

SEE SHEET 2 FOR INDEX OF SHEETS

# STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

## PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. :  
CONTROL SECTION JOB : 0133-04-042

### BAYLOR COUNTY US 82

LIMITS: FROM: KNOX COUNTY LINE  
TO: BU 183B

TOTAL LENGTH OF PROJECT =	BRIDGE =	0.00FT. =	0.000MI.
	ROADWAY =	66,353.48FT. =	12.567MI.
	TOTAL =	66,353.48FT. =	12.567MI.

TYPE OF WORK: FOR THE CONSTRUCTION OF THE UPGRADING OF A NON-FREEWAY FACILITY  
CONSISTING OF: THE WIDENING OF THE STRUCTURES

DIV. NO.	FPN			NO.
6				1
STATE	DIST.	COUNTY		
TEXAS	WFS	BAYLOR		
CONT.	SECT.	JOB	HIGHWAY NO.	
0133	04	042	US 82	

US 82  
MAIN LANE DESIGN SPEED = STA 34+20.00-658+00.00 - 70 MPH  
STA 658+00.00-697+73.48 - 45 MPH  
ADT (2019) = 2700 VPD  
ADT (2039) YR PROJECTED ADT = 3780  
FUNCTIONAL CLASSIFICATION:

CONTRACTOR NAME: \_\_\_\_\_  
CONTRACTOR ADDRESS: \_\_\_\_\_  
LETTING DATE: \_\_\_\_\_  
DATE WORK BEGAN: \_\_\_\_\_  
DATE WORK COMPLETED: \_\_\_\_\_  
DATE OF ACCEPTANCE: \_\_\_\_\_

SUBMITTED FOR  
LETTING: 12-15-2020  
*STE. SIMMONS, P.E.*  
STEVEN E. SIMMONS, P.E.

PLANS PREPARED BY:  
**HUITT-ZOLLARS**  
3701 EXECUTIVE CENTER DRIVE - SUITE 101  
AUSTIN, TX 78731  
FIRM NO. F-761



SUBMITTED FOR LETTING 09/27/2021  
*Monty F. Brown, P.E.*  
DESIGN ENGINEER

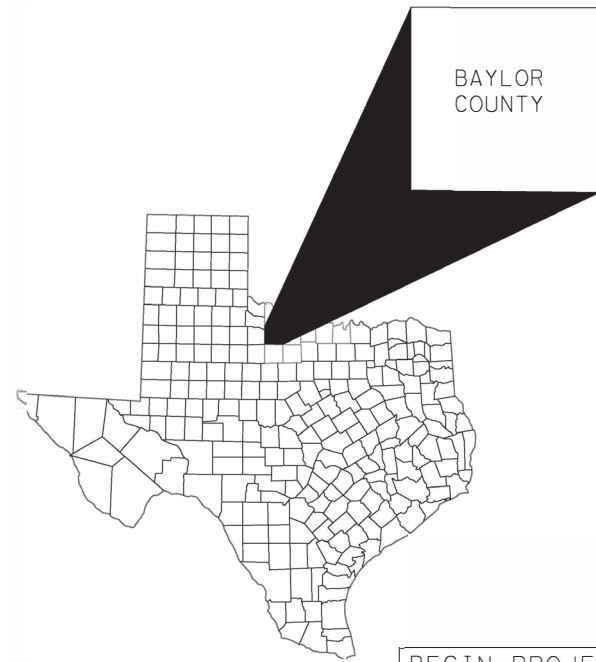
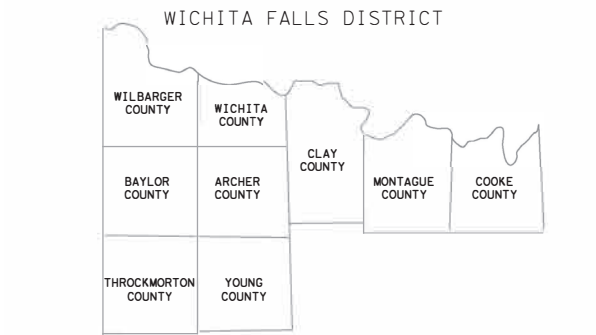
APPROVED FOR LETTING \_\_\_\_\_  
DIRECTOR, TRAFFIC OPERATIONS DIVISION

RECOMMENDED FOR LETTING 9/30/2021  
*James S. Reaves, P.E.*  
DISTRICT DIRECTOR OF TRANSPORTATION  
PLANNING AND DEVELOPMENT

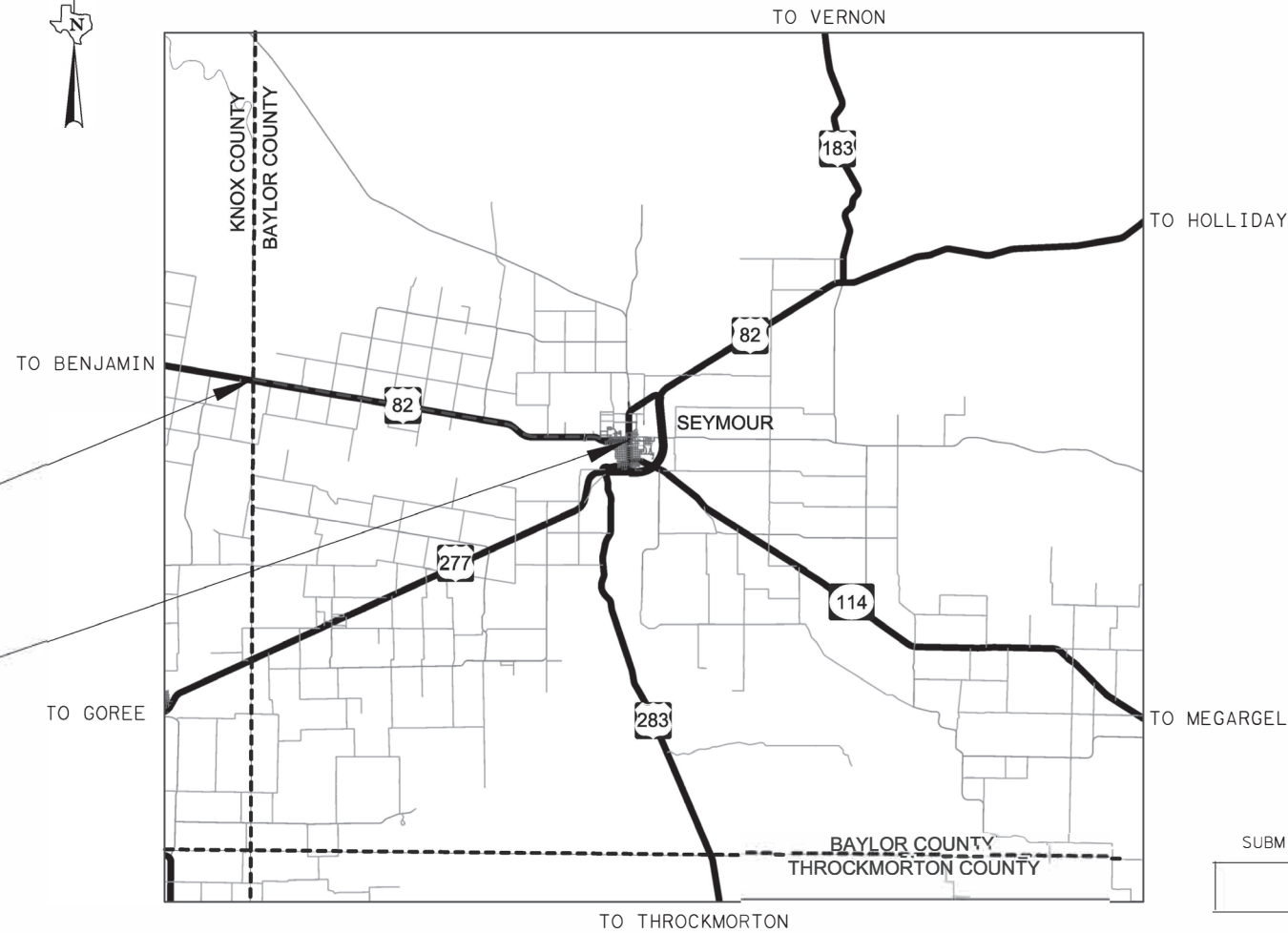
APPROVED FOR LETTING \_\_\_\_\_  
DIRECTOR, BRIDGE DIVISION

RECOMMENDED FOR LETTING 09/28/2021  
*Nicholas D. Brown, P.E.*  
DISTRICT ENGINEER

APPROVED FOR LETTING \_\_\_\_\_  
DIRECTOR, DESIGN DIVISION



BEGIN PROJECT  
CSJ: 0133-04-042  
STA. 34+20.00  
REF. MARKER 458+0.00  
  
END PROJECT  
STA. 697+73.48  
REF. MARKER 469.446



VICINITY MAP  
EXCEPTIONS: NONE  
EQUATIONS: NONE  
RAILROAD X-INGS: NONE

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

HWY. NO. \_\_\_\_\_ LETTING DATE \_\_\_\_\_  
 DATE ACCEPTED \_\_\_\_\_  
 DATE: 12/15/2020  
 FILE: ...X01\*GENERAL\5563804-TTL-01.dgn

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		326-327	WFS-TA-VES

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



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

Kyle J. Poirot, P.E.

NAME  
9/24/2021  
DATE

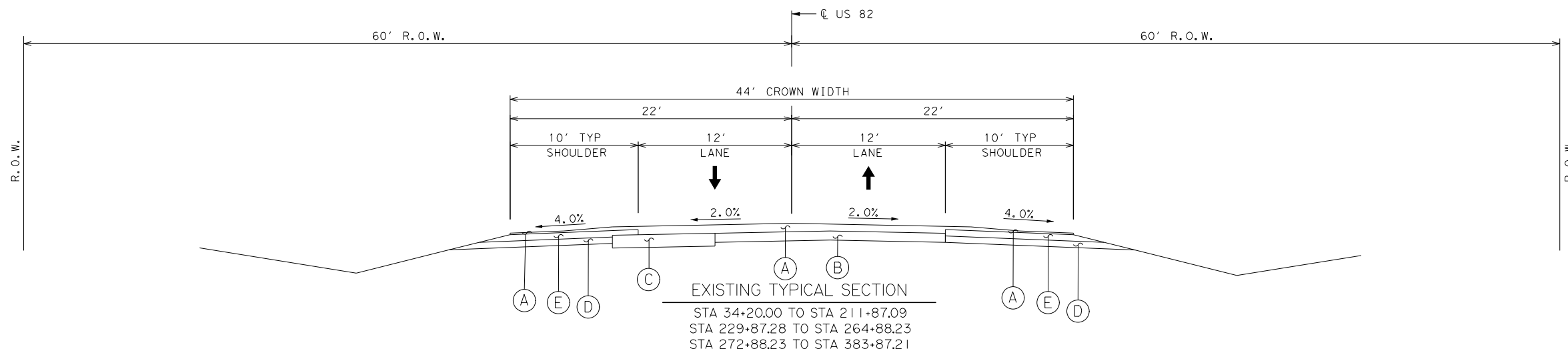
US 82  
INDEX OF  
SHEETS

Texas Department of Transportation  
SHEET 1 OF 1

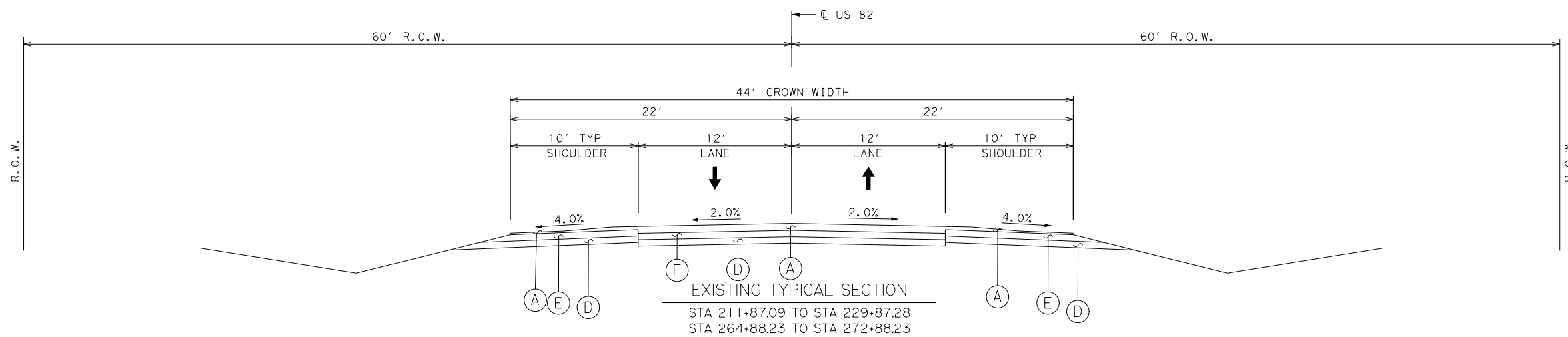
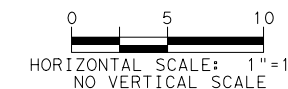
CONT	SECT	JOB	HIGHWAY
0133	04	042	us 82
DIST	COUNTY		SHEET NO.
WFS	BAYLOR		2

LEGEND

- (A) VARIES 1.5" TO 6.5" HOT MIX
- (B) 8.5" FLEX BASE
- (C) 12" FLEX BASE
- (D) 6" FLEX BASE
- (E) 6" LIME TREATED FLEX BASE
- (F) 6" SOIL CEMENT BASE
- (G) 6" CONCRETE PAVEMENT



NOTE: EXISTING CROSS SLOPES MAY VARY



12/14/2020

**EXISTING TYPICAL SECTIONS**

SHEET 1 OF 2

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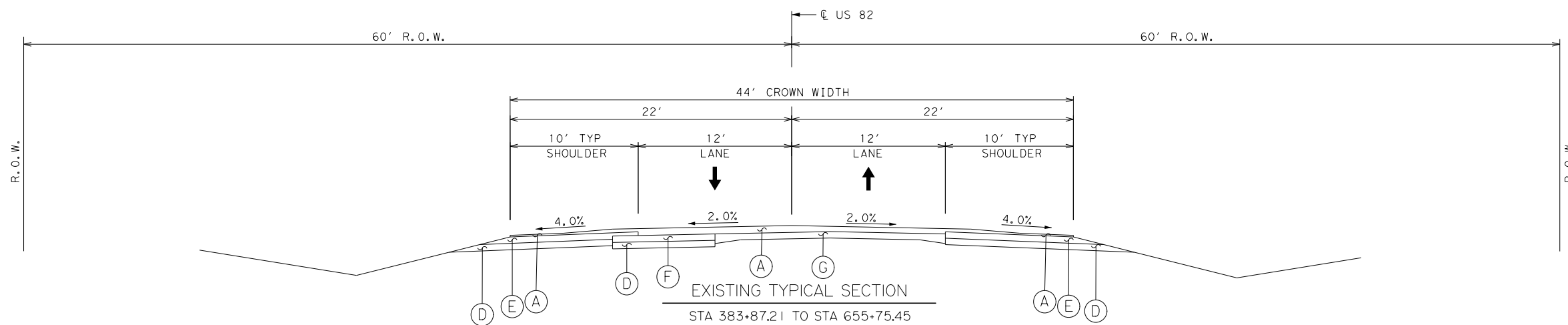
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		3	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

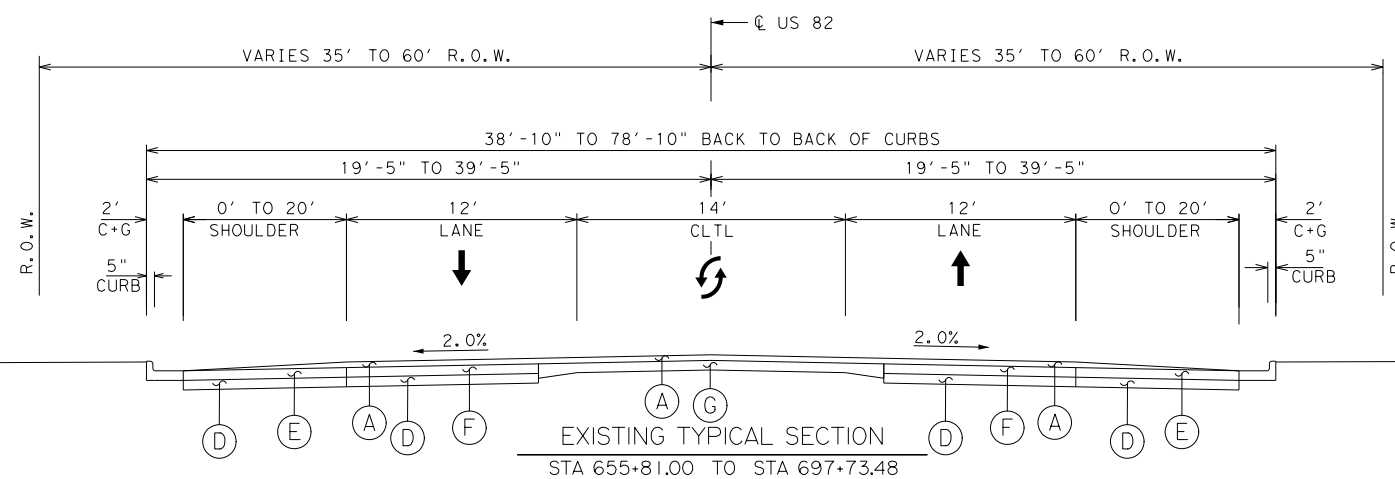
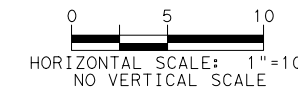
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**LEGEND**

- (A) VARIES 1.5" TO 6.5" HOT MIX
- (B) 8.5" FLEX BASE
- (C) 12" FLEX BASE
- (D) 6" FLEX BASE
- (E) 6" LIME TREATED FLEX BASE
- (F) 6" SOIL CEMENT BASE
- (G) 6" CONCRETE PAVEMENT



NOTE: EXISTING CROSS SLOPES MAY VARY



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**EXISTING TYPICAL SECTIONS**

SHEET 2 OF 2

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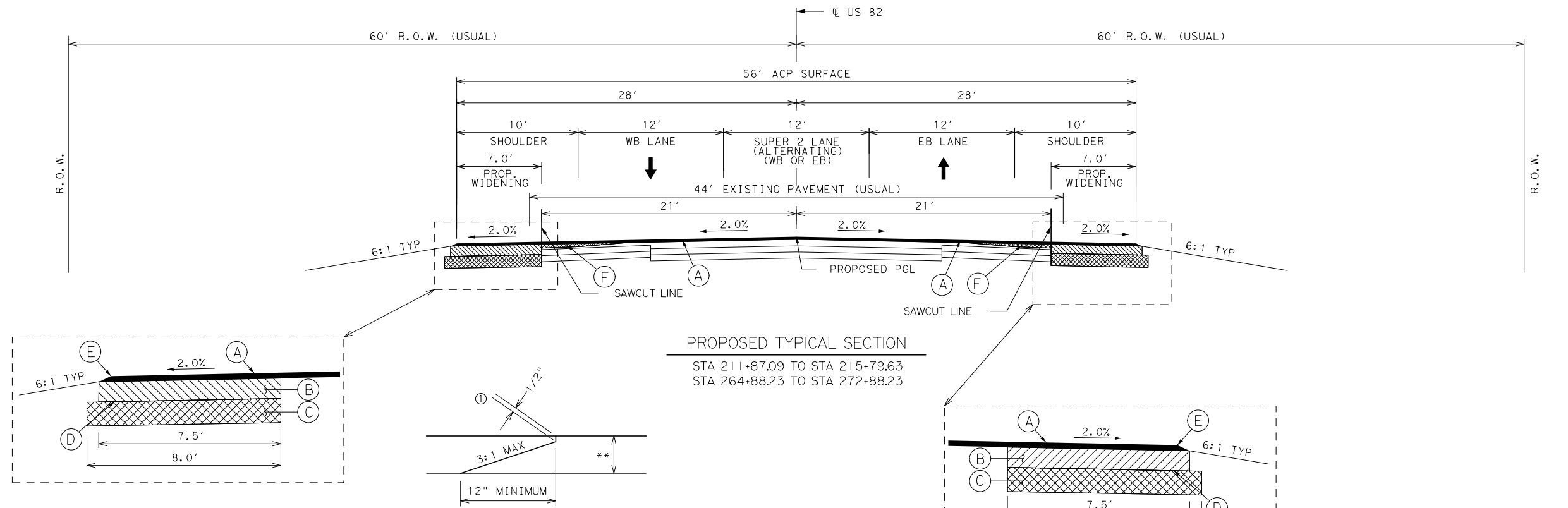
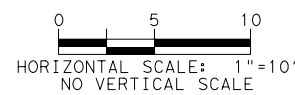
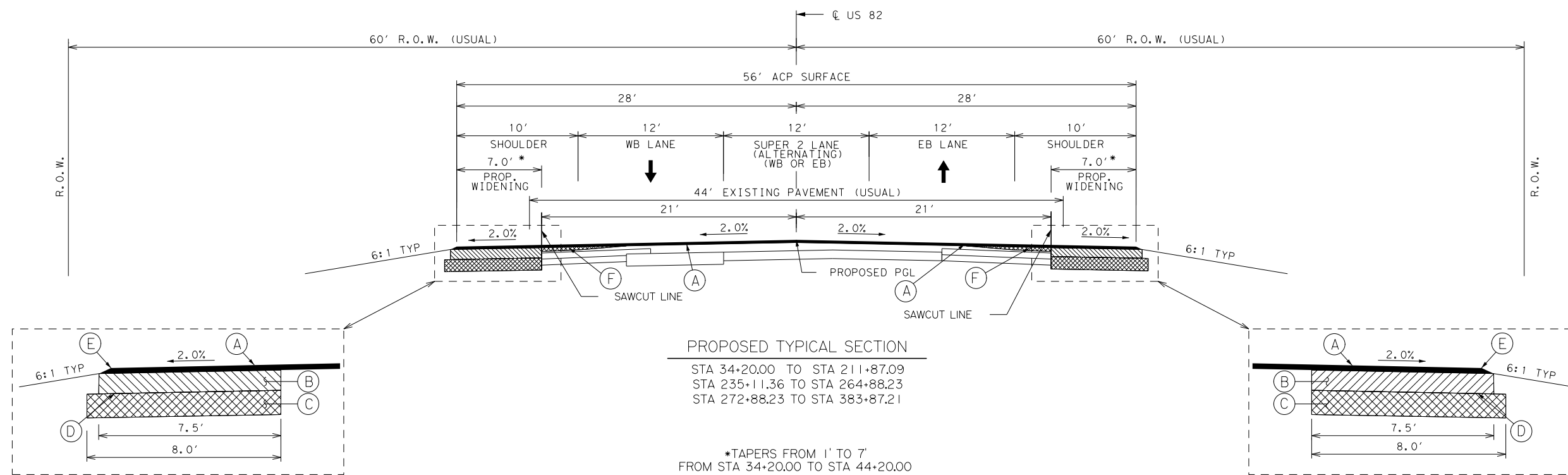
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FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		4	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

LEGEND

- (A) 2" TYPE D HOT MIX SURFACE
- (B) 6" TYPE B HOT MIX BASE
- (C) 8" CEMENT TREATED SUBGRADE
- (D) PRIME COAT
- (E) TAPERED EDGE
- (F) ACP LEVEL UP CROSS-SLOPE CORRECTION WEDGE
- (G) 2" MILL



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PROPOSED TYPICAL SECTIONS

SHEET 1 OF 5



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 FIRM NO. F-761

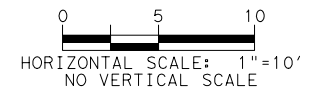
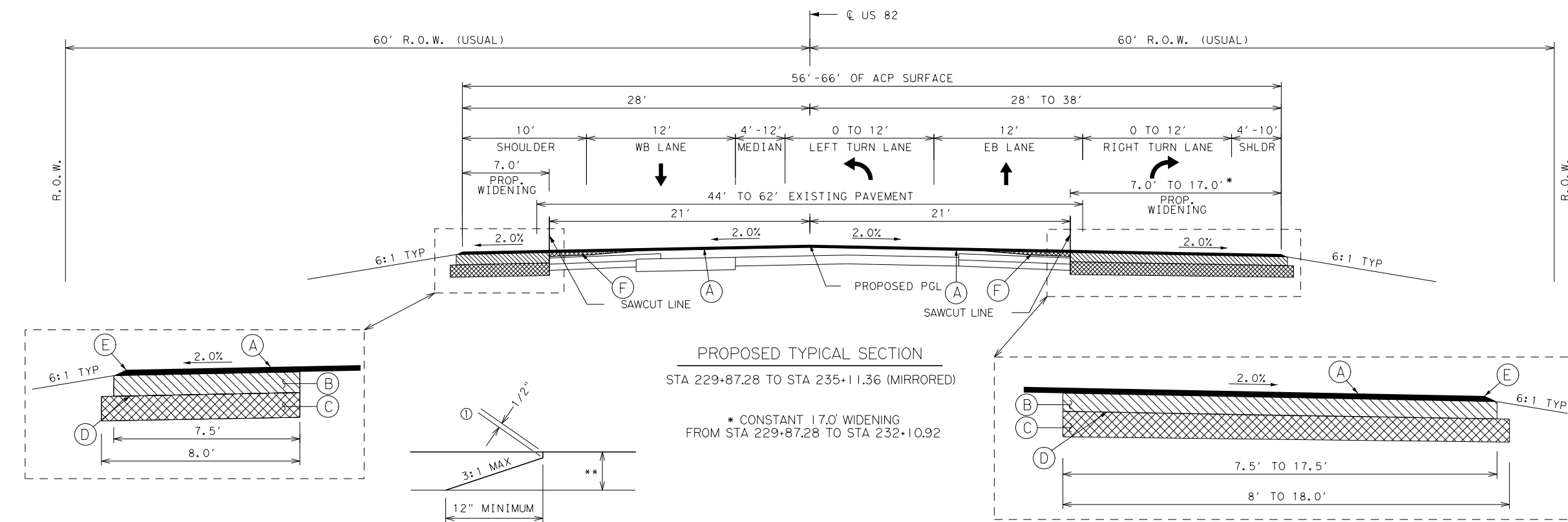
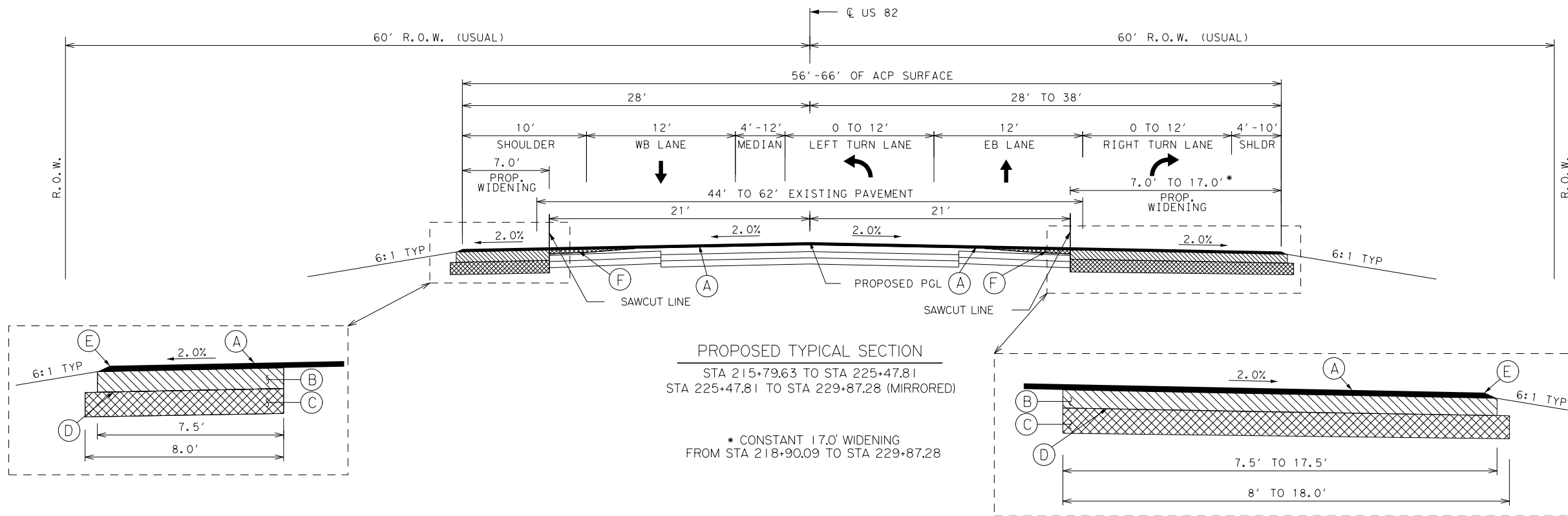
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STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO.
		US 82

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TAPERED JOINT DETAIL  
 HMA THICKNESS LESS THAN 2"  
 \*\* SEE TYPICAL SECTION FOR DEPTH AND TYPE OF HMA  
 DEPTH >= LARGEST AGGREGATE IN MIX

LEGEND

- (A) 2" TYPE D HOT MIX SURFACE
- (B) 6" TYPE B HOT MIX BASE
- (C) 8" CEMENT TREATED SUBGRADE
- (D) PRIME COAT
- (E) TAPERED EDGE
- (F) ACP LEVEL UP CROSS-SLOPE CORRECTION WEDGE
- (G) 2" MILL



12/14/2020

PROPOSED TYPICAL SECTIONS

SHEET 2 OF 5



HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

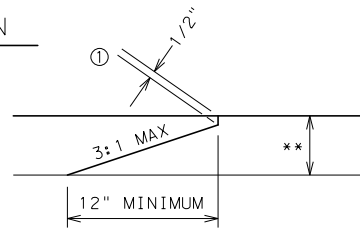
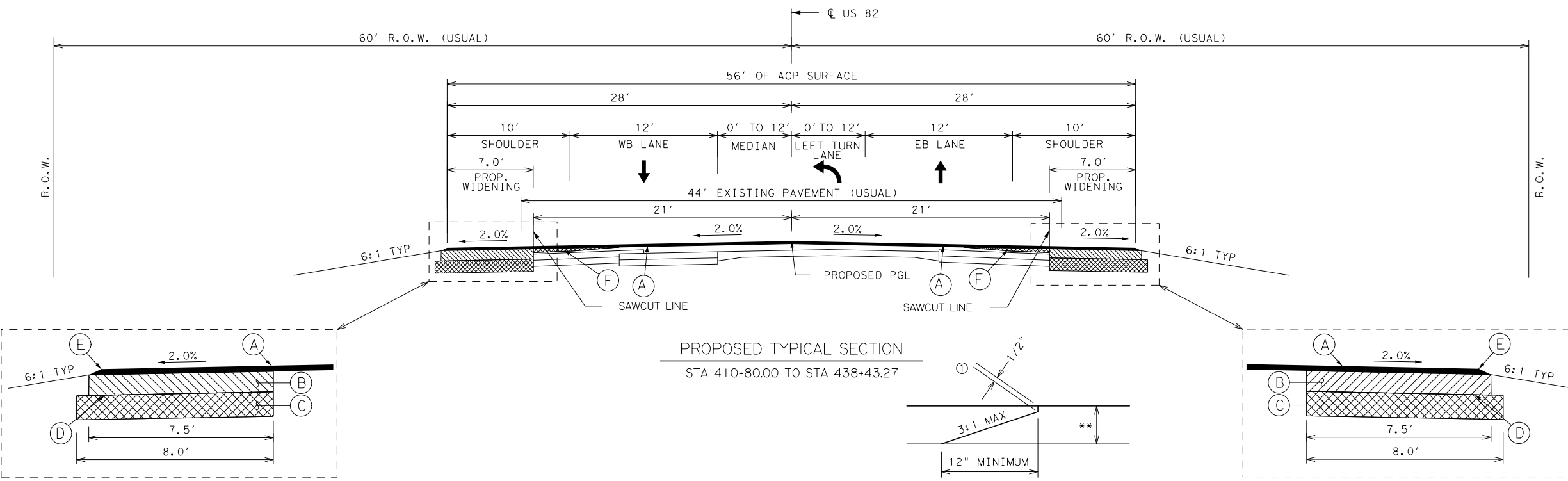
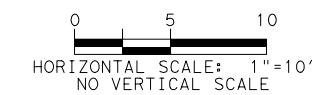
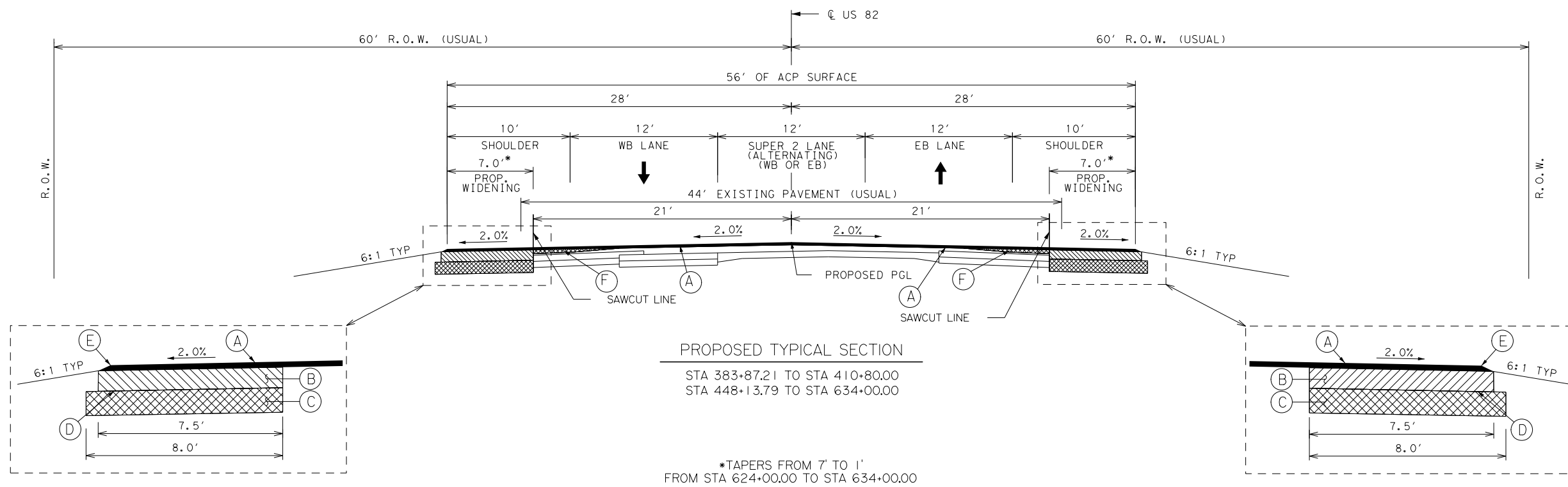
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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TAPERED JOINT DETAIL  
 HMA THICKNESS LESS THAN 2"  
 \*\* SEE TYPICAL SECTION FOR DEPTH AND TYPE OF HMA  
 DEPTH > LARGEST AGGREGATE IN MIX

LEGEND

- (A) 2" TYPE D HOT MIX SURFACE
- (B) 6" TYPE B HOT MIX BASE
- (C) 8" CEMENT TREATED SUBGRADE
- (D) PRIME COAT
- (E) TAPERED EDGE
- (F) ACP LEVEL UP CROSS-SLOPE CORRECTION WEDGE
- (G) 2" MILL



12/14/2020

PROPOSED TYPICAL SECTIONS

SHEET 3 OF 5



HUITT-ZOLLARS

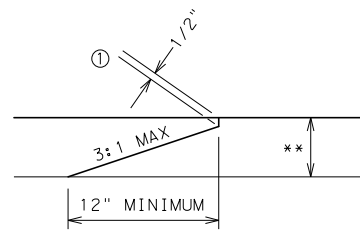
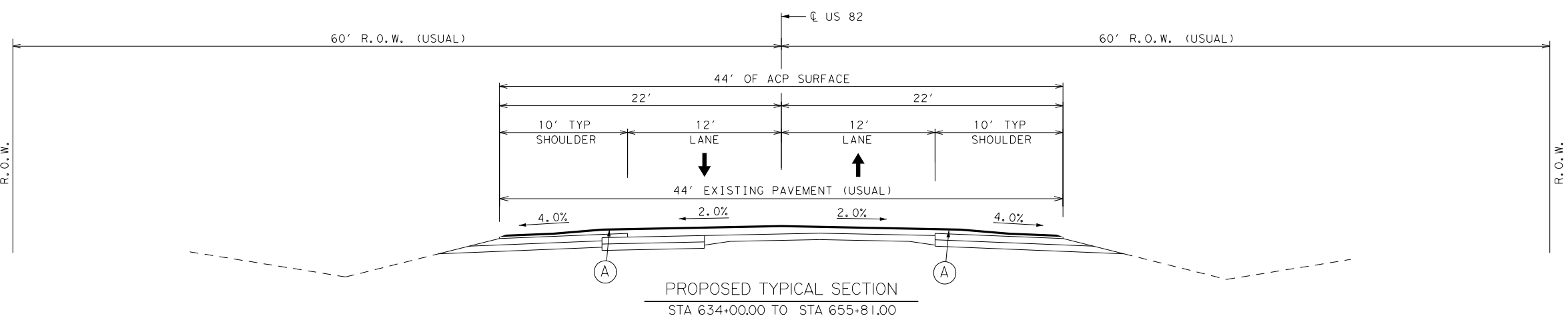
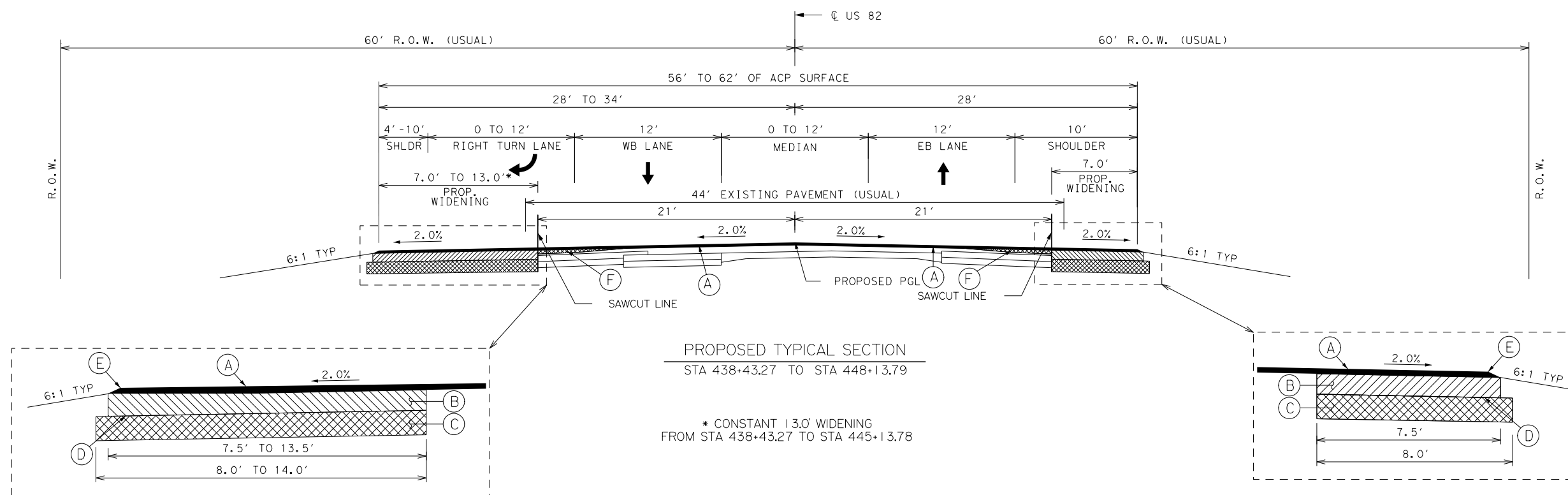
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
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 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		7	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

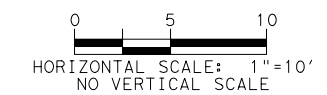
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LEGEND

- (A) 2" TYPE D HOT MIX SURFACE
- (B) 6" TYPE B HOT MIX BASE
- (C) 8" CEMENT TREATED SUBGRADE
- (D) PRIME COAT
- (E) TAPERED EDGE
- (F) ACP LEVEL UP CROSS-SLOPE CORRECTION WEDGE
- (G) 2" MILL



\*\* SEE TYPICAL SECTION FOR DEPTH AND TYPE OF HMA  
DEPTH >= LARGEST AGGREGATE IN MIX



12/14/2020

PROPOSED TYPICAL SECTIONS

SHEET 4 OF 5



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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

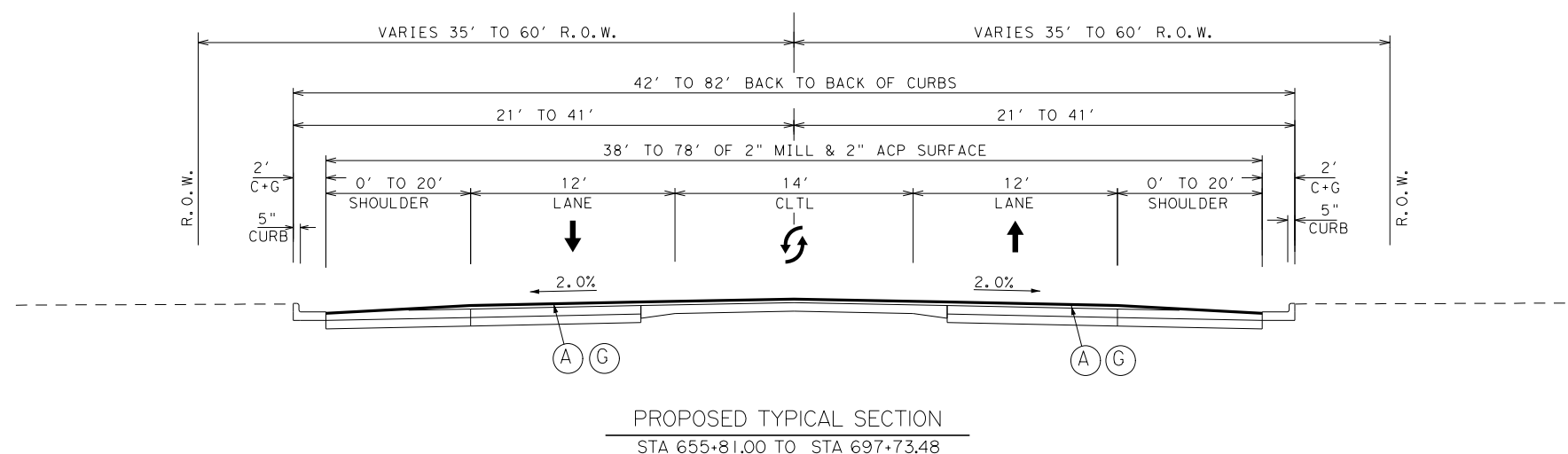
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STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
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0133	04	042	US 82

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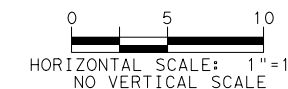


**LEGEND**

- (A) 2" TYPE D HOT MIX SURFACE
- (B) 6" TYPE B HOT MIX BASE
- (C) 8" CEMENT TREATED SUBGRADE
- (D) PRIME COAT
- (E) TAPERED EDGE
- (F) ACP LEVEL UP CROSS-SLOPE CORRECTION WEDGE
- (G) 2" MILL



NOTE: MATCH EXISTING CROSS SLOPES. EXISTING CROSS SLOPES MAY VARY



12/14/2020

**PROPOSED TYPICAL SECTIONS**

SHEET 5 OF 5

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**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		9	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

County: BAYLOR

Control: 0133-04-042

Highway: US 82

**GENERAL NOTES**

**Basis of Estimate:**

<u>Item - Description</u>	<u>Rate*</u>	<u>Unit</u>
166 - Fertilizer	100 LB of Nitrogen / acre with a 3:1:1 ratio of N, P, K	LB
168 - Vegetative Watering	1.4 GAL/SY per Application every 2 weeks for 3 months	MG
275 - Cement (8")	3% by weight Est @ 120 LB /CU FT	TON
310 – Prime Coat (MC-30)	0.25 GAL/SY	GAL
314 – Emulsified Asphalt Treatment (Erosion Control) (MS 2 or SS 1)	0.25 GAL/SY	GAL
3076 – Dense Graded Hot Mix Asphalt	110 LB / SY / Inch	TON
3084 – Bonding Course	0.06 GAL/SY Residual Asphalt (For New Asphalt Shoulder)	GAL
	0.06 GAL/SY Residual Asphalt (For Level Up)	GAL
	0.06 GAL/SY Residual Asphalt (For New Asphalt Overlay)	GAL

For contractor’s information only, actual production rates may vary.

**General Requirements**

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

Zachary Husen, P.E.: [Zachary.Husen@txdot.gov](mailto:Zachary.Husen@txdot.gov)

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

County: BAYLOR

Control: 0133-04-042

Highway: US 82

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.

The following standard detail sheets have been modified: MBGF(SR)-19(MOD), RAC-R(MOD)

**Bid Item Specific General Notes**

**Item 4 - Scope of Work**

For the preconstruction conference submit a work schedule; temporary water pollution control plan; material sources; the person responsible for the SW3P; written utility coordination plan; certification statements; request for proposed subcontractors and letters designating the project superintendent, safety officer, and payroll officer at the preconstruction conference.

**Item 5 - Control of the Work**

Provide the Engineer a minimum 24 hours’ notice for work requiring inspection or testing.

**Item 7 - Legal Relations and Responsibilities**

- No significant traffic generator events identified for this project.

Use an all-weather material in conjunction with item 7.2.4. This work will not be paid for directly, but will be subsidiary to various bid items.

The Contractor’s responsible person as described in item 7.2.6.1 must be able to respond within 45 minutes of being notified.

**Item 8 – Prosecution and Progress**

For this project, contract time will be computed as described in Item 8 based on a Standard Workweek (8.3.1.4).

**Item Specific**

**Item 100 – Preparing Right of Way**

Areas of brush removal and tree trimming shown in the plans will be paid for under Item 100, Preparing Right of Way. Mulch and/or shred brush and trimmed limbs and place material on the

County: BAYLOR

Control: 0133-04-042

Highway: US 82

backslope in those areas as an erosion deterrent. Follow procedures for tree trimming as shown on Maintenance Standard TRB-15(1).

**Item 132 - Embankment**

All borrow/aggregate sites shall meet the requirements of the Texas Aggregate Quarry and Pit Safety Act which can be found at [www.txdot.gov/inside-txdot/division/maintenance/quarry.html](http://www.txdot.gov/inside-txdot/division/maintenance/quarry.html). This material shall consist of suitable earth material such as loam, clay or other materials that will form a stable embankment and be free from vegetation or other objectionable matter. Any embankment needed from a borrow pit must first be approved by the Engineer.

Windrow approximately 4" of existing grass and topsoil adjacent to the right of way line or vegetative buffer zone prior to beginning earthwork operations. Upon completion of earthwork operations scarify the slopes and ditches longitudinally to a depth of approximately 4 inches and return the windrowed material to the slopes and the ditches as a permanent erosion control measure. This work will not be paid for directly, but is considered subsidiary to the various bid items.

**Item 164 - Seeding for Erosion Control**

Temporary seeding will be required in several small areas as work progresses to comply with the storm water pollution prevention plan and may require multiple mobilizations of seeding crew. The Engineer may blend temporary and permanent seeding according to the temperatures and time of year in order to achieve maximum coverage in the least amount of time.

The contractor is responsible for the protection and maintenance of all seeded areas until final acceptance of the project. Maintenance includes:

1. Protection of seeded and mulched areas against traffic.
2. Fully mowing the project twice (2) for a rehab/widening job or once (1) for an overlay. This work will not be paid for directly.

**Item 168 - Vegetative Watering**

Water as directed by the Engineer all areas that receive seed to sustain grass growth to obtain a minimum 70% vegetative cover within the right of way. This may require the contractor to water the newly established grass for a period of up to three months after all other work on the contract is completed and before the project is accepted. Watering shall be done at times determined by the Engineer in order to minimize any loss due to evaporation.

**Item 275 – Cement Treatment (Road Mixed)**

Cement percentage in the Basis of Estimate are for estimating purposes only. The target range value of 150 to 200 psi Unconfined Compressive Strength is required.

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**Item 402 – Trench Excavation Protection**

No additional payment will be made for backfill material if the contractor elects to bench or slope for trench excavation protection.

For this project a trench is defined as follows:

"Trench (Trench Excavation Protection)" means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

**Item 502 - Barricades, Signs, and Traffic Handling**

The Traffic Control Plan (TCP) for this project includes the plans, the Texas Manual on Traffic Control Devices, Barricade and Construction Standard Sheets, Standard TCP Sheets, and as otherwise required by the Engineer.

The Contractor's person responsible for TCP compliance is available by local telephone 24 hours a day and must respond to traffic control needs within 45 minutes of being notified.

Work will not be permitted without adequate traffic control devices in place. Work will only be permitted on one side of the roadway at any time.

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

Work vehicles within 30 feet of the traveled way shall have strobe lights or rotating beacons in use.

Wear appropriate personal protective equipment at all times while outside of vehicles and equipment on the project.

Contractor shall not set up traffic control at multiple locations. All work and traffic control operations shall be complete prior to advancing to next location unless otherwise directed by the Engineer.

Provide adequate flagging on side roads to ensure that traffic flow is not compromised during one way traffic control operations.

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Repair barricades within 48 hours after barricade report has been delivered to the Contractor. Failure to comply will cease all work until barricades are repaired to the satisfaction of the Department. Replace all damaged traffic control devices immediately. Remove any damaged traffic control devices from the project within 24 hours. Failure to make necessary corrections to Traffic Control items based on barricade inspections will be cause for withholding the monthly estimate until such corrections are made.

Remove from the roadway and store in a central location approved by the Engineer all temporary traffic control devices, such as cones, barrels, portable signs, vertical panels, etc., which will not be used within 24 hours. This includes removal of temporary traffic control devices from the roadway over the weekend.

Refer to the "Worksheet for Edge Condition Treatment Types" for the proper traffic control devices to be used for the various edge conditions.

**Item 506 - Temporary Erosion, Sedimentation, and Environmental Controls**

The disturbed area for this project, as shown on the plans, is 103.49 acres. The total disturbed area (TDA) will establish the required authorization for storm water discharges. The TDA of the project will be determined as described by the Environmental Permits Issues and Commitments (EPIC) sheet.

Contractor shall meet the requirements for the Project SW3P binder as described on the SW3P sheet.

The Contractor shall collect and dispose of all waste material as required by the Storm Water Pollution Prevention Plan (SW3P).

If sediment escapes the construction site, immediately stop all work on the project, remove the sediment, and modify the SW3P site plan to prevent future non-compliance issues.

The Contractor shall meet the requirements for concrete truck washouts as described in Part V of the TPDES General Permit TXR150000. This work including materials and labor will not be measured or paid for directly but will be subsidiary to Item 506.

Anticipate multiple mobilizations for SWP3 work.

Verify locations and dimensions of BMP's and obtain the Engineer's approval prior to placement. BMP locations indicated on the plans are approximate and may be adjusted as necessary by the Engineer.

If it is determined that other erosion control devices are needed, payment for the work will be determined in accordance with Article 4.4, "Changes in the Work".

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**Item 530 - Intersections, Driveways, and Turnouts**

Removal of existing asphalt driveways will not be paid for directly but will be considered subsidiary to this pay item.

Coordinate the replacement of driveways with the property owners prior to performing work. Driveway locations and widths will be verified by the Engineer before placement.

Saw cut existing concrete and asphaltic concrete drives to create a smooth joint with the proposed driveway or street.

When intersections of state roadways are encountered extend final 2" overlay to the ROW line regardless of existing pavement structure.

**Item 542 – Removing Metal Beam Guard Fence**

Salvage and stockpile the existing rail elements, timber and metal posts in a neat and orderly manner at the Seymour maintenance facility. Dispose of all posts deemed not salvageable as directed by the Engineer.

**Item 560 - Mailbox Assemblies**

Provide temporary installation as to not interrupt mail service. Contact the mail carrier for this route to determine the most desirable relocation place. For temporary mailbox supports, use type 6 as shown on the MB-21 standards.

**Item 585 – Ride Quality for Pavement Surfaces**

Use Surface Test Type B pay adjustment schedule 2 on this project.

**Item 644 – Small Roadside Sign Assemblies**

Stockpile signs that are removed in a manner as to not damage the sign at the Seymour Maintenance Office. Any sign damaged due to the contractor's negligence will be replaced by the contractor at their own expense. Damaged signs shall be disposed of as directed by the Engineer.

**Item 658 - Delineator and Object Marker Assemblies**

Provide Shur-Tite products in accordance with the TxDOT Material Producers List for all delineators and object markers on this project. Substitutions for Shur-Tite products shall be approved by the Engineer prior to ordering any alternate materials.

**Item 666 - Reflectorized Pavement Markings**

Contractor is responsible for verifying passing/no-passing zones for final stripe. Poly-dot the locations of the proposed reflectorized pavement markings and obtain approval from the Engineer prior to placement.

Type I striping to be placed on contract for the retracing of existing markings and may begin prior to sealcoat operations.

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Use Type II beads on all striping.

Remove temporary tabs from all roads prior to striping. Removal of tabs will be subsidiary to pertinent items.

The lead vehicle and trail vehicle will be required for all striping operations as shown on TCP (3-1)-13.

**Item 672 - Raised Pavement Markers**

Raised pavement marker adhesive will meet the requirements of Departmental Materials Specifications DMS-6130, "Bituminous Adhesive for Pavement Markers".

The lead vehicle and trail vehicle(s) will be required for all marker installation operations as shown on TCP(3-3)-14.

**Item 3076 – Dense-Graded Hot-Mix Asphalt**

Provide mixture Type B using PG binder 64-22. No Substitute PG Binder will be allowed on this project. The Type B Mix shall be place in two lifts.

Provide mixture Type D using PG binder 70-28. No Substitute PG Binder will be allowed on this project.

Design the surface mixture using the Superpave gyratory compactor with a minimum asphalt content of 5.4% and with a target lab mold density of 96.0%.

Level-up may be performed prior to widening the roadway. Locations are to be selected and approved by the Engineer prior to level-up.

Hamburg Wheel Test requirements for this project will be a minimum of 5,000 passes @12.5 mm rut depth for PG 64-22 and 10,000 passes @12.5 mm rut depth for PG 70-28.

The use of Recycled Asphalt Shingles (RAS) or Recycled Asphalt Pavement (RAP) will not be permitted in the surface mix for this project.

RAP shall not include more that 1.5% deleterious material when tested in accordance with Test Method TEX 413-A.

**Item 3084 – Bonding Course**

Spray paver will not be used unless otherwise authorized by the Engineer.



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0133-04-042

DISTRICT Wichita Falls

COUNTY Baylor

HIGHWAY US 82

CONTROL SECTION JOB				0133-04-042		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00075762			
COUNTY				Baylor			
HIGHWAY				US 82			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6002	PREPARING ROW	STA	32.000		32.000	
	110-6001	EXCAVATION (ROADWAY)	CY	21,015.000		21,015.000	
	132-6004	EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	49,659.000		49,659.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	133,289.000		133,289.000	
	162-6002	BLOCK SODDING	SY	293.000		293.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	66,644.000		66,644.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY	66,644.000		66,644.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	133,289.000		133,289.000	
	168-6001	VEGETATIVE WATERING	MG	1,120.000		1,120.000	
	169-6003	SOIL RETENTION BLANKETS (CL 1) (TY C)	SY	5,668.000		5,668.000	
	275-6001	CEMENT	TON	1,188.000		1,188.000	
	275-6010	CEMENT TREAT (SUBGRADE) (8")	SY	109,967.000		109,967.000	
	310-6009	PRIME COAT (MC-30)	GAL	27,492.000		27,492.000	
	314-6009	EMULS ASPH (EROSN CONT)(MULTI)	GAL	13,329.000		13,329.000	
	351-6025	FLEX PAVEMENT STRUCTURE REPAIR (8"-15")	SY	10,000.000		10,000.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	24,603.000		24,603.000	
	400-6006	CUT & RESTORING PAV	SY	180.700		180.700	
	403-6001	TEMPORARY SPL SHORING	SF	1,680.000		1,680.000	
	420-6052	CL C CONC (CULV)(HPC)	CY	29.300		29.300	
	423-6005	RETAINING WALL (SPREAD FOOTING)	SF	1,200.000		1,200.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	6.700		6.700	
	432-6002	RIPRAP (CONC)(5 IN)	CY	96.000		96.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	84.700		84.700	
	450-6018	RAIL (TY T631)	LF	146.300		146.300	
	450-6023	RAIL (TY SSTR)	LF	300.000		300.000	
	460-6002	CMP (GAL STL 18 IN)	LF	250.000		250.000	
	460-6003	CMP (GAL STL 24 IN)	LF	389.000		389.000	
	460-6004	CMP (GAL STL 30 IN)	LF	200.000		200.000	
	460-6005	CMP (GAL STL 36 IN)	LF	78.000		78.000	
	462-6001	CONC BOX CULV (3 FT X 2 FT)	LF	92.000		92.000	
	462-6045	CONC BOX CULV (3 FT X 2 FT)(EXTEND)	LF	161.000		161.000	
	462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	152.800		152.800	
	462-6048	CONC BOX CULV (4 FT X 3 FT)(EXTEND)	LF	135.000		135.000	
	462-6049	CONC BOX CULV (4 FT X 4 FT)(EXTEND)	LF	171.000		171.000	
	462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF	118.200		118.200	
	462-6059	CONC BOX CULV (7 FT X 4 FT)(EXTEND)	LF	15.500		15.500	
	462-6060	CONC BOX CULV (7 FT X 5 FT)(EXTEND)	LF	18.000		18.000	



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0133-04-042

DISTRICT Wichita Falls  
HIGHWAY US 82

COUNTY Baylor

CONTROL SECTION JOB				0133-04-042		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00075762			
COUNTY				Baylor			
HIGHWAY				US 82			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	464-6003	RC PIPE (CL III)(18 IN)	LF	70.000		70.000	
	464-6007	RC PIPE (CL III)(30 IN)	LF	606.100		606.100	
	466-6099	HEADWALL (CH - PW - 0) (DIA= 30 IN)	EA	4.000		4.000	
	466-6181	WINGWALL (PW - 1) (HW=6 FT)	EA	1.000		1.000	
	466-6182	WINGWALL (PW - 1) (HW=7 FT)	EA	1.000		1.000	
	466-6185	WINGWALL (PW - 2) (HW=10 FT)	EA	2.000		2.000	
	466-6192	WINGWALL (PW - 2) (HW=3 FT)	EA	1.000		1.000	
	466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	20.000		20.000	
	466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	12.000		12.000	
	466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA	9.000		9.000	
	466-6197	WINGWALL (PW - 2) (HW=8 FT)	EA	1.000		1.000	
	466-6207	WINGWALL (SW - 0) (HW=4 FT)	EA	2.000		2.000	
	467-6106	SET (TY I)(S=3 FT)(HW=3FT)(4:1)(C)	EA	1.000		1.000	
	467-6112	SET (TY I)(S=3 FT)(HW= 4 FT)(4:1)(C)	EA	2.000		2.000	
	467-6116	SET (TY I)(S=3 FT)(HW= 4 FT)(6:1)(P)	EA	2.000		2.000	
	467-6142	SET (TY I)(S= 4 FT)(HW= 3 FT)(6:1) (P)	EA	2.000		2.000	
	467-6144	SET (TY I)(S= 4 FT)(HW= 4 FT)(4:1) (C)	EA	1.000		1.000	
	467-6177	SET (TY I)(S= 5 FT)(HW= 4 FT)(4:1) (C)	EA	1.000		1.000	
	467-6348	SET (TY II) (18 IN) (CMP) (6: 1) (P)	EA	10.000		10.000	
	467-6380	SET (TY II) (24 IN) (CMP) (6: 1) (P)	EA	16.000		16.000	
	467-6410	SET (TY II) (30 IN) (CMP) (6: 1) (P)	EA	4.000		4.000	
	467-6420	SET (TY II) (30 IN) (RCP) (4: 1) (P)	EA	2.000		2.000	
	467-6423	SET (TY II) (30 IN) (RCP) (6: 1) (P)	EA	4.000		4.000	
	467-6444	SET (TY II) (36 IN) (CMP) (6: 1) (P)	EA	2.000		2.000	
	480-6001	CLEAN EXIST CULVERTS	EA	28.000		28.000	
	496-6004	REMOV STR (SET)	EA	44.000		44.000	
	496-6005	REMOV STR (WINGWALL)	EA	53.000		53.000	
	496-6006	REMOV STR (HEADWALL)	EA	1.000		1.000	
	496-6007	REMOV STR (PIPE)	LF	1,430.000		1,430.000	
	496-6008	REMOV STR (BOX CULVERT)	LF	26.000		26.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	18.000		18.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	780.000		780.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	780.000		780.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,080.000		1,080.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,080.000		1,080.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	6,278.000		6,278.000	

DISTRICT	COUNTY	CCSJ	SHEET
Wichita Falls	Baylor	0133-04-042	11A



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0133-04-042

DISTRICT Wichita Falls

COUNTY Baylor

HIGHWAY US 82

CONTROL SECTION JOB				0133-04-042		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00075762			
COUNTY				Baylor			
HIGHWAY				US 82			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	6,278.000		6,278.000	
	530-6005	DRIVEWAYS (ACP)	SY	3,182.000		3,182.000	
	530-6008	TURNOUTS (ACP)	SY	350.000		350.000	
	530-6016	DRIVEWAYS (BASE)	SY	12,952.000		12,952.000	
	533-6001	RUMBLE STRIPS (SHOULDER)	LF	119,960.000		119,960.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)	LF	59,980.000		59,980.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	937.500		937.500	
	540-6014	SHORT RADIUS	LF	25.000		25.000	
	540-6015	DRIVEWAY TERMINAL ANCHOR SECTION	EA	4.000		4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	900.000		900.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	8.000		8.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	8.000		8.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	6.000		6.000	
	560-6011	MAILBOX INSTALL-S (TWW-POST) TY 4	EA	33.000		33.000	
	560-6012	MAILBOX INSTALL-D (TWW-POST) TY 4	EA	2.000		2.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	33.000		33.000	
	644-6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	2.000		2.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	34.000		34.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	8.000		8.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	1.000		1.000	
	644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA	8.000		8.000	
	644-6037	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	EA	3.000		3.000	
	644-6056	IN SM RD SN SUP&AM TYTWT(1)UA(P)	EA	39.000		39.000	
	644-6057	IN SM RD SN SUP&AM TYTWT(1)UA(T)	EA	3.000		3.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	116.000		116.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	20.000		20.000	
	658-6099	INSTL OM ASSM (OM-2Z)(WFLX)GND	EA	93.000		93.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	40,000.000		40,000.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	32,368.000		32,368.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	6,474.000		6,474.000	
	666-6006	REFL PAV MRK TY I (W)4"(DOT)(100MIL)	LF	1,113.000		1,113.000	
	666-6029	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	373.000		373.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	3,719.000		3,719.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	161.000		161.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	36.000		36.000	
	666-6072	REFL PAV MRK TY I(W)(LNDP ARW)(100MIL)	EA	6.000		6.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	22.000		22.000	





# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0133-04-042

DISTRICT Wichita Falls

COUNTY Baylor

HIGHWAY US 82

CONTROL SECTION JOB				0133-04-042		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00075762			
COUNTY				Baylor			
HIGHWAY				US 82			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	11,650.000		11,650.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	129,437.000		129,437.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	1,630.000		1,630.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	144,631.000		144,631.000	
	672-6007	REFL PAV MRKR TY I-C	EA	817.000		817.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	2,995.000		2,995.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON	34,087.000		34,087.000	
	3076-6044	D-GR HMA TY-D PG70-28	TON	45,301.000		45,301.000	
	3076-6047	D-GR HMA TY-D PG70-28 (LEVEL-UP)	TON	25,826.000		25,826.000	
	3084-6001	BONDING COURSE	GAL	38,096.000		38,096.000	
	6185-6002	TMA (STATIONARY)	DAY	446.000		446.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	21.000		21.000	
	18	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	

SUMMARY OF ROADWAY ITEMS																
US 82 CSJ: 0133-04-042			100	275	275	310	351	354	400	432	533	533	3076	3076	3076	3084
			6002	6001	6010	6009	6025	6045	6006	6001	6001	6002	6001	6044	6047	6001
			PREPARING ROW	CEMENT	CEMENT TREAT (SUBGRADE) (8")	PRIME COAT (MC-30)	FLEX PAVEMENT STRUCTURE REPAIR (8"-15")	PLANE ASPH CONC PAV (2")	CUT & RESTORING PAV	RIPRAP (CONC)(4 IN)	RUMBLE STRIPS (SHOULDER)	RUMBLE STRIPS (CENTERLINE)	D-GR HMA TY-B PG64-22	D-GR HMA TY-D PG70-28	D-GR HMA TY-D PG70-28 (LEVEL-UP)	BONDING COURSE
STA		STA	STA	TON	SY	GAL	SY	SY	SY	SF	LF	LF	TON	TON	TON	GAL
34+20.00	to	697+73.48	32				10000									
34+20.00	to	215+79.63		349	32284	8071					36319	18160	9988	12430	5746	11517
215+79.63	to	235+11.36		61	5644	1411			31.4		3863	1932	1790	1564	687	1822
235+11.36	to	438+43.27		391	36244	9061			149.3	3630	40664	20332	11214	13926	9518	12386
438+43.27	to	448+13.79		30	2753	688					1941	971	873	777	433	929
448+13.79	to	634+00.00		357	33042	8260				1942	37172	18586	10222	12721	9441	9324
634+00.00	to	655+81.00												1177		642
655+81.00	to	697+73.48						24603						2706		1476
<b>PROJECT TOTALS</b>			<b>32</b>	<b>1188</b>	<b>109967</b>	<b>27492</b>	<b>10000</b>	<b>24603</b>	<b>180.7</b>	<b>5572</b>	<b>119960</b>	<b>59980</b>	<b>34087</b>	<b>45301</b>	<b>25826</b>	<b>38096</b>

SUMMARY OF MBGF ITEMS												
LOCATION	420	432	450	540	540	540	542	542	544	544	658	658
	6052	6045	6018	6001	6014	6015	6001	6002	6001	6003	6099	6062
	CL C CONC (CULV)(HPC)	RIPRAP (MOW STRIP) (4 IN)	RAIL (TY T631)	MTL W-BEAM GD FEN (TIM POST)	SHORT RADIUS	DRIVEWAY TERMINAL ANCHOR SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL OM ASSM (OM-2Z) (WFLX)GND	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)
	CY	CY	LF	LF	LF	EA	LF	EA	EA	EA	EA	EA
STA 110+47.60 TO STA 112+97.60							225			2		
STA 300+65.51 TO STA 302+65.51 (RT)		17		200			175		2	2		3
STA 301+46.47 TO STA 304+21.47 (LT)		20		275			175		2	2		4
STA 487+95.17 TO STA 491+69.73 (RT)		23		325		2	125	4	2		1	6
STA 659+81.02 TO STA 662+23.17 (LT)	13.7	12	69.8	162.5		1	150	2	1			4
STA 659+88.68 TO STA 661+04.37 (RT)	15.6	7	76.5	25	25	1	50	2	1		1	3
<b>PROJECT TOTALS</b>	<b>29.3</b>	<b>78</b>	<b>146.3</b>	<b>987.5</b>	<b>25</b>	<b>4</b>	<b>900</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>2</b>	<b>20</b>

**QUANTITY SUMMARIES**

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**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		12
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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SUMMARY OF SIDE ROAD ITEMS										
US 82 CSJ: 0133-04-042			"W"	"L"	RADIUS		AREA	530	530	COMMENT
								6005	6016	
SR #	STATION	LOCATION	FT	FT	R1	R2	SY	DRIVEWAYS (ACP)	DRIVEWAYS (BASE)	
1-1	40+67.27	LT	33	34	40	40	197		197	GRAVEL
2-1	51+48.26	LT	16	33	40	30	119		119	GRAVEL
2-2	51+74.30	RT	10	31	20	25	60		60	GRAVEL
3-1	66+99.21	RT	23	31	30	40	134	134		PAVEMENT CR
6-1	105+95.21	RT	24	29	20	30	105		105	GRAVEL
7-1	108+04.29	RT	25	29	20	30	117		117	GRAVEL
8-1	119+69.05	RT	17	28	20	15	76	76		GRAVEL CR
8-2	119+70.81	LT	32	36	15	30	171	171		GRAVEL CR + DVWY
10-1	151+56.79	RT	11	27	50	50	117		117	GRAVEL
12-1	172+37.00	LT	20	37	30	30	129	129		PAVEMENT CR
12-2	172+55.51	RT	17	27	25	25	80	80		PAVEMENT CR
13-1	184+50.95	RT	13	13	20	20	57		57	GRAVEL
13-2	185+62.88	RT	14	26	35	40	96		96	GRAVEL
15-1	203+01.17	LT	48	38	25	25	240		240	GRAVEL
15-2	206+37.90	LT	20	33	30	35	134		134	GRAVEL
15-3	207+41.46	LT	14	35	30	30	105		105	GRAVEL
15-4	209+48.81	LT	18	36	20	20	87		87	GRAVEL
15-5	211+30.43	LT	12	36	20	20	66		66	GRAVEL
15-6	211+84.62	RT	17	28	30	30	97		97	GRAVEL
15-7	212+74.37	LT	17	36	20	20	88		88	GRAVEL
15-8	212+86.86	RT	18	28	30	30	101		101	GRAVEL
16-1	214+29.10	RT	29	28	25	25	125		125	GRAVEL
16-2	215+01.96	RT	12	28	20	20	64		64	GRAVEL
16-3	215+74.84	RT	15	28	15	15	59		59	GRAVEL
16-4	216+80.68	LT	12	36	20	20	72		72	GRAVEL
16-5	218+21.00	RT	14	20	15	15	42		42	GRAVEL
16-6	218+76.09	LT	19	36	20	20	95		95	GRAVEL
16-7	218+91.28	RT	10	18	15	15	30		30	GRAVEL
16-8	221+18.56	RT	13	17	15	15	37		37	GRAVEL
16-9	222+87.41	RT	21	17	20	25	62		62	GRAVEL
16-10	223+38.10	LT	16	37	30	30	108		108	GRAVEL
16-11	223+83.60	RT	26	17	30	25	77		77	GRAVEL
16-12	224+15.01	LT	14	37	30	30	106		106	GRAVEL
17-1	227+03.37	RT	14	29	15	15	71		71	GRAVEL
17-2	228+37.15	LT	20	24	15	15	65		65	GRAVEL
17-3	233+37.67	RT	25	28	30	20	110		110	GRAVEL
17-4	236+60.45	RT	115	31	20	30	432		432	GRAVEL
19-1	250+90.08	RT	10	31	25	25	68		68	GRAVEL
19-2	251+75.75	RT	13	31	30	30	90		90	GRAVEL
19-3	259+63.80	RT	10	30	25	25	67		67	GRAVEL
19-4	260+86.77	RT	10	31	20	30	63		63	GRAVEL
20-1	269+13.41	RT	16	31	25	30	93		93	GRAVEL
20-2	269+36.62	LT	10	33	20	20	56		56	GRAVEL
21-1	278+43.67	RT	19	31	35	30	115	115		GRAVEL CR
21-2	278+47.86	LT	20	33	20	30	104	104		GRAVEL CR
21-3	285+25.36	LT	10	33	30	25	73		73	GRAVEL
22-1	289+56.71	RT	12	31	25	25	72		72	GRAVEL
23-1	299+72.68	LT	14	33	30	25	89		89	GRAVEL
24-1	310+62.29	LT	10	33	15	30	63		63	GRAVEL
24-2	313+43.83	RT	29	31	30	50	166		166	GRAVEL
24-3	314+75.17	LT	13	33	25	25	79		79	GRAVEL
24-4	319+07.12	LT	20	33	20	25	94		94	GRAVEL
25-1	327+66.81	LT	20	33	20	20	93		93	GRAVEL
25-2	331+31.93	RT	21	31	30	30	116	116		GRAVEL CR
25-3	331+35.04	LT	18	33	25	25	98	98		GRAVEL CR
26-1	342+30.37	LT	14	32	15	15	59		59	GRAVEL

**QUANTITY SUMMARIES**

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**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			13
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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SUMMARY OF SIDE ROAD ITEMS										
US 82 CSJ: 0133-04-042			"W"	"L"	RADIUS		AREA	530	530	COMMENT
								6005	6016	
SR #	STATION	LOCATION	FT	FT	R1	R2	SY	DRIVEWAYS (ACP)	DRIVEWAYS (BASE)	
27-1	348+14.16	RT	16	32	30	30	101		101	GRAVEL
27-2	354+04.83	LT	11	31	20	25	64		64	GRAVEL
28-1	363+27.20	RT	12	33	25	25	73		73	GRAVEL
28-2	368+25.95	RT	12	33	30	30	88		88	GRAVEL
29-1	379+50.39	RT	22	33	25	40	129		129	GRAVEL
30-1	382+55.29	RT	13	33	25	30	92		92	GRAVEL
30-2	383+49.39	RT	10	33	15	30	67		67	GRAVEL
30-3	384+06.32	RT	21	33	35	20	113	113		GRAVEL CR
30-4	384+06.07	LT	22	31	30	30	119	119		GRAVEL CR
31-1	394+94.12	RT	11	33	30	30	85		85	GRAVEL
31-2	398+77.84	LT	10	31	15	20	53		53	GRAVEL
31-3	399+31.59	LT	13	31	20	25	69		69	GRAVEL
31-4	401+80.35	LT	10	31	20	30	67		67	GRAVEL
31-5	403+71.07	LT	11	31	20	35	66		66	GRAVEL
31-6	404+12.06	LT	12	31	20	20	59	59		PAVEMENT
31-7	405+52.43	LT	12	31	20	25	64	64		PAVEMENT
32-1	408+92.84	RT	10	33	20	30	77		77	GRAVEL
32-2	409+20.59	LT	10	31	20	25	60		60	GRAVEL
32-3	410+33.85	LT	10	31	20	30	67	67		PAVEMENT
32-4	413+28.63	LT	238	30	20	35	835		835	GRAVEL
32-5	415+31.50	RT	15	34	30	30	110		110	GRAVEL
33-1	418+37.60	LT	13	30	15	15	55		55	GRAVEL
33-2	419+87.87	RT	11	34	30	25	84		84	GRAVEL
33-3	421+35.11	LT	13	31	15	15	56		56	GRAVEL
33-4	422+32.42	LT	11	30	15	20	59		59	GRAVEL
33-5	423+77.99	RT	10	34	35	30	89		89	GRAVEL
33-6	429+51.46	RT	12	34	25	25	77		77	GRAVEL
34-2	442+02.83	RT	11	34	20	30	69		69	GRAVEL
36-1	461+76.14	LT	10	30	20	30	63	63		PAVEMENT
37-1	476+32.40	LT	13	29	15	15	49		49	GRAVEL
38-1	480+64.81	RT	12	35	30	20	74		74	GRAVEL
39-1	490+45.74	RT	17	34	10	10	71		71	GRAVEL
39-2	498+09.82	LT	13	30	15	70	94		94	GRAVEL
39-3	501+34.47	LT	13	30	20	35	77		77	GRAVEL
42-1	532+72.61	LT	10	30	15	25	57		57	GRAVEL
42-2	534+09.25	LT	10	30	25	30	71		71	GRAVEL
43-1	538+73.69	RT	16	33	30	30	102		102	GRAVEL
43-2	546+94.46	RT	11	33	20	20	55		55	GRAVEL
43-3	547+53.36	RT	17	33	50	60	165		165	GRAVEL
44-1	555+22.07	LT	21	32	20	20	84		84	GRAVEL
44-2	557+21.74	LT	21	32	30	40	132	132		GRAVEL CR
44-3	557+12.74	RT	20	3	30	30	146		146	GRAVEL
44-4	558+03.58	RT	10	32	15	20	56		56	GRAVEL
44-5	558+90.05	LT	16	32	20	30	81		81	GRAVEL
44-6	559+27.60	RT	10	32	25	30	71		71	GRAVEL
44-7	560+49.42	LT	10	32	25	25	66		66	GRAVEL
44-8	561+18.31	LT	13	32	25	30	83		83	GRAVEL
44-9	561+79.50	RT	10	32	20	25	67		67	GRAVEL
45-1	562+08.12	LT	19	32	20	25	93		93	GRAVEL
45-2	562+35.96	RT	10	32	20	25	67		67	GRAVEL
45-3	563+06.89	LT	25	32	20	25	104		104	GRAVEL
45-4	563+11.93	RT	10	32	25	25	67		67	GRAVEL
45-5	564+03.84	LT	10	32	25	30	73		73	GRAVEL
45-6	564+31.25	RT	10	32	20	35	72	72		PAVEMENT
45-7	564+76.88	LT	10	32	20	20	56		56	GRAVEL
45-8	565+31.56	LT	10	32	20	25	62		62	GRAVEL
45-9	565+48.76	RT	10	32	20	35	67		67	GRAVEL

**QUANTITY SUMMARIES**

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Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		14
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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SUMMARY OF SIDE ROAD ITEMS										
US 82 CSJ: 0133-04-042		"W"	"L"	RADIUS		AREA	530	530	COMMENT	
							6005	6016		
SR #	STATION	LOCATION	FT	FT	R1	R2	SY	SY	SY	
45-10	566+44.36	RT	15	32	25	25	93		93	GRAVEL
45-11	566+88.11	RT	10	32	25	30	62		62	GRAVEL
45-12	567+07.55	LT	10	32	25	25	67	67		PAVEMENT
45-13	567+06.67	RT	11	32	30	30	59		59	GRAVEL
45-14	567+73.97	LT	10	32	15	20	52		52	GRAVEL
45-15	569+73.41	LT	14	32	25	25	80		80	GRAVEL
45-16	570+35.81	LT	17	32	20	25	86		86	GRAVEL
45-17	571+81.74	LT	23	32	25	35	127		127	GRAVEL
45-18	573+26.15	LT	17	32	25	55	124		124	GRAVEL
46-1	574+54.17	LT	10	32	25	25	62		62	GRAVEL
46-2	575+16.73	LT	10	32	25	25	63		63	GRAVEL
46-3	576+13.64	LT	18	32	25	25	92		92	GRAVEL
46-4	577+91.69	LT	10	32	20	25	60		60	GRAVEL
46-5	580+94.29	LT	16	32	20	20	77	77		PAVEMENT
47-1	587+15.87	LT	16	32	30	35	109	109		GRAVEL CR
47-2	594+61.10	RT	31	32	25	30	143		143	GRAVEL
47-3	595+36.72	RT	10	32	20	25	63		63	GRAVEL
47-4	596+55.47	LT	10	32	20	30	63		63	GRAVEL
48-1	598+95.01	RT	15	32	30	35	102	102		PAVEMENT
48-2	599+58.31	RT	15	32	25	30	87		87	GRAVEL
48-3	604+27.68	RT	32	32	25	30	150		150	GRAVEL
48-4	606+24.50	RT	20	32	25	20	85		85	GRAVEL
48-5	607+23.51	LT	11	32	25	35	83		83	GRAVEL
48-6	607+43.27	RT	29	32	20	35	129		129	GRAVEL
49-1	613+05.62	RT	20	32	20	20	78		78	GRAVEL
49-2	613+80.03	RT	13	31	25	75	123		123	GRAVEL
49-3	615+81.50	LT	16	33	25	25	87		87	GRAVEL
49-4	616+28.68	RT	23	31	30	20	126		126	GRAVEL
49-5	616+67.77	LT	14	33	25	25	88		88	GRAVEL
49-6	617+30.01	LT	14	33	25	30	87	87		GRAVEL ST
49-7	617+75.42	RT	13	31	20	30	71		71	GRAVEL
49-8	618+97.78	LT	17	33	20	25	79		79	GRAVEL
49-9	619+43.66	RT	39	31	25	25	159	159		PAVEMENT ST
49-10	619+66.69	LT	15	33	20	30	83		83	GRAVEL
49-11	620+84.51	LT	22	33	25	30	120	120		GRAVEL ST
49-12	621+77.48	RT	10	31	20	25	65		65	GRAVEL
50-1	622+07.15	LT	10	33	25	30	79	79		PAVEMENT
50-2	622+53.13	RT	10	31	25	25	80		80	GRAVEL
50-3	623+28.92	LT	15	33	30	30	99		99	GRAVEL
50-4	623+70.98	LT	10	33	40	35	79		79	GRAVEL
50-5	623+85.37	RT	38	31	30	30	176	176		PAVEMENT RD
50-6	624+71.98	LT	20	33	35	30	128		128	GRAVEL
50-7	625+34.04	RT	17	31	25	25	100		100	GRAVEL
50-8	625+51.93	LT	10	33	20	20	59		59	GRAVEL
50-9	625+90.46	RT	10	31	20	40	69		69	GRAVEL
50-10	626+70.20	RT	20	31	25	25	102	102		PAVEMENT
50-11	626+85.43	LT	19	32	20	25	89	86		PAVEMENT
50-12	627+61.68	LT	19	32	20	25	87	87		PAVEMENT
50-13	628+49.32	LT	14	32	25	30	84		84	GRAVEL
50-14	629+48.77	RT	10	31	20	20	56	56		PAVEMENT
50-15	629+77.71	LT	16	31	20	15	68	68		PAVEMENT
50-16	629+77.49	RT	16	31	15	35	104		104	GRAVEL
50-17	629+97.67	LT	19	31	20	35	94		94	GRAVEL
50-18	631+14.18	RT	12	31	25	35	87		87	GRAVEL
50-19	631+65.09	RT	19	31	25	30	96	96		PAVEMENT
50-20	633+61.35	LT	18	37	25	30	147		147	GRAVEL
51-1	634+14.19	LT	13	37	15	35	112		112	GRAVEL
<b>PROJECT TOTALS</b>							<b>3182</b>	<b>12952</b>		

**QUANTITY SUMMARIES**

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**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		15
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

SUMMARY OF MAILBOX ITEMS						
US 82 CSJ: 0133-04-042				560	560	530
				6011	6012	6008
				MAILBOX INSTALL-S (TWW-POS T) TY 4	MAILBOX INSTALL-D (TWW-POS T) TY 4	TURNOUTS (ACP)
SHEET	STATION	SIDE	MB #	EA	EA	SY
SHEET 7 OF 56	107+98.81	LT	MB 7-1	1		10
SHEET 8 OF 56	119+35.40	LT	MB 8-1	1		10
SHEET 15 OF 56	203+88.50	LT	MB 15-1	1		10
SHEET 15 OF 56	207+79.27	LT	MB 15-2	1		10
SHEET 15 OF 56	213+11.57	LT	MB 15-3		1	10
SHEET 20 OF 56	269+72.33	LT	MB 20-1	1		10
SHEET 23 OF 56	300+32.57	LT	MB 23-1	1		10
SHEET 24 OF 56	314+30.93	LT	MB 24-1	1		10
SHEET 27 OF 56	354+43.56	LT	MB 27-1	1		10
SHEET 30 OF 56	383+14.28	LT	MB 30-1	1		10
SHEET 31 OF 56	398+99.27	LT	MB 31-1	1		10
SHEET 31 OF 56	402+10.57	LT	MB 31-2	1		10
SHEET 36 OF 56	462+05.93	LT	MB 36-1	1		10
SHEET 42 OF 56	532+45.37	LT	MB 42-1	1		10
SHEET 44 OF 56	560+84.21	LT	MB 44-1	1		10
SHEET 45 OF 56	562+42.32	LT	MB 45-1	1		10
SHEET 45 OF 56	563+44.68	LT	MB 45-2	1		10
SHEET 45 OF 56	567+39.22	LT	MB 45-3	1		10
SHEET 45 OF 56	570+65.73	LT	MB 45-4	1		10
SHEET 45 OF 56	572+62.08	LT	MB 45-5	1		10
SHEET 46 OF 56	574+88.47	LT	MB 46-1	1		10
SHEET 46 OF 56	575+75.34	LT	MB 46-2	1		10
SHEET 46 OF 56	578+42.38	LT	MB 46-3	1		10
SHEET 46 OF 56	580+81.40	LT	MB 46-4	1		10
SHEET 47 OF 56	587+65.35	LT	MB 47-1		1	10
SHEET 47 OF 56	587+67.65	LT	MB 47-2	1		10
SHEET 47 OF 56	596+94.34	LT	MB 47-3	1		10
SHEET 48 OF 56	607+50.73	LT	MB 48-1	1		10
SHEET 49 OF 56	616+23.92	LT	MB 49-1	1		10
SHEET 49 OF 56	617+71.41	LT	MB 49-2	1		10
SHEET 49 OF 56	618+80.68	LT	MB 49-3	1		10
SHEET 50 OF 56	622+71.25	LT	MB 50-1	1		10
SHEET 50 OF 56	623+98.51	LT	MB 50-2	1		10
SHEET 50 OF 56	627+93.60	LT	MB 50-3	1		10
SHEET 50 OF 56	630+49.68	LT	MB 50-4	1		10
<b>PROJECT TOTAL</b>				<b>33</b>	<b>2</b>	<b>350</b>

SUMMARY OF SIDE ROAD & DRIVEWAY DRAINAGE ITEMS												
US 82 CSJ: 0133-04-042			460	460	460	460	467	467	467	467	496	496
			6002	6003	6004	6005	6348	6380	6410	6444	6004	6007
			CMP (GAL STL 18)	CMP (GAL STL 24)	CMP (GAL STL 30)	CMP (GAL STL 36)	SET (TY II) (18 IN) (CMP) (6: 1) (P)	SET (TY II)(24 IN)(CMP)(6:1	SET (TY II) (30 IN) (CMP) (6: 1) (P)	SET (TY II) (36 IN) (CMP) (6: 1) (P)	REMOV STR (SET)	REMOV STR (PIPE)
SR #	STATION	LOCATION	LF	LF	LF	LF	EA	EA	EA	EA	EA	LF
1-1	40+67.51	LT	54				2				2	46
2-2	51+74.30	RT	22				2				2	17
FM 2069	225+47.81	LT		70				2			2	57
17-2	228+37.15	LT		96				2			2	52
24-1	310+70.83	LT		35				2			2	35
25-1	327+66.81	LT				78				2	2	62
26-1	342+30.37	LT		23				2			2	23
28-1	363+27.20	RT	28				2				2	21
31-2	398+77.84	LT	47				1				1	44
31-3	399+31.59	LT	49				1				1	45
33-2	419+87.87	RT		32				2			2	24
33-3	421+35.11	LT		33				2			2	33
33-4	422+32.42	LT		32				2			2	32
33-6	429+51.46	RT			136				2		2	136
34-2	442+02.83	RT			64				2		2	64
37-1	476+32.40	LT		68				2			2	68
39-3	501+34.47	LT	50				2				2	50
<b>PROJECT TOTALS</b>			<b>250</b>	<b>389</b>	<b>200</b>	<b>78</b>	<b>10</b>	<b>16</b>	<b>4</b>	<b>2</b>	<b>32</b>	<b>809</b>

SUMMARY OF RETAINING WALL ITEMS		
423-6005	432-6045	450-6023
RETAINING WALL (SPREAD FOOTING)	RIP RAP (MOW STRIP) (4 IN)	RAIL (TY SSTR)
SF	CY	LF
1200'	6.7	300

**QUANTITY SUMMARIES**

SHEET 5 OF 10



Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		16
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

SUMMARY OF DRAINAGE ITEMS																				
US 82 CSJ: 0133-04-042		LT	RT	403	432	462	462	462	462	462	462	462	464	464	466	466	466			
				6001	6002	6001	6045	6046	6048	6049	6051	6059	6060	6003	6007	6099	6181	6182		
				TEMPORARY SPL SHORING	RIPRAP (CONC) (IN)	CONC BOX CULV (3 FT X 2 FT)	CONC BOX CULV (3 FT X 2 FT) (EXTEND)	CONC BOX CULV (3 FT X 3 FT) (EXTEND)	CONC BOX CULV (4 FT X 3 FT) (EXTEND)	CONC BOX CULV (4 FT X 4 FT) (EXTEND)	CONC BOX CULV (5 FT X 3 FT) (EXTEND)	CONC BOX CULV (7 FT X 4 FT) (EXTEND)	CONC BOX CULV (7 FT X 5 FT) (EXTEND)	RC PIPE (CL III)(18 IN)	RC PIPE (CL III)(30 IN)	HEADWALL (CH - PW - 0) (DIA= 30 IN)	WINGWALL (PW - 1) (HW=6 FT)	WINGWALL (PW - 1) (HW=7 FT)		
				SF	CY	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA			
CULVERT 1	CONC BOX CULV 1-4'x4'x78'	9	12								21					1	1			
CULVERT 2	CONC BOX CULV 1-4'x3'x77'	13	9						22											
CULVERT 3	CONC BOX CULV 1-4'x3'x66'	18	15						33											
CULVERT 4	CONC BOX CULV 1-3'x2'x63'	21	16				37													
CULVERT 5	CONC BOX CULV 1-3'x3'x57'	20	22.6					42.6												
CULVERT 6	CONC BOX CULV 1-3'x2'x66'	18	15				33													
CULVERT 7	CMP CULV 1-35'x24'x69' (REPLACE WITH 3'x2' CONC BOX)	0	0	760		92														
CULVERT 8	CONC BOX CULV 1-4'x4'x68'	16	15							31										
CULVERT 9	CONC BOX CULV 1-3'x2'x66'	18	16				34													
CULVERT 10	CMP CULV 1-30'x68' (REPLACE WITH 30" RCP)	0	0										98.5	1						
CULVERT 11	CONC BOX CULV 1-4'x4'x70'	14	15							29										
CULVERT 12	CONC BOX CULV 1-3'x2'x68'	14	17				31													
CULVERT 13	CONC BOX CULV 1-4'x4'x67'	19	13							32										
CULVERT 14	CMP CULV 1-24'x64.5' (REPLACE WITH 30" RCP)	0	0										99	2						
CULVERT 15	CONC BOX CULV 1-4'x4'x66'	14	9	320	21.15					23										
CULVERT 16	CONC BOX CULV 1-3'x2'x73'	16	10				26													
CULVERT 17	CONC BOX CULV 1-4'x4'x64'	18	17		7.65					35										
CULVERT 18	CONC BOX CULV 1-4'x3'x70'	17	12		12.44				29											
CULVERT 19	CONC BOX CULV 2-5'x3'x84'	0	8		8.73					16										
CULVERT 20	CONC BOX CULV 1-3'x3'x75'	14	10		7.28			28												
CULVERT 21	CONC BOX CULV 1-4'x3'x65'	11	20						31											
CULVERT 22	CMP CULV 1-28'x20'x77' (REPLACE WITH 18" RCP)	0	0										70							
CULVERT 23	CONC BOX CULV 1-4'x3'x65'	4	17		8.24				20											
CULVERT 24	CMP CULV 2-30'x74' (REPLACE WITH 2-30" RCP)	0	0	600										198	1					
CULVERT 25	CMP CULV 2-30'x93' (REPLACE WITH 2-30" RCP)	0	0										210.6							
CULVERT 26	CONC BOX CULV 1-3'x3'x88'; RCP CULV 1-32'x8'	33	13		1.60			46												
CULVERT 27	CONC BOX CULV 1-3'x3'x90.5'	6	0		4.85			5.7												
CULVERT 28	CONC BOX CULV 2-5'x3'x85'	7	7							27.2										
CULVERT 29	CONC BOX CULV 1-7'x4'x84' & 1-3'x3'x84'	7.5	8					15.5				15.5								
CULVERT 30	CONC BOX CULV 1-7'x5'x85'	8	10		4.79							18								
CULVERT 31	CONC BOX CULV 2-5'x3'x84'	7	8		7.10					30										
CULVERT 32	CONC BOX CULV 3-5'x3'x85' & 1-3'x3'x85'	7.5	7.5		12.19			15		45										
CULVERT 33	CONC BOX CULV 1-3'x2'x67'	no work	no work																	
CULVERT 34	CONC BOX CULV 3-10'x10'x70.0'	no work	no work																	
<b>PROJECT TOTALS</b>						<b>1680</b>	<b>96.0</b>	<b>92</b>	<b>161</b>	<b>152.8</b>	<b>135</b>	<b>171</b>	<b>118.2</b>	<b>15.5</b>	<b>18</b>	<b>70</b>	<b>606.1</b>	<b>4</b>	<b>1</b>	<b>1</b>

\*TABLE CONTINUED ON SHEET 7 OF 10

**QUANTITY  
SUMMARIES**

SHEET 6 OF 10

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**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		17
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

\$DAYS \$  
 \$FILES \$

466 6185	466 6192	466 6193	466 6194	466 6195	466 6197	466 6207	467 6106	467 6112	467 6116	467 6142	467 6144	467 6177	467 6420	467 6423	480 6001	496 6004	496 6005	495 6006	496 6007	496 6008	658 6099	
WINGWALL (PW - 2) (HW=10 FT)	WINGWALL (PW - 2) (HW=3 FT)	WINGWALL (PW - 2) (HW=4 FT)	WINGWALL (PW - 2) (HW=5 FT)	WINGWALL (PW - 2) (HW=6 FT)	WINGWALL (PW - 2) (HW=8 FT)	WINGWALL (SW - 0) (HW=4 FT)	SET (TY I)(S=3 FT)(HW=3F T)(4:1)(C)	SET (TY I)(S=3 FT)(HW= 4 FT)(4:1)(C)	SET (TY I)(S=3 FT)(HW= 4 FT)(6:1)(P)	SET (TY I)(S= 4 FT)(HW= 3 FT)(6:1) (P)	SET (TY I)(S= 4 FT)(HW= 4 FT)(4:1) (C)	SET (TY I)(S= 5 FT)(HW= 4 FT)(4:1) (C)	SET (TY II) (30 IN) (RCP) (4:1) (P)	SET(TY II)(30 IN)(RCP)(6: 1)(P)	CLEAN EXIST CULVERTS	REMOV STR (SET)	REMOV STR (WINGWALL)	REMOV STR (HEADWALL)	REMOV STR (PIPE)	REMOV STR (BOX CULVERT)	INSTR OM ASSM (OM-22)(WF LX)GND	
EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	EA
			1	1											1		2					4
			1												1		2					4
		1	1												1		2					3
	1	1													1		2					2
		2													1		2					2
		2													1		2					2
		1					1									2			69			2
				2											1		2					4
		2												1		2						2
														1		2						2
				2											1	2						4
		2													1		2					2
																2			64.5			2
2			1	1											1		1	1				2
			1	1	1										1		2					4
			1	1											1		2					3
			1									1			1		2			10.4		4
			1	2											1		2					2
										2					1		3					3
													2			2			77			2
				1							1				1		2					3
														1		2			148			2
														2		2			186			2
						2		1	1						1		4		8	16		4
			1												1		1					1
			2												1		2					4
				2											1		2					4
					1	1									1		2					4
			2												1		2					4
				2											1		2					4
															1							
															1							
<b>2</b>	<b>1</b>	<b>20</b>	<b>12</b>	<b>9</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>28</b>	<b>12</b>	<b>53</b>	<b>1</b>	<b>621</b>	<b>26</b>	<b>91</b>	

**QUANTITY SUMMARIES**

SHEET 7 OF 10



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 18
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 4:57:21 PM  
... \01 \*GENERAL\5563804-SUM-04A.dgn



12/14/2020 4:57:30 PM  
 ... \01 \*GENERAL\5563804-SUM-05.dgn

SUMMARY OF EXCAVATION AND EMBANKMENT ITEMS		
US 82 CSJ: 0133-04-042	110	132
	6001	6004
	EXCAVATION (ROADWAY) CY	EMBANKMENT (FINAL)(DENS CONT)(TY B) CY
SHEET 1 OF 56	170	570
SHEET 2 OF 56	31	1830
SHEET 3 OF 56	44	1065
SHEET 4 OF 56	33	1763
SHEET 5 OF 56	15	2074
SHEET 6 OF 56	13	1591
SHEET 7 OF 56	246	1391
SHEET 8 OF 56	56	1270
SHEET 9 OF 56	0	1665
SHEET 10 OF 56	22	993
SHEET 11 OF 56	0	1022
SHEET 12 OF 56	4	1009
SHEET 13 OF 56	54	1074
SHEET 14 OF 56	37	924
SHEET 15 OF 56	374	520
SHEET 16 OF 56	470	339
SHEET 17 OF 56	802	809
SHEET 18 OF 56	498	1609
SHEET 19 OF 56	1156	252
SHEET 20 OF 56	1061	685
SHEET 21 OF 56	624	737
SHEET 22 OF 56	272	1067
SHEET 23 OF 56	576	852
SHEET 24 OF 56	535	607
SHEET 25 OF 56	446	994
SHEET 26 OF 56	533	628
SHEET 27 OF 56	569	446
SHEET 28 OF 56	167	1107
SHEET 29 OF 56	402	794
SHEET 30 OF 56	452	476
SHEET 31 OF 56	1000	596
SHEET 32 OF 56	196	731
SHEET 33 OF 56	728	511
SHEET 34 OF 56	570	998
SHEET 35 OF 56	481	1594
SHEET 36 OF 56	13	1548
SHEET 37 OF 56	76	1106
SHEET 38 OF 56	493	1748
SHEET 39 OF 56	111	4506
SHEET 40 OF 56	550	578
SHEET 41 OF 56	402	2891
SHEET 42 OF 56	837	431
SHEET 43 OF 56	311	369
SHEET 44 OF 56	894	109
SHEET 45 OF 56	1081	50
SHEET 46 OF 56	520	419
SHEET 47 OF 56	452	943
SHEET 48 OF 56	1128	194
SHEET 49 OF 56	648	120
SHEET 50 OF 56	859	52
SHEET 51 OF 56		
SHEET 52 OF 56		
SHEET 53 OF 56		
SHEET 54 OF 56		
SHEET 55 OF 56		
SHEET 56 OF 56		
<b>PROJECT TOTALS</b>	<b>21015</b>	<b>49659</b>

SUMMARY OF EROSION CONTROL ITEMS														
US 82 CSJ: 0133-04-042	160	162	164	164	164	168	169	314	506	506	506	506	506	506
	6003	6002	6009	6011	6035	6001	6003	6009	6002	6011	6038	6039	6040	6043
	FURNISHING AND PLACING TOPSOIL (4") SY	BLOCK SODDING SY	BROADCAST SEED (TEMP)(WARM) SY	BROADCAST SEED (TEMP)(COOL) SY	DRILL SEEDING (PERM)(RURAL)(CLAY) SY	VEGETATIVE WATERING MG	SOIL RETENTION BLANKETS (CL 1)(TY C) SY	EMULS ASPH (EROSN CONT)(MULTI) GAL	ROCK FILTER DAMS (INSTALL)(TY 2) LF	ROCK FILTER DAMS (REMOVE) LF	TEMP SEDMT CONT FENCE (INSTALL) LF	TEMP SEDMT CONT FENCE (REMOVE) LF	BIODEG EROSN CONT LOGS (INSTL)(8") LF	BIODEG EROSN CONT LOGS (REMOVE) LF
SHEET 1 OF 28	5289	30.1	2644	2644	5289	44		529	50	50	40	40	308	308
SHEET 2 OF 28	5333	7.8	2667	2667	5333	45		533	20	20			277	277
SHEET 3 OF 28	5333	6.4	2667	2667	5333	45		533	20	20			234	234
SHEET 4 OF 28	5333	7.3	2667	2667	5333	45		533	20	20			237	237
SHEET 5 OF 28	5333		2667	2667	5333	45		533					200	200
SHEET 6 OF 28	5333		2667	2667	5333	45		533					200	200
SHEET 7 OF 28	5333	7.3	2667	2667	5333	45		533	20	20			243	243
SHEET 8 OF 28	5333		2667	2667	5333	45		533					160	160
SHEET 9 OF 28	5333	32.2	2667	2667	5333	45	889	533	70	70	20	20	314	314
SHEET 10 OF 28	5333	17.7	2667	2667	5333	45	1846	533	70	70			367	367
SHEET 11 OF 28	5333	16.7	2667	2667	5333	45	1128	533	50	50			309	309
SHEET 12 OF 28	5333	34.6	2667	2667	5333	45		533	90	90	20	20	338	338
SHEET 13 OF 28	5333	29.7	2667	2667	5333	45		533	50	50	40	40	244	244
SHEET 14 OF 28	5333	16.6	2667	2667	5333	45		533	20	20	20	20	188	188
SHEET 15 OF 28	5333		2667	2667	5333	45		533	40	40			265	265
SHEET 16 OF 28	5333	16.2	2667	2667	5333	45	1017	533	40	40	20	20	287	287
SHEET 17 OF 28	5333		2667	2667	5333	45		533	40	40	120	120	244	244
SHEET 18 OF 28	5333		2667	2667	5333	45		533					200	200
SHEET 19 OF 28	5333	7.8	2667	2667	5333	45		533			60	60	264	264
SHEET 20 OF 28	5333	25.5	2667	2667	5333	45	788	533	70	70	720	720	269	269
SHEET 21 OF 28	5333	8.9	2667	2667	5333	45		533	40	40			279	279
SHEET 22 OF 28	5333		2667	2667	5333	45		533					200	200
SHEET 23 OF 28	5333		2667	2667	5333	45		533					160	160
SHEET 24 OF 28	5333	27.8	2667	2667	5333	45		533	70	70			291	291
SHEET 25 OF 28	5333		2667	2667	5333	45		533					200	200
SHEET 26 OF 28														
SHEET 27 OF 28														
SHEET 28 OF 28														
<b>PROJECT TOTALS</b>	<b>133289</b>	<b>293</b>	<b>66644</b>	<b>66644</b>	<b>133289</b>	<b>1120</b>	<b>5668</b>	<b>13329</b>	<b>780</b>	<b>780</b>	<b>1080</b>	<b>1080</b>	<b>6278</b>	<b>6278</b>

**QUANTITY SUMMARIES**

SHEET 8 OF 10



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761


FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		19
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

SUMMARY OF PAVEMENT MARKING ITEMS										
LOCATION	666	666	666	666	666	666	666	666	666	666
	6006	6029	6036	6048	6300	6303	6312	6315	6054	6072
	REFL PAV MRK TY I (W) 4" (DOT) (100MIL)	REFL PAV MRK TY I (W) 8" (DOT) (090MIL)	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	REFL PAV MRK TY I (W) (ARROW) (100MIL)	REFL PAV MRK TY I (W) (LNDP ARW) (100MIL)
	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA
SHEET 01 (STA 34+20 TO 58+00)	250				92	4760		4760		2
SHEET 02 (STA 58+00 TO 81+00)				11	545	4479		4358		
SHEET 03 (STA 81+00 TO 104+00)					575	4600		4600		
SHEET 04 (STA 104+00 TO 127+00)					546	4368		4368		
SHEET 05 (STA 127+00 TO 150+00)					575	4600		4600		
SHEET 06 (STA 150+00 TO 173+00)				26	550	4398		4398		
SHEET 07 (STA 173+00 TO 196+00)					575	4600		4600		
SHEET 08 (STA 196+00 TO 219+00)	118	101	63		397	4600		6032	1	
SHEET 09 (STA 219+00 TO 242+00)	118	126	2038	18	173	4374		7457	11	
SHEET 10 (STA 242+00 TO 265+00)					575	4600		4600		
SHEET 11 (STA 265+00 TO 288+00)					554	4430		4430		
SHEET 12 (STA 288+00 TO 311+00)					575	4600		4600		
SHEET 13 (STA 311+00 TO 334+00)					552	4410		4410		
SHEET 14 (STA 334+00 TO 357+00)					575	4600		4600		
SHEET 15 (STA 357+00 TO 380+00)					575	4600		4600		
SHEET 16 (STA 380+00 TO 403+00)	72				491	4490		4490		1
SHEET 17 (STA 403+00 TO 426+00)	183					4620		7940		1
SHEET 18 (STA 426+00 TO 449+00)		126	1432	18		4298		6444	6	
SHEET 19 (STA 449+00 TO 472+00)	109					4600		8334		1
SHEET 20 (STA 472+00 TO 495+00)	145					4600		4600		1
SHEET 21 (STA 495+00 TO 518+00)					430	4600		4600		
SHEET 22 (STA 518+00 TO 541+00)					575	4600		4600		
SHEET 23 (STA 541+00 TO 564+00)					553	4510		4420		
SHEET 24 (STA 564+00 TO 587+00)					568	4572		4544		
SHEET 25 (STA 587+00 TO 610+00)				10	561	4458		4316		
SHEET 26 (STA 610+00 TO 633+00)	93			36	463	4336		4072		
SHEET 27 (STA 633+00 TO 656+00)	25					4542		5012		
SHEET 28 (STA 656+00 TO 679+00)						4060	929	5102	7	
SHEET 29 (STA 679+00 TO 699+12)		20	186	42		3132	701	3744	11	
PROJECT TOTALS	1113	373	3719	161	11650	129437	1630	144631	36	6


SUMMARY OF PAVEMENT MARKING ITEMS			
LOCATION	666	672	672
	6078	6007	6009
	REFL PAV MRK TY I (W) (WORD) (100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY I1-A-A
	EA	EA	EA
SHEET 01 (STA 34+20 TO 58+00)		5	60
SHEET 02 (STA 58+00 TO 81+00)		28	56
SHEET 03 (STA 81+00 TO 104+00)		29	58
SHEET 04 (STA 104+00 TO 127+00)		28	56
SHEET 05 (STA 127+00 TO 150+00)		29	58
SHEET 06 (STA 150+00 TO 173+00)		29	58
SHEET 07 (STA 173+00 TO 196+00)		29	58
SHEET 08 (STA 196+00 TO 219+00)	2	34	186
SHEET 09 (STA 219+00 TO 242+00)	10	125	324
SHEET 10 (STA 242+00 TO 265+00)		29	58
SHEET 11 (STA 265+00 TO 288+00)		29	58
SHEET 12 (STA 288+00 TO 311+00)		29	58
SHEET 13 (STA 311+00 TO 334+00)		28	56
SHEET 14 (STA 334+00 TO 357+00)		29	58
SHEET 15 (STA 357+00 TO 380+00)		29	58
SHEET 16 (STA 380+00 TO 403+00)		21	58
SHEET 17 (STA 403+00 TO 426+00)			344
SHEET 18 (STA 426+00 TO 449+00)	6	84	327
SHEET 19 (STA 449+00 TO 472+00)			388
SHEET 20 (STA 472+00 TO 495+00)		22	58
SHEET 21 (STA 495+00 TO 518+00)		29	58
SHEET 22 (STA 518+00 TO 541+00)		29	58
SHEET 23 (STA 541+00 TO 564+00)		28	56
SHEET 24 (STA 564+00 TO 587+00)		29	58
SHEET 25 (STA 587+00 TO 610+00)		29	56
SHEET 26 (STA 610+00 TO 633+00)		25	54
SHEET 27 (STA 633+00 TO 656+00)			106
SHEET 28 (STA 656+00 TO 679+00)			66
SHEET 29 (STA 679+00 TO 699+12)	4	12	48
PROJECT TOTALS	22	817	2995

## QUANTITY SUMMARIES

SHEET 9 OF 10



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Richardson, Texas 75243

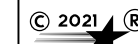
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		20
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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SUMMARY OF SIGNING ITEMS										
LOCATION	644	644	644	644	644	644	644	644	644	644
	6001	6002	6004	6030	6033	6034	6037	6056	6057	6076
	IN SM RD SN SUP&AM TY10BWG (1) SA (P)	IN SM RD SN SUP&AM TY10BWG (1) SA (P -BM)	IN SM RD SN SUP&AM TY10BWG (1) SA (T)	IN SM RD SN SUP&AM TYS80 (1) SA (T)	IN SM RD SN SUP&AM TYS80 (1) SA (U)	IN SM RD SN SUP&AM TYS80 (1) SA (U-1 EXT)	IN SM RD SN SUP&AM TYS80 (1) SA (U-W C)	IN SM RD SN SUP&AM TYTWT (1) UA (P)	IN SM RD SN SUP&AM TYTWT (1) UA (T)	REMOVE SM RD SN SUP&AM
EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	
SHEET 01 (STA 34+20 TO 58+00)	1		1		2			2		3
SHEET 02 (STA 58+00 TO 81+00)	1		1							3
SHEET 03 (STA 81+00 TO 104+00)								2		
SHEET 04 (STA 104+00 TO 127+00)	2		1							4
SHEET 05 (STA 127+00 TO 150+00)	1							1		1
SHEET 06 (STA 150+00 TO 173+00)	2							1		3
SHEET 07 (STA 173+00 TO 196+00)			4					1	1	5
SHEET 08 (STA 196+00 TO 219+00)			2	1		1		4	1	3
SHEET 09 (STA 219+00 TO 242+00)	3		3	2		3	1	1		13
SHEET 10 (STA 242+00 TO 265+00)	1		3					2		5
SHEET 11 (STA 265+00 TO 288+00)	2									7
SHEET 12 (STA 288+00 TO 311+00)								2		
SHEET 13 (STA 311+00 TO 334+00)	2		1							5
SHEET 14 (STA 334+00 TO 357+00)	1									1
SHEET 15 (STA 357+00 TO 380+00)								2		
SHEET 16 (STA 380+00 TO 403+00)	2		3					1		5
SHEET 17 (STA 403+00 TO 426+00)	1					1		6		1
SHEET 18 (STA 426+00 TO 449+00)	2		3			2	1	1		10
SHEET 19 (STA 449+00 TO 472+00)	1			1		1				2
SHEET 20 (STA 472+00 TO 495+00)			2							
SHEET 21 (STA 495+00 TO 518+00)										
SHEET 22 (STA 518+00 TO 541+00)								2		
SHEET 23 (STA 541+00 TO 564+00)	3							1		4
SHEET 24 (STA 564+00 TO 587+00)	2							1		3
SHEET 25 (STA 587+00 TO 610+00)	1		5							7
SHEET 26 (STA 610+00 TO 633+00)	3		2	1						7
SHEET 27 (STA 633+00 TO 656+00)			3					3	1	6
SHEET 28 (STA 656+00 TO 679+00)	2	2						6		7
SHEET 29 (STA 679+00 TO 699+12)				1	1		1			11
<b>PROJECT TOTALS</b>	<b>33</b>	<b>2</b>	<b>34</b>	<b>8</b>	<b>1</b>	<b>8</b>	<b>3</b>	<b>39</b>	<b>3</b>	<b>116</b>

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS						
LOCATION	502	662	662	662	6185	6185
	6001	6034	6109	6111	6002	6003
	BARRICADES, SIGNS AND TRAFFIC HANDLING	WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	TMA (STATIONARY)	TMA (MOBILE OPERATION)
MO	LF	EA	EA	DAY	DAY	
US 82 - CSJ: 0133-04-042	18	40000	32368	6474	446	21
<b>PROJECT TOTALS</b>	<b>18</b>	<b>40000</b>	<b>32368</b>	<b>6474</b>	<b>446</b>	<b>21</b>

**QUANTITY  
SUMMARIES**



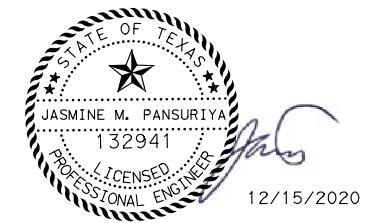
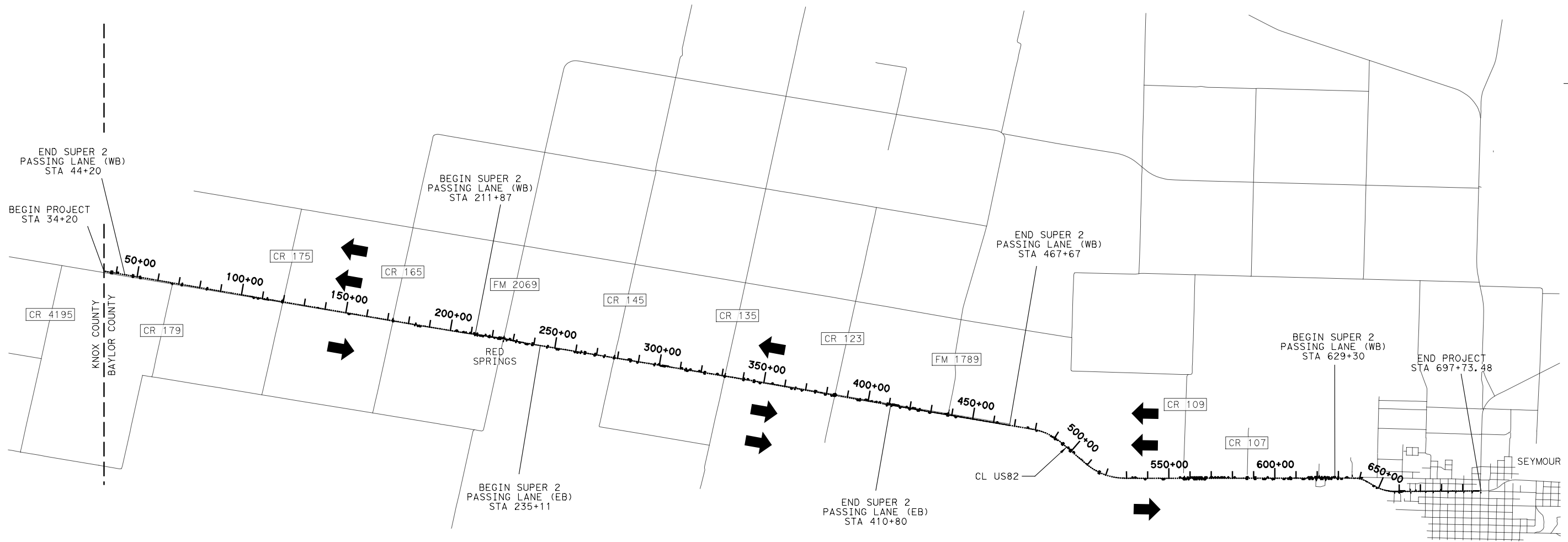
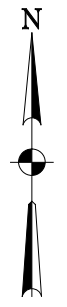
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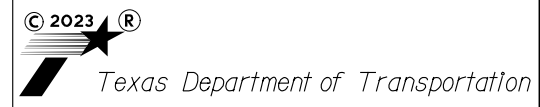
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			21
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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**SUPER 2 LAYOUT**

SHEET 1 OF 1



SCALE: N. T. S.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		22	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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SUGGESTED SEQUENCE OF WORK

TRAFFIC CONTROL PLAN:

PHASE 1 EASTBOUND PAVEMENT

1. INSTALL ADVANCED WARNING SIGNS AS SHOWN IN THE STANDARDS.
2. PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER PRIOR TO BEGINNING ANY OTHER WORK.
3. PREPARE ROW IN LOCATIONS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
4. COMPLETE FLEXIBLE PAVEMENT REPAIR WORK USING TCP(1-2)-18 OR TCP(2-2)-18 AND WZ(RS)-16 WITH ONE-LANE TWO-WAY OPERATIONS CONTROLLED BY PILOT CAR AND FLAGGERS. CONSTRUCTION ACTIVITY WILL BE LIMITED TO WORK ABLE TO BE COMPLETED IN ONE WORKING DAY OR AS DIRECTED BY THE ENGINEER. WORK ZONE PAVEMENT MARKINGS SHORT TERM (TABS) SHALL BE PLACED DIRECTLY FOLLOWING REPAIRS BEING MADE. WORK ZONE PAVEMENT MARKINGS NON-REMOVABLE SHALL BE PLACED WITHIN 14 DAYS OF PLACEMENT OF TABS .
5. COMPLETE LEVEL-UP USING TCP(1-2)-18 OR TCP(2-2)-18 AND WZ(RS)-16 WITH ONE-LANE TWO-WAY OPERATIONS CONTROLLED BY PILOT CAR AND FLAGGERS. WORK ZONE PAVEMENT MARKINGS SHORT TERM (TABS) SHALL BE PLACED DIRECTLY FOLLOWING REPAIRS BEING MADE. WORK ZONE PAVEMENT MARKINGS NON-REMOVABLE SHALL BE PLACED WITHIN 14 DAYS OF PLACEMENT OF TABS .
6. WIDEN ALL EXISTING CROSS DRAINAGE STRUCTURES AS SHOWN IN THE PLANS USING TCP(2-1)-18 FOR EASTBOUND SIDE OF ROADWAY.
7. PERFORM ROADWAY WIDENING USING TCP(2-1)-18.
8. RETURN TRAFFIC TO TWO-LANE OPERATIONS DURING NON-CONSTRUCTION HOURS.
9. PLACE VERTICAL PANELS OR DRUMS ALONG WIDENED SECTIONS OF THE NEW SHOULDER TO ENSURE TRAFFIC MAINTAINS PROPER LANE CONFIGURATIONS UNTIL FINAL STRIPING CAN BE PLACED.

CONSTRUCTION NOTES:

ALL ONE-WAY TRAFFIC CONTROL WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502.

LIMIT LANE CLOSURES ALONG HIGHWAY INTERSECTIONS, AND AT CROSS STREETS TO THE HOURS DIRECTED BY THE ENGINEER.

WORK ON BOTH SIDES OF THE ROAD WILL NOT BE ALLOWED UNLESS OTHERWISE DIRECTED BY ENGINEER.

MAXIMUM WIDENING LENGTH MAY BE EXTENDED BY THE ENGINEER WHEN THE CONTRACTOR PROVES TO HAVE ADEQUATE FORCES & EQUIPMENT TO PERFORM MORE WORK.

PHASE 2 WESTBOUND PAVEMENT

1. INSTALL ADVANCED WARNING SIGNS AS SHOWN IN THE STANDARDS.
2. PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER PRIOR TO BEGINNING ANY OTHER WORK.
3. PREPARE ROW IN LOCATIONS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
4. COMPLETE FLEXIBLE PAVEMENT REPAIR WORK USING TCP(1-2)-18 OR TCP(2-2)-18 AND WZ(RS)-16 WITH ONE-LANE TWO-WAY OPERATIONS CONTROLLED BY PILOT CAR AND FLAGGERS. CONSTRUCTION ACTIVITY WILL BE LIMITED TO WORK ABLE TO BE COMPLETED IN ONE WORKING DAY OR AS DIRECTED BY THE ENGINEER. WORK ZONE PAVEMENT MARKINGS SHORT TERM (TABS) SHALL BE PLACED DIRECTLY FOLLOWING REPAIRS BEING MADE. WORK ZONE PAVEMENT MARKINGS NON-REMOVABLE SHALL BE PLACED WITHIN 14 DAYS OF PLACEMENT OF TABS .
5. COMPLETE LEVEL-UP USING TCP(1-2)-18 OR TCP(2-2)-18 AND WZ(RS)-16 WITH ONE-LANE TWO-WAY OPERATIONS CONTROLLED BY PILOT CAR AND FLAGGERS. WORK ZONE PAVEMENT MARKINGS SHORT TERM (TABS) SHALL BE PLACED DIRECTLY FOLLOWING REPAIRS BEING MADE. WORK ZONE PAVEMENT MARKINGS NON-REMOVABLE SHALL BE PLACED WITHIN 14 DAYS OF PLACEMENT OF TABS .
6. WIDEN ALL EXISTING CROSS DRAINAGE STRUCTURES AS SHOWN IN THE PLANS USING TCP(2-1)-18 FOR EASTBOUND SIDE OF ROADWAY.
7. PERFORM ROADWAY WIDENING USING TCP(2-1)-18.
8. RETURN TRAFFIC TO TWO-LANE OPERATIONS DURING NON-CONSTRUCTION HOURS.
9. PLACE VERTICAL PANELS OR DRUMS ALONG WIDENED SECTIONS OF THE NEW SHOULDER TO ENSURE TRAFFIC MAINTAINS PROPER LANE CONFIGURATIONS UNTIL FINAL STRIPING CAN BE PLACED.

PILOT CAR SHALL BE REQUIRED FOR ALL ONE-WAY TRAFFIC CONTROL OPERATIONS.

THE PORTION OF THIS PROJECT WHICH COINCIDES WITH EXISTING ROADS AND / OR PRIVATE DRIVES SHALL BE MAINTAINED AS ALL-WEATHER ROADS AND KEPT OPEN AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE ENGINEER. THIS WILL BE CONSIDERED SUBSIDIARY TO TRAFFIC HANDLING AND BARRICADES.

CW 8-9a "SHOULDER DROP-OFF" SIGNS SHALL BE PLACED DURING PHASES WHERE ROADWAY WIDENING OCCURS AND AT A MAXIMUM SPACING OF 1,800 FT. PLACE OTHER SIGNS AND DEVICES AS REQUIRED ON THE EDGE CONDITION SHEET.

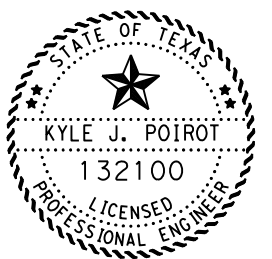
PHASE 3 FINAL OVERLAY AND STRIPING

1. PLACE ADVANCED WARNING SIGNS AS SHOWN IN THE STANDARDS.
2. CONSTRUCT FINAL OVERLAY USING TCP(1-2)-18 OR TCP(2-2)-18 AND WZ(RS)-16. PLACE REFLECTIVE ROADWAY MARKER TABS AS WORK PROGRESSES PER STANDARD WZ(STPM)-13.
3. CONSTRUCTION ACTIVITY WILL BE LIMITED TO WORK ABLE TO BE COMPLETED IN ONE WORKING DAY OR AS DIRECTED BY THE ENGINEER. RETURN TRAFFIC TO TWO-LANE OPERATIONS DURING NON-CONSTRUCTION HOURS.
4. PLACE FINAL STRIPING AND SIGNS AND ALL OTHER APPURTENANCES REQUIRED TO COMPLETE TO THE FINAL CONFIGURATION AS SHOWN IN THE PLANS AND STANDARDS.
5. CONSTRUCT LONGITUDINAL PAVING JOINTS ON PERMANENT LANE LINES. CENTERLINE CHANNELIZING DEVICES WILL BE OPPOSING TRAFFIC LANE DIVIDERS USED IN COMBINATION WITH 42" CONES AS DESCRIBED ON BC(9)-21. PASSING LANES WILL REMAIN CLOSED WITH BARRELS OR VERTICAL PANELS. THESE DEVICES WILL ALL REMAIN IN-PLACE UNTIL ALL PERMANENT STRIPE, RUMBLESTRIPS AND SIGNS ARE INSTALLED.

EDGE LINE CHANNELIZING DEVICES TO BE USED ARE BACK TO BACK MOUNTED PORTABLE VERTICAL PANELS ON SELF-RIGHTING SUPPORTS AS DESCRIBED ON BC(9)-21 OR PLASTIC DRUMS AS DESCRIBED ON BC(8)-21.

BARRICADE & CONSTRUCTION STANDARDS BC(1-12)-21 ARE REQUIRED FOR ALL PHASES.

REFER TO WORK ZONE STANDARD (WZ) SHEETS FOR ADDITIONAL DETAILS. STANDARDS SHOWN ARE CONSIDERED TO BE THE MINIMUM REQUIREMENTS FOR WORK ZONE SIGNING AND TRAFFIC CONTROL. ADDITIONAL OR OTHER DEVICES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.



*Kyle J. Poirot, P.E.*

9/24/2021

**US 82  
SEQUENCE OF  
WORK**

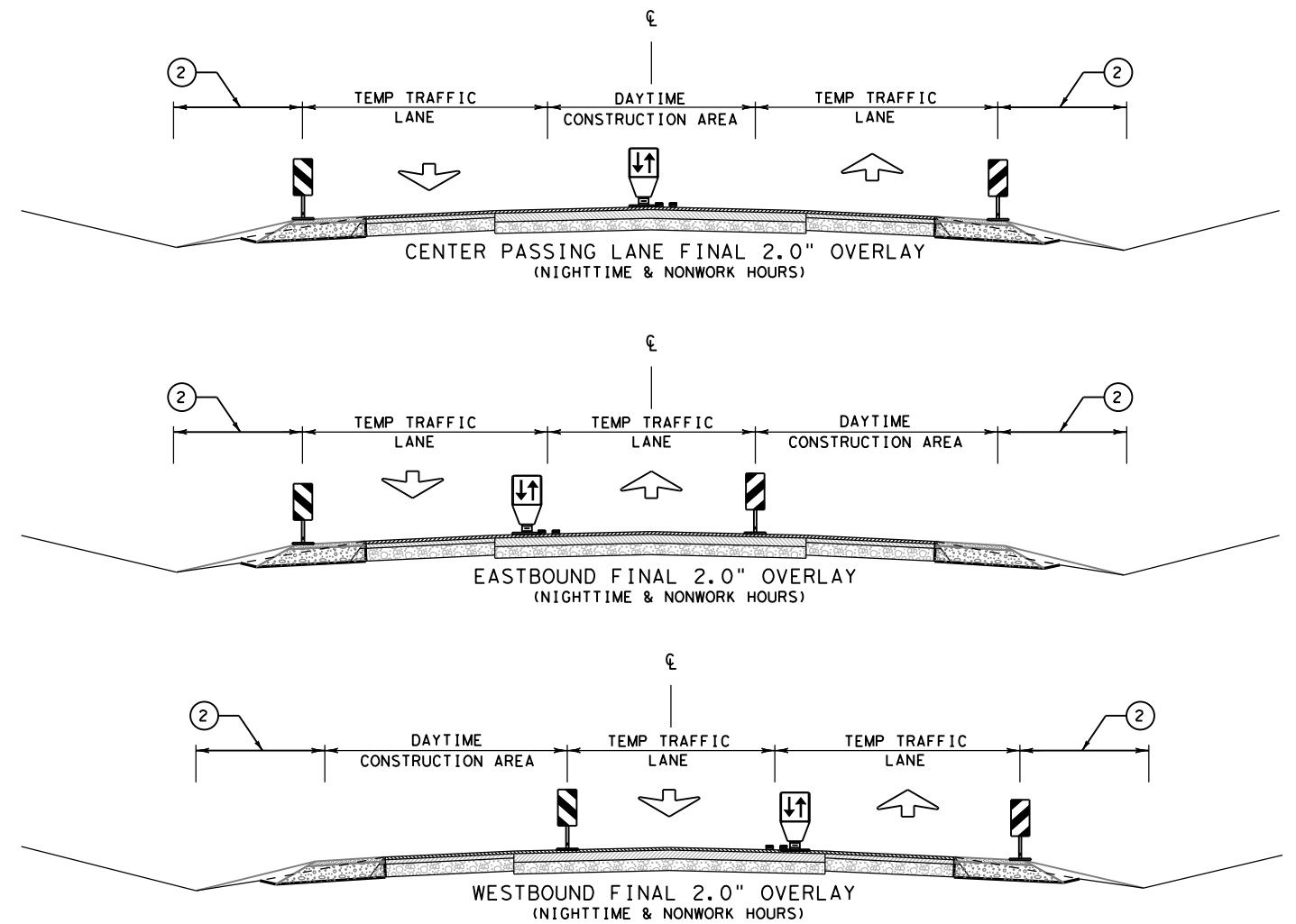
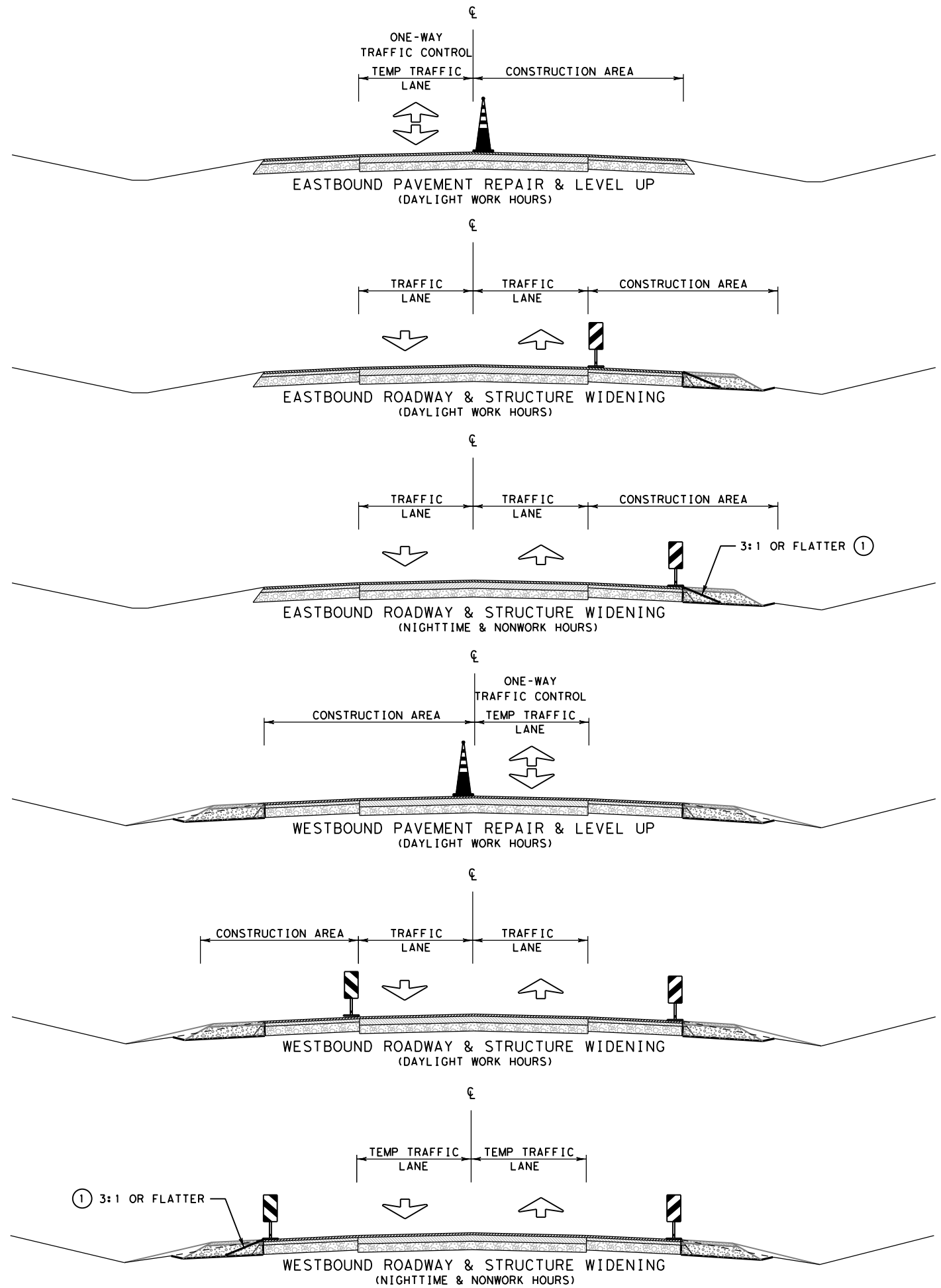


CONT		SECT	JOB	HIGHWAY
0133		04	042	US 82
DIST		COUNTY		SHEET NO.
03		BAYLOR		23

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

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



- ① - THE 3:1 SLOPE BACKFILL FOR END OF DAY OPERATIONS SHALL BE DURABLE CRUSHED STONE TYPE OF FLEXIBLE BASE OR OTHER MATERIALS APPROVED BY THE ENGINEER. WHEN WORK IS RESUMED ON THIS EXCAVATED AREA THIS BACKFILL MATERIAL SHALL BE INCORPORATED INTO THE ROAD WORK OR DISPOSED OF AS APPROVED BY THE ENGINEER. MATERIALS AND LABOR FOR THIS WORK WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.
- ② - BACKFILLED AND SEEDING AREA TO BE SHOULDERED UP TO THE FINAL OVERLAY

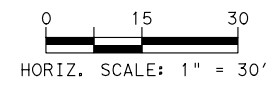
SCALE = N. T. S.

STATE OF TEXAS  
 KYLE J. POIROT  
 132100  
 LICENSED PROFESSIONAL ENGINEER  
 Kyle J. Poirot, P.E.  
 9/24/2021

**US 82 SEQUENCE OF WORK**

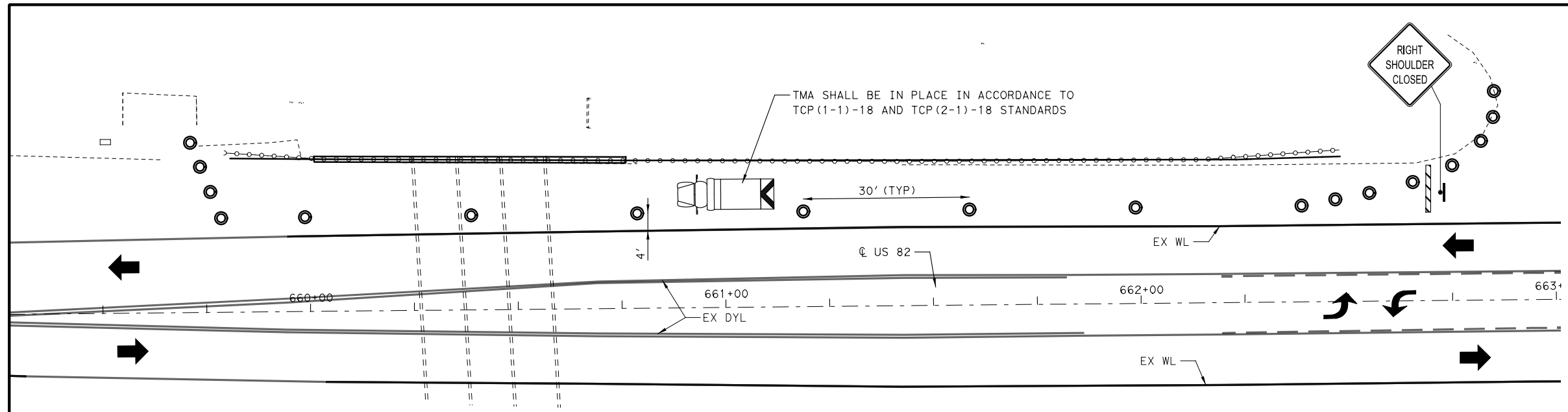
Texas Department of Transportation  
 SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY	SHEET NO.	
03	BAYLOR	24	



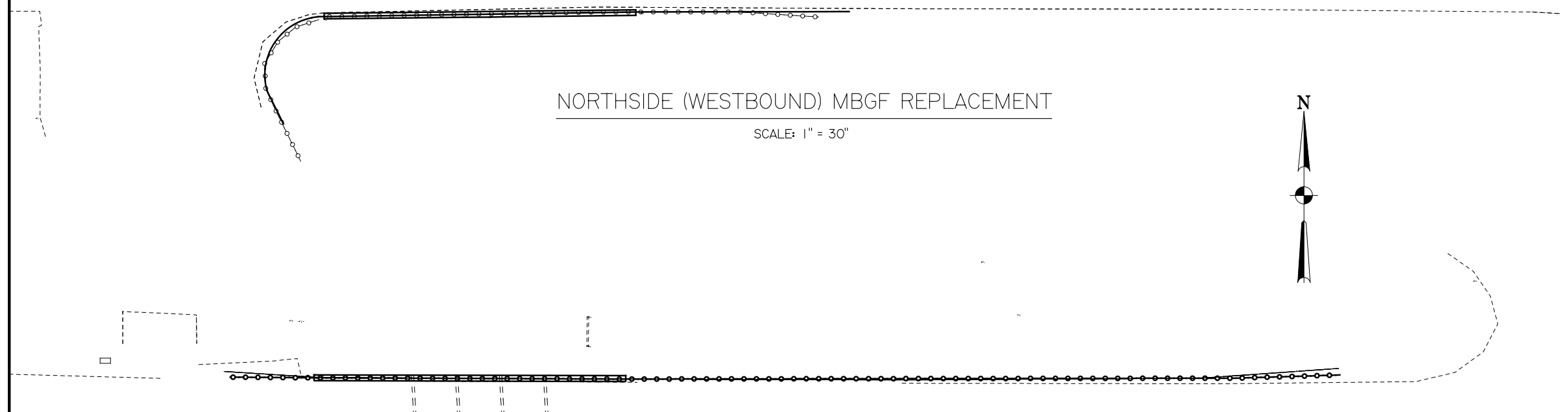
**LEGEND**

- PROP DIRECTION OF TRAVEL
- TYPE 3 BARRICADE
- CHANNELIZING DEVICES
- HEAVY WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR (TMA)
- SIGN



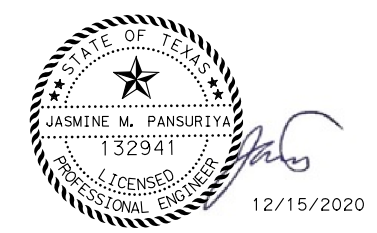
**NORTHSIDE (WESTBOUND) MBGF REPLACEMENT**

SCALE: 1" = 30"



**SOUTHSIDE (EASTBOUND) MBGF REPLACEMENT**

SCALE: 1" = 30"



**TCP LAYOUT AT MBGF REPLACEMENT**

**STA 660+50.00**

SHEET 1 OF 1



SCALE: 1" = 30'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		30	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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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).

<b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b> <a href="http://www.txdot.gov">http://www.txdot.gov</a>
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

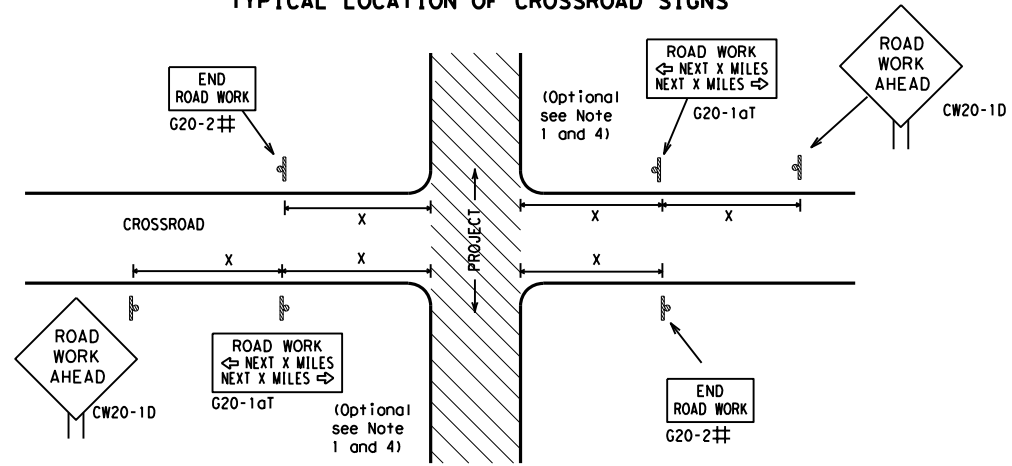
SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
<b>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</b>			
<b>BC (1) - 21</b>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CK:	TxDOT
		DW:	TxDOT
		CK:	TxDOT
REVISIONS	CONT	SECT	JOB
4-03 7-13	0133	04	042
9-07 8-14			US 82
5-10 5-21	DIST	COUNTY	SHEET NO.
	WFS	BAYLOR	31



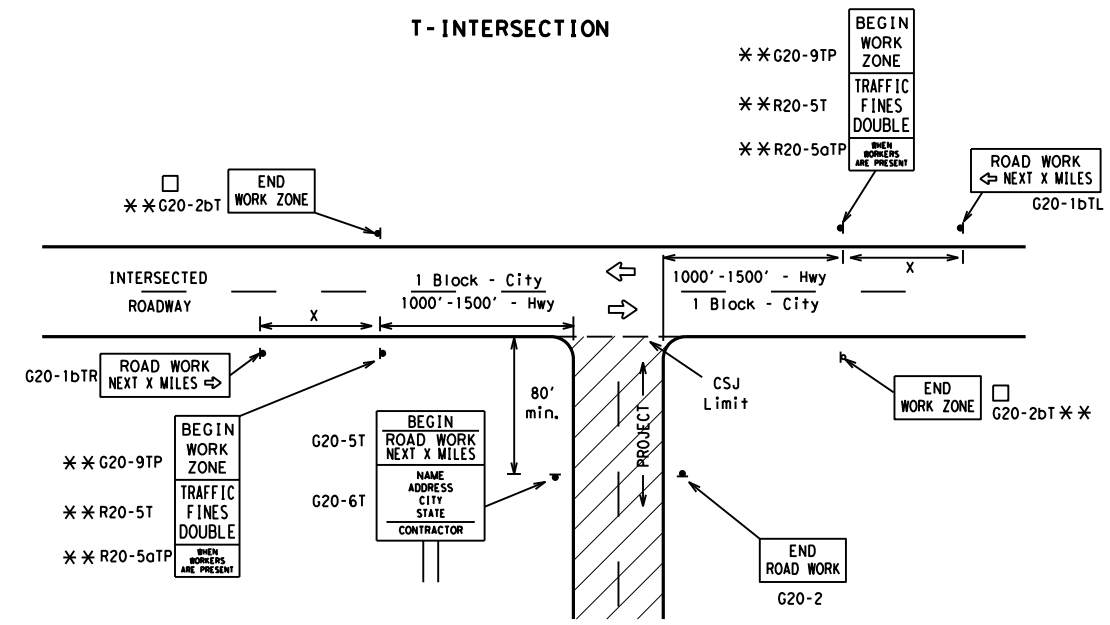
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**TYPICAL LOCATION OF CROSSROAD SIGNS**



- ## 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<sup>1,5,6</sup>**

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "x" Feet (Apprx.)
CW20 <sup>4</sup>	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 <sup>2</sup>
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 <sup>2</sup>
			65	700 <sup>2</sup>
			70	800 <sup>2</sup>
			75	900 <sup>2</sup>
			80	1000 <sup>2</sup>
			*	* <sup>3</sup>

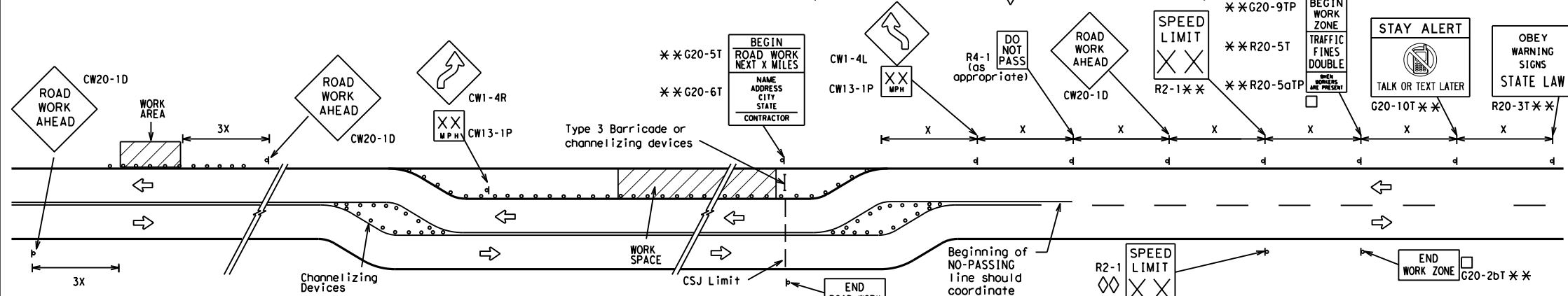
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

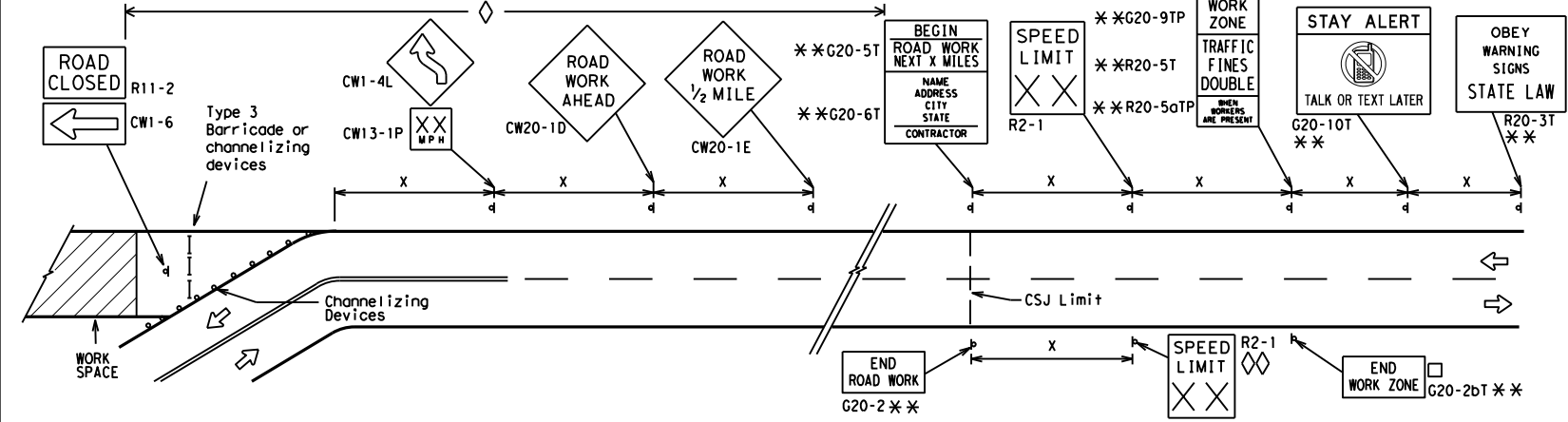
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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**

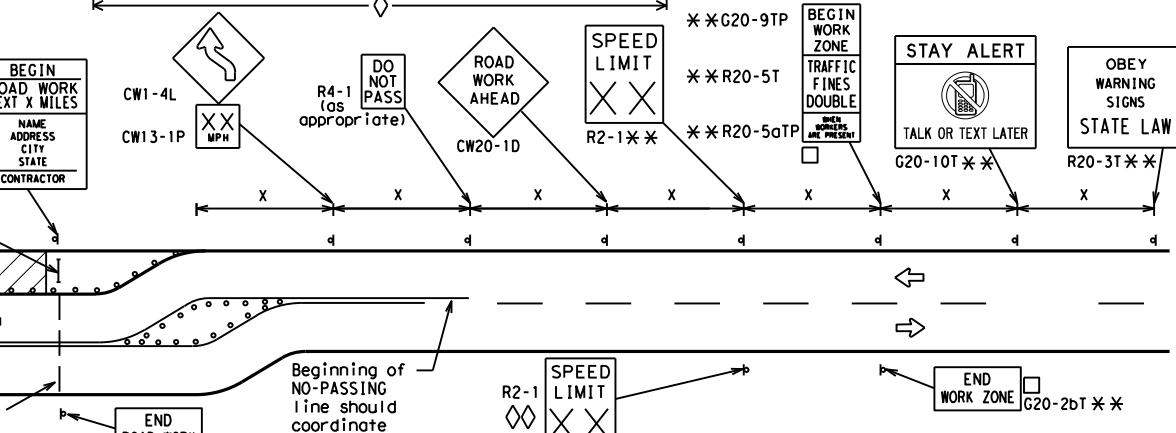


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing 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" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
  - CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
  - Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
  - Contractor will install a regulatory speed limit sign at the end of the work zone.

**LEGEND**

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

SHEET 2 OF 12

Texas Department of Transportation  
Traffic Safety Division Standard

**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC(2)-21**

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	WFS	BAYLOR	32	

# 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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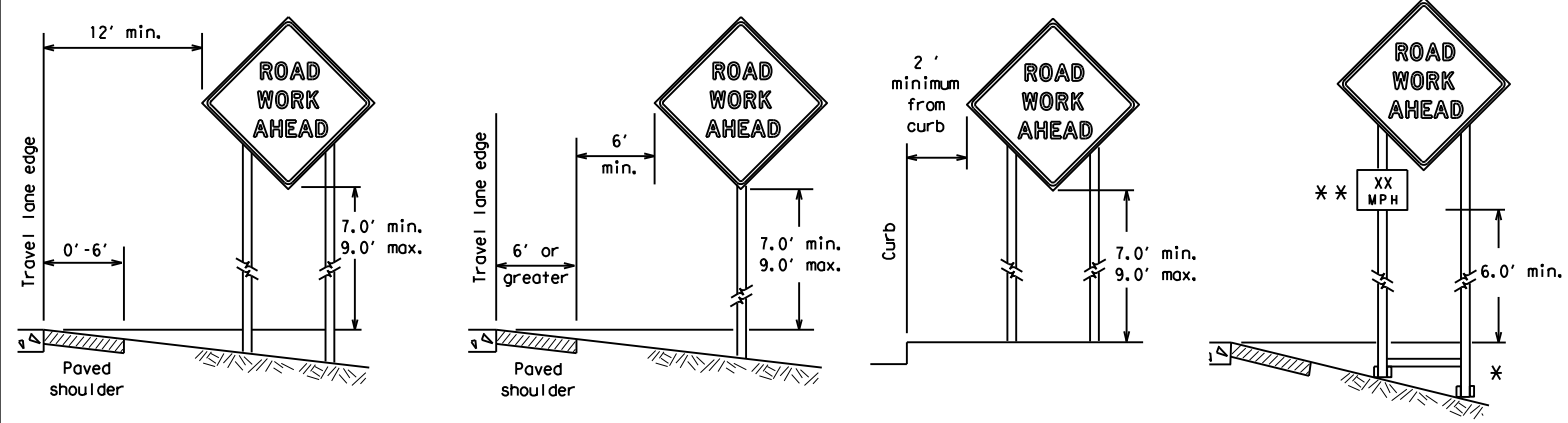
SHEET 3 OF 12

<h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2>			
<h3>BC (3) - 21</h3>			
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© TxDOT	November 2002	CONT:	0133 04
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9-07 8-14		HIGHWAY:	US 82
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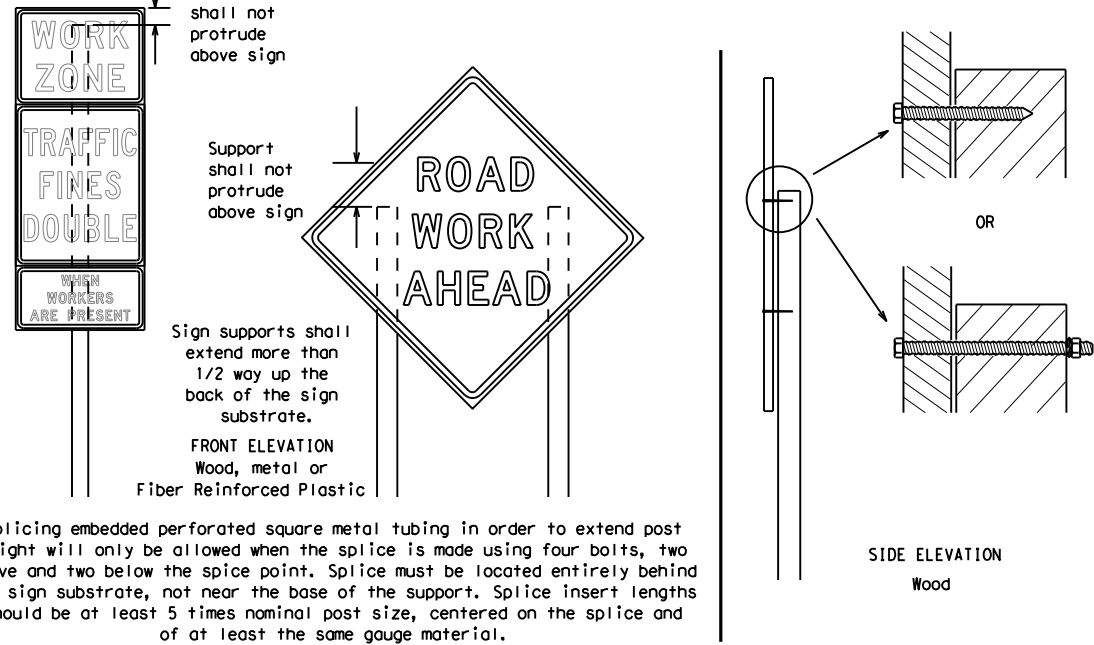
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



\* 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**



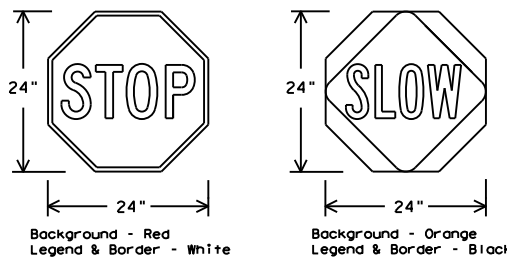
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

**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 <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

**CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS**

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

**GENERAL NOTES FOR WORK ZONE SIGNS**

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

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

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

**SIGN MOUNTING HEIGHT**

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

**SIZE OF SIGNS**

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

**SIGN SUBSTRATES**

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

**REFLECTIVE SHEETING**

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

**SIGN LETTERS**

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

**REMOVING OR COVERING**

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

**SIGN SUPPORT WEIGHTS**

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

**FLAGS ON SIGNS**

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

SHEET 4 OF 12



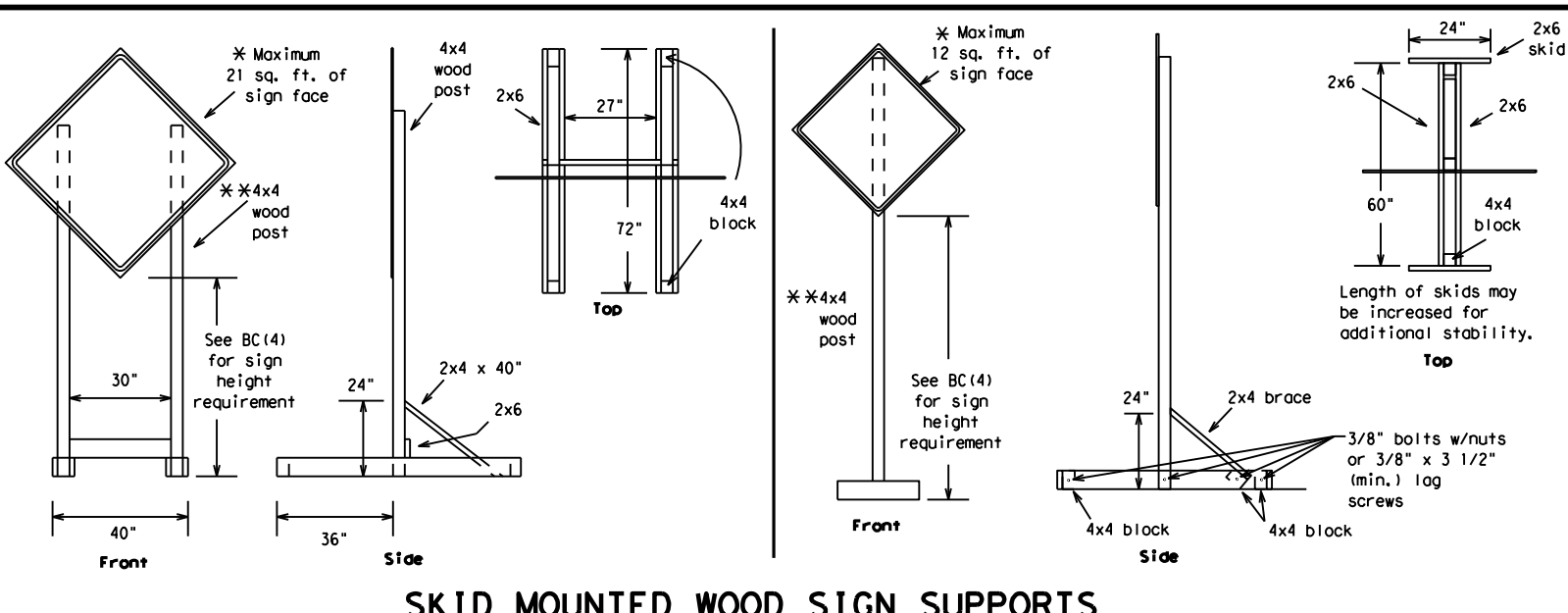
**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

BC (4) - 21

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7-13	5-21	WFS	BAYLOR	34					

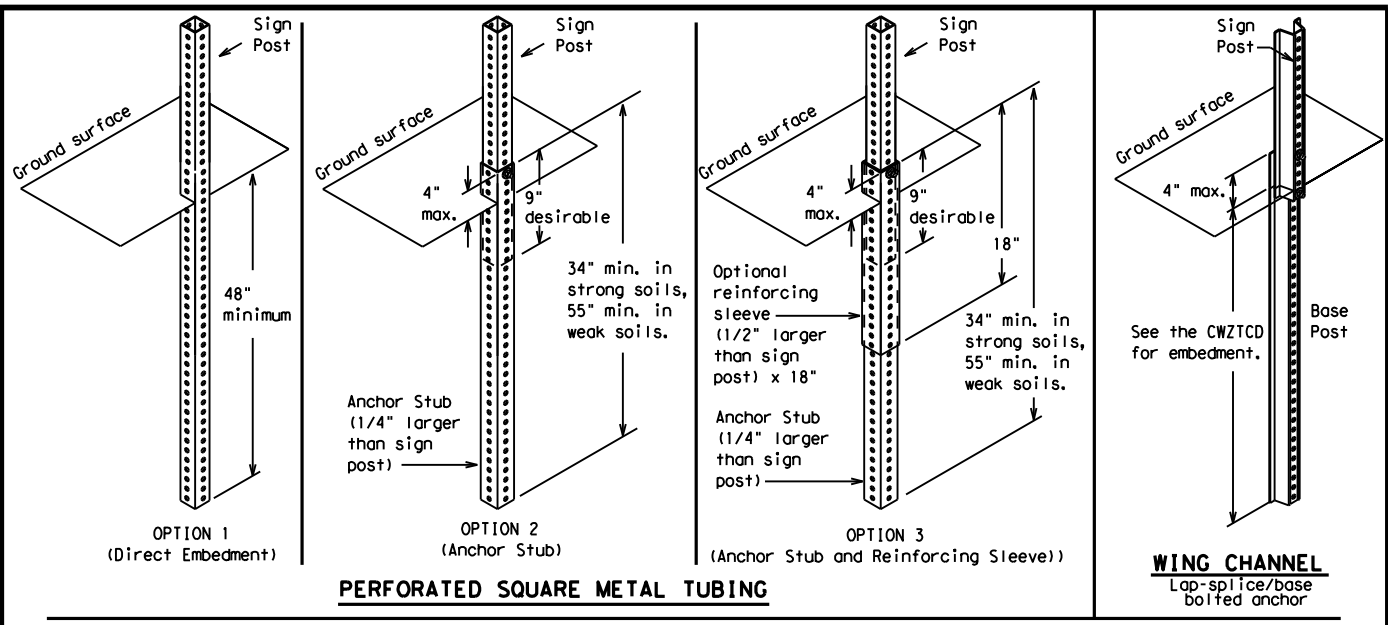
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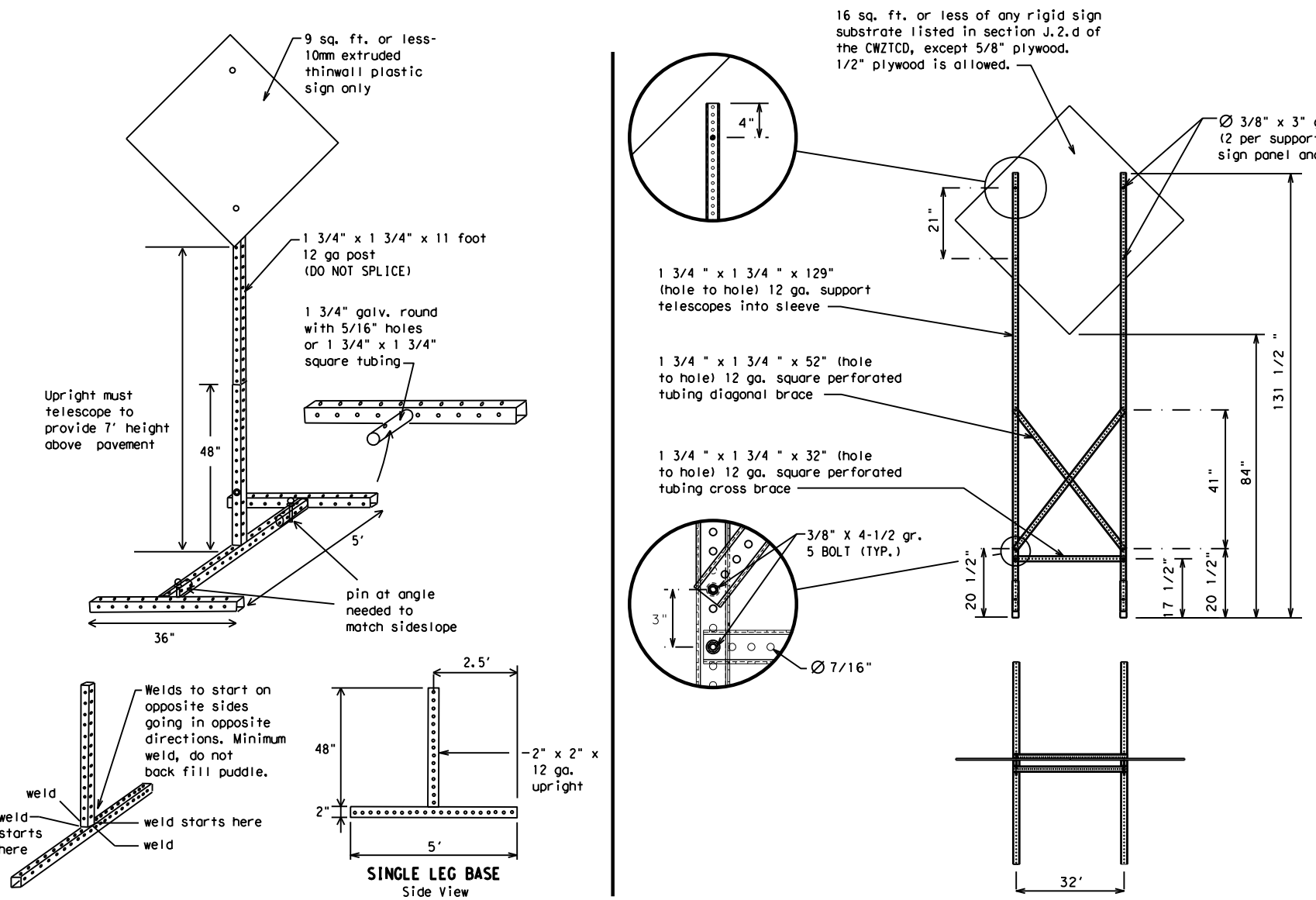
**SKID MOUNTED WOOD SIGN SUPPORTS**

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



**GROUND MOUNTED SIGN SUPPORTS**

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



**SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS**

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

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

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

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

SHEET 5 OF 12

Texas Department of Transportation  
 Traffic Safety Division Standard

**BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT**

**BC(5) - 21**

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	WFS	BAYLOR	<b>35</b>	

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.

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.

## 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.

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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
Canot	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)

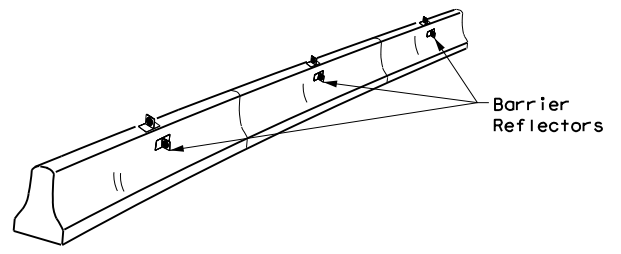
BC (6) - 21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	WFS	BAYLOR	36	

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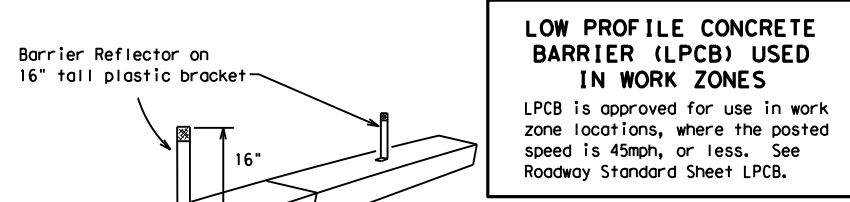
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



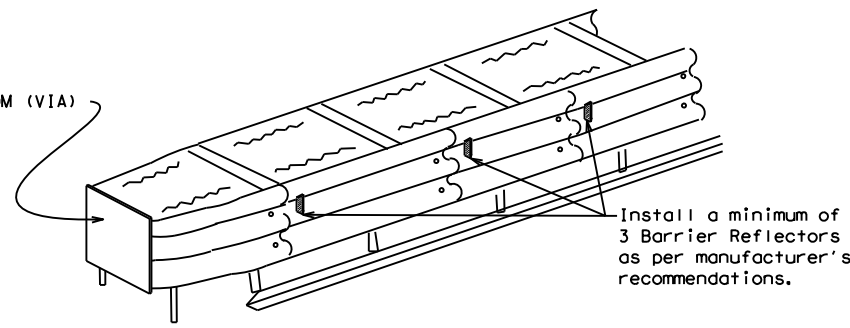
**CONCRETE TRAFFIC BARRIER (CTB)**

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



**LOW PROFILE CONCRETE BARRIER (LPCB) 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**

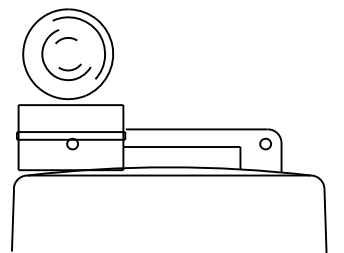
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

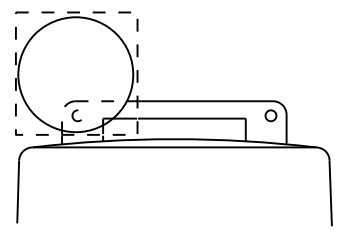
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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



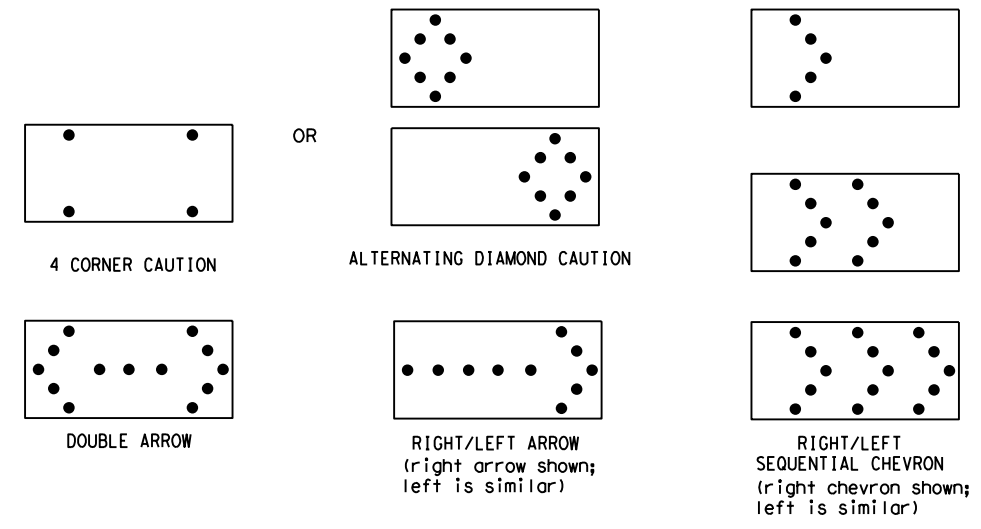
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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.

Texas Department of Transportation  
 Traffic Safety Division Standard

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

**BC (7) - 21**

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	WFS	BAYLOR	37	

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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**

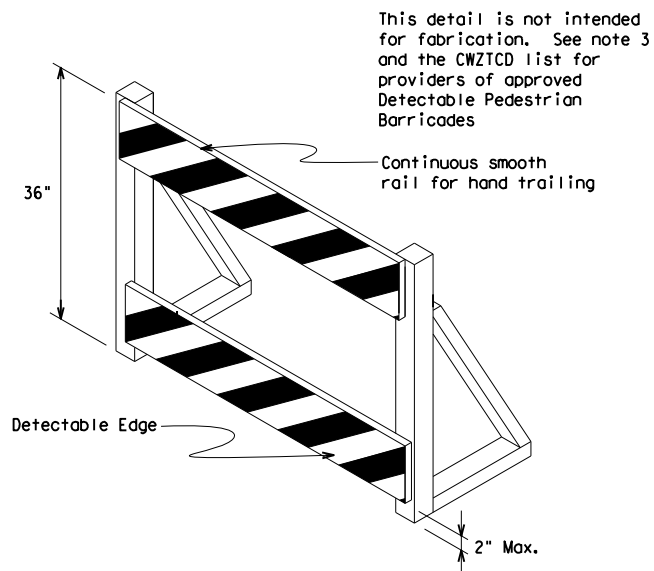
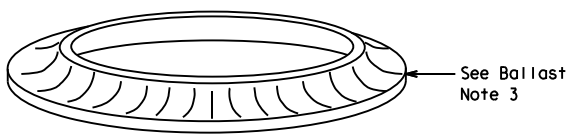
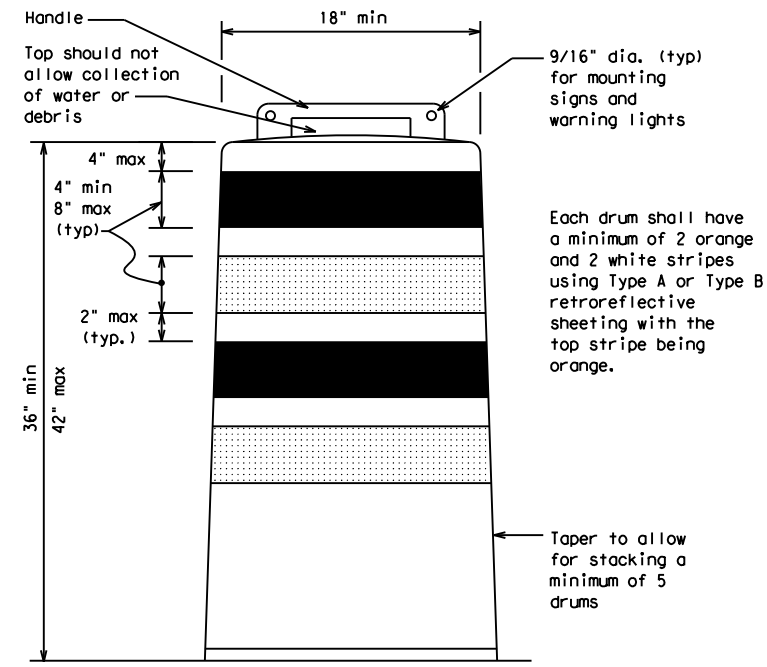
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
  - The body and base shall lock together in such a manner that the body separates from the base when impacted 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.

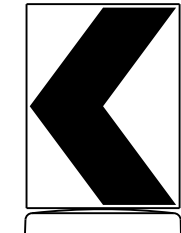
**BALLAST**

- 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.

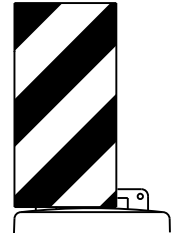


**DETECTABLE PEDESTRIAN BARRICADES**

- 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<sub>FL</sub> or Type C<sub>FL</sub> 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



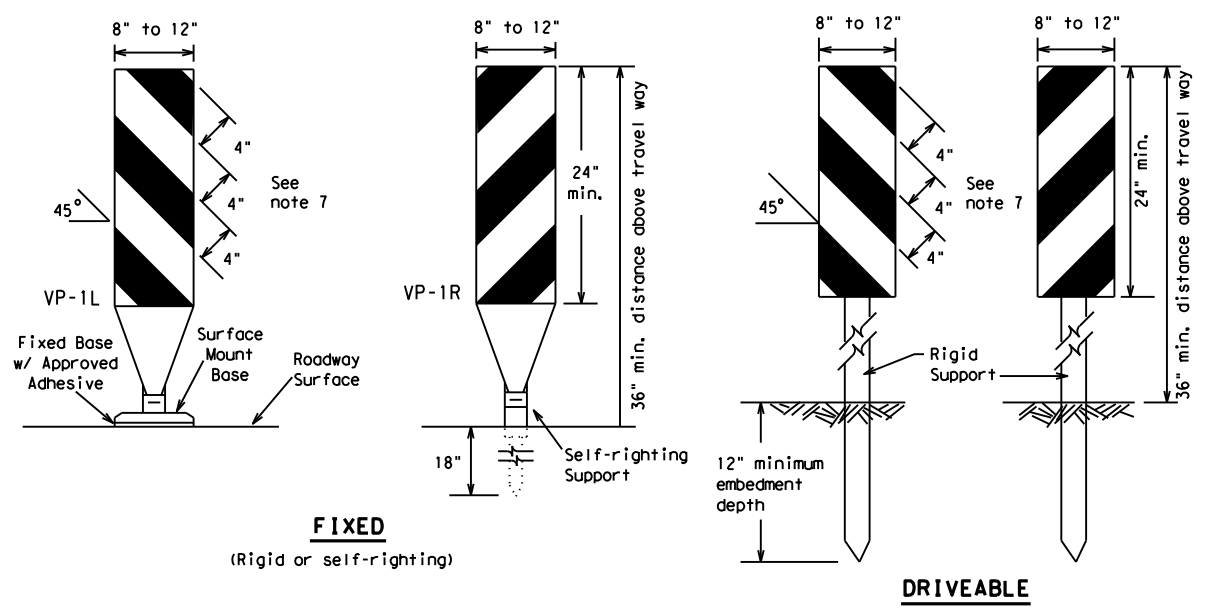
**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (8) - 21**

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7-13									

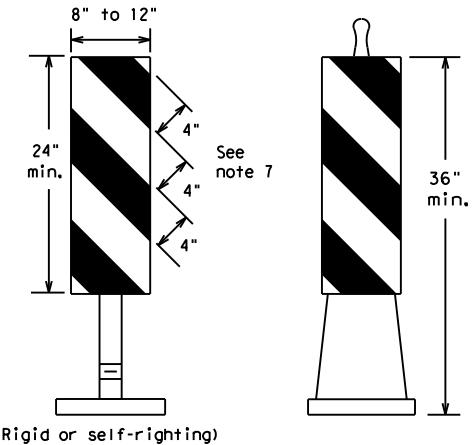
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**FIXED**  
(Rigid or self-righting)

**DRIVEABLE**

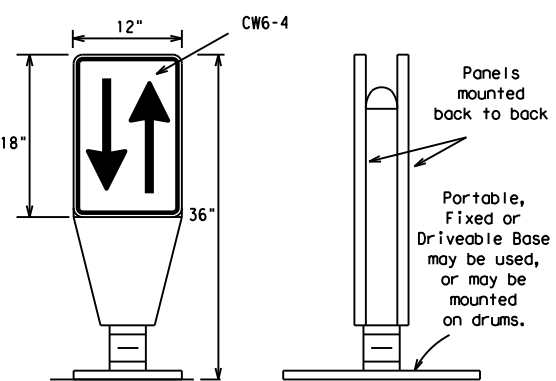


(Rigid or self-righting)

**PORTABLE**

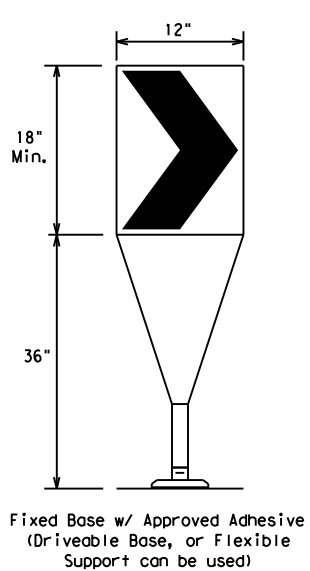
**VERTICAL PANELS (VPs)**

- 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)**

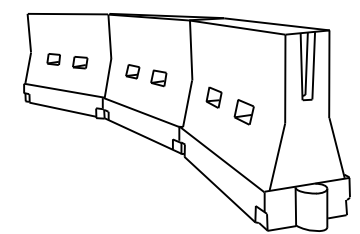
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base 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<sub>FL</sub> or Type C<sub>FL</sub> conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



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

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
- Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B<sub>FL</sub> or Type C<sub>FL</sub> 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 <sup>2</sup> / 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.

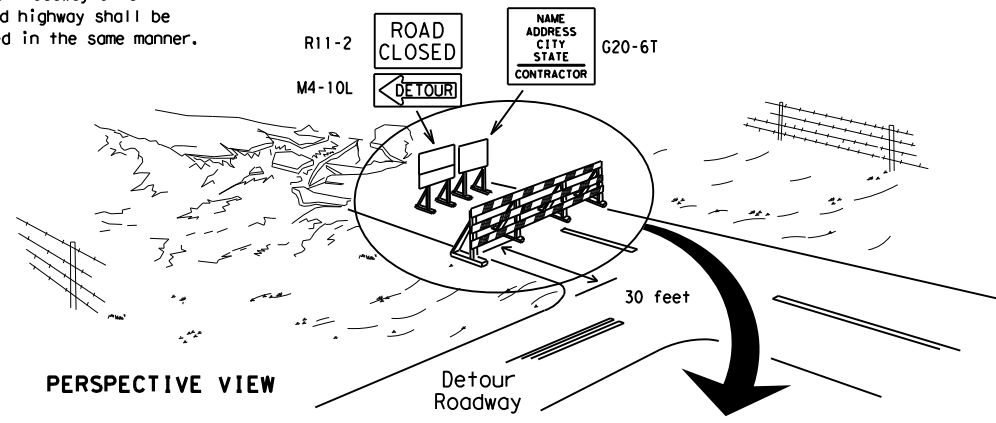


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



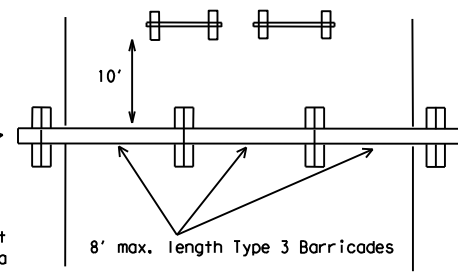
**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**

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



PERSPECTIVE VIEW

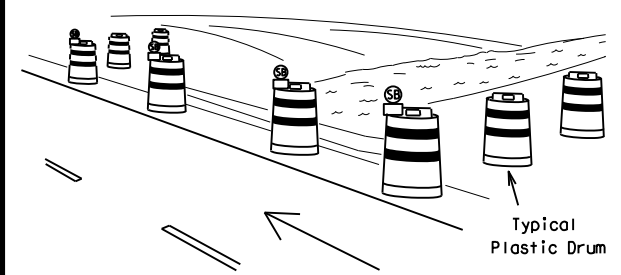
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



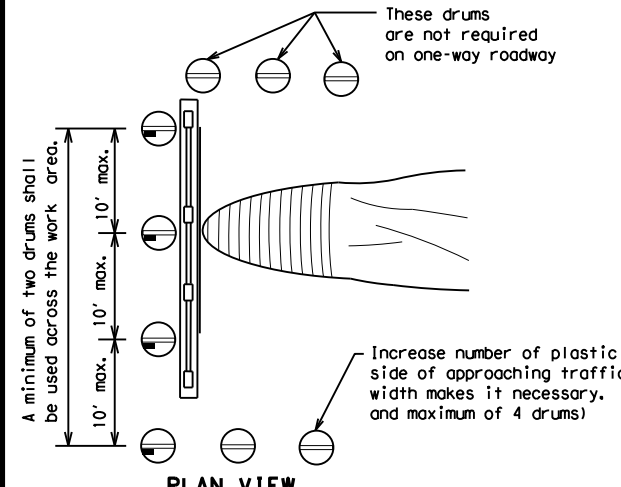
PLAN VIEW

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

**TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION**



PERSPECTIVE VIEW

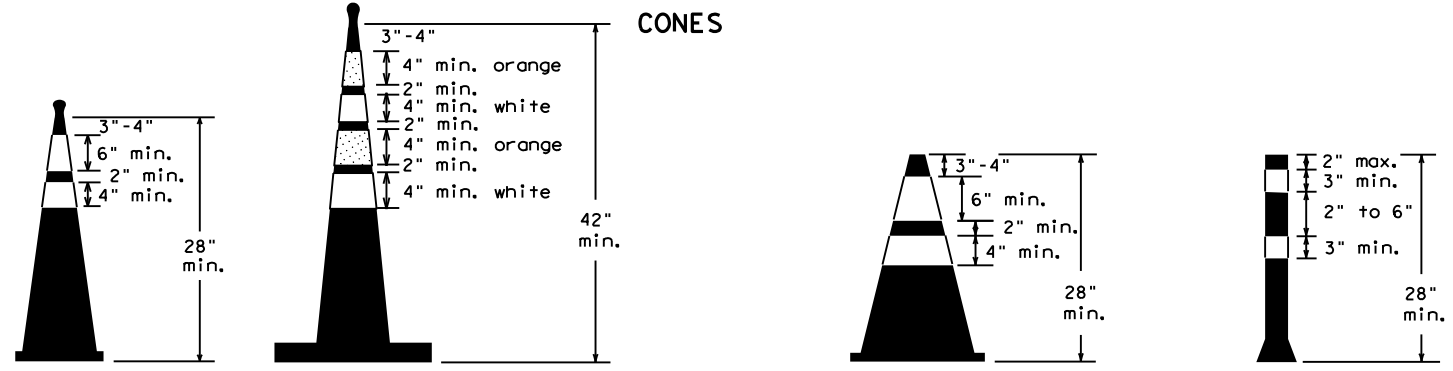


PLAN VIEW

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**

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

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



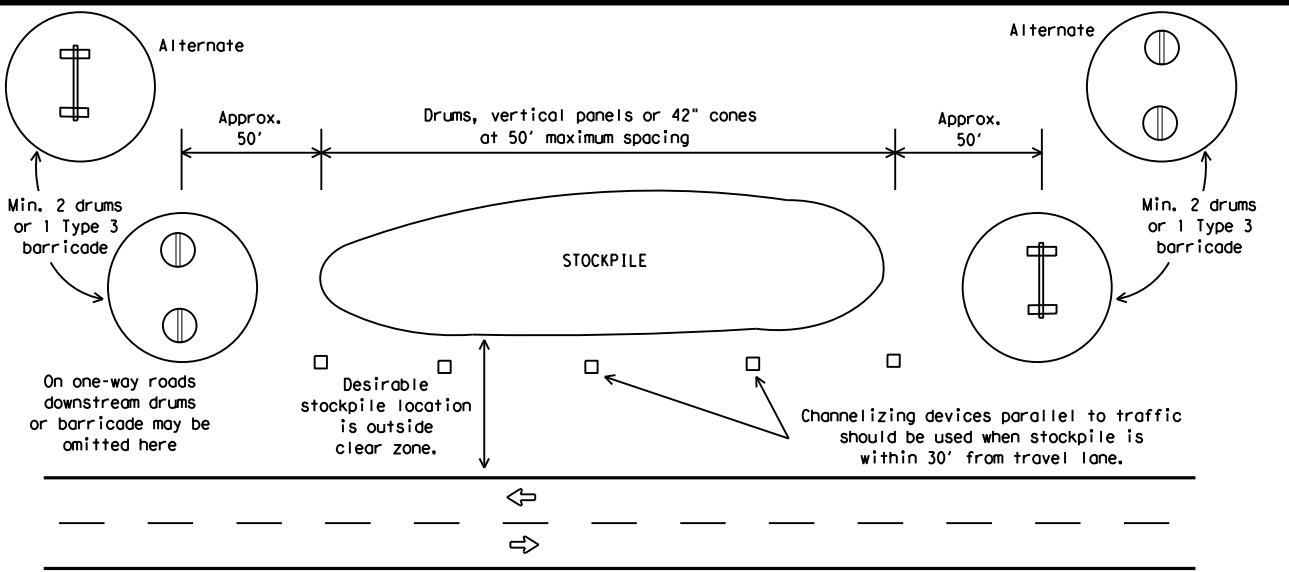
Two-Piece cones

One-Piece cones

Tubular Marker

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

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



**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) - 21**

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## WORK ZONE PAVEMENT MARKINGS

### GENERAL

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

### RAISED PAVEMENT MARKERS

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

### PREFABRICATED PAVEMENT MARKINGS

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

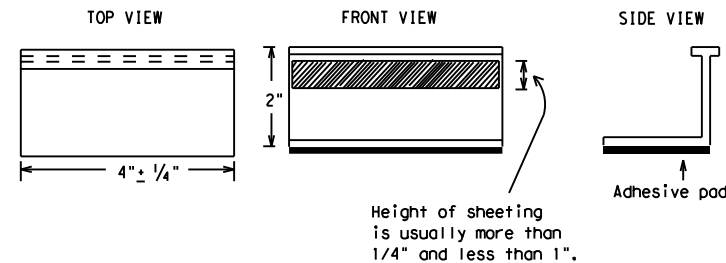
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

### REMOVAL OF PAVEMENT MARKINGS

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

## Temporary Flexible-Reflective Roadway Marker Tabs



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

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

### RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

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## 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.



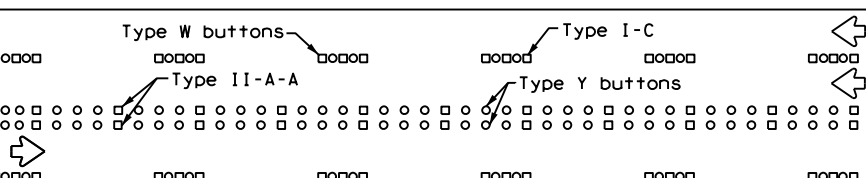
RAISED PAVEMENT MARKERS

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



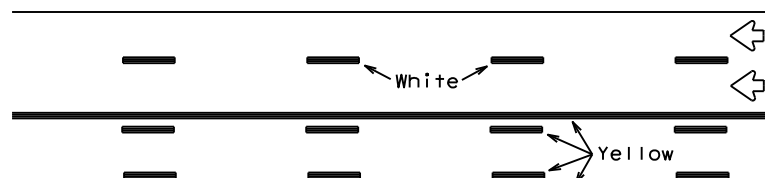
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



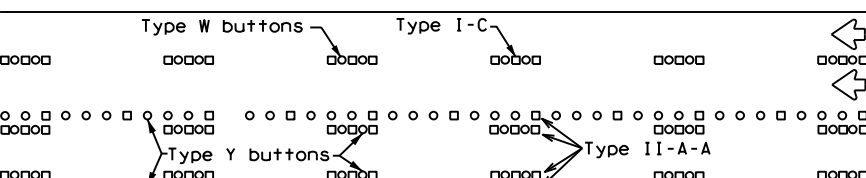
RAISED PAVEMENT MARKERS

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



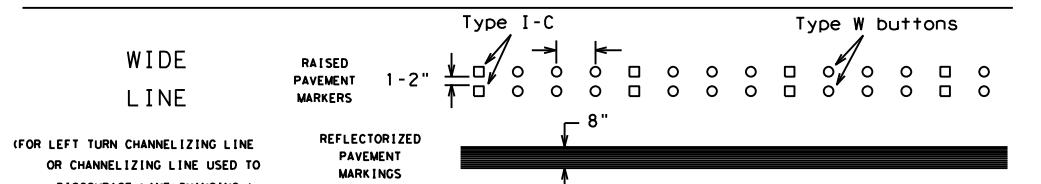
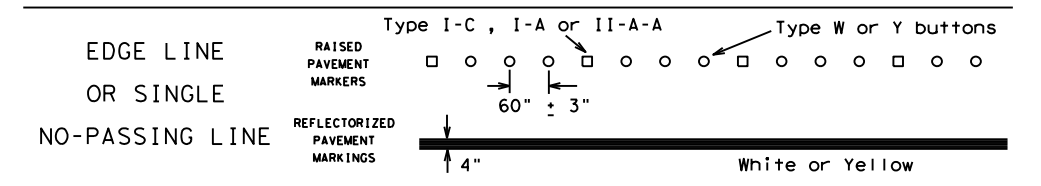
RAISED PAVEMENT MARKERS

## TWO-WAY LEFT TURN LANE

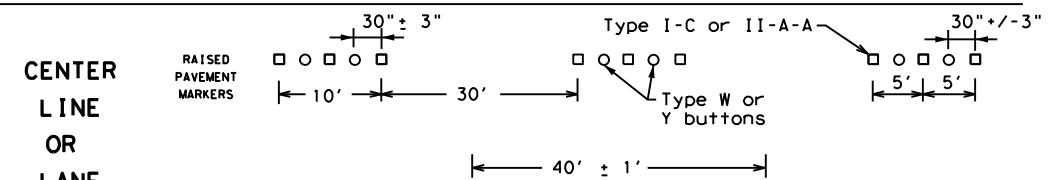
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



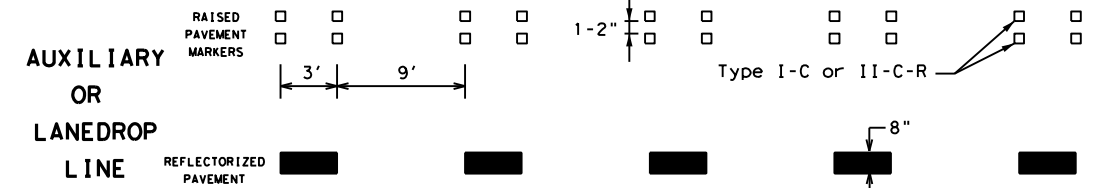
### SOLID LINES



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



### BROKEN LINES



### REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



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## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 21

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1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	WFS	BAYLOR	42	
11-02 8-14				

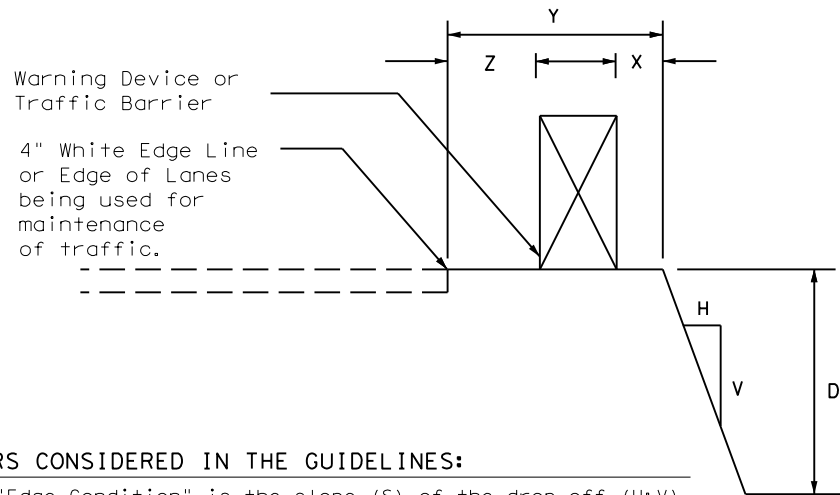
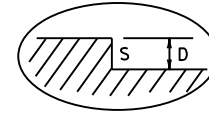
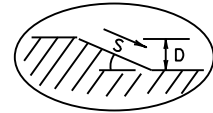
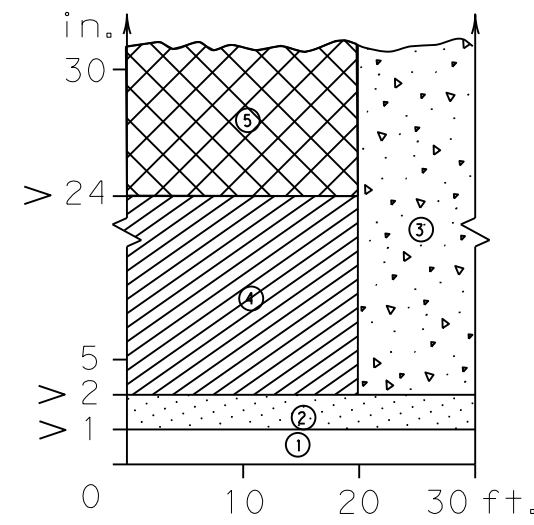
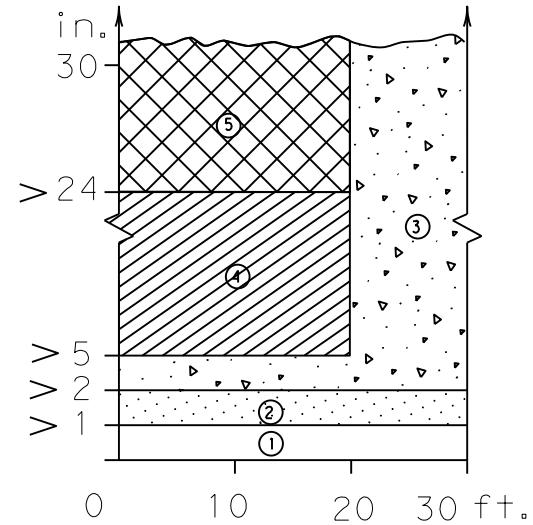
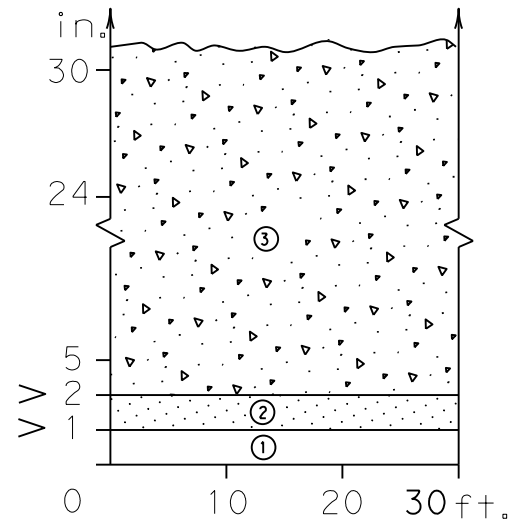
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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DATE: 9/7/2021 9:14:21 AM  
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# DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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



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

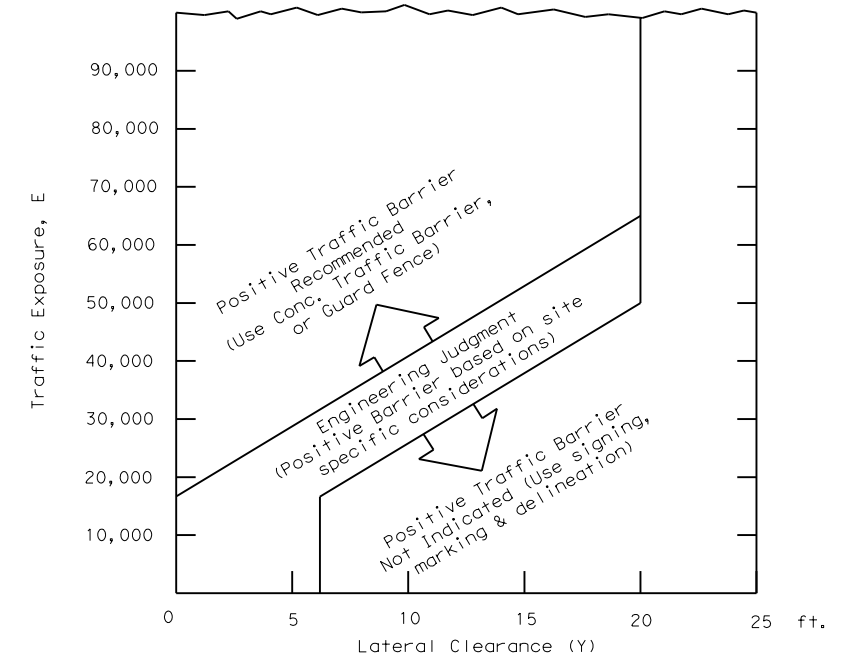
### FACTORS CONSIDERED IN THE GUIDELINES:

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

### Edge Condition Notes:

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

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



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

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

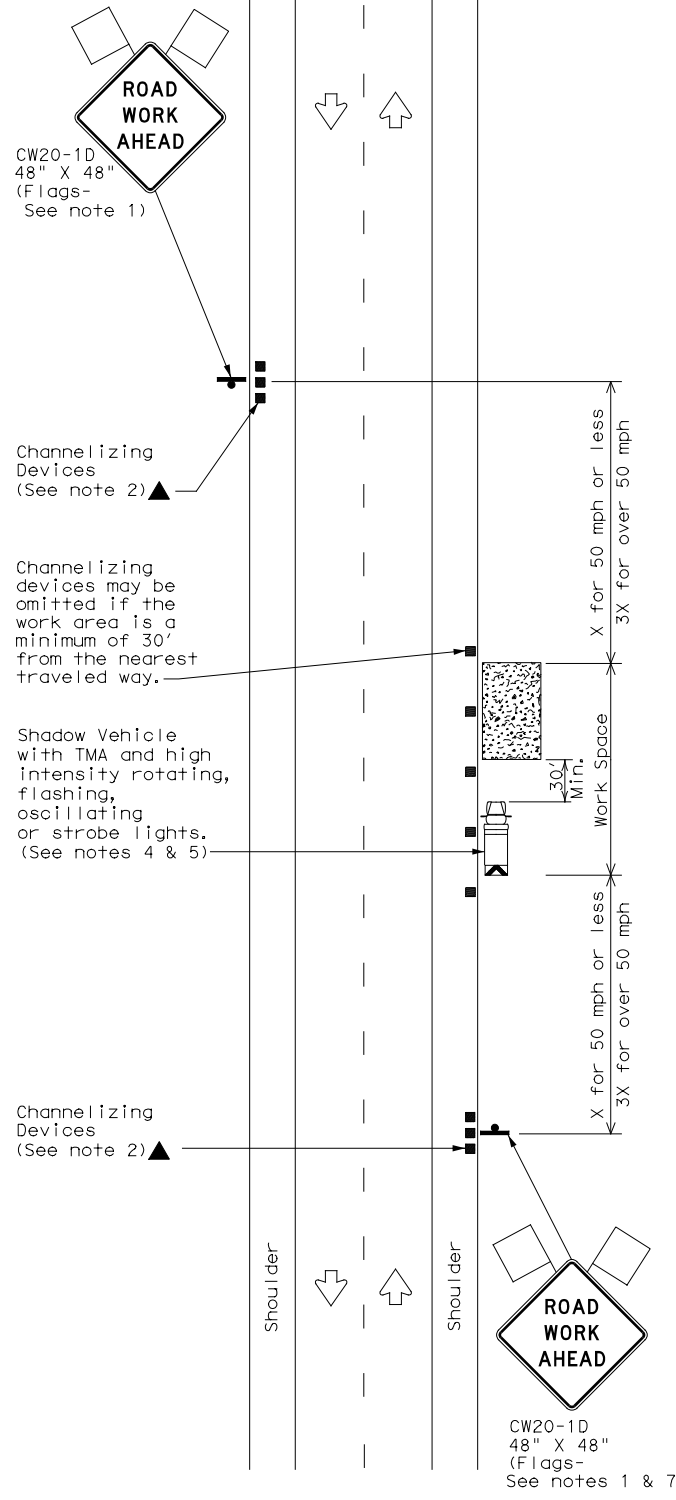
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DATE: FILE:

				<b>Traffic Safety Division Standard</b>	
<h2>TREATMENT FOR VARIOUS EDGE CONDITIONS</h2>					
FILE: edgecon.dgn	DN:	CK:	DW:	CK:	
© TxDOT August 2000	CONT	SECT	JOB	HIGHWAY	
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08-01	DIST	COUNTY		SHEET NO.	
9-21	WFS	BAYLOR		43	

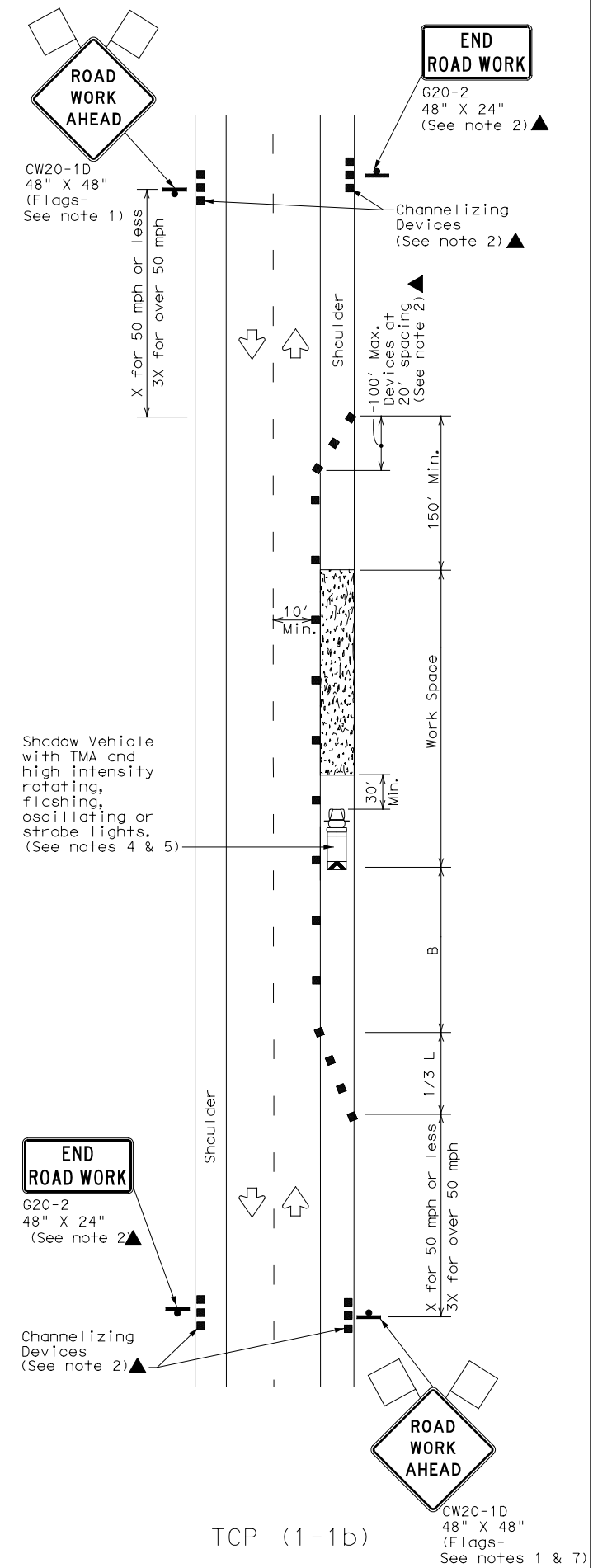
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DATE: 12/15/2020 9:50:02 AM  
FILE: tcp1-1-18.dgn



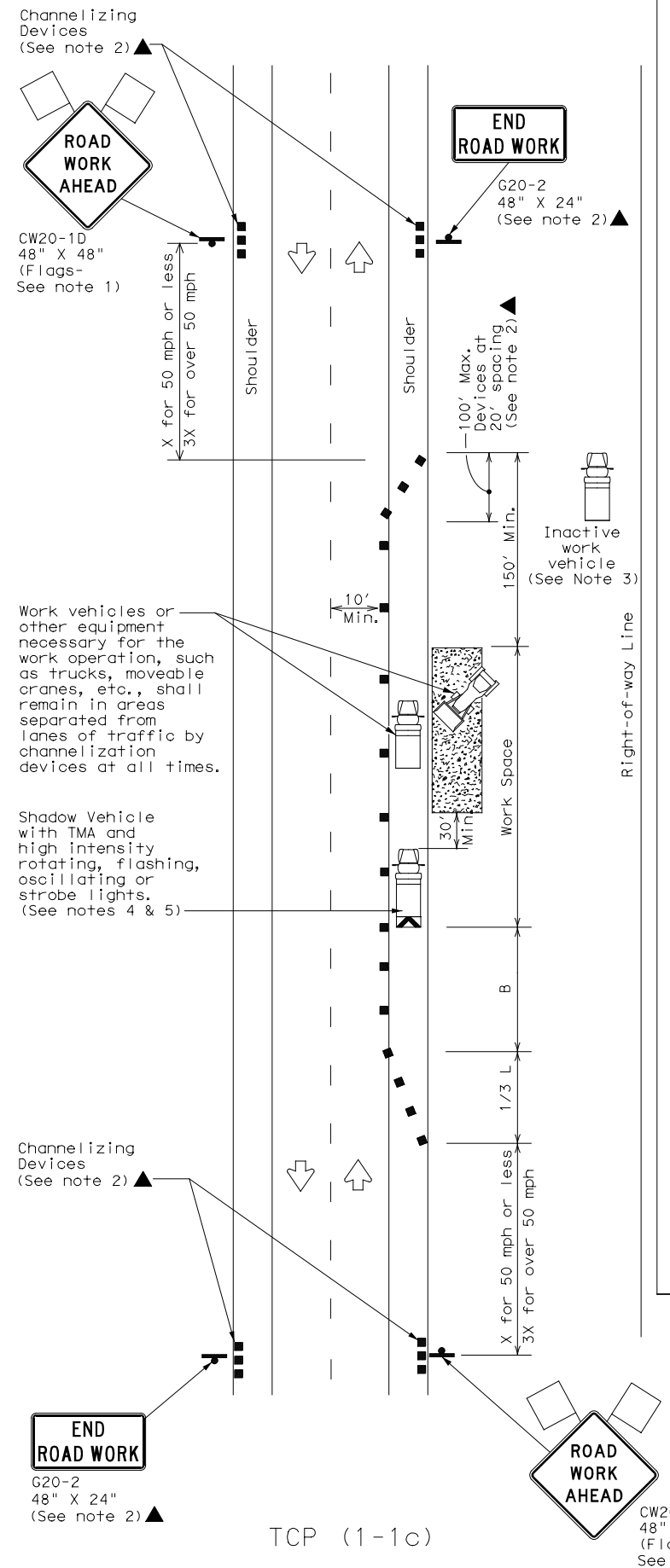
TCP (1-1a)

WORK SPACE NEAR SHOULDER  
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER  
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER  
Conventional Roads

LEGEND

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

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

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

TYPICAL USAGE

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

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



TRAFFIC CONTROL PLAN  
CONVENTIONAL ROAD  
SHOULDER WORK

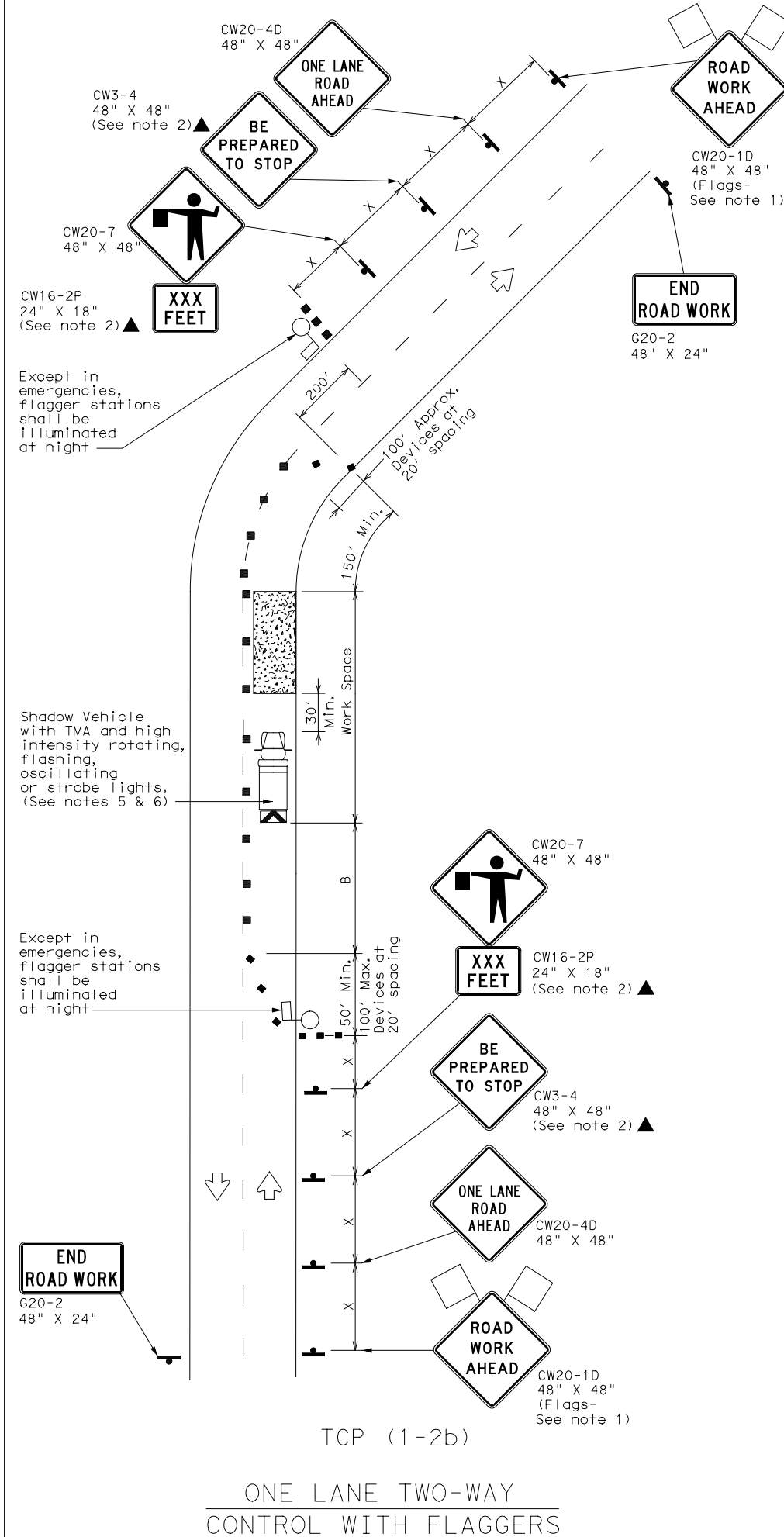
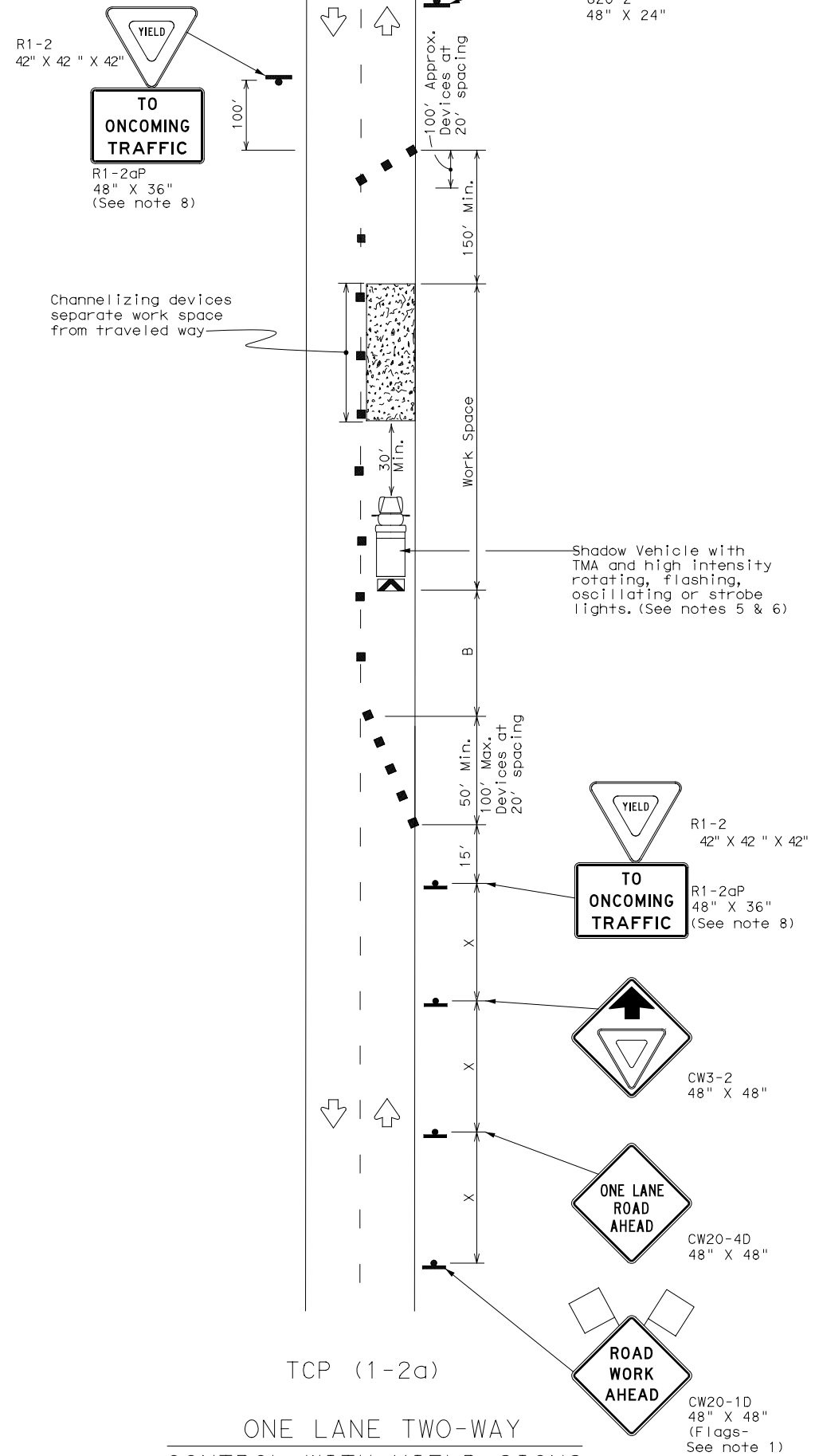
TCP (1-1) - 18

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© TxDOT December 1985	CON: 0133	SECT: 04	JOB: 042	HIGHWAY: US82
REVISIONS				
2-94 4-98				
8-95 2-12				
1-97 2-18				
	DIST: WFS	COUNTY: BAYLOR	SHEET NO.: 44	

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Warning Sign Sequence in Opposite Direction Same as Below



**LEGEND**

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

Posted Speed * X	Formula L = WS <sup>2</sup> / 60	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS <sup>2</sup> / 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45		450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

**TYPICAL USAGE**

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

**GENERAL NOTES**

- Flags attached to signs where shown are REQUIRED.
  - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
  - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
  - Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
  - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- TCP (1-2a)**
- R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
  - R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.
- TCP (1-2b)**
- Flaggers should use two-way radios or other methods of communication to control traffic.
  - Length of work space should be based on the ability of flaggers to communicate.
  - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
  - Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
  - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

**Texas Department of Transportation** Traffic Operations Division Standard

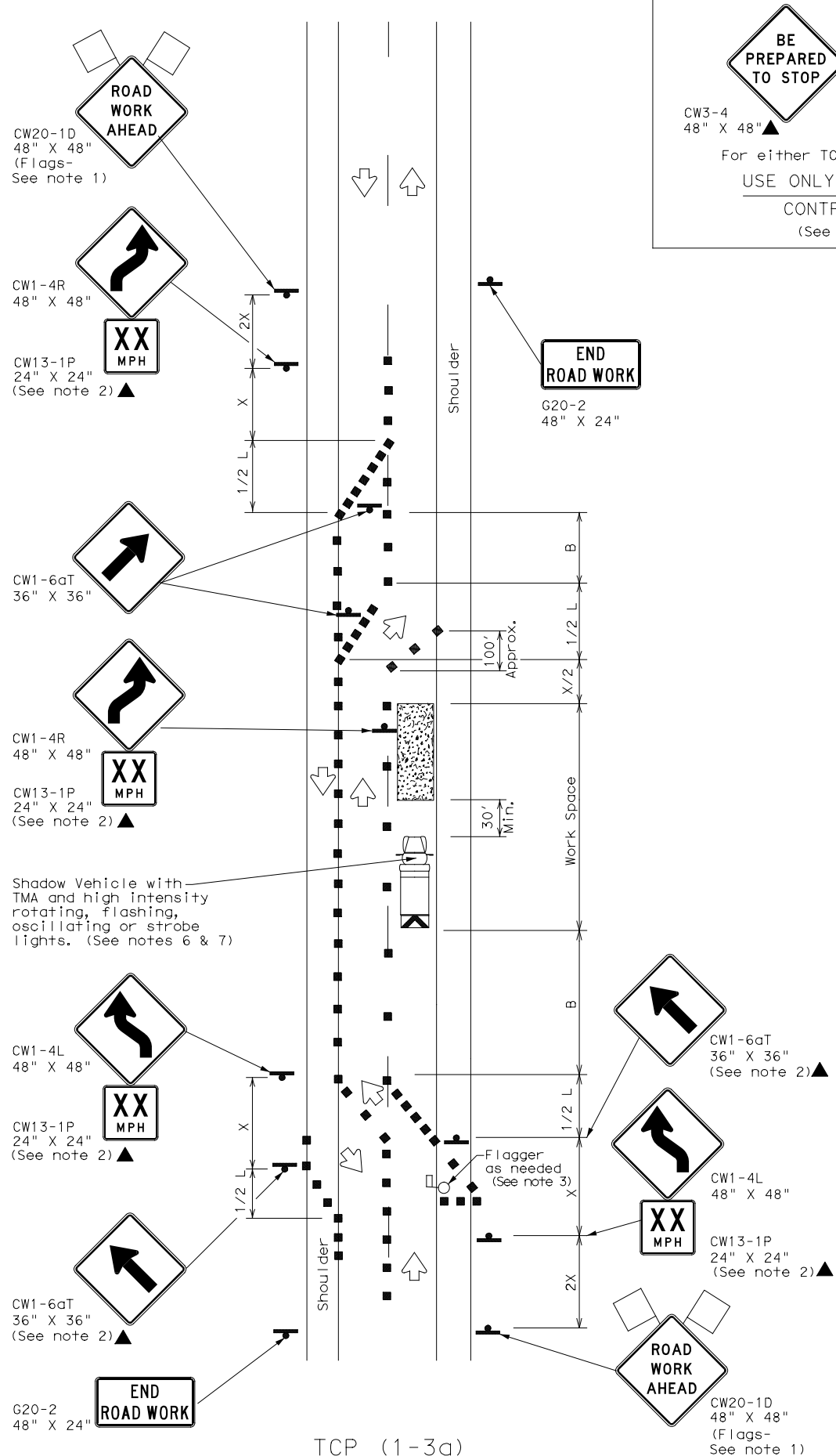
**TRAFFIC CONTROL PLAN**  
ONE-LANE TWO-WAY TRAFFIC CONTROL

**TCP (1-2) - 18**

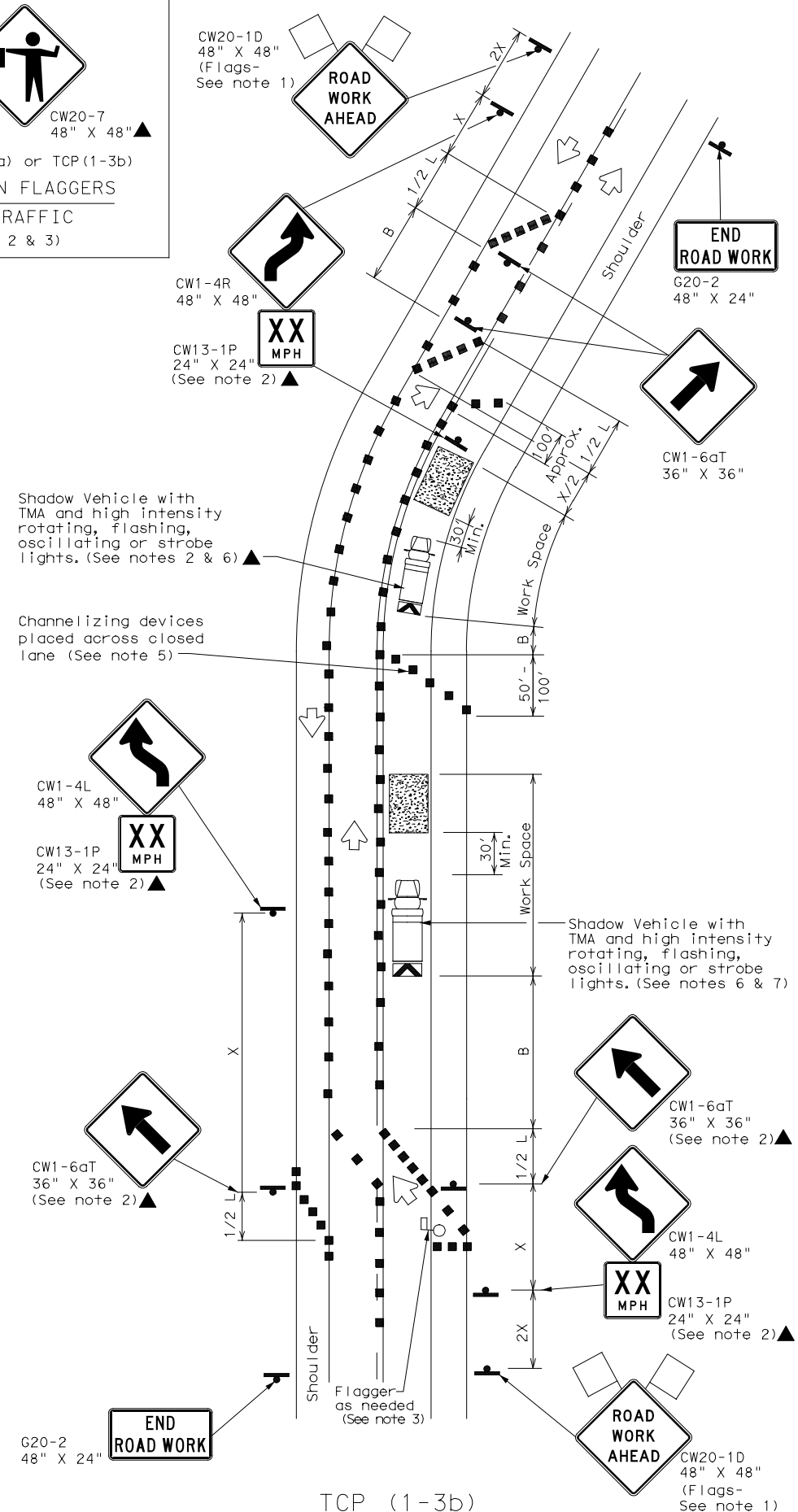
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© TxDOT December 1985	CON:	SECT:	JOB:	HIGHWAY:
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4-90 4-98	DIST:	COUNTY:	SHEET NO.:	
2-94 2-12	WFS	BAYLOR	45	
1-97 2-18				

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DATE: 12/15/2020 9:50:13 AM  
FILE: tcp1-3-18.dgn



**BE PREPARED TO STOP**  
 CW3-4 48" X 48"  
 CW20-7 48" X 48"  
 For either TCP(1-3a) or TCP(1-3b)  
**USE ONLY WHEN FLAGGERS CONTROL TRAFFIC**  
 (See Notes 2 & 3)



**LEGEND**

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

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

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

**TYPICAL USAGE**

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

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

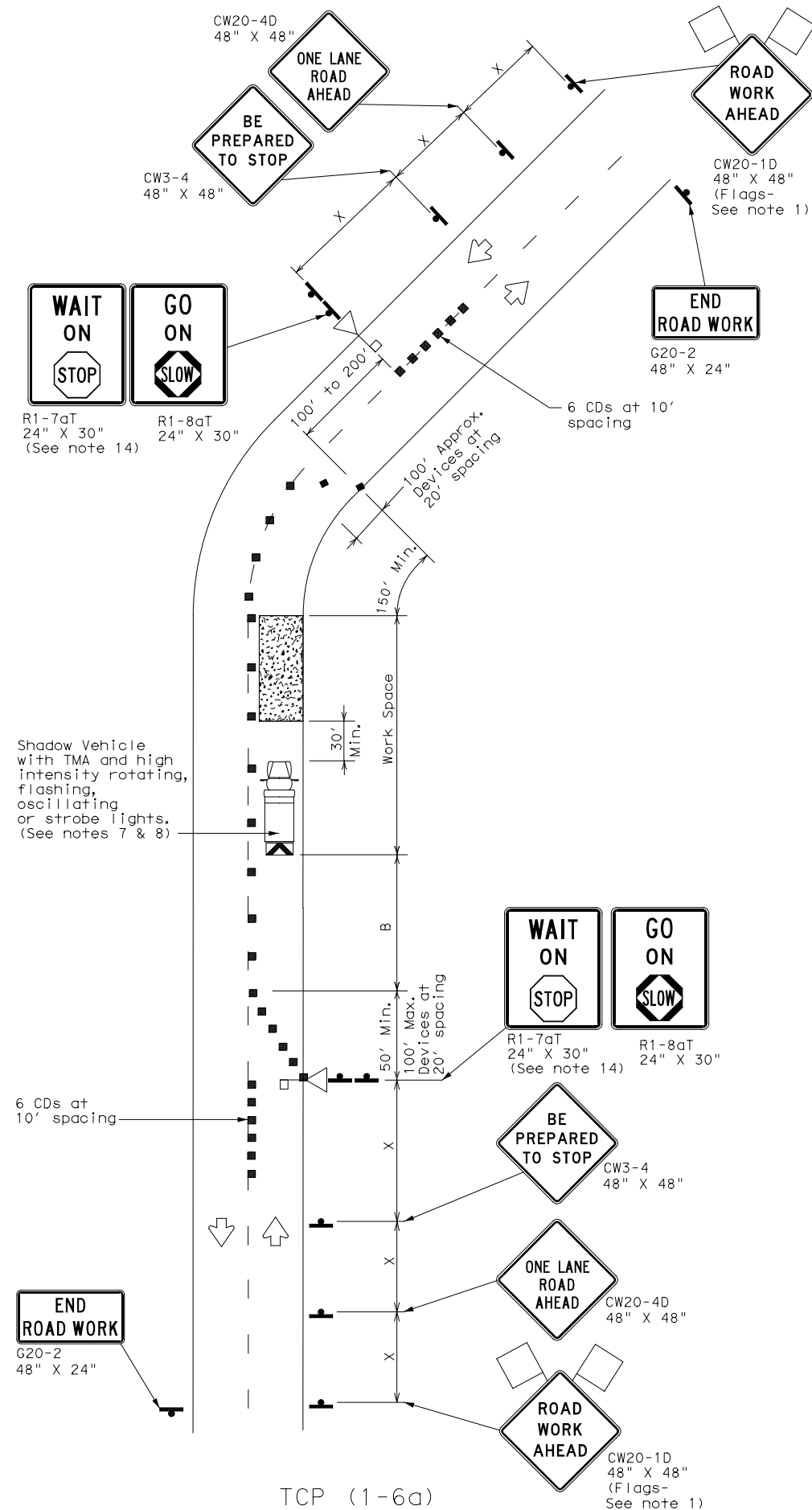


**TRAFFIC CONTROL PLAN**  
**TRAFFIC SHIFTS ON**  
**TWO LANE ROADS**  
**TCP (1-3)-18**

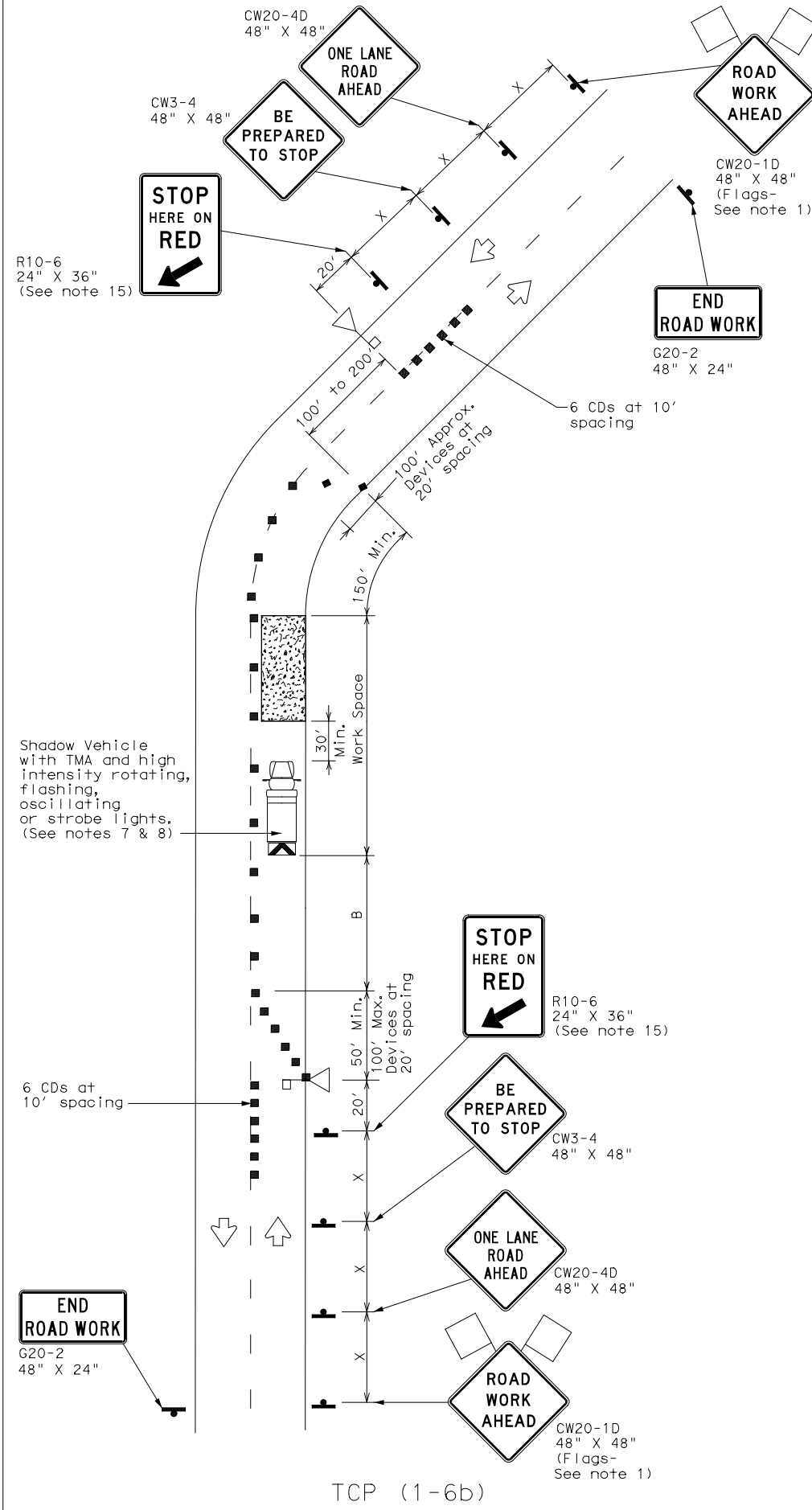
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	WFS	BAYLOR	46	
1-97 2-18				

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DATE: 12/15/2020 9:50:25 AM  
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TCP (1-6a)  
ONE LANE TWO-WAY  
CONTROL WITH STOP/SLOW AFADs



TCP (1-6b)  
ONE LANE TWO-WAY CONTROL  
WITH RED/YELLOW LENS AFADs

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

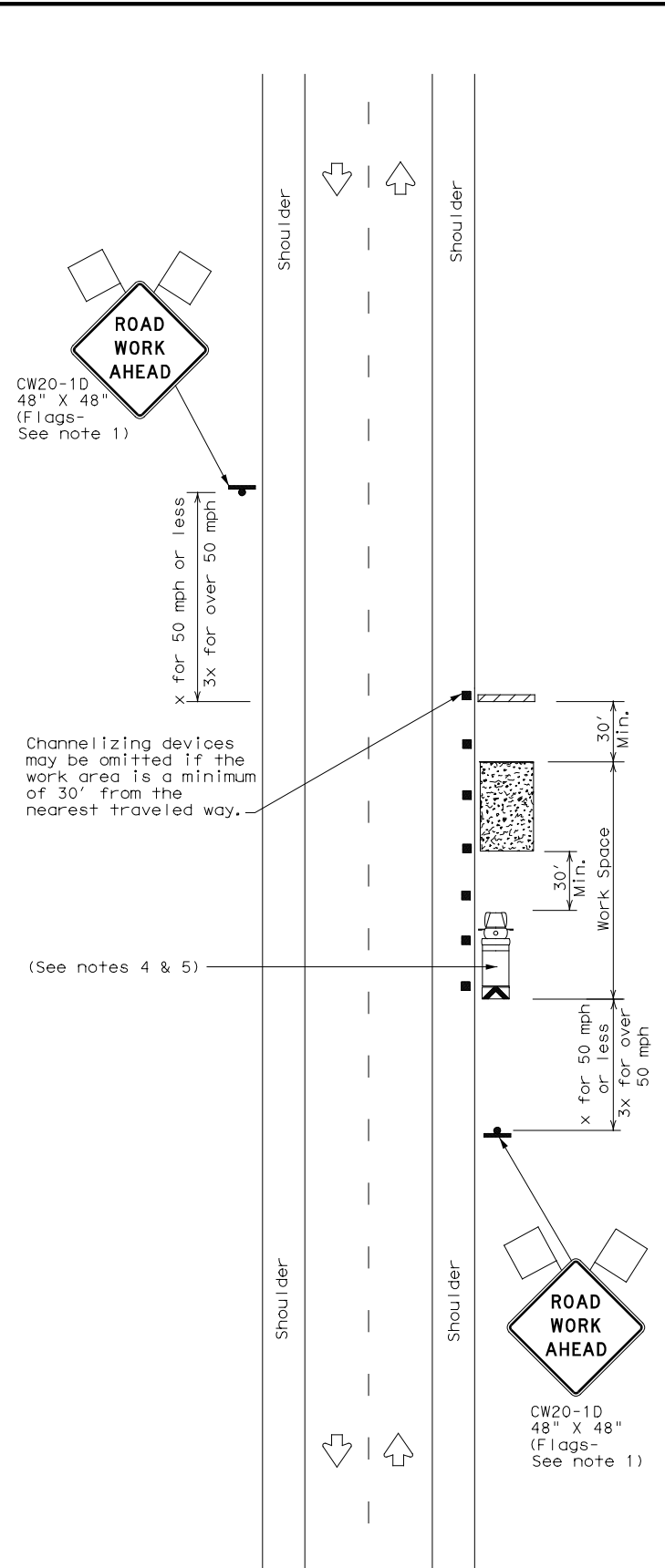
- Flags attached to signs where shown are REQUIRED.
- AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
- Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
- Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
- One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
- When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
- All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
- A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- Flaggers should use two-way radios or other methods of communication to control traffic.
- Length of work space should be based on the ability of flaggers to communicate.
- If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the AFAD.
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
- The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
- The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

		<b>Traffic Operations Division Standard</b>	
TRAFFIC CONTROL PLAN AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADs)			
<b>TCP (1-6)-18</b>			
FILE:	tcp1-6-18.dgn	DN:	CK:
© TxDOT	February 2012	CONT SECT:	JOB HIGHWAY:
2-18	REVISIONS	0133 04	042 US82
	DIST:	COUNTY:	SHEET NO.:
	WFS	BAYLOR	47



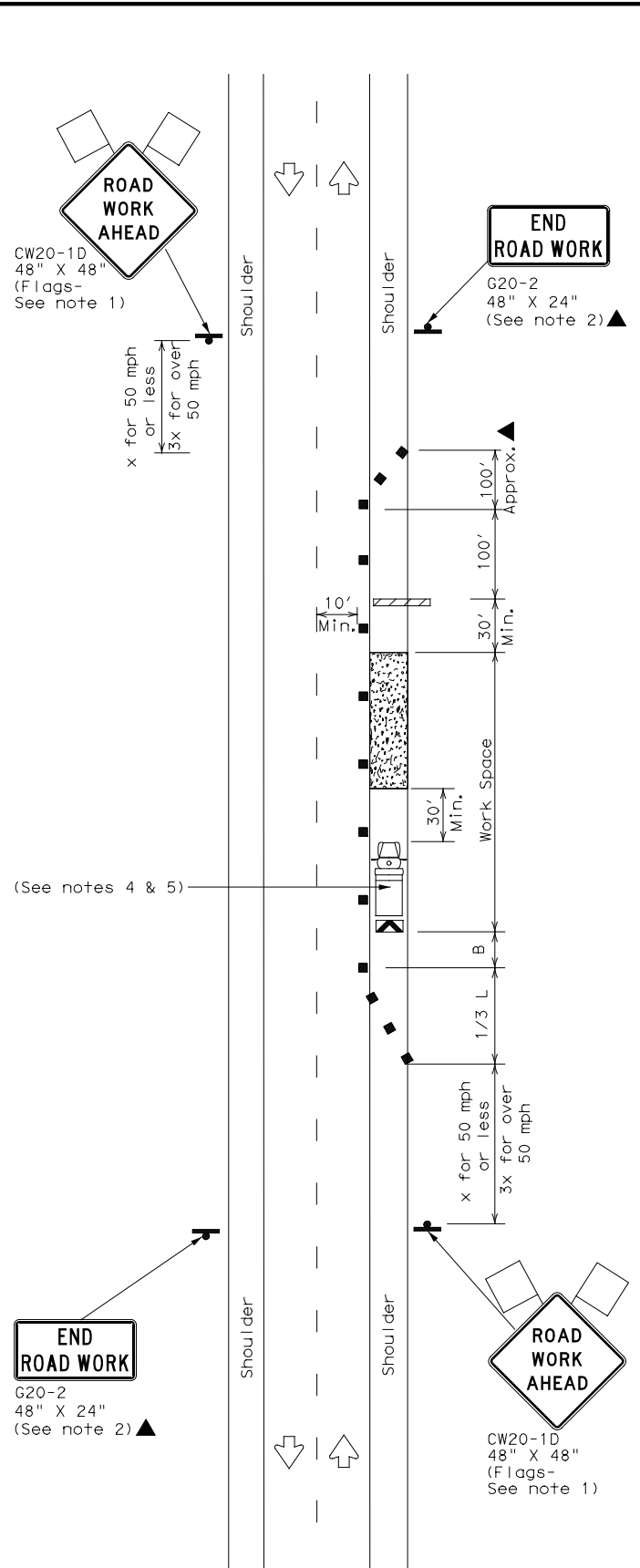
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FILE: tcp2-1-18.dgn



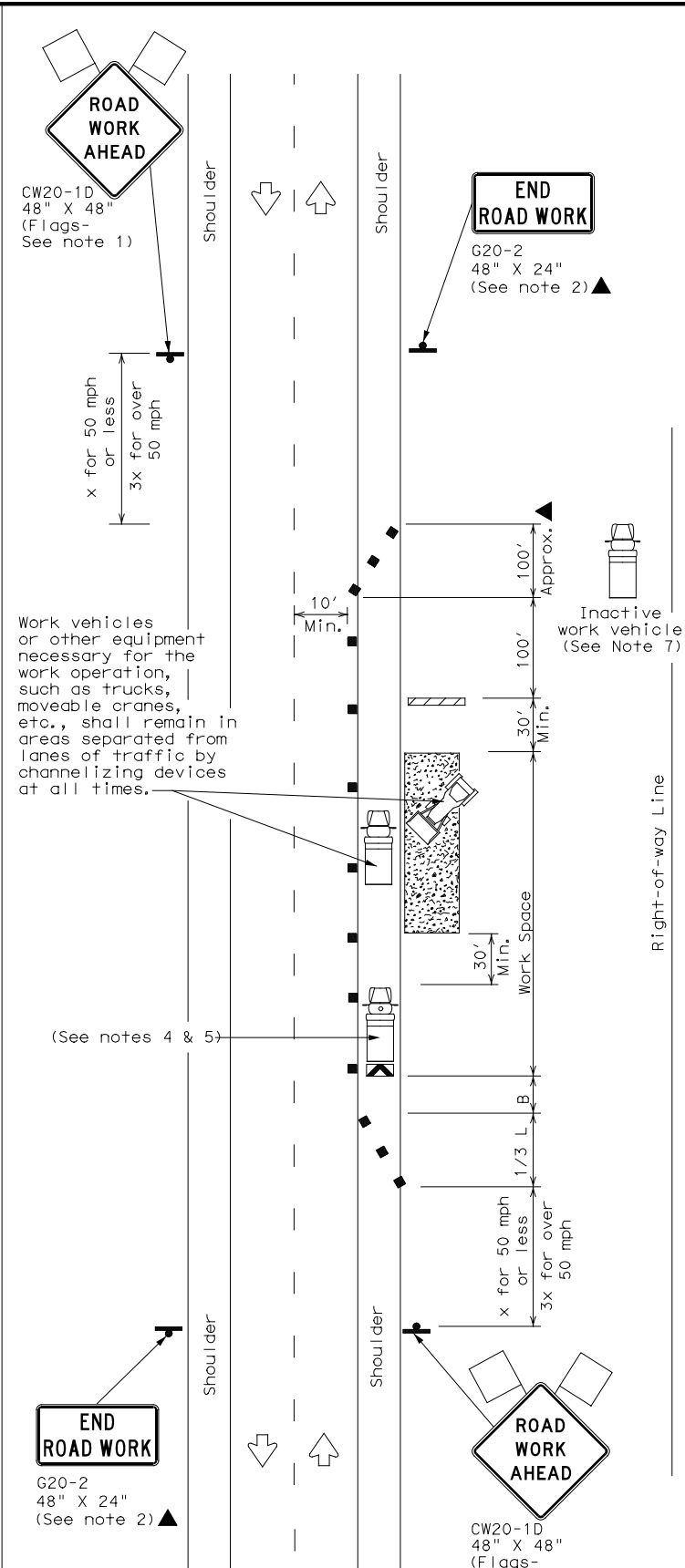
TCP (2-1a)

WORK SPACE NEAR SHOULDER  
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER  
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER  
Conventional Roads

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

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

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

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

GENERAL NOTES

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



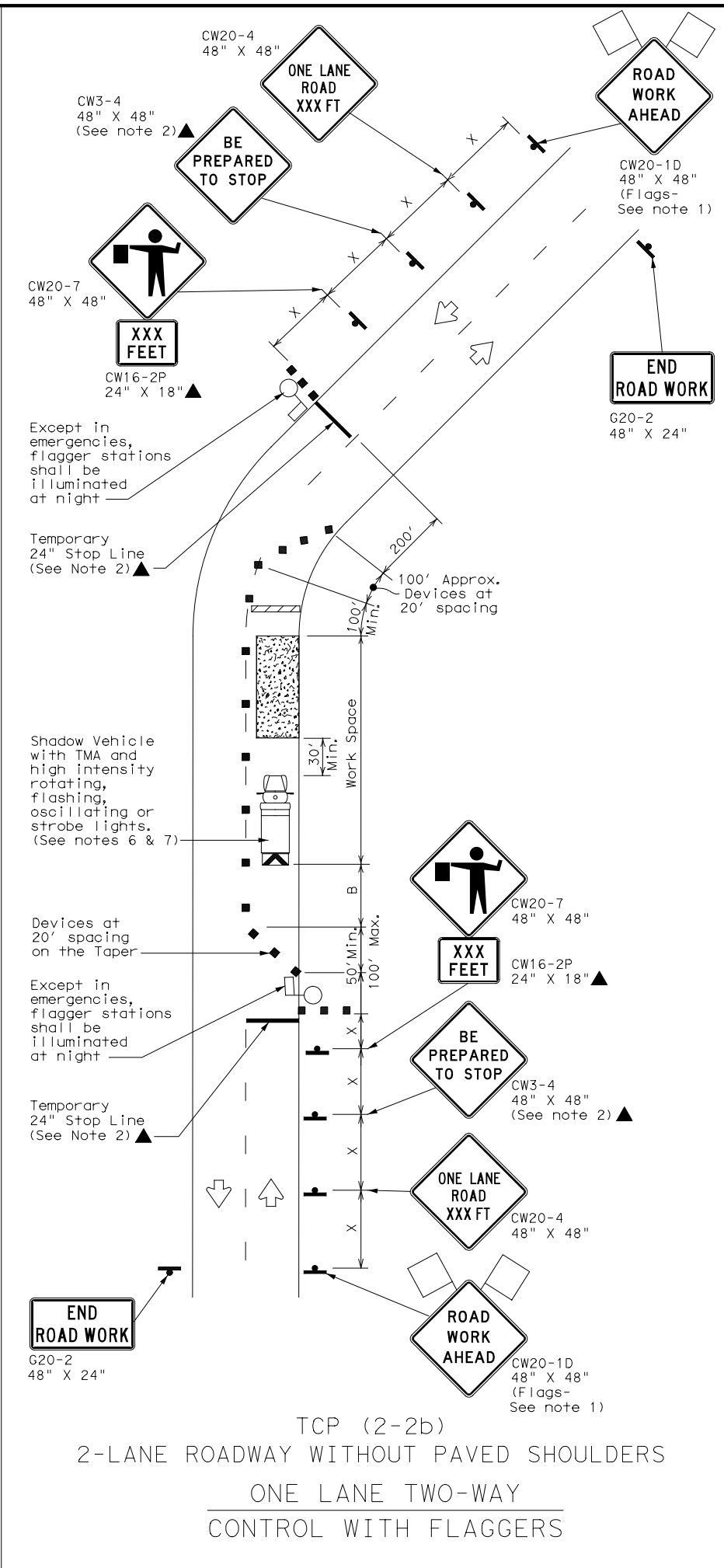
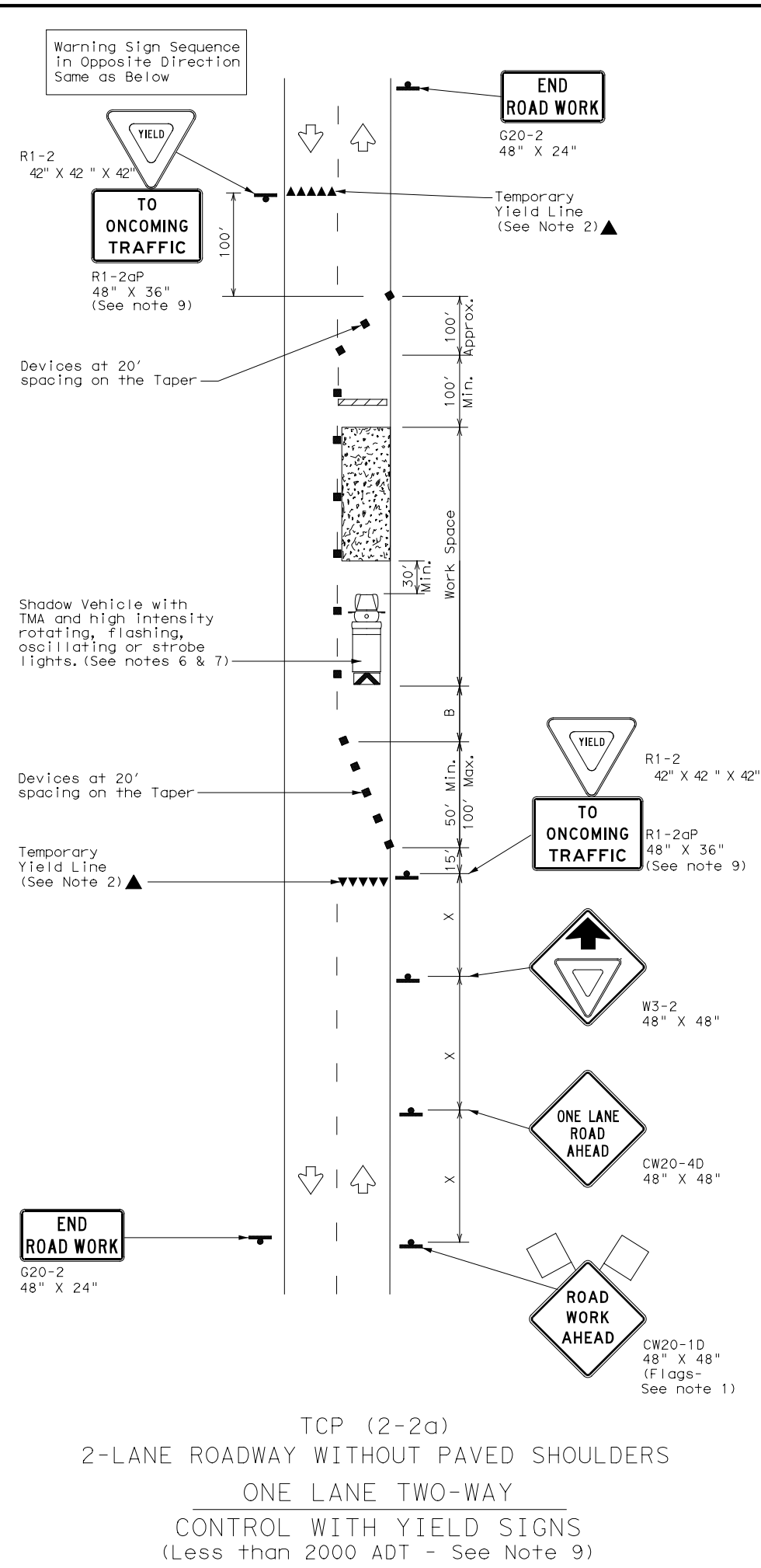
TRAFFIC CONTROL PLAN  
CONVENTIONAL ROAD  
SHOULDER WORK

