliance with current

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standards. Structurally sound rust spots with the largest dimension of 4 in. may be cleaned and repaired in accordance with 540.3.5. Contractor may punch or field drill holes in the metal rail element to accommodate post spacing. Additional holes for splice or connections are not allowed. The holes shall be spaced in accordance with the latest standard and shall not be closer than the minimum spacing shown on the current standard.

Remove, replace, and install mow strip block out material. Construct new block outs and backfill unused block outs with class B concrete. This work is subsidiary.

Repair of mow strip damage, not caused by contractor negligence, and installation of new mow strip will be paid with appropriate bid items. Backfill and shoulder up of area around fence and mow strip will be paid using embankment item.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES

Triangular slip base that use set screws to secure the post will require 1 of the set screws to penetrate the post by drilling a hole in the post at the location of the screw. All set screws shall be treated with anti-seize compound.

ITEM 658 – DELINEATOR AND OBJECT MARKER ASSEMBLIES

Installation and maintenance of portable CTB reflectors will be subsidiary to the barrier.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0914-18-111

DISTRICT Austin
HIGHWAY CR 197, CR 290

COUNTY Bastrop

CONTROL SECTION JOB				0914-18-111		0914-18-112		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00064098		A00064099			
COUNTY				Bastrop		Bastrop			
HIGHWAY				CR 290		CR 197			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW	STA	3.400		3.240		6.640	
	110-6001	EXCAVATION (ROADWAY)	CY	151.000		65.000		216.000	
	110-6002	EXCAVATION (CHANNEL)	CY	152.000		395.000		547.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	93.000		169.000		262.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	1,702.000		1,702.000		3,404.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	389.000		389.000		778.000	
	164-6021	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	778.000		778.000		1,556.000	
	168-6001	VEGETATIVE WATERING	MG	20.000		20.000		40.000	
	169-6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	778.000		778.000		1,556.000	
	247-6366	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	CY	164.000		165.000		329.000	
	275-6001	CEMENT	TON			16.000		16.000	
	275-6003	CEMENT TREAT (NEW BASE) (6")	SY			624.000		624.000	
	400-6005	CEM STABIL BKFL	CY	53.000		53.000		106.000	
	409-6002	PRESTR CONC PIL (18 IN SQ)	LF	240.000		280.000		520.000	
	416-6002	DRILL SHAFT (24 IN)	LF	216.000		240.000		456.000	
	420-6013	CL C CONC (ABUT)	CY	18.600		18.600		37.200	
	422-6007	REINF CONC SLAB (SLAB BEAM)	SF	1,300.000		1,300.000		2,600.000	
	422-6015	APPROACH SLAB	CY	38.600		38.600		77.200	
	425-6012	PRESTR CONC SLAB BEAM (5SB15)	LF	247.500		247.500		495.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	152.000		156.000		308.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	22.000		30.000		52.000	
	450-6018	RAIL (TY T631)	LF	224.000		124.000		348.000	
	454-6004	ARMOR JOINT (SEALED)	LF	44.000		44.000		88.000	
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1.000		1.000		2.000	
	500-6001	MOBILIZATION	LS	0.500		0.500		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		3.000		6.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	42.000		42.000		84.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	42.000		42.000		84.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	611.000		542.000		1,153.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	611.000		542.000		1,153.000	
	508-6001	CONSTRUCTING DETOURS	SY	200.000				200.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	400.000		390.000		790.000	
	540-6007	MTL BEAM GD FEN TRANS (TL2)	EA	4.000		4.000		8.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000		4.000		8.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	4.000		2.000		6.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	2.000		1.000		3.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	6.000		6.000		12.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0914-18-111

DISTRICT Austin
HIGHWAY CR 197, CR 290

COUNTY Bastrop

CONTROL SECTION JOB				0914-18-111		0914-18-112		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00064098		A00064099			
COUNTY				Bastrop		Bastrop			
HIGHWAY				CR 290		CR 197			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	12.000		12.000		24.000	
	3076-6072	D-GR HMA TY-D PG 76-22 (EXEMPT)	TON	128.000				128.000	
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000				1.000	

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SUMMARY OF ROADWAY ITEMS												
LOCATION	100 6002	110 6001	110 6002	132 6003	160 6003	247 6366	432 6045	508 6001	540 6001	540 6007	544 6001	3076 6072
	PREPARING ROW	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (ORD COMP) (TY B)	FURNISHING AND PLACING TOPSOIL (4")	FL BS (CMP IN PLC) (TY A GR 5) (FNAL POS)	RIPRAP (MOW STRIP) (4 IN)	CONSTRUCTING DETOURS	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (TL2)	GUARDRAIL END TREATMENT (INSTALL)	D-GR HMA TY-D P676-22
	STA	CY	CY	CY	SY	CY	CY	SY	LF	EA	EA	TON
0914-18-111	3.4	151	152	93	778	164	22	200	400	4	4	128
PROJECT TOTALS	3.4	151	152	93	778	164	22	200	400	4	4	128

SUMMARY OF PAVEMENT MARKING ITEMS		
LOCATION	658 6014	658 6062
	INSTL DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF2 (BI)
	EA	EA
0914-18-111	6	12
PROJECT TOTALS	6	12

SUMMARY OF SIGNING ITEMS		
LOCATION	644 6001	644 6076
	IN SM RD SN SUP&AM TY10BWG (1) SA (P)	REMOVE SM RD SN SUP&AM
	EA	EA
0914-18-111	4	2
PROJECT TOTALS	4	2

SUMMARY OF REMOVAL ITEMS	
LOCATION	496 6009
	REMOV STR (BRIDGE 0 - 99 FT LENGTH)
	EA
0914-18-111	1
PROJECT TOTALS	1


SUMMARY OF BRIDGE # 1 ITEMS										
LOCATION	400 6005	409 6002	416 6002	420 6013	422 6007	422 6015	425 6012	432 6033	450 6018	454 6004
	CEM STABIL BKFL	PRESTR CONC PIL (18 IN SQ)	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	REINF CONC SLAB (SLAB BEAM)	APPROACH SLAB	PRESTR CONC SLAB BEAM (5SB15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T631)	ARMOR JOINT (SEALED)
	CY	LF	LF	CY	SF	CY	LF	CY	LF	LF
0914-18-111			216		1300		247.5		100	
Abutment#1	26.5	120		9.3		19.3		80	12	22
Abutment#2	26.5	120		9.3		19.3		72	12	22
PROJECT TOTALS	53	240	216	18.6	1300	38.6	247.5	152	124	44

SUMMARY OF EROSION CONTROL ITEMS									
LOCATION	160 6003	164 6009	164 6021	168 6001	169 6002	506 6002	506 6011	506 6038	506 6039
	FURNISHING AND PLACING TOPSOIL (4")	BROADCAST SEED (TEMP) (WARM)	CELL FBR MLCH SEED (PERM) (RURA L) (SANDY)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY B)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	MG	SY	LF	LF	LF	LF
0914-18-111	924	389	778	20	778	42	42	611	611
PROJECT TOTALS	924	389	778	20	778	42	42	611	611

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS	
LOCATION	502 6001
	BARRICADES, SIGNS AND TRAFFIC HANDLING
	MO
0914-18-111	3
PROJECT TOTALS	3

SUMMARY OF MOBILIZATION ITEMS	
LOCATION	500 6001
	MOBILIZATION
	LS
0914-18-111	1.00
PROJECT TOTALS	1

**Austin District
Central Design**



**COMMUNITY CENTER RD
QUANTITY
SUMMARY**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	DIST		COUNTY	SHEET NO.
		AUS	BASTROP	12

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SUMMARY OF ROADWAY ITEMS												
LOCATION	100 6002	110 6001	110 6002	132 6003	160 6003	247 6366	275 6003	275 6001	432 6045	540 6001	540 6007	544 6001
	PREPARING ROW	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (ORD COMP) (TY B)	FURNISHING AND PLACING TOPSOIL (4")	FL BS (CMP IN PLC) (TY A GR 5) (FNAL POS)	CEMENT TREAT (NEW BASE) (6")	CEMENT	RIPRAP (MOW STRIP) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (TL2)	GUARDRAIL END TREATMENT (INSTALL)
	STA	CY	CY	CY	SY	CY	SY	TON	CY	LF	EA	EA
0914-18-112	3.24	65	395	169	778	165	624	16	30	390	4	4
PROJECT TOTALS	3.24	65	395	169	778	165	624	16	30	390	4	4

SUMMARY OF BRIDGE # 1 ITEMS										
LOCATION	400 6005	409 6002	416 6002	420 6013	422 6007	422 6015	425 6012	432 6033	450 6018	454 6004
	CEM STABIL BKFL	PRESTR CONC PIL (18 IN SQ)	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	REINF CONC SLAB (SLAB BEAM)	APPROACH SLAB	PRESTR CONC SLAB BEAM (5SB15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T631)	ARMOR JOINT (SEALED)
	CY	LF	LF	CY	SF	CY	LF	CY	LF	LF
0914-18-112			240		1300		247.5		100	
Abutment#1	26.5	140		9.3		19.3		76	12	22
Abutment#2	26.5	140		9.3		19.3		80	12	22
PROJECT TOTALS	53	280	240	18.6	1300	38.6	247.5	156	124	44

SUMMARY OF EROSION CONTROL ITEMS									
LOCATION	160 6003	164 6009	164 6021	168 6001	169 6002	506 6002	506 6011	506 6038	506 6039
	FURNISHING AND PLACING TOPSOIL (4")	BROADCAST SEED (TEMP) (WARM)	CELL FBR MLCH SEED (PERM) (RURA L) (SANDY)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY B)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	MG	SY	LF	LF	LF	LF
0914-18-112	924	389	778	20	778	42	42	542	542
PROJECT TOTALS	924	389	778	20	778	42	42	542	542

SUMMARY OF PAVEMENT MARKING ITEMS		
LOCATION	658 6014	658 6062
	INSTL DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF2 (BI)
	EA	EA
0914-18-112	6	12
PROJECT TOTALS	6	12


SUMMARY OF SIGNING ITEMS		
LOCATION	644 6001	644 6076
	IN SM RD SN SUP&AM TY10BWG (1) SA (P)	REMOVE SM RD SN SUP&AM
	EA	EA
0914-18-112	2	1
PROJECT TOTALS	2	1

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS	
LOCATION	502 6002
	BARR, SIGNS, TRAFFIC HANDLING ADD ALTIX
	MO
0914-18-112	3
PROJECT TOTALS	3

SUMMARY OF MOBILIZATION ITEMS	
LOCATION	500 6001
	MOBILIZATION
	LS
0914-18-112	1.00
PROJECT TOTALS	1

SUMMARY OF REMOVAL ITEMS	
LOCATION	496 6009
	REMOV STR (BRIDGE 0 - 99 FT LENGTH)
	EA
0914-18-112	1
PROJECT TOTALS	1

**Austin District
Central Design**



**YOUNG RD
QUANTITY
SUMMARY**

SHEET 1 OF 1

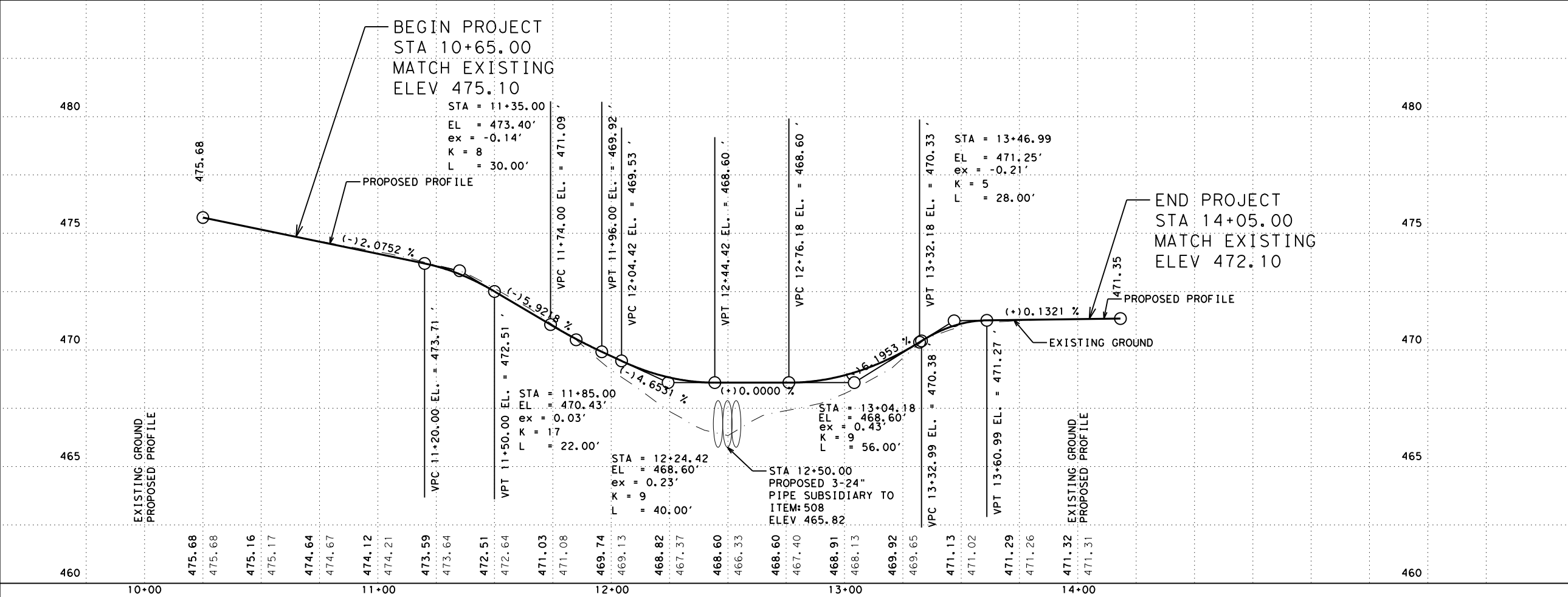
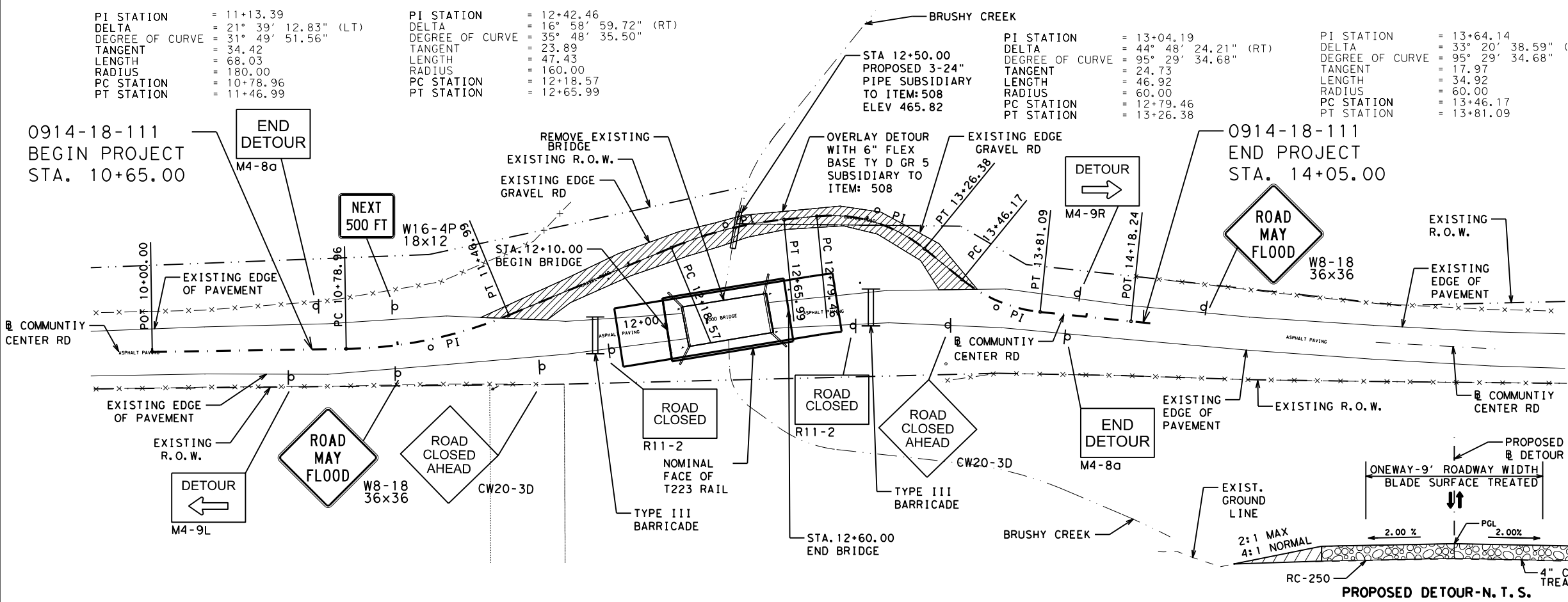
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	AUS		BASTROP	13

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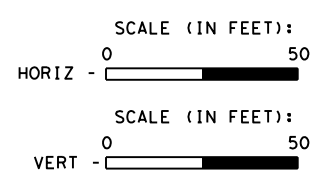
DETOUR CONSTRUCTION NARRATIVE

- DETOUR AREA LOCATION
TRAFFIC CONTROL FROM STA 11+46.00 TO STA 13+50.00
- SETUP ADVANCED WARNING SIGNS ACCORDING TO BC STANDARDS.
 - INSTALL EROSION CONTROLS.
 - PREPARE RIGHT OF WAY.
- PHASE I**
PHASE ONE CONSISTS OF CONSTRUCTING AND OVERLAY WITH 6" FLEX BASE TY D GR 5 OF A 9' ONE WAY TEMPORARY DETOUR ON THE NORTH SIDE AND REMOVING THE EXISTING BRIDGE.
- PHASE II**
SWITCH TRAFFIC FROM ROAD TO DETOUR
- PHASE III**
WHEN BRIDGE IS FINISHED MOVE TRAFFIC FROM DETOUR BACK TO MAIN ROAD.



NOTES

- ① 2 COURSE SURFACE TREATED



**Austin District
Central Design**



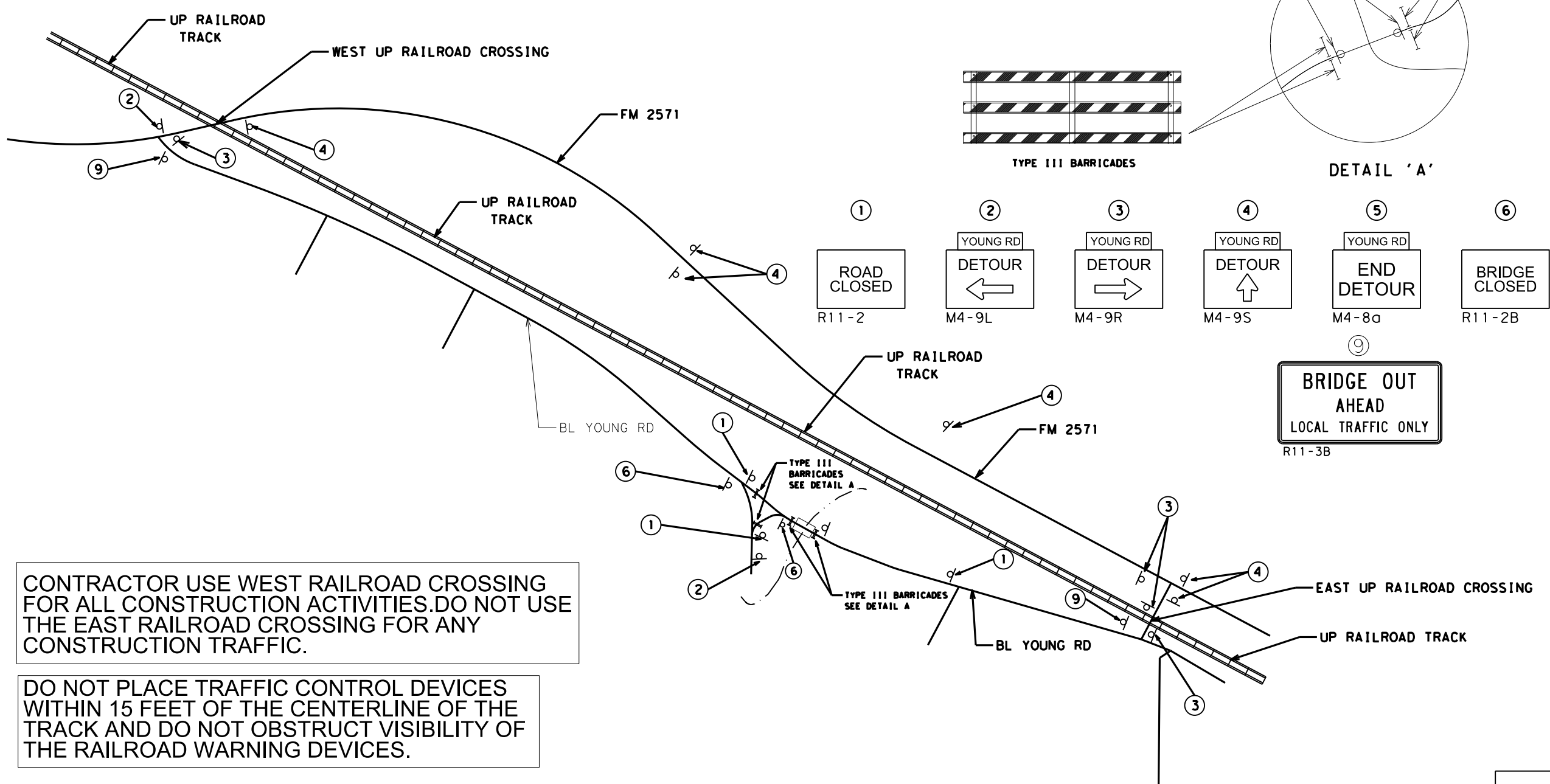
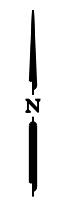
**COMMUNITY CENTER RD
TRAFFIC CONTROL
PLAN
DETOUR**

SHEET 1 OF 1

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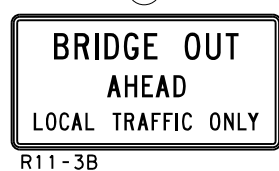
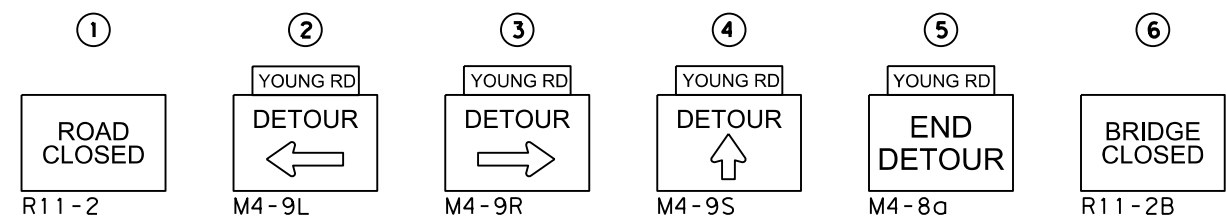


TYPE III BARRICADES SUPPLEMENTED WITH WATER BARRIERS AND OTHER TRAFFIC CONTROL MEASURES AS NEEDED



TYPE III BARRICADES

DETAIL 'A'



CONTRACTOR USE WEST RAILROAD CROSSING FOR ALL CONSTRUCTION ACTIVITIES. DO NOT USE THE EAST RAILROAD CROSSING FOR ANY CONSTRUCTION TRAFFIC.

DO NOT PLACE TRAFFIC CONTROL DEVICES WITHIN 15 FEET OF THE CENTERLINE OF THE TRACK AND DO NOT OBSTRUCT VISIBILITY OF THE RAILROAD WARNING DEVICES.

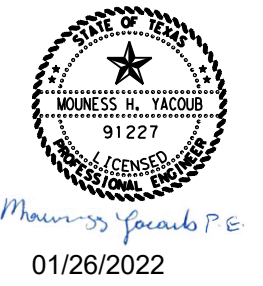
TCP NARRATIVE

1. PLACE APPROACH SIGNAGE IN ACCORDANCE WITH BC STANDARD SHEETS.
2. PLACE DETOUR SIGNAGE.

SIGNS MAY BE ADJUSTED TO FIT EXISTING DRIVEWAYS WITH PERMISSION OF ENGINEER. MINIMUM SPACING OF 500' MUST BE USED.

GENERAL NOTES

TXDOT SHALL COORDINATE WITH THE PROPER CITY, COUNTY, EMERGENCY MEDICAL SERVICES, FIRE DEPARTMENT, POLICE DEPARTMENT, TEXAS DEPARTMENT OF PUBLIC SAFETY WHEN MAJOR TRAFFIC CHANGES ARE TO BE PERFORMED. ALSO A SIGNED LETTER OF CONCURRENCE FROM A CITY/COUNTY OFFICIAL SHOULD BE OBTAINED AS WELL.



NOT TO SCALE

**Austin District
Central Design**

Texas Department of Transportation

**YOUNG RD
TRAFFIC CONTROL
PLAN
DETOUR**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

WORKER SAFETY NOTES:


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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

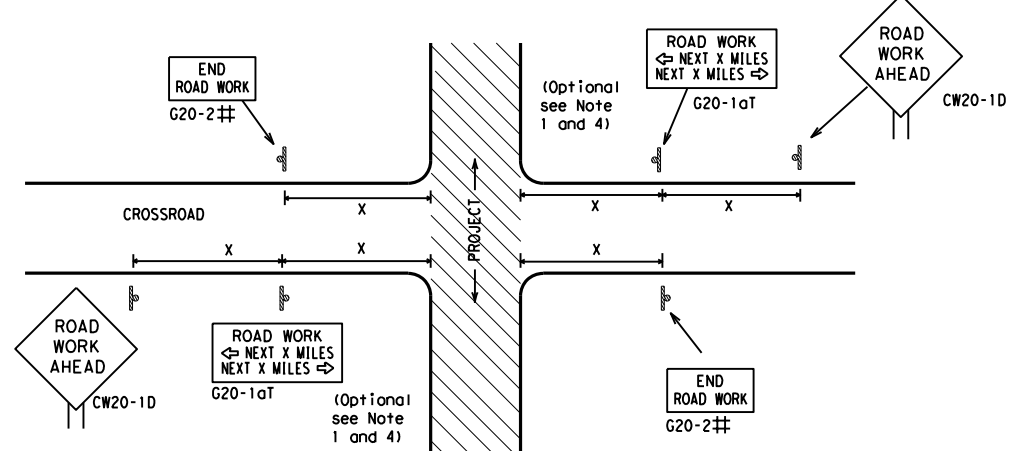
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS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

SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS			
BC (1) - 21			
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REVISIONS	0914	18	111, etc. CR290, etc.
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9-07 8-14	AUS	BASTROP	16
5-10 5-21			

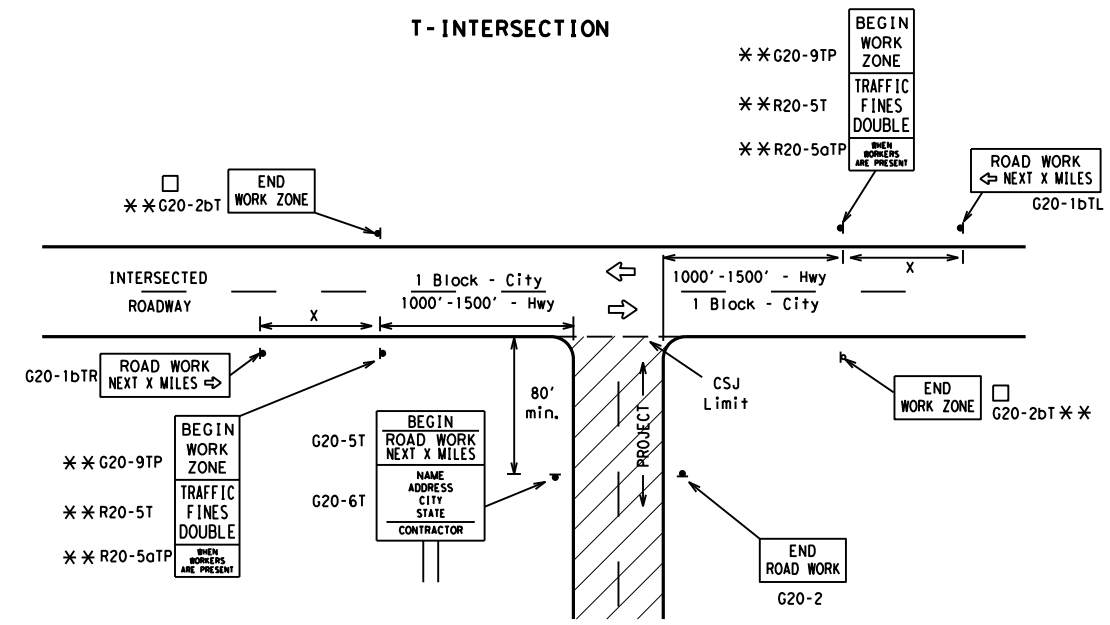
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TYPICAL LOCATION OF CROSSROAD SIGNS



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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

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

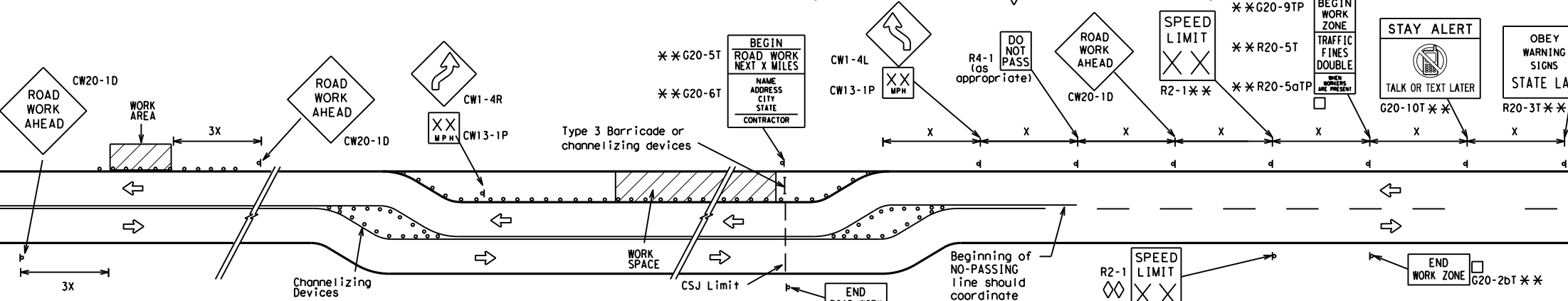
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

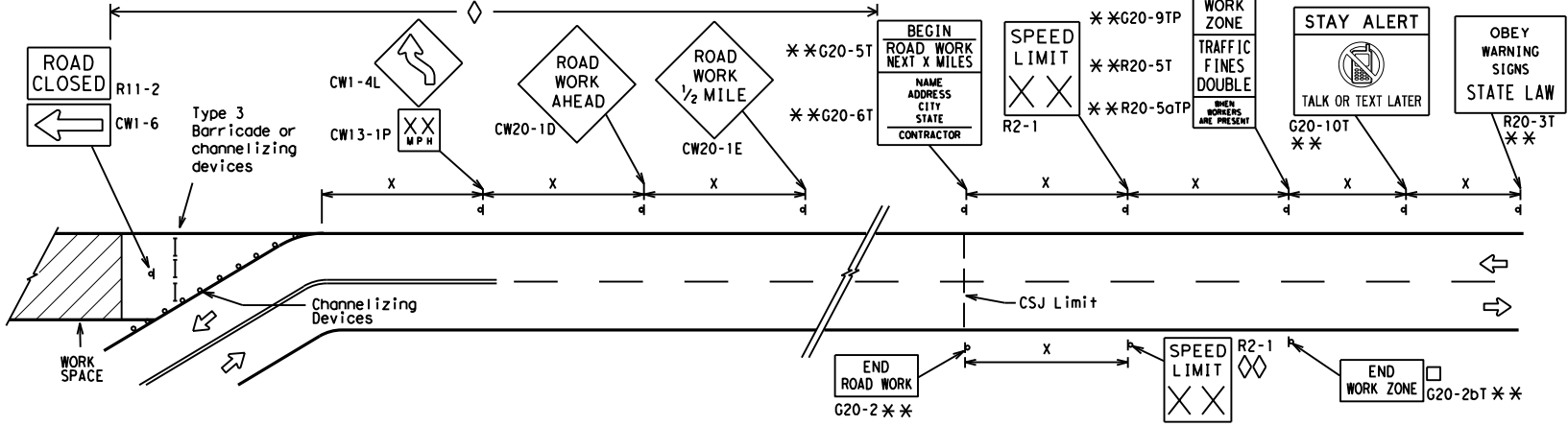
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

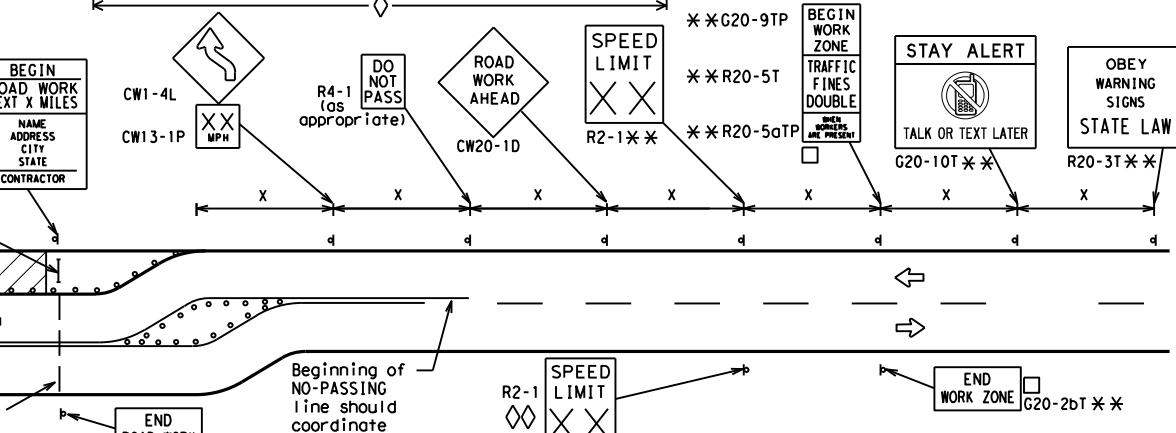


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

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

LEGEND

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

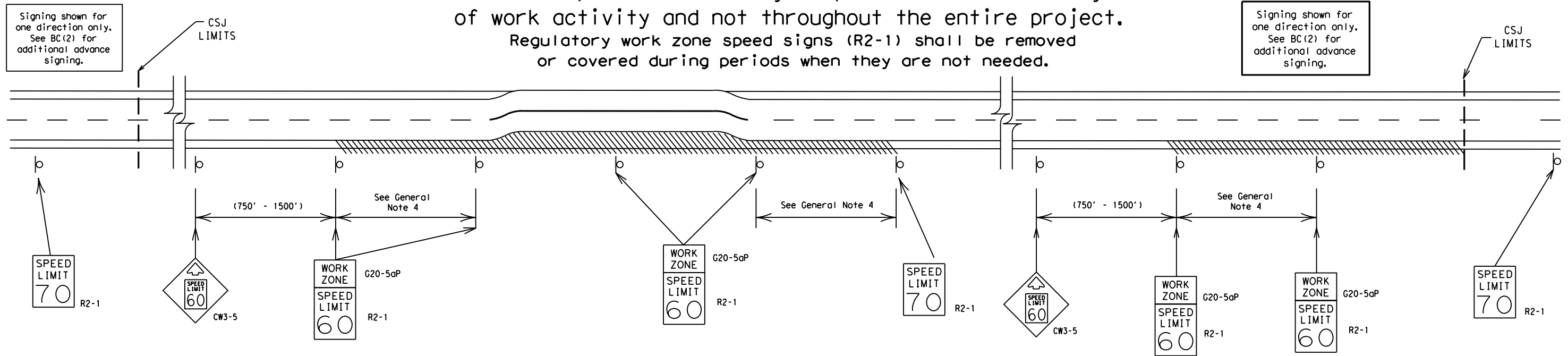
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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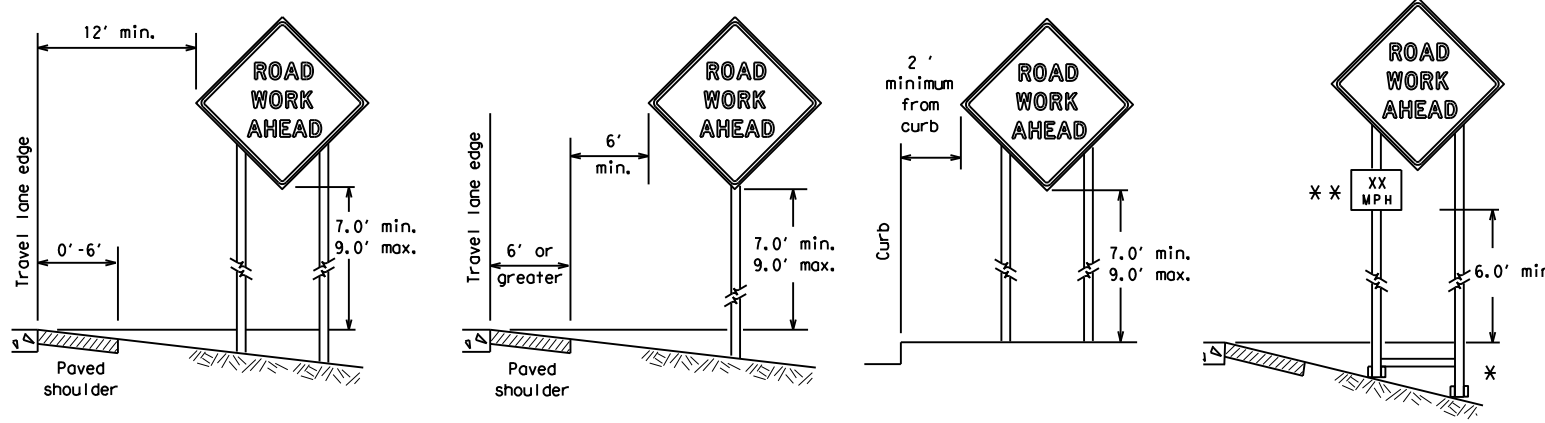
SHEET 3 OF 12

		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT			
BC (3) - 21			
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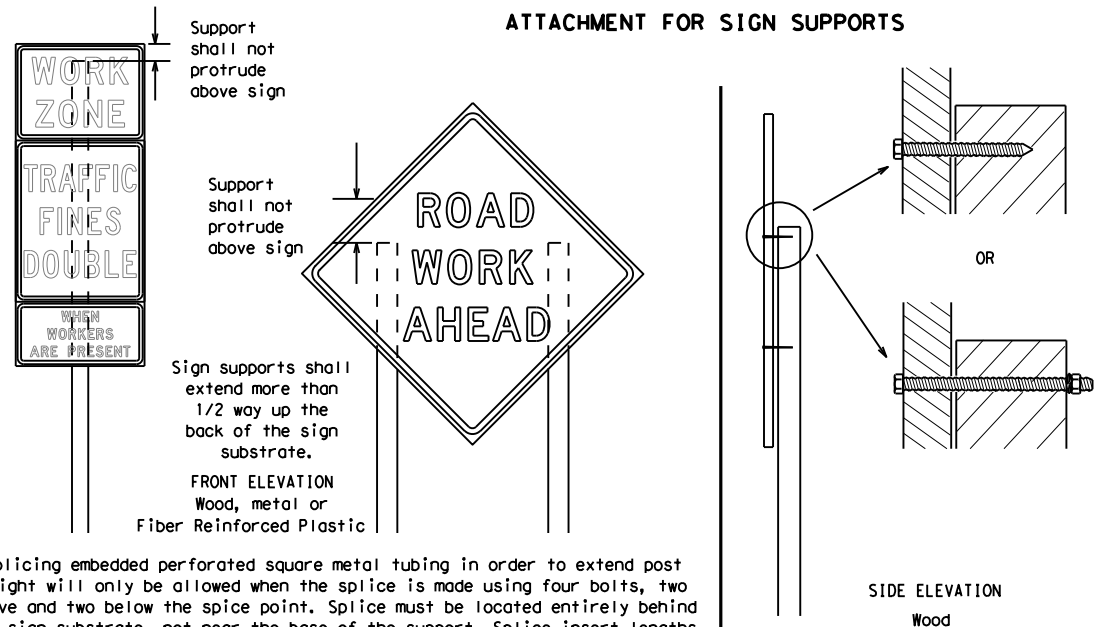
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS



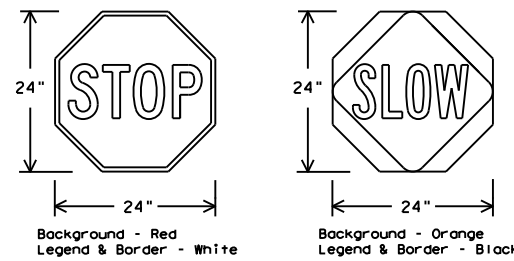
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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 retroreflective 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 CWZTC 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" (CWZTC) 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 CWZTC 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 CWZTC 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.

SHEET 4 OF 12

Texas Department of Transportation
 Traffic Safety Division Standard

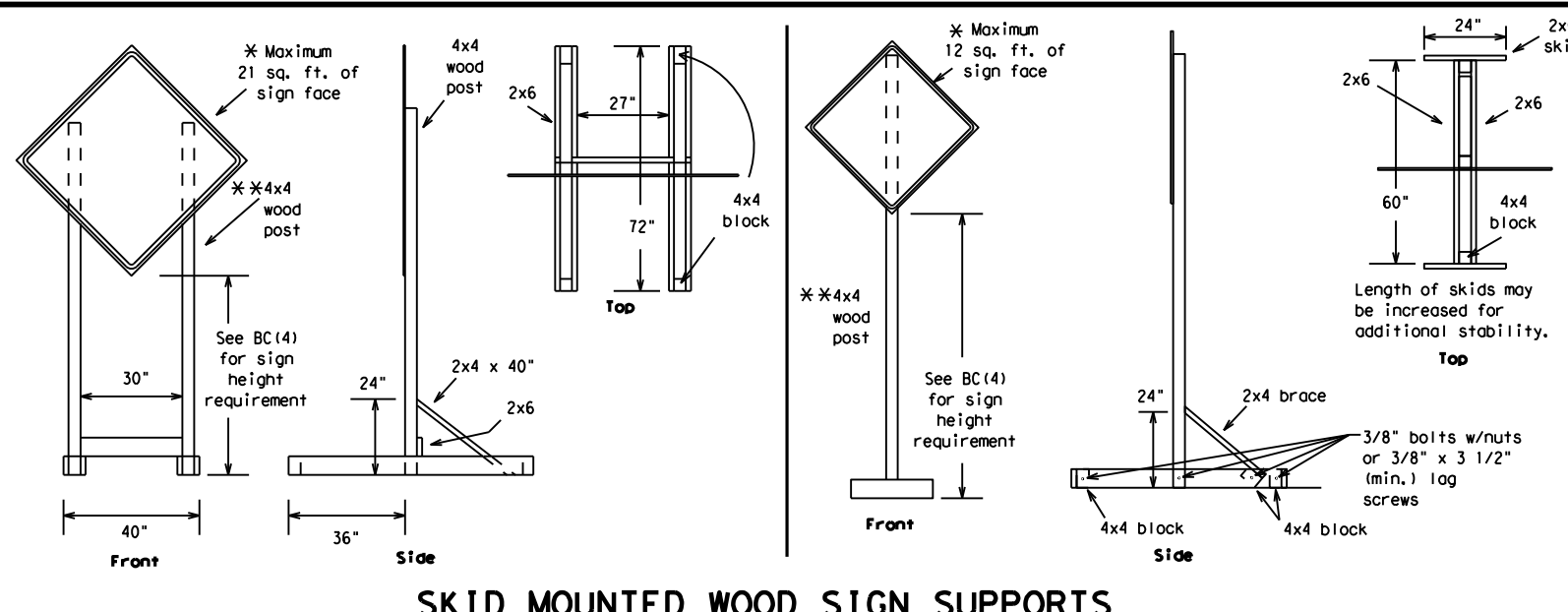
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

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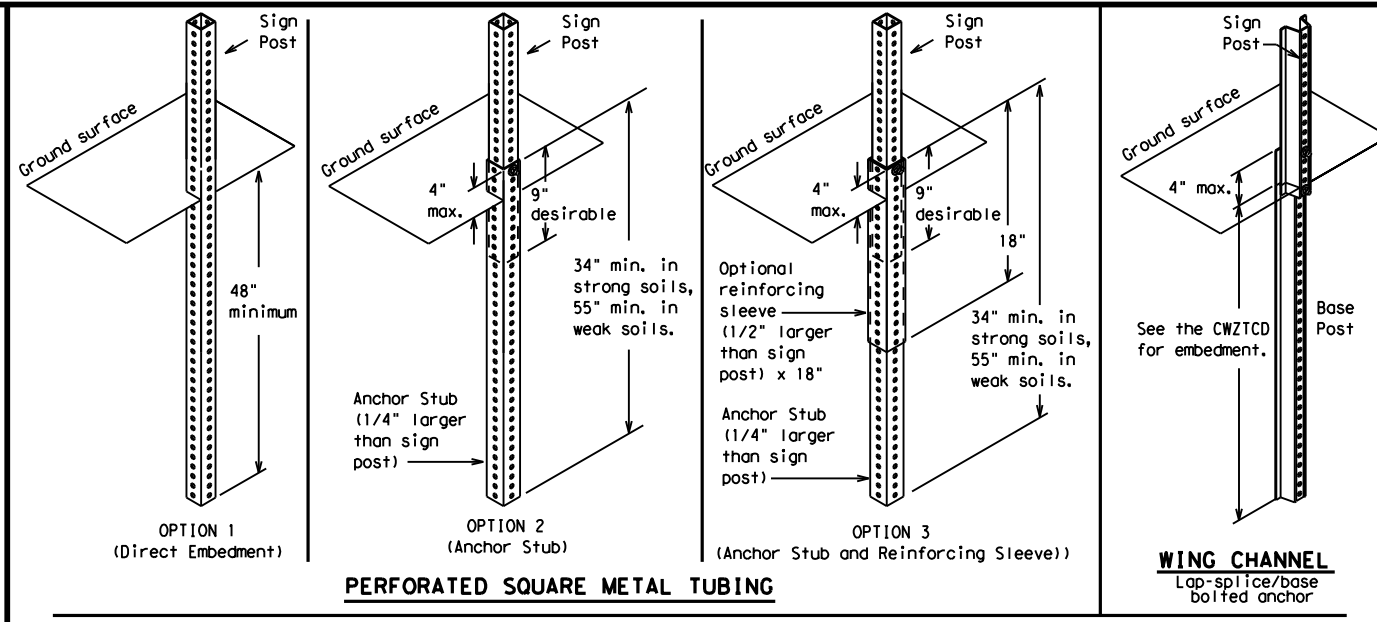
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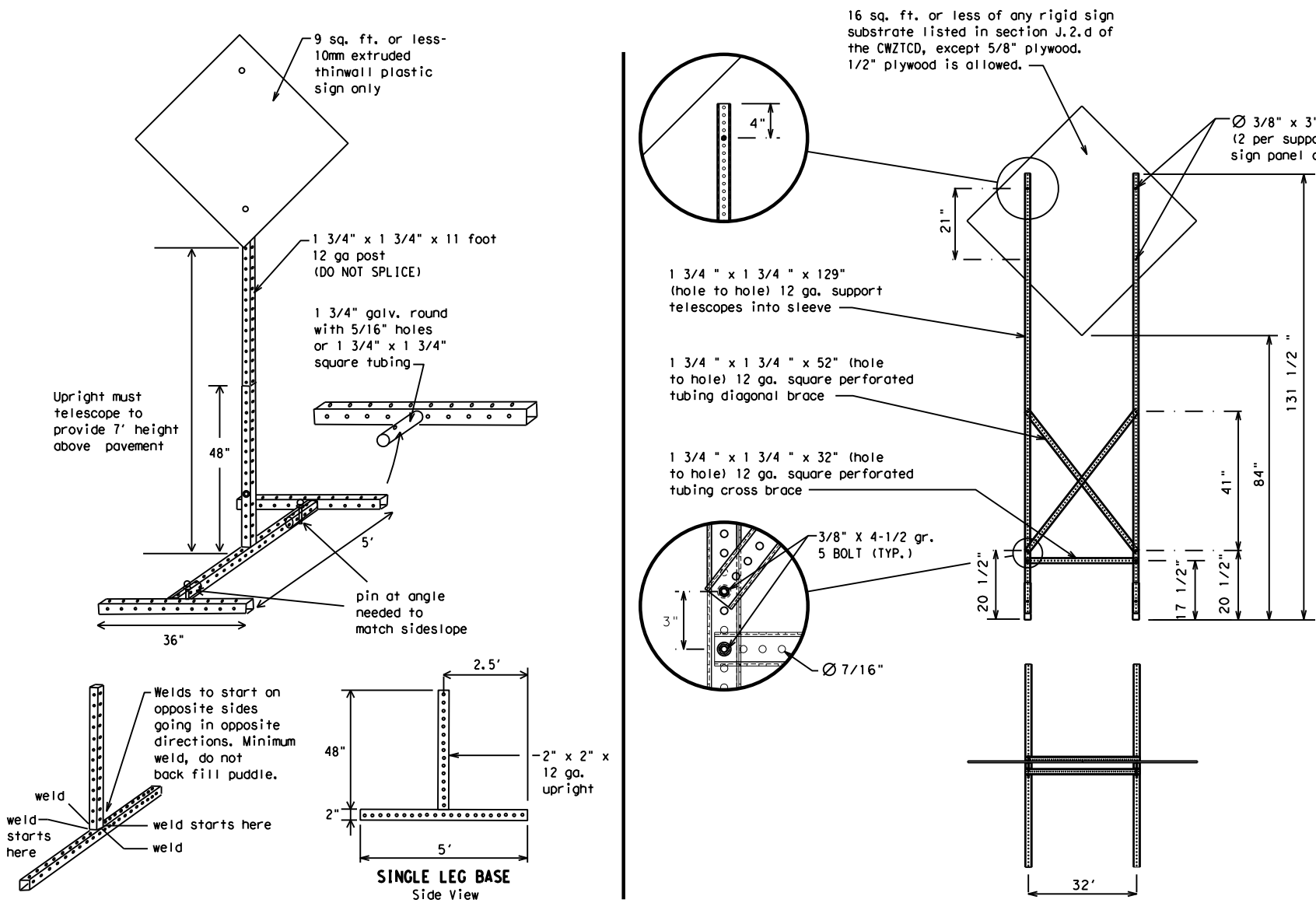
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

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

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

- GENERAL NOTES**
- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.
- * See BC(4) for definition of "Work Duration."
 - ** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
 - ☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

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

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



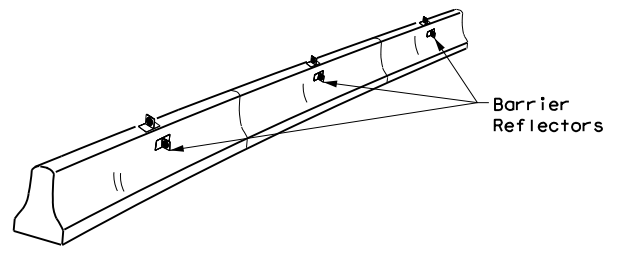
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

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9-07	8-14	DIST	COUNTY	SHEET NO.
7-13	5-21	AUS	BASTROP	21

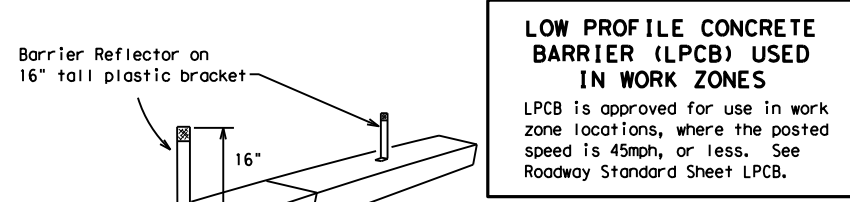
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



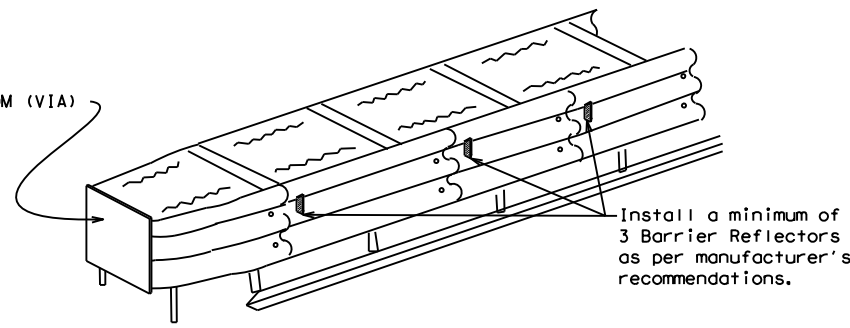
CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES
 LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

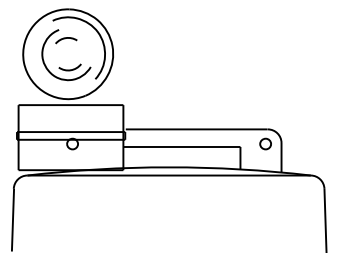
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

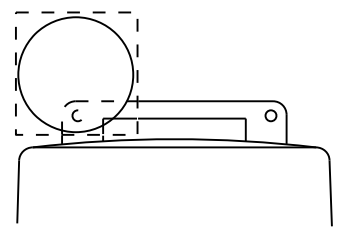
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



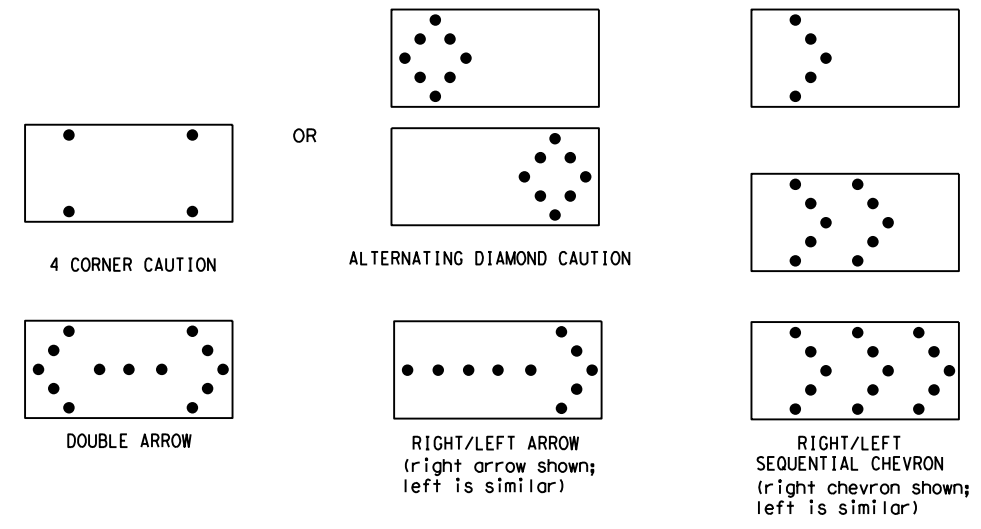
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

ATTENTION
 Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) - 21

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

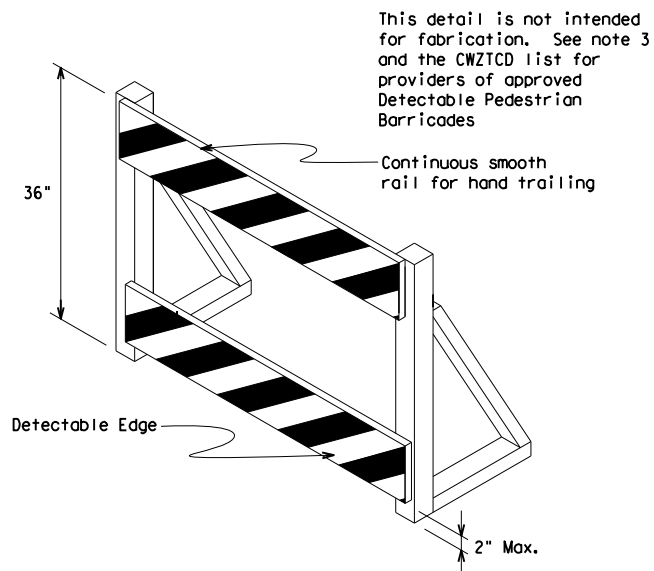
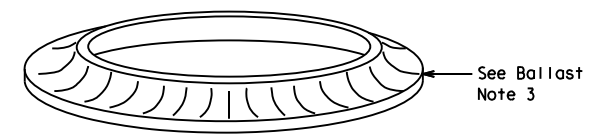
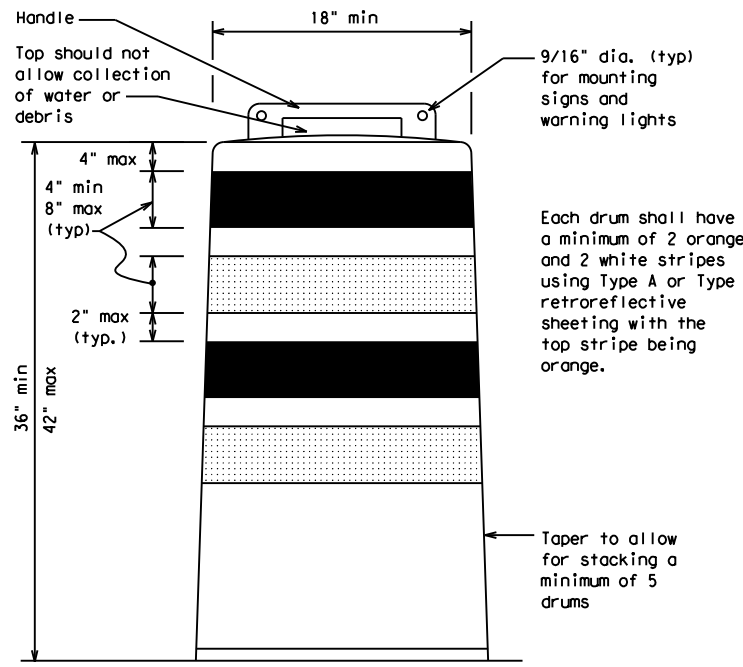
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 - The body and base shall lock together in such a manner that the body separates from the base when impacted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

RETROREFLECTIVE SHEETING

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

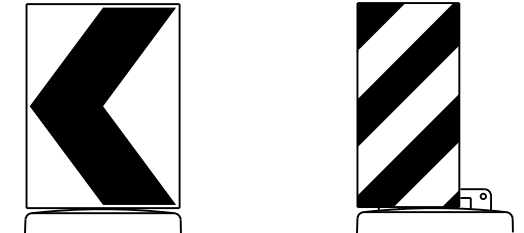
BALLAST

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



DETECTABLE PEDESTRIAN BARRICADES

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



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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12



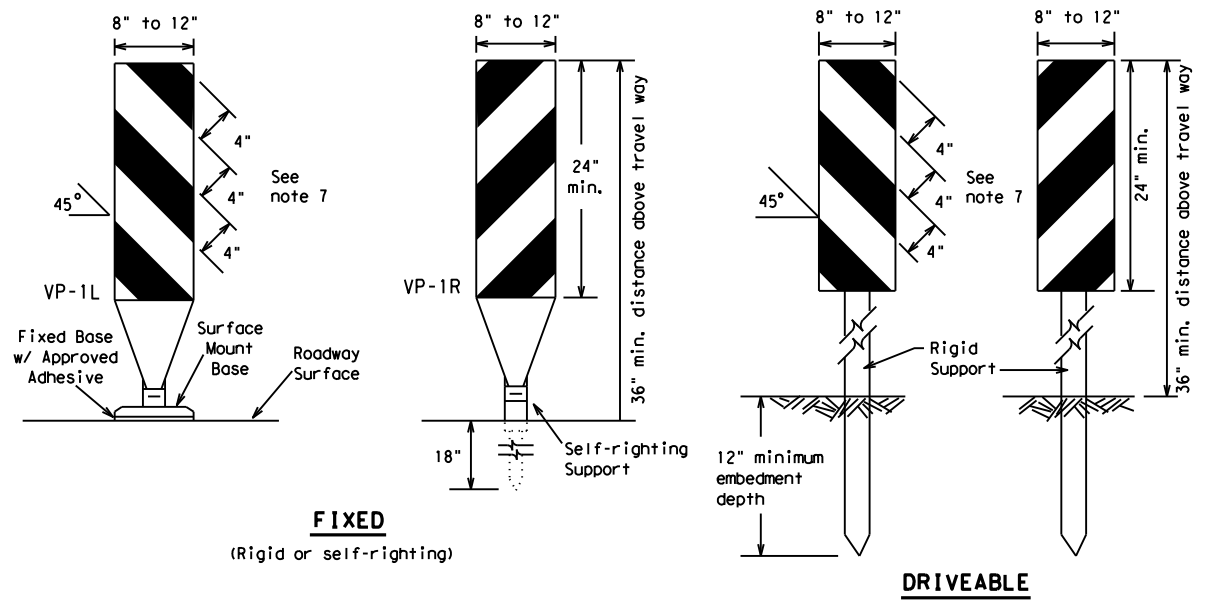
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

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7-13									

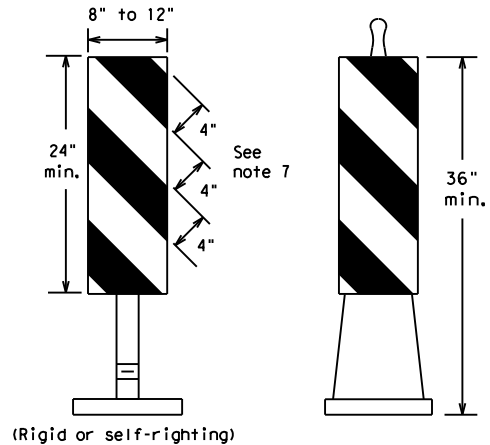
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FIXED
(Rigid or self-righting)

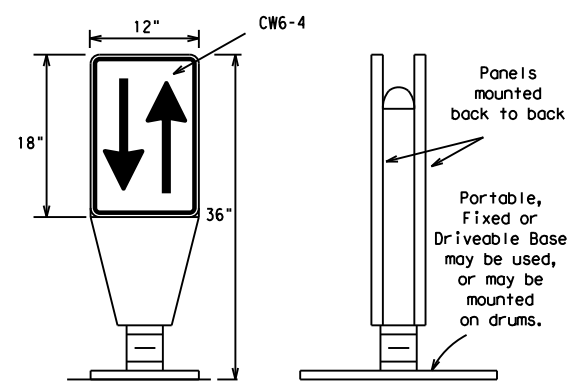
DRIVEABLE



PORTABLE

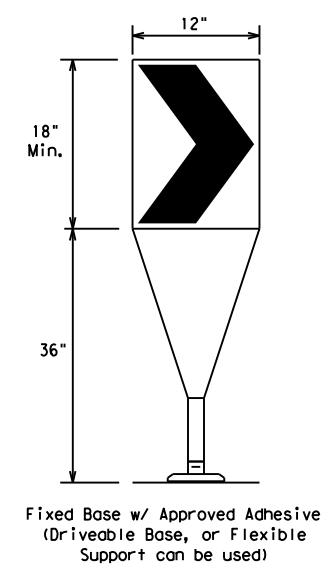
VERTICAL PANELS (VPs)

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



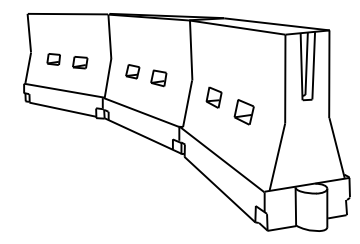
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

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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.

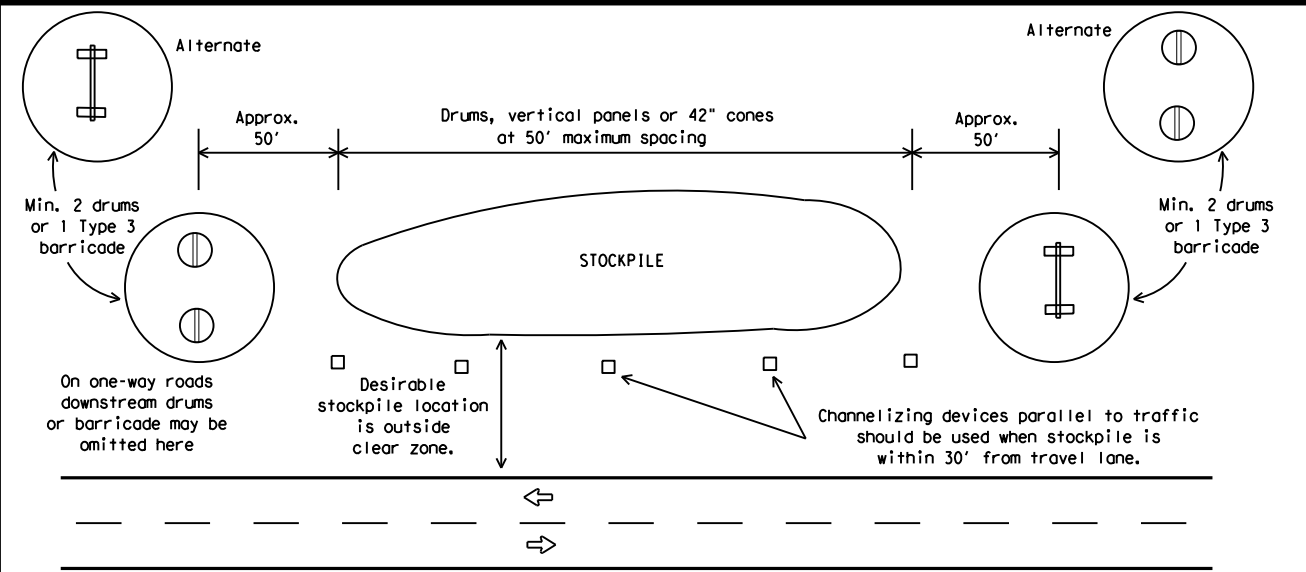


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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



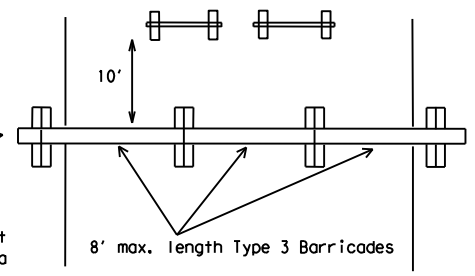
TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



PERSPECTIVE VIEW

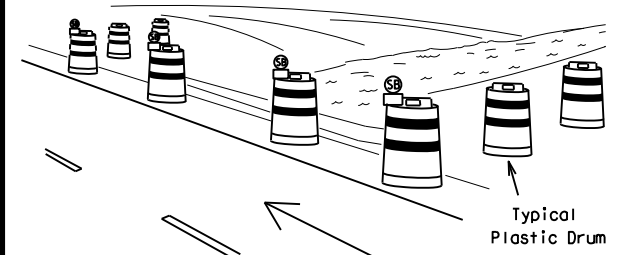
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



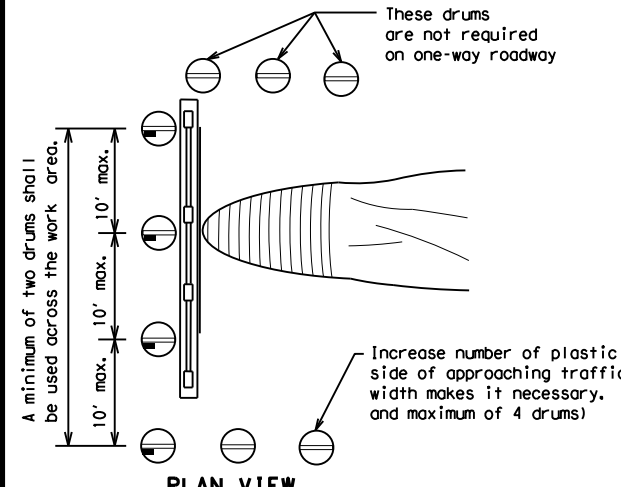
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

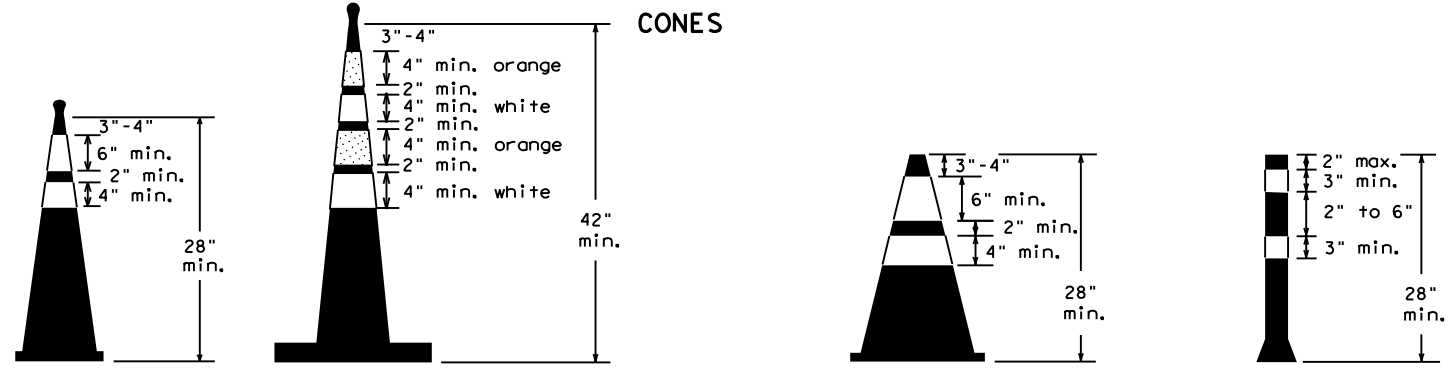


PLAN VIEW

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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones

One-Piece cones

Tubular Marker

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

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.



