STATE PROJECT NO.			
STP 2B24(176HES)			
CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST		COUNTY	SHEET NO.
FTW		WISE	1

INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NUMBER: STP 2B24(176HES)

HIGHWAY: US 81
WISE COUNTY

CSJ 0013-06-050
NET LENGTH OF PROJECT: 33260.00 FT = 6.300 MI

CSJ 0013-07-086
NET LENGTH OF PROJECT: 58251.00 FT = 11.000 MI

CSJ 0013-08-145
NET LENGTH OF PROJECT: 27143.00 FT = 5.200 MI

LIMITS: FROM: MONTAGUE COUNTY LINE
TO: 0.5 MI SOUTH OF CR 4228

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENT WORK
CONSISTING OF MEDIAN CABLE BARRIER

STA 15+20 TO STA 347+81.82

DESIGN SPEED = 75 MPH
AADT (2023) = 22,537
AADT (2043) = 31,573
FUNCTIONAL CLASS = PRINCIPAL ARTERIAL

STA 347+81.82 TO STA 930+62.80

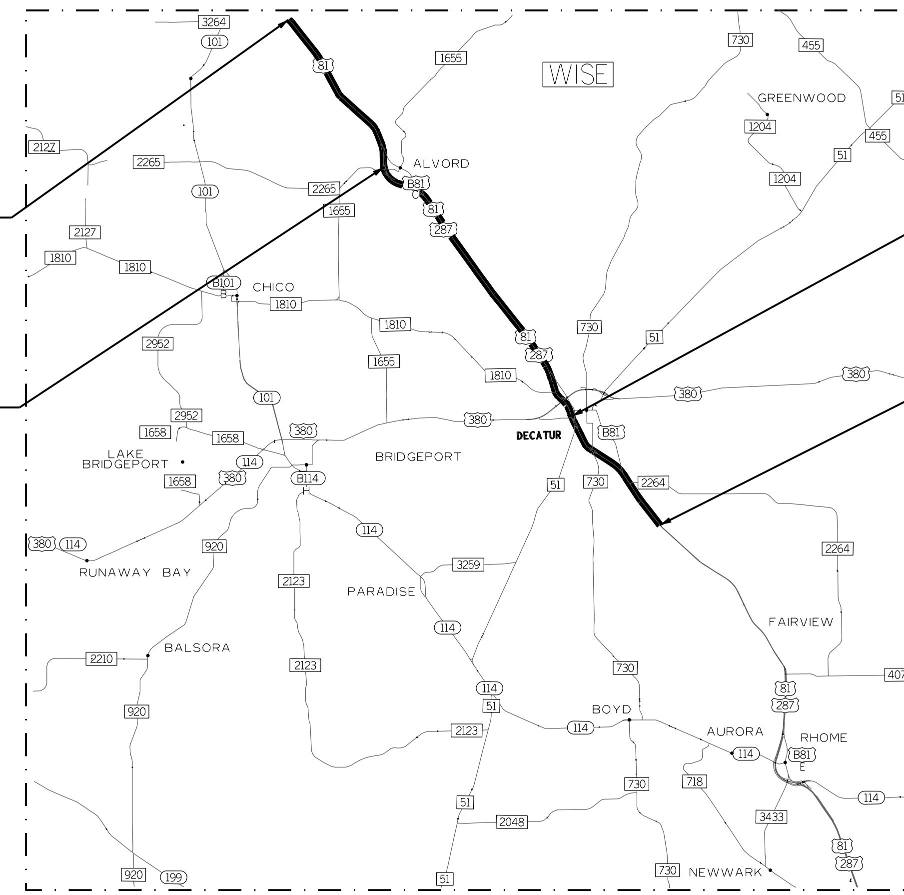
DESIGN SPEED = 55-75 MPH
AADT (2023) = 32,874
AADT (2043) = 46,054
FUNCTIONAL CLASS: PRINCIPAL ARTERIAL

STA 930+62.80 TO STA 1201+60.41

DESIGN SPEED = 55-70 MPH
AADT (2023) = 37,867
AADT (2043) = 53,049
FUNCTIONAL CLASS: PRINCIPAL ARTERIAL

BEGIN PROJECT
CCSJ 0013-07-086, ETC
BEGIN CSJ 0013-06-050
℄ US 81 STA 15+20.00
REF MRK #226+0

END CSJ 0013-06-050
BEGIN CSJ 0013-07-086
℄ US 81 STA 347+81.82
REF MRK #232+0.316



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END CSJ 0013-07-086
BEGIN CSJ 0013-08-145
℄ US 81 STA 930+62.80
REF MRK # 242+1.463

END PROJECT
CCSJ 0013-07-086, ETC
END CSJ 0013-08-145
℄ US 81 STA 1201+60.41
REF MRK #248+0.242

LETTING DATE: ______
CONTRACTOR: ______
______
WORK BEGAN: ______
WORK COMPLETED: ______
WORK ACCEPTED: ______
CHANGE ORDERS: ______
USED X OF X ALLOTED DAYS: ______
FINAL CONTRACT DAY: ______

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, P.E. 3/15/2024
DATE

AECOM
AECOM Technical Services, Inc.- F-3580

EQUATIONS: NONE
EXCEPTIONS:NONE

RAILROAD: NONE
NO TDLR REQUIRED

SUBMITTED FOR LETTING: 3/19/2024
DATE

DocuSigned by:
P.E.
1C2C4AEE88A847B...
AREA ENGINEER

RECOMMENDED FOR LETTING: 3/27/2024
DATE

DocuSigned by:
7879B0B92E5D403...
DIRECTOR, TP&D

APPROVED FOR LETTING: 3/28/2024
DATE

DocuSigned by:
David M Salazar, P.E.
B741E64FAD82411...
DISTRICT ENGINEER

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)-21 THRU BC(12)-21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

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, OCTOBER 23, 2023)

FILE: c:\pwworking\ust+x\dms25326\US81*AEC*GN*CO*001.dgn
DATE: 3/13/2024 2:40:58 AM

INDEX OF SHEETS

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER

4/2/2024

Salcido Pauwis, P.E.

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

AECOM
13355 Noel Road, Suite 400
Dallas, Texas 72540
(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

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CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
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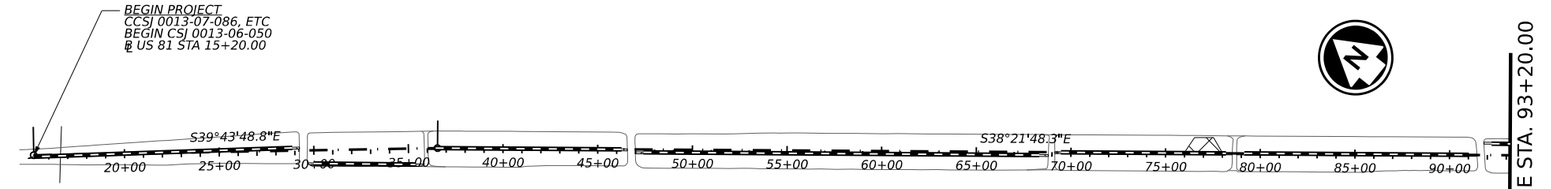

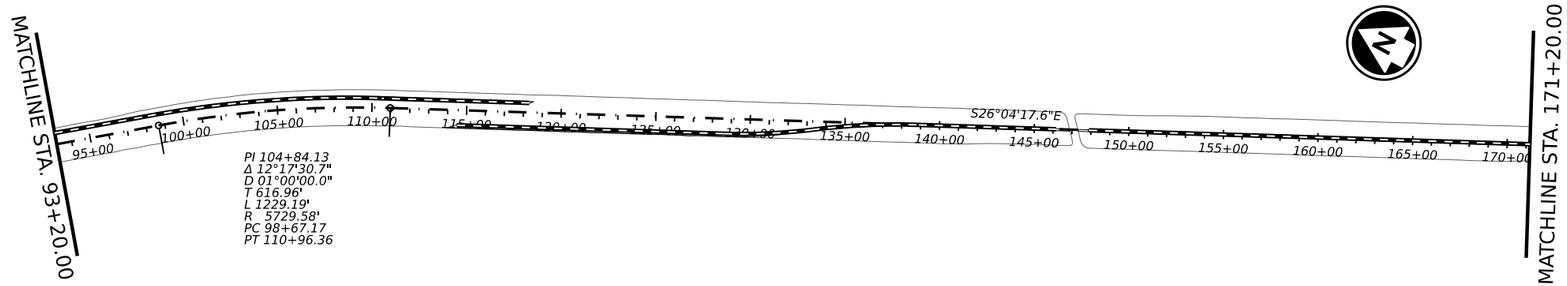

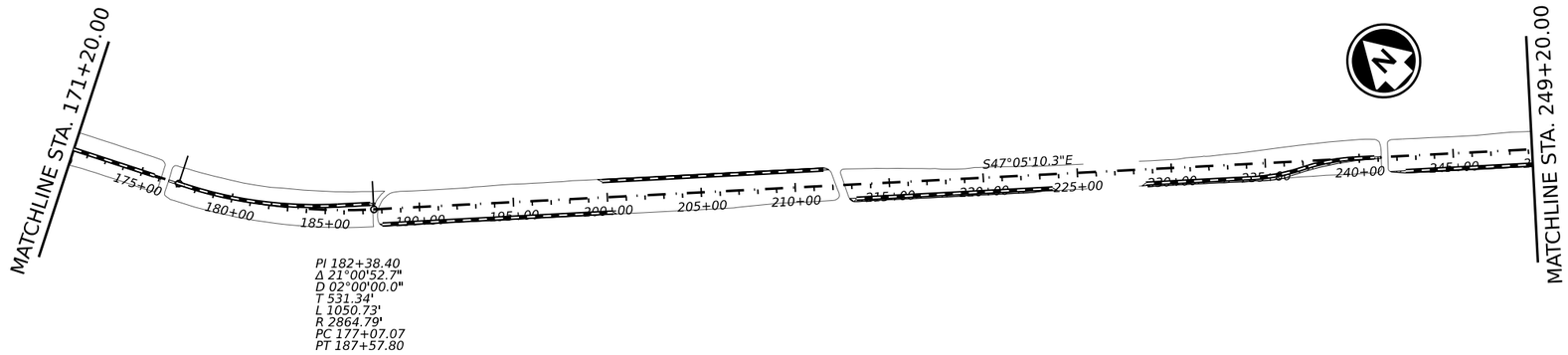

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER

3/21/2024

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Texas Department of Transportation

US 81

PROJECT LAYOUT

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		3

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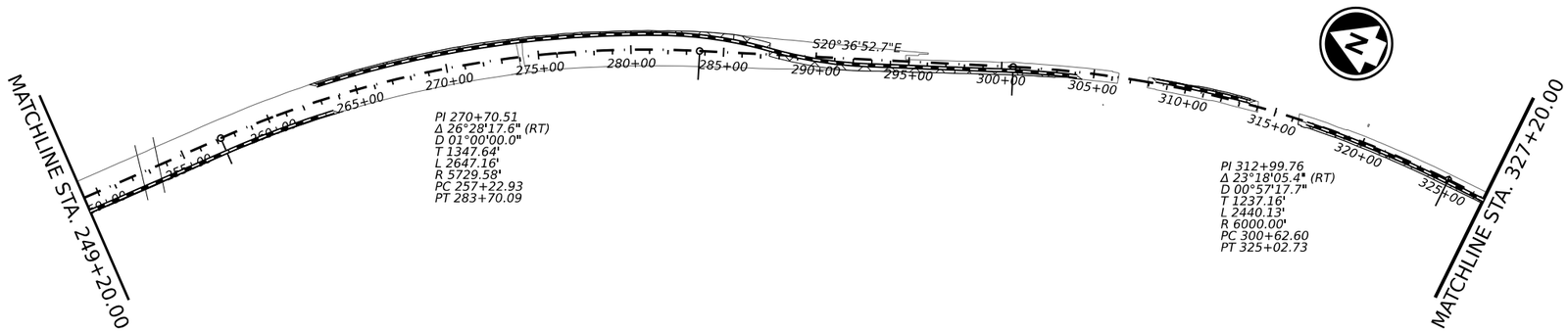

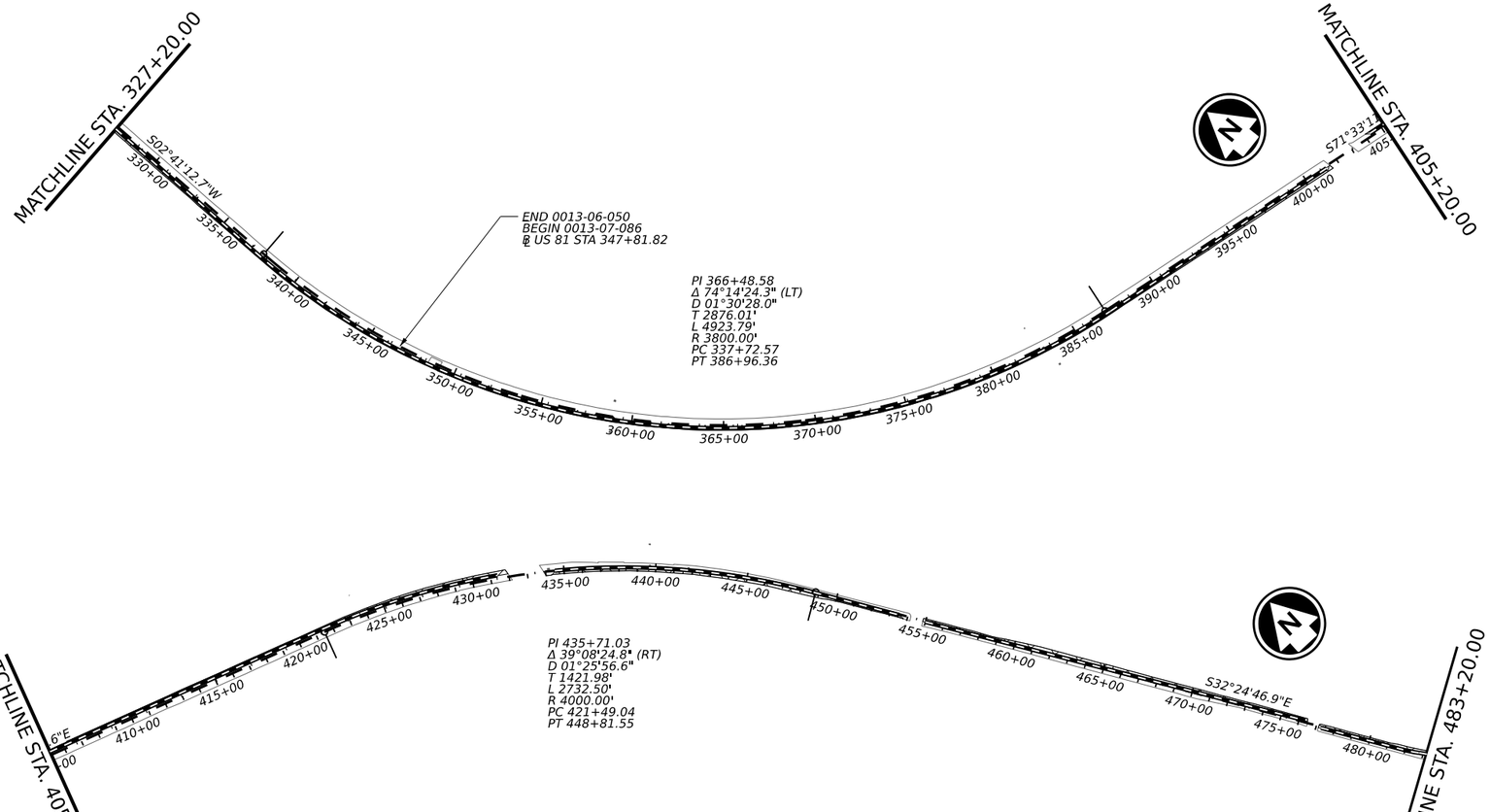

ERNESTO SALCIDO
100177
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

3/21/2024

Salcido, P.E.

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Texas Department of Transportation

US 81

PROJECT LAYOUT

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		4

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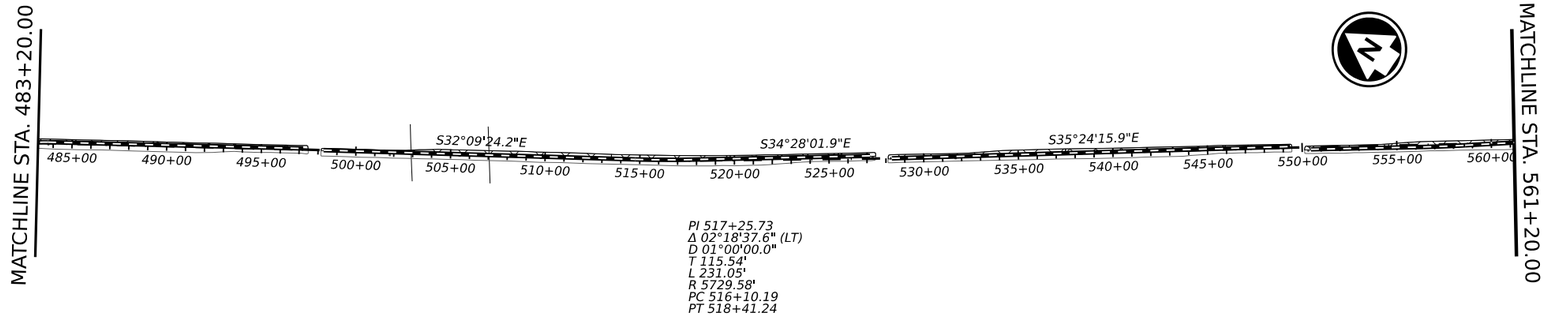

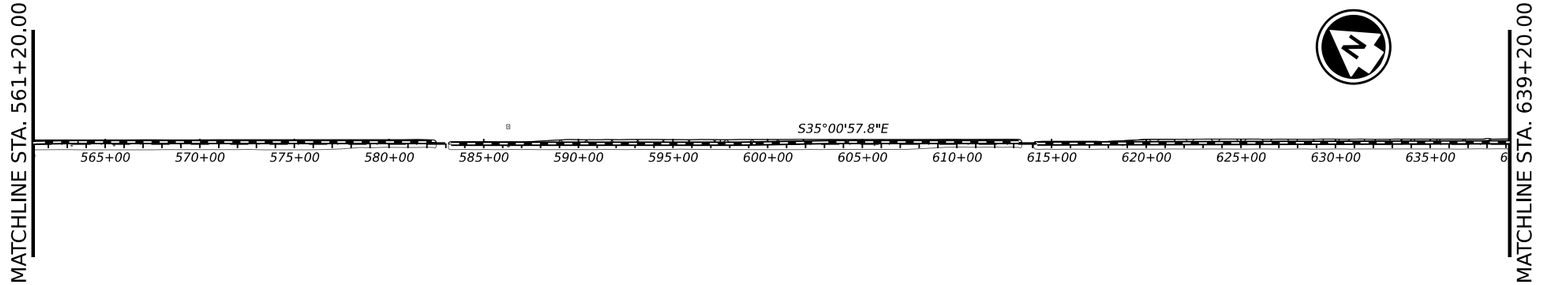

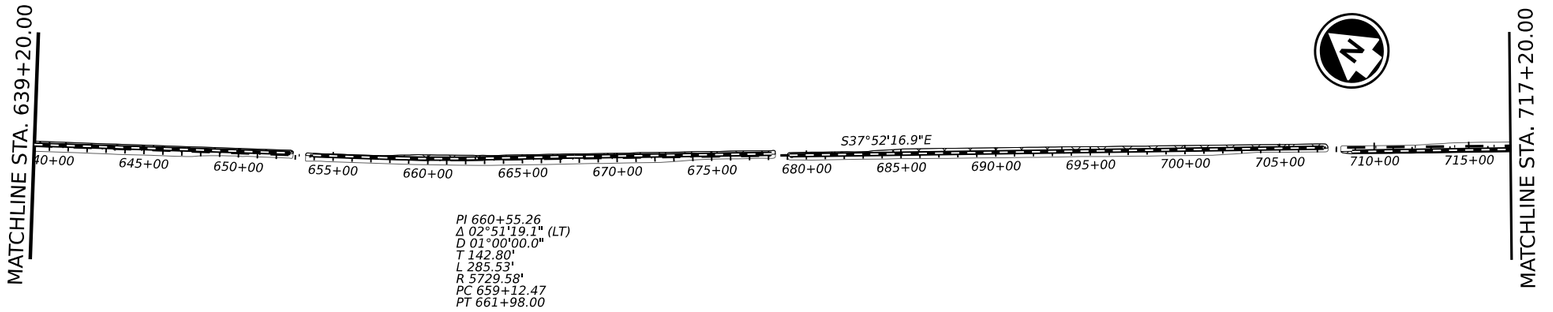

STATE OF TEXAS
ERNESTO SALCIDO
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3/21/2024
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Texas Department of Transportation

US 81

PROJECT LAYOUT

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
FTW	WISE		5

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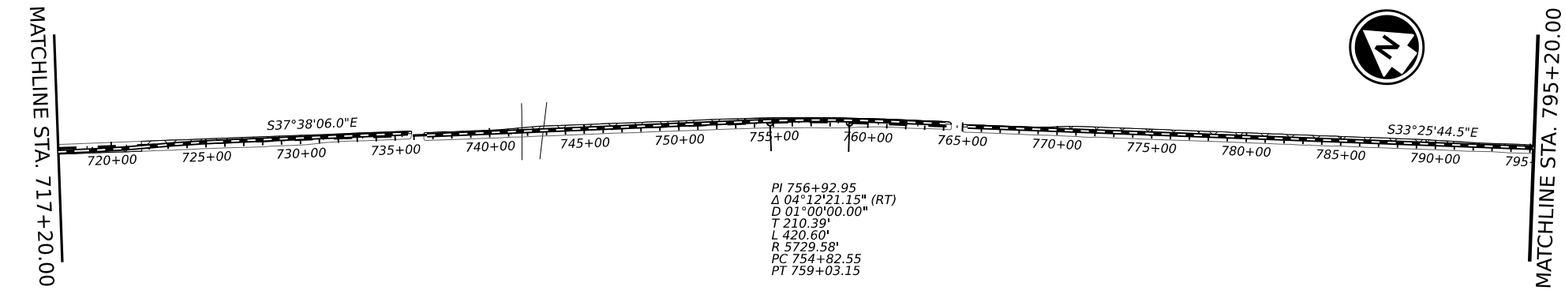

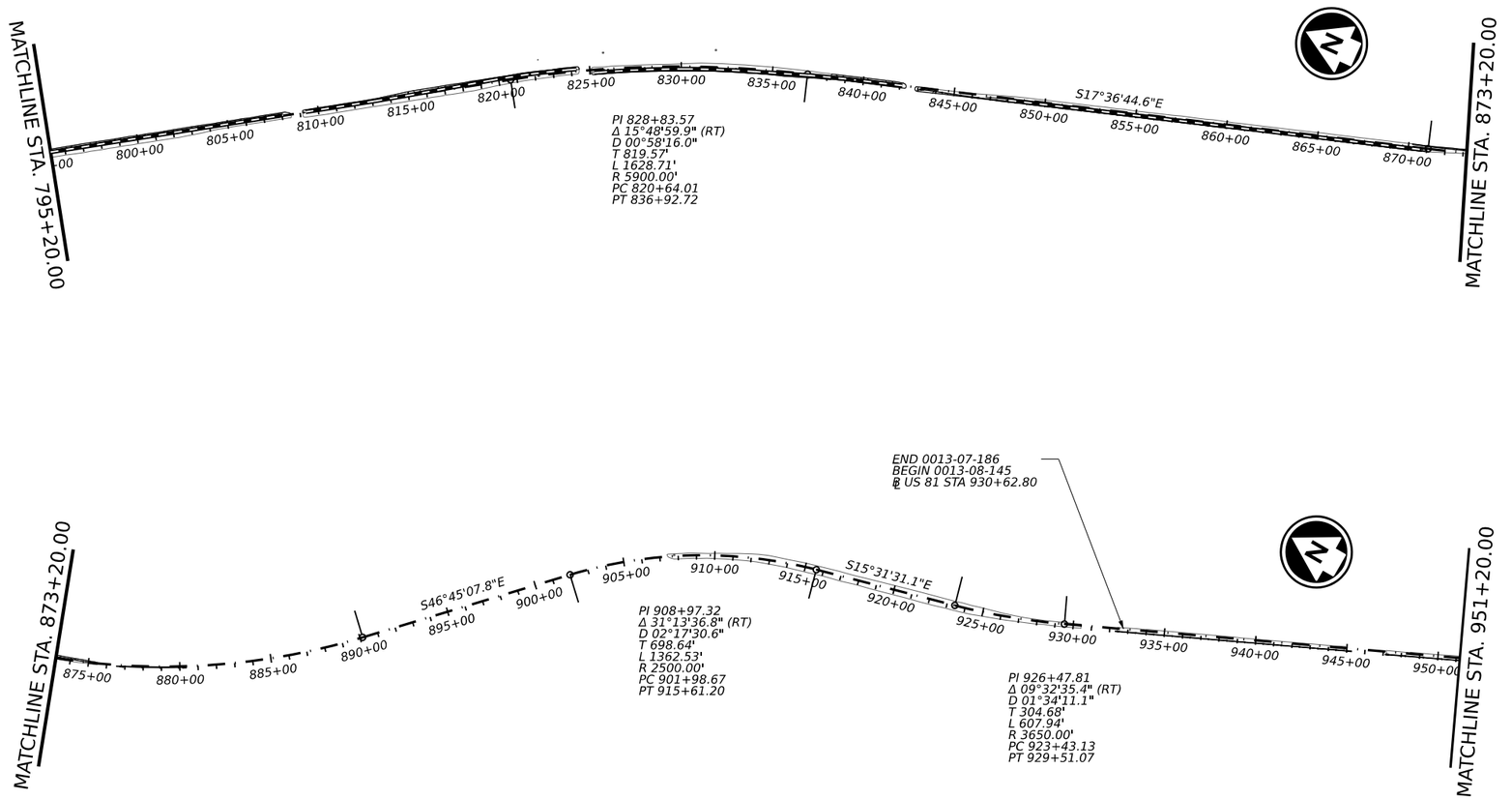

STATE OF TEXAS
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Texas Department of Transportation

US 81

PROJECT LAYOUT

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
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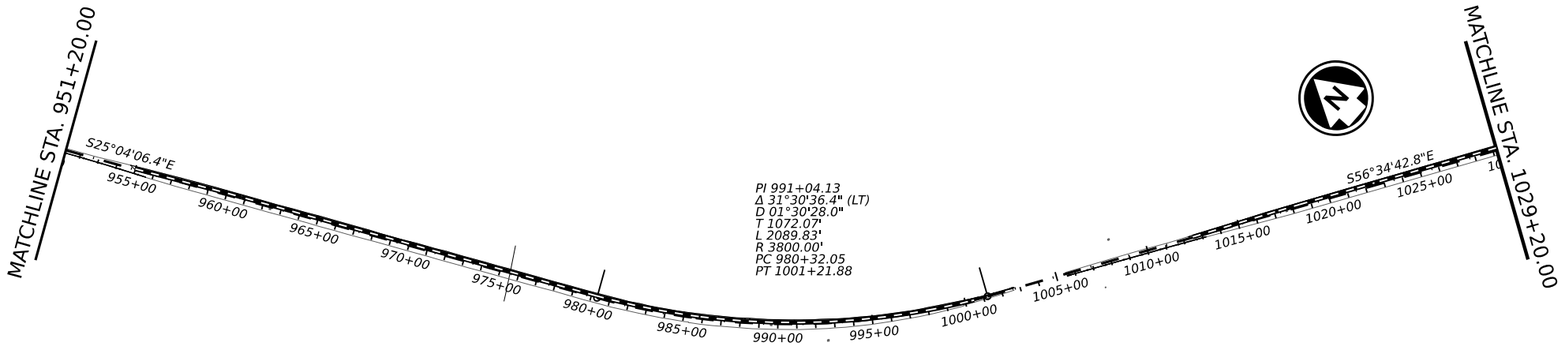

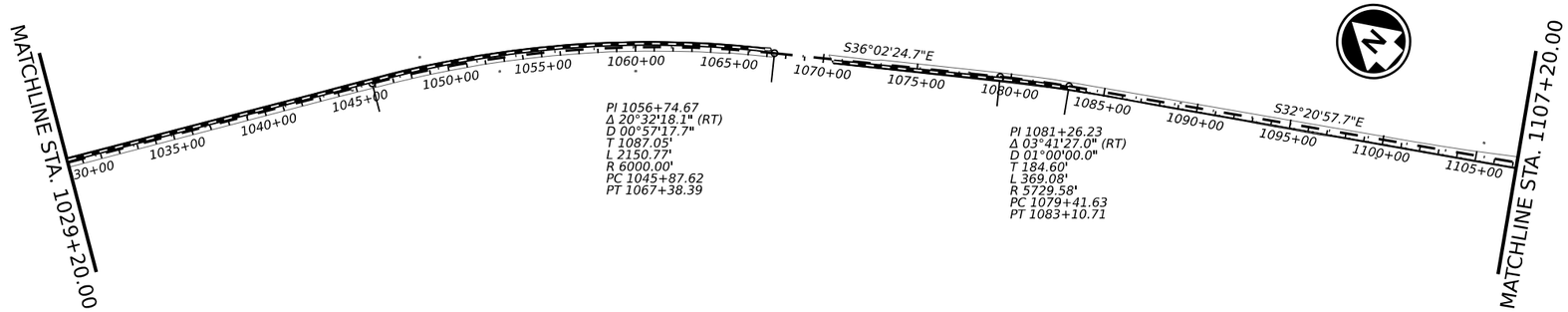

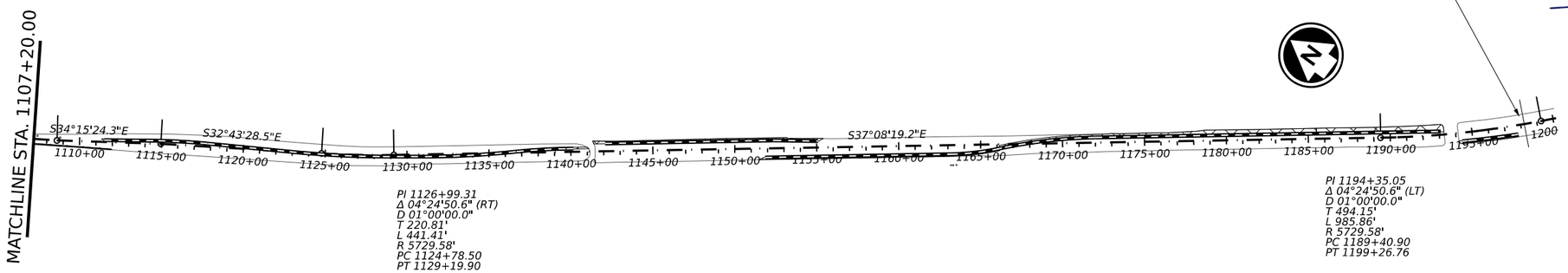

STATE OF TEXAS
ERNESTO SALCIDO
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LICENSED
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3/21/2024

Ernesto Salcido, P.E.

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Texas Department of Transportation

US 81

PROJECT LAYOUT

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
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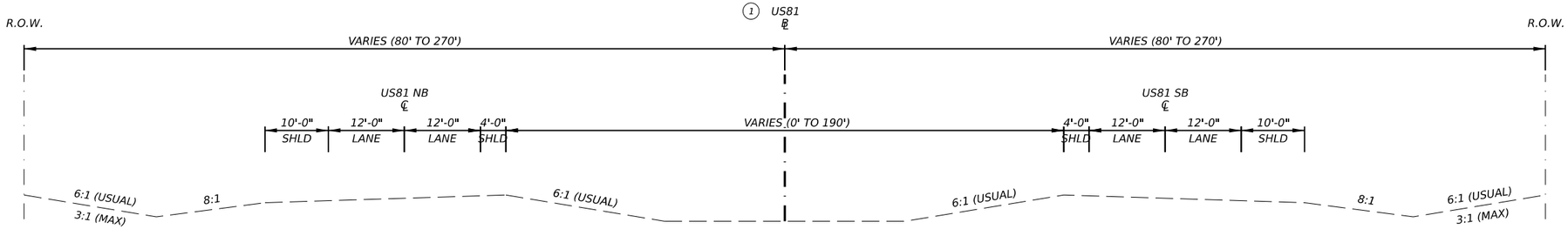
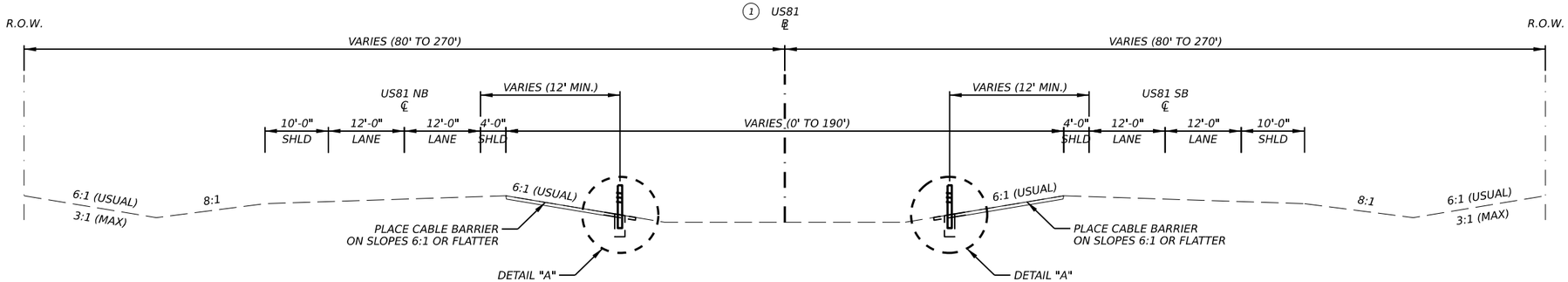


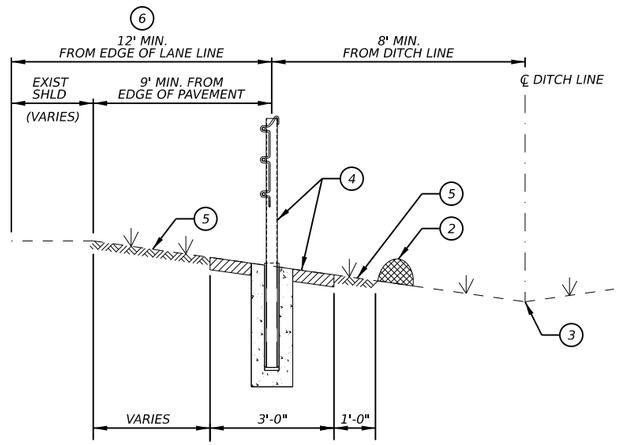
EXISTING TYPICAL SECTION

STA 15+20.00 TO STA 2006+12.00
N.T.S.



PROPOSED TYPICAL SECTION

SEE PLAN LAYOUT SHEETS FOR PLACEMENT OF CABLE BARRIER
N.T.S.



DETAIL "A"

N.T.S.

CABLE BARRIER WITH MOW STRIP

NOTES:

1. BASELINE FOR US 81 MAY NOT BE LOCATED AT CENTER OF RIGHT-OF-WAY.
2. BLADE EXISTING VEGETATION AND EXPOSED SOIL TO ESTABLISH WINDROW. WINDROW TO BE USED AS A BERM FOR EROSION PROTECTION.
3. EXISTING DITCH LINE TO BE RE-GRADED TO DRAIN, AS DIRECTED BY THE ENGINEER.
4. CABLE BARRIER SYSTEM WITH 5" CONCRETE RIP RAP MOWSTRIP.
5. CELLULOSE FIBER MULCH SEEDING AND VEGETATIVE WATERING WITH TOPSOIL.
6. PLACE CABLE BARRIER AT 12' MINIMUM FROM EDGE OF TRAVEL LANE AT SLOPES THAT ARE 6:1 OR FLATTER. REFER TO PLAN LAYOUT FOR PROPOSED CABLE BARRIER LOCATIONS.

CO	REV	DESCRIPTION	DATE	BY

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED PROFESSIONAL ENGINEER
3/21/2024

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Texas Department of Transportation

US 81

TYPICAL SECTION

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0013	07	086, ETC	US 81
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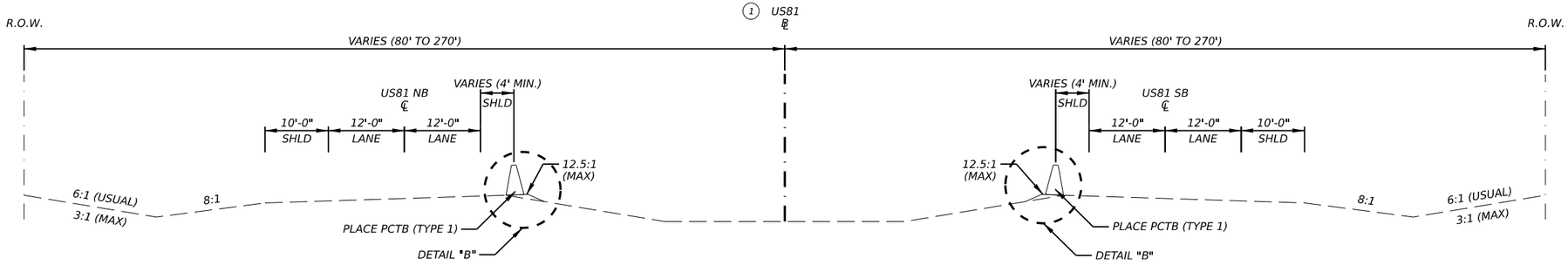
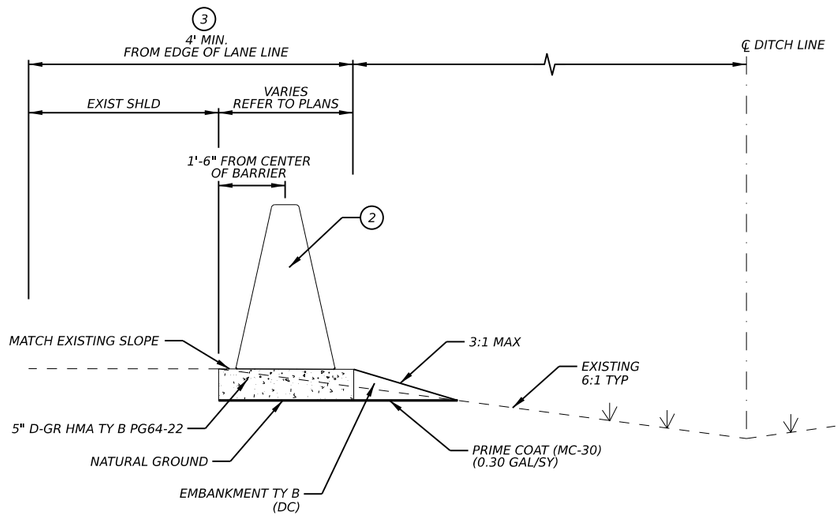


PROPOSED TYPICAL SECTION

SEE PLAN LAYOUT SHEETS FOR PLACEMENT OF SINGLE SLOPE BARRIER
N.T.S.



DETAIL "B"

N.T.S.

PORTABLE CONCRETE TRAFFIC BARRIER WITH HMAC LEVELING PAD

NOTES:

1. *BASELINE FOR US 81 MAY NOT BE LOCATED AT CENTER OF RIGHT-OF-WAY.*
2. *PORTABLE CONCRETE TRAFFIC BARRIER (PCTB) WITH 3' WIDE HMAC LEVELING PAD.*
3. *PLACE CONCRETE BARRIER AT 8' MINIMUM FROM EDGE OF TRAVEL LANE AT SLOPES THAT ARE 12.5:1 OR FLATTER. REFER TO PLAN LAYOUT FOR PROPOSED CONCRETE BARRIER.*

GENERAL NOTES:

1. *WIDENING WORK FOR PCTB CONSTRUCTION WILL NEED TO BE PERFORMED UNDER A DAILY LANE CLOSURE.*
2. *NO PAVEMENT DROP-OFF EXPOSURE TO TRAFFIC WILL OCCUR OVERNIGHT, CONTRACTOR WILL BE REQUIRED TO SHOULDER UP AT THE END OF THE DAY BY PROVIDING A COMPACTED 3:1 SLOPED AT EDGE OF PAVEMENT.*
3. *CONTRACTOR SHALL INSTALL "SHOULDER CLOSED" SIGNS AND TRAFFIC CONTROL DEVICES TO DELINEATE THE WORK AREA IN ALL PAVEMENT WIDENING SECTIONS.*
4. *SHOULDERING UP WORK, SIGNS, AND TRAFFIC CONTROL DEVICES WILL NOT BE PAID FOR DIRECTLY BUT WILL SUBSIDIARY TO PERTINENT BID ITEMS.*
5. *EXCAVATION QUANTITIES FOR INFORMATION PURPOSES ONLY, SHALL BE SUBSIDIARY TO PERTINENT ITEM.*

CO	REV	DESCRIPTION	DATE	BY

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
3/21/2024
Salcido, P.E.

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(214) 741-7777
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Texas Department of Transportation

US 81

TYPICAL SECTION

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
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DATE: 3/21/2024 9:38:10 PM
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Specification Data

Basis of Estimate

Item	Description	Rate	Unit
166	Fertilizer (16-8-8)	600 lb./acre**	ton
168	Vegetative Watering	169,400 gal./acre	1,000 gal.
310	Asph Mat'l (MC-30, EC-30, or CBSMS-1S) (Subgrade Priming)	0.30 gal./sq. yd.*	gal.**
3076	D-GR HMA TY B	115 lb./sq. yd.-in.	ton
3076	Tack Coat - CSS-1P	0.20 gal./sq. yd.**	gal.

* Based On 50% Asphalt Residue.
** Non-Pay, for Contractor's Information Only

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at

TxDOT's public FTP site at https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/.

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site: http://www.txdot.gov/business/letting-bids/plans-online.html

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

Area Engineer's Email: _ Edrean.Cheng@txdot.gov
Assistant Area Engineer's Email: __ Oscar.R.Chavez@txdot.gov

Control: 0013-07-086, ETC

County: WISE

Highway: US 81

For Q&A's on Proposals navigate to https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors. Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Peak Hours		Off-Peak Hours	
6 to 9 AM Monday through Friday	3 to 7 PM Monday through Friday	9 AM to 3 PM and 7 PM to 6 AM Monday through Friday	All day Saturday and Sunday

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.

The following Holiday/Event lane closure restriction requirements apply to this project:

No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Event Lane Closure Restrictions 3 PM the day before Event to 9 AM the day after the Event			
NASCAR Races at Texas Motor Speedway (generally 3 events):	NASCAR Nationwide and Sprint Cup Series (Held in late March/early April)	NASCAR Nationwide and Sprint Cup Series (Held in Late October/early November)	Indy Series Racing and NASCAR Truck Series (Held in June)
Within one mile radius of major retail traffic generators i.e. malls (Thanksgiving Day through January 2)			

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

For dimensions of right-of-way not shown on the plans, see right-of-way map on file at the TxDOT District Office.

Provide temporary drain openings at all low points or other drainage structures, as required, at the Contractor's expense.

Remove any obstructions to existing drainage due to the contractor's operations, as required, at the Contractor's expense.

Item 4. Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and ½ inch top, right, and bottom margins.

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 6. Control of Materials

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

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

The Buy America Material Classification Sheet is located at the below link.

https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7. Legal Relations and Responsibilities

The total area disturbed for this project is 6.77 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Five-Day Workweek.'

The number of working days for final acceptance will be 135 working days.

Prepare the progress schedule as a bar chart, include all planned work activities and sequences and show Contract completion within the number of working days specified. Submit an updated hard copy when changes to the schedule occur or when requested.

Item 100. Preparing Right of Way

Measurement for this item will be along the centerline of the project with the limits of measurements as shown on the plans.

Item 132. Embankment

Do not provide Type B embankment material with a Plasticity Index (PI) higher than _35_.

Item 160. Topsoil

Place approximately 3 inches of topsoil on areas shown or directed.

Item 166. Fertilizer

Fertilize all areas of project to be seeded.

Item 168. Vegetative Watering

Furnish and install an approved rain gauge at the project site, as directed. Furnishing and installation of the rain gauge will not be paid for directly, but will be subsidiary to Item 168.

Apply vegetative watering for an establishment period of thirteen weeks following application of seed or installation of sod, at a rate of 1/2 inch of water depth per week (approximately 13,030 gallons per acre). During the first four weeks after seeding, apply water twice per week, on non-consecutive days, each at half the weekly application rate. For the remainder of the establishment period, apply vegetative watering once per week during the months of January through June or September through December, at the weekly application rate; apply watering twice per week, on non-consecutive days during the months of July and August, each at one-half the weekly application rate.

Average weekly rainfall rates for the District are:

January—0.39"	April—0.86"	July—0.48"	October—0.68"
February—0.46"	May—1.00"	August—0.47"	November—0.46"
March—0.48"	June—0.63"	September—0.74"	December—0.37"

Item 432. Riprap

No RAP shall be used as embankment under the mow strip.

Mow strip shall be reinforced with welded wire reinforcement (WWR) or conventional steel.

No fiber reinforced concrete will be allowed in mow strip construction.

Provide weep holes as directed.

The quantities for riprap at the location indicated may be varied to the extent necessary to ensure proper functioning for the purpose intended.

All concrete riprap will be 5" (.42') in thickness, unless otherwise shown on the plans, and must be reinforced.

Item 502. Barricades, Signs, and Traffic Handling

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 typically 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.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas”.

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 512. Portable Concrete Traffic Barrier

“*Furnish and Install*” barrier in compliance with Single-Slope Concrete Barrier (SSCB) as shown on the plans.

Furnish Class H Concrete with a minimum 28 day compressive strength of 3,600 psi.

Provide the hardware assemblies to join barrier sections.
Provide welded tie bar assembly at the assembly joints when using slotted-end PCTB as shown on Fort Worth Standard PCTB(1)-03(FW) joint tie details.

For permanent installations, grout the joints with an approved non-shrink grout material when using slotted-end PCTB.

Connection hardware will remain the property of the State upon completion of the project and will not be paid for directly but will be subsidiary to Item 512,”Portable Concrete Traffic Barrier”. Deliver hardware to the location specified by the Engineer.

Delineate all barriers in accordance with Barricade and Construction (BC) Standard sheets. Barrier delineation will not be paid for directly, but will be subsidiary to Item 512,”Portable Concrete Traffic Barrier”.

Remove and replace traffic barrier damaged by the traveling public and no longer serviceable as directed. Additional payment will be provided as compensation to remove and replace the traffic barrier damaged by the traveling public in accordance with Item 512.

Item 543. Cable Barrier System

Driven posts will not be permitted.

The following products are approved for use on this project:

Trinity Industries CASS (TL-4) System
Nu-Cable (TL-4) System
Gibraltar Cable Barrier (TL-4) System

Pre-stretch all cable or wire rope.

Site conditions may require grading for proper installation of cable barrier. This grading will be considered subsidiary to this item.

The contractor shall avoid underground utilities and TxDOT drainage facilities by layout out cable barrier before installation. The engineer shall approve layout and lengths of cable barrier runs.

Item 545. Crash Cushion Attenuators

Salvageable units removed by this project are the property of the contractor.

Item 658. Delineator and Object Marker Assemblies

Contractor to provide delineators that are “SHUR-TITE” or approved equal by the Engineer.

Removal of existing delineators and object marker assemblies shall be considered subsidiary to various bid items.

Item 3076. Dense-Graded Hot-Mix Asphalt

Natural (field) sands are not allowed.

Provide a PG 64-22 asphalt for the base course.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

Warm Mix Asphalt (WMA) is not permitted in any mix type on this project.

RAP and RAS are not permitted in any surface and levelup mixes on this project.

Grade substitution per Table 5 is not allowed.

Use the Boil Test, Test Procedure Tex-530-C, and provide only mixes that produce zero percent (0%) stripping for design verification and during production.

Include the approved mix design number on each delivery ticket.

Use a Material Transfer Device (MTD) unless otherwise directed.

Stop production after Lot 1. Review all test data and confirm any changes with the Engineer. Do not start production and placement on subsequent Lots until approved by the Engineer.

Shoulders, crossovers, and other areas listed on the Plan sheets or as directed are not subject to in-place air void determination for this project.

Temporary detours are subject to in-place air void determination for this project.

Ride quality is not required on this project.

Item 6001. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

Two (2) electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles

Item 6185. Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 0 additional shadow vehicle(s) with TMA for TCP (5-1)-18 as detailed on General Note of this standard sheet.

Therefore, 1 total shadow vehicle with TMA will be required for this type of work. Determine if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0013-07-086 **DISTRICT** Fort Worth **COUNTY** Wise
HIGHWAY US 81

			CONTROL SECTION JOB	**0013-06-050**		**0013-07-086**		**0013-08-145**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00178906**		**A00178908**		**A00178903**			
			COUNTY	**Wise**		**Wise**		**Wise**			
			HIGHWAY	**US 81**		**US 81**		**US 81**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	100-6001	PREPARING ROW	AC	8.650		18.210		6.190		33.050	
	105-6011	REMOVING STAB BASE AND ASPH PAV (2"-6")	SY			1,291.000				1,291.000	
	132-6004	EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY			145.000		63.000		208.000	
	160-6006	FURNISHING AND PLACING TOPSOIL (3")	SY			1,291.000				1,291.000	
	164-6021	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	52,330.000		104,665.000		36,568.000		193,563.000	
	164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	26,164.500		52,333.000		18,285.000		96,782.500	
	164-6031	CELL FBR MLCH SEED(TEMP)(COOL)	SY	26,165.000		52,332.000		18,283.000		96,780.000	
	168-6001	VEGETATIVE WATERING	MG	3,663.100		7,326.550		2,559.760		13,549.410	
	432-6046	RIPRAP (MOW STRIP)(5 IN)	CY	1,449.240		2,295.790		925.690		4,670.720	
	500-6001	MOBILIZATION	LS			1.000				1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			9.000				9.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	558.000		108.000		400.000		1,066.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	558.000		108.000		400.000		1,066.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120.000		1,480.000		72.000		1,672.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	120.000		1,480.000		72.000		1,672.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF			1,350.000		6,094.000		7,444.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF					402.000		402.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA					3.000		3.000	
	543-6002	CABLE BARRIER SYSTEM (TL-4)	LF	29,185.500		47,471.500		19,211.000		95,868.000	
	543-6020	CABLE BARRIER TERMINAL SECTION (TL-4)	EA	35.000		35.000		13.000		83.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA			1.000				1.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA			3.000		1.000		4.000	
	658-6027	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA			12.000		61.000		73.000	
	658-6101	INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	35.000		35.000		13.000		83.000	
	772-6001	POST AND CABLE FENCE (REMOVAL)	LF			670.000				670.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON			218.790		584.210		803.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA			4.000				4.000	
	6185-6002	TMA (STATIONARY)	DAY			662.000				662.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY			20.000				20.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS			1.000				1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000				1.000	

LOCATION	100 6001	164 6021	164 6029	164 6031	166 6002	168 6001	432 6046	506 6002	506 6011	506 6041	506 6043	543 6002	543 6020	658 6101
CSJ 0013-06-050	PREPARING ROW	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	CELL FBR MLCH SEED(TEMP)(WARM)	CELL FBR MLCH SEED(TEMP)(COOL)	FERTILIZER*	VEGETATIVE WATERING	RIPRAP (MOW STRIP)(5 IN)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)	CABLE BARRIER SYSTEM (TL-4)	CABLE BARRIER TERMINAL SECTION (TL-4)	INSTL OM ASSM (OM-2Z)(WFLX)SRF) SRF
	AC	SY	SY	SY	TON	MG	CY	LF	LF	LF	LF	LF	EA	EA
SHEET 1	0.10	717	358	359	0.09	50.19	29.31					573	1	1
SHEET 2	0.17	1185	593	592	0.15	82.95	50.74	18	36			975	2	2
SHEET 3	0.27	1672	836	836	0.21	117.04	50.97	36	36			980	2	2
SHEET 4	0.19	1287	644	643	0.16	90.09	50.51	36	36			970	2	2
SHEET 5	0.19	1295	648	647	0.16	90.65	50.42	18	18			968	2	2
SHEET 6	0.47	2638	1319	1319	0.33	184.66	51.48	36	36			991	2	2
SHEET 7	0.15	1077	538	539	0.13	75.39	50.28	36	36			965	2	2
SHEET 8	0.19	1341	671	670	0.17	93.87	55.88					1207		
SHEET 9	0.30	1973	986	987	0.24	138.11	69.81					1448	1	1
SHEET 10	0.42	2460	1230	1230	0.30	172.20	59.40	36	36			1223	1	1
SHEET 11	0.22	1468	734	734	0.18	102.76	55.74					1204		
SHEET 12	0.19	1285	642	643	0.16	89.95	47.73	54	54			910	2	2
SHEET 13	0.20	1333	667	666	0.17	93.31	55.56					1200		
SHEET 14	0.19	1286	643	643	0.16	90.02	50.14	36	36			962	2	2
SHEET 15	0.20	1339	669	670	0.17	93.73	52.92	18	18			1022	2	2
SHEET 16	0.26	1656	828	828	0.21	115.92	58.15	36	36			1135	2	2
SHEET 17	0.23	1479	740	739	0.18	103.53	48.15					919	2	2
SHEET 18	0.34	1990	995	995	0.25	139.30	47.13	36	36			958	1	1
SHEET 19	0.34	1964	982	982	0.24	137.48	41.48	36	36			836	1	1
SHEET 20	0.29	1734	867	867	0.21	121.38	48.43	36	36			925	2	2
SHEET 21	0.27	1717	858	859	0.21	120.19	55.28					1194		
SHEET 22	0.49	2787	1394	1393	0.35	195.09	58.38	36	36			1140	2	2
SHEET 23	0.52	2903	1452	1451	0.36	203.21	56.30	18	18			1216		
SHEET 24	0.88	4639	2319	2320	0.58	324.73	55.93					1208		
SHEET 25	0.33	1869	934	935	0.23	130.83	36.16	18	18	40	40	660	2	2
SHEET 26	0.85	4828	2414	2414	0.60	337.96	96.39	18	18	80	80	1961	2	2
SHEET 27	0.40	2408	1204	1204	0.30	168.56	66.57					1438		
PROJECT TOTALS	8.65	52330	26165	26165	6.50	3663.10	1449.24	558	576	120	120	29186	35	35

* NON-PAY ITEM, FOR CONTRACTOR'S REFERENCE ONLY.

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Texas Department of Transportation

US 81

CABLE BARRIER
SUMMARY SHEET

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		12

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LOCATION	100 6001	105 6011	110 6001	132 6004	160 6006	164 6021	164 6029	164 6031	166 6002	168 6001	310 6009	432 6046	506 6002	506 6011	506 6041	506 6043
CSJ 0013-07-086	PREPARING ROW	REMOVING STAB BASE AND ASPH PAV (2"-6")	EXCAVATION (ROADWAY)**	EMBANKMENT (FINAL)(DENS CONT)(TY B)	FURNISHING AND PLACING TOPSOIL (3")	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	CELL FBR MLCH SEED(TEMP)(WARM)	CELL FBR MLCH SEED(TEMP)(COOL)	* FERTILIZER	VEGETATIVE WATERING	* PRIME COAT (MC-30)	RIPRAP (MOW STRIP)(5 IN)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
	AC	SY	CY	CY	SY	SY	SY	SY	TON	MG	GAL	CY	LF	LF	LF	LF
SHEET 27	0.22					1406	703	703	0.17	98.42		45.05				
SHEET 28	0.63					3834	1917	1917	0.48	268.38		111.57			120	120
SHEET 29	0.72					4203	2102	2101	0.52	294.21		97.59			40	40
SHEET 30	0.80					4671	2335	2336	0.58	326.97		111.30			120	120
SHEET 31	1.00					5536	2768	2768	0.69	387.52		97.08	18	18	80	80
SHEET 32	0.93					5240	2620	2620	0.65	366.80		100.42				
SHEET 33	0.83					4777	2389	2388	0.59	334.39		106.34	18	18	80	80
SHEET 34	1.10					6105	3052	3053	0.76	427.35		111.11			160	160
SHEET 35	0.95					5380	2690	2690	0.67	376.60		105.60			120	120
SHEET 36	0.84					4854	2427	2427	0.60	339.78		106.85			120	120
SHEET 37	0.79					4584	2292	2292	0.57	320.88		106.62	18	18	40	40
SHEET 38	0.76					4470	2235	2235	0.55	312.90		106.85	18	18	80	80
SHEET 39	0.99					5576	2788	2788	0.69	390.32		111.11			40	40
SHEET 40	0.76					4434	2217	2217	0.55	310.38		103.29			120	120
SHEET 41	0.99					5548	2774	2774	0.69	388.36		107.04			80	80
SHEET 42	0.92					5184	2592	2592	0.64	362.88		104.49			40	40
SHEET 43	0.82					4717	2359	2358	0.58	330.19		106.76				
SHEET 44	0.87		16	67		4988	2494	2494	0.62	349.16		106.02	18	18		
SHEET 45	1.09		28	78		6070	3035	3035	0.75	424.90		111.11			80	80
SHEET 46	0.78					4532	2266	2266	0.56	317.24		105.56	18	18	40	40
SHEET 47	0.63					3832	1916	1916	0.48	268.24		106.90			120	120
SHEET 48	0.58	1291			1291	3412	1706	1706	0.42	238.84	155.40	84.26				
SHEET 49	0.21					1312	656	656	0.16	91.84	126.30	42.87				
SHEET 50																
SHEET 51																
PROJECT TOTALS	18.21	1291	44	145	1291	104665	52333	52332	12.97	7326.55	281.70	2295.79	108	108	1480	1480

* NON-PAY ITEM, FOR CONTRACTOR'S REFERENCE ONLY.

** FOR CONTRACTOR'S REFERENCE ONLY, SHALL BE SUBIDIARY TO PERTINENT ITEM.

LOCATION	512 6001	543 6002	543 6020	545 6007	658 6027	658 6101	772 6001	3076 6001
CSJ 0013-07-086 (CONTINUED)	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	CABLE BARRIER SYSTEM (TL-4)	CABLE BARRIER TERMINAL SECTION (TL-4)	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	INSTL OM ASSM (OM-22)(WFLX) SRF)SRF	POST AND CABLE FENCE (REMOVAL)	D-GR HMA TY-B PG64-22
	LF	LF	EA	EA	EA	EA	LF	TON
SHEET 27		973						
SHEET 28		2410						
SHEET 29		1987	2			2		
SHEET 30		2404						
SHEET 31		1976	2			2		
SHEET 32		1927	4			4		
SHEET 33		2176	2			2		
SHEET 34		2400						
SHEET 35		2100	3			3		
SHEET 36		2248	1			1		
SHEET 37		2182	2			2		
SHEET 38		2187	2			2		
SHEET 39		2400						
SHEET 40		2110	2			2		
SHEET 41		2191	2			2		
SHEET 42		2136	2			2		
SHEET 43		2185	2			2		
SHEET 44		2169	2			2		
SHEET 45		2400						
SHEET 46		2159	2			2		
SHEET 47		2188	2			2		
SHEET 48	540	1699	2	1	5	2	362	62.96
SHEET 49	810	866	1	2	7	1	308	155.83
SHEET 50								
SHEET 51								
PROJECT TOTALS	1350	47472	35	3	12	35	670	218.79

SUMMARY OF TRAFFIC CONTROL ITEMS

LOCATION	6001 6002	6185 6002	6185 6005
CSJ 0013-07-086, ETC	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	EA	DAY	DAY
PHASE 0			10
PHASE 1	2	555	
PHASE 2	2	107	
PHASE 3			10
PROJECT TOTALS	4	662	20

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Texas Department of Transportation

US 81

CABLE BARRIER SUMMARY SHEET

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		13

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CK DW CK DW

LOCATION	100 6001	110 6001	132 6001	164 6021	164 6029	164 6031	166 6002	168 6001	310 6009	432 6046	506 6002	506 6011	506 6041	506 6043	512 6001
CSJ 0013-08-145	PREPARING ROW	EXCAVATION (ROADWAY)**	EMBANKMENT (FINAL)(ORD COMP)(TY A)	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	CELL FBR MLCH SEED(TEMP)(WARM)	CELL FBR MLCH SEED(TEMP)(COOL)	* FERTILIZER	VEGETATIVE WATERING	* PRIME COAT (MC-30)	RIPRAP (MOW STRIP)(5 IN)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)
	AC	CY	CY	SY	SY	SY	TON	MG	GAL	CY	LF	LF	LF	LF	LF
SHEET 51		3	8						10.80						108
SHEET 52	0.08	57	143	486	243	243	0.06	34.02	198.60	11.71					2006
SHEET 53	0.68			4095	2048	2047	0.51	286.65		111.11	40	40			
SHEET 54	0.56	8	19	3328	1664	1664	0.41	232.96	26.10	87.13	40	40	18	18	260
SHEET 55	0.40	21	54	2499	1250	1249	0.31	174.93	75.00	78.84	40	40			750
SHEET 56	0.64			3919	1959	1960	0.49	274.33		111.20	80	80			
SHEET 57	0.51			3141	1570	1571	0.39	219.87		94.44	40	40			
SHEET 58	0.16	55	139	980	490	490	0.12	68.60	394.80	30.19	80	80			1925
SHEET 59	0.23	30	75	1566	783	783	0.19	109.62	217.20	65.00	80	80			1045
SHEET 60	0.52			3240	1620	1620	0.40	227		102.55			18	18	
SHEET 61	0.93			5397	2699	2698	0.67	378		126.67			18	18	
SHEET 62	1.47			7864	3932	3932	0.97	550		105.65			18	18	
SHEET 63	0.01			53	27	26	0.01	4		1.20					
PROJECT TOTALS	6.19	174	438	36568	18285	18283	4.53	2559.76	922.50	925.69	400	400	72	72	6094

* NON-PAY ITEM, FOR CONTRACTOR'S REFERENCE ONLY.

** FOR CONTRACTOR'S REFERENCE ONLY, SUBSIDIARY TO PERTINENT ITEM.

LOCATION	542 6001	542 6002	543 6002	543 6020	545 6007	658 6027	658 6101	3076 6001
CSJ 0013-08-145 (CONTINUED)	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	CABLE BARRIER SYSTEM (TL-4)	CABLE BARRIER TERMINAL SECTION (TL-4)	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	INSTL OM ASSM (OM-2Z)(WFLX)SRF) SRF	D-GR HMA TY-B PG64-22
	LF	EA	LF	EA	EA	EA	EA	TON
SHEET 51	126					2		10.35
SHEET 52	276	3	193	1		20	1	190.33
SHEET 53			2400					
SHEET 54			1822	1		3	1	25.01
SHEET 55			1643	1		7	1	71.88
SHEET 56			2402					
SHEET 57			1919	2			2	
SHEET 58			592	1	1	19	1	378.35
SHEET 59			1344	1		10	1	208.15
SHEET 60			2094	2			2	
SHEET 61			2615	2			2	
SHEET 62			2161	2			2	
SHEET 63			26					
PROJECT TOTALS	402	3	19211	13	1	61	13	884.07

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Texas Department of Transportation

US 81

CABLE BARRIER SUMMARY SHEET

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		14

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CK
DW
CK
DW

SUGGESTED SEQUENCE OF CONSTRUCTION

PHASE 0: ADVANCED WARNING SIGNS

1. PLACE ADVANCED WARNING SIGNS, IN CONFORMANCE WITH BC STANDARDS.

PHASE 1: CABLE BARRIER INSTALLATION AND SEEDING

LENGTH OF WORK SHALL NOT EXCEED 2-MILE SEGMENTS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
REPEAT STAGE 1 AND STAGE 2 FOR EACH LENGTH OF WORK.

STAGE 1:

1. FOLLOW STANDARD TCP (5-1a)-18 TO PLACE NECESSARY EROSION CONTROL DEVICES, AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STAGE 2:

1. FOLLOW STANDARD TCP (5-1b)-18 FOR BLADING OF EXISTING VEGETATION AND EXPOSED SOIL TO ESTABLISH WINDROW.

2. FOLLOW STANDARD TCP (6-1a)-12 FOR GRADING, CABLE BARRIER CONSTRUCTION, CONCRETE TRAFFIC BARRIER, MOW STRIP, AND SEEDING OPERATIONS.

PHASE 2: PERMANENT SEEDING AND REMOVAL OF EROSION CONTROL DEVICES

LENGTH OF WORK SHALL NOT EXCEED 2-MILE SEGMENTS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

1. FOLLOW STANDARD TCP (6-1a)-12 FOR PERMANENT SEEDING OPERATIONS.

2. FOLLOW STANDARD TCP (5-1a)-18 TO REMOVE EROSION CONTROL DEVICES.

PHASE 3: PROJECT CLOSE-OUT

1. REMOVE ADVANCED WARNING SIGNS.

GENERAL NOTES

1. THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK AND IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER WITH THE STATE OF TEXAS. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISE PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE TRAFFIC MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.

2. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC. DO NOT STORE EQUIPMENT OUTSIDE DESIGNATED RIGHT OF WAY WITHOUT THE PERMISSION GRANTED FIRST BY THE PROPERTY OWNER.

3. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE AT ALL TIMES.