TCP (2-1) - 18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	WFS	BAYLOR		48
1-97 2-18				

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FILE: tcp2-2-18.dgn



LEGEND

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

Posted Speed * X	Formula L = WS <sup>2</sup> / 60	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS <sup>2</sup> / 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70	700'	770'	840'	70'	140'	800'	475'	730'	
75	750'	825'	900'	75'	150'	900'	540'	820'	

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

TYPICAL USAGE

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

- GENERAL NOTES
- Flags attached to signs where shown, are REQUIRED.
  - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
  - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
  - Flaggers should use two-way radios or other methods of communication to control traffic.
  - Length of work space should be based on the ability of flaggers to communicate.
  - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-2a)
- The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
  - The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- TCP (2-2b)
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
  - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
  - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation  
Traffic Operations Division Standard

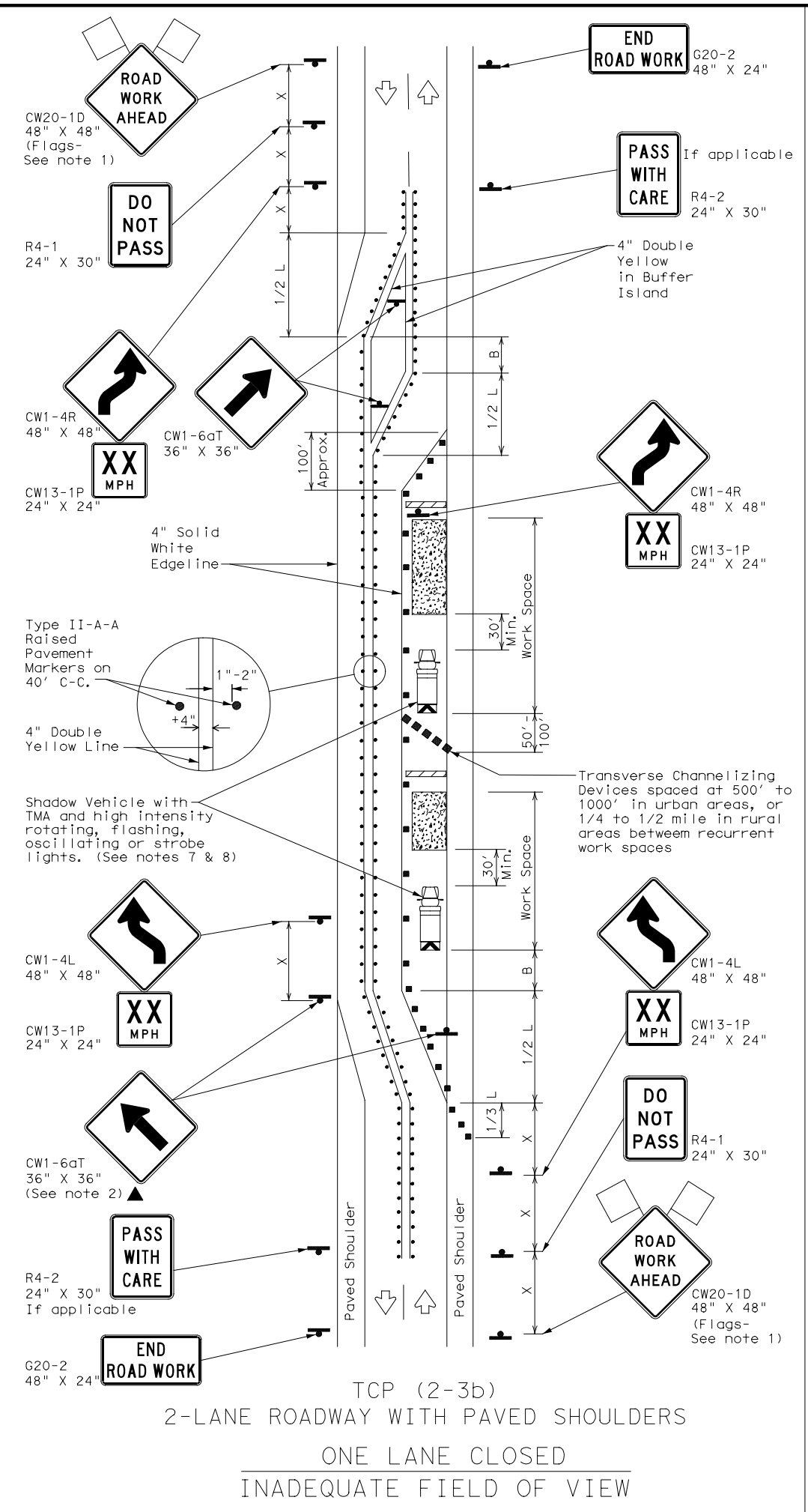
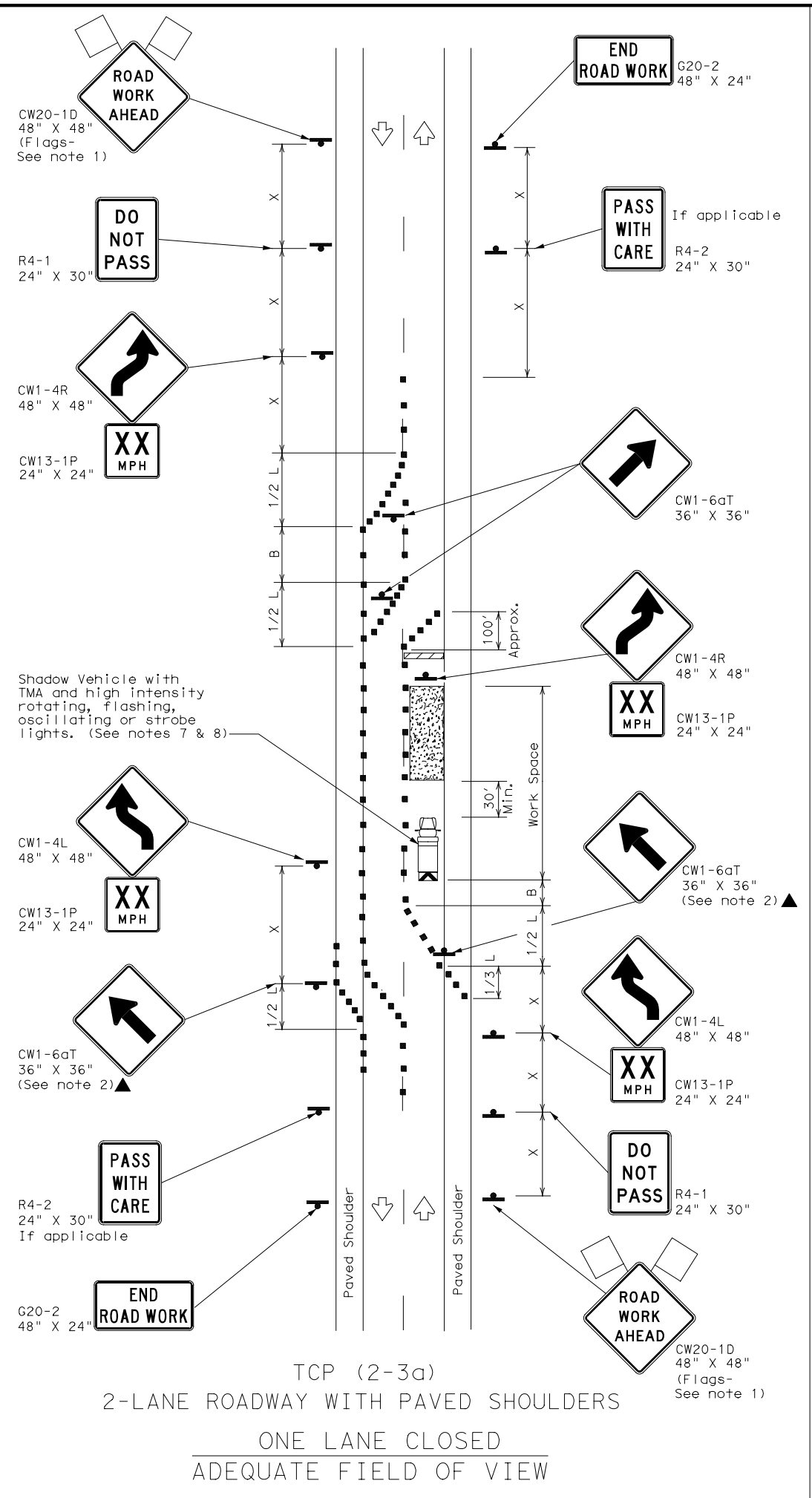
TRAFFIC CONTROL PLAN  
ONE-LANE TWO-WAY  
TRAFFIC CONTROL

**TCP (2-2) - 18**

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CON:	SECT:	JOB:	HIGHWAY:
REVISIONS	0133	04	042	US82
8-95 3-03	DIST:	COUNTY:	SHEET NO.:	
1-97 2-12	WFS	BAYLOR	49	
4-98 2-18				

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DATE: 12/15/2020 9:50:43 AM  
FILE: tcp2-3-18.dgn



**LEGEND**

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

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

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

**TYPICAL USAGE**

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
  - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
  - When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
  - Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
  - The R4-1 "DO NOT PASS," R4-2 "PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
  - Conflicting pavement marking shall be removed for long term projects.
  - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-3a)**
- Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

**Texas Department of Transportation**  
Traffic Operations Division Standard

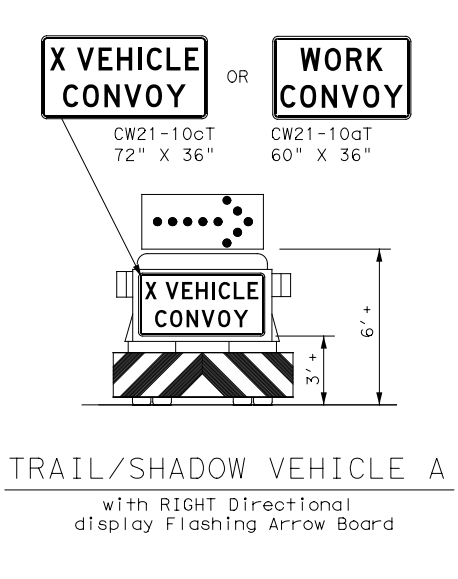
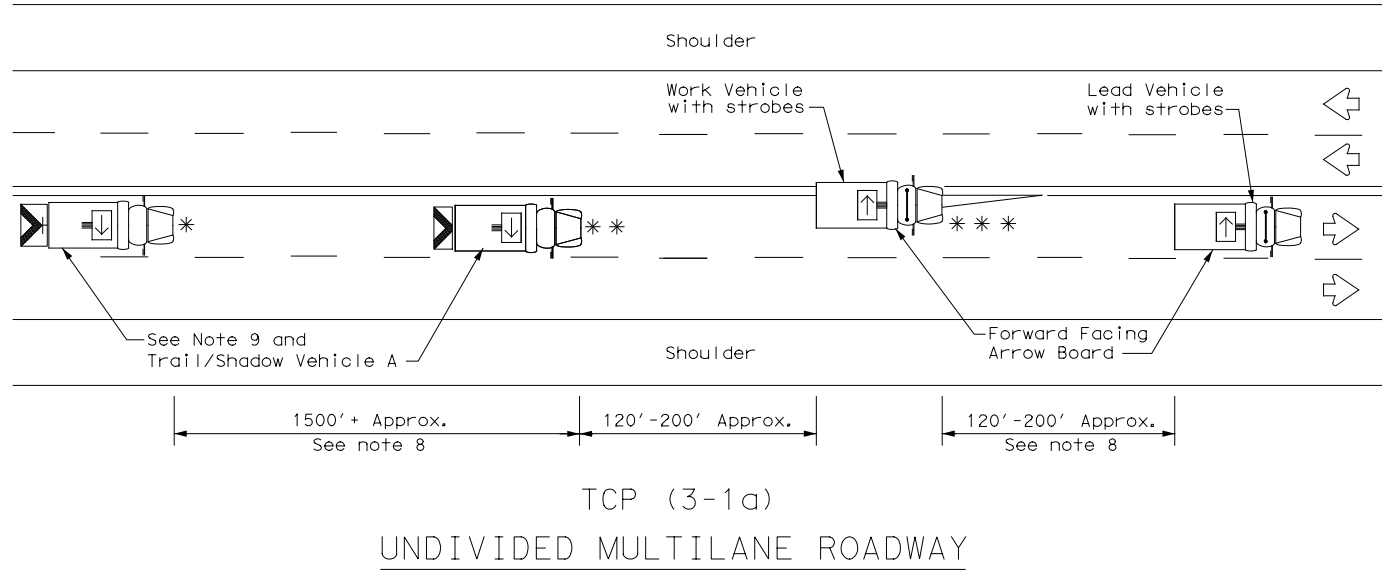
**TRAFFIC CONTROL PLAN**  
**TRAFFIC SHIFTS ON**  
**TWO-LANE ROADS**

**TCP (2-3) - 18**

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
8-95 3-03	DIST	COUNTY	SHEET NO.	
1-97 2-12	WFS	BAYLOR	50	
4-98 2-18				

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DATE: 12/15/2020 9:50:46 AM  
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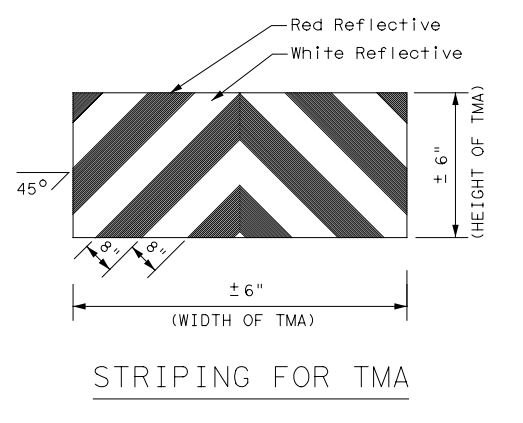
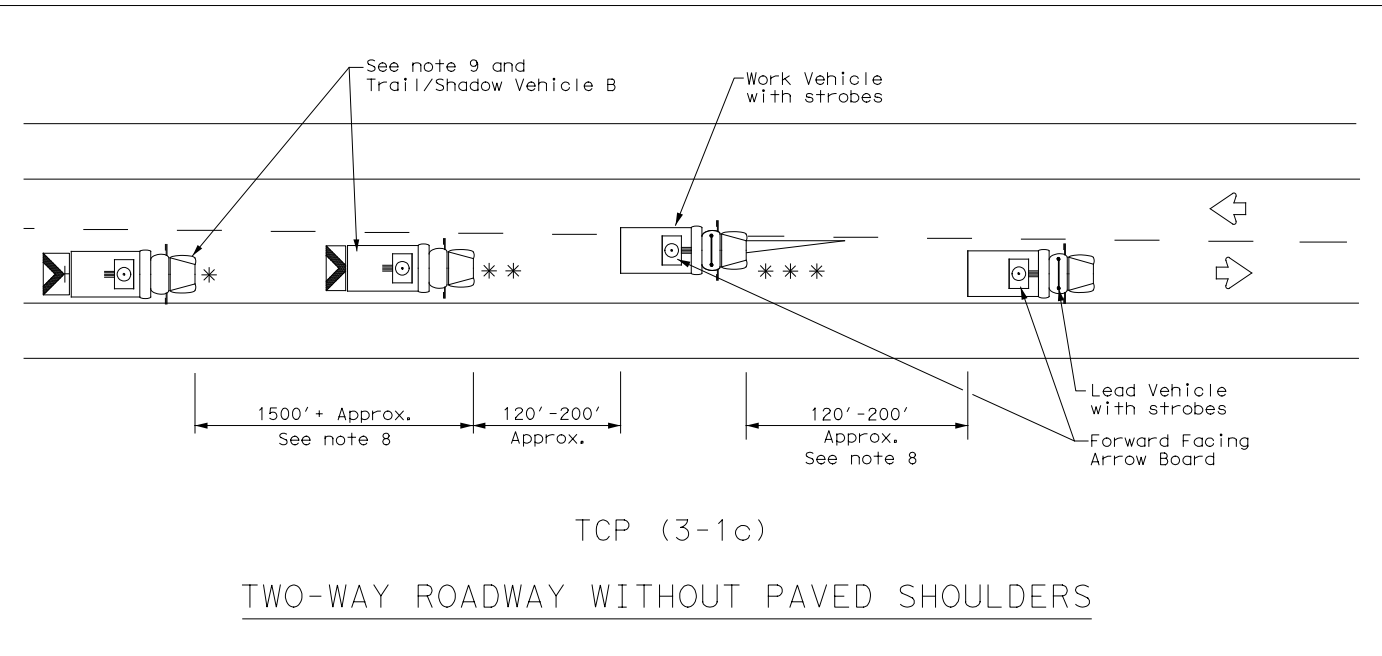
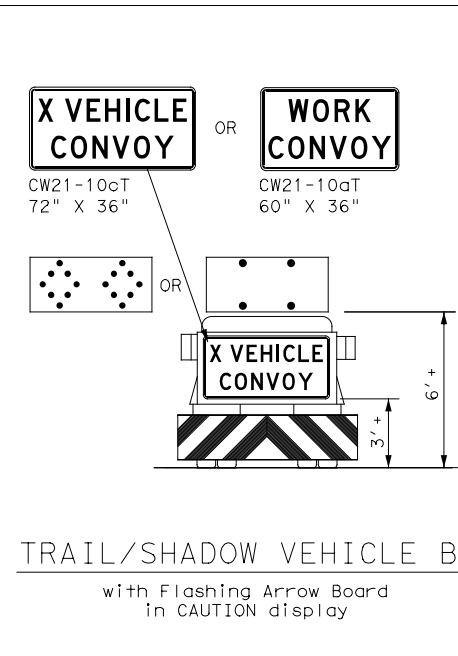
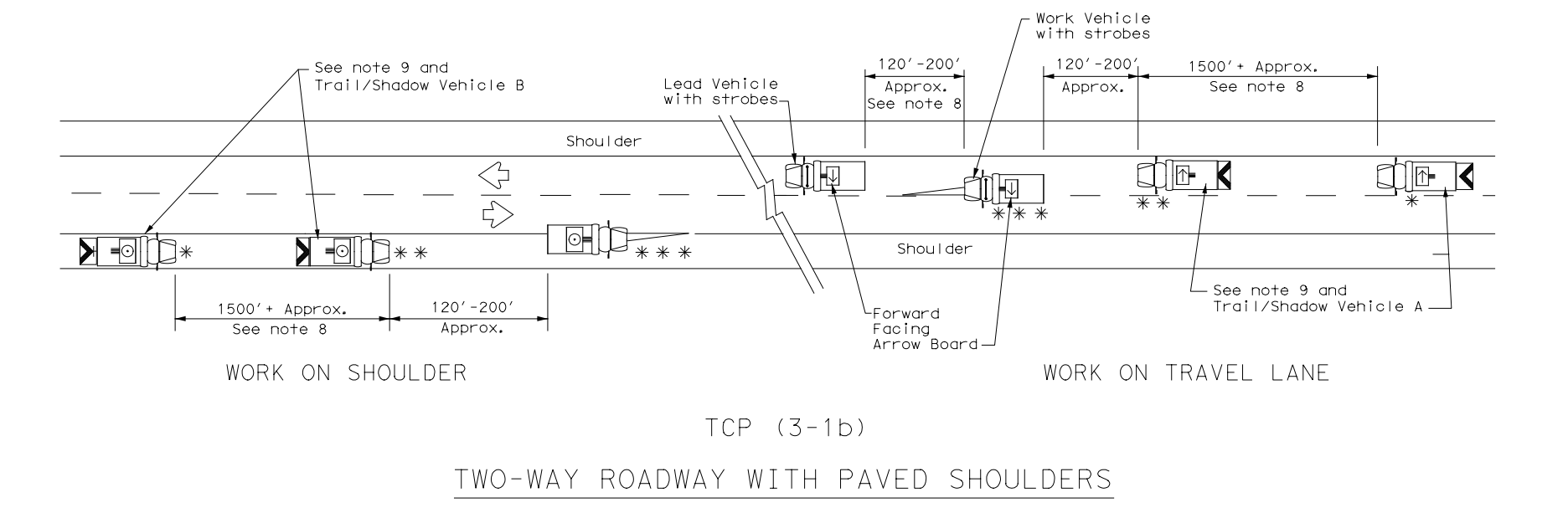


LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

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



Texas Department of Transportation

Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN  
MOBILE OPERATIONS  
UNDIVIDED HIGHWAYS**

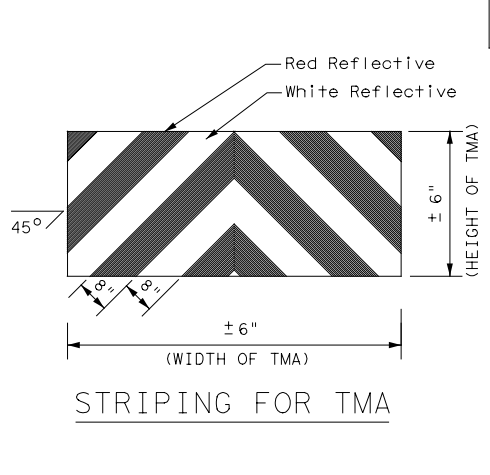
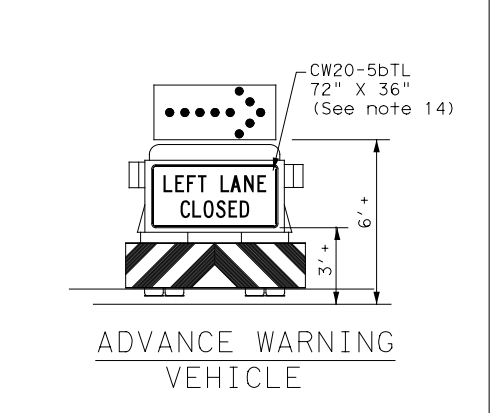
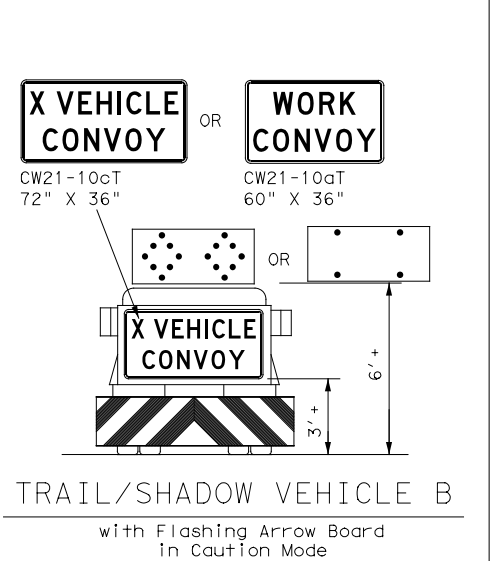
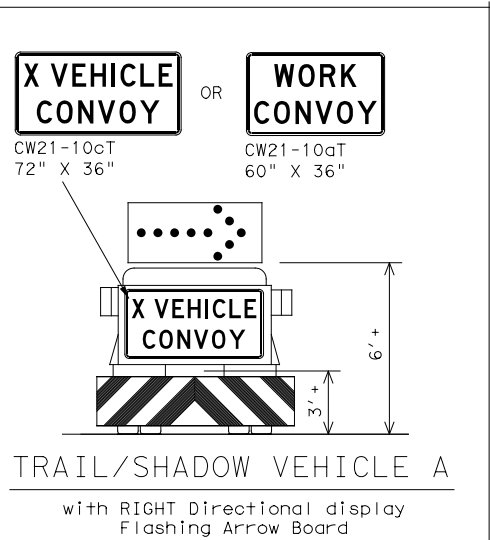
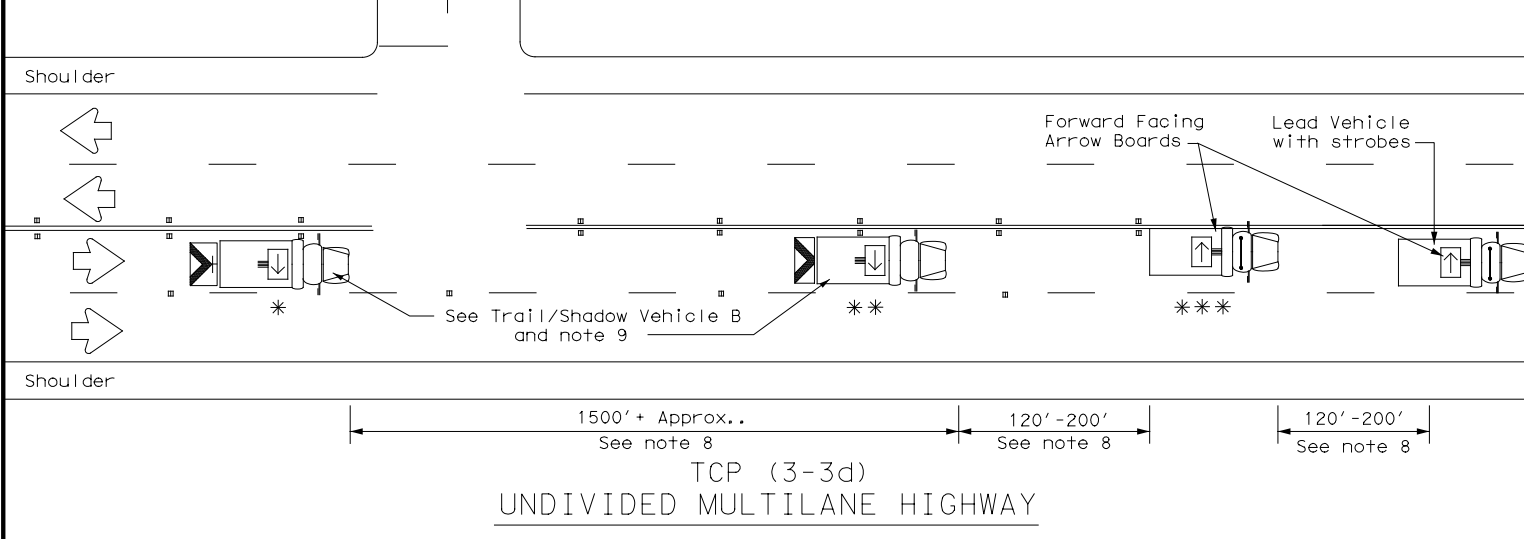
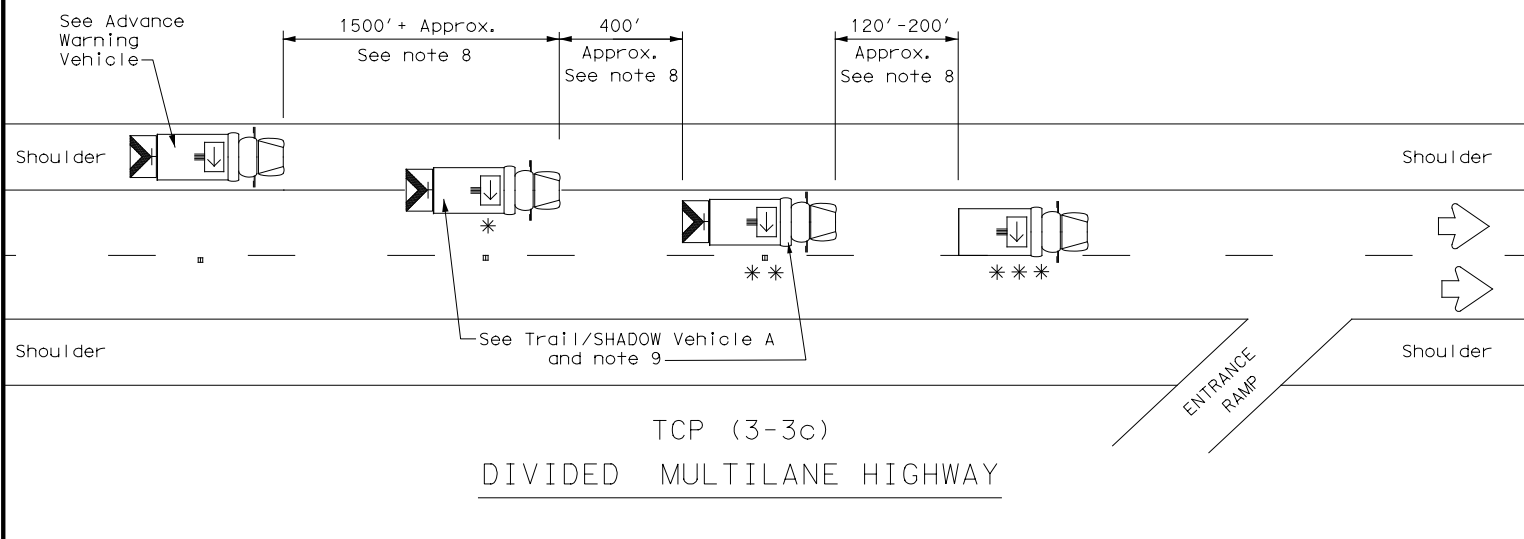
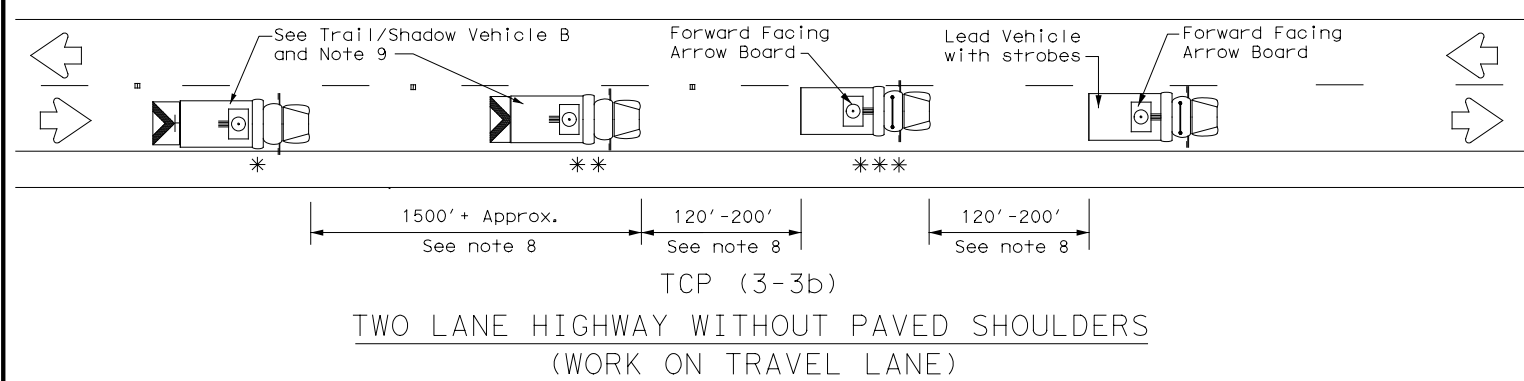
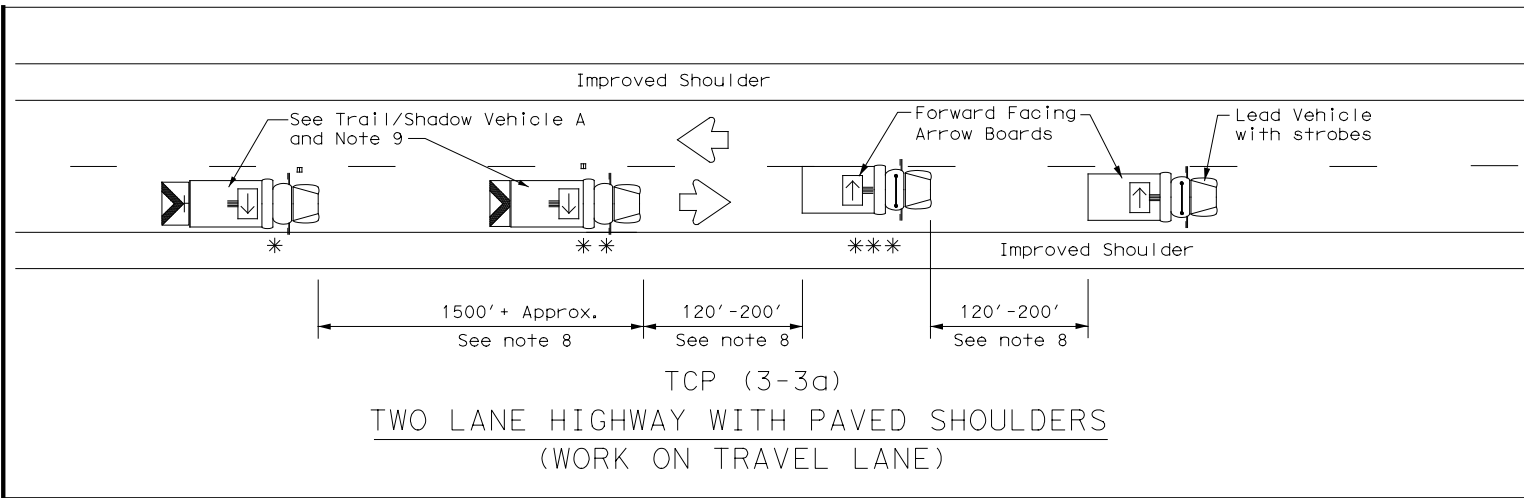
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© TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0133	04	042	US82				
2-94	4-98								
8-95	7-13								
1-97									
		DIST	COUNTY		SHEET NO.				
		WFS	BAYLOR		51				

175

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DATE: 12/15/2020 9:50:50 AM  
FILE: tcp3-3.dgn



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

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

GENERAL NOTES

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

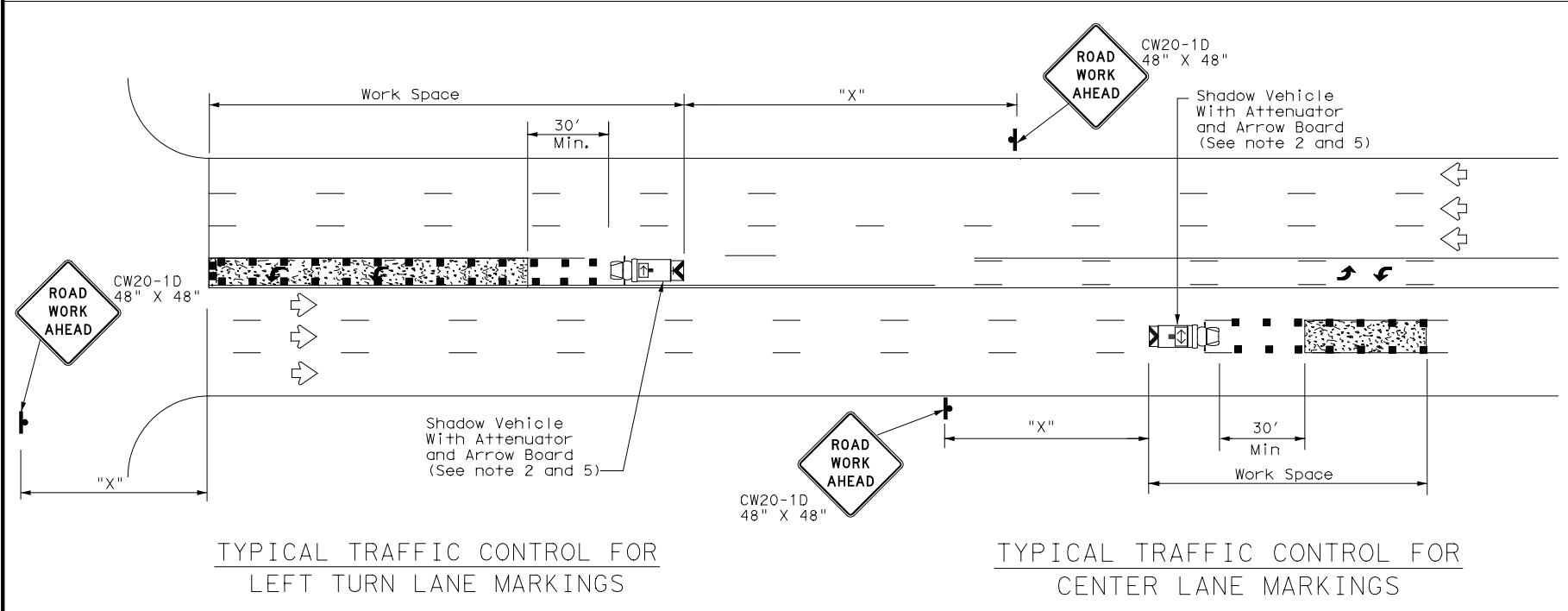
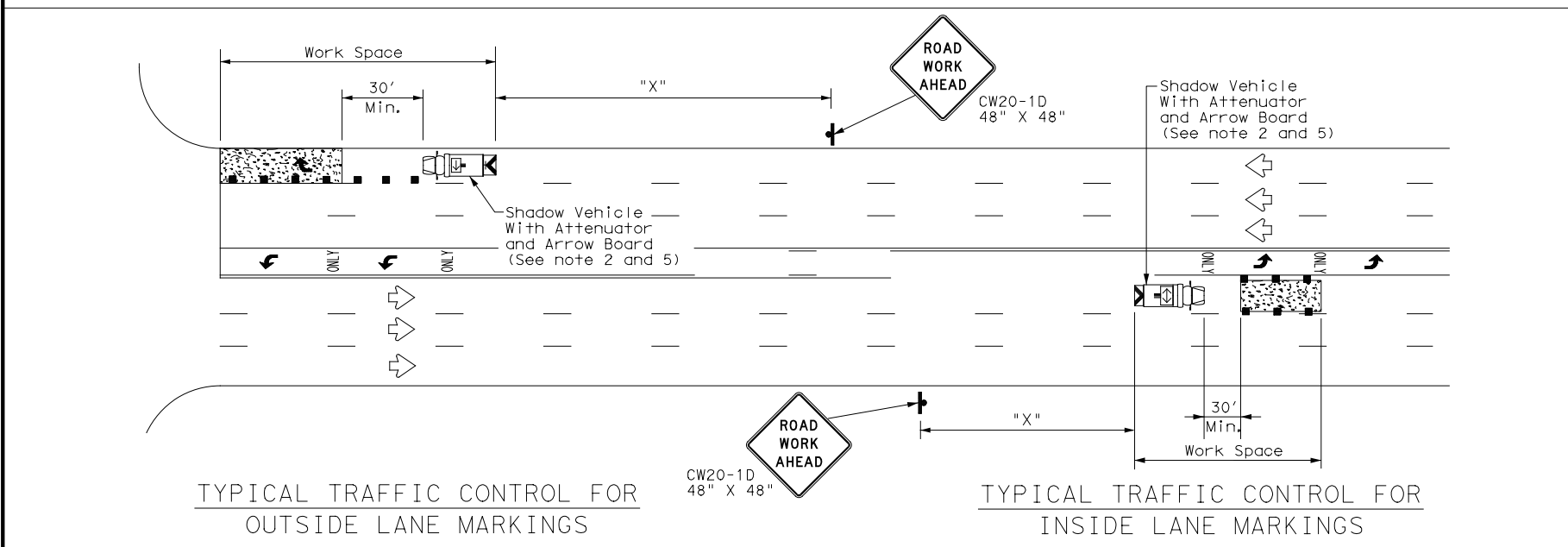
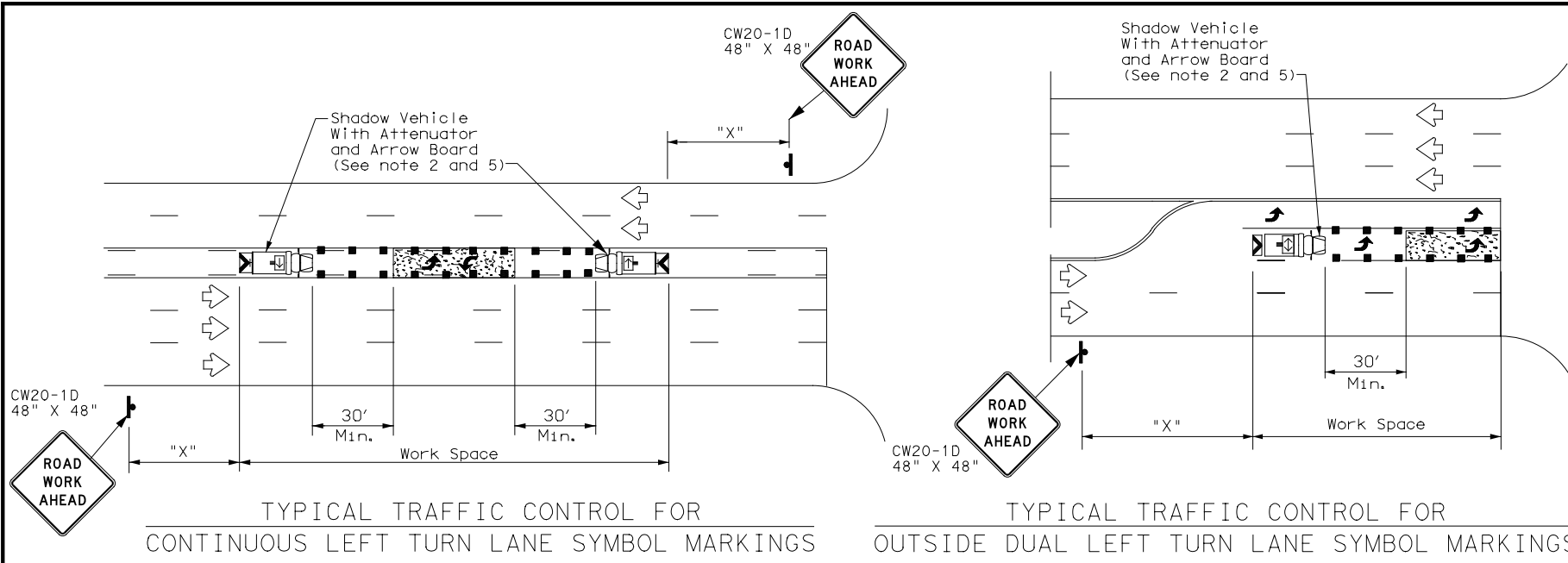
Texas Department of Transportation

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	WFS	BAYLOR	52	
1-97 7-14				

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

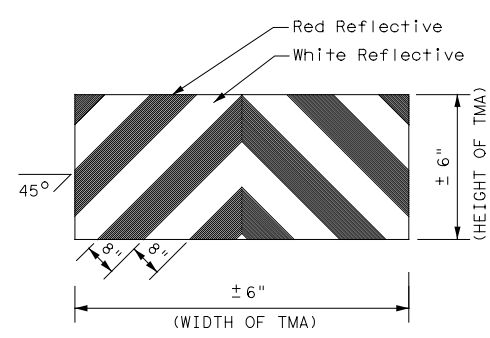
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS <sup>2</sup> / 60	150'	165'	180'	30'	60'	120'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

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

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

**GENERAL NOTES**

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



**Texas Department of Transportation**  
 Traffic Operations Division Standard

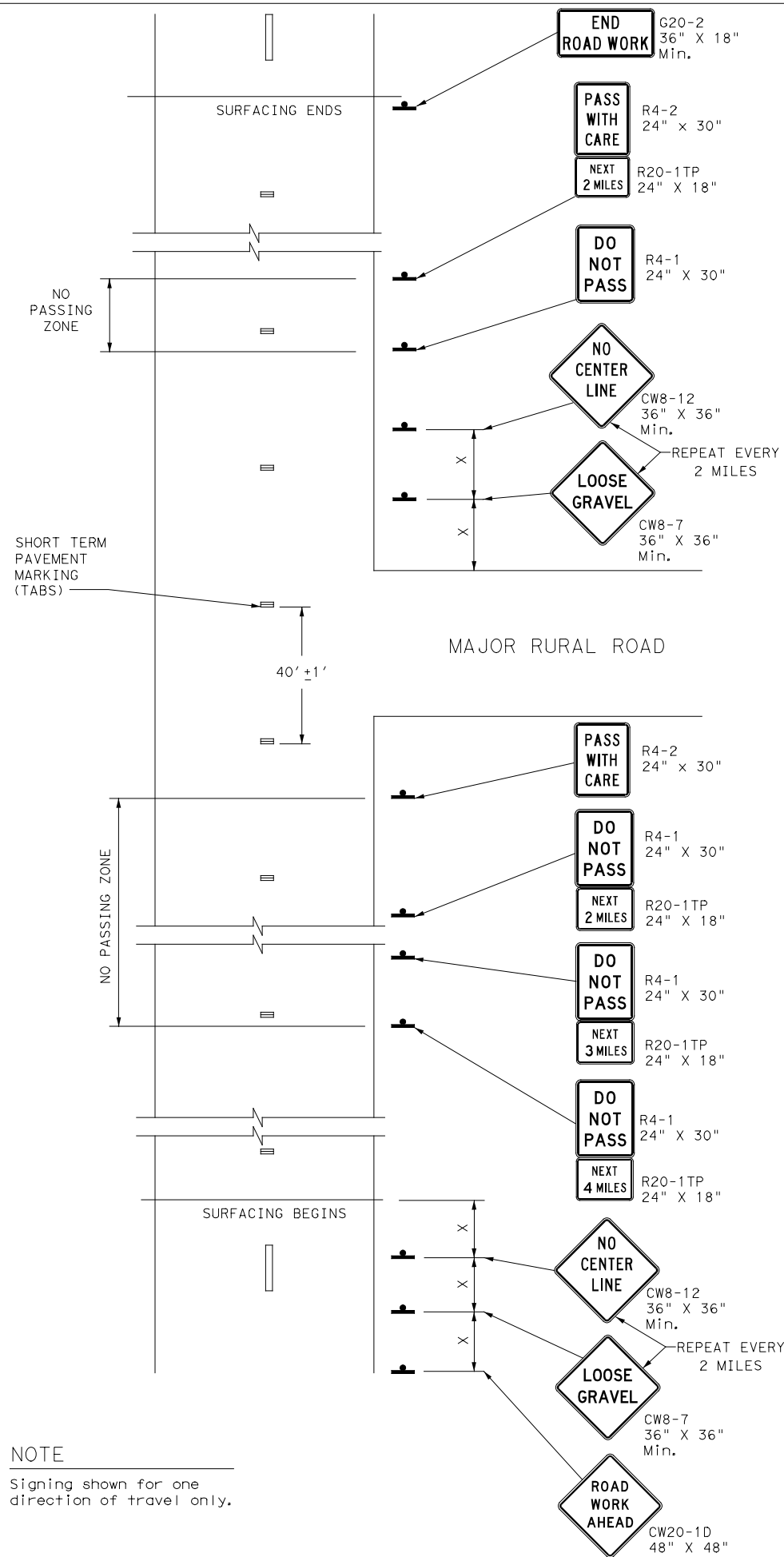
**TRAFFIC CONTROL PLAN  
 MOBILE OPERATIONS FOR  
 ISOLATED WORK AREAS  
 UNDIVIDED HIGHWAYS**

**TCP (3-4) - 13**

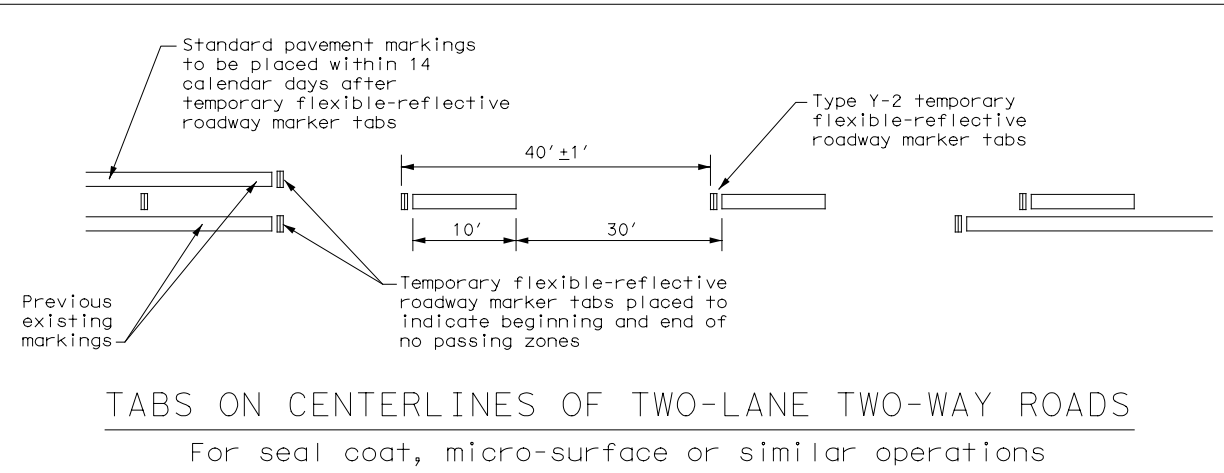
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© TxDOT July, 2013	CONT: 0133	SECT: 04	JOB: 042	HIGHWAY: US82
REVISIONS	DIST: WFS	COUNTY: BAYLOR	SHEET NO. 53	

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**NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS**



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

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

**"NO CENTER LINE" SIGN (CW8-12)**

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

**"LOOSE GRAVEL" SIGN (CW8-7)**

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

**PAVEMENT MARKINGS**

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

**COORDINATION OF SIGN LOCATIONS**

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

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

\* Conventional Roads Only

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

**GENERAL NOTES**

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



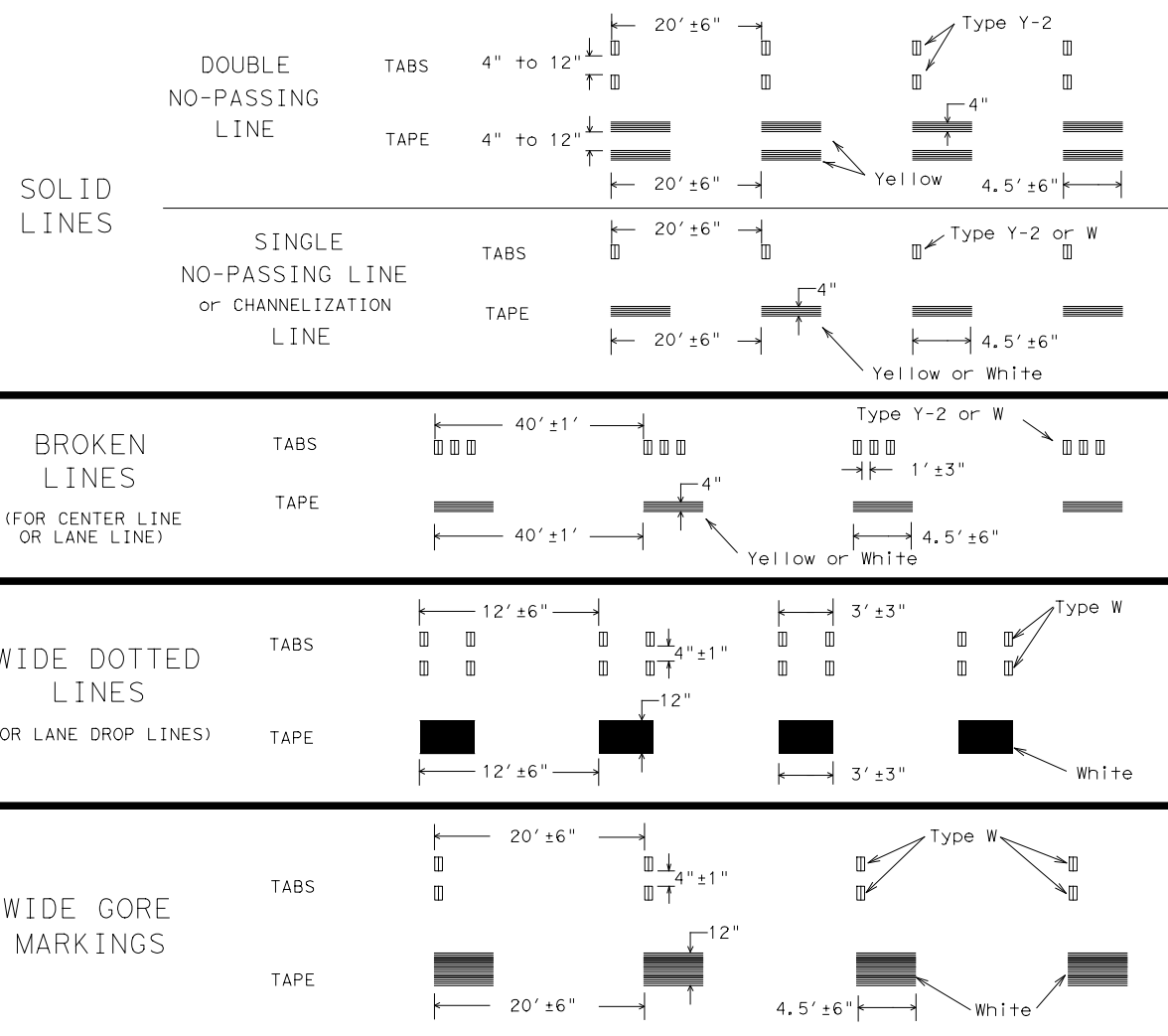
**TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS**  
**TCP (7-1) - 13**

FILE:	tcp7-1.dgn	DN:	TxDOT	CK:	TxDOT	DN:	TxDOT	CK:	TxDOT
© TxDOT	March 1991	CONT:	0133	SECT:	04	JOB:	042	HIGHWAY:	US82
4-92	4-98	DIST:	WFS	COUNTY:	BAYLOR	SHEET NO.		54	
1-97	7-13								

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## WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



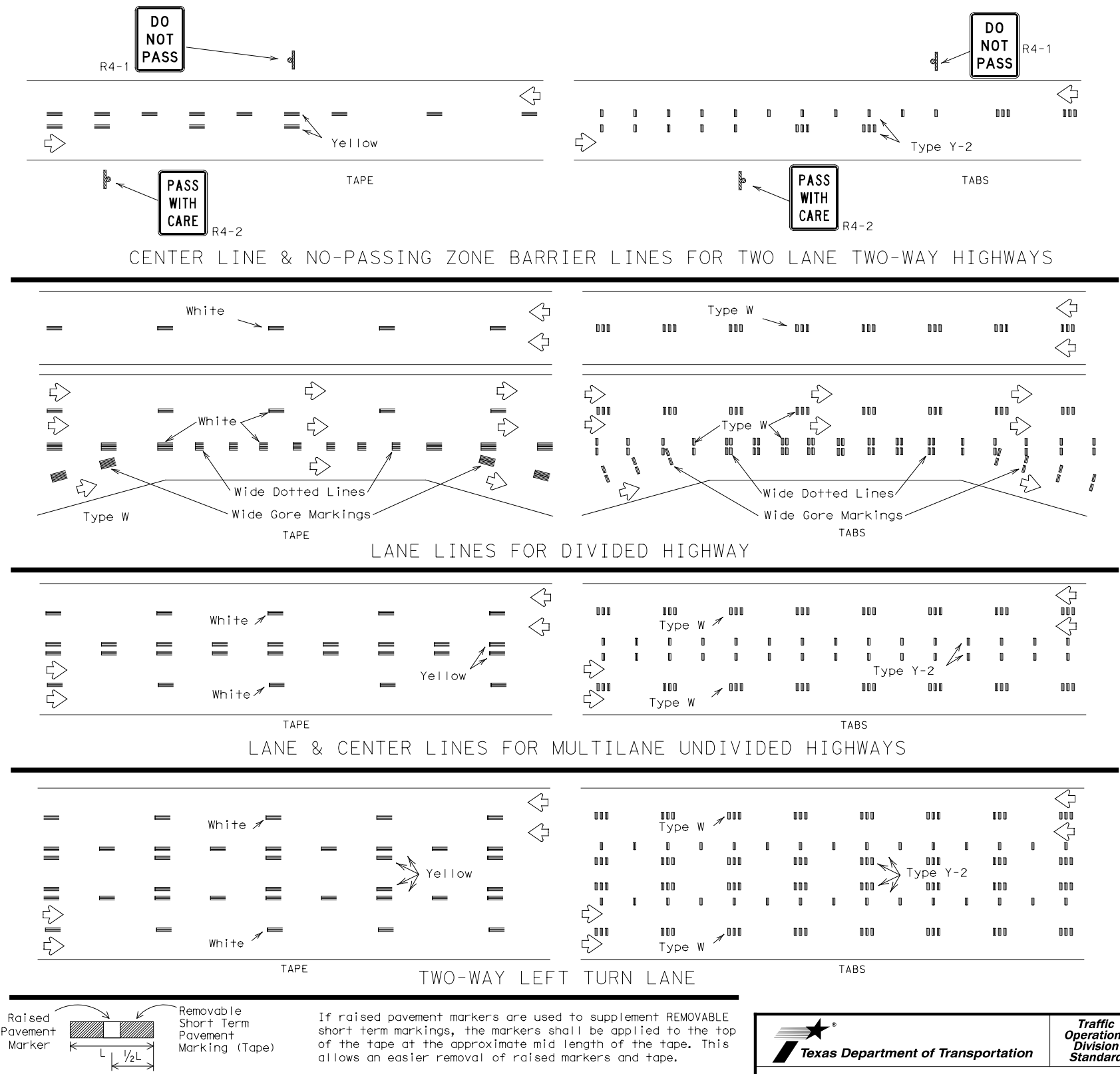
### NOTES:

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

### TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

## WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



### PREFABRICATED PAVEMENT MARKINGS

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

### RAISED PAVEMENT MARKERS

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

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

- DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:  
[http://www.txdot.gov/business/contractors\\_consultants/material\\_specifications/default.htm](http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm)



## WORK ZONE SHORT TERM PAVEMENT MARKINGS

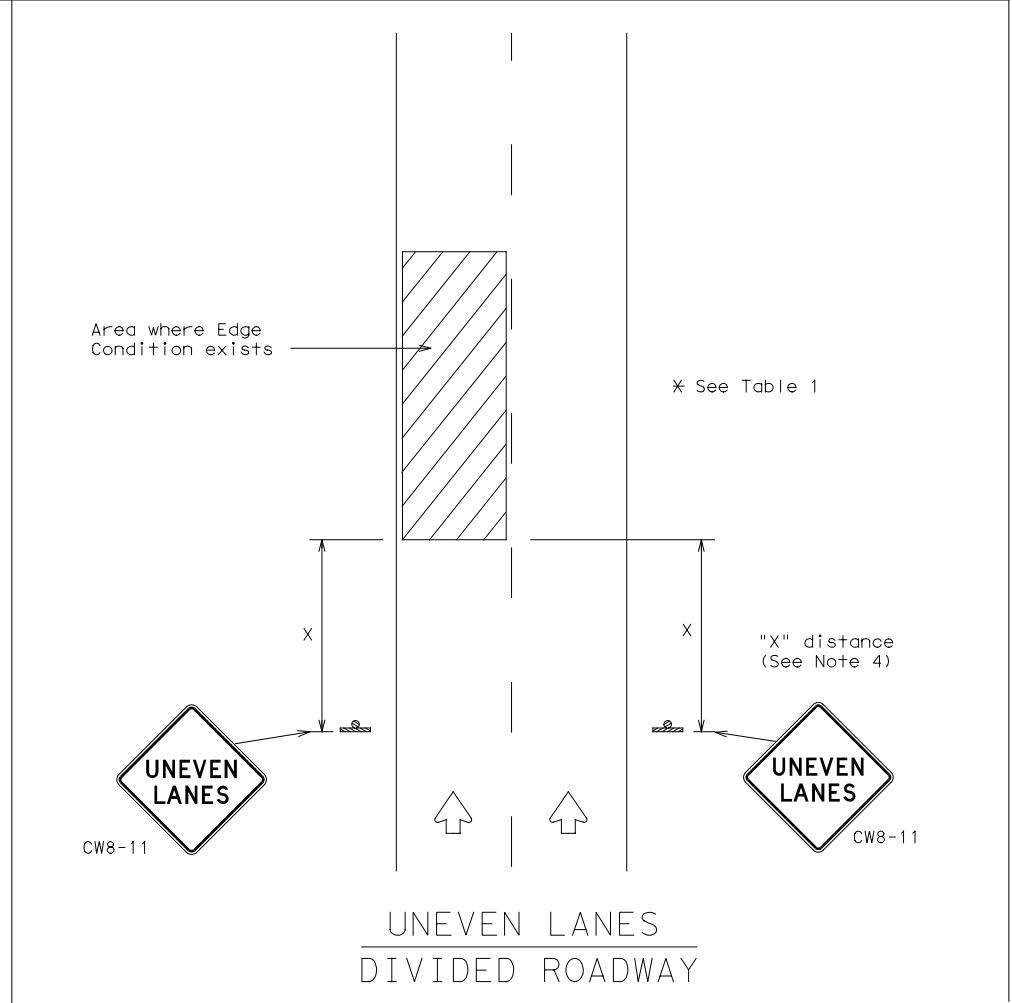
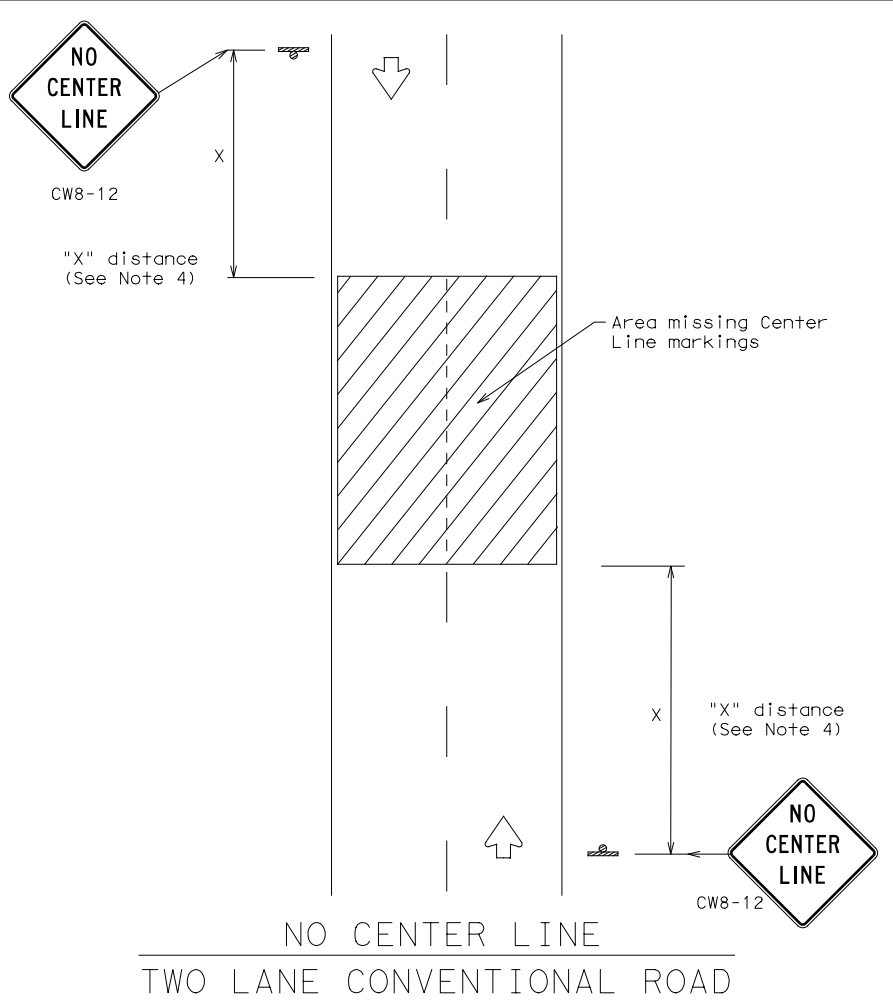
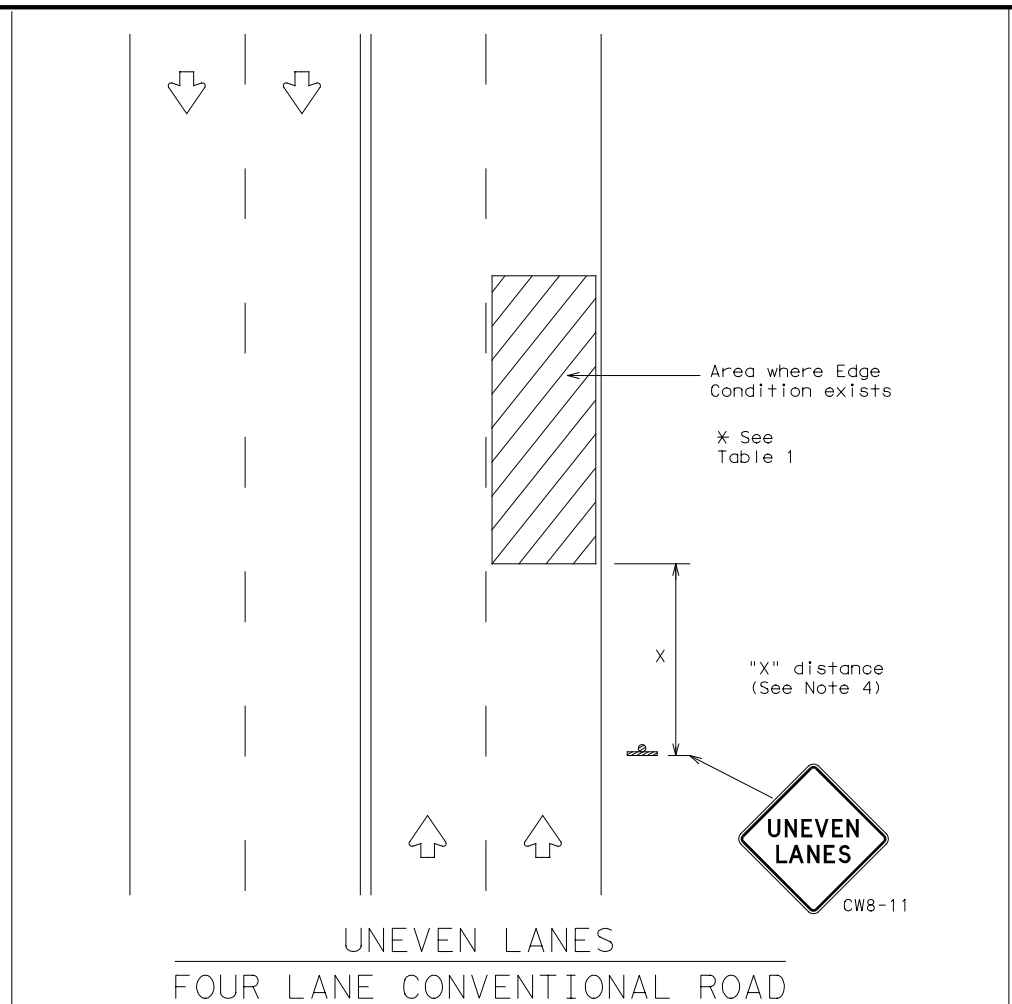
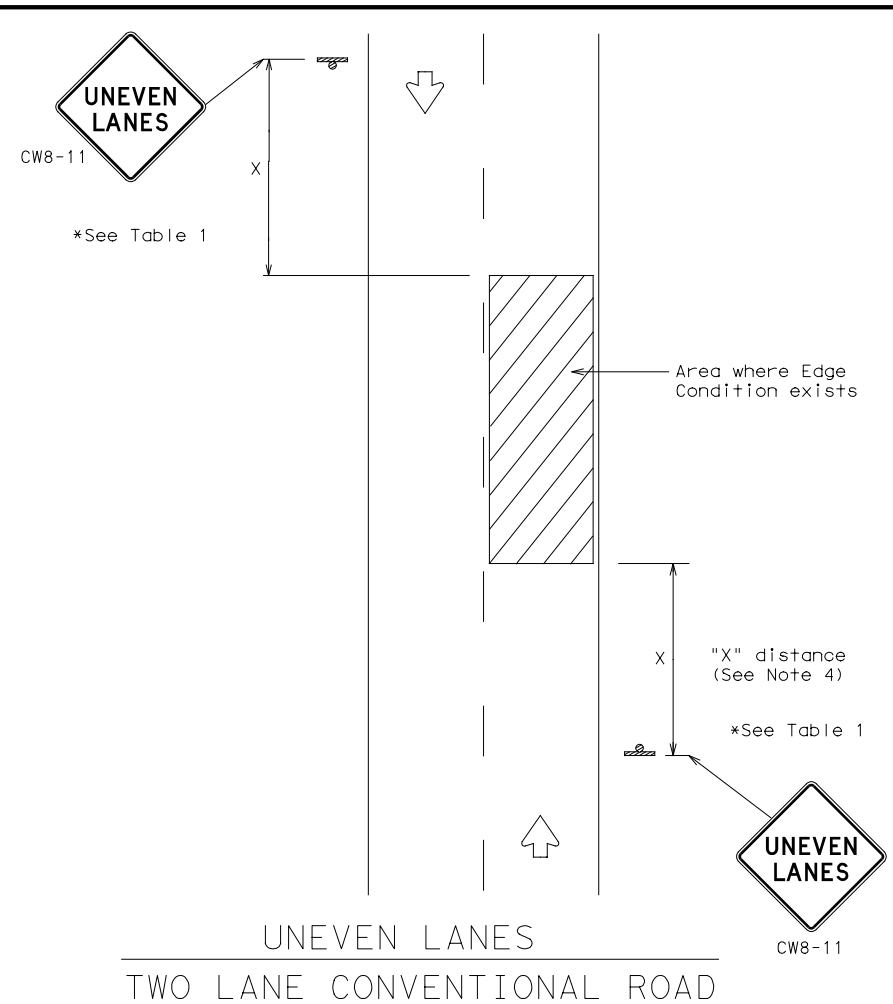
### WZ (STPM) - 13

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©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0133	04	042	US82				
1-97	3-03	DIST	COUNTY	SHEET NO.					
7-13		WFS	BAYLOR	55					



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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 <sub>FL</sub> OR TYPE C <sub>FL</sub> 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.

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"



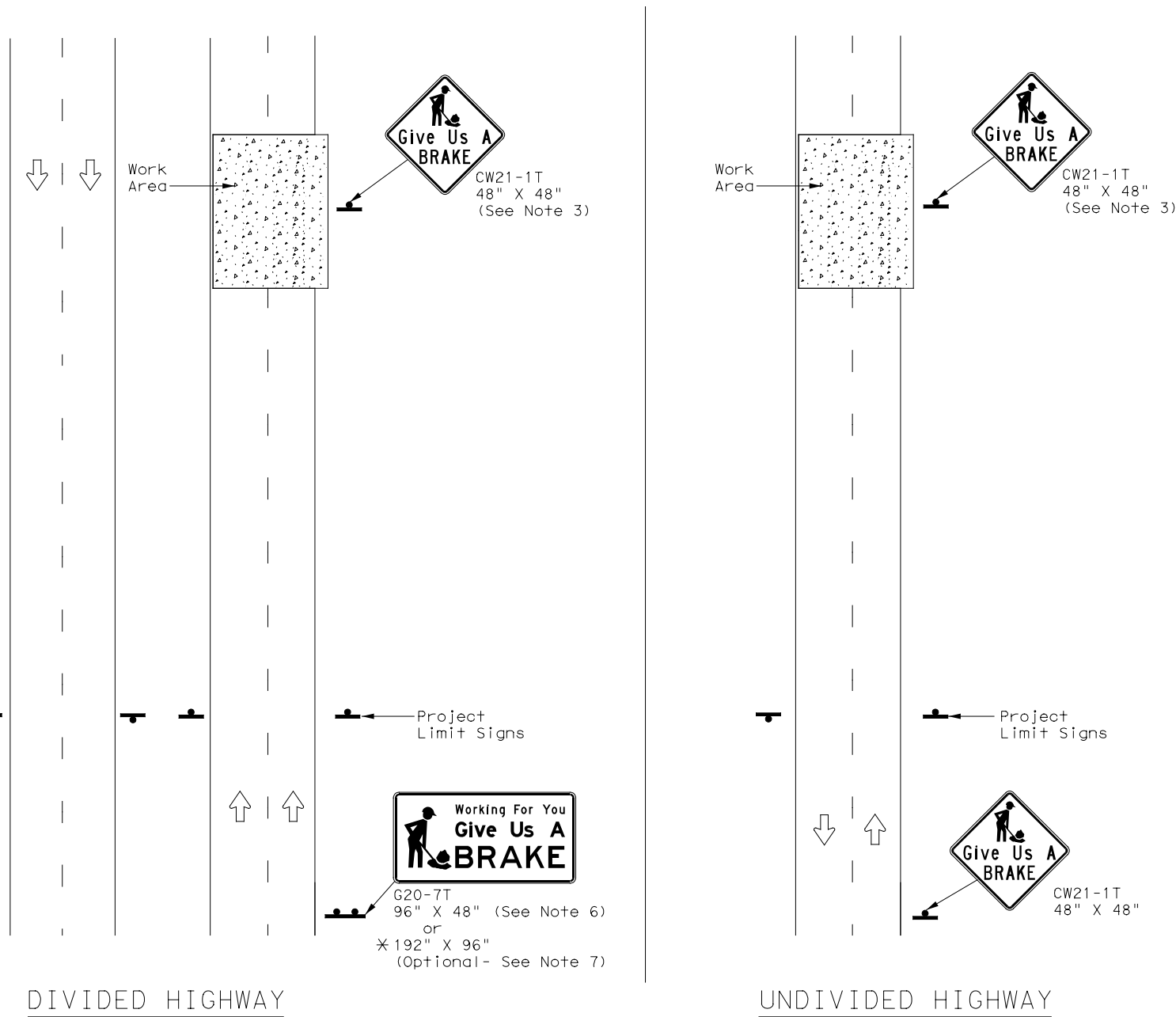
SIGNING FOR UNEVEN LANES

WZ (UL) - 13

FILE: wzu1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
8-95 2-98 7-13	DIST	COUNTY	SHEET NO.	
1-97 3-03	WFS	BAYLOR	56	

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SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

**LEGEND**

	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS

PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B <sub>FL</sub> OR TYPE C <sub>FL</sub>
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

- See BC and SMD sheets for additional sign support details.
- Sign locations shall be approved by the Engineer.
- For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
- Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
- Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
- The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
- The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:  
Item 636 - Aluminum Signs  
Item 647 - Large Roadside Sign Supports and Assemblies.  
Item 416 - Drilled Shaft Foundations
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.



WORK ZONE  
"GIVE US A BRAKE"  
SIGNS

WZ (BRK) - 13

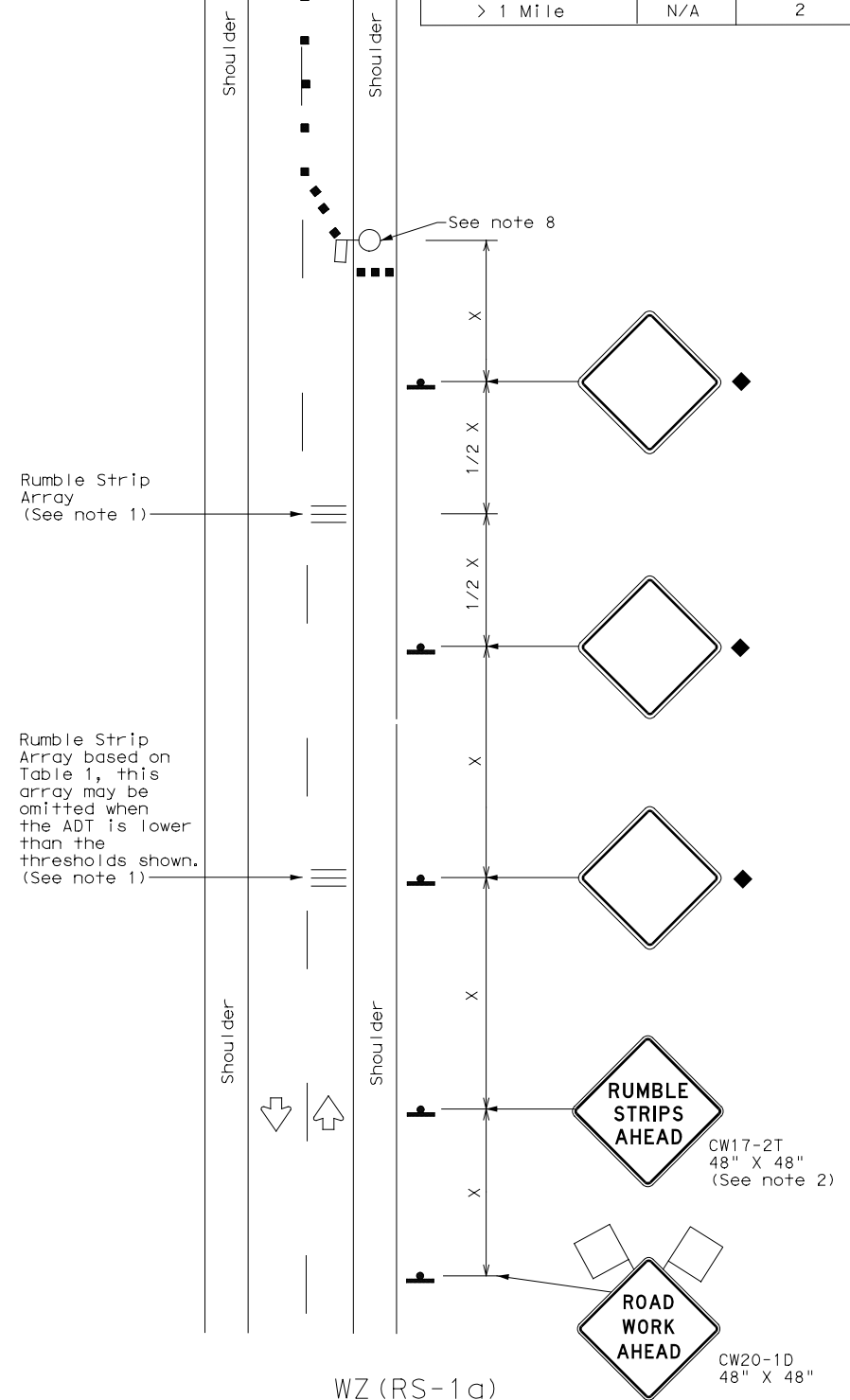
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©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
6-96 5-98 7-13	DIST	COUNTY	SHEET NO.	
8-96 3-03	WFS	BAYLOR	57	

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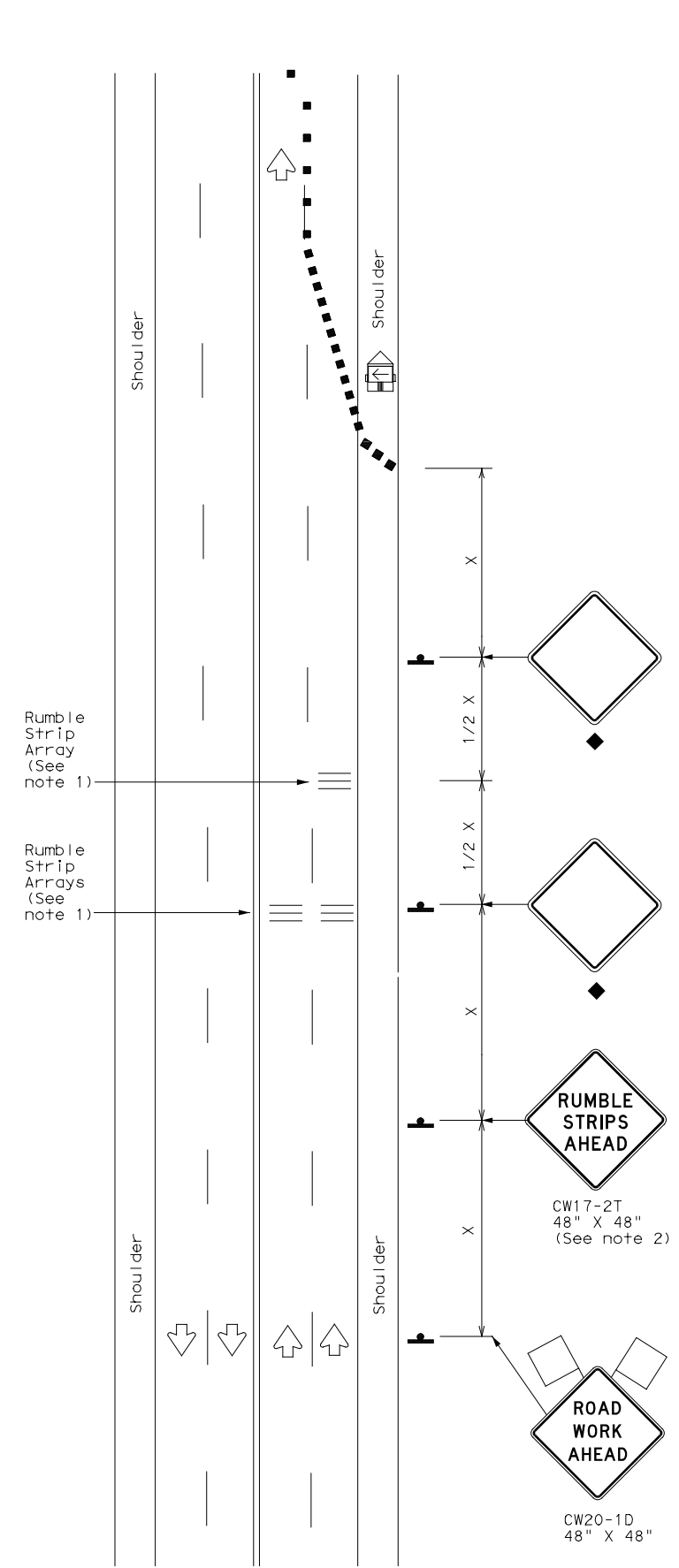
DATE: 12/15/2020 9:51:13 AM  
FILE: wzrs16.dgn

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

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



WZ (RS-1a)  
75 mph or Less  
RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ (RS-1b)  
75 mph or Less  
RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

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

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

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

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

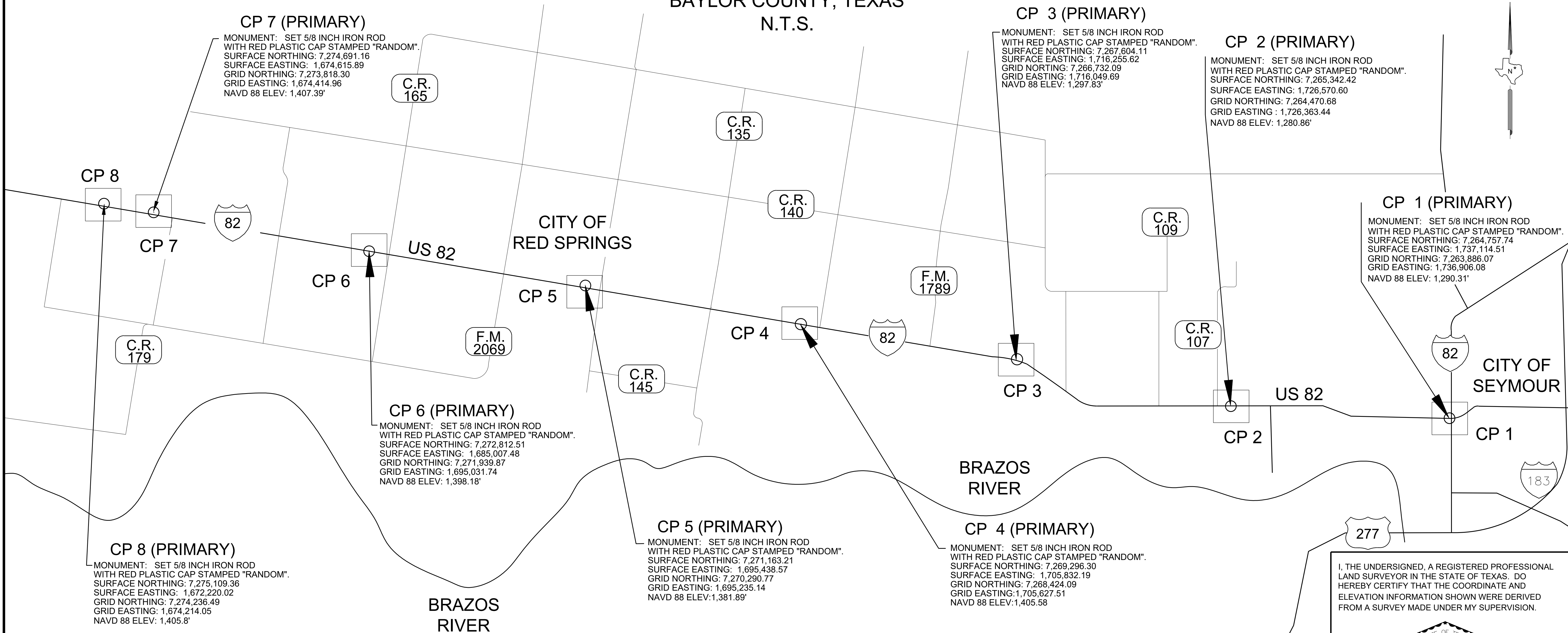
Texas Department of Transportation  
Traffic Operations Division Standard

## TEMPORARY RUMBLE STRIPS

### WZ (RS) - 16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
2-14	DIST	COUNTY	SHEET NO.	
4-16	WFS	BAYLOR	58	

**SURVEY CONTROL INDEX  
BAYLOR COUNTY, TEXAS  
N.T.S.**



**CP 7 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,274,691.16  
SURFACE EASTING: 1,674,615.89  
GRID NORTHING: 7,273,818.30  
GRID EASTING: 1,674,414.96  
NAVD 88 ELEV: 1,407.39'

**CP 3 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,267,604.11  
SURFACE EASTING: 1,716,255.62  
GRID NORTHING: 7,266,732.09  
GRID EASTING: 1,716,049.69  
NAVD 88 ELEV: 1,297.83'

**CP 2 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,265,342.42  
SURFACE EASTING: 1,726,570.60  
GRID NORTHING: 7,264,470.68  
GRID EASTING: 1,726,363.44  
NAVD 88 ELEV: 1,280.86'

**CP 1 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,264,757.74  
SURFACE EASTING: 1,737,114.51  
GRID NORTHING: 7,263,886.07  
GRID EASTING: 1,736,906.08  
NAVD 88 ELEV: 1,290.31'

**CP 6 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,272,812.51  
SURFACE EASTING: 1,685,007.48  
GRID NORTHING: 7,271,939.87  
GRID EASTING: 1,695,031.74  
NAVD 88 ELEV: 1,398.18'

**CP 5 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,271,163.21  
SURFACE EASTING: 1,695,438.57  
GRID NORTHING: 7,270,290.77  
GRID EASTING: 1,695,235.14  
NAVD 88 ELEV: 1,381.89'

**CP 4 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,269,296.30  
SURFACE EASTING: 1,705,832.19  
GRID NORTHING: 7,268,424.09  
GRID EASTING: 1,705,627.51  
NAVD 88 ELEV: 1,405.58'

**CP 8 (PRIMARY)**  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
SURFACE NORTHING: 7,275,109.36  
SURFACE EASTING: 1,672,220.02  
GRID NORTHING: 7,274,236.49  
GRID EASTING: 1,674,214.05  
NAVD 88 ELEV: 1,405.8'

- UNITED STATES HIGHWAY
- INTERSTATE HIGHWAY
- STATE HIGHWAY
- FARM-TO-MARKET ROAD

I, THE UNDERSIGNED, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THE COORDINATE AND ELEVATION INFORMATION SHOWN WERE DERIVED FROM A SURVEY MADE UNDER MY SUPERVISION.



MITCHELL S. PILLAR - R.P.L.S. No. 5491

NO.	REVISIONS	BY	DATE
-----	-----------	----	------

**HUITT-ZOLIARS**  
Huitt-Zollars, Inc. Dallas  
1717 McKinney Avenue, Suite 1400  
Dallas, Texas 75202-1236  
Phone (214) 871-3311 Fax (214) 871-0757  
TBPLS REGISTRATION No. 10025600



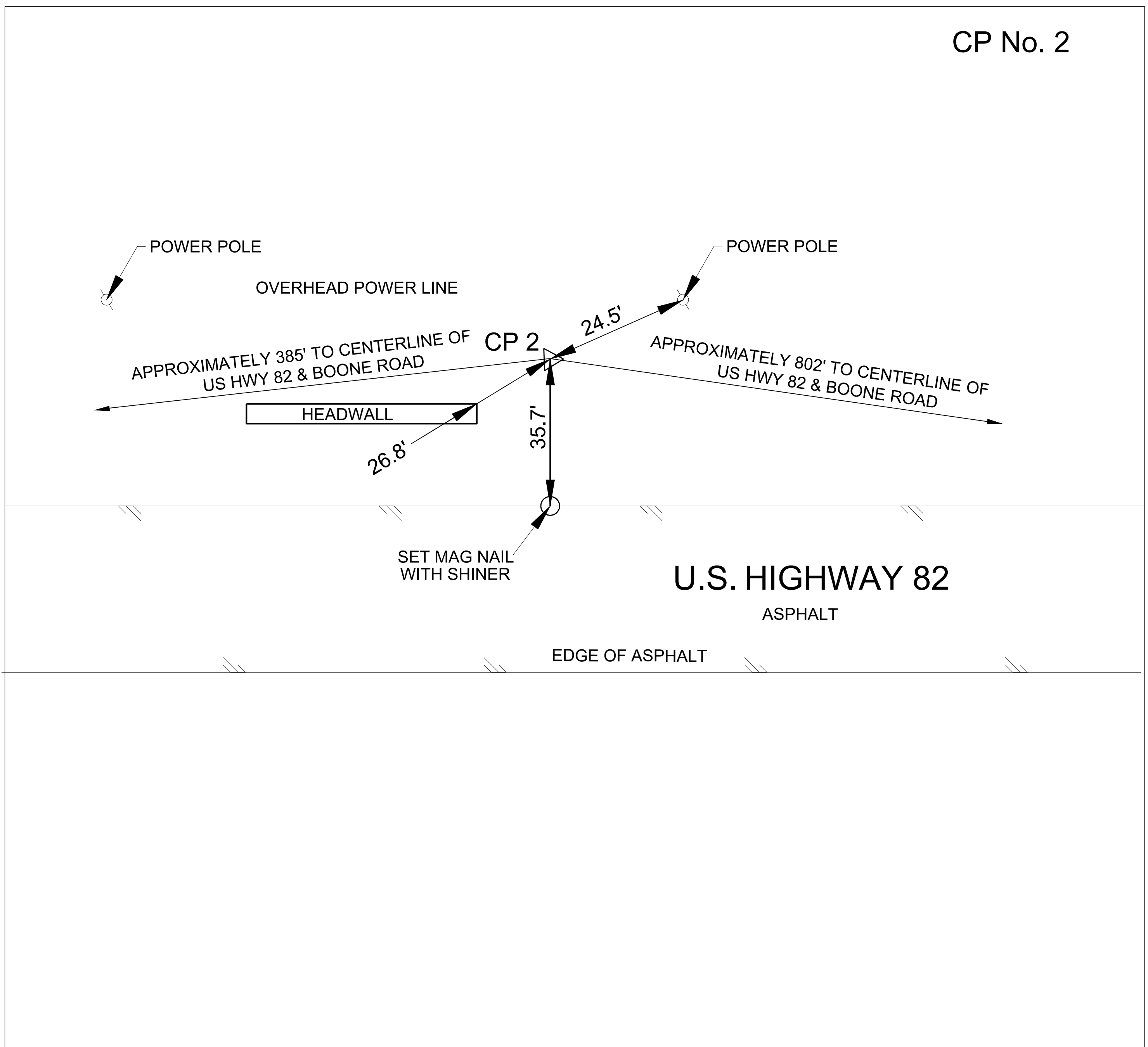
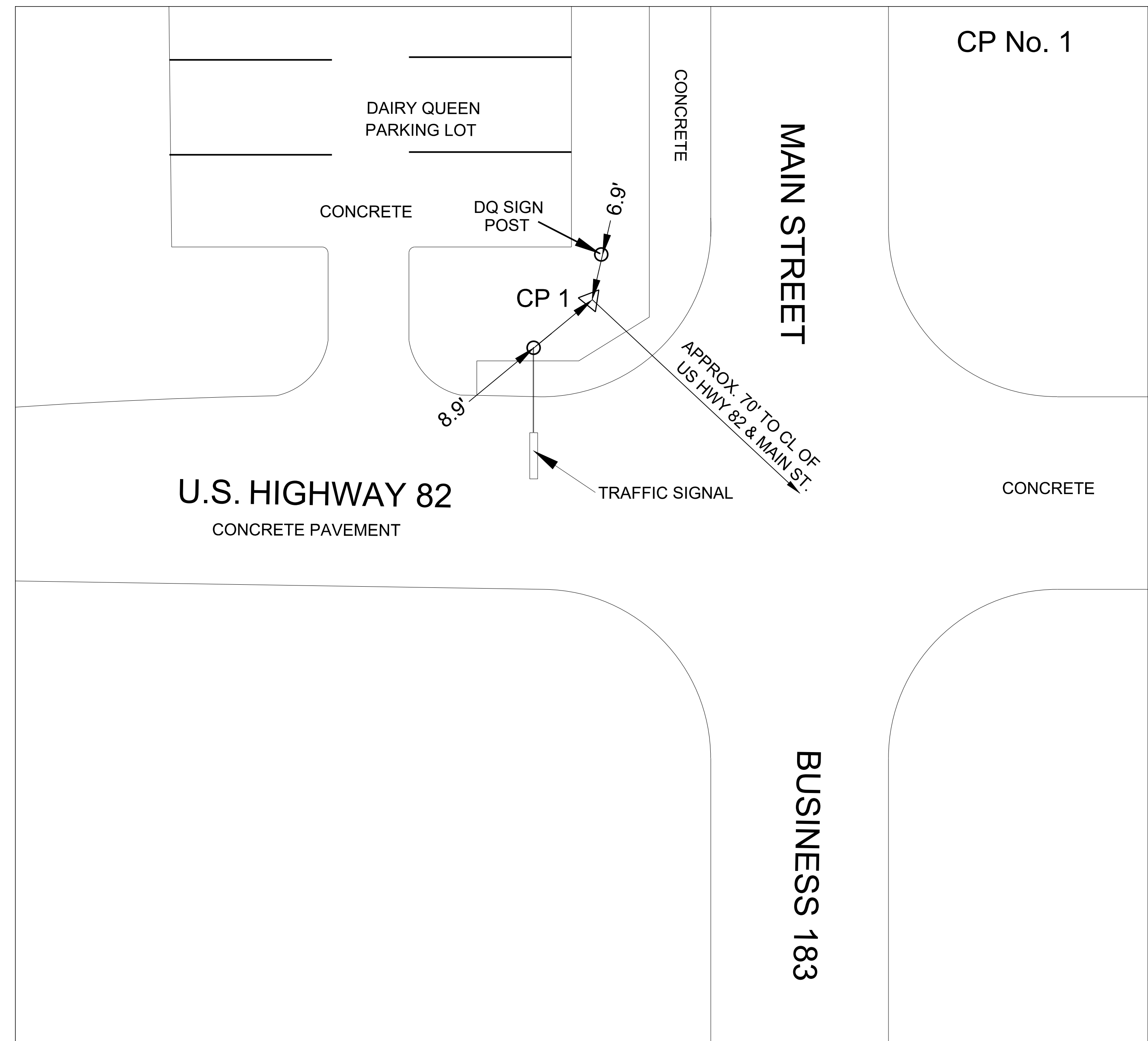
U.S. HIGHWAY NO. 82  
**SURVEY CONTROL INDEX**

SCALE: "N.T.S." SHEET 1 OF 5

FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6	TEXAS		US 82
DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
18	BAYLOR	0133	04
			JOB NO.
			042
			SHEET NO.
			59

**NOTES:**  
DATE SET: 10/7/2019  
MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM".  
ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).



**CONTROL POINT No. 1**

**APPROXIMATE LOCATION:**

+/- 88 FEET NORTHWEST OF INTERSECTION US 82 & MAIN STREET  
 +/-0.07 MILES NORTHEAST OF INTERSECTION US 82 & N. WASHINGTON ST.

DATE SET: 10/7/2019  
 MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM". ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

SURFACE NORTHING: 7,264,757.74  
 SURFACE EASTING: 1,737,114.51  
 GRID NORTHING: 7,263,886.07  
 GRID EASTING: 1,705,627.51  
 NAVD 88 ELEV: 1,290.31'

**CONTROL POINT No. 2**

**APPROXIMATE LOCATION:**

+/- 0.07 MILES NORTHEAST OF INTERSECTION US 82 & FM 107.  
 +/-0.15 MILES NORTHWEST OF INTERSECTION US 82 & BOONE ROAD.

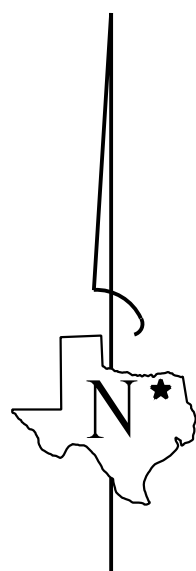
DATE SET: 10/7/2019  
 MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM". ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

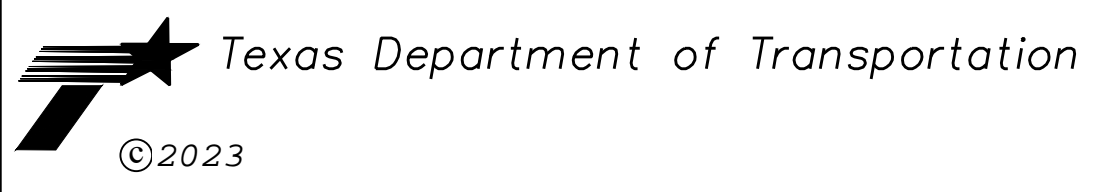
SURFACE NORTHING: 7,265,342.42  
 SURFACE EASTING: 1,726,570.60  
 GRID NORTHING: 7,264,470.68  
 GRID EASTING : 1,726,363.44  
 NAVD 88 ELEV: 1,280.86'

I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN WAS DETERMINED BY A FIELD SURVEY ON 10/7/2019.



MITCHELL S. PILLAR - R.P.L.S. No. 5491

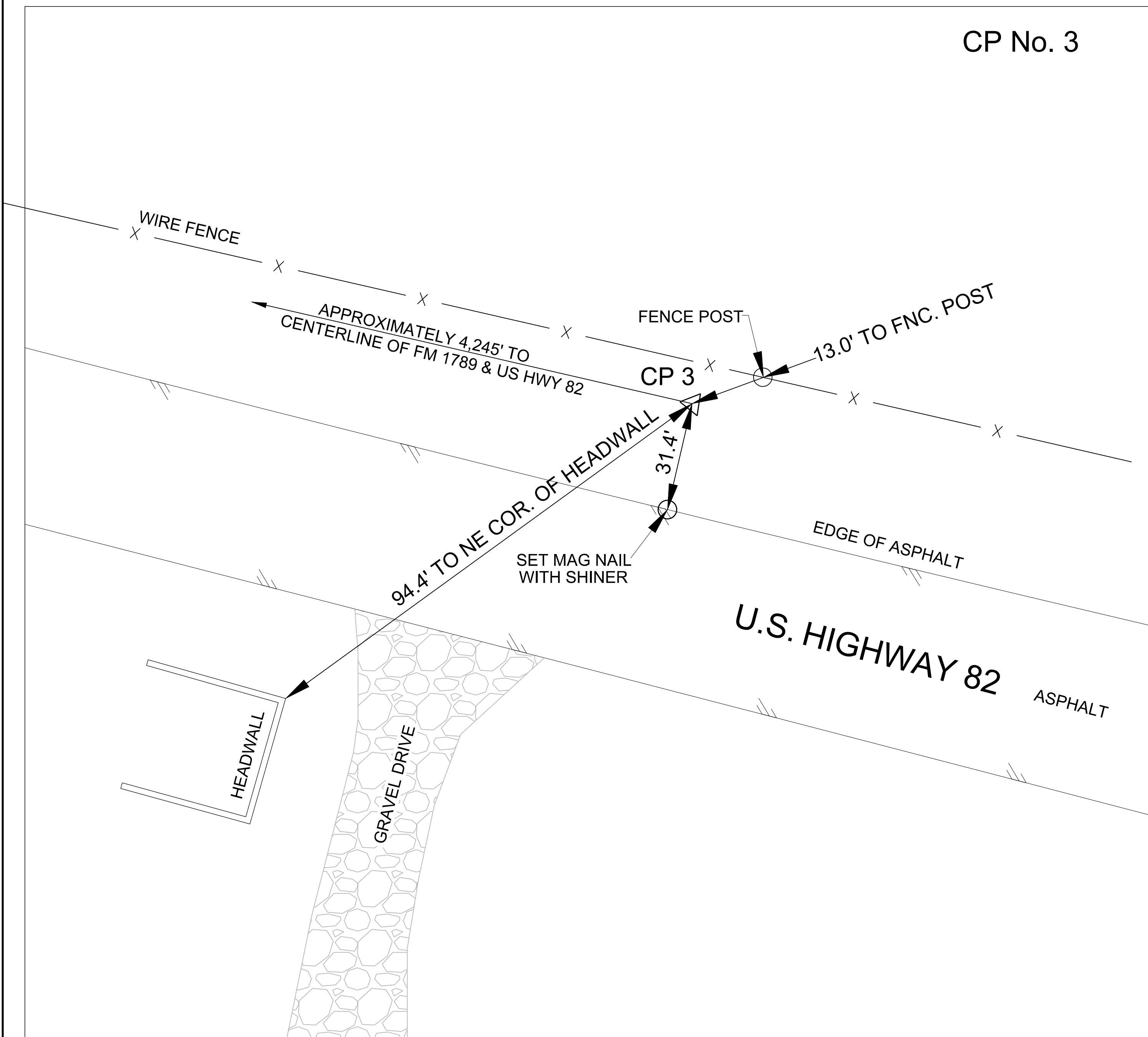
**HUITT-ZOLLARS**  
 Huitt-Zollars, Inc. Dallas  
 1717 McKinney Avenue, Suite 1400  
 Dallas, Texas 75202-1236  
 Phone (214) 871-3311 Fax (214) 871-0757  
 TBPLS REGISTRATION No. 10025600



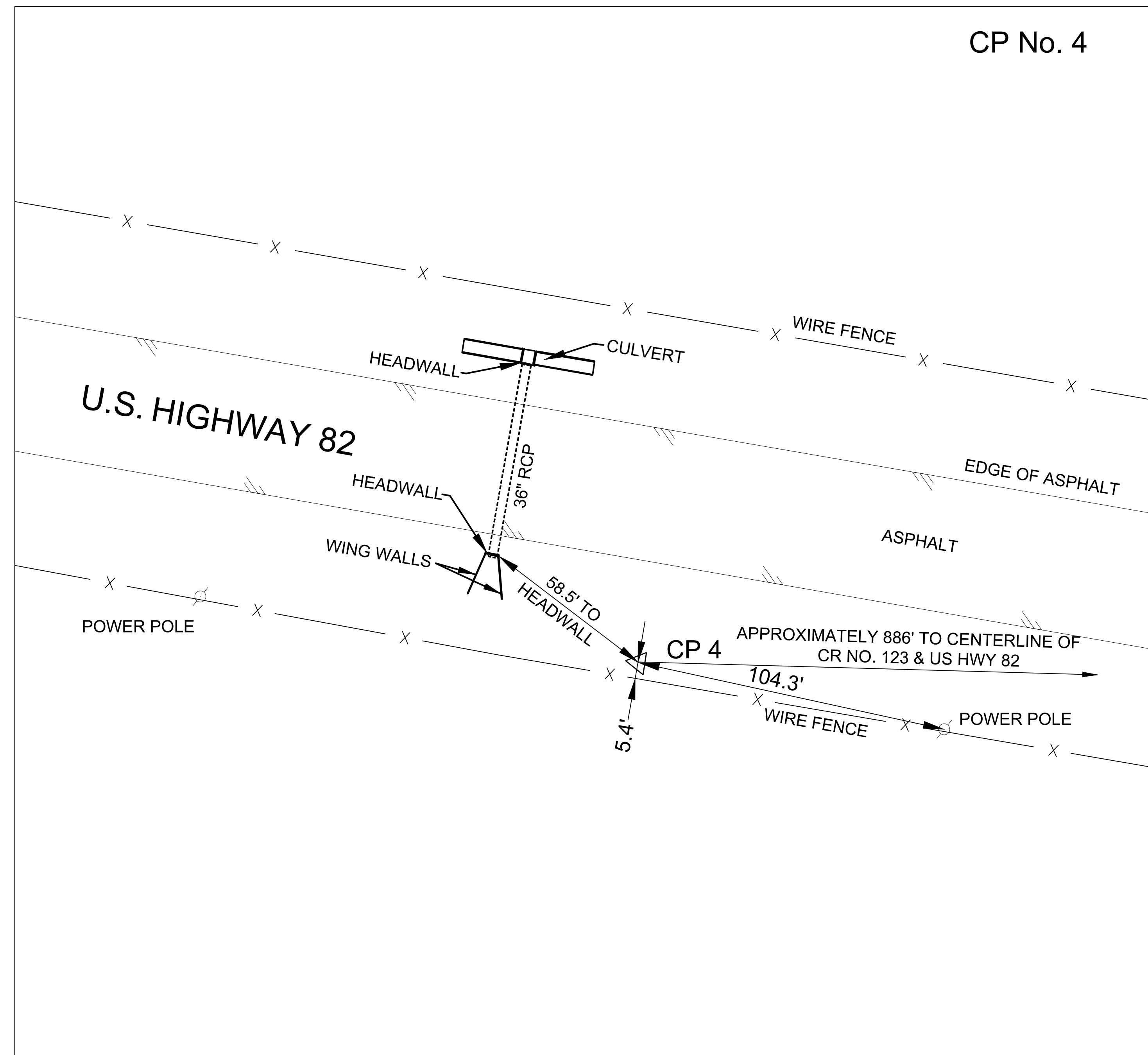
U.S. HIGHWAY NO. 82  
**SURVEY CONTROL**  
 SCALE: "N.T.S." SHEET 2 OF 5

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
6	TEXAS		US 82		
DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
18	BAYLOR	0133	04	042	60

CP No. 3



CP No. 4



**CONTROL POINT No. 3**

APPROXIMATE LOCATION:

+/- 0.80 MILES SOUTHEAST OF INTERSECTION FM 1789 & US 82  
 +/-0.84 MILES SOUTHWEST OF INTERSECTION CR 135 & US 82

DATE SET: 10/7/2019  
 MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM". ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

SURFACE NORTHING: 7,267,604.11  
 SURFACE EASTING: 1,716,255.62  
 GRID NORTHING: 7,266,732.09  
 GRID EASTING: 1,716,049.69  
 NAVD 88 ELEV: 1,297.83'

**CONTROL POINT No. 4**

APPROXIMATE LOCATION:

+/- 0.17 MILES NORTHWEST OF INTERSECTION CR 123 & US 82  
 +/-0.84 MILES SOUTHWEST OF INTERSECTION CR 135 & US 82

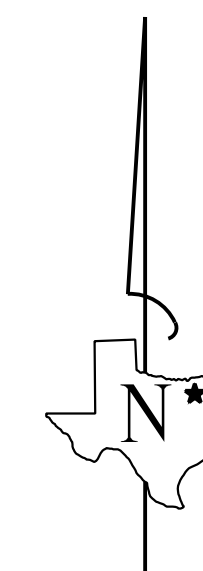
DATE SET: 10/7/2019  
 MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM". ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

SURFACE NORTHING: 7,269,296.30  
 SURFACE EASTING: 1,705,832.19  
 GRID NORTHING: 7,268,424.09  
 GRID EASTING: 1,705,627.51  
 NAVD 88 ELEV: 1,405.58

I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN WAS DETERMINED BY A FIELD SURVEY ON 10/7/2019.



MITCHELL S. PILLAR - R.P.L.S. No. 5491

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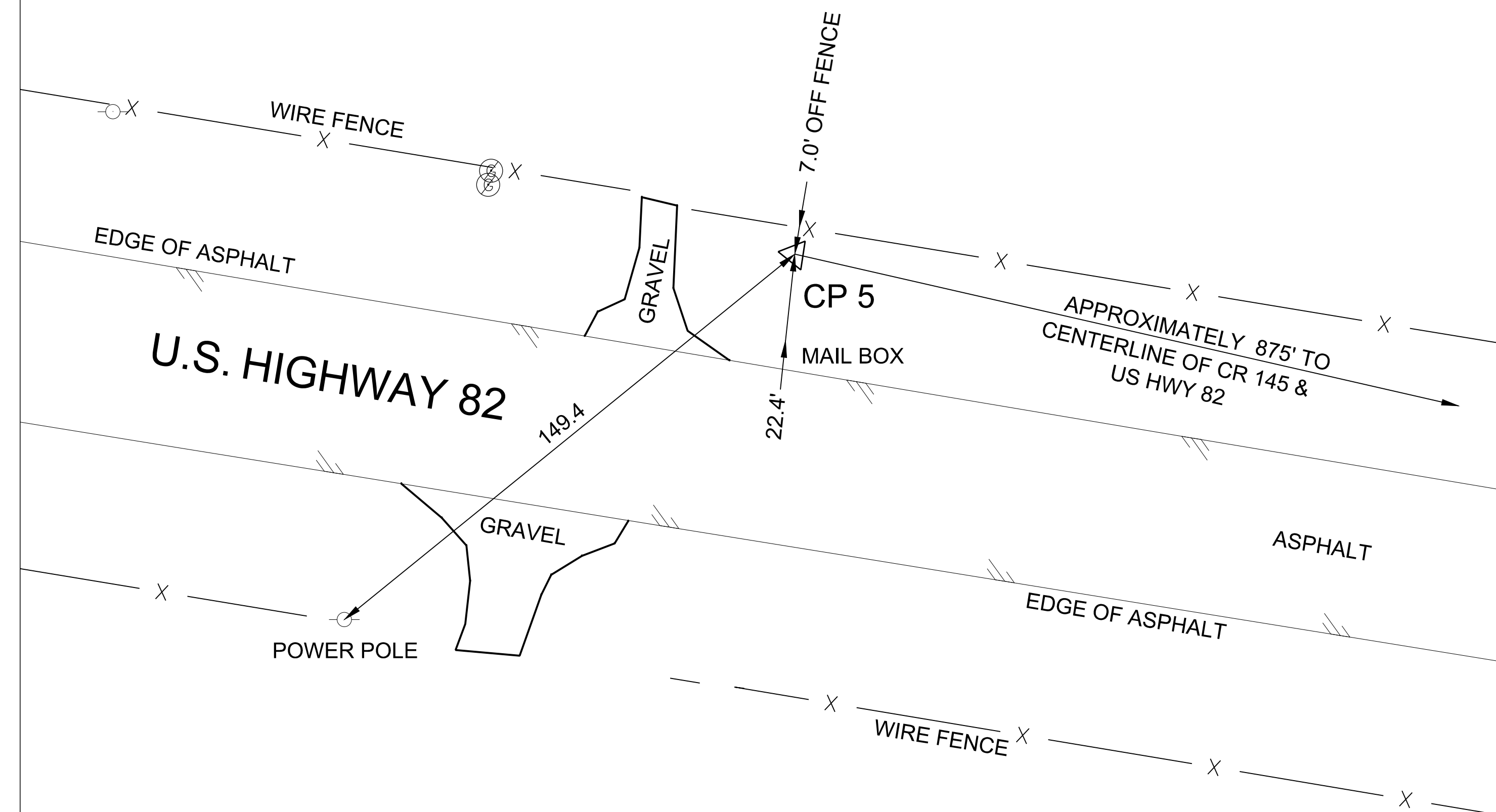


U.S. HIGHWAY NO. 82  
**SURVEY CONTROL**

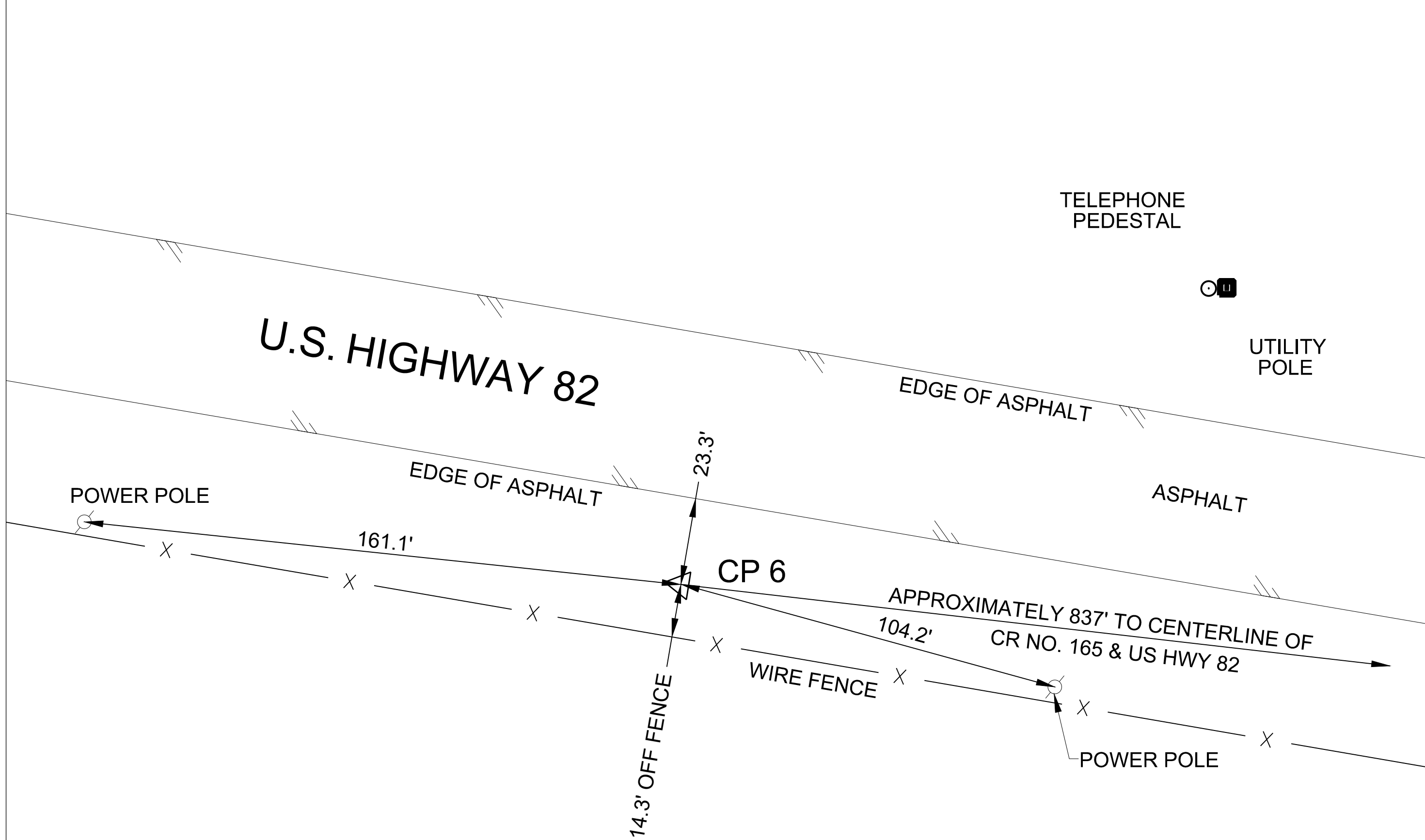
SCALE: "N.T.S." SHEET 3 OF 5

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
6	TEXAS		US 82		
DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
18	BAYLOR	0133	04	042	61

CP No. 5



CP No. 6



**CONTROL POINT No. 5**

APPROXIMATE LOCATION:

+/- 0.16 MILES NORTHWEST OF INTERSECTION CR 145 & US 82  
 +/- 0.84 MILES SOUTHWEST OF INTERSECTION CR 269 & CR US 82

DATE SET: 10/7/2019  
 MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM". ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

SURFACE NORTHING: 7,271,163.21  
 SURFACE EASTING: 1,695,438.57  
 GRID NORTHING: 7,270,290.77  
 GRID EASTING: 1695235.14  
 NAVD 88 ELEV: 1,381.89'

**CONTROL POINT No. 6**

APPROXIMATE LOCATION:

+/- 0.16 MILES NORTHWEST OF INTERSECTION CR 165 & US 82  
 +/- 0.84 MILES SOUTHWEST OF INTERSECTION CR 175 & CR US 82

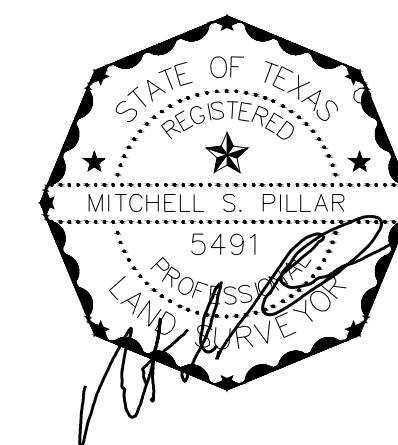
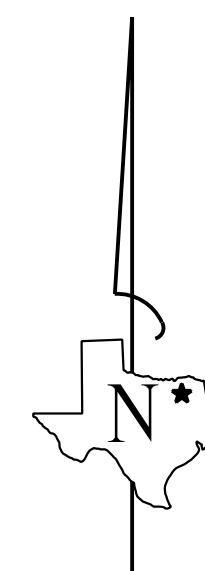
DATE SET: 10/7/2019  
 MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM". ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

SURFACE NORTHING: 7,272,812.51  
 SURFACE EASTING: 1,685,007.48  
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 GRID EASTING: 1,695,031.74  
 NAVD 88 ELEV: 1,398.18'

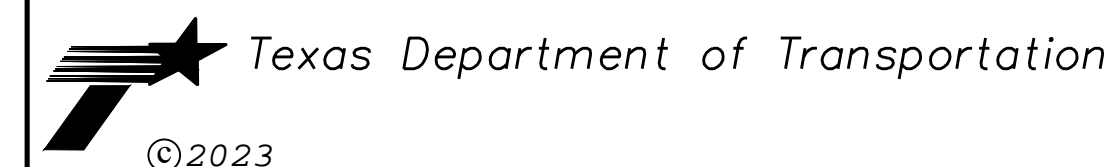
I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN WAS DETERMINED BY A FIELD SURVEY ON 10/7/2019.



MITCHELL S. PILLAR - R.P.L.S. No. 5491

**HUITT-ZOLIARS**

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 Phone (214) 871-3311 Fax (214) 871-0757  
 TBPLS REGISTRATION No. 10025600

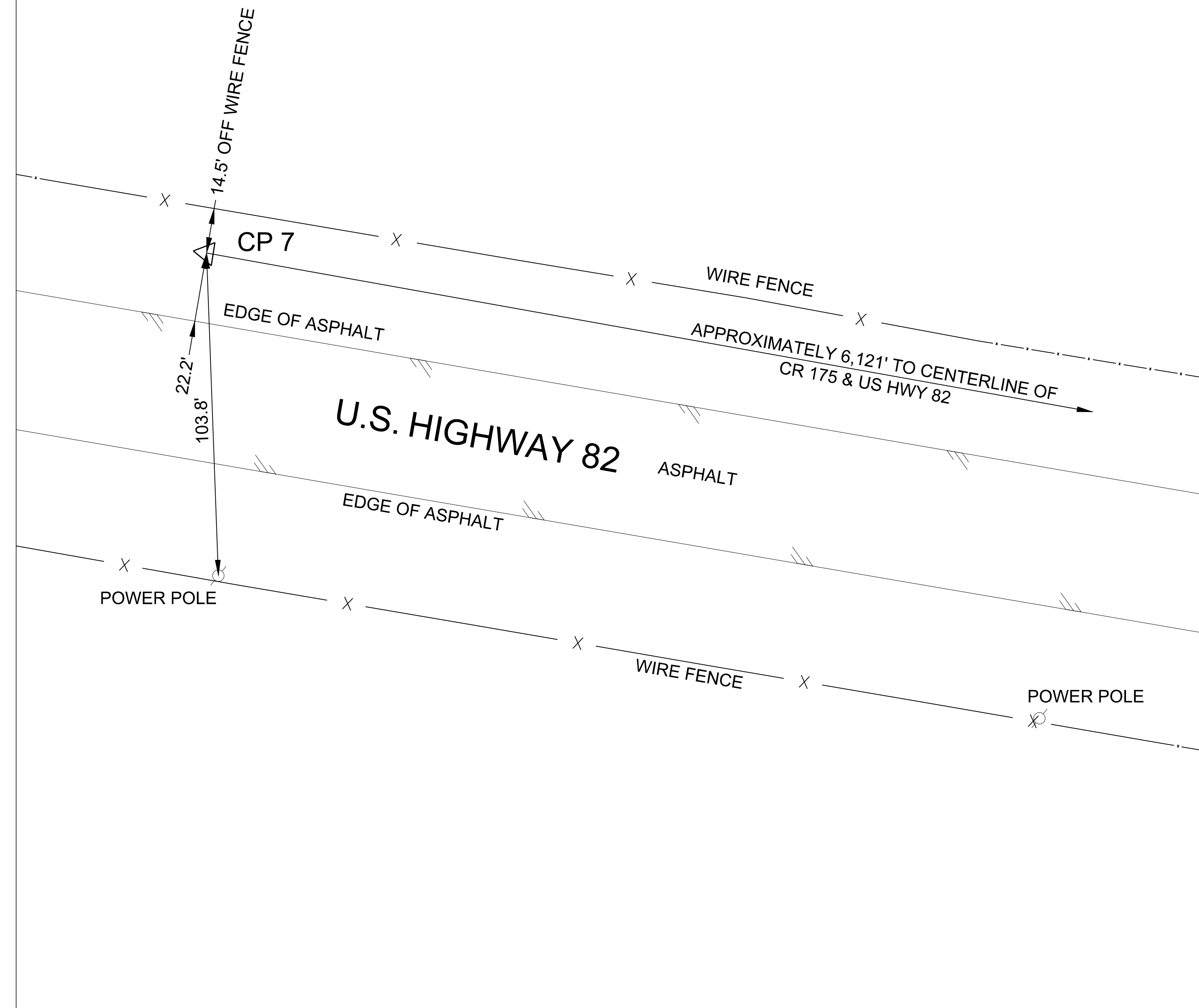


U.S. HIGHWAY NO. 82  
**SURVEY CONTROL**

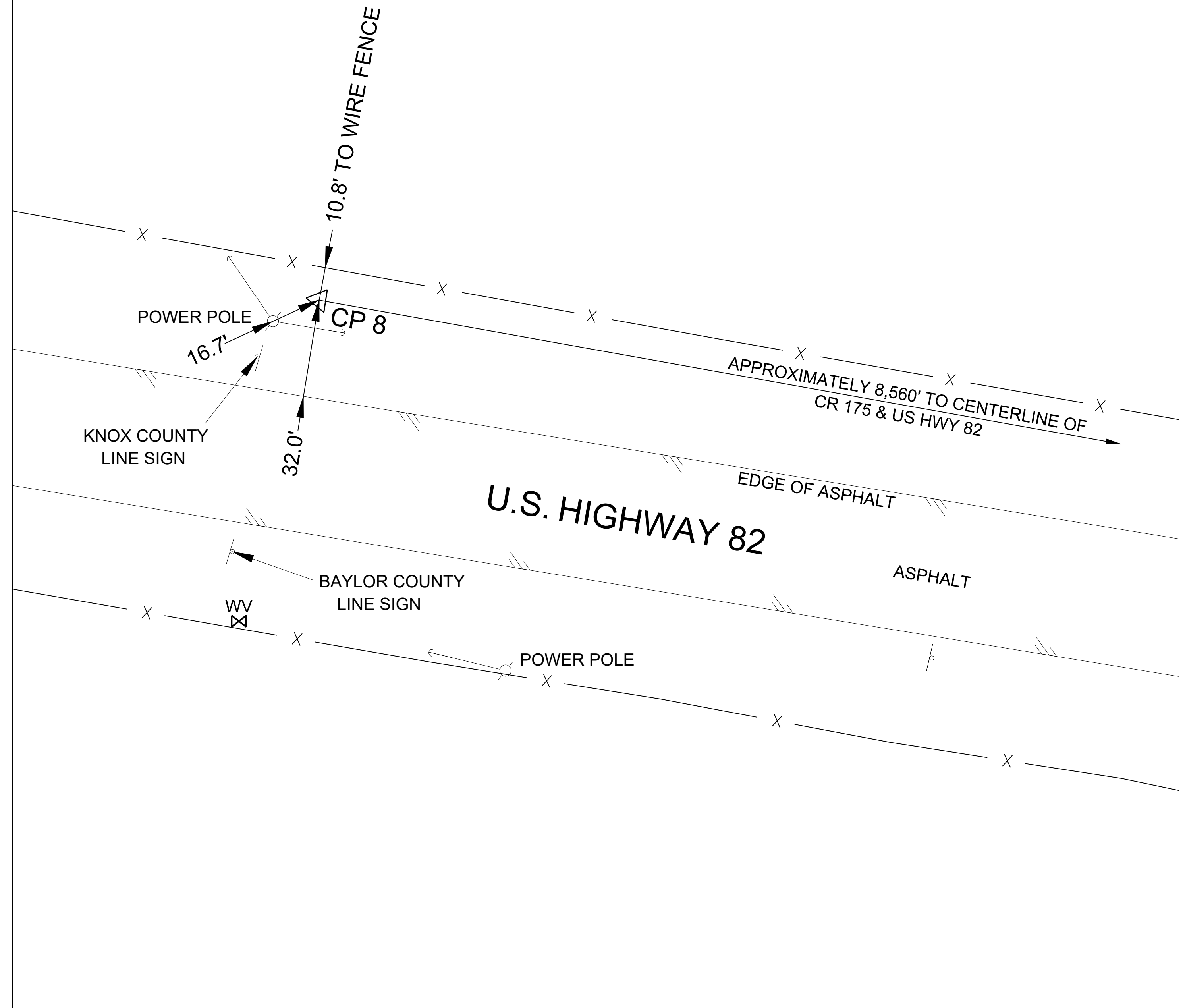
SCALE: "N.T.S." SHEET 4 OF 5

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
6	TEXAS		US 82		
DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
18	BAYLOR	0133	04	042	62

CP No. 7



CP No. 8



CONTROL POINT No. 7

APPROXIMATE LOCATION:

+/- 0.84 MILES SOUTHEAST OF INTERSECTION FM 4195 & US 82  
 +/- 1.16 MILES NORTHWEST OF INTERSECTION CR 175 & CR US 82

DATE SET: 10/7/2019  
 MONUMENT: SET 5/8 INCH IRON ROD WITH RED PLASTIC CAP STAMPED "RANDOM". ALL HORIZONTAL COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT, 2010 EPOCH, STATE PLANE COORDINATE, TEXAS NORTH CENTRAL ZONE (4202). COORDINATES ARE BASED ON DATA OBTAINED FROM THE NORTH\_VRS\_RTK SOLUTION IN THE TXDOT RTK NETWORK.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

SURFACE NORTHING: 7,274,691.16  
 SURFACE EASTING: 1,674,615.89  
 GRID NORTHING 7,273,818.30  
 GRID EASTING: 1,674,414.96  
 NAVD 88 ELEV: 1,407.39'

CONTROL POINT No. 8

APPROXIMATE LOCATION:

+/- 0.38 MILES SOUTHEAST OF INTERSECTION FM 4195 & US 82  
 +/- 1.62 MILES NORTHWEST OF INTERSECTION CR 175 & CR US 82

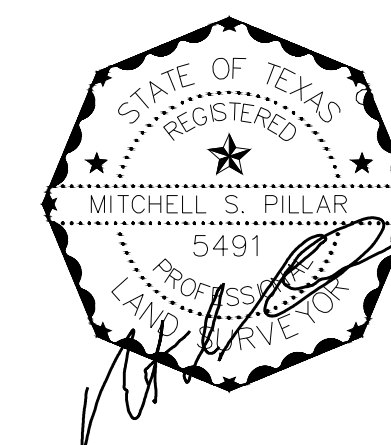
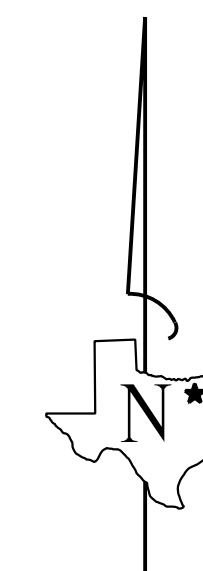
DATE SET: 10/7/2019  
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ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

BAYLOR COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

SURFACE NORTHING: 7,275,109.36  
 SURFACE EASTING: 1,672,220.02  
 GRID NORTHING 7,274,236.49  
 GRID EASTING: 1,674,214.05  
 NAVD 88 ELEV: 1,405.8'

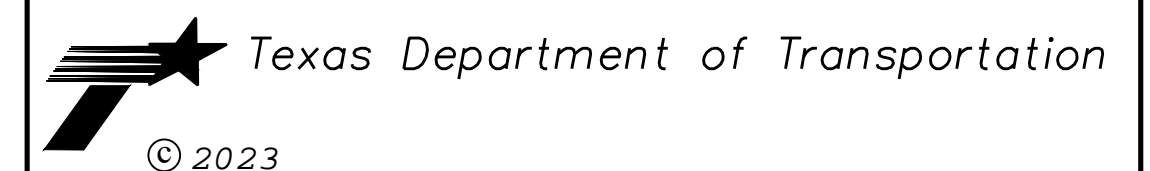
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U.S. HIGHWAY NO. 82  
 SURVEY CONTROL

SCALE: "N.T.S." SHEET 5 OF 5

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
6	TEXAS				US 82
DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
18	BAYLOR	0133	04	042	63



BEGINNING CHAIN CL82 DESCRIPTION

POINT 1 X = 1,672,212.5901 Y = 7,275,056.1320 STA 34+20.00  
 COURSE FROM 1 TO 2 S 80° 22' 53.96" E DIST 1,286.2351  
 POINT 2 X = 1,673,480.7440 Y = 7,274,841.2221 STA 47+06.24  
 COURSE FROM 2 TO 3 S 80° 15' 34.53" E DIST 1,263.6772  
 POINT 3 X = 1,674,726.2046 Y = 7,274,627.4275 STA 59+69.91  
 COURSE FROM 3 TO 4 S 80° 13' 58.29" E DIST 2,561.3943  
 POINT 4 X = 1,677,250.4724 Y = 7,274,192.9014 STA 85+31.31  
 COURSE FROM 4 TO 5 S 80° 15' 01.46" E DIST 5,121.5943  
 POINT 5 X = 1,682,298.0968 Y = 7,273,325.5975 STA 136+52.90  
 COURSE FROM 5 TO 6 S 80° 14' 58.60" E DIST 5,122.1757  
 POINT 6 X = 1,687,346.2822 Y = 7,272,458.1254 STA 187+75.08  
 COURSE FROM 6 TO PC CL821 S 80° 34' 49.43" E DIST 1,800.7043

CURVE DATA  
\*-----\*

CURVE CL821  
 P. I. STATION = 207+67.77 X = 1,689,312.1034 Y = 7,272,131.9948  
 DELTA = 1° 55' 10.94" (LT)  
 DEGREE = 0° 30' 00.02"  
 TANGENT = 191.9859  
 LENGTH = 383.9358  
 RADIUS = 11,459.0000  
 EXTERNAL = 1.6082  
 LONG CHORD = 383.9178  
 MID. ORD. = 1.6079  
 P. C. STATION = 205+75.78 X = 1,689,122.7062 Y = 7,272,163.4159  
 P. T. STATION = 209+59.72 X = 1,689,502.4468 Y = 7,272,106.9360  
 C. C. X = 1,690,998.1260 Y = 7,283,467.9054  
 BACK = S 80° 34' 49.43" E  
 AHEAD = S 82° 30' 00.37" E  
 CHORD BEAR = S 81° 32' 24.90" E

COURSE FROM PT CL821 TO PC CL822 S 82° 30' 00.37" E DIST 403.3639

CURVE DATA  
\*-----\*

CURVE CL822  
 P. I. STATION = 215+64.41 X = 1,690,101.9684 Y = 7,272,028.0086  
 DELTA = 2° 00' 47.26" (RT)  
 DEGREE = 0° 30' 00.02"  
 TANGENT = 201.3308  
 LENGTH = 402.6202  
 RADIUS = 11,459.0000  
 EXTERNAL = 1.7685  
 LONG CHORD = 402.5994  
 MID. ORD. = 1.7682  
 P. C. STATION = 213+63.08 X = 1,689,902.3600 Y = 7,272,054.2871  
 P. T. STATION = 217+65.70 X = 1,690,300.5305 Y = 7,271,994.7343  
 C. C. X = 1,688,406.6809 Y = 7,260,693.3178  
 BACK = S 82° 30' 00.37" E  
 AHEAD = S 80° 29' 13.11" E  
 CHORD BEAR = S 81° 29' 36.74" E

COURSE FROM PT CL822 TO PC CL823 S 80° 29' 13.11" E DIST 714.3885

CURVE DATA  
\*-----\*

CURVE CL823  
 P. I. STATION = 226+75.32 X = 1,691,197.6393 Y = 7,271,844.4001  
 DELTA = 1° 57' 07.67" (RT)  
 DEGREE = 0° 30' 00.02"  
 TANGENT = 195.2293  
 LENGTH = 390.4208  
 RADIUS = 11,459.0000  
 EXTERNAL = 1.6630  
 LONG CHORD = 390.4019  
 MID. ORD. = 1.6627  
 P. C. STATION = 224+80.09 X = 1,691,005.0948 Y = 7,271,876.6660  
 P. T. STATION = 228+70.51 X = 1,691,388.9730 Y = 7,271,805.5940  
 C. C. X = 1,689,111.2451 Y = 7,260,575.2495  
 BACK = S 80° 29' 13.11" E  
 AHEAD = S 78° 32' 05.44" E  
 CHORD BEAR = S 79° 30' 39.28" E

COURSE FROM PT CL823 TO PC CL824 S 78° 32' 05.44" E DIST 480.7781

CURVE DATA  
\*-----\*

CURVE CL824  
 P. I. STATION = 235+56.82 X = 1,692,061.5923 Y = 7,271,669.1740  
 DELTA = 2° 03' 18.61" (LT)  
 DEGREE = 0° 30' 00.02"  
 TANGENT = 205.5361  
 LENGTH = 411.0282  
 RADIUS = 11,459.0000  
 EXTERNAL = 1.8432  
 LONG CHORD = 411.0062  
 MID. ORD. = 1.8429  
 P. C. STATION = 233+51.29 X = 1,691,860.1575 Y = 7,271,710.0288  
 P. T. STATION = 237+62.32 X = 1,692,264.3627 Y = 7,271,635.5692  
 C. C. X = 1,694,137.8853 Y = 7,282,940.3732  
 BACK = S 78° 32' 05.44" E  
 AHEAD = S 80° 35' 24.05" E  
 CHORD BEAR = S 79° 33' 44.74" E

COURSE FROM PT CL824 TO 7 S 80° 35' 24.05" E DIST 4,893.1110

POINT 7 X = 1,697,091.6305 Y = 7,270,835.5558 STA 286+55.43

COURSE FROM 7 TO 8 S 80° 35' 11.15" E DIST 4,938.1072

POINT 8 X = 1,701,963.2384 Y = 7,270,027.8809 STA 335+93.53

COURSE FROM 8 TO 9 S 80° 07' 38.34" E DIST 2,077.1656

POINT 9 X = 1,704,009.6436 Y = 7,269,671.7313 STA 356+70.70

COURSE FROM 9 TO 10 S 80° 05' 09.99" E DIST 2,072.3012

POINT 10 X = 1,706,051.0004 Y = 7,269,314.9474 STA 377+43.00

COURSE FROM 10 TO 11 S 80° 04' 36.19" E DIST 2,078.0588

POINT 11 X = 1,708,097.9701 Y = 7,268,956.8368 STA 398+21.06

COURSE FROM 11 TO 12 S 80° 06' 44.21" E DIST 2,072.7297

POINT 12 X = 1,710,139.9118 Y = 7,268,600.9120 STA 418+93.79

COURSE FROM 12 TO 13 S 80° 21' 31.42" E DIST 2,855.4156

POINT 13 X = 1,712,954.9965 Y = 7,268,122.6900 STA 447+49.21

COURSE FROM 13 TO PC CL825 S 80° 22' 30.22" E DIST 3,107.3172

CURVE DATA  
\*-----\*

CURVE CL825  
 P. I. STATION = 486+52.99 X = 1,716,803.8283 Y = 7,267,469.9856  
 DELTA = 31° 04' 33.93" (RT)  
 DEGREE = 2° 00' 00.53"  
 TANGENT = 796.4669  
 LENGTH = 1,553.6907  
 RADIUS = 2,864.5790  
 EXTERNAL = 108.6637  
 LONG CHORD = 1,534.7165  
 MID. ORD. = 104.6924  
 P. C. STATION = 478+56.52 X = 1,716,018.5730 Y = 7,267,603.1531  
 P. T. STATION = 494+10.21 X = 1,717,407.6479 Y = 7,266,950.6000  
 C. C. X = 1,715,539.6215 Y = 7,264,778.8978  
 BACK = S 80° 22' 30.22" E  
 AHEAD = S 49° 17' 56.30" E  
 CHORD BEAR = S 64° 50' 13.26" E

COURSE FROM PT CL825 TO PC CL826 S 49° 17' 56.30" E DIST 1,203.0311

CURVE DATA  
\*-----\*

CURVE CL826  
 P. I. STATION = 506+50.74 X = 1,718,348.1201 Y = 7,266,141.6369  
 DELTA = 0° 45' 00.00" (LT)  
 DEGREE = 1° 00' 00.36"  
 TANGENT = 37.4968  
 LENGTH = 74.9924  
 RADIUS = 5,729.0000  
 EXTERNAL = 0.1227  
 LONG CHORD = 74.9919  
 MID. ORD. = 0.1227  
 P. C. STATION = 506+13.24 X = 1,718,319.6930 Y = 7,266,166.0889  
 P. T. STATION = 506+88.24 X = 1,718,376.8649 Y = 7,266,117.5590  
 C. C. X = 1,722,055.6427 Y = 7,270,509.3735  
 BACK = S 49° 17' 56.30" E  
 AHEAD = S 50° 02' 56.30" E  
 CHORD BEAR = S 49° 40' 26.30" E

COURSE FROM PT CL826 TO PC CL827 S 50° 02' 56.30" E DIST 254.7793



**HORIZONTAL ALIGNMENT DATA**

12/14/2020

SHEET 1 OF 2



Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		64
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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CURVE DATA  
\*-----\*

CURVE CL827  
P. I. STATION = 519+27.50 X = 1,719,326.8745 Y = 7,265,321.7889  
DELTA = 38° 06' 47.26" (LT)  
DEGREE = 2° 00' 37.36"  
TANGENT = 984.4819  
LENGTH = 1,895.8187  
RADIUS = 2,850.0000  
EXTERNAL = 165.2454  
LONG CHORD = 1,861.0581  
MID. ORD. = 156.1894  
P. C. STATION = 509+43.02 X = 1,718,572.1770 Y = 7,265,953.9569  
P. T. STATION = 528+38.83 X = 1,720,310.8500 Y = 7,265,290.2147  
C. C. X = 1,720,402.2550 Y = 7,268,138.7485  
BACK = S 50° 02' 56.30" E  
AHEAD = S 88° 09' 43.55" E  
CHORD BEAR = S 69° 06' 19.92" E

COURSE FROM PT CL827 TO PC CL828 S 88° 09' 43.55" E DIST 138.0366

CURVE DATA  
\*-----\*

CURVE CL828  
P. I. STATION = 530+70.08 X = 1,720,541.9804 Y = 7,265,282.7980  
DELTA = 1° 51' 51.41" (LT)  
DEGREE = 1° 00' 00.36"  
TANGENT = 93.2128  
LENGTH = 186.4091  
RADIUS = 5,729.0000  
EXTERNAL = 0.7583  
LONG CHORD = 186.4009  
MID. ORD. = 0.7582  
P. C. STATION = 529+76.87 X = 1,720,448.8156 Y = 7,265,285.7876  
P. T. STATION = 531+63.28 X = 1,720,635.1932 Y = 7,265,282.8410  
C. C. X = 1,720,632.5558 Y = 7,271,011.8404  
BACK = S 88° 09' 43.55" E  
AHEAD = N 89° 58' 25.04" E  
CHORD BEAR = S 89° 05' 39.26" E

COURSE FROM PT CL828 TO 14 N 89° 58' 25.04" E DIST 2,462.3295

POINT 14 X = 1,723,097.5225 Y = 7,265,283.9745 STA 556+25.61

COURSE FROM 14 TO 15 N 89° 55' 30.29" E DIST 2,497.9518

POINT 15 X = 1,725,595.4721 Y = 7,265,287.2409 STA 581+23.56

COURSE FROM 15 TO 16 N 89° 56' 50.90" E DIST 2,502.7429

POINT 16 X = 1,728,098.2140 Y = 7,265,289.5354 STA 606+26.30

COURSE FROM 16 TO PC CL829 N 89° 56' 12.29" E DIST 3,114.4927

CURVE DATA  
\*-----\*

CURVE CL829  
P. I. STATION = 640+49.13 X = 1,731,521.0395 Y = 7,265,293.3141  
DELTA = 30° 07' 12.02" (RT)  
DEGREE = 4° 59' 59.93"  
TANGENT = 308.3349  
LENGTH = 602.4024  
RADIUS = 1,145.9200  
EXTERNAL = 40.7573  
LONG CHORD = 595.4898  
MID. ORD. = 39.3575  
P. C. STATION = 637+40.80 X = 1,731,212.7048 Y = 7,265,292.9737  
P. T. STATION = 643+43.20 X = 1,731,787.9126 Y = 7,265,138.8823  
C. C. X = 1,731,213.9699 Y = 7,264,147.0544  
BACK = N 89° 56' 12.29" E  
AHEAD = S 59° 56' 35.69" E  
CHORD BEAR = S 75° 00' 11.70" E

COURSE FROM PT CL829 TO PC CL8210 S 59° 56' 35.69" E DIST 420.6725

CURVE DATA  
\*-----\*

CURVE CL8210  
P. I. STATION = 653+10.41 X = 1,732,625.0614 Y = 7,264,654.4479  
DELTA = 30° 36' 42.27" (LT)  
DEGREE = 2° 52' 08.73"  
TANGENT = 546.5373  
LENGTH = 1,066.9485  
RADIUS = 1,997.0000  
EXTERNAL = 73.4376  
LONG CHORD = 1,054.3037  
MID. ORD. = 70.8328  
P. C. STATION = 647+63.87 X = 1,732,152.0171 Y = 7,264,928.1853  
P. T. STATION = 658+30.82 X = 1,733,171.5730 Y = 7,264,659.7418  
C. C. X = 1,733,152.2296 Y = 7,266,656.6482  
BACK = S 59° 56' 35.69" E  
AHEAD = N 89° 26' 42.04" E  
CHORD BEAR = S 75° 14' 56.83" E

COURSE FROM PT CL8210 TO 17 N 89° 26' 42.04" E DIST 914.8199

POINT 17 X = 1,734,086.3500 Y = 7,264,668.6030 STA 667+45.64

COURSE FROM 17 TO 18 N 89° 32' 51.17" E DIST 830.1554

POINT 18 X = 1,734,916.4795 Y = 7,264,675.1585 STA 675+75.80

COURSE FROM 18 TO 19 N 89° 38' 49.90" E DIST 975.6246

POINT 19 X = 1,735,892.0856 Y = 7,264,681.1660 STA 685+51.42

COURSE FROM 19 TO 20 N 89° 41' 04.36" E DIST 1,278.2029

POINT 20 X = 1,737,170.2691 Y = 7,264,688.2034 STA 698+29.62

=====  
ENDING CHAIN CL82 DESCRIPTION



12/14/2020

**HORIZONTAL  
ALIGNMENT DATA**

SHEET 2 OF 2

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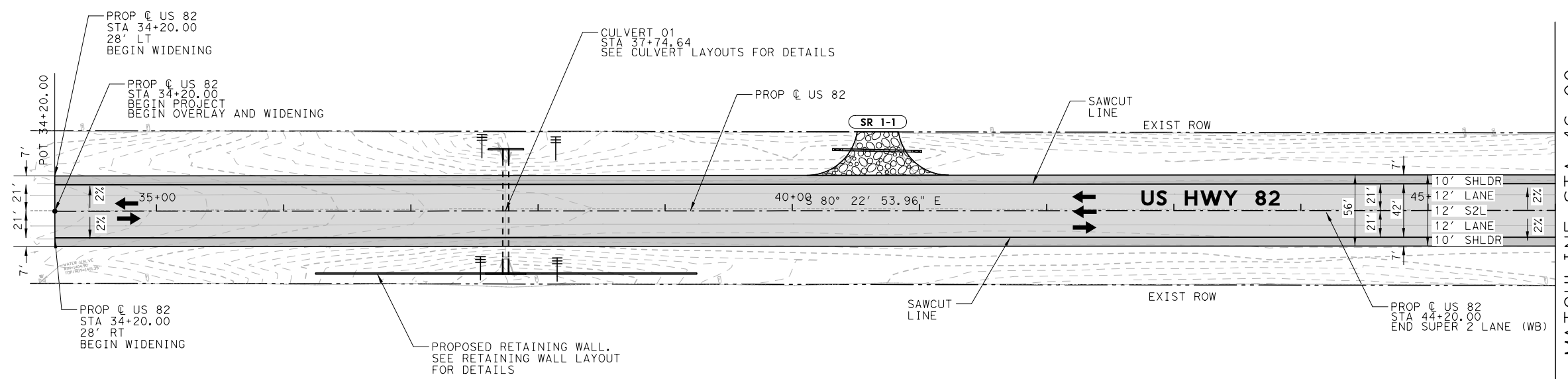
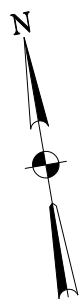


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		65	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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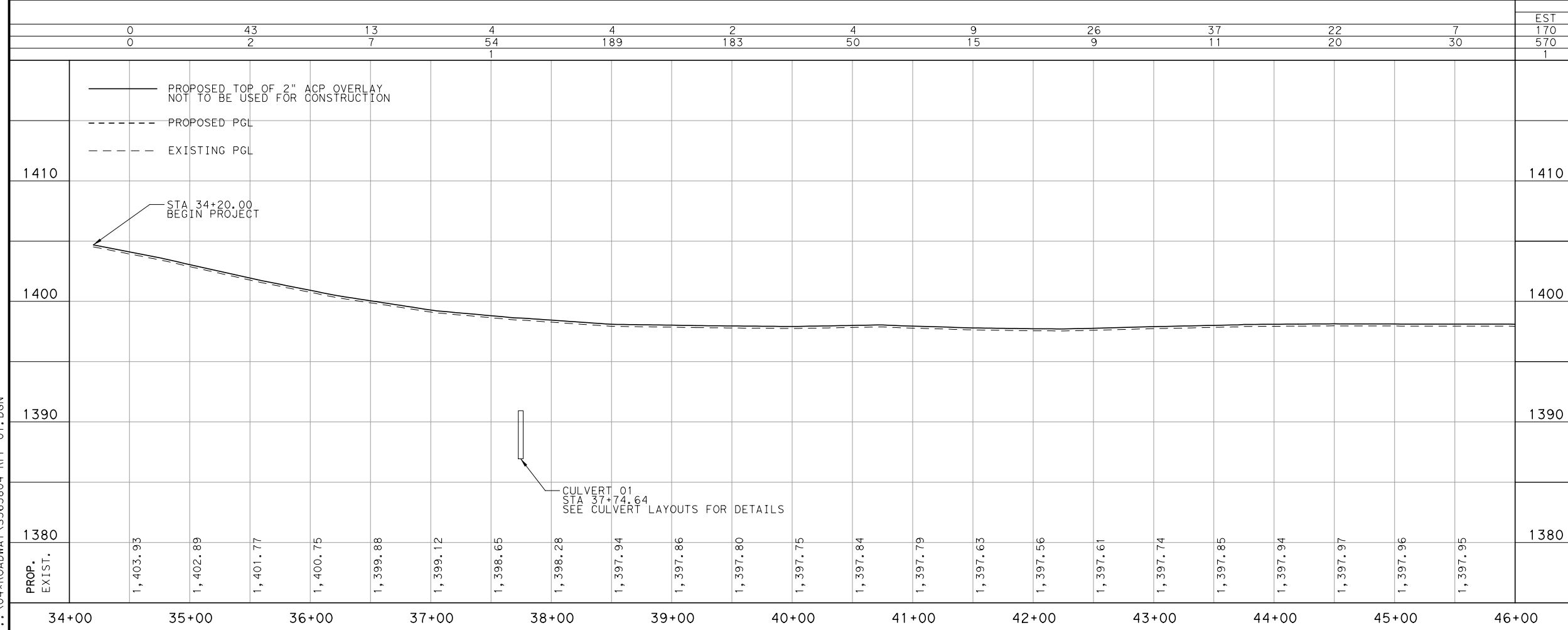


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
170		CY	EXCAVATION (RDWY)
570		CY	EMBANKMENT
1		STA	PREPARING ROW



**PLAN & PROFILE**

**STA 34+20.00 TO STA 46+00.00**

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

SHEET 1 OF 56

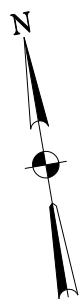


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

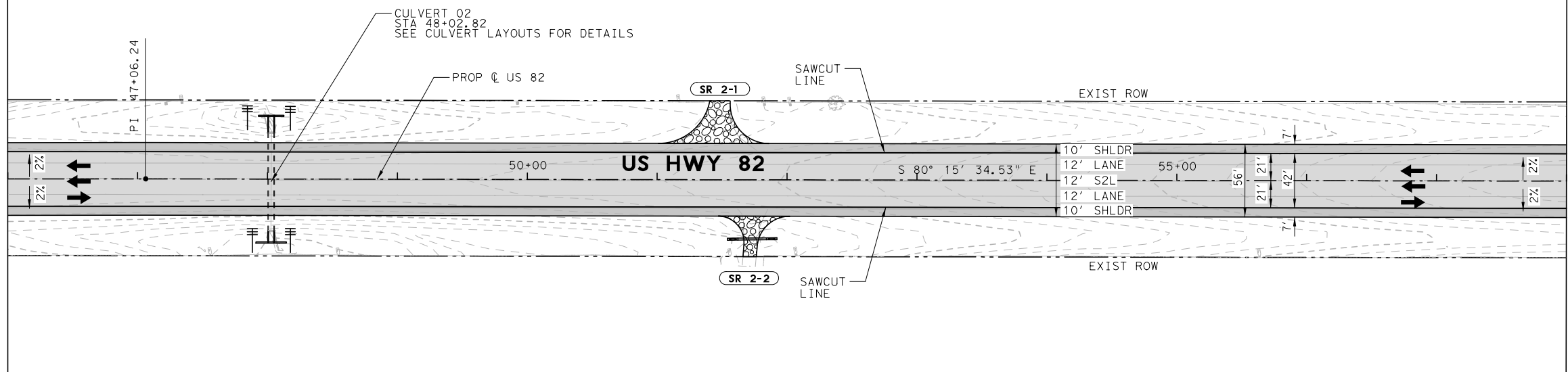
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 66	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

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MATCHLINE STA 46+00

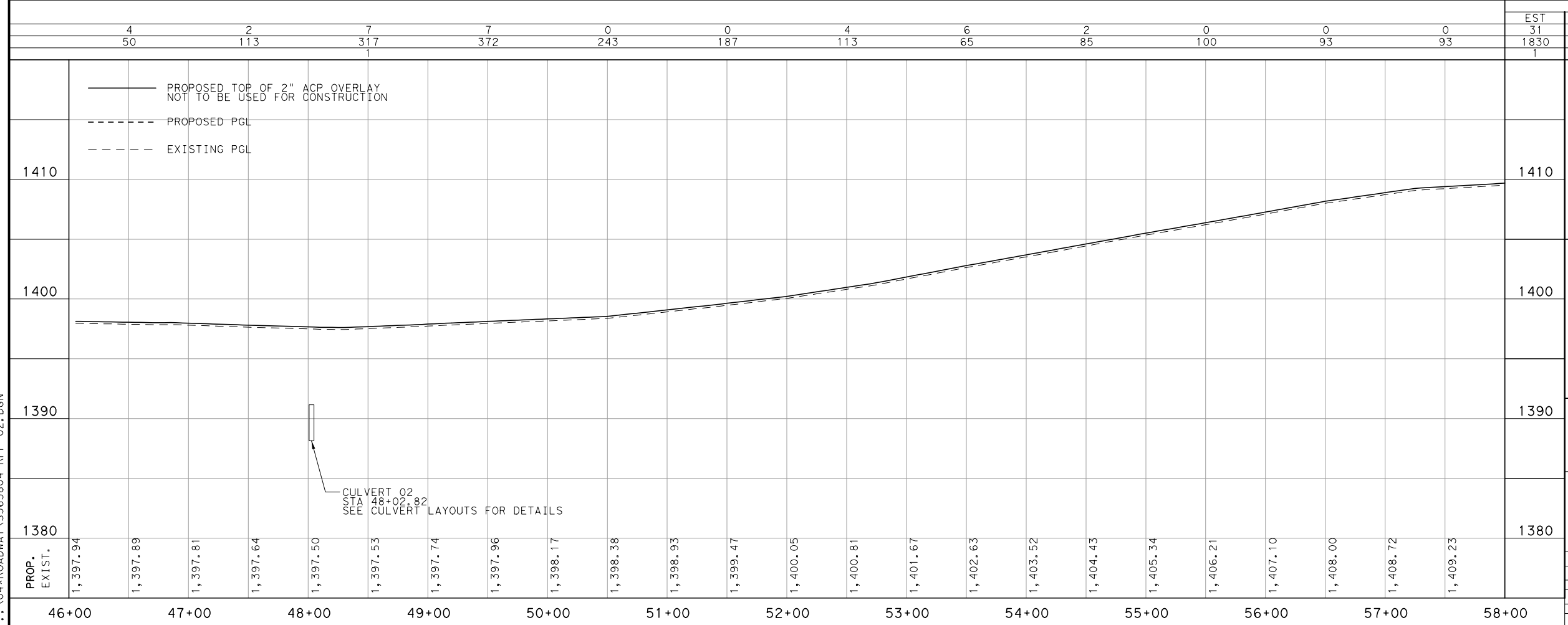
MATCHLINE STA 58+00



**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS				
EST	FINAL	UNIT	DESCRIPTION	
31		CY	EXCAVATION (RDWY)	
1830		CY	EMBANKMENT	
1		STA	PREPARING ROW	



12/14/2020

**PLAN & PROFILE**

**STA 46+00.000 TO STA 58+00.000**

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

SHEET 2 OF 56

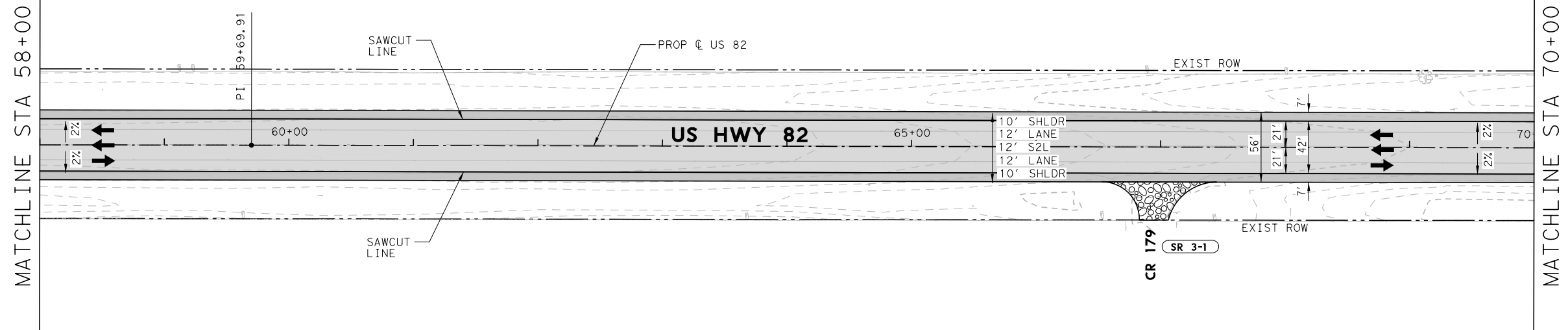
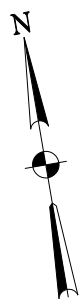


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		67	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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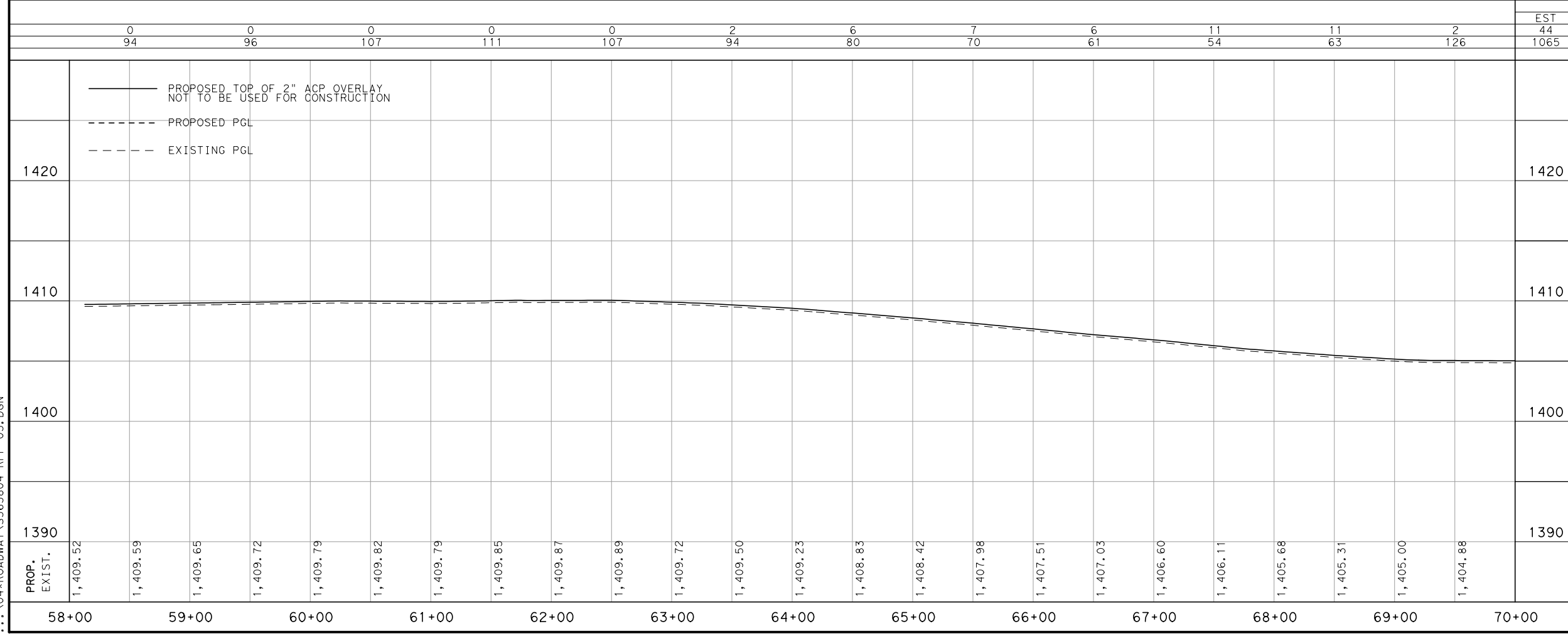


**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
44		CY	EXCAVATION (RDWY)
1065		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 58+00.00 TO STA 70+00.00**

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

SHEET 3 OF 56

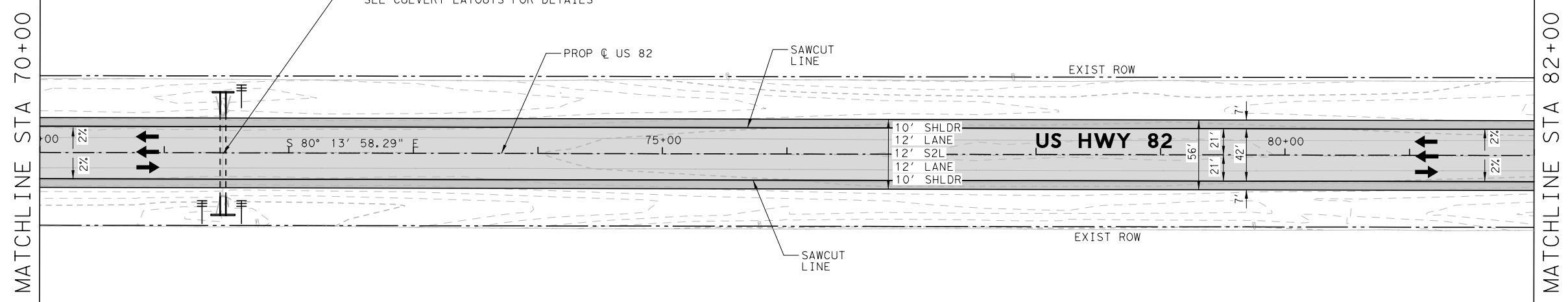
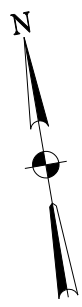


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 68
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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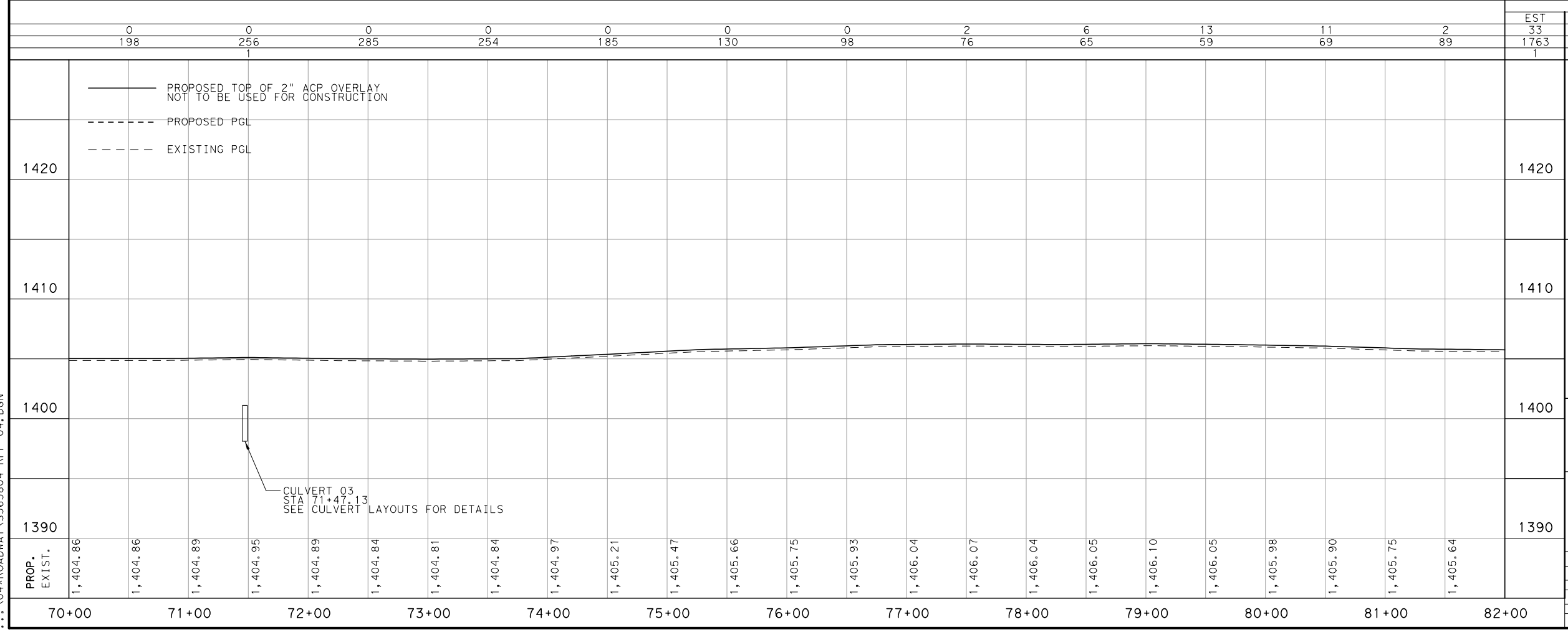


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



		SECTION TOTALS			
		EST	FINAL	UNIT	DESCRIPTION
		33		CY	EXCAVATION (RDWY)
		1763		CY	EMBANKMENT
		1		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**  
**STA 70+00.00 TO STA 82+00.00**

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

SHEET 4 OF 56

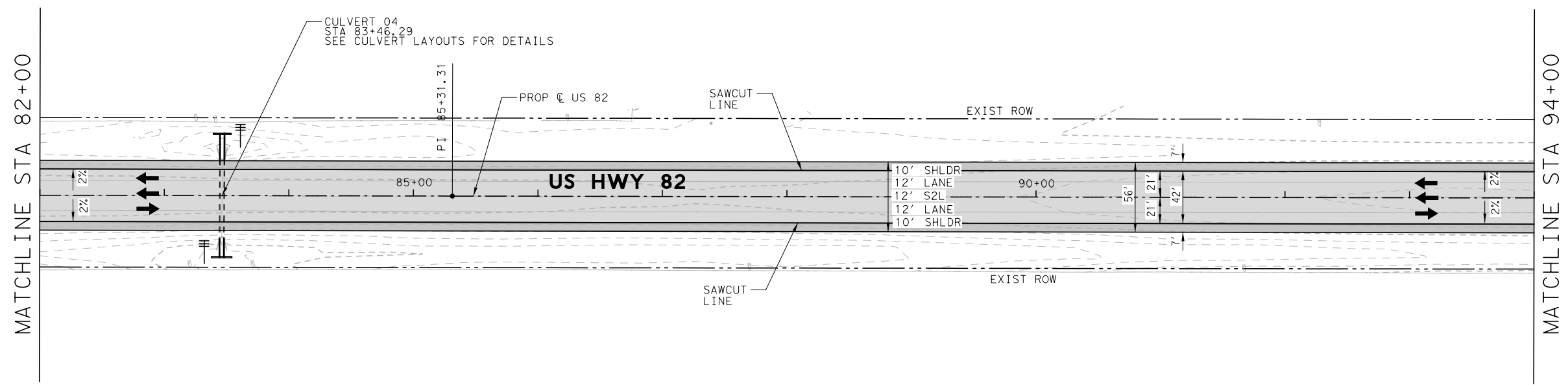
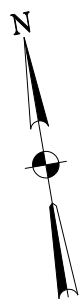


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		69	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

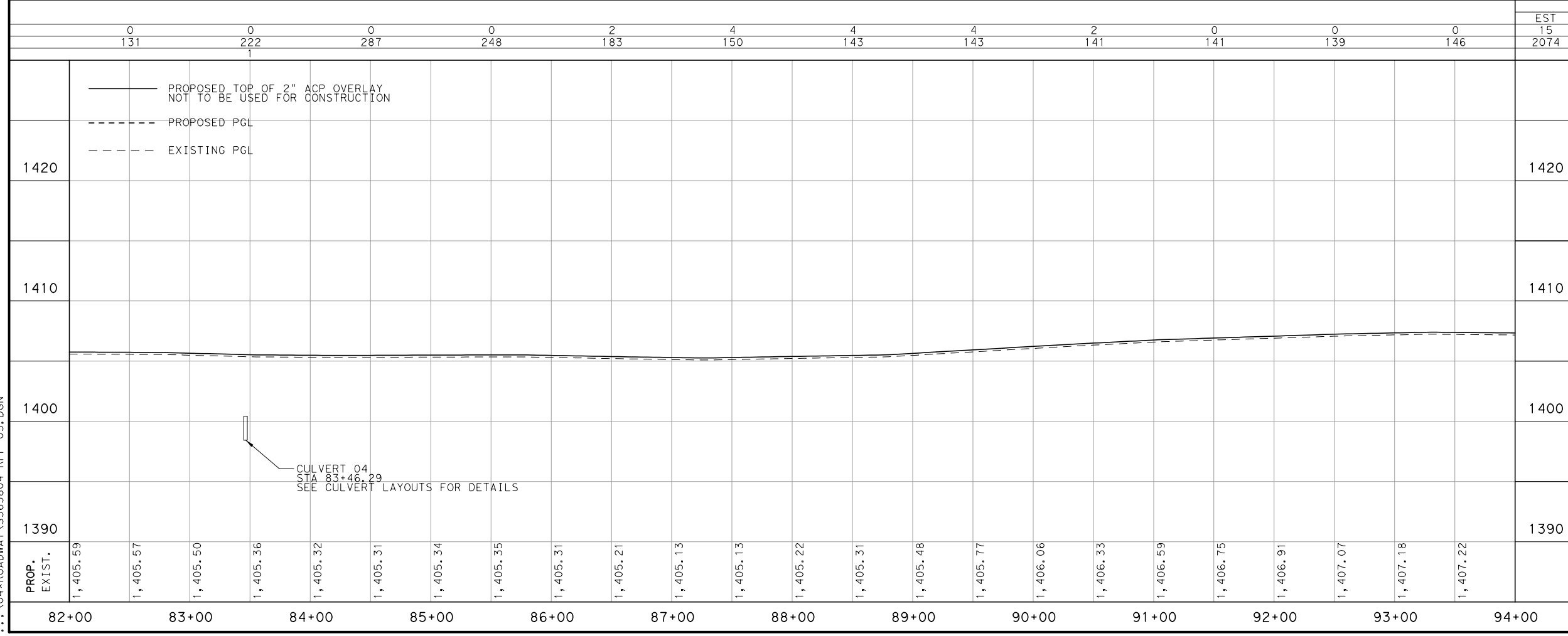
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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
15		CY	EXCAVATION (RDWY)
2074		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 82+00.00 TO STA 94+00.00**

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

SHEET 5 OF 56

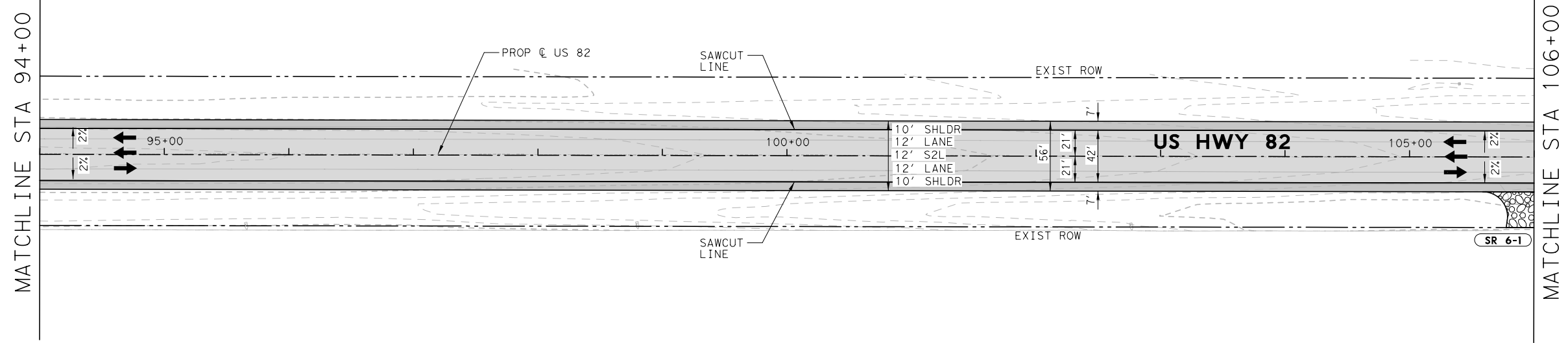
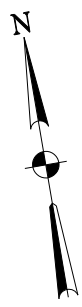


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 70
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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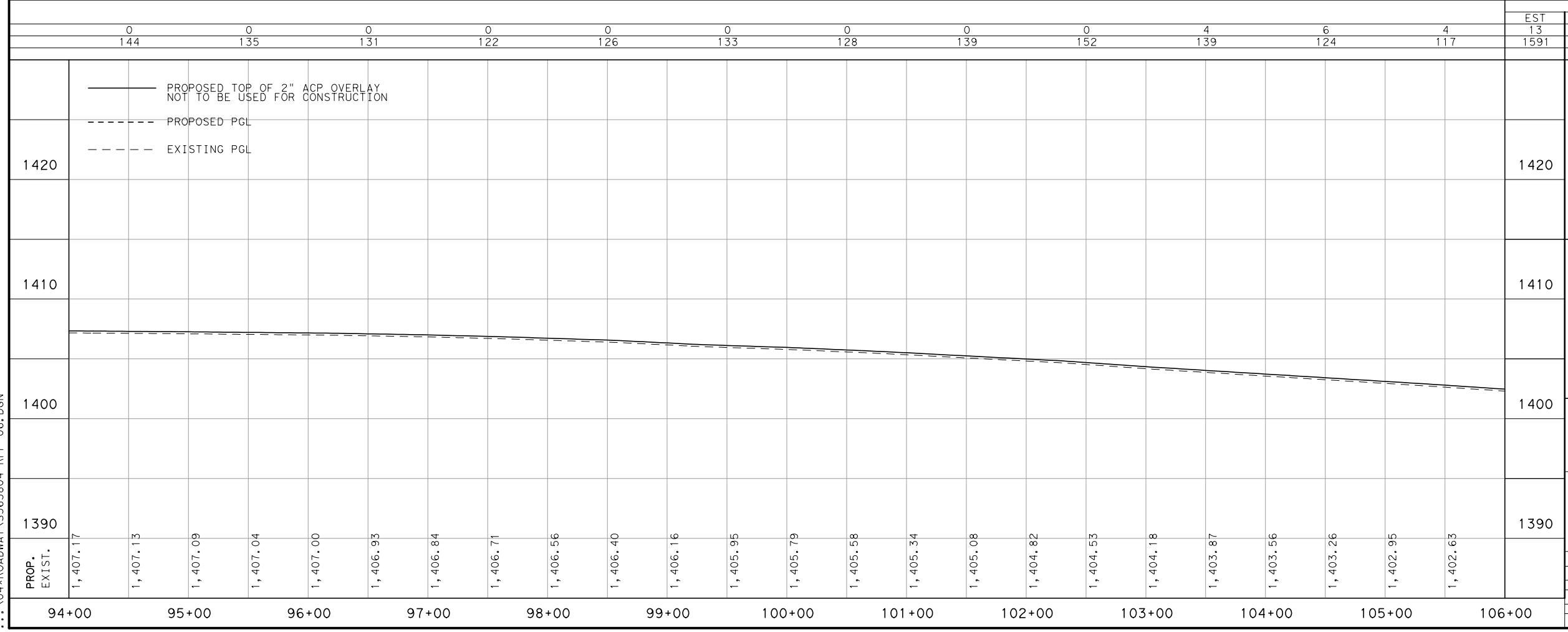


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
13		CY	EXCAVATION (RDWY)
1591		CY	EMBANKMENT
		STA	PREPARING ROW

12/14/2020

**PLAN & PROFILE**

**STA 94+00.00 TO STA 106+00.00**

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

SHEET 6 OF 56

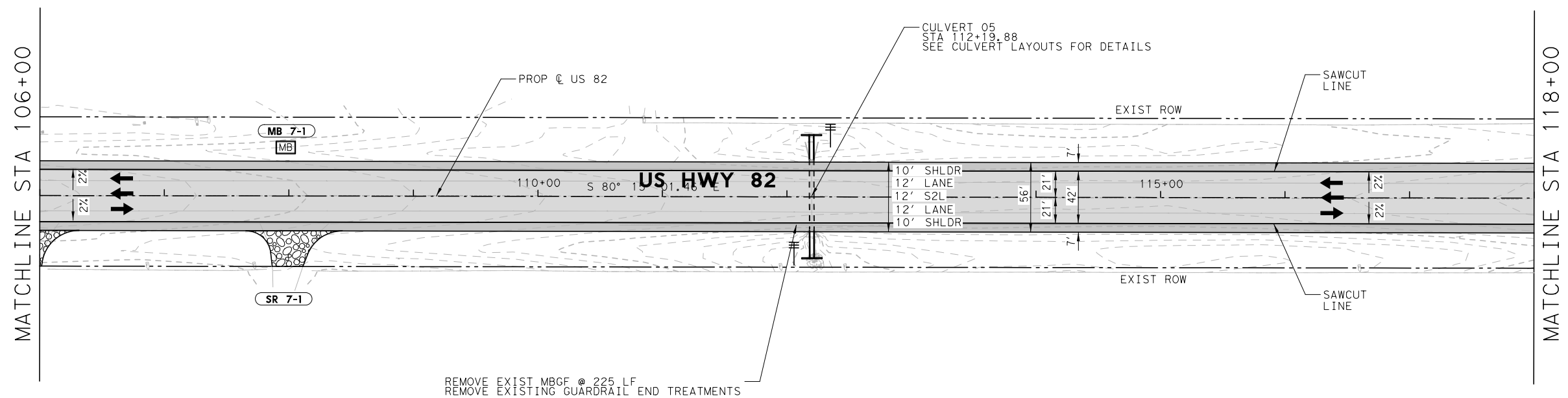
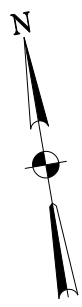
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 71
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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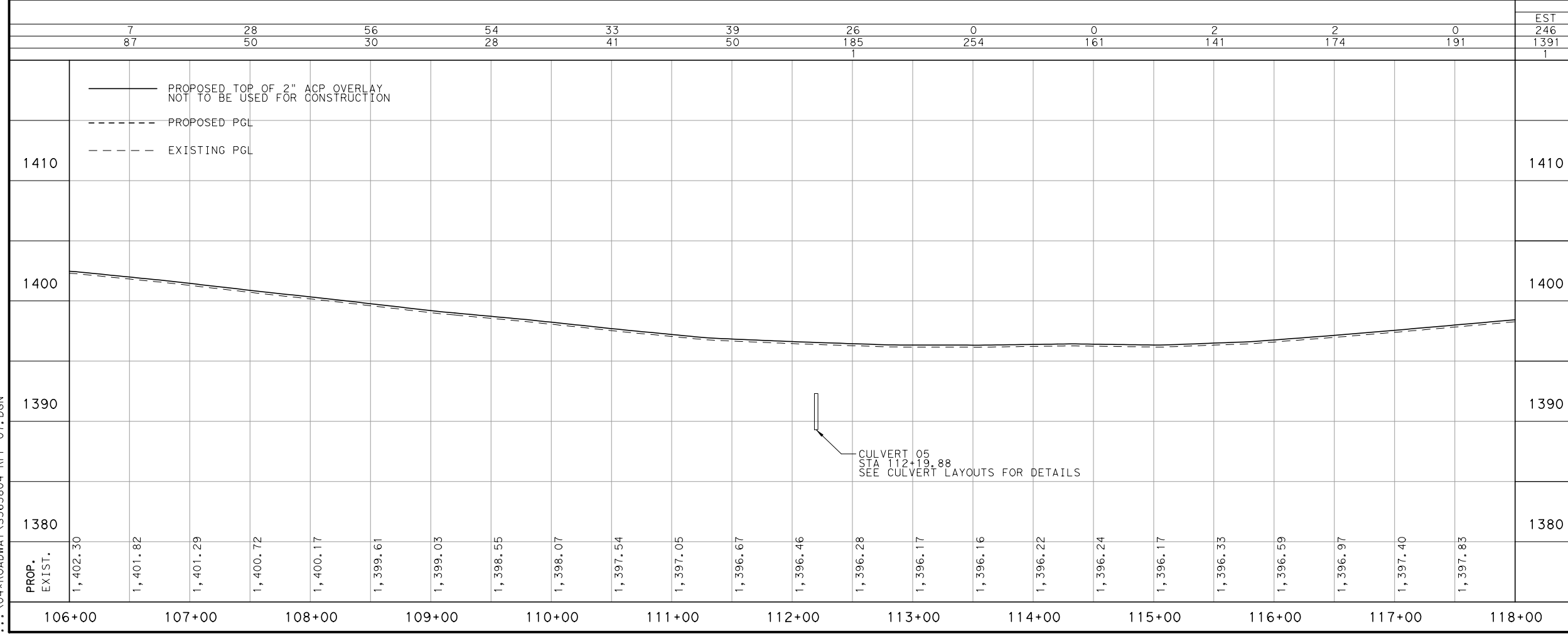




**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



		SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION		
246		CY	EXCAVATION (RDWY)		
1391		CY	EMBANKMENT		
1		STA	PREPARING ROW		



12/14/2020

**PLAN & PROFILE**

**STA 106+00.00 TO STA 118+00.00**

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

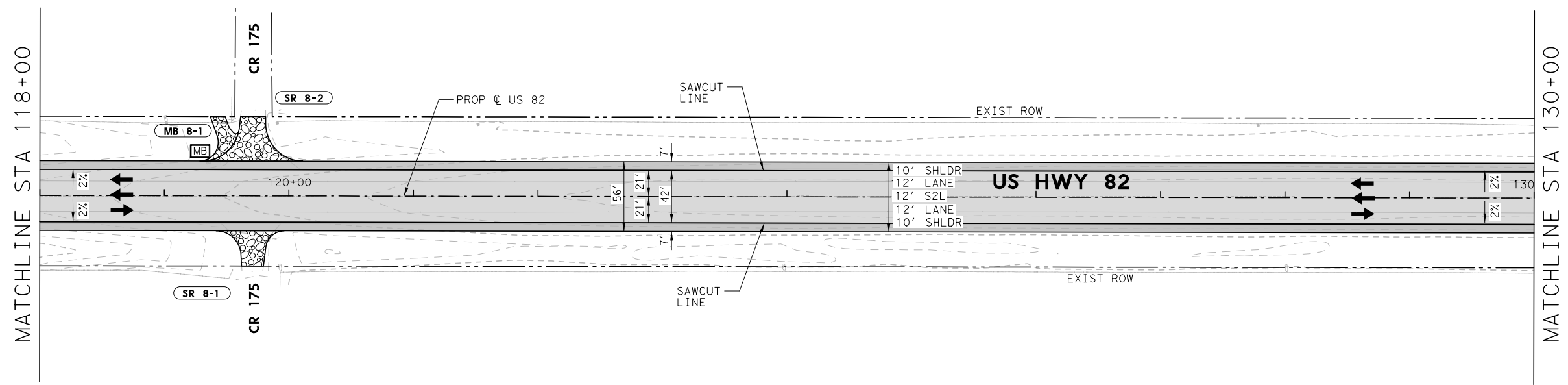
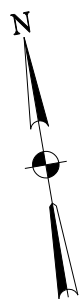
SHEET 7 OF 56



**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 72
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

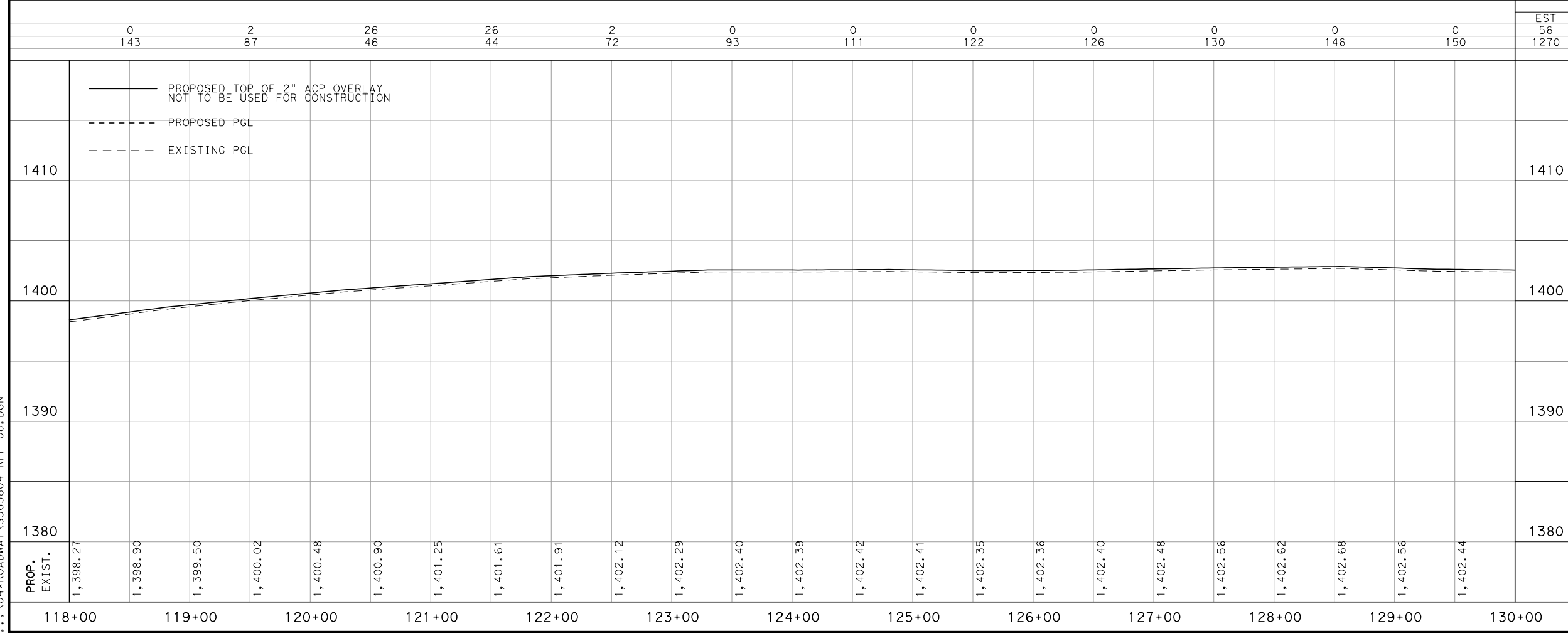
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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- + OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



		SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION		
56		CY	EXCAVATION (RDWY)		
1270		CY	EMBANKMENT		
		STA	PREPARING ROW		



12/14/2020

**PLAN & PROFILE**  
**STA 118+00 TO STA 130+00.00**

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

SHEET 8 OF 56

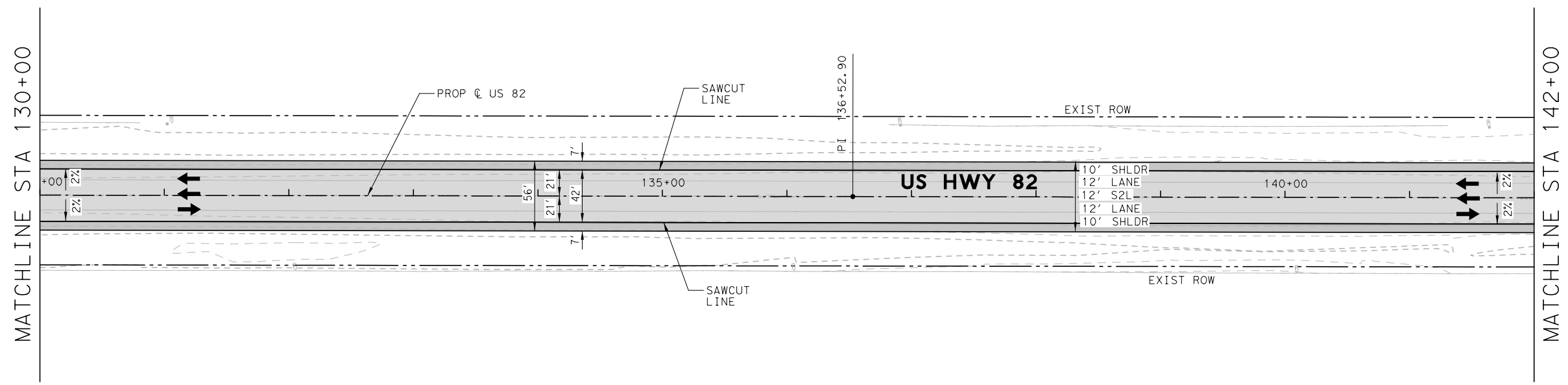
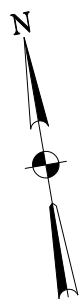


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 73
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**  
 1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS  
 2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

STATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
EST	131	131	161	176	178	181	174	161	133	89	70	78												
PROP. EXIST.	1,402.39	1,402.42	1,402.49	1,402.58	1,402.69	1,402.77	1,402.82	1,402.88	1,402.90	1,402.87	1,402.94	1,403.00	1,403.00	1,402.99	1,402.97	1,402.97	1,402.91	1,402.87	1,402.89	1,402.88	1,402.88	1,402.89	1,402.81	1,402.72

SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
0		CY	EXCAVATION (RDWY)
1665		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

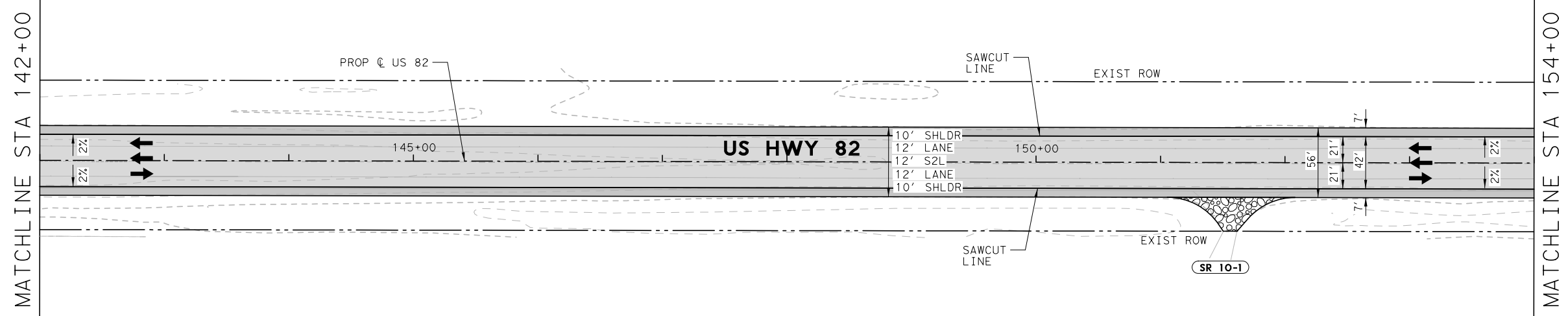
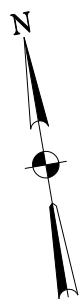
**PLAN & PROFILE**  
**STA 130+00.00 TO STA 142+00.00**  
 HORIZONTAL SCALE: 1" = 100'  
 VERTICAL SCALE: 1' = 10'  
 SHEET 9 OF 56



**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 74
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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 ... \04\ROADWAY\5563804-RPP-09.DGN



**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

	2	6	4	2	4	2	0	0	0	0	2	2												
	74	57	61	78	76	83	107	119	111	94	69	63												
1410	— PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION - - - PROPOSED PGL - - - EXISTING PGL												1410											
1400													1400											
1390													1390											
1380													1380											
PROP. EXIST.	1,402.66	1,402.52	1,402.41	1,402.42	1,402.39	1,402.32	1,402.19	1,402.17	1,402.15	1,402.09	1,402.06	1,402.03	1,402.02	1,401.99	1,401.95	1,401.87	1,401.81	1,401.76	1,401.74	1,401.74	1,401.75	1,401.78	1,401.77	1,401.74
	142+00	143+00	144+00	145+00	146+00	147+00	148+00	149+00	150+00	151+00	152+00	153+00	154+00											

SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
22		CY	EXCAVATION (RDWY)
993		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 142+00.00 TO STA 154+00.00**

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

SHEET 10 OF 56

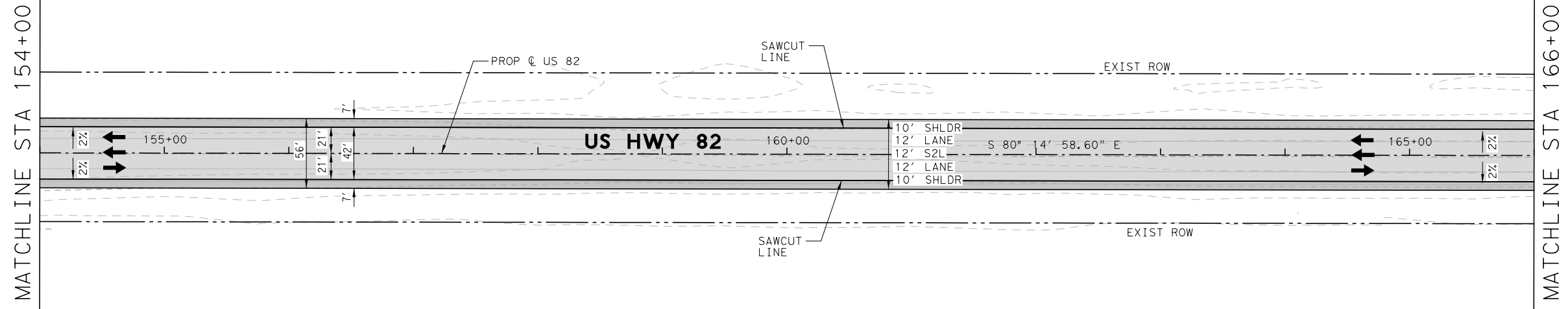
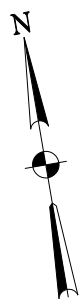


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		75
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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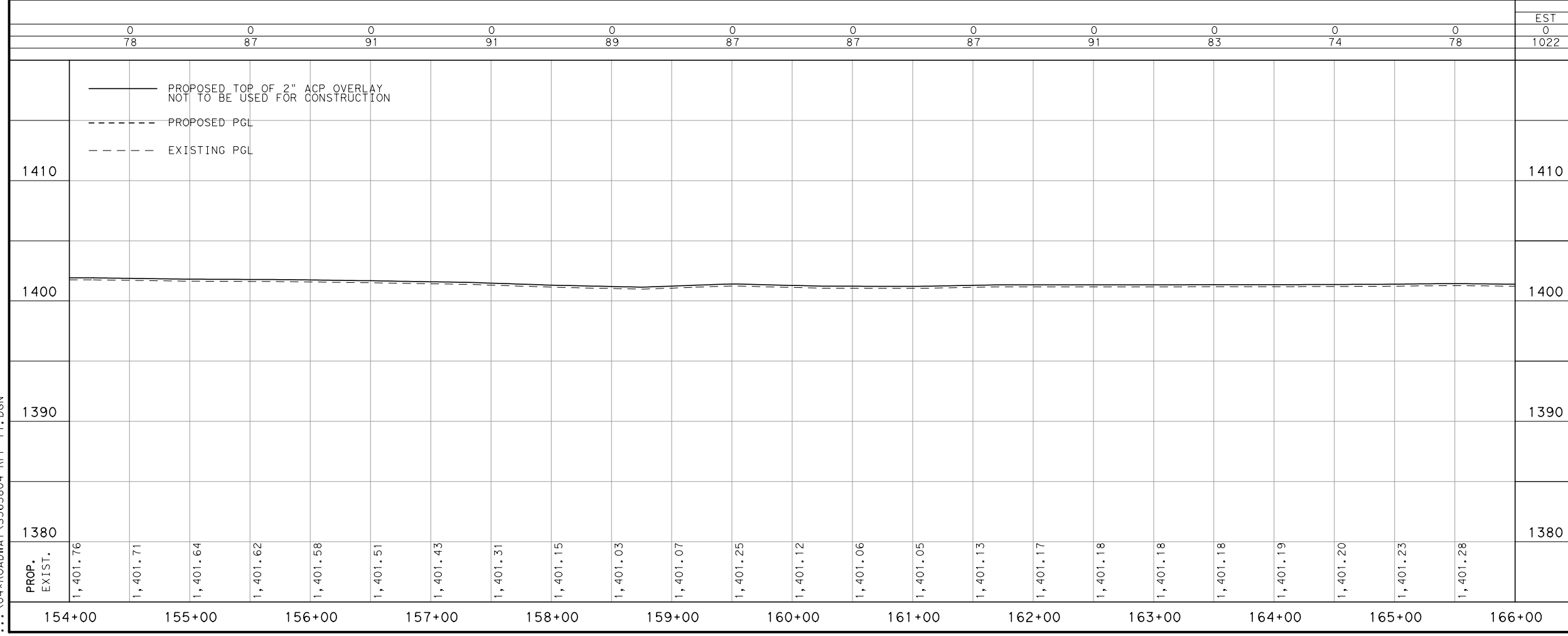


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
0		CY	EXCAVATION (RDWY)
78		CY	EMBANKMENT
87		STA	PREPARING ROW
91			
91			
89			
87			
87			
87			
91			
83			
74			
78			
1022			



12/14/2020

**PLAN & PROFILE**

**STA 154+00.00 TO STA 166+00.00**

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

SHEET 11 OF 56

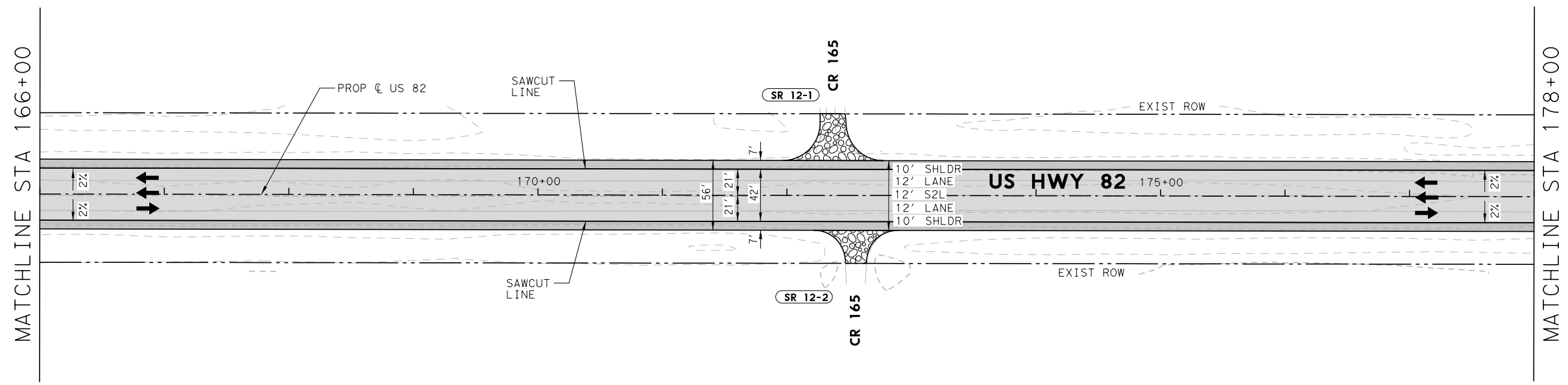
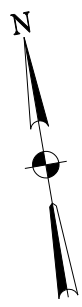


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		76
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

	0	0	0	0	0	0	0	2	2	0	0	0
	83	80	72	70	80	96	89	67	81	102	98	91

	1410	1400	1390	1380
	1410	1400	1390	1380

PROP. EXIST.	1,401.22	1,401.18	1,401.14	1,401.13	1,401.12	1,401.09	1,401.19	1,401.20	1,401.07	1,401.05	1,401.06	1,401.09	1,401.21	1,401.26	1,401.21	1,401.23	1,401.25	1,401.28	1,401.31	1,401.30	1,401.26	1,401.15	1,401.07	1,401.01
	166+00	167+00	168+00	169+00	170+00	171+00	172+00	173+00	174+00	175+00	176+00	177+00	178+00											

SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
4		CY	EXCAVATION (RDWY)
1009		CY	EMBANKMENT
		STA	PREPARING ROW

GREGORY O. DELGADO  
81454  
REGISTERED PROFESSIONAL ENGINEER

*Gregory O. Delgado*

12/14/2020

**PLAN & PROFILE**

**STA 166+00.00 TO STA 178+00.00**

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

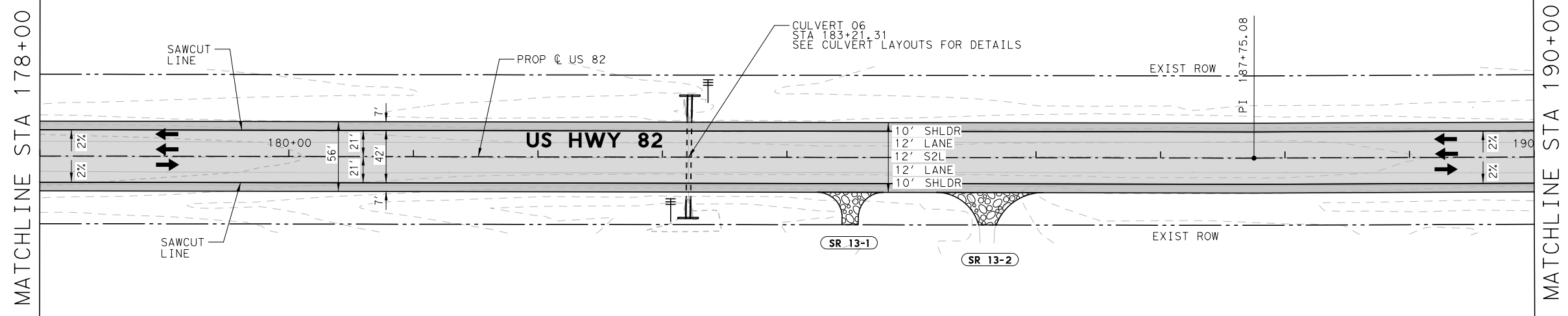
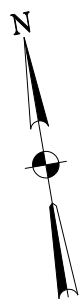
SHEET 12 OF 56

Texas Department of Transportation

**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		77
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

12/14/2020 4:57:42 PM  
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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

EST	FINAL	UNIT	DESCRIPTION
54		CY	EXCAVATION (RDWY)
1074		CY	EMBANKMENT
1		STA	PREPARING ROW

PROF. EXIST.	178+00	179+00	180+00	181+00	182+00	183+00	184+00	185+00	186+00	187+00	188+00	189+00	190+00
1,400.86	1,400.69	1,400.51	1,400.27	1,400.04	1,399.81	1,399.59	1,399.41	1,399.28	1,399.29	1,399.30	1,399.33	1,399.27	1,399.24
1,399.33	1,399.27	1,399.24	1,399.23	1,399.25	1,399.27	1,399.29	1,399.31	1,399.33	1,399.37	1,399.21	1,399.04	1,398.85	

SECTION TOTALS

SHEET 13 OF 56

**PLAN & PROFILE**

**STA 178+00.00 TO STA 190+00.00**

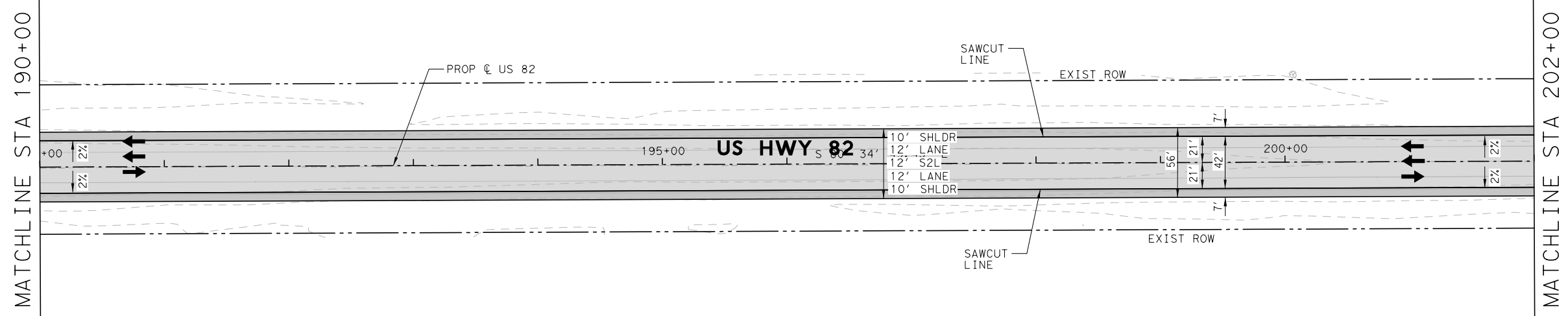
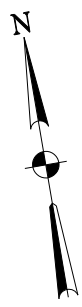
HORIZONTAL SCALE: 1" = 100'  
VERTICAL SCALE: 1" = 10'

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**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 78
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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- LEGEND**
- LIMITS OF PAVEMENT WIDENING
  - LIMITS OF PAVEMENT OVERLAY
  - LIMITS OF PROPOSED DRIVEWAY
  - OBJECT MARKER
  - MAILBOX
  - DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

	7	7	6	6	2	2	2	0	0	0	2	4											
	44	54	69	74	85	81	78	91	91	89	89	80											
1410	<p>— PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION</p> <p>- - - PROPOSED PGL</p> <p>- - - EXISTING PGL</p>																						
1400																							
1390																							
1380																							
PROP. EXIST.	1,398.78	1,398.75	1,398.76	1,398.69	1,398.61	1,398.52	1,398.52	1,398.52	1,398.40	1,398.35	1,398.37	1,398.34	1,398.32	1,398.32	1,398.35	1,398.33	1,398.28	1,398.21	1,398.14	1,398.06	1,397.97	1,397.84	1,397.70
	190+00	191+00	192+00	193+00	194+00	195+00	196+00	197+00	198+00	199+00	200+00	201+00	202+00										

SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
37		CY	EXCAVATION (RDWY)
924		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 190+00 TO STA 202+00**

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

SHEET 14 OF 56



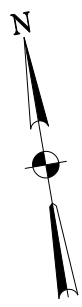
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		79	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

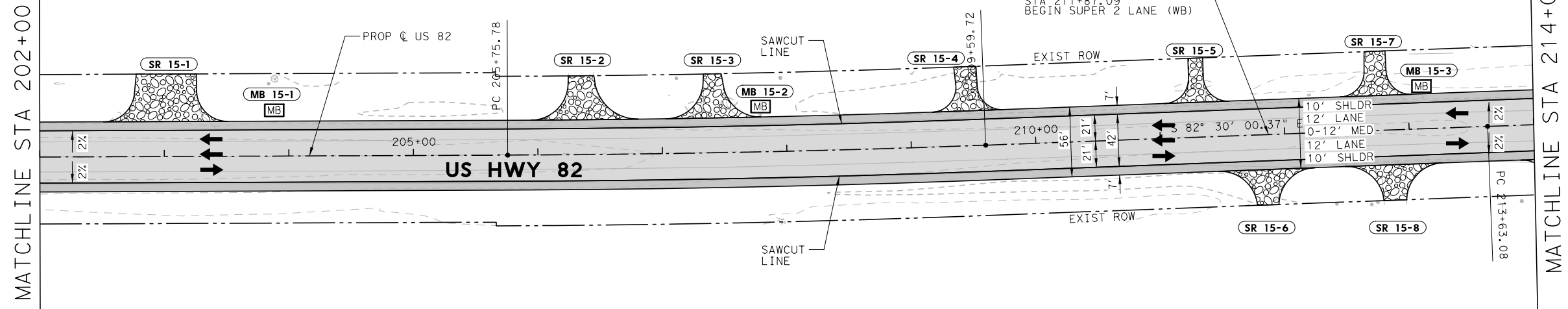
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PI STATION = 207+67.77  
 DELTA = 1° 55' 10.94"  
 DEGREE OF CURVE = 0° 30' 00.02"  
 TANGENT = 191.99'  
 LENGTH = 383.94'  
 RADIUS = 11,459.00'  
 PC STATION = 205+75.78  
 PRC STATION = 209+59.72

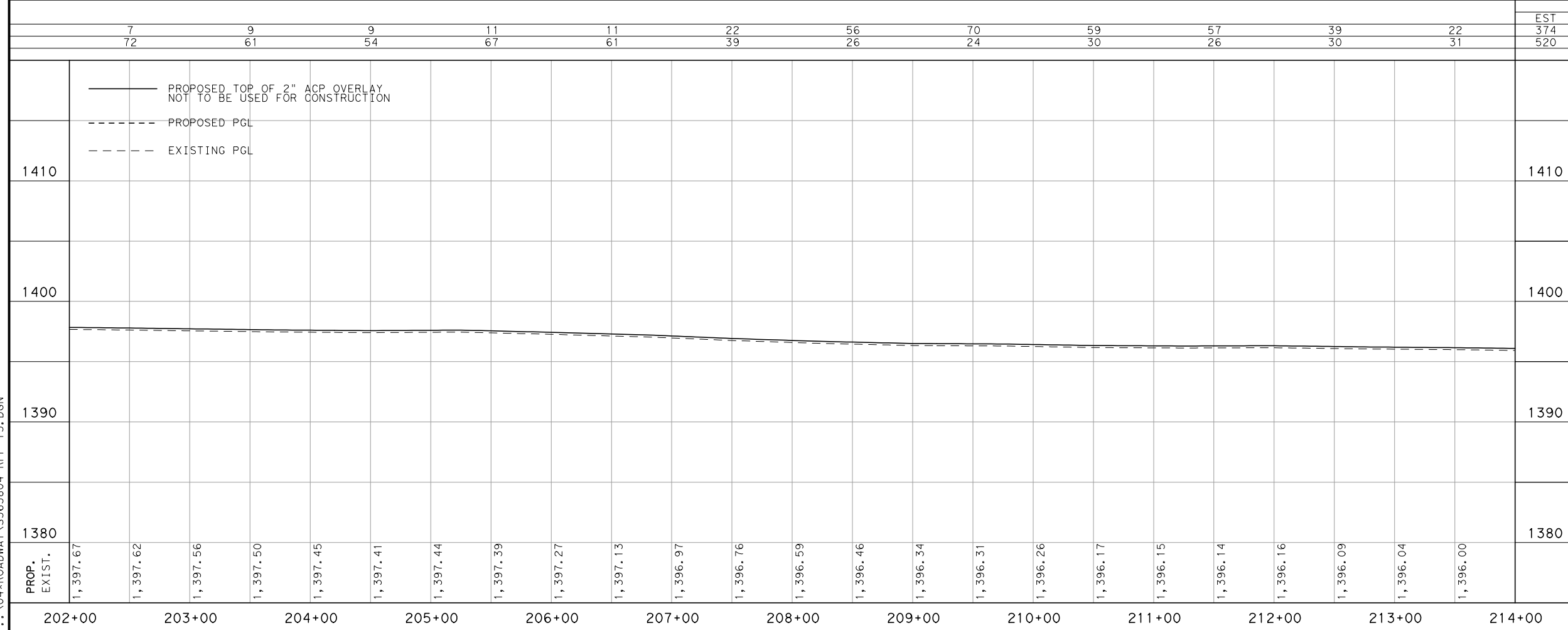
PI STATION = 215+64.41  
 DELTA = 2° 00' 47.26"  
 DEGREE OF CURVE = 0° 30' 00.02"  
 TANGENT = 201.33'  
 LENGTH = 402.62'  
 RADIUS = 11,459.00'  
 PC STATION = 213+63.08  
 PT STATION = 217+65.70



**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
374		CY	EXCAVATION (RDWY)
520		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 202+00.00 TO STA 214+00.00**

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

SHEET 15 OF 56

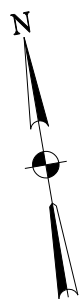


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

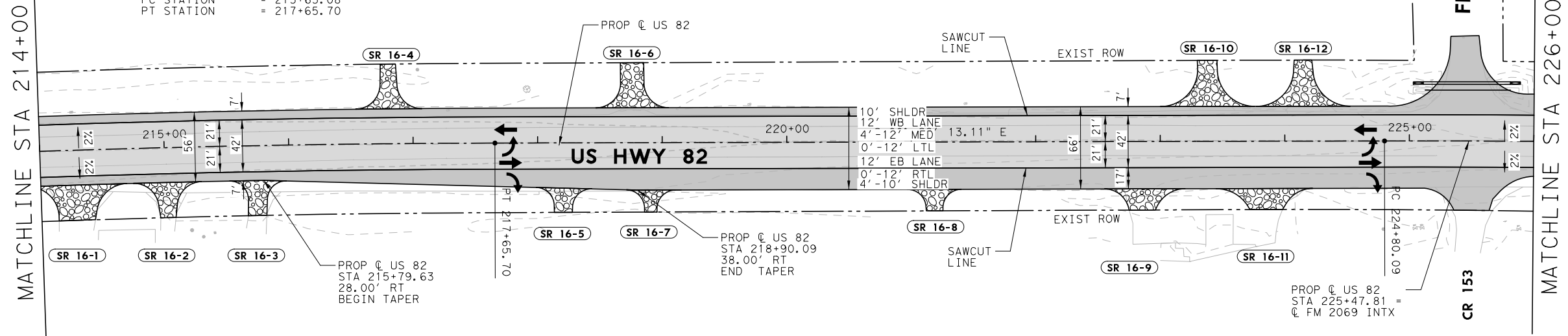
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 80
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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PI STATION = 215+64.41  
 DELTA = 2° 00' 47.26"  
 DEGREE OF CURVE = 0° 30' 00.02"  
 TANGENT = 201.33'  
 LENGTH = 402.62'  
 RADIUS = 11,459.00'  
 PC STATION = 213+63.08  
 PT STATION = 217+65.70

PI STATION = 226+75.326  
 DELTA = 1° 57' 07.67"  
 DEGREE OF CURVE = 0° 30' 00.02"  
 TANGENT = 195.23'  
 LENGTH = 390.42'  
 RADIUS = 11,459.00'  
 PRC STATION = 224+80.09  
 PRC STATION = 228+70.51



**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

		SECTION TOTALS													EST	FINAL	UNIT	DESCRIPTION
		30	26	19	20	31	43	43	46	57	61	57	37	470		CY	EXCAVATION (RDWY)	
		31	37	37	33	17	4	15	26	26	24	30	59	339		CY	EMBANKMENT	
																STA	PREPARING ROW	

1410	<p>— PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION</p> <p>- - - PROPOSED PGL</p> <p>- - - EXISTING PGL</p>	1410												
1400		1400												
1390		1390												
1380		1380												
PROP. EXIST.	1,395.93 1,395.86 1,395.79 1,395.74 1,395.69 1,395.65 1,395.55 1,395.46 1,395.37 1,395.27 1,395.18 1,395.10 1,395.00 1,394.89 1,394.76 1,394.72 1,394.61 1,394.52 1,394.51 1,394.50 1,394.49 1,394.34 1,394.19 1,394.07													
	214+00	215+00	216+00	217+00	218+00	219+00	220+00	221+00	222+00	223+00	224+00	225+00	226+00	

**PLAN & PROFILE**

**STA 214+00.00 TO STA 226+00.00**

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

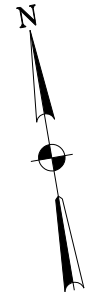
SHEET 16 OF 56

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**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 81
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

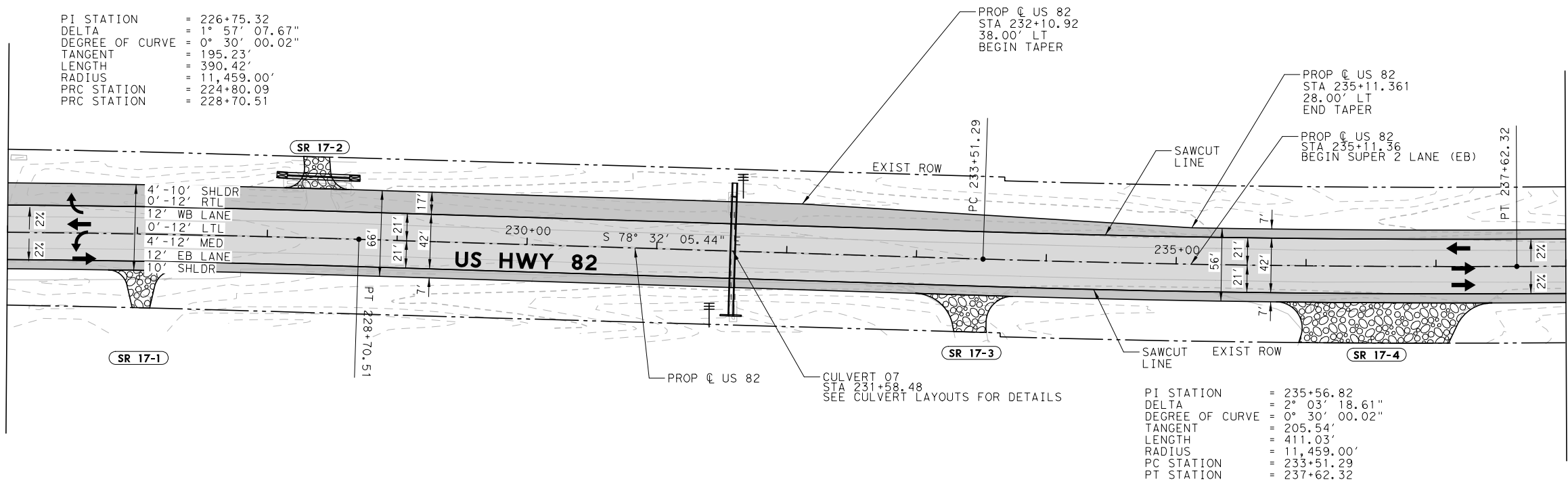
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 ... \04\ROADWAY\5563804-RPP-16.DGN



PI STATION = 226+75.32  
 DELTA = 1° 57' 07.67"  
 DEGREE OF CURVE = 0° 30' 00.02"  
 TANGENT = 195.23'  
 LENGTH = 390.42'  
 RADIUS = 11,459.00'  
 PRC STATION = 224+80.09  
 PRC STATION = 228+70.51

MATCHLINE STA 226+00

MATCHLINE STA 238+00



**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

PI STATION = 235+56.82  
 DELTA = 2° 03' 18.61"  
 DEGREE OF CURVE = 0° 30' 00.02"  
 TANGENT = 205.54'  
 LENGTH = 411.03'  
 RADIUS = 11,459.00'  
 PC STATION = 233+51.29  
 PT STATION = 237+62.32

CULVERT 07  
 STA 231+58.48  
 SEE CULVERT LAYOUTS FOR DETAILS

		57	100	72	41	35	15	2	26	65	102	159	128	SECTION TOTALS	
		EST	FINAL	UNIT	DESCRIPTION										
		802		CY	EXCAVATION (RDWY)										
		809		CY	EMBANKMENT										
		1		STA	PREPARING ROW										

PROF.	EXIST.	226+00	227+00	228+00	229+00	230+00	231+00	232+00	233+00	234+00	235+00	236+00	237+00	238+00									
1,393.95	1,393.81	1,393.63	1,393.45	1,393.22	1,392.87	1,392.62	1,392.39	1,392.10	1,391.89	1,391.68	1,391.59	1,391.47	1,391.32	1,391.16	1,390.97	1,390.79	1,390.68	1,390.69	1,390.75	1,390.83	1,390.90	1,390.94	1,390.91

**PLAN & PROFILE**

**STA 224+00.00 TO STA 236+00.00**

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

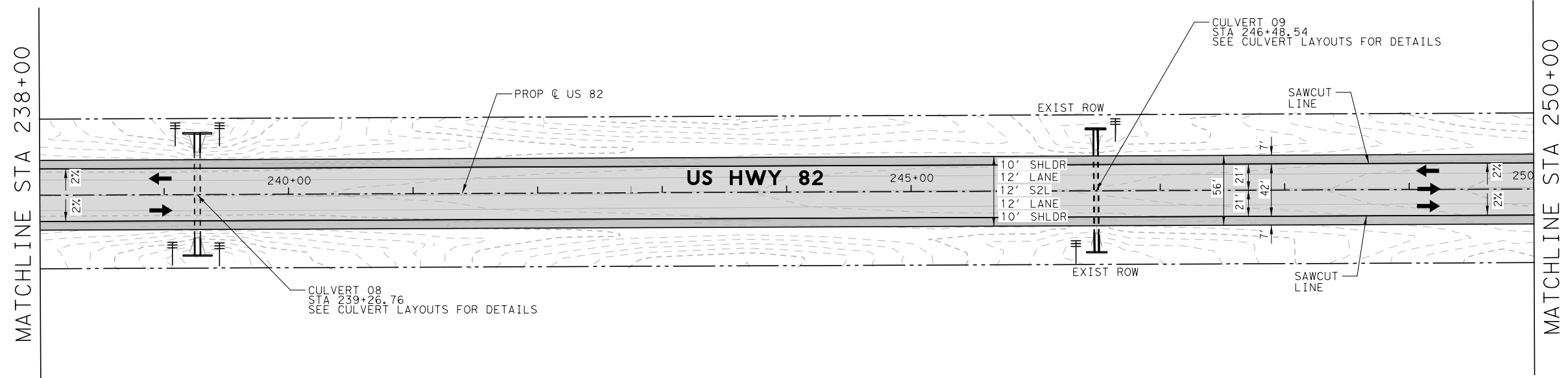
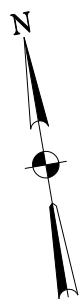
SHEET 17 OF 56

12/14/2020

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.: 6	FEDERAL AID PROJECT NO.:	SHEET NO. 82
STATE: TEXAS	DISTRICT: WFS	COUNTY: BAYLOR
CONT: 0133	SECT: 04	JOB: 042
		HIGHWAY NO: US 82



**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

EST	FINAL	UNIT	DESCRIPTION
498		CY	EXCAVATION (RDWY)
1609		CY	EMBANKMENT
2		STA	PREPARING ROW

SECTION TOTALS	EST	FINAL	UNIT	DESCRIPTION
	30	0	0	
	56	267	372	
		2	191	
		39	52	
		122	24	
		187	19	
		109	41	
		7	109	
		0	194	
		0	185	
		2	100	

PROF. EXIST.	238+00	239+00	240+00	241+00	242+00	243+00	244+00	245+00	246+00	247+00	248+00	249+00	250+00
1,390.92	1,390.92	1,390.89	1,390.88	1,390.94	1,391.04	1,391.07	1,391.19	1,391.47	1,391.63	1,391.76	1,391.91	1,392.19	1,392.51
1,392.71	1,392.85	1,392.92	1,393.06	1,393.22	1,393.46	1,393.77	1,394.13	1,394.55	1,395.06				

**PLAN & PROFILE**  
**STA 238+00.00 TO STA 250+00.00**

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

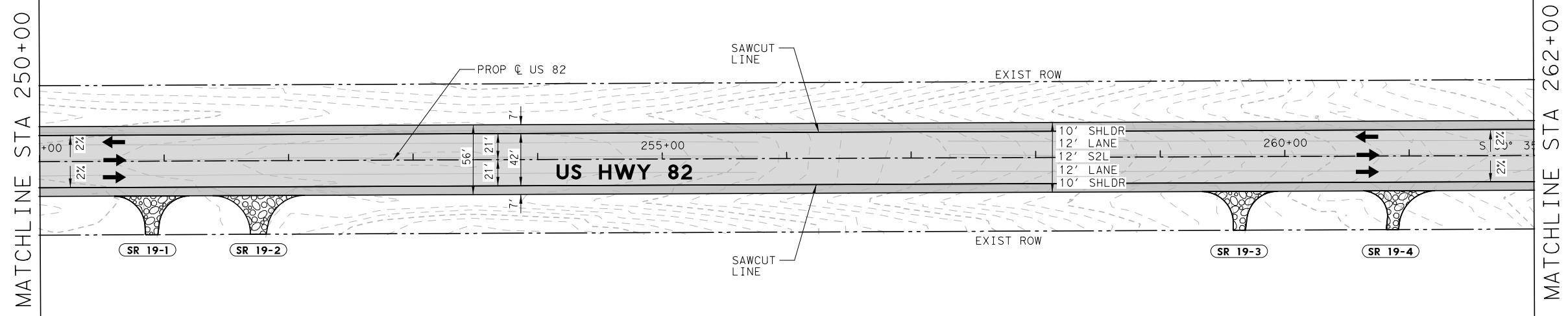
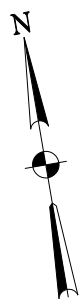
SHEET 18 OF 56

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 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 83
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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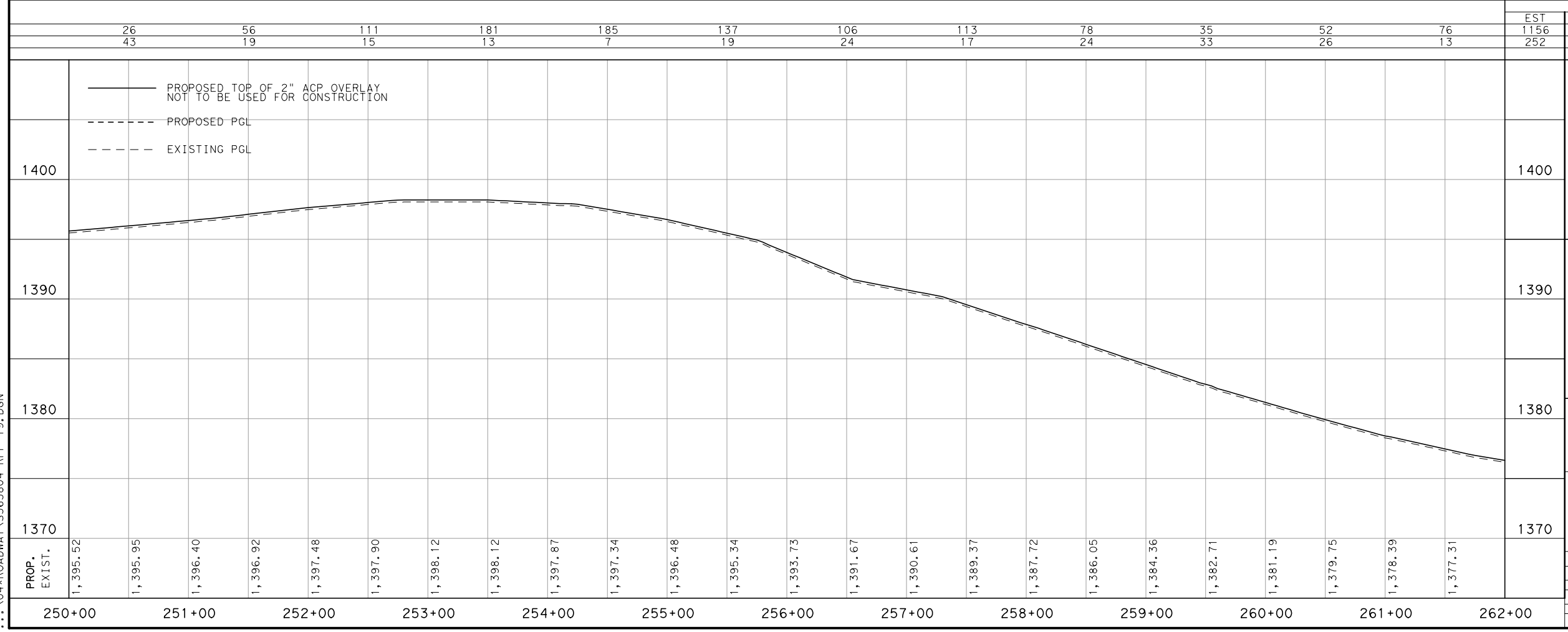


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
1156		CY	EXCAVATION (RDWY)
252		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 250+00.00 TO STA 262+00.00**

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

SHEET 19 OF 56

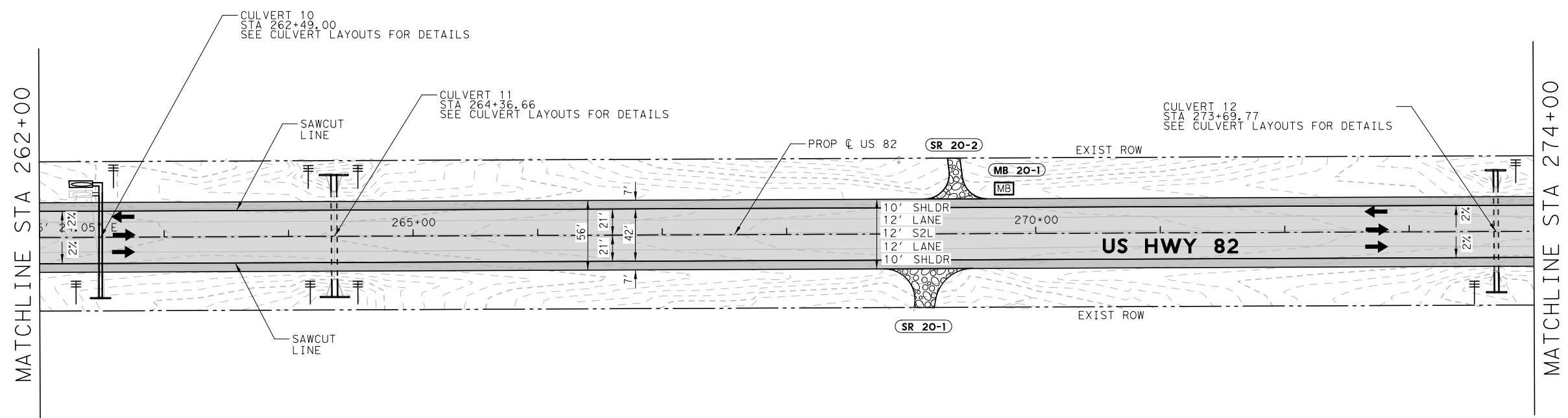
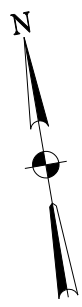


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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 84
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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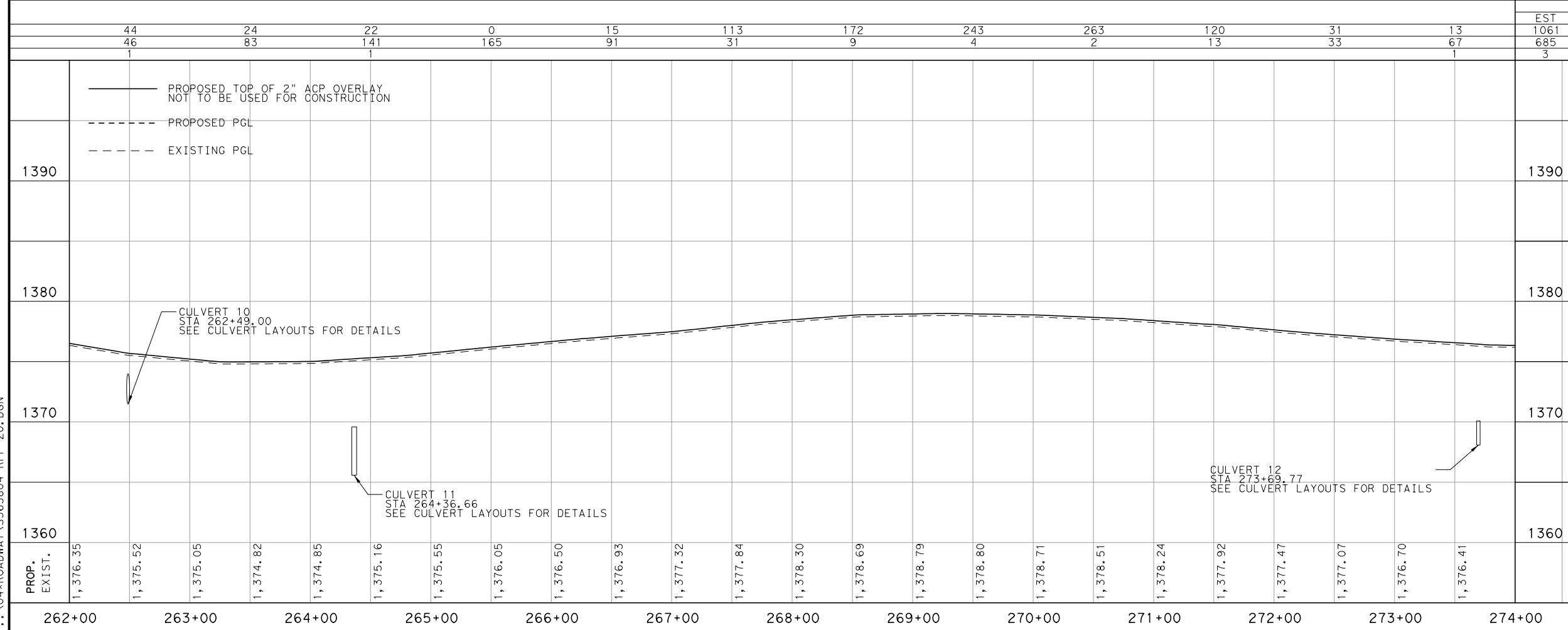


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
1061		CY	EXCAVATION (RDWY)
685		CY	EMBANKMENT
3		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 262+00.00 TO STA 274+00.00**

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

SHEET 20 OF 56

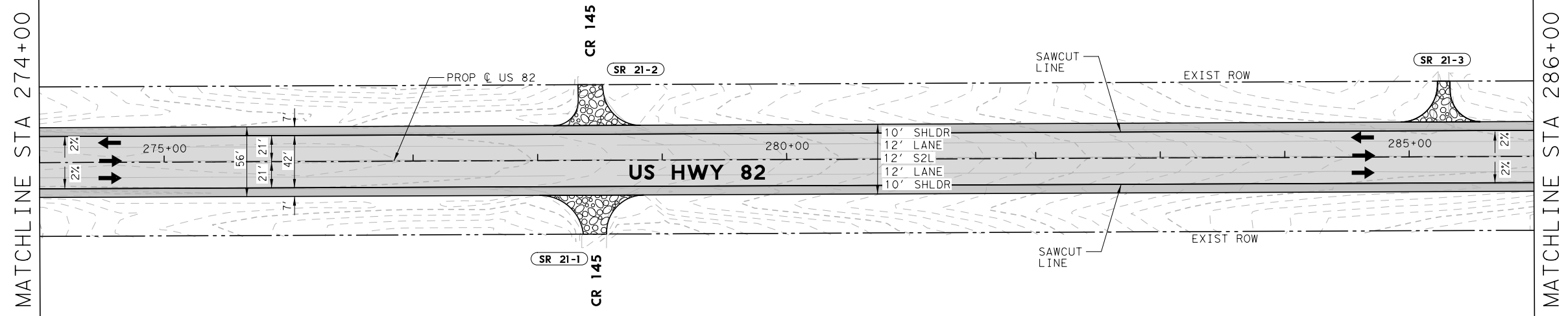
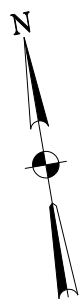


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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 85
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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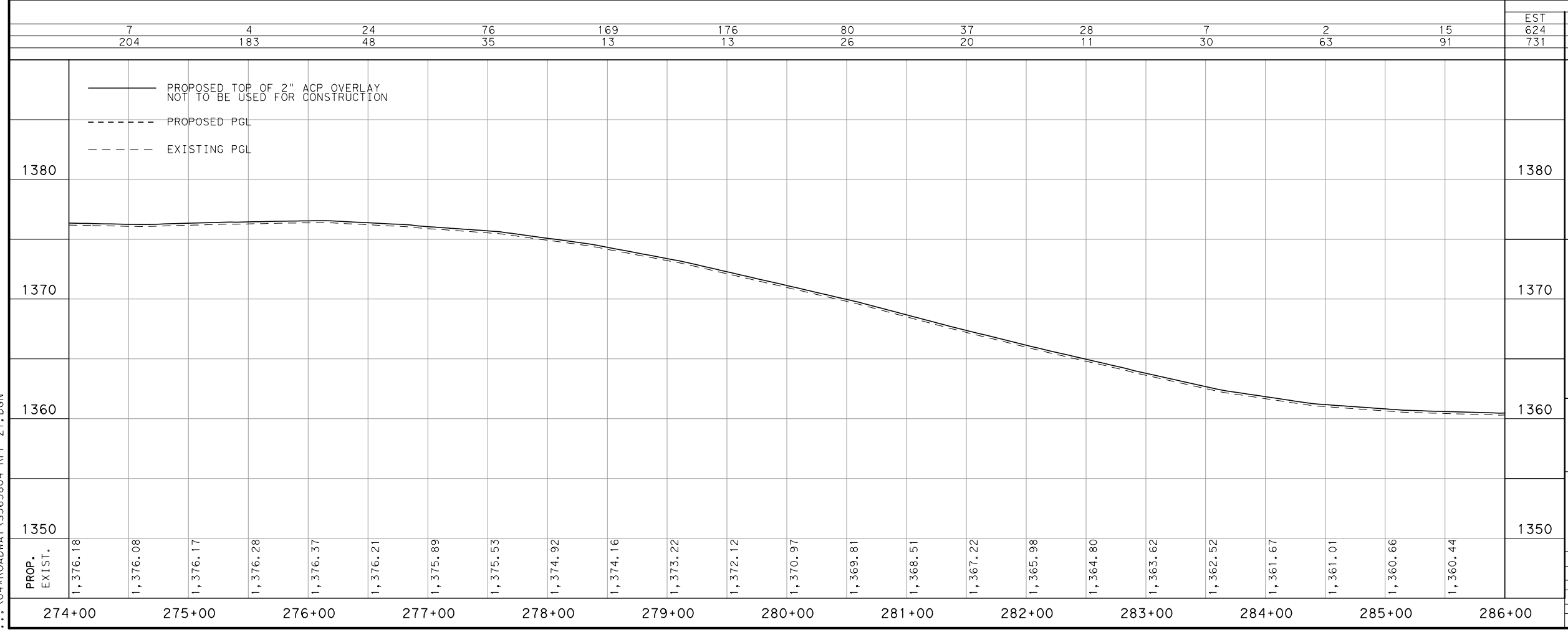


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
624		CY	EXCAVATION (RDWY)
731		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 274+00 TO STA 286+00**

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

SHEET 21 OF 56

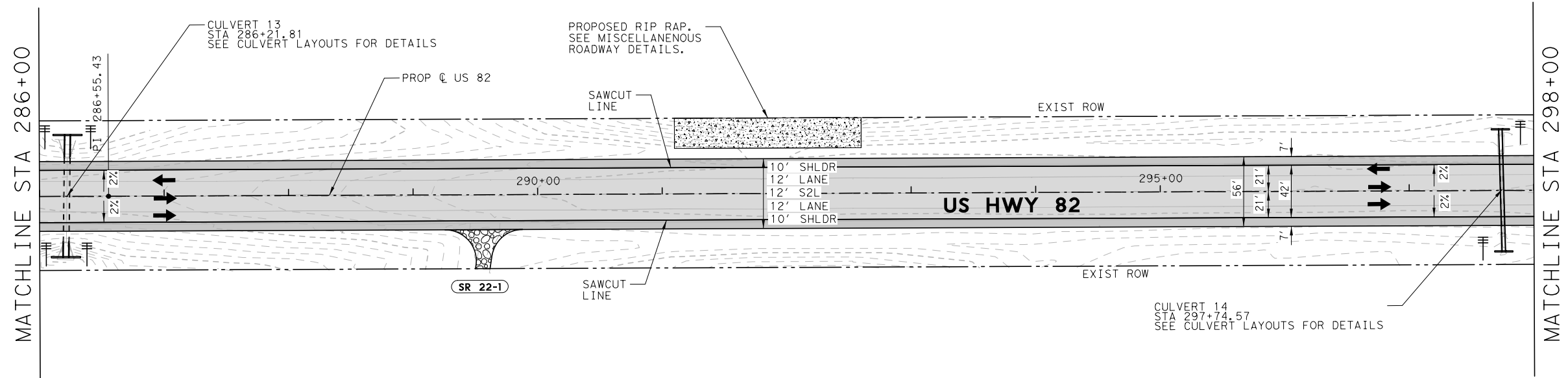
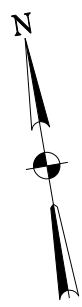


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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 86
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

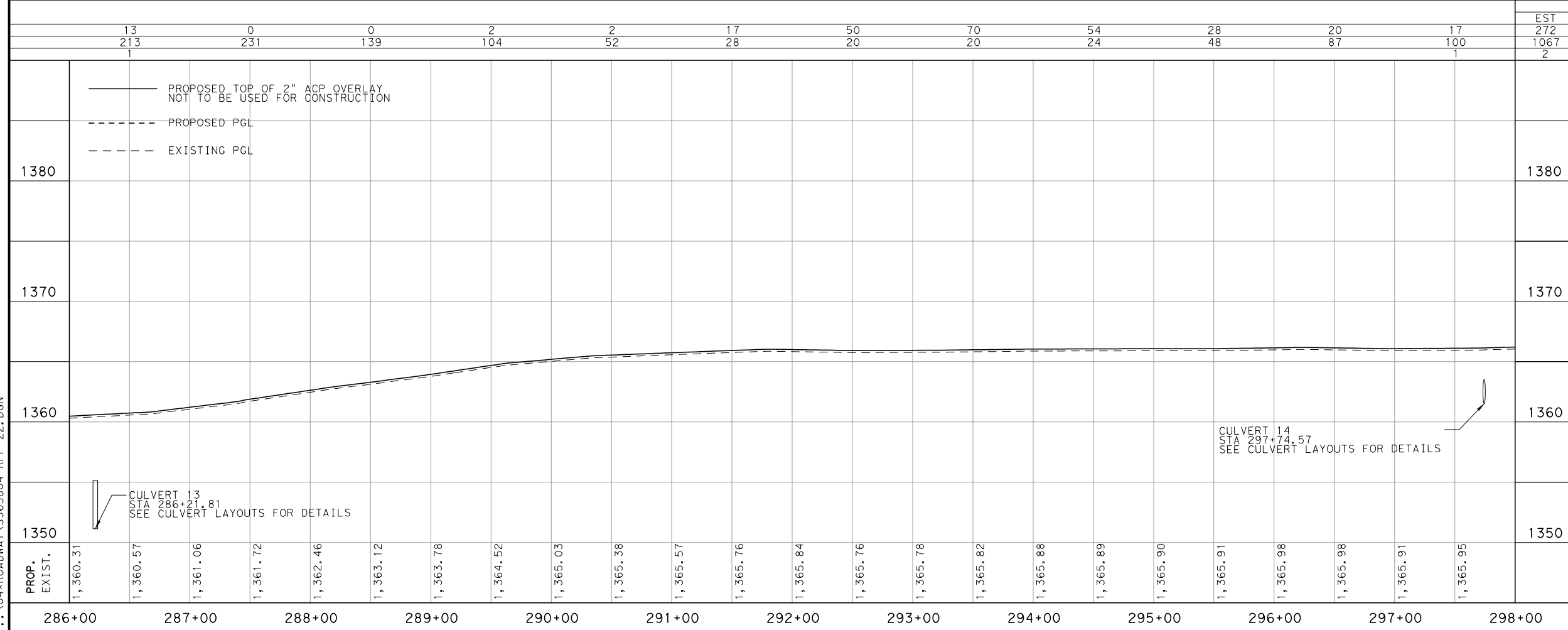
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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
272		CY	EXCAVATION (RDWY)
1067		CY	EMBANKMENT
2		STA	PREPARING ROW



**PLAN & PROFILE**

**STA 286+00.00 TO STA 298+00.00**

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

SHEET 22 OF 56



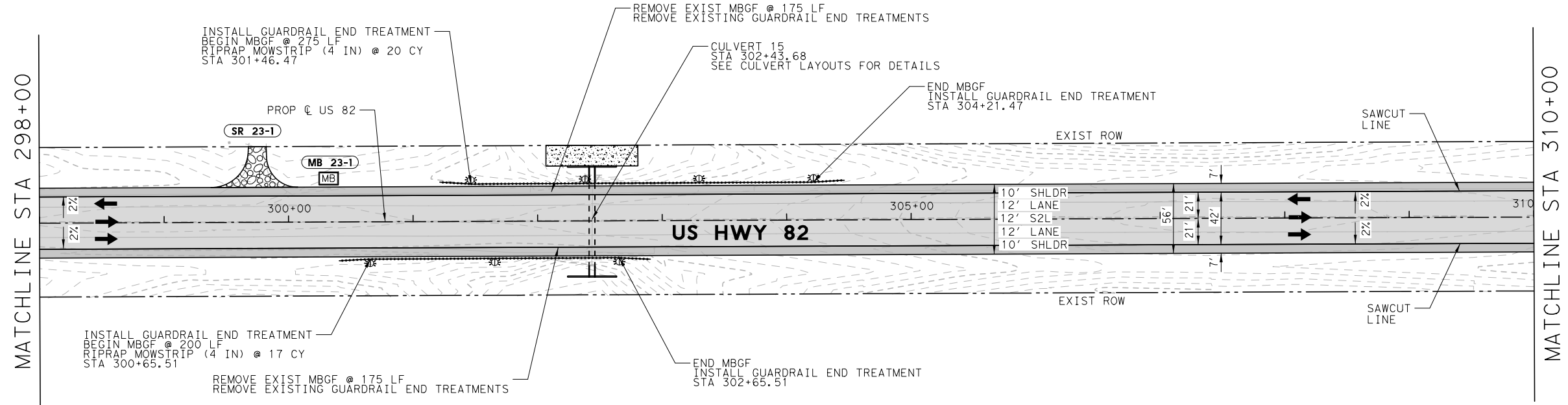
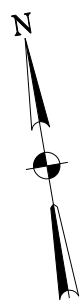
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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 87
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

		SECTION TOTALS													EST	FINAL	UNIT	DESCRIPTION
		11	20	128	165	56	2	7	28	50	48	35	26	576		CY	EXCAVATION (RDWY)	
		91	61	24	22	215	274	83	15	15	13	17	22	852		CY	EMBANKMENT	
						1								1		STA	PREPARING ROW	

PROF. EXIST.	298+00	299+00	300+00	301+00	302+00	303+00	304+00	305+00	306+00	307+00	308+00	309+00	310+00
1,366.04	1,366.17	1,366.23	1,366.20	1,366.16	1,366.13	1,366.01	1,366.01	1,366.12	1,366.31	1,366.78	1,367.43	1,368.23	1,369.13
1,370.22	1,371.32	1,372.35	1,373.22	1,373.35	1,373.32	1,373.12	1,372.90	1,372.90	1,372.90	1,372.90	1,372.90	1,372.90	1,372.57