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

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7-13	5-21	AUS	BASTROP	25					

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

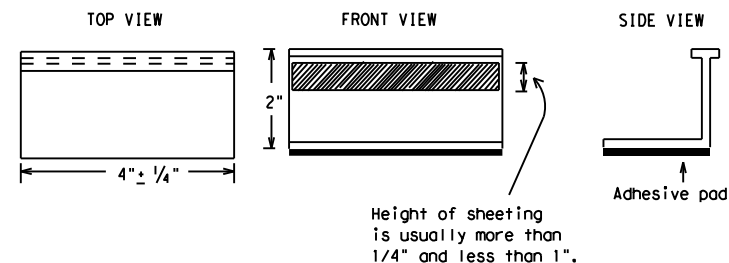
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

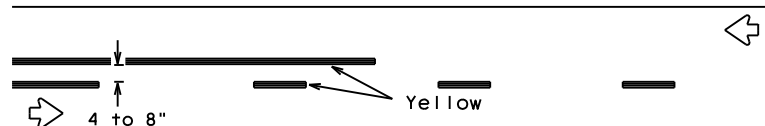
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PAVEMENT MARKING PATTERNS

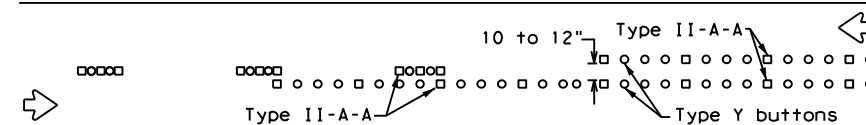


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

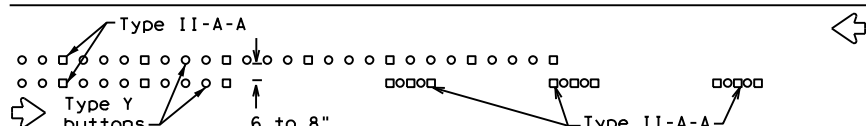


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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



RAISED PAVEMENT MARKERS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN B

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



REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



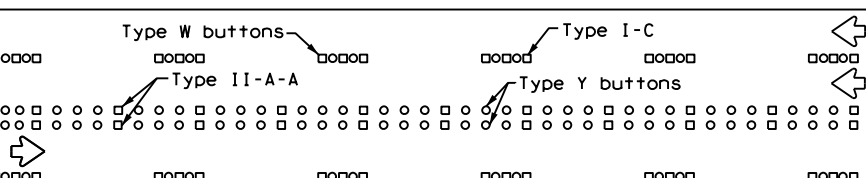
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



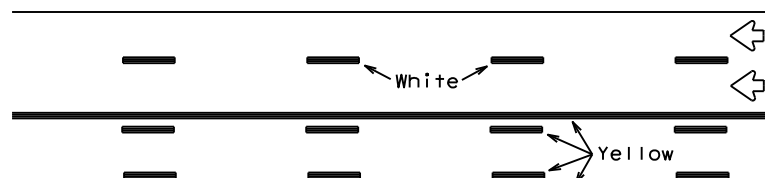
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



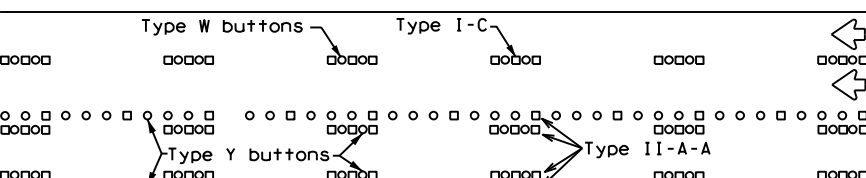
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

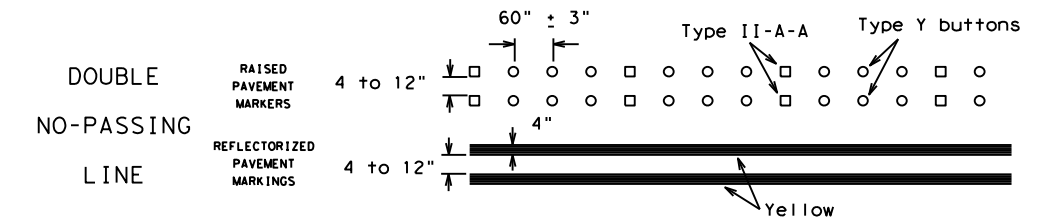
Prefabricated markings may be substituted for reflectorized pavement markings.



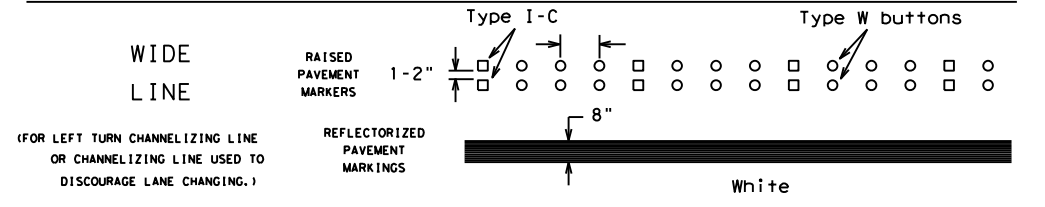
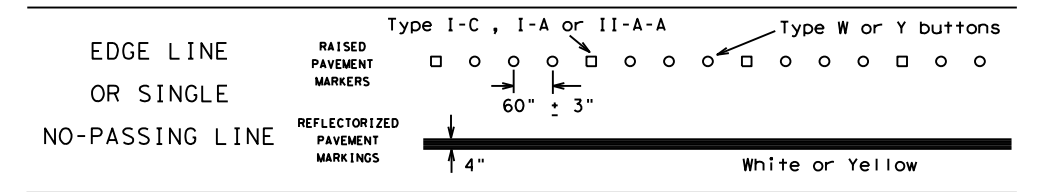
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

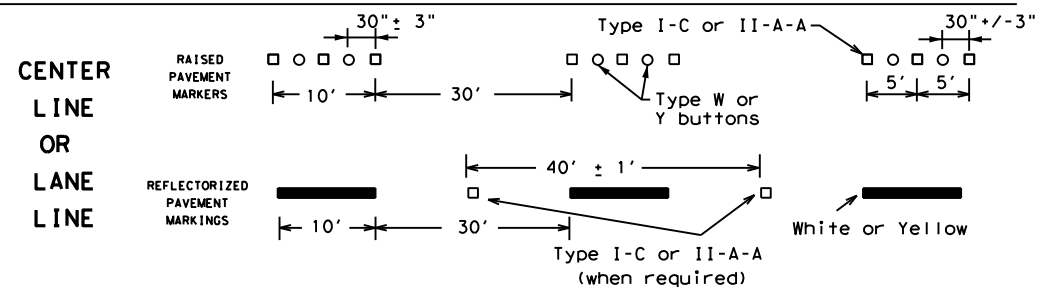
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



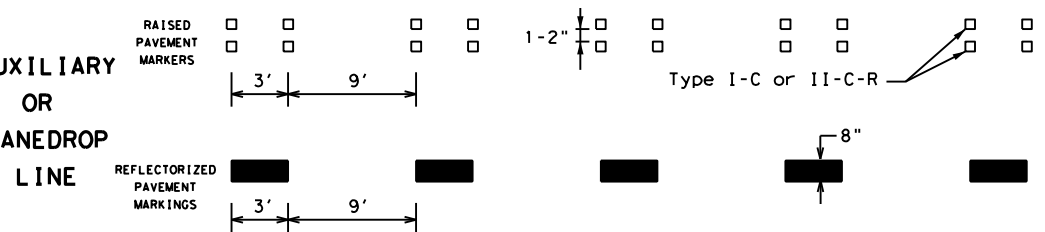
SOLID LINES



BROKEN LINES

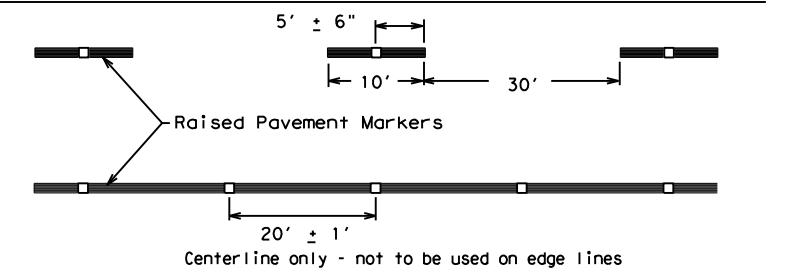


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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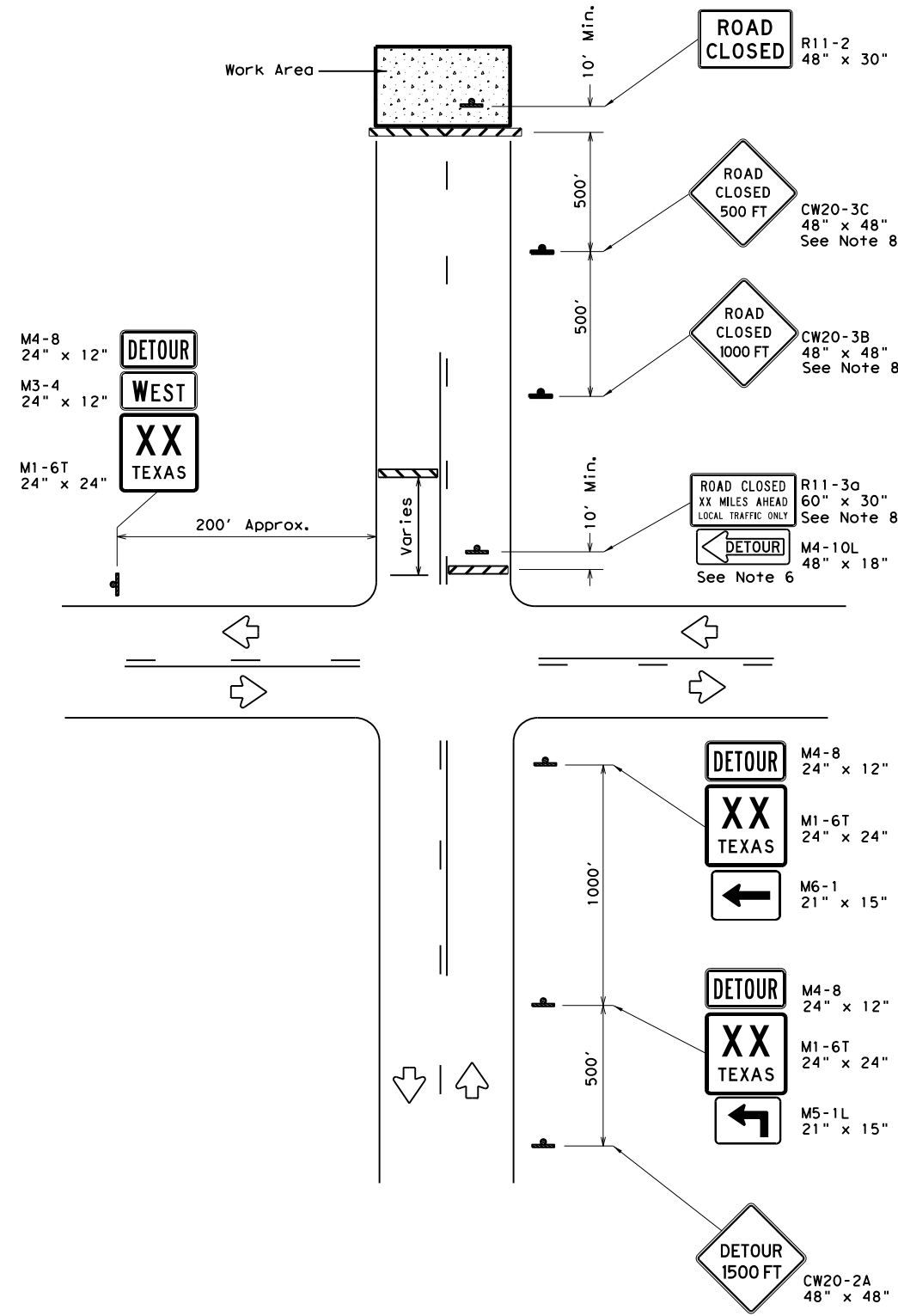
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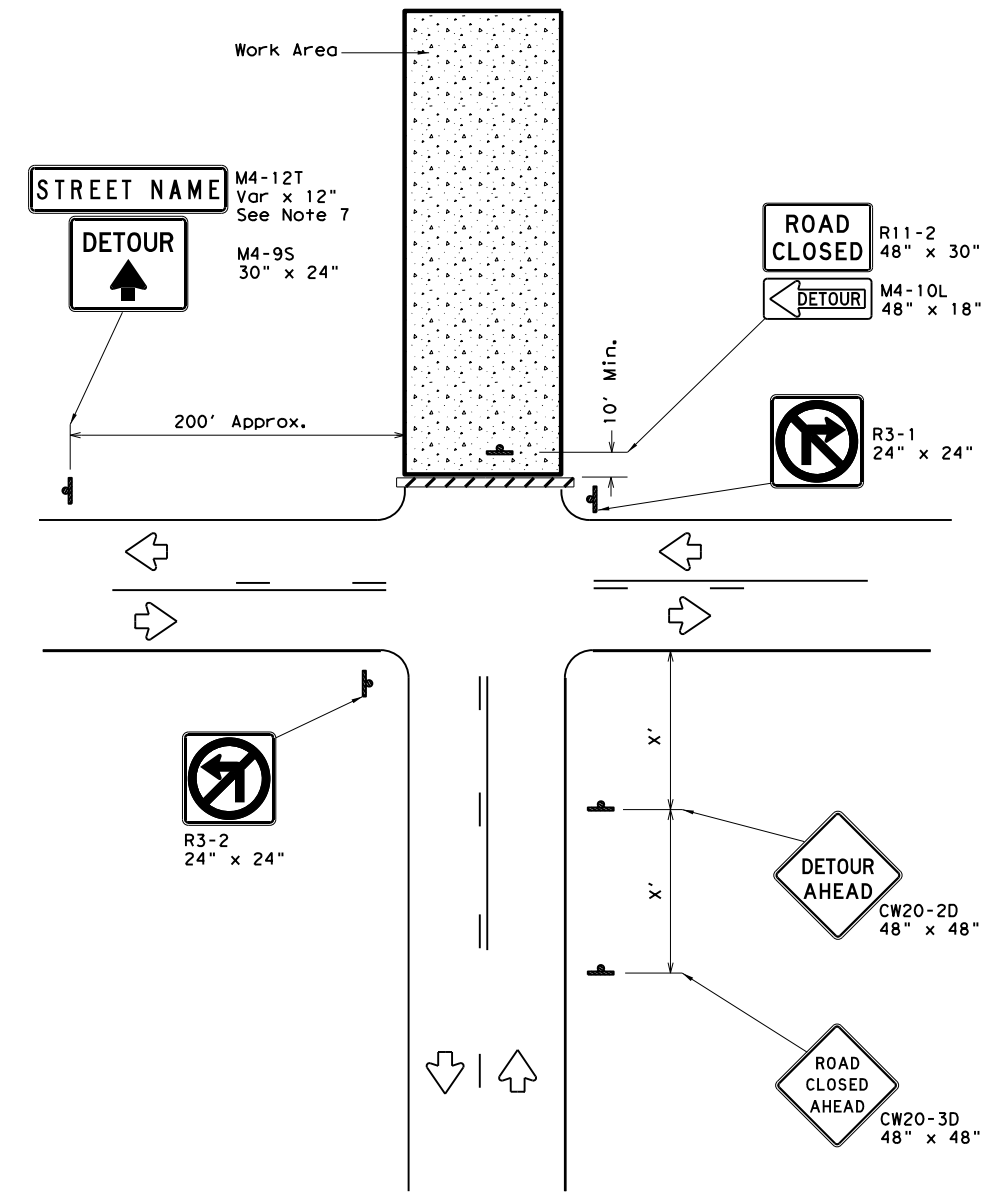
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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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.

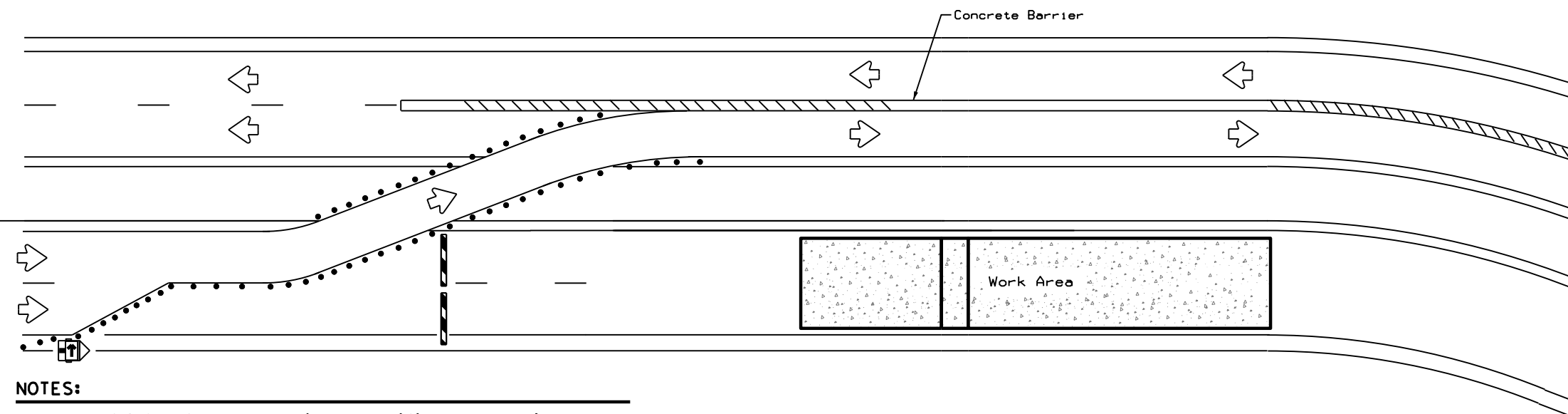
WORK ZONE ROAD CLOSURE DETAILS

WZ (RCD) - 13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
1-97 4-98 7-13	DIST	COUNTY	SHEET NO.	
2-98 3-03	AUS	BASTROP	28	

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LEGEND	
	Type 3 Barricade
	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
	Safety glare screen

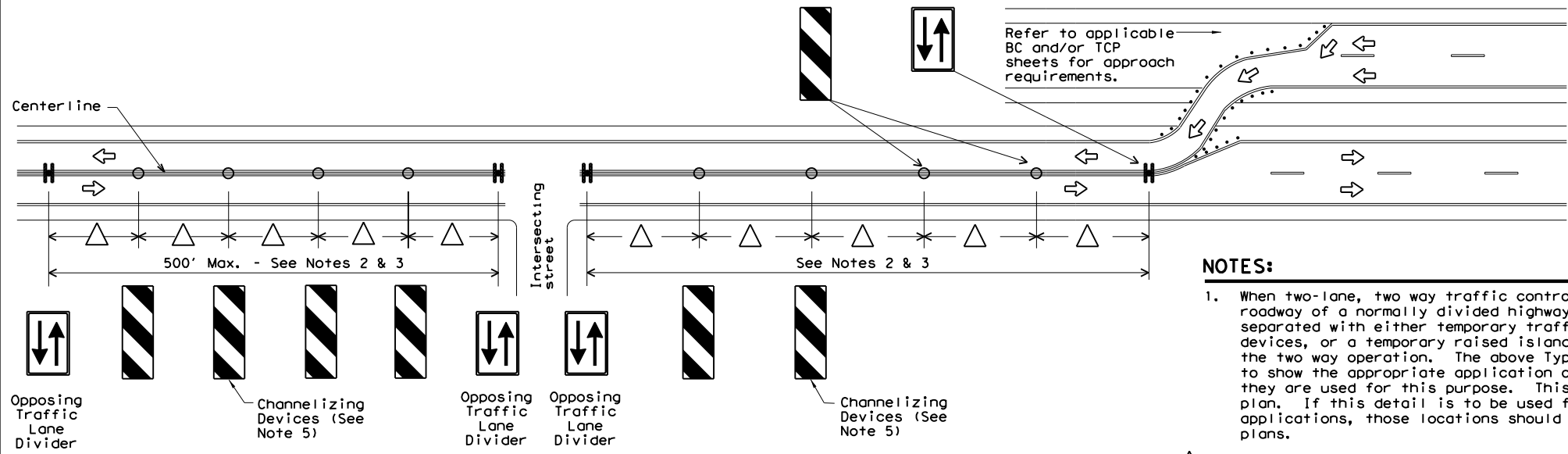
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:

<http://www.txdot.gov/business/resources/producer-list.html>

- NOTES:**
- Length of Safety Glare screen will be specified elsewhere in the plans.
 - The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
 - Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
 - Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
 - This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

BARRIER DELINEATION WITH MODULAR GLARE SCREENS



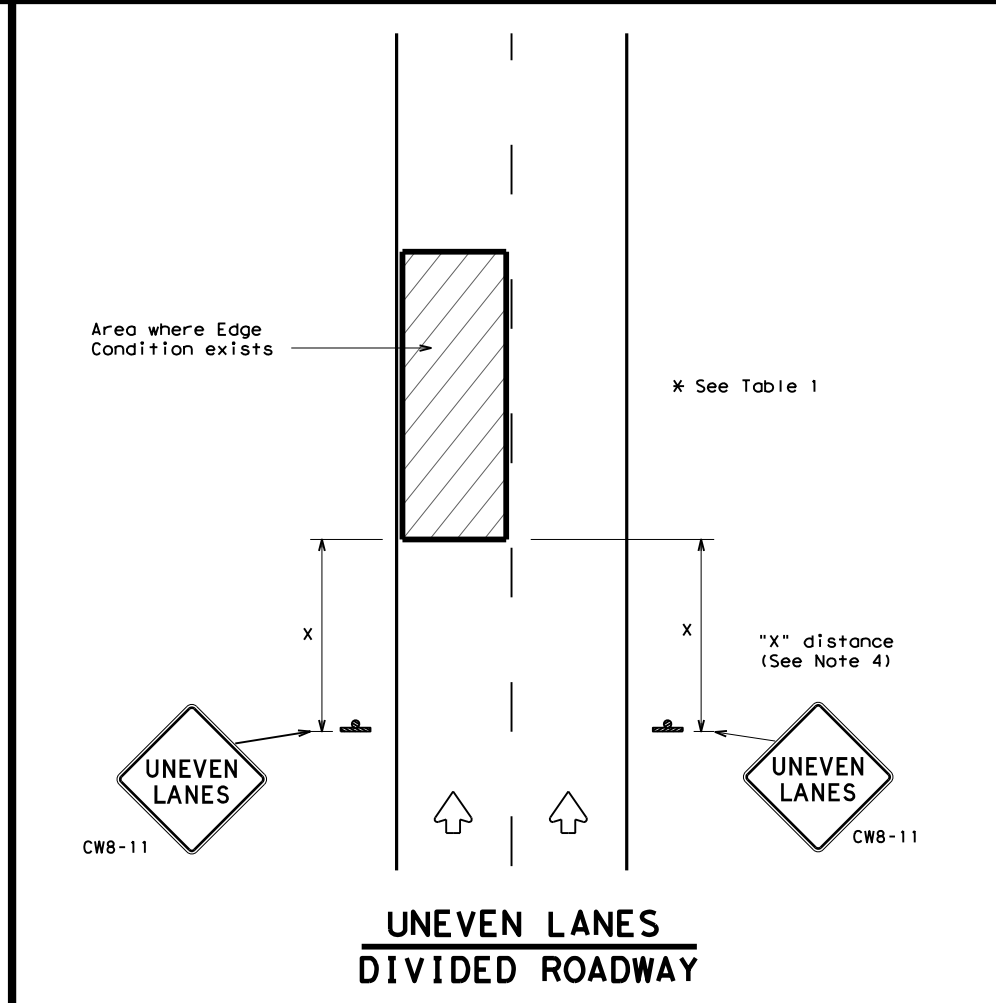
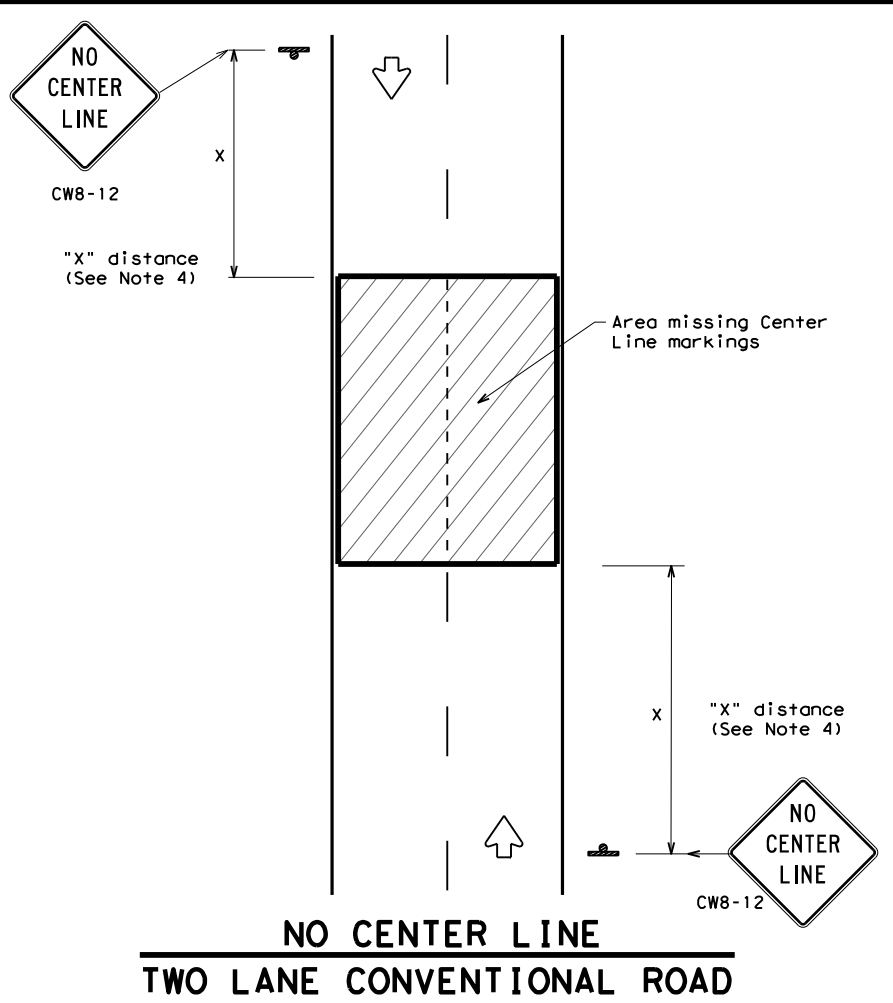
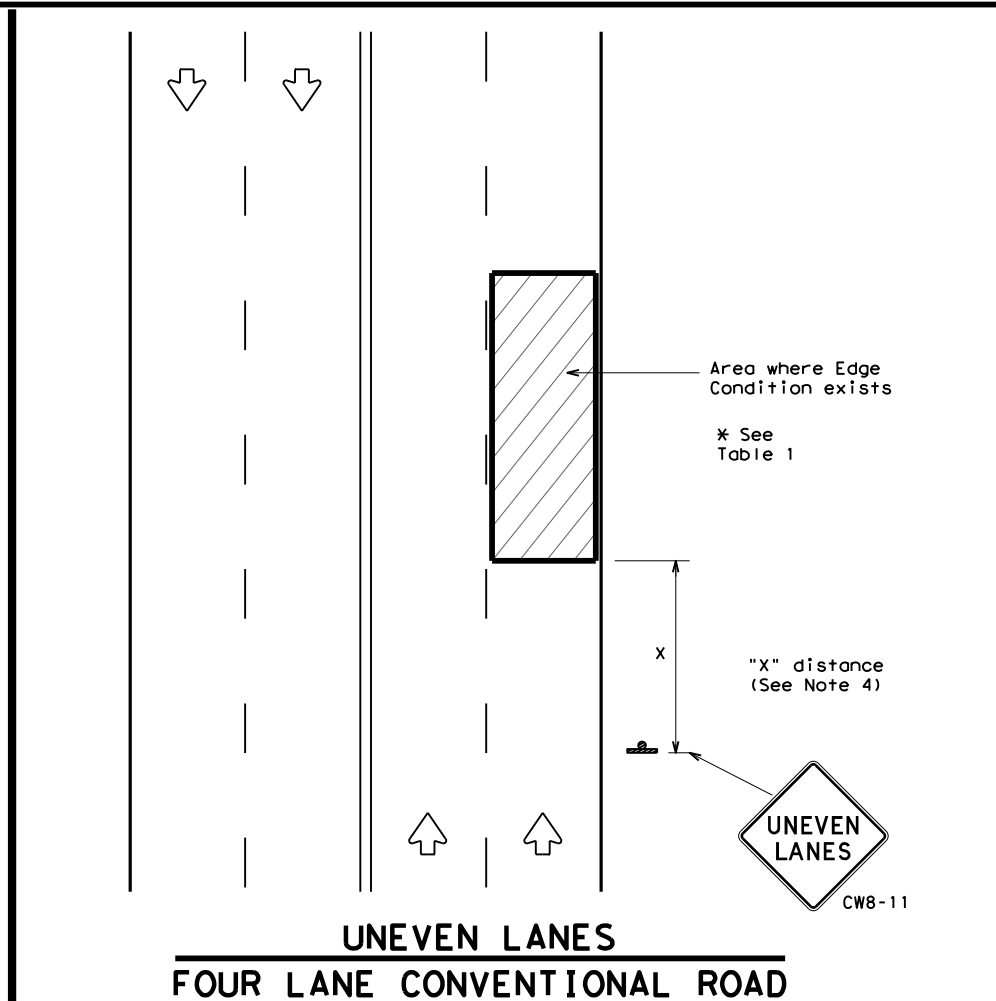
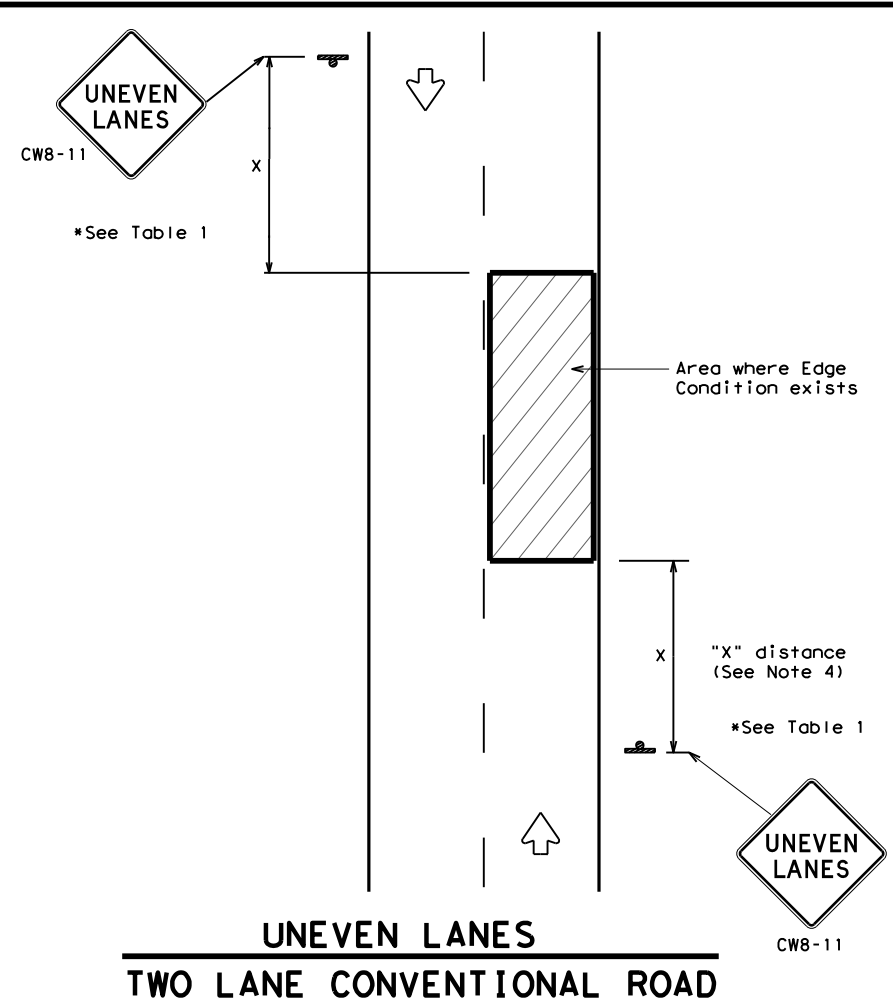
- NOTES:**
- When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
 - Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
 - Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
 - Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
 - Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

		Traffic Operations Division Standard	
TRAFFIC CONTROL PLAN TYPICAL DETAILS			
WZ(TD) - 17			
FILE:	wztd-17.dgn	DN:	TxDOT
© TxDOT	February 1998	CK:	TxDOT
REVISIONS		OW:	TxDOT
4-98	2-17	CR:	TxDOT
3-03		CONT	SECT
7-13		0914	18
		JOB	HIGHWAY
		111, etc.	CR290, etc.
		DIST	COUNTY
		AUS	BASTROP
		SHEET NO.	29

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

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

GENERAL NOTES

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

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

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

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



SIGNING FOR UNEVEN LANES

WZ (UL) - 13

FILE: wzu1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT	APRIL 1992	CONT	SECT	JOB
REVISIONS	0914 18	111, etc.	CR290, etc.	
8-95 2-98 7-13	DIST	COUNTY	SHEET NO.	
1-97 3-03	AUS	BASTROP	30	

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Beginning chain CR290-CL2 description
 Feature: Road-Centerline
 =====
 Point 13 N 9,937,079.5985 E 3,236,925.5797 Sta 10+65.00
 Course from 13 to PC CR290-CL2-3 S 62° 30' 20.83" E Dist 83.3092

Curve Data

P.I. Station	11+70.41	N	9,937,030.9340	E	3,237,019.0865
	Delta	=	8° 25' 39.16"	(LT)	
	Degree	=	19° 05' 54.94"		
	Tangent	=	22.1031		
	Length	=	44.1265		
	Radius	=	300.0000		
	External	=	0.8131		
	Long Chord	=	44.0867		
	Mid. Ord.	=	0.8109		
P.C. Station	11+48.31	N	9,937,041.1381	E	3,236,999.4798
P.T. Station	11+92.44	N	9,937,023.7136	E	3,237,039.9770
C.C.		N	9,937,307.2553	E	3,237,137.9775
	Back	= S	62° 30' 20.83"	E	
	Ahead	= S	70° 55' 59.99"	E	
	Chord Bear	= S	66° 43' 10.41"	E	

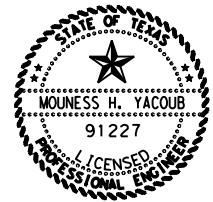
Course from PT CR290-CL2-3 to PC CR290-CL2-6 S 70° 55' 59.99" E Dist 78.3287

Curve Data

P.I. Station	12+97.54	N	9,936,989.3810	E	3,237,139.3105
	Delta	=	15° 14' 52.02"	(RT)	
	Degree	=	28° 38' 52.40"		
	Tangent	=	26.7706		
	Length	=	53.2248		
	Radius	=	200.0000		
	External	=	1.7837		
	Long Chord	=	53.0679		
	Mid. Ord.	=	1.7679		
P.C. Station	12+70.76	N	9,936,998.1261	E	3,237,114.0086
P.T. Station	13+23.99	N	9,936,974.2895	E	3,237,161.4218
C.C.		N	9,936,809.0983	E	3,237,048.6749
	Back	= S	70° 55' 59.99"	E	
	Ahead	= S	55° 41' 07.97"	E	
	Chord Bear	= S	63° 18' 33.98"	E	

Course from PT CR290-CL2-6 to 14 S 55° 41' 07.97" E Dist 81.2128

Point 14 N 9,936,928.5071 E 3,237,228.5000 Sta 14+05.20
 =====
 Ending chain CR290-CL2 description



Mouness Yacoub P.E.

01/26/2022

Austin District Central Design				
Texas Department of Transportation				
COMMUNITY CENTER RD HORIZONTAL ALIGNMENT DATA				
SHEET 1 OF 1				
© 2022	CONT	SECT	JOB	HIGHWAY
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Beginning chain DET description
 Feature: BL

Point DET1 N 9,937,109.5417 E 3,236,867.8840 Sta 10+00.00

Course from DET1 to PC DET*3 S 62° 33' 00.71" E Dist 78.9615

Curve Data 4

Curve DET*3
 P.I. Station 11+13.39 N 9,937,057.2743 E 3,236,968.5040
 Delta = 21° 39' 12.83" (LT)
 Degree = 31° 49' 51.56"
 Tangent = 34.4240
 Length = 68.0267
 Radius = 180.0000
 External = 3.2621
 Long Chord = 67.6226
 Mid. Ord. = 3.2041
 P.C. Station 10+78.96 N 9,937,073.1428 E 3,236,937.9556
 P.T. Station 11+46.99 N 9,937,053.7977 E 3,237,002.7521
 C.C. N 9,937,232.8775 E 3,237,020.9305
 Back = S 62° 33' 00.71" E
 Ahead = S 84° 12' 13.54" E
 Chord Bear = S 73° 22' 37.12" E

Course from PT DET*3 to PC DET*6 S 84° 12' 13.54" E Dist 71.5804

Curve Data

Curve DET*6
 P.I. Station 12+42.46 N 9,937,044.1563 E 3,237,097.7326
 Delta = 16° 58' 59.72" (RT)
 Degree = 35° 48' 35.50"
 Tangent = 23.8883
 Length = 47.4262
 Radius = 160.0000
 External = 1.7734
 Long Chord = 47.2528
 Mid. Ord. = 1.7540
 P.C. Station 12+18.57 N 9,937,046.5688 E 3,237,073.9665
 P.T. Station 12+65.99 N 9,937,034.9071 E 3,237,119.7577
 C.C. N 9,936,887.3868 E 3,237,057.8080
 Back = S 84° 12' 13.54" E
 Ahead = S 67° 13' 13.81" E
 Chord Bear = S 75° 42' 43.68" E

Course from PT DET*6 to PC DET*9 S 67° 13' 13.81" E Dist 13.4606

Curve Data

Curve DET*9
 P.I. Station 13+04.19 N 9,937,020.1186 E 3,237,154.9735
 Delta = 44° 48' 24.21" (RT)
 Degree = 95° 29' 34.68"
 Tangent = 24.7343
 Length = 46.9215
 Radius = 60.0000
 External = 4.8983
 Long Chord = 45.7350
 Mid. Ord. = 4.5286
 P.C. Station 12+79.46 N 9,937,029.6953 E 3,237,132.1684
 P.T. Station 13+26.38 N 9,936,997.2528 E 3,237,164.4045
 C.C. N 9,936,974.3752 E 3,237,108.9372
 Back = S 67° 13' 13.81" E
 Ahead = S 22° 24' 49.60" E
 Chord Bear = S 44° 49' 01.71" E

Course from PT DET*9 to PC DET*12 S 22° 24' 49.60" E Dist 19.7949

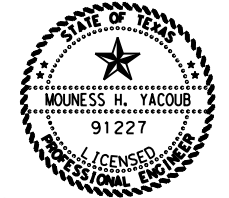
Curve Data

Curve DET*12
 P.I. Station 13+64.14 N 9,936,962.3419 E 3,237,178.8035
 Delta = 33° 20' 38.59" (LT)
 Degree = 95° 29' 34.68"
 Tangent = 17.9689
 Length = 34.9178
 Radius = 60.0000
 External = 2.6329
 Long Chord = 34.4271
 Mid. Ord. = 2.5222
 P.C. Station 13+46.17 N 9,936,978.9533 E 3,237,171.9521
 P.T. Station 13+81.09 N 9,936,952.2309 E 3,237,193.6579
 C.C. N 9,937,001.8309 E 3,237,227.4194
 Back = S 22° 24' 49.60" E
 Ahead = S 55° 45' 28.19" E
 Chord Bear = S 39° 05' 08.89" E

Course from PT DET*12 to DET14 S 55° 45' 28.19" E Dist 37.1520

Point DET14 N 9,936,931.3257 E 3,237,224.3702 Sta 14+18.24

Ending chain DET description



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**Austin District
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Texas Department of Transportation

**COMMUNITY CENTER RD
 HORIZONTAL
 DETOUR
 ALIGNMENT DATA**

SHEET 2 OF 2

© 2022	CONT	SECT	JOB	HIGHWAY
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DW: CK:	DIST		COUNTY	SHEET NO.
	AUS		BASTROP	32

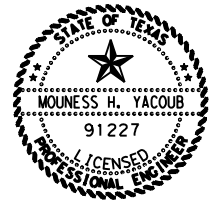
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* 1 Print Profile CR290 PR2

Beginning profile CR290 PR2 description:
 Feature: Road Centerline


		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	10+65.00	474.8615				
VPC		10+99.93	474.2604	-1.7208	K = 68.8		
VPI	2	11+49.93	473.4000		100.0000	50.0000	50.0000
VPT		11+99.93	473.2667	-0.2667			
VPC		12+74.93	473.0667	-0.2667	K = 15.0	SSD = 348.7	
VPI	3	12+99.93	473.0000		50.0000	25.0000	25.0000
VPT		13+24.93	472.1000	-3.6000			
VPC		13+24.94	472.0998	-3.6000	K = 12.7		
VPI	4	13+49.93	471.2000		49.9900	24.9950	24.9950
Low Point		13+70.80	471.2743				
VPT		13+74.93	471.2810	0.3242			
VPI	5	14+05.20	471.3792	0.3242			

Ending profile CR290 PR2 description



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01/26/2022

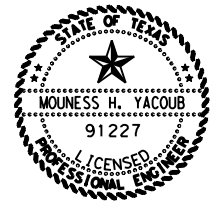
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COMMUNITY CENTER RD				
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	AUS		BASTROP	33

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Beginning profile PDET description:


		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	10+25.00	475.6779				
VPC		11+20.00	473.7064	-2.0752	K = 7.8	SSD = 295.5	
VPI	2	11+35.00	473.3952		30.0000	15.0000	15.0000
VPT		11+50.00	472.5069	-5.9218			
VPC		11+74.00	471.0857	-5.9218	K = 17.3		
VPI	3	11+85.00	470.4343		22.0000	11.0000	11.0000
VPT		11+96.00	469.9224	-4.6531			
VPC		12+04.42	469.5306	-4.6531	K = 8.6		
VPI	4	12+24.42	468.6000		40.0000	20.0000	20.0000
VPT		12+44.42	468.6000	0.0000			
VPC		12+76.18	468.6000	0.0000	K = 9.0		
VPI	5	13+04.18	468.6000		56.0000	28.0000	28.0000
VPT		13+32.18	470.3347	6.1953			
VPC		13+32.99	470.3849	6.1953	K = 4.6	SSD = 192.0	
VPI	6	13+46.99	471.2522		28.0000	14.0000	14.0000
VPT		13+60.99	471.2707	0.1321			
VPI	7	14+18.24	471.3464	0.1321			

Ending profile PDET description:



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01/26/2022

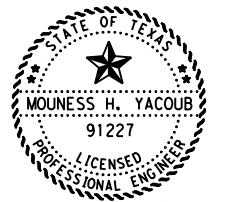
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 Texas Department of Transportation				
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© 2022	CONT	SECT	JOB	HIGHWAY
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	AUS BASTROP		34	

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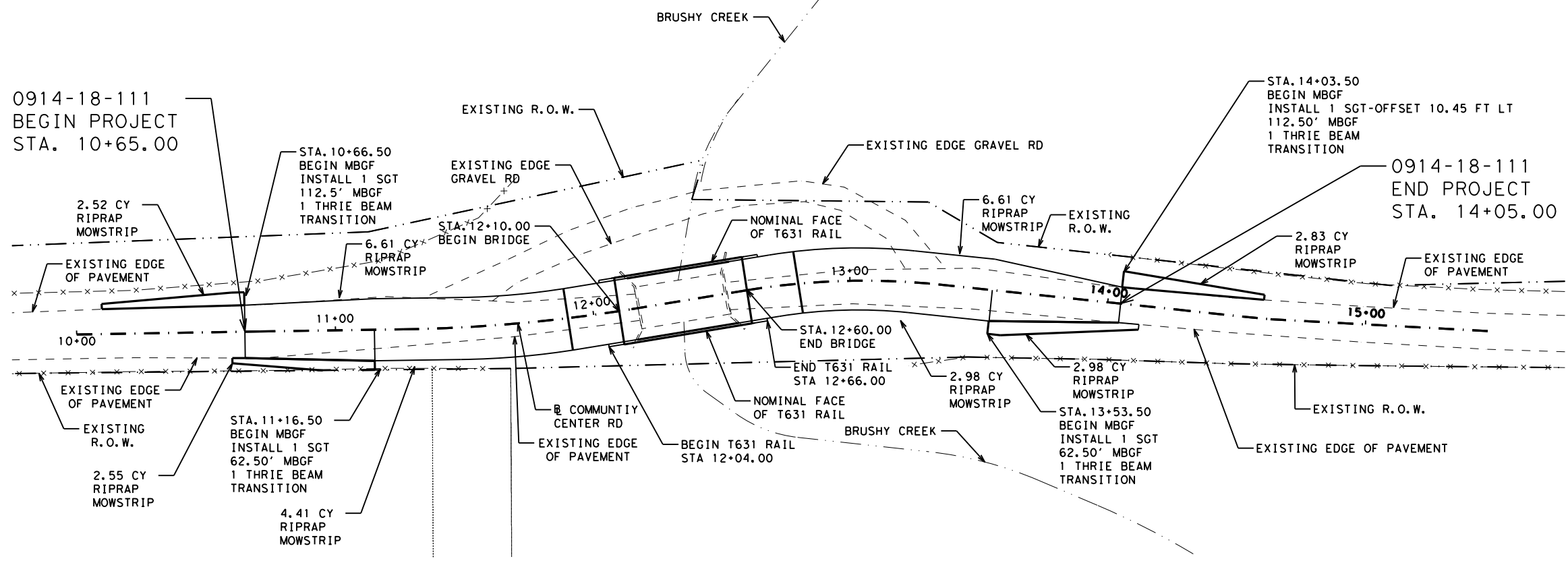
0914-18-111
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 STA. 10+65.00

0914-18-111
 END PROJECT
 STA. 14+05.00

NOTE: REMOVE 1 EXISTING
 BRIDGE WEIGHT
 LIMIT SIGNS

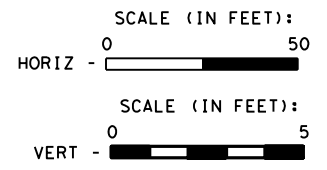
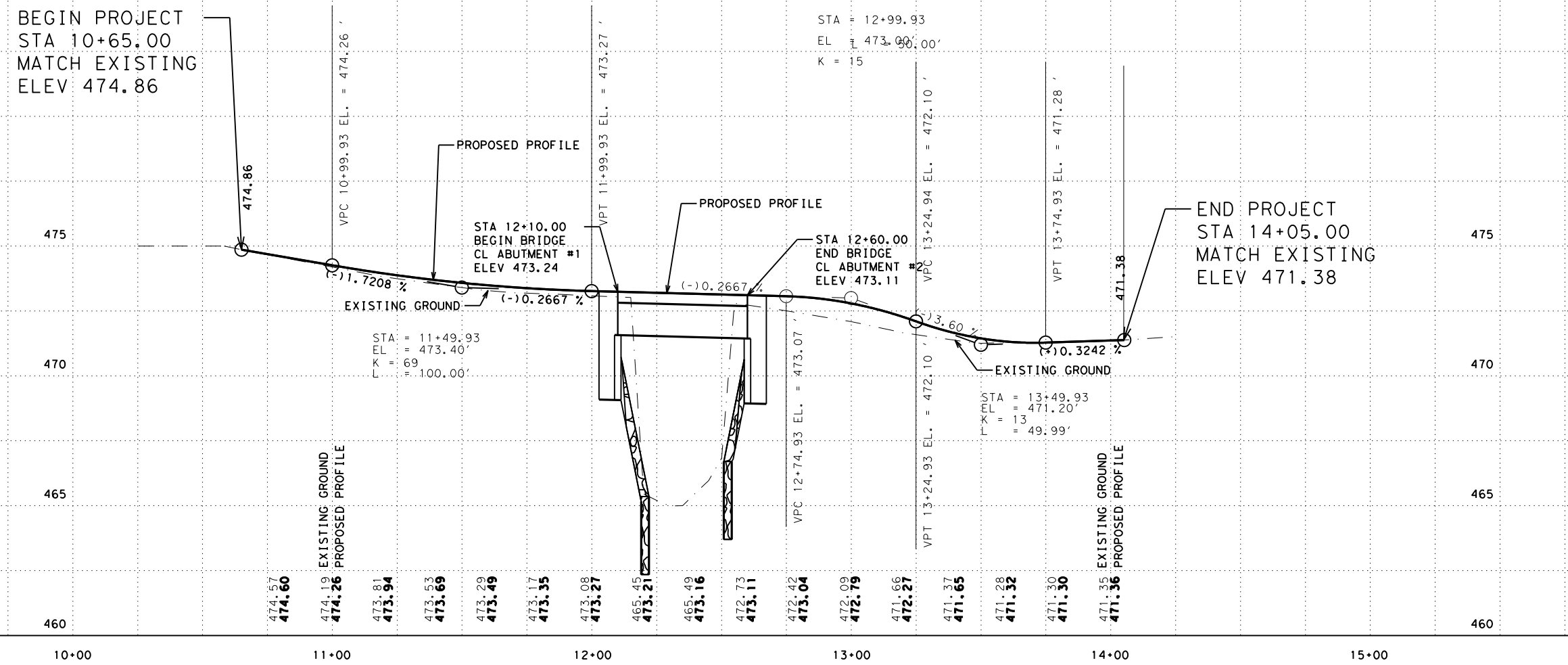


Mouness Yacoub P.E.
 01/27/2022



BEGIN PROJECT
 STA 10+65.00
 MATCH EXISTING
 ELEV 474.86

END PROJECT
 STA 14+05.00
 MATCH EXISTING
 ELEV 471.38



Austin District
 Central Design
 Texas Department of Transportation

COMMUNITY CENTER RD
 PLAN & PROFILE

SHEET 1 OF 1					
DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0914	18	111, etc.	CR290, etc.
DW:	CK:	DIST	COUNTY	SHEET NO.	
		AUS	BASTROP	35	

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Beginning chain YOUNGRD CL description
 Feature: Road Centerline

Point 1 N 9,980,735.0943 E 3,269,811.9065 Sta 12+00.00

Course from 1 to PC YOUNGRD CL 3 S 50° 49' 28.92" E Dist 84.5745

Curve Data

Curve YOUNGRD CL 3

P.I. Station 13+02.34 N 9,980,670.4456 E 3,269,891.2435
 Delta = 10° 09' 11.51" (LT)
 Degree = 28° 38' 52.40"
 Tangent = 17.7672
 Length = 35.4413
 Radius = 200.0000
 External = 0.7876
 Long Chord = 35.3950
 Mid. Ord. = 0.7845
 P.C. Station 12+84.57 N 9,980,681.6690 E 3,269,877.4701
 P.T. Station 13+20.02 N 9,980,661.8259 E 3,269,906.7797
 C.C. N 9,980,836.7124 E 3,270,003.8091
 Back = S 50° 49' 28.92" E
 Ahead = S 60° 58' 40.43" E
 Chord Bear = S 55° 54' 04.67" E

Course from PT YOUNGRD CL 3 to PC YOUNGRD CL 6 S 60° 58' 40.43" E Dist 106.3490

Curve Data

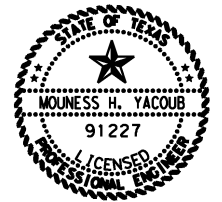
Curve YOUNGRD CL 6

P.I. Station 14+47.10 N 9,980,600.1715 E 3,270,017.9060
 Delta = 7° 54' 27.16" (LT)
 Degree = 19° 05' 54.94"
 Tangent = 20.7348
 Length = 41.4038
 Radius = 300.0000
 External = 0.7157
 Long Chord = 41.3710
 Mid. Ord. = 0.7140
 P.C. Station 14+26.36 N 9,980,610.2310 E 3,269,999.7748
 P.T. Station 14+67.77 N 9,980,592.7021 E 3,270,037.2487
 C.C. N 9,980,872.5608 E 3,270,145.3189
 Back = S 60° 58' 40.43" E
 Ahead = S 68° 53' 07.59" E
 Chord Bear = S 643° 55' 54.01" E

Course from PT YOUNGRD CL 6 to 2 S 68° 53' 07.59" E Dist 56.2392


Point 2 N 9,980,572.4429 E 3,270,089.7121 Sta 15+24.01

Ending chain YOUNGRD CL description



Mouness Yacoub P.E.

01/26/2022

Austin District Central Design				
 Texas Department of Transportation				
YOUNG RD				
HORIZONTAL ALIGNMENT DATA				
SHEET 1 OF 1				
© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	DIST		COUNTY	SHEET NO.
	AUS		BASTROP	36

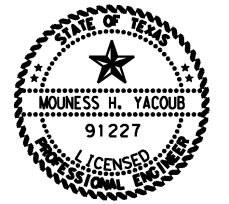
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* 1 Print Profile YOUNGRD PR


Beginning profile YOUNGRD PR description:
 Feature: Road Centerline

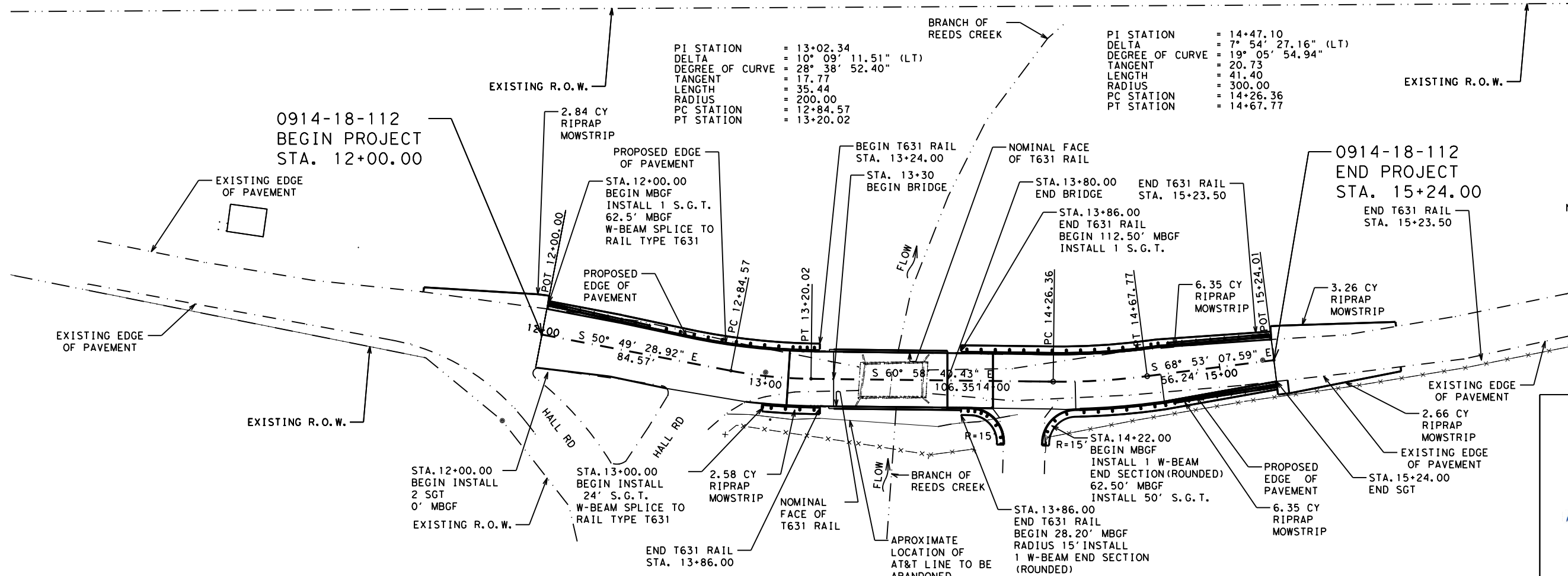
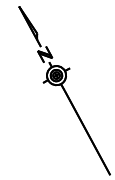
		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	12+00.00	327.2705				
VPC		12+65.00	325.6307	-2.5227	K = 23.7		
VPI	2	12+90.00	325.0000		50.0000	25.0000	25.0000
VPT		13+15.00	324.8958	-0.4167			
VPC		13+85.00	324.6042	-0.4167	K = 18.9	SSD = 432.7	
VPI	3	14+10.00	324.5000		50.0000	25.0000	25.0000
VPT		14+35.00	323.7341	-3.0635			
VPC		14+65.00	322.8151	-3.0635	K = 15.9		
VPI	4	14+90.00	322.0492		50.0000	25.0000	25.0000
Low Point		15+13.61	322.0704				
VPT		15+15.00	322.0711	0.0874			
VPI	5	15+24.01	322.0789	0.0874			

Ending profile YOUNGRD PR description



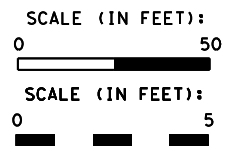
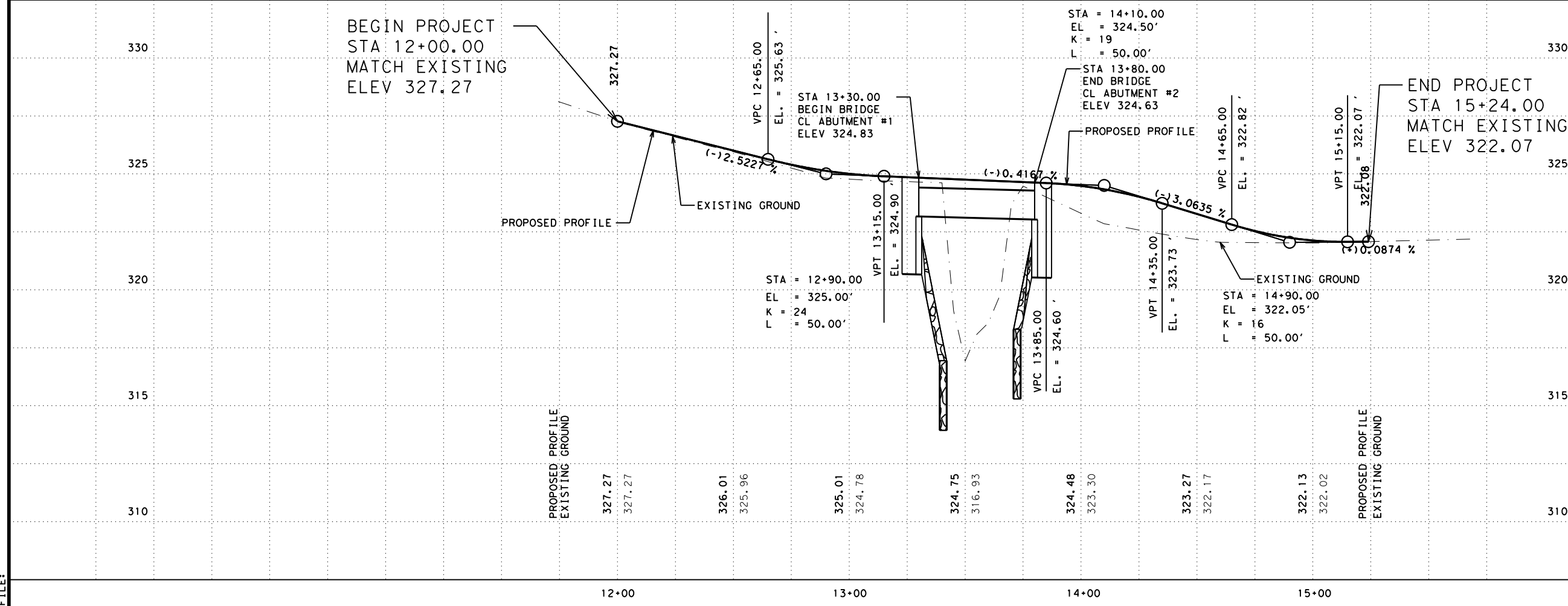
Mouness Yacoub P.E.
 01/26/2022

Austin District Central Design				
 Texas Department of Transportation				
YOUNG RD				
VERTICAL ALIGNMENT DATA				
SHEET 1 OF 1				
© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	DIST		COUNTY	SHEET NO.
	AUS		BASTROP	37



NOTE: REMOVE 2 EXISTING BRIDGE WEIGHT LIMIT SIGNS

STATE OF TEXAS
 MOUNESS H. YACCOUB
 91227
 LICENSED PROFESSIONAL ENGINEER
 Mouness Yacoub P.E.
 03/15/2022



Austin District
 Central Design

Texas Department of Transportation

YOUNG RD
 PLAN & PROFILE

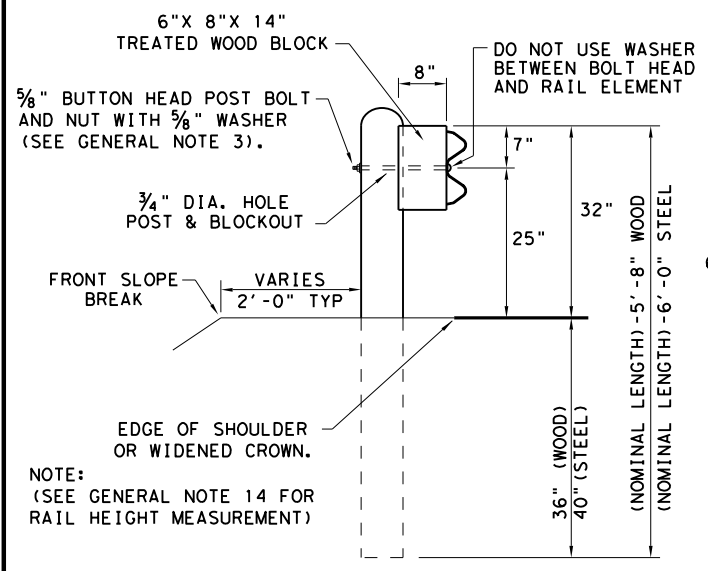
SHEET 1 OF 1

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DIST:	COUNTY:	AUS		BASTROP	
DW:	CK:	38			

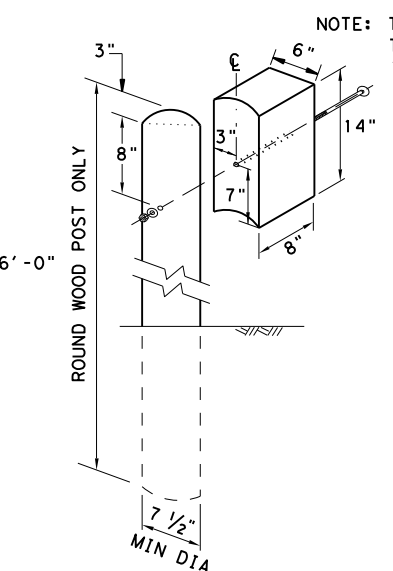
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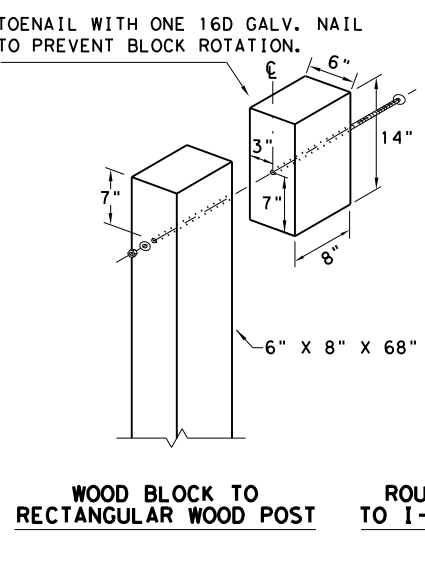
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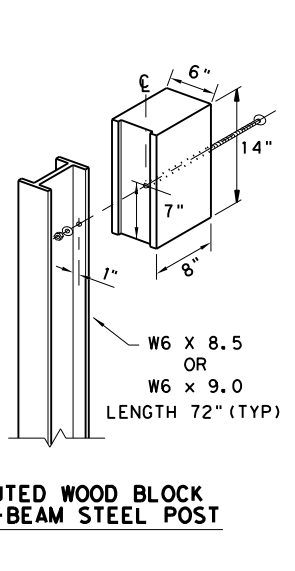
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

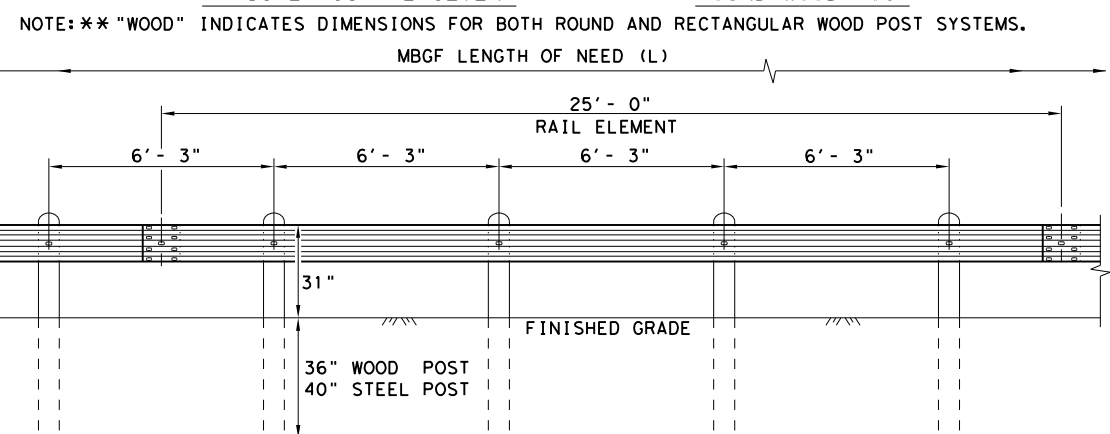


WOOD BLOCK TO RECTANGULAR WOOD POST



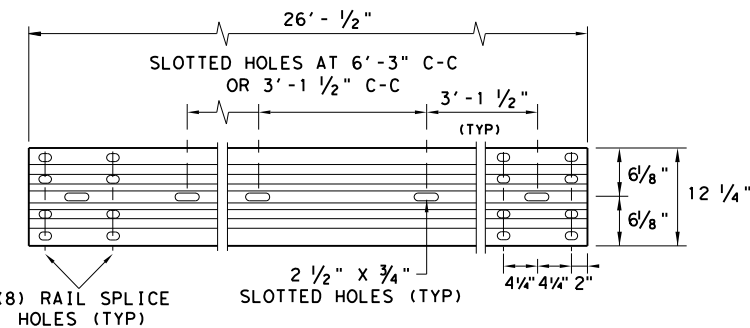
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

- GENERAL NOTES**
1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
 2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'-0", OR 12'-6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
 3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 3/8" WASHER (FWC160) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
 4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
 6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
 7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
 8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
 9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
 10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
 11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
 12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
 13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
 14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.



ELEVATION MID-SPAN RAIL SPLICE

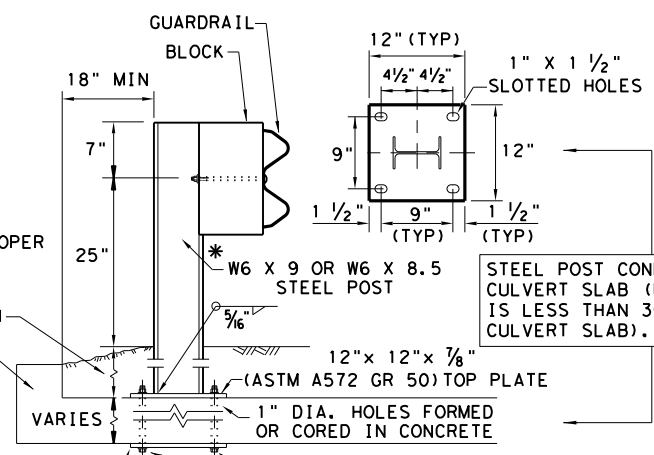
SHOWING A 25'-0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

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

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



LOW FILL CULVERT POST

1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

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

NOTE: FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECESSED NUT.