4. ACCESS TO ADJOINING PROPERTIES MUST BE MAINTAINED AT ALL TIMES.

5. THE CONTRACTOR SHALL PERFORM WORK DURING THE DAY AND MAINTAIN ROADWAY LANES OPEN TO TRAFFIC AT NIGHT.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER

Salcido Yanin, P.E. 3/21/2024

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Texas Department of Transportation

US 81

TCP NARRATIVE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		15

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

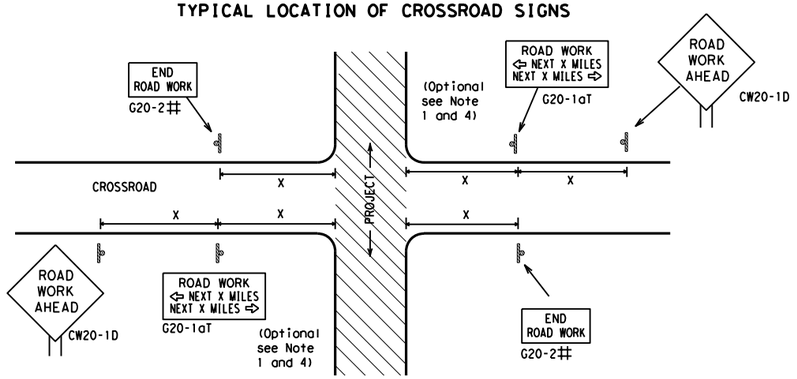
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	FTW	WISE		16
5-10 5-21				

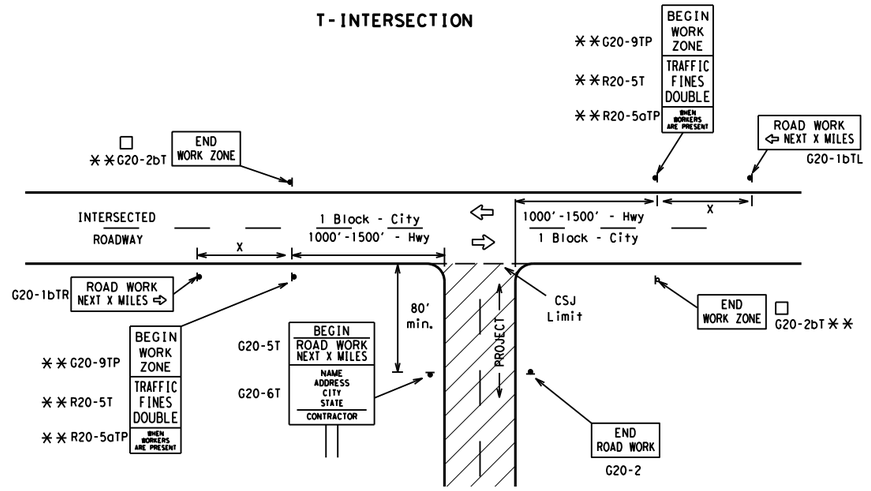
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

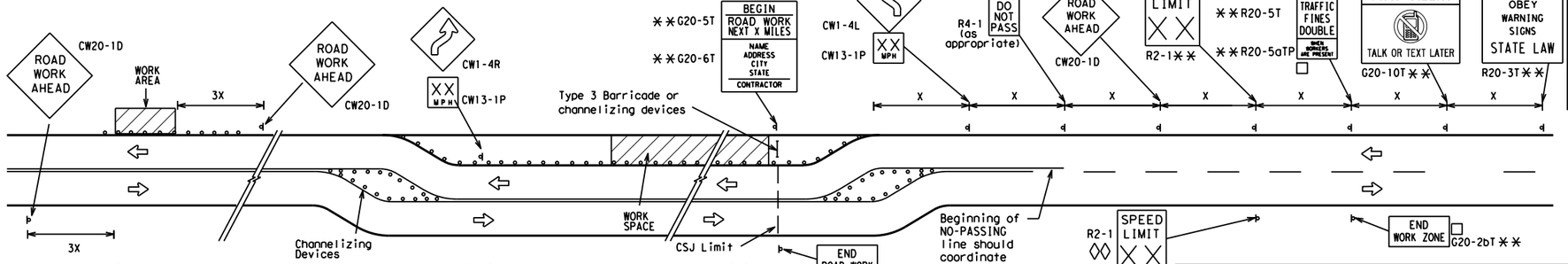
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

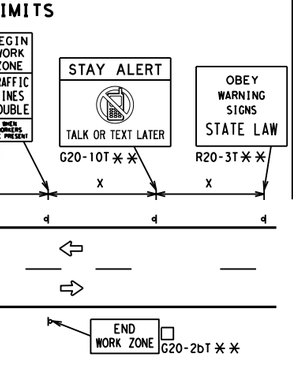
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

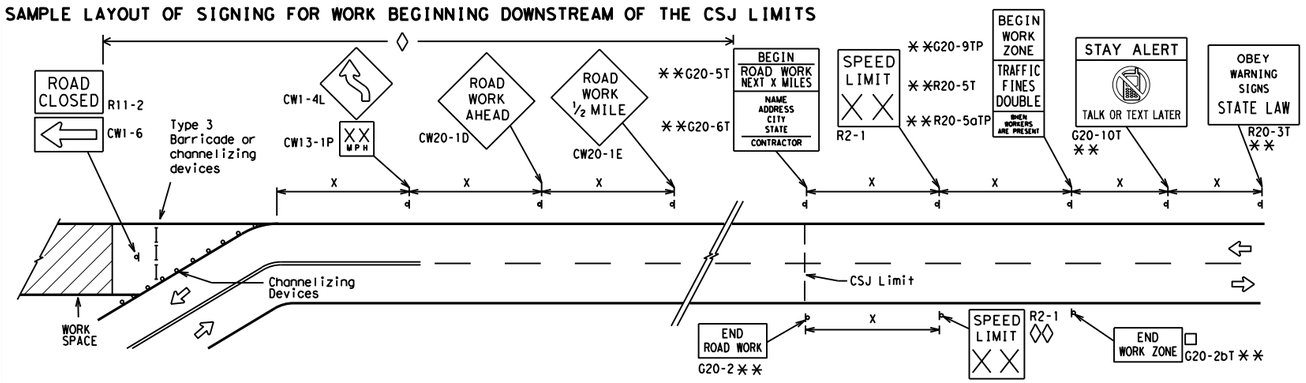


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

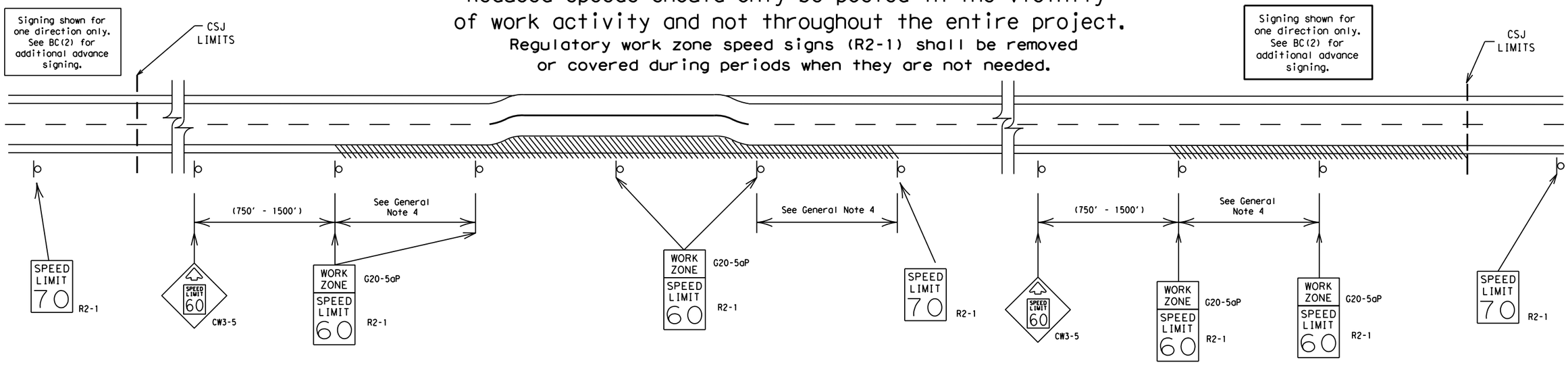
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	WISE		17

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	WISE		18

DATE: 3/21/2024 9:40:59 PM
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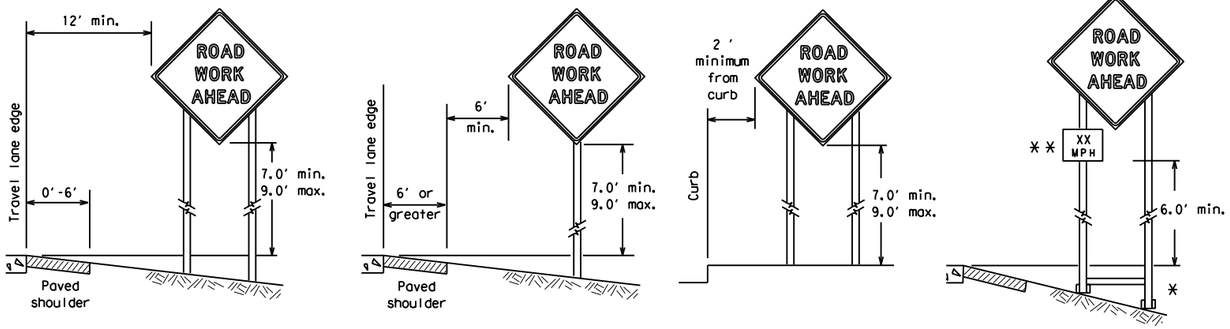
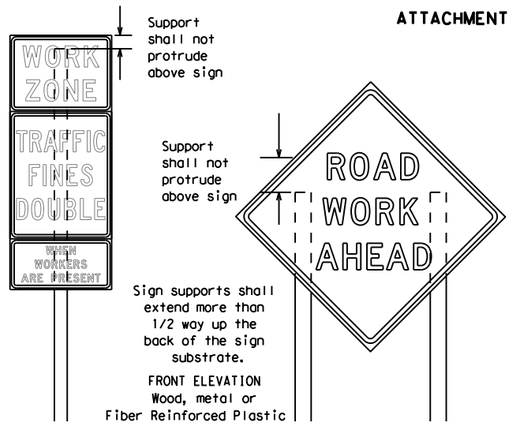
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

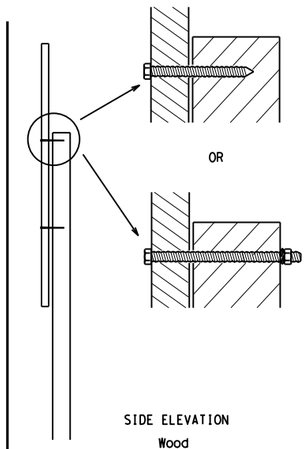


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





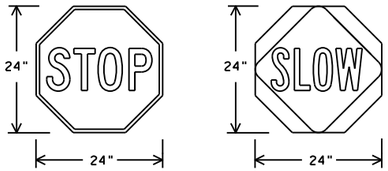
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	WISE		19

DATE: 3/21/2024 9:41:20 PM
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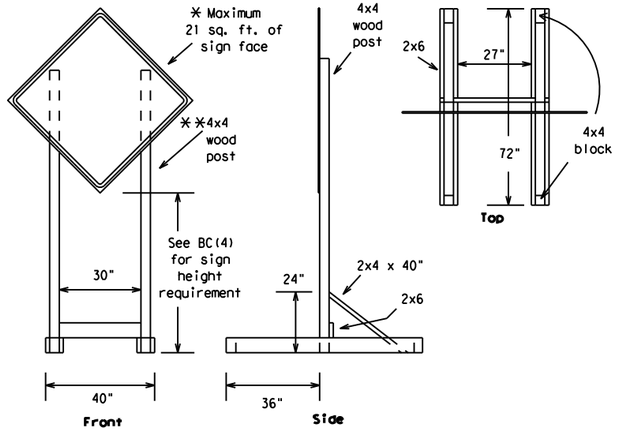
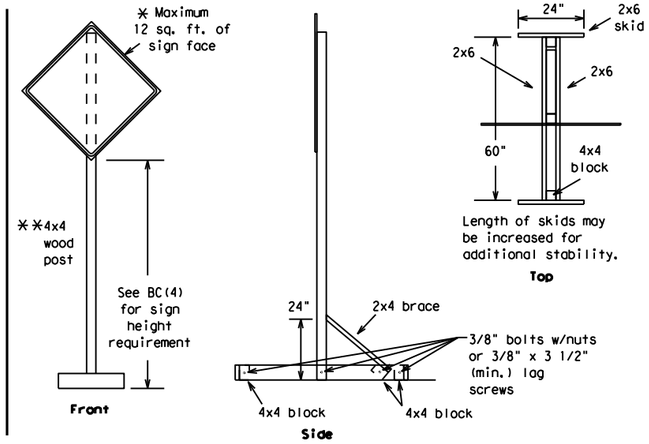
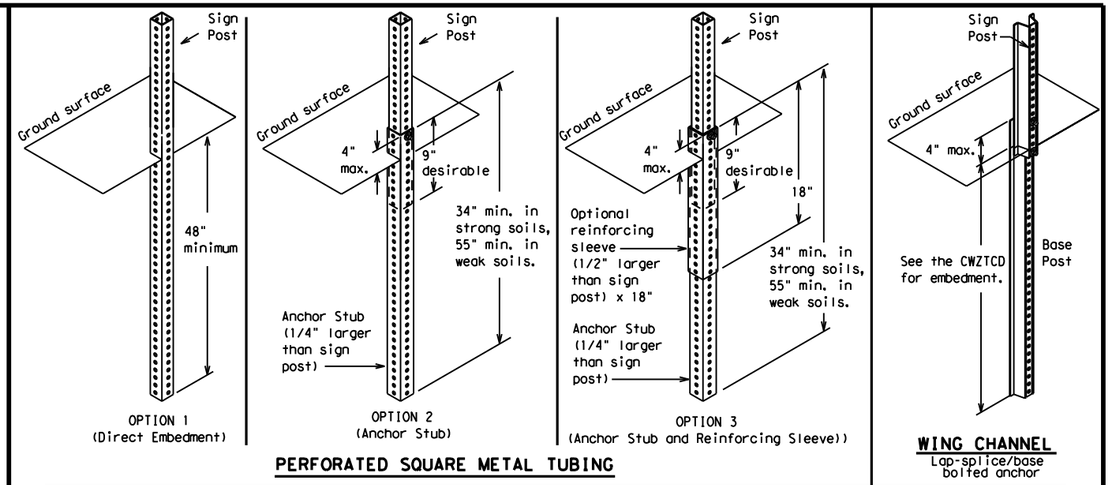




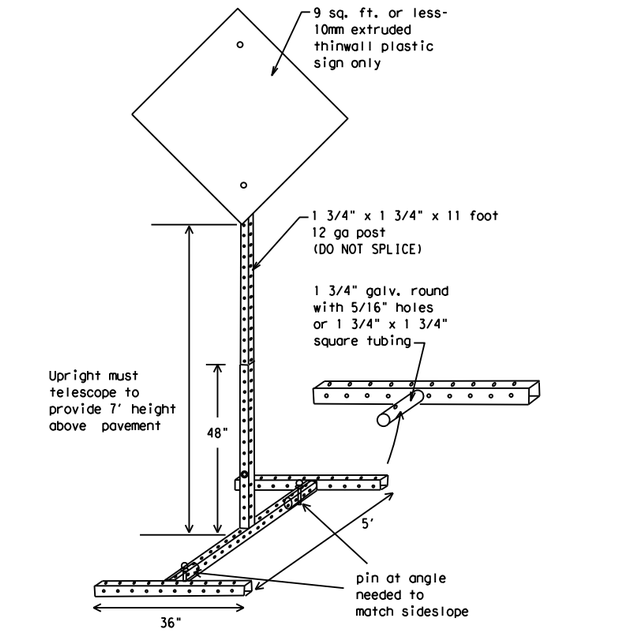
SKID MOUNTED WOOD SIGN SUPPORTS

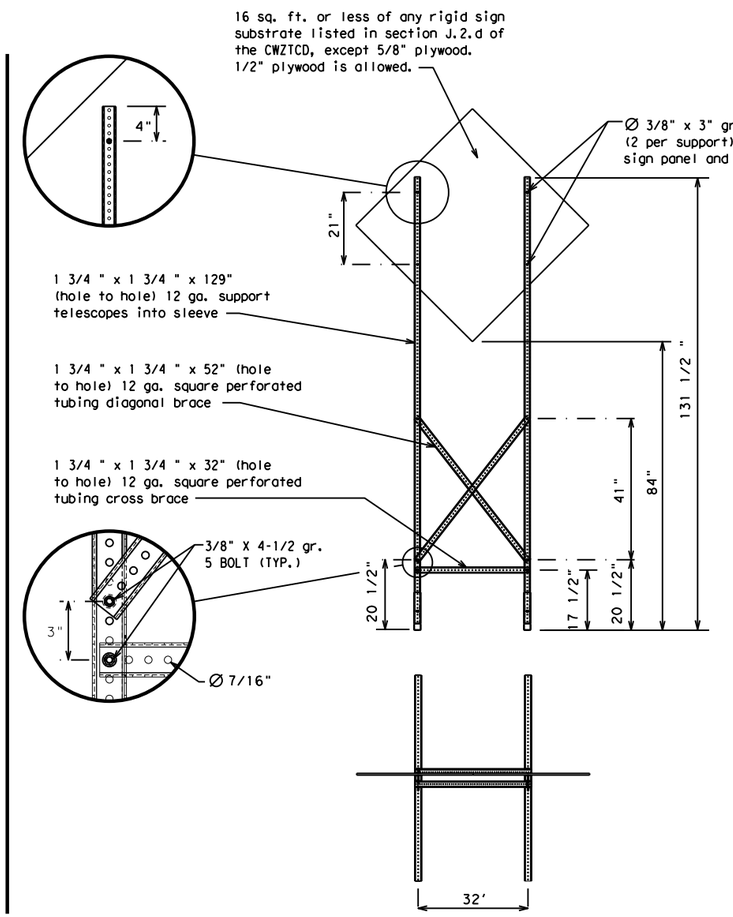
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

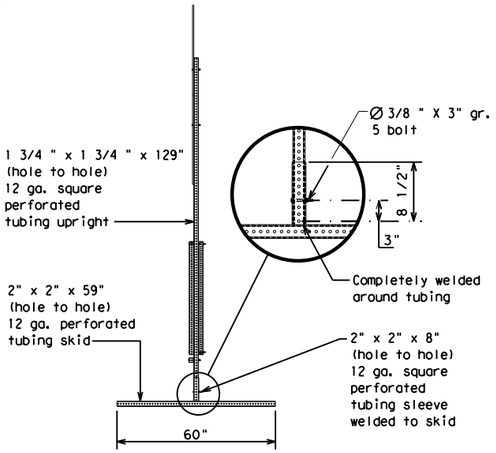


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	WISE		20

DATE: 3/21/2024 9:41:39 PM
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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	WISE		21

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DATE: 3/21/2024 9:41:59 PM
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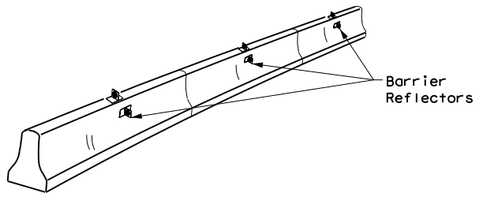
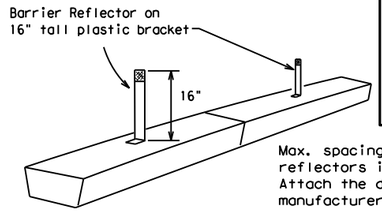
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

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

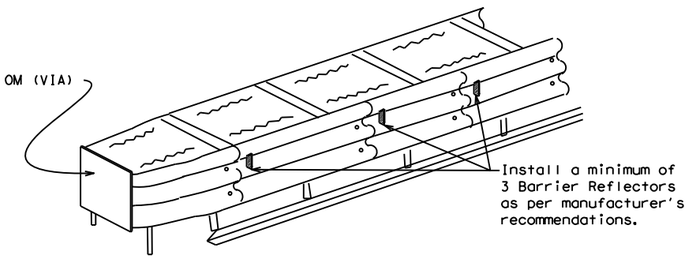


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

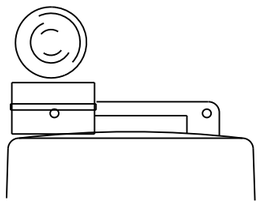


DELINEATION OF END TREATMENTS

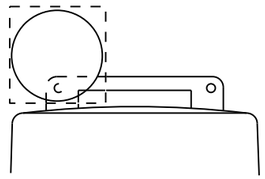
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

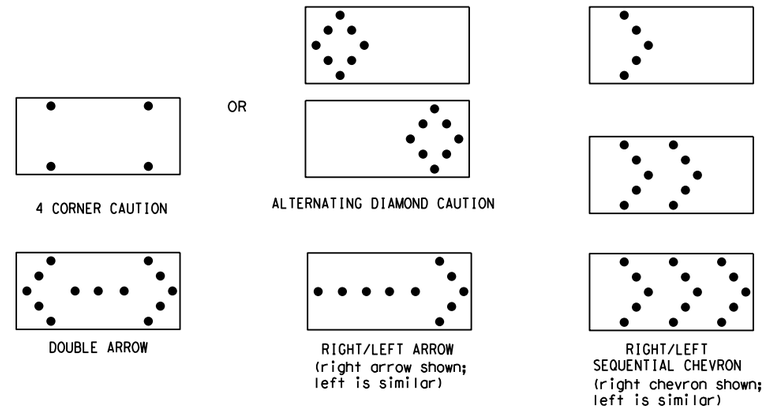
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	WISE		22

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

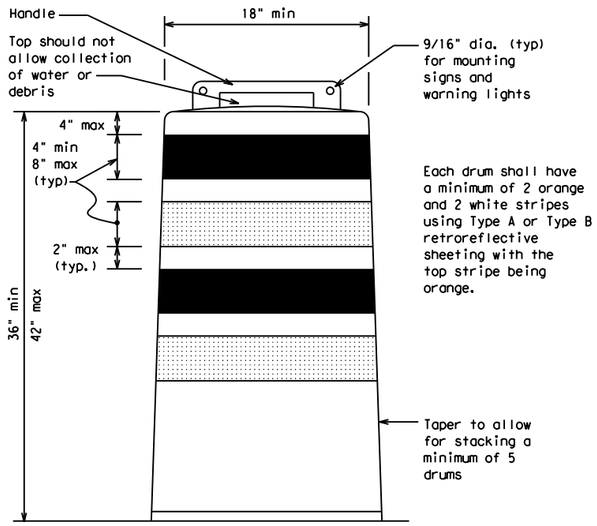
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

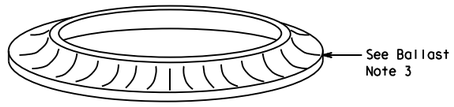
RETROREFLECTIVE SHEETING

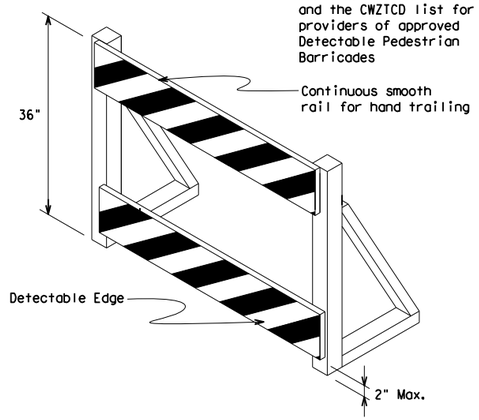
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

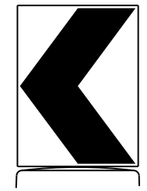




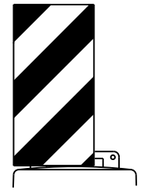


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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REVISIONS	0013	07	086, ETC	US 81
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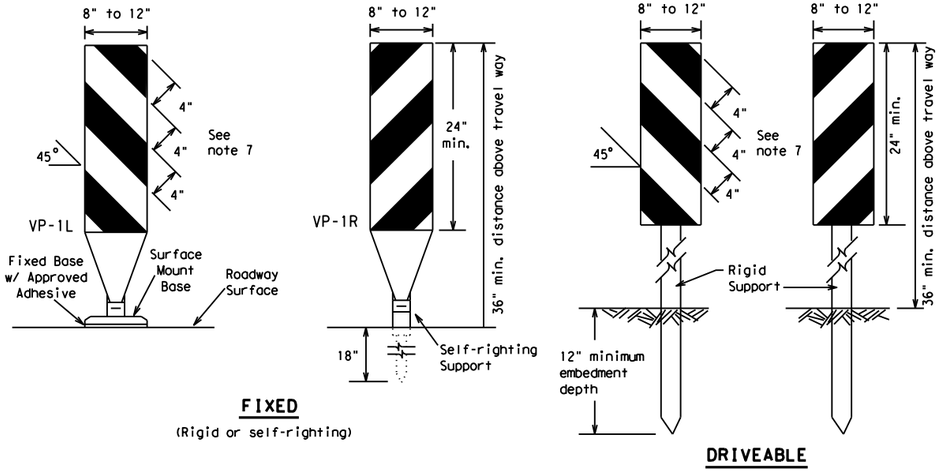


FIXED
(Rigid or self-righting)

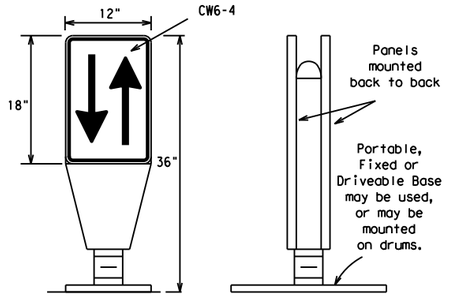
DRIVEABLE

(Rigid or self-righting)

PORTABLE

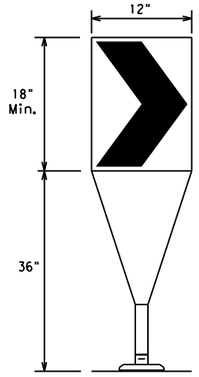
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

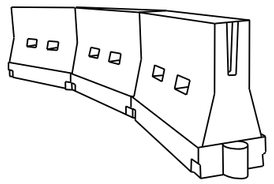
1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The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



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

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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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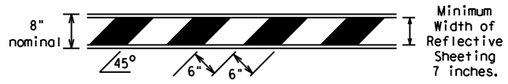
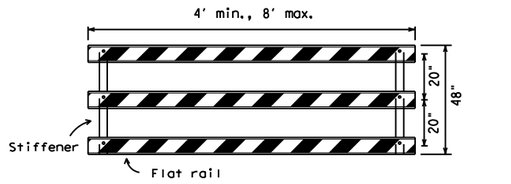
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



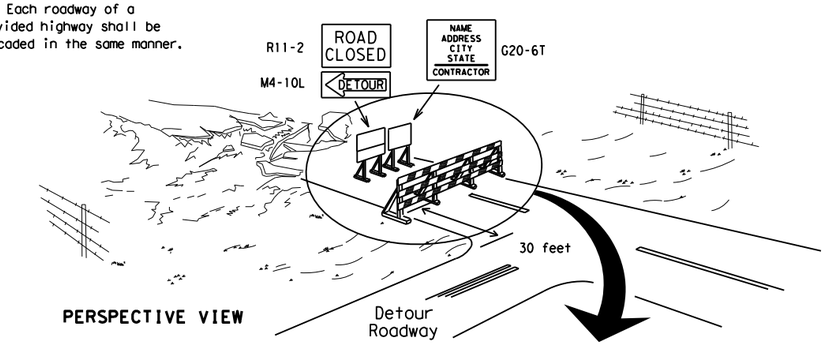
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

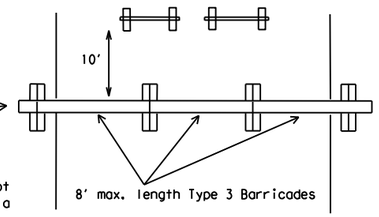
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

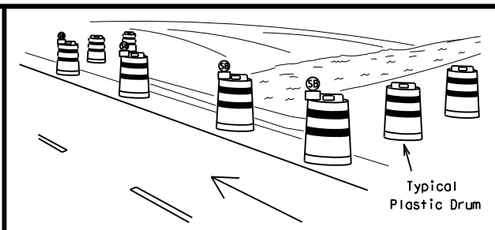
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

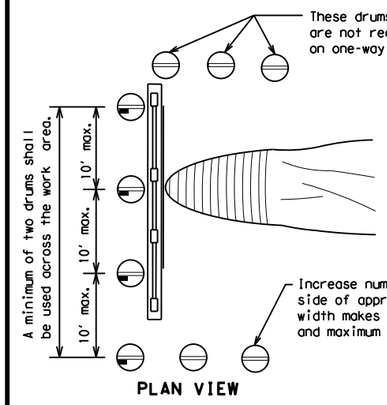
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

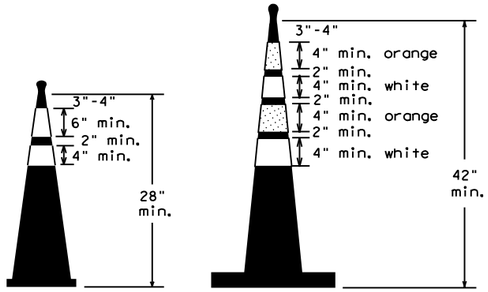
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

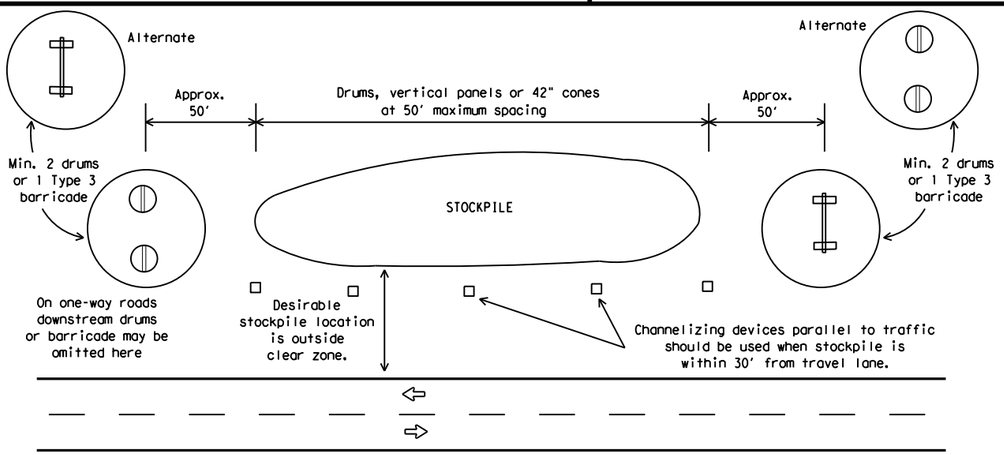
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		25

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

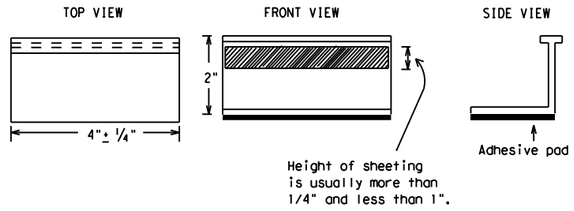
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	FTW	WISE		26
11-02 8-14				

105

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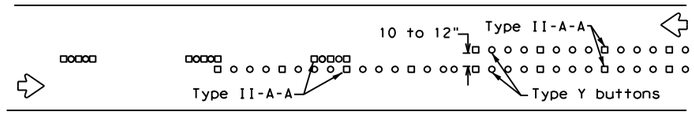
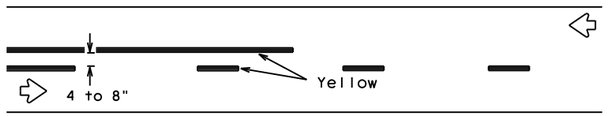
PAVEMENT MARKING PATTERNS

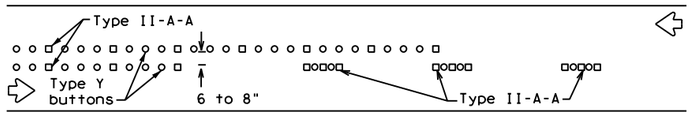
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



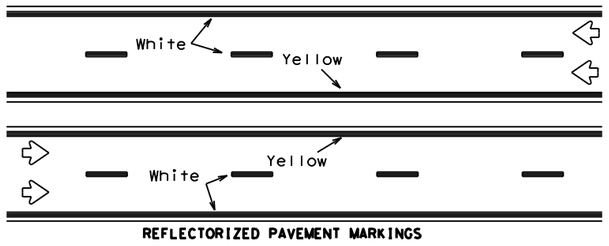
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



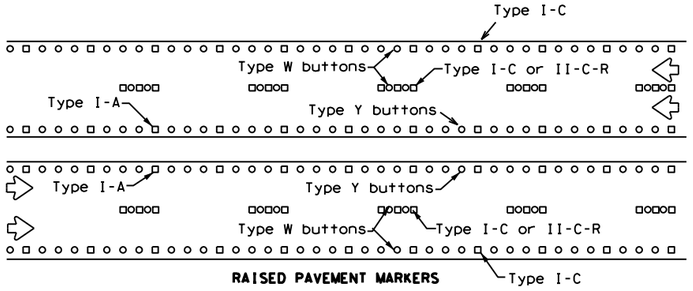
RAISED PAVEMENT MARKERS - PATTERN B

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

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



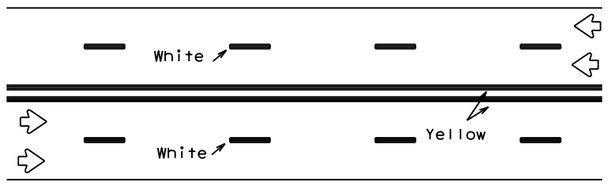
REFLECTORIZED PAVEMENT MARKINGS



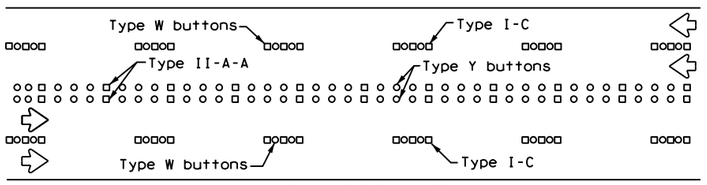
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



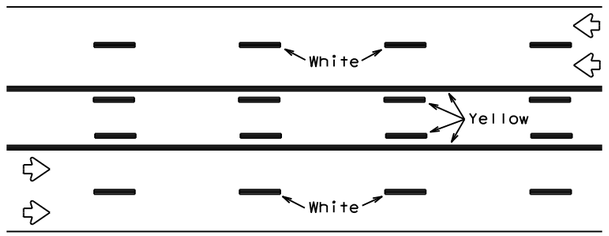
REFLECTORIZED PAVEMENT MARKINGS



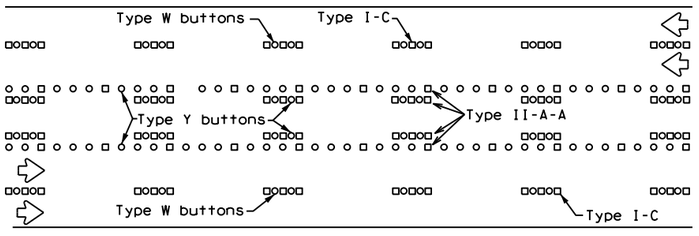
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

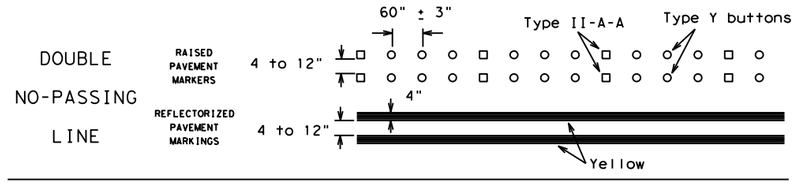
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

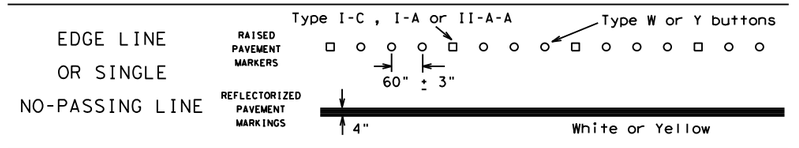
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

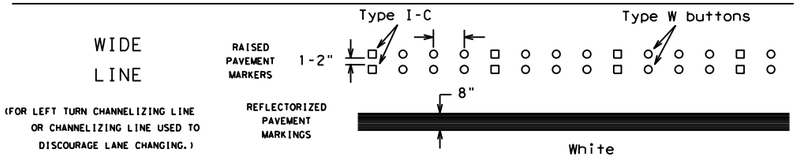


EDGE LINE OR SINGLE NO-PASSING LINE



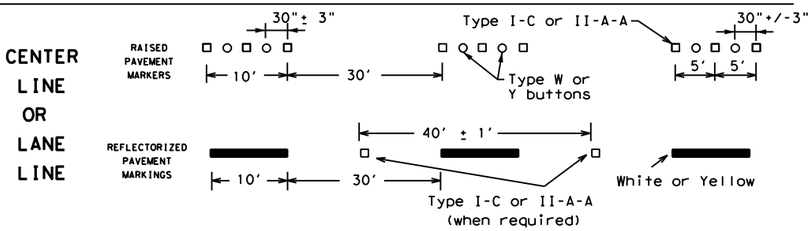
WIDE LINE

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

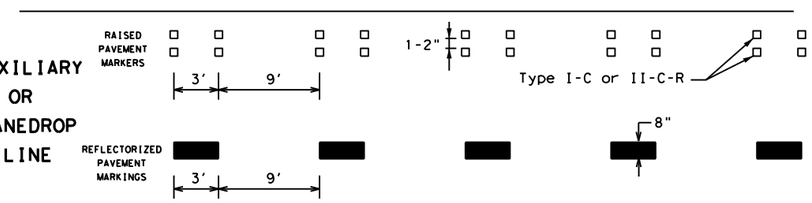


BROKEN LINES

CENTER LINE OR LANE LINE

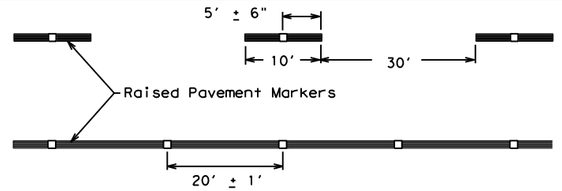


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0013	07	086, ETC	US 81
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	FTW	WISE		27

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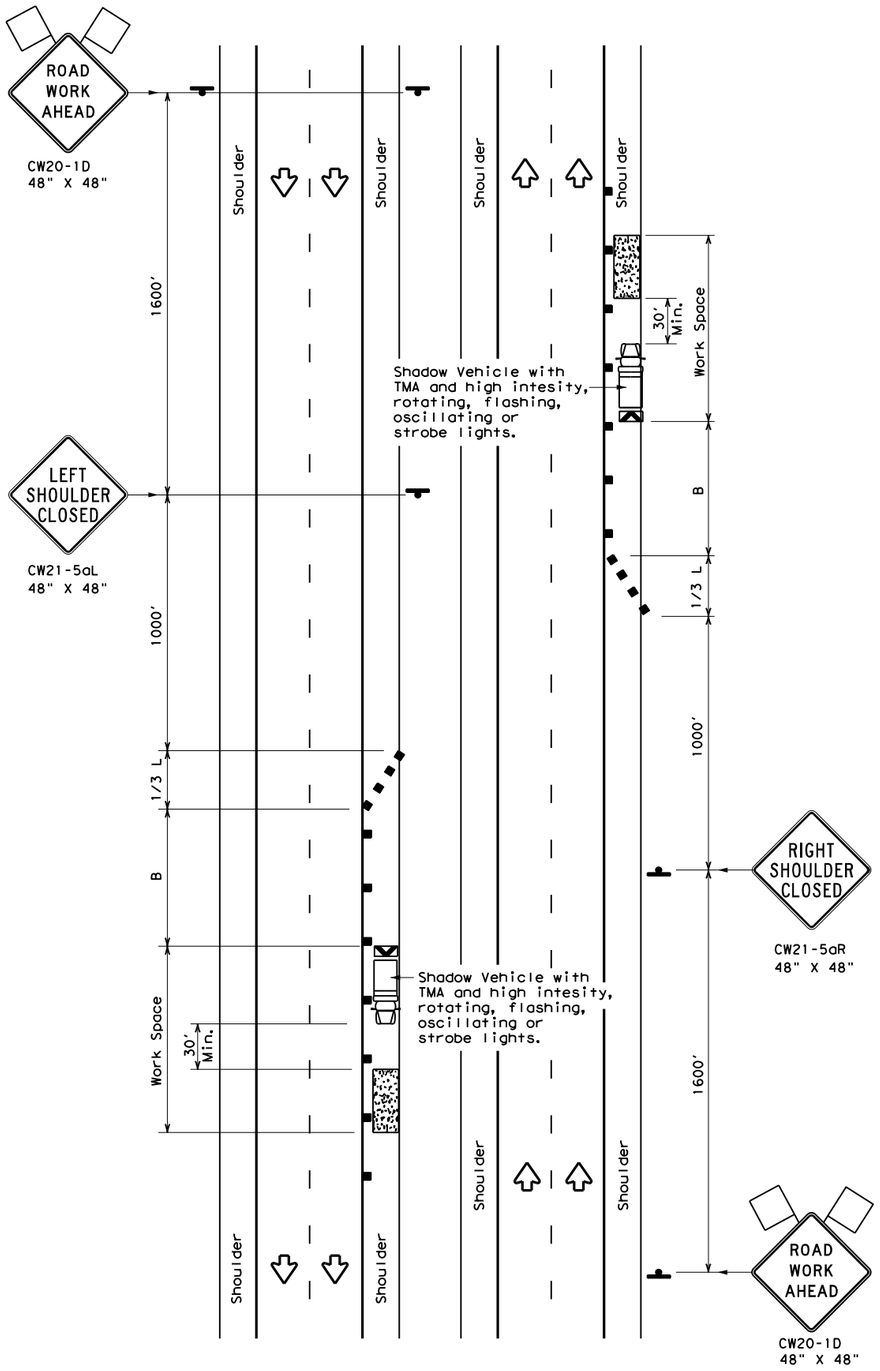
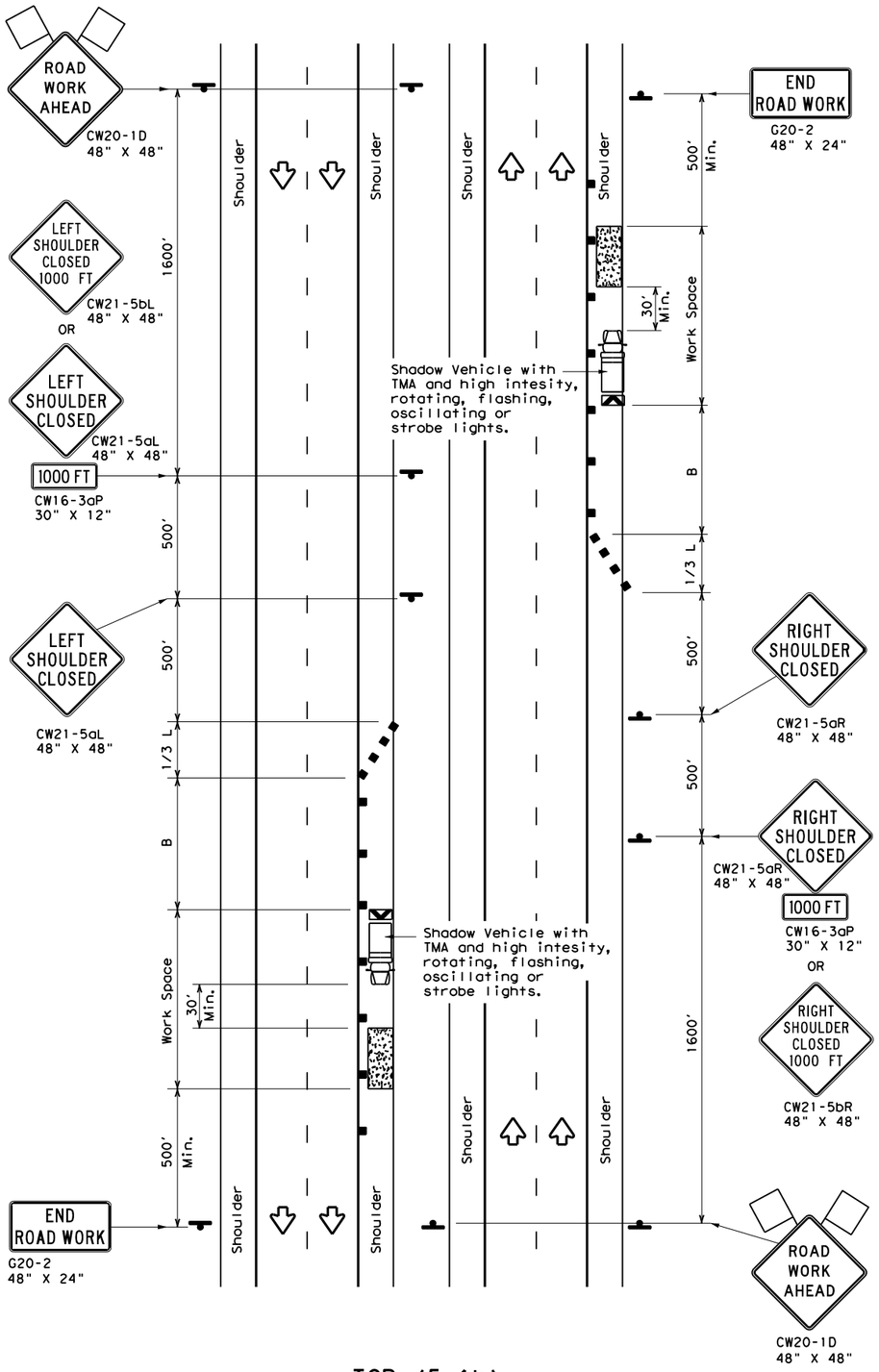


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	TCP(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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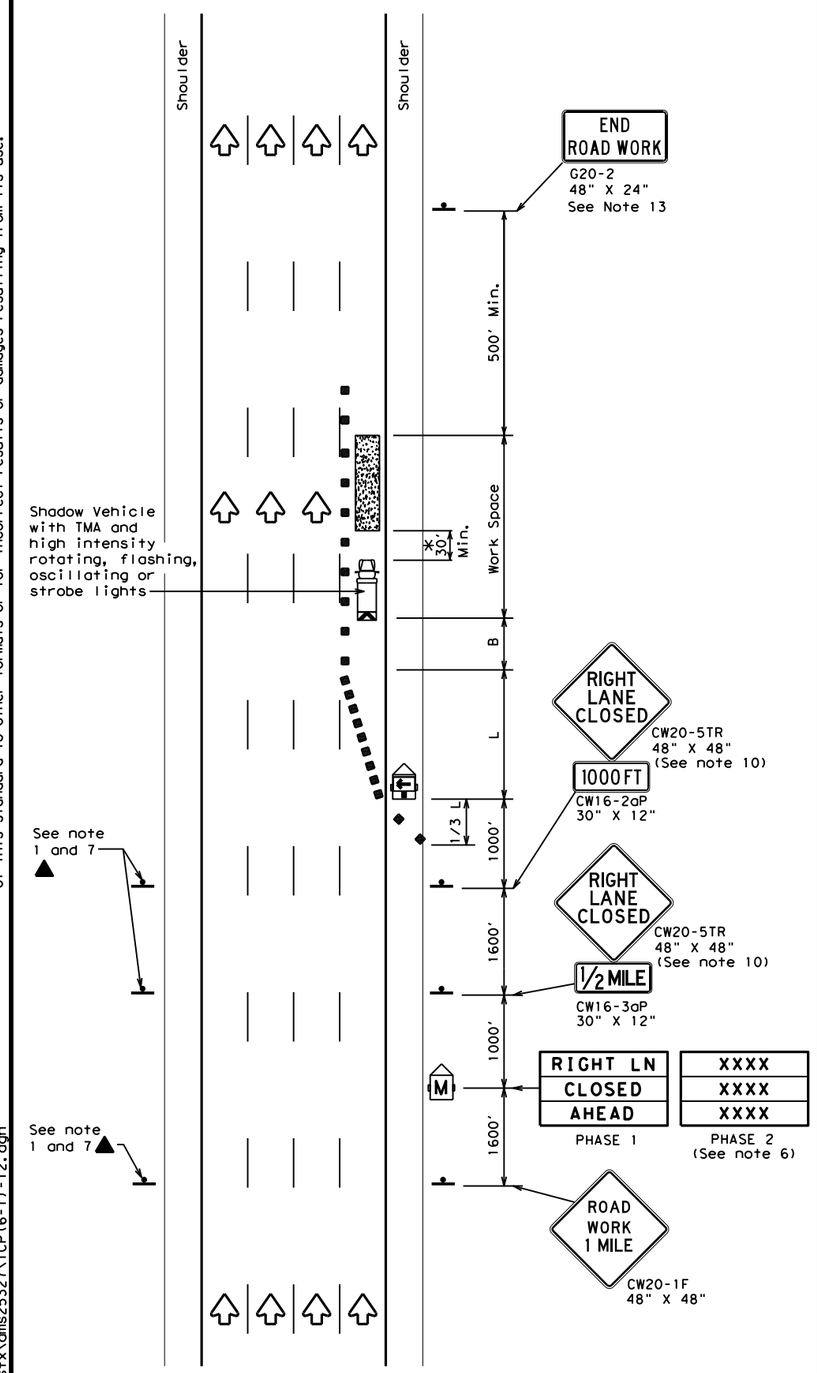
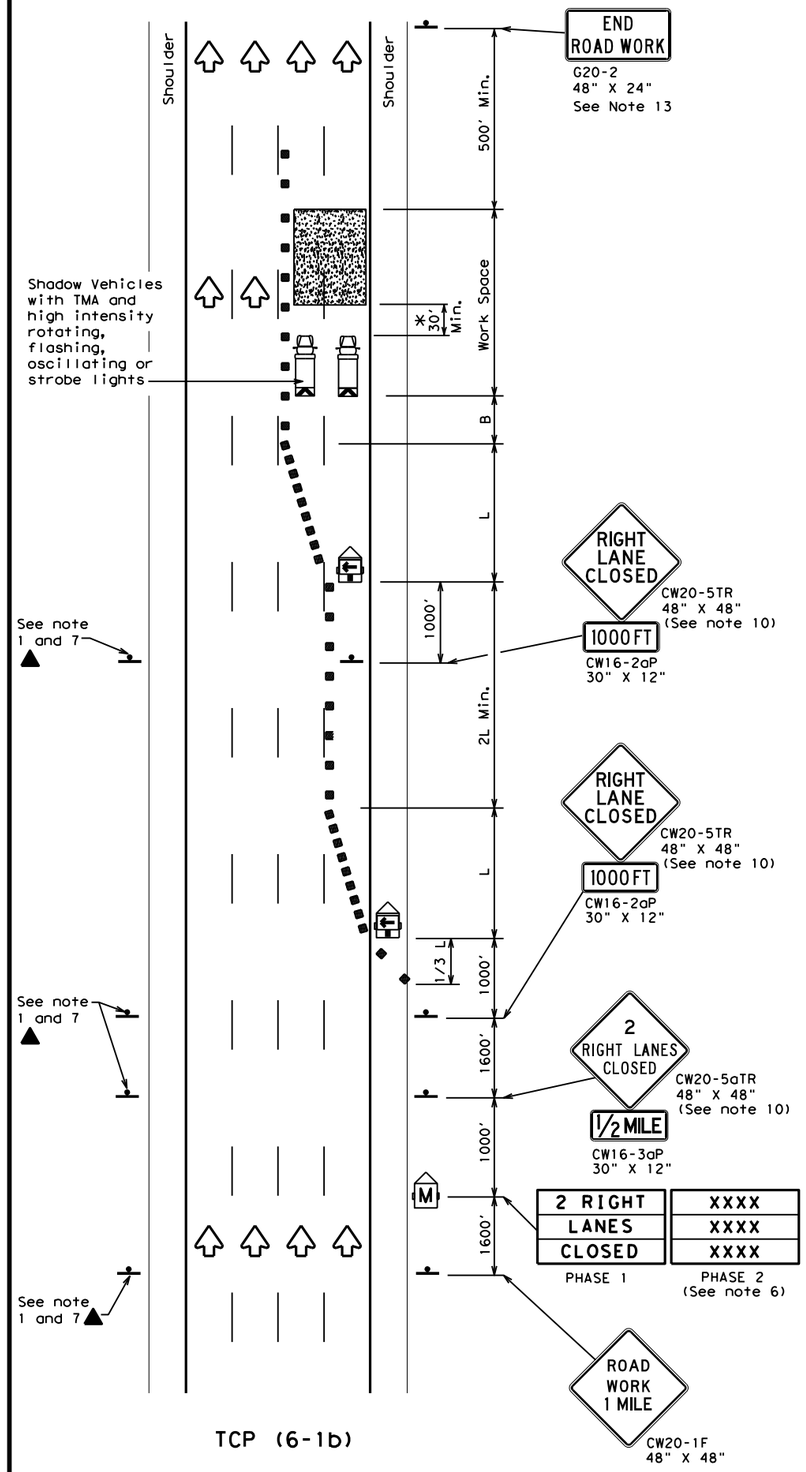


TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Drums or 42"cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
3. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
4. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
5. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
6. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
7. Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
8. The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
9. Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
10. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
11. When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
12. For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
8-12	DIST	COUNTY		SHEET NO.
	FTW	WISE		29

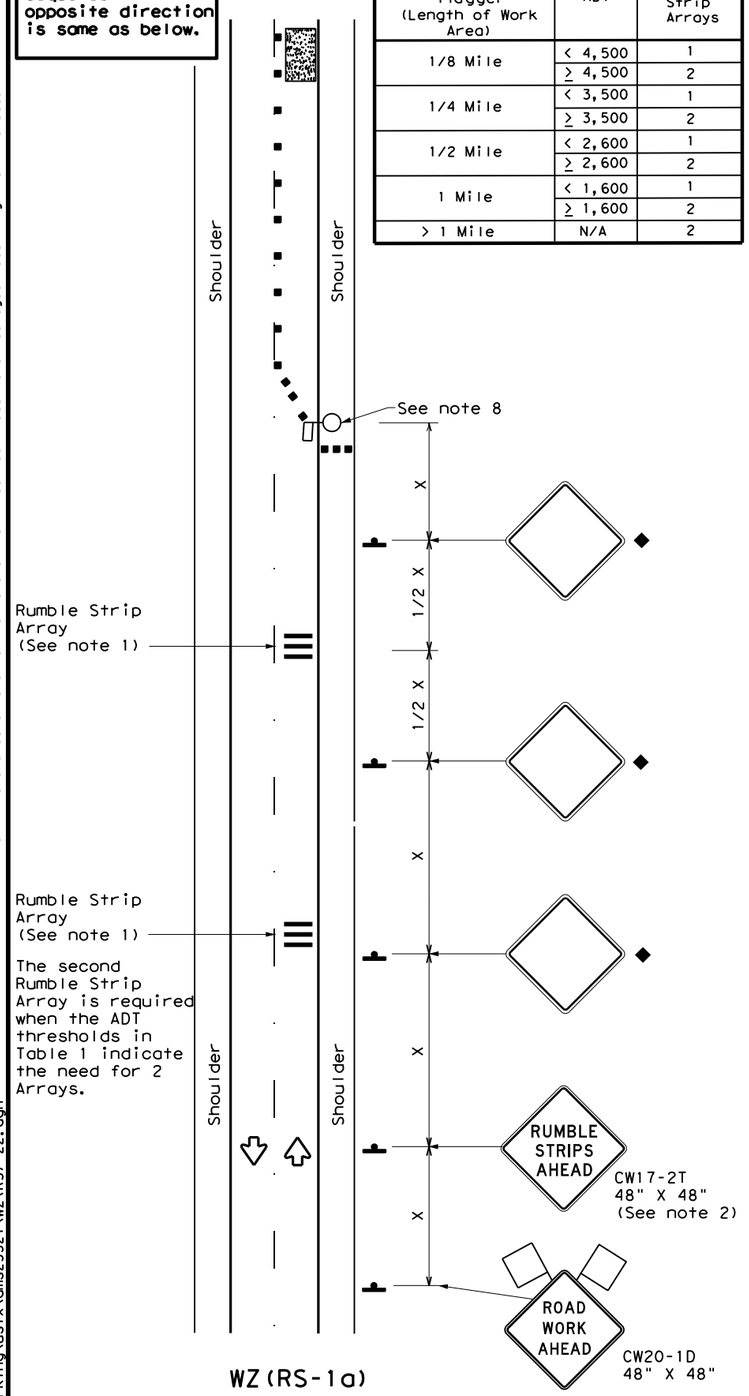
201

DATE: 3/21/2024 9:44:27 PM
FILE: c:\pwworking\ustx\dms25327\TCP(6-1)-12.dgn

DATE: 3/21/2024 9:44:45 PM
FILE: c:\pwworking\ustx\dms25327\WZ(RS)-22.dgn

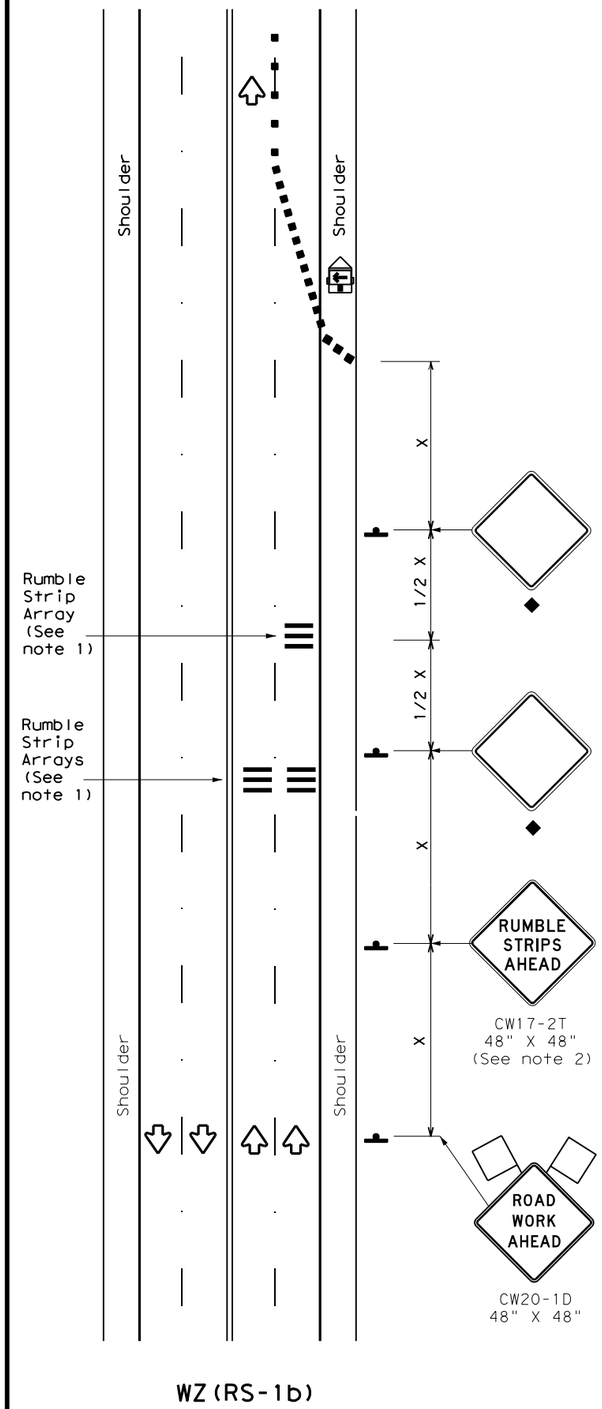
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		30

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HORIZONTAL ALIGNMENT REPORT

Alignment Name: CL US81

	STATION	X	Y
POT	1520.000 R1	7206282.004	2194461.196
PI	3653.977 R1	7204640.842	2195825.178
Tangential Direction:	S39.730°E		
Tangential Length:	2133.977		
PI	3653.977 R1	7204640.842	2195825.178
PC	9867.169 R1	7199769.142	2199681.380
Tangential Direction:	S38.363°E		
Tangential Length:	6213.192		
PC	9867.169 R1	7199769.142	2199681.380
PI	10484.130	7199285.389	2200064.296
CC		7196213.093	2195188.875
PT	11096.356	7198731.206	2200335.446
Radius:	5729.580		
Delta:	12.292° Right		
Degree of Curvature (Arc):	1.000°		
Length:	1229.187		
Tangent:	616.962		
Chord:	1226.831		
Middle Ordinate:	32.931		
External:	33.121		
Back Tangent Direction:	S38.363°E		
Back Radial Direction:	S51.637°W		
Chord Direction:	S32.217°E		
Ahead Radial Direction:	S63.928°W		
Ahead Tangent Direction:	S26.072°E		
PT	11096.356	7198731.206	2200335.446
PC	17707.065	7192793.164	2203240.810
Tangential Direction:	S26.072°E		
Tangential Length:	6610.710		
PC	17707.065	7192793.164	2203240.810
PI	18238.401	7192315.894	2203474.328
CC		7194052.220	2205814.095
PT	18757.797	7191954.109	2203863.467
Radius:	2864.790		
Delta:	21.015° Left		
Degree of Curvature (Arc):	2.000°		
Length:	1050.732		
Tangent:	531.336		
Chord:	1044.852		
Middle Ordinate:	48.038		
External:	48.857		
Back Tangent Direction:	S26.072°E		
Back Radial Direction:	S63.928°W		
Chord Direction:	S36.579°E		
Ahead Radial Direction:	S42.914°W		
Ahead Tangent Direction:	S47.086°E		
PT	18757.797	7191954.109	2203863.467
PC	25722.931	7187211.567	2208964.584
Tangential Direction:	S47.086°E		
Tangential Length:	6965.134		
PC	25722.931	7187211.567	2208964.584
PI	27070.567	7186293.966	2209951.564
CC		7183015.344	2205063.328
PT	28370.087	7185032.620	2210426.041
Radius:	5729.580		
Delta:	26.472° Right		
Degree of Curvature (Arc):	1.000°		
Length:	2647.156		
Tangent:	1347.636		
Chord:	2623.675		
Middle Ordinate:	152.200		
External:	156.353		
Back Tangent Direction:	S47.086°E		
Back Radial Direction:	S42.914°W		
Chord Direction:	S33.850°E		
Ahead Radial Direction:	S69.385°W		
Ahead Tangent Direction:	S20.615°E		

HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PT	28370.087	7185032.620	2210426.041
PC	30062.600	7183448.478	2211021.942
Tangential Direction:	S20.615°E		
Tangential Length:	1692.514		
PC	30062.600	7183448.478	2211021.942
PI	31299.763	7182290.532	2211457.524
CC		7181335.993	2205406.125
PT	32502.728	7181054.729	2211399.529
Radius:	6000.000		
Delta:	23.302° Right		
Degree of Curvature (Arc):	0.955°		
Length:	2440.128		
Tangent:	1237.163		
Chord:	2423.346		
Middle Ordinate:	123.619		
External:	126.220		
Back Tangent Direction:	S20.615°E		
Back Radial Direction:	S69.385°W		
Chord Direction:	S8.964°E		
Ahead Radial Direction:	N87.313°W		
Ahead Tangent Direction:	S2.687°W		
PT	32502.728	7181054.729	2211399.529
PC	33772.571	7179786.282	2211340.002
Tangential Direction:	S2.687°W		
Tangential Length:	1269.843		
PC	33772.571	7179786.282	2211340.002
PI	36648.579	7176913.436	2211205.182
CC		7179608.148	2215135.824
PT	38696.361	7176003.399	2213933.415
Radius:	3800.000		
Delta:	74.240° Left		
Degree of Curvature (Arc):	1.508°		
Length:	4923.789		
Tangent:	2876.008		
Chord:	4586.501		
Middle Ordinate:	769.983		
External:	965.650		
Back Tangent Direction:	S2.687°W		
Back Radial Direction:	N87.313°W		
Chord Direction:	S34.433°E		
Ahead Radial Direction:	S18.447°W		
Ahead Tangent Direction:	S71.553°E		
PT	38696.361	7176003.399	2213933.415
PC	42149.043	7174910.889	2217208.692
Tangential Direction:	S71.553°E		
Tangential Length:	3452.683		
PC	42149.043	7174910.889	2217208.692
PI	43571.028	7174460.940	2218557.613
CC		7171116.417	2215942.998
PT	44881.546	7173260.491	2219319.823
Radius:	4000.000		
Delta:	39.140° Right		
Degree of Curvature (Arc):	1.432°		
Length:	2732.502		
Tangent:	1421.985		
Chord:	2679.680		
Middle Ordinate:	231.071		
External:	245.237		
Back Tangent Direction:	S71.553°E		
Back Radial Direction:	S18.447°W		
Chord Direction:	S51.983°E		
Ahead Radial Direction:	S57.587°W		
Ahead Tangent Direction:	S32.413°E		
PT	44881.546	7173260.491	2219319.823
PI	49712.785	7169181.929	2221909.457
Tangential Direction:	S32.413°E		
Tangential Length:	4831.239		
PI	49712.785	7169181.929	2221909.457
PC	51610.194	7167575.592	2222919.328
Tangential Direction:	S32.157°E		
Tangential Length:	1897.408		

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3/21/2024

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Texas Department of Transportation

US 81

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		31

DATE: 3/21/2024 9:45:08 PM
FILE: c:\pw\working\ustx\dms25326\US81_AEC_RD_HALN_001.dgn

HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PC	51610.194	7167575.592	2222919.328
PI	51725.732	7167477.778	2222980.822
CC		7170625.087	2227769.964
PT	51841.239	7167382.522	2223046.209
Radius:	5729.580		
Delta:	2.310° Left		
Degree of Curvature (Arc):	1.000°		
Length:	231.046		
Tangent:	115.538		
Chord:	231.030		
Middle Ordinate:	1.165		
External:	1.165		
Back Tangent Direction:	S32.157°E		
Back Radial Direction:	S57.843°W		
Chord Direction:	S33.312°E		
Ahead Radial Direction:	S55.533°W		
Ahead Tangent Direction:	S34.467°E		
PT	51841.239	7167382.522	2223046.209
PI	52913.321	7166498.643	2223652.937
Tangential Direction:	S34.467°E		
Tangential Length:	1072.082		
PI	52913.321	7166498.643	2223652.937
PI	54889.389	7164887.984	2224797.760
Tangential Direction:	S35.404°E		
Tangential Length:	1976.068		
PI	54889.389	7164887.984	2224797.760
PC	65912.465	7155860.180	2231122.866
Tangential Direction:	S35.016°E		
Tangential Length:	11023.076		
PC	65912.465	7155860.180	2231122.866
PI	66055.261	7155743.232	2231204.803
CC		7159147.847	2235815.342
PT	66197.997	7155630.511	2231292.464
Radius:	5729.580		
Delta:	2.855° Left		
Degree of Curvature (Arc):	1.000°		
Length:	285.532		
Tangent:	142.796		
Chord:	285.502		
Middle Ordinate:	1.779		
External:	1.779		
Back Tangent Direction:	S35.016°E		
Back Radial Direction:	S54.984°W		
Chord Direction:	S36.444°E		
Ahead Radial Direction:	S52.129°W		
Ahead Tangent Direction:	S37.871°E		
PT	66197.997	7155630.511	2231292.464
PI	70648.986	7152116.940	2234024.885
Tangential Direction:	S37.871°E		
Tangential Length:	4450.989		
PI	70648.986	7152116.940	2234024.885
PC	75482.554	7148289.157	2236976.403
Tangential Direction:	S37.635°E		
Tangential Length:	4833.568		
PC	75482.554	7148289.157	2236976.403
PI	75692.948	7148122.543	2237104.875
CC		7144790.508	2232439.053
PT	75903.152	7147946.955	2237220.782
Radius:	5729.580		
Delta:	4.206° Right		
Degree of Curvature (Arc):	1.000°		
Length:	420.598		
Tangent:	210.394		
Chord:	420.504		
Middle Ordinate:	3.859		
External:	3.862		
Back Tangent Direction:	S37.635°E		
Back Radial Direction:	S52.365°W		
Chord Direction:	S35.532°E		
Ahead Radial Direction:	S56.571°W		
Ahead Tangent Direction:	S33.429°E		

HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PT	75903.152	7147946.955	2237220.782
PC	82064.007	7142805.298	2240614.820
Tangential Direction:	S33.429°E		
Tangential Length:	6160.855		
PC	82064.007	7142805.298	2240614.820
PI	82883.573	7142121.314	2241066.322
CC		7139554.966	2235690.864
PT	83692.716	7141340.165	2241314.303
Radius:	5900.000		
Delta:	15.817° Right		
Degree of Curvature (Arc):	0.971°		
Length:	1628.709		
Tangent:	819.566		
Chord:	1623.543		
Middle Ordinate:	56.112		
External:	56.651		
Back Tangent Direction:	S33.429°E		
Back Radial Direction:	S56.571°W		
Chord Direction:	S25.521°E		
Ahead Radial Direction:	S72.388°W		
Ahead Tangent Direction:	S17.612°E		
PT	83692.716	7141340.165	2241314.303
PC	87107.845	7138085.119	2242347.639
Tangential Direction:	S17.612°E		
Tangential Length:	3415.129		
PC	87107.845	7138085.119	2242347.639
PI	88082.543	7137156.110	2242642.559
CC		7139219.780	2245921.858
PT	89015.040	7136488.291	2243352.526
Radius:	3750.000		
Delta:	29.140° Left		
Degree of Curvature (Arc):	1.528°		
Length:	1907.195		
Tangent:	974.698		
Chord:	1886.706		
Middle Ordinate:	120.594		
External:	124.601		
Back Tangent Direction:	S17.612°E		
Back Radial Direction:	S72.388°W		
Chord Direction:	S32.182°E		
Ahead Radial Direction:	S43.248°W		
Ahead Tangent Direction:	S46.752°E		
PT	89015.040	7136488.291	2243352.526
PC	90198.675	7135677.317	2244214.683
Tangential Direction:	S46.752°E		
Tangential Length:	1183.635		
PC	90198.675	7135677.317	2244214.683
PI	90897.320	7135198.637	2244723.573
CC		7133856.324	2242501.794
PT	91561.205	7134525.484	2244910.575
Radius:	2500.000		
Delta:	31.227° Right		
Degree of Curvature (Arc):	2.292°		
Length:	1362.530		
Tangent:	698.645		
Chord:	1345.729		
Middle Ordinate:	92.251		
External:	95.786		
Back Tangent Direction:	S46.752°E		
Back Radial Direction:	S43.248°W		
Chord Direction:	S31.139°E		
Ahead Radial Direction:	S74.475°W		
Ahead Tangent Direction:	S15.525°E		
PT	91561.205	7134525.484	2244910.575
PC	92343.130	7133772.089	2245119.868
Tangential Direction:	S15.525°E		
Tangential Length:	781.925		

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Texas Department of Transportation

US 81

HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		32

DATE: 3/21/2024 9:45:28 PM
FILE: c:\pw\workinglustx\dms25326\US81 AEC RD HALN 002.dgn

HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PC	92343.130	7133772.089	2245119.868
PI	92647.806	7133478.530	2245201.419
CC		7134749.062	2248636.689
PT	92951.072	7133202.554	2245330.510
Radius:	3650.000		
Delta:	9.543° Left		
Degree of Curvature (Arc):	1.570°		
Length:	607.942		
Tangent:	304.676		
Chord:	607.240		
Middle Ordinate:	12.650		
External:	12.694		
Back Tangent Direction:	S15.525°E		
Back Radial Direction:	S74.475°W		
Chord Direction:	S20.297°E		
Ahead Radial Direction:	S64.932°W		
Ahead Tangent Direction:	S25.068°E		
PT	92951.072	7133202.554	2245330.510
PC	98032.053	7128600.190	2247483.325
Tangential Direction:	S25.068°E		
Tangential Length:	5080.981		
PC	98032.053	7128600.190	2247483.325
PI	99104.126	7127629.104	2247937.564
CC		7130210.253	2250925.374
PT	100121.883	7127038.614	2248832.361
Radius:	3800.000		
Delta:	31.510° Left		
Degree of Curvature (Arc):	1.508°		
Length:	2089.830		
Tangent:	1072.073		
Chord:	2063.593		
Middle Ordinate:	142.761		
External:	148.334		
Back Tangent Direction:	S25.068°E		
Back Radial Direction:	S64.932°W		
Chord Direction:	S40.824°E		
Ahead Radial Direction:	S33.421°W		
Ahead Tangent Direction:	S56.579°E		
PT	100121.883	7127038.614	2248832.361
PC	104587.618	7124578.919	2252559.650
Tangential Direction:	S56.579°E		
Tangential Length:	4465.734		
PC	104587.618	7124578.919	2252559.650
PI	105674.669	7123980.178	2253466.949
CC		7119571.067	2249254.892
PT	106738.391	7123101.183	2254106.518
Radius:	6000.000		
Delta:	20.538° Right		
Degree of Curvature (Arc):	0.955°		
Length:	2150.773		
Tangent:	1087.052		
Chord:	2139.277		
Middle Ordinate:	96.114		
External:	97.678		
Back Tangent Direction:	S56.579°E		
Back Radial Direction:	S33.421°W		
Chord Direction:	S46.309°E		
Ahead Radial Direction:	S53.960°W		
Ahead Tangent Direction:	S36.040°E		
PT	106738.391	7123101.183	2254106.518
PC	107941.629	7122128.240	2254814.446
Tangential Direction:	S36.040°E		
Tangential Length:	1203.238		

HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PC	107941.629	7122128.24	2254814.446
PI	108126.234	7121978.967	2254923.059
CC		7118757.226	2250181.483
PT	108310.711	7121823.013	2255021.838
Radius:	5729.580		
Delta:	3.691° Right		
Degree of Curvature (Arc):	1.000°		
Length:	369.082		
Tangent:	184.605		
Chord:	369.018		
Middle Ordinate:	2.972		
External:	2.973		
Back Tangent Direction:	S36.040°E		
Back Radial Direction:	S53.960°W		
Chord Direction:	S34.195°E		
Ahead Radial Direction:	S57.651°W		
Ahead Tangent Direction:	S32.349°E		
PT	108310.711	7121823.013	2255021.838
PI	110861.899	7119667.767	2256386.929
Tangential Direction:	S32.349°E		
Tangential Length:	2551.188		
PI	110861.899	7119667.767	2256386.929
PI	111495.478	7119144.099	2256743.572
Tangential Direction:	S34.257°E		
Tangential Length:	633.579		
PI	111495.478	7119144.099	2256743.572
PC	112478.496	7118317.106	2257274.993
Tangential Direction:	S32.725°E		
Tangential Length:	983.019		
PC	112478.496	7118317.106	2257274.993
PI	112699.309	7118131.341	2257394.365
CC		7121414.526	2262095.167
PT	112919.903	7117955.315	2257527.679
Radius:	5729.580		
Delta:	4.414° Left		
Degree of Curvature (Arc):	1.000°		
Length:	441.407		
Tangent:	220.813		
Chord:	441.297		
Middle Ordinate:	4.250		
External:	4.253		
Back Tangent Direction:	S32.725°E		
Back Radial Direction:	S57.275°W		
Chord Direction:	S34.932°E		
Ahead Radial Direction:	S52.861°W		
Ahead Tangent Direction:	S37.139°E		
PT	112919.903	7117955.315	2257527.679
PC	118940.901	7113155.515	2261162.833
Tangential Direction:	S37.139°E		
Tangential Length:	6020.998		
PC	118940.901	7113155.515	2261162.833
PI	119435.053	7112761.589	2261461.175
CC		7116614.726	2265730.321
PT	119926.764	7112424.561	2261822.558
Radius:	5729.580		
Delta:	9.859° Left		
Degree of Curvature (Arc):	1.000°		
Length:	985.863		
Tangent:	494.151		
Chord:	984.648		
Middle Ordinate:	21.191		
External:	21.270		
Back Tangent Direction:	S37.139°E		
Back Radial Direction:	S52.861°W		
Chord Direction:	S42.068°E		
Ahead Radial Direction:	S43.003°W		
Ahead Tangent Direction:	S46.997°E		
PT	119926.764	7112424.561	2261822.558
PI	125323.675	7108743.690	2265769.435
Tangential Direction:	S46.997°E		
Tangential Length:	5396.911		