**PLAN & PROFILE**

**STA 298+00.00 TO STA 310+00.00**

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

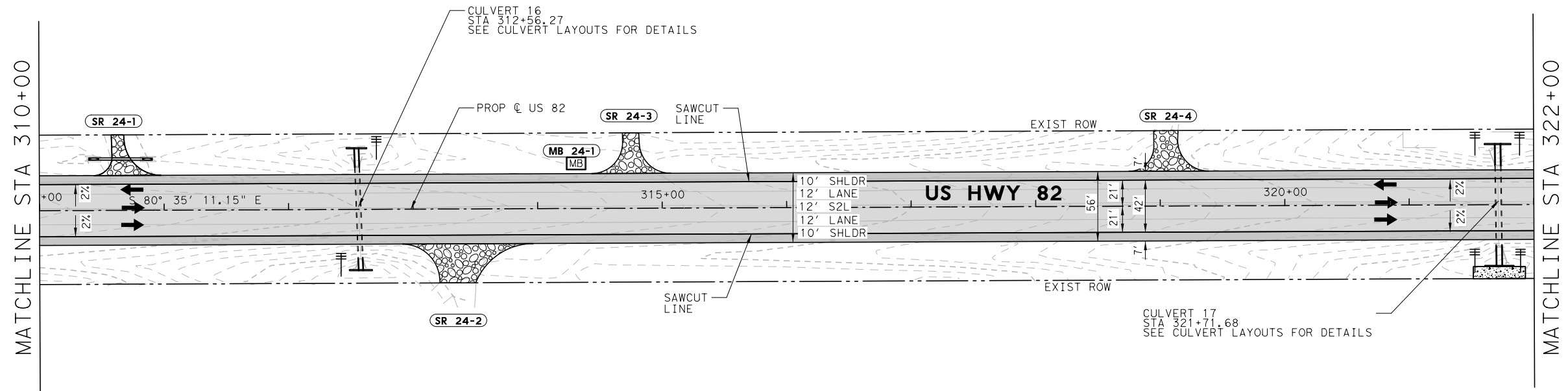
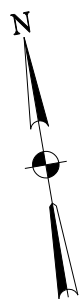
SHEET 23 OF 56

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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 88
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

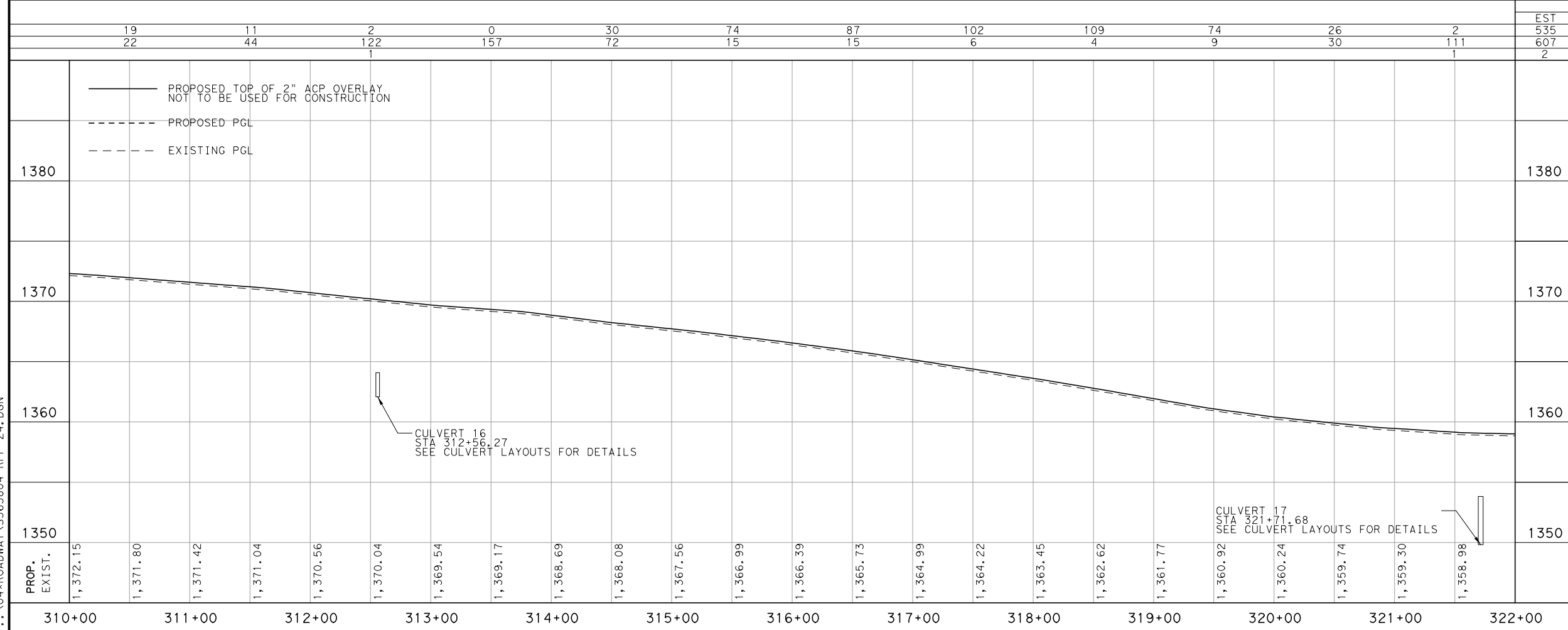
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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
535		CY	EXCAVATION (RDWY)
607		CY	EMBANKMENT
2		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 310+00 TO STA 322+00**

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

SHEET 24 OF 56

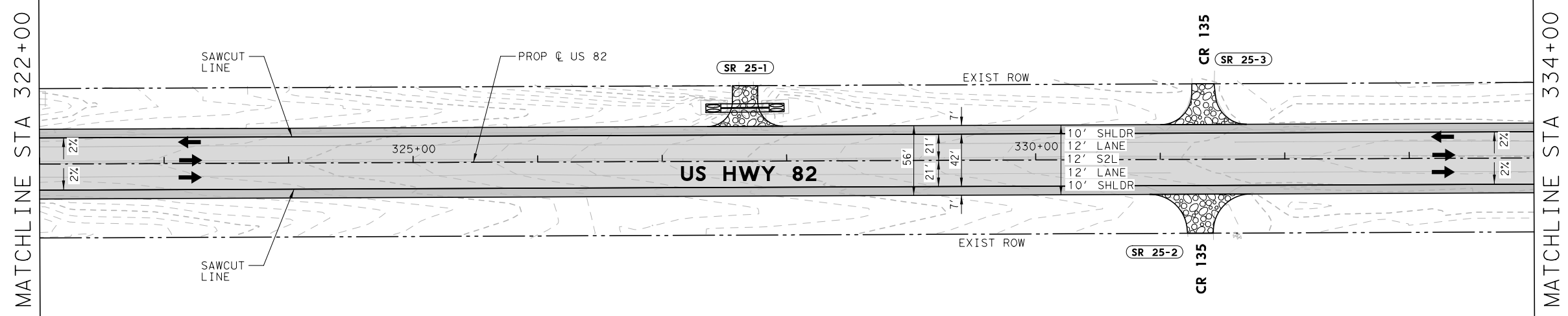
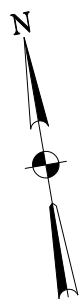


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 89
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

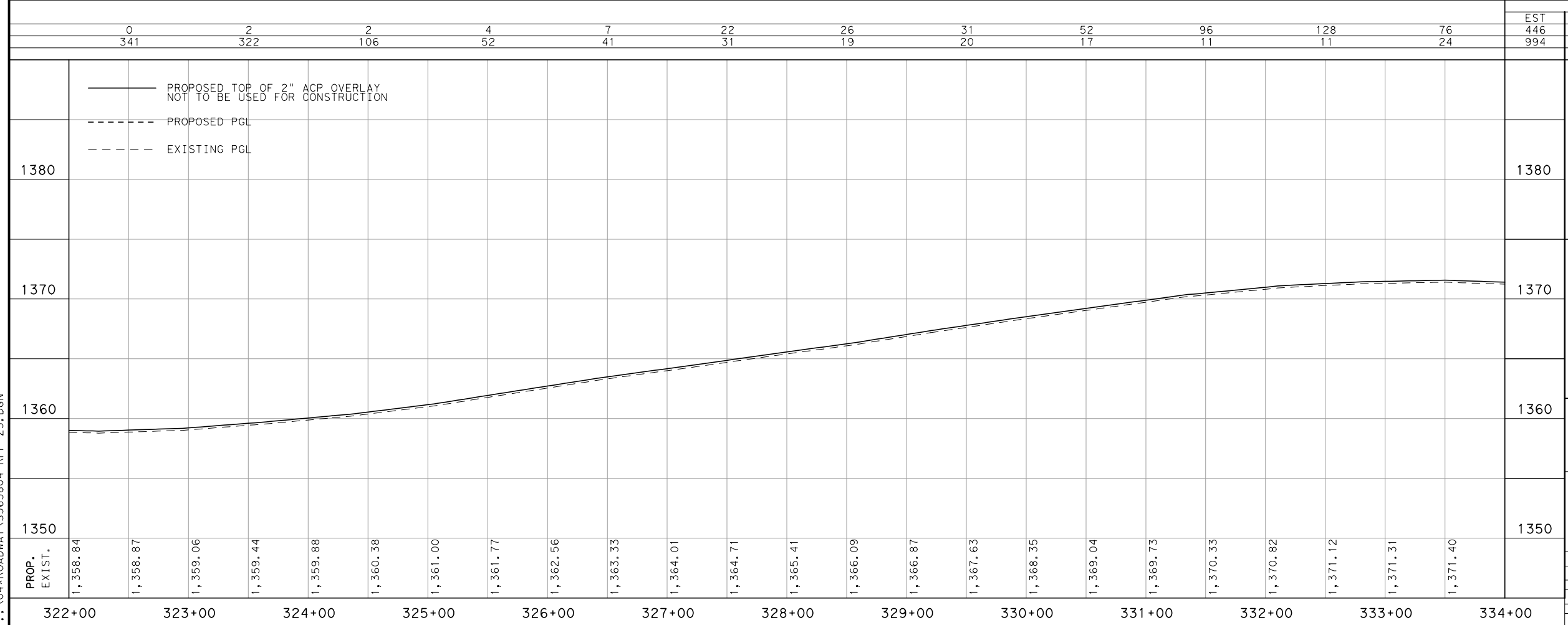
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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
446		CY	EXCAVATION (RDWY)
994		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 322+00.00 TO STA 334+00.00**

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

SHEET 25 OF 56

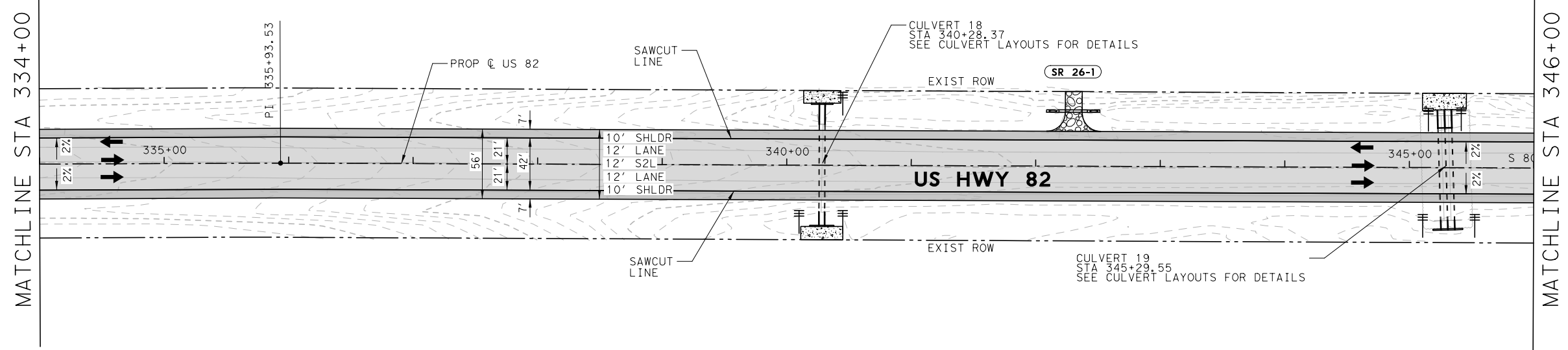
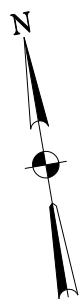


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 90
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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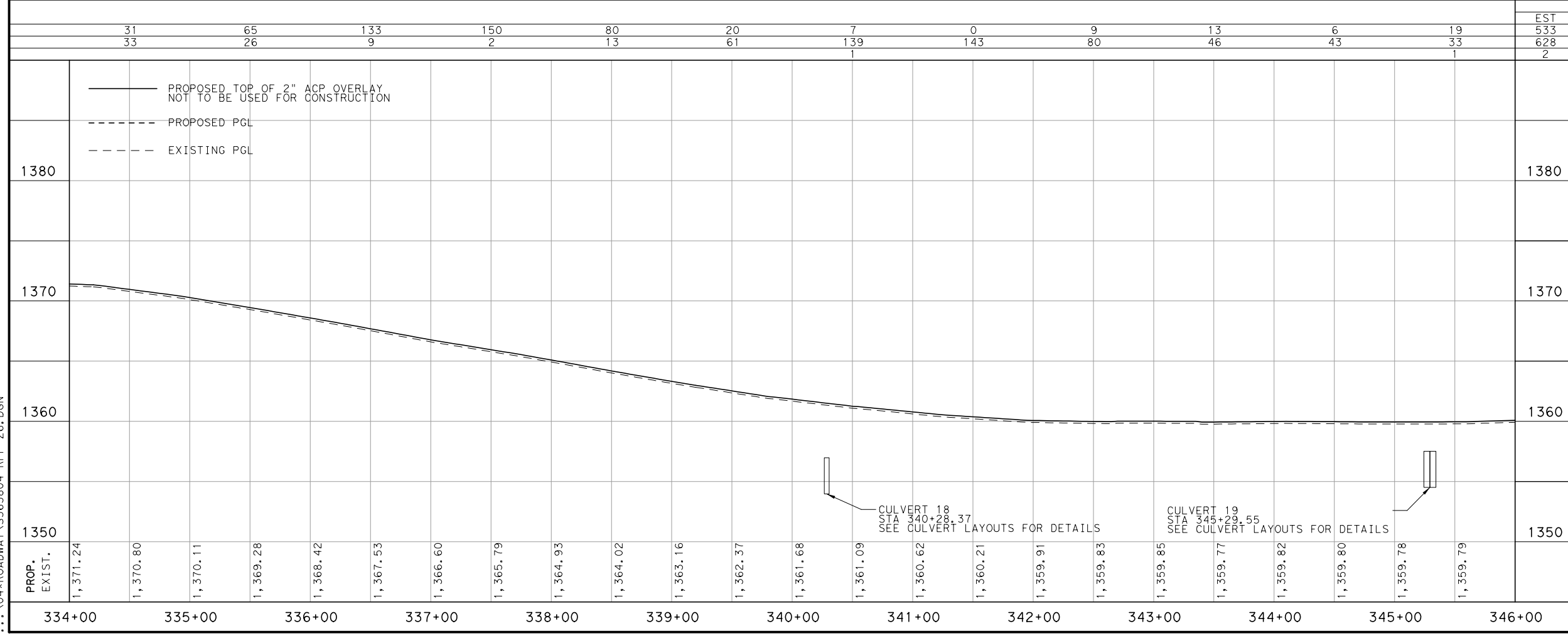


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
533		CY	EXCAVATION (RDWY)
628		CY	EMBANKMENT
2		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 334+00.00 TO STA 346+00.00**

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

SHEET 26 OF 56

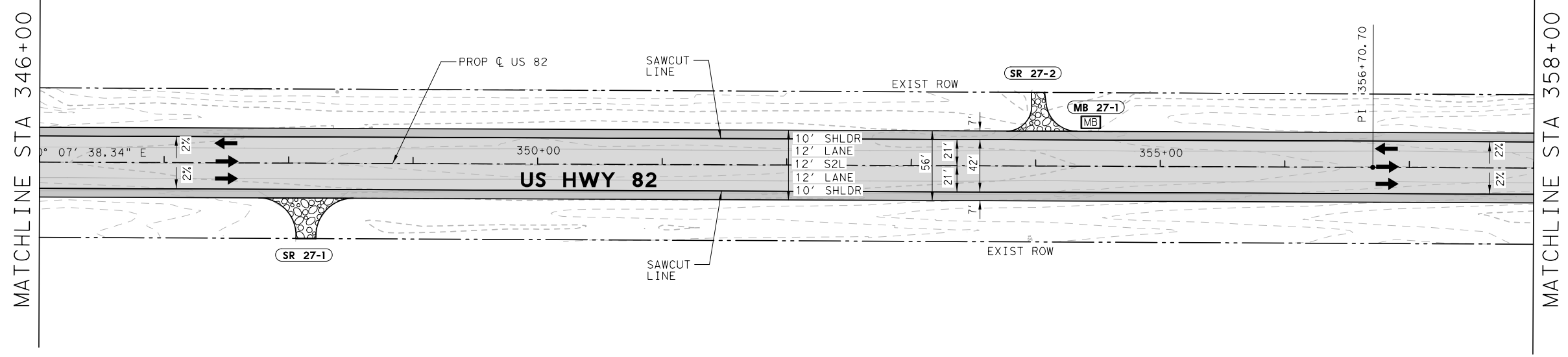
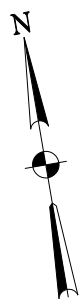


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 91
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

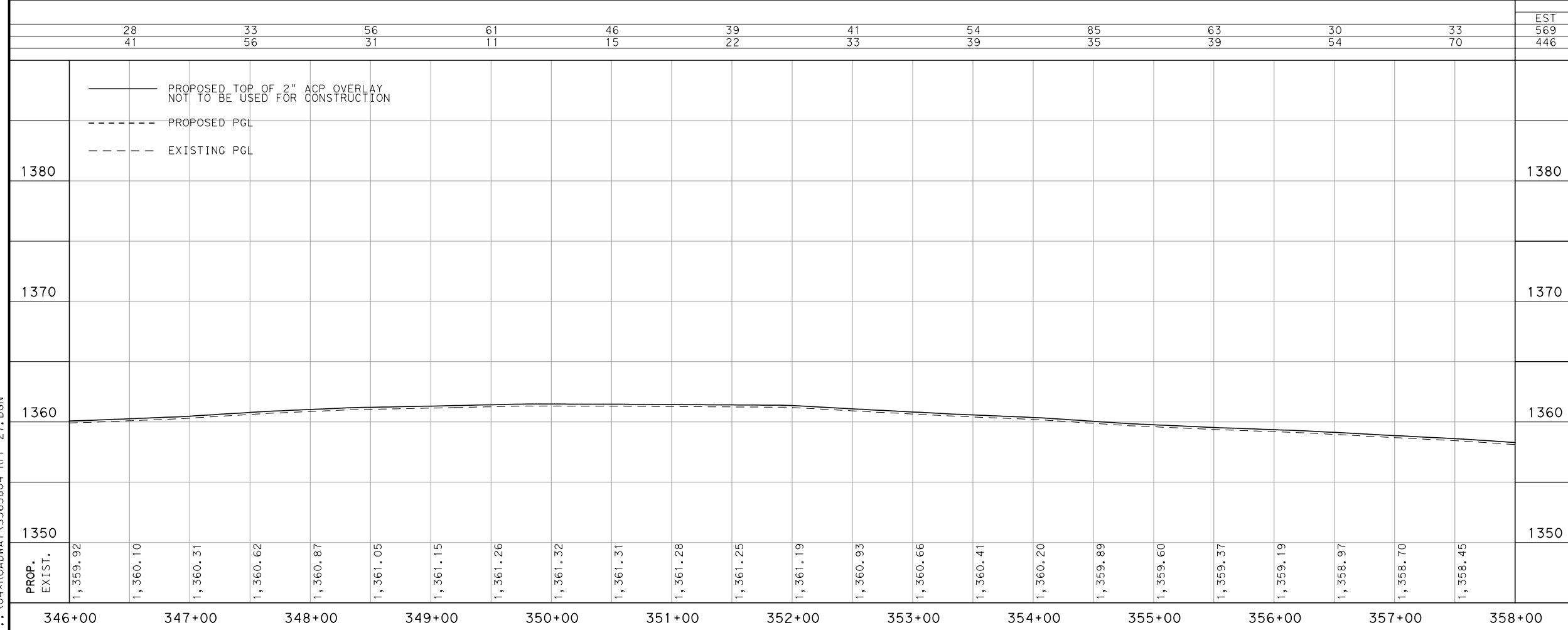
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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
569		CY	EXCAVATION (RDWY)
446		CY	EMBANKMENT
		STA	PREPARING ROW

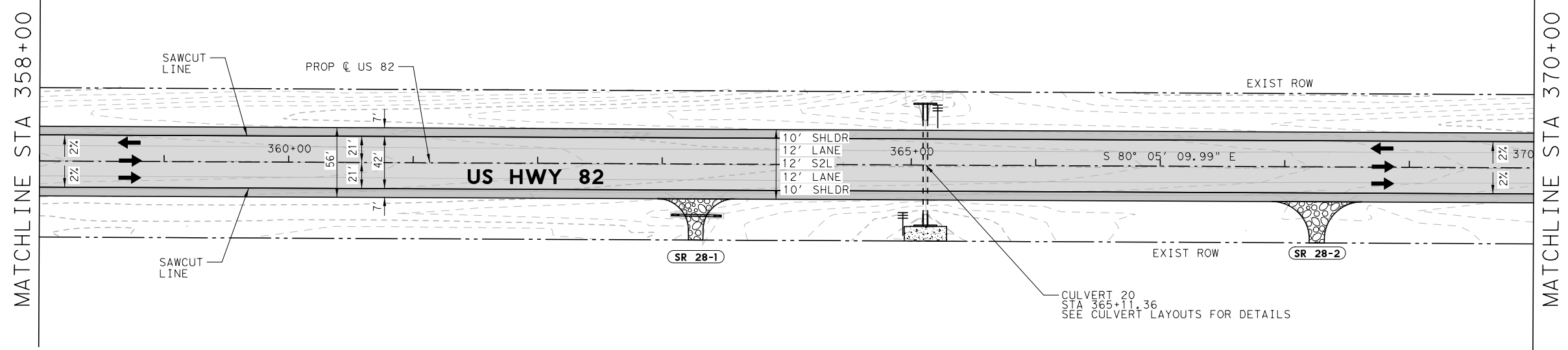
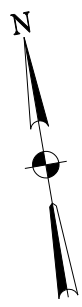


**PLAN & PROFILE**  
**STA 346+00.00 TO STA 358+00.00**  
 HORIZONTAL SCALE: 1" = 100'  
 VERTICAL SCALE: 1' = 10'  
 SHEET 27 OF 56



<b>HUITT-ZOLLARS</b>			
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731 FIRM NO. F-761			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 92	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

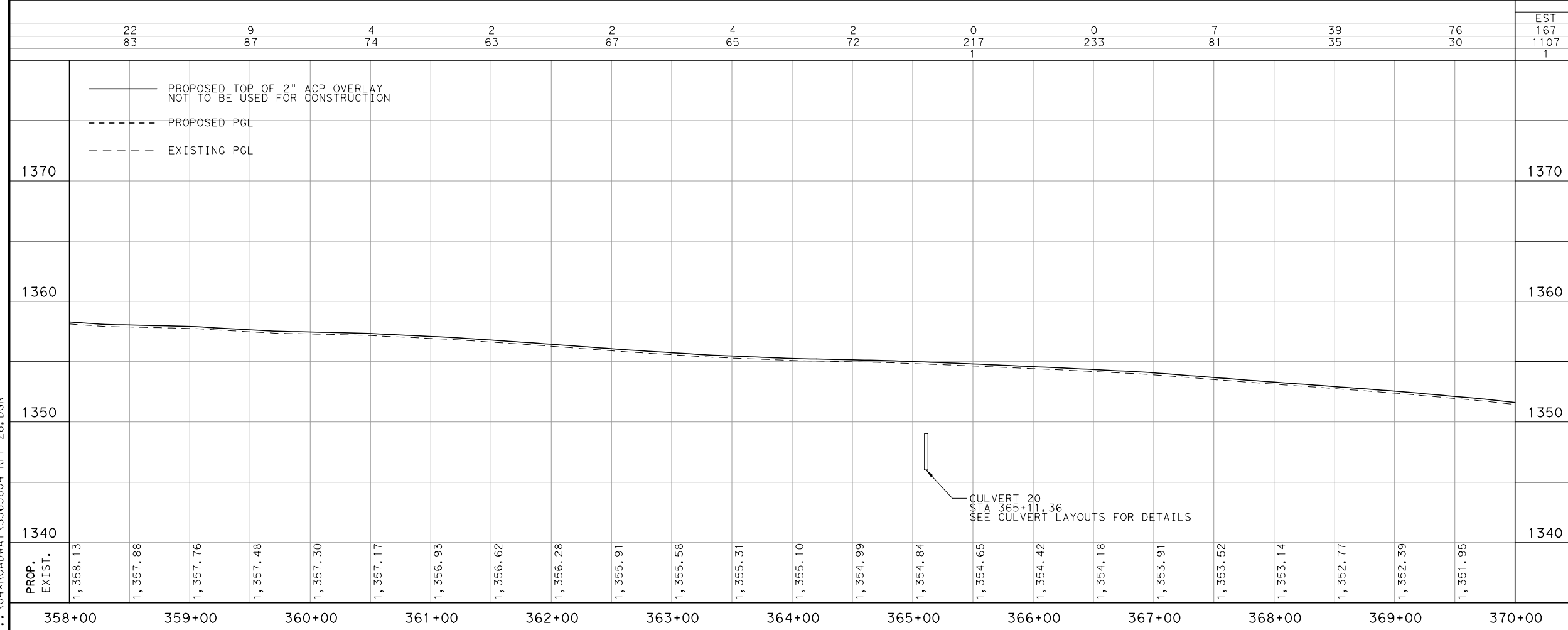
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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
167		CY	EXCAVATION (RDWY)
1107		CY	EMBANKMENT
1		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 358+00.00 TO STA 370+00.00**

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

SHEET 28 OF 56

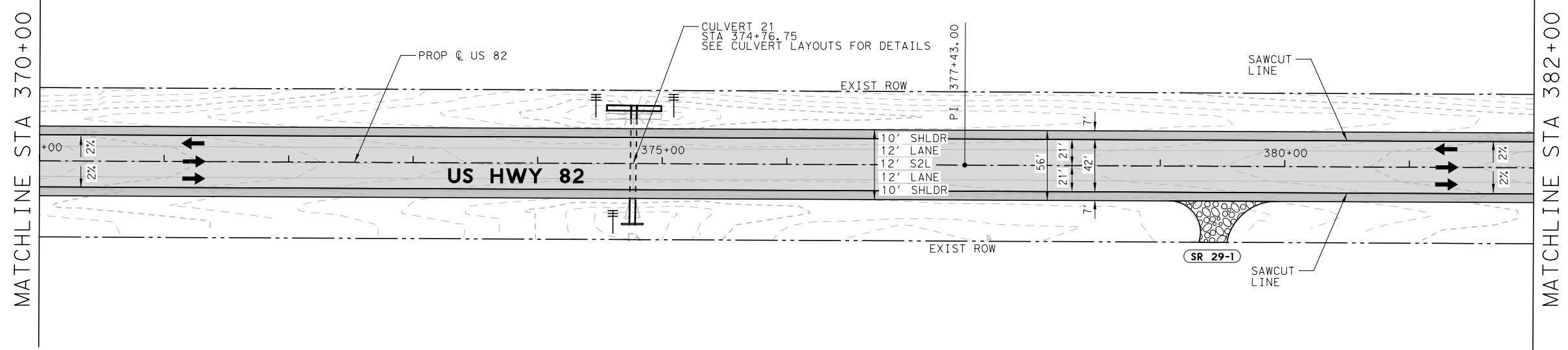
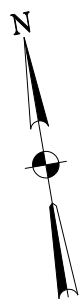


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 93
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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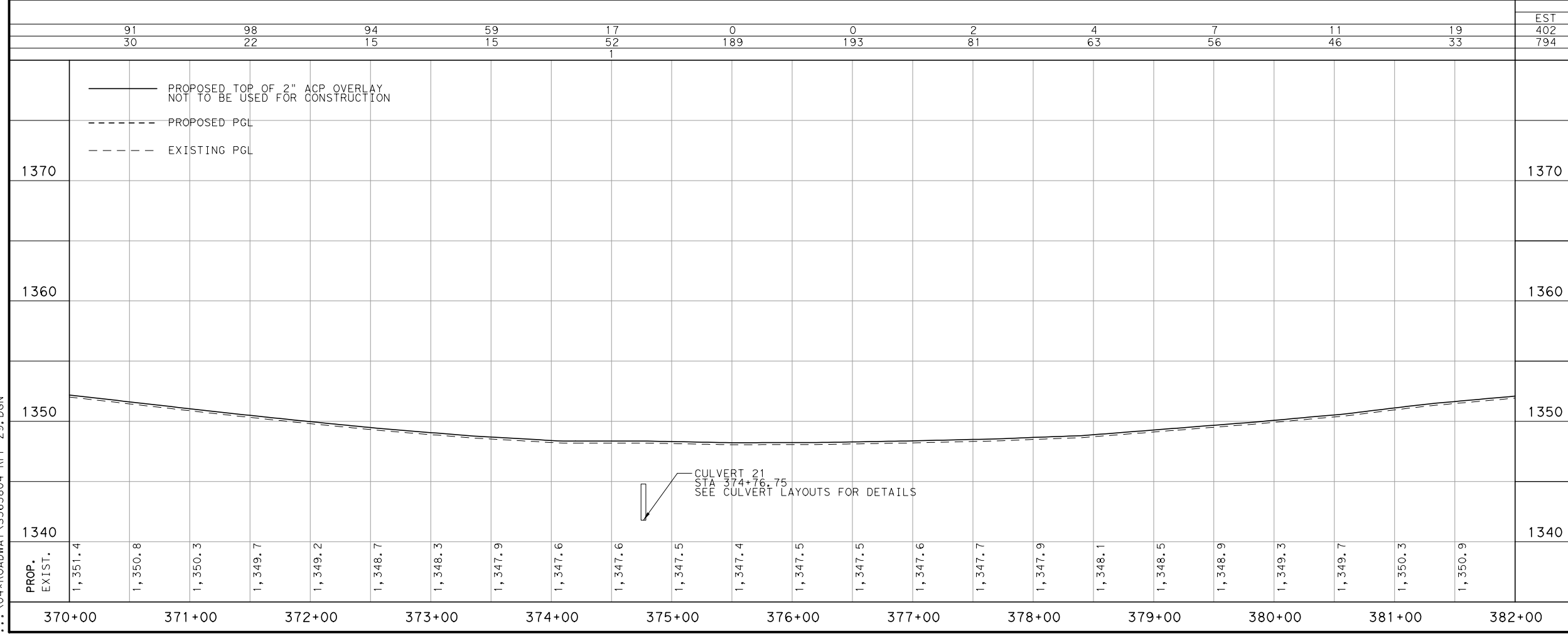


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
402		CY	EXCAVATION (RDWY)
794		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 370+00.00 TO STA 382+00.00**

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

SHEET 29 OF 56

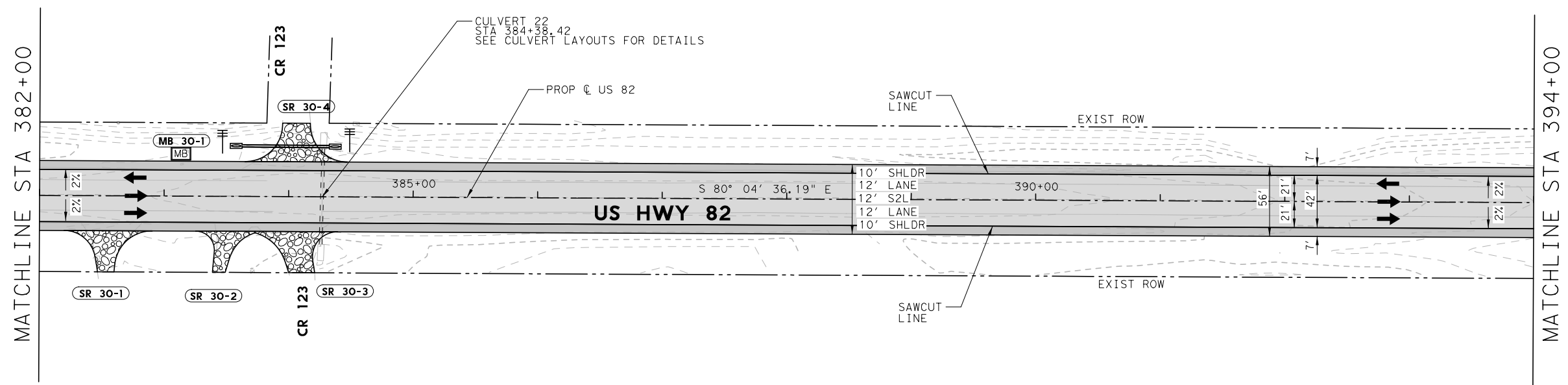
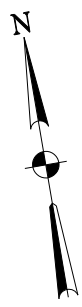


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 94
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

STATION	PROF. EXIST.	PROF. PROP.
382+00	1,351.36	1,351.36
383+00	1,351.73	1,352.05
384+00	1,352.32	1,352.42
385+00	1,352.28	1,352.44
386+00	1,352.38	1,352.36
387+00	1,352.36	1,352.35
388+00	1,352.35	1,352.38
389+00	1,352.43	1,352.49
390+00	1,352.41	1,352.31
391+00	1,352.18	1,351.71
392+00	1,352.02	1,351.33
393+00	1,350.93	1,350.57
394+00	1,349.57	1,349.15

SECTION TOTALS	
EST	FINAL
452	476
1	1

GREGORY O. DELGADO
   
 81454
   
 REGISTERED PROFESSIONAL ENGINEER
   
  
 12/14/2020

**PLAN & PROFILE**  
**STA 382+00.00 TO STA 394+00.00**  
 HORIZONTAL SCALE: 1" = 100'  
 VERTICAL SCALE: 1' = 10'  
 SHEET 30 OF 56

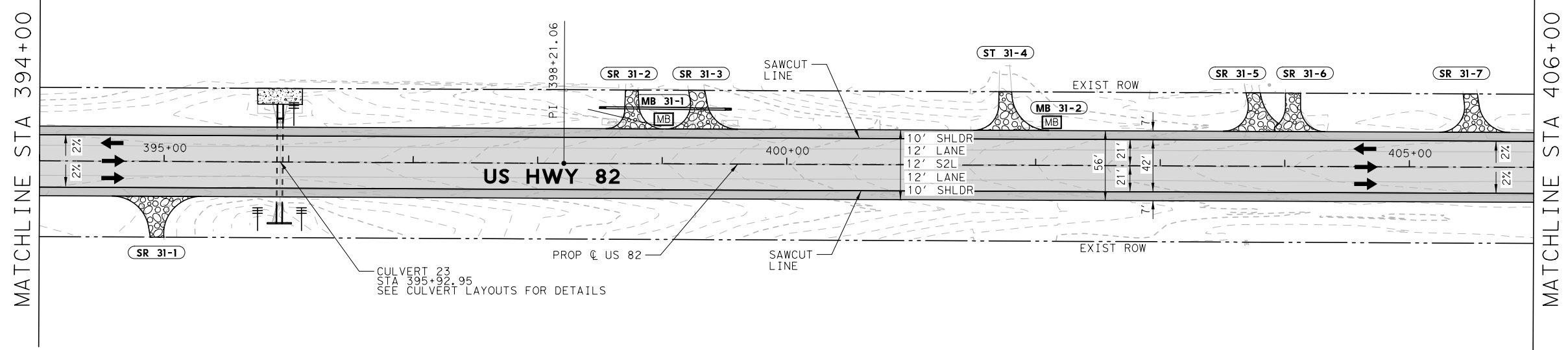
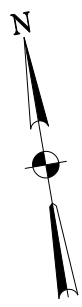


**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 95
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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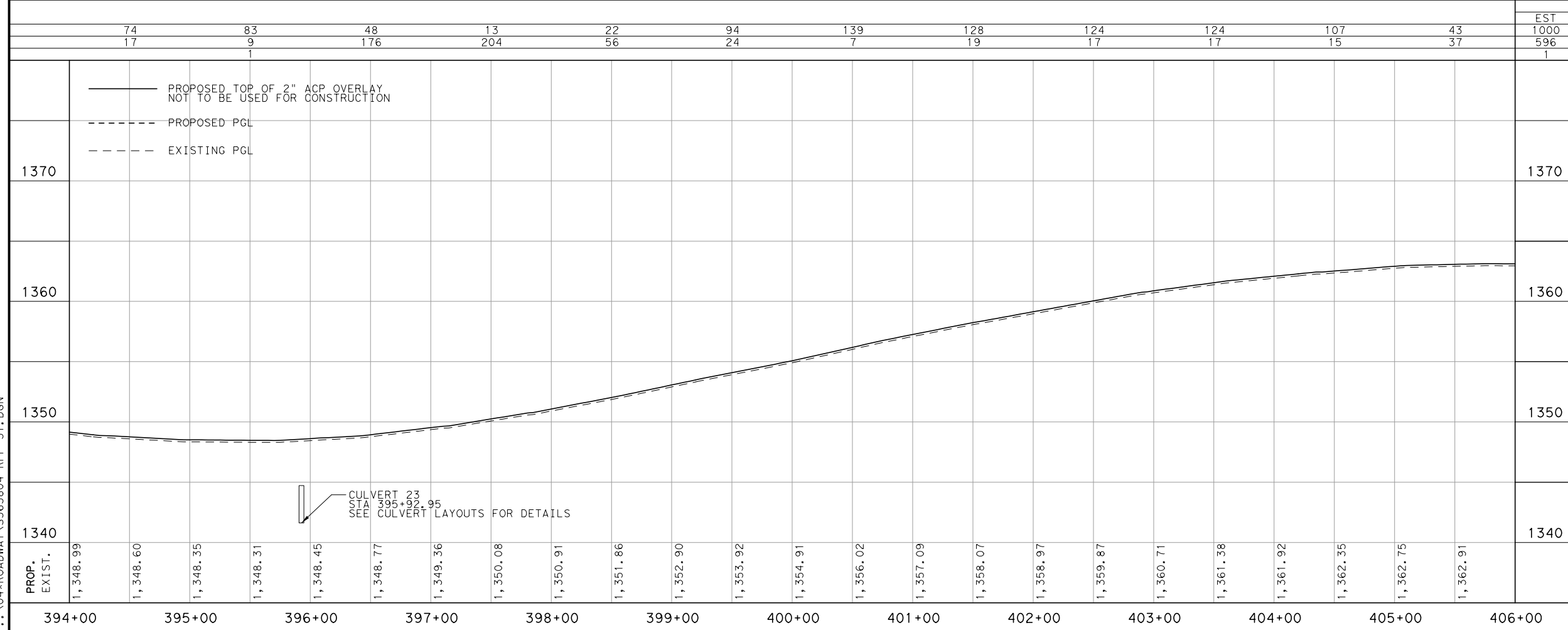




**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
1000		CY	EXCAVATION (RDWY)
596		CY	EMBANKMENT
1		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 394+00.00 TO STA 406+00.00**

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

SHEET 31 OF 56

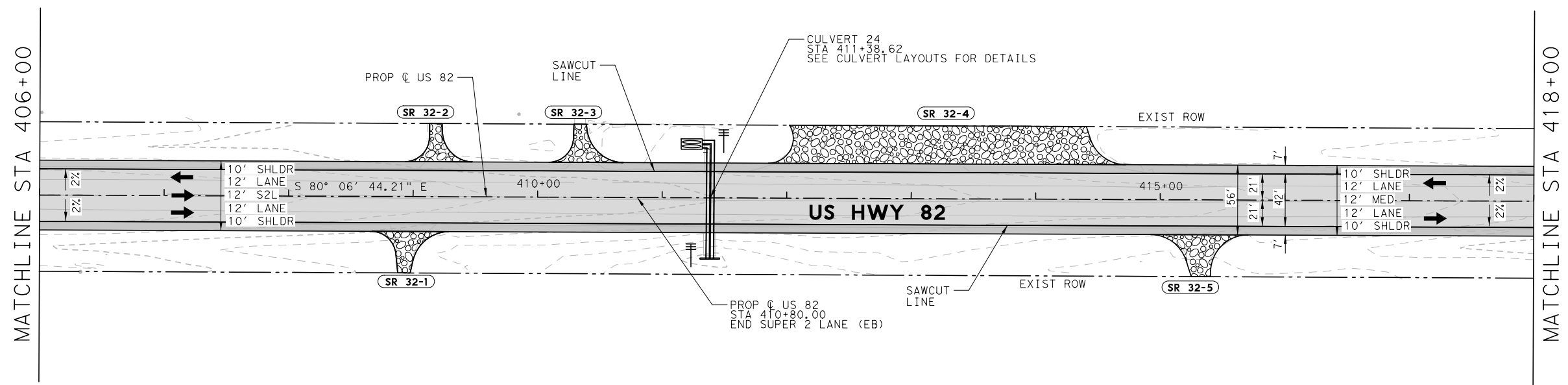
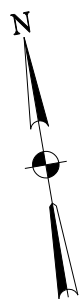


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 96
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

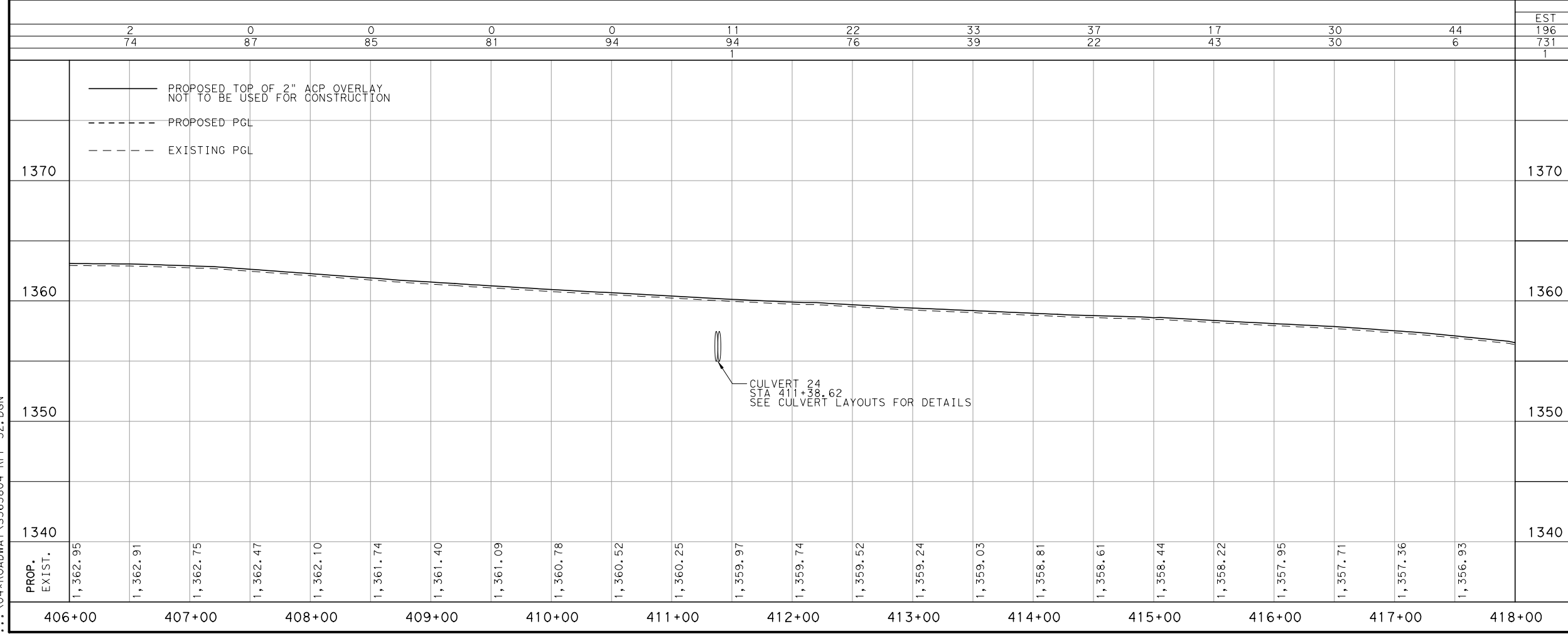
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**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
196		CY	EXCAVATION (RDWY)
731		CY	EMBANKMENT
1		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 406+00.00 TO STA 418+00.00**

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

SHEET 32 OF 56

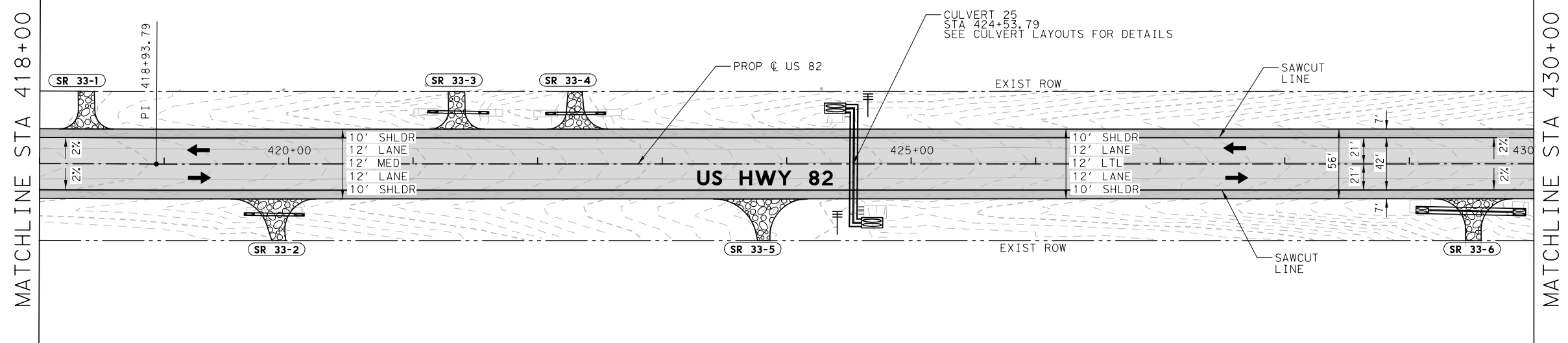
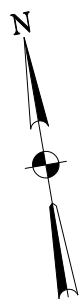


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 97
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

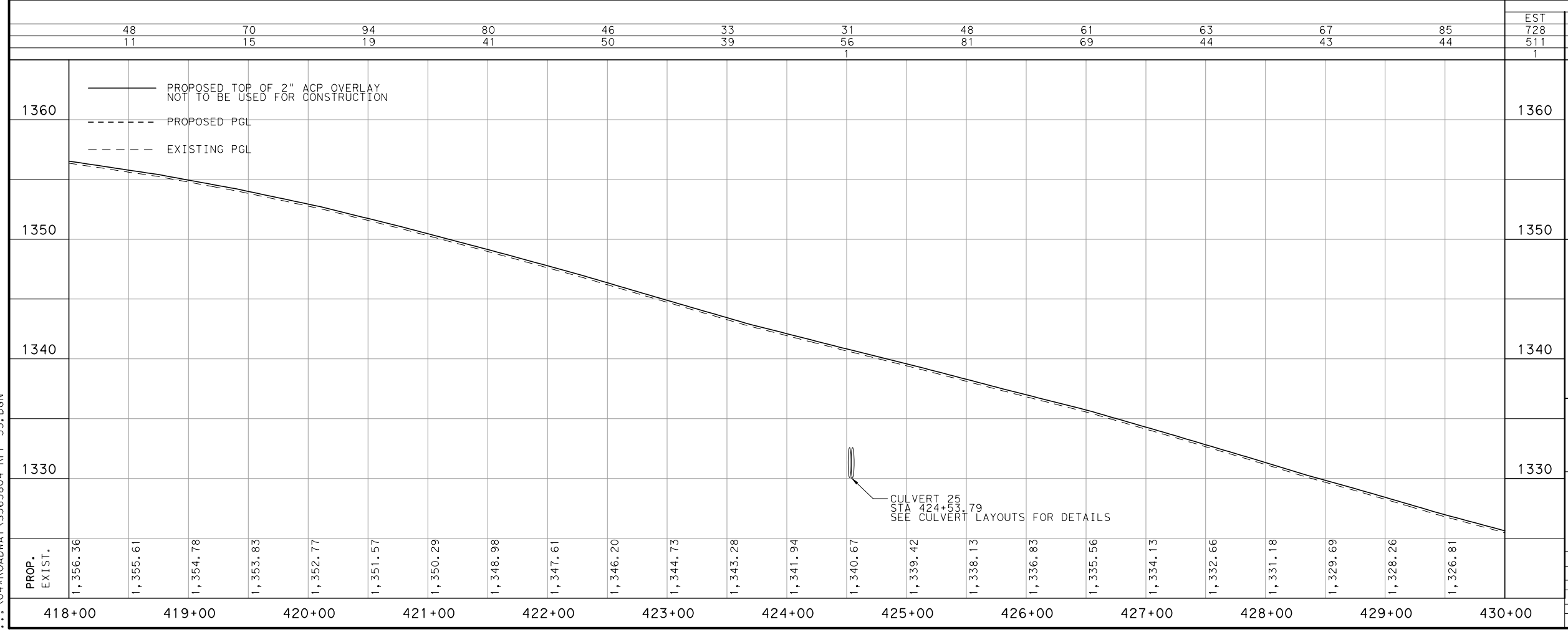
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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
728		CY	EXCAVATION (RDWY)
511		CY	EMBANKMENT
1		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 418+00.00 TO STA 430+00.00**

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

SHEET 33 OF 56

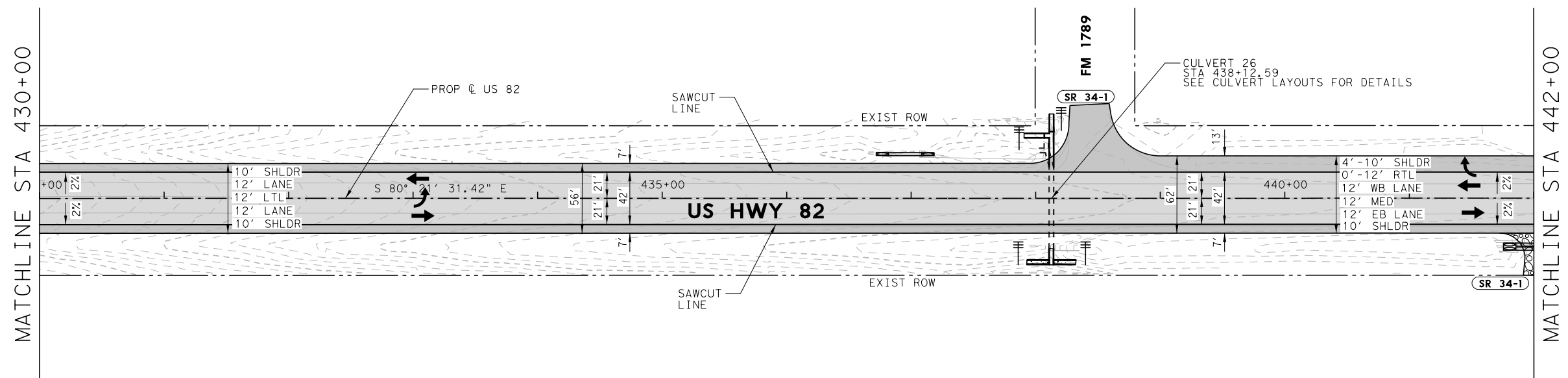
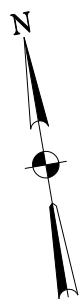


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 98
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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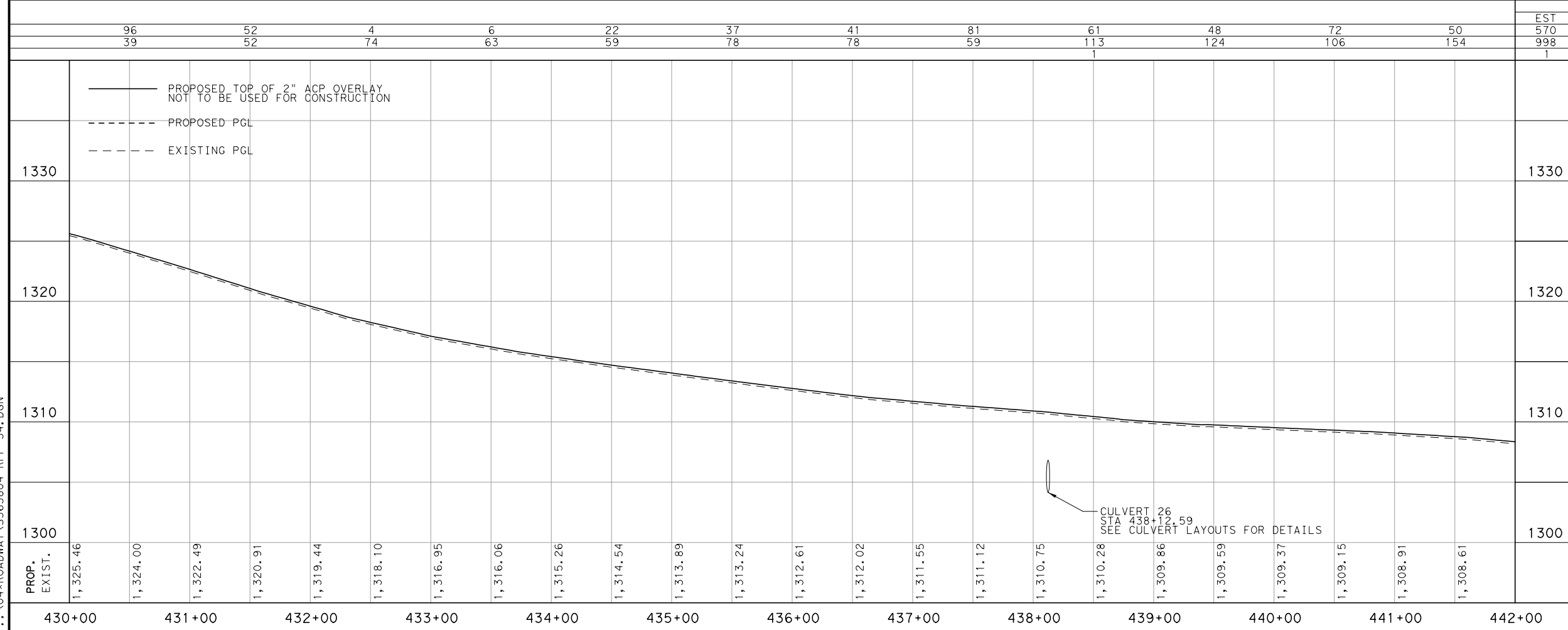


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
570		CY	EXCAVATION (RDWY)
998		CY	EMBANKMENT
1		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 430+00.00 TO STA 442+00.00**

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

SHEET 34 OF 56

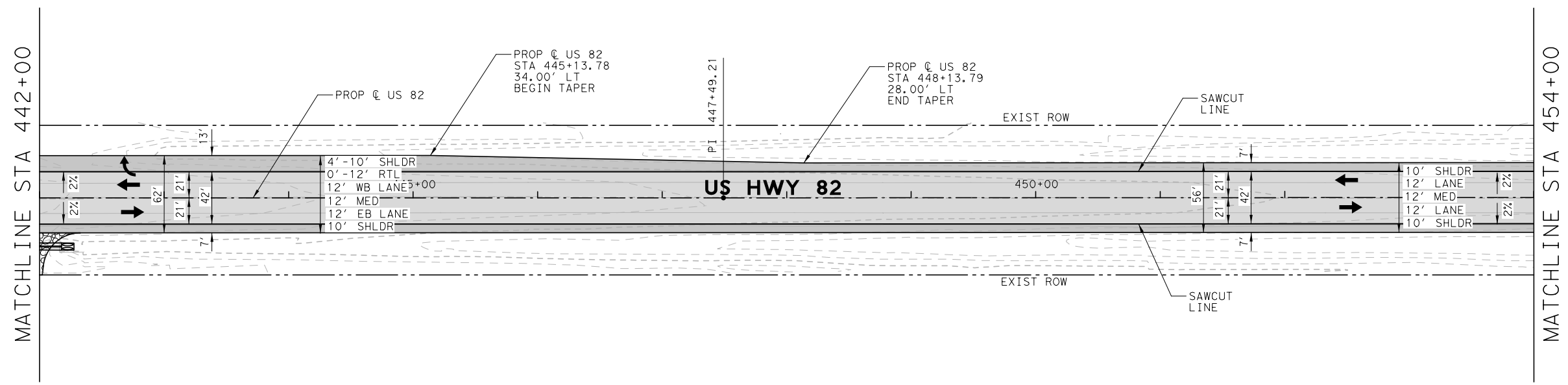
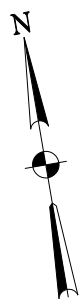


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 99
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

EST	FINAL	UNIT	DESCRIPTION
481		CY	EXCAVATION (RDWY)
1594		CY	EMBANKMENT
		STA	PREPARING ROW

PROF. EXIST.	442+00	443+00	444+00	445+00	446+00	447+00	448+00	449+00	450+00	451+00	452+00	453+00	454+00
1,308.19	1,307.80	1,307.70	1,307.44	1,307.16	1,306.88	1,306.77	1,306.63	1,306.49	1,306.27	1,306.09	1,305.94	1,305.88	1,305.78
1,305.68	1,305.59	1,305.47	1,305.34	1,305.21	1,305.09	1,304.98	1,304.84	1,304.64	1,304.45				

**SECTION TOTALS**

EST	FINAL	UNIT	DESCRIPTION
481		CY	EXCAVATION (RDWY)
1594		CY	EMBANKMENT
		STA	PREPARING ROW

PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION

PROPOSED PGL

EXISTING PGL

1320

1310

1300

1290

**PLAN & PROFILE**

**STA 442+00.00 TO STA 454+00.00**

HORIZONTAL SCALE: 1" = 100'

VERTICAL SCALE: 1' = 10'

SHEET 35 OF 56

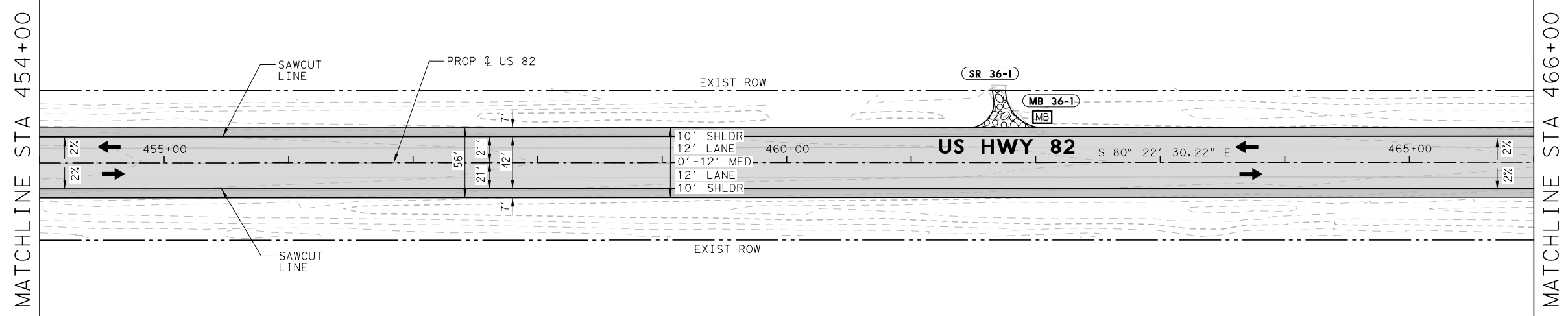
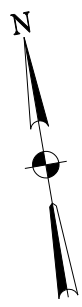
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**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 100
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

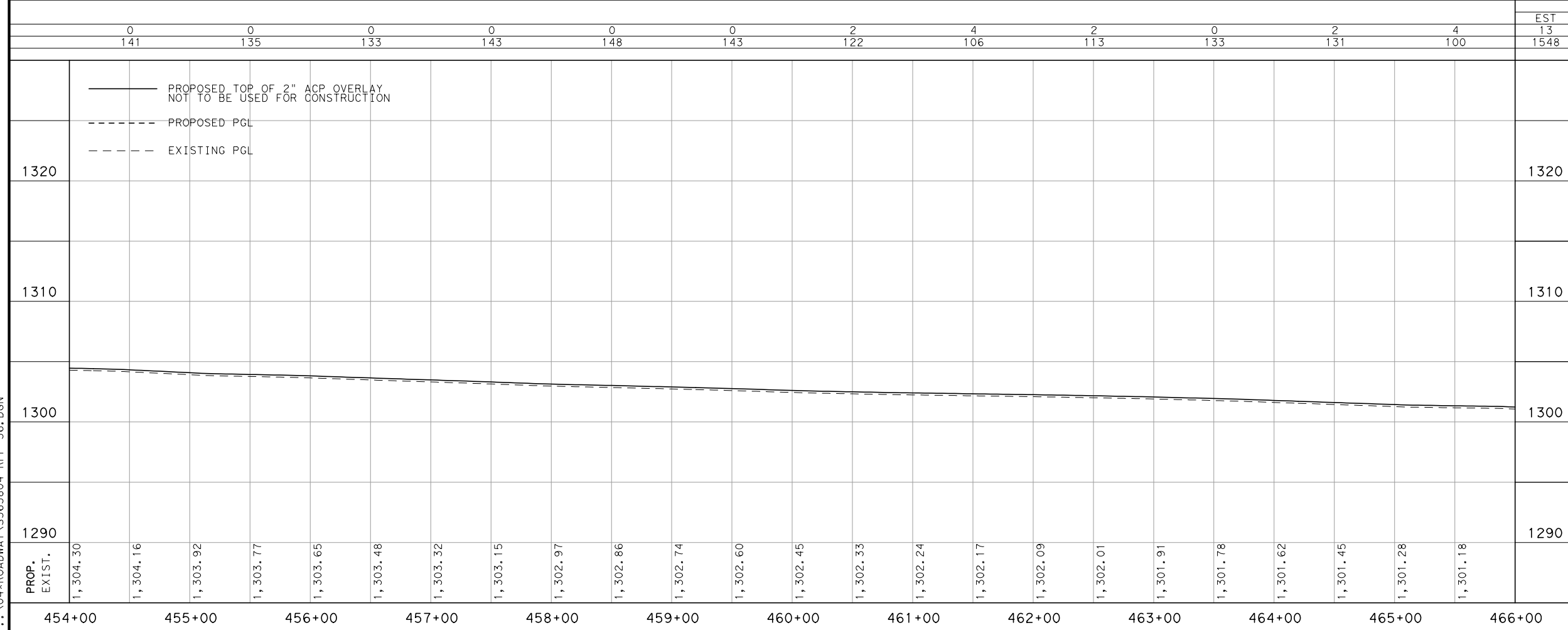
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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

**NOTES:**  
 1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS  
 2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
13		CY	EXCAVATION (RDWY)
1548		CY	EMBANKMENT
		STA	PREPARING ROW

GREGORY O. DELGADO  
 81454  
 REGISTERED PROFESSIONAL ENGINEER  
 12/14/2020

**PLAN & PROFILE**  
**STA 454+00.00 TO STA 466+00.00**

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

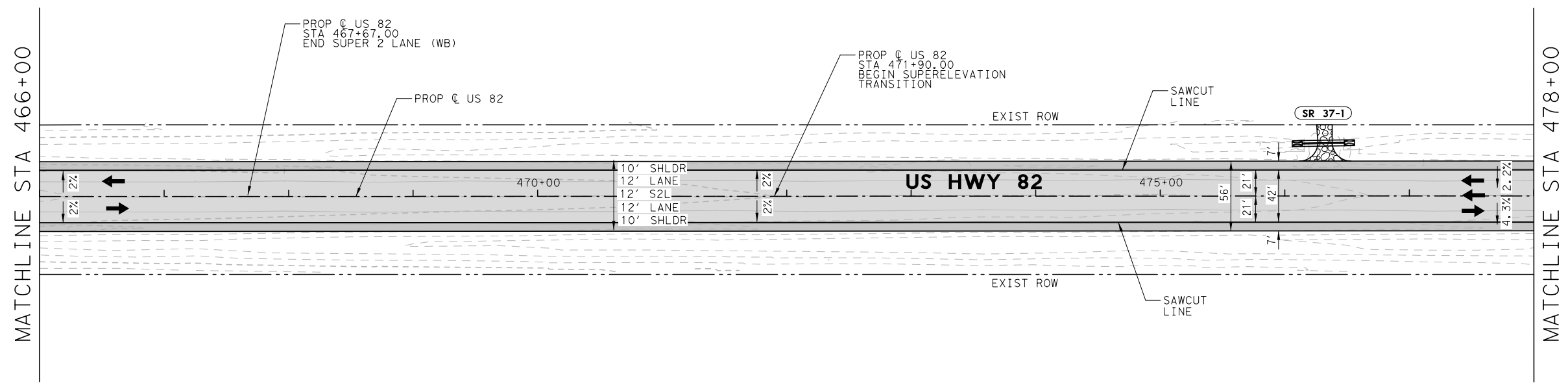
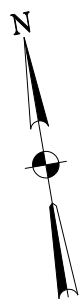
SHEET 36 OF 56

Texas Department of Transportation

**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		101
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

EST	FINAL	UNIT	DESCRIPTION
76		CY	EXCAVATION (RDWY)
1106		CY	EMBANKMENT
		STA	PREPARING ROW

SECTION TOTALS	EST	FINAL	UNIT	DESCRIPTION
	76		CY	EXCAVATION (RDWY)
	1106		CY	EMBANKMENT
			STA	PREPARING ROW

PROF. EXIST.	466+00	467+00	468+00	469+00	470+00	471+00	472+00	473+00	474+00	475+00	476+00	477+00	478+00										
1,301.08	1,300.91	1,300.79	1,300.73	1,300.70	1,300.54	1,300.45	1,300.40	1,300.32	1,300.26	1,300.18	1,300.07	1,299.98	1,299.90	1,299.81	1,299.69	1,299.60	1,299.49	1,299.37	1,299.30	1,299.20	1,299.03	1,298.91	1,298.75

1320

1310

1300

1290

PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION

PROPOSED PGL

EXISTING PGL

12/14/2020

**PLAN & PROFILE**

**STA 466+00.00 TO STA 478+00.00**

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

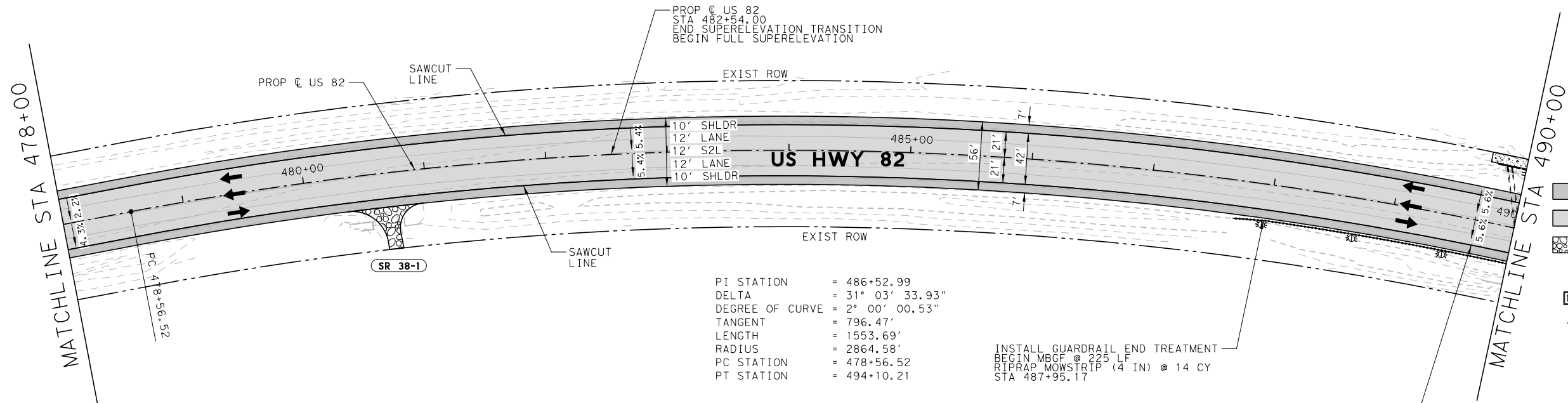
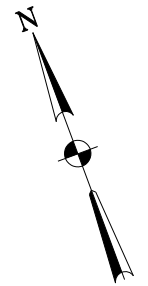
SHEET 37 OF 56

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**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		102	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

**NOTES:**  
 1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS  
 2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

REMOVE EXIST MBGF @ 125 LF  
 REMOVE EXISTING TERMINAL ANCHOR SECTIONS

INSTALL GUARDRAIL END TREATMENT  
 BEGIN MBGF @ 225 LF  
 RIPRAP MOWSTRIP (4 IN) @ 14 CY  
 STA 487+95.17

STATION	SECTION TOTALS																	
	20	65	63	80	91	41	35	30	26	26	15	2	EST	FINAL	UNIT	DESCRIPTION		
	117	111	107	102	98	100	109	111	117	131	228	417	493		CY	EXCAVATION (RDWY)		
													1748		CY	EMBANKMENT		
															STA	PREPARING ROW		

PROF. EXIST.	478+00	479+00	480+00	481+00	482+00	483+00	484+00	485+00	486+00	487+00	488+00	489+00	490+00										
1,298.58	1,298.45	1,298.37	1,298.26	1,298.10	1,297.94	1,297.87	1,297.79	1,297.67	1,297.54	1,297.50	1,297.44	1,297.33	1,297.26	1,297.22	1,297.18	1,297.16	1,297.15	1,297.15	1,297.18	1,297.19	1,297.19	1,297.19	1,297.18

PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION  
 PROPOSED PGL  
 EXISTING PGL

1310  
1300  
1290  
1280

**PLAN & PROFILE**  
 STA 478+00.00 TO STA 490+00.00  
 HORIZONTAL SCALE: 1" = 100'  
 VERTICAL SCALE: 1' = 10'

SHEET 38 OF 56

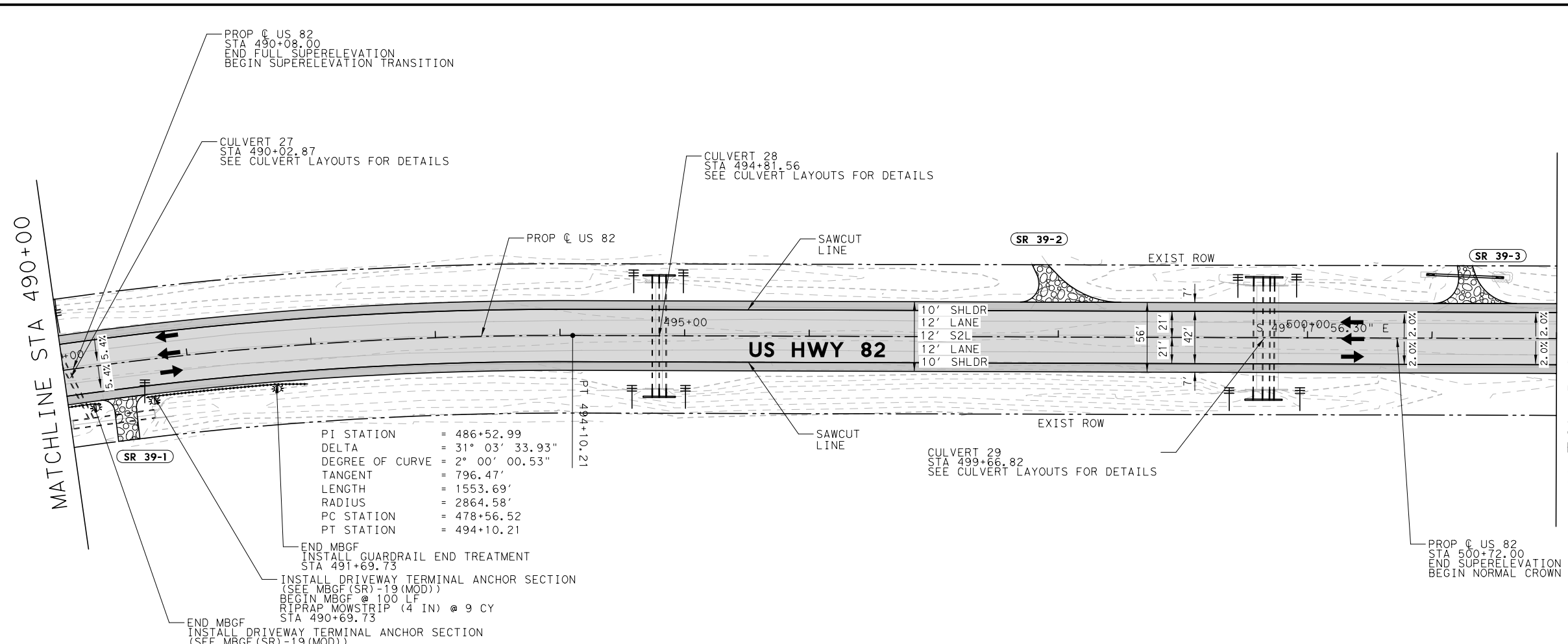
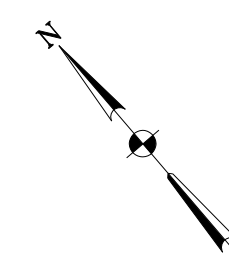
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 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 103
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/14/2020 4:58:07 PM  
 ... \04\ROADWAY\5563804-RPP-38.DGN





**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

		SECTION TOTALS															EST	FINAL	UNIT	DESCRIPTION						
		0	0	0	0	0	7	7	2	11	13	33	37	EST	FINAL	CY	EXCAVATION (RDWY)									
		500	578	652	630	589	541	422	231	141	135	72	15	4506		CY	EMBANKMENT									
														3		STA	PREPARING ROW									
1310	— PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION - - - PROPOSED PGL - - - EXISTING PGL																									
1300																										
1290																										
1280																										
PROP. EXIST.		1,297.18	1,297.29	1,297.31	1,297.31	1,297.40	1,297.41	1,297.37	1,297.32	1,297.21	1,297.16	1,297.13	1,297.04	1,297.05	1,297.08	1,297.09	1,297.10	1,297.11	1,297.23	1,297.24	1,297.28	1,297.32	1,297.29	1,297.33	1,297.35	
		490+00	491+00	492+00	493+00	494+00	495+00	496+00	497+00	498+00	499+00	500+00	501+00	502+00												

**PLAN & PROFILE**  
**STA 490+00.00 TO STA 502+00.00**

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

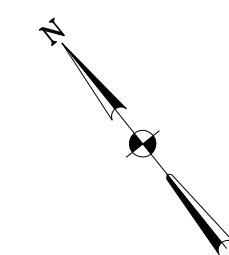
SHEET 39 OF 56

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 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

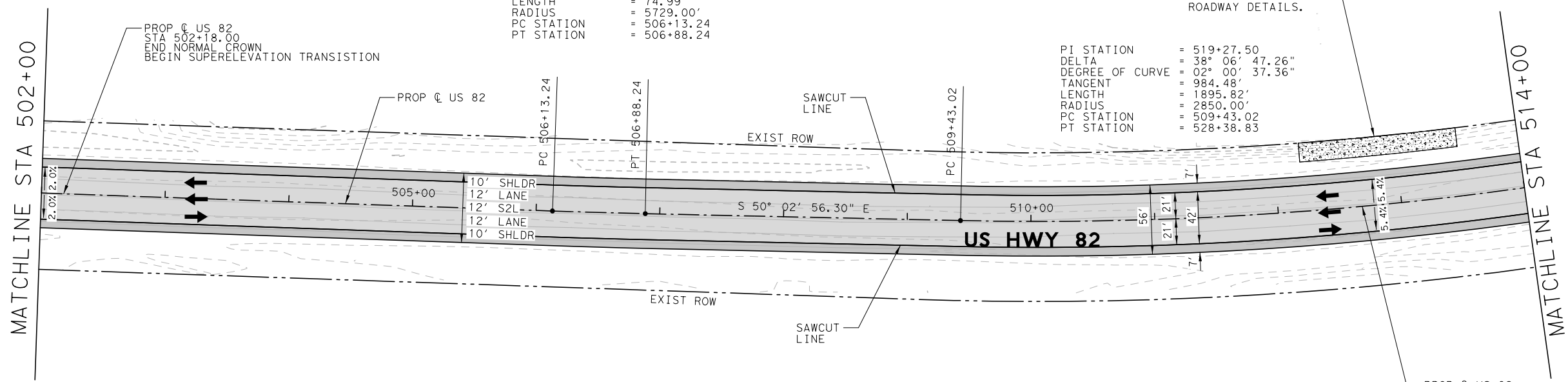
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		104
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

12/14/2020 4:58:08 PM  
 ... \04\ROADWAY\5563804-RPP-39.DGN



PI STATION = 506+50.74  
 DELTA = 00° 45' 00.00"  
 DEGREE OF CURVE = 01° 00' 00.36"  
 TANGENT = 37.50'  
 LENGTH = 74.99'  
 RADIUS = 5729.00'  
 PC STATION = 506+13.24  
 PT STATION = 506+88.24

PI STATION = 519+27.50  
 DELTA = 38° 06' 47.26"  
 DEGREE OF CURVE = 02° 00' 37.36"  
 TANGENT = 984.48'  
 LENGTH = 1895.82'  
 RADIUS = 2850.00'  
 PC STATION = 509+43.02  
 PT STATION = 528+38.83



**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

STATION	SECTION TOTALS									
	EST	FINAL	UNIT	DESCRIPTION	EST	FINAL	UNIT	DESCRIPTION	EST	FINAL
502+00	31	54	50	31	22	22	31	54	85	89
503+00	20	15	11	17	31	48	57	74	93	85
504+00										
505+00										
506+00										
507+00										
508+00										
509+00										
510+00										
511+00										
512+00										
513+00										
514+00										

EST	FINAL	UNIT	DESCRIPTION
550		CY	EXCAVATION (RDWY)
578		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 502+00.00 TO STA 514+00.00**

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

SHEET 40 OF 56

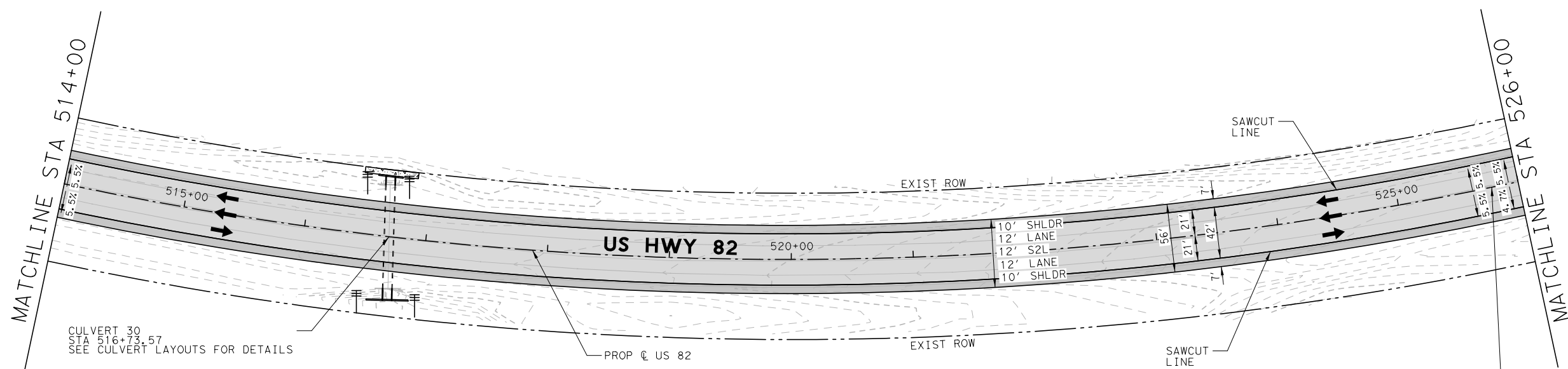
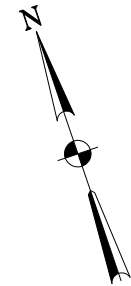


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 105
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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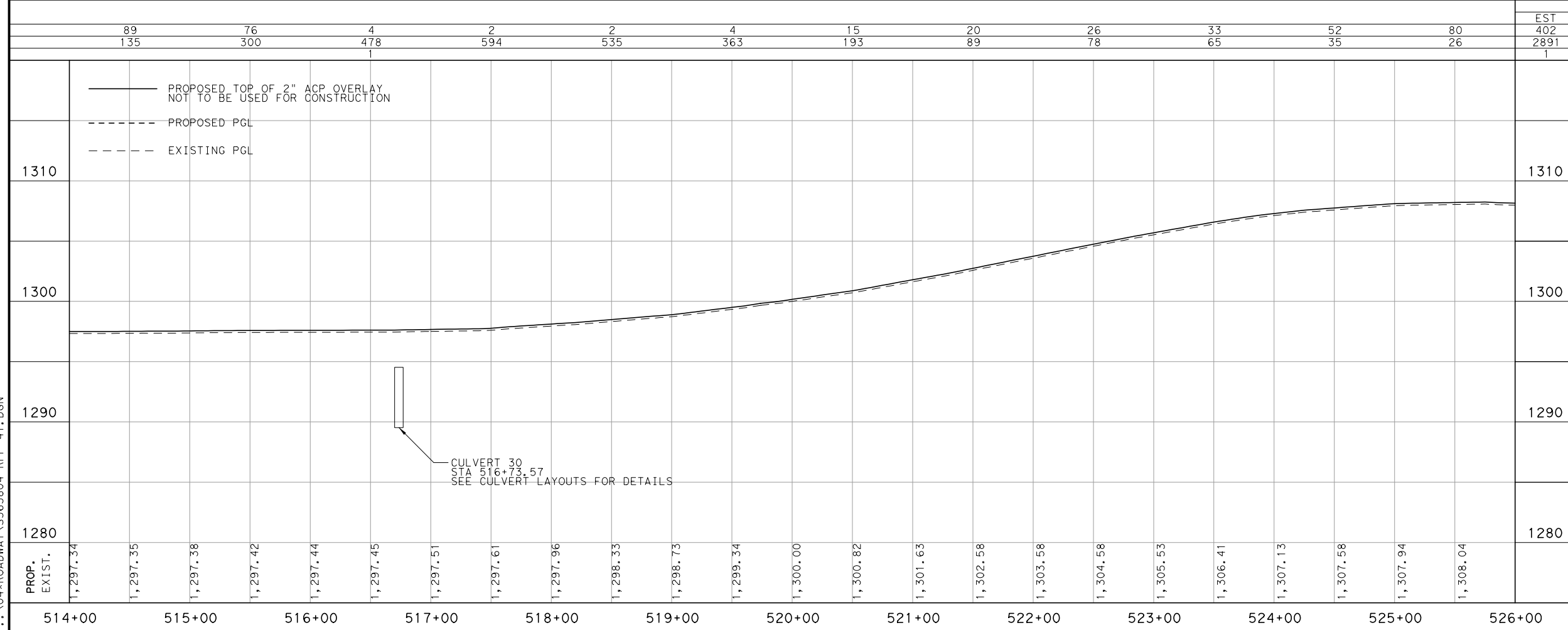
**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

PI STATION = 519+27.50  
 DELTA = 38° 06' 47.26"  
 DEGREE OF CURVE = 02° 00' 37.36"  
 TANGENT = 984.48'  
 LENGTH = 1895.82'  
 RADIUS = 2850.00'  
 PC STATION = 509+43.02  
 PT STATION = 528+38.83

PROP C US 82  
 STA 525+78.00  
 END FULL SUPERELEVATION  
 BEGIN SUPERELEVATION TRANSITION

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



		SECTION TOTALS			
		EST	FINAL	UNIT	DESCRIPTION
		402		CY	EXCAVATION (RDWY)
		2891		CY	EMBANKMENT
		1		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 514+00.00 TO STA 526+00.00**

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

SHEET 41 OF 56

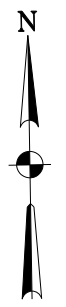


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

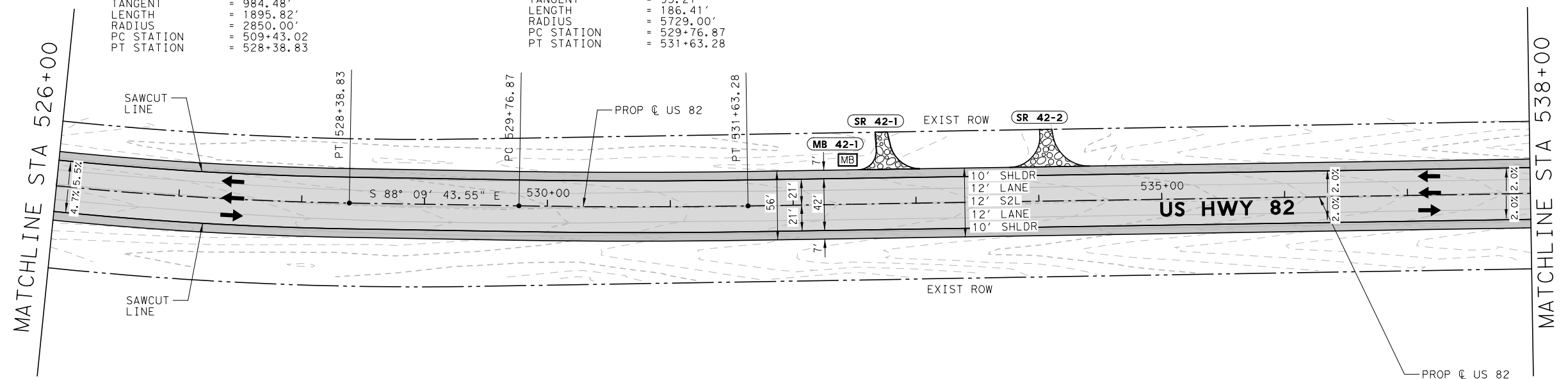
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 106
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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 ... \04\ROADWAY\5563804-RPP-41.DGN



PI STATION = 519+27.50  
 DELTA = 38° 06' 47.26"  
 DEGREE OF CURVE = 02° 00' 37.36"  
 TANGENT = 984.48'  
 LENGTH = 1895.82'  
 RADIUS = 2850.00'  
 PC STATION = 509+43.02  
 PT STATION = 528+38.83

PI STATION = 530+70.08  
 DELTA = 01° 51' 51.41"  
 DEGREE OF CURVE = 01° 00' 00.36"  
 TANGENT = 93.21'  
 LENGTH = 186.41'  
 RADIUS = 5729.00'  
 PC STATION = 529+76.87  
 PT STATION = 531+63.28

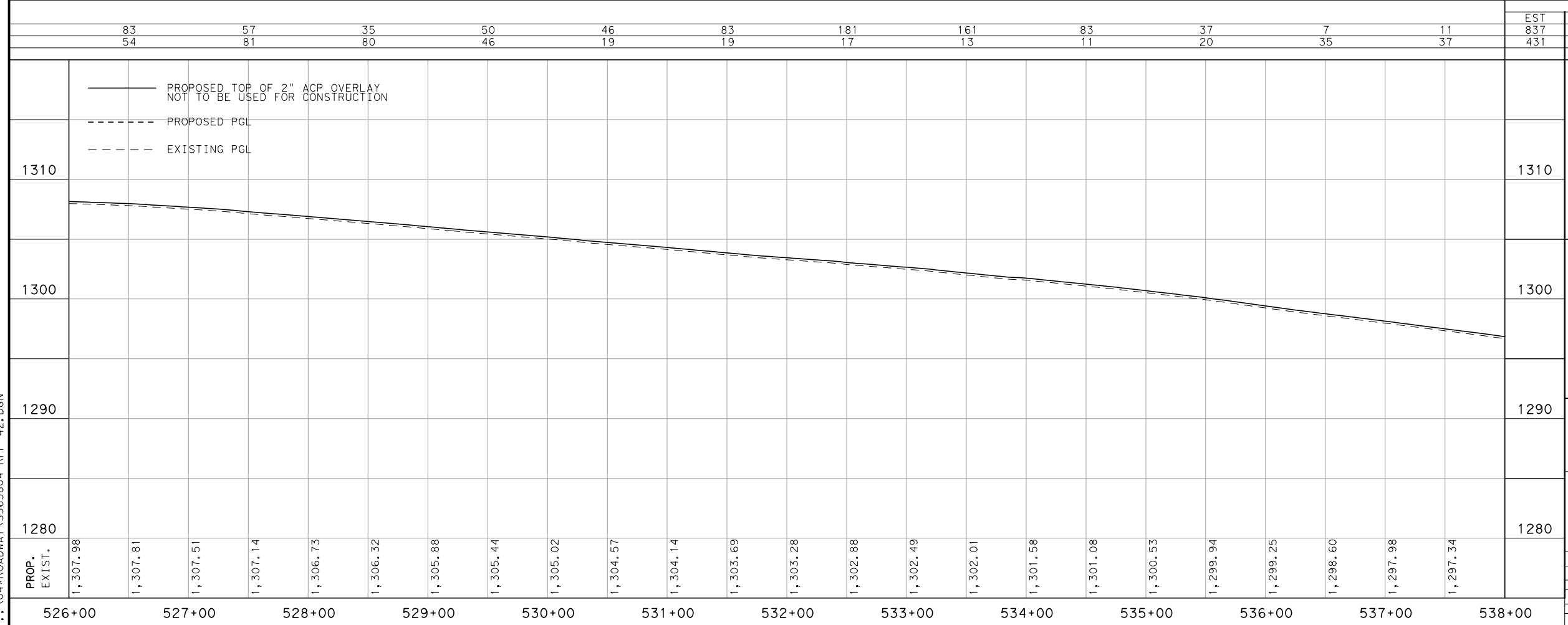


**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

PROP C US 82  
 STA 536+28.00  
 END SUPERELEVATION TRANSITION  
 BEGIN NORMAL CROWN

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
837	837	CY	EXCAVATION (RDWY)
431		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

**PLAN & PROFILE**

**STA 526+00.00 TO STA 538+00.00**

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

SHEET 42 OF 56

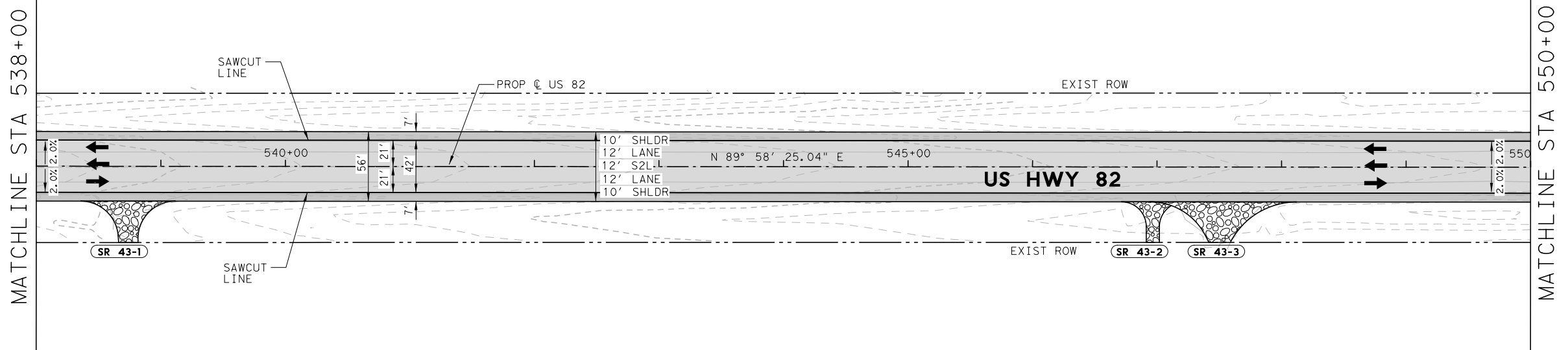


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 107
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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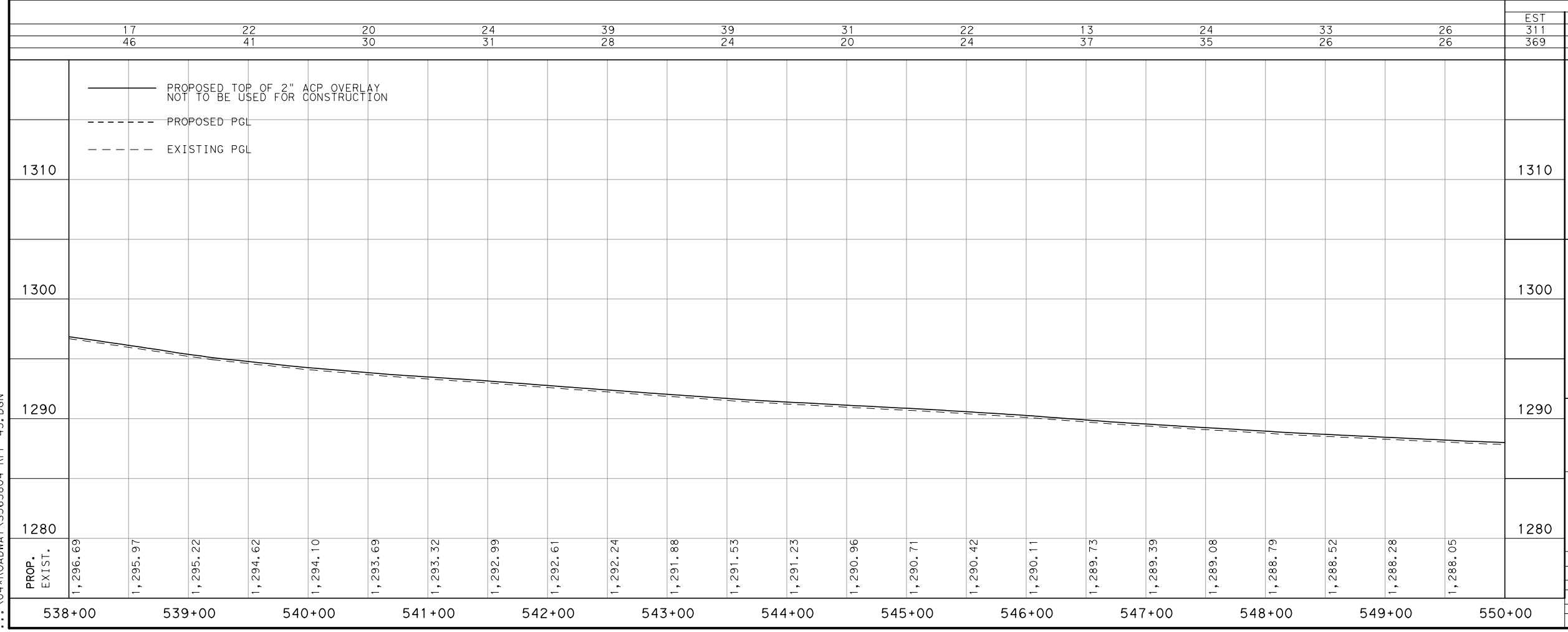


**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
- ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
311		CY	EXCAVATION (RDWY)
369		CY	EMBANKMENT
		STA	PREPARING ROW



12/14/2020

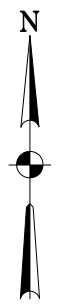
**PLAN & PROFILE**  
**STA 538+00.00 TO STA 550+00.00**  
 HORIZONTAL SCALE: 1" = 100'  
 VERTICAL SCALE: 1" = 10'  
 SHEET 43 OF 56



**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

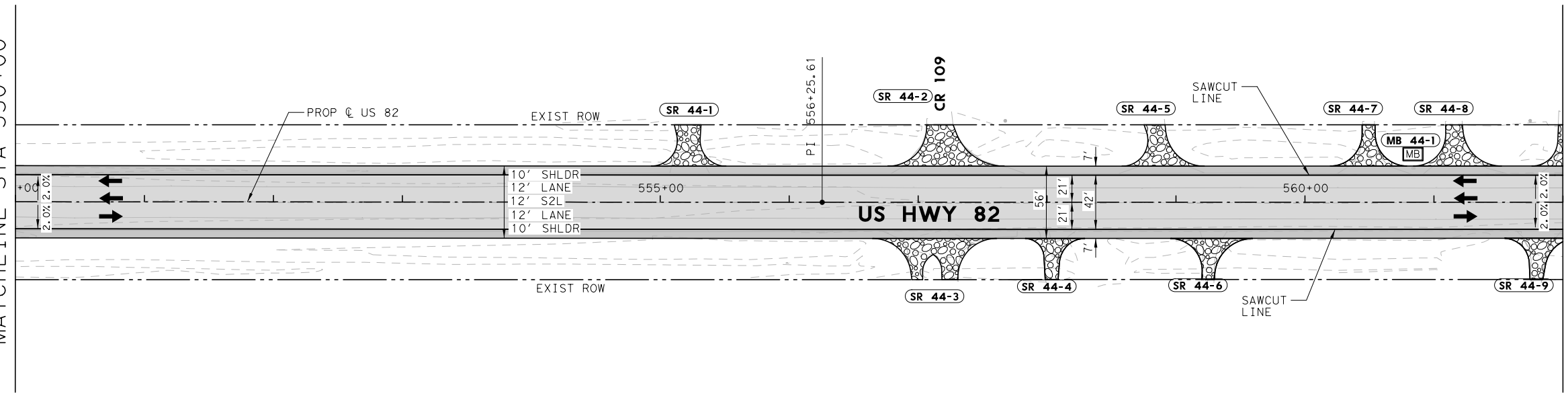
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		108
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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 ... \04\ROADWAY\5563804-RPP-43.DGN



MATCHLINE STA 550+00

MATCHLINE STA 562+00



**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

STA	SECTION TOTALS															EST	FINAL	UNIT	DESCRIPTION									
	37	61	61	50	37	30	39	74	117	130	124	135	894	109	CY					EXCAVATION (RDWY)	CY	EMBANKMENT	STA	PREPARING ROW				
550+00	1,287.84	1,287.67	1,287.61	1,287.55	1,287.49	1,287.43	1,287.40	1,287.39	1,287.39	1,287.36	1,287.31	1,287.21	1,287.14	1,287.08	1,287.00	1,286.94	1,286.89	1,286.92	1,286.92	1,286.90	1,286.82	1,286.78	1,286.76	1,286.69				

PROPOSED TOP OF 2" ACP OVERLAY  
NOT TO BE USED FOR CONSTRUCTION

PROPOSED PGL

EXISTING PGL

**GREGORY O. DELGADO**  
81454  
REGISTERED PROFESSIONAL ENGINEER

*Gregory O. Delgado*

12/14/2020

**PLAN & PROFILE**

**STA 550+00.00 TO STA 562+00.00**

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

SHEET 44 OF 56

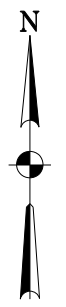
**Texas Department of Transportation**

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

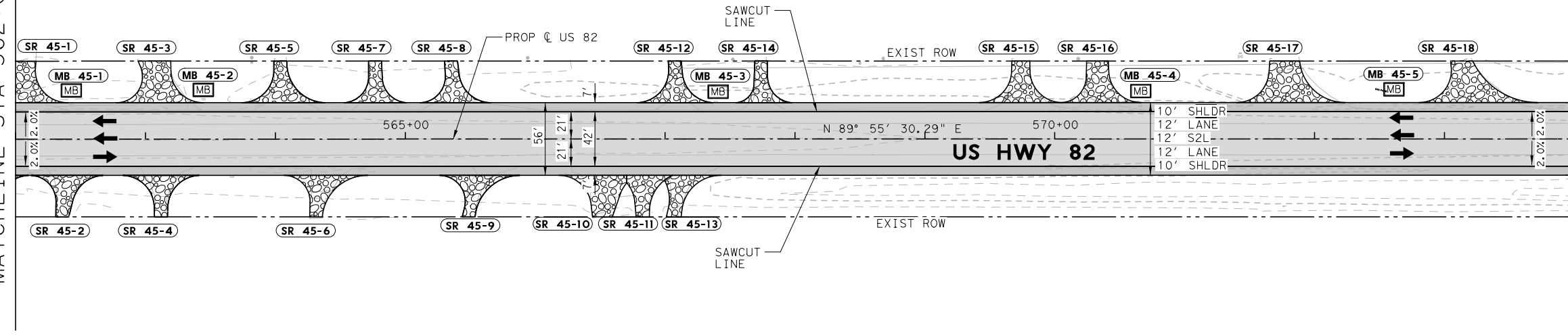
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		109	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/14/2020 4:58:11 PM ... \04\ROADWAY\5563804-RPP-44.DGN



MATCHLINE STA 562+00

MATCHLINE STA 574+00



**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

PROF. EXIST.	SECTION TOTALS																		
	154	148	126	102	87	76	61	57	63	69	72	67	EST	FINAL	UNIT	DESCRIPTION			
1,286.63	0	0	0	2	4	4	6	7	6	6	7	9	1081		CY	EXCAVATION (RDWY)			
1,286.56													50		CY	EMBANKMENT			
1,286.57															STA	PREPARING ROW			
1,286.55																			
1,286.51																			
1,286.45																			
1,286.42																			
1,286.42																			
1,286.39																			
1,286.36																			
1,286.34																			
1,286.28																			
1,286.20																			
1,286.09																			
1,285.98																			
1,285.88																			
1,285.79																			
1,285.70																			
1,285.62																			
1,285.57																			
1,285.52																			
1,285.48																			
1,285.47																			
1,285.40																			

**PLAN & PROFILE**

**STA 562+00.00 TO STA 574+00.00**

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

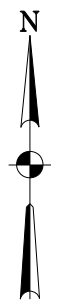
SHEET 45 OF 56

**Gregory O. Delgado**  
12/14/2020

**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

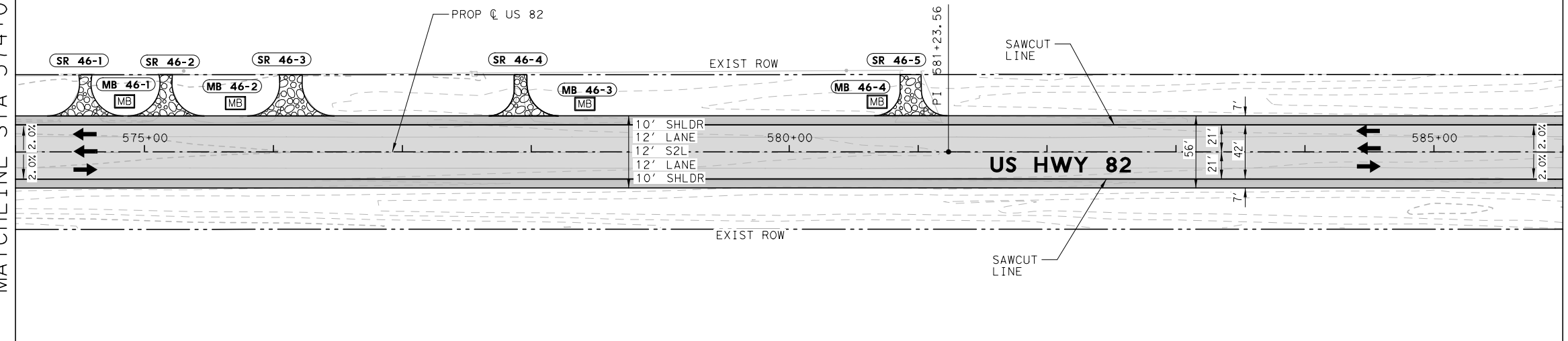
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 110
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 4:58:12 PM ... \04\ROADWAY\5563804-RPP-45.DGN



MATCHLINE STA 574+00

MATCHLINE STA 586+00



**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

STA	SECTION TOTALS																EST	FINAL	UNIT	DESCRIPTION
	67	69	69	65	59	56	48	39	24	13	9	4	520	CY	EXCAVATION (RDWY)					
	11	17	22	24	26	28	33	35	33	39	44	106	419		CY	EMBANKMENT				
															STA	PREPARING ROW				

STATE OF TEXAS  
  
 GREGORY O. DELGADO  
 81454  
 REGISTERED PROFESSIONAL ENGINEER  
*Gregory O. Delgado*  
 12/14/2020

**PLAN & PROFILE**  
**STA 574+00.00 TO STA 586+00.00**  
 HORIZONTAL SCALE: 1" = 100'  
 VERTICAL SCALE: 1' = 10'  
 SHEET 46 OF 56

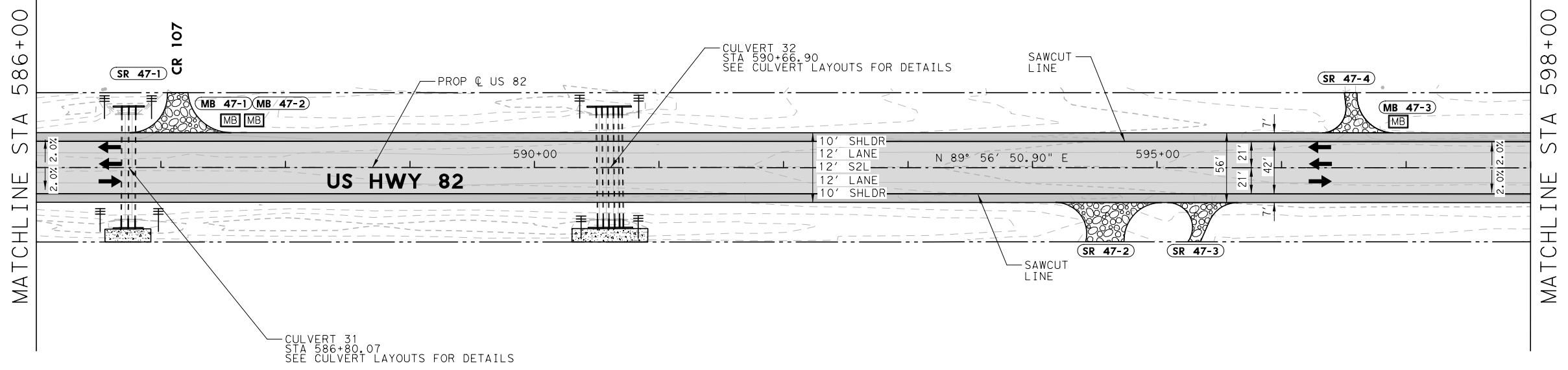
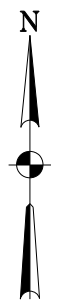
Texas Department of Transportation

**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		111
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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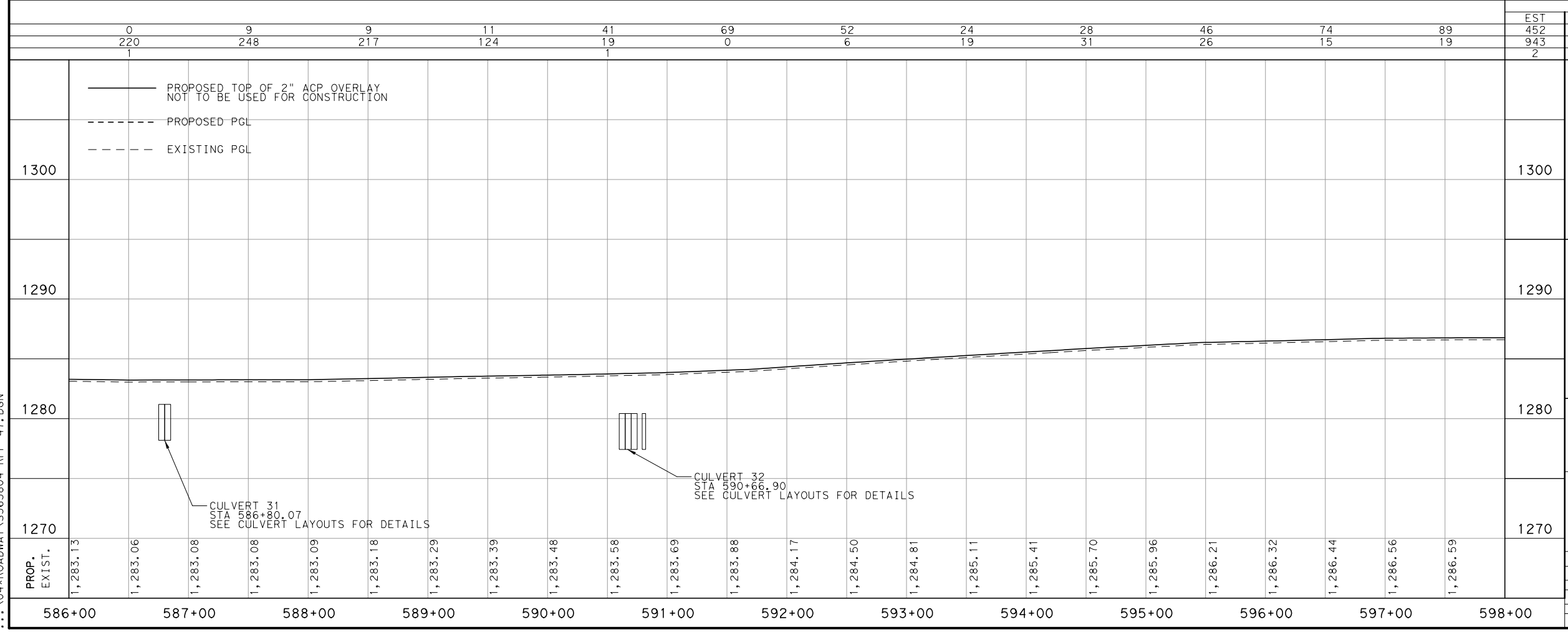




**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
- SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  - ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



12/14/2020

**PLAN & PROFILE**

**STA 586+00.00 TO STA 598+00.00**

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

SHEET 47 OF 56

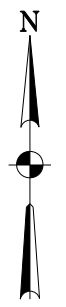


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

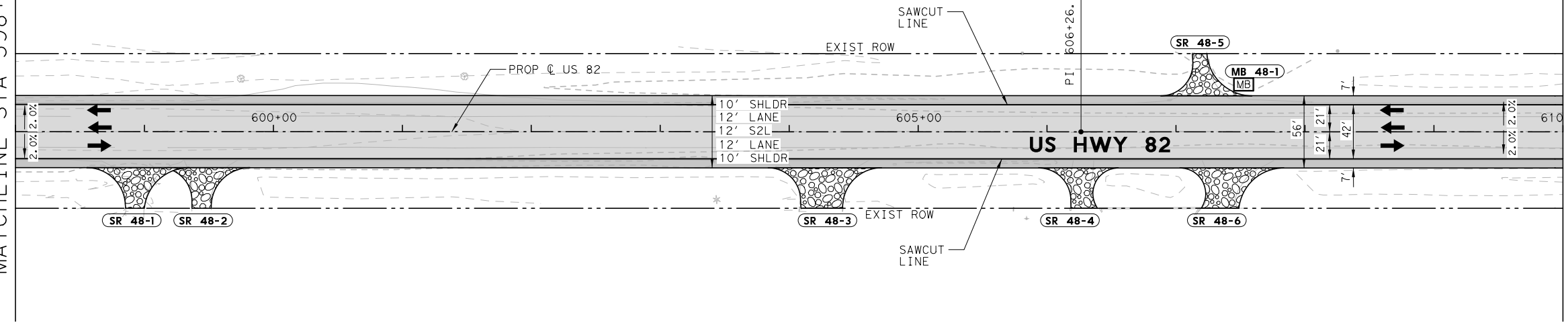
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		112
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

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... \04\ROADWAY\5563804-RPP-47.DGN



MATCHLINE STA 598+00

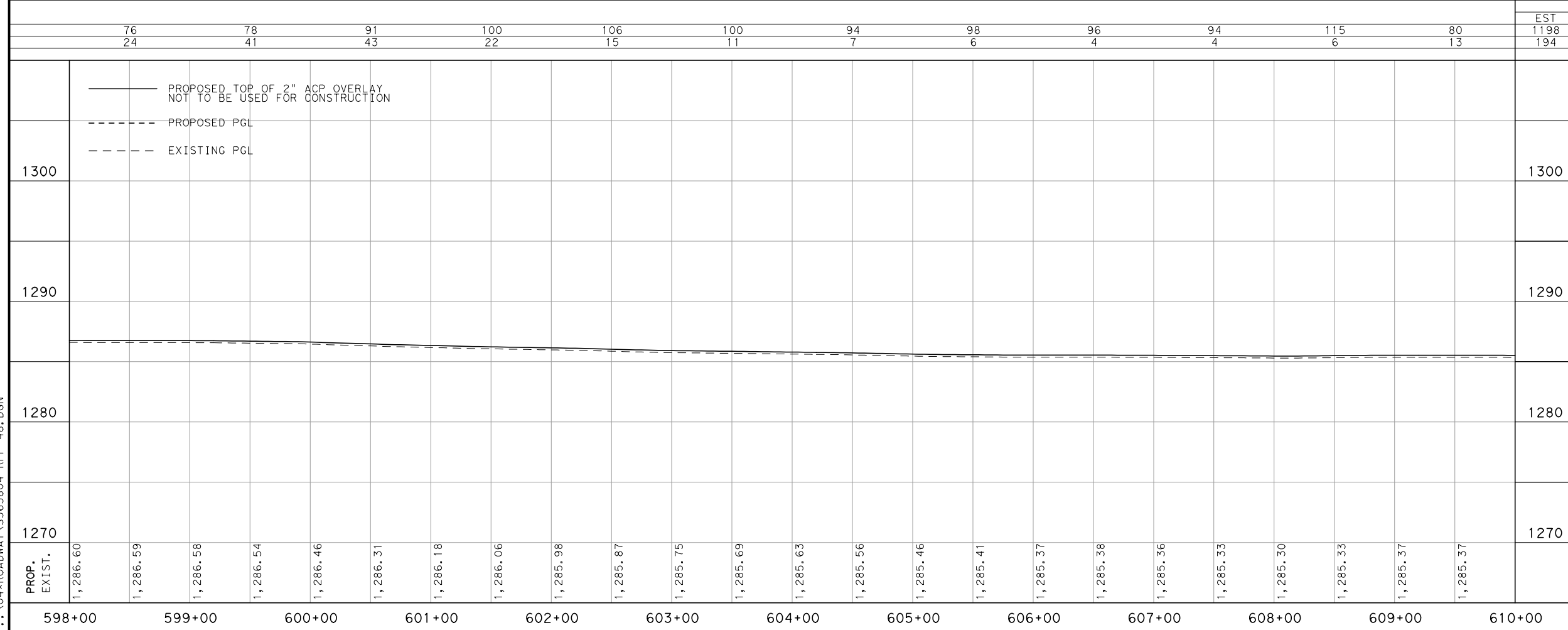
MATCHLINE STA 610+00



**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



SECTION TOTALS			
EST	FINAL	UNIT	DESCRIPTION
1198		CY	EXCAVATION (RDWY)
194		CY	EMBANKMENT
		STA	PREPARING ROW

12/14/2020

**PLAN & PROFILE**

**STA 598+00.00 TO STA 610+00.00**

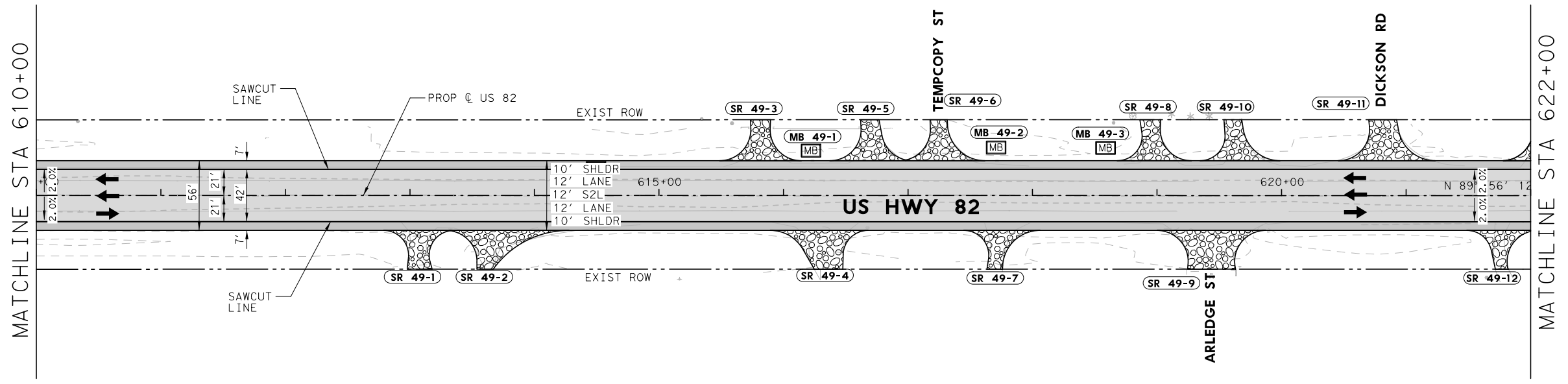
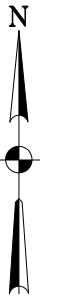
HORIZONTAL SCALE: 1" = 100'  
VERTICAL SCALE: 1' = 10'

SHEET 48 OF 56

**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 113
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 4:58:14 PM ... \04\ROADWAY\5563804-RPP-48.DGN



**LEGEND**

	LIMITS OF PAVEMENT WIDENING
	LIMITS OF PAVEMENT OVERLAY
	LIMITS OF PROPOSED DRIVEWAY
	OBJECT MARKER
	MAILBOX
	DELINEATOR

**NOTES:**  
 1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS  
 2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

STA	SECTION TOTALS																	EST	FINAL	UNIT	DESCRIPTION
	33	39	46	52	52	41	44	59	67	67	74	74	648	120	CY	CY	STA				
610+00	33	39	46	52	52	41	44	59	67	67	74	74	648	120							
611+00	22	22	20	13	6	9	7	4	4	4	4	6									
612+00																					
613+00																					
614+00																					
615+00																					
616+00																					
617+00																					
618+00																					
619+00																					
620+00																					
621+00																					
622+00																					

EST	FINAL	UNIT	DESCRIPTION
648		CY	EXCAVATION (RDWY)
120		CY	EMBANKMENT
		STA	PREPARING ROW

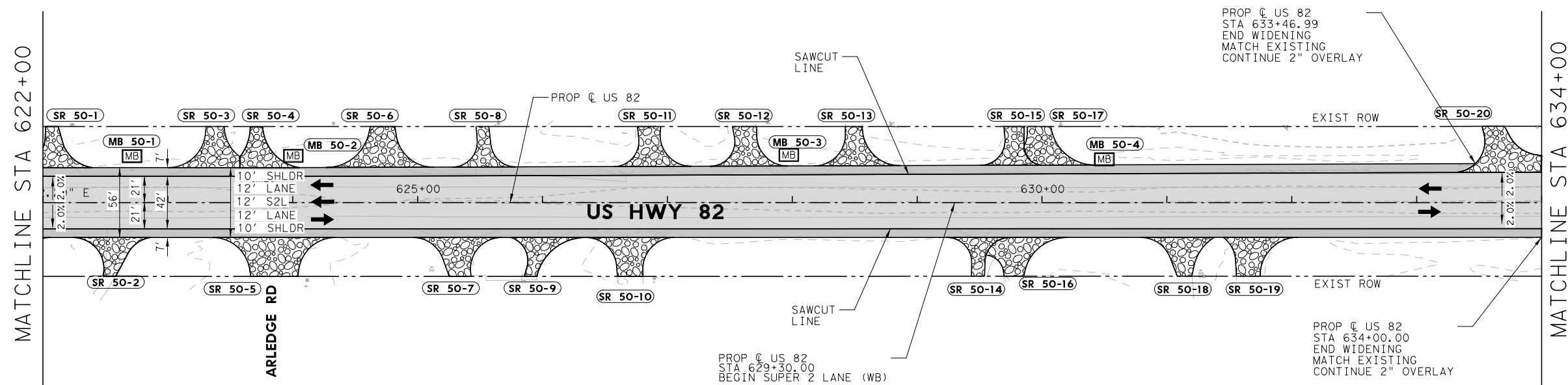
PROPOSED TOP OF 2" ACP OVERLAY NOT TO BE USED FOR CONSTRUCTION  
 - - - - - PROPOSED PGL  
 - - - - - EXISTING PGL

**PLAN & PROFILE**  
**STA 610+00.00 TO STA 622+00.00**  
 HORIZONTAL SCALE: 1" = 100'  
 VERTICAL SCALE: 1' = 10'  
 SHEET 49 OF 56

**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 114
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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 ... \04\ROADWAY\5563804-RPP-49.DGN



**LEGEND**

- LIMITS OF PAVEMENT WIDENING
- LIMITS OF PAVEMENT OVERLAY
- LIMITS OF PROPOSED DRIVEWAY
- OBJECT MARKER
- MAILBOX
- DELINEATOR

**NOTES:**

1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE

		SECTION TOTALS																																		
		EST	FINAL	UNIT	DESCRIPTION																															
		859		CY	EXCAVATION (RDWY)	57	70	83	104	102	50	31	50	70	89	83	69																			
		52		CY	EMBANKMENT	9	6	2	2	0	7	11	4	2	2	2	6																			
				STA	PREPARING ROW																															
1300																									1300											
1290																									1290											
1280																									1280											
1270																									1270											
PROP.	EXIST.	1,285.29	1,285.27	1,285.21	1,285.14	1,285.06	1,284.97	1,284.99	1,285.00	1,285.02	1,285.08	1,285.12	1,285.15	1,285.18	1,285.17	1,285.15	1,285.14	1,285.13	1,285.13	1,285.17	1,285.21	1,285.22	1,285.22	1,285.18	1,285.17											
		622+00	623+00	624+00	625+00	626+00	627+00	628+00	629+00	630+00	631+00	632+00	633+00	634+00																						

PROPOSED TOP OF 2" ACP OVERLAY  
NOT TO BE USED FOR CONSTRUCTION

--- PROPOSED PGL

--- EXISTING PGL

GREGORY O. DELGADO  
81454  
REGISTERED PROFESSIONAL ENGINEER

12/14/2020

**PLAN & PROFILE**

**STA 622+00.00 TO STA 634+00.00**

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

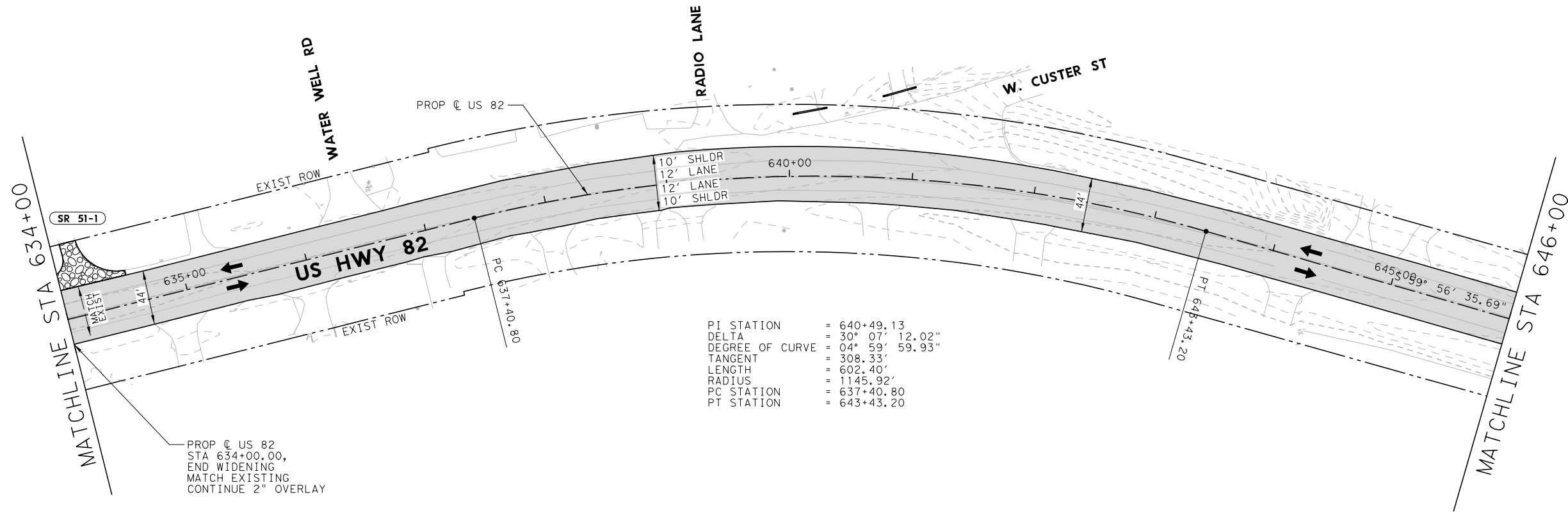
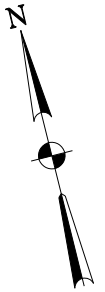
SHEET 50 OF 56

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HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

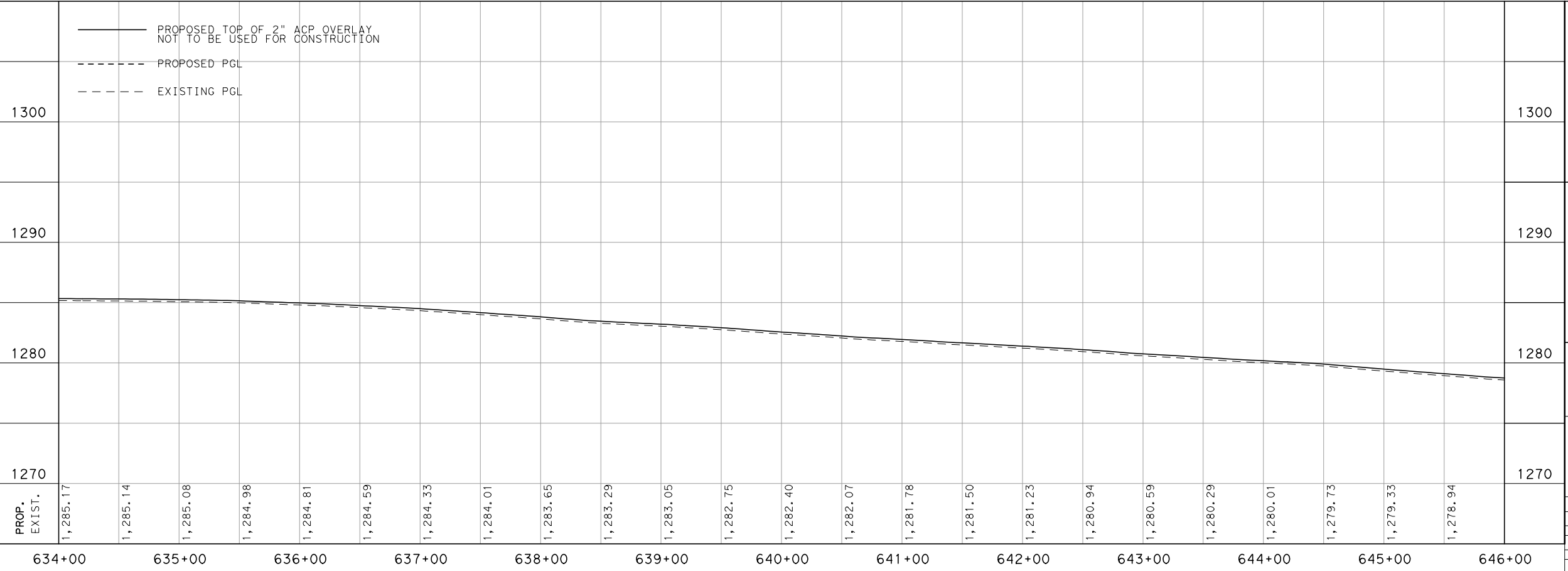
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		115	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/14/2020 4:58:15 PM  
... \04\ROADWAY\5563804-RPP-50.DGN



- LEGEND**
- LIMITS OF PAVEMENT WIDENING
  - LIMITS OF PAVEMENT OVERLAY
  - LIMITS OF PROPOSED DRIVEWAY
  - OBJECT MARKER
  - MAILBOX
  - DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



12/14/2020

**PLAN & PROFILE**

**STA 634+00.00 TO STA 646+00.00**

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

SHEET 51 OF 56

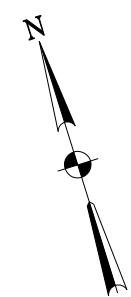


**HUITT-ZOLLARS**

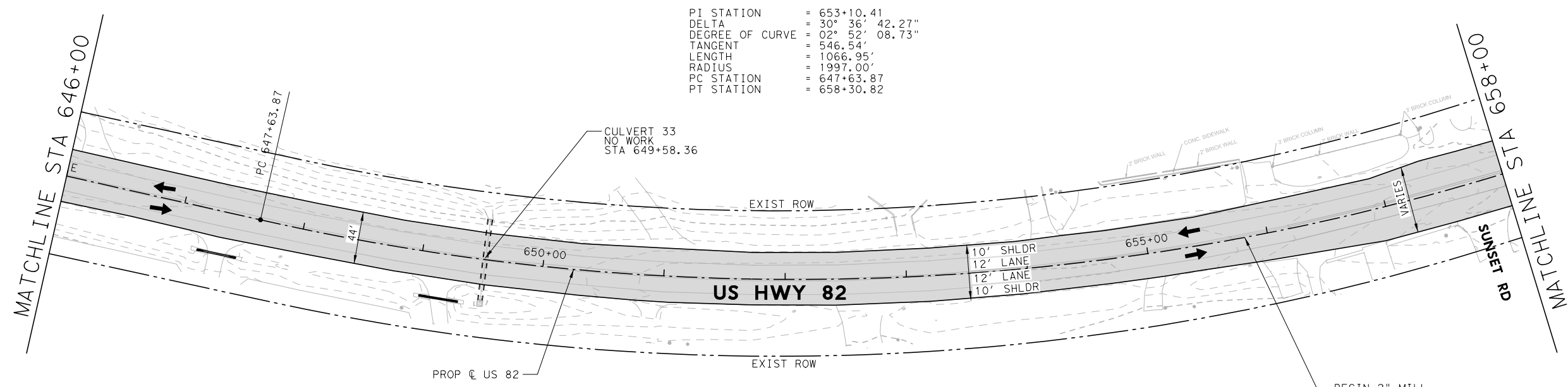
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.:	FEDERAL AID PROJECT NO.	SHEET NO.
6		116
STATE:	DISTRICT:	COUNTY:
TEXAS	WFS	BAYLOR
CONT:	SECT:	JOB:
0133	04	042
		HIGHWAY NO.
		US 82

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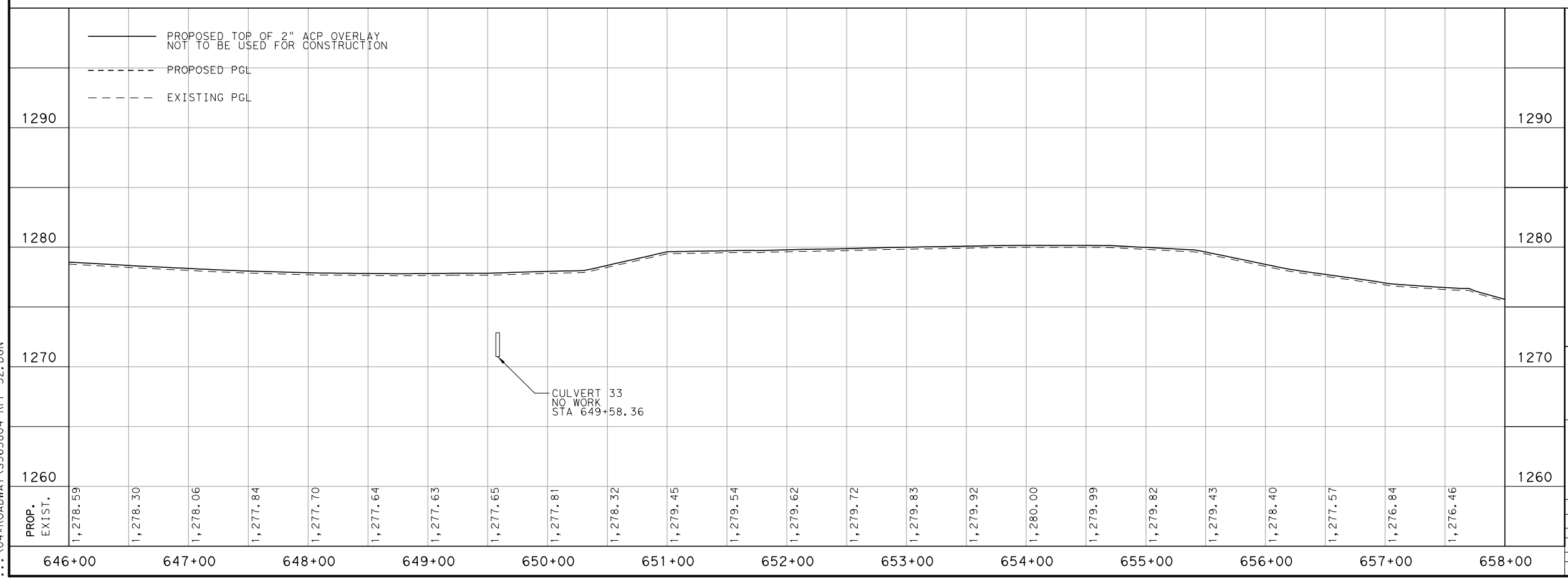


DEGREE = 02° 52' 08.73"  
 DELTA = 30° 36' 42.27"  
 TANGENT = 546.54'  
 LENGTH = 1066.95'  
 RADIUS = 1997.00'  
 PC STATION = 647+63.87  
 PT STATION = 658+30.82  
 PI STATION = 653+10.41



- LEGEND**
- LIMITS OF PAVEMENT WIDENING
  - LIMITS OF PAVEMENT OVERLAY
  - LIMITS OF PROPOSED DRIVEWAY
  - OBJECT MARKER
  - MAILBOX
  - DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



12/14/2020

**PLAN & PROFILE**

**STA 646+00.00 TO STA 658+00.00**

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

SHEET 52 OF 56

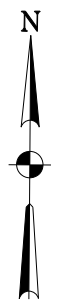


**HUITT-ZOLLARS**

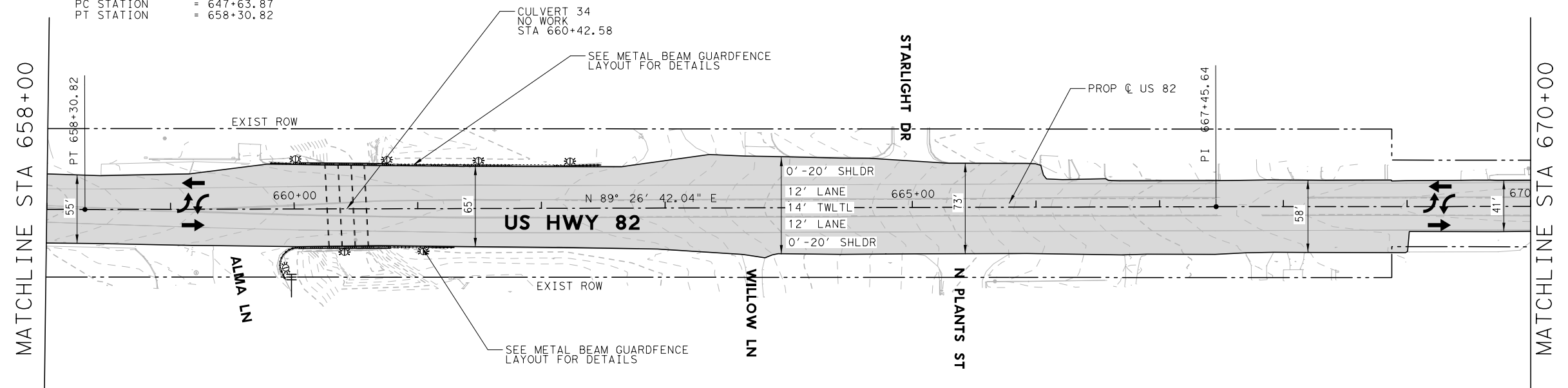
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 117
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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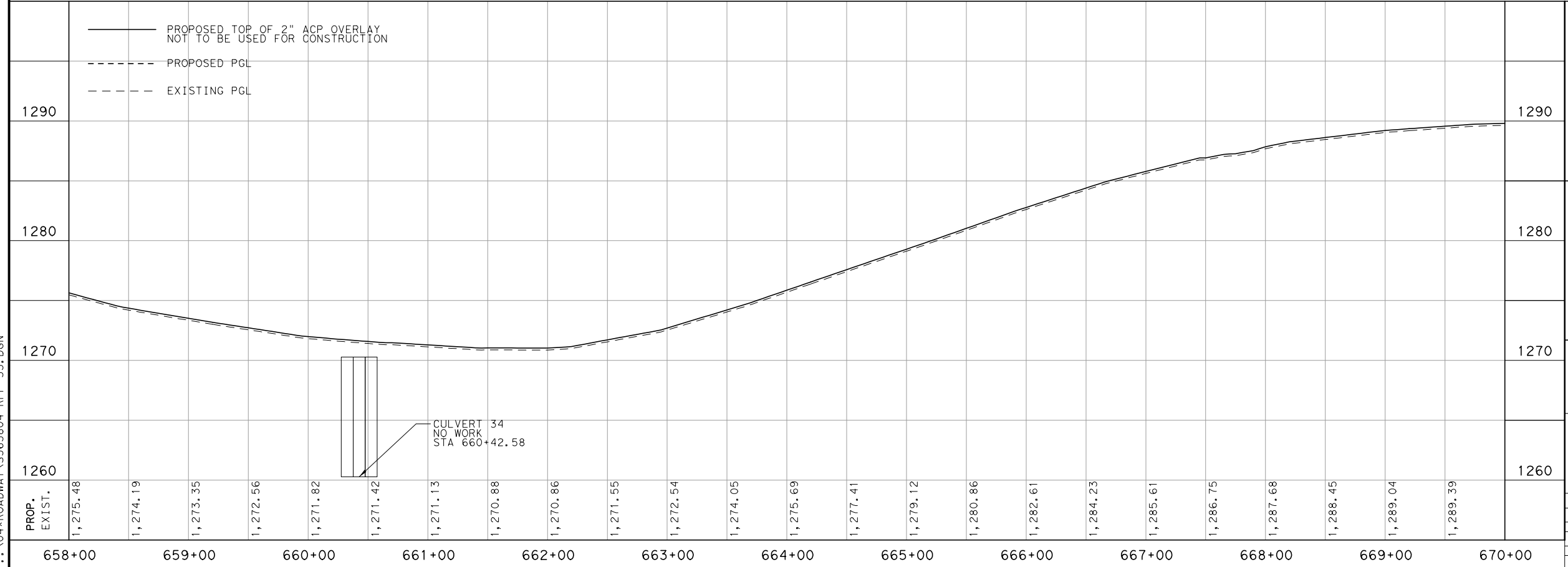


PI STATION = 653+10.41  
 DELTA = 30° 36' 42.27"  
 DEGREE OF CURVE = 02° 52' 08.73"  
 TANGENT = 546.54'  
 LENGTH = 1066.95'  
 RADIUS = 1997.00'  
 PC STATION = 647+63.87  
 PT STATION = 658+30.82



- LEGEND**
- LIMITS OF PAVEMENT WIDENING
  - LIMITS OF PAVEMENT OVERLAY
  - LIMITS OF PROPOSED DRIVEWAY
  - OBJECT MARKER
  - MAILBOX
  - DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



12/14/2020

**PLAN & PROFILE**

**STA 658+00.00 TO STA 670+00.00**

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

SHEET 53 OF 56

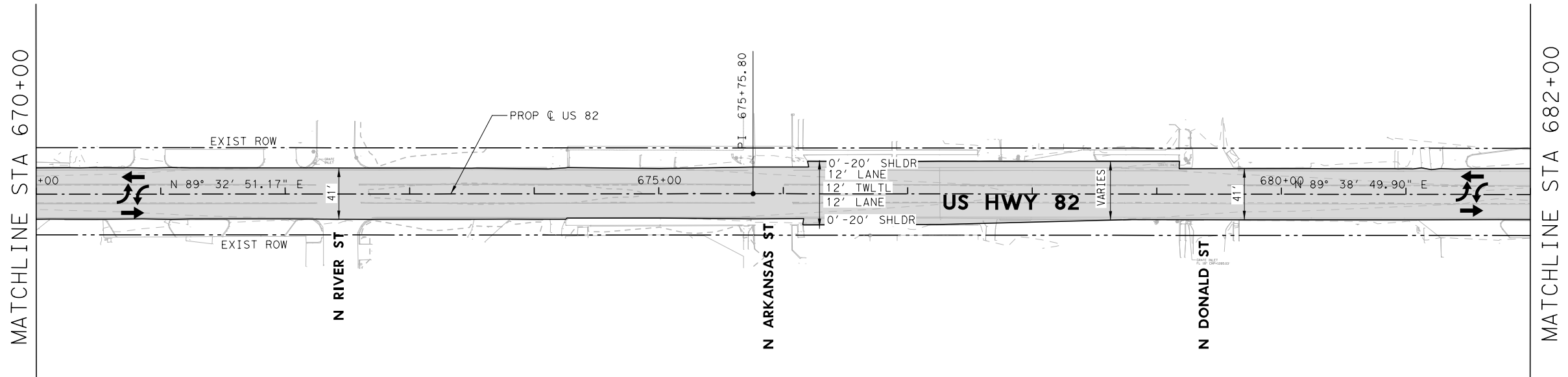


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

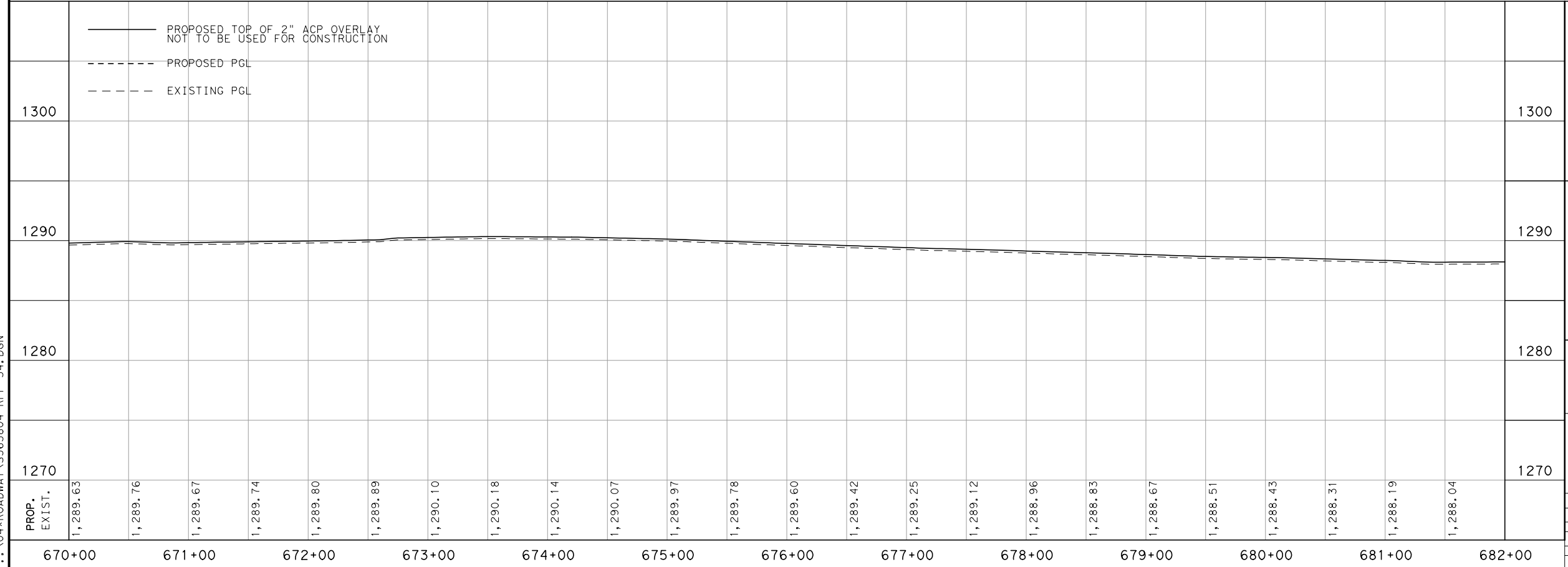
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 118
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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- LEGEND**
- LIMITS OF PAVEMENT WIDENING
  - LIMITS OF PAVEMENT OVERLAY
  - LIMITS OF PROPOSED DRIVEWAY
  - OBJECT MARKER
  - MAILBOX
  - DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



12/14/2020

**PLAN & PROFILE**

**STA 670+00.00 TO 682+00.00**

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

SHEET 54 OF 56



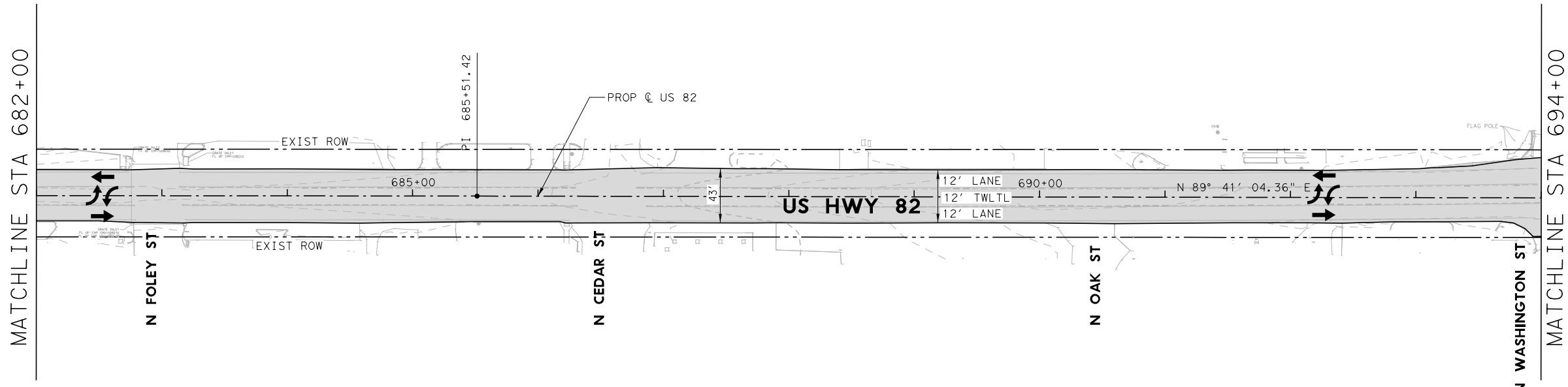
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 119
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

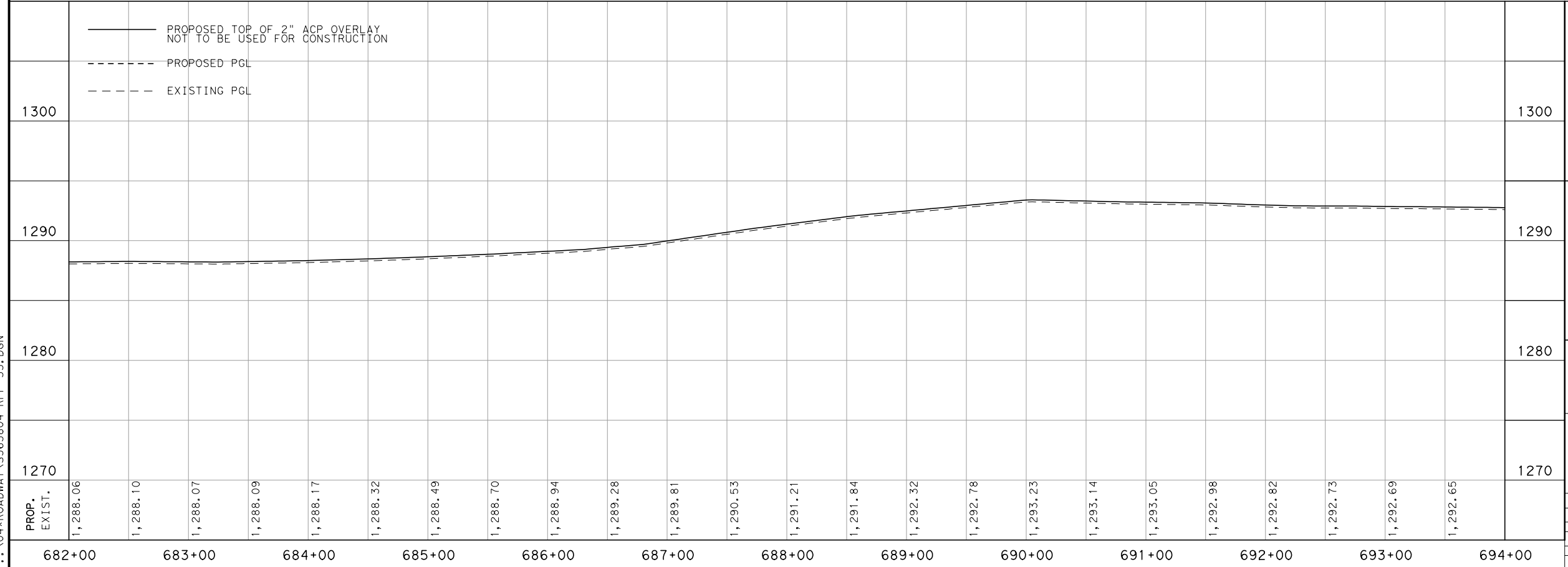
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- LEGEND**
- LIMITS OF PAVEMENT WIDENING
  - LIMITS OF PAVEMENT OVERLAY
  - LIMITS OF PROPOSED DRIVEWAY
  - OBJECT MARKER
  - MAILBOX
  - DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



12/14/2020

**PLAN & PROFILE**

**STA 682+00.00 TO STA 694+00.00**

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

SHEET 55 OF 56

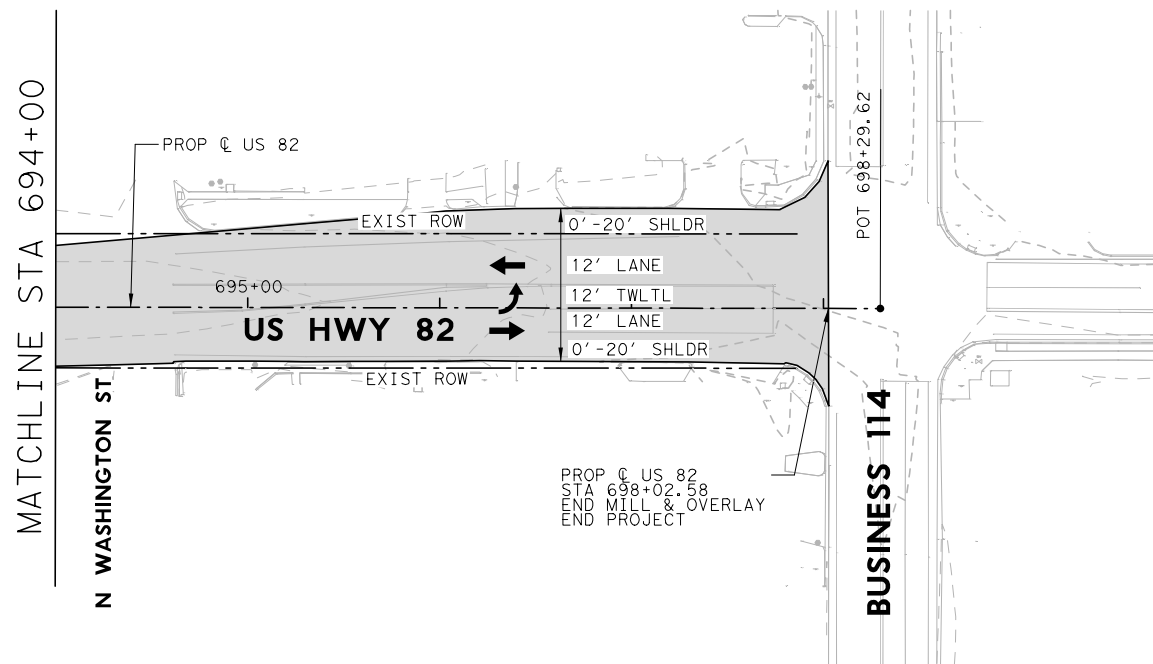


**HUITT-ZOLLARS**







HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 120
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

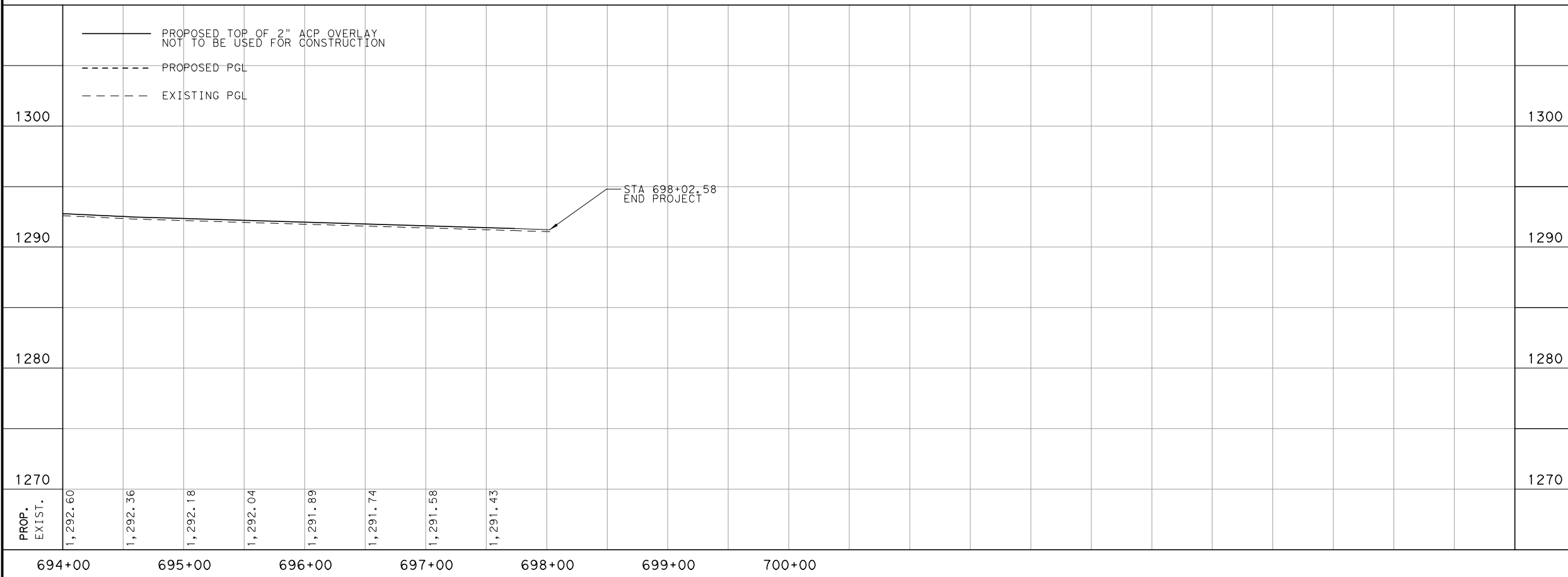
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... \04\ROADWAY\5563804-RPP-55.DGN



**LEGEND**

-  LIMITS OF PAVEMENT WIDENING
-  LIMITS OF PAVEMENT OVERLAY
-  LIMITS OF PROPOSED DRIVEWAY
-  OBJECT MARKER
-  MAILBOX
-  DELINEATOR

- NOTES:**
1. SEE SUMMARY OF SIDE ROAD ITEMS FOR DRIVEWAY AND SIDE ROAD DETAILS
  2. ONE STATION OF PREP ROW CENTERED AROUND EACH CULVERT STRUCTURE



12/14/2020

**PLAN & PROFILE**

**STA 694+00.00 TO STA 699+12.33**

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

SHEET 56 OF 56

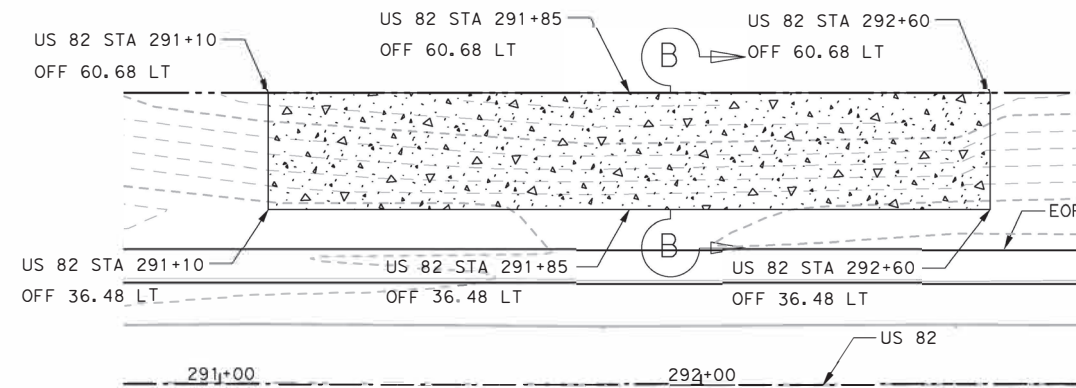
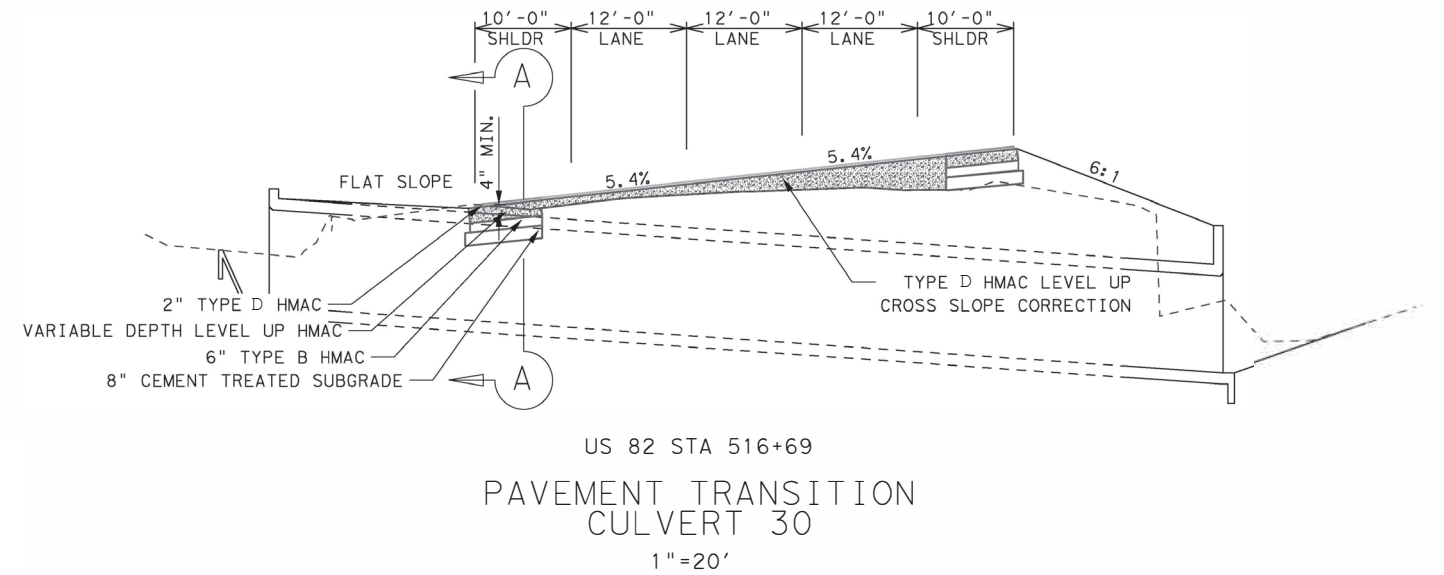
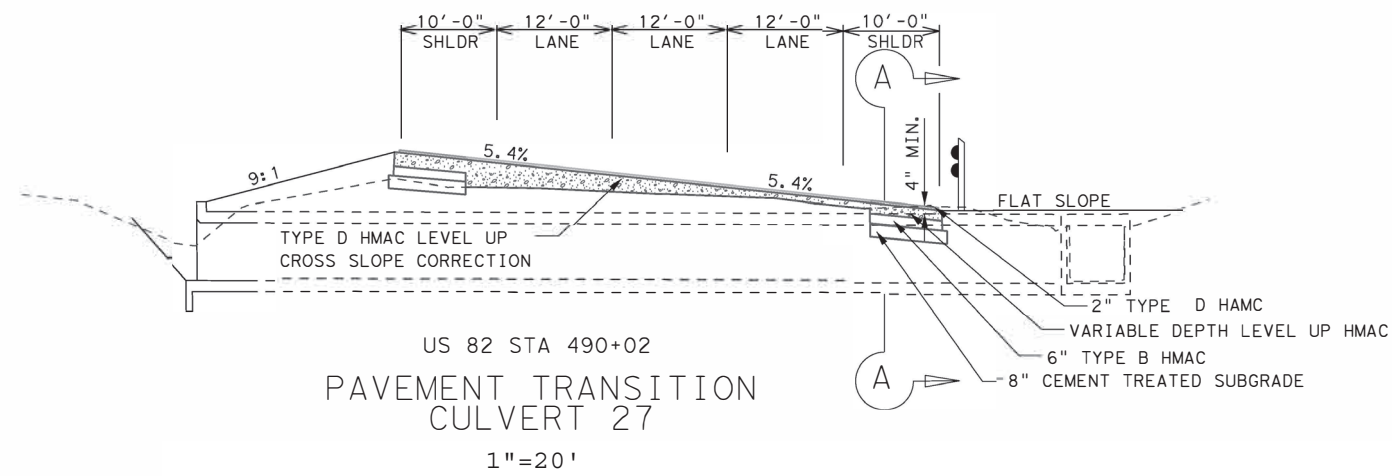


**HUITT-ZOLLARS**

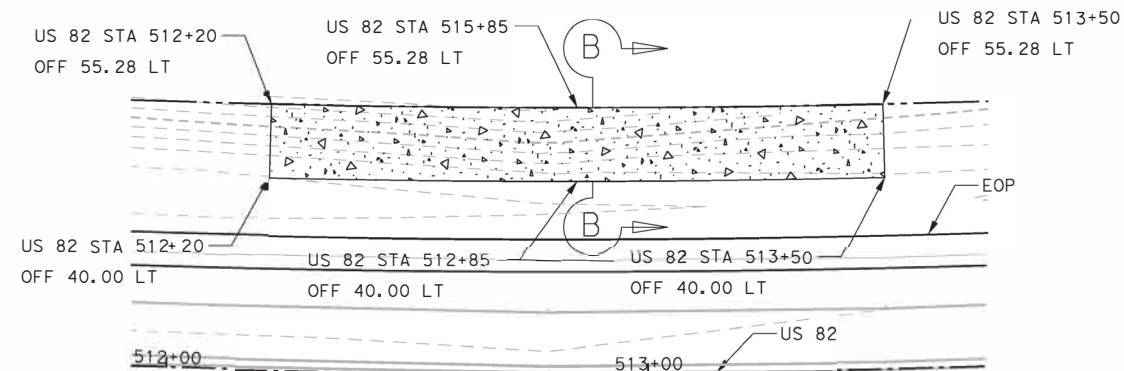
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 121
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

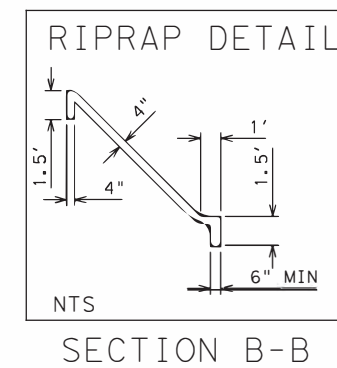
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RIP RAP DETAIL  
1"=40'



RIP RAP DETAIL  
1"=40'



12/14/2020

MISCELLANEOUS ROADWAY  
DETAILS

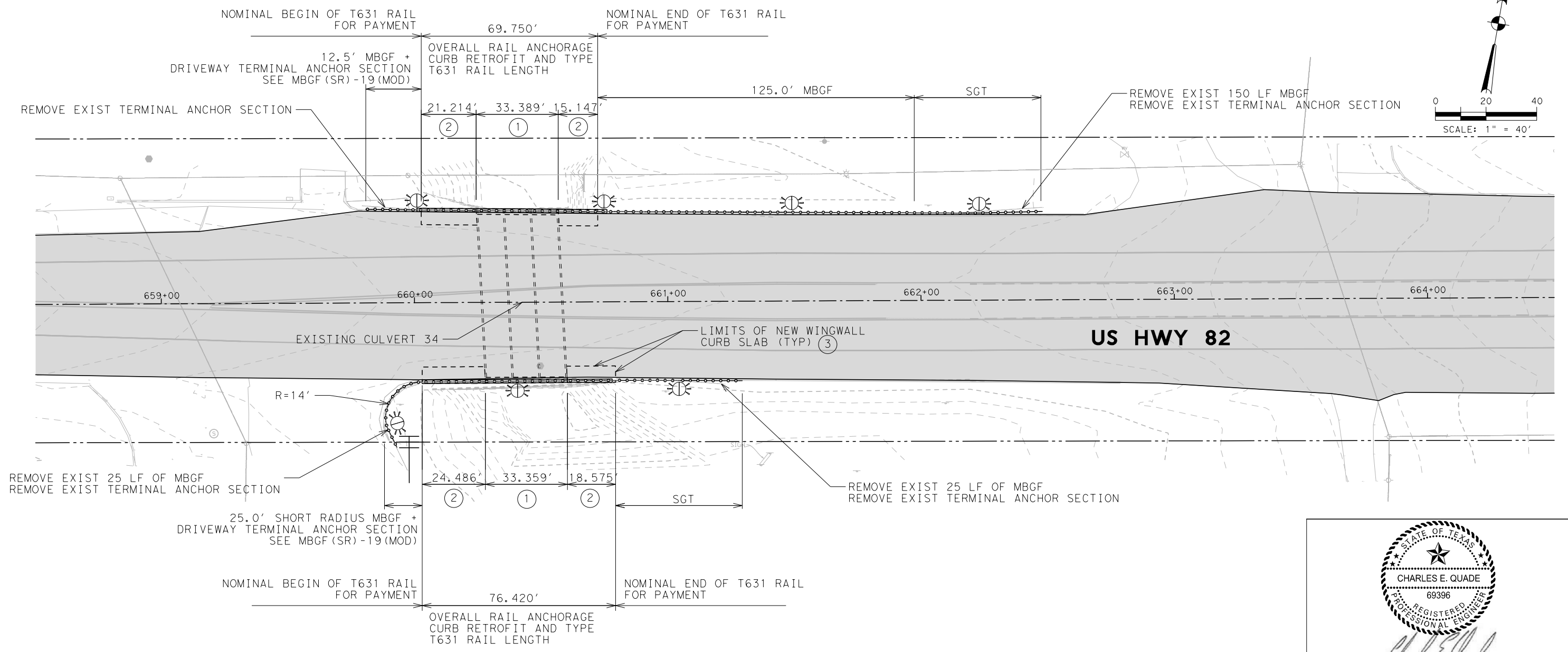
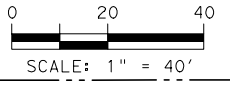
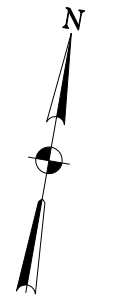
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HUITT-ZOLLARS

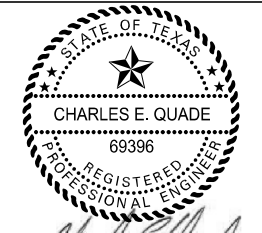
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		122
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO.
		US 82



REMOVE EXIST 25 LF OF MBGF  
REMOVE EXIST TERMINAL ANCHOR SECTION

REMOVE EXIST 25 LF OF MBGF  
REMOVE EXIST TERMINAL ANCHOR SECTION



*Charles E. Quade*  
12/14/2020

**METAL BEAM  
GUARD FENCE LAYOUT  
AND RAIL REPLACEMENT  
AT CULVERT 34**  
SCALE: 1" = 40'

SHEET 1 OF 1



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

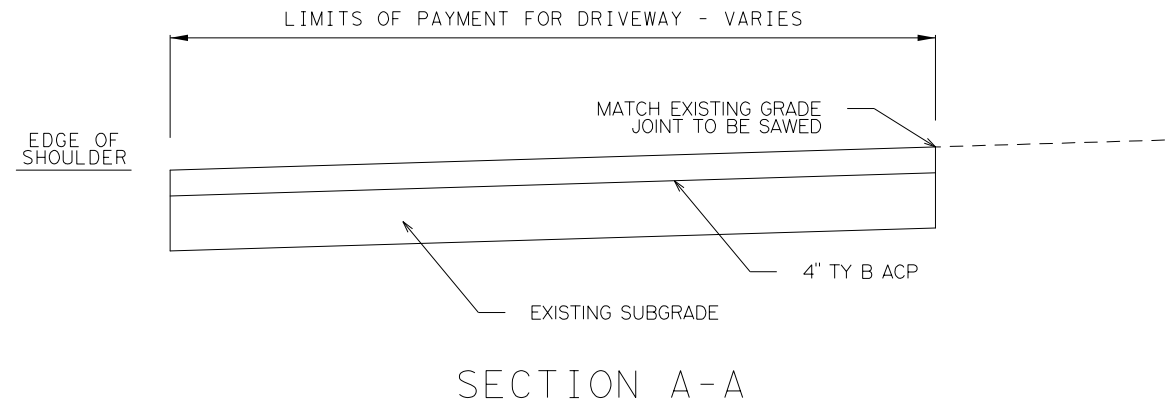
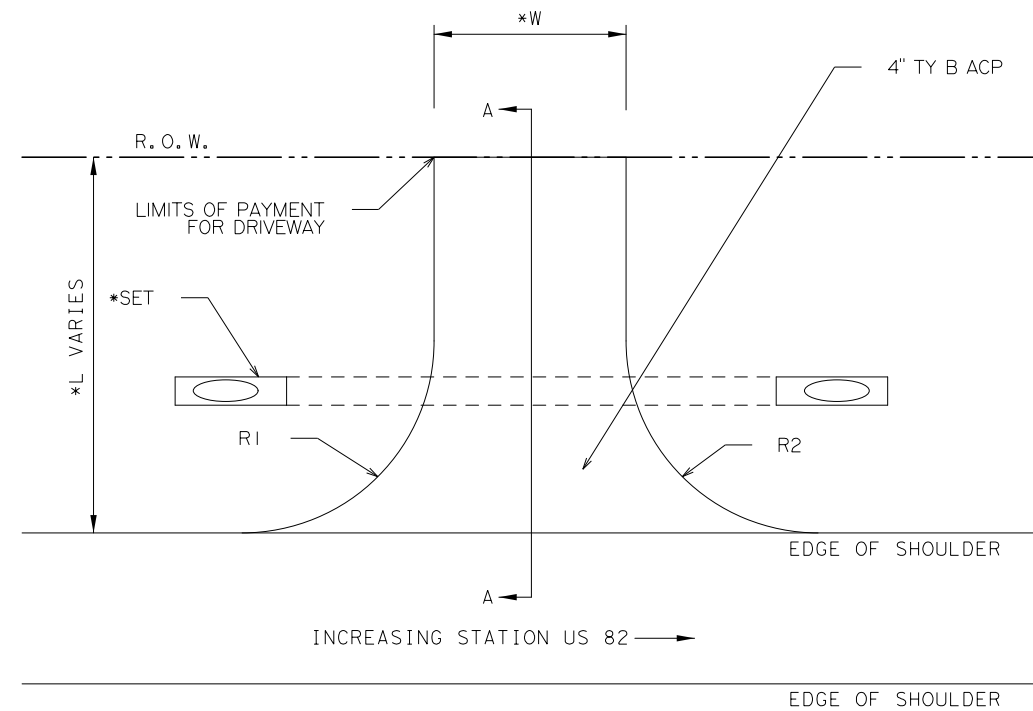
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		124	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

KEY NOTES:

- ① CULVERT RAIL ANCHORAGE CURB RETROFIT PORTION
- ② WINGWALL RAIL ANCHORAGE CURB RETROFIT PORTION
- ③ REFERENCE RAC-R(MOD) STANDARD FOR LIMITS AT EACH WINGWALL

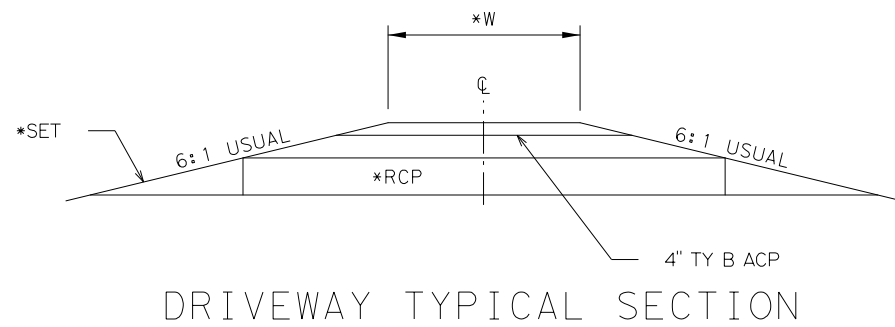
NOTES:  
1. SEE BRIDGE STANDARDS "TYPE T631" AND "RAC-R(MOD)"  
2. SEE ROADWAY STANDARD "MBGF (SR) -19 (MOD)"

12/14/2020 4:58:30 PM ... \04\ROADWAY\5563804-MBGF-01.DGN



**DRIVEWAYS (ACP)**

DRIVEWAYS (ACP) SHALL CONSIST OF: BLADING AND RESHAPING THE SUBGRADE, ANY EXTRA EMBANKMENT MATERIAL NECESSARY TO ACHIEVE THE PROPER SUBGRADE WIDTH AND PLACEMENT OF 4" TY B ACP



**DRIVEWAY TYPICAL SECTION**

\*SEE SUMMARY OF DRIVEWAY ITEMS FOR: DIMENTSION "W" AND RCP/SET DETAILS (IF REQ'D)



**DRIVEWAY DETAILS**

SHEET 1 OF 2

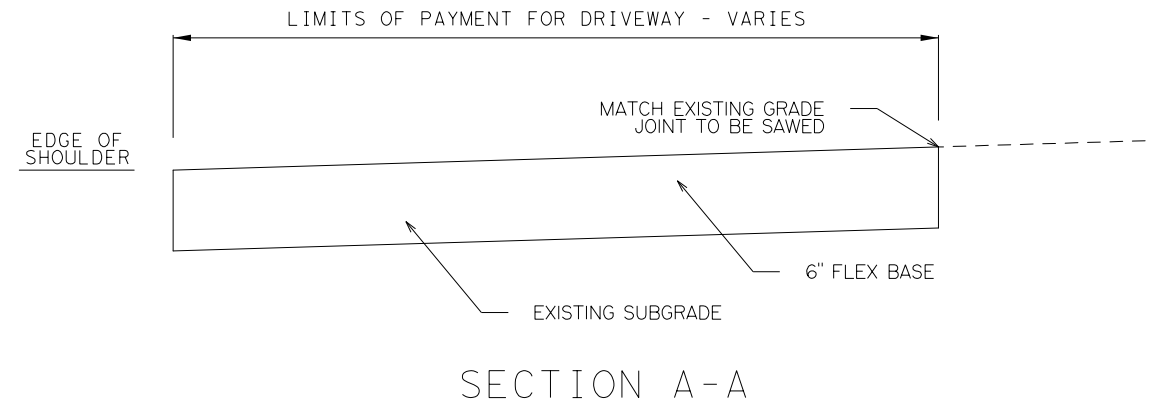
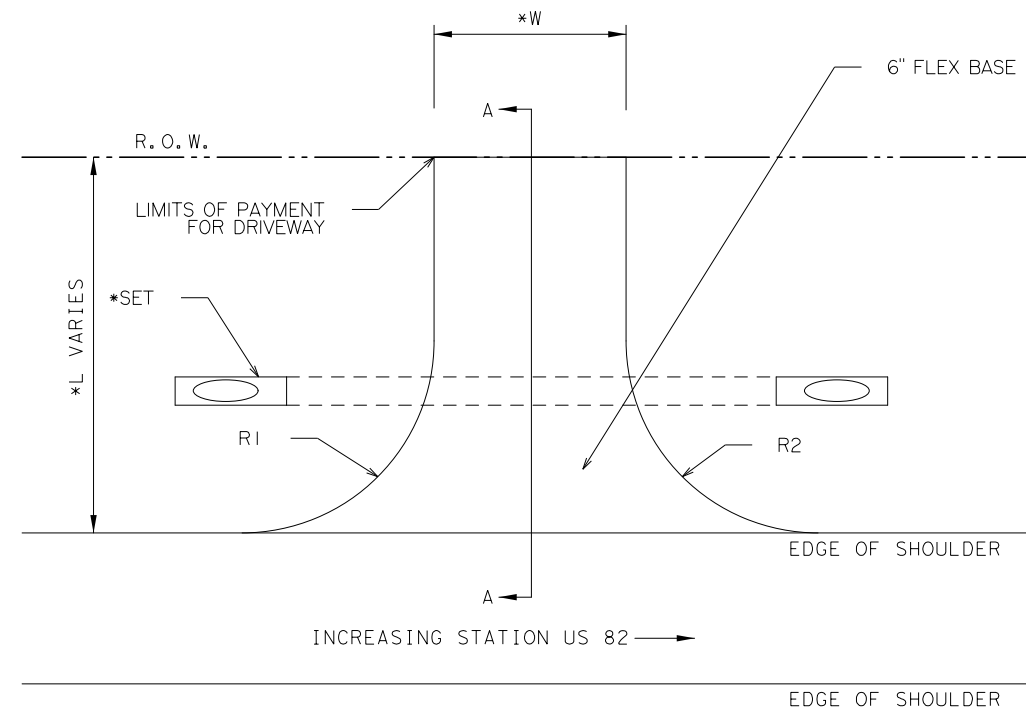


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

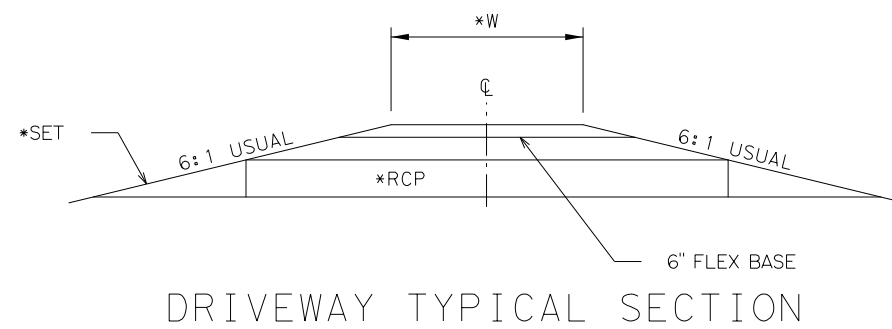
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STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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... \04 \ROADWAY \S563804-DWDT-01.DGN



### DRIVEWAYS (BASE)

DRIVEWAYS (BASE) SHALL CONSIST OF: BLADING AND RESHAPING THE SUBGRADE. ANY EXTRA EMBANKMENT MATERIAL NECESSARY TO ACHIEVE THE PROPER SUBGRADE WIDTH AND PLACEMENT OF 6" FLEX BASE.



\*SEE SUMMARY OF DRIVEWAY ITEMS FOR: DIMENSION "W" AND RCP/SET DETAILS (IF REQ'D)



12/14/2020

### DRIVEWAY DETAILS

SHEET 2 OF 2

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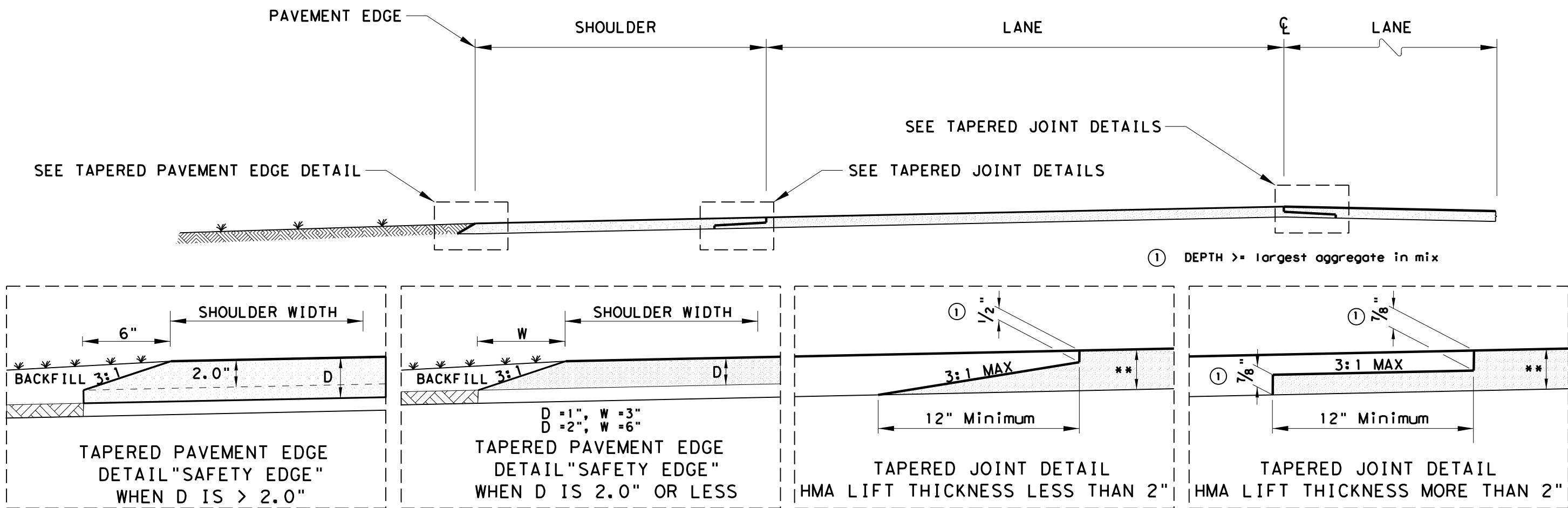
### HUITT-ZOLLARS

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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
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STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
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DATE: 9/7/2021 9:14:23 AM  
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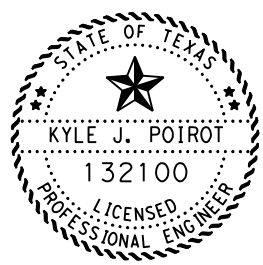


\*\* SEE TYPICAL SECTION FOR DEPTH AND TYPE OF HMA.

**NOTES:**

LONGITUDINAL JOINTS SHALL BE CONSTRUCTED BY TAPERING THE BITUMINOUS MAT. THE TAPERED PORTION SHALL EXTEND BEYOND THE NORMAL LANE WIDTH. THE TAPERED PORTION OF THE MAT SHALL BE CONSTRUCTED BY THE USE OF AN APPROVED SCREED ATTACHMENT WHICH WILL PRODUCE THE DESIRED SHAPE WITH THE MAIN SCREED. USE OF AN EXTERNAL STRIKE-OFF DEVICE TO MODIFY THE MAT SHAPE AFTER PASSING OF THE SCREED WILL NOT BE ALLOWED. TACK COAT SHALL BE APPLIED TO THE IN-PLACE TAPER BEFORE THE ADJACENT MAT IS PLACED. FINAL DENSITY REQUIREMENTS FOR THE ENTIRE PAVEMENT, INCLUDING THE TAPER AREA, WILL REMAIN UNCHANGED.

PAVEMENT EDGES SHALL BE CONSTRUCTED BY TAPERING THE BITUMINOUS MAT. THE TAPERED PORTION SHALL BE PLACED WITHIN THE NORMAL LANE WIDTH UNLESS OTHERWISE SHOWN ON THE PLANS. THE TAPERED PORTION OF THE MAT SHALL BE CONSTRUCTED BY THE USE OF AN APPROVED SCREED ATTACHMENT WHICH WILL PRODUCE THE DESIRED SHAPE WITH THE MAIN SCREED. USE OF AN EXTERNAL STRIKE-OFF DEVICE TO MODIFY THE MAT SHAPE AFTER PASSING OF THE SCREED WILL NOT BE ALLOWED. COMPACTION OF THE PAVEMENT EDGE TAPER WILL BE REQUIRED TO AS NEAR TO FINAL DENSITY AS POSSIBLE.



*Kyle J. Poirot, P.E.*  
 9/7/2021

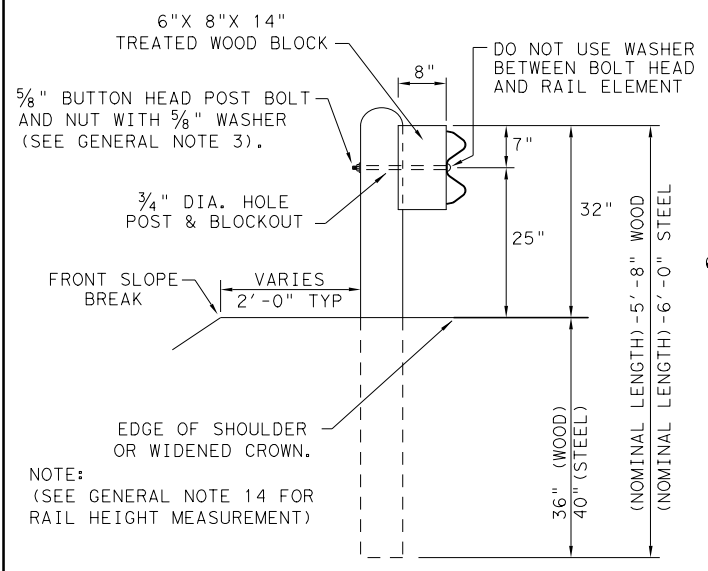
**US 82  
 HOT MIX  
 LONGITUDINAL  
 JOINT DETAILS**



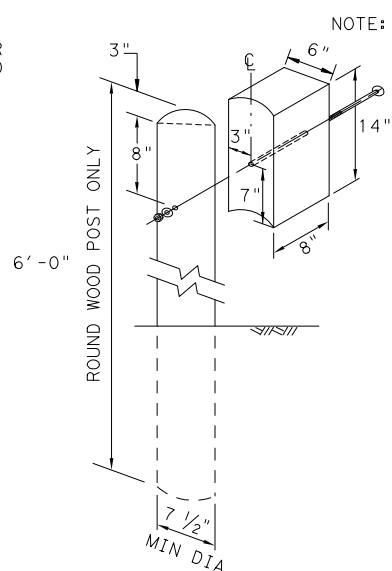
CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	127	

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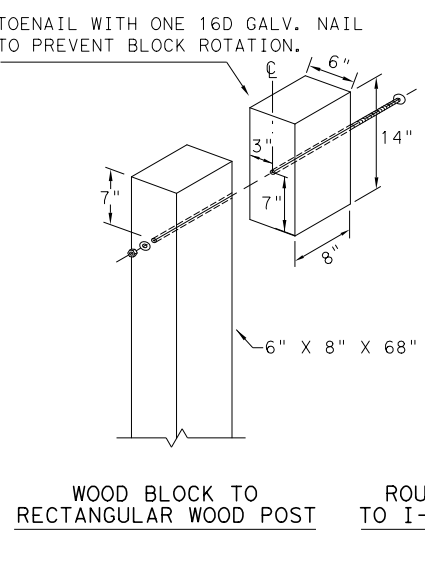
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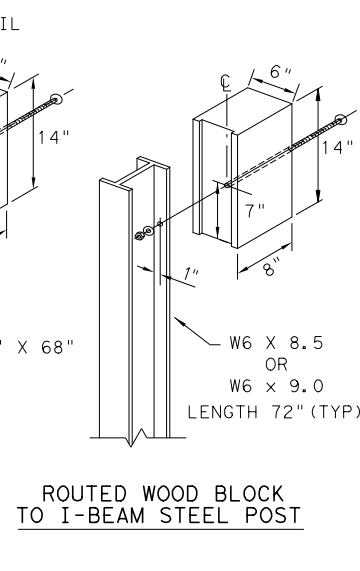
**TYPICAL POST PLACEMENT**



**WOOD BLOCK TO ROUND WOOD POST**



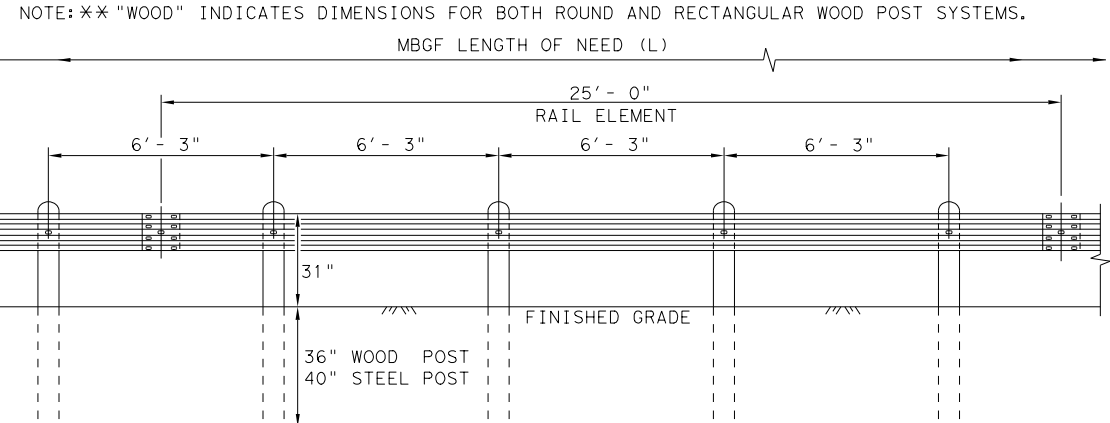
**WOOD BLOCK TO RECTANGULAR WOOD POST**



**ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

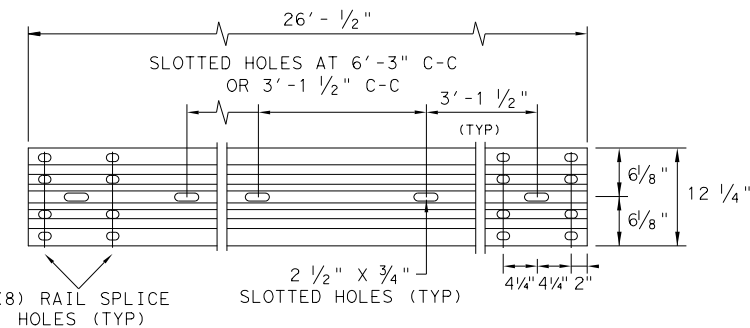
NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

- GENERAL NOTES**
1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
  2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'-0", OR 12'-6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
  3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16d) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
  4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
  6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
  7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
  8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
  9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
  10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
  11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
  12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
  13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
  14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.



**ELEVATION MID-SPAN RAIL SPLICE**

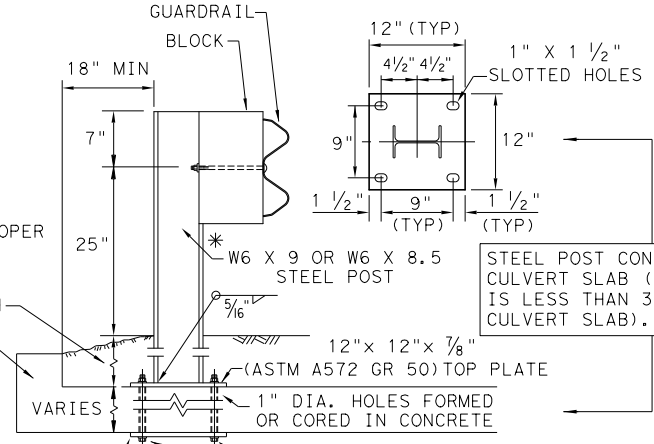
SHOWING A 25'-0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

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

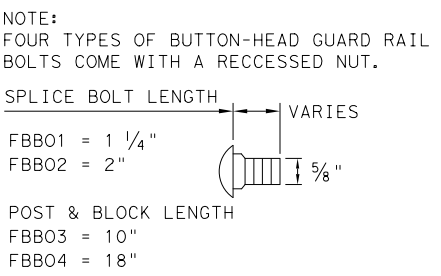
\* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



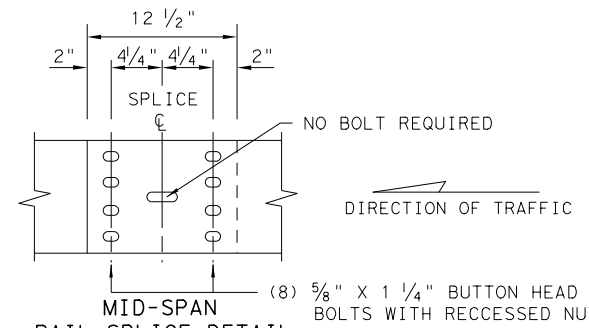
**LOW FILL CULVERT POST**

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

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



**BUTTON HEAD BOLT**



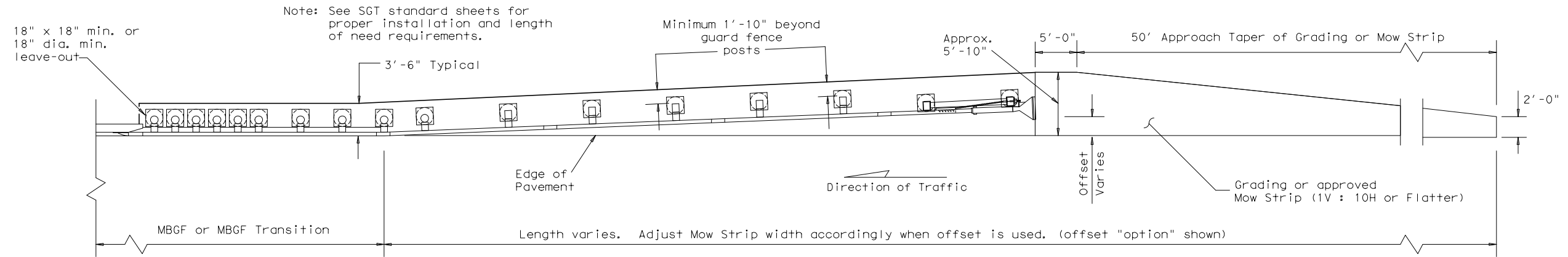
**MID-SPAN RAIL SPLICE DETAIL**

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

				<b>Design Division Standard</b>	
<b>METAL BEAM GUARD FENCE</b> <b>TL-3 MASH COMPLIANT</b> <b>GF(31)-19</b>					
FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG	
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0133	04	042	US 82	
	DIST	COUNTY	SHEET NO.		
	WFS	BAYLOR	128		



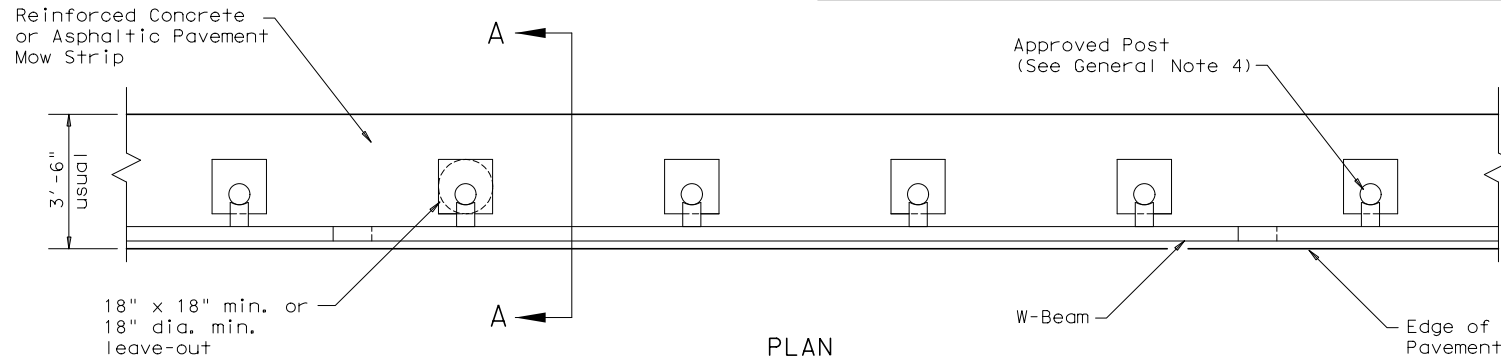
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**GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS**

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.

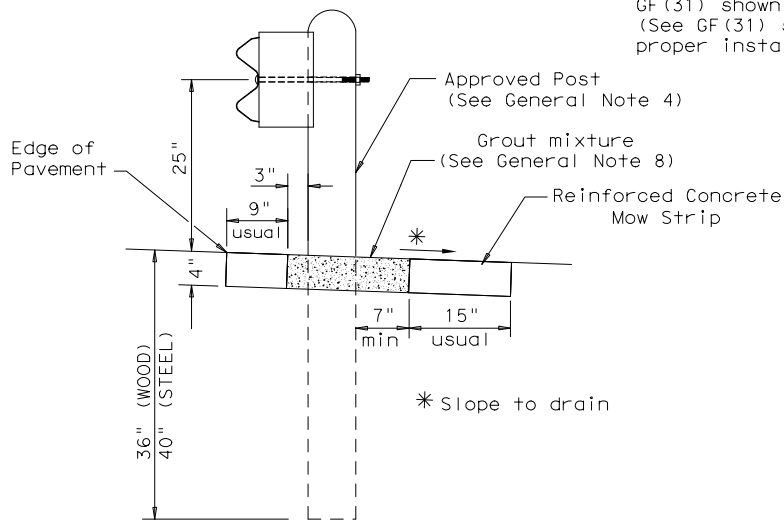


**PLAN**

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

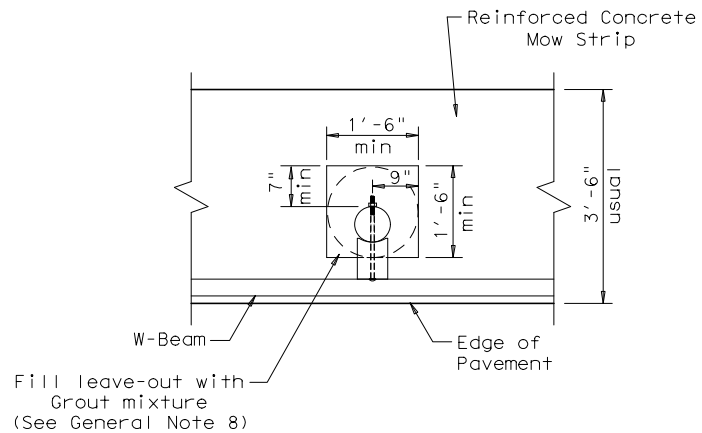
**GENERAL NOTES**

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.



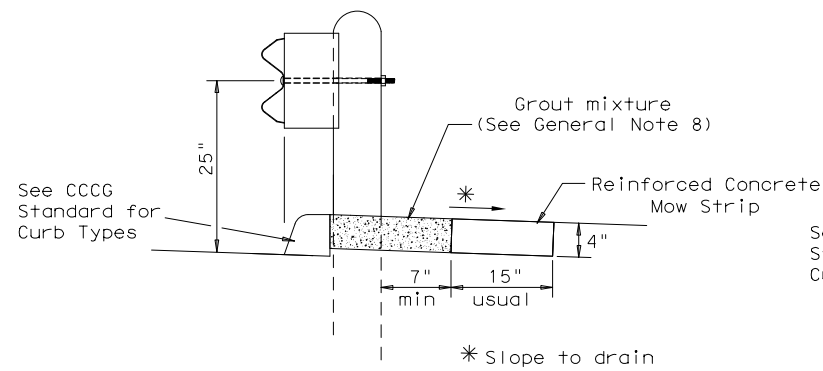
**SECTION A-A**

Typical



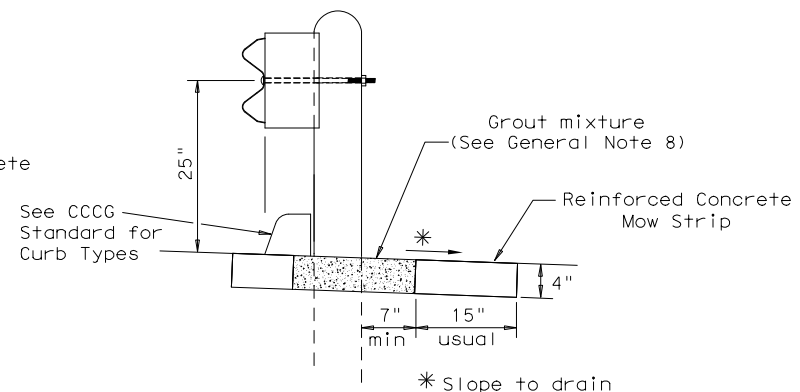
**MOW STRIP DETAIL**

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



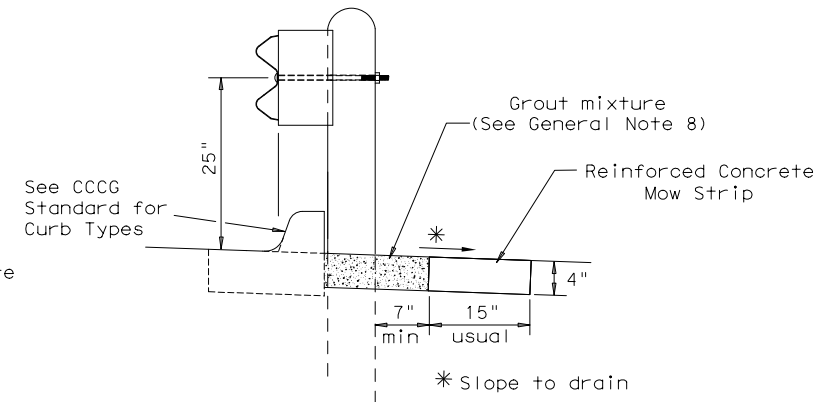
**CURB OPTION (1)**

This option will increase the post embedment throughout the system.



**CURB OPTION (2)**

Curb shown on top of mow strip



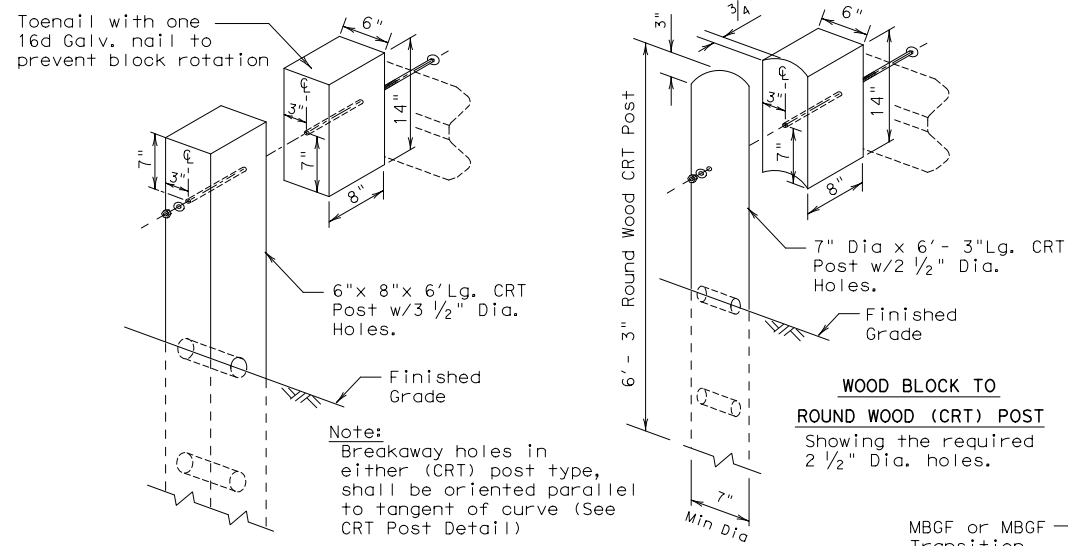
**CURB OPTION (3)**

		<b>Design Division Standard</b>	
<b>METAL BEAM GUARD FENCE (MOW STRIP)</b> <b>TL-3 MASH COMPLIANT</b> <b>GF (31) MS-19</b>			
FILE: gf31ms19.dgn	DN: TXDOT	CK: KM	DW: VP
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0133	04	042
	DIST	COUNTY	SHEET NO.
	WFS	BAYLOR	129

DATE:  
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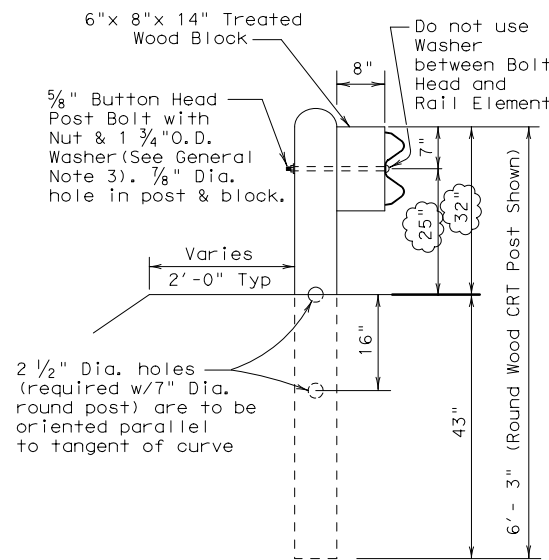
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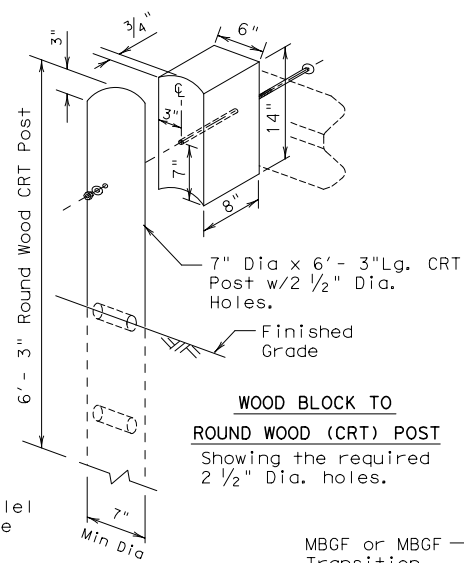
**WOOD BLOCK TO RECTANGULAR WOOD (CRT) POST**

Showing the required 3 1/2" Dia. holes.

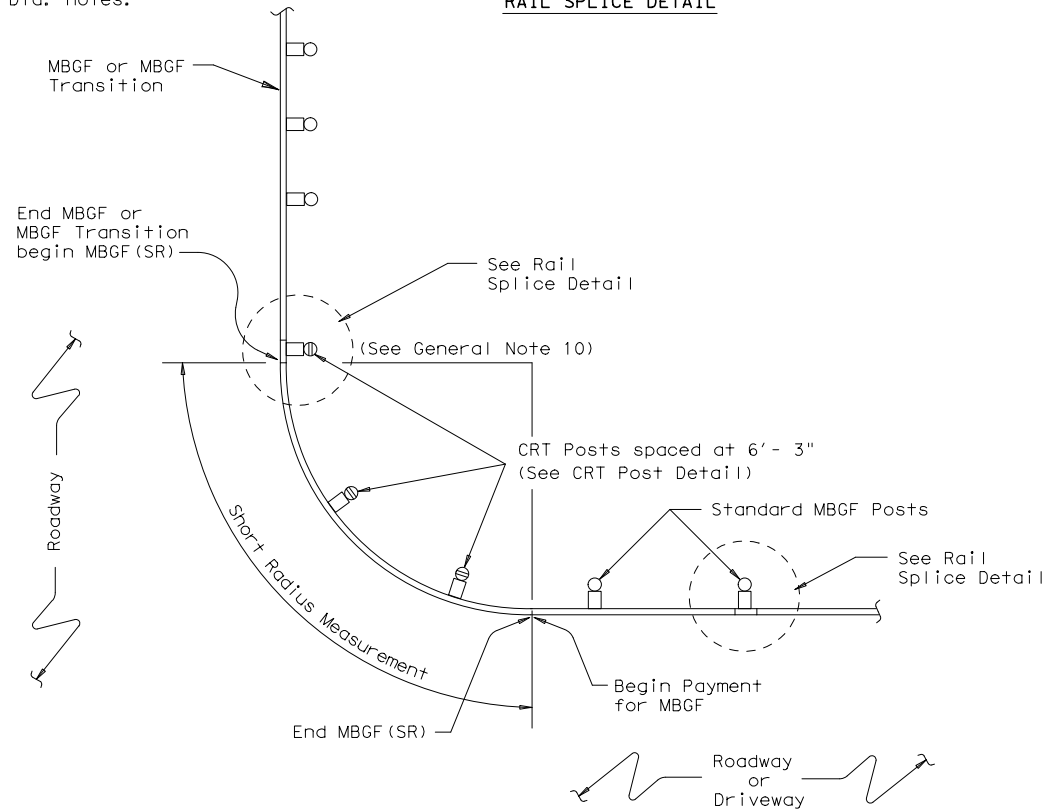


**(CRT) POST DETAIL CONTROLLED RELEASE TERMINAL POST**

Two or more wood CRT post(s) are required at any radius installation located at intersecting roadways or driveways.

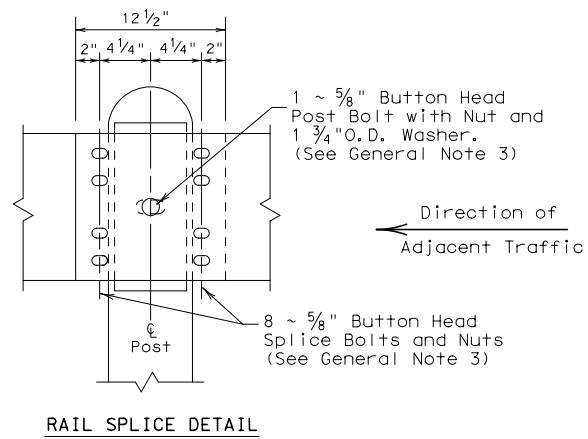


**WOOD BLOCK TO ROUND WOOD (CRT) POST**  
Showing the required 2 1/2" Dia. holes.



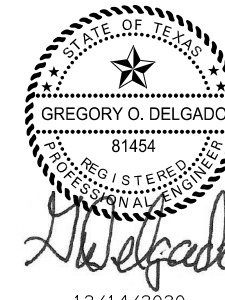
**PLAN VIEW SHOWING TYPICAL RADIUS**

The required radius is shown elsewhere on the plans.



**GENERAL NOTES**

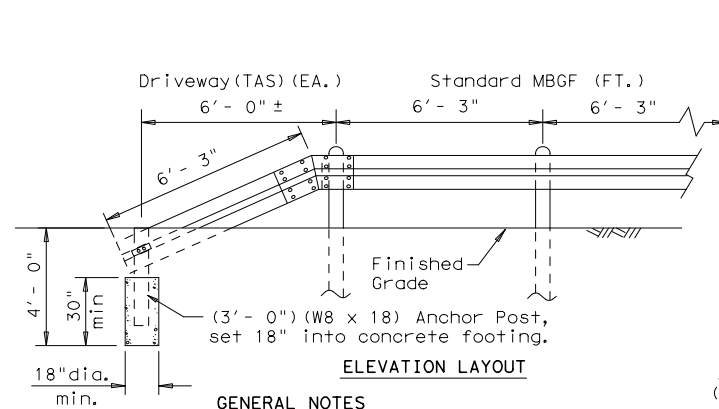
- The type of (CRT) post (round wood post, or rectangular wood post) will be shown elsewhere in the plans. The exact position of MGBF shall be shown elsewhere in the plans or as directed by the Engineer.
- Steel posts are not permitted at CRT post positions.
- Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified on the plans. The Contractor may furnish rail elements of 12 1/2 or 25 foot nominal lengths.
- Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 3/4" O.D.) washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are 5/8" x 1 1/4" (or 2" long at triple rail splices) with a 5/8" double recessed nut (ASTM A563).
- Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
- Crown shall be widened to accommodate the Metal Beam Guard Fence.
- The lateral approach to the guard fence, shall have a slope rate of not more than 1V:10H.
- 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 block. Rail placed over curbs shall be installed so that the post bolt is located approximately 21 inches above the gutter pan or roadway surface.
- If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, 24" into the rock, or drill two 12" dia. front to back overlapping holes, 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 is less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
- Guardrail posts shall not be set in concrete, of any depth.
- Special rail fabrication will be required at installations having a curvature of less than 150 ft. radius. The required radius shall be shown on the plans.
- The terminal anchor section (TAS) post shall be set in Class A concrete (unless otherwise shown in the plans) in accordance with Item 421, "Hydraulic Cement Concrete." Concrete shall be subsidiary to the bid item requiring construction of the terminal anchor section (TAS). Terminal anchor post to be galvanized in accordance with Item 445, "Galvanizing."
- Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or 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 can furnish composite material posts and/or blocks.



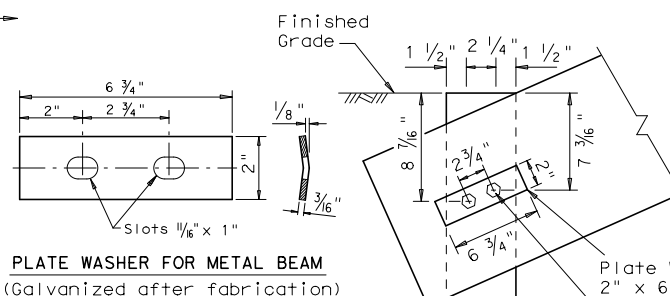
12/14/2020

**1** CHANGED RAIL HEIGHT FOR SPECIAL CONDITION

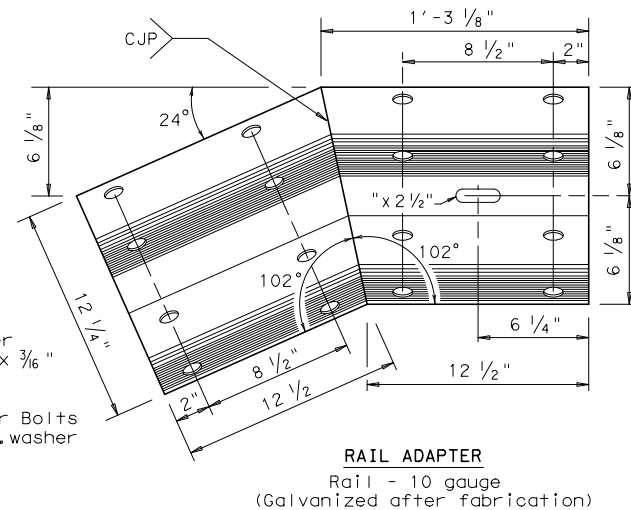
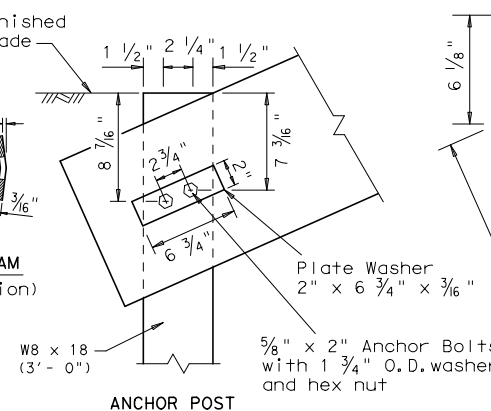
**ONLY FOR USE IN MAINTENANCE REPAIRS OR HIGHLY CONSTRAINED SITE CONDITIONS.**



**"DRIVEWAY" TERMINAL ANCHOR SECTION**  
Only for use within driveway locations, where a standard (TAS) Terminal Anchor Section can not be installed.



**PLATE WASHER FOR METAL BEAM**  
(Galvanized after fabrication)



**GENERAL NOTES**

- The "Driveway" Terminal Anchor Section is ONLY to be used within driveway locations, where the ROW is limited and a standard 25 ft. (TAS) Terminal Anchor Section, is too long.
- Terminal anchor post shall be set in Class A concrete.
- All steel shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."

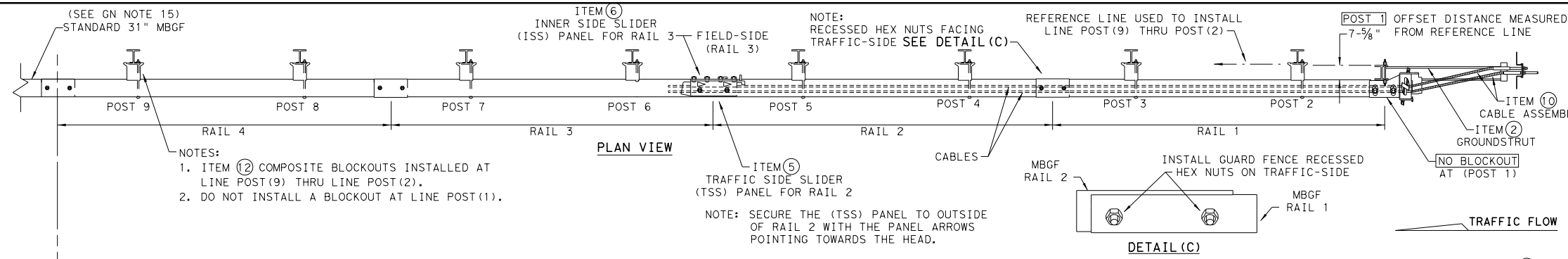


**METAL BEAM GUARD FENCE (SHORT RADIUS) MGBF (SR) - 19 (MOD)**

FILE: mbgfsr19.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
© TxDOT NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	130	

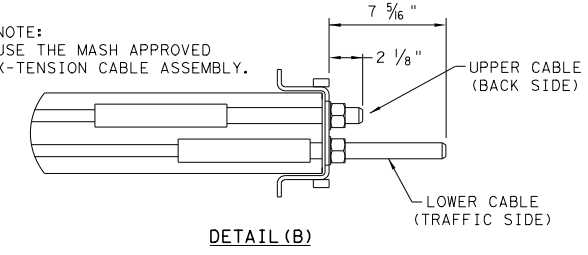
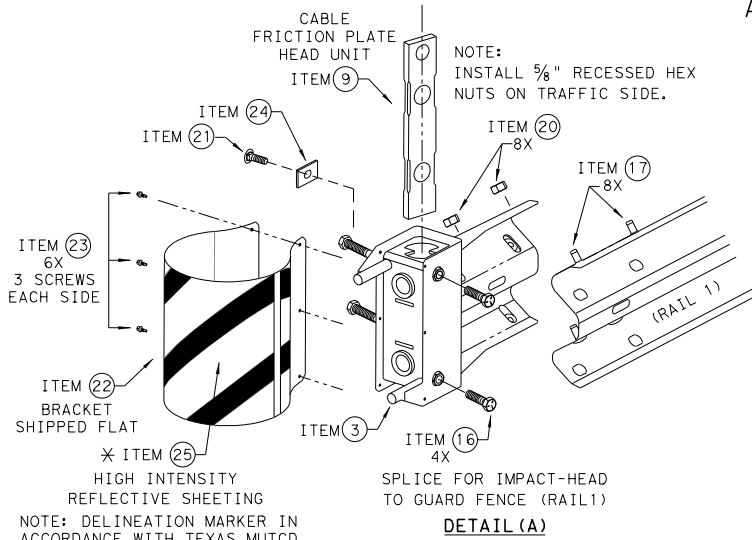
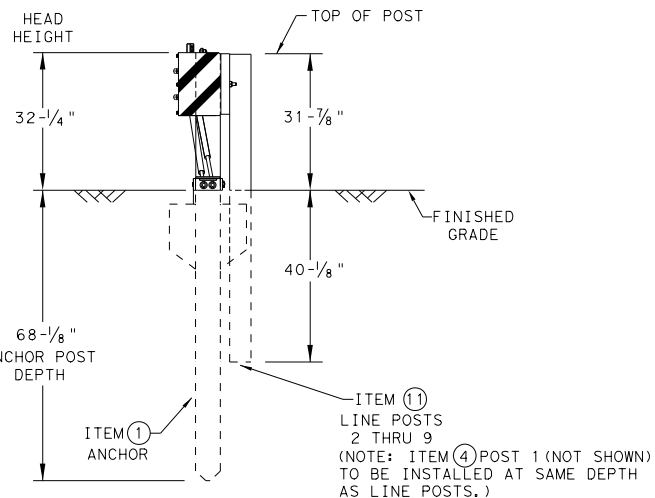
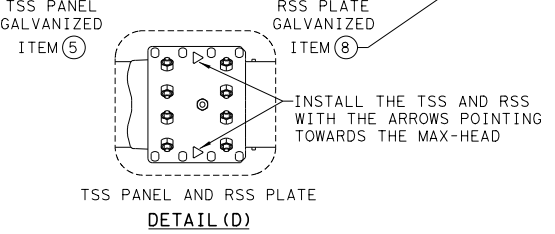
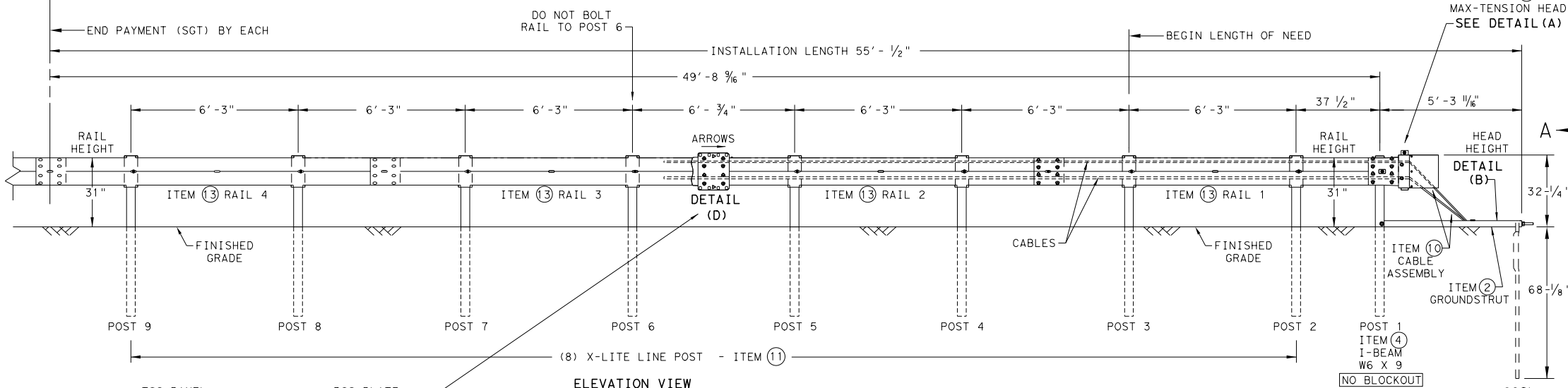
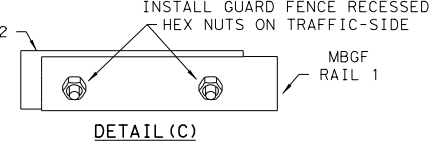
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DATE: FILE:



- NOTES:
- ITEM ② COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (9) THRU LINE POST (2).
  - DO NOT INSTALL A BLOCKOUT AT LINE POST (1).

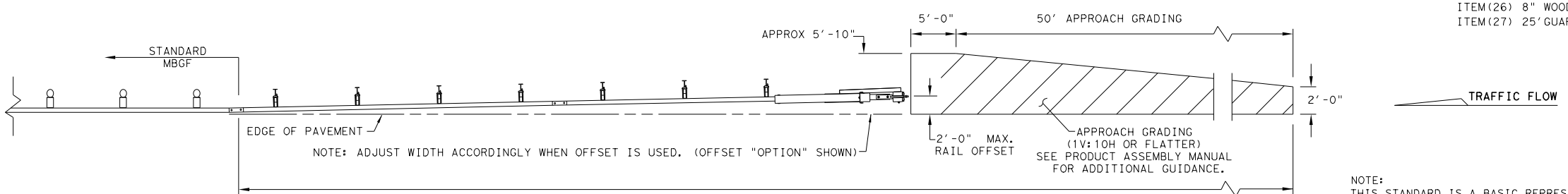
NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.



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

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

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



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

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

**Texas Department of Transportation** Design Division Standard

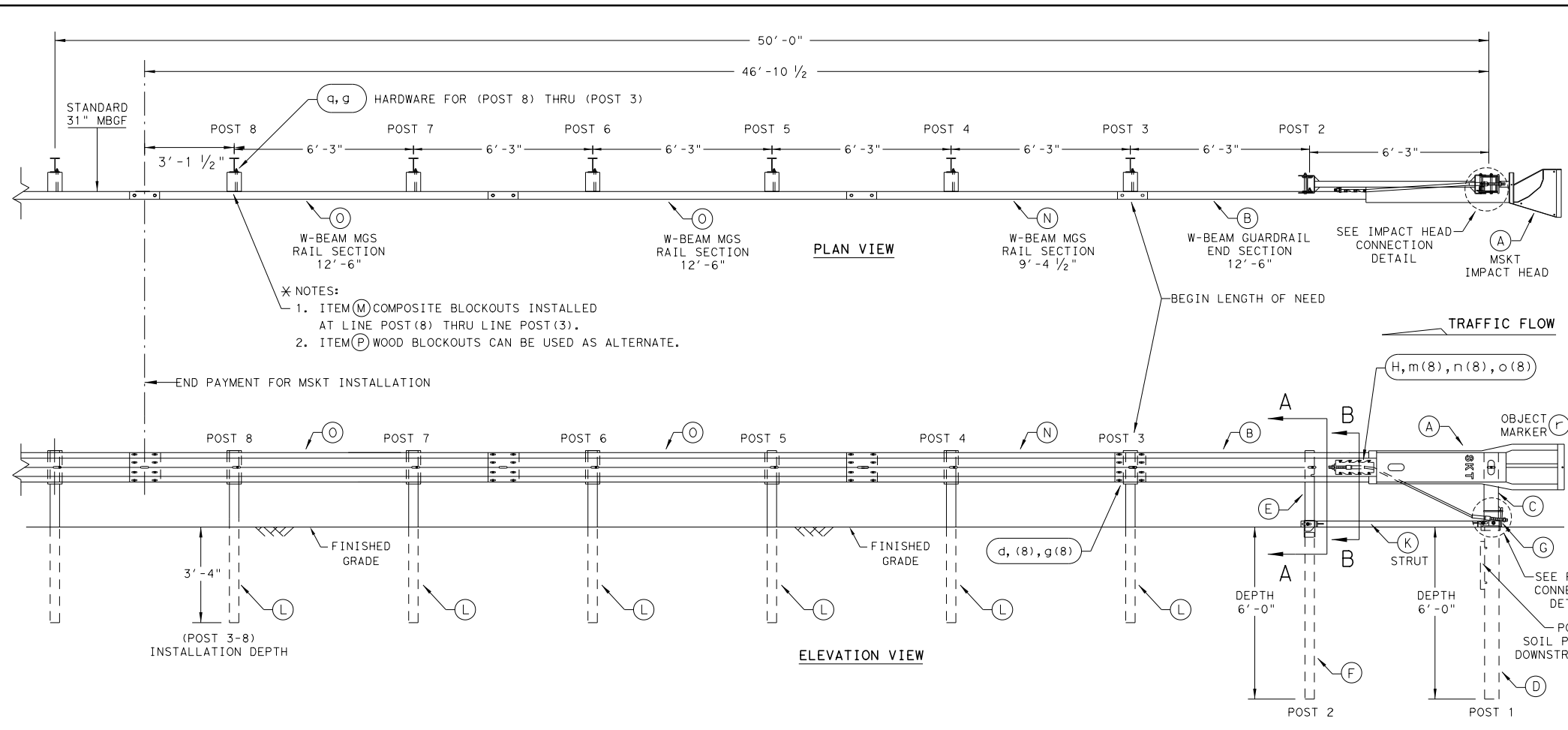
## MAX-TENSION END TERMINAL

### MASH - TL-3

### SGT (11S) 31-18

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© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	131	

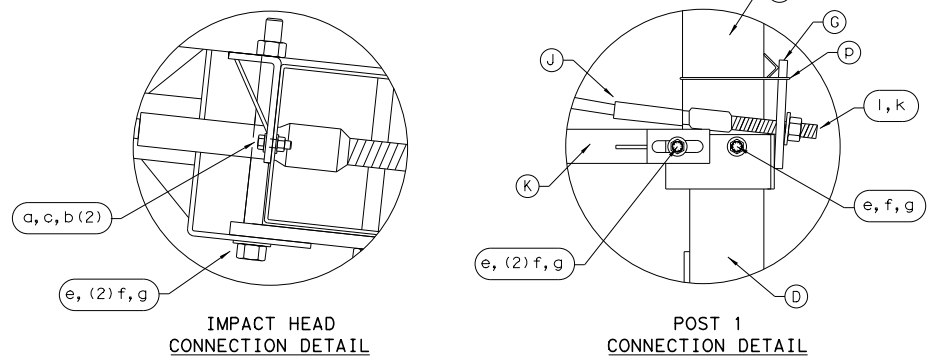
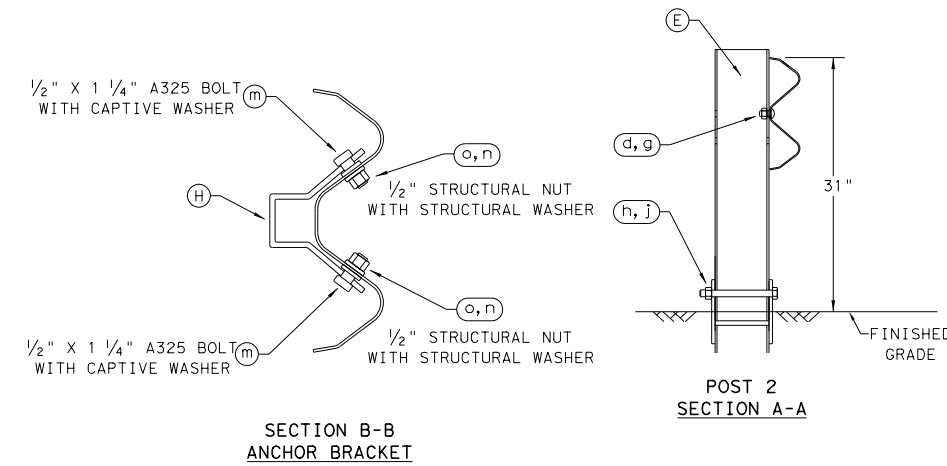
DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



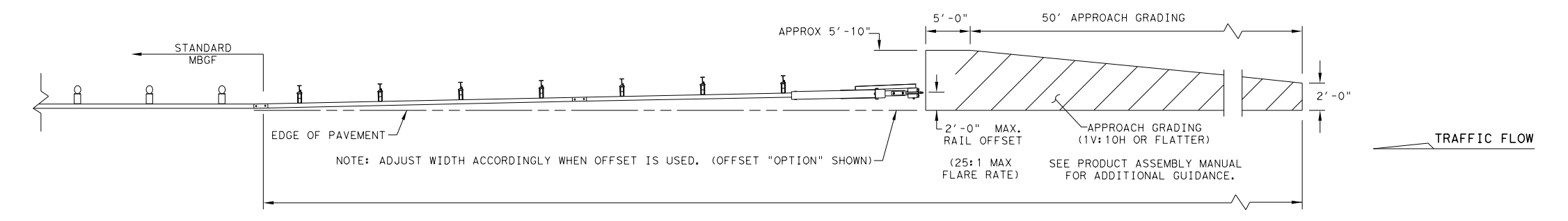
- NOTES:
- ITEM (M) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (8) THRU LINE POST (3).
  - ITEM (P) WOOD BLOCKOUTS CAN BE USED AS ALTERNATE.

- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
  - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
  - APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
  - A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
  - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBSGF STANDARD FOR INSTALLATION GUIDANCE.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBSGF.
  - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
  - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
  - THE SYSTEM IS SHOWN WITH TWO 12'-6" MBSGF PANELS, ONE 25'-0" MBSGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
  - A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6X9 OR W6X8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
<b>SMALL HARDWARE</b>			
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 3/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



ALTERNATIVE ITEMS NOT SHOWN. \* \*  
 \* ITEM (P) 8" WOOD-BLOCKOUT  
 \* \* ITEM (Q) 25' GUARD FENCE PANEL



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

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

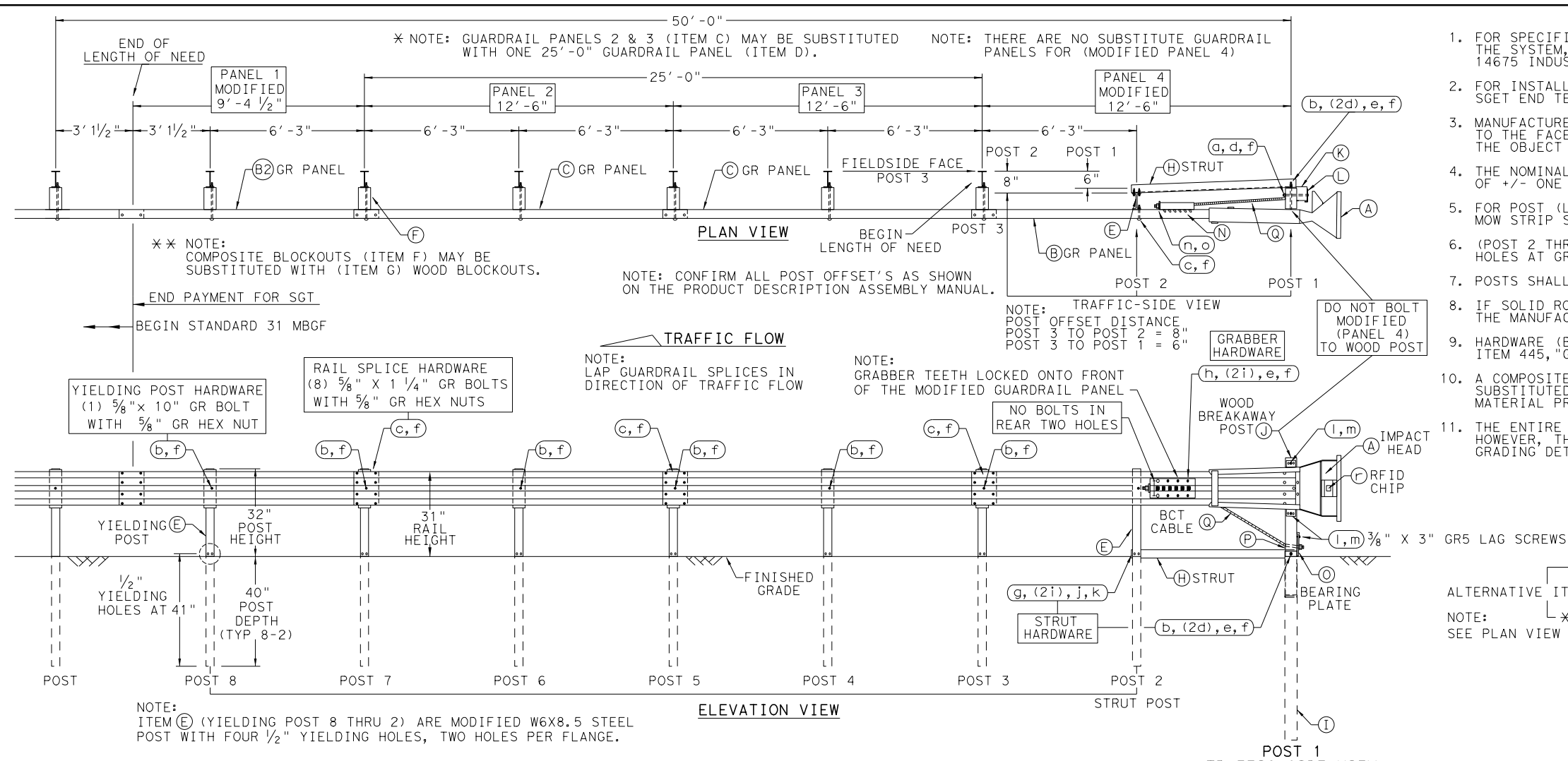
Design Division Standard

SINGLE GUARDRAIL TERMINAL  
 MSKT-MASH-TL-3  
 SGT (12S) 31-18

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© TXDOT: APRIL 2018	CONT SECT	JOB	HIGHWAY	
REVISIONS	0133 04	042	US 82	
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	132	

DATE:  
FILE:

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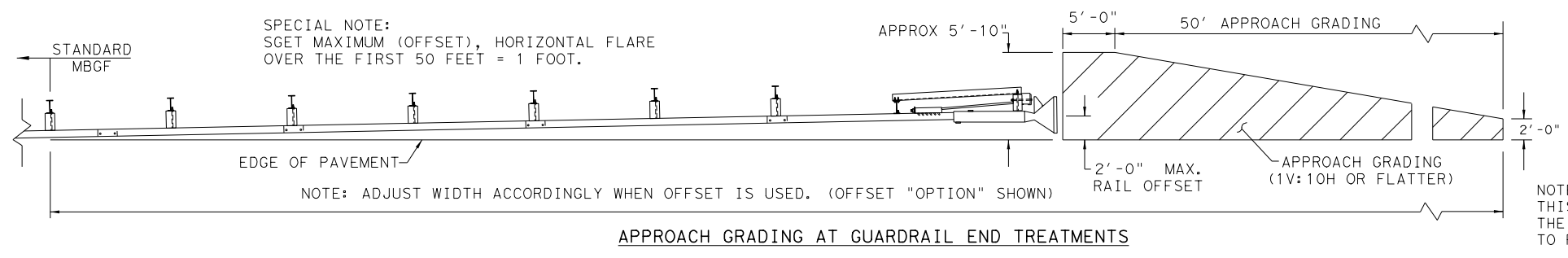
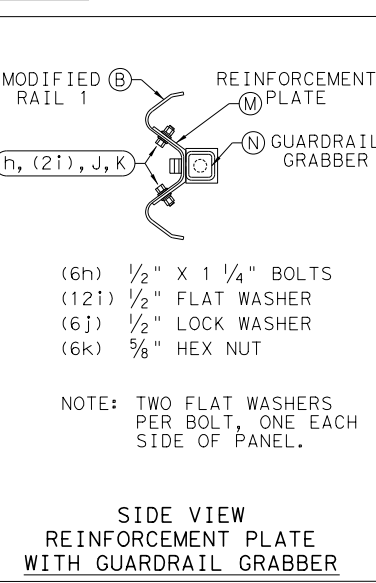
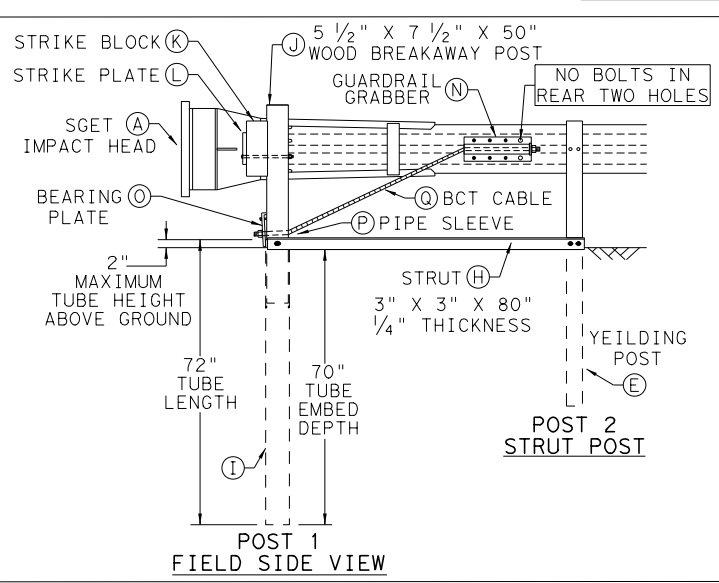
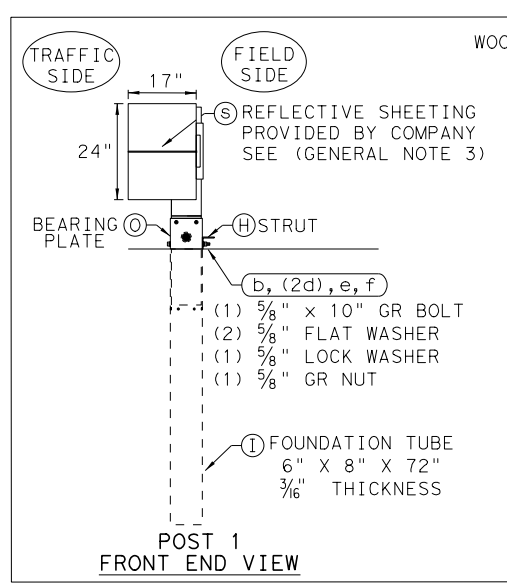
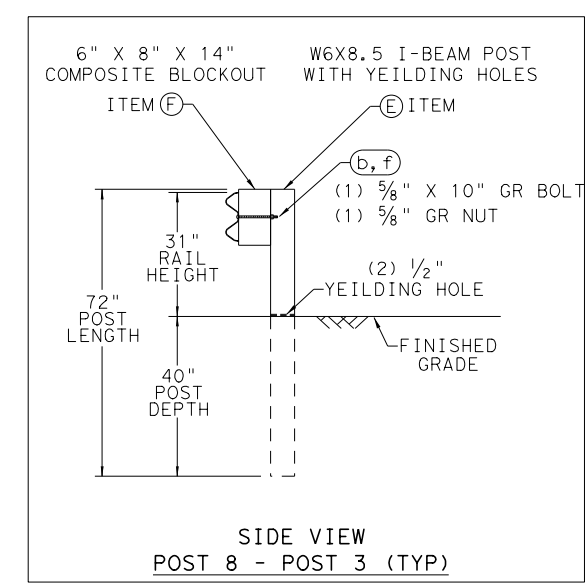


- ### GENERAL NOTES
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
  - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
  - MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
  - THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WB08
H	1	STRUT 3" X 3" X 80" X 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" X 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" X 7 1/2" X 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81

SMALL HARDWARE			
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563HD HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M



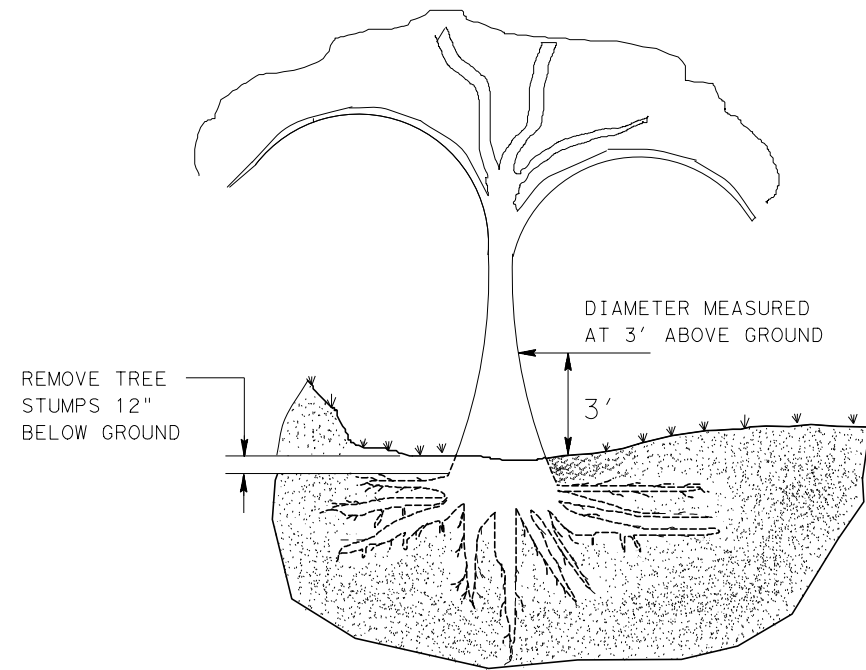
NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

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

FILE: sg153120.dgn	DN: TXDOT	CK: KM	DW: VP	CK: VP
© TXDOT: APRIL 2020	CONT: 0133	SECT: 04	JOB: 042	HIGHWAY: US 82
REVISIONS	DIST: WFS	COUNTY: BAYLOR	SHEET NO. 133	

DATE: FILE:

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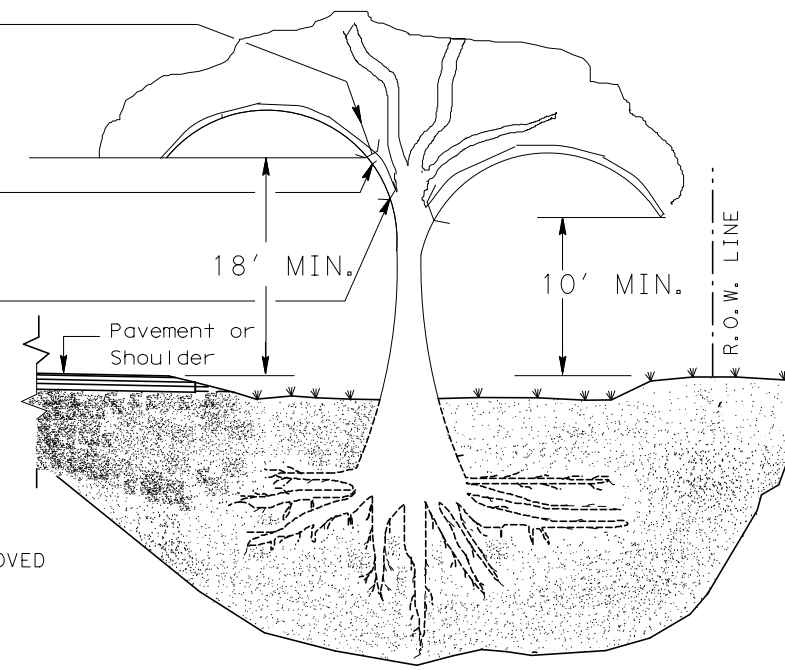
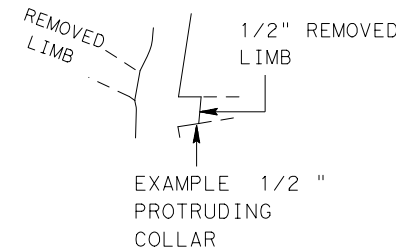


TREE REMOVAL

STEP 1:  
CUT 1/3 WAY THROUGH BOTTOM OF LIMB 8" TO 12" ABOVE MAIN STEM (OR TRUNK).