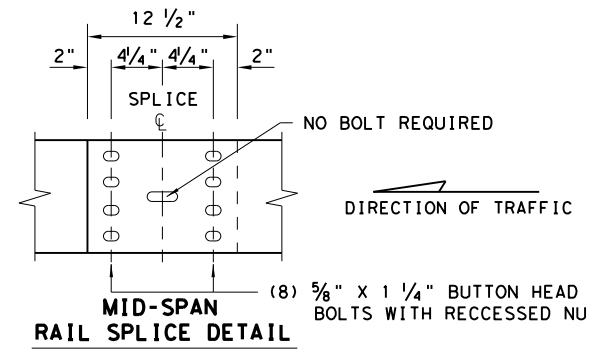
SPLICE BOLT LENGTH VARIES

FBB01 = 1 1/4"
FBB02 = 2"

POST & BLOCK LENGTH

FBB03 = 10"
FBB04 = 18"

BUTTON HEAD BOLT



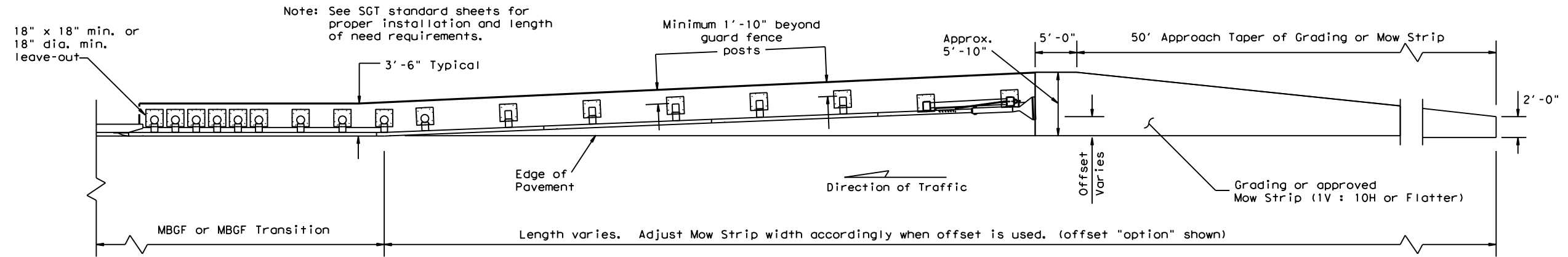
MID-SPAN RAIL SPLICE DETAIL

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

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

		Design Division Standard	
<h2>METAL BEAM GUARD FENCE</h2> <h3>TL-3 MASH COMPLIANT</h3> <h1>GF(31)-19</h1>			
FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0914	18	111
	DIST	COUNTY	SHEET NO.
	AUS	BASTROP	39

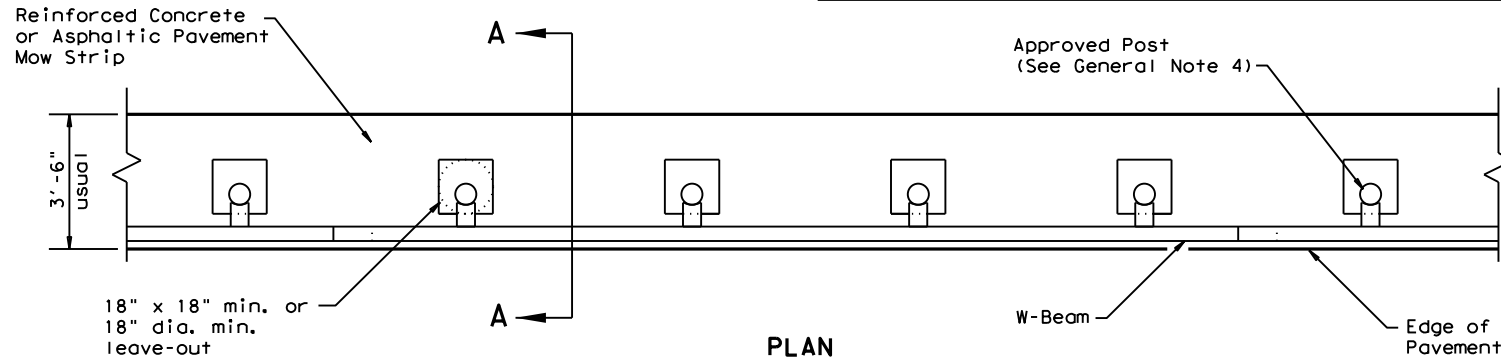
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GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

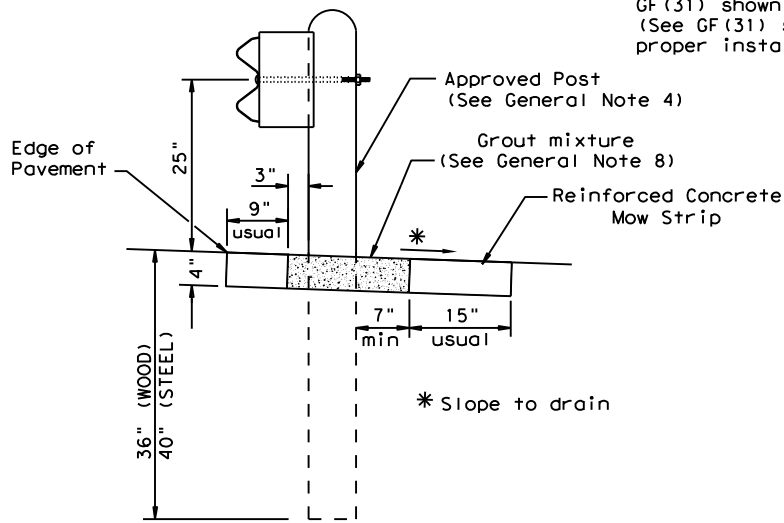
Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments. Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.



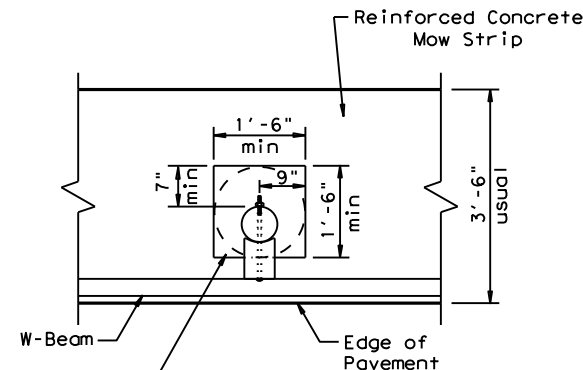
PLAN

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



SECTION A-A

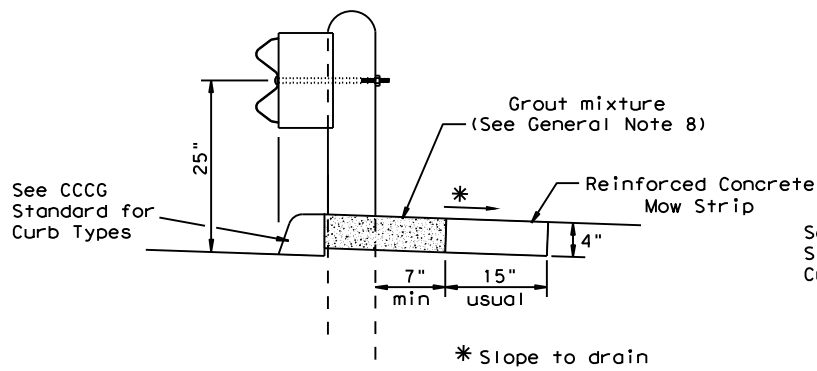
Typical



MOW STRIP DETAIL

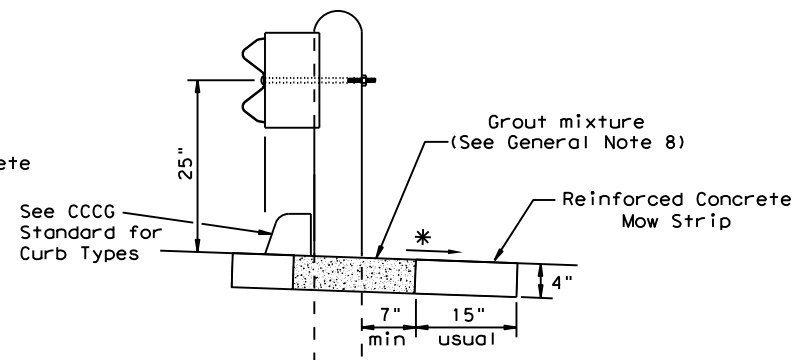
Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.

- 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 1/2" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
 5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
 6. Thickness of the mow strip will be 4".
 7. The limits of payment for 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.



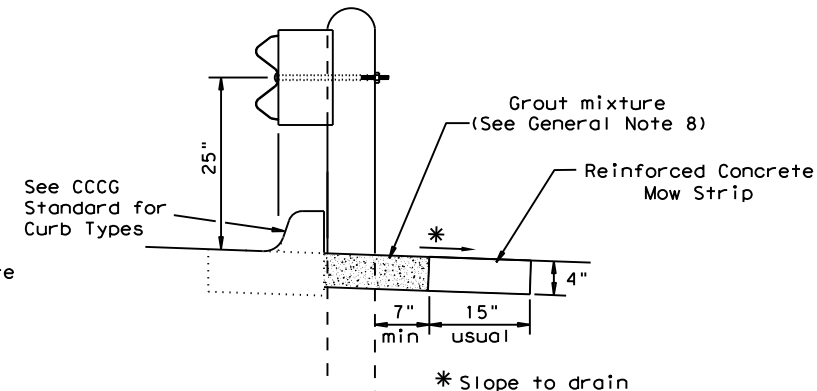
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



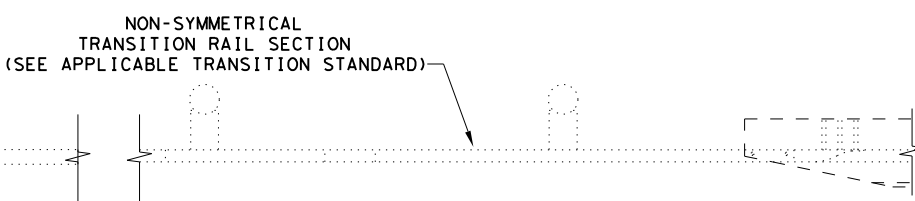
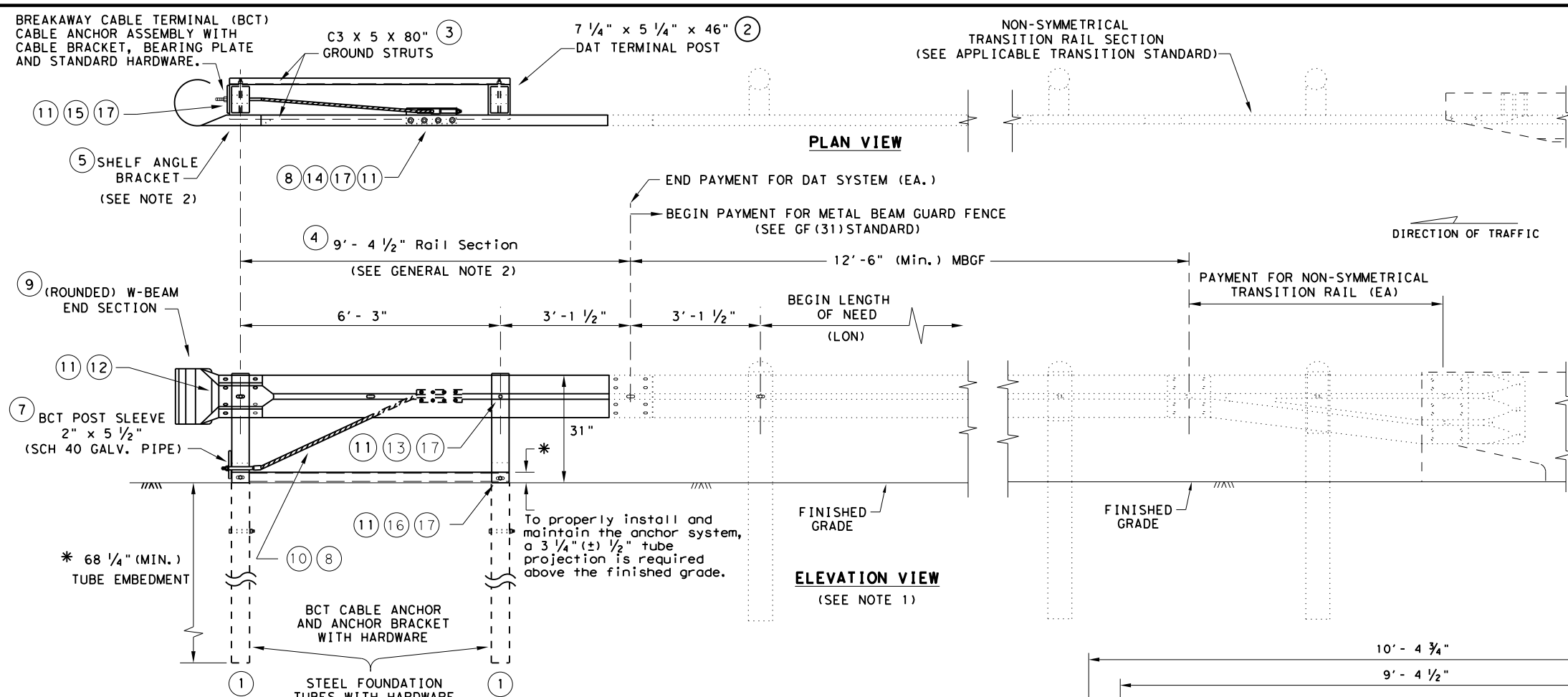
CURB OPTION (3)

				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	HIGHWAY
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	CR 290	
REVISIONS		0914	18	111	CR 290
DIST	COUNTY	SHEET NO.			
AUS	BASTROP	40			

DATE: FILE:

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DATE: 1/26/2022
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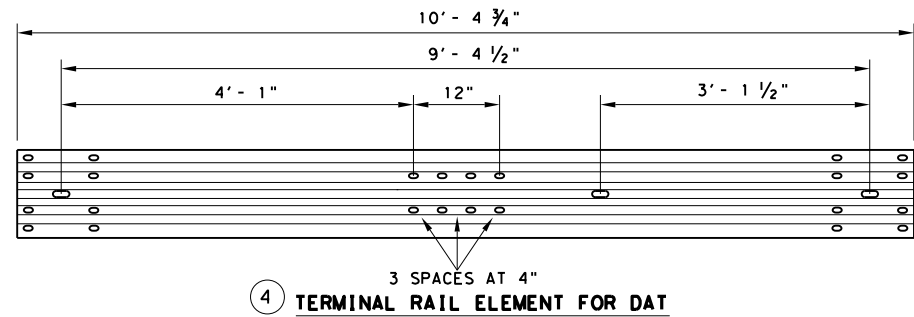


- GENERAL NOTES**
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
 2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
 3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
 4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
 5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

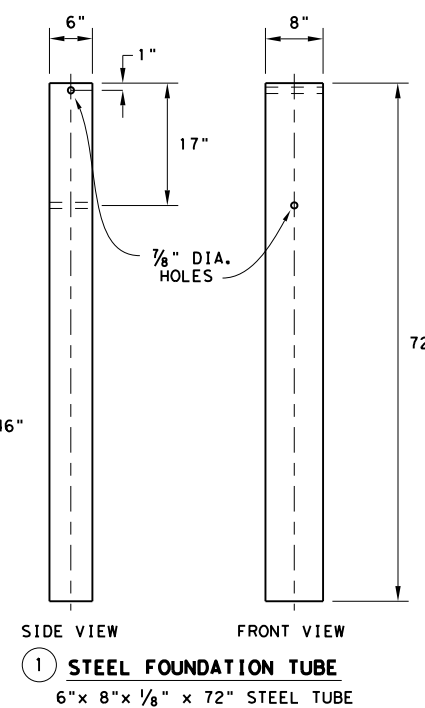
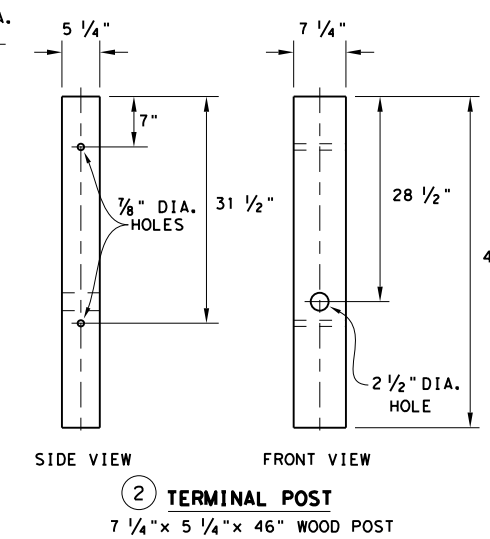
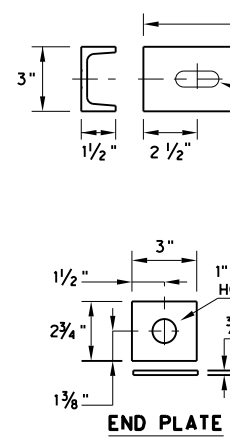
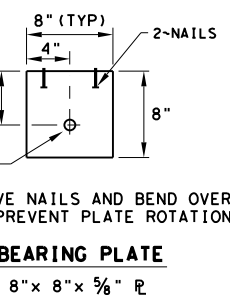
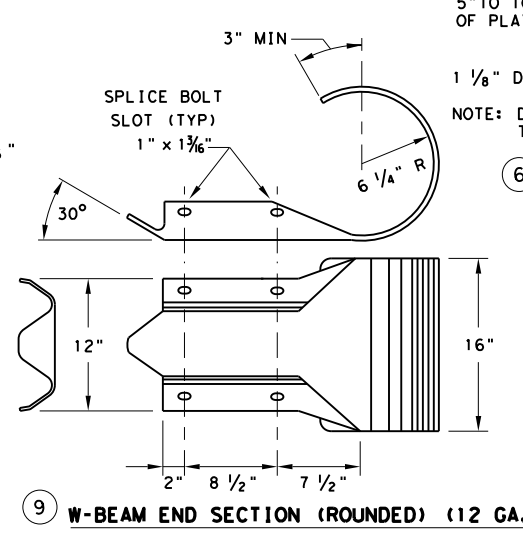
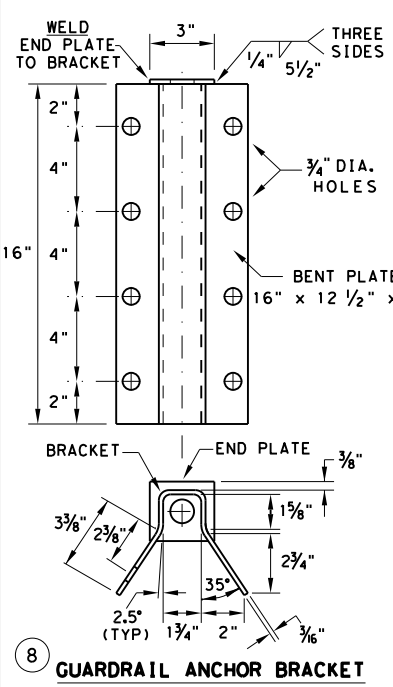
MOW STRIP INSTALLATION
 IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.



#	(DAT) PARTS LIST	QTY
1	STEEL FOUNDATION TUBE	2
2	DAT TERMINAL POST	2
3	CHANNEL STRUT	2
4	TERMINAL RAIL ELEMENT	1
5	SHELF ANGLE BRACKET	1
6	BCT BEARING PLATE	1
7	BCT POST SLEEVE	1
8	GUARDRAIL ANCHOR BRACKET	1
9	(ROUNDED) W-BEAM END SECTION	1
10	BCT CABLE ANCHOR	1
11	RECESSED NUT, GUARDRAIL	20
12	1 1/4" BUTTON HEAD BOLT	4
13	10" BUTTON HEAD BOLT	2
14	5/8" X 2" HEX HEAD BOLT	8
15	5/8" X 8" HEX HEAD BOLT	4
16	5/8" X 10" HEX HEAD BOLT	2
17	5/8" FLAT WASHER	18

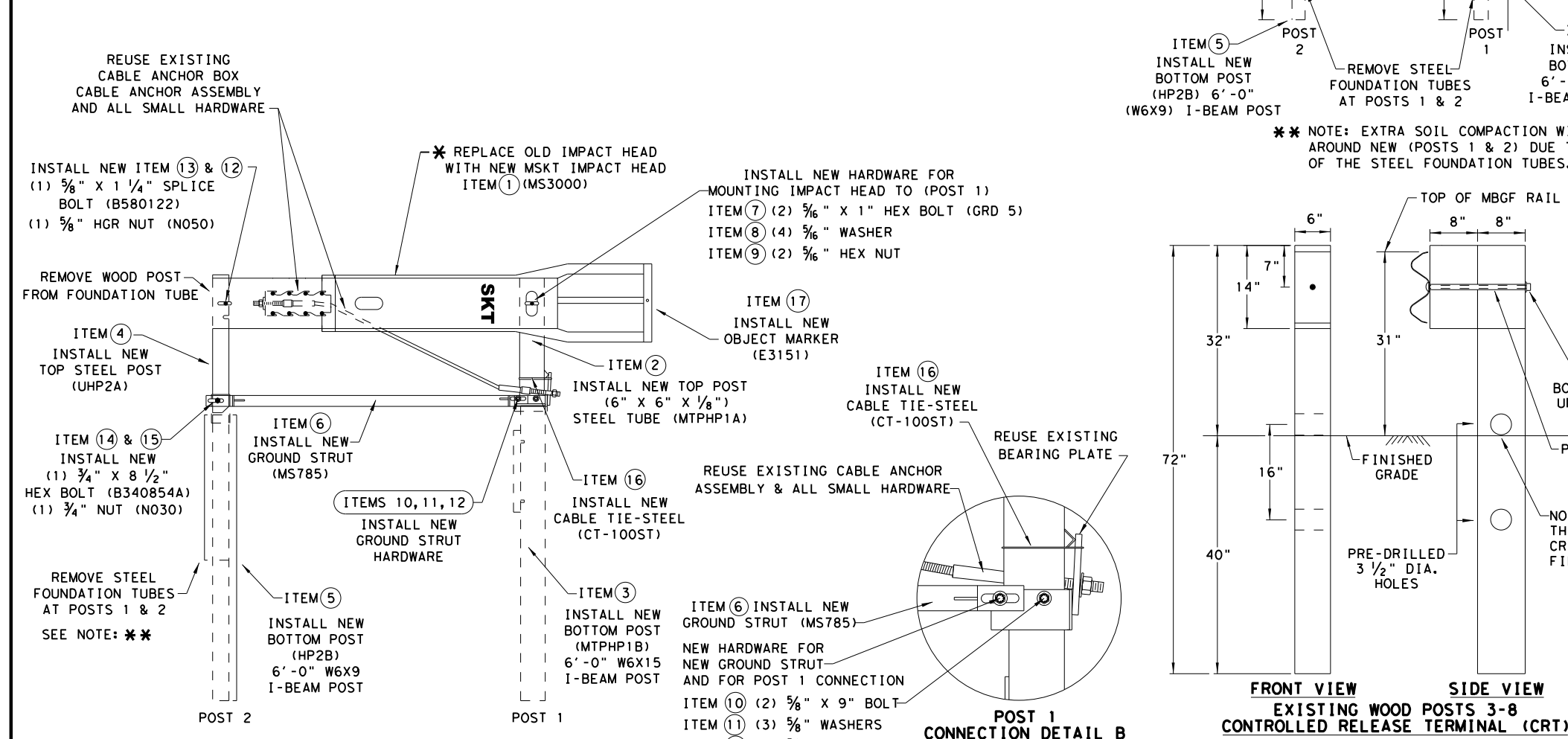
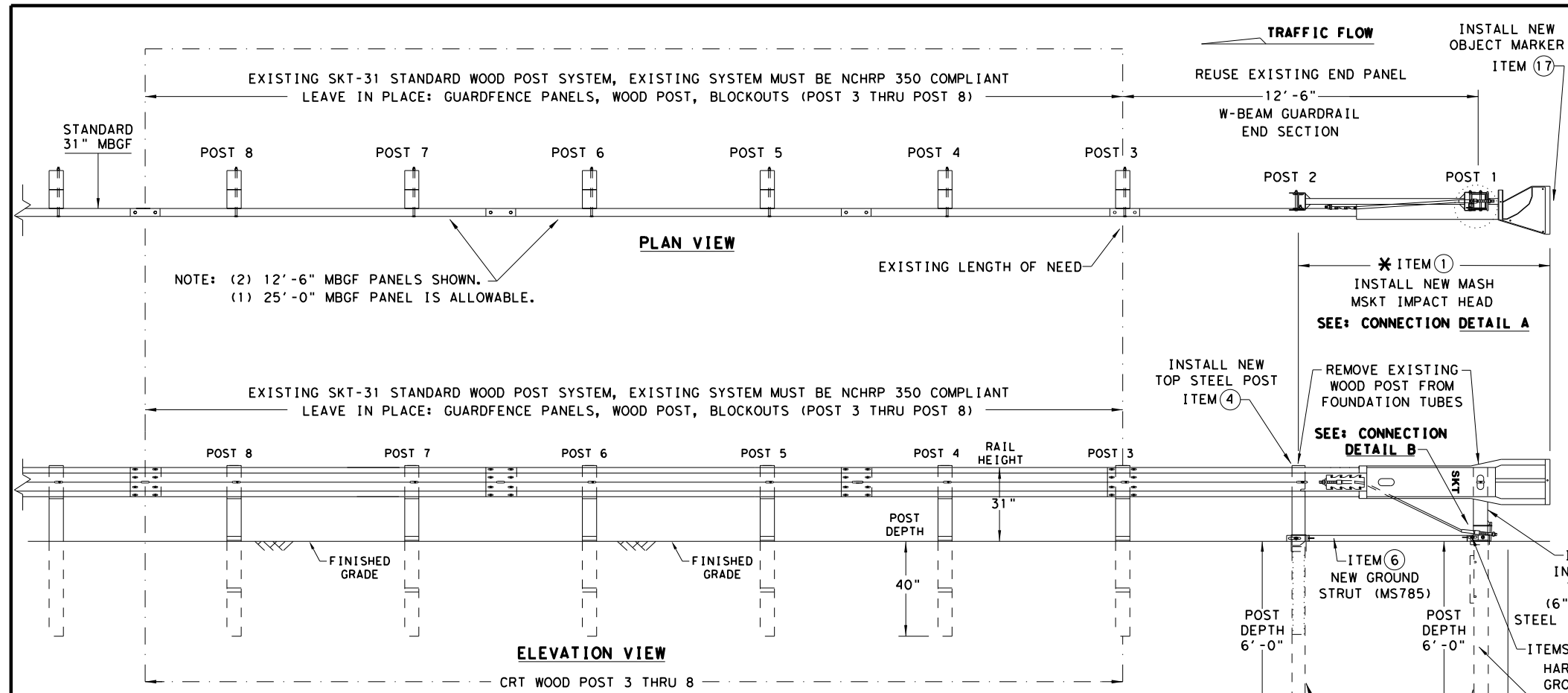


Texas Department of Transportation
 Design Division Standard

METAL BEAM GUARD FENCE (DOWNSTREAM ANCHOR TERMINAL) TL-3 MASH COMPLIANT GF(31)DAT-19

FILE: gf31dot19.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
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	0914	18	111, etc.	CR290, etc.
	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	41	

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.

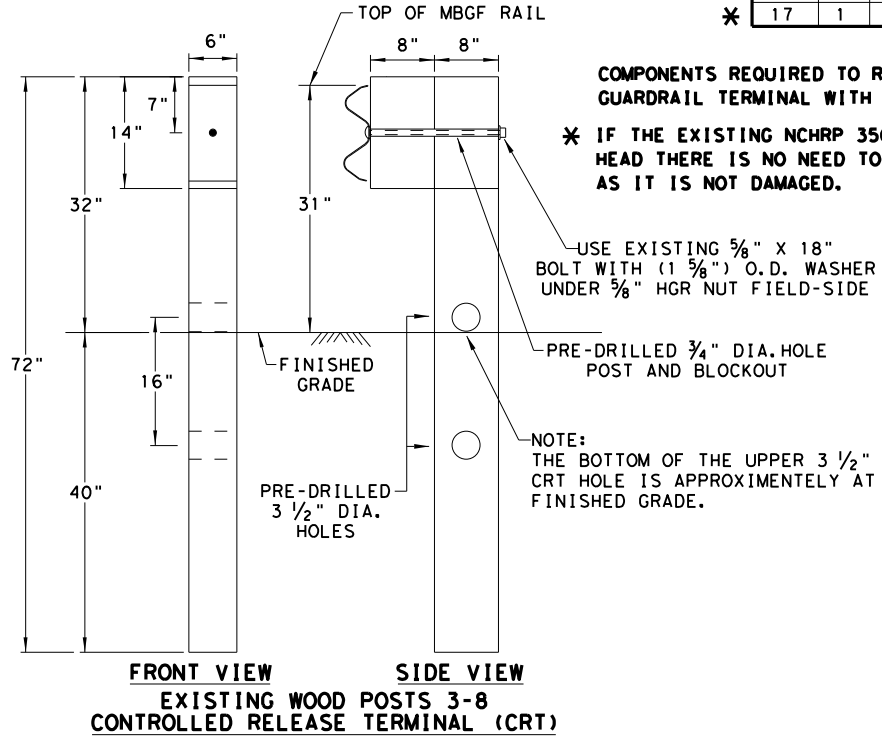


CONNECTION DETAIL A
IMPACT HEAD (POST 1 & POST 2)

CONNECTION DETAIL B
POST 1 CONNECTION DETAIL B

- ### GENERAL NOTES
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432) 263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
 - APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - THE EXISTING SKT 31" STANDARD WOOD POST SYSTEM MUST BE THOROUGHLY INSPECTED, AND DETERMINED TO BE INTACT, AND FREE OF ANY DAMAGE OR DEFECTS BEFORE RETROFITTING. THIS INSPECTION INCLUDES COMPLETING THE MSKT RETROFIT INSPECTION CHECKLIST FOR THE EXISTING SKT 31" WOOD POST NCHRP 350 SYSTEM. ALL EXISTING, AND REUSABLE PARTS MUST BE FREE OF ANY DAMAGE FOR A MASH COMPLIANT RETROFIT.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
 - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
 - SPECIAL DRIVING CAP TO BE USED WHEN DRIVING (LOWER POSTS 1 & 2) TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEMS	QTY	MAIN SYSTEM COMPONENTS	PART NUMBERS
1	1	MSKT IMPACT HEAD	MS3000
2	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
3	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
4	1	POST 2 - ASSEMBLY TOP	UHP2A
5	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
6	1	GROUND STRUT	MS785
7	2	5/16" X 1" HEX BOLT (GRD 5)	B516014A
8	4	5/16" WASHERS	W0516
9	2	5/8" HEX NUT	N0516
10	2	5/8" X 9" HEX BOLT (GRD A449)	B580904A
11	3	5/8" WASHERS	W050
12	3	5/8" H.G.R NUT	N050
13	1	5/8" X 1 1/4" SPLICE BOLT	B580122
14	1	3/4" X 8 1/2" HEX BOLT (GRD 5)	B340854A
15	1	3/4" HEX NUT	N030
16	1	CABLE TIE-STEEL	CT-100ST
17	1	OBJECT MARKER 18" X 18"	E3151



FRONT VIEW
SIDE VIEW
EXISTING WOOD POSTS 3-8
CONTROLLED RELEASE TERMINAL (CRT)

COMPONENTS REQUIRED TO RETROFIT: EXISTING 31" WOOD POST (NCHRP 350 SKT) GUARDFENCE TERMINAL WITH THE NEW 31" (MASH COMPLIANT MSKT IMPACT HEAD).

* IF THE EXISTING NCHRP 350 (31" WOOD POST SKT) ALREADY HAS THE MSKT IMPACT HEAD THERE IS NO NEED TO REPLACE THE IMPACT HEAD OR OBJECT MARKER AS LONG AS IT IS NOT DAMAGED.

Design Division Standard

RETROFIT STANDARD SKT 31" WOOD POST SYSTEM TO MASH MSKT SGT (14W) 31-18

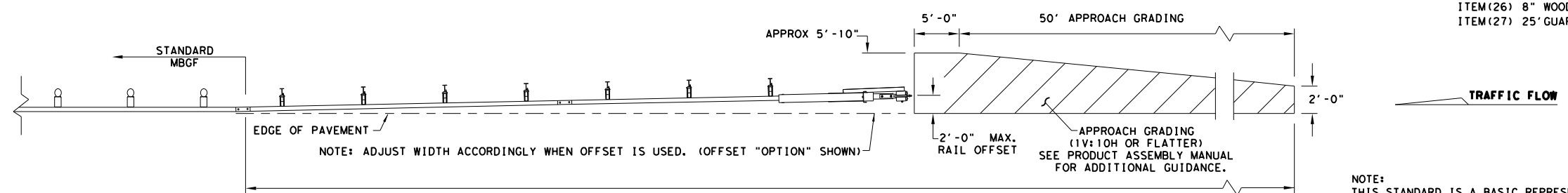
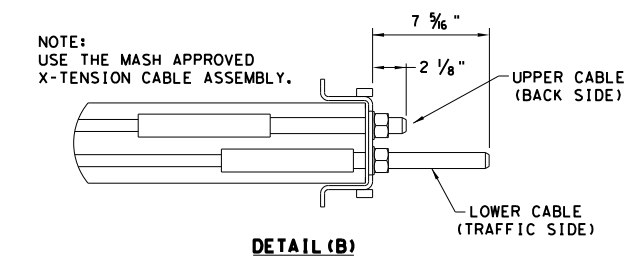
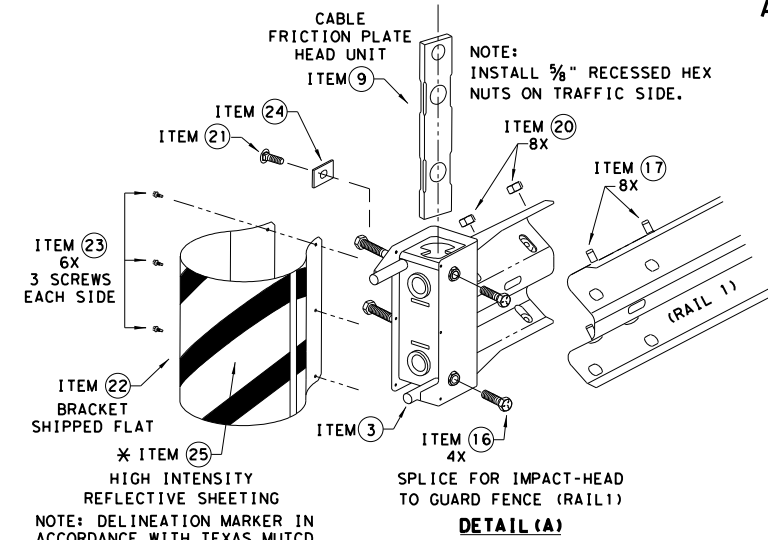
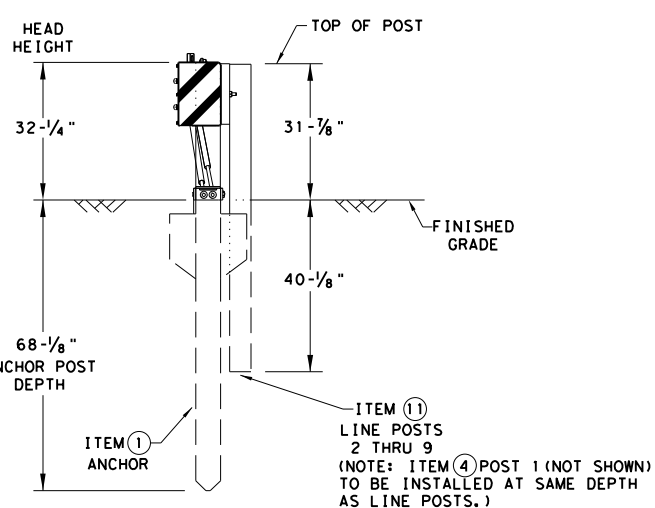
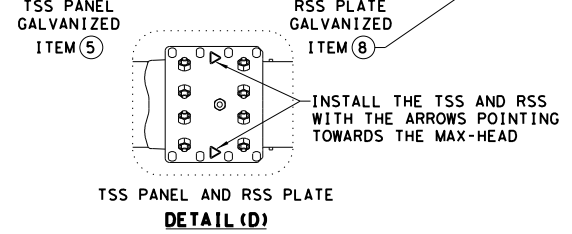
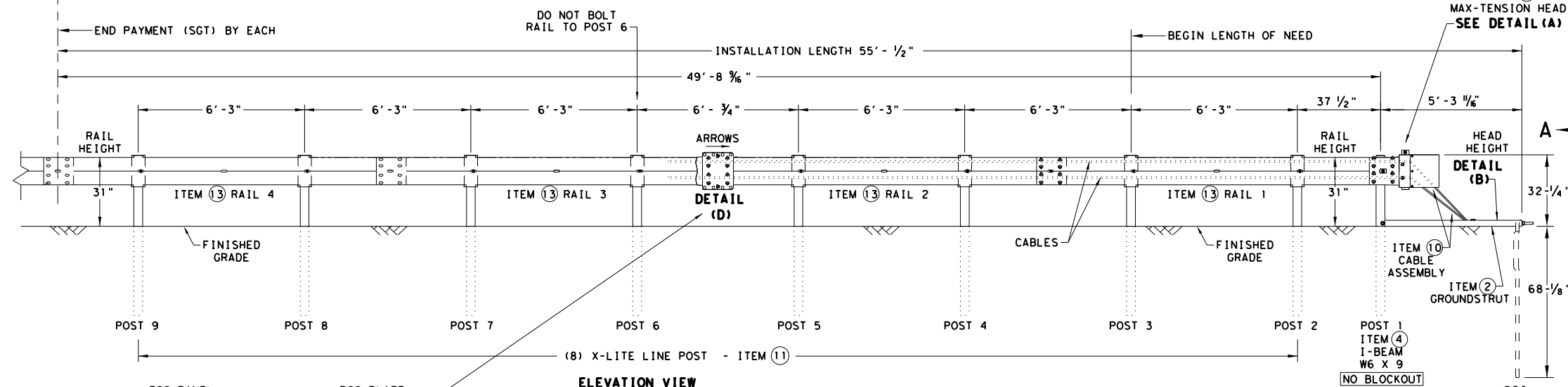
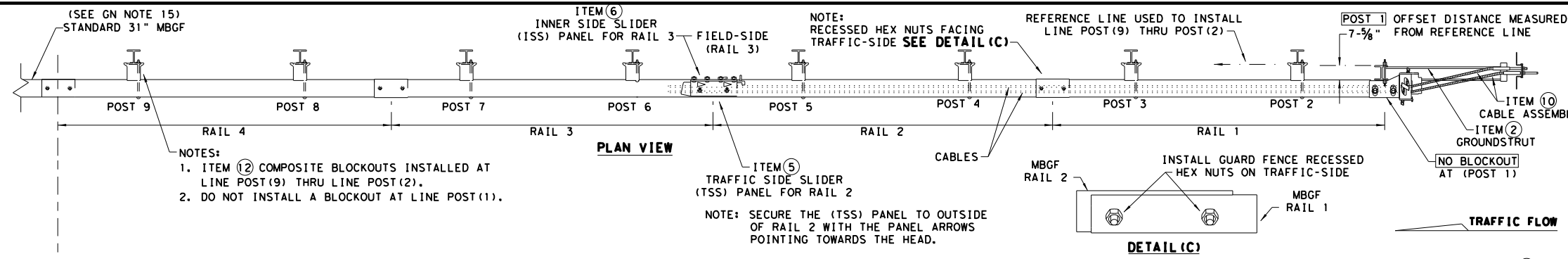
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© TXDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	42	

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE EXISTING; SKT END TERMINAL RETROFITTED TO THE MSKT MASH COMPLIANT TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

DATE: FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to metric units or for any other errors or omissions that may appear hereon.

DATE: 1/26/2022
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GENERAL NOTES

- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
- FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE MAX-TENSION INSTALLATION INSTRUCTION MANUAL, P/N MANMAX REV D (ECN 3516).
- APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
- FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TxDOT'S LATEST ROADWAY MOW STRIP STANDARD.
- ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
- SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
- COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
- REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
- IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
- POSTS SHALL NOT BE SET IN CONCRETE.
- A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
- MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
- IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
- THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
- A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT. -GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	3/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	3/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWRO3	1
25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL, 8-SPACE, 12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

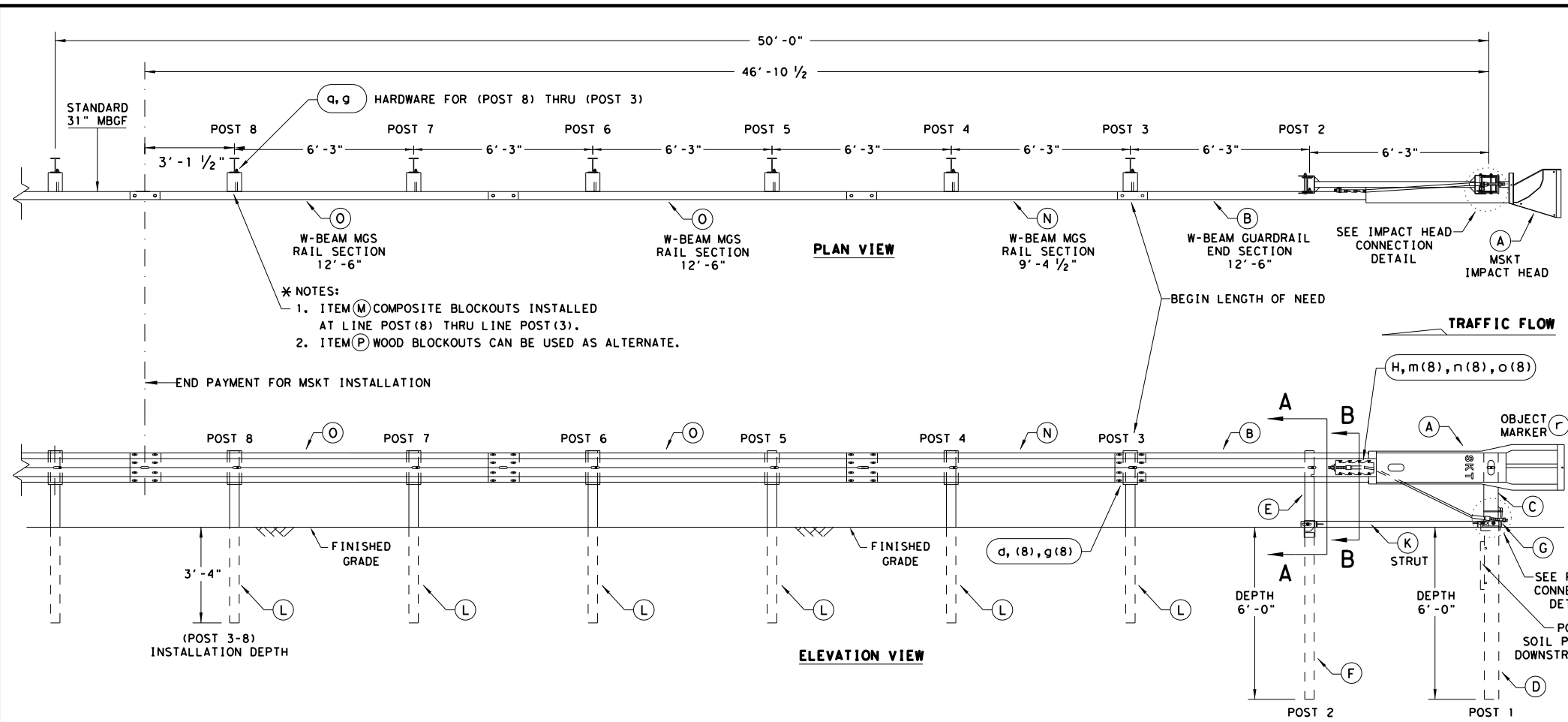
* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.
 ** ALTERNATIVE ITEMS NOT SHOWN. ITEM (26) 8" WOOD-BLOCKOUTS ITEM (27) 25' GUARD FENCE PANELS

Texas Department of Transportation
 Design Division Standard

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

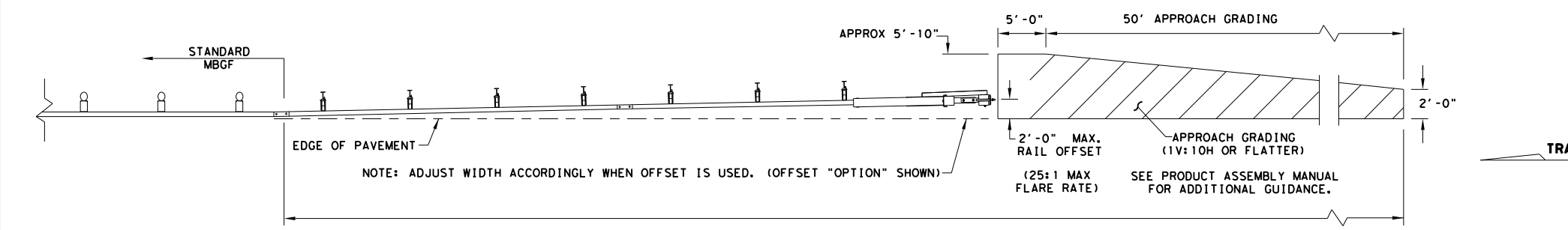
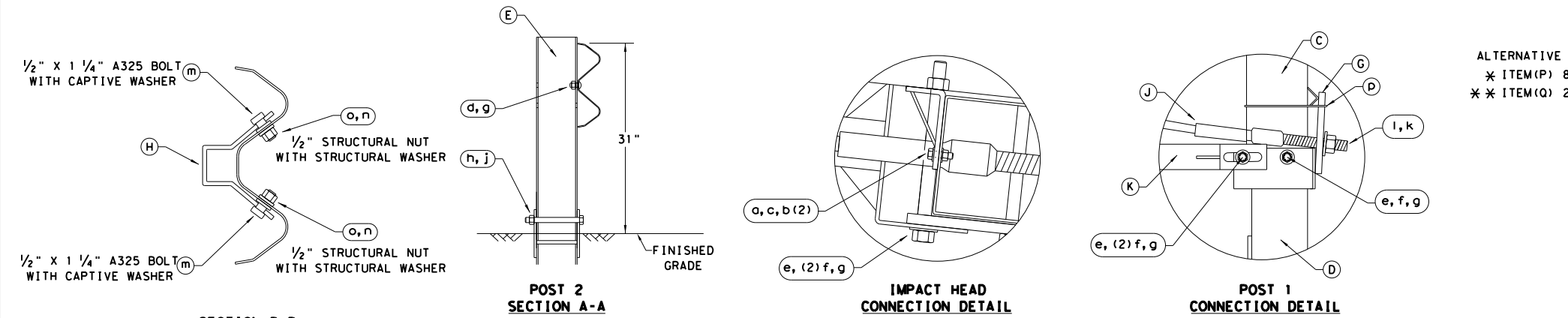
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© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914 18	111, etc.	CR290, etc.	
	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	43	

DATE: 1/26/2022
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 DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



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 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
 - A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
 - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBSG STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBSG.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
 - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
 - THE SYSTEM IS SHOWN WITH TWO 12'-6" MBSG PANELS, ONE 25'-0" MBSG PANEL IS ALSO ALLOWED IN ITS PLACE.
 - A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Go.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6X9 OR W6X8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
SMALL HARDWARE			
a	2	3/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	3/8" WASHER	W0516
c	2	3/8" HEX NUT	N0516
d	25	3/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	3/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	3/8" WASHER	W050
g	33	3/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/8" O.D. x 3/8" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	3/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

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

Design Division Standard

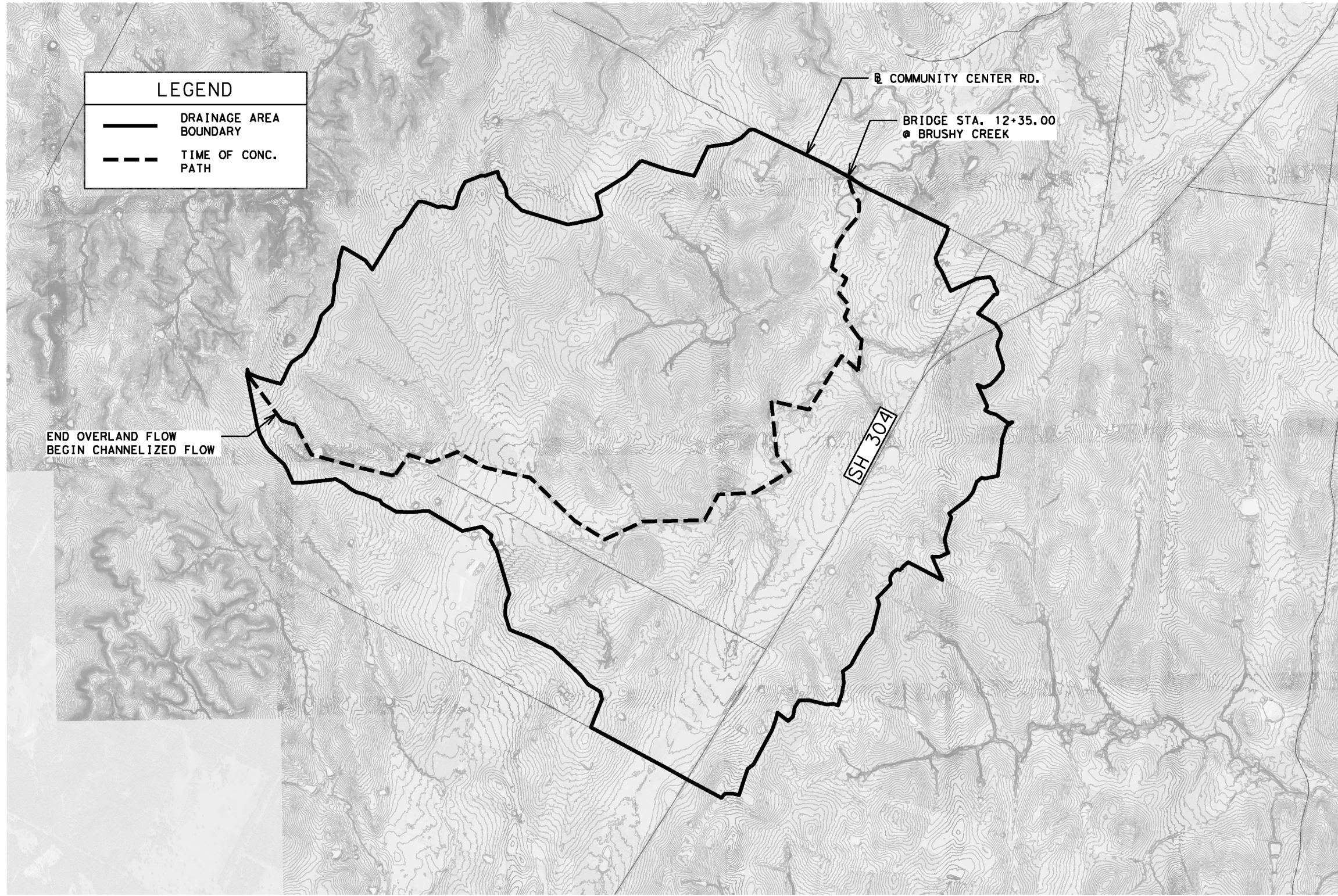
SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT (12S) 31-18

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© TXDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	44	

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LEGEND	
	DRAINAGE AREA BOUNDARY
	TIME OF CONC. PATH

FLOOD HAZARD AREA
 BRUSHY CREEK IS IDENTIFIED ON FEMA FIRM PANEL 48021C0500E EFFECTIVE 1/19/2006 AS A SPECIAL FLOOD HAZARD AREA WITH ZONE A DESIGNATION AT THE CR 290 BRIDGE CROSSING.

1/25/2022



DocuSign

 102EF1917E2C49D...

NOTES:

1. CONTOURS WERE OBTAINED FROM TNRIS 2017 CENTRAL TEXAS LIDAR.
2. H&H FILES WERE SENT TO THE BASTROP COUNTY FLOODPLAIN ADMINISTRATOR, KALA SCHWABE, ON JANUARY 25, 2022.



**Austin District
 Central Design**

 Texas Department of Transportation

**COMMUNITY CENTER RD
 HYDROLOGICAL
 DATA SHEET**

SHEET 1 OF 1

TIME OF CONC. CALCULATIONS (KERBY-KERPICH METHOD)					
OVERLAND DIST (FT)	CHANNELIZED DIST (FT)	OVERLAND SLOPE (FT/FT)	CHANNELIZED SLOPE (FT/FT)	RET COEFF, N	t _c (MIN)
1200	23220	0.0230	0.0076	0.4	153

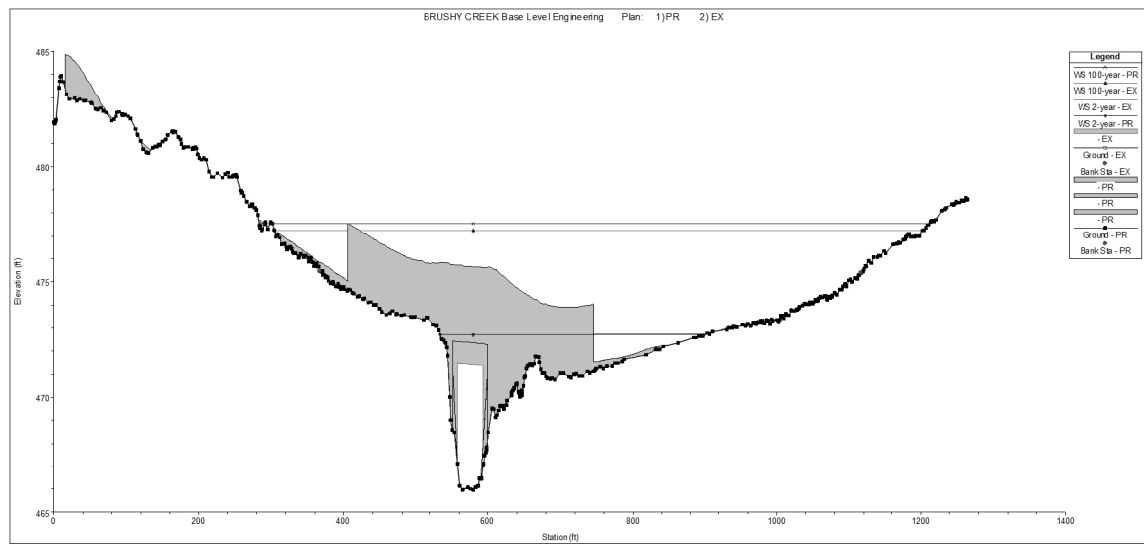
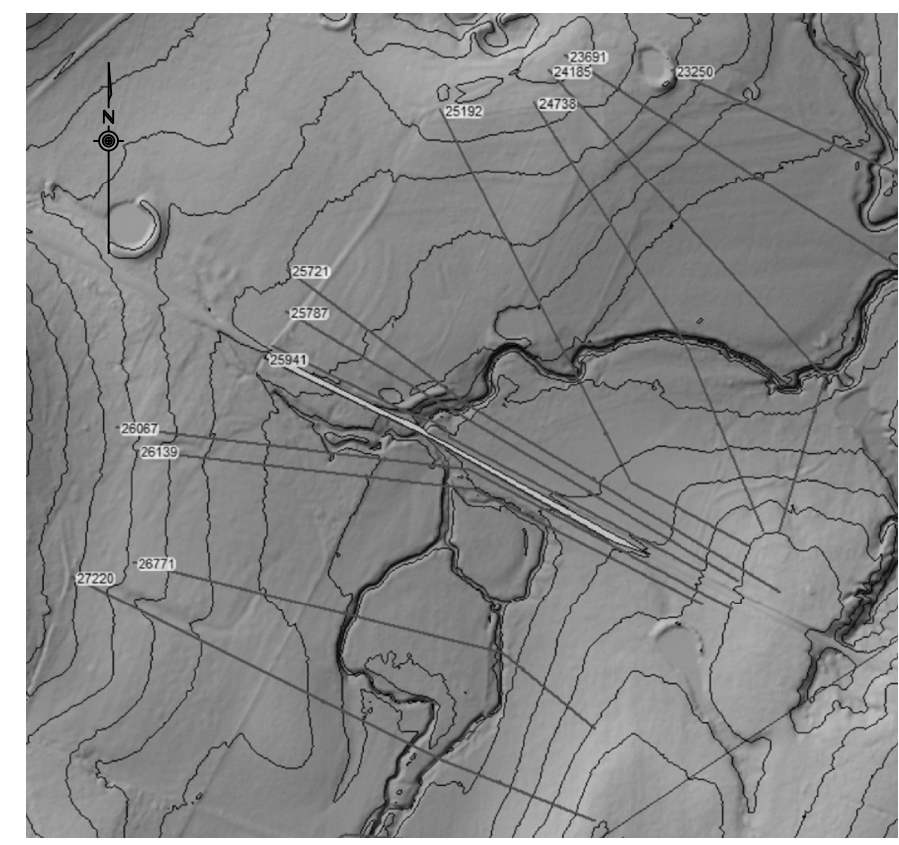
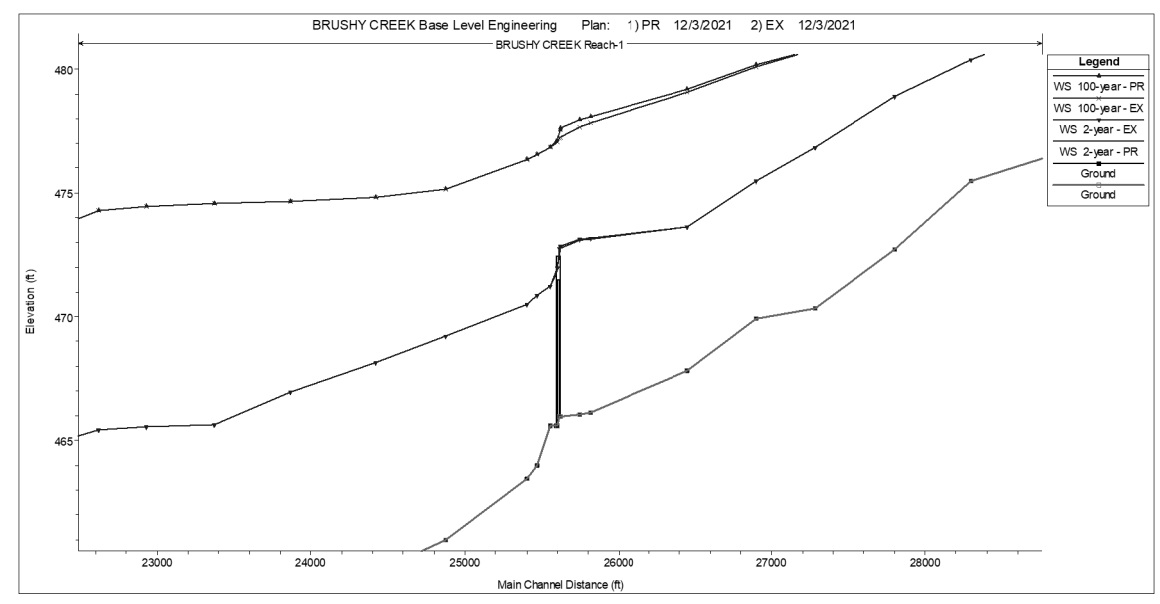
HEC-HMS SCS CURVE METHOD (v. 4.3)										
AREA (SQ MI)	CURVE NUMBER	t _c (MIN)	LAG TIME (MIN)	Q (CFS)						
				2 YR	5 YR	10 YR	25 YR	50 YR	100 YR	
5.31	63	153	92	672.7	1618.9	2527.3	3925.4	5094.3	6400.5	

DS:	CK:	0914	18	111, etc.	CR290, etc.
DW:	CK:	AUS	BASTROP		45

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HEC-RAS ANALYSIS OUTPUT DATA (HEC-RAS 5.0.7)

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
27600	2-year	PR	662.5	470.33	476.84		476.87	0.005536	1.39	475.05	451.64	0.24
27600	2-year	EX	662.5	470.33	476.84		476.87	0.005536	1.39	474.98	451.61	0.24
27600	100-year	PR	8998	470.33	480.82		480.89	0.001487	2.14	4222.53	1122	0.18
27600	100-year	EX	8998	470.33	480.78		480.85	0.001533	2.16	4183.24	1121.06	0.18
27220	2-year	PR	662.5	469.94	475.47		475.5	0.002541	1.25	531.97	438.51	0.2
27220	2-year	EX	662.5	469.94	475.47		475.5	0.002544	1.25	531.67	437.72	0.2
27220	100-year	PR	8998	469.94	480.16		480.27	0.00178	2.62	3487.65	736.06	0.2
27220	100-year	EX	8998	469.94	480.1		480.21	0.001848	2.65	3445.6	728.68	0.2
26771	2-year	PR	662.5	467.83	473.61		473.68	0.007348	2.18	303.88	203.55	0.31
26771	2-year	EX	662.5	467.83	473.63		473.7	0.007107	2.15	308.57	204.82	0.31
26771	100-year	PR	8998	467.83	479.19		479.28	0.00274	2.39	3974.53	900.07	0.18
26771	100-year	EX	8998	467.83	479.08		479.17	0.00296	2.45	3872.33	894.92	0.18
26139	2-year	PR	662.5	466.15	473.14		473.15	0.000292	0.36	1841.67	535.5	0.03
26139	2-year	EX	662.5	466.15	473.18		473.18	0.000283	0.36	1861.66	537.53	0.03
26139	100-year	PR	6316.7	466.15	478.07		478.09	0.001168	1.22	5402.92	979.97	0.08
26139	100-year	EX	6316.7	466.15	477.84		477.86	0.001319	1.27	5174.34	963.37	0.08
26067	2-year	PR	662.5	466.06	473.1		473.1	0.001891	0.7	946.01	416.69	0.08
26067	2-year	EX	662.5	466.06	473.13		473.14	0.001801	0.69	962.31	419.42	0.08
26067	100-year	PR	6316.7	466.06	477.94		477.98	0.002404	1.57	4321.15	1018.02	0.11
26067	100-year	EX	6316.7	466.06	477.68		477.72	0.002865	1.67	4064.14	989.43	0.12
25941	2-year	PR	662.5	465.98	472.78	468.37	472.79	0.003374	0.86	766.03	375.25	0.11
25941	2-year	EX	662.5	465.98	472.84	468.37	472.85	0.003109	0.84	788.04	378.84	0.1
25941	100-year	PR	6316.7	465.98	477.6	472.79	477.64	0.003032	1.55	4161.45	929.82	0.12
25941	100-year	EX	6316.7	465.98	477.27	472.79	477.31	0.003821	1.67	3857.25	902.9	0.13
25915												
25875	2-year	PR	662.5	465.6	471.26		471.28	0.007671	1.25	529.63	277.09	0.16
25875	2-year	EX	662.5	465.6	471.26		471.28	0.007671	1.25	529.63	277.09	0.16
25875	100-year	PR	6316.7	465.6	476.83		476.89	0.004117	1.89	3436.31	786.15	0.14
25875	100-year	EX	6316.7	465.6	476.83		476.89	0.004117	1.89	3436.31	786.15	0.14
25787	2-year	PR	662.5	463.99	470.88		470.91	0.00266	1.31	506.56	171.09	0.13
25787	2-year	EX	662.5	463.99	470.88		470.91	0.00266	1.31	506.56	171.09	0.13
25787	100-year	PR	6316.7	463.99	476.56		476.61	0.002371	1.85	3463.23	836.58	0.14
25787	100-year	EX	6316.7	463.99	476.56		476.61	0.002371	1.85	3463.23	836.58	0.14
25721	2-year	PR	662.5	463.45	470.51		470.59	0.009001	2.4	275.66	92.67	0.25
25721	2-year	EX	662.5	463.45	470.51		470.59	0.009001	2.4	275.66	92.67	0.25
25721	100-year	PR	6316.7	463.45	476.34		476.41	0.003767	2.19	2928.52	783.37	0.17
25721	100-year	EX	6316.7	463.45	476.34		476.41	0.003767	2.19	2928.52	783.37	0.17
25192	2-year	PR	662.5	460.99	469.22		469.28	0.001127	2.07	319.84	102.89	0.21
25192	2-year	EX	662.5	460.99	469.22		469.28	0.001127	2.07	319.84	102.89	0.21
25192	100-year	PR	6316.7	460.99	475.17		475.33	0.001277	3.26	2181.08	607.05	0.25
25192	100-year	EX	6316.7	460.99	475.17		475.33	0.001277	3.26	2181.08	607.05	0.25
24738	2-year	PR	662.5	459.65	468.17		468.23	0.007314	1.91	347.01	155.46	0.23
24738	2-year	EX	662.5	459.65	468.17		468.23	0.007314	1.91	347.01	155.46	0.23
24738	100-year	PR	6316.7	459.65	474.82		474.86	0.000736	1.53	4240.23	817.36	0.11
24738	100-year	EX	6316.7	459.65	474.82		474.86	0.000736	1.53	4240.23	817.36	0.11
24185	2-year	PR	662.5	457.73	466.95		466.98	0.001068	1.52	434.67	154.09	0.16
24185	2-year	EX	662.5	457.73	466.95		466.98	0.001068	1.52	434.67	154.09	0.16
24185	100-year	PR	6316.7	457.73	474.67		474.68	0.000163	1.07	6237.17	1094.93	0.07
24185	100-year	EX	6316.7	457.73	474.67		474.68	0.000163	1.07	6237.17	1094.93	0.07



HYDRAULIC METHOD
 WATER SURFACE ELEVATIONS COMPUTED USING HEC-RAS v.5.0.7). THE PROJECT HEC-RAS MODEL WAS DEVELOPED USING USGS LIDAR, FIELD INVESTIGATION, AND PROPOSED ROADWAY & BRIDGE LAYOUT.

- NOTES:**
1. PROP BRIDGE LOCATED AT HEC-RAS RIVER STATION 25915.
 2. UPSTREAM CROSS SECTION LOCATED AT RIVER STATION 25941.
 3. DOWNSTREAM CROSS SECTION LOCATED AT RIVER STATION 25875.
 4. DESIGN AEP FOR PROPOSED BRIDGE WAS DETERMINED BY REFERENCING TABLE 4-2 IN THE HYDRAULIC DESIGN MANUAL. OFF SYSTEM BRIDGES REQUIRE A DESIGN AEP TO BE "THE SAME OR SLIGHTLY BETTER" THAN EXISTING.

1/25/2022
 Documented by:
 Matthew Sanner
 135459

**Austin District
 Central Design**

Texas Department of Transportation

**COMMUNITY CENTER RD
 BRIDGE
 HYDRAULIC DATA**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	AUS	BASTROP	SHEET NO.	46

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CRITICAL VELOCITY ANALYSIS						
	y1	D50	Ku	Vc	V1	REGIME
2-YR	3.44	0.00066	11.17	1.19	0.36	CLEAR WATER
5-YR	4.69	0.00066	11.17	1.26	0.55	CLEAR WATER - PRESSURE
10-YR	5.42	0.00066	11.17	1.29	0.71	CLEAR WATER - PRESSURE
25-YR	6.39	0.00066	11.17	1.32	0.93	CLEAR WATER - PRESSURE
50-YR	7.01	0.00066	11.17	1.34	1.08	CLEAR WATER - PRESSURE

Vc = critical velocity above which bed material of size D and smaller will be transported, fps
 V1 = mean velocity of flow directly upstream of the pier, fps
 y1 = average depth of flow upstream of the bridge, fps
 D50 = median grain size of bed material, ft * 0.00066 ft.
 Ku = 11.17

CLEAR WATER CONTRACTION SCOUR ANALYSIS							
	Ku	D50	Q	W	y0	y2	ys
2-YR	0.0077	0.00066	663	97	2.29	4.92	2.63

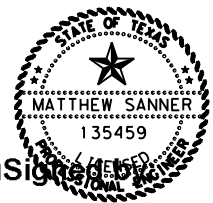
ys = average contraction scour depth, ft
 y2 = average equilibrium depth in the contracted section after contraction scour, ft
 Q = discharge at the bridge associated with width, W (cfs)
 D50 = median grain size of bed material, ft * 0.00066 ft.
 W = top width of contracted section less pier widths, ft
 y0 = average existing depth in the contracted section, ft
 Ku = 0.0077

CLEAR WATER PRESSURE FLOW CONTRACTION SCOUR ANALYSIS									
	hu	hb	ht	hw	W	Q	y0	t	ys
5-YR	4.69	6.37	-1.68	0	252.8	1595.1	8.21	1.84	0.46
10-YR	5.42	6.37	-0.95	0	422.05	2489.0	9.24	1.84	0.41
25-YR	6.39	6.37	0.02	0	518.52	3844.6	10.18	1.84	1.46
50-YR	7.01	6.37	0.64	0	575.0	4913.6	10.97	1.84	2.21


hu = Upstream channel flow depth as defined for Equation 6.2, ft
 hb = vertical size of bridge opening prior to scour, ft
 ht = distance from the water surface to the lower face of the bridge girders,
 hw = Weir flow height = ht - T for ht > T, hw = 0 for ht < T
 W = top width of contracted section less pier widths, ft
 Q = discharge at the bridge associated with width, W (cfs)
 y0 = depth prior to scour at upstream bridge face, ft
 t = separation zone thickness, ft
 ys = pressure scour depth, ft

- NOTES:
- TEST HOLES MAY NOT BE SHOWN IN EXACT LOCATION.
 - SEE GEOTECHNICAL REPORT FOR BORE HOLE LOCATION MAP.
 - SCOUR CALCULATIONS WERE PERFORMED IN ACCORDANCE WITH HEC-18, 5TH EDITION, TXDOT GEOTECHNICAL MANUAL AND SCOUR EVALUATION GUIDE.
 - SCOUR COMPUTATION WAS PERFORMED FOR SCOUR DESIGN FLOODS 2, 5, 10, & 25-YEAR. 50-YR IS THE SCOUR DESIGN CHECK FLOOD.
 - WITH EXCEPTION OF THE 2-YR FLOOD, ALL OTHER DESIGN FLOODS RESULT IN OVERTOPPING OF BRIDGE. PRESSURE SCOUR WAS CALCULATED FOR THESE DESIGN FLOODS.