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US 81

HORIZONTAL ALIGNMENT DATA

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		33

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HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PI	125323.675	7108743.690	2265769.435
PC	128591.853	7106524.219	2268168.379
Tangential Direction:	S47.225°E		
Tangential Length:	3268.177		
PC	128591.853	7106524.219	2268168.379
PI	129027.516	7106228.354	2268488.170
CC		7110194.376	2271563.958
PT	129460.985	7105992.255	2268854.312
Radius:	5000.000		
Delta:	9.960° Left		
Degree of Curvature (Arc):	1.146°		
Length:	869.132		
Tangent:	435.664		
Chord:	868.038		
Middle Ordinate:	18.873		
External:	18.944		
Back Tangent Direction:	S47.225°E		
Back Radial Direction:	S42.775°W		
Chord Direction:	S52.205°E		
Ahead Radial Direction:	S32.815°W		
Ahead Tangent Direction:	S57.185°E		
PT	129460.985	7105992.255	2268854.312
PC	134320.517	7103358.732	2272938.381
Tangential Direction:	S57.185°E		
Tangential Length:	4859.533		
PC	134320.517	7103358.732	2272938.381
PI	136226.738	7102325.696	2274540.415
CC		7097895.975	2269415.841
PT	138028.979	7100591.051	2275330.785
Radius:	6500.000		
Delta:	32.689° Right		
Degree of Curvature (Arc):	0.881°		
Length:	3708.461		
Tangent:	1906.221		
Chord:	3658.368		
Middle Ordinate:	262.686		
External:	273.749		
Back Tangent Direction:	S57.185°E		
Back Radial Direction:	S32.815°W		
Chord Direction:	S40.840°E		
Ahead Radial Direction:	S65.504°W		
Ahead Tangent Direction:	S24.496°E		
PT	138028.979	7100591.051	2275330.785
PC	143492.476	7095619.316	2277596.099
Tangential Direction:	S24.496°E		
Tangential Length:	5463.497		
PC	143492.476	7095619.316	2277596.099
PI	144264.020	7094917.217	2277916.003
CC		7097526.600	2281782.060
PT	145021.334	7094357.917	2278447.477
Radius:	4600.000		
Delta:	19.043° Left		
Degree of Curvature (Arc):	1.246°		
Length:	1528.858		
Tangent:	771.545		
Chord:	1521.831		
Middle Ordinate:	63.370		
External:	64.256		
Back Tangent Direction:	S24.496°E		
Back Radial Direction:	S65.504°W		
Chord Direction:	S34.017°E		
Ahead Radial Direction:	S46.461°W		
Ahead Tangent Direction:	S43.539°E		
PT	145021.334	7094357.917	2278447.477
PC	146585.675	7093223.911	2279525.064
Tangential Direction:	S43.539°E		
Tangential Length:	1564.341		

HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PC	146585.675	7093223.911	2279525.064
PI	147398.398	7092634.761	2280084.903
CC		7089090.846	2275175.608
PT	148201.288	7091917.908	2280467.840
Radius:	6000.000		
Delta:	15.428° Right		
Degree of Curvature (Arc):	0.955°		
Length:	1615.612		
Tangent:	812.723		
Chord:	1610.736		
Middle Ordinate:	54.297		
External:	54.793		
Back Tangent Direction:	S43.539°E		
Back Radial Direction:	S46.461°W		
Chord Direction:	S35.825°E		
Ahead Radial Direction:	S61.889°W		
Ahead Tangent Direction:	S28.111°E		
PT	148201.288	7091917.908	2280467.840
PC	150528.194	7089865.487	2281564.225
Tangential Direction:	S28.111°E		
Tangential Length:	2326.906		
PC	150528.194	7089865.487	2281564.225
PI	150901.766	7089535.982	2281740.243
CC		7092692.549	2286856.456
PT	151274.374	7089230.856	2281955.775
Radius:	6000.000		
Delta:	7.125° Left		
Degree of Curvature (Arc):	0.955°		
Length:	746.181		
Tangent:	373.572		
Chord:	745.700		
Middle Ordinate:	11.596		
External:	11.618		
Back Tangent Direction:	S28.111°E		
Back Radial Direction:	S61.889°W		
Chord Direction:	S31.673°E		
Ahead Radial Direction:	S54.764°W		
Ahead Tangent Direction:	S35.236°E		
PT	151274.374	7089230.856	2281955.775
PC	152779.479	7088001.516	2282824.143
Tangential Direction:	S35.236°E		
Tangential Length:	1505.105		
PC	152779.479	7088001.516	2282824.143
PI	154783.866	7086364.372	2283980.572
CC		7084741.755	2278209.335
PT	156631.740	7084364.459	2283846.723
Radius:	5650.000		
Delta:	39.065° Right		
Degree of Curvature (Arc):	1.014°		
Length:	3852.261		
Tangent:	2004.388		
Chord:	3778.076		
Middle Ordinate:	325.149		
External:	345.004		
Back Tangent Direction:	S35.236°E		
Back Radial Direction:	S54.764°W		
Chord Direction:	S15.704°E		
Ahead Radial Direction:	N86.171°W		
Ahead Tangent Direction:	S3.829°W		
PT	156631.740	7084364.459	2283846.723
PC	166525.994	7074492.289	2283186.003
Tangential Direction:	S3.829°W		
Tangential Length:	9894.255		

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US 81

HORIZONTAL ALIGNMENT DATA

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		34

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HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PC	166525.994	7074492.289	2283186.003
PI	167231.516	7073788.343	2283138.889
CC		7074839.536	2277997.610
PT	167928.473	7073122.398	2282905.913
Radius:	5200.000		
Delta:	15.453° Right		
Degree of Curvature (Arc):	1.102°		
Length:	1402.479		
Tangent:	705.521		
Chord:	1398.232		
Middle Ordinate:	47.211		
External:	47.643		
Back Tangent Direction:	S3.829°W		
Back Radial Direction:	N86.171°W		
Chord Direction:	S11.556°W		
Ahead Radial Direction:	N70.718°W		
Ahead Tangent Direction:	S19.282°W		
PT	167928.473	7073122.398	2282905.913
PC	171462.973	7069786.168	2281738.755
Tangential Direction:	S19.282°W		
Tangential Length:	3534.500		
PC	171462.973	7069786.168	2281738.755
PI	174595.138	7066829.704	2280704.455
CC		7068840.161	2284442.843
PT	176218.259	7066062.614	2283741.234
Radius:	2864.790		
Delta:	95.106° Left		
Degree of Curvature (Arc):	2.000°		
Length:	4755.286		
Tangent:	3132.165		
Chord:	4227.858		
Middle Ordinate:	931.315		
External:	1379.91		
Back Tangent Direction:	S19.282°W		
Back Radial Direction:	N70.718°W		
Chord Direction:	S28.271°E		
Ahead Radial Direction:	S14.176°W		
Ahead Tangent Direction:	S75.824°E		
PT	176218.259	7066062.614	2283741.234
PC	178204.994	7065576.048	2285667.466
Tangential Direction:	S75.824°E		
Tangential Length:	1986.735		
PC	178204.994	7065576.048	2285667.466
PI	180467.959	7065021.831	2287861.515
CC		7059952.678	2284247.003
PT	182520.199	7063128.166	2289100.483
Radius:	5800.000		
Delta:	42.628° Right		
Degree of Curvature (Arc):	0.988°		
Length:	4315.205		
Tangent:	2262.965		
Chord:	4216.365		
Middle Ordinate:	396.708		
External:	425.834		
Back Tangent Direction:	S75.824°E		
Back Radial Direction:	S14.176°W		
Chord Direction:	S54.510°E		
Ahead Radial Direction:	S56.804°W		
Ahead Tangent Direction:	S33.196°E		
PT	182520.199	7063128.166	2289100.483
PC	188588.016	7058050.574	2292422.601
Tangential Direction:	S33.196°E		
Tangential Length:	6067.817		

HORIZONTAL ALIGNMENT REPORT (CONTINUED)

Alignment Name: CL US81

	STATION	X	Y
PC	188588.016	7058050.574	2292422.601
PI	189322.534	7057435.924	2292824.748
CC		7054913.641	2287628.048
PT	190049.083	7056739.709	2293058.845
Radius:	5729.580		
Delta:	14.611° Right		
Degree of Curvature (Arc):	1.000°		
Length:	1461.067		
Tangent:	734.518		
Chord:	1457.111		
Middle Ordinate:	46.509		
External:	46.890		
Back Tangent Direction:	S33.196°E		
Back Radial Direction:	S56.804°W		
Chord Direction:	S25.890°E		
Ahead Radial Direction:	S71.415°W		
Ahead Tangent Direction:	S18.585°E		
PT	190049.083	7056739.709	2293058.845
PC	200980.148	7046378.671	2296542.674
Tangential Direction:	S18.585°E		
Tangential Length:	10931.065		
PC	200980.148	7046378.671	2296542.674
PI	201169.564	7046199.132	2296603.043
CC		7048204.740	2301973.471
PT	201358.843	7046023.972	2296675.138
Radius:	5729.580		
Delta:	3.787° Left		
Degree of Curvature (Arc):	1.000°		
Length:	378.695		
Tangent:	189.417		
Chord:	378.626		
Middle Ordinate:	3.128		
External:	3.130		
Back Tangent Direction:	S18.585°E		
Back Radial Direction:	S71.415°W		
Chord Direction:	S20.478°E		
Ahead Radial Direction:	S67.628°W		
Ahead Tangent Direction:	S22.372°E		
PT	201358.843	7046023.972	2296675.138
POT	203271.583	7044255.197	2297403.157
Tangential Direction:	S22.372°E		
Tangential Length:	1912.741		

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US 81

HORIZONTAL ALIGNMENT DATA

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		35

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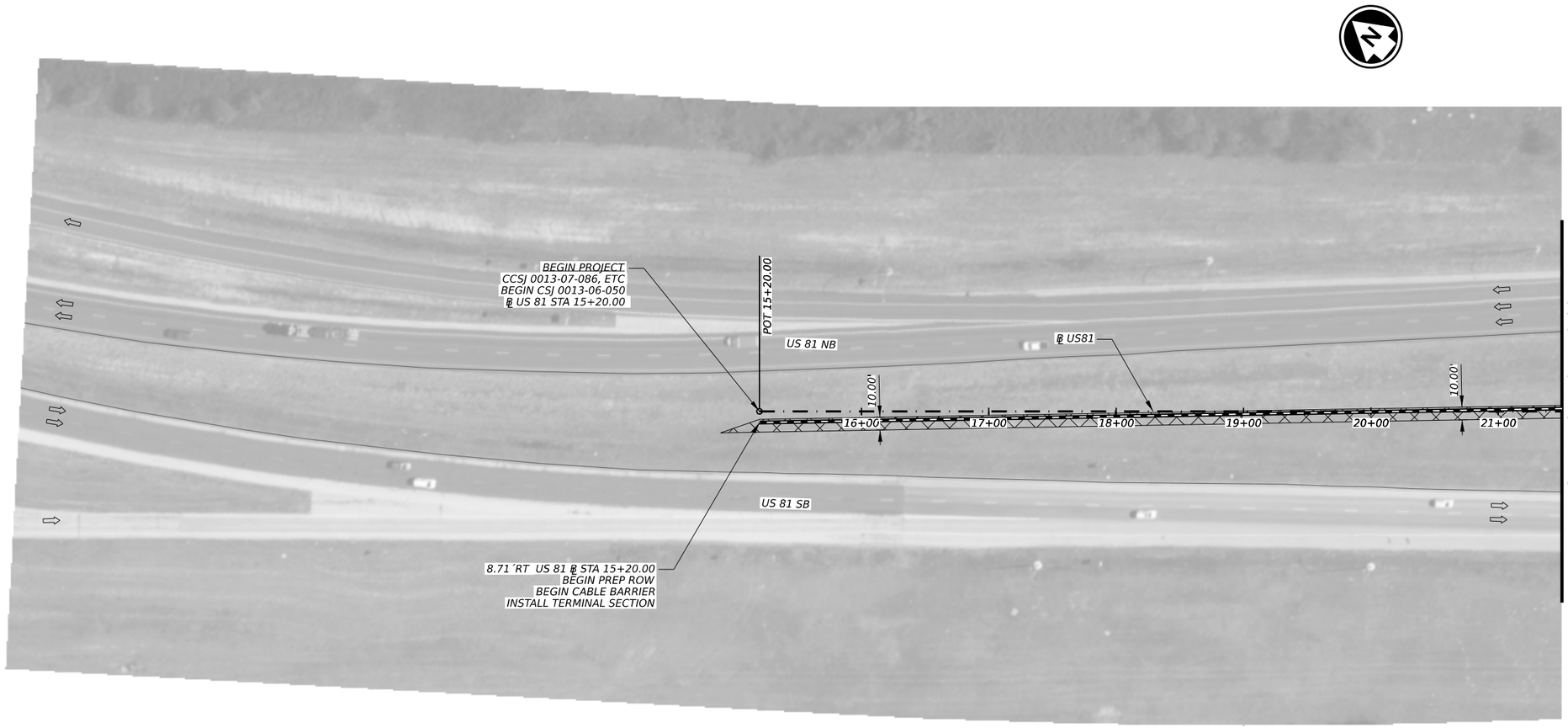

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.10
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	717
CELL FBR MLCH SEED(TEMP)(WARM)	SY	358
CELL FBR MLCH SEED(TEMP)(COOL)	SY	359
FERTILIZER *	TON	0.09
VEGETATIVE WATERING	MG	50.19
RIPRAP (MOW STRIP)(5 IN)	CY	29.31
CABLE BARRIER SYSTEM (TL-4)	LF	573
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1

* FOR CONTRACTOR'S INFORMATION ONLY.

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US 81

CABLE BARRIER LAYOUT STA 15+20 TO STA 21+50

SHEET 1 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		36

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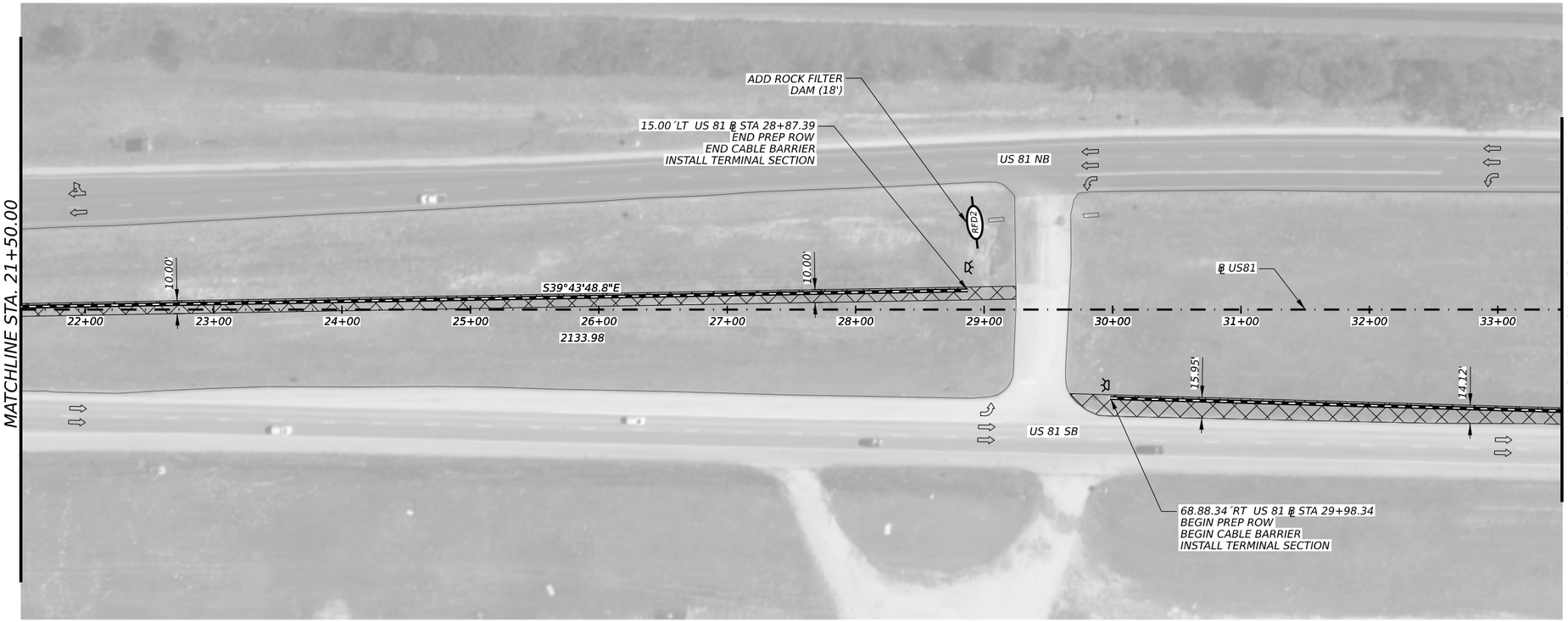

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.17
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1185
CELL FBR MLCH SEED(TEMP)(WARM)	SY	593
CELL FBR MLCH SEED(TEMP)(COOL)	SY	592
FERTILIZER *	TON	0.15
VEGETATIVE WATERING	MG	82.95
RIPRAP (MOW STRIP)(5 IN)	CY	50.74
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	975
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 21+20 TO STA 33+50

SHEET 2 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		37

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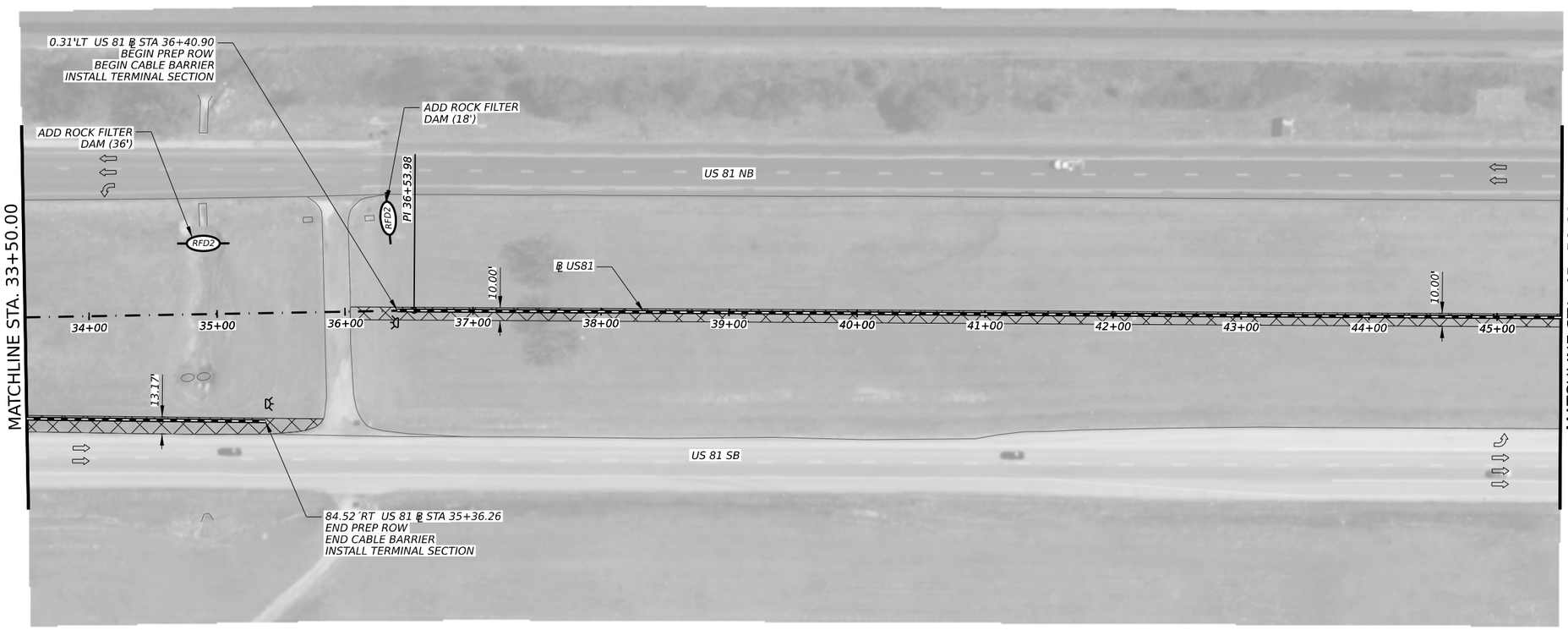

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.27
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1672
CELL FBR MLCH SEED(TEMP)(WARM)	SY	836
CELL FBR MLCH SEED(TEMP)(COOL)	SY	836
FERTILIZER *	TON	0.21
VEGETATIVE WATERING	MG	117.04
RIPRAP (MOW STRIP)(5 IN)	CY	50.97
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	980
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

* FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER

Salcido Pavia, P.E. 3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 33+50 TO STA 45+50

SHEET 3 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		38

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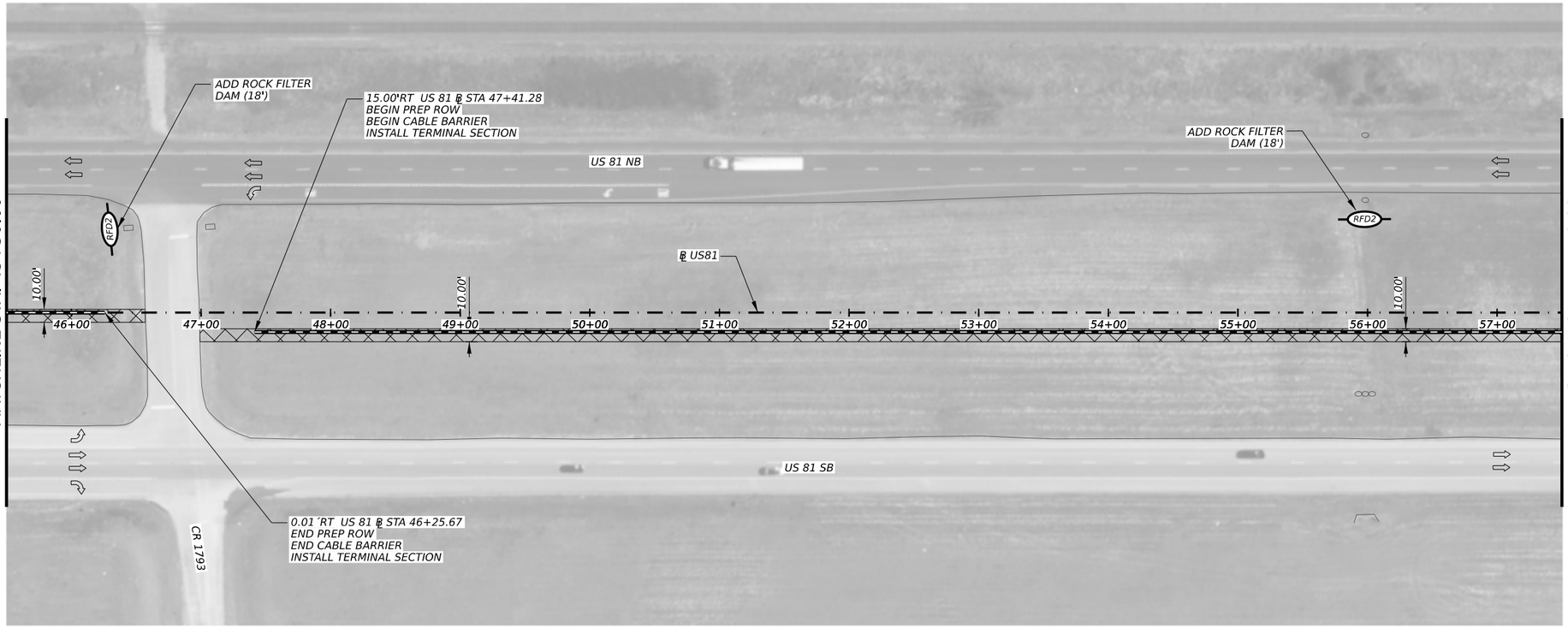

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.19
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1287
CELL FBR MLCH SEED(TEMP)(WARM)	SY	644
CELL FBR MLCH SEED(TEMP)(COOL)	SY	643
FERTILIZER *	TON	0.16
VEGETATIVE WATERING	MG	90.09
RIPRAP (MOW STRIP)(5 IN)	CY	50.51
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	970
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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US 81

CABLE BARRIER LAYOUT STA 45+50 TO STA 57+50

SHEET 4 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		39

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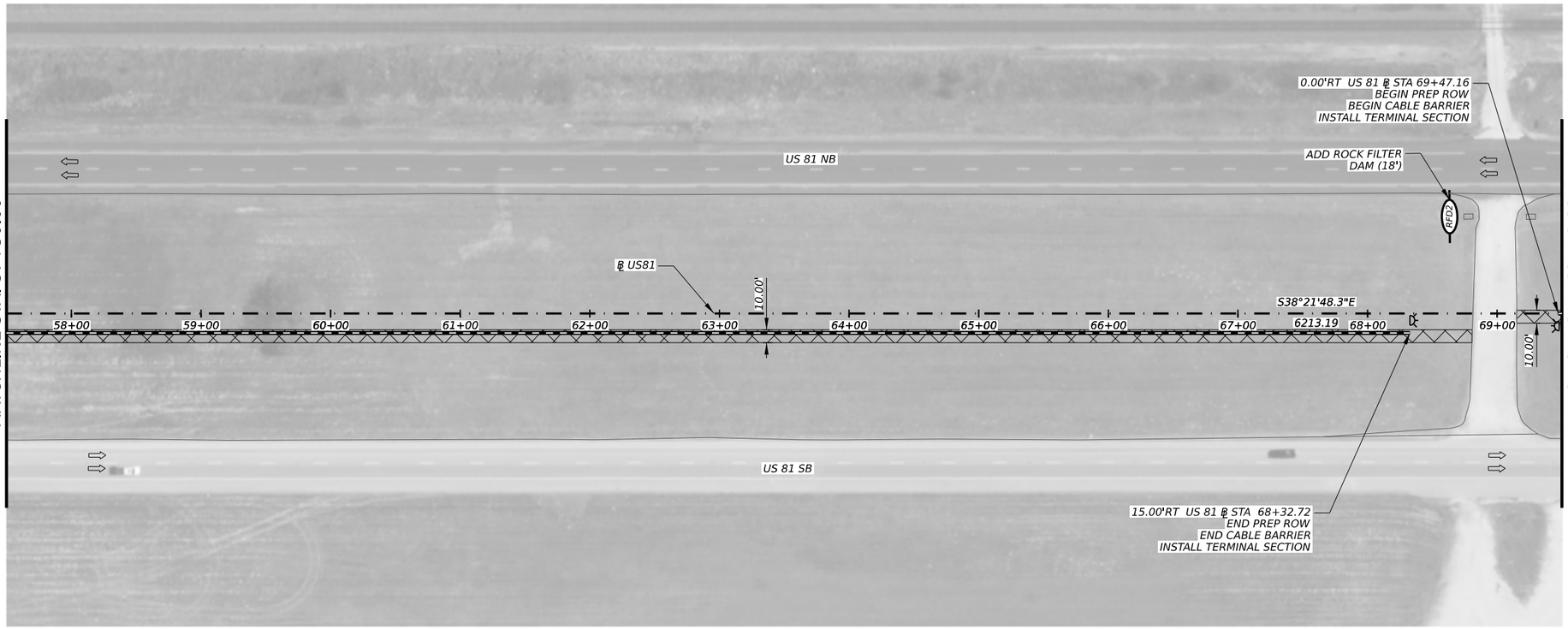

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.19
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1295
CELL FBR MLCH SEED(TEMP)(WARM)	SY	648
CELL FBR MLCH SEED(TEMP)(COOL)	SY	647
FERTILIZER *	TON	0.16
VEGETATIVE WATERING	MG	90.65
RIPRAP (MOW STRIP)(5 IN)	CY	50.42
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	968
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 57+50 TO STA 69+50

SHEET 5 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		40

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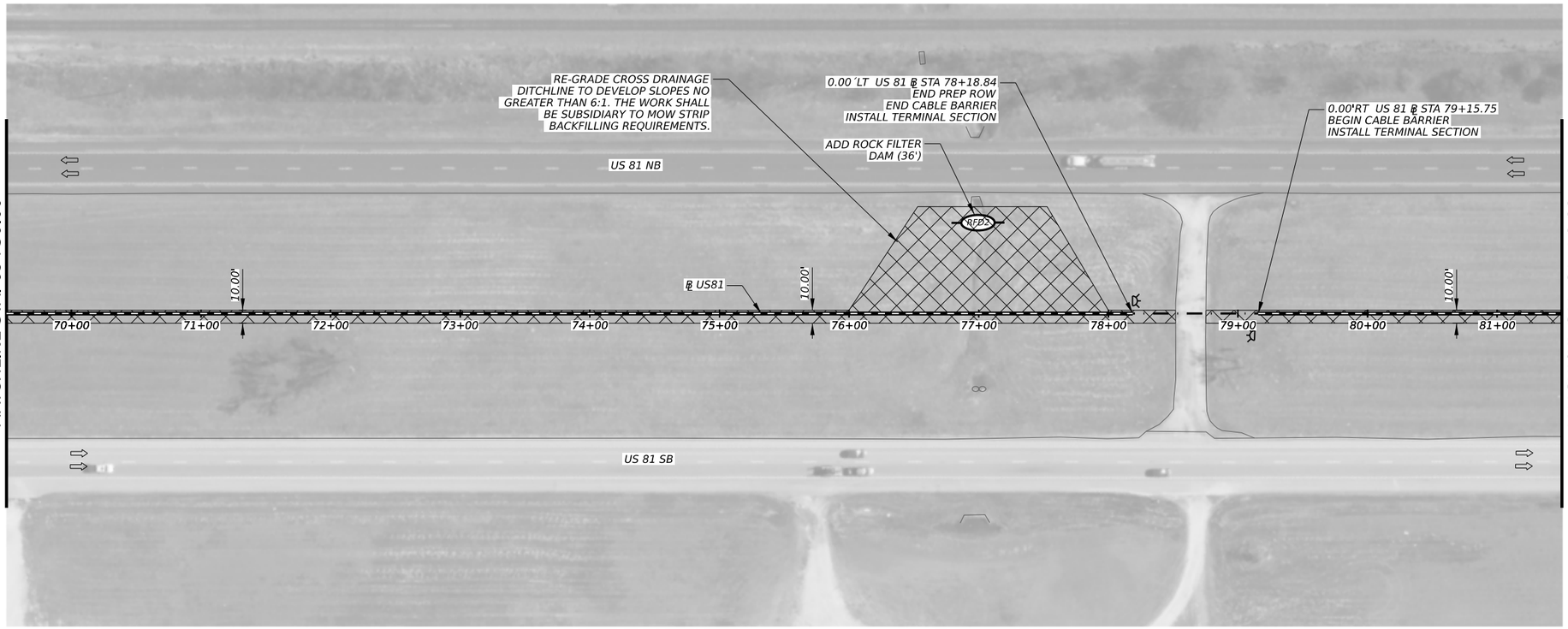

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.47
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	2638
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1319
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1319
FERTILIZER *	TON	0.33
VEGETATIVE WATERING	MG	184.66
RIPRAP (MOW STRIP)(5 IN)	CY	51.48
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	991
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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US 81

CABLE BARRIER LAYOUT
STA 69+50 TO STA 81+50

SHEET 6 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		41

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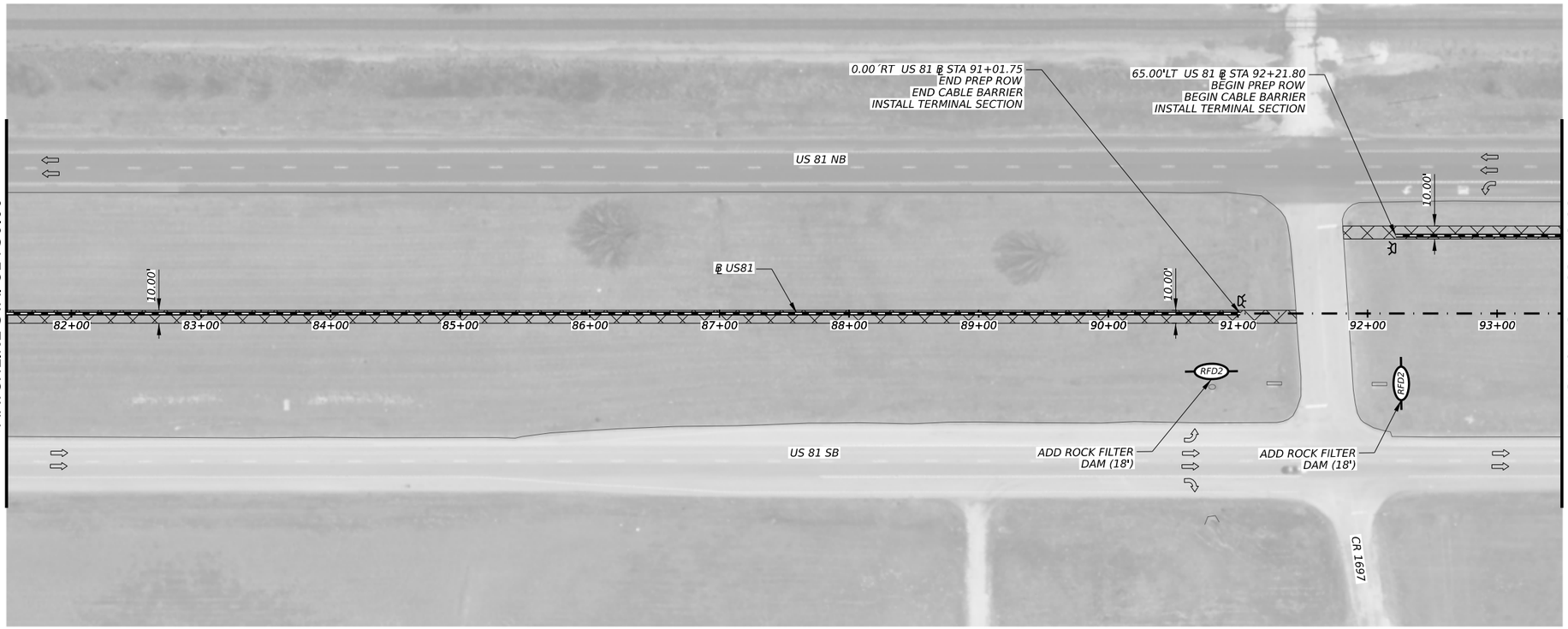

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.15
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1077
CELL FBR MLCH SEED(TEMP)(WARM)	SY	538
CELL FBR MLCH SEED(TEMP)(COOL)	SY	539
FERTILIZER *	TON	0.13
VEGETATIVE WATERING	MG	75.39
RIPRAP (MOW STRIP)(5 IN)	CY	50.28
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	965
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2

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US 81

CABLE BARRIER LAYOUT
STA 81+50 TO STA 93+50

SHEET 7 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		42

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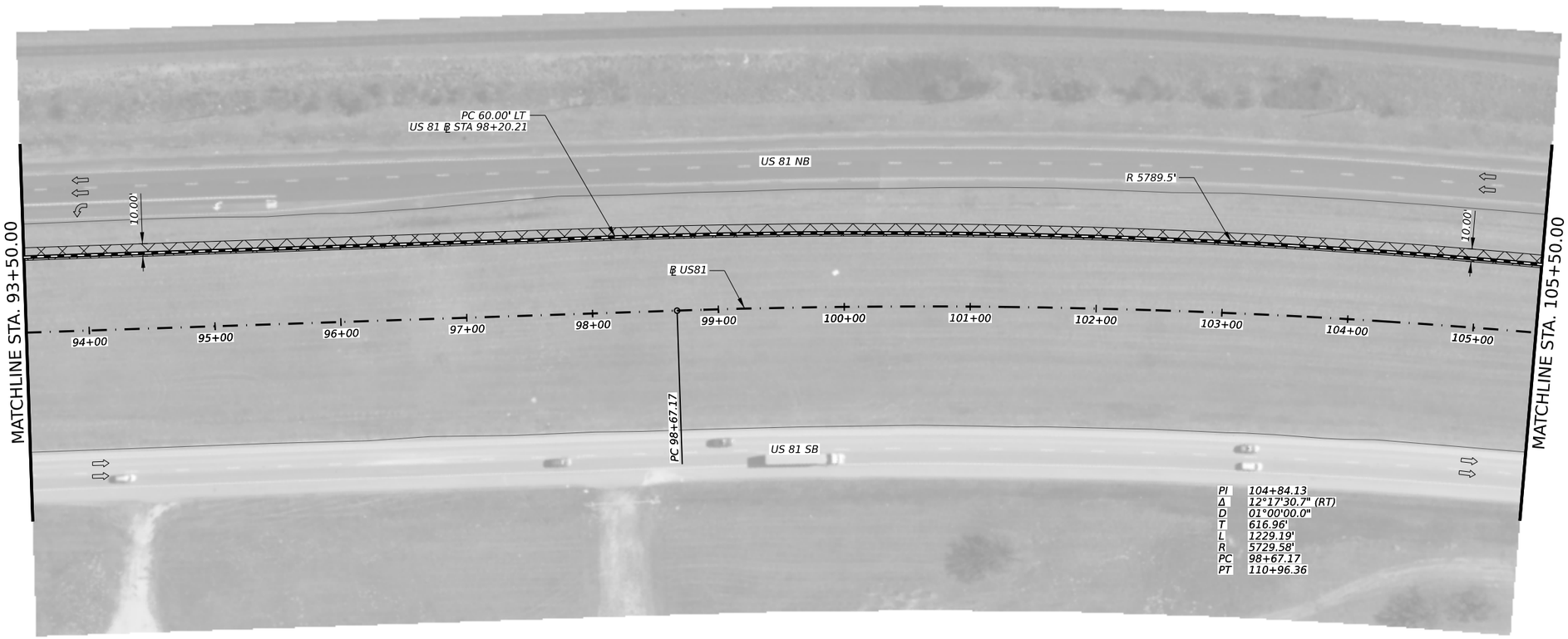

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
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- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.19
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1341
CELL FBR MLCH SEED(TEMP)(WARM)	SY	671
CELL FBR MLCH SEED(TEMP)(COOL)	SY	670
FERTILIZER *	TON	0.17
VEGETATIVE WATERING	MG	93.87
RIPRAP (MOW STRIP)(5 IN)	CY	55.88
CABLE BARRIER SYSTEM (TL-4)	LF	1207

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 93+50 TO STA 105+50

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81

DIST	COUNTY	SHEET NO.
FTW	WISE	43

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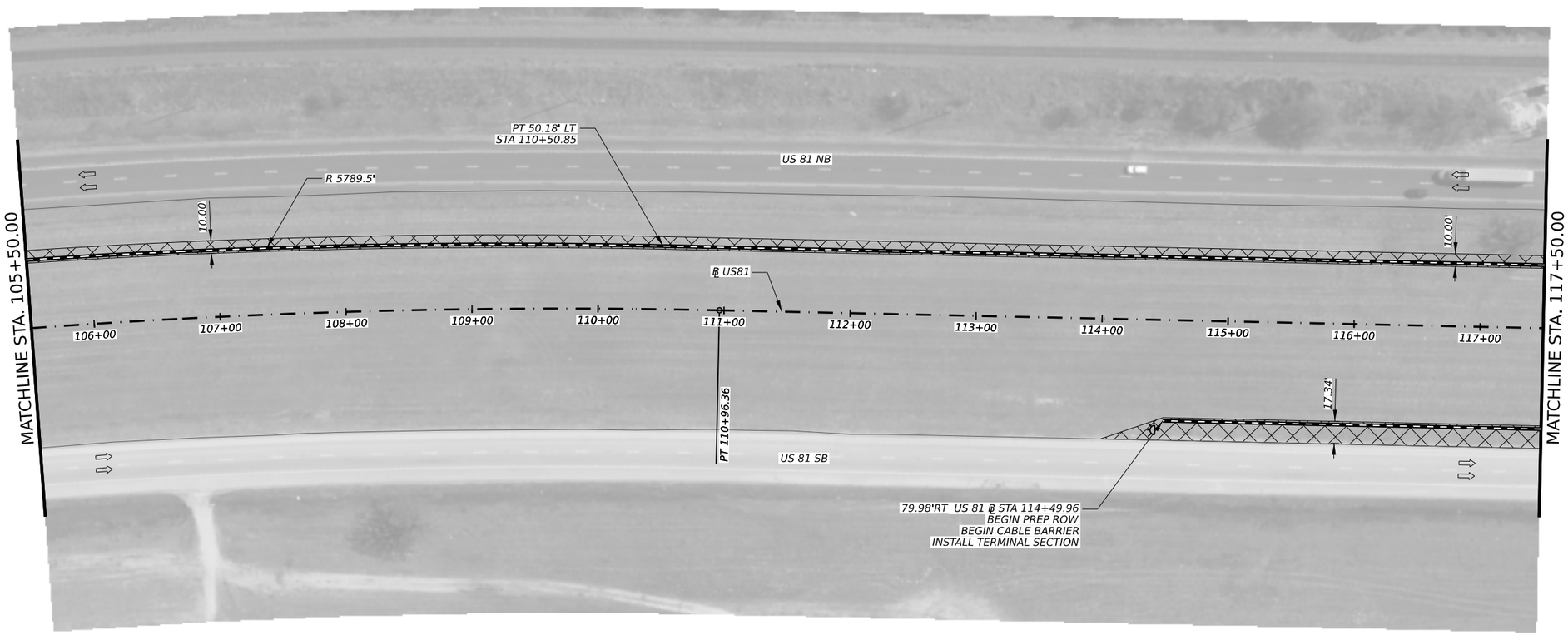

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
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   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.30
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1973
CELL FBR MLCH SEED(TEMP)(WARM)	SY	986
CELL FBR MLCH SEED(TEMP)(COOL)	SY	987
FERTILIZER *	TON	0.24
VEGETATIVE WATERING	MG	138.11
RIPRAP (MOW STRIP)(5 IN)	CY	69.81
CABLE BARRIER SYSTEM (TL-4)	LF	1448
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1

* FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
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100177
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Salcido Pavia, P.E. 3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 105+50 TO STA 117+50

SHEET 9 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		44

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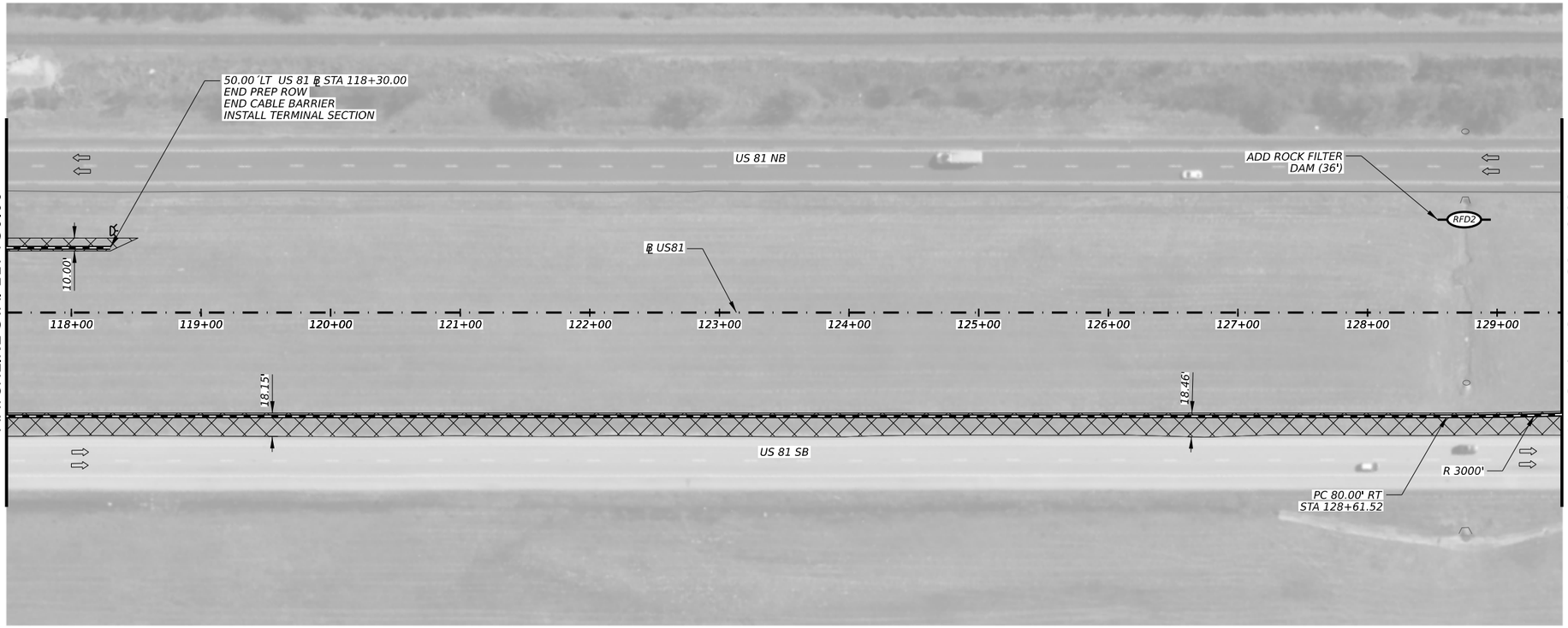

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
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9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.42
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	2460
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1230
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1230
FERTILIZER *	TON	0.30
VEGETATIVE WATERING	MG	172.20
RIPRAP (MOW STRIP)(5 IN)	CY	59.40
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	1223
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 117+50 TO STA 129+50

SHEET10 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		45

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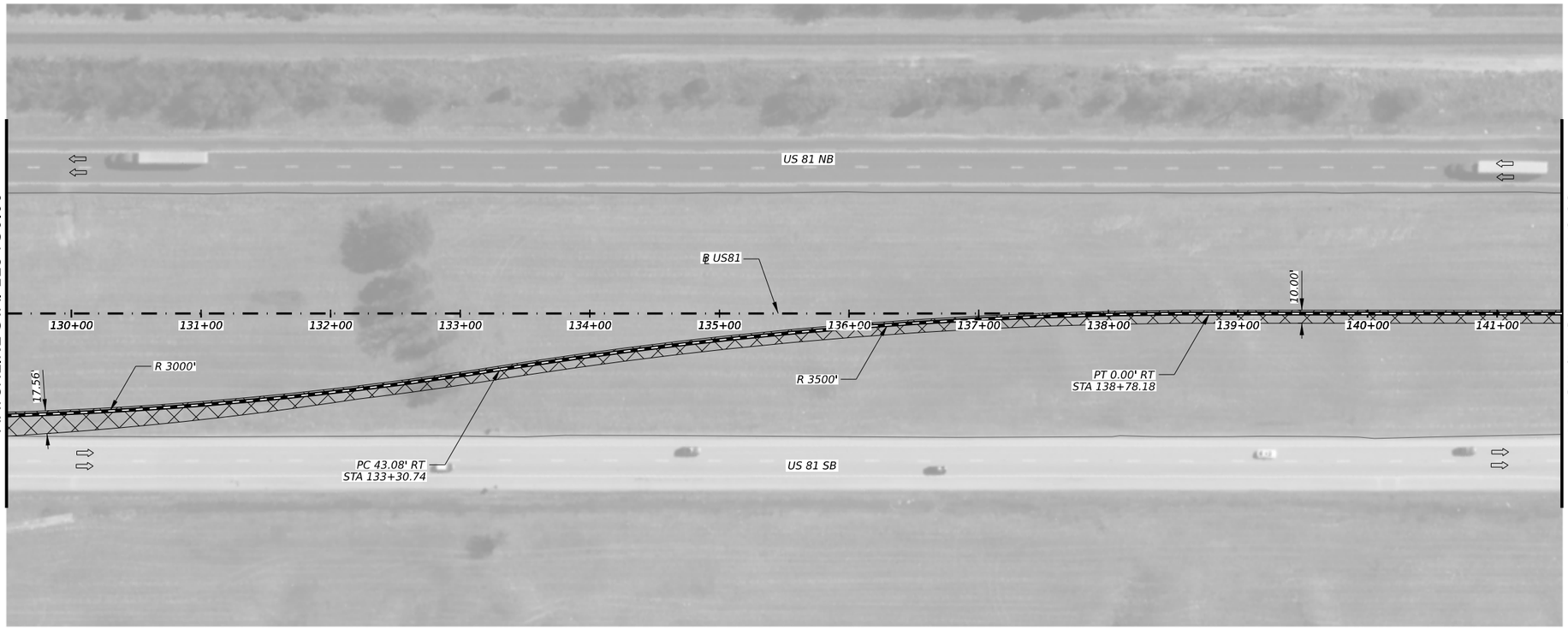

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.22
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1468
CELL FBR MLCH SEED(TEMP)(WARM)	SY	734
CELL FBR MLCH SEED(TEMP)(COOL)	SY	734
FERTILIZER *	TON	0.18
VEGETATIVE WATERING	MG	102.76
RIPRAP (MOW STRIP)(5 IN)	CY	55.74
CABLE BARRIER SYSTEM (TL-4)	LF	1204

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 129+50 TO STA 141+50

SHEET11 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		46

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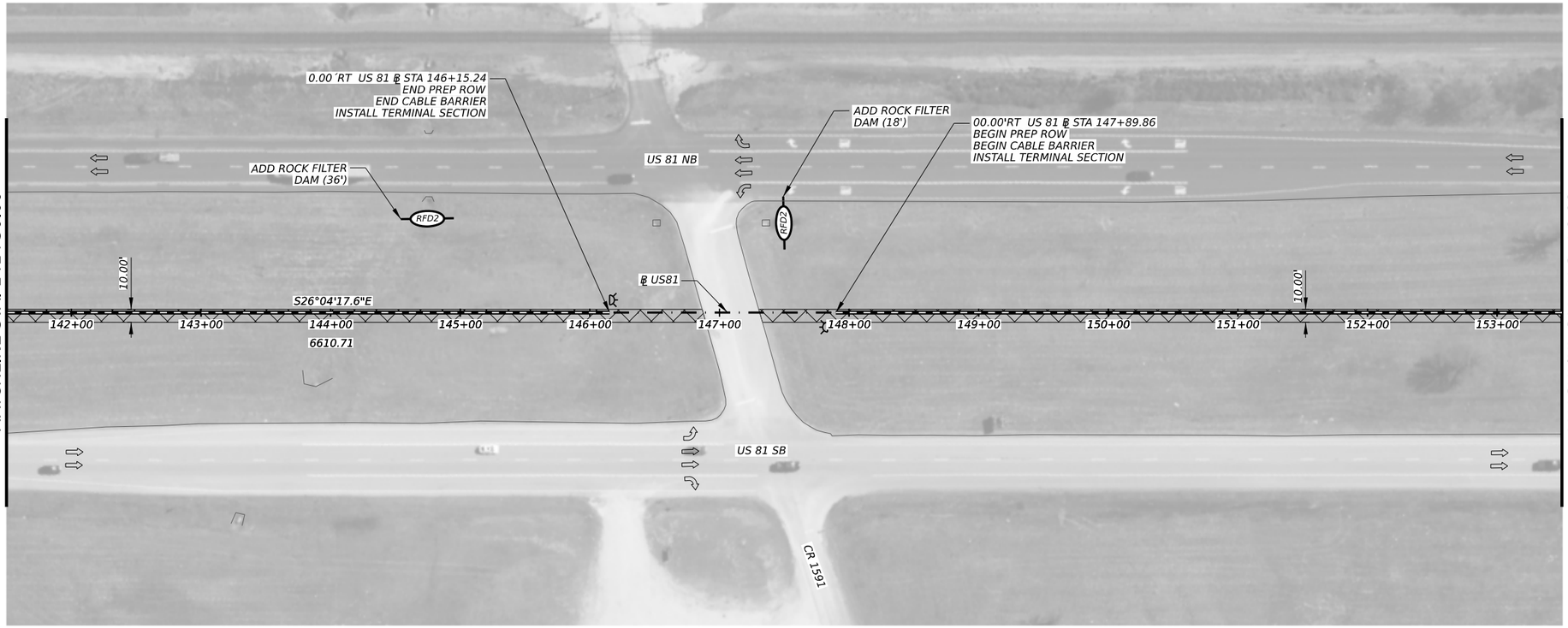

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.19
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1285
CELL FBR MLCH SEED(TEMP)(WARM)	SY	642
CELL FBR MLCH SEED(TEMP)(COOL)	SY	643
FERTILIZER *	TON	0.16
VEGETATIVE WATERING	MG	89.95
RIPRAP (MOW STRIP)(5 IN)	CY	47.73
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	54
ROCK FILTER DAMS (REMOVE)	LF	54
CABLE BARRIER SYSTEM (TL-4)	LF	910
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
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STATE OF TEXAS
ERNESTO SALCIDO
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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 141+50 TO STA 153+50

SHEET12 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		47

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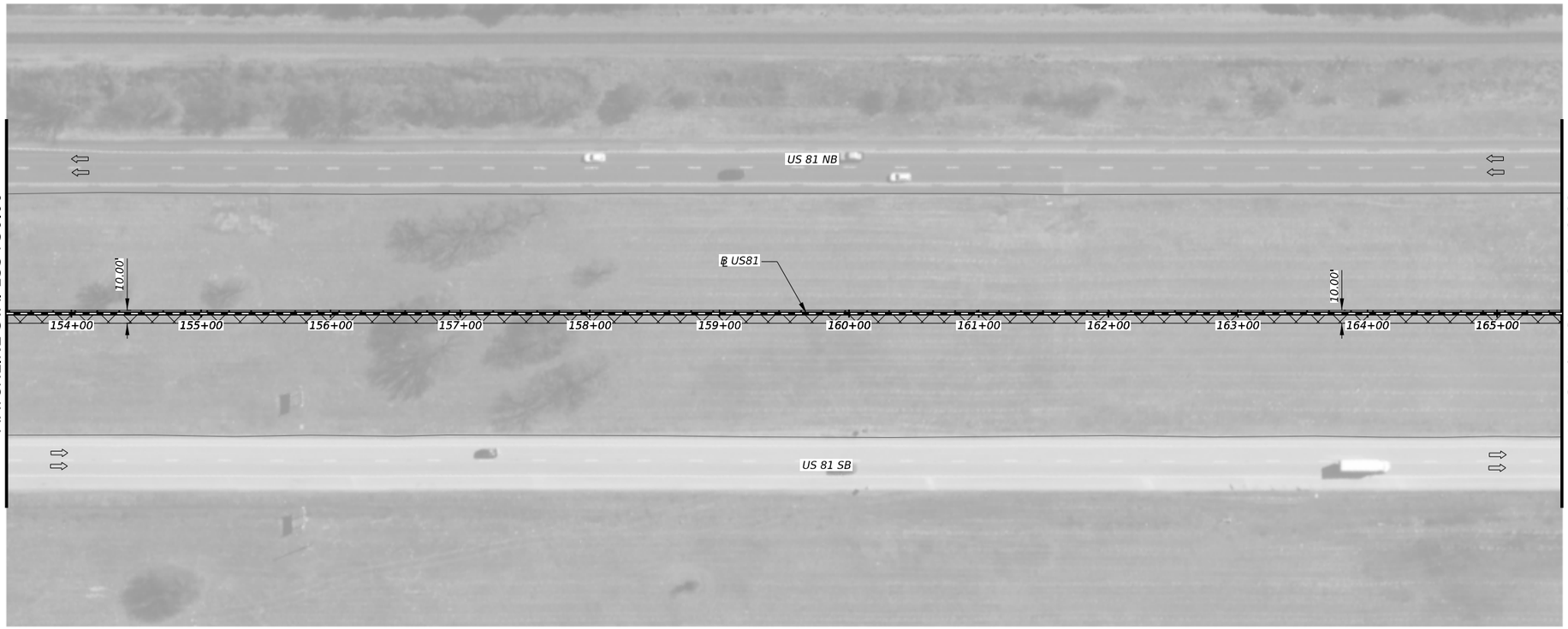

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.19
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1333
CELL FBR MLCH SEED(TEMP)(WARM)	SY	667
CELL FBR MLCH SEED(TEMP)(COOL)	SY	666
FERTILIZER *	TON	0.17
VEGETATIVE WATERING	MG	93.31
RIPRAP (MOW STRIP)(5 IN)	CY	55.56
CABLE BARRIER SYSTEM (TL-4)	LF	1200

* FOR CONTRACTOR'S INFORMATION ONLY.

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 153+50 TO STA 165+50

SHEET 13 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		48

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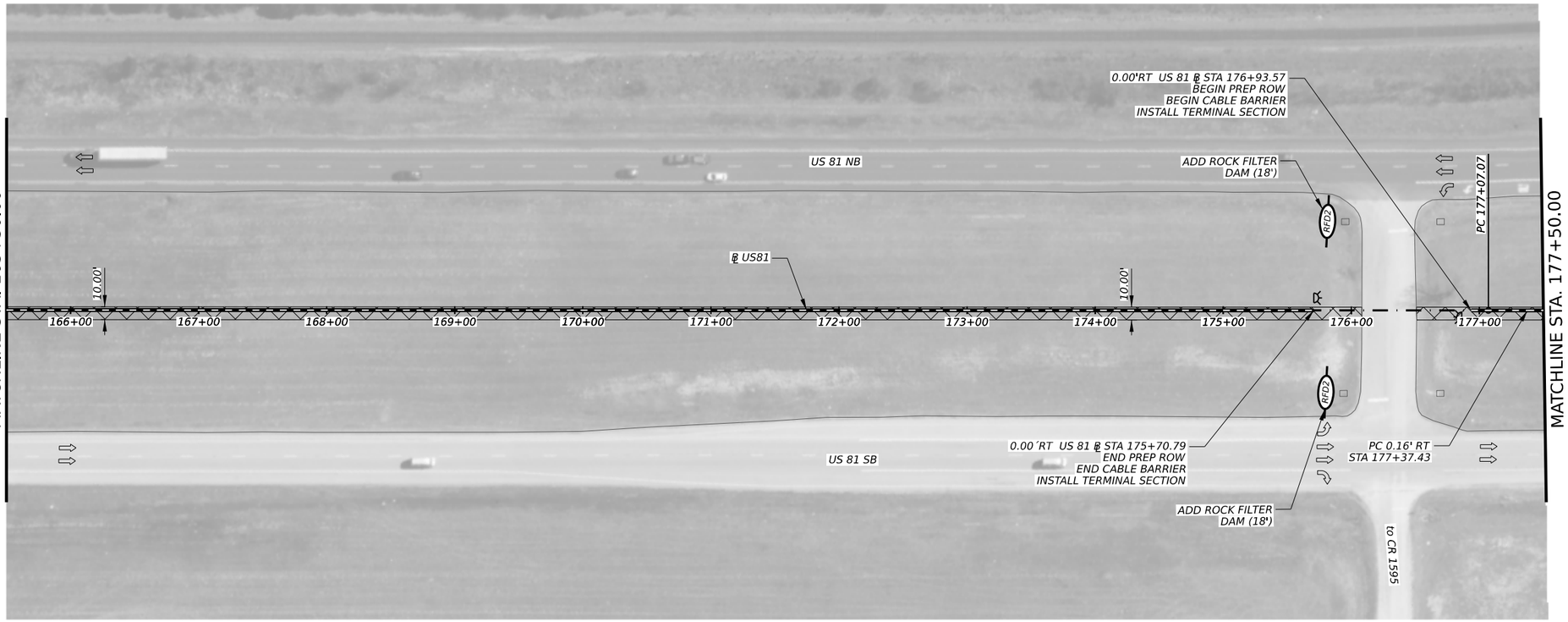

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.19
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1286
CELL FBR MLCH SEED(TEMP)(WARM)	SY	643
CELL FBR MLCH SEED(TEMP)(COOL)	SY	643
FERTILIZER *	TON	0.16
VEGETATIVE WATERING	MG	90.02
RIPRAP (MOW STRIP)(5 IN)	CY	50.14
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	962
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 165+50 TO STA 177+50

SHEET14 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		49

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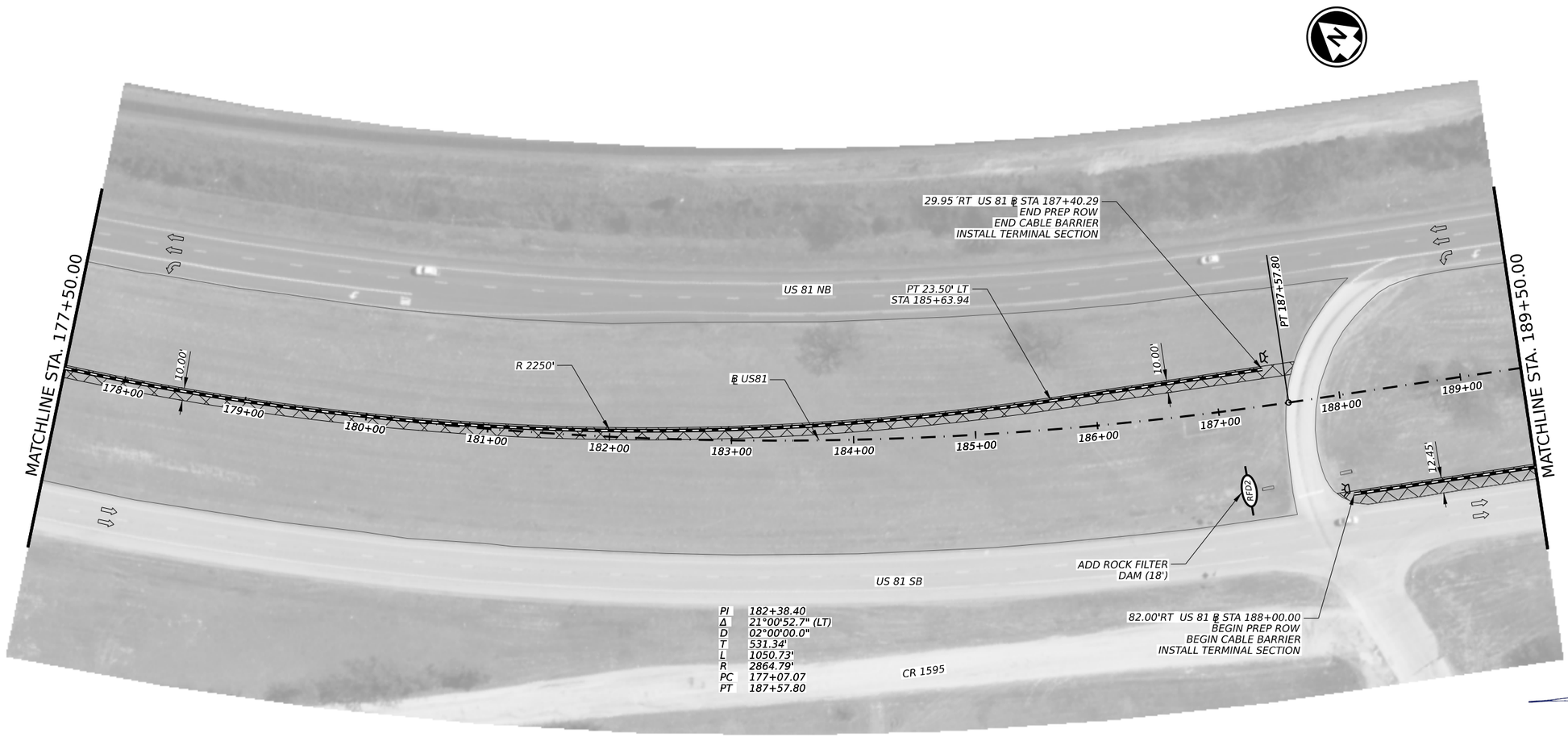

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.20
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1339
CELL FBR MLCH SEED(TEMP)(WARM)	SY	669
CELL FBR MLCH SEED(TEMP)(COOL)	SY	670
FERTILIZER *	TON	0.17
VEGETATIVE WATERING	MG	93.73
RIPRAP (MOW STRIP)(5 IN)	CY	52.92
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	1022
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 177+50 TO STA 189+50

SHEET15 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		50

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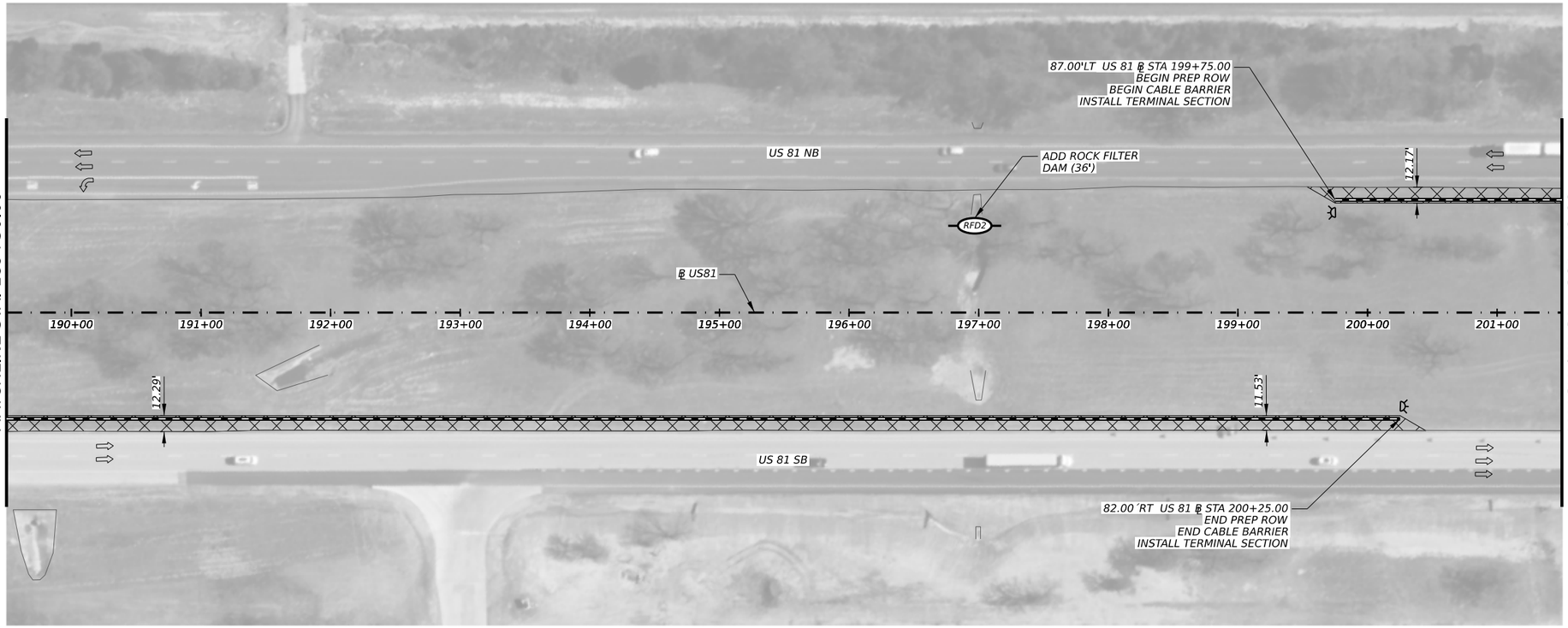

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.26
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1656
CELL FBR MLCH SEED(TEMP)(WARM)	SY	828
CELL FBR MLCH SEED(TEMP)(COOL)	SY	828
FERTILIZER *	TON	0.21
VEGETATIVE WATERING	MG	115.92
RIPRAP (MOW STRIP)(5 IN)	CY	58.15
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	1135
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

* FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
3/21/2024

Salcido Pavia, P.E.