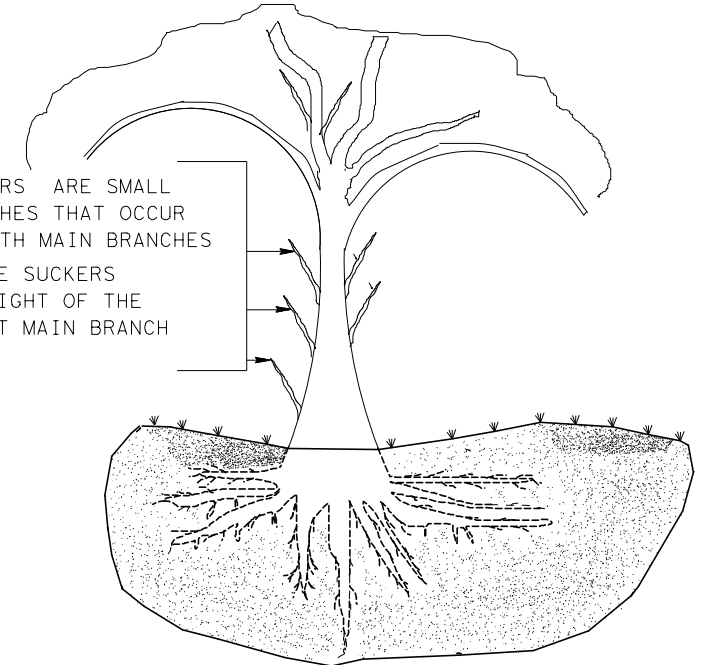
STEP 2:  
REMOVE LIMB 4" TO 6" BEYOND THE FIRST CUT

STEP 3:  
REMOVE STUB WITH A SMOOTH CUT SO THAT TRACE COLLAR OF THE REMOVED LIMB PROTRUDES APPROXIMATELY 1/2" FROM THE MAIN STEM

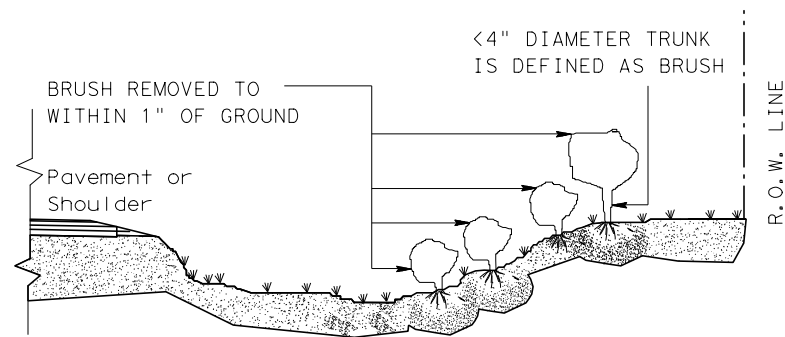


TREE TRIMMING

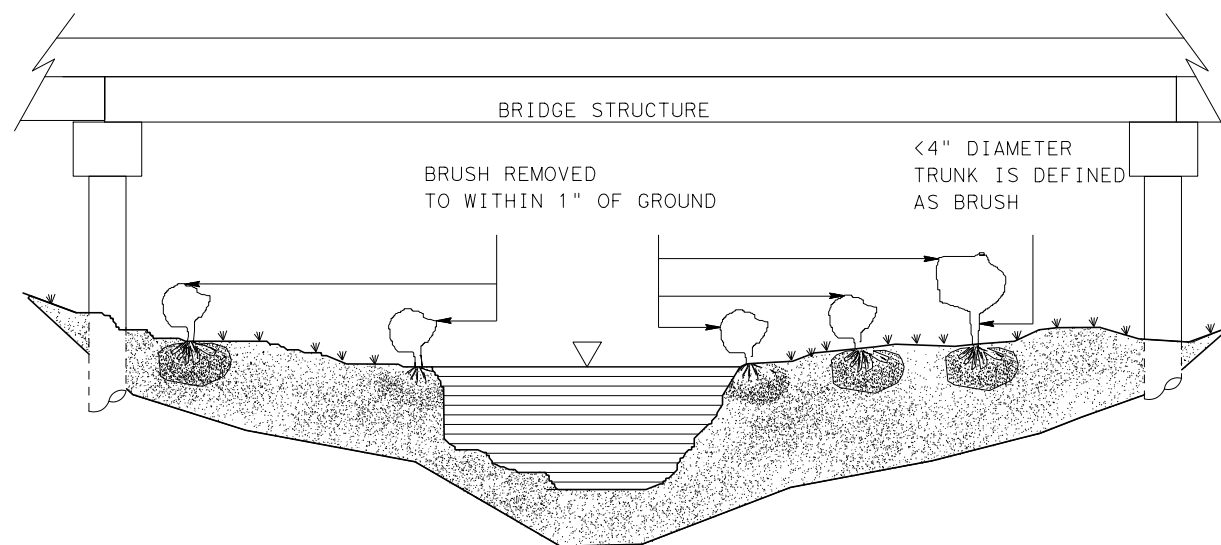
SUCKERS ARE SMALL BRANCHES THAT OCCUR BENEATH MAIN BRANCHES. REMOVE SUCKERS TO HEIGHT OF THE LOWEST MAIN BRANCH



STEPS 1, 2 AND 3 APPLY WHEN REMOVING LIMBS 2" IN DIAMETER OR LARGER.



BRUSH REMOVAL



BRUSH REMOVAL UNDER BRIDGE AND IN CHANNEL

GENERAL NOTES:

TREE TRIMMING

1. TRIM AND REMOVE ALL TREE LIMBS ON THE PAVEMENT SIDE OF THE TRUNK 18' ABOVE THE PAVEMENT OR BRIDGE DECK ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.
2. TRIM AND REMOVE ALL TREE LIMBS BETWEEN THE TRUNK AND R.O.W. LINE 10' ABOVE NATURAL GROUND, TERRAIN OR OTHER STRUCTURE ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.

TREE REMOVAL

3. FOR TREES MARKED FOR REMOVAL, THE DIAMETER OF TREES ARE DETERMINED BY MEASUREMENT OF THE TRUNK CIRCUMFERENCE 3' ABOVE THE GROUND. TREES WITH TRUNKS OF LESS THAN 4" DIAMETER ARE CONSIDERED TO BE BRUSH. TREES WITH MULTIPLE TRUNKS AT THE POINT OF MEASUREMENT ARE MEASURED AND PAID FOR SEPARATELY.
4. MEASUREMENTS FOR PAYMENT OF TREE DIAMETERS ARE DIVIDED INTO THE RANGES SHOWN IN TABLE 1.

PAY ITEM	RANGE FOR PAY ITEMS			
	TRUNK DIAMETER *		TRUNK CIRCUMFERENCE	
	LOWER LIMIT IS GREATER THAN	UPPER LIMIT IS LESS THAN OR EQUAL TO	LOWER LIMIT IS GREATER THAN	UPPER LIMIT IS LESS THAN OR EQUAL TO
752 6005	4	12	12 1/2	37 1/2
752 6006	12	18	37 1/2	56 1/2
752 6007	18	24	56 1/2	75 1/2
752 6008	24	30	75 1/2	94
752 6009	30	36	94	113
752 6010	36	42	113	132
752 6011	42	48	132	151
752 6012	48	60	151	188 1/2
752 6013	60	72	188 1/2	226
752 6019	72	84	226	264
	84	GREATER THAN 84	264	NOT APPLICABLE

\*SEE GENERAL NOTE #3.

Maintenance Division Standard

## TREE AND BRUSH REMOVAL

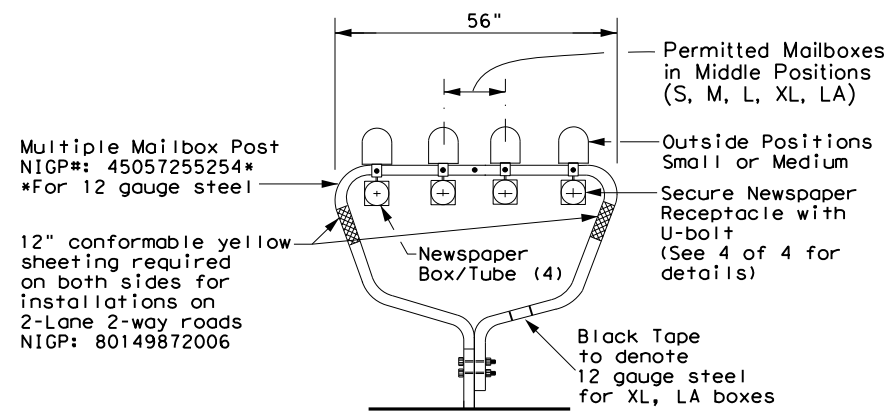
### TRB-15(1)

FILE:	DN: JEO	CK: LJB	DW: JEO	CK:
© TxDOT MARCH 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
Revised table 1 to 2014 Specification	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	134	

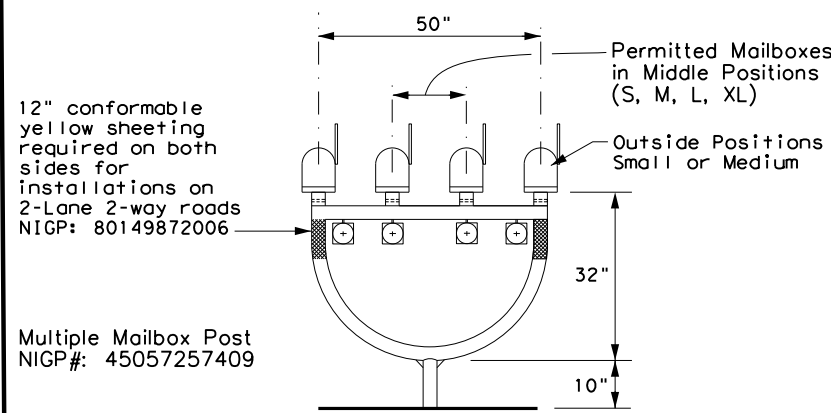
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DATE: FILE:

### TYPE 1 - MULTIPLE



### TYPE 4 - MULTIPLE



### MAILBOX SIZES

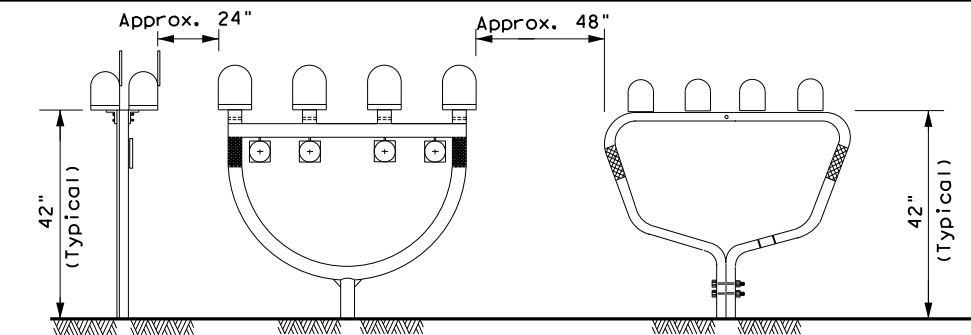
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

#### GENERAL NOTES:

- Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
- Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

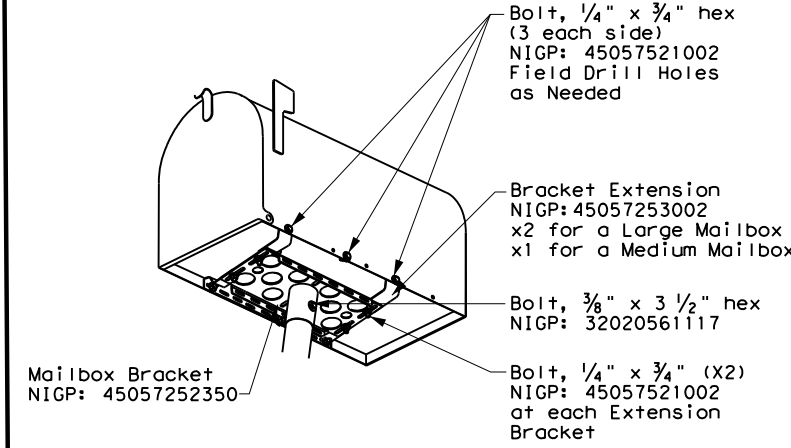
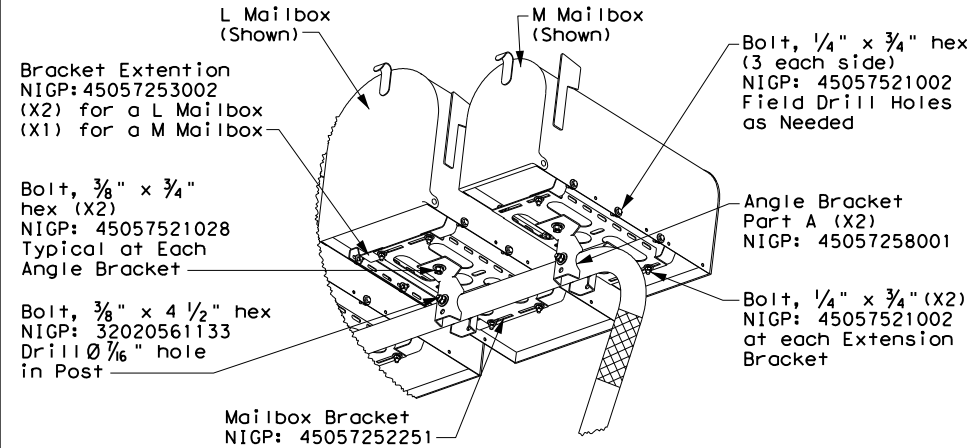
\* See Note 1.  
 \*\* Excluding Molded Plastic on 4 X 4 Post

### TYPICAL INSTALLATION MEASUREMENTS

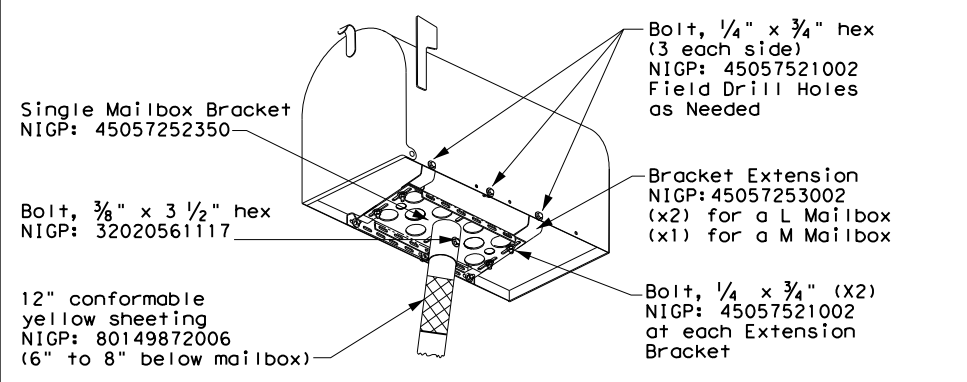


#### NOTE:

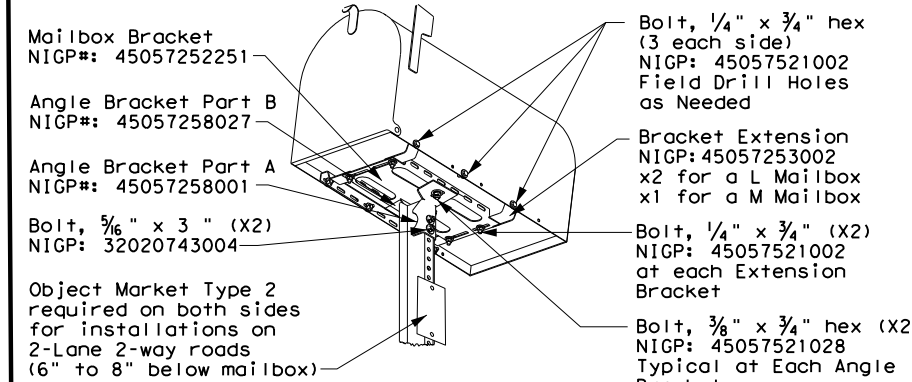
Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.



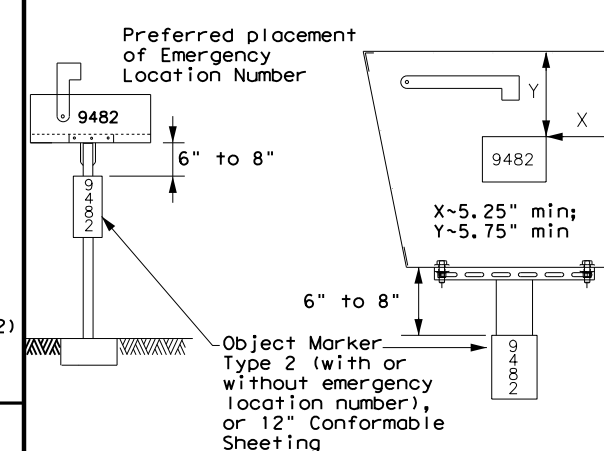
### TYPE 2 and 4 - SINGLE/DOUBLE



### TYPE 3 - SINGLE/DOUBLE

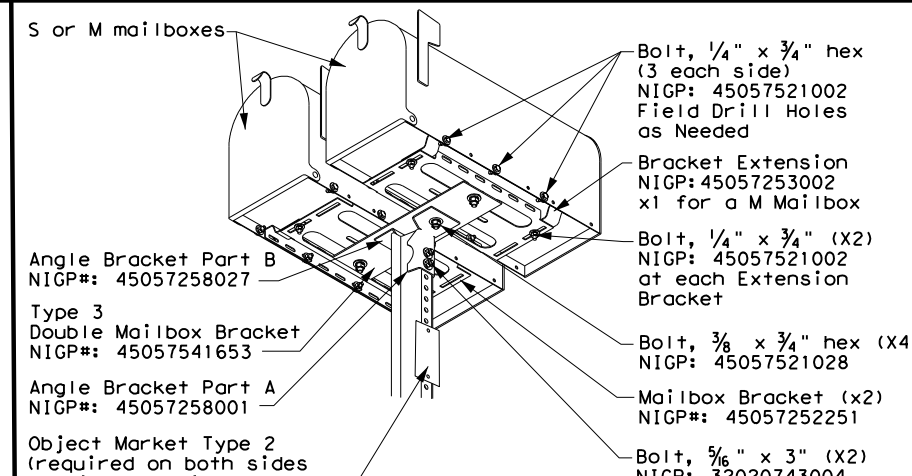
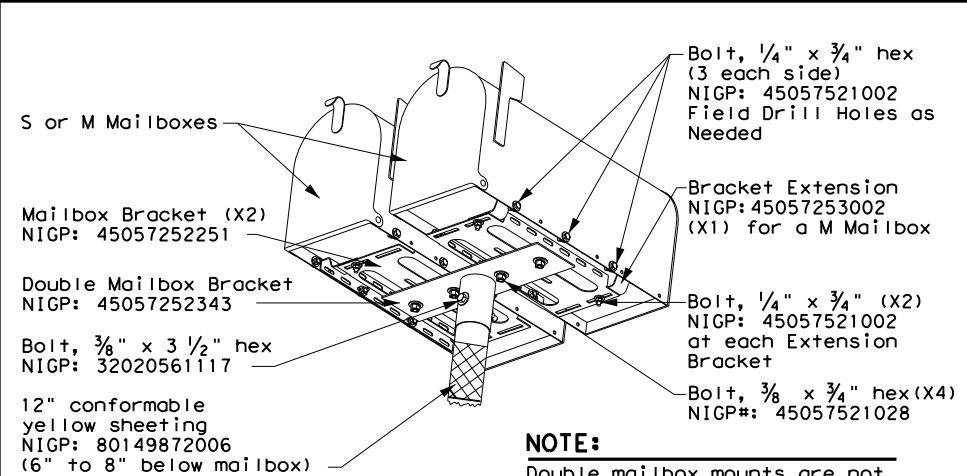


### PLACEMENT OF EMERGENCY LOCATION NUMBER

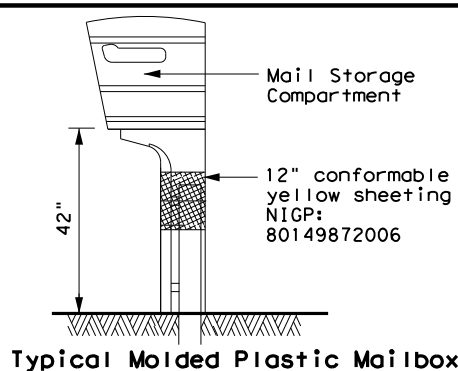


#### NOTES:

- Location numbers are provided by homeowner. Minimum size 1" height.
- Location number is typically placed on the mailbox in a contrasting color.
- Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
- Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
- See 3 of 4 for Foundation details.
- See 4 of 4 for Hardware details.



### TYPE 5



SHEET 1 OF 4



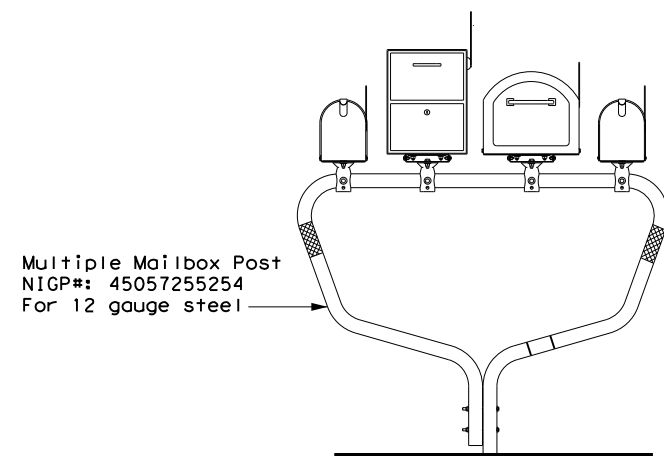
## MAILBOX MOUNTING AND ASSEMBLY

### MB(1)-21

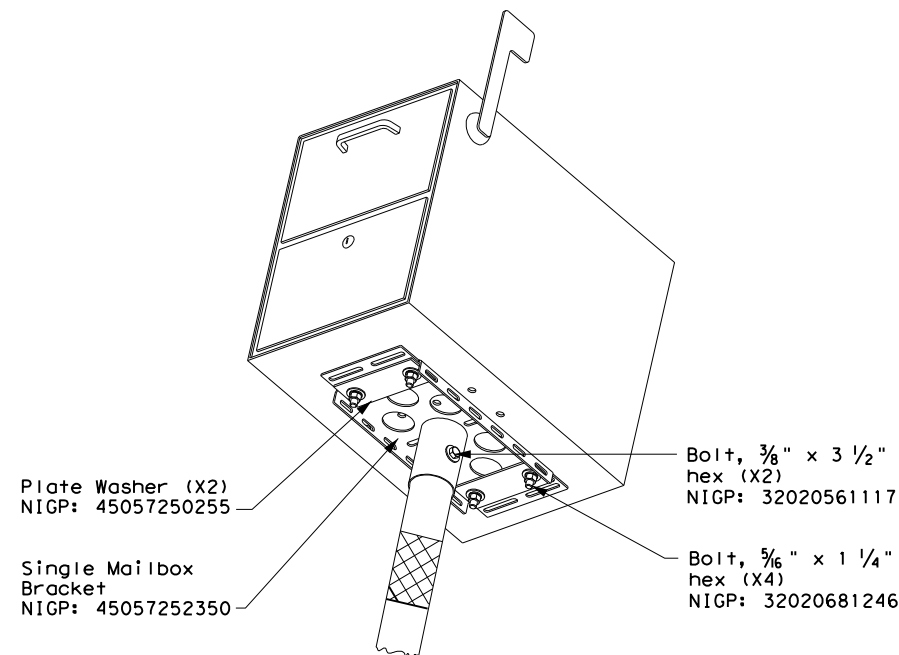
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
2/2005	11/2009	4/2015		
6/2005	1/2011			
11/2006	7/2014			
	DIST	COUNTY		SHEET NO.
	WFS	BAYLOR		135

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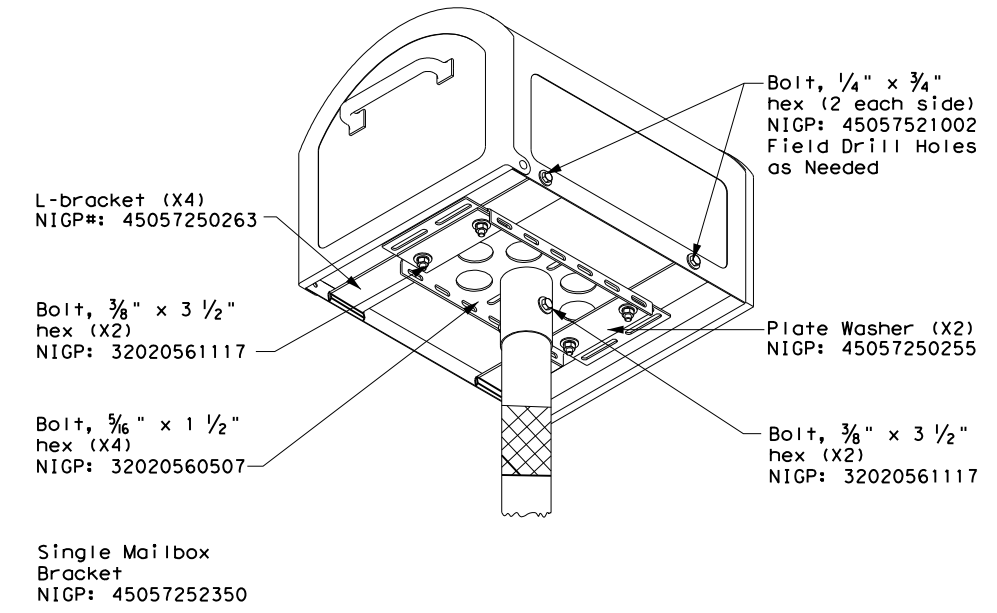
**TYPE 1 - MULTI LOCKABLE AND XL MAILBOX**



**TYPE 2/4 - SINGLE LOCKABLE MAILBOX**

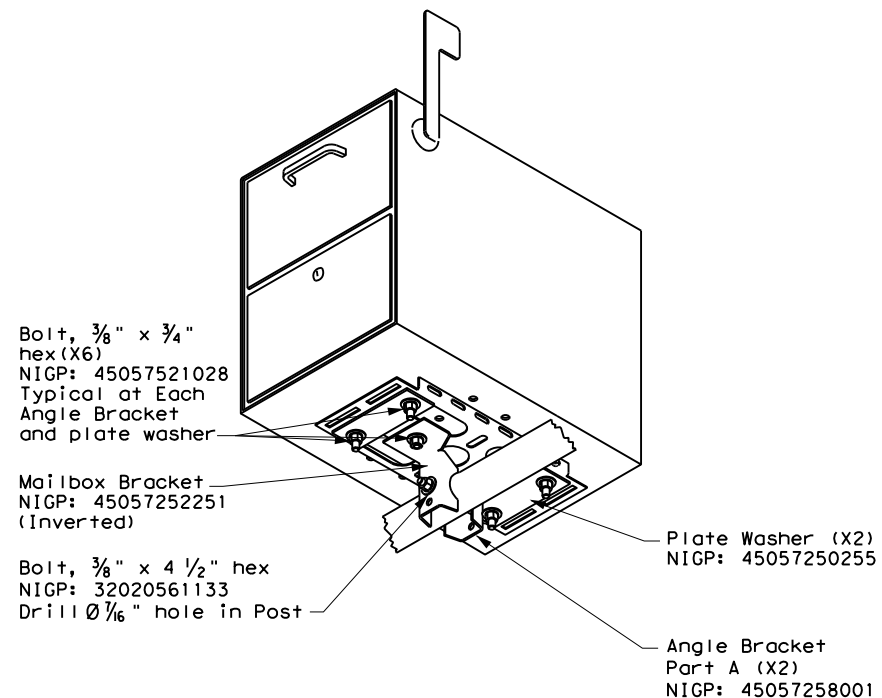


**TYPE 2/4 - SINGLE XL MAILBOX**

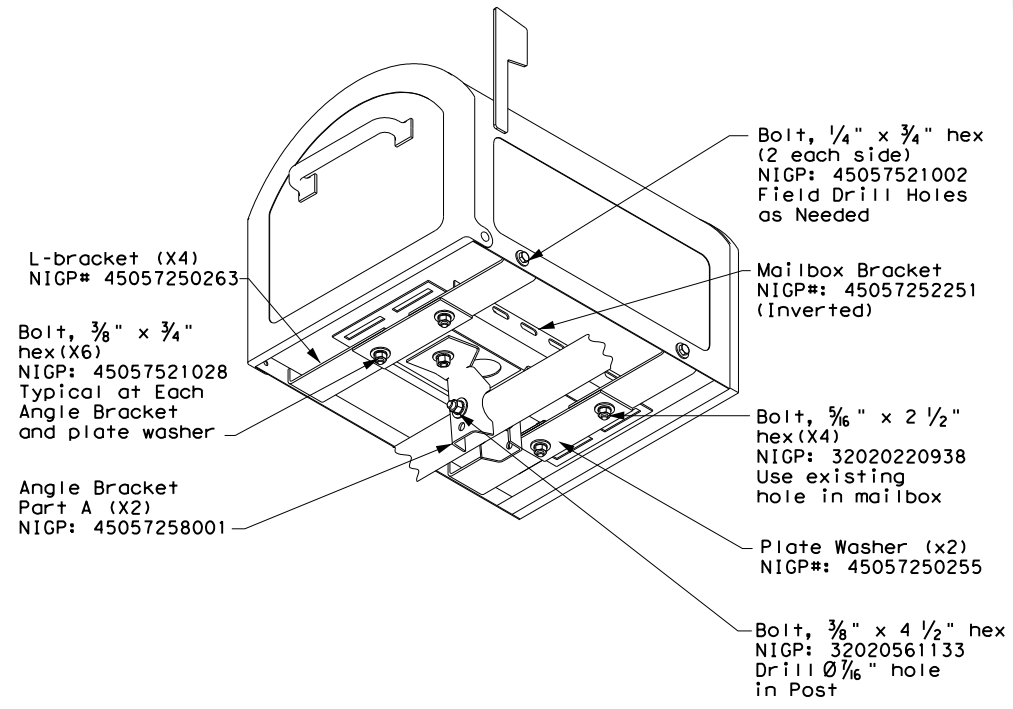


**NOTE:**  
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

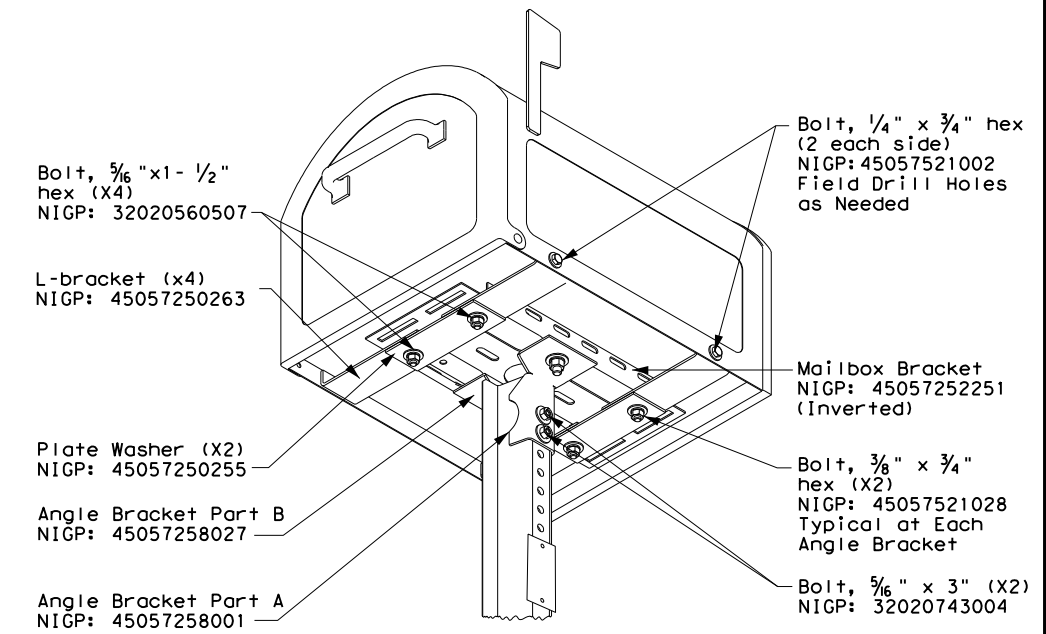
**TYPE 1 MULTI - LOCKABLE ARCHITECTURAL (LA)**



**TYPE 1 MULTI - XL MAILBOX**



**TYPE 3 - XL MAILBOX MOUNTING**



SHEET 2 OF 4

Texas Department of Transportation Maintenance Division Standard

**XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY MB (2) - 21**

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
2/2005	0133	04	042	US 82
6/2005	DIST	COUNTY	SHEET NO.	
11/2006	WFS	BAYLOR	136	

DATE: FILE:

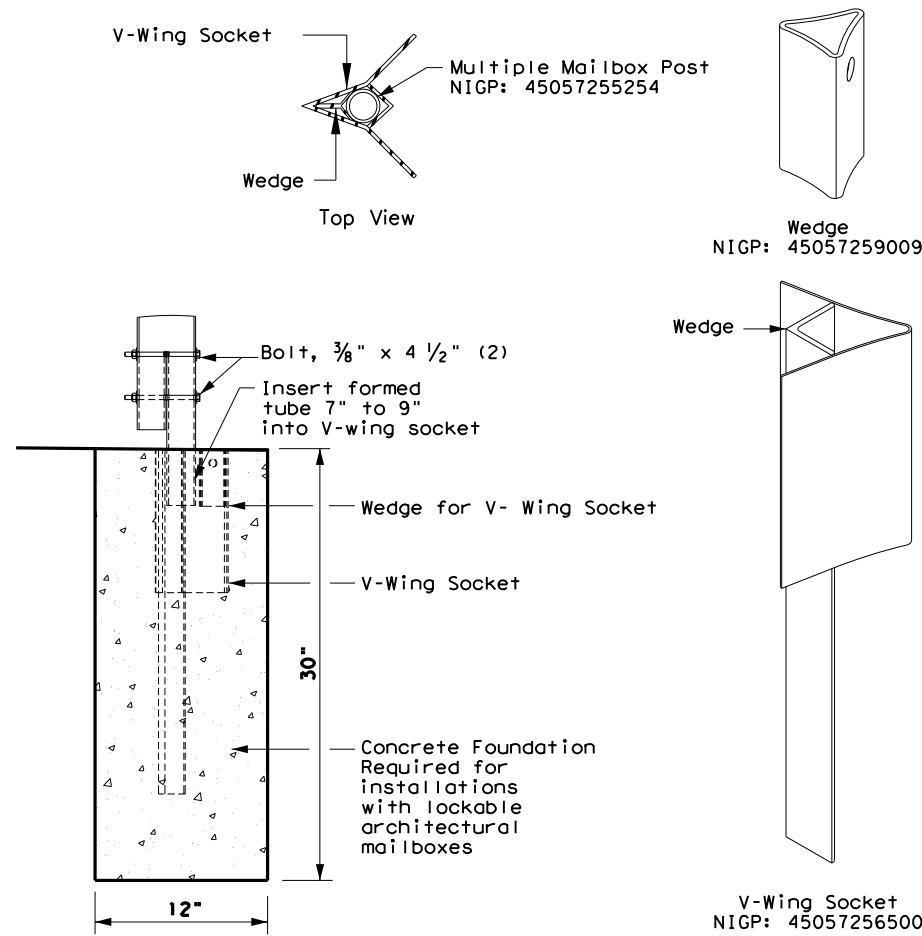


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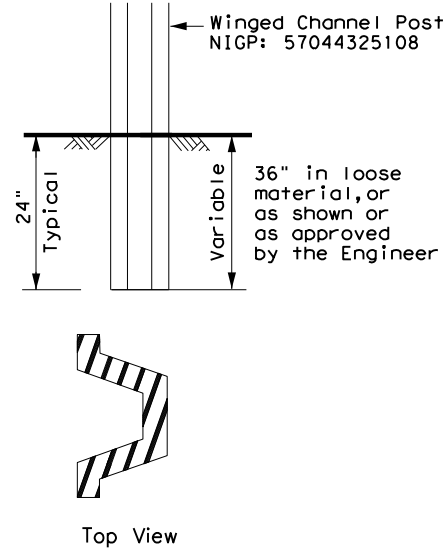
DATE: 9/7/2021 9:14:50 AM  
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### TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



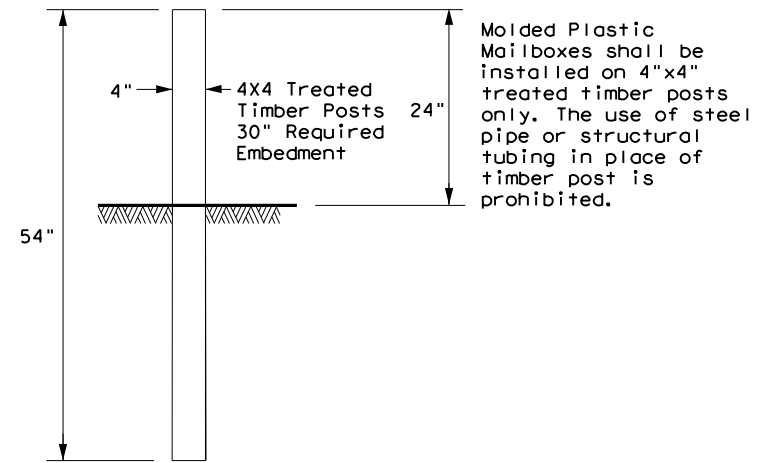
### TYPE 3 - SUPPORT/FOUNDATION



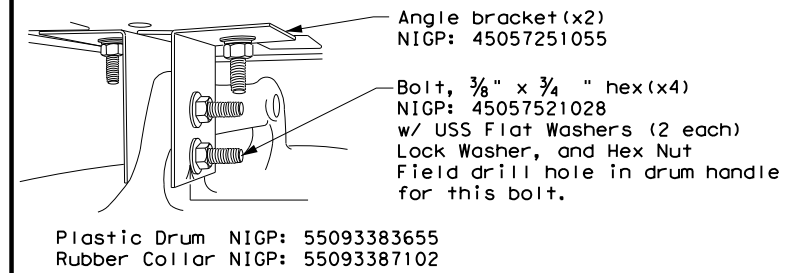
#### NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

### TYPE 5 - SUPPORT/FOUNDATION



### TYPE 6 - TEMPORARY MAILBOX SUPPORT

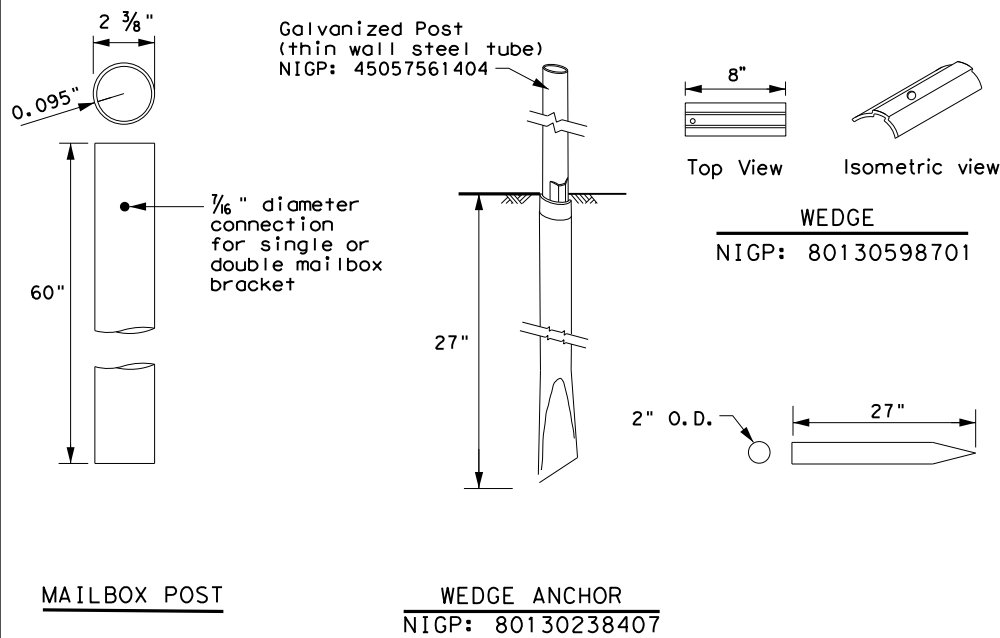


#### NOTES:

1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

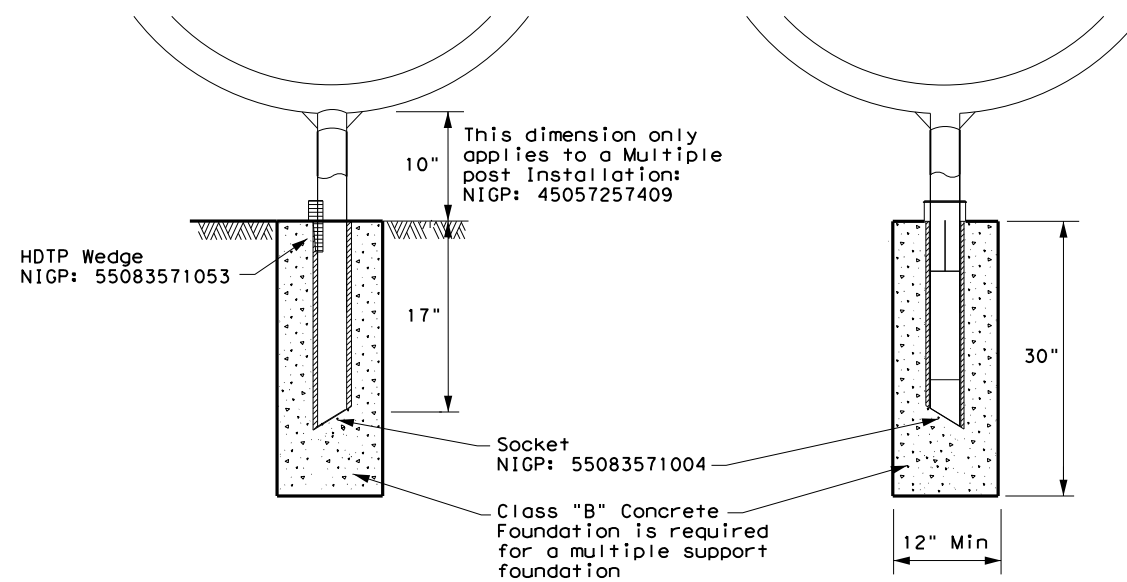
### TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System



### TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107  
 Multiple post NIGP: 45057257409  
 Recycled Rubber post (RR) NIGP: 45057561057



#### GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

SHEET 3 OF 4



## MAILBOX SUPPORT AND FOUNDATION

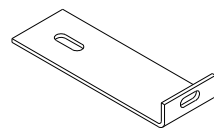
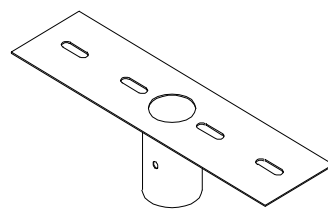
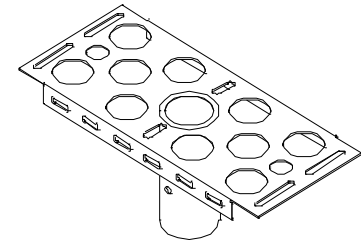
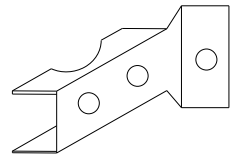
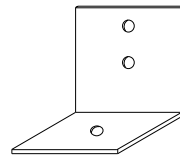
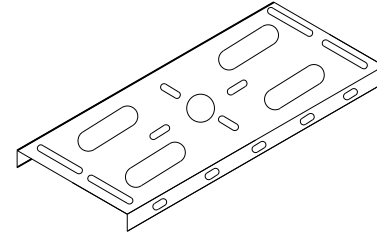
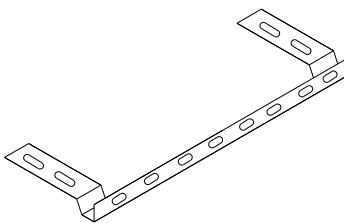
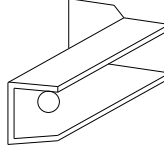
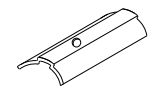

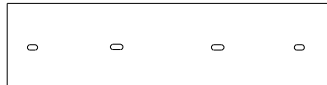
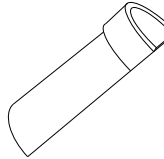
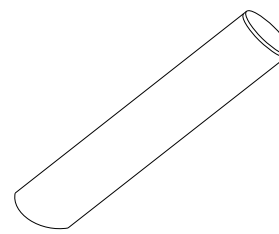

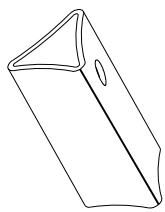
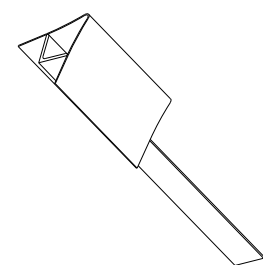
MB (3) - 21

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2/2005	11/2009	4/2015	DIST	COUNTY
6/2005	1/2011		WFS	BAYLOR
11/2006	7/2014			SHEET NO. 137

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DATE: 9/7/2021 9:14:32 AM  
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TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Govanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete

 NIGP: 45057250263 L-Bracket x4 for XL sized mailboxes	 NIGP: 45057252343 Double Mailbox Bracket For Type 2 and Type 4 double mount	 NIGP: 45057252350 Single Mailbox Bracket For Type 2 single and for Type 4 single and multi mount	 NIGP: 45057258001 Part "A" Angle Bracket For Type 1 multi (2 per mailbox) and Type 3 single and double
 NIGP: 45057251055 Type 6 Angle Bracket (2 per mailbox)	 NIGP: 45057252251 Mailbox Bracket For Type 1 multi and any double mount (use 2)	 NIGP: 45057253002 Bracket Extension Use 1 for a medium Mailbox Use 2 for a Large Mailbox	 NIGP: 45057258027 Part "B" Angle Bracket For Type 3 single and double
 NIGP: 80130598701 Wedge for Type 2	 NIGP: 45057250255 Plate Washer for Architecural and XL Mailboxes	 NIGP: 45057541653 Type 3 double mailbox bracket	 NIGP: 55083571053 Type 4 Mailbox Wedge
 NIGP: 55083571004 Type 4 Mailbox Socket	 NIGP: 80130238407 Type 2 Wedge Anchor	 NIGP: 45057259009 Wedge for Type 1 V-wing Socket	 NIGP: 45057256500 V-wing Socket for Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

**NOTES:**

- Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
- A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

**BID CODES FOR CONTRACTS**

**MB-(X) ASSM TY (XXX) (X)**

Type of Mailbox \_\_\_\_\_

S = Single  
D = Double  
M = Multiple  
MP = Molded Plastic


Type of Post \_\_\_\_\_

WC = Winged Channel Post  
RR = Recycled Rubber  
TWW = Thin Walled White Tubing  
TWG = Thin Walled Galvanized Tubing  
TIM = Timber

Type of Foundation \_\_\_\_\_

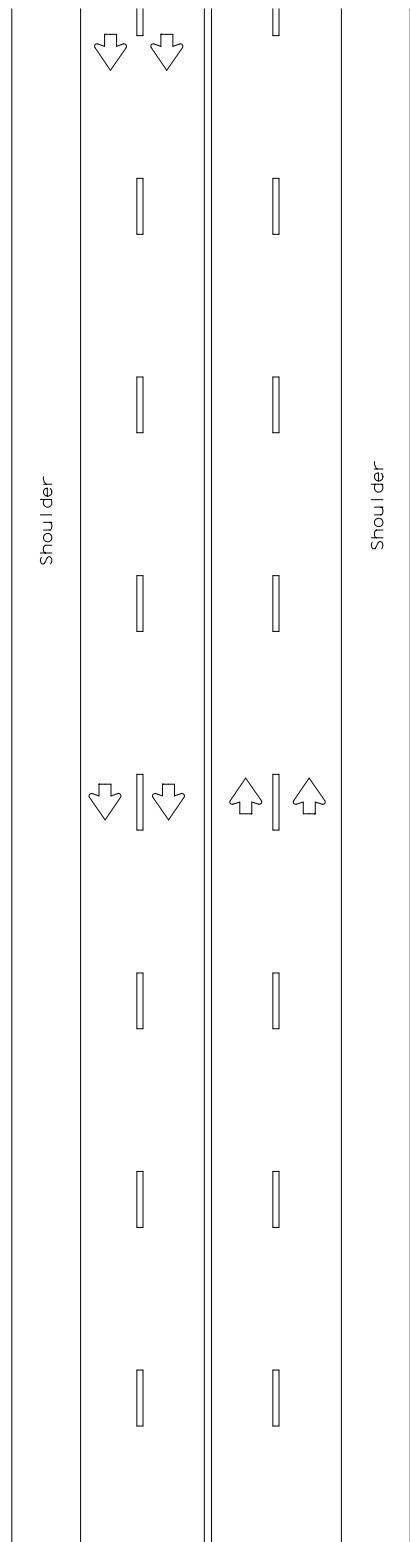
Ty 1 = V-Loc  
Ty 2 = Wedge Anchor Steel System  
Ty 3 = Winged Channel post  
Ty 4 = Wedge Anchor Plastic System  
Ty 5 = 4 X 4 Post

SHEET 4 OF 4

 Texas Department of Transportation		Maintenance Division Standard
<h2>NIGP PARTS LIST AND COMPATIBILITY</h2> <h3>MB(4)-21</h3>		
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT: 0133	SECT: 04
2/2005	11/2009	4/2015
6/2005	1/2011	
11/2006	7/2014	
DIST: WFS		SHEET NO. 138

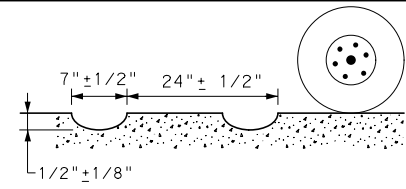
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DATE:  
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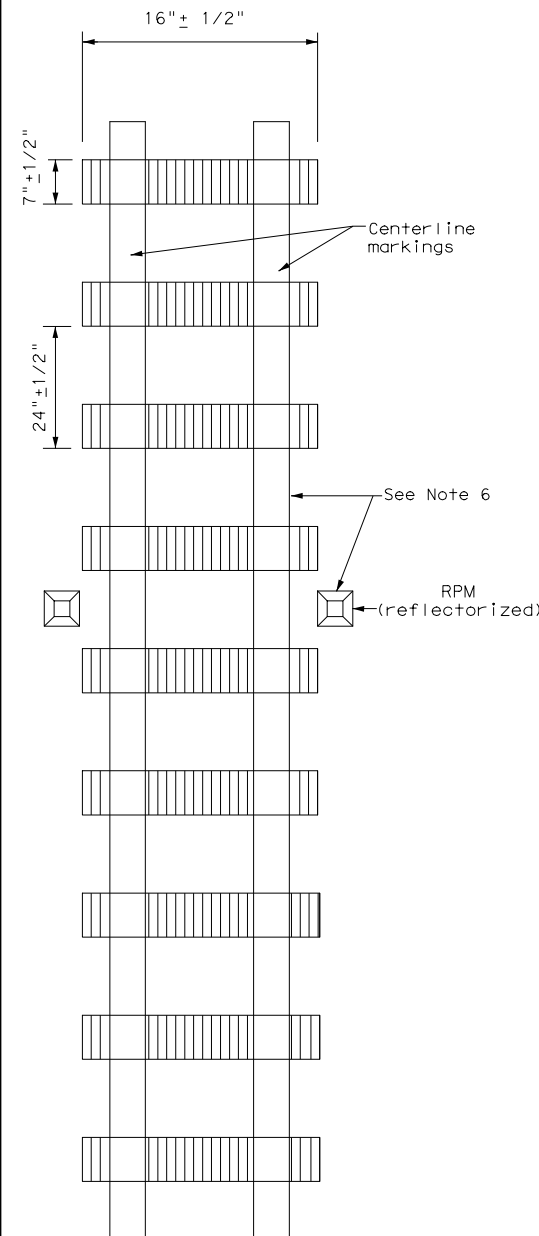


MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

CENTERLINE RUMBLE STRIPS

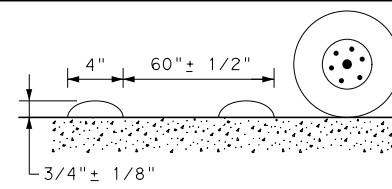


PROFILE VIEW

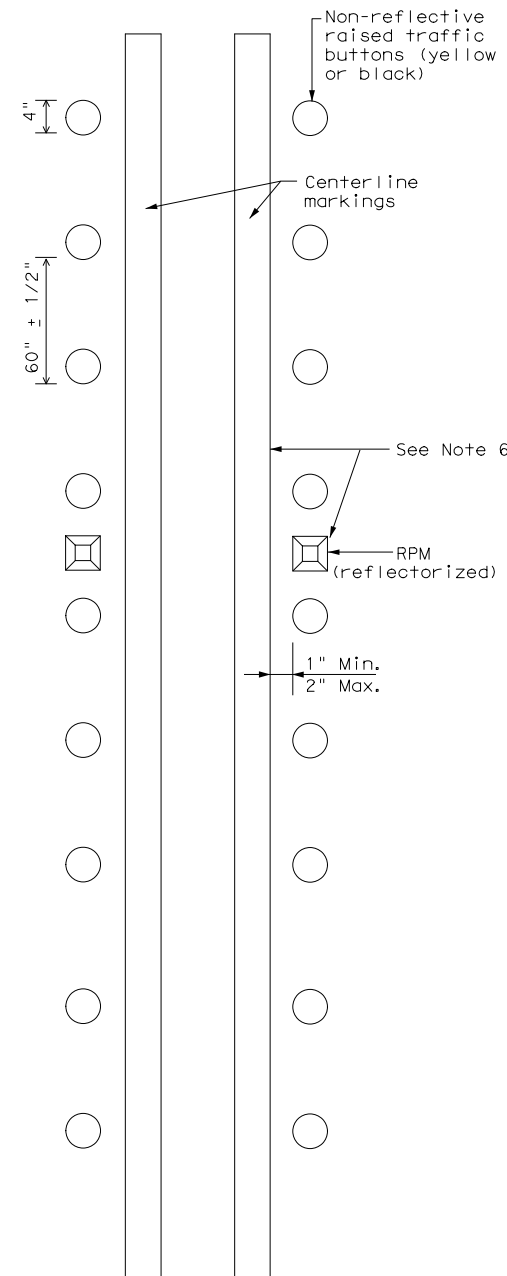


PLAN VIEW  
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

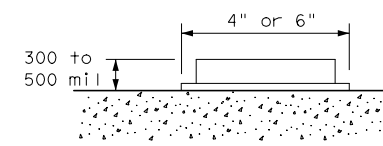


PROFILE VIEW

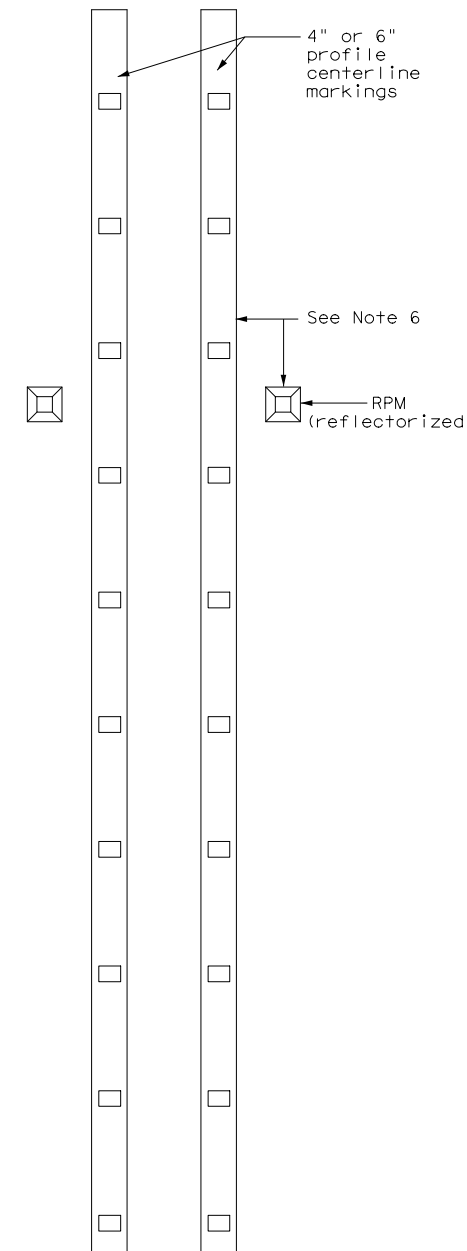


PLAN VIEW  
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW  
OPTION 3

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.

WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

11. See standard sheet RS(4).



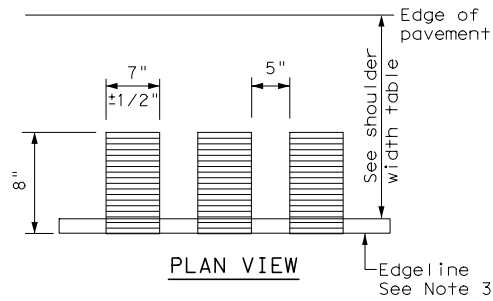
CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS

RS(2) - 13

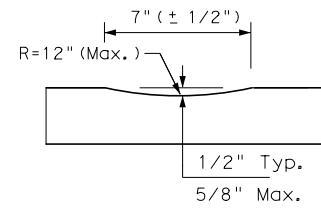
FILE: r's(2)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	139	

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DATE:  
FILE:

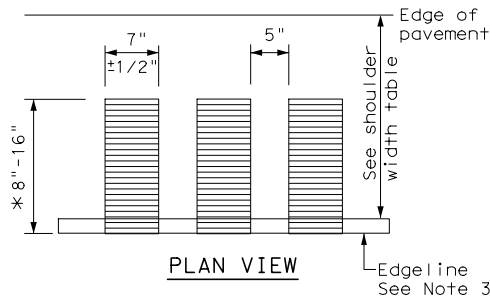


PLAN VIEW

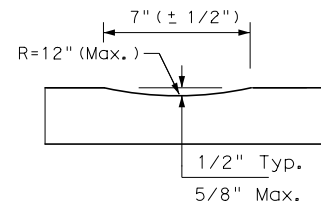


PROFILE VIEW  
OPTION 1

CONTINUOUS MILLED  
DEPRESSIONS  
(Rumble Strips)

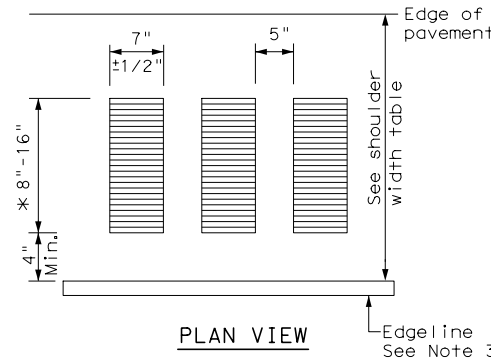


PLAN VIEW



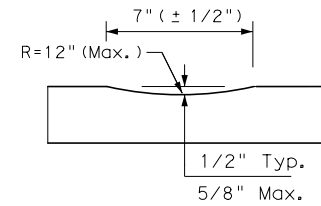
PROFILE VIEW  
OPTION 2

CONTINUOUS MILLED  
DEPRESSIONS  
(Rumble Strips)



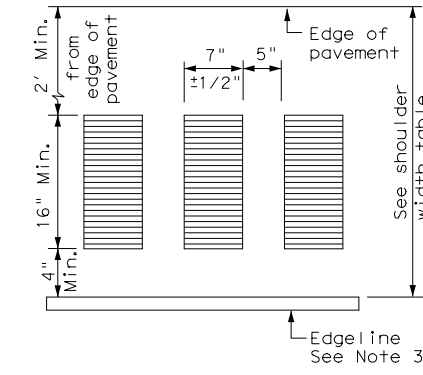
PLAN VIEW

\* This distance may vary based on width of shoulder

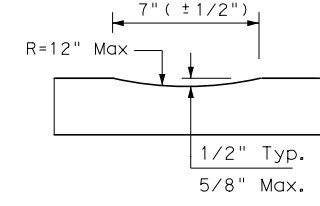


PROFILE VIEW  
OPTION 3

CONTINUOUS MILLED  
DEPRESSIONS  
(Rumble Strips)

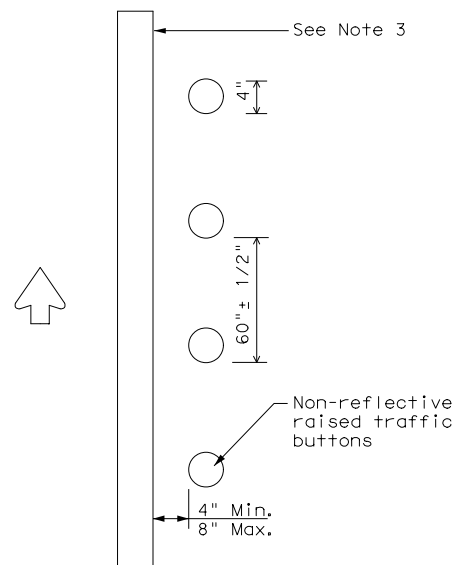


PLAN VIEW



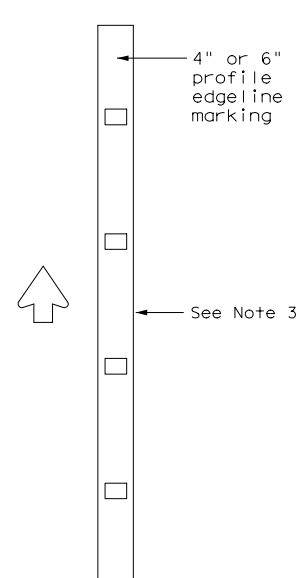
PROFILE VIEW  
OPTION 4

CONTINUOUS MILLED  
DEPRESSIONS  
(Rumble Strips)



PLAN VIEW  
OPTION 5

RAISED EDGELINE  
RUMBLE STRIPS



PLAN VIEW  
OPTION 6

PROFILE EDGELINE  
MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3 5 OR 6	Option 2, 4, 5 OR 6

**GENERAL NOTES**

- Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
- Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
- Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
- See the table below for determining what options may be used for edgeline rumble strips.

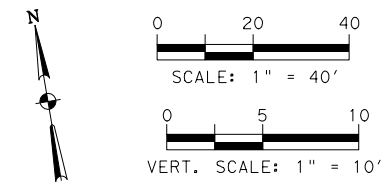
**WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:**

- See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
- Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
- Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
- Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
- On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

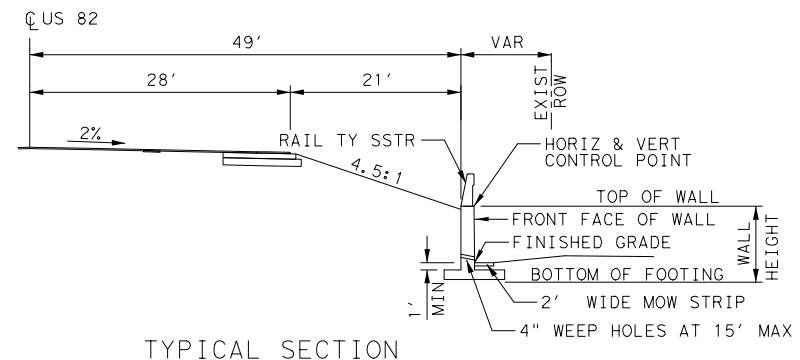
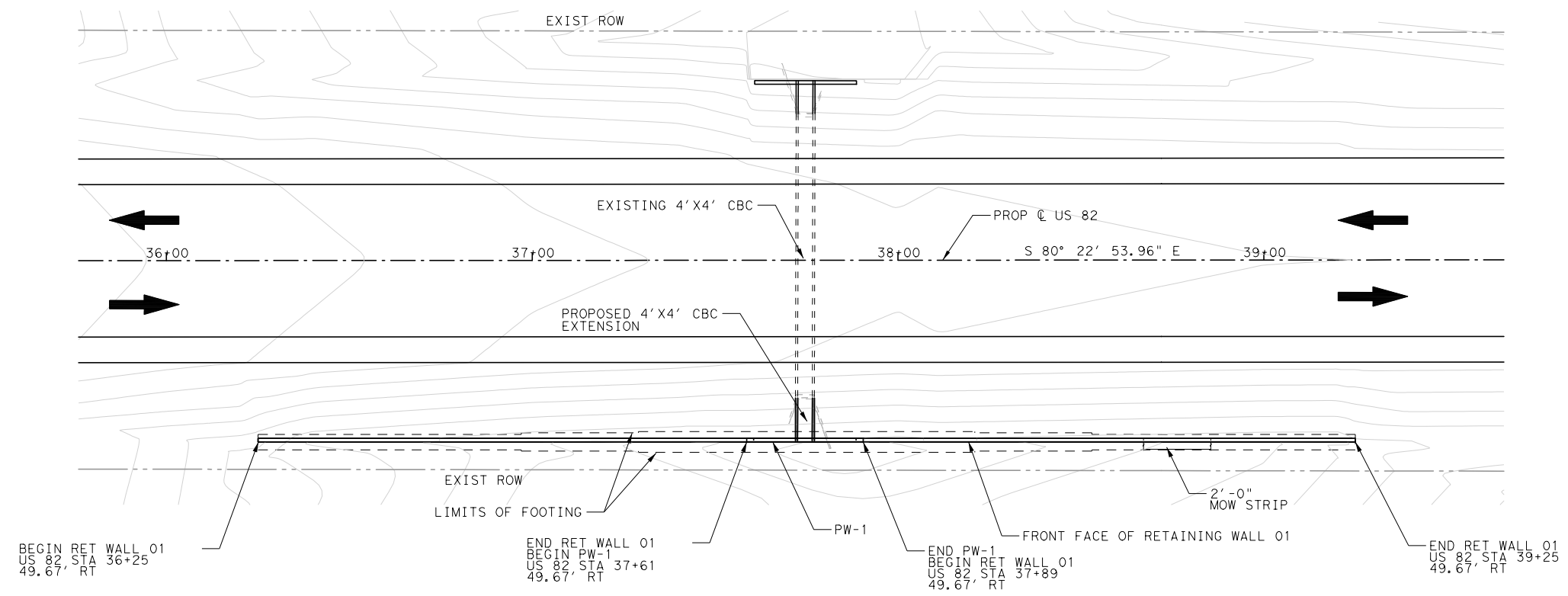
**WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:**

- Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
- Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
- Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
- The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
- Raised profile thermoplastic markings used as edgelines may substitute for buttons.

		<b>Texas Department of Transportation</b>		<b>Traffic Operations Division Standard</b>	
<b>EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13</b>					
FILE:	rs(4)-13.dgn	DN:	TxDOT	CK:	TxDOT
©TxDOT	October 2013	CON:	0133	SECT:	04
REVISIONS		JOB:	042	HIGHWAY:	US 82
		DIST:	WFS	COUNTY:	BAYLOR
				SHEET NO.:	140

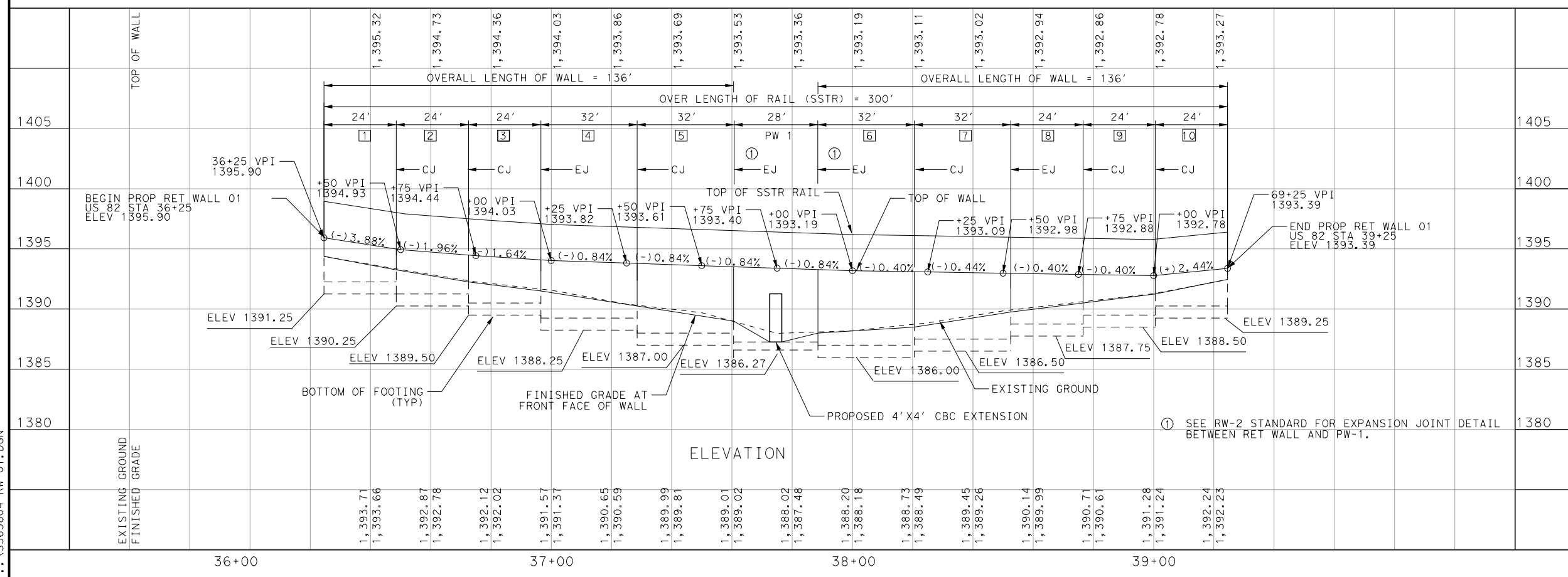


LEGEND:  
 EJ = EXPANSION JOINT  
 CJ = CONSTRUCTION JOINT  
 [X] = WALL PANEL NUMBER



NOTES:  
 SQUARE FOOT SURFACE AREA OF RETAINING WALL IS MEASURED FROM TOP OF WALL TO TOP OF FOOTING.  
 SEE TxDOT RW 1(L)B AND RW 2 STANDARDS FOR ADDITIONAL INFORMATION.  
 SEE PW-1 STANDARD FOR CULVERT WINGWALL DETAILS.

PLAN



ELEVATION



12/14/2020

**RETAINING WALL 01 AND PW-1 LAYOUT**



**HUITT-ZOLLARS**

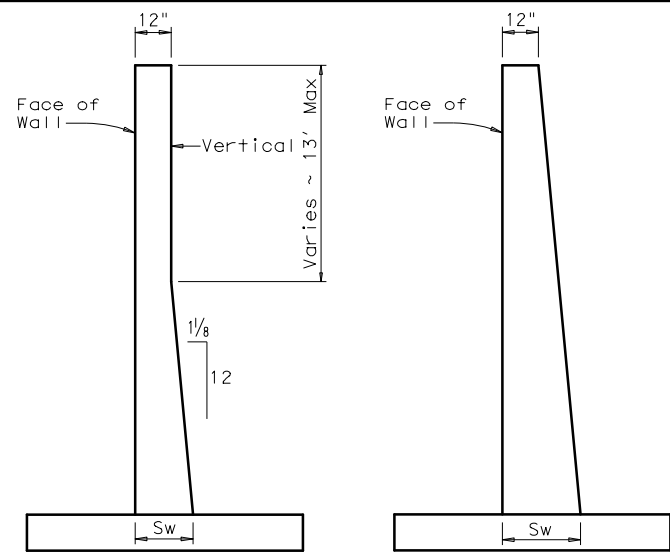
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 141
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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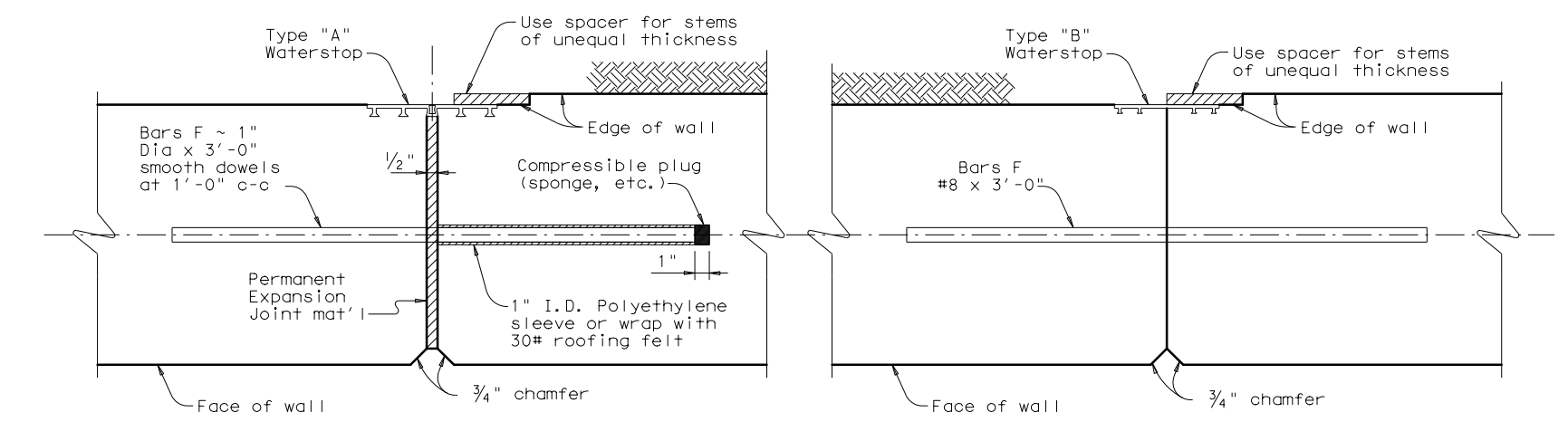
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AS DETAILED ALL HEIGHTS (Basis for payment)  
FRONT FACE VERTICAL BACK FACE SLOPED

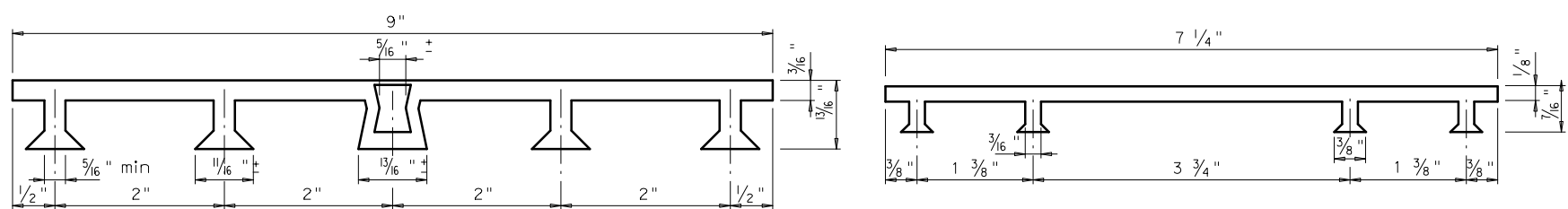
**ALTERNATE STEM SLOPE DETAILS**

Walls with slopes other than those shown may be used after approval by the Engineer. Sw shall not be less than shown in Table on Sheet 1. No payment will be made for excess concrete due to changing of slope of wall stem.



**EXPANSION JOINT**

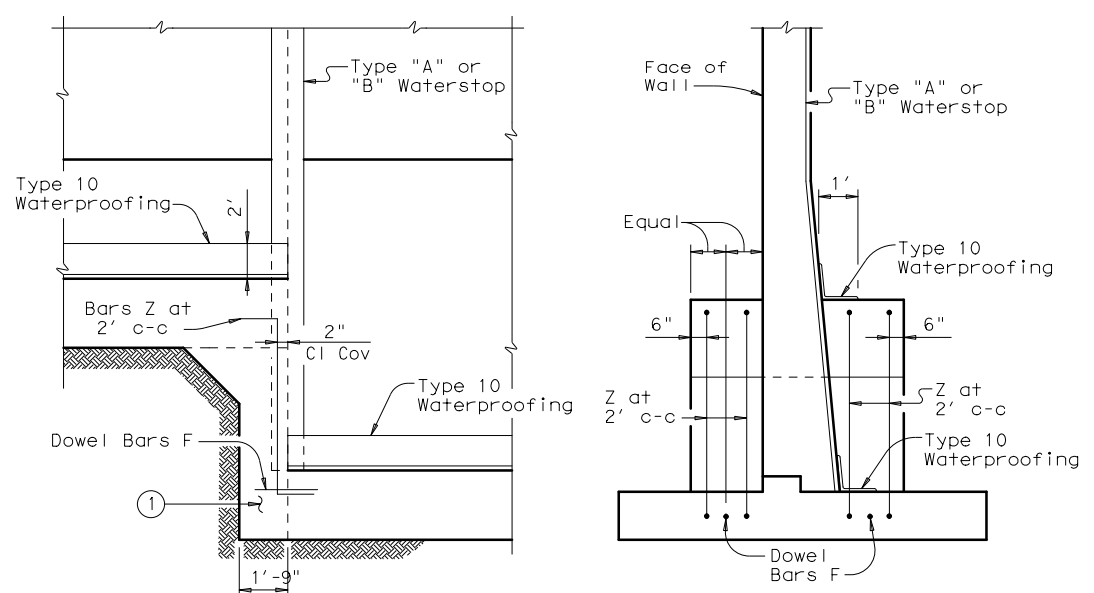
**CONSTRUCTION JOINT**



**PVC WATERSTOP TYPE "A"**

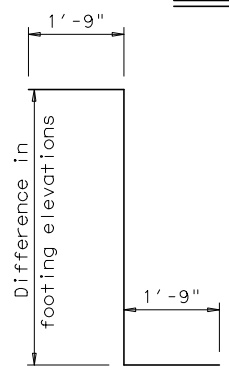
**PVC WATERSTOP TYPE "B"**

Note: Dimensions and shapes may vary slightly depending on manufacturer.

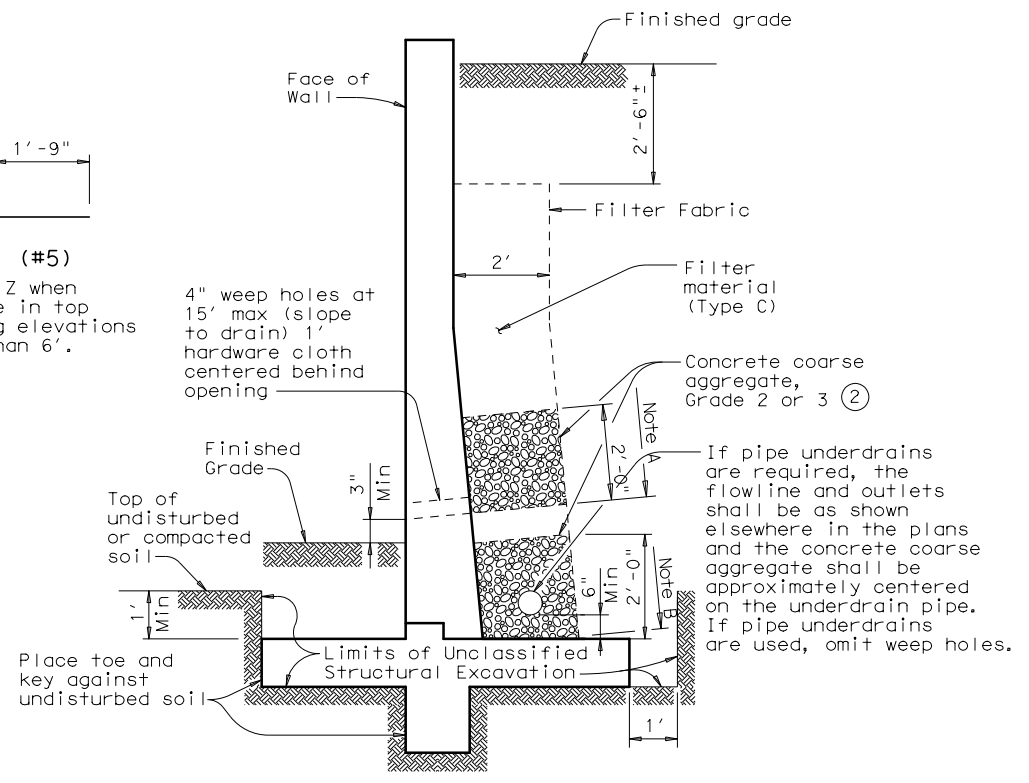


**SHOWING WATERSTOP AT FOOTING JOINT**

① Unreinforced Class "C" Concrete when difference in top of footing elevations is less than 6'. Omit when Dowel Bars F can be placed between adjacent footings with 4" cover top and bottom.



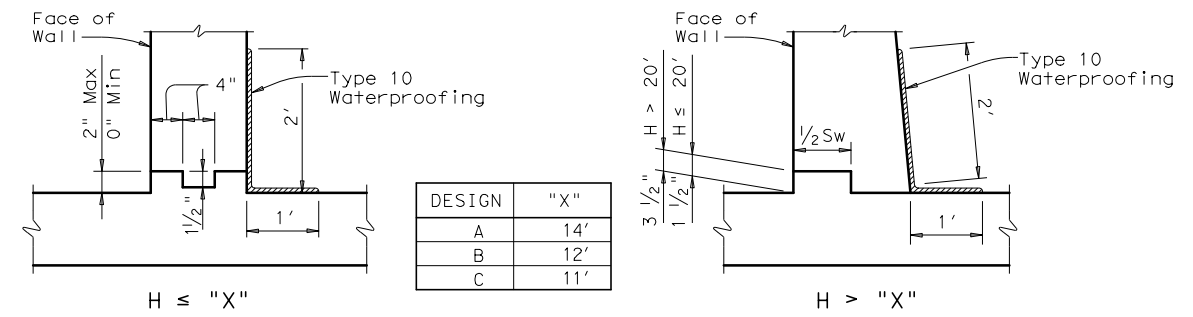
**BARS Z (#5)**  
Omit Bars Z when difference in top of footing elevations is less than 6'.



**DRAINAGE DETAILS AND EXCAVATION DIAGRAM**

Note A: Stop coarse aggregate at this level when weep holes are used.  
Note B: Use coarse aggregate to here with filter material above when underdrains are used.

**GENERAL NOTES:**  
Walls are designed assuming unit weight of soil = 120 pcf, and coefficient of horizontal earth pressure = 0.33.  
Walls are designed to provide a minimum factor of safety against sliding of 1.5. The undisturbed or compacted soil depth in front of walls, from bottom of Key up, shall not be less than  $K_w + Ft + 1'$ .  
Retaining walls are detailed to be placed on grades up thru 10% with footing level, with no changes in reinforcing steel. Steeper grades can be accommodated by shortening Bars A1 and B and increasing length of legs of Bars U by the same amount. No change in Quantities will be involved.  
Retaining walls may be placed on Horizontal Curves by adjusting lengths of footing Bars T and H. Minor revisions of Concrete Quantities may be required.  
Designed in accordance with current AASHTO Standard and Interim Specifications.  
All concrete to be Class "C".  
All reinforcing steel to be Grade 60.

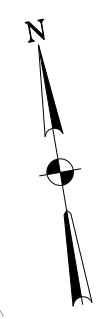
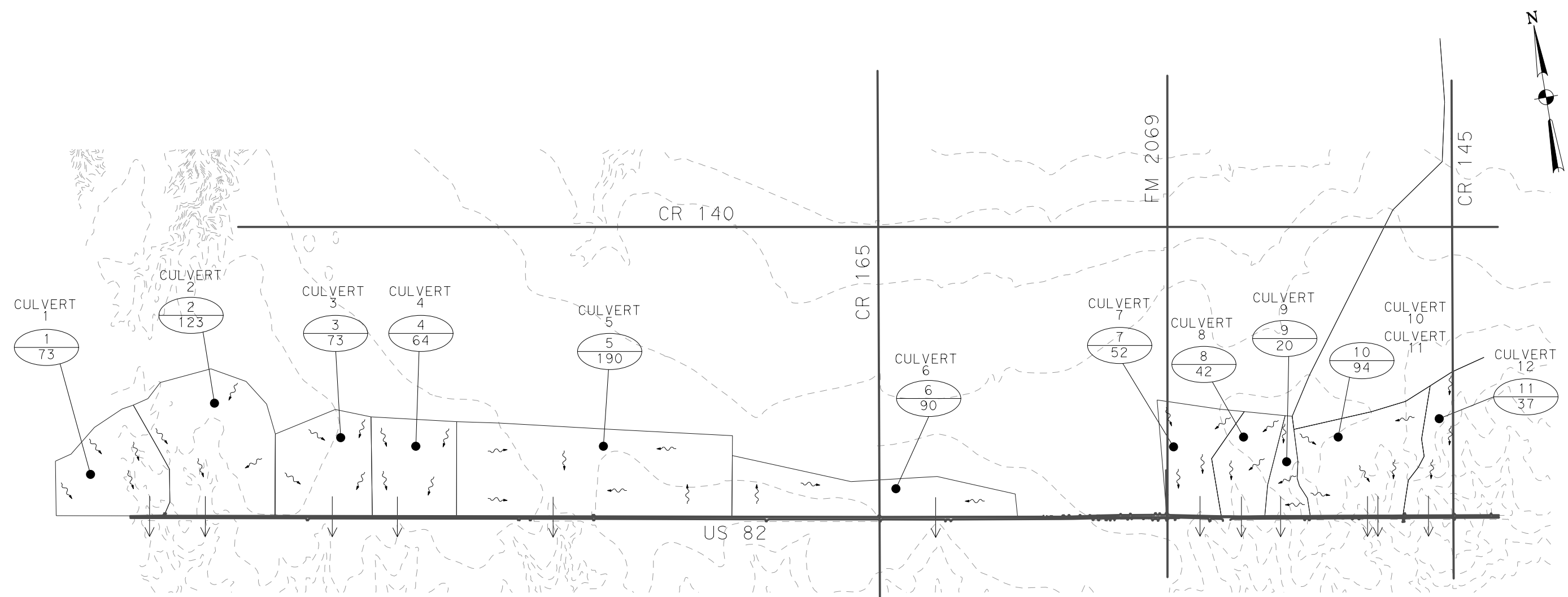


**JOINT AND WATERSTOP DETAILS**

		<b>Bridge Division Standard</b>	
<b>RETAINING WALL MISCELLANEOUS DETAILS</b>			
<b>RW 2</b>			
FILE: rwstdel1.dgn	DN: TxDOT	CK: TxDOT	DW: JGD
REVISIONS	CONT	SECT	JOB
0133	04	042	US 82
04-11: Added Note 2.	DIST	COUNTY	SHEET NO.
	WFS	BAYLOR	143

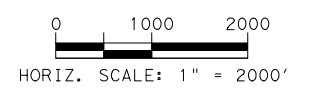
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LEGEND

- DA#  
ACRES
- STRUCTURE AND  
FLOW DIRECTION
- FLOW DIRECTION



*Russell A Parr* 12/14/2020

**CULVERT  
DRAINAGE AREA  
MAP**

SHEET 1 OF 3



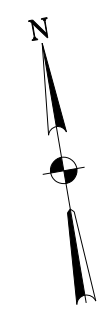
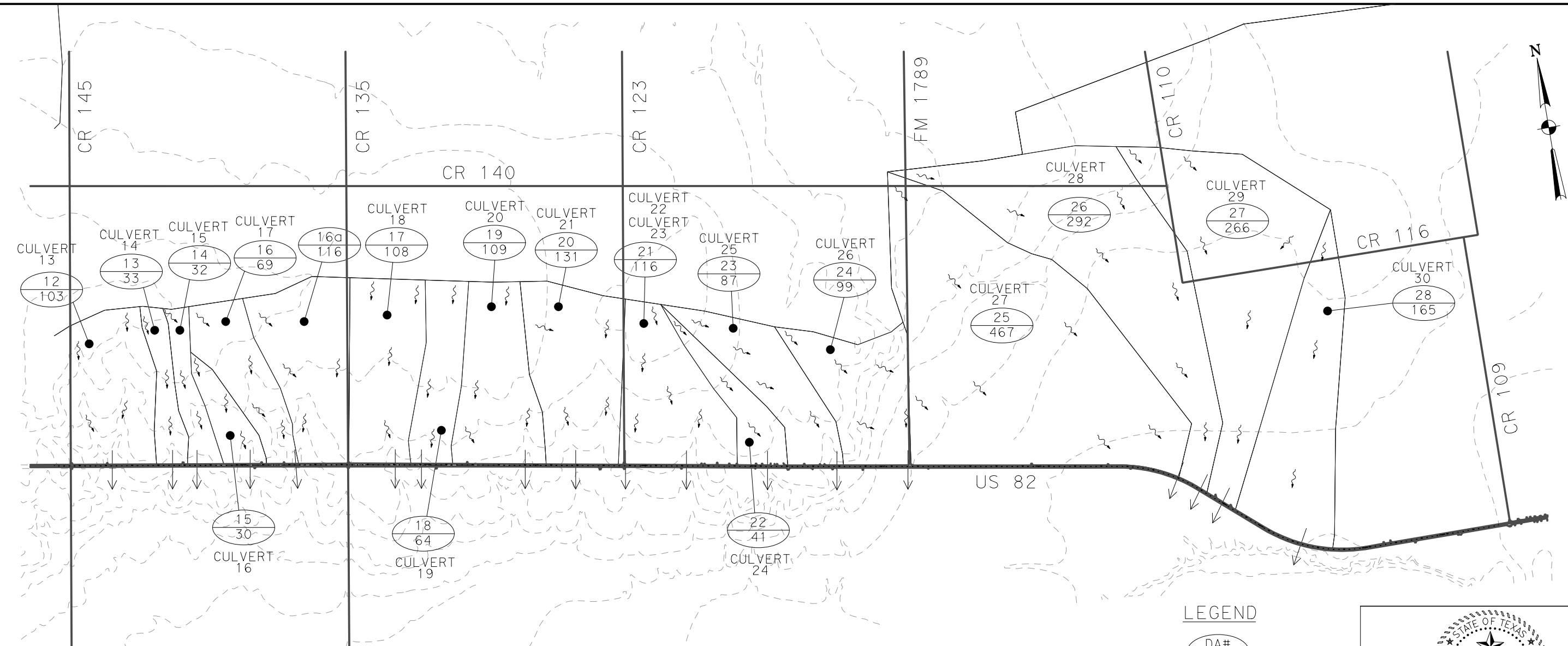
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 FIRM NO. F-761




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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO. US 82

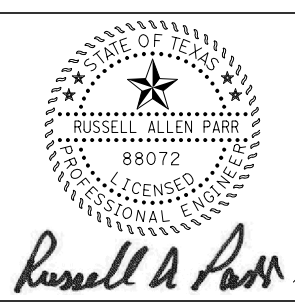
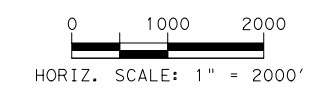


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**LEGEND**

-  DA#  
ACRES
-  STRUCTURE AND  
FLOW DIRECTION
-  FLOW DIRECTION



**CULVERT  
DRAINAGE AREA  
MAP**

SHEET 2 OF 3

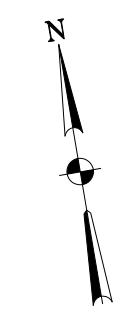


**HUITT-ZOLLARS**

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 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

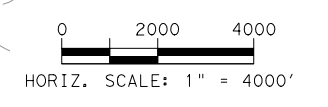
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**LEGEND**

- DA#  
ACRES
- STRUCTURE AND FLOW DIRECTION
- FLOW DIRECTION



*Russell A Parr* 12/14/2020

**CULVERT DRAINAGE AREA MAP**

SHEET 3 OF 3



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 FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			146
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

RATIONAL METHOD HYDROLOGY CALCULATIONS

Drainage Basin	Structure No.	Exist. Structure Type	Centerline (sta)	Alignment	Area (ac)	Runoff Coefficient (C)	Time of Concentration (min)	Intensity (I)					Computed Discharges (Q)				
								5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
1	CULVERT 1	4'x4' BOX	37+74.64	US 82 BL	73.25	0.35	40	2.50	3.01	3.71	4.29	5.03	64	77	95	110	129
2	CULVERT 2	4'x3' BOX	48+02.82	US 82 BL	123.37	0.35	51	2.12	2.57	3.17	3.68	4.32	92	111	137	159	187
3	CULVERT 3	4'x3' BOX	71+47.13	US 82 BL	73.43	0.33	46	2.28	2.75	3.39	3.93	4.61	55	67	82	95	112
4	CULVERT 4	3'x2' BOX	83+46.29	US 82 BL	64.34	0.33	119	1.16	1.41	1.76	2.05	2.42	25	30	37	43	51
5	CULVERT 5	3'x3' BOX	112+19.88	US 82 BL	189.72	0.37	146	1.00	1.22	1.51	1.76	2.09	70	85	106	124	146
6	CULVERT 6	3'x2' BOX	183+21.37	US 82 BL	89.50	0.36	105	1.28	1.55	1.92	2.24	2.65	41	50	62	72	85
7	CULVERT 7	35"x24" CMP	231+58.27	US 82 BL	51.69	0.31	57	1.97	2.38	2.95	3.42	4.03	32	38	47	55	64
8	CULVERT 8	4'x4' BOX	239+26.53	US 82 BL	41.85	0.3	57	1.97	2.38	2.95	3.42	4.03	25	30	37	43	51
9	CULVERT 9	3'x2' BOX	246+48.26	US 82 BL	20.36	0.3	42	2.42	2.91	3.59	4.16	4.88	15	18	22	25	30
10	CULVERT 10 CULVERT 11	30" CMP 4'x4' BOX	262+48.78 264+36.43	US 82 BL	93.99	0.33	62	1.86	2.25	2.79	3.23	3.81	58	70	86	100	118
11	CULVERT 12	3'x2' BOX	273+69.53	US 82 BL	37.22	0.34	81	1.54	1.87	2.32	2.69	3.18	19	24	29	34	40
12	CULVERT 13	4'x4' BOX	286+21.61	US 82 BL	102.79	0.38	54	2.04	2.47	3.06	3.54	4.17	80	97	119	138	163
13	CULVERT 14	24" CMP	297+74.35	US 82 BL	32.53	0.34	52	2.10	2.53	3.13	3.63	4.27	23	28	35	40	47
14	CULVERT 15	4'x4' BOX	302+43.46	US 82 BL	31.56	0.33	54	2.04	2.47	3.06	3.54	4.17	21	26	32	37	43
15	CULVERT 16	3'x2' BOX	312+55.97	US 82 BL	30.06	0.33	46	2.28	2.75	3.39	3.93	4.61	23	27	34	39	46
16	CULVERT 17	4'x4' BOX	321+71.41	US 82 BL	69.42	0.35	84	1.50	1.82	2.26	2.63	3.10	36	44	55	64	75
16a					116.42	0.36	84	1.50	1.82	2.26	2.63	3.10	63	76	95	110	130
17	CULVERT 18	4'x3' BOX	340+28.16	US 82 BL	107.85	0.33	82	1.53	1.85	2.30	2.67	3.15	54	66	82	95	112
18	CULVERT 19	2-5'x3' BOX	345+29.30	US 82 BL	63.81	0.31	75	1.63	1.97	2.44	2.84	3.35	32	39	48	56	66
19	CULVERT 20	3'x3' BOX	365+11.16	US 82 BL	109.26	0.34	72	1.67	2.03	2.51	2.92	3.45	62	75	93	109	128
20	CULVERT 21	4'x3' BOX	374+76.55	US 82 BL	130.82	0.33	83	1.51	1.84	2.28	2.65	3.13	65	79	98	114	135
21	CULVERT 22 CULVERT 23	28"x20" CMP 4'x3' BOX	384+38.22 395+92.74	US 82 BL	116.30	0.35	65	1.80	2.18	2.70	3.13	3.69	73	89	110	127	150
22	CULVERT 24	2-30" CMP	411+38.41	US 82 BL	41.08	0.35	66	1.78	2.16	2.67	3.10	3.65	26	31	38	45	53
23	CULVERT 25	2-30" CMP	424+53.60	US 82 BL	86.62	0.35	72	1.67	2.03	2.51	2.92	3.45	51	62	76	89	104
24	CULVERT 26	3'x3' BOX/32" RCP	438+12.38	US 82 BL	98.91	0.35	64	1.82	2.20	2.73	3.17	3.73	63	76	94	110	129
* 25	CULVERT 27	3'x3' BOX	490+02.87	US 82 BL	467.08	0.34	132	1.08	1.31	1.63	1.90	2.25	171	208	259	301	357
* 26	CULVERT 28	2-5'x3' BOX	494+81.56	US 82 BL	292.43	0.36	159	0.94	1.14	1.42	1.65	1.96	99	120	149	174	206
* 27	CULVERT 29	7'x4' BOX; 3'x3' BOX	499+66.82	US 82 BL	266.32	0.33	136	1.05	1.28	1.59	1.86	2.20	93	113	140	163	193
28	CULVERT 30	7'x5' BOX	516+73.57	US 82 BL	165.03	0.33	134	1.07	1.30	1.61	1.88	2.22	58	71	88	102	121
* 29	CULVERT 31 CULVERT 32	2-5'x3' BOX 3-5'x3' BOX; 3'x3'	586+80.07 590+66.90	US 82 BL	2252.00	0.33	342	0.52	0.64	0.79	0.92	1.09	388	472	587	687	813
* 30	CULVERT 33 CULVERT 34	3'x2' BOX 3-10'x10' BOX	649+58.36 660+47.34	US 82 BL	15258.97	0.35	1751	0.15	0.18	0.22	0.26	0.30	778	941	1164	1369	1607

\* Rational Equation used for information only. Hydrograph Method used for drainage areas greater than 200 acres and shown on sheet 4 of 4.

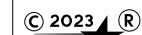
NOTE: SEE SHEET 2 OF 4 FOR TIME OF CONCENTRATION INPUTS AND SHEET 3 OF 4 FOR RUNOFF COEFFICIENT INPUTS.



*Russell A Parr* 12/14/2020

**DRAINAGE AREA CALCULATIONS**

SHEET 1 OF 2



Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 147
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

TIME OF CONCENTRATION CALCULATIONS (NRCS METHOD)															
Drainage Basin	L <sub>sh</sub>	S <sub>sh</sub>	P <sub>2</sub>	n <sub>ai</sub>	t <sub>sh</sub>	L <sub>sc</sub>	S <sub>sc</sub>	K	t <sub>sc</sub>	L <sub>ch</sub>	S <sub>ch</sub>	n	R	t <sub>ch</sub>	t <sub>c</sub>
1	150	0.013	3	0.17	18.19	678.0	0.0221	16.13	4.71	1401.0	0.0157	0.13	0.90	17.49	40
2	150	0.013	3	0.17	18.19	1665.0	0.0138	16.13	14.64	1097.0	0.0091	0.13	0.90	17.97	51
3	150	0.0067	3	0.17	24.01	1990.0	0.0090	16.13	21.62	0	0.0000	0	0	0	46
4	150	0.0033	3	0.17	31.68	2379.0	0.0008	16.13	84.78	214.0	0.0187	0.13	0.90	2.45	119
5	150	0.0067	3	0.17	24.01	4926.4	0.0018	16.13	119.09	247.0	0.0202	0.13	0.90	2.72	146
6	150	0.0067	3	0.17	24.01	4632.9	0.0035	16.13	81.46	0	0	0	0	0	105
7	150	0.0067	3	0.17	24.01	2282.0	0.0053	16.13	32.52	0	0.0000	0	0	0	57
8	150	0.0067	3	0.17	24.01	1423.3	0.0105	16.13	14.33	633.0	0.0158	0.30	0.90	18.18	57
9	150	0.0067	3	0.17	24.01	1706.5	0.0094	16.13	18.21	0	0.0000	0	0	0	42
10	150	0.0033	3	0.17	31.68	1166.9	0.0069	16.13	14.56	848.6	0.0177	0.20	0.90	15.32	62
11	150	0.0067	3	0.17	24.01	1045.5	0.0143	16.13	9.02	1843.4	0.0087	0.20	0.90	47.61	81
12	150	0.0067	3	0.17	24.01	1355.4	0.0177	16.13	10.52	1784.6	0.0196	0.13	0.90	19.93	54
13	150	0.0067	3	0.17	24.01	3071.0	0.0130	16.13	27.80	0	0	0	0	0	52
14	150	0.0067	3	0.17	24.01	3079.3	0.0114	16.13	29.84	0	0	0	0	0	54
15	150	0.0067	3	0.17	24.01	2326.3	0.0116	16.13	22.31	0	0	0	0	0	46
16	150	0.0067	3	0.17	24.01	1480.0	0.0088	16.13	16.32	2156.3	0.0139	0.20	0.90	43.87	84
16a	150	0.0033	3	0.17	31.68	2234.8	0.0081	16.13	25.73	1352.7	0.0148	0.20	0.90	26.70	84
17	150	0.0033	3	0.17	31.68	2983.7	0.0060	16.13	39.69	697.6	0.0172	0.17	0.90	10.88	82
18	150	0.0033	3	0.17	31.68	3580.2	0.0073	16.13	43.41	0	0	0	0	0	75
19	150	0.0033	3	0.17	31.68	2755.5	0.0083	16.13	31.16	678.5	0.0236	0.17	0.90	9.04	72
20	150	0.0033	3	0.17	31.68	2824.8	0.0078	16.13	33.07	1349.9	0.0133	0.13	0.90	18.29	83
21	150	0.0033	3	0.17	31.68	3064.0	0.0114	16.13	29.62	261.6	0.0268	0.17	0.90	3.26	65
22	150	0.0067	3	0.17	24.01	3811.1	0.0087	16.13	42.32	0	0	0	0	0	66
23	150	0.0067	3	0.17	24.01	4584.9	0.0098	16.13	47.82	0	0	0	0	0	72
24	150	0.0033	3	0.17	31.68	3834.3	0.0151	16.13	32.21	0	0	0	0	0	64
25	150	0.0067	3	0.17	24.01	8170.8	0.0061	16.13	107.93	0	0	0	0	0	132
26	150	0.0067	3	0.17	24.01	9504.5	0.0053	16.13	135.40	0	0	0	0	0	159
27	150	0.0067	3	0.17	24.01	7697.6	0.0051	16.13	111.74	0	0	0	0	0	136
28	150	0.0033	3	0.17	31.68	6242.4	0.0040	16.13	101.92	0	0	0	0	0	134
29	150	0.0033	3	0.17	31.68	16423.5	0.0030	16.13	310.68	0	0	0	0	0	342
30	150	0.0067	3	0.17	24.01	46897.3	0.0022	16.13	1033.99	13544.6	0.0022	0.20	0.90	692.56	1751

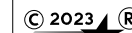
Drainage Basin	Total Runoff Coefficient (C)	Watershed Characteristic			
		Relief (Cr)	Soil Infiltration (Ci)	Vegetal Cover (Cv)	Surface Storage (Cs)
1	0.35	0.12	0.07	0.11	0.05
2	0.35	0.12	0.07	0.12	0.04
3	0.33	0.09	0.07	0.11	0.06
4	0.33	0.08	0.08	0.11	0.06
5	0.37	0.10	0.10	0.11	0.06
6	0.36	0.10	0.10	0.10	0.06
7	0.31	0.09	0.07	0.08	0.07
8	0.30	0.09	0.07	0.08	0.06
9	0.30	0.09	0.07	0.07	0.07
10	0.33	0.11	0.07	0.08	0.07
11	0.34	0.11	0.07	0.09	0.07
12	0.38	0.13	0.07	0.09	0.09
13	0.34	0.10	0.07	0.11	0.06
14	0.33	0.10	0.08	0.10	0.05
15	0.33	0.10	0.07	0.09	0.07
16	0.35	0.11	0.07	0.09	0.08
16a	0.36	0.11	0.07	0.10	0.08
17	0.33	0.09	0.07	0.11	0.06
18	0.31	0.09	0.07	0.11	0.04
19	0.34	0.10	0.08	0.11	0.05
20	0.33	0.10	0.08	0.11	0.04
21	0.35	0.11	0.08	0.10	0.06
22	0.35	0.10	0.07	0.11	0.07
23	0.35	0.10	0.07	0.11	0.07
24	0.35	0.12	0.07	0.09	0.07
25	0.34	0.11	0.06	0.11	0.06
26	0.36	0.11	0.07	0.11	0.07
27	0.33	0.09	0.07	0.10	0.07
28	0.33	0.09	0.07	0.11	0.06
29	0.33	0.09	0.08	0.10	0.06
30	0.35	0.12	0.07	0.10	0.06

HYDROGRAPH METHOD CALCULATIONS (HEC-HMS 4.2.1)													
Drainage Basin	Area (mi <sup>2</sup> )	Lag Time	CN	Depth, 24 Hour Storm (in)					Computed Discharges (Q)				
				5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
25	0.73	79	80	4.1	5.0	6.1	7.2	8.3	307	420	564	711	859
26	0.46	96	80	4.1	5.0	6.1	7.2	8.3	168	230	309	389	470
27	0.42	81	80	4.1	5.0	6.1	7.2	8.3	173	237	318	400	483
29	3.52	205	80	4.1	5.0	6.1	7.2	8.3	711	976	1311	1653	2001
30	23.84	1050	80	4.1	5.0	6.1	7.2	8.3	910	1254	1698	2159	2633



*Russell A Parr* 12/14/2020

**DRAINAGE AREA CALCULATIONS**



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 148
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

HY-8 Ver 7.40 Culvert Summary Table : Culvert 1 (Sta 0037)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	77.00	77.00	1391.78	1391.25	3.80	1.97	1-S2n	1.49	2.26	1.73	2.30	11.12	2.53
100-yr	129.00	129.00	1393.07	1393.16	5.71	4.50	5-S2n	2.19	3.18	2.56	2.88	12.61	2.89

HY-8 Ver 7.40 Culvert Summary Table : Culvert 2 (Sta 0048)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	111.00	111.00	1396.46	1396.65	6.17	1.79	5-S2n	2.70	3.00	2.70	2.70	15.09	2.78
100-yr	187.00	126.12	1397.72	1397.82	7.34	3.13	5-S2n	1.98	3.00	3.37	3.37	15.50	3.17

HY-8 Ver 7.40 Culvert Summary Table : Culvert 3 (Sta 0071)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	67.00	67.00	1403.07	1402.85	3.51	1.80	5-S2n	0.98	2.06	1.20	2.17	13.93	2.44
100-yr	112.00	109.45	1404.70	1404.97	5.63	3.95	5-JS1f	1.39	2.85	3.00	2.71	9.10	2.79

HY-8 Ver 7.40 Culvert Summary Table : Culvert 4 (Sta 0083)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	30.00	30.00	1402.31	1403.71	2.60	2.32	5-S2n	1.16	1.68	0.93	1.24	10.70	1.80
100-yr	51.00	47.67	1403.69	1405.51	4.40	0.76	5-S2n	1.47	2.00	1.29	1.59	12.33	2.07

HY-8 Ver 7.40 Culvert Summary Table : Culvert 5 (Sta 0112)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	85.00	76.95	1396.54	1396.47	5.60	2.60	5-S2n	2.47	3.00	2.51	2.51	11.42	2.60
100-yr	146.00	79.96	1396.73	1396.74	5.87	3.39	5-S2n	2.51	3.00	3.14	3.14	10.74	2.98

NOTE: Overtopping frequency is 10 year.

HY-8 Ver 7.40 Culvert Summary Table : Culvert 6 (Sta 0183)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	50.00	42.65	1399.46	1399.30	3.84	5.46	4-FFf	2.00	1.84	2.00	2.00	7.11	2.28
100-yr	85.00	57.67	1399.55	1399.51	3.47	5.67	4-FFf	2.00	1.74	2.00	2.51	6.53	2.60

NOTE: Overtopping frequency is 10 year.



*Russell A Parr* 12/14/2020

**HYDRAULIC DATA SHEET**

SHEET 1 OF 6

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Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		149
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

HY-8 Ver 7.40 Culvert Summary Table : Culvert 7 (Sta 0231)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	38.00	38.00	1391.79	1390.80	3.32	0.88	5-S2n	0.90	1.71	0.98	1.58	12.91	1.94
100-yr	64.00	46.28	1391.97	1391.71	4.23	1.75	5-S2n	1.04	1.95	1.14	1.96	13.52	2.21

HY-8 Ver 7.40 Culvert Summary Table : Culvert 8 (Sta 0239)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	30.00	30.00	1383.39	1383.23	2.02	1.26	1-JS1t	0.86	1.20	2.12	1.36	3.54	1.82
100-yr	51.00	51.00	1383.95	1384.06	1.84	4.05	1-JS1t	1.24	1.72	2.47	1.71	5.15	2.08

HY-8 Ver 7.40 Culvert Summary Table : Culvert 9 (Sta 0246)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	18.00	18.00	1388.49	1388.67	1.74	1.99	1-S1f	0.67	1.04	2.00	1.27	3.00	1.75
100-yr	30.00	30.00	1389.03	1389.58	2.62	2.90	4-FFf	0.97	1.46	2.00	1.60	5.00	2.00

HY-8 Ver 7.40 Culvert Summary Table : Culvert 10 (Sta 0262)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	70.00	39.34	1377.04	1375.88	4.20	4.00	7-M2t	2.50	2.11	2.31	2.31	8.31	2.48
100-yr	118.00	39.15	1377.16	1376.07	4.17	4.39	4-FFf	2.50	2.11	2.50	2.88	7.98	2.83

NOTE: Overtopping frequency less than 10 year.

HY-8 Ver 7.40 Culvert Summary Table : Culvert 11 (Sta 0264)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	70.00	70.00	1377.04	1371.27	3.51	0.06	1-S2n	0.64	2.12	1.31	1.97	13.36	2.26
100-yr	118.00	118.00	1377.16	1373.17	5.41	1.21	5-S2n	0.91	3.00	1.93	2.45	15.27	2.57

HY-8 Ver 7.40 Culvert Summary Table : Culvert 12 (Sta 0273)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	24.00	24.00	1371.05	1371.40	2.13	1.89	5-FFf	0.85	1.43	3.08	1.45	9.93	1.89
100-yr	40.00	40.00	1371.91	1372.60	3.33	2.66	5-FFf	1.07	1.77	3.44	1.81	10.76	2.15



*Russell A Parr* 12/14/2020

**HYDRAULIC DATA SHEET**

SHEET 2 OF 6

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**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		150
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO.
		US 82

HY-8 Ver 7.40 Culvert Summary Table : Culvert 13 (Sta 0286)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	97.00	97.00	1357.23	1357.04	4.53	1.11	5-S2n	1.23	2.63	1.56	2.55	15.56	2.69
100-yr	163.00	163.00	1359.05	1360.26	7.75	4.54	5-S2n	1.80	3.72	2.36	3.18	17.30	3.06

HY-8 Ver 7.40 Culvert Summary Table : Culvert 14 (Sta 0297)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	28.00	23.62	1365.42	1366.06	3.55	3.37	5-JS1t	1.11	1.72	2.00	1.65	7.52	1.97
100-yr	47.00	24.25	1365.49	1366.18	3.67	1.54	5-JS1f	1.13	1.74	2.00	2.05	7.72	2.25

NOTE: Overtopping frequency is 10 year.

HY-8 Ver 7.40 Culvert Summary Table : Culvert 15 (Sta 0302)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	26.00	26.00	1355.06	1356.50	1.84	3.47	1-S1f	0.73	1.09	4.00	1.41	1.63	1.91
100-yr	43.00	43.00	1355.51	1357.01	2.55	3.98	1-S1f	1.03	1.53	4.00	1.78	2.69	2.18

HY-8 Ver 7.40 Culvert Summary Table : Culvert 16 (Sta 0312)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	27.00	27.00	1365.97	1367.23	2.35	2.64	5-S2n	0.45	1.36	0.67	1.36	13.46	1.78
100-yr	46.00	34.29	1367.04	1369.06	4.18	0.99	5-S2n	0.64	1.94	0.31	1.71	14.60	2.03

HY-8 Ver 7.40 Culvert Summary Table : Culvert 17 (Sta 0321)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	120.00	120.00	1356.66	1358.29	5.49	3.53	5-FFf	2.86	3.52	5.32	2.79	11.77	2.83
100-yr	205.00	139.12	1359.76	1359.21	6.41	4.78	5-FFf	4.00	4.00	6.03	3.50	12.81	3.25

HY-8 Ver 7.40 Culvert Summary Table : Culvert 18 (Sta 0340)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	66.00	66.00	1358.84	1359.99	3.53	3.55	5-FFf	1.18	2.35	6.26	2.15	13.43	2.43
100-yr	112.00	93.97	1360.08	1361.46	5.02	4.97	5-FFf	1.42	2.79	6.82	2.71	14.19	2.79



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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		151	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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HY-8 Ver 7.40 Culvert Summary Table : Culvert 19 (Sta 0345)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	39.00	39.00	1356.39	1357.22	1.31	2.45	1-S1f	0.48	0.78	3.00	1.28	1.30	2.02
100-yr	66.00	66.00	1356.74	1357.40	1.84	2.63	1-S1f	0.68	1.11	3.00	1.68	2.20	2.35

HY-8 Ver 7.40 Culvert Summary Table : Culvert 20 (Sta 0365)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	75.00	75.00	1353.90	1353.41	5.41	3.98	5-FFf	0.80	2.69	3.00	2.09	8.33	2.30
100-yr	128.00	91.72	1354.22	1355.03	7.03	5.43	5-FFf	0.93	3.00	3.00	2.61	10.19	2.63

HY-8 Ver 7.40 Culvert Summary Table : Culvert 21 (Sta 0374)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	79.00	79.00	1346.88	1346.11	4.22	4.11	7-M2c	3.00	2.30	2.30	2.07	8.60	2.33
100-yr	135.00	106.83	1347.22	1347.81	5.92	5.53	7-M2c	3.00	2.81	2.81	2.59	9.51	2.66

HY-8 Ver 7.40 Culvert Summary Table : Culvert 22 (Sta 0384)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	1.34	1.34	1348.04	1350.35	0.49	2.06	1-S1f	0.21	0.37	2.50	0.35	0.27	0.86
100-yr	2.25	103.44	1348.26	1350.47	0.66	2.18	1-S1f	0.26	0.49	2.50	0.46	0.46	1.00

HY-8 Ver 7.40 Culvert Summary Table : Culvert 23 (Sta 0395)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	89.00	89.00	1348.04	1347.46	4.74	2.17	5-S2n	0.97	2.49	1.47	2.18	15.15	2.40
100-yr	150.00	108.57	1348.26	1348.72	6.00	2.89	5-S2n	1.12	2.84	1.72	2.71	15.79	2.73

HY-8 Ver 7.40 Culvert Summary Table : Culvert 24 (Sta 0411)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	31.00	31.00	1361.07	1357.21	1.98	2.10	3-M1t	1.37	1.33	1.62	1.62	4.60	2.02
100-yr	53.00	53.00	1361.69	1358.09	2.85	2.98	3-M2t	2.50	1.75	2.05	2.05	6.15	2.31



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FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		152	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82



HY-8 Ver 7.40 Culvert Summary Table : Culvert 25 (Sta 0424)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	62.00	62.00	1340.84	1340.06	3.57	1.12	5-S2n	1.11	1.89	1.27	2.19	10.96	2.40
100-yr	104.00	71.88	1344.06	1340.77	4.28	2.24	5-S2n	1.21	2.03	1.39	2.73	11.41	2.74

HY-8 Ver 7.40 Culvert Summary Table : Culvert 26 (Sta 0438)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	76.00	76.00	1312.10	1310.63	5.21	5.43	7-M2c	3.00	2.71	2.71	2.11	9.34	2.31
100-yr	129.00	81.31	1314.14	1311.03	5.62	5.83	7-M2c	3.00	2.84	2.84	2.62	9.56	2.64

HY-8 Ver 7.40 Culvert Summary Table : Culvert 27 (Sta 0490)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	208.00	105.23	1300.64	1301.49	8.64	7.43	4-FFf	3.00	3.00	3.00	3.04	7.35	3.22
100-yr	357.00	108.31	1300.90	1301.88	9.03	8.45	5-FFf	3.00	3.00	3.00	3.78	6.29	3.68

NOTE: Overtopping frequency less than 10 year.

HY-8 Ver 7.40 Culvert Summary Table : Culvert 28 (Sta 0494)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	120.00	120.00	1297.51	1297.57	2.77	5.17	4-FFf	1.35	1.65	3.00	2.04	4.00	2.53
100-yr	206.00	157.15	1297.98	1298.55	3.43	6.15	4-FFf	1.63	1.97	3.00	2.63	5.24	2.92

HY-8 Ver 7.40 Culvert Summary Table : Culvert 29 (Sta 0499)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	113.00	113.00	1294.72	1294.38	2.64	1.80	1-JS1t	0.96	1.59	2.51	1.90	3.23	2.63
100-yr	193.00	193.00	1295.49	1295.63	3.89	2.42	1-S2n	1.41	2.30	1.77	2.51	5.42	3.07

HY-8 Ver 7.40 Culvert Summary Table : Culvert 30 (Sta 0516)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	71.00	71.00	1293.68	1294.17	2.42	2.64	1-S1f	0.58	1.47	5.00	1.70	14.15	2.42
100-yr	121.00	121.00	1294.69	1294.96	3.43	3.00	1-JS1f	0.84	2.10	5.00	2.17	16.08	2.78



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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			153
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO.
0133	04	042	US 82

HY-8 Ver 7.40 Culvert Summary Table : Culvert 31 (Sta 0586)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	472.00	30.01	1285.89	1285.89	1.31	7.18	4-FFF	0.52	0.78	3.00	3.83	1.30	3.62
100-yr	813.00	37.80	1286.92	1286.92	1.28	8.21	4-FFF	0.51	0.76	3.00	4.86	1.26	4.16

NOTE: Overtopping frequency less than 10 year.

HY-8 Ver 7.40 Culvert Summary Table : Culvert 32 (Sta 0590)													
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Existing Headwater Elevation	Proposed Headwater Elevation	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10-yr	472.00	42.59	1285.51	1285.51	1.06	7.45	4-FFF	0.41	0.63	3.00	3.48	0.95	3.58
100-yr	813.00	47.40	1286.52	1286.52	1.14	8.46	4-FFF	0.44	0.68	3.00	4.49	1.05	4.13

NOTE: Overtopping frequency less than 10 year.



*Russell A Parr* 12/14/2020

**HYDRAULIC DATA SHEET**

SHEET 6 OF 6

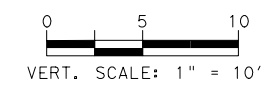
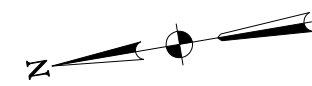
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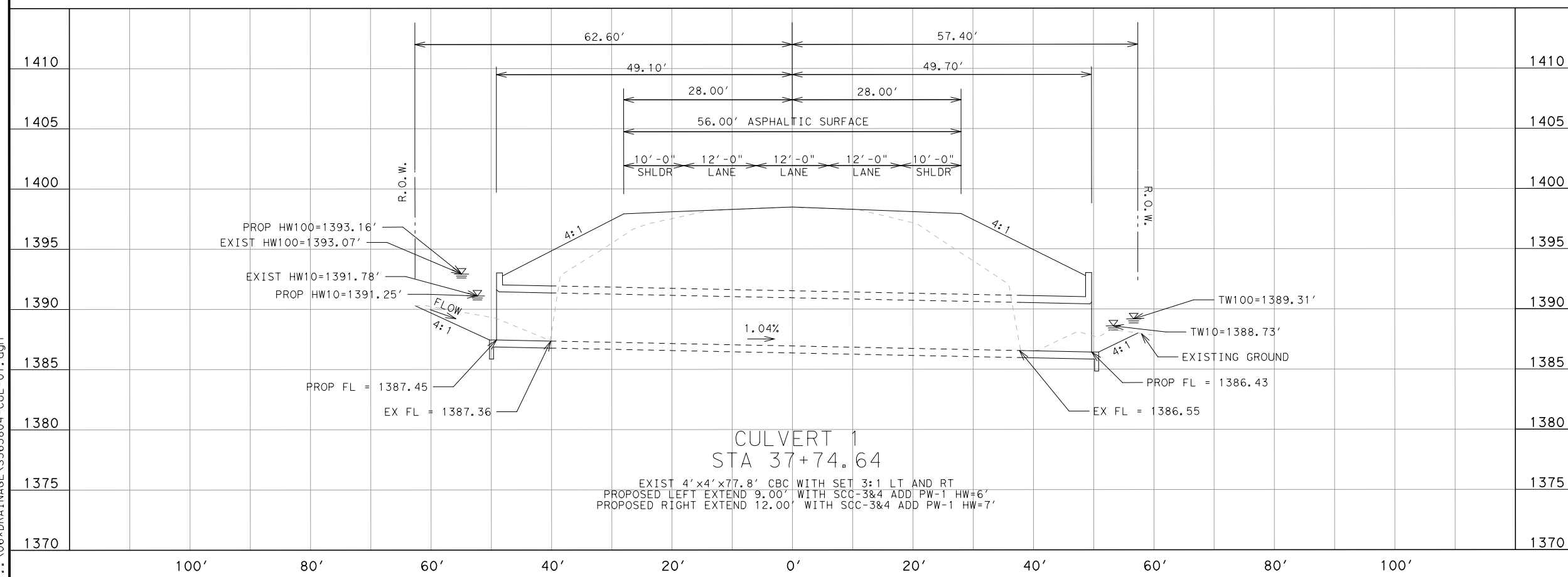
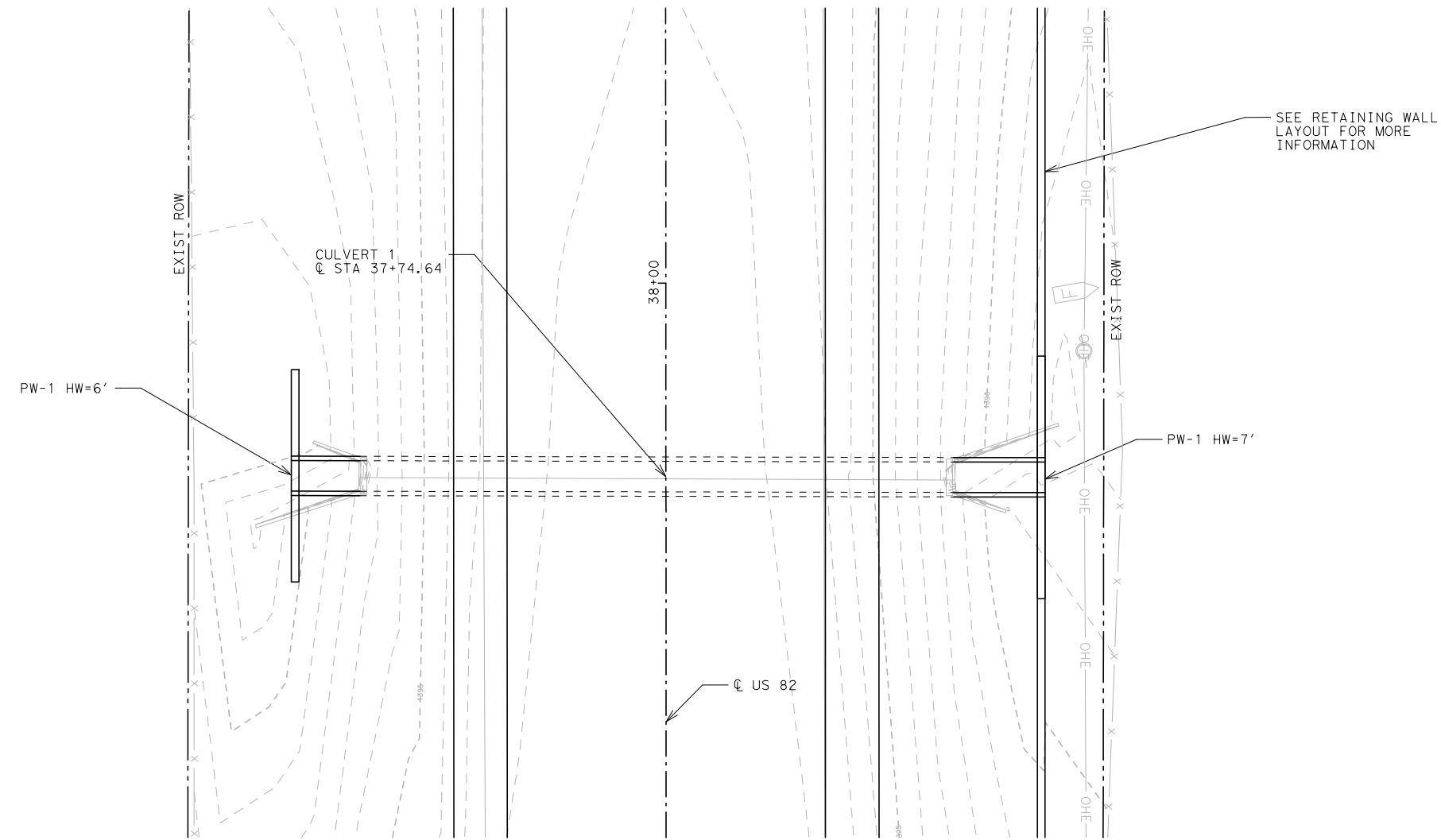
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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			154
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6049	CONC BOX CULV (4 FT X 4 FT)(EXTEND)	LF	21
466-6181	WINGWALL (PW - 1) (HW=6 FT)	EA	1
466-6182	WINGWALL (PW - 1) (HW=7 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 1  
US 82  
STA 37+74.64**

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

SHEET 1 OF 32



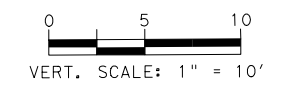
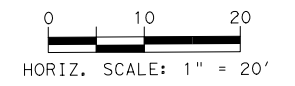
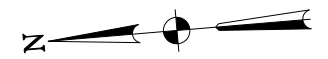
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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

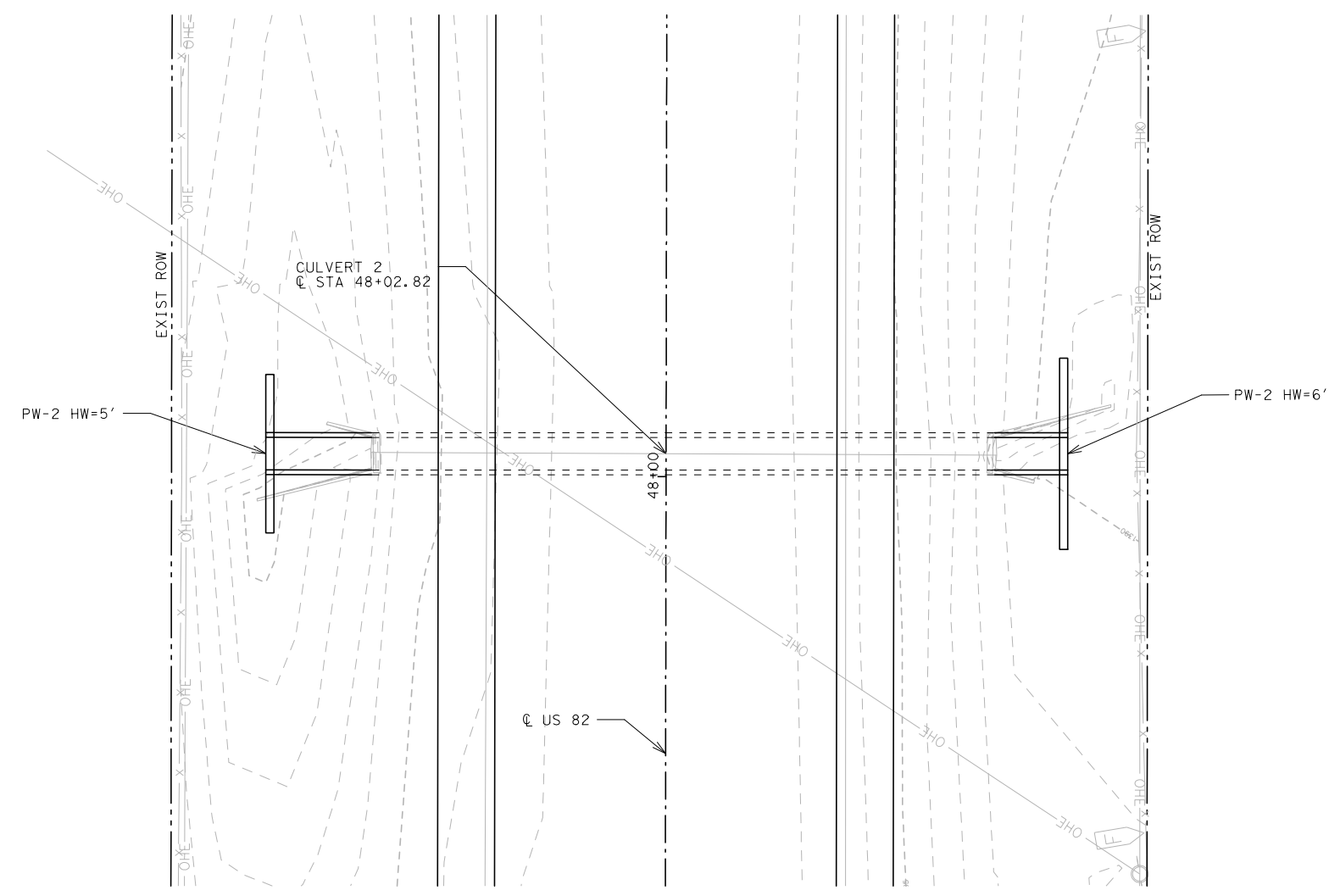
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

**CULVERT 1  
STA 37+74.64**  
EXIST 4'x4'x77.8' CBC WITH SET 3:1 LT AND RT  
PROPOSED LEFT EXTEND 9.00' WITH SCC-3&4 ADD PW-1 HW=6'  
PROPOSED RIGHT EXTEND 12.00' WITH SCC-3&4 ADD PW-1 HW=7'

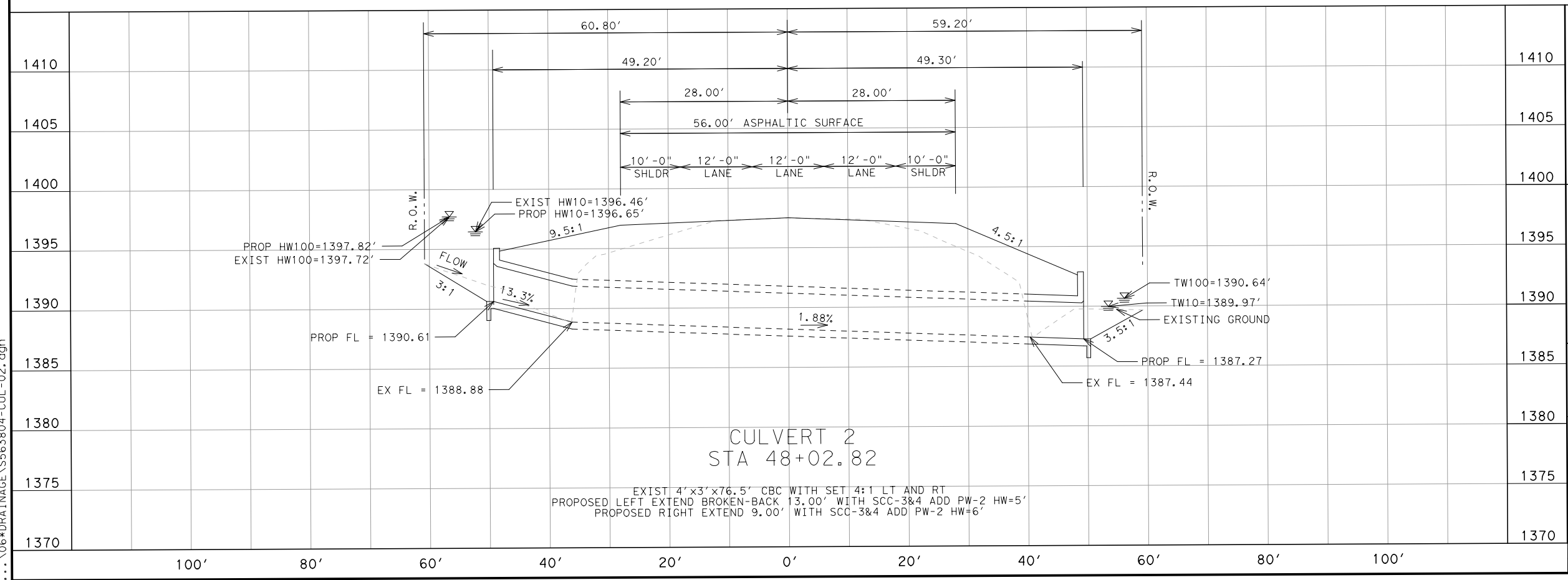
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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.



ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6048	CONC BOX CULV (4 FT X 3 FT)(EXTEND)	LF	22
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	1
466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 2**  
**US 82**  
**STA 48+02.82**

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

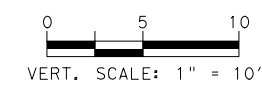
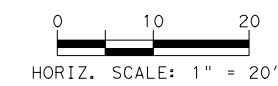
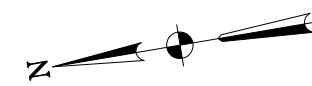
SHEET 2 OF 32



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 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

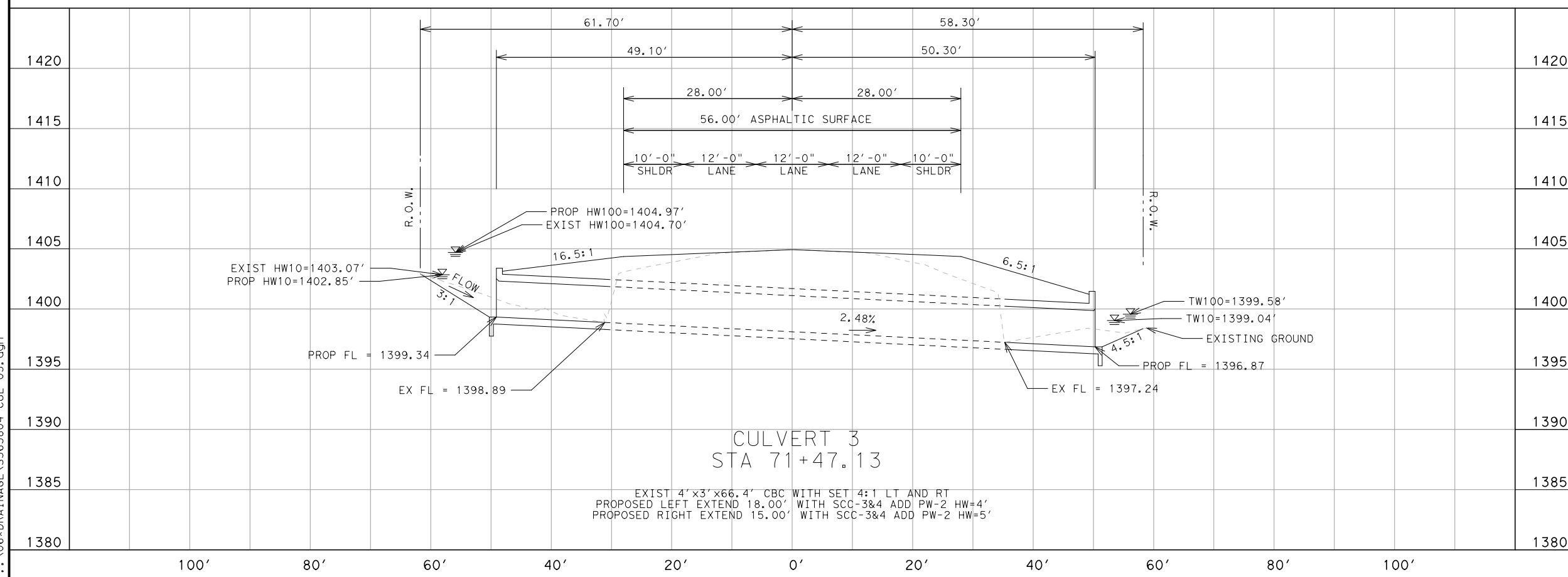
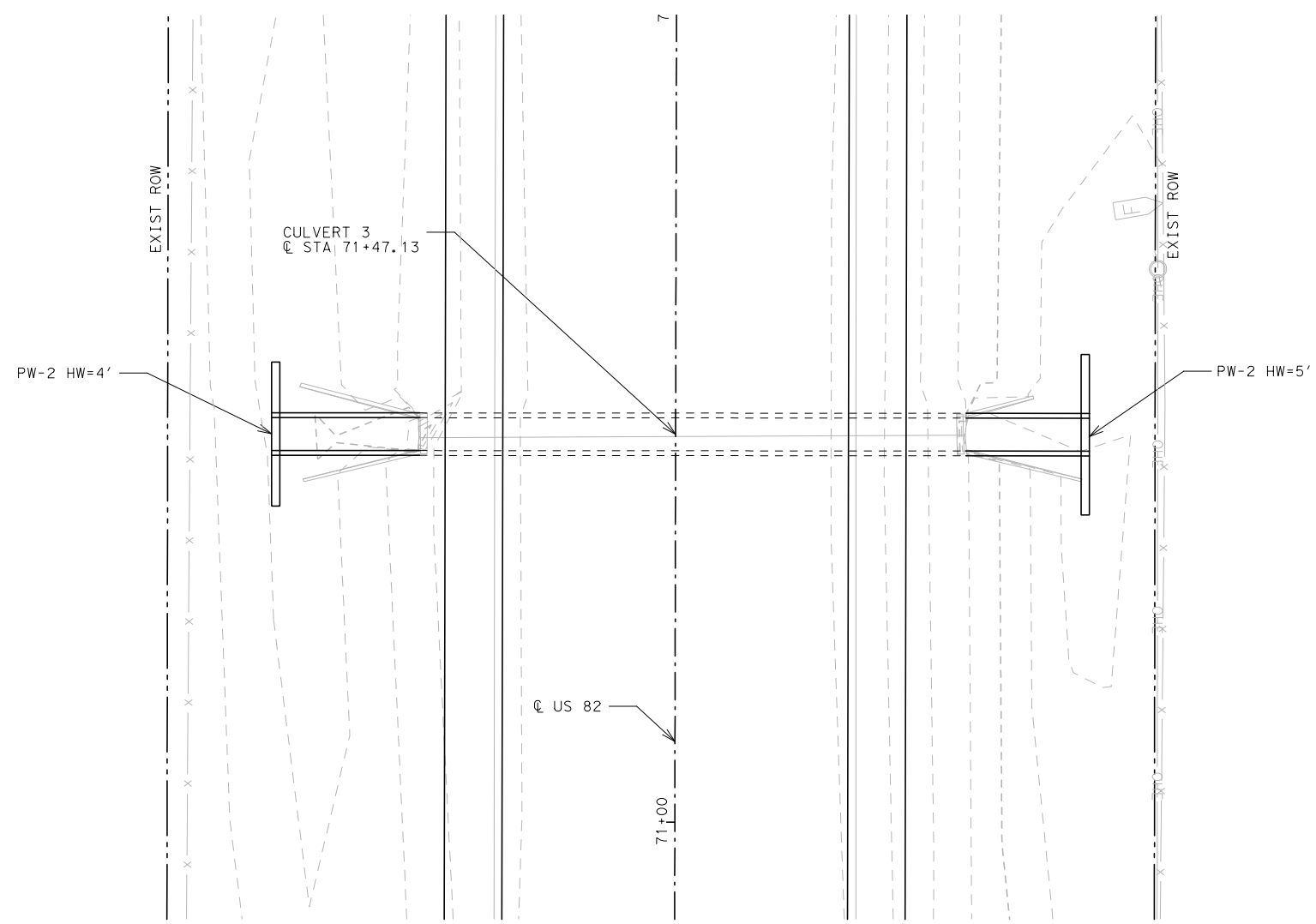
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6		156	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6048	CONC BOX CULV (4 FT X 3 FT)(EXTEND)	LF	33
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	1
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 3  
US 82  
STA 71+47.13**

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

SHEET 3 OF 32

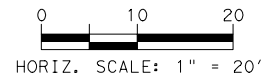
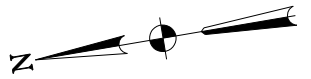


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

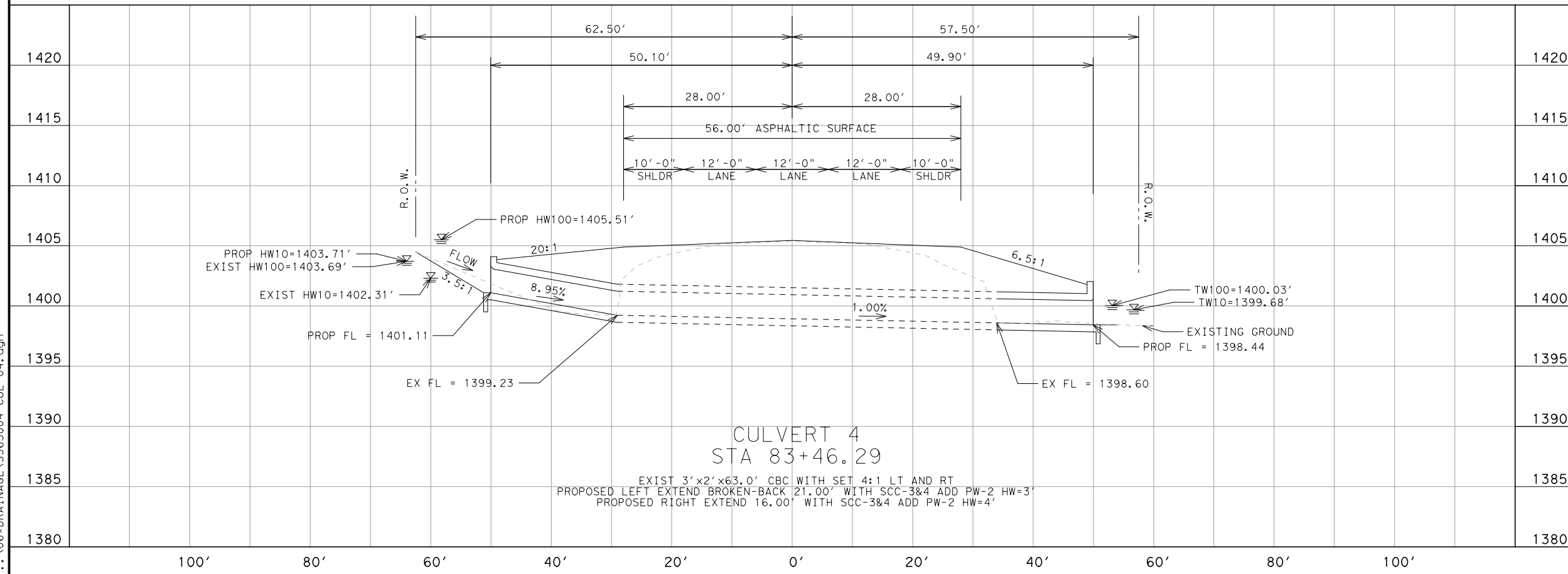
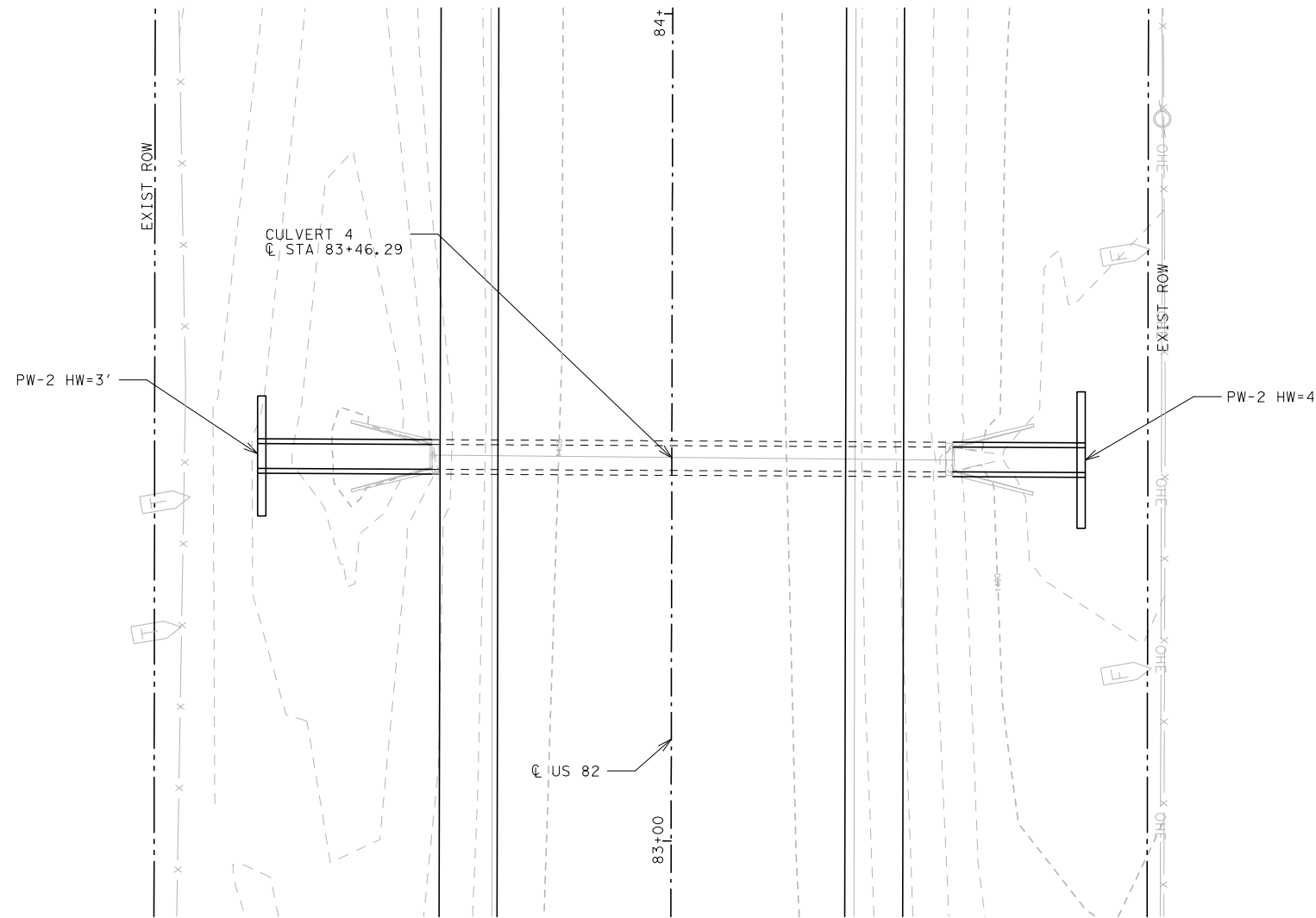
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:00:26 PM ... \06\DRAINAGE\5563804-CUL-03.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6045	CONC BOX CULV (3 FT X 2 FT)(EXTEND)	LF	37
462-6192	WINGWALL (PW - 2) (HW=3 FT)	EA	1
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 4  
US 82  
STA 83+46.29**

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

SHEET 4 OF 32

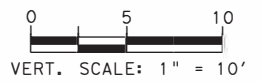
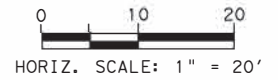


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

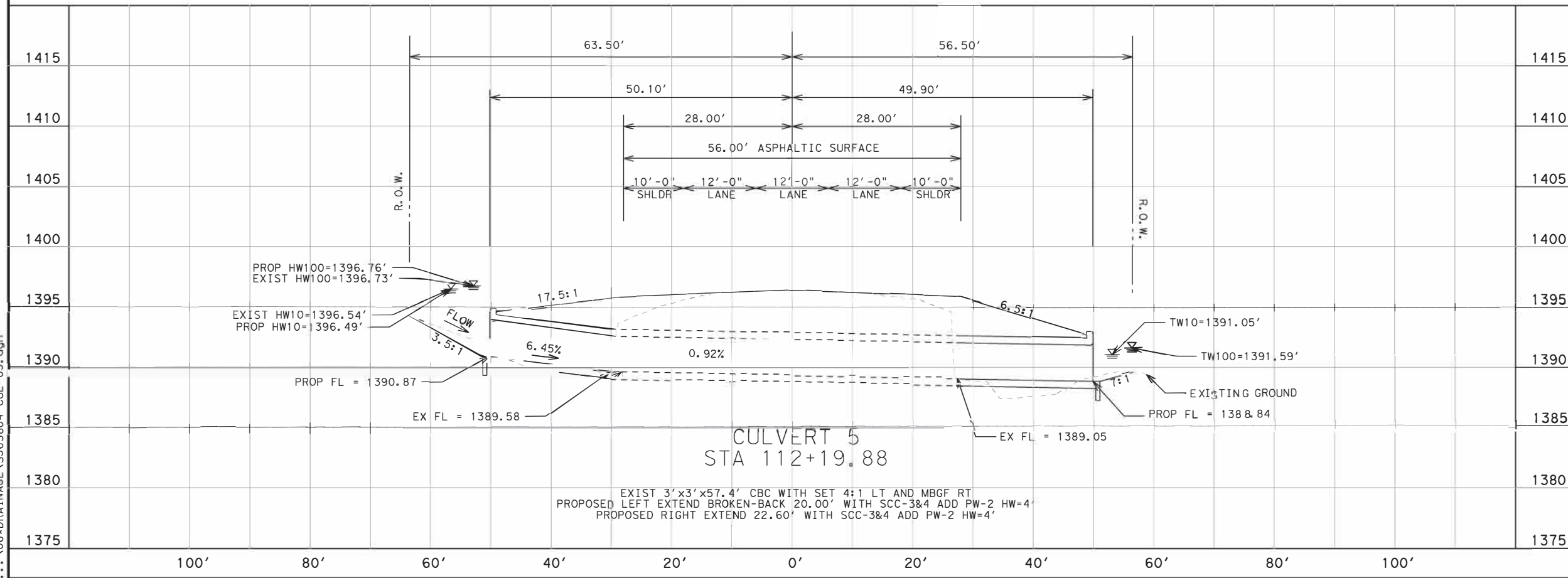
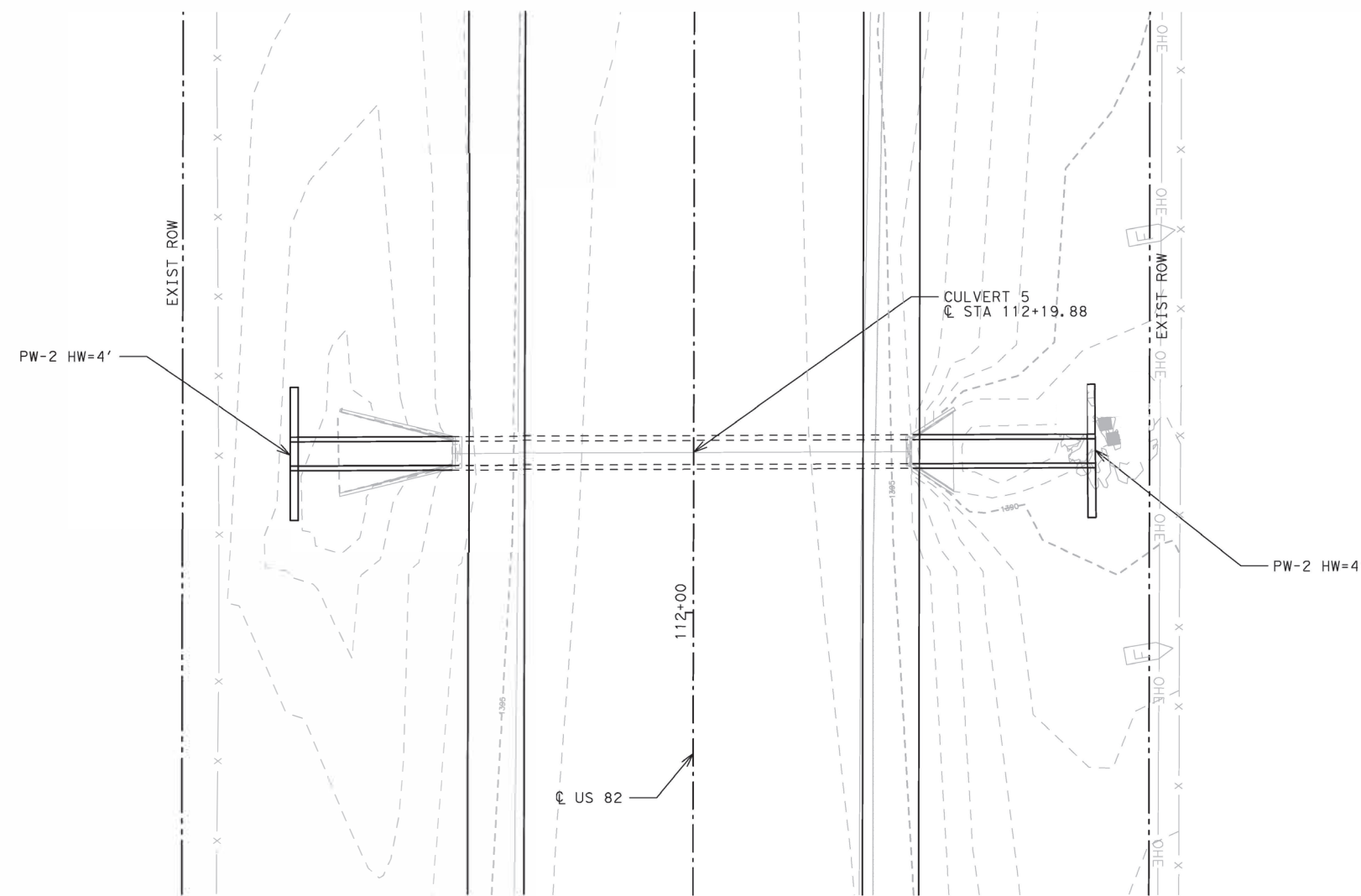
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:00:28 PM ... \06\*DRAINAGE\5563804-CUL-04.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	42.6
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 5**  
**US 82**  
**STA 112+19.88**

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

SHEET 5 OF 32

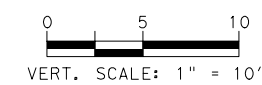
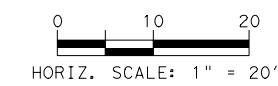
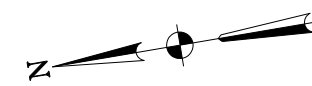


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

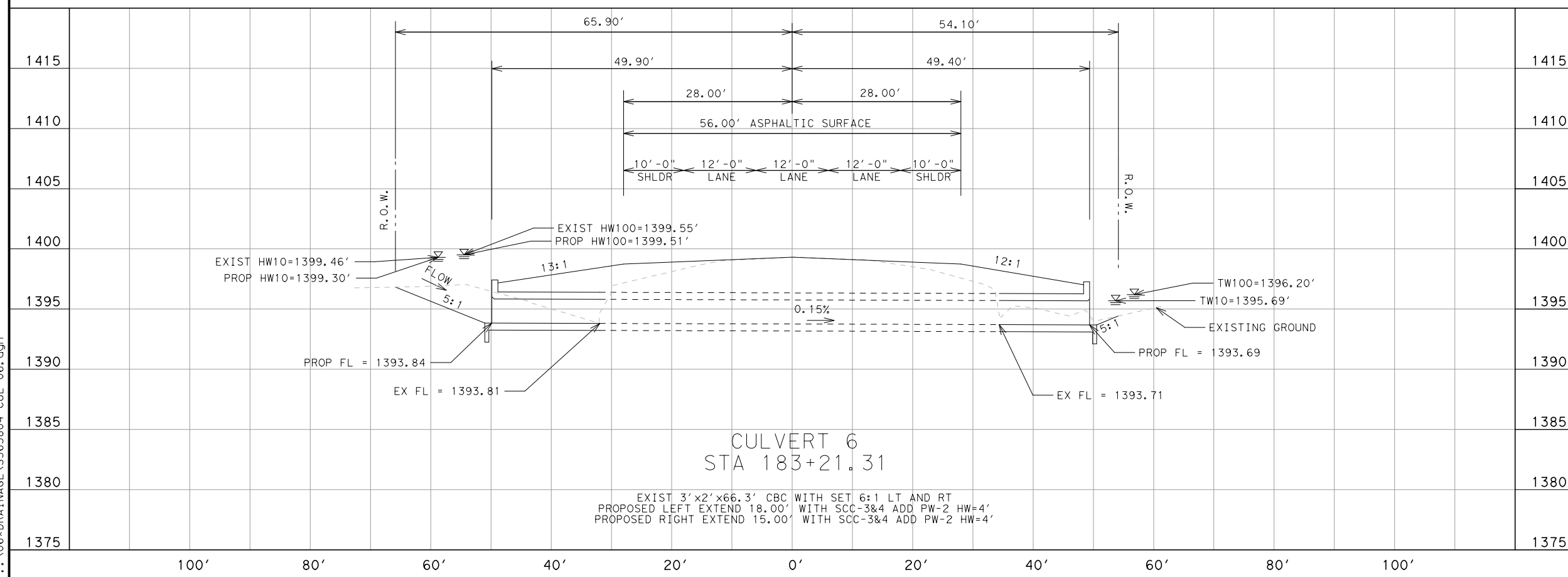
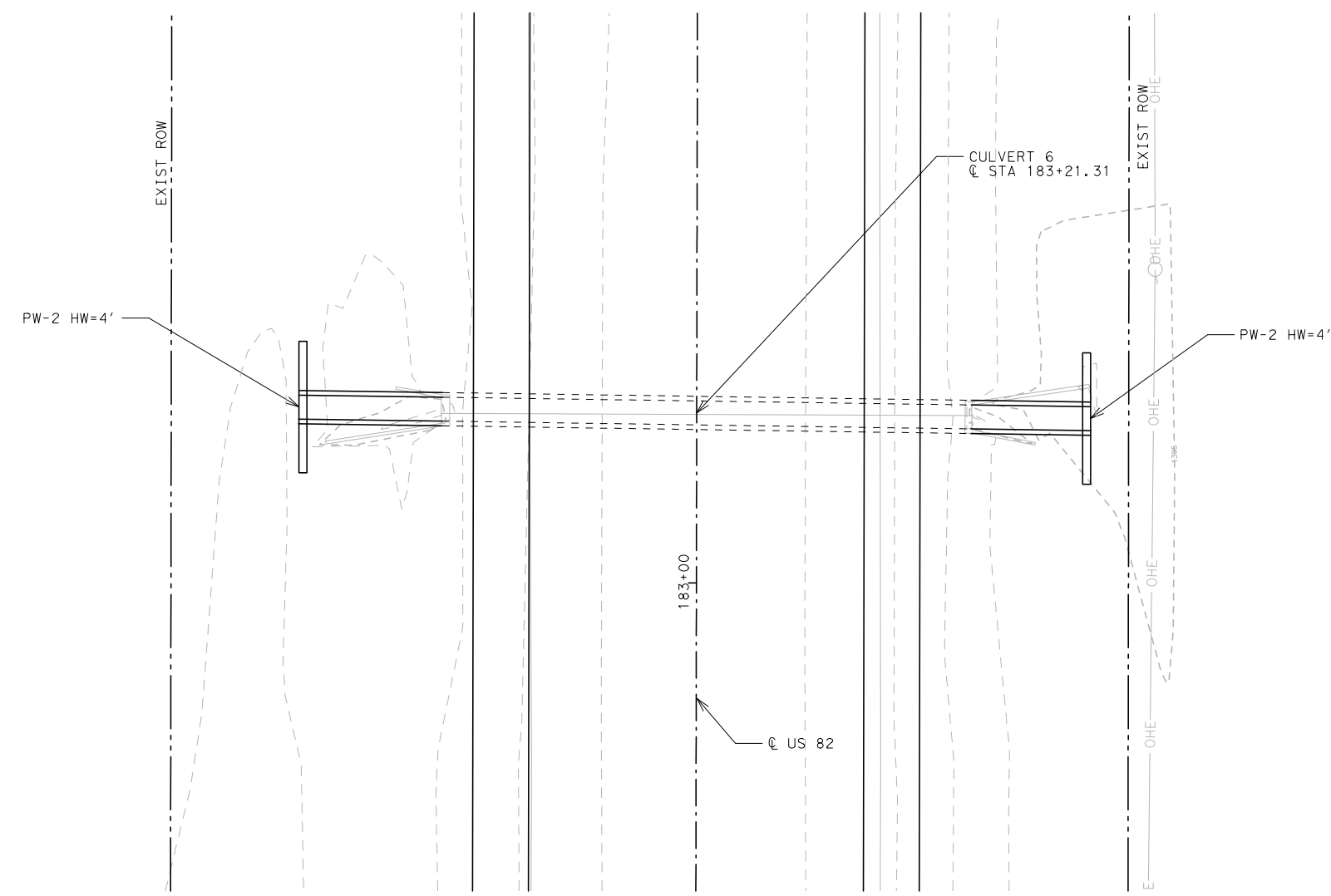
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		159	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/14/2020 5:00:31 PM \\... \06\DRAINAGE\5563804-CUL-05.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6045	CONC BOX CULV (3 FT X 2 FT)(EXTEND)	LF	33
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 6**  
**US 82**  
**STA 183+21.31**

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

SHEET 6 OF 32



**HUITT-ZOLLARS**

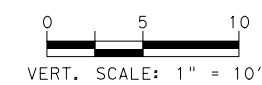
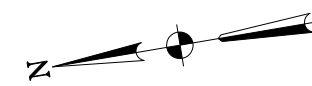
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 160
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

**CULVERT 6**  
**STA 183+21.31**  
 EXIST 3'x2'x66.3' CBC WITH SET 6:1 LT AND RT  
 PROPOSED LEFT EXTEND 18.00' WITH SCC-3&4 ADD PW-2 HW=4'  
 PROPOSED RIGHT EXTEND 15.00' WITH SCC-3&4 ADD PW-2 HW=4'

12/14/2020 5:00:34 PM ... \06\DRAINAGE\5563804-CUL-06.dgn

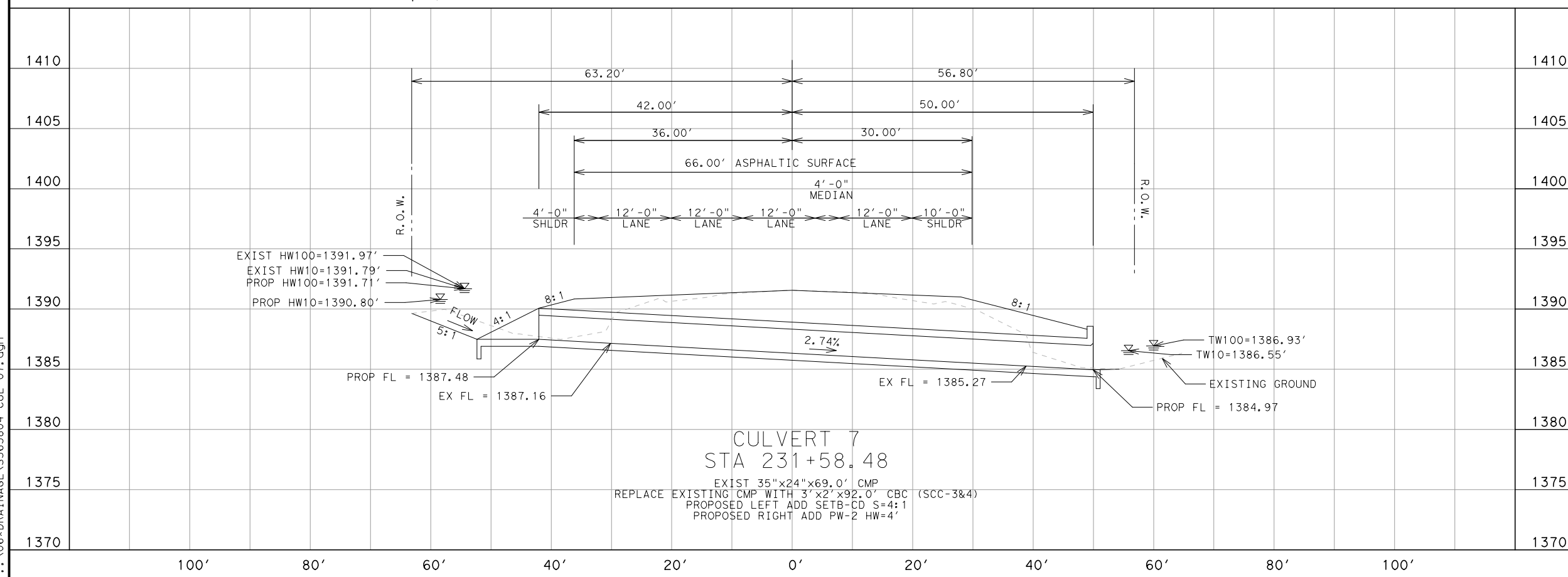
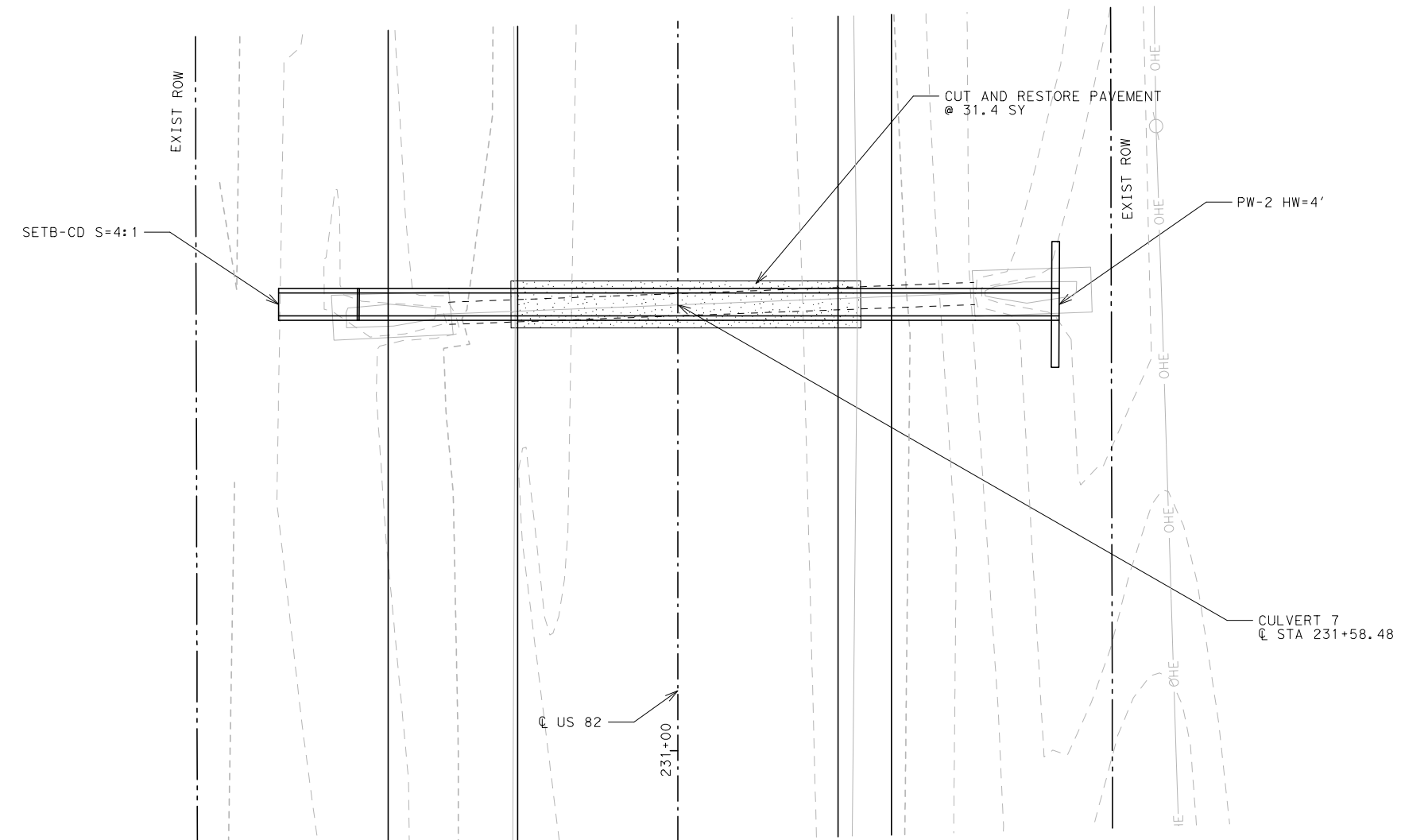




CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
403-6001	TEMPORARY SPL SHORING	SF	760
462-6001	CONC BOX CULV (3 FT X 2 FT)	LF	92
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	1
467-6106	SET (TY I)(S=3 FT)(HW=3FT)(4:1)(C)	EA	1
496-6007	REMOV STR (PIPE)	LF	69

NOTE: SEE CUT AND RESTORE DETAILS



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 7**  
**US 82**  
**STA 231+58.48**

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

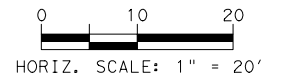
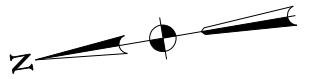
SHEET 7 OF 32



**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

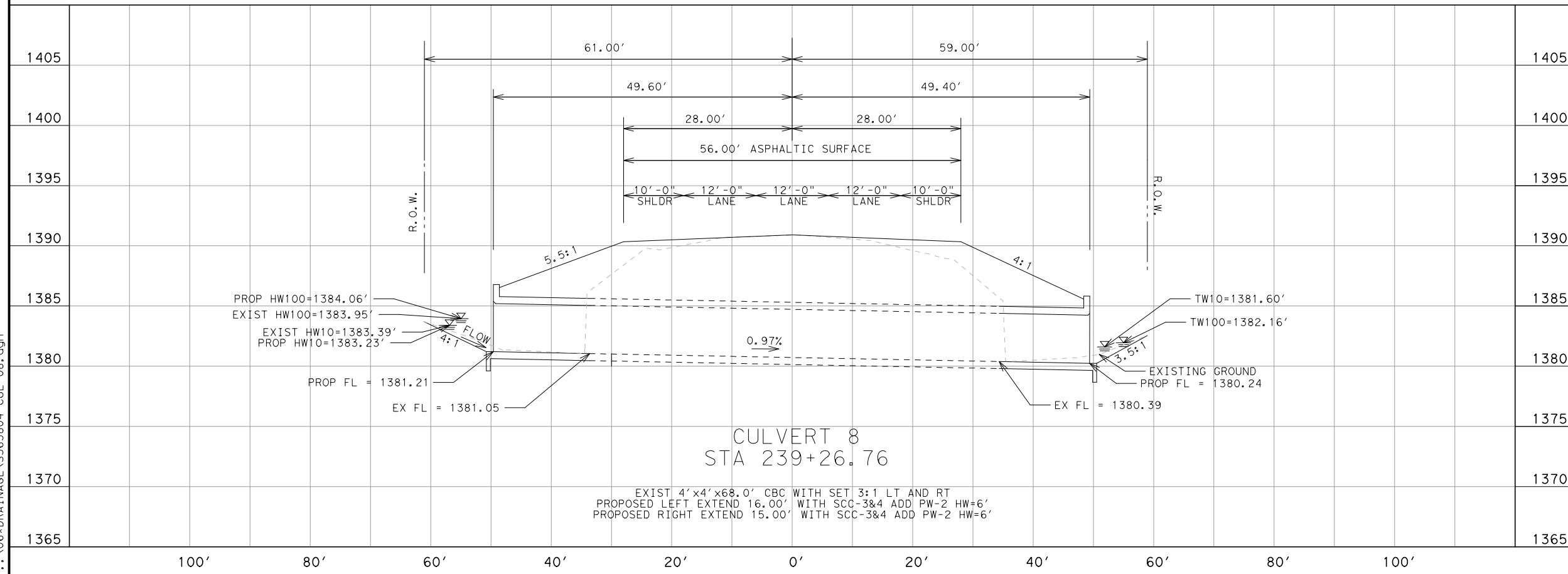
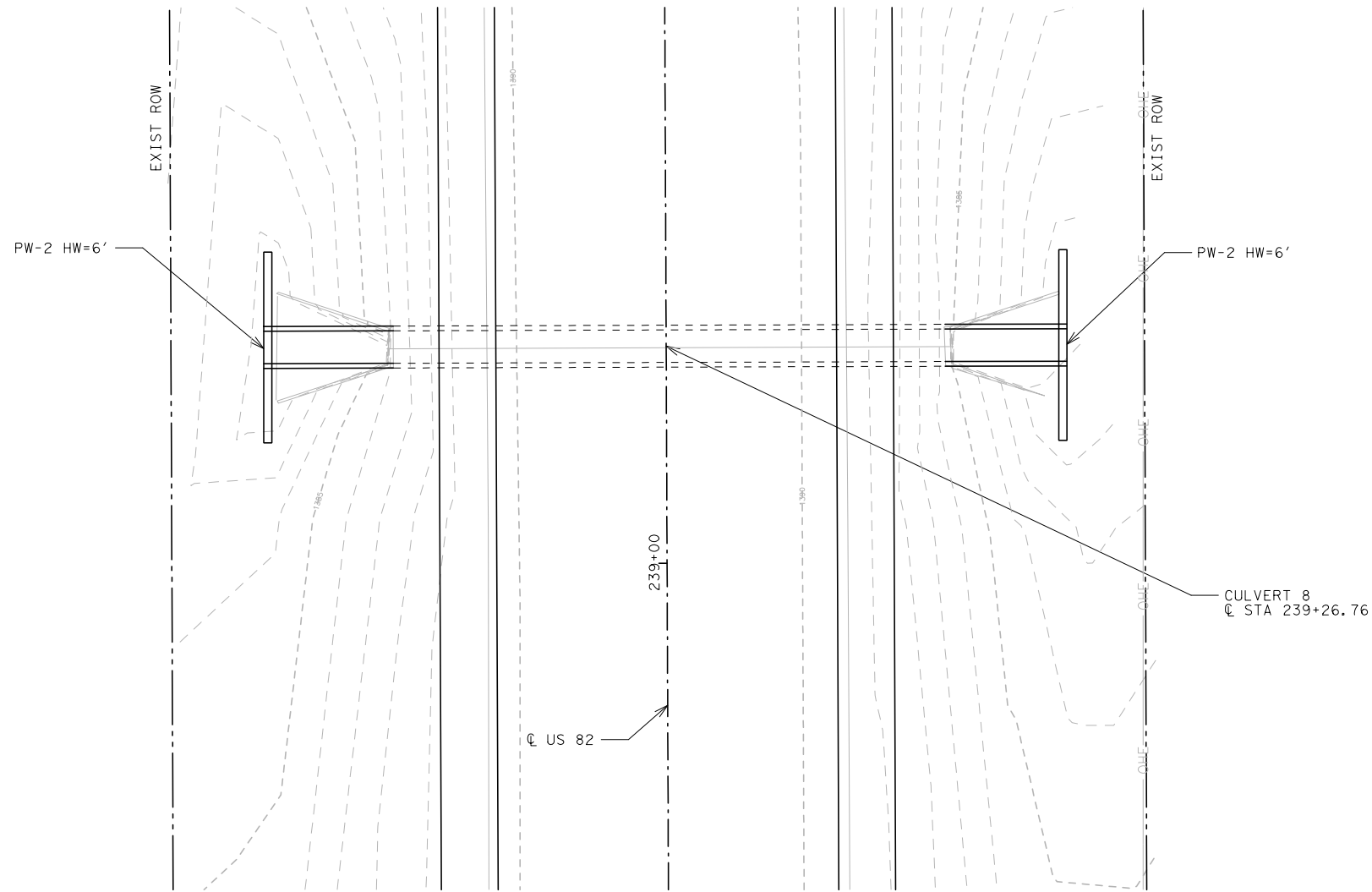
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		161	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/14/2020 5:00:37 PM ... \06\*\DRAINAGE\5563804-CUL-07.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6049	CONC BOX CULV (4 FT X 4 FT)(EXTEND)	LF	31
466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 8**  
**US 82**  
**STA 239+26.76**

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

SHEET 8 OF 32



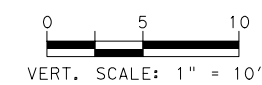
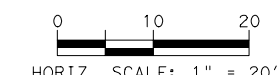
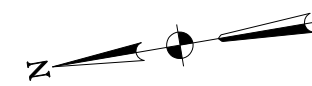
Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

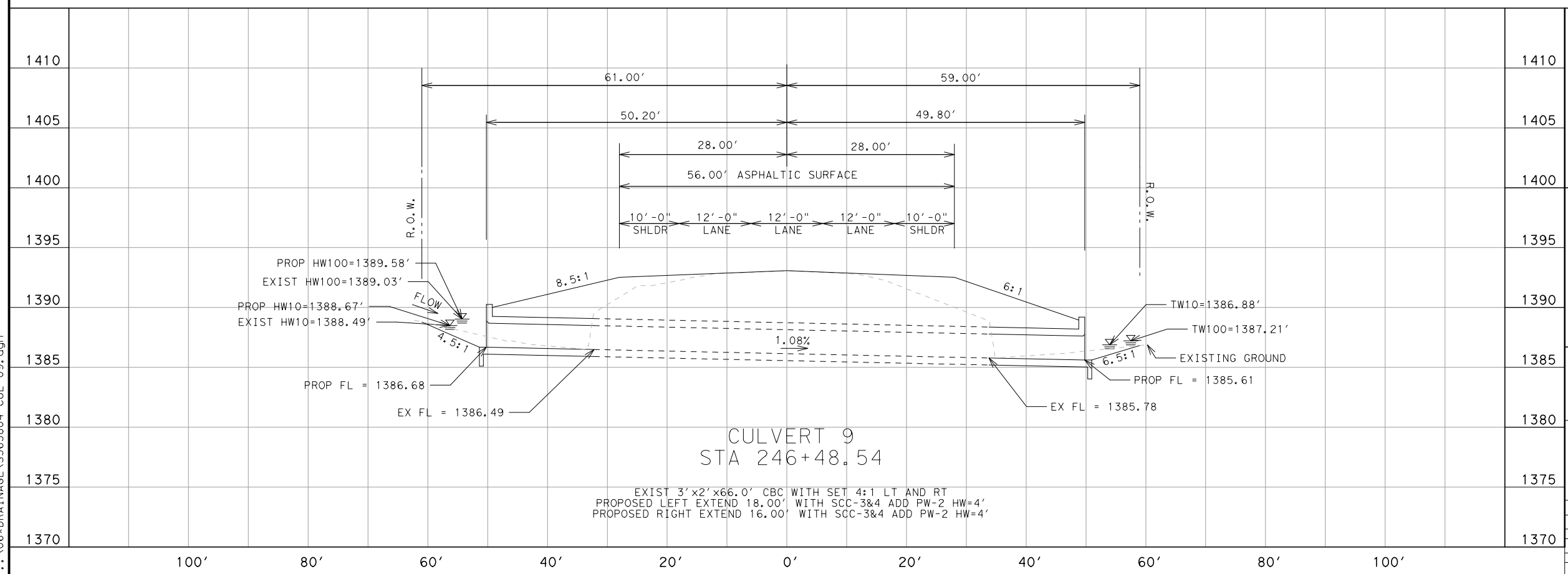
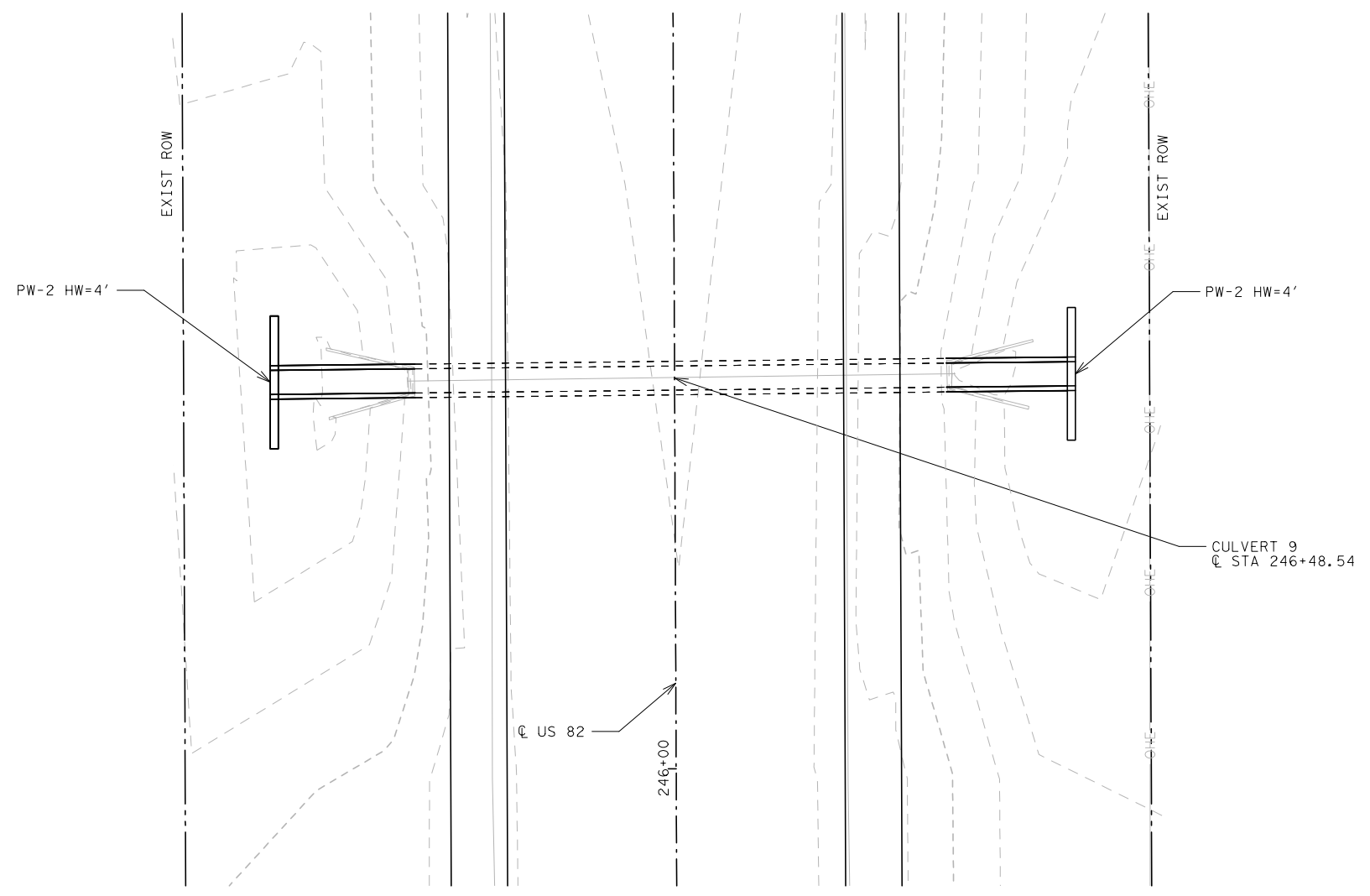
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:00:39 PM ... \06\DRAINAGE\5563804-CUL-08.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6045	CONC BOX CULV (3 FT X 2 FT)(EXTEND)	LF	34
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 9  
US 82  
STA 246+48.54**

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

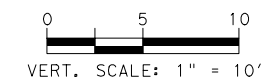
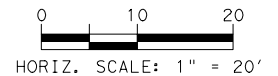
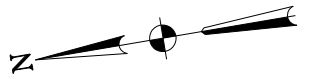
SHEET 9 OF 32



**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		163	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/14/2020 5:00:43 PM ... \06\\*DRAINAGE\5563804-CUL-09.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
464-6007	RC PIPE (CL III)(30 IN)	LF	98.5
466-6099	HEADWALL (CH - PW - 0) (DIA= 30 IN)	EA	1
467-6423	SET(TY II)(30 IN)(RCP)(6:1)(P)	EA	1
496-6007	REMOV STR (PIPE)	LF	68

NOTES:  
 1. GRADE TO DRAIN  
 2. SEE CUT AND RESTORE DETAILS

SETP-PD S=6:1

EXIST ROW

EXIST ROW

CH-PW-0

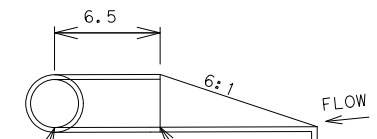
CUT AND RESTORE PAVEMENT @ 25.1'SY

CULVERT 10 @ STA 262+49.00

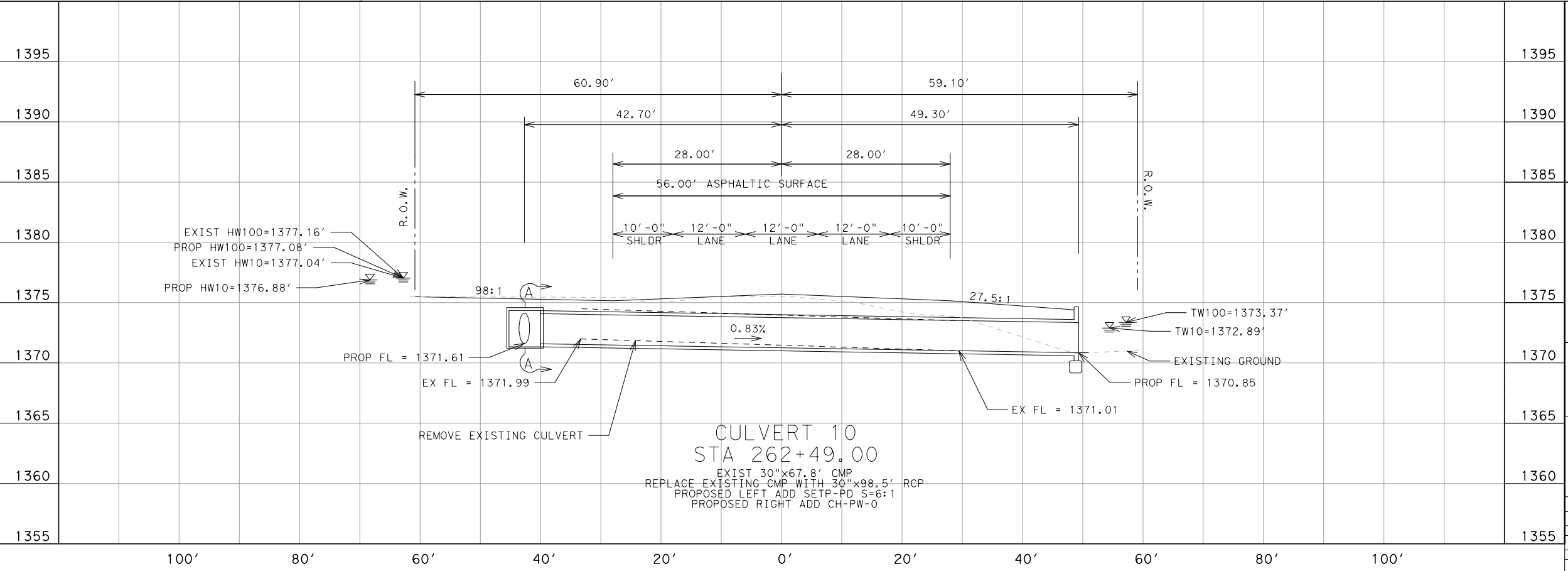
CL US 82

262+00

SEC A-A



PROP FL = 1371.61  
 PROP FL = 1371.66



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
 CULVERT 10  
 US 82  
 STA 262+49.00**

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

SHEET 10 OF 32



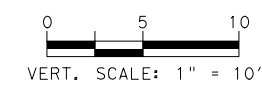
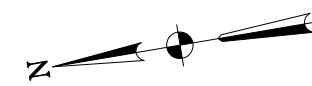
Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

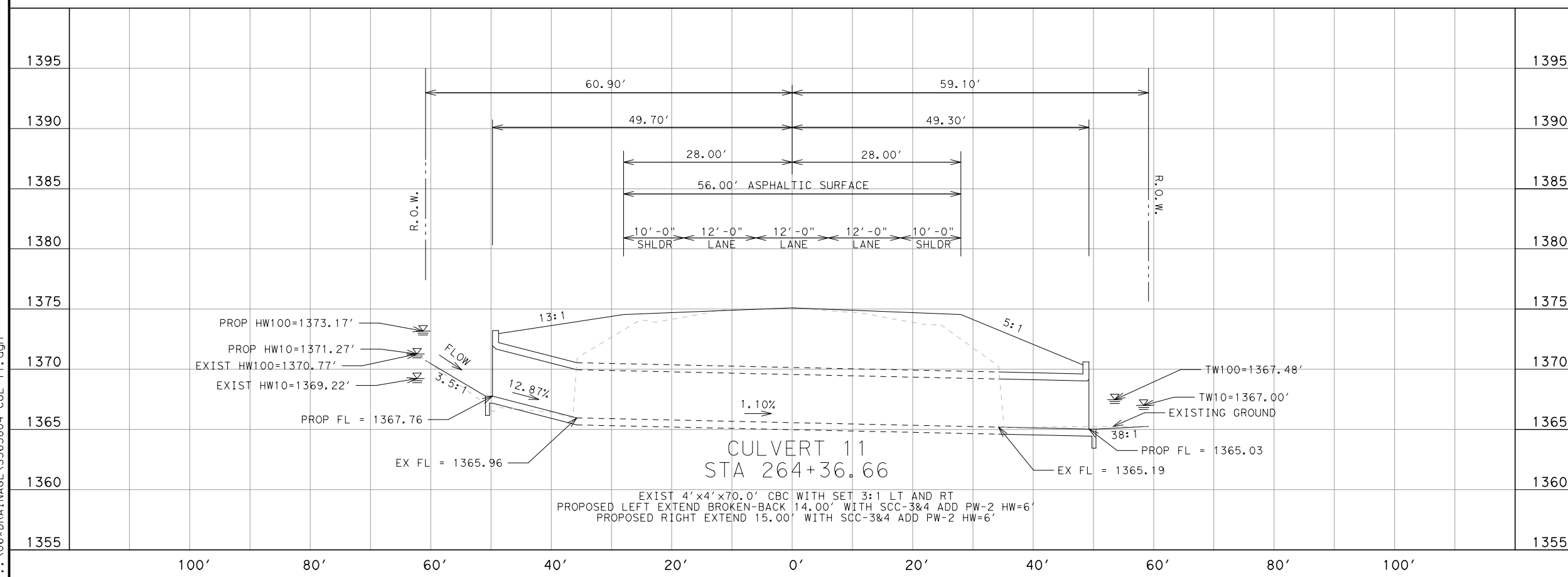
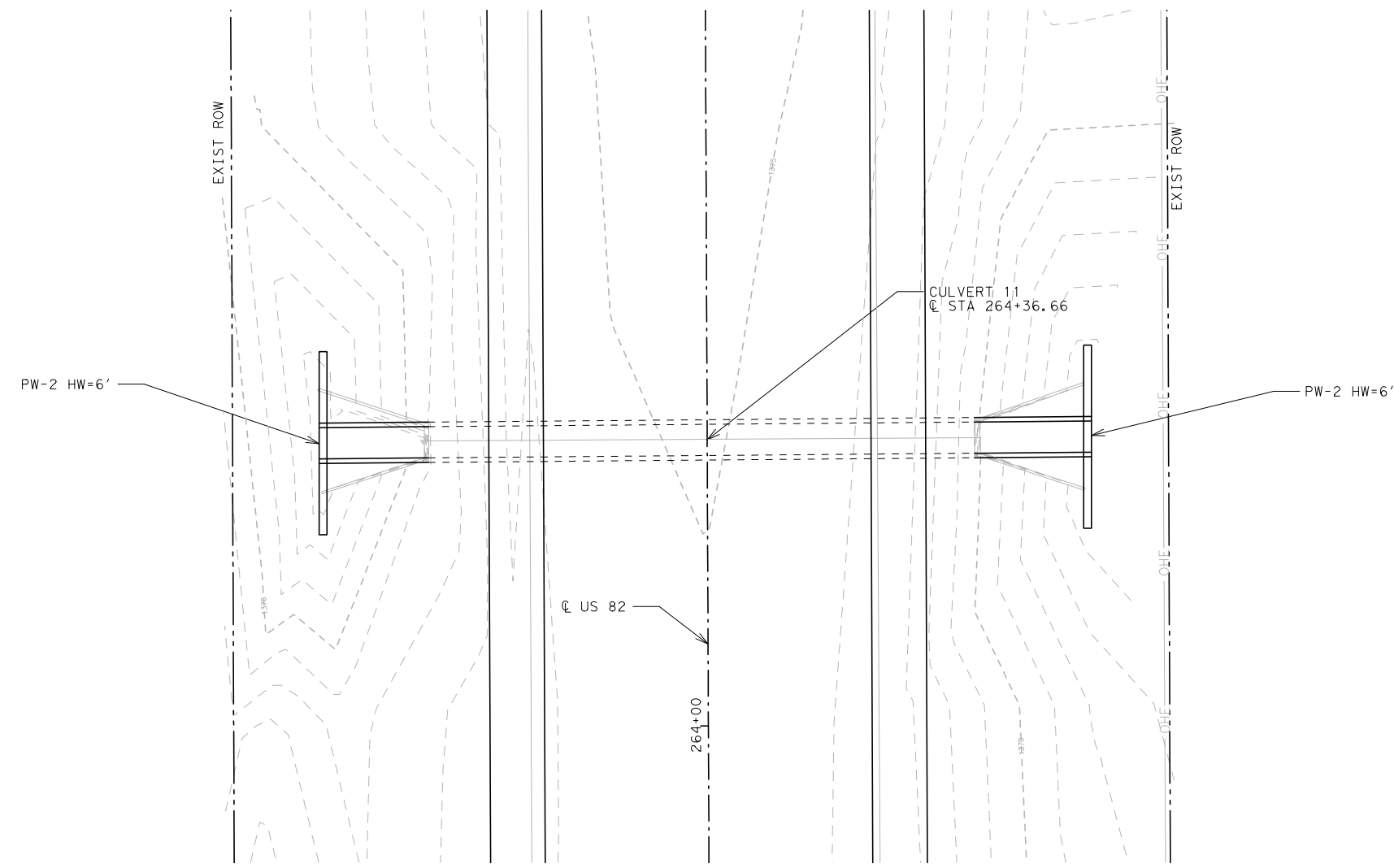
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6049	CONC BOX CULV (4 FT X 4 FT)(EXTEND)	LF	29
466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 11  
US 82  
STA 264+36.66**

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

SHEET 11 OF 32

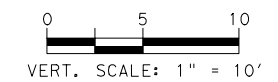
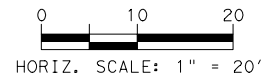
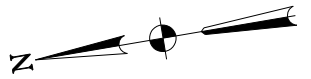


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

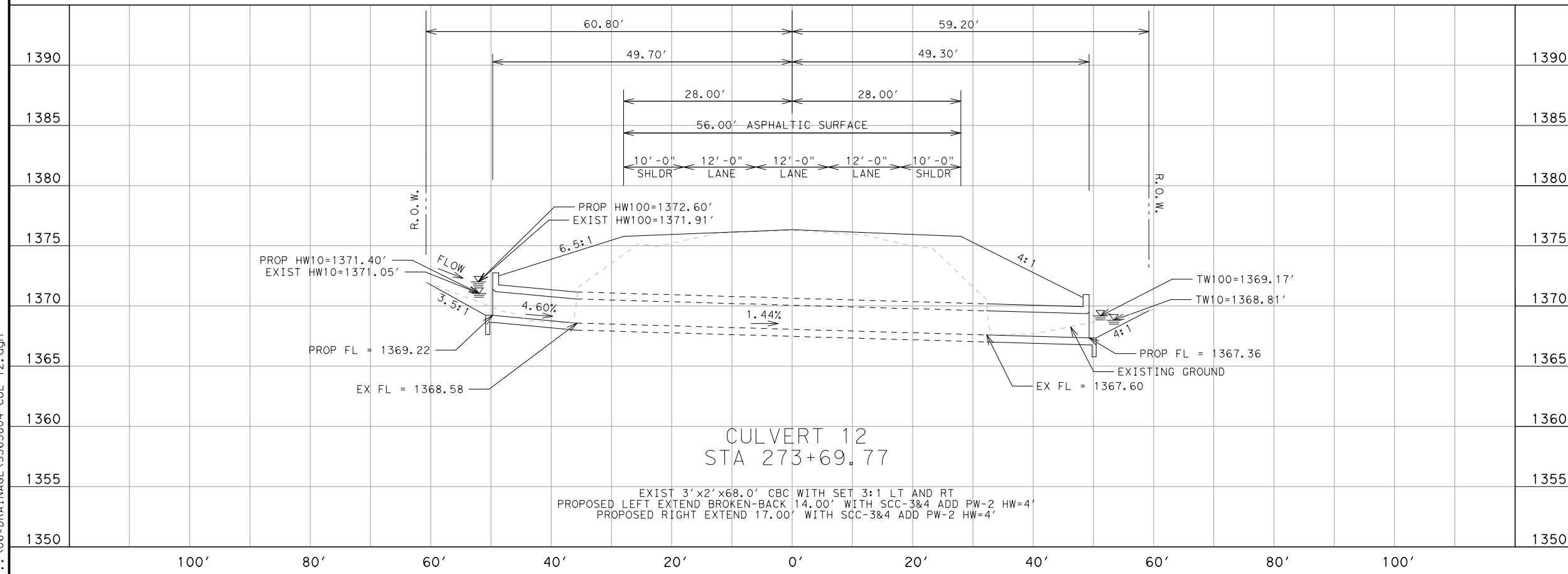
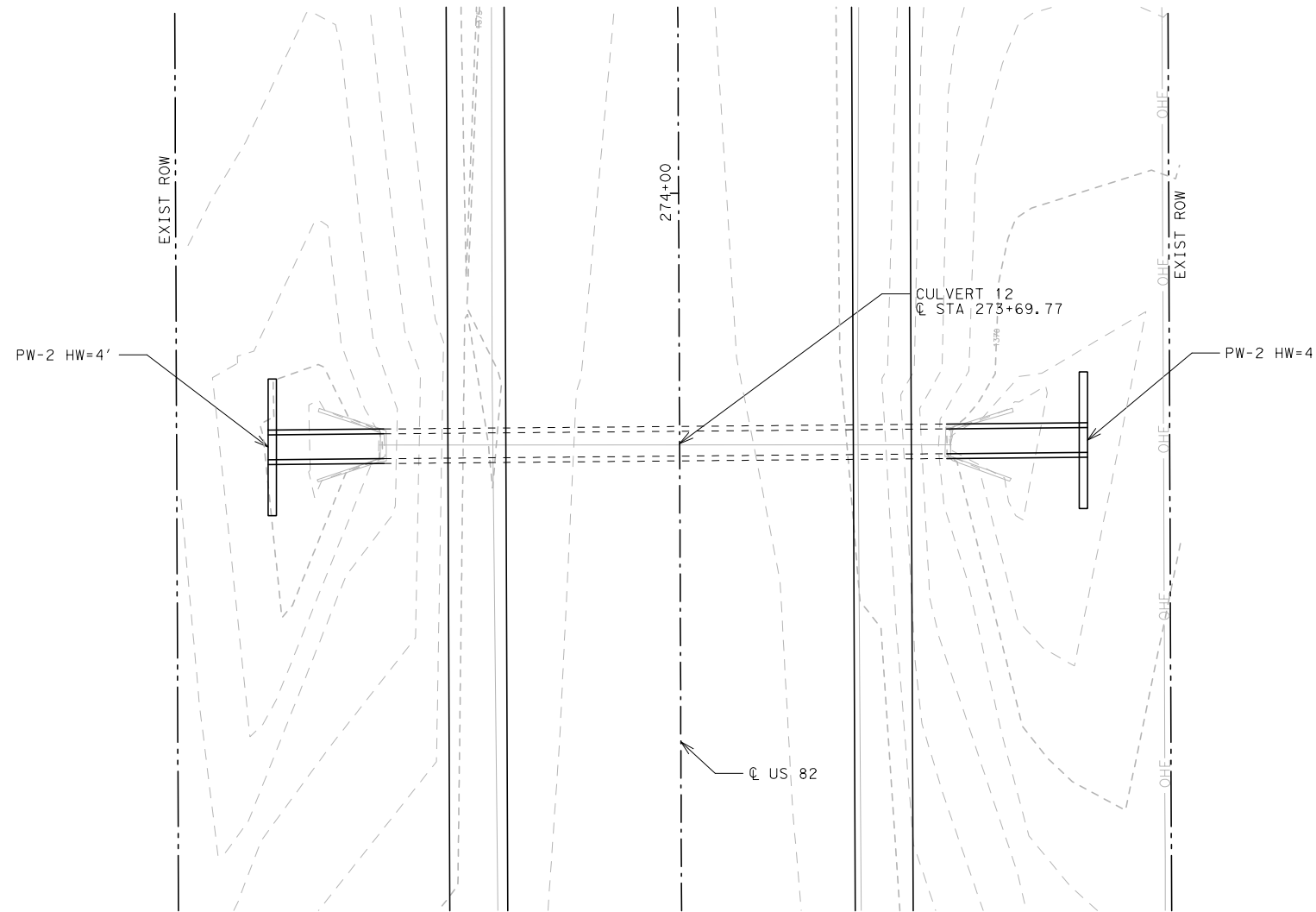
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:00:46 PM ... \06\\*DRAINAGE\5563804-CUL-11.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6045	CONC BOX CULV (3 FT X 2 FT)(EXTEND)	LF	31
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 12  
US 82  
STA 273+69.77**

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

SHEET 12 OF 32

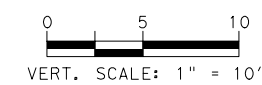
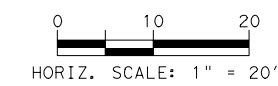
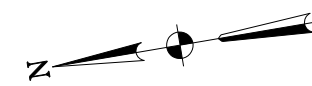


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

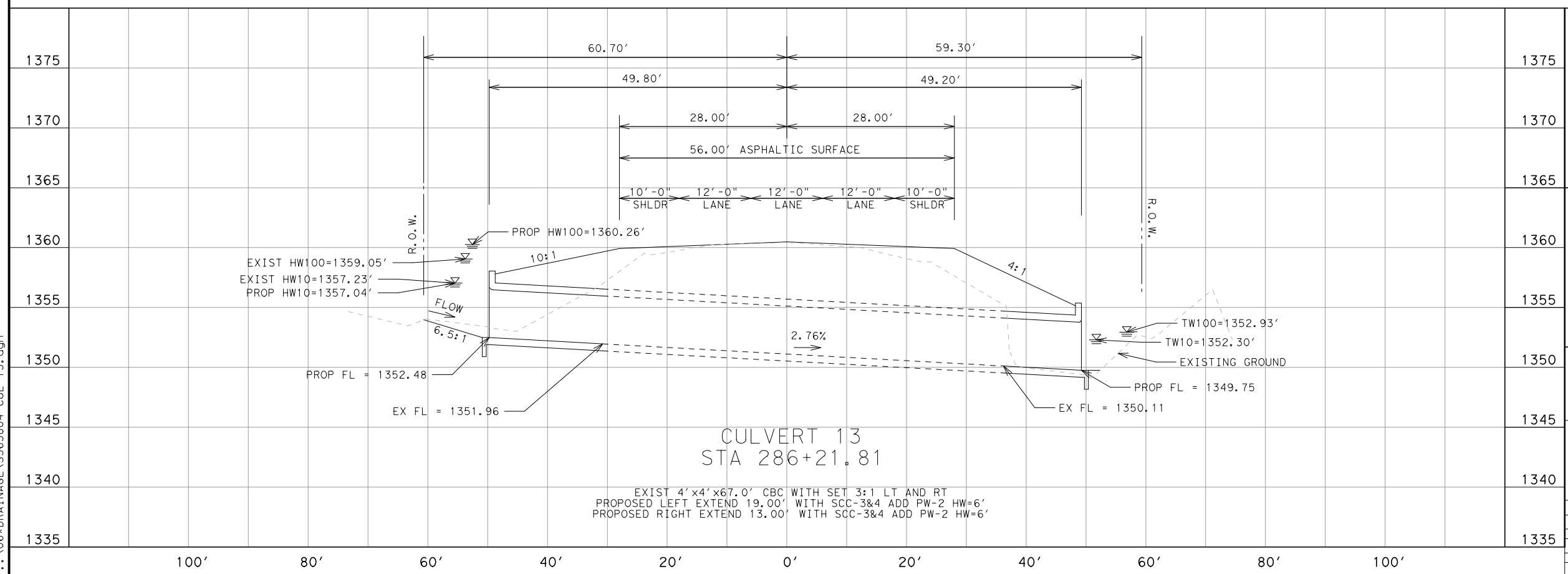
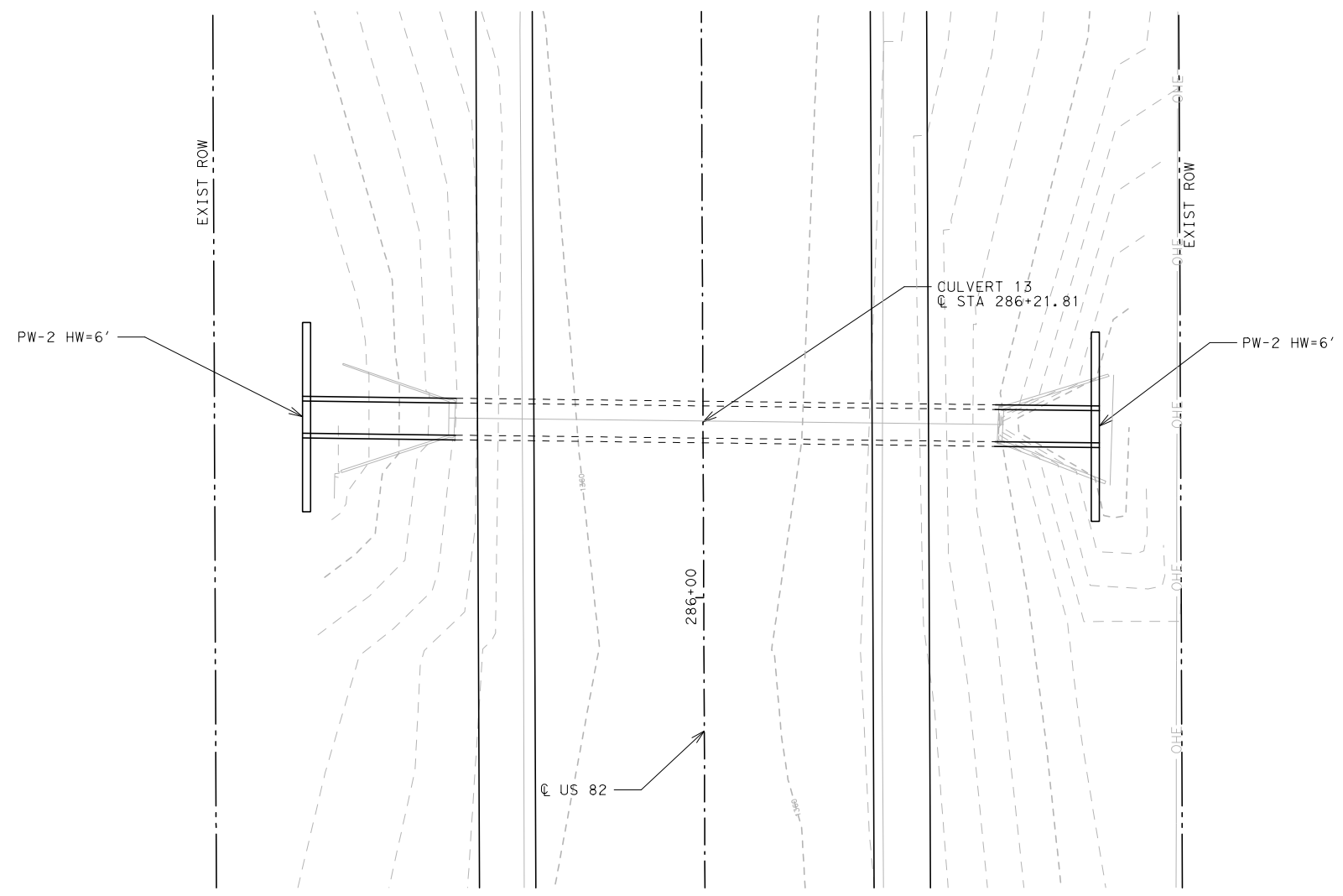
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:00:48 PM ... \06\DRAINAGE\5563804-CUL-12.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6049	CONC BOX CULV (4 FT X 4 FT)(EXTEND)	LF	32
466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 13**  
**US 82**  
**STA 286+21.81**

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

SHEET 13 OF 32

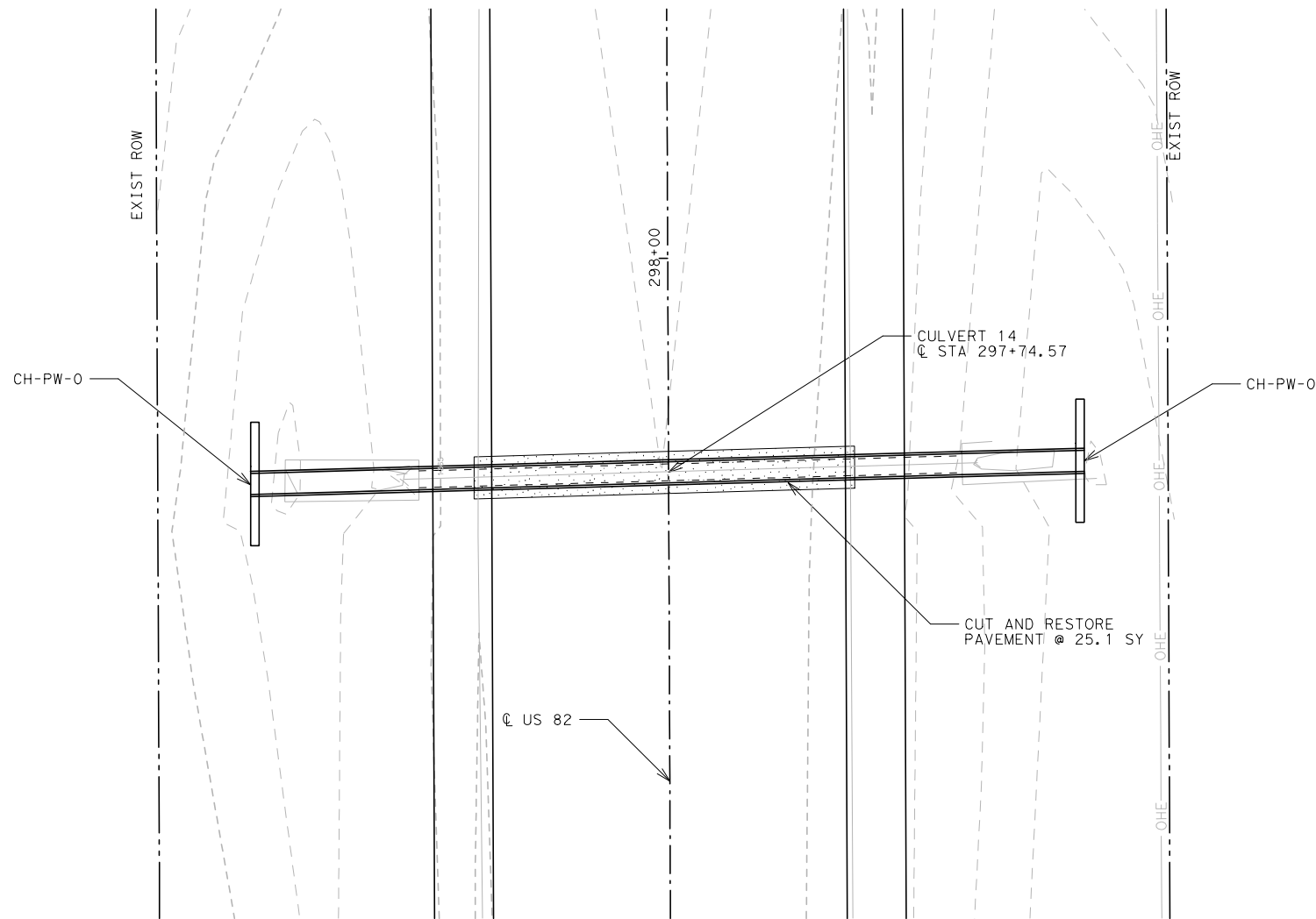
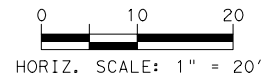
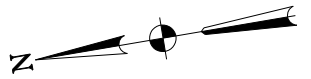


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 167	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

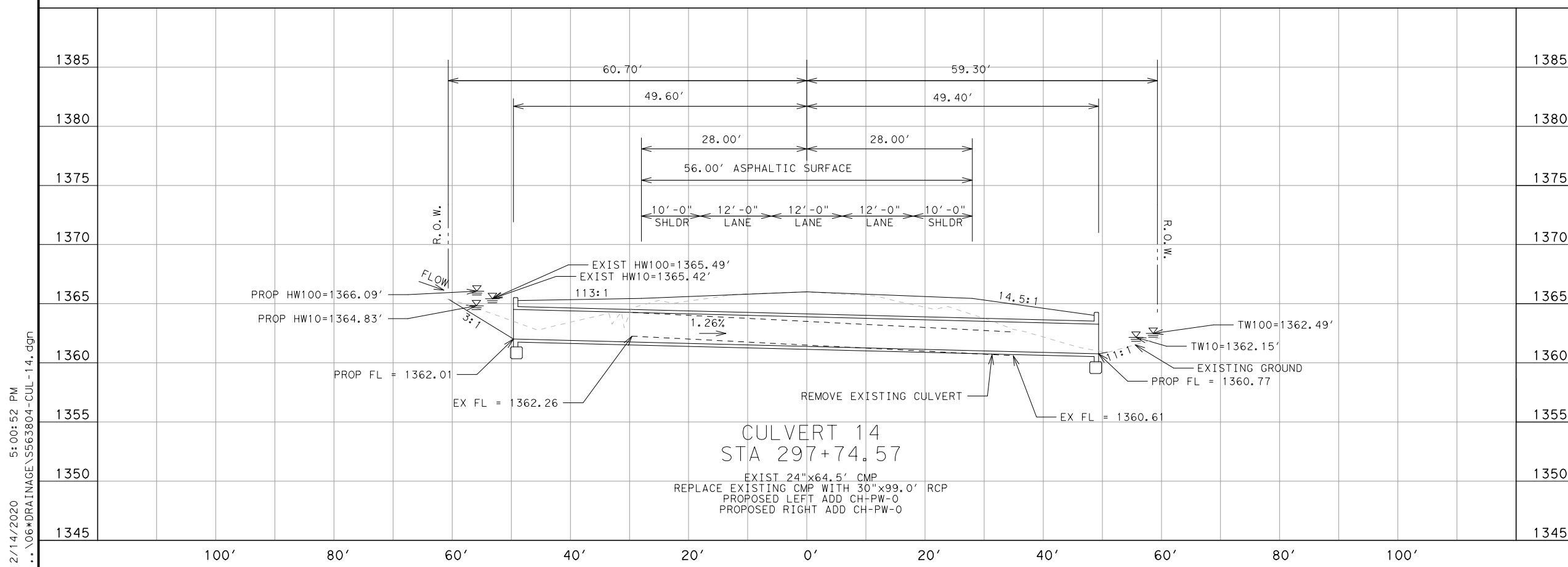
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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
464-6007	RC PIPE (CL III)(30 IN)	LF	99
466-6099	HEADWALL (CH - PW - 0) (DIA= 30 IN)	EA	2
496-6007	REMOV STR (PIPE)	LF	64.5

NOTE: SEE CUT AND RESTORE DETAILS



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 14  
US 82  
STA 297+74.57**

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

SHEET 14 OF 32



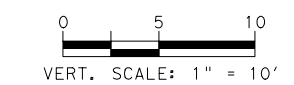
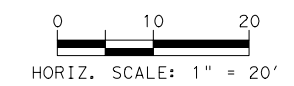
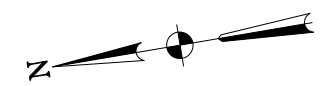
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 168	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

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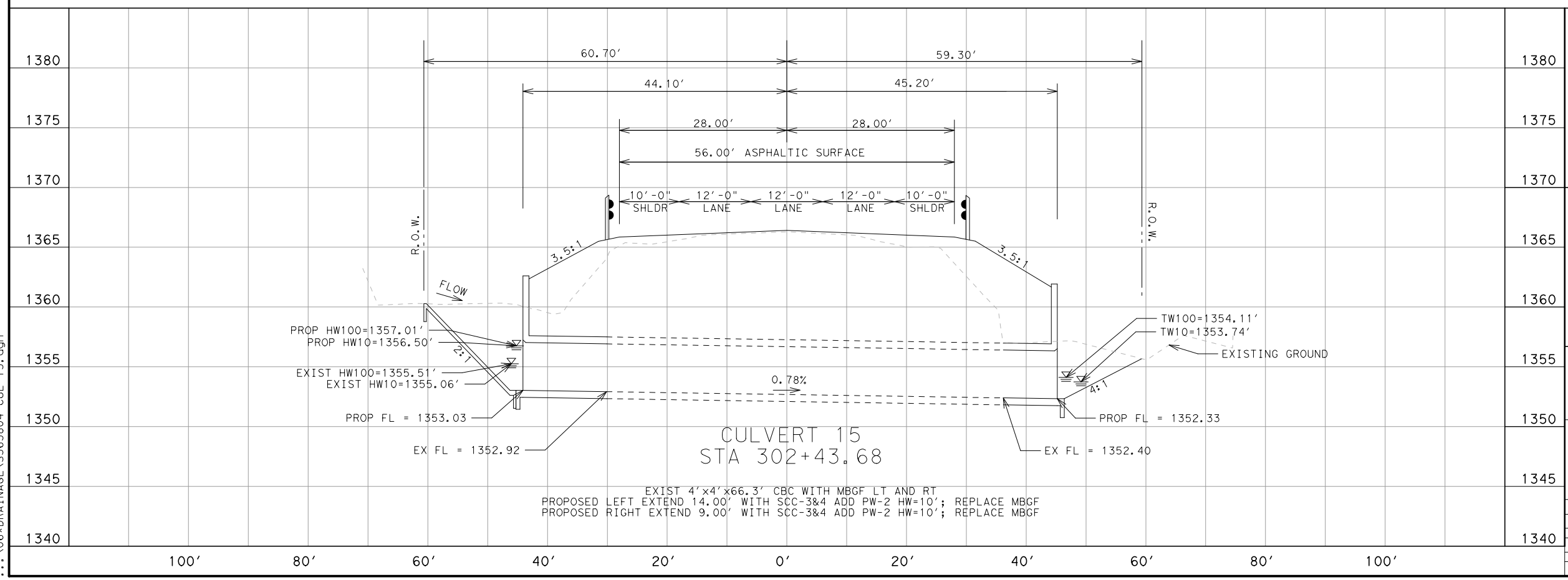
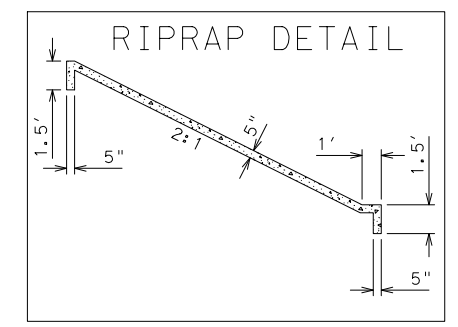
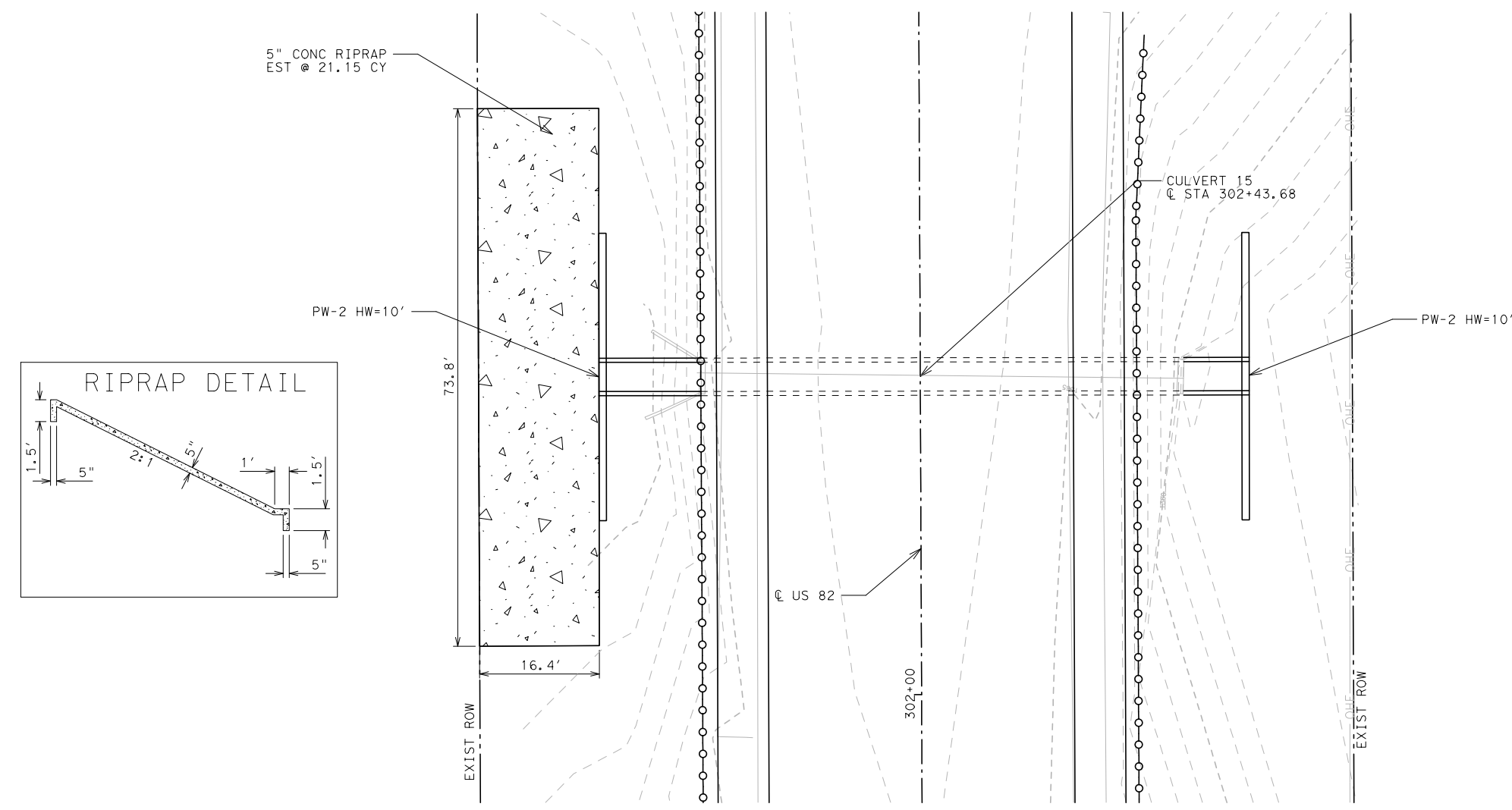




CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	21.15
462-6049	CONC BOX CULV (4 FT X 4 FT)(EXTEND)	LF	23
466-6185	WINGWALL (PW - 2) (HW=10 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 15  
US 82  
STA 302+43.68**

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

SHEET 15 OF 32



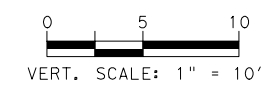
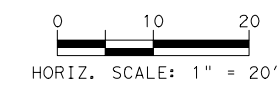
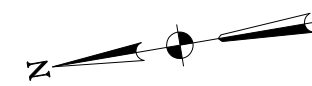
Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

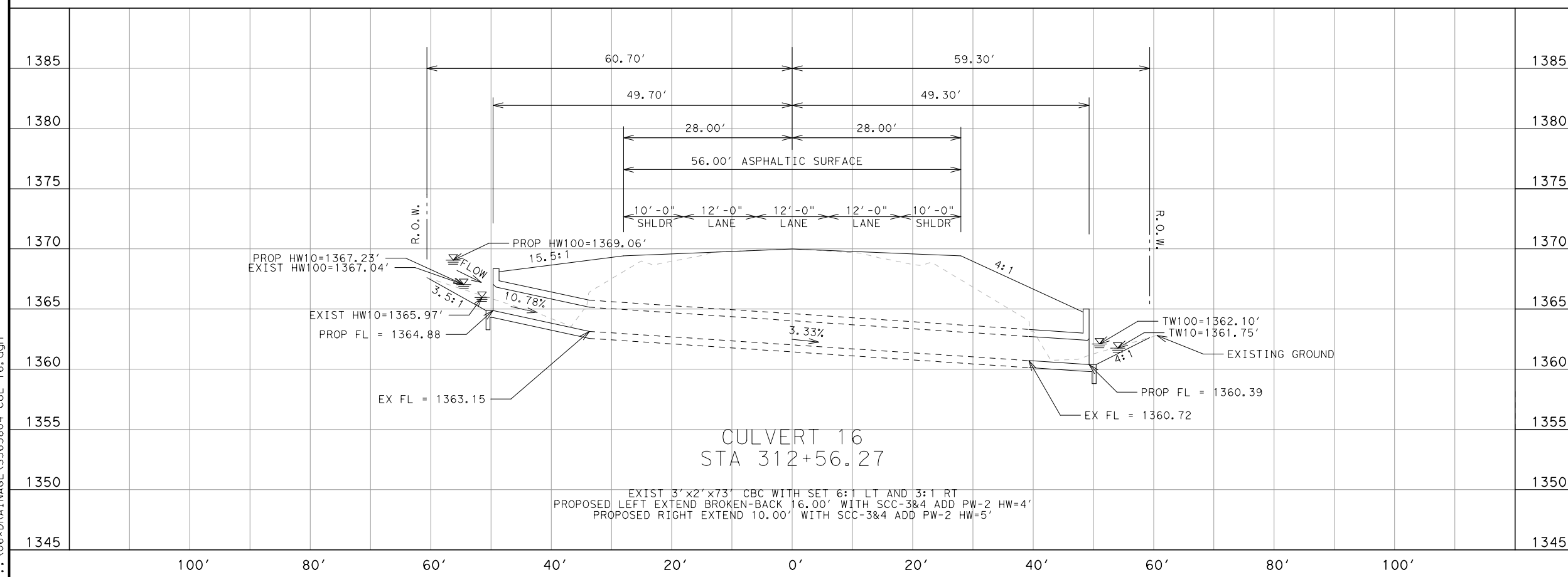
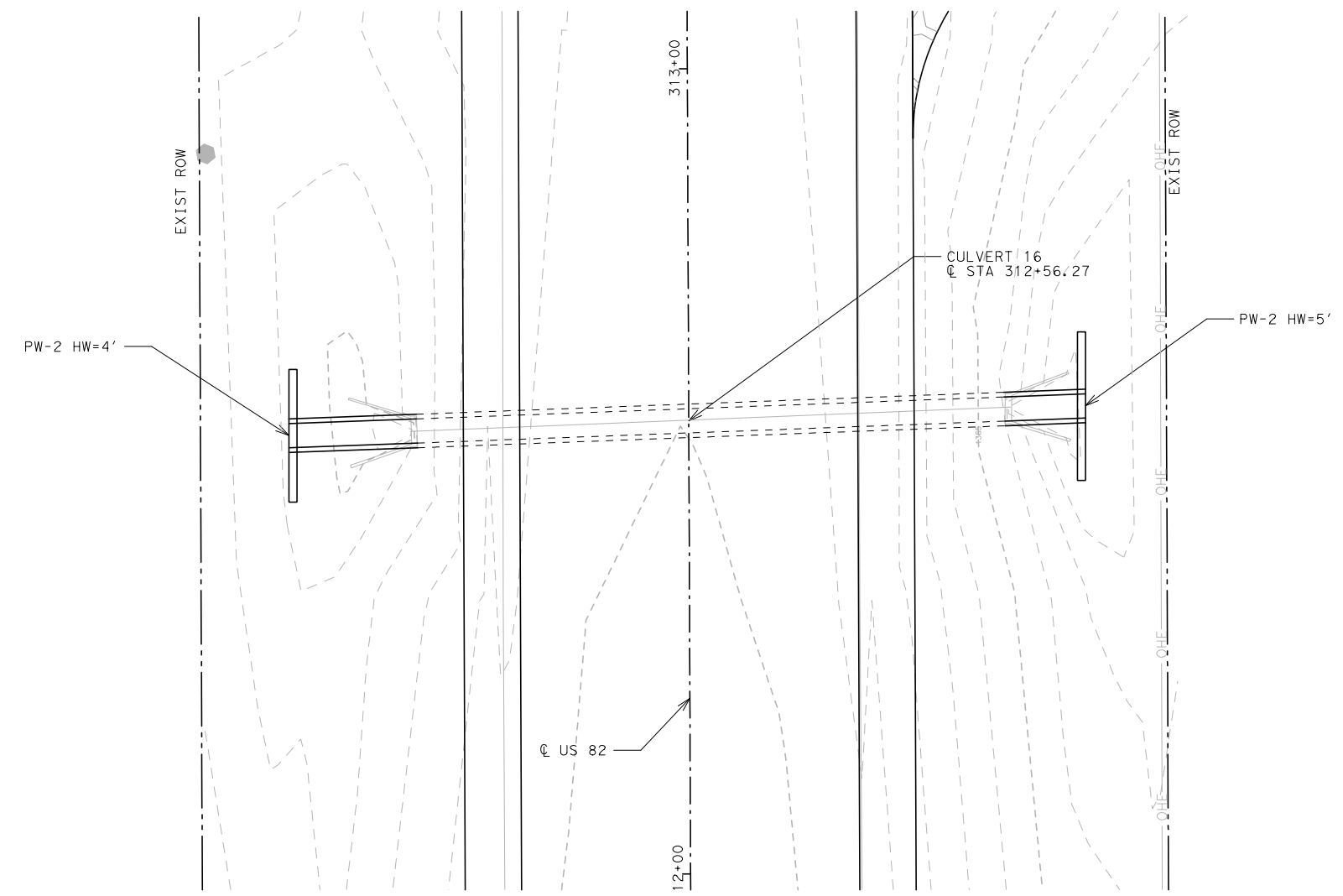
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		169
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

12/14/2020 5:00:55 PM ... \06\DRainage\5563804-CUL-15.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6045	CONC BOX CULV (3 FT X 2 FT)(EXTEND)	LF	26
466-6193	WINGWALL (PW-2) (HW=4 FT)	EA	1
466-6194	WINGWALL (PW-2) (HW=5 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 16  
US 82  
STA 312+56.27**

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

SHEET 16 OF 32

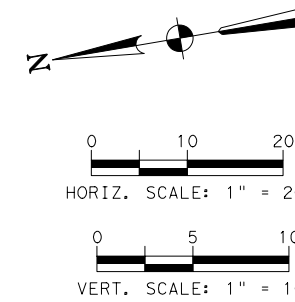
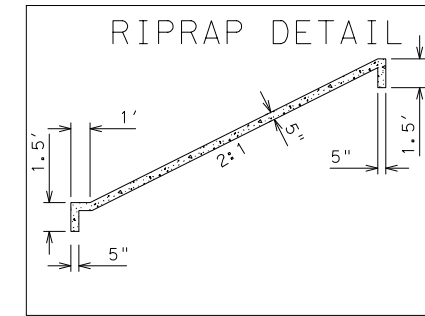
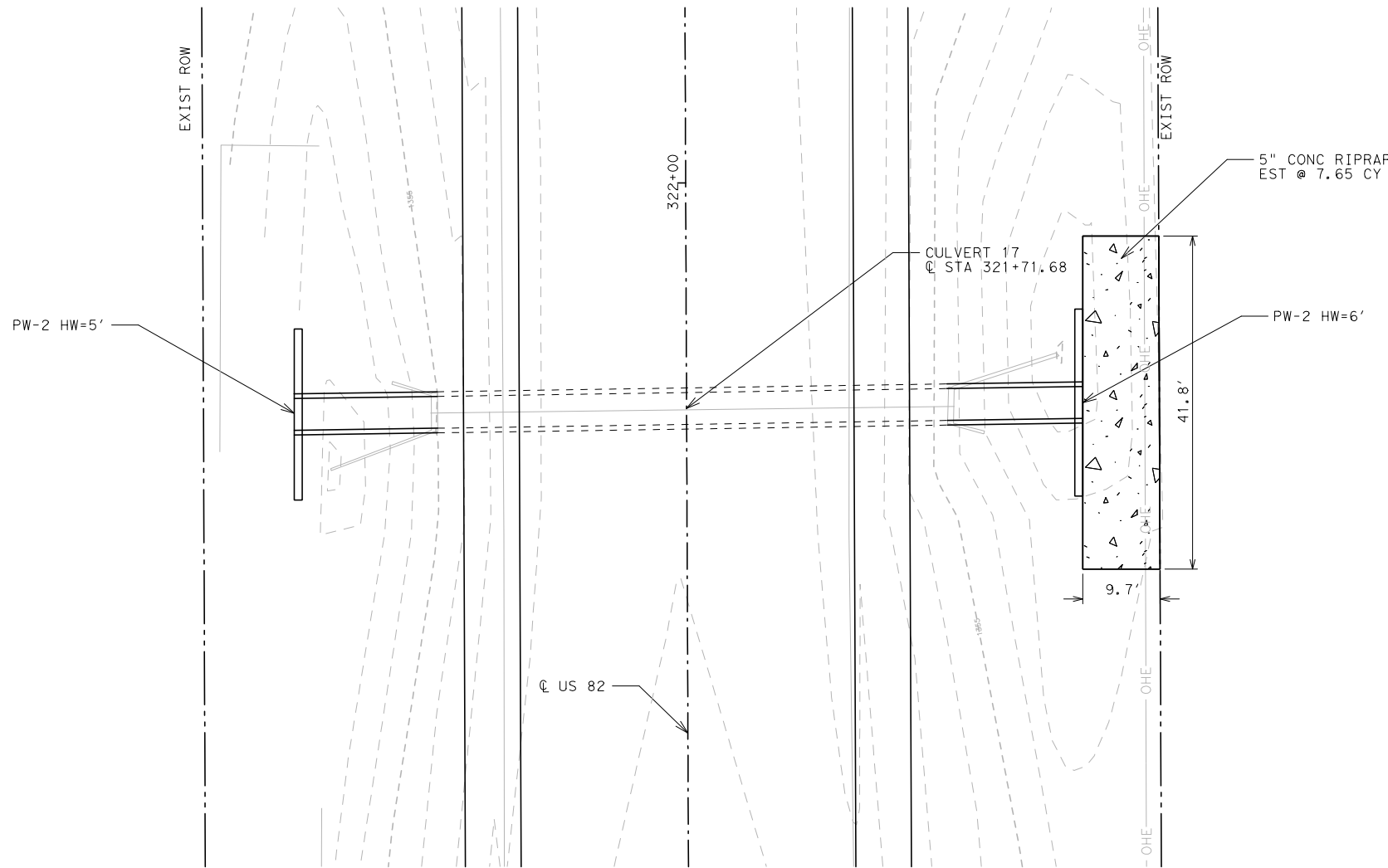


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HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 170	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

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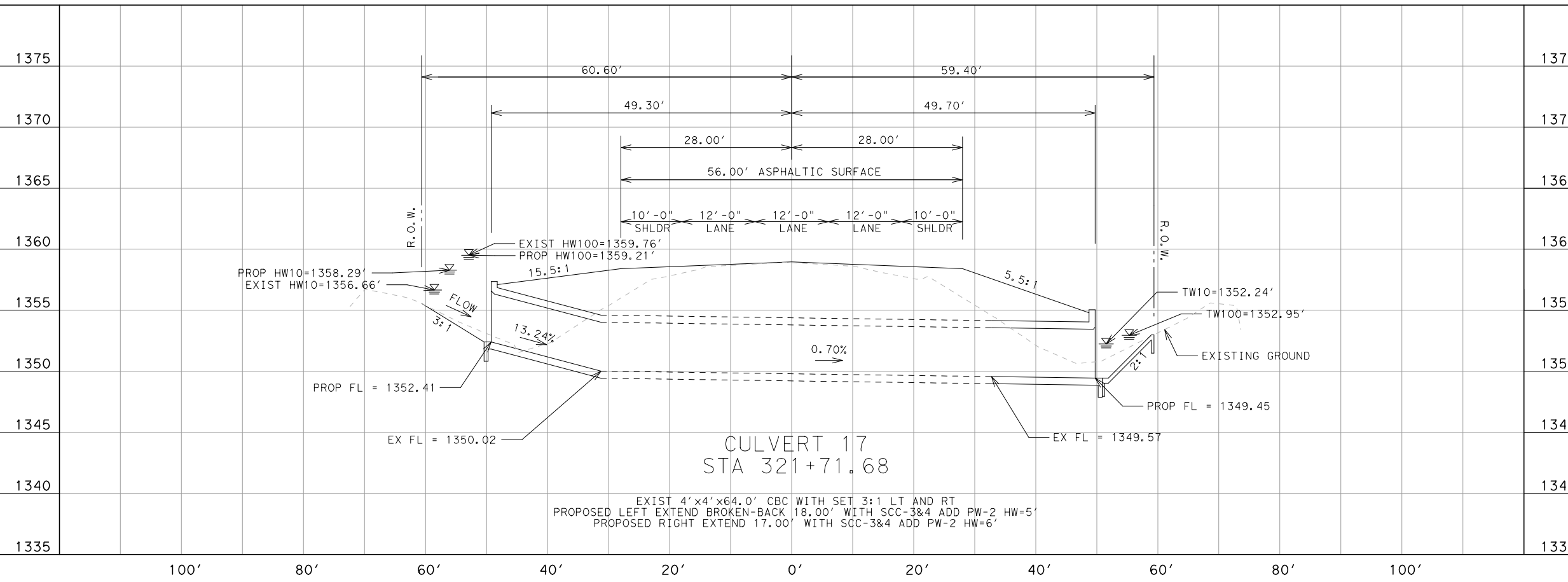


CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	7.65
462-6049	CONC BOX CULV (4 FT X 4 FT)(EXTEND)	LF	35
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	1
466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON

12/14/2020 5:00:59 PM ... \06\*DRAINAGE\5563804-CUL-17.dgn



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 17  
US 82  
STA 321+71.68**

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

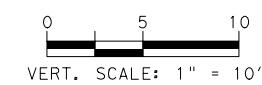
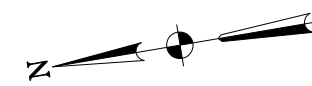
SHEET 17 OF 32



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

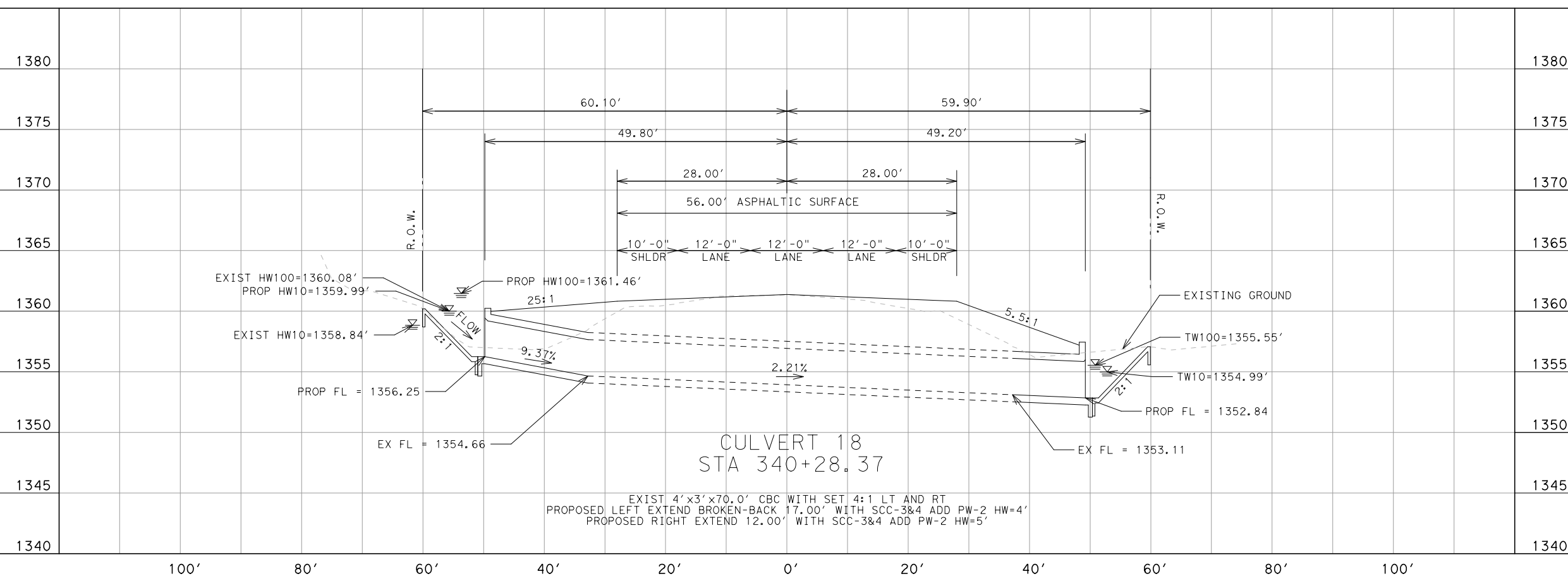
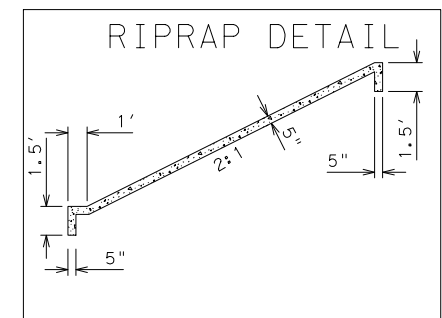
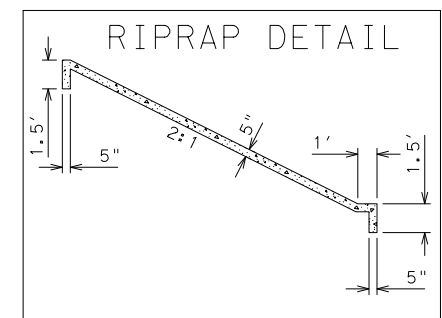
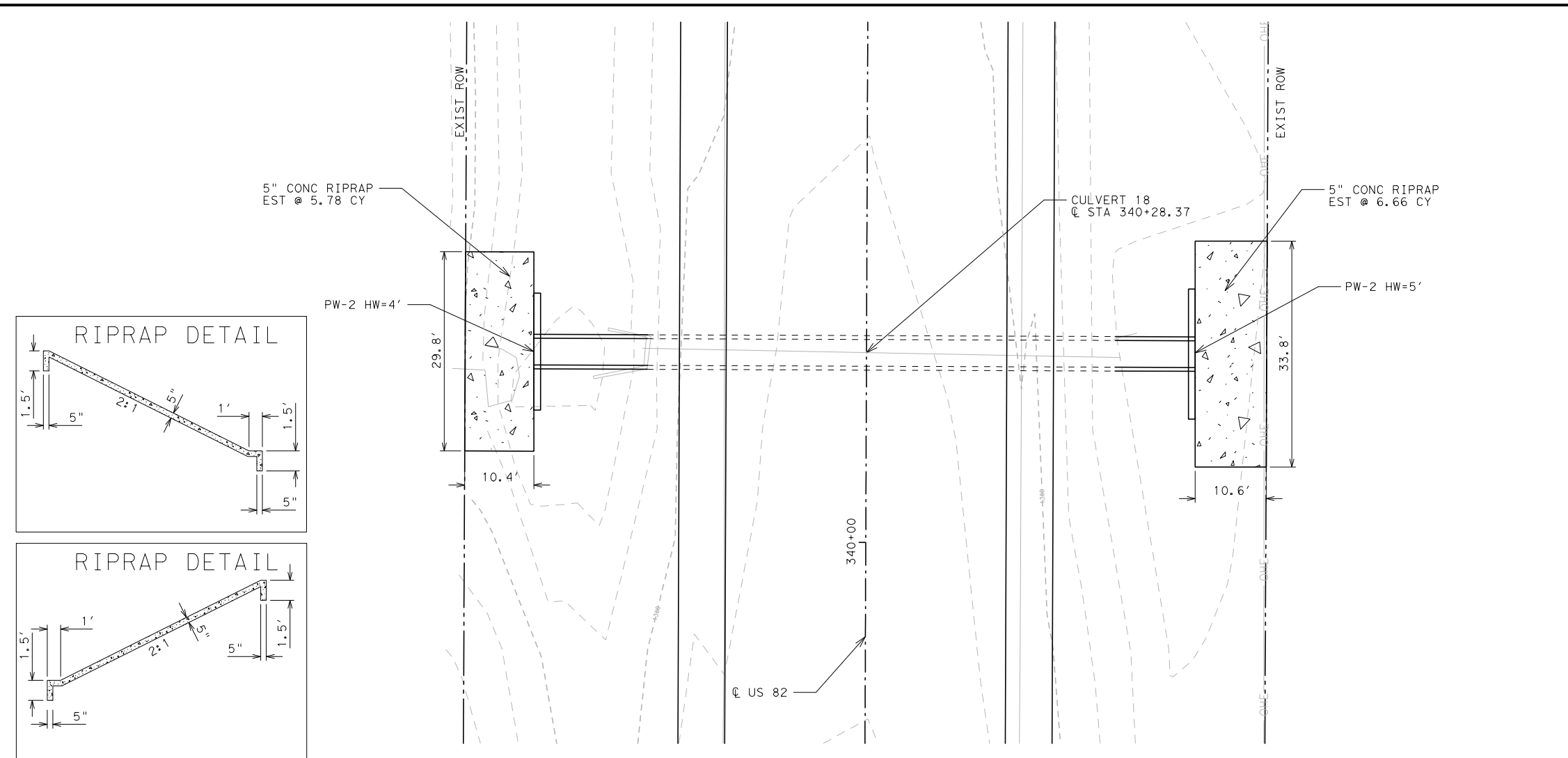
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 171	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	12.44
462-6048	CONC BOX CULV (4 FT X 3 FT)(EXTEND)	LF	29
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	1
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON



**CULVERT LAYOUT**  
**CULVERT 18**  
**US 82**  
**STA 340+28.37**

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

SHEET 18 OF 32

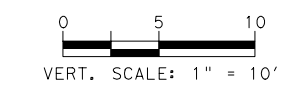
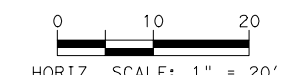
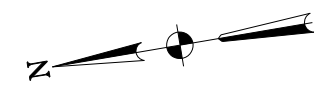


**HUITT-ZOLLARS**

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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 172
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:01:02 PM ... \06\\*DRAINAGE\5563804-CUL-18.dgn