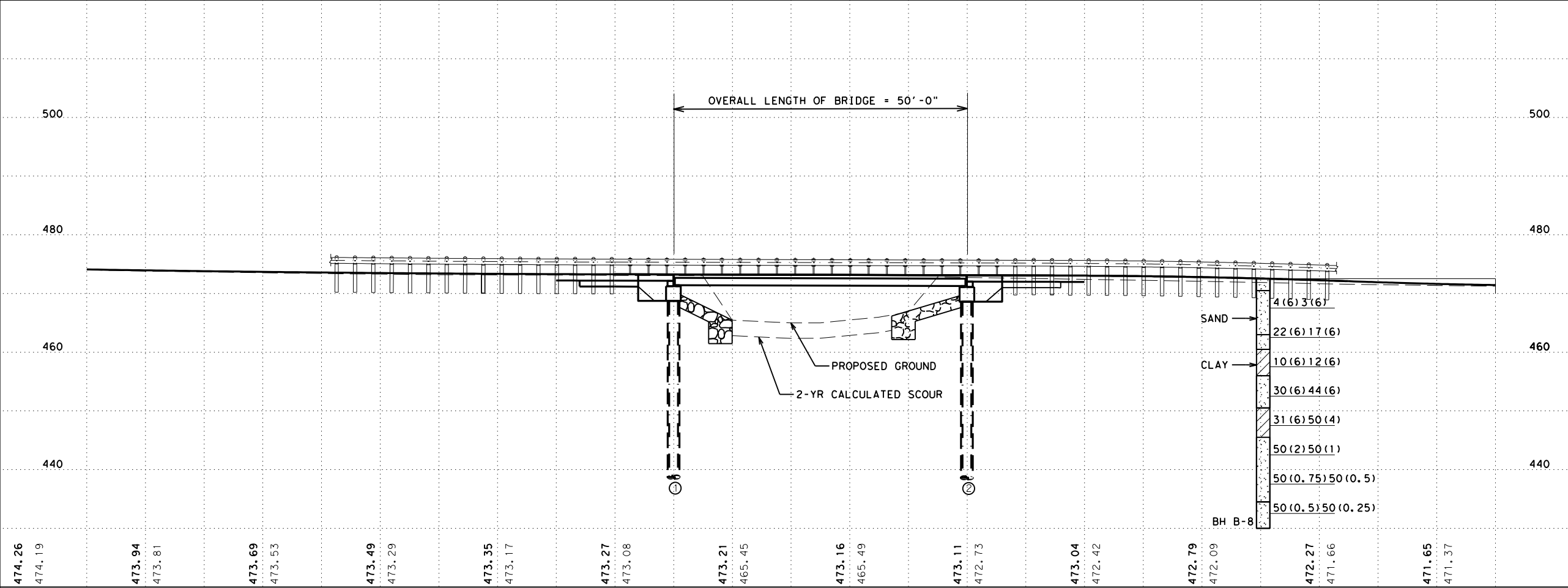
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HL-93 LOADING

SCALE (IN FEET):

HORZ - 0 20

SCALE (IN FEET):

VERT - 0 20

Austin District
 Central Design

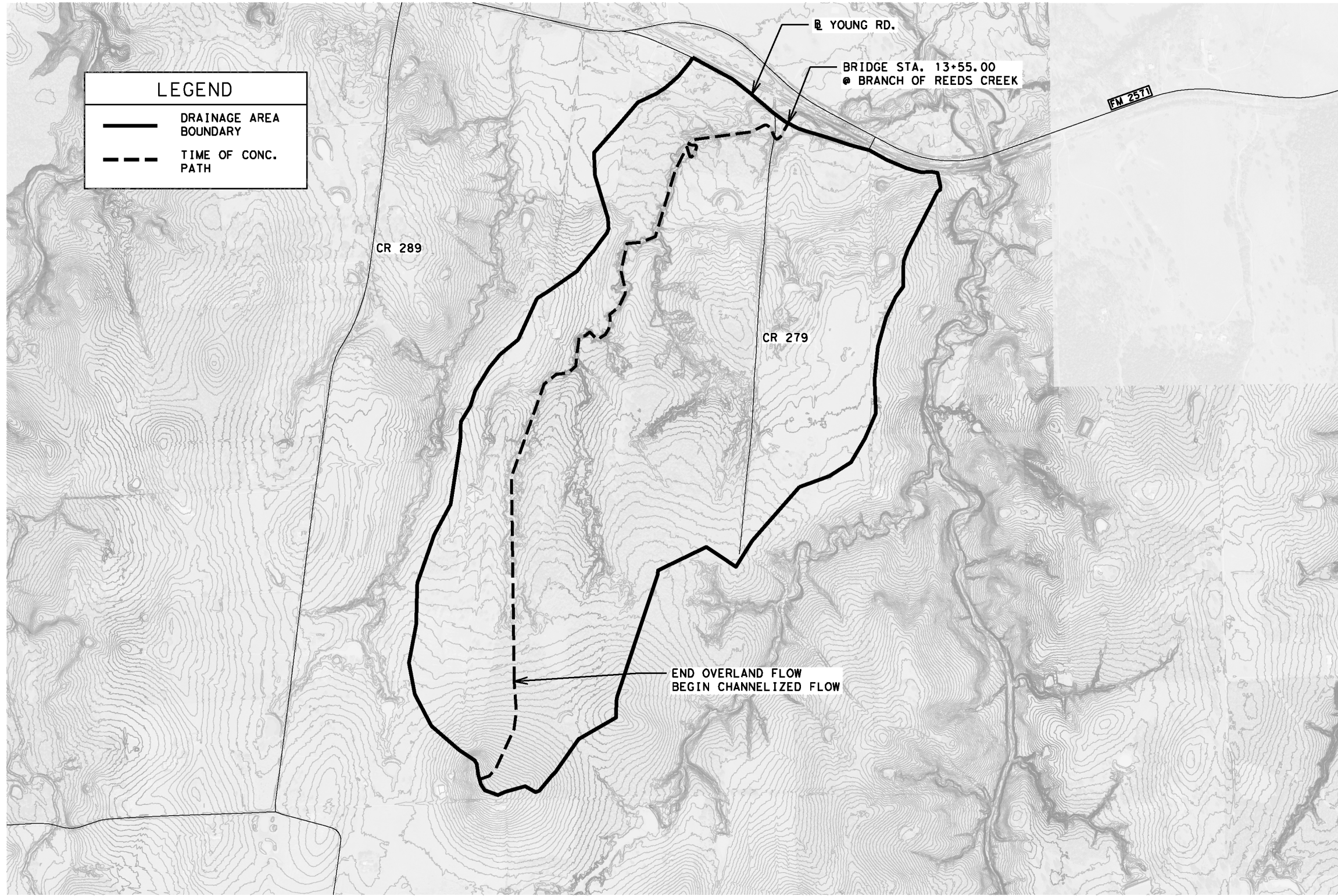
Texas Department of Transportation

COMMUNITY CENTER RD
 SCOUR DATA SHEET

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
0914	18	111, etc.	CR290, etc.	
AUS	BASTROP			47

DATE: 1/25/2022 1:39:29 PM
 FILE: P:\dot\projectwiseonline.com\TXDOT14\Documents\14 - AUS\Design Projects\091418112\4 - Design\Plan Set\5. Drainage\YOUNG RD EXTERNAL DRAINAGE AREA MAP.dgn



LEGEND	
	DRAINAGE AREA BOUNDARY
	TIME OF CONC. PATH

NOTES:

1. CONTOURS WERE OBTAINED FROM TNRIS 2017 CENTRAL TEXAS LIDAR.

1/25/2022

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**Austin District
Central Design**

Texas Department of Transportation

**YOUNG RD
HYDROLOGICAL
DATA SHEET**

TIME OF CONC. CALCULATIONS (KERBY-KERPICH METHOD)					
OVERLAND DIST (FT)	CHANNELIZED DIST (FT)	OVERLAND SLOPE (FT/FT)	CHANNELIZED SLOPE (FT/FT)	RET COEFF, N	t _c (MIN)
1200	8385	0.0483	0.0129	0.6	80

HEC-HMS SCS CURVE METHOD (v. 4.3)									
AREA (SQ MI)	CURVE NUMBER	t _c (MIN)	LAG TIME (MIN)	Q (CFS)					
				2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
0.83	71	80	48	304.1	582.4	816.3	1142.8	1395.5	1659.9

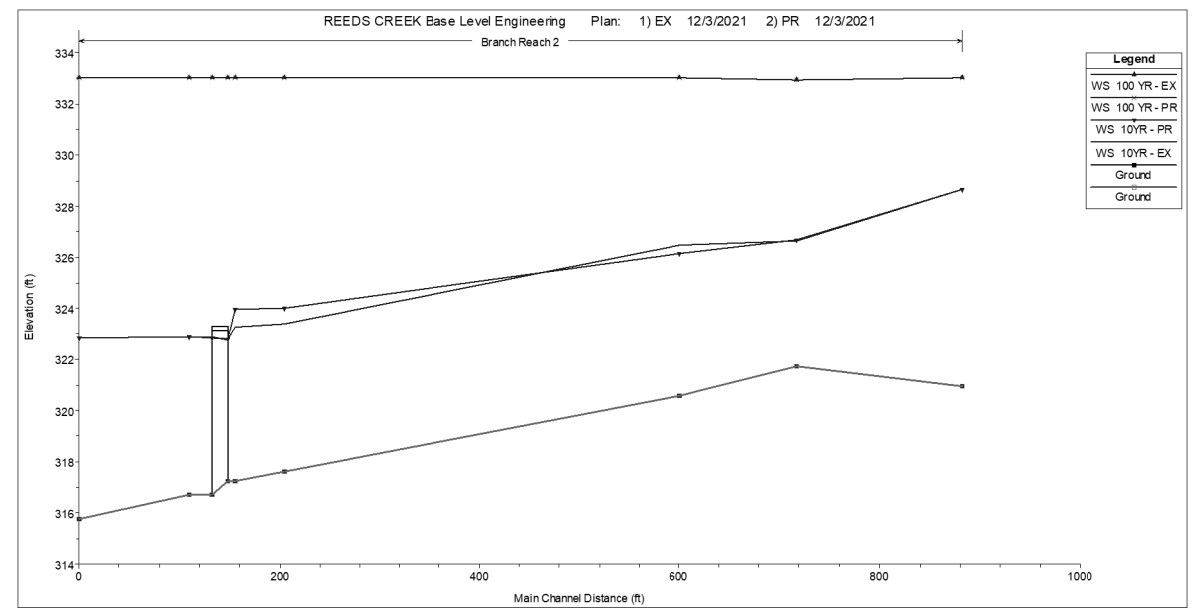
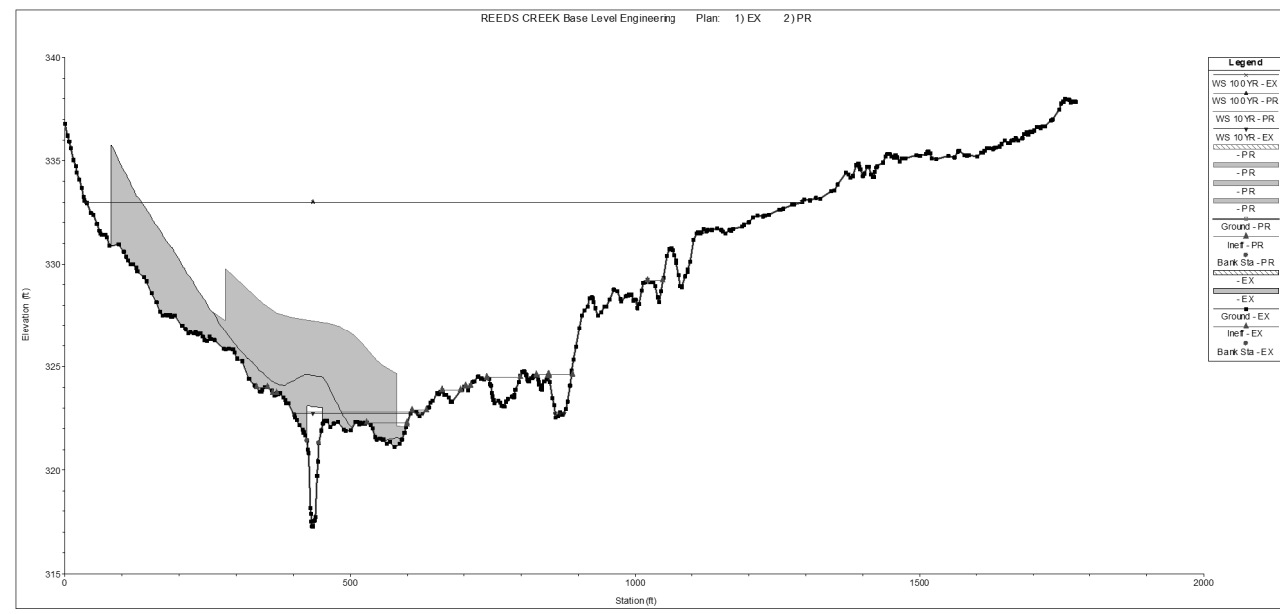
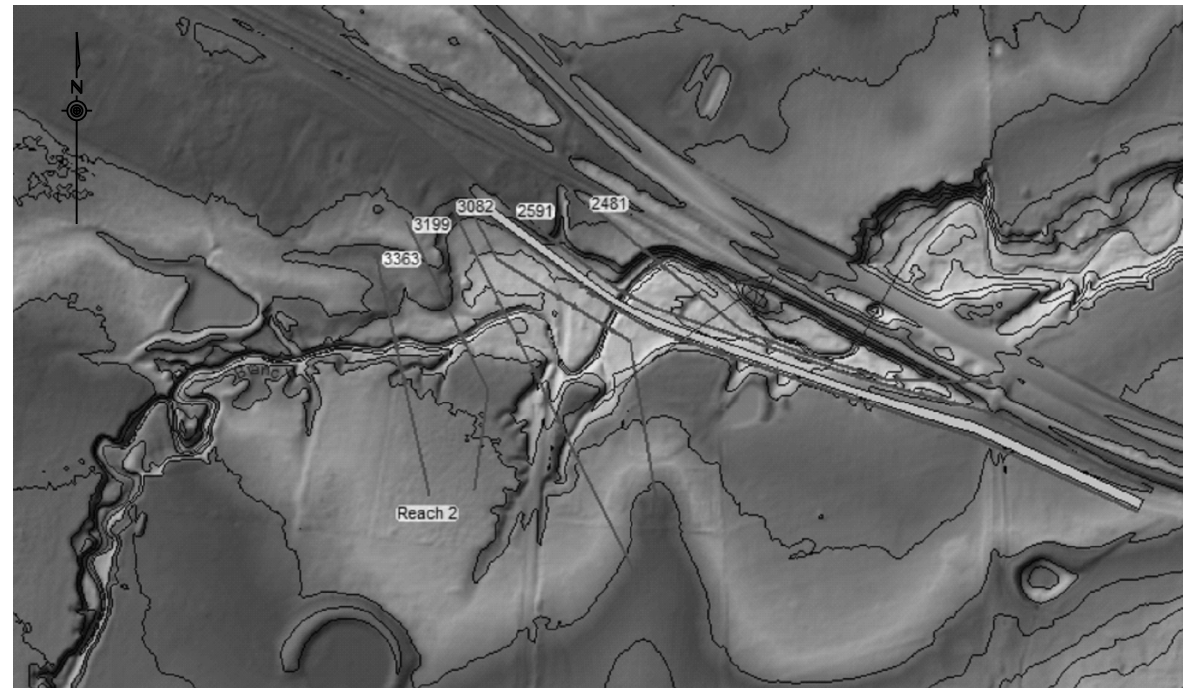
SHEET 1 OF 1

DS: 0914	SECT: 18	JOB: 111, etc.	HIGHWAY: CR290, etc.
DW: 0914	DIST: AUS	COUNTY: BASTROP	SHEET NO.: 48

DATE: 1/25/2022 1:41:17 PM
 FILE: pw:\txdot\project\wiseonline.com\TXDOT4\Documents\14 - AUS\Design Projects\091418112\4 - Design\Plan Set\5. Drainage\YOUNG RD BRIDGE HYDRAULIC DATA SHEET.dgn


HEC-RAS ANALYSIS OUTPUT DATA (HEC-RAS 5.0.7)

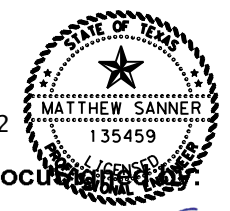
River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
3363	10YR	EX	796	320.93	328.67	326.12	329.25	0.004841	6.11	146.59	57.79	0.44
3363	10YR	PR	796	320.93	328.64	326.12	329.22	0.004932	6.15	144.83	56.61	0.44
3363	100 YR	EX	1618.2	320.93	333.01	328.55	333.36	0.001874	5.47	595.49	201.28	0.30
3363	100 YR	PR	1618.2	320.93	333.01	328.55	333.36	0.001874	5.47	595.51	201.29	0.30
3199	10YR	EX	796	321.72	326.64	326.64	327.79	0.01881	8.78	118.47	77.90	0.84
3199	10YR	PR	796	321.72	326.70	326.64	327.79	0.017488	8.57	123.37	78.46	0.81
3199	100 YR	EX	1618.2	321.72	332.91		333.08	0.001015	4.09	879.91	201.39	0.23
3199	100 YR	PR	1618.2	321.72	332.91		333.08	0.001015	4.09	879.94	201.40	0.23
3082	10YR	EX	796	320.58	326.47	325.64	326.53	0.004167	2.75	465.39	334.64	0.24
3082	10YR	PR	796	320.58	326.14	325.64	326.25	0.00716	3.41	375.59	317.99	0.31
3082	100 YR	EX	1618.2	320.58	333.01	326.00	333.01	0.000068	0.66	3857.68	635.08	0.04
3082	100 YR	PR	1618.2	320.58	333.01	326.00	333.01	0.000068	0.66	3857.82	635.08	0.04
2685	10YR	EX	796	317.62	323.39	323.30	323.86	0.012068	6.67	212.20	197.19	0.66
2685	10YR	PR	796	317.62	324.03	323.30	324.19	0.003915	4.30	361.33	285.34	0.39
2685	100 YR	EX	1618.2	317.62	333.00	324.00	333.00	0.000013	0.55	5017.73	601.66	0.03
2685	100 YR	PR	1618.2	317.62	333.00	324.00	333.00	0.000013	0.55	5017.86	601.66	0.03
2636	10YR	EX	796	317.26	323.30	322.70	323.47	0.003675	4.46	361.98	296.64	0.38
2636	10YR	PR	796	317.26	323.99	322.70	324.06	0.001378	3.02	570.76	446.07	0.24
2636	100 YR	EX	1618.2	317.26	333.00	323.36	333.00	0.000007	0.42	8166.41	1256.57	0.02
2636	100 YR	PR	1618.2	317.26	333.00	323.36	333.00	0.000007	0.42	8166.67	1256.60	0.02
2620			Bridge									
2591	10YR	EX	796	316.69	322.86	318.17	322.86	0.000187	0.92	2000.15	559.42	0.08
2591	10YR	PR	796	316.69	322.86	318.17	322.86	0.000187	0.92	2000.41	559.42	0.08
2591	100 YR	EX	1618.2	316.69	333.00	318.76	333.00	0.000007	0.43	10938.00	1159.93	0.02
2591	100 YR	PR	1618.2	316.69	333.00	318.76	333.00	0.000007	0.43	10938.27	1159.93	0.02
2481	10YR	EX	796	315.75	322.84	317.25	322.84	0.000119	0.93	2449.70	721.21	0.07
2481	10YR	PR	796	315.75	322.84	317.25	322.84	0.000119	0.93	2449.70	721.21	0.07
2481	100 YR	EX	1618.2	315.75	333.00	318.52	333.00	0.000006	0.41	10385.12	834.15	0.02
2481	100 YR	PR	1618.2	315.75	333.00	318.52	333.00	0.000006	0.41	10385.12	834.15	0.02




HYDRAULIC METHOD
 WATER SURFACE ELEVATIONS COMPUTED USING HEC-RAS v. 5.0.7).
 THE PROJECT HEC-RAS MODEL WAS DEVELOPED USING USGS LIDAR,
 FIELD INVESTIGATION, AND PROPOSED ROADWAY & BRIDGE LAYOUT.

- NOTES:
1. PROP BRIDGE LOCATED AT HEC-RAS RIVER STATION 2620.
 2. UPSTREAM CROSS SECTION LOCATED AT RIVER STATION 2636.
 3. DOWNSTREAM CROSS SECTION LOCATED AT RIVER STATION 2591.
 4. DESIGN AEP FOR PROPOSED BRIDGE WAS DETERMINED BY REFERENCING TABLE 4-2 IN THE HYDRAULIC DESIGN MANUAL. OFF-SYSTEM BRIDGES REQUIRE A DESIGN AEP TO BE "THE SAME OR SLIGHTLY BETTER" THAN EXISTING.

1/25/2022
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**Austin District
 Central Design**


Texas Department of Transportation

**YOUNG RD
 HYDRAULIC
 DATA SHEET**

SHEET OF

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	AUS	BASTROP	SHEET NO.	49

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CRITICAL VELOCITY ANALYSIS						
	Y1	D50	Ku	Vc	V1	REGIME
25-YR	2.75	0.00066	11.17	1.15	2.25	LIVE BED
50-YR	8.56	0.00066	11.17	1.39	0.97	CLEAR WATER

Vc = critical velocity above which bed material of size D and smaller will be transported, fps
 V1 = mean velocity of flow directly upstream of the pier, fps
 y1 = average depth of flow upstream of the bridge, fps
 D50 = median grain size of bed material, ft * 0.00066 ft.
 Ku = 11.17

CLEAR WATER PRESSURE FLOW CONTRACTION SCOUR ANALYSIS										
	hu	hb	ht	hw	W	Q	y0	t	ys	
50-YR	8.56	6.00	2.56	0.76	21.6	66.8	11.52	1.8	0	

hu = Upstream channel flow depth as defined for Equation 6.2, ft
 hb = vertical size of bridge opening prior to scour, ft
 ht = distance from the water surface to the lower face of the bridge girders,
 hw = Weir flow height = ht - T for ht > T, hw = 0 for ht < * T
 W = top width of contracted section less pier widths, ft
 Q = discharge at the bridge associated with width, W (cfs)
 y0 = depth prior to scour at upstream bridge face, ft
 t = separation zone thickness, ft
 ys = pressure scour depth, ft


LIVE BED PRESSURE FLOW CONTRACTION SCOUR ANALYSIS													
	hu	hb	ht	hw	W1	W2	Q1	Q2	S	y0	t	ys	
25-YR	2.75	6.00	-3.25	0	21.6	24.6	191.6	298.6	0.002	8.32	1.8	0	

hu = Upstream channel flow depth as defined for Equation 6.2, ft
 hb = vertical size of bridge opening prior to scour, ft
 ht = distance from the water surface to the lower face of the bridge girders,
 hw = Weir flow height = ht - T for ht > T, hw = 0 for ht < * T
 W1 = top width of contracted section less pier widths, ft
 W2 = top width of upstream section, ft
 Q1 = discharge at the bridge associated with width, W1 (cfs)
 Q2 = discharge upstream associated with width, W2 (cfs)
 S = slope of energy grade line at approach section, ft/ft
 y0 = depth prior to scour at upstream bridge face, ft
 t = separation zone thickness, ft
 ys = pressure scour depth, ft

NOTES:

- TEST HOLES MAY NOT BE SHOWN IN EXACT LOCATION.
- SEE GEOTECHNICAL REPORT FOR BORE HOLE LOCATION MAP.
- SCOUR CALCULATIONS WERE PERFORMED IN ACCORDANCE WITH HEC-18, 5TH EDITION, TXDOT GEOTECHNICAL MANUAL AND SCOUR EVALUATION GUIDE.
- SCOUR COMPUTATION WAS PERFORMED FOR THE 25-YEAR AEP, THE SCOUR DESIGN FLOOD. AN ANALYSIS WAS ALSO PERFORMED FOR THE 50-YR AEP, THE SCOUR CHECK FLOOD.

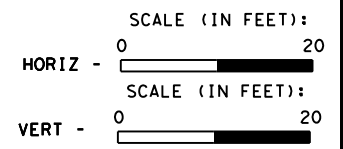
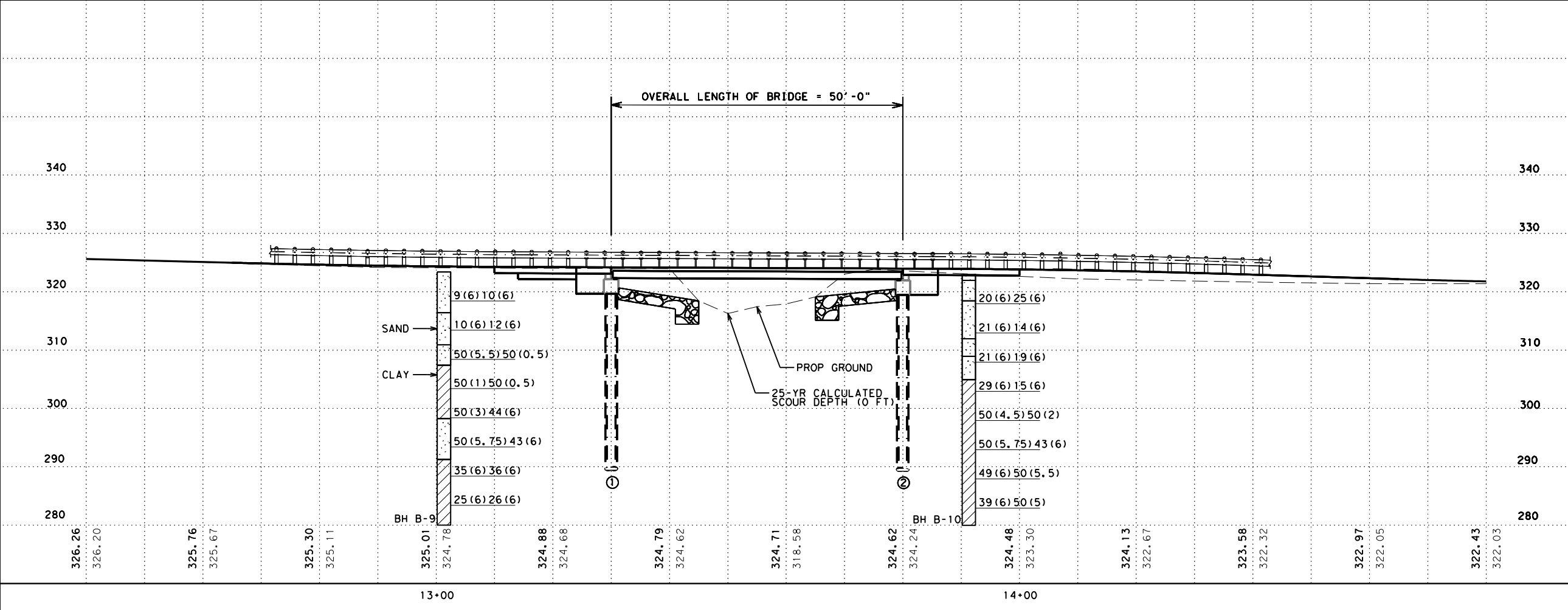
1/25/2022



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Matthew Sanner

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Austin District
 Central Design

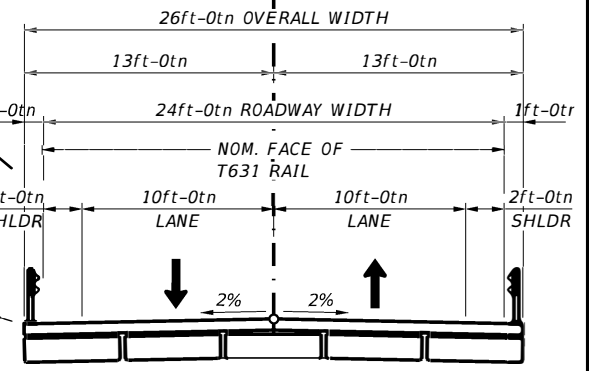
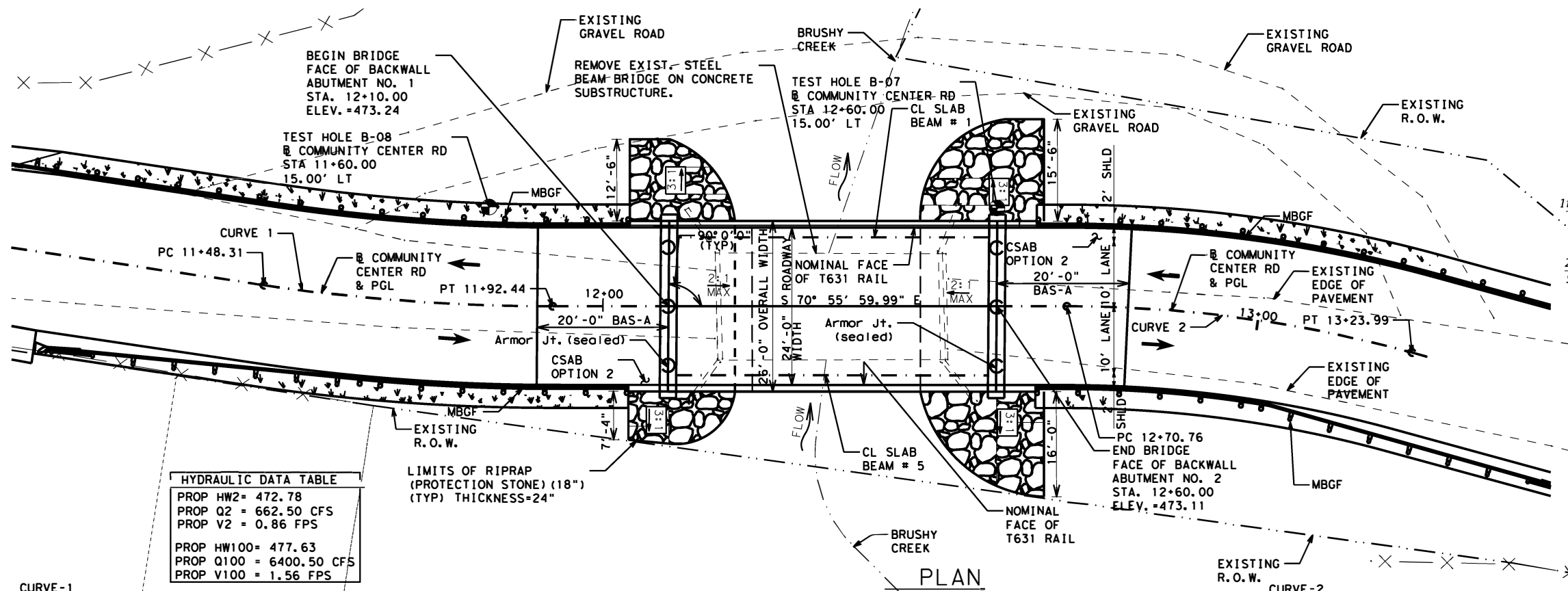
Texas Department of Transportation

YOUNG RD
 SCOUR DATA SHEET

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
0914	18	111, etc.	CR290, etc.	
DIST	COUNTY	SHEET NO.		
AUS	BASTROP	50		

ALL ABUTMENTS ARE ON BEARING N 19° 04' 0.01" E



TYPICAL TRANSVERSE SECTION
NOT TO SCALE



HYDRAULIC DATA TABLE

PROP HW2 =	472.78
PROP Q2 =	662.50 CFS
PROP V2 =	0.86 FPS
PROP HW100 =	477.63
PROP Q100 =	6400.50 CFS
PROP V100 =	1.56 FPS

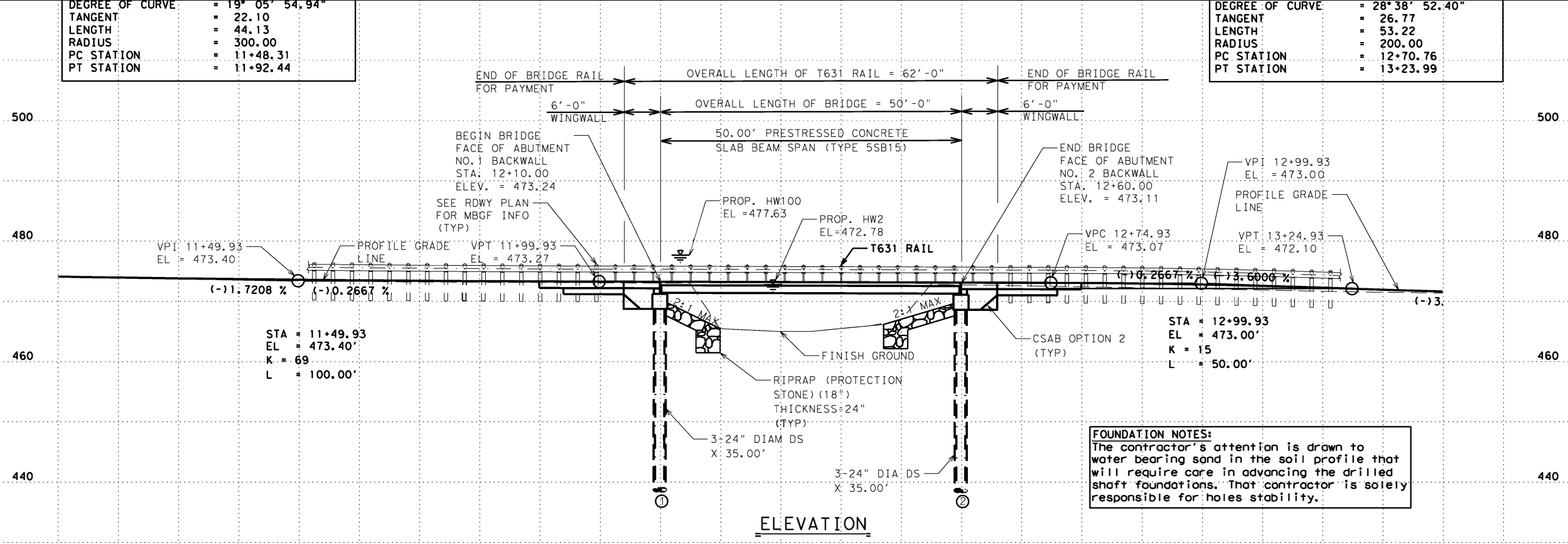
CURVE-1
HORIZONTAL CURVE DATA

PI STATION	= 11+70.41
DELTA	= 8° 25' 39.16" (LT)
DEGREE OF CURVE	= 19° 05' 54.94"
TANGENT LENGTH	= 22.10
RADIUS	= 300.00
PC STATION	= 11+48.31
PT STATION	= 11+92.44

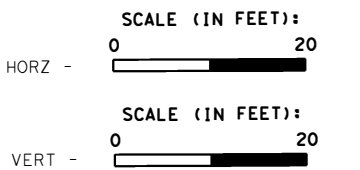
CURVE-2
HORIZONTAL CURVE DATA

PI STATION	= 12+97.54
DELTA	= 15° 14' 52.02" (RT)
DEGREE OF CURVE	= 28° 38' 52.40"
TANGENT LENGTH	= 26.77
RADIUS	= 53.22
PC STATION	= 12+70.76
PT STATION	= 13+23.99

DocuSigned by:
Hilina Shibeshi
EE0019CCB328ACF
1/26/2022
Mouness Yacoub P.E.
01/26/2022



STA. 12+10.00 TO STA. 12+60.00
PERMANENT STRUCTURE NO. EXISTING NBI: 14-011-0-AA02-90-001
PROPOSED NBI: 14-011-0-AA02-90-501
DESIGN SPEED = 30 MPH
EXIST. ADT (2020) = 15 VPD
PROP. ADT (2050) = 25 VPD
TERRAIN: LEVEL
ROWY FUNCT CLASS: RURAL LOCAL
HL-93 LOADING



FOUNDATION NOTES:
The contractor's attention is drawn to water bearing sand in the soil profile that will require care in advancing the drilled shaft foundations. That contractor is solely responsible for holes stability.

Austin District
Central Design
Texas Department of Transportation

COMMUNITY CENTER RD
AT BRUSHY CREEK
BRIDGE LAYOUT

SHEET 1 OF 1

YEAR	CONT	SECT	JOB	HIGHWAY
0914	18		111, etc.	CR290, etc.
DIST	COUNTY	SHEET NO.		
AUS	BASTROP	51		

DATE: \$DATE\$
FILE: \$FILES\$

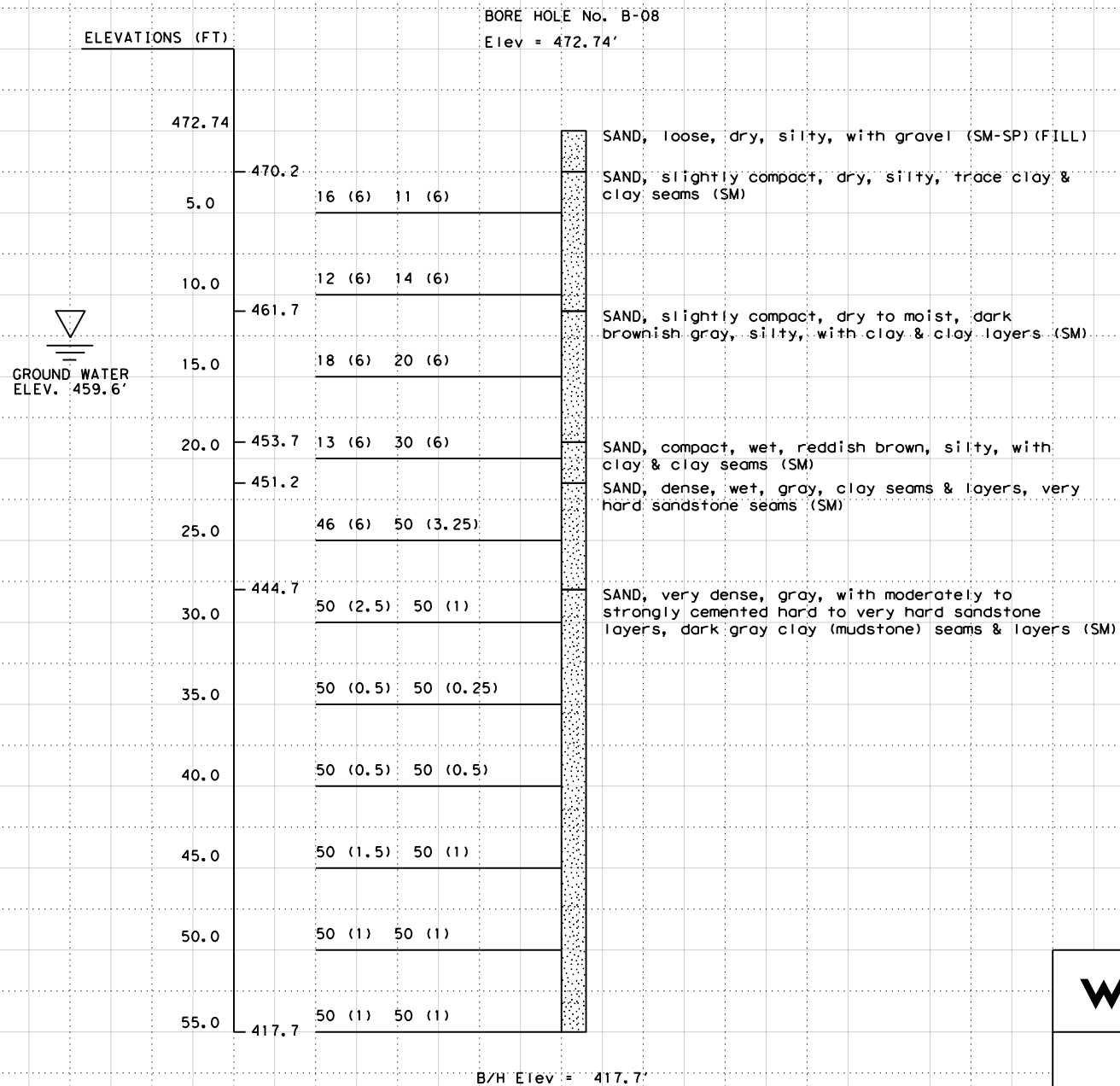
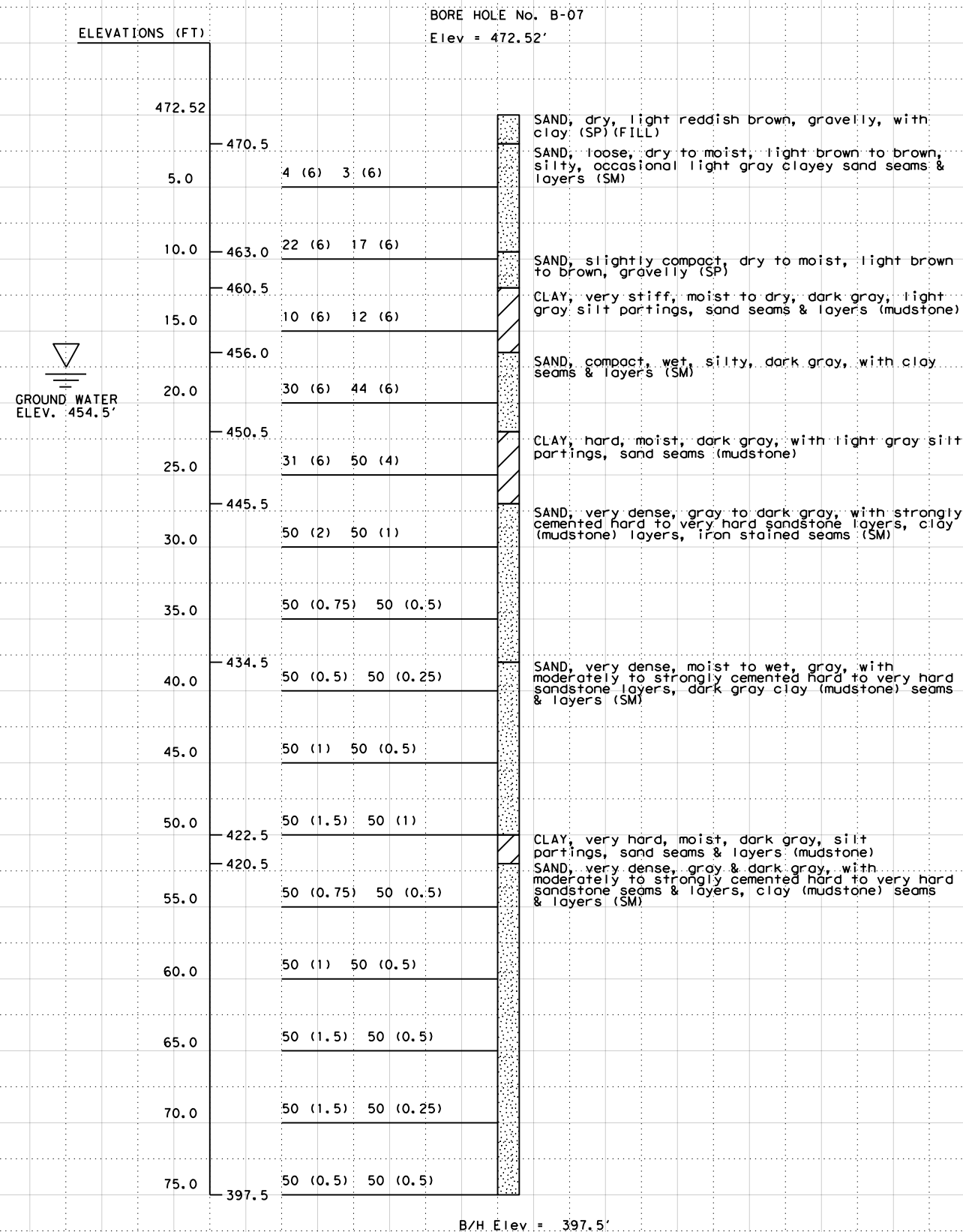
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					11+00						12+00						13+00						13+40		

LEGEND:

	CLAY (CL)
	CLAY (CH)
	SHALE
	SAND

BORE HOLE No. B-07
 N: 9,936,702.142
 E: 3,237,032.415

BORE HOLE No. B-08
 N: 9,936,733.828
 E: 3,236,953.224



FILE: \$FILEL\$.S
 DATE: \$DATES \$TIME\$

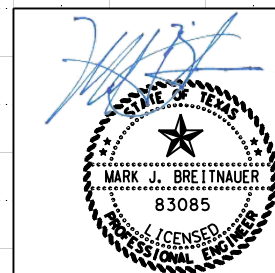
wood. Wood Environment & Infrastructure Solutions, Inc.
 4801 Spring Valley Road, Suite 125
 Dallas, Texas 75244 (469) 828-4100
 T.B.P.E. Firm Registration #12

**Austin District
 Central Design**

Texas Department of Transportation

**COMMUNITY ROAD
 AT BRUSHY CREEK**

SOIL BORING LOG



12/20/2021

SHEET 4 OF 5

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CK:	914	18	111
DW:	CK:	DIST	COUNTY	SHEET NO.
		AUS	BASTROP	52

DATE: 1/26/2022 3:13:41 PM
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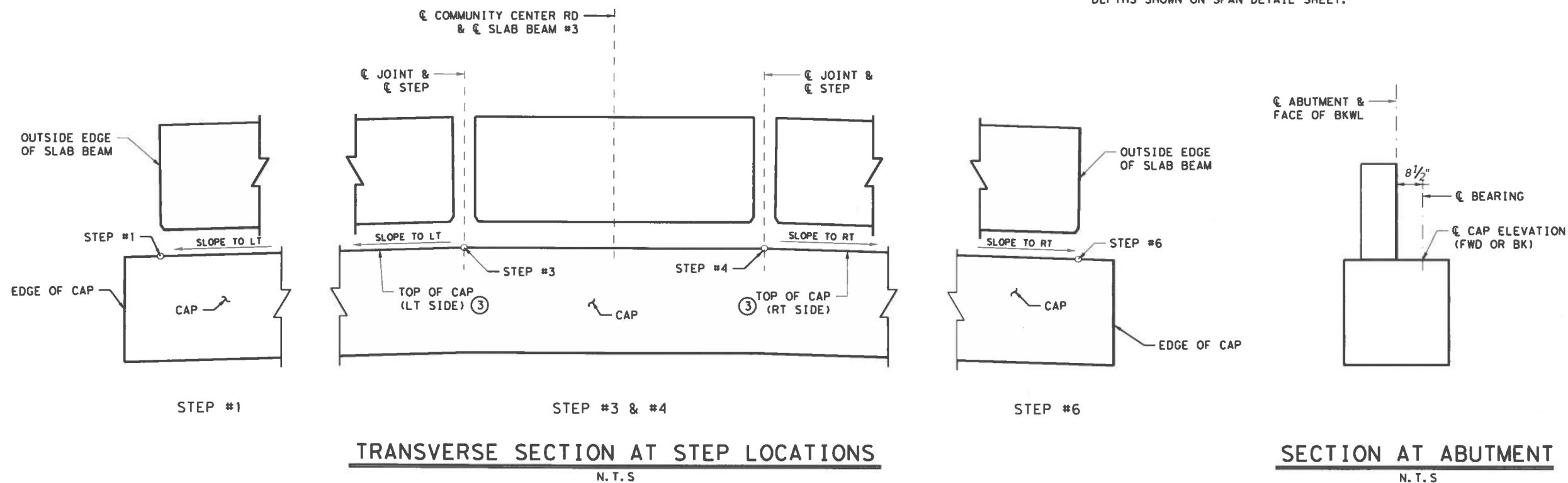
SUMMARY OF ESTIMATED BRIDGE QUANTITIES

Community Center Road Bridge									
BID CODES	0400-6005	0416-6002	0420-6013	0422-6007	0422-6015	0425-6012	0432-6033	0450-6018	0454-6004
BID ITEM DESCRIPTION	CEM STABIL BKFL ①	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	REINF CONC SLAB (SLAB BEAM)	APPROACH SLAB	PRESTR CONC SLAB BEAM (5SB15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T631)	ARMOR JOINT (SEALED)
BRIDGE ELEMENT	CY	LF	CY	SF	CY	LF	CY	LF	LF
2 ~ ABUTMENT	53	210	18.6		38.6		152	24.0	44
1 ~ 50.00' PRESTR CON SLAB BEAM SPAN				1300		247.50		100.0	
PROJECT TOTALS	53	210	18.6	1300	38.6	247.50	152	124.0	44

① QUANTITY IS FOR CSAB OPTION 2.

CAP ELEVATIONS ^②				
	STEP #1	STEP #3	STEP #4	STEP #6
ABUT #1 (FWD)	470.978	471.186	471.186	470.978
ABUT #2 (BK)	470.849	471.056	471.056	470.849

② TOP OF CAP ELEVATIONS ARE BASED ON SECTION DEPTHS SHOWN ON SPAN DETAIL SHEET.



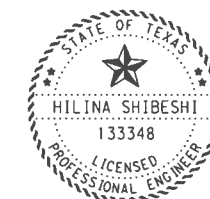
TRANSVERSE SECTION AT STEP LOCATIONS

N. T. S

SECTION AT ABUTMENT

N. T. S

③ LEFT SIDE AND RIGHT SIDE ARE REFERENCED FROM
 ☉ COMMUNITY CENTER RD LOOKING UPSTATION.



DocuSigned by:
Hilina Shibeshi
 EE0019CCB3294CF...
 1/26/2022

**Austin District
 Bridge Section**



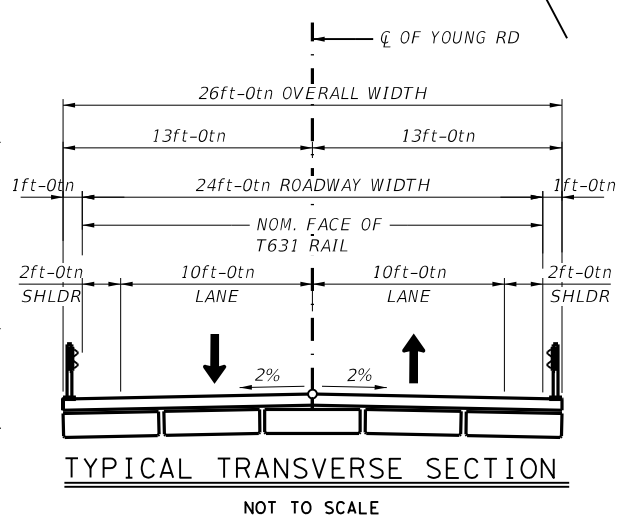
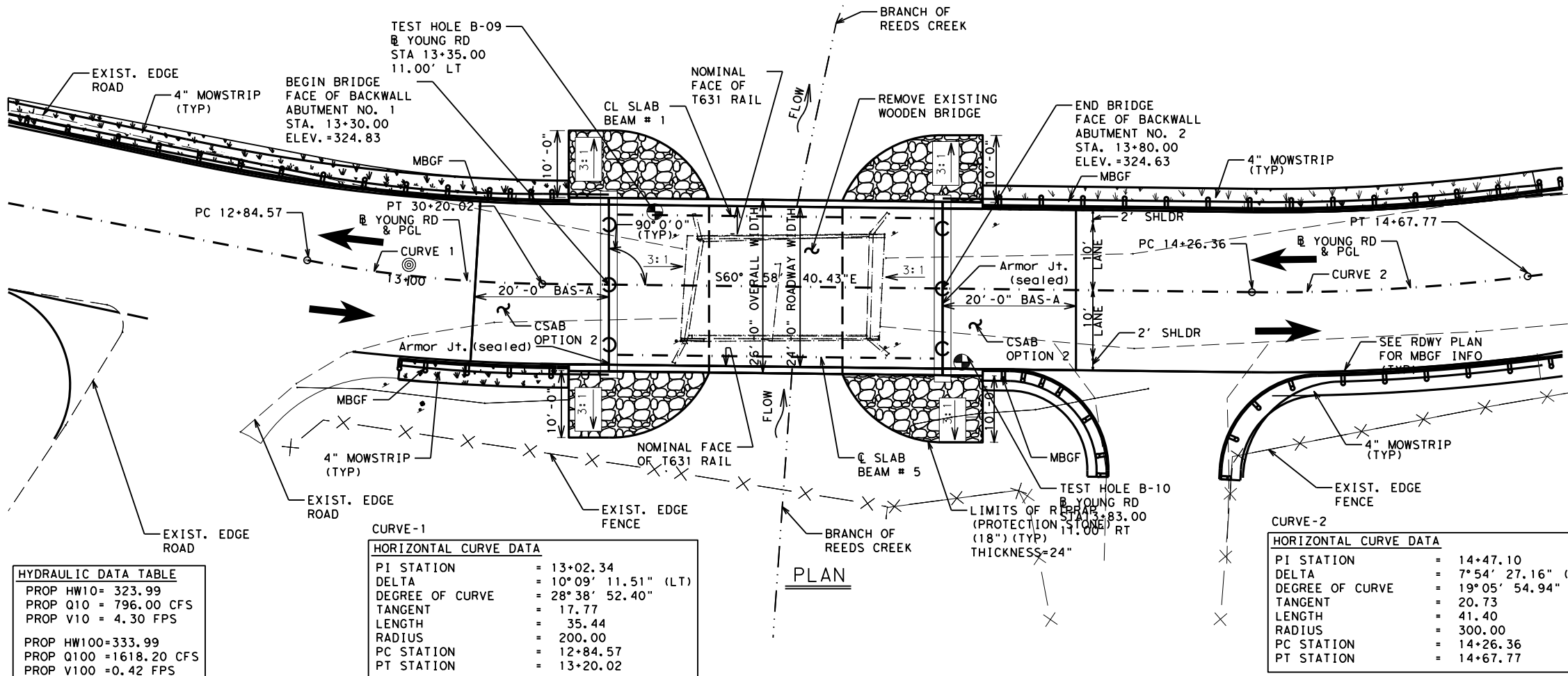
**BRIDGE QUANTITIES
 AND CAP ELEVATIONS**

**COMMUNITY CENTER RD
 AT BRUSHY CREEK**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS: HS	CK: 0914	18	111, etc.	CR290, etc.
DW: HS	CK: AUS	BASTROP	SHEET NO.	53

ALL ABUTMENTS ARE ON BEARING N 29° 01' 19.57" E



HYDRAULIC DATA TABLE

PROP HW10= 323.99
 PROP Q10 = 796.00 CFS
 PROP V10 = 4.30 FPS

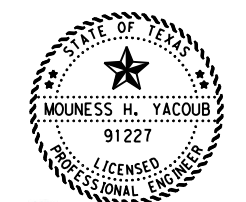
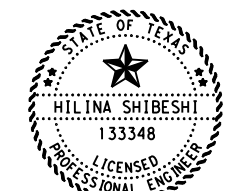
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 PROP Q100 =1618.20 CFS
 PROP V100 =0.42 FPS

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PI STATION = 13+02.34
 DELTA = 10° 09' 11.51" (LT)
 DEGREE OF CURVE = 28° 38' 52.40"
 TANGENT = 17.77
 LENGTH = 35.44
 RADIUS = 200.00
 PC STATION = 12+84.57
 PT STATION = 13+20.02

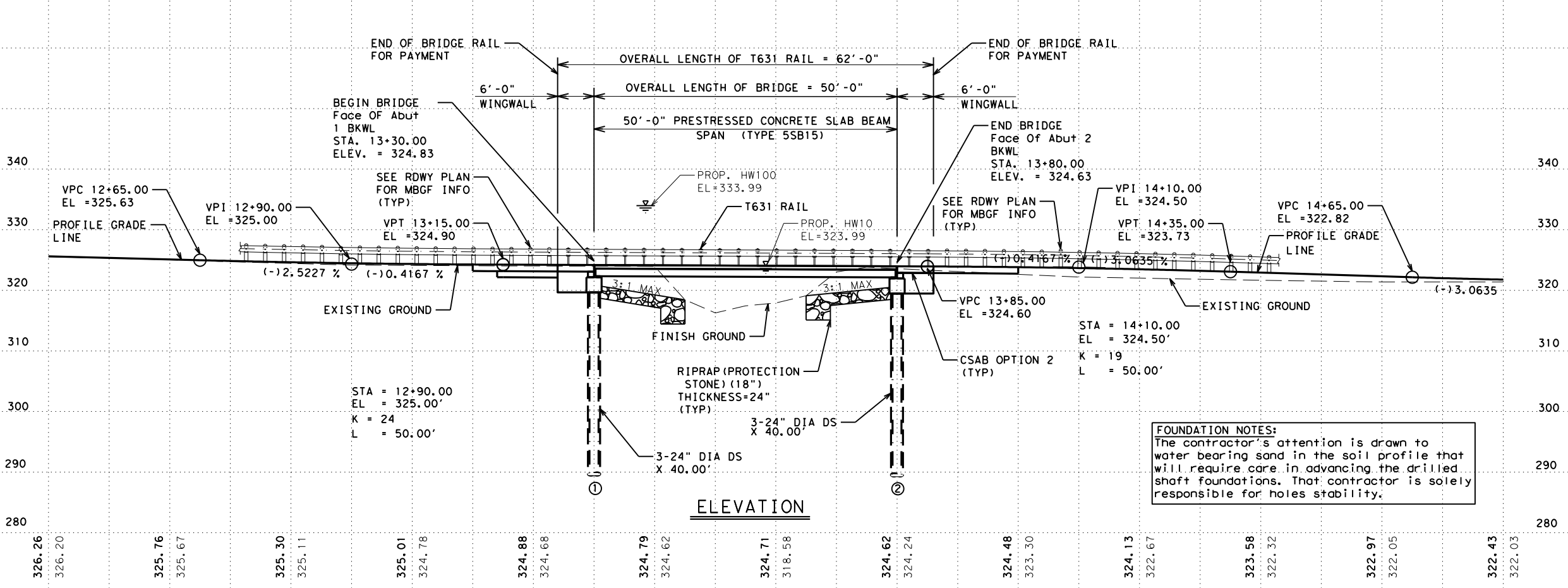
HORIZONTAL CURVE DATA

PI STATION = 14+47.10
 DELTA = 7° 54' 27.16" (LT)
 DEGREE OF CURVE = 19° 05' 54.94"
 TANGENT = 20.73
 LENGTH = 41.40
 RADIUS = 300.00
 PC STATION = 14+26.36
 PT STATION = 14+67.77

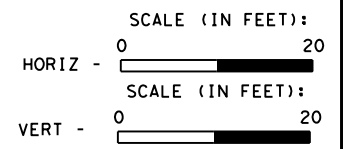


DocuSigned by:
 Hilina Shibeshi
 EE0019CCB3294CF
 2/14/2022

Mouness H. Yacoub P.E.
 02/14/2022



STA. 13+30.00 TO STA. 13+80.00
 PERMANENT STRUCTURE NO. EXISTING NBI: 14-011-0-AA01-97-001
 PROPOSED NBI: 14-011-0-AA01-97-501
 DESIGN SPEED = 30 MPH
 EXIST. ADT (2020) = 15 VPD
 PROP. ADT (2050) = 25 VPD
 TERRAIN: LEVEL
 RDWY FUNCT CLASS: RURAL LOCAL
 HL-93 LOADING



Austin District
 Central Design



YOUNG RD @
 BRANCH OF REEDS CREEK

BRIDGE LAYOUT

SHEET 1 OF 1

DATE: \$DATE\$	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	\$DST\$	\$CTY\$	54	

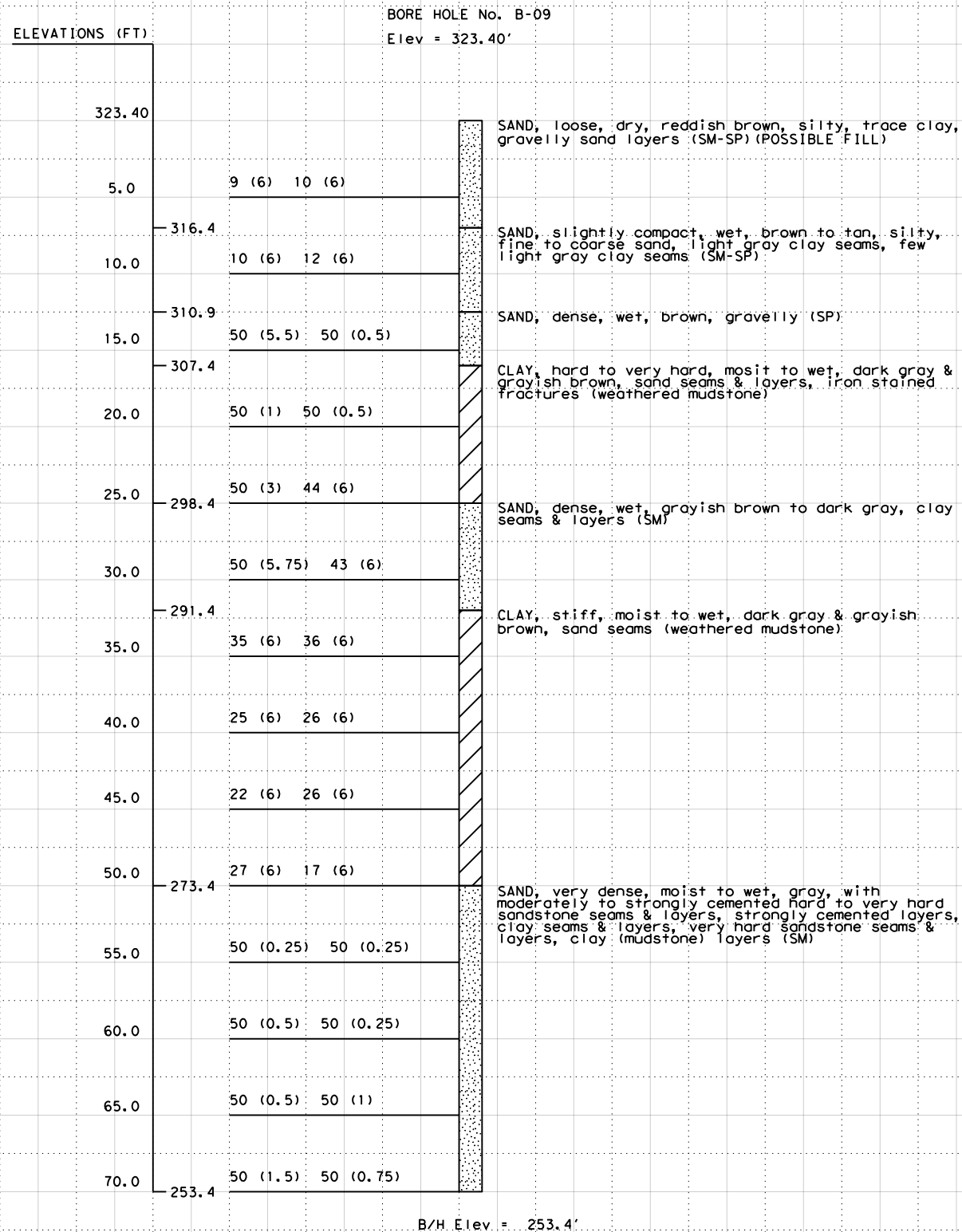
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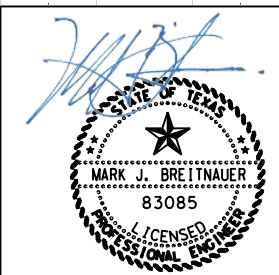
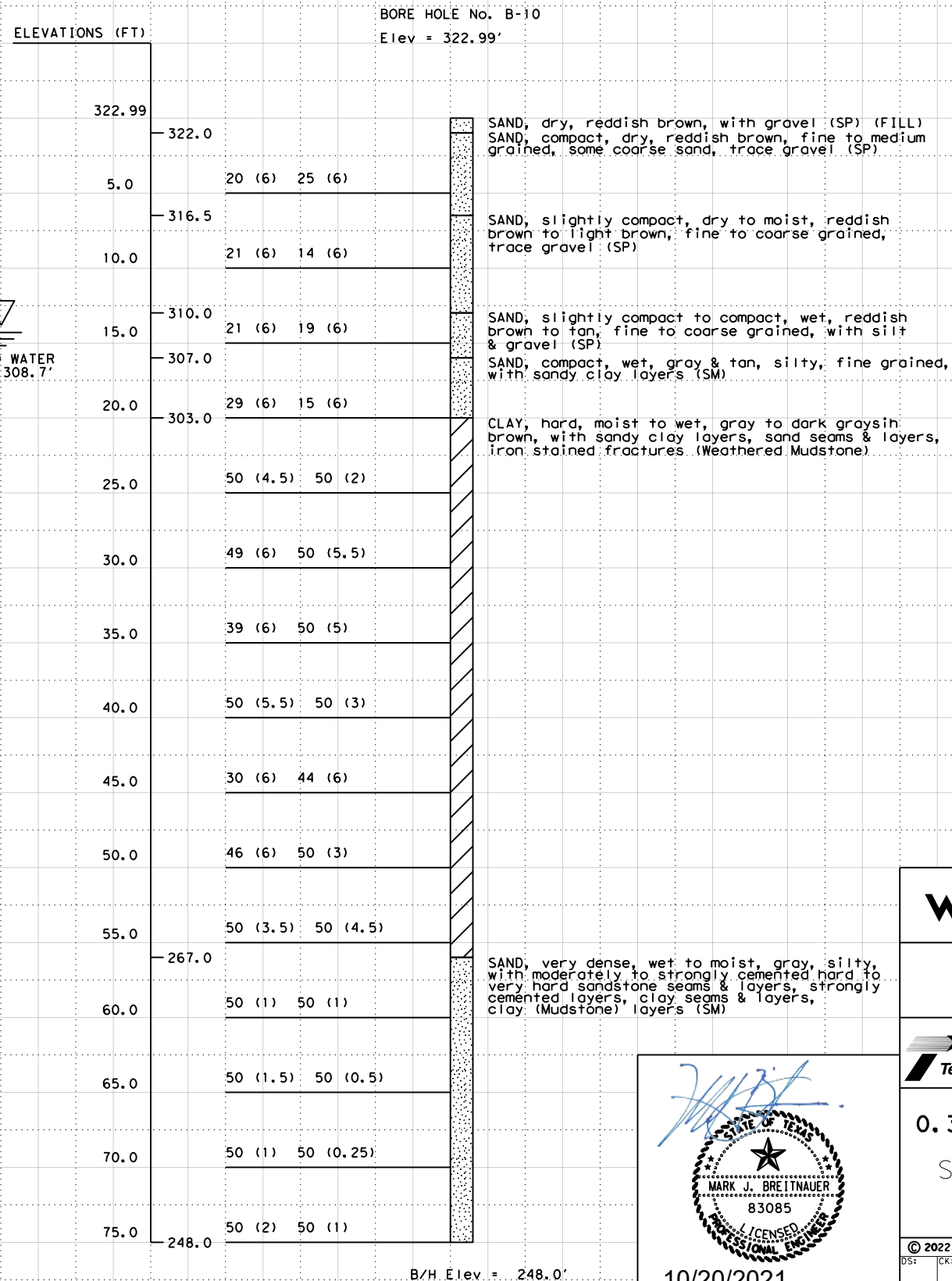
	CLAY (CL)
	CLAY (CH)
	SHALE
	SAND

BORE HOLE No. B-09
 N: 9,980,371.18
 E: 3,269,819.01

BORE HOLE No. B-10
 N: 9,980,314.368
 E: 3,269,876.621



GROUND WATER
 ELEV. 308.7'



wood. Wood Environment & Infrastructure Solutions, Inc.
 4801 Spring Valley Road, Suite 125
 Dallas, Texas 75244 (469) 828-4100
 T.B.P.E. Firm Registration #12

**Austin District
 Central Design**

Texas Department of Transportation

**YOUNG ROAD
 0.35 MI S. OF FM 2571
 SOIL BORING LOG**

SHEET 5 OF 5

© 2022	CONT	SECT	JOB	HIGHWAY
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DW:	CK:	DIST	COUNTY	SHEET NO.
		AUS	BASTROP	55

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 DATE: \$DATE\$.S

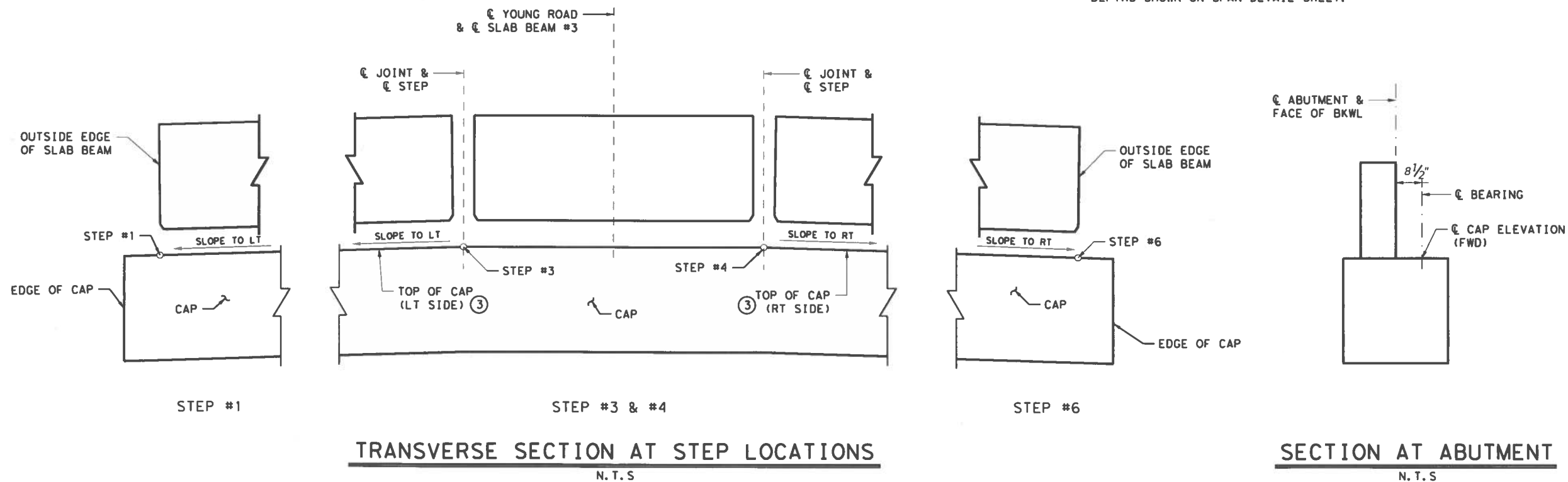
SUMMARY OF ESTIMATED BRIDGE QUANTITIES

Young Road Bridge									
BID CODES	0400-6005	0416-6002	0420-6013	0422-6007	0422-6015	0425-6012	0432-6033	0450-6018	0454-6004
BID ITEM DESCRIPTION	CEM STABIL BKFL ①	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	REINF CONC SLAB (SLAB BEAM)	APPROACH SLAB	PRESTR CONC SLAB BEAM (5SB15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T631)	ARMOR JOINT (SEALED)
BRIDGE ELEMENT	CY	LF	CY	SF	CY	LF	CY	LF	LF
2 ~ ABUTMENT	53	240	18.6		38.6		156	24.0	44
1 ~ 50.00' PRESTR CON SLAB BEAM SPAN				1300		247.50		100.0	
PROJECT TOTALS	53	240	18.6	1300	38.6	247.50	156	124.0	44

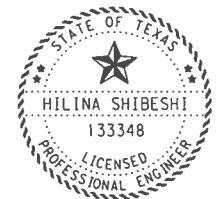
① QUANTITY IS FOR CSAB OPTION 2.