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 189+50 TO STA 201+50

SHEET16 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		51

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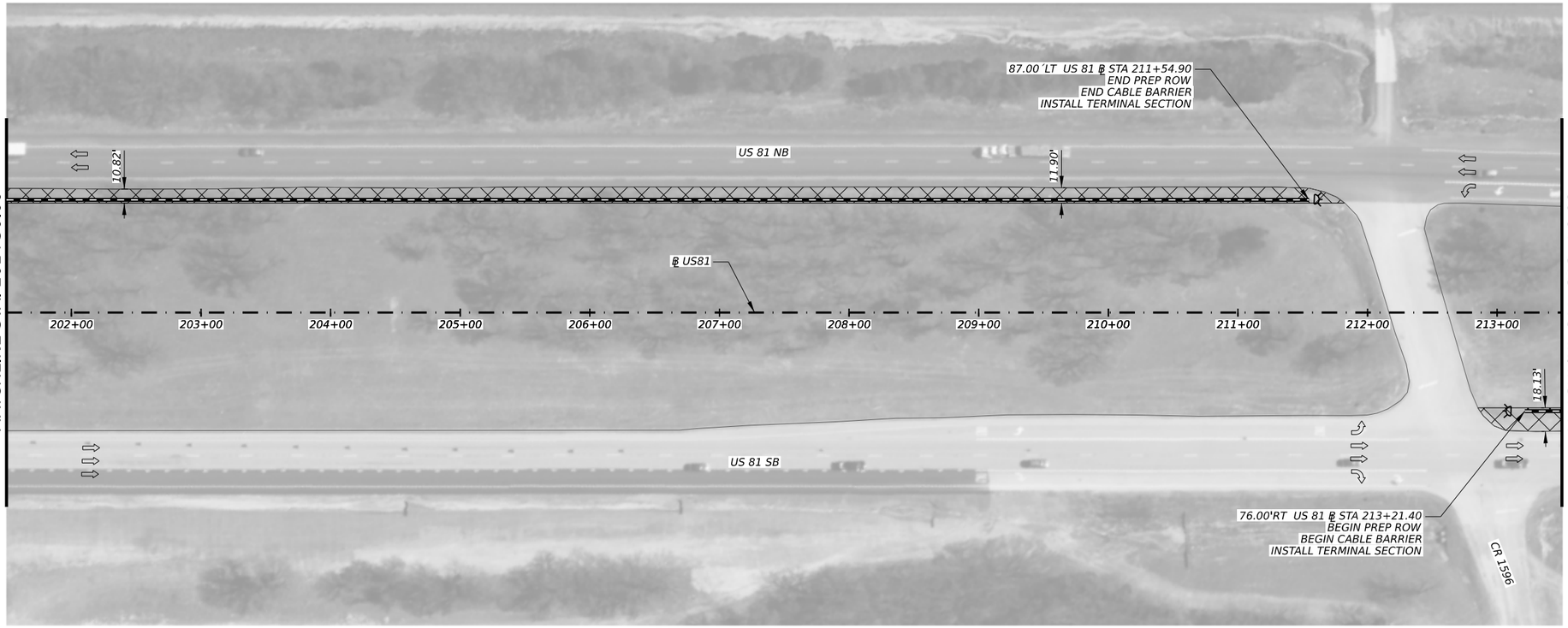

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.23
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1479
CELL FBR MLCH SEED(TEMP)(WARM)	SY	740
CELL FBR MLCH SEED(TEMP)(COOL)	SY	739
FERTILIZER *	TON	0.18
VEGETATIVE WATERING	MG	103.53
RIPRAP (MOW STRIP)(5 IN)	CY	48.15
CABLE BARRIER SYSTEM (TL-4)	LF	919
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 201+50 TO STA 213+50

SHEET17 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		52

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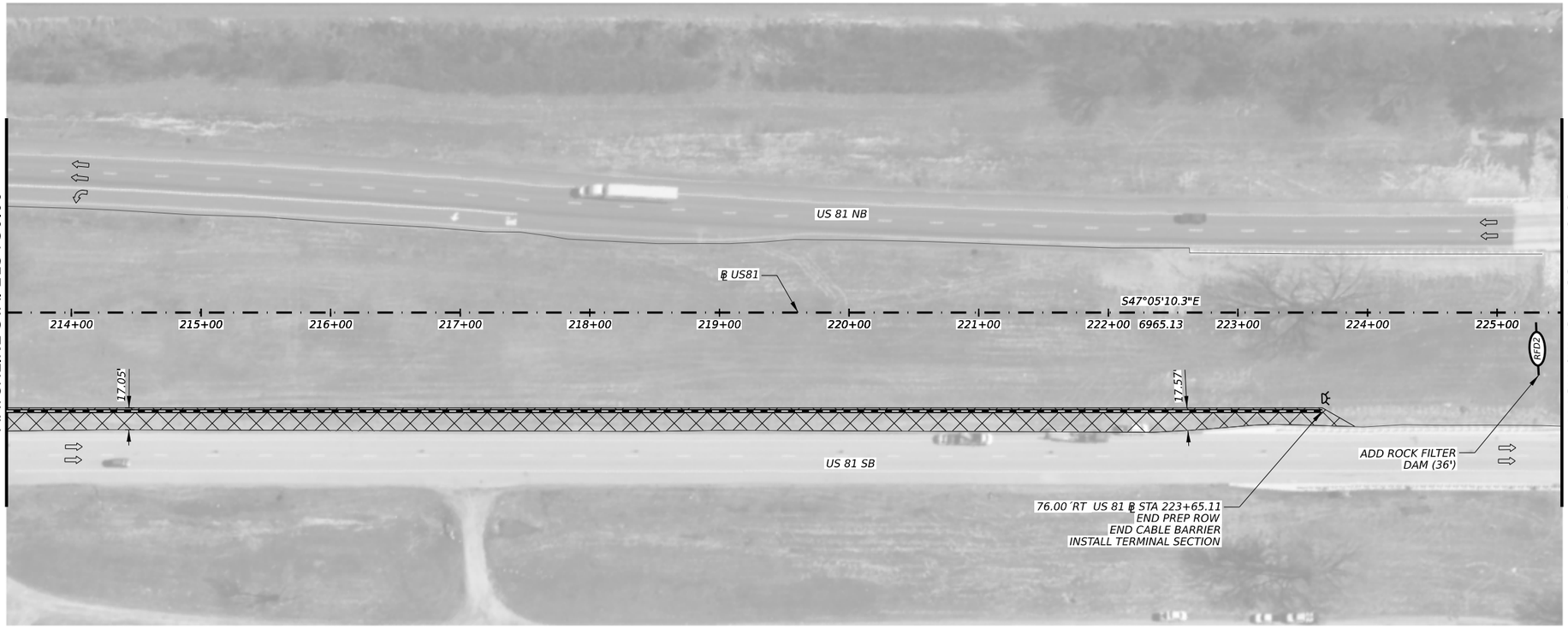

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.34
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1990
CELL FBR MLCH SEED(TEMP)(WARM)	SY	995
CELL FBR MLCH SEED(TEMP)(COOL)	SY	995
FERTILIZER *	TON	0.25
VEGETATIVE WATERING	MG	139.30
RIPRAP (MOW STRIP)(5 IN)	CY	47.13
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	958
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1

* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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STATE OF TEXAS
ERNESTO SALCIDO
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Ernesto Salcido, P.E. 3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 213+50 TO STA 225+50

SHEET18 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		53

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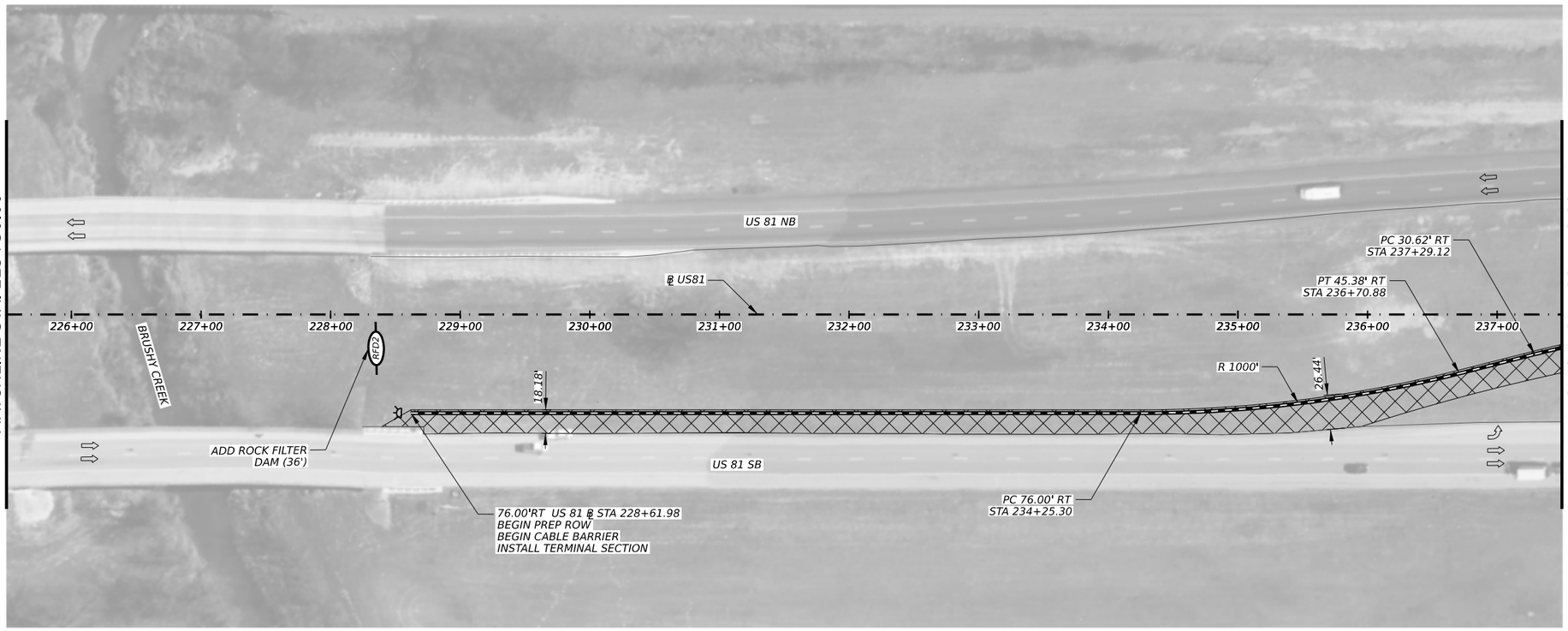

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.34
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1964
CELL FBR MLCH SEED(TEMP)(WARM)	SY	982
CELL FBR MLCH SEED(TEMP)(COOL)	SY	982
FERTILIZER *	TON	0.24
VEGETATIVE WATERING	MG	137.48
RIPRAP (MOW STRIP)(5 IN)	CY	41.48
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	836
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1

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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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STATE OF TEXAS
ERNESTO SALCIDO
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Salcido Ramirez, P.E. 3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 225+50 TO STA 237+50

SHEET19 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		54

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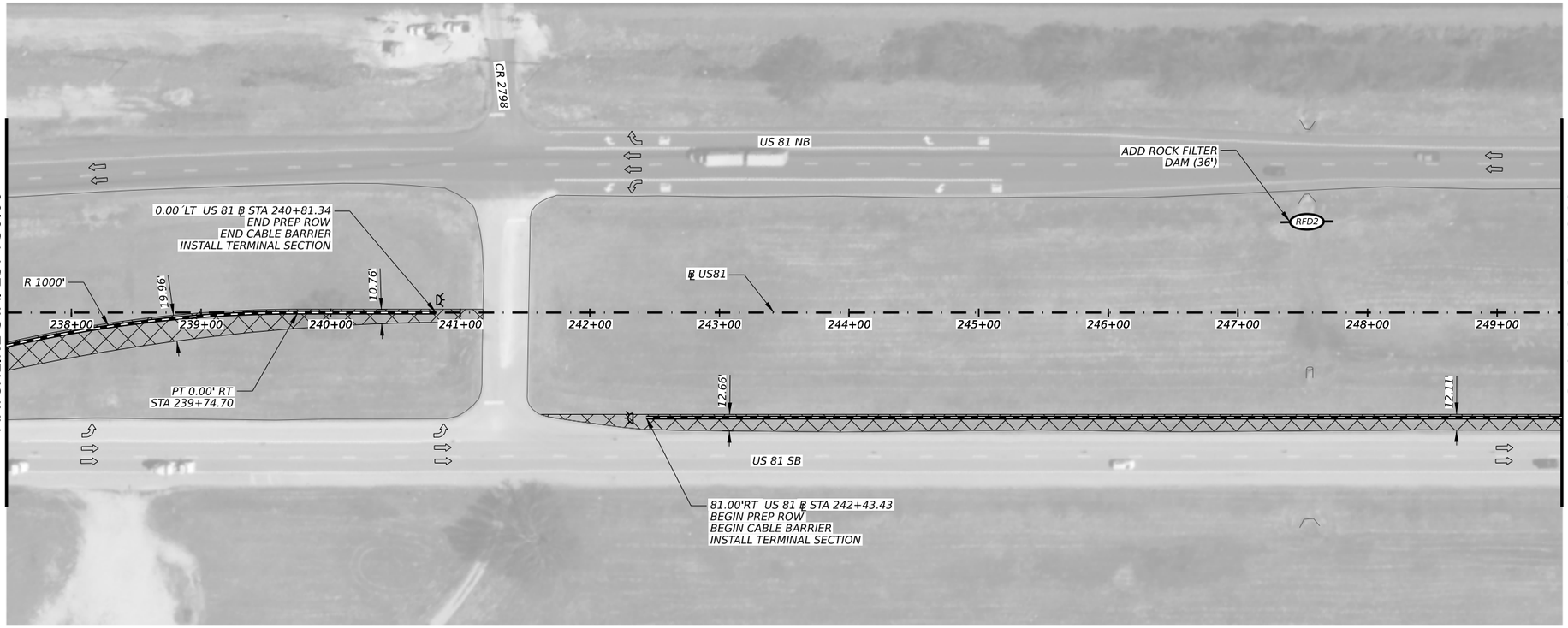

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.29
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1734
CELL FBR MLCH SEED(TEMP)(WARM)	SY	867
CELL FBR MLCH SEED(TEMP)(COOL)	SY	867
FERTILIZER *	TON	0.21
VEGETATIVE WATERING	MG	121.38
RIPRAP (MOW STRIP)(5 IN)	CY	48.43
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	925
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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100177
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3/21/2024

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 237+50 TO STA 249+50

SHEET20 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		55

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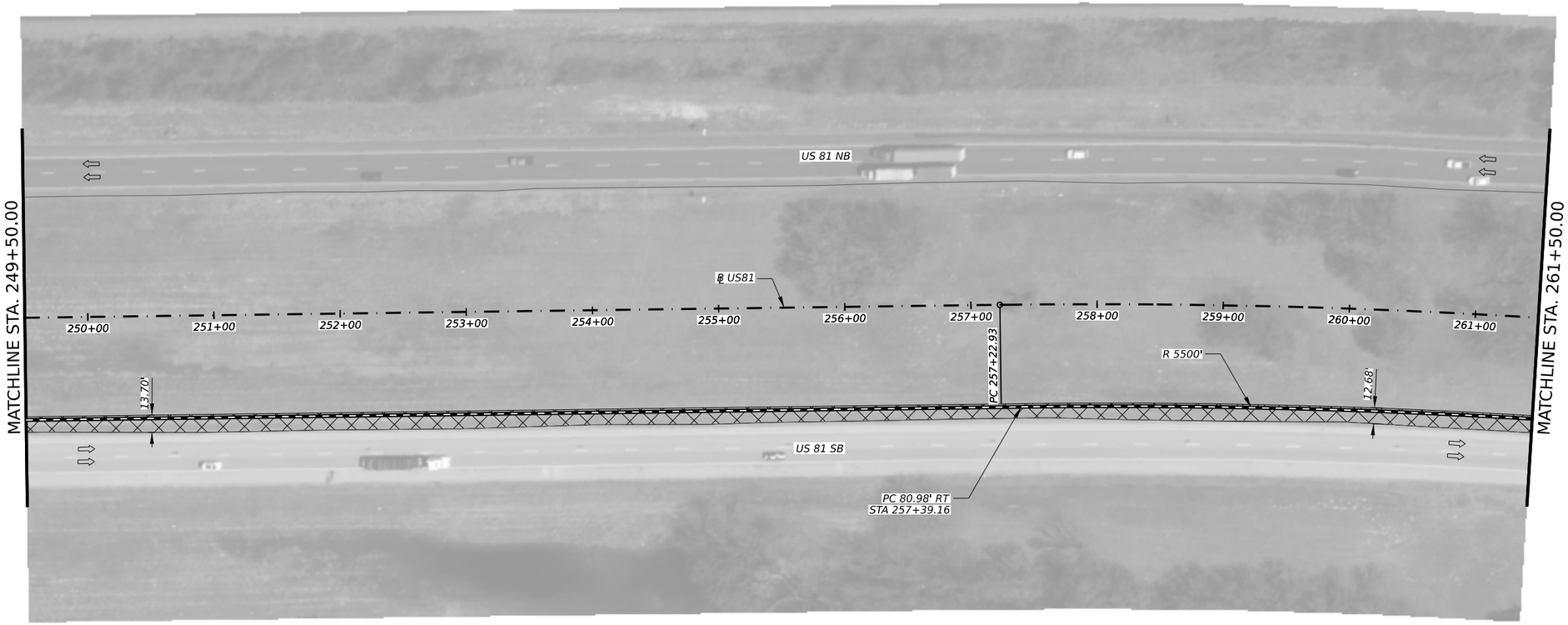

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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NOTES:

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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.27
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1717
CELL FBR MLCH SEED(TEMP)(WARM)	SY	858
CELL FBR MLCH SEED(TEMP)(COOL)	SY	859
FERTILIZER *	TON	0.21
VEGETATIVE WATERING	MG	120.19
RIPRAP (MOW STRIP)(5 IN)	CY	55.28
CABLE BARRIER SYSTEM (TL-4)	LF	1194

* FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
ERNESTO SALCIDO
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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 249+50 TO STA 261+50

SHEET 21 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		56

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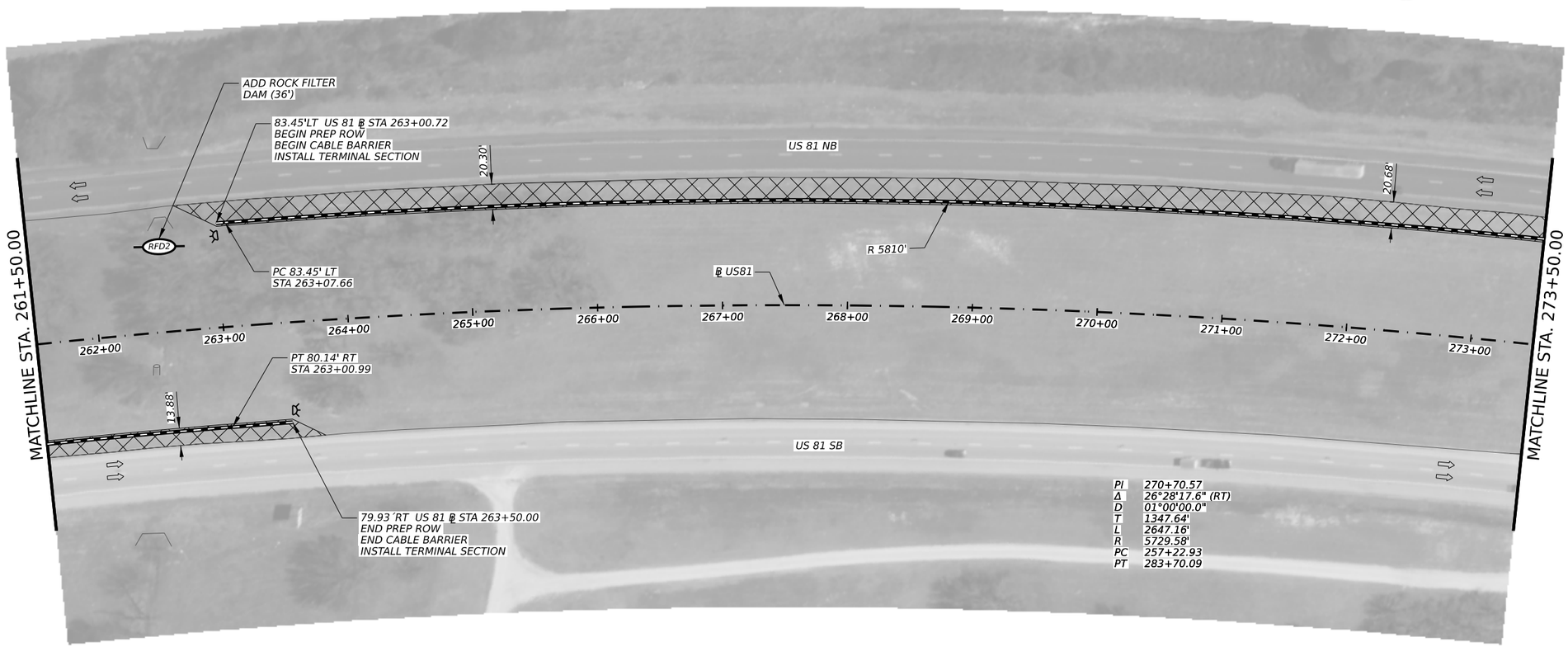

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
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   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.49
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	2787
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1394
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1393
FERTILIZER *	TON	0.35
VEGETATIVE WATERING	MG	195.09
RIPRAP (MOW STRIP)(5 IN)	CY	58.38
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	36
ROCK FILTER DAMS (REMOVE)	LF	36
CABLE BARRIER SYSTEM (TL-4)	LF	1140
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

* FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
ERNESTO SALCIDO
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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 261+50 TO STA 273+50

SHEET 22 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		57

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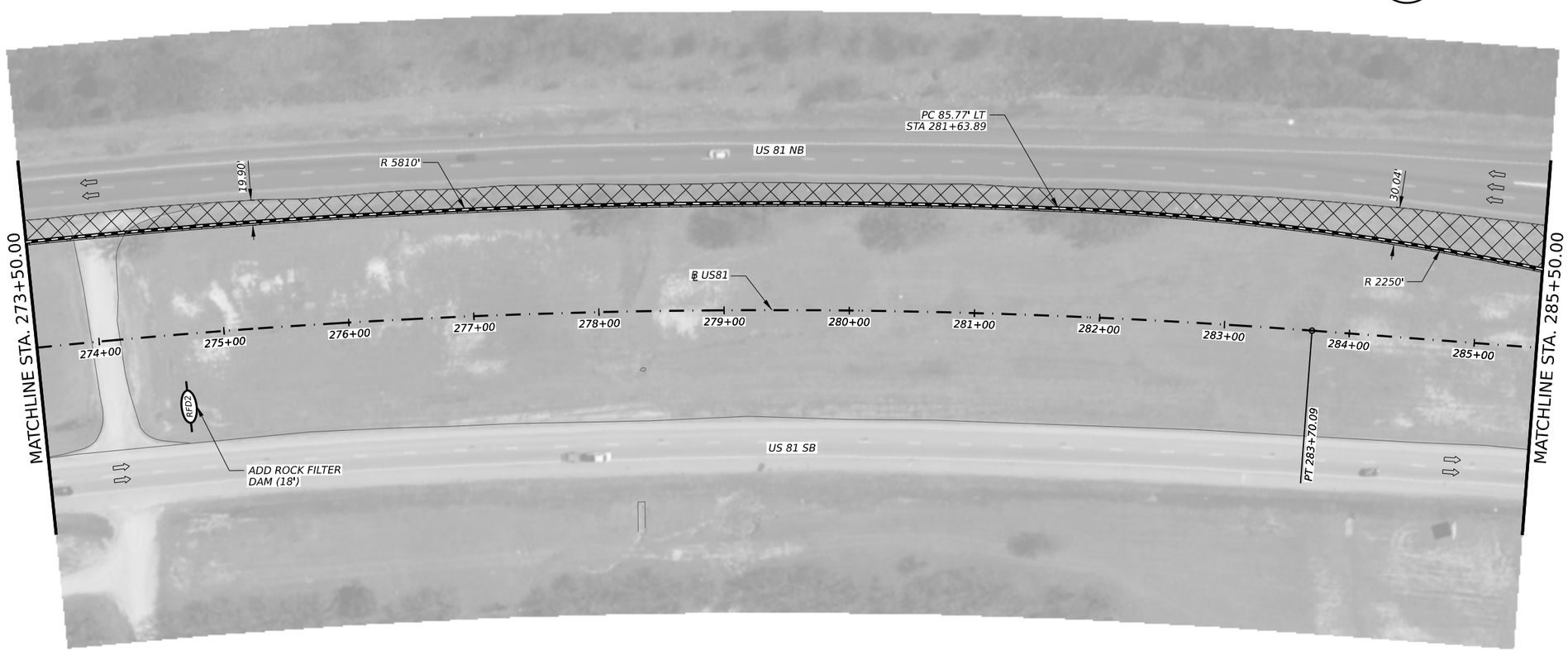

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.52
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	2903
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1452
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1451
FERTILIZER *	TON	0.36
VEGETATIVE WATERING	MG	203.21
RIPRAP (MOW STRIP)(5 IN)	CY	56.30
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	1216

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 273+50 TO STA 285+50

SHEET23 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		58

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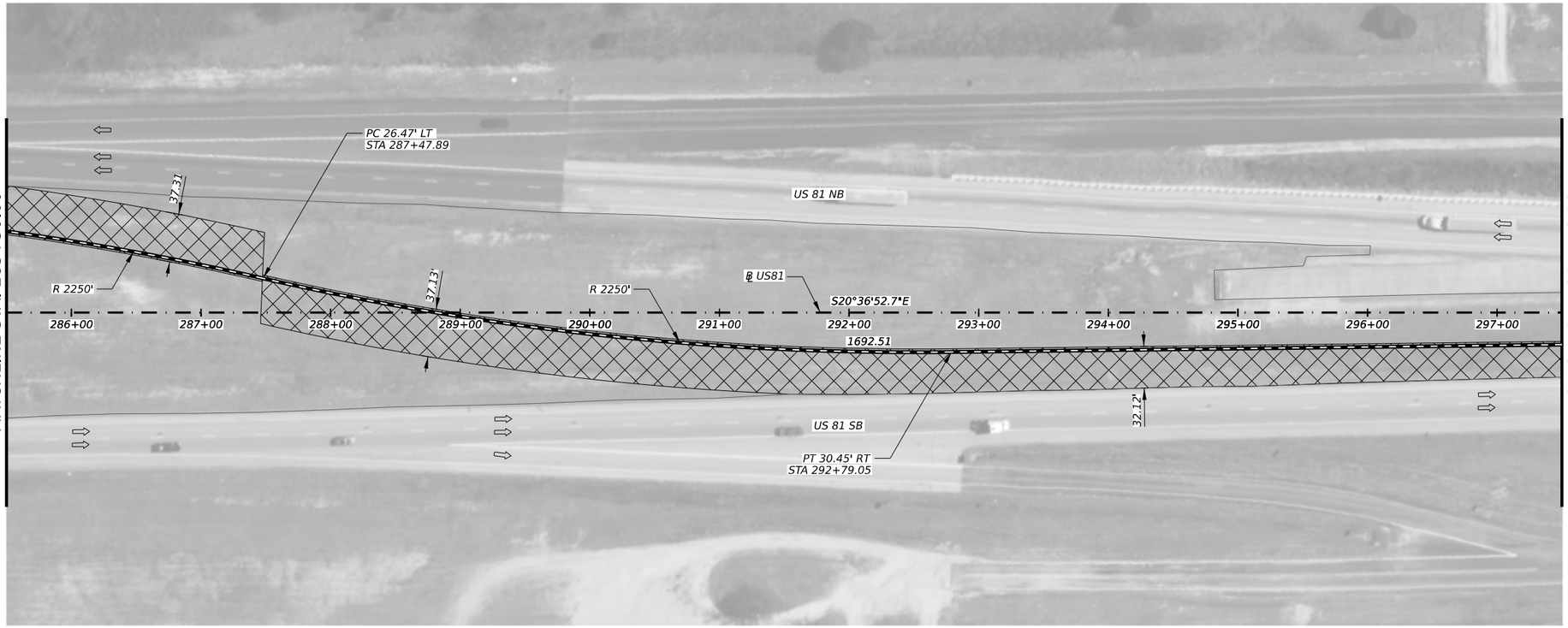

CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.88
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4639
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2319
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2320
FERTILIZER *	TON	0.58
VEGETATIVE WATERING	MG	324.73
RIPRAP (MOW STRIP)(5 IN)	CY	55.93
CABLE BARRIER SYSTEM (TL-4)	LF	1208

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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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US 81

CABLE BARRIER LAYOUT
STA 237+50 TO STA 249+50

SHEET24 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		59

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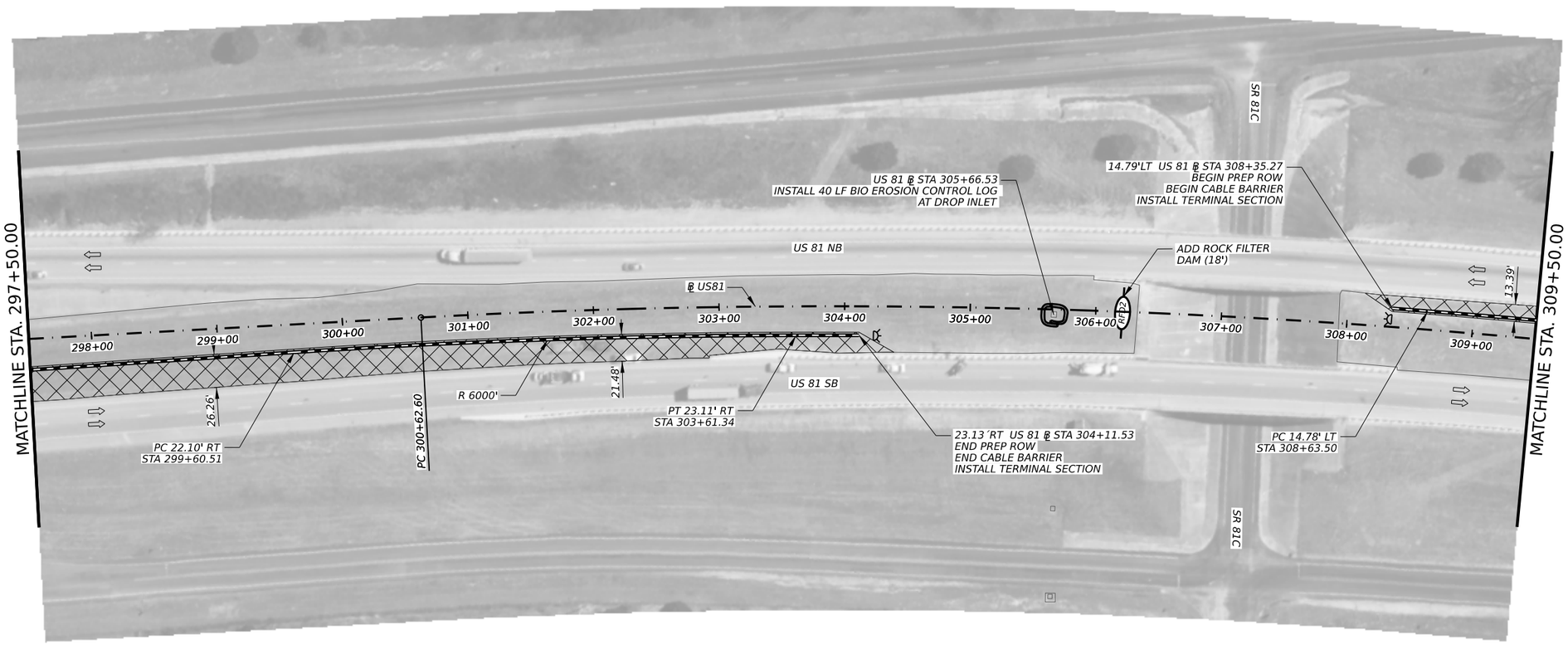

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.33
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1869
CELL FBR MLCH SEED(TEMP)(WARM)	SY	934
CELL FBR MLCH SEED(TEMP)(COOL)	SY	935
FERTILIZER *	TON	0.23
VEGETATIVE WATERING	MG	130.83
RIPRAP (MOW STRIP)(5 IN)	CY	36.16
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	40
BIODEG EROSN CONT LOGS (REMOVE)	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	660
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 297+50 TO STA 309+50

SHEET25 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		60

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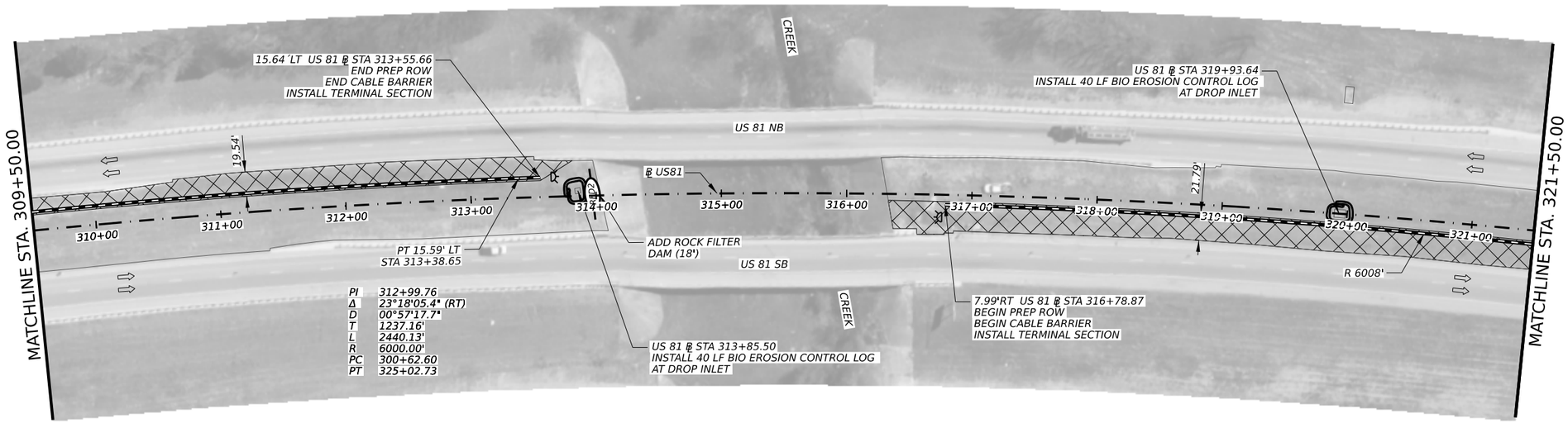
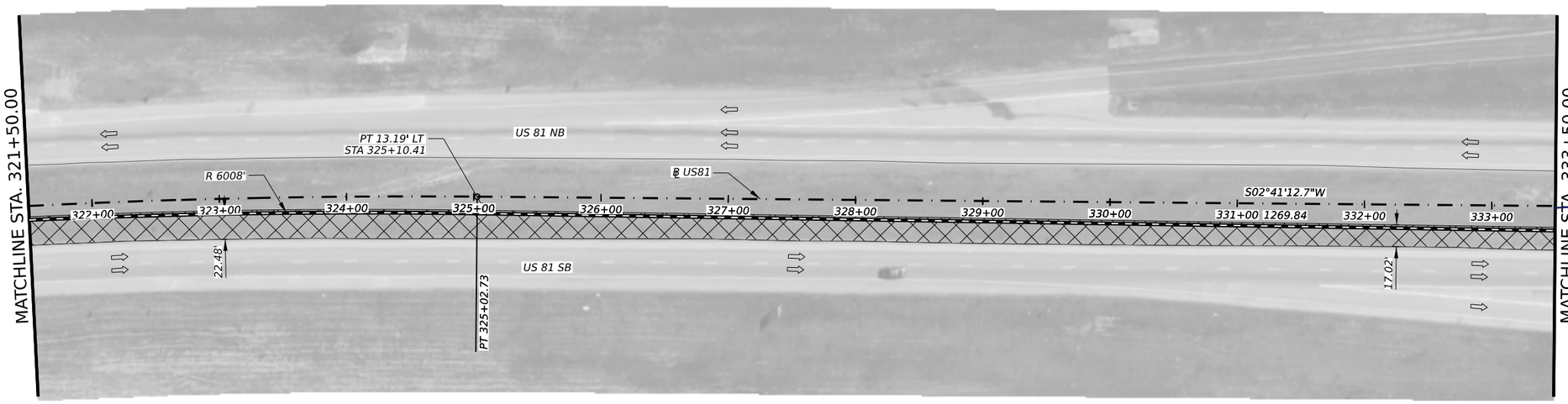


CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.85
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4828
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2414
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2414
FERTILIZER *	TON	0.60
VEGETATIVE WATERING	MG	337.96
RIPRAP (MOW STRIP)(5 IN)	CY	96.39
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	80
BIODEG EROSN CONT LOGS (REMOVE)	LF	80
CABLE BARRIER SYSTEM (TL-4)	LF	1961
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100
SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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STATE OF TEXAS
ERNESTO SALCIDO
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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 309+50 TO STA 333+50

SHEET26 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		61

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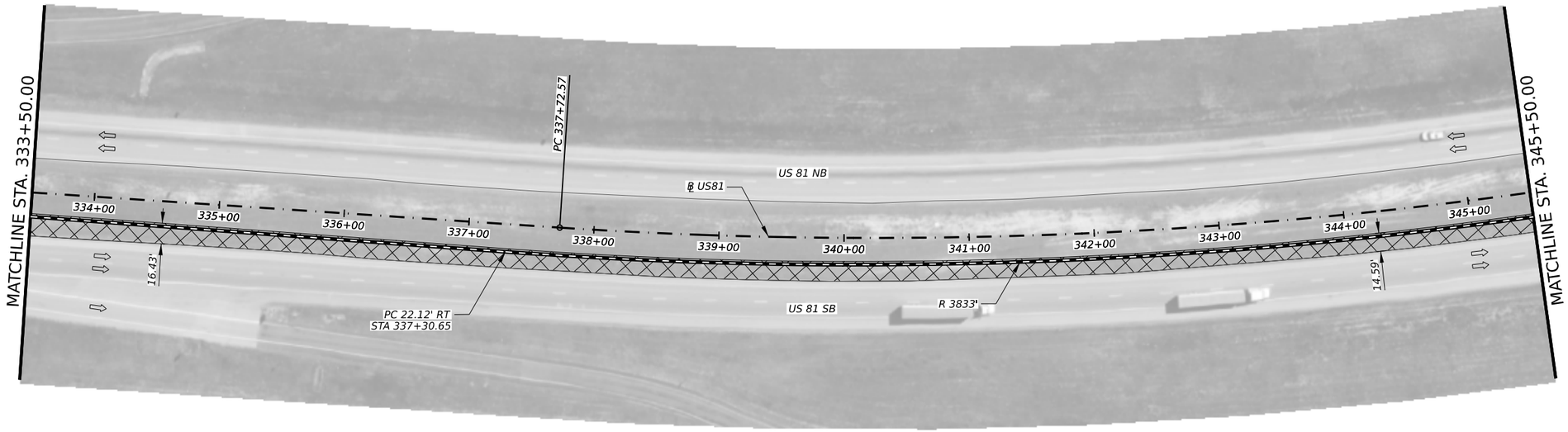
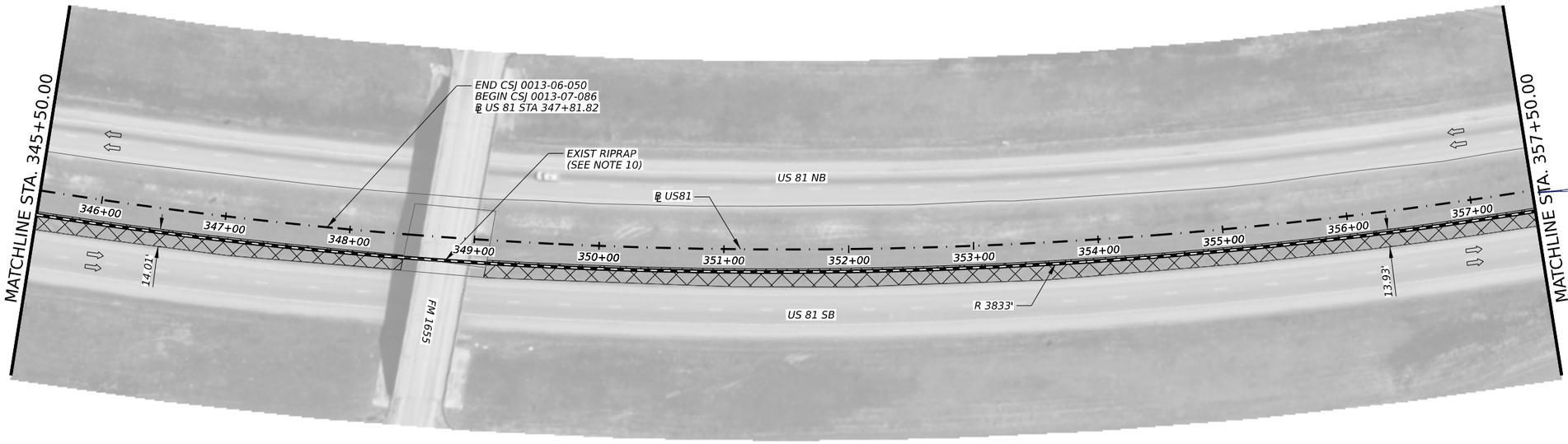


CSJ 0013-06-050 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.40
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	2408
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1204
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1204
FERTILIZER *	TON	0.30
VEGETATIVE WATERING	MG	168.56
RIPRAP (MOW STRIP)(5 IN)	CY	66.57
CABLE BARRIER SYSTEM (TL-4)	LF	1438

CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.22
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1406
CELL FBR MLCH SEED(TEMP)(WARM)	SY	703
CELL FBR MLCH SEED(TEMP)(COOL)	SY	703
FERTILIZER *	TON	0.17
VEGETATIVE WATERING	MG	98.42
RIPRAP (MOW STRIP)(5 IN)	CY	45.05
CABLE BARRIER SYSTEM (TL-4)	LF	973



* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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10. CABLE POST FOOTINGS TO BE DRILLED THROUGH EXISTING RIPRAP. WORK SHALL BE SUBSIDIARY TO ITEM 543.

STATE OF TEXAS
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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 333+50 TO STA 357+50

SHEET27 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		62

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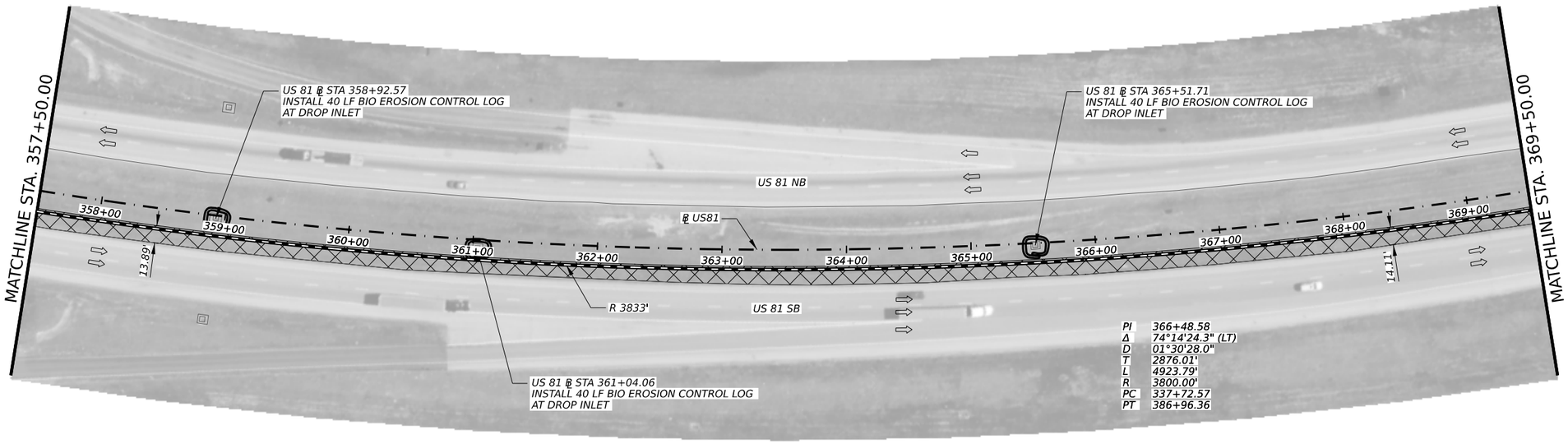
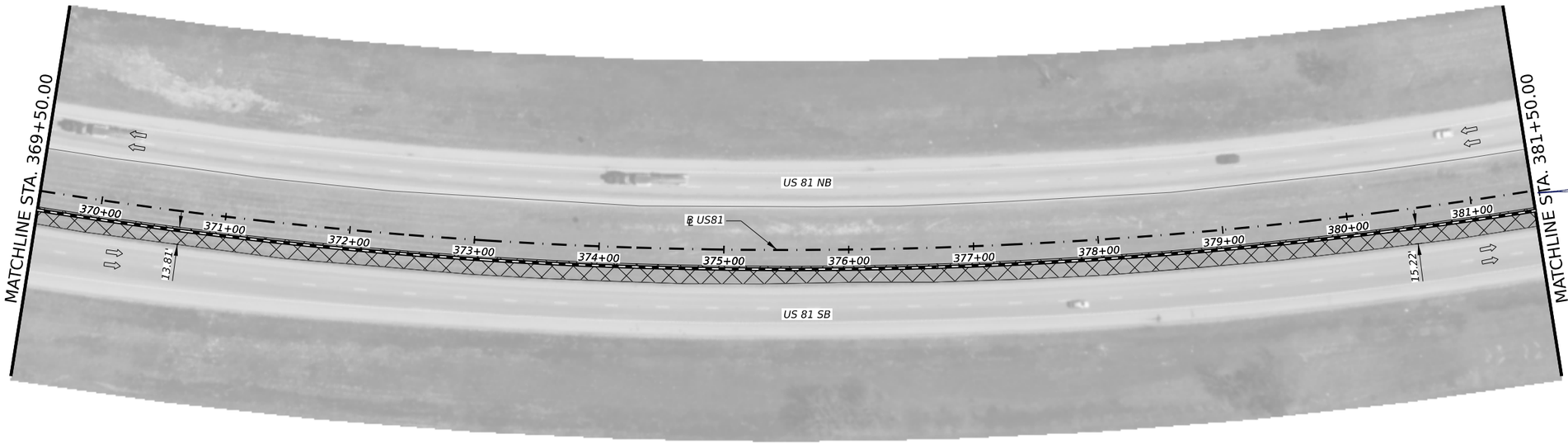


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.63
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	3834
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1917
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1917
FERTILIZER *	TON	0.48
VEGETATIVE WATERING	MG	268.38
RIPRAP (MOW STRIP)(5 IN)	CY	111.57
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
BIODEG EROSN CONT LOGS (REMOVE)	LF	120
CABLE BARRIER SYSTEM (TL-4)	LF	2410



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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
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- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

STATE OF TEXAS
ERNESTO SALCIDO
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PROFESSIONAL ENGINEER

3/21/2024

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 357+50 TO STA 381+50

SHEET28 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		63

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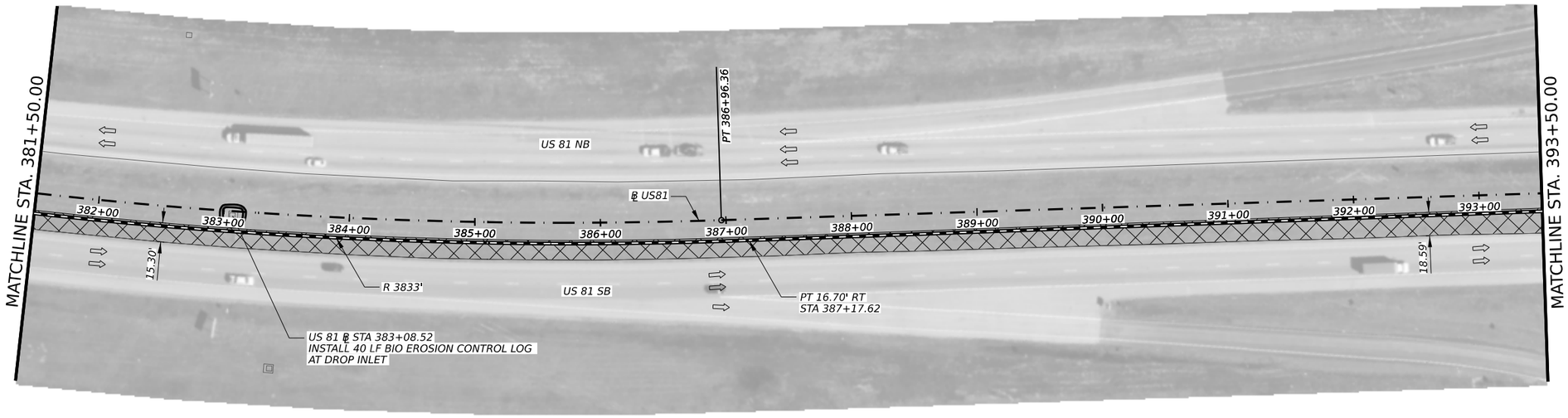
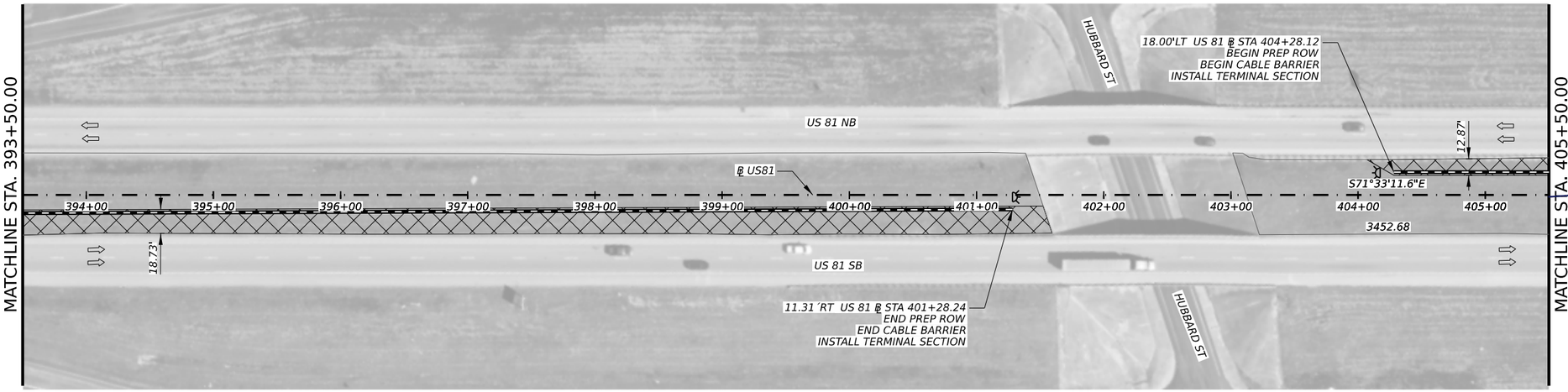


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.72
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4203
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2102
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2101
FERTILIZER *	TON	0.52
VEGETATIVE WATERING	MG	294.21
RIPRAP (MOW STRIP)(5 IN)	CY	97.59
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	40
BIODEG EROSN CONT LOGS (REMOVE)	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	1987
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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STATE OF TEXAS
ERNESTO SALCIDO
100177
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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 381+50 TO STA 405+50

SHEET29 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		64

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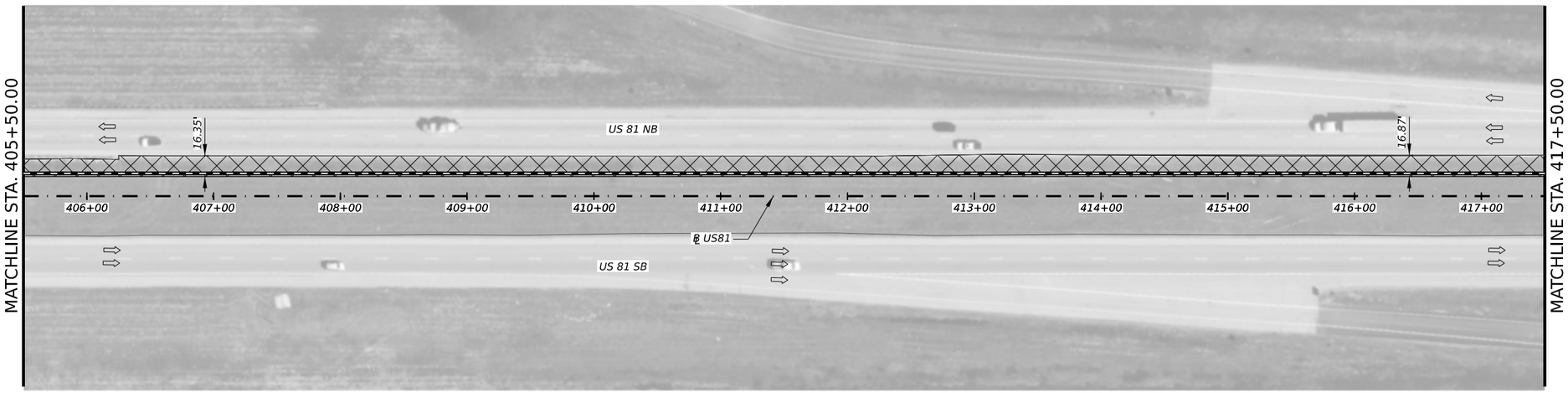
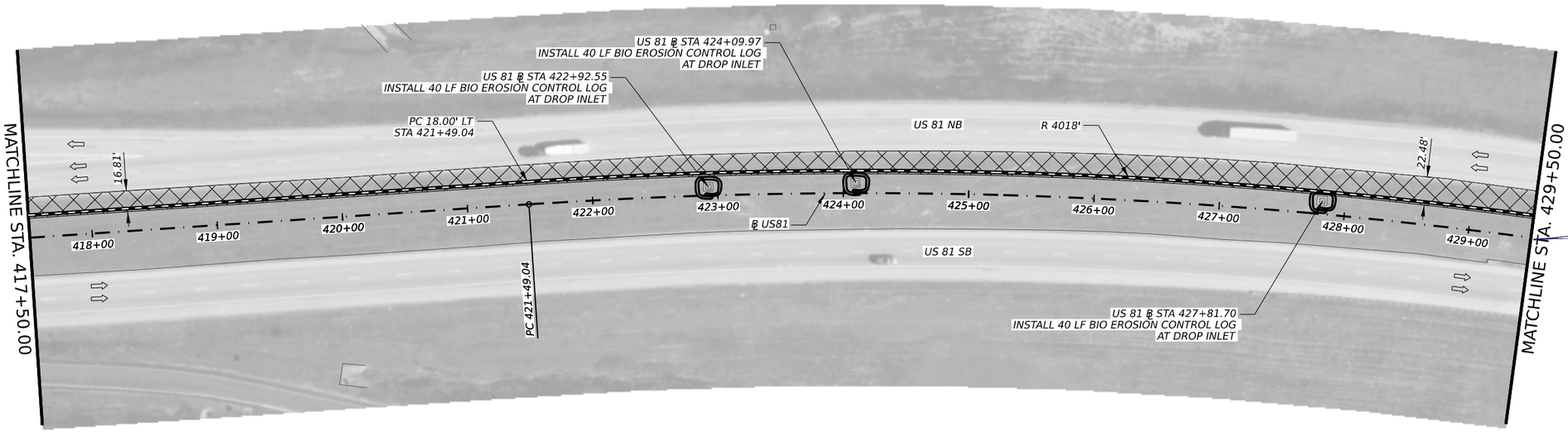


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.80
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4671
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2335
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2336
FERTILIZER *	TON	0.58
VEGETATIVE WATERING	MG	326.97
RIPRAP (MOW STRIP)(5 IN)	CY	111.30
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
BIODEG EROSN CONT LOGS (REMOVE)	LF	120
CABLE BARRIER SYSTEM (TL-4)	LF	2404



* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 405+50 TO STA 429+50

SHEET 30 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		65

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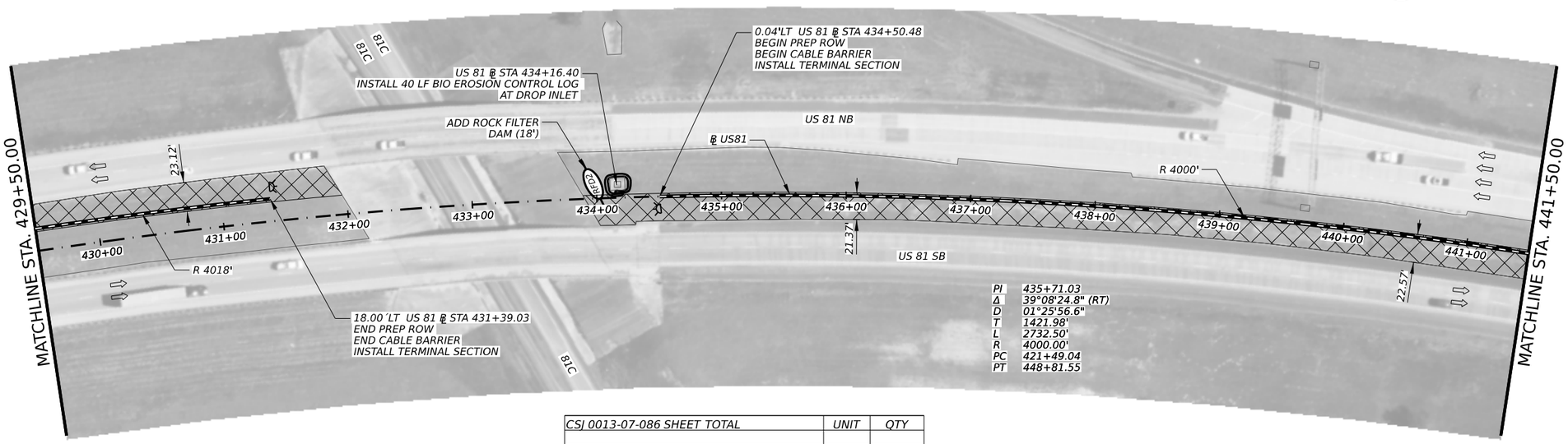
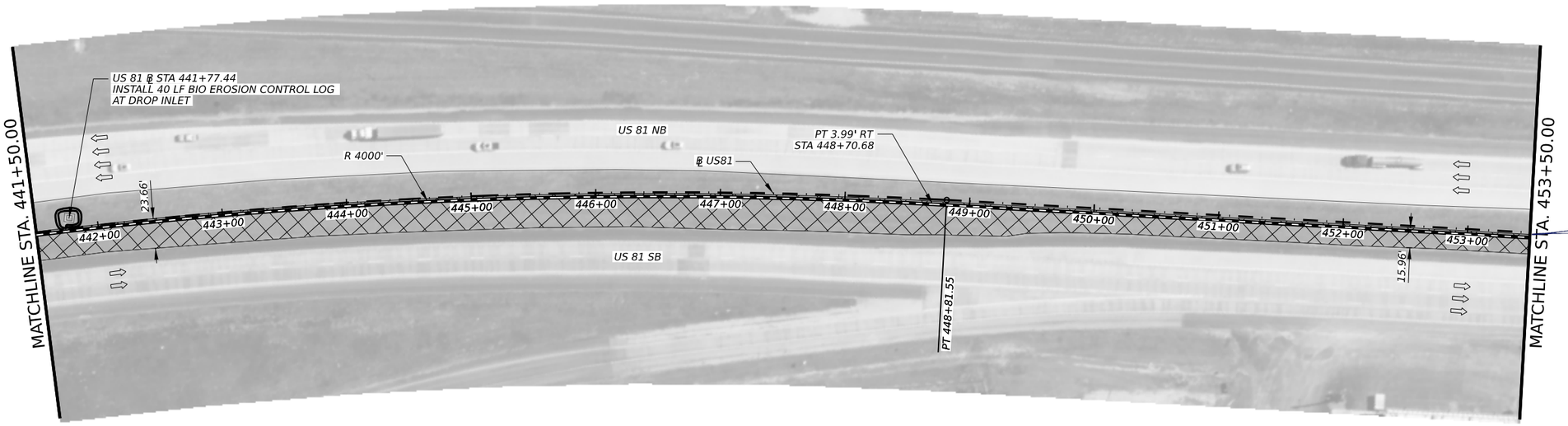


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	1.00
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	5536
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2768
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2768
FERTILIZER *	TON	0.69
VEGETATIVE WATERING	MG	387.52
RIPRAP (MOW STRIP)(5 IN)	CY	97.08
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	80
BIODEG EROSN CONT LOGS (REMOVE)	LF	80
CABLE BARRIER SYSTEM (TL-4)	LF	1976
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



0 50 100
SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 429+50 TO STA 453+50

SHEET 31 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		66

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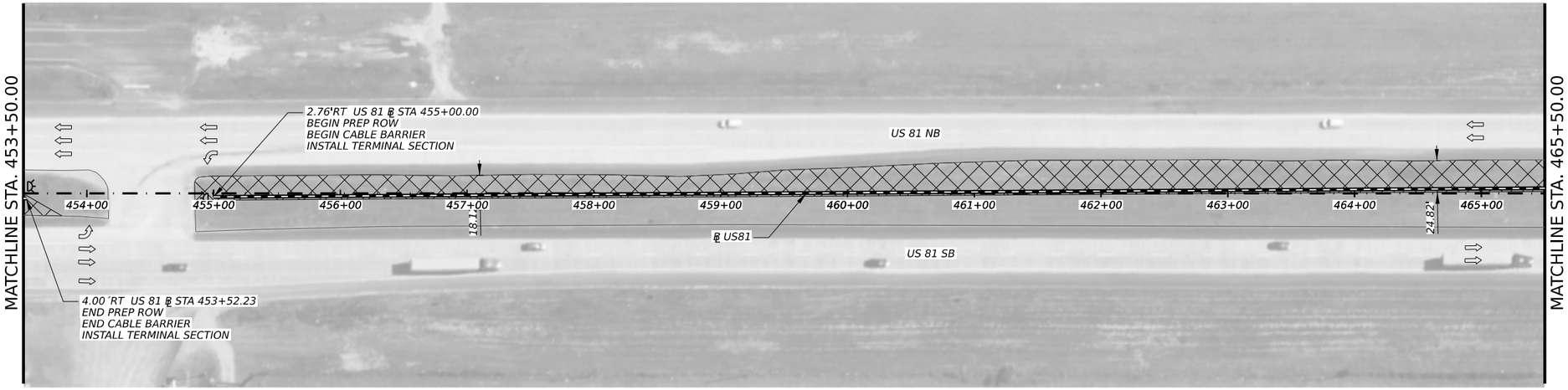
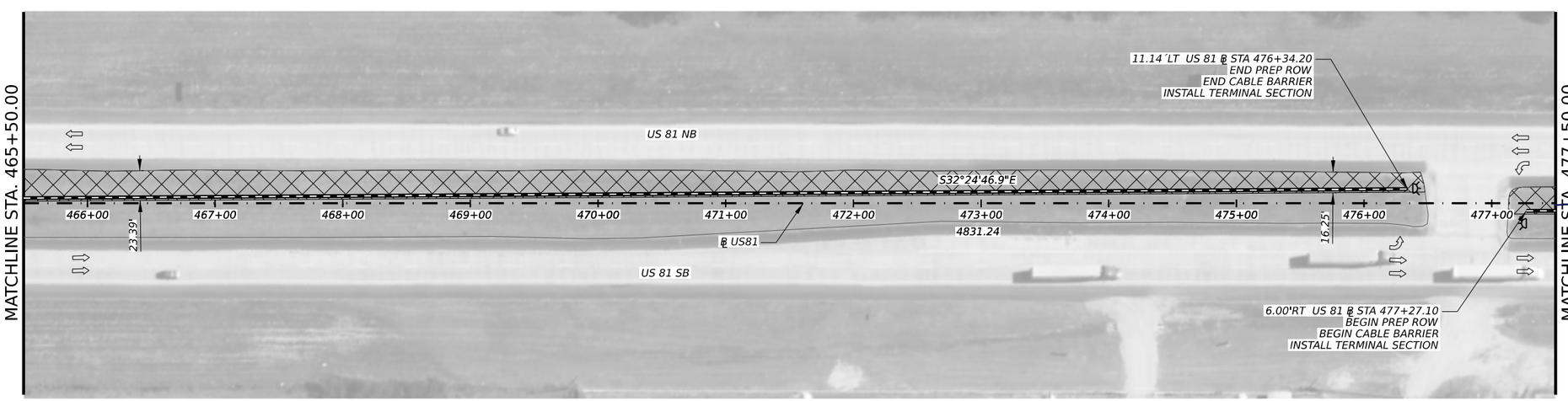


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.93
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	5240
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2620
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2620
FERTILIZER *	TON	0.65
VEGETATIVE WATERING	MG	366.80
RIPRAP (MOW STRIP)(5 IN)	CY	100.42
CABLE BARRIER SYSTEM (TL-4)	LF	1927
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	4
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	4



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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 453+50 TO STA 477+50

SHEET 32 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		67

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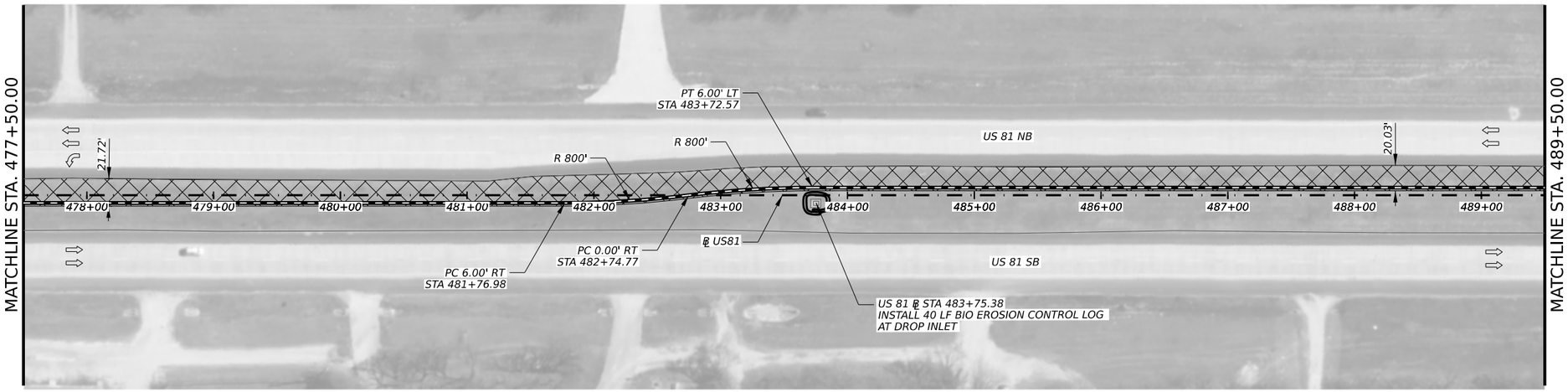
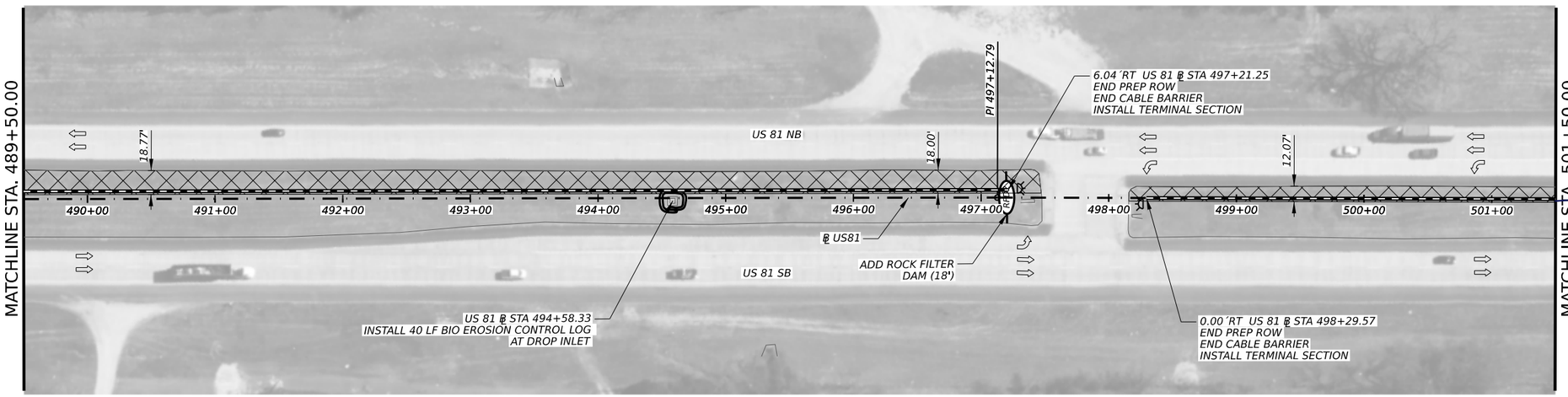


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.83
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4777
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2389
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2388
FERTILIZER *	TON	0.59
VEGETATIVE WATERING	MG	334.39
RIPRAP (MOW STRIP)(5 IN)	CY	106.34
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	80
BIODEG EROSN CONT LOGS (REMOVE)	LF	80
CABLE BARRIER SYSTEM (TL-4)	LF	2176
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100
SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 477+50 TO STA 501+50

SHEET 33 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		68

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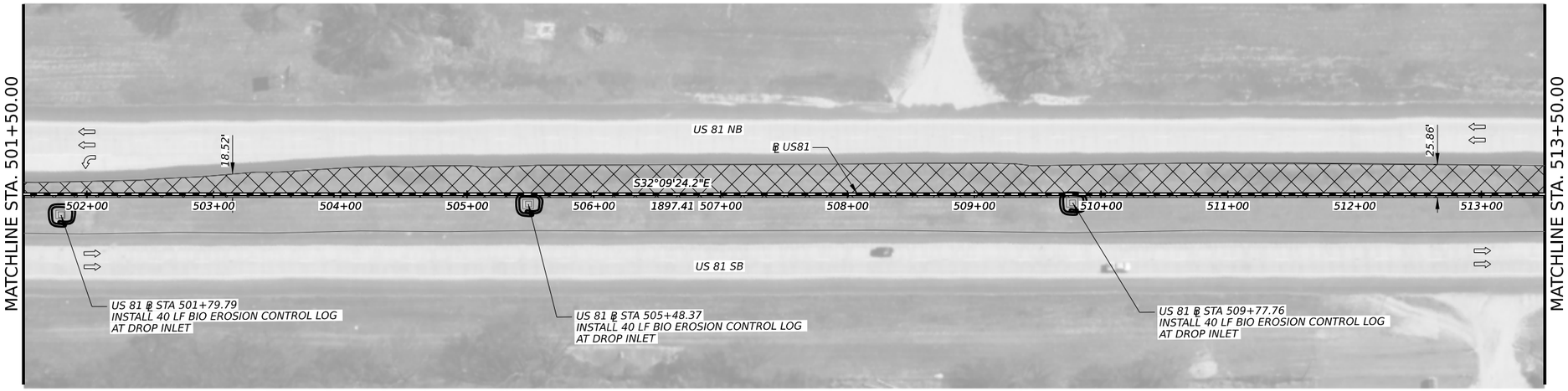

CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	1.10
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	6105
CELL FBR MLCH SEED(TEMP)(WARM)	SY	3052
CELL FBR MLCH SEED(TEMP)(COOL)	SY	3053
FERTILIZER *	TON	0.76
VEGETATIVE WATERING	MG	427.35
RIPRAP (MOW STRIP)(5 IN)	CY	111.11
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	160
BIODEG EROSN CONT LOGS (REMOVE)	LF	160
CABLE BARRIER SYSTEM (TL-4)	LF	2400

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
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8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
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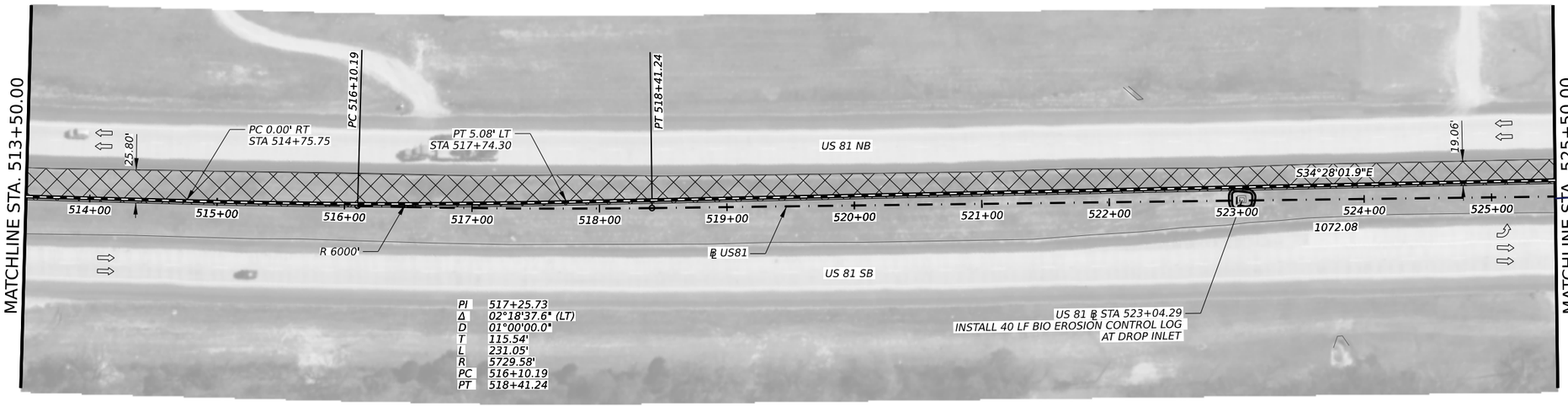

* FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
3/21/2024

Salcido Pavia, P.E.