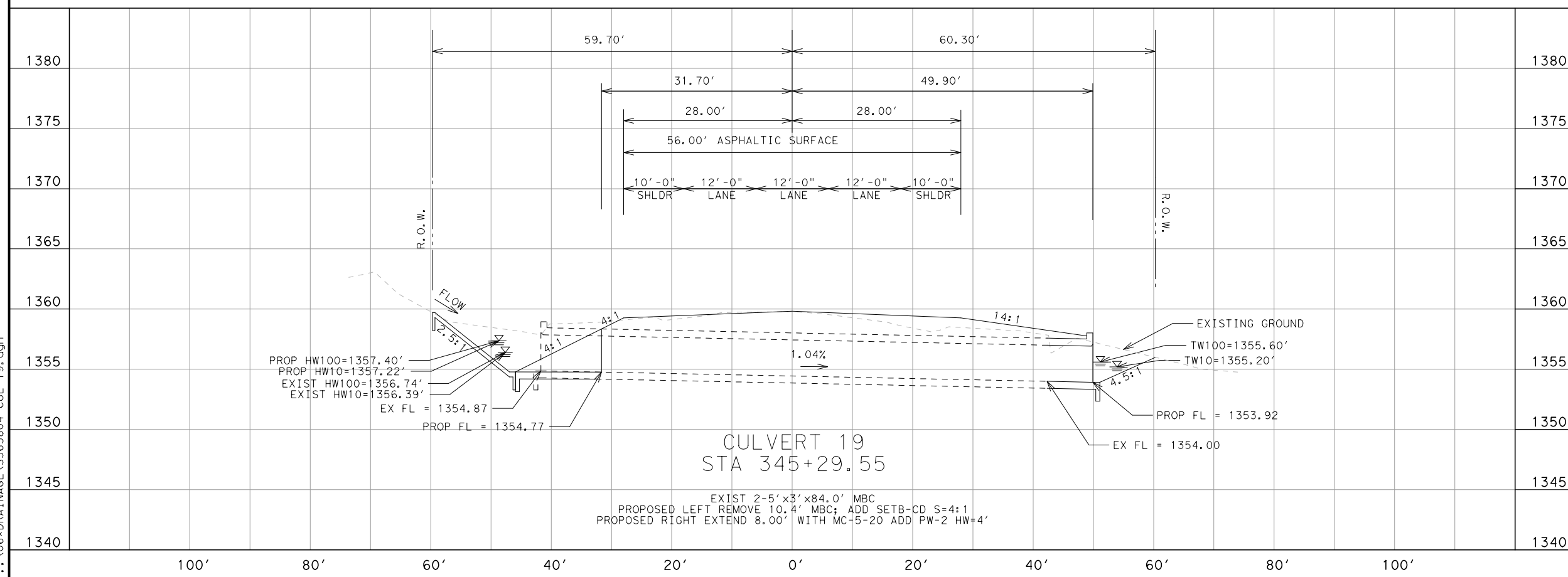
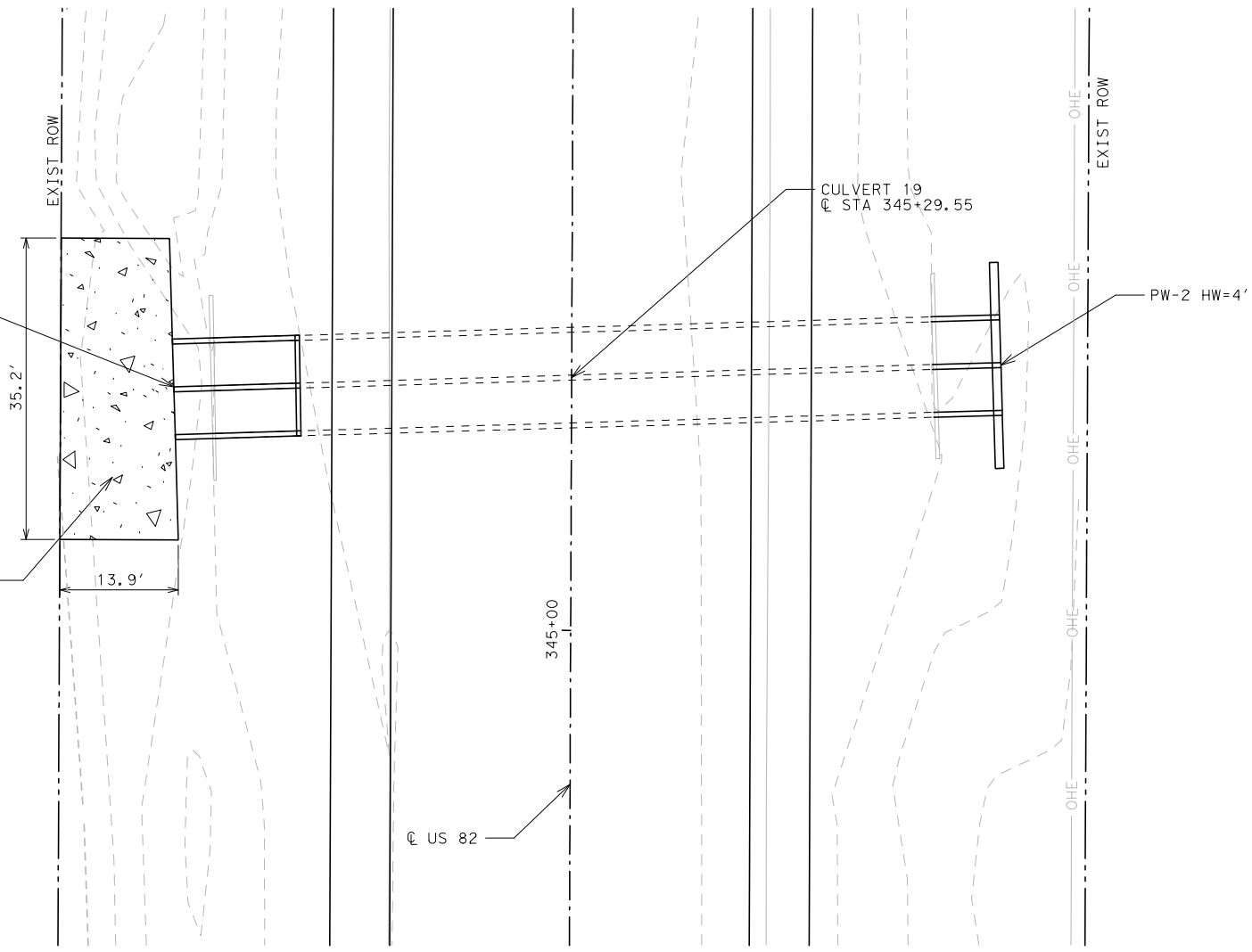
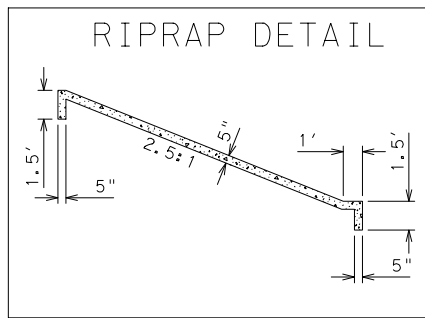
CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	8.73
462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF	16
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	1
467-6177	SET (TY I)(S= 5 FT)(HW= 4 FT)(4:1) (C)	EA	1
496-6008	REMOV STR (BOX CULVERT)	LF	10.4
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON

SETB-CD S=4:1

5" CONC RIPRAP  
EST @ 8.73 CY



**CULVERT 19**  
**STA 345+29.55**

EXIST 2-5'x3'x84.0' MBC  
PROPOSED LEFT REMOVE 10.4' MBC; ADD SETB-CD S=4:1  
PROPOSED RIGHT EXTEND 8.00' WITH MC-5-20 ADD PW-2 HW=4'



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 19**  
**US 82**  
**STA 345+29.55**

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

SHEET 19 OF 32

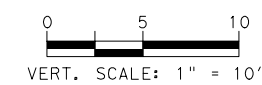
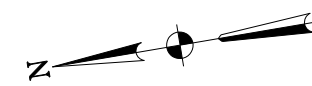


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 173
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

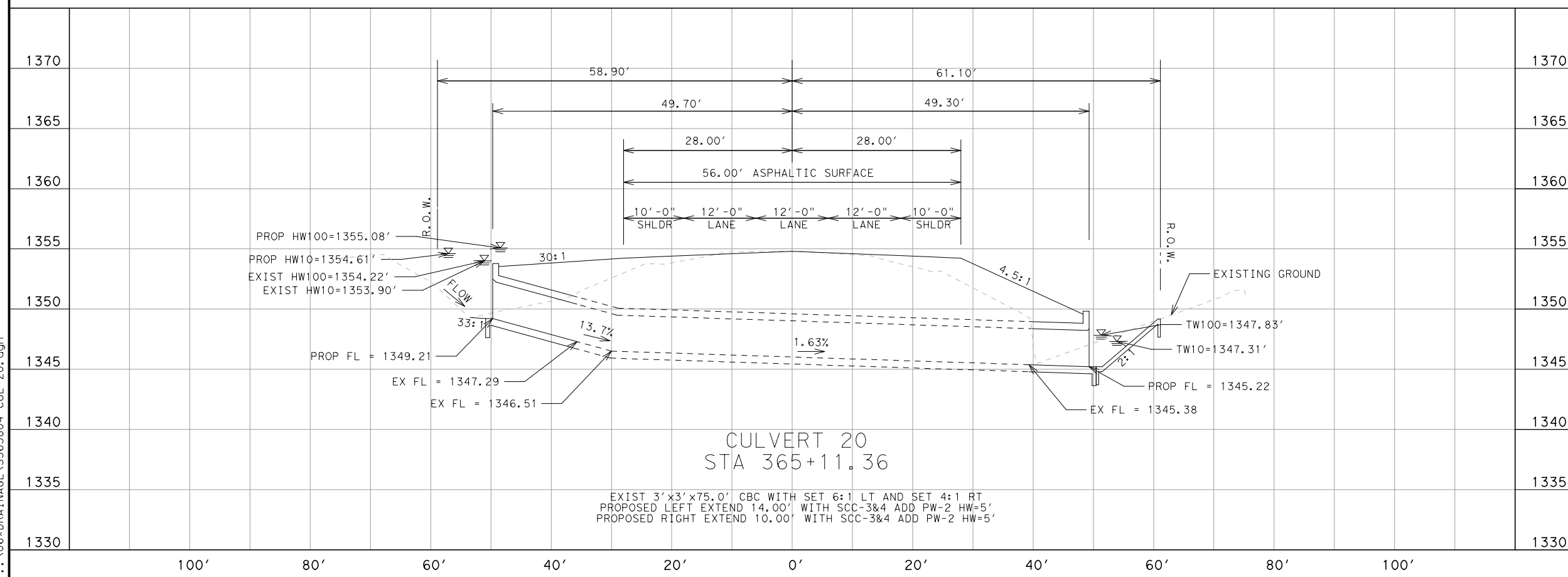
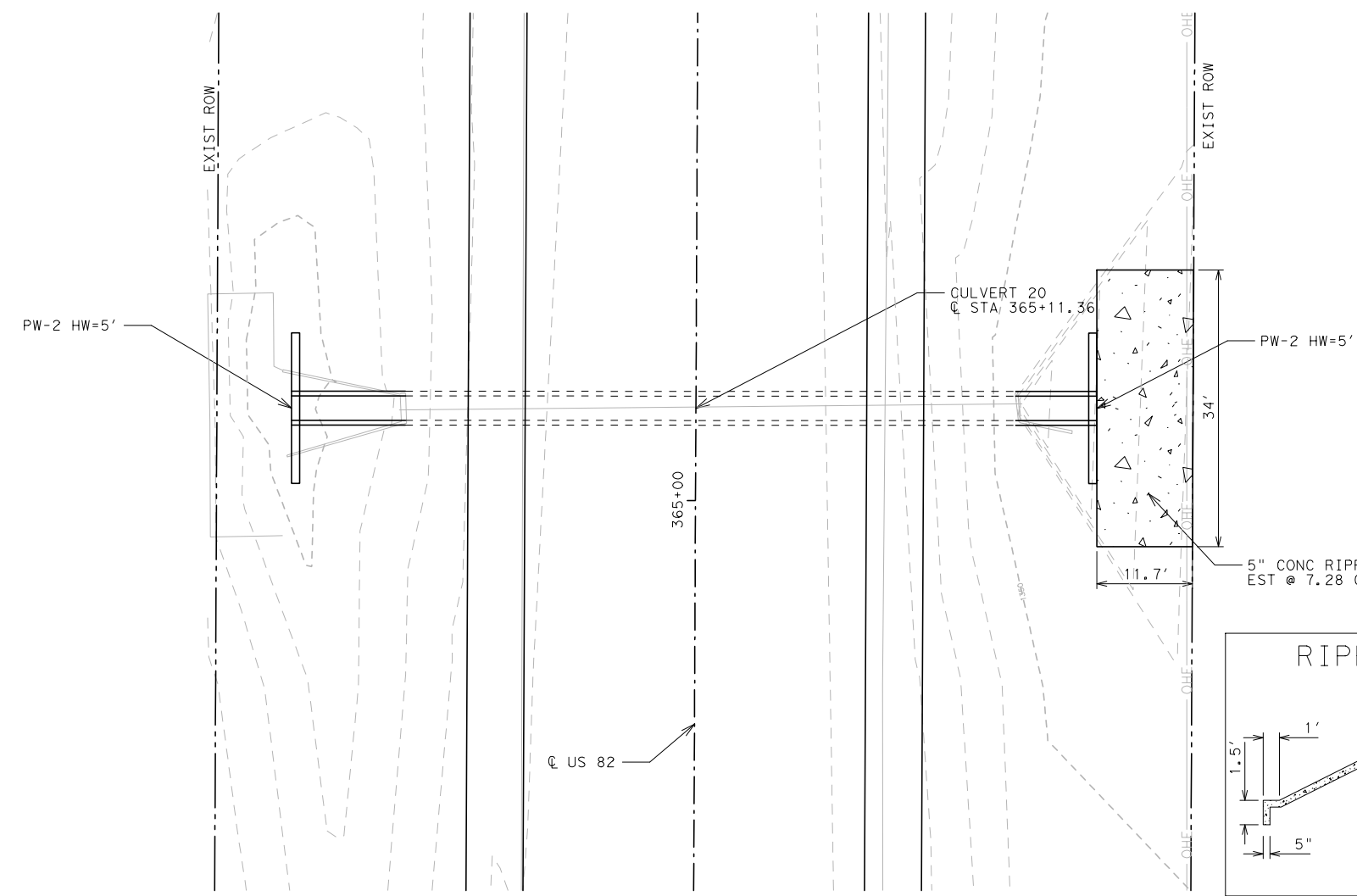
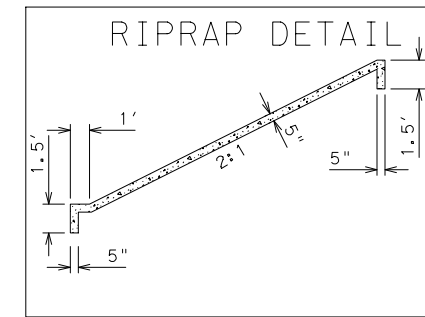
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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	7.28
462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	28
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 20**  
**US 82**  
**STA 365+11.36**

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

SHEET 20 OF 32



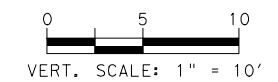
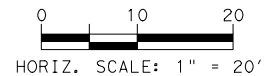
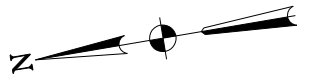
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 174
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

CULVERT 20  
 STA 365+11.36  
 EXIST 3'x3'x75.0' CBC WITH SET 6:1 LT AND SET 4:1 RT  
 PROPOSED LEFT EXTEND 14.00' WITH SCC-3&4 ADD PW-2 HW=5'  
 PROPOSED RIGHT EXTEND 10.00' WITH SCC-3&4 ADD PW-2 HW=5'

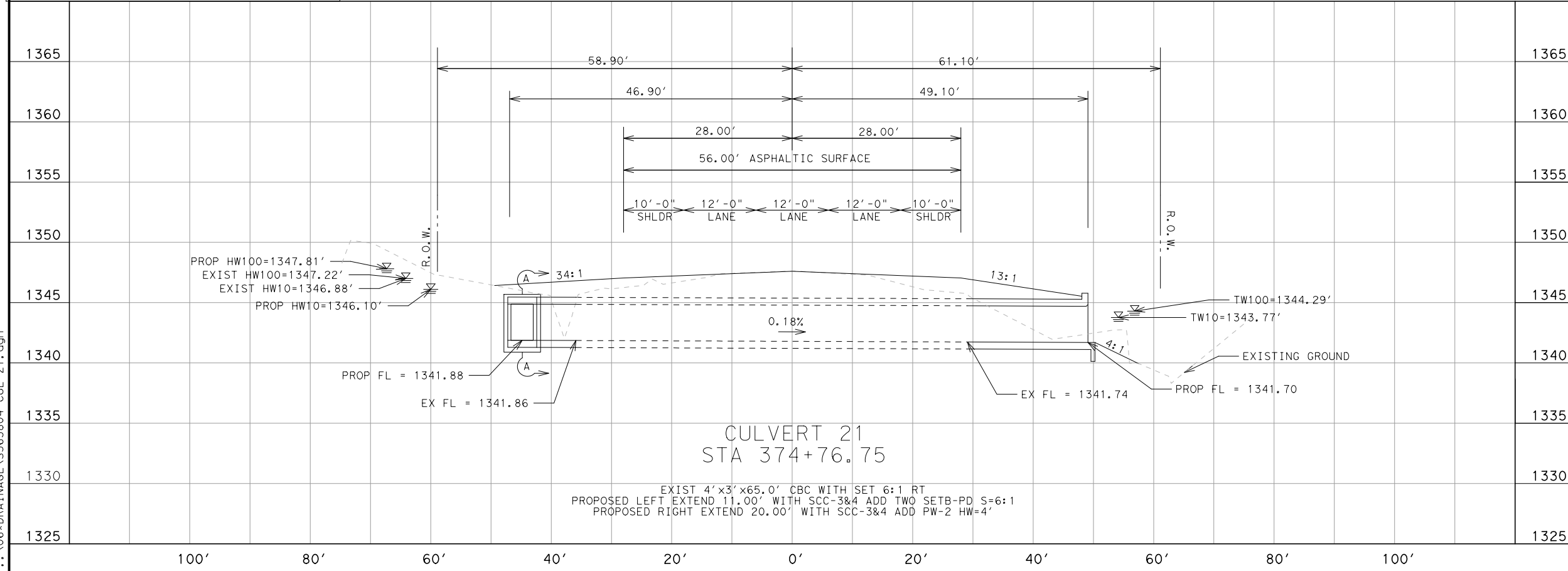
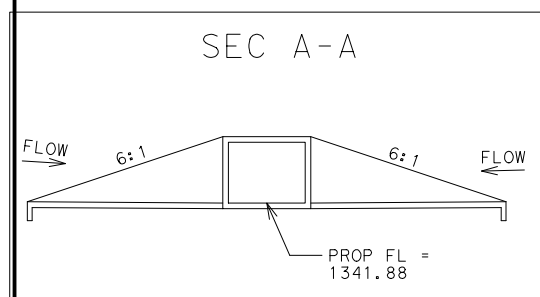
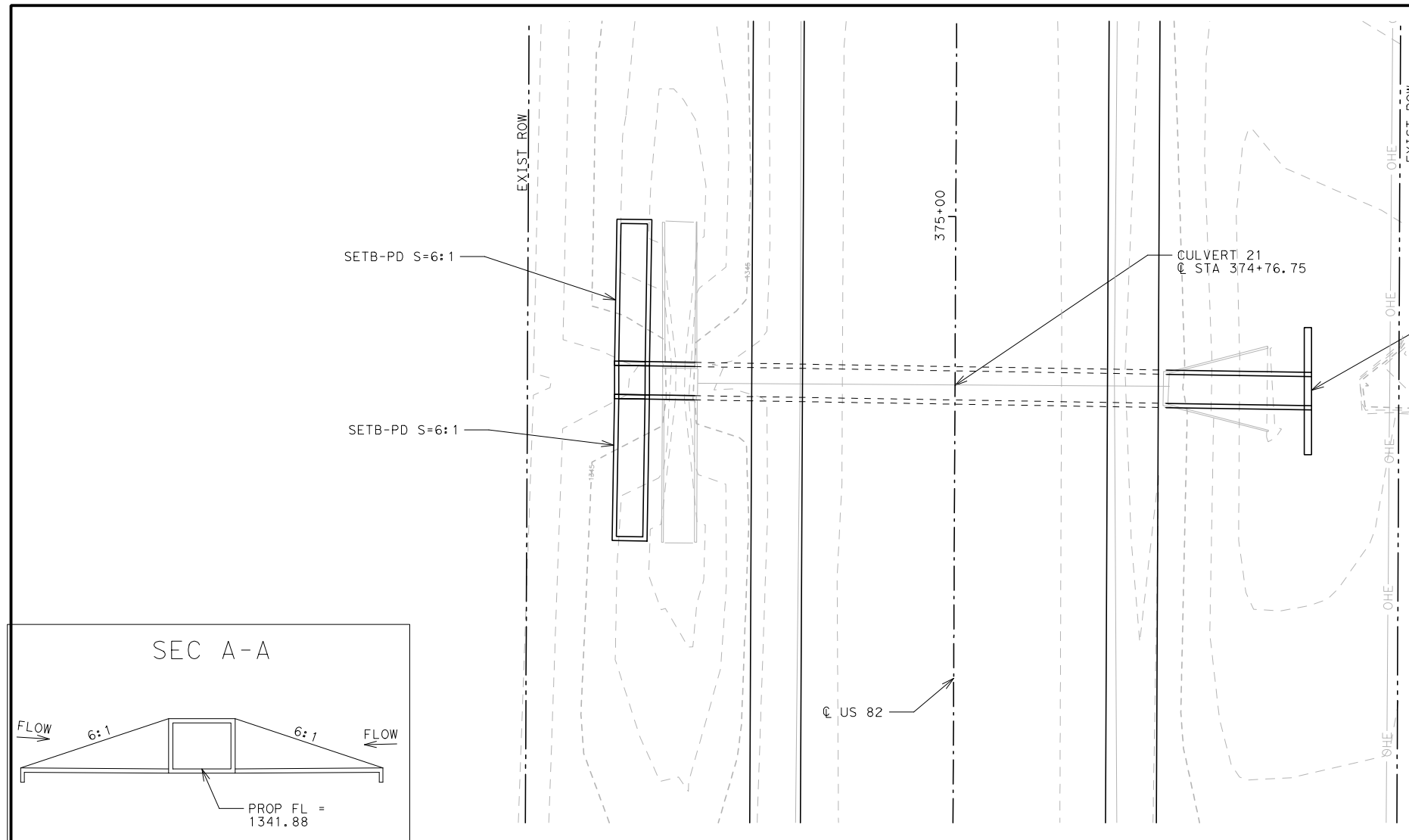
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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6048	CONC BOX CULV (4 FT X 3 FT)(EXTEND)	LF	31
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	1
467-6142	SET (TY I)(S= 4 FT)(HW= 3 FT)(6:1) (P)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: GRADE TO DRAIN



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 21  
US 82  
STA 374+76.75**

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

SHEET 21 OF 32

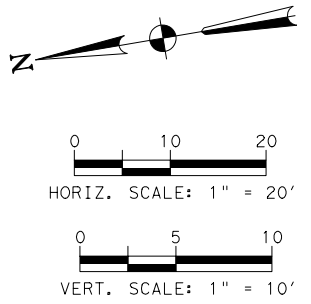
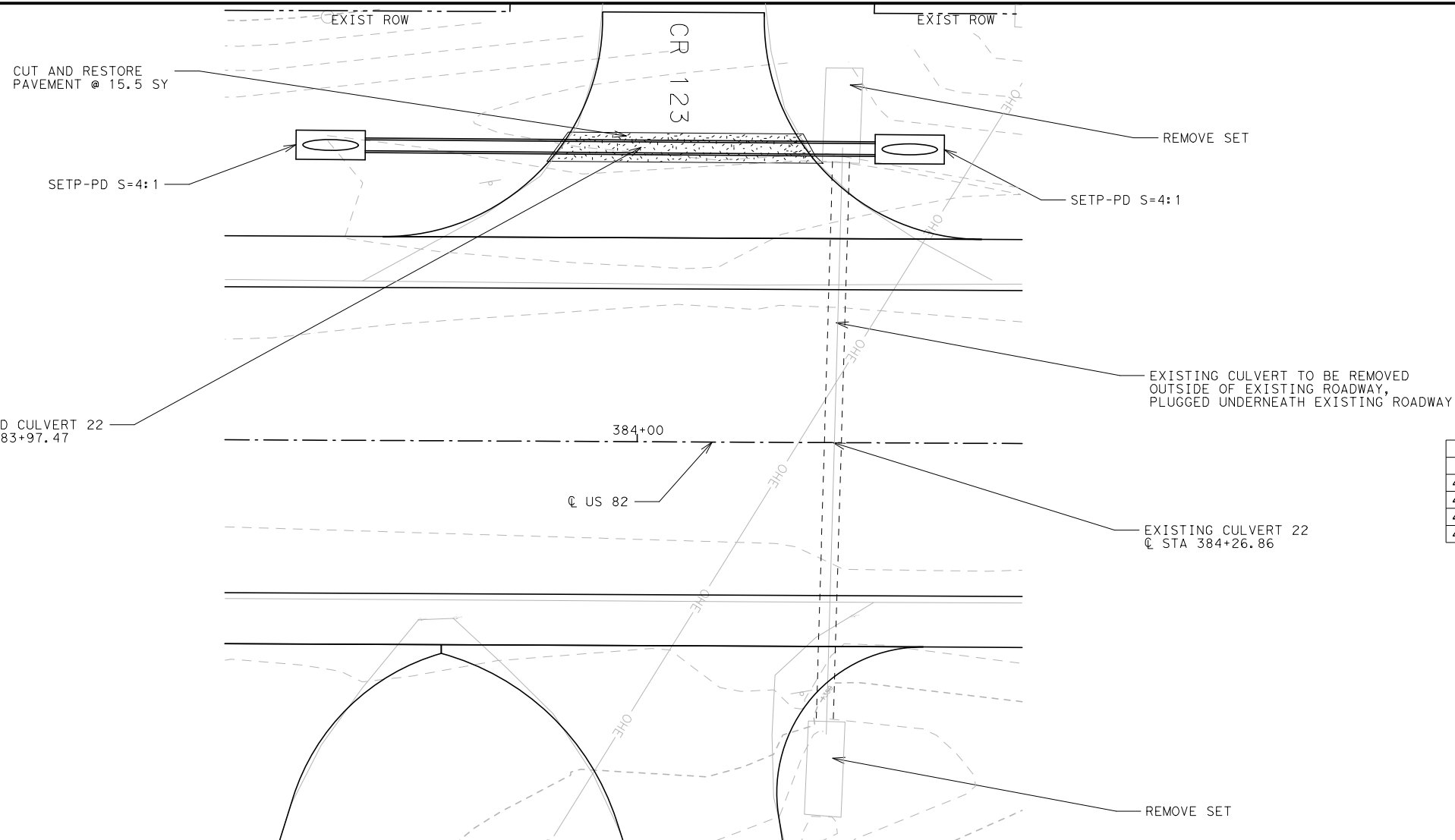


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 175	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

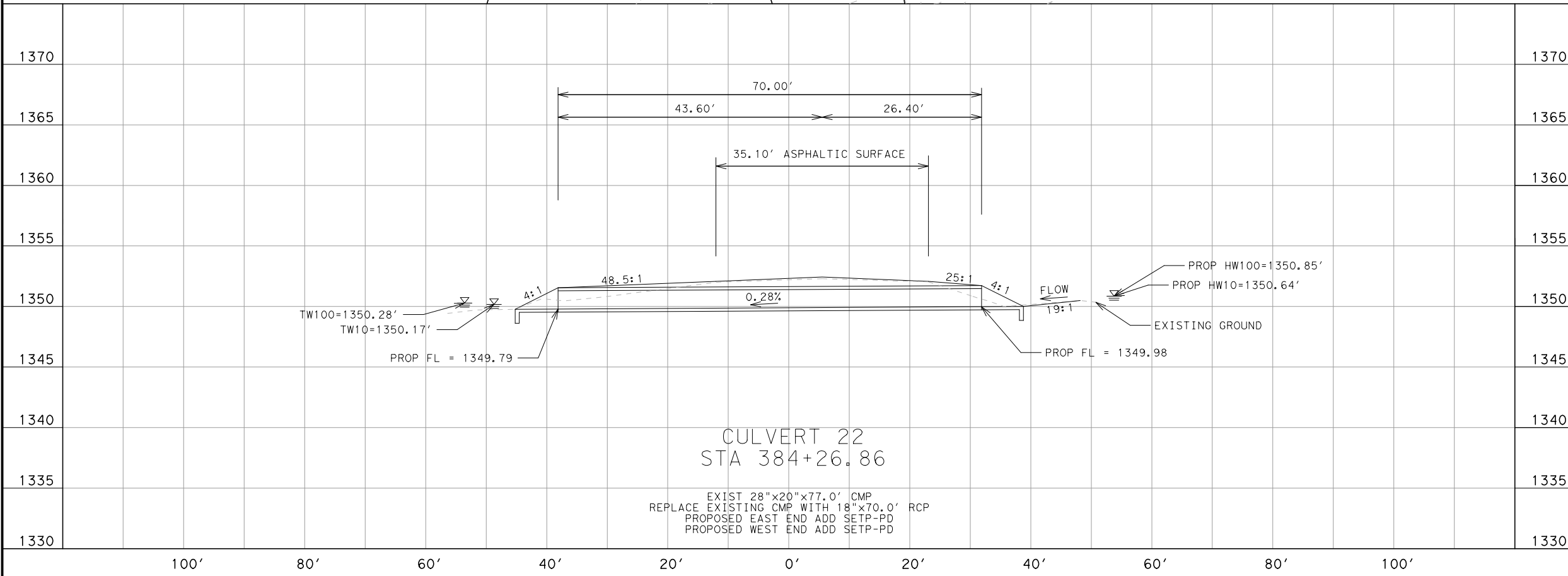
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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
464-6003	RC PIPE (CL III)(18 IN)	LF	70
467-6359	SET (TY II) (18 IN) (RCP) (4:1) (P)	EA	2
496-6007	REMOV STR (PIPE)	LF	8
496-6004	REMOV STR (SET)	EA	2

NOTE: SEE CUT AND RESTORE DETAILS



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 22  
US 82  
STA 384+26.86**

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

SHEET 22 OF 32



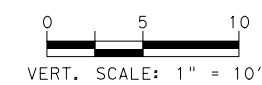
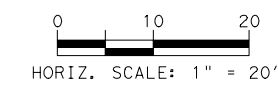
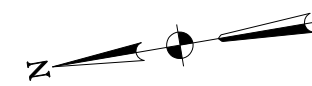
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 176	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

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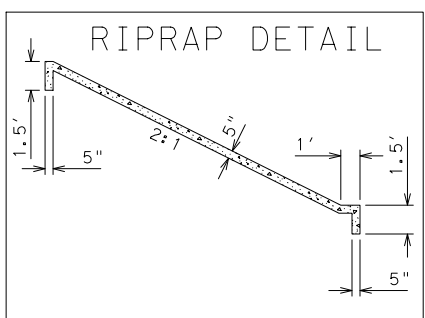
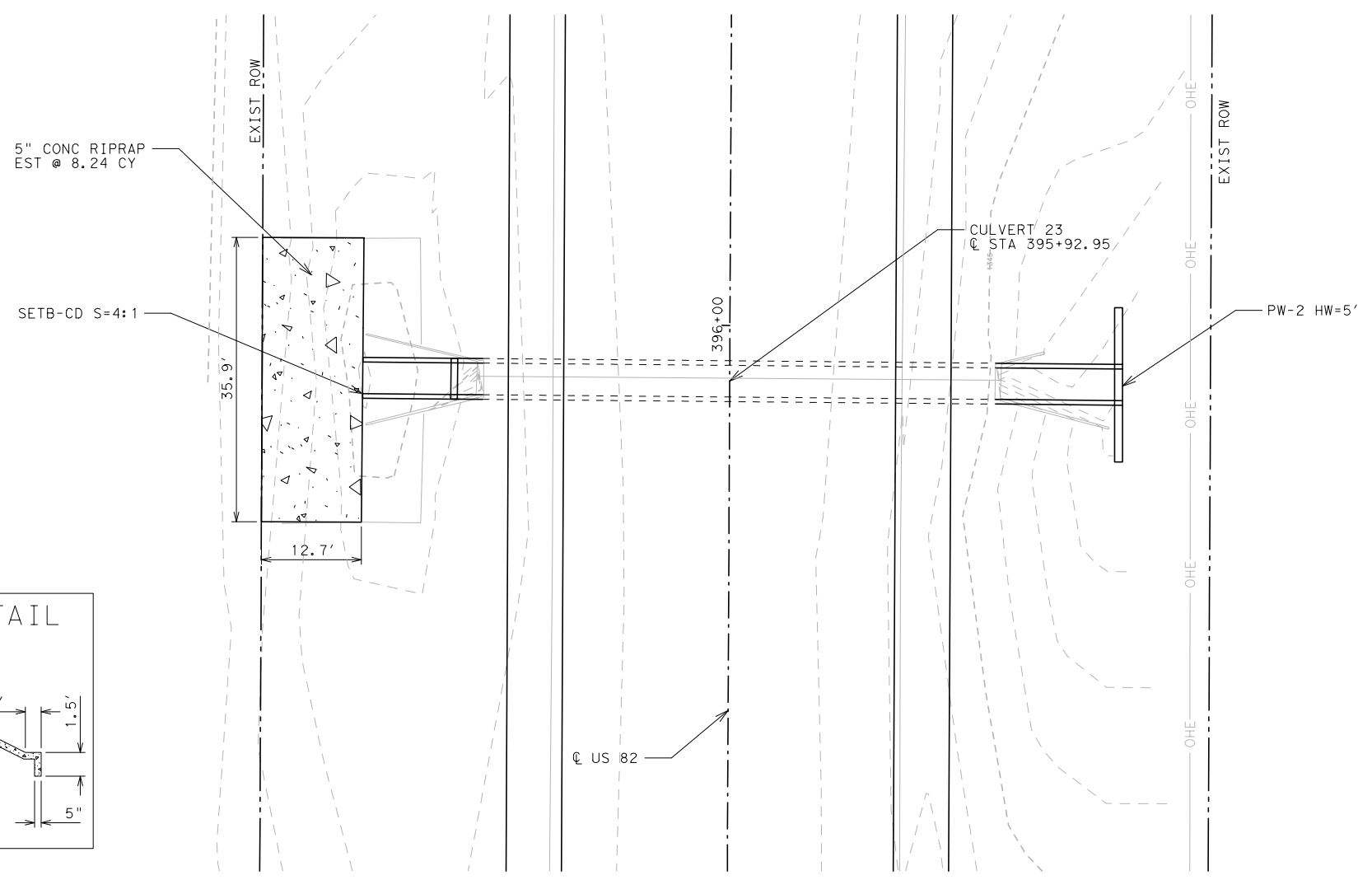




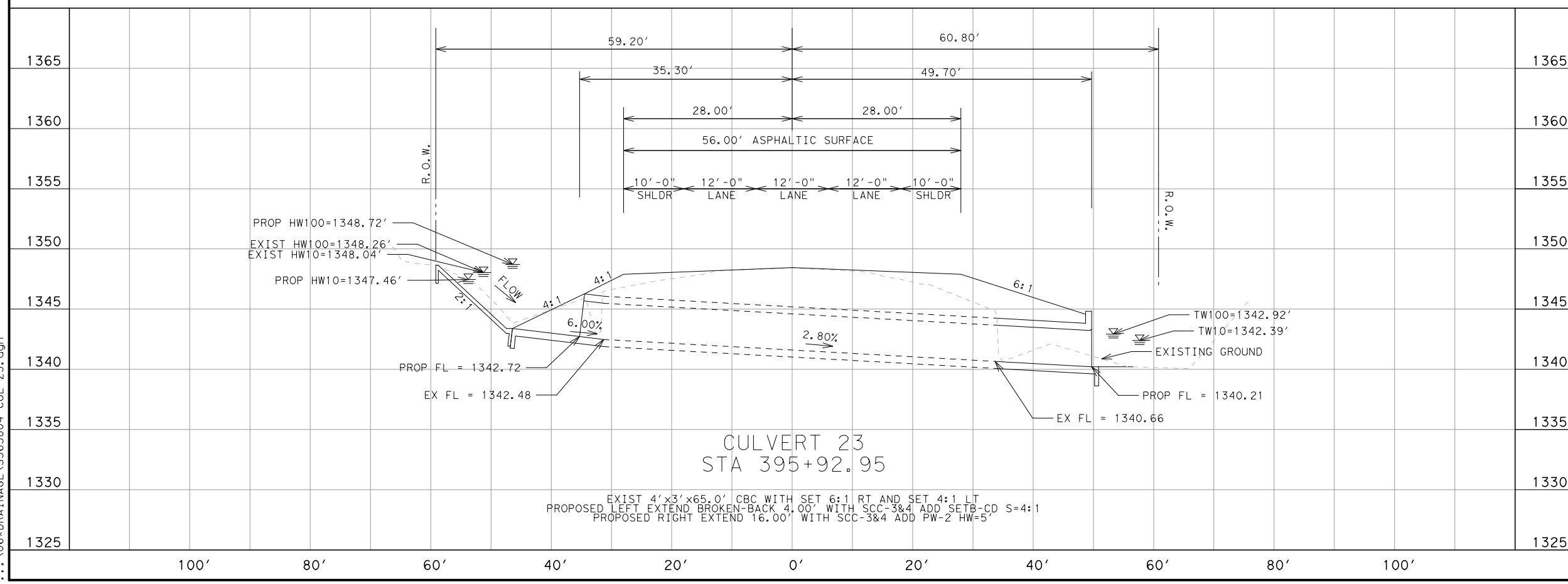
CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	8.24
462-6048	CONC BOX CULV (4 FT X 3 FT)(EXTEND)	LF	20
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	1
467-6144	SET (TY I)(S= 4 FT)(HW= 4 FT)(4:1) (C)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON



12/14/2020 5:01:13 PM ... \06\*\DRAINAGE\5563804-CUL-23.dgn



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 23  
US 82  
STA 395+92.95**

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

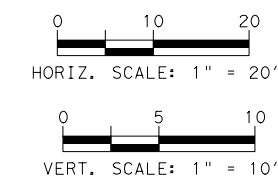
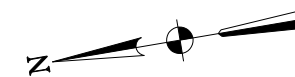
SHEET 23 OF 32



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

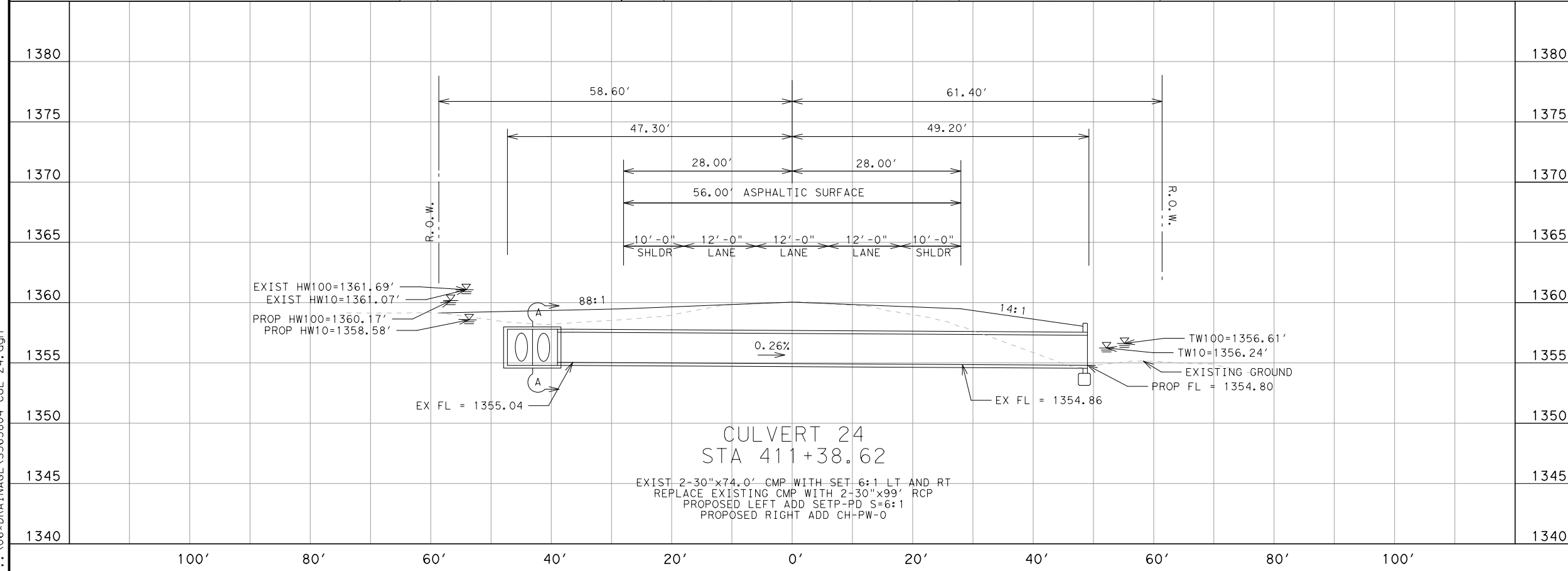
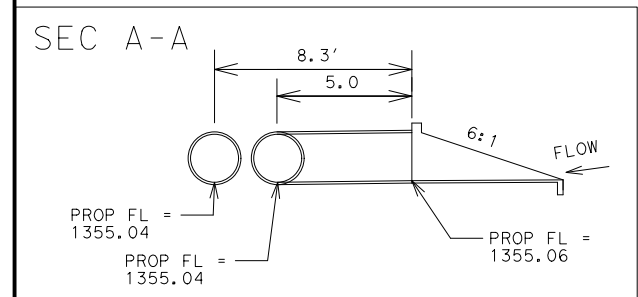
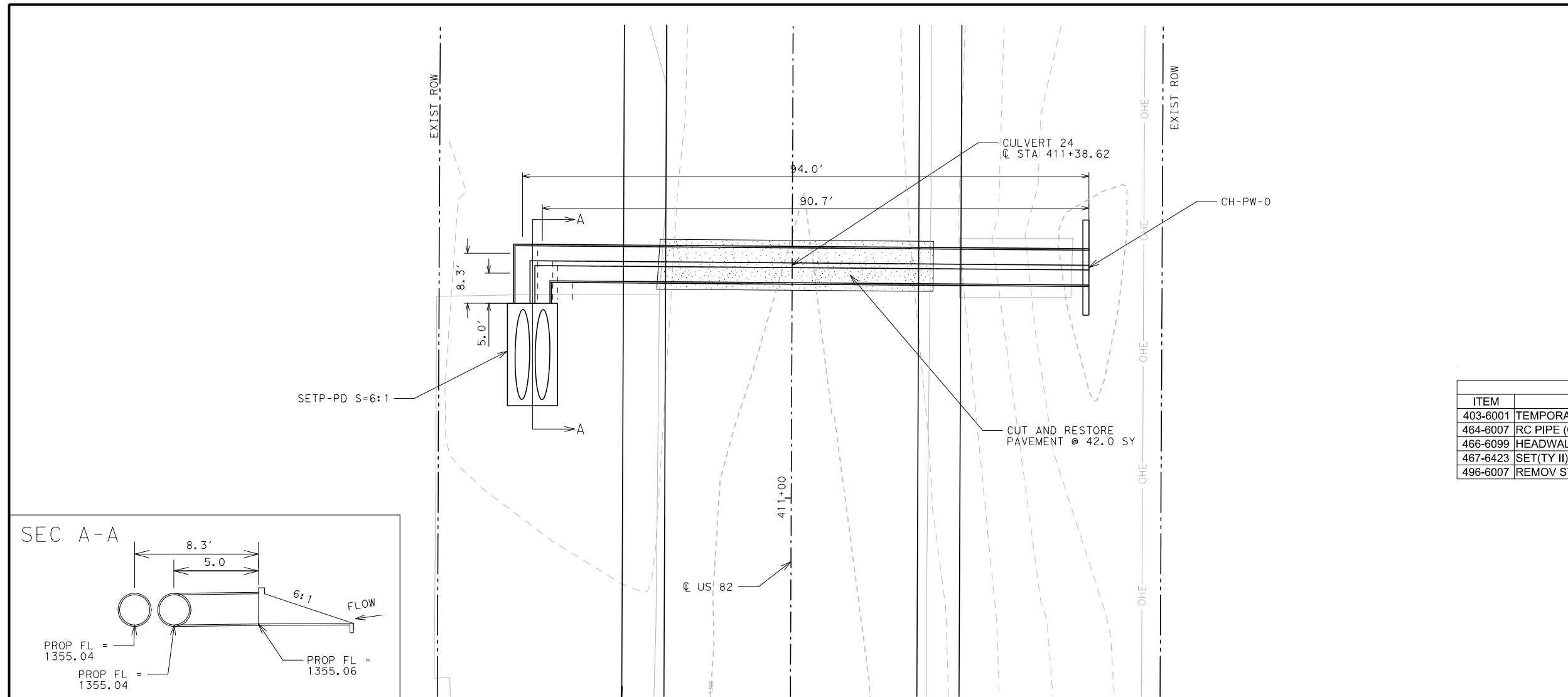
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 177
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
403-6001	TEMPORARY SPL SHORING	SF	600
464-6007	RC PIPE (CL III)(30 IN)	LF	198
466-6099	HEADWALL (CH - PW - 0) (DIA= 30 IN)	EA	1
467-6423	SET(TY II)(30 IN)(RCP)(6:1)(P)	EA	2
496-6007	REMOV STR (PIPE)	LF	148

- NOTES:  
 1. GRADE TO DRAIN  
 2. SEE CUT AND RESTORE DETAILS



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
 CULVERT 24  
 US 82  
 STA 411+38.62**

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

SHEET 24 OF 32

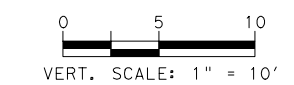
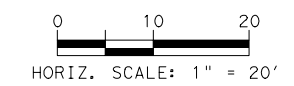
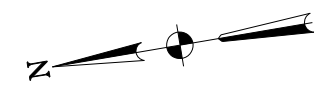


**HUITT-ZOLLARS**

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 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 178	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

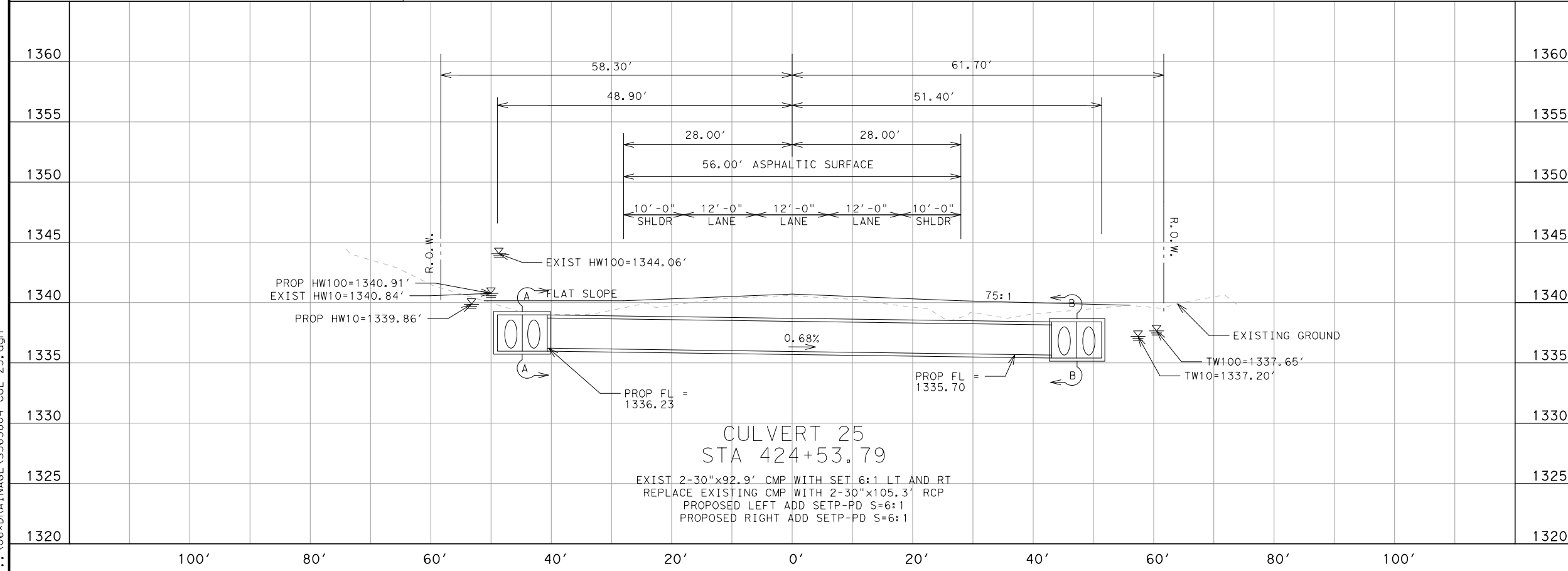
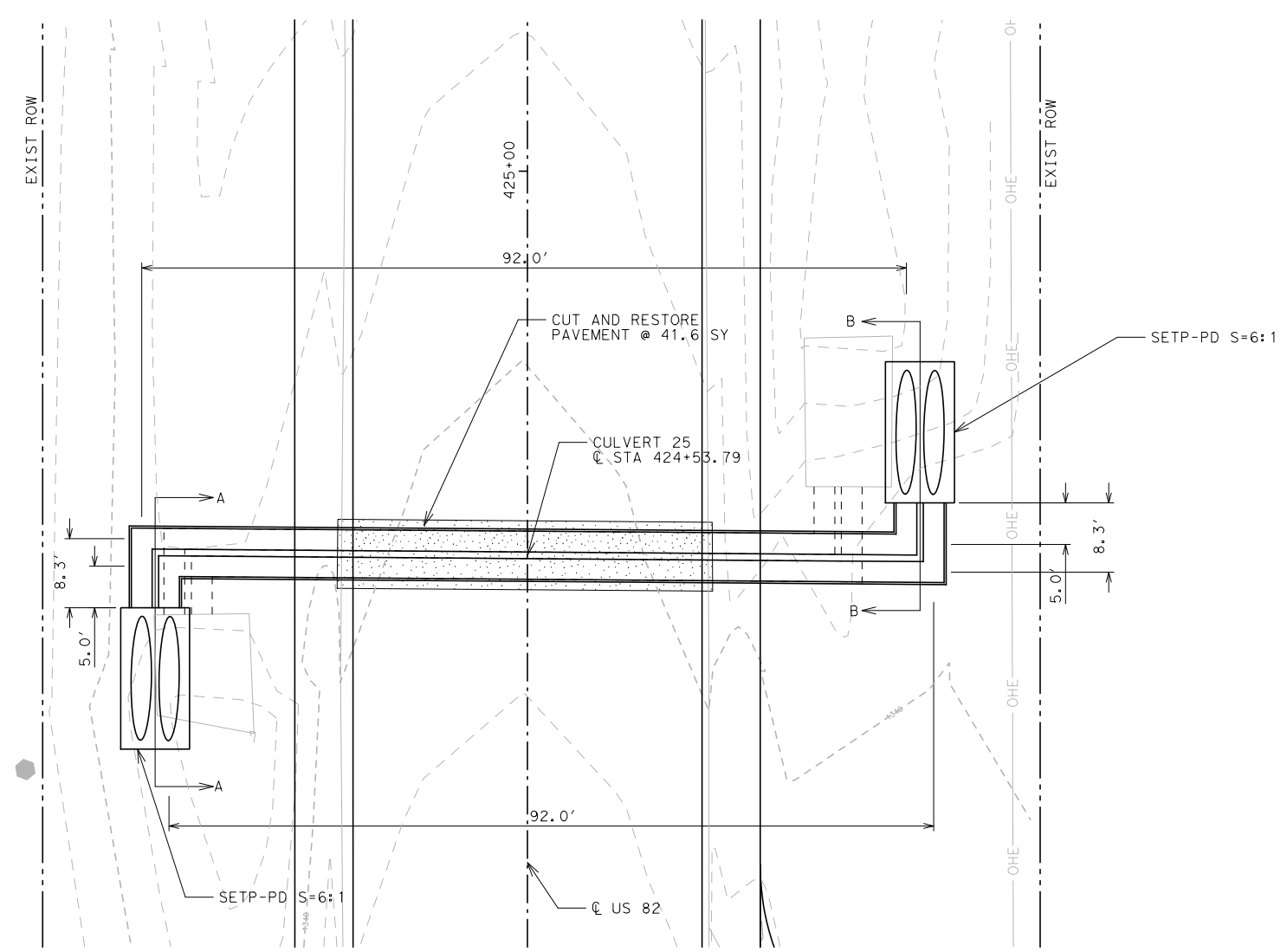
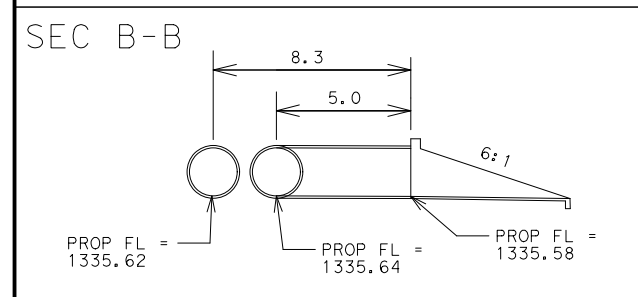
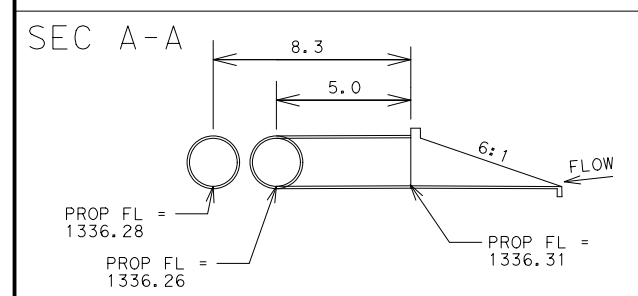
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CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
464-6007	RC PIPE (CL III)(30 IN)	LF	210.6
467-6423	SET(TY II)(30 IN)(RCP)(6:1)(P)	EA	4
496-6007	REMOV STR (PIPE)	LF	186

NOTES:  
 1. GRADE TO DRAIN  
 2. SEE CUT AND RESTORE DETAILS



**CULVERT 25**  
**STA 424+53.79**  
 EXIST 2-30"x92.9' CMP WITH SET 6:1 LT AND RT  
 REPLACE EXISTING CMP WITH 2-30"x105.3' RCP  
 PROPOSED LEFT ADD SETP-PD S=6:1  
 PROPOSED RIGHT ADD SETP-PD S=6:1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 25**  
**US 82**  
**STA 424+53.79**

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

SHEET 25 OF 32

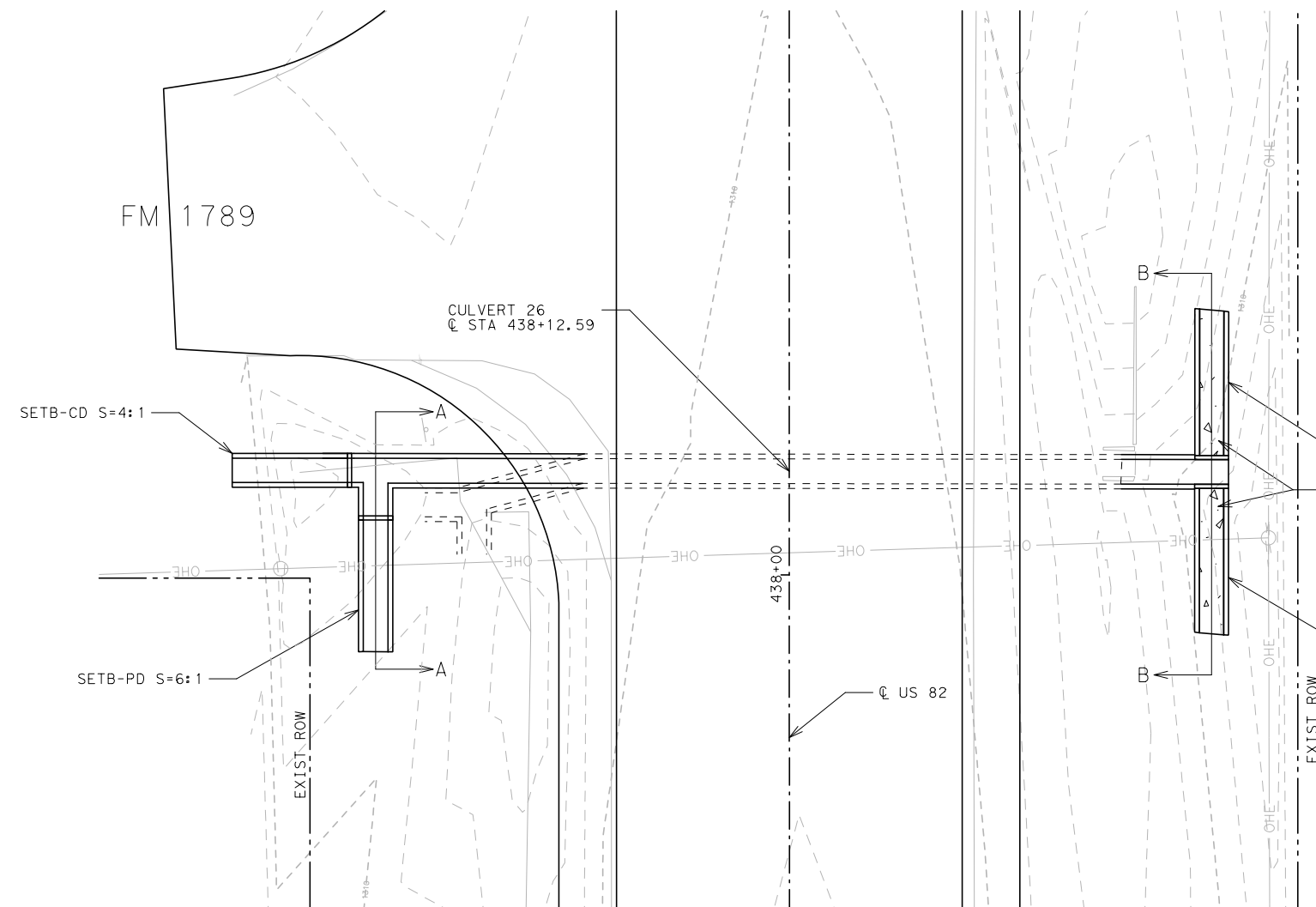


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 FIRM NO. F-761

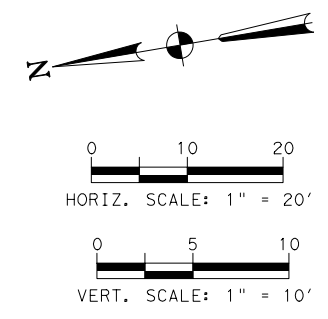
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 179	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

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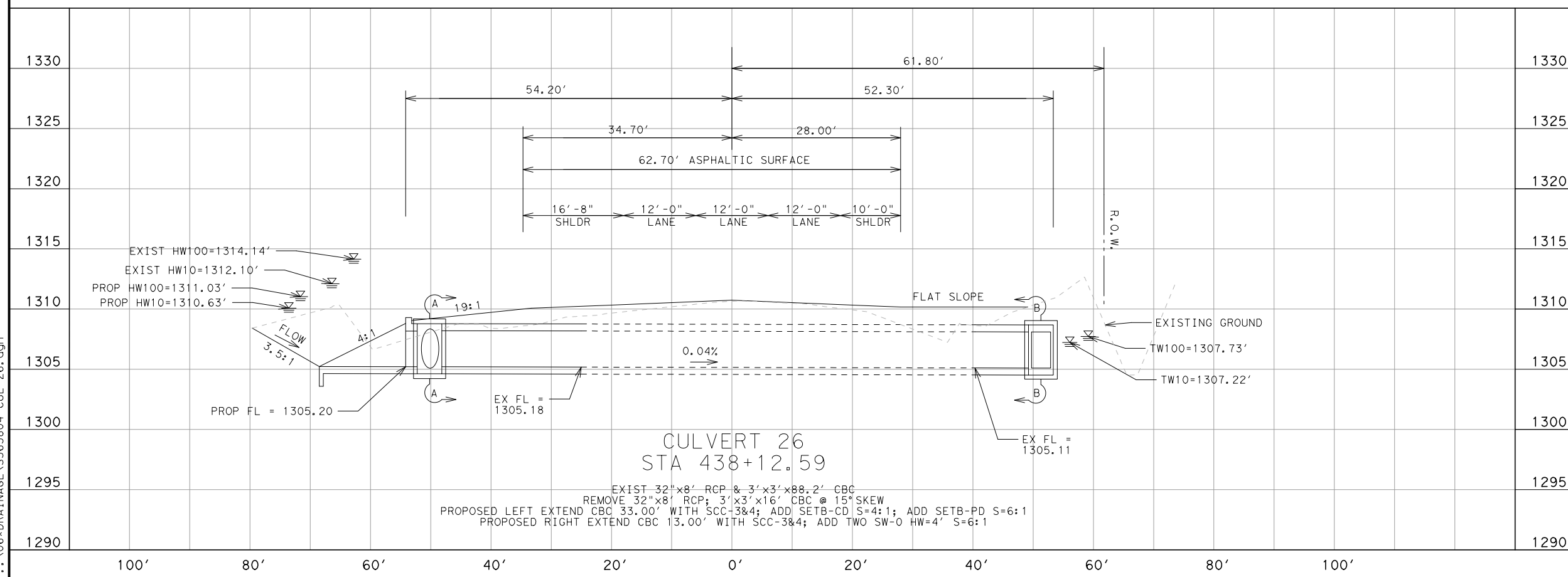
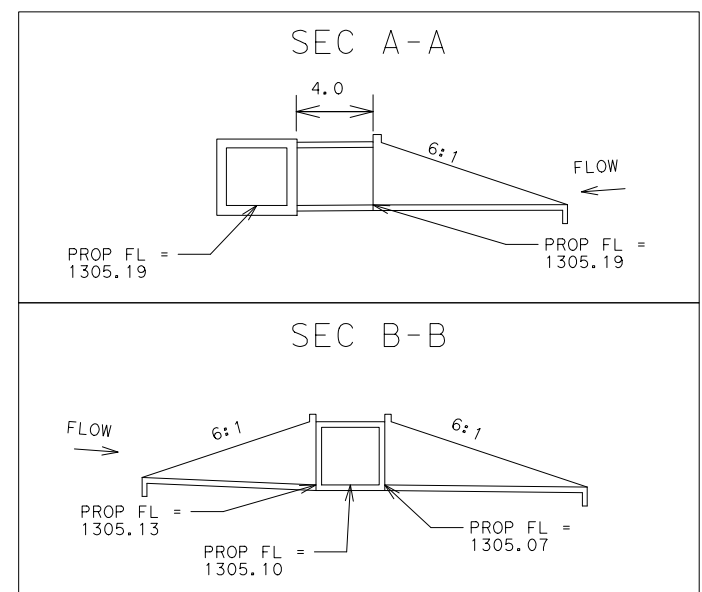


ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	1.60
462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	46
466-6207	WINGWALL (SW - 0) (HW=4 FT)	EA	2
467-6112	SET (TY I)(S=3 FT)(HW= 4 FT)(4:1)(C)	EA	1
467-6116	SET (TY I)(S=3 FT)(HW= 4 FT)(6:1)(P)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1
496-6007	REMOV STR (PIPE)	LF	8
496-6008	REMOV STR (BOX CULVERT)	LF	16

NOTES: RIPRAP SW-0 CULVERT APRONS  
GRADE TO DRAIN



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 26**  
**US 82**  
**STA 438+12.59**

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

SHEET 26 OF 32

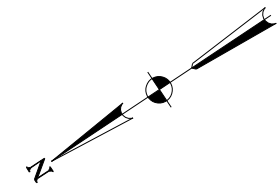
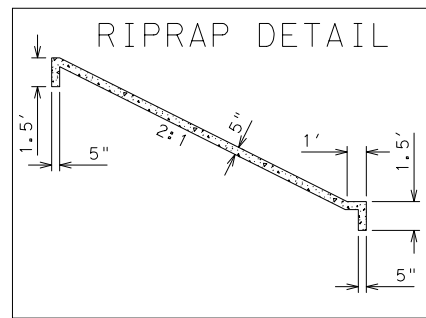


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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 180
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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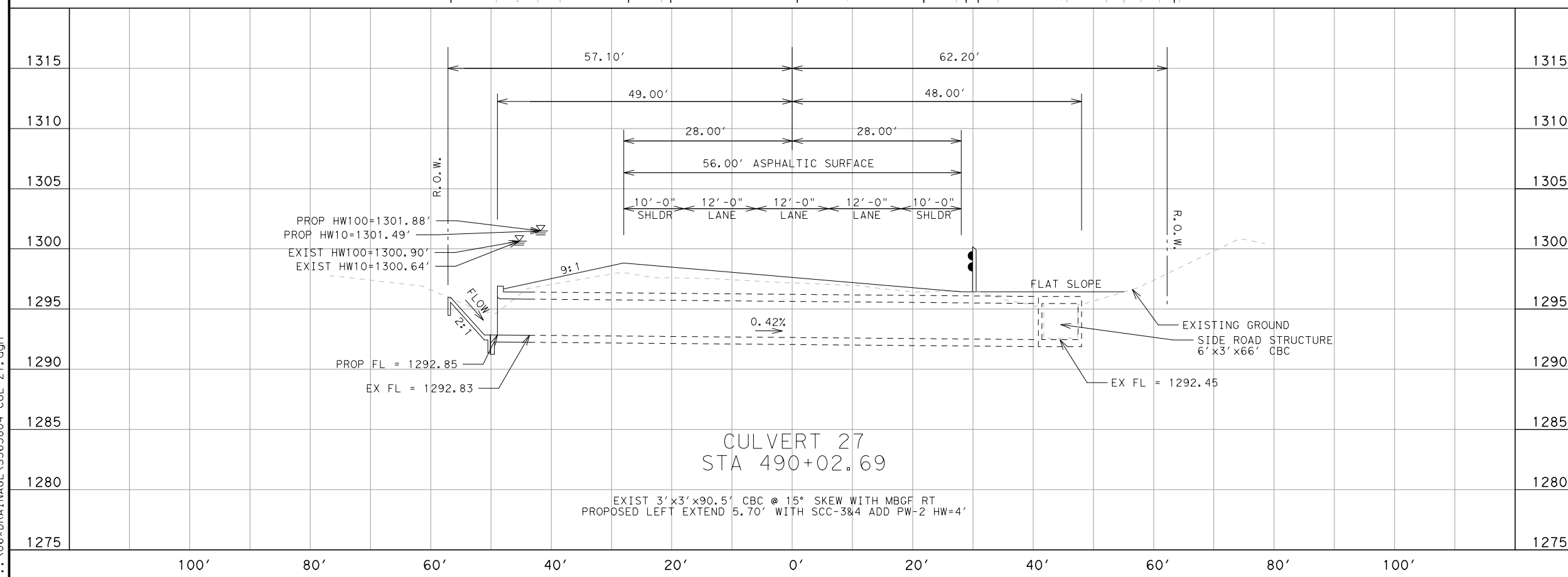
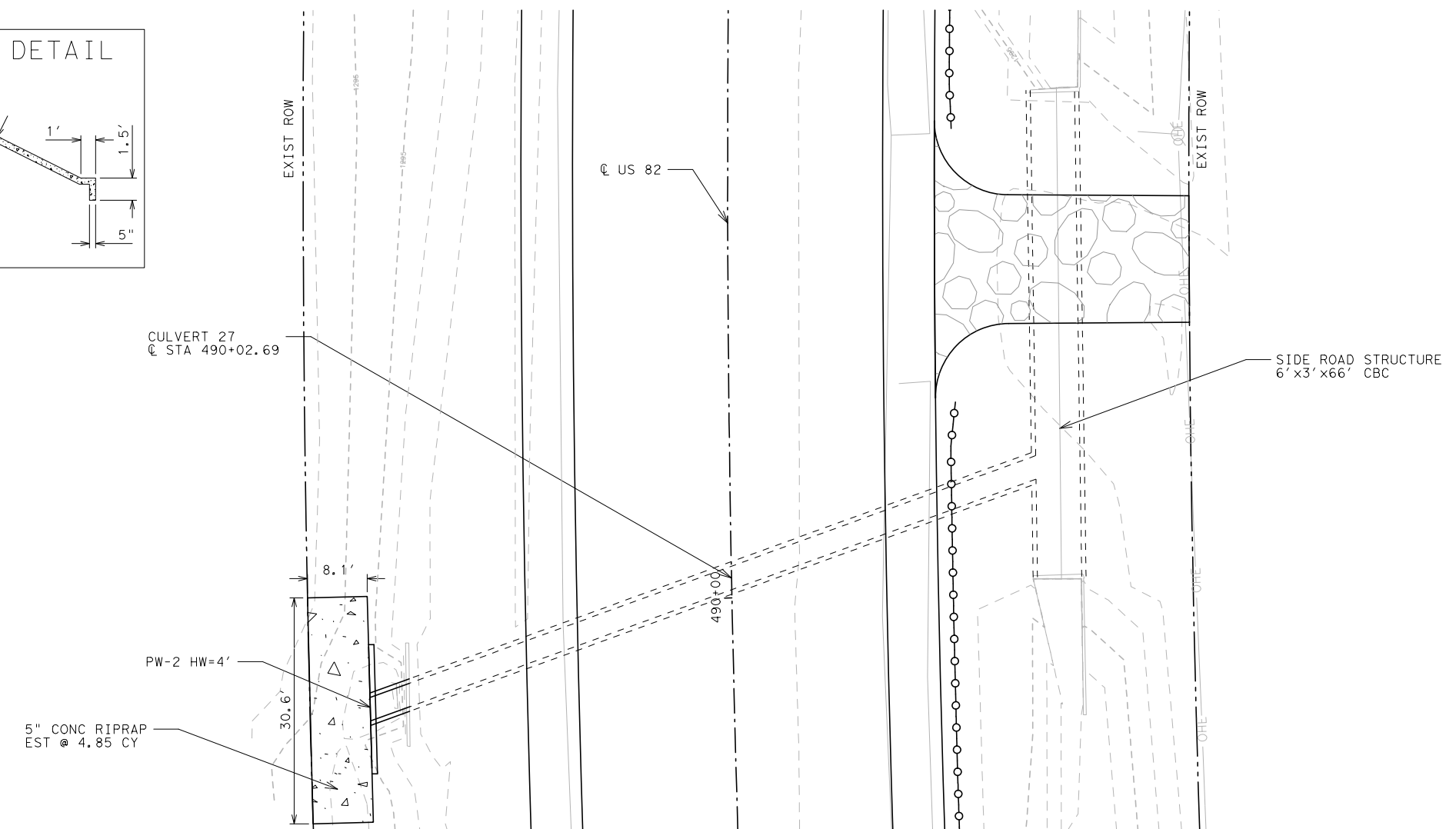
0 10 20  
HORIZ. SCALE: 1" = 20'

0 5 10  
VERT. SCALE: 1" = 10'

CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	4.85
462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	5.7
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 27  
US 82  
STA 490+02.69**

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

SHEET 27 OF 32



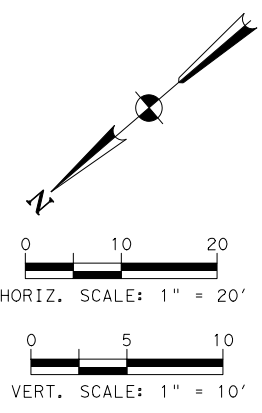
**HUITT-ZOLLARS**

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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 181	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

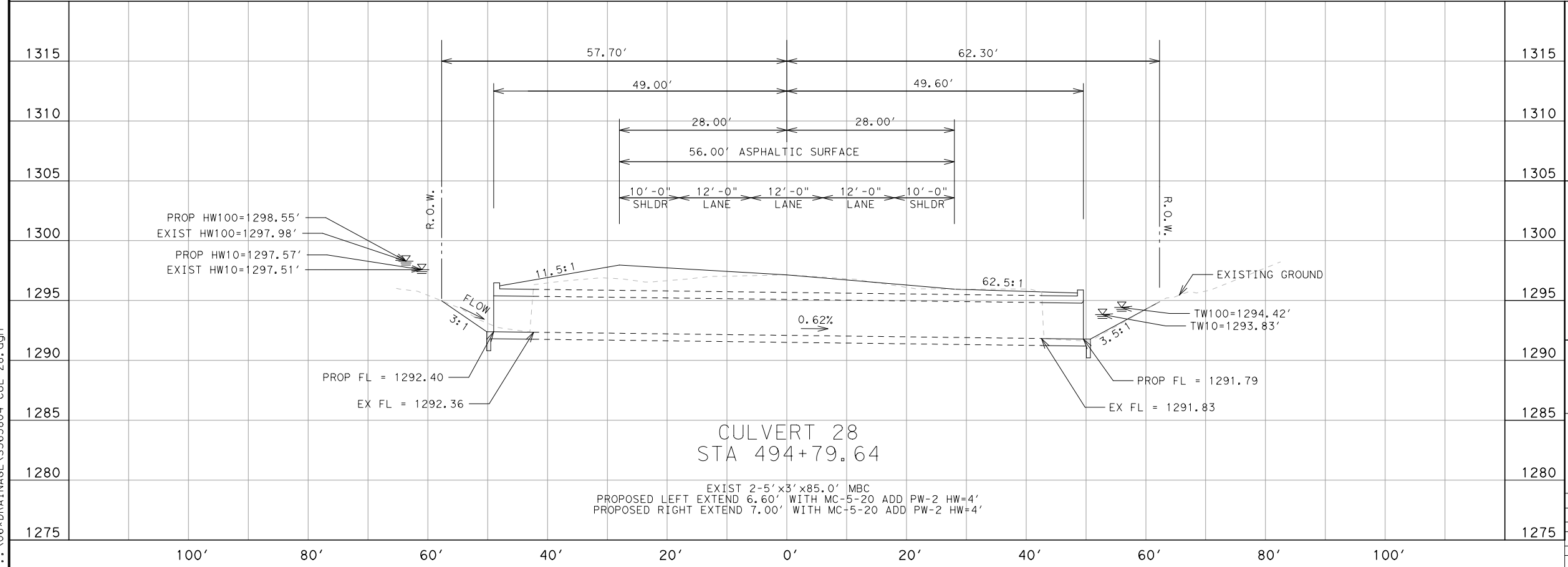
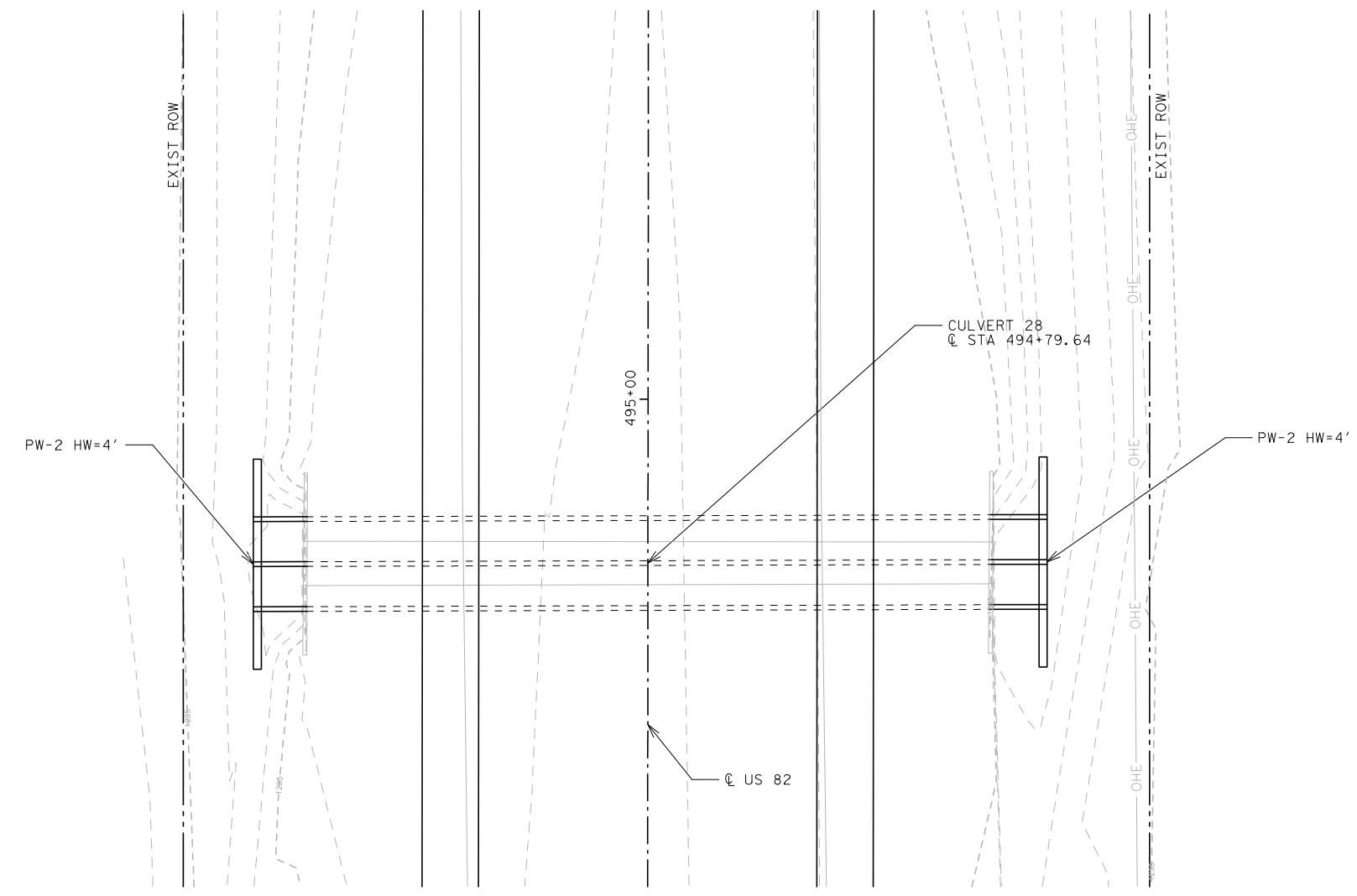
**CULVERT 27  
STA 490+02.69**  
EXIST 3'x3'x90.5' CBC @ 15° SKEW WITH MBGF RT  
PROPOSED LEFT EXTEND 5.70' WITH SCC-3&4 ADD PW-2 HW=4'

12/14/2020 5:01:22 PM  
... \06 \*DRAINAGE\5563804-CUL-27.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF	27.2
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 28  
US 82  
STA 494+79.64**

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

SHEET 28 OF 32

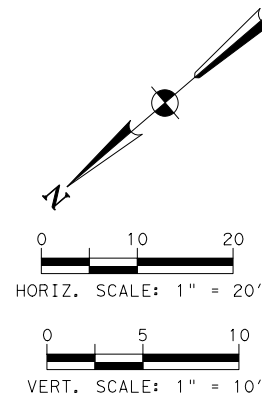
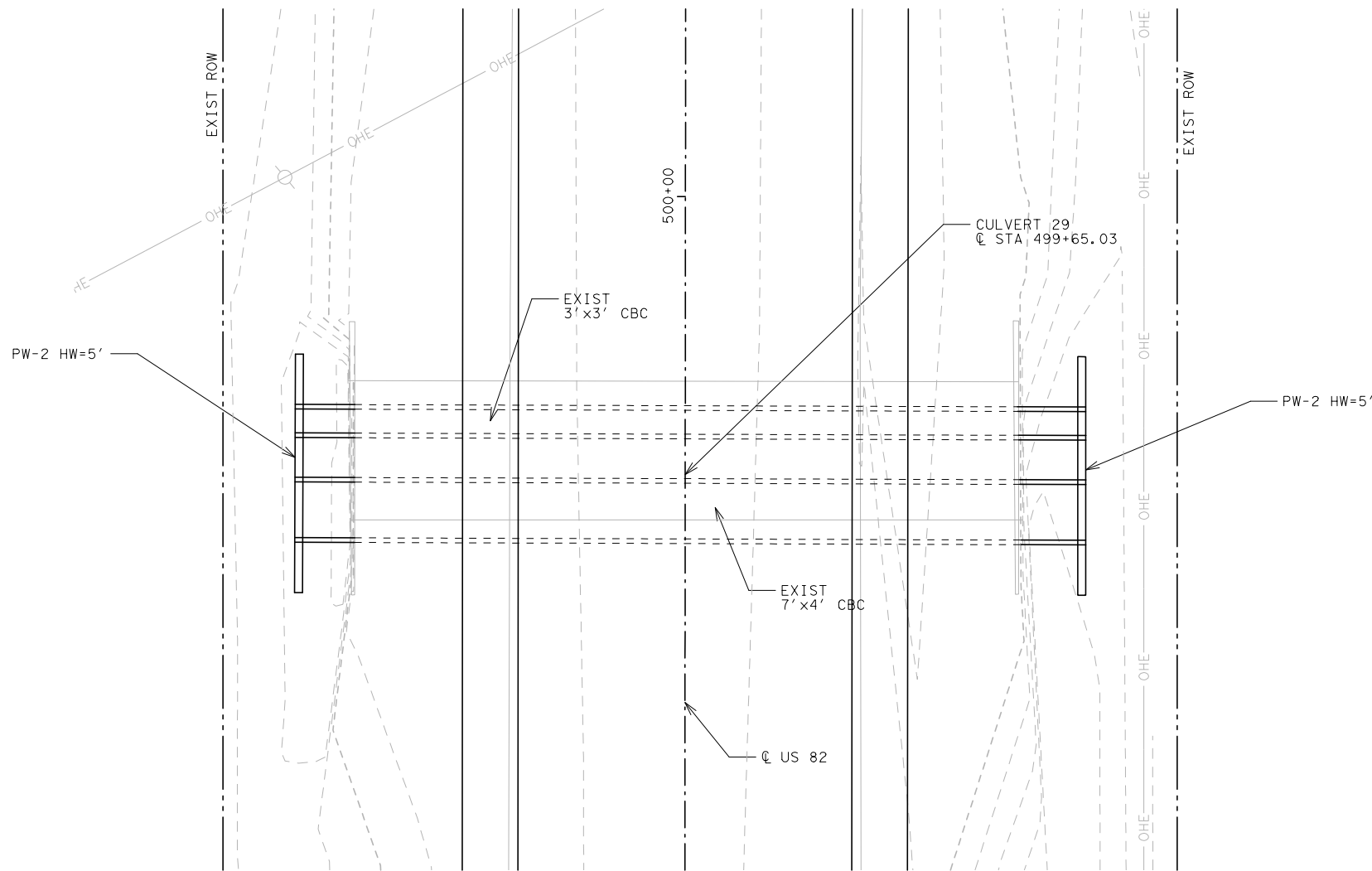


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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

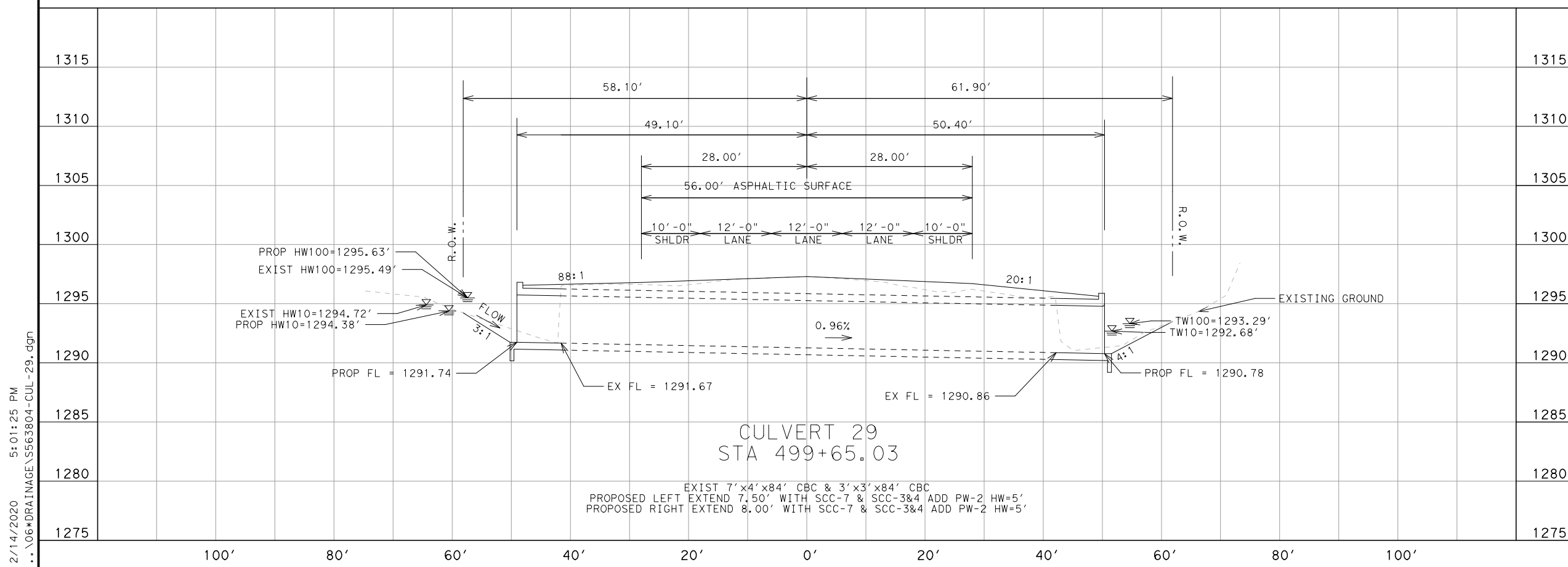
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82

12/14/2020 5:01:24 PM ... \06\\*DRAINAGE\5563804-CUL-28.dgn



CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	15.5
462-6059	CONC BOX CULV (7 FT X 4 FT)(EXTEND)	LF	15.5
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 29  
US 82  
STA 499+65.03**

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

SHEET 29 OF 32

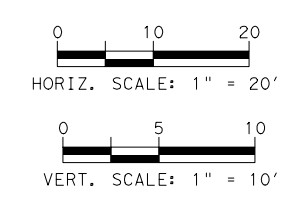
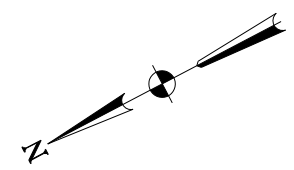


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 183
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

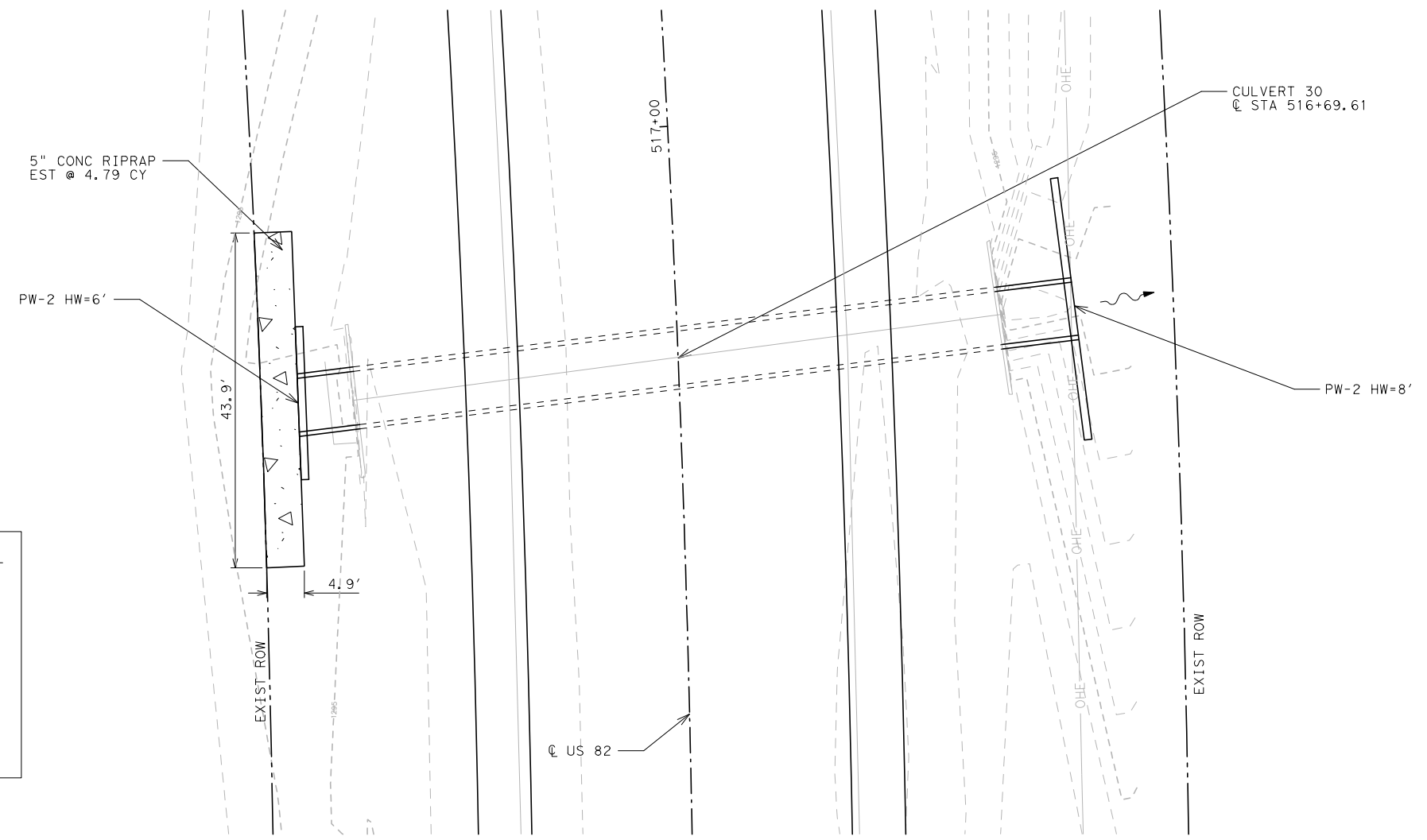
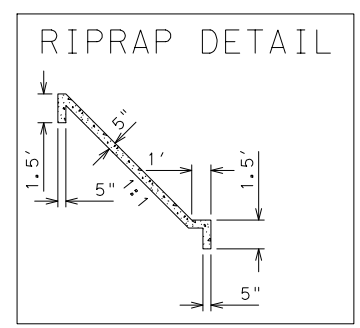
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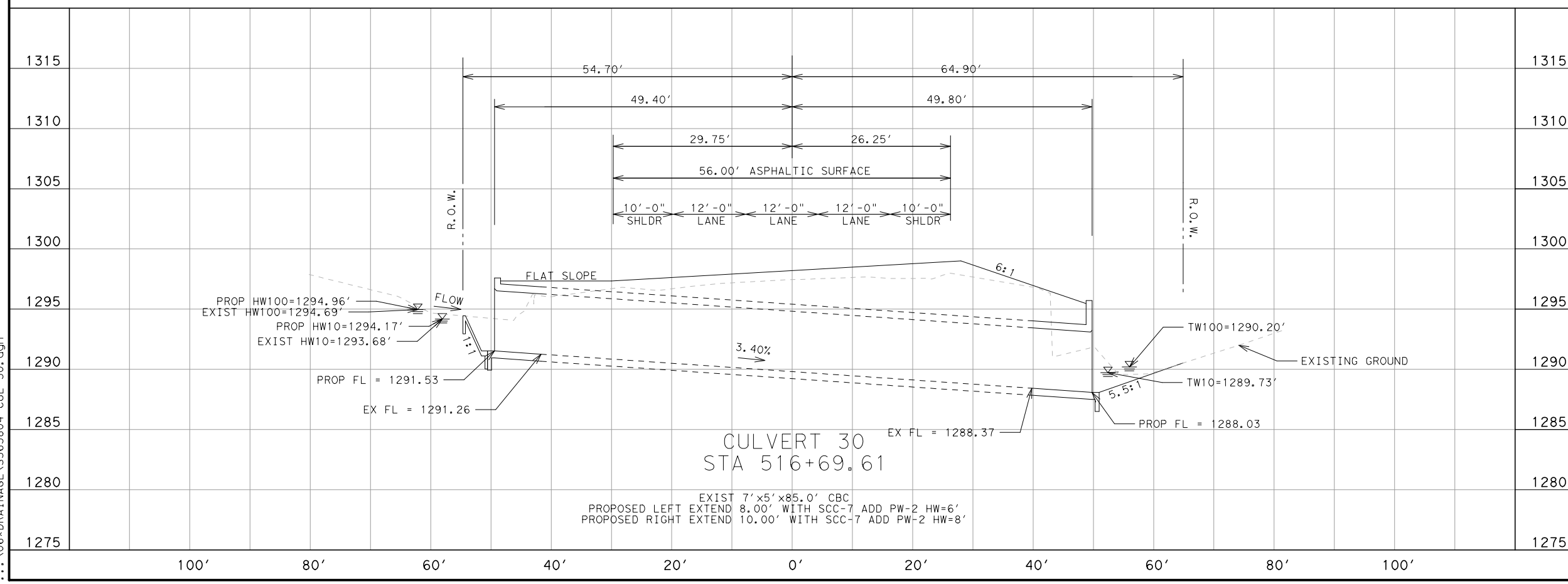
CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	4.79
462-6060	CONC BOX CULV (7 FT X 5 FT)(EXTEND)	LF	18
466-6195	WINGWALL (PW - 2) (HW=5 FT)	EA	1
466-6197	WINGWALL (PW - 2) (HW=8 FT)	EA	1
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON



12/14/2020 5:01:27 PM ... \06\DRAINAGE\5563804-CUL-30.dgn



**CULVERT LAYOUT**  
**CULVERT 30**  
**US 82**  
**STA 516+69.61**

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

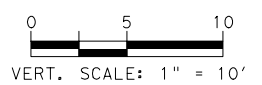
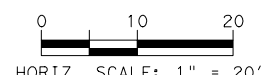
SHEET 30 OF 32



**HUITT-ZOLLARS**  
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 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 184
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

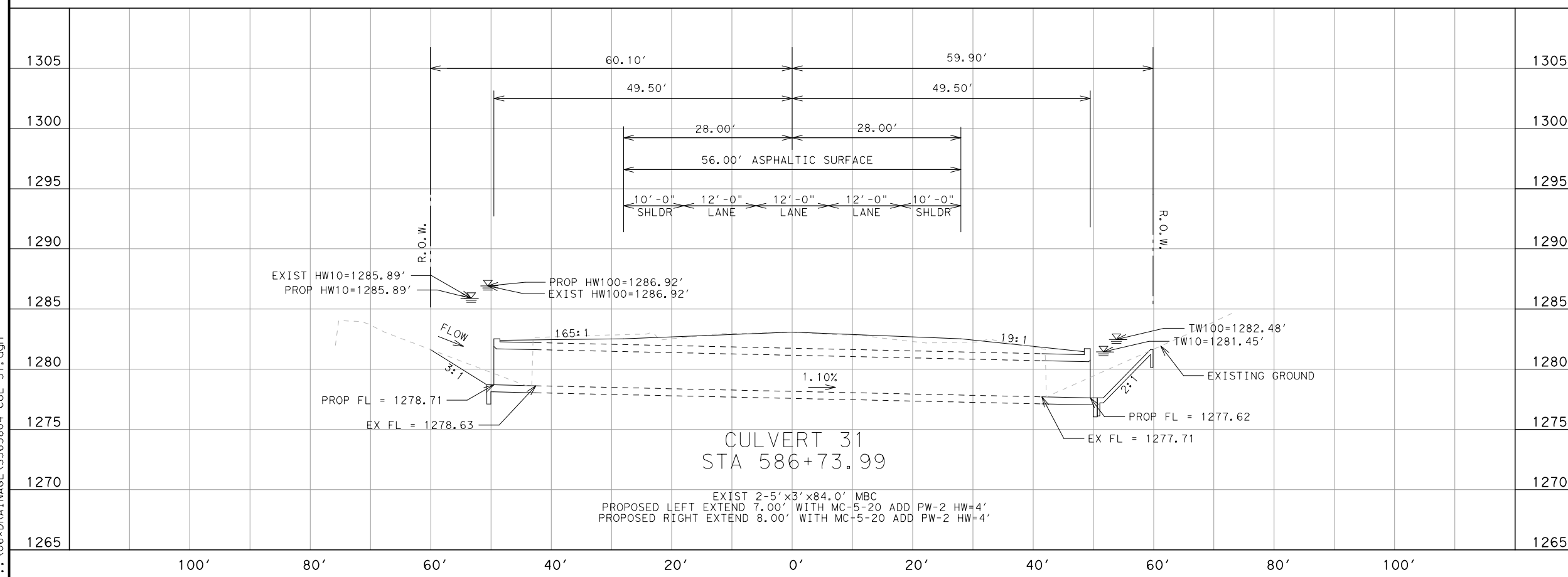
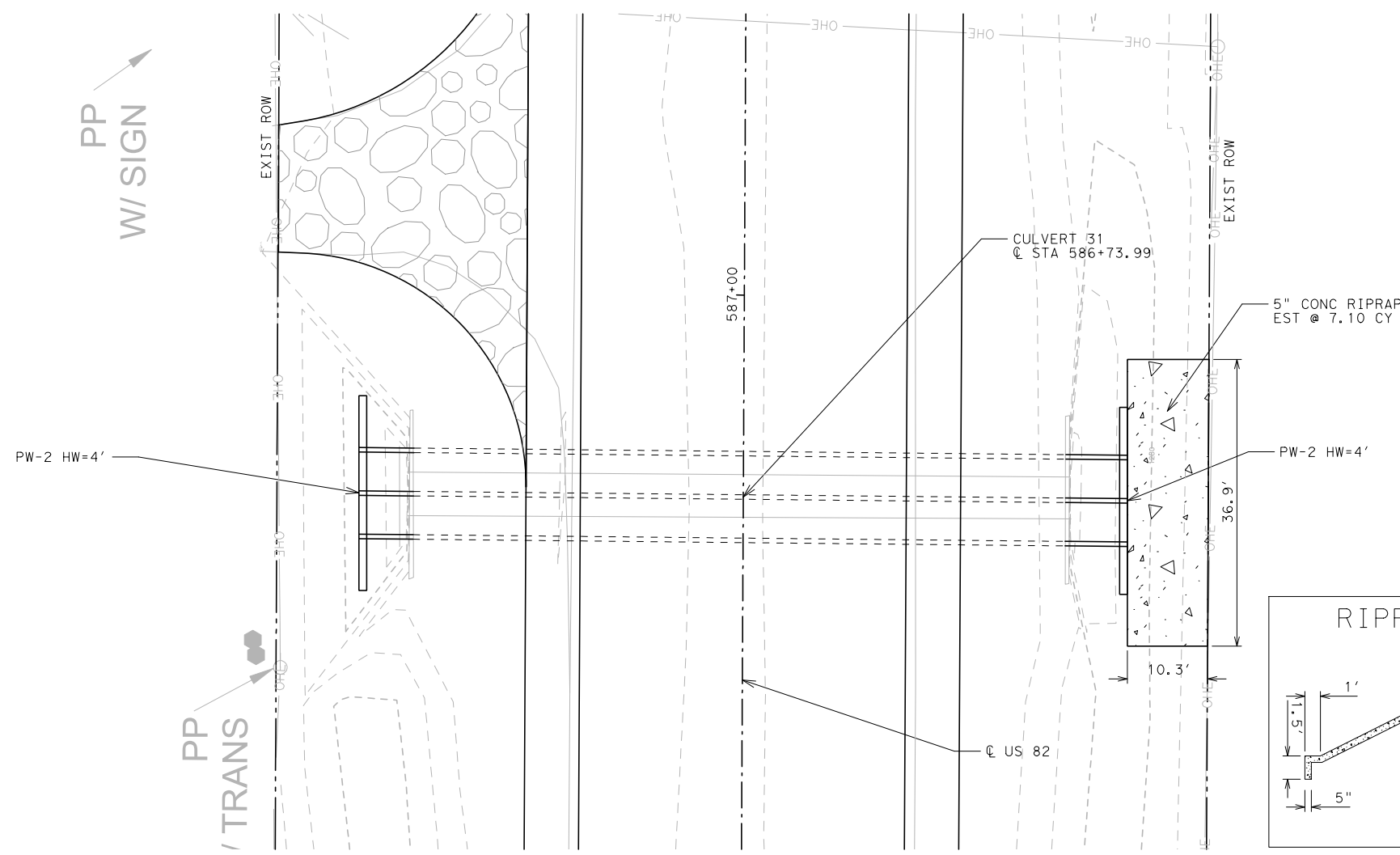
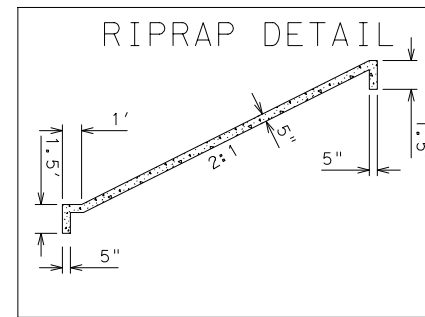




CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK ON CULVERT.

ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	7.10
462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF	30
466-6193	WINGWALL (PW - 2) (HW=4 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18\"/>



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT  
CULVERT 31  
US 82  
STA 586+73.99**

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

SHEET 31 OF 32

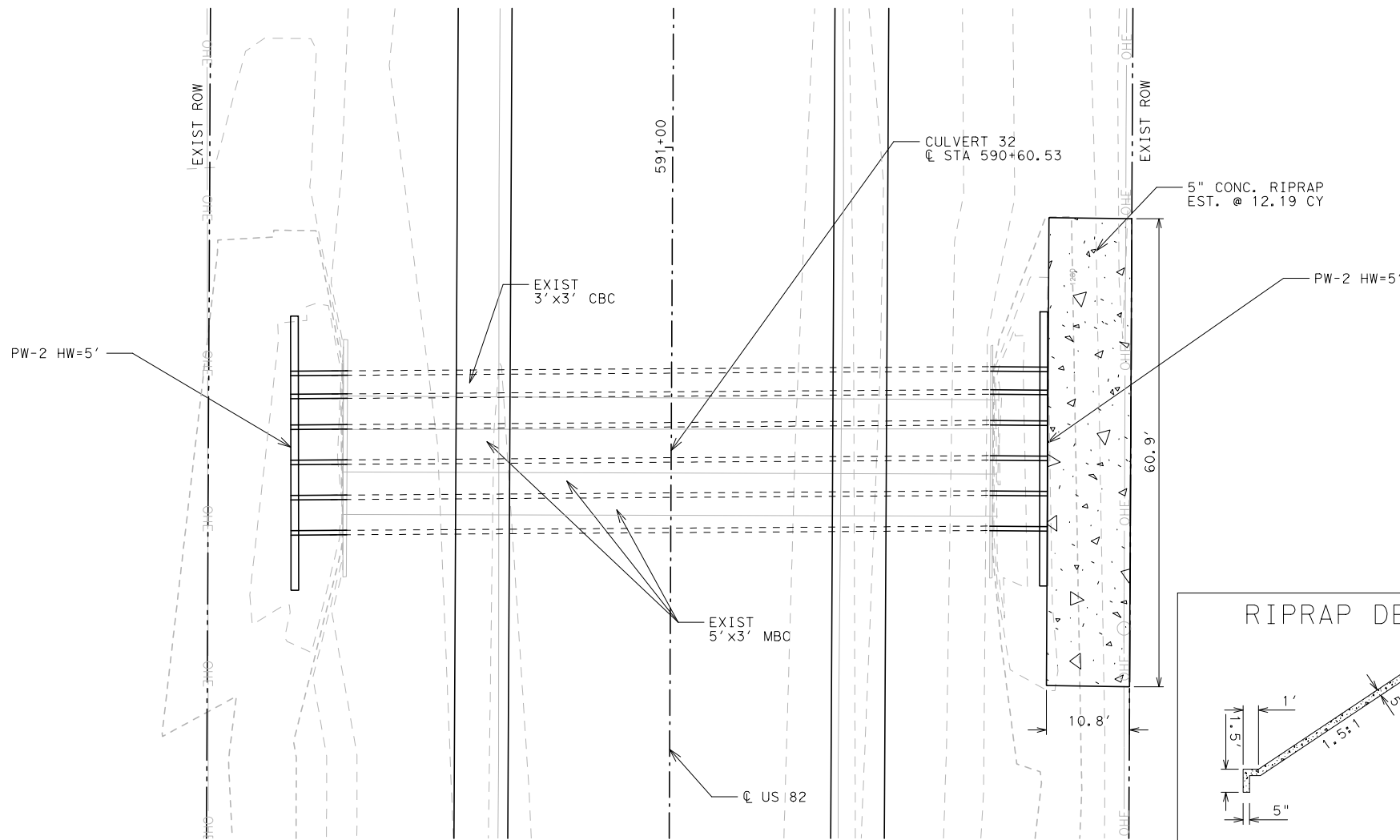
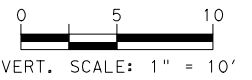
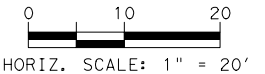


**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

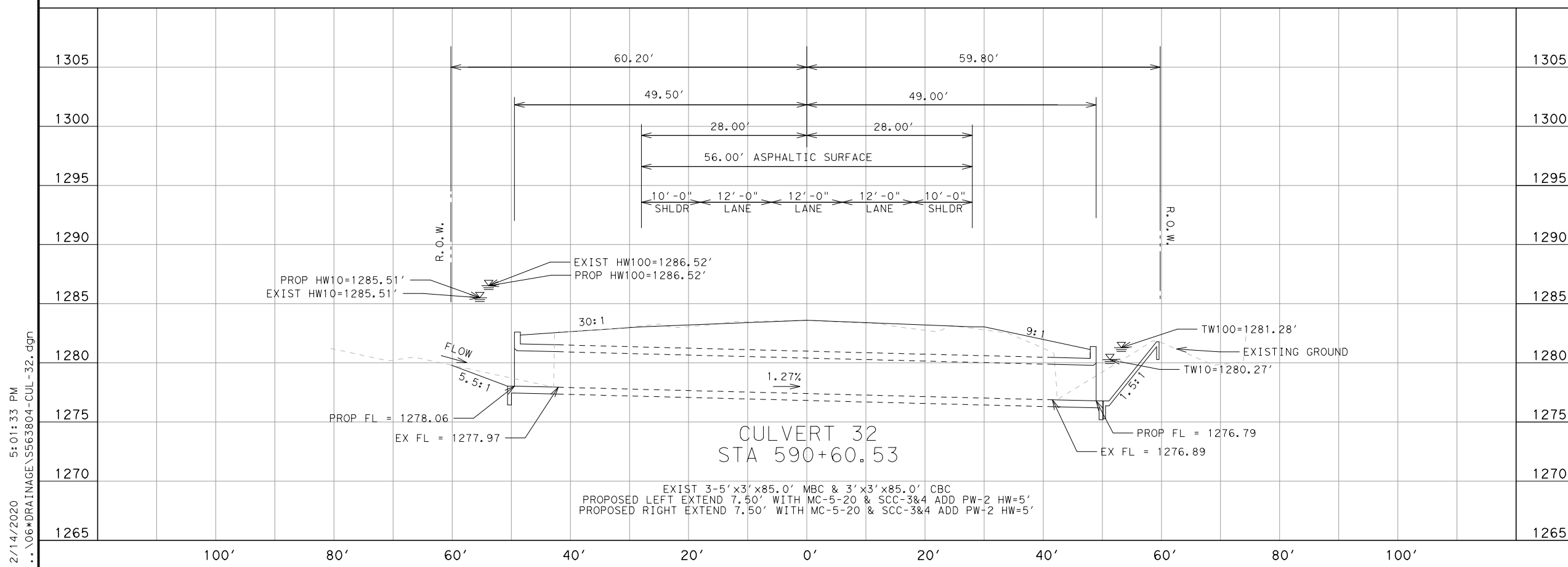
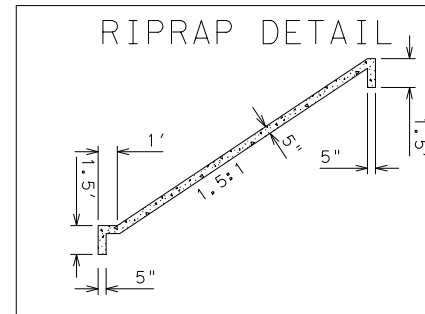
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STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:01:30 PM ... \06\*DRAINAGE\5563804-CUL-31.dgn



ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6002	RIPRAP (CONC)(5 IN)	CY	12.19
462-6046	CONC BOX CULV (3 FT X 3 FT)(EXTEND)	LF	15
462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF	45
466-6194	WINGWALL (PW - 2) (HW=5 FT)	EA	2
480-6001	CLEAN EXIST CULVERTS	EA	1

NOTE: ON SLOPES STEEPER THAN 3:1 18" TOE SHOULD BE INSTALLED AT TOP OF RIPRAP APRON



*Russell A Parr* 12/14/2020

**CULVERT LAYOUT**  
**CULVERT 32**  
**US 82**  
**STA 590+60.53**

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

SHEET 32 OF 32



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 186
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/14/2020 5:01:33 PM ... \06\DRAINAGE\5563804-CUL-32.dgn

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (CY)	Class "C" Conc (Curb) (CY)	Class "C" Conc (Wingwall) (CY)	Total Wingwall Area (SF)
Culvert 1 (Lt)	1 - 4'x4'	30'	SCC - 3&4	PW-1	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	11.333'	5.167'	N/A	N/A	0.2	8.7	128
Culvert 1 (Rt)	1 - 4'x4'	30'	SCC - 3&4	PW-1	0°	2:1	8"	7"	2,000'	6.667'	N/A	N/A	13.333'	5.167'	N/A	N/A	0.4	12.0	178
Culvert 2 (Lt)	1 - 4'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	4.667'	N/A	N/A	7.333'	5.167'	N/A	N/A	0.2	4.8	62
Culvert 2 (Rt)	1 - 4'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	2,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.4	7.0	100
Culvert 3 (Lt)	1 - 4'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0,500'	4.167'	N/A	N/A	6.333'	5.167'	N/A	N/A	0.1	3.7	47
Culvert 3 (Rt)	1 - 4'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	4.667'	N/A	N/A	7.333'	5.167'	N/A	N/A	0.2	4.8	62
Culvert 4 (Lt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0,500'	3.167'	N/A	N/A	5.333'	4.167'	N/A	N/A	0.1	2.6	32
Culvert 4 (Rt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 5 (Lt)	1 - 3'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0,500'	4.167'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.1	3.7	47
Culvert 5 (Rt)	1 - 3'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0,500'	4.167'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.1	3.7	47
Culvert 6 (Lt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 6 (Rt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 7 (Lt)	1 - 3'x2'	30'	SCC - 3&4	SETB-CD	0°	4:1	8"	7"	0,000'	2.417'	N/A	N/A	8.333'	N/A	4.167'	N/A	0.0	1.4	N/A
Culvert 7 (Rt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 8 (Lt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.2	7.0	100
Culvert 8 (Rt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.2	7.0	100
Culvert 9 (Lt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 9 (Rt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 11 (Lt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.2	7.0	100
Culvert 11 (Rt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.2	7.0	100
Culvert 12 (Lt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 12 (Rt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 13 (Lt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.2	7.0	100
Culvert 13 (Rt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.2	7.0	100
Culvert 15 (Lt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	5,000'	9.667'	N/A	N/A	17.333'	5.167'	N/A	N/A	1.0	21.8	329
Culvert 15 (Rt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	5,000'	9.667'	N/A	N/A	17.333'	5.167'	N/A	N/A	1.0	21.8	329
Culvert 16 (Lt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	3.667'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.2	3.6	45
Culvert 16 (Rt)	1 - 3'x2'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	2,000'	4.667'	N/A	N/A	7.333'	4.167'	N/A	N/A	0.3	4.7	62
Culvert 17 (Lt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0,500'	5.167'	N/A	N/A	8.333'	5.167'	N/A	N/A	0.1	5.7	80
Culvert 17 (Rt)	1 - 4'x4'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	5.667'	N/A	N/A	9.333'	5.167'	N/A	N/A	0.2	7.0	100
Culvert 18 (Lt)	1 - 4'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0,500'	4.167'	N/A	N/A	6.333'	5.167'	N/A	N/A	0.1	3.7	47
Culvert 18 (Rt)	1 - 4'x3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1,000'	4.667'	N/A	N/A	7.333'	5.167'	N/A	N/A	0.2	4.8	62
Culvert 19 (Lt)	2 - 5'x3'	20'	MC-5-20	SETB-CD	0°	4:1	8"	7"	0,000'	3.417'	N/A	N/A	12.333'	N/A	11.750'	N/A	0.0	4.9	N/A
Culvert 19 (Rt)	2 - 5'x3'	20'	MC-5-20	PW-2	0°	2:1	8"	7"	0,500'	4.167'	N/A	N/A	6.333'	11.750'	N/A	N/A	0.2	4.2	47

- ① Round the wall heights shown to the nearest foot for bidding purposes.
- ② Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.
- ③ Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.
- ④ Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

**SPECIAL NOTE:**

This sheet is a supplement to the box culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

		<b>Bridge Division Standard</b>	
<b>BOX CULVERT SUPPLEMENT WINGS AND END TREATMENTS</b>			
<b>SHEET 1 OF 2</b>			
<b>BCS</b>			
FILE: bcsstd1-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT February 2020	CONT SECT	JOB	HIGHWAY
REVISIONS	0133 04	042	US 82
	DIST	COUNTY	SHEET NO.
	WFS	BAYLOR	187

Russell A. Parr 12/14/2020

DATE: FILE:

**NOTES:**

Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;  
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical

- Side slope at culvert for flared or straight wingwalls.
- Channel slope for parallel wingwalls.
- Slope must be 3:1 or flatter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)

Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.  
Area for four wingwalls (two structure ends) if Both.

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Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (CY)	Class "C" Conc (Curb) (CY) (2)	Class "C" Conc (Wingwall) (CY) (3)	Total Wingwall Area (SF)
Culvert 20 (Lt)	1 - 3' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1.000'	4.667'	N/A	N/A	7.333'	4.167'	N/A	N/A	0.2	4.7	62
Culvert 20 (Rt)	1 - 3' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1.000'	4.667'	N/A	N/A	7.333'	4.167'	N/A	N/A	0.2	4.7	62
Culvert 21 (Lt)	1 - 4' x 3'	30'	SCC - 3&4	SETB-PD	0°	6:1	8"	7"	0.000'	3.417'	N/A	N/A	19.000'	N/A	5.167'	N/A	0.0	7.4	N/A
Culvert 21 (Rt)	1 - 4' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0.500'	4.167'	N/A	N/A	6.333'	5.167'	N/A	N/A	0.1	3.7	47
Culvert 23 (Lt)	1 - 4' x 3'	30'	SCC - 3&4	SETB-CD	0°	4:1	8"	7"	0.000'	3.417'	N/A	N/A	12.333'	N/A	5.167'	N/A	0.0	2.5	N/A
Culvert 23 (Rt)	1 - 4' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1.000'	4.667'	N/A	N/A	7.333'	5.167'	N/A	N/A	0.2	4.8	62
Culvert 26 (Lt)	1 - 3' x 3'	30'	SCC - 3&4	SETB-CD	0°	4:1	8"	7"	0.500'	3.917'	N/A	N/A	14.333'	N/A	4.167'	N/A	0.1	2.7	N/A
Culvert 26 (Rt)	1 - 3' x 3'	30'	SCC - 3&4	SETB-PD	0°	6:1	8"	7"	0.500'	3.917'	N/A	N/A	22.000'	N/A	4.167'	N/A	0.1	4.1	N/A
Culvert 26 (Rt)	1 - 3' x 3'	30'	SCC - 3&4	SW-0	0°	6:1	8"	7"	0.500'	3.917'	N/A	N/A	21.500'	N/A	N/A	1.0	0.2	12.2	182
Culvert 27 (Lt)	1 - 3' x 3'	30'	SCC - 3&4	PW-2	15°	2:1	8"	7"	0.500'	4.167'	N/A	N/A	6.557'	4.314'	N/A	N/A	0.1	3.8	49
Culvert 28 (Lt)	2 - 5' x 3'	20'	MC-5-20	PW-2	0°	2:1	8"	7"	0.500'	4.167'	N/A	N/A	6.333'	11.750'	N/A	N/A	0.2	4.2	47
Culvert 28 (Rt)	2 - 5' x 3'	20'	MC-5-20	PW-2	0°	2:1	8"	7"	0.500'	4.167'	N/A	N/A	6.333'	11.750'	N/A	N/A	0.2	4.2	47
Culvert 29 (Lt)	1 - 7' x 4'	16'	SCC-7	PW-2	0°	2:1	8"	7"	0.500'	5.167'	N/A	N/A	8.333'	8.167'	N/A	N/A	0.2	6.0	80
Culvert 29 (Lt)	1 - 3' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0.500'	4.167'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.1	3.7	47
Culvert 29 (Rt)	1 - 7' x 4'	16'	SCC-7	PW-2	0°	2:1	8"	7"	0.500'	5.167'	N/A	N/A	8.333'	8.167'	N/A	N/A	0.2	6.0	80
Culvert 29 (Rt)	1 - 3' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	0.500'	4.167'	N/A	N/A	6.333'	4.167'	N/A	N/A	0.1	3.7	47
Culvert 30 (Lt)	1 - 7' x 5'	16'	SCC-7	PW-2	0°	2:1	8"	7"	0.500'	6.167'	N/A	N/A	10.333'	8.167'	N/A	N/A	0.2	8.4	121
Culvert 30 (Rt)	1 - 7' x 5'	16'	SCC-7	PW-2	0°	2:1	8"	7"	2.000'	7.667'	N/A	N/A	13.333'	8.167'	N/A	N/A	0.6	13.4	198
Culvert 31 (Lt)	2 - 5' x 3'	20'	MC-5-20	PW-2	0°	2:1	8"	7"	0.250'	3.917'	N/A	N/A	6.833'	11.750'	N/A	N/A	0.1	4.4	52
Culvert 31 (Rt)	2 - 5' x 3'	20'	MC-5-20	PW-2	0°	2:1	8"	7"	0.250'	3.917'	N/A	N/A	6.833'	11.750'	N/A	N/A	0.1	4.4	52
Culvert 32 (Lt)	3 - 5' x 3'	20'	MC-5-20	PW-2	0°	2:1	8"	7"	1.000'	4.667'	N/A	N/A	7.333'	17.333'	N/A	N/A	0.6	5.7	62
Culvert 32 (Lt)	1 - 3' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1.000'	4.667'	N/A	N/A	7.333'	4.167'	N/A	N/A	0.2	4.7	62
Culvert 32 (Rt)	3 - 5' x 3'	20'	MC-5-20	PW-2	0°	2:1	8"	7"	1.000'	4.667'	N/A	N/A	7.333'	17.333'	N/A	N/A	0.6	5.7	62
Culvert 32 (Rt)	1 - 3' x 3'	30'	SCC - 3&4	PW-2	0°	2:1	8"	7"	1.000'	4.667'	N/A	N/A	7.333'	4.167'	N/A	N/A	0.2	4.7	62

**NOTES:**

Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;  
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical

- Side slope at culvert for flared or straight wingwalls.
- Channel slope for parallel wingwalls.
- Slope must be 3:1 or flatter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)

Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.  
Area for four wingwalls (two structure ends) if Both.

(1) Round the wall heights shown to the nearest foot for bidding purposes.

(2) Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.

(3) Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

**SPECIAL NOTE:**

This sheet is a supplement to the box culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.



Bridge Division Standard

**BOX CULVERT SUPPLEMENT  
WINGS AND END TREATMENTS**

SHEET 2 OF 2

BCS

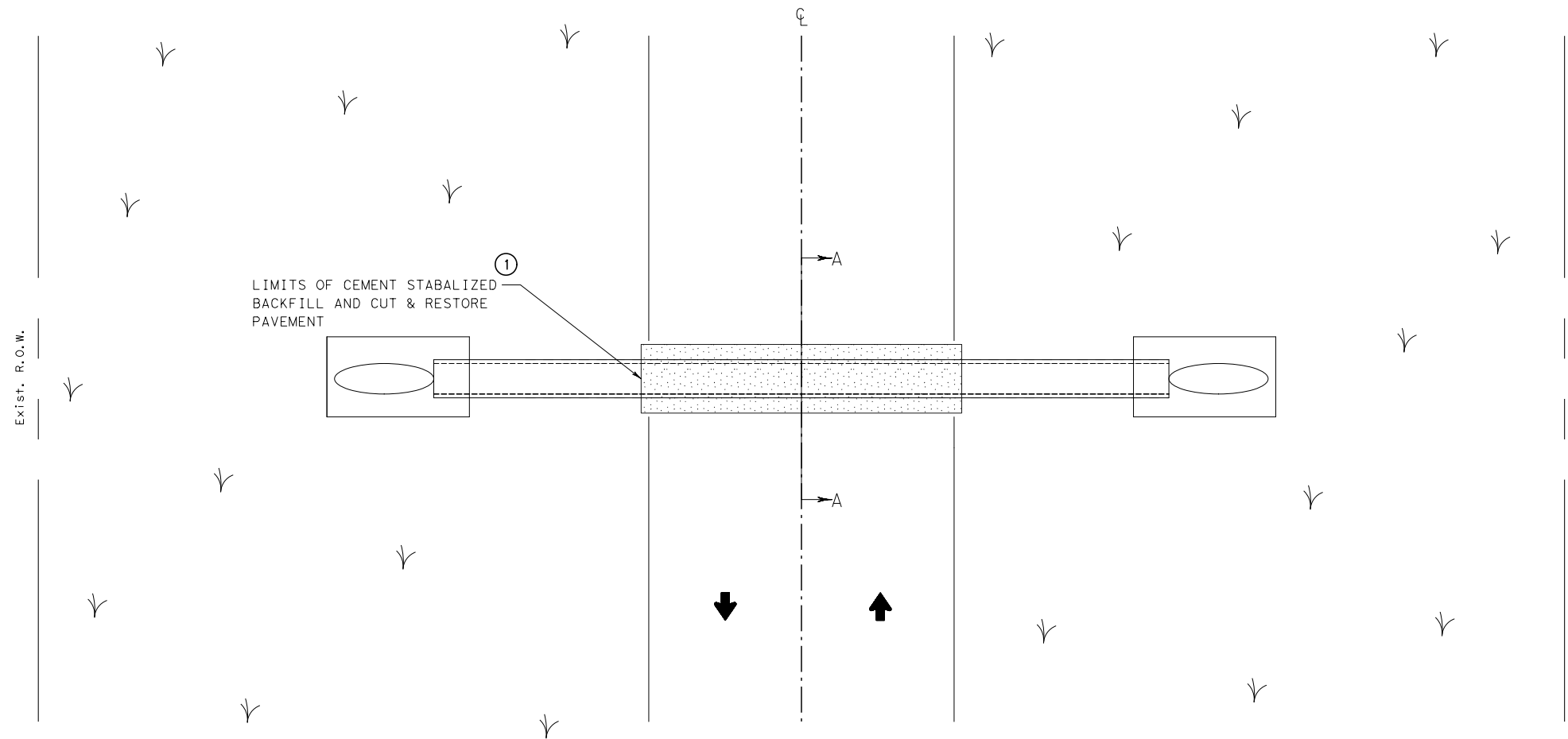
FILE: bcsstdel-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	188	



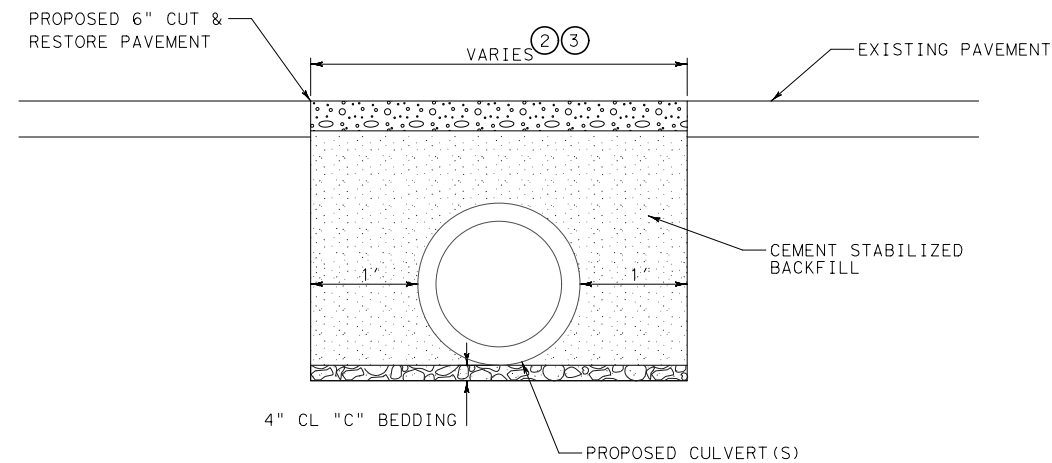
Russell A Parr 2/14/2020

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 ... \ACUT RESTORE DETAILS.DGN



PLAN VIEW



SECTION A-A

CUT & RESTORE DETAILS

NOTES:

- ① LIMITS OF CEMENT STABILIZED BACKFILL AND CUT & RESTORE PAVEMENT SHALL EXTEND 6" BEYOND EXISTING EDGE OF PAVEMENT ON EACH SIDE OF THE ROADWAY.
- ② PLACE CEMENT STABILIZED BACKFILL AT DEPTH TO ALLOW A MINIMUM DEPTH OF 6" OF HOTMIX PLACEMENT.
- ③ USE TY B HOTMIX UNLESS OTHERWISE APPROVED BY ENGINEER.

WORK ON BOTH SIDES OF THE ROAD AT THE SAME TIME WILL NOT BE ALLOWED. COMPLETE CULVERT REPLACEMENT AND CUT & RESTORE PAVEMENT SO THAT ROADWAY WILL BE OPENED TO TWO LANES OF TRAFFIC BEFORE THE END OF THE WORKDAY.



*Gregory O. Delgado*  
 12/14/2020

**CUT AND RESTORE DETAILS**

SHEET 1 OF 1

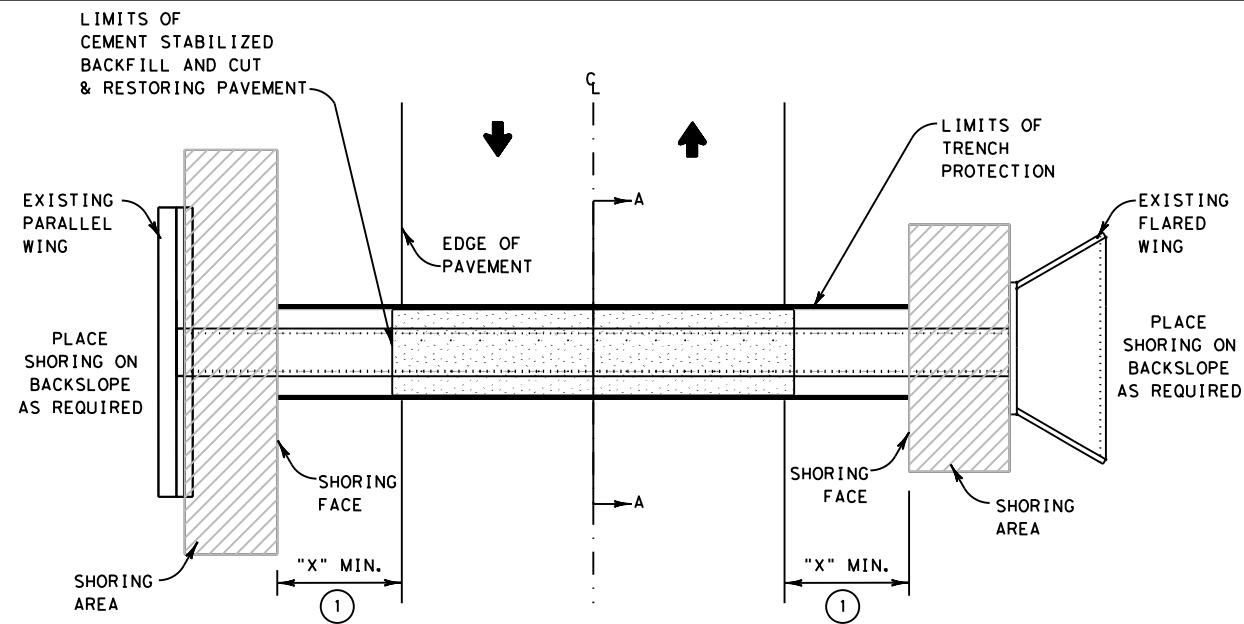
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Texas Department of Transportation

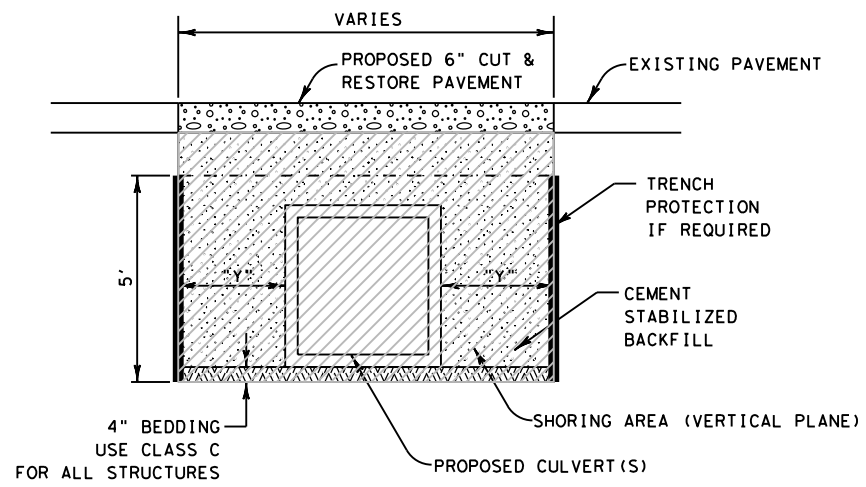
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 189	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO. US 82



PLAN VIEW  
TYPICAL SECTION



SECTION A-A  
SHORING AND CUT &  
RESTORING PAVEMENT DETAIL

SURFACE AREA IN A VERTICAL PLANE TO BE MEASURED AND PAID IF GREATER THAN FIVE FEET. THIS SHALL INCLUDE INGRESS/EGRESS AREAS.

CEMENT STABILIZED BACKFILL

SL:1 = SLOPE RATIO (HORIZONTAL : 1 VERTICAL)  
SEE REQUIREMENTS BASED ON SOIL TYPE

① ADEQUATE PHYSICAL BARRIER PROTECTION SHALL BE PROVIDED AT ALL EXCAVATIONS IN ACCORDANCE WITH WORKSHEET FOR EDGE CONDITION TREATMENT TYPES AND BC(10)-14. THIS SHALL BE AS DIRECTED BY THE ENGINEER.

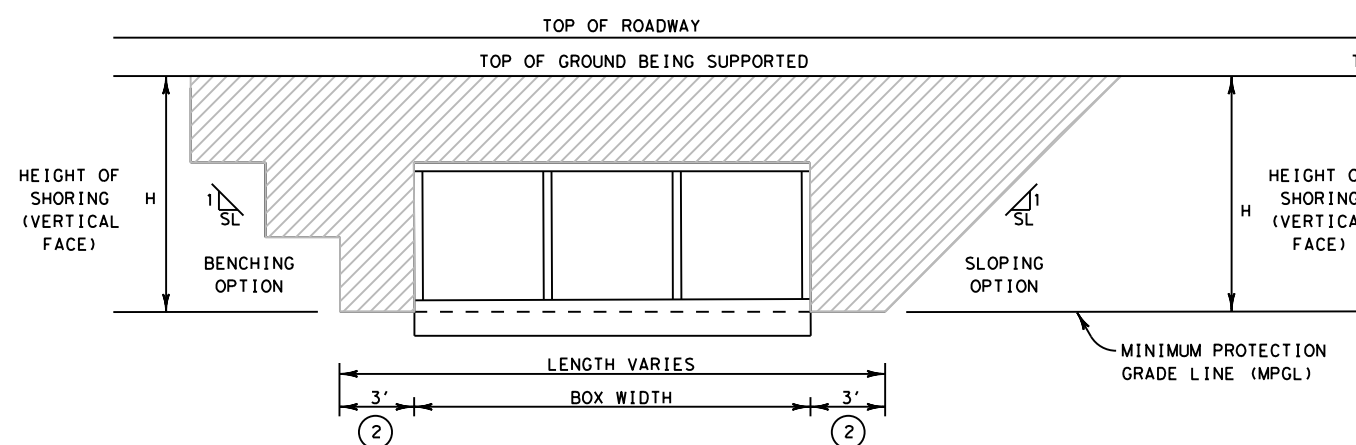
EMBANKMENT FRONT SLOPE SHALL BE A 3:1 OR FLATTER FROM EDGE OF PAVEMENT TO SHORING FACE. SEE EDGE CONDITION TREATMENT TYPES FOR REQUIRED DEVICES.

MINIMUM "X" OFFSET DISTANCE SHALL BE SPECIFIED IN SHORING PLAN SUBMITTED BY THE CONTRACTOR AND BASED ON SPECIFIC STRUCTURE LOCATION. THIS OFFSET WILL BE BASED ON SOIL TYPES, STABILITY, SLOPE ANALYSIS, AND SURCHARGE LOADING, BUT IN NO CASE SHALL IT BE LESS THAN 5 FEET.

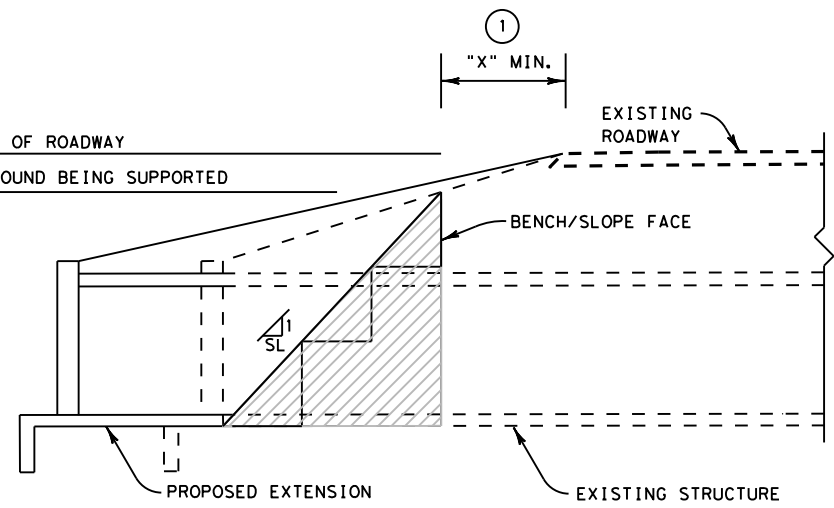
② DISTANCE IS MEASURED FROM END OF BOX OR END TREATMENT PLUS 3 FEET IF SHORING PLACEMENT IS REQUIRED.

"Y" ~ DIMENSION AS SPECIFIED BY ITEM 400 BUT NO LESS THAN ONE FOOT.

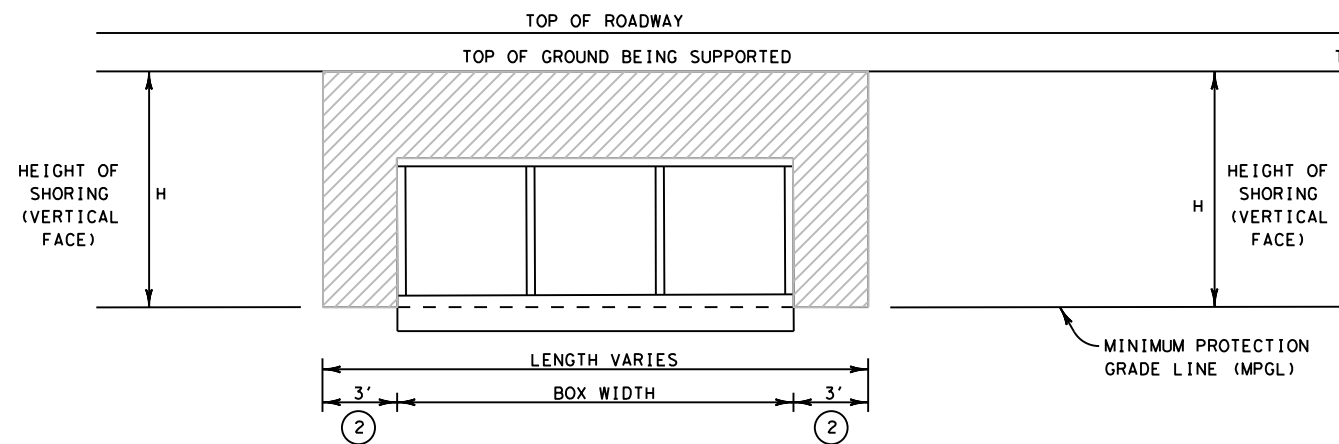
DETAILS AND NOTES SHOWN ARE GENERIC ILLUSTRATIONS AND DO NOT COVER ALL POSSIBLE SCENARIOS THAT MAY BE ENCOUNTERED ON A PROJECT. THE DETAILS ARE NOT A SUBSTITUTE FOR THE REQUIRED SPECIFIC ENGINEERED PLAN THAT IS TO BE SUBMITTED FOR APPROVAL AT EACH LOCATION THAT REQUIRES TEMPORARY SPECIAL SHORING. ALL ENGINEERED PLAN REQUIREMENTS SHALL COMPLY WITH OSHA STANDARDS 29 CFR PART 1926, SUBPART P.



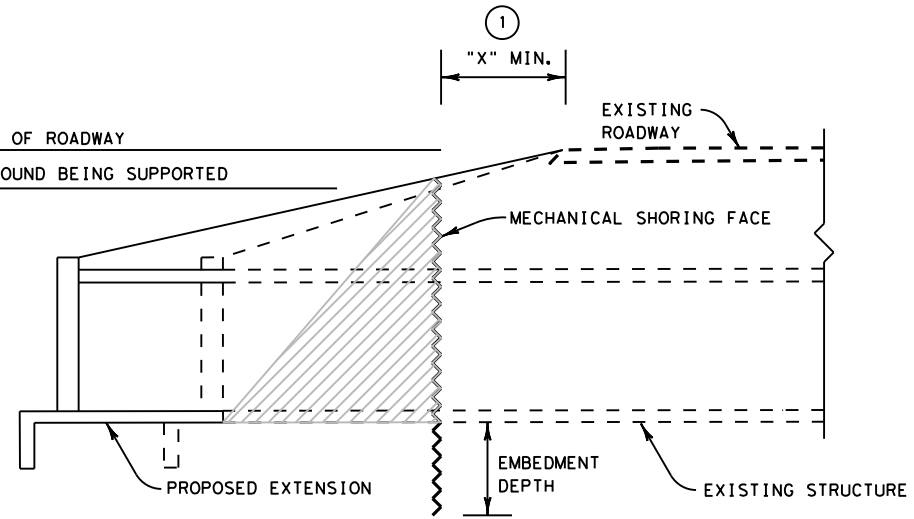
PROFILE VIEW  
SLOPING/BENCHING



CROSS SECTION VIEW  
SLOPING/BENCHING

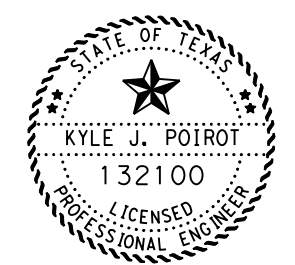


PROFILE VIEW  
MECHANICAL SHORING



CROSS SECTION VIEW  
MECHANICAL SHORING

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Kyle J. Poirot, P.E.

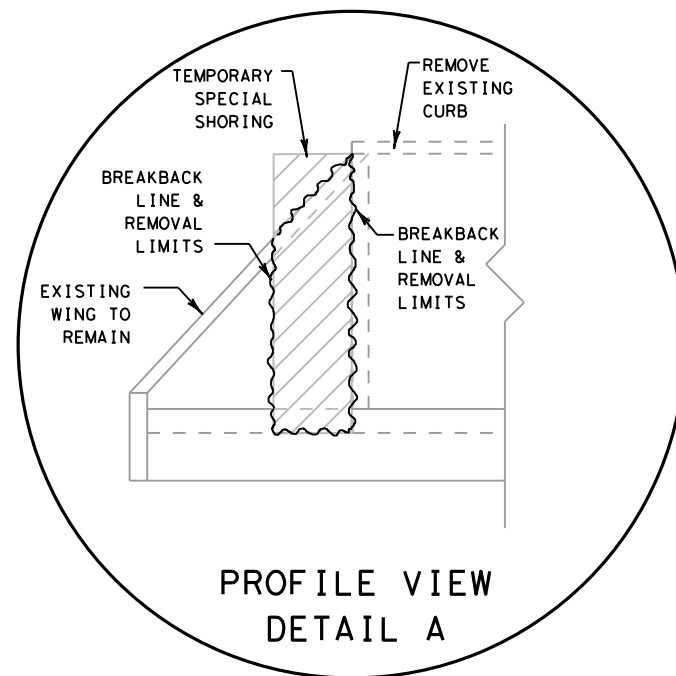
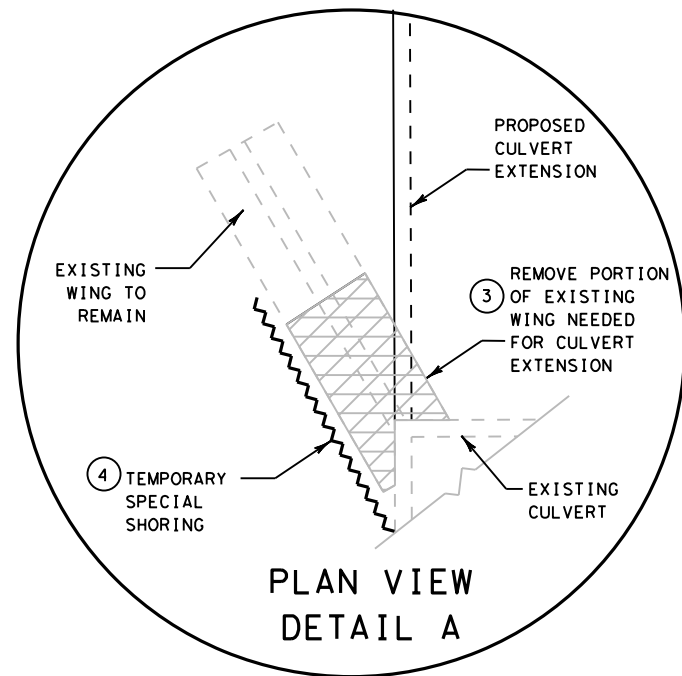
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US 82  
TEMPORARY SHORING  
DETAILS

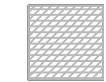
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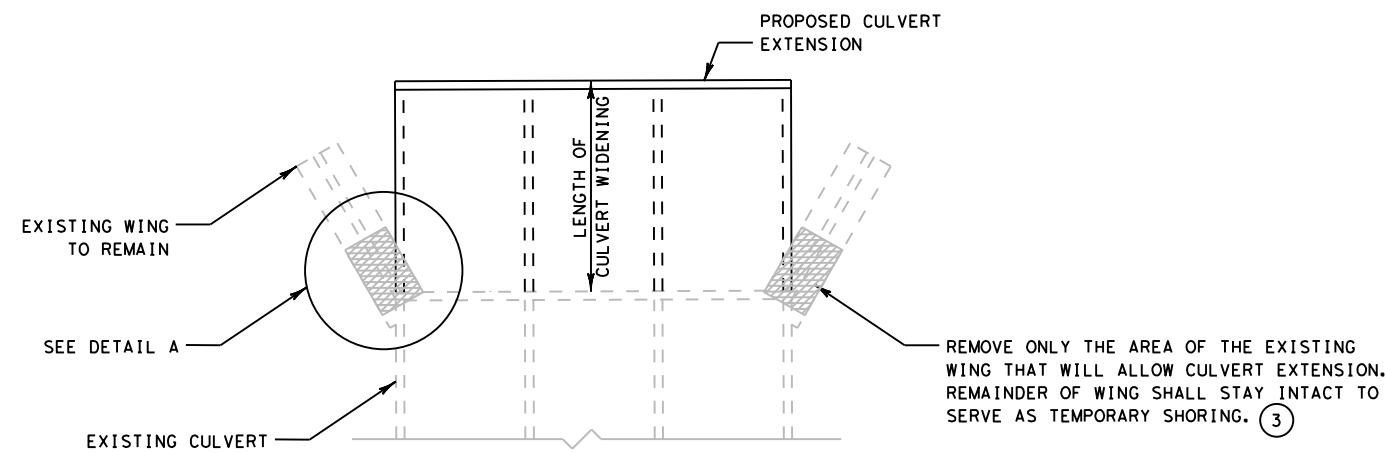
SHEET 1 OF 6			
CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	190	



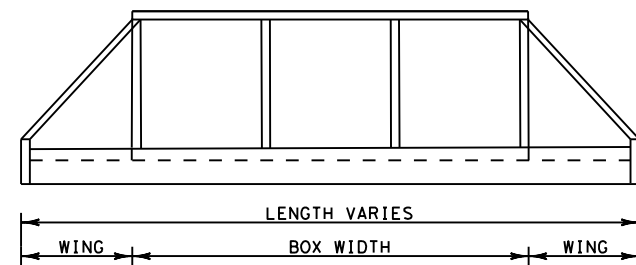
 SURFACE AREA IN A VERTICAL PLANE TO BE MEASURED AND PAID IF GREATER THAN FIVE FEET.

 REMOVAL AREA

- 3 AREA AND EXTENT OF REMOVAL SHOWN MAY VARY. REMAINDER OF EXISTING WING MAY REMAIN IN PLACE IF PROPER BACKFILL AND A MINIMUM FILL HEIGHT CAN BE ACHIEVED. IN SOME CASES THE EXISTING WING MAY HAVE TO BE FULLY REMOVED. THE ENGINEER SHALL APPROVE BREAKBACK LINES AND AREA TO REMAIN OR TO BE REMOVED PRIOR TO BEGINNING WORK. PAYMENT FOR ALL WORK SHALL BE SUBSIDIARY TO SHORING ITEMS.
- 4 PLACE SHORING FOR PROTECTION IN AREA WHERE EXISTING WING WAS REMOVED AS DESIGNED BY ENGINEERED PLAN SUBMITTED BY CONTRACTOR.

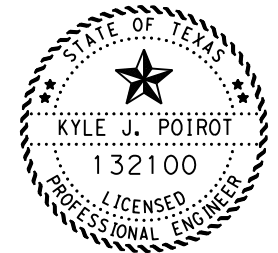


PLAN VIEW  
BOX CULVERT EXTENSION WITH  
PARTIAL SECTION OF FLARED WINGS REMAINING IN PLACE



PROFILE VIEW  
EXISTING BOX CULVERT WITH FLARED WINGS

DETAILS AND NOTES SHOWN ARE GENERIC ILLUSTRATIONS AND DO NOT COVER ALL POSSIBLE SCENARIOS THAT MAY BE ENCOUNTERED ON A PROJECT. THE DETAILS ARE NOT A SUBSTITUTE FOR THE REQUIRED SPECIFIC ENGINEERED PLAN THAT IS TO BE SUBMITTED FOR APPROVAL AT EACH LOCATION THAT REQUIRES TEMPORARY SPECIAL SHORING. ALL ENGINEERED PLAN REQUIREMENTS SHALL COMPLY WITH OSHA STANDARDS 29 CFR PART 1926, SUBPART P.



*Kyle J. Poirot, P.E.*

9/22/2021

**US 82**

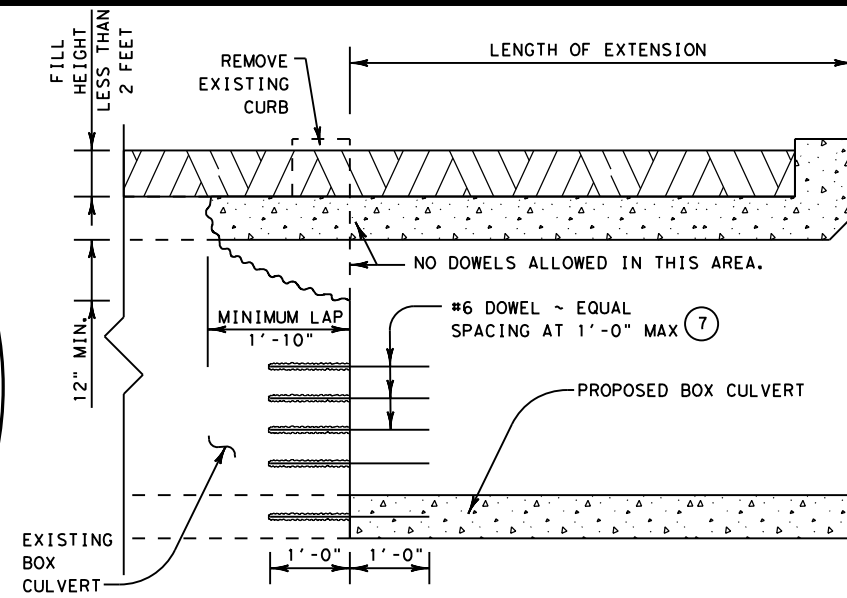
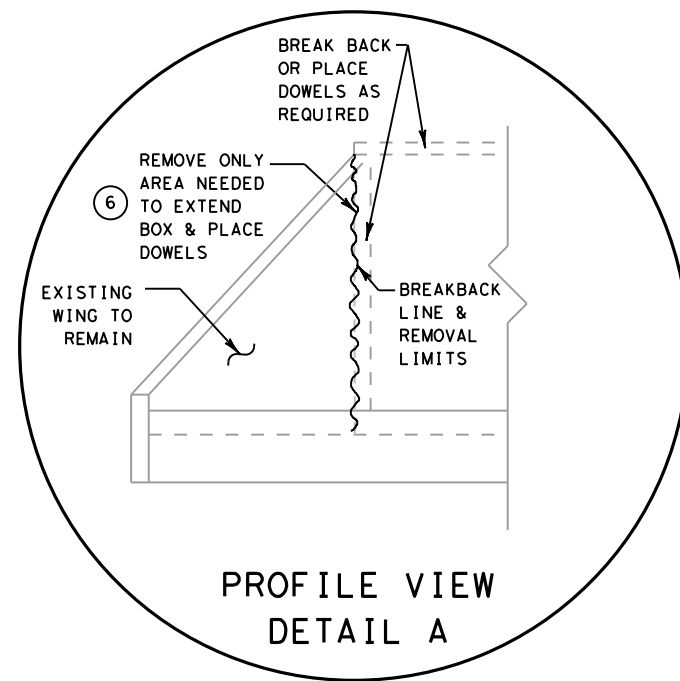
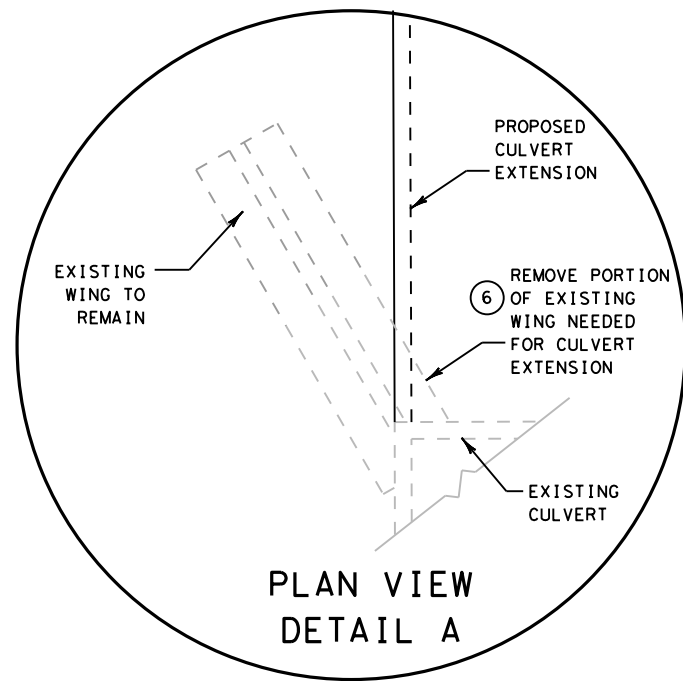
**TEMPORARY SHORING  
DETAILS**

NOT TO SCALE

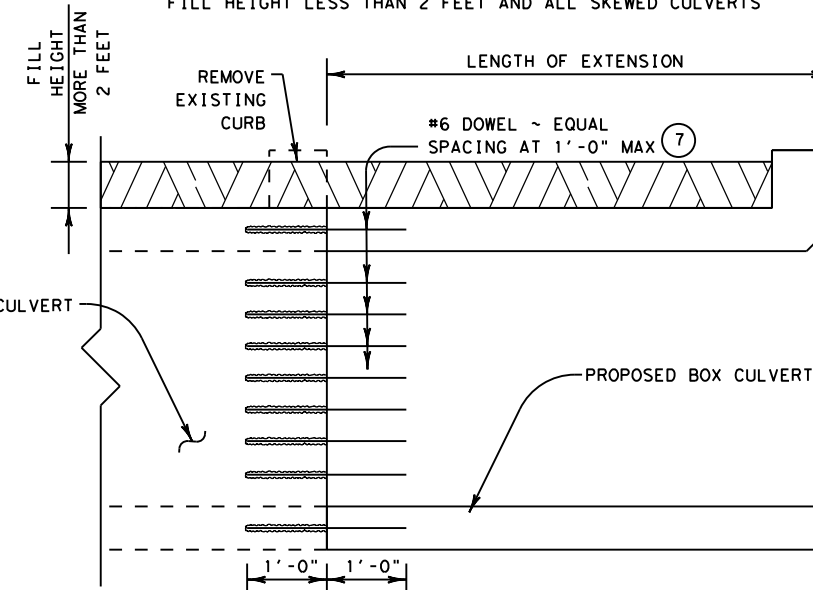


CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	190A	

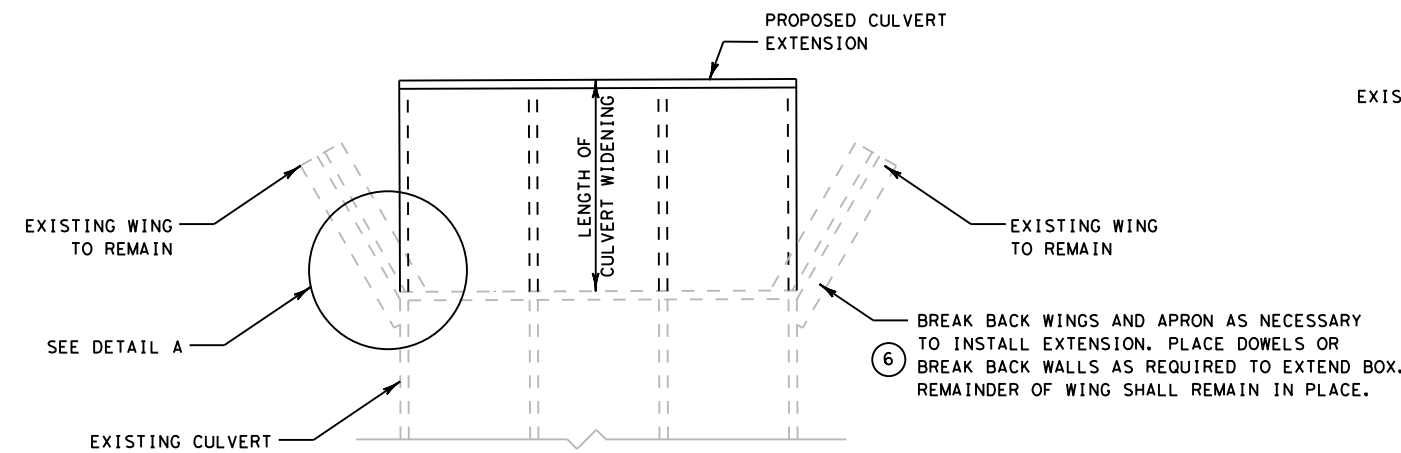
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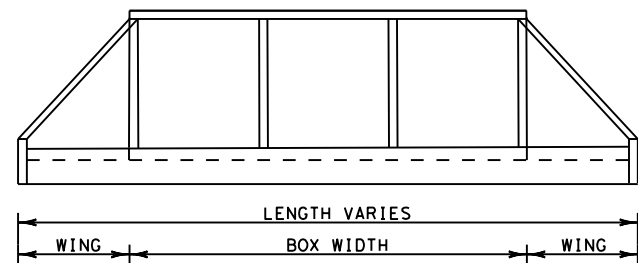
**LENGTHENING DETAIL TYPICAL 7**  
FILL HEIGHT LESS THAN 2 FEET AND ALL SKEWED CULVERTS



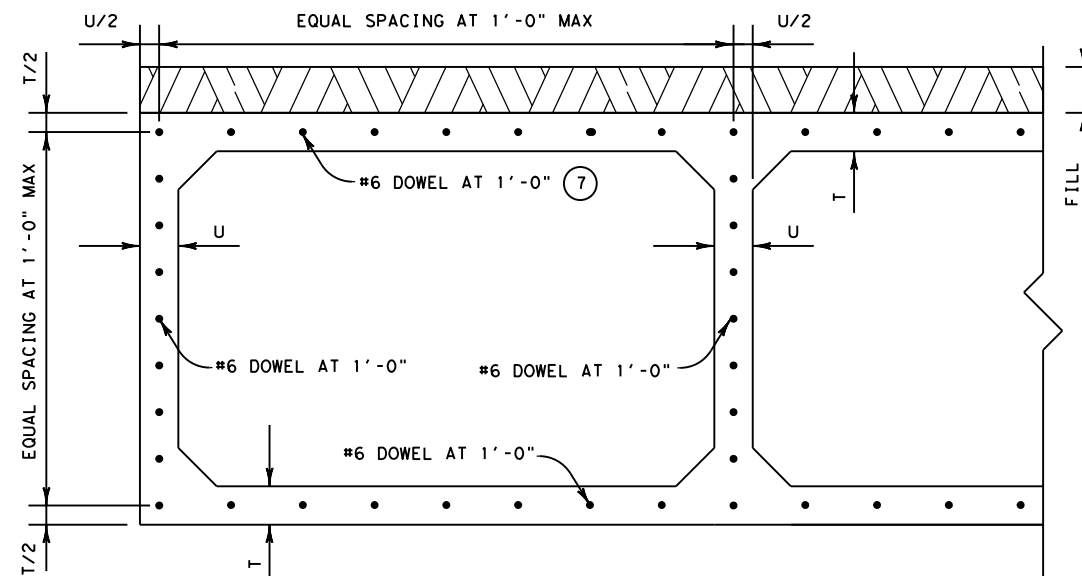
**LENGTHENING DETAIL TYPICAL 7**  
FILL HEIGHT MORE THAN 2 FEET AND NOT A SKEWED CULVERT



**PLAN VIEW**  
**BOX CULVERT EXTENSION WITH**  
**FLARED WINGS REMAINING IN PLACE**



**PROFILE VIEW**  
**EXISTING BOX CULVERT WITH FLARED WINGS**



**LENGTHENING DETAIL TYPICAL SECTION 7**  
NOTE: ONLY SHOWING DOWELS OTHER REINFORCING NOT SHOWN FOR CLARITY.

- ⑥ REMAINDER OF EXISTING WING MAY REMAIN IN PLACE IF PROPER BACKFILL AND A MINIMUM FILL HEIGHT CAN BE ACHIEVED. ENGINEER SHALL APPROVE BREAKBACK LINES AND AREA TO REMAIN OR TO BE REMOVED PRIOR TO BEGINNING WORK.
  - ⑦ FOR BOX CULVERTS WITH LESS THAN 2'-0" OF FILL, BREAK BACK THE TOP SLAB TO PROVIDE A 1'-10" MINIMUM LAP OF THE EXISTING LONGITUDINAL BARS WITH THE LONGITUDINAL BARS IN THE EXTENSION. DOWELS ARE NOT ALLOWED FOR BOX CULVERTS WITH LESS THAN 2'-0" OF FILL.
- FOR BOX CULVERTS WITH MORE THAN 2'-0" OF FILL, BREAK BACK THE TOP SLAB TO PROVIDE A 1'-10" MINIMUM LAP OF THE EXISTING LONGITUDINAL BARS WITH THE LONGITUDINAL BARS IN THE EXTENSION. ALTERNATIVELY, IF THE BOX IS NON-SKEWED, EMBED #6 ANCHOR BARS WITH A TYPE III, C, D, E, OR F ANCHOR ADHESIVE INTO THE EXISTING WALLS, TOP, AND BOTTOM SLAB AT 1'-0" CENTER-TO-CENTER SPACING. MINIMUM EMBEDMENT DEPTH IS 12".
- CORE AND GROUT #6 DOWEL 1'-0" INTO EXISTING STRUCTURE AS SHOWN IN ACCORDANCE WITH ITEM 420.4.7.10, "CONCRETE STRUCTURES" - INSTALLATION OF DOWELS AND ANCHOR BOLTS."

*Kyle J. Poirot, P.E.*  
9/22/2021

**US 82**  
**TEMPORARY SHORING**  
**DETAILS**

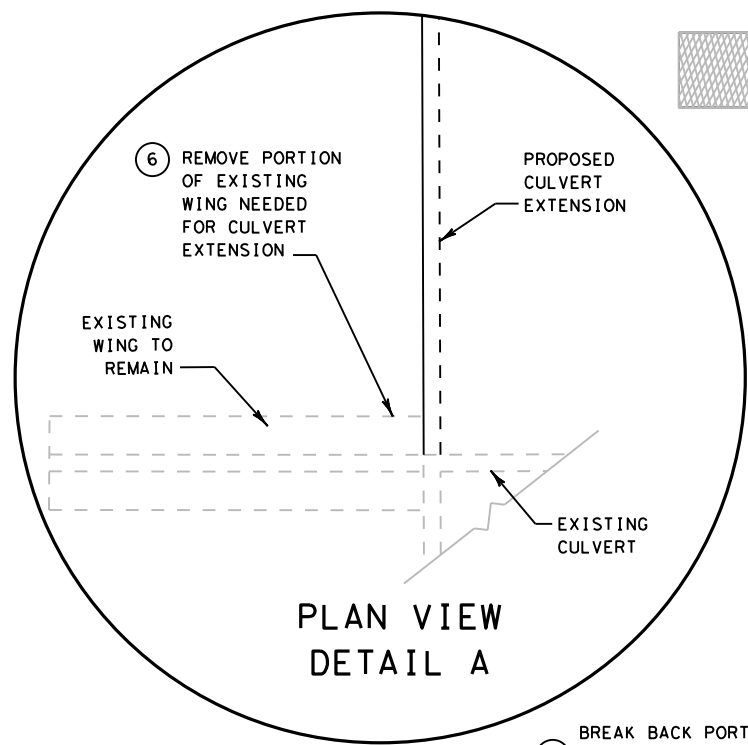
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SHEET 3 OF 6

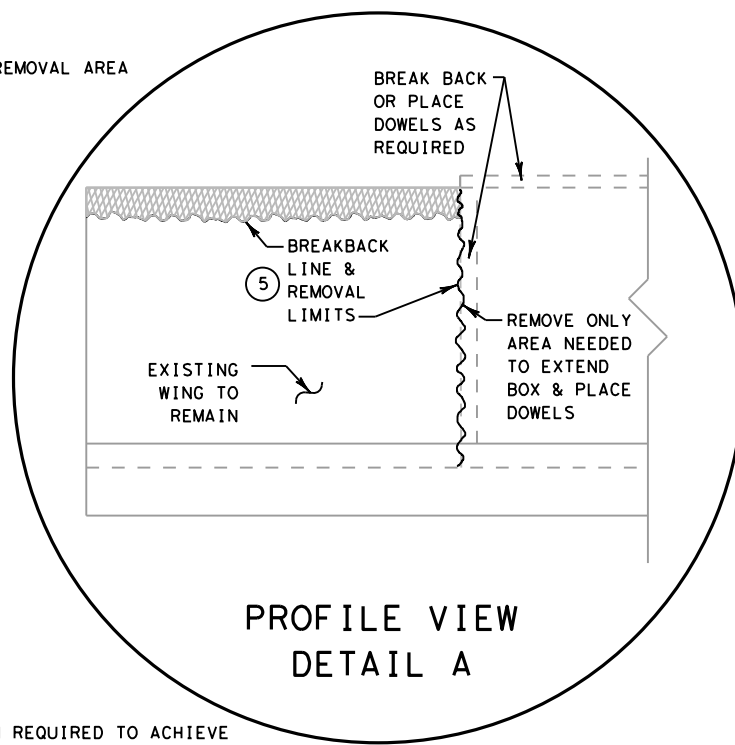
CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	190B	

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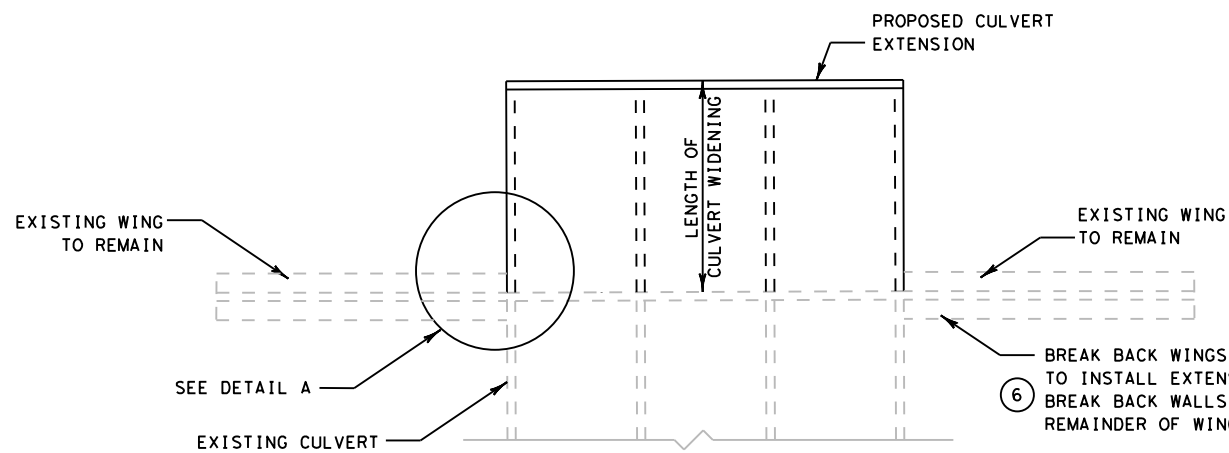


PLAN VIEW  
DETAIL A

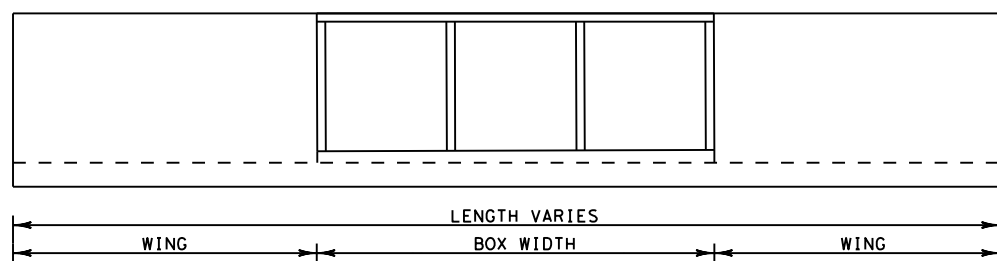


PROFILE VIEW  
DETAIL A

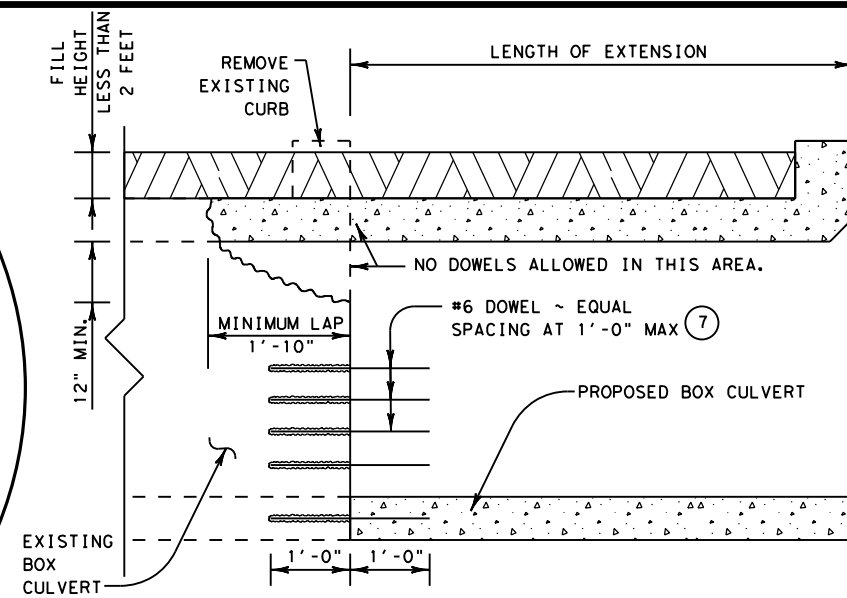
(5) BREAK BACK PORTION REQUIRED TO ACHIEVE CLEARANCE FOR PLACEMENT OF EMBANKMENT FOR FRONT SLOPE AS REQUIRED BY TYPICAL.



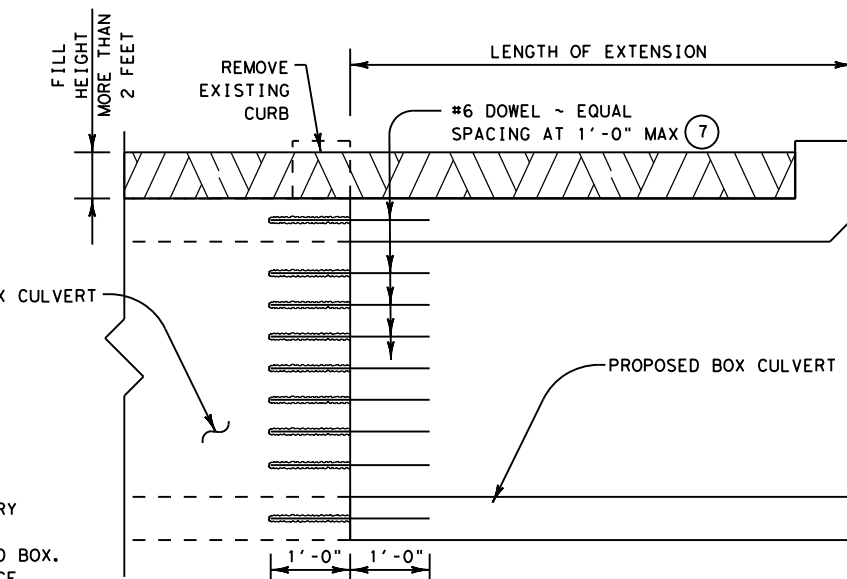
PLAN VIEW  
BOX CULVERT EXTENSION WITH  
PARTIAL SECTION OF PARALLEL  
WINGS REMAINING IN PLACE



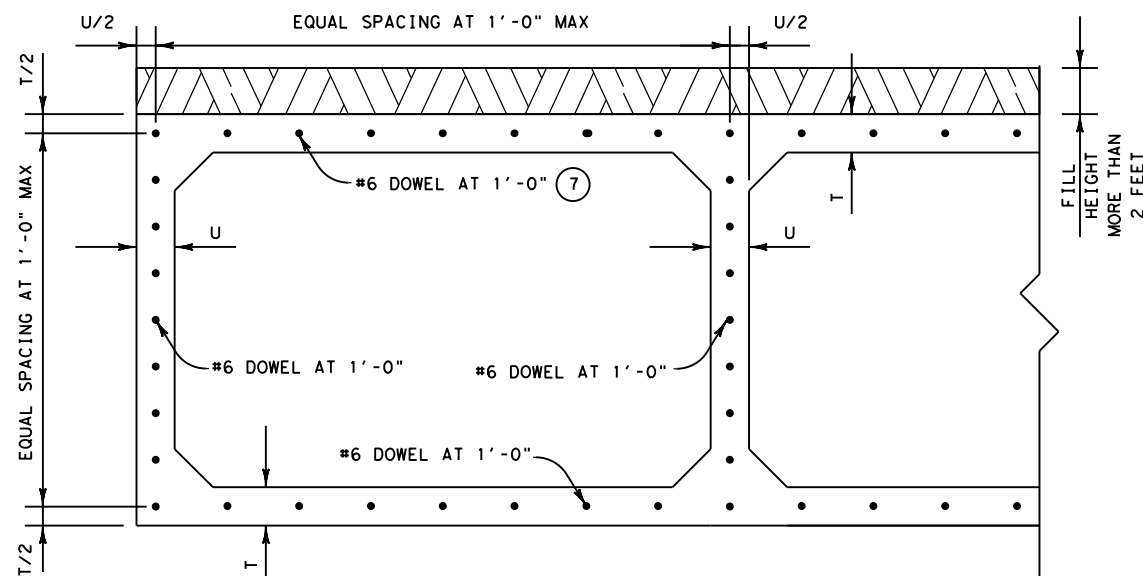
PROFILE VIEW  
EXISTING BOX CULVERT WITH PARALLEL WINGS



LENGTHENING DETAIL TYPICAL (7)  
FILL HEIGHT LESS THAN 2 FEET AND ALL SKEWED CULVERTS



LENGTHENING DETAIL TYPICAL (7)  
FILL HEIGHT MORE THAN 2 FEET AND NOT A SKEWED CULVERT



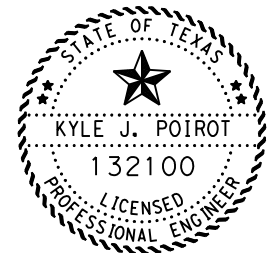
LENGTHENING DETAIL TYPICAL SECTION (7)  
NOTE: ONLY SHOWING DOWELS OTHER REINFORCING NOT SHOWN FOR CLARITY.

(6) REMAINDER OF EXISTING WING MAY REMAIN IN PLACE IF PROPER BACKFILL AND A MINIMUM FILL HEIGHT CAN BE ACHIEVED. ENGINEER SHALL APPROVE BREAKBACK LINES AND AREA TO REMAIN OR TO BE REMOVED PRIOR TO BEGINNING WORK.

(7) FOR BOX CULVERTS WITH LESS THAN 2'-0" OF FILL, BREAK BACK THE TOP SLAB TO PROVIDE A 1'-10" MINIMUM LAP OF THE EXISTING LONGITUDINAL BARS WITH THE LONGITUDINAL BARS IN THE EXTENSION. DOWELS ARE NOT ALLOWED FOR BOX CULVERTS WITH LESS THAN 2'-0" OF FILL.

FOR BOX CULVERTS WITH MORE THAN 2'-0" OF FILL, BREAK BACK THE TOP SLAB TO PROVIDE A 1'-10" MINIMUM LAP OF THE EXISTING LONGITUDINAL BARS WITH THE LONGITUDINAL BARS IN THE EXTENSION. ALTERNATIVELY, IF THE BOX IS NON-SKEWED, EMBED #6 ANCHOR BARS WITH A TYPE III, C, D, E, OR F ANCHOR ADHESIVE INTO THE EXISTING WALLS, TOP, AND BOTTOM SLAB AT 1'-0" CENTER-TO-CENTER SPACING. MINIMUM EMBEDMENT DEPTH IS 12".

CORE AND GROUT #6 DOWEL 1'-0" INTO EXISTING STRUCTURE AS SHOWN IN ACCORDANCE WITH ITEM 420.4.7.10, "CONCRETE STRUCTURES" ~ INSTALLATION OF DOWELS AND ANCHOR BOLTS."



Kyle J. Poirot, P.E.  
9/22/2021

US 82  
TEMPORARY SHORING  
DETAILS

NOT TO SCALE



CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	190C	

TEMPORARY SHORING AND TRENCH PROTECTION GENERAL NOTES:

THE SHORING PLAN SHALL ADDRESS VERY CLEARLY WITH RESPECT TO THE PROPOSED CONTRACTORS SEQUENCE OF WORK AND METHODS FOR SHORING FOR THE DURATION OF THE PROJECT EXPOSURE.

THE SHORING PLAN SHALL NOT BE A GENERIC PLAN BUT VERY SPECIFIC IN REGARDS TO EACH LOCATION THAT REQUIRES SHORING WITH ALL RELEVANT MATERIALS TO BE USED WITH SPECIFICATIONS DETAILING THOSE MATERIALS ALONG WITH ANY MANUFACTURERS SPECIFICATIONS OF MATERIALS BEING USED.

BENCHING, SLOPING, MECHANICAL SHORING INSTALLED OUTSIDE LIMITS SHOWN WILL NOT BE PAID FOR UNLESS APPROVED IN WRITING BY THE ENGINEER.

SUBSTITUTION OF BENCHING/SLOPING FOR MECHANICAL SHORING WILL NOT BE PERMITTED UNLESS APPROVED IN WRITING BY THE ENGINEER.

SUBSTITUTION OF MECHANICAL SHORING FOR BENCHING/SLOPING WILL NOT BE PERMITTED UNLESS APPROVED IN WRITING BY THE ENGINEER.

DETAILED SHORING PLAN WILL BE CONSIDERED PREREQUISITE TO SUBSTITUTION OF ORIGINAL SHORING PROPOSED IN PLAN.

SUBMIT SOIL CLASSIFICATION AND IDENTIFICATION TESTING THAT IS PERFORMED FOR EACH STRUCTURE TO THE ENGINEER PRIOR TO COMMENCING WORK.

CALCULATIONS THAT ARE SUBMITTED SHALL INCLUDE A GLOBAL STABILITY ANALYSIS TO ENSURE IMPLEMENTATION OF THE SHORING DOES NOT CREATE A HAZARD TO THE ROADWAY. ALL DESIGN CALCULATIONS SHALL CLEARLY INDICATE DESIGN ASSUMPTIONS, SOIL PARAMETERS, SURCHARGE LOADING AND GEOMETRY USED FOR ANALYSIS AND ALL OTHER INFORMATION DEEMED PERTINENT. TYPICAL SECTIONS SHOULD BE SUBMITTED TO VERIFY THE MODELS AND METHODS PROPOSED FOR USE BY THE CONTRACTOR ACCOUNT FOR SURCHARGE LOADING.

SUBMIT COMPETENT PERSONS NAME THAT WILL BE ON SITE WHILE SHORING SYSTEMS ARE IN USE. THAT PERSON SHALL BE RESPONSIBLE FOR MAKING SURE THAT ALL ELEMENTS OF THE PLAN ARE ADHERED TO AND SHALL NOTIFY THE ENGINEER IF CONDITIONS ENCOUNTERED ARE DIFFERENT THAN ANTICIPATED AND SHOWN ON THE SUBMITTED AND APPROVED PLAN.

SHORING MUST BE PROPERLY INSTALLED PRIOR TO EXCAVATION. LOCATION OF SHORING SHOWN IS DIAGRAMMATIC AND NOT THE MEANS AND METHOD OF DOING THE WORK.

EVALUATION OF THE EXISTING WINGWALL TO REMAIN SHALL BE PERFORMED TO ENSURE STABILITY OF THE WALL ONCE DETACHED FROM EXISTING CULVERT WALL. SUBMIT THIS EVALUATION FOR APPROVAL PRIOR TO PERFORMING ANY REMOVAL.

SHORING ITEM WILL BE MEASURED BY THE SQUARE FOOT OF SURFACE AREA OF A VERTICAL PLANE AT THE FACE OF THE SHORING BETWEEN THE TOP OF THE GROUND BEING SUPPORTED AND THE MINIMUM PROTECTION GRADE LINE SHOWN.

SHORING PROJECTING ABOVE THE LEVEL OF THE GROUND BEING SUPPORTED AND CAUSED BY THE CONTRACTORS OPERATIONS WILL NOT BE MEASURED FOR PAYMENT. SHORING THAT PROJECTS ABOVE THE LEVEL OF THE GROUND AND PRESENTS A HAZARD TO THE TRAVELING PUBLIC SHALL BE PROTECTED BY MEANS AND METHODS APPROVED BY THE ENGINEER AND AT THE EXPENSE OF THE CONTRACTOR PERFORMING THE WORK AND SUBSIDIARY TO ITEM 403.

TRENCH PROTECTION WILL BE MEASURED BY THE LINEAR FOOT OF PROTECTION IN PLACE.

TRENCHES OR EXCAVATIONS LESS THAN FIVE FEET IN DEPTH SHALL ALSO BE EFFECTIVELY PROTECTED WHEN EXAMINATION OF GROUND INDICATES HAZARDOUS GROUND MOVEMENT MAY BE EXPECTED.

WHERE TRENCH PROTECTION IS SHOWN IN THE ROADWAY AREA NO BENCHING OR SLOPING WILL BE ALLOWED.

DETAILS AND NOTES SHOWN ARE GENERIC ILLUSTRATIONS AND DO NOT COVER ALL POSSIBLE SCENARIOS THAT MY BE ENCOUNTERED ON A PROJECT. THE DETAILS ARE NOT A SUBSTITUTE FOR THE REQUIRED SPECIFIC ENGINEERED PLAN THAT IS TO BE SUBMITTED FOR APPROVAL AT EACH LOCATION THAT REQUIRES TEMPORARY SPECIAL SHORING. ALL ENGINEERED PLAN REQUIREMENTS FOR THOSE LOCATIONS SHALL COMPLY WITH OSHA STANDARDS 29 CFR PART 1926, SUBPART P AND AASHTO STANDARDS SPECIFICATIONS FOR HIGHWAY BRIDGES OR AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND AREMA MANUAL FOR RAILWAY ENGINEERING FOR RAILROAD LOADING.

SEE ITEM 402 TRENCH PROTECTION AND ITEM 403 TEMPORARY SPECIAL SHORING FOR ADDITIONAL REQUIREMENTS NOT STATED.

REQUIREMENTS BEFORE BEGINNING SHORING WORK OPERATIONS:

1. SUBMIT DETAILS AND DESIGN CALCULATIONS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER FOR APPROVAL THAT COMPLIES WITH OSHA STANDARDS AND INTERPRETATIONS, 29 CFR 1926, SUBPART P, EXCAVATIONS. DESIGN STRUCTURAL SYSTEMS TO COMPLY WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES OR AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
2. SUBMIT PROPOSED SEQUENCE OF WORK AND METHOD FOR SHORING IF DIFFERENT THAN PROPOSED IN THE SUBMITTED ENGINEERED PLAN.
3. RECEIVE APPROVAL FOR SUBSTITUTE SHORING AS SHOWN IN THE SUBMITTED ENGINEERED PLAN.
4. SUBMIT COMPETENT PERSONS NAME THAT WILL BE ON SITE.
5. SUBMIT SOIL CLASSIFICATION AND IDENTIFICATION TEST FOR EACH SPECIFIC STRUCTURE LOCATION.
6. PROCEED WITH WORK ONLY AFTER APPROVAL IS GIVEN BY THE ENGINEER.

MAXIMUM ALLOWABLE SLOPES PER 29 CFR 1926.652		
SOIL TYPE	SLOPE (H:V)	ANGLE (DEGREES)
STABLE ROCK	VERTICAL	90
TYPE A	3/4 : 1	53
TYPE B	1 : 1	45
TYPE C	1 1/2 : 1	34

MAXIMUM ALLOWABLE DEPTH OF CUT/TRENCH VARIES. SEE APPROVED ENGINEERED PLAN FOR SPECIFICS. SLOPES SHALL BE FLATTENED WHEN AN EXCAVATION HAS WATER CONDITIONS, SILTY MATERIALS, LOOSE BOULDERS, AND AREAS WHERE EROSION, DEEP FROST ACTION, SLIDE PLANES APPEAR, LOADING IMPOSED BY STRUCTURES, SURCHARGE LOADING FROM EQUIPMENT, OVERLYING MATERIAL LOADING, OR STORED MATERIAL; AND VIBRATION FROM EQUIPMENT, BLASTING, TRAFFIC OR OTHER SOURCES ARE PRESENT.

CUT AND RESTORING PAVEMENT GENERAL NOTES:

LIMITS OF CEMENT STABILIZED BACKFILL AND CUT & RESTORE PAVEMENT SHALL EXTEND 6" BEYOND EXISTING EDGE OF PAVEMENT ON EACH SIDE OF THE ROADWAY.

SEE QUANTITY SUMMARY FOR TEMPORARY SPECIAL SHORING AND TRENCH PROTECTION QUANTITIES AT APPLICABLE STRUCTURES.

TEMPORARY SPECIAL SHORING SHALL BE PLACED ON VERTICAL PLANE PARALLEL TO THE ROADWAY AS SHOWN ON SECTION A-A AND AS DESIGNED BY SUBMITTED ENGINEERED PLAN.

ON MULTI-BARREL STRUCTURES, ACCOUNT FOR ADDITIONAL BARREL WIDTHS AND BARREL SPACING. SEE CULVERT DATA SHEET FOR PROPOSED WORK AND APPLICABLE STANDARDS FOR STRUCTURE DIMENSIONS.

PLACE CEMENT STABILIZED BACKFILL AT DEPTH TO ALLOW A MINIMUM DEPTH OF 6" OF HOTMIX PLACEMENT.

HOT MIX TYPE TO BE APPROVED BY THE ENGINEER.

LENGTHENING AND SPECIAL NOTES FOR DOWEL OPERATIONS:

THE BREAK BACK LINES, AS SHOWN OR AS LOCATED AND APPROVED BY THE ENGINEER, SHALL BE SAW CUT (SCORED) 1" DEEP AND NORMAL TO THE CONCRETE SURFACE AS TO PROVIDE A CLEAN FIT UP OF NEW CONSTRUCTION. AFTER SCORING, REMOVE DAMAGED PORTIONS OF THE EXISTING STRUCTURE AND REPAIR AREAS TO A NEAT CONDITION MATCHING THE ORIGINAL PROFILE.

CARE SHALL BE TAKEN IN BREAKING BACK THE CONCRETE SO THAT EXISTING REINFORCING CAN BE RE-USED IF NEEDED. EXPOSED REINFORCING WHICH REMAINS FIRMLY ANCHORED TO THE CONCRETE SHALL BE CLEANED AND INCORPORATED INTO THE NEW CONSTRUCTION.

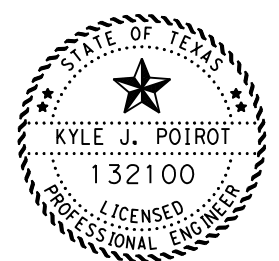
THE ROUGHENED, EXPOSED CONCRETE SURFACES SHALL BE CLEANED OF ALL LOOSE DEBRIS PRIOR TO THE PLACEMENT OF NEW CONCRETE.

UNLESS OTHERWISE APPROVED BY THE ENGINEER, USE ONLY HAND TOOLS OR POWER-DRIVEN CHIPPING HAMMERS (15-LB CLASS MAXIMUM) TO REMOVE CONCRETE ADJACENT TO EXTENSION AREA TO AVOID DAMAGING SURROUNDING CONCRETE.

HOLES SHALL BE DRILLED WITH A NON-IMPACT, ROTARY CORE DRILL AND CLEANED PER TXDOT SPECIFICATION REQUIREMENTS AND ADHESIVE MANUFACTURER'S INSTRUCTIONS. NO IMPACT HAMMER DRILLS WILL BE ALLOWED. NOTE THAT A SPECIAL DRILL BIT (TO CUT THROUGH EXISTING REINFORCING) MAY BE REQUIRED. ANCHORS SHALL BE INSTALLED PER ADHESIVE MANUFACTURER'S INSTRUCTIONS. SEE ITEM 420 "CONCRETE STRUCTURES SECTION 420.4.7.10 INSTALLATION OF DOWELS AND ANCHOR BOLTS IN ADDITION TO ITEM 450 RAILING FOR ALL INSTALLATION REQUIREMENTS.

ANCHOR ADHESIVE CHOSEN MUST BE ABLE TO ACHIEVE A BASIC BOND STRENGTH IN TENSION,  $N_{ba}$ , OF 26.4 KIPS. SUBMIT SIGNED AND SEALED CALCULATIONS OR THE MANUFACTURERS PUBLISHED LITERATURE SHOWING THE PROPOSED ANCHOR ADHESIVE'S ABILITY TO DEVELOP THIS LOAD TO THE ENGINEER FOR APPROVAL PRIOR TO USE. ANCHOR INSTALLATION, INCLUDING HOLE SIZE, DRILLING, AND CLEAN OUT, MUST BE IN ACCORDANCE WITH ITEM 450, "RAILING." TEST ADHESIVE ANCHORS IN ACCORDANCE WITH ITEM 450.3.3, "TESTS." TEST 3 ANCHORS PER 100 ANCHORS INSTALLED. BREAK BACK WINGS AND APRON AS NECESSARY TO INSTALL THE EXTENSION. CLEAN AND EXTEND THE EXPOSED WINGWALL AND APRON REINFORCING INTO THE EXTENSION. WHEN LENGTHENING EXISTING BOX CULVERTS WITH DIMENSIONS DIFFERENT THAN CURRENT STANDARD DIMENSIONS, FORM HORIZONTAL AND VERTICAL TRANSITIONS AS DIRECTED BY THE ENGINEER. MATCH BOTTOM SLABS TO MAINTAIN AN UNINTERRUPTED FLOW LINE. FIELD BEND EXISTING AND NEW REINFORCING INTO TRANSITIONS AND MAINTAIN SPECIFIED COVER REQUIREMENTS.

DATE: \$DATES \$TIME\$  
FILE: \$FILES



*Kyle J. Poirot, P.E.*

9/22/2021

**US 82**  
**TEMPORARY SHORING**  
**DETAILS**



SHEET 5 OF 6			
CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	190D	


SUMMARY OF TEMPORARY SPECIAL SHORING & TRENCH PROTECTION

STRUCTURE #	STATION	STRUCTURE TYPE	DESCRIPTION OF STRUCTURE	LEFT/RIGHT	EXISTING END TREATMENT TYPE	TYPE OF SHORING		TRENCH PROTECTION (LF)	RETAIN EXISTING PARALLEL WING (YES/NO)	RETAIN EXISTING FLARED WING (YES/NO)	REMARKS
						BENCH OR SLOPING (SF)	MECHANICAL (SF)				
7	231+58.48	BOX	1 ~ 3' X 2'	LEFT	FLARED WINGS		380			NO	REPLACEMENT OF EXISTING STRUCTURE
7	231+58.48	BOX	1 ~ 3' X 2'	RIGHT	PARALLEL WINGS		380		NO		REPLACEMENT OF EXISTING STRUCTURE
15	302+43.68	BOX	1 ~ 4' X 4'	LEFT	FLARED WINGS		160			NO	
15	302+43.68	BOX	1 ~ 4' X 4'	RIGHT	FLARED WINGS		160			NO	
24	411+38.62	CMP	2-30" CMP	LEFT	6:1 SET		300				REPLACEMENT OF EXISTING STRUCTURE
24	411+38.62	CMP	2-30" CMP	RIGHT	6:1 SET		300				REPLACEMENT OF EXISTING STRUCTURE
PROJECT TOTALS							1680				

DATE: \$DATE\$ \$TIME\$  
FILE: \$FILE\$

**\*\*NOTE\*\*:**  
EVALUATION OF THE EXISTING WINGWALL TO REMAIN SHALL BE PERFORMED TO ENSURE STABILITY OF THE WALL ONCE DETACHED FROM EXISTING CULVERT WALL. SUBMIT THIS EVALUATION FOR APPROVAL PRIOR TO PERFORMING ANY REMOVAL.

**US 82**  
TEMPORARY SHORING  
DETAILS

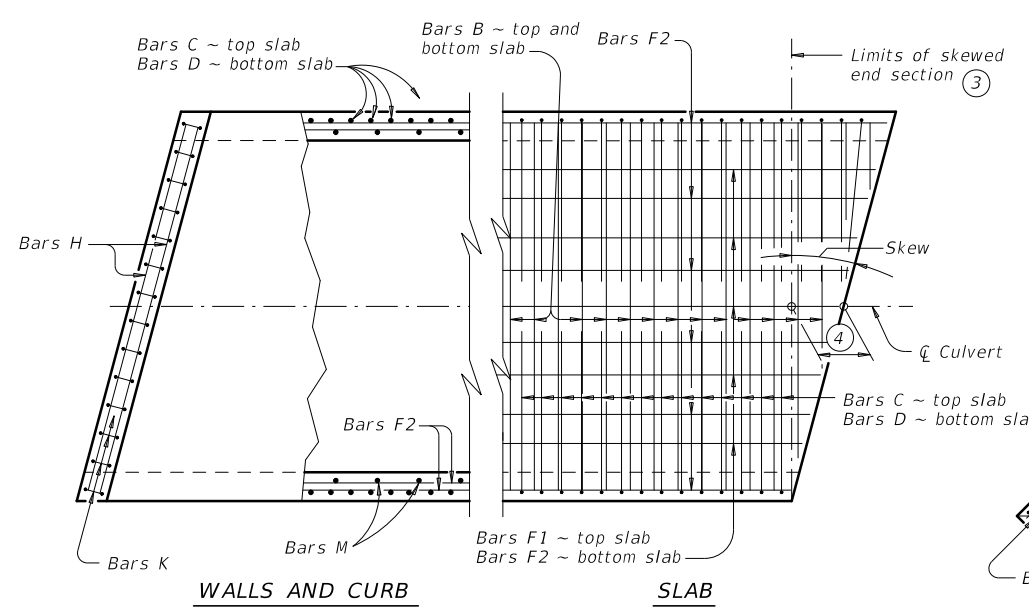


19 YEARS  
Texas Department of Transportation®  
SHEET 6 OF 6

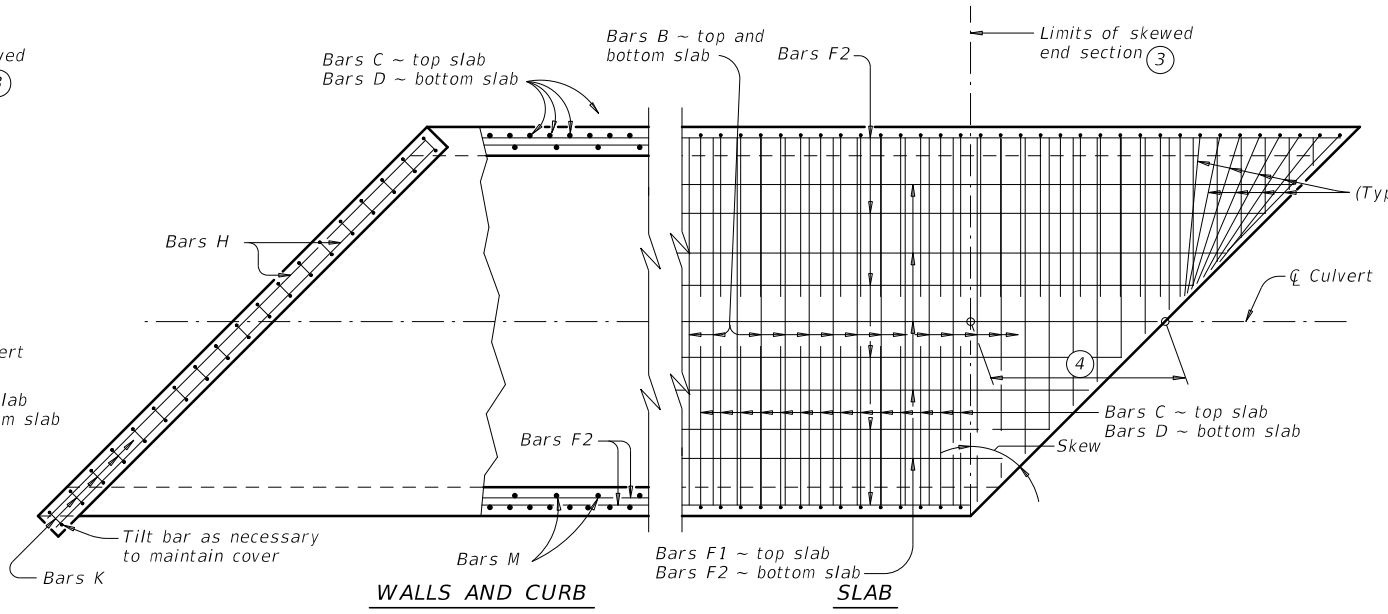
CONT	SECT	JOB	HIGHWAY
0133	04	042	US 82
DIST	COUNTY		SHEET NO.
WFS	BAYLOR		190F

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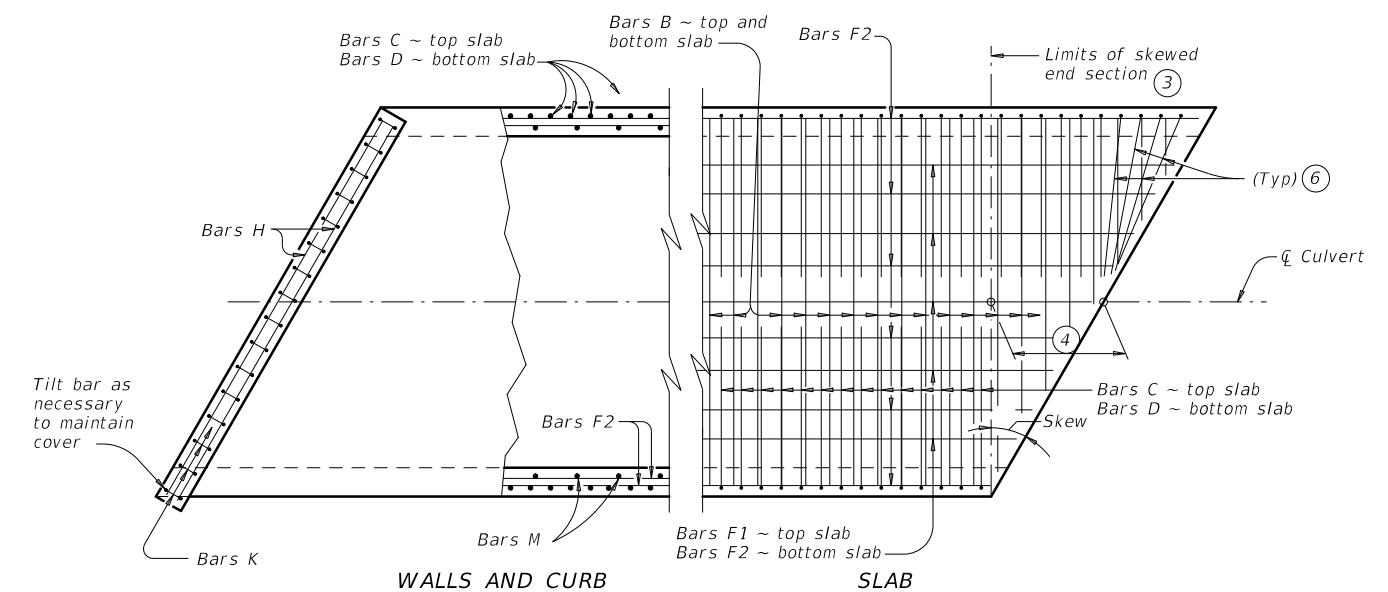
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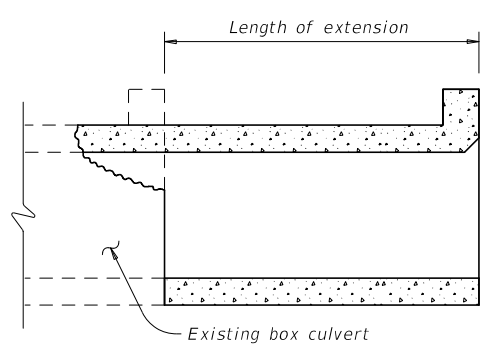
PLAN OF SKEWED ENDS ~ FROM 0° TO 15° ⑦



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



LENGTHENING DETAIL ①

① For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.  
For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, N<sub>ba</sub>, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.  
Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

- ② When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.
- ③ The length of Bars B vary in the skewed end sections.
- ④  $[One\ half\ of\ overall\ width] \times [tangent\ of\ the\ skew\ angle]$
- ⑤ Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- ⑥ When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- ⑦ At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standards sheets to accommodate the skew.

**CONSTRUCTION NOTES:**  
Do not use permanent forms.  
When required, lap Bars H 1'-8" for uncoated or galvanized bars.  
Provide a minimum of 1 1/2" clear cover.

**MATERIAL NOTES:**  
Provide Grade 60 reinforcing steel.  
Provide galvanized reinforcing steel, if required elsewhere in the plans.  
Provide Class C concrete (f'c = 3,600 psi) with these exceptions:  
provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

**GENERAL NOTES:**  
Designed according to AASHTO LRFD Bridge Design Specifications.  
Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.  
For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.  
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-In-Place (SCC) standard sheets by the cosine of the skew angle.

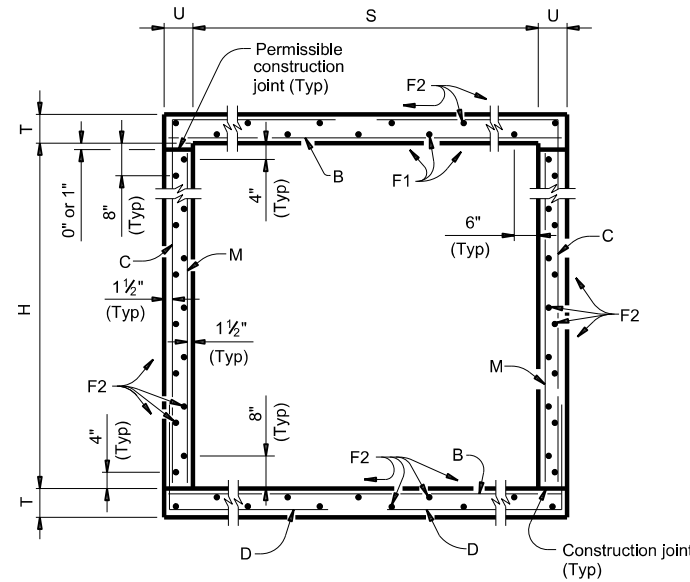
Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

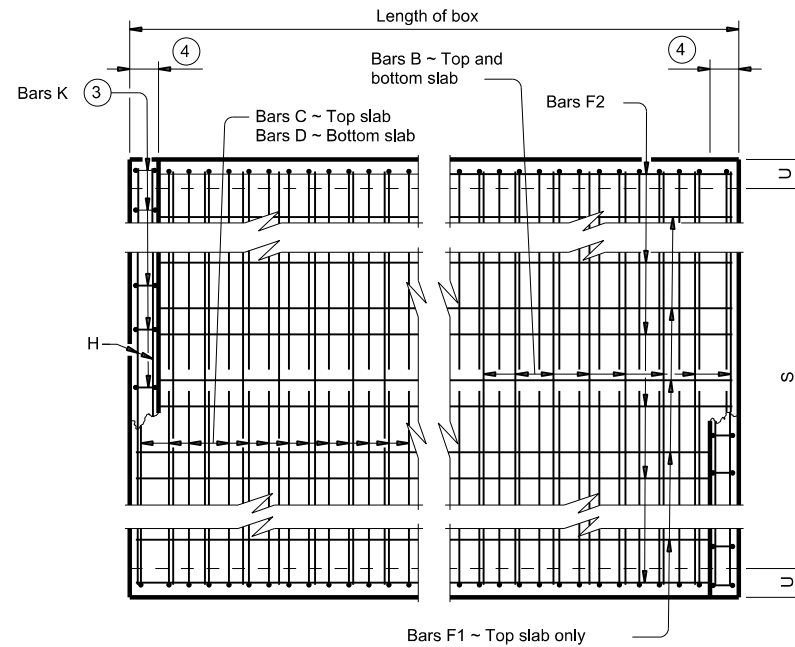
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<b>SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS</b>			
<b>SCC-MD</b>			
FILE: sccmdste-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT February 2020	CONT 0133	SECT 04	JOB 042
REVISIONS	US 82	COUNTY	SHEET NO.
WFS	BAYLOR		191

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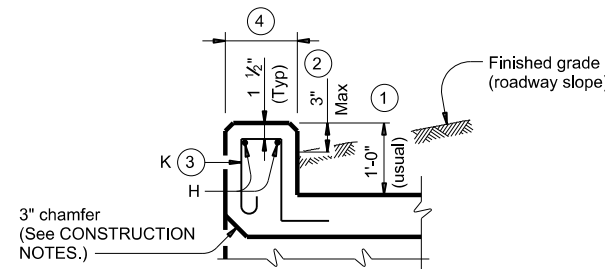
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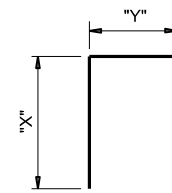
**TYPICAL SECTION**



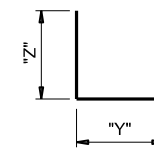
**PLAN OF REINF STEEL**



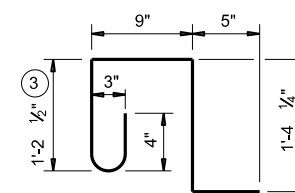
**SECTION THRU CURB**



BARS C



BARS D



BARS K (#4)  
 (Spa = 1'-0" Max)  
 (Length = 4'-2")

- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" above finished grade.
  - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.  
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.  
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

**CONSTRUCTION NOTES:**

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

**MATERIAL NOTES:**

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
  - culverts with overlay,
  - culverts with 1-to-2 course surface treatment, or
  - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
  - Uncoated or galvanized ~ #4 = 1'-8" Min
  - Uncoated or galvanized ~ #5 = 2'-1" Min

**GENERAL NOTES:**

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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

HL93 LOADING

SHEET 1 OF 2



**SINGLE BOX CULVERTS  
 CAST-IN-PLACE  
 0' TO 30' FILL**

**SCC-3 & 4**

FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	192	


DATE: 9/7/2021 9:14:36 AM  
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DISCLAIMER:

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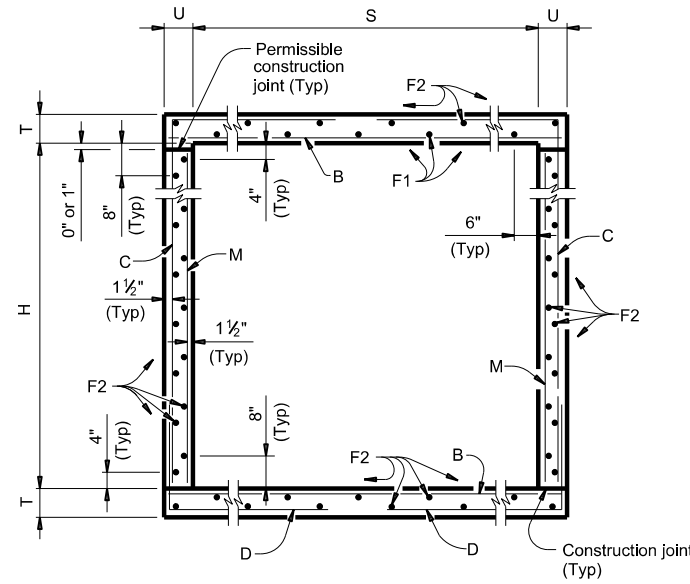
SECTION DIMENSIONS				⑤ FILL HEIGHT	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B					Bars C					Bars D					Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total					
					S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)
3' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	5' - 4"	385	2' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	19	39' - 9"	505	3' - 11"	10	10	28	0.292	48.1	0.3	38	12.0	1,960
3' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	6' - 4"	457	3' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	23	39' - 9"	611	3' - 11"	10	10	28	0.335	54.3	0.3	38	13.7	2,210
4' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	5' - 8"	613	2' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	21	39' - 9"	558	4' - 11"	13	12	33	0.342	63.4	0.4	46	14.1	2,581
4' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	6' - 8"	721	3' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.385	70.5	0.4	46	15.8	2,867
4' - 0"	4' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	7' - 8"	830	4' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	4' - 0"	289	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.428	75.1	0.4	46	17.5	3,049

⑤ For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

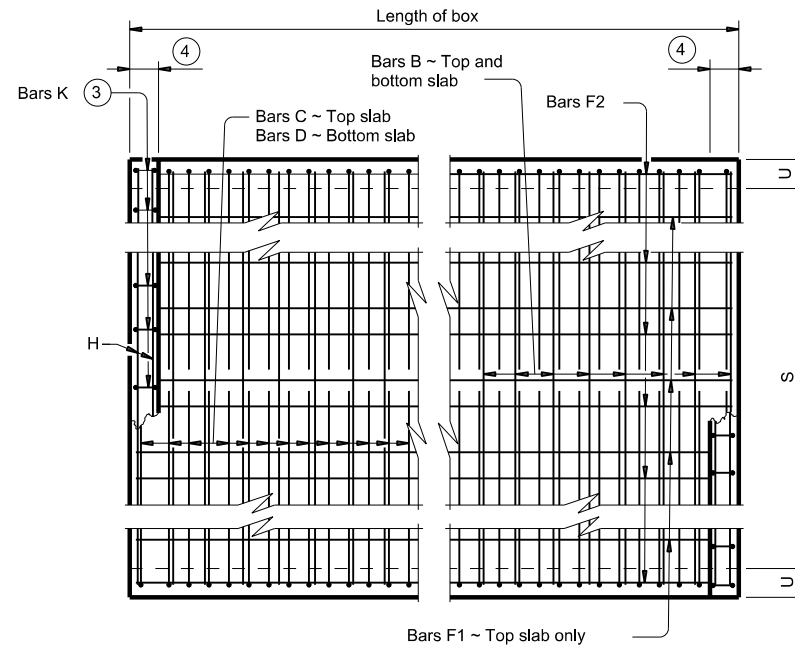
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<b>SINGLE BOX CULVERTS          CAST-IN-PLACE          0' TO 30' FILL</b>					
<b>SCC-3 &amp; 4</b>					
FILE:	scc34ste-21.dgn	DN:	TBE	CK:	BMP
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REVISIONS	0133	04	042	US	82
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.	
	WFS	BAYLOR		193	

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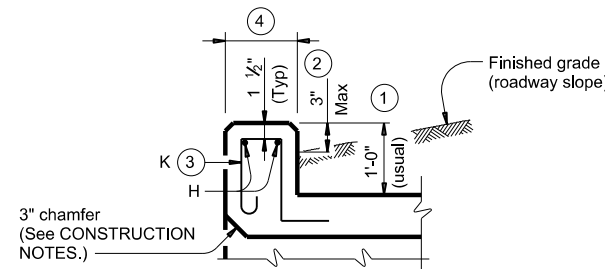
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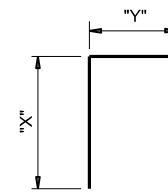
**TYPICAL SECTION**



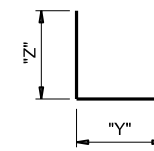
**PLAN OF REINF STEEL**



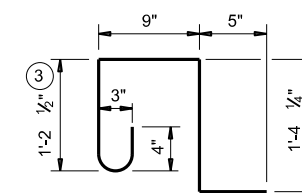
**SECTION THRU CURB**



BARS C



BARS D



BARS K (#4)  
 (Spa = 1'-0" Max)  
 (Length = 4'-2")

- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" above finished grade.
  - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, worked up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.  
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.  
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

**CONSTRUCTION NOTES:**

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

**MATERIAL NOTES:**

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
  - culverts with overlay,
  - culverts with 1-to-2 course surface treatment, or
  - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
  - Uncoated or galvanized ~ #4 = 1'-8" Min
  - Uncoated or galvanized ~ #5 = 2'-1" Min
  - Uncoated or galvanized ~ #6 = 2'-6" Min

**GENERAL NOTES:**

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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

HL93 LOADING

SHEET 1 OF 2



**SINGLE BOX CULVERTS  
 CAST-IN-PLACE  
 0' TO 30' FILL**

**SCC-7**

FILE: scc07ste-21.dgn	DN: TBE	CK: BMP	DWR: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	194	

DATE: 9/7/2021 9:14:41 AM  
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SECTION DIMENSIONS				FILL HEIGHT	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																										QUANTITIES												
					Bars B					Bars C					Bars D					Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa		Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total						
					S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)
7' - 0"	3' - 0"	8"	7"	16'	108	#6	9"	7' - 11"	1,284	162	#5	6"	7' - 11"	1,338	3' - 6"	4' - 5"	162	#5	6"	7' - 1"	1,197	4' - 5"	2' - 8"	108	9"	3' - 0"	216	5	39' - 9"	133	31	39' - 9"	823	7' - 11"	21	18	50	0.533	124.8	0.6	71	21.9	5,062
7' - 0"	3' - 0"	9"	7"	20'	108	#6	9"	7' - 11"	1,284	162	#5	6"	8' - 0"	1,352	3' - 7"	4' - 5"	162	#5	6"	7' - 2"	1,211	4' - 5"	2' - 9"	108	9"	3' - 0"	216	5	39' - 9"	133	31	39' - 9"	823	7' - 11"	21	18	50	0.583	125.5	0.6	71	23.9	5,090
7' - 0"	3' - 0"	10"	8"	23'	108	#6	9"	8' - 1"	1,311	162	#5	6"	8' - 2"	1,380	3' - 8"	4' - 6"	162	#5	6"	7' - 4"	1,239	4' - 6"	2' - 10"	82	12"	3' - 0"	164	5	39' - 9"	133	31	39' - 9"	823	8' - 1"	22	20	56	0.663	126.3	0.6	78	27.1	5,128
7' - 0"	3' - 0"	11"	8"	30'	108	#6	9"	8' - 1"	1,311	162	#5	6"	8' - 3"	1,394	3' - 9"	4' - 6"	162	#5	6"	7' - 5"	1,253	4' - 6"	2' - 11"	82	12"	3' - 0"	164	5	39' - 9"	133	31	39' - 9"	823	8' - 1"	22	20	56	0.714	127.0	0.6	78	29.2	5,156
7' - 0"	4' - 0"	8"	7"	16'	108	#6	9"	7' - 11"	1,284	162	#5	6"	8' - 11"	1,507	4' - 6"	4' - 5"	162	#5	6"	7' - 1"	1,197	4' - 5"	2' - 8"	108	9"	4' - 0"	289	5	39' - 9"	133	31	39' - 9"	823	7' - 11"	21	18	50	0.576	130.8	0.6	71	23.6	5,304
7' - 0"	4' - 0"	9"	7"	20'	108	#6	9"	7' - 11"	1,284	162	#5	6"	9' - 0"	1,521	4' - 7"	4' - 5"	162	#5	6"	7' - 2"	1,211	4' - 5"	2' - 9"	108	9"	4' - 0"	289	5	39' - 9"	133	31	39' - 9"	823	7' - 11"	21	18	50	0.627	131.5	0.6	71	25.7	5,332
7' - 0"	4' - 0"	10"	8"	23'	108	#6	9"	8' - 1"	1,311	162	#5	6"	9' - 2"	1,549	4' - 8"	4' - 6"	162	#5	6"	7' - 4"	1,239	4' - 6"	2' - 10"	82	12"	4' - 0"	219	5	39' - 9"	133	31	39' - 9"	823	8' - 1"	22	20	56	0.712	131.9	0.6	78	29.1	5,352
7' - 0"	4' - 0"	11"	8"	30'	162	#6	6"	8' - 1"	1,967	162	#5	6"	9' - 3"	1,563	4' - 9"	4' - 6"	162	#5	6"	7' - 5"	1,253	4' - 6"	2' - 11"	82	12"	4' - 0"	219	5	39' - 9"	133	31	39' - 9"	823	8' - 1"	22	20	56	0.763	149.0	0.6	78	31.1	6,036
7' - 0"	5' - 0"	8"	7"	16'	108	#6	9"	7' - 11"	1,284	162	#5	6"	9' - 11"	1,676	5' - 6"	4' - 5"	162	#5	6"	7' - 1"	1,197	4' - 5"	2' - 8"	108	9"	5' - 0"	361	5	39' - 9"	133	35	39' - 9"	929	7' - 11"	21	18	50	0.619	139.5	0.6	71	25.4	5,651
7' - 0"	5' - 0"	9"	7"	20'	108	#6	9"	7' - 11"	1,284	162	#5	6"	10' - 0"	1,690	5' - 7"	4' - 5"	162	#5	6"	7' - 2"	1,211	4' - 5"	2' - 9"	108	9"	5' - 0"	361	5	39' - 9"	133	35	39' - 9"	929	7' - 11"	21	18	50	0.670	140.2	0.6	71	27.4	5,679
7' - 0"	5' - 0"	10"	8"	23'	108	#6	9"	8' - 1"	1,311	162	#5	6"	10' - 2"	1,718	5' - 8"	4' - 6"	162	#5	6"	7' - 4"	1,239	4' - 6"	2' - 10"	82	12"	5' - 0"	274	5	39' - 9"	133	35	39' - 9"	929	8' - 1"	22	20	56	0.761	140.1	0.6	78	31.1	5,682
7' - 0"	5' - 0"	11"	8"	30'	162	#6	6"	8' - 1"	1,967	162	#5	6"	10' - 3"	1,732	5' - 9"	4' - 6"	162	#5	6"	7' - 5"	1,253	4' - 6"	2' - 11"	82	12"	5' - 0"	274	5	39' - 9"	133	35	39' - 9"	929	8' - 1"	22	20	56	0.813	157.2	0.6	78	33.1	6,366
7' - 0"	6' - 0"	8"	7"	16'	108	#6	9"	7' - 11"	1,284	162	#5	6"	10' - 11"	1,845	6' - 6"	4' - 5"	162	#5	6"	7' - 1"	1,197	4' - 5"	2' - 8"	108	9"	6' - 0"	433	5	39' - 9"	133	39	39' - 9"	1,036	7' - 11"	21	18	50	0.663	148.2	0.6	71	27.1	5,999
7' - 0"	6' - 0"	9"	7"	20'	108	#6	9"	7' - 11"	1,284	162	#5	6"	11' - 0"	1,859	6' - 7"	4' - 5"	162	#5	6"	7' - 2"	1,211	4' - 5"	2' - 9"	108	9"	6' - 0"	433	5	39' - 9"	133	39	39' - 9"	1,036	7' - 11"	21	18	50	0.713	148.9	0.6	71	29.1	6,027
7' - 0"	6' - 0"	10"	8"	23'	108	#6	9"	8' - 1"	1,311	162	#5	6"	11' - 2"	1,887	6' - 8"	4' - 6"	162	#5	6"	7' - 4"	1,239	4' - 6"	2' - 10"	82	12"	6' - 0"	329	5	39' - 9"	133	39	39' - 9"	1,036	8' - 1"	22	20	56	0.811	148.4	0.6	78	33.1	6,013
7' - 0"	6' - 0"	11"	8"	30'	162	#6	6"	8' - 1"	1,967	162	#5	6"	11' - 3"	1,901	6' - 9"	4' - 6"	162	#5	6"	7' - 5"	1,253	4' - 6"	2' - 11"	82	12"	6' - 0"	329	5	39' - 9"	133	39	39' - 9"	1,036	8' - 1"	22	20	56	0.862	165.5	0.6	78	35.1	6,697
7' - 0"	7' - 0"	8"	7"	16'	108	#6	9"	7' - 11"	1,284	162	#5	6"	11' - 11"	2,014	7' - 6"	4' - 5"	162	#5	6"	7' - 1"	1,197	4' - 5"	2' - 8"	108	9"	7' - 0"	505	5	39' - 9"	133	39	39' - 9"	1,036	7' - 11"	21	18	50	0.706	154.2	0.6	71	28.8	6,240
7' - 0"	7' - 0"	9"	7"	20'	108	#6	9"	7' - 11"	1,284	162	#5	6"	12' - 0"	2,028	7' - 7"	4' - 5"	162	#5	6"	7' - 2"	1,211	4' - 5"	2' - 9"	108	9"	7' - 0"	505	5	39' - 9"	133	39	39' - 9"	1,036	7' - 11"	21	18	50	0.756	154.9	0.6	71	30.8	6,268
7' - 0"	7' - 0"	10"	8"	23'	108	#6	9"	8' - 1"	1,311	162	#5	6"	12' - 2"	2,056	7' - 8"	4' - 6"	162	#5	6"	7' - 4"	1,239	4' - 6"	2' - 10"	108	9"	7' - 0"	505	5	39' - 9"	133	39	39' - 9"	1,036	8' - 1"	22	20	56	0.860	157.0	0.6	78	35.0	6,358
7' - 0"	7' - 0"	11"	8"	30'	162	#6	6"	8' - 1"	1,967	162	#5	6"	12' - 3"	2,070	7' - 9"	4' - 6"	162	#5	6"	7' - 5"	1,253	4' - 6"	2' - 11"	108	9"	7' - 0"	505	5	39' - 9"	133	39	39' - 9"	1,036	8' - 1"	22	20	56	0.912	174.1	0.6	78	37.1	7,042

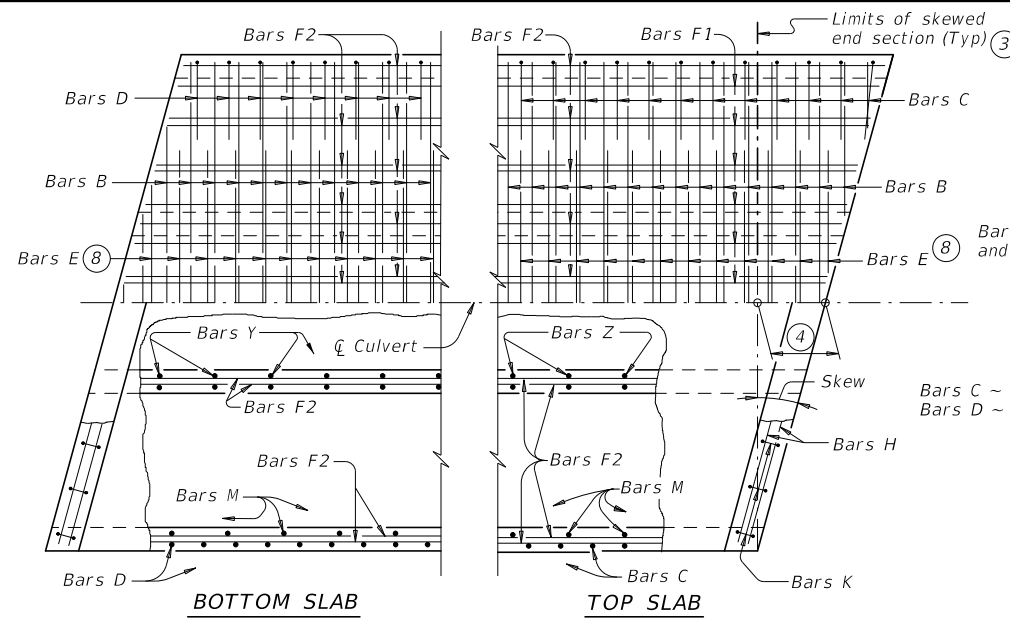
5 For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

<b>SINGLE BOX CULVERTS          CAST-IN-PLACE          0' TO 30' FILL</b>			
<b>SCC-7</b>			
FILE: scc07ste-21.dgn	DN: TBE	CK: BMP	DWR: TxDOT
©TxDOT February 2020	CONC: 0133	SECT: 04	HIGHWAY: US 82
REVISIONS	JOB		SHEET NO.
04/2021 Updated X values.	COUNTY: BAYLOR		195



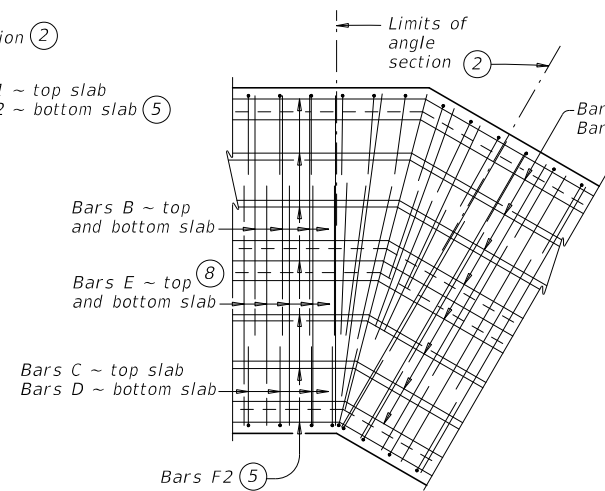
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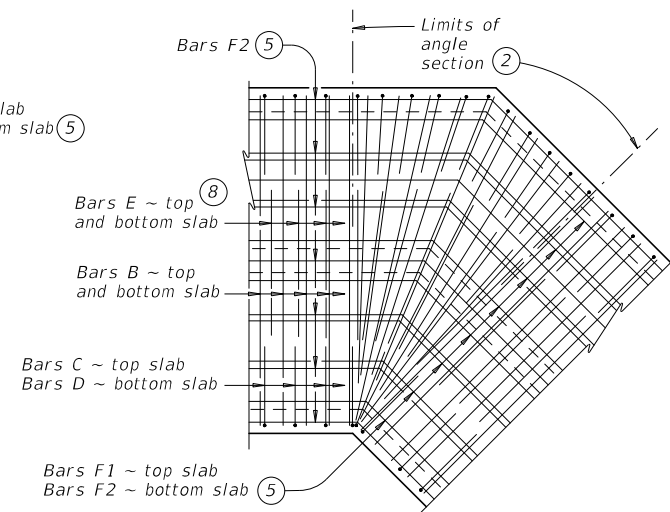


PLAN OF SKEWED ENDS ~ FROM 0° TO 15°

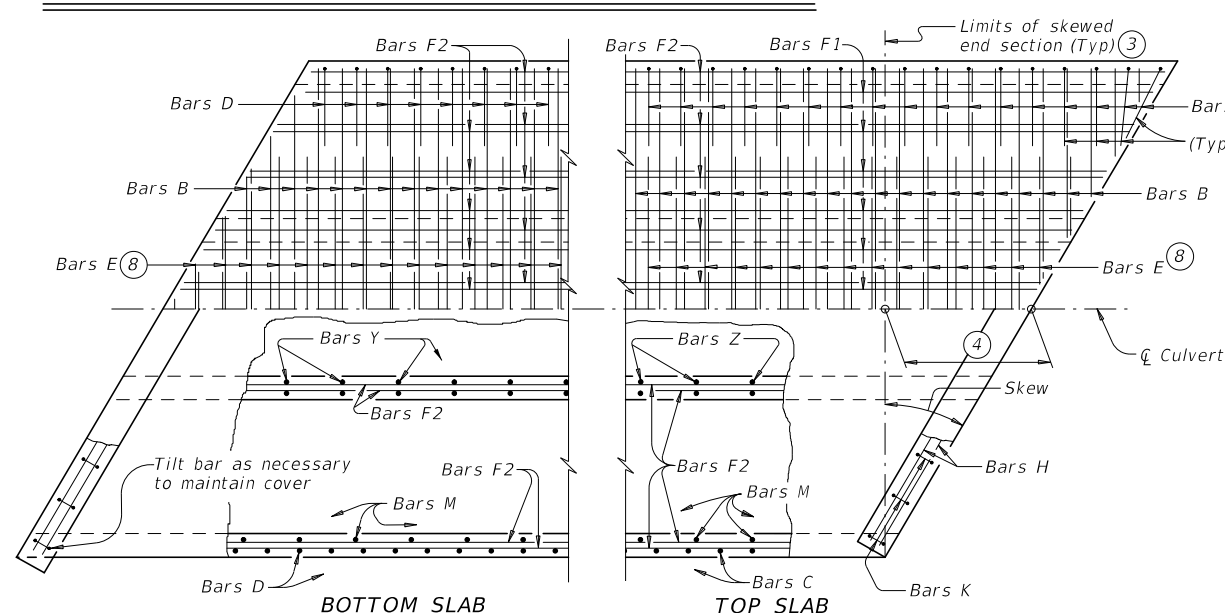
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°

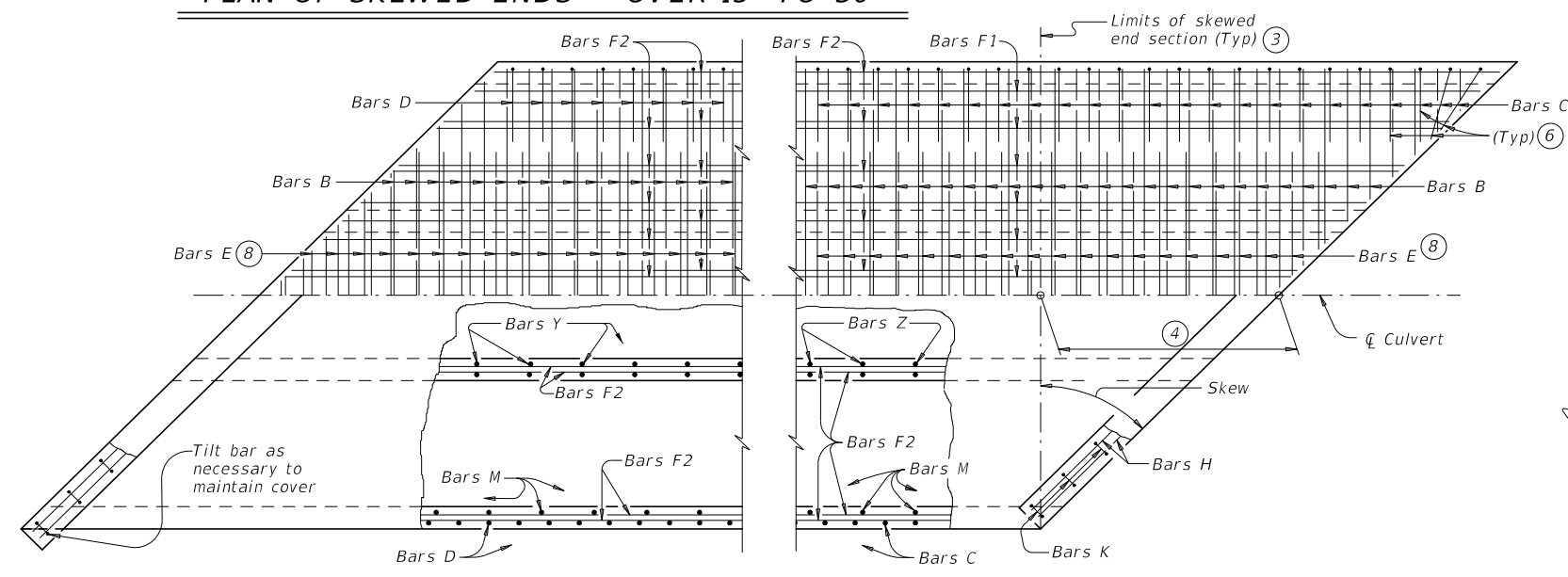


PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

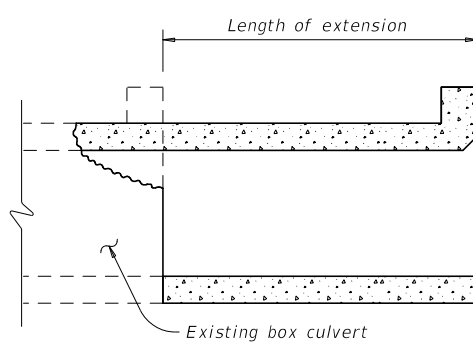


PLAN OF SKEWED ENDS ~ OVER 15° TO 30°

- ① For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.  
For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, Class C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension,  $N_{ba}$ , of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.  
Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.
- ② When the spacing between Bars B or Bars E becomes less than half of the normal spacing, cut bars to avoid conflict.
- ③ The length of Bars B and Bars E will vary in the skewed end sections.
- ④  $[0.5 \times \text{overall width}] \times [\text{tangent of the skew angle}]$
- ⑤ Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- ⑥ When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- ⑦ At the Contractor's option, for skews of 15° or less, place Bars B, C, D, and E parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B and Bars E shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets to accommodate the skew.
- ⑧ Extend Bars E as shown on the MC standard sheet for direct traffic culverts.



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



LENGTHENING DETAIL

- CONSTRUCTION NOTES:**  
Do not use permanent forms.  
When required, lap Bars H 1'-8" for uncoated or galvanized bars.  
Provide a minimum of 1 1/2" clear cover.
- MATERIAL NOTES:**  
Provide Grade 60 reinforcing steel.  
Provide galvanized reinforcing steel, if required elsewhere in the plans.  
Provide Class C concrete ( $f'_c = 3,600$  psi) with these exceptions:  
provide Class S concrete ( $f'_c = 4,000$  psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
- GENERAL NOTES:**  
Designed according to AASHTO LRFD Bridge Design Specifications.  
Refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for details of straight sections of culvert.  
For skewed sections and angle sections, refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.  
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets by the cosine of the skew angle.
- Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation  
Bridge Division Standard

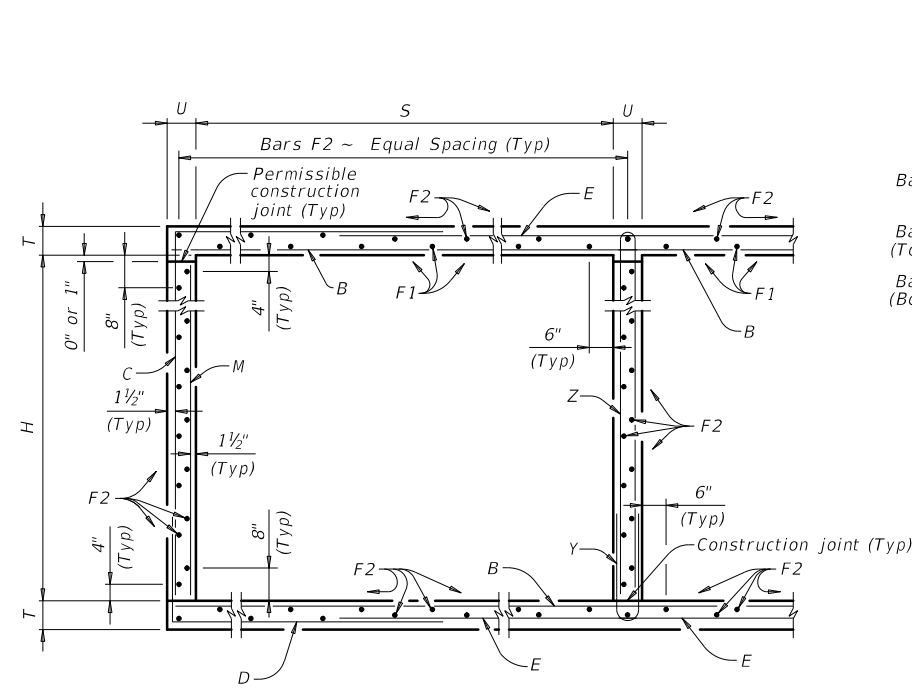
## MULTIPLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

MC-MD

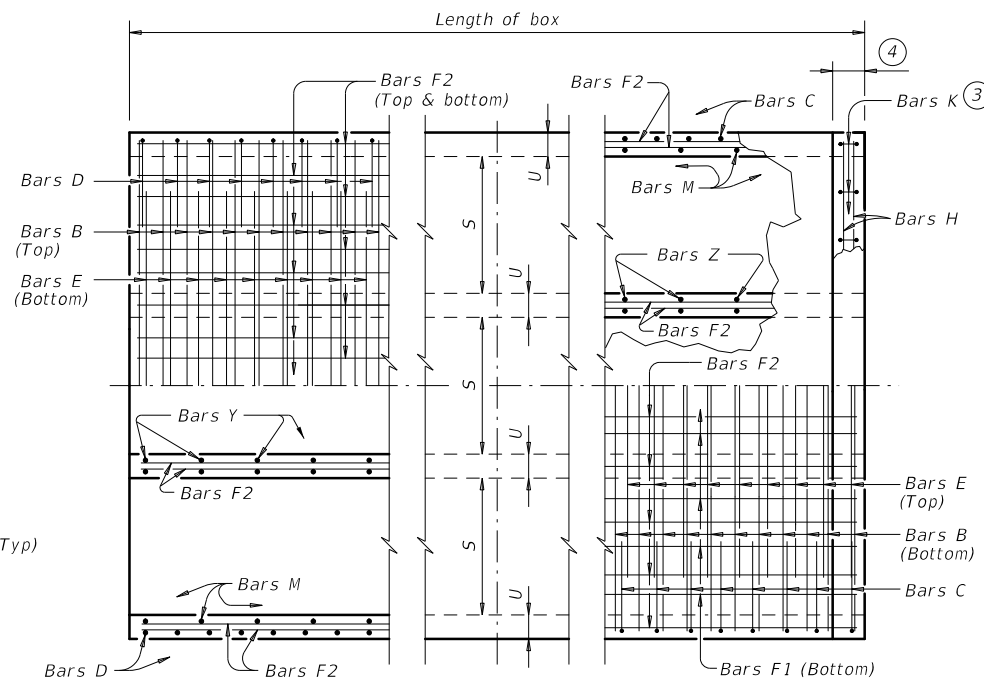
FILE: mc-mdste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	196	

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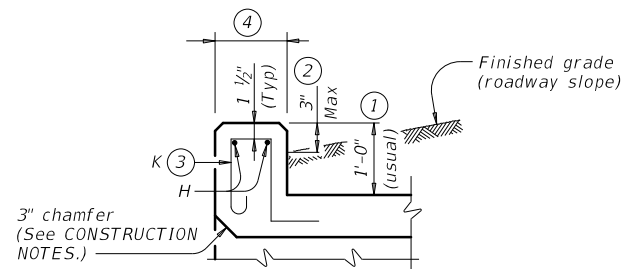
DATE: FILE:



**TYPICAL SECTION**

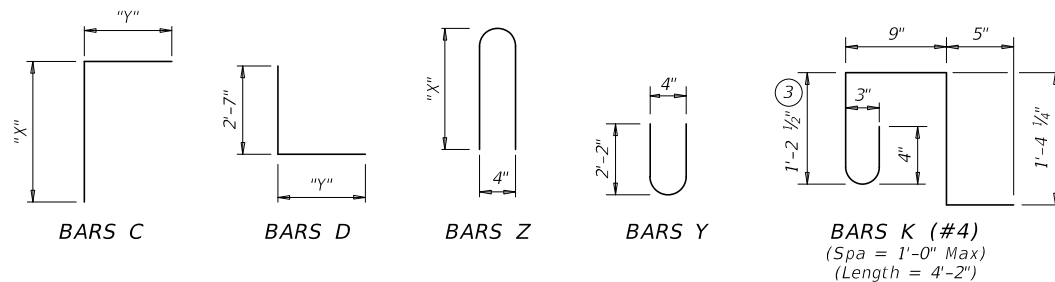


**BOTTOM SLAB**      **TOP SLAB**  
**PART PLANS**



**SECTION THRU CURB**

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
2'-0"	2'-6 1/2"	3'-8 1/2"
3'-0"	3'-6 1/2"	3'-8 1/2"
4'-0"	4'-6 1/2"	3'-8 1/2"
5'-0"	5'-6 1/2"	3'-8 1/2"



- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" above finished grade.
  - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR  
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.  
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

**CONSTRUCTION NOTES:**

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

**MATERIAL NOTES:**

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
  - culverts with overlay,
  - culverts with 1-to-2 course surface treatment, or
  - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
  - Uncoated or galvanized ~ #4 = 1'-8" Min
  - Uncoated or galvanized ~ #5 = 2'-1" Min
  - Uncoated or galvanized ~ #6 = 2'-6" Min

**GENERAL NOTES:**

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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



**MULTIPLE BOX CULVERTS CAST-IN-PLACE**  
**5'-0" SPAN**  
**0' TO 20' FILL**

**MC-5-20**


FILE: mc520ste-20.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133		042	US 82
	DIST	COUNTY		SHEET NO.
	WFS	BAYLOR		197

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DATE: FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES																				
					Bars B				Bars C & D				Bars E				Bars F1 ~ #4			Bars F2 ~ #4			Bars M ~ #4			Bars Y & Z ~ #4				Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total											
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bars C		Bars D		No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Bars Y		Bars Z		Length	Wt	No.	Wt	Conc (CY)	Ref (Lb)	Conc (CY)	Ref (Lb)	Conc (CY)	Ref (Lb)
2	5'-0"	2'-0"	8"	7"	108	#5	9"	11'-6"	1,295	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	38	18"	39'-9"	1,009	108	9"	2'-0"	144	54	9"	4'-7"	165	5'-3"	189	11'-6"	31	26	72	0.710	135.2	0.9	103	29.3	5,510
3	5'-0"	2'-0"	8"	7"	108	#5	9"	17'-1"	1,924	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	54	18"	39'-9"	1,434	108	9"	2'-0"	144	108	9"	4'-7"	331	5'-3"	379	17'-1"	46	38	106	1.029	188.8	1.3	152	42.4	7,705
4	5'-0"	2'-0"	8"	7"	108	#5	9"	22'-8"	2,553	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	70	18"	39'-9"	1,859	108	9"	2'-0"	144	162	9"	4'-7"	496	5'-3"	568	22'-8"	61	48	134	1.348	242.4	1.7	195	55.6	9,891
5	5'-0"	2'-0"	8"	7"	108	#5	9"	28'-3"	3,182	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	86	18"	39'-9"	2,284	108	9"	2'-0"	144	216	9"	4'-7"	661	5'-3"	758	28'-3"	75	60	167	1.667	296.0	2.1	242	68.8	12,082
6	5'-0"	2'-0"	8"	7"	108	#5	9"	33'-10"	3,811	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	102	18"	39'-9"	2,708	108	9"	2'-0"	144	270	9"	4'-7"	827	5'-3"	947	33'-10"	90	70	195	1.986	349.6	2.5	285	82.0	14,268
2	5'-0"	3'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	3'-0"	216	54	9"	4'-7"	165	7'-3"	262	11'-6"	31	26	72	0.775	159.9	0.9	103	31.9	6,497
3	5'-0"	3'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	3'-0"	216	108	9"	4'-7"	331	7'-3"	523	17'-1"	46	38	106	1.115	223.5	1.3	152	45.9	9,093
4	5'-0"	3'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	3'-0"	216	162	9"	4'-7"	496	7'-3"	785	22'-8"	61	48	134	1.456	287.2	1.7	195	59.9	11,682
5	5'-0"	3'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	3'-0"	216	216	9"	4'-7"	661	7'-3"	1,046	28'-3"	75	60	167	1.796	350.8	2.1	242	73.9	14,274
6	5'-0"	3'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	3'-0"	216	270	9"	4'-7"	827	7'-3"	1,308	33'-10"	90	70	195	2.137	414.5	2.5	285	88.0	16,863
2	5'-0"	4'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	4'-0"	289	54	9"	4'-7"	165	9'-3"	334	11'-6"	31	26	72	0.840	166.3	0.9	103	34.5	6,754
3	5'-0"	4'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	4'-0"	289	108	9"	4'-7"	331	9'-3"	667	17'-1"	46	38	106	1.202	231.8	1.3	152	49.4	9,422
4	5'-0"	4'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	4'-0"	289	162	9"	4'-7"	496	9'-3"	1,001	22'-8"	61	48	134	1.564	297.2	1.7	195	64.3	12,083
5	5'-0"	4'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	4'-0"	289	216	9"	4'-7"	661	9'-3"	1,335	28'-3"	75	60	167	1.926	362.7	2.1	242	79.1	14,748
6	5'-0"	4'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	4'-0"	289	270	9"	4'-7"	827	9'-3"	1,668	33'-10"	90	70	195	2.288	428.1	2.5	285	94.0	17,408
2	5'-0"	5'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	50	18"	39'-9"	1,328	108	9"	5'-0"	361	54	9"	4'-7"	165	11'-3"	406	11'-6"	31	26	72	0.904	176.7	0.9	103	37.0	7,171
3	5'-0"	5'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	70	18"	39'-9"	1,859	108	9"	5'-0"	361	108	9"	4'-7"	331	11'-3"	812	17'-1"	46	38	106	1.288	245.3	1.3	152	52.8	9,965
4	5'-0"	5'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	90	18"	39'-9"	2,390	108	9"	5'-0"	361	162	9"	4'-7"	496	11'-3"	1,217	22'-8"	61	48	134	1.672	313.9	1.7	195	68.6	12,750
5	5'-0"	5'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	110	18"	39'-9"	2,921	108	9"	5'-0"	361	216	9"	4'-7"	661	11'-3"	1,623	28'-3"	75	60	167	2.056	382.5	2.1	242	84.3	15,540
6	5'-0"	5'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	130	18"	39'-9"	3,452	108	9"	5'-0"	361	270	9"	4'-7"	827	11'-3"	2,029	33'-10"	90	70	195	2.439	451.0	2.5	285	100.1	18,326

HL93 LOADING SHEET 2 OF 2

				<b>Bridge Division Standard</b>	
<b>MULTIPLE BOX CULVERTS CAST-IN-PLACE 5'-0" SPAN 0' TO 20' FILL</b>					
<b>MC-5-20</b>					
FILE: mc520ste-20.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0133	04	042	US 82	
	DIST	COUNTY		SHEET NO.	
	WFS	BAYLOR		198	

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DATE: FILE:

**TABLE OF DIMENSIONS AND REINFORCING STEEL**  
(Wings for one structure end)

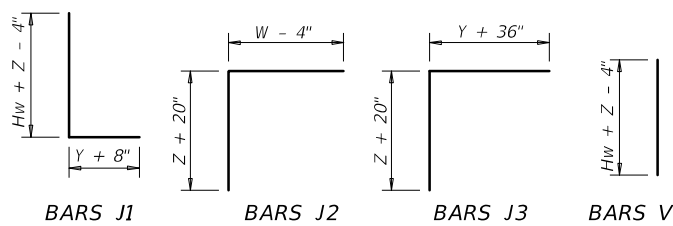
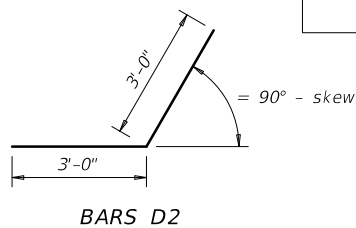
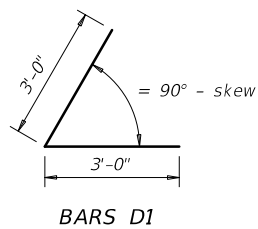
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-wings) (4)		Estimated Quantities per ft of Toewall (1-toewall)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa				
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

**TABLE OF WINGWALL REINFORCING**  
(2-wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

**TABLE OF TOEWALL REINFORCING**

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



**WING DIMENSION FORMULAS:**

(All values are in feet.)

$$Hw = H + T + C$$

$$Lw = (Hw)(SL) \div \cosine(\theta) \text{ for Type PW-1}$$

$$= (Hw - 1')(SL) \div \cosine(\theta) \text{ for Type PW-2 and } Hw \ge 4'$$

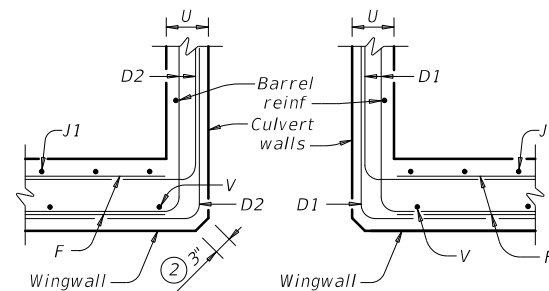
$$= (Hw - 0.5')(SL) \div \cosine(\theta) \text{ for Type PW-2 and } Hw < 4'$$

For cast-in-place culverts:  
 $Ltw = [(N)(S) + (N + 1)(U)] \div \cosine(\theta)$

For precast culverts:  
 $Ltw = [(N)(2U + S) + (N - 1)(0.5')] \div \cosine(\theta)$   
 Total Wingwall Area (two wings ~ SF)  
 $= (2)(Hw)(Lw) \text{ for Type PW-1}$   
 $= (2)(Hw)(Lw) - 6 \text{ SF for Type PW-2 and } Hw \ge 4'$   
 $= (2)(Hw)(Lw) - 1.5 \text{ SF for Type PW-2 and } Hw < 4'$

Hw = Height of wingwall  
 Lw = Length of wingwall  
 Ltw = Culvert toewall length  
 N = Number of culvert spans  
 SL:1 = Channel slope ratio, (horizontal: 1 vertical, usual value is 2:1)  
 θ = Culvert skew

See applicable box culvert standard sheet for S, H, T, and U values.



**SECTION C-C - PW-1**

**SECTION C-C - PW-2**

- Skew = 0°
- At discharge end, chamfer may be 3/4" minimum.
- For 15° skew ~ 1"  
For 30° skew ~ 2"  
For 45° skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" above finished grade.
  - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.

**DESIGNER NOTES:**

Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall. Type PW-2 can only be used for applications without a railing mounted to the wingwall.