CAP ELEVATIONS ^②				
	STEP #1	STEP #3	STEP #4	STEP #6
ABUT #1 (FWD)	322.570	322.778	322.778	322.570
ABUT #2 (BK)	322.368	322.575	322.575	322.368

② TOP OF CAP ELEVATIONS ARE BASED ON SECTION DEPTHS SHOWN ON SPAN DETAIL SHEET.



③ LEFT SIDE AND RIGHT SIDE ARE REFERENCED FROM CENTRELINE OF YOUNG RD LOOKING UPSTATION.



DocuSigned by:
Hilina Shibeshi
EE0019CCB3294CF...
1/26/2022

**Austin District
Bridge Section**

Texas Department of Transportation

**BRIDGE QUANTITIES
AND CAP ELEVATIONS**

**YOUNG ROAD AT
BRANCH OF REEDS CREEK**

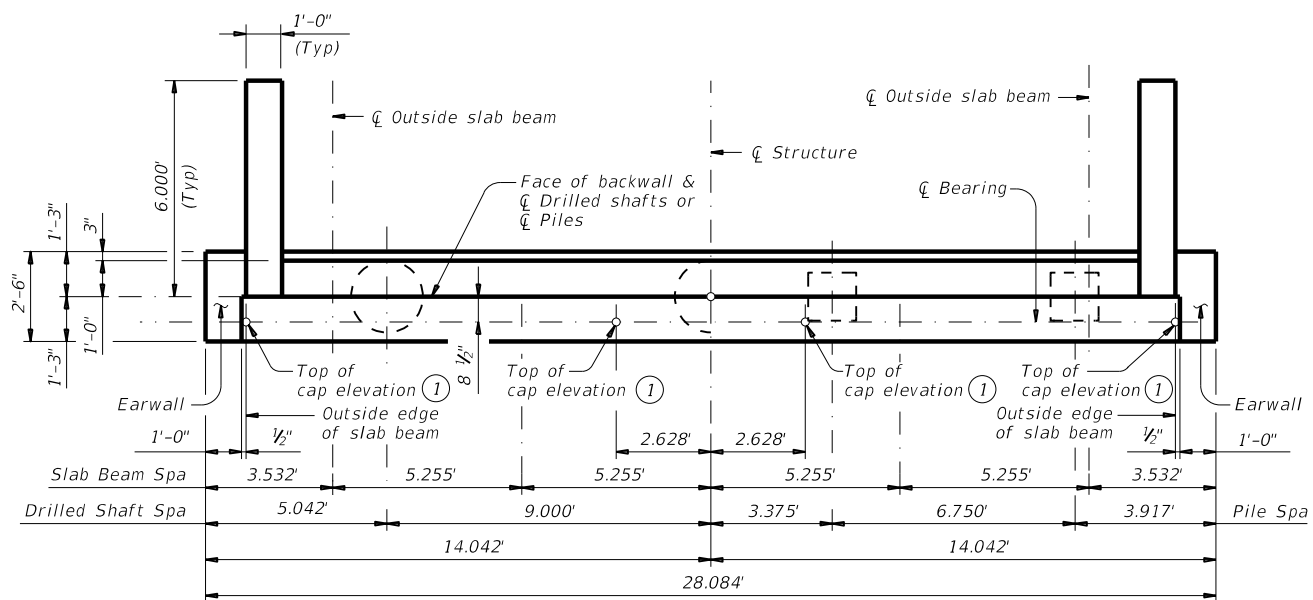
SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
HS	0914	18	111, etc.	CR290, etc.
DW	CK	DIST	COUNTY	SHEET NO.
HS		AUS	BASTROP	56

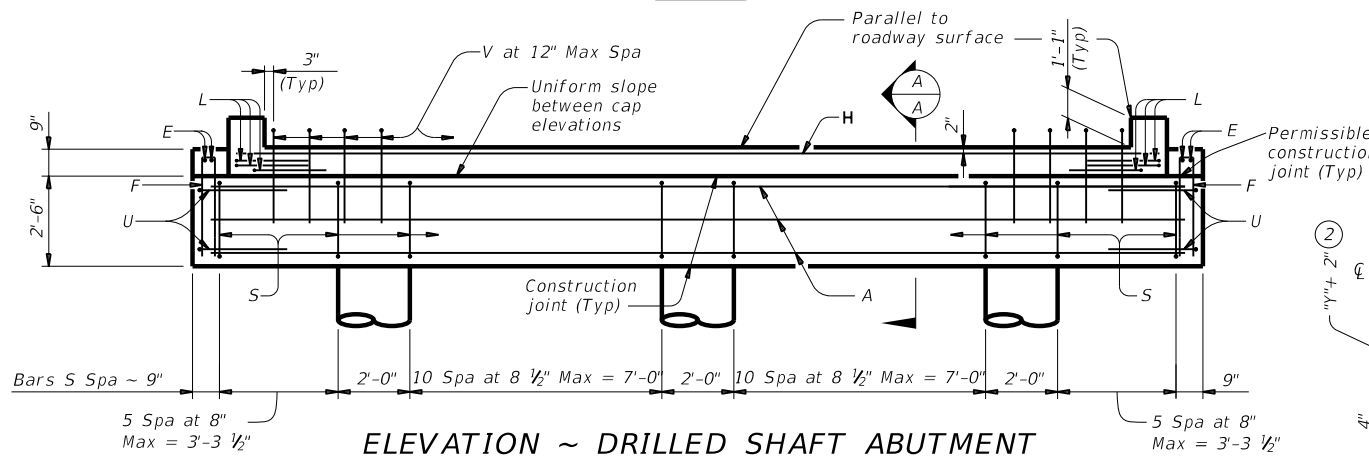
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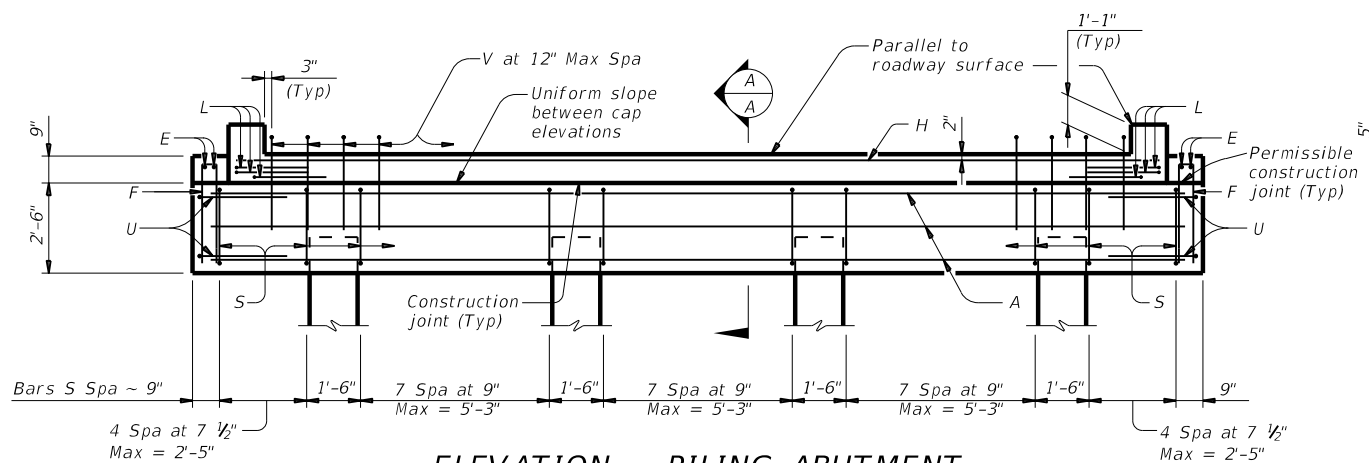
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SHOWING DRILLED SHAFTS PLAN SHOWING PILES

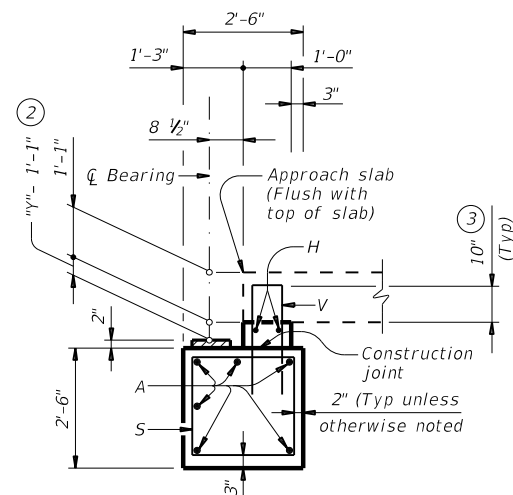
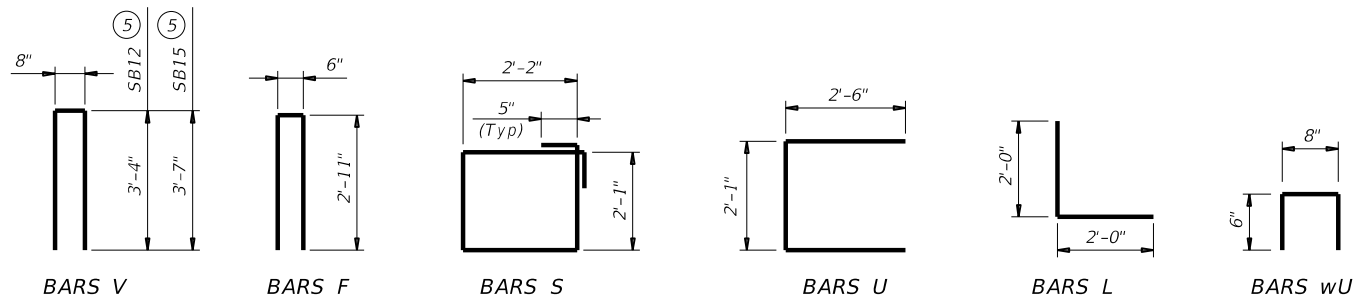


ELEVATION ~ DRILLED SHAFT ABUTMENT



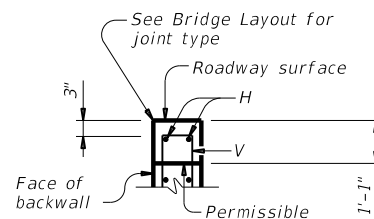
ELEVATION ~ PILING ABUTMENT

Note: For piles larger than 16", adjust Bars S spacing as required to avoid piles.



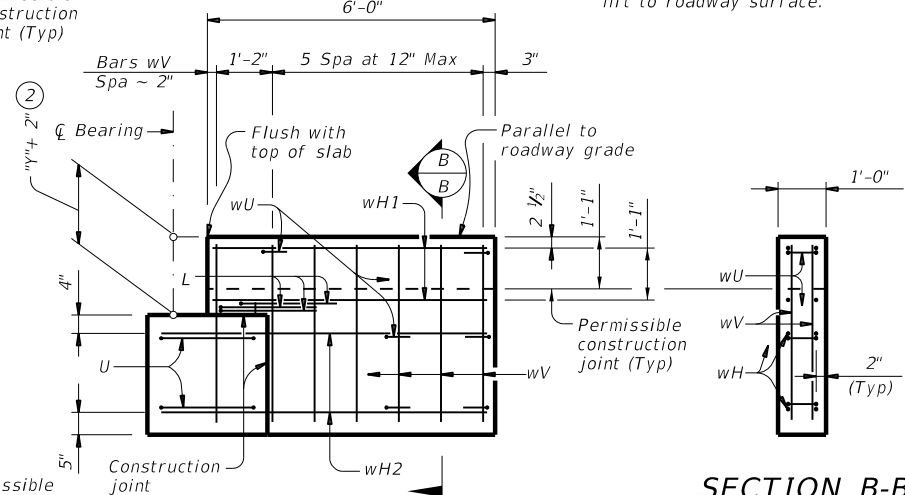
SECTION A-A (4)

(With approach slab)
 Note: At Contractor's option, backwall may be cast with approach slab.



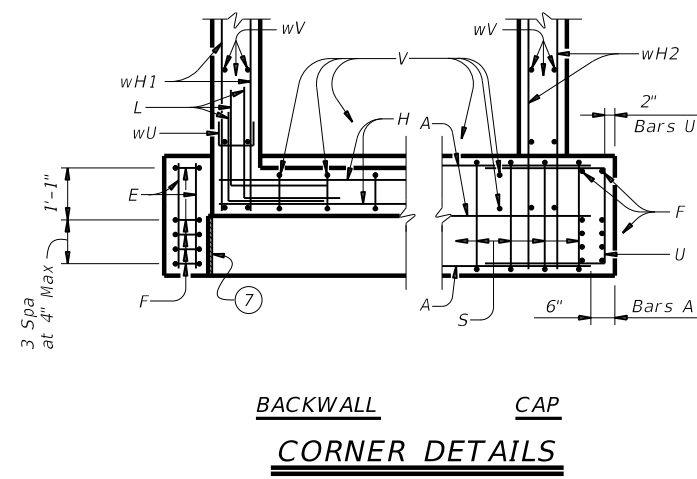
BACKWALL DETAIL (4)

(Without approach slab)
 Note: At Contractor's option, backwall may be cast in one lift to roadway surface.



WINGWALL ELEVATION

(Earwall not shown for clarity.)



BACKWALL CAP CORNER DETAILS

FOUNDATION LOADS

Span Length	Drilled Shaft Loads		Vertical Pile Loads	
	Tons/DS	Tons/Pile	5SB12	5SB15
Ft	5SB12	5SB15	5SB12	5SB15
25	39	41	29	31
30	43	46	33	34
35	48	51	36	38
40	52	55	39	41
45	59		44	
50	63		47	

TABLE OF ESTIMATED QUANTITIES (6)

Bar	No.	Size	Length (5)		Weight (5)		
			5SB12	5SB15	5SB12	5SB15	
A	6	#11	27'-1"	27'-1"	863	863	
E	4	#4	2'-2"	2'-2"	6	6	
F	10	#4	6'-4"	6'-4"	43	43	
H	2	#5	25'-8"	25'-8"	54	54	
L	6	#6	4'-0"	4'-0"	36	36	
S	34	#4	9'-4"	9'-4"	212	212	
U	4	#6	7'-1"	7'-1"	43	43	
V	25	#5	7'-4"	7'-10"	191	204	
wH1	8	#6	5'-8"	5'-8"	68	68	
wH2	8	#6	6'-11"	6'-11"	83	83	
wU	12	#4	1'-8"	1'-8"	14	14	
wV	28	#5	3'-10"	4'-1"	112	119	
Reinforcing Steel					Lb	1,725	1,745
CI "C" Conc (Abut)					CY	8.8	9.2

- Top of cap elevations are based on section depths shown on Span Details.
- See Span Details for "Y".
- Increase as required to maintain 3" from finished grade.
- See Bridge Layout to determine if approach slab is present.
- See Bridge Layout for beam type used in the superstructure.
- Quantities shown are for one abutment only (with approach slab). Without approach slab, add 1.0 CY Class "C" concrete and 54 Lb reinforcing steel for 2 additional Bars H.
- 1/2" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
 Designed for a normal embankment header slope of 3:1 and a maximum span length of 50 feet.
 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 or Stone Riprap (SRR) standard sheet for riprap attachment details, if applicable.
 See applicable rail details for rail anchorage in wingwalls.
 These abutment details may be used with standard SPSB-24 only.

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

MATERIAL NOTES:

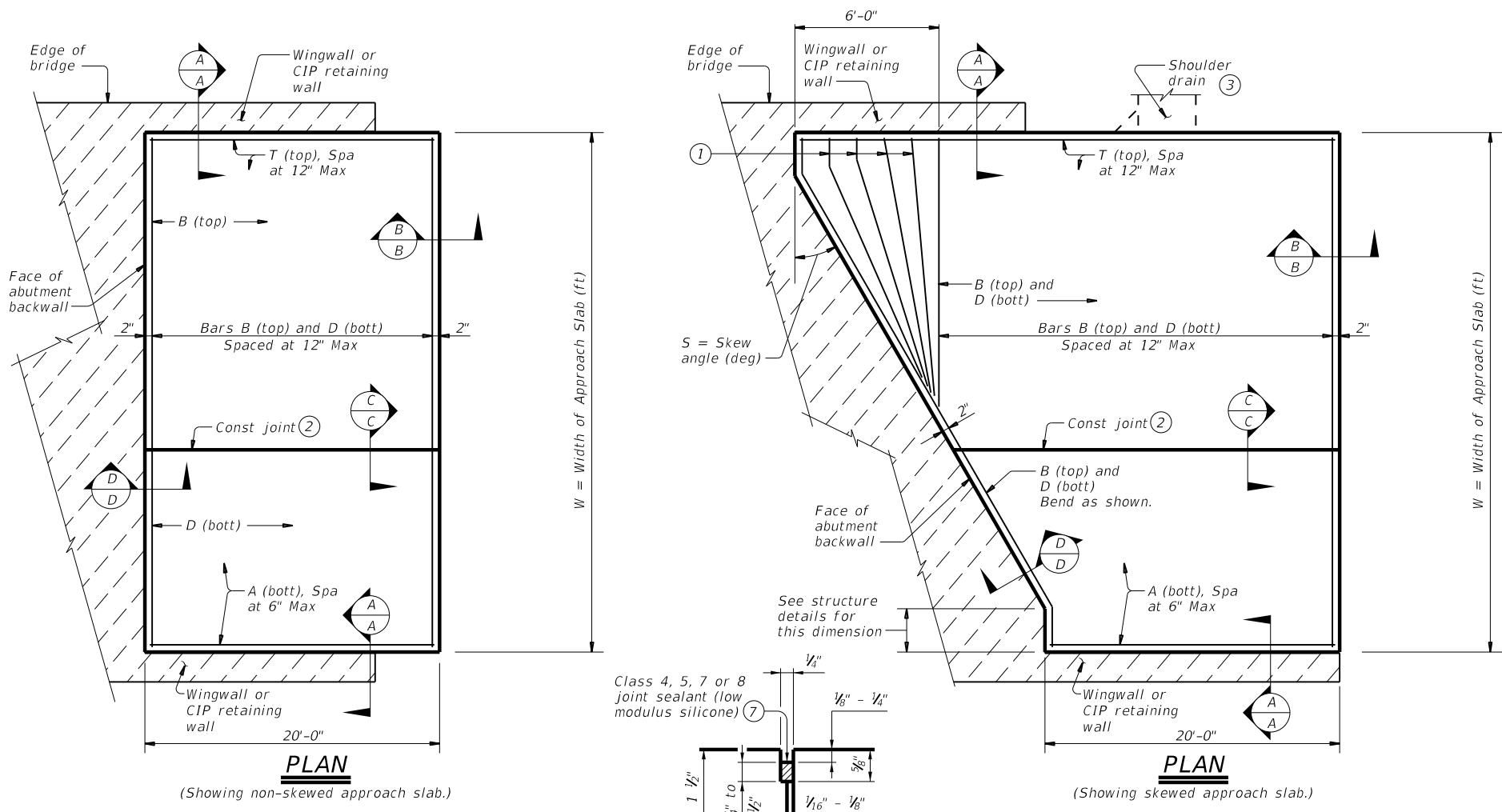
Provide Class C concrete (f'c = 3,600 psi).
 Provide Class C (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.

HL93 LOADING

				Bridge Division Standard	
ABUTMENTS PRESTR CONCRETE SLAB BEAM 24' ROADWAY APSB-24					
FILE: pbsbte09-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	CK: TxDOT
REVISIONS	091418	111, etc.	CR290, etc.		
DIST: AUS	COUNTY: BASTROP	SHEET NO. 57			

1/26/2022 10:34:53 AM
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 DRAWING: BAS-A

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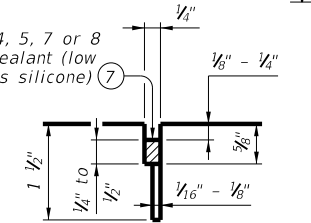


BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
T	#5

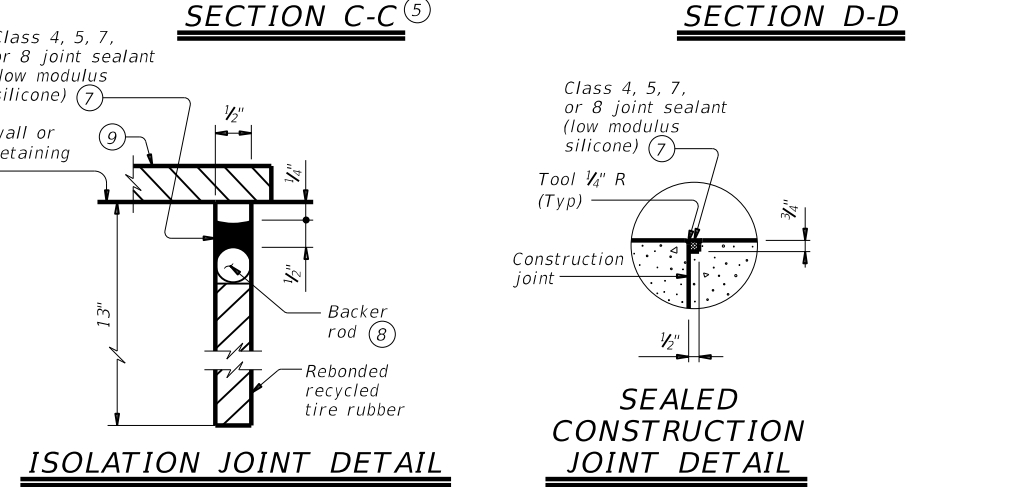
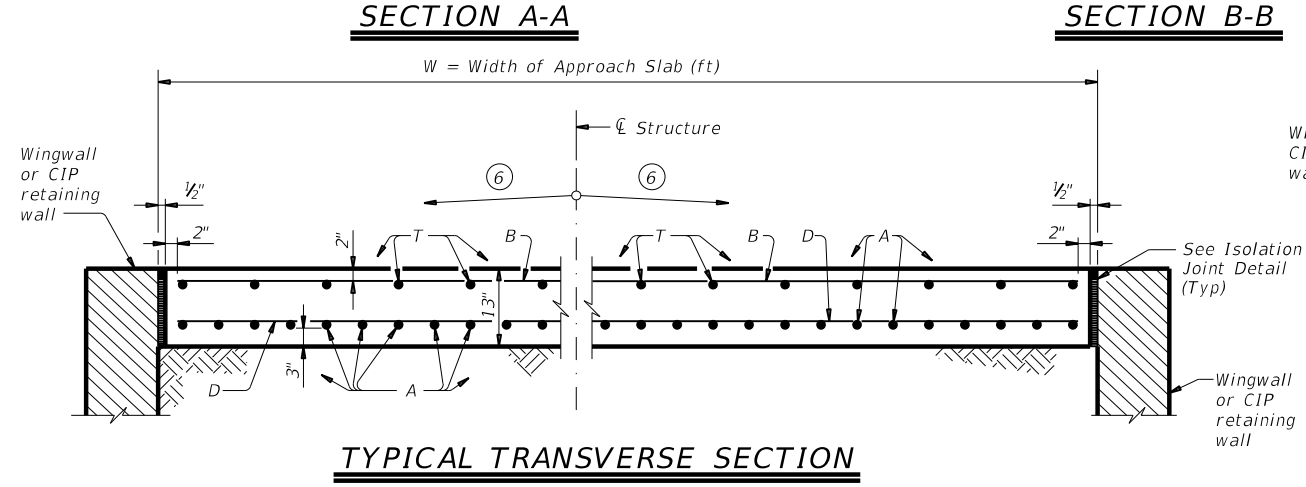
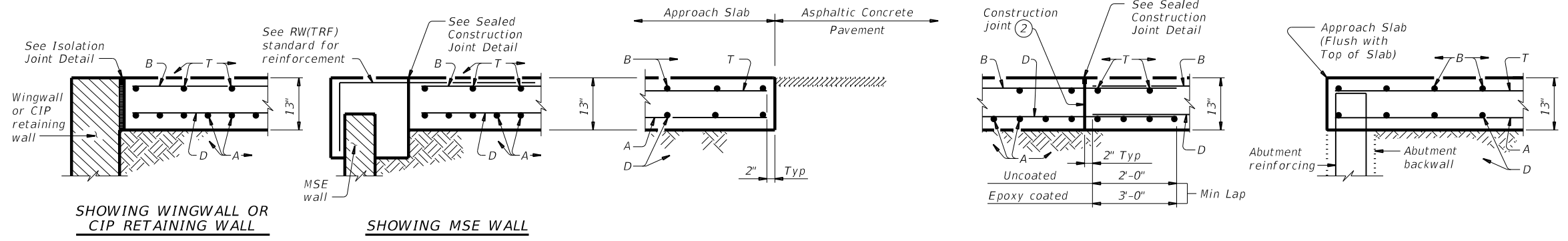
APPROXIMATE QUANTITIES ④	
Reinf steel weight =	8.5 Lbs/SF of Approach Slab
Volume of Appr Slab Conc (CY) =	0.802W + 0.02W ² Tan S
W =	Width of Approach Slab (ft)
S =	Skew Angle (deg)

- 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 1/2" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

LONGITUDINAL SAW CUT JOINT DETAIL



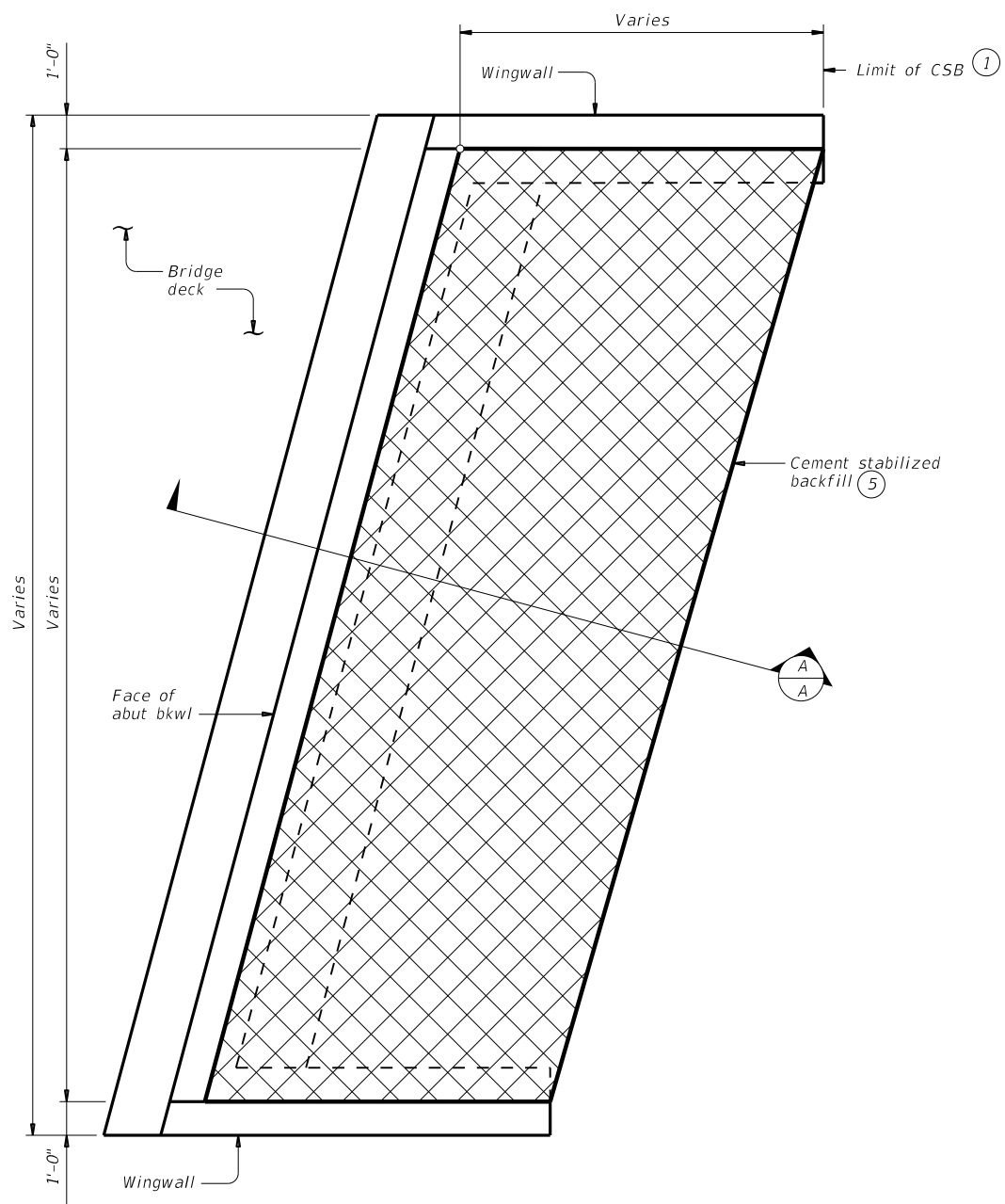
GENERAL NOTES:
 Construct approach slab in accordance with Item 422.
 Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.
 Provide Grade 60 reinforcing steel.
 Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 1/2" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 1/2" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)
 Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers."
 Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.
 Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.
 Cure for 4 days using water or membrane curing per Item 422.
 All details shown herein are subsidiary to bridge approach slab.
 Cover dimensions are clear dimensions, unless noted otherwise.



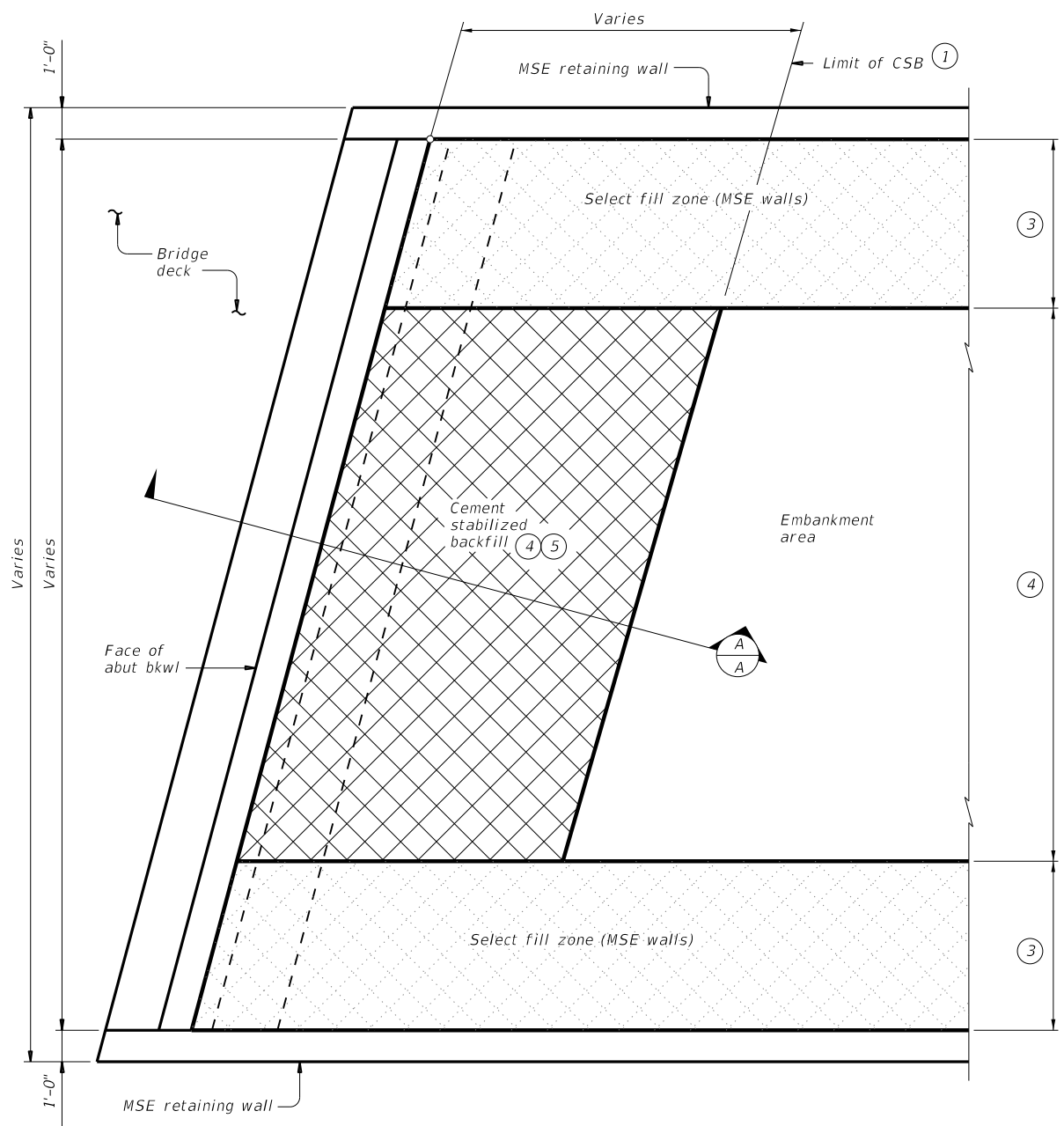
Texas Department of Transportation		Bridge Division Standard	
BRIDGE APPROACH SLAB			
ASPHALTIC CONCRETE PAVEMENT			
BAS-A			
FILE: basaste1-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT April 2019	CON: 0914	SECT: 18	JOB: 111, etc.
REVISIONS	0914	18	CR290, etc.
02-20: Removed stress relieving pad.	DIST: AUS	COUNTY: BASTROP	SHEET NO: 58

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DATE: FILE:



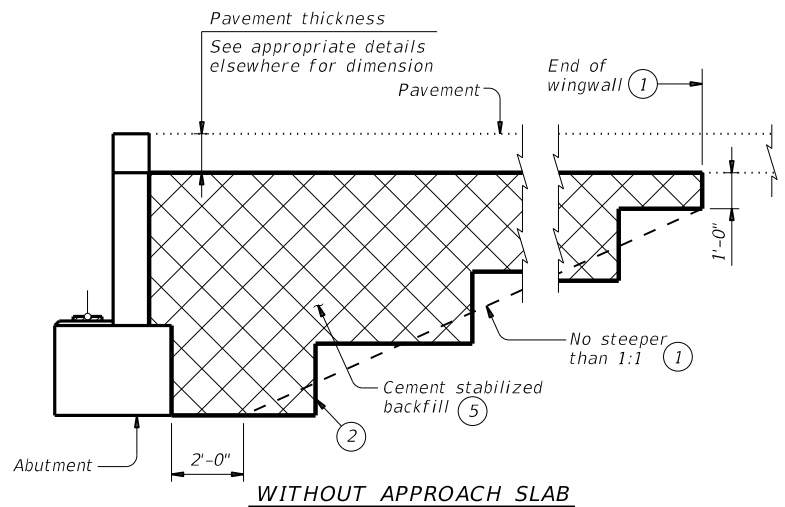
OPTION 1 ~ PLAN WITH WINGWALLS
Cast-in-place retaining walls similar.



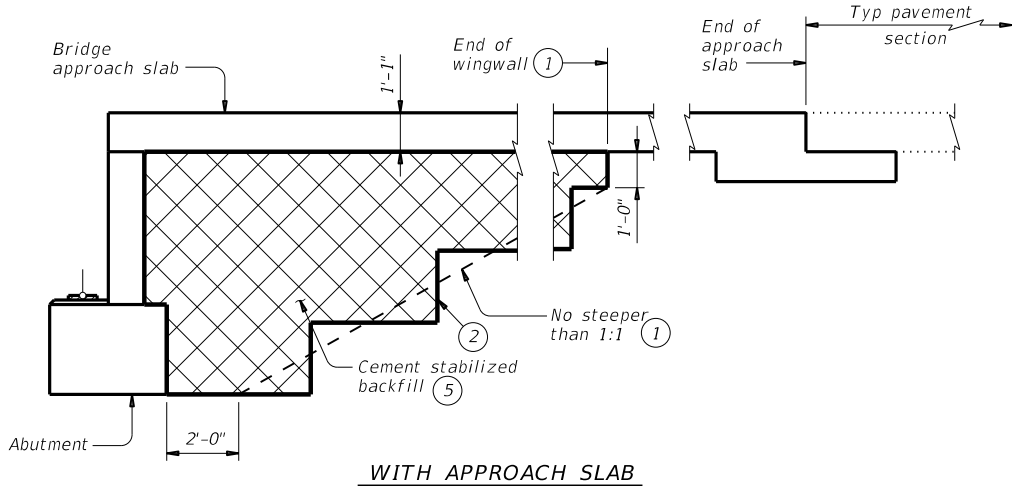
OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

- 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 2 is intended for new construction requiring high plasticity embankment fill with a plasticity index (PI) greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays. Option 1 is intended for construction only requiring PI controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment.
Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.
If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", to the limits shown at bridge abutments.
Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.
These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.



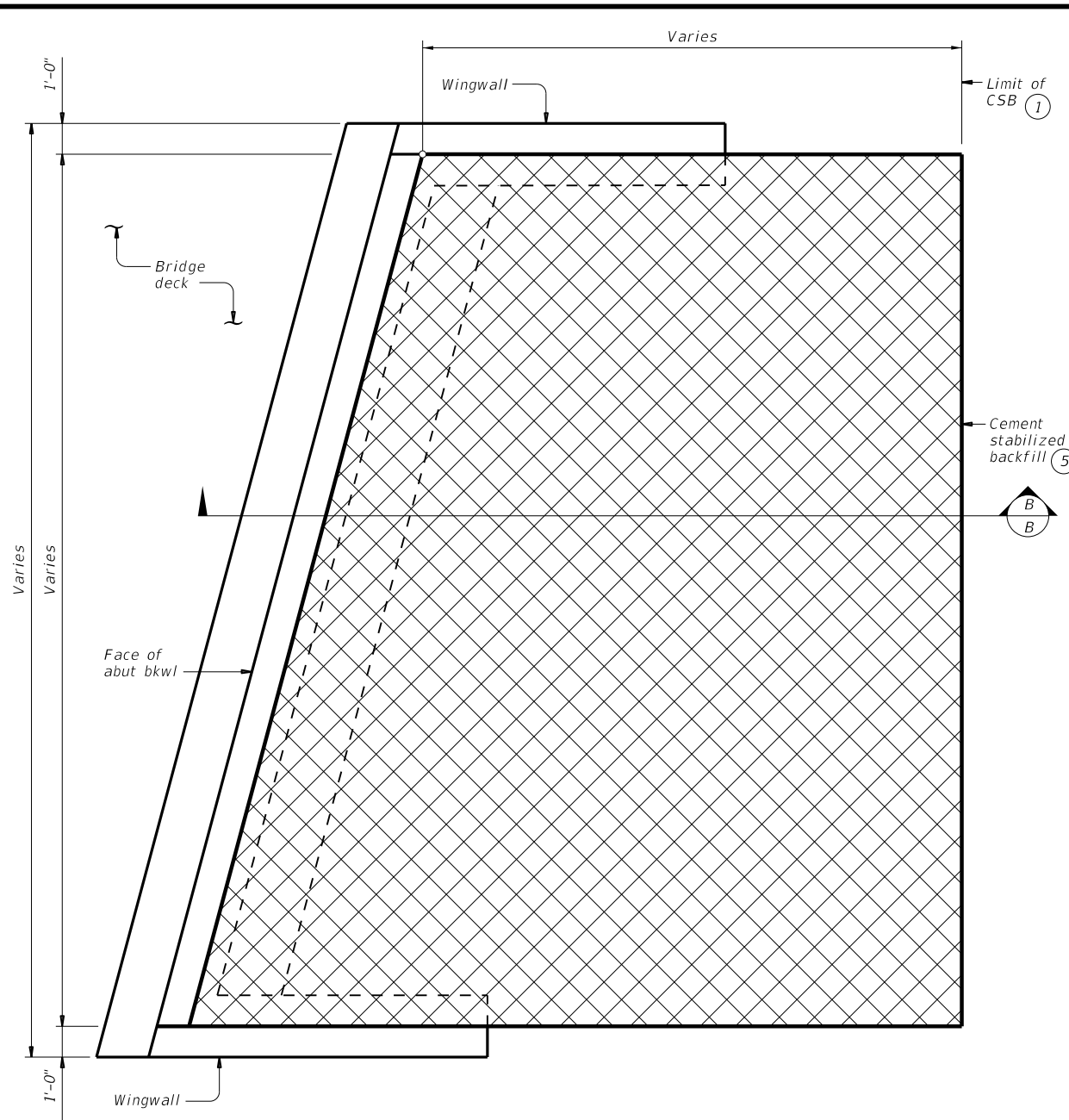
WITHOUT APPROACH SLAB



SECTION A-A
WITH APPROACH SLAB
(Showing BAS-C, BAS-A similar.)

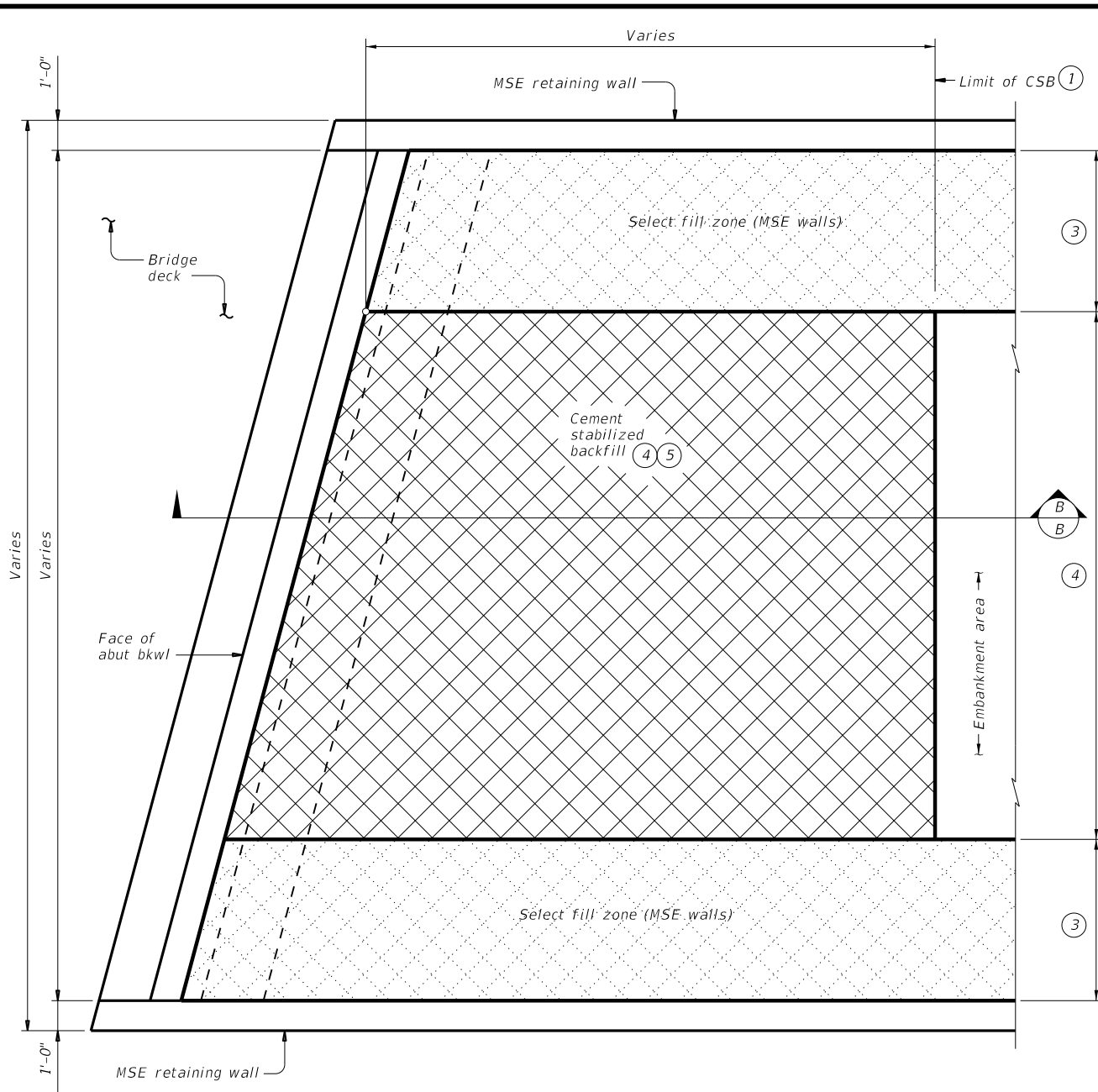
		Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT			
CSAB			
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0914	18	111
02-20: Added Option 2.	DIST	COUNTY	SHEET NO.
	AUS	BASTROP	59

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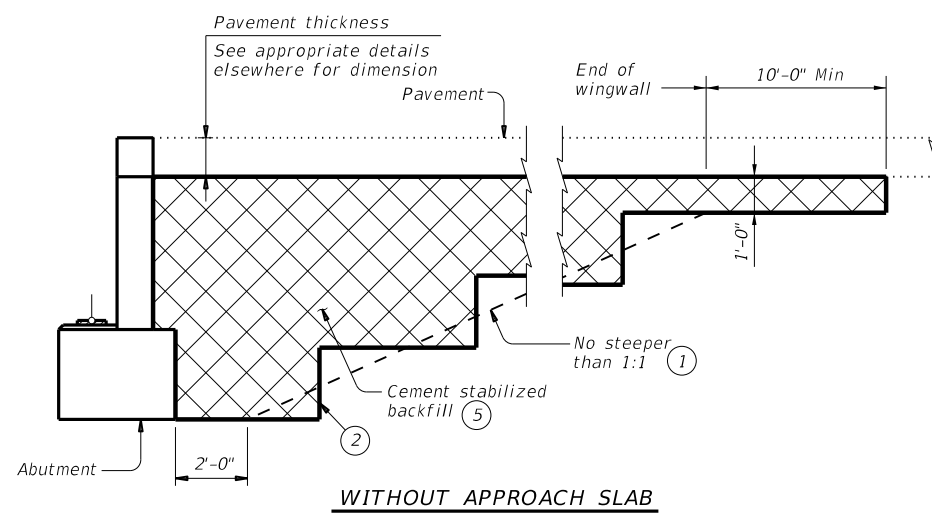
OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

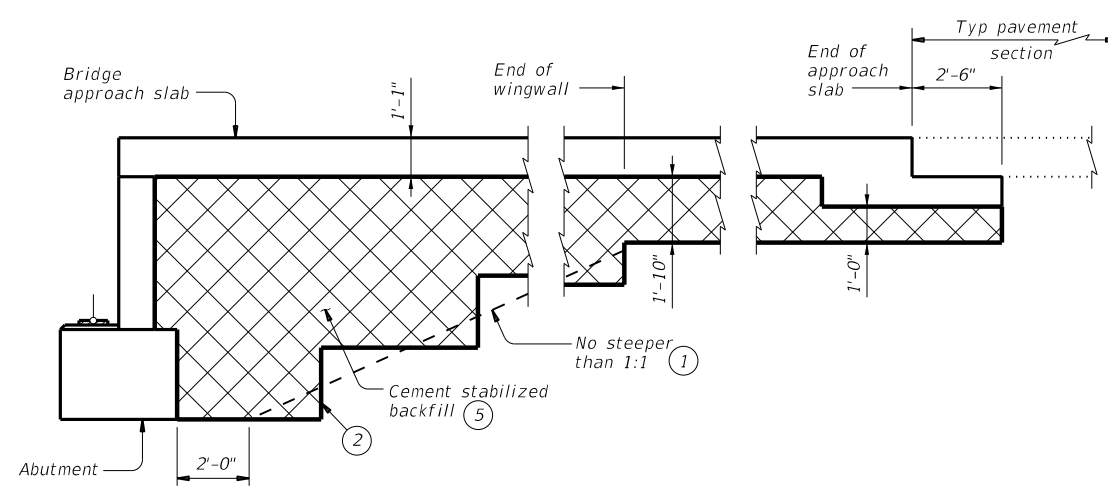


OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ④ When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.
- ⑤ If shown in the plans flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
 - a). If flowable backfill is to be placed over MSE backfill then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
 - b). Place flowable fill in lifts not exceeding 2 feet in height, place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).



WITHOUT APPROACH SLAB



SECTION B-B

WITH APPROACH SLAB
(Showing BAS-C, BAS-A similar.)

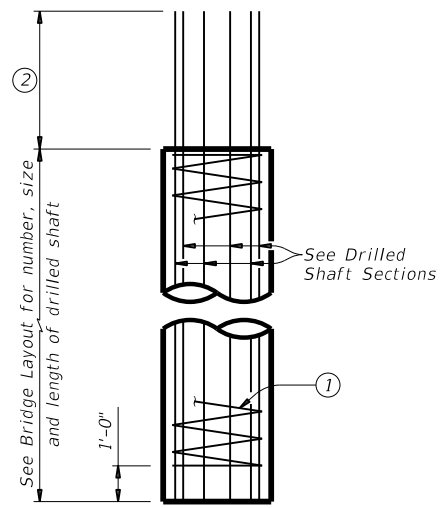
SHEET 2 OF 2

		Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT			
CSAB			
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT April 2019	CONTRACT NO. 0914	SECTION 18	JOB NO. 111
REVISIONS	02-20: Added Option 2.	COUNTY	SHEET NO.
	AUS	BASTROP	60

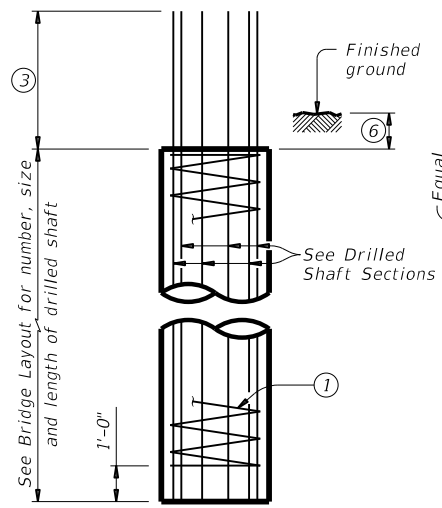
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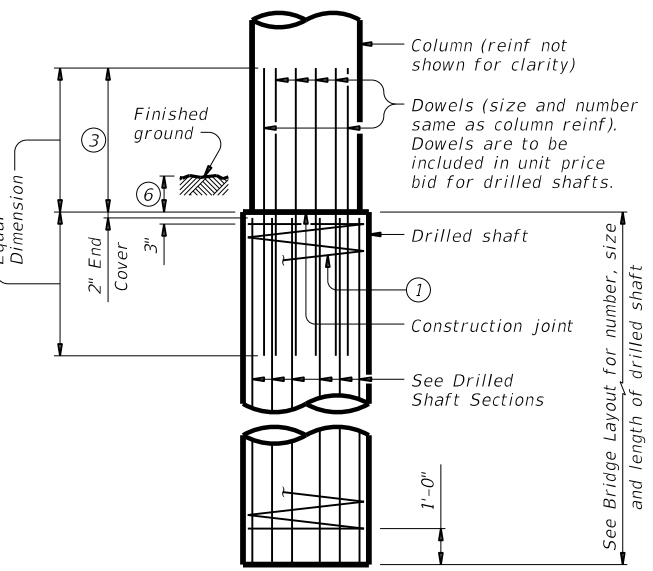
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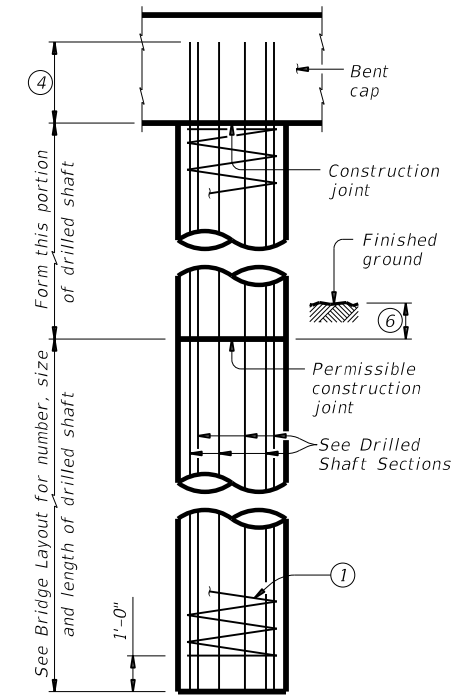
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



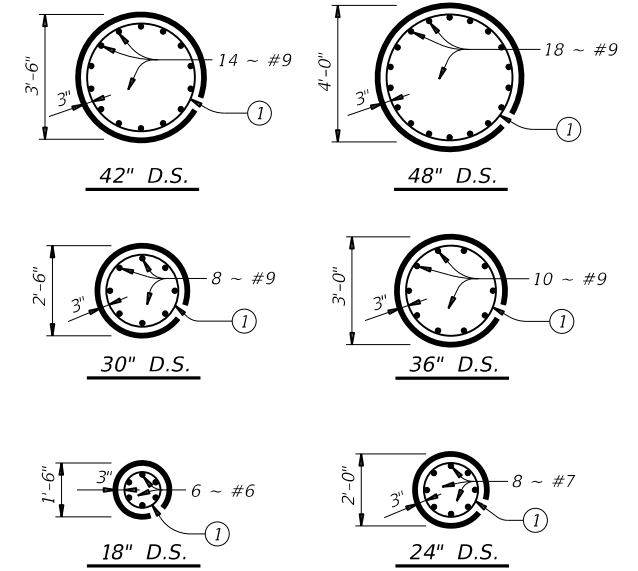
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL

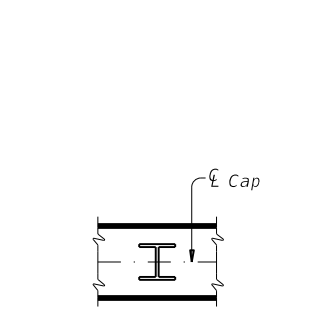


DRILLED SHAFT SECTIONS

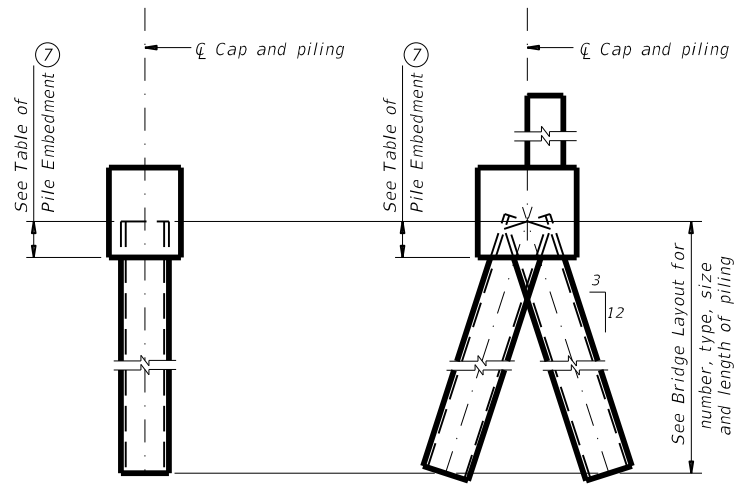
DRILLED SHAFT DETAILS

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"

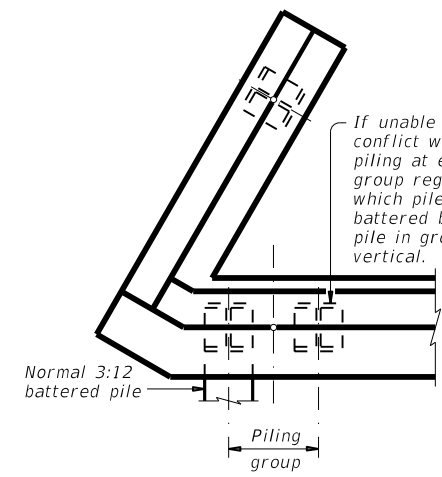
See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.



ORIENTATION OF STEEL H-PIILING

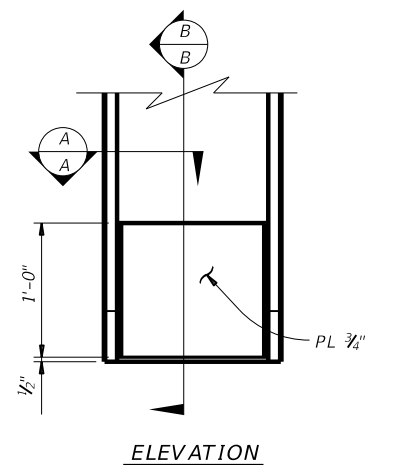


PIILING DETAILS (Concrete or steel H)

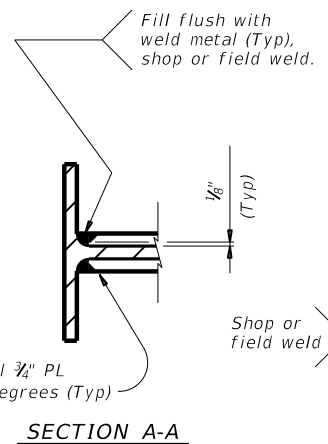


DETAIL "A" (Showing plan view of a 30° skewed abutment)

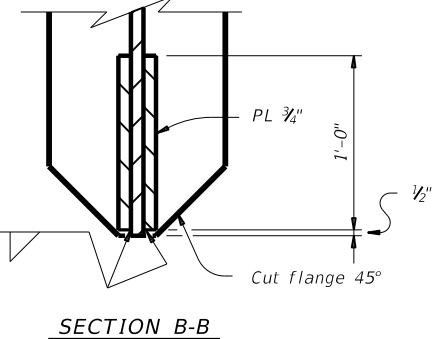
- ① #3 spiral at 6" pitch (one and a half flat turns top and bottom).
- ② Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"
- ③ Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"
- ④ Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"
- ⑤ Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.
- ⑥ 1'-0" Min, unless shown otherwise on plans.
- ⑦ Or as shown on plans.



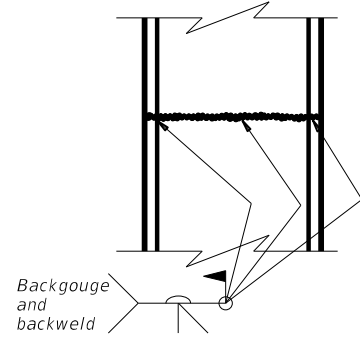
ELEVATION



SECTION A-A



SECTION B-B



SECTION THRU FLANGE OR WEB

STEEL H-PILE TIP REINFORCEMENT

See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.

STEEL H-PILE SPLICE DETAIL

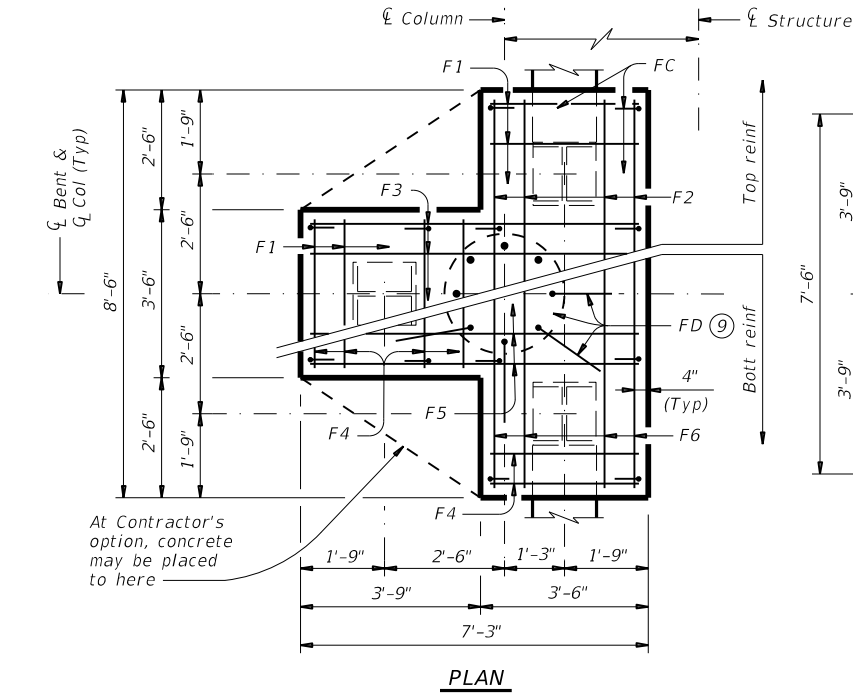
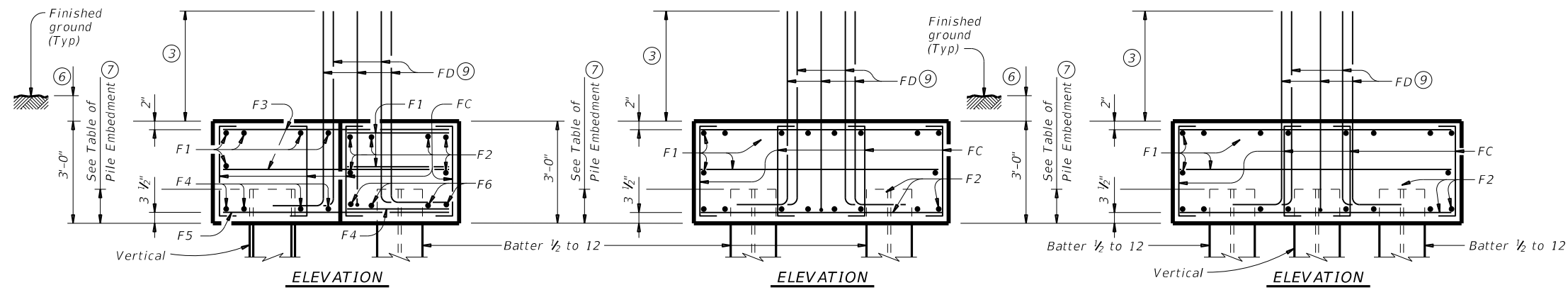
Use when required.

SHEET 1 OF 2

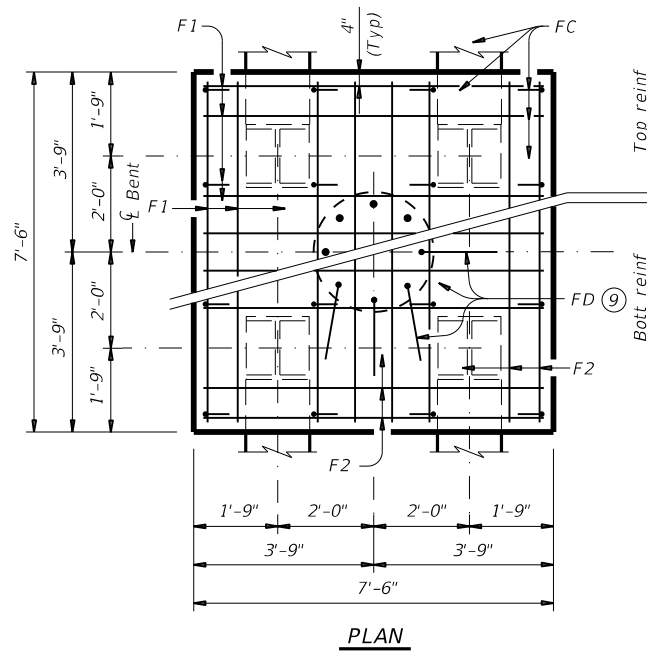
		Bridge Division Standard	
COMMON FOUNDATION DETAILS			
FD			
FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONTRACT	SECTION	JOB
0914 18	111, etc.	CR290, etc.	
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.
AUS	BASTROP		61

DATE: 1/26/2022 10:35:06 AM
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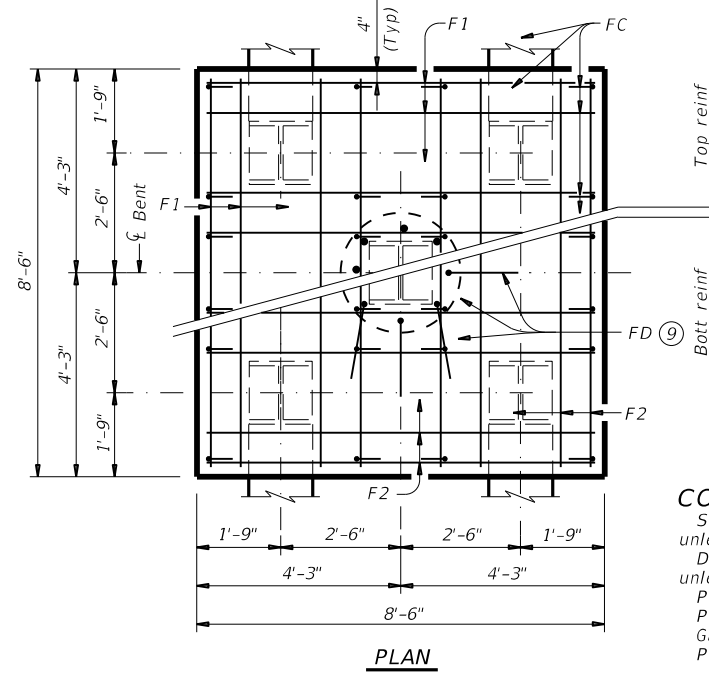
DISCLAIMER:
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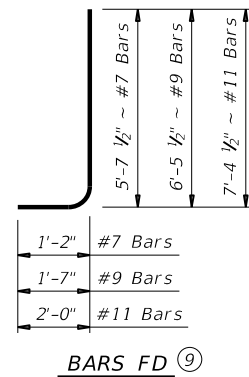
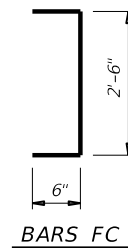
THREE PILE FOOTING^⑧
 For 36" Dia and smaller columns.