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 501+50 TO STA 525+50

SHEET 34 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		69

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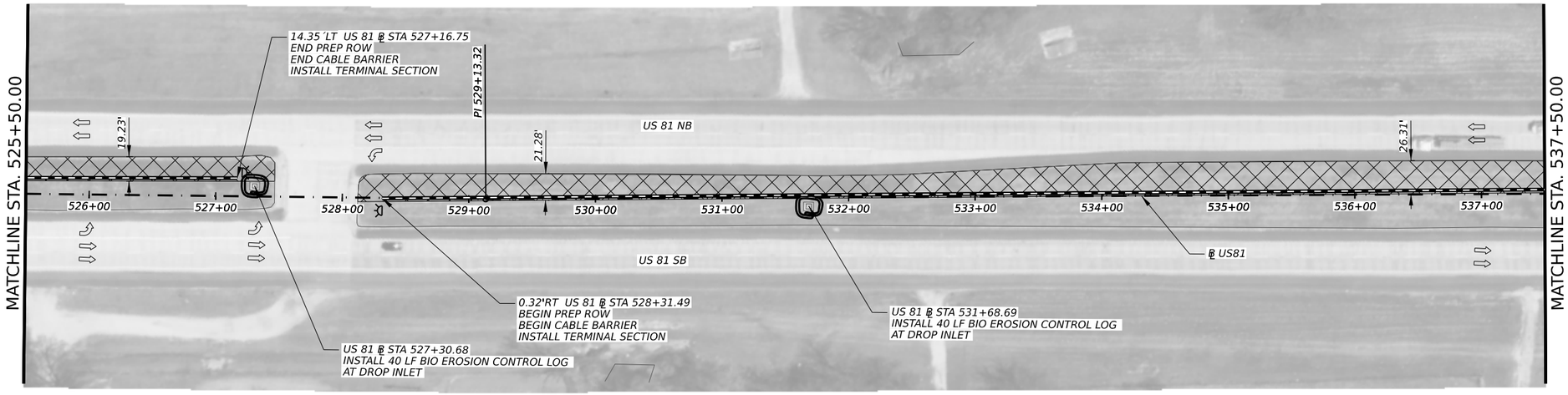
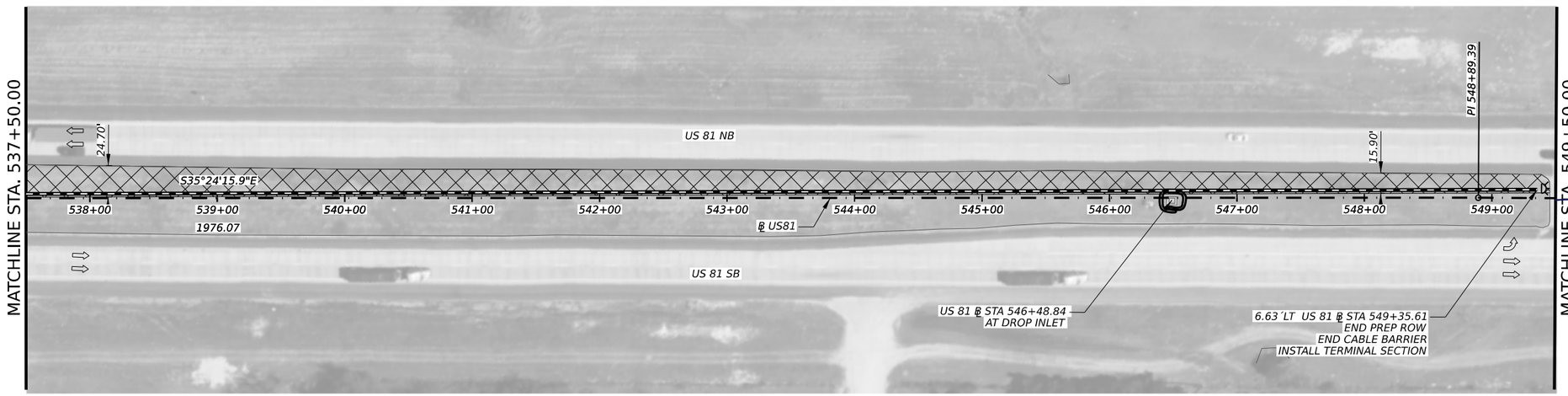


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.95
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	5380
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2690
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2690
FERTILIZER *	TON	0.67
VEGETATIVE WATERING	MG	376.60
RIPRAP (MOW STRIP)(5 IN)	CY	105.60
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
BIODEG EROSN CONT LOGS (REMOVE)	LF	120
CABLE BARRIER SYSTEM (TL-4)	LF	2100
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	3
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	3



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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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STATE OF TEXAS
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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 525+50 TO STA 549+50

SHEET 35 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		70

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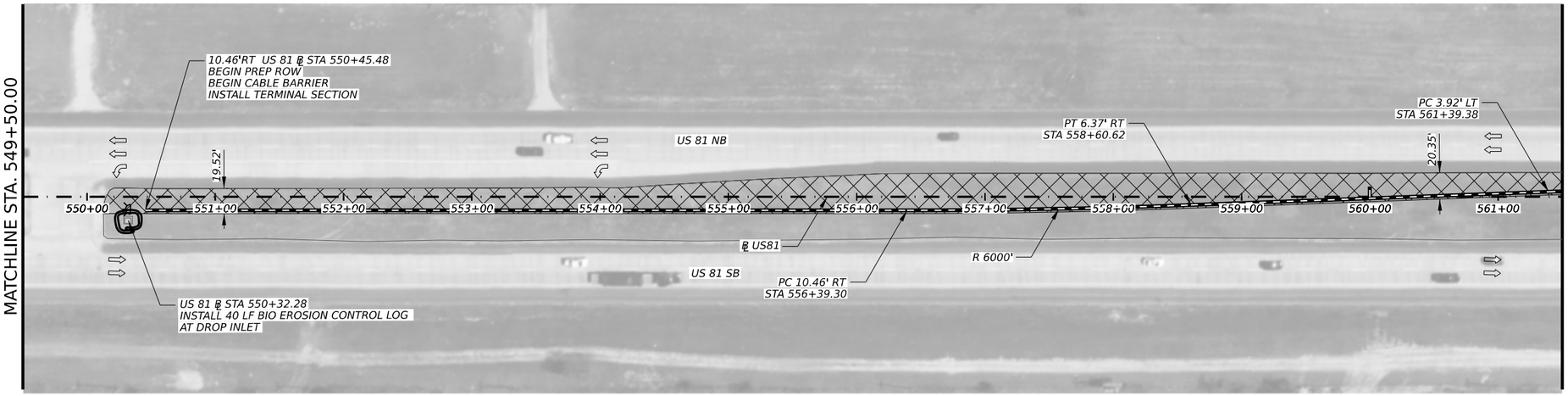
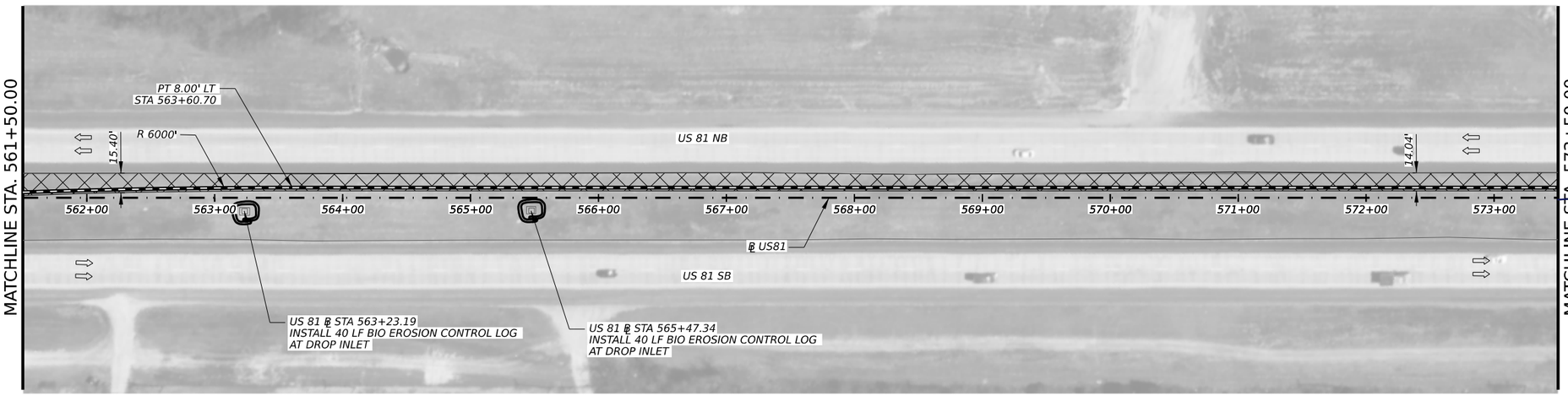


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.84
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4854
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2427
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2427
FERTILIZER *	TON	0.60
VEGETATIVE WATERING	MG	339.78
RIPRAP (MOW STRIP)(5 IN)	CY	106.85
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
BIODEG EROSN CONT LOGS (REMOVE)	LF	120
CABLE BARRIER SYSTEM (TL-4)	LF	2248
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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3/21/2024

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 549+50 TO STA 573+50

SHEET 36 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		71

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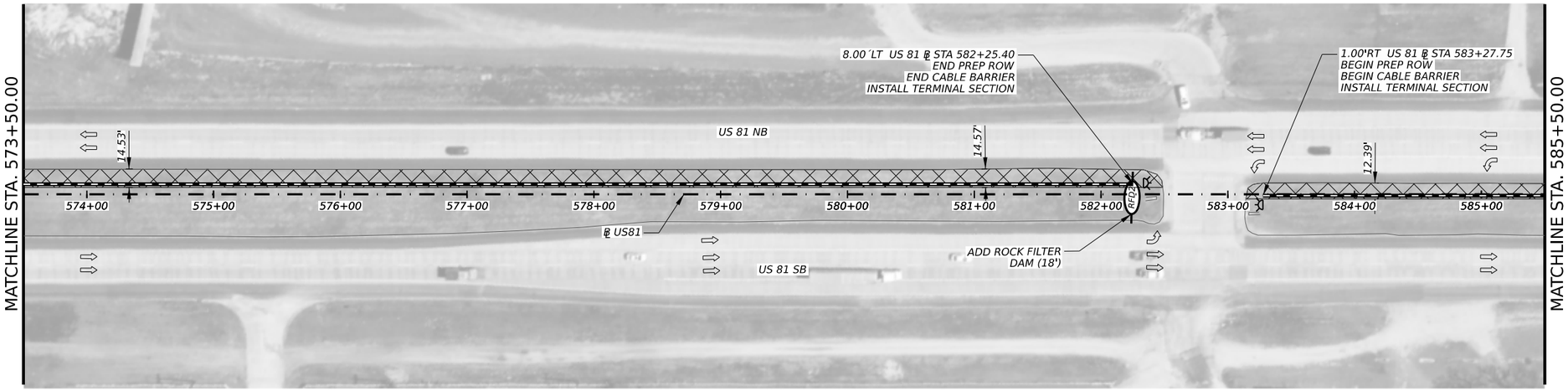
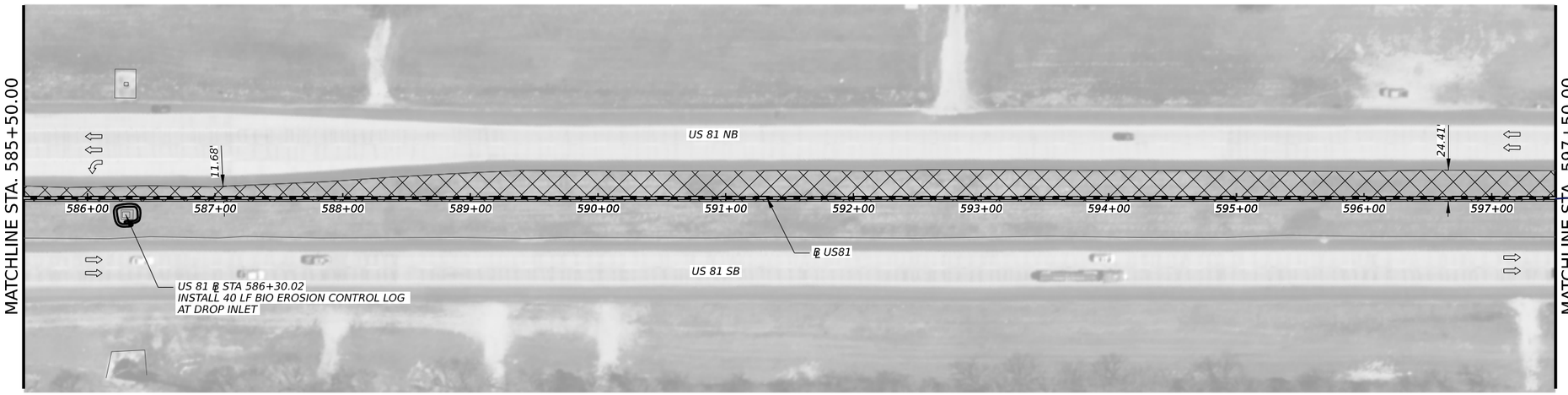


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.79
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4584
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2292
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2292
FERTILIZER *	TON	0.57
VEGETATIVE WATERING	MG	320.88
RIPRAP (MOW STRIP)(5 IN)	CY	106.62
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	40
BIODEG EROSN CONT LOGS (REMOVE)	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	2182
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
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STATE OF TEXAS
ERNESTO SALCIDO
100177
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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 573+50 TO STA 597+50

SHEET 37 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		72

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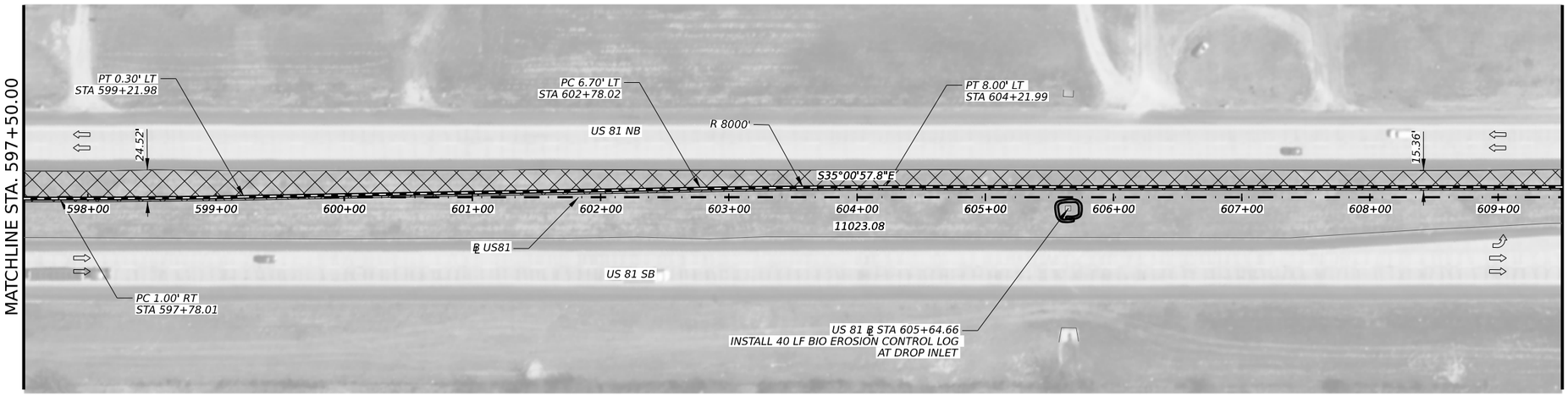
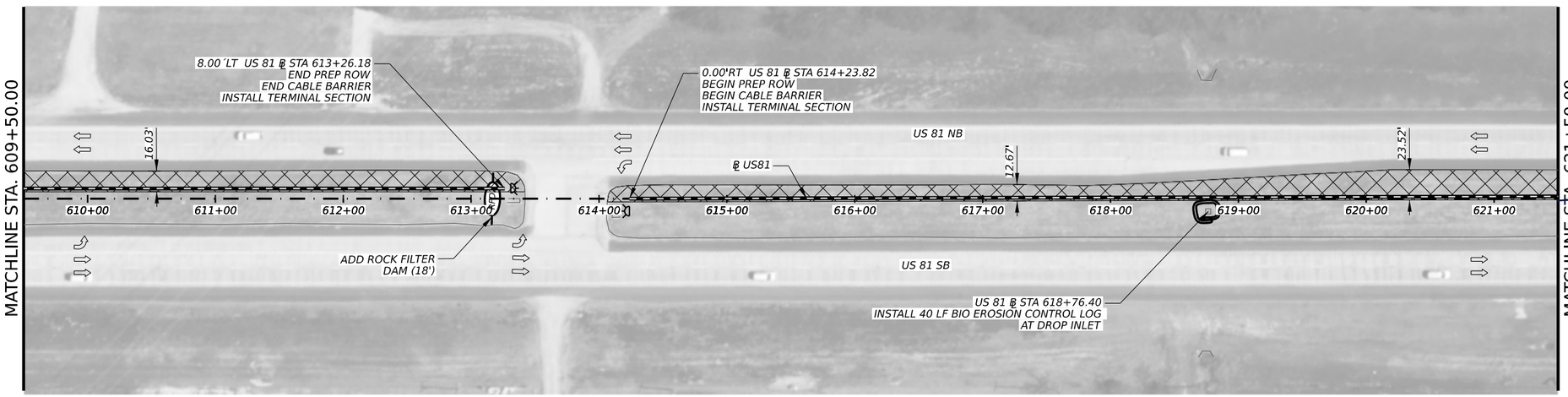


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.76
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4470
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2235
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2235
FERTILIZER *	TON	0.55
VEGETATIVE WATERING	MG	312.90
RIPRAP (MOW STRIP)(5 IN)	CY	106.85
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	80
BIODEG EROSN CONT LOGS (REMOVE)	LF	80
CABLE BARRIER SYSTEM (TL-4)	LF	2187
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 597+50 TO STA 621+50

SHEET 38 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		73

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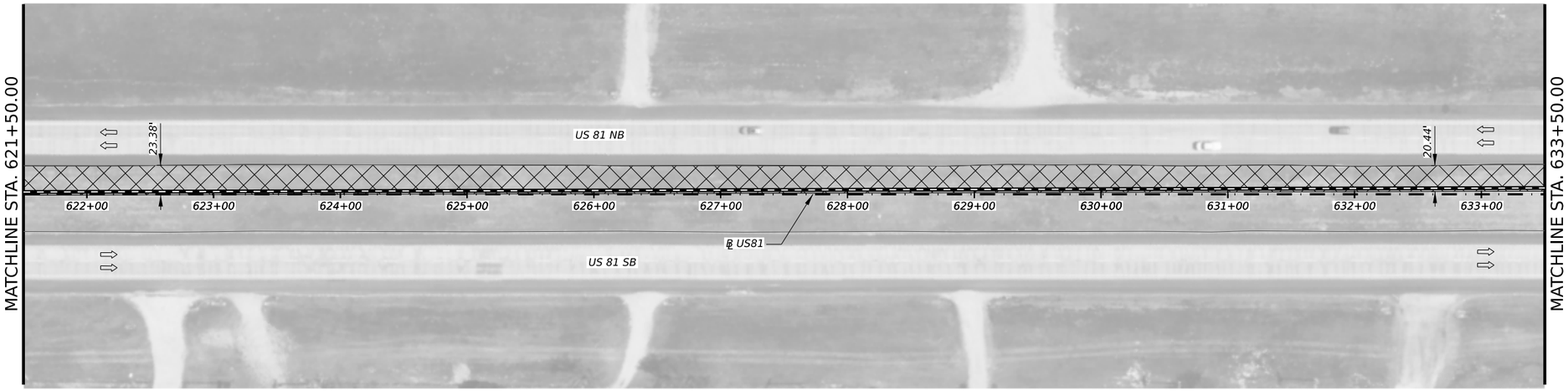
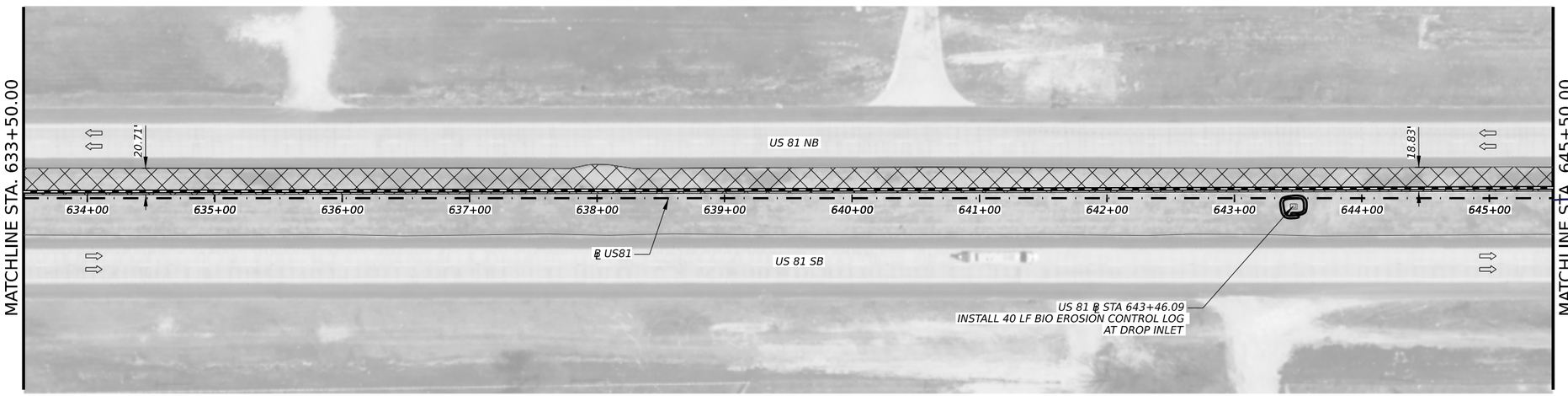


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.99
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	5576
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2788
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2788
FERTILIZER *	TON	0.69
VEGETATIVE WATERING	MG	390.32
RIPRAP (MOW STRIP)(5 IN)	CY	111.11
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	40
BIODEG EROSN CONT LOGS (REMOVE)	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	2400



0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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US 81

CABLE BARRIER LAYOUT
STA 621+50 TO STA 645+50

SHEET 39 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		74

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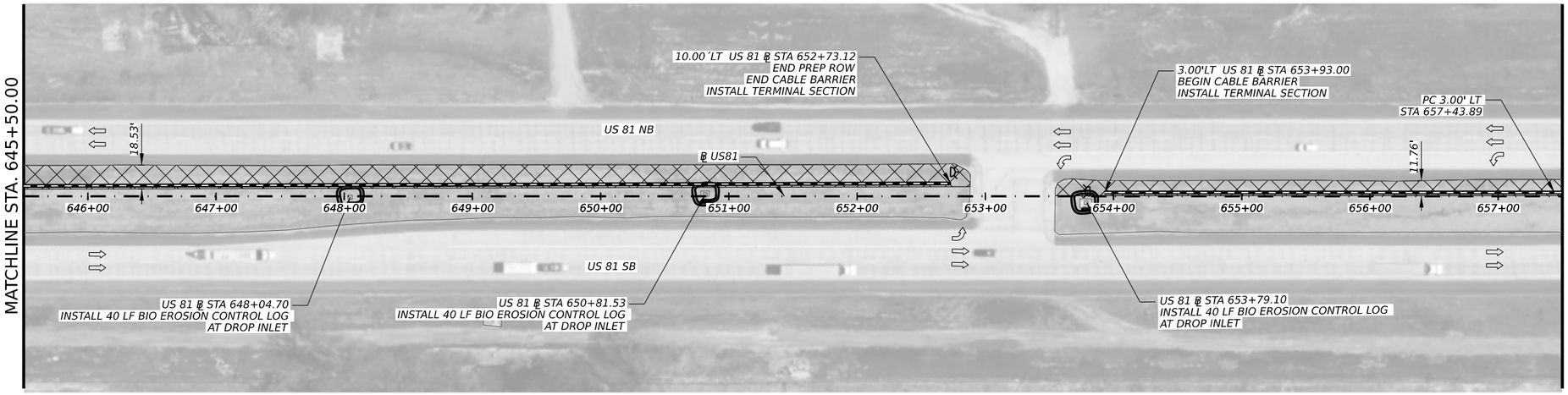
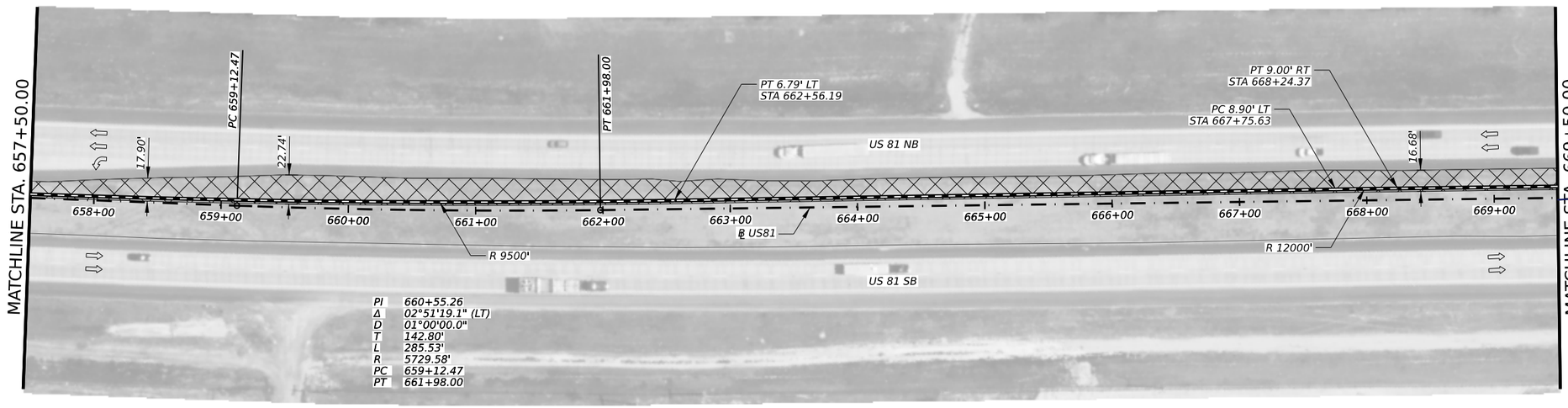


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.76
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4434
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2217
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2217
FERTILIZER *	TON	0.55
VEGETATIVE WATERING	MG	310.38
RIPRAP (MOW STRIP)(5 IN)	CY	103.29
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
BIODEG EROSN CONT LOGS (REMOVE)	LF	120
CABLE BARRIER SYSTEM (TL-4)	LF	2110
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



* FOR CONTRACTOR'S INFORMATION ONLY.

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
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8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
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3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 645+50 TO STA 669+50

SHEET 40 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		75

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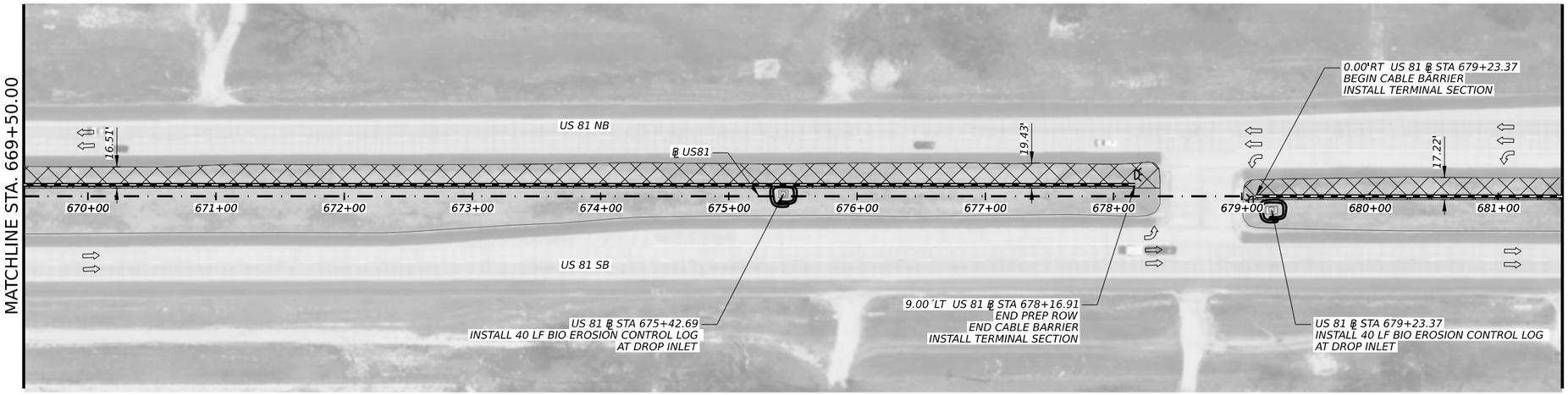
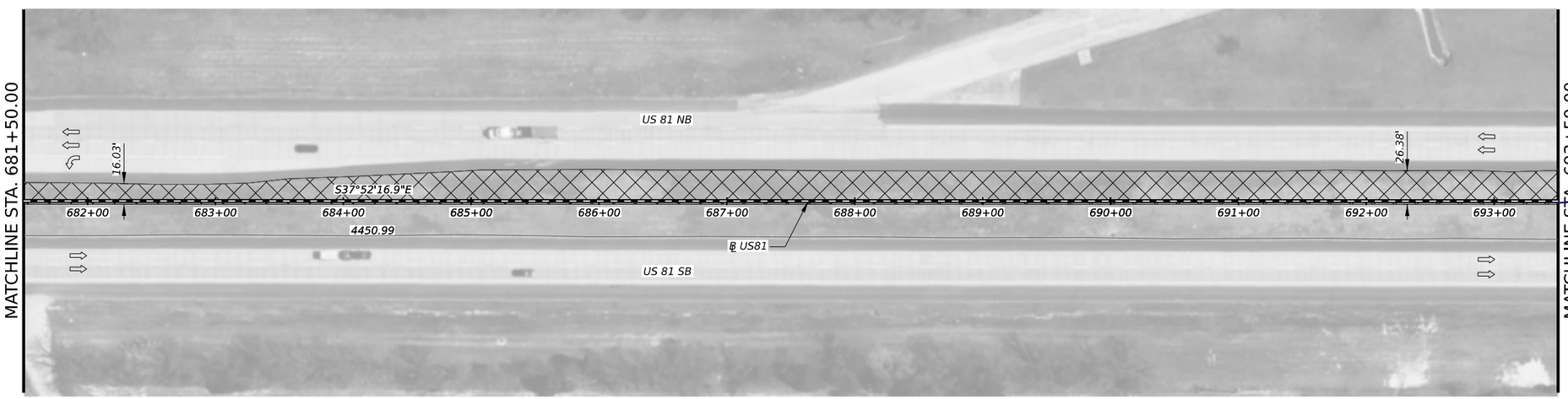


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.99
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	5548
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2774
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2774
FERTILIZER *	TON	0.69
VEGETATIVE WATERING	MG	388.36
RIPRAP (MOW STRIP)(5 IN)	CY	107.04
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	80
BIODEG EROSN CONT LOGS (REMOVE)	LF	80
CABLE BARRIER SYSTEM (TL-4)	LF	2191
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 669+50 TO STA 693+50

SHEET 41 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		76

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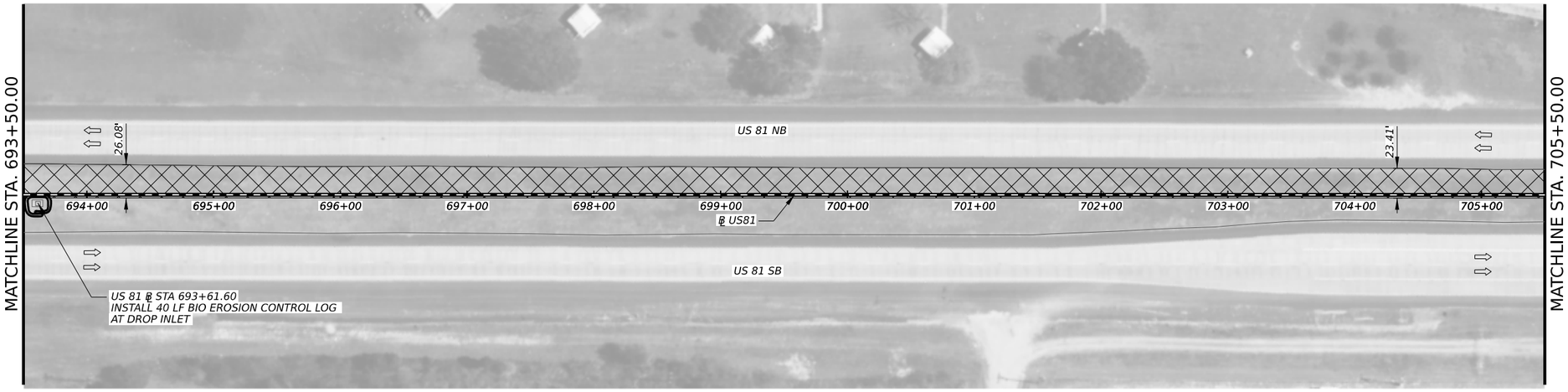
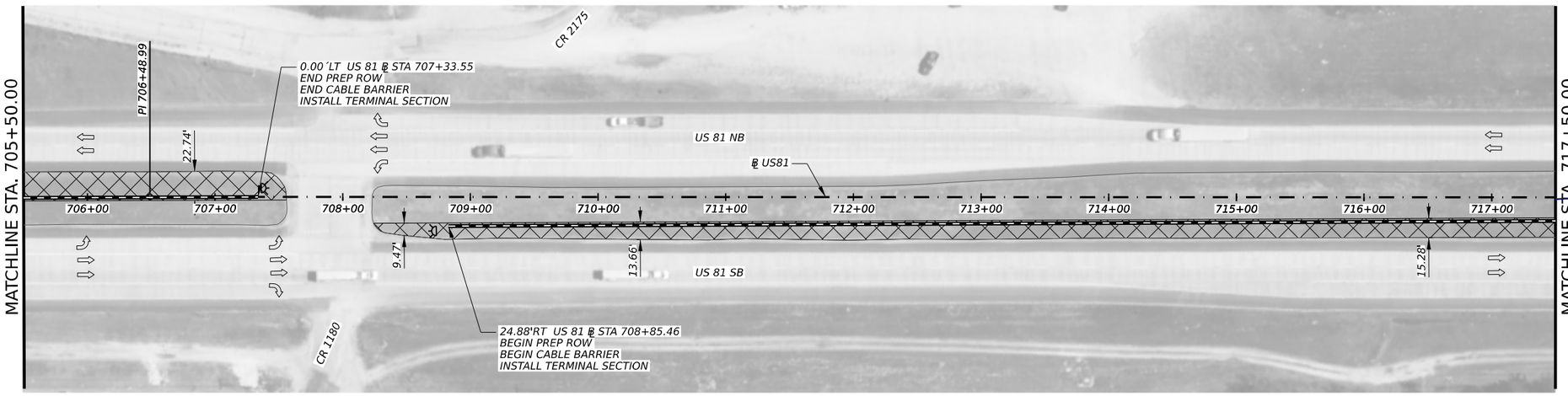


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.92
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	5184
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2592
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2592
FERTILIZER *	TON	0.64
VEGETATIVE WATERING	MG	362.88
RIPRAP (MOW STRIP)(5 IN)	CY	104.49
ROCK FILTER DAMS (REMOVE)	LF	40
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	2136
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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US 81

CABLE BARRIER LAYOUT
STA 693+50 TO STA 717+50

SHEET 42 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		77

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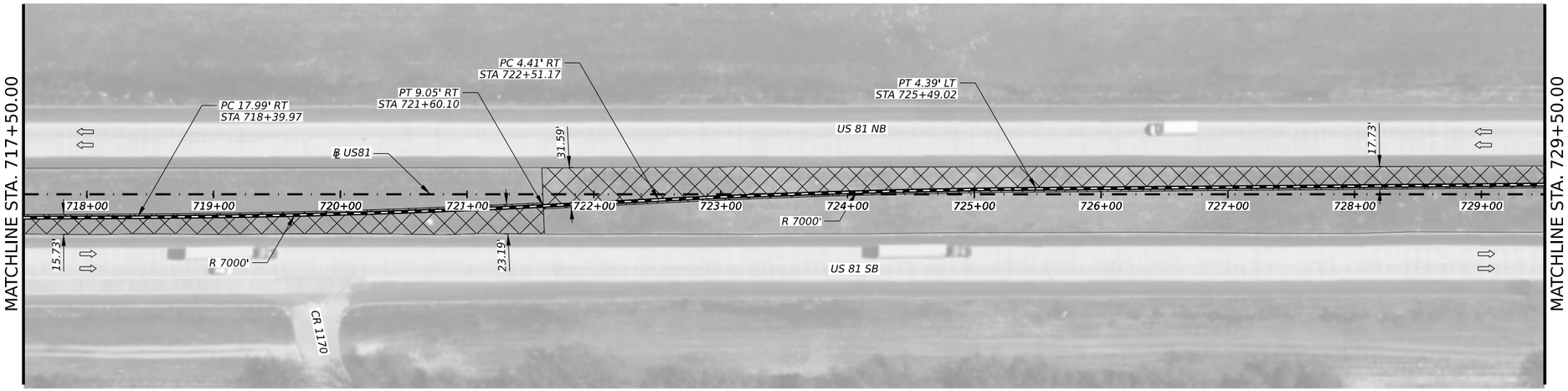
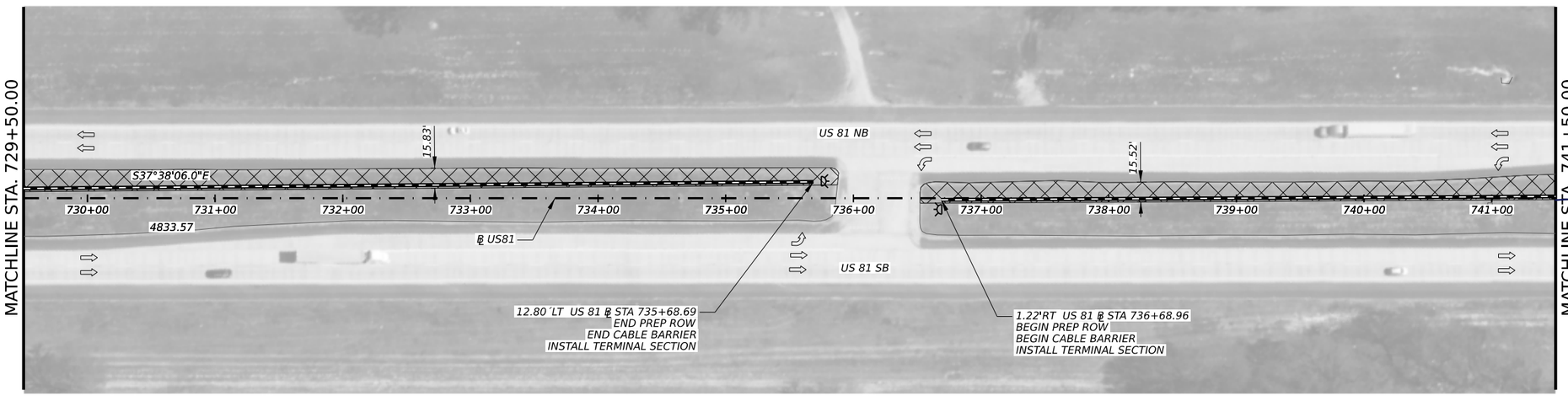


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.82
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4717
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2359
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2358
FERTILIZER *	TON	0.58
VEGETATIVE WATERING	MG	330.19
RIPRAP (MOW STRIP)(5 IN)	CY	106.76
PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	LF	2185
CABLE BARRIER SYSTEM (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 717+50 TO STA 741+50

SHEET 43 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		78

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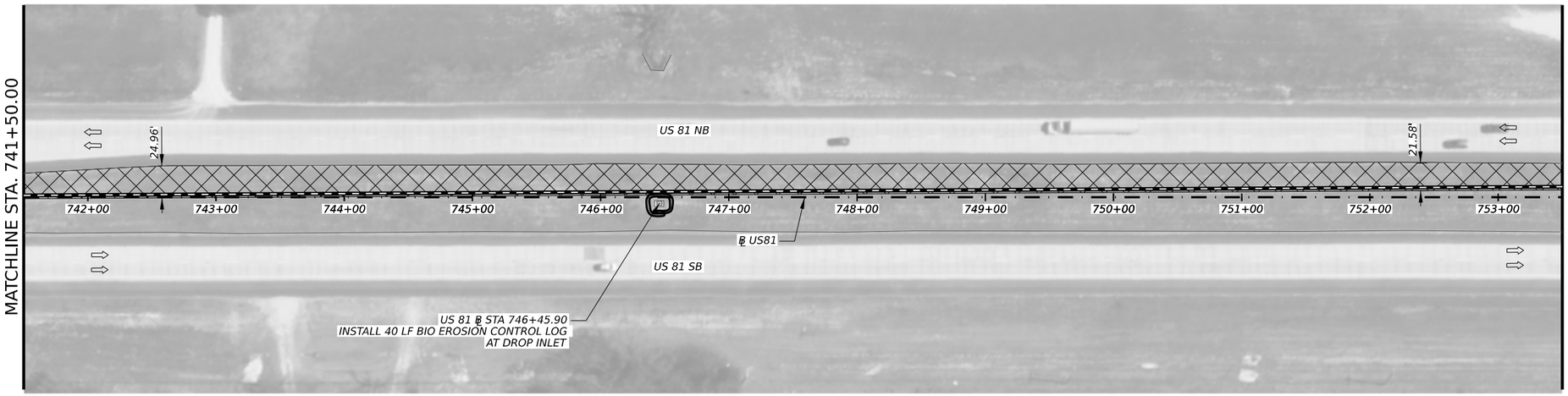
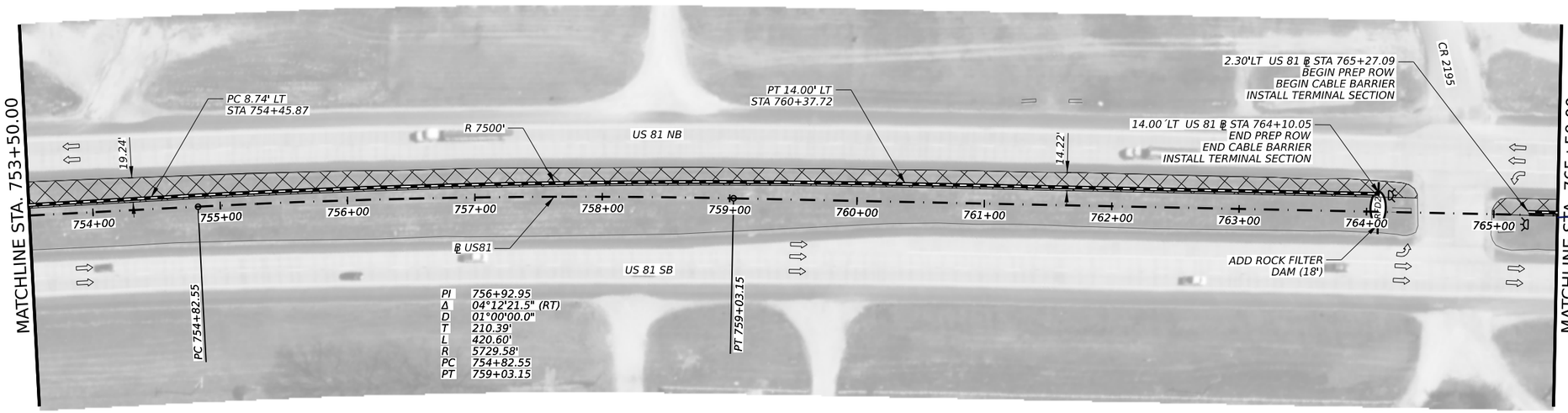


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.87
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4988
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2494
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2494
FERTILIZER *	TON	0.62
VEGETATIVE WATERING	MG	349.16
RIPRAP (MOW STRIP)(5 IN)	CY	106.02
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	2169
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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US 81

CABLE BARRIER LAYOUT STA 741+50 TO STA 765+50

SHEET 44 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		79

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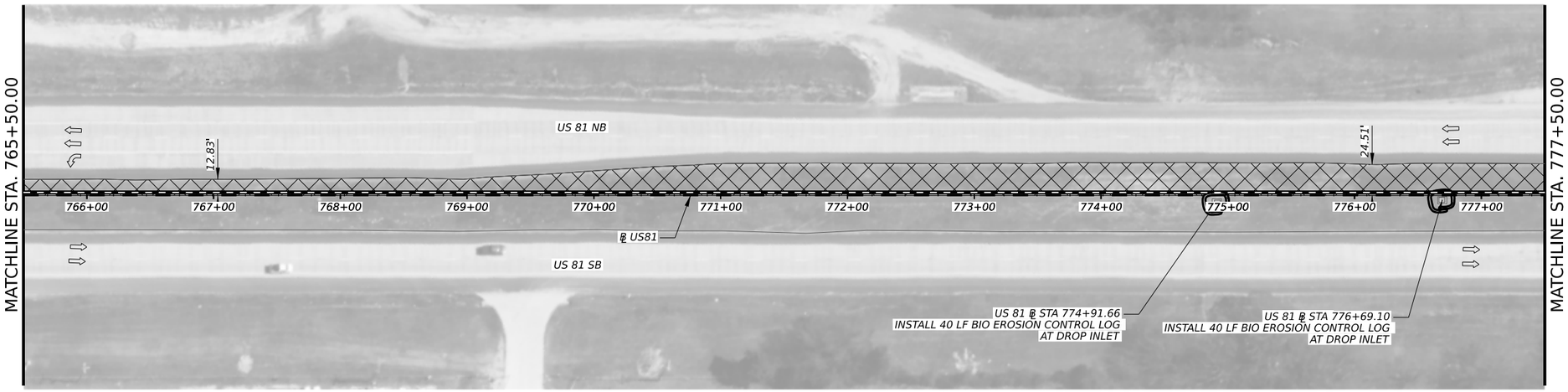
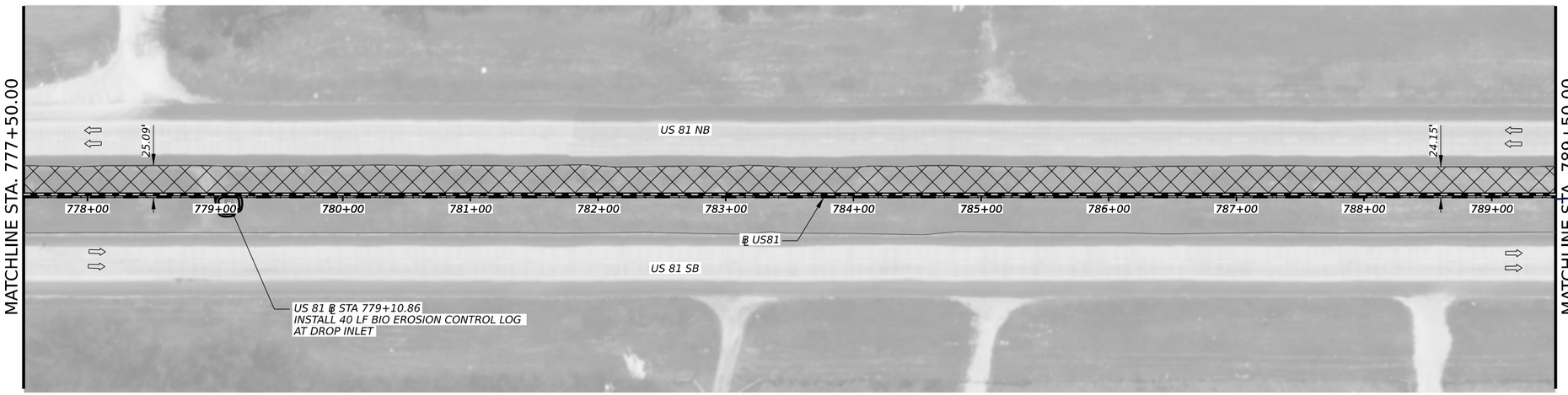


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	1.09
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	6070
CELL FBR MLCH SEED(TEMP)(WARM)	SY	3035
CELL FBR MLCH SEED(TEMP)(COOL)	SY	3035
FERTILIZER *	TON	0.75
VEGETATIVE WATERING	MG	424.90
RIPRAP (MOW STRIP)(5 IN)	CY	111.11
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	80
BIODEG EROSN CONT LOGS (REMOVE)	LF	80
CABLE BARRIER SYSTEM (TL-4)	LF	2400



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 765+50 TO STA 789+50

SHEET 45 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		80

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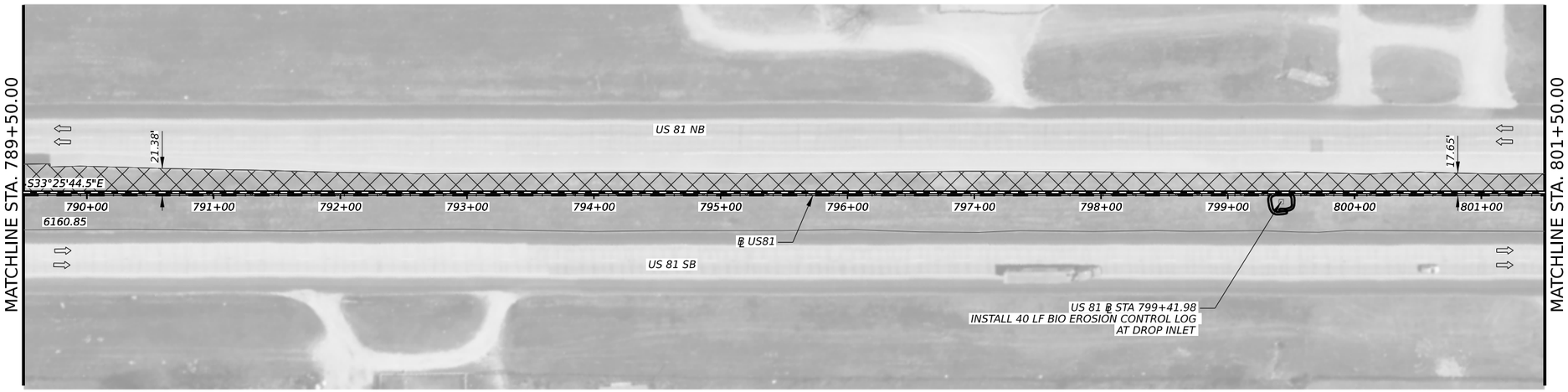
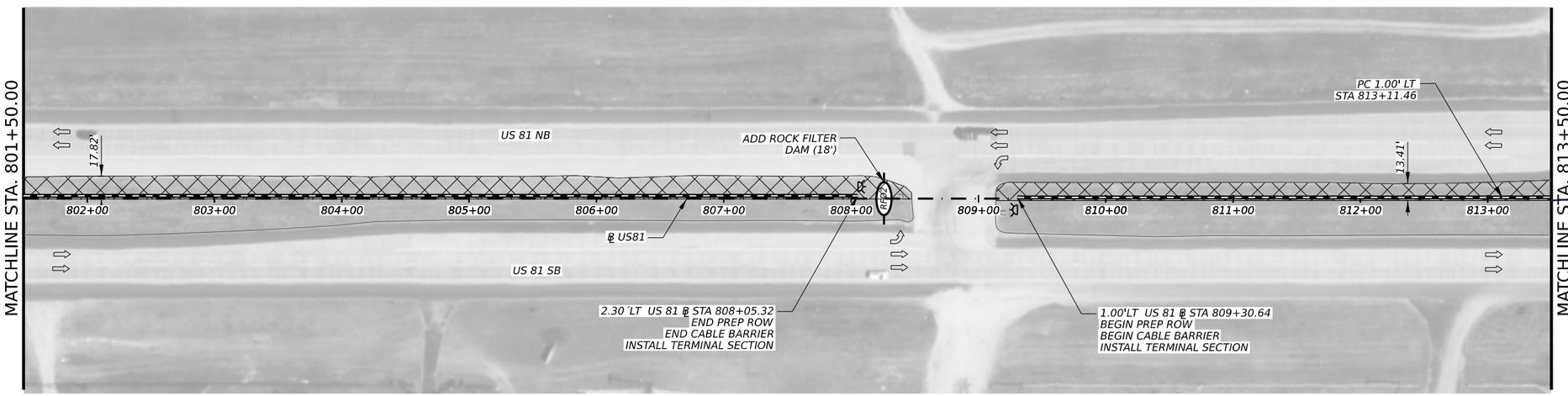


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.78
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4532
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2266
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2266
FERTILIZER *	TON	0.56
VEGETATIVE WATERING	MG	317.24
RIPRAP (MOW STRIP)(5 IN)	CY	105.56
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	18
ROCK FILTER DAMS (REMOVE)	LF	18
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	40
BIODEG EROSN CONT LOGS (REMOVE)	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	2159
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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STATE OF TEXAS
ERNESTO SALCIDO
100177
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PROFESSIONAL ENGINEER

3/21/2024

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(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 789+50 TO STA 813+50

SHEET 46 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		81

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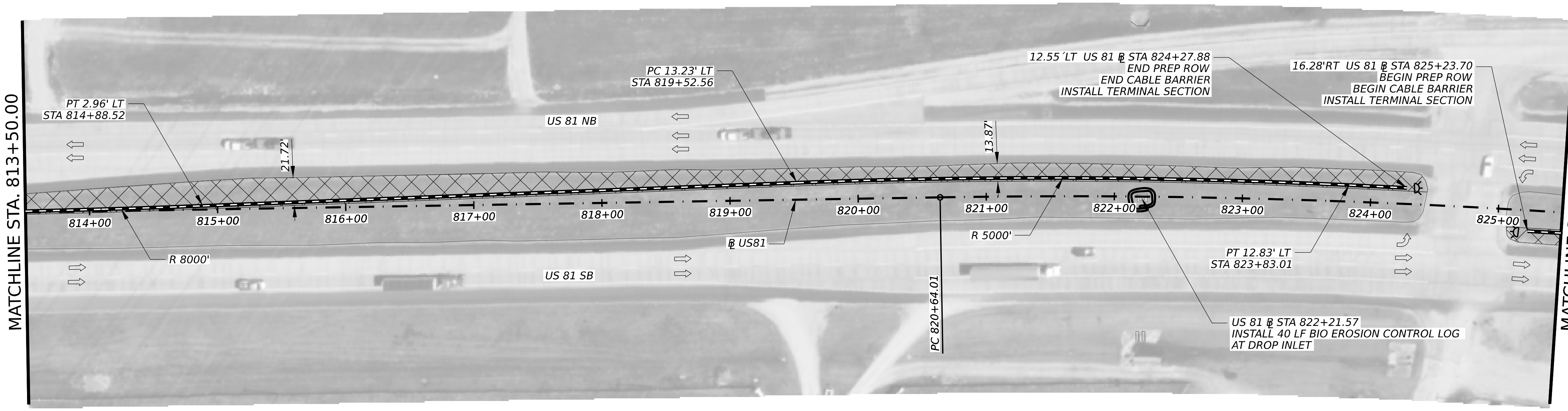
SCALE IN FEET 0 50 100

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW



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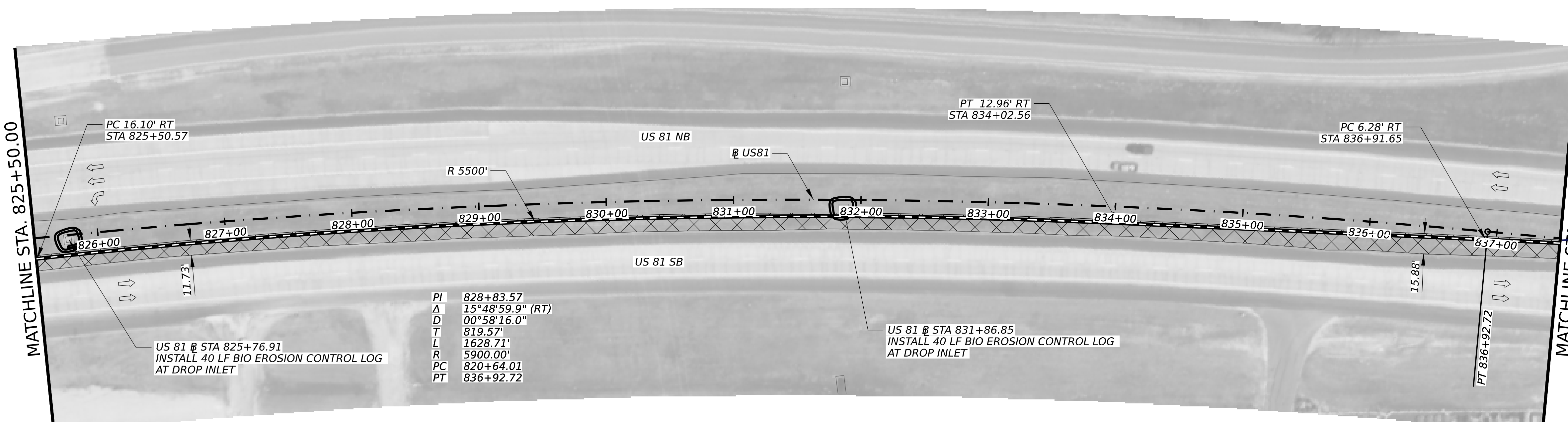
CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.63
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	3832
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1916
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1916
FERTILIZER *	TON	0.48
VEGETATIVE WATERING	MG	268.24
RIPRAP (MOW STRIP)(5 IN)	CY	106.90
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
BIODEG EROSN CONT LOGS (REMOVE)	LF	120
CABLE BARRIER SYSTEM (TL-4)	LF	2188
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



PI	828+83.57
Δ	15°48'59.9" (RT)
D	00°58'16.0"
T	819.57'
L	1628.71'
R	5900.00'
PC	820+64.01
PT	836+92.72

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED PROFESSIONAL ENGINEER
3/21/2024

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AECOM Technical Services, Inc. - F-3580

 Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 813+50 TO STA 837+50

SHEET 47 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		82

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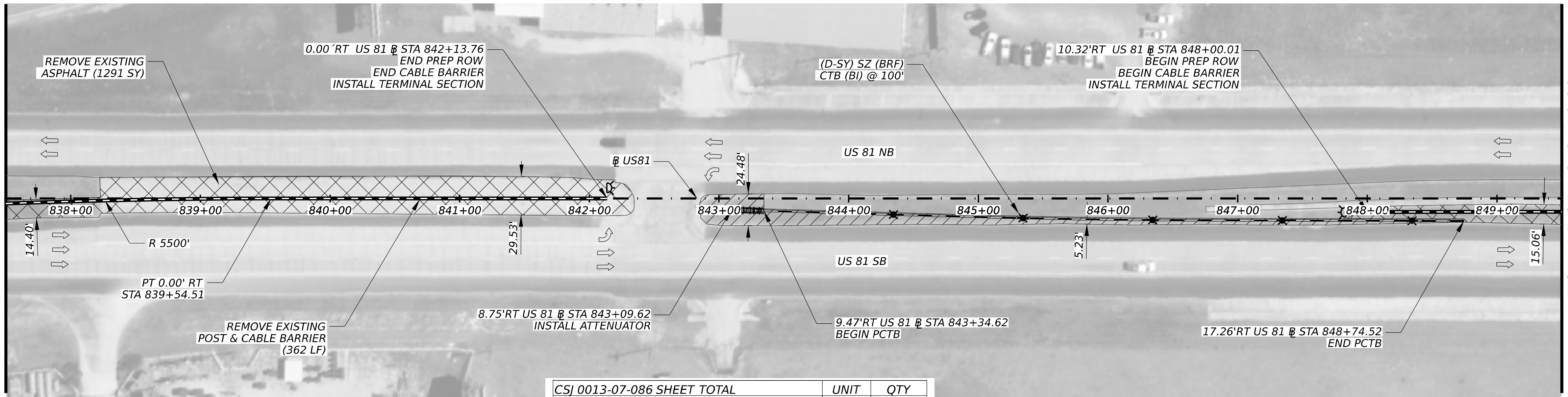
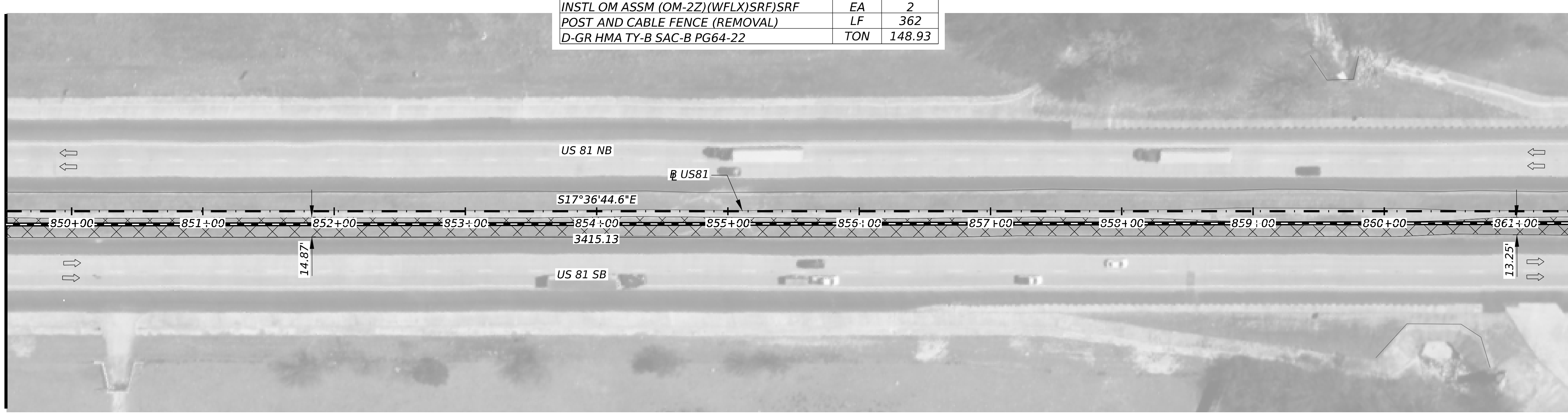


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.58
REMOVING STAB BASE AND ASPH PAV (2"-6")	SY	1291
EXCAVATION (ROADWAY) **	CY	16.00
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	67.00
FURNISHING AND PLACING TOPSOIL (3")	SY	1291
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	3412
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1706
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1706
FERTILIZER *	TON	0.42
VEGETATIVE WATERING	MG	238.84
PRIME COAT (MC-30)	GAL	155.40
RIPRAP (MOW STRIP)(5 IN)	CY	84.26
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	540.00
CABLE BARRIER SYSTEM (TL-4)	LF	1699
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	1
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	5
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2
POST AND CABLE FENCE (REMOVAL)	LF	362
D-GR HMA TY-B SAC-B PG64-22	TON	148.93



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
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- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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STATE OF TEXAS
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3/21/2024

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 837+50 TO STA 861+50

SHEET 48 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81

DIST	COUNTY	SHEET NO.
FTW	WISE	83

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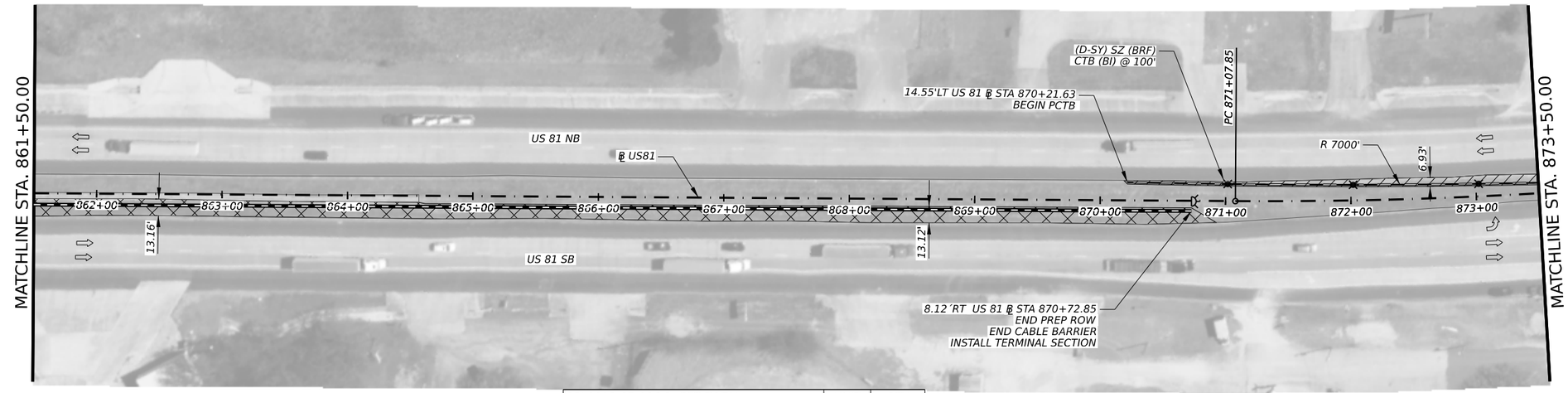
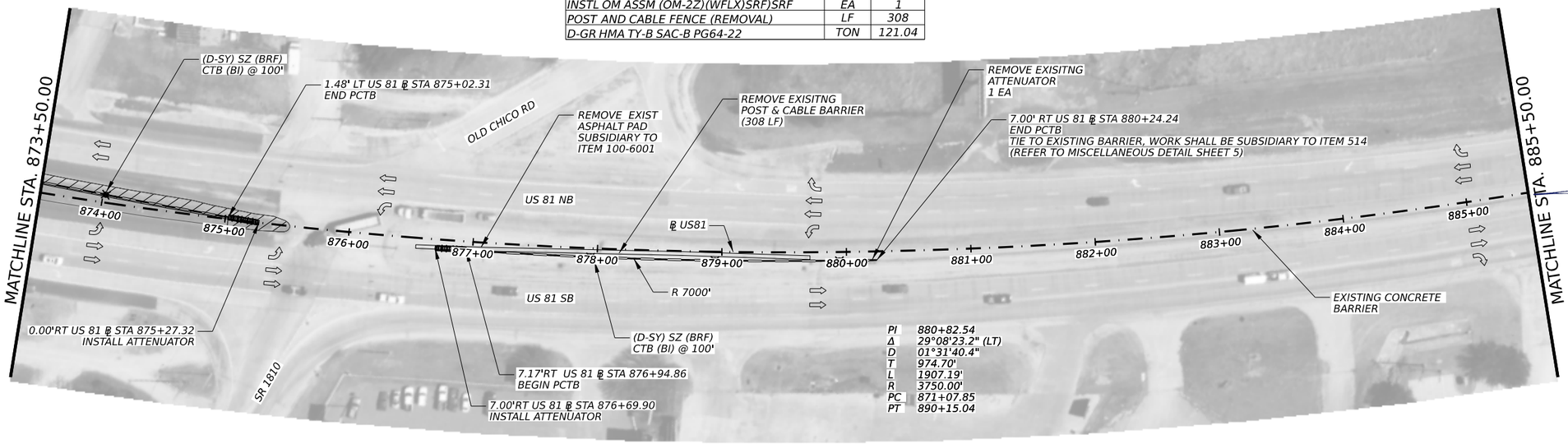


CSJ 0013-07-086 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.21
EXCAVATION (ROADWAY) **	CY	28.00
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	78.00
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1312
CELL FBR MLCH SEED(TEMP)(WARM)	SY	656
CELL FBR MLCH SEED(TEMP)(COOL)	SY	656
FERTILIZER *	TON	0.16
VEGETATIVE WATERING	MG	91.84
PRIME COAT (MC-30)	GAL	126.30
RIPRAP (MOW STRIP)(5 IN)	CY	42.87
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	810
CABLE BARRIER SYSTEM (TL-4)	LF	866
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
CRASH CUSH ATTEN (REMOVE)	EA	1
CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	2
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	7
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1
POST AND CABLE FENCE (REMOVAL)	LF	308
D-GR HMA TY-B SAC-B PG64-22	TON	121.04



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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10. REMOVAL AND PROPER DISPOSAL OF EXISTING CABLE APPURTENANCES SHALL BE SUBSIDIARY TO ITEM 5033.
11. VOID SPACE RESULTING FROM POST AND CABLE REMOVAL TO BE BACKFILLED WITH 2" TY C SP 70-28 SAC B FILL. WORK SHALL BE SUBSIDIARY TO ITEM 5033.