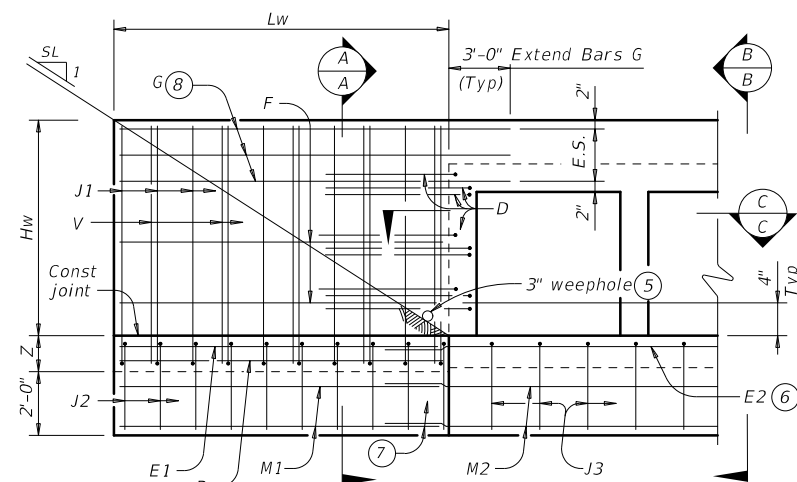
**MATERIAL NOTES:**

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

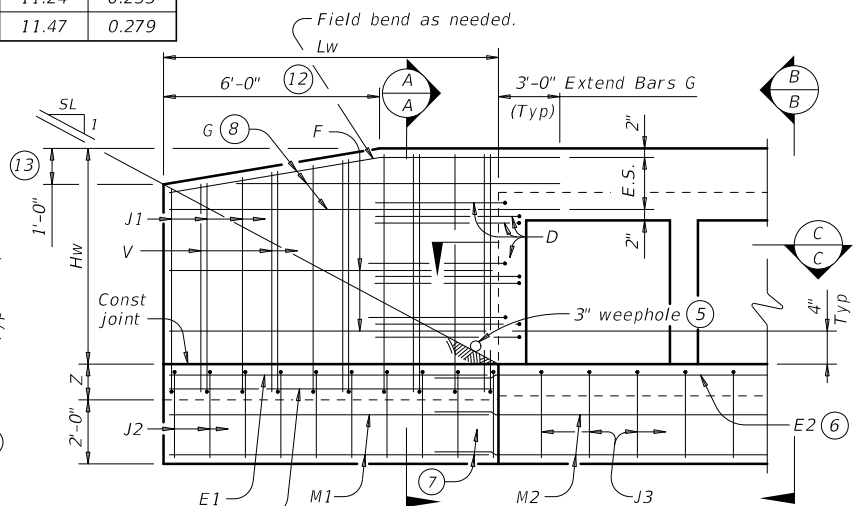
**GENERAL NOTES:**

Designed in accordance with AASHTO LRFD Bridge Design Specifications.  
 Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.  
 See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information. Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

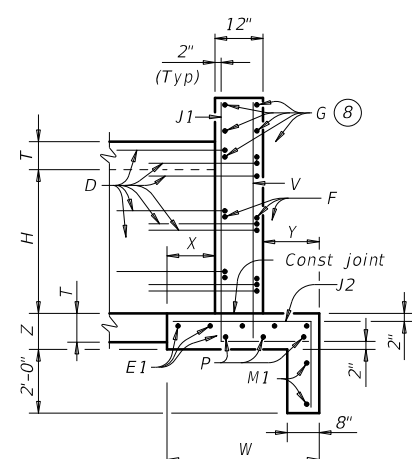
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



**PARTIAL ELEVATION - PW-1**

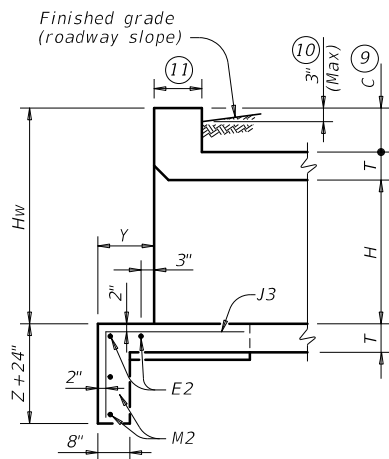


**PARTIAL ELEVATION - PW-2**



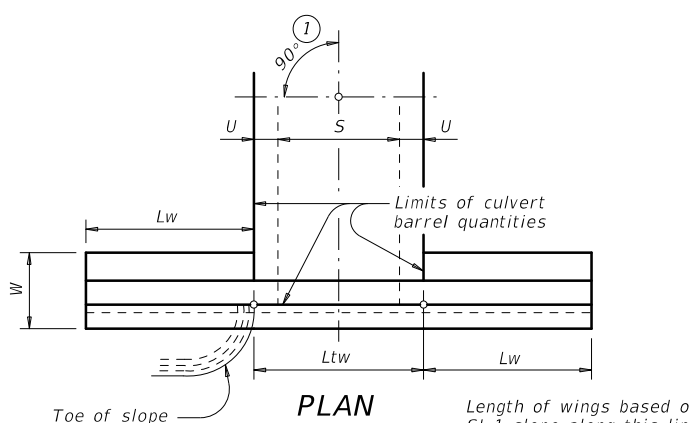
**SECTION A-A**

(Showing wing reinforcement.)



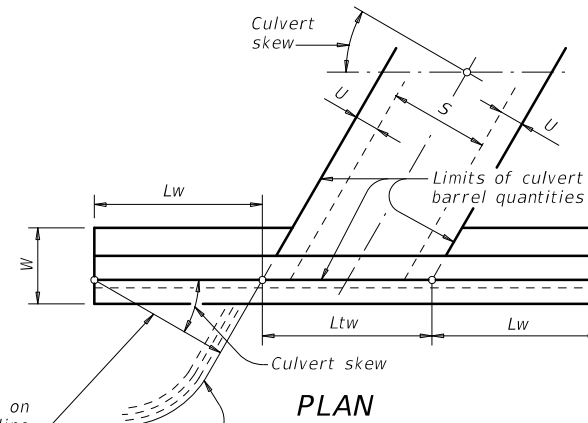
**SECTION B-B**

(Showing wing reinforcement.)



**PLAN**

Length of wings based on SL:1 slope along this line.



**PLAN**

Length of wings based on SL:1 slope along this line.

Texas Department of Transportation  
 Bridge Division Standard

**CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2**

**PW**

FILE: pwstde01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
REVISIONS	CONTRACT	SECTION	JOB	HIGHWAY
0133	04	042	US 82	
DIST	COUNTY	SHEET NO.		
WFS	BAYLOR	199		

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DATE: FILE:

**TABLE OF DIMENSIONS AND REINFORCING STEEL**  
(Wings for one structure end)

Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing length (2-wings)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa		
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

**TABLE OF WINGWALL REINFORCING**  
(2-wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

**TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES**

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

**WING DIMENSION FORMULAS:**

(All values are in feet.)

$$\begin{aligned}
 Hw &= H + T + C - 0.250' \\
 A &= (Hw - 0.333') (SL) \\
 B &= (A) \text{ tangent } (30^\circ) \\
 Lw &= (A) \div \text{cosine } (30^\circ)
 \end{aligned}$$

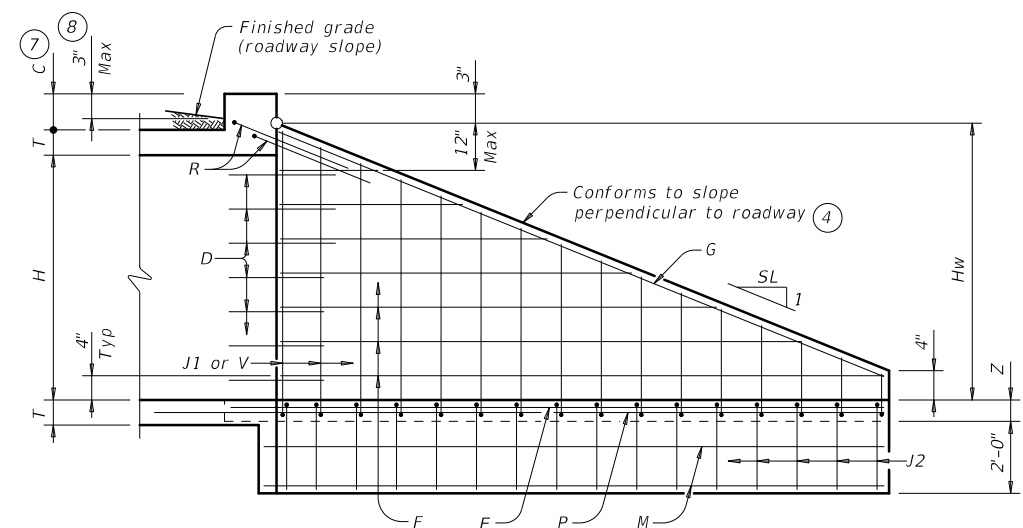
For cast-in-place culverts:  
 $Ltw = (N) (S) + (N + 1) (U)$

For precast culverts:  
 $Ltw = (N) (2U + S) + (N - 1) (0.5')$

$$\text{Total Wingwall Area (two wings ~ SF)} = (Hw + 0.333') (Lw)$$

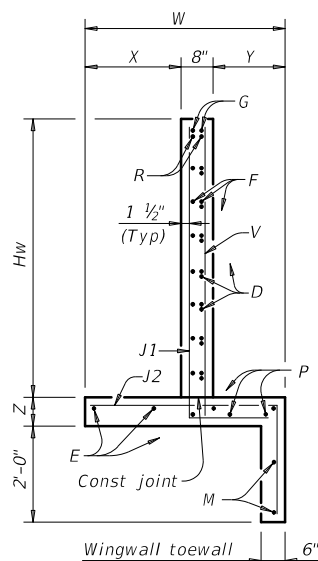
$Hw$  = Height of wingwall  
 $SL:1$  = Side slope ratio (horizontal:1 vertical)  
 $Lw$  = Length of wingwall  
 $Ltw$  = Culvert toewall length  
 $N$  = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.

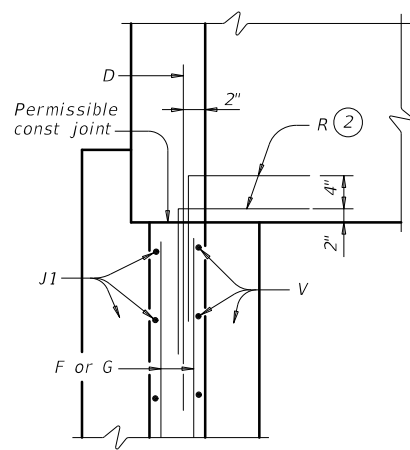


**INSIDE ELEVATION**

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

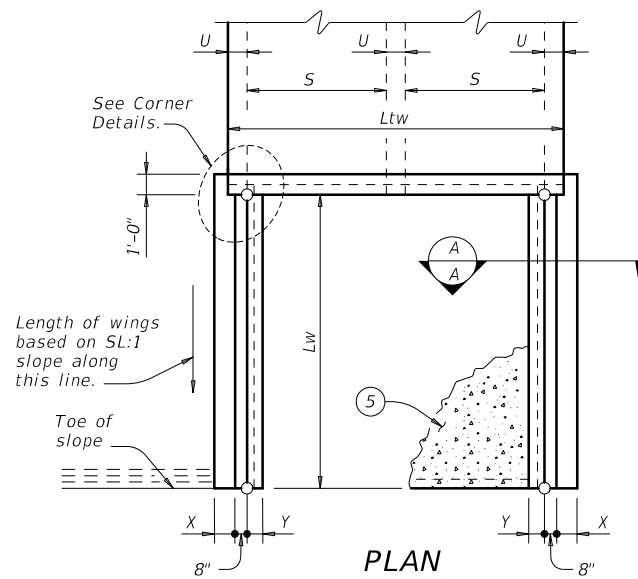


**SECTION A-A**



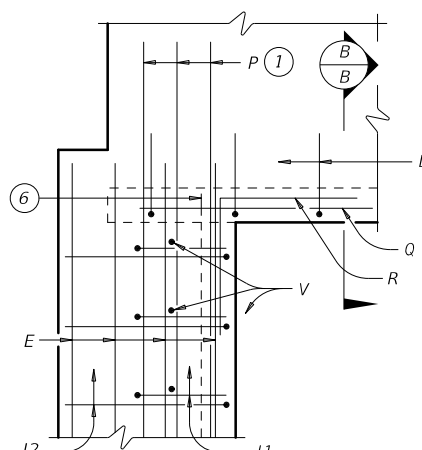
**WINGWALL**

**CORNER DETAILS**

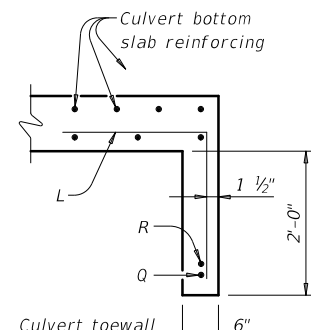


**PLAN**

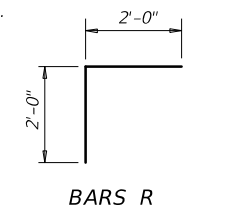
(Showing dimensions.)



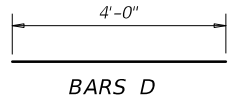
**FOOTING AND TOEWALL**



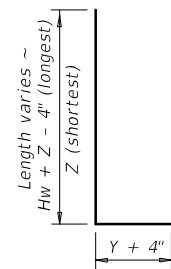
**SECTION B-B**



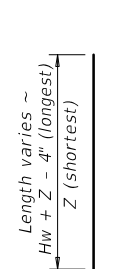
**BARS R**



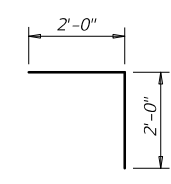
**BARS D**



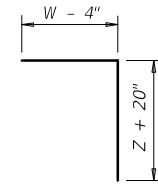
**BARS J1**



**BARS V**



**BARS L**



**BARS J2**

- Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- Adjust as necessary to maintain 1 #2" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
- Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" above finished grade.
  - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

**MATERIAL NOTES:**

- Provide Class C concrete (f'c=3,600 psi).
- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

**GENERAL NOTES:**

- Designed according to AASHTO LRFD Bridge Design Specifications.
- When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
- See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
- The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

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

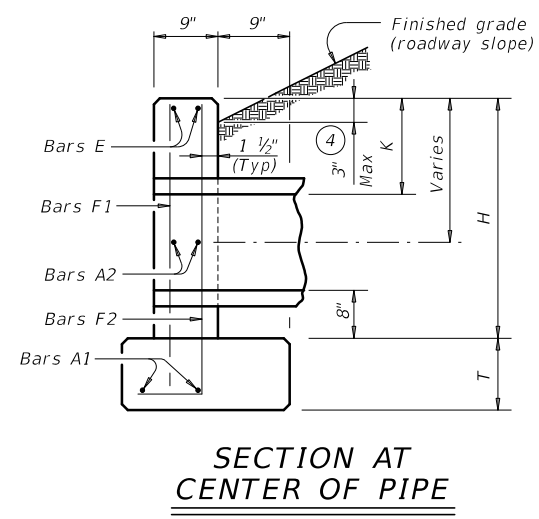
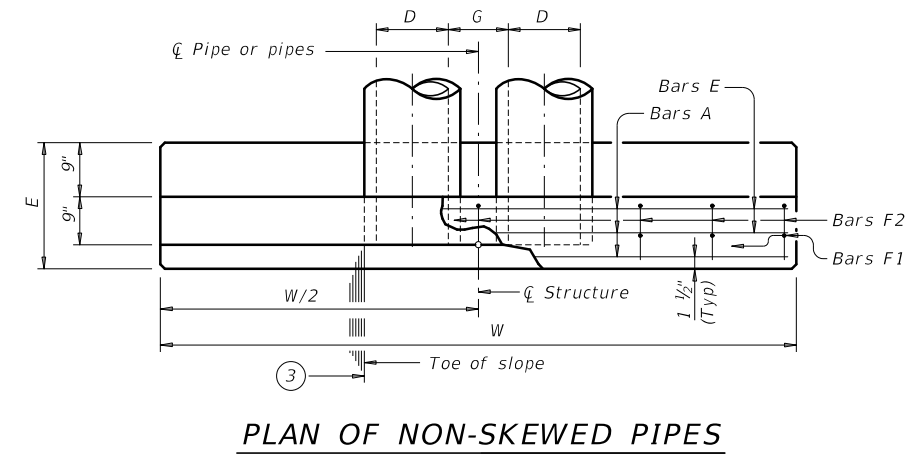
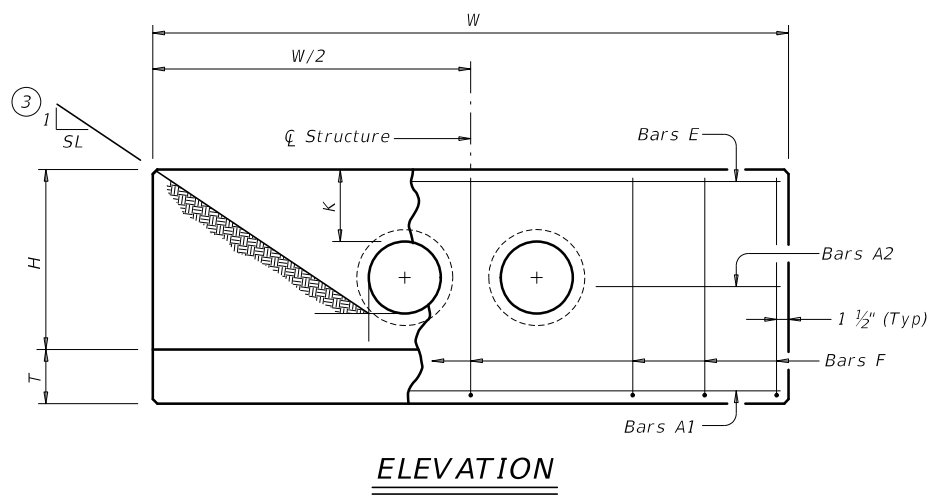
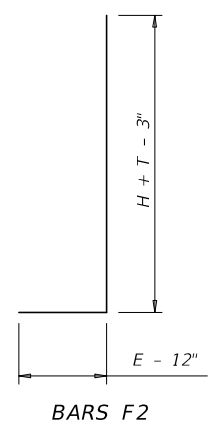
		<b>Bridge Division Standard</b>	
<b>CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS</b>			
<b>SW-O</b>			
FILE: sw-0std-20.dgn	DN: GAF	CK: CAT	DW: TxDOT
REVISIONS	CONTRACT NO. 0133	SECTION 04	JOB NO. 042
	DISTRICT WFS	COUNTY BAYLOR	SHEET NO. 200

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DATE: FILE:

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

Slope	Dia of Pipe (D)	Values for One Pipe		Values To Be Added for Each Add'l Pipe			
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' - 0"	122	1.1	1' - 9"	15	0.2
	15"	10' - 3"	136	1.3	2' - 2"	16	0.2
	18"	11' - 6"	163	1.5	2' - 8"	19	0.3
	21"	12' - 9"	200	1.8	3' - 1"	31	0.4
	24"	14' - 0"	217	2.1	3' - 7"	34	0.4
	27"	15' - 3"	254	2.4	3' - 11"	37	0.5
	30"	16' - 6"	272	2.7	4' - 4"	40	0.6
	33"	17' - 9"	314	3.1	4' - 8"	43	0.6
	36"	19' - 0"	371	3.9	5' - 1"	46	0.8
	42"	21' - 6"	442	4.9	5' - 10"	52	1.0
	48"	25' - 0"	569	6.4	6' - 7"	59	1.3
	54"	27' - 6"	701	7.5	7' - 6"	82	1.6
60"	30' - 0"	794	8.8	8' - 3"	90	1.8	
66"	32' - 6"	894	10.2	8' - 9"	96	2.0	
72"	35' - 0"	1,055	11.7	9' - 4"	103	2.3	
3:1	12"	13' - 0"	175	1.6	1' - 9"	14	0.2
	15"	14' - 9"	193	1.9	2' - 2"	17	0.2
	18"	16' - 6"	228	2.2	2' - 8"	19	0.3
	21"	18' - 3"	299	2.6	3' - 1"	31	0.4
	24"	20' - 0"	323	3.0	3' - 7"	33	0.4
	27"	21' - 9"	371	3.5	3' - 11"	37	0.5
	30"	23' - 6"	415	4.0	4' - 4"	40	0.5
	33"	25' - 3"	469	4.6	4' - 8"	43	0.6
	36"	27' - 0"	556	5.7	5' - 1"	46	0.8
	42"	30' - 6"	675	7.1	5' - 10"	52	1.0
	48"	35' - 6"	837	9.2	6' - 7"	59	1.3
	54"	39' - 0"	1,015	11.0	7' - 6"	84	1.6
60"	42' - 6"	1,171	12.9	8' - 3"	91	1.8	
66"	46' - 0"	1,298	14.9	8' - 9"	98	2.0	
72"	49' - 6"	1,561	17.1	9' - 4"	103	2.3	
4:1	12"	17' - 0"	229	2.0	1' - 9"	15	0.2
	15"	19' - 3"	266	2.4	2' - 2"	17	0.2
	18"	21' - 6"	308	2.9	2' - 8"	19	0.3
	21"	23' - 9"	382	3.5	3' - 1"	31	0.3
	24"	26' - 0"	430	3.9	3' - 7"	34	0.4
	27"	28' - 3"	486	4.7	3' - 11"	37	0.5
	30"	30' - 6"	539	5.2	4' - 4"	40	0.6
	33"	32' - 9"	603	6.0	4' - 8"	42	0.6
	36"	35' - 0"	738	7.5	5' - 1"	47	0.8
	42"	39' - 6"	881	9.3	5' - 10"	52	1.0
	48"	46' - 0"	1,102	12.1	6' - 7"	61	1.3
	54"	50' - 6"	1,364	14.4	7' - 6"	84	1.6
60"	55' - 0"	1,547	16.9	8' - 3"	91	1.8	
66"	59' - 6"	1,741	19.5	8' - 9"	98	2.0	
72"	64' - 0"	2,077	22.4	9' - 4"	102	2.3	
6:1	12"	25' - 0"	336	3.0	1' - 9"	14	0.2
	15"	28' - 3"	384	3.6	2' - 2"	17	0.2
	18"	31' - 6"	452	4.2	2' - 8"	19	0.3
	21"	34' - 9"	581	5.1	3' - 1"	31	0.4
	24"	38' - 0"	644	5.8	3' - 7"	34	0.4
	27"	41' - 3"	737	6.9	3' - 11"	37	0.5
	30"	44' - 6"	807	7.7	4' - 4"	39	0.6
	33"	47' - 9"	912	8.9	4' - 8"	44	0.6
	36"	51' - 0"	1,108	11.0	5' - 1"	48	0.8
	42"	57' - 6"	1,318	13.7	5' - 10"	54	1.0
	48"	67' - 0"	1,682	17.9	6' - 7"	59	1.3
	54"	73' - 6"	2,072	21.3	7' - 6"	83	1.6
60"	80' - 0"	2,351	24.9	8' - 3"	89	1.8	
66"	86' - 6"	2,643	28.9	8' - 9"	96	2.0	
72"	93' - 0"	3,121	33.1	9' - 4"	101	2.3	



- ① Total quantities include one 3'-1" lap for bars over 60' in length.
- ② Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- ③ Indicated slope is perpendicular to centerline pipe or pipes.
- ④ For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ⑤ Dimensions shown are usual and maximum.
- ⑥ Quantities shown are for one structure end only (one headwall).

**TABLE OF CONSTANT DIMENSIONS**

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' - 9"	1' - 0"	2' - 8"	0' - 9"	1' - 9"
15"	0' - 11"	1' - 0"	2' - 11"	0' - 9"	1' - 9"
18"	1' - 2"	1' - 0"	3' - 2"	0' - 9"	1' - 9"
21"	1' - 4"	1' - 0"	3' - 5"	0' - 9"	2' - 0"
24"	1' - 7"	1' - 0"	3' - 8"	0' - 9"	2' - 0"
27"	1' - 8"	1' - 0"	3' - 11"	0' - 9"	2' - 3"
30"	1' - 10"	1' - 0"	4' - 2"	0' - 9"	2' - 3"
33"	1' - 11"	1' - 0"	4' - 5"	0' - 9"	2' - 6"
36"	2' - 1"	1' - 0"	4' - 8"	1' - 0"	2' - 6"
42"	2' - 4"	1' - 0"	5' - 2"	1' - 0"	2' - 9"
48"	2' - 7"	1' - 3"	5' - 11"	1' - 0"	3' - 0"
54"	3' - 0"	1' - 3"	6' - 5"	1' - 0"	3' - 3"
60"	3' - 3"	1' - 3"	6' - 11"	1' - 0"	3' - 6"
66"	3' - 3"	1' - 3"	7' - 5"	1' - 0"	3' - 9"
72"	3' - 4"	1' - 3"	7' - 11"	1' - 0"	4' - 0"

**TABLE OF (6) REINFORCING STEEL**

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' - 6"	~
E	#5	~	2
F	#5	1' - 0"	~

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

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

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

Texas Department of Transportation
Bridge Division Standard

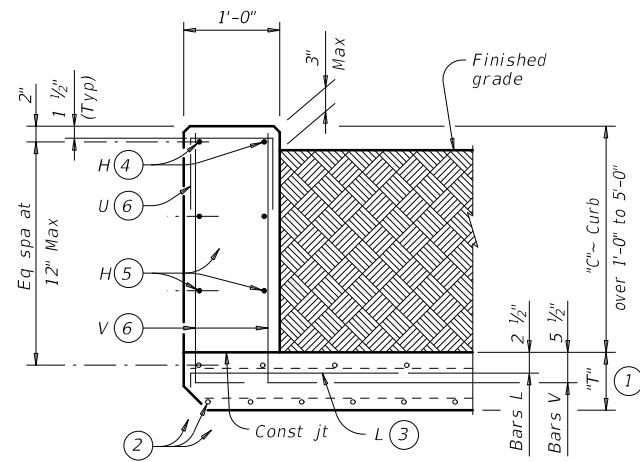
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

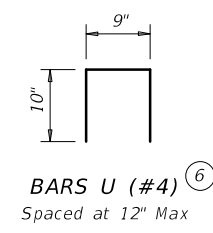
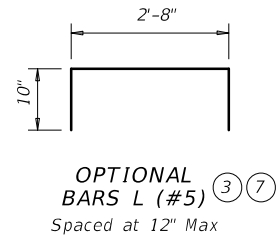
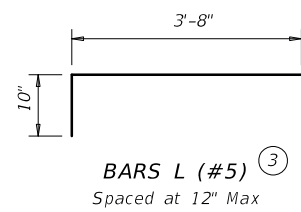
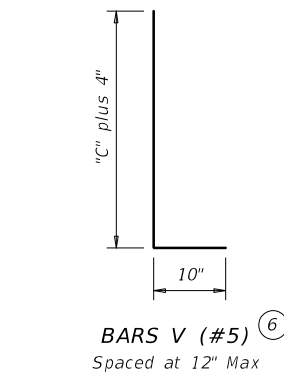
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	201	

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DATE:  
FILE:



**TYPICAL SECTION**  
Used for curbs over 1'-0" to 5'-0"



- ① "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.
- ② Adjust normal culvert slab bars as necessary to clear obstructions.
- ③ Place bars L as shown. Tilt hook as necessary to maintain cover.
- ④ Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.
- ⑤ Additional bars H(#4) as required to maintain 12" Max spacing.
- ⑥ Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.
- ⑦ Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.
- ⑧ Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES ⑧		
Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

**CONSTRUCTION NOTES:**  
Adjust reinforcing steel as necessary to provide 1 1/4" cover.  
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

**MATERIAL NOTES:**  
Provide Grade 60 reinforcing steel.  
Provide galvanized reinforcing steel if required elsewhere in the plans.  
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.  
Provide bar laps, where required, as follows:  
• Uncoated or galvanized ~ #4 = 1'-8" Min

**GENERAL NOTES:**  
Designed according to AASHTO LRFD Bridge Design Specifications.  
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.  
This Curb is considered as part of the Box Culvert for payment.

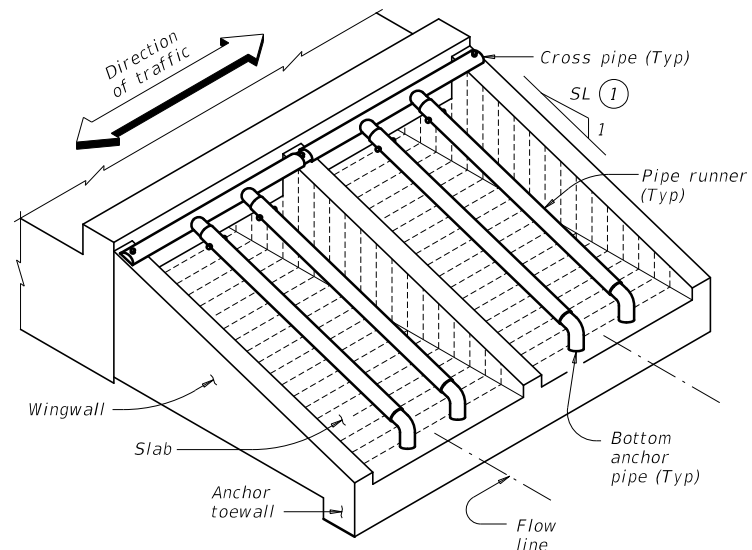
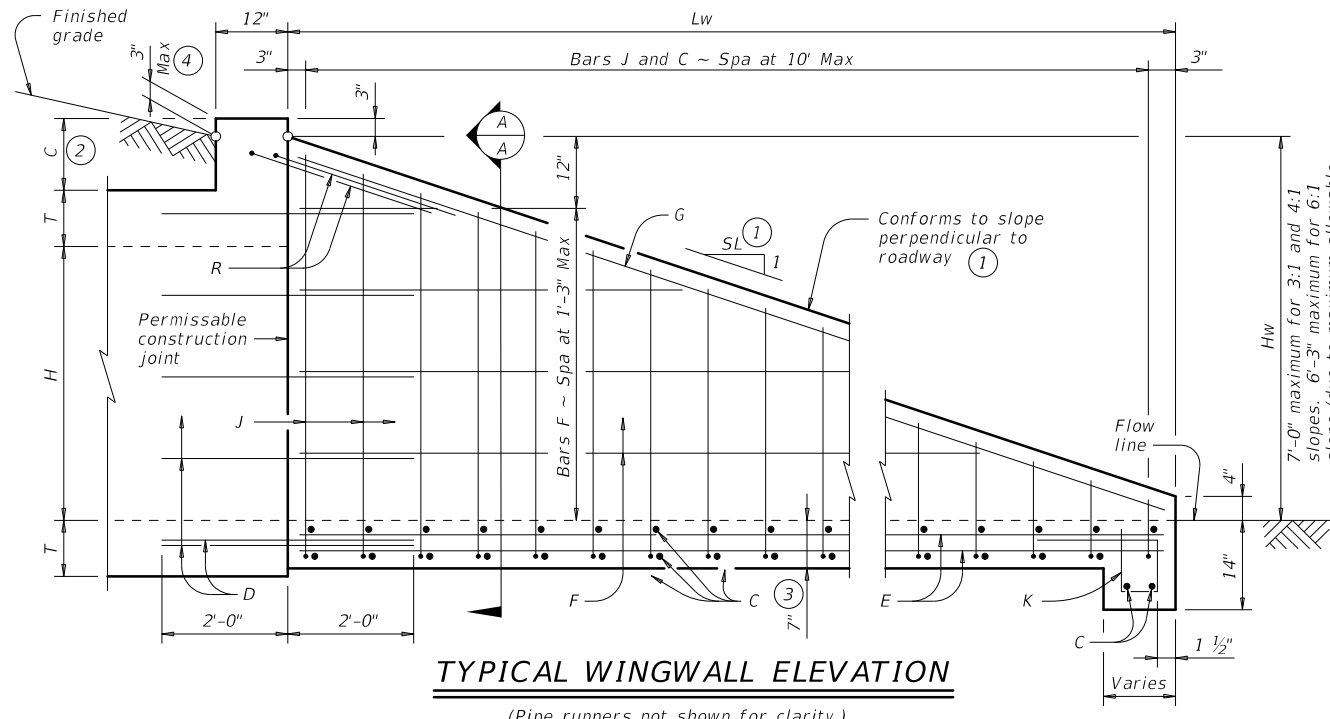
Cover dimensions are clear dimensions, unless noted otherwise.  
Reinforcing bar dimensions shown are out-to-out of bar.



**EXTENDED CURB DETAILS**  
FOR BOX CULVERTS WITH  
CURBS OVER 1'-0" TO 5'-0" TALL

<b>ECD</b>				
FILE: ecdside1-20.dgn	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	202	

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**WING DIMENSION CALCULATIONS:**

$$H_w = H + T + C - 0.250'$$

$$L_w = (H_w - 0.333') (SL)$$

For cast-in-place culverts:  

$$A_{tw} = (N) (S) + (N + 1) (U)$$
 For precast culverts:  

$$A_{tw} = (N) (2U + S) + (N - 1) (0.500')$$
 Total Wingwall Area (SF)  

$$= (0.5) (H_w + 0.333') (L_w) (N + 1)$$
 Total Concrete Volume (CY)  

$$= [(Wingwall Area) (0.583') + (L_w) (A_{tw}) (0.583') + (A_{tw}) (1.167') (1.167' - 0.583')] \div (27)$$

**PIPE RUNNER DIMENSION CALCULATIONS:**

Pipe Runner Length  

$$= (L_w) (K1) - (1.917')$$
 Total Reinforcing (Lb)  

$$= (1.55) (L_w) (A_{tw}) + (4.43) (A_{tw}) + (K2) (H_w) (N + 1) (\sqrt{L_w})$$

C = Height of curb above top of top slab (feet)  
 Hw = Height of wingwall (feet)  
 K = Constant value for use in formulas  
 Slope SL:1    K1    K2  
 3:1 ~ 1.054 ~ 7.45  
 4:1 ~ 1.031 ~ 8.49  
 6:1 ~ 1.014 ~ 10.30  
 Atw = Anchor toewall length (feet)  
 Lw = Length of wingwall (feet)  
 N = Number of culvert barrels  
 SL:1 = Side slope ratio (horizontal : 1 vertical)  
 See applicable box culvert standard for H, S, T, and U values.

**MATERIAL NOTES:**  
 Provide Grade 60 reinforcing steel.  
 Provide galvanized reinforcing steel if required elsewhere in the plans.  
 Adjust reinforcing as necessary to provide a minimum clear cover of 1 1/2".  
 Provide Class "C" concrete (f'c = 3,600 psi).  
 Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.  
 Provide ASTM A307 bolts.  
 Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.  
 Repair galvanizing damaged during transport or construction in accordance with the Item 445, "Galvanizing".

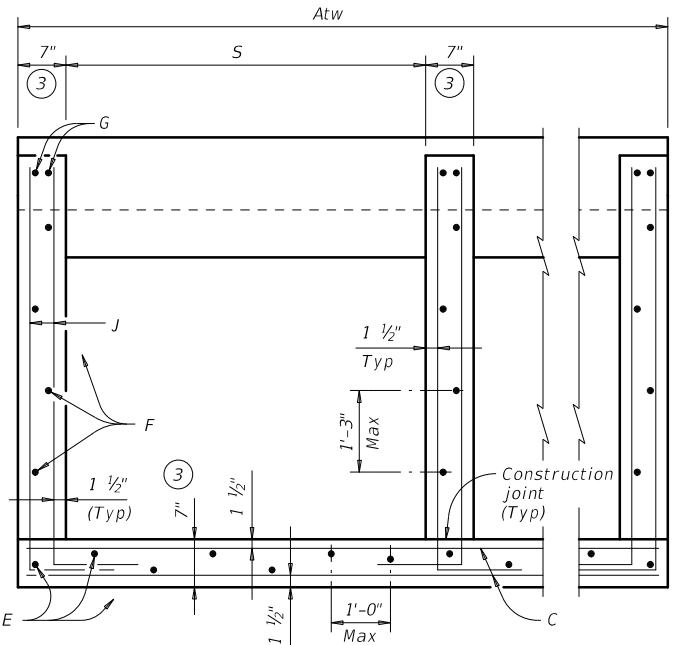
**GENERAL NOTES:**  
 Designed according to AASHTO LRFD Bridge Design Specifications.  
 The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.  
 Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.  
 The quantities for pipe runners, reinforcing steel, and concrete resulting from the formulas given herein are for Contractor's information only.  
 See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.  
 Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

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

SHEET 1 OF 2

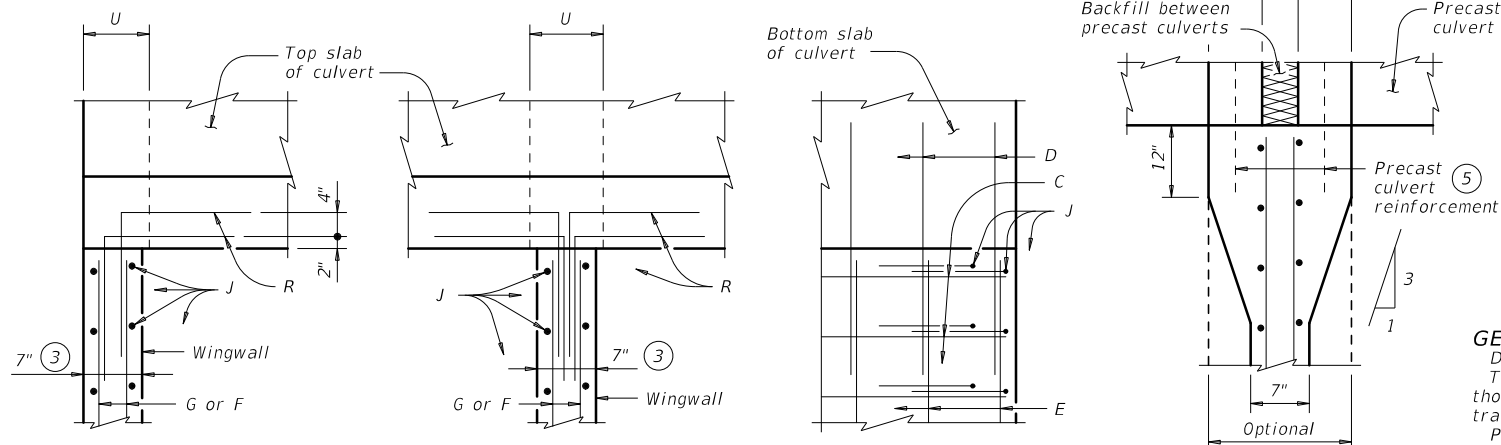
Texas Department of Transportation  
**SAFETY END TREATMENT FOR 0° SKEW BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ CROSS DRAINAGE**  
**SETB-CD**

FILE: setbcdse-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONTRACT: 0133	SECTION: 04	JOB: 042	HIGHWAY: US 82
REVISIONS	DIST: WFS	COUNTY: BAYLOR	SHEET NO. 203	



**SECTION A-A**

(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)

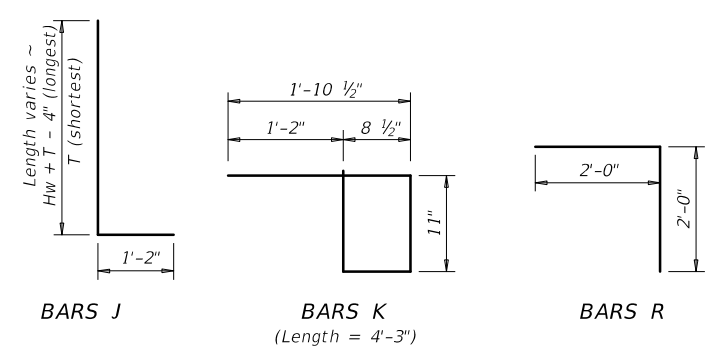


**PLAN VIEWS OF CORNER DETAILS**

- Recommended values of slope are: 3:1, 4:1, and 6:1. Provide 3:1 or flatter slope.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet.
- Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.
- For vehicle safety, reduce curb height, if necessary, to provide a maximum 3" projection. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall Bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.

**TABLE OF REINFORCING BAR SIZES AND SPACING**

Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'-0" Max
F	#4	1'-3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'-0" Max
R	#4	As shown

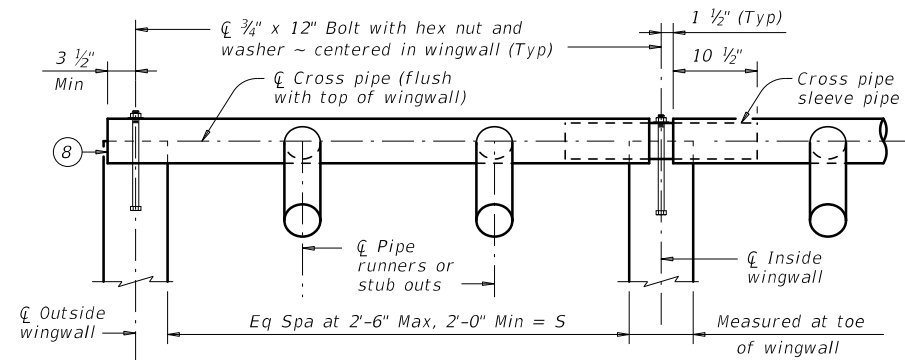


DATE: FILE:



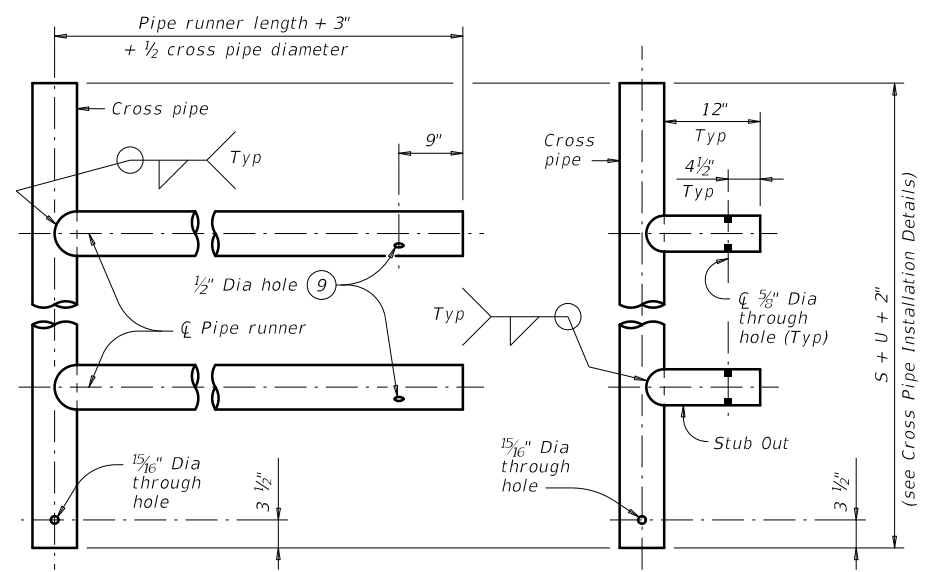
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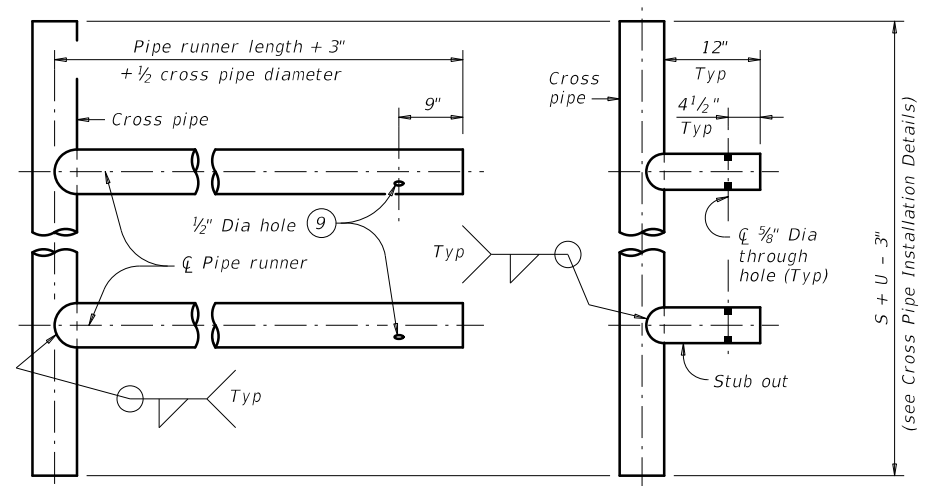


NOTE: At Contractor's option, make the cross pipe continuous across the inside wingwalls. If option is selected, omit the sleeve pipe and make a 1 5/16" diameter through hole in the cross pipe to accept the anchor bolt at the centerline of each inside wingwall.

**CROSS PIPE INSTALLATION DETAILS**

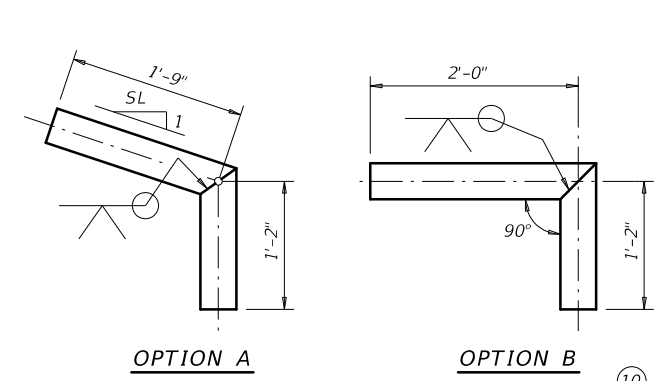


**OPTION A2**  
**OPTION A1**  
FOR USE IN OUTSIDE CULVERT BAY

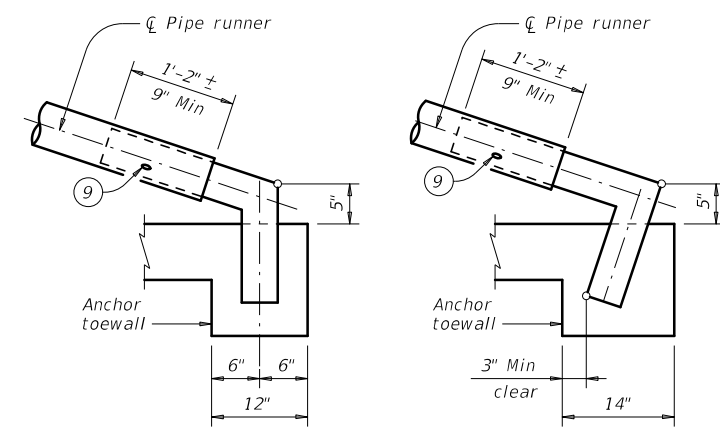


**OPTION A2**  
**OPTION A1**  
FOR USE IN INSIDE CULVERT BAY

**CROSS PIPE AND CONNECTIONS DETAILS**

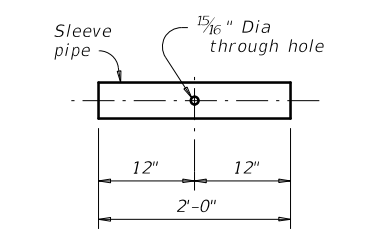


**OPTION A**  
**OPTION B**  
**BOTTOM ANCHOR PIPE DETAILS**

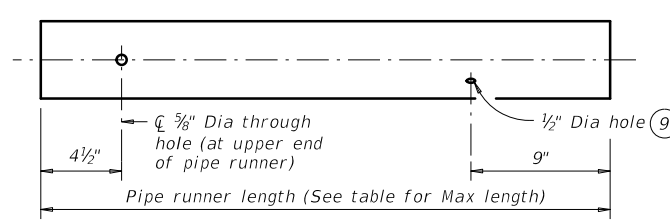


**OPTION B1**  
**OPTION B2**  
**BOTTOM ANCHOR TOEWALL DETAILS**

(Wingwall not shown for clarity.)



**CROSS PIPE SLEEVE PIPE DETAILS**

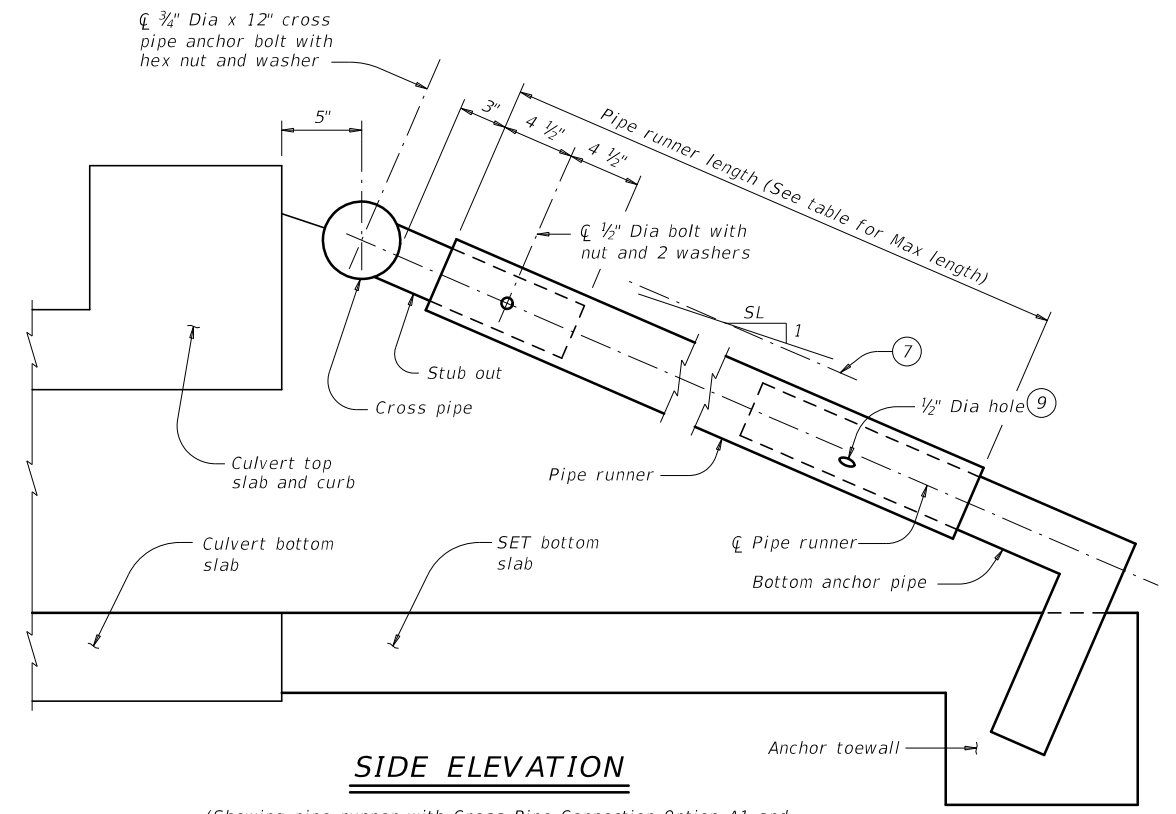


NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

**PIPE RUNNER DETAILS**

- ⑥ Cross pipe is the same size as the pipe runner. Cross pipe stub out is the same size as the anchor pipe.
- ⑦ Note that actual slope of safety pipe runner may vary slightly from side slope.
- ⑧ Take care to ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.
- ⑨ After installation, inspect the 1#2" hole to ensure that the lap of the safety pipe runner with the bottom anchor pipe is adequate.
- ⑩ At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

Maximum Pipe Runner Length	Required Pipe Runner Size			Required Anchor Pipe Size		
	Pipe Size	Pipe O.D.	Pipe I.D.	Pipe Size	Pipe O.D.	Pipe I.D.
10'- 0"	3" STD	3.500"	3.068"	2" STD	2.375"	2.067"
19'- 8"	4" STD	4.500"	4.026"	3" STD	3.500"	3.068"
34'- 2"	5" STD	5.563"	5.047"	4" STD	4.500"	4.026"



**SIDE ELEVATION**

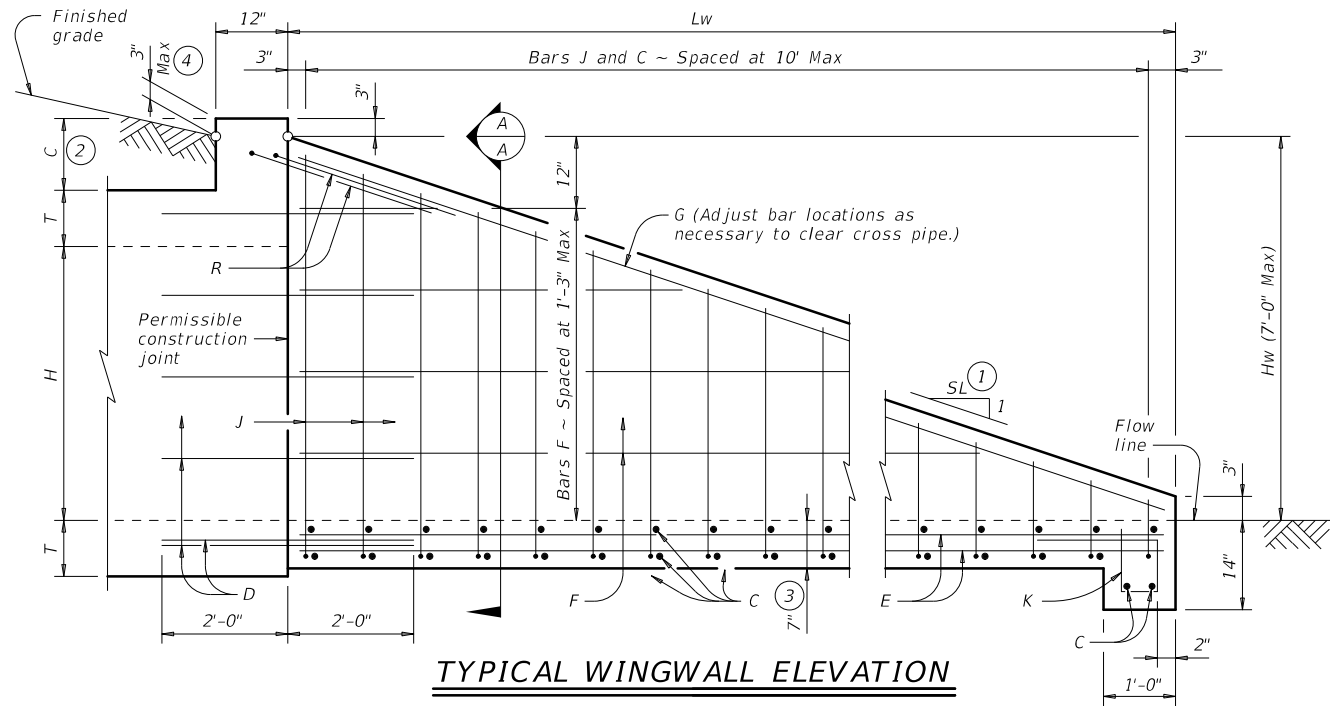
(Showing pipe runner with Cross Pipe Connection Option A1 and Bottom Anchor Toewall Option B2. Wingwall not shown for clarity.)

SHEET 2 OF 2

				<b>Bridge Division Standard</b>	
<b>SAFETY END TREATMENT</b> FOR 0° SKEW BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ CROSS DRAINAGE					
<b>SETB-CD</b>					
FILE:	setbcdse-20.dgn	DN:	GAF	CK:	CAT
©TxDOT	February 2020	CONTRACT:	0133	SECTION:	04
REVISIONS:		JOB:	042	HIGHWAY:	US 82
		DIST:	WFS	COUNTY:	BAYLOR
				SHEET NO.:	204

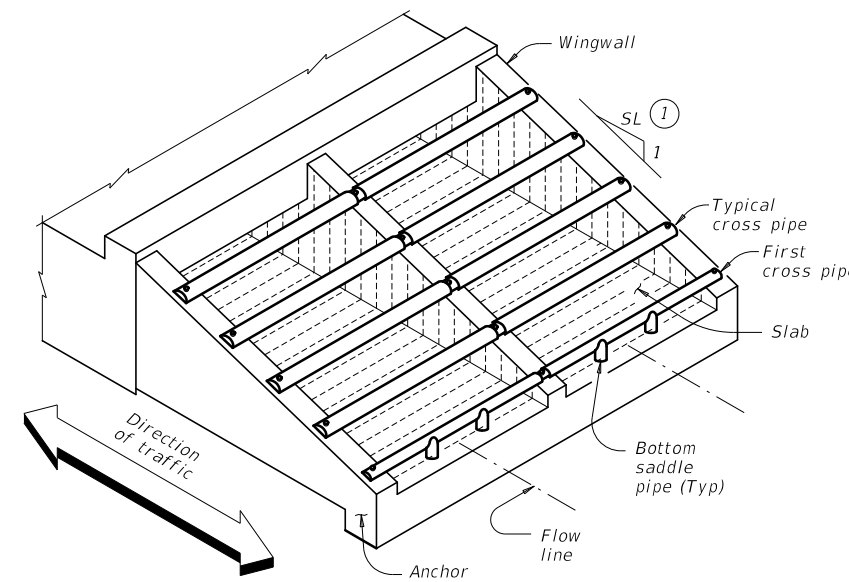
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**TYPICAL WINGWALL ELEVATION**

(Cross pipes not shown for clarity.)



**ISOMETRIC VIEW OF TYPICAL INSTALLATION**

(Showing bolted anchor option.)

**WING DIMENSION CALCULATIONS:**

$$Hw = H + T + C - 0.250'$$

$$Lw = (Hw - 0.333') (SL)$$

For cast-in-place culverts:  
 $Atw = (N) (S) + (N + 1) (U)$

For precast culverts:  
 $Atw = (N) (2U + S) + (N - 1) (0.500')$

$$\text{Total Wingwall Area (SF)} = (0.5) (Hw + 0.333') (Lw) (N - 1)$$

$$\text{Total Concrete Volume (CY)} = \frac{[(\text{Wingwall Area}) (0.583') + (Lw) (Atw) (0.583') + (Atw) (1.167') (1.167' - 0.583')] \div (27)}$$

**PIPE RUNNER DIMENSION CALCULATIONS:**

$$\text{Pipe Runner Length (feet)} = (Lw) (K1) = (1.917')$$

$$\text{Total Reinforcing (Lb)} = (1.55) (Lw) (Atw) + (4.43) (Atw) + (K2) (Hw) (N + 1) (\sqrt{Lw})$$

C = Height of curb above top of top slab (feet)  
 Hw = Height of wingwall (feet)  
 K = Constant value for use in formulas

Slope SL:1	K1	K2
3:1	~ 1.054	~ 7.45
4:1	~ 1.031	~ 8.49
6:1	~ 1.014	~ 10.30

Atw = Anchor toewall length (feet)  
 Lw = Length of wingwall (feet)  
 N = Number of culvert barrels  
 SL:1 = Side slope ratio (horizontal : 1 vertical)

See applicable box culvert standard for H, S, T, and U values.

**MATERIAL NOTES:**  
 Provide Grade 60 reinforcing steel.  
 Provide galvanized reinforcing steel if required elsewhere in the plans. Adjust reinforcing as necessary to provide a minimum clear cover of 1 1/2".  
 Provide Class "C" concrete (f'c = 3,600 psi).  
 Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.  
 Provide ASTM A307 bolts.  
 Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.  
 Repair galvanizing damaged during transport or construction in accordance with Item 445, "Galvanizing."

**GENERAL NOTES:**  
 Designed according to AASHTO LRFD Bridge Design Specifications.  
 The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.  
 Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.  
 The quantities for concrete, reinforcing steel, and cross pipes resulting from the formulas given herein are for Contractor's information only.  
 See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.  
 Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

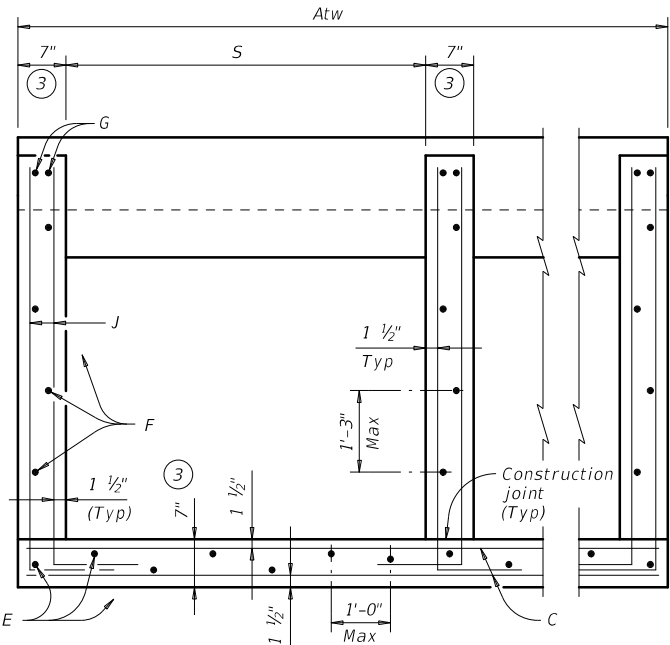
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

**Bridge Division Standard**

## SAFETY END TREATMENT FOR BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ PARALLEL DRAINAGE

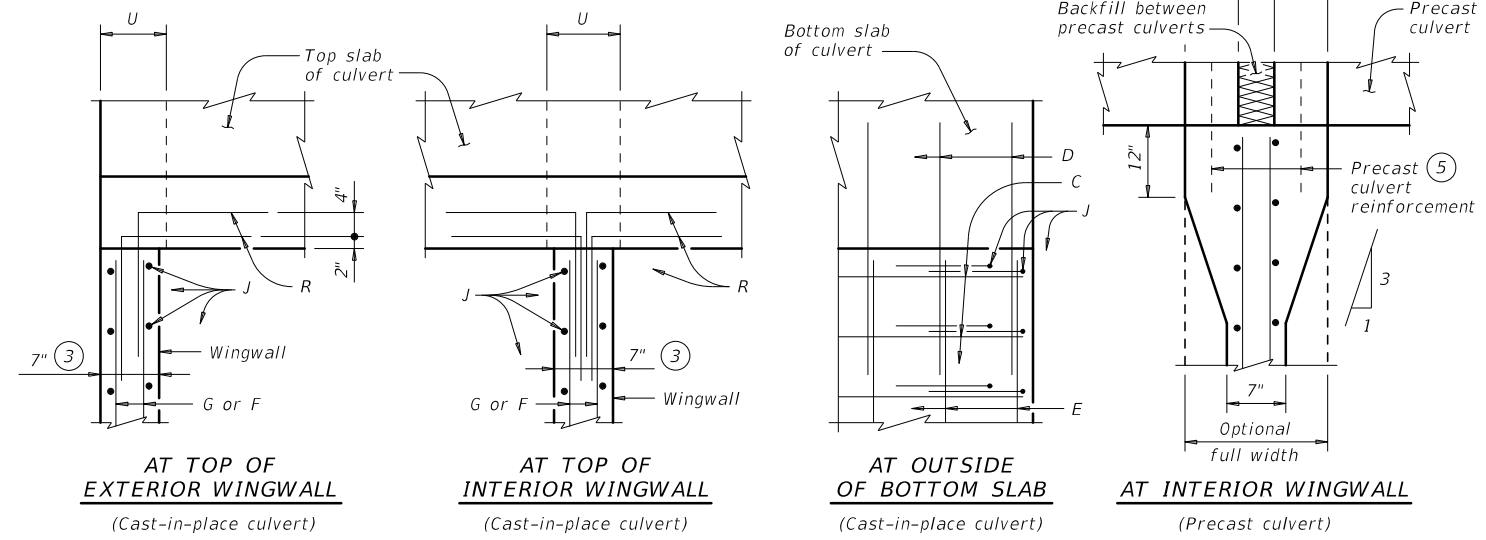
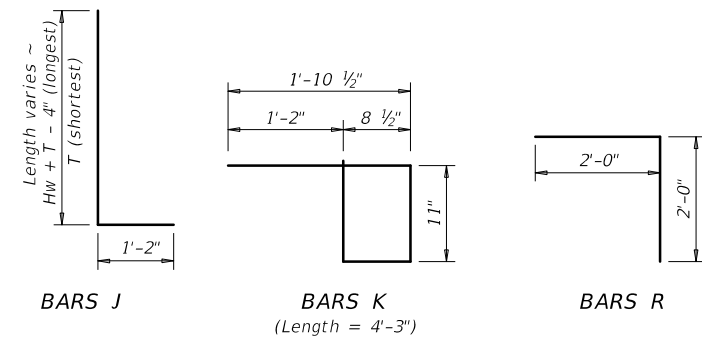
### SETB-PD

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©TxDOT February 2020	CONV	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	205	



**SECTION A-A**

(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)



**PLAN VIEWS OF CORNER DETAILS**

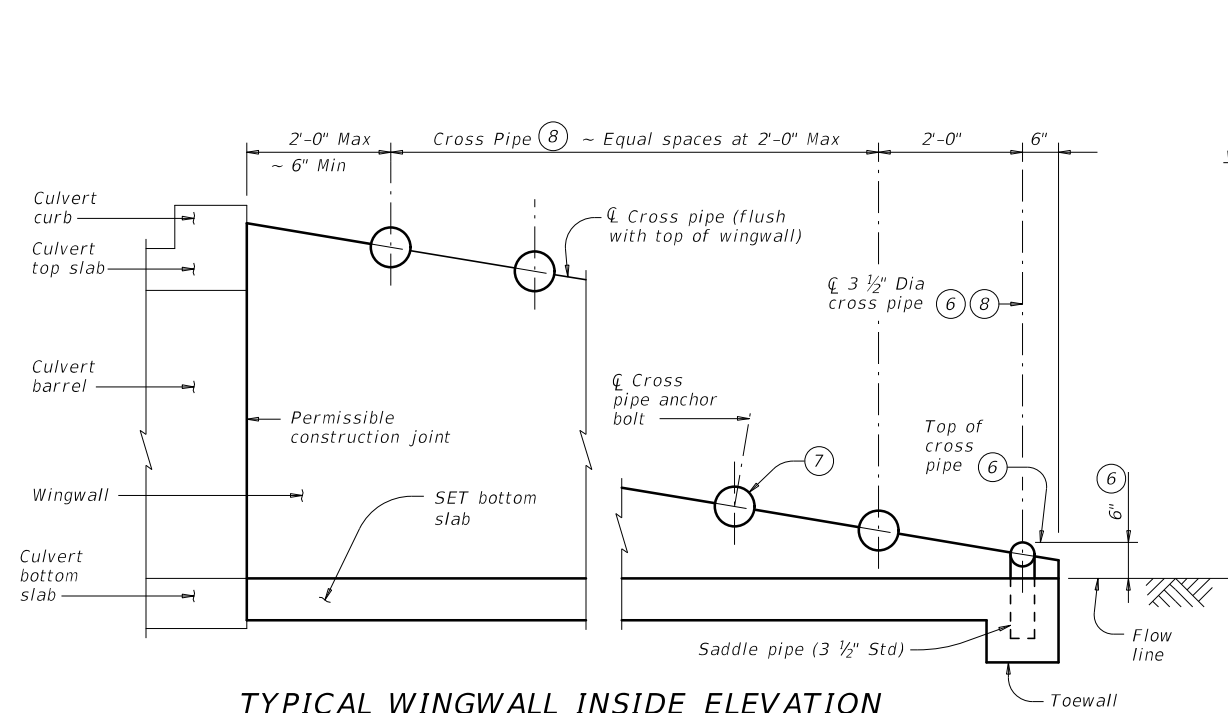
**TABLE OF REINFORCING BAR SIZES AND SPACING**

Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'- 0" Max
F	#4	1'- 3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'- 0" Max
R	#4	As shown

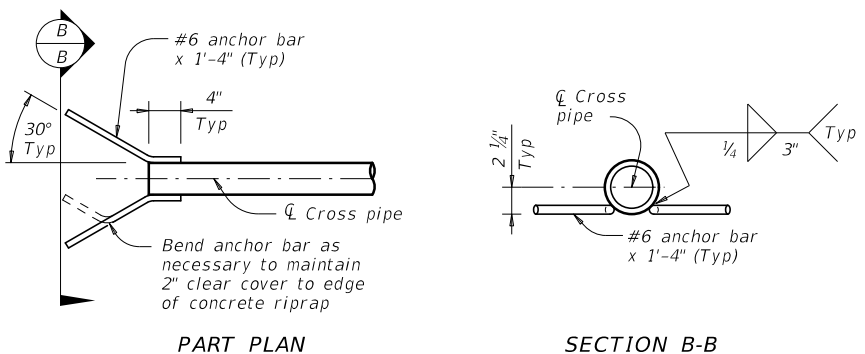
- ① Provide 6:1 or flatter slope.
- ② 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to Extended Curb Details the Extended Curb Details (ECD) standard sheet.
- ③ Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" Minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.
- ④ For vehicle safety, reduce height, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ⑤ For culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.

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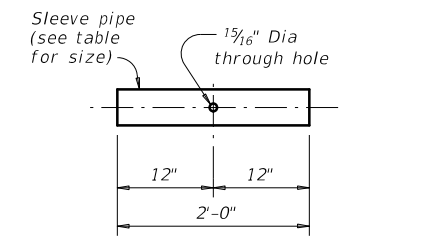
DATE: FILE:



**TYPICAL WINGWALL INSIDE ELEVATION**  
(Showing installation of cross pipes.)



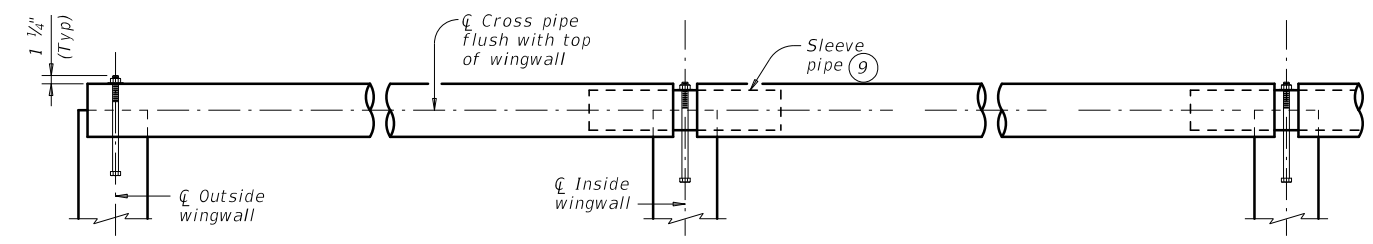
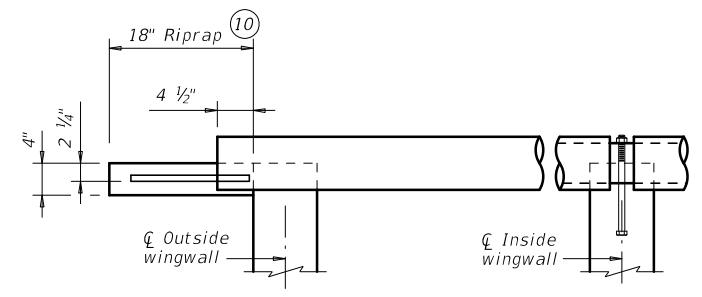
**OPTIONAL ANCHOR BAR DETAILS**



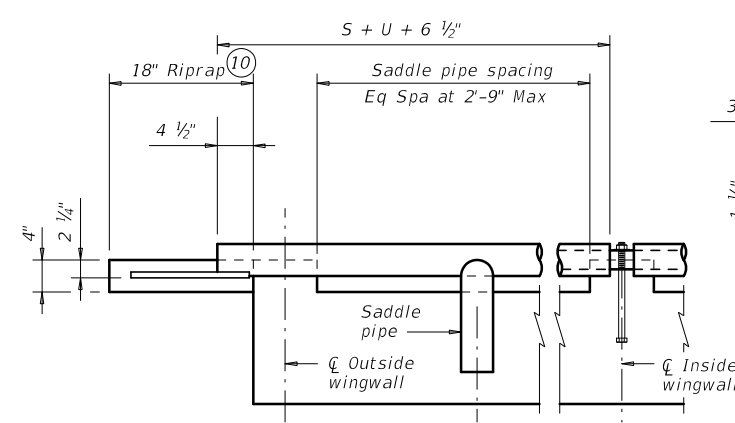
**SLEEVE PIPE DETAILS**

REQUIRED PIPE SIZES <sup>(8)</sup>			STANDARD PIPE SIZES		
Culvert Span Sizes	Cross Pipe Size	Sleeve Pipe Size <sup>(9)</sup>	Pipe Size	Pipe O.D.	Pipe I.D.
First Pipe	3 1/2" STD	2 1/2" STD	2 1/2" STD	2.875"	2.469"
30" to 42"	4" STD	3" STD	3" STD	3.500"	3.068"
48" to 72"	5" STD	4" STD	3 1/2" STD	4.000"	3.548"
78" to 120"	6" STD	5" STD	4" STD	4.500"	4.026"
			5" STD	5.563"	5.047"
			6" STD	6.625"	6.065"

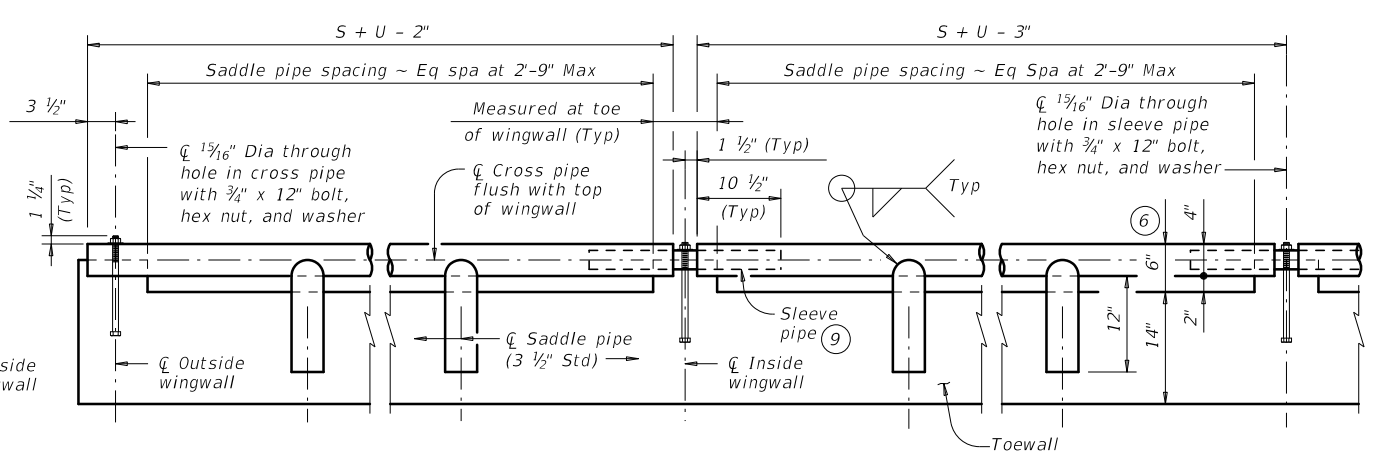
- <sup>(6)</sup> The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe at no more than 6" above the flow line.
- <sup>(7)</sup> Always install the third cross pipe from the bottom of the culvert using a bolted connection. Take care to ensure that concrete does not flow into this cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.
- <sup>(8)</sup> Provide cross pipes and sleeve pipes (if required) as shown in the Required Pipe Sizes table. Provide 3 #2" saddle pipes for the 3 #2" first cross pipe.
- <sup>(9)</sup> At Contractor's option, make the cross pipe continuous across the inside wingwalls. If this option is selected, omit the sleeve pipe and make a 15#16" diameter throughhole in the cross pipe to accept the anchor bolt at the centerline of each interior wingwall.
- <sup>(10)</sup> Provide riprap when using the Optional Anchor Bar details. Riprap is included in the bid price for Safety End Treatment. Provide riprap in accordance with Item 432, "Riprap".



**SECTION THROUGH INSTALLATION OF TYPICAL FULL CROSS PIPE**  
(Anchor details and dimensions are similar to those shown below in Section Through Installation of 3 1/2" First Cross Pipe detail.)



**OUTSIDE CULVERT BARREL WITH OPTIONAL ANCHOR BARS & RIPRAP**



**OUTSIDE CULVERT BARREL WITH BOLTED ANCHOR**

**INSIDE CULVERT BARREL**

**CROSS PIPE INSTALLATION DETAILS**

SHEET 2 OF 2

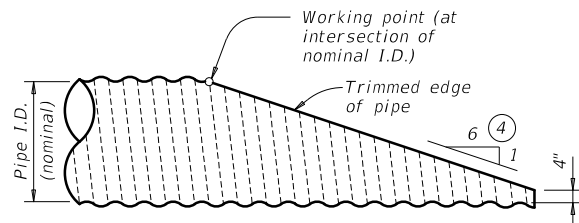
Texas Department of Transportation  
Bridge Division Standard

**SAFETY END TREATMENT FOR BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ PARALLEL DRAINAGE**

**SETB-PD**

FILE: setbpdse-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
DIST	COUNTY		SHEET NO.	
WFS	BAYLOR		206	

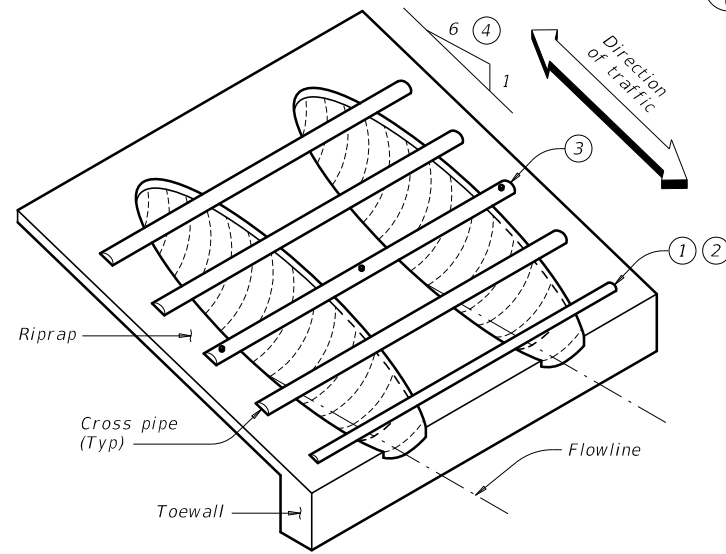
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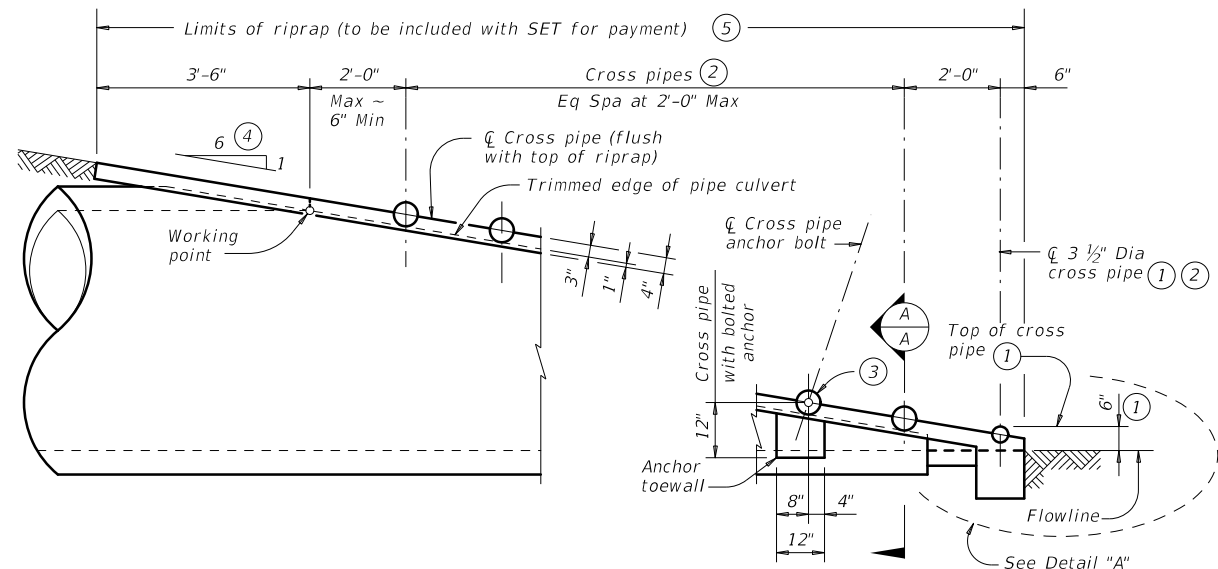
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

### SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

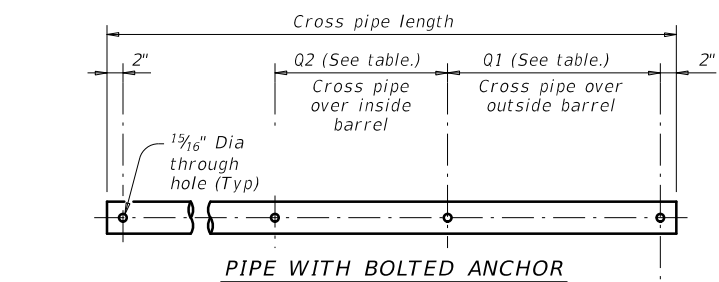


### ISOMETRIC VIEW OF TYPICAL INSTALLATION

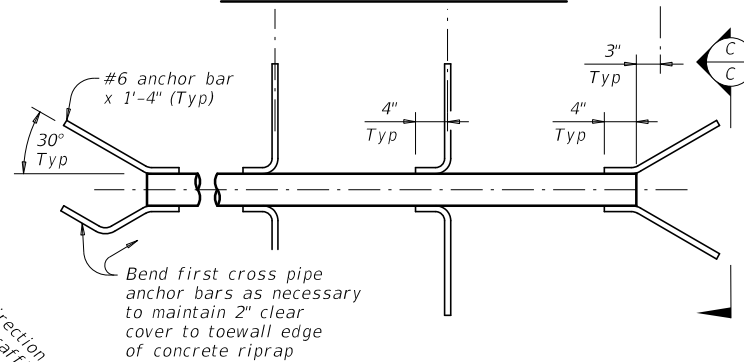


### SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

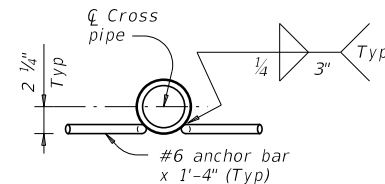
(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



### PIPE WITH BOLTED ANCHOR

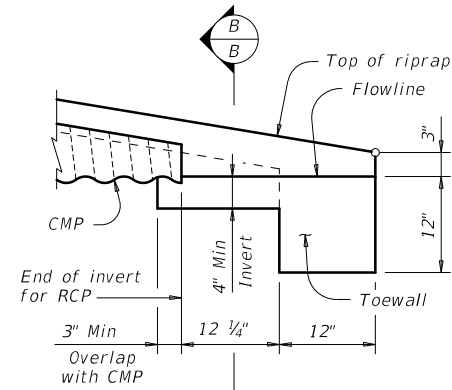


### PIPE WITH ANCHOR BARS



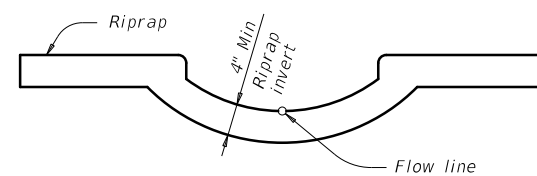
### SECTION C-C

### CROSS PIPE DETAILS



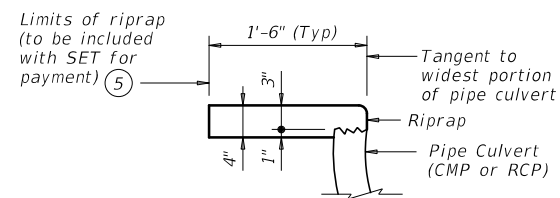
### DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)

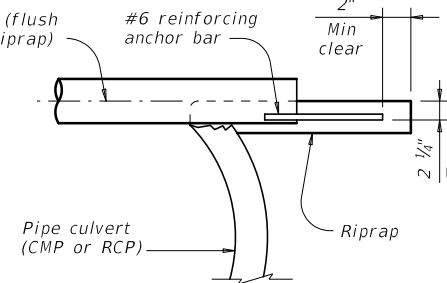


### SECTION B-B

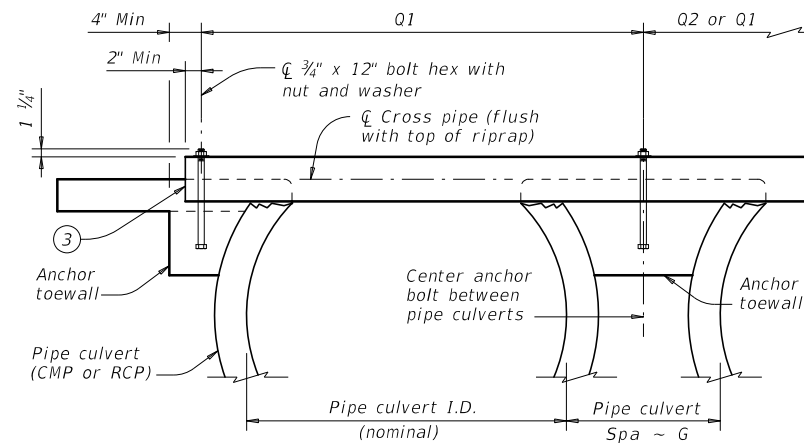
(Cross pipes not shown for clarity.)



### SHOWING TYPICAL PIPE CULVERT AND RIPRAP



### SHOWING CROSS PIPE WITH ANCHOR BAR



### SHOWING CROSS PIPE WITH BOLTED ANCHOR

### SECTION A-A

## CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	2 or more pipe culverts	
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	All pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	4" Std (4.500" O.D.)
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"		
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"	All pipe culverts	5" Std (5.563" O.D.)
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"		
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"	All pipe culverts	5" Std (5.563" O.D.)
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

- The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flowline.
- Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
- Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
- Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
- Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".
- Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

#### MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52. Provide ASTM A307 bolts and nuts. Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

#### GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981. Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes. Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap". Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

**Texas Department of Transportation**  
 Bridge Division Standard

## SAFETY END TREATMENT

FOR 12" DIA TO 72" DIA  
PIPE CULVERTS  
TYPE II ~ PARALLEL DRAINAGE

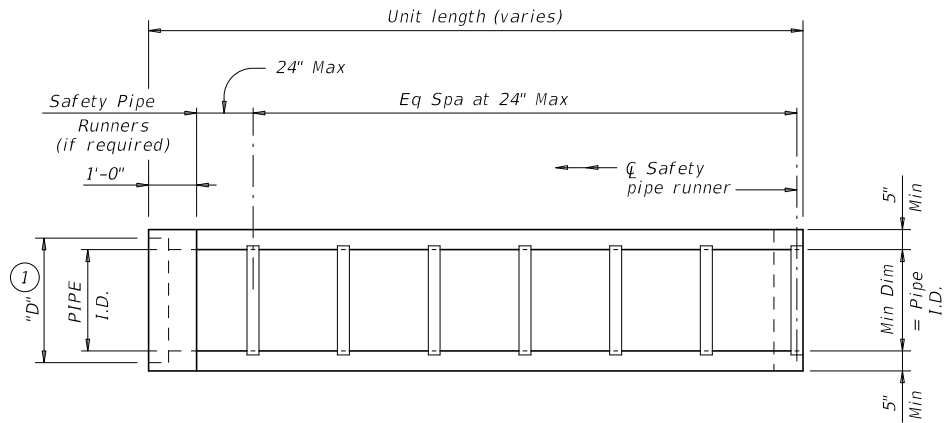
### SETP-PD

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©TxDOT February 2020	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	207	

DATE: FILE:

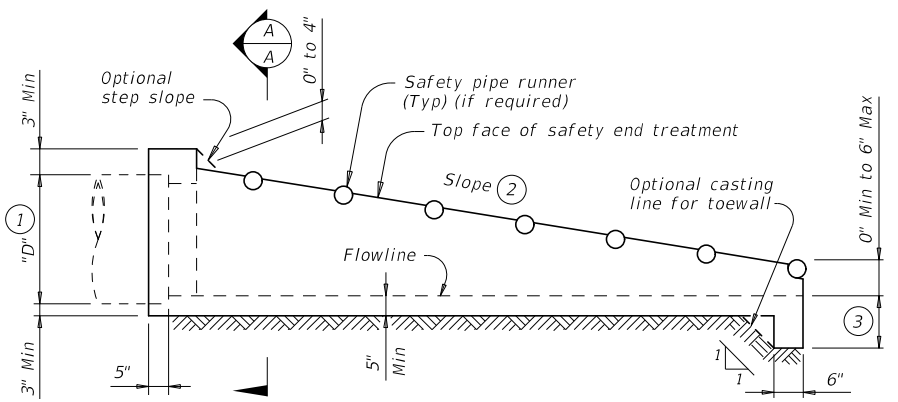
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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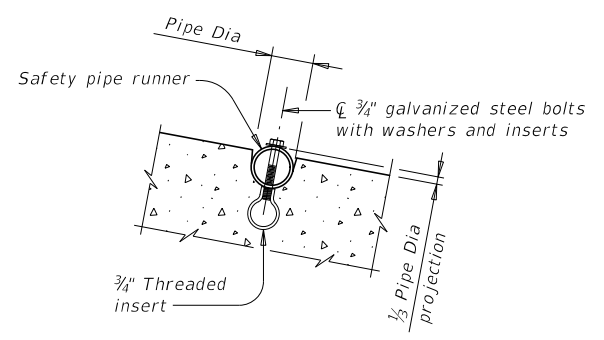
**PLAN**

(Showing bell end connection.)



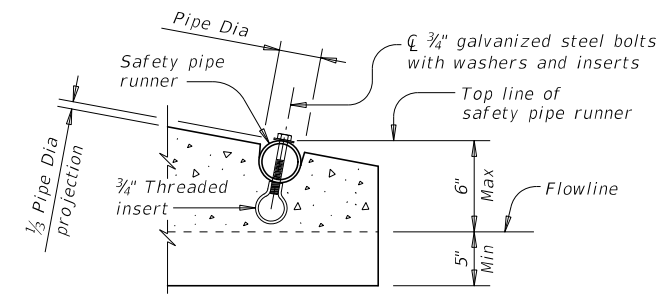
**LONGITUDINAL ELEVATION**

(Showing bell end connection.)

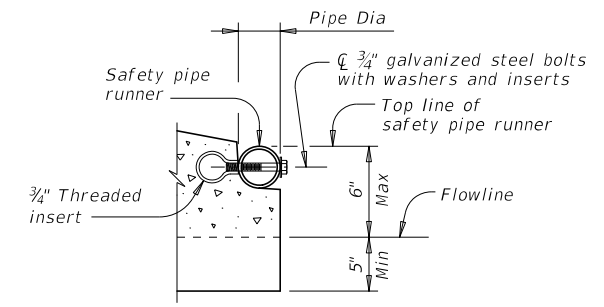


**INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS**

(If required)



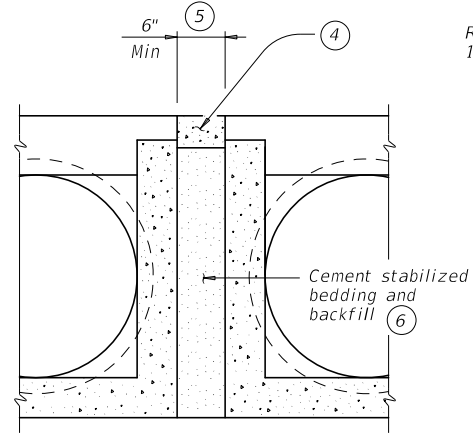
**OPTION A**



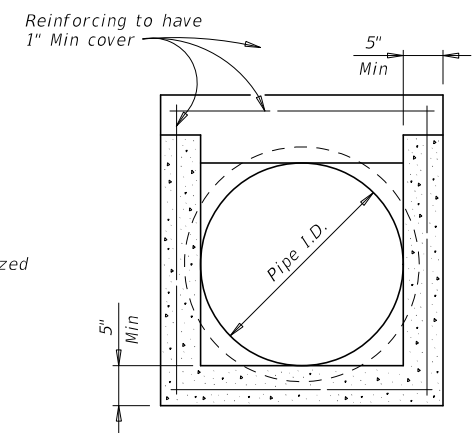
**OPTION B**

**END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS**

(If required)

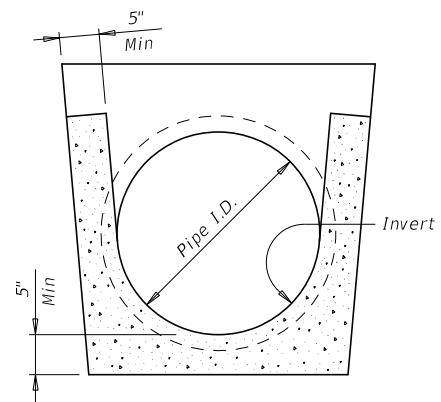


**MULTIPLE PIPE INSTALLATION**

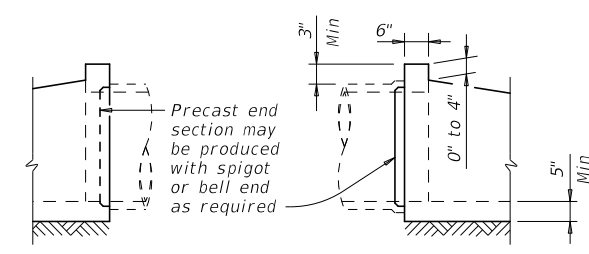


**OPTION WITH SQUARE BOTTOM**

**SECTION A-A**



**OPTION WITH INVERT BOTTOM**



**OPTIONAL JOINT FOR RCP**

(Showing joint between RCP and precast safety end treatment.)

**REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS**

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' - 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 1/4"	1.30"	20.50"	6:1	6' - 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 1/2"	1.60"	24.00"	6:1	8' - 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' - 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 1/2"	2.65"	38.50"	6:1	14' - 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' - 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 1/2"	N/A	52.50"	6:1	21' - 2"	Yes	Yes	4" STD	4.500"	4.026"

- Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.
- Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.
- Toewall to be used only when dimension is shown elsewhere in the plans.
- Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
- Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

**GENERAL NOTES:**

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".  
 When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.  
 Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.  
 Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below:  
 A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).  
 B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).  
 At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.  
 Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.  
 Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.  
 Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.  
 Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See PBGC standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation  
 Bridge Division Standard

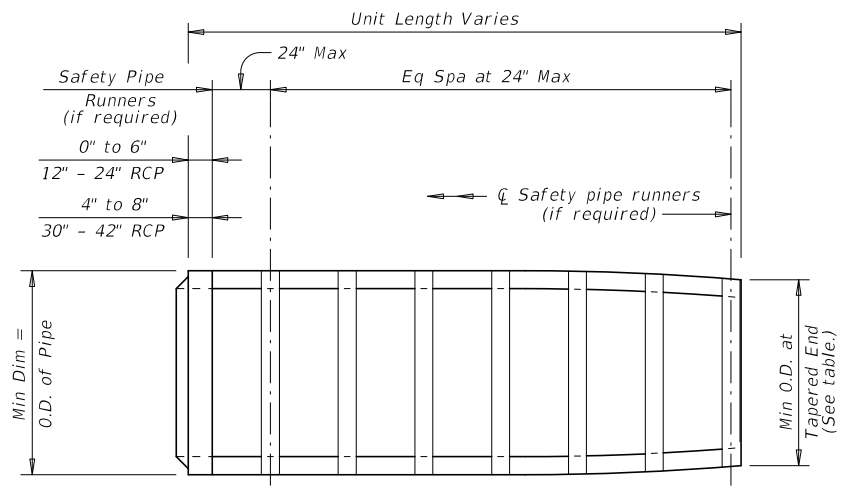
**PRECAST SAFETY END TREATMENT TYPE II ~ PARALLEL DRAINAGE**

**PSET-SP**

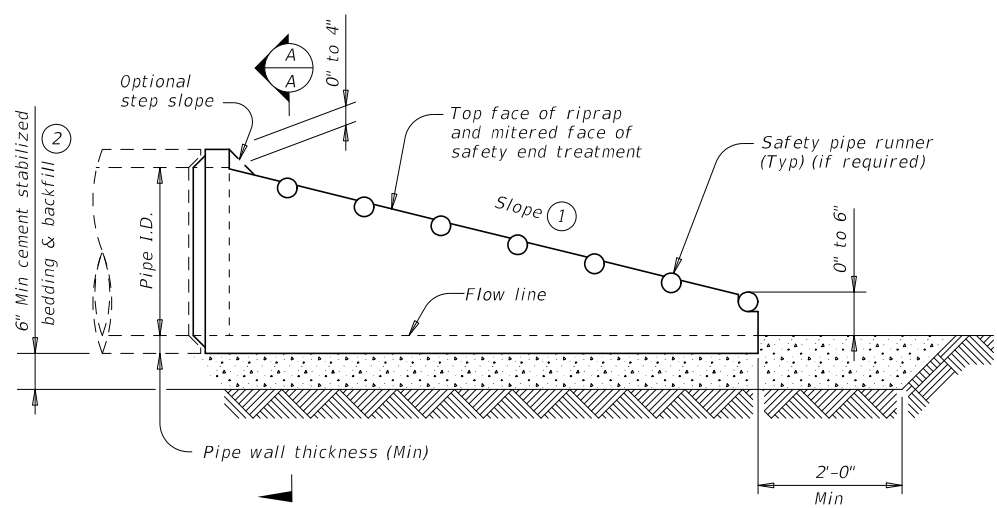
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©TxDOT February 2020	CONTRACT: 0133	SECTION: 04	JOB: 042	HIGHWAY: US 82
REVISIONS	DIST: WFS	COUNTY: BAYLOR	SHEET NO. 208	

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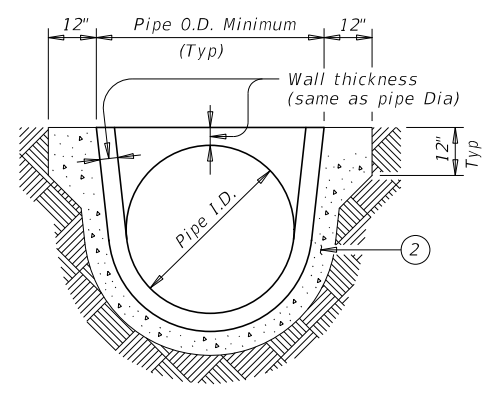
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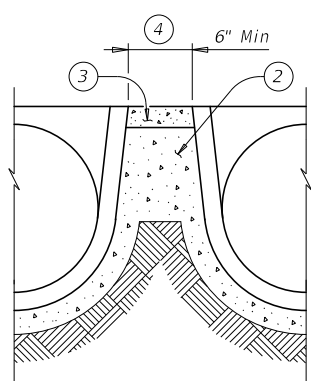
**PLAN VIEW - 12" THRU 24"**  
(Showing spigot end connection.)



**LONGITUDINAL ELEVATION - 12" THRU 24"**  
(Showing spigot end connection.)

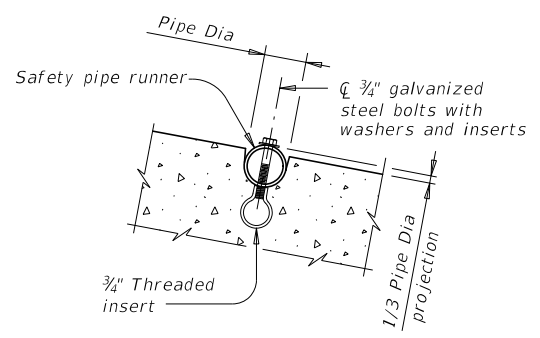


**SECTION A-A**

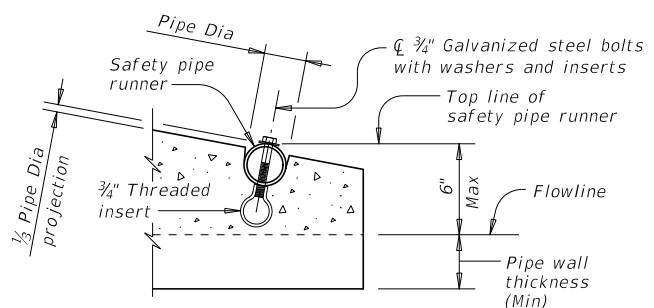


**MULTIPLE PIPE INSTALLATION**

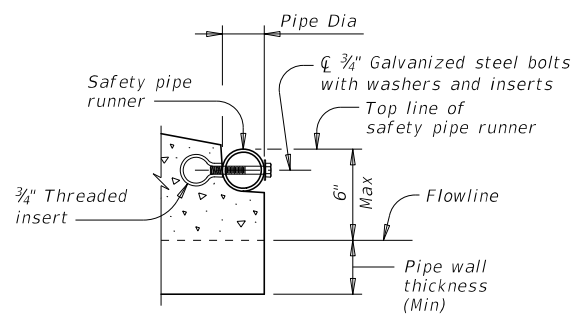
- ① Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.  
Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- ③ Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
- ④ Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- ⑤ Safety pipe runners are required for multiple pipe culverts with more than two pipes.



**INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS**  
(If required)



**OPTION A**



**OPTION B**

**END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS**  
(If required)

**REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS**

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4'-0"	No	⑤	3" STD	3.500"	3.068"
15"	2 1/4"	19 1/2"	19"	0.07 Circ.	6:1	5'-8"	No	⑤	3" STD	3.500"	3.068"
18"	2 1/2"	23"	21 1/2"	0.07 Circ.	6:1	7'-3"	No	⑤	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10'-6"	No	⑤	3" STD	3.500"	3.068"
30"	3 1/2"	37"	31"	0.18 Circ.	6:1	12'-1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15'-4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 1/2"	51"	41 1/2"	0.23 Ellip.	6:1	18'-7"	Yes	Yes	4" STD	4.500"	4.026"

**MATERIAL NOTES:**  
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.  
Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.  
Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

**GENERAL NOTES:**  
Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".  
When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.  
Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.  
Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.  
Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.  
Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.



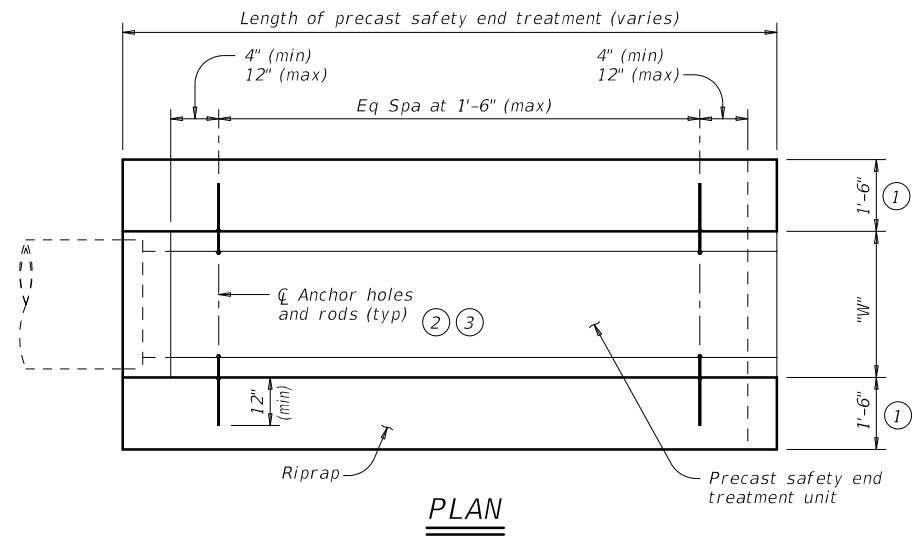
**PRECAST SAFETY END TREATMENT TYPE II ~ PARALLEL DRAINAGE**

**PSET-RP**

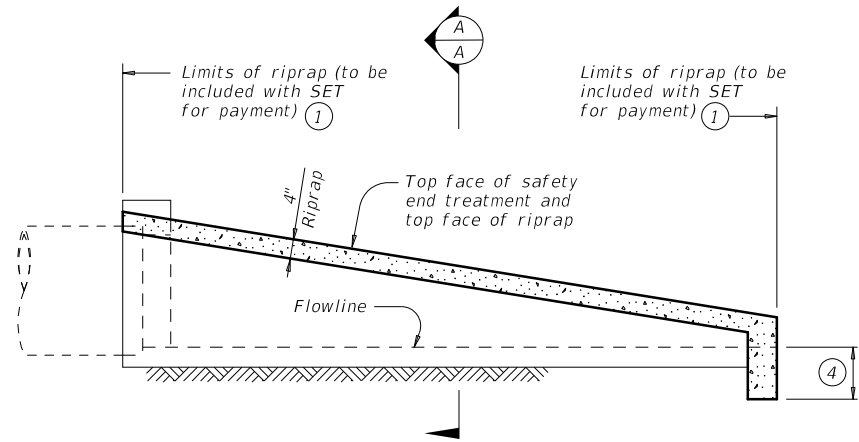
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©TxDOT REVISIONS	0133	04	042	US 82
	WFS		BAYLOR	SHEET NO. 209

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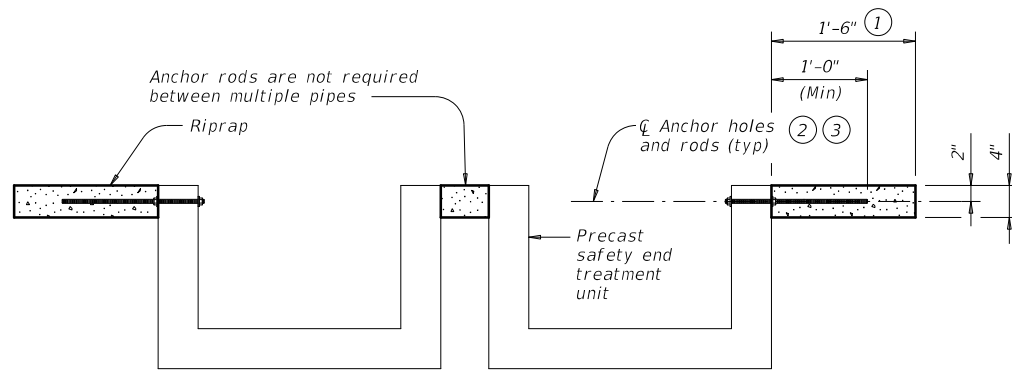
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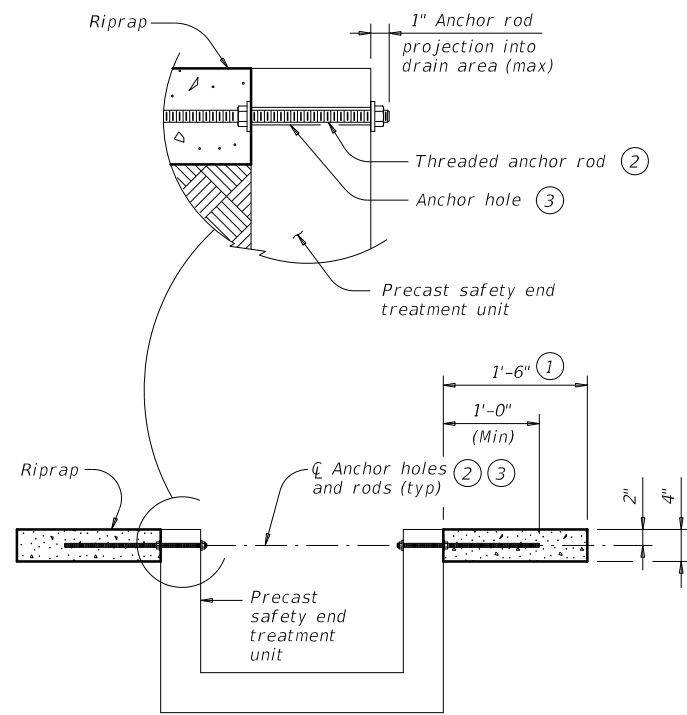
**PLAN**



**LONGITUDINAL ELEVATION**



**MULTIPLE PIPE INSTALLATION**



**SINGLE PIPE INSTALLATION**

**SECTION A-A**

**ESTIMATED CONCRETE RIPRAP QUANTITIES (CY)**

Nominal Culvert (Pipe) I.D.	PSET-SC and PSET-SP Standards					PSET-RC and PSET-RP Standards		
	Unit Width "W"	Side Slope			Unit Width "W"	Side Slope		
		3:1	4:1	6:1		3:1	4:1	6:1
12"	23.0"	0.1	0.2	0.2	16.0"	0.1	0.1	0.2
15"	26.5"	0.2	0.2	0.3	19.5"	0.1	0.2	0.2
18"	30.0"	0.2	0.2	0.3	23.0"	0.2	0.2	0.3
24"	37.0"	0.3	0.3	0.5	30.0"	0.2	0.3	0.4
30"	44.5"	0.3	0.4	0.6	37.0"	0.3	0.3	0.5
36"	51.5"	0.4	0.5	0.7	44.0"	0.3	0.4	0.6
42"	58.5"	0.5	0.6	0.8	51.0"	0.4	0.5	0.7

- Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap". When riprap is cast integrally with the precast safety end treatment, this dimension is 1'-0" minimum.
- 1#2" Dia ASTM A307 Gr A threaded anchor rod with 2 nuts and 2 washers. Galvanize all components in accordance with Item 445, "Galvanizing". Repair galvanizing that is damaged during transport or construction in accordance with the specifications.
- 3#4" through holes in walls of safety end treatment for riprap anchor rods may be drilled with rotary (coring or masonry) type drilling equipment or may be formed. Do not use percussive (star) type drilling equipment. If holes are drilled, patch spalls in the inside face of the wall exceeding 1#2" from the holes.
- Provide riprap toe wall when dimension is shown elsewhere in the plans or when field conditions require a toe wall.
- Quantities shown are for one end of one reinforced concrete pipe culvert. For multiple pipe culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only. Quantities are based on the minimum unit lengths shown on the Precast Safety End Treatment (SET) standard sheets.

**MATERIAL NOTES:**

Provide Class "B" riprap in accordance with Item 432, "Riprap". Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. The anchor rods shown are always required.

**GENERAL NOTES:**

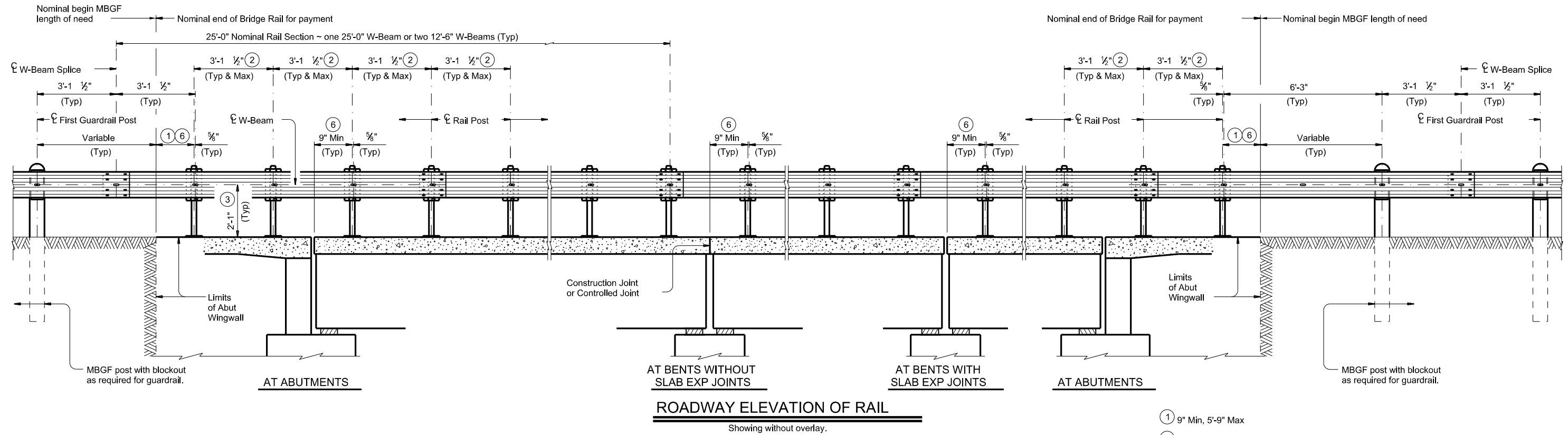
Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment". Refer to PSET-SC or PSET-SP standard sheets for details of square safety end treatments not shown. Refer to PSET-RC or PSET-RP standard sheets for details of round safety end treatments not shown. For precast units with integrally cast riprap, substitute reinforcing steel in the amount on 0.26 in./ft. minimum for the threaded anchor rods shown. When requested, submit sealed engineering drawings for approval prior to construction. Shop drawings will not be required. Note that a proprietary precast unit with integral riprap is available from L&R Precast Concrete Works, Inc. (956) 583-6293 or www.lrpccast.com. Payment for riprap and toewalls is included in the price bid for each safety end treatment.

These riprap details are only applicable when notes that require placement of riprap with precast safety end treatments are shown elsewhere in the plans.

Precast units with integrally cast riprap are permitted unless noted otherwise on the plans.

				<b>Bridge Division Standard</b>	
<b>PRECAST SAFETY END TREATMENT TYPE II RIPRAP DETAILS</b>					
<b>PSET-RR</b>					
FILE: psetrrse-20.dgn	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0133	04	042	US 82	
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	WFS	BAYLOR	210		

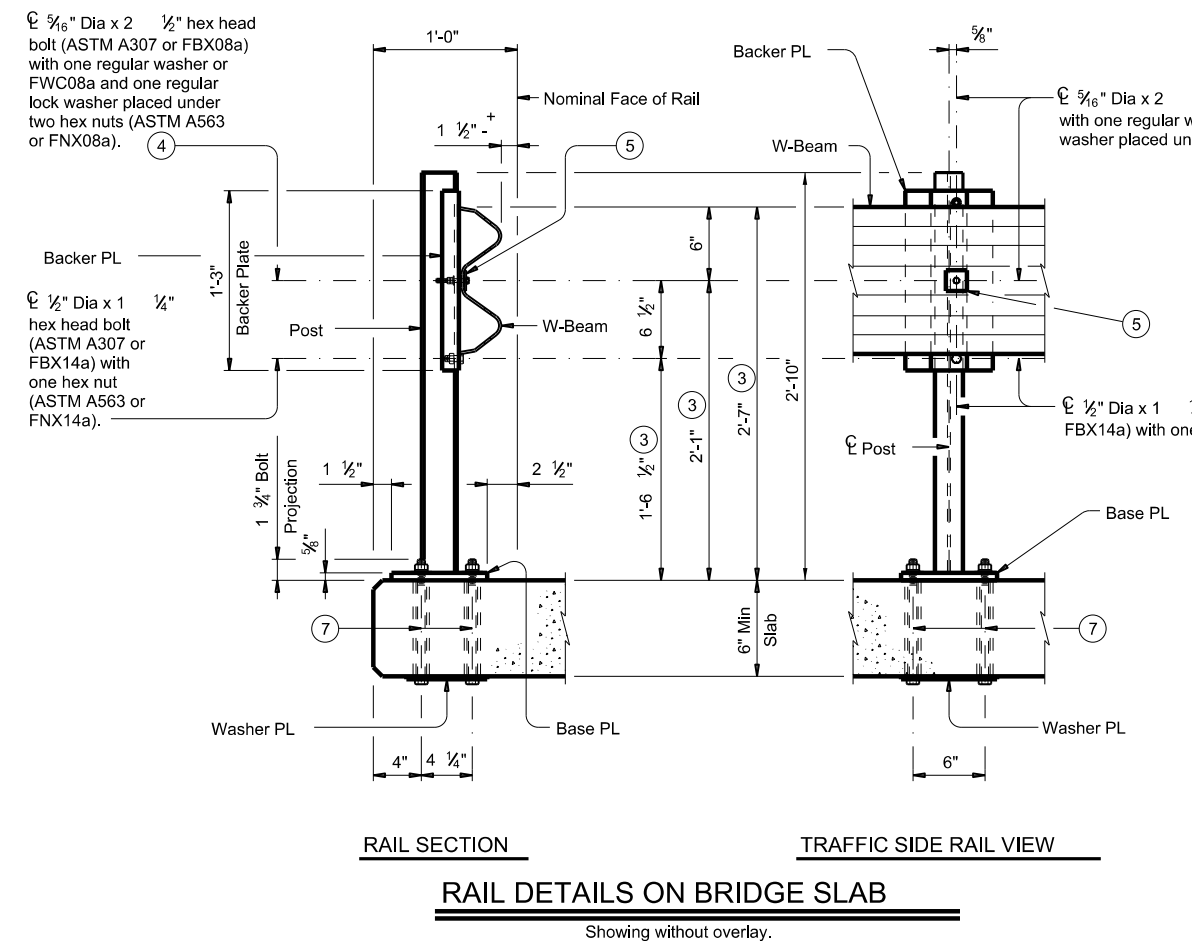
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**ROADWAY ELEVATION OF RAIL**

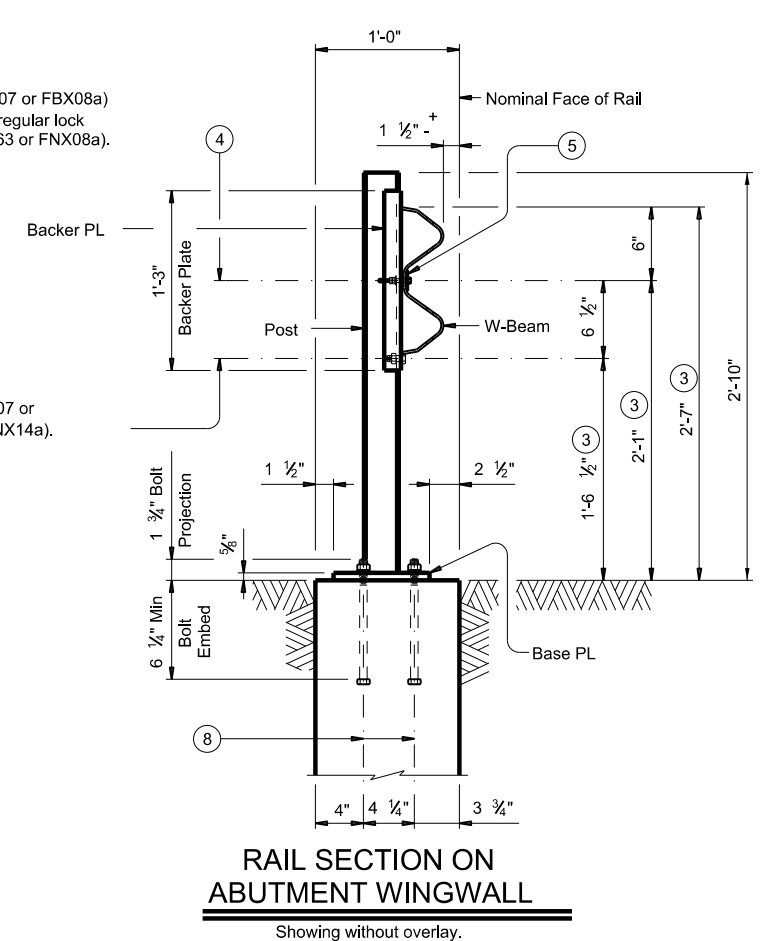
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- ① 9" Min, 5'-9" Max
- ② Maintain 3'-1 1/2" Rail Post spacing wherever possible for use with nominal 25'-0" or 12'-6" W-Beam sections. Symmetry of post spacing on both sides and along the structure is not necessary.
- ③ Increase 2" for structures 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 1/2" x 1 3/4" x 1 3/4" with 3/8" Dia Hole centered in PL (ASTM A36). Square Guardrail Washer (FWR01).
- ⑥ The post nearest to a slab joint or end of structure may be shifted up to 9" in order to satisfy the minimum offset dimension. Drill a new 3/8" Dia hole on 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 3/8" Dia formed holes for 3/8" 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 DETAILS ON BRIDGE SLAB**

Showing without overlay.



**RAIL SECTION ON ABUTMENT WINGWALL**

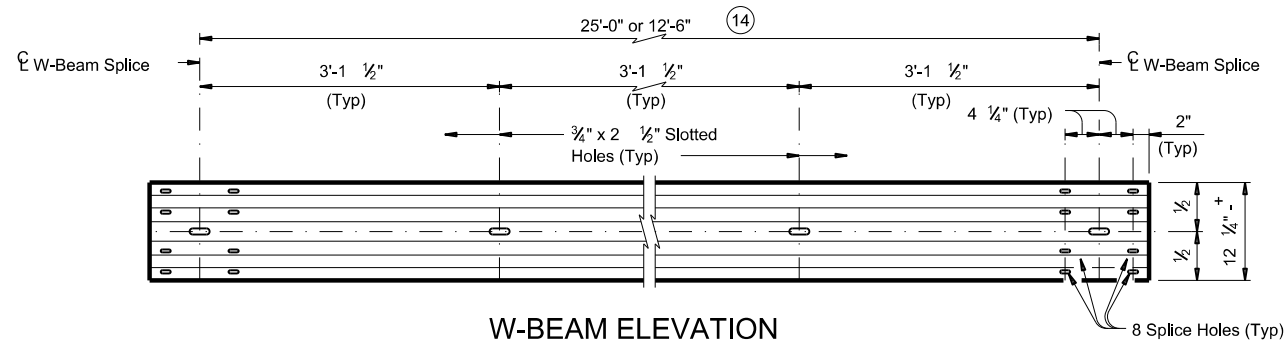
Showing without overlay.

SHEET 1 OF 2

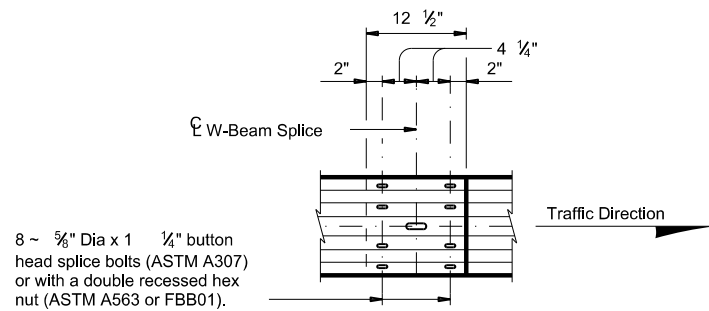
			<b>Bridge Division Standard</b>	
<h2>TRAFFIC RAIL</h2>				
<h3>TYPE T631</h3>				
FILE: tstd038-20.dgn	DN: TxDOT	CK: AES	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US 82
07-20c Allow 9'-4" sections.	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	211	



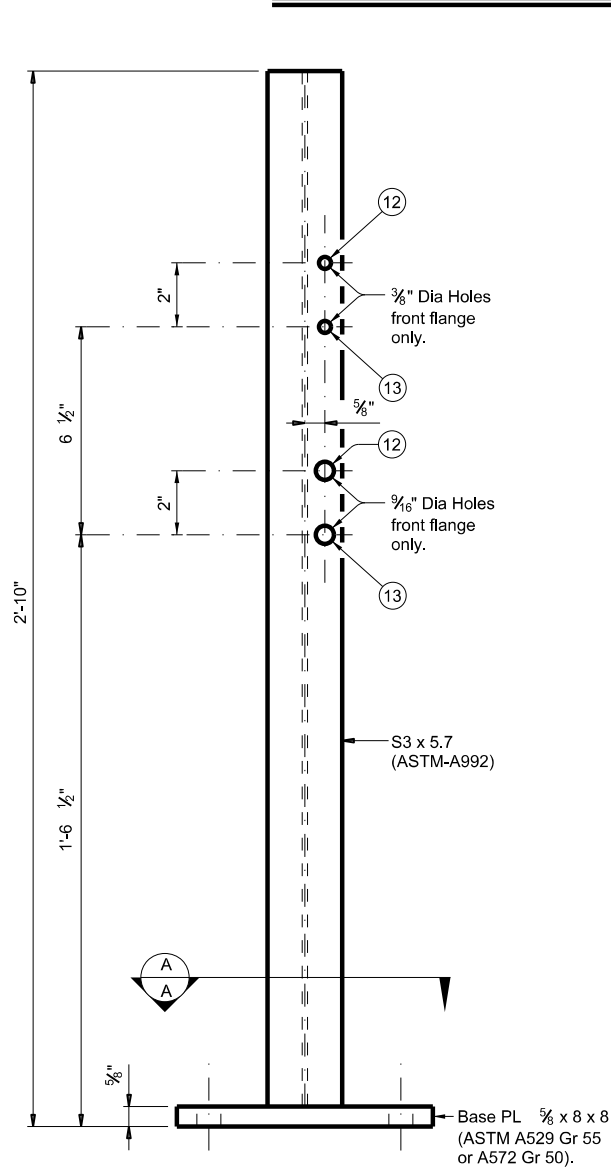
DATE: 9/7/2021 9:14:45 AM  
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 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.



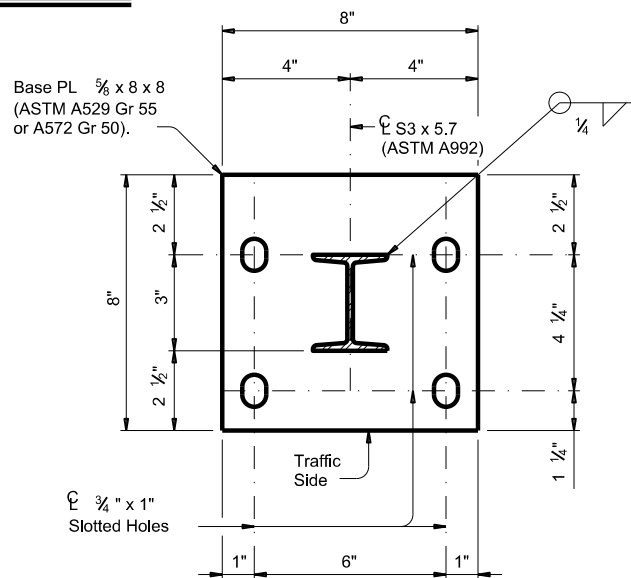
**W-BEAM ELEVATION**



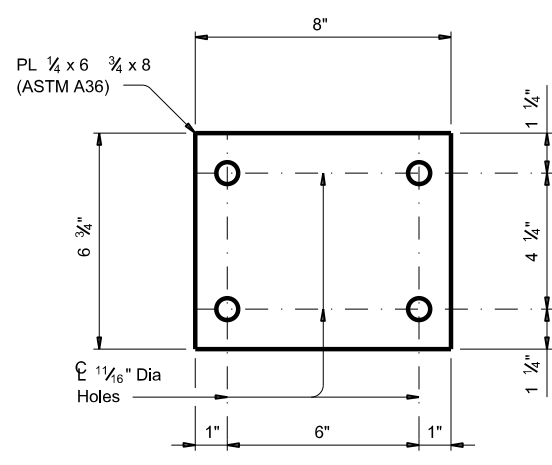
**W-BEAM SPLICE ELEVATION**



**POST ELEVATION**

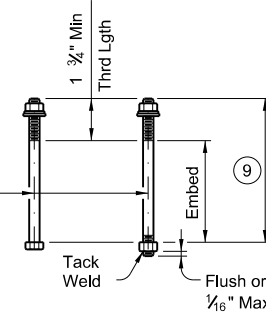


**SECTION A-A**



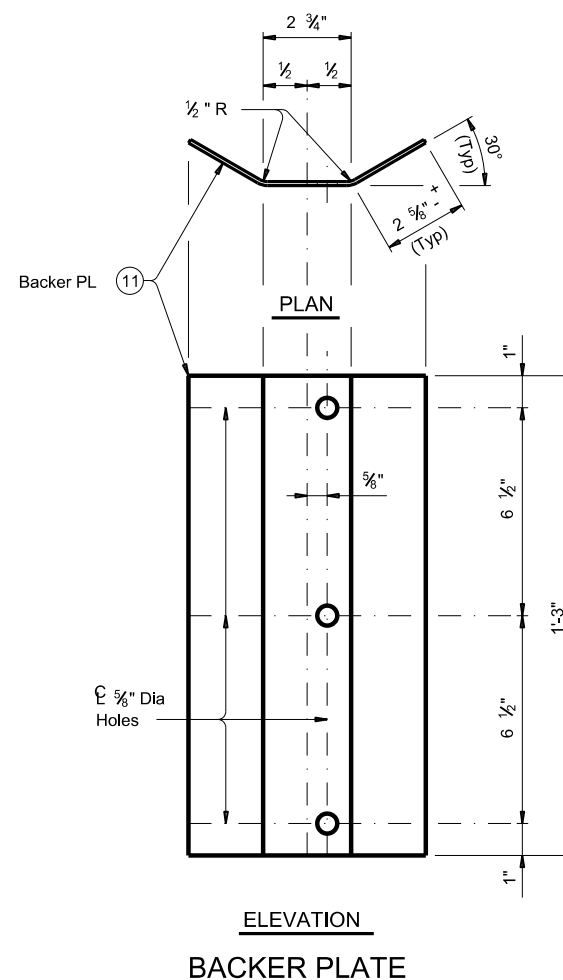
**WASHER PLATE DETAIL**

□ 5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (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.



**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 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 tack welded heavy hex nut each) with one hardened steel washer (ASTM F436) and one regular lock washer placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements.

Optional adhesive anchorage system must be 5/8" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed fully threaded rod into slab and/or abutment wingwall using a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4 3/4". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 8 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing."

W-beam must meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified in the plans. The Contractor may furnish rail elements of 25'-0" or 12'-6" (Nominal) lengths and a single rail element of 9'-4 1/2" or 6'-3" (Nominal) length. W-Beam must have slotted holes at 3'-1 1/2".  
 Some part numbers from the "Task Force 13" Guide to Standardized Highway Barrier Hardware have been furnished for quick reference.

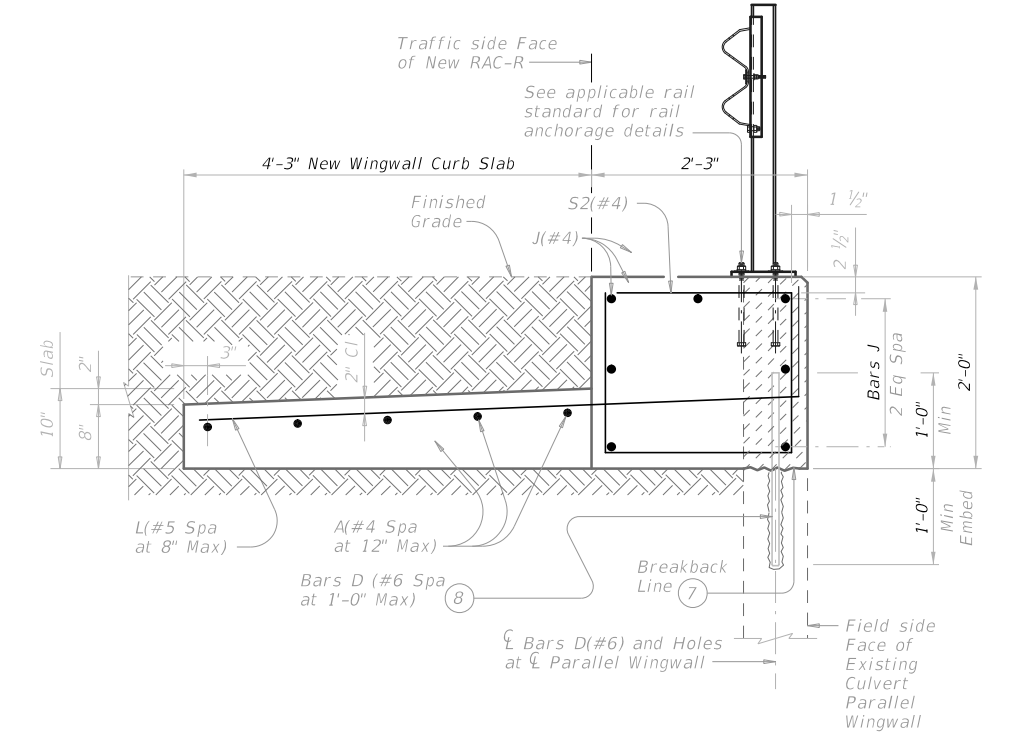
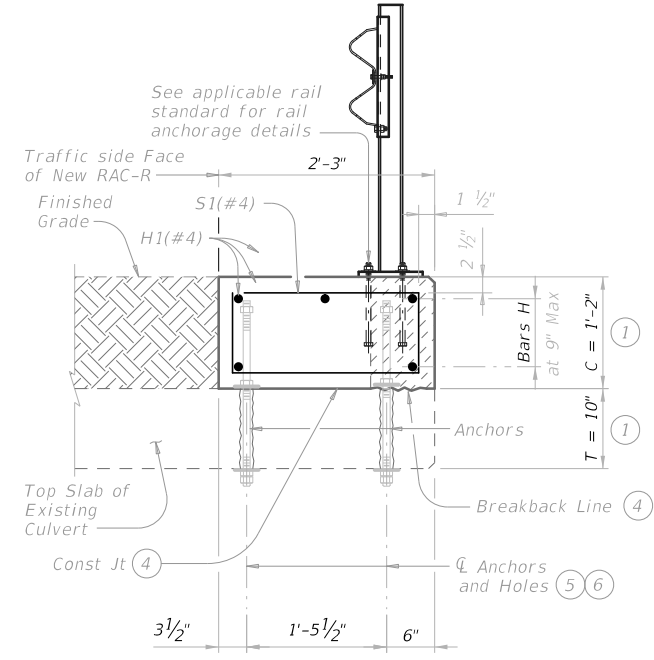
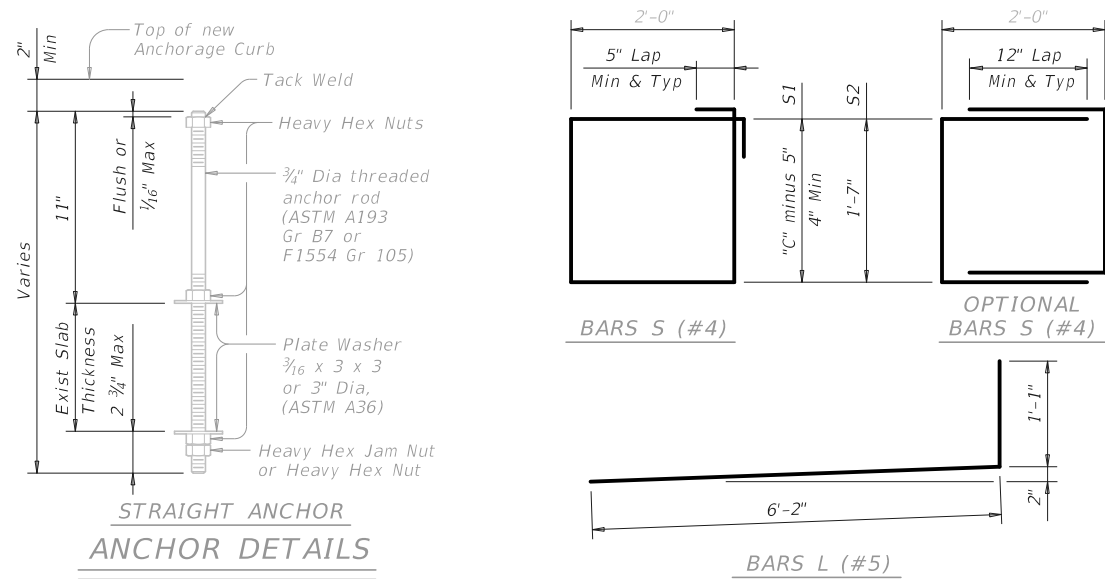
**GENERAL NOTES:**  
 This railing has been successfully evaluated by full-scale crash test to meet MASH TL-3 criteria. This railing can be used for speeds of 50 mph and greater.  
 This rail is designed to deflect approximately 4' to 4'-6" as it contains and redirects the errant vehicle. This rail may not be installed on top of or behind curbs that project above finished grade, on bridges with expansion joints providing more than 5" movement, on retaining walls, or on grade separations and interchanges.  
 Repairs to impact-damaged post and base plate unit are not permitted. Replace all impact-damaged posts with a new post and base plate unit.  
 Average weight of railing with no overlay: 20 plf total.

SHEET 2 OF 2

		<i>Bridge Division Standard</i>	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T631</h2>			
FILE: tstd038-20.dgn	DN: TxDOT	CK: AES	DW: JTR
REVISIONS	CONT	SECT	JOB
September 2019	0133	04	042
07-20c Allow 9'-4 sections.	DIST	COUNTY	SHEET NO.
	WFS	BAYLOR	212

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:



**TYPICAL SECTION ~ TYPE 2**

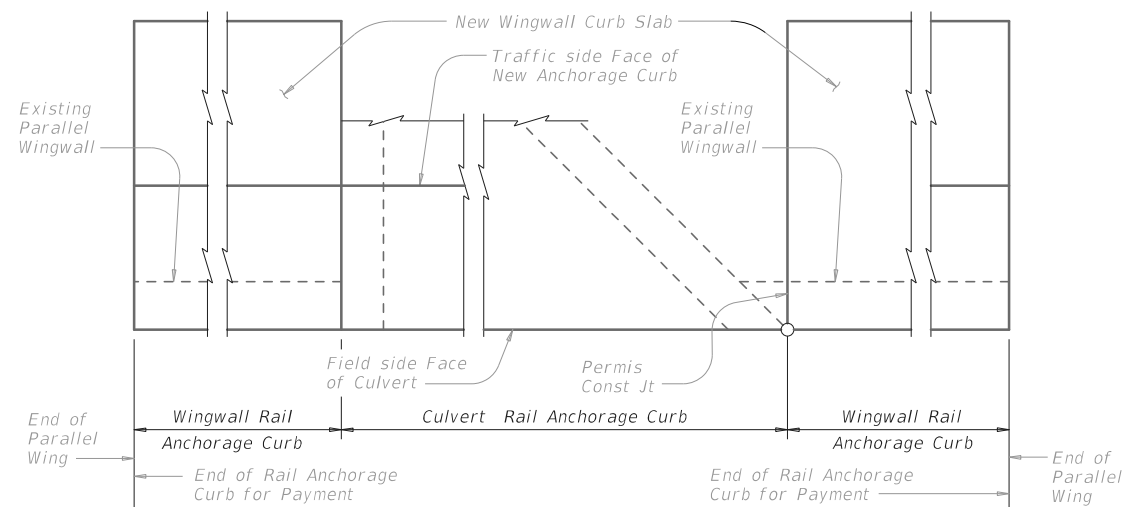
**TYPICAL SECTION ~ PARALLEL WINGWALL**

- "T" is equal to the existing culvert top slab thickness. If "T" is less than 6", a special design will be required. "C" is equal to the Retrofit Rail Anchorage Curb thickness.
- Not Used.
- Not Used.
- Saw cut (score) 1" deep flush with top of existing culvert slab, on the field side face of existing curb, if present. After scoring, remove shaded portion of existing concrete to Breakback Line shown. Do not damage existing reinforcing. Clean, bend and incorporate existing reinforcing into new concrete construction. Note that new anchors, as shown in the detail, are required even when existing reinforcing remains in use. Remove existing overlay and/or base material to flush with top of culvert in areas of new construction. Care must be taken to not damage the existing slab. In order to prevent existing asphalt remnants from acting as a bond breaker between the exposed, existing concrete and the retrofitted concrete curb, clean the newly exposed concrete with abrasive blasting or shot blasting. Remove all loose debris prior to placing new anchorage curb.
- Core drill 1" diameter holes through existing slab. Percussion drilling is not permitted. Patch spalls, when directed by the Engineer, in accordance with Item 429, "Concrete Structure Repair", at the Contractor's expense. Tighten nuts snug tight.
- Space field side anchors at 36" maximum. Space traffic side anchors at 11" maximum. Do not align field side and traffic side anchors transversely.
- Retrofit Wingwall Anchorage Curb must always be 2'-0" in height. Breakback existing wingwall as needed in order to properly align the wingwall Anchorage Curb with that placed on the existing culvert. Saw cut (score) 1" deep on field side face of the existing wingwall prior to breakback. Care must be taken so as to not damage existing reinforcing. Clean and extend existing reinforcing into new construction. Note that new Bars D(#6), as shown in the detail, are required even when existing reinforcing remains in use.
- Embed bars D(#6) into existing wingwall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 12". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." If existing parallel wingwall thickness is less than 8", a special design will be required.

**CONSTRUCTION NOTES:**  
Field verify dimensions before commencing work and ordering materials.

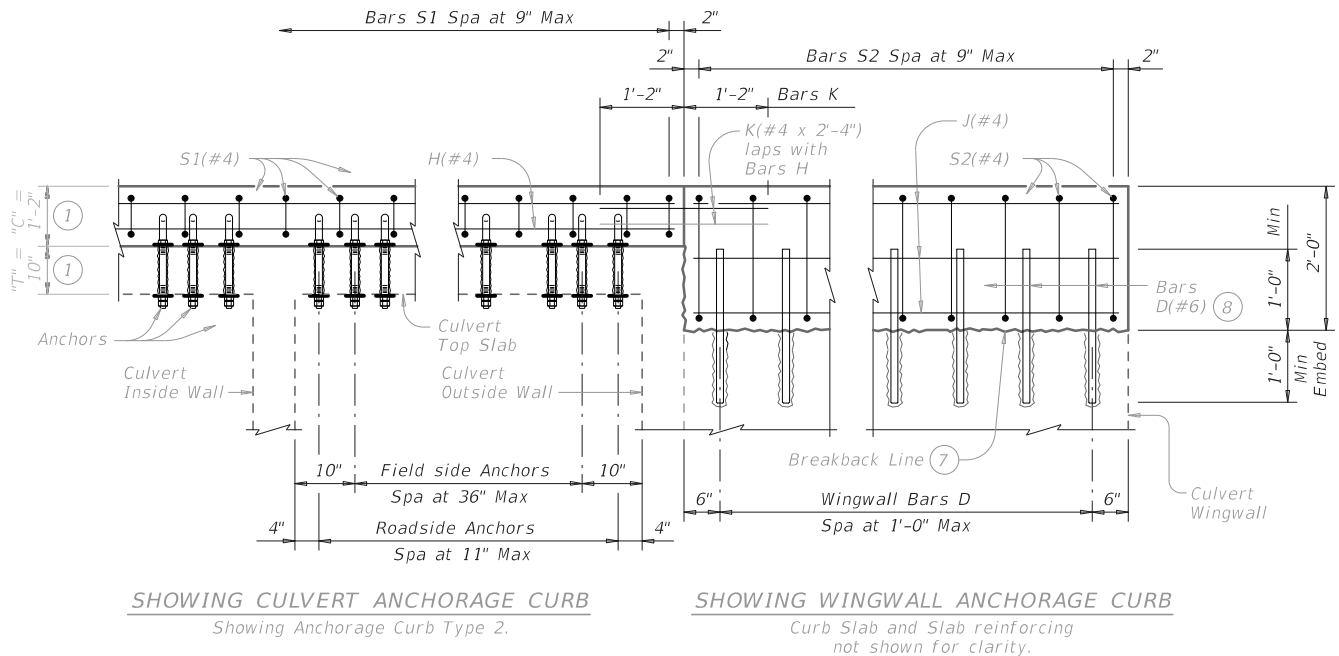
**MATERIAL NOTES:**  
Provide Class "C" concrete (f'c=3,600 psi). Provide Class "C" (HPC) concrete if shown elsewhere in the plans.  
Chamfer all exposed corners 3/4" unless shown otherwise.  
Provide Grade 60 reinforcing steel.  
Galvanize all reinforcing steel if required elsewhere.  
Provide bar laps, where required, as follows: Uncoated or galvanized ~ #4 = 1'-11"  
Galvanize 3/4" Dia threaded rods, heavy hex nuts and plate washers, unless otherwise shown on plans.

**GENERAL NOTES:**  
Designed according to AASHTO LRFD Bridge Design Specifications.  
The rail anchorage curb details have sufficient strength for use with all standard rail types. See appropriate rail standard for approved speed restrictions, notes and details not shown.  
For vehicle safety, the top of the new curb must be flush with the finished grade. These details are for use with curbs with a maximum height of 2'-0" only. Curb heights greater than 2'-0" will require special design.  
Payment for rail anchorage curb (including wingwall curb slab) will be by CY of Class "C" or Class "C" (HPC) concrete. This price will be full compensation for removal and disposal of Existing railing, disassembling and delivering members to be retained by the Department, removing existing concrete, repairing any damaged culvert deck and wings, furnishing, preparing, and placing concrete, expansion joint material, reinforcing steel, structural steel, cast steel, pipe, anchor bolts or bars, testing of epoxy anchors, and all other materials required in the finished rail anchorage curb; and hardware, galvanizing, equipment, labor, tools, and incidentals.  
Removal and replacement of backfill, subgrade, and asphalt or concrete pavement necessary for this installation is considered subsidiary to the rail anchorage curb.  
Not all possible combinations of existing box culverts, curbs, wingwalls etc. have been shown on this sheet. Other combinations and reinforcement arrangements are permissible if they meet the same strength requirements as indicated on this sheet.  
Cover dimensions are clear dimensions, unless noted otherwise.  
Reinforcing bar dimensions shown are out-to-out of bar.



**TYPICAL CURB PLANS**

Showing Geometry only. Reinforcing, Curb Anchors, and Railing not shown for clarity.



**TYPICAL ELEVATIONS OF INSTALLATION**



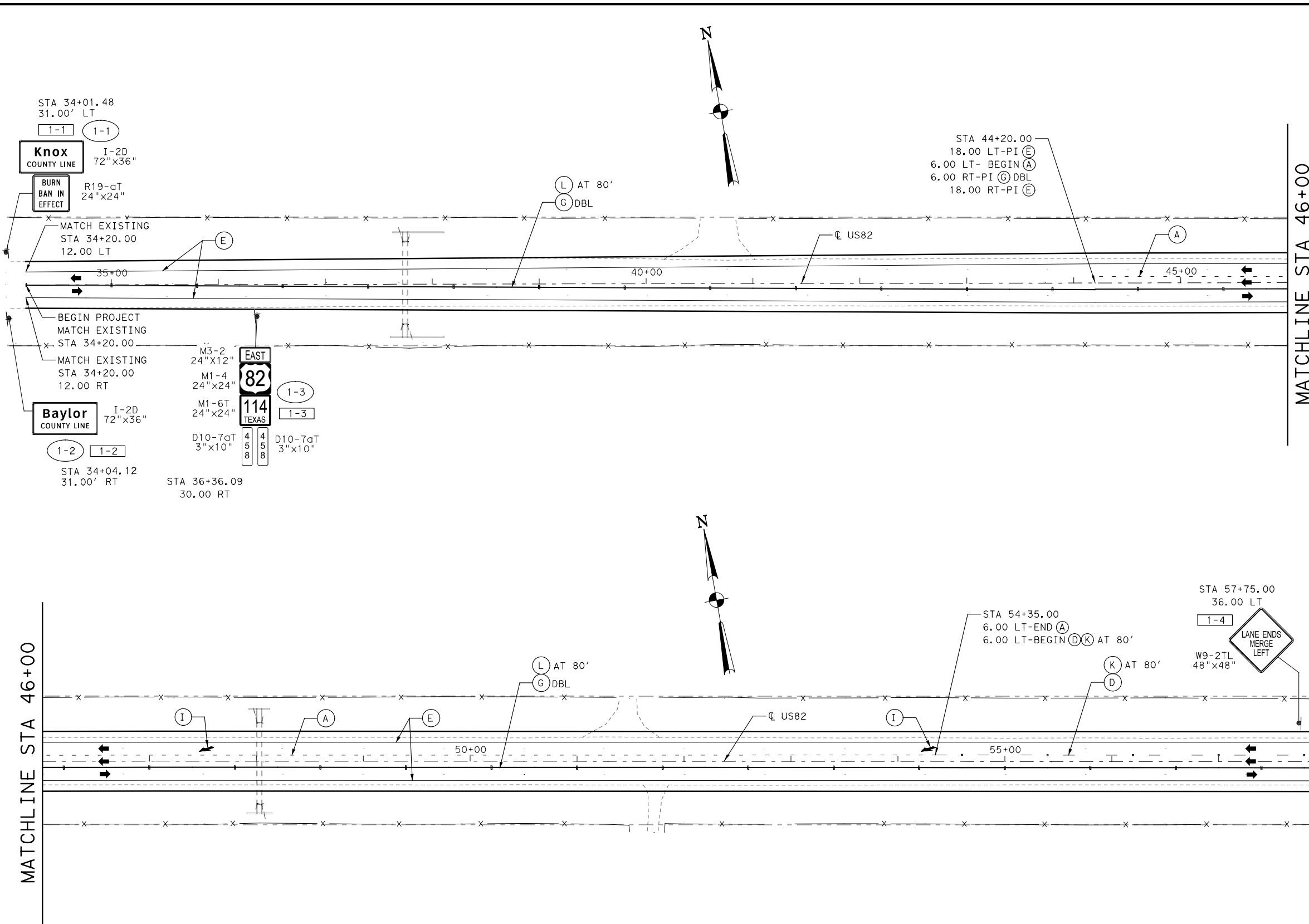
12/14/2020

SHEET 1 OF 1

		<b>Bridge Division Standard</b>	
<b>RAIL ANCHORAGE CURB RETROFIT</b> <b>BOX CULVERT RAIL MOUNTING DETAILS</b> (CURBS 2'-0" TALL AND LESS ONLY)			
<b>RAC-R(MOD)</b>			
FILE: racst02-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
REV: February 2020	CON: 0133	SECT: 04	JOB: 042
REVISIONS	COUNTY: BAYLOR		SHEET NO.: 213

THE TxDOT RETROFIT GUIDE STANDARD RAC-R HAS BEEN MODIFIED FOR PROJECT SPECIFIC USE AT CULVERT NO. 34 ONLY. THE USE OF THIS STANDARD AT OTHER LOCATIONS IS NOT PERMITTED.

12/15/2020 9:55:51 AM  
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**LEGEND**

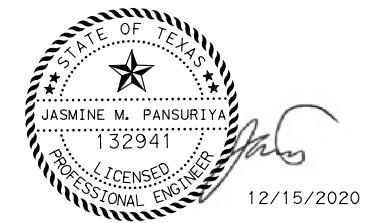
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(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	92
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4760
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4760
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	2
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	5
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	60
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR

MATCHLINE STA 46+00

MATCHLINE STA 46+00

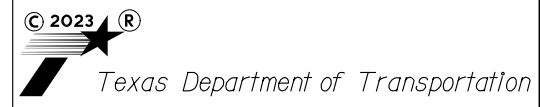
MATCHLINE STA 58+00



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 34+20 TO 58+00

SHEET 1 OF 29



SCALE: 1" = 100'

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STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

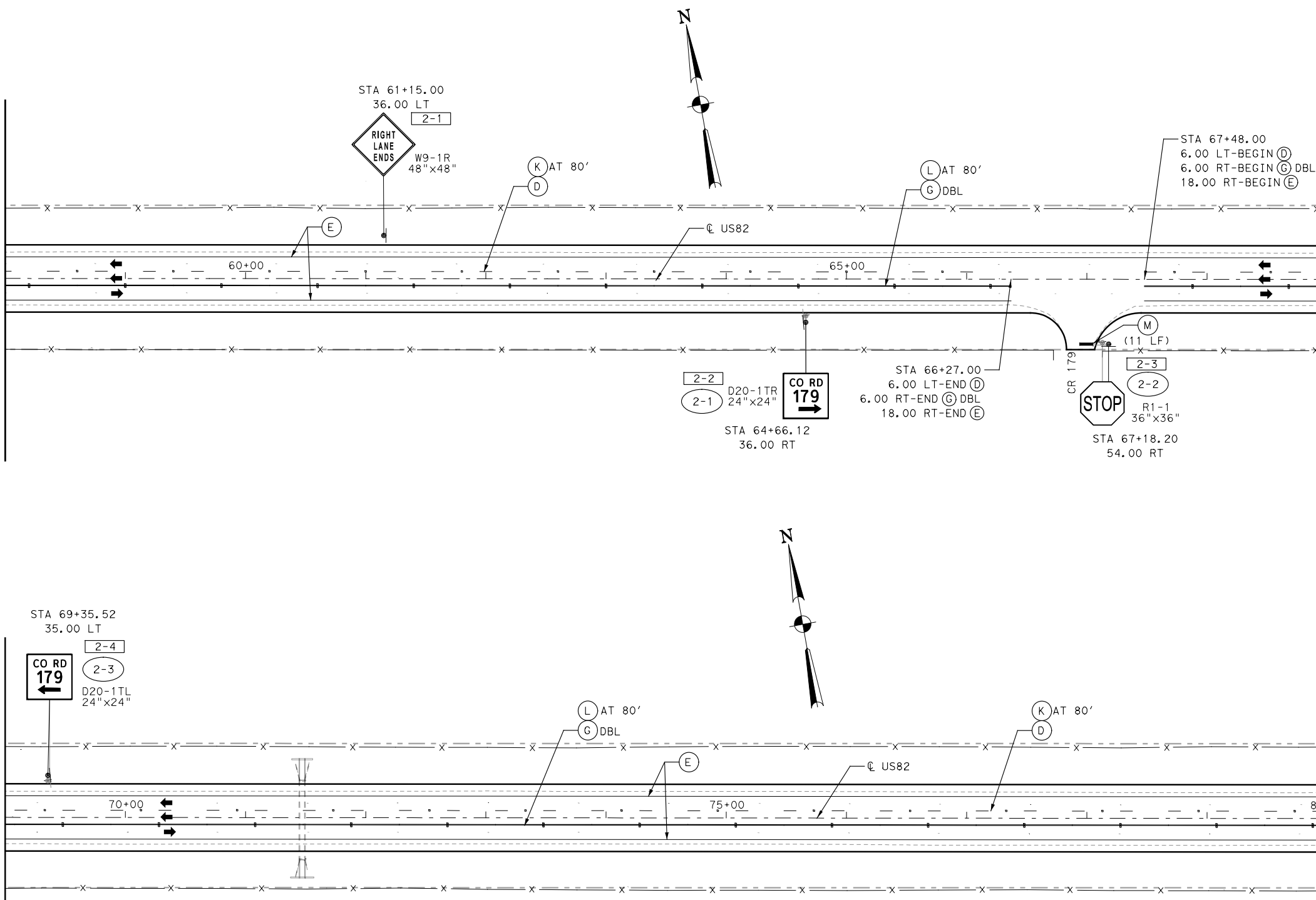
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MATCHLINE STA 58+00

MATCHLINE STA 69+00

MATCHLINE STA 69+00

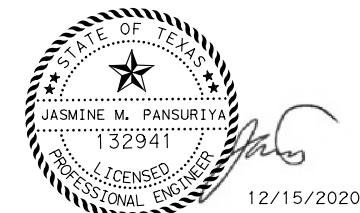
MATCHLINE STA 81+00



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(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	545
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4479
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4358
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	28
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	56
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	11

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 58+00 TO 81+00

SHEET 2 OF 29

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SCALE: 1" = 100'

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STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

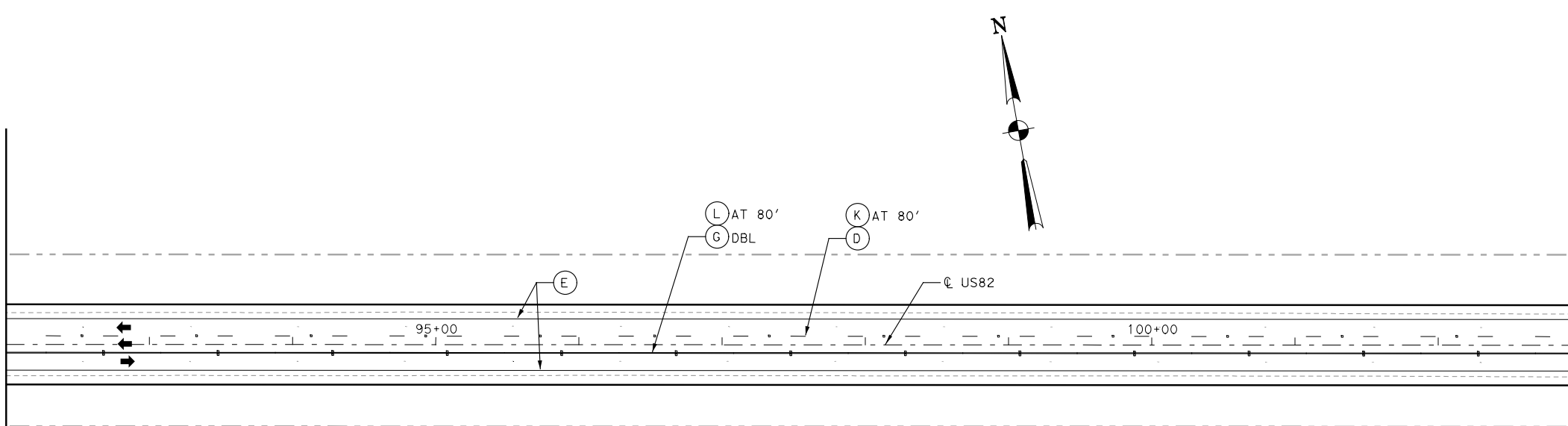
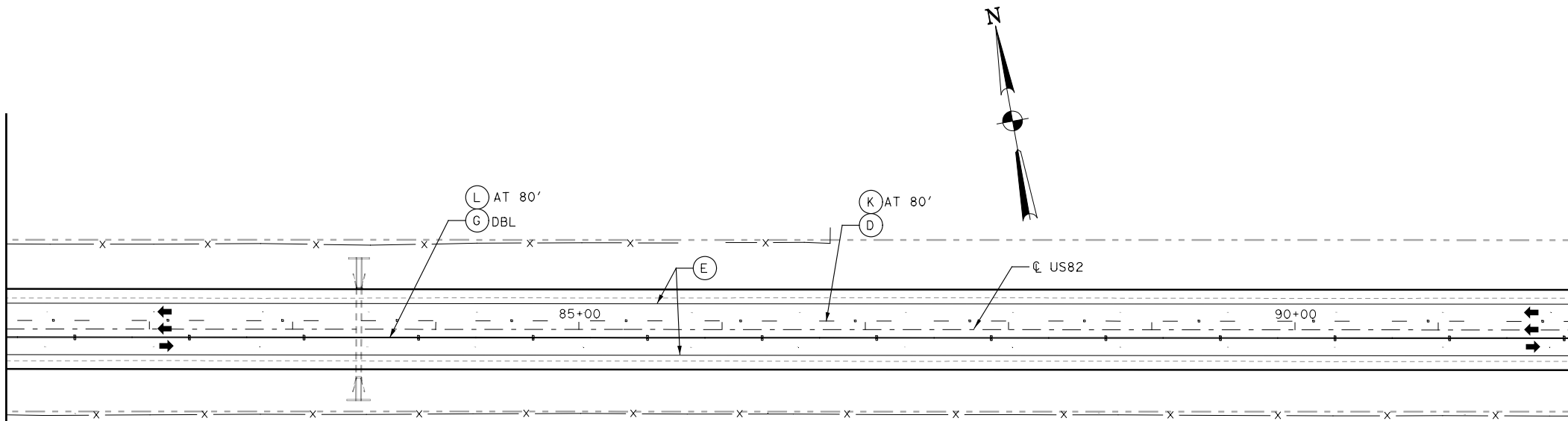
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MATCHLINE STA 81+00

MATCHLINE STA 92+00

MATCHLINE STA 92+00

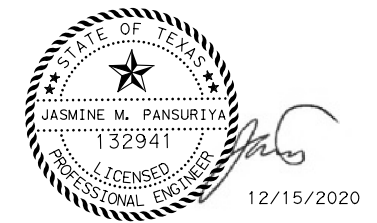
MATCHLINE STA 104+00



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(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 81+00 TO 104+00

SHEET 3 OF 29



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
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STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

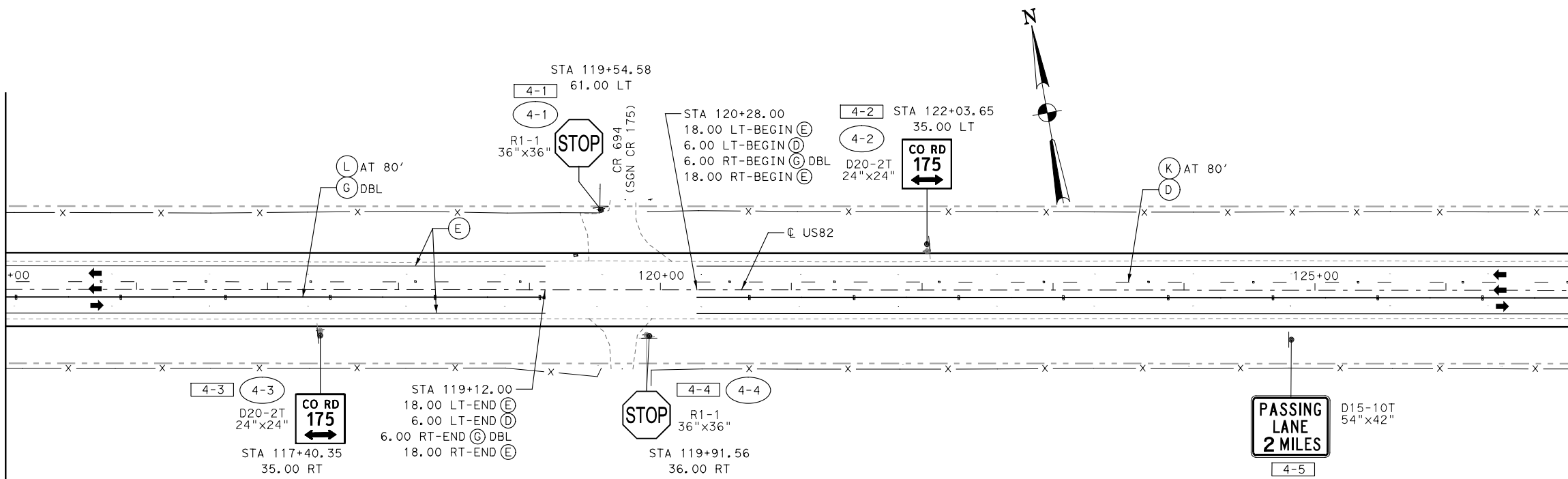
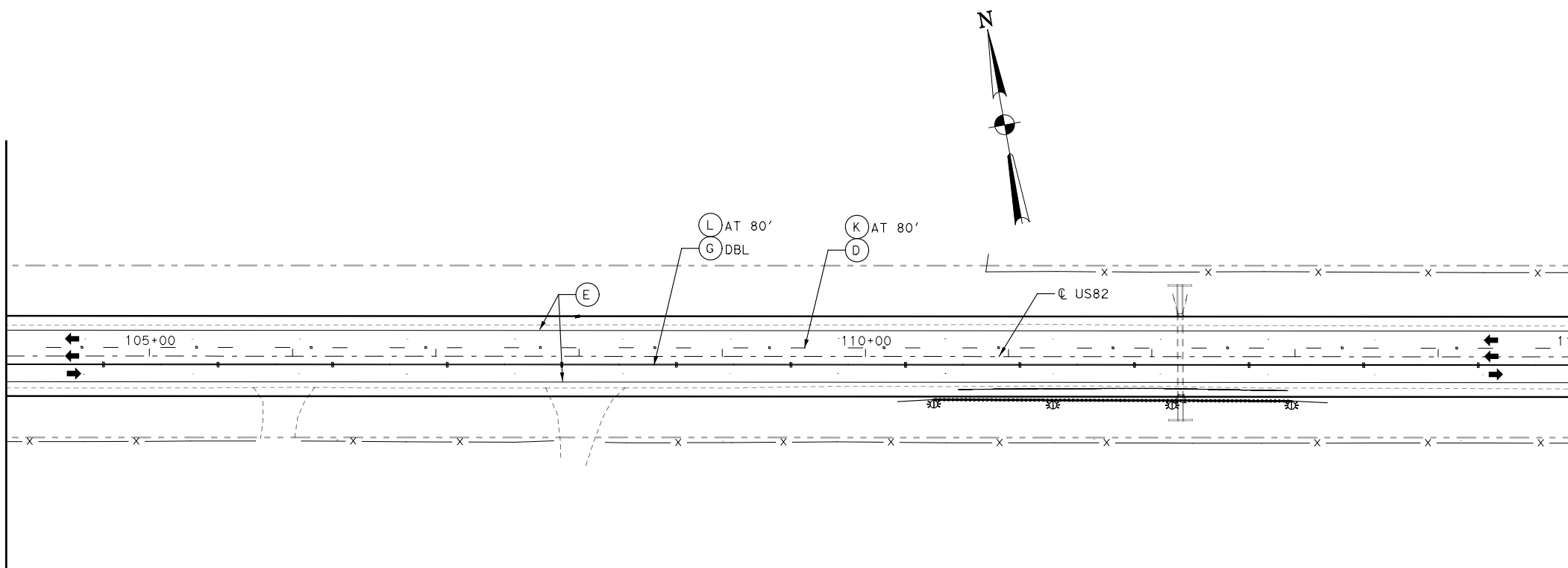
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MATCHLINE STA 104+00

MATCHLINE STA 115+00

MATCHLINE STA 115+00

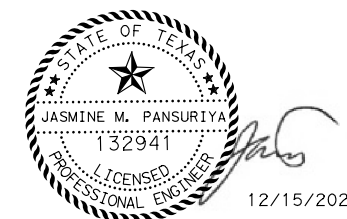
MATCHLINE STA 127+00



LEGEND

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(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	546
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4368
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4368
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	28
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	56
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 104+00 TO 127+00

SHEET 4 OF 29

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SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
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TEXAS	WFS	BAYLOR	
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0133	04	042	US 82

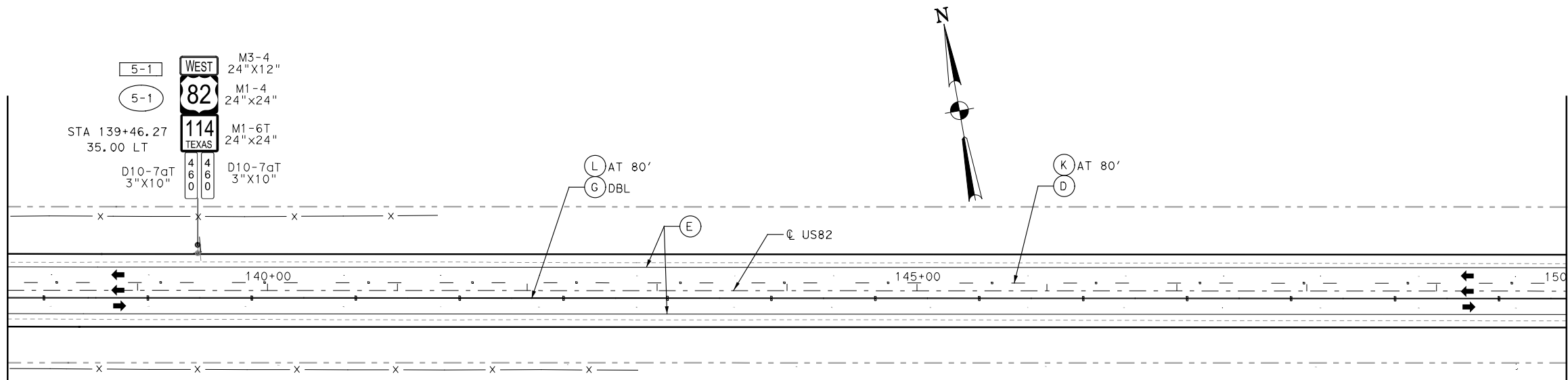
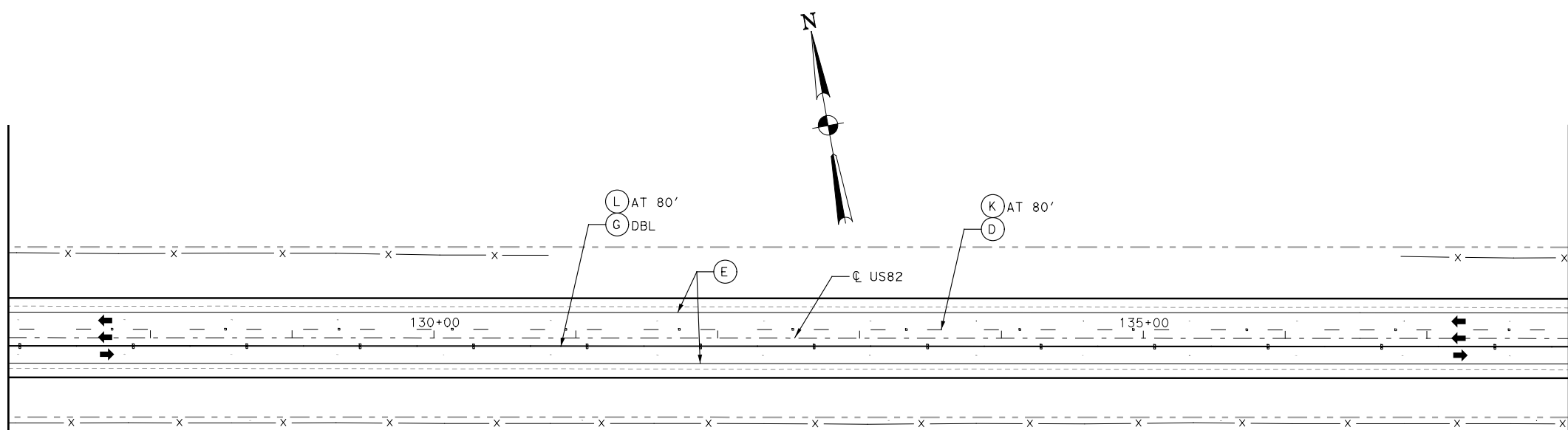
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MATCHLINE STA 127+00

MATCHLINE STA 138+00

MATCHLINE STA 138+00

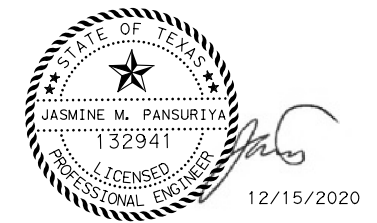
MATCHLINE STA 150+00



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 127+00 TO 150+00

SHEET 5 OF 29



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		218	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/15/2020 9:56:39 AM  
 OTH\*FVMRK\*06.DGN

MATCHLINE STA 150+00

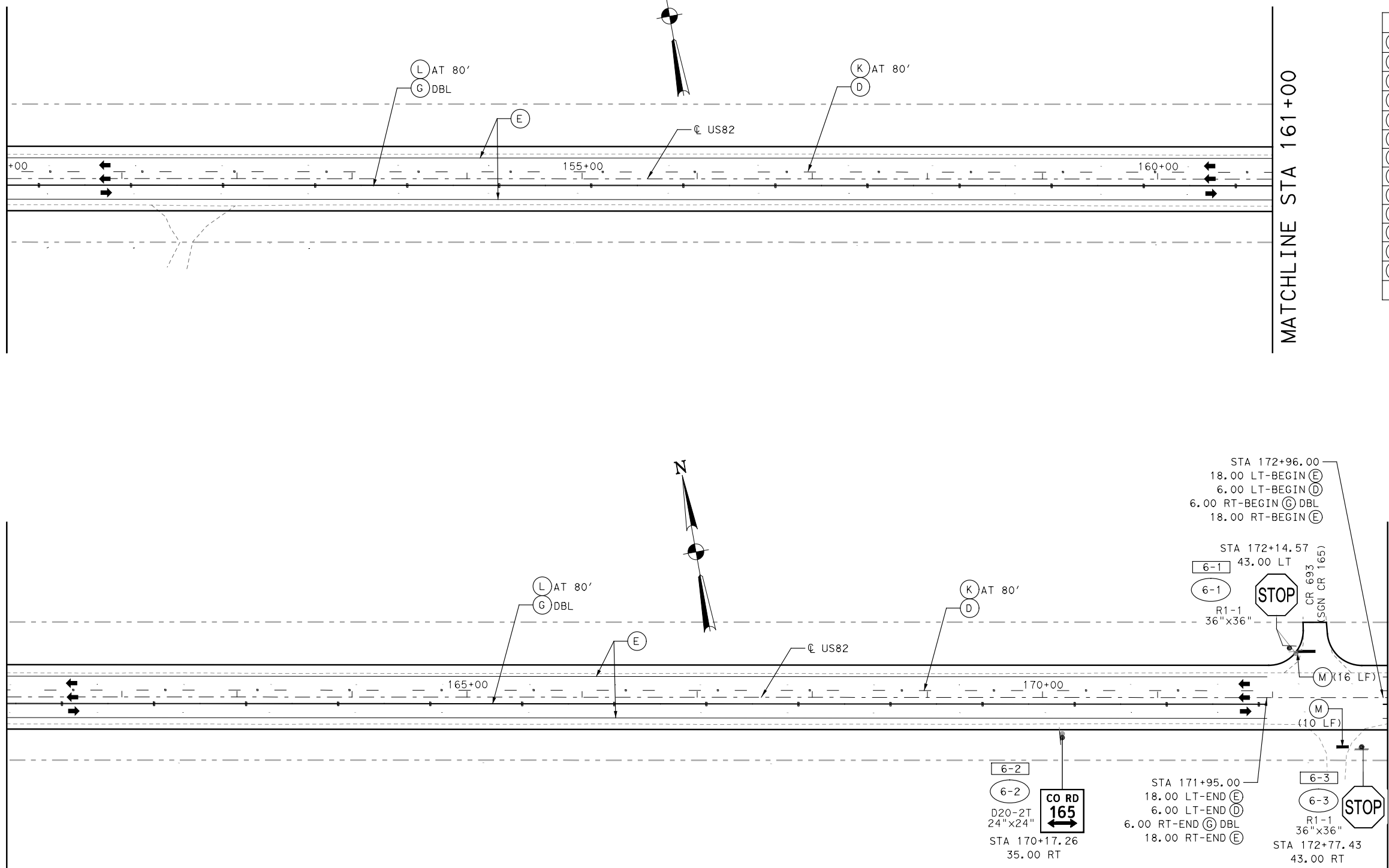
MATCHLINE STA 161+00

MATCHLINE STA 161+00

**LEGEND**

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	550
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4398
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4398
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	26

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

**STA 150+00 TO 173+00**

SHEET 6 OF 29

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**OTHON**  
 CONSULTING ENGINEERS

F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		219	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82



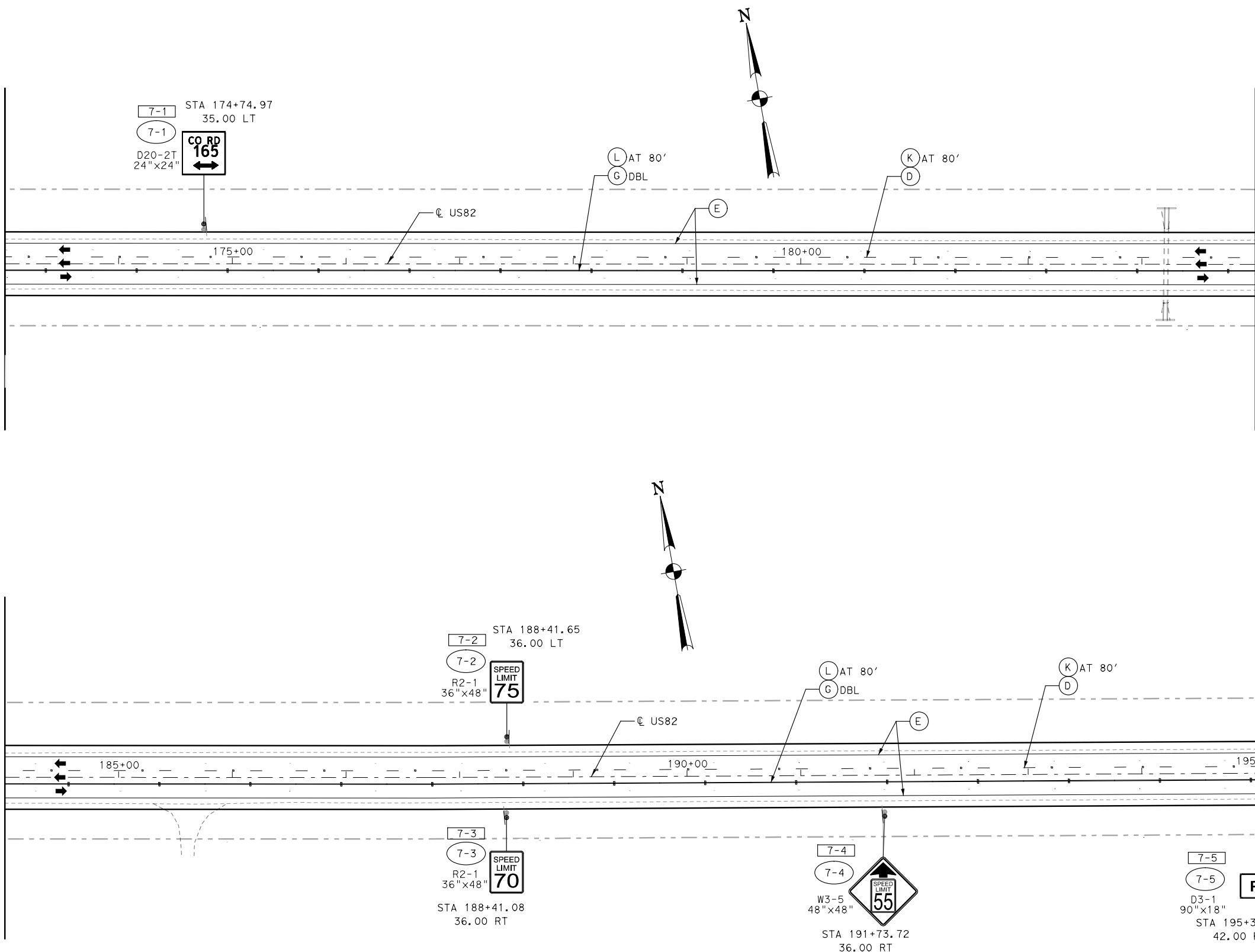
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 OTH\*PVMRK\*07.DGN

MATCHLINE STA 173+00

MATCHLINE STA 184+00

MATCHLINE STA 184+00

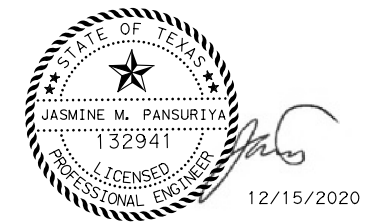
MATCHLINE STA 196+00



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
K	0672-6007 REFL PAV MRKR TY I-C	EA	29
L	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

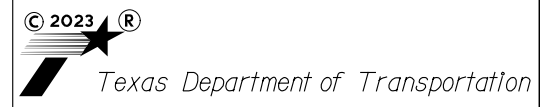
- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 173+00 TO 196+00

SHEET 7 OF 29



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		220	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/15/2020 9:56:51 AM  
 OTH\*FVMRK\*08.DGN

MATCHLINE STA 196+00

MATCHLINE STA 207+00

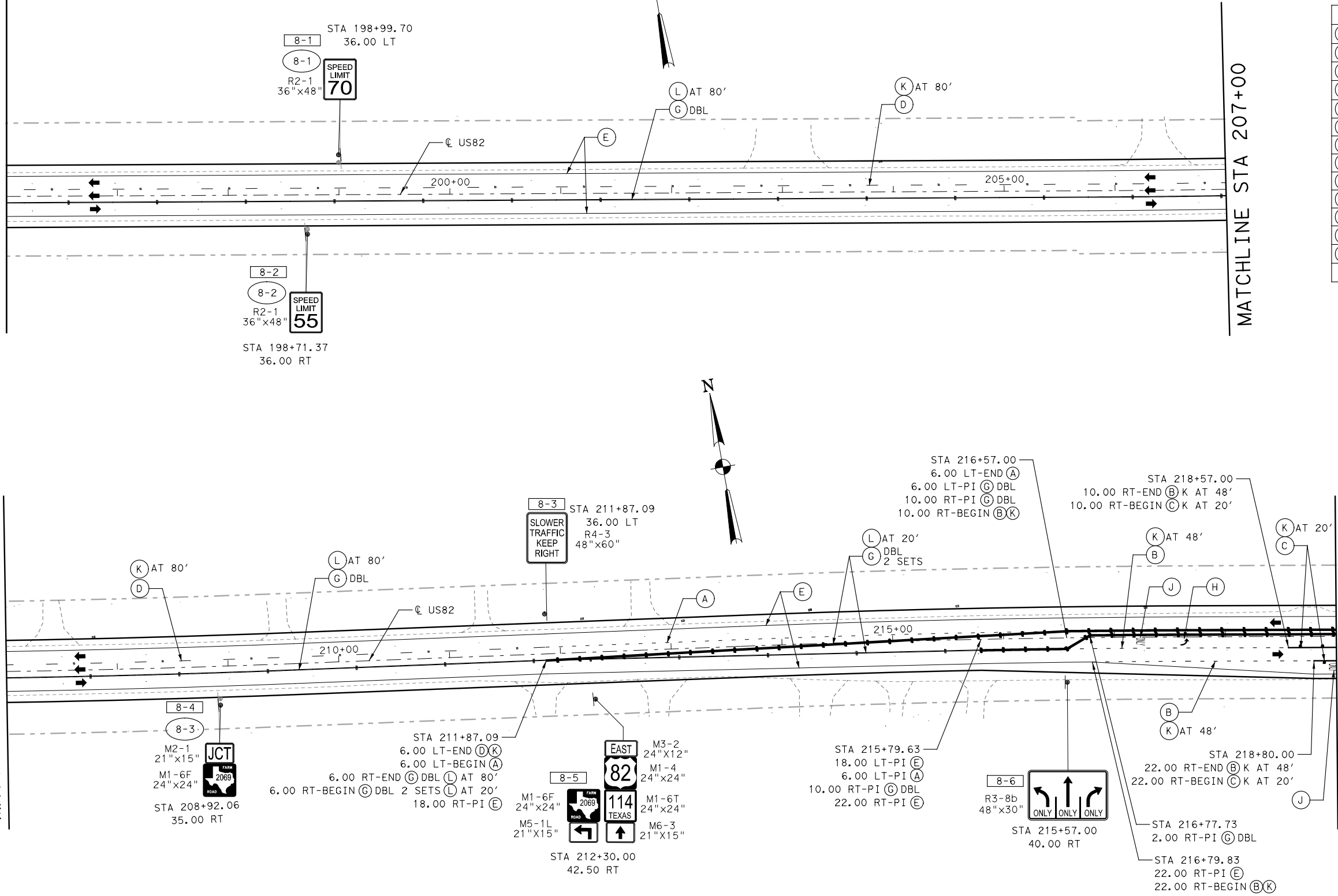
MATCHLINE STA 207+00

### LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	118
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	101
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	63
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	397
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	6032
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	1
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	2
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	34
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	186
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



JASMINE M. PANSURIYA  
 132941  
 LICENSED PROFESSIONAL ENGINEER  
 12/15/2020

## SIGNING AND PAVEMENT MARKING LAYOUT

STA 196+00 TO 219+00

SHEET 8 OF 29

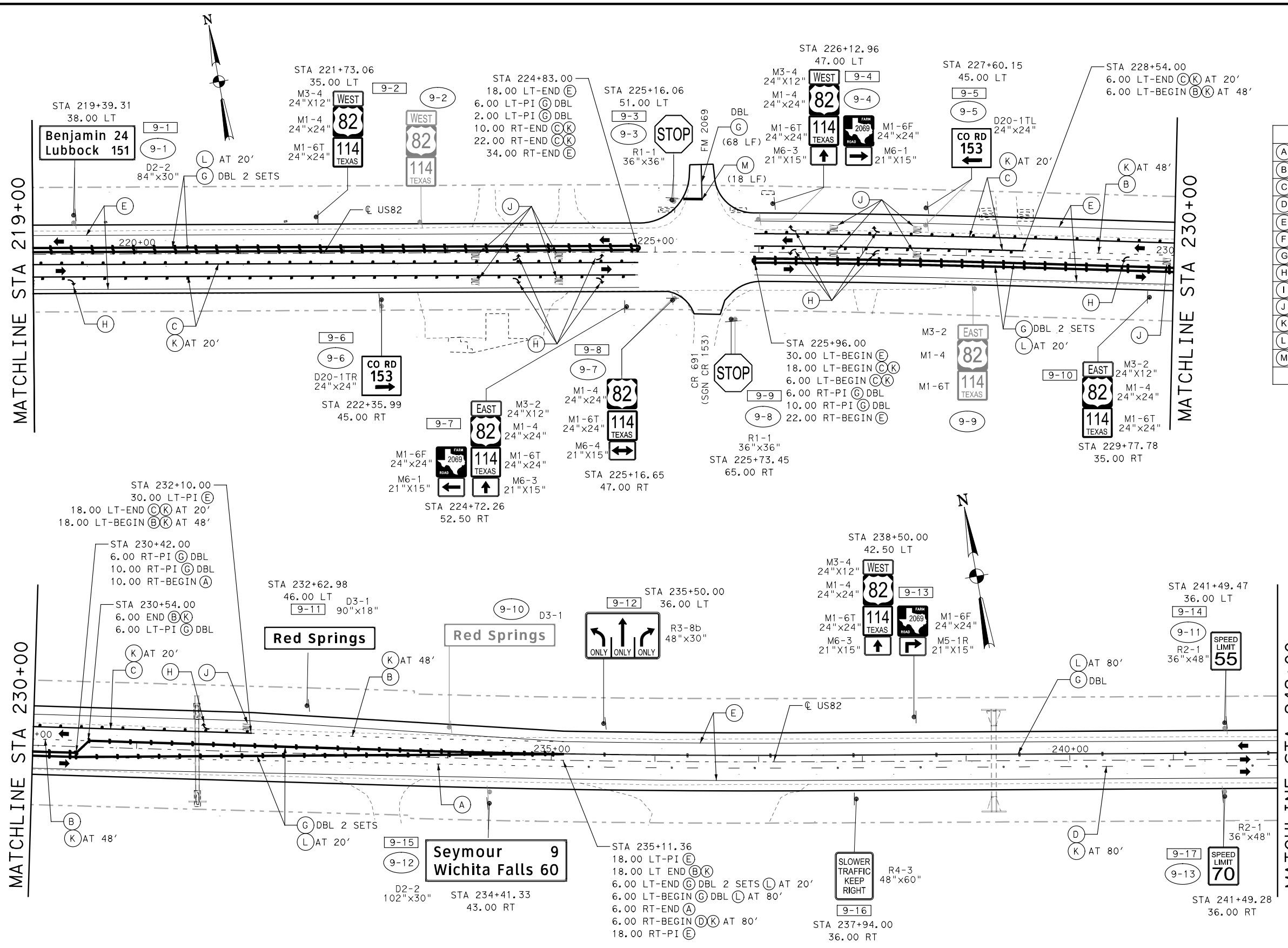
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F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		221	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

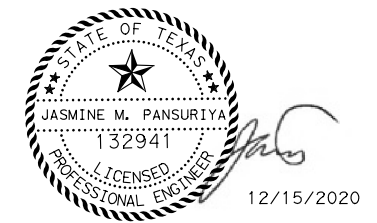
12/15/2020 9:56:57 AM  
 OTH\*PVMRK\*09.DGN



**LEGEND**

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	118
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	126
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	2038
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	173
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4374
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	7457
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	11
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	10
K	0672-6007 REFL PAV MRK TY I-C	EA	125
L	0672-6009 REFL PAV MRK TY II-A-A	EA	324
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	18

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 219+00 TO 242+00

SHEET 9 OF 29



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		222	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

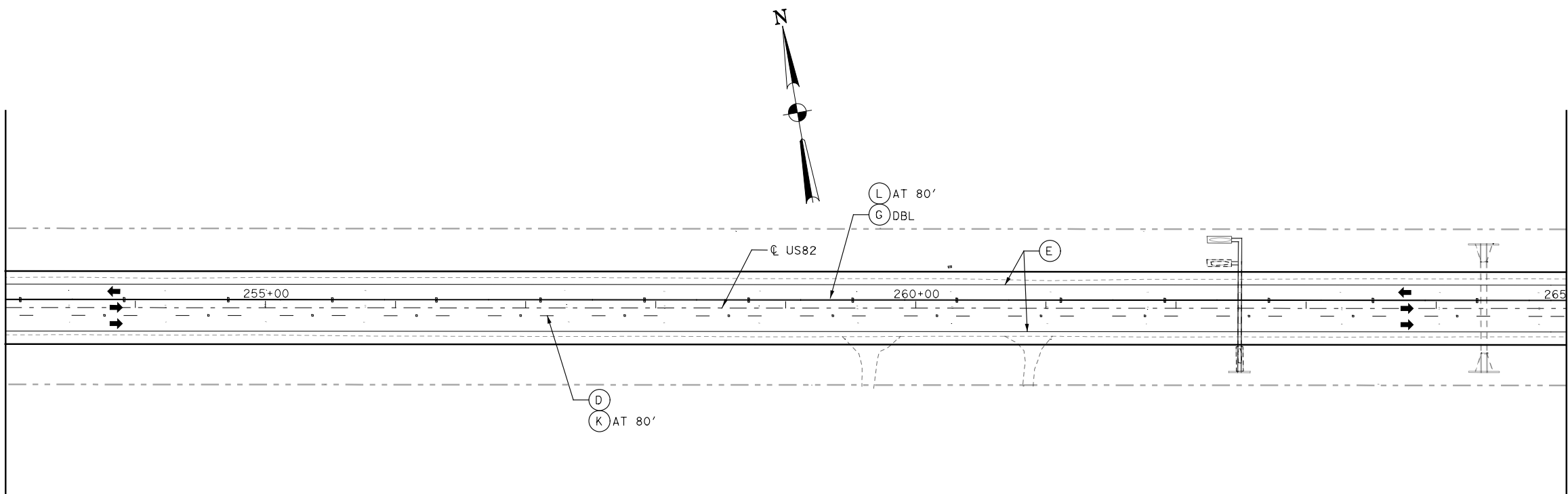
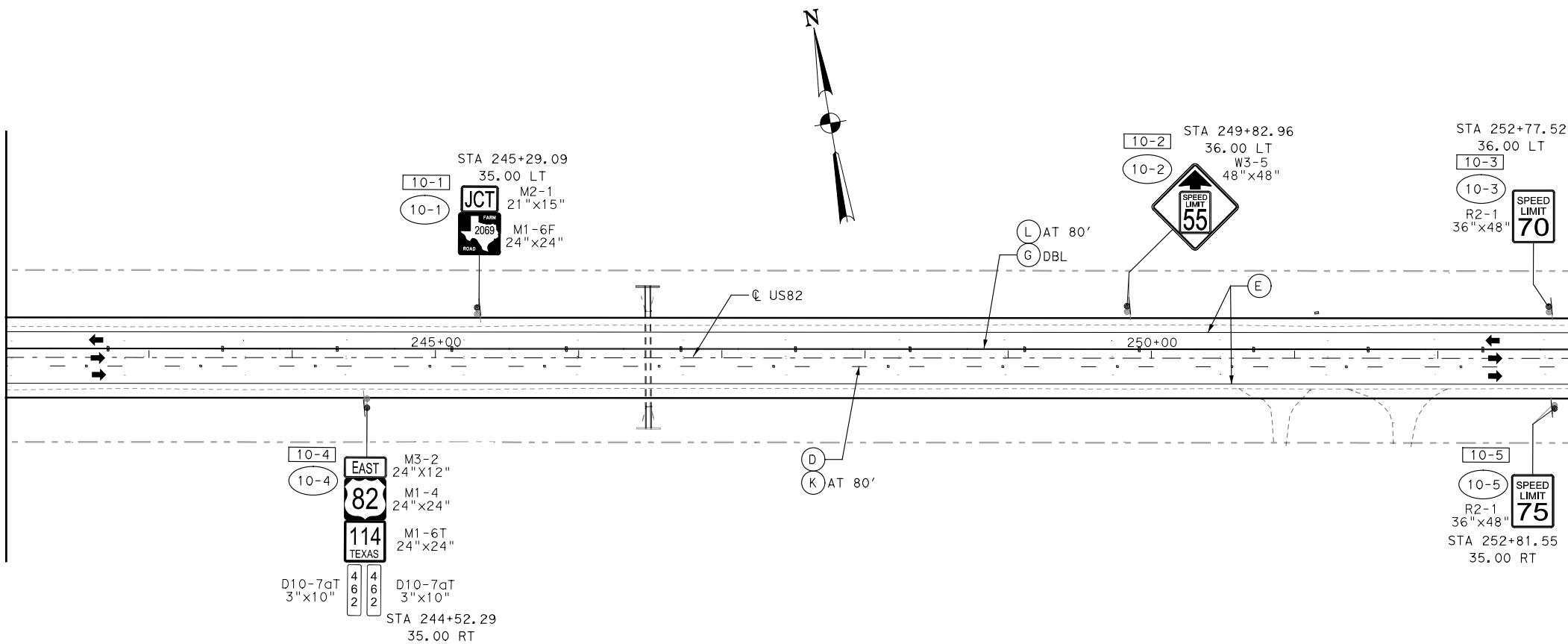
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 OTH\*PVMRK\*10.DGN

MATCHLINE STA 242+00

MATCHLINE STA 253+00

MATCHLINE STA 253+00

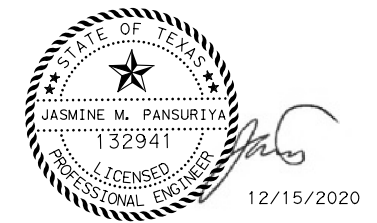
MATCHLINE STA 265+00



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
K	0672-6007 REFL PAV MRKR TY I-C	EA	29
L	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

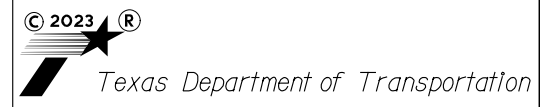
- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 242+00 TO 265+00

SHEET 10 OF 29



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		223	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

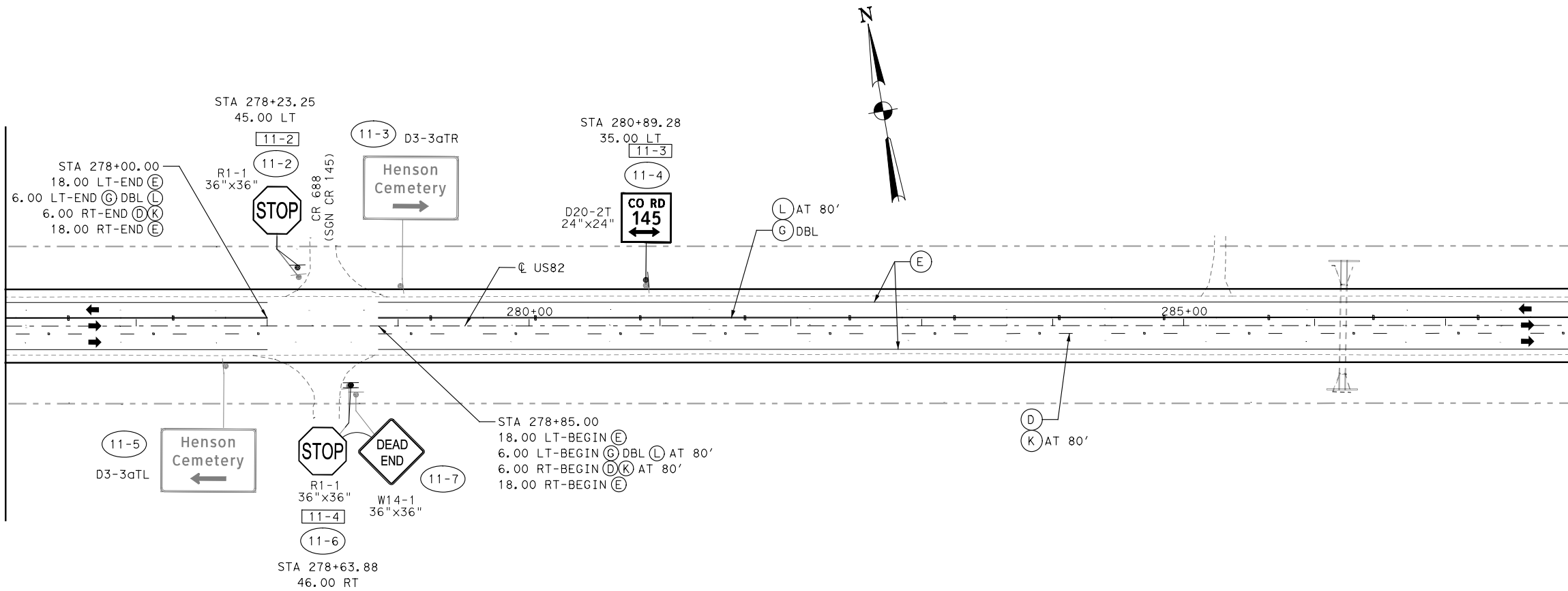
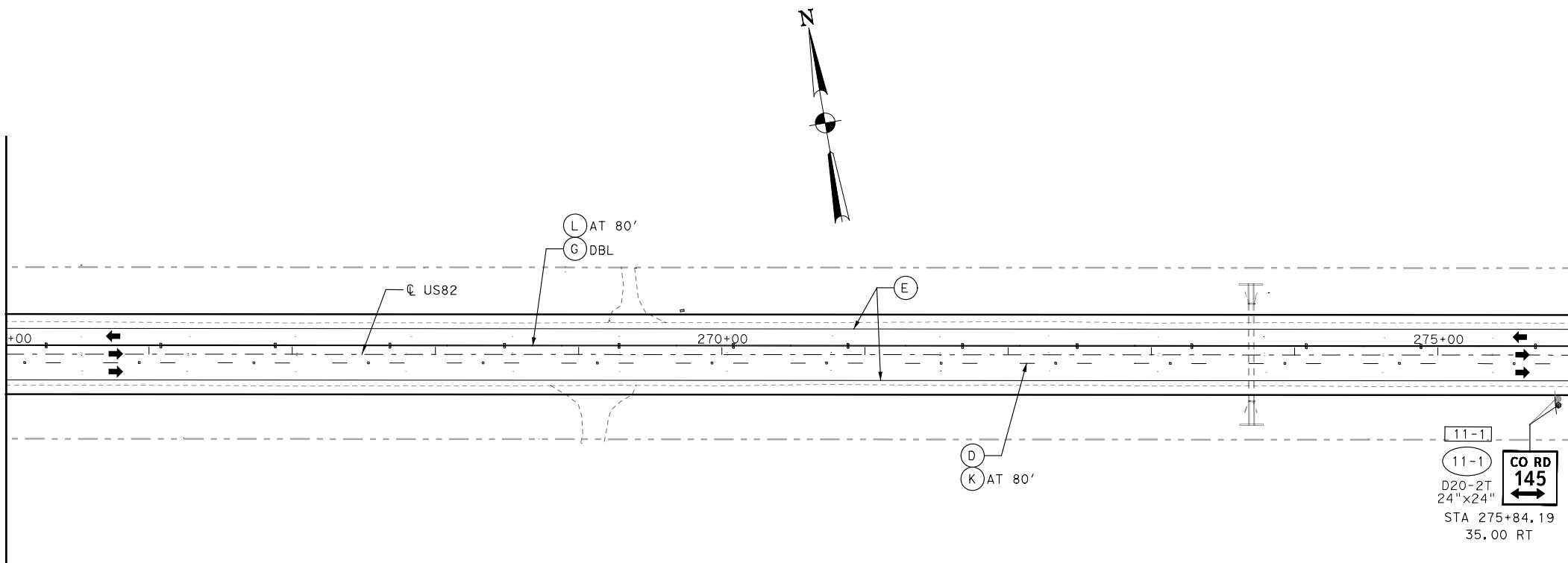
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 OTH\*PVMRK\*11.DGN

MATCHLINE STA 265+00

MATCHLINE STA 276+00

MATCHLINE STA 276+00

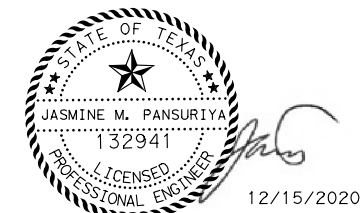
MATCHLINE STA 288+00



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	554
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4430
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4430
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 265+00 TO 288+00

SHEET 11 OF 29

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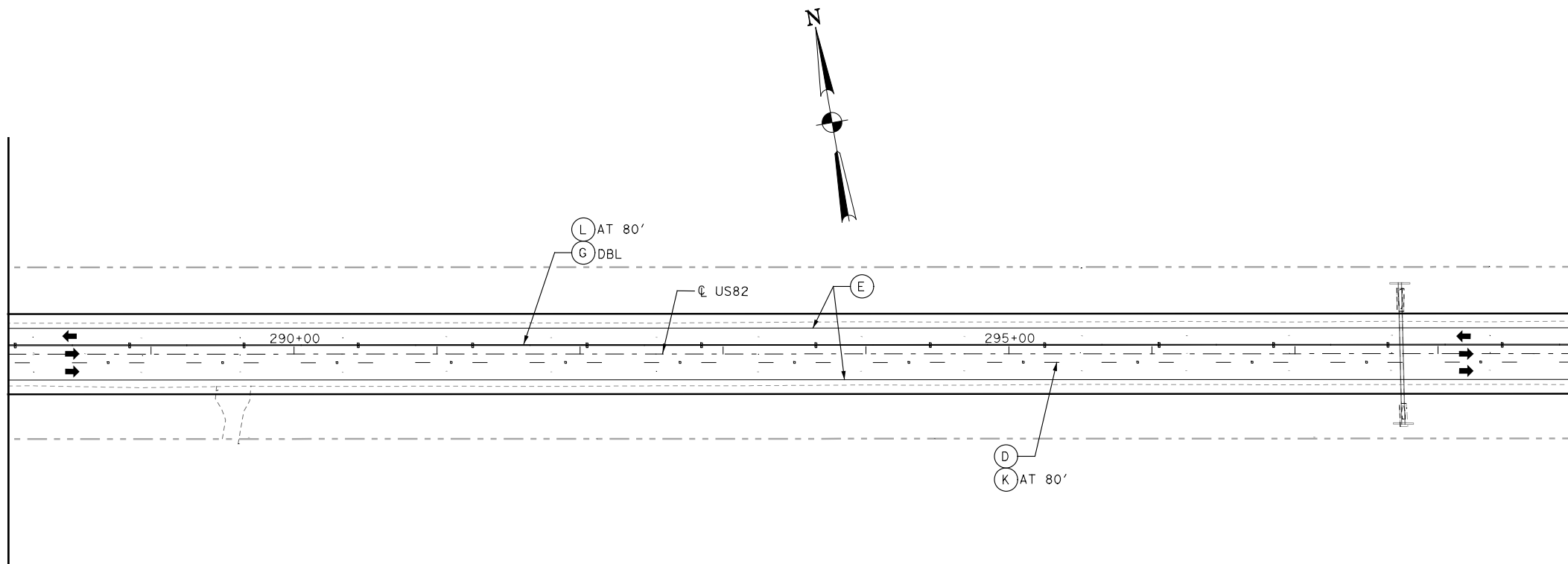


SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		224	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

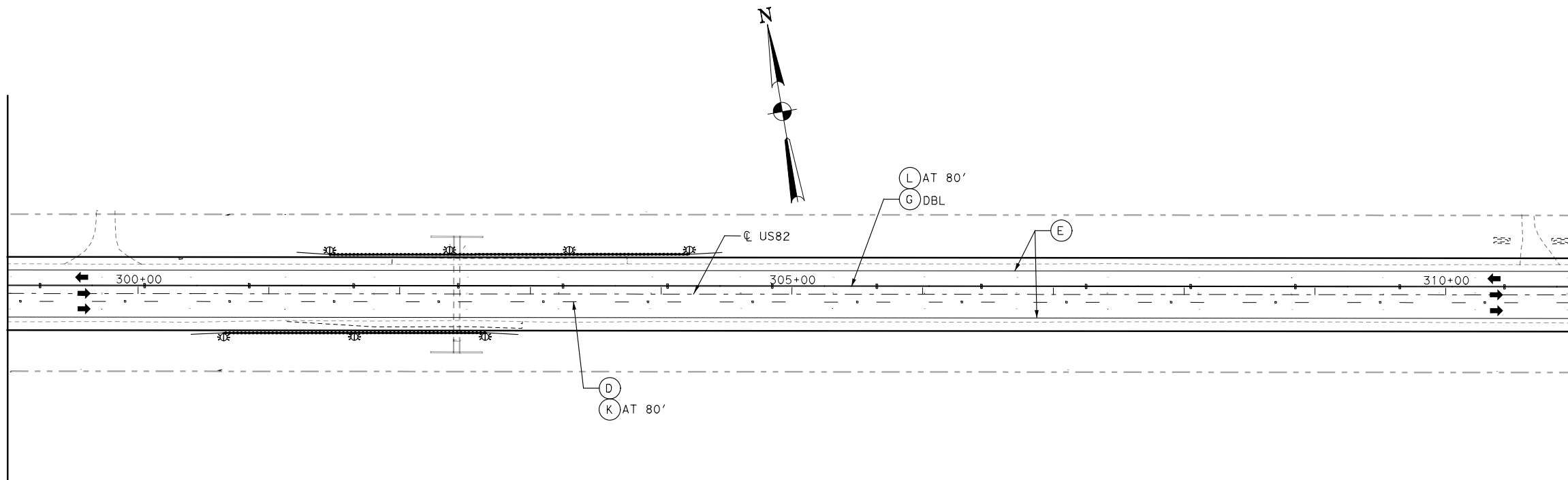
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 OTH\*PVMRK\*12.DGN

MATCHLINE STA 288+00



MATCHLINE STA 299+00

MATCHLINE STA 299+00

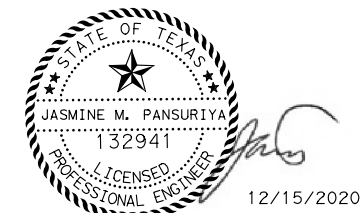


MATCHLINE STA 311+00

LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 288+00 TO 311+00

SHEET 12 OF 29



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		225	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/15/2020 9:57:34 AM  
 OTH\*PVMRK\*13.DGN

MATCHLINE STA 311+00

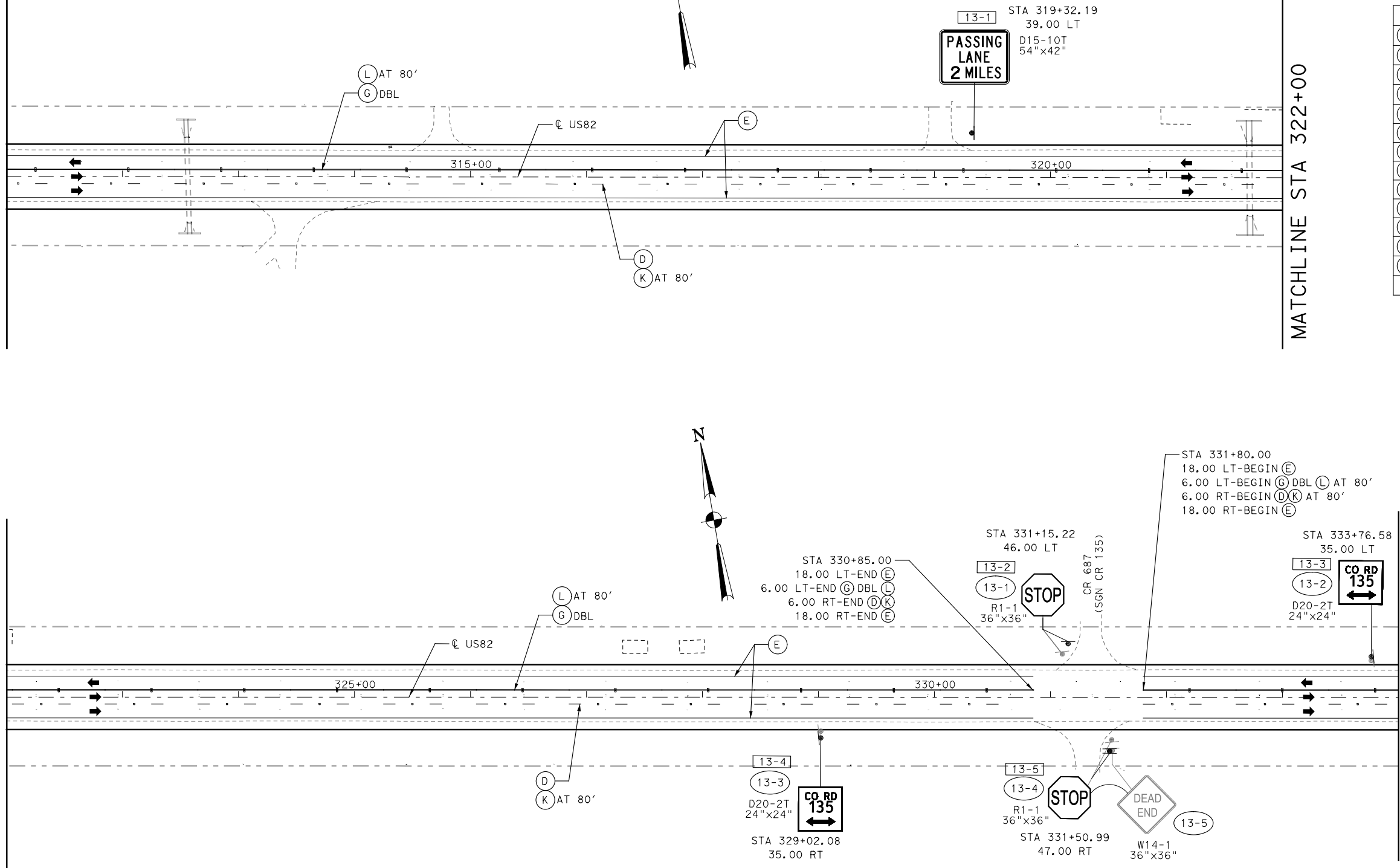
MATCHLINE STA 322+00

MATCHLINE STA 322+00

**LEGEND**

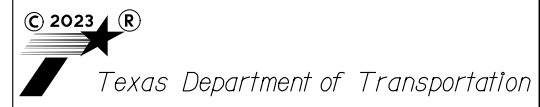
Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	552
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4410
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4410
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	28
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	56
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**  
 STA 311+00 TO 334+00

SHEET 13 OF 29



OTHON CONSULTING ENGINEERS  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		226	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

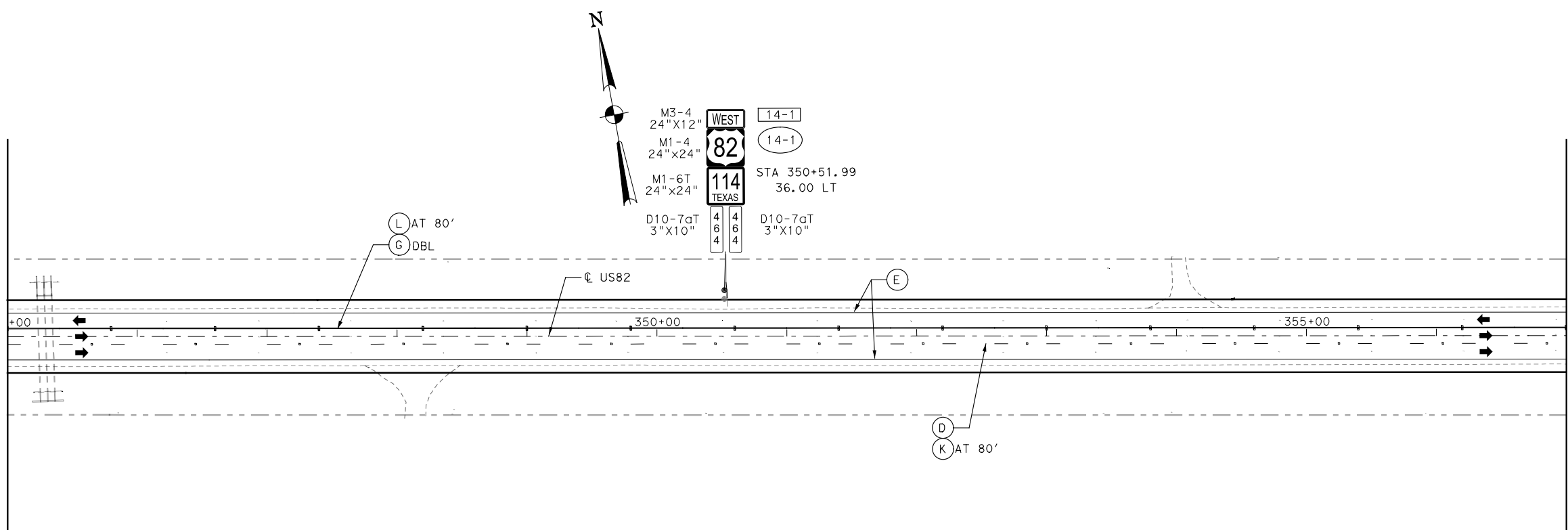
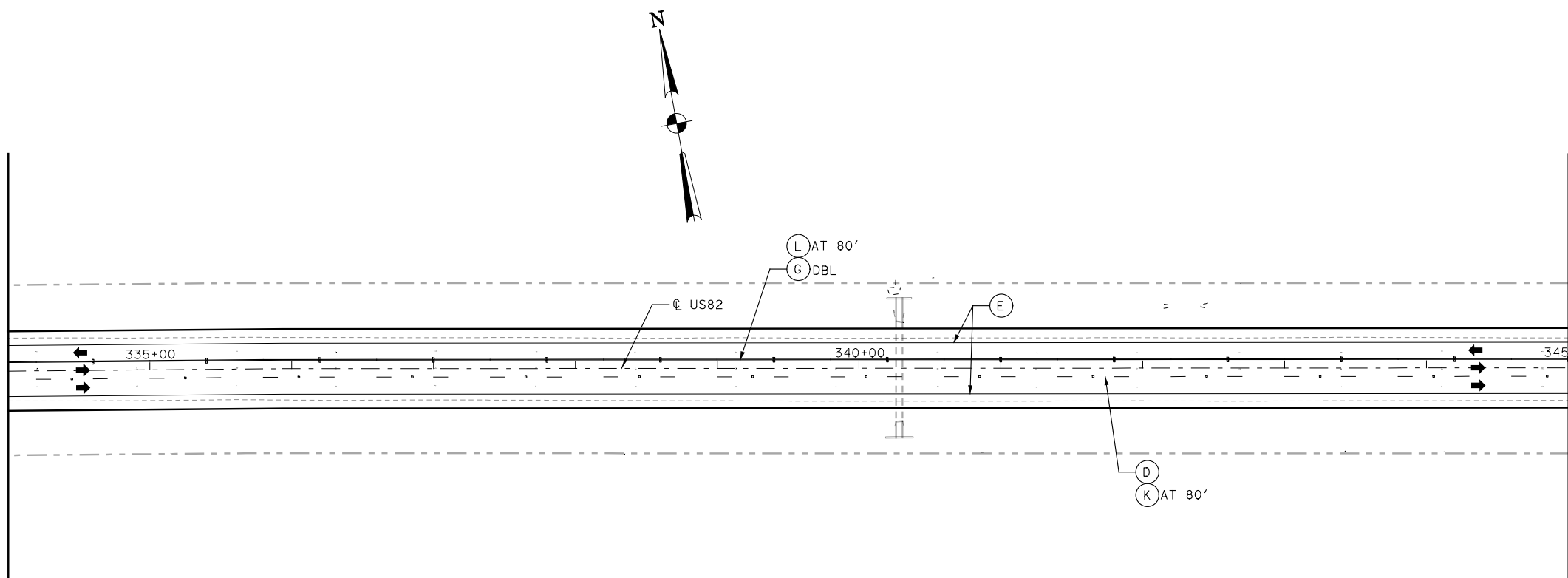
12/15/2020 9:57:44 AM  
 OTH\*PVMRK\*14.DGN

MATCHLINE STA 334+00

MATCHLINE STA 345+00

MATCHLINE STA 345+00

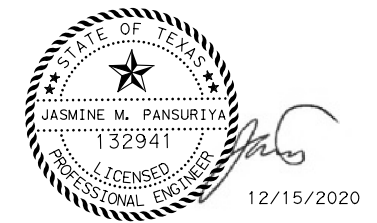
MATCHLINE STA 357+00



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

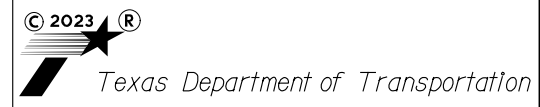
- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 334+00 TO 357+00

SHEET 14 OF 29



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		227	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82



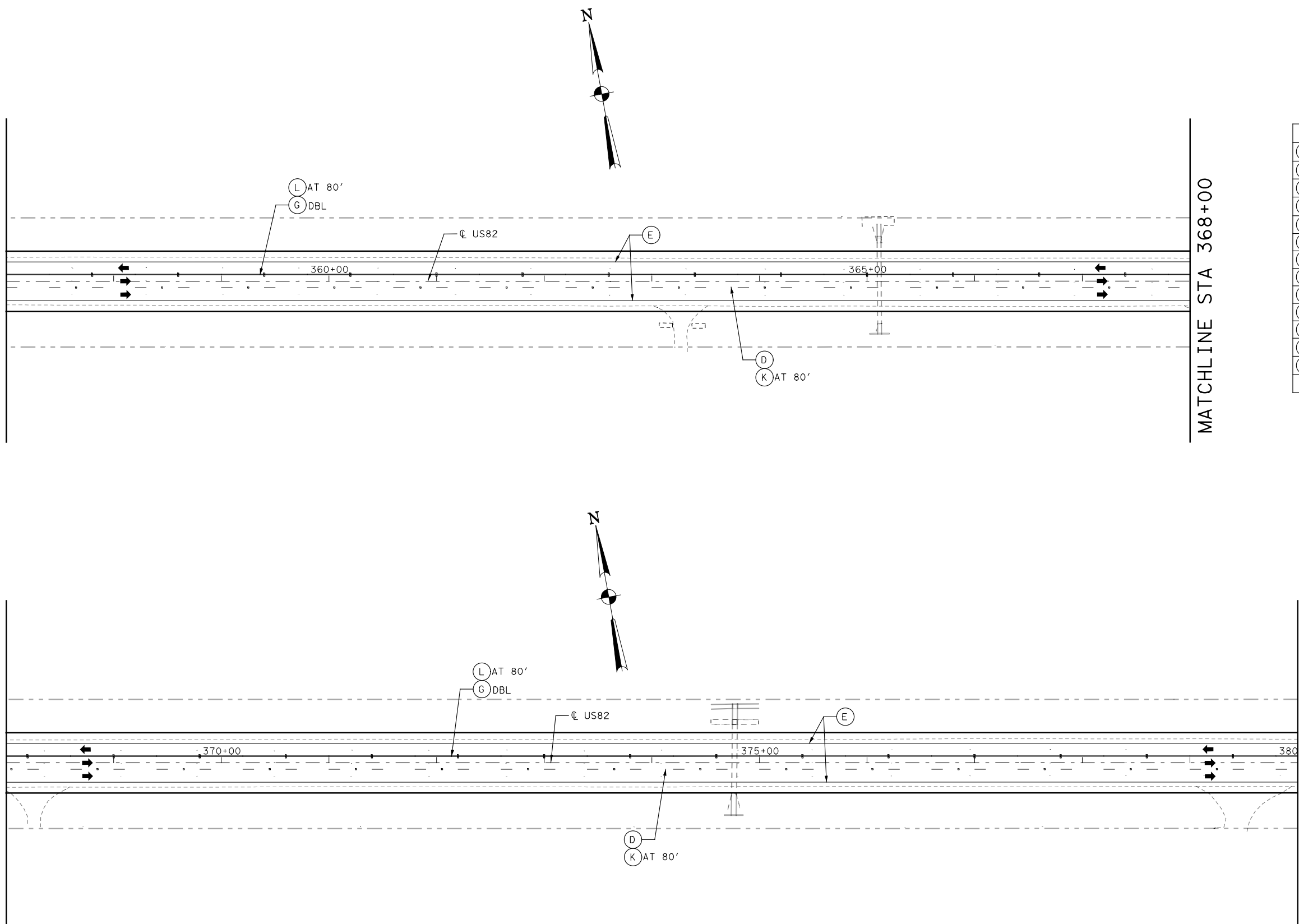
12/15/2020 9:57:50 AM  
 OTH\*PVMRK\*15.DGN

MATCHLINE STA 357+00

MATCHLINE STA 368+00

MATCHLINE STA 368+00

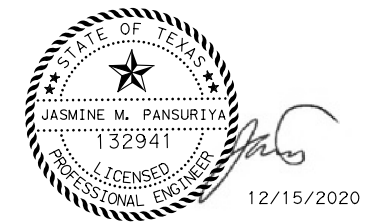
MATCHLINE STA 380+00



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

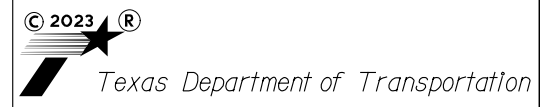
- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 357+00 TO 380+00

SHEET 15 OF 29



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		228	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

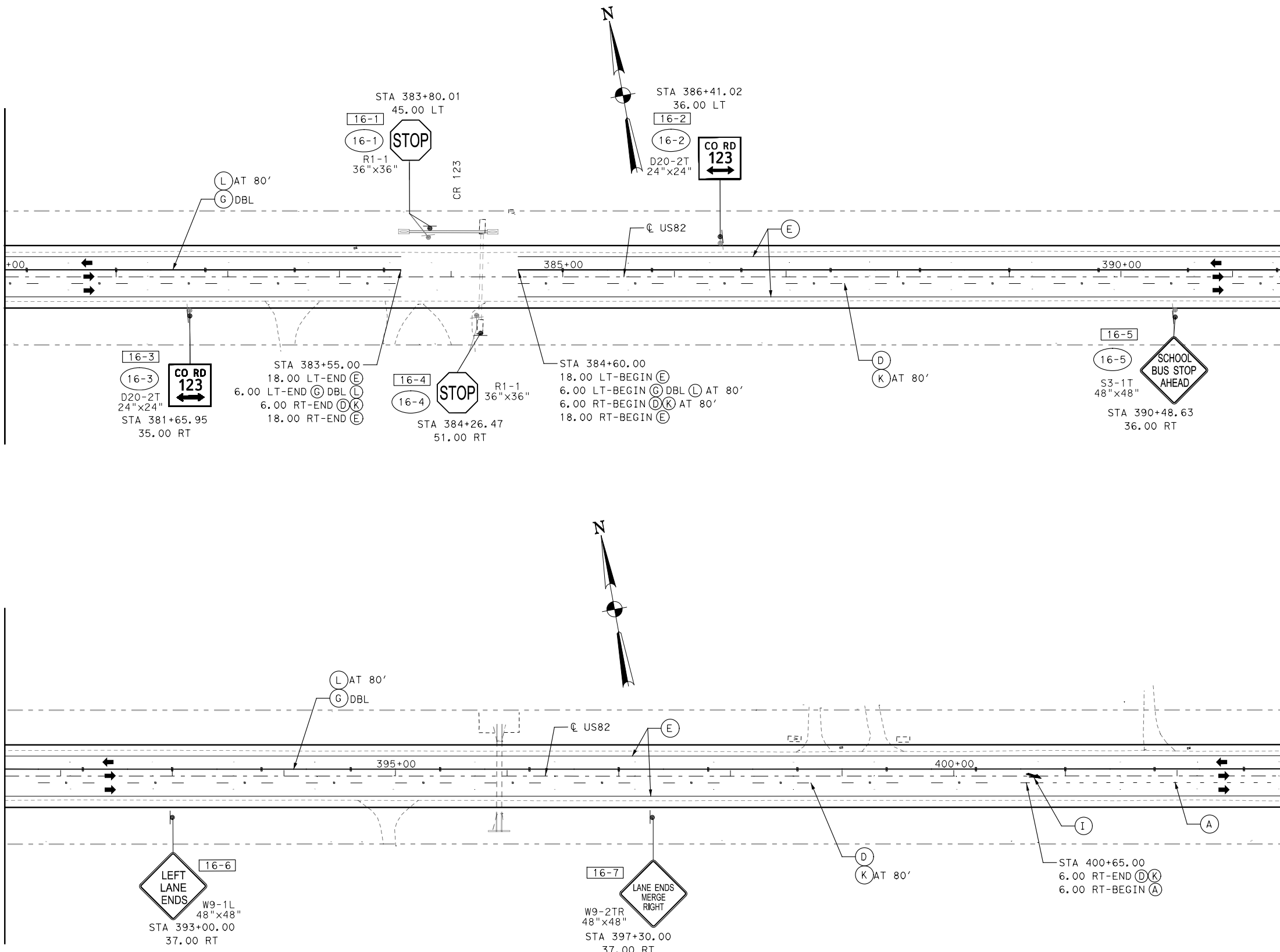
12/15/2020 9:58:10 AM  
 OTH\*PVMRK\*16.DGN

MATCHLINE STA 380+00

MATCHLINE STA 391+50

MATCHLINE STA 391+50

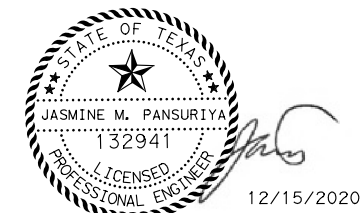
MATCHLINE STA 403+50



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	72
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	491
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4490
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4490
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	1
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
K	0672-6007 REFL PAV MRKR TY I-C	EA	21
L	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 380+00 TO 403+50

SHEET 16 OF 29

© 2023



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		229	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

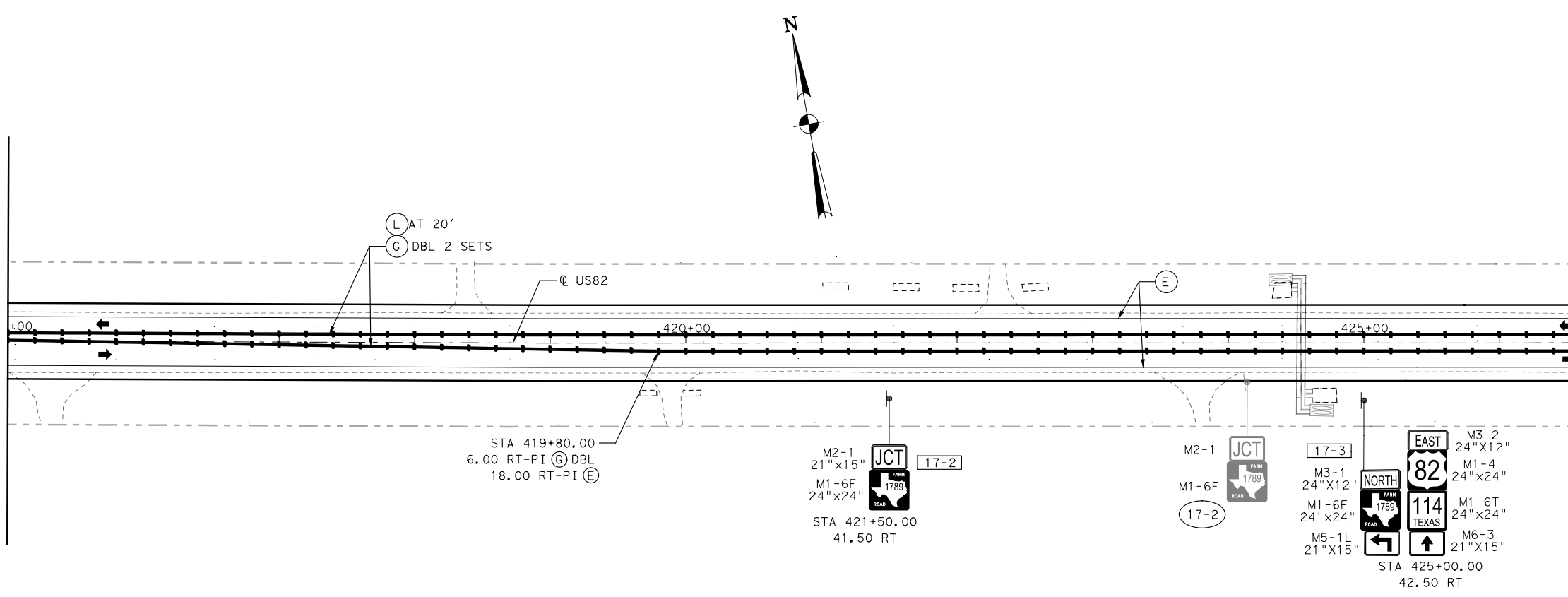
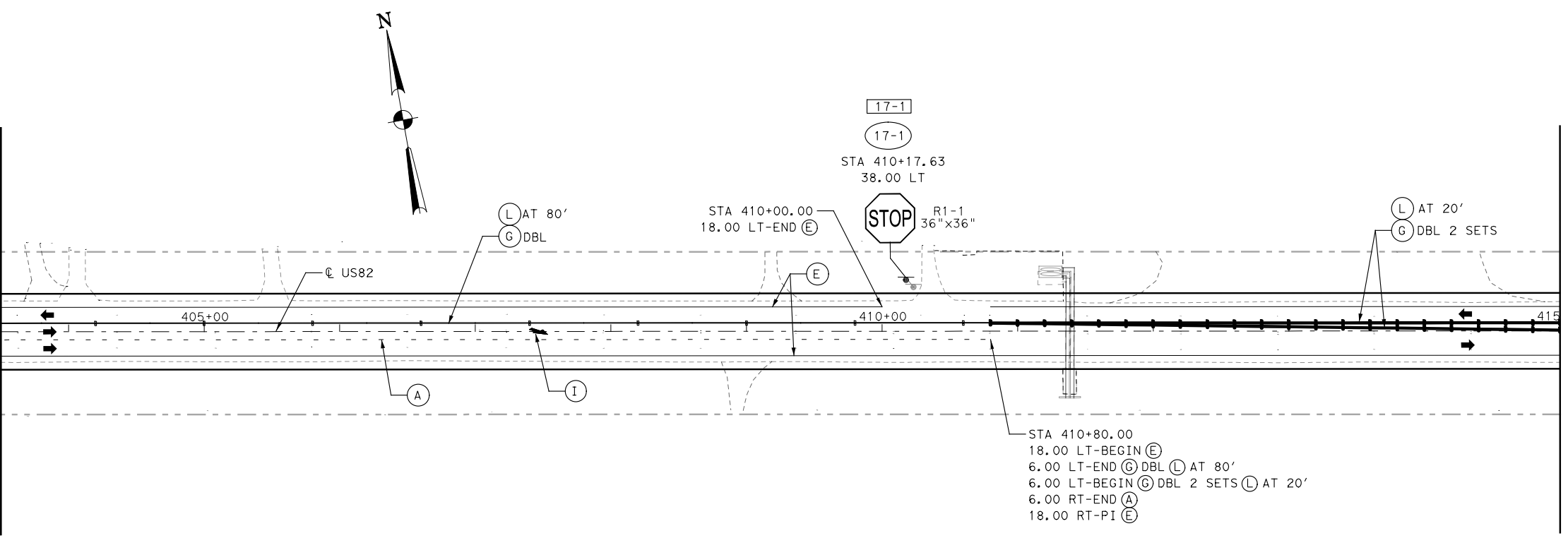
12/15/2020 9:58:21 AM  
 OTH\*FVVRK\*17.DGN

MATCHLINE STA 403+50

MATCHLINE STA 415+00

MATCHLINE STA 415+00

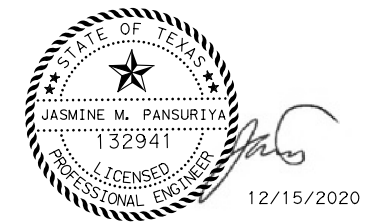
MATCHLINE STA 427+00



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	183
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	0
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4620
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	7940
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	1
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	0
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	344
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 403+50 TO 427+00

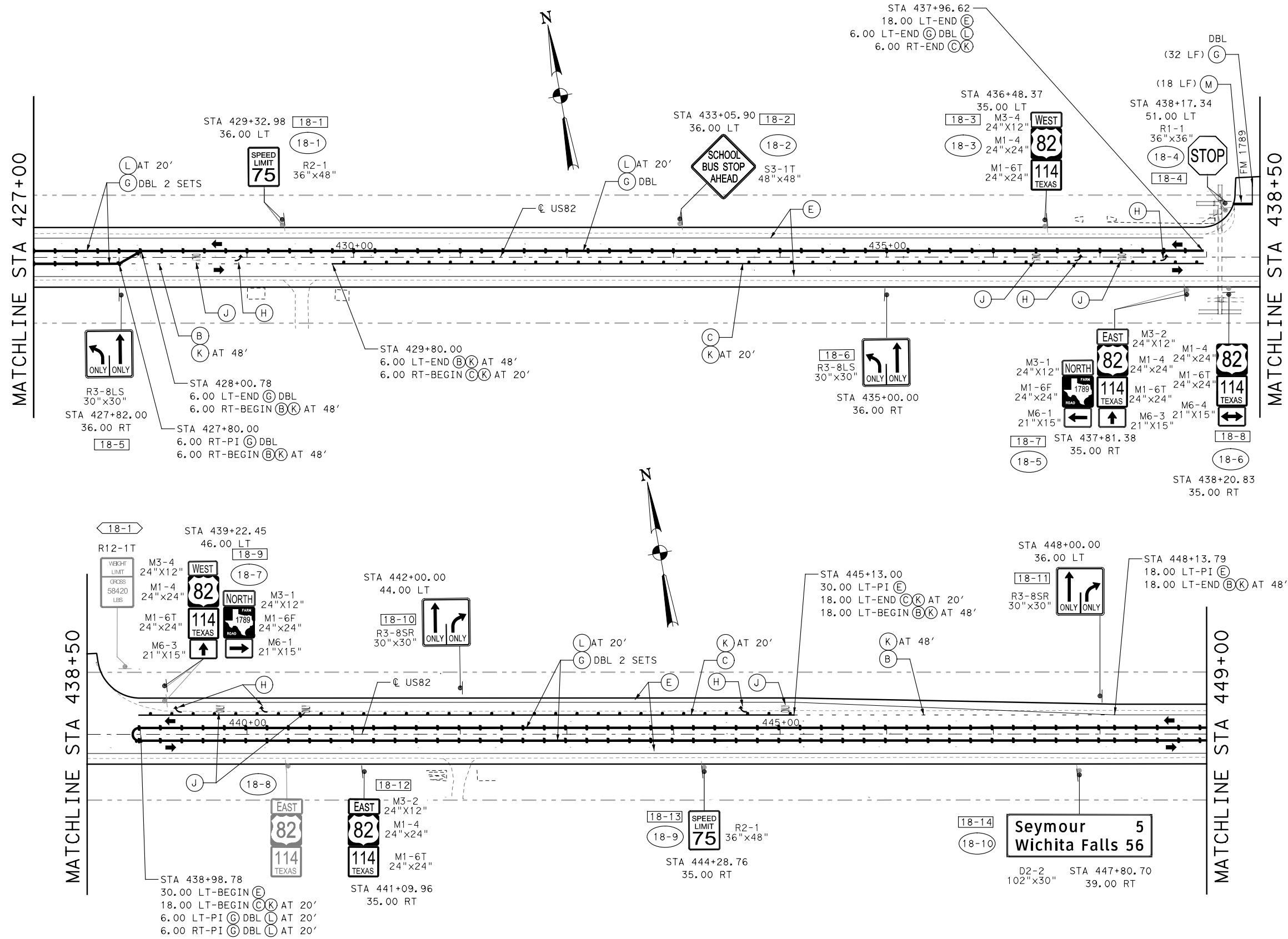
SHEET 17 OF 29



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		230	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

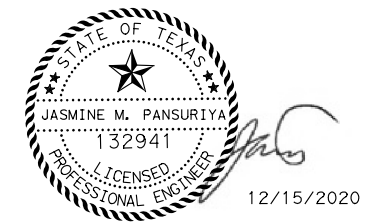
12/15/2020 9:58:29 AM  
 OTH\*PVMRK\*18.DGN



**LEGEND**

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	126
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1432
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	0
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4298
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	6444
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	6
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	6
K	0672-6007 REFL PAV MRKR TY I-C	EA	84
L	0672-6009 REFL PAV MRKR TY II-A-A	EA	327
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	18

- ➔ PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- ##-## PROPOSED SMALL SIGN
- ##-## EXISTING SMALL SIGN TO REMAIN
- ##-## EXISTING SMALL SIGN TO BE REMOVED
- ⊗ DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 427+00 TO 449+00

SHEET 18 OF 29



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		231	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/15/2020 9:58:35 AM  
 OTH\*PVMRK\*19.DGN

MATCHLINE STA 449+00

MATCHLINE STA 460+00

MATCHLINE STA 460+00

MATCHLINE STA 472+00

STA 451+50.00  
 42.50 LT  
 M3-2 24"x12"  
 M1-4 24"x24"  
 M1-6T 24"x24"  
 M6-3 21"x15"  
 EAST 19-1  
 NORTH 1789  
 114 TEXAS  
 M3-1 24"x12"  
 M1-6F 24"x24"  
 M5-1R 21"x15"

STA 454+63.42  
 35.00 LT  
 M2-1 21"x15"  
 M1-6F 24"x24"  
 JCT 1789  
 19-2  
 19-1

STA 457+50.00  
 37.00 LT  
 NEXT PASSING LANE 4 MILES  
 19-3  
 D15-11T 54"x48"

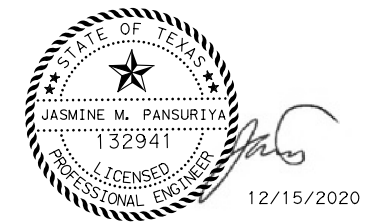
M3-2 24"x12"  
 M1-4 24"x24"  
 M1-6T 24"x24"  
 D10-7aT 3"x10"  
 EAST 82  
 114 TEXAS  
 4 4  
 6 6  
 STA 454+26.82  
 35.00 RT  
 D10-7aT 3"x10"  
 19-4  
 19-2

STA 467+67.00  
 6.00 LT-BEGIN (A)  
 6.00 RT-END (G) DBL 2 SETS (L) AT 20'  
 6.00 RT-BEGIN (G) DBL (L) AT 80'

LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	109
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	0
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	8334
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	1
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	0
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	388
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 449+00 TO 472+00

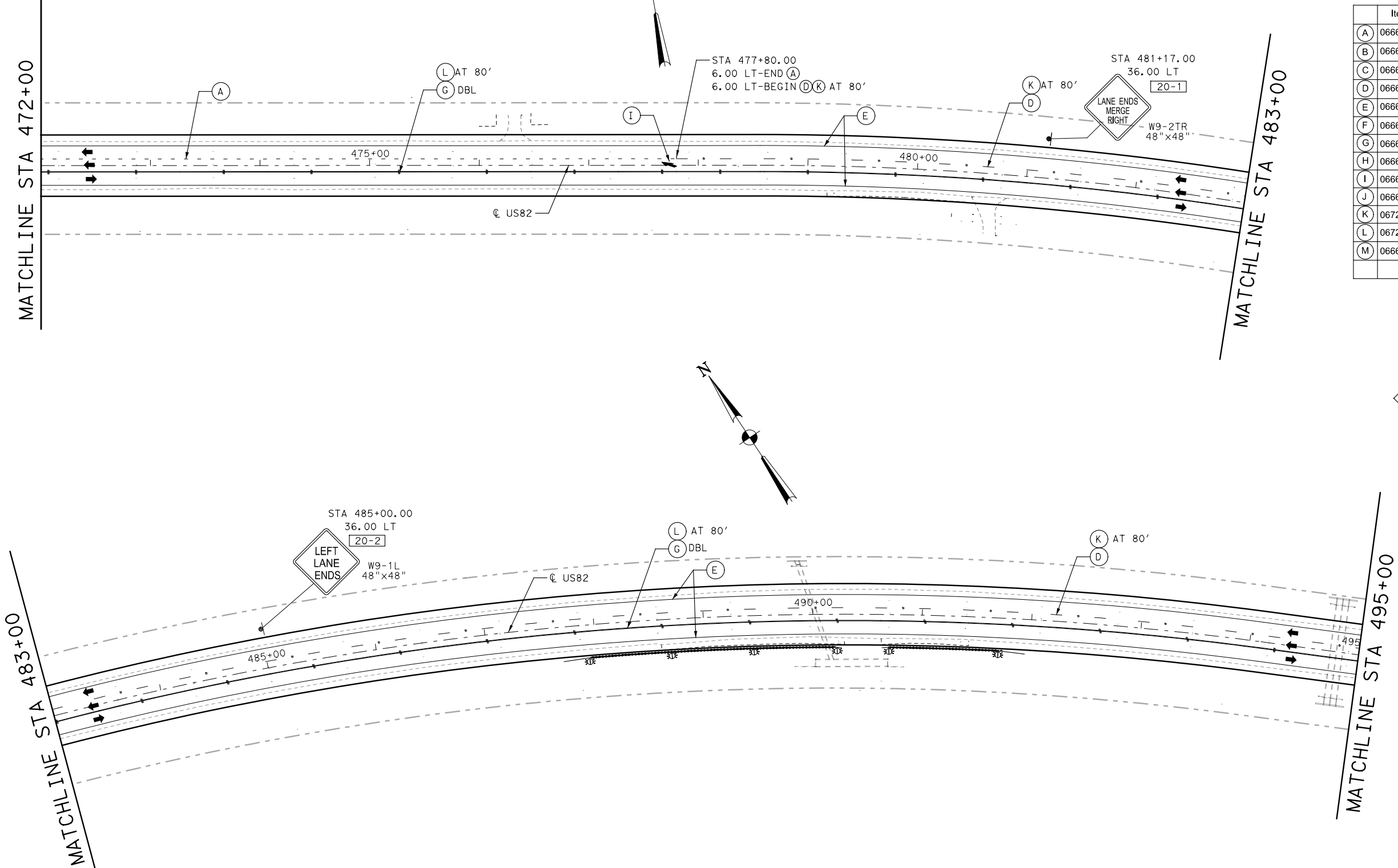
SHEET 19 OF 29



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		232	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

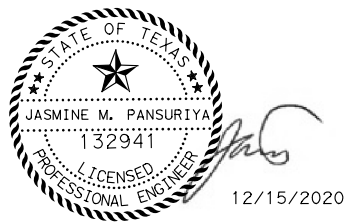
12/15/2020 9:58:40 AM  
 OTH\*FVVRK\*20.DGN



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	145
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	430
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	1
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	22
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 472+00 TO 495+00

SHEET 20 OF 29



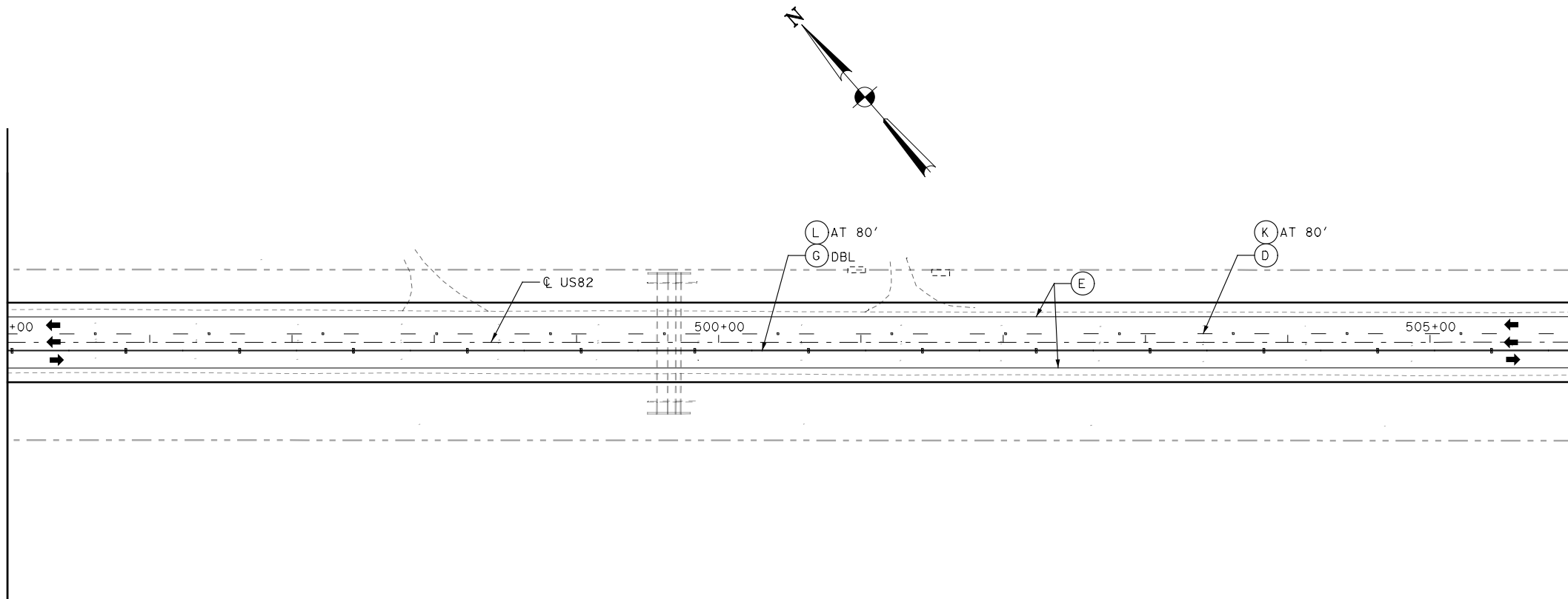
SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		233	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/15/2020 9:58:48 AM  
 OTH\*PVMRK\*21.DGN

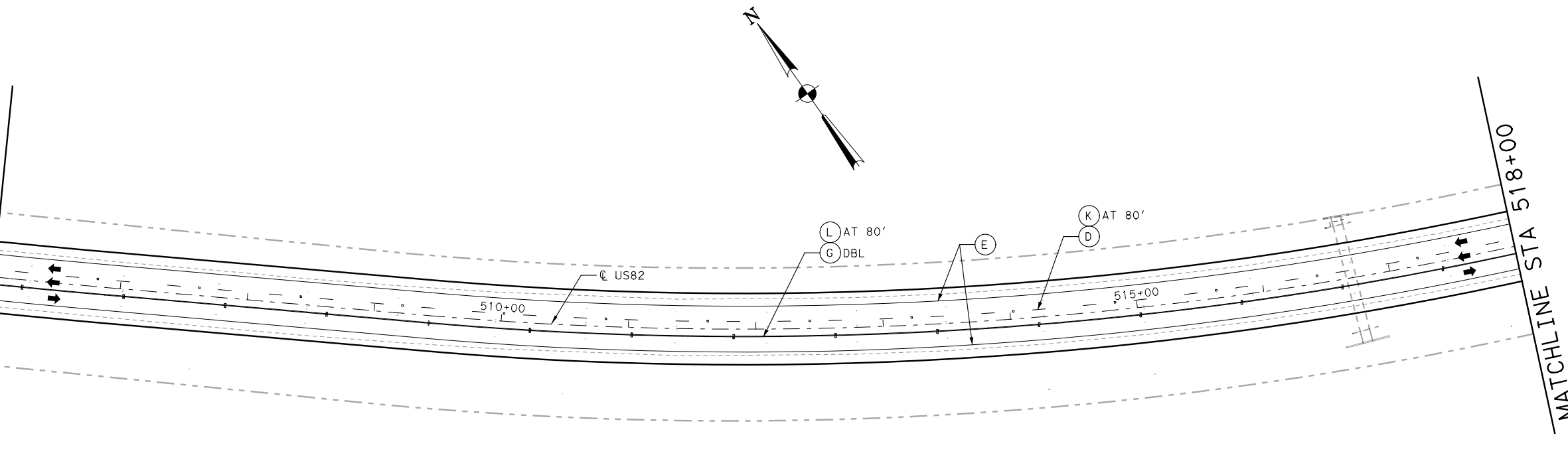
MATCHLINE STA 495+00

MATCHLINE STA 506+00



MATCHLINE STA 506+00

MATCHLINE STA 518+00



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



12/15/2020

**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 495+00 TO 518+00

SHEET 21 OF 29

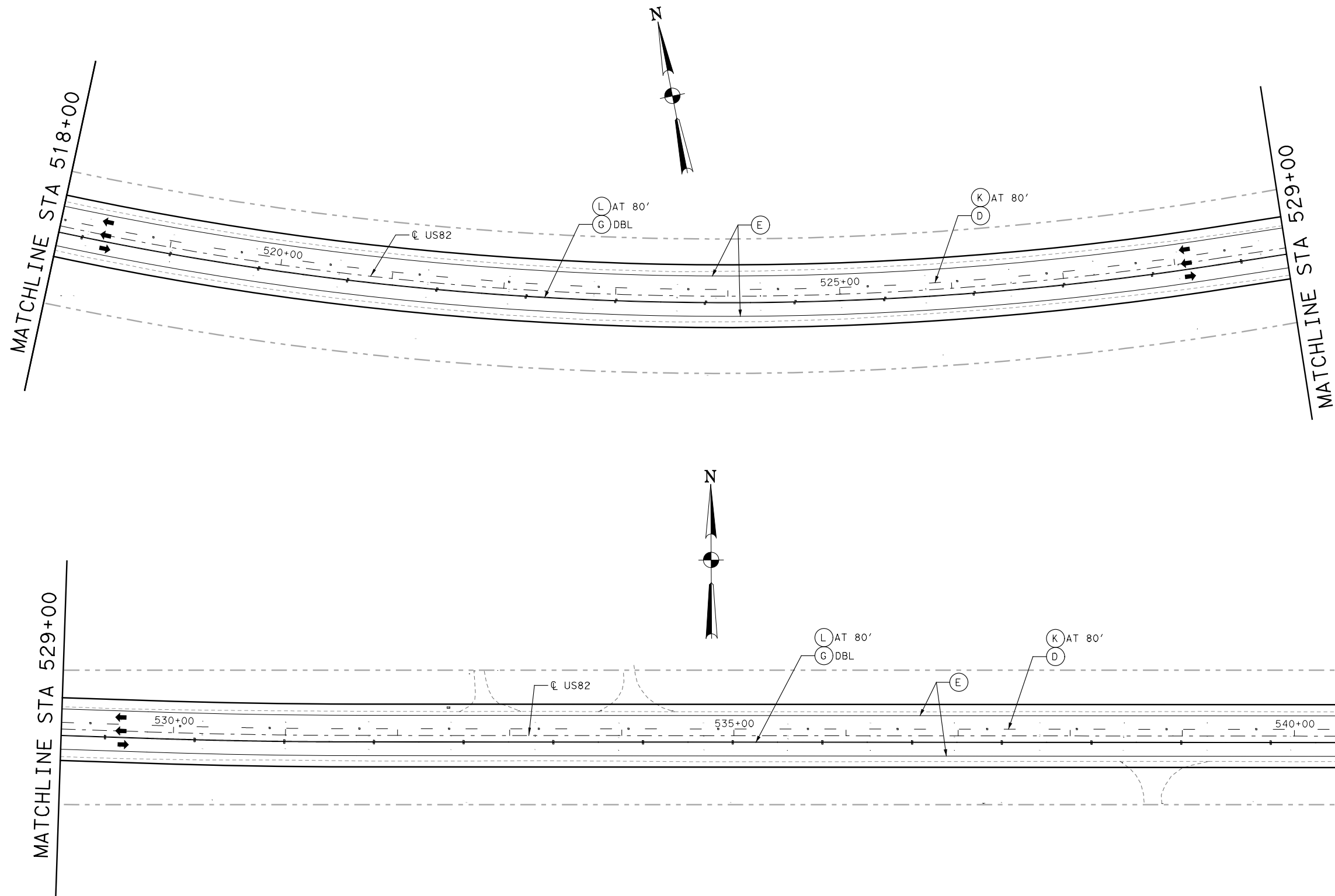
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SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		234	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