FOUR PILE FOOTING^⑧
 For 42" Dia and smaller columns.



FIVE PILE FOOTING^⑧
 For 42" Dia and smaller columns.



- 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

SHEET 2 OF 2



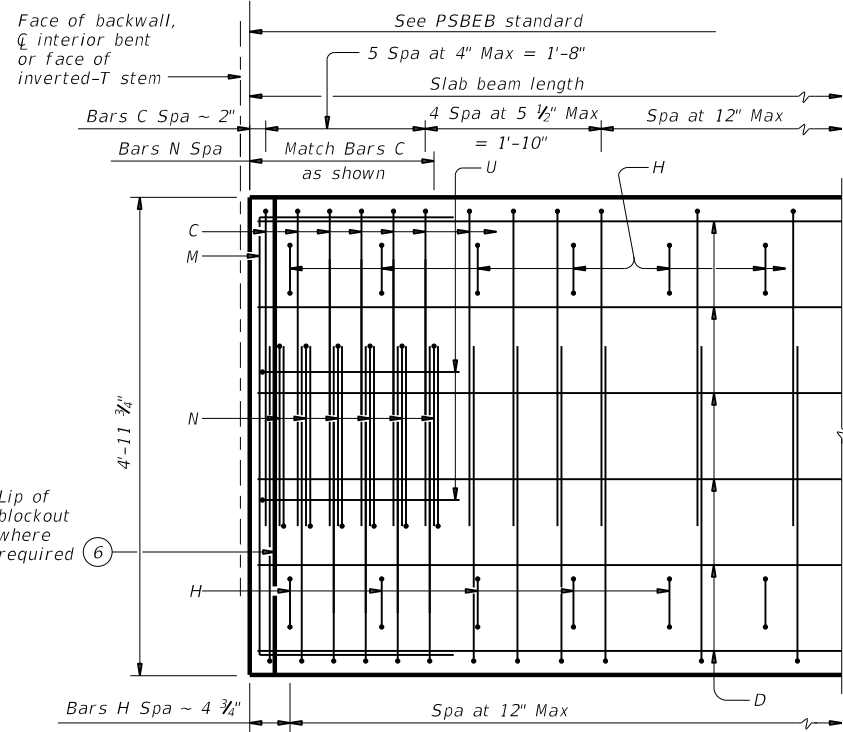
COMMON FOUNDATION DETAILS

FD

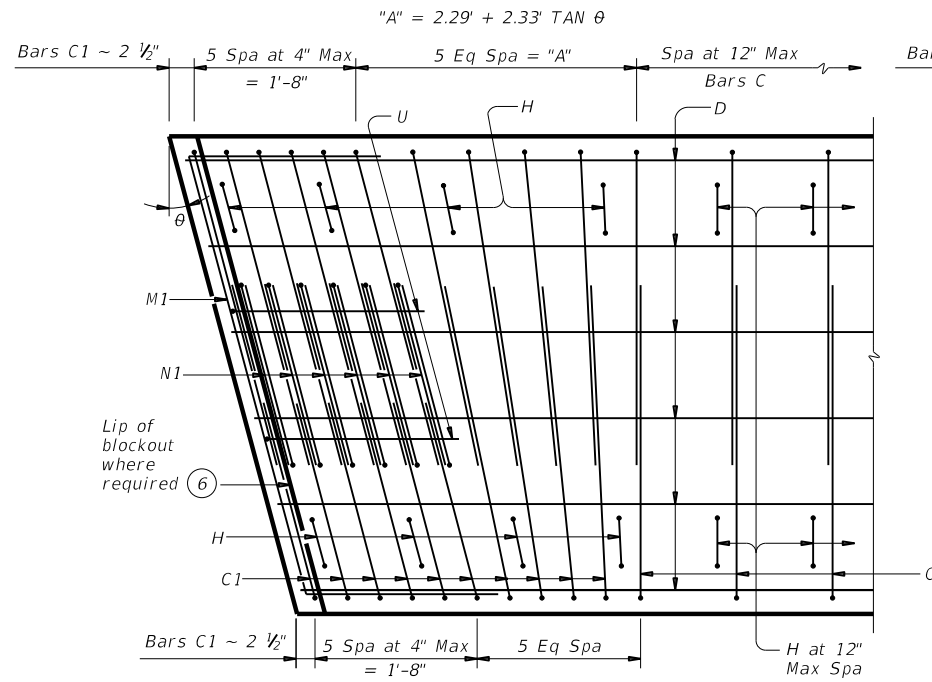
FILE: fdstd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	62	

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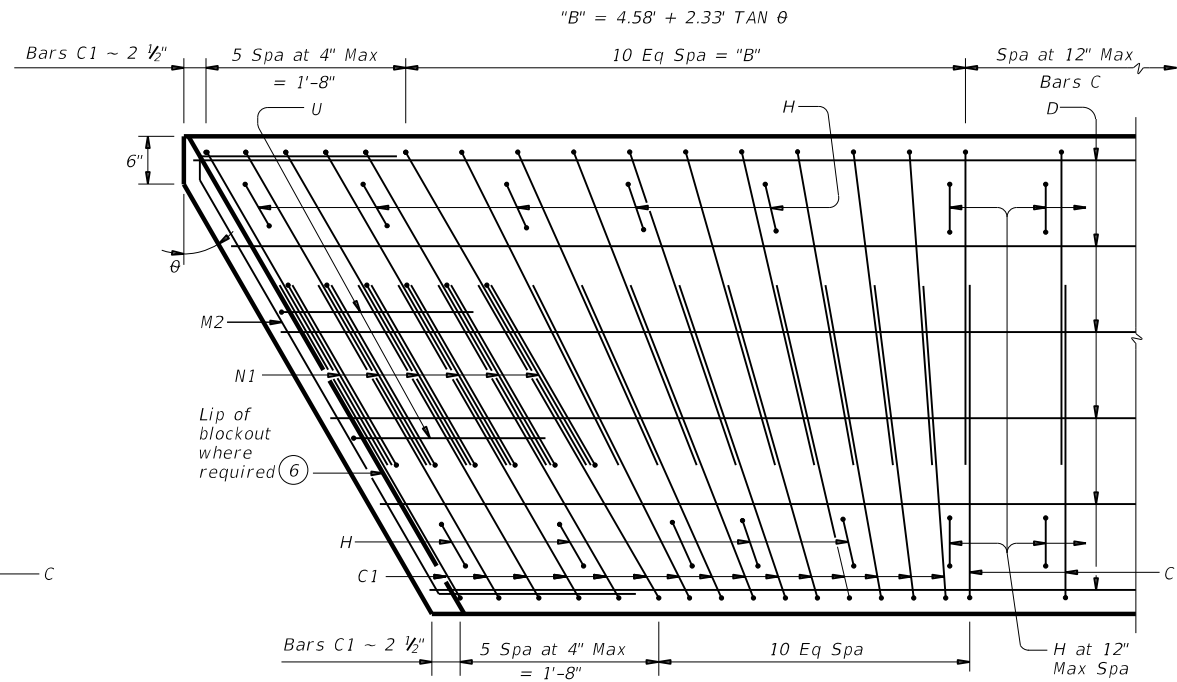
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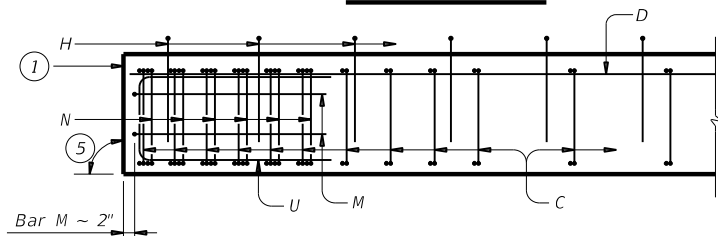
PART PLAN



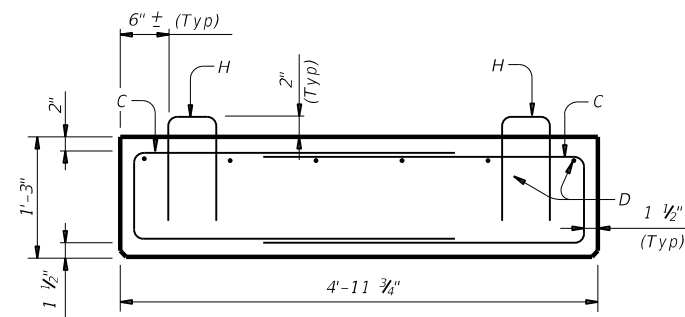
PART SKEW PLAN
(Showing θ over 0° to 15° skew)



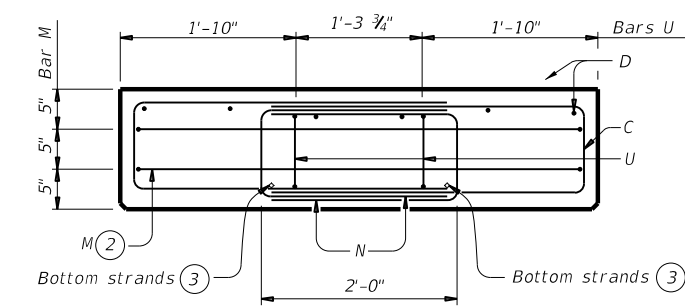
PART SKEW PLAN
(Showing θ over 15° to 30° skew)



ELEVATION

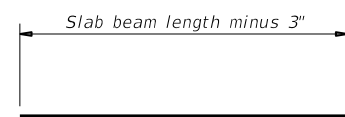


SECTION

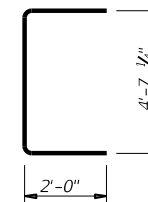


END MAT REINFORCING

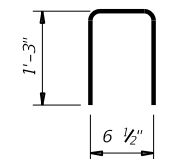
Bars H not shown for clarity.



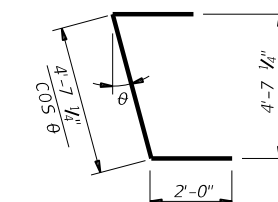
BARS D(#6)



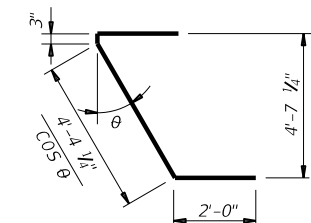
BARS M(#4)



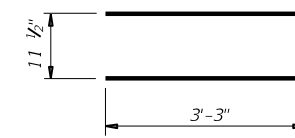
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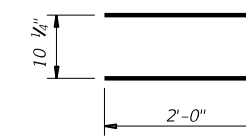
BARS M1(#4)



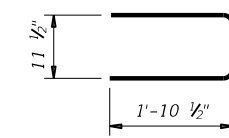
BARS M2(#4)



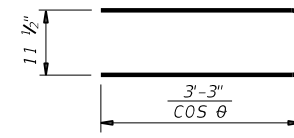
BARS C(#4)



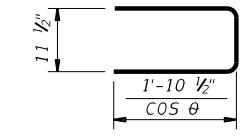
BARS U(#5)



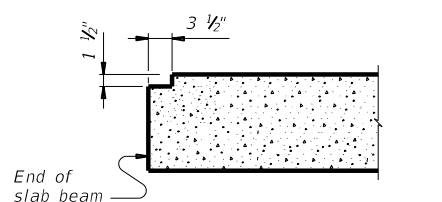
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT

BEAM PROPERTIES		
Area	in ²	896.2
Y top	in	7.50
Y bott	in	7.50
I	in ⁴	16,805
Weight	lb/ft	934

GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications. Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.
- Provide Grade 60 reinforcing steel.
- An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.
- These details can be used for any skew angle up to a maximum of 30 degrees.
- Chamfer all exposed corners 3/4" or round to a 3/4" radius.
- Details are drawn showing right forward skew. See Bridge Layout for actual direction.

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

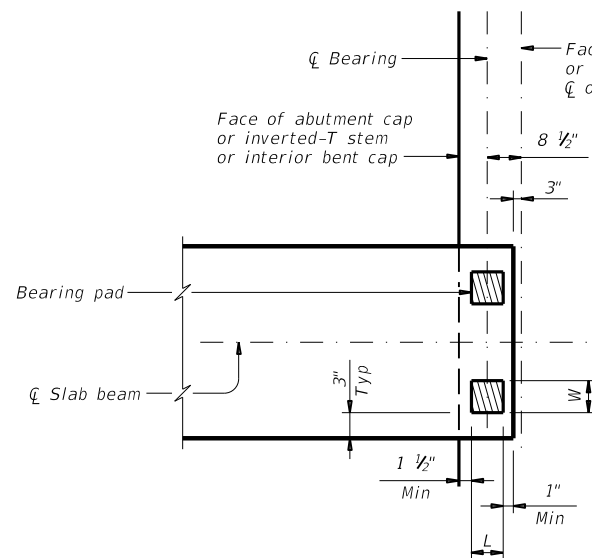
- ① See End Mat Reinforcing detail.
- ② Adjust bars M vertically to avoid strands.
- ③ See sheet PSBND or PSBSD for strand locations.
- ④ Assumes 150 pcf weight density of concrete.
- ⑤ 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
- ⑥ Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

HL93 LOADING

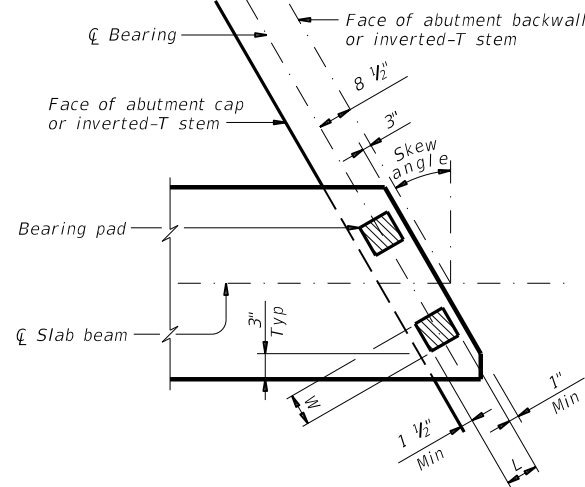
		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM DETAILS (TYPE 5SB15)			
PSB-5SB15			
FILE: psbsts04-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONT	SECT	JOB
REVISIONS	0914	18	111, etc.
	DIST	COUNTY	SHEET NO.
	AUS	BASTROP	63

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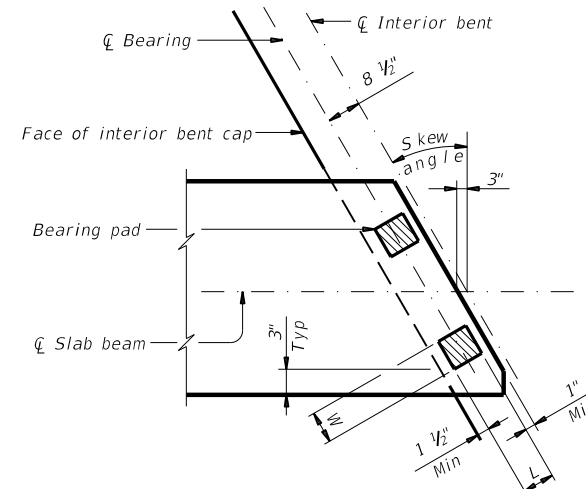
DATE: 1/26/2022 10:35:21 AM
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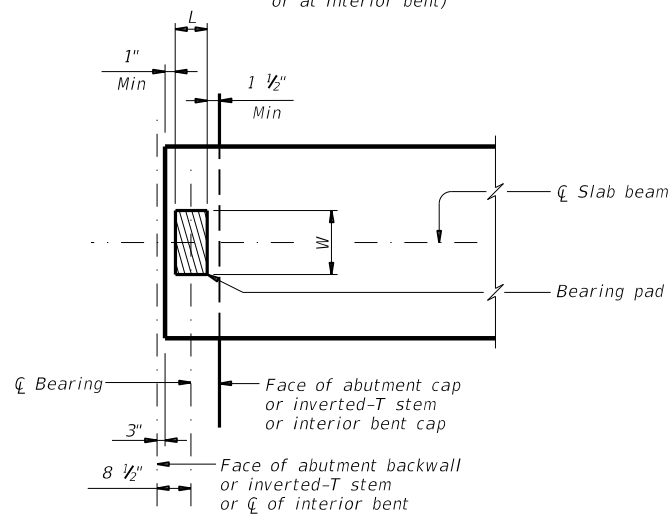
TWO-PAD DETAIL PLAN
 (At abutment or inverted-T cap or at interior bent)



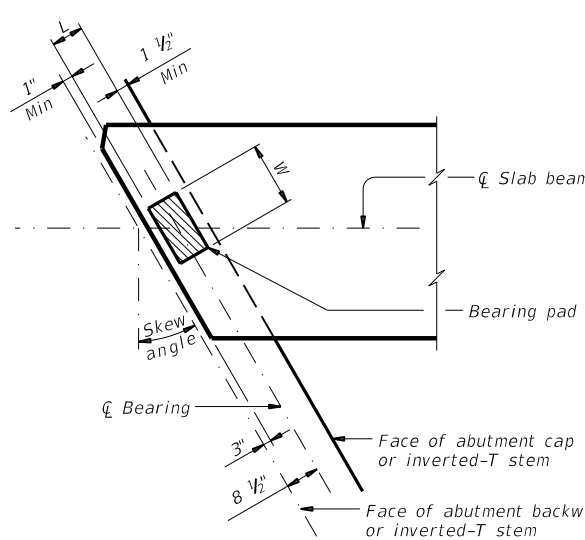
TWO-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



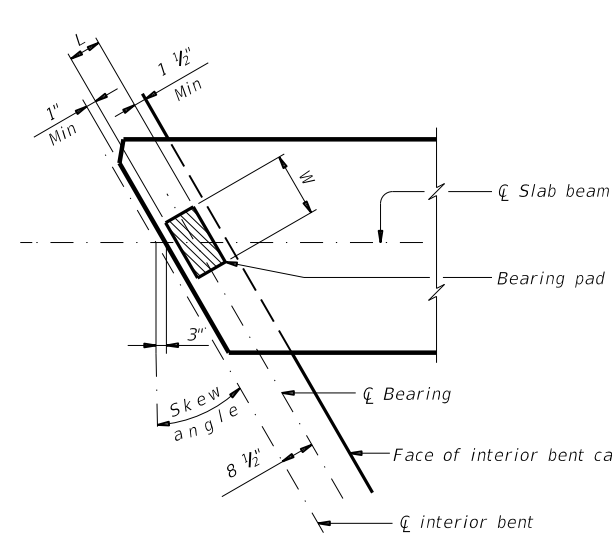
TWO-PAD DETAIL SKEW PLAN
 (At interior bent)



ONE-PAD DETAIL PLAN
 (At abutment or inverted-T cap or at interior bent)



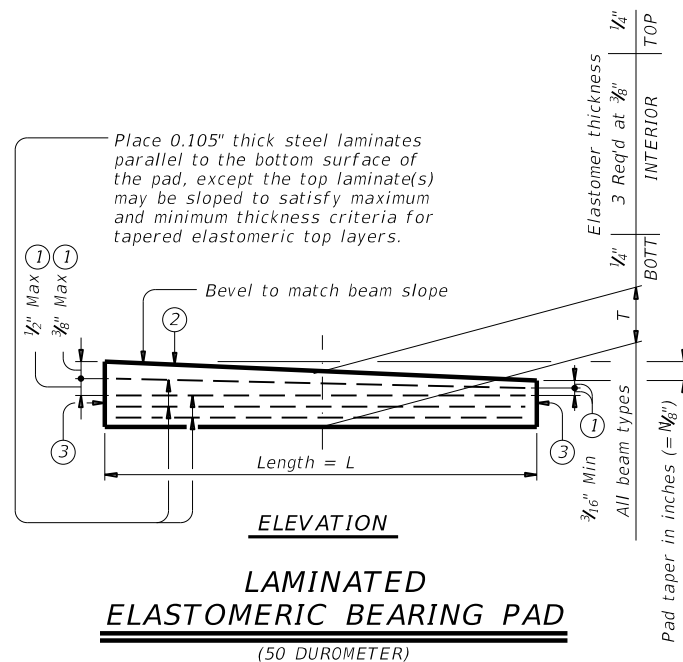
ONE-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
 (At interior bent)

ELASTOMERIC BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

Place one bearing pad at forward station beam end.
 Place two bearing pads at back station beam end.



- Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.
- Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in 1/8 inch increments) in this mark. Examples: N=0, (for 0 inch taper) N=1, (for 1/8 inch taper) N=2, (for 1/4 inch taper) (etc.) Fabricated pad top surface slope must not vary from plan beam slope by more than $(\frac{0.0625}{\text{Length}})$ IN/IN.
- Locate permanent mark here.

TABLE OF BEARING PAD DIMENSIONS (ALL PRESTR CONC SLAB BM TYPES)

One-Pad (Ty SB1-"N") (2)			Two-Pad (Ty SB2-"N") (2)		
W	L	T	W	L	T
14"	7"	2"	7"	7"	2"

Pad sizes shown are applicable for the following conditions:

- All one, two and three span units where the minimum span length is not less than 25' and the maximum span is not more than 50'.
- Skews less than or equal to 30°.

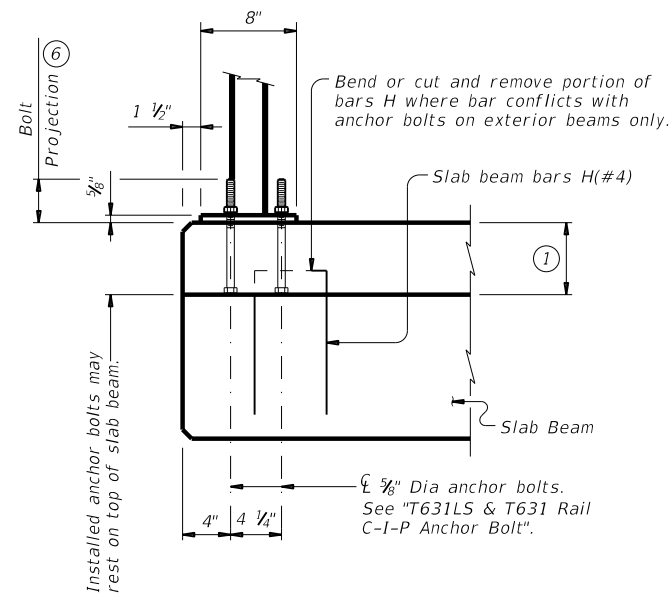
GENERAL NOTES:
 These details accommodate skew angles up to 30°. Shop drawings for approval are required. A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer. Cost of furnishing and installing elastomeric bearings must be included in unit price bid for "Prestressed Concrete Slab Beams".

HL93 LOADING

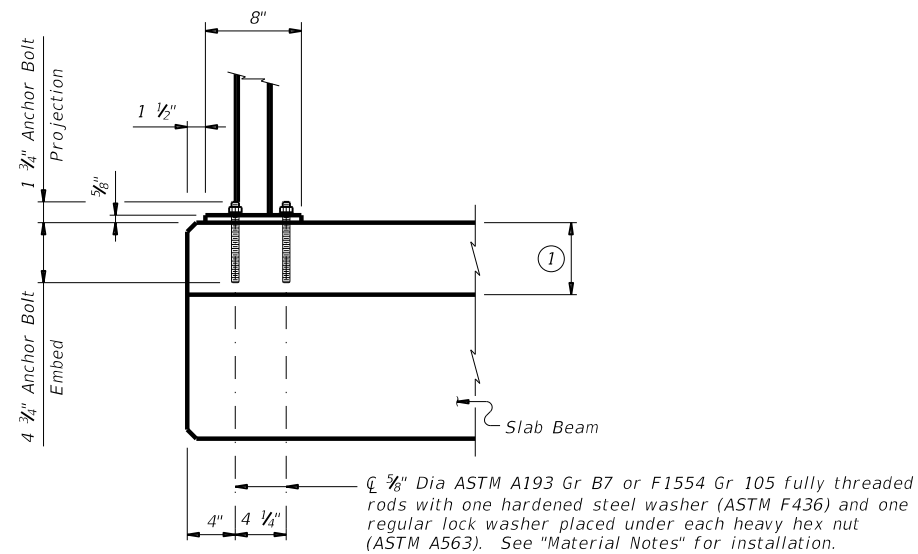
		Bridge Division Standard	
ELASTOMERIC BEARING AND BEAM END DETAILS			
PRESTR CONCRETE SLAB BEAM			
PSBEB			
FILE: psbste06-17.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT January 2017	CONT SECT	JOB	HIGHWAY
REVISIONS	0914 18	111, etc.	CR290, etc.
DIST	COUNTY	SHEET NO.	
AUS	BASTROP	64	

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DATE: 10/07/2021 07:28 AM
FILE: DOCUMENT NAME

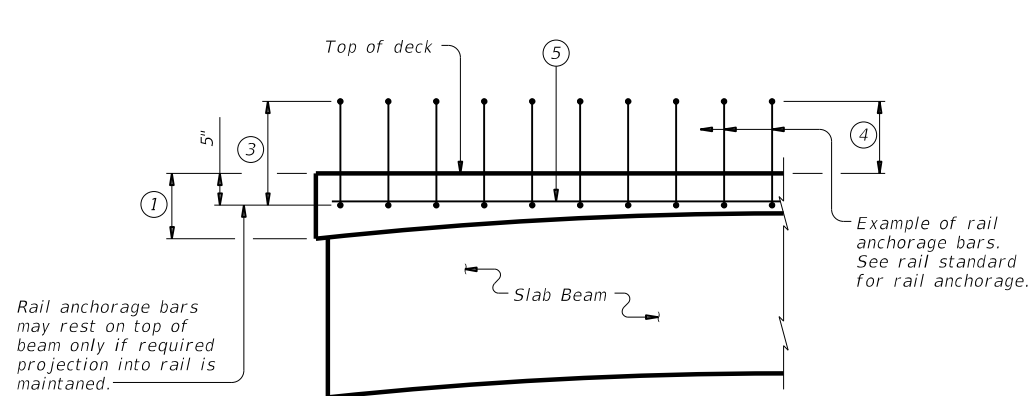


CAST-IN-PLACE ANCHORAGE OPTION

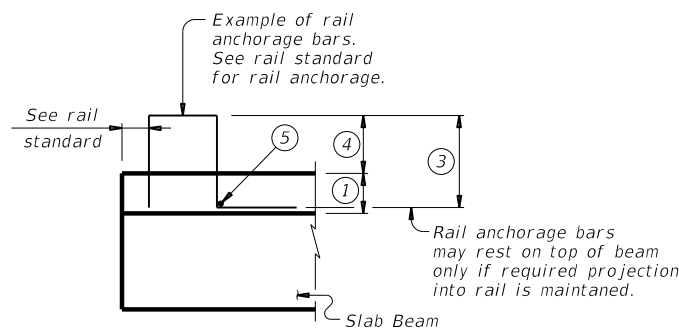


ADHESIVE ANCHORAGE OPTION

T631LS & T631 RAIL ANCHORAGE PLACEMENT (2)(7)



PART SPAN ELEVATION

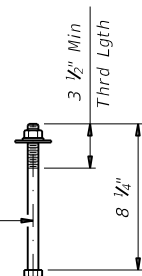


SECTION

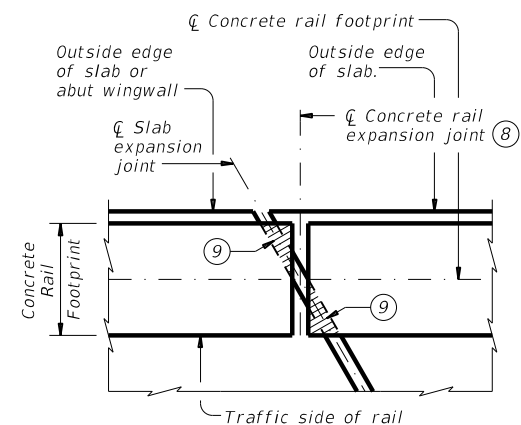
TYPICAL CONCRETE RAIL ANCHORAGE

(Showing typical concrete rail anchorage)

3/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563).



T631LS & T631 RAIL C-I-P ANCHOR BOLT



PLAN OF CONCRETE RAILS AT EXPANSION JOINTS

- ① Cast-in-place slab thickness varies due to beam camber (5" minimum).
- ② Replace cast-in-place anchor bolts shown on T631LS and T631 Rail standard with an adhesive anchor system or cast-in-place anchor bolts shown on this sheet.
- ③ Bar length shown on rail standard, minus 1 1/4". Adjust bar length for a raised sidewalk.
- ④ See rail standard for projection from finished grade or top of sidewalk.
- ⑤ Place additional (#5) longitudinal bar.
- ⑥ Excess bolt length has been provided to accommodate a variable slab thickness due to beam camber. If slab thickness on span details exceed 7", bolt length must be increased accordingly. After posts have been set and bolts tightened, bolt projection above nuts of more than 1/2" must be cut off and painted with two coats of zinc-rich paint conforming to the Item 445 "Galvanizing".
- ⑦ Distance from end of top outside edge of slab to center of first bolt group can not be less than 9", except: 15° Skew: 1'-0" (acute corner only) 30° Skew: 1'-3" (acute corner only)
- ⑧ Location of rail expansion joint must be at the intersection of centerline of slab expansion joint, centerline of rail footprint and perpendicular to slab outside edge.
- ⑨ Cross-hatched area must have 1/2" preformed bituminous fiber material under concrete rail, as shown.

CONSTRUCTION NOTES:

Rail anchorage bars may be field bent as required to clear rail reinforcing or provide minimum cover shown on standard rail detail sheets. Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Galvanize all steel components of steel rail system. Provide Grade 60 reinforcing steel. Cast-in-place anchorage system for T631LS and T631 Rail must be 3/8" Dia heavy hex head anchor bolts (ASTM F3125 Gr 325 or A449) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed anchor bolts 4 1/2" minimum. Adhesive anchors for T631LS and T631 Rail must be 3/8" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed fully threaded rod into slab and/or abutment wingwall using a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4 3/4". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 8 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Epoxy coat or galvanize reinforcing steel shown on this standard if rail reinforcement is epoxy coated or galvanized.

GENERAL NOTES:

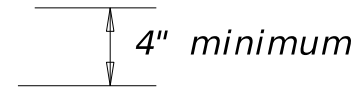
Designed in accordance with AASHTO LRFD Bridge Design Specifications. This standard is for use with structures with a 5" minimum cast-in-place concrete slab. This standard may require modification for interior rails. This standard does not apply to median barriers. This standard does not provide details for Type T221P, T224, T80HT, T80SS, C412, PR11, PR22 and PR3 rails on slab beam bridges. See rail standards for approved speed restrictions, notes and details not shown.

Cover dimensions are clear dimensions, unless noted otherwise.

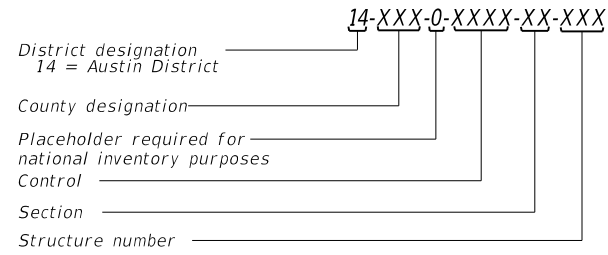
		Bridge Division Standard	
<h2>RAIL ANCHORAGE DETAILS</h2>			
<h3>PRESTR CONCRETE SLAB BEAMS</h3>			
<h4>PSBRA</h4>			
FILE: psbste07-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT January 2017	CON: 0914	SECT: 18	JOB: 111
REVISIONS	0914	18	111
03-18: Updated adhesive anchor notes.	DIST: AUS	COUNTY: BASTROP	SHEET NO. 65

14-XXX-0-XXXX-XX-XXX

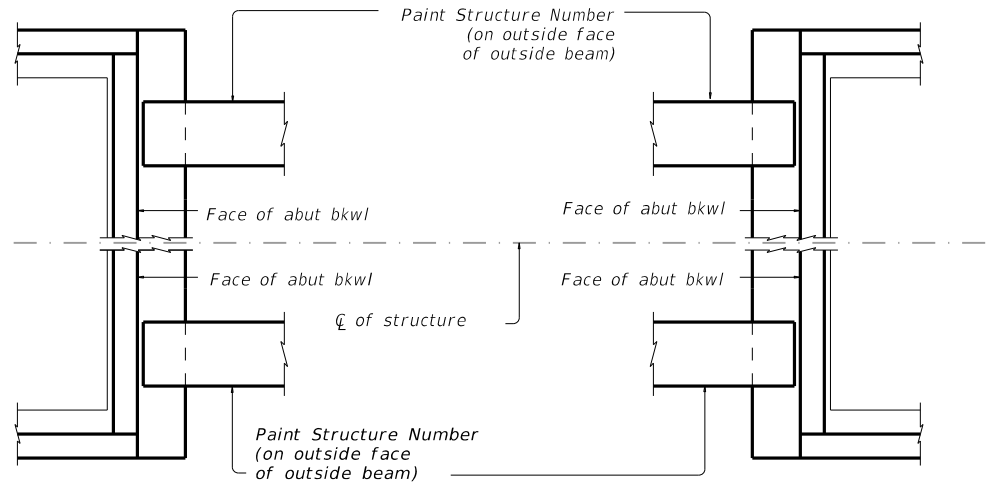
District designation County designation Placeholder Control Section Structure number



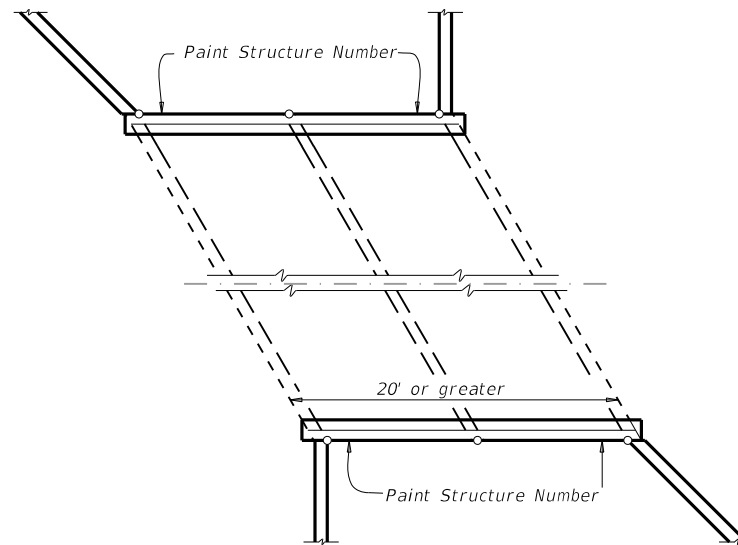
PAINTED STRUCTURE NUMBER LEGEND



- 011 = Bastrop
- 016 = Blanco
- 027 = Burnet
- 028 = Caldwell
- 087 = Gillespie
- 106 = Hays
- 144 = Lee
- 150 = Llano
- 157 = Mason
- 227 = Travis
- 246 = Williamson



AT BRIDGE LOCATIONS



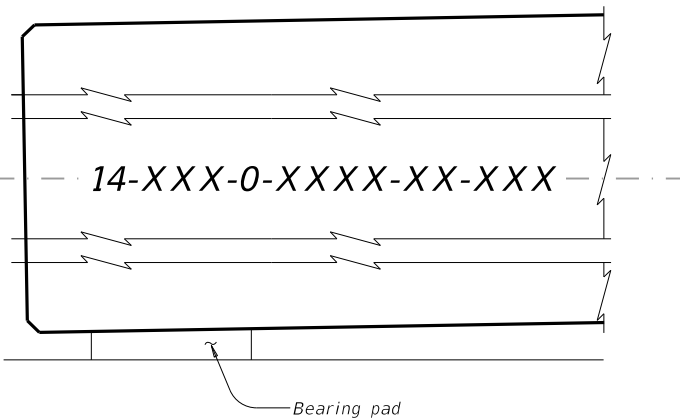
AT CULVERT LOCATIONS

GENERAL NOTES:

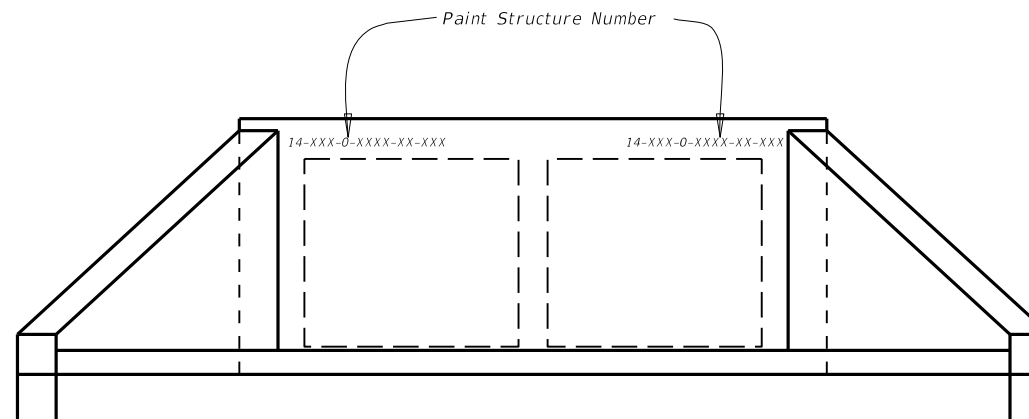
Permanently mark each structure with the painted structure number in accordance with the plans.
 Each Structure shall have 4 (four) Structure numbers painted per structure.
 Painting structure number work will not be measured or paid for directly but will be considered subsidiary to other pertinent items.

MATERIAL:

Provide black, lead free, CFC free, and CFHC free paint that is water proof, weather resistant, and dries instantly on all surfaces without smearing, smudging, or rippling



ELEVATION VIEW DETAIL



ELEVATION VIEW DETAIL



PAINTING STRUCTURE NUMBERS

PSN-19 (AUS)

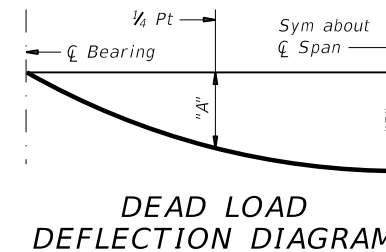
©TxDOT 2022	CONT	SECT	JOB	HIGHWAY
	0914	18	111, etc.	CR290, etc.
	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	67	

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DATE: 1/26/2022 10:35:50 AM
FILE: \\twdot\project\wison\1.4 - AUS\Design Project\psbste30-17.dgn

TABLE OF VARIABLE VALUES

Span Length	Beam Type	Dead Load Deflection		Section Depths ⁽³⁾	
		"A"	"B"	"x"	"y"
Ft	(1)	Ft	Ft	In	Ft/In
25	5SB12	0.004	0.005	5 1/4"	1'-5 1/4"
30	5SB12	0.008	0.011	5 1/2"	1'-5 1/2"
35	5SB12	0.015	0.021	6"	1'-6"
40	5SB12	0.026	0.036	6 1/2"	1'-6 1/2"
25	5SB15	0.002	0.003	5 1/4"	1'-8 1/4"
30	5SB15	0.004	0.006	5 1/2"	1'-8 1/2"
35	5SB15	0.008	0.011	5 3/4"	1'-8 3/4"
40	5SB15	0.013	0.019	6 1/2"	1'-9 1/2"
45	5SB15	0.022	0.030	7"	1'-10"
50	5SB15	0.034	0.047		



NOTE: Deflections shown are due to concrete slab only ($E_c = 5,000$ ksi). Calculated deflections shown are theoretical and actual dimensions may vary. Adjust based on field verification.

BAR TABLE

BAR	SIZE
A	#5
T	#4

TABLE OF ESTIMATED QUANTITIES

SPAN LENGTH	REINF CONCRETE SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (5SB12 OR 5SB15) ⁽¹⁾			TOTAL REINF STEEL ⁽²⁾
		ABUT TO INT BT	INT BT TO INT BT	ABUT TO ABUT	
Ft	SF	LF ⁽⁴⁾	LF ⁽⁴⁾	LF ⁽⁴⁾	Lb
25	650	122.50	122.50	122.50	1,820
30	780	147.50	147.50	147.50	2,180
35	910	172.50	172.50	172.50	2,550
40	1,040	197.50	197.50	197.50	2,910
45	1,170	222.50	222.50	222.50	3,280
50	1,300	247.50	247.50	247.50	3,640

- See Bridge Layout for beam type used in the superstructure. These standards do not provide for the use of both SB12 and SB15 beams within the same structure.
- Reinforcing steel weight is calculated using an approximate factor of 2.8 Lbs/SF.
- Based on theoretical beam camber, dead load deflections of 5" cast-in-place concrete slab and a constant grade. The Contractor will adjust these values for any vertical curve.
- Fabricator will adjust beam lengths for beam slopes as required.
- Where slab is continuous over Interior Bents, Bars T are continuous through Joint. See "Continuous Slab Detail".
- This standard does not provide for changes in roadway cross-slopes within the structure.
- 1 1/4" 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.
- 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.
- See Bridge Layout for expansion joint locations. If using Type A expansion joints, the maximum distance between joints is 100 feet. Type A joints are subsidiary to Item 422, "Concrete Superstructures".

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications. Two- or three-span units, with slab continuous over interior bents, may be formed with the details shown on this sheet. See applicable rail details for rail anchorage in slab. This standard does not support the use of transition bents.

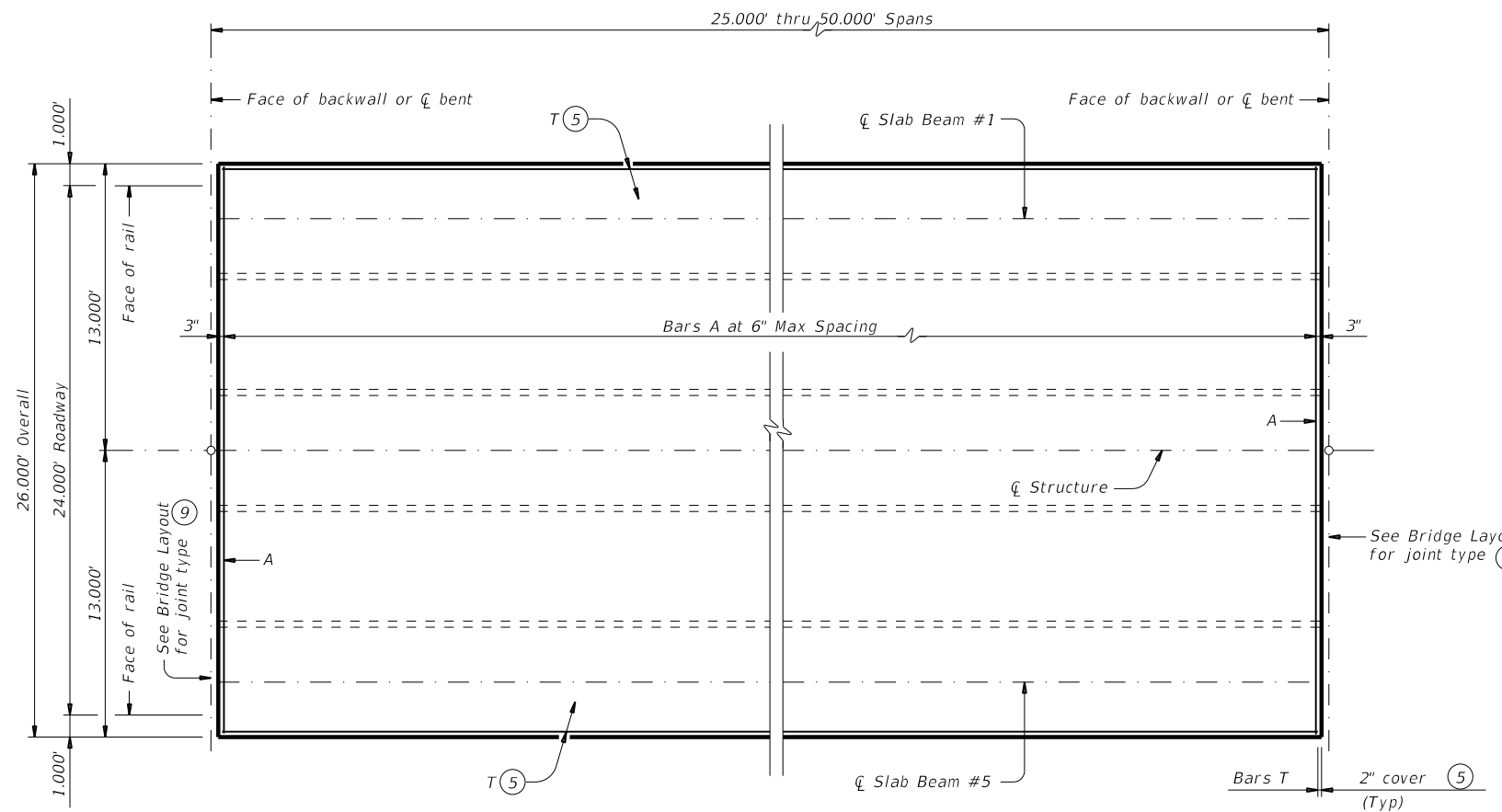
Cover dimensions are clear dimensions, unless noted otherwise.

MATERIAL NOTES:

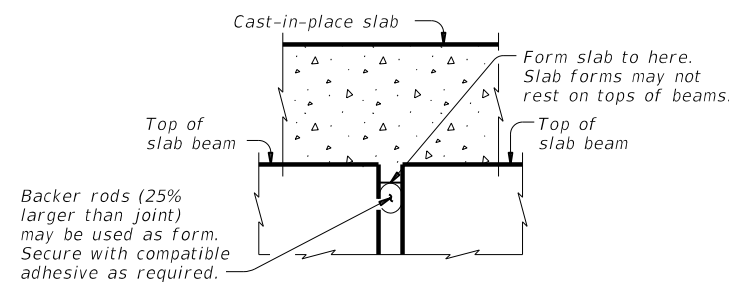
Provide Class S concrete ($f'_c = 4,000$ psi).
Provide Class S (HPC) concrete if shown elsewhere in the plans.
Provide Grade 60 reinforcing steel.
Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"
~ #5 = 2'-0"
Epoxy coated ~ #4 = 2'-5"
~ #5 = 3'-0"
Deformed welded wire reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A or T unless noted otherwise.

HL93 LOADING

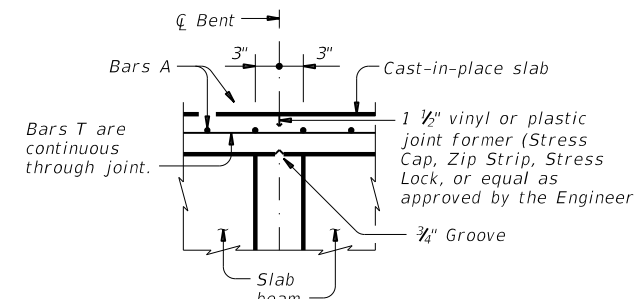
		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM SPANS (TY SB12 OR SB15) 24' ROADWAY			
SPSB-24			
FILE: psbste30-17.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT January 2017	CON: TxDOT	SECT: 111, etc.	HIGHWAY: CR290, etc.
REVISIONS	DIST: AUS	COUNTY: BASTROP	SHEET NO. 68



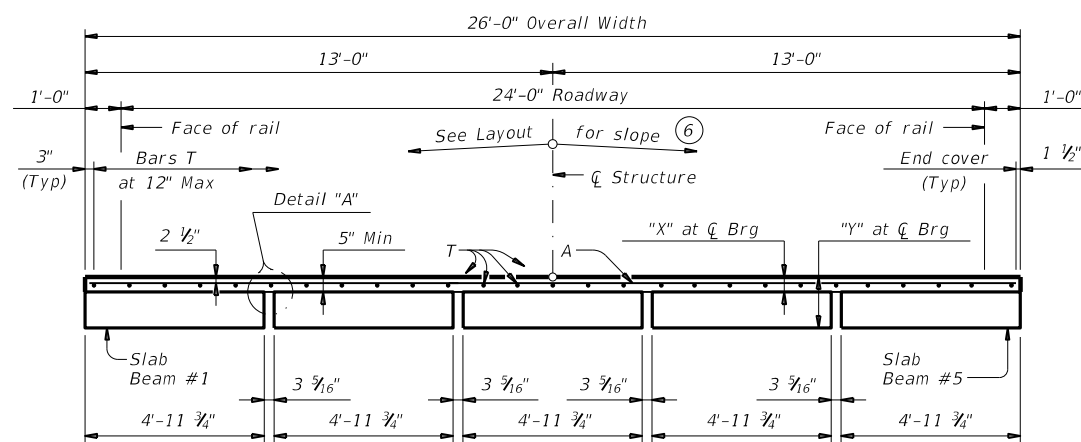
PLAN



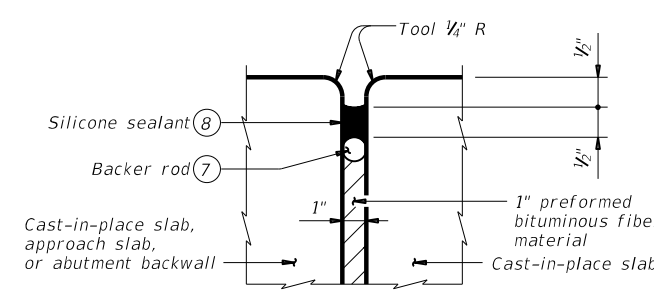
DETAIL "A"



CONTINUOUS SLAB DETAIL

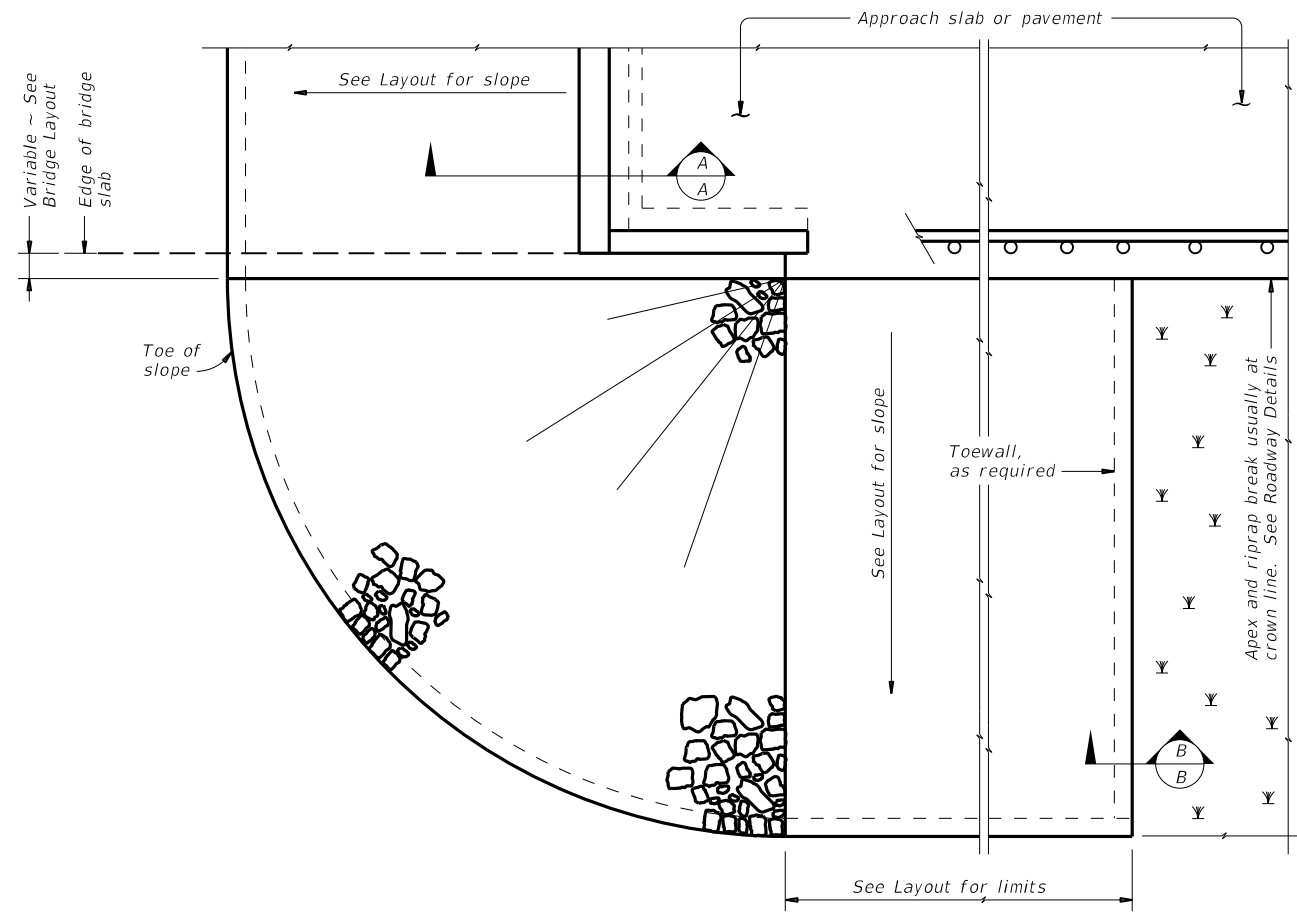


TYPICAL TRANSVERSE SECTION

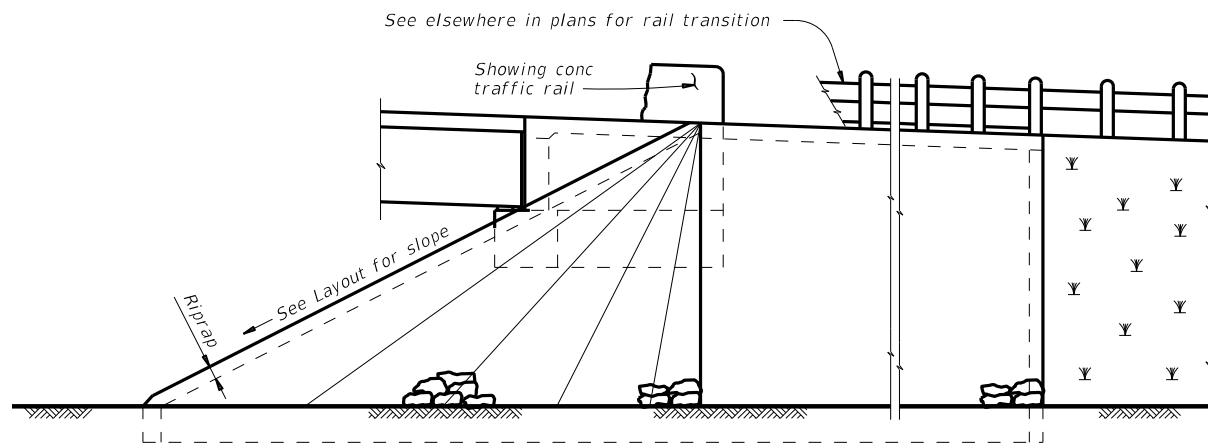


TYPE A JOINT DETAIL (9)

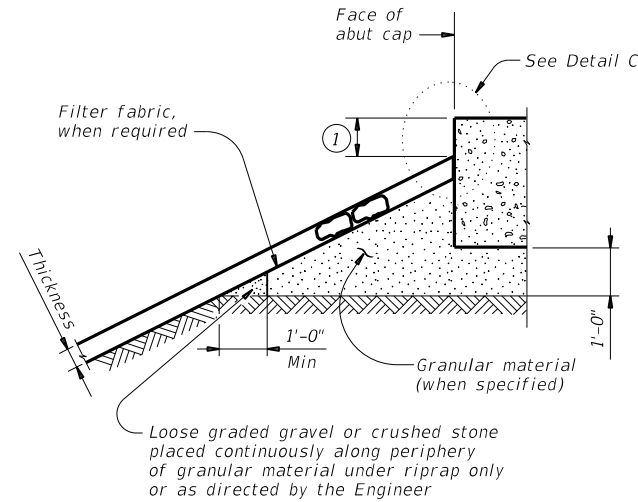
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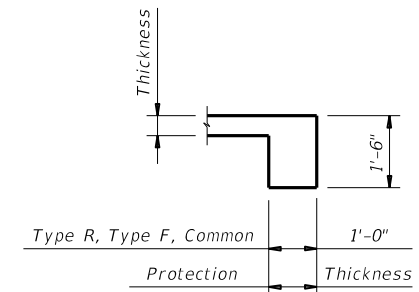
PLAN



ELEVATION

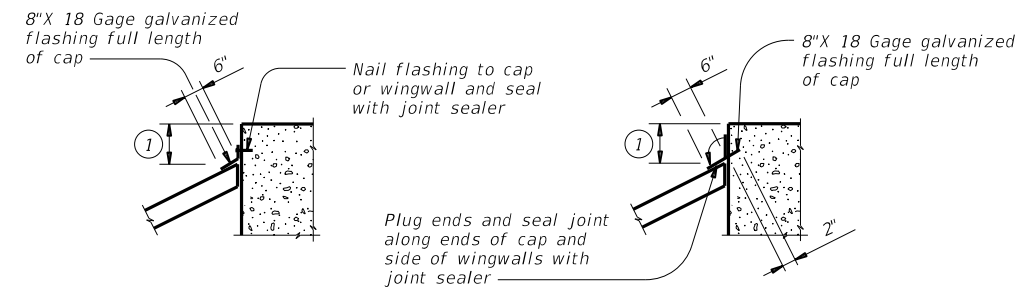


SECTION A-A AT CAP



SECTION B-B

Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C

① Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:

Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
 See elsewhere in plans for locations and details of shoulder drains.

SHEET 1 OF 2

		Bridge Division Standard	
<h1>STONE RIPRAP</h1>			
<h2>SRR</h2>			
FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0914	18	111, etc. CR290, etc.
DIST	COUNTY		SHEET NO.
AUS	BASTROP		69

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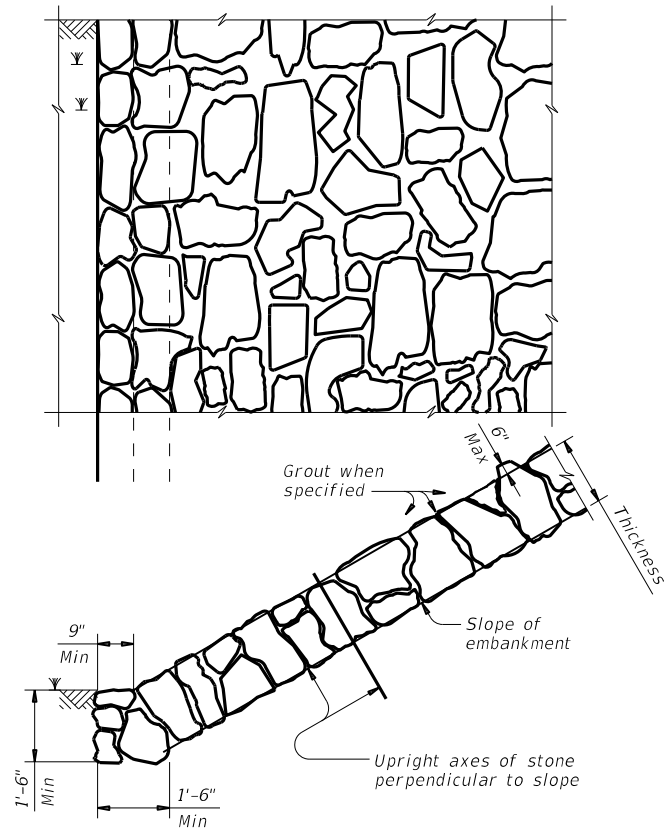


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

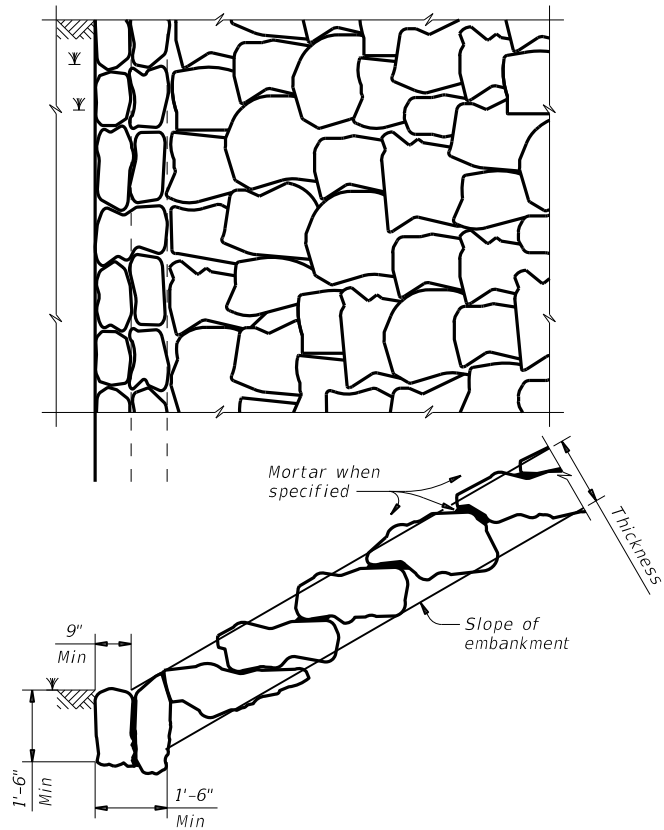


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

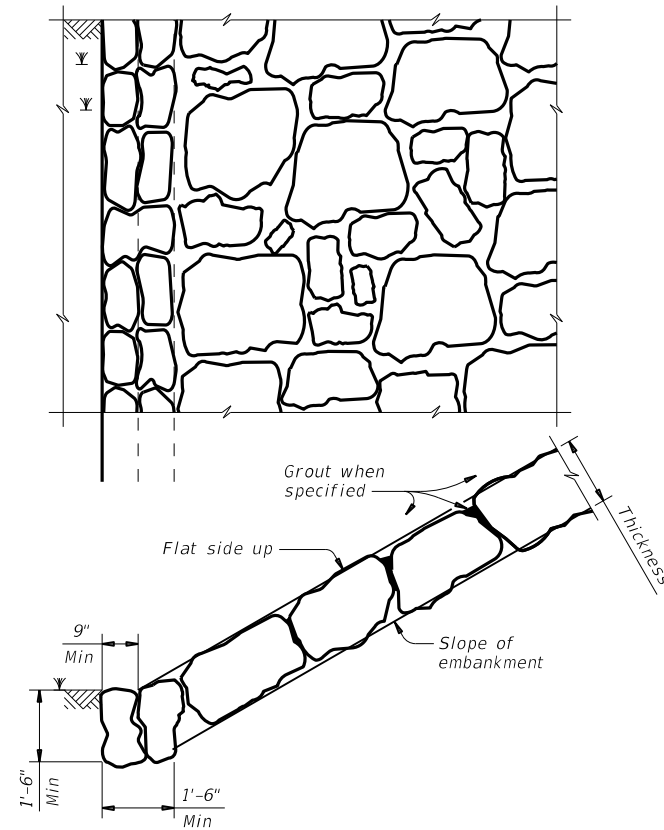
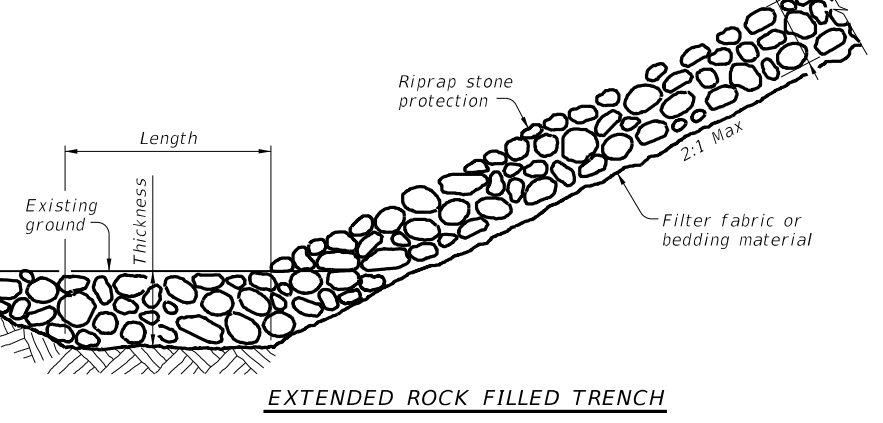
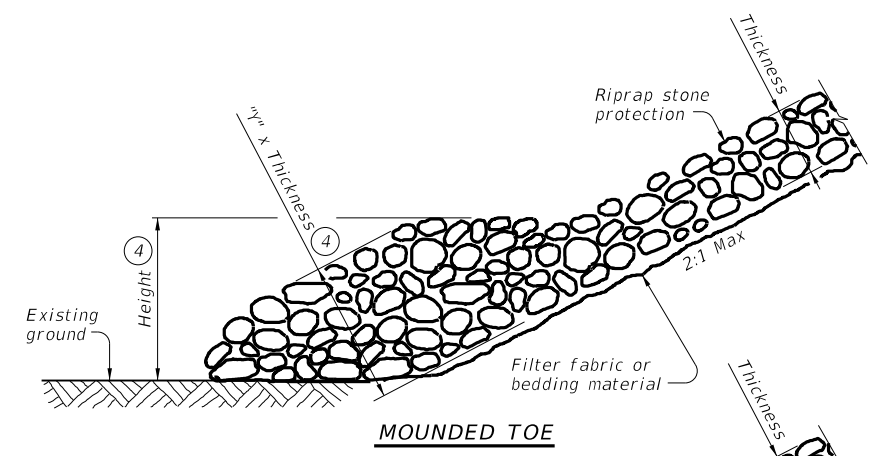


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

- ② Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.
- ③ Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.
- ④ "y" and Height need to be defined. See layout or detail sheet for values if this option is used.
- ⑤ List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



PROTECTION STONE RIPRAP TOE OPTIONS ⑤

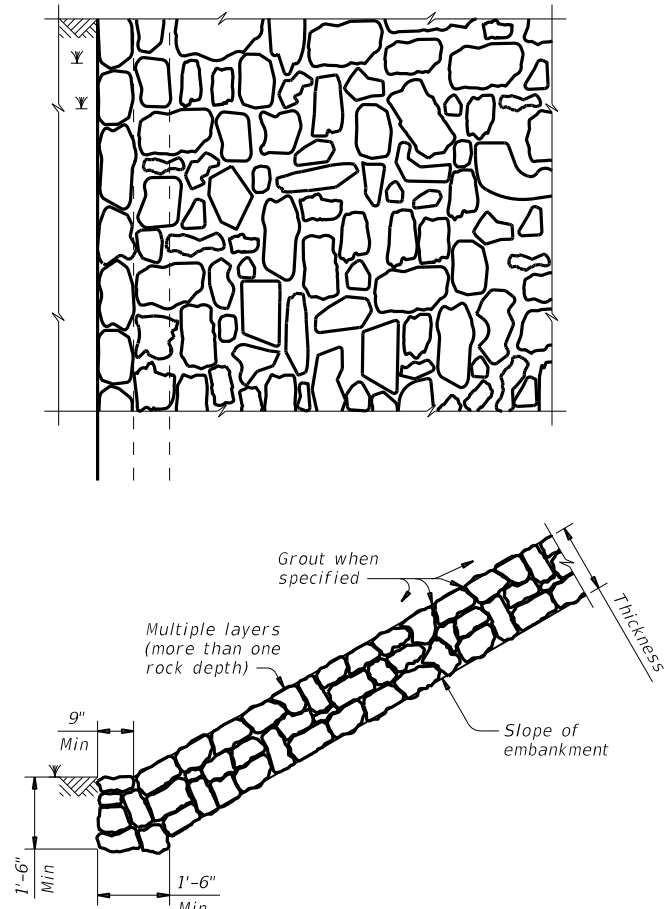


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

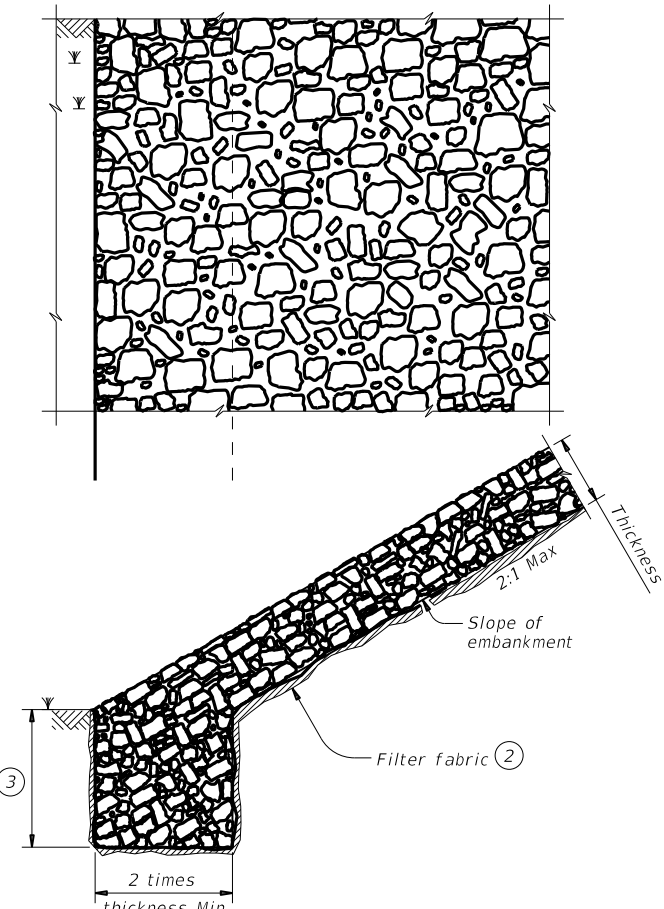


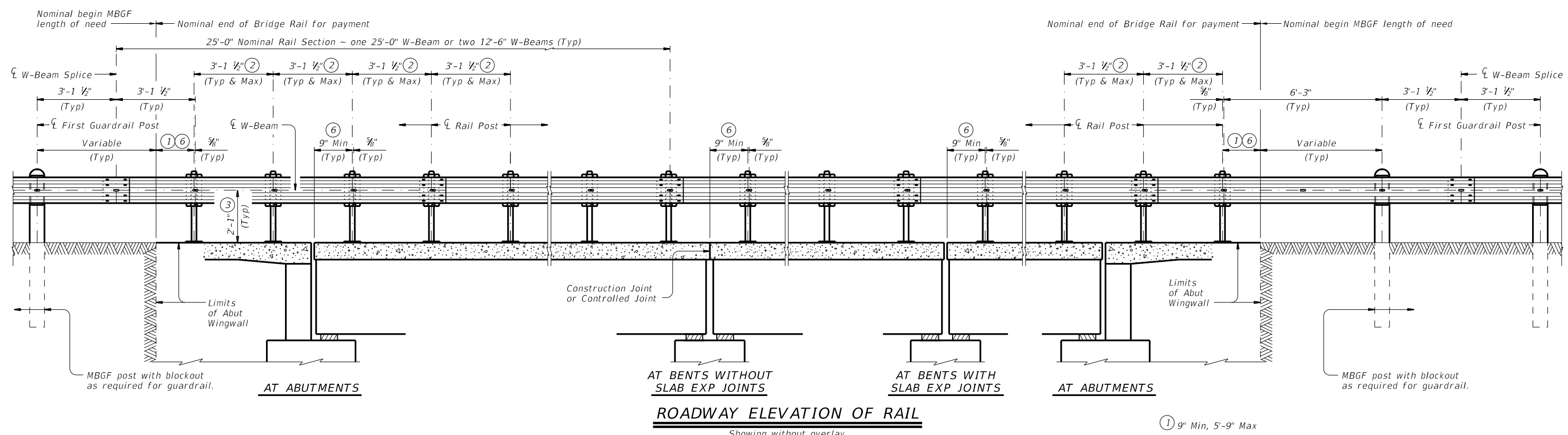
FIGURE 5 ~ PROTECTION STONE RIPRAP ⑤

STONE RIPRAP

SRR

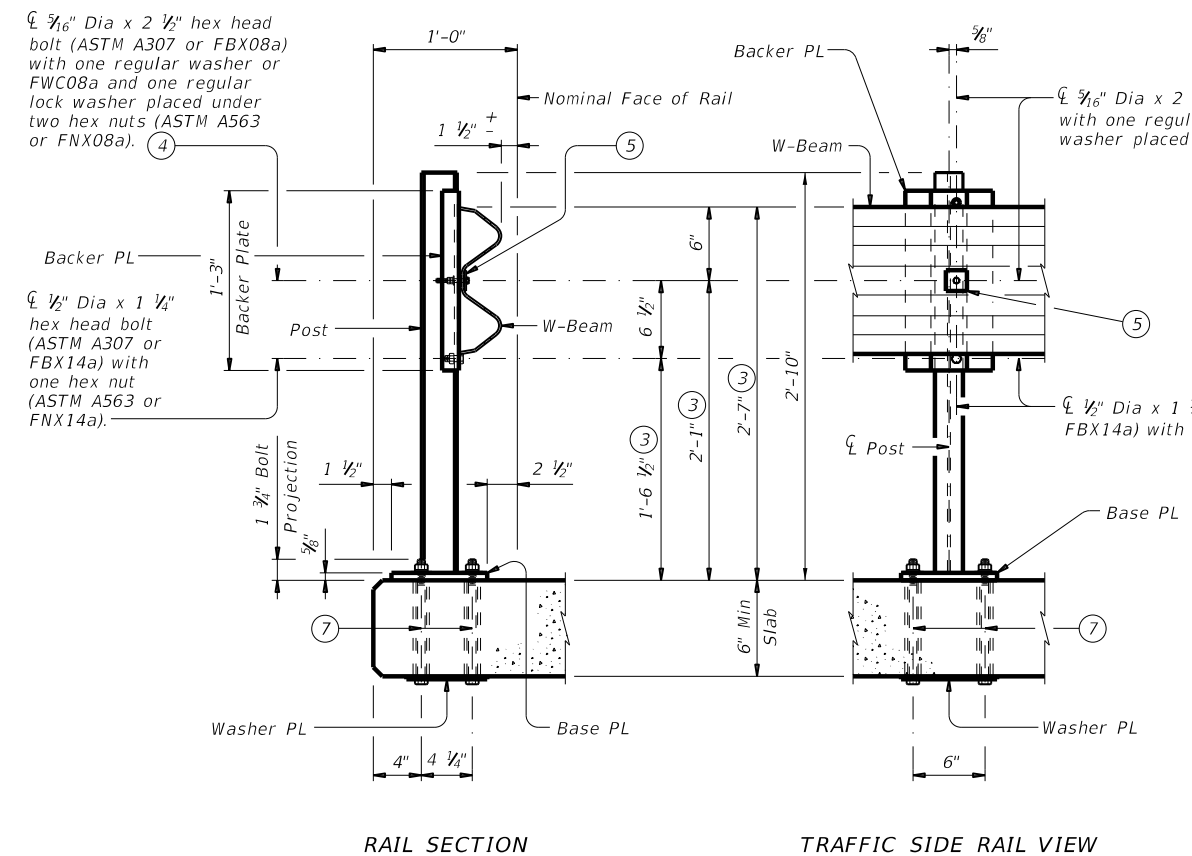
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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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	AUS	BASTROP	70	

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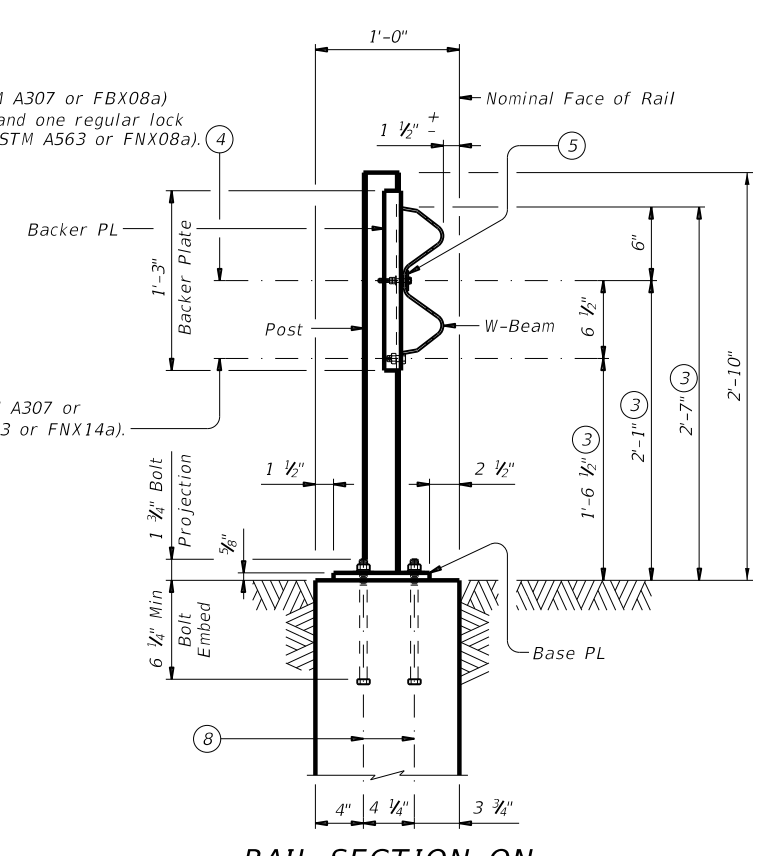


ROADWAY ELEVATION OF RAIL
 Showing without overlay.