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 861+50 TO STA 885+50

SHEET 49 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		84

DATE: 3/21/2024 10:26:08 PM
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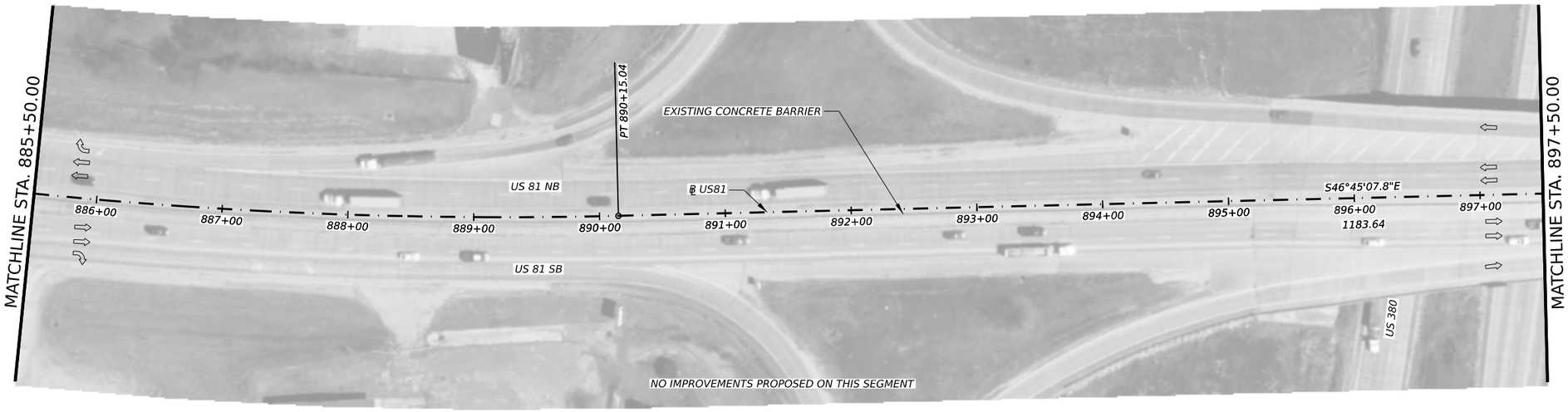

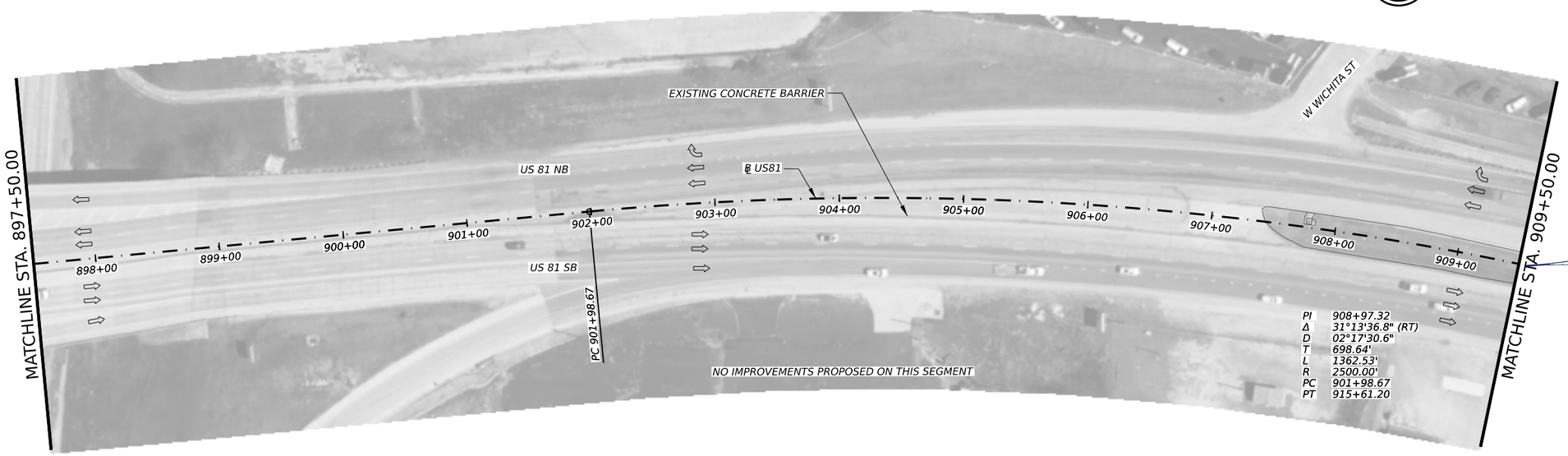

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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
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US 81

CABLE BARRIER LAYOUT STA 885+50 TO STA 909+50

SHEET 50 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		85

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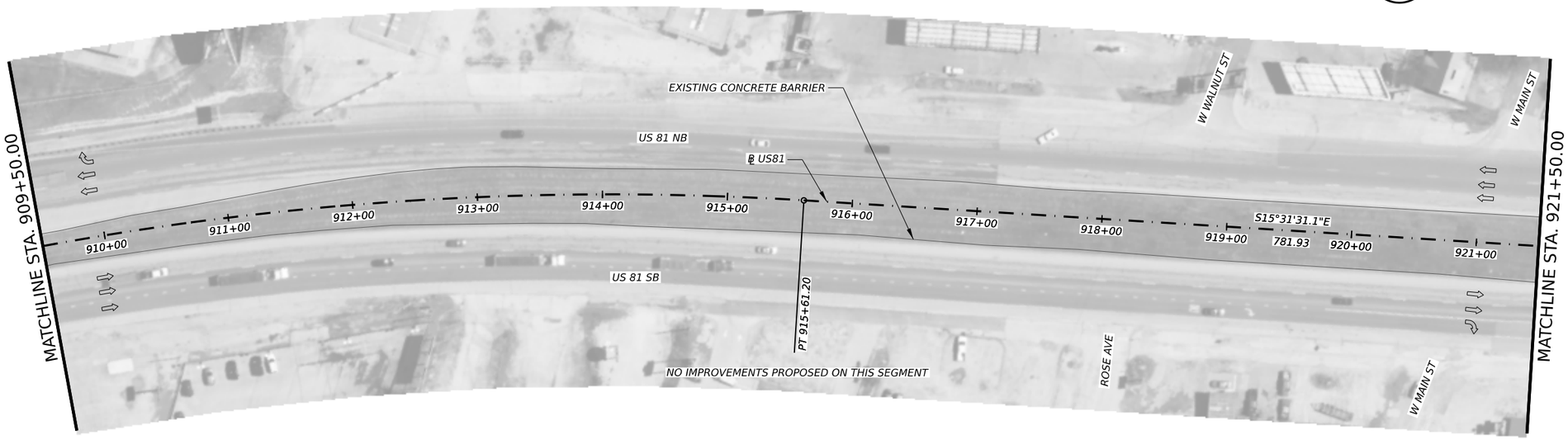

CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
EXCAVATION (ROADWAY) **	CY	3
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	8
PRIME COAT (MC-30) *	GAL	10.80
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	108
REMOVE METAL BEAM GUARD FENCE	LF	126
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	2
D-GR HMA TY-B SAC-B PG64-22	TON	10.35

*

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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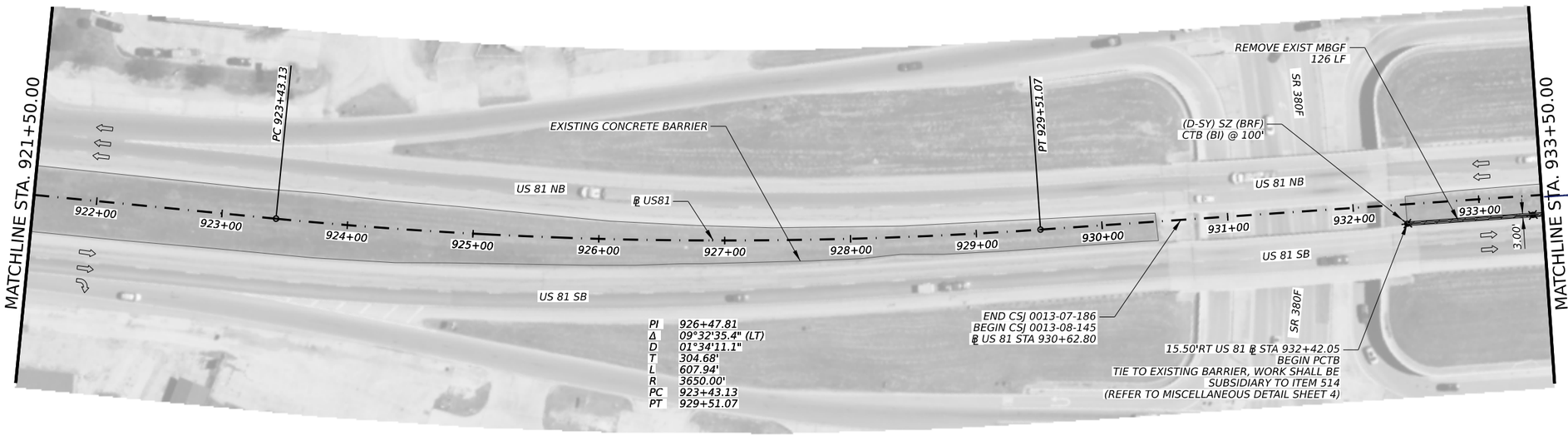

PI 926+47.81
Δ 09°32'35.4" (LT)
D 01°34'11.1"
T 304.68'
L 607.94'
R 3650.00'
PC 923+43.13
PT 929+51.07

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STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER

3/21/2024

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(214) 741-7777
AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 909+50 TO STA 933+50

SHEET 51 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		86

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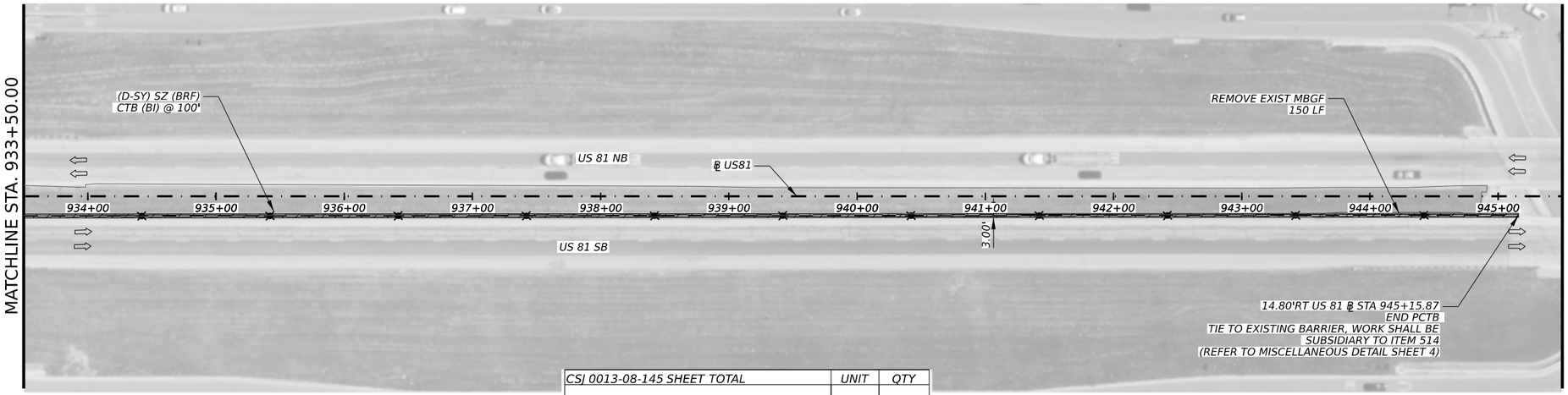
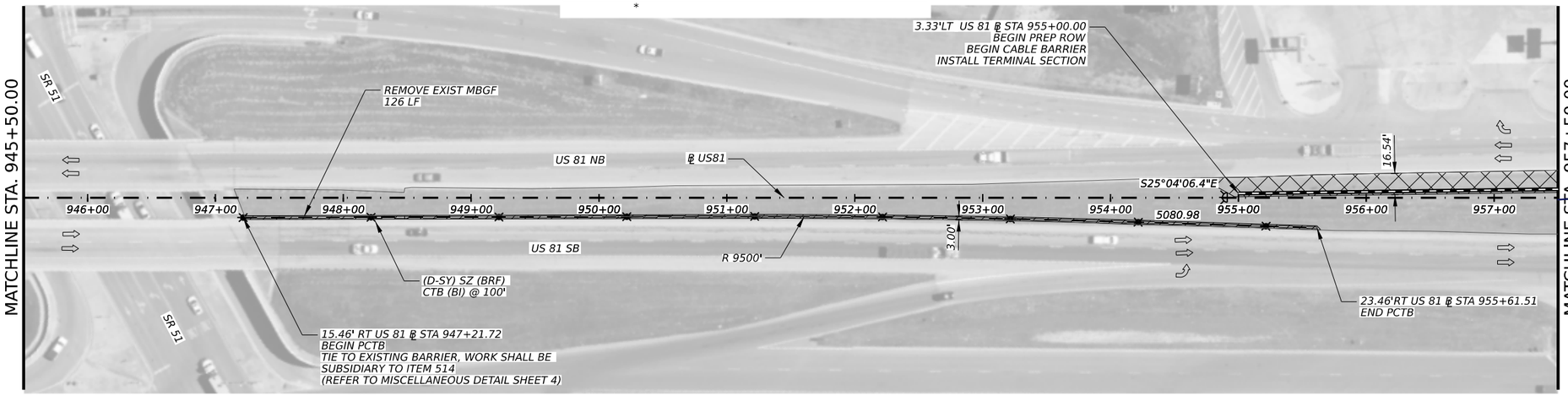


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.08
EXCAVATION (ROADWAY) **	CY	57
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	143
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	486
CELL FBR MLCH SEED(TEMP)(WARM)	SY	243
CELL FBR MLCH SEED(TEMP)(COOL)	SY	243
FERTILIZER *	TON	0.06
VEGETATIVE WATERING	MG	34.02
PRIME COAT (MC-30)	GAL	198.60
RIPRAP (MOW STRIP)(5 IN)	CY	11.71
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	2006
REMOVE METAL BEAM GUARD FENCE	LF	276
REMOVE TERMINAL ANCHOR SECTION	EA	3
CABLE BARRIER SYSTEM (TL-4)	LF	193
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	20
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1
D-GR HMA TY-B SAC-B PG64-22	TON	190.33

*



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 933+50 TO STA 957+50

SHEET 52 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		87

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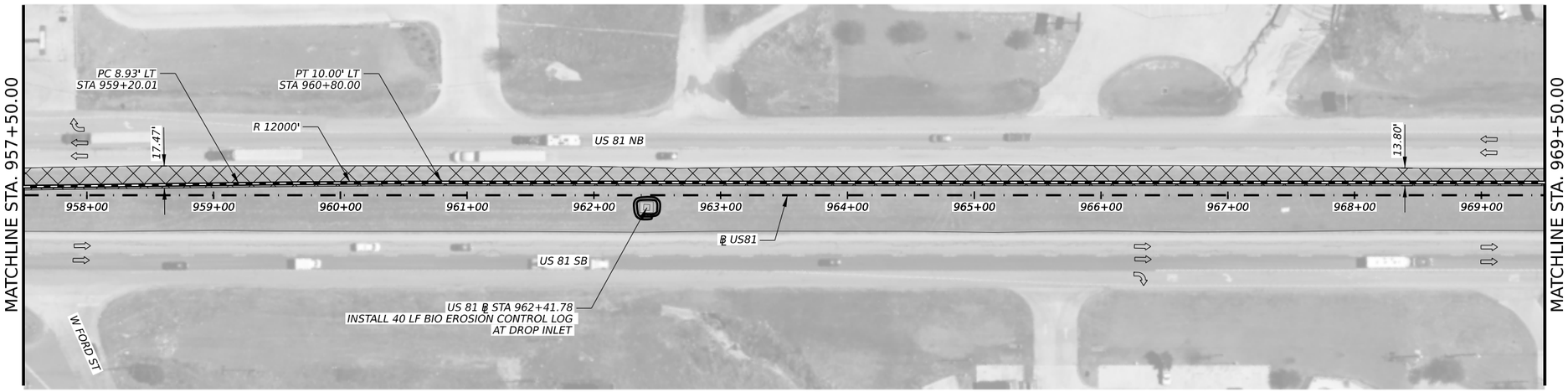
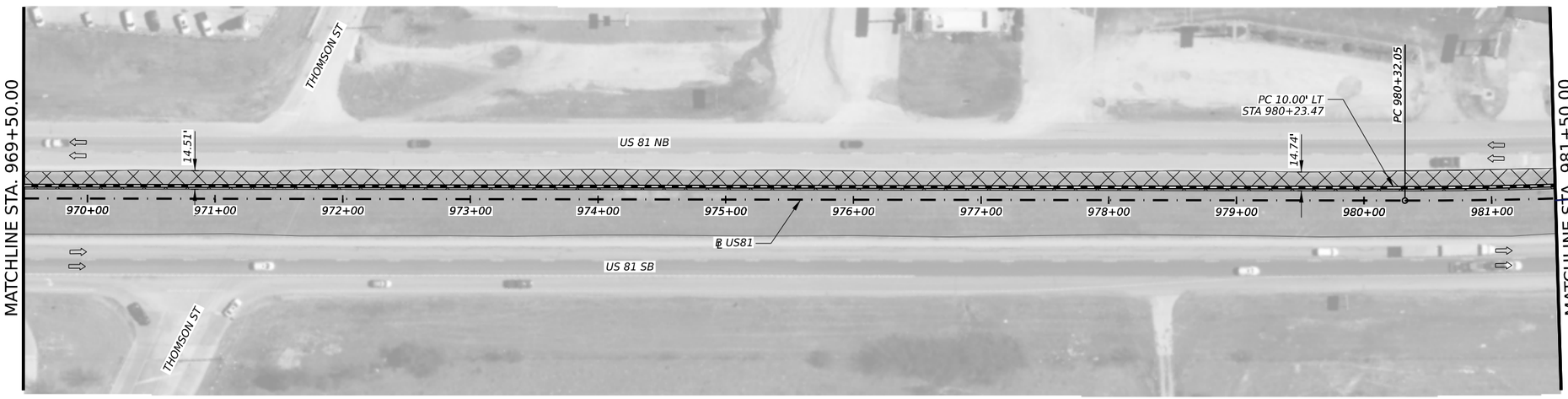


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.68
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	4095
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2048
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2047
FERTILIZER *	TON	0.51
VEGETATIVE WATERING	MG	286.65
RIPRAP (MOW STRIP)(5 IN)	CY	111.11
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	40
ROCK FILTER DAMS (REMOVE)	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	2400



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 957+50 TO STA 981+50

SHEET 53 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		88

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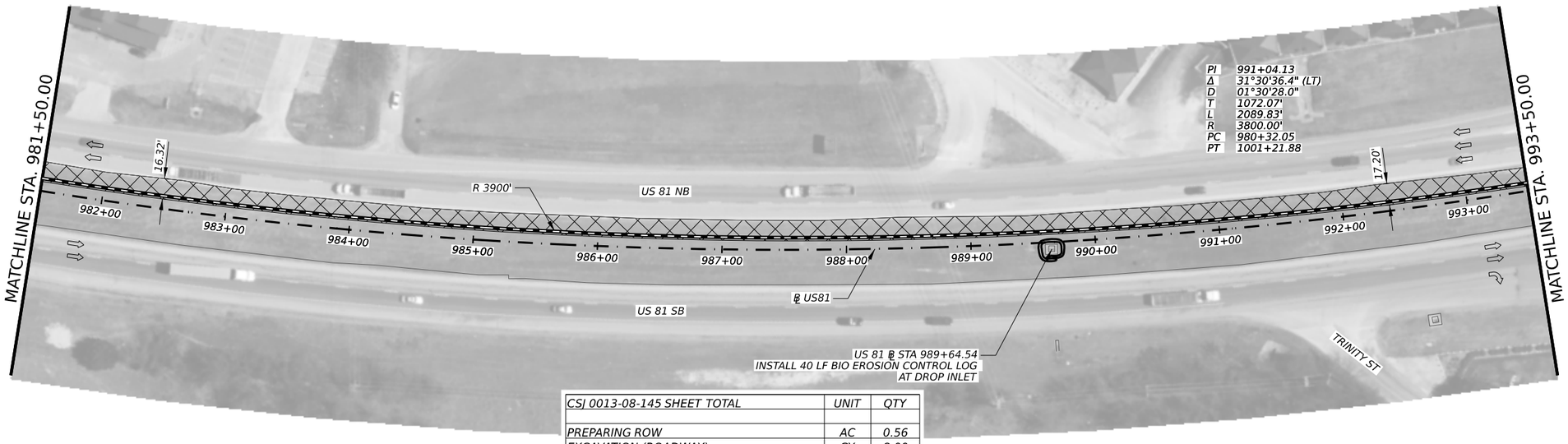
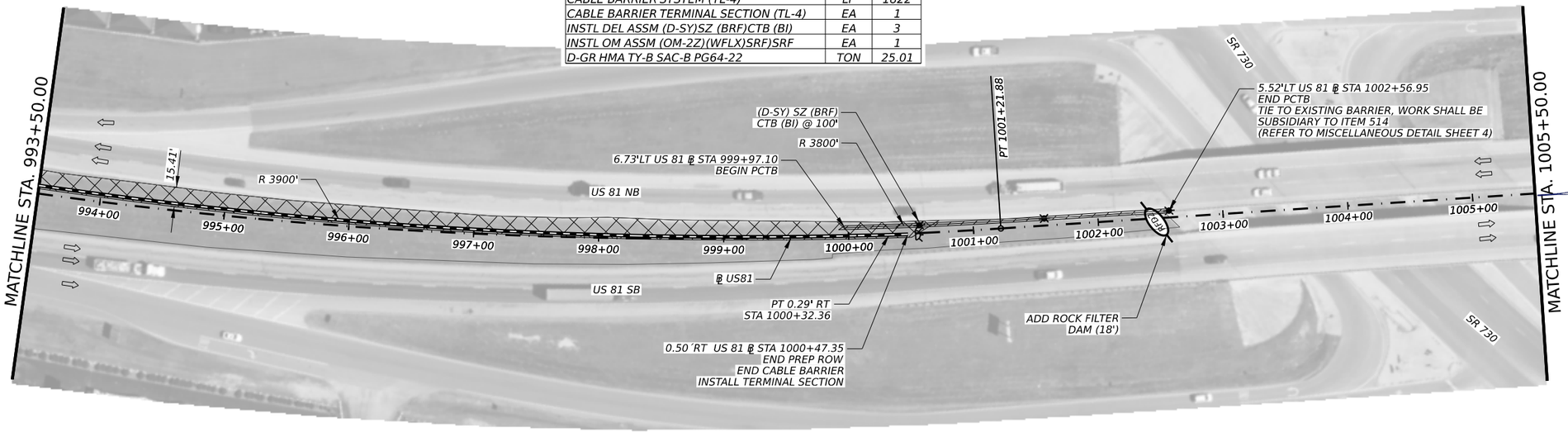


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.56
EXCAVATION (ROADWAY)	CY	8.00
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	19.00
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	3328
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1664
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1664
FERTILIZER *	TON	0.41
VEGETATIVE WATERING	MG	232.96
PRIME COAT (MC-30)	GAL	26.10
RIPRAP (MOW STRIP)(5 IN)	CY	87.13
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	40
ROCK FILTER DAMS (REMOVE)	LF	40
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	18
BIODEG EROSN CONT LOGS (REMOVE)	LF	18
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	260
CABLE BARRIER SYSTEM (TL-4)	LF	1822
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	3
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1
D-GR HMA TY-B SAC-B PG64-22	TON	25.01



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
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NOTES:

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STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
3/21/2024

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AECOM Technical Services, Inc.- F-3580

Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 981+50 TO STA 1005+50

SHEET 54 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		89

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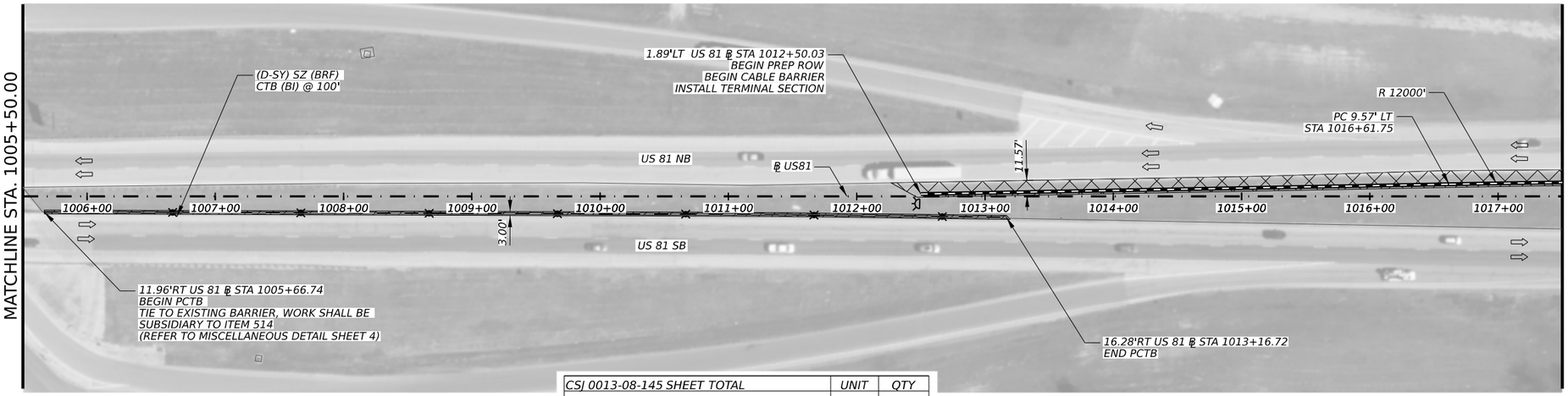
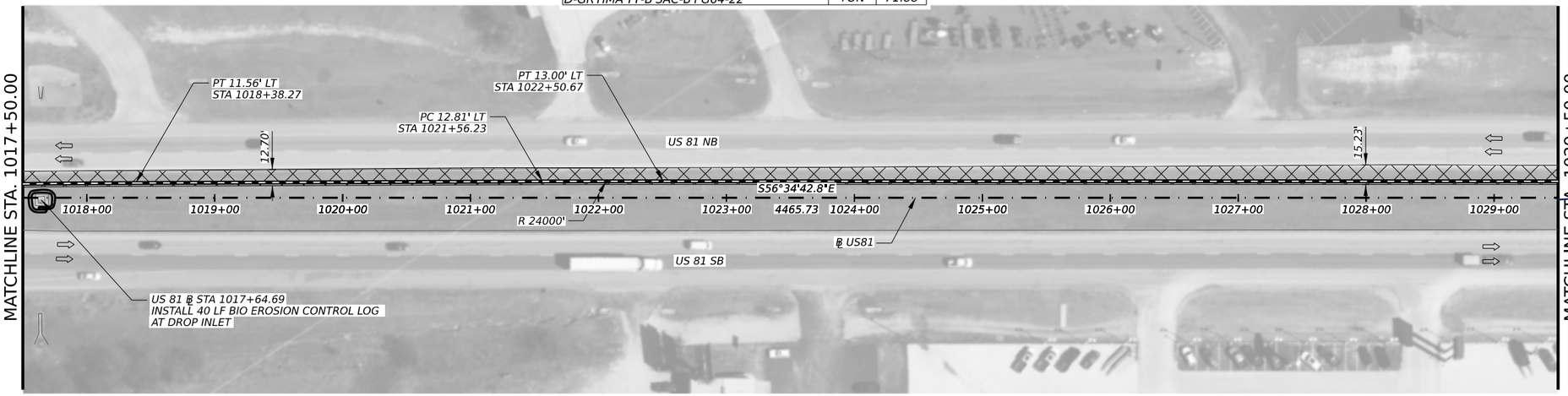


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.40
EXCAVATION (ROADWAY) **	CY	21.00
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	54.00
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	2499
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1250
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1249
FERTILIZER *	TON	0.31
VEGETATIVE WATERING	MG	174.93
PRIME COAT (MC-30)	GAL	75.00
RIPRAP (MOW STRIP)(5 IN)	CY	78.84
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	40
ROCK FILTER DAMS (REMOVE)	LF	40
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	750
CABLE BARRIER SYSTEM (TL-4)	LF	1643
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	7
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1
D-GR HMA TY-B SAC-B PG64-22	TON	71.88



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 1005+50 TO STA 1029+50

SHEET 55 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		90

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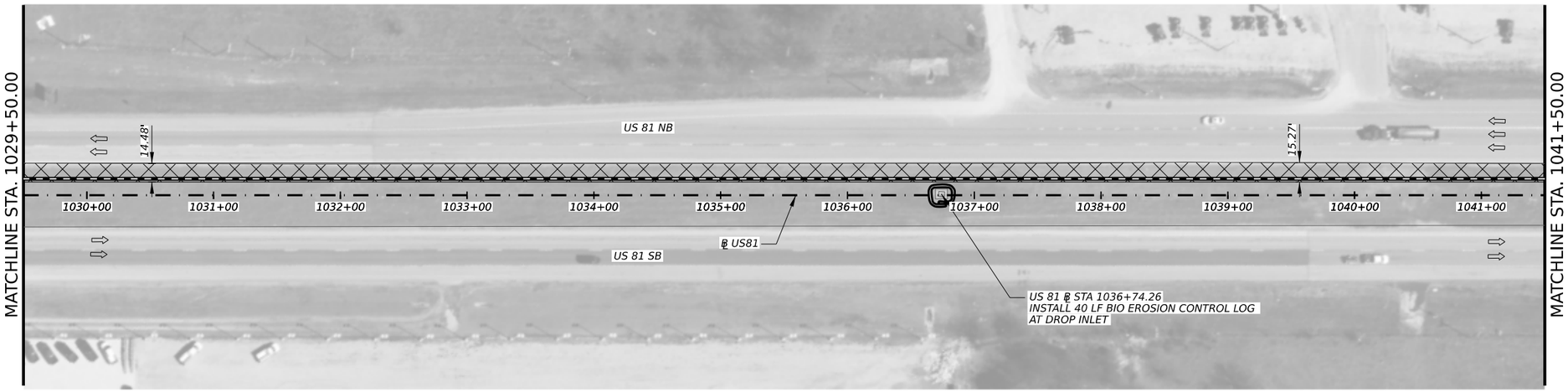
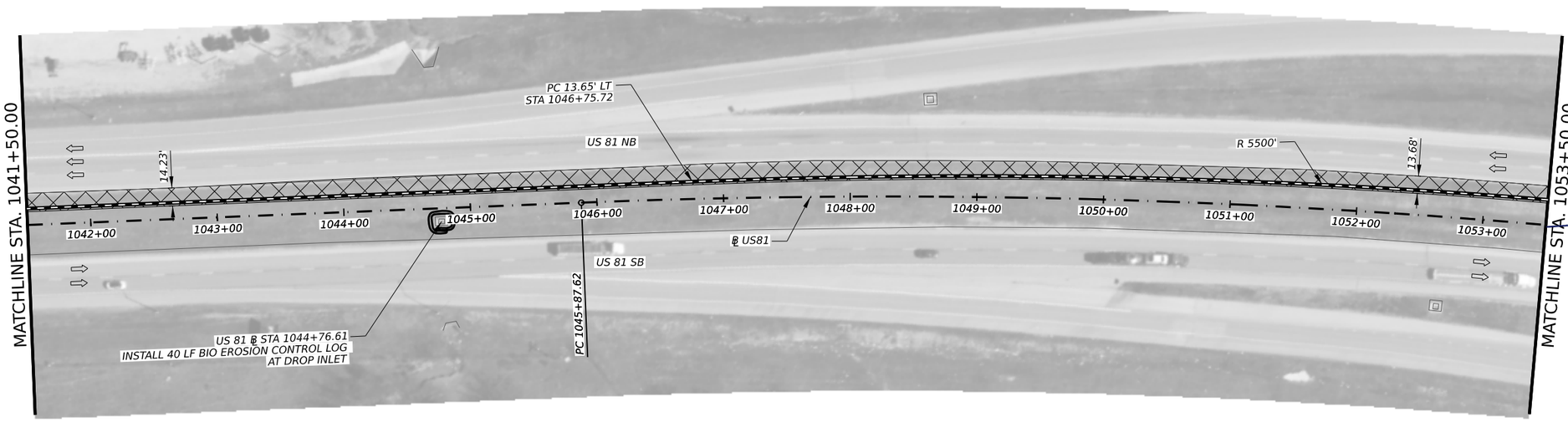


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.64
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	3919
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1959
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1960
FERTILIZER *	TON	0.49
VEGETATIVE WATERING	MG	274.33
RIPRAP (MOW STRIP)(5 IN)	CY	111.20
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	80
ROCK FILTER DAMS (REMOVE)	LF	80
CABLE BARRIER SYSTEM (TL-4)	LF	2402



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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
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US 81

CABLE BARRIER LAYOUT STA 1029+50 TO STA 1053+50

SHEET 56 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		91

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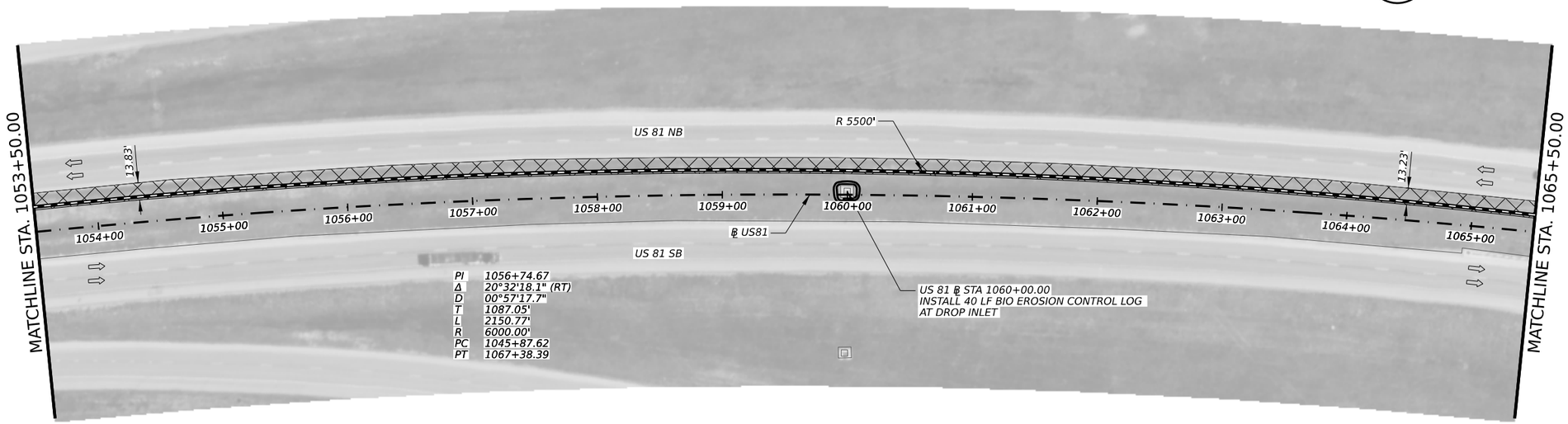

CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.51
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	3141
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1570
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1571
FERTILIZER *	TON	0.39
VEGETATIVE WATERING	MG	219.87
RIPRAP (MOW STRIP)(5 IN)	CY	94.44
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	40
ROCK FILTER DAMS (REMOVE)	LF	40
CABLE BARRIER SYSTEM (TL-4)	LF	1919
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
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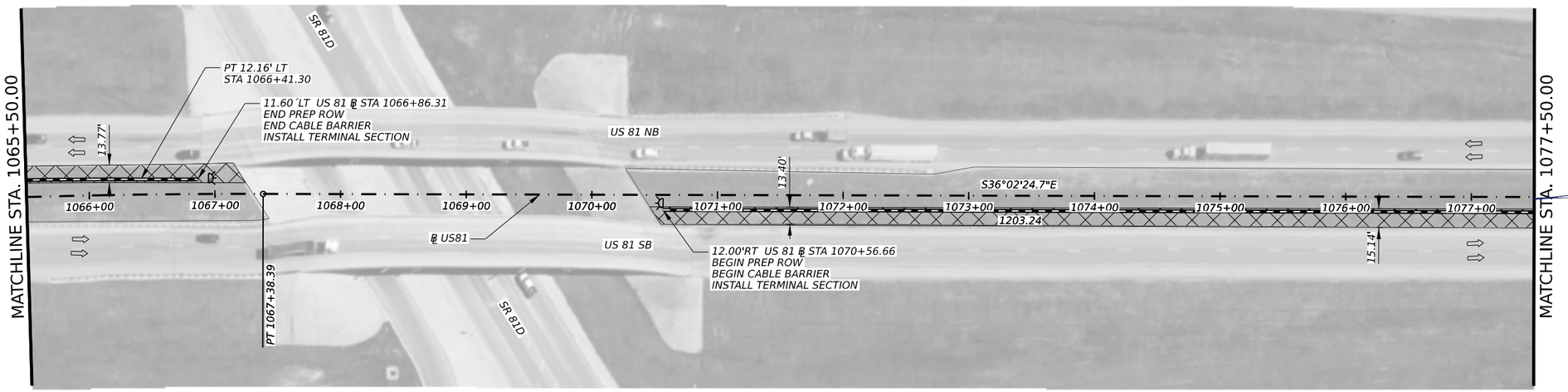

* FOR CONTRACTOR'S INFORMATION ONLY.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
3/21/2024

Salcido Garcia, P.E.

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 1053+50 TO STA 1077+50

SHEET 57 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		92

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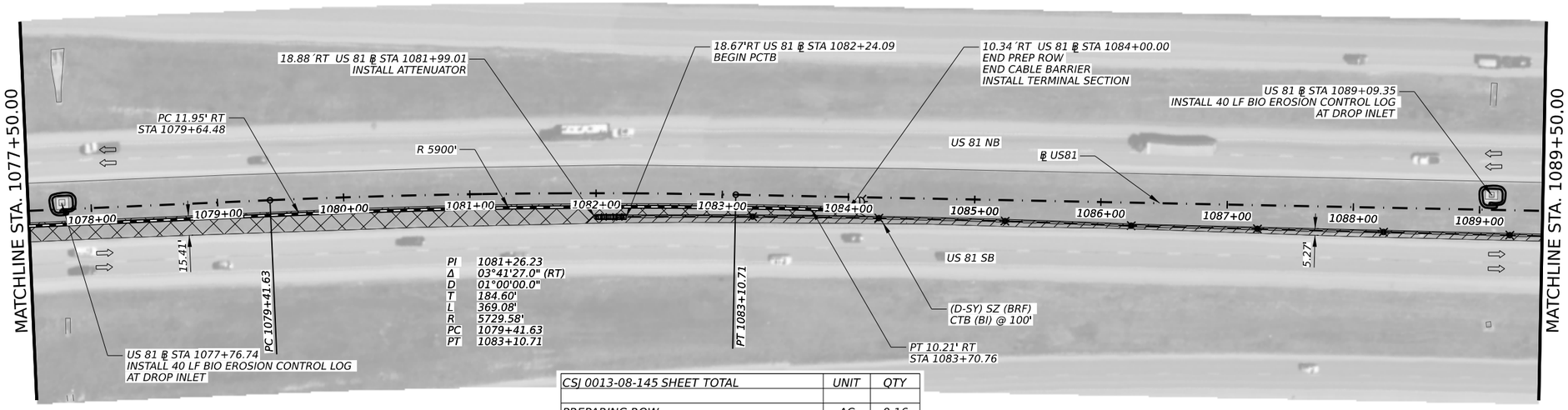
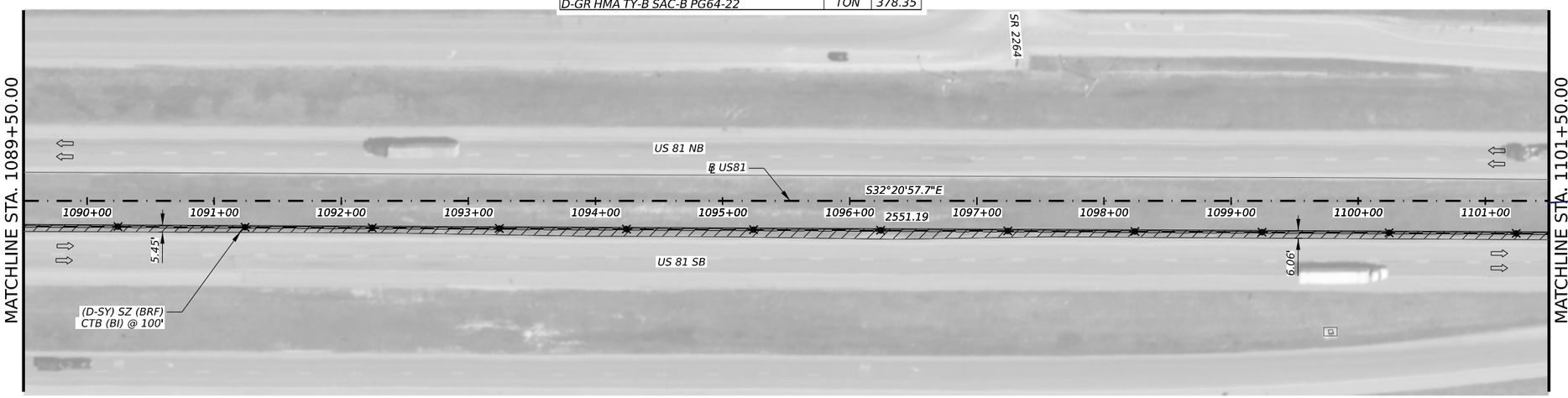


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.16
EXCAVATION (ROADWAY) **	CY	55.00
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	139.00
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	980
CELL FBR MLCH SEED(TEMP)(WARM)	SY	490
CELL FBR MLCH SEED(TEMP)(COOL)	SY	490
FERTILIZER *	TON	0.12
VEGETATIVE WATERING	MG	68.60
PRIME COAT (MC-30)	GAL	394.80
RIPRAP (MOW STRIP)(5 IN)	CY	30.19
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	80
ROCK FILTER DAMS (REMOVE)	LF	80
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	1925
CABLE BARRIER SYSTEM (TL-4)	LF	592
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	1
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	19
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1
D-GR HMA TY-B SAC-B PG64-22	TON	378.35



0 50 100
SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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STATE OF TEXAS
ERNESTO SALCIDO
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PROFESSIONAL ENGINEER
3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 1077+50 TO STA 1101+50

SHEET58 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		93

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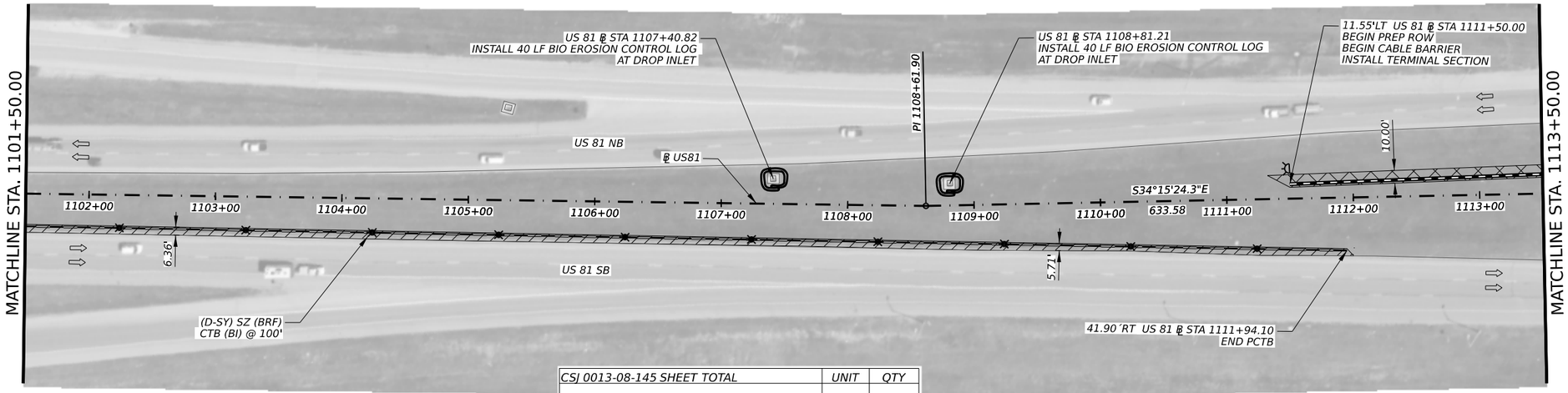
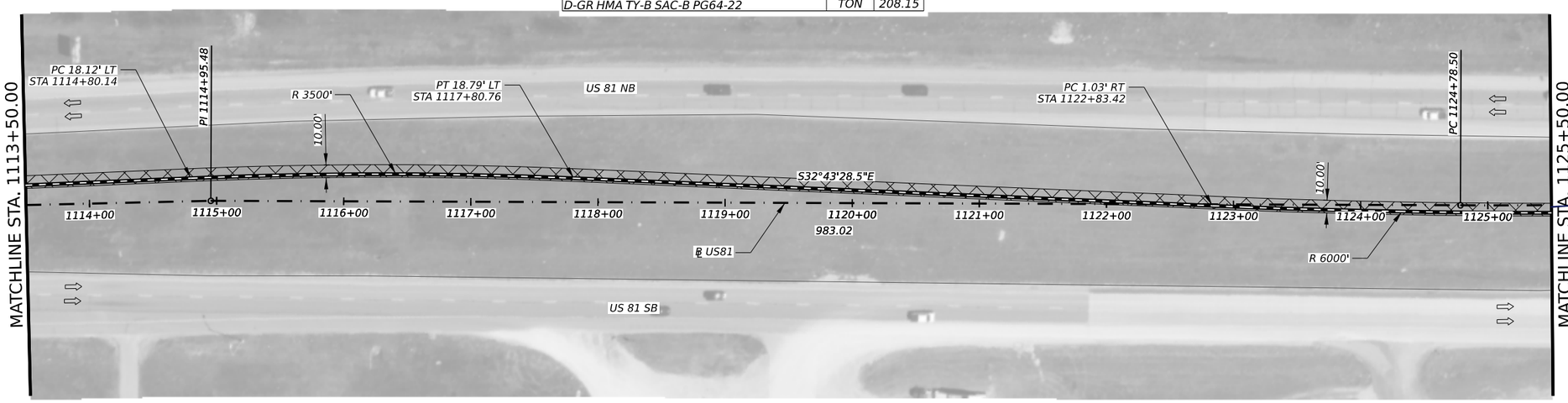


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.23
EXCAVATION (ROADWAY) **	CY	30.00
EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	75.00
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	1566
CELL FBR MLCH SEED(TEMP)(WARM)	SY	783
CELL FBR MLCH SEED(TEMP)(COOL)	SY	783
FERTILIZER *	TON	0.19
VEGETATIVE WATERING	MG	109.62
PRIME COAT (MC-30)	GAL	217.20
RIPRAP (MOW STRIP)(5 IN)	CY	65.00
ROCK FILTER DAMS (INSTALL) (TY 2)	LF	80
ROCK FILTER DAMS (REMOVE)	LF	80
PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	1045
CABLE BARRIER SYSTEM (TL-4)	LF	1344
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	1
INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI)	EA	10
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	1
D-GR HMA TY-B SAC-B PG64-22	TON	208.15



0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

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STATE OF TEXAS
ERNESTO SALCIDO
100177
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3/21/2024

Salcido Ernesto, P.E.

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 1101+50 TO STA 1125+50

SHEET 59 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		94

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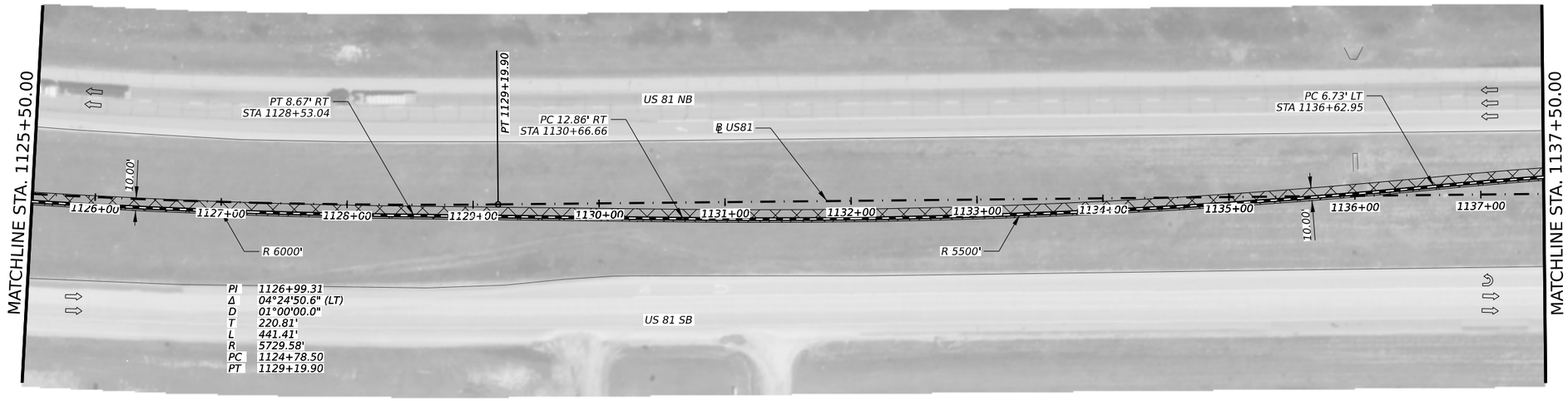
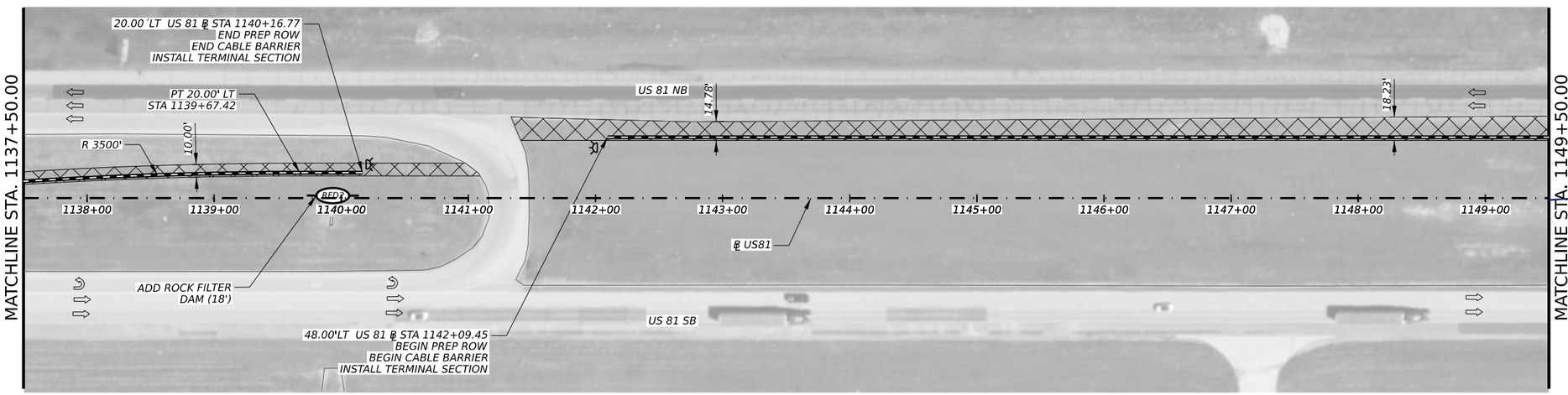


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.52
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	3240
CELL FBR MLCH SEED(TEMP)(WARM)	SY	1620
CELL FBR MLCH SEED(TEMP)(COOL)	SY	1620
FERTILIZER *	TON	0.40
VEGETATIVE WATERING	MG	226.80
RIPRAP (MOW STRIP)(5 IN)	CY	102.55
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	18
BIODEG EROSN CONT LOGS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	2094
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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NOTES:

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STATE OF TEXAS
ERNESTO SALCIDO
100177
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PROFESSIONAL ENGINEER

3/21/2024

Salcido, P.E.

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 1125+50 TO STA 1149+50

SHEET 60 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		95

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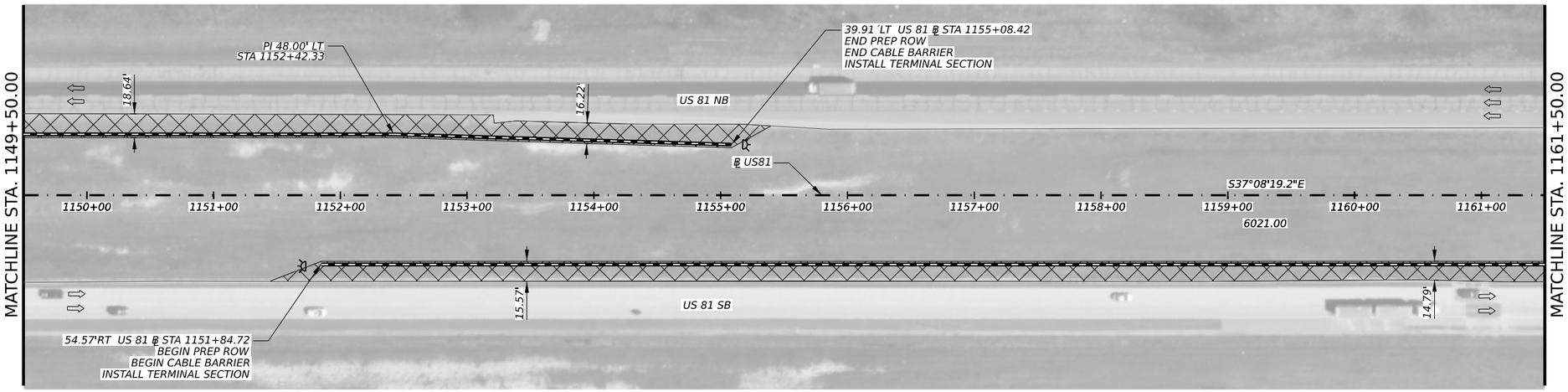
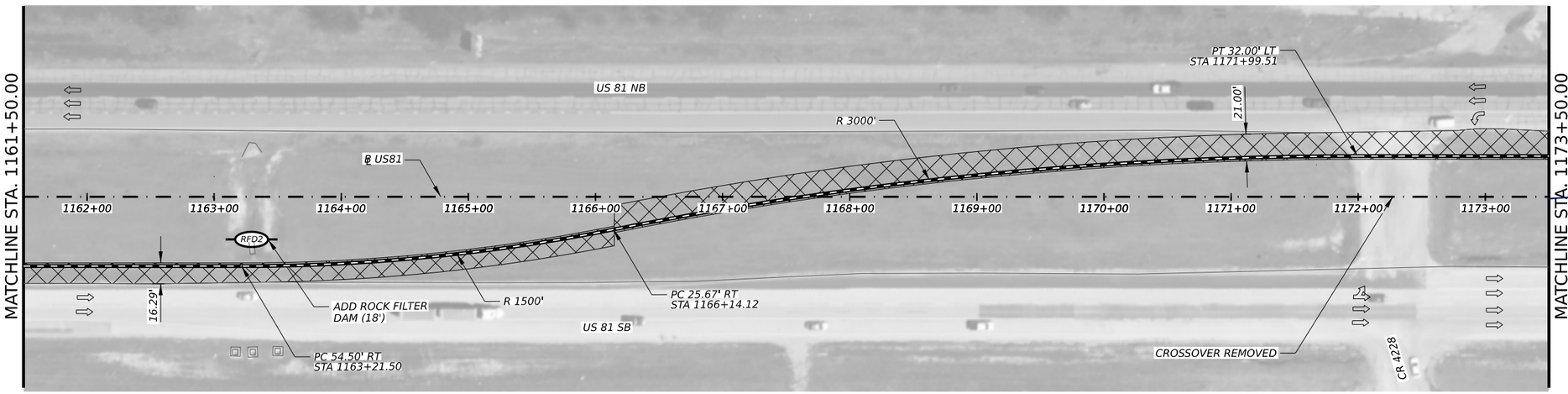


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.93
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	5397
CELL FBR MLCH SEED(TEMP)(WARM)	SY	2699
CELL FBR MLCH SEED(TEMP)(COOL)	SY	2698
FERTILIZER *	TON	0.67
VEGETATIVE WATERING	MG	377.79
RIPRAP (MOW STRIP)(5 IN)	CY	126.67
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	18
BIODEG EROSN CONT LOGS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	2615
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 1149+50 TO STA 1173+50

SHEET 61 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		96

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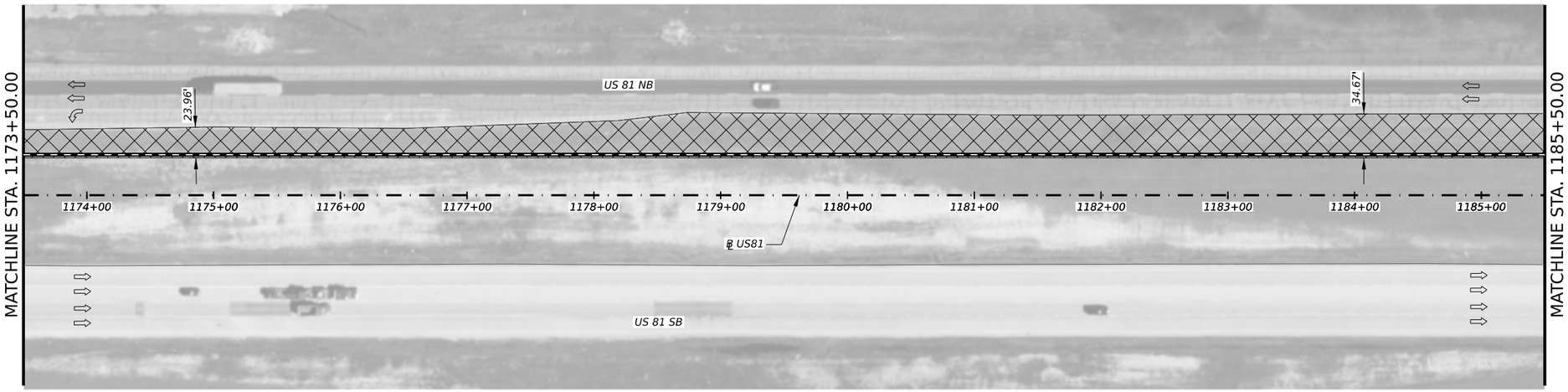
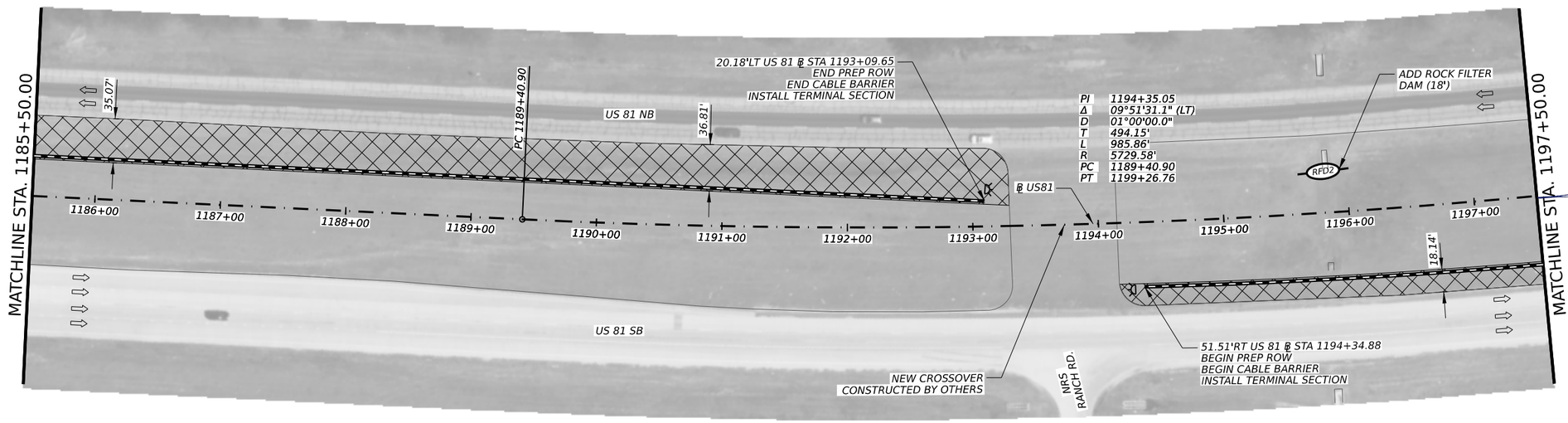


CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	1.47
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	7864
CELL FBR MLCH SEED(TEMP)(WARM)	SY	3932
CELL FBR MLCH SEED(TEMP)(COOL)	SY	3932
FERTILIZER *	TON	0.97
VEGETATIVE WATERING	MG	550.48
RIPRAP (MOW STRIP)(5 IN)	CY	105.65
BIODEG EROSN CONT LOGS (INSTL) (12")	LF	18
BIODEG EROSN CONT LOGS (REMOVE)	LF	18
CABLE BARRIER SYSTEM (TL-4)	LF	2161
CABLE BARRIER TERMINAL SECTION (TL-4)	EA	2
INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2



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0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
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NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED PROFESSIONAL ENGINEER

3/21/2024

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT STA 1173+50 TO STA 1197+50

SHEET 62 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		97

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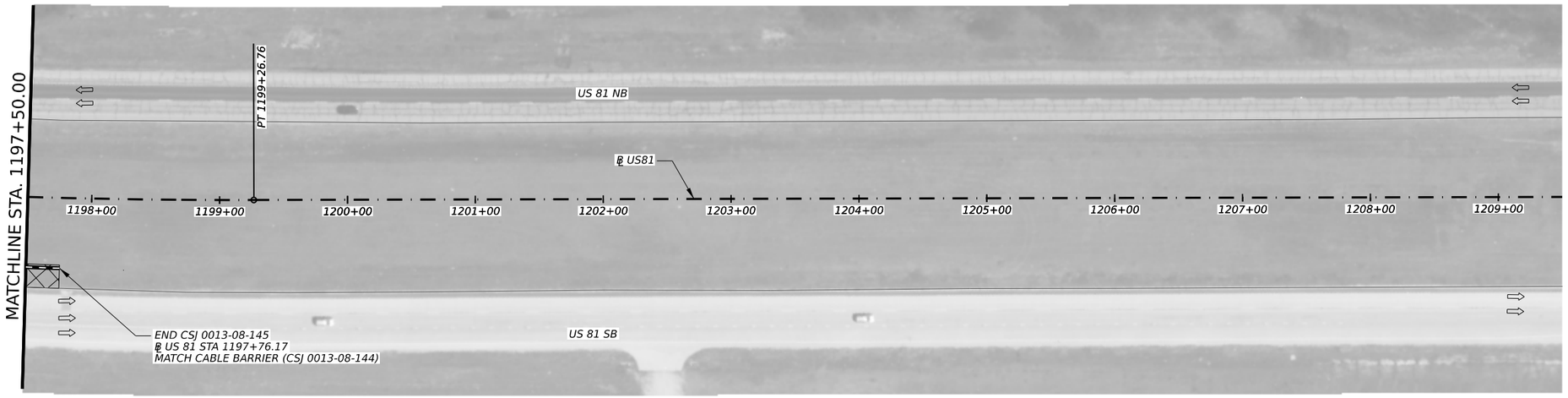

CSJ 0013-08-145 SHEET TOTAL	UNIT	QTY
PREPARING ROW	AC	0.01
CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	53
CELL FBR MLCH SEED(TEMP)(WARM)	SY	27
CELL FBR MLCH SEED(TEMP)(COOL)	SY	26
FERTILIZER *	TON	0.01
VEGETATIVE WATERING	MG	3.71
RIPRAP (MOW STRIP)(5 IN)	CY	1.20
CABLE BARRIER SYSTEM (TL-4)	LF	26.00

0 50 100

SCALE IN FEET

LEGEND

- ATTENUATOR
- EXISTING LANES
- CABLE BARRIER SYSTEM (TL-4)
- SINGLE SLOPE CONCRETE BARRIER (SSCB) (TYP 1)
- HMAC LEVELING PAD
- PERMANENT SEEDING
- RFD2 — TYPE 2 ROCK FILTER DAM (TYPICAL 18 LF)
- EROSION CONTROL LOG AT DROP INLET (TYPICAL 40 LF UNLESS OTHERWISE NOTED)
- INSTL OM ASSM (OM-2Z) (WFX) SRF) SRF, WHITE
- BI-DIRECTIONAL DELINEATOR, YELLOW-YELLOW

NOTES:

1. MEDIAN CABLE BARRIER SHALL NOT BE PLACED WITHIN 10' OF CROSSOVER EDGE OF PAVEMENT. LOCATION SHALL BE FIELD VERIFIED BY CONTRACTOR.
2. DESIGN ESTABLISHED WITH AERIAL IMAGERY, TOPOGRAPHIC INFORMATION IS NOT AVAILABLE.
3. CABLE BARRIER TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES.
   A. 12' MIN FROM EDGE OF TRAVEL LANE.
   B. 9' MIN FROM EDGE OF PAVEMENT.
   C. 8' MIN FROM DITCH FLOW LINE.
4. EXISTING DITCH FLOW LINE TO BE REGRADED TO MAINTAIN POSITIVE DRAINAGE. WORK SHALL BE SUBSIDIARY TO MOW STRIP BACKFILLING REQUIREMENTS.
5. CABLE BARRIER MAY NOT BE PLACED ON SLOPES EXCEEDING 6:1.
6. POST SPACING SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR MAY DECREASE POST SPACING TO AVOID OBSTRUCTION OR UTILITIES.
7. CROSS DRAINAGE STRUCTURES WITH LESS THAN 36" OF COVER POSE A CHALLENGE FOR PLACING POSTS. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS AND SPAN POSTS TO AVOID CONFLICT.
8. FOR ESTIMATING PURPOSES, CABLE BARRIER TERMINAL SECTION ASSUMED TO BE 57.5' LONG, PER NU-CABLE (TL4)-14. QUANTITIES TO BE ADJUSTED ACCORDINGLY FOR DIFFERENT CABLE SYSTEM.
9. AT A MINIMUM, THE FIRST THREE (3) TERMINAL END CABLE BARRIER POSTS SHALL BE DELINEATED ON BOTH SIDES. DELINEATIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

* FOR CONTRACTOR'S INFORMATION ONLY.

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Texas Department of Transportation

US 81

CABLE BARRIER LAYOUT
STA 1197+50 TO END

SHEET 63 OF 63

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		98

DATE: 3/21/2024 10:39:53 PM
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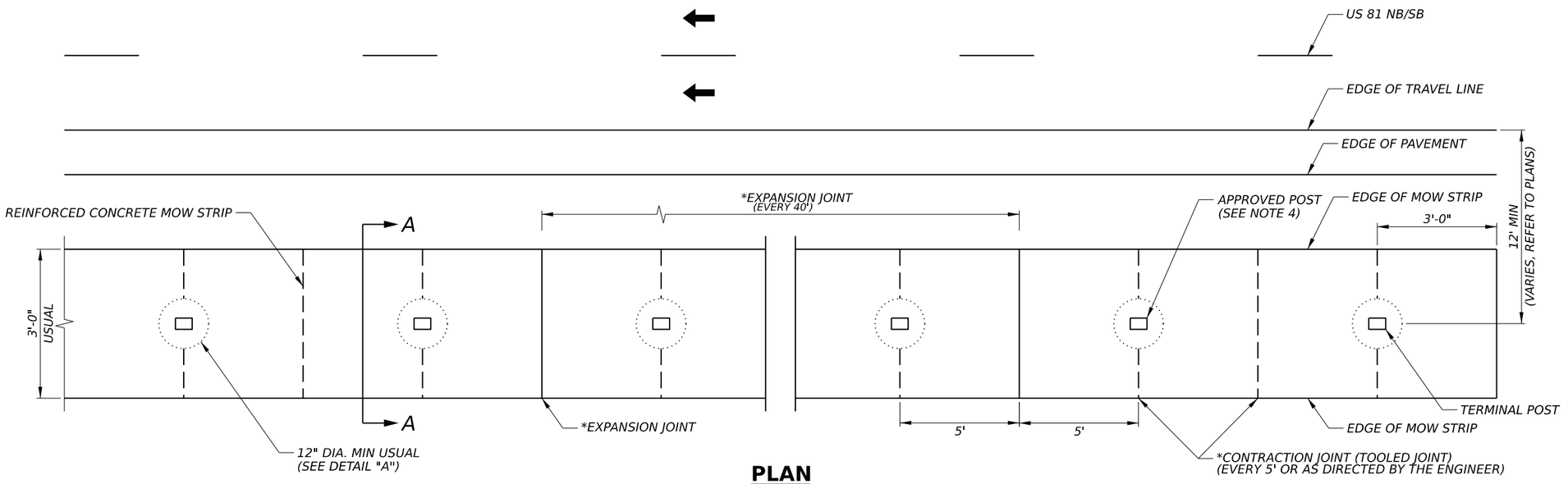
LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC. #	N	W	N	W	N	W
1	N/A	48 of 63	US 81 SB	843+09.62	TL3	UNI	HMAC	5" HMAC		3' 1½"	2' 9⅜"	21' 6"	1				X					
2	N/A	49 of 63	US 81 NB	875+27.32	TL3	UNI	HMAC	5" HMAC		3' 1½"	2' 9⅜"	21' 6"	1				X					
3	N/A	49 of 63	US 81 SB	876+94.86	TL3	UNI	HMAC	5" HMAC		3' 1½"	2' 9⅜"	21' 6"	1				X					
4	N/A	58 of 63	US 81 SB	1081+99.01	TL3	UNI	HMAC	5" HMAC		3' 1½"	2' 9⅜"	21' 6"	1				X					
												TOTALS										

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

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

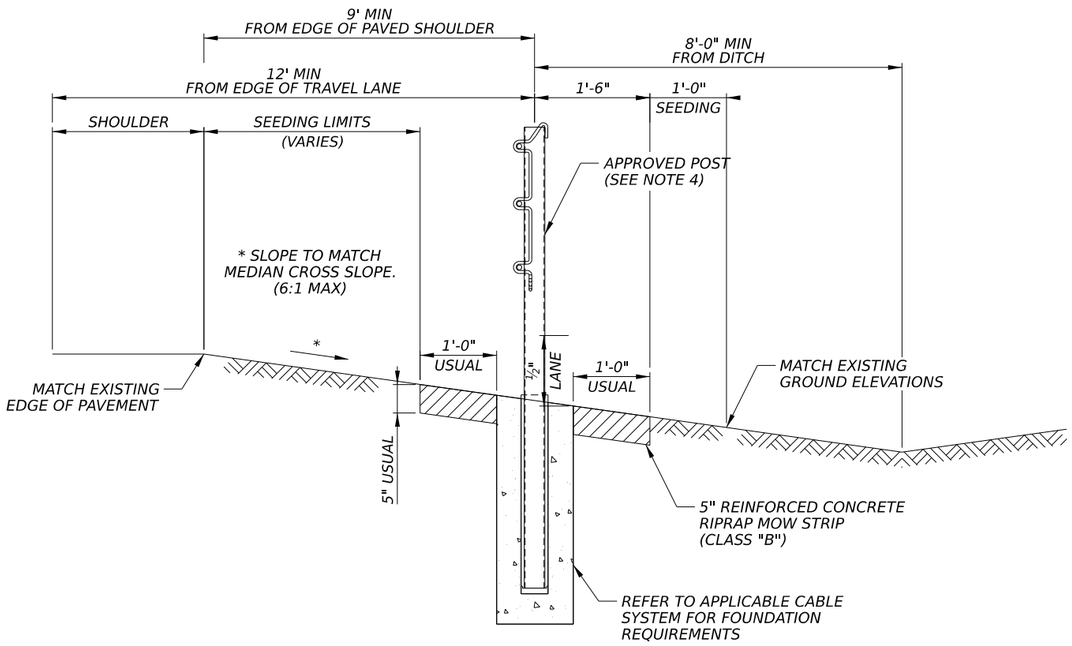
CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
	DIST	COUNTY		
	FTW	WISE		
	FEDERAL AID PROJECT			SHEET NO.
				99



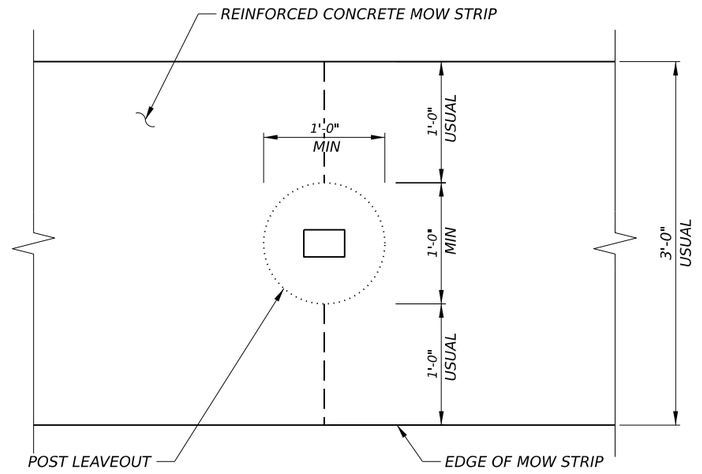
PLAN

N.T.S.



SECTION A-A

N.T.S.



DETAIL "A"

N.T.S.

GENERAL NOTES

1. MOW STRIPS SHALL BE CONCRETE RIPRAP AS SHOWN ON THE PLANS AND WILL BE PLACED AND PAID FOR IN ACCORDANCE WITH ITEM 432, "RIPRAP (MOWSTRIP)".
2. MOW STRIPS SHALL BE REINFORCED WITH WIRE MESH OR CONVENTIONAL STEEL. FIBER REINFORCEMENT IS NOT ALLOWED IN LIEU OF STANDARD REINFORCEMENT.
3. RAP IS NOT ALLOWED AS EMBANKMENT UNDER MOW STRIP.
4. THE TYPE OF APPROVED POST WILL BE SHOWN ELSEWHERE IN THE PLANS. SEE THE APPLICABLE CABLE SYSTEM SHEETS FOR ADDITIONAL DETAILS AND INFORMATION.
5. DEPTH OF MOW STRIP MAY VARY (5" USUAL, 8" MAXIMUM), BUT PAYMENT WILL NOT INCLUDE DEPTHS GREATER THAN 5".
6. THE LIMITS OF PAYMENT FOR CONCRETE RIPRAP WILL INCLUDE LEAVEOUTS FOR POST.
7. * EXPANSION AND CONTRACTION JOINTS TO BE CONSTRUCTED AS REQUESTED BY ENGINEER.
8. EXPANSION MATERIAL WILL BE REDWOOD OR ASPHALT BOARD OR OTHER APPROVED MATERIAL AS DIRECTED BY THE ENGINEER. THE WORK AND MATERIAL FOR THE EXPANSION JOINTS WILL BE SUBSIDIARY TO ITEM 432, "RIPRAP (MOWSTRIP)".
9. CROSS DRAINAGE STRUCTURES LESS THAN 16' SHALL BE SPANNED. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS PRIOR TO SETTING POST LOCATIONS.