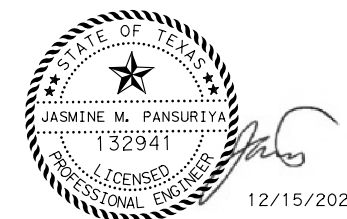
12/15/2020 9:58:58 AM  
 OTH\*VMRK\*22.DGN



LEGEND

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	575
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4600
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4600
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 518+00 TO 541+00

SHEET 22 OF 29

© 2023



SCALE: 1" = 100'

FED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		235	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82



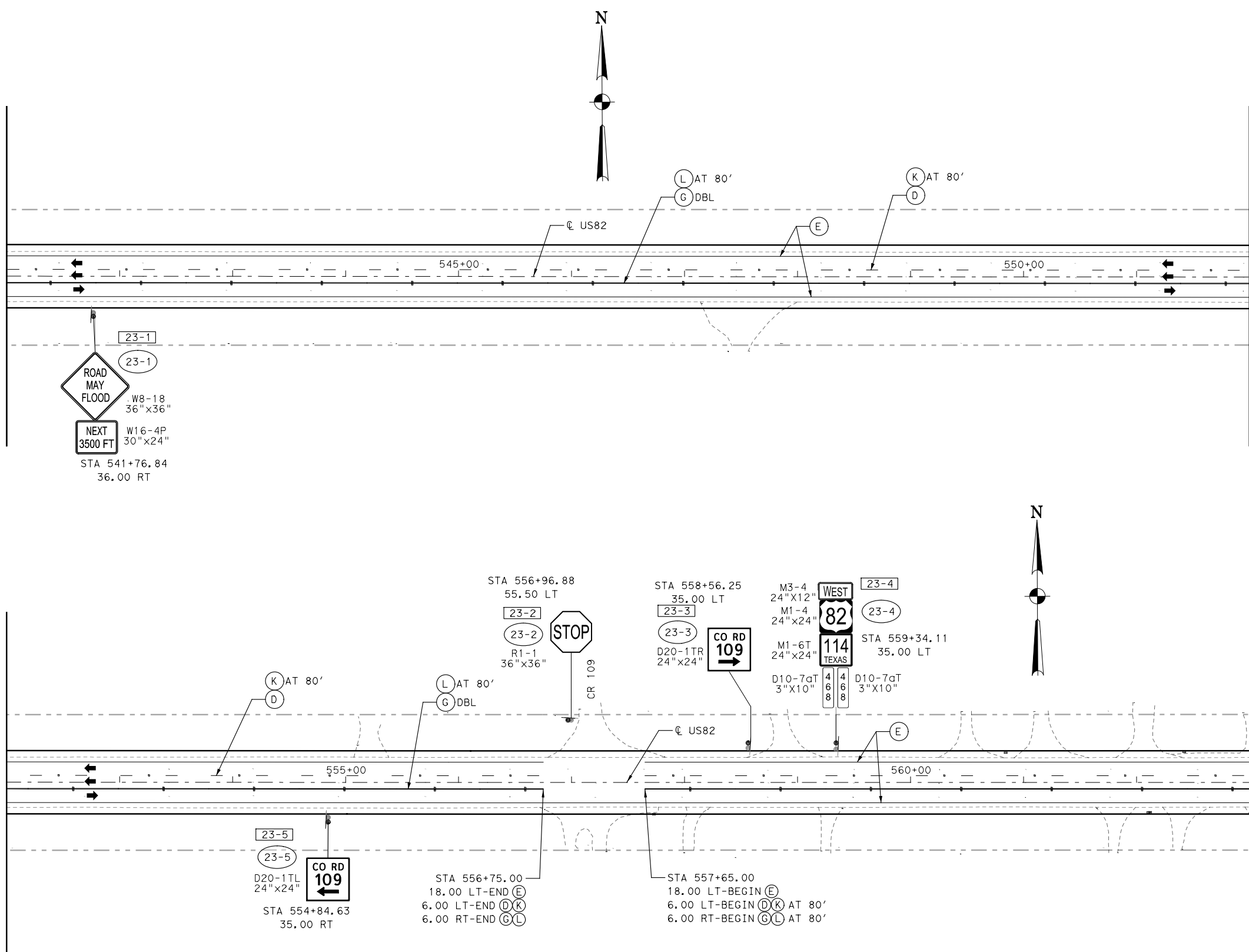
12/15/2020 9:59:10 AM  
 OTH\*PVMRK\*23.DGN

MATCHLINE STA 541+00

MATCHLINE STA 552+00

MATCHLINE STA 552+00

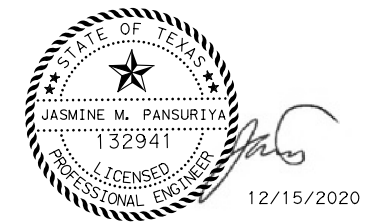
MATCHLINE STA 564+00



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	553
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4510
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4420
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
K	0672-6007 REFL PAV MRKR TY I-C	EA	28
L	0672-6009 REFL PAV MRKR TY II-A-A	EA	56
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

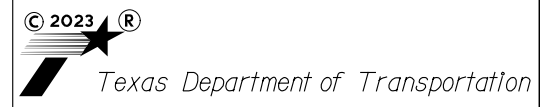
- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 541+00 TO 564+00

SHEET 23 OF 29



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		236	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/15/2020 9:59:17 AM  
 OTH\*FVMRK\*24.DGN

MATCHLINE STA 564+00

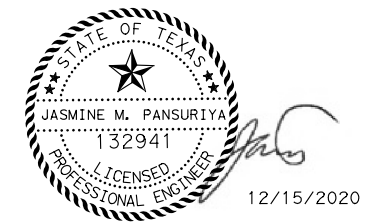
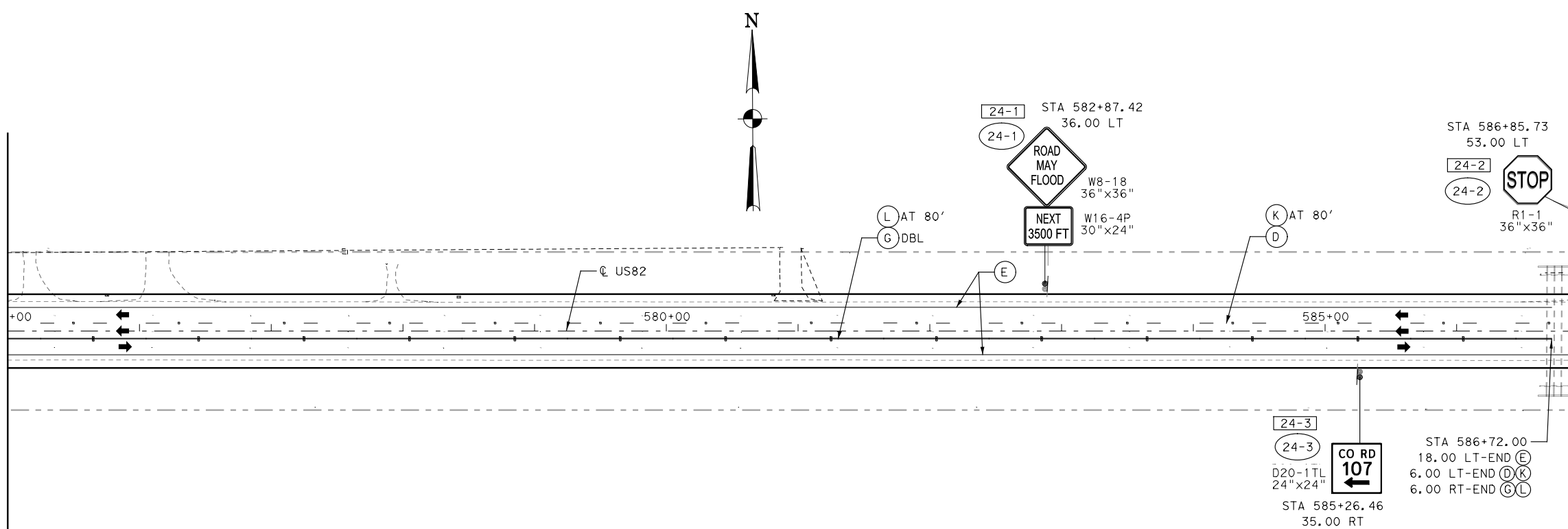
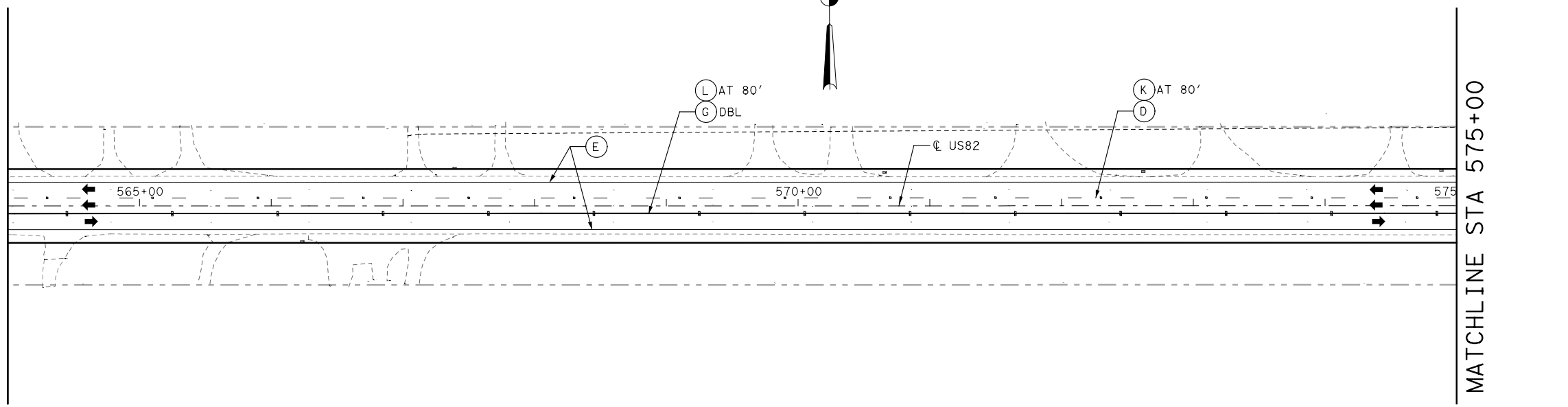
MATCHLINE STA 575+00

MATCHLINE STA 575+00

**LEGEND**

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	568
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4572
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4544
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	29
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	58
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 564+00 TO 587+00

SHEET 24 OF 29



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		237	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

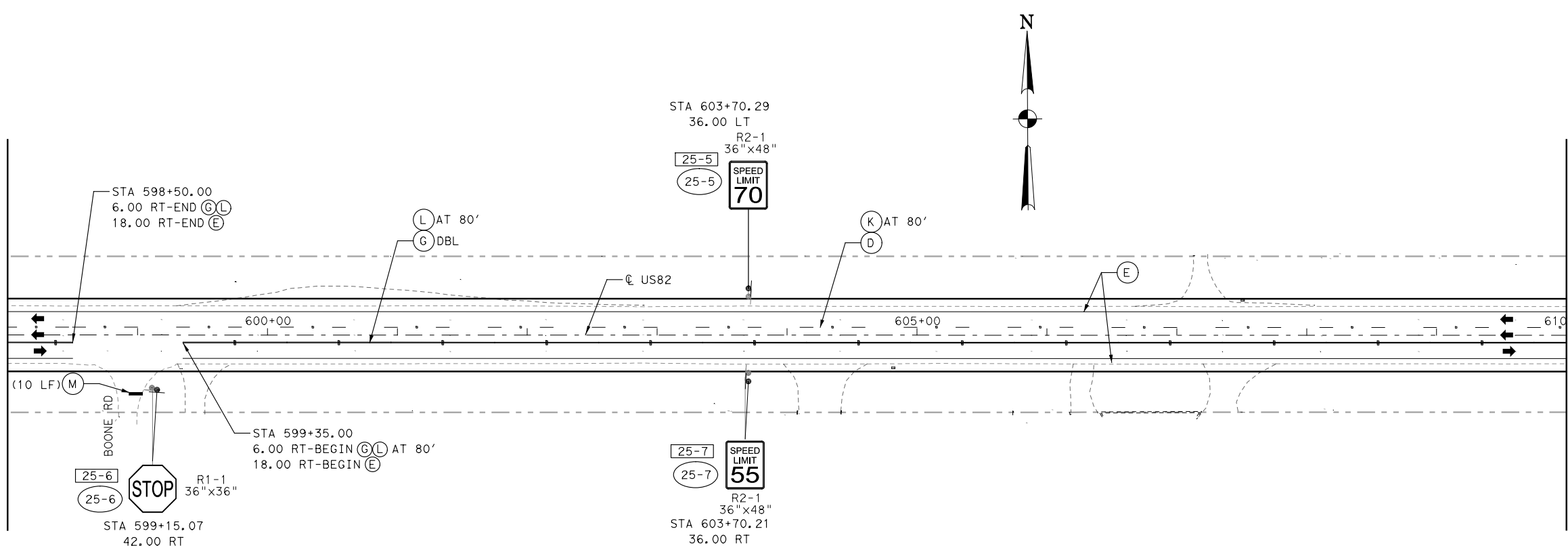
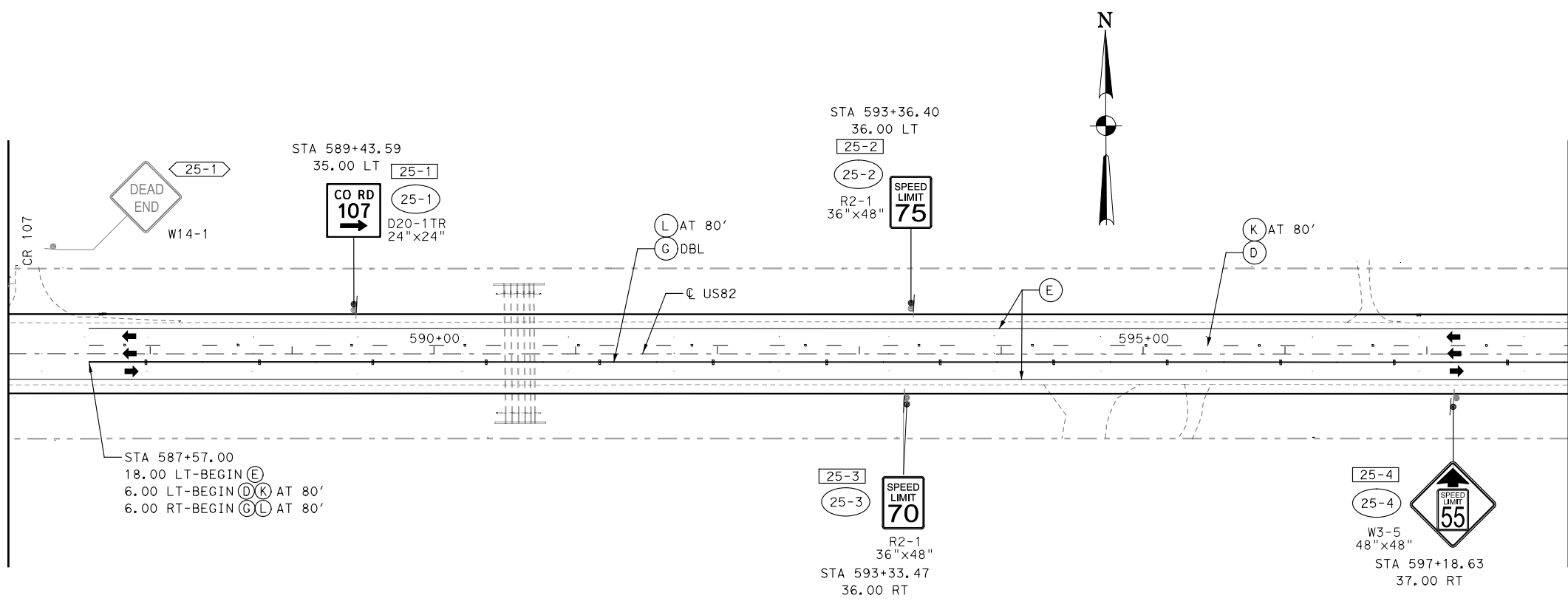
12/15/2020 9:59:25 AM  
 OTH\*PVMRK\*25.DGN

MATCHLINE STA 587+00

MATCHLINE STA 598+00

MATCHLINE STA 598+00

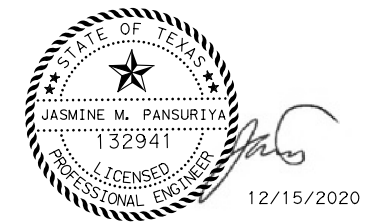
MATCHLINE STA 610+00



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	561
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4458
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4316
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
K	0672-6007 REFL PAV MRKR TY I-C	EA	29
L	0672-6009 REFL PAV MRKR TY II-A-A	EA	56
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	10

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 587+00 TO 610+00

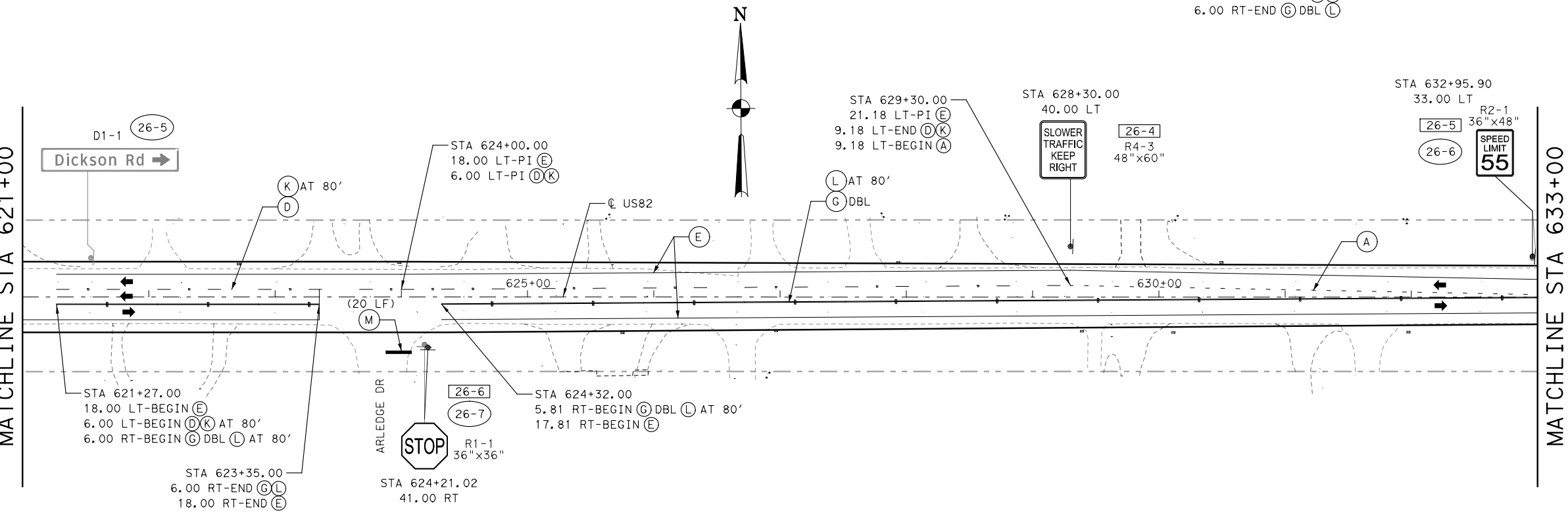
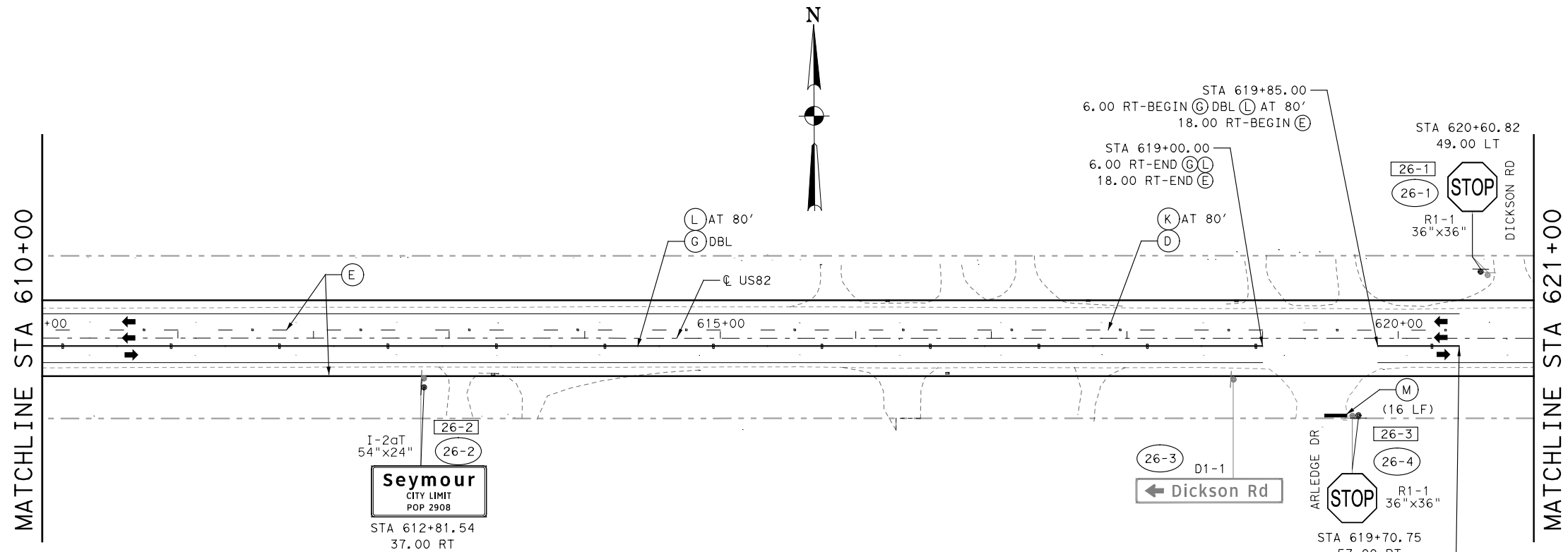
SHEET 25 OF 29



SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		238	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

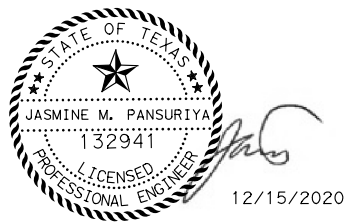
12/15/2020 9:59:32 AM  
 OTH\FV\MRK\*26.DGN



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	93
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	463
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4336
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	4072
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
K	0672-6007 REFL PAV MRKR TY I-C	EA	25
L	0672-6009 REFL PAV MRKR TY II-A-A	EA	54
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	36

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

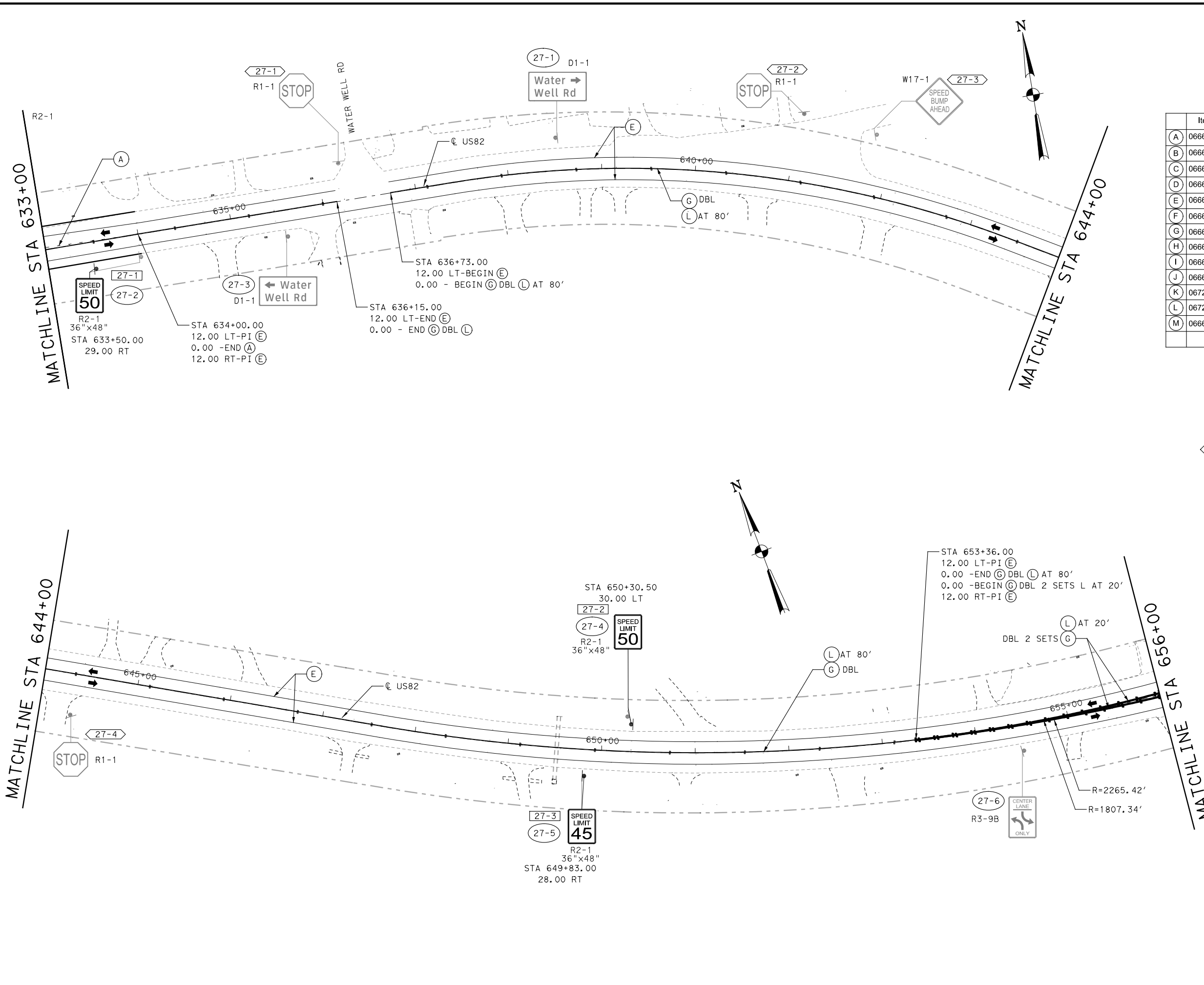
STA 610+00 TO 633+00

SHEET 26 OF 29



SCALE: 1" = 100'

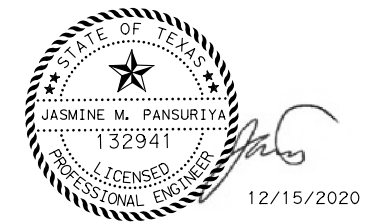
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		239	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82



**LEGEND**

Item	Description	Unit	Qty
(A)	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	25
(B)	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
(C)	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
(D)	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	0
(E)	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4542
(F)	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	0
(G)	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	5012
(H)	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	0
(I)	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
(J)	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
(K)	0672-6007 REFL PAV MRKR TY I-C	EA	0
(L)	0672-6009 REFL PAV MRKR TY II-A-A	EA	106
(M)	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED SMALL SIGN
- EXISTING SMALL SIGN TO REMAIN
- EXISTING SMALL SIGN TO BE REMOVED
- DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 633+00 TO 656+00

SHEET 27 OF 29



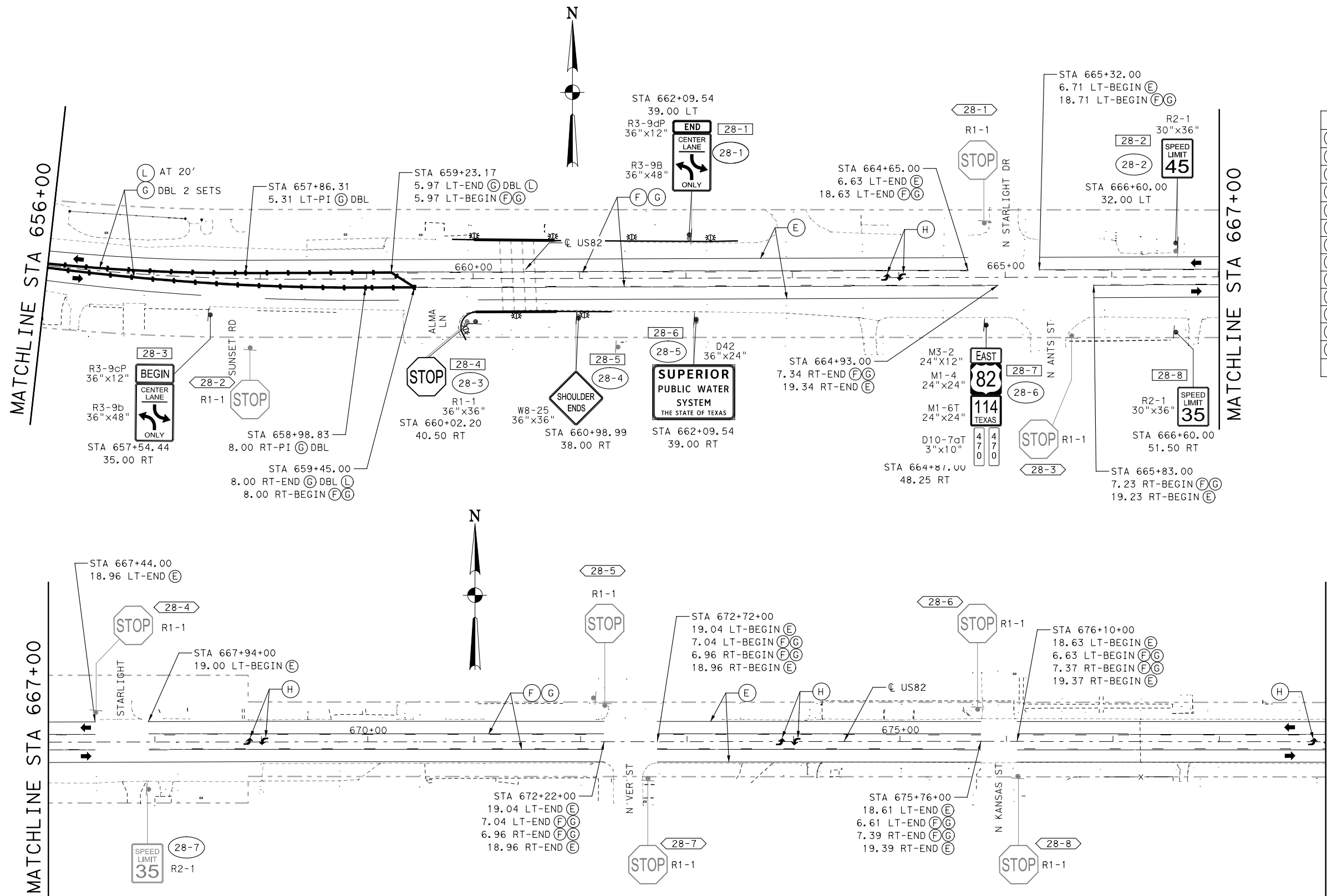
**OTHON CONSULTING ENGINEERS**  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		240	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

12/15/2020 9:59:41 AM  
 OTH\FV\MRK\*27.DGN

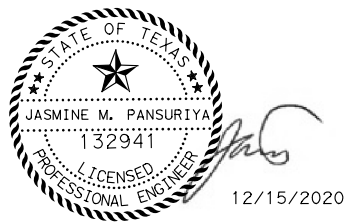
12/15/2020 9:59:51 AM  
 OTH\*PVMRK\*28.DGN



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	0
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	0
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	0
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4060
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	929
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	5102
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	7
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	0
K	0672-6007 REFL PAV MRK TY I-C	EA	0
L	0672-6009 REFL PAV MRK TY II-A-A	EA	66
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	0

- ➔ PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- ##-## PROPOSED SMALL SIGN
- ##-## EXISTING SMALL SIGN TO REMAIN
- ##-## EXISTING SMALL SIGN TO BE REMOVED
- ⊗ DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 656+00 TO 679+00

SHEET 28 OF 29

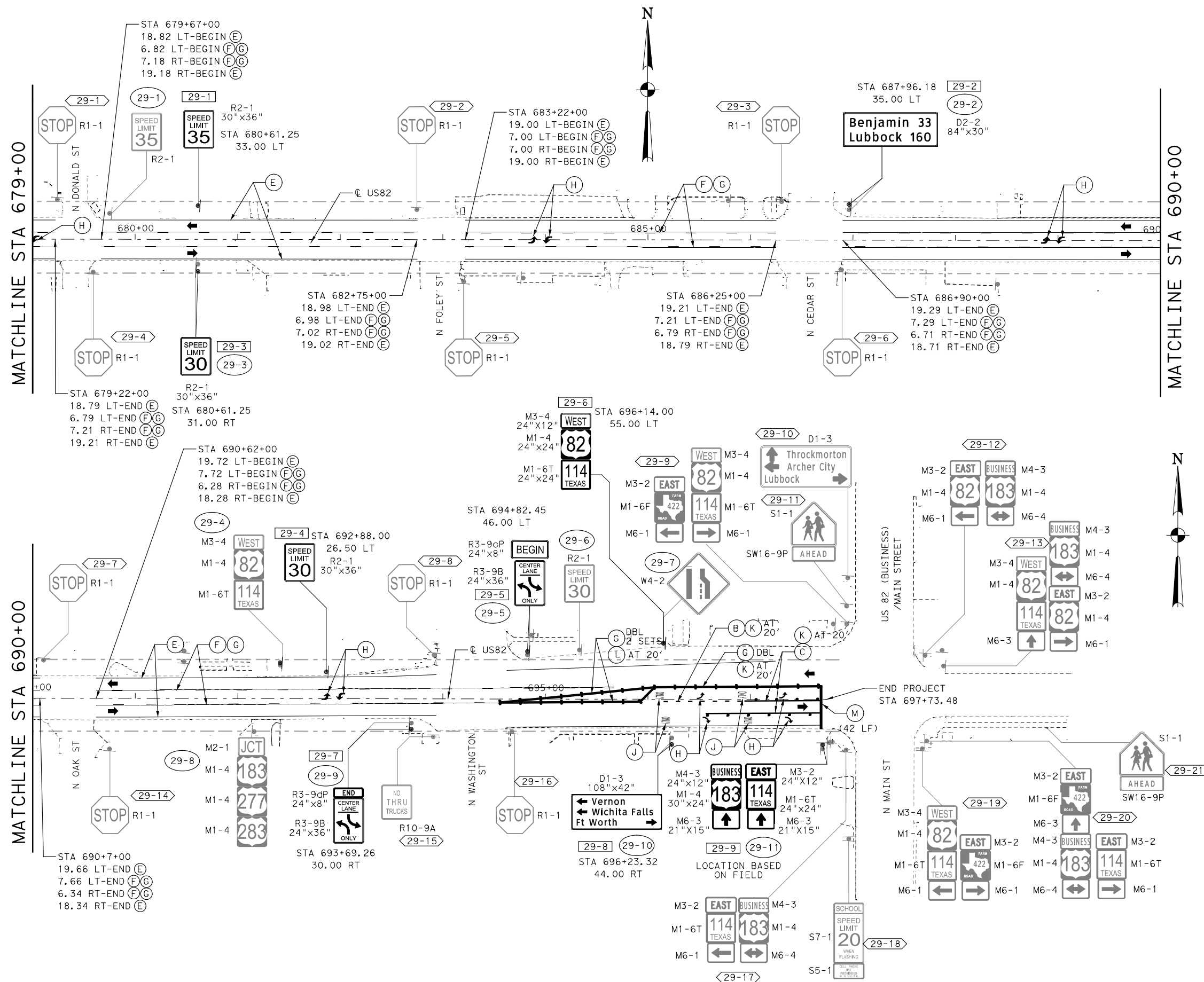


**OTHON CONSULTING ENGINEERS**  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		241	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

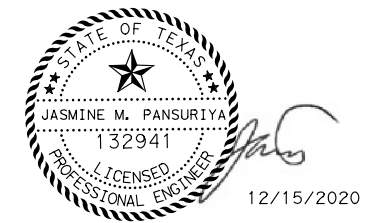
12/15/2020 9:59:58 AM  
 OTH\*PVMRK\*29.DGN



LEGEND

Item	Description	Unit	Qty
A	0666-6006 REFL PAV MRK TY I (W)4"(DOT)(100 MIL)	LF	0
B	0666-6029 REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	20
C	0666-6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	186
D	0666-6300 RE PM W/RET REQ TY I (W)4"(BRK)(100 MIL)	LF	0
E	0666-6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	3132
F	0666-6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100 MIL)	LF	701
G	0666-6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100 MIL)	LF	3744
H	0666-6054 REF PAV MRK TY I (W)(ARROW)(100 MIL)	EA	11
I	0666-6072 REF PAV MRK TY I (W)(LNDP ARROW)(100 MIL)	EA	0
J	0666-6078 REF PAV MRK TY I (W)(WORD)(100 MIL)	EA	4
K	0672-6007 REFL PAV MRK TY I-C	EA	12
L	0672-6009 REFL PAV MRK TY II-A-A	EA	48
M	0666-6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	42

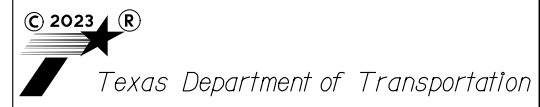
- ➔ PROP DIRECTION OF TRAVEL
- EXISTING SIGN
- PROPOSED SIGN
- ##-## PROPOSED SMALL SIGN
- ##-## EXISTING SMALL SIGN TO REMAIN
- ##-## EXISTING SMALL SIGN TO BE REMOVED
- ⊗ DELINEATOR



**SIGNING AND PAVEMENT MARKING LAYOUT**

STA 679+00 TO 699+12

SHEET 29 OF 29







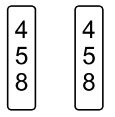


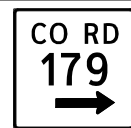

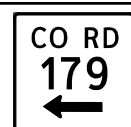


**OTHON** CONSULTING ENGINEERS  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

SCALE: 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		242
STATE	DISTRICT	COUNTY
TEXAS	WFS	BAYLOR
CONT	SECT	JOB
0133	04	042
		HIGHWAY NO
		US 82

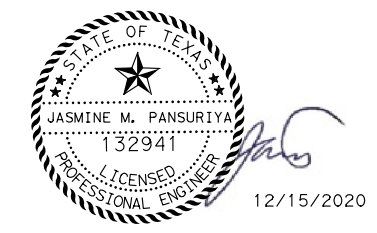
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
1	1	I-2D		72"x36"	X		S80	1	SA	T	
		R19-gT		24"x24"	X						
	2	I-2D		72"x36"	X		S80	1	SA	T	
	3	M3-2		24"x12"	X		10BWG	1	SA	P	
		M1-4		24"x24"	X						
		M1-6T		24"x24"	X						
		D10-7aT		3"x10"	X						
	4	W9-2TL		48"x48"	X		10BWG	1	SA	T	
	2	1	W9-1R		48"x48"	X	10BWG	1	SA	T	
	2	D20-1TR		24"x24"	X		TWT	1	UA	P	
	3	R1-1		36"x36"	X		10BWG	1	SA	P	
	4	D20-1TL		24"x24"	X		TWT	1	UA	P	

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 1 OF 19




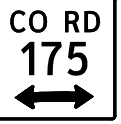






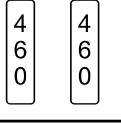

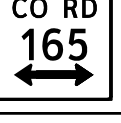

**OTHON CONSULTING ENGINEERS**  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 243
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/15/2020 10:00:16 AM  
OTH\*5055\*01.dgn



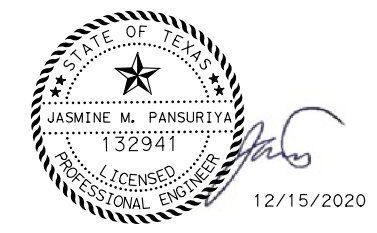
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
4	1	R1-1		36"X36"	X		10BWG	1	SA	P	
	2	D20-2T		24"X24"	X		TWT	1	UA	P	
	3	D20-2T		24"X24"	X		TWT	1	UA	P	
	4	R1-1		36"X36"	X		10BWG	1	SA	P	
	5	D15-10T		54"X42"	X		10BWG	1	SA	T	
	5	M3-4		24"X12"	X		10BWG	1	SA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		D10-7aT		3"X10"	X						
6	1	R1-1		36"X36"	X		10BWG	1	SA	P	
	2	D20-2T		24"X24"	X		TWT	1	UA	P	
	3	R1-1		36"X36"	X		10BWG	1	SA	P	

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 2 OF 19



**OTHON CONSULTING ENGINEERS**  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 244
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:00:20 AM  
OTH\*5055\*02.dgn

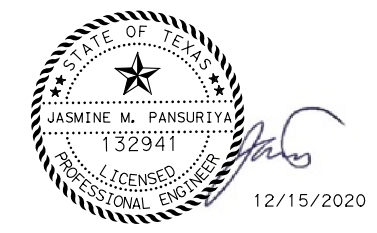
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
7	1	D20-2T		24"X24"	X		TWT	1	UA	P	
	2	R2-1		36"X48"	X		10BWG	1	SA	T	
	3	R2-1		36"X48"	X		10BWG	1	SA	T	
	4	W3-5		48"X48"	X		10BWG	1	SA	T	
	5	D3-1	<b>Red Springs</b>	90"X18"	X		10BWG	1	SA	T	
8	1	R2-1		36"X48"	X		10BWG	1	SA	T	
	2	R2-1		36"X48"	X		10BWG	1	SA	T	
	3	R4-3		48"X60"	X		S80	1	SA	T	
	4	M2-1		21"X15"	X		TWT	1	UA	P	
		M1-6F		24"X24"	X						
	5	M1-6F		24"X24"	X		S80	1	SA	U	1EXT
		M5-1L		21"X15"	X						

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 3 OF 19





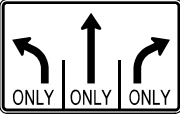








**OTHON CONSULTING ENGINEERS**  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 245
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/15/2020 10:00:24 AM OTH\*5055\*03.dgn

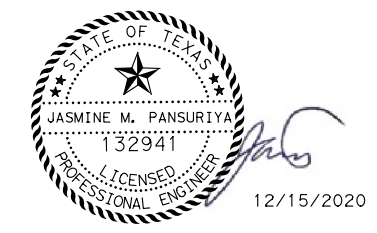
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
		M3-2		24"X12"	X						
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		M6-3		21"X15"	X						
	6	R3-8b		48"X30"	X		TWT	1	UA	T	
	9	1	Benjamin 24 Lubbock 151	84"X30"	X		S80	1	SA	T	
		2		24"X12"	X		TWT	1	UA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		3		36"X36"	X		10BWG	1	SA	P	
		4		24"X12"	X		S80	1	SA	U	1EXT
		M1-4		24"X24"	X						

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

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



## SUMMARY OF SMALL SIGNS

SHEET 4 OF 19






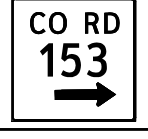








**OTHON**  
CONSULTING ENGINEERS  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 246
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:00:28 AM  
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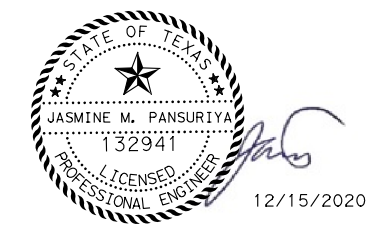
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
		M1-6T		24"X24"	X						
		M6-3		21"X15"	X						
		M1-6F		24"X24"	X						
		M6-1		21"X15"	X						
5		D20-1TL		24"X24"	X		TWT	1	UA	P	
6		D20-1TR		24"X24"	X		TWT	1	UA	P	
	7	M1-6F		24"X24"	X		S80	1	SA	U	1EXT
		M6-1		21"X15"	X						
		M3-2		24"X12"	X						
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		M6-3		21"X15"	X						

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.  
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- NOTE:**
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  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).



## SUMMARY OF SMALL SIGNS

SHEET 5 OF 19



**OTHON** CONSULTING ENGINEERS  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 247
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/15/2020 10:00:33 AM  
OTH\*5055\*05.dgn

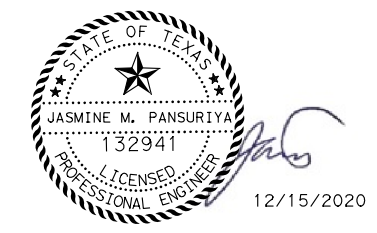
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
	8	M1-4		24"X24"	X		10BWG	1	SA	P	
		M1-6T		24"X24"	X						
		M6-4		21"X15"	X						
	9	R1-1		36"X36"	X		10BWG	1	SA	P	
	10	M3-2		24"X12"	X		TWT	1	UA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
	11	D3-1		90"X18"	X		10BWG	1	SA	T	
	12	R3-8b		48"X30"	X		TWT	1	UA	T	
	13	M3-4		24"X12"	X		S80	1	SA	U	1EXT
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.  
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- NOTE:**
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  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).



## SUMMARY OF SMALL SIGNS

SHEET 6 OF 19















**OTHON CONSULTING ENGINEERS**  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 248
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:00:38 AM  
OTH\*5055\*06.dgn

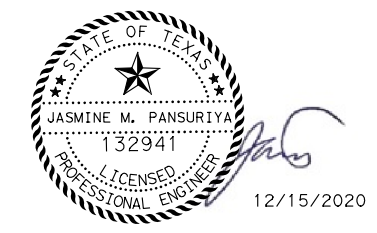
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
		M6-3		21"X15"	X						
		M1-6F		24"X24"	X						
		M5-1R		21"X15"	X						
	14	R2-1		36"X48"	X		10BWG	1	SA	T	
	15	D2-2		102"X30"	X		S80	1	SA	U	WC
	16	R4-3		48"X60"	X		S80	1	SA	T	
	17	R2-1		36"X48"	X		10BWG	1	SA	T	
	10	1	M2-1		21"X15"	X		TWT	1	UA	P
		M1-6F		24"X24"	X						
	2	W3-5		48"X48"	X		10BWG	1	SA	T	
	3	R2-1		36"X48"	X		10BWG	1	SA	T	
	4	M3-2		24"X12"	X		10BWG	1	SA	P	

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.  
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## SUMMARY OF SMALL SIGNS

SHEET 7 OF 19



**OTHON**  
CONSULTING ENGINEERS  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 249
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/15/2020 10:00:44 AM  
OTH\*5055\*07.dgn

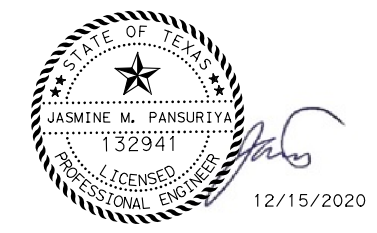
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		D10-7aT		3"X10"	X						
	5	R2-1		36"X48"	X		10BWG	1	SA	T	
11	1	D20-2T		24"X24"	X		TWT	1	UA	P	
	2	R1-1		36"X36"	X		10BWG	1	SA	P	
	3	D20-2T		24"X24"	X		TWT	1	UA	P	
	4	R1-1		36"X36"	X		10BWG	1	SA	P	
		W14-1		36"X36"	X						
13	1	D15-10T		54"X42"	X		10BWG	1	SA	T	
	2	R1-1		36"X36"	X		10BWG	1	SA	P	
	3	D20-2T		24"X24"	X		TWT	1	UA	P	

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.  
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- NOTE:**
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## SUMMARY OF SMALL SIGNS

SHEET 8 OF 19



**OTHON CONSULTING ENGINEERS**  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 250
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/15/2020 10:00:50 AM OTH\*5055\*08.dgn

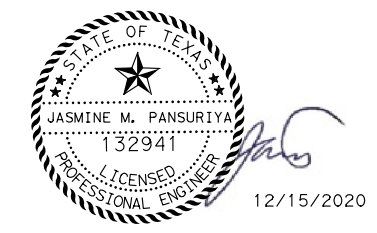
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
	4	D20-2T		24"X24"	X		TWT	1	UA	P	
	5	R1-1		36"X36"	X		10BWG	1	SA	P	
		W14-1		36"X36"	X						
14	1	M3-4		24"X12"	X		10BWG	1	SA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		D10-7aT		3"X10"	X						
16	1	R1-1		36"X36"	X		10BWG	1	SA	P	
	2	D20-2T		24"X24"	X		TWT	1	UA	P	
	3	D20-2T		24"X24"	X		TWT	1	UA	P	
	4	R1-1		36"X36"	X		10BWG	1	SA	P	
	5	S3-1T		48"X48"	X		10BWG	1	SA	T	

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 9 OF 19















**OTHON**  
CONSULTING ENGINEERS  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 251
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:00:54 AM  
OTH\*5055\*09.dgn



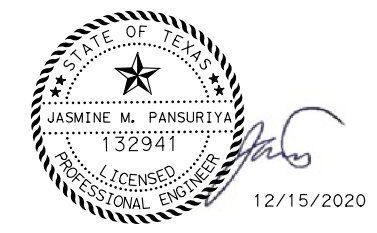
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
	6	W9-1L		48"X48"	X		10BWG	1	SA	T	
	7	W9-2TR		48"X48"	X		10BWG	1	SA	T	
17	1	R1-1		36"X36"	X		10BWG	1	SA	P	
	2	M2-1		24"X12"	X		TWT	1	UA	P	
		M1-6F		24"X24"	X						
	3	M3-1		24"X12"	X		S80	1	SA	U	1EXT
		M1-6F		24"X24"	X						
		M5-1L		21"X15"	X						
		M3-2		24"X12"	X						
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		M6-3		21"X15"	X						

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 10 OF 19















**OTHON CONSULTING ENGINEERS**  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 252
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:00:59 AM  
OTH\*50SS\*10.dgn

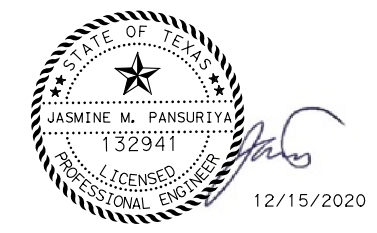
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
18	1	R2-1		36"X48"	X		10BWG	1	SA	T	
	2	S3-1T		48"X48"	X		10BWG	1	SA	T	
	3	M3-4		24"X12"	X		TWT	1	UA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
	4	R1-1		36"X36"	X		10BWG	1	SA	P	
	5	R3-8LS		30"X30"	X		TWT	1	UA	P	
	6	R3-8LS		30"X30"	X		TWT	1	UA	P	
	7	M3-1		24"X12"	X		S80	1	SA	U	1EXT
		M1-6F		24"X24"	X						
		M6-1		21"X15"	X						
		M3-2		24"X12"	X						

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 11 OF 19



**OTHON CONSULTING ENGINEERS**  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 253
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:01:06 AM OTH\*5055\*11.dgn

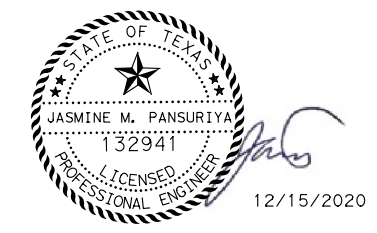
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		M6-3		21"X15"	X						
8		M1-4		24"X24"	X		10BWG	1	SA	P	
		M1-6T		24"X24"	X						
		M6-4		21"X15"	X						
9		M3-4		24"X12"	X		S80	1	SA	U	1EXT
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		M6-3		21"X15"	X						
		M3-1		24"X12"	X						
		M1-6F		24"X24"	X						

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 12 OF 19















**OTHON CONSULTING ENGINEERS**  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 254
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/15/2020 10:01:12 AM  
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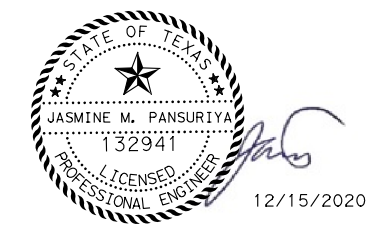
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
		M6-1		21 "X15"	X						
	10	R3-8SR		30 "X30"	X		TWT	1	UA	P	
	11	R3-8SR		30 "X30"	X		TWT	1	UA	P	
	12	M3-2		24 "X12"	X		TWT	1	UA	P	
		M1-4		24 "X24"	X						
		M1-6T		24 "X24"	X						
	13	R2-1		36 "X48"	X		10BWG	1	SA	T	
	14	D2-2		102 "X30"	X		S80	1	SA	U	WC
	19	1	M3-2		24 "X12"	X	S80	1	SA	U	1EXT
		M1-4		24 "X24"	X						
		M1-6T		24 "X24"	X						
		M6-3		21 "X15"	X						

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

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

- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
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  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).



## SUMMARY OF SMALL SIGNS










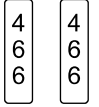


SHEET 13 OF 19



FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 255
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:01:22 AM OTH\*5055\*13.dgn

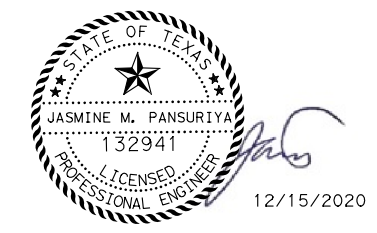
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
		M3-1		24"X12"	X						
		M1-6F		24"X24"	X						
		M5-1R		21"X15"	X						
	2	M2-1		21"X15"	X		TWT	1	UA	P	
		M1-6F		24"X24"	X						
	3	D15-11T		54"X48"	X		S80	1	SA	T	
	4	M3-2		24"X12"	X		10BWG	1	SA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		D10-7aT		3"X10"	X						
	20	1	W9-2TR		48"X48"	X	10BWG	1	SA	T	
		2	W9-1L		48"X48"	X	10BWG	1	SA	T	

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.  
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- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
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  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).



## SUMMARY OF SMALL SIGNS

SHEET 14 OF 19




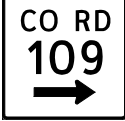










**OTHON**  
CONSULTING ENGINEERS  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 256
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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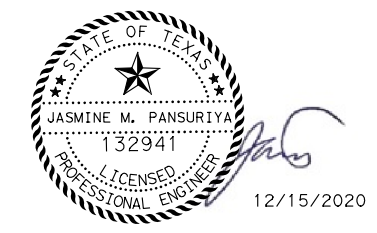
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
23	1	W8-18		36"X36"	X		10BWG	1	SA	P	
		W16-4P		30"X24"	X						
	2	R1-1		36"X36"	X		10BWG	1	SA	P	
	3	D20-1TR		24"X24"	X		TWT	1	UA	P	
	4	M3-4		24"X12"	X		10BWG	1	SA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		D10-7aT		3"X10"	X						
	5	D20-1TL		24"X24"	X		TWT	1	UA	P	
24	1	W8-18		36"X36"	X		10BWG	1	SA	P	
		W16-4P		30"X24"	X						
	2	R1-1		36"X36"	X		10BWG	1	SA	P	

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 15 OF 19










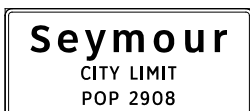




**OTHON CONSULTING ENGINEERS**  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 257
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:01:30 AM OTH\*5055\*15.dgn

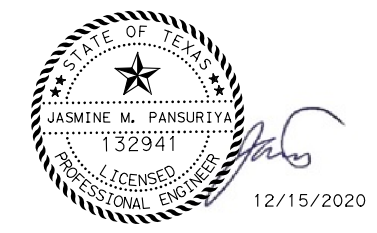
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
	3	D20-1TL		24"X24"	X		TWT	1	UA	P	
25	1	D20-1TR		24"X24"	X		TWT	1	UA	P	
	2	R2-1		36"X48"	X		10BWG	1	SA	T	
	3	R2-1		36"X48"	X		10BWG	1	SA	T	
	4	W3-5		48"X48"	X		10BWG	1	SA	T	
	5	R2-1		36"X48"	X		10BWG	1	SA	T	
	6	R1-1		36"X36"	X		10BWG	1	SA	P	
	7	R2-1		36"X48"	X		10BWG	1	SA	T	
26	1	R1-1		36"X36"	X		10BWG	1	SA	P	
	2	I-2aT		54"X24"	X		10BWG	1	SA	T	
	3	R1-1		36"X36"	X		10BWG	1	SA	P	
	4	R4-3		48"X60"	X		S80	1	SA	T	

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

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

- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
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## SUMMARY OF SMALL SIGNS

SHEET 16 OF 19







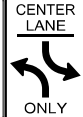







**OTHON CONSULTING ENGINEERS**  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 258
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

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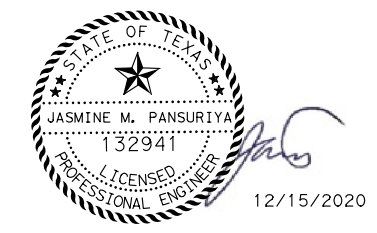
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
	5	R2-1		36"X48"	X		10BWG	1	SA	T	
	6	R1-1		36"X36"	X		10BWG	1	SA	P	
27	1	R2-1		36"X48"	X		10BWG	1	SA	T	
	2	R2-1		36"X48"	X		10BWG	1	SA	T	
	3	R2-1		36"X48"	X		10BWG	1	SA	T	
28	1	R3-9dP		36"X12"	X		10BWG	1	SA	P	BM
		R3-9B		36"X48"	X						
	2	R2-1		30"X36"	X		TWT	1	UA	P	
	3	R3-9CP		36"X12"	X		10BWG	1	SA	P	BM
		R3-9B		36"X48"	X						
	4	R1-1		36"X36"	X		10BWG	1	SA	P	
	5	W8-25		36"X36"	X		TWT	1	UA	P	

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

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

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



## SUMMARY OF SMALL SIGNS

SHEET 17 OF 19



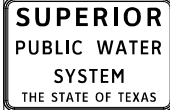



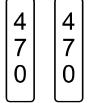







**OTHON CONSULTING ENGINEERS**  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 259
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

12/15/2020 10:01:39 AM  
OTH\*50SS\*17.dgn



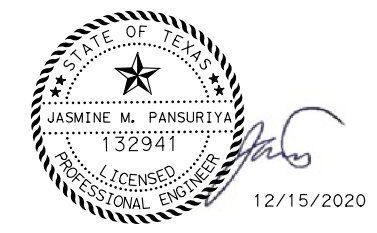
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
	6	D42		36"X24"	X		TWT	1	UA	T	
	7	M3-2		24"X12"	X		10BWG	1	SA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
		D10-7aT		3"X10"	X						
	8	R2-1		30"X36"	X		TWT	1	UA	P	
29	1	R2-1		30"X36"	X		TWT	1	UA	P	
	2	D2-2		84"X30"	X		S80	1	SA	T	
	3	R2-1		30"X36"	X		TWT	1	UA	P	
	4	R2-1		30"X36"	X		TWT	1	UA	P	
	5	R3-9cP		24"X8"	X		TWT	1	UA	P	
		R3-9B		24"X36"	X						

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

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



## SUMMARY OF SMALL SIGNS

SHEET 18 OF 19















**OTHON CONSULTING ENGINEERS**  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 260
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

12/15/2020 10:01:43 AM  
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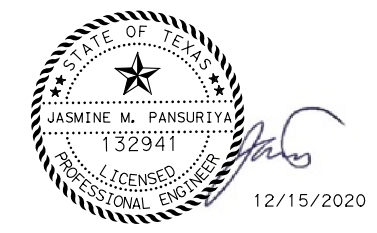
# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U" 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
	6	M3-4		24"X12"	X		TWT	1	UA	P	
		M1-4		24"X24"	X						
		M1-6T		24"X24"	X						
	7	R3-9dP		24"X8"	X		TWT	1	UA	P	
		R3-9B		24"X36"	X						
	8	D1-3		108"X42"	X		S80	1	SA	U	WC
	9	M4-3		24"X12"	X		S80	1	SA	U	
		M1-4		30"X24"	X						
		M6-3		21"X15"	X						
		M3-2		24"X12"	X						
		M1-6T		24"X24"	X						
		M6-3		21"X15"	X						

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

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



## SUMMARY OF SMALL SIGNS

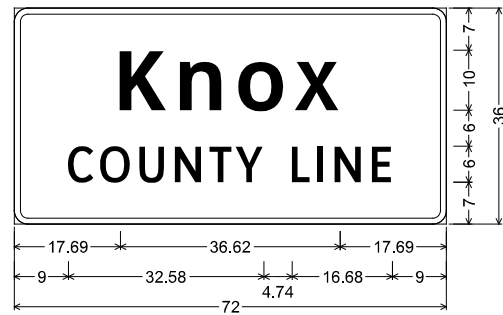
SHEET 19 OF 19



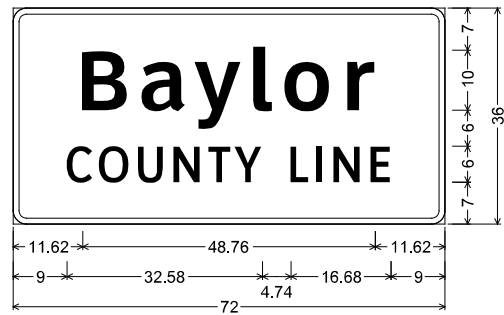
**OTHON** CONSULTING ENGINEERS  
 F-1471  
 2140 Lake Park Boulevard  
 Richardson, Texas 75243

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 261
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO US 82

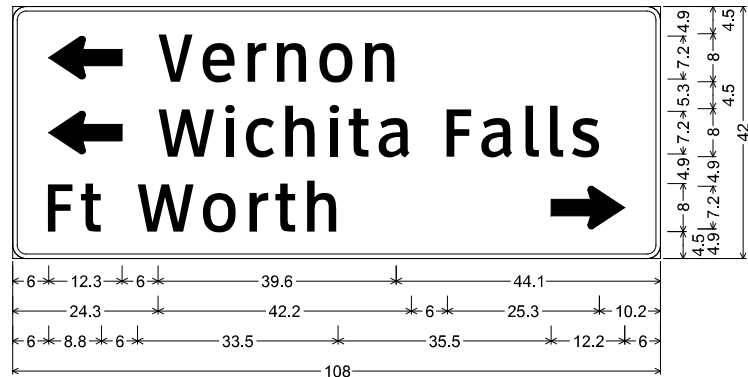
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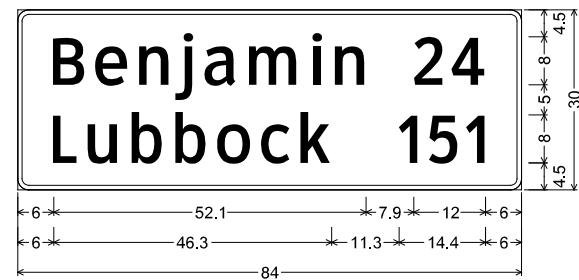
I-2dT\_72"x36";  
2.25" Radius, 1.00" Border, White on, Green;  
"Knox", ClearviewHwy-5-W-R;  
"COUNTY LINE", ClearviewHwy-3-W;



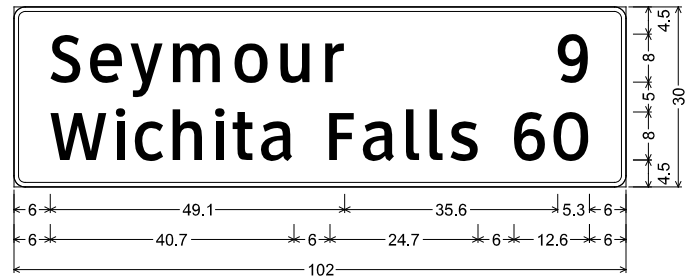
I-2dT\_72"x36";  
2.25" Radius, 1.00" Border, White on, Green;  
"Baylor", ClearviewHwy-5-W-R;  
"COUNTY LINE", ClearviewHwy-3-W;



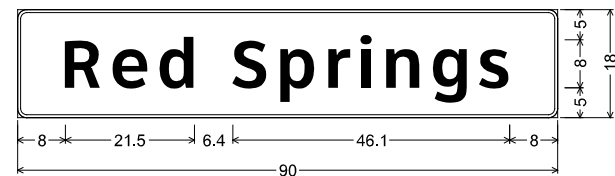
D1-3\_108"x42";  
2.3" Radius, 0.8" Border, White on, Green;  
Standard Arrow Custom 12.3" X 7.1" 180; "Vernon", ClearviewHwy-3-W;  
Standard Arrow Custom 12.3" X 7.1" 180; "Wichita", ClearviewHwy-3-W;  
"Falls", ClearviewHwy-3-W; "Ft", ClearviewHwy-3-W;  
"Worth", ClearviewHwy-3-W; Standard Arrow Custom 12.3" X 7.1" 0;



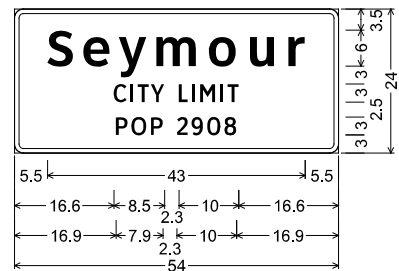
D2-2\_84"x30";  
1.9" Radius, 0.8" Border, White on, Green;  
"Benjamin", ClearviewHwy-3-W; "24", ClearviewHwy-3-W;  
"Lubbock", ClearviewHwy-3-W; "151", ClearviewHwy-3-W;



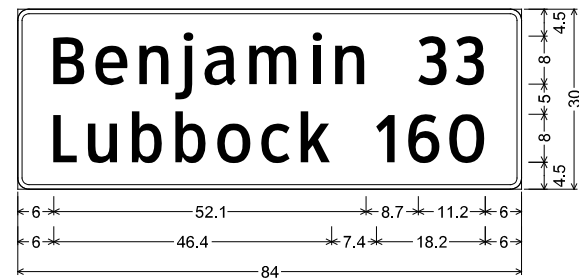
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1.9" Radius, 0.8" Border, White on, Green;  
"Seymour", ClearviewHwy-3-W; "9", ClearviewHwy-3-W;  
"Wichita", ClearviewHwy-3-W 85% spacing;  
"Falls", ClearviewHwy-3-W 90% spacing;  
"60", ClearviewHwy-3-W 85% spacing;



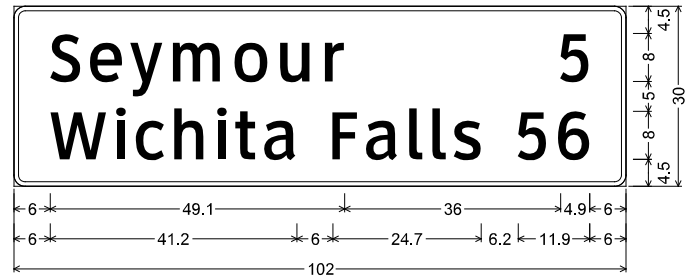
I-2cT\_90"x18";  
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"Red", ClearviewHwy-5-W-R; "Springs", ClearviewHwy-5-W-R;



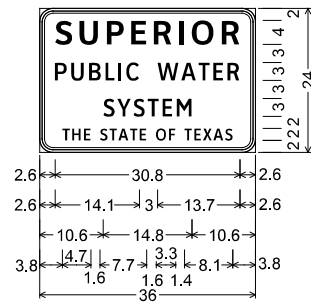
I-2aT\_54"x24";  
1.5" Radius, 0.8" Border, White on, Green;  
"Seymour", ClearviewHwy-5-W 103% spacing;  
"CITY LIMIT", ClearviewHwy-3-W;  
"POP 2908", ClearviewHwy-3-W;



D2-2\_84"x30";  
1.9" Radius, 0.8" Border, White on, Green;  
"Benjamin", ClearviewHwy-3-W; "33", ClearviewHwy-3-W;  
"Lubbock", ClearviewHwy-3-W; "160", ClearviewHwy-3-W;



D2-2\_102"x30";  
1.9" Radius, 0.8" Border, White on, Green;  
"Seymour", ClearviewHwy-3-W; "5", ClearviewHwy-3-W;  
"Wichita", ClearviewHwy-3-W 90% spacing;  
"Falls", ClearviewHwy-3-W 90% spacing; "56", ClearviewHwy-3-W;



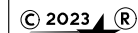
D42\_36"x24";  
0.4" Inner border Black, 2.3" Radius, 0.4" Outer border, White on, White;  
"SUPERIOR" Black, ClearviewHwy-5-W 90% spacing;  
"PUBLIC" Black, ClearviewHwy-3-W;  
"WATER" Black, ClearviewHwy-3-W;  
"SYSTEM" Black, ClearviewHwy-3-W;  
"THE STATE OF TEXAS" Black, ClearviewHwy-3-W;



12/15/2020

**SIGNS DETAIL**

SHEET 1 OF 1



Texas Department of Transportation

**OTHON** CONSULTING ENGINEERS  
F-1471  
2140 Lake Park Boulevard  
Richardson, Texas 75243

SCALE: N. T. S.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6		262	
STATE	DISTRICT	COUNTY	
TEXAS	WFS	BAYLOR	
CONT	SECT	JOB	HIGHWAY NO
0133	04	042	US 82

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DATE: 12/15/2020 10:02:02 AM  
 FILE: dcm1-20.dgn

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

OBJECT MARKERS								D & OM DESCRIPTIVE CODES	
DEVICE	Type 1 (OM-1)		Type 2 (OM-2)			Type 3 (OM-3)		Type 4 (OM-4)	
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4	
								<b>INSTL OM ASSM</b> (OM-XX) (XXXX)XXX (XX) <b>TYPE OF OBJECT MARKER</b> 1, 2, 3, or 4 <b>NUMBER OF REFLECTORS OR DIRECTION</b> X = 3-Size 2 reflector units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) <b>TYPE OF POST</b> WC = Wing Channel Post WFLX = White Flexible Post TWT = Thin Walled Tubing <b>TYPE OF MOUNT</b> GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic <b>DIRECTION</b> If Required BI = Bi-Directional	
SHEETING	Yellow-Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting		Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting		Red -Type B <sub>FL</sub> or C <sub>FL</sub> 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						
								<b>DELINEATOR &amp; OBJECT MARKER MATERIAL DESCRIPTION</b> <b>D &amp; OM(1)-20</b>				
SHEETING	Yellow, White, Red			SIZE (W x L)	18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)		36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
NOTE	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.			MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only		MOUNTING HEIGHT	7'-0"		
				NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).							



FILE: dcm1-20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	WFS	BAYLOR	263	

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 FILE: dom2-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS		
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT	
GND	GND	SRF	WAS	WAP	GF1	GF2
	EMBEDDED	SURFACE MOUNT	STEEL	PLASTIC	CONCRETE TRAFFIC BARRIER (CTB)	
<b>NOTES</b> 1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only. 2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.	<b>NOTES</b> 1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices. 2. Install per manufacturer's recommendations. 3. Post length may vary to meet field conditions. 4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.		<b>NOTE</b> 1. Install per manufacturer's recommendations.		<b>GENERAL NOTES</b> 1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface. 6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.	
<b>TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS</b>	<b>CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN</b>		<b>DELINEATORS AND TYPE 2 OBJECT MARKERS</b>			
<b>NOTE</b> Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)	<b>NOTE</b> Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.		See general notes 1, 2 and 3.			

**Texas Department of Transportation**  
Traffic Safety Division Standard

## DELINEATOR & OBJECT MARKER INSTALLATION

### D & OM(2)-20

FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	WFS	BAYLOR	<b>264</b>	

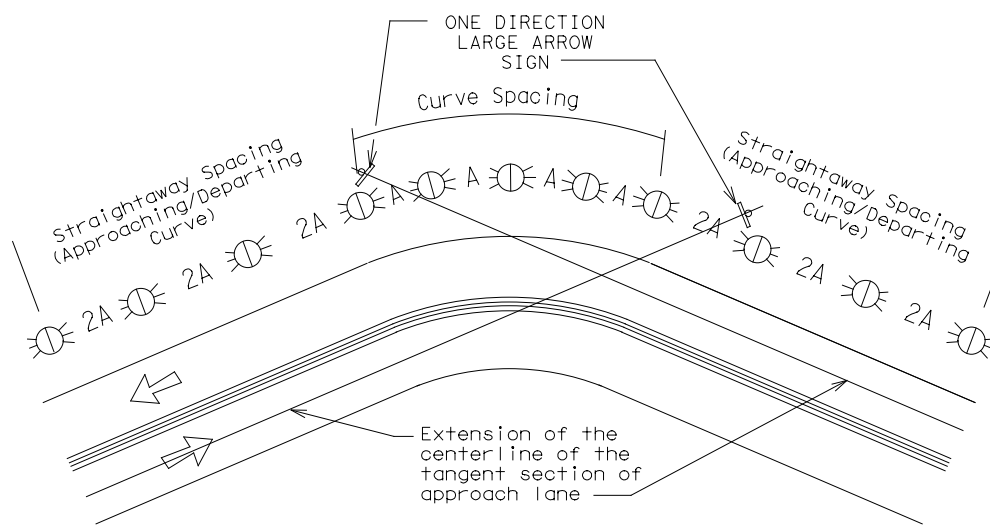
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 12/15/2020 10:02:41 AM  
 FILE: dom3-20.dgn

### MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	● RPMs	● RPMs
15 MPH & 20 MPH	● RPMs and One Direction Large Arrow sign	● RPMs and Chevrons; or ● RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	● RPMs and Chevrons; or ● RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	● RPMs and Chevrons

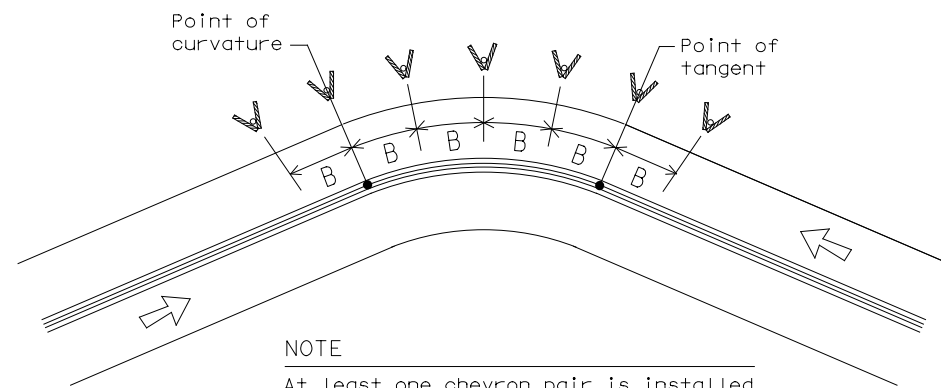
### SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



**NOTE**

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

### SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



**NOTE**

At least one chevron pair is installed beyond the point of tangent in tangent section.

### DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN				
Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

### DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN			
Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

### DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp. Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete) and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100' max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100' max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

**NOTES**

- Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
- Barrier reflectors may be used to replace required delineators.
- Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

**Texas Department of Transportation**

**Traffic Safety Division Standard**

## DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

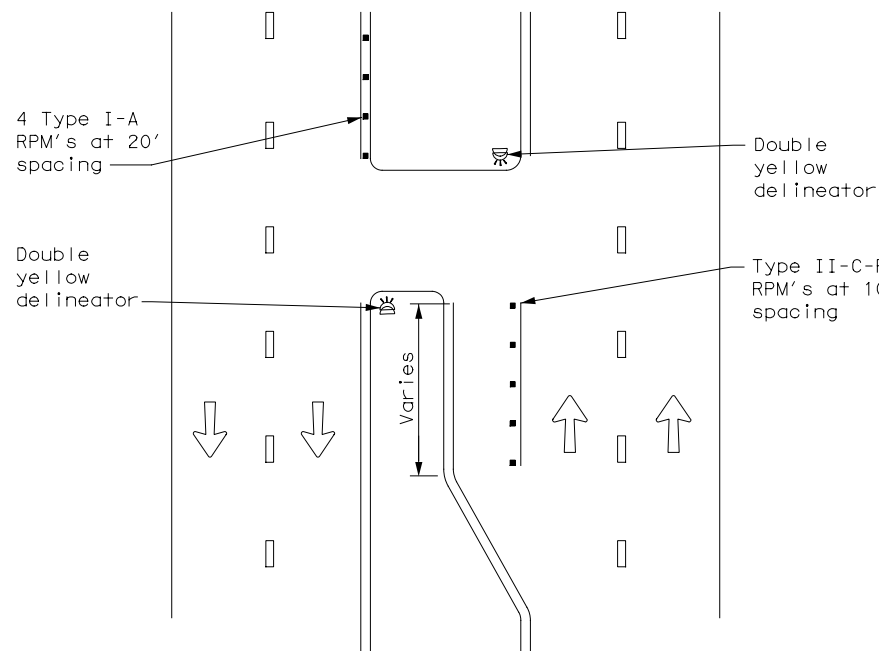
### D & OM(3)-20

FILE: dom3-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS		0133	04	042
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	WFS	BAYLOR		<b>265</b>

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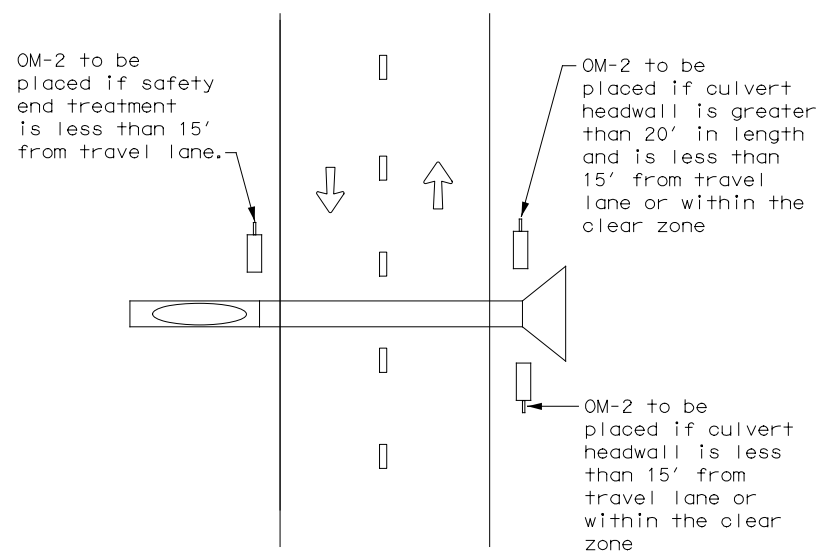
DATE: 12/15/2020 10:02:50 AM  
FILE: dom4-20.dgn

**CROSSOVERS**



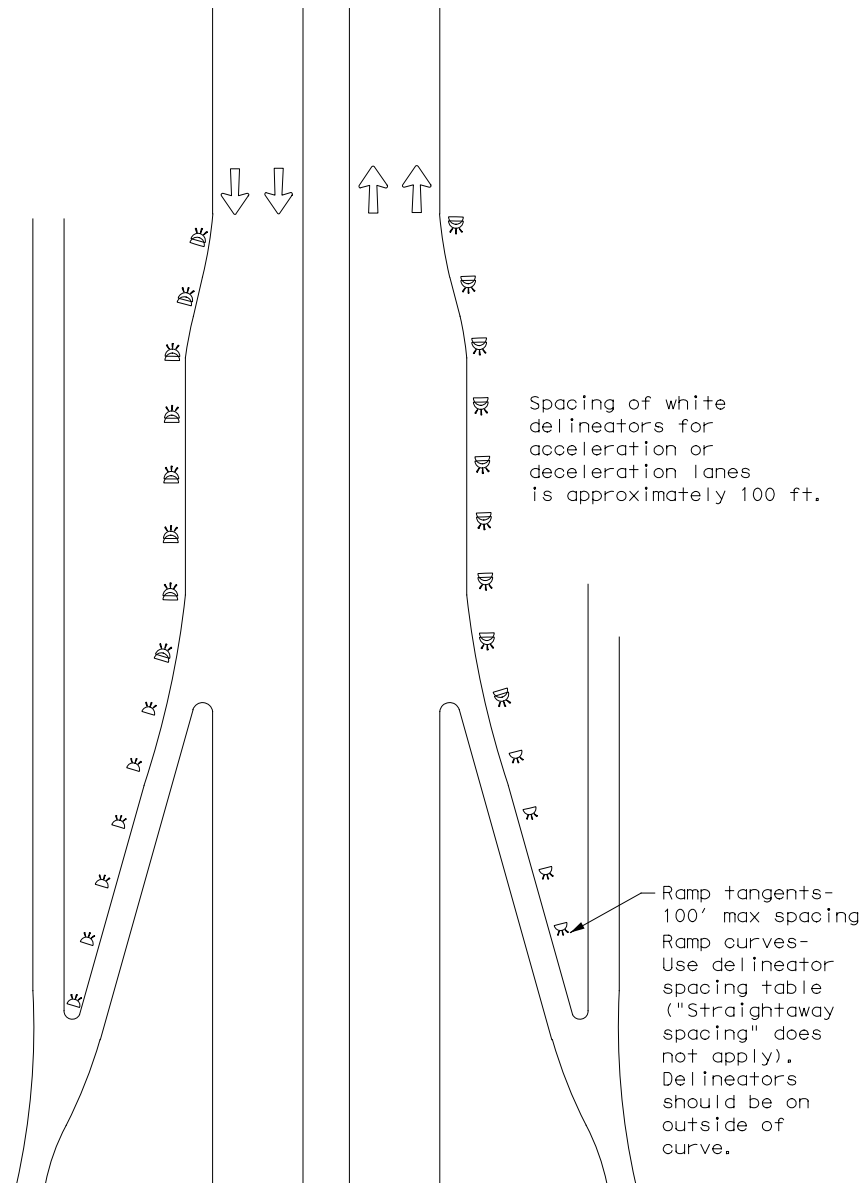
**DETAIL 1**

**FOR CULVERTS WITHOUT MBGF**



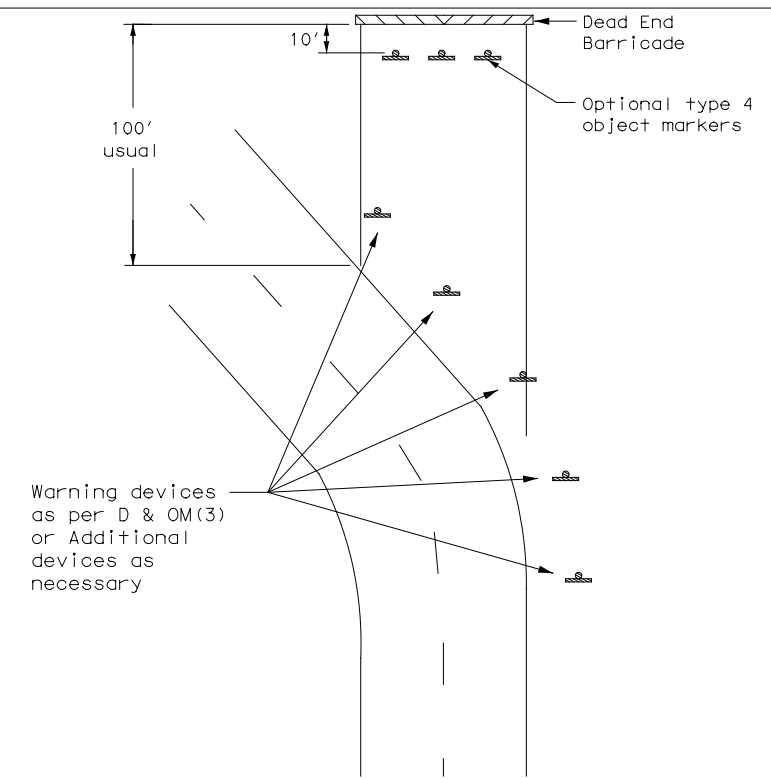
**DETAIL 2**

**FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES**



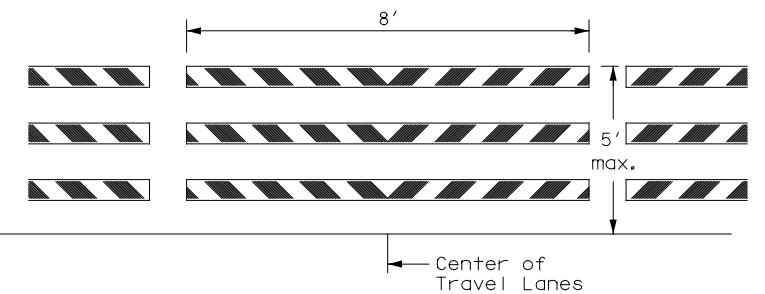
**DETAIL 3**

**TYPICAL APPLICATION OF DEAD END BARRICADE**



**DETAIL 4**

**TYPICAL DEAD END BARRICADE INSTALLATION**



**NOTES**

- Barricade striping shall be red and white reflective sheeting for all permanent road closures.
- Barricade striping is red and white sloping toward the center of the roadway.
- Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

**DETAIL 5**

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

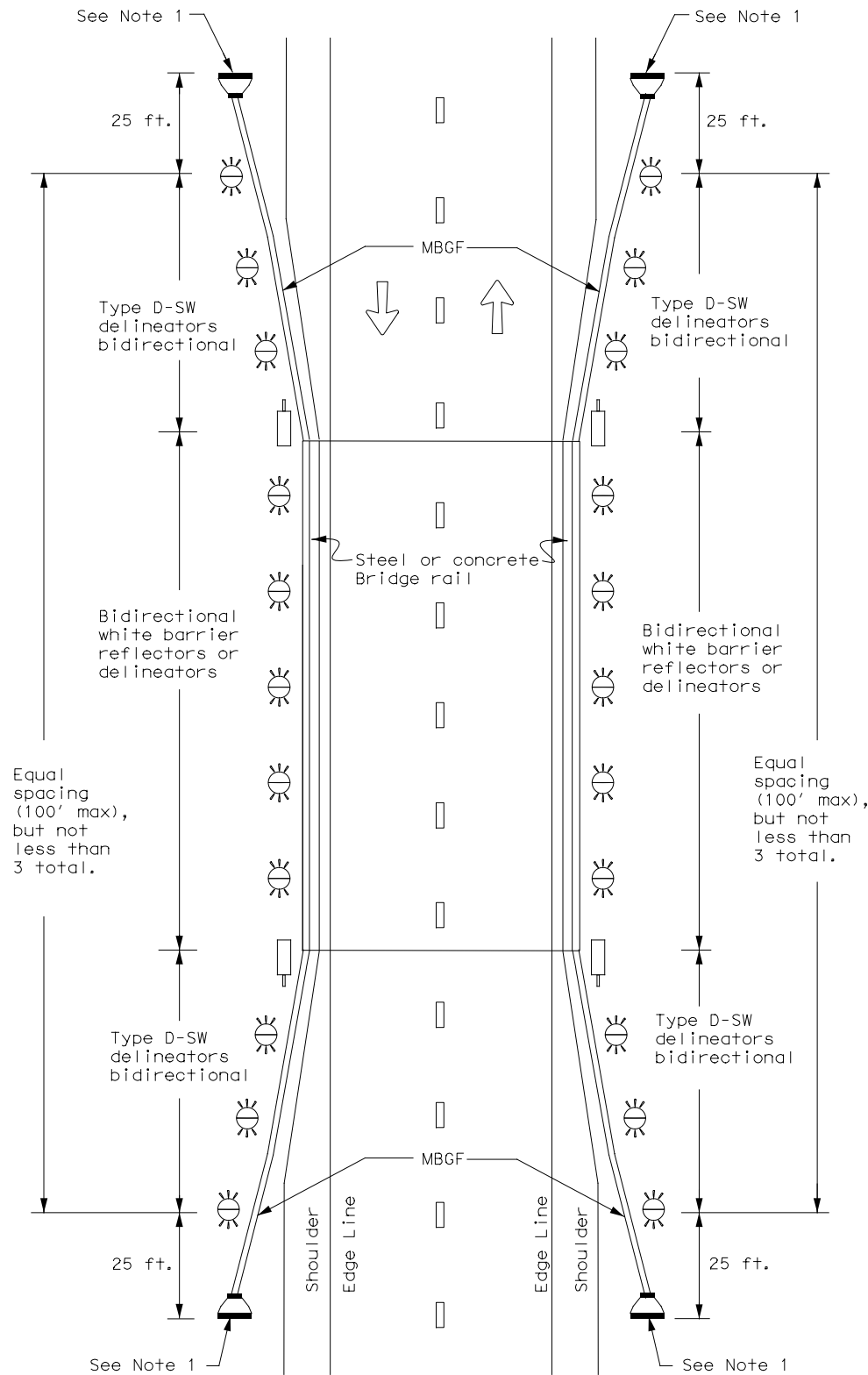


**DELINEATOR & OBJECT MARKER PLACEMENT DETAILS**

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
3-15	DIST	COUNTY	SHEET NO.	
7-20	WFS	BAYLOR	266	

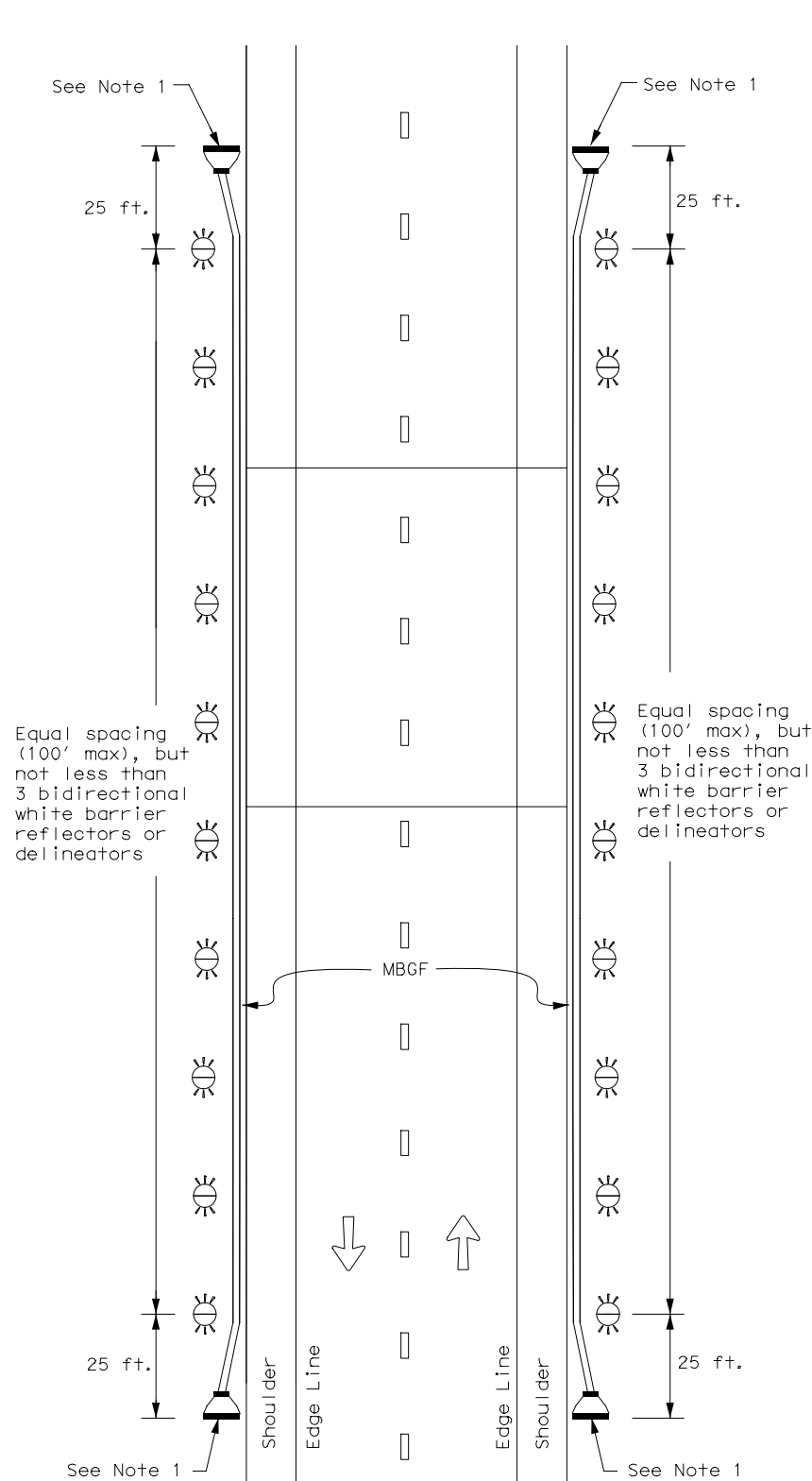
**TWO-WAY, TWO LANE ROADWAY  
WITH REDUCED WIDTH APPROACH RAIL**



**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.

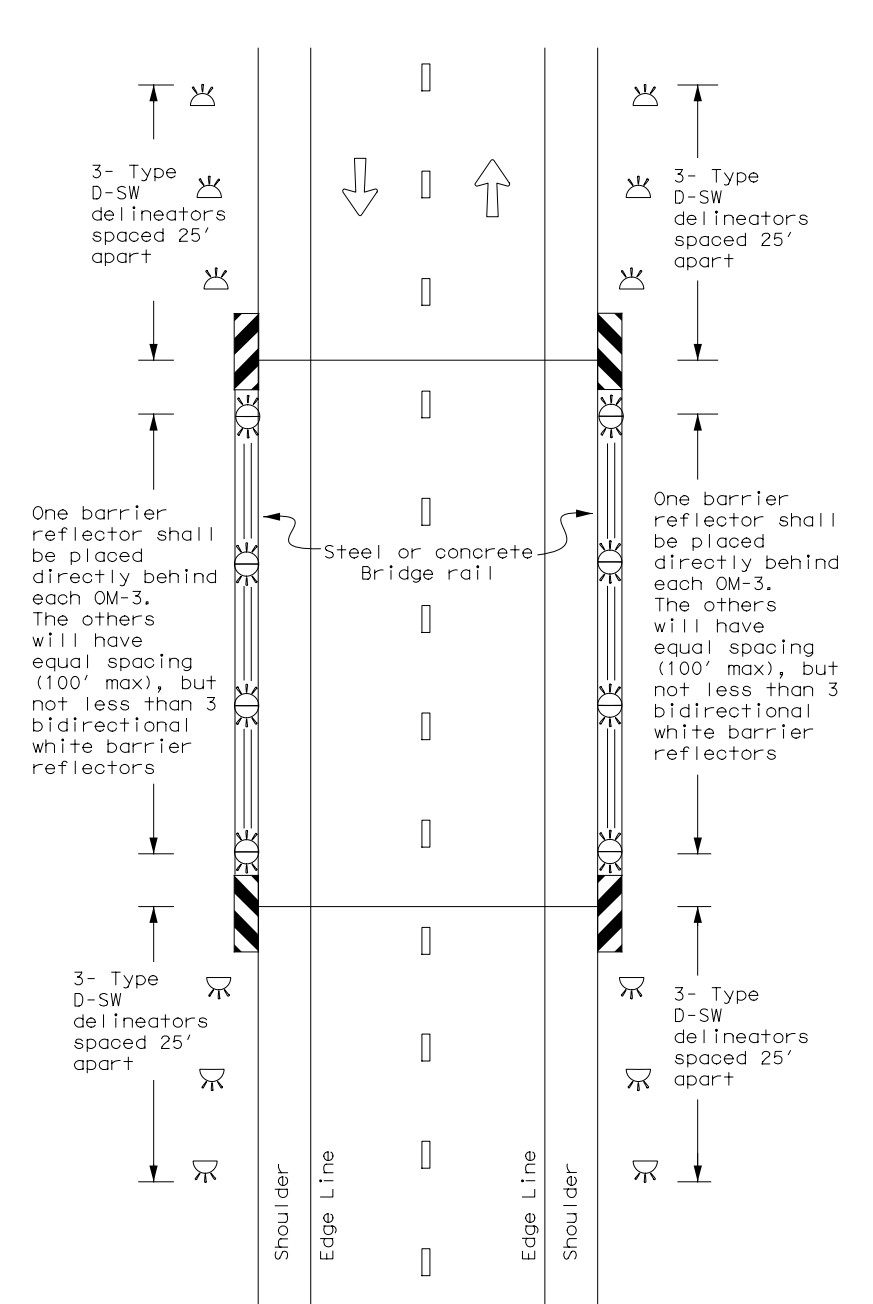
**TWO-WAY, TWO LANE ROADWAY  
WITH METAL BEAM GUARD FENCE (MBGF)**



**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	0133	04	042	US82
7-20	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	<b>267</b>	

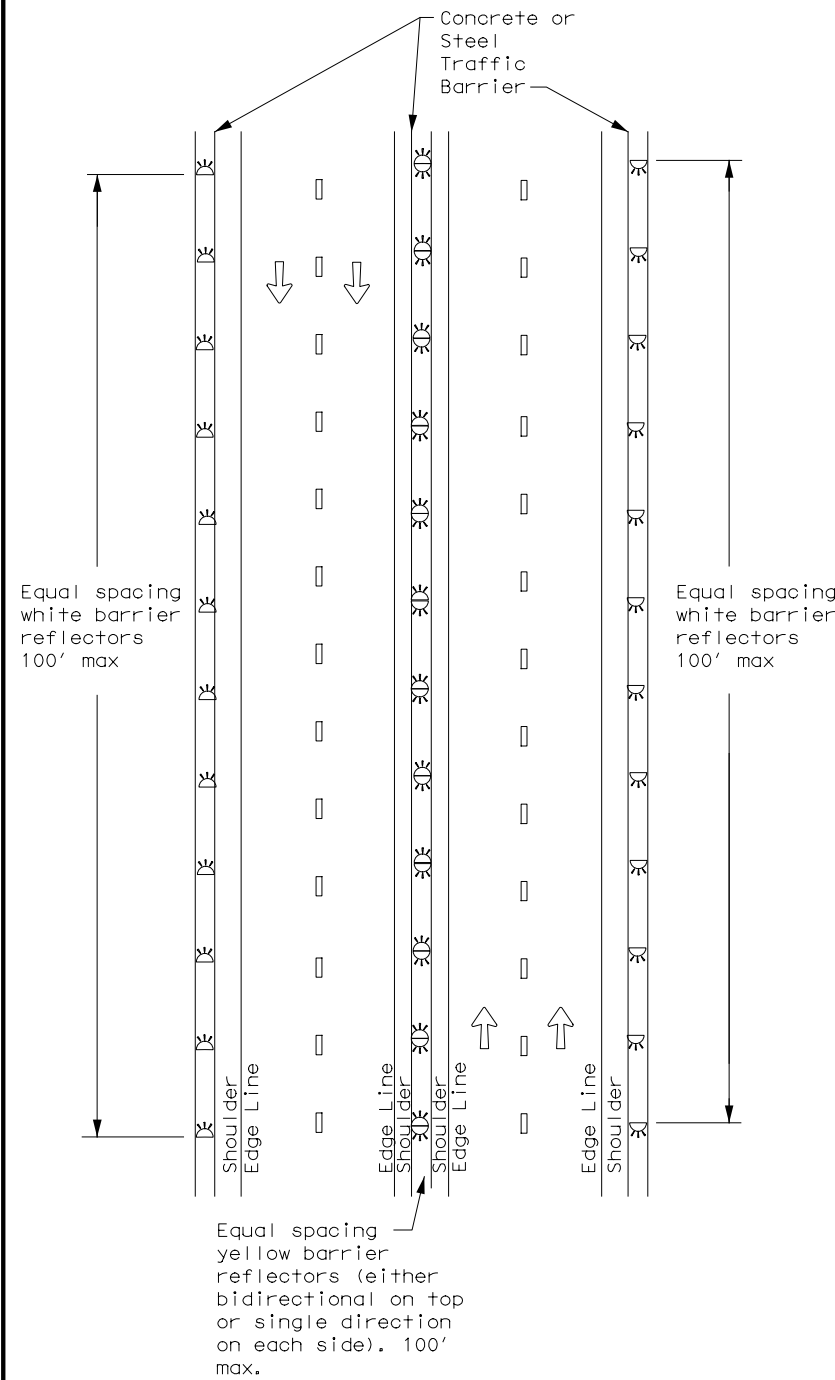
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DATE: 12/15/2020 10:02:58 AM  
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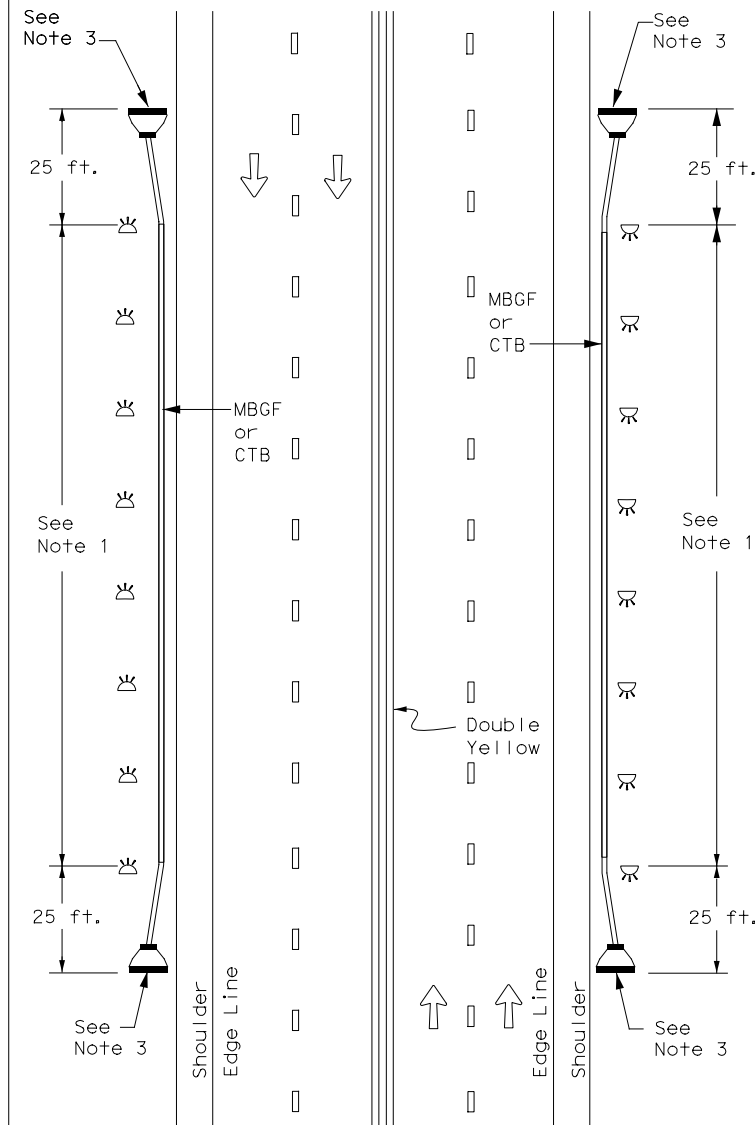


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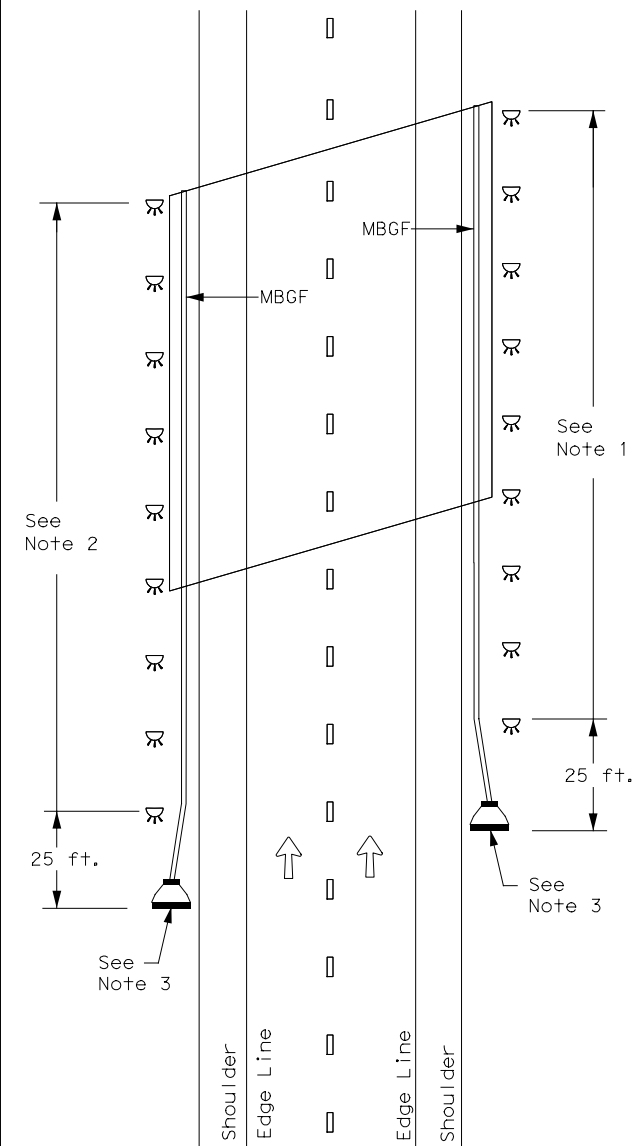
### CONTINUOUS CONCRETE OR STEEL BARRIER



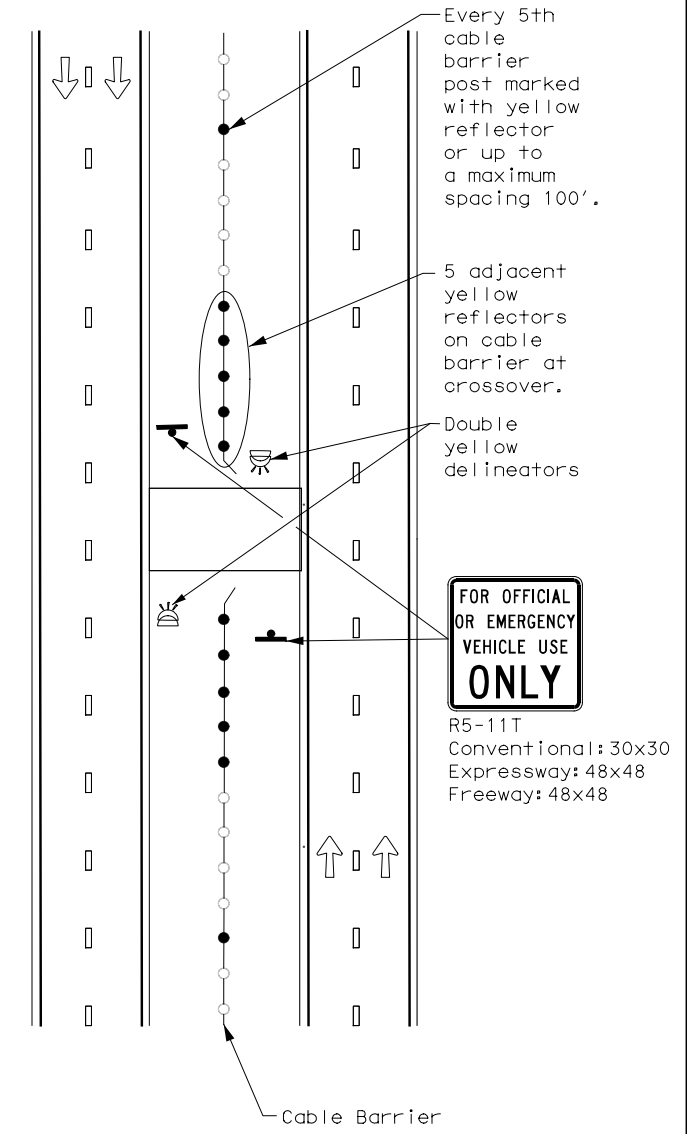
### MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



### DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



### EMERGENCY CROSSOVER



#### NOTES

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

#### LEGEND

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

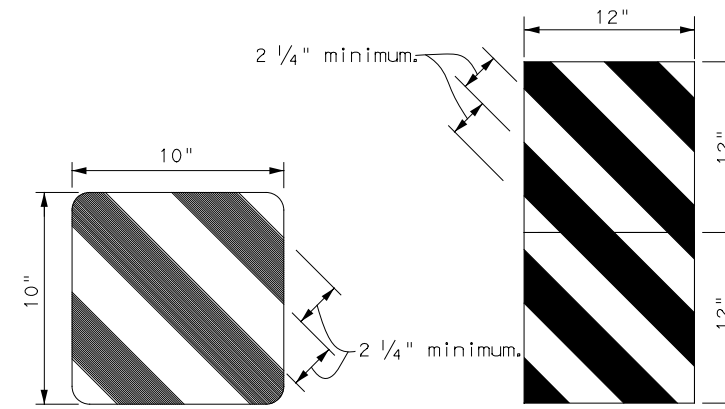
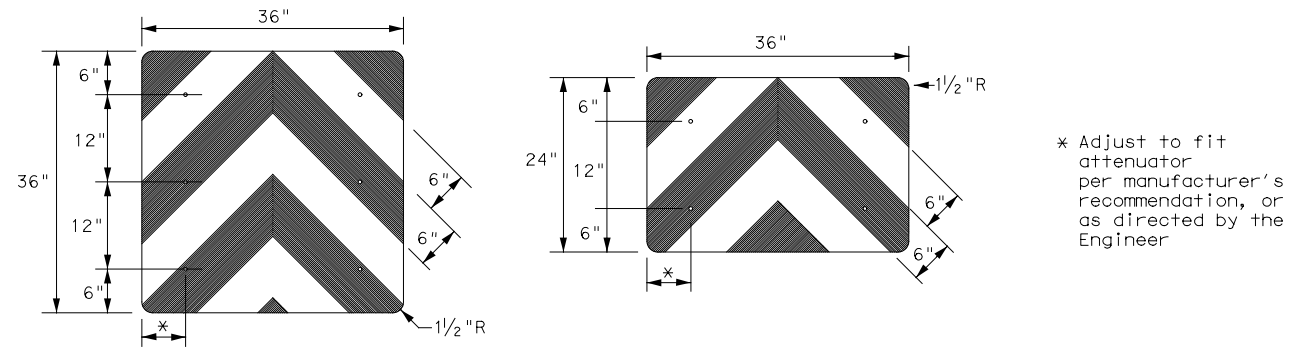
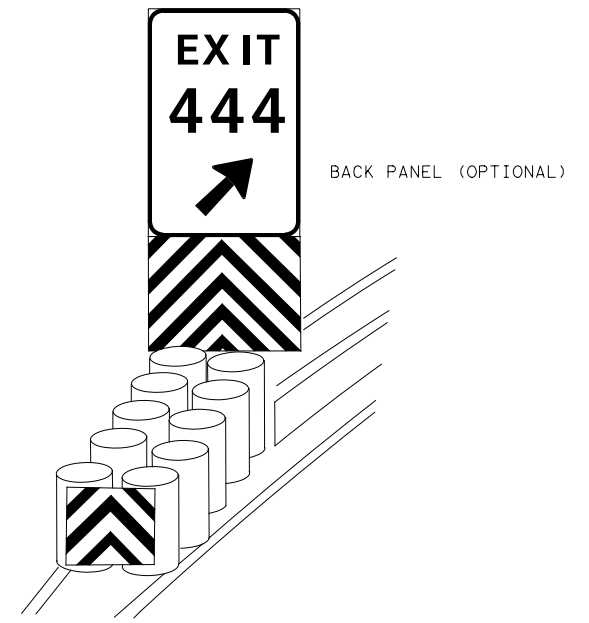
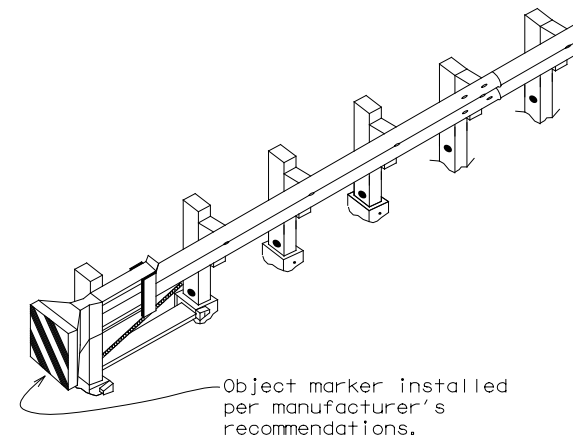
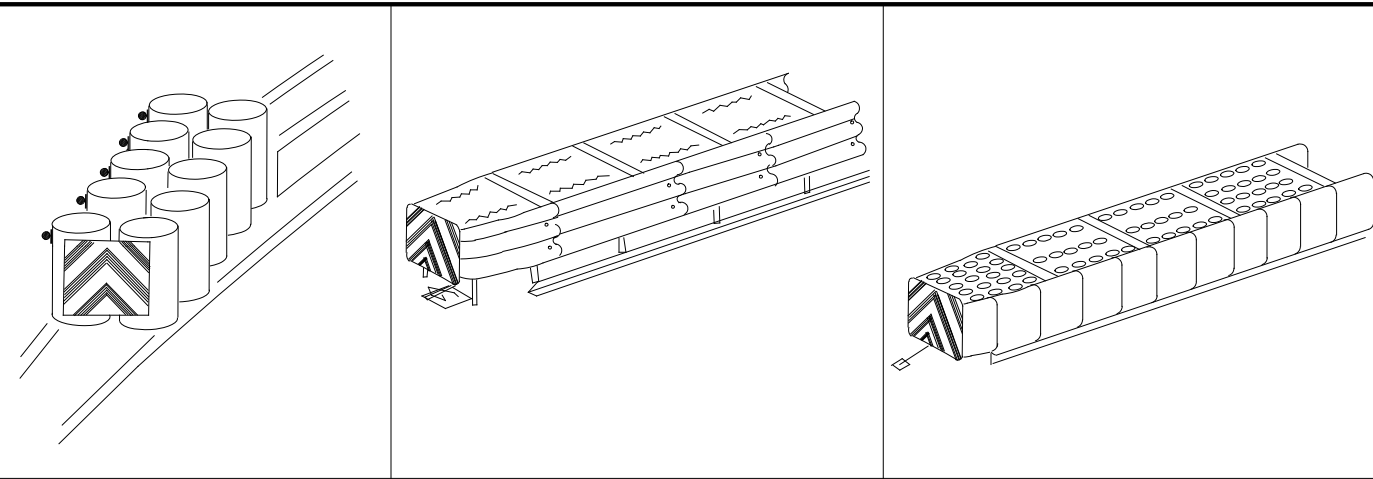


### DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

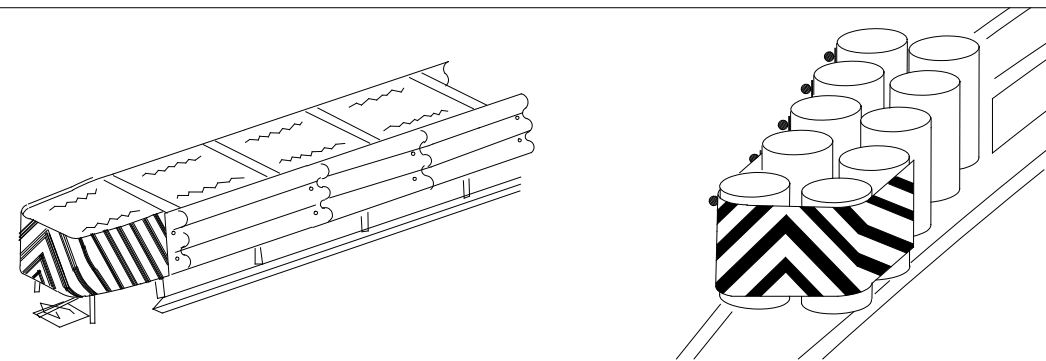
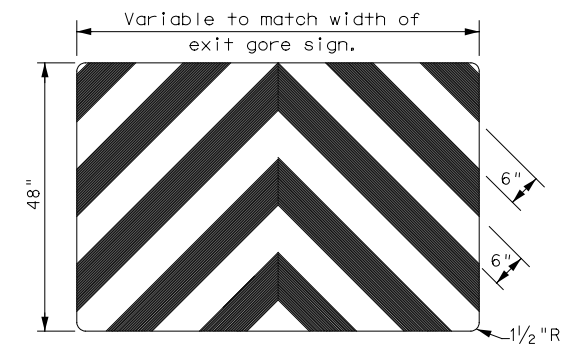
#### D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
7-20	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	268	

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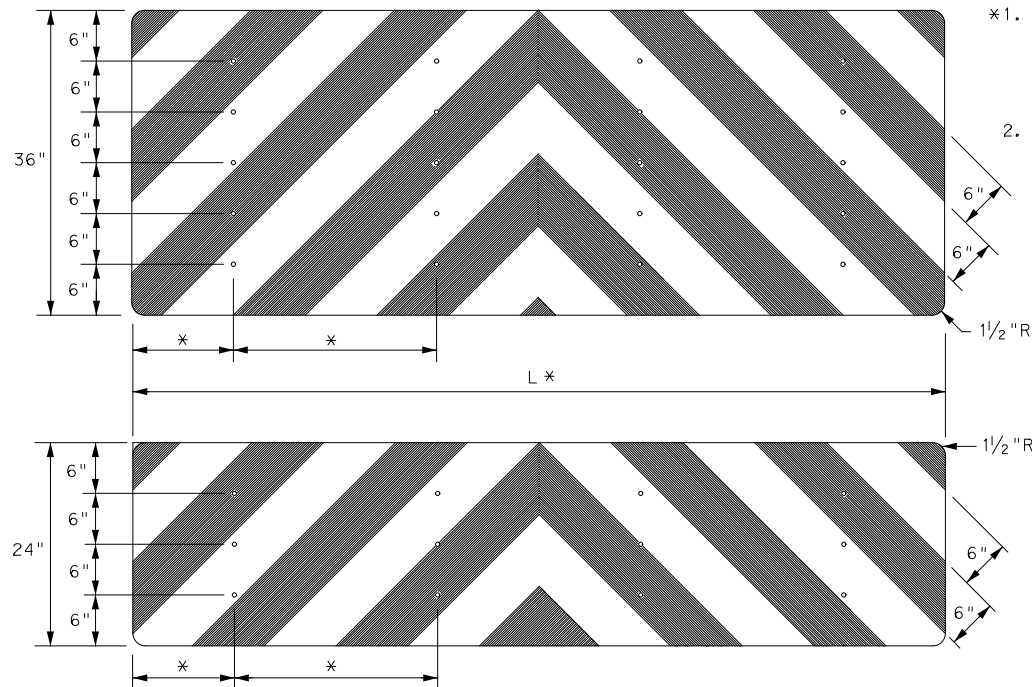


OBJECT MARKERS SMALLER THAN 3 FT<sup>2</sup>



NOTES

1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturer's recommendation, or as directed by the Engineer.
2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".



NOTES

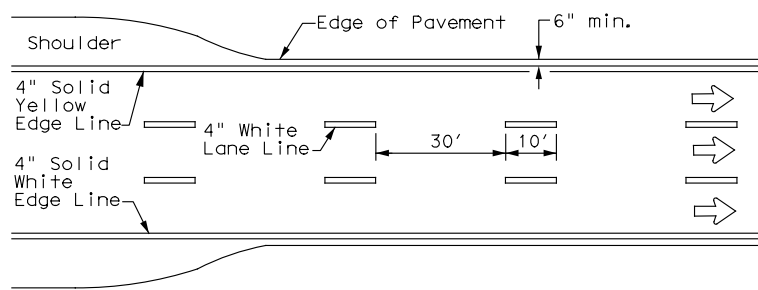
1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.
3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 1/4".
4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
5. Object Marker at nose of attenuator is subsidiary to the attenuator.
6. See D & OM (1-4) for required barrier reflectors.

DATE: 12/15/2020 10:03:13 AM  
FILE: domvia-20.dgn

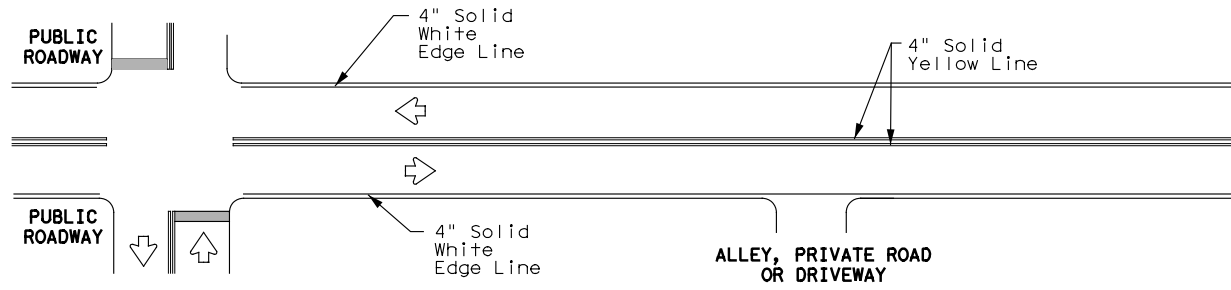
<p>DELINEATOR &amp; OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D &amp; OM(VIA) - 20</p>			
FILE: domvia20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT December 1989	CONT	SECT	JOB
REVISIONS		0133	04
4-92 8-04		042	US82
8-95 3-15			
4-98 7-20			
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	269	
20G			

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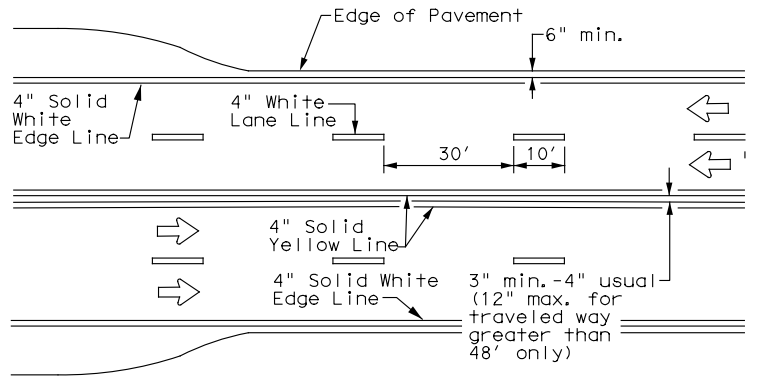
DATE: 12/15/2020 10:03:23 AM  
FILE: pm1-20.dgn



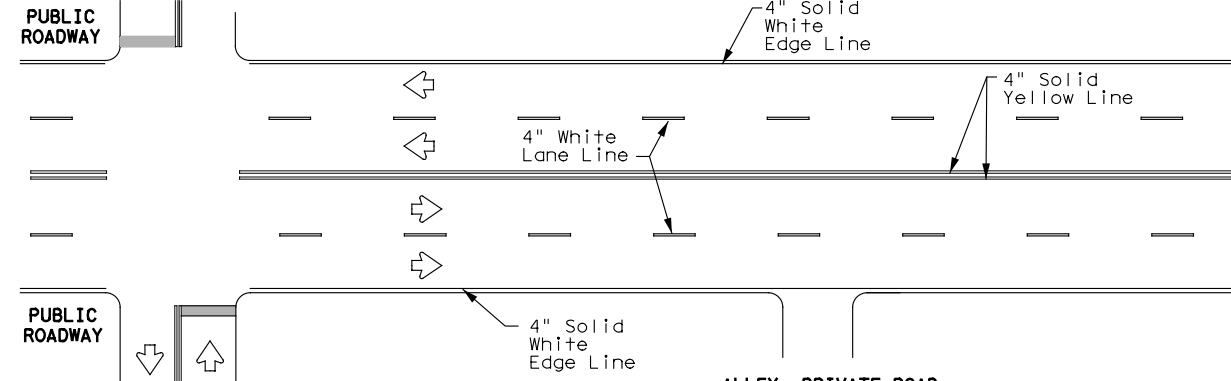
**EDGE LINE AND LANE LINES  
ONE-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



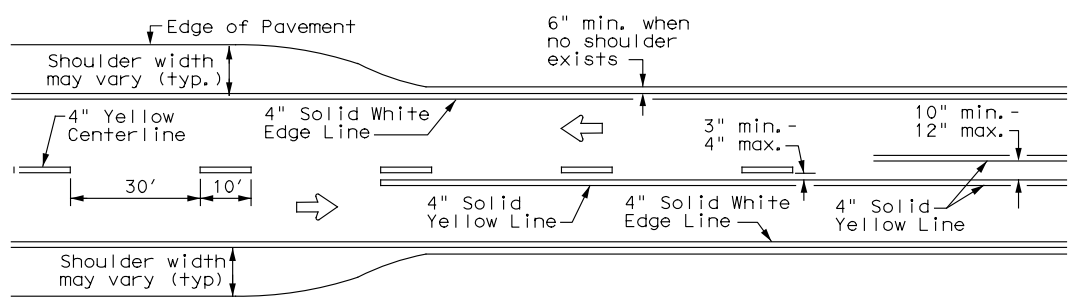
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



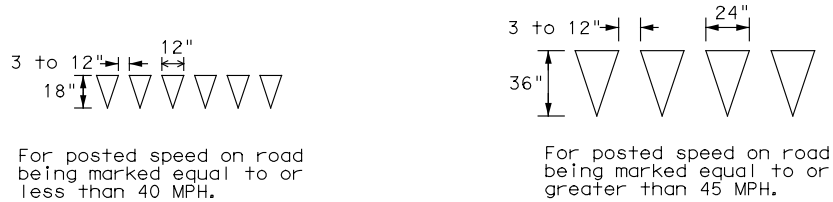
**CENTERLINE AND LANE LINES  
FOUR LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



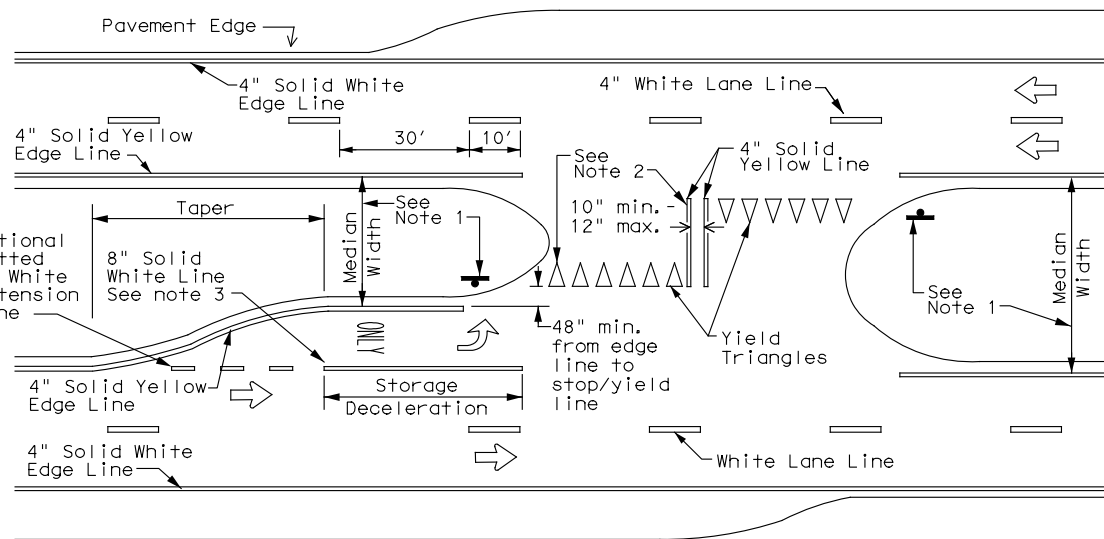
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



**TWO LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



**YIELD LINES**



**FOUR LANE DIVIDED ROADWAY CROSSOVERS**

**NOTES**

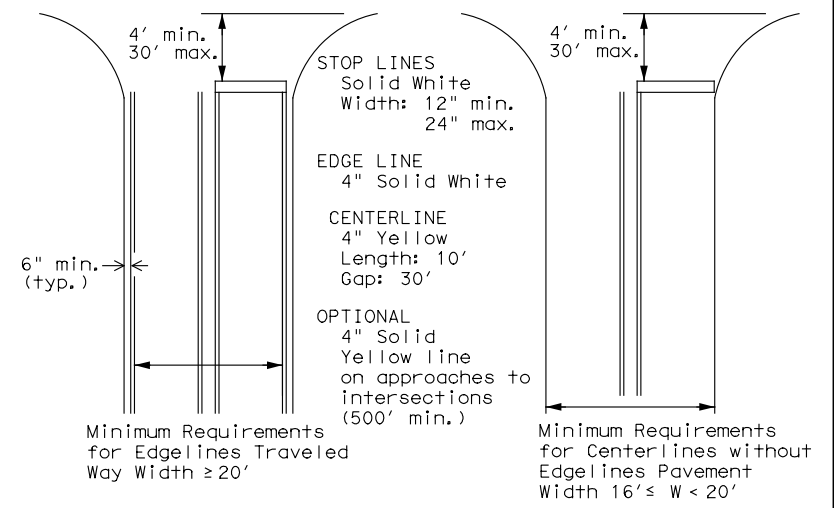
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.
- Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield triangles shall only be used with yield signs.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

**GENERAL NOTES**

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
- The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**GUIDE FOR PLACEMENT OF STOP LINES,  
EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Highways



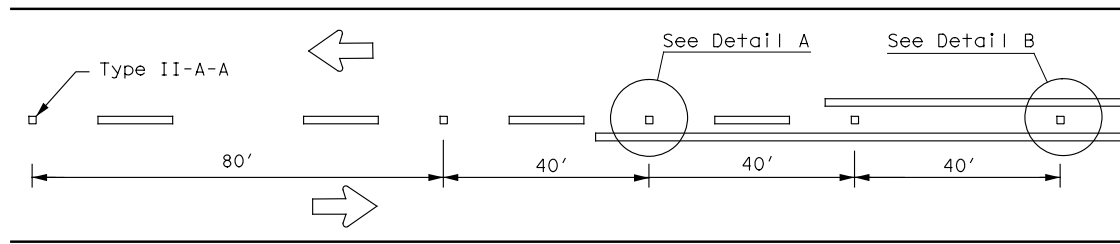
**TYPICAL STANDARD  
PAVEMENT MARKINGS**

**PM(1)-20**

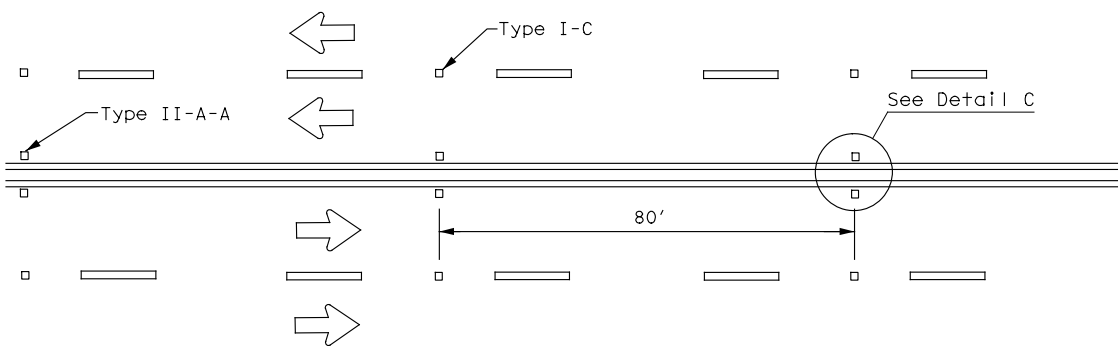
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS	0133	04	042	US82
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	WFS	BAYLOR	270	

# REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

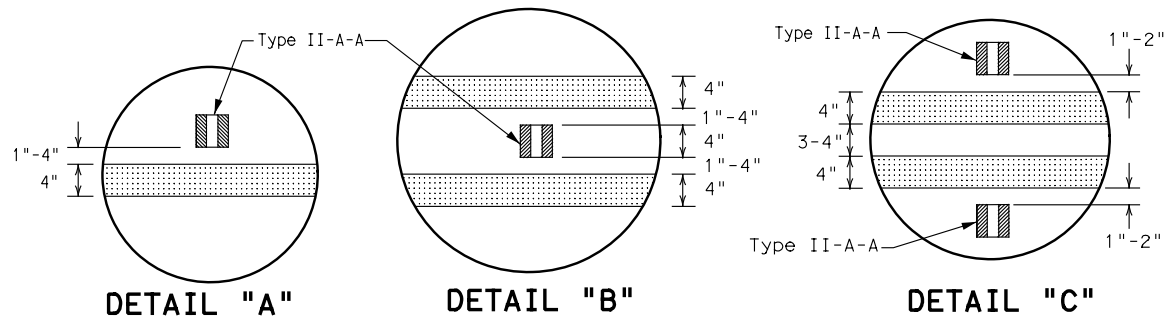
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**CENTERLINE FOR ALL TWO LANE ROADWAYS**



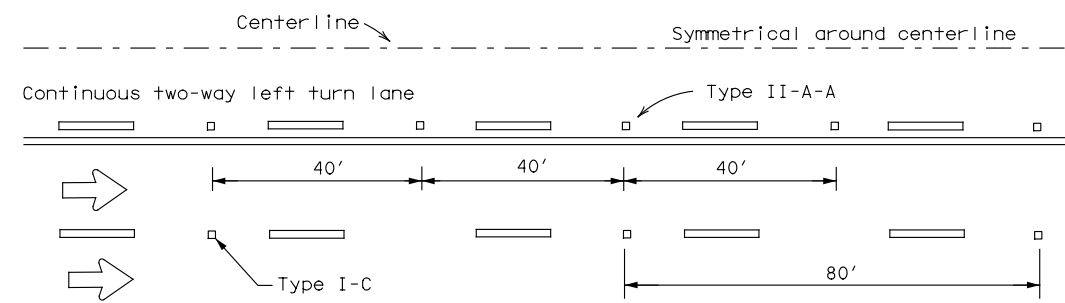
**CENTERLINE & LANE LINES  
FOR FOUR LANE TWO-WAY HIGHWAYS**



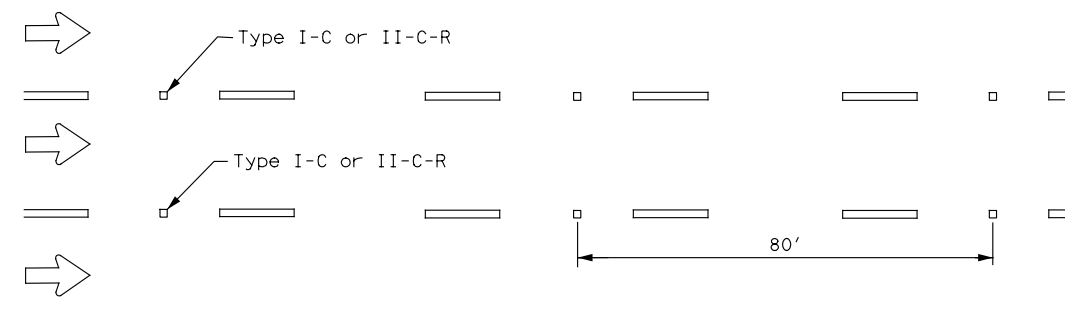
**DETAIL "A"**

**DETAIL "B"**

**DETAIL "C"**



**CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE**

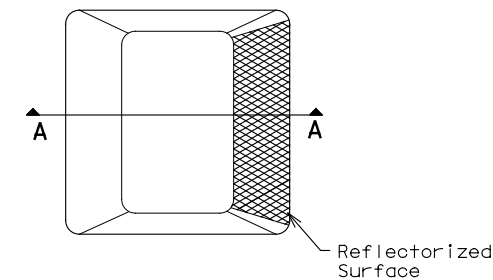


**LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)**

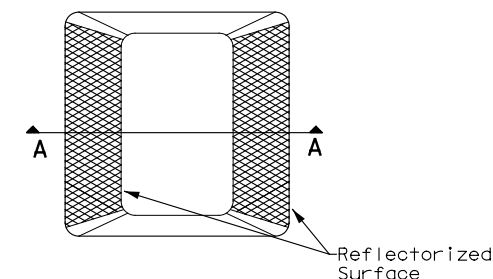
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

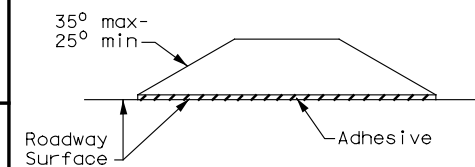
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**Type I (Top View)**



**Type II (Top View)**



**SECTION A**

**RAISED PAVEMENT MARKERS**

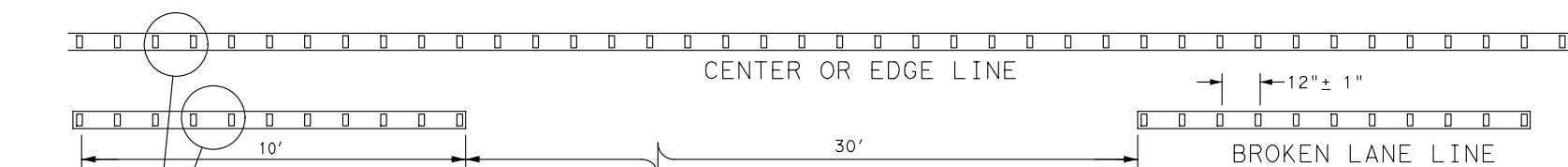


## POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10 REVISIONS	0133	04	042	US82
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	WFS	BAYLOR	<b>271</b>	

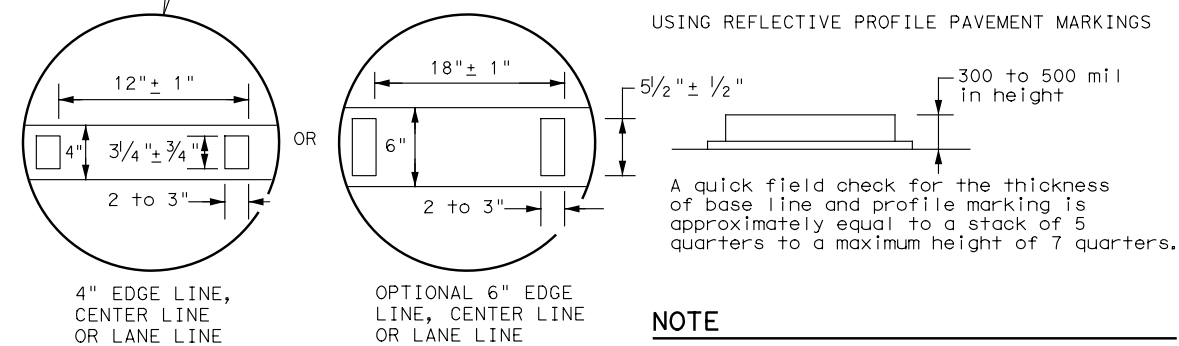
**GENERAL NOTES**

1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



**REFLECTORIZED PROFILE  
PATTERN DETAIL**

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



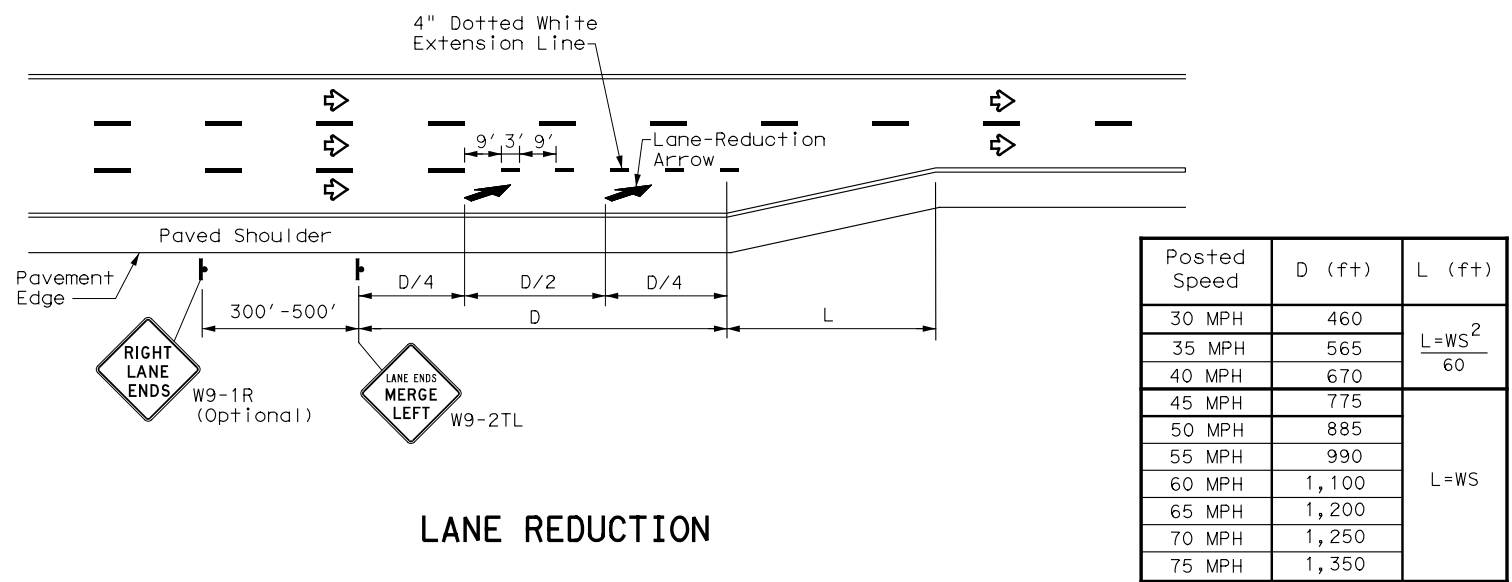
**NOTE**

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

DATE: 12/15/2020 10:03:27 AM  
FILE: pm2-20.dgn

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DATE: 12/15/2020 10:03:31 AM  
FILE: pm3-20.dgn



**LANE REDUCTION**

**NOTES**

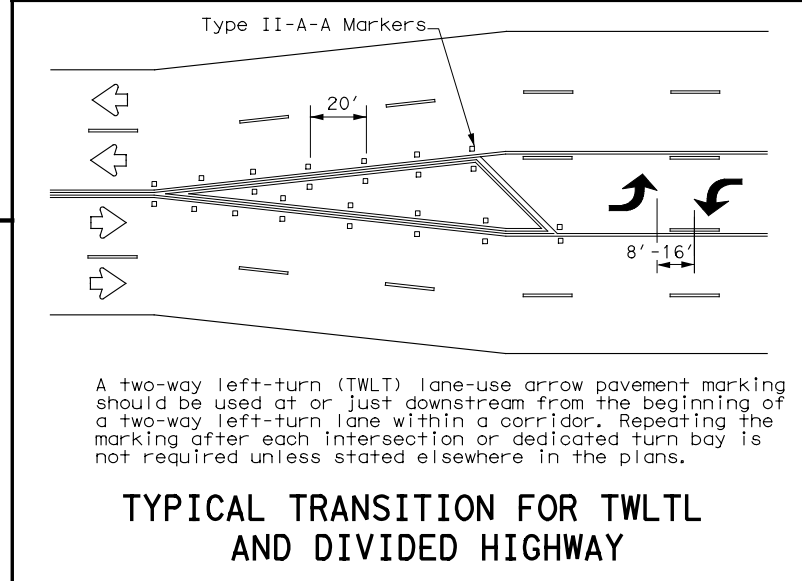
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
- On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

**GENERAL NOTES**

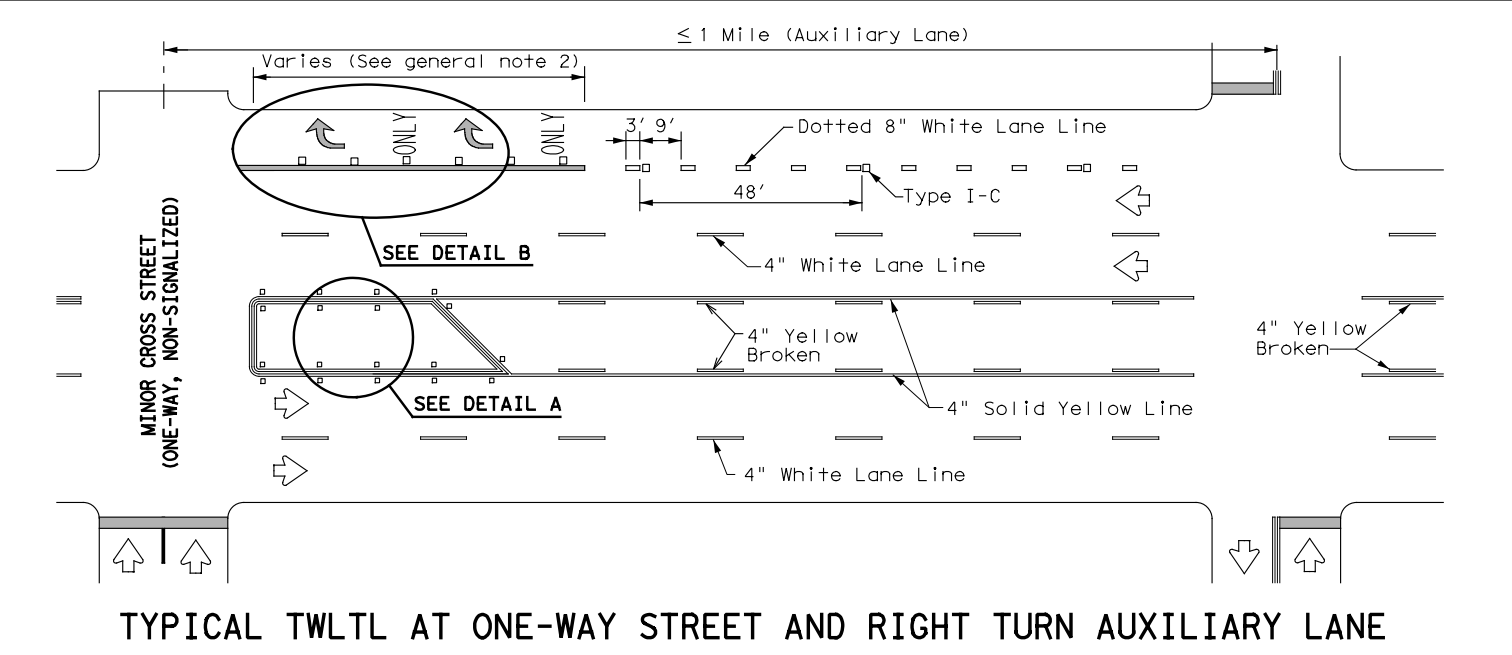
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
- Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

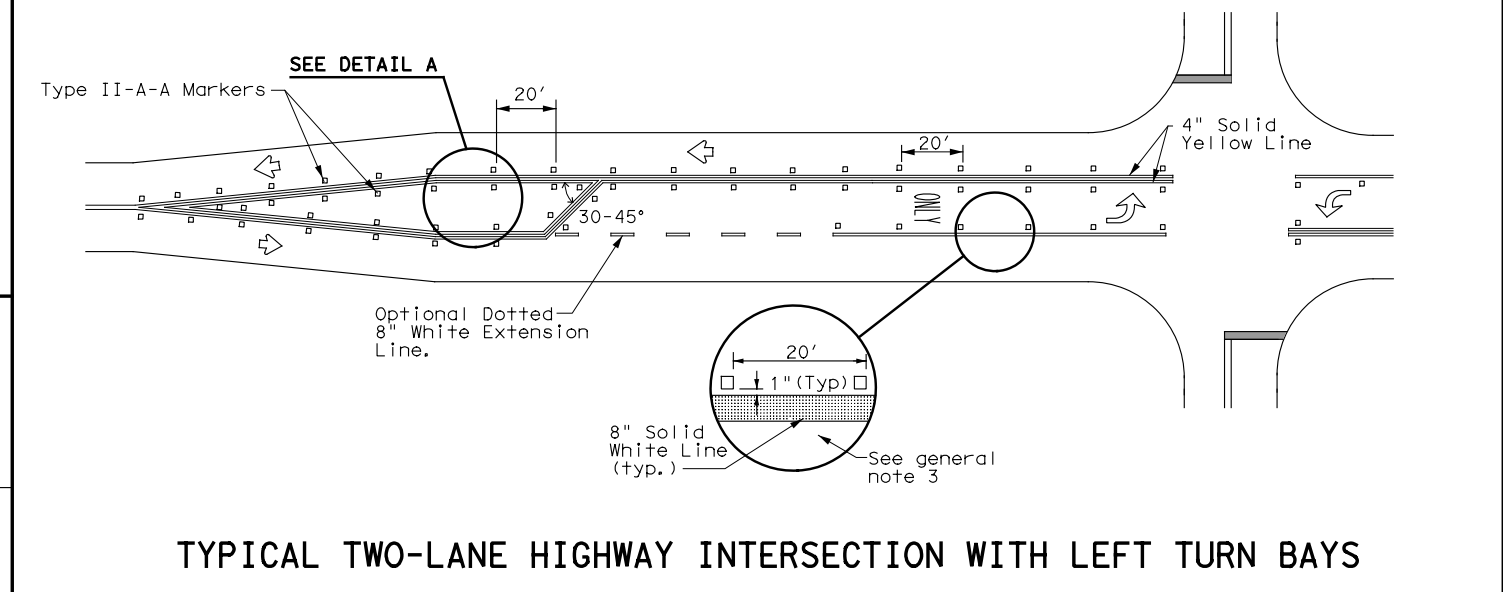
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



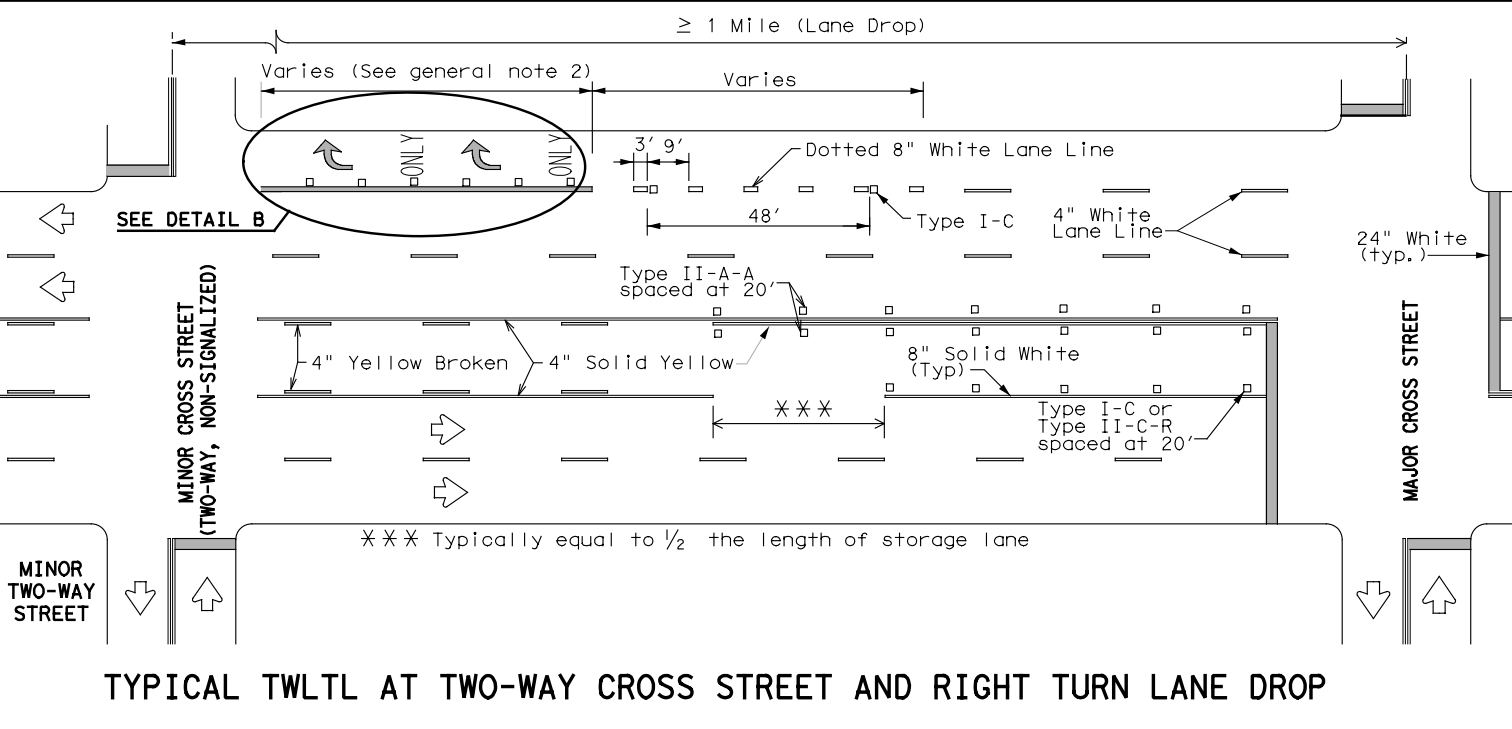
**TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY**



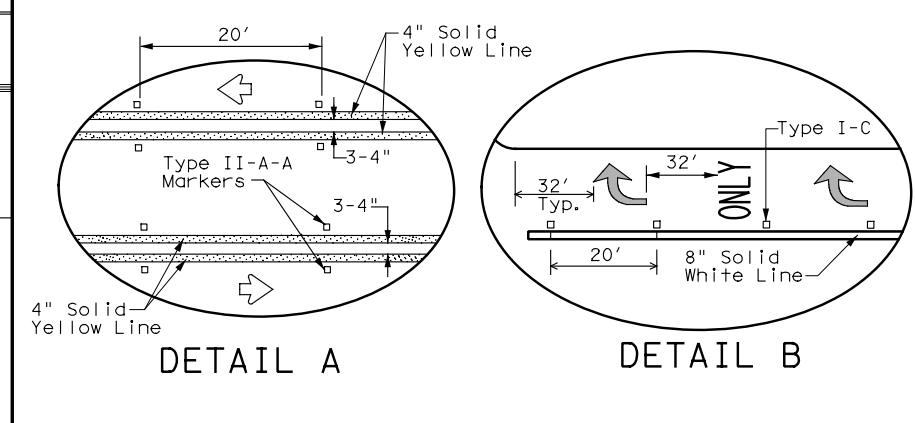
**TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE**



**TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS**



**TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP**



Texas Department of Transportation

Traffic Safety Division Standard

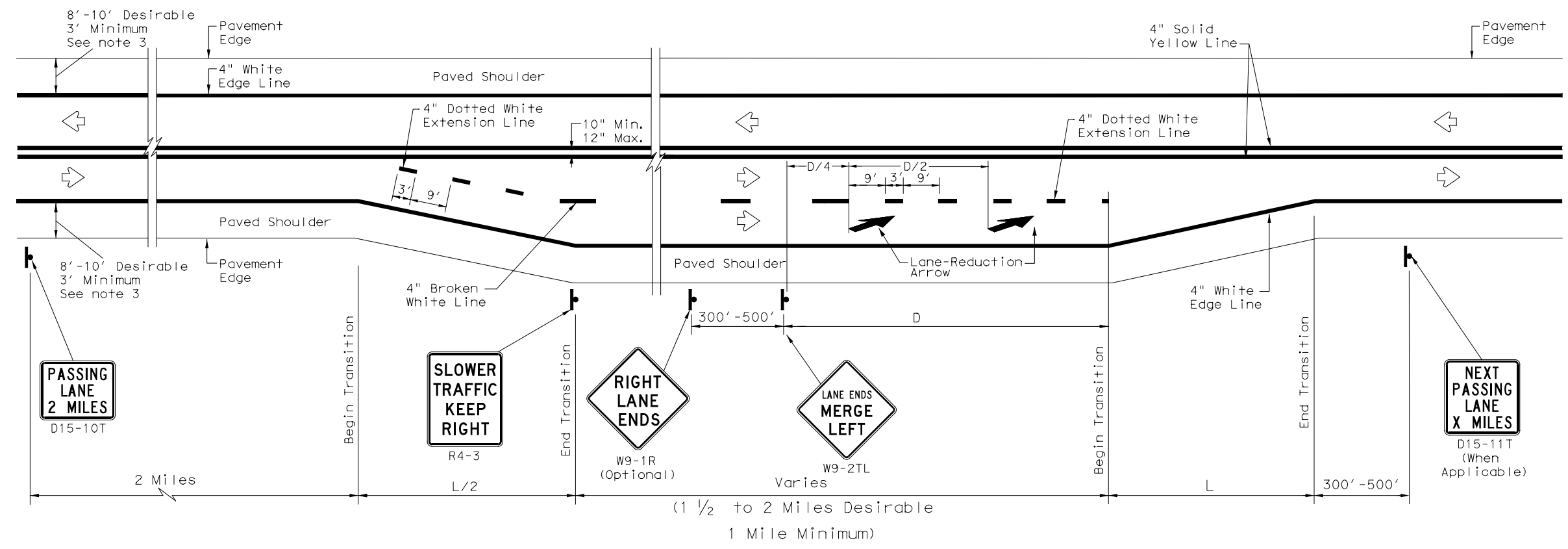
**TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20**

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
5-00 2-10	DIST	COUNTY	SHEET NO.	
8-00 2-12	WFS	BAYLOR	272	
3-03 6-20				

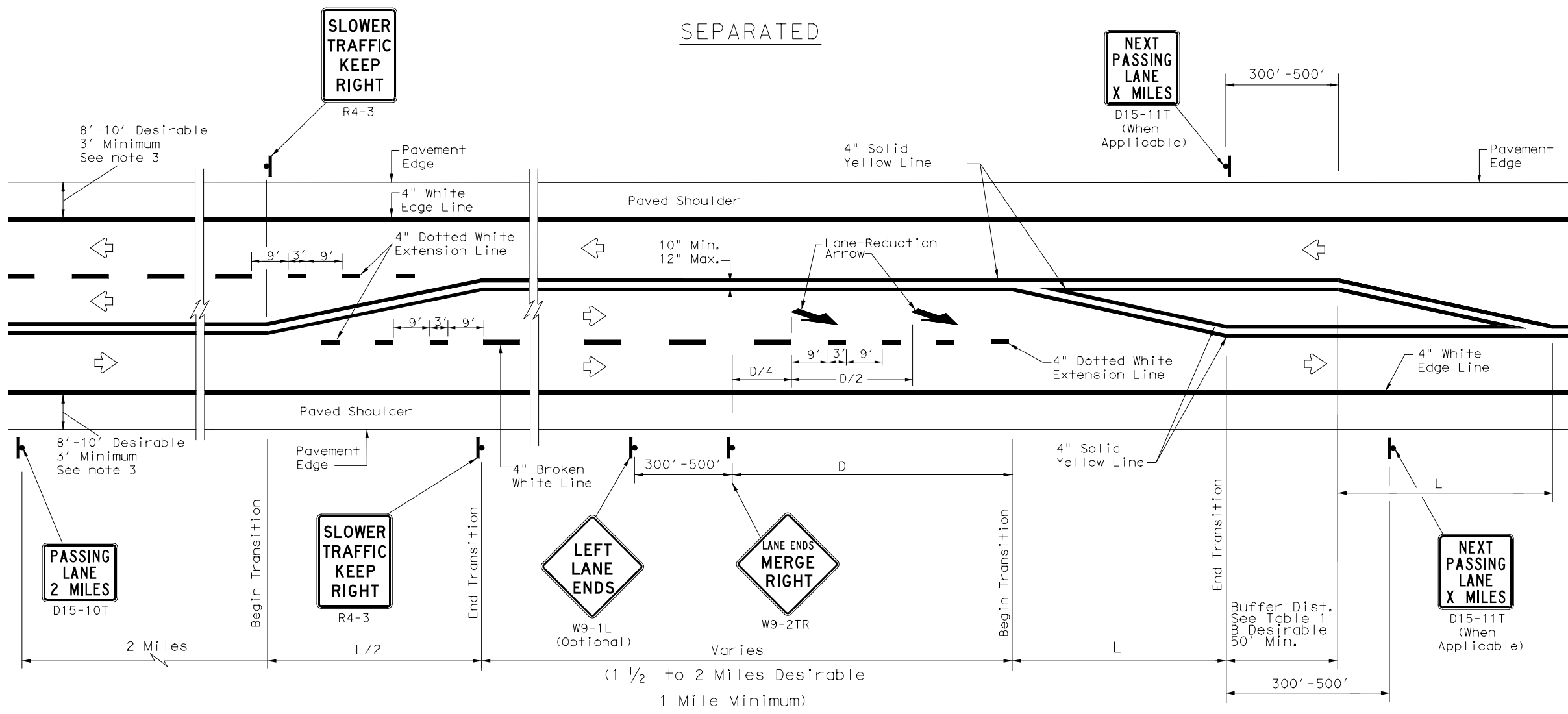
220

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DATE: 12/15/2020 10:03:34 AM  
FILE: ts2-1-18.dgn



**SEPARATED**



**ALTERNATING**

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	$L = WS$

\* Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)  
W=Width of Offset (FT)  
S=Posted Speed (MPH)

EXAMPLE  
A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:  
 $L=12 \times 70 = 840$  ft

Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

**GENERAL NOTES**

- For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
- For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2). Note that RPMs are not recommended on the 4" dotted white extension lines.
- For rumble strip options available for the designed shoulder width, see rumble strip standard sheet RS(4).



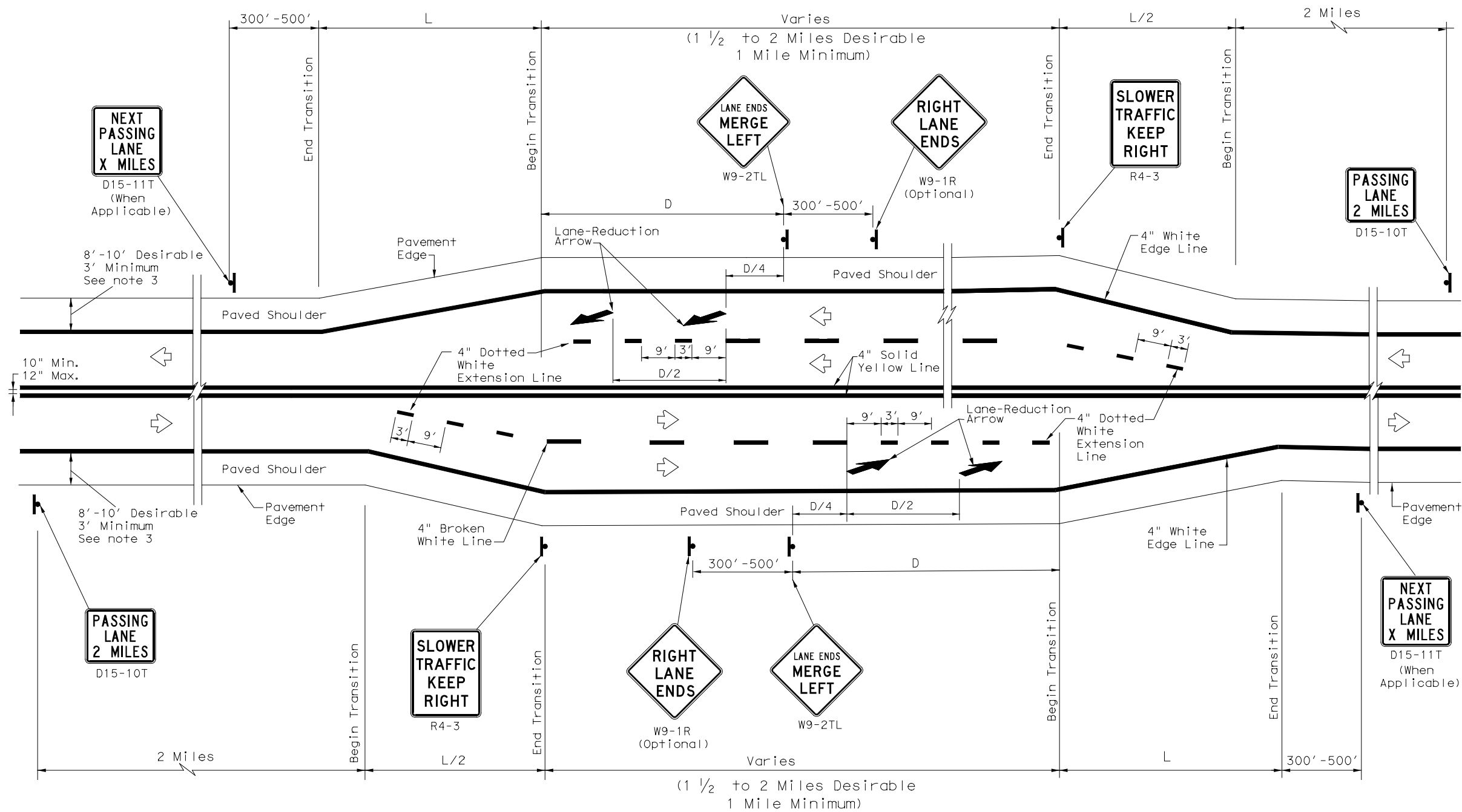
**TEXAS SUPER 2  
PASSING LANES**

**TS2(PL-1)-18**

FILE: ts2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT May 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
2-12	DIST	COUNTY	SHEET NO.	
3-12	WFS	BAYLOR	273	
3-18				

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FILE: ts2-2-18.dgn



LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	$L = WS$

\* Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)  
W=Width of Offset (FT)  
S=Posted Speed (MPH)

EXAMPLE  
A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:  
 $L=12 \times 70=840$  ft

Posted Speed	D (FT)
40	670
45	775
50	885
55	990
60	1100
65	1200
70	1250
75	1350

- GENERAL NOTES
- For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
  - For Raised Pavement Markers(RPM) details, see Pavement Markings Standard sheet, PM(2). Note that RPMs are not recommended on the 4" dotted white extension lines.
  - For rumble strip options available for the designed shoulder width, see rumble strip standard sheet RS(4).



## TEXAS SUPER 2 PASSING LANES

### TS2(PL-2)-18

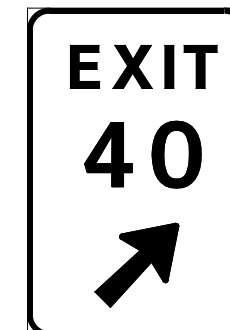
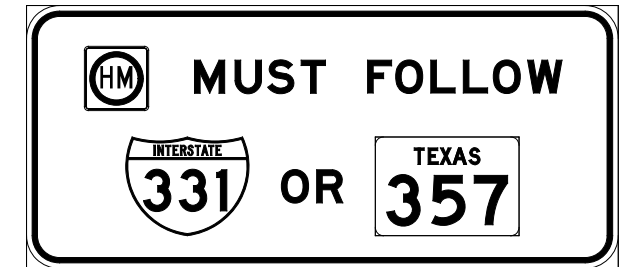
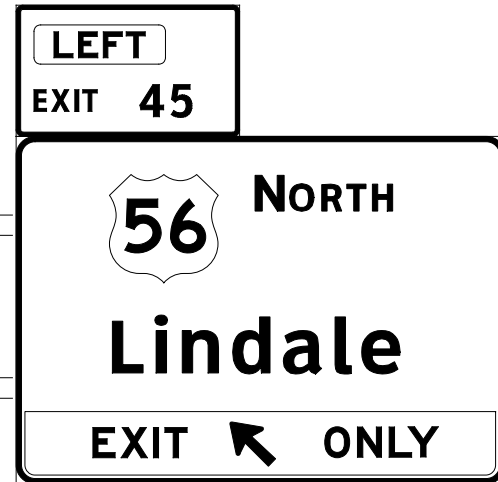
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© TxDOT May 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
2-12	DIST	COUNTY	SHEET NO.	
3-12	WFS	BAYLOR	274	
3-18				

## SIDE BY SIDE PASSING LANES

REQUIREMENTS FOR OVERHEAD AND LARGE GROUND-MOUNTED SIGNS

TYPICAL EXAMPLES

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GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign summary sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Black legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F). White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white FHWA lettering, when not specified in the SHSD or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be cut-out white sheeting applied to colored background sheeting.
6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius need not be trimmed or rounded if fabricated from an extruded material.
7. Sign substrate for ground-mounted signs shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative. Sign substrate for overhead signs shall be any material that meets DMS-7110. Exit Number Panels attached above the parent sign shall be made with the same substrate and sheeting as the parent sign.
8. Mounting details of attachments to parent sign face are shown on Standard Plan Sheet TSR(5). Mounting details of exit number panels above parent sign are shown in the "SMD series" Standard Plan Sheets.
9. Background sheeting shall be applied to the substrate per sheeting manufacturer's recommendations. Sheeting will not be allowed to bridge the horizontal gap between panels.
10. Cut all legend, symbols, borders, and direct applied sign attachments at panel joints.

DEPARTMENTAL MATERIAL SPECIFICATIONS

ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

<http://www.txdot.gov/>

SHEETING REQUIREMENTS

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE B OR C SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM



TYPICAL SIGN REQUIREMENTS

TSR(1)-13

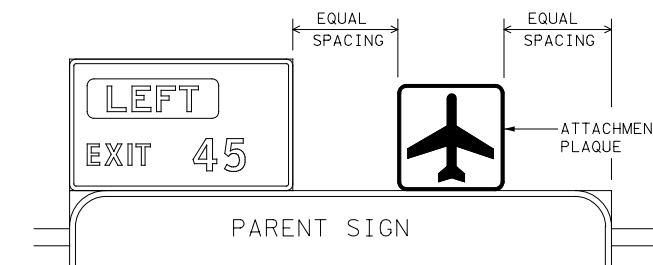
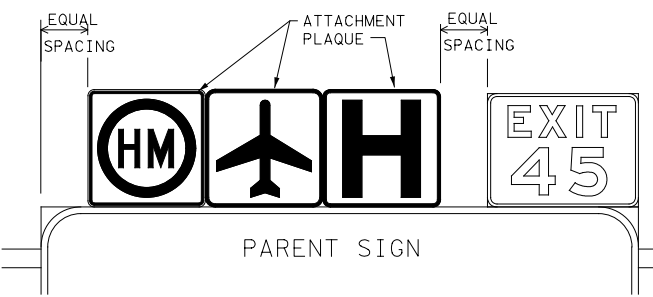
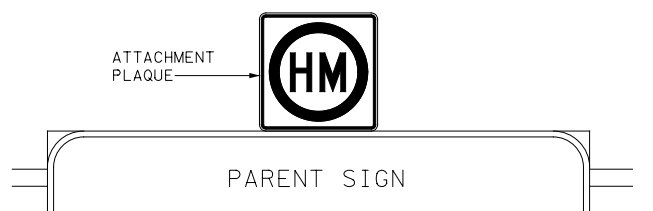
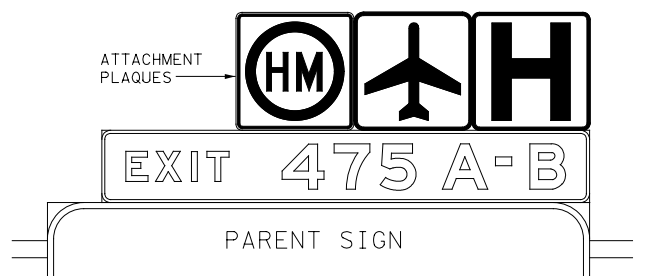
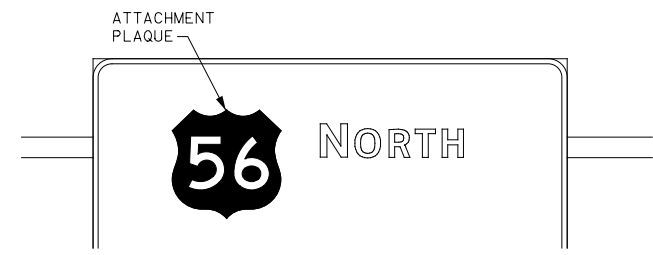
FILE:	tsr1-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0133	04	042	US82				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		WFS	BAYLOR	275					

DATE: 12/15/2020 10:03:57 AM  
FILE: tsr1-13.dgn



# REQUIREMENTS FOR ATTACHMENTS TO OVERHEAD AND LARGE GROUND MOUNTED SIGNS

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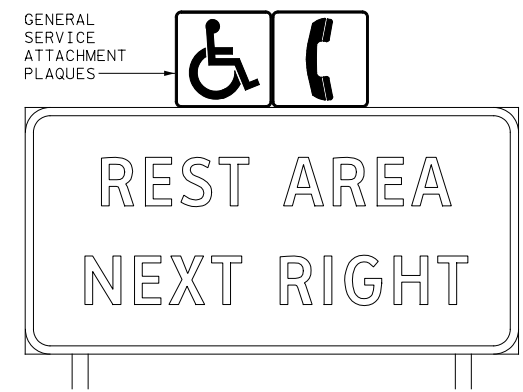


DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B OR C SHEETING

### GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- Route Marker legends (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
- Colored legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to white background sheeting, or combination thereof.
- Route markers and other attachments within the parent sign face shall be direct applied unless otherwise specified in the plans. Attachments not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
- General Service Plaques shall be 0.080 inch thick and Routing Plaques shall be 0.100 inch thick.
- The priority for Routing Plaques shall be (left to right) Hazardous Material, Airport then Hospital. See examples for mounting location.
- Mounting details of attachments to parent signs face are shown on Standard Plan Sheet TSR(5). Mounting details of sign plaque attachments above and below parent sign are shown in the "SMD series" Standard Plan Sheets.
- Plaques shall be horizontally centered at the top of the parent sign. If an exit number panel exists, the plaque shall be centered between the edge of the parent sign and the edge of the exit number panel. The plaque may be placed above the exit number panel when there is insufficient space.



TYPICAL EXAMPLES

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FILE: tsr2-13.dgn

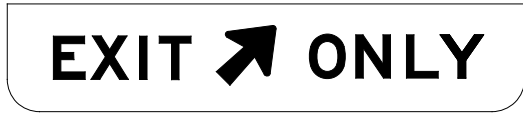
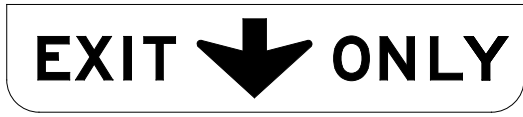
# REQUIREMENTS FOR EXIT ONLY AND LEFT EXIT PANELS

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

SHEETING REQUIREMENTS FOR OVERHEAD EXIT PANELS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLUORESCENT YELLOW	TYPE B <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND	BLACK	ACRYLIC NON-REFLECTIVE FILM

### GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD). Individual panel sizes shown in the plans may be adjusted to fit actual parent sign sizes if necessary.
- Exit Panel legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets E Series.
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to yellow background sheeting, or combination thereof.
- Exit Only and Left Exit panels within the parent sign face shall be direct applied unless otherwise specified in the plans. Panels not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
- Mounting details of Exit Only and Left Exit panel attachments to parent signs face are shown on Standard Plan Sheet TSR(5).



TYPICAL EXAMPLES

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

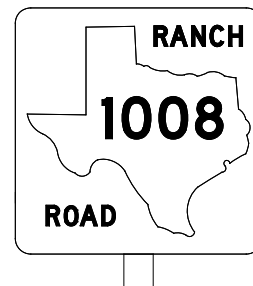
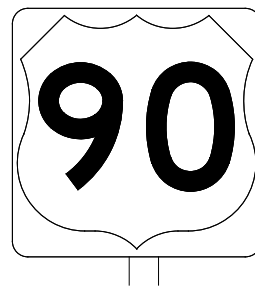
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©TxDOT October 2003	CONT	SECT	JOB
REVISIONS	0133	04	042
12-03 7-13	DIST	COUNTY	SHEET NO.
9-08	WFS	BAYLOR	276

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DATE: 12/15/2020 10:04:05 AM  
 FILE: tsr3-13.dgn

## REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

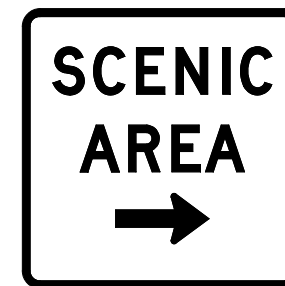
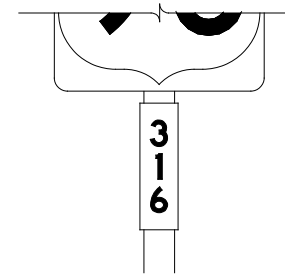
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

## REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

## GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

- Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.
- Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

<http://www.txdot.gov/>

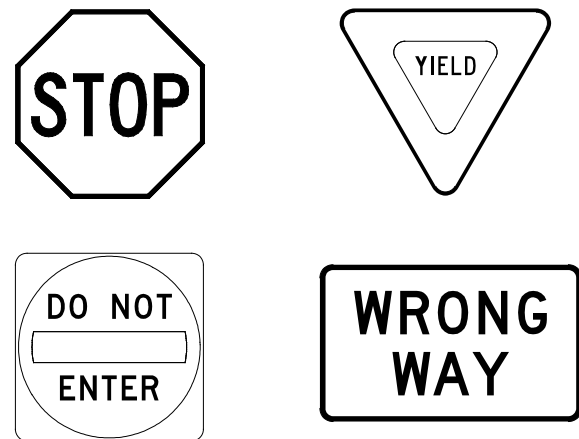
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FILE:	tsr3-13.dgn	DN:	TxDOT	CK:	TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0133	04	042	US82
12-03	7-13	DIST	COUNTY		SHEET NO.
9-08		WFS	BAYLOR		277

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DATE: 12/15/2020 10:04:07 AM  
 FILE: tsr-4-13.dgn

### REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

### REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

### GENERAL NOTES

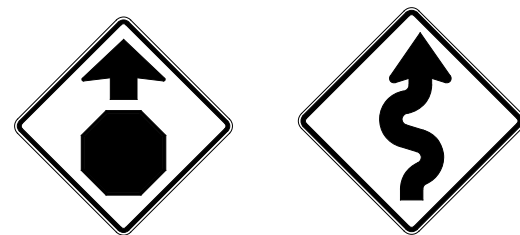
- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
- Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

### REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

### REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING



## TYPICAL SIGN REQUIREMENTS

TSR (4) - 13

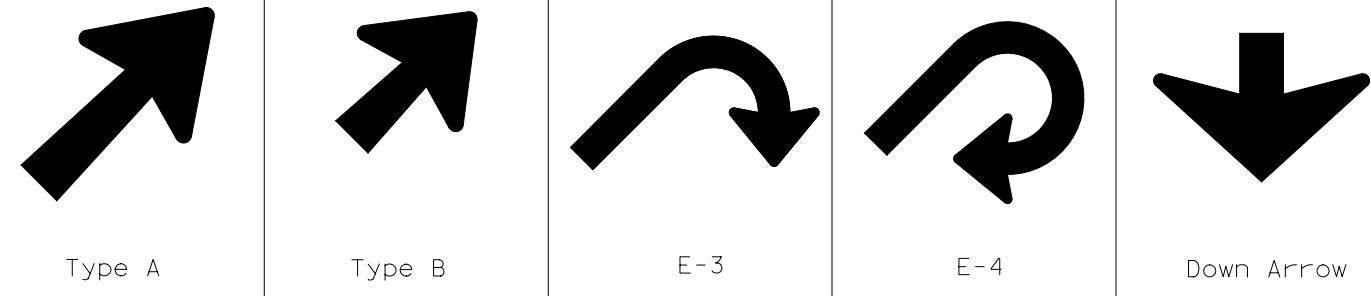
FILE:	tsr-4-13.dgn	DN:	TxDOT	CK:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0133	04	042	US82				
12-03	7-13	DIST	COUNTY		SHEET NO.				
9-08		WFS	BAYLOR		278				

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DATE: 12/15/2020 10:04:09 AM  
 FILE: tsr5-13.dgn

### ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



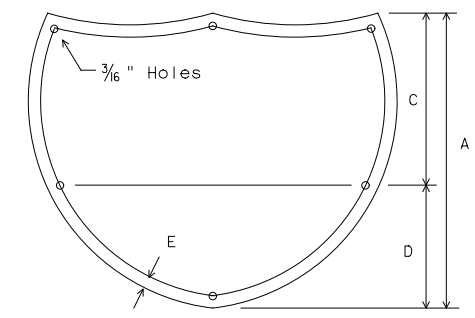
TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

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.

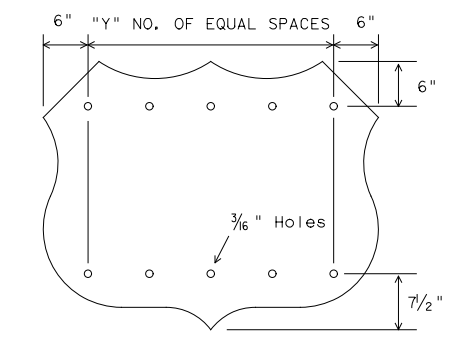
The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>

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



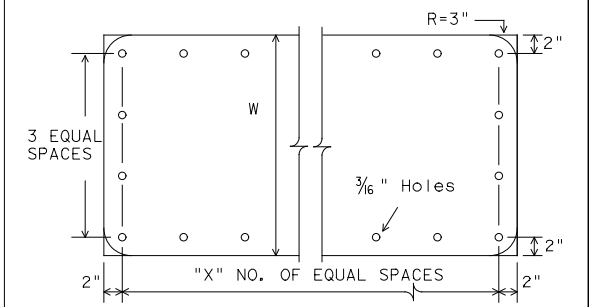
INTERSTATE ROUTE MARKERS

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



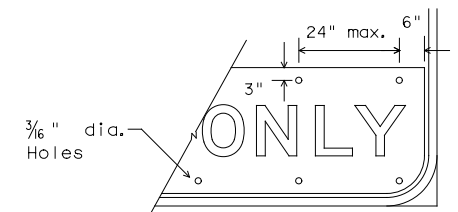
U.S. ROUTE MARKERS

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



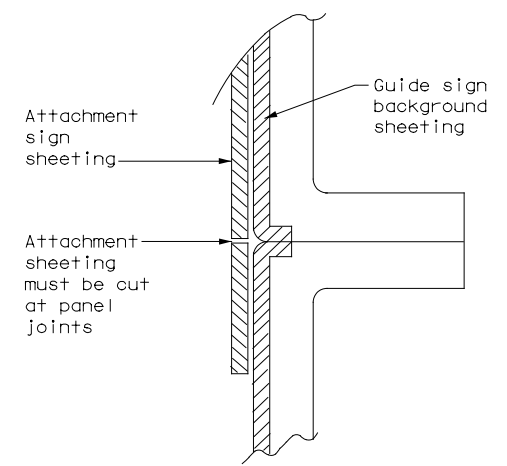
STATE ROUTE MARKERS

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



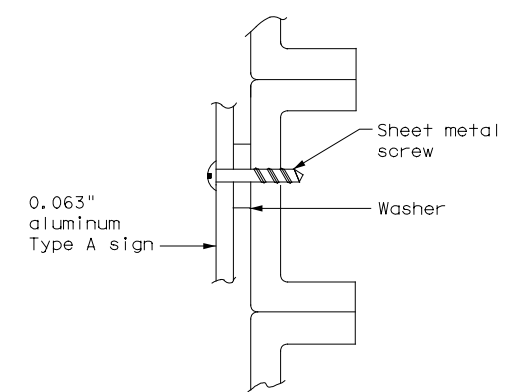
EXIT ONLY PANEL

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

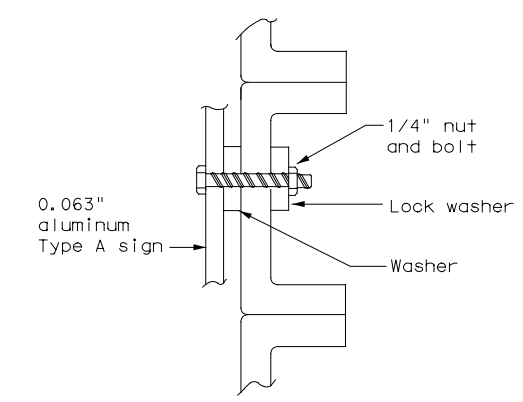


DIRECT APPLIED ATTACHMENT

- 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".



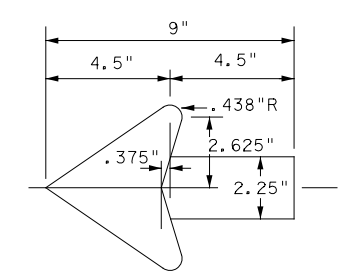
SCREW ATTACHMENT



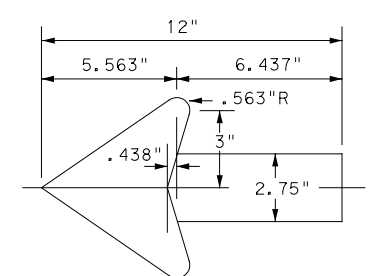
NUT/BOLT ATTACHMENT

- 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	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US82
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	WFS	BAYLOR	279	

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### SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

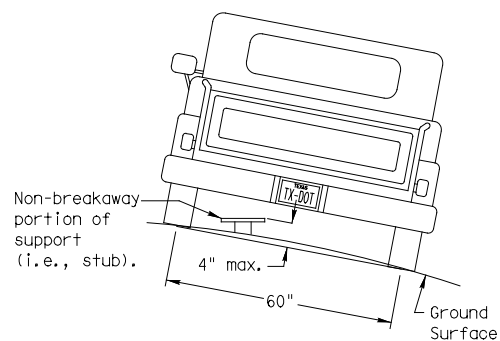
Post Type \_\_\_\_\_  
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD (FRP))  
 TWT = Thin-Walled Tubing (see SMD (TWT))  
 10BWG = 10 BWG Tubing (see SMD (SLIP-1) to (SLIP-3))  
 S80 = Schedule 80 Pipe (see SMD (SLIP-1) to (SLIP-3))

Number of Posts (1 or 2) \_\_\_\_\_

Anchor Type \_\_\_\_\_  
 UA = Universal Anchor - Concreted (see SMD (FRP) and (TWT))  
 UB = Universal Anchor - Bolted down (see SMD (FRP) and (TWT))  
 WS = Wedge Anchor Steel - (see SMD (TWT))  
 WP = Wedge Anchor Plastic (see SMD (TWT))  
 SA = Slipbase - Concreted (see SMD (SLIP-1) to (SLIP-3))  
 SB = Slipbase - Bolted Down (see SMD (SLIP-1) to (SLIP-3))

Sign Mounting Designation  
 P = Prefab. "Plain" (see SMD (SLIP-1) to (SLIP-3), (TWT), (FRP))  
 T = Prefab. "T" (see SMD (SLIP-1) to (SLIP-3), (TWT))  
 U = Prefab. "U" (see SMD (SLIP-1) to (SLIP-3))  
 IF REQUIRED  
 1EXT or 2EXT = Number of Extensions (see SMD (SLIP-1) to (SLIP-3), (TWT))  
 BM = Extruded Wind Beam (see SMD (SLIP-1) to (SLIP-3))  
 WC = 1.12 #/ft Wing Channel (see SMD (SLIP-1) to (SLIP-3))  
 EXAL = Extruded Aluminum Sign Panels (see SMD (SLIP-3))

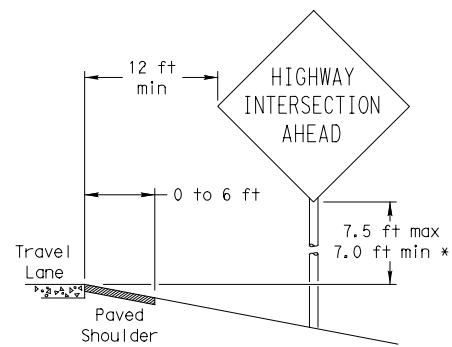
### REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

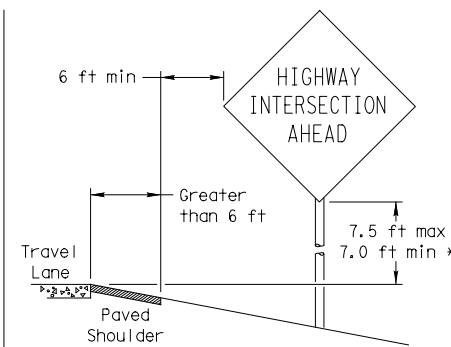
### SIGN LOCATION

#### PAVED SHOULDERS



LESS THAN 6 FT. WIDE

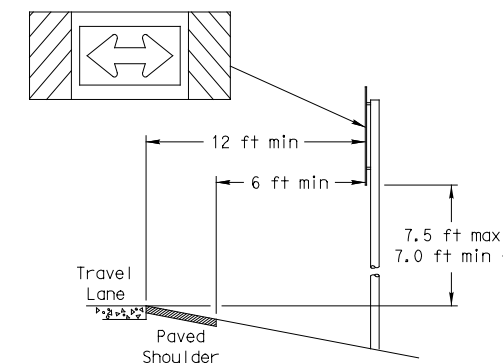
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

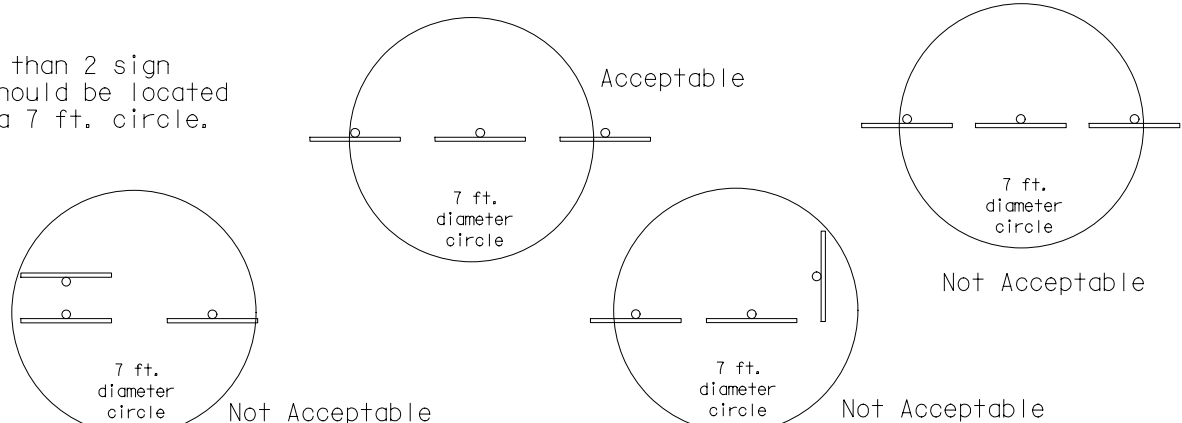
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

#### T-INTERSECTION

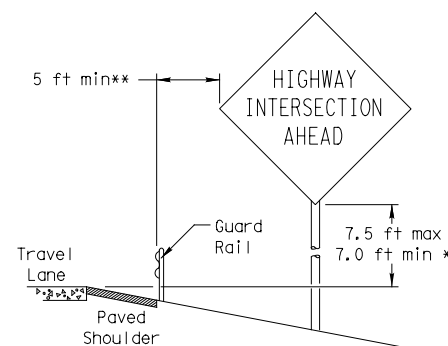


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

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

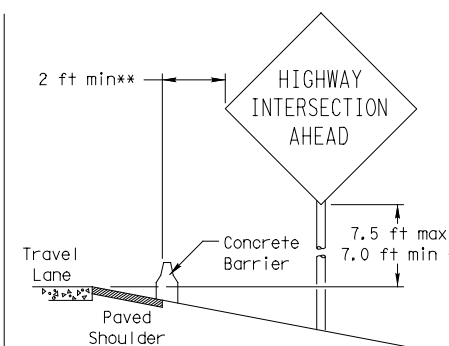


#### BEHIND BARRIER



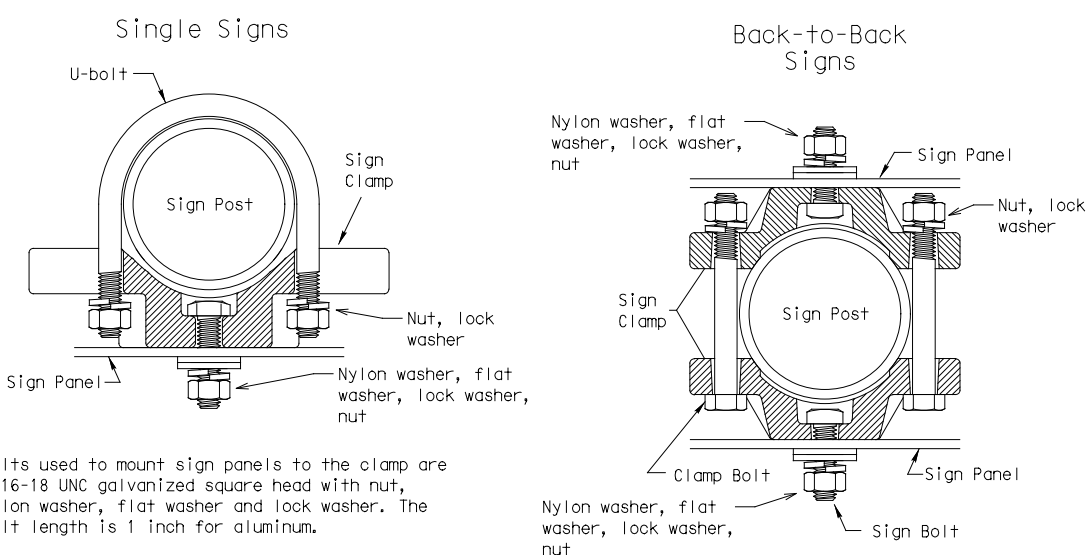
BEHIND GUARDRAIL

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



BEHIND CONCRETE BARRIER

### TYPICAL SIGN ATTACHMENT DETAIL



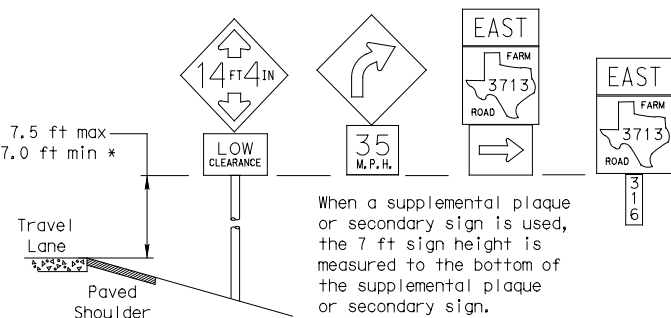
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

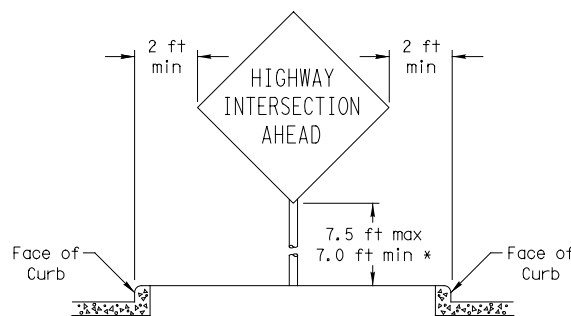
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

#### SIGNS WITH PLAQUES

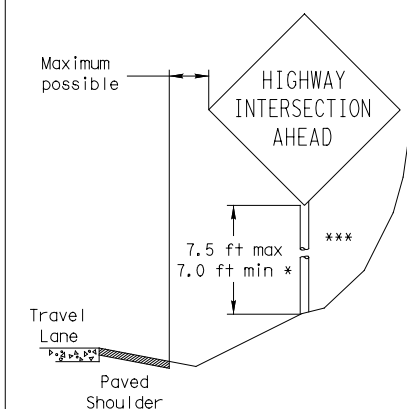


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

#### CURB & GUTTER OR RAISED ISLAND



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



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

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

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

\* Signs shall be mounted using the following condition that results in the greatest sign elevation:

- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
- (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:  
<http://www.txdot.gov/publications/traffic.htm>



## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD (GEN) -08

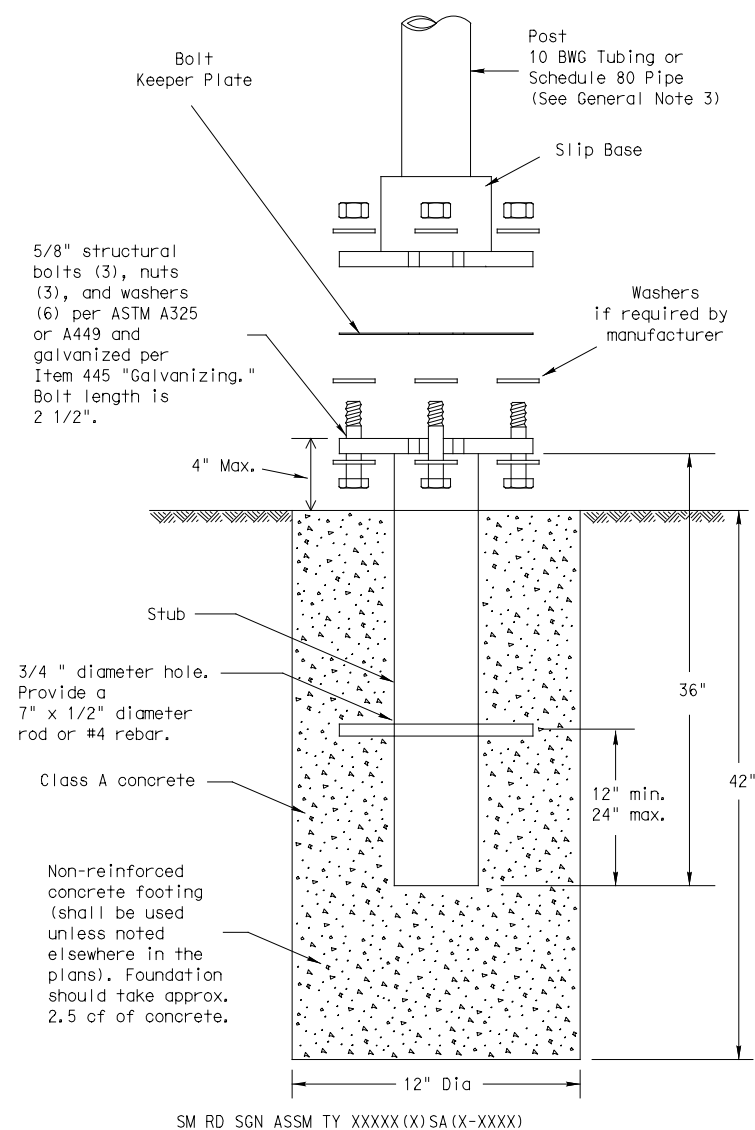
© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0133	04	042	US82
		DIST	COUNTY		SHEET NO.
		WFS	BAYLOR		280

DATE: 12/15/2020 10:04:13 AM  
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DATE: 12/15/2020 10:04:14 AM  
FILE: smds1.dgn

## TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

### NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. [http://www.txdot.gov/business/producer\\_list.htm](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

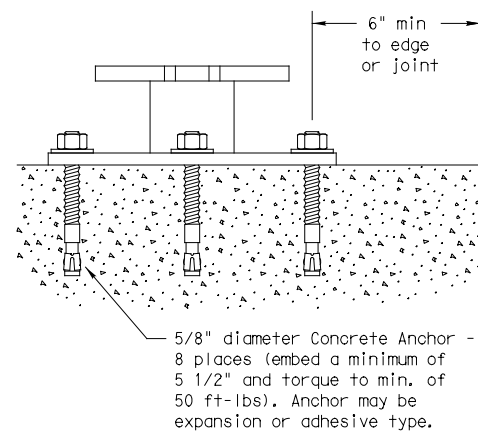
#### Foundation

- 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 concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

#### Support

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

## CONCRETE ANCHOR



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

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

 Texas Department of Transportation  
Traffic Operations Division

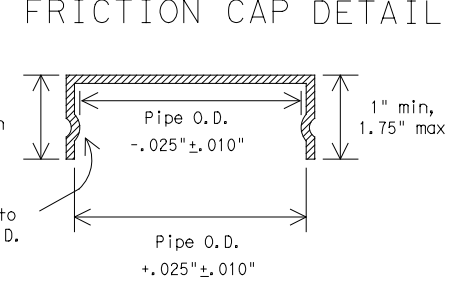
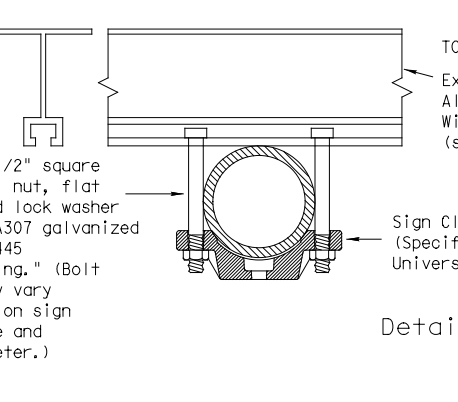
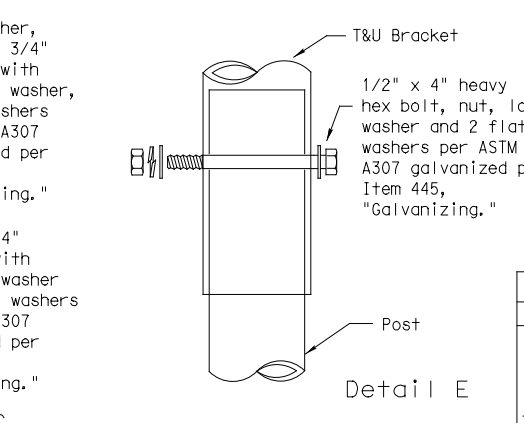
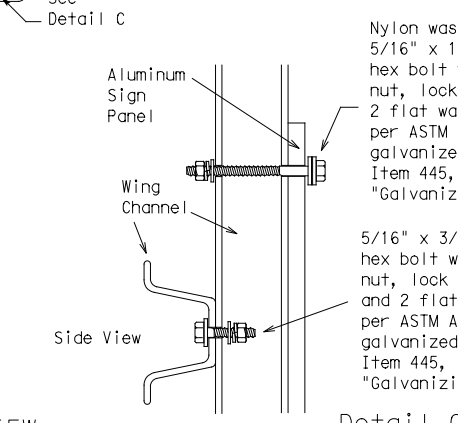
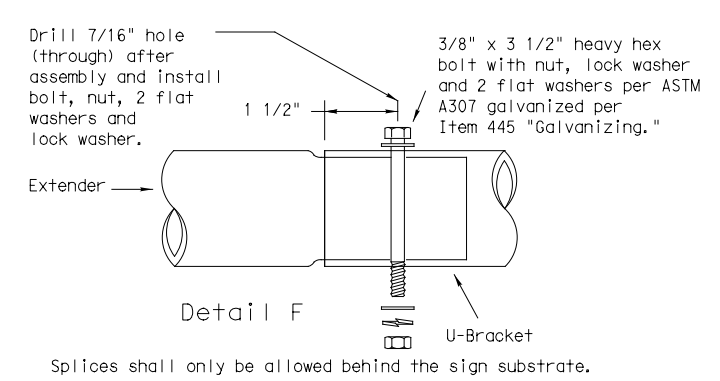
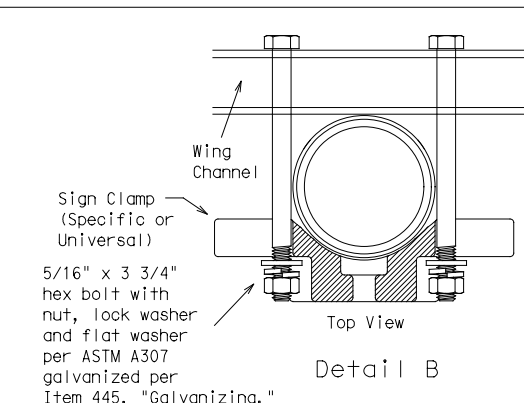
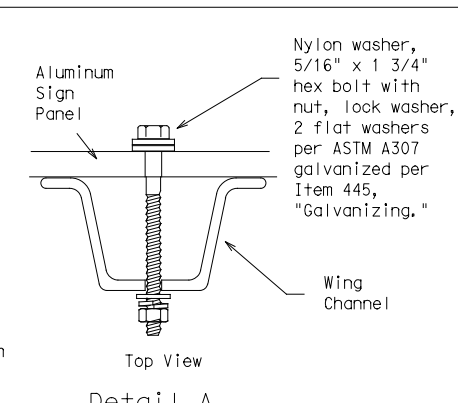
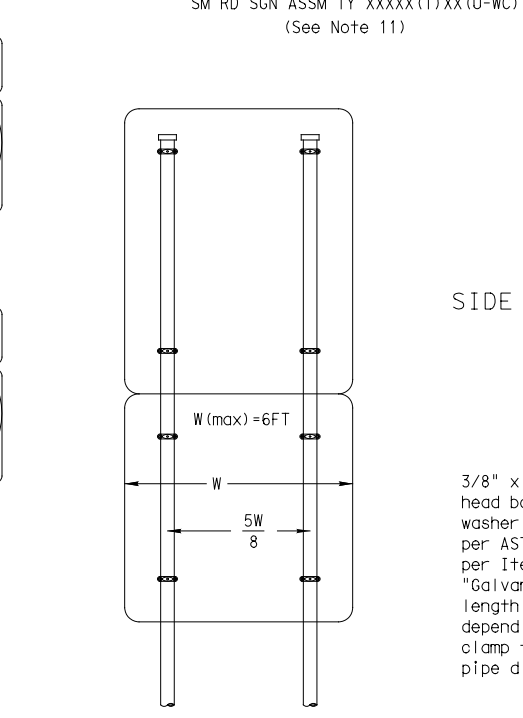
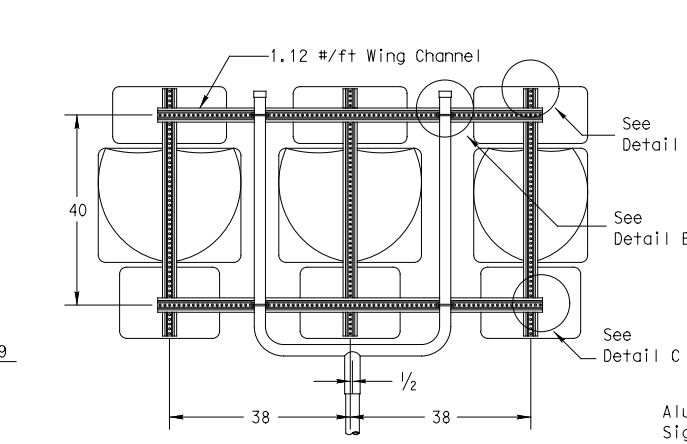
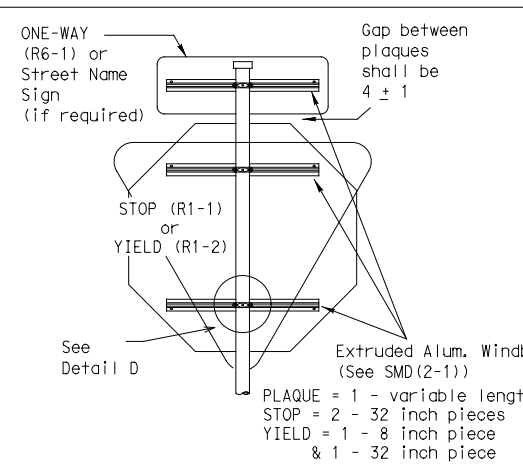
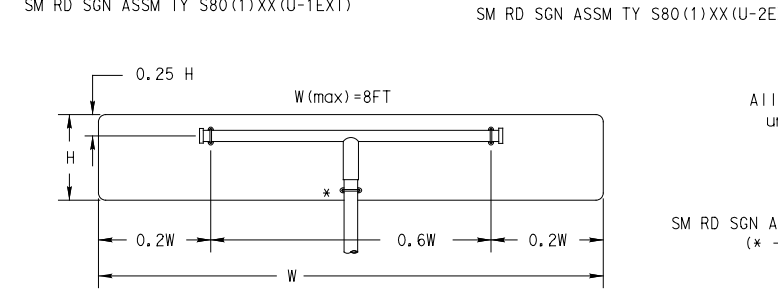
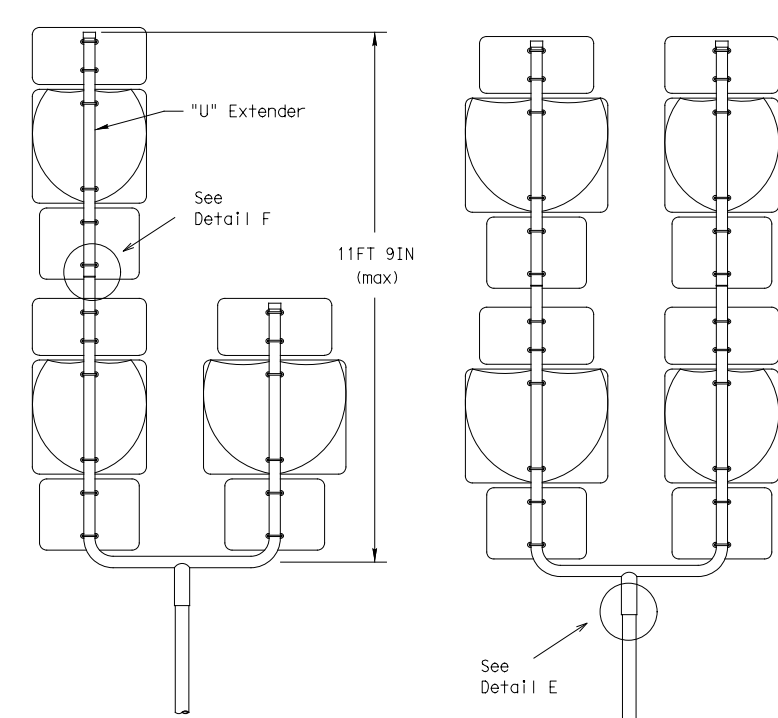
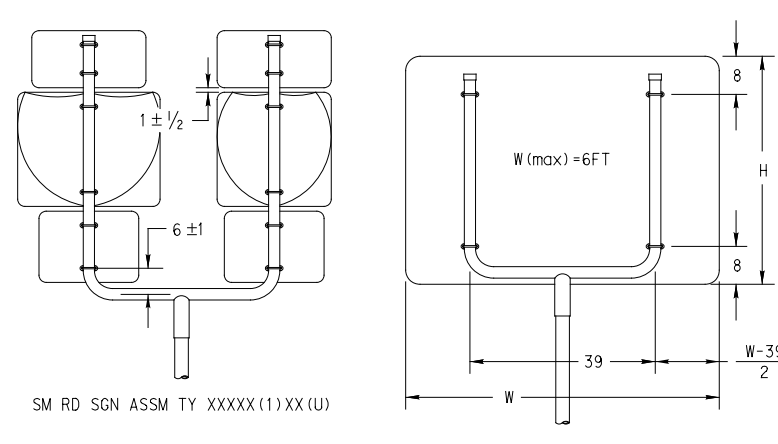
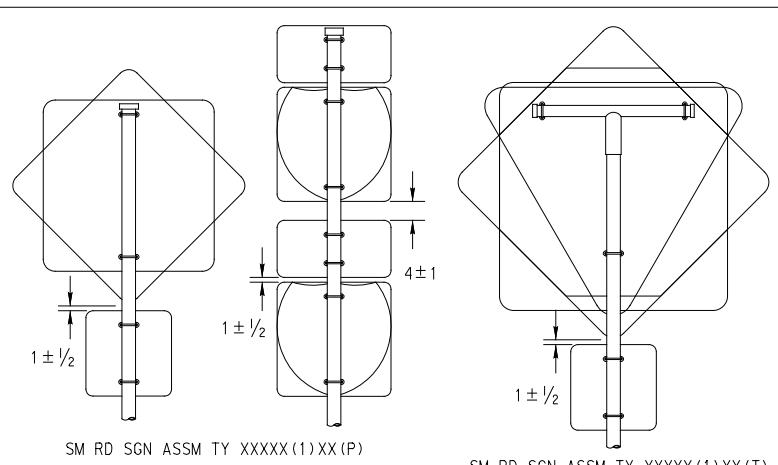
SIGN MOUNTING DETAILS  
SMALL ROADSIDE SIGNS  
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0133	04	042	US82
		DIST	COUNTY		SHEET NO.
		WFS	BAYLOR		281

26B

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

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

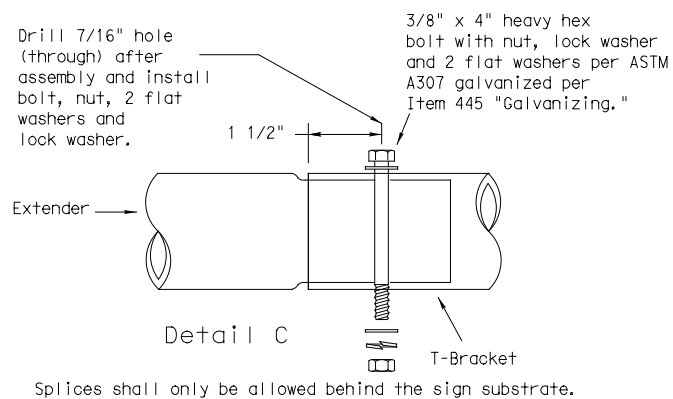
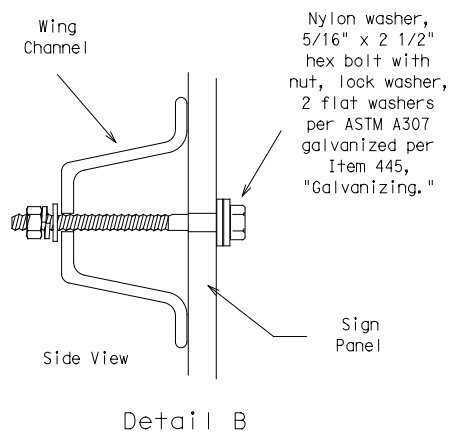
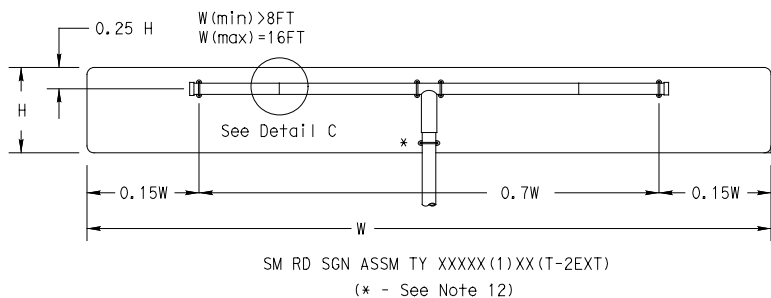
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26C

DATE: 12/15/2020 10:04:16 AM  
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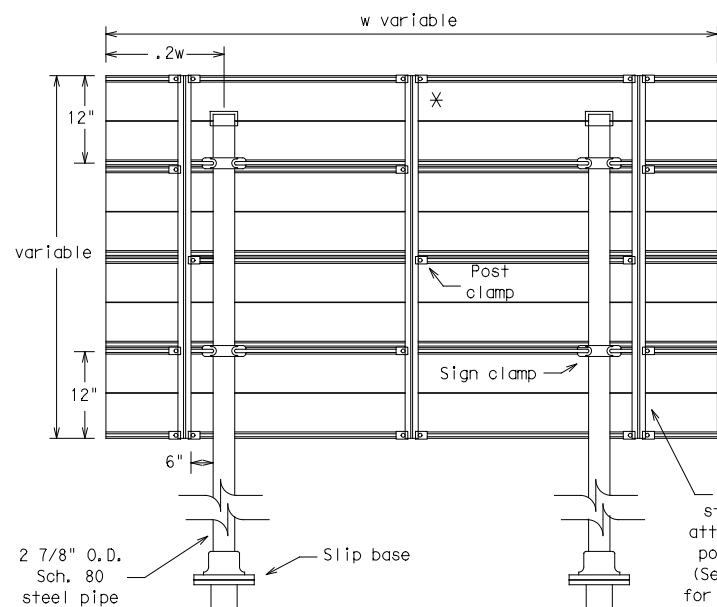
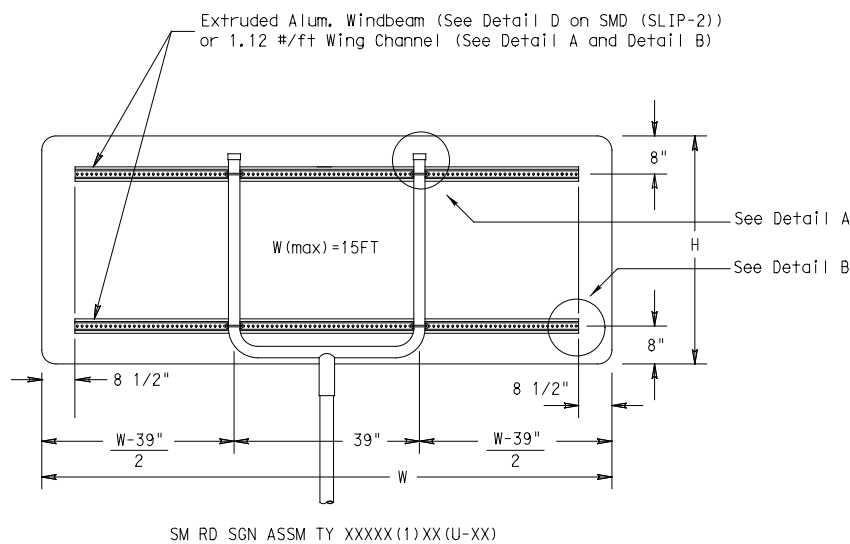
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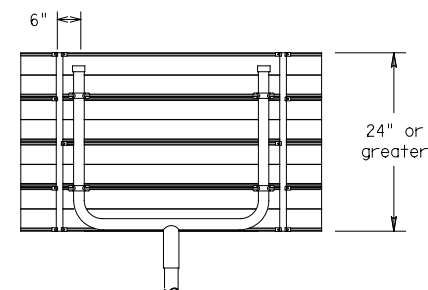
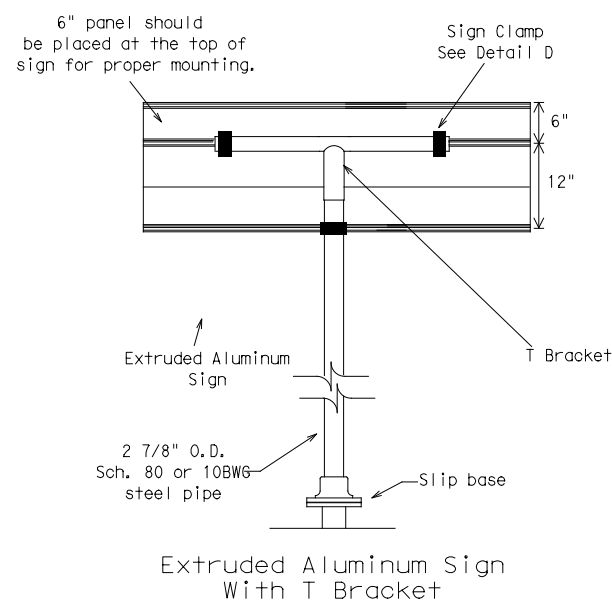
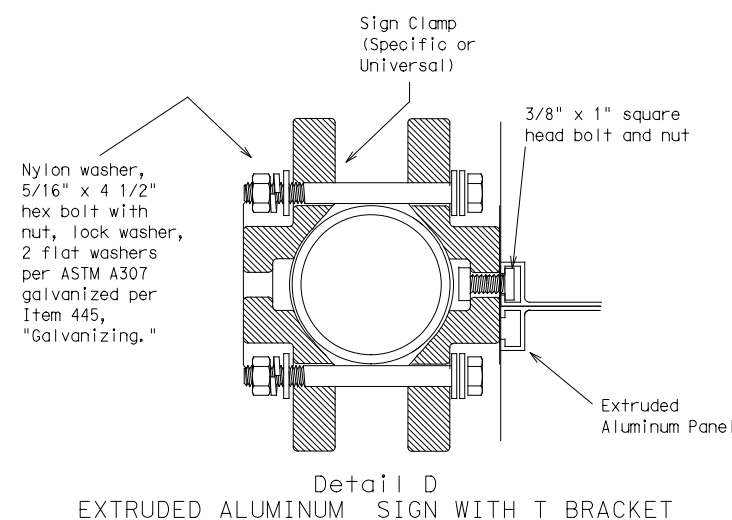
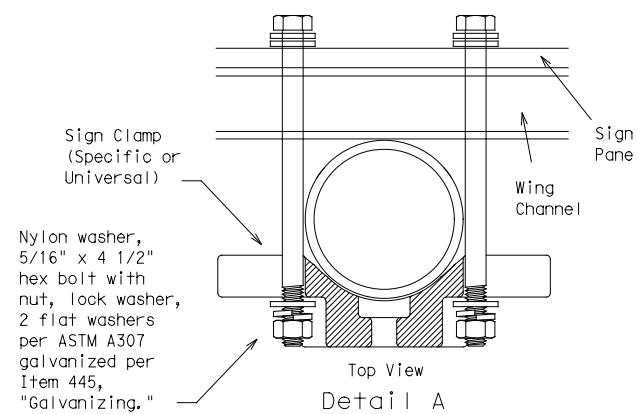
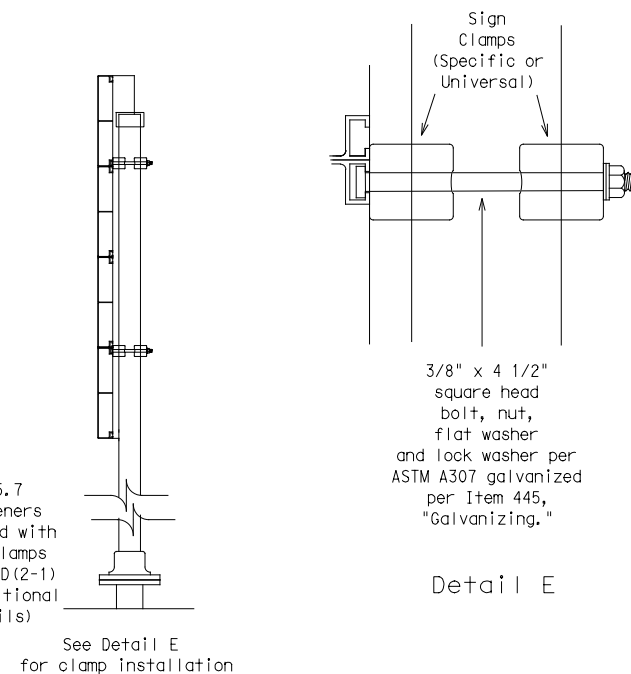
Splices shall only be allowed behind the sign substrate.

GENERAL NOTES:

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



\* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details  
See Detail E for clamp installation

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	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)

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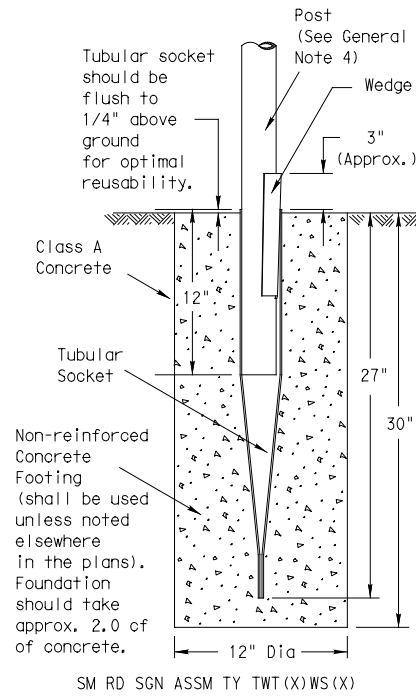
SIGN MOUNTING DETAILS  
SMALL ROADSIDE SIGNS  
TRIANGULAR SLIPBASE SYSTEM  
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		WFS	BAYLOR	283	

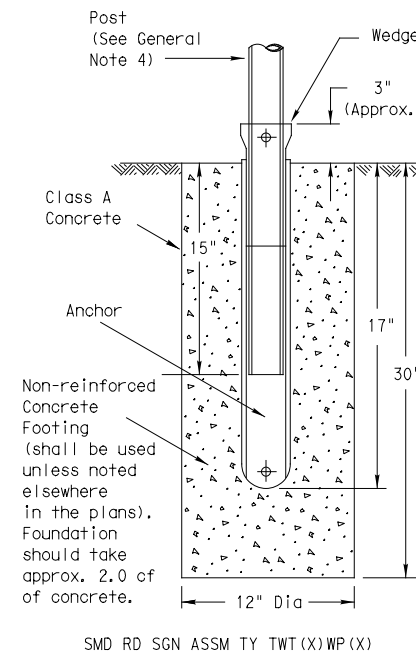


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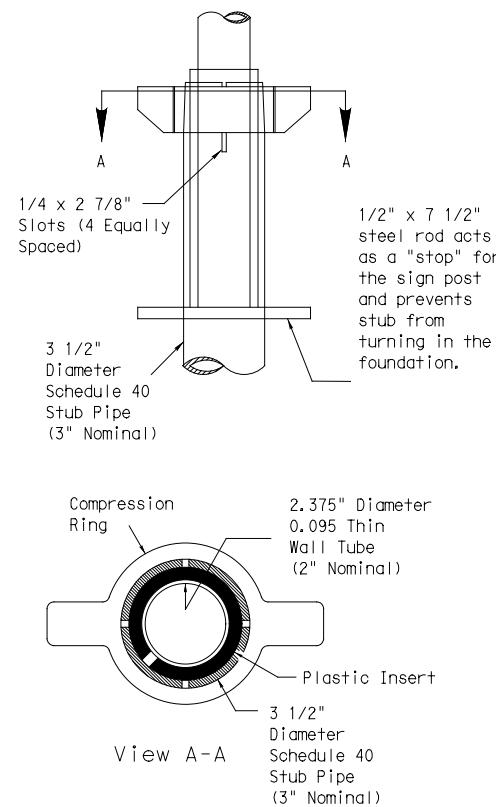
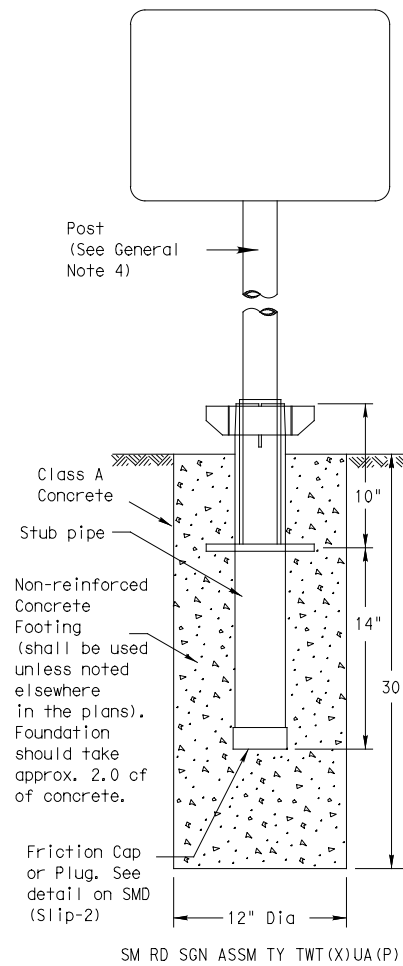
### Wedge Anchor Steel System



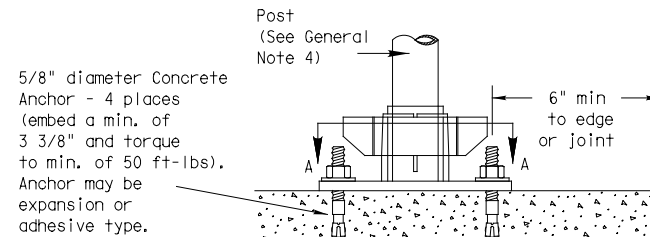
### Wedge Anchor High Density Polyethylene (HDPE) System



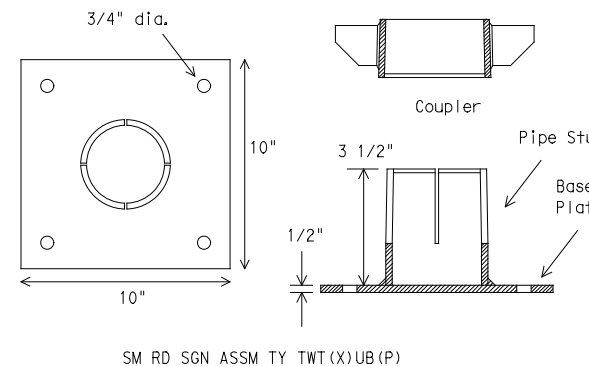
### Universal Anchor System with Thin-Walled Tubing Post



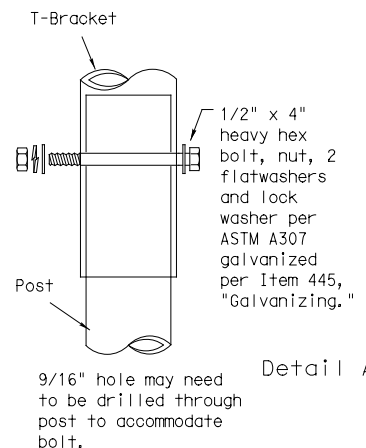
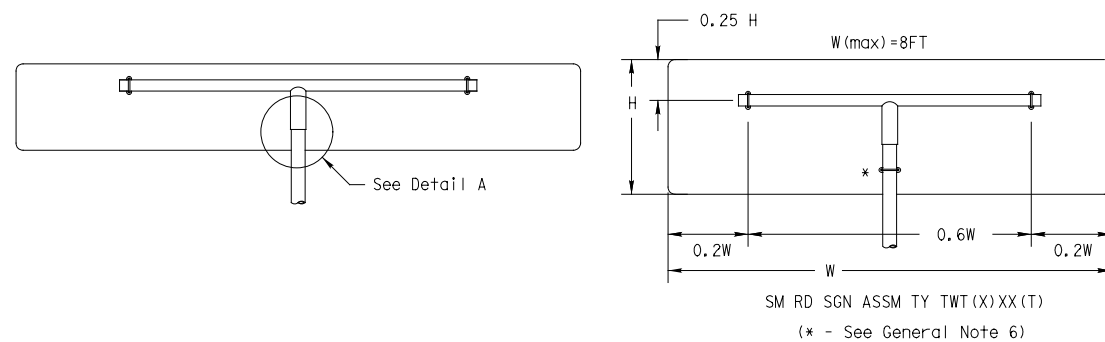
Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.



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, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



### Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



NOTE  
The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

### GENERAL NOTES:

- The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
- The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
- Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: <http://www.txdot.gov/business/producerlist.htm>
- Material used as post with this system shall conform to the following specifications:  
13 BWG Tubing (2.375" outside diameter) (TWT)  
0.095" nominal wall thickness  
Seamless or electric-resistance welded steel tubing  
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  
18% minimum elongation in 2"  
Wall thickness (uncoated) shall be within the range of .083" to .099"  
Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"  
Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>

### WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". 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. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
- Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
- Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
- Attach the sign to the sign post.
- Insert the sign post into socket and align sign face with roadway.
- Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

### UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". 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.
- Insert base post in hole to depths shown and backfill hole with concrete.
- Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
- Attach the sign to the sign post.
- Install plastic insert around bottom of post.
- Insert sign post into base post. Lower until the post comes to rest on steel rod.
- Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
- Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation  
Traffic Operations Division

SIGN MOUNTING DETAILS  
SMALL ROADSIDE SIGNS  
WEDGE & UNIVERSAL ANCHOR  
WITH THIN WALL TUBING POST  
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DATE: FILE:

**I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402**

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

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

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# \_\_\_\_\_

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.

- Cottonwood Creek which flows into Brazos River Above Possum Kingdom Lake, segment 1208.
- Plants Creek which flows into Brazos River Above Possum Kingdom Lake, segment 1208.
- All unmarked ephemeral streams and draws are now considered waters of the US.
- Impacts to any waters of the US are limited to the minimum necessary to construct the upgrades/replacements of culverts.
- Equipment should not be placed in the channel.

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.

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:**

<b>Erosion</b>	<b>Sedimentation</b>	<b>Post-Construction TSS</b>
<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	<input type="checkbox"/> Grassy Swales

**III. CULTURAL RESOURCES**

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

No Action Required  Required Action

Action No.

- If burial remains and/or artifacts are discovered cease work and contact the WFS District Environmental Coordinator. If discovered, tribes request immediate notification by TxDOT.
- No impacts of right-of-way are permitted without coordinating with DEQC and/or EC.

**IV. VEGETATION RESOURCES**

Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

No Action Required  Required Action

Action No.

- Impacts to vegetation should be kept to the minimum necessary. Associated impact will be the minimum necessary to extend culverts and widen the roadway as necessary.
- Trees shall be trimmed rather than removed when feasible.
- Disturbed areas would be re-vegetated according to TxDOT's standard practices for rural areas, which to the extent practicable, is in compliance with Executive Memorandum on Beneficial Landscaping, if applicable.

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

No Action Required  Required Action

Action No.

**Migratory Bird Treaty Act (MBTA):** Migratory birds may arrive in the project area to breed during construction of the proposed project. Measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young, in accordance with the migratory bird treaty act through phasing or work or preventative measures. Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structures that would be affected by the proposed project, and complete any bridge work/demolition and/or vegetation clearing. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided. Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

**Bat BMPs:**

In all instances, avoid harm or death to bats. If bats are encountered during construction stop work in the area and contact district environmental coordinator. Bats should only be handled as a last resort and after communication with TPWD.

**Fossorial Mammal BMPs:**

If Texas Kangaroo Rat or the Black-Tailed Prairie Dog are to be excavated/directly impacted coordinate with TPWD WHAB

**Mammal SGCN-** The Contractor will be instructed with the following for mammalian species that do not have established BMPs. Contractor will be advised of the potential occurrence of the Long-tailed Weasel and the Eastern Spotted Skunk to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.

**Terrestrial Reptile BMPs:**

If erosion control blankets or mats are required utilize products that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable. Inform contractors that if reptiles are found on project site allow species to safely leave the project area. Additionally, for Texas horned lizard, contractors will be advised to avoid harvester ant mounds in the selection of Project Specific Locations (PSLs).

**Amphibian and Aquatic Reptile BMPs**

Contractors will be advised of potential occurrence of the Woodhouse's Toad in the project area, and to avoid harming them if encountered.

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.

- If sheen or other contamination is visible in the waters of the U.S., or on the project site, the site shall be immediately cleaned up in accordance with local, state, and federal regulations.


**VII. OTHER ENVIRONMENTAL ISSUES**

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

No Action Required  Required Action

Action No.

- Keep noise to minimum. Reduce idling of vehicles and equipment.
- Maintain project site. Minimize dust and airborne particles to the maximum extent practicable.
- Collect sanitary waste collector. Portable units shall not be placed in or near a waterway or drainage area.
- Collect all waste materials, trash, and debris from the construction site daily and deposit into a metal dumpster having a secure cover.
- TxDOT EMS Policy Statement (English & Spanish) should be displayed at the construction site.

		<i>Design Division Standard</i>	
<b>ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS</b>			
<b>EPIC</b>			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
© TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 (DS)	0133	04	042
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES)	WFS	BAYLOR	285

SITE DESCRIPTION

PROJECT LIMITS: *ON US 82 IN BAYLOR COUNTY, FROM THE KNOX COUNTY LINE TO BUSINESS 183*

PROJECT DESCRIPTION: *REHABILITATION OF EXISTING ROAD, UPGRADING TO ADD PASSING LANES (UPGRADING TO SUPER-2), GRADING, STRUCTURES, BASE, SURFACE, AND PAVEMENT MARKINGS.*

MAJOR SOIL DISTURBING ACTIVITIES:

*PREPARING ROW, CULVERT EXTENSIONS, GRADING, EXCAVATION, EMBANKMENT, EROSION, AND SEDIMENT CONTROLS. TOP SOIL AND SEEDING.*

TOTAL PROJECT AREA: 182.79 ACRES

TOTAL AREA TO BE DISTURBED: 103.49 ACRES

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:

*THE EXISTING SOIL CONSISTS OF MILES FINE SANDY LOAM, ROTAN CLAY LOAM, AND SAGERTON CLAY LOAM WHICH SLOPES RANGE FROM 0 TO 3%.*

*THESE SOILS ARE MODERATELY WELL DRAINED TO WELL DRAINED.*

*VEGETATIVE COVER IS FAIR, WITH 85% OF AREA IN CULTIVATED CROPS.*

NAME OF RECEIVING WATERS:

*THIS PROJECT IS IN THE BRAZOS RIVER BASIN FLOWING TO THE BRAZOS RIVER, SEGMENT 1208 VIA COTTONWOOD CREEK AND PLANTS CREEK.*

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES & STRUCTURAL PRACTICES:

EROSION CONTROL:

- TEMPORARY SEEDING
- PERMANENT PLANTING, SODDING, OR SEEDING
- MULCHING
- SOIL RETENTION BLANKET
- BUFFER ZONES
- PRESERVATION OF NATURAL RESOURCES

OTHER:  
*DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME AND DO WITHIN 21 DAYS.*

SEDIMENTATION CONTROL:

- SILT FENCES
- HAY BALES
- ROCK BERMS
- 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
- EROSION CONTROL LOGS

POST-CONSTRUCTION CONTROLS

- RETENTION / IRRIGATION
- EXTENDED DETENTION BASIN (ie: ROCK BERMS)
- VEGETATIVE FILTER STRIPS
- GRASSY SWALES
- VEGETATIVE LINED DRAINAGE DITCHES
- CONSTRUCTED WET LANDS
- WET BASINS
- SAND FILTER SYSTEMS
- RIPRAP

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

1. REMOVE EXISTING TOPSOIL AND WINDROW TO EDGE OF WORK AREA. MINIMIZE IMPACTS TO TOPSOIL TO COMPLETE WORK.
2. PLACE BMPS
3. WIDEN STRUCTURES ONE SIDE AT A TIME AND ADJUST BMPS.
4. WIDEN ROADBED ONE SIDE AT A TIME UP TO FINISH SURFACE AND ADJUST BMPS.
5. GRADE SIDESLOPES BY RETURNING TOPSOIL TO PREPARED SLOPES AND ADJUST BMPS.
6. PLACE TEMPORARY SEEDING.
7. PLACE FINAL SURFACE.
8. DRESS PAVEMENT EDGE AND PLACE PERMANENT SEEDING. FERTILIZER AND WATER UNTIL VEGETATION IS ESTABLISHED AND REMOVE BMPS.

REMARKS: *Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, waterbody or streambed. The Contractor shall designate a location for, construct, and maintain an area for concrete mixing, handling and delivery equipment to wash out. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants. All waterways shall be cleared as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.*

MAINTENANCE:

*All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days following the inspection. In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable. "Too Wet" is the only reason for not adhering to time frames described. Actions taken as a result of inspections must be described within, and retained as a part of the SWP3. The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within 7 calendar days following the inspection.*

INSPECTION:

*A TxDOT Inspector shall perform a regularly scheduled SW3P inspection every 7 calendar days. An inspection and maintenance report, signed by the TxDOT Inspector and Contractor, will be filed for each inspection. Revise/clean/repair each BMP control device in accordance with the current field inspection and maintenance report (Form 2118) and item 1 (Maintenance) above.*

OTHER EROSION AND SEDIMENT CONTROLS:

WASTE MATERIALS: *On a daily basis, or as directed by TxDOT, collect all waste materials, trash and debris from the construction site and deposit into a dumpster having a secure cover and which meets all local and state solid waste management requirements. Empty the dumpster as required by regulation, or as may be directed, at an approved landfill facility. Burying of construction waste is PROHIBITED.*

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): *Any hazardous waste spills shall be reported to the TxDOT Safety Officer in Wichita Falls. It shall be the responsibility of the waste owner to provide for the required clean-up. If the owner cannot be determined, the district laboratory shall direct in the clean-up operation.*

SANITARY WASTE: *Any sanitary waste shall be collected from portable units as necessary or as required by local regulation by a licensed sanitary waste management contractor. All sanitary waste from permanent sites will be collected by local sanitary sewer systems.*

OFFSITE VEHICLE TRACKING:

- HAUL ROADS DAMPENED FOR DUST CONTROL
- LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- EXCESS DIRT ON ROAD REMOVED DAILY
- STABILIZED CONSTRUCTION ENTRANCE

*THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL SUBCONTRACTORS ARE AWARE OF AND COMPLY WITH ALL COMPONENTS OF THE SW3P.*

Note To Designer:  
 1. Do not alter Sheet Design or Font style, size or weight - match text attributes.  
 2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position.