- ① 9" Min, 5'-9" Max
- ② Maintain 3'-1 1/2" Rail Post spacing wherever possible for use with nominal 25'-0" or 12'-6" W-Beam sections. Symmetry of post spacing on both sides and along the structure is not necessary.
- ③ Increase 2" for structures with overlay.
- ④ Tighten the first hex nut by hand until the top and bottom edges of the W-Beam engage the Backer Plate (Backer Plate should be snug against the post). Then tighten hex nut one revolution with wrench and secure with the second hex nut.
- ⑤ PL 1/8" x 1 3/4" x 1 3/4" with 5/8" Dia Hole centered in PL (ASTM A36). Square Guardrail Washer (FWR01).
- ⑥ The post nearest to a slab joint or end of structure may be shifted up to 9" in order to satisfy the minimum offset dimension. Drill a new 3/4" Dia hole in the centerline of W-beam for shifted post. Paint hole with two coats of zinc-rich paint conforming to the Item "Galvanizing". All other posts must remain on the typical spacing.
- ⑦ 5/8" Dia formed holes for 5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ATSM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod. See "Cast-In-Place & Formed Hole Anchor Bolt Options".
- ⑧ 5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ATSM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod. See "Cast-In-Place & Formed Hole Anchor Bolt Options".



RAIL SECTION **TRAFFIC SIDE RAIL VIEW**
RAIL DETAILS ON BRIDGE SLAB
 Showing without overlay.

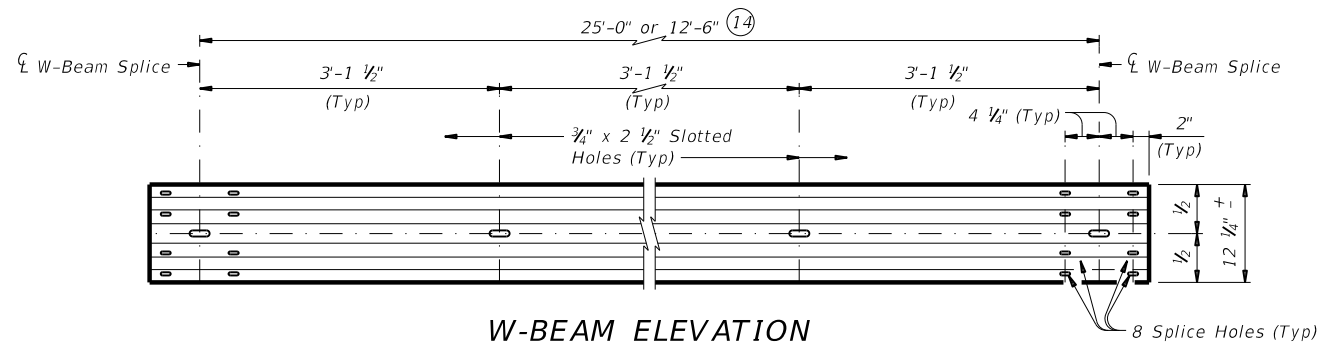


RAIL SECTION ON ABUTMENT WINGWALL
 Showing without overlay.

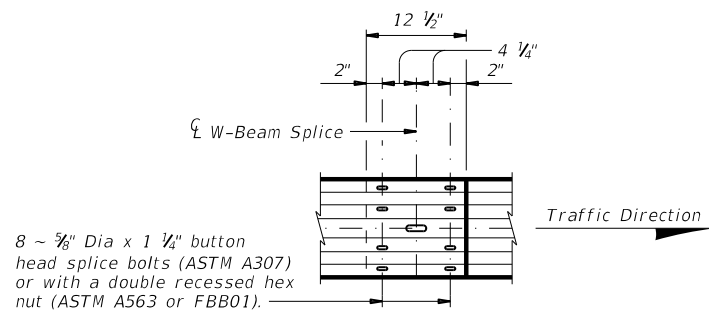
SHEET 1 OF 2

		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T631</h2>			
FILE: r1std038-20.dgn	DN: TxDOT	CK: AES	DW: JTR
©TxDOT September 2019	CONT	SECT	JOB
REVISIONS	0914 18	111, etc.	CR290, etc.
07-20: Allowing 9'-4 1/2" or 6'-3" W-Beam sections.	DIST	COUNTY	SHEET NO.
AUS	BASTROP		71

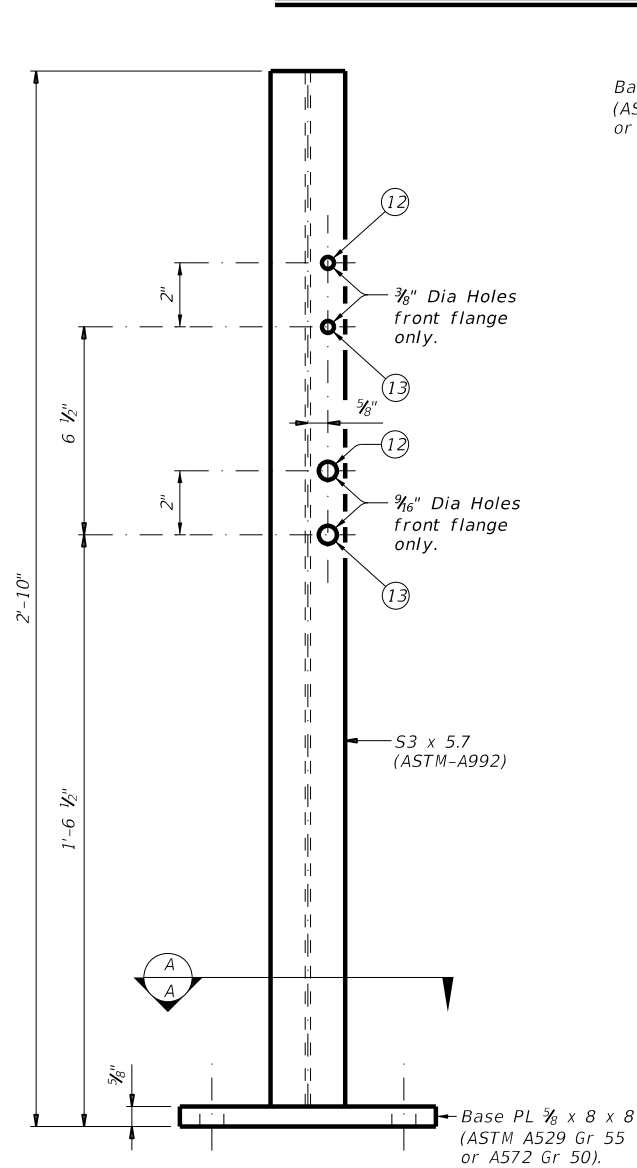
DATE: 1/26/2022 10:36:03 AM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\14 - AUS\Design Projects\0914181\14 - Plans\BHT\BCE\T631.dgn
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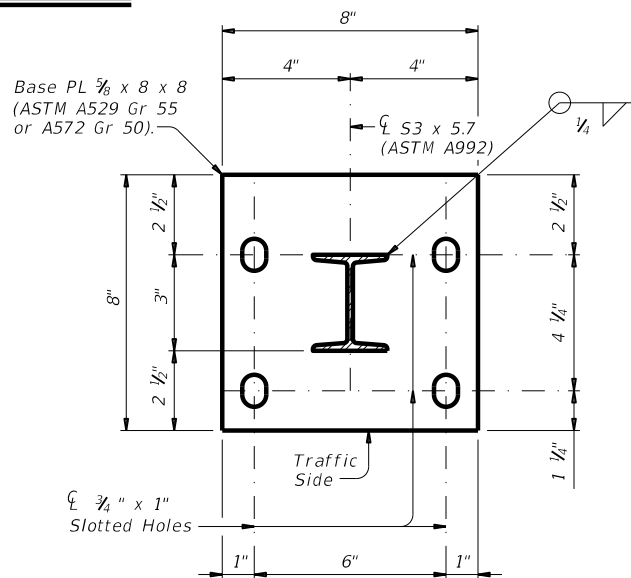
W-BEAM ELEVATION



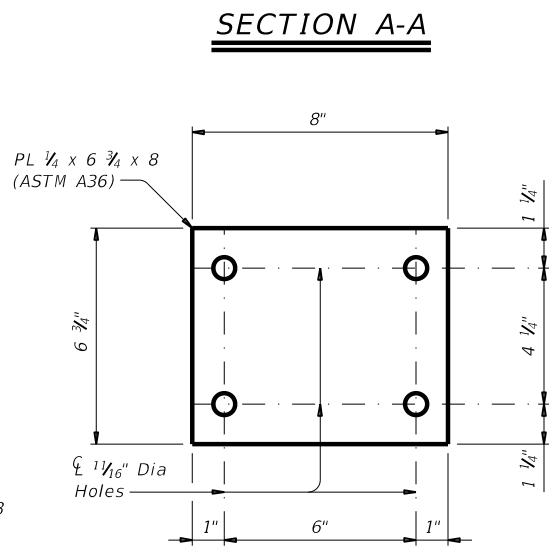
W-BEAM SPLICE ELEVATION



POST ELEVATION

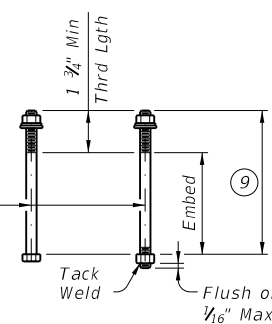


SECTION A-A



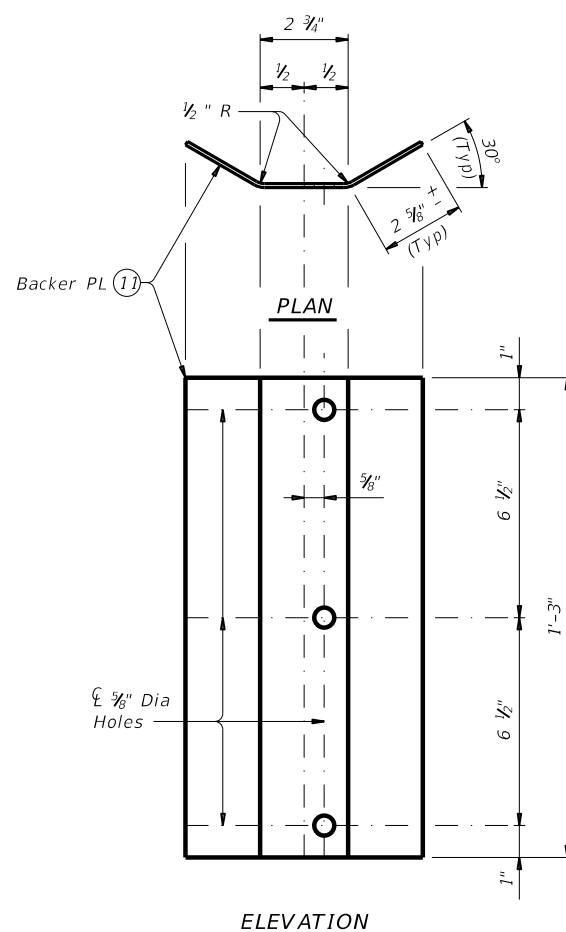
WASHER PLATE DETAIL

5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ASTM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod.



CAST-IN-PLACE & FORMED HOLE ANCHOR BOLT OPTIONS

- 9 See "Rail Details On Bridge Slab" and/or "Rail Section On Abutment Wingwall".
- 10 See "Material Notes" for anchor bolt information.
- 11 Backer PL 1/4 x 8 x 1'-3" (ASTM A1011 CS or SS Gr 33, or A1008 CS or SS Gr 33 (11 Gage acceptable)).
- 12 Used for structures with overlay.
- 13 Used for structures without overlay.
- 14 At the nominal end of the bridge rail for payment, one 9'-4 1/2" or 6'-3" W-beam section is permitted in order to achieve the required W-Beam splice location on the MBGF.



ELEVATION

BACKER PLATE

MBGF AND END TREATMENT NOTES:

This traffic railing must be anchored by metal beam guard fence (MBGF) and guard fence end treatments. Determine MBGF length of need in accordance with the Roadway Design Manual, unless otherwise specified. The minimum MBGF length of need required for anchoring the railing is 25' of MBGF plus the appropriate end treatment.

CONSTRUCTION NOTES:

Face of rail post must be plumb unless otherwise approved by the Engineer. Post must be perpendicular to adjacent roadway grade. Use epoxy mortar under post base plates if gaps larger than 1/16" exist.

Fully anchored guardrail must be attached to each end of rail. A metal beam guard fence transition is not used with this rail.

At the Contractor's option anchor bolts may be an adhesive anchor system. See "Material Notes".

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

It is recommended to show a Rail Layout with rail posts and W-beam splices. Fabricator must submit erection drawings to the Engineer for approval.

Round or chamfer exposed edges of rail post and backer plate to approximately 1/16" by grinding.

Shop drawings are not required for this rail.

MATERIAL NOTES:

Galvanize all steel components.

Anchor bolts for base plate must be 5/8" Dia ASTM F3125 Gr A325 or A449 bolts (or ASTM A193 Gr B7 or F1554 Gr 105 threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements.

Optional adhesive anchorage system must be 5/8" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed fully threaded rod into slab and/or abutment wingwall using a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4 3/4".

Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 8 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

W-beam must meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified in the plans. The Contractor may furnish rail elements of 25'-0" or 12'-6" (Nominal) lengths and a single rail element of 9'-4 1/2" or 6'-3" (Nominal) length. W-Beam must have slotted holes at 3'-1 1/2".

Some part numbers from the "Task Force 13" Guide to Standardized Highway Barrier Hardware have been furnished for quick reference.

GENERAL NOTES:

This railing has been successfully evaluated by full-scale crash test to meet MASH TL-3 criteria. This railing can be used for speeds of 50 mph and greater.

This rail is designed to deflect approximately 4' to 4'-6" as it contains and redirects the errant vehicle. This rail may not be installed on top of or behind curbs that project above finished grade, on bridges with expansion joints providing more than 5" movement, on retaining walls, or on grade separations and interchanges.

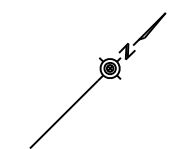
Repairs to impact-damaged post and base plate unit are not permitted. Replace all impact-damaged posts with a new post and base plate unit.

Average weight of railing with no overlay: 20 plf total.

SHEET 2 OF 2

		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T631</h2>			
FILE: r1std038-20.dgn	DN: TxDOT	CK: AES	DW: JTR
REVISIONS	CONTRACT	SECTION	JOB
091418			111, etc. CR290, etc.
07-20: Allowing 9'-4 1/2" or 6'-3" W-Beam sections.	DIST	COUNTY	SHEET NO.
AUS	BASTROP		72

DATE: 1/26/2022 10:58:33 AM
 FILE: pw:\txdot\projectwiseonline.com:TXDOT14\Documents\14 - AUS\Design Projects\091418111\4 - Design\Plan Set\8 - Traffic\CR290_TRAFFIC_SPM.DGN



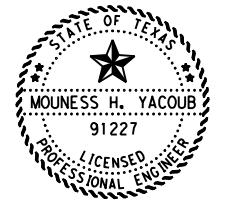
LEGEND
 ⇌ DIRECTION OF TRAFFIC

0914-18-111
 BEGIN PROJECT
 STA. 10+65.00

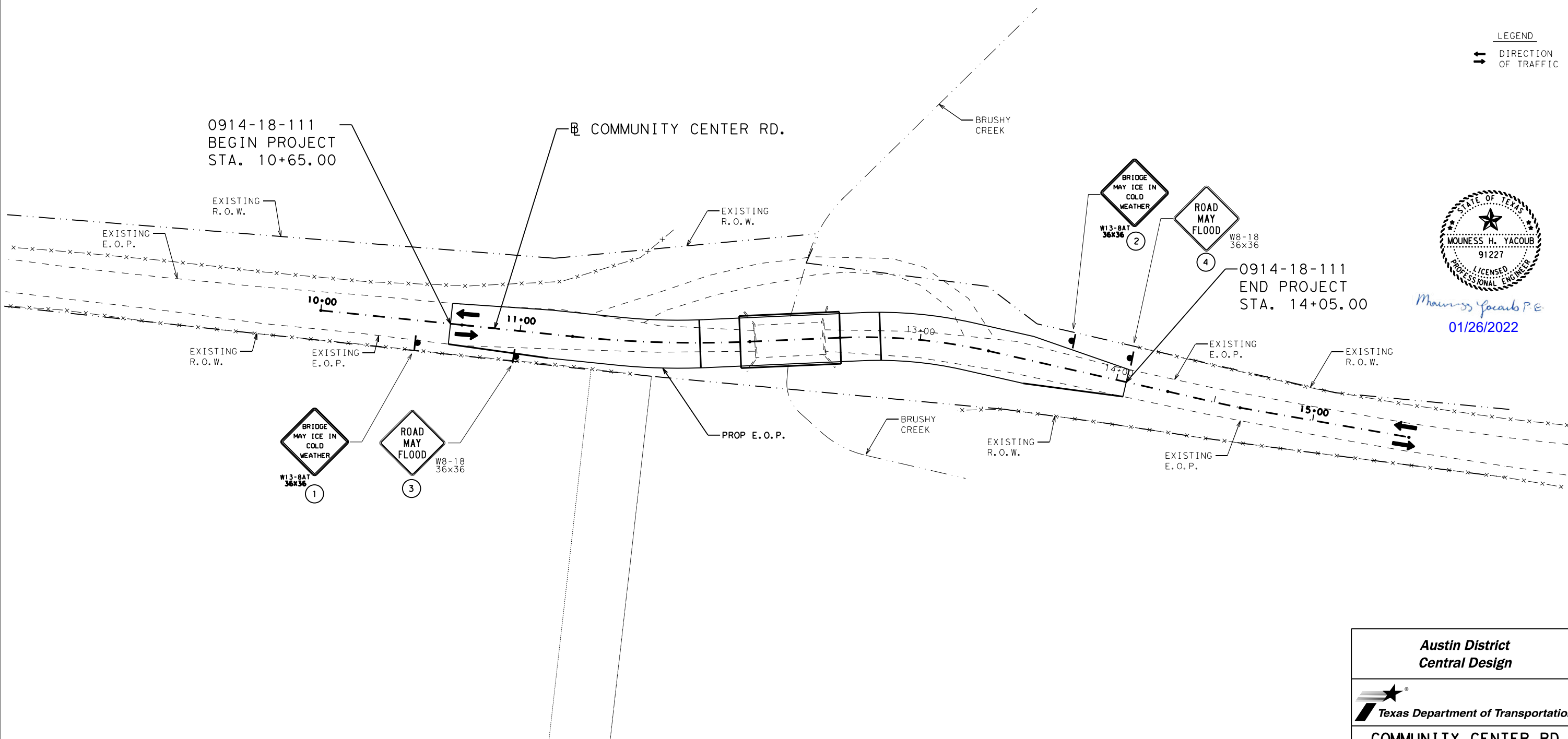
COMMUNITY CENTER RD.

BRUSHY CREEK

0914-18-111
 END PROJECT
 STA. 14+05.00



Mouness Yacoub P.E.
 01/26/2022



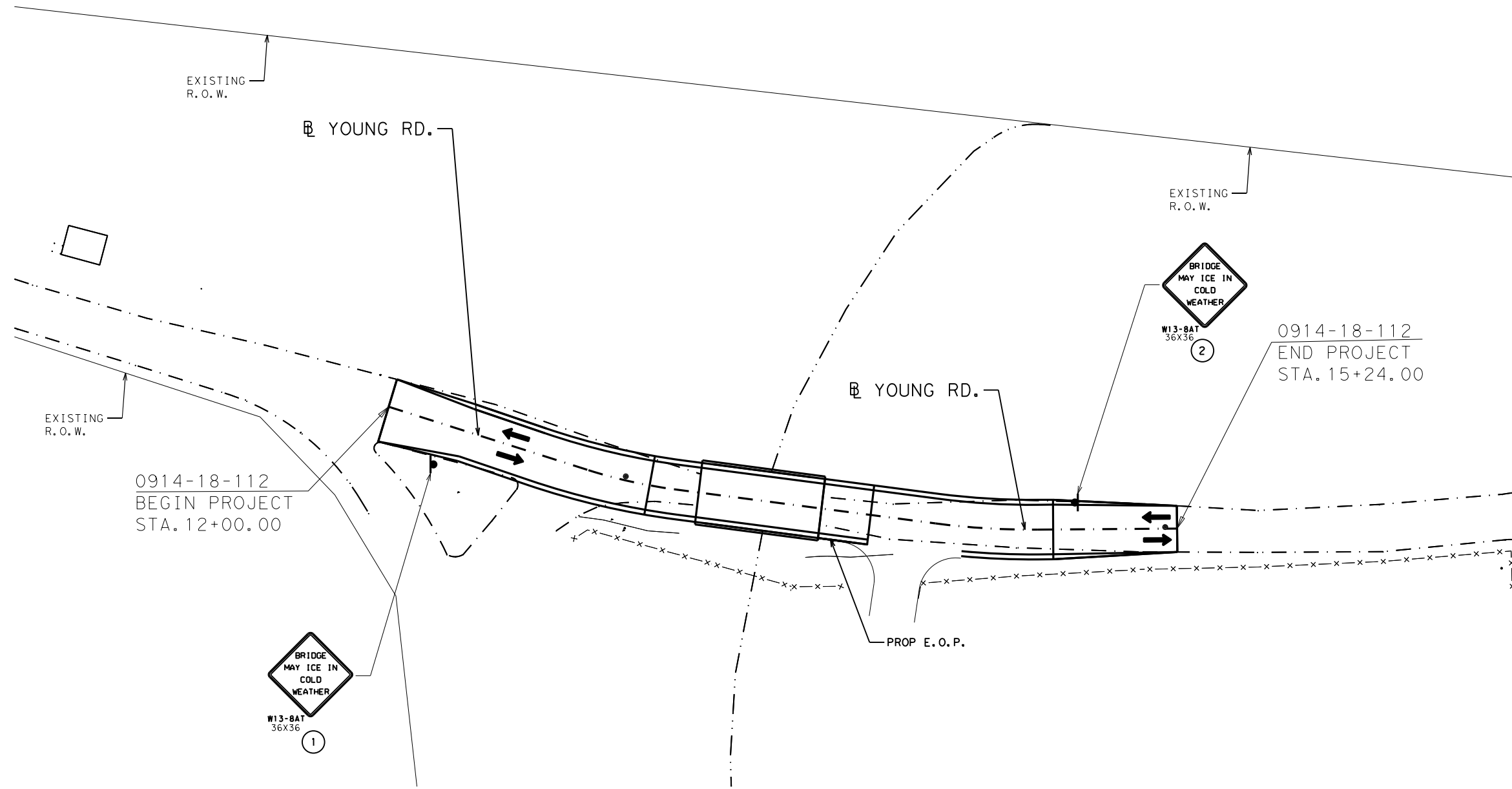
**Austin District
 Central Design**

**COMMUNITY CENTER RD
 SIGNING AND
 PAVEMENT
 MARKING LAYOUT**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS:	CK:	0914 18	111, etc.	CR290, etc.
DW:	CK:	DIST	COUNTY	SHEET NO.
		AUS	BASTROP	73

DATE: 1/26/2022 10:58:55 AM
 FILE: pw:\txdot\projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\091418112\4 - Design\Plan Set\8. Traffic\YOUNGRD_TRAFFIC_SPWD.dgn



STATE OF TEXAS
 MOUNESS H. YACOURB
 91227
 LICENSED PROFESSIONAL ENGINEER
Mouness Yacoub P.E.
 01/26/2022

DO NOT PLACE TRAFFIC CONTROL DEVICES WITHIN 15 FEET OF CENTERLINE OF THE TRACK AND DO NOT OBSTRUCT VISIBILITY OF THE RAILROAD WARNING DEVICES.

**Austin District
Central Design**

Texas Department of Transportation

**YOUNG RD
SIGNING AND
PAVEMENT
MARKING LAYOUT**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	DIST		COUNTY	SHEET NO.
	AUS		BASTROP	75

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 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\140114\140114.dwg

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES	
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	DEVICE	SINGLE	DOUBLE	INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)	
								NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE 1 or 2 TYPE OF POST OR DELINEATOR WC = Wing Channel Post YFLX = Yellow Flexible Post WFLX = White Flexible Post BRF = Barrier Reflector TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back	
SHEETING	Yellow, White or Red Type B or C reflective sheeting				SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (fix). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.				POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
					MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

OBJECT MARKERS									
DEVICE	Type 1 (OM-1)		Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
		OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
SHEETING	Yellow-Type B _{FL} or C _{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting			Red -Type B _{FL} or C _{FL} Sheeting	
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT	
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP	

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

BARRIER REFLECTORS (BRF)			CHEVRONS				ONE DIRECTION LARGE ARROW		NOTE: Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.	
DEVICE	GF1	GF2	CTB	 W1-8				 W1-6		
	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.		SIZE (W x L)	18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
			MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only		MOUNTING HEIGHT	7'-0"	
SHEETING	Yellow, White, Red		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).						
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.									

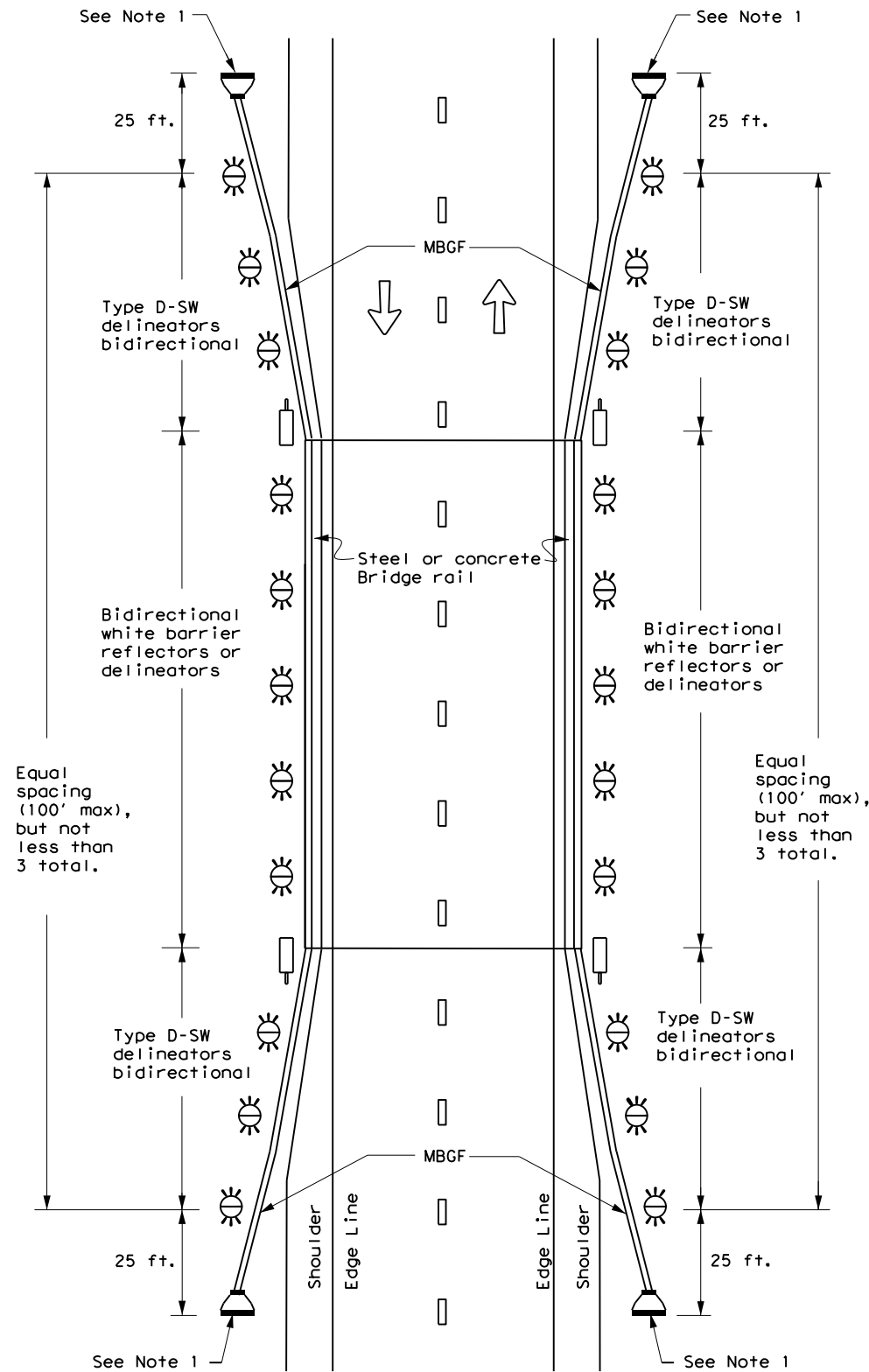


DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT	CR: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	AUS	BASTROP	77	

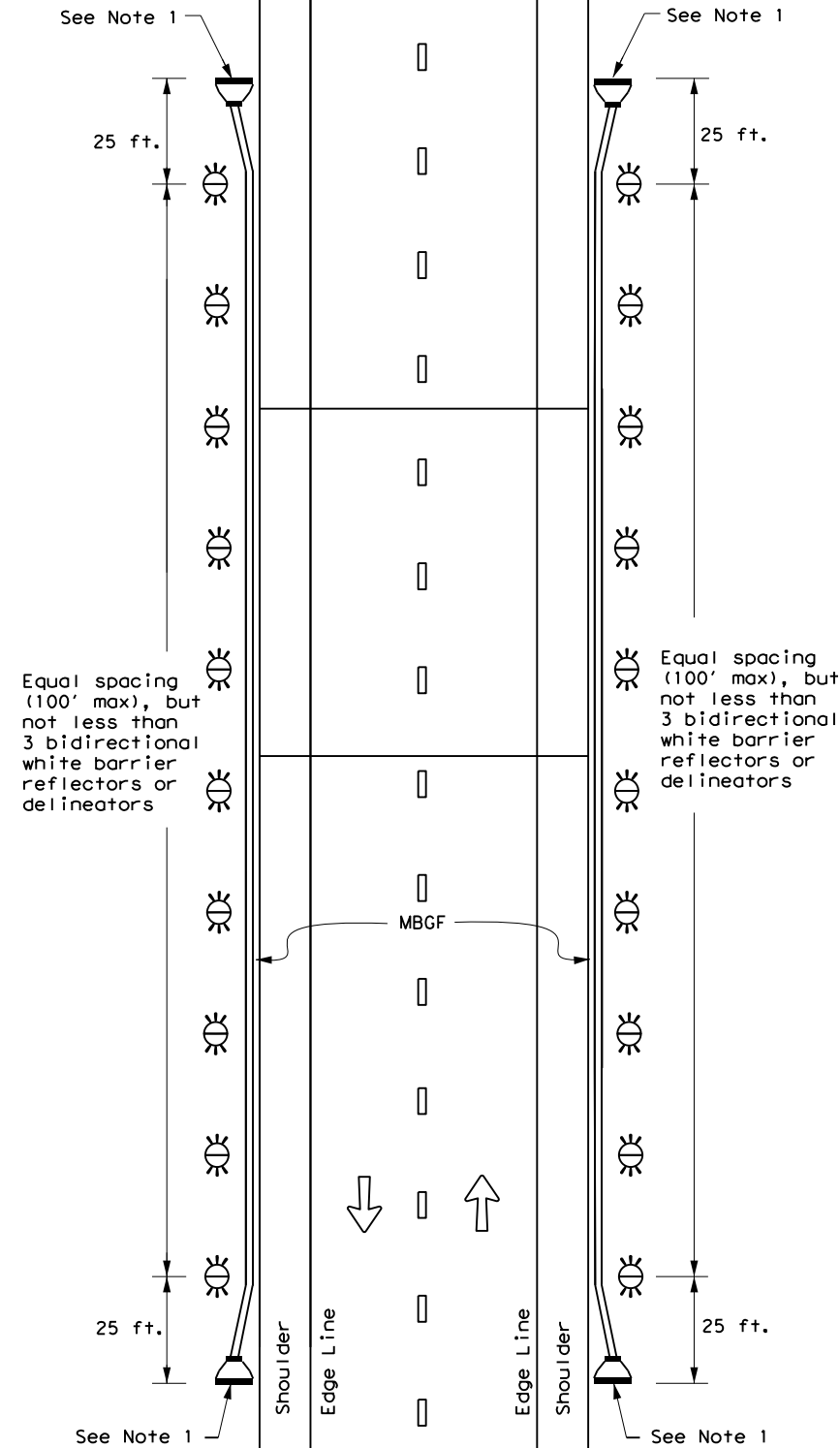
**TWO-WAY, TWO LANE ROADWAY
WITH REDUCED WIDTH APPROACH RAIL**



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

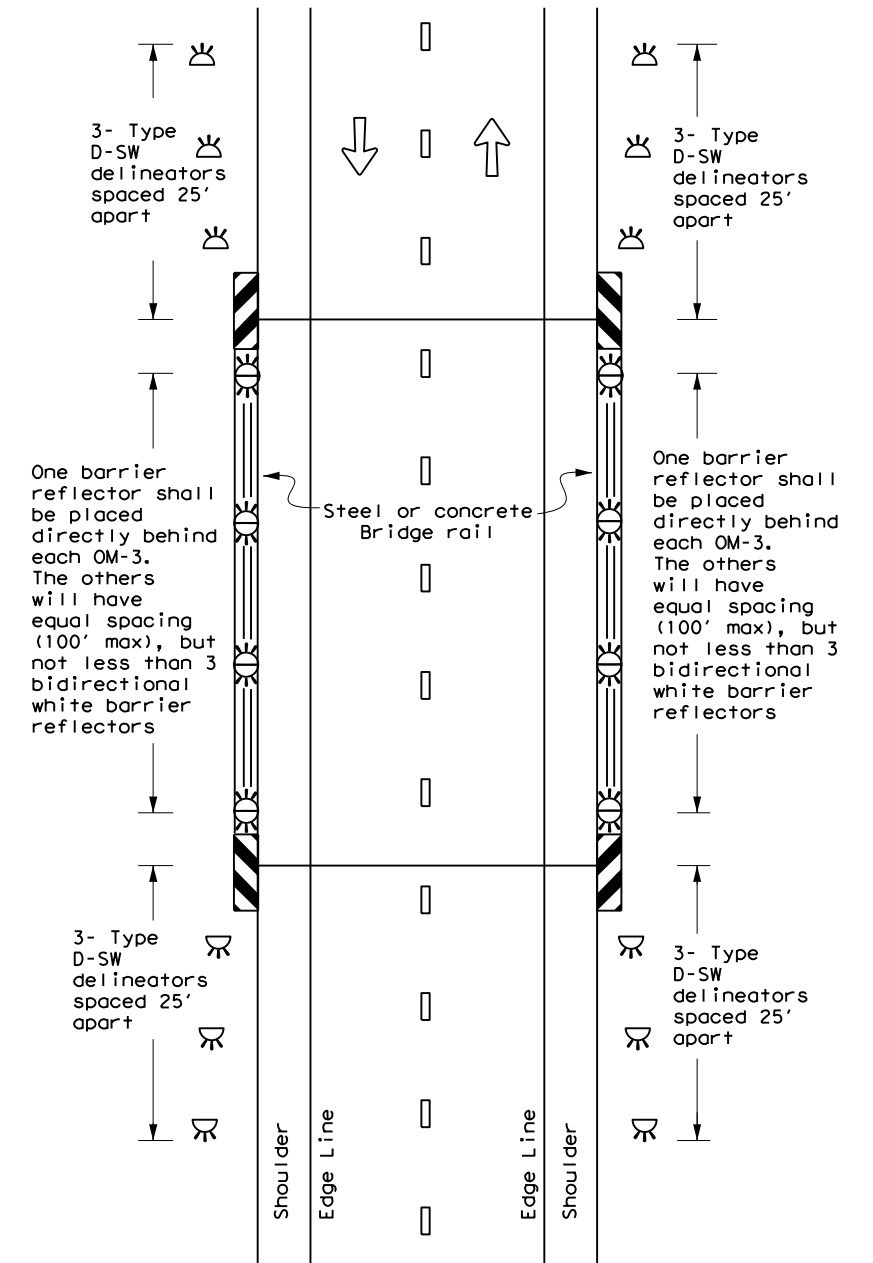
**TWO-WAY, TWO LANE ROADWAY
WITH METAL BEAM GUARD FENCE (MBGF)**



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

**TWO-WAY, TWO LANE ROADWAY
BRIDGE WITH NO APPROACH RAIL**



LEGEND

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



**DELINEATOR &
OBJECT MARKER
PLACEMENT DETAILS**

D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
7-20	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	78	

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DATE: 1/26/2022 10:37:24 AM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\14 - AUS\Standards\Statewide_Standards\Traffic\Sign Mounting\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)

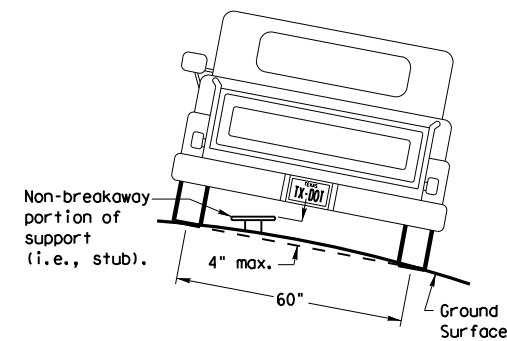
Anchor Type

- 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-3))

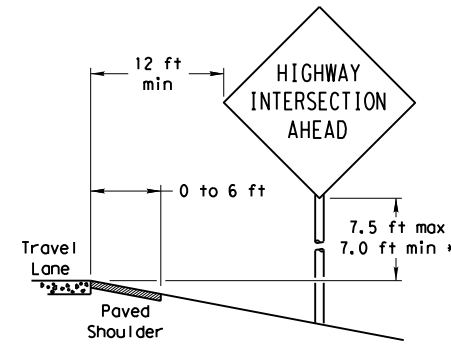
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

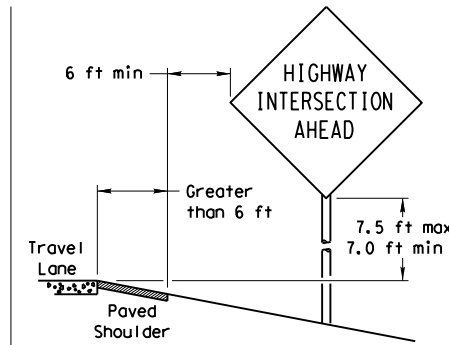
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

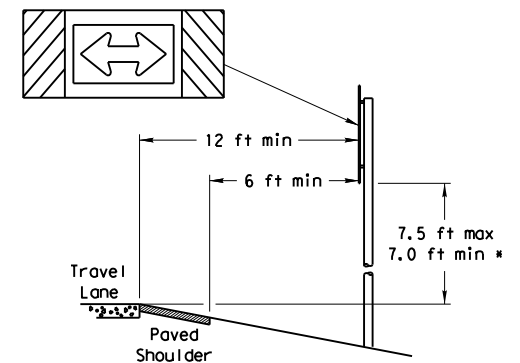
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

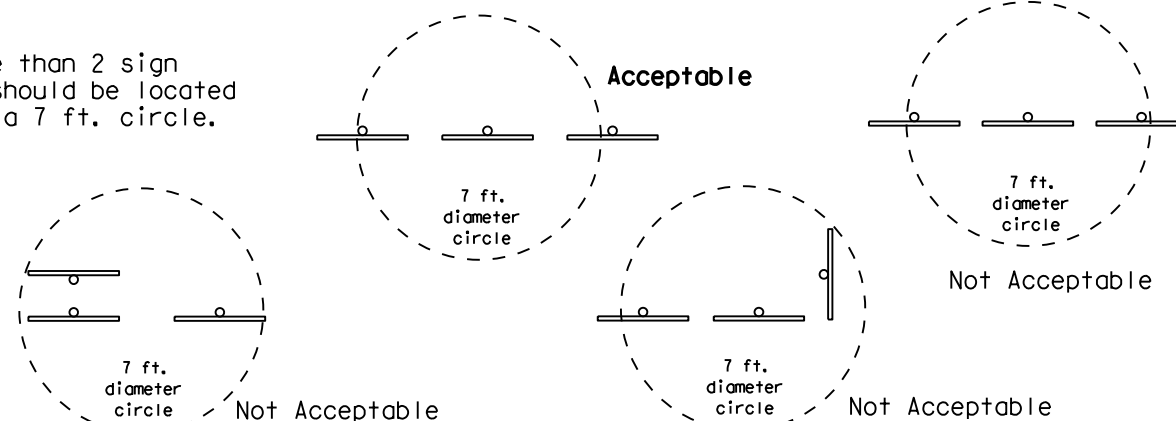
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

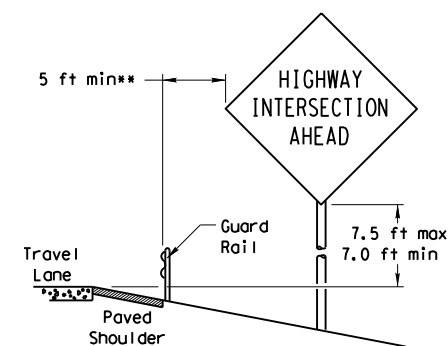


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

No more than 2 sign posts should be located within a 7 ft. circle.

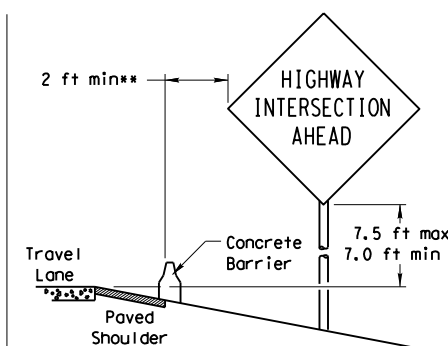


BEHIND BARRIER



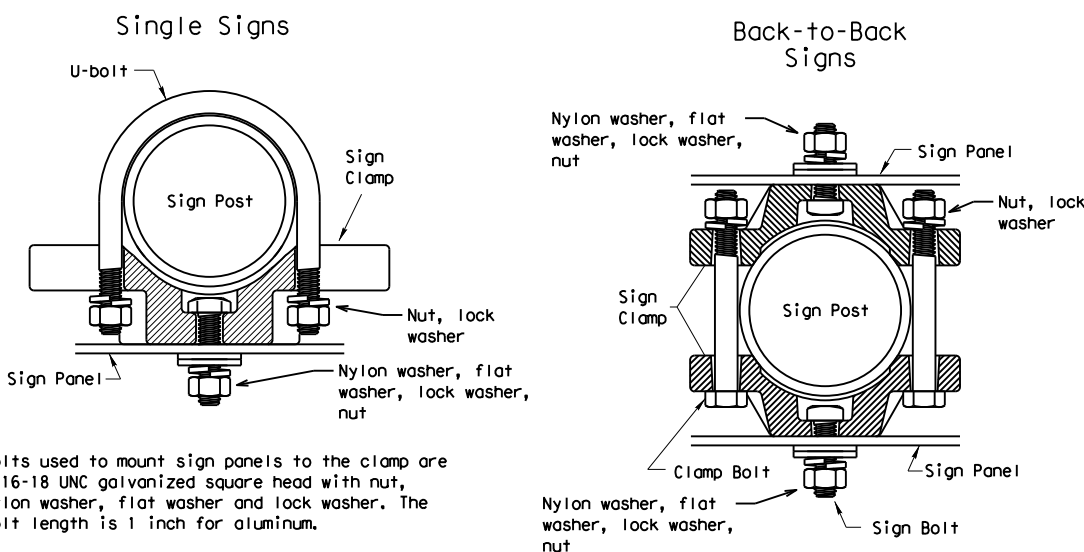
BEHIND GUARDRAIL

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.



BEHIND CONCRETE BARRIER

TYPICAL SIGN ATTACHMENT DETAIL



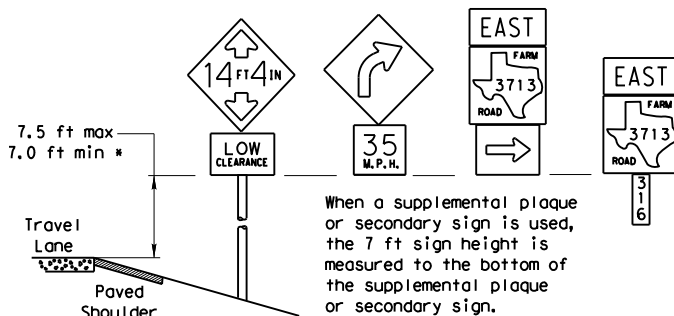
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

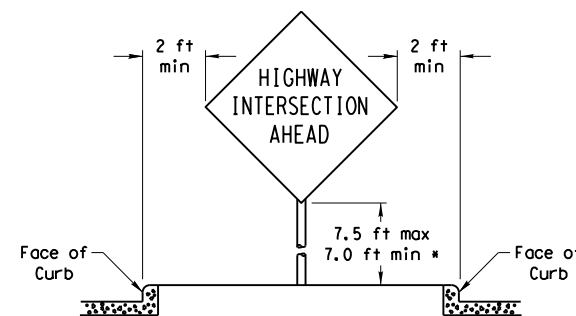
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

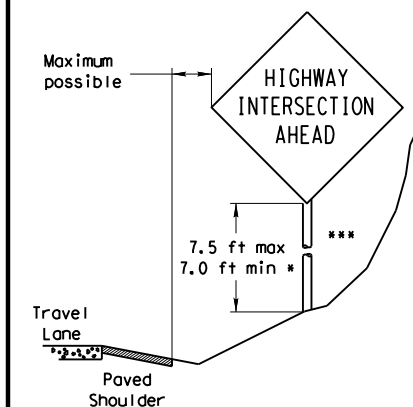


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

- * Signs shall be mounted using the following condition that results in the greatest sign elevation:
 - (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
 - (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.
- The maximum values may be increased when directed by the Engineer.
- See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.
- The website address is:
<http://www.txdot.gov/publications/traffic.htm>



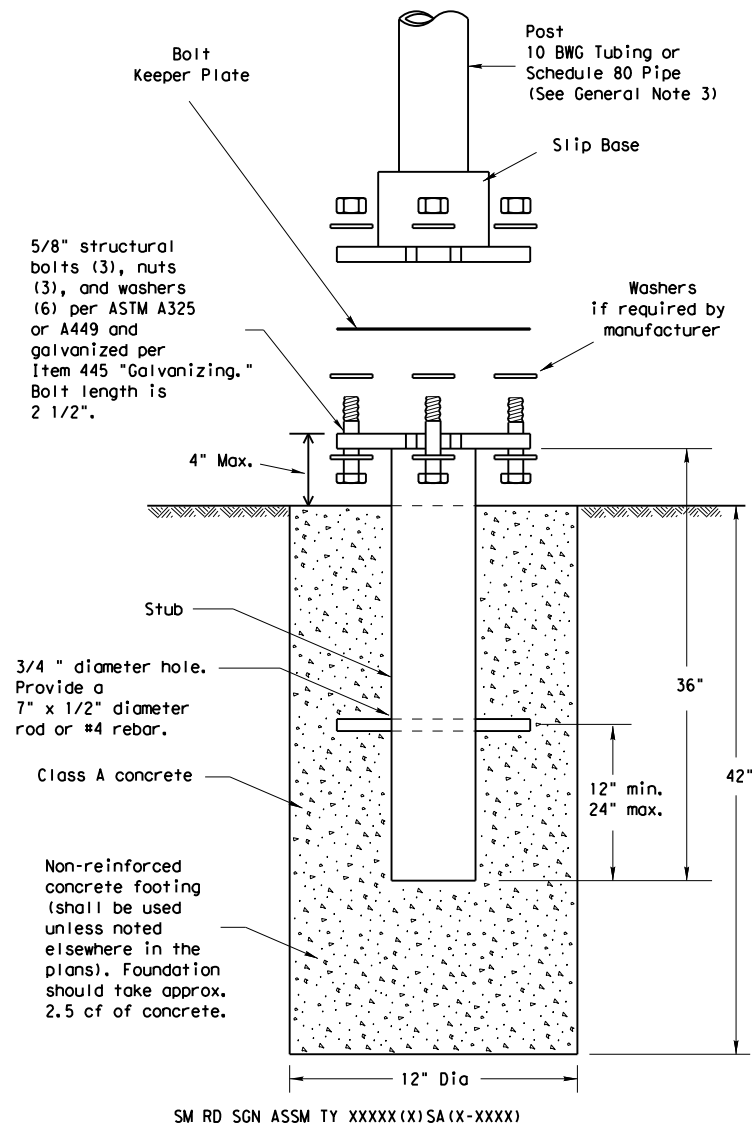
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0914	18	111, etc.	CR290, etc.
		DIST	COUNTY		SHEET NO.
		AUS	BASTROP		79

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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm
 The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

- Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
- Material used as post with this system shall conform to the following specifications:
 - 10 BWG Tubing (2.875" outside diameter)
 - 0.134" nominal wall thickness
 - Seamless or electric-resistance welded steel tubing or pipe
 - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
 - Other steels may be used if they meet the following:
 - 55,000 PSI minimum yield strength
 - 70,000 PSI minimum tensile strength
 - 20% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
 - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
 - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
 - Schedule 80 Pipe (2.875" outside diameter)
 - 0.276" nominal wall thickness
 - Steel tubing per ASTM A500 Gr C
 - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
 - 46,000 PSI minimum yield strength
 - 62,000 PSI minimum tensile strength
 - 21% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
 - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
 - Galvanization per ASTM A123
- See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

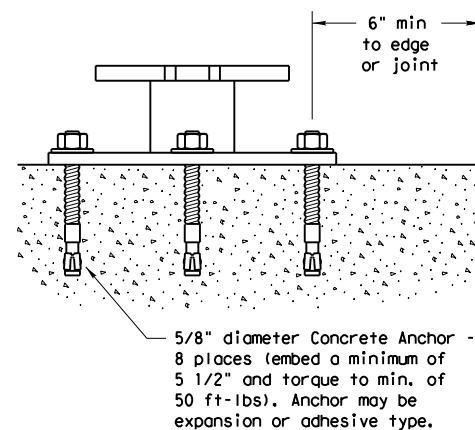
Foundation

- Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
- Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

- Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
- Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

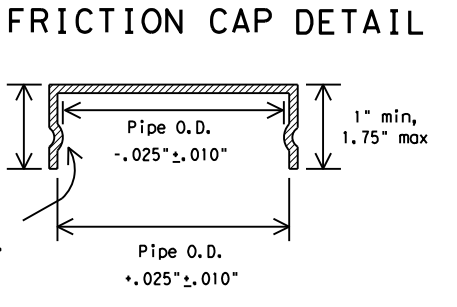
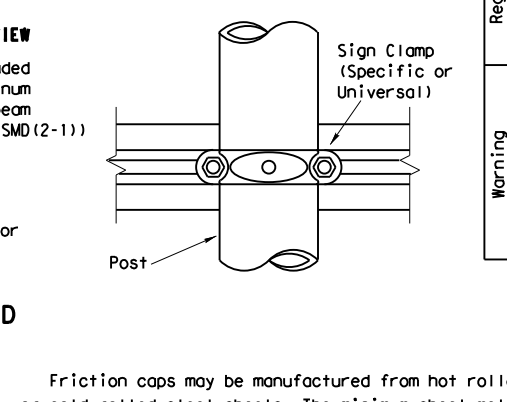
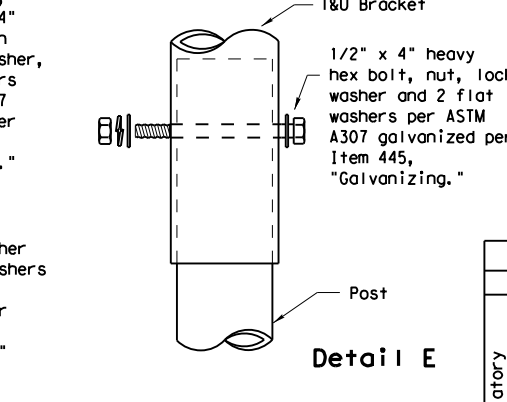
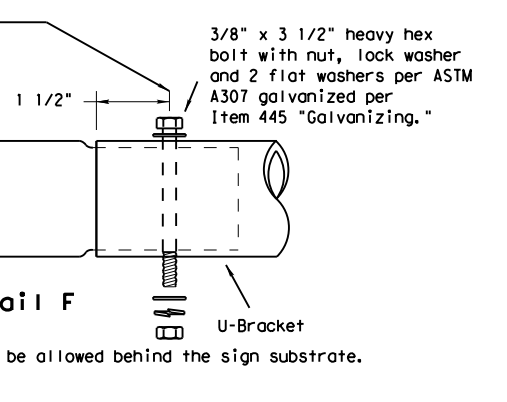
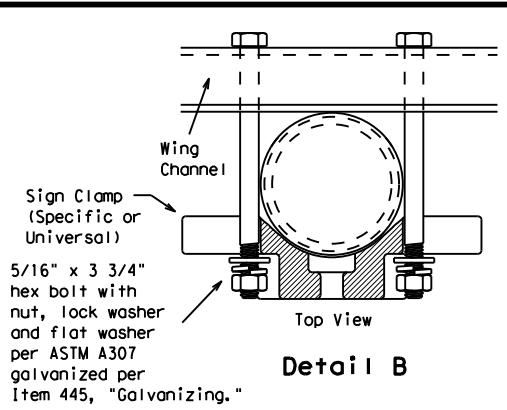
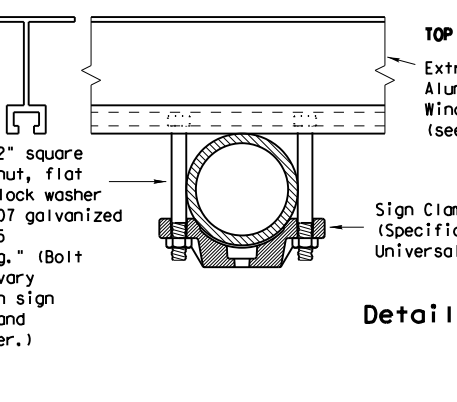
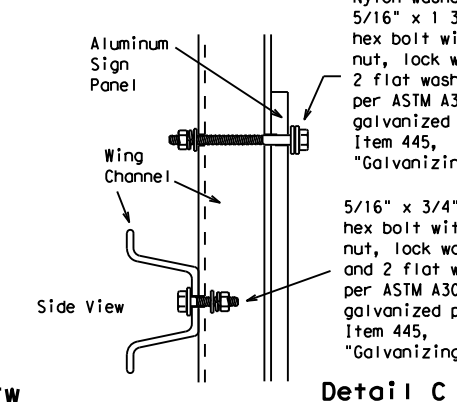
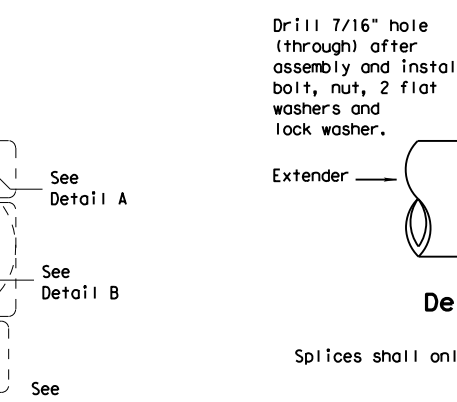
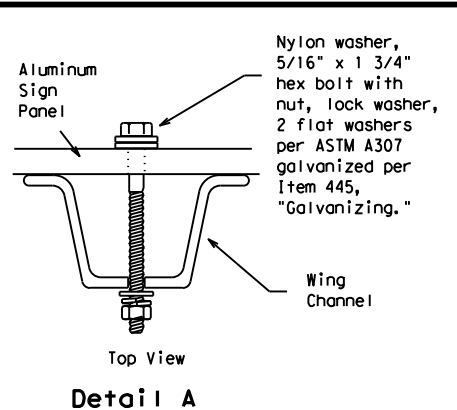
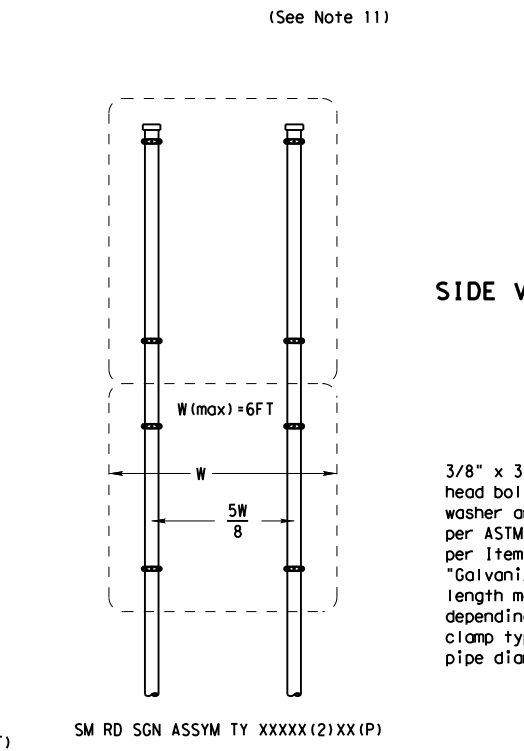
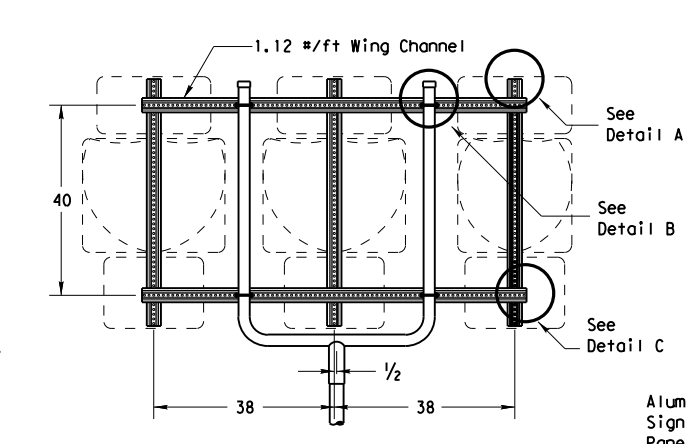
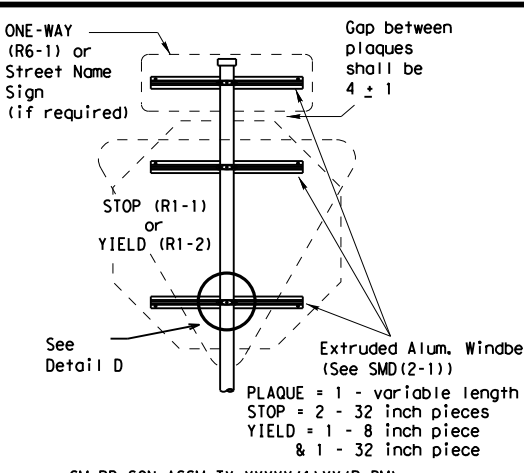
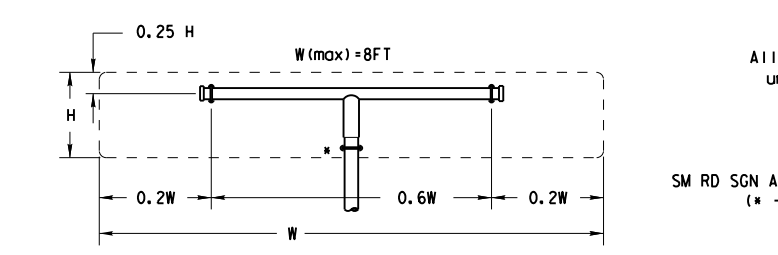
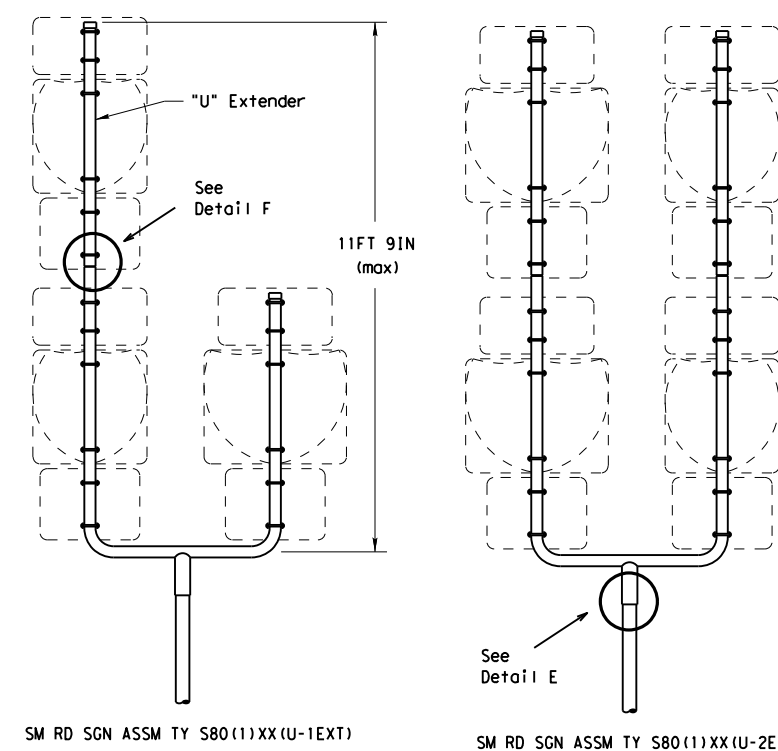
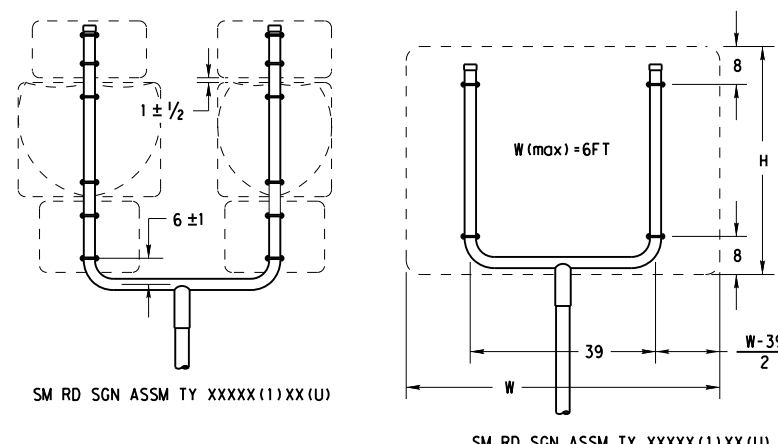
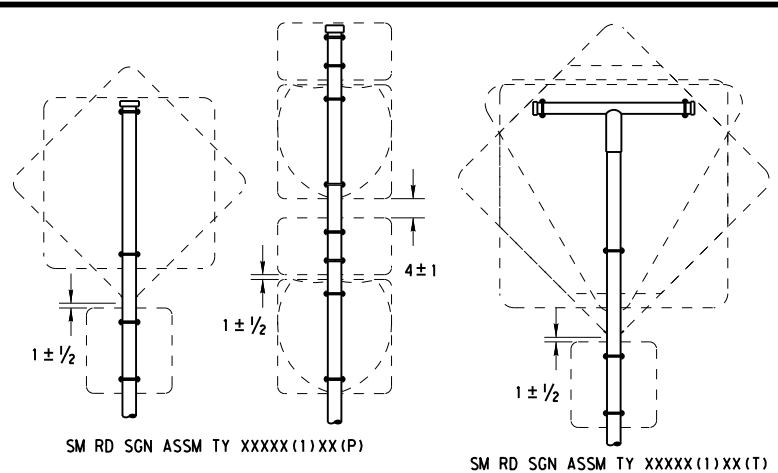


SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-1)-08

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		DIST	COUNTY	SHEET NO.	
		AUS	BASTROP	80	

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GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
- When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
- Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
- Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.
- Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

Regulatory	SIGN DESCRIPTION		SUPPORT
	Regulatory	Warning	
Regulatory	48-inch STOP sign (R1-1)		TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)		TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)		TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Warning	36x48, 48x36, and 48x48-inch signs		TY 10BWG(1)XX(T)
	48x60-inch signs		TY S80(1)XX(T)
	48x48-inch signs (diamond or square)		TY 10BWG(1)XX(T)
	48x60-inch signs		TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)		TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)		TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)		TY 10BWG(1)XX(T)

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.