RECOMMENDEDPOST SPACING IN A CURVE	
RADIUS (FT)	POST SPACING (FT)
650-2500	6'-8"
2501-5500	10'-0"
>5500	STANDARDRECOMMENDATIONS

STATE OF TEXAS
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Texas Department of Transportation

US 81

MISCELLANEOUS
DETAIL

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		100

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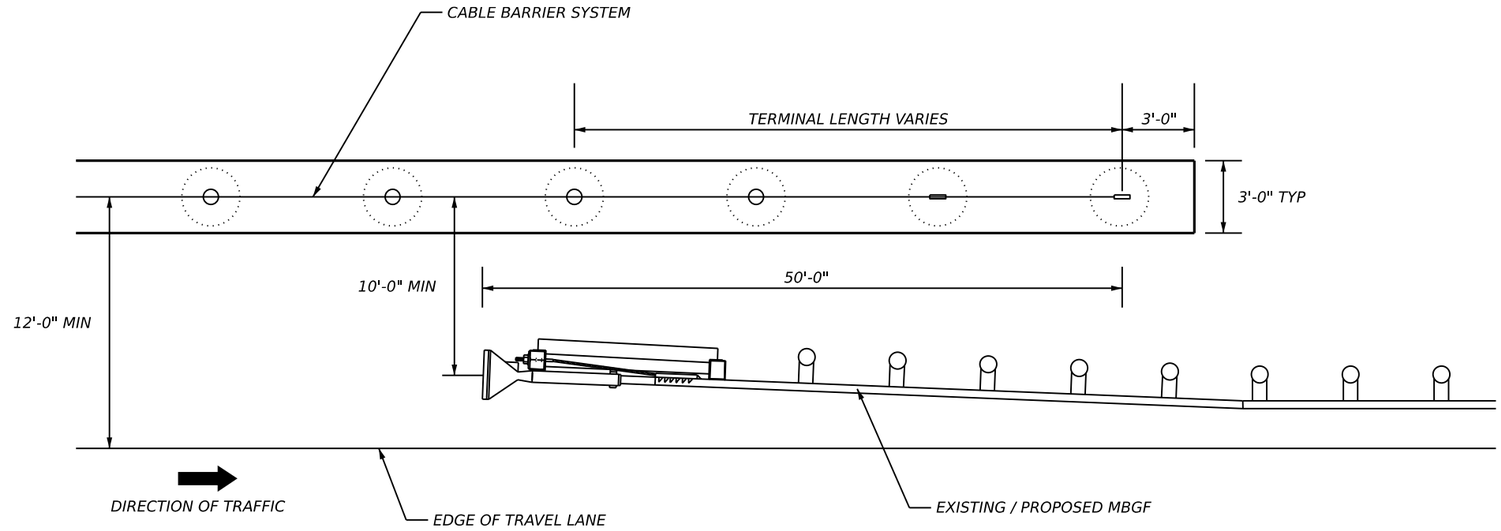
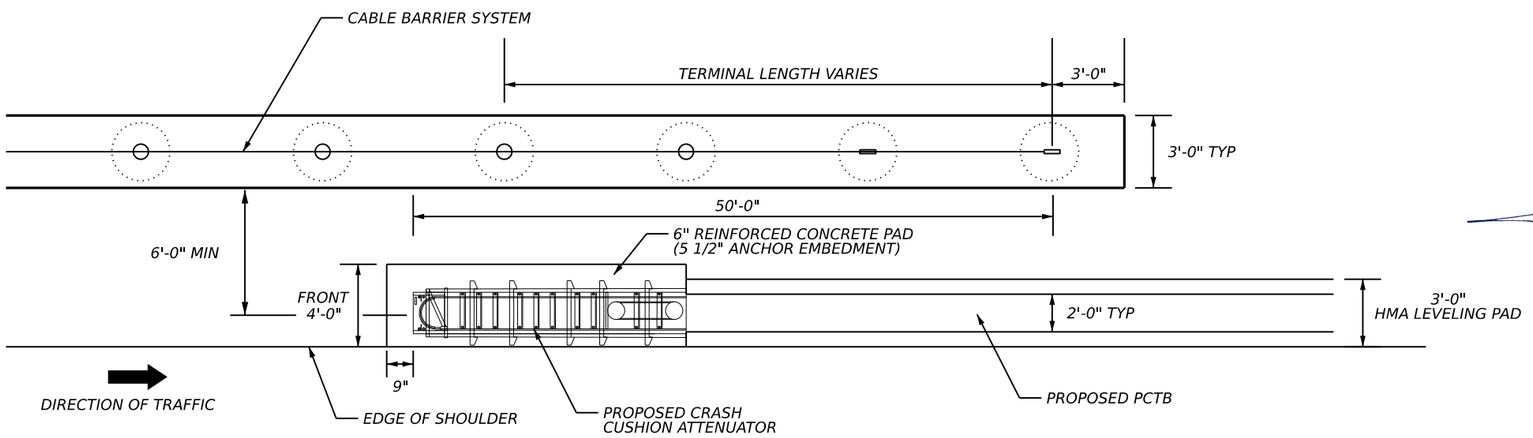


CABLE BARRIER AT MBGF DETAIL

N.T.S.



CABLE BARRIER AT PCTB WITH CRASH CUSHION ATTENUATORS

N.T.S.

STATE OF TEXAS
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US 81

MISCELLANEOUS
DETAIL

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		101

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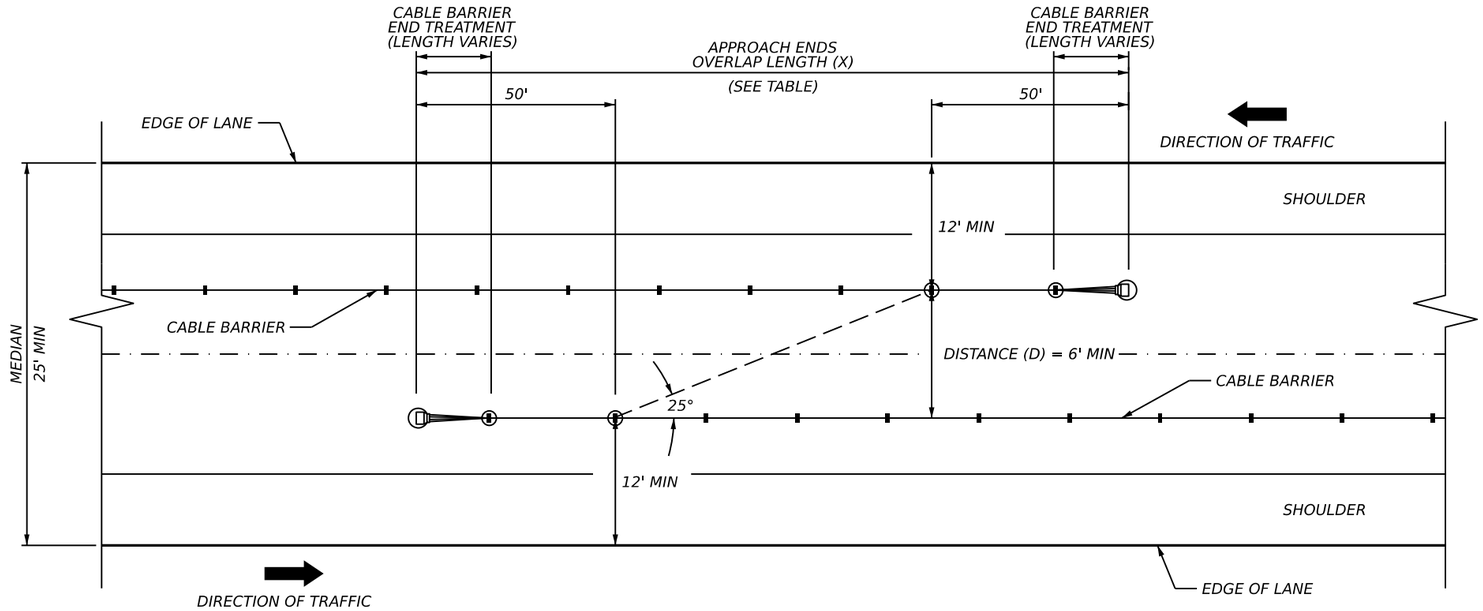
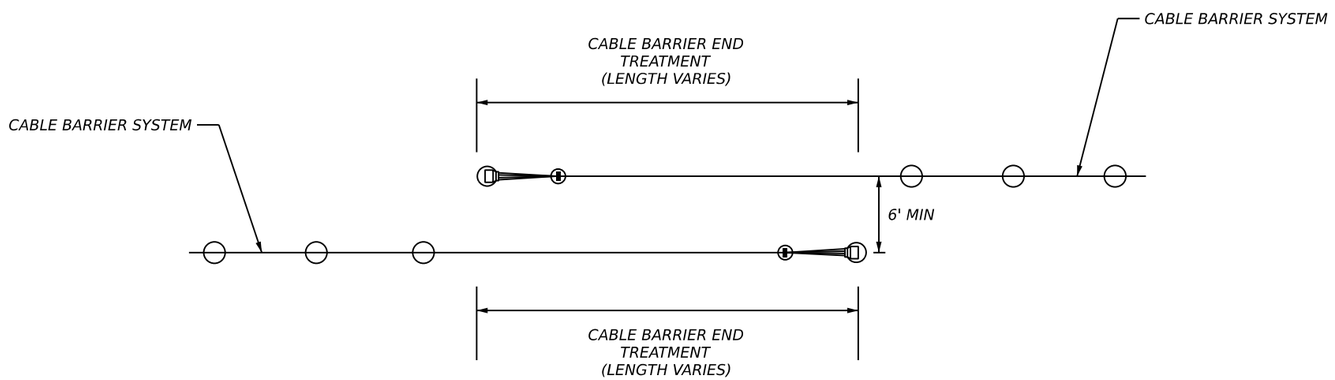


TABLE	
DISTANCE (D) (FT)	APPROACH ENDS OVERLAP LENGTH (X) (LF)
6	113
8	118
10	122
12	126
14	130
16	135
18	139

X (FT) = 2(GATING LENGTH) + D/tan 25°

CABLE BARRIER OVERLAP AT APPROACH ENDS

N.T.S.



CABLE BARRIER OVERLAP AT TRAILING ENDS

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Texas Department of Transportation

US 81

MISCELLANEOUS DETAIL

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		102

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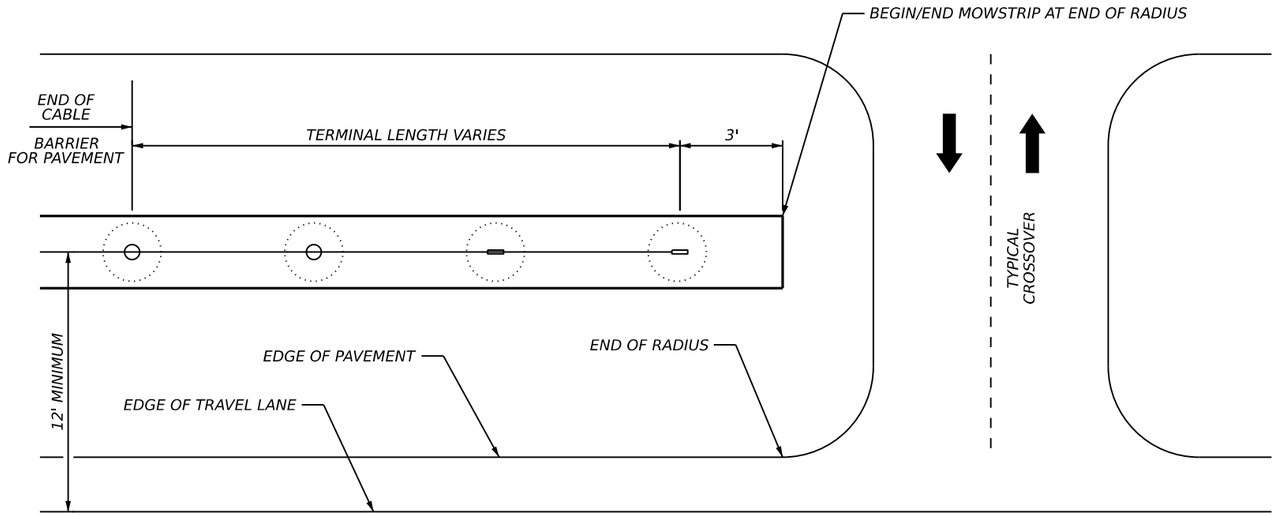

TYPICAL PLAN VIEW AT CROSSOVERS

N.T.S.

STATE OF TEXAS
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3/22/2024

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US 81

MISCELLANEOUS DETAIL

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
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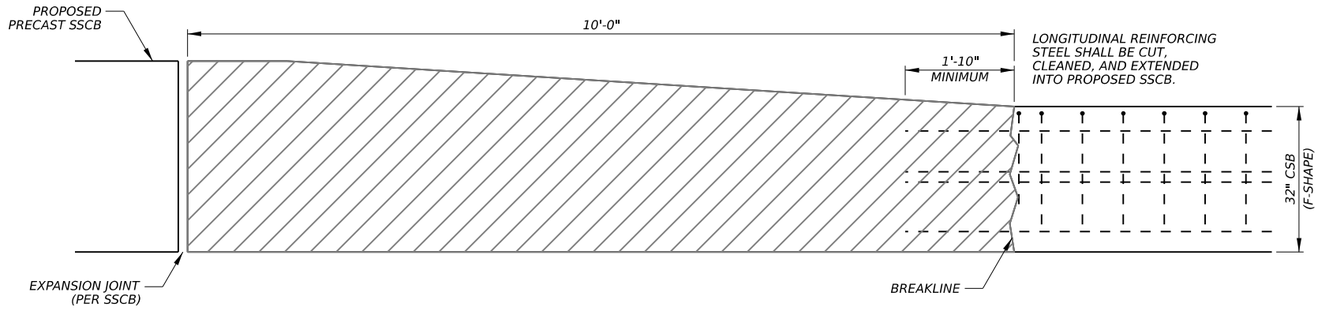

TRAFFIC SIDE ELEVATION OF EXISTING TRANSITION

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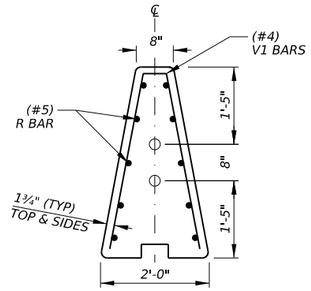
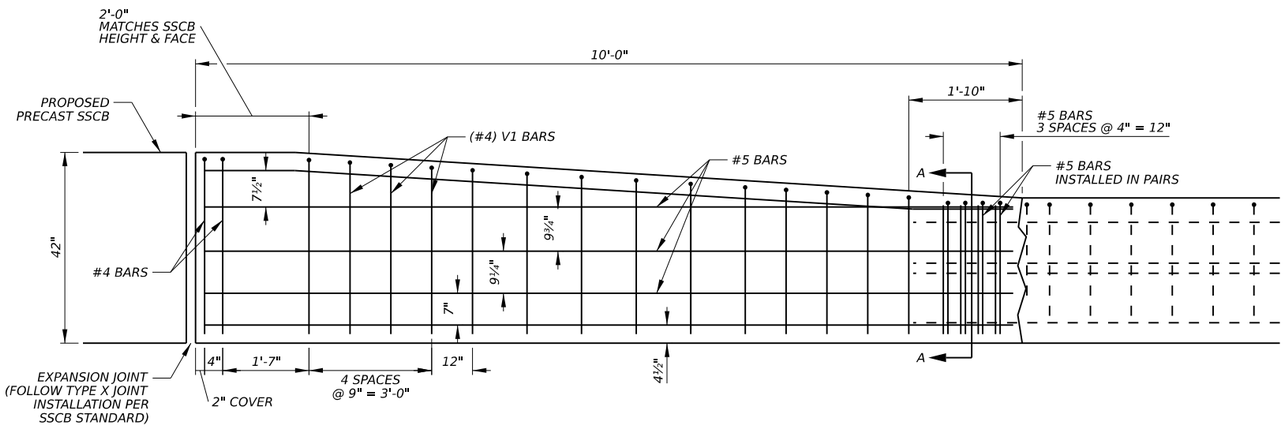


RAILING PROFILE

TRANSITION SECTION A-A



TRAFFIC SIDE ELEVATION OF PROPOSED TRANSITION

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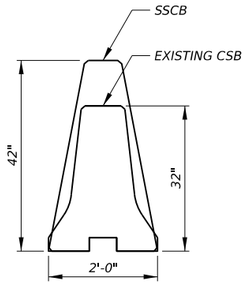

CSB TO SSCB PROFILE TRANSITION

STATE OF TEXAS
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3/22/2024

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US 81

MISCELLANEOUS
DETAIL

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0013	07	086, ETC	US 81
DIST	COUNTY		SHEET NO.
FTW	WISE		104

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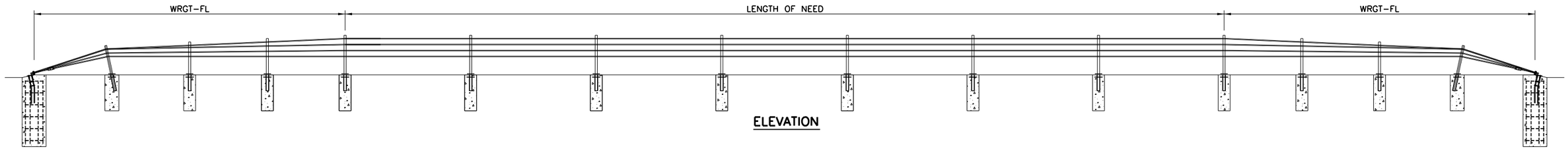
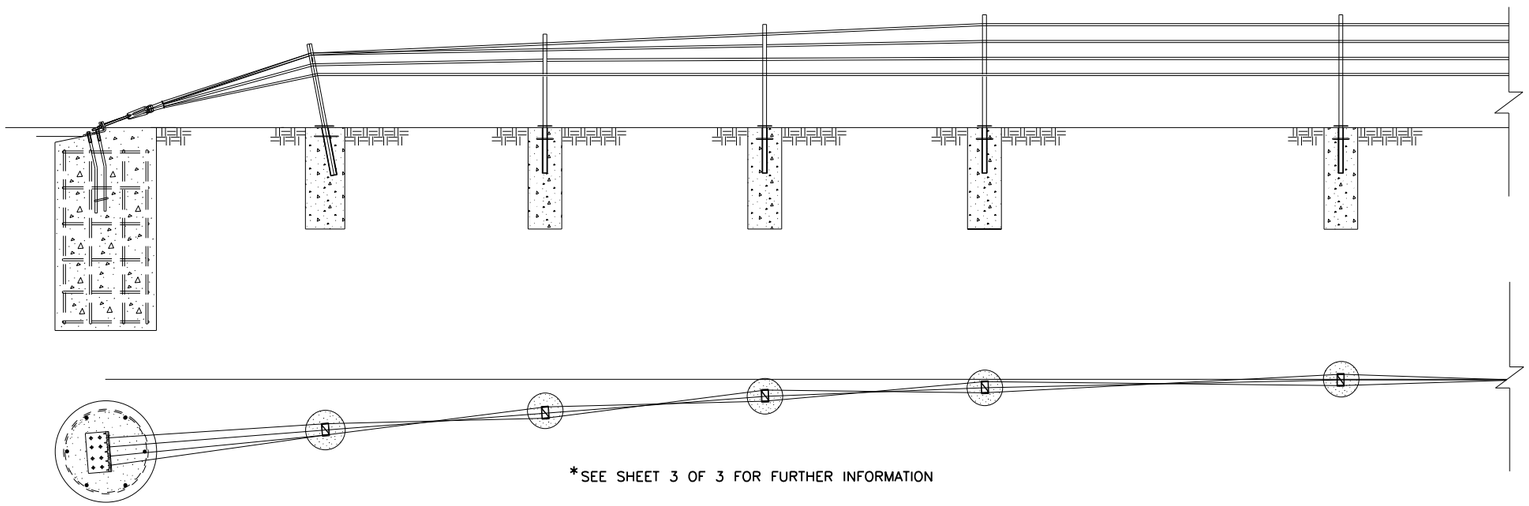


ELEVATION

PLAN

WRGT-FL END ANCHOR



*SEE SHEET 3 OF 3 FOR FURTHER INFORMATION

ROPE TENSION TABLE		
ROPE TEMP (°F)	TENSION (LBS)	TENSION (kN)
0	5700	25.4
5	5550	24.7
10	5400	24.0
15	5250	23.4
20	5100	22.7
25	4950	22.0
30	4800	21.4
35	4650	20.74
40	4500	20.0
45	4350	19.3
50	4200	18.7
55	4050	18.0
60	3900	17.3
65	3750	16.7
70	3600	16.0
75	3450	15.3
80	3300	14.7
85	3150	14.0
90	3000	13.3
95	2850	12.7
100	2700	12.0
105	2550	11.3
110	2400	10.7
115	2250	10.0
120	2100	9.3
125	1950	8.7
130	1800	8.0
135	1650	7.3
140	1500	6.7

*ROPE TENSION: ± 20% AFTER 2-WEEK INTERVAL

GENERAL NOTES:

1. BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. AT 1-866-427-4336.
2. THE BRIFEN WRSF HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-4 CONDITIONS ON SLOPES 6:1 OR FLATTER AND NCHRP 350 TL-3 CONDITIONS ON SLOPES 4:1 TO 6:1.
3. THE POST SPACING SHALL BE DETERMINED BY THE SPECIFYING AGENCY. POST SPACING MAY BE DECREASED TO AVOID OBSTRUCTIONS OR UTILITIES. IN NO EVENT SHALL THE POST SPACING EXCEED 21'-0".
4. BRIFEN WRSF SHALL BE PLACED ON A SMOOTH SURFACE, WITHOUT HUMPS, DROP-OFFS, HOLES, ETC THAT WOULD INTERFERE WITH THE STABILITY OF THE ERRANT VEHICLE. GRADING, FILL AND COMPACT MAY BE REQUIRED TO ASSURE THAT ROPES ARE INSTALLED AT THE DESIGN HEIGHT.
5. THE WRGT-FL END ANCHOR HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-3 CONDITIONS. THE LENGTH OF NEED BEGINS 31'-0" FROM THE END ANCHOR. POSTS A THROUGH POST B3, SPACED 6'-6" APART, HAVE WEAKENED CUTS AT THE GROUND THAT SHALL FACE THE ANCHOR.
6. ANCHOR AND LINE POST DIMENSIONS AND STEEL REINFORCEMENT WILL BE DETERMINED ON PROJECT SPECIFIC SOIL CLASSIFICATION, PROPERTIES AND TEMPERATURE EXTREMES. CONTACT BRIFEN USA, INC. FOR ADDITIONAL INFORMATION.
7. ALL REINFORCEMENT AND CONCRETE FOR THE ANCHORS AND LINE POSTS PROVIDED BY OTHERS.
8. REINFORCEMENT AND CONCRETE PROPERTIES SHALL MEET AGENCY SPECIFICATIONS.
9. FOR PLACEMENT NEAR GUARDRAIL OR OTHER OBSTACLES CONTACT BRIFEN USA, INC. FOR ADDITIONAL DRAWINGS AND SUPPORT.
10. TAPER RATES FOR THE BRIFEN WRSF ARE AS FOLLOWS:
    HORIZONTAL: 25:1 MAXIMUM, 50:1 PREFERABLE
    VERTICAL: 25:1 MAXIMUM, 50:1 PREFERABLE

Texas Department of Transportation

Design Division Standard

BRIFEN
WIRE ROPE SAFETY FENCE
(TL-4)

BRIFEN(TL4)-14

FILE: brifentl414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: MARCH 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		105

DATE: 3/21/2024
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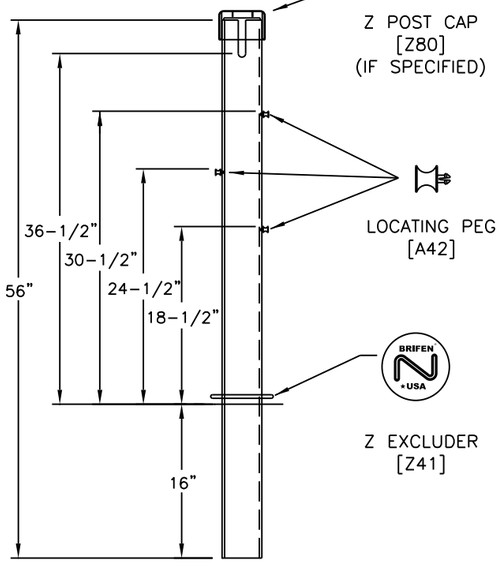
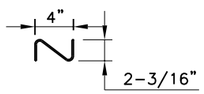
LINE POST ASSEMBLY
[Z11]



ELEVATION

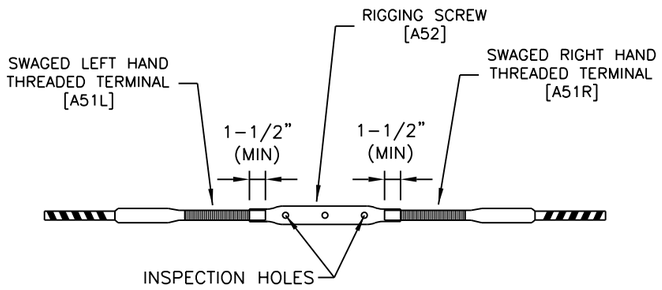


PLAN

NOTES SPECIFIC TO LINE POST ASSEMBLY

1. ROPE HEIGHTS SHALL BE ±1" TO GROUND LINE.
2. POST SHALL BE ±4" FROM VERTICAL PLUMB.
3. POST CAPS SHALL BE USED IF SPECIFIED.
4. REFLECTORS SHALL BE SPACED ACCORDING TO AGENCY SPECIFICATIONS.
5. REFLECTORS CAN BE PLACED ON THE POST CAP OR POST.

ROPE CONNECTION DETAIL

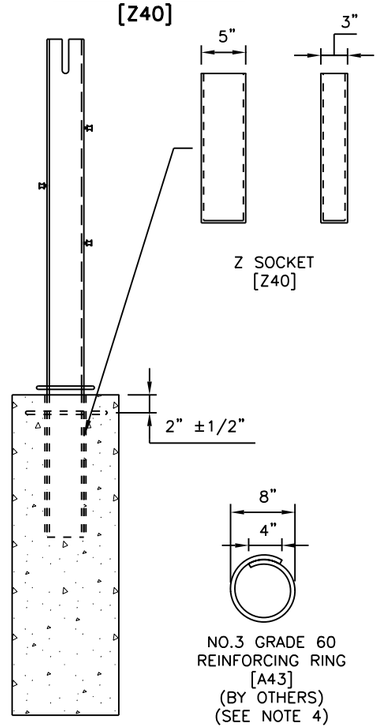


NOTES SPECIFIC TO ROPE CONNECTION DETAIL

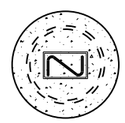
1. THE WIRE ROPE TERMINALS SHALL BE THREADED A MINIMUM OF 1-1/2" INTO RIGGING SCREW.
2. AFTER FINAL TENSIONING, THE TERMINALS SHALL BE VISIBLE IN THE INSPECTION HOLES.

SOCKET ASSEMBLY

CONCRETE FOOTING
[Z40]



ELEVATION

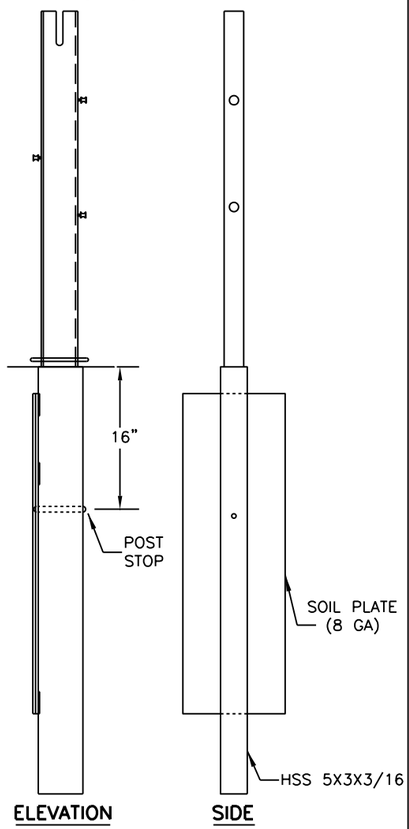


PLAN

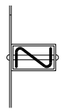
NOTES SPECIFIC TO CONCRETE FOOTING

1. SIZE OF FOOTING WILL BE DETERMINED BY SOIL CONDITIONS, FOUNDATION TYPE AND PROJECT CONDITIONS.
2. CONCRETE BASED ON AGENCY SPECIFICATIONS.
3. CONCRETE BY OTHERS.
4. REINFORCING RING (BY OTHERS) WILL BE USED ACCORDING TO FOUNDATION SIZE AND TYPE. THE REINFORCEING RING MAY BE OMITTED IF THE FOOTING IS PLACED IN A CONTINOUS CONCRETE MOW STRIP.
5. FOOTING SHALL BE FLUSH WITH THE GROUND LINE, TO A MAXIMUM OF 1 INCH BELOW OR ABOVE GROUND LINE.
6. SOCKET SHALL BE ±2° OF VERTICAL PLUMB.

DRIVE SOCKET
[Z44]



ELEVATION SIDE



PLAN

NOTES SPECIFIC TO DRIVE SOCKETS

1. SIZE OF SOIL PLATE WILL BE DETERMINED BY SOIL CONDITIONS AND PROJECT CONDITIONS.
2. THE SOIL PLATE SHALL BE PARALLEL TO ROADWAY AND CAN FACE TOWARD OR AWAY FROM THE TRAVEL LANE.
3. FOOTING SHALL BE FLUSH WITH THE GROUND LINE, TO A MAXIMUM OF 1 INCH BELOW OR ABOVE GROUND LINE.
4. SOCKET SHALL BE ±2° OF VERTICAL PLUM.
5. SOCKETS SHALL BE DRIVEN IN A MANNER TO NOT DISTORT OR DESTROY THE TOP OF SOCKET TO A DEGREE THAT PLACES THE SOCKET OR LINE POST OUT OF CONSTRUCTION TOLERANCES.

GENERAL NOTES:

1. BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. 1-866-427-4336.
2. THE BRIFEN WRSF HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-4 CONDITIONS ON SLOPES 6:1 OR FLATTER AND NCHRP 350 TL-3 CONDITIONS ON SLOPES 4:1 TO 6:1.
3. THE POST SPACING SHALL BE DETERMINED BY THE SPECIFYING AGENCY. POST SPACING MAY BE DECREASED TO AVOID OBSTRUCTIONS OR UTILITIES. IN NO EVENT SHALL THE POST SPACING EXCEED 21'-0".
4. BRIFEN WRSF SHALL BE PLACED ON A SMOOTH SURFACE, WITHOUT HUMPS, DROP-OFFS, HOLES, ETC THAT WOULD INTERFERE WITH THE STABILITY OF THE ERRANT VEHICLE. GRADING, FILL AND COMPACTION MAY BE REQUIRED TO ASSURE THAT ROPES ARE INSTALLED AT THE DESIGN HEIGHT.

Texas Department of Transportation

Design Division Standard

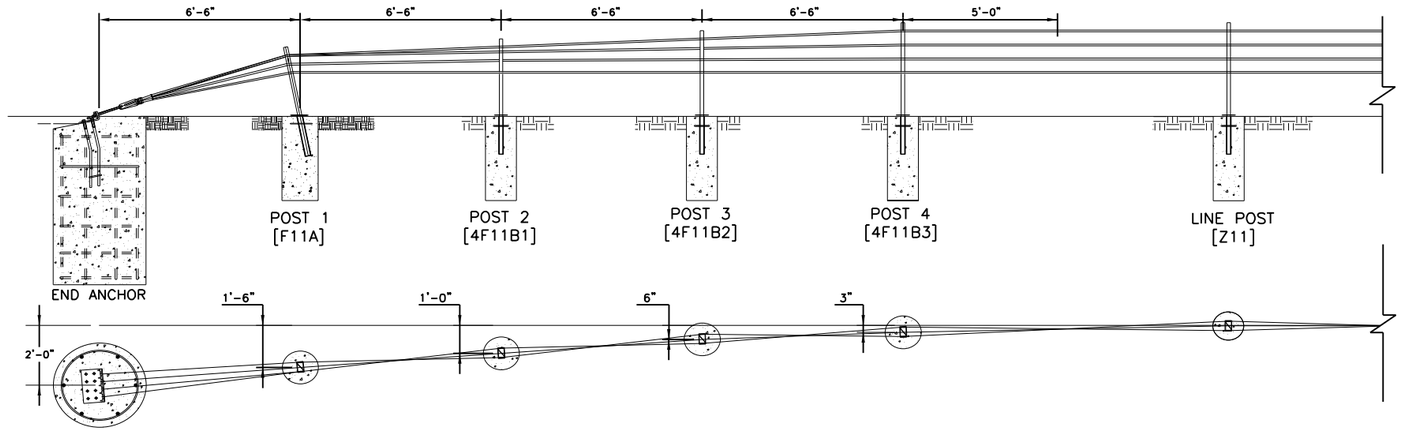
BRIFEN
WIRE ROPE SAFETY FENCE
(TL-4)

BRIFEN(TL4)-14

FILE: brifent1414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: MARCH 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		106

DATE: 3/21/2024
FILE: c:\pwworking\ustx\dms25327\BRIFEN(TL4)-14_Sht3.dgn

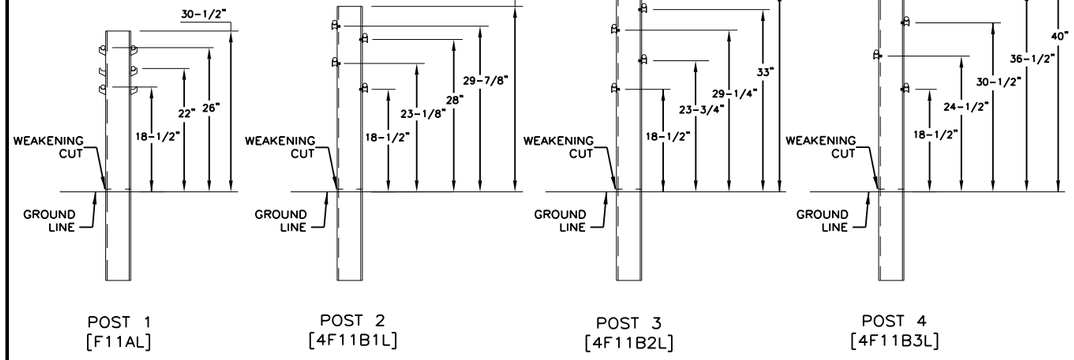
WRGT-FL END ANCHOR LAYOUT



GENERAL NOTES:

1. BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. AT 1-866-427-4336.
2. THE WRGT-FL END ANCHOR HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-3 CONDITIONS. THE LENGTH OF NEED BEGINS 31'-0" FROM THE END ANCHOR. POSTS A THROUGH POST B3, SPACED 6'-6" APART, HAVE WEAKENED CUTS AT THE GROUND THAT SHALL FACE THE ANCHOR.
3. ANCHOR AND LINE POST DIMENSIONS AND STEEL REINFORCEMENT WILL BE DETERMINED ON PROJECT SPECIFIC SOIL CLASSIFICATION, PROPERTIES AND TEMPERATURE EXTREMES. CONTACT BRIFEN USA, INC. FOR ADDITIONAL INFORMATION.
4. ALL REINFORCEMENT AND CONCRETE FOR THE ANCHORS AND LINE POSTS PROVIDED BY OTHERS.
5. REINFORCEMENT AND CONCRETE PROPERTIES SHALL MEET AGENCY SPECIFICATIONS.
6. FOR PLACEMENT NEAR GUARDRAIL OR OTHER OBSTACLES CONTACT BRIFEN USA, INC. FOR ADDITIONAL DRAWINGS AND SUPPORT.

WRGT-FL POST DETAILS

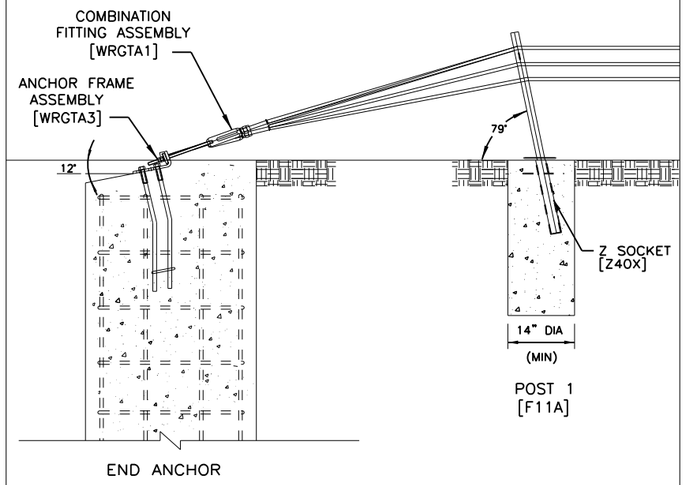


POST 1 [F11AL] | POST 2 [4F11B1L] | POST 3 [4F11B2L] | POST 4 [4F11B3L]

NOTES SPECIFIC TO WRGT-FL POST DETAIL

1. ROPE HEIGHTS SHALL BE ±1" TO GROUND LINE.
2. POST SHALL BE ±4" FROM VERTICAL PLUMB.
3. POST CAPS SHALL BE USED IF SPECIFIED.
4. REFLECTORS SHALL BE SPACED ACCORDING TO AGENCY SPECIFICATIONS.
5. REFLECTORS CAN BE PLACED ON THE POST CAP OR POST.
6. Z EXCLUDER (Z41) SHALL BE USED.
7. POST A & SOCKET SHALL BE PLACED 79" (±4") TOWARD END ANCHOR FROM THE HORIZONTAL PLANE.
8. POST A SOCKET SHALL BE PLACED IN 14" (MIN) CONCRETE FOUNDATION. DEPTH TO BE DETERMINED FROM SOIL CONDITIONS AND PROJECT CONDITIONS.
9. FOUNDATIONS FOR POST 2 THRU 4 SHALL BE THE SAME AS THE LINE POST ASSEMBLY'S FOR THE PROJECT.
10. WEAKENED CUTS SHALL FACE END ANCHOR.

END ANCHOR DETAILS

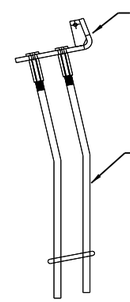


NOTES SPECIFIC TO END ANCHOR DETAIL

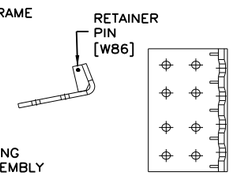
1. THE END ANCHOR ASSEMBLY SHALL BE PLACED 12" (+3", -1") BELOW HORIZONTAL PLANE.
2. POST 1 & SOCKET SHALL BE PLACED 79" (±4") TOWARD END ANCHOR FROM THE HORIZONTAL PLANE.
3. POST 1 SOCKET SHALL BE PLACED IN 14" (MIN) CONCRETE FOUNDATION. DEPTH TO BE DETERMINED FROM SOIL CONDITIONS AND PROJECT CONDITIONS.

END ANCHOR COMPONENTS

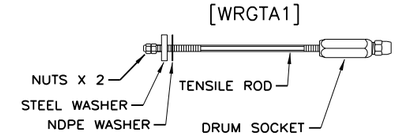
ANCHOR FRAME ASSEMBLY



ANCHOR FRAME [A70]



COMBINATION FITTING [WRGTA1]



SHEET 3 OF 3

Texas Department of Transportation — Design Division Standard

BRIFEN
WIRE ROPE SAFETY FENCE
(TL-4)

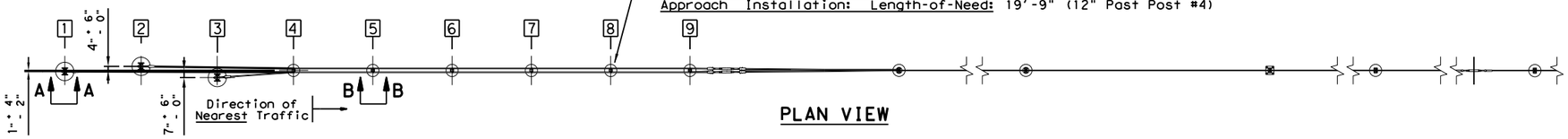
BRIFEN(TL4)-14

FILE: brifent1414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:	
©TxDOT: MARCH 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0013	07	086, ETC	US 81	
	DIST	COUNTY		SHEET NO.	
	FTW	WISE		107	

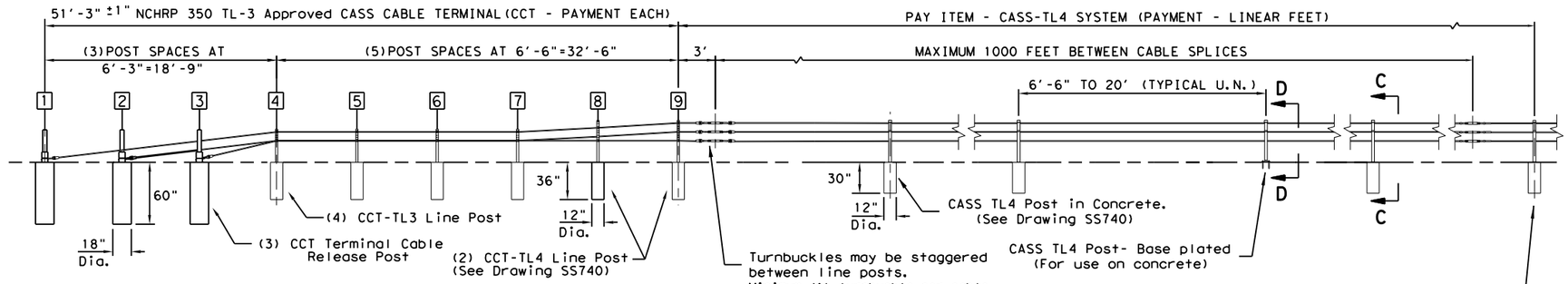
DATE: 3/21/2024
FILE: c:\pwworking\ustx\dms25327\CASS(TL4)-14.dgn

Preferred Installation: Locate post #2 away from nearest traffic.
System has been succesfully tested with opposite installation.

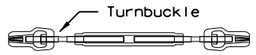
Length-of-Need Cass Cable Terminal (CCT):
Departure Installation: Length-of-Need: 44'-9" (At Post #8)
Approach Installation: Length-of-Need: 19'-9" (12" Past Post #4)



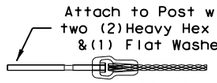
PLAN VIEW



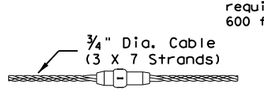
ELEVATION VIEW
(TYPICAL LAY-OUT)



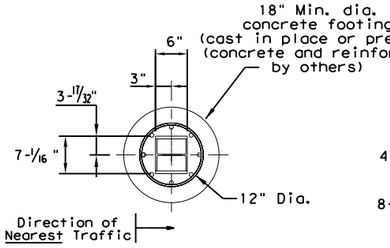
CABLE SPLICE WITH TURNBUCKLE
(OPEN BODY STYLE)



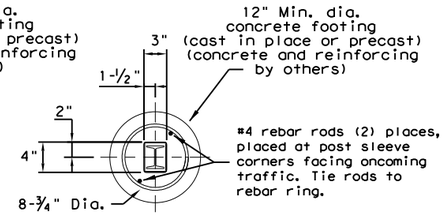
CABLE STUD ASSEMBLY



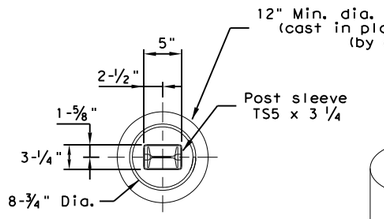
TORPEDO CABLE SPLICE



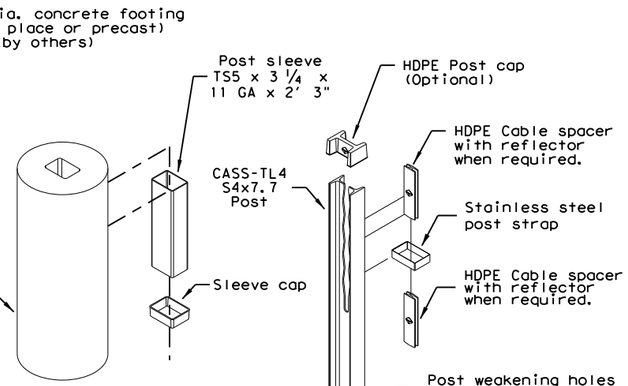
SECTION E-E



SECTION F-F

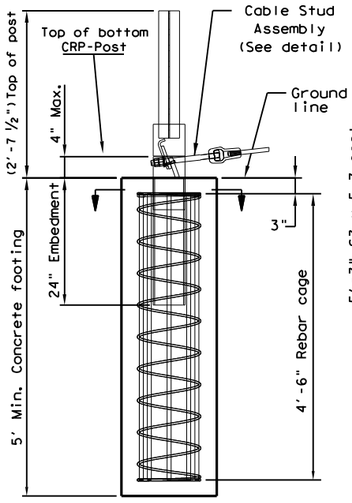


SECTION G-G

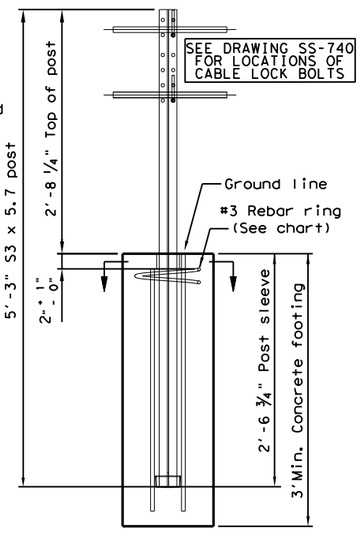


CONCRETE FOOTING
(IN QUALIFYING MOW STRIP SEE CHART)

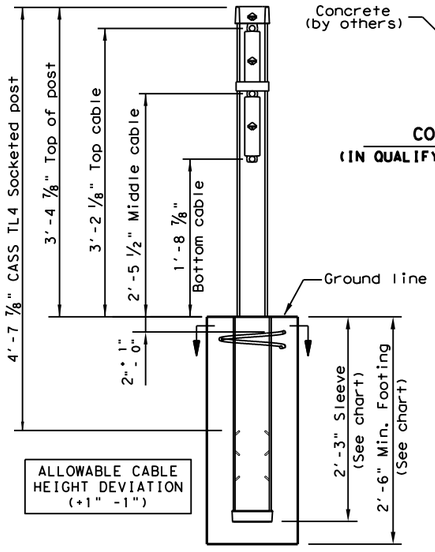
STANDARD POST & CONCRETE FOOTING
(SOCKETED POST)



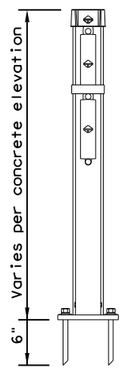
VIEW A-A
(CABLE RELEASE POST 1-3)



VIEW B-B
(TERMINAL LINE POST 4-7)



SECTION C-C
(SOCKETED POST)



SECTION D-D
(BASE PLATED POST)

GENERAL NOTES

1. This drawing is a general overview of CASS TL-4 Barrier System. See SS-740 (latest version) for specific details of CASS cable terminal (CCT) and cable safety system (CASS) requirements, proper installation, options and specification.
2. CASS is designed for bi-directional traffic flows and can be installed on either side of the median. Contact Trinity (800-527-6050) or consult the design, installation, or repair manual(s) for additional information.
3. All concrete for CASS footings shall be TxDOT class A. If class A or stronger concrete is utilized for the mowstrip, please see chart below for allowable footing depth and sleeve deviations.
4. All posts shall be socketed unless otherwise specified. All cables shall be pre-stretched unless otherwise specified.
5. For payment see Special Specification "Cable Barrier System".
6. CASS-TL4 shall be installed on shoulders or medians with slopes of 6:1 or flatter without obstructions, depressions, etc. That may significantly affect the stability of an errant vehicle. Grading of site and/or appropriate fill materials may be required. The designer/installer shall "Flatten" or "Round" various topographical inconsistencies that could interfere with the ability of the installer to consistently maintain the design height (in relation to the terrain) of the cables. Please consult manual(s) and / or TxDOT Memo(s) for installations in "Ditch Sections".
7. CASS TL-4 post spacing may be modified to avoid obstacles that conflict with the installation of cass-tl4 line posts or to reduce deflection on radiuses. No post space can exceed the maximum post TxDOT space limit of 20'. Reducing or increasing post spacing affects deflection. CASS TL-4 may be laterally transferred at a rate not to exceed 30:1.
8. Post foundations may be drilled through existing pavement. Please see line post foundation chart for minimum footing requirements in various applications.
9. For aesthetic purposes Trinity recommends all sleeves, driven posts, and lower cable release posts to be installed reasonably plumb (approximately 1/8" per foot).
10. CASS TL-4 shall be installed in well-drained, compacted, NCHRP Report 350 Standard soil. If soil does not meet this classification, if solid rock/concrete is encountered below grade or if soil is susceptable to severe freeze/thaw cycles, please contact Trinity about alternate footing design(s). Trinity suggests the use of "Mow strips" for erosion prevention and ease of maintenance / installation.
11. See the Texas MUTCD for proper "Barrier" Delineation.

MOW STRIP DETAIL*			CONCRETE FOOTING CHART		
MOW STRIP	DEPTH	WIDTH	FOOTING	TUBE SLEEVE	REBAR RING
NONE			30" Min.	27" Min.	YES
HMA	6" Min.	3' Min.	27" Min.	15" Min.	NO
HMA	8" Min.	3' Min.	24" Min.	15" Min.	NO
RC	3" Min.	3' Min.	24" Min.	15" Min.	NO

Chart does not apply to Terminal Posts 1 thru 9.
* Mow strip or pavement.
HMA = Hot Mix Asphalt (Not Recycled Asphalt Pavement).
RC = Reinforced Concrete (TxDOT Class A Minimum).

CABLE TENSION CHART	
FAHRENHEIT	PRE-STRETCHED
DEGREES	LB / FORCE
-10	7300
0	7000
10	6600
20	6300
30	6000
40	5600
50	5300
60	5000
70	4600
80	4300
90	4000
100	3600
110	3300
120	3000
130	2700
140	2500
150	2300

Allowable deviation from chart in tangent sections: +800, -200 pounds/force. Cable tension readings are typically higher in curved cable sections.

Trinity Highway Products, LLC.
2525 Stemmons Freeway
Dallas, TX 75207
Phone: (800) 644-7976

Product.INFO@TRIN.NET

Texas Department of Transportation
Design Division Standard

TRINITY CABLE SAFETY SYSTEM (TL-4)

CASS(TL4)-14

FILE: casstl414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:	
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0013	07	086, ETC	US 81	
	DIST	COUNTY		SHEET NO.	
	FTW	WISE		108	

DATE: 3/21/2024
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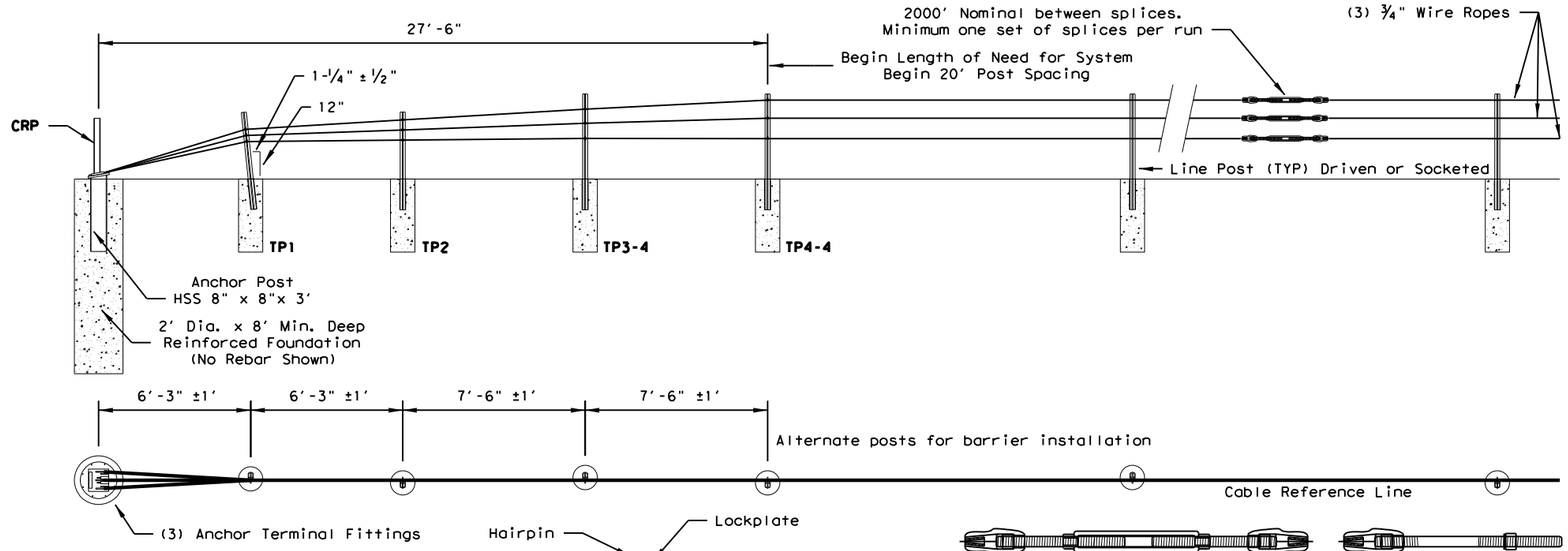
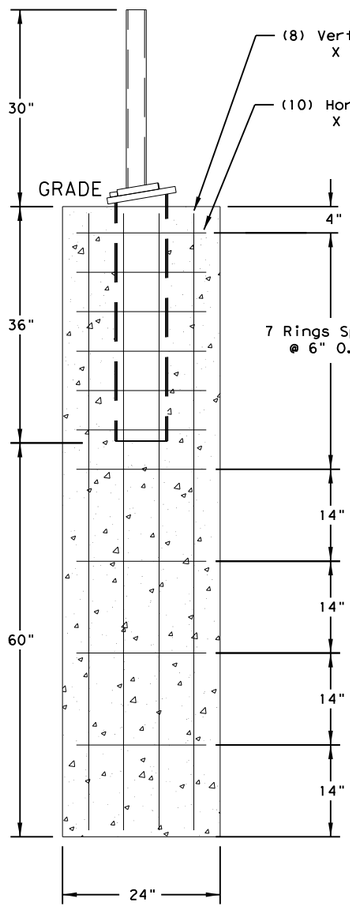
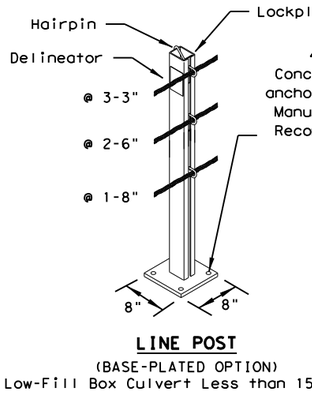
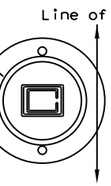




CABLE RELEASE AND ANCHOR POST



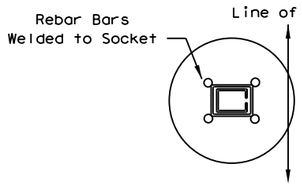
LINE POST
(BASE-PLATED OPTION)
Low-Fill Box Culvert Less than 15" Fill



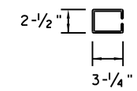
SECTION A

¾" MIN
T/B CABLE SPLICE FITTING

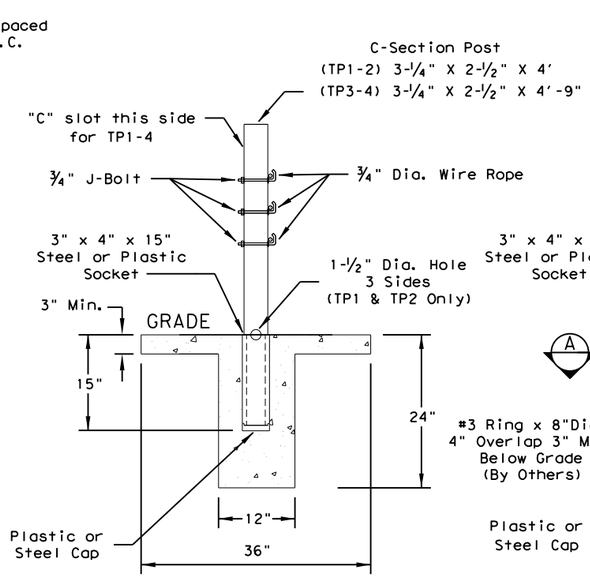
¾" MIN
TERMINAL FITTING



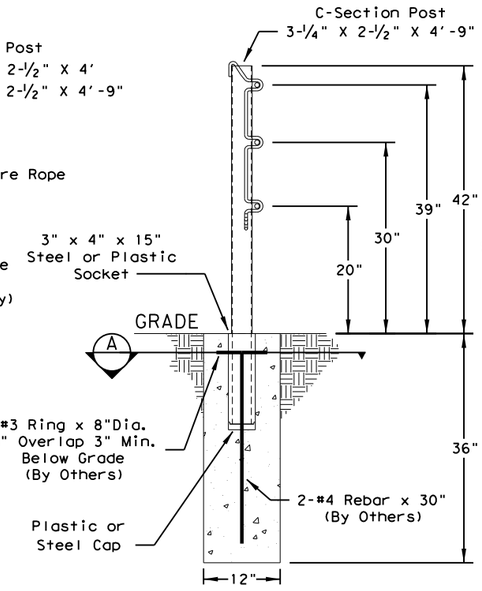
SECTION B



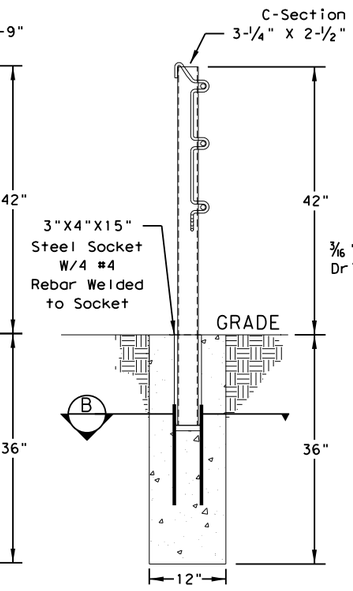
C-SECTION POST



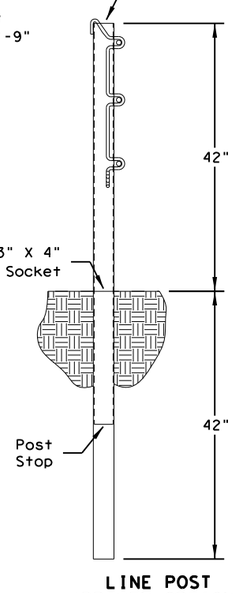
TERMINAL POST
(SHOWN WITH CONCRETE MOWSTRIP)
(Shown with Tube Plate Option)
(See Note 10)



LINE POST SOCKETED
(Shown with Rebar Ring/Bars Socket Option)
(See Note 9)



LINE POST SOCKETED
(Shown with Welded Rebar Socket Option)
(See Note 9)



LINE POST
(DRIVEN OPTION)
(Shown with Driven
Socket Option)
(See Note 9)

GENERAL NOTES

1. For additional information contact Gibraltar, Inc. at 1-800-495-8957, 830-798-5444, or see the manufacturer's product manual.
2. All concrete shall be CLASS A.
3. The Cable Barrier System shall be installed on shoulders or on medians with slopes of 6:1 or flatter. If installed on slopes steeper than 6:1 up to 4:1 the TL-4 system performs as a TL-3 and Gibraltar must be contacted for various guidelines related to placement.
4. The Cable Barrier System is accepted by the FHWA Test Level - 4.
5. See the Texas MUTCD for proper "Barrier" delineation.
6. Rock Clause: Where solid rock is encountered:
   A. For socketed post, continue digging 12" diameter, 15" deep into rock or the required plan depth, whichever comes first.
   B. For driven post, core drill a 4" diameter hole 18" deep into rock or the required plan depth, whichever comes first.
   C. For Anchor post, continue digging 24" diameter, 30" deep into rock or the required plan depth, whichever comes first.
7. Tolerances:
   * LP = 3" out of plumb, at top
   * Cable height = 1"
   * Anchor Post = 5" off of Cable Reference Line
8. The Gibraltar cable barrier system shall be installed in NCHRP Report 350 standard compacted soil. Soil must be well drained.
9. All non-welded rebar by others.
10. Minimum recommended line post foundation.
    A. Without mowstrip, 36" Deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long
    B. With 4" minimum depth hot mix asphalt, 30" deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long.
    C. With 3" minimum depth concrete mowstrip, 24" deep x 12" diameter foundations. (No rebar required)
    D. Direct drive post 42" deep.

CABLE TENSION CHART*	
-10 °F	8000
0 °F	7600
10 °F	7200
20 °F	6800
30 °F	6400
40 °F	6000
50 °F	5600
60 °F	5200
70 °F	4800
80 °F	4400
90 °F	4000
100 °F	3600
110 °F	3200

DEFLECTION	
Deflection	Post Spacing
8'-0"	20 FT
7'-0"	12 FT
6'-8"	10 FT

* Allowable Deviation from Chart +/- 10%

Texas Department of Transportation — Design Division Standard

GIBRALTAR
CABLE BARRIER SYSTEM
(TL-4)

GBRLTR(TL4)-14

FILE: gbrltrtl414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		109

DATE: 3/21/2024
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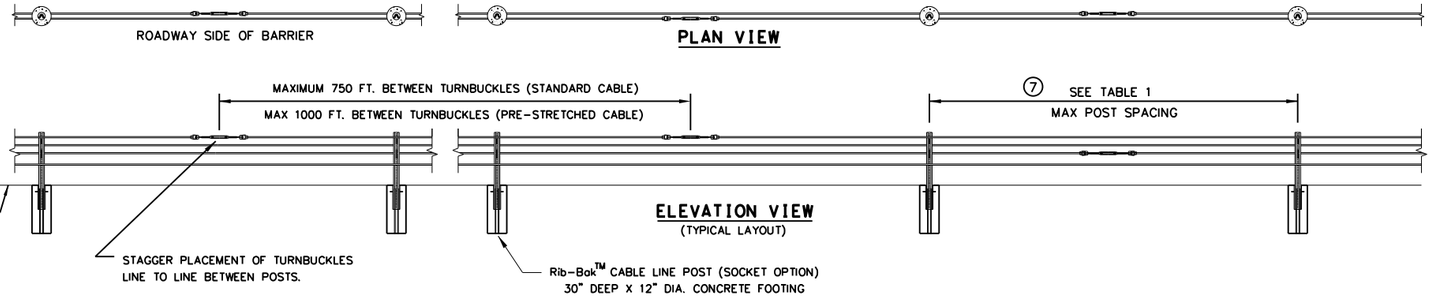
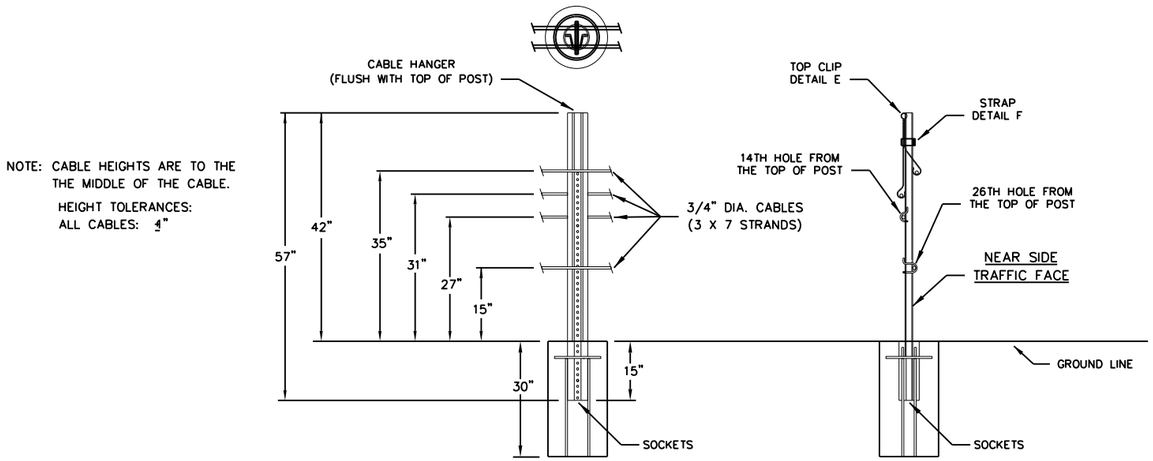
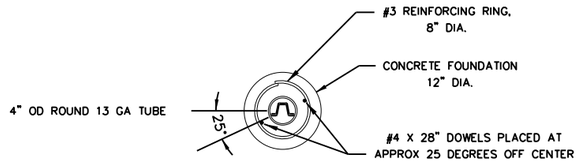
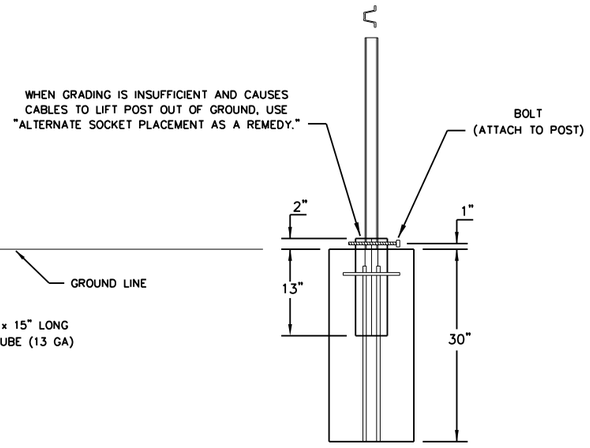




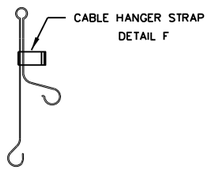
INSTALLATION DETAIL
4 CABLE 6:1



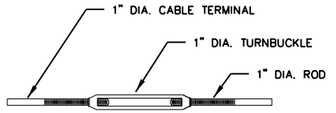
⑪ **SOCKETED POST OPTION**
(TYPE S POST)



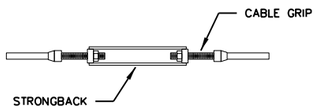
ALTERNATE SOCKET PLACEMENT
(TYPE S POST)



CABLE HANGER BRACKET
DETAIL E
(SUBJECT TO MANUFACTURER'S TOLERANCES)



WEDGED FITTING
TURNBUCKLE DETAIL
(TYPICAL)



STRONGBACK (SELF-SWAGING)
TURNBUCKLE DETAIL
(OPTIONAL)

GENERAL NOTES

1. FOR ADDITIONAL INFORMATION CONTACT YOUR DISTRIBUTOR OR NUCOR STEEL MARION, INC. AT (740) 383-4011.
2. FOR PAYMENT SEE SPECIAL SPECIFICATION "CABLE BARRIER SYSTEM".
3. FOR ADDITIONAL INFORMATION SEE THE MANUFACTURER'S PRODUCT MANUAL.
4. THE NU-CABLE SYSTEM IS DESIGNED FOR BI-DIRECTIONAL TRAFFIC FLOWS. SEE THE MANUFACTURER'S PRODUCT MANUAL FOR PLACEMENT ADJACENT TO GUARDRAIL END TREATMENTS.
5. THE NU-CABLE SYSTEM SHALL BE INSTALLED ON MEDIANS WITH SLOPES OF 6:1 OR FLATTER WITHOUT OBSTRUCTIONS, DEPRESSIONS, ETC; THAT MAY SIGNIFICANTLY AFFECT THE STABILITY OF AN ERRANT VEHICLE.
6. THE NU-CABLE SYSTEM MAY BE INSTALLED ON EITHER SIDE OF THE ROADWAY. Rib-Bak™ CABLE LINE POSTS MAY BE SOCKETED OR DRIVEN DESIGN.
7. THE TL-4 FOR 6:1 SLOPES CAN USE 4# / LF POST. SEE TABLE #1 FOR POST SIZE PER SPACING.
8. SEE (TABLE 2) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR INITIAL INSTALLATION.
9. SEE (TABLE 3) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR MAINTENANCE.
10. FOURTH (LOWEST) CABLE IS NOT OPTIONAL ON THE TL-4 SYSTEM.
11. CONSULT YOUR PROJECT PLAN SHEETS AND CABLE BARRIER SPECIFICATIONS FOR DESIRED SOCKET MATERIAL.
12. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGN IF SOIL TYPES DIFFER.

⑦ TABLE 1

POST SIZE TABLE	
POST SPACING	POST SIZE
0' - 17'-6"	4# / LF X 4' OR 6' POST
17'-6" - 20'	5# / LF X 4' POST

POST SPACING IS PER 8 FOOT DEFLECTION REQUIRMENTS.
CONSULT PRODUCT MANUAL IF GREATER DEFLECTION IS PERMISSIBLE.