12/14/2020

Signature of Registrant & Date

REVISION DATE:

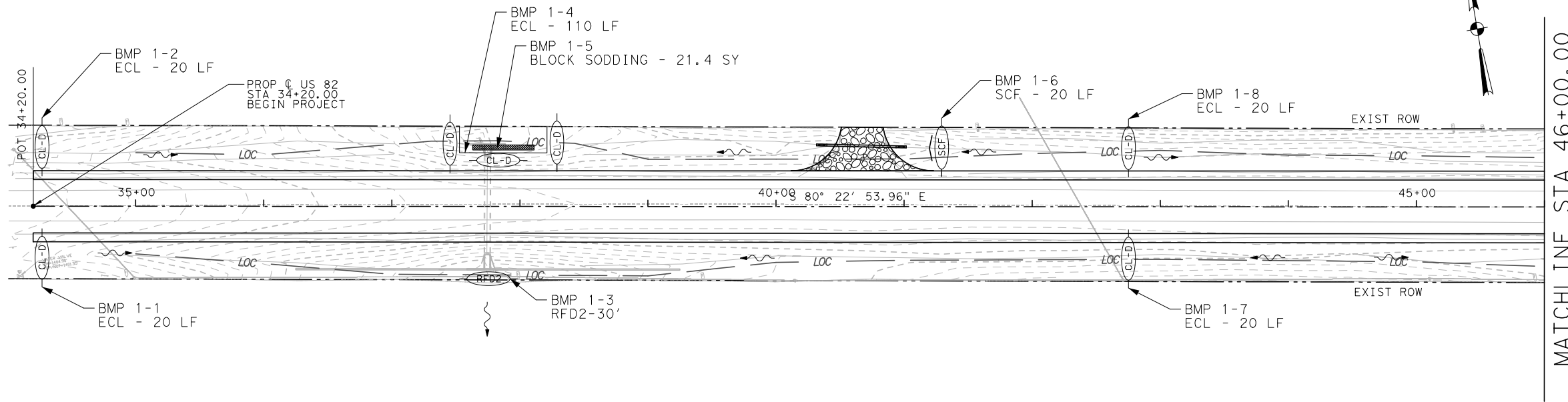
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731 FIRM NO. F-761				
<b>STORM WATER POLLUTION PREVENTION PLAN (SW3P)</b>				
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			HIGHWAY NO.
				US
STATE	DISTRICT	COUNTY		82
TEXAS	WFS	BAYLOR		SHEET NO.
CONTROL	SECTION	JOB		
	0133	04	042	286

DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

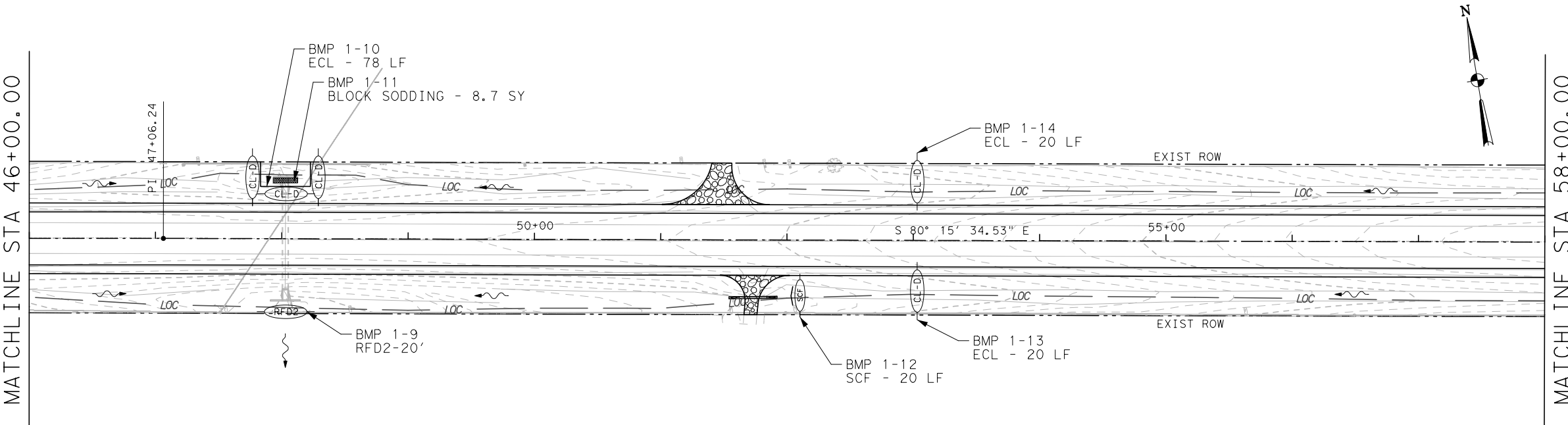
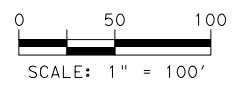
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 34+20.00 TO STA 58+00.00**

SHEET 1 OF 28



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 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 287
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO US 82

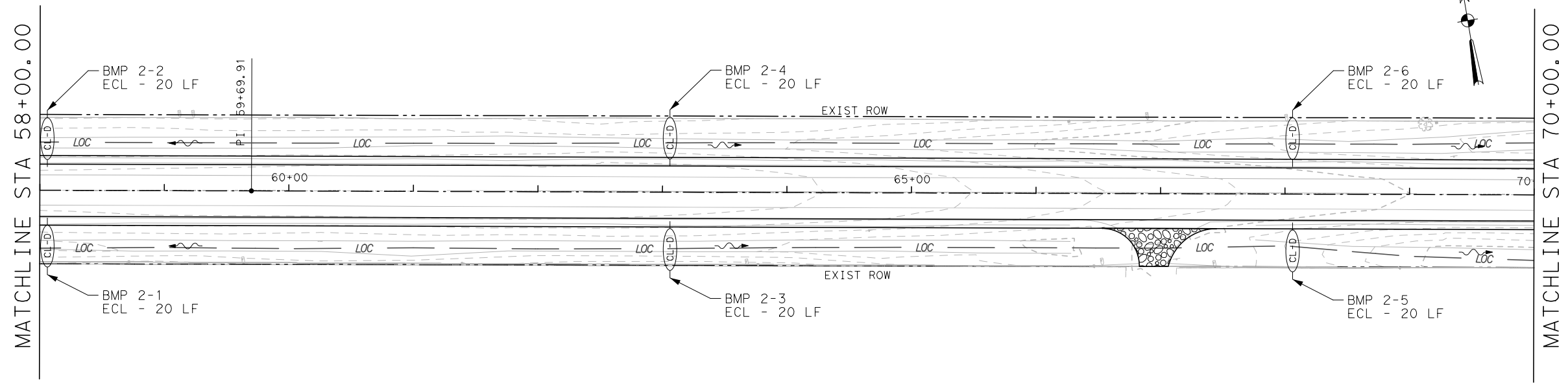
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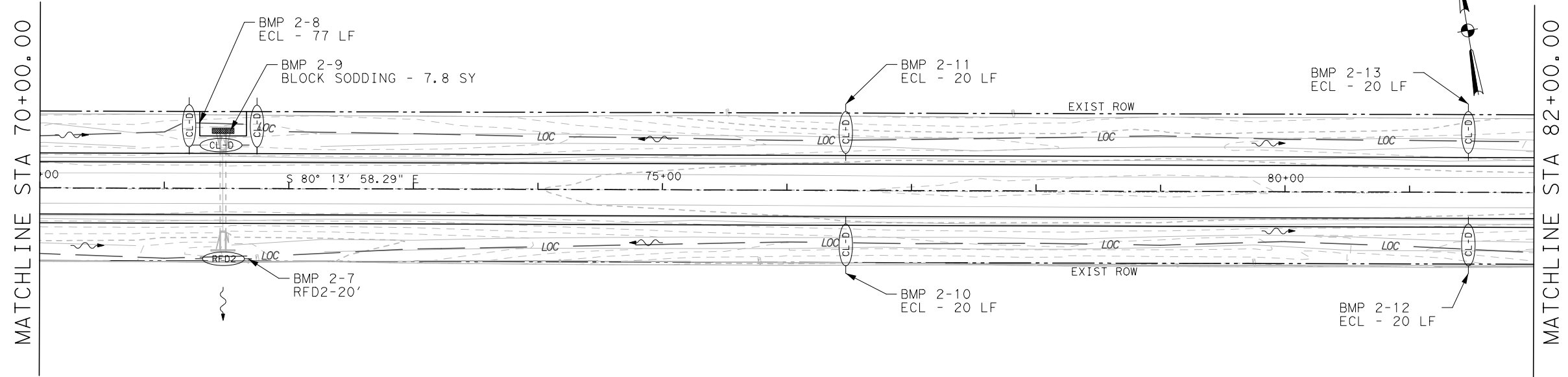
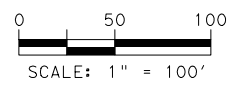
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 58+00.00 TO STA 82+00.00

SHEET 2 OF 28



**HUITT-ZOLLARS**

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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 288
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO US 82

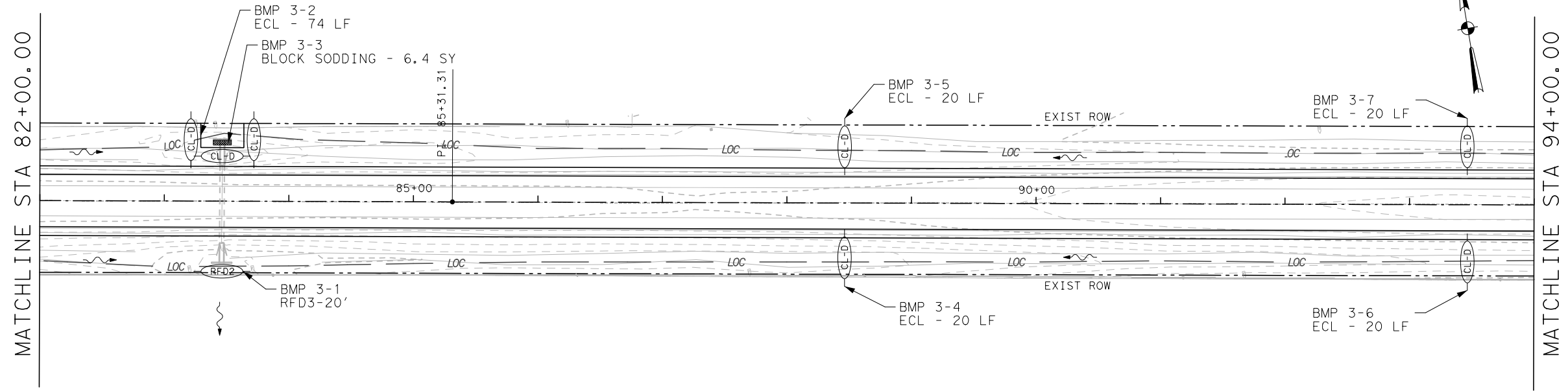
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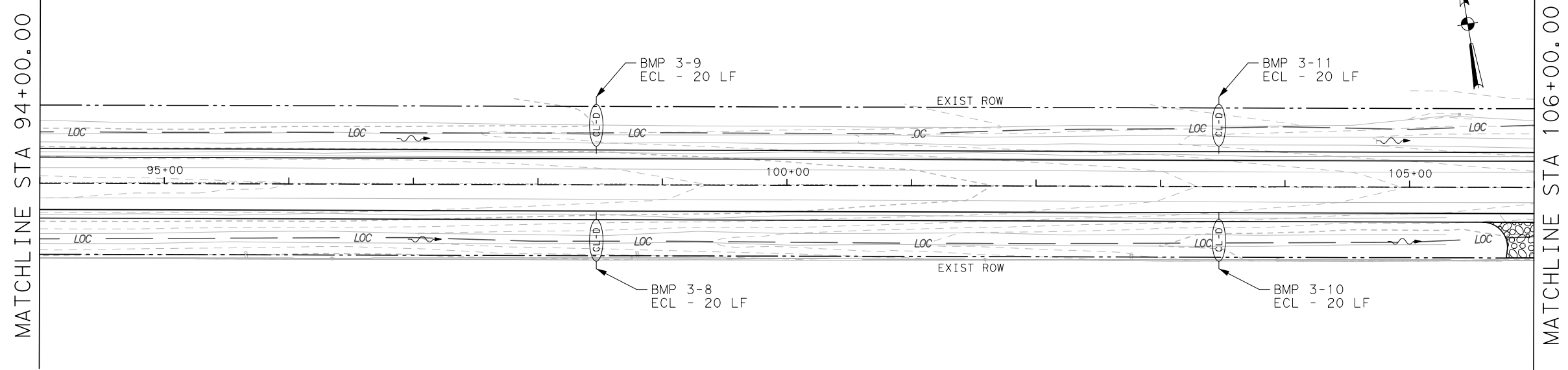
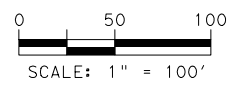
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 82+00.00 TO STA 106+00.00

SHEET 3 OF 28



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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 289
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
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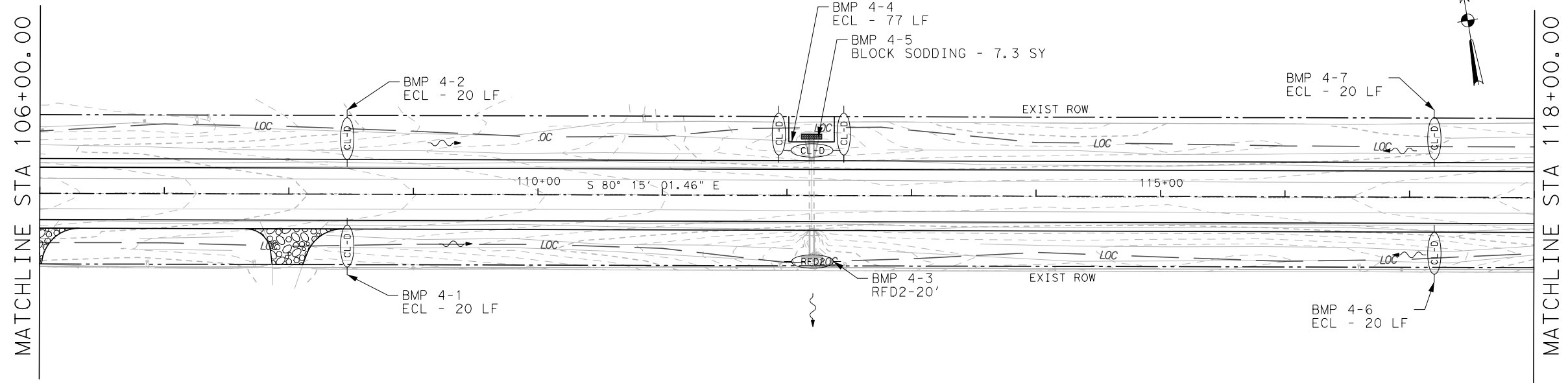
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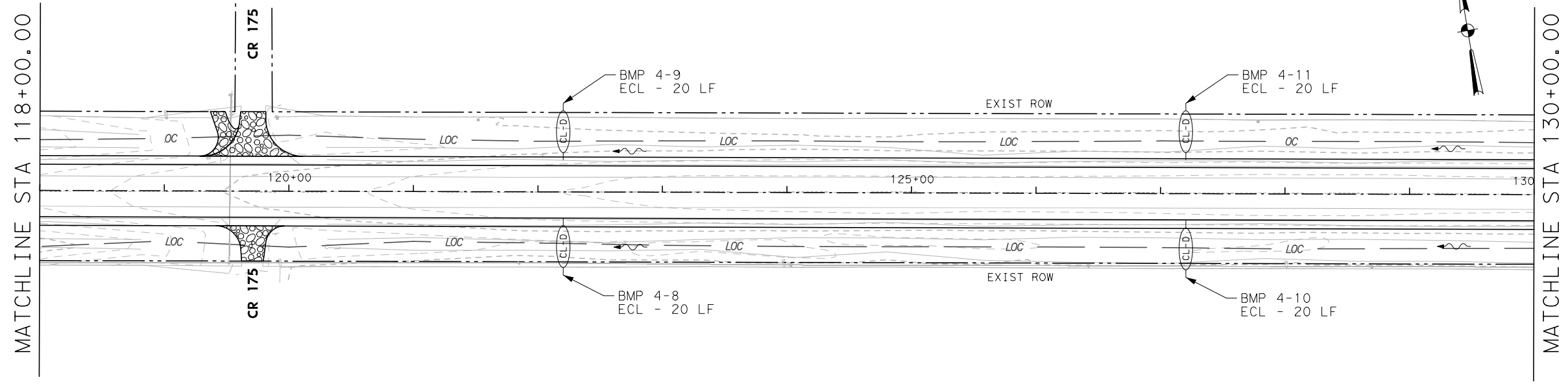
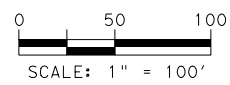
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 106+00.00 TO STA 130+00.00**

SHEET 4 OF 28



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 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 290
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

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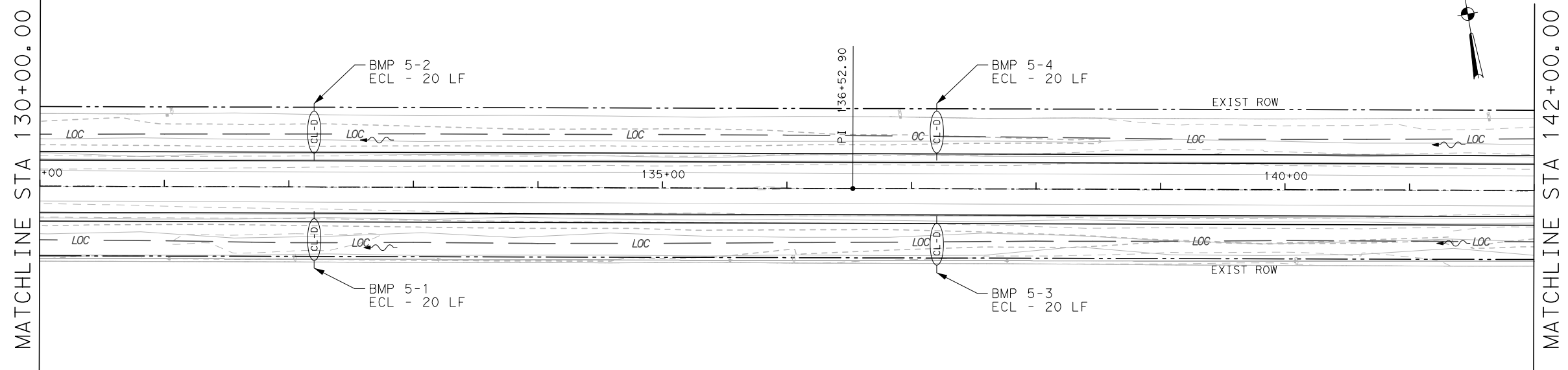
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**NOTES:**

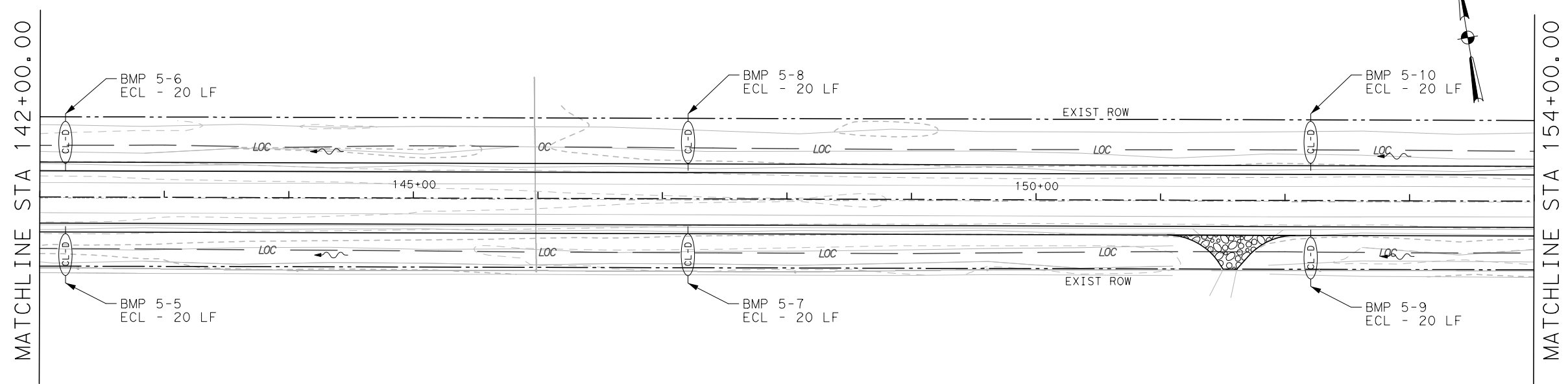
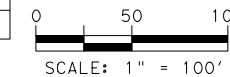
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**LEGEND**

- (SCF)— SEDIMENT CONTROL FENCE
- (CL-D)— EROSION CONTROL LOGS
- (RFD2)— ROCK FILTER DAM TYPE 2
- LOC— LIMITS OF CONSTRUCTION
- ~> DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**

**STA 130+00.00 TO STA 154+00.00**

SHEET 5 OF 28

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FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 291
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO US 82

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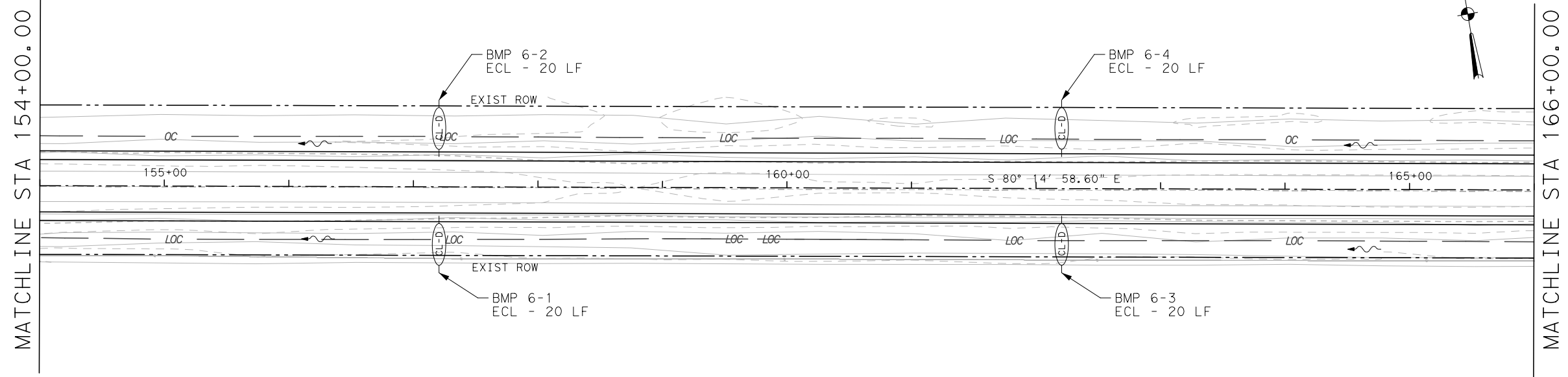


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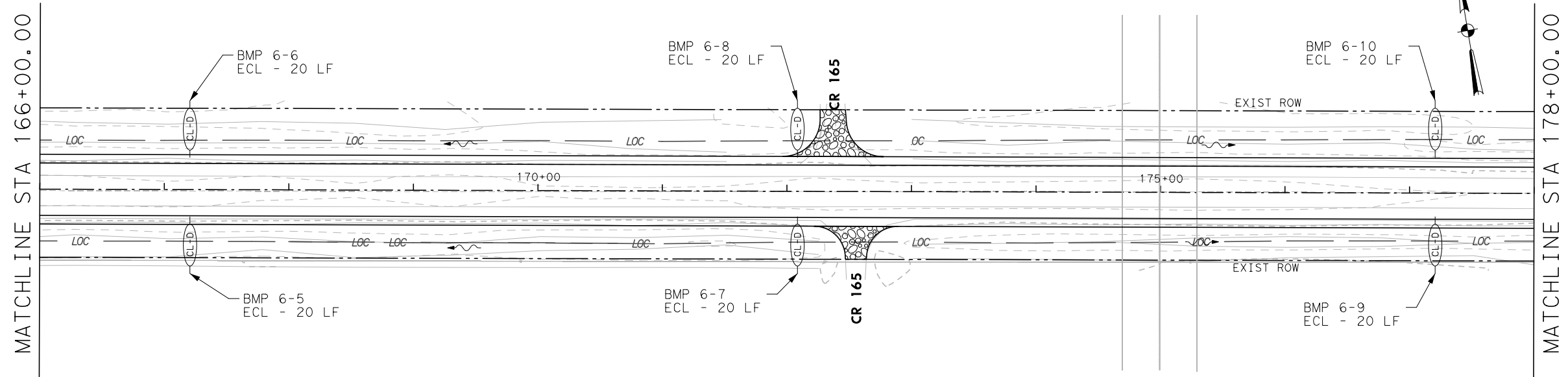
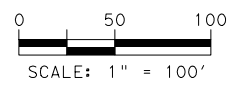
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**LEGEND**

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BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 154+00.00 TO STA 178+00.00

SHEET 6 OF 28



**HUITT-ZOLLARS**  
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3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 292
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
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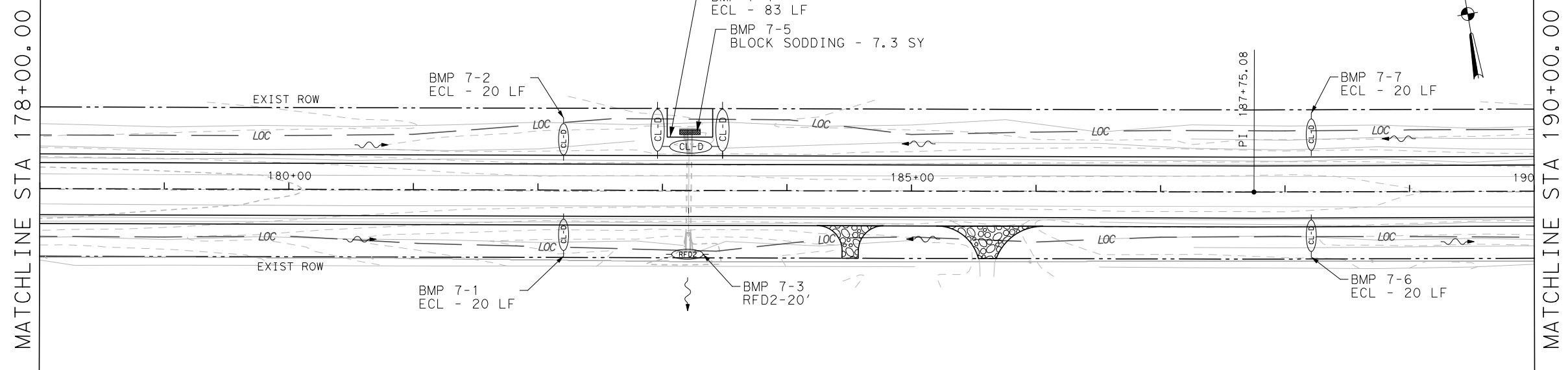
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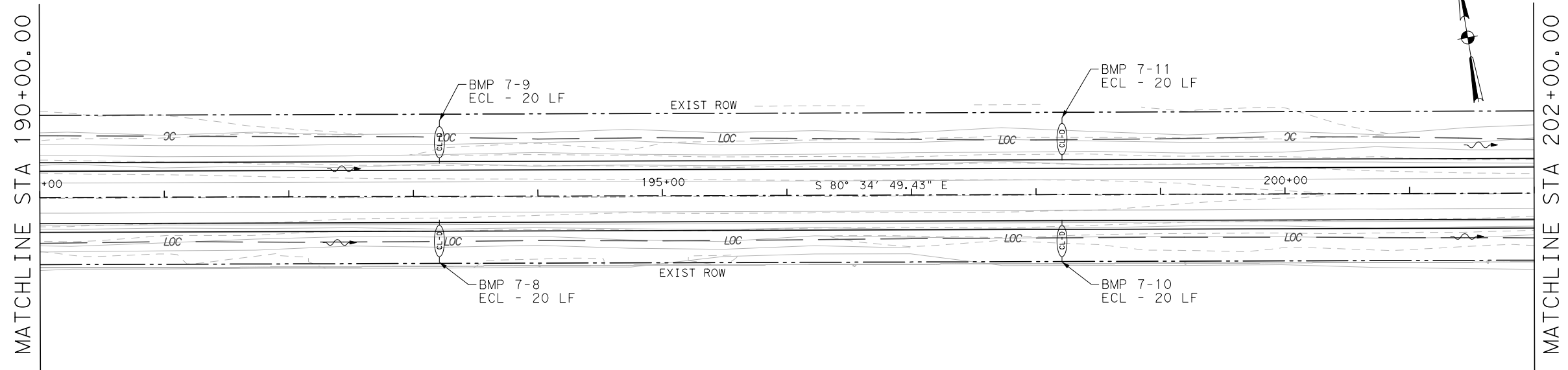
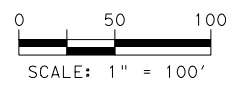
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**LEGEND**

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BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 178+00.00 TO STA 202+00.00

SHEET 7 OF 28



**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 293
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO US 82

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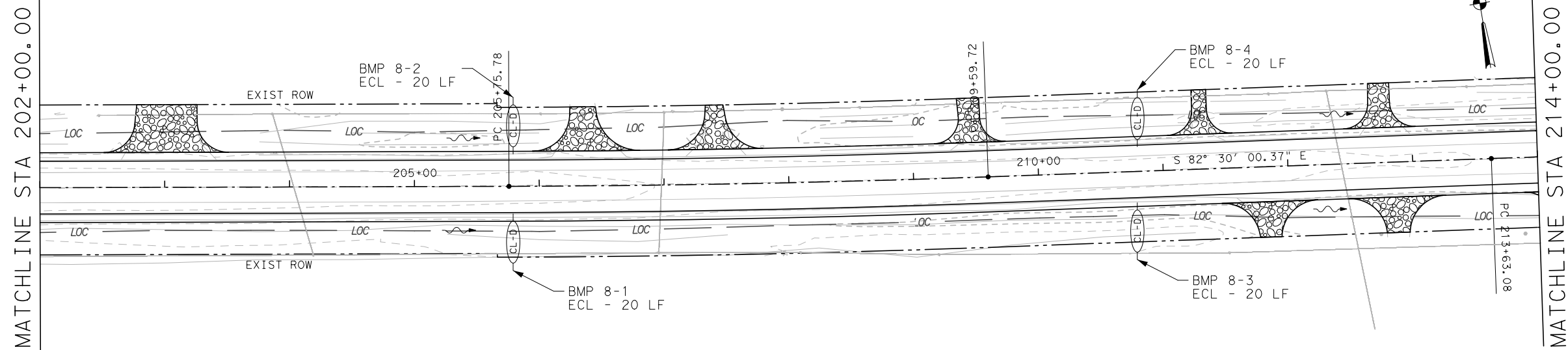
DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

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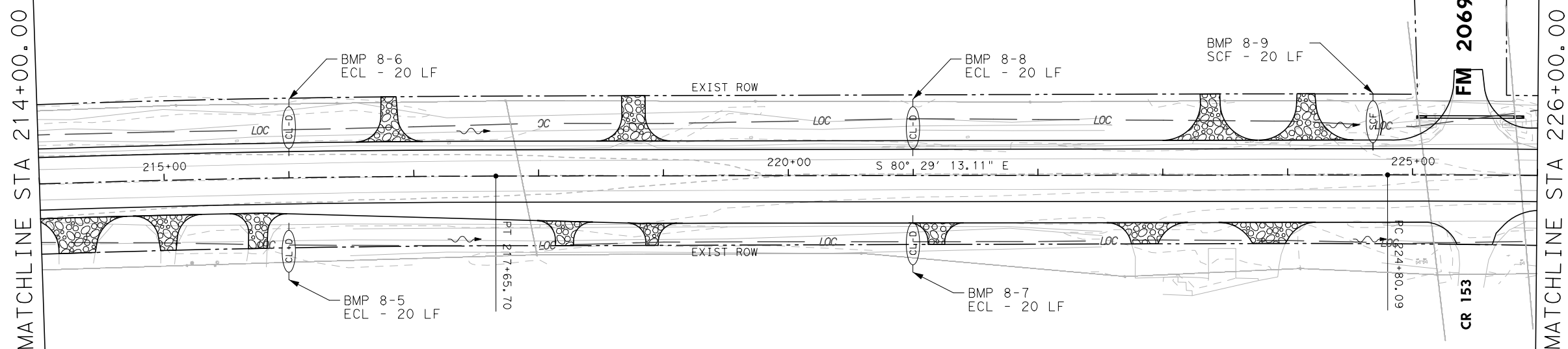
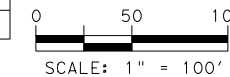
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  2. RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  3. PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SCF SEDIMENT CONTROL FENCE
- CL-D EROSION CONTROL LOGS
- RFD2 ROCK FILTER DAM TYPE 2
- LOC LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**

STA 202+00.00 TO STA 226+00.00

SHEET 8 OF 28

© 2023

Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 294
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

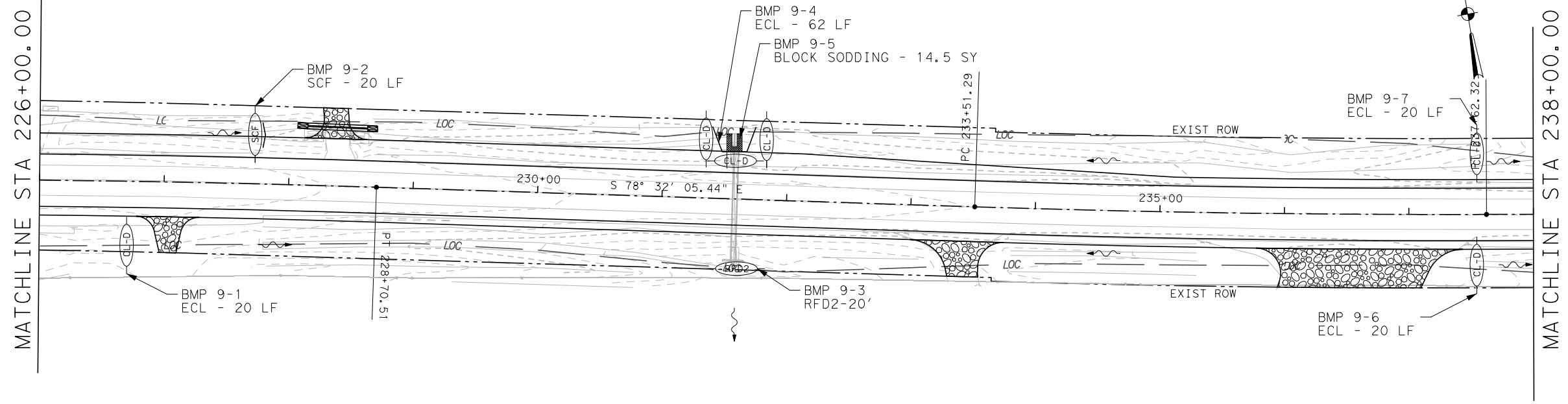
DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

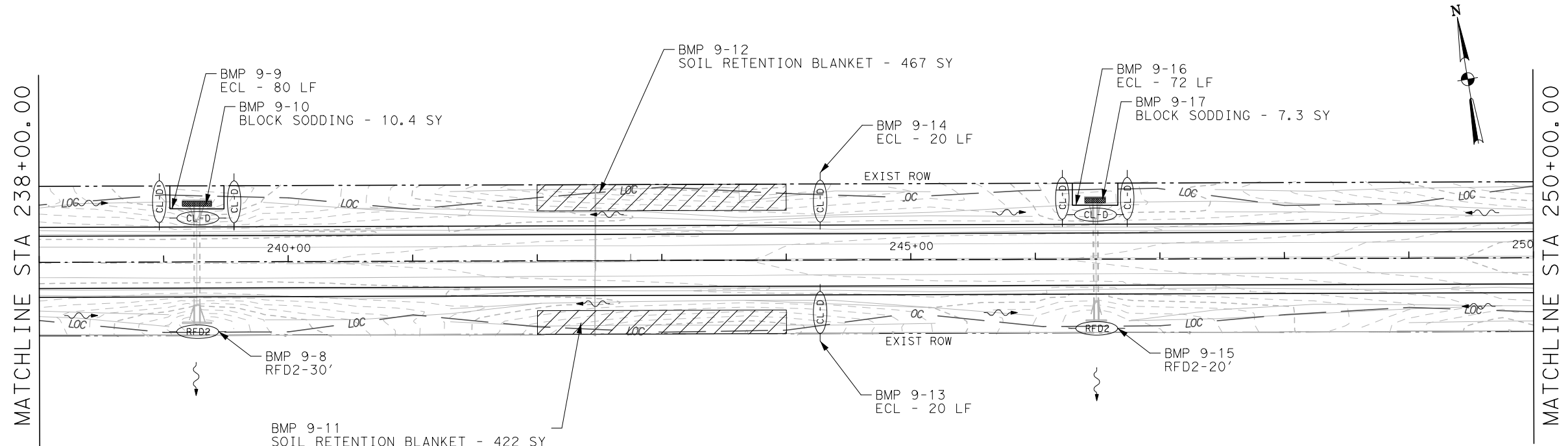
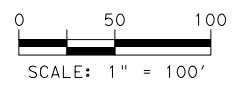
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- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

**EROSION CONTROL PLAN LAYOUT**  
STA 226+00.00 TO STA 250+00.00

SHEET 9 OF 28



**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 295
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

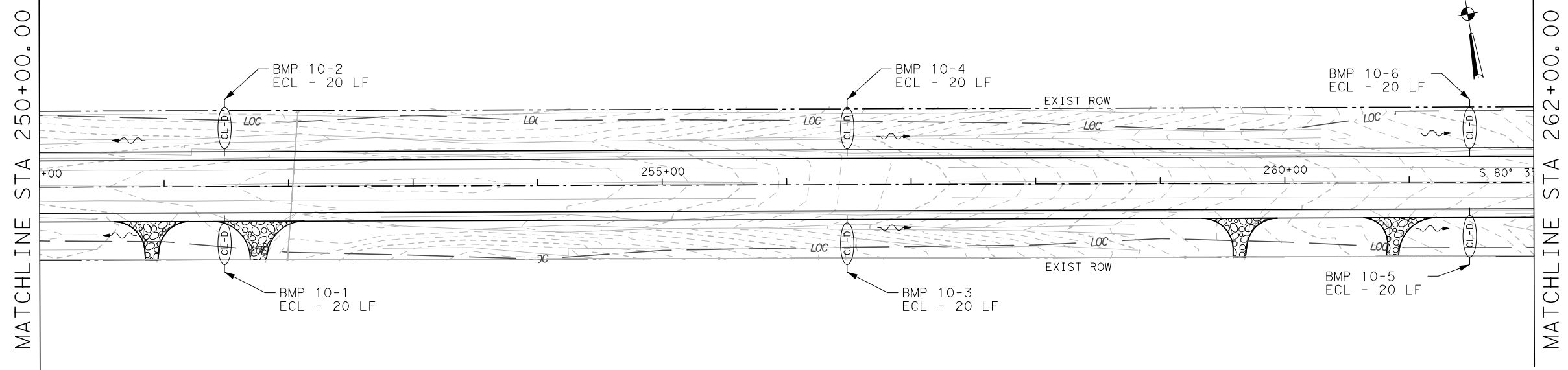
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

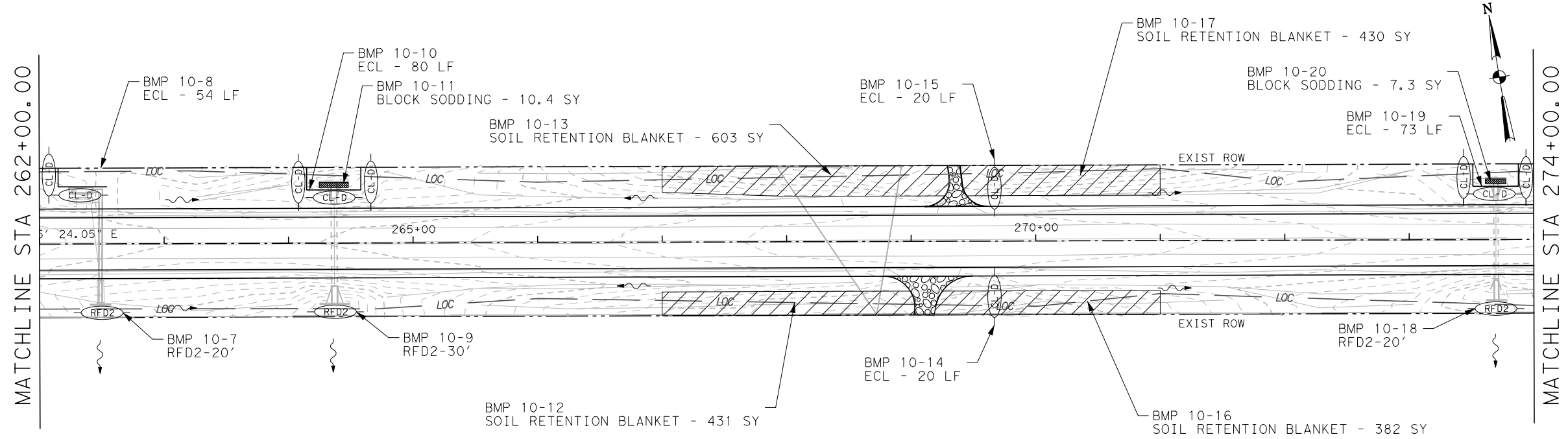
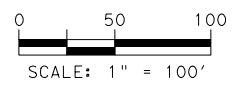
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 250+00.00 TO STA 274+00.00**

SHEET 10 OF 28



**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 296
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

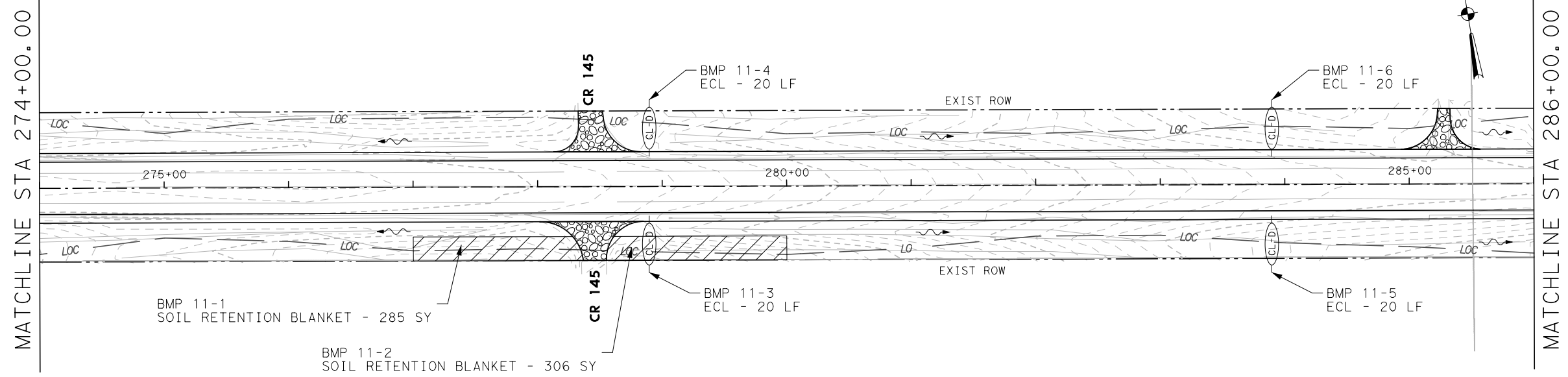
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

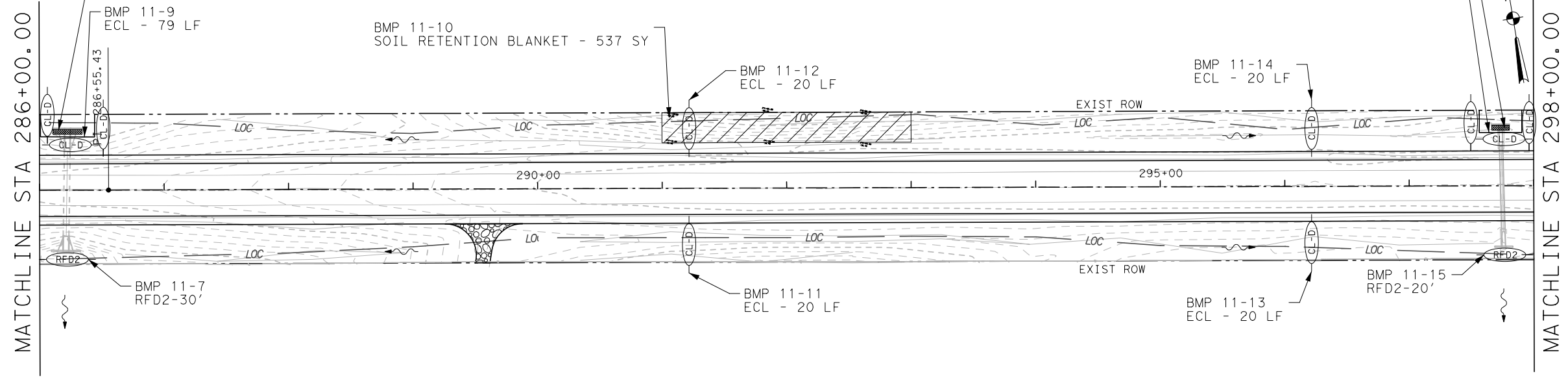
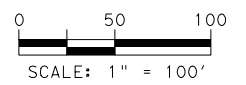
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



**EROSION CONTROL PLAN LAYOUT**  
STA 274+00.00 TO STA 298+00.00

SHEET 11 OF 28



**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 297
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

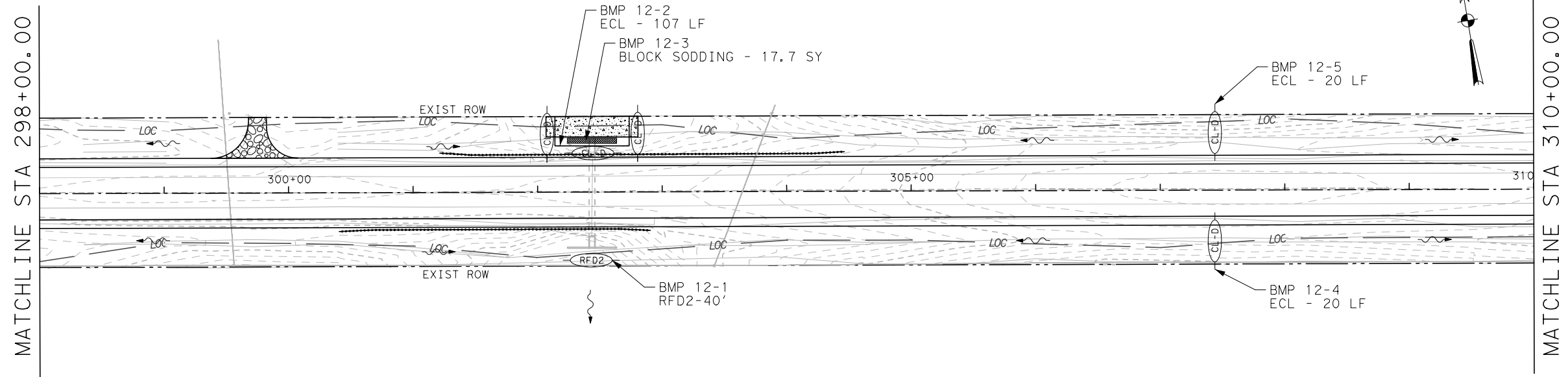
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

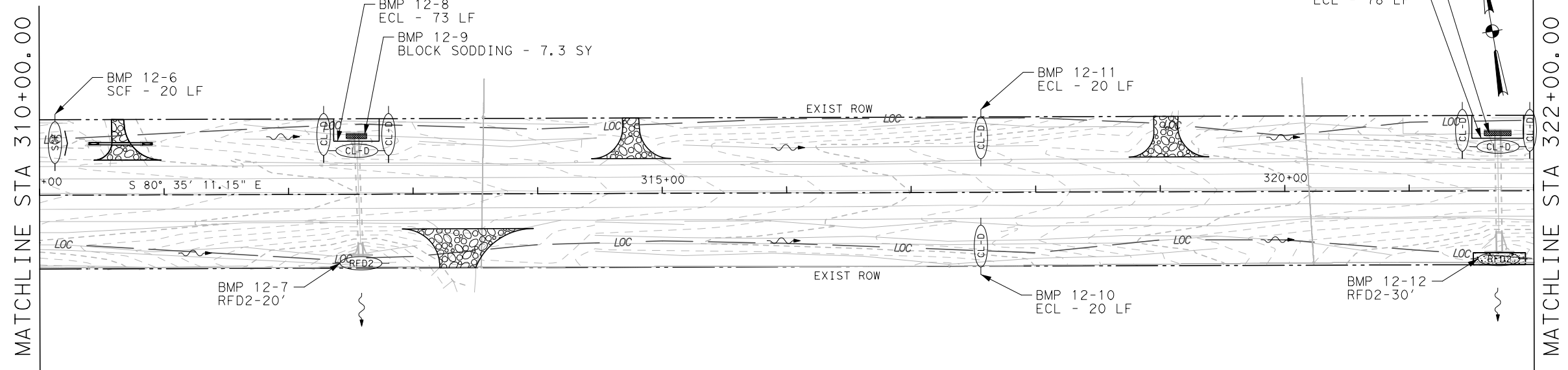
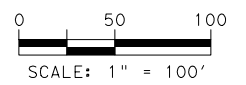
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



**EROSION CONTROL PLAN LAYOUT**  
STA 298+00.00 TO STA 322+00.00

SHEET 12 OF 28



**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 298
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

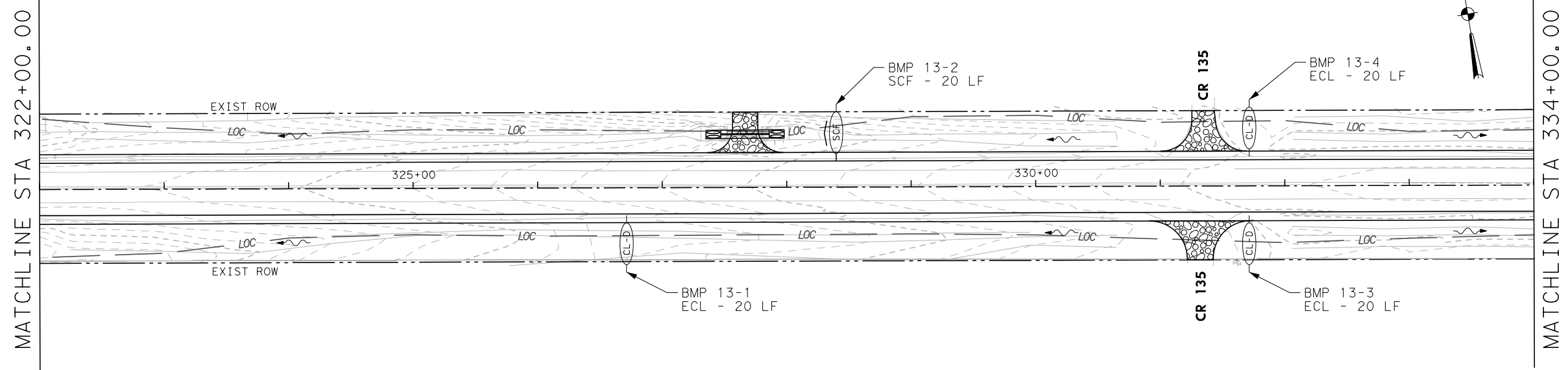
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

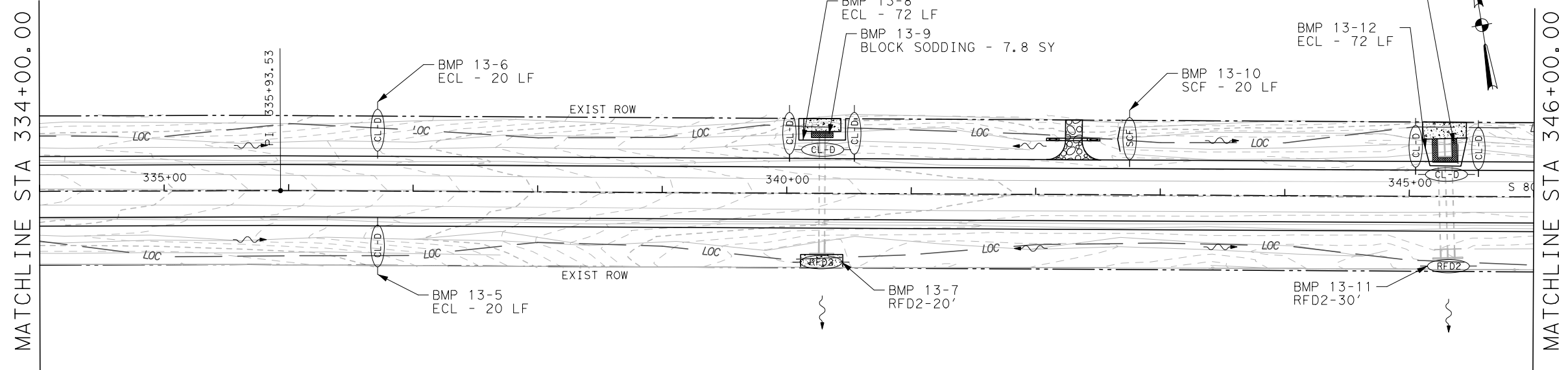
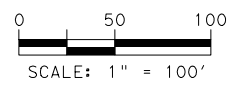
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



**EROSION CONTROL PLAN LAYOUT**  
**STA 322+00.00 TO STA 346+00.00**

SHEET 13 OF 28



**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 299
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

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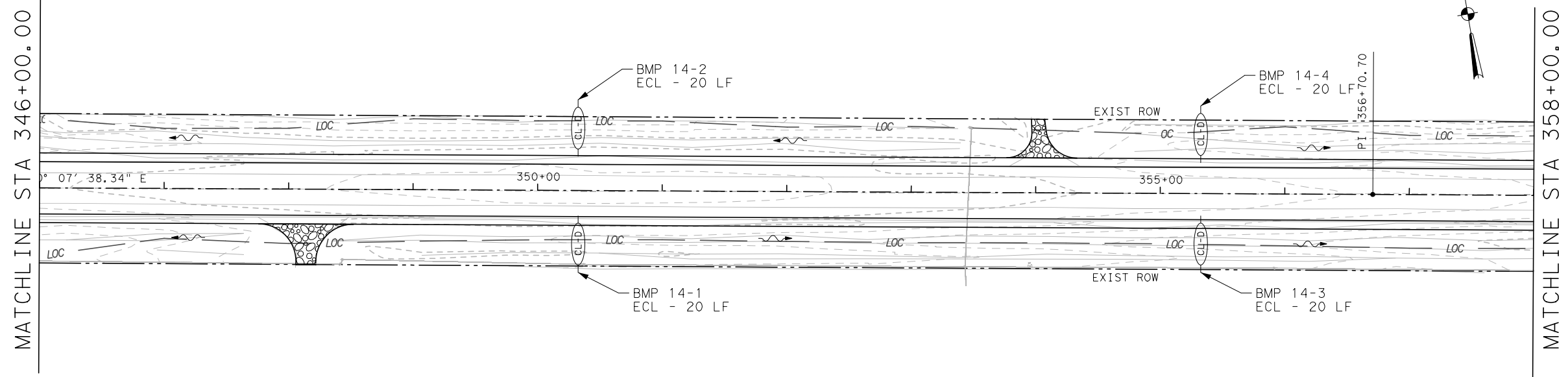


DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

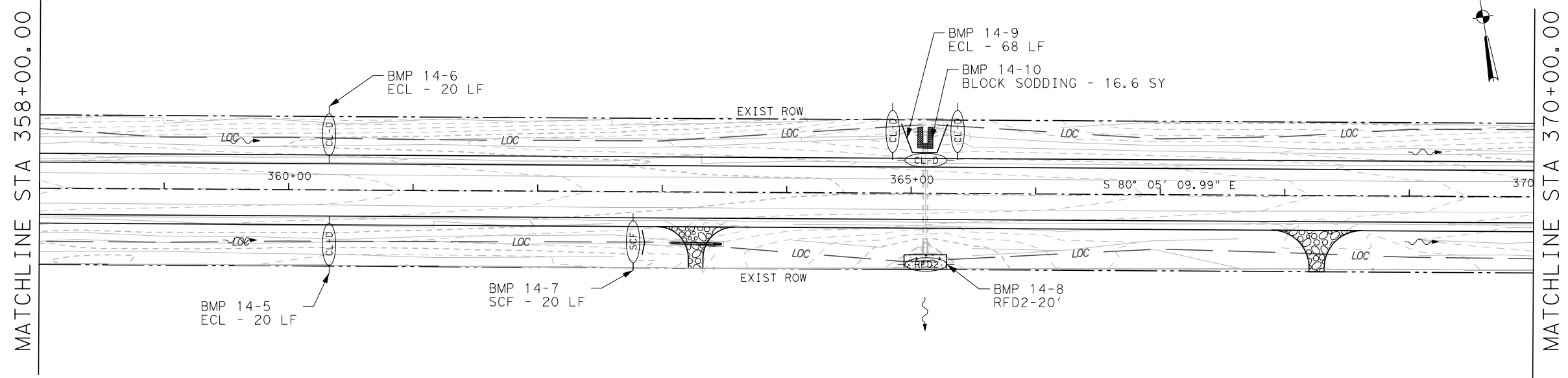
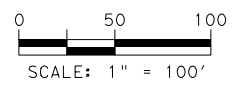
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 346+00.00 TO STA 370+00.00**

SHEET 14 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 300
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

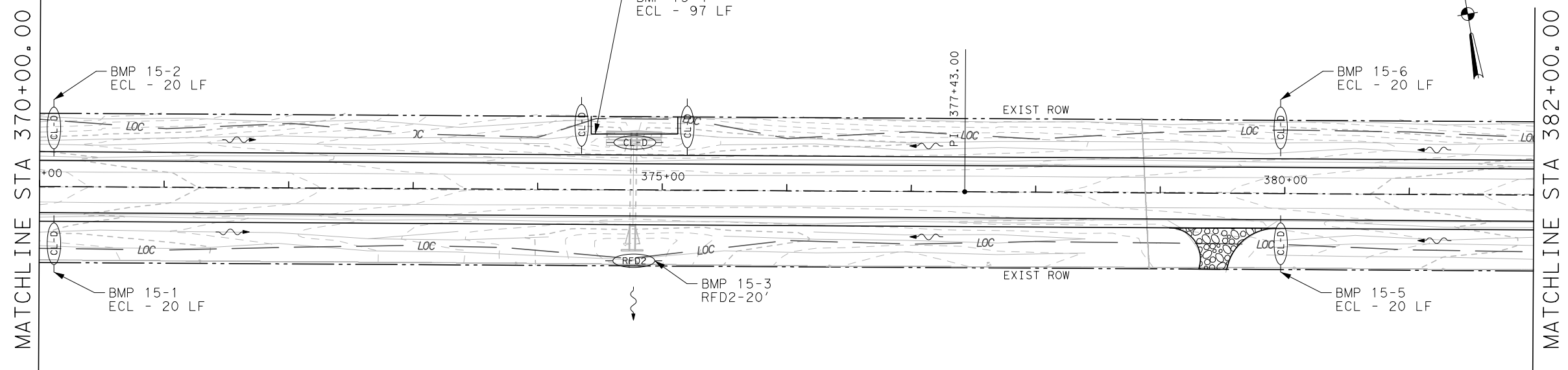
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

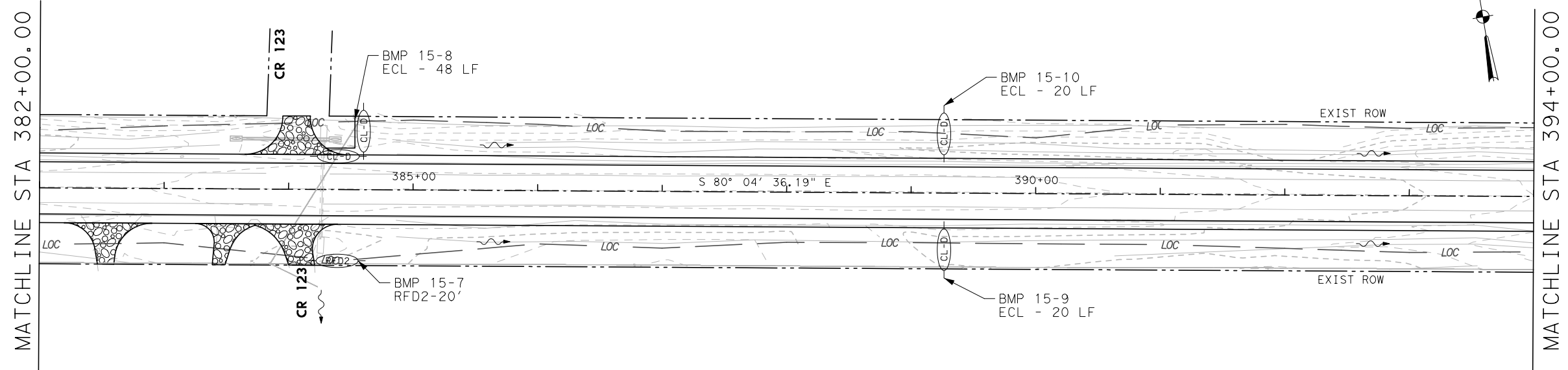
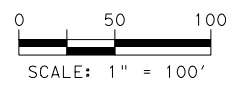
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**LEGEND**

- (SCF)— SEDIMENT CONTROL FENCE
- (CL-D)— EROSION CONTROL LOGS
- (RFD2)— ROCK FILTER DAM TYPE 2
- LOC— LIMITS OF CONSTRUCTION
- ~> DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 370+00.00 TO STA 394+00.00**

SHEET 15 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 301
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

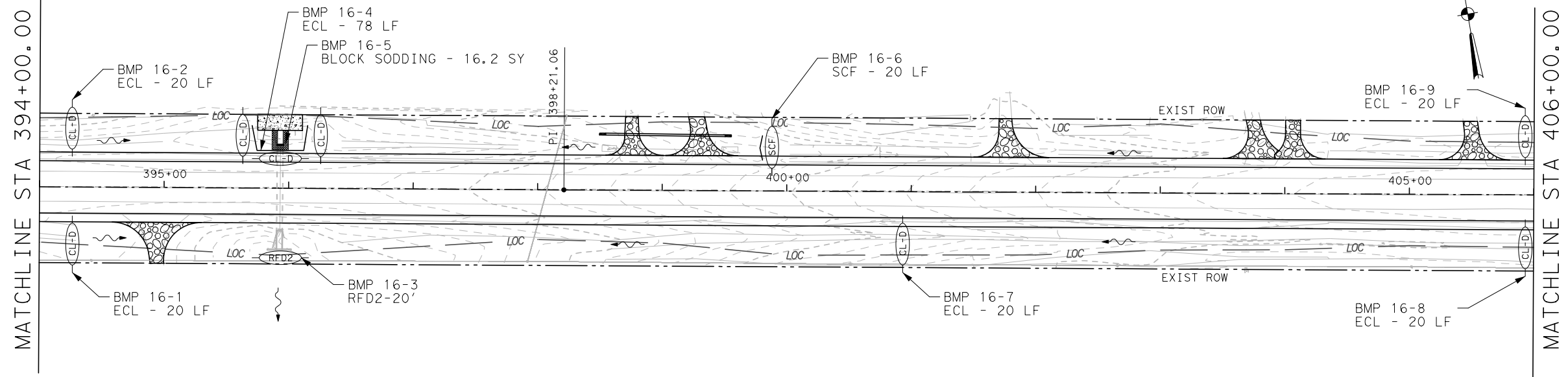
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

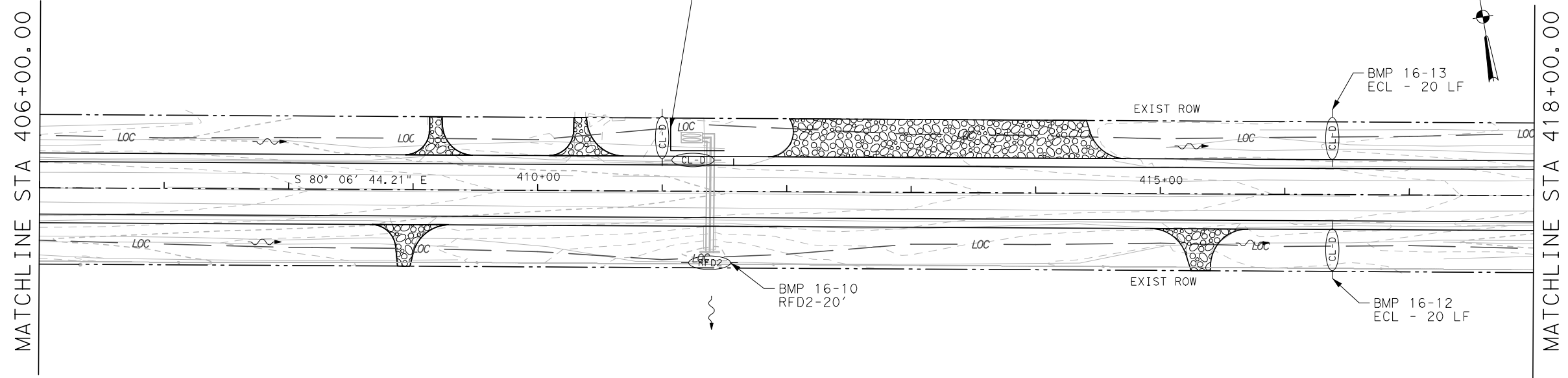
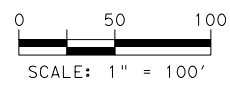
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**LEGEND**

- (SCF)— SEDIMENT CONTROL FENCE
- (CL-D)— EROSION CONTROL LOGS
- (RFD2)— ROCK FILTER DAM TYPE 2
- LOC— LIMITS OF CONSTRUCTION
- >— DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 394+00.00 TO STA 418+00.00

SHEET 16 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 302
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO US 82

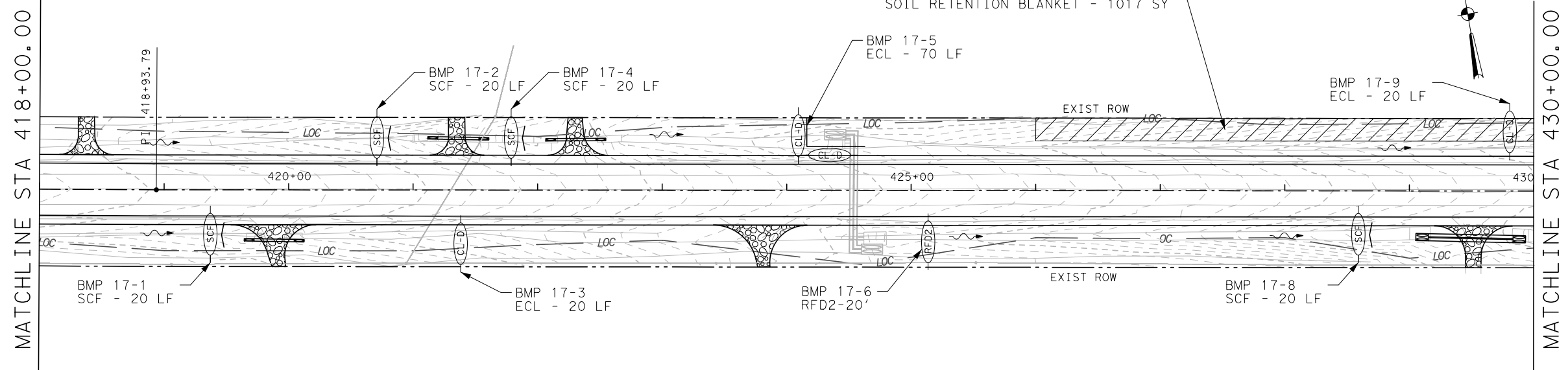
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

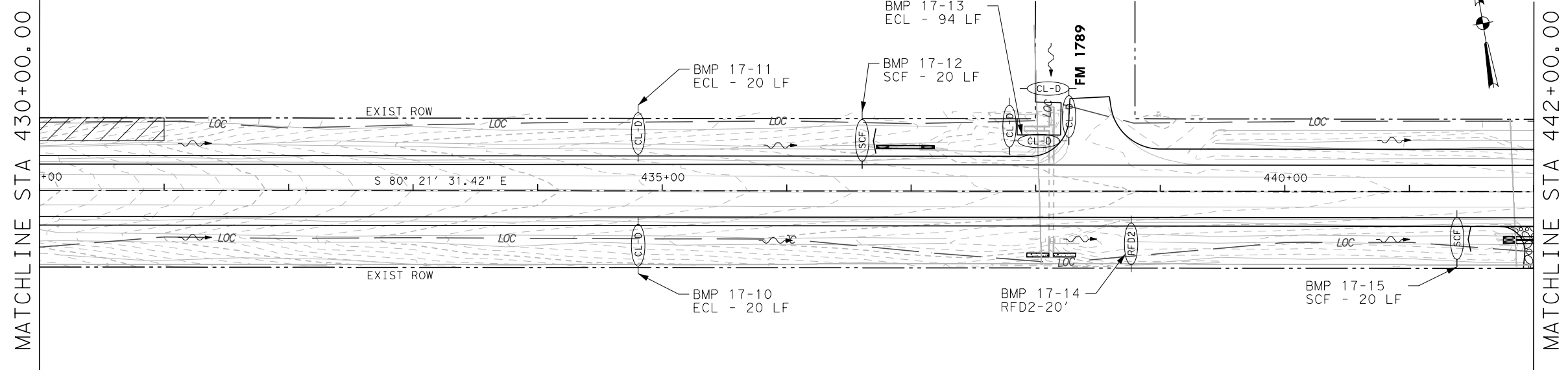
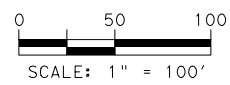
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**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 418+00.00 TO STA 442+00.00**

SHEET 17 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 303
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

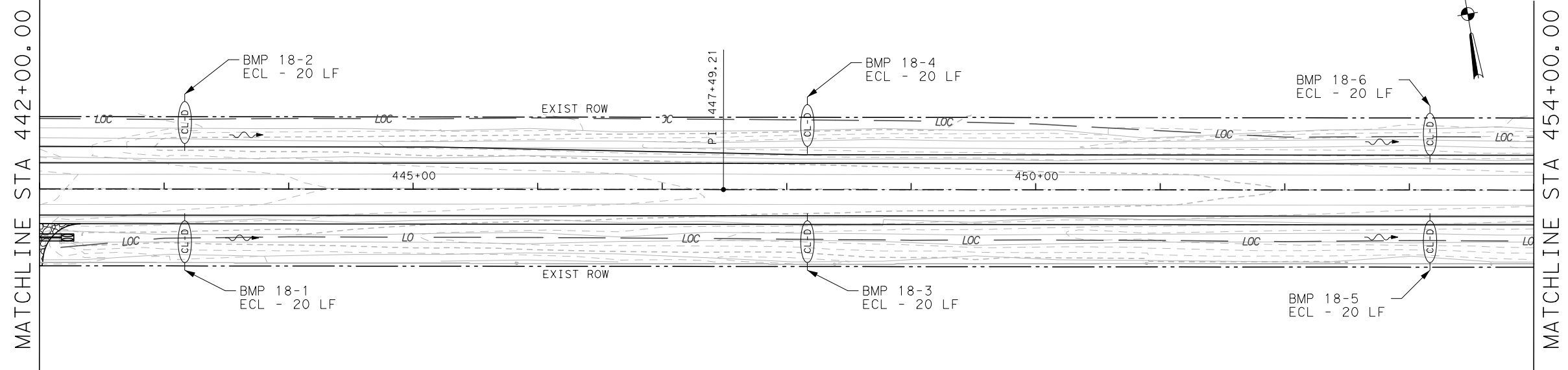
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

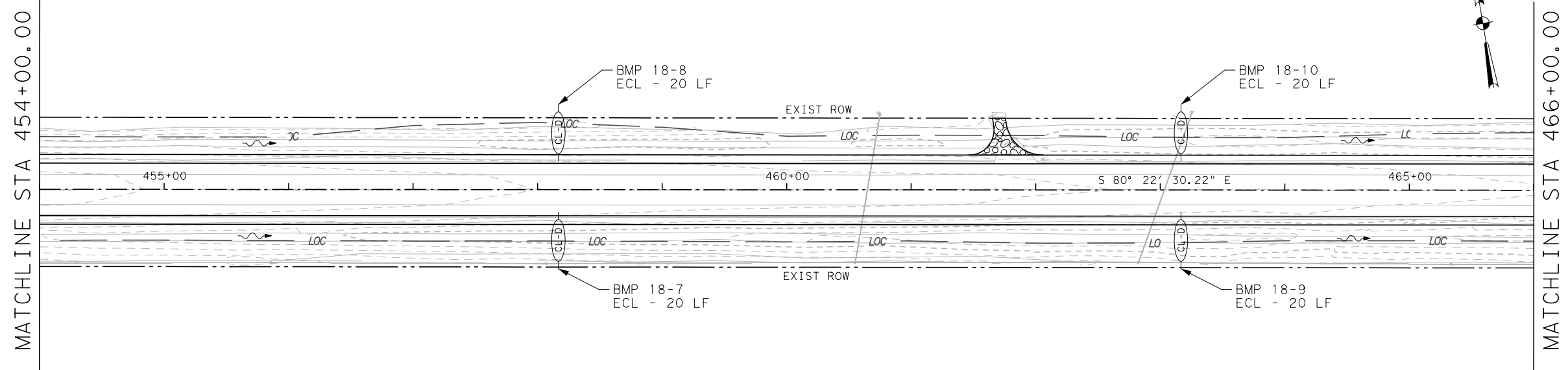
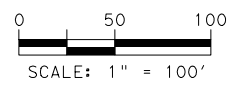
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  - PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 442+00.00 TO STA 466+00.00

SHEET 18 OF 28



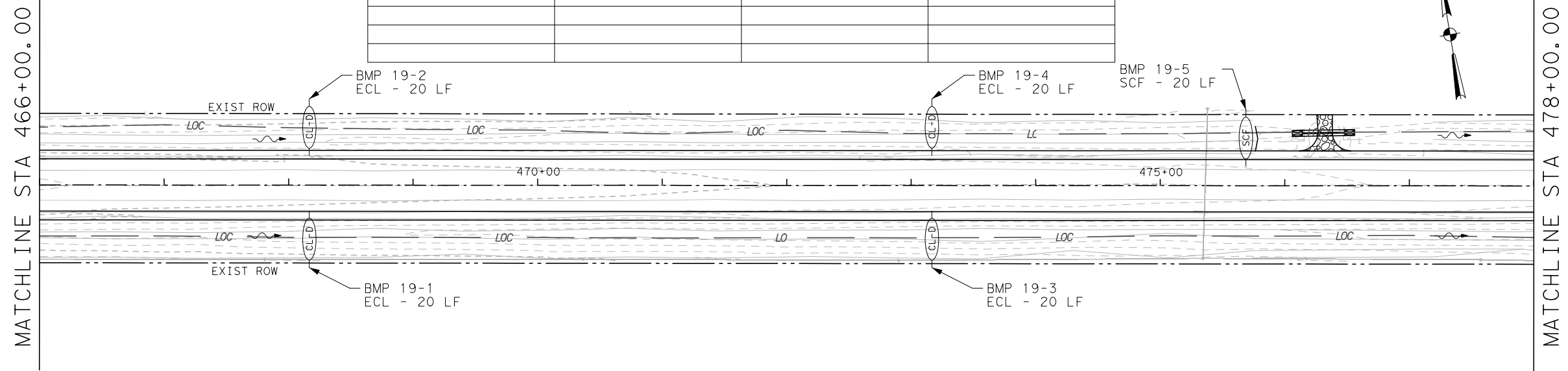
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 304
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

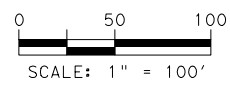
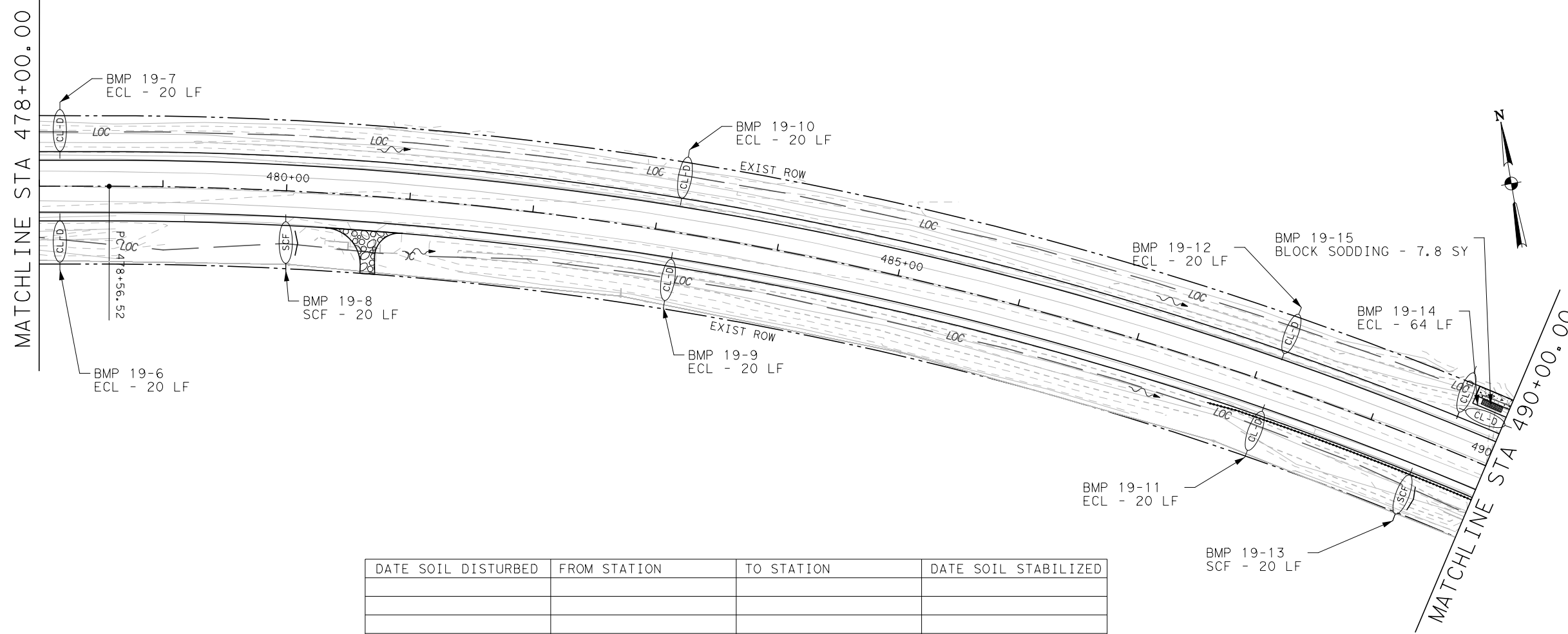


- NOTES:**
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  2. RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  3. PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- (SCF)— SEDIMENT CONTROL FENCE
- (CL-D)— EROSION CONTROL LOGS
- (RFD2)— ROCK FILTER DAM TYPE 2
- LOC— LIMITS OF CONSTRUCTION
- ~> DRAINAGE FLOW ARROWS

BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 466+00.00 TO STA 490+00.00

SHEET 19 OF 28



**HUITT-ZOLLARS**  
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 305
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

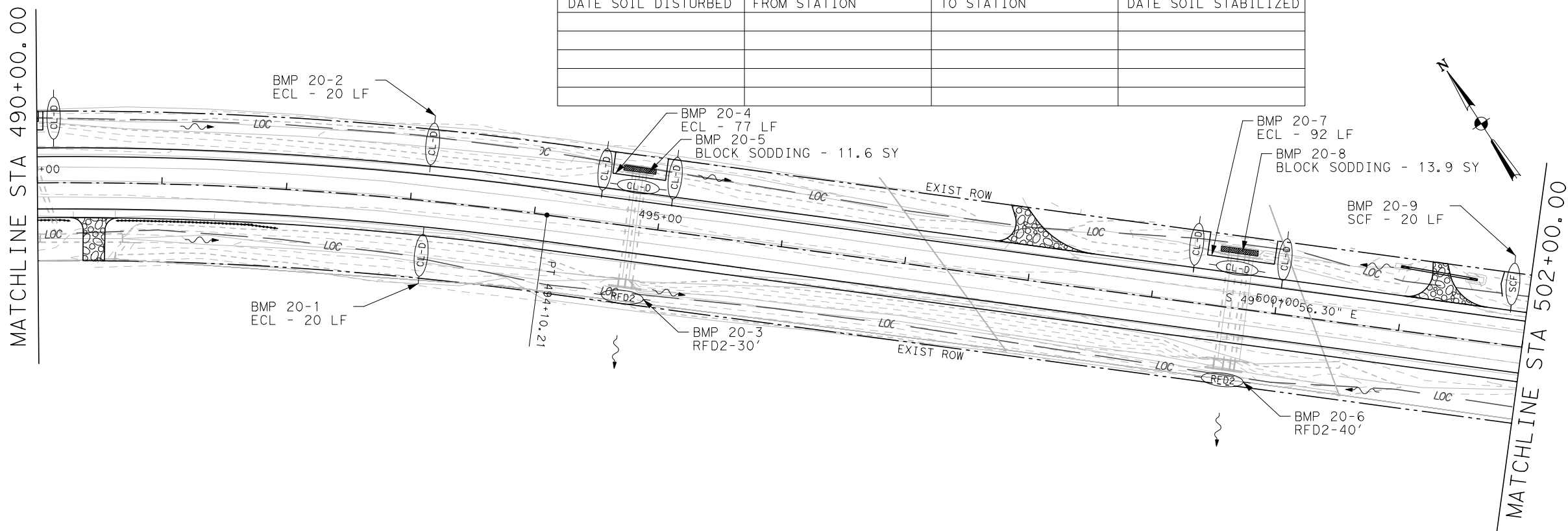
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

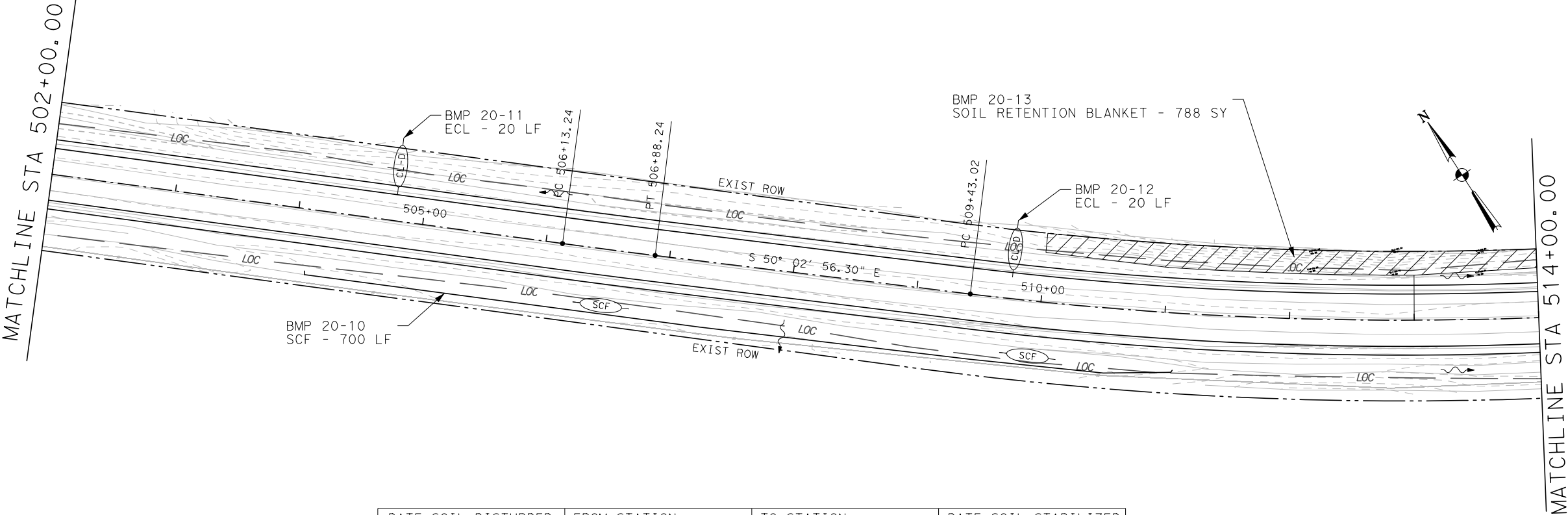
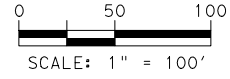
- NOTES:**
- ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  - RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  - PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 490+00.00 TO STA 514+00.00

SHEET 20 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 306
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

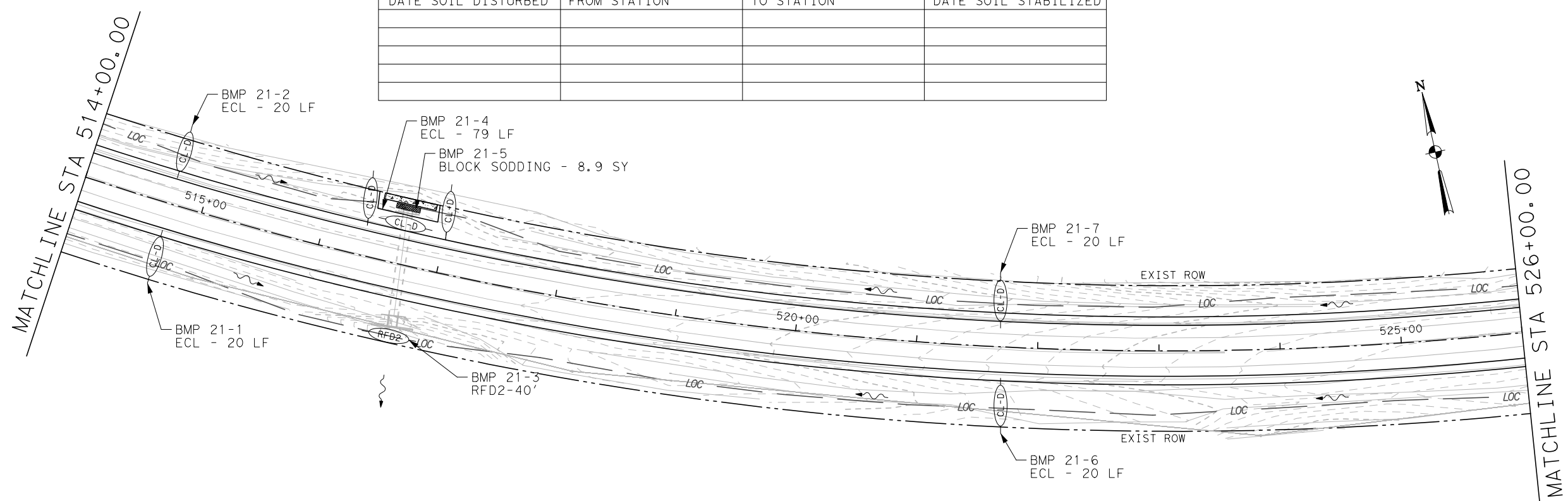
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

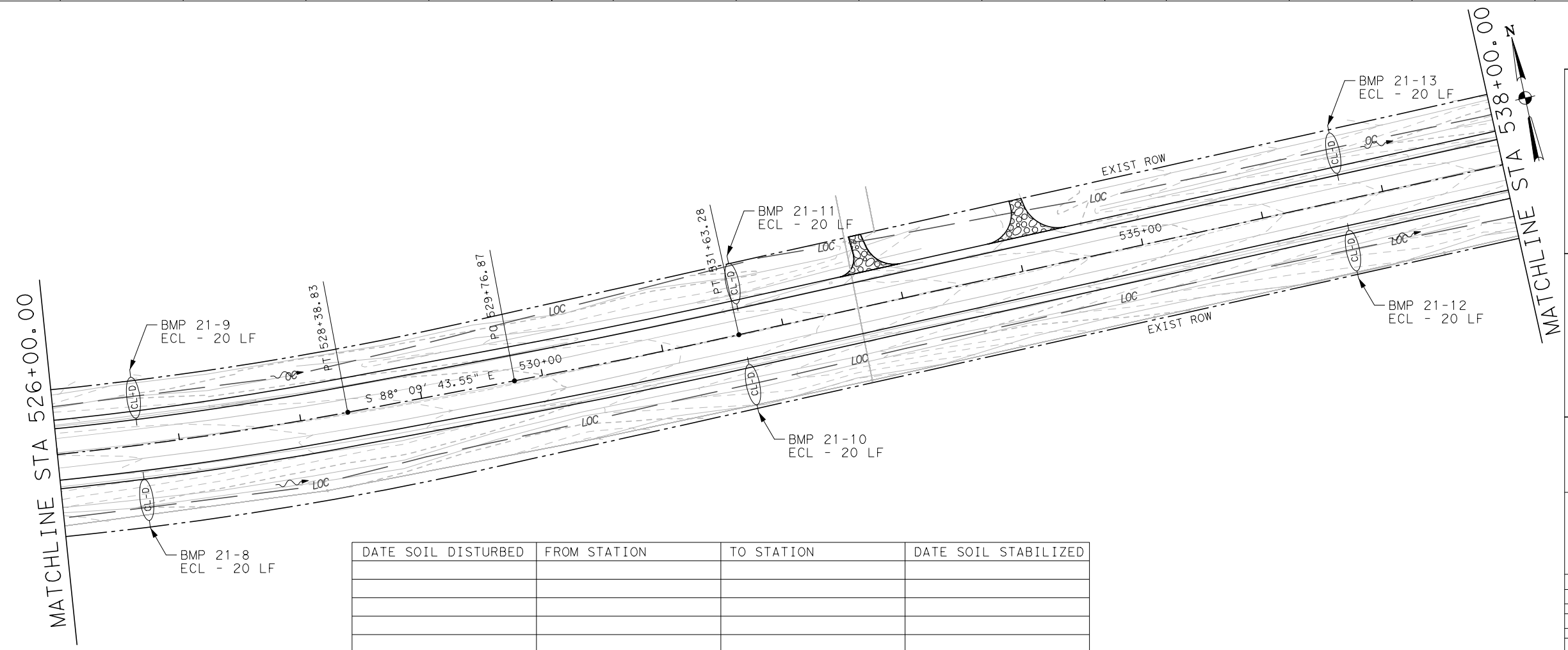
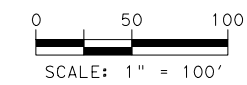
- NOTES:**
- ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  - RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  - PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
STA 514+00.00 TO STA 538+00.00

SHEET 21 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 307
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

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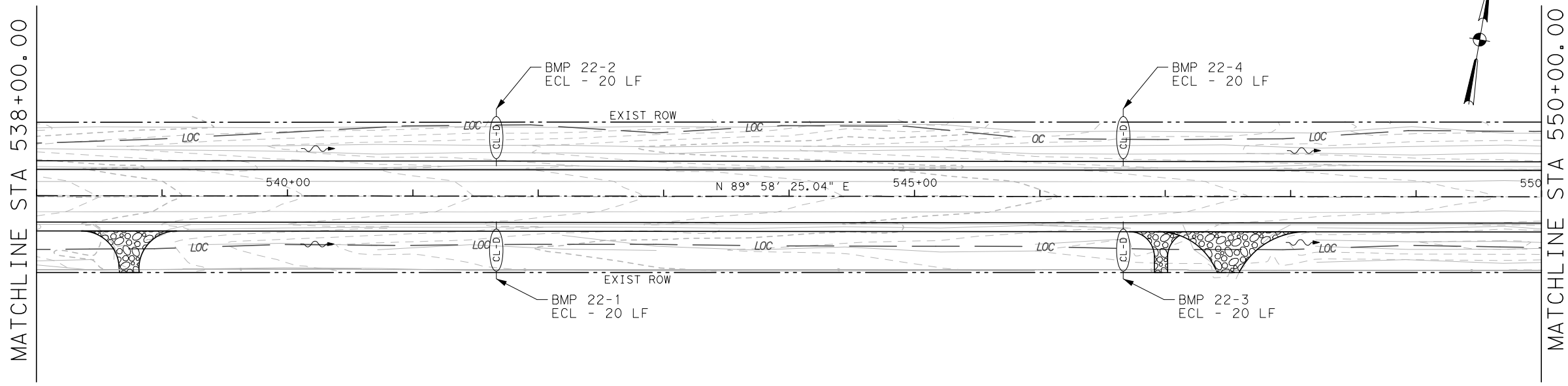


DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

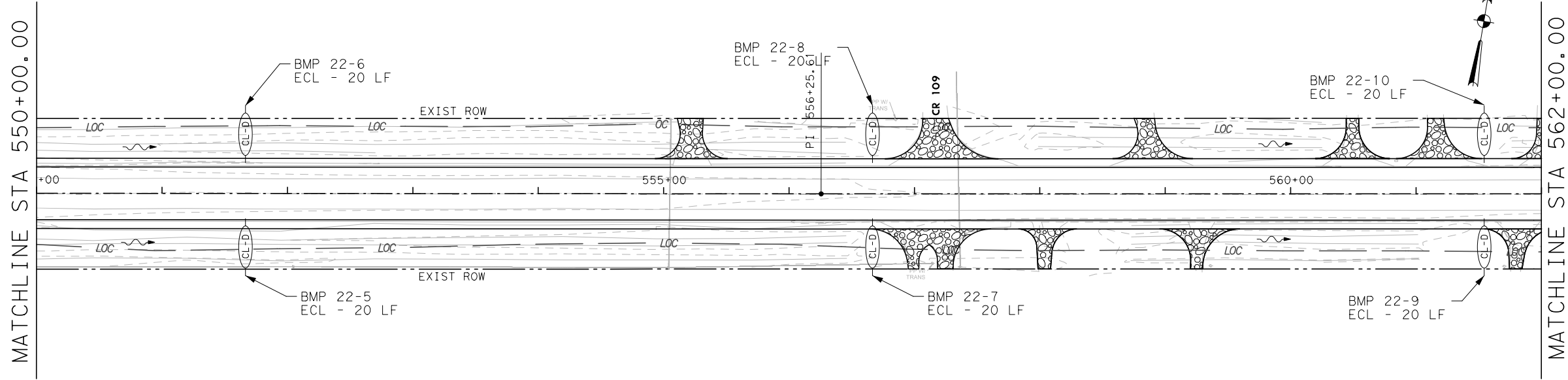
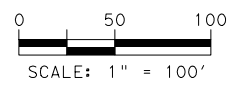
- NOTES:**
- ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  - RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  - PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 538+00.00 TO STA 562+00.00**

SHEET 22 OF 28



**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 308
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

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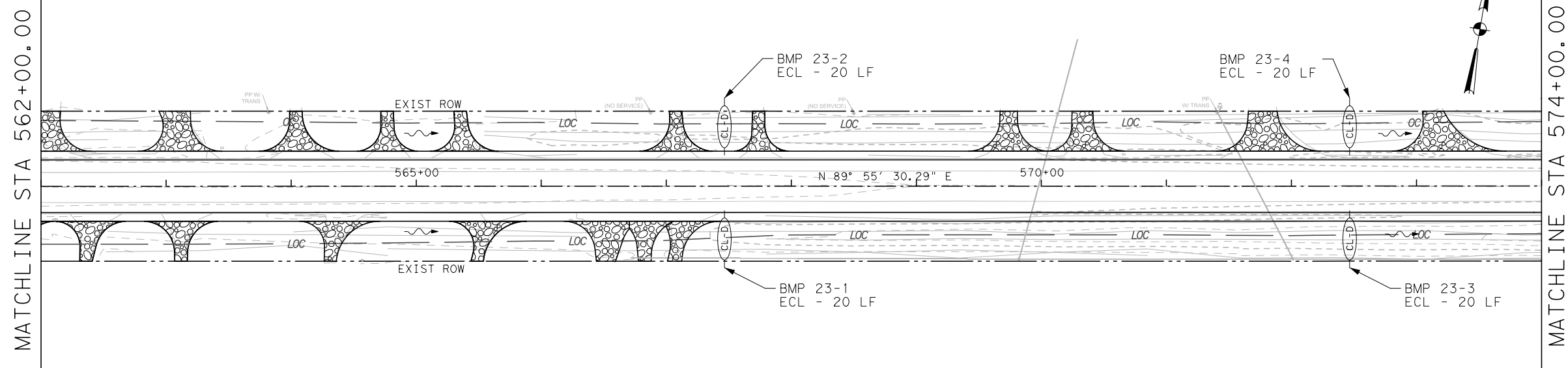
DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

**NOTES:**

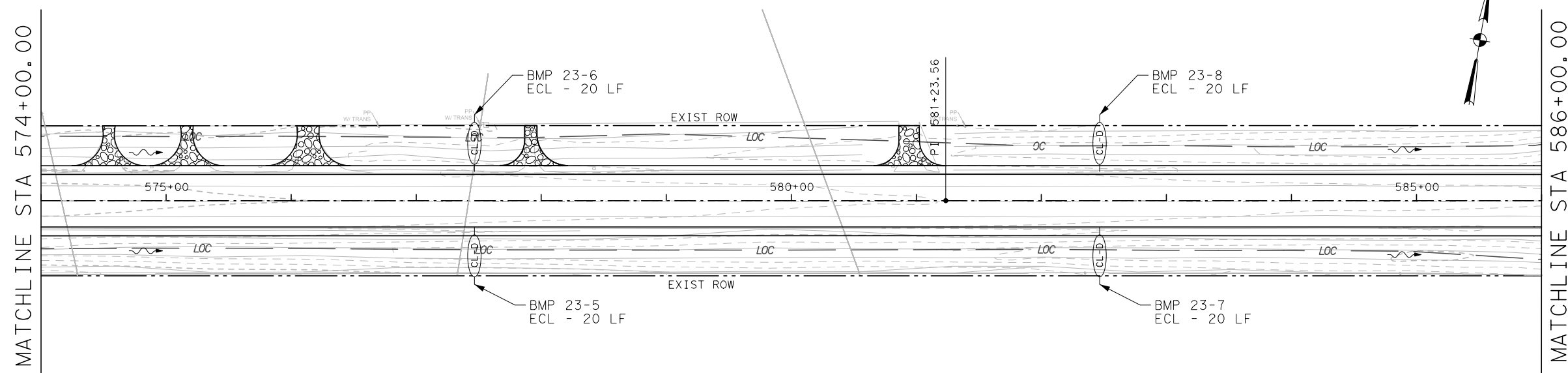
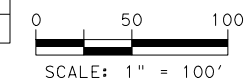
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  2. RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  3. PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- (SCF)— SEDIMENT CONTROL FENCE
- (CL-D)— EROSION CONTROL LOGS
- (RFD2)— ROCK FILTER DAM TYPE 2
- LOC— LIMITS OF CONSTRUCTION
- ~> DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 562+00.00 TO STA 586+00.00**

SHEET 23 OF 28



**HUITT-ZOLLARS**

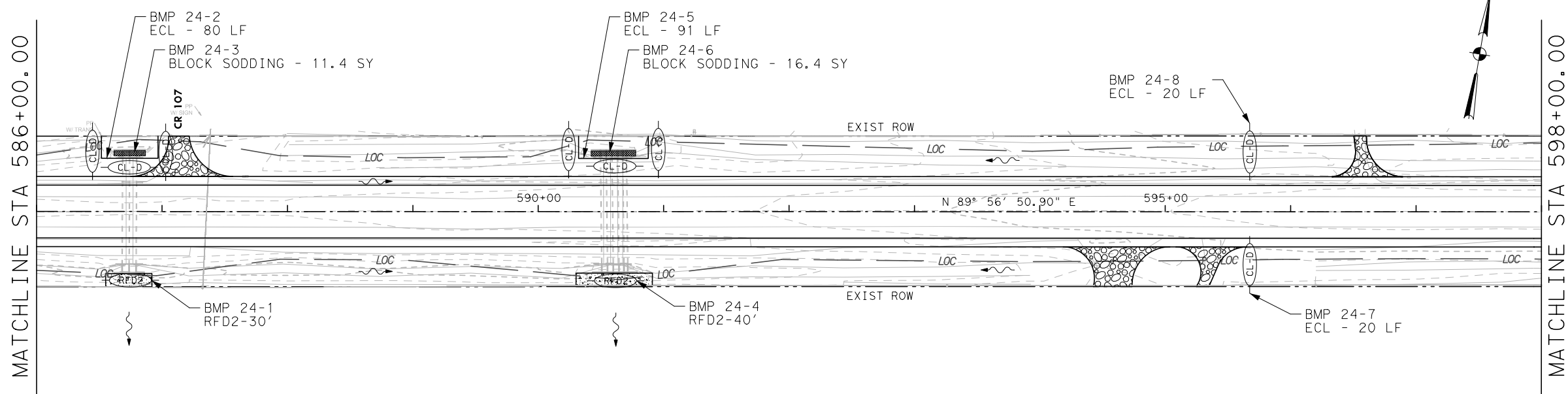
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 309
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

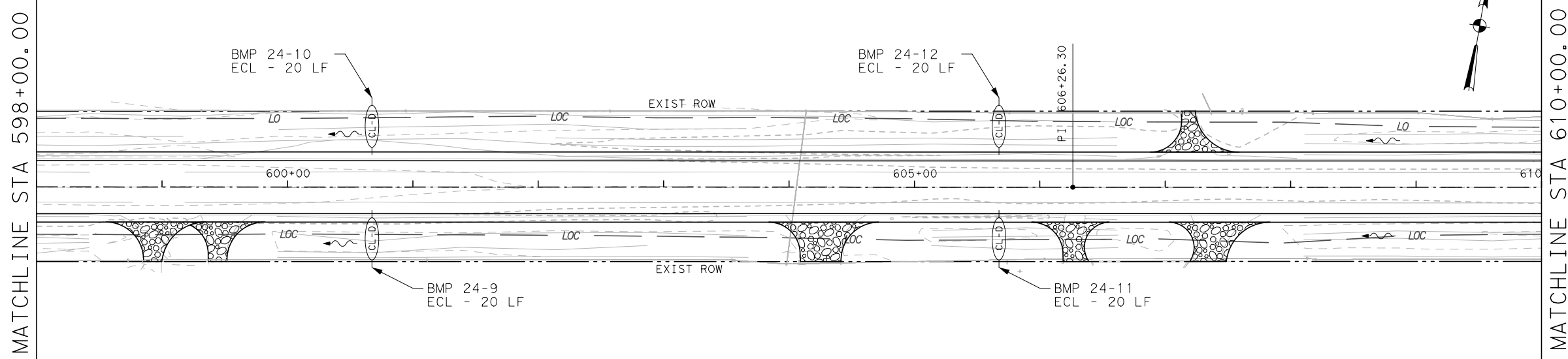
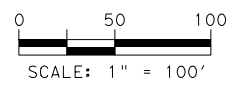
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

- NOTES:**
- ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  - RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  - PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

**EROSION CONTROL PLAN LAYOUT**  
**STA 586+00.00 TO STA 610+00.00**

SHEET 24 OF 28



**HUITT-ZOLLARS**  
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 310
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042
		HIGHWAY NO. US 82

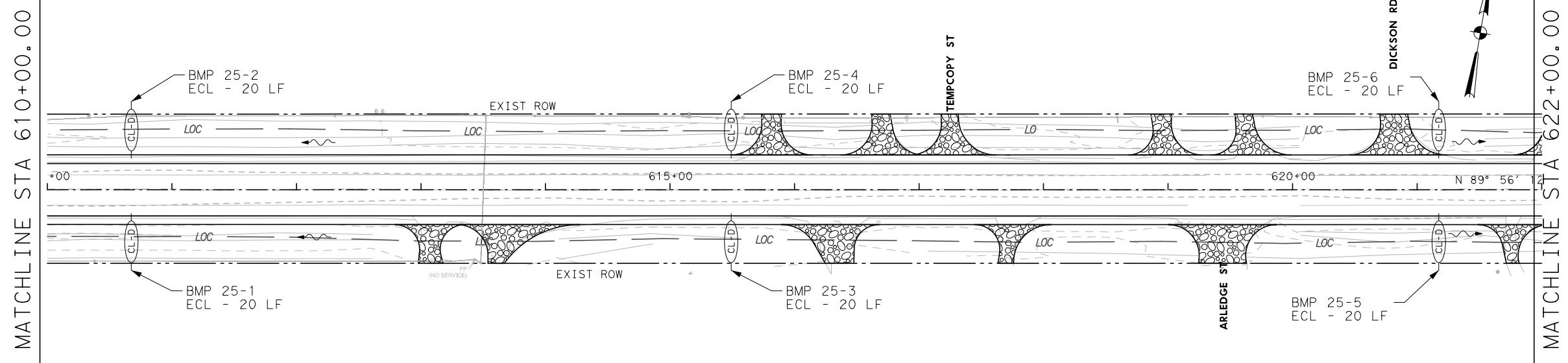
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

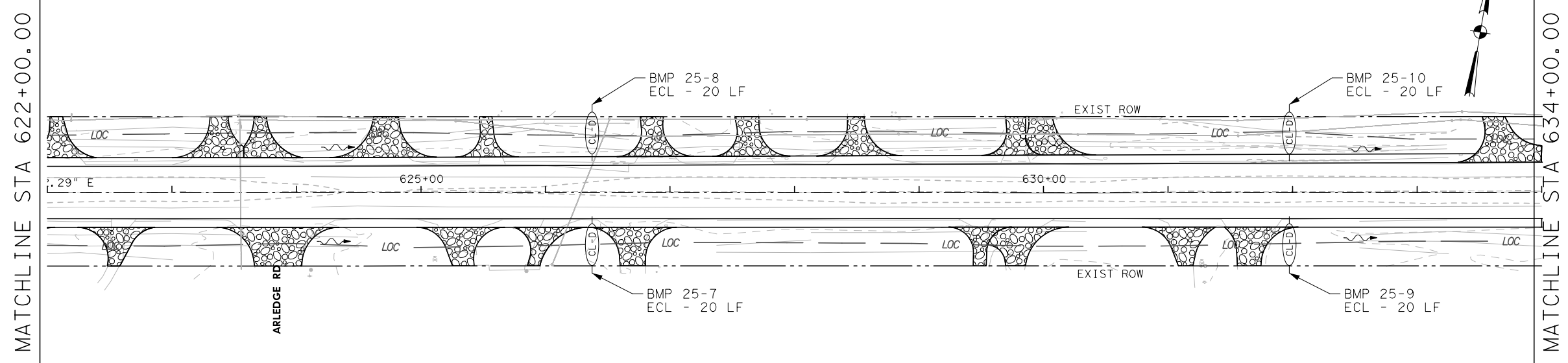
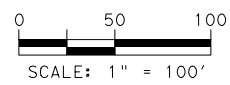
- NOTES:**
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  2. RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  3. PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- (SCF)— SEDIMENT CONTROL FENCE
- (CL-D)— EROSION CONTROL LOGS
- (RFD2)— ROCK FILTER DAM TYPE 2
- LOC— LIMITS OF CONSTRUCTION
- >— DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 610+00.00 TO STA 634+00.00**

SHEET 25 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 311
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

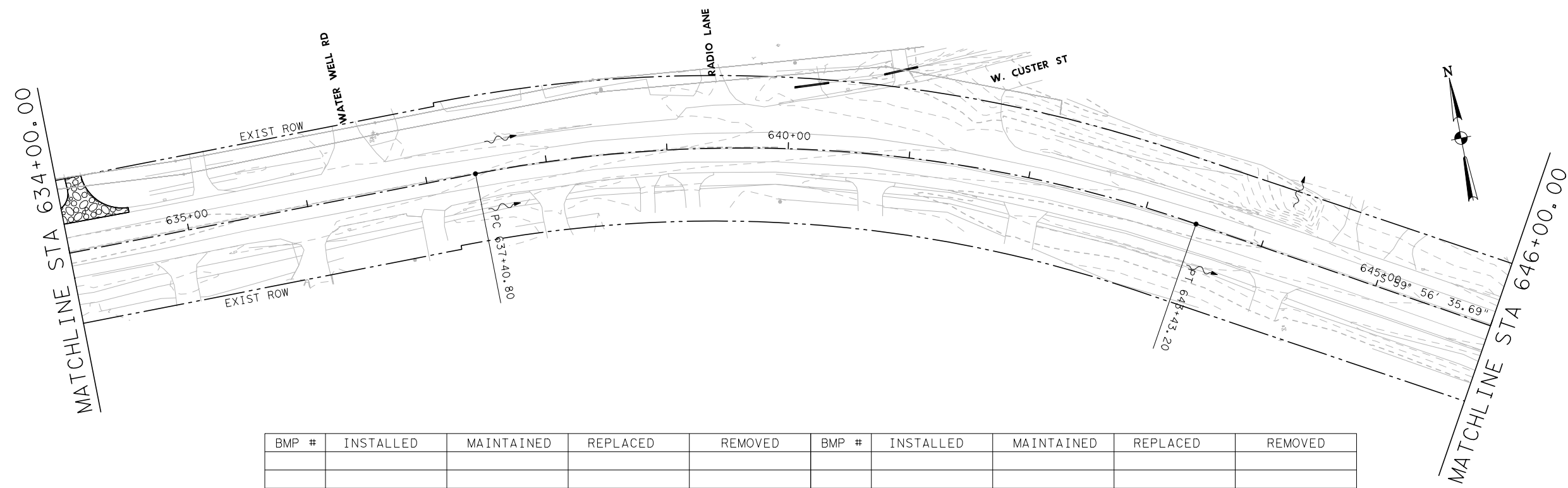
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DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

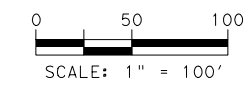
- NOTES:**
- ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  - RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  - PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 634+00.00 TO STA 658+00.00**

SHEET 26 OF 28



**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 312
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR
CONT 0133	SECT 04	JOB 042 HIGHWAY NO. US 82

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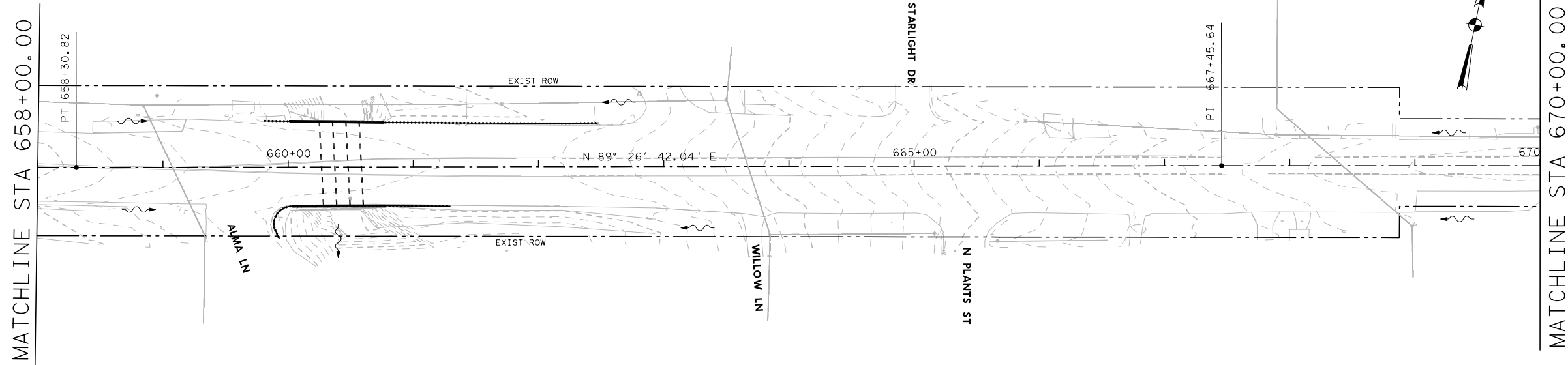
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**NOTES:**

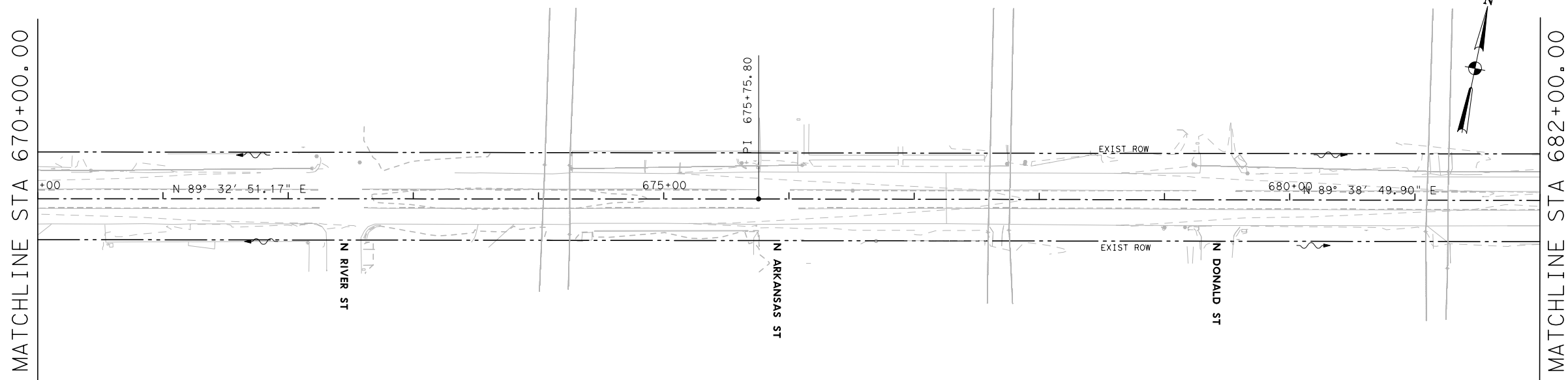
1. ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  2. RFDs MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  3. PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOGS
- ROCK FILTER DAM TYPE 2
- LIMITS OF CONSTRUCTION
- DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

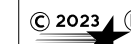


12/14/2020

**EROSION CONTROL PLAN LAYOUT**

STA 658+00.00 TO STA 682+00.00

SHEET 27 OF 28



Texas Department of Transportation

**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
FIRM NO. F-761

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 313	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO US 82





DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED

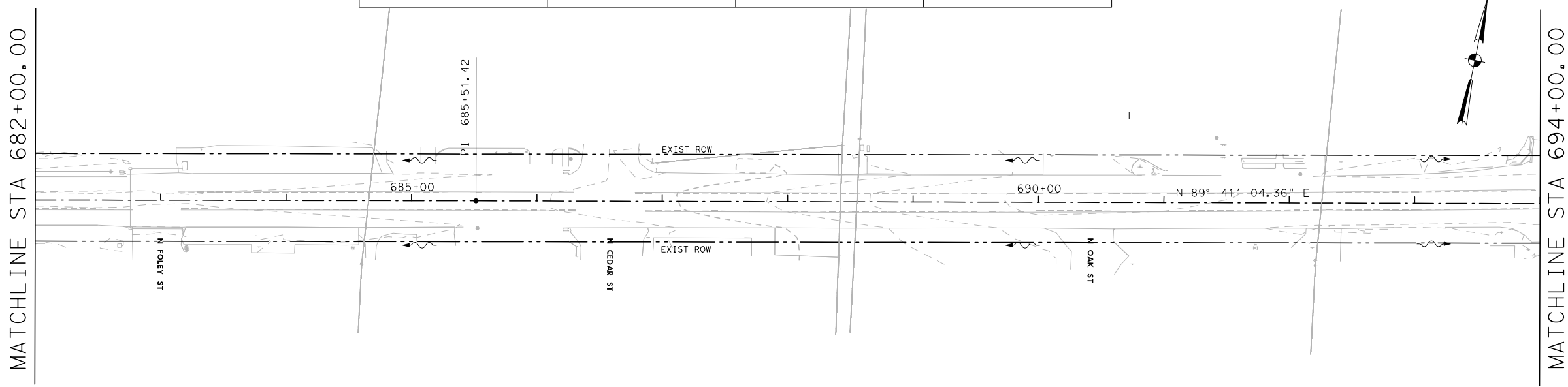
MATCHLINE STA 682+00.00

MATCHLINE STA 694+00.00

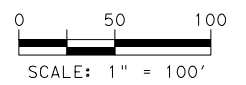
- NOTES:**
- ALL STATIONS ARE BASELINE STATIONS UNLESS OTHERWISE NOTED.
  - RFDS MUST BE REMOVED ONCE 90% NATIVE VEGETATION HAS BEEN ESTABLISHED.
  - PRESERVATION OF NATURAL VEGETATION BUFFERS MAY NOT BE DISTURBED UNLESS AS DIRECTED.
- EROSION CONTROL QUANTITIES LISTED ARE APPROXIMATE AND MAY NEED TO BE VARIED TO MEET FIELD CONDITIONS.

**LEGEND**

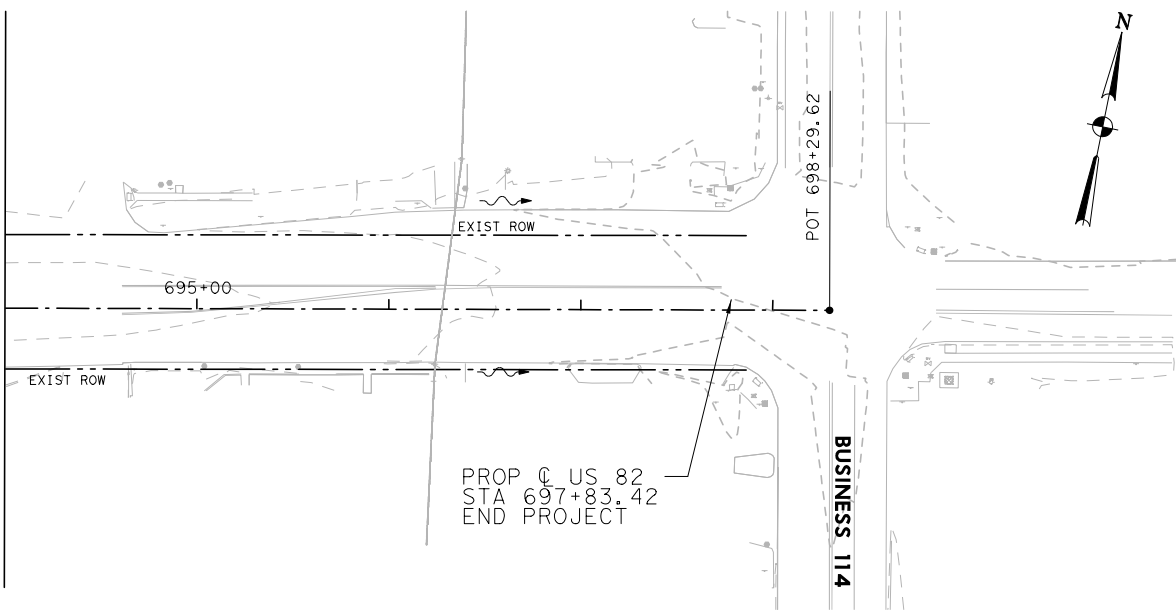
-  SEDIMENT CONTROL FENCE
-  EROSION CONTROL LOGS
-  ROCK FILTER DAM TYPE 2
-  DRAINAGE FLOW ARROWS



BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED	BMP #	INSTALLED	MAINTAINED	REPLACED	REMOVED



MATCHLINE STA 694+00.00



DATE SOIL DISTURBED	FROM STATION	TO STATION	DATE SOIL STABILIZED



12/14/2020

**EROSION CONTROL PLAN LAYOUT**  
**STA 682+00.00 TO STA 699+12.33**

SHEET 28 OF 28



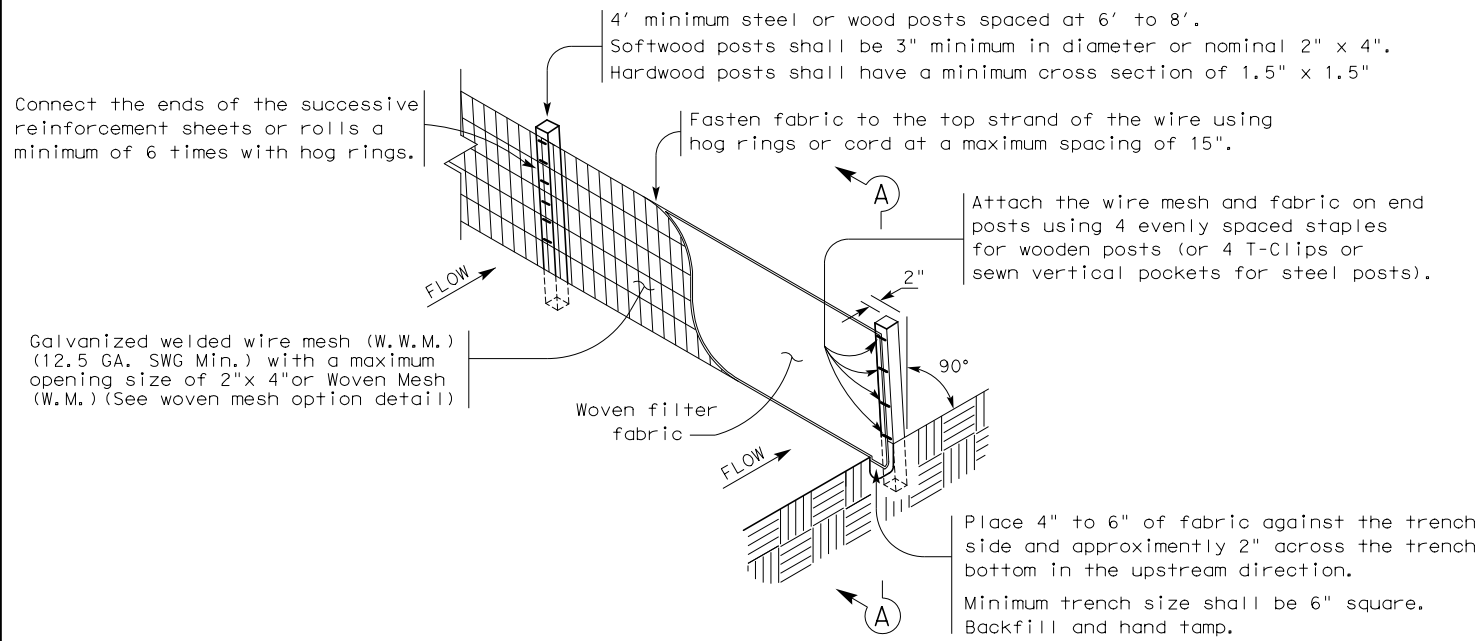
**HUITT-ZOLLARS**

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING  
 3701 EXECUTIVE CENTER DR. - SUITE 101 - AUSTIN, TX 78731  
 FIRM NO. F-761

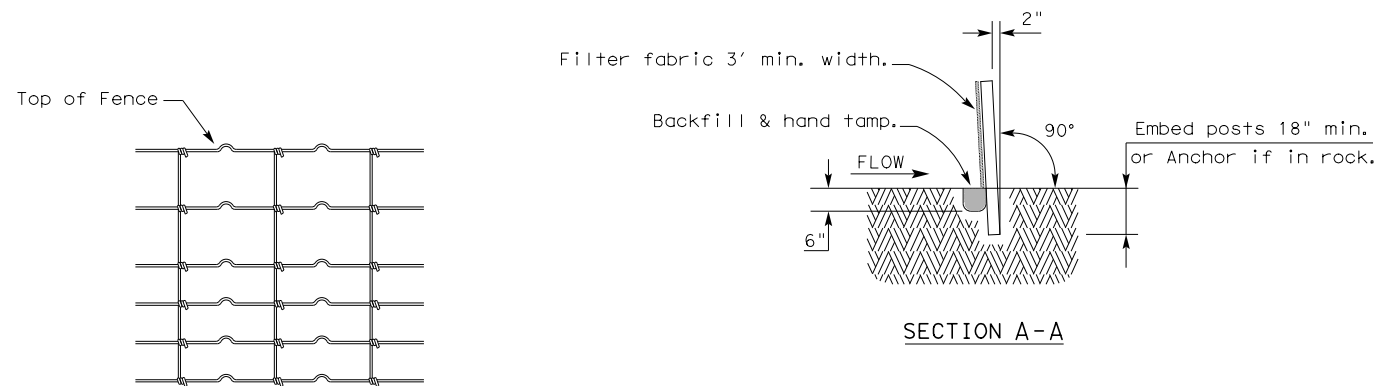
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO.	SHEET NO. 314	
STATE TEXAS	DISTRICT WFS	COUNTY BAYLOR	
CONT 0133	SECT 04	JOB 042	HIGHWAY NO. US 82

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DATE  
FILE



TEMPORARY SEDIMENT CONTROL FENCE



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

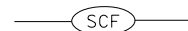
**SEDIMENT CONTROL FENCE USAGE GUIDELINES**

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

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

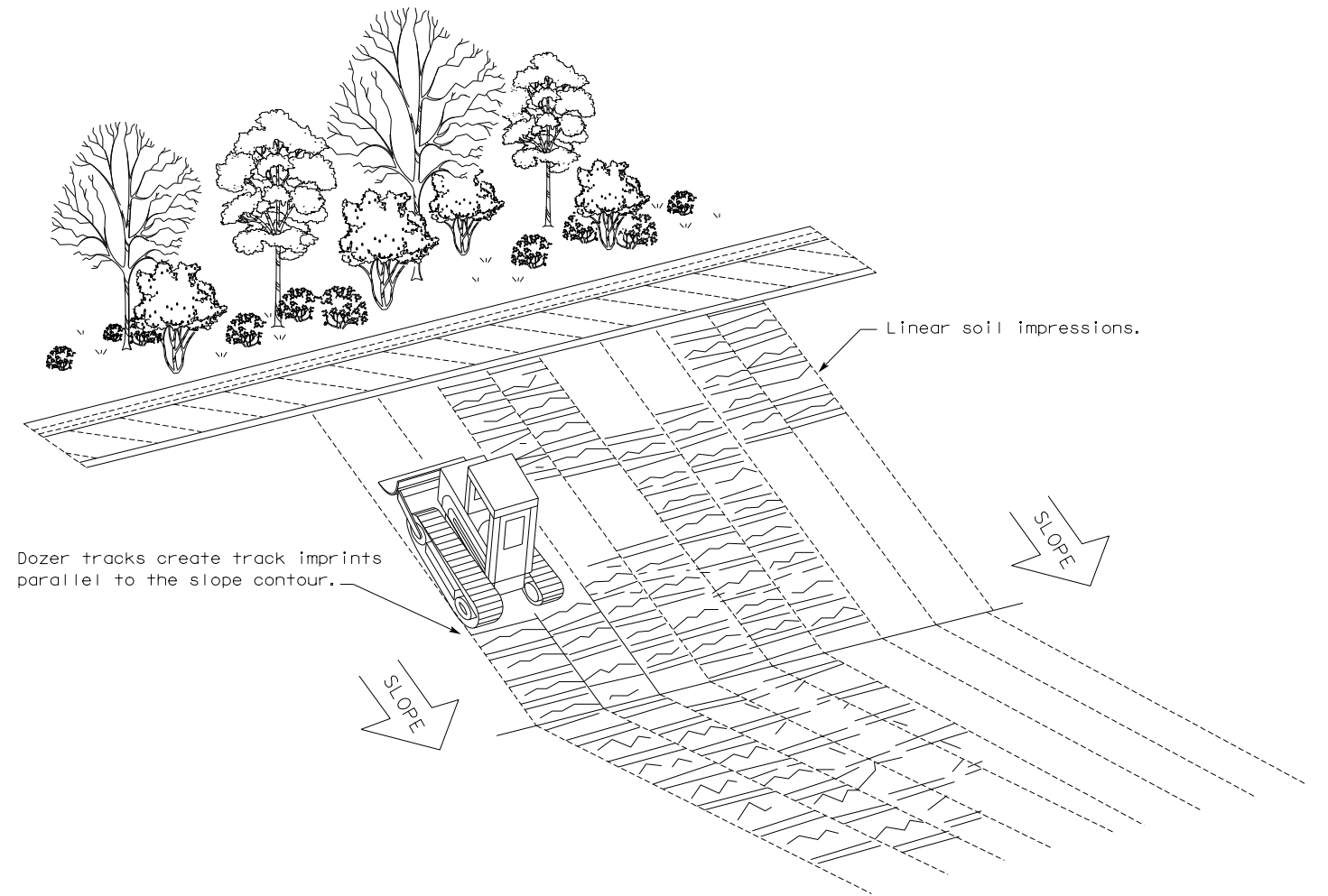
**LEGEND**

Sediment Control Fence



**GENERAL NOTES**

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



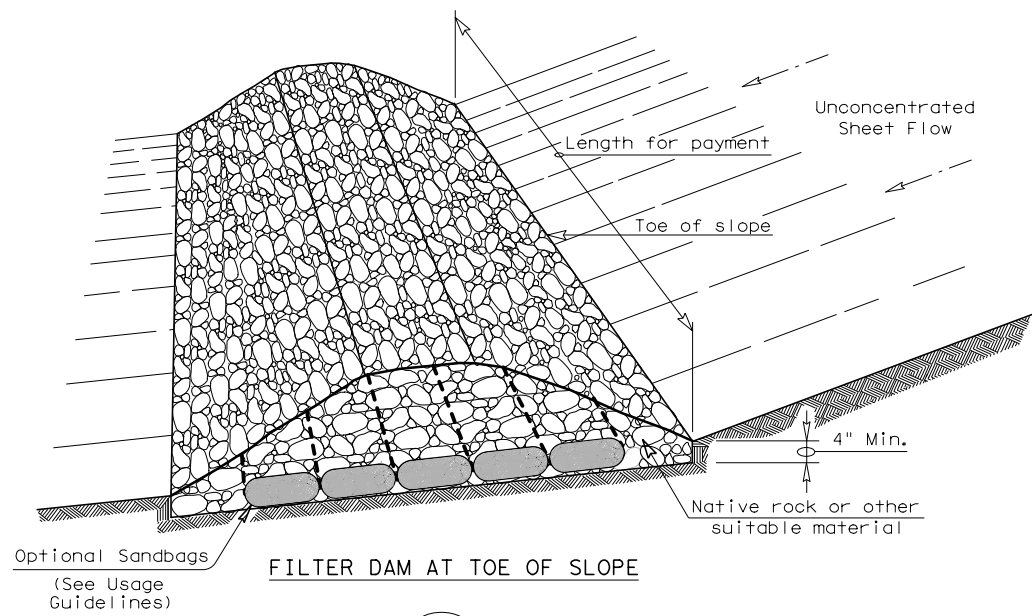
VERTICAL TRACKING

				<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE &amp; VERTICAL TRACKING</b> <b>EC(1)-16</b>					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS		0133	04	042	US 82
	DIST	COUNTY		SHEET NO.	
	WFS	BAYLOR		315	



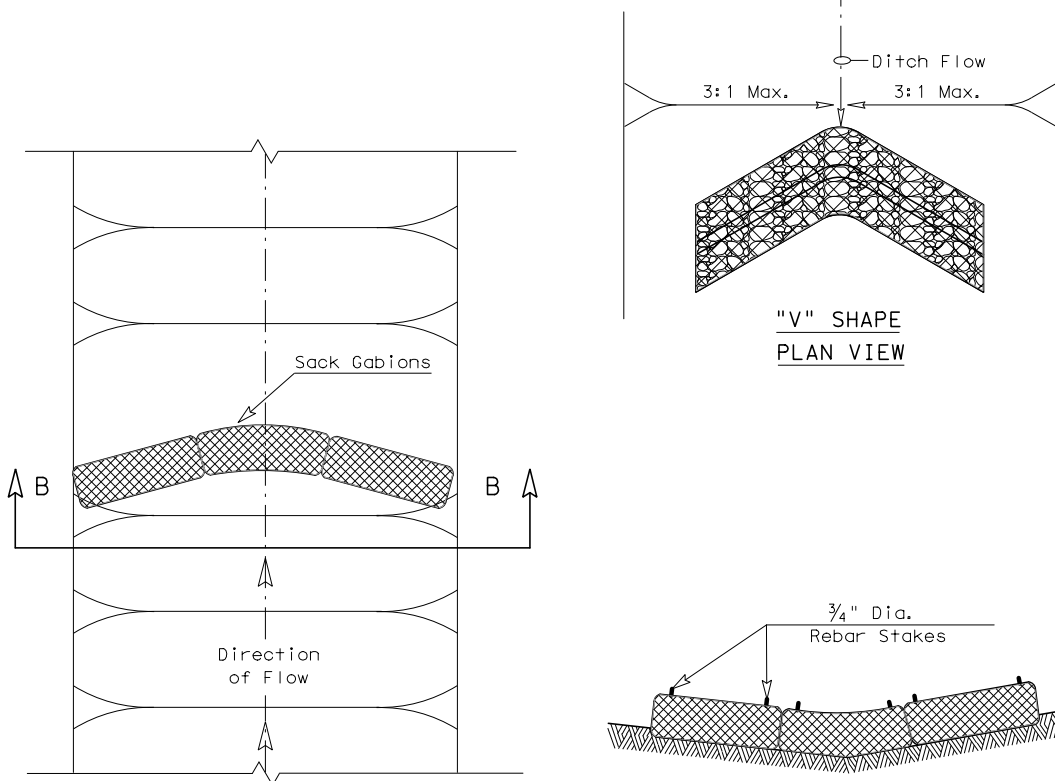
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DATE: FILE:



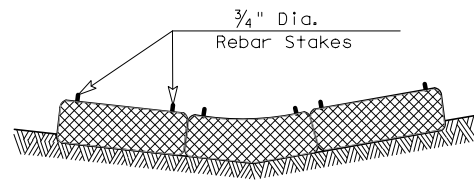
FILTER DAM AT TOE OF SLOPE

(RFD1)

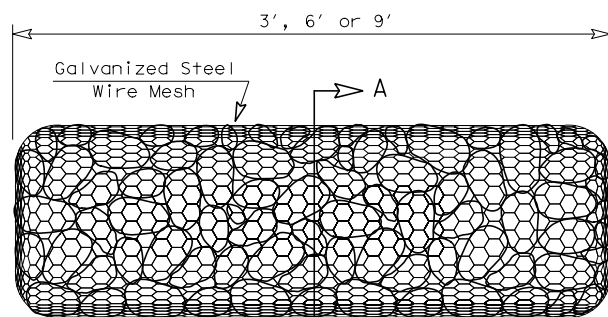


"V" SHAPE PLAN VIEW

PLAN VIEW

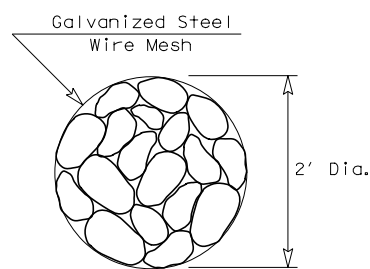


SECTION B-B

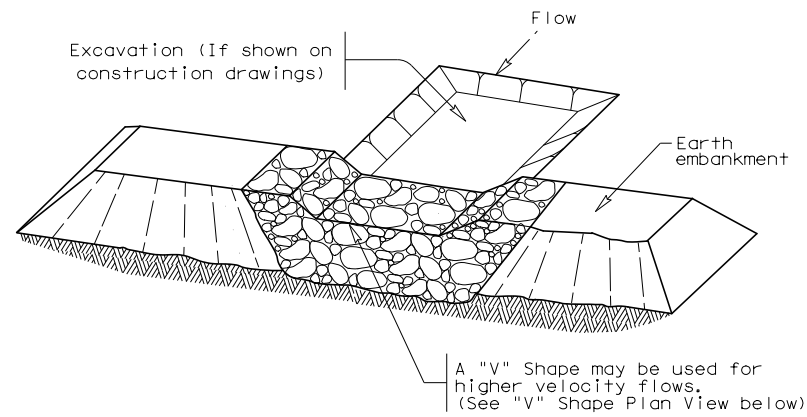


TYPE 4 (SACK GABIONS)

(RFD4)

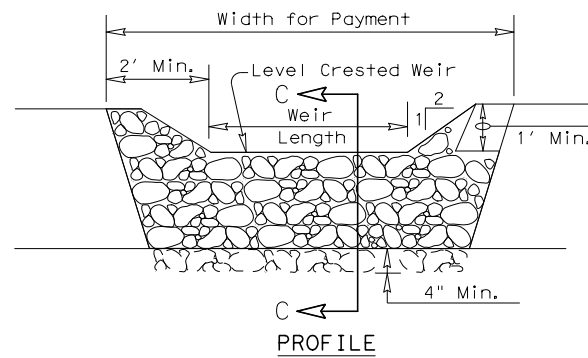


SECTION A-A

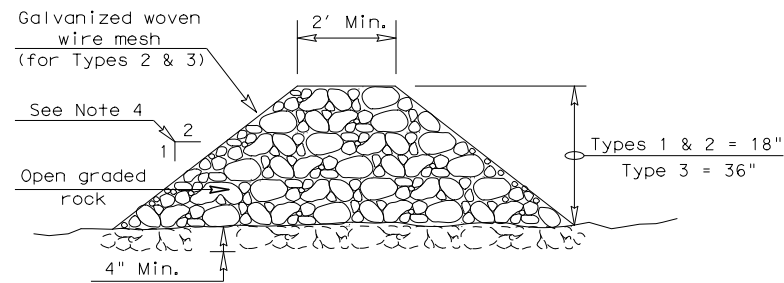


FILTER DAM AT SEDIMENT TRAP

(RFD2) OR (RFD2)



PROFILE



SECTION C-C

**ROCK FILTER DAM USAGE GUIDELINES**

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT<sup>2</sup> of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

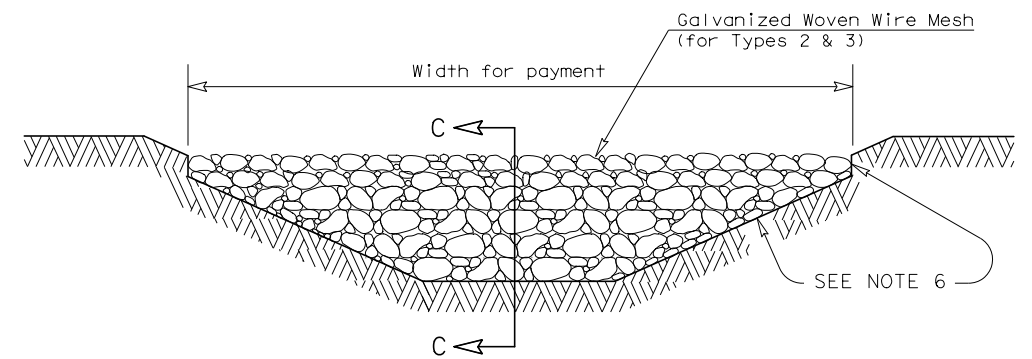
**Type 1 (18" high with no wire mesh) (3" to 6" aggregate):** Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

**Type 2 (18" high with wire mesh) (3" to 6" aggregate):** Type 2 may be used in ditches and at dike or swale outlets.

**Type 3 (36" high with wire mesh) (4" to 8" aggregate):** Type 3 may be used in stream flow and should be secured to the stream bed.

**Type 4 (Sack gabions) (3" to 6" aggregate):** Type 4 May be used in ditches and smaller channels to form an erosion control dam.

**Type 5:** Provide rock filter dams as shown on plans.



FILTER DAM AT CHANNEL SECTIONS

(RFD3) OR (RFD2) OR (RFD1)

**GENERAL NOTES**

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

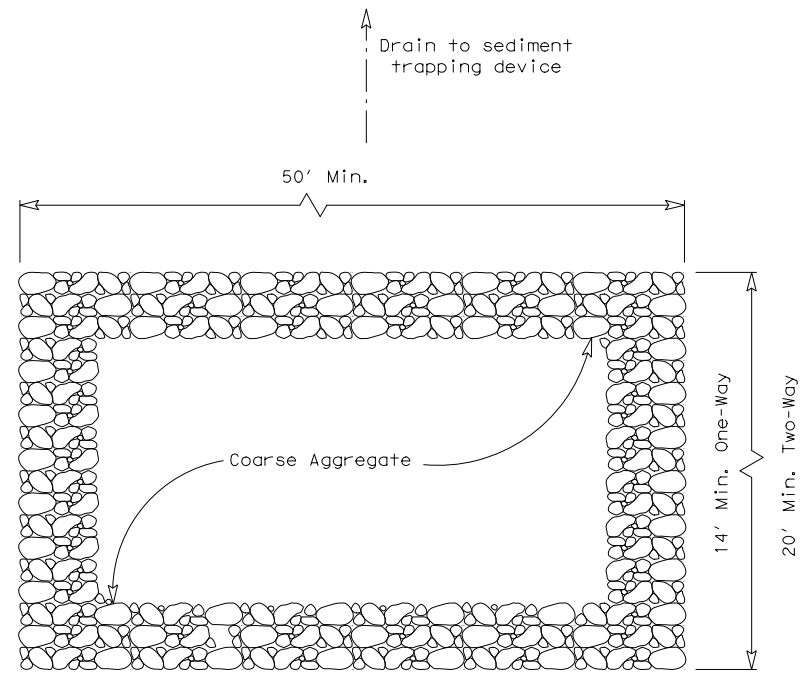
**PLAN SHEET LEGEND**

- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)

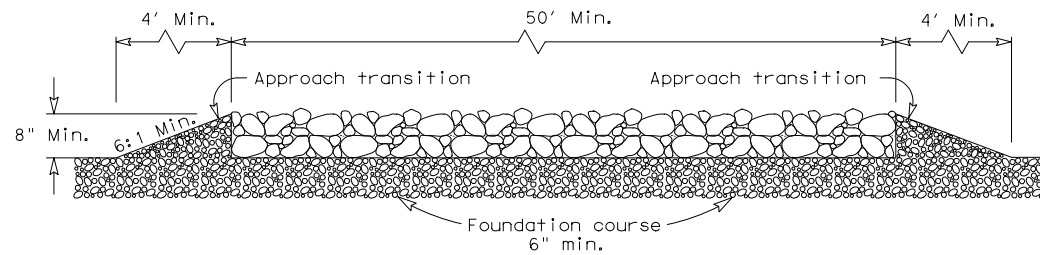
		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>ROCK FILTER DAMS</b> <b>EC (2) - 16</b>			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT: 0133	SECT: 04	JOB: 042
REVISIONS	DIST: WFS	COUNTY: BAYLOR	HIGHWAY: US 82
			SHEET NO. 316

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DATE: 12/14/2020  
FILE: ...STANDARDS\ec316.dgn



PLAN VIEW

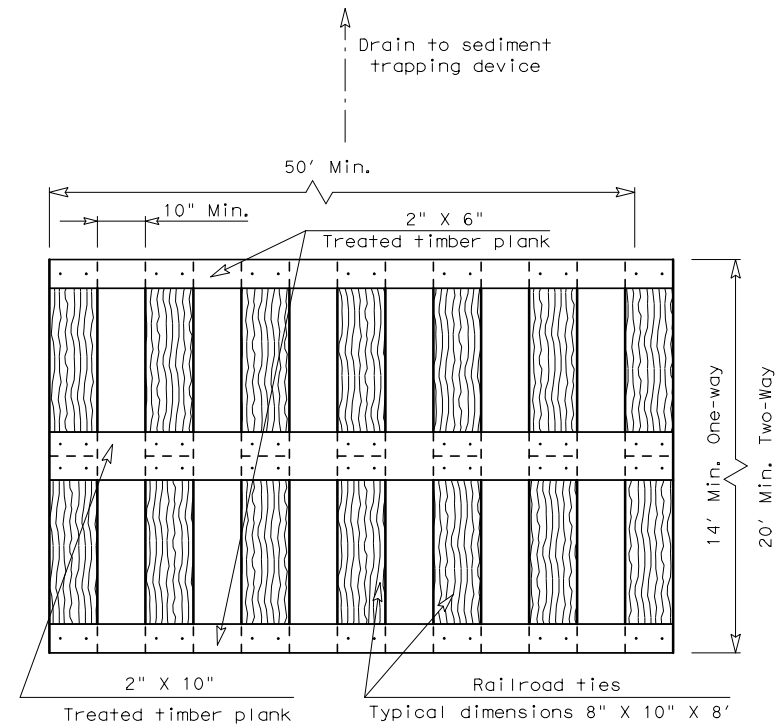


ELEVATION VIEW

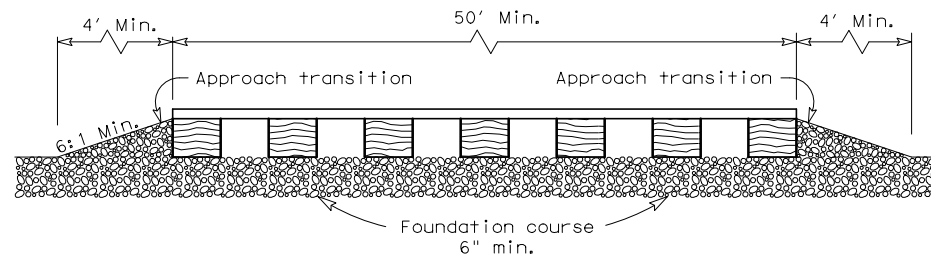
CONSTRUCTION EXIT (TYPE 1)  
ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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



PLAN VIEW

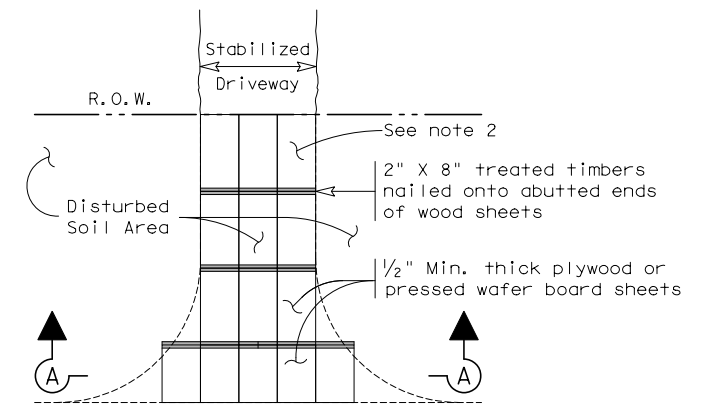


ELEVATION VIEW

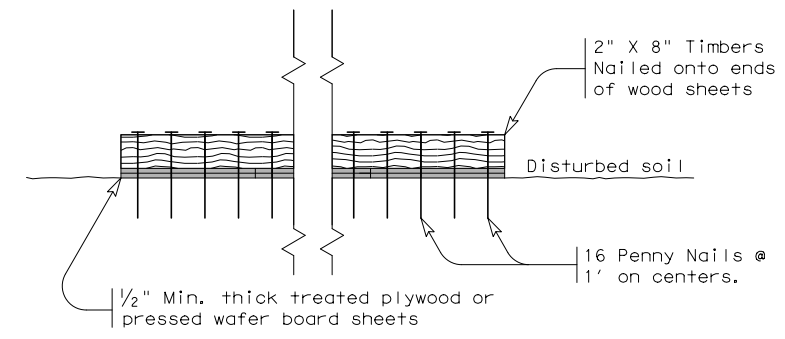
CONSTRUCTION EXIT (TYPE 2)  
TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

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



PLAN VIEW



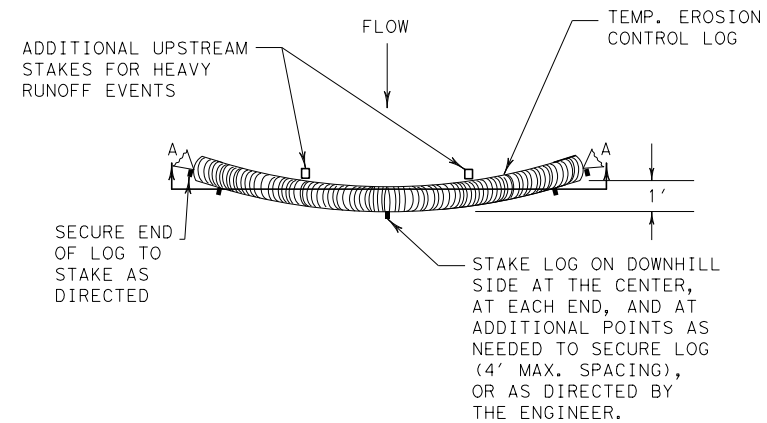
SECTION A-A  
CONSTRUCTION EXIT (TYPE 3)  
SHORT TERM

GENERAL NOTES (TYPE 3)

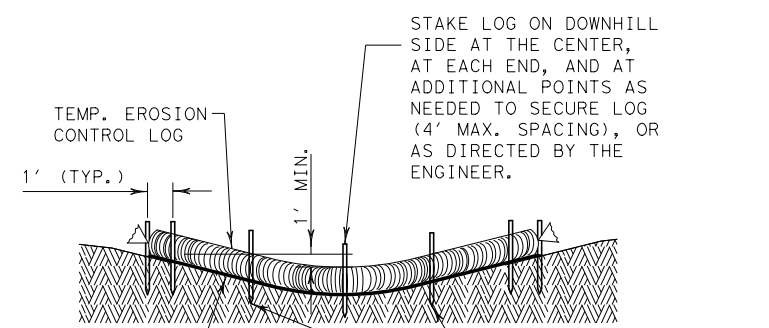
- The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
- The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
- The treated timber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

		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>CONSTRUCTION EXITS</b> <b>EC (3) - 16</b>			
FILE: ec316	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS		0133 04	042 US 82
DIST	COUNTY	SHEET NO.	
WFS	BAYLOR	317	

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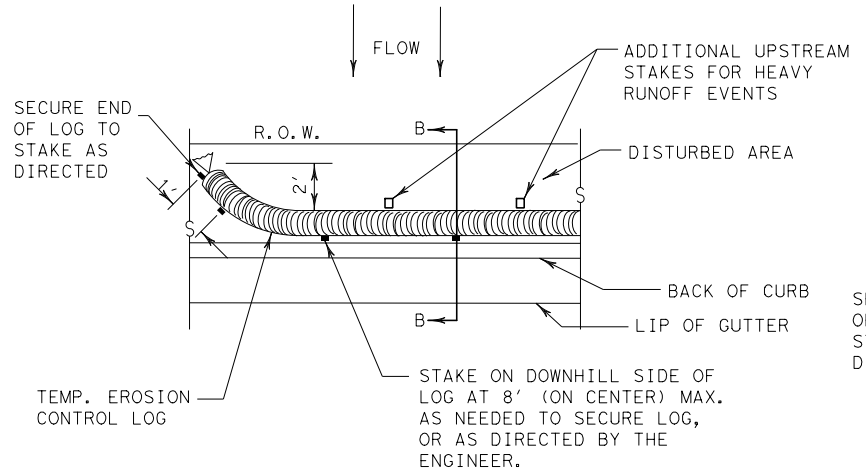
PLAN VIEW



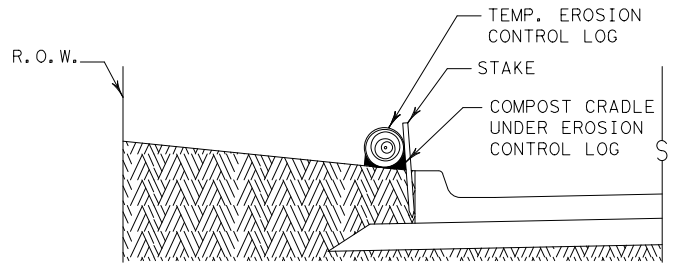
SECTION A-A

EROSION CONTROL LOG DAM

CL-D



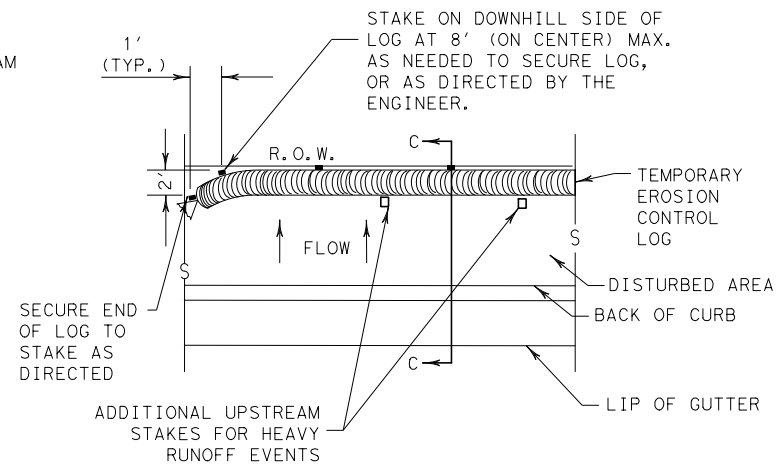
PLAN VIEW



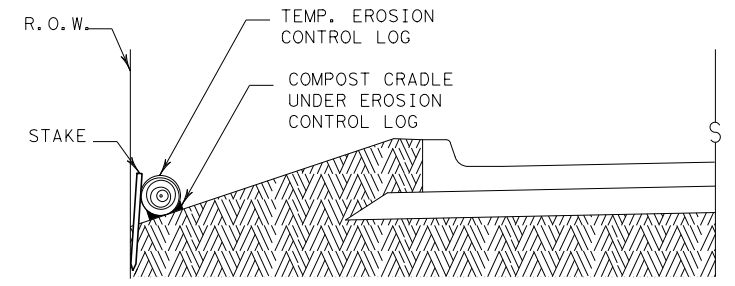
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



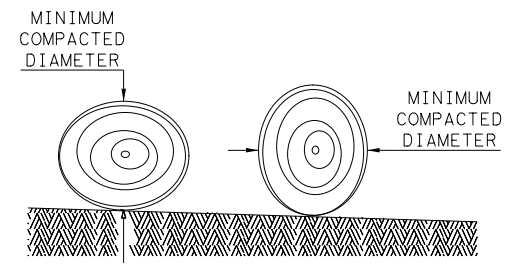
PLAN VIEW



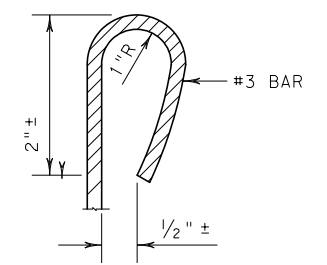
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS



REBAR STAKE DETAIL

**SEDIMENT BASIN & TRAP USAGE GUIDELINES**

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

**Log Traps:** The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

**GENERAL NOTES:**

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

- LEGEND**
- CL-D EROSION CONTROL LOG DAM
  - CL-BOC EROSION CONTROL LOG AT BACK OF CURB
  - CL-ROW EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
  - CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
  - CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
  - CL-DI EROSION CONTROL LOG AT DROP INLET
  - CL-CI EROSION CONTROL LOG AT CURB INLET
  - CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET

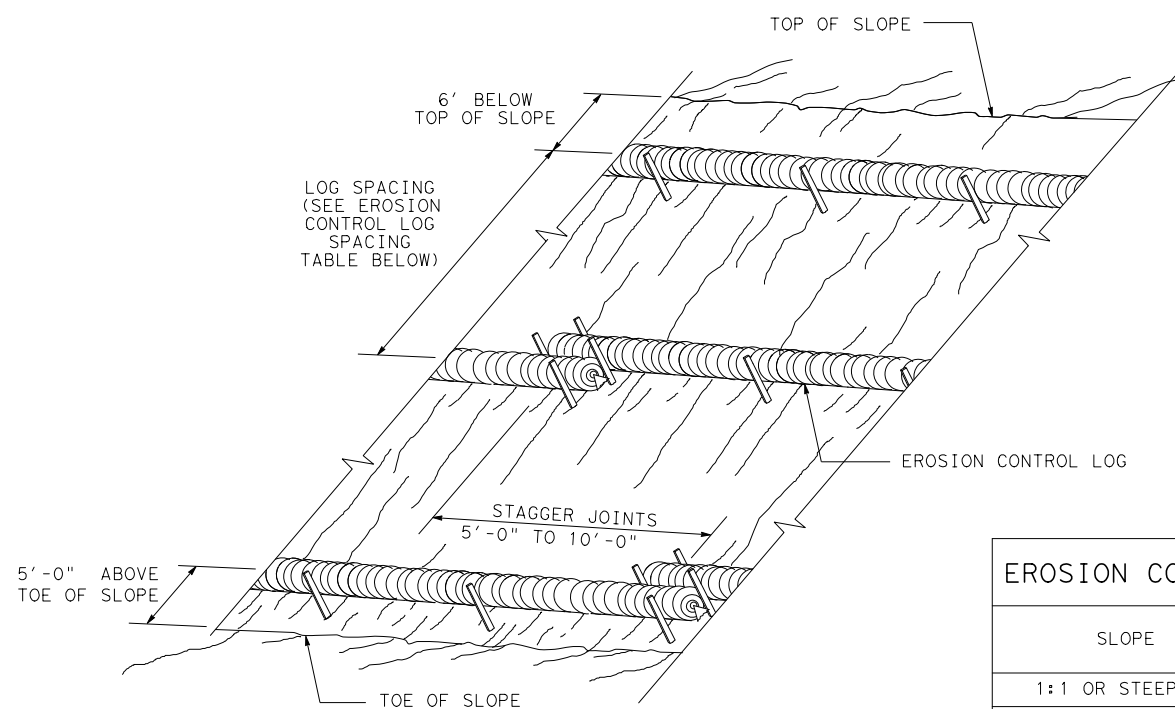
SHEET 1 OF 3

		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b>			
<b>EROSION CONTROL LOG</b>			
<b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
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REVISIONS	0133	04	042
	DIST	COUNTY	SHEET NO.
	WFS	BAYLOR	318

DATE: FILE:

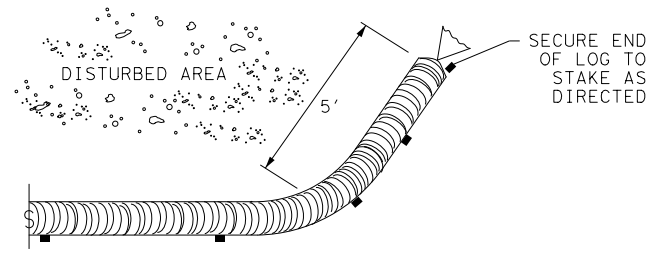
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DATE:  
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EROSION CONTROL LOGS ON SLOPES  
STAKE AND TRENCHING ANCHORING

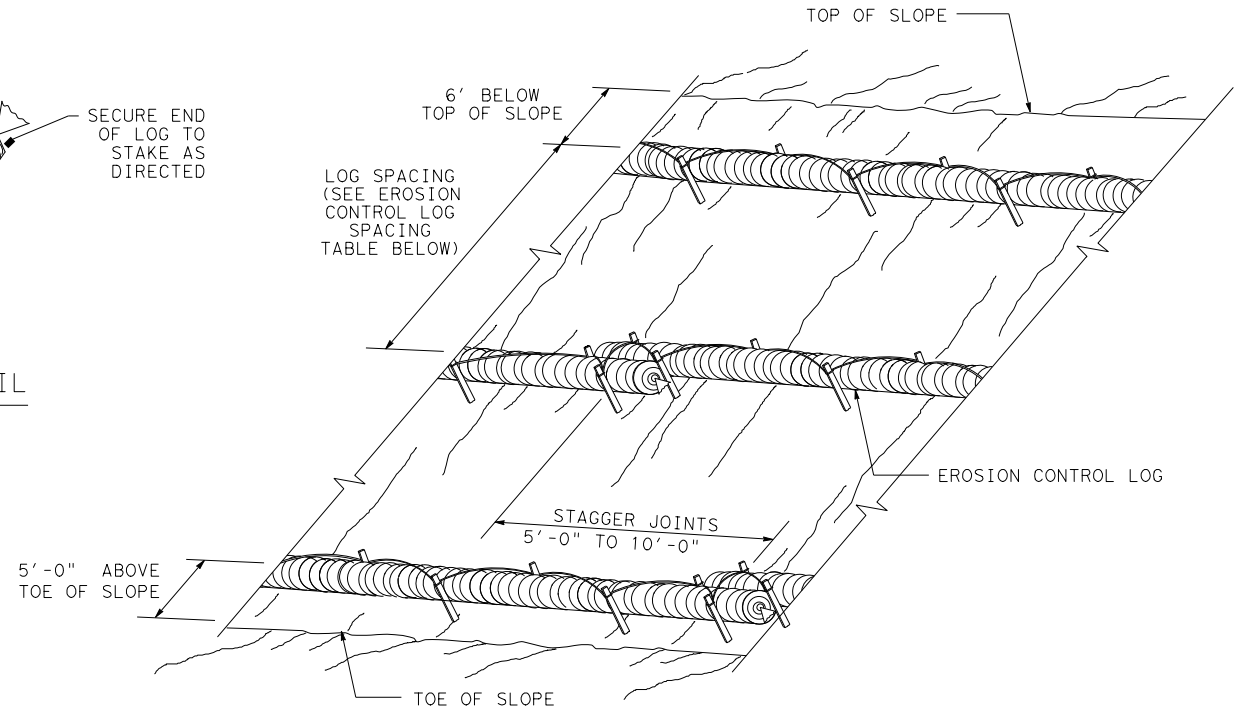
CL-SST



END SECTION RAP DETAIL

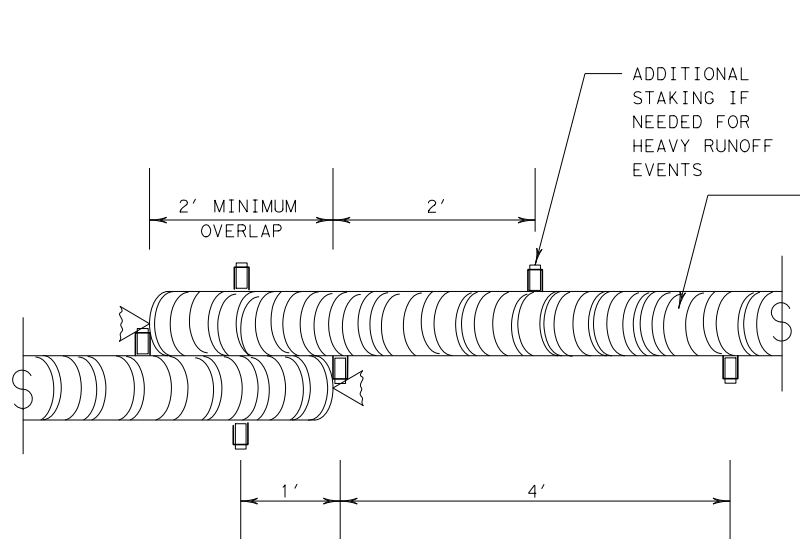
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

\* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:  
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;  
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



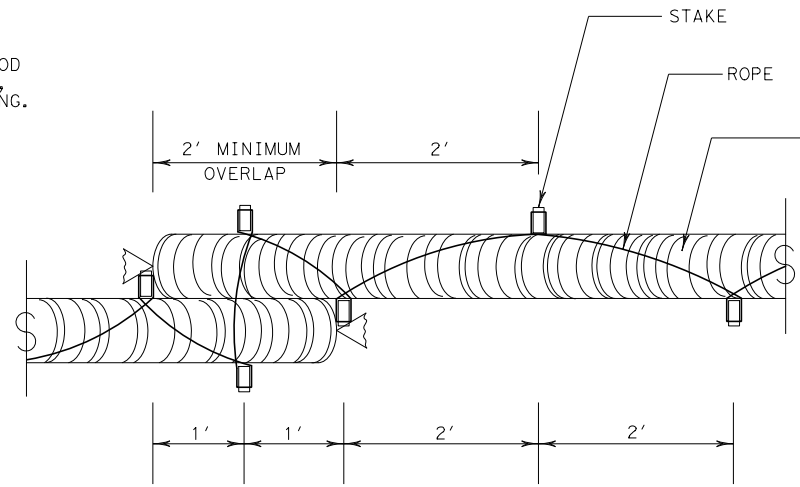
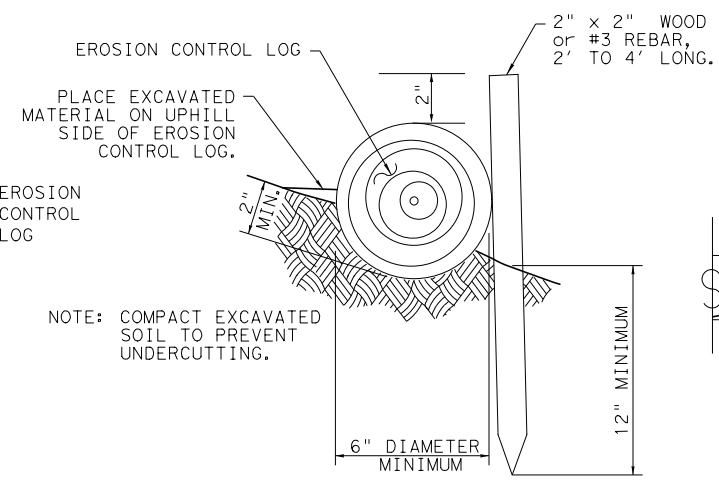
EROSION CONTROL LOGS ON SLOPES  
STAKE AND LASHING ANCHORING

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

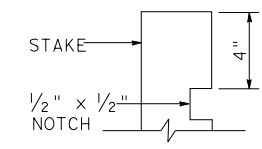
CL-SST



STAKE AND LASHING ANCHORING DETAIL

CL-SSL

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

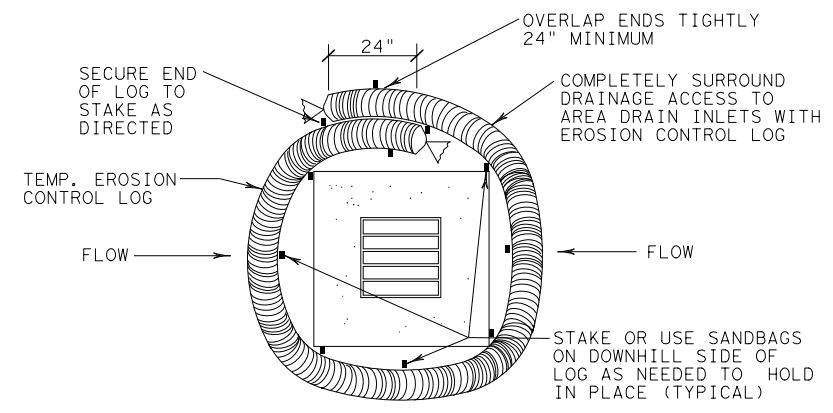


STAKE NOTCH DETAIL

SHEET 2 OF 3

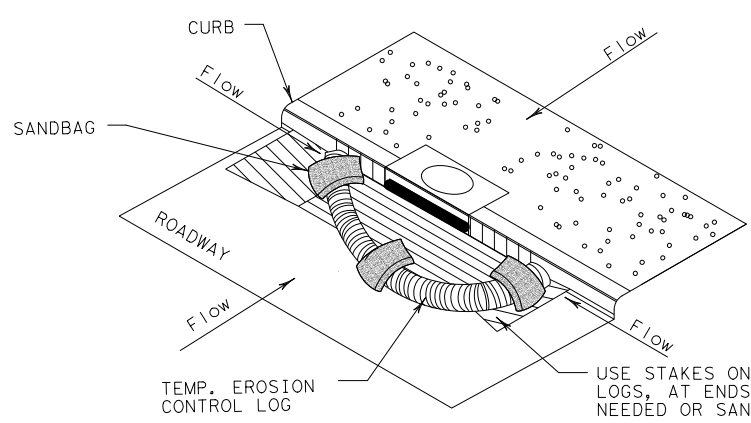
		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
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REVISIONS	DIST: WFS	COUNTY: BAYLOR	SHEET NO.: 319

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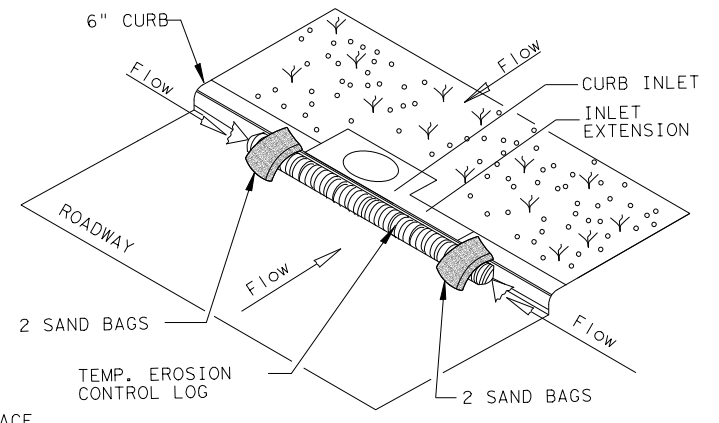
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

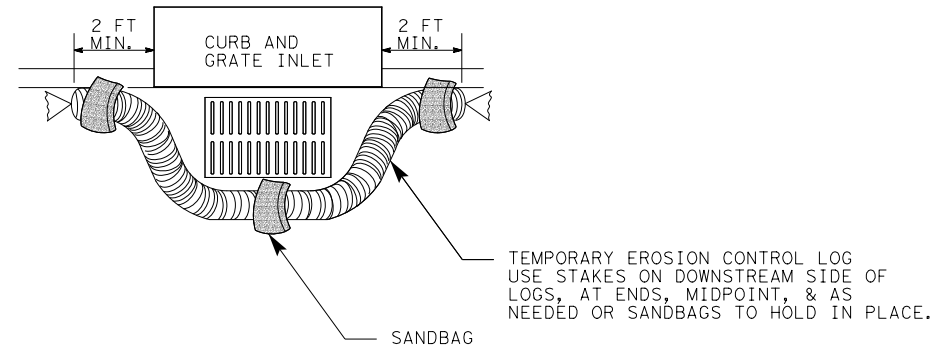
CL-CI



EROSION CONTROL LOG AT CURB INLET

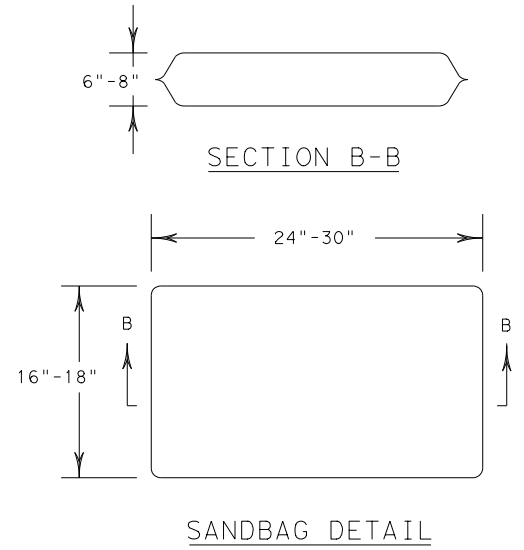
CL-CI

NOTE:  
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

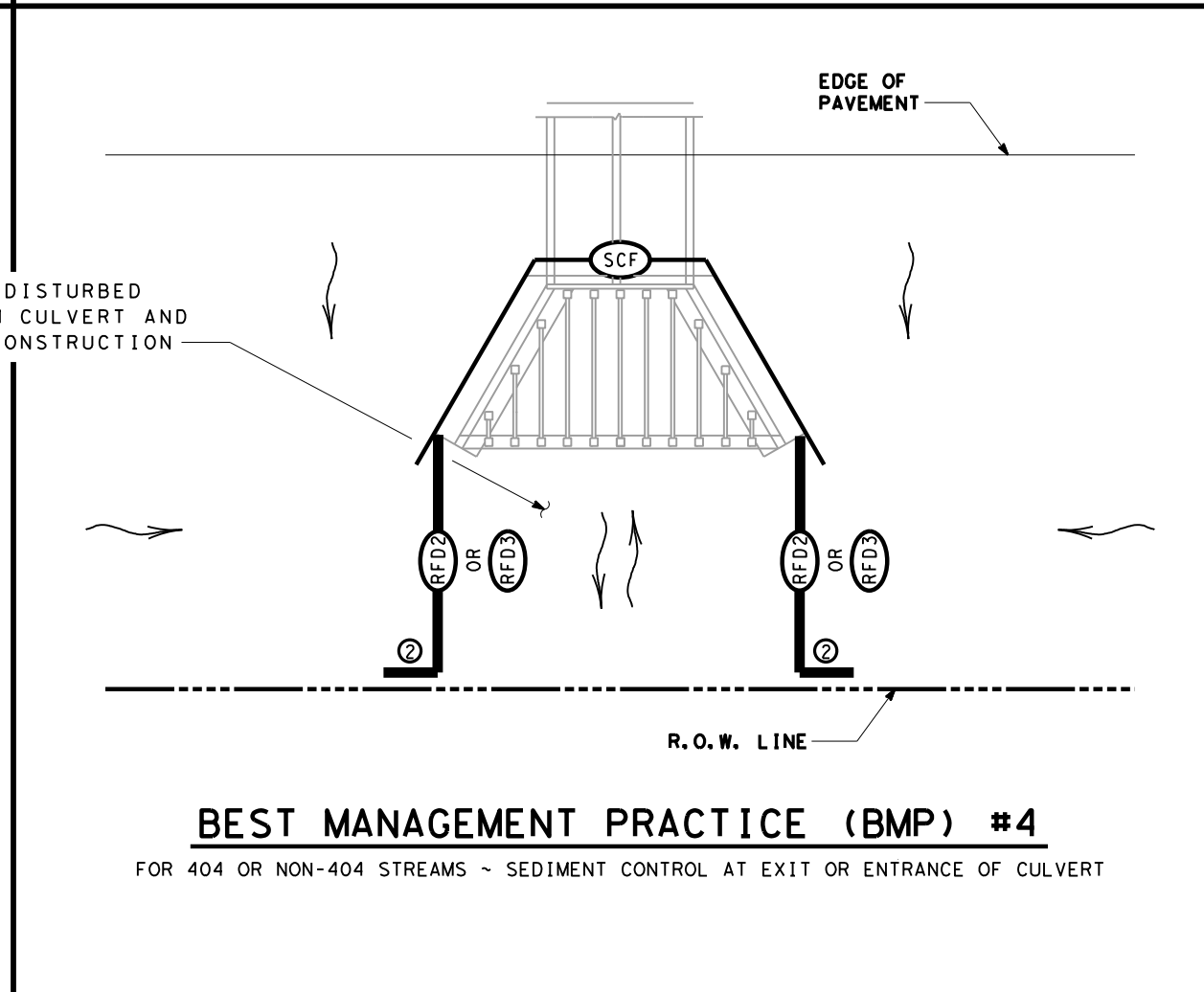
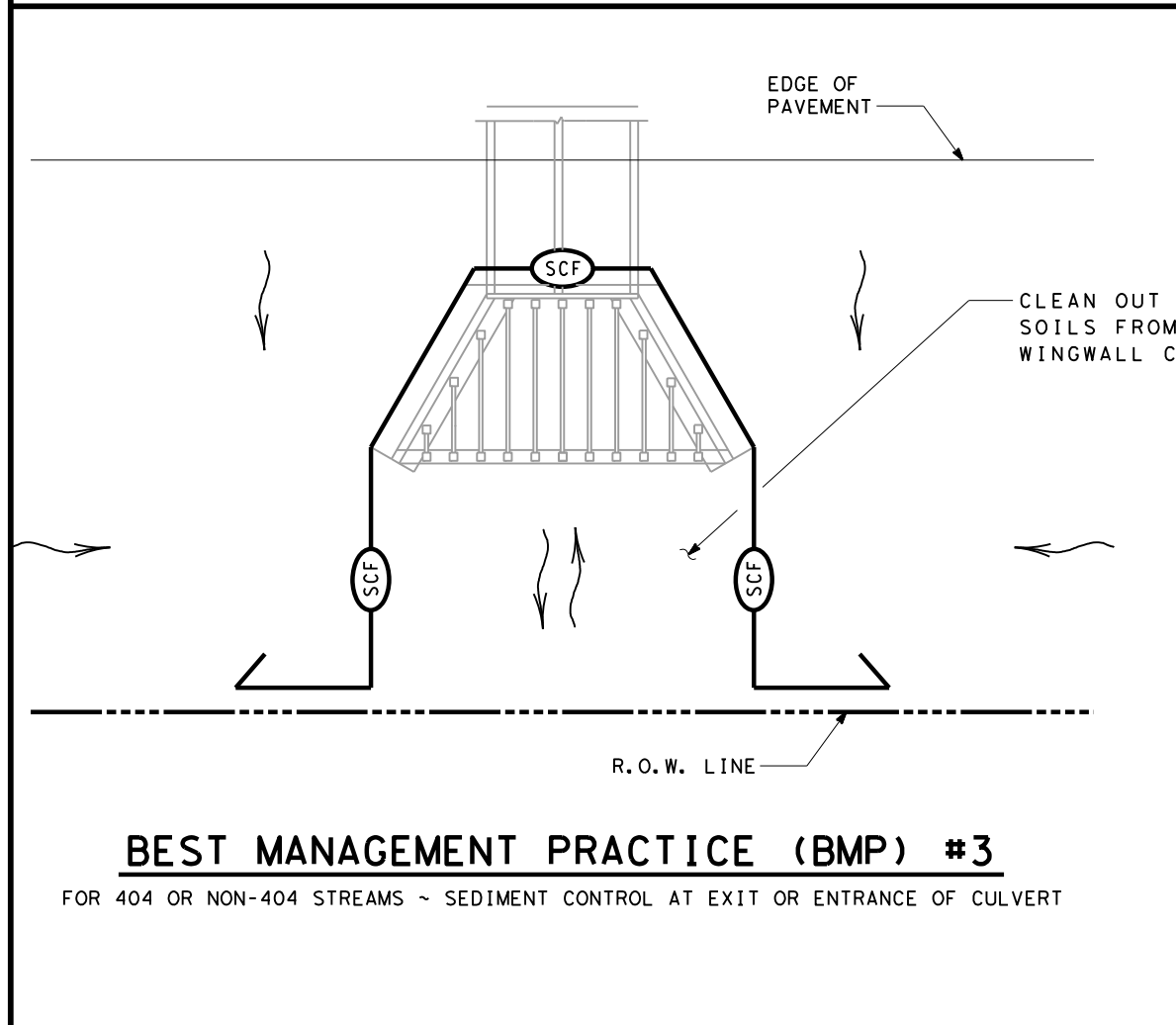
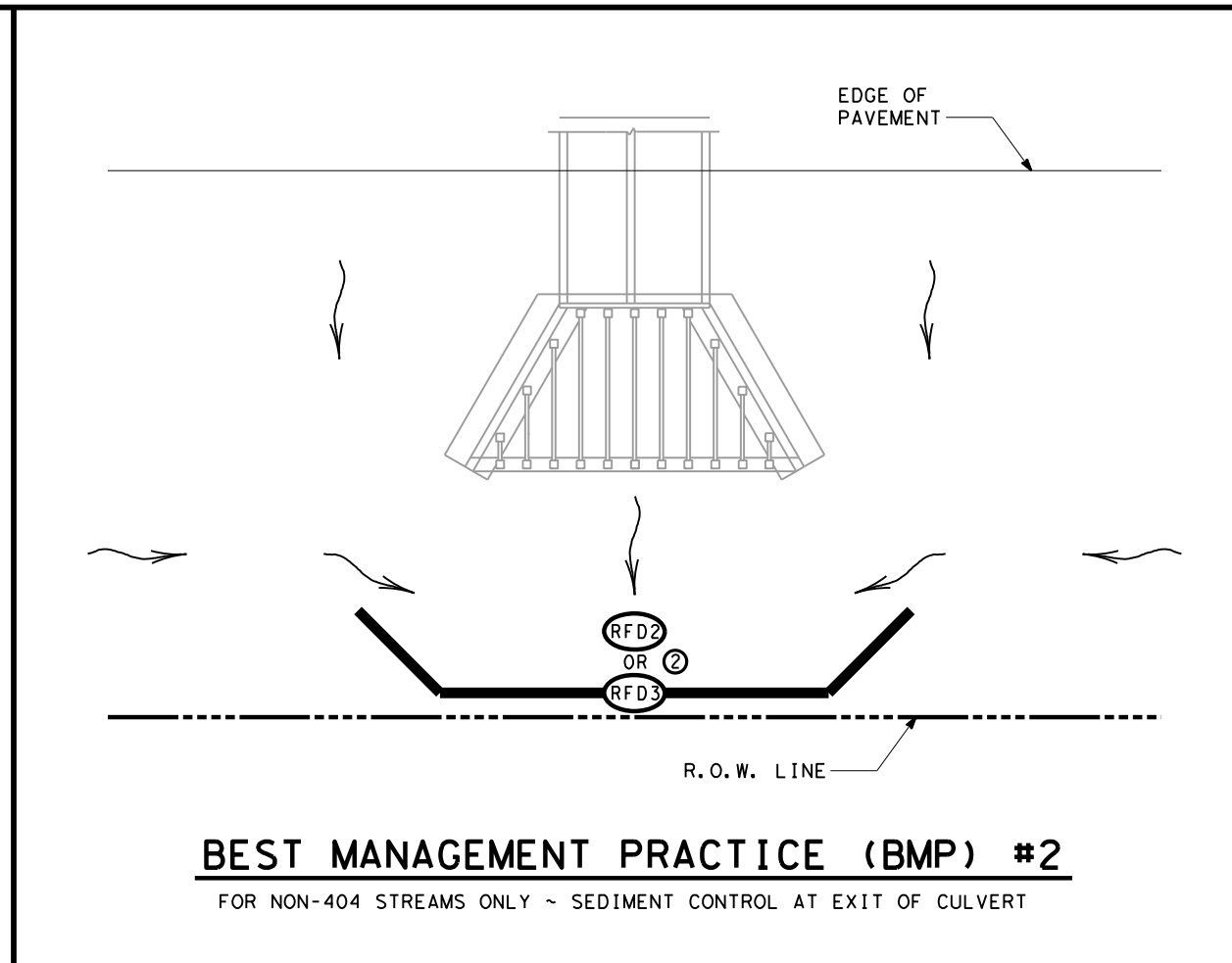
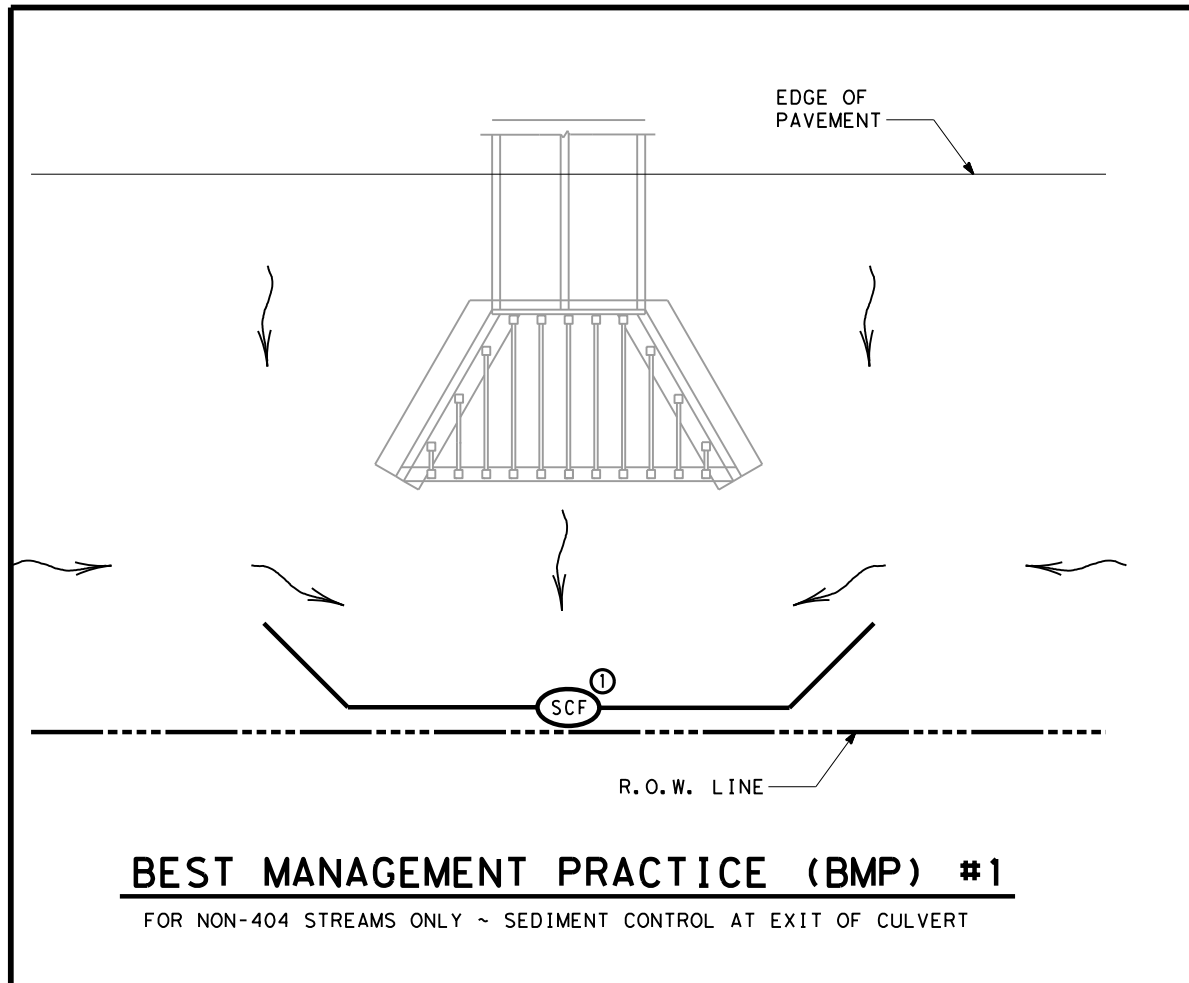


SANDBAG DETAIL

SHEET 3 OF 3

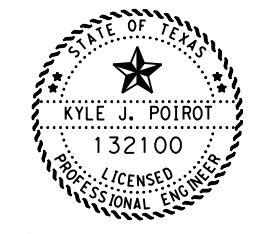
		<b>Design Division Standard</b>		
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>				
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0133	04	042	US B2
	DIST	COUNTY		SHEET NO.
	WFS	BAYLOR		320

DATE:  
FILE:



	SEDIMENT CONTROL FENCE
	ROCK FILTER DAM (TY 2)
	ROCK FILTER DAM (TY 3)
	DIRECTION OF FLOW

- NOTES:
- ① EXTEND SILT FENCE SO STORM WATER DOES NOT GO AROUND THE ENDS. USE L-HOOKS ON ENDS AS REQUIRED.
  - ② EXTEND ROCK FILTER DAM SO STORM WATER DOES NOT GO AROUND THE ENDS.



*Kyle J. Poirot, P.E.*  
9/7/2021

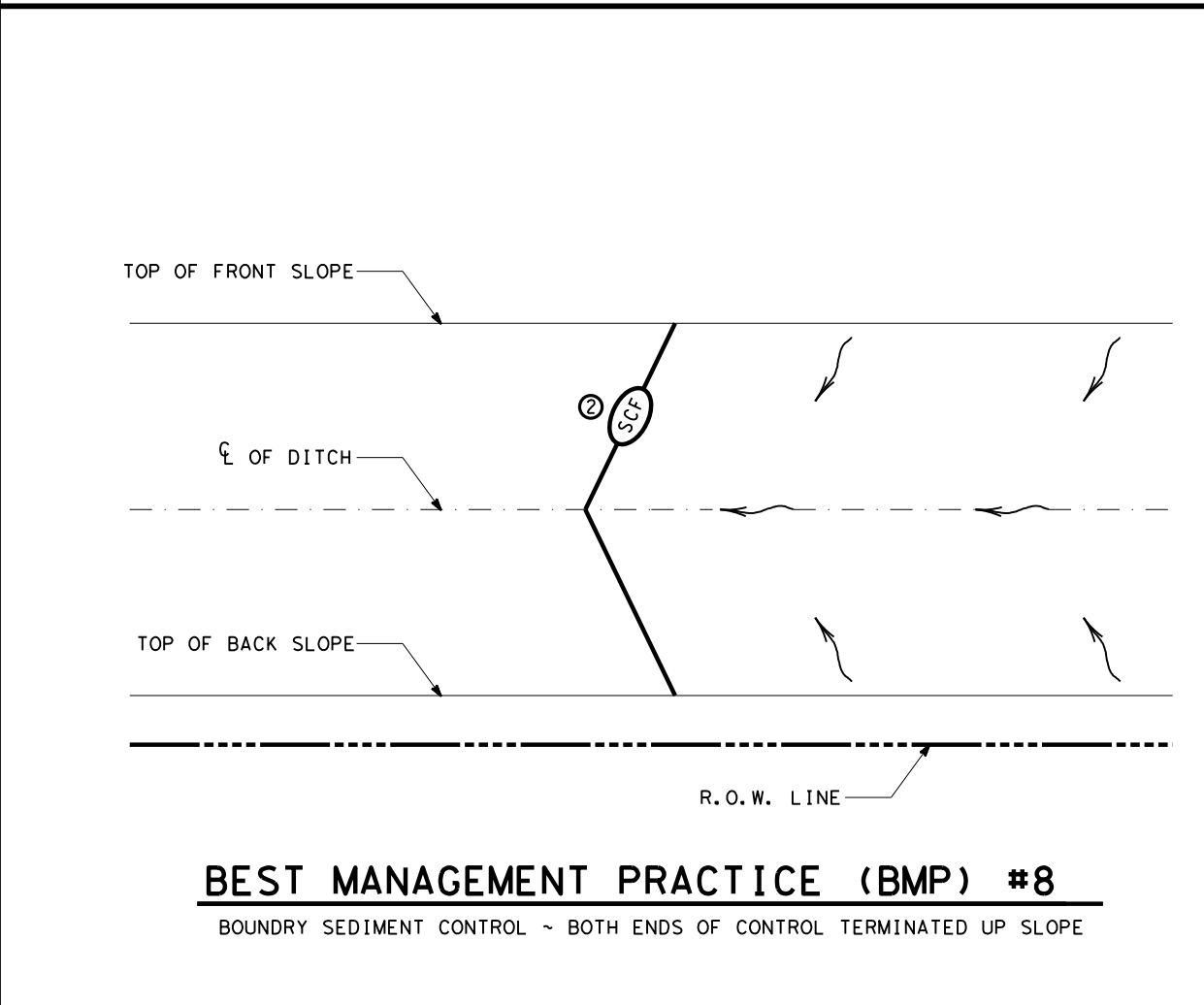
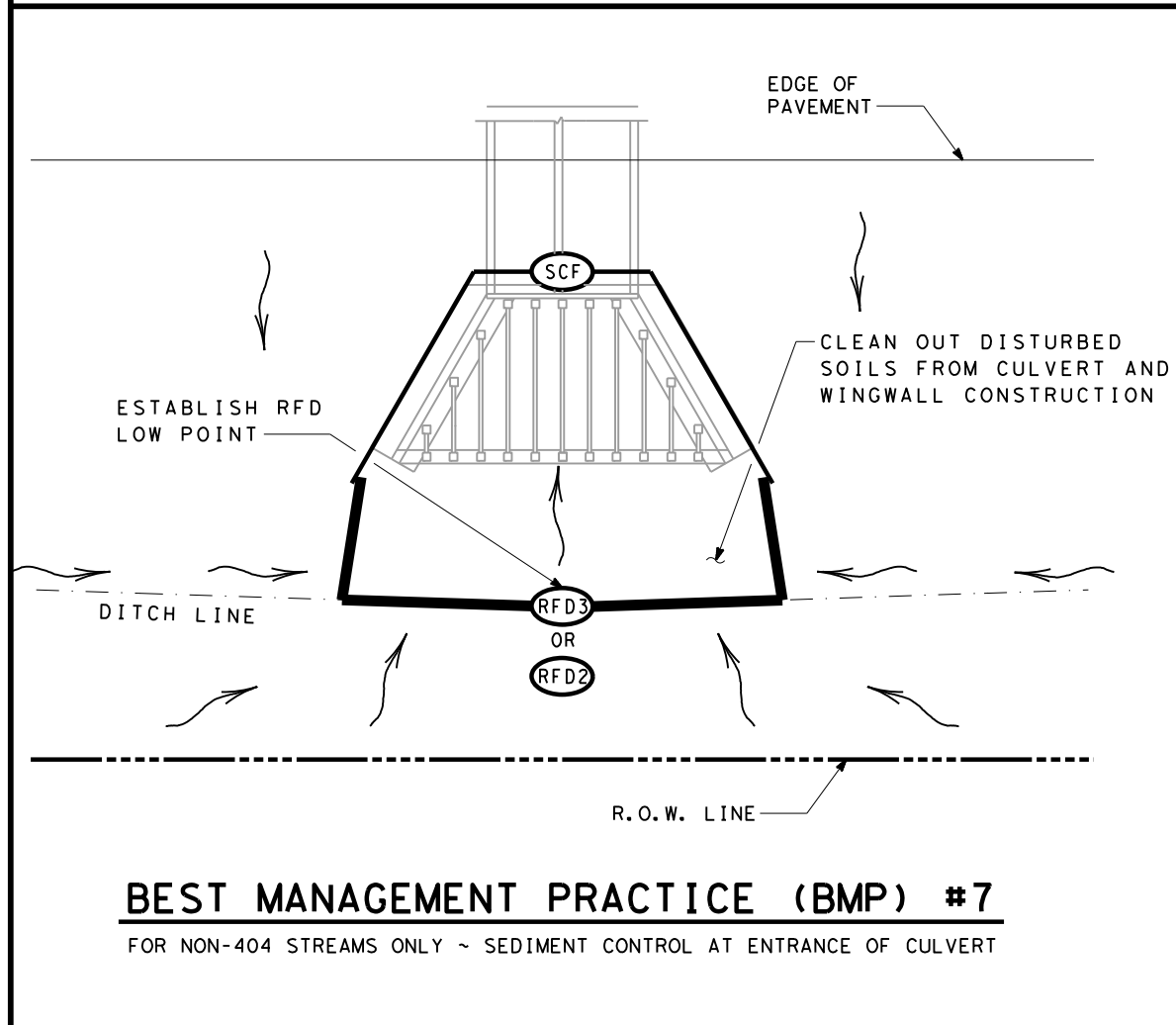
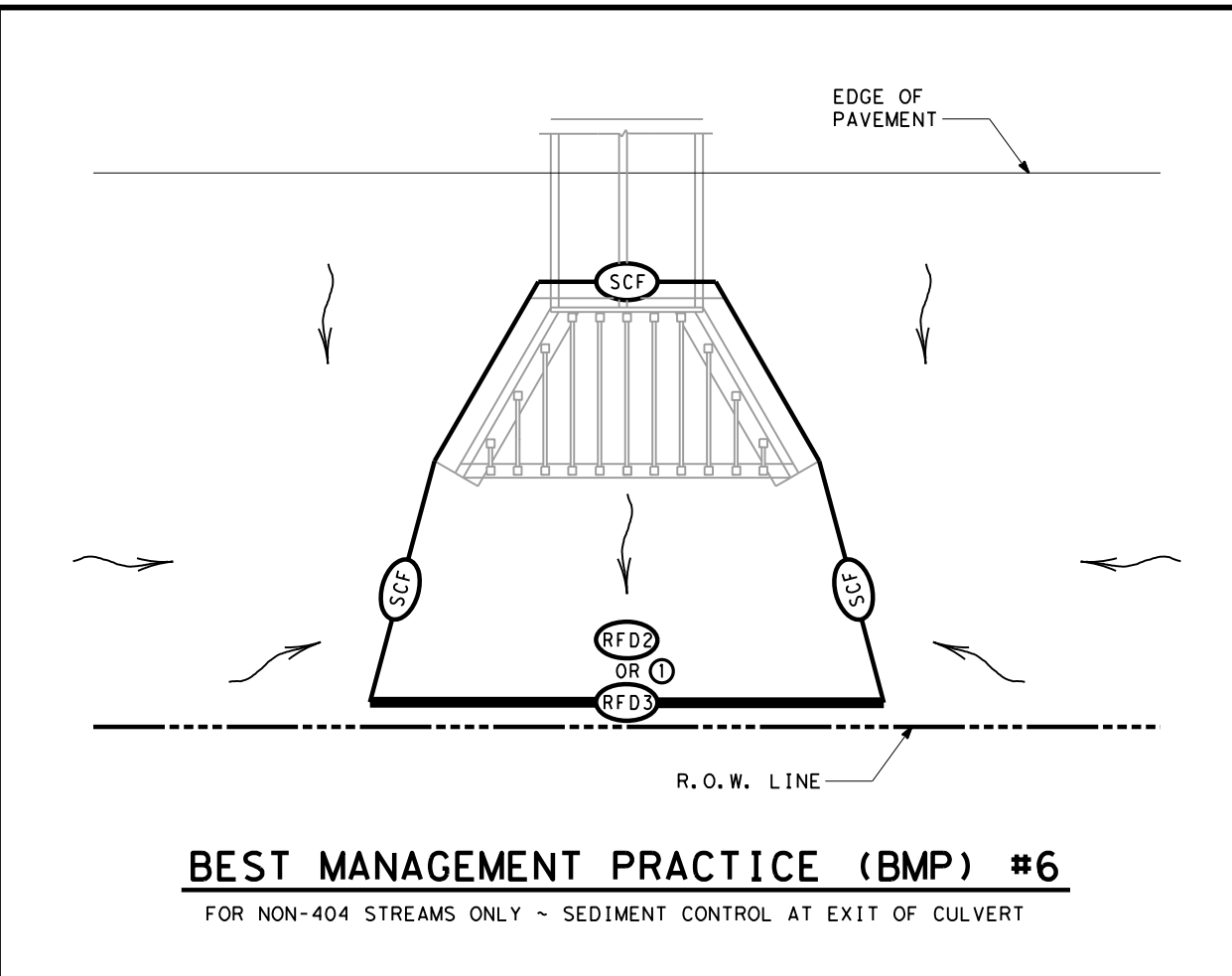
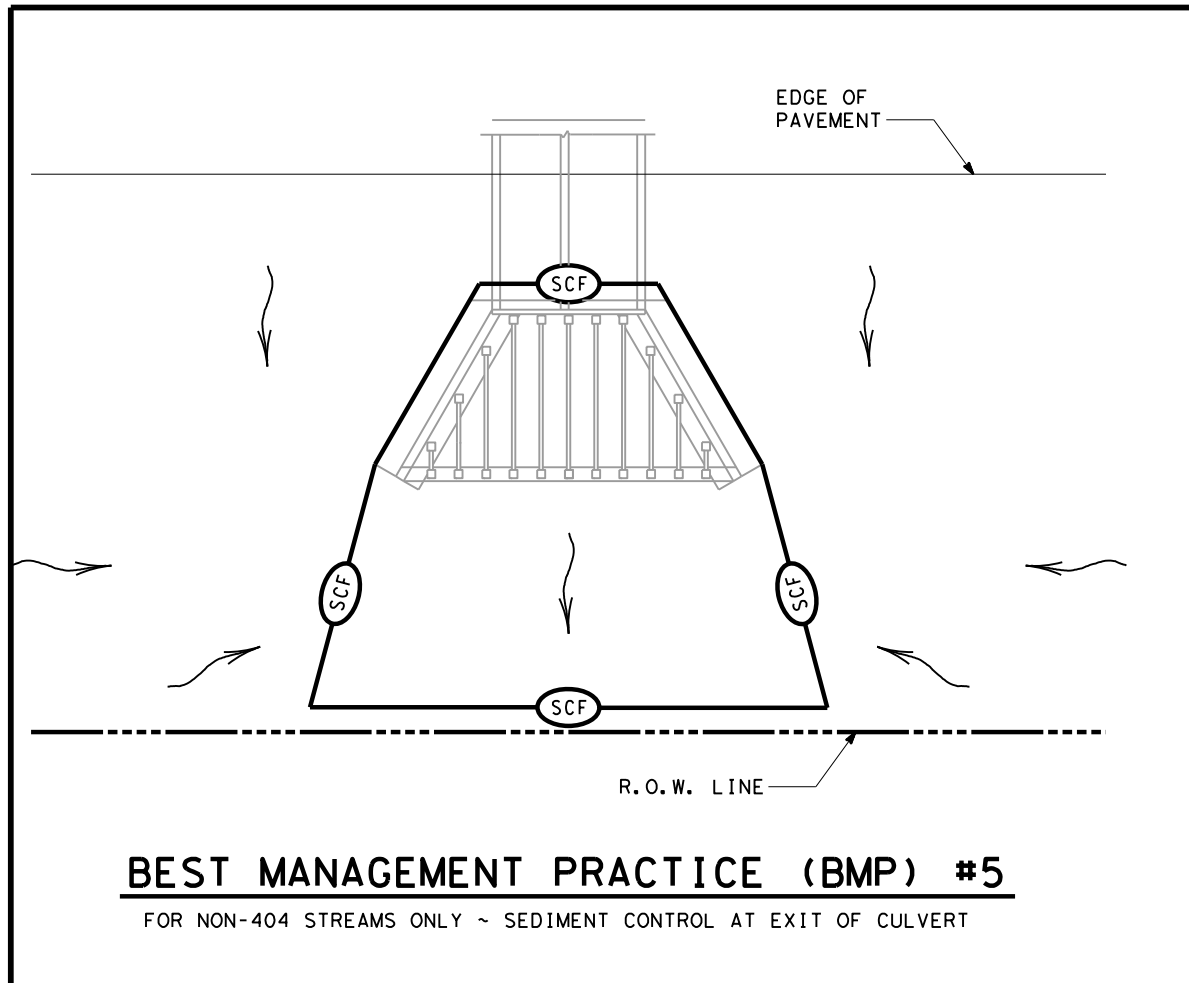
SCALE = NTS SHEET 1 OF 5

Texas Department of Transportation  
Wichita Falls District Standard

**TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES**

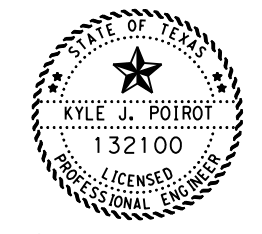
**WFS-TA-BMP**

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© TXDOT 2009	CONT	SECT	JOB	HIGHWAY
REVISIONS JULY 2019	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	321	



	SEDIMENT CONTROL FENCE
	ROCK FILTER DAM (TY 2)
	ROCK FILTER DAM (TY 3)
	DIRECTION OF FLOW

- NOTES:
- 1 PROVIDE OVERLAP OF SILT FENCE WITH ROCK FILTER DAM.
  - 2 ROCK FILTER DAMS OR EARTH/GRASSED EMBANKMENTS CAN BE SUBSTITUTED AS DIRECTED.



*Kyle J. Poirot, P.E.*  
9/7/2021

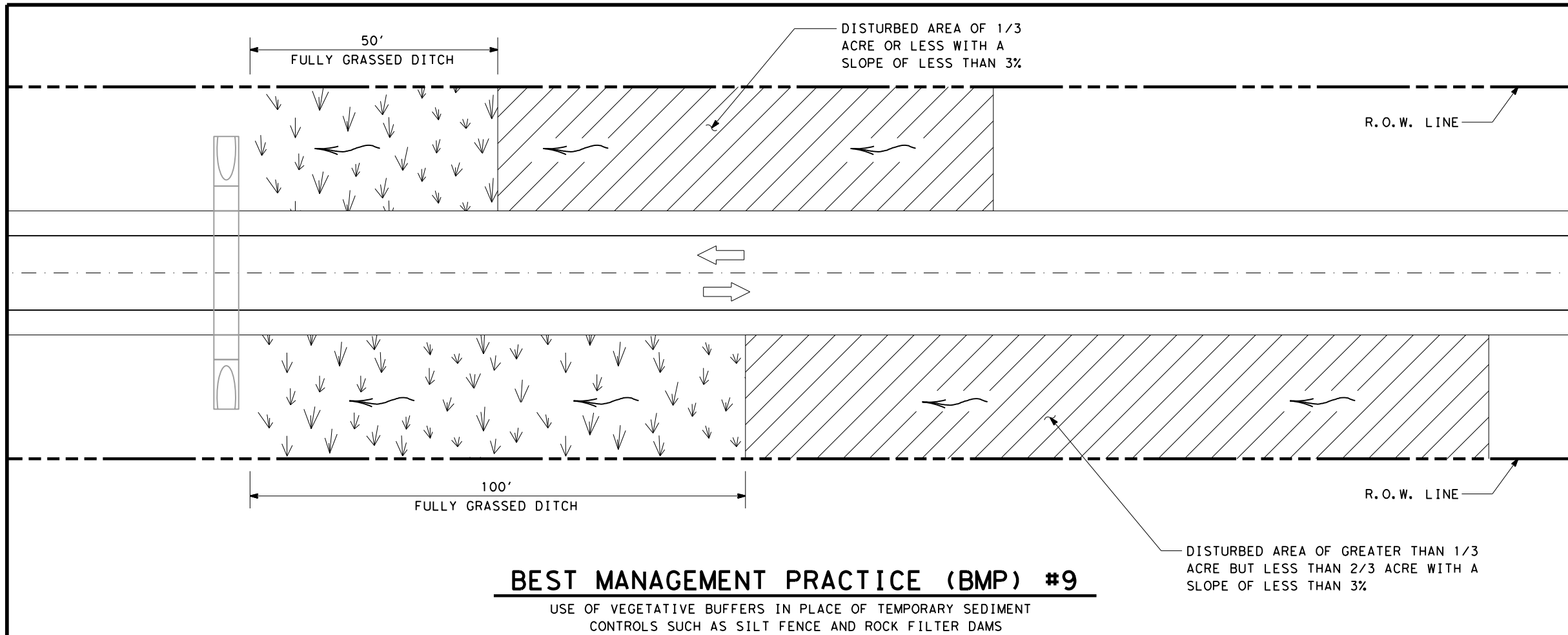
SCALE = NTS SHEET 2 OF 5

Texas Department of Transportation  
Wichita Falls District Standard

**TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES**

**WFS-TA-BMP**

FILE: BMPLAYOUTS.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TXDOT 2009	CONT	SECT	JOB	HIGHWAY
REVISIONS JULY 2019	0133	04	042	US 82
	DIST	COUNTY	SHEET NO.	
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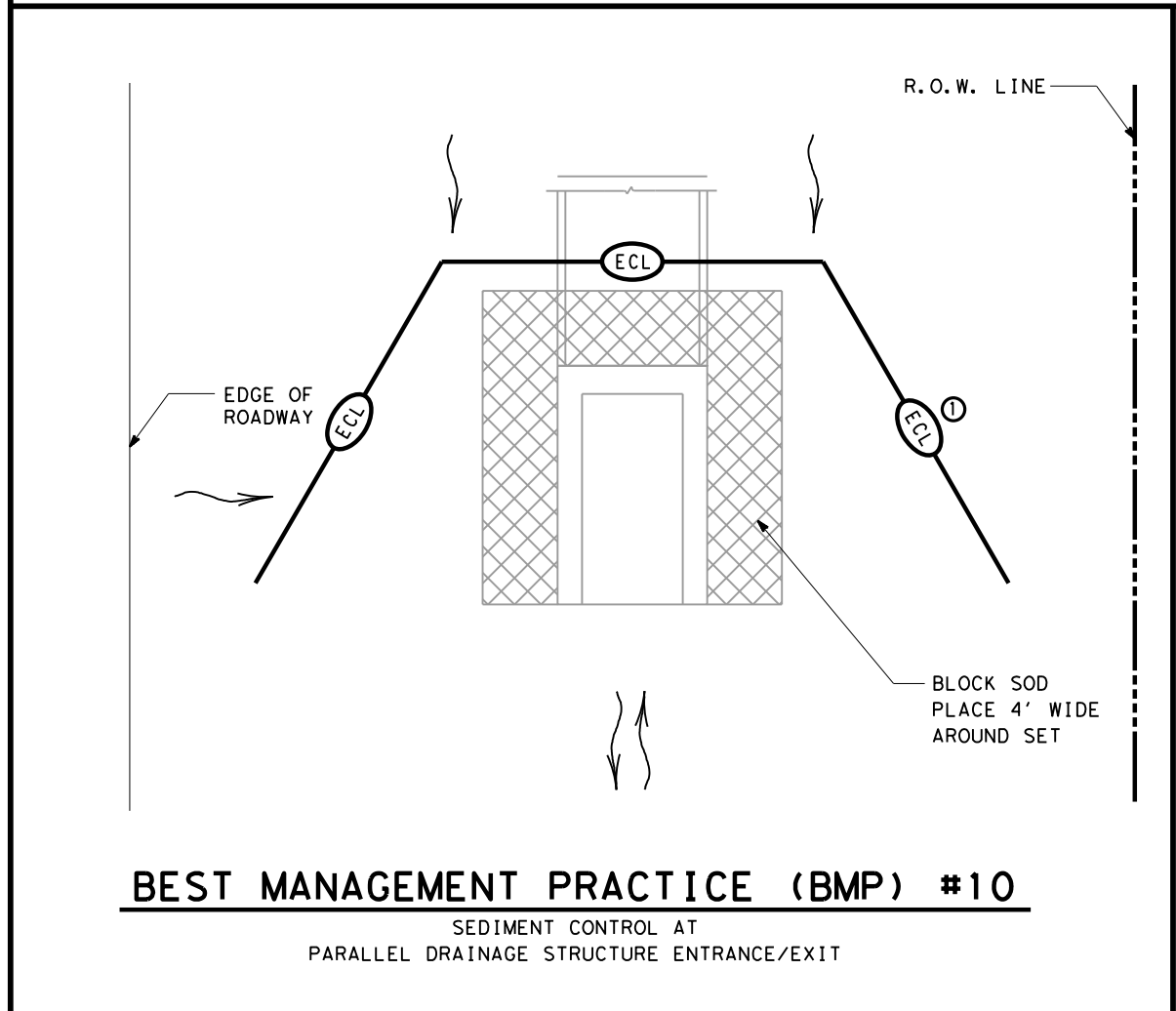


**BEST MANAGEMENT PRACTICE (BMP) #9**

USE OF VEGETATIVE BUFFERS IN PLACE OF TEMPORARY SEDIMENT CONTROLS SUCH AS SILT FENCE AND ROCK FILTER DAMS

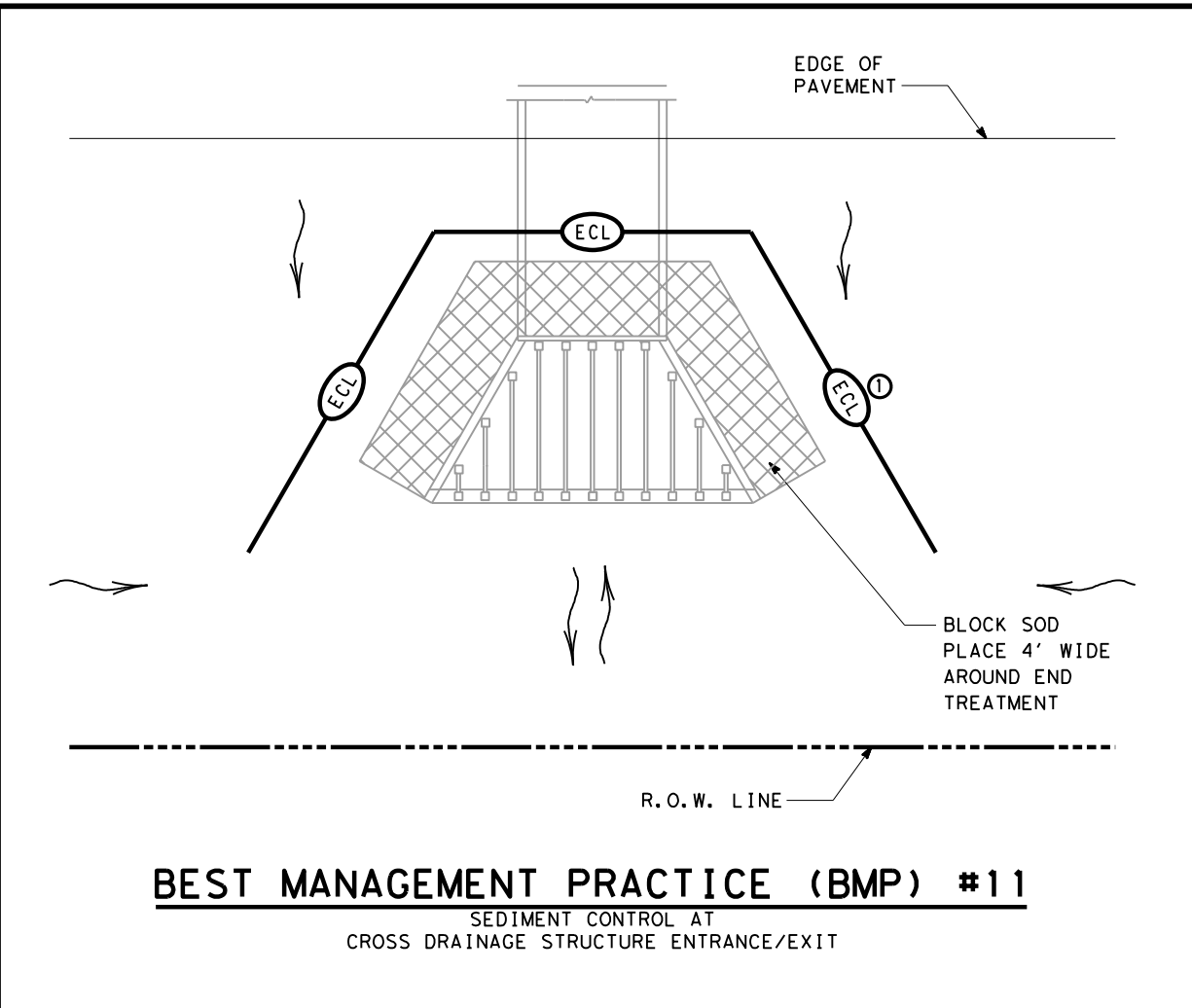
	FULLY GRASSED DITCH
	DISTURBED AREA
	DIRECTION OF FLOW
	EROSION CONTROL LOG
	SOD

NOTES:  
 ① SEDIMENT CONTROL FENCE, OR OTHER DEVICES CAN BE SUBSTITUTED AS DIRECTED BY THE ENGINEER.



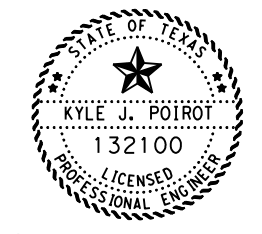
**BEST MANAGEMENT PRACTICE (BMP) #10**

SEDIMENT CONTROL AT PARALLEL DRAINAGE STRUCTURE ENTRANCE/EXIT



**BEST MANAGEMENT PRACTICE (BMP) #11**

SEDIMENT CONTROL AT CROSS DRAINAGE STRUCTURE ENTRANCE/EXIT



*Kyle J. Poirot, P.E.*  
 9/7/2021

SCALE = NTS SHEET 3 OF 5

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**TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES**

**WFS-TA-BMP**

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REVISIONS	0133	04	042	US 82
JULY 2019	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	323	

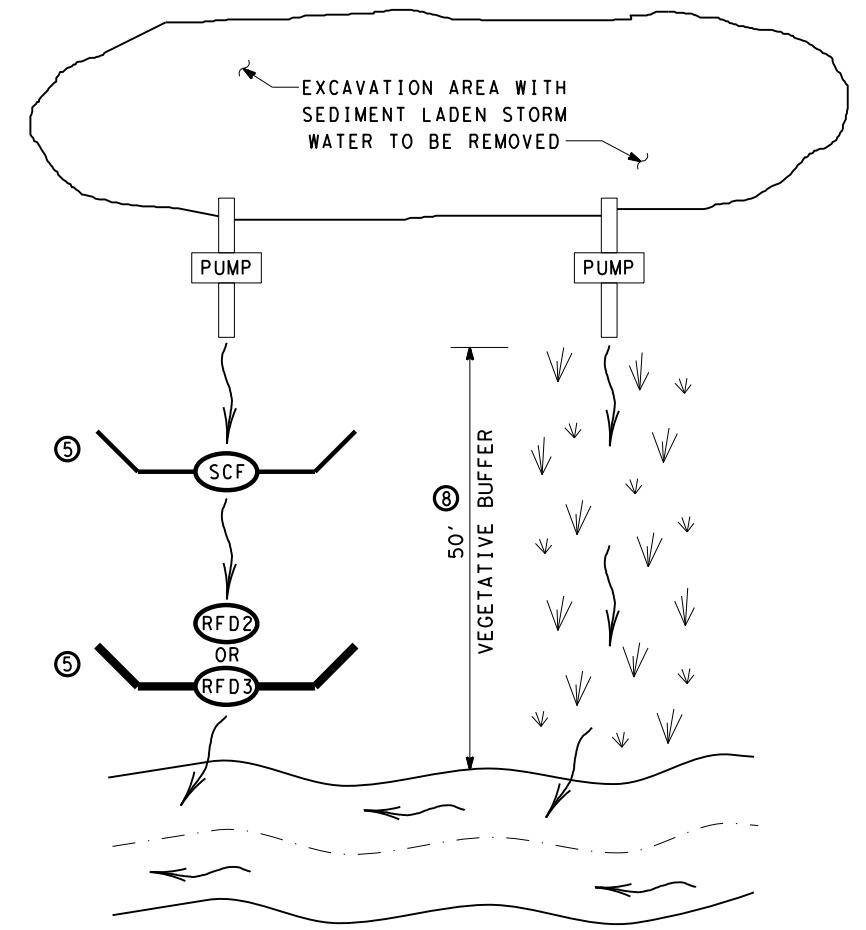
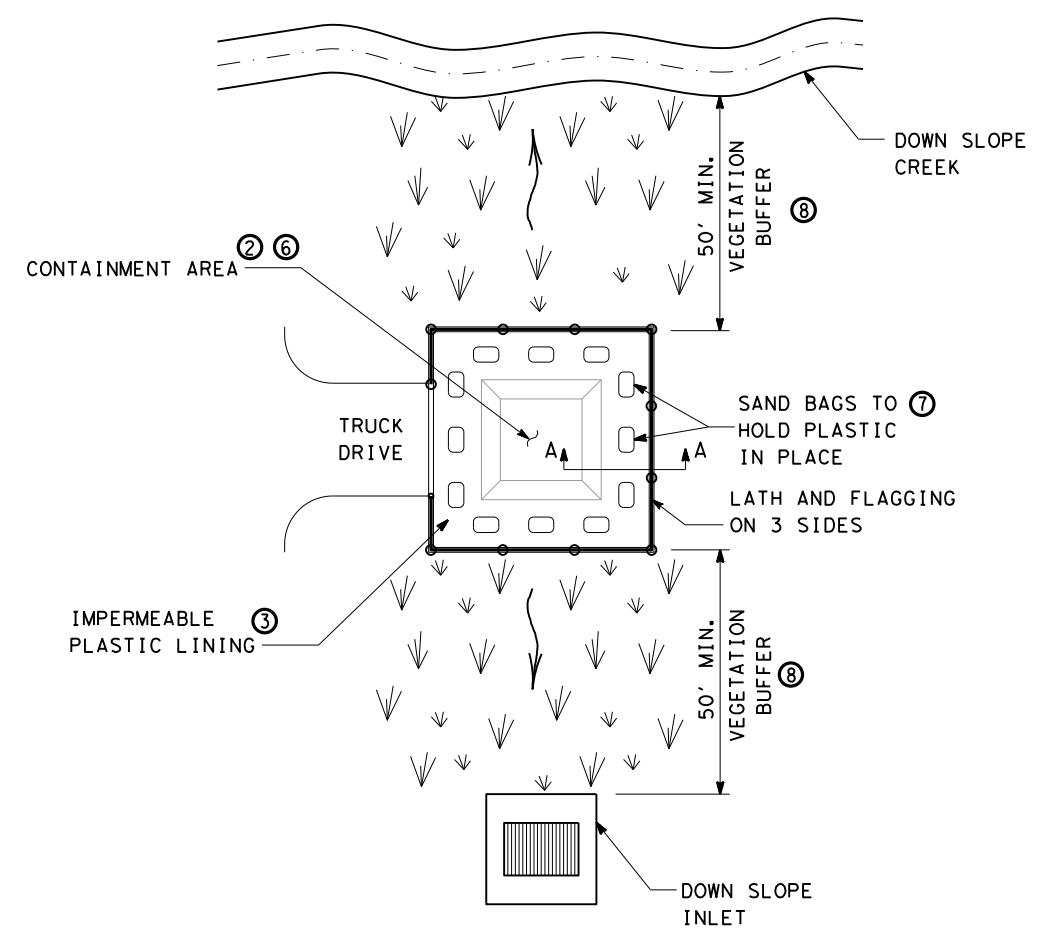
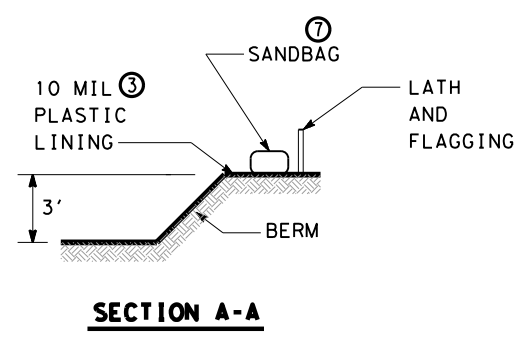
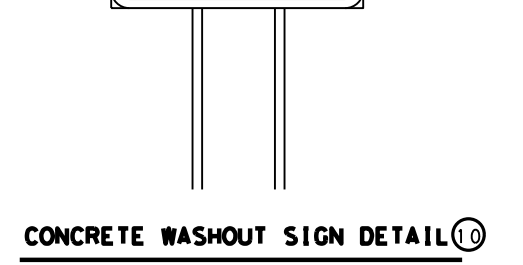


DEPARTMENT MATERIAL SPECIFICATIONS		
PLYWOOD SIGN BLANKS		DMS-7100
FLAT SURFACE REFLECTIVE SHEETING		DMS-8300
VINYL NON-REFLECTIVE DECAL SHEETING		DMS-8320

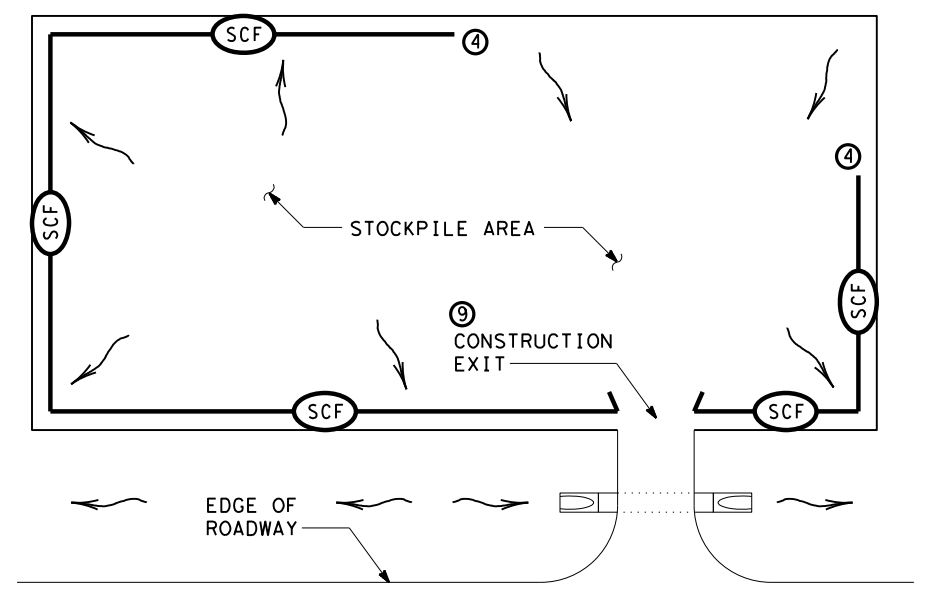
COLOR	USAGE	REFLECTIVE SHEETING OR OTHER MATERIAL
WHITE	BACKGROUND	TYPE C (FLUORESCENT PRISMATIC)
BLACK	LEGEND & BORDERS	VINYL NON-REFLECTIVE DECAL SHEETING

- SIGN GENERAL NOTES:**
- A. THE ALPHABETS AND LATERAL SPACING BETWEEN LETTERS AND NUMERALS SHALL CONFORM WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", (TMUTCD) LATEST EDITION, AND THE "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST". LATERAL SPACING OF TEXT SHALL PROVIDE A BALANCED APPEARANCE. ALL MATERIALS SHALL CONFORM TO DEPARTMENT SPECIFICATIONS.
- B. LEGEND AND BORDER MAY BE APPLIED BY REVERSE SCREENING PROCESS WITH TRANSPARENT COLORED INK, CUT-OUT WHITE REFLECTIVE SHEETING APPLIED TO COLORED BACKGROUND OR COMBINATION THEREOF. BACKGROUND SHALL BE REFLECTIVE SHEETING TYPE C.
- C. FINAL SIGN LOCATION SHALL BE AS APPROVED BY THE ENGINEER. IF THE SIGN CANNOT BE PLACED OUTSIDE THE CLEAR ZONE, IT MUST ADHERE TO THE TMUTCD. IF PLACED OUTSIDE THE CLEAR ZONE, SIGN MAY BE PLACED PERPENDICULAR OR PARALLEL TO ROW LINE.
- D. SIGN DIMENSION IS 42" WIDE X 24" TALL WITH 5" BLACK LETTERS.

Concrete Washout



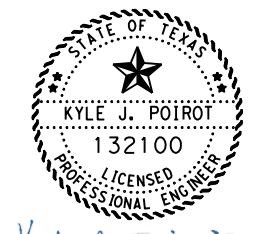
**BEST MANAGEMENT PRACTICE (BMP) #13**  
PUMPED STORM WATER SEDIMENT CONTROLS 1



**BEST MANAGEMENT PRACTICE (BMP) #14**  
STOCKPILE SEDIMENT CONTROL

	VEGETATIVE BUFFER
	DIRECTION OF FLOW
	SEDIMENT CONTROL FENCE
	ROCK FILTER DAM (TY 2)
	ROCK FILTER DAM (TY 3)

- NOTES:**
- PUMPED STORM WATER FROM AN EXCAVATION AREA SHOULD BE DISCHARGED IN A 50' VEGETATIVE BARRIER OR THROUGH TWO TEMPORARY SEDIMENT CONTROLS.
  - WHEN CONTAINMENT AREA REACHES 1' FREEBOARD, DISCONTINUE WASHOUT PLACEMENT AND REMOVE MATERIAL UPON SOLIDIFICATION.
  - EACH TIME SOLIDIFIED MATERIAL IS REMOVED REPLACE PLASTIC SHEETING. USE 10 MIL PLASTIC LINING MINIMUM.
  - START SEDIMENT CONTROL AT LOCATION SO ALL STORM WATER WITH SEDIMENT IS COLLECTED
  - ROCK FILTER DAMS, SEDIMENT CONTROL FENCE, OR OTHER DEVICES CAN BE SUBSTITUTED AS DIRECTED.
  - ACTUAL SIZE, LAYOUT, & LOCATION WILL BE DETERMINED IN THE FIELD.
  - AN EARTHEN BERM MAY BE USED IN LIEU OF SANDBAGS.
  - VEGETATIVE BUFFER SHOULD HAVE AT A MINIMUM 70% VEGETATIVE COVERAGE
  - PLACEMENT OF DEVICES FOR OFFSITE TRACKING AS APPLICABLE AND/OR DIRECTED BY THE ENGINEER.
  - ALL ITEMS REQUIRED FOR CONCRETE WASHOUT AND SIGN SHALL BE SUBSIDIARY TO ITEM 506.



Kyle J. Poirot, P.E.  
9/7/2021

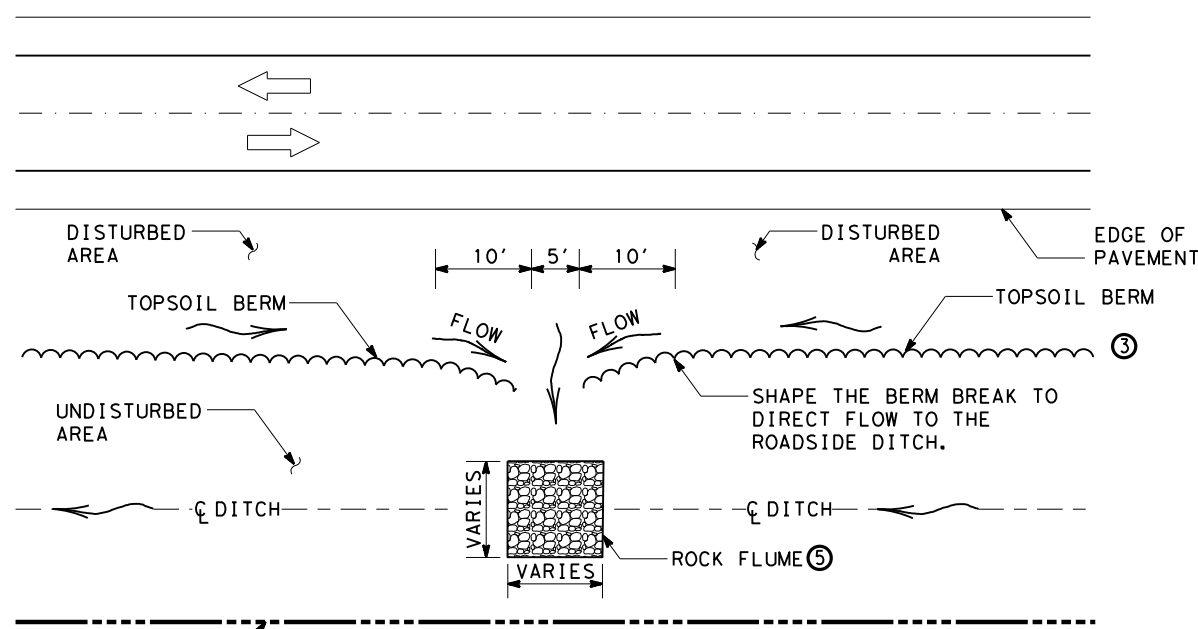
SCALE = NTS SHEET 4 OF 5

Texas Department of Transportation  
Wichita Falls District

**TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES**

**WFS-TA-BMP**

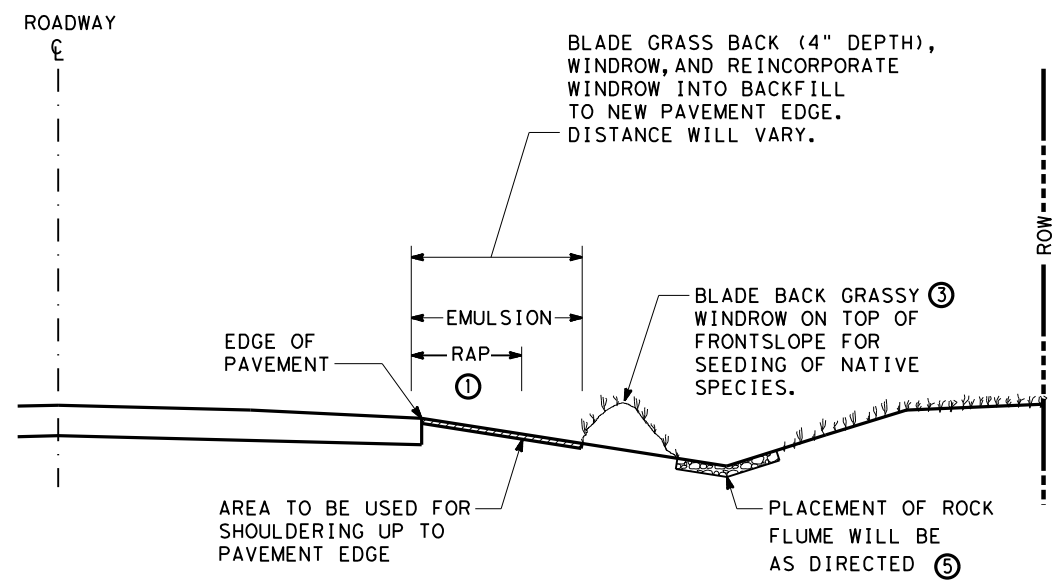
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REVISIONS	0133	04	042	US 82
JULY 2019	DIST	COUNTY	SHEET NO.	
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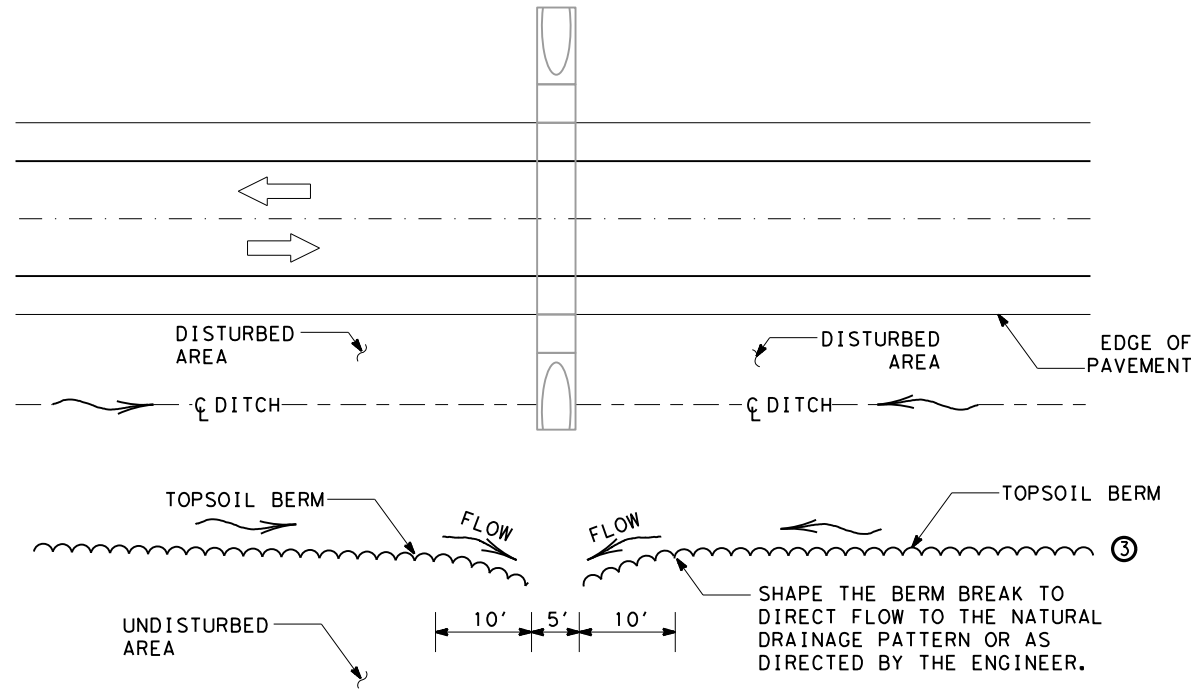
"BERM BREAK" DETAIL PLAN VIEW ②

**BEST MANAGEMENT PRACTICE (BMP) #15**

SEDIMENT CONTROL AND BERM DETAIL WITH BERM ON FRONTSLOPE



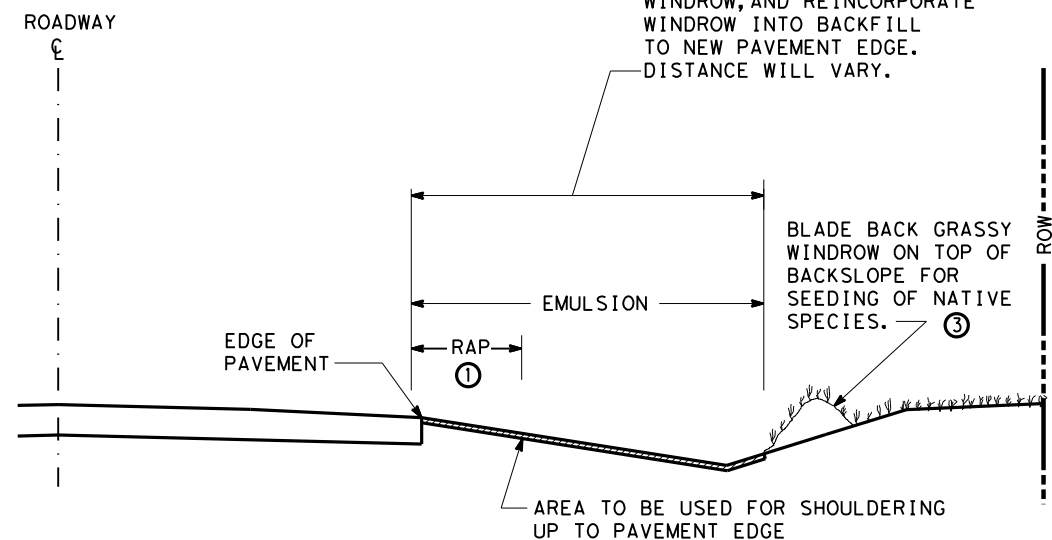
TYPICAL DITCH SECTION SHOWING BERM/WINDROW OF TOPSOIL



"BERM BREAK" DETAIL PLAN VIEW ②

**BEST MANAGEMENT PRACTICE (BMP) #16**

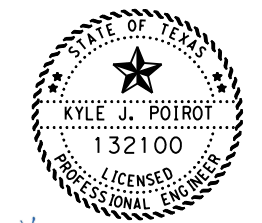
SEDIMENT CONTROL AND BERM DETAIL AT CROSS DRAINAGE STRUCTURE WITH BERM ON BACKSLOPE



TYPICAL DITCH SECTION SHOWING BERM/WINDROW OF TOPSOIL

	FULLY GRASSED DITCH
	DISTURBED AREA
	DIRECTION OF FLOW
	SEDIMENT CONTROL FENCE
	ROCK FLUME-ENERGY DISSIPATOR
	BERM

- NOTES:
- AS DIRECTED PLACE RAP ADJACENT TO EDGE OF PAVEMENT AS A BACKFILL MATERIAL. PLACEMENT DISTANCE IS TO BE A MINIMUM OF 4' OR AS NEEDED TO ACHIEVE SMOOTH TIE IN TO EXISTING FRONT SLOPE.
  - BREAK BERM SO THAT MAXIMUM FLOW LENGTH ALONG THE BERM IS LESS THAN 1000'. BREAK BERM IN LOW AREAS WHERE FLOW MAY OVERTOP THE BERM. DO NOT BREAK BERM ON HILLTOPS OR WHERE RUNOFF AND SEDIMENT FLOW DIRECTLY OFF THE ROW.
  - LOCATION OF BERM WILL VARY. BERM COULD BE PLACED ON FRONTSLOPE OR BACKSLOPE DEPENDING ON FIELD CONDITIONS. SEE SPECIFIC SW3P LAYOUT SHEET FOR MORE DETAILS ON LOCATION OF BERM.
  - ROCK FILTER DAMS, SEDIMENT CONTROL FENCE, EROSION CONTROL LOGS, ROCK FLUME, OR OTHER DEVICES CAN BE SUBSTITUTED AS DIRECTED. DEVICE MAY NOT BE NEEDED IN ALL LOCATIONS. SEE SPECIFIC SW3P LAYOUT SHEET FOR MORE DETAILS ON LOCATION OF DEVICES.
  - PLACE ROCK FLUME DISSIPATOR AS DIRECTED BY THE ENGINEER. SIZE AND LOCATIONS OF ROCK FLUME WILL VARY. PROVIDE ROCK OR RUBBLE WITH A 3" TO 6" AGGREGATE. SECURE ROCK WITH 20-GAUGE GALVANIZED WOVEN WIRE MESH WITH 1" DIAMETER HEXAGONAL OPENINGS. ROCK SHOULD BE PLACED ON THE MESH AND MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE ROCK AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES. PAYMENT WILL BE MADE BY ITEM TEMP PAVED FLUME (INSTALL).



Kyle J. Poirot, P.E.  
9/7/2021

SCALE = NTS SHEET 5 OF 5

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**TYPICAL APPLICATIONS FOR BEST MANAGEMENT PRACTICES**

**WFS-TA-BMP**

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REVISIONS	0133	04	042	US 82
JULY 2019	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	325	

ITEM 164 SEEDING FOR EROSION CONTROL		
SEED (PERMANENT) (URBAN) (SAND or CLAY)		
"WARM SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH.
PERMANENT: EARLY SPRING SEED FROM FEBRUARY 1st THROUGH May 15th. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP: BUFFALO GRASS (Texoka) COMMON BERMUDA GRASS (HULLED) BLUE GRAMA (NATIVE)	4.0 LBS PLS / ACRE 5.0 LBS PLS / ACRE 1.5 LBS PLS / ACRE @1/4 -1/2" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER .		

ITEM 164 SEEDING FOR EROSION CONTROL		
SEED (PERMANENT) (RURAL) (CLAY)		
"WARM SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH.
PERMANENT: EARLY SPRING SEED FROM FEBRUARY 1st THROUGH May 15th. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP: GREEN SPRANGLETOP SIDEOATS GRAMA BUFFALOGRASS BERMUDA GRASS BLACKWELL SWITCHGRASS ILLINOIS BUNDLEFLOWER	1.5 LBS PLS / ACRE 1.5 LBS PLS / ACRE 3.0 LBS PLS / ACRE 2.0 LBS PLS / ACRE 1.0 LBS PLS / ACRE 0.5 LBS PLS / ACRE @1/4 -1/2" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER .		

ITEM 164 SEEDING FOR EROSION CONTROL		
SEED (PERMANENT) (RURAL) (SANDY)		
"WARM SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH.
PERMANENT: EARLY SPRING SEED FROM FEBRUARY 1st THROUGH May 15th. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP: GREEN SPRANGLETOP BERMUDA GRASS SAND LOVEGRASS SAND DROPSEED WEEPING LOVEGRASS BLUE GRAMA PARTRIDGE PEAS (COMANCHE)	1.5 LBS PLS / ACRE 2.0 LBS PLS / ACRE 1.0 LBS PLS / ACRE 1.0 LBS PLS / ACRE 1.0 LBS PLS / ACRE 1.0 LBS PLS / ACRE 1.0 LBS PLS / ACRE @1/4 -1/2" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER .		

ITEM 164 SEEDING FOR EROSION CONTROL		
SEED (TEMPORARY) (URBAN) WARM SEASON SEEDING		
"WARM SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH.
TEMPORARY: LATE SPRING & SUMMER SEED FROM MAY 16th THROUGH AUGUST 31st. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE : BUFFALOGRASS (TEXOKA) COMMON BERMUDA GRASS (UNHULLED) FOXTAIL MILLET	3.0 LBS PLS / ACRE 4.0 LBS PLS / ACRE 15. LBS PLS / ACRE @ 1" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER .		

ITEM 164 SEEDING FOR EROSION CONTROL		
SEED (TEMPORARY) (RURAL) WARM SEASON SEEDING		
"WARM SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH.
TEMPORARY: LATE SPRING & SUMMER SEED FROM MAY 16th THROUGH AUGUST 31st. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE : BUFFALOGRASS (TEXOKA) BERMUDA GRASS (UNHULLED) GREEN SPRANGLETOP FOXTAIL MILLET	3.0 LBS PLS / ACRE 4.0 LBS PLS / ACRE 2.0 LBS PLS / ACRE 20. LBS PLS / ACRE @ 1" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER .		

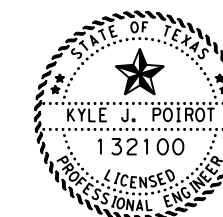
NOTES:

1. SEE NOTES ON TA-VES SHEET 2 OF 2 FOR ADDITIONAL INFORMATION.

SCALE = NTS SHEET 1 OF 2

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**TYPICAL APPLICATION  
FOR  
VEGETATION  
ESTABLISHMENT  
SHEET TA-VES**



Kyle J. Poirot, P.E.

9/7/2021

FILE: BMLAYOUTS.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	0133	04	042	US 82
JULY 2019	DIST	COUNTY	SHEET NO.	
	WFS	BAYLOR	326	

ITEM 164 SEEDING FOR EROSION CONTROL		
SEED (TEMPORARY) (URBAN) COOL SEASON SEEDING		
"COOL SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH.
TEMPORARY: EARLY FALL SEED FROM SEPTEMBER 1st THROUGH DECEMBER 1st. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE : BUFFALOGRASS (TEXOKA) COMMON BERMUDA GRASS (UNHULLED) TALL FESCUE ANNUAL RYE GRASS	3.0 LBS PLS / ACRE 4.0 LBS PLS / ACRE 4.0 LBS PLS / ACRE 15.0 LBS PLS / ACRE @ 1" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER .		

ITEM 164 SEEDING FOR EROSION CONTROL		
SEED (TEMPORARY) (RURAL) COOL SEASON SEEDING		
"COOL SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH.
TEMPORARY: EARLY FALL SEED FROM SEPTEMBER 1st THROUGH DECEMBER 1st. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE : BUFFALOGRASS (TEXOKA) BERMUDA GRASS (UNHULLED) GREEN SPRANGLETOP WESTERN WHEATGRASS CANADA WILD RYE GRASS ELBON RYE GRASS	3.0 LBS PLS / ACRE 4.0 LBS PLS / ACRE 2.0 LBS PLS / ACRE 3.0 LBS PLS / ACRE 2.0 LBS PLS / ACRE 15.0 LBS PLS / ACRE @ 1" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER .		

NOTES:

1. ALL SEED MIXTURE TYPES SHALL BE PURCHASED IN PRE- MIXED BAGS, "BY TYPE" BLENDED BY THE GROWER SHIPPER.
2. SOILS THAT ARE COMPACTED, HAVE CLODS, SHALL BE REWORKED UNTIL READY FOR SEEDING. AS DIRECTED.
3. ALL SOIL SURFACES SHALL BE LEVEL WITH NATURAL FLOWING SMOOTH GRADES. NO TIRE RUTS OR FURTHER TRAFFIC ALLOWED.
4. SOIL SURFACE SHALL BE FIRM BUT NOT COMPACTED, ALLOWING 1/4" DEPRESSION UNDER NORMAL FOOT TRAFFIC.
5. SEED 100% OF THE BED AREA. NO SKIPS OR VOID AREAS ALLOWED. EXAMPLE: AREAS AROUND SIGN POSTS AND INLETS.
6. SEED UP TO THE FIRST 6" OF THE EDGE OF PAVEMENT. AS DIRECTED, HAND RAKE ISOLATED SEEDED AREAS.
7. WEIGH ALL CALIBRATED SEED SAMPLES FOR ACCURACY AND PRESENT DOCUMENTATION TO ENGINEER.

FOR DRILL SEEDING

8. USE ONLY PROFESSIONAL NATIVE GRASS OR TURF GRASS (MULTI- 3 BIN) DRILL SEEDERS. NO DROP SEEDERS ALLOWED. OTHER TYPES OF SEEDERS AS APPROVED BY THE ENGINEER.
9. CALIBRATE DRILL SEEDER FOR SPECIFIED (PLS) PER ACRE BEFORE DRILL SEEDING.
10. DRILL SEEDER MUST BE EQUIPPED WITH THE LARGE FRONT CUTTING COULTERS DURING THE INSPECTION OF DRILL SEEDER.

FOR BROADCAST SEEDING

11. USE ONLY COMMERCIAL TYPE CYCLONE TYPE SPREADERS.
12. CALIBRATE CYCLONE SPREADER FOR 1000 Sq. Ft. (PLS) PER ACRE BEFORE SEEDING.
13. TO PREVENT SEED SEPARATION IN SPREADERS, SPREAD ALL SEED TYPES INDEPENDENTLY IN A SEPARATE APPLICATION.
14. IMMEDIATELY AFTER SEEDING, IN ONE OR TWO OPERATIONS, CULTI-PACK THE SEEDED SOILS AND FIRM SEED INTO SURFACE.
15. DISCONTINUE SEEDING IF WIND EXCEEDS 10 MPH.

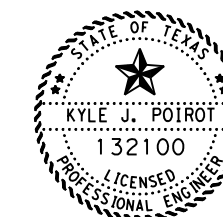
ITEM 314 EMULSIFIED ASPHALT TREATMENT	
TIME SCHEDULE	FUNCTIONAL USE:
IMMEDIATELY AFTER: SOIL PREPARATION OR WITHIN 24 HOURS AFTER SEEDING, APPLY THE TACK COAT TO DESIGNATED SOIL SURFACES.	SOIL EROSION CONTROL, OR MOISTURE RETENTION BARRIER.
NOTES:	
<ol style="list-style-type: none"> <li>1. ALL TRUCK APPLICATIONS SHALL BE COMPLETED IN ONE PASS OF THE DISTRIBUTOR. ALL TOUCH UP WORK WILL BE FINISHED BY HAND AND HOSE PROCEDURES. APPLY FROM EDGE OF PAVEMENT THROUGH THE FULL SPECIFIED AREAS.</li> <li>2. ENGINEER WILL INSPECT FOR ACCURACY THE OVERALL DEPTH OF THE APPLIED TACK COAT MATERIALS.</li> <li>3. FURTHER VEHICULAR TRAFFIC IS NOT ALLOWED ON LAID BY TACK COAT SURFACES. AT THE CONTRACTORS EXPENSE ALL DAMAGES TO TACK COAT SURFACES WILL BE RE -SHOT AS DIRECTED BY THE ENGINEER.</li> <li>4. USE MATERIALS AS SPECIFIED FOR EROSION CONTROL ON TABLE 18 IN ITEM 300 ASPHALTS, OILS, AND EMULSIONS, AT A RATE OF 0.25 GAL/SY.</li> </ol>	

ITEM 166 FERTILIZER	
TIME SCHEDULE	FUNCTIONAL USE:
AFTER TOPSOIL PLOWING PREPARATIONS ARE COMPLETED, FERTILIZE ROW SOIL SURFACES AND HARROW 2" TO 4" DEEP INTO PLACE.	PLANT NUTRIENTS FOR PLANT AND ROOT DEVELOPMENT.
FERTILIZER SHALL BE EVENLY DISTRIBUTED AT A RATE OF 100 LBS OF NITROGEN PER ACRE. THE BREAK DOWN OF THE NITROGEN ELEMENT SHALL BE IN A 50% SLOW RELEASE FORM. ANALYSIS OF THE (NPK) IS: 3:1:1 OR AS DIRECTED BY THE AREA ENGINEER.	
ITEM 166 NOTES:	
<ol style="list-style-type: none"> <li>1. BROADCAST SPECIFIED FERTILIZER FROM THE EDGE OF PAVEMENT, THROUGH THE ENTIRE ROW SEED BED AREA. APPLICATIONS FOR EDGE OF PAVEMENT, CULVERTS, SIGN POST AREAS, GUARD RAILS AND ISOLATED AREAS SHALL BE APPLIED BY WALK BEHIND SPREADERS AND BY HAND. NO FERTILIZER ALLOWED ON PAVEMENT SURFACES.</li> <li>2. ALL SPREADERS SHALL BE CALIBRATED BY THE CONTRACTOR AND THE ENGINEER FOR ACCURACY AND PERFORMANCE. SHALL USE UNOPENED 50# BAGS OF SPECIFIED FERTILIZER FOR DAILY CALIBRATIONS. APPLICATION SHALL BE A EVEN DISTRIBUTION OF PRODUCT ON DESIGNATED SOIL SURFACES.</li> <li>3. FERTILIZER SHALL BE DELIVERED IN 50# BAGS UNLESS OTHERWISE SPECIFIED OR APPROVED PRIOR TO DELIVERY. BAGS SHALL BE CLEARLY LABELED SHOWING CONTENTS. IF BULK FERTILIZER IS APPROVED, DOCUMENTATION WILL BE REQUIRED FOR EACH LOAD OF MATERIAL DELIVERED VERIFYING AUTHENTICITY OF THE MATERIAL. CULTURAL PROCEDURES ARE UNDER THE DIRECTION OF THE TXDOT AREA ENGINEER.</li> </ol>	

SCALE = NTS SHEET 2 OF 2

Texas Department of Transportation  
Wichita Falls District Standard

TYPICAL APPLICATION FOR VEGETATION ESTABLISHMENT SHEET TA-VES



Kyle J. Poirot, P.E.  
9/7/2021

FILE: BMPLAYOUTS.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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JULY 2019	DIST	COUNTY	SHEET NO.	
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