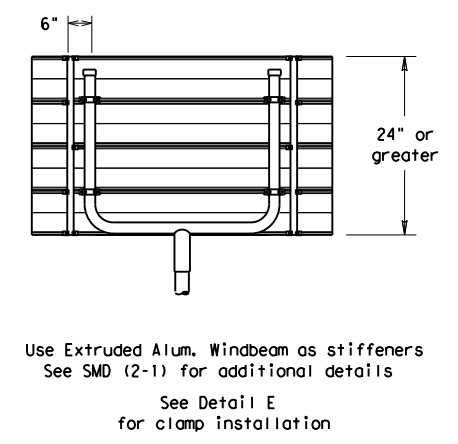
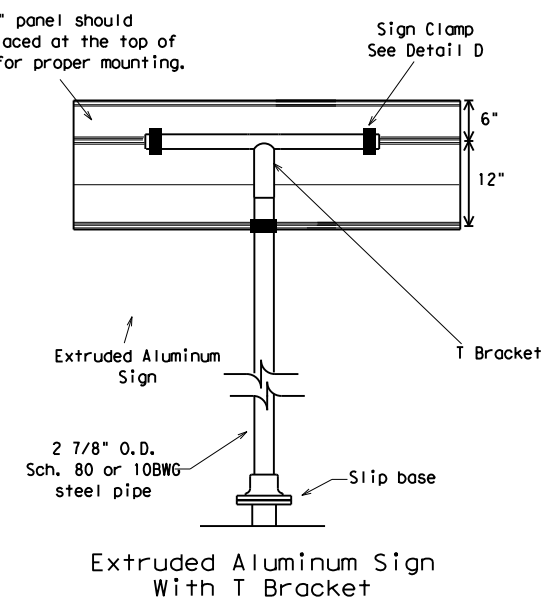
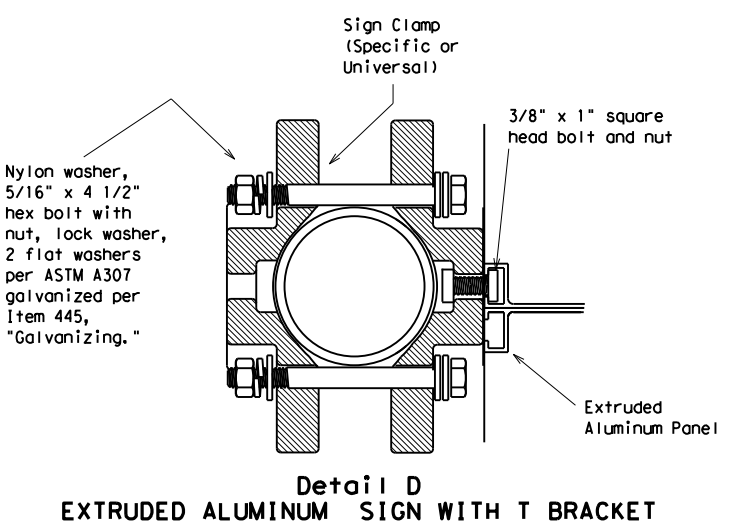
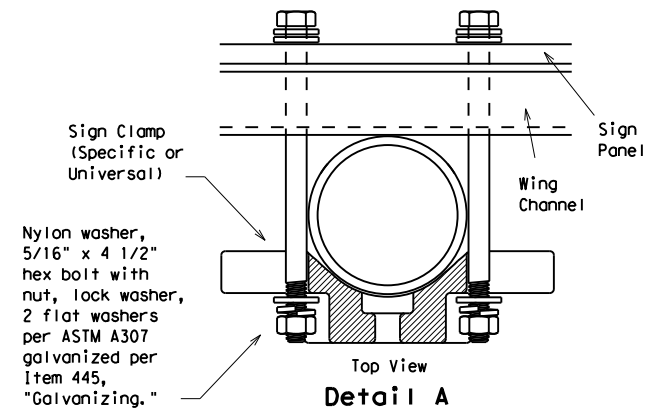
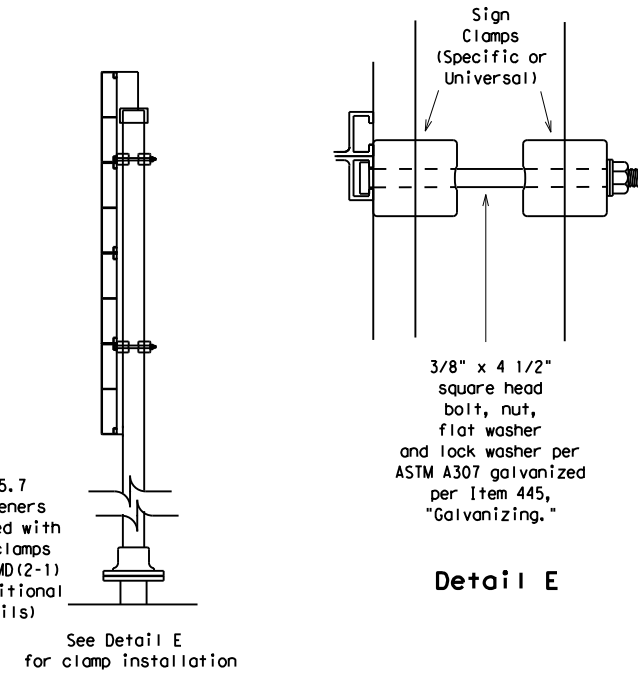
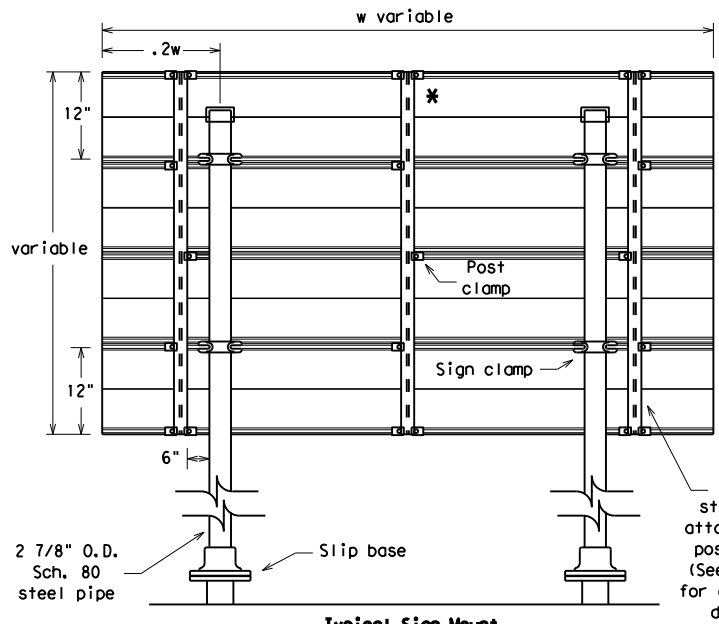
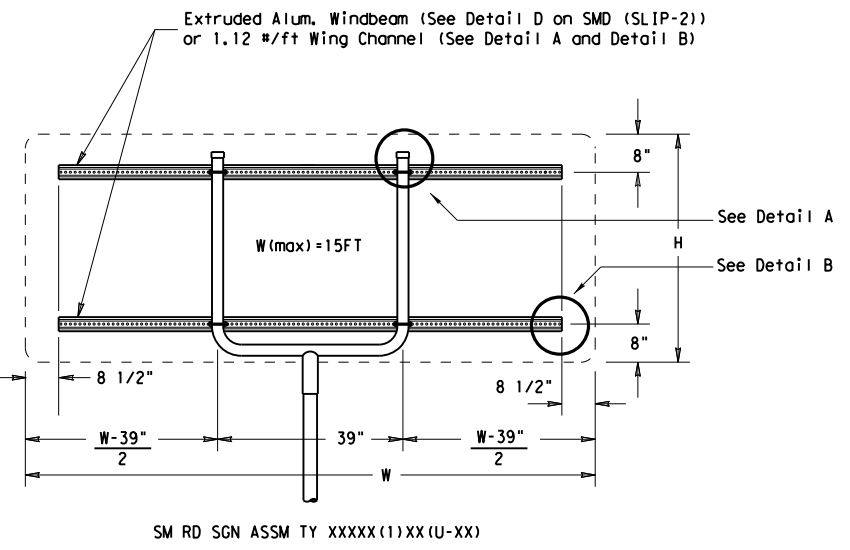
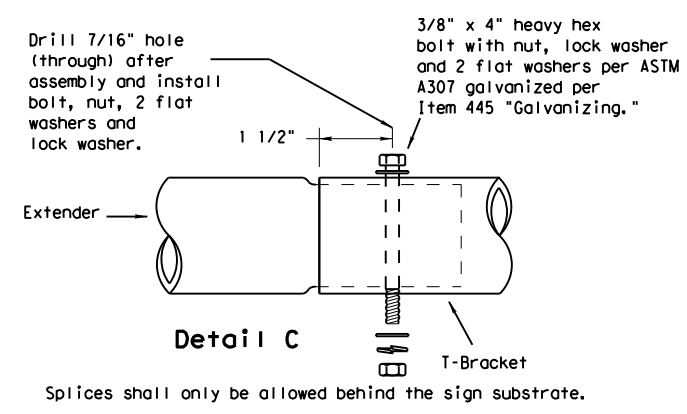
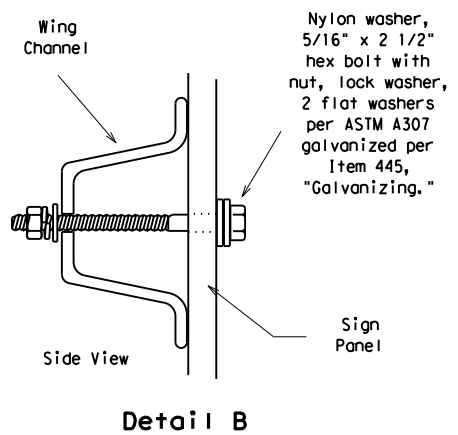
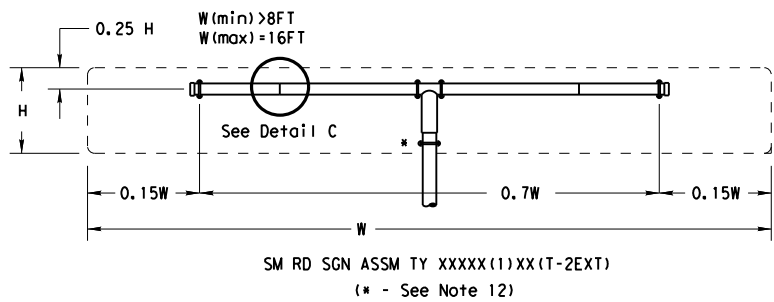
Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-2)-08

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GENERAL NOTES:

- | SIGN SUPPORT | # OF POSTS | MAX. SIGN AREA |
|--------------|------------|----------------|
| 10 BWG | 1 | 16 SF |
| 10 BWG | 2 | 32 SF |
| Sch 80 | 1 | 32 SF |
| Sch 80 | 2 | 64 SF |
- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
- When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.

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)

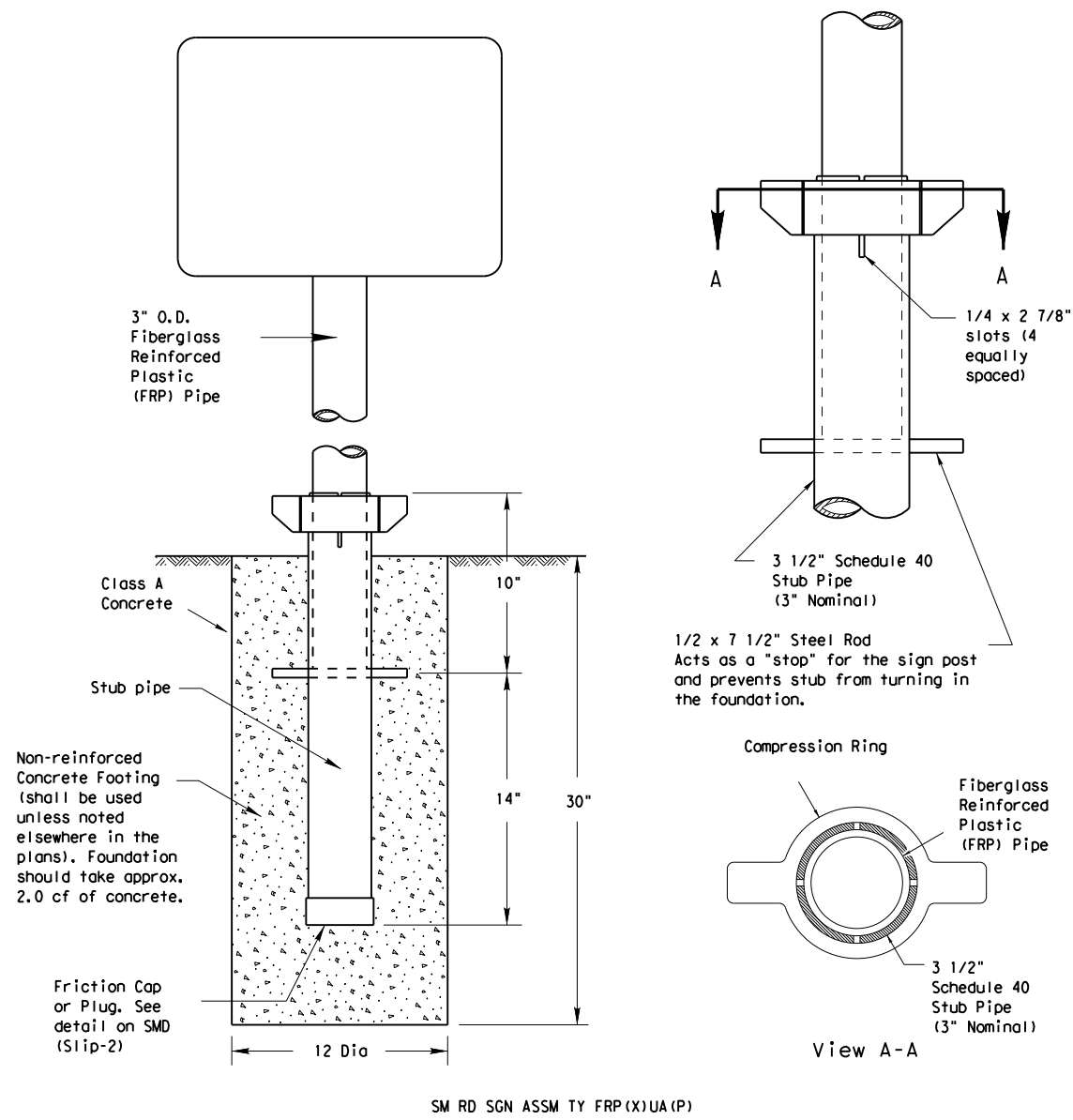
Texas Department of Transportation
 Traffic Operations Division

**SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM**

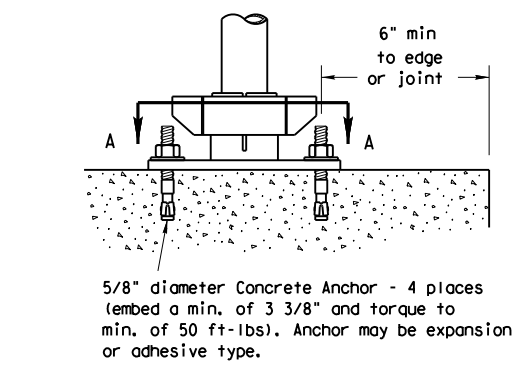
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Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post

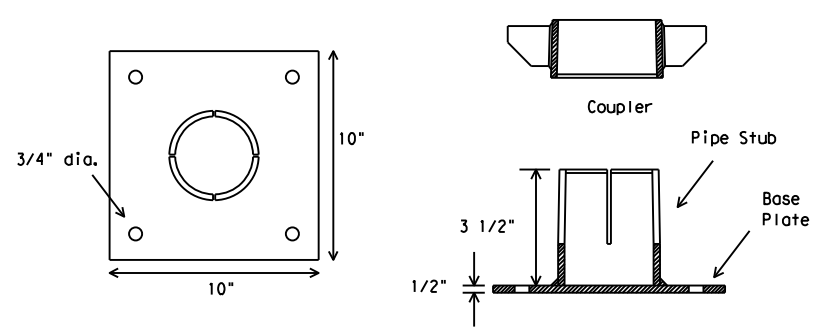


SM RD SGN ASSM TY FRP (X)UA (P)



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxy and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP (X)UB (P)

GENERAL NOTES:

- FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
- All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
- See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: <http://www.txdot.gov/publications/traffic.htm>

FRP POST REQUIREMENTS

- Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
- Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
- FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing: Texas Department of Transportation Traffic Operations Division 125 East 11th Street Austin, Texas 78701-2483

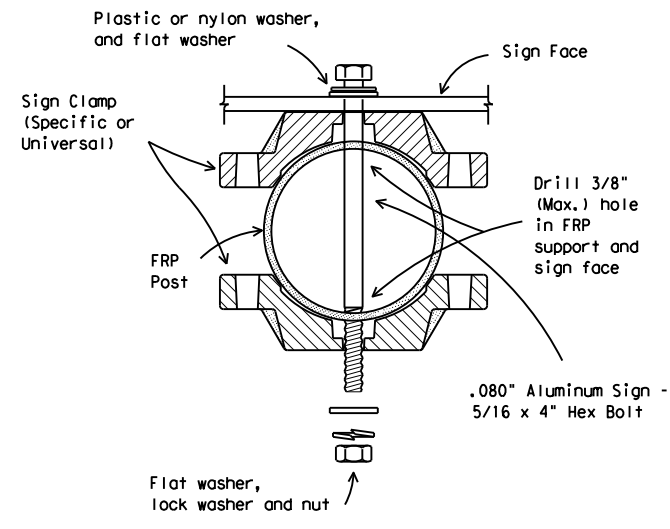
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD (GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
- Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
- Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
- Attach sign to FRP post.
- Insert sign post into base post. Lower until the post comes to rest on the steel rod.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

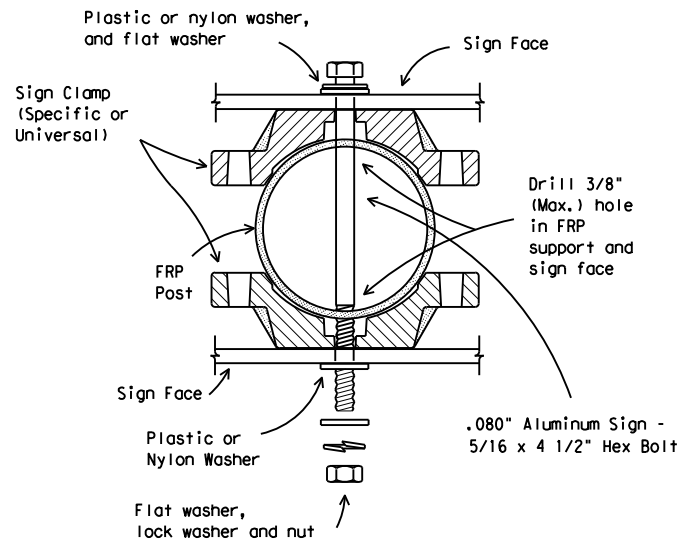
BOLT DOWN SIGN SUPPORT

- Position base plate with coupler on existing concrete.
- Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
- Attach sign to FRP post.
- Insert bottom of sign post into pipe stub.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



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Texas Department of Transportation
Traffic Operations Division

**SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
UNIVERSAL ANCHOR SYSTEM
WITH FRP POST**

SMD (FRP) -08

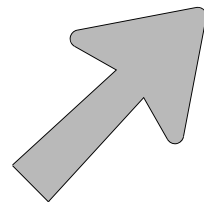
© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0914	18	111, etc.	CR290, etc.
		DIST	COUNTY	SHEET NO.	
		AUS	BASTROP	83	

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 units or for any errors or omissions in this standard or for any damages resulting from its use.

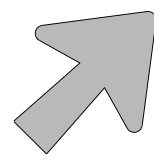
DATE: 1/26/2022 10:37:35 AM
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ARROW DETAILS

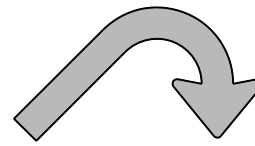
for Large Ground-Mounted and Overhead Guide Signs



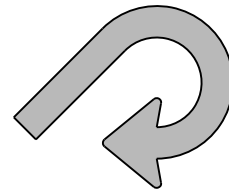
Type A



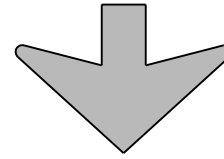
Type B



E-3



E-4



Down Arrow

TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

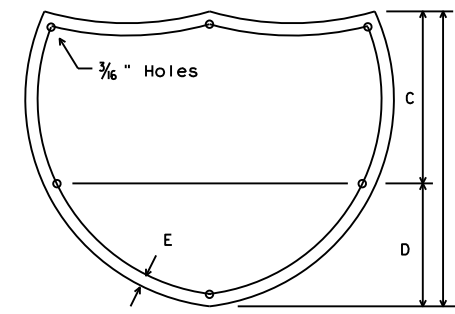
CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

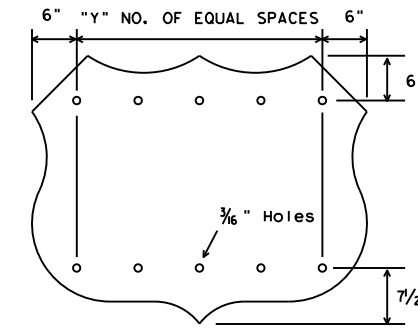
The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)



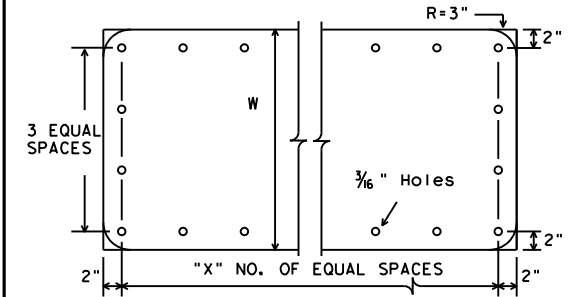
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4



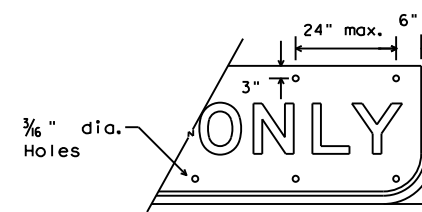
U.S. ROUTE MARKERS

Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



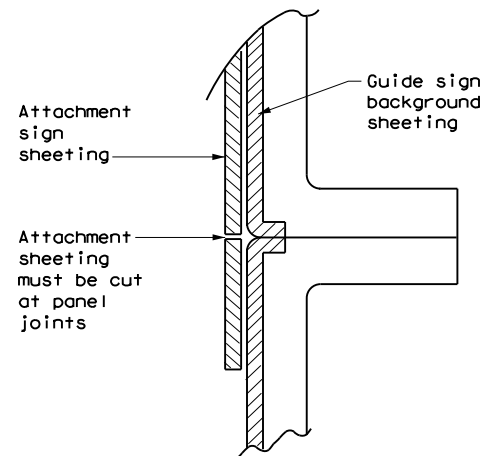
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5



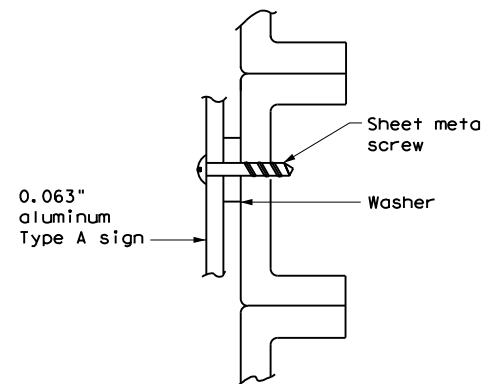
EXIT ONLY PANEL

MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)

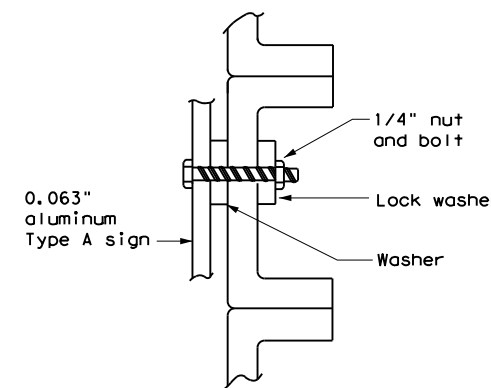


DIRECT APPLIED ATTACHMENT

- NOTE:**
- Sheeting for legend, symbols, and borders must be cut at panel joints.
 - Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



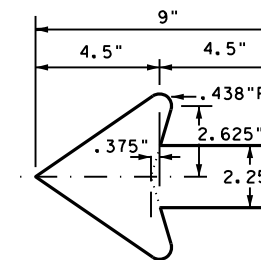
SCREW ATTACHMENT



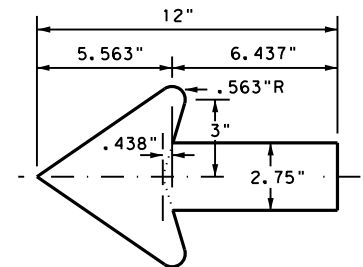
NUT/BOLT ATTACHMENT

- NOTE:**
- Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.



TYPICAL SIGN REQUIREMENTS

TSR (5) - 13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	AUS	BASTROP	85	

A. GENERAL SITE DATA

1. PROJECT LIMITS:
 ON COMMUNITY CENTER RD AT BRUSHY CREEK STR AA0290001
 PROJECT LENGTH = 340 FT. = 0.063 MILES
 PROJECT COORDINATES:
 LATITUDE: N 29.89117402
 LONGITUDE: W -97.36561811
 PROJECT LOCATION:
 BEG LATITUDE: +29.891405 BEG LONGITUDE: -97.365775
 END LATITUDE: +29.890969 END LONGITUDE: -97.365225
2. PROJECT SITE MAPS:
 * PROJECT LOCATION MAP: **TITLE SHEET**
 * DRAINAGE PATTERNS: **DRAINAGE AREA MAP**
 * SLOPES ANTICIPATED AFTER MAJOR GRADINGS OR AREAS OF SOIL DISTURBANCE: **EXISTING AND PROPOSED TYPICAL SECTIONS**
 * LOCATION OF EROSION AND SEDIMENT CONTROLS: **EROSION CONTROL PLAN**
 * SURFACE WATERS AND DISCHARGE LOCATIONS: **DRAINAGE LAYOUTS**
 * PROJECT SPECIFIC LOCATIONS: TO BE SPECIFIED BY THE PROJECT FIELD OFFICE DURING CONSTRUCTION AND LOCATED IN THE PROJECT SW3P FILE. REFERENCE ITEM #10 BELOW
3. PROJECT DESCRIPTION: **REPLACE BRIDGE AND APPROACHES**
4. MAJOR SOIL DISTURBING ACTIVITIES: **REMOVAL OF BRIDGE, REPLACING BRIDGE APPROACHES AND PREPARATION OF ROW**
5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:
60.0%
6. TOTAL PROJECT AREA: **0.439 ACRES**
7. TOTAL AREA TO BE DISTURBED: **0.378 ACRES**
8. WEIGHTED RUNOFF COEFFICIENT
 BEFORE CONSTRUCTION: **0.60**
 AFTER CONSTRUCTION: **0.60**
9. NAME OF RECEIVING WATERS: (SEGMENT NUMBER OF RECEIVING WATERS)
STORMWATER RUNOFF WOULD FLOW INTO BRUSHY CREEK WHICH FLOWS TO THE COLORADO RIVER. THE PROJECT IS LOCATED IN THE COLORADO RIVER BASIN - SEGMENT 1428.
10. PROJECT SW3P FILE: FOR PROJECTS DISTURBING ONE ACRE OR MORE, TXDOT WILL MAINTAIN AN SW3P FILE WITH ALL PERTINENT ENVIRONMENTAL DOCUMENTS, CORRESPONDENCE, ETC. AT THE PROJECT FIELD OFFICE. IF NO FIELD OFFICE IS AVAILABLE THEN THE SW3P FILE SHALL BE KEPT IN THE INSPECTOR'S TRUCK.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES:
 TEMPORARY SEEDING
 PERMANENT PLANTING, SODDING, OR SEEDING
 MULCHING
 SOIL RETENTION BLANKET
 BUFFER ZONES
 PRESERVATION OF NATURAL RESOURCES
 OTHER:
2. STRUCTURAL PRACTICES:
 SILT FENCES
 ROCK FILTER DAMS
 DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
 DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
 DIVERSION DIKE AND SWALE COMBINATIONS
 PIPE SLOPE DRAINS
 PAVED FLUMES
 ROCK BEDDING AT CONSTRUCTION EXIT
 TIMBER MATTING AT CONSTRUCTION EXIT
 CHANNEL LINERS
 SEDIMENT TRAPS
 SEDIMENT BASINS
 STORM INLET SEDIMENT TRAP
 STONE OUTLET STRUCTURES
 CURBS AND GUTTERS
 STORM SEWERS
 VELOCITY CONTROL DEVICES
 OTHER:
3. STORM WATER MANAGEMENT:
 STORM WATER DRAINAGE WILL BE PROVIDED BY **EXISTING DITCHES.**
 THIS SYSTEM WILL CARRY THE DRAINAGE WITHIN THE RIGHT-OF-WAY TO **THE COLORADO RIVER VIA BRUSHY CREEK.**
4. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)
 1. **INSTALL ROCK FILTER DAMS AND TEMPORARY SEDIMENT CONTROL FENCE AS SHOWN IN THE PLANS.**
 2. **SET UP TRAFFIC CONTROL & DETOUR, REMOVE EXISTING BRIDGE, HEADWALLS, AND ABUTMENTS, AS SHOWN ON PLANS.**
 3. **EXCAVATE AND PREPARE SUBGRADE FOR PLACEMENT OF BRIDGE PER BRIDGE LAYOUT SHEET.**
 4. **INSTALL PROPOSED BRIDGE. BACKFILL AND PLACE FLEXBASE TO PGL GRADE AS PER CULVERT LAYOUT, PLAN AND PROFILE SHEETS AND TYPICAL SECTIONS.**
 5. **COMPLETE TOPSOIL / SEED ON SLOPES.**
 6. **ESTABLISH GRASS GROWTH ON PERMANENT SLOPES UTILIZING TOPSOIL / SEED.**
 7. **WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND THE SITE IS ESTABLISHED AND APPROVED BY THE PROJECT ENGINEER, THEN REMOVE ALL TEMPORARY STRUCTURAL CONTROLS AND RESOD ANY AREAS DISTURBED BY THEIR REMOVAL.**
5. NON-STORM WATER DISCHARGES:
 FILTER NON-STORM WATER DISCHARGES, OR HOLD RETENTION BASINS, BEFORE BEING ALLOWED TO MIX WITH STORM WATER. THESE DISCHARGES CONSIST OF NON-POLLUTED GROUND WATER, SPRING WATER, FOUNDATION AND/OR FOOTING DRAIN WATER; AND WATER USED FOR DUST CONTROL, PAVEMENT WASHING AND VEHICLE WASHWATER CONTAINING NO DETERGENTS.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
 MAINTENANCE WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.
 2. INSPECTION:
 INSPECTION WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.
 3. WASTE MATERIALS:
 ALL WASTE MATERIALS WILL BE COLLECTED, STORED AND DISPOSED OF IN A LEGAL AND PROPER MANNER. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.
 4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
 AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS. PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR MUST BE CONTACTED IMMEDIATELY.
 5. SANITARY WASTE:
 ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.
- OFFSITE VEHICLE TRACKING:
- HAUL ROADS DAMPENED FOR DUST CONTROL
 LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
 EXCESS DIRT ON ROAD REMOVED DAILY
 STABILIZED CONSTRUCTION ENTRANCE
- OTHER:
- REMARKS: DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL SEDIMENT FROM ENTERING RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WATERBODY OR STREAMBED.
- CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED TO MINIMIZE THE RUNOFF OF POLLUTANTS.

COMMUNITY CENTER RD STORM WATER POLLUTION PREVENTION PLAN (SW3P)

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation or its employees for any use of this standard other than that intended by the Texas Department of Transportation.

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 1122.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.
2.
- No Action Required Required Action

Action No.

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
- Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

- No Permit Required
- Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
- Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# 3a without ACN

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

- Willow Creek, STA 12+87.50 to 13+37.50.
-
-
-

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input checked="" type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input checked="" type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	

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.

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-

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

- No Action Required Required Action

Action No.

-
-
-

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

- No Action Required Required Action

Action No.

- In the event that migratory birds are encountered on-site during project construction, every effort will be made to avoid harm of protected birds, active nests, eggs and/or young.
- Migratory bird nesting activity can be concentrated on roadway structures such as bridges and culverts. Remove all old migratory bird nests from any structures between September 1 and January 31, and while the nests are not occupied or being used by migratory birds. In addition, be prepared to prevent migratory birds from re-nesting between February 1 and August 31.
- All methods used for the removal of old bird nests and the prevention of re-nesting must be approved by the Engineer, well in advance of the planned use.
- In the event that any active nest of a migratory bird species is encountered on-site during project construction, all construction activity, within the immediate vicinity of the nest, will cease immediately. Contact the Engineer to determine how to proceed.
- Notify the contractor of the possibility that the Texas Garter Snake may be present and to avoid harm to the snake.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- * Dead or distressed vegetation (not identified as normal)
- * Trash piles, drums, canister, barrels, etc.
- * Undesirable smells or odors
- * Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

- Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

- Yes No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

- No Action Required Required Action

Action No.

-
-
-


VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

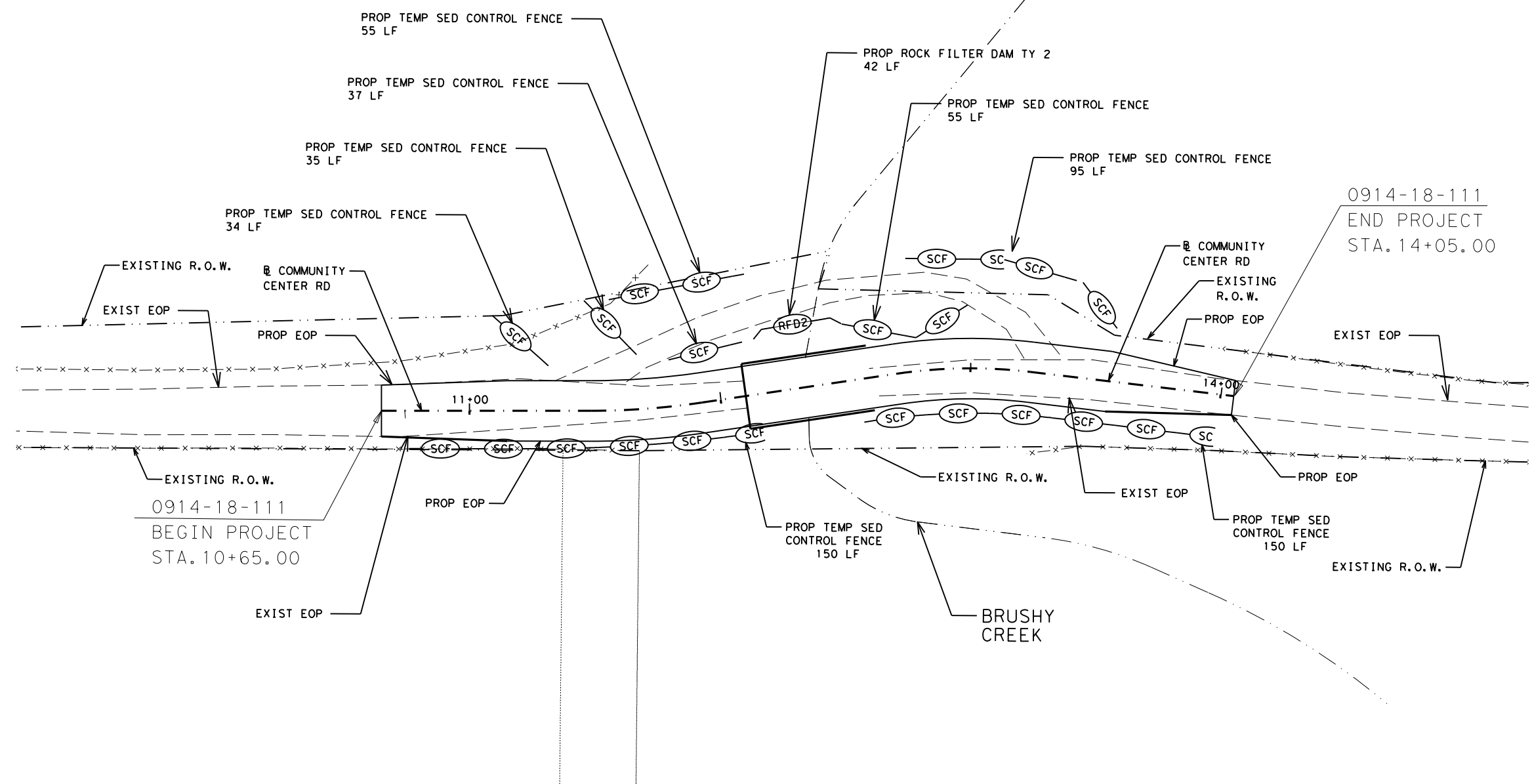
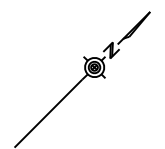
- No Action Required Required Action

Action No.

-
-
-

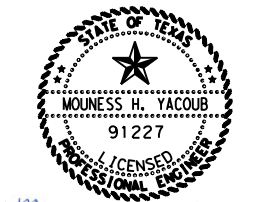
 Texas Department of Transportation		Design Division Standard		
<h2>ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS</h2> <h1>EPIC</h1>				
FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
© TxDOT January 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
12-12-2011 (DS)	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	87	

DATE: 1/26/2022 11:00:08 AM
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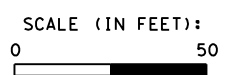


LEGEND

	PROPOSED TOPSOIL & SEEDING
	ROCK FILTER DAM
	SEDIMENT CONTROL FENCE FLOW



Mouness Yacoub P.E.
 01/26/2022



NOTE TO CONTRACTOR:
 NUMBER SEDIMENT CONTROL FENCE SECTIONS AND ROCK FILTER DAMS WITH PERMANENT MARKING AS SHOWN ON THIS SHEET FOR IDENTIFICATION PURPOSES TO ASSIST WITH THE REPAIR OR REPLACEMENT OF DAMAGED SECTIONS.
 SEE CROSS SECTIONS FOR LIMITS OF TOPSOIL.

**Austin District
 Central Design**

Texas Department of Transportation

**CR 290
 EROSION CONTROL
 LAYOUT**

SHEET 1 OF 1

© 2022	CONT	SECT	JOB	HIGHWAY
DS: CK:	0914	18	111, etc.	CR290, etc.
DW: CK:	DIST		COUNTY	SHEET NO.
AUS		BASTROP		88

A. GENERAL SITE DATA

1. PROJECT LIMITS:
 ON YOUNG RD AT BRANCH OF REEDS CREEK STR AA0197001
 PROJECT LENGTH = 350 FT. = 0.066 MILES
 PROJECT COORDINATES:
 LATITUDE: N 30.00869899
 LONGITUDE: W -97.25828251
 PROJECT LOCATION:
 BEG LATITUDE: +30.008933 BEG LONGITUDE: -97.25863611
 END LATITUDE: +30.008463 END LONGITUDE: -97.25777222
2. PROJECT SITE MAPS:
 * PROJECT LOCATION MAP: **TITLE SHEET**
 * DRAINAGE PATTERNS: **DRAINAGE AREA MAP**
 * SLOPES ANTICIPATED AFTER MAJOR GRADINGS OR AREAS OF SOIL DISTURBANCE: **EXISTING AND PROPOSED TYPICAL SECTIONS**
 * LOCATION OF EROSION AND SEDIMENT CONTROLS: **EROSION CONTROL PLAN**
 * SURFACE WATERS AND DISCHARGE LOCATIONS: **DRAINAGE LAYOUTS**
 * PROJECT SPECIFIC LOCATIONS: TO BE SPECIFIED BY THE PROJECT FIELD OFFICE DURING CONSTRUCTION AND LOCATED IN THE PROJECT SW3P FILE. REFERENCE ITEM #10 BELOW
3. PROJECT DESCRIPTION: **REPLACE BRIDGE AND APPROACHES**
4. MAJOR SOIL DISTURBING ACTIVITIES: **REMOVAL OF BRIDGE, REPLACING BRIDGE APPROACHES AND PREPARATION OF ROW**
5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:
90.0%
6. TOTAL PROJECT AREA: **0.289 ACRES**
7. TOTAL AREA TO BE DISTURBED: **0.286 ACRES**
8. WEIGHTED RUNOFF COEFFICIENT
 BEFORE CONSTRUCTION: **0.60**
 AFTER CONSTRUCTION: **0.60**
9. NAME OF RECEIVING WATERS: (SEGMENT NUMBER OF RECEIVING WATERS)
STORMWATER RUNOFF WOULD FLOW INTO BRANCH OF REEDS CREEK WHICH FLOWS TO THE COLORADO RIVER. THE PROJECT IS LOCATED IN THE COLORADO RIVER BASIN - SEGMENT 1428.
10. PROJECT SW3P FILE: FOR PROJECTS DISTURBING ONE ACRE OR MORE, TXDOT WILL MAINTAIN AN SW3P FILE WITH ALL PERTINENT ENVIRONMENTAL DOCUMENTS, CORRESPONDENCE, ETC. AT THE PROJECT FIELD OFFICE. IF NO FIELD OFFICE IS AVAILABLE THEN THE SW3P FILE SHALL BE KEPT IN THE INSPECTOR'S TRUCK.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES:
 TEMPORARY SEEDING
 PERMANENT PLANTING, SODDING, OR SEEDING
 MULCHING
 SOIL RETENTION BLANKET
 BUFFER ZONES
 PRESERVATION OF NATURAL RESOURCES
 OTHER:
2. STRUCTURAL PRACTICES:
 SILT FENCES
 ROCK FILTER DAMS
 DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
 DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
 DIVERSION DIKE AND SWALE COMBINATIONS
 PIPE SLOPE DRAINS
 PAVED FLUMES
 ROCK BEDDING AT CONSTRUCTION EXIT
 TIMBER MATTING AT CONSTRUCTION EXIT
 CHANNEL LINERS
 SEDIMENT TRAPS
 SEDIMENT BASINS
 STORM INLET SEDIMENT TRAP
 STONE OUTLET STRUCTURES
 CURBS AND GUTTERS
 STORM SEWERS
 VELOCITY CONTROL DEVICES
 OTHER:
3. STORM WATER MANAGEMENT:
 STORM WATER DRAINAGE WILL BE PROVIDED BY **EXISTING DITCHES.**
 THIS SYSTEM WILL CARRY THE DRAINAGE WITHIN THE RIGHT-OF-WAY TO **THE COLORADO RIVER VIA BRANCH OF REEDS CREEK.**
4. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)
 1. **INSTALL ROCK FILTER DAMS AND TEMPORARY SEDIMENT CONTROL FENCE AS SHOWN IN THE PLANS.**
 2. **SET UP TRAFFIC CONTROL & DETOUR, REMOVE EXISTING BRIDGE, HEADWALLS, AND ABUTMENTS, AS SHOWN ON PLANS.**
 3. **EXCAVATE AND PREPARE SUBGRADE FOR PLACEMENT OF BRIDGE PER BRIDGE LAYOUT SHEET.**
 4. **INSTALL PROPOSED BRIDGE. BACKFILL AND PLACE FLEXBASE TO PGL GRADE AS PER CULVERT LAYOUT, PLAN AND PROFILE SHEETS AND TYPICAL SECTIONS.**
 5. **COMPLETE TOPSOIL / SEED ON SLOPES.**
 6. **ESTABLISH GRASS GROWTH ON PERMANENT SLOPES UTILIZING TOPSOIL / SEED.**
 7. **WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND THE SITE IS ESTABLISHED AND APPROVED BY THE PROJECT ENGINEER, THEN REMOVE ALL TEMPORARY STRUCTURAL CONTROLS AND RESOD ANY AREAS DISTURBED BY THEIR REMOVAL.**
5. NON-STORM WATER DISCHARGES:
 FILTER NON-STORM WATER DISCHARGES, OR HOLD RETENTION BASINS, BEFORE BEING ALLOWED TO MIX WITH STORM WATER. THESE DISCHARGES CONSIST OF NON-POLLUTED GROUND WATER, SPRING WATER, FOUNDATION AND/OR FOOTING DRAIN WATER; AND WATER USED FOR DUST CONTROL, PAVEMENT WASHING AND VEHICLE WASHWATER CONTAINING NO DETERGENTS.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
 MAINTENANCE WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.
 2. INSPECTION:
 INSPECTION WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.
 3. WASTE MATERIALS:
 ALL WASTE MATERIALS WILL BE COLLECTED, STORED AND DISPOSED OF IN A LEGAL AND PROPER MANNER. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.
 4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
 AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS. PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR MUST BE CONTACTED IMMEDIATELY.
 5. SANITARY WASTE:
 ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.
- OFFSITE VEHICLE TRACKING:
- HAUL ROADS DAMPENED FOR DUST CONTROL
 LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
 EXCESS DIRT ON ROAD REMOVED DAILY
 STABILIZED CONSTRUCTION ENTRANCE
- OTHER:
- REMARKS: DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL SEDIMENT FROM ENTERING RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WATERBODY OR STREAMBED.
- CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED TO MINIMIZE THE RUNOFF OF POLLUTANTS.

**YOUNG RD
 STORM WATER
 POLLUTION
 PREVENTION
 PLAN (SW3P)**

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation for the conversion of this standard to any other format. The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation for the conversion of this standard to any other format.

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 1122.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

- 1.
2. No Action Required Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

- No Permit Required
- Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
- Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# 3a without ACN

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. Willow Creek, STA 12+87.50 to 13+37.50.
- 2.
- 3.
- 4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input checked="" type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input checked="" type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	

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.

- No Action Required Required Action

Action No.

- 1.
- 2.
- 3.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

- No Action Required Required Action

Action No.

1. In the event that migratory birds are encountered on-site during project construction, every effort will be made to avoid harm of protected birds, active nests, eggs and/or young.
2. Migratory bird nesting activity can be concentrated on roadway structures such as bridges and culverts. Remove all old migratory bird nests from any structures between September 1 and January 31, and while the nests are not occupied or being used by migratory birds. In addition, be prepared to prevent migratory birds from re-nesting between February 1 and August 31.
3. All methods used for the removal of old bird nests and the prevention of re-nesting must be approved by the Engineer, well in advance of the planned use.
4. In the event that any active nest of a migratory bird species is encountered on-site during project construction, all construction activity, within the immediate vicinity of the nest, will cease immediately. Contact the Engineer to determine how to proceed.
5. Notify the contractor of the possibility that the Texas Garter Snake may be present and to avoid harm to the snake.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- * Dead or distressed vegetation (not identified as normal)
- * Trash piles, drums, canister, barrels, etc.
- * Undesirable smells or odors
- * Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

- Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

- Yes No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

- No Action Required Required Action

Action No.

- 1.
- 2.
- 3.


VII. OTHER ENVIRONMENTAL ISSUES

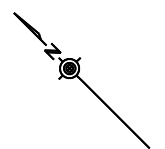
(includes regional issues such as Edwards Aquifer District, etc.)

- No Action Required Required Action

Action No.

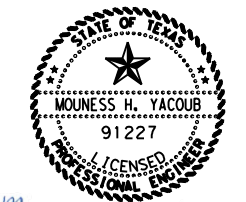
- 1.
- 2.
- 3.

		Design Division Standard		
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC				
FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
© TxDOT January 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0914	18	111, etc.	CR290, etc.
12-12-2011 (DS)	DIST	COUNTY	SHEET NO.	
	AUS	BASTROP	90	



LEGEND

	PROPOSED TOPSOIL & SEEDING
	ROCK FILTER DAM
	SEDIMENT CONTROL FENCE
	FLOW



Mouness H. Yacoub P.E.
01/26/2022

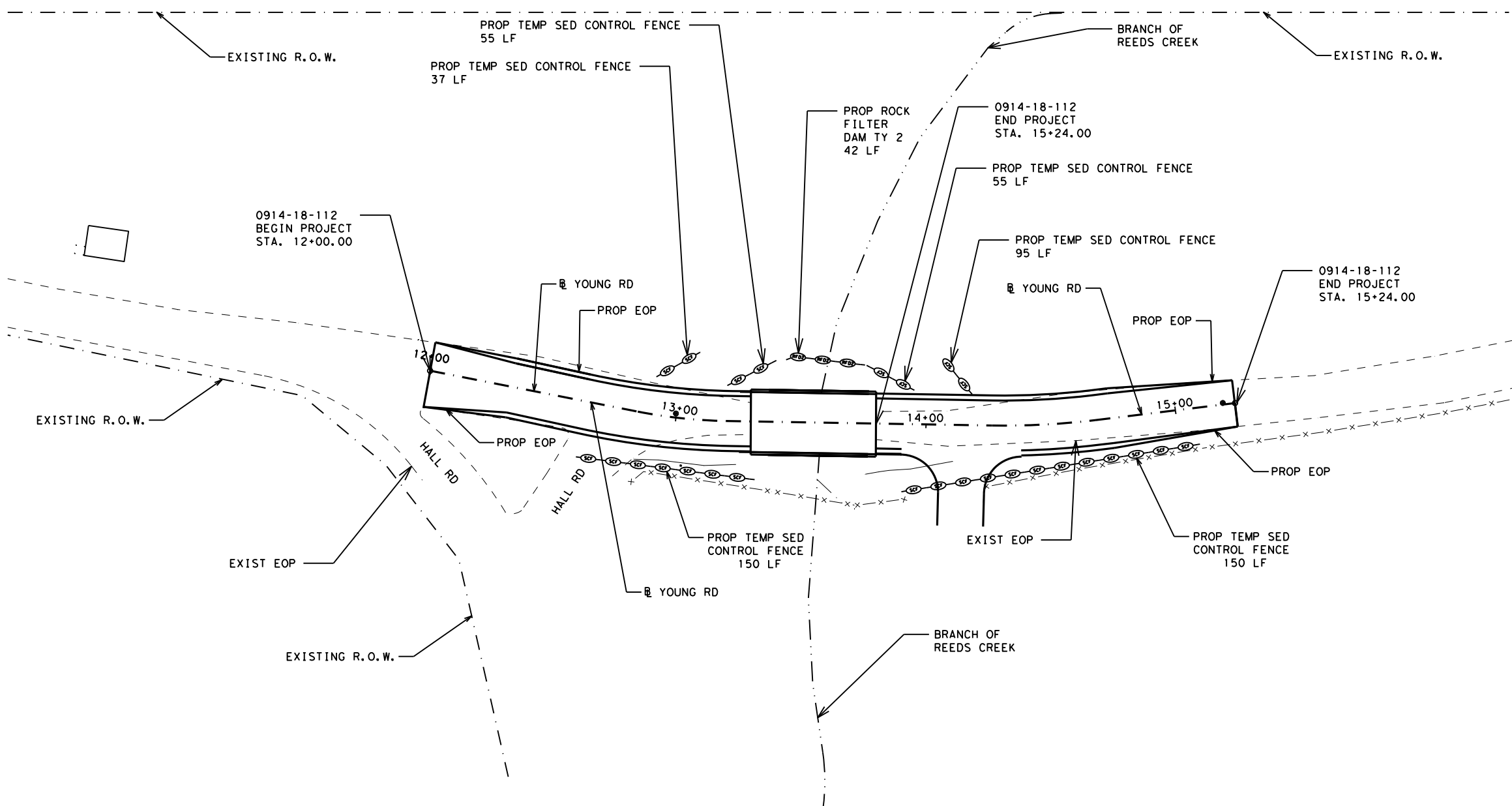


**Austin District
Central Design**

**YOUNG RD
EROSION CONTROL
LAYOUT**

SHEET 1 OF 1

DS:	CK:	0914	18	111, etc.	CR290, etc.
DW:	CK:	AUS	BASTROP	91	

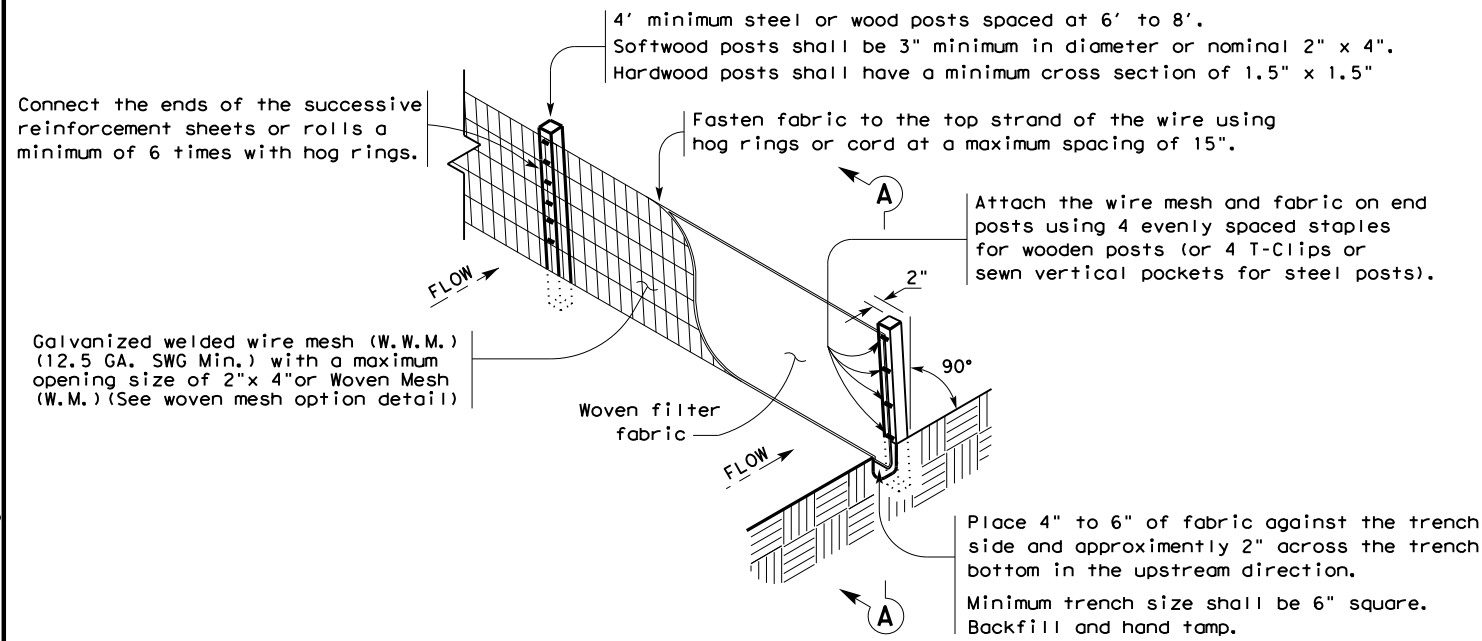


NOTE TO CONTRACTOR:
NUMBER SEDIMENT CONTROL FENCE SECTIONS AND ROCK FILTER DAMS WITH PERMANENT MARKING AS SHOWN ON THIS SHEET FOR IDENTIFICATION PURPOSES TO ASSIST WITH THE REPAIR OR REPLACEMENT OF DAMAGED SECTIONS.
SEE CROSS SECTIONS FOR LIMITS OF TOPSOIL AND SOIL RETENSION BLANKET.

DATE:
FILE:

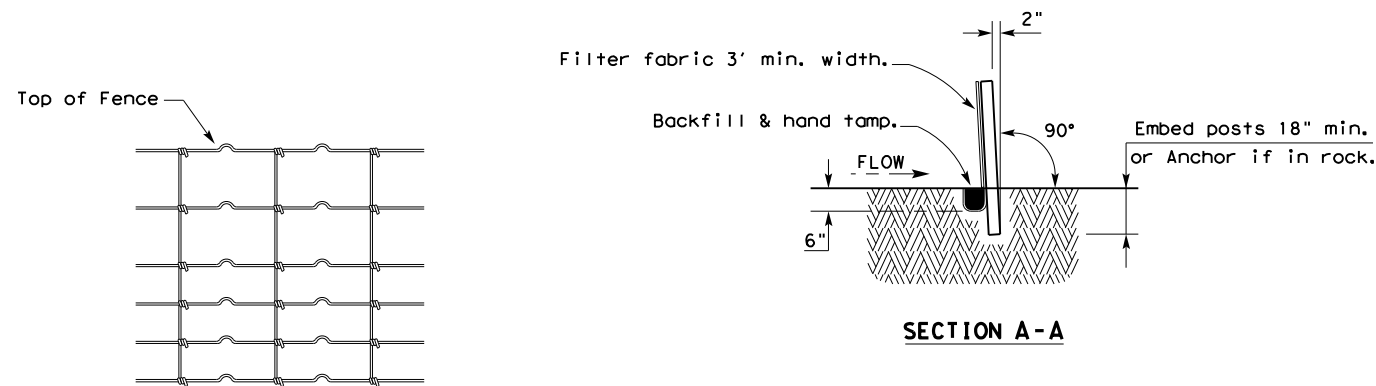
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TEMPORARY SEDIMENT CONTROL FENCE

SCF



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

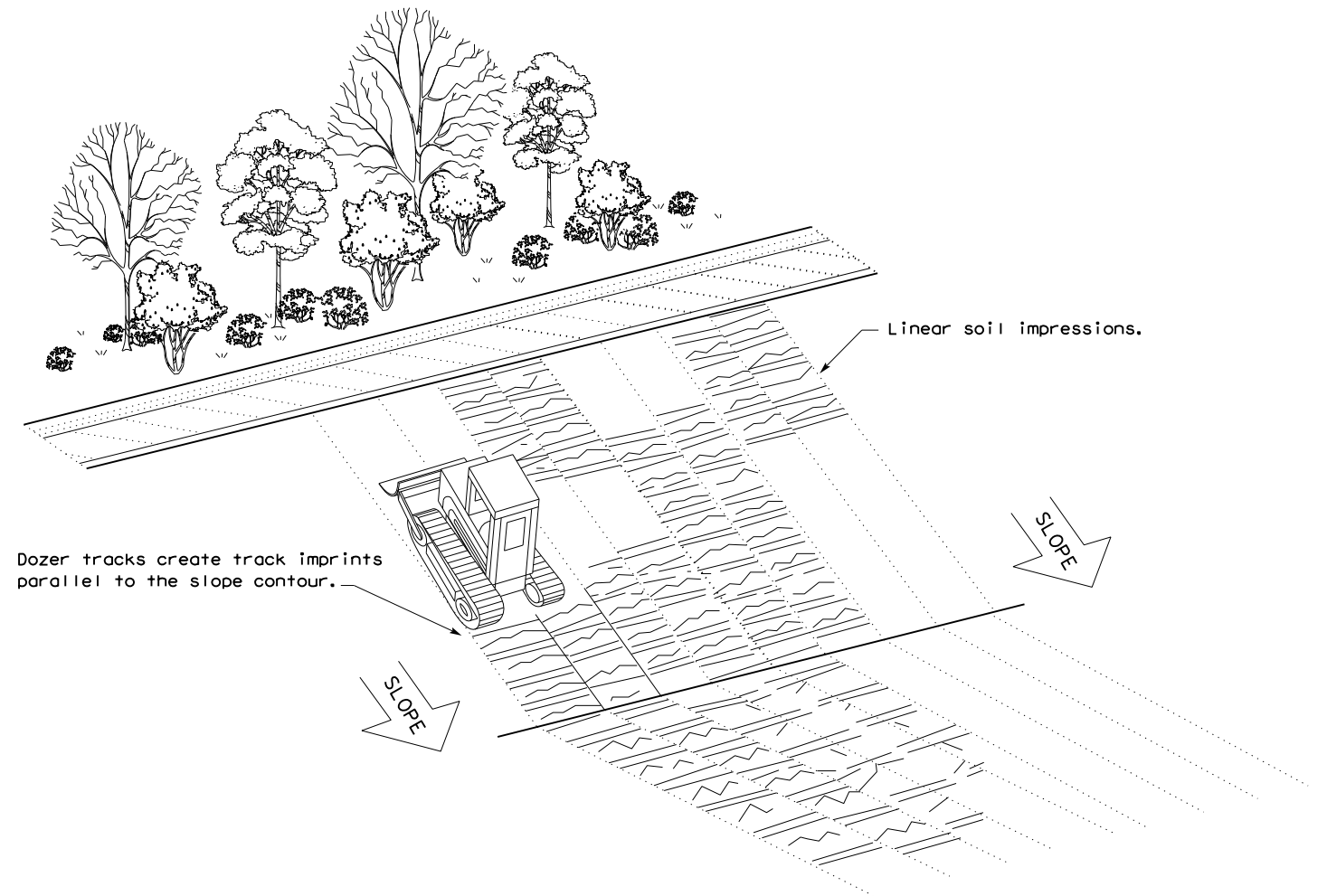
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

				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	
© 2022	JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS		0914	18	111, etc.	CR290, etc.
		DIST	COUNTY		SHEET NO.
		AUS	BASTROP		92

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 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\091418\CR290\091418-111\091418-111.dgn

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 416-340N
 Crossing Type: **** AT GRADE**
 RR Company Owning Track at Crossing: UPRR
 Operating RR Company at Track: UPRR, BNSF
 RR MP: 0962.33
 RR Subdivision: Waco
 City: Smithville
 County: Bastrop
 CSJ at this Crossing: 0914-18-111
 Highway/Roadway name crossing the railroad: FM 2571
 # of regularly scheduled trains per day at this crossing: 4
 # of switching movements per day at this crossing: 0
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:

BRIDGE REPLACEMENT WORK ON YOUNG RD WHICH IS ADJACENT TO UP ROW AND NOT ON UP ROW

Scope of Work at this Crossing to Be Performed by Railroad Company:

NONE

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 0

On this project, night or weekend flagging is:

Expected

Not Expected

Flagging services will be provided by:

Railroad Company: TxDOT will pay flagging invoices

Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

Not Required

Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

Required

Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
Commercial General Liability	\$2,000,000 / \$4,000,000
Business Automobile	\$2,000,000 combined single limit
Railroad Protective Liability	
<input checked="" type="checkbox"/> Not Required	
<input type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

Not Required

Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)

Required: Contractor to obtain (see Item 5, Article 8.4)

With the following railroad companies: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

<http://www.txdot.gov/inside-txdot/division/rail/samples.html>

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

Not Required

Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call UPRR EMERGENCY LINE
AT 800-848-8715
 Location: FM 2571
 DOT#: 416340N
 RR Milepost : 962.33
 Subdivision : Waco

Texas Department of Transportation				<i>Rail Division</i>	
RAILROAD SCOPE OF WORK					
PROJECT SPECIFIC DETAILS					
FILE: RR Scope of Work.dgn	DN: TxDOT	CK: _____	DW: _____	CK: _____	
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY	
3/2020	REVISIONS	0914 18	111, etc.	CR290, etc.	
	DIST	COUNTY		SHEET NO.	
	AUS	BASTROP		94	

DATE: 1/26/2022 10:39:02 AM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\14 - AUS\Design Projects\091418\CR290\091418-18-111\091418-18-111.dgn
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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 416-341V
 Crossing Type: **** AT GRADE**
 RR Company Owning Track at Crossing: UPRR
 Operating RR Company at Track: UPRR, BNSF
 RR MP: 0962.83
 RR Subdivision: Waco
 City: Smithville
 County: Bastrop
 CSJ at this Crossing: 0914-18-111
 Highway/Roadway name crossing the railroad: CR 197
 # of regularly scheduled trains per day at this crossing: 4
 # of switching movements per day at this crossing: 0
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:
BRIDGE REPLACEMENT WORK ON YOUNG RD WHICH IS ADJACENT TO UP ROW AND NOT ON UP ROW

Scope of Work at this Crossing to Be Performed by Railroad Company:
NONE

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 0
 On this project, night or weekend flagging is:
 Expected
 Not Expected
 Flagging services will be provided by:
 Railroad Company: TxDOT will pay flagging invoices
 Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

UPRR - UP.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 BNSF - BNSF.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 KCS - KCS.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 - Bottom Line On-Track Safety Services
 bottomline076@aol.com, 903-767-7630
 OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

Not Required
 Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:
 Required
 Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.
 The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.
 Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.
 No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
Commercial General Liability	\$2,000,000 / \$4,000,000
Business Automobile	\$2,000,000 combined single limit
Railroad Protective Liability	
<input checked="" type="checkbox"/> Not Required	
<input type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:
 Not Required
 Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
 Required: Contractor to obtain (see Item 5, Article 8.4)
 With the following railroad companies: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

<http://www.txdot.gov/inside-txdot/division/rail/samples.html>

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:
 Not Required
 Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call UPRR EMERGENCY LINE
AT 800-848-8715
Location: FM 2571
DOT#: 416340N
RR Milepost : 962.33
Subdivision : Waco

Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK: _____	DW: _____	CK: _____
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
3/2020	0914 18	111, etc.	CR290, etc.	
DIST	COUNTY		SHEET NO.	
AUS	BASTROP		95	

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PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad 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					
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REVISIONS March 2020	0914 18	111, etc.	CR290, etc.		
	DIST	COUNTY	SHEET NO.		
	AUS	BASTROP	96		

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3.09 MAINTENANCE OF RAILROAD FACILITIES

- A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.
- B. Perform all such maintenance and repair of damages due to the 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 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				
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