⑧ TABLE 2

CABLE TENSION CHART	
INITIAL INSTALL	
F	LBF
120	4624
110	4986
100	5350
90	5713
80	6077
70	6440
60	7167
50	7894
40	8619
30	9346
20	10073
10	10800
0	11525
-10	12252
-20	12979
-30	13706

⑨ TABLE 3

CABLE TENSION CHART	
MAINTENANCE	
F	LBF
120	4021
110	4336
100	4652
90	4968
80	5284
70	5600
60	6232
50	6864
40	7495
30	8127
20	8759
10	9391
0	10022
-10	10654
-20	11286
-30	11918

Texas Department of Transportation | Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-4) (4 CABLE)

NU-CABLE(TL4)-14

FILE: nucable1414	DN: TxDOT		CK: RM	DW: VP		CK:
©TxDOT: March 2014	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0013	07	086, ETC		US 81	
	DIST	COUNTY			SHEET NO.	
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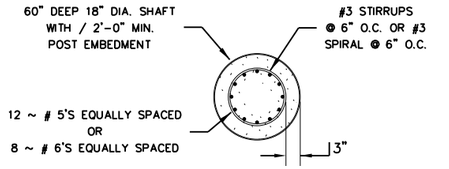
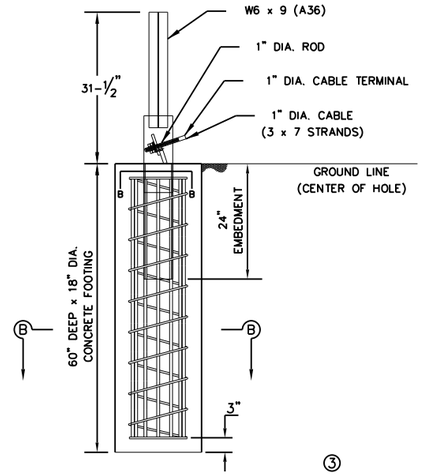
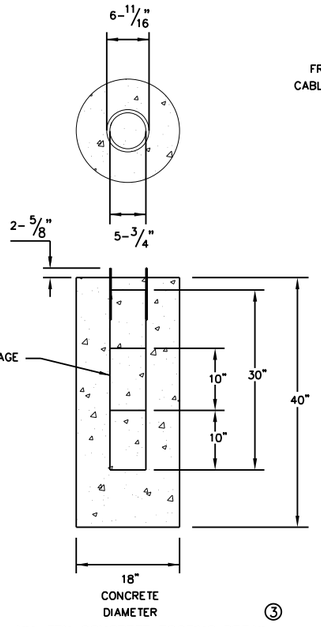


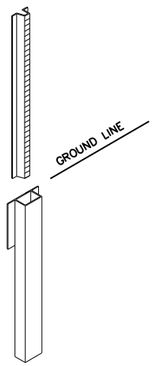
SECTION B-B
(CABLE RELEASE POST)



DETAIL A – CRP IN CONCRETE FOOTING ③
(3000 PSI MIN CONCRETE)

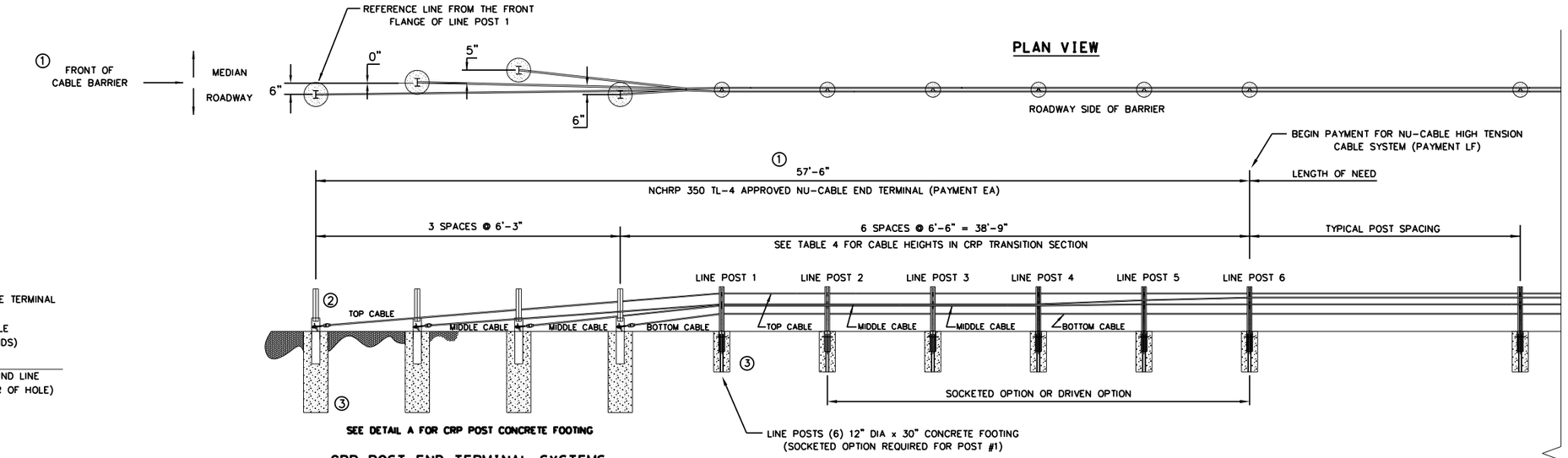


③



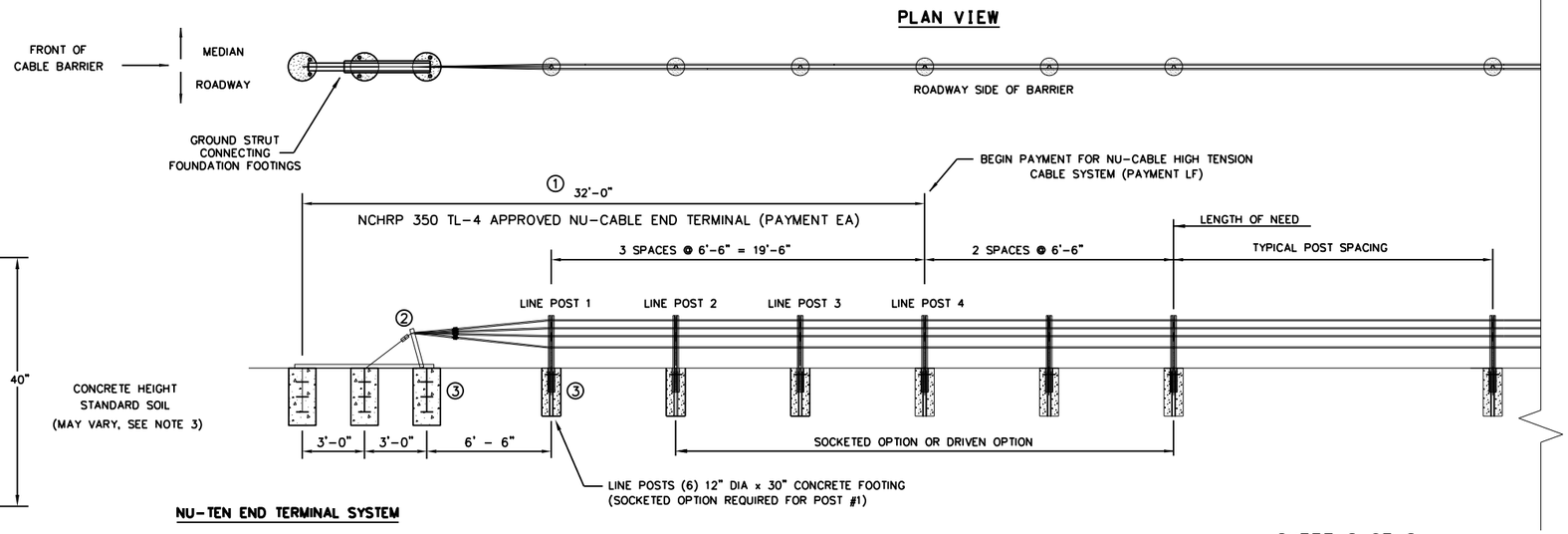
DRIVEN SOCKET OPTION

NU-TEN CONCRETE FOOTING DETAIL ③



CRP POST END TERMINAL SYSTEMS

① THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT.



NU-TEN END TERMINAL SYSTEM

④ **TABLE 4**

CRP END TERMINAL CABLE HEIGHTS - TL-4						
	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	34"	34"	34"	34"	34"	34"
UPPER-MIDDLE CABLE	27"	27"	27"	27"	28"	31"
BOTTOM-MIDDLE CABLE	24"	24"	24"	24"	24"	24"
BOTTOM CABLE	15"	15"	15"	15"	15"	15"

NOTES

1. THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT. SYSTEM PAYMENT IS PER EACH (EA). REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL PAYMENT INFORMATION
2. REFER TO INSTALLATION MANUAL FOR CABLE END ASSEMBLY DETAIL.
3. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGNS IF SOIL TYPES DIFFER.
4. SEE TABLE 4 CABLE HEIGHTS IN CRP TRANSITION SECTION.

Texas Department of Transportation | Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-4) (4 CABLE)

NU-CABLE(TL4)-14

FILE: nucable1414	DN: TxDOT	CK: RM	DW: VP	CK:
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
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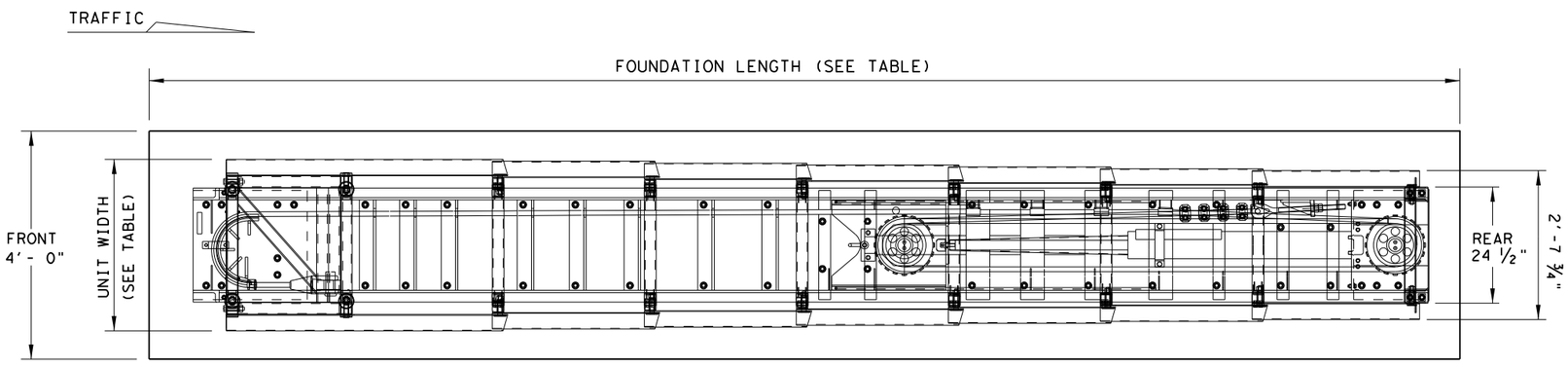
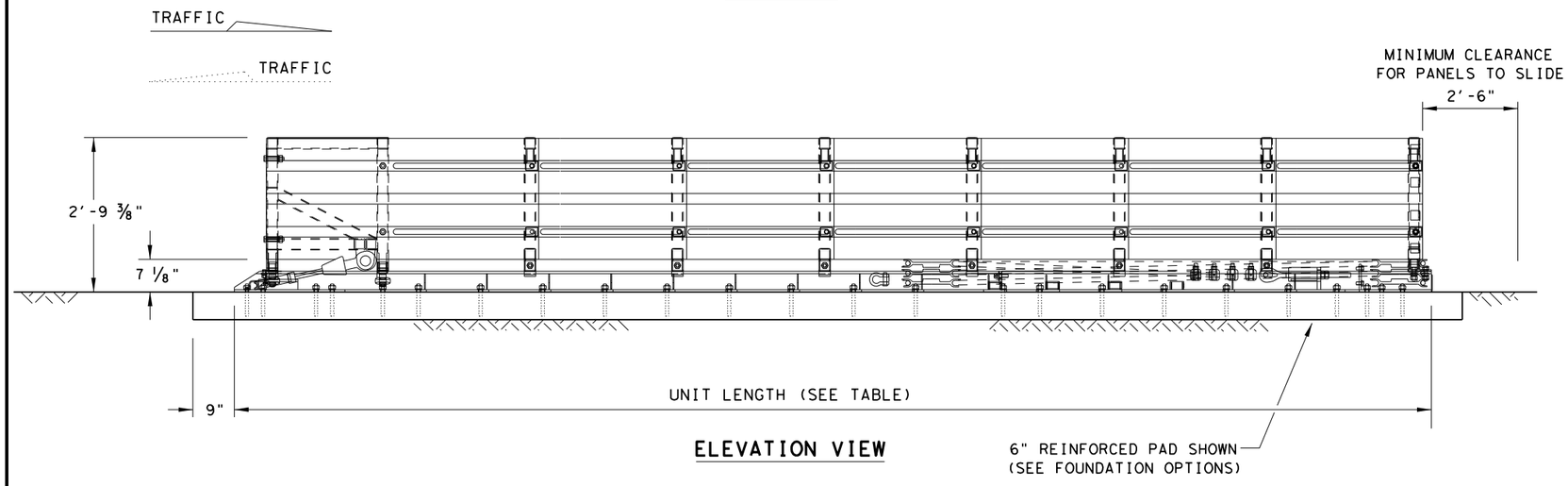


PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION AND FOUNDATION OPTION WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
5. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13'-6"	2'-10 ⅝"	15'- 6 ¼"	24"to 36"
SCI100GM	TL-3	21'-6"	3'-1 ½"	23'- 0"	24"to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 ½" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 ½" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 ½" ANCHOR EMBEDMENT)

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, SEE MANUFACTURER'S PRODUCT MANUAL.

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.

LOW MAINTENANCE

Texas Department of Transportation

Design Division Standard

WORK AREA PROTECTION CORP (SMART-NARROW)

SMTC(N)-16

FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
© TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 06, 2013 (VP) REVISED 03, 2016 (VP)	0013	07	086, ETC	US 81
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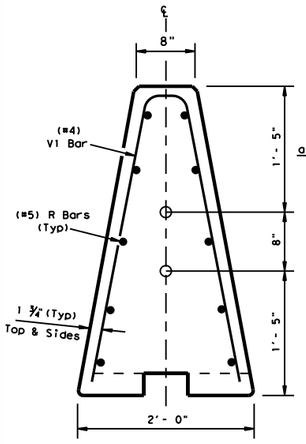
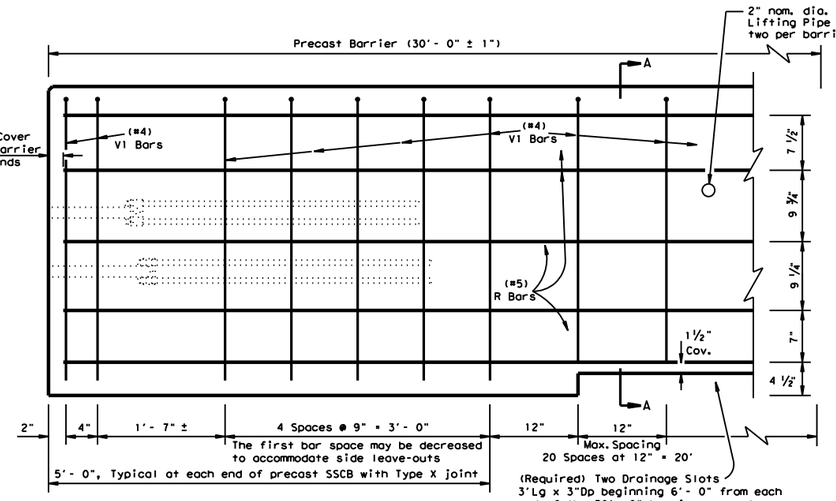


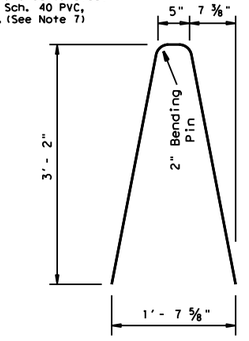
End View
Precast Barrier

Pipe locations for Joint Type X connection



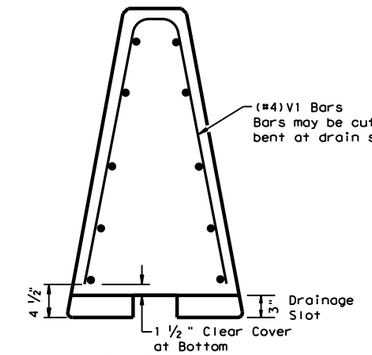
Reinforcement for Precast (SSCB)
Single Slope Concrete Barrier (Type 1)

Showing reinforcement for Joint Connection (Type X)



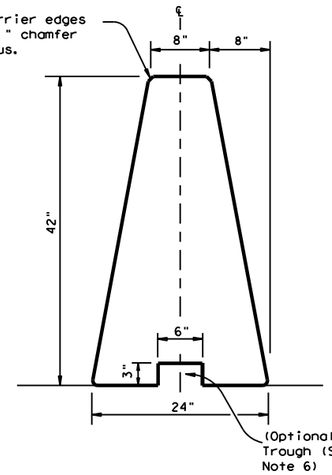
V1 Bar
#4 Rebar

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



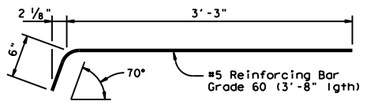
Section A-A
Steel Placement at (Required) Drainage Slots

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



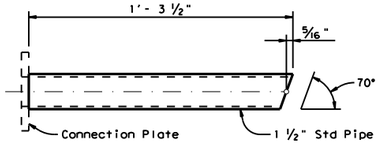
Single Slope Concrete Traffic Barrier

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



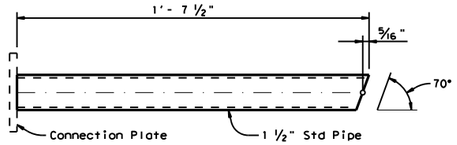
DEFORMED BAR ANCHOR DETAILS

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



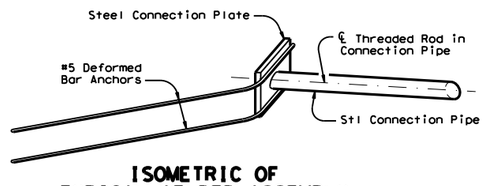
UPPER CONNECTION PIPE DETAILS

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



LOWER CONNECTION PIPE DETAILS

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

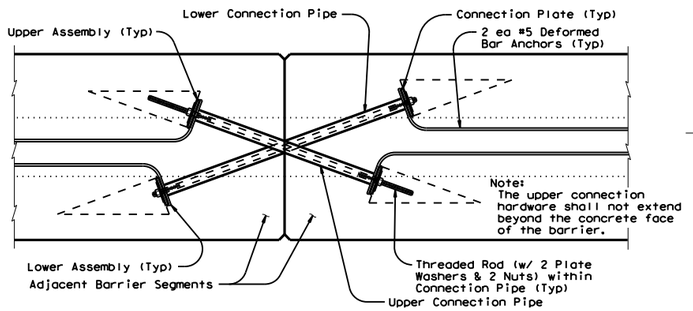


ISOMETRIC OF TYPICAL WELDED ASSEMBLY

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

General Notes

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



TYPE X JOINT INSTALLATION DETAIL

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

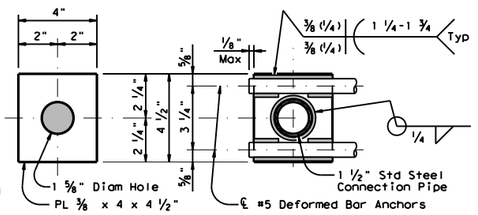
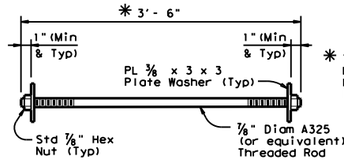


PLATE DIMENSIONS **WELDING DETAILS**

CONNECTION PLATE DETAILS

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

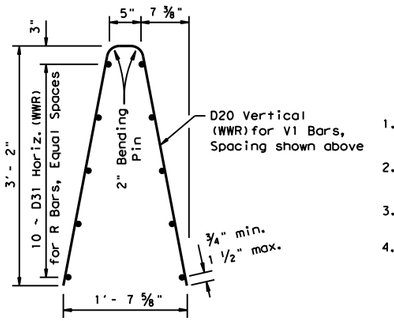


* The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.

CONNECTION BOLT OR THREADED ROD DETAIL

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

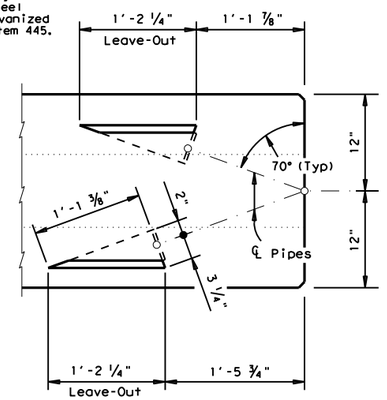
Weight of one precast 30 ft. (SSCB) segment = Approx. 10.5 Tons or 717 lbs per ft.



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

(WWR) General Notes

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



BARRIER PLAN AT JOINT

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER (TYPE 1)

SSCB(2)-10

FILE: sscb210.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
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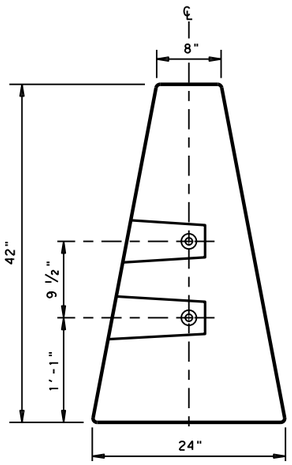
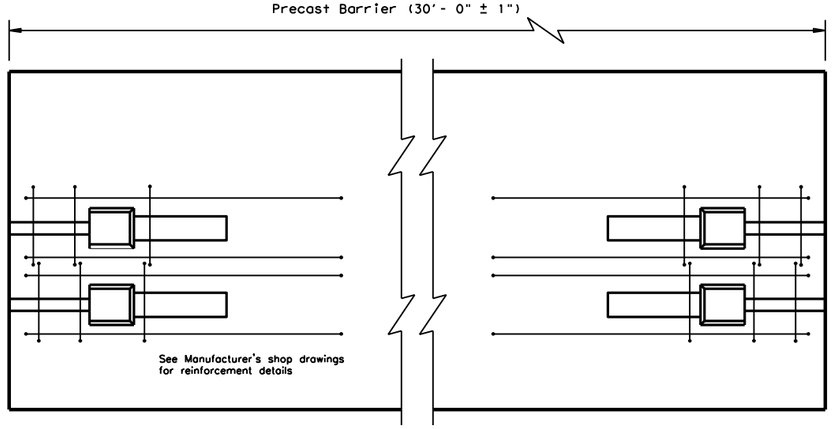
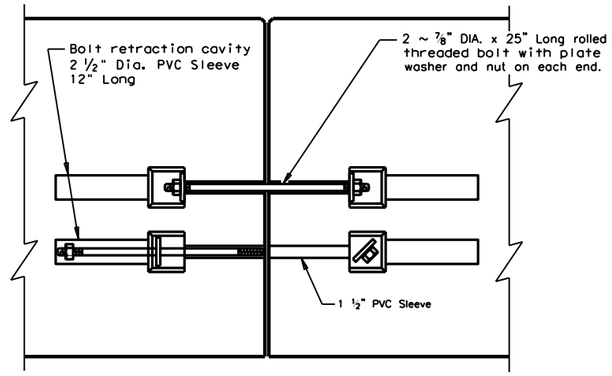
REVISIONS	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		113



END VIEW
"QUICK-BOLT" POCKET LOCATIONS

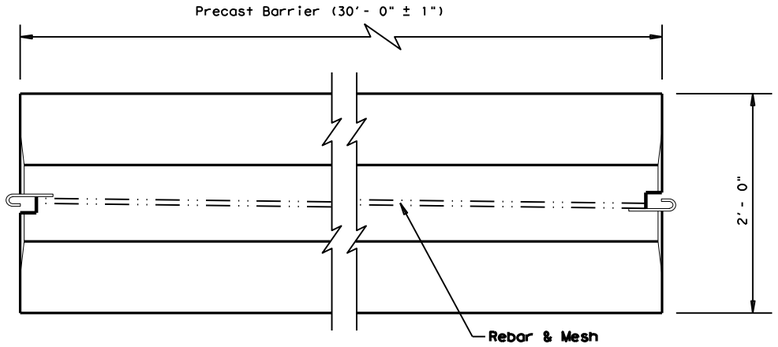


ELEVATION VIEW
"QUICK-BOLT" (SSCB)
See Manufacturer's shop drawing for additional details

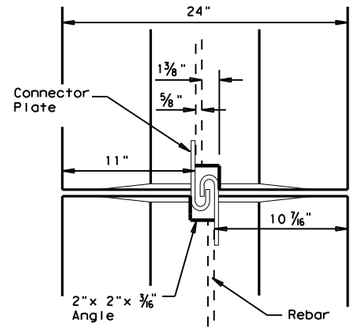


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

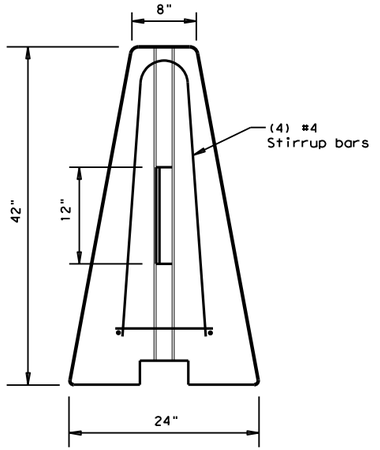
Joint Connection (Type Q)



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



VIEW FROM ABOVE
J-J HOOK CONNECTION



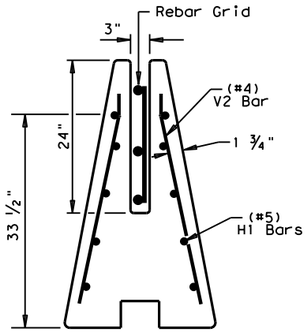
END VIEW

Proprietary Joint Connections (SSCB)

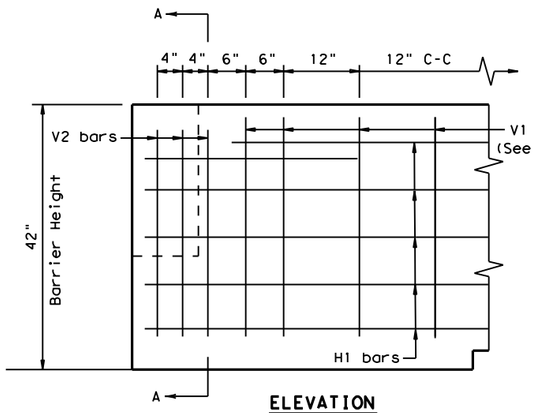
Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

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

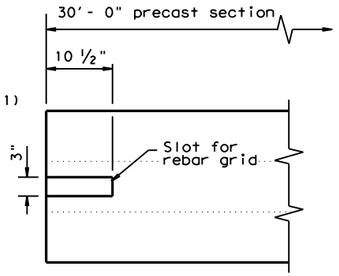
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.



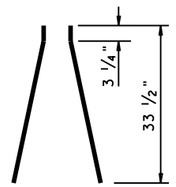
SECTION A-A
Showing (Type R) Rebar Grid



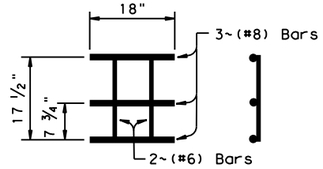
ELEVATION
V1 Bars (See Sheet 1)



TOP VIEW
JOINT CONNECTION
Typical at both ends of barrier segment



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



WELDED REBAR GRID

Joint Connection (Type R)

DATE: 3/21/2024
FILE: c:\pwworking\ustx\dms25327\SSCB(2)-10.dgn

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER
(TYPE 1)

SSCB(2)-10

FILE: sscb210.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		114

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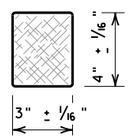
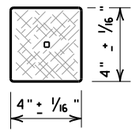
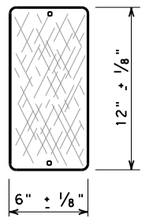
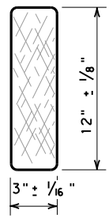
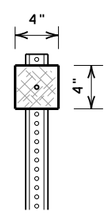
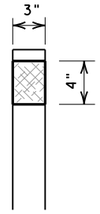
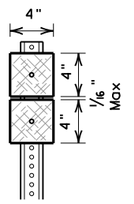
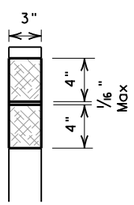
DATE: 3/21/2024 10:45:47 PM
FILE: c:\pwworking\ustx\dms25327\dom1-20.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

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

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

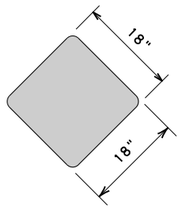
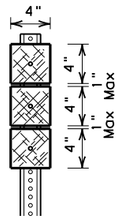
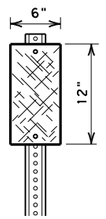
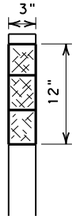
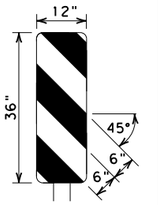
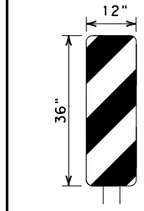
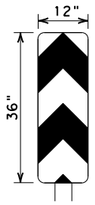
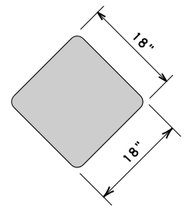
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

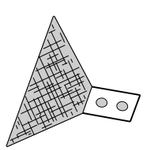
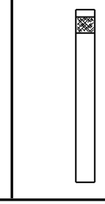
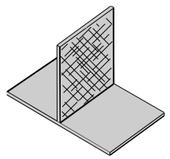
TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

OBJECT MARKERS

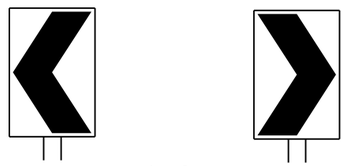
	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		 3-Size 2 reflector units	 1-Size 3 reflector unit	 3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting	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

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
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.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



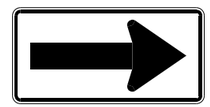
W1-8

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

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

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

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

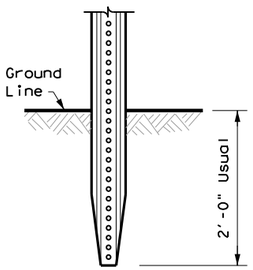
FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	FTW	WISE		115

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

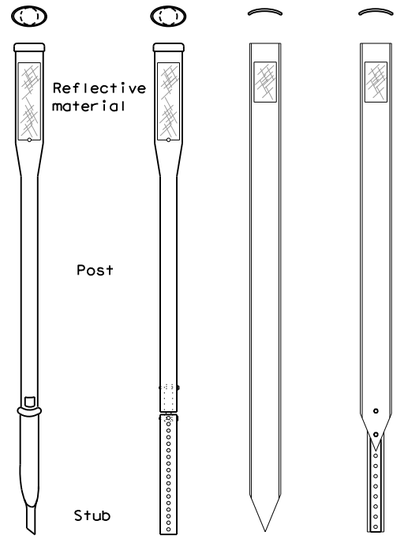


NOTES

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

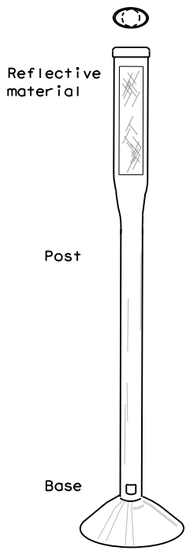
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



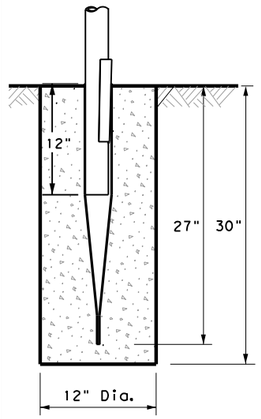
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

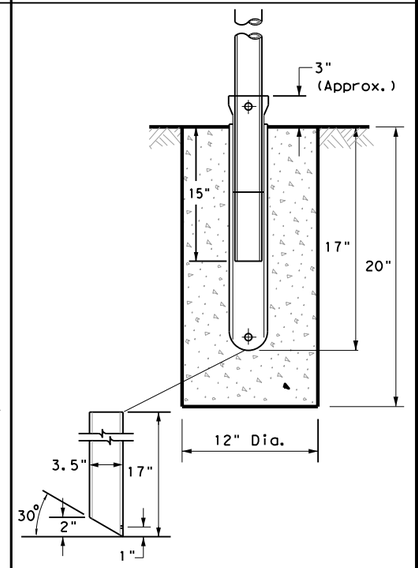
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

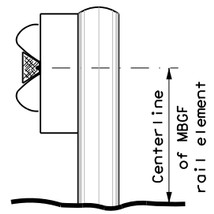
NOTE

1. Install per manufacturer's recommendations.

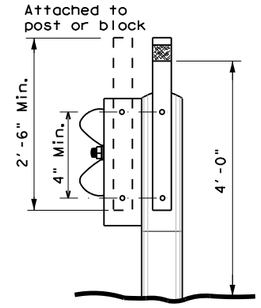
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

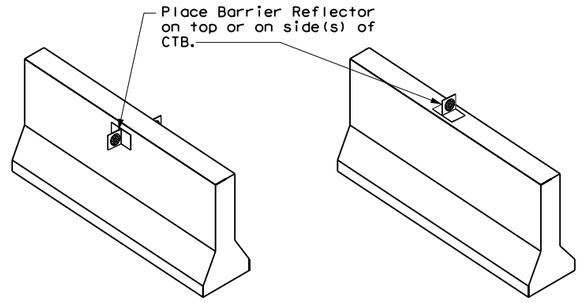
GF1



GF2



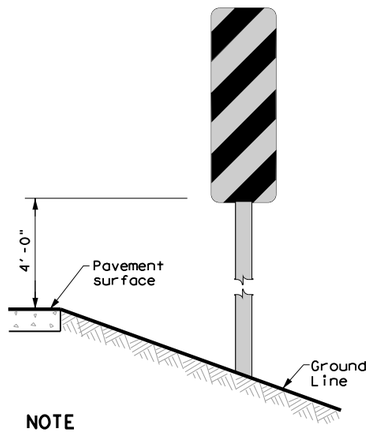
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

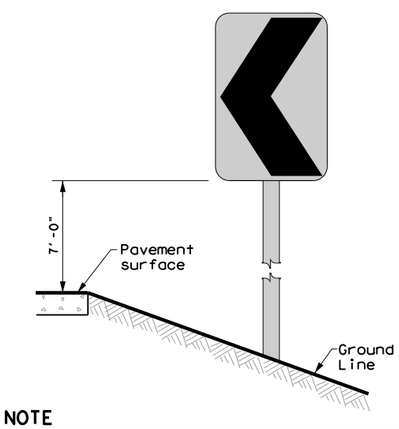
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

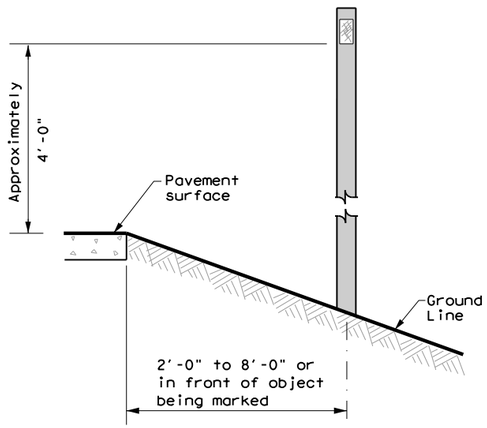
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	FTW	WISE		116

20B

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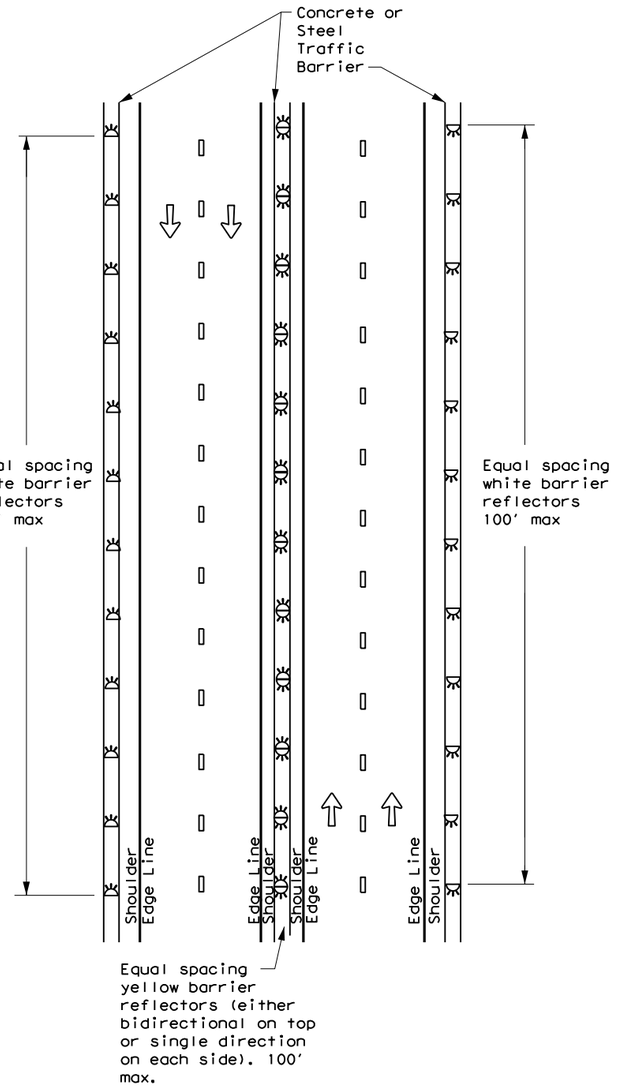
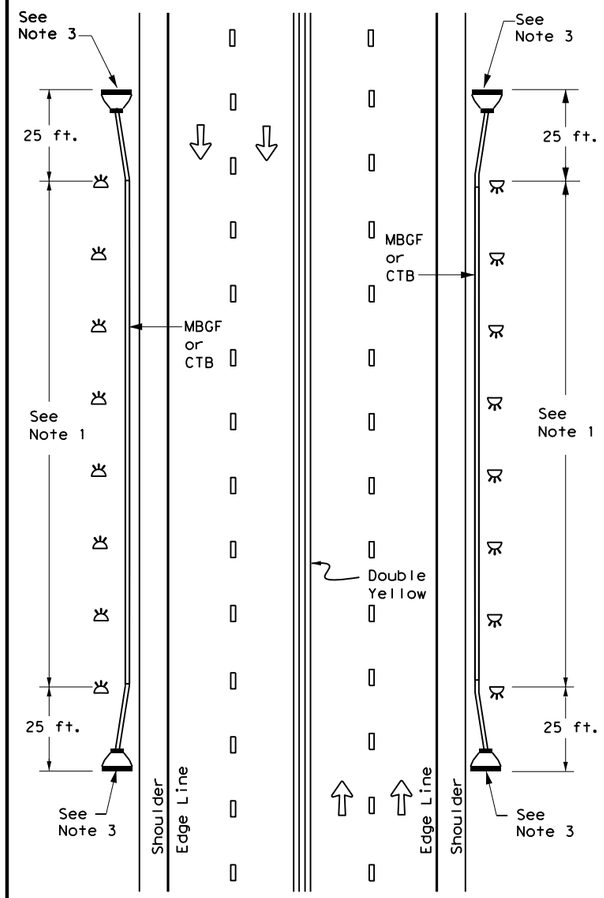
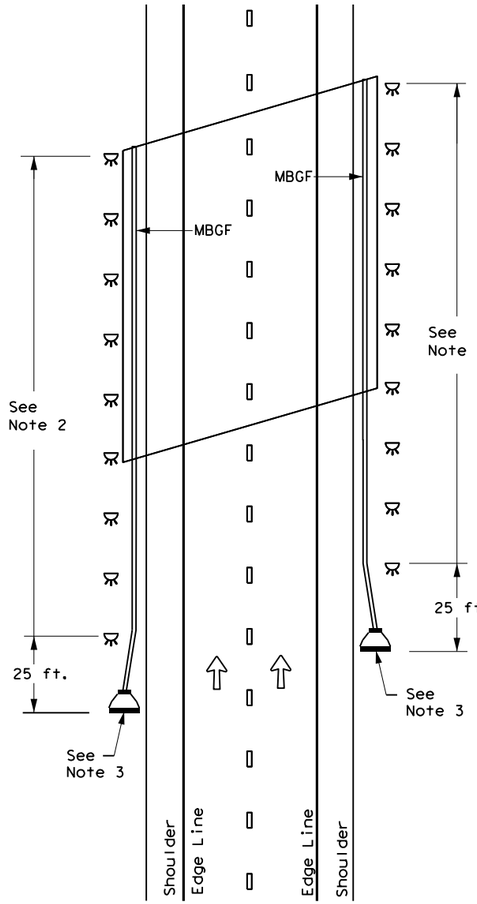
CONTINUOUS CONCRETE OR STEEL BARRIER



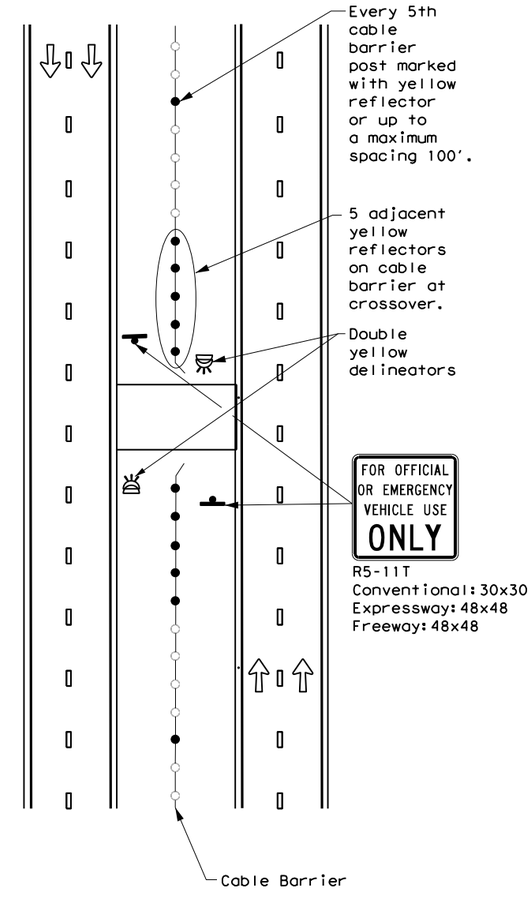
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
7-20	DIST	COUNTY		SHEET NO.
	FTW	WISE		117

DATE: 3/21/2024 10:46:20 PM
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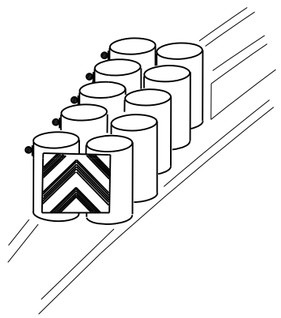
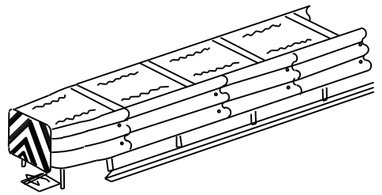
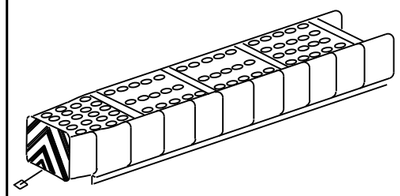
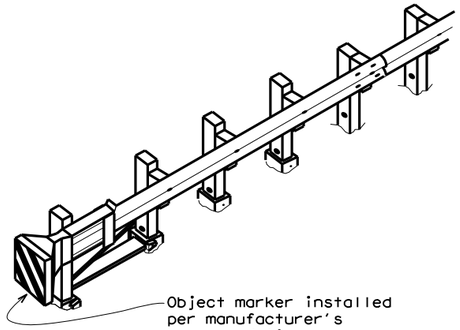
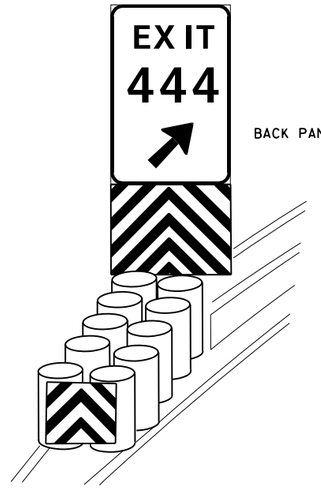
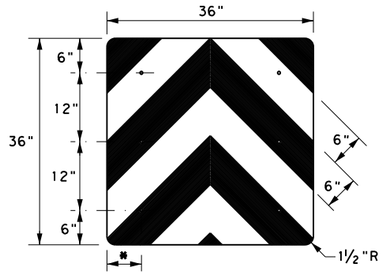


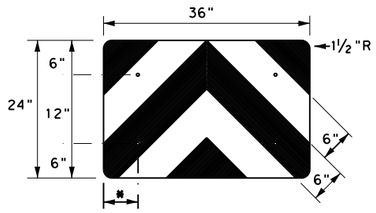




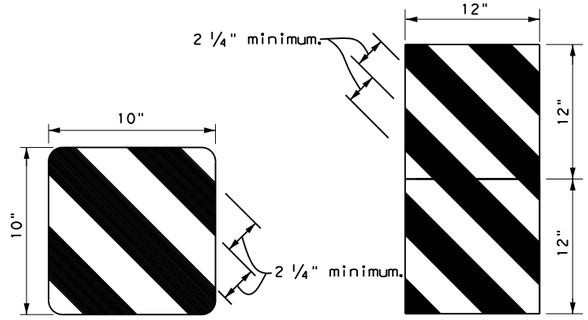




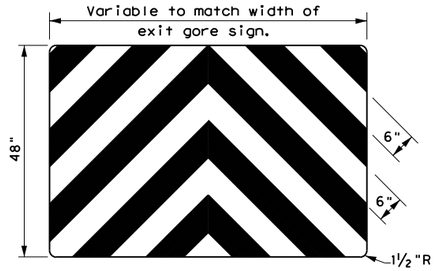


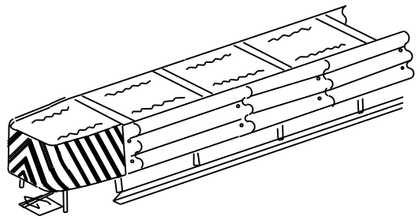


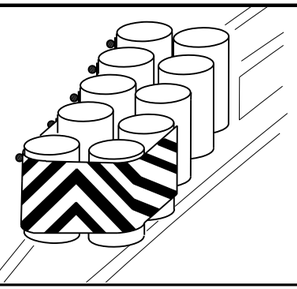
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

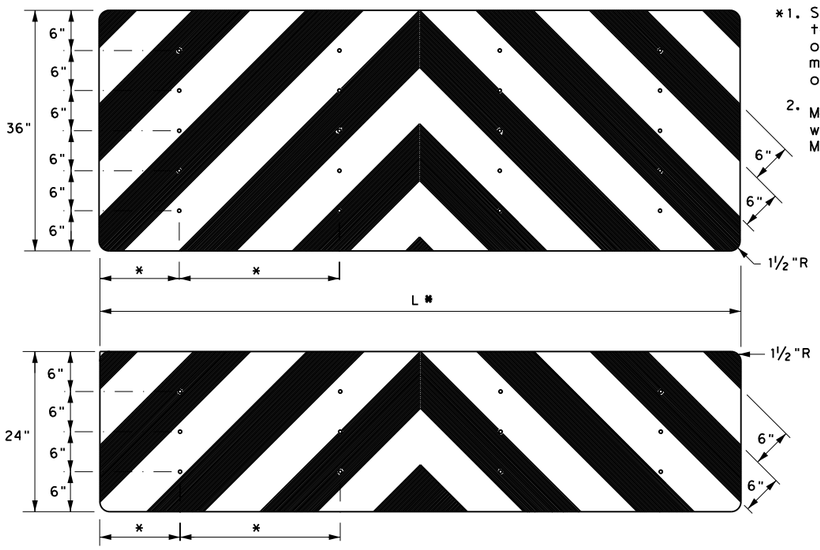


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	FTW	WISE		118
4-98 7-20				

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DATE: 4/3/2024
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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

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

1.

2.

☒ No Action Required ☐ Required Action

Action No.

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

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

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

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

☒ No Permit Required
☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

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

During construction, efforts would be taken to avoid and minimize disturbance of vegetation and soils. Areas within the existing ROW, but outside the limits of construction, would not be disturbed. Every effort would be made to preserve trees where they would neither compromise safety nor substantially interfere with the proposed projects.

No landscaping would be a part of the proposed project activities. Re-vegetation of disturbed areas would be in compliance with the Executive Memorandum on Beneficial Landscaping (26Apr94) and the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants would be used to the extent practicable in landscaping and re-vegetation.

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

☐ No Action Required ☒ Required Action

No disturbing, destroying, or removing active nests of Bald Eagles, including ground nesting birds, during the nesting season. Avoid the removal of unoccupied, inactive nests as practicable. Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. No collecting, capturing, relocating or transporting birds, eggs, young or active nests without a permit. The Eagle Protection Act prohibits the taking or possession of and commerce in eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Eagles may not be taken for any purpose unless a permit is issued prior to the taking.

Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structure that would be affected by theproposed project, and complete any bridge work/demolition and/or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October 1. 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.

The contractor and/or TxDOT personnel would be advised of the potential for Whooping Cranes to occur within the project limits. Construction personnel would be advised to avoid adverse impacts to this species and to report any sightings to TxDOT District Environmental staff. Drainage modifications would be limited to the extent practical to accommodate the additional paved surface needed to bring the roadway up to current TxDOT safety standards. The construction personnel would report all sightings to TxDOT Fort Worth District Environmental staff. Reports should include the time, date and location and any available photos.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):
Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
4/3/2024

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0013	07	086, ETC	US 81
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.	FTW	WISE		119

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept in the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0013-07-086, ETC

1.2 PROJECT LIMITS:
From: *MONTAGUE COUNTY LINE*

To: *0.5 MI SOUTH OF CR 4228*

1.3 PROJECT COORDINATES:
BEGIN: (Lat) *33°26'2.08"N* ,(Long) *97°45'36.50"W*

END: (Lat) *33°10'26.47"N* ,(Long) *97°32'29.78"W*

1.4 TOTAL PROJECT AREA (Acres): *408.6*

1.5 TOTAL AREA TO BE DISTURBED (Acres): *6.77*

1.6 NATURE OF CONSTRUCTION ACTIVITY:
CONSTRUCTION OF SAFETY IMPROVEMENT WORK CONSISTING OF CABLE BARRIER AND PORTABLE CONCRETE TRAFFIC BARRIER

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SoC SOMERVELL	*CONSIST OF MODERATELY DEEP, WELL DRAINED, MODERATELY PERMEABLE SOILS FORMED IN VERY GRAVELLY LOAMY SEDIMENTS.*
PvB PURVES CLAY	*CONSIST OF SHALLOW, WELL DRAINED, MODERATELY SLOWLY PEREAMBLE SOILS THAT FORMED IN INTERBEDDED LIMESTONE AND MARL.*
KtC KEETER VERY FINE SAND	*CONSIST OF MODERATELY DEEP OVER NON CEMENTED SANDSTONE BEDROCK, WELL DRAINED, MODERATELY SLOWLY PERMEABLE.*

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

☒ Mobilization
☒ Install sediment and erosion controls
☒ Blade existing topsoil into windrows, prep ROW, clear and grub
☐ Remove existing pavement
☐ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☐ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☒ Install mow strip, MBGF, bridge rail
☐ Place flex base
☐ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☐ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
3/21/2024
Salcido Ramos, P.E.

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

US 81

Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2B24(176HES)		120
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	WISE	
CONT.	SECT.	JOB	HIGHWAY NO.
0013	07	086, ETC	US 81

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☒ ☒ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☒ ☐ Temporary Seeding
- ☐ ☒ Permanent Planting, Sodding or Seeding
- ☒ ☐ Biodegradable Erosion Control Logs
- ☒ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☐ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- ☐ ☐ Sedimentation Basin
  - ☐ Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - ☐ Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☐ Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- ☐ Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- ☒ Concrete and Materials Waste Management
- ☐ Debris and Trash Management
- ☐ Dust Control
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☒ Fire hydrant flushings
- ☒ Irrigation drainage
- ☒ Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- ☒ Potable water sources
- ☒ Springs
- ☒ Uncontaminated groundwater
- ☒ Water used to wash vehicles or control dust
- ☒ Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3 .

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

STATE OF TEXAS
ERNESTO SALCIDO
100177
LICENSED
PROFESSIONAL ENGINEER
3/21/2024

Salcido, P.E.

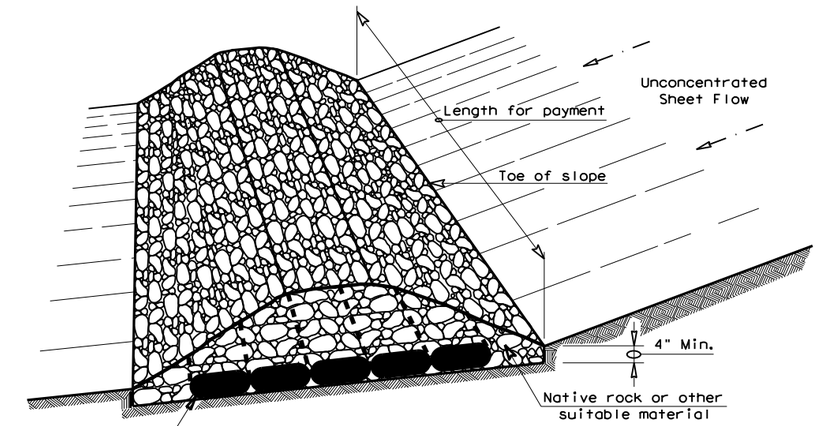
STORMWATER POLLUTION PREVENTION PLAN (SWP3)

US 81

Sheet 2 of 2

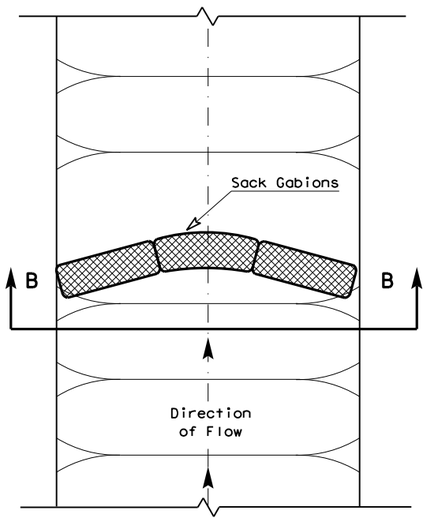
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2B24(176HES)		121
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	WISE	
CONT.	SECT.	JOB	HIGHWAY NO.
0013	07	086, ETC	US 81

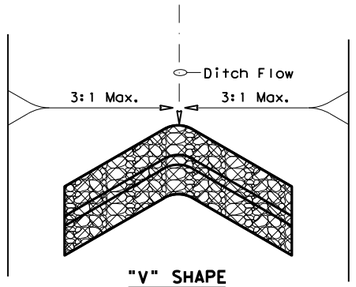


FILTER DAM AT TOE OF SLOPE

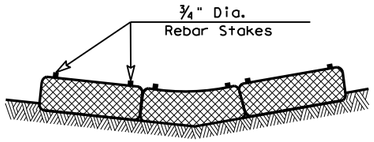
RFD1



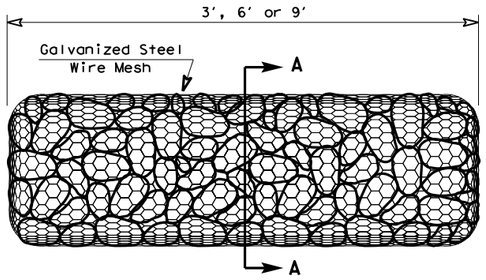
PLAN VIEW



"V" SHAPE
PLAN VIEW

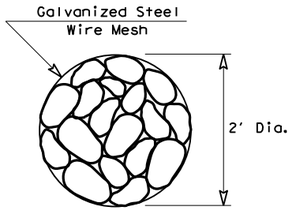


SECTION B-B

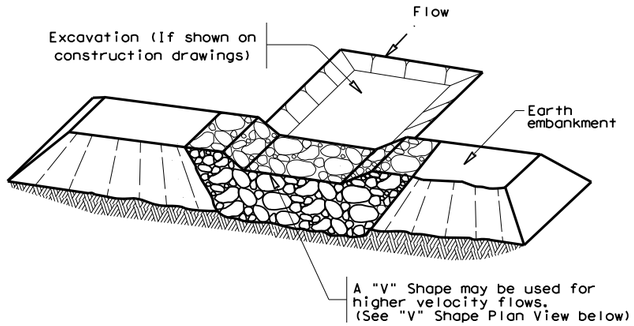


TYPE 4 (SACK GABIONS)

RFD4

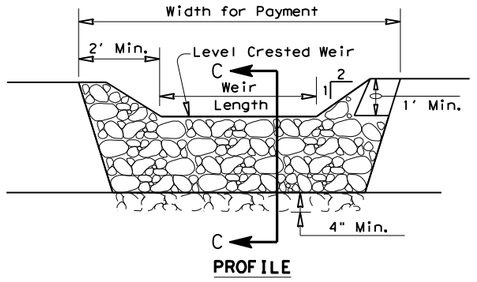


SECTION A-A

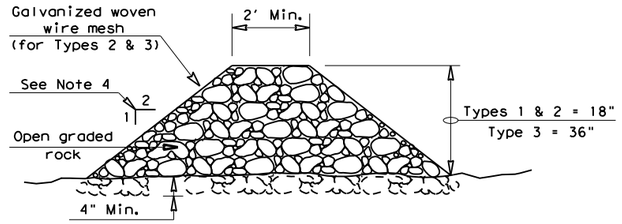


FILTER DAM AT SEDIMENT TRAP

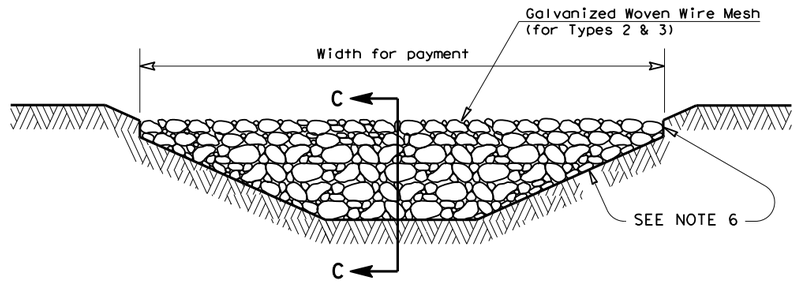
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS		
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0013	07	086, ETC		US 81	
	DIST	COUNTY			SHEET NO.	
	FTW	WISE			122	

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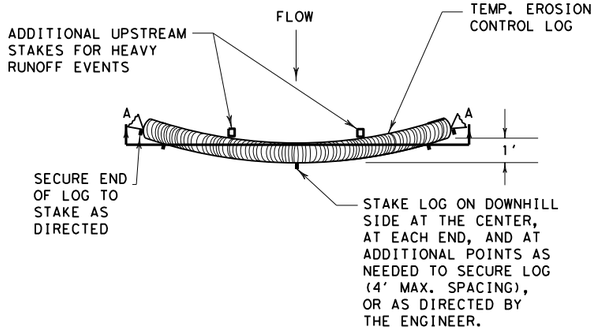
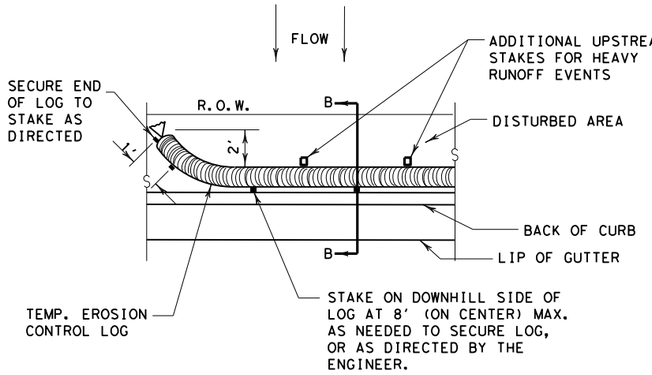


PLAN VIEW



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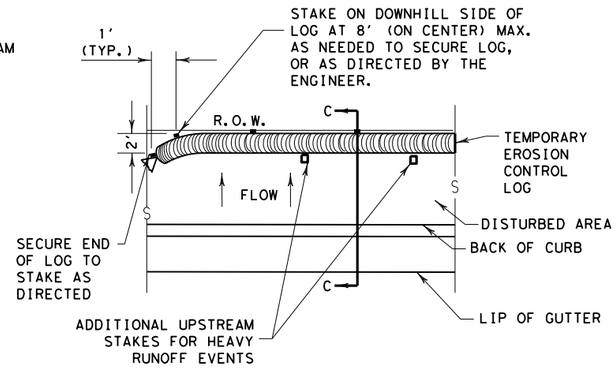
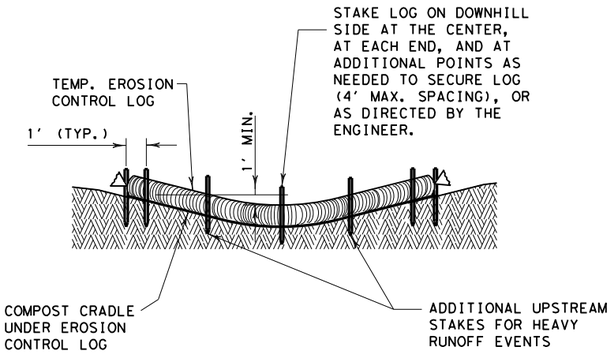


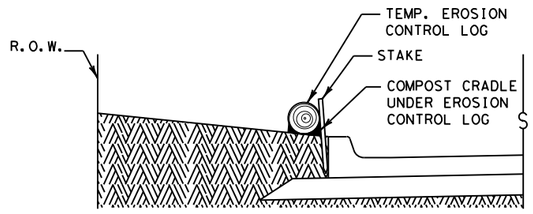
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

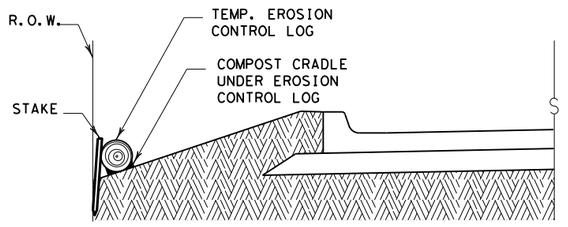
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

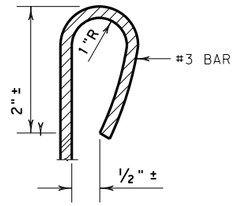
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



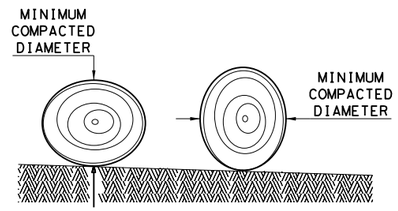
REBAR STAKE DETAIL

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

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0013	07	086, ETC		US 81		
	DIST		COUNTY				SHEET NO.
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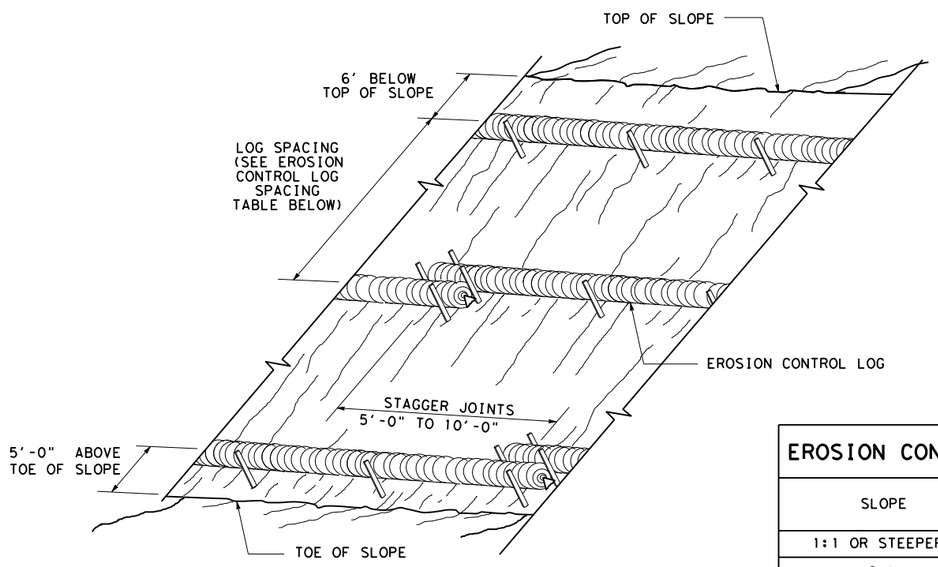
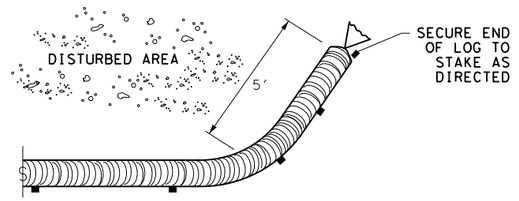


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

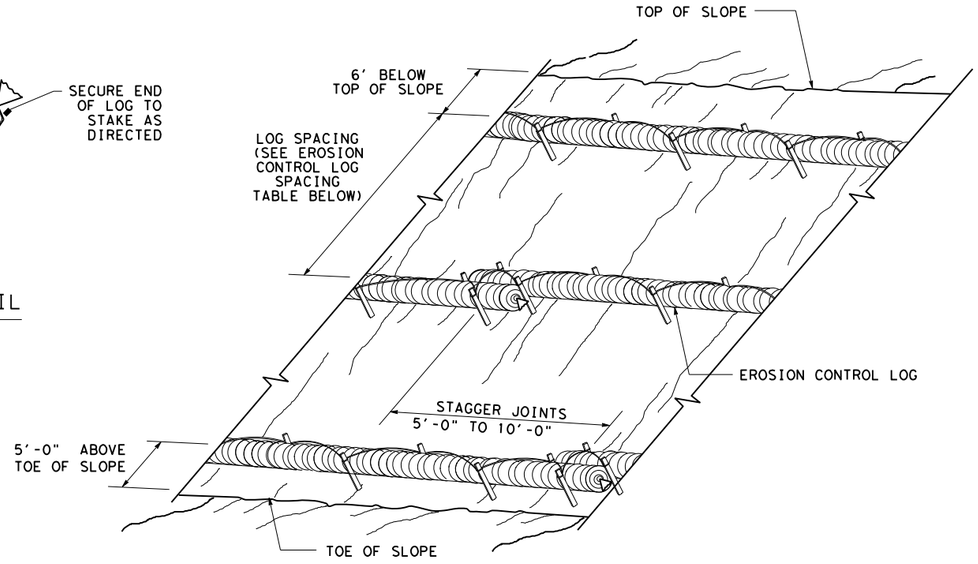
CL-SST



END SECTION RAP DETAIL

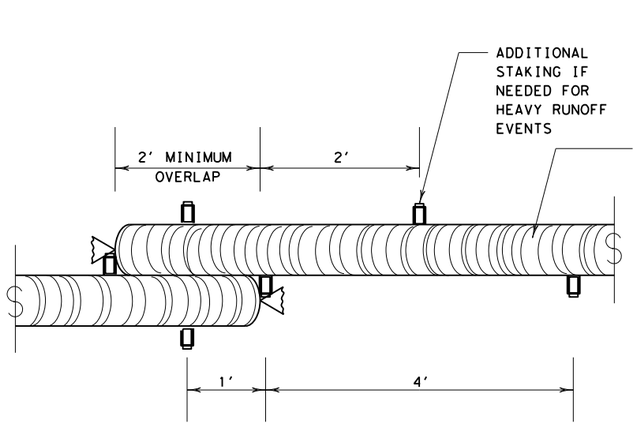
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

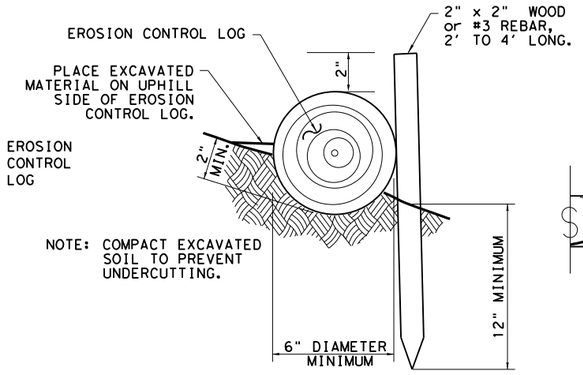
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

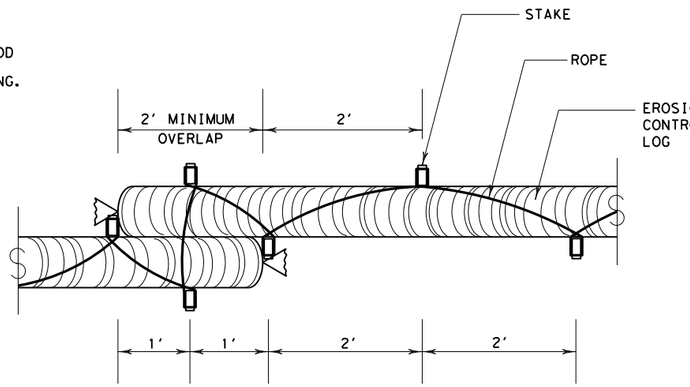


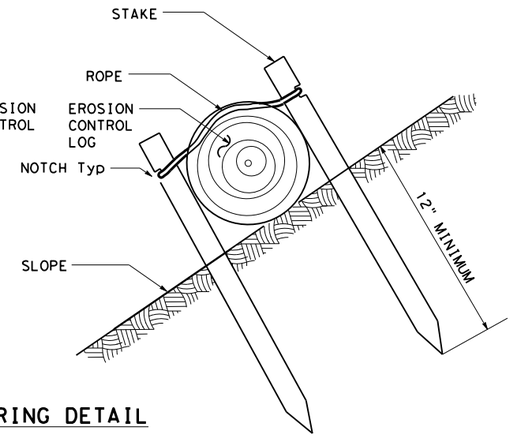


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

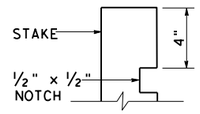
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
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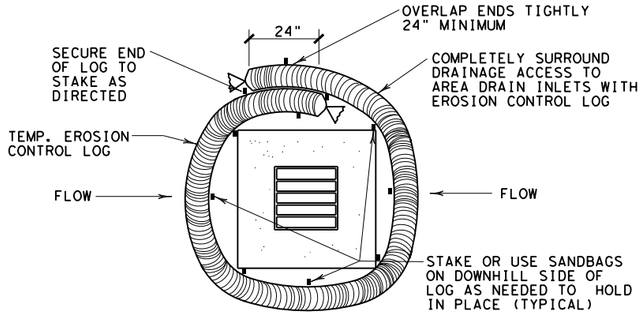
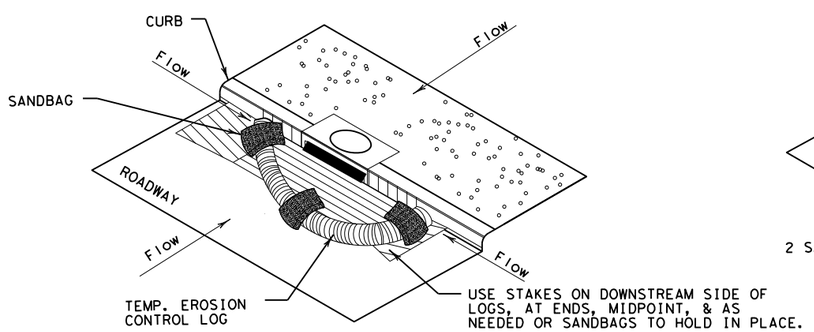


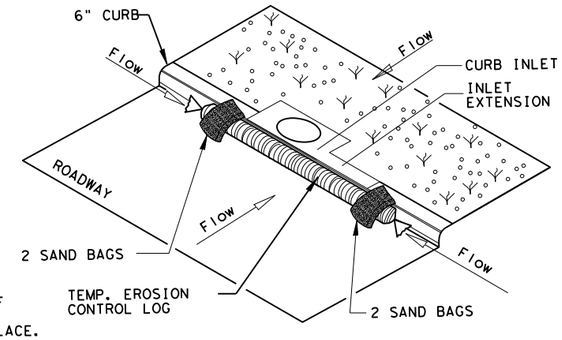
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

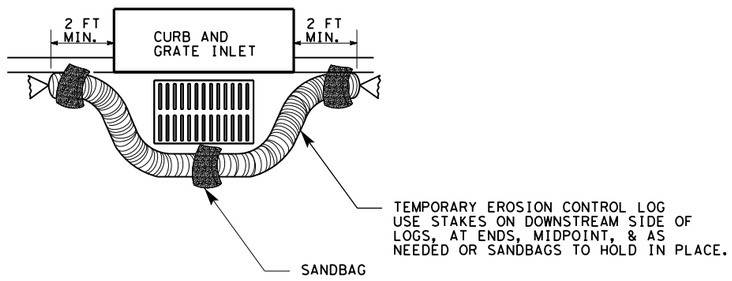
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

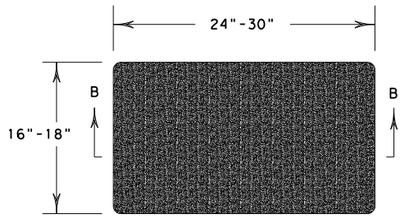
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0013	07	086, ETC	US 81
	DIST	COUNTY		SHEET NO.
	FTW	WISE		125