FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	F 2023(301)		1
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	ECTOR	
CONT.	SECT.	JOB	HIGHWAY NO.
3570	01	012	FM 3503

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. F 2023(301)

ECTOR
FM 3503

NET LENGTH OF PROJECT: 12,095.91 FT = 2.291 MI

LIMITS: FROM IH 20 EXIT TO JBS PKWY

FOR THE CONSTRUCTION OF REHABILITATION OF EXISTING ROAD

CONSISTING OF PLANING, ASPHALT OVERLAY, AND PAVEMENT MARKINGS

Functional Classification:
MAJOR COLLECTOR

URBAN
DESIGN SPEED = 40
2021 ADT = 3,234
2041 ADT = 4,528

FINAL PLANS

CONTRACTOR: _____

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK:

DATE WORK WAS COMPLETED: _____

DATE WORK WAS ACCEPTED: _____

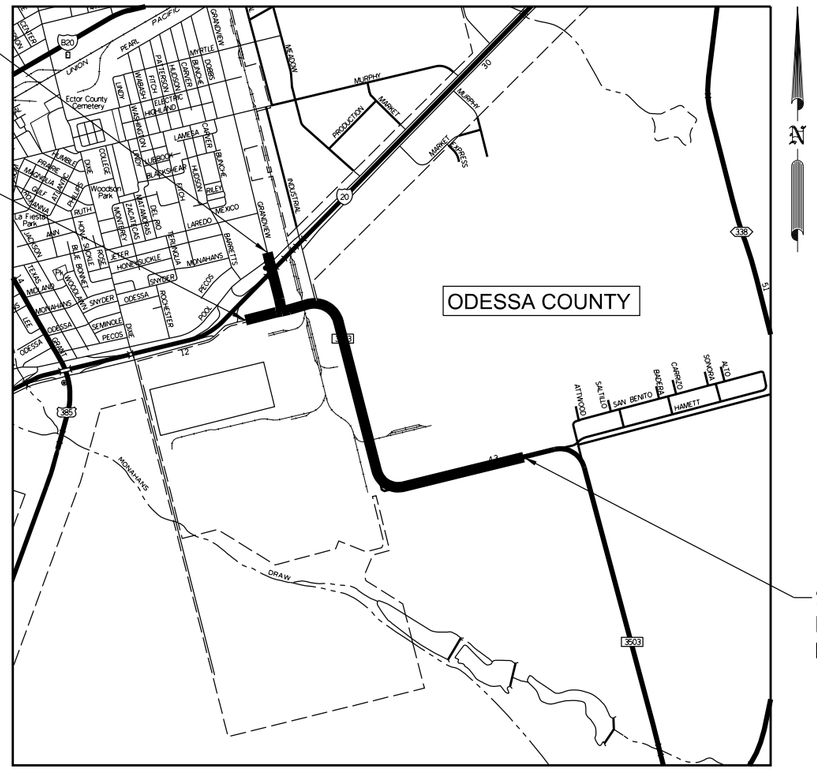
FINAL CONTRACT COST: $ _____

INDEX OF SHEETS

SEE SHEET 2

STA. 500+00.00
BEGIN CSJ: 3570-01-012
RM: 334+0.242

STA. 1000+00.00
BEGIN CSJ: 3570-01-012
RM: XXX+XX.XXX



STA. 1105+66.52
END CSJ: 3570-01-012
RM: 336+0.442

EXCEPTIONS:
NONE

RAILROADS:
UPRR @ 1018+12.40
UPRR @ 1062+11.61

EQUATIONS:
NONE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 2022).

COUNTY_____ PROJ. NO._____
HWY. NO._____ LETTING DATE_____
DATE ACCEPTED_____

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING: 7/7/2023 20__
DocuSigned by:
_____, P.E.
88BF61DF320A4BB...
AREA ENGINEER

RECOMMENDED FOR LETTING: 7/7/2023 20__
DocuSigned by:
_____, P.E.
DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 7/6/2023 20__
DocuSigned by:
_____, P.E.
9D2D0C440F0F4A4...
DISTRICT ENGINEER

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

Dale Vehlewald , PE 03/21/2023

NAME DATE

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
03/21/2023

Dale Vehlewald

Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3680

FM 3503
INDEX OF SHEETS

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	2
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

Contractor questions on this project are to be addressed to the following individual(s):
ODA-PreLettingQuestions@txdot.gov

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:
https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

Item 5: Control of the Work

The existing alignment is the control for the Contractor staking. Establish reference points for the control prior to removing the existing surface.

In the event the finished surface does not conform to the typical sections or does not meet the required IRI, rework the non-conforming area to the limits necessary and employ additional survey control as directed.

Item 6: Control of Materials

Restrict storage of equipment and materials to approved areas. The Engineer will not approve storage in any TxDOT yard.

Promptly and properly dispose of any waste generated from servicing equipment on the project.

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

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

The Buy America Material Classification Sheet is located at the below link.
https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7: Legal Relations and Responsibilities

If access to the project is required through a new or unapproved driveway (i.e. Material source, stockpile location, field office, etc.), obtain an approved "Permit to Construct Access Driveway Facilities on Highway Right Of Way" (TxDOT Form 1058) before beginning any construction operations.

Utilities (public, private and TxDOT) exist throughout the project. Prior to any excavation, investigate to determine the utility locations within the project right of way. Contact the TxDOT Odessa Traffic Operations shop at 432-498-4690 to investigate and determine the location of any TxDOT utility that may

County: Ector **Sheet: 2A**
Highway: FM 3503 **Control: 3570-01-012**

exist within the project right of way. Exercise caution when excavating in areas where investigations have determined that utilities exist. The contractor is responsible for maintaining utility markings.

No significant traffic generator events identified.

As an element of ensuring public safety and convenience under Article 7.2.4, the Contractor is hereby directed to open all closed lanes and shoulder and remove all traffic control devices from any areas where work is not being actively performed unless overnight traffic control is required and approved by the engineer. Removed devices must be stored outside of the clear zones near the right of way line or removed from the right of way line entirely.

At any time during construction that a previously installed crash cushion is damaged by the traveling public and is requested to be repaired by the Engineer, the repair will be paid at the same unit cost as the original installation.

Item 8: Prosecution and Progress

The following portions of the plans may affect the Contractor's planned construction sequencing. The Contractor's attention is directed to the appropriate plan sheet or standard sheet.

-Traffic Control Plan

-Storm Water Pollution Prevention Plan

-Environmental Permit, Issues And Commitments (EPIC)

-Railroad Exhibits and/or Notes

Maintain ingress and egress to side streets and private property at all times.

Working days will be computed and charged in accordance with Article 8. 3.1.4. "Standard Workweek."

Incentive for early contract completion shall be based on contract administrative liquidated damage rates.

The road-user cost liquidated damages are $936 per day.

90 day lead time is needed to allow for sufficient time to obtain and produce materials needed for various bid items in this project.

Item 105: Removing Treated and Untreated Base and Asphalt Pavement

Saw cut and remove existing asphaltic pavement by an approved method.

Item 150: Blading

Use blading to construct and remove side road turnouts, rebuild existing dikes, ditch blocks, and other work as directed.

When directed, fill and grade low areas outside the embankment areas to drain.

Preserve the top 4" of topsoil outside of the work area. Preserve this material in windrows until topsoil can be replaced and seeded to stabilize all exposed terrain.

Item 216: Proof Rolling

Proof rolling will be required on rock embankments where density tests are not practical and at other locations as directed.

Item 310: Prime Coat

MC-30 will have a minimum 72 hour curing time or as directed by the engineer.

Item 479: Adjusting Manholes and Inlets

Raise the manholes and water valves up to finished roadway elevation, matching the finish cross-slope.

Item 502: Barricades, Signs, and Traffic Handling

Stop work immediately if any major traffic control element such as an advanced warning flashing panel or TMA or PCMS is not in good working order or control setup.

Maintain "No Center Line", "Do Not Pass" and "Pass With Care" signs until the permanent lane markings have been placed in accordance with plans.

Place orange fencing around sidewalk, wheelchair ramps and other pedestrian areas that pose a hazard to pedestrian traffic as directed.

Use Shoulder Drop-Off (CW8-9A) signs during construction when shoulder drop-off conditions are 3 inches or greater or as directed. Placement shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices".

This project has a regulatory work zone speed reduction within the project limits. The work zone speed limit is reduced from 40 mph to 30 mph. Placement of speed reduction zone signs shall comply with BC (3)-21. Speed resumption sign(s) is required at the end of a speed reduction zone.

Place chevrons, at a minimum, on every other drum used for outsides of curves, merging tapers and shifting tapers.

Vertical panels shall be self-righting.

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

When construction operations result in a drop-off of more than 2 inches, a 3:1 or flatter slope will be required. The slope must be constructed with a compacted material capable of supporting vehicles as approved by the Engineer. This work shall be done expeditiously during daylight hours. Flaggers and appropriate signing to safely guide traffic through the work area will be required as directed by the Engineer. This shall be considered subsidiary to Item 502.

County: Ector **Sheet: 2B**
Highway: FM 3503 **Control: 3570-01-012**

Item 504: Field Office and Laboratory

Provide a Type D structure (asphalt mix control laboratory) adequately air conditioned and furnished with a minimum of one desk, three chairs, and one file cabinet. The structure will be provided with a 240 volt electrical service entrance. The service shall consist of a minimum of four 120 volt circuits with 20 amp breakers and no more than two grounded convenience outlets per circuit and provisions for a minimum of two 220 volt ovens with vents to the outside. The structure will have a minimum of two (2) convenience outlets per wall, and a utility sink with an adequate clean potable water supply for testing. Space heaters for heating the structure are unacceptable. Portable structures will be support blocked for stability and be tied down.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

In accordance with the Construction General Permit (CGP), erosion control and stabilization measures should be initiated as soon as practicable to include Biodegradable Erosion Control Logs.

The total disturbed area for this project is 0.00 Acres. The disturbed area in this project, all project locations in the contract, and 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 any required authorization from the TCEQ for any Contractor PSLS for construction support activities on or off the right of way. When the total area disturbed for all projects 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 (or to the appropriate MS4 operator when on an off-state system route).

Upon acceptance of the project, all SW3P devices will become property of the State and maintenance responsibility is transferred to the State until final stabilization is attained.

Item 585: Ride Quality for Pavement Surfaces

Use surface test Type B pay adjustment schedule 2 to evaluate ride quality of the travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

Item 644: Small Roadside Sign Assemblies

All new sign supports for stop and yield signs will have a 12" red strip of Type C High Specific Intensity Reflective tape. Please the top of the tape 4" above the edge of the roadway. This work will not be paid for directly and will be subsidiary to the pertinent bid item.

For standard small sign details and dimensions, refer to the "Standard Highway Sign Designs for Texas (SHSD)"; a supplement to the Texas Manual on Uniform Traffic Control Devices (TMUTCD)".

Locate and mark existing reference marker(s) perpendicular to the road and along the right of way, or as directed, prior to removal. Erect new reference marker(s) at the original location, upon completion of construction.

Only bolt clamp style slip bases will be allowed for sign assemblies. Set screws will not be allowed.

Item 662: Work Zone Pavement Markings

After permanent pavement markings are placed, pull tabs from hot mix surface and/or cut off tabs flush with the pavement on seal coat surface. Remove tabs from the project and dispose of properly.

Materials used for non-removable work zone pavement markings will be paint and beads or other approved materials.

Item 666 Retroreflectorized Pavement Markings

Type I markings shall meet the minimum retroreflectivity values defined by Article 4.4 Retroreflectivity Requirements.

Place Type I pavement markings with a ribbon-gun application.

Measure thickness for markings in accordance with Tex-854-B using usage rates (Part II).

Item 672: Raised Pavement Markers

Do not place raised pavement markers until the thin overlay mixture has cured a minimum of 48 hours.

Item 677: Eliminating Existing Pavement Markings and Markers

Submit eliminating plan for approval by the Engineer in accordance with Item 677.

Item 682: Vehicle and Pedestrian Signal Heads

Contractor to inspect and replace damaged or missing backplates from existing traffic and pedestrian signal heads following TxDOT Standard Drawing TS-BP-20 Traffic Signal Head with Backplate.

Item 3077: Superpave Mixtures

Binder:

Provide a binder that has a Performance Grade of 70 -22 (PG 70 -22) for the SP-B mix.

Aggregate quality:

Furnish Class B aggregate for the Type B mix.

Furnish aggregates for the shoulders and/or ramps that meet project SAC requirements.

Mixture design:

Design a mixture with a gradation that has stone on stone contact and passes below the reference zone.

Test method Tex-530-C (Boil Test) will not be required.

Placement:

Semi-trailer type vehicles are prohibited from dumping directly into the finishing machine for the finished surface unless the trailer is equipped with an auger slatted chain or another approved conveyor.

County: Ector **Sheet: 2C**
Highway: FM 3503 **Control: 3570-01-012**

No RAP will be allowed in the surface course.

No RAS will be allowed.

Mineral filler will not be allowed.

Lime will not be allowed as an anti-stripping agent.

Field sand will not be allowed.

Item 3081: Thin Overlay Mixtures

Binder:

Provide a binder that has a Performance Grade of 70 -22 (PG 70 -22) for the TOM-C mix.

No RAP or RAS will be allowed.

Aggregate quality:

Furnish only Class A aggregate. Blending of SAC A and SAC B material will not be allowed for the coarse aggregate.

Mineral filler will not be allowed.

Lime will not be allowed as an anti-stripping agent.

Field sand will not be allowed.

Item 6001: Portable Changeable Message Sign

PCMS shall be placed in operation a minimum of one (1) week prior to construction. Location(s) and duration for PCMS shall be as directed by the Engineer;

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

General Note 7 of TCP (2-2)-18 provides for additional shadow vehicle(s) with truck mounted attenuator (TMA); one (1) additional shadow vehicle with TMA is included in the basis of estimate for this operation. The shadow vehicle(s) with TMA specified on the traffic control plan as “required” plus the ‘additional shadow vehicle’ is the quantity that has been estimated for this operation.

General Note 8 of TCP (2-3)-18 provides for additional shadow vehicle(s) with truck mounted attenuator (TMA); one (1) additional shadow vehicle with TMA is included in the basis of estimate for this operation. The shadow vehicle(s) with TMA specified on the traffic control plan as “required” plus the ‘additional shadow vehicle’ is the quantity that has been estimated for this operation.

General Note 6 of TCP (2-4)-18 provides for additional shadow vehicle(s) with truck mounted attenuator (TMA); one (1) additional shadow vehicle with TMA is included in the basis of estimate for this operation. The shadow vehicle(s) with TMA specified on the traffic control plan as “required” plus the ‘additional shadow vehicle’ is the quantity that has been estimated for this operation.

General Note 4 of TCP (2-5)-18 provides for additional shadow vehicle(s) with truck mounted attenuator (TMA); one (1) additional shadow vehicle with TMA is included in the basis of estimate for this operation. The shadow vehicle(s) with TMA specified on the traffic control plan as "required" plus the 'additional shadow vehicle' is the quantity that has been estimated for this operation.

There are no General Notes for additional shadow vehicle(s) with truck mounted attenuator (TMA) on TCP (3-1)-13; the shadow vehicle(s) with TMA specified on the traffic control plan as "required" is the quantity that has been estimated for this operation.

There are no General Notes for additional shadow vehicle(s) with truck mounted attenuator (TMA) on TCP (3-2)-13; the shadow vehicle(s) with TMA specified on the traffic control plan as "required" is the quantity that has been estimated for this operation.

There are no General Notes for additional shadow vehicle(s) with truck mounted attenuator (TMA) on TCP (3-3)-14; the shadow vehicle(s) with TMA specified on the traffic control plan as "required" is the quantity that has been estimated for this operation.

There are no General Notes for additional shadow vehicle(s) with truck mounted attenuator (TMA) on TCP (3-4)-13; the shadow vehicle(s) with TMA specified on the traffic control plan as "required" is the quantity that has been estimated for this operation.

The Contractor will be responsible for determining if one or more 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 3570-01-012 **DISTRICT** Odessa **COUNTY** Ector
HIGHWAY FM 3503

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**3570-01-012**			
		PROJECT ID		**A00187826**			
		COUNTY		**Ector**			
		HIGHWAY		**FM 3503**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	105-6041	REMOVING STAB BASE AND ASPH PAV(8")	SY	50,538.000		50,538.000	
	150-6002	BLADING	HR	30.000		30.000	
	216-6001	PROOF ROLLING	HR	30.000		30.000	
	251-6079	REWORK BS MTL (TY D)(SURF)(ORD COMP)	SY	50,538.000		50,538.000	
	310-6005	PRIME COAT (AE-P)	GAL	10,108.000		10,108.000	
	315-6004	FOG SEAL (CSS-1H)	GAL	10,108.000		10,108.000	
	479-6001	ADJUSTING MANHOLES	EA	3.000		3.000	
	479-6005	ADJUSTING MANHOLES (WATER VALVE BOX)	EA	2.000		2.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000		7.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	216.000		216.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	216.000		216.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	535.000		535.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	55.000		55.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	7.000		7.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	3.000		3.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	65.000		65.000	
	662-6048	WK ZN PAV MRK REMOV (REFL) TY I-C	EA	1,245.000		1,245.000	
	662-6064	WK ZN PAV MRK REMOV (W)6"(BRK)	LF	19,235.000		19,235.000	
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	41,635.000		41,635.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	214.000		214.000	
	662-6080	WK ZN PAV MRK REMOV (W)(ARROW)	EA	3.000		3.000	
	662-6090	WK ZN PAV MRK REMOV (W)(WORD)	EA	4.000		4.000	
	662-6096	WK ZN PAV MRK REMOV (Y)6"(BRK)	LF	863.000		863.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	56,641.000		56,641.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	940.000		940.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,000.000		1,000.000	
	666-6093	REFL PAV MRK TY I (W)(RR XING)(100MIL)	EA	4.000		4.000	
	666-6099	REF PAV MRK TY I(W)18"(YLD TRI)(100MIL)	EA	12.000		12.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	19,235.000		19,235.000	
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	47,635.000		47,635.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	160.000		160.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA	3.000		3.000	
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA	4.000		4.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	863.000		863.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	44,565.000		44,565.000	
	672-6007	REFL PAV MRKR TY I-C	EA	1,245.000		1,245.000	

TxDOTCONNECT

Report Generated By: txdotconnect_internal_ext

Report Created On: Jul 5, 2023 3:18:57 PM

DISTRICT	COUNTY	CCSJ	SHEET
Odessa	Ector	3570-01-012	2E

DATE:7/5/2023 4:00:37 PM USER:MR.ucf PENTABLE:FM3503_PEN_TABLE.tbl
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\V4 - Design\Plan Set\General\FM3503_ESTIMATES AND QUANTITIES_01.dgn PLOTDRIVER:BW_HALF_PDF.plt

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 3570-01-012 **DISTRICT** Odessa **COUNTY** Ector
HIGHWAY FM 3503

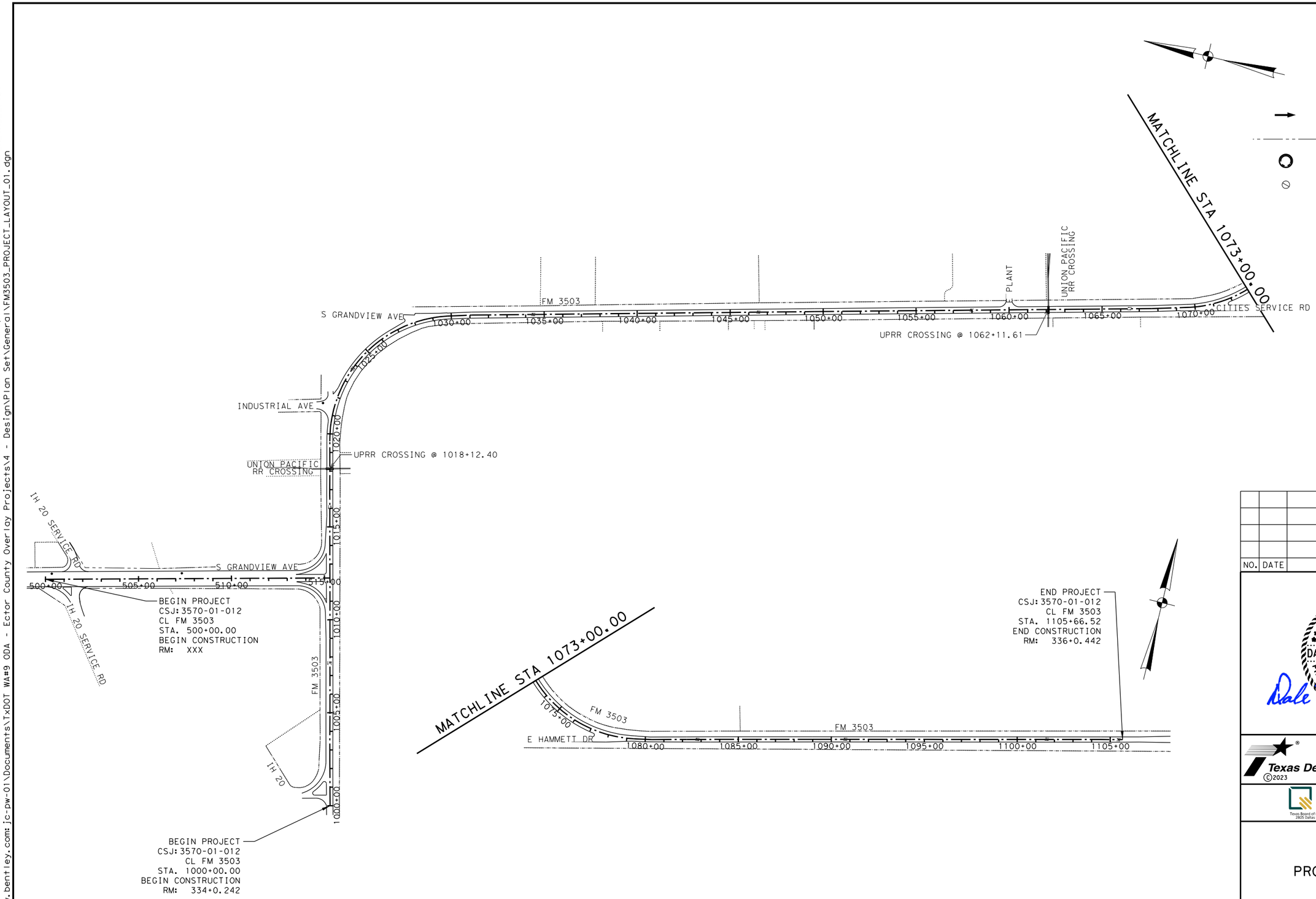
		CONTROL SECTION JOB		**3570-01-012**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00187826**			
		COUNTY		**Ector**			
		HIGHWAY		**FM 3503**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	15,000.000		15,000.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	54.000		54.000	
	682-6050	BACKPLATE W/REFL BRDR(5 SEC)	EA	2.000		2.000	
	682-6060	BACKPLATE W/REFL BRDR(3 SEC)	EA	12.000		12.000	
	3077-6007	SP MIXESSP-BSAC-B PG70-22	TON	19,457.000		19,457.000	
	3081-6002	TOM-C SAC-A	TON	2,906.000		2,906.000	
	3084-6001	BONDING COURSE	GAL	12,634.000		12,634.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	685.000		685.000	
	6185-6002	TMA (STATIONARY)	DAY	137.000		137.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	60.000		60.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

TxDOTCONNECT

Report Generated By: txdotconnect_internal_ext

Report Created On: Jul 5, 2023 3:18:57 PM

DISTRICT	COUNTY	CCSJ	SHEET
Odessa	Ector	3570-01-012	2F



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

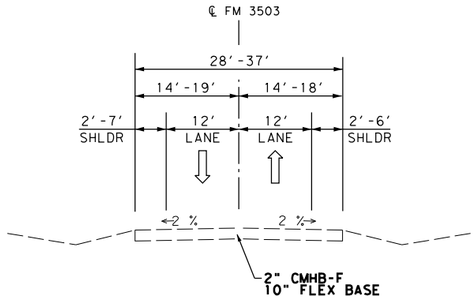
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PROJECT LAYOUT

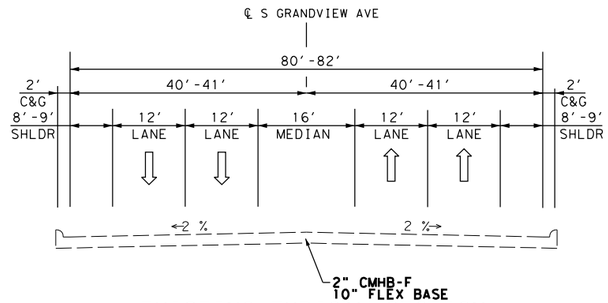
SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	
APPROVED	CONT.	SECT.	JOB	3
	3570	01	012	

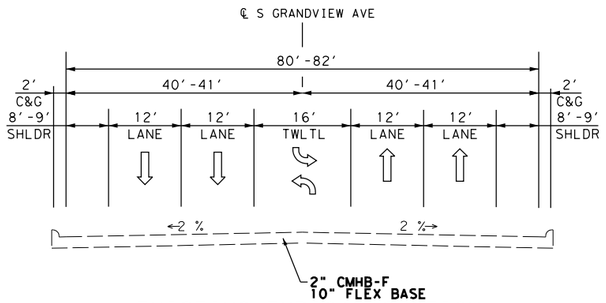
DATE:3/21/2023 4:16:48 PM USER:untitled
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\General\FM3503_PROJECT_LAYOUT_01.dgn
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl



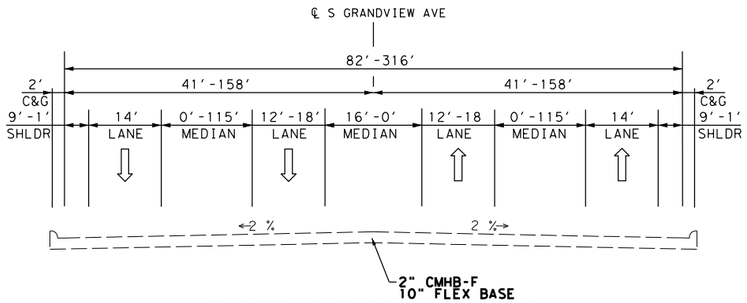
EXISTING TYPICAL SECTION
STA 1000+00.00 TO STA 1105+66.52
NTS



EXISTING TYPICAL SECTION
STA 503+72.98 TO STA 511+37.60
NTS



EXISTING TYPICAL SECTION
STA 500+00.00 TO STA 503+72.98
NTS



EXISTING TYPICAL SECTION
STA 511+37.60 TO STA 515+29.39
NTS

NO.	DATE	REVISION	APPROVED

03/21/2023

Texas Department of Transportation
©2023

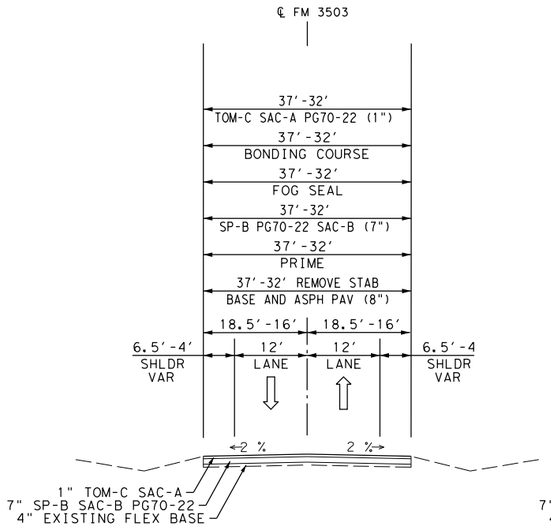
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
EXISTING
TYPICAL SECTIONS

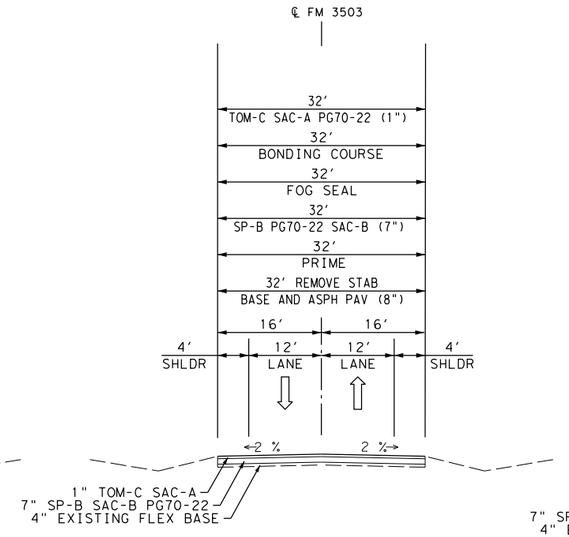
SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	4
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

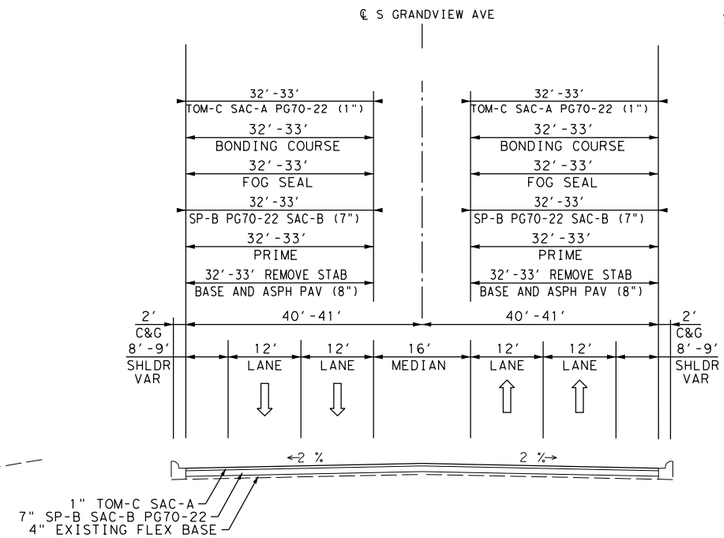
RAILROAD CROSSING HAVE NO MILL AND OVERLAY
STA 1018+07.42 TO STA 1018+17.42
STA 1062+06.45 TO STA 1062+16.45



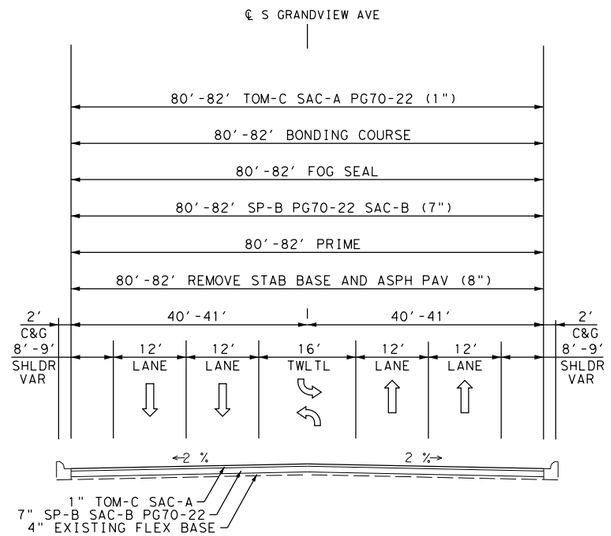
PROPOSED TYPICAL SECTION
STA 1000+00.00 TO STA 1015+55.15
NTS



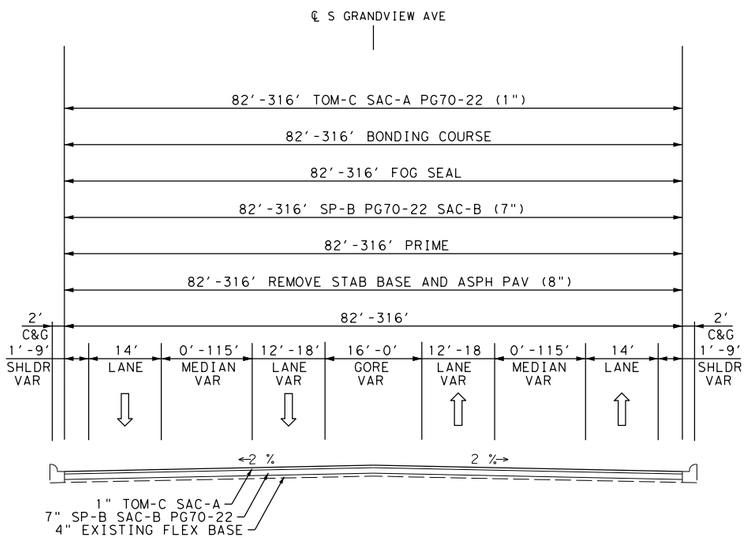
PROPOSED TYPICAL SECTION
STA 1015+55.15 TO STA 1018+07.42
STA 1018+17.42 TO STA 1062+06.45
STA 1062+16.45 TO STA 1105+66.52
NTS



PROPOSED TYPICAL SECTION
STA 503+72.98 TO STA 511+37.60
NTS



PROPOSED TYPICAL SECTION
STA 500+00.00 TO STA 503+72.98
NTS



PROPOSED TYPICAL SECTION
STA 511+37.60 TO STA 515+29.39
NTS

NO.	DATE	REVISION	APPROVED

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

FM 3503
PROPOSED
TYPICAL SECTIONS

SHEET 1 OF 1

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	5
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl
USER:untitled
4:16:50 PM
DATE:3/21/2023
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\General\FM3503_PROPOSED_TYP_01.dgn

SUMMARY OF TCP

Item Code	662 6048	662 6064	662 6067	662 6075	662 6080	662 6090	662 6096	662 6098
Item Description	WK ZN PAV MRK REMOV (REFL) TY I-C	WK ZN PAV MRK REMOV (W)6"(BRK)	WK ZN PAV MRK REMOV (W)6"(SLD)	WK ZN PAV MRK REMOV (W)24"(SLD)	WK ZN PAV MRK REMOV (W)(ARROW)	WK ZN PAV MRK REMOV (W)(WORD)	WK ZN PAV MRK REMOV (Y)6"(BRK)	WK ZN PAV MRK REMOV (Y)6"(SLD)
Unit of Measure	EA	LF	LF	LF	EA	EA	LF	LF
Total	1245	19235	41635	214	3	4	863	56641

Item Code	662 6109	662 6111	677 6001	677 6008	6001 6001	6185 6002	6185 6005
Item Description	WK ZN PAV MRK SHT TERM (TAB) TY W	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (24")	PORTABLE CHANGEABLE MESSAGE SIGNS	TMA (STATIONARY)	TMA (MOBILE OPERATION)
Unit of Measure	EA	EA	LF	LF	DAY	DAY	DAY
Total	940	1000	15000	54	685	137	60

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

FM 3503
SUMMARY OF TRAFFIC CONTROL

SHEET 1 OF 4

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	6
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

DATE:7/5/2023 4:00:43 PM USER:MR.ucf PENTABLE:FM3503_PEN_TABLE.tbl
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Summaries\FM3503_SUMMARY_TCP_01.dgn PLOTDRIVER:BW_HALF_PDF.plt

SUMMARY OF CONSOLIDATED ITEMS

FROM	TO	LENGTH	WIDTH GUTTER-GUTTER/ EDGE-EDGE LF BEGIN	WIDTH GUTTER-GUTTER/ EDGE-EDGE LF END	AREA GUTTER-GUTTER/ EDGE-EDGE	Item Code / Item Description / RATE	105 6041 REMOVING STAB BASE & ASPH PAV (8")	251 6079 REWORK BS MTL (TY D)(SURF) (ORD COMP)
		LF	BEGIN	END	SY	Unit of Measure	SY	SY
1000+00.00	1015+55.15	1555.15	37	32	5961.41		5961.41	5961.41
1015+55.15	1105+66.52	9011.37	32	32	32040.43		32040.43	32040.43
500+00.00	503+72.98	372.98	80	82	3356.82		3356.82	3356.82
503+72.98	511+37.60	764.62	66	64	5522.26		5522.26	5522.26
511+37.60	515+29.39	391.79	82	86	3656.71		3656.71	3656.71
						TOTAL	50537.63	50537.63

310 6005 PRIME COAT (AE-P)	315 6004 FOG SEAL (CSS-1H)	3077 6007 SP MIXES SP-B SAC-B PG70-22(7")	3081 6002 TOM-C SAC-A (1")	3084 6001 BONDING COURSE
0.2 GAL/SY	0.2 GAL/SY	110 LB/SY PER IN	115 LB/SY PER IN	0.25 GAL/SY
GAL	GAL	TON	TON	GAL
1192.28	1192.28	2295.14	342.78	1490.35
6408.09	6408.09	12335.57	1842.32	8010.11
671.36	671.36	1292.38	193.02	839.21
1104.45	1104.45	2126.07	317.53	1380.57
731.34	731.34	1407.83	210.26	914.18
10107.52	10107.52	19456.99	2905.91	12634.42

SUMMARY OF ROADWAY

Item Code	150 6002	216 6001	479 6001	479 6005
Item Description	BLADING	PROOF ROLLING	ADJUSTING MANHOLES	ADJUSTING MANHOLES (WATER VALVES)
Unit of Measure	HR	HR	EA	EA
Sheet 1				2
Sheet 2			1	
Sheet 3				
Sheet 4				
Sheet 5				
Sheet 6				
S Grandview Ave			2	
Total	30	30	3	2

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
SUMMARY OF ROADWAY

SHEET 2 OF 4

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	7
	CONT.	SECT.	JOB	
	3570	01	012	

SUMMARY OF SIGNING & PAVEMENT MARKINGS

Item Code	666 6093	666 6099	666 6171	666 6174	666 6182	666 6184	666 6192	666 6208	666 6210	672 6007
Item Description	REFL PAV MRK TY I(W) (RRXING) (100MIL)	REFL PAV MRK TY I (W) 18" (YLD TRI) (100 MIL)	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (W) (ARROW)	REFL PAV MRK TY II (W) (WORD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY I-C
Unit of Measure	EA	EA	LF	LF	LF	EA	EA	LF	LF	EA
Total	4	12	19235	47635	160	3	4	863	44565	1245

Item Code	636 6001	644 6001	644 6004	644 6007	644 6076
Item Description	ALUMINUM SIGNS (TY A)	IN SM RD SN SUP & AM TY1 OBWG (1) SA(P)	IN SM RD SN SUP & AM TY1 OBWG (1) SA(T)	IN SM RD SN SUP & AM TY1OBWG (1) SA(U)	REMOVE SM RD SN SUP & AM
Unit of Measure	SF	EA	EA	EA	EA
Total	535	55	7	3	65

SUMMARY OF TRAFFIC SIGNAL ITEMS

Item Code	682 6050	682 6060
Item Description	BACKPLATE W/ REFL BRDR (5 SEC)	BACKPLATE W/ REFL BRDR (3 SEC)
Unit of Measure	EA	EA
Total	2	12

NO.	DATE	REVISION	APPROVED

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
SUMMARY OF SIGNING & PAVEMENT MARKINGS

SHEET 3 OF 4

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	8
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

SUMMARY OF SW3P

Item Code	506 6042	506 6043
Item Description	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)
Unit of Measure	LF	LF
Sheet 1	90	90
Sheet 2	0	0
Sheet 3	48	48
Sheet 4	0	0
Sheet 5	0	0
Sheet 6	24	24
S Grandview Ave	54	54
Total	216	216

NO.	DATE	REVISION	APPROVED

Texas Department of Transportation

QUIDDITY

Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
SUMMARY OF STORMWATER POLLUTION PREVENTION PLAN

SHEET 4 OF 4

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	9
	CONT.	SECT.	JOB	
	3570	01	012	

DATE:7/5/2023 4:00:44 PM USER:MR.ucf PENTABLE:FM3503_PEN_TABLE.tbl
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Summaries\FM3503_SUMMARY_SW3P_01.dgn PLOTDRIVER:BW_HALF_PDF.plt

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

1. GENERAL

1. TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.

2. THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR MODIFICATIONS BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEM, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A TEXAS LICENSED PROFESSIONAL ENGINEER FOR INCLUSION IN THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED 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 MOVEMENT, THE CONTRACTOR WILL IMMEDIATLEY CHANGE THEIR OPERATION TO CORRECT THE UNSTISFACTORY CONDITION.

3. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD OR WILL ENDANGER TRAFFIC.

4. THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING/UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND/OR PERMANENT LANE, RAMP, CONNECTOR, FRONTAGE, SHOULDER, ETC. CLOSURES OR DETOURS. SEE GENERAL NOTES NOTIFICATION REQUIREMENTS.

5. ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.

6. AT NO TIME SHALL TWO CONSECUTIVE INTERSECTION ROADWAYS BE CLOSED AT ONE TIME DURING CONSTRUCTION.

7. UNLESS OTHERWISE STATED IN THE PLANS AND/OR AS DIRECTED BY THE ENGINEER, DAILY LANE CLOSURES SHALL BE LIMITED ACCORDING TO THE FOLLOWING RESTRICTIONS:

   DAYTIME WORK WILL ONLY BE ALLOWED.

   NO LANE CLOSURES WILL BE PERMITTED FOR THE FOLLOWING DATES AND/OR SPECIAL EVENTS:
   WEDNESDAY BEFORE THANKSGIVING THROUGH SUNDAY AFTER THANKSGIVING
   SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY (INCLUDING LABOR DAY AND MEMORIAL DAY)

8. ALL SEQUENCE OF WORK ON THIS PROJECT SHALL BE COORDINATED TO COINCIDE WITH ANY PROJECTS WITHIN OR ADJACENT TO THIS PROJECT.

9. EGRESS AND INGRESS TO THE CONSTRUCTION ZONES IN MAINLANE AREAS SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL INCORPORATE BARRIERS AS SHOWN ON PERTINENT STANDARD SHEETS AND/OR AS DIRECTED BY THE ENGINEER.

10. INSTALL AND MAINTAIN AN ADEQUATE NUMBER OF BARRICADES, WARNING AND DIRECTIONAL SIGNS TO DELINEATE TRAFFIC FOR ANY DETOURS OR CLOSURES. THE CONTRACTOR MAY, WITH THE APPROVAL AND/OR AS DIRECTED BY THE ENGINEER, BE REQUIRED TO VARY THE NUMBER AND LOCATION OF SIGNS AND BARRICADES FROM THAT INDICATED ON THE PLANS.

11. COVER PERMANENT SIGNS THAT CONFLICT TO TRAFFIC PHASING. THIS IS SUBSIDIARY TO ITEM 502.

12. THE CONTRACTOR SHALL NOT WORK IN AREAS WHERE UTILITIES ARE IN CONFLICT UNTIL UTILITIES ARE CLEAR.

13. DRIVEWAYS AND INTERSECTING STREETS SHALL BE CONSTRUCTED IN ACCORDANCE TO THE DRIVEWAY AND INTERSECTING STREET STANDARDS.

2. LANE CLOSURES

1. IN ADDITION TO THE PREVIOUSLY MENTIONED REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

   i. ALL TRAFFIC WORK, DETOURS, HORIZONTAL TRAFFIC MOVEMENTS, LANE CLOSURES, ETC. ARE DIRECTLY RELATED TO THE SEQUENCE OF WORK.
   ii. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF IMPENDING UPCOMING LANE CLOSURES AT LEAST FIVE DAYS IN ADVANCE OF CLOSURES.

3. SAFETY

1. THE CONTRACTOR SHALL PROVIDE, CONSTRUCT, AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC (1-12)-14. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN CONFORMANCE WITH THE TEXAS MUTCD AND THE "STANDARD HIGHWAY DESIGNS FOR TEXAS".

2. BARRICADES AND WARNING SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIREMENT TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AND THE CONTRACTOR'S PERSONNEL.

3. SAFETY (CONTINUED)

3. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN FLAGGERS AS DIRECTED/APPROVED BY THE ENGINEER. AT SUCH POINTS, AND FOR SUCH PERIODS OF TIME AS MAY BE REQUIRED, TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AND THE CONTRACTOR'S PERSONNEL.

4. THE CONTRACTOR SHALL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

4. HAULING EQUIPMENT

1. THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENTED SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR THE OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT, THEY SHALL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED/APPROVED BY THE ENGINEER.

2. THROUGHOUT CONSTRUCTION OPERATIONS, THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THEIR HAULING OPERATIONS IN A MANNER SUCH THAT VEHICLES WILL NOT HAUL OVER PREVIOUSLY RECOMPACTED SUBGRADE OR COMPACTED BASE MATERIAL, EXCEPT IN SHORT SECTIONS FOR DUMPING MANIPULATIONS.

5. FINAL CLEAUP

1. UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

6. PAYMENT

1. ALL BARRICADES AND SIGNS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS, AND TRAFFIC HANDLING. ALL EROSION AND SEDIMENT CONTROL DEVICES WILL BE PAID FOR UNDER ITEM 506 TEMPORARY EROSION, SEDIMENTATION, ENVIRONMENTAL CONTROLS, AND BIODEGRADABLE EROSION CONTROL LOGS. ALL WORK ZONE PAVEMENT MARKINGS WILL BE PAID FOR UNDER ITEM 662 WORK ZONE PAVEMENT MARKINGS. ALL OTHER WORK AND MATERIALS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS UNLESS INDICATED IN THE PLANS.

7. SEQUENCE OF WORK

PHASE 1

PHASE 1 CONSISTS OF MILLING EXISTING PAVEMENT STRUCTURE AND FURNISHING AND INSTALLING AN OVERLAY OVER THE EXISTING BASE MATERIAL IN OUTSIDE LANE OF NORTHBOUND GRANDVIEW AVE ROADWAY, AS WELL AS EASTBOUND FM 3503.

1. SET UP ADVANCE WARNING SIGNS ACCORDING TO ADVANCE WARNING SIGNS SHEET. PLACE WORK ZONE SIGNS, BARRICADES, DRUMS, AND SW3P ACCORDING TO STANDARDS AND PLAN SHEETS.

2. MAINTAIN TRAFFIC ON EXISTING ROADWAY (USING FLAGGER OPERATIONS/SHADOW VEHICLE ON FM 3503).

3. PERFORM MILLING OPERATIONS TO REMOVE 8" OF EXISTING ACP.

4. INSTALL OVERLAY ON OUTSIDE LANE OF NORTHBOUND GRANDVIEW AVE (AND EASTBOUND FM 3503), IN ACCORDANCE TO TCP PHASING ON SUBSEQUENT SHEETS, WHILE PROVIDING A SAFE AREA FOR CONTRACTOR PERSONNEL TO WORK. PHASING OF INTERSECTIONS AND DRIVEWAYS MUST ADHERE TO TRAFFIC CONTROL STANDARDS, TYPICAL INTERSECTION PHASING SHEETS PROVIDED. ALL WORK WITHIN RAILROAD RIGHT-OF-WAY MUST BE COORDINATED, AND MILLING OPERATIONS WILL CEASE AT RAILROAD CONCRETE CROSSING PANEL.

5. INSTALL TEMPORARY PAVEMENT MARKINGS AND TABS ONTO NEW ROADWAY SURFACE TO DESIGNATE LANES.

PHASE 2

PHASE 2 CONSISTS OF MILLING EXISTING PAVEMENT STRUCTURE AND FURNISHING AND INSTALLING AN OVERLAY OVER THE EXISTING BASE MATERIAL IN OUTSIDE LANE OF SOUTHBOUND GRANDVIEW AVE ROADWAY, AS WELL AS WESTBOUND FM 3503.

1. SET UP ADVANCE WARNING SIGNS ACCORDING TO ADVANCE WARNING SIGNS SHEET. PLACE WORK ZONE SIGNS, BARRICADES, DRUMS, AND SW3P ACCORDING TO STANDARDS AND PLAN SHEETS.

2. MAINTAIN TRAFFIC ON EXISTING ROADWAY (USING FLAGGER OPERATIONS/SHADOW VEHICLE ON FM 3503).

3. PERFORM MILLING OPERATIONS TO REMOVE 8" OF EXISTING ACP.

4. INSTALL OVERLAY ON OUTSIDE LANE OF SOUTHBOUND GRANDVIEW AVE (AND WESTBOUND FM 3503), IN ACCORDANCE TO TCP PHASING ON SUBSEQUENT SHEETS, WHILE PROVIDING A SAFE AREA FOR CONTRACTOR PERSONNEL TO WORK. PHASING OF INTERSECTIONS AND DRIVEWAYS MUST ADHERE TO TRAFFIC CONTROL STANDARDS, TYPICAL INTERSECTION PHASING SHEETS PROVIDED. ALL WORK WITHIN RAILROAD RIGHT-OF-WAY MUST BE COORDINATED, AND MILLING OPERATIONS WILL CEASE AT RAILROAD CONCRETE CROSSING PANEL.

5. INSTALL TEMPORARY PAVEMENT MARKINGS AND TABS ONTO NEW ROADWAY SURFACE TO DESIGNATE LANES.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

FM 3503
TCP NARRATIVE

SHEET 1 OF 2

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	
APPROVED	CONT.	SECT.	JOB	10
	3570	01	012	

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

7. SEQUENCE OF WORK (CONTINUED)

PHASE 3

PHASE 3 CONSISTS OF MILLING EXISTING PAVEMENT STRUCTURE AND FURNISHING AND INSTALLING AN OVERLAY OVER THE EXISTING BASE MATERIAL IN INSIDE LANE OF SOUTHBOUND GRANDVIEW AVE ROADWAY.

1. SET UP ADVANCE WARNING SIGNS ACCORDING TO ADVANCE WARNING SIGNS SHEET. PLACE WORK ZONE SIGNS, BARRICADES, DRUMS, AND SW3P ACCORDING TO STANDARDS AND PLAN SHEETS.

2. MAINTAIN TRAFFIC ON EXISTING ROADWAY.

3. PERFORM MILLING OPERATIONS TO REMOVE 8" OF EXISTING ACP.

4. INSTALL OVERLAY ON INSIDE LANE OF SOUTHBOUND GRANDVIEW AVE, IN ACCORDANCE TO TCP PHASING ON SUBSEQUENT SHEETS, WHILE PROVIDING A SAFE AREA FOR CONTRACTOR PERSONNEL TO WORK. PHASING OF INTERSECTIONS AND DRIVEWAYS MUST ADHERE TO TRAFFIC CONTROL STANDARDS, TYPICAL INTERSECTION PHASING SHEETS PROVIDED. ALL WORK WITHIN RAILROAD RIGHT-OF-WAY MUST BE COORDINATED, AND MILLING OPERATIONS WILL CEASE AT RAILROAD CONCRETE CROSSING PANEL.

5. INSTALL TEMPORARY PAVEMENT MARKINGS AND TABS ONTO NEW ROADWAY SURFACE TO DESIGNATE LANES.

PHASE 4

PHASE 4 CONSISTS OF MILLING EXISTING PAVEMENT STRUCTURE AND FURNISHING AND INSTALLING AN OVERLAY OVER THE EXISTING BASE MATERIAL IN INSIDE LANE OF NORTHBOUND GRANDVIEW AVE ROADWAY.

1. SET UP ADVANCE WARNING SIGNS ACCORDING TO ADVANCE WARNING SIGNS SHEET. PLACE WORK ZONE SIGNS, BARRICADES, DRUMS, AND SW3P ACCORDING TO STANDARDS AND PLAN SHEETS.

2. MAINTAIN TRAFFIC ON EXISTING ROADWAY.

3. PERFORM MILLING OPERATIONS TO REMOVE 8" OF EXISTING ACP.

4. INSTALL OVERLAY ON INSIDE LANE OF NORTHBOUND GRANDVIEW AVE, IN ACCORDANCE TO TCP PHASING ON SUBSEQUENT SHEETS, WHILE PROVIDING A SAFE AREA FOR CONTRACTOR PERSONNEL TO WORK. PHASING OF INTERSECTIONS AND DRIVEWAYS MUST ADHERE TO TRAFFIC CONTROL STANDARDS, TYPICAL INTERSECTION PHASING SHEETS PROVIDED. ALL WORK WITHIN RAILROAD RIGHT-OF-WAY MUST BE COORDINATED, AND MILLING OPERATIONS WILL CEASE AT RAILROAD CONCRETE CROSSING PANEL.

5. INSTALL TEMPORARY PAVEMENT MARKINGS AND TABS ONTO NEW ROADWAY SURFACE TO DESIGNATE LANES.

PHASE 5

PHASE 5 CONSISTS OF MILLING EXISTING PAVEMENT STRUCTURE AND FURNISHING AND INSTALLING AN OVERLAY OVER THE EXISTING BASE MATERIAL AT INTERSECTIONS FOR GRANDVIEW AVE AND FM 3503 ROADWAYS.

1. SET UP ADVANCE WARNING SIGNS ACCORDING TO ADVANCE WARNING SIGNS SHEET. PLACE WORK ZONE SIGNS, BARRICADES, DRUMS, AND SW3P ACCORDING TO STANDARDS AND PLAN SHEETS.

2. MAINTAIN TRAFFIC ON EXISTING ROADWAY.

3. PERFORM MILLING OPERATIONS TO REMOVE 8" OF EXISTING ACP.

4. INSTALL OVERLAY AT INTERSECTIONS ON GRANDVIEW AVE AND FM 3503, IN ACCORDANCE TO TCP PHASING ON SUBSEQUENT SHEETS, WHILE PROVIDING A SAFE AREA FOR CONTRACTOR PERSONNEL TO WORK. PHASING OF INTERSECTIONS AND DRIVEWAYS MUST ADHERE TO TRAFFIC CONTROL STANDARDS, TYPICAL INTERSECTION PHASING SHEETS PROVIDED. ALL WORK WITHIN RAILROAD RIGHT-OF-WAY MUST BE COORDINATED, AND MILLING OPERATIONS WILL CEASE AT RAILROAD CONCRETE CROSSING PANEL.

5. INSTALL TEMPORARY PAVEMENT MARKINGS AND TABS ONTO NEW ROADWAY SURFACE TO DESIGNATE LANES.

PHASE 6

PHASE 6 CONSISTS OF FURNISHING AND INSTALLING PERMANENT PAVEMENT MARKINGS, IN ACCORDANCE WITH STATE STANDARDS.

1. SET UP ADVANCE WARNING SIGNS ACCORDING TO ADVANCE WARNING SIGNS SHEET. PLACE WORK ZONE SIGNS, BARRICADES, DRUMS, AND SW3P ACCORDING TO STANDARDS AND PLAN SHEETS.

2. MAINTAIN TRAFFIC ON EXISTING ROADWAY.

3. REMOVE TEMPORARY PAVEMENT MARKINGS AND TABS.

4. FOLLOWING CONSTRUCTION PHASING, PLACE PERMANENT PAVEMENT MARKINGS IN ACCORDANCE WITH SIGNING AND PAVEMENT MARKINGS SHEETS AND IN ACCORDANCE TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS."

5. OPEN ROADWAY TO FINAL TRAFFIC CONFIGURATION.

6. REMOVE ALL CONSTRUCTION SIGNING, CHANNELIZING DEVICES, AND TEMPORARY SW3P DEVICES.

7. CLEAN UP SITE.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

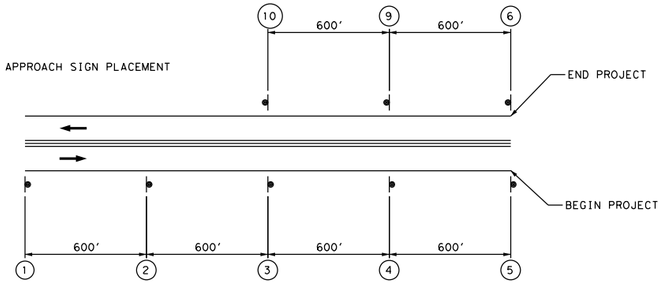
FM 3503
TCP NARRATIVE

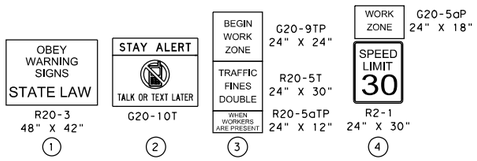
SHEET 2 OF 2

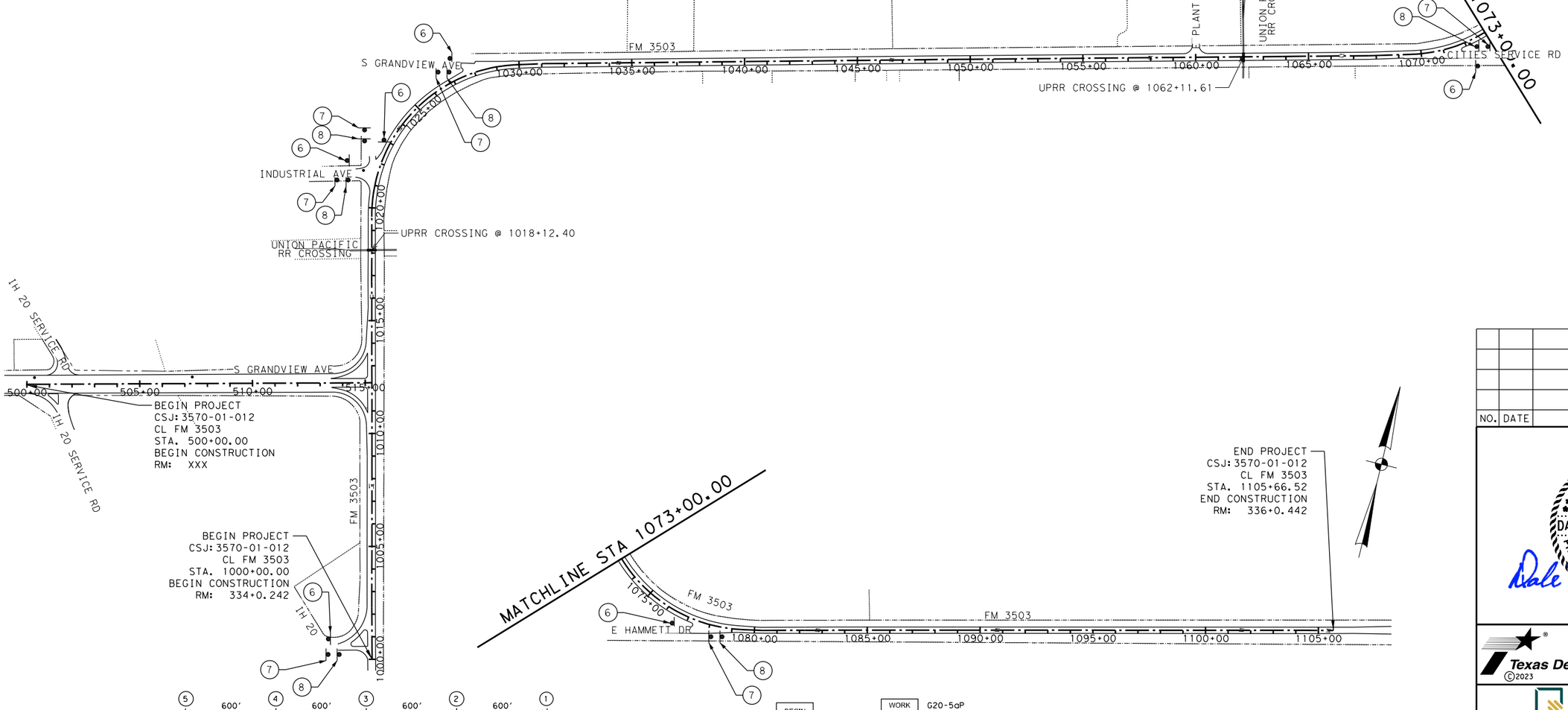
DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	11
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

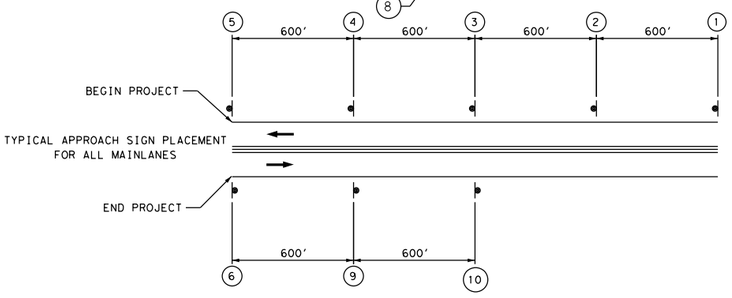
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl
USER:untitled
DATE:3/21/2023 4:17:00 PM
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\TCP\FM3503_TCP_NARR_02.dgn

TYPICAL APPROACH SIGN PLACEMENT









0' 125' 250' 500'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

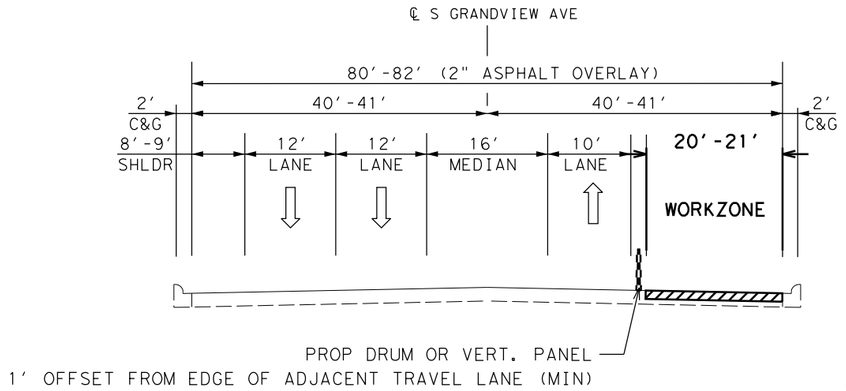
Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
ADVANCE WARNING LAYOUT

SHEET 1 OF 1

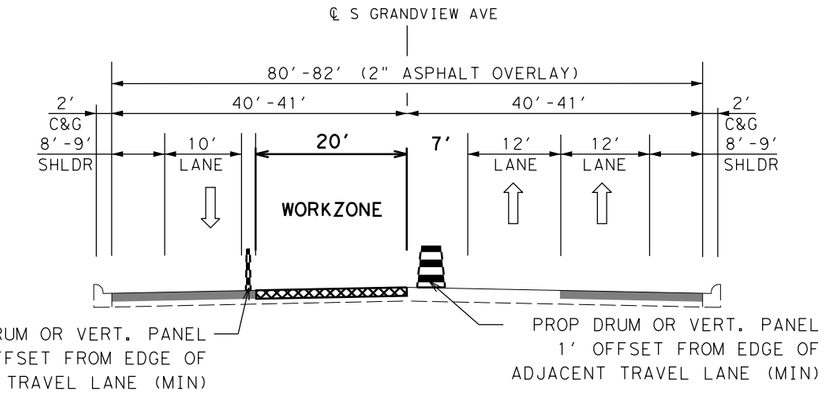
DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	12
	CONT.	SECT.	JOB	
	3570	01	012	



PHASE 1

PROPOSED PAVING WIDTH FOR PHASE 1 IS 12′ AND SHOULDER WITH A NARROWED LANE ADJACENT TO CONSTRUCTION OF 10′.

PHASE 1
OUTSIDE LANE WIDTH + SHOULDER

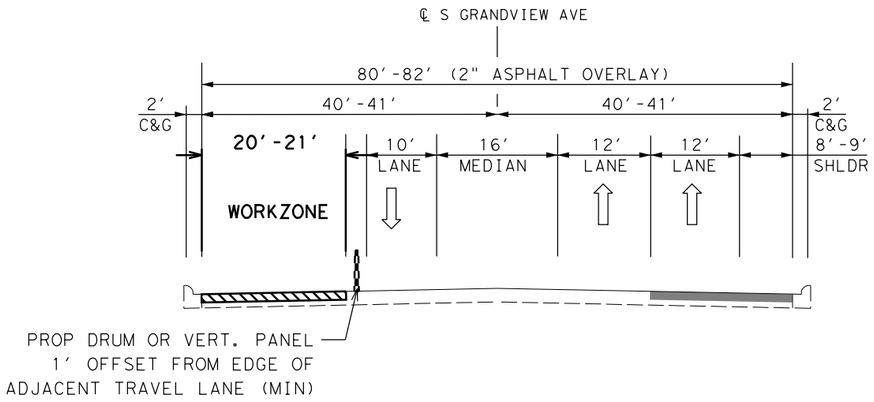


PHASE 3

PROPOSED PAVING WIDTH FOR PHASE 3 IS 20′ WITH A NARROWED LANE ADJACENT TO CONSTRUCTION OF 10′. GORE/MEDIAN WILL PROVIDE BUFFER TO ONCOMING TRAFFIC OF 8′.

PHASE 3
INSIDE LANE WIDTH + 8′ OF GORE/MEDIAN

PREVIOUS PHASE(S)
CONSTRUCTION

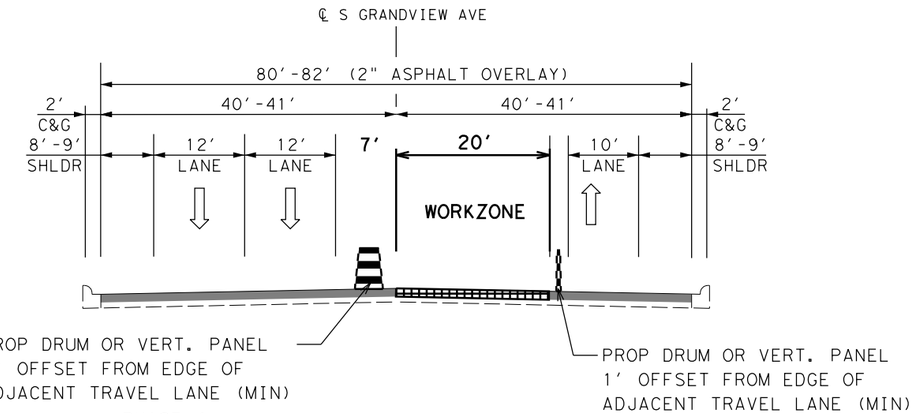


PHASE 2

PROPOSED PAVING WIDTH FOR PHASE 2 IS 12′ AND SHOULDER WITH A NARROWED LANE ADJACENT TO CONSTRUCTION OF 10′.

PHASE 2
OUTSIDE LANE WIDTH + SHOULDER

PREVIOUS PHASE(S)
CONSTRUCTION



PHASE 4

PROPOSED PAVING WIDTH FOR PHASE 4 IS 20′ WITH A NARROWED LANE ADJACENT TO CONSTRUCTION OF 10′. GORE/MEDIAN WILL PROVIDE BUFFER TO ONCOMING TRAFFIC OF 8′.

PHASE 4
INSIDE LANE WIDTH + 8′ OF GORE/MEDIAN

PREVIOUS PHASE(S)
CONSTRUCTION

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

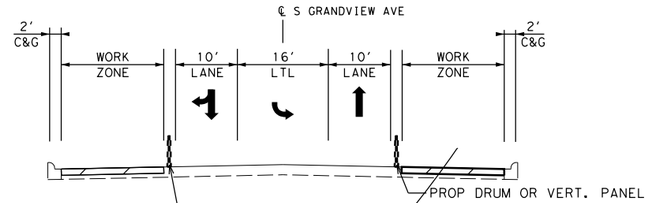
Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

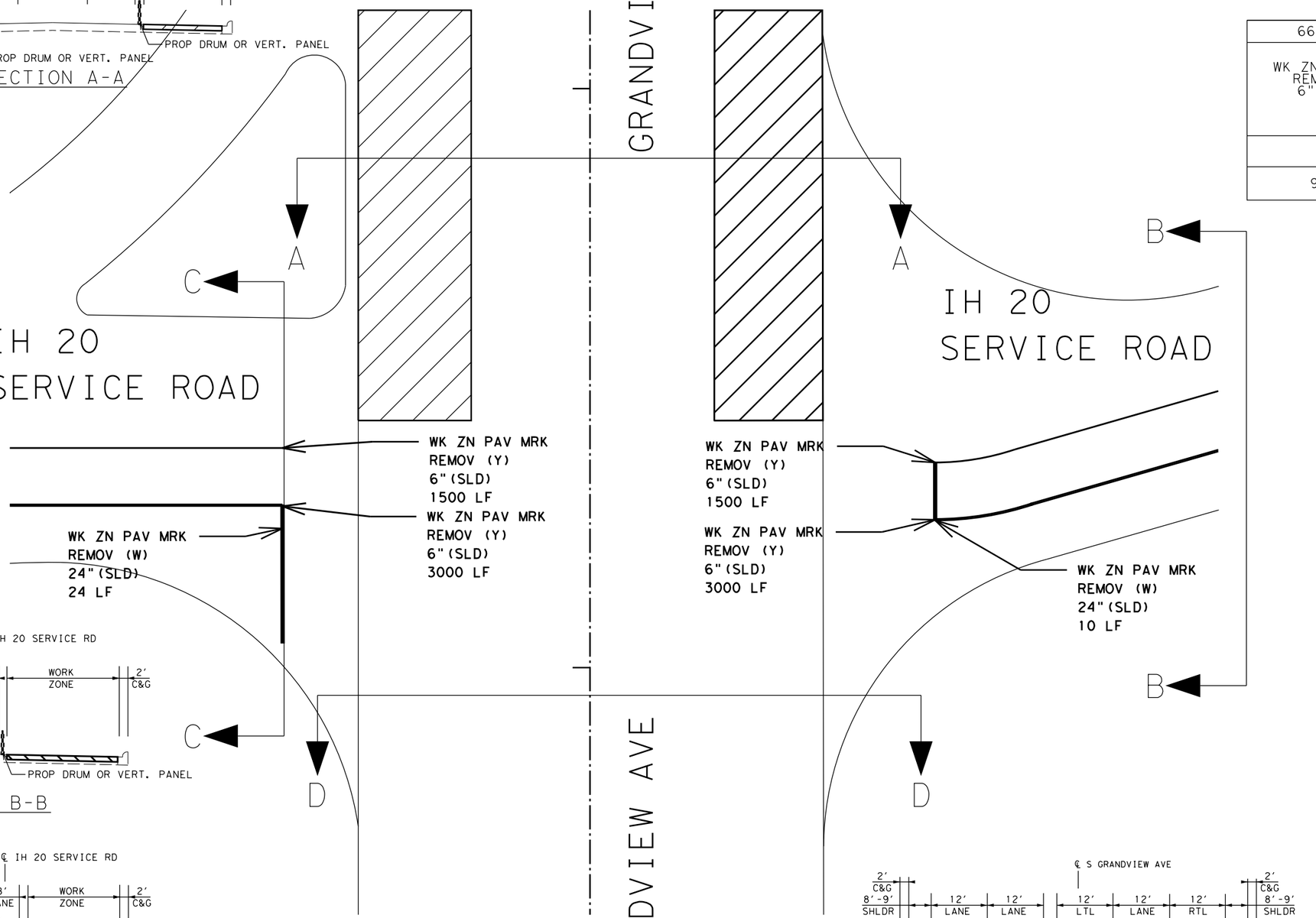
FM 3503
TYPICAL TCP PHASING

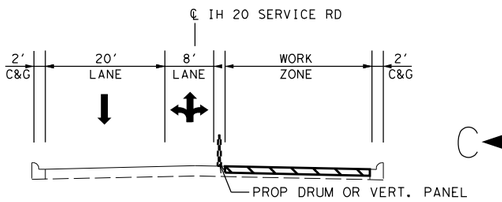
SHEET 1 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	
APPROVED	CONT.	SECT.	JOB	13
	3570	01	012	

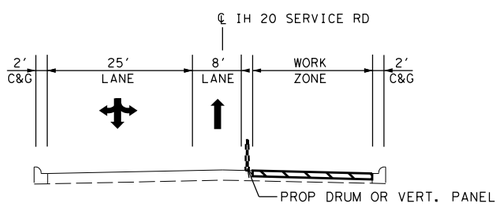


SECTION A-A

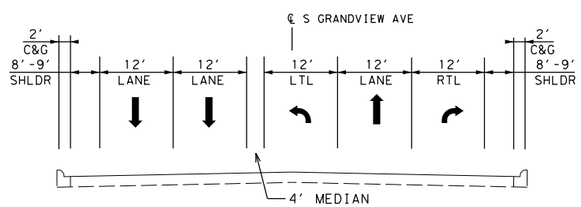




SECTION B-B



SECTION C-C



SECTION D-D

PHASE 1
OUTSIDE LANE WIDTHS + SHOULDER

662 6098	662 6075
WK ZN PAV MRK REMOV (Y) 6" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SLD)
LF	LF
9,000	34

NOTE: PHASE SIDE STREET CONSTRUCTION, TO ALLOW ACCESS OR PROVIDE DETOUR

NO.	DATE	REVISION	APPROVED

NOTE: PHASE SIDE STREET CONSTRUCTION, TO ALLOW ACCESS OR PROVIDE DETOUR

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

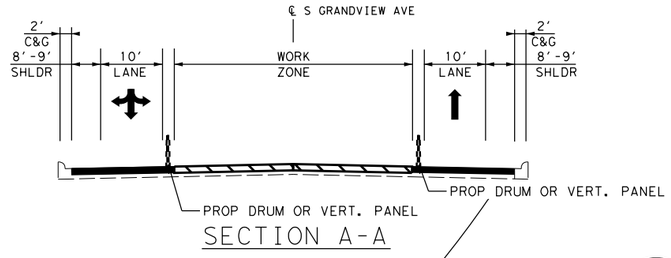
Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

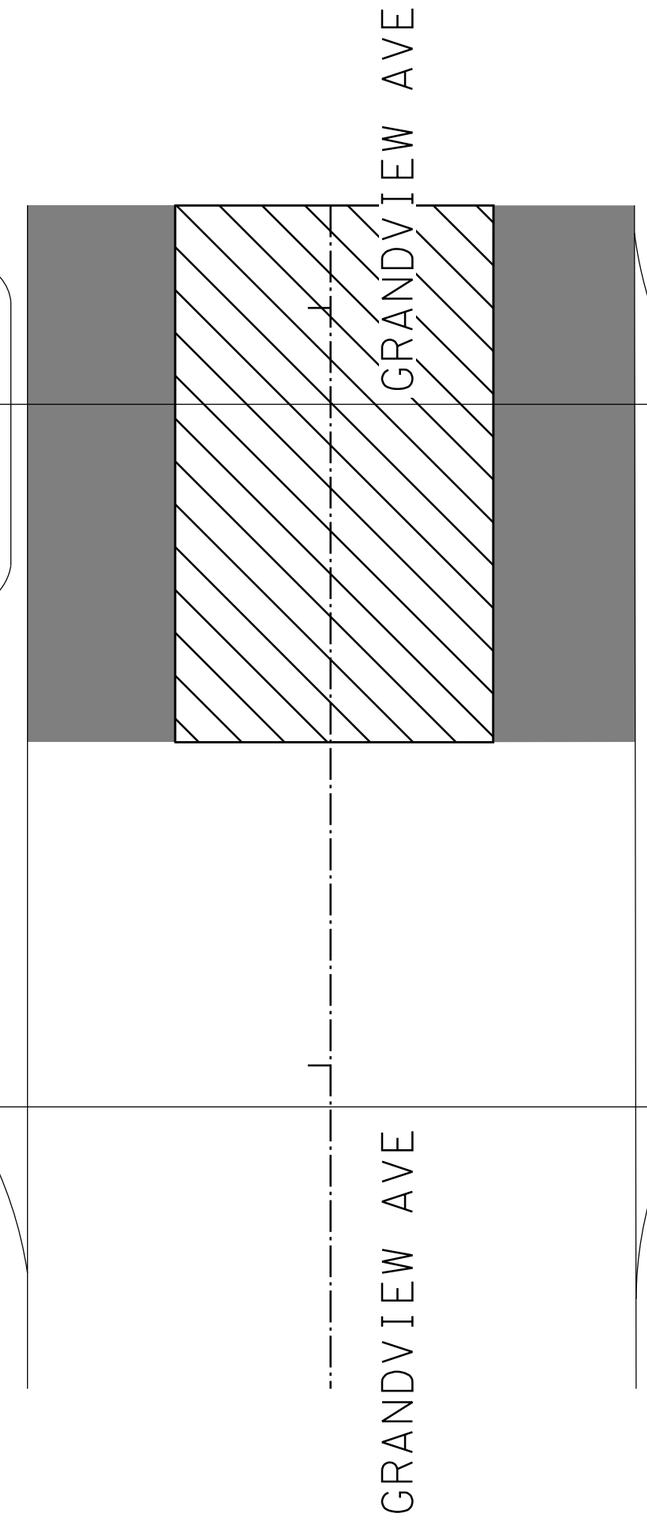
FM 3503
IH 20 SERVICE RD PHASING

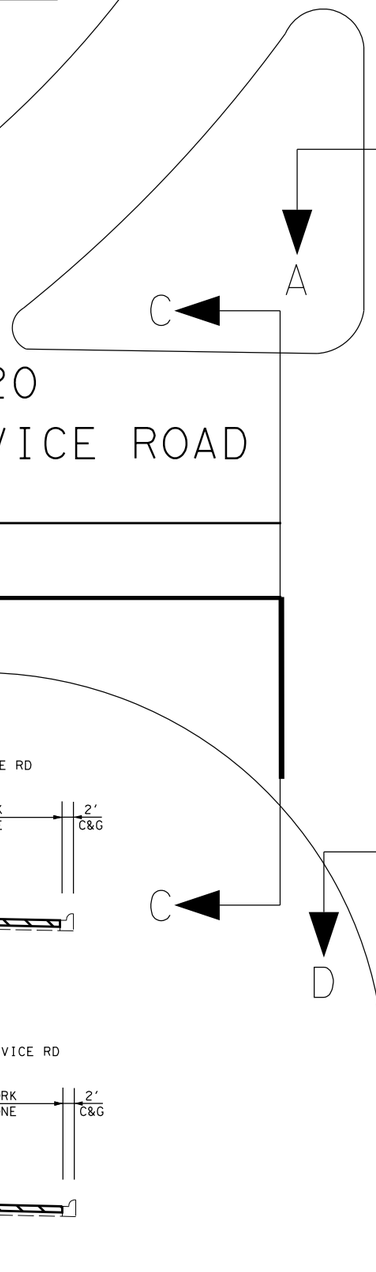
SHEET 2 OF 7

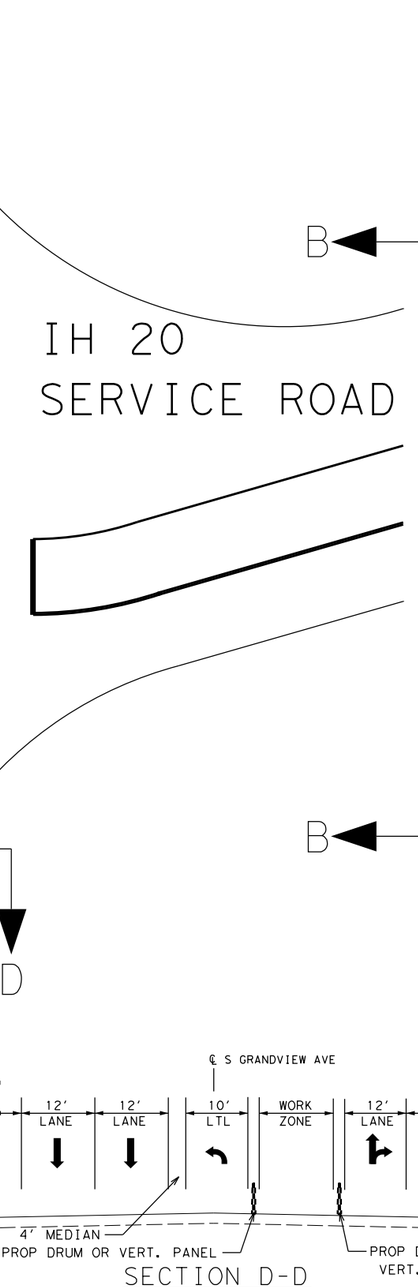
DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	14
	CONT.	SECT.	JOB	
	3570	01	012	

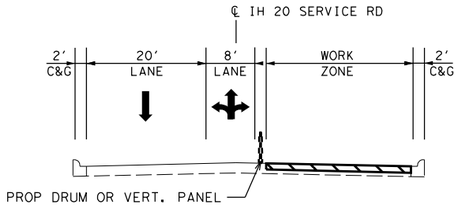


SECTION A-A

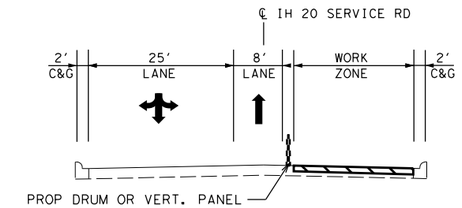




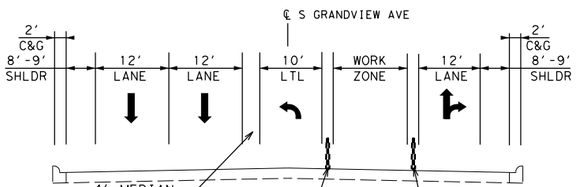




SECTION B-B



SECTION C-C



SECTION D-D

PREVIOUS PHASE CONSTRUCTION

PHASE 2
INSIDE LANE WIDTHS + LEFT TURN LANE

662 6098	662 6075
WK ZN PAV MRK REMOV (Y) 6" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SLD)
LF	LF
0	0

NOTE: PHASE SIDE STREET CONSTRUCTION, TO ALLOW ACCESS OR PROVIDE DETOUR

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
PROFESSIONAL ENGINEER
LICENSED

03/21/2023

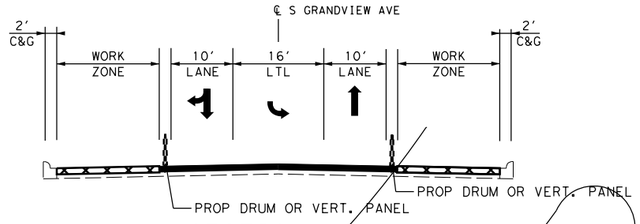
Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3680

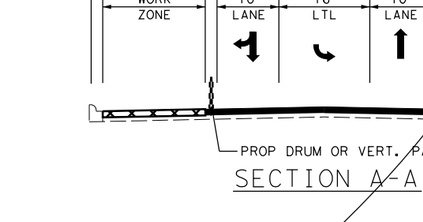
FM 3503
IH 20 SERVICE RD PHASING

SHEET 3 OF 7

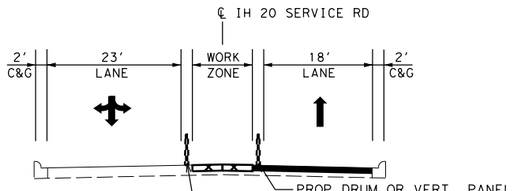
DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	
APPROVED	CONT.	SECT.	JOB	15
	3570	01	012	



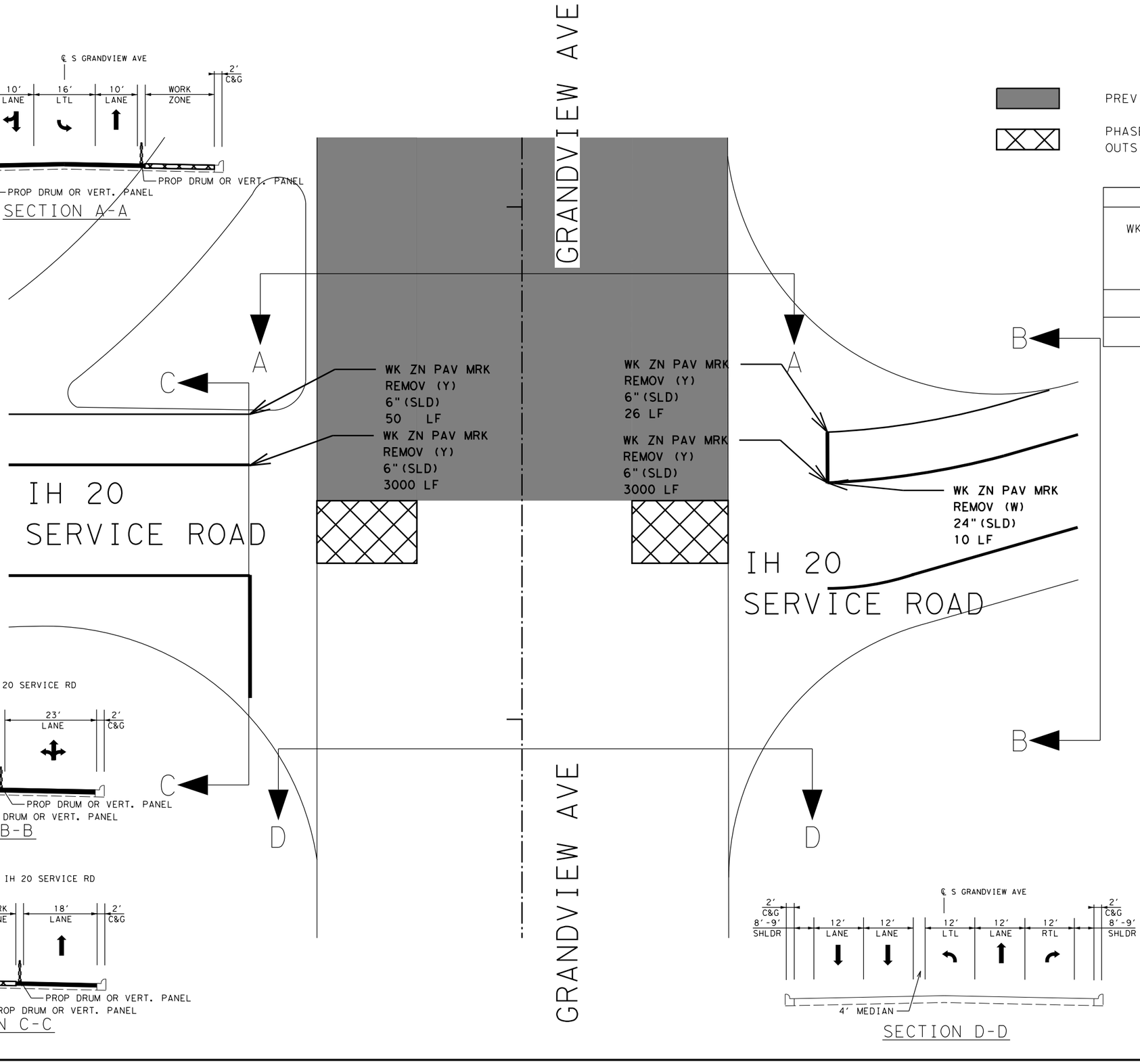
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

PREVIOUS PHASE CONSTRUCTION

PHASE 3 A
OUTSIDE LANE WIDTHS

662 6098	662 6075
WK ZN PAV MRK REMOV (Y) 6" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SLD)
LF	LF
6,076	10

NOTE: PHASE SIDE STREET CONSTRUCTION, TO ALLOW ACCESS OR PROVIDE DETOUR

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

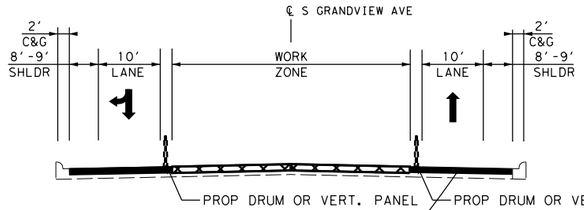
Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2925 Dallas Parkway, Suite 660 • Plano, Texas 75093 • 972.488.3880

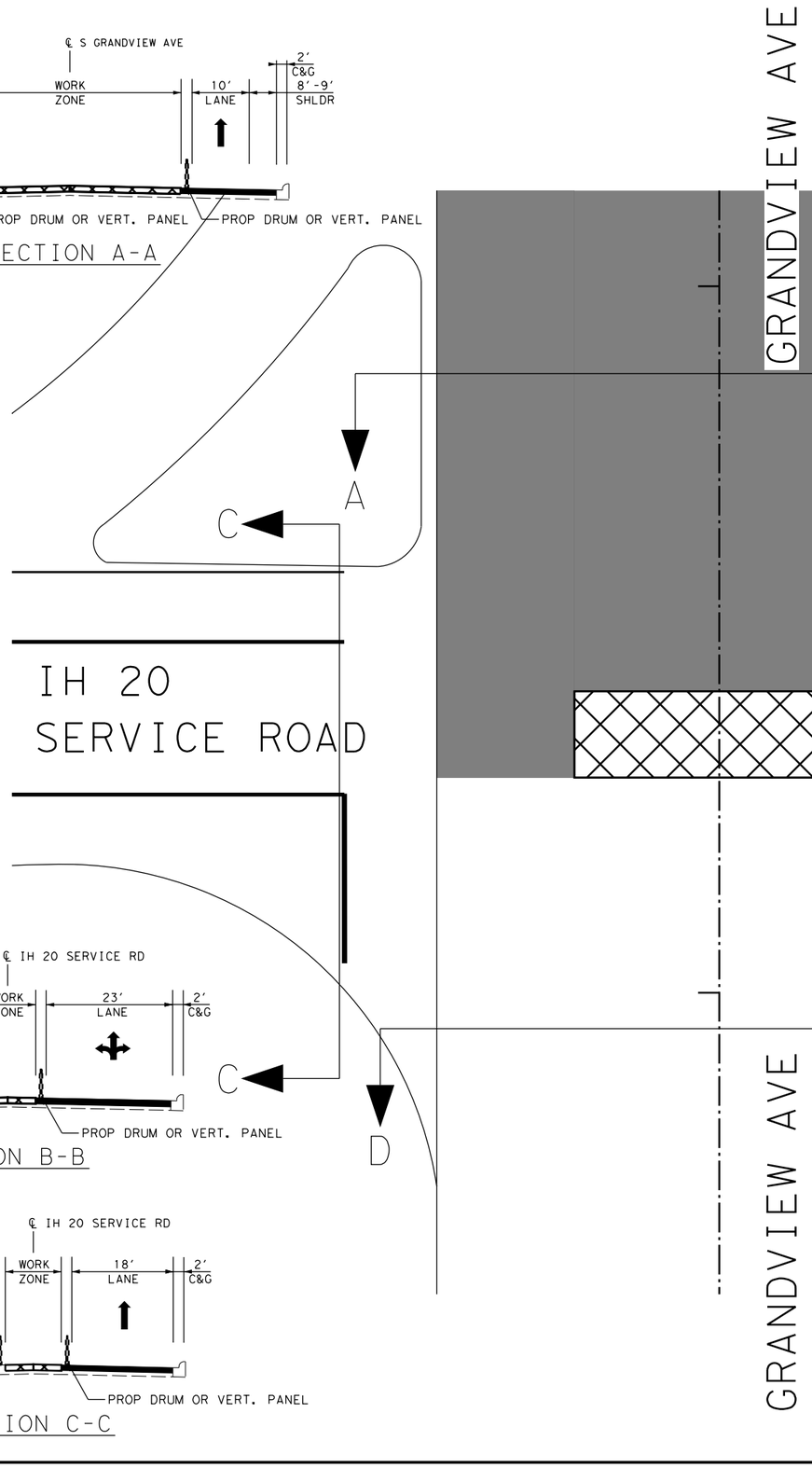
FM 3503
IH 20 SERVICE RD PHASING

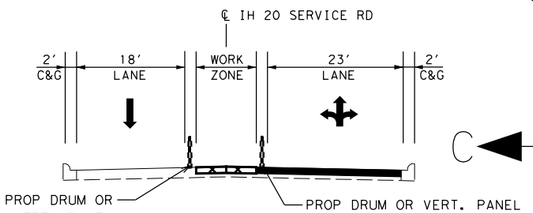
SHEET 4 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	16
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

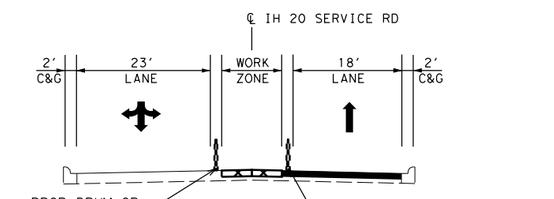


SECTION A-A

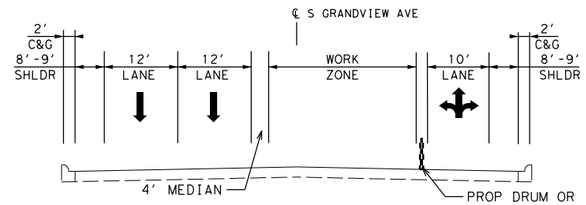




SECTION B-B



SECTION C-C



SECTION D-D

PREVIOUS PHASE CONSTRUCTION

PHASE 3 B
INSIDE LANE WIDTH + LEFT TURN LANE

662 6098	662 6075
WK ZN PAV MRK REMOV (Y) 6" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SLD)
LF	LF
0	0

NOTE: PHASE SIDE STREET CONSTRUCTION, TO ALLOW ACCESS OR PROVIDE DETOUR

NO.	DATE	REVISION	APPROVED

DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

03/21/2023

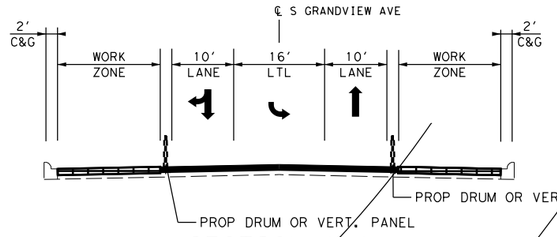
Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

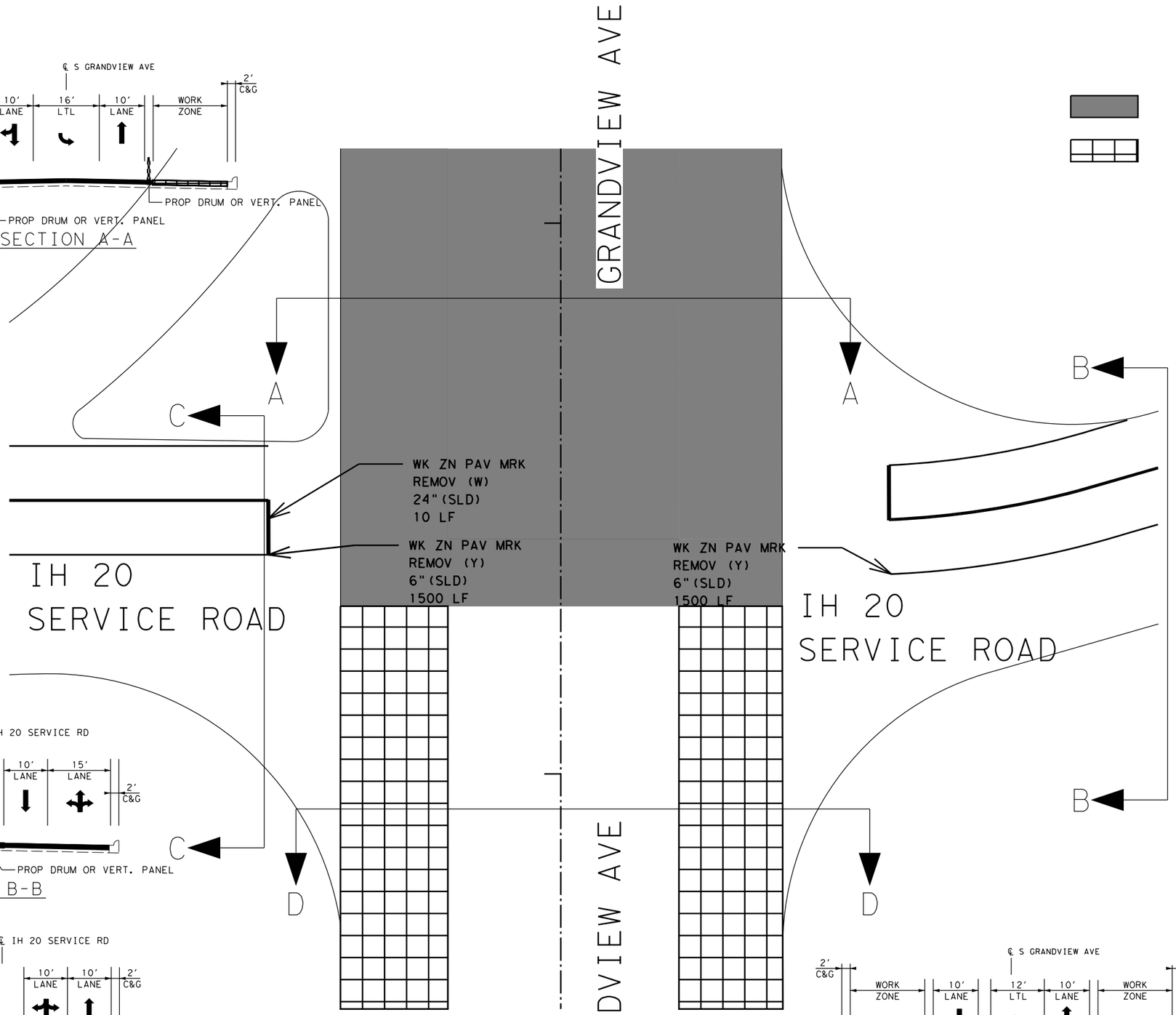
FM 3503
IH 20 SERVICE RD PHASING

SHEET 5 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	17
	CONT.	SECT.	JOB	
	3570	01	012	



SECTION A-A

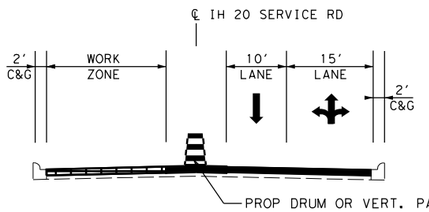


PREVIOUS PHASE CONSTRUCTION

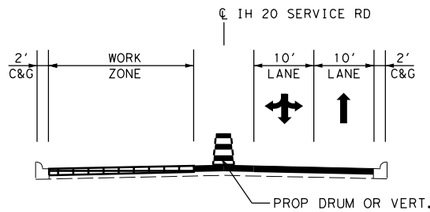
PHASE 4
OUTSIDE LANE WIDTHS + SHOULDERS

662 6098	662 6075
WK ZN PAV MRK REMOV (Y) 6" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SLD)
LF	LF
3,000	10

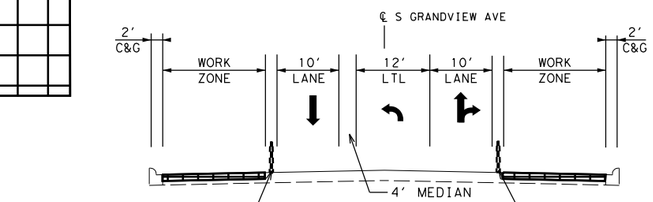
NOTE: PHASE SIDE STREET CONSTRUCTION, TO ALLOW ACCESS OR PROVIDE DETOUR



SECTION B-B



SECTION C-C



SECTION D-D

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED PROFESSIONAL ENGINEER

03/21/2023

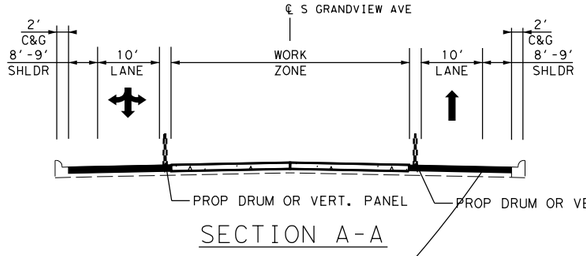
Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

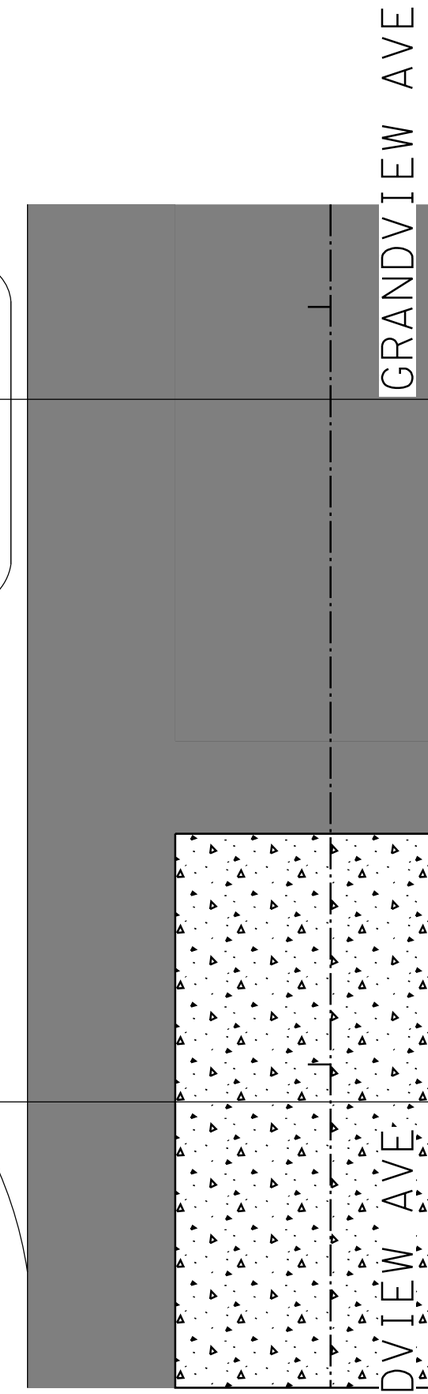
FM 3503
IH 20 SERVICE RD PHASING

SHEET 6 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	18
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	



SECTION A-A

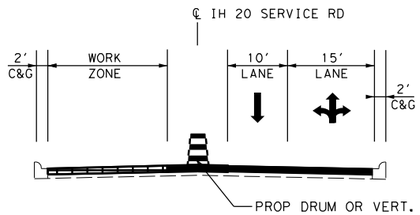


PREVIOUS PHASE CONSTRUCTION

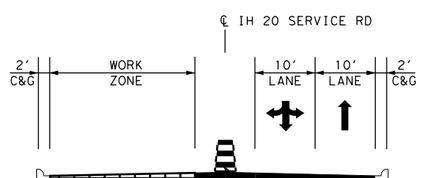
PHASE 5
INSIDE LANE WIDTHS + LEFT TURN LANE

662 6098	662 6075
WK ZN PAV MRK REMOV (Y) 6" (SLD)	WK ZN PAV MRK REMOV (W) 24" (SLD)
LF	LF
0	0

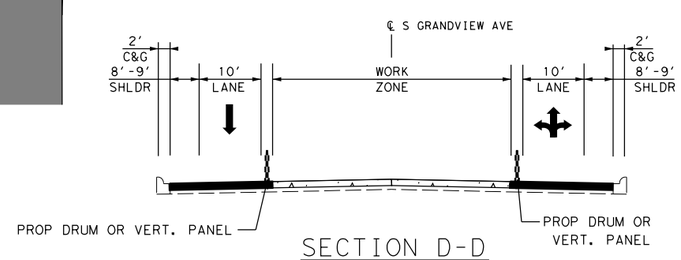
NOTE: PHASE SIDE STREET CONSTRUCTION, TO ALLOW ACCESS OR PROVIDE DETOUR



SECTION B-B



SECTION C-C



SECTION D-D

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2022

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
IH 20 SERVICE RD PHASING

SHEET 7 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	19
	CONT.	SECT.	JOB	
	3570	01	012	

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

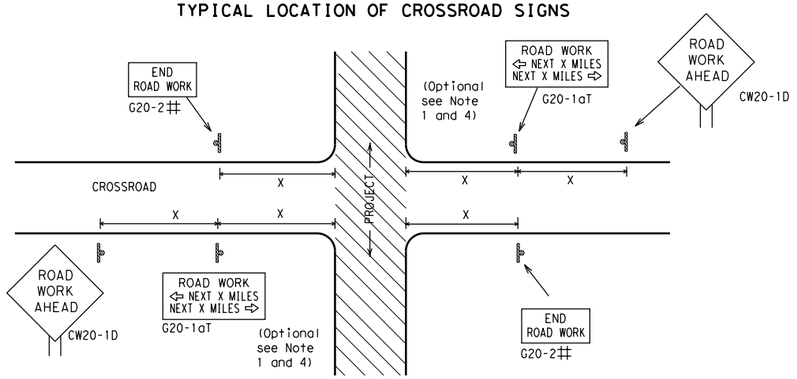
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		20

DATE: 3/21/2023 4:17:22 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\bc-21.dgn

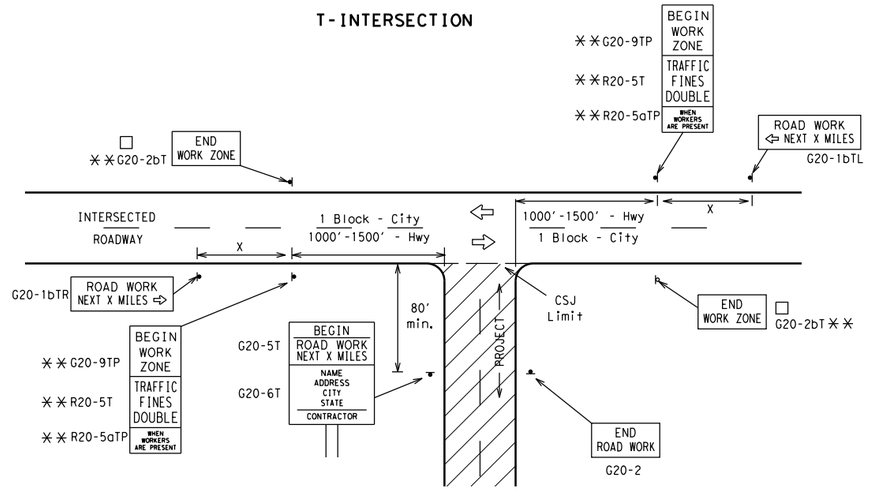
TYPICAL LOCATION OF CROSSROAD SIGNS



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.

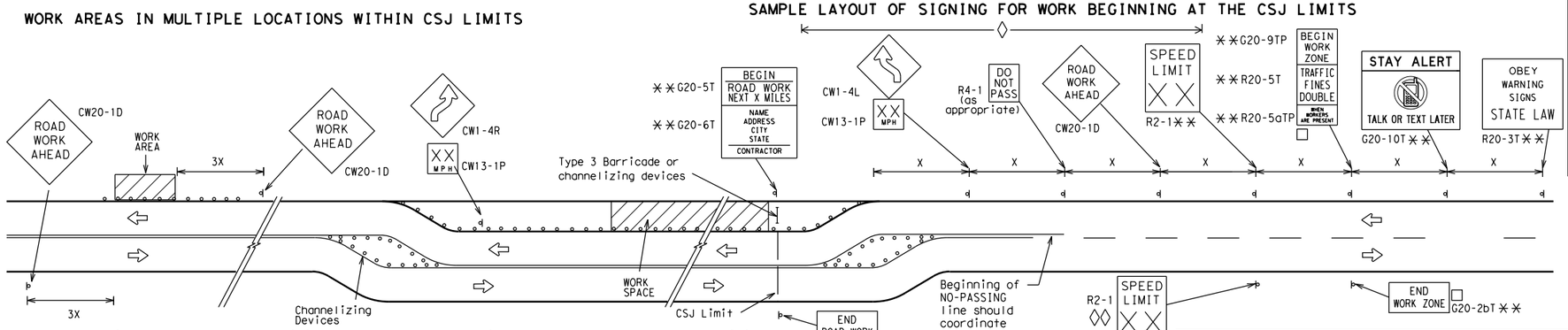
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

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.

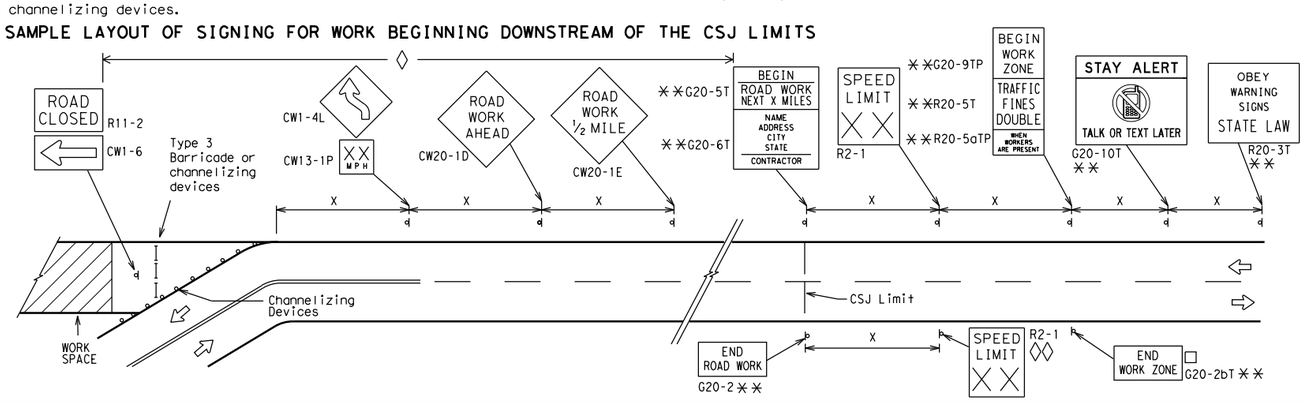
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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

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



NOTES

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

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

XX 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	3570	01	012	FM 3503
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	ECTOR		21

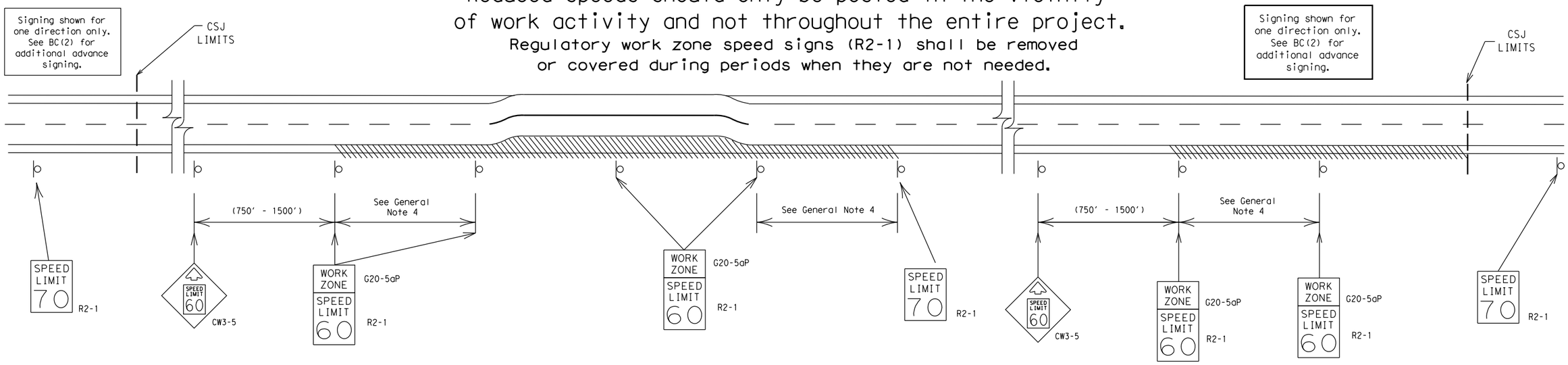
DATE: 3/21/2023 4:17:22 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\bc-21.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

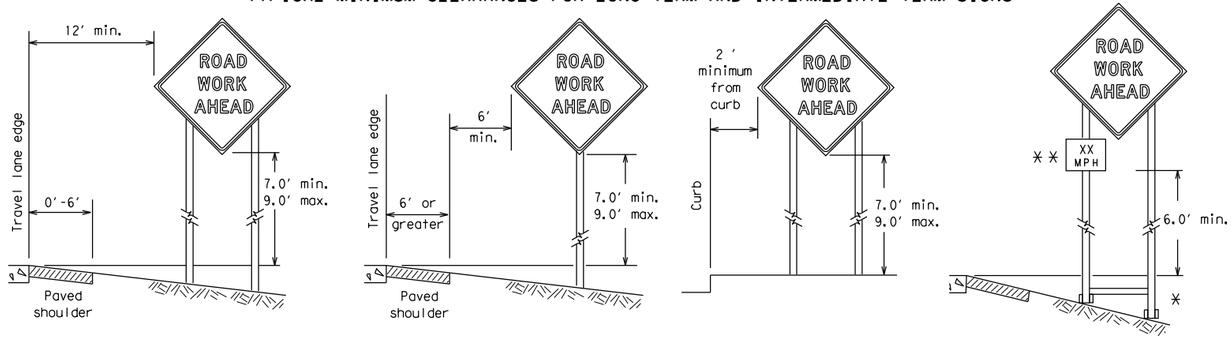
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		22

DATE: 3/21/2023 4:17:23 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\bc-21.dgn

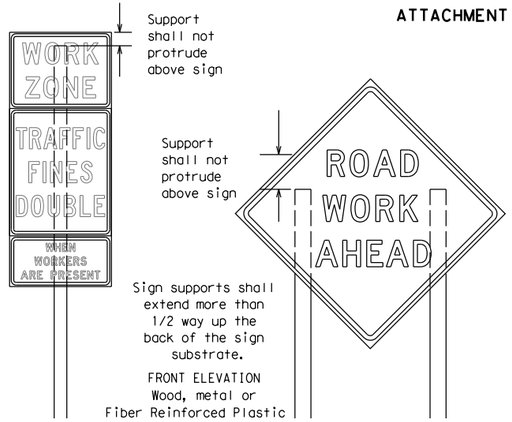
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



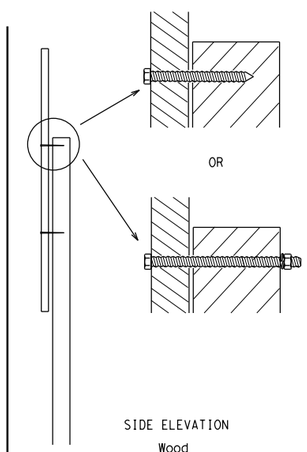
⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



FRONT ELEVATION
Wood, metal or
Fiber Reinforced Plastic



SIDE ELEVATION
Wood

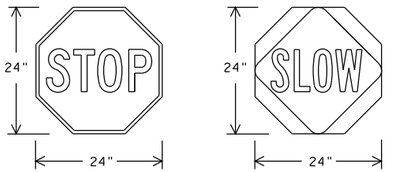
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

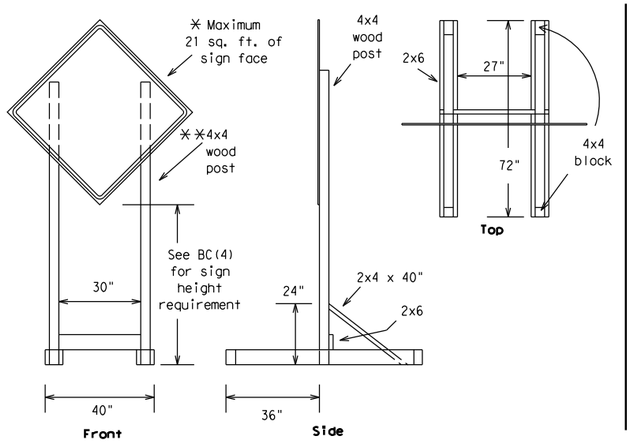
Traffic Safety Division Standard

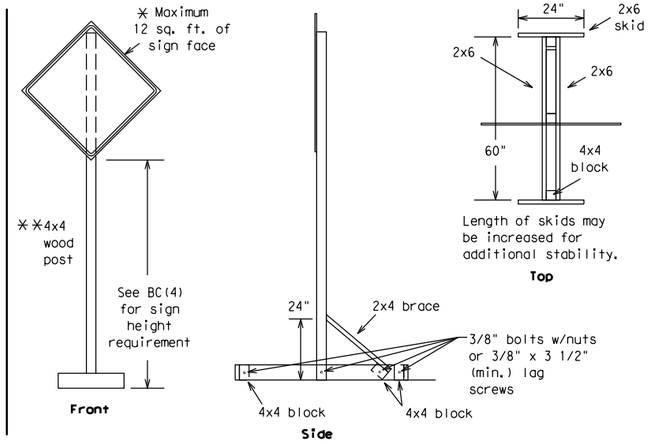
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	ECTOR		23

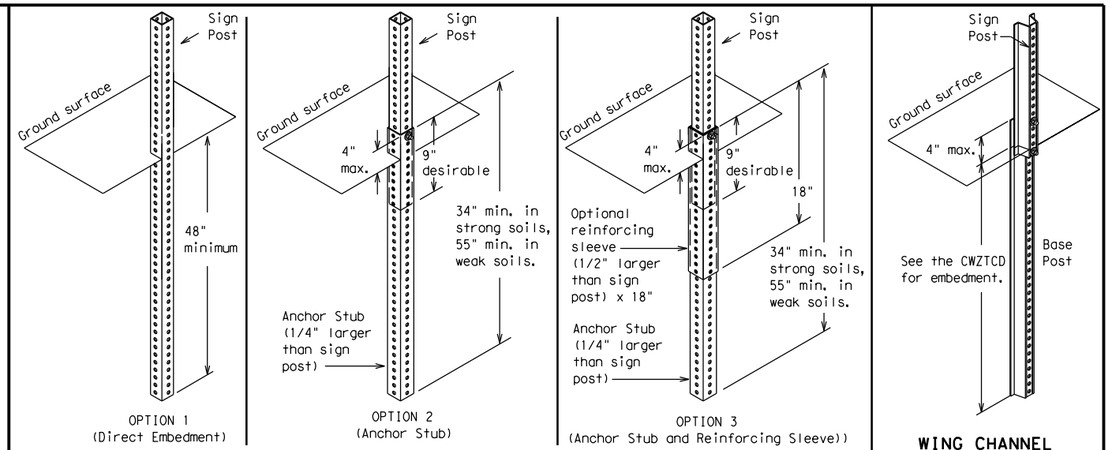
DATE: 3/21/2023 4:17:24 PM
FILE: c:\bms\pwe101-01\bradley.krecman\dms28985\bc-21.dgn





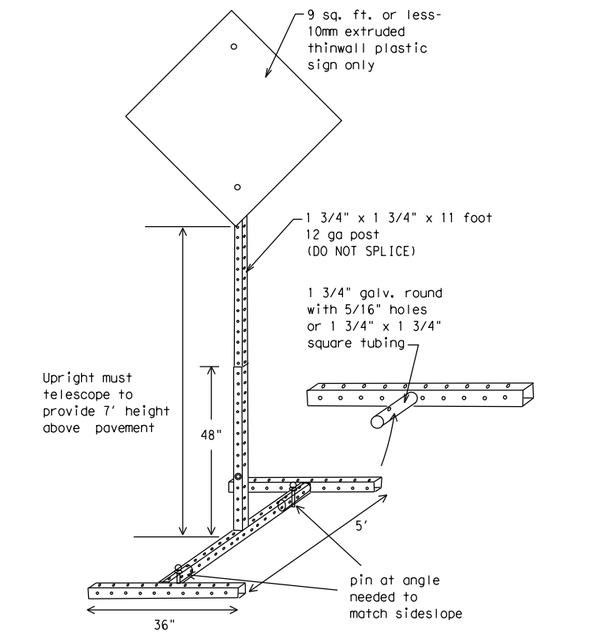
SKID MOUNTED WOOD SIGN SUPPORTS

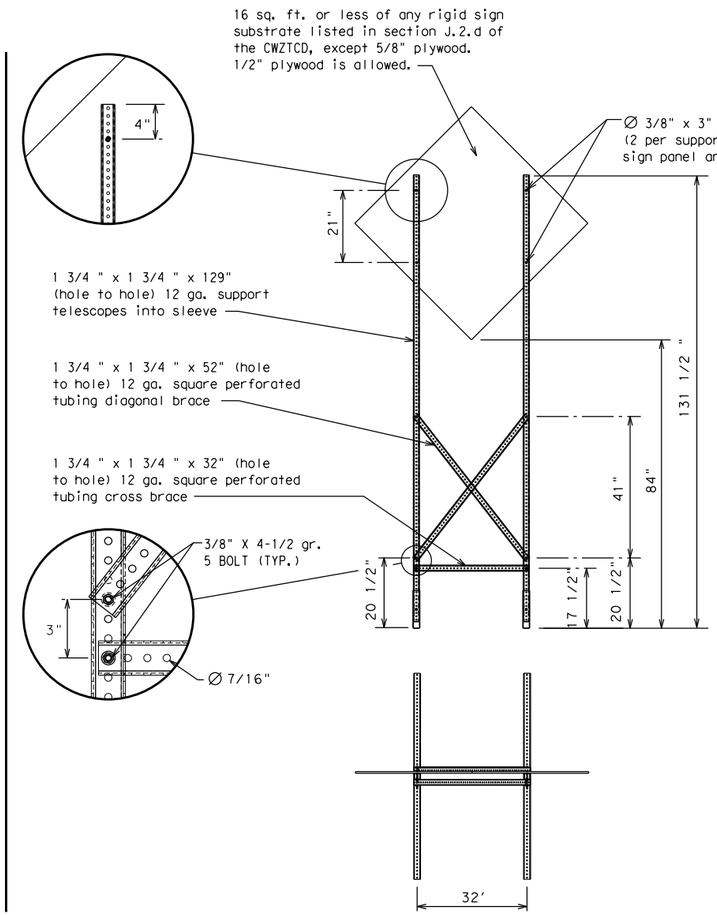
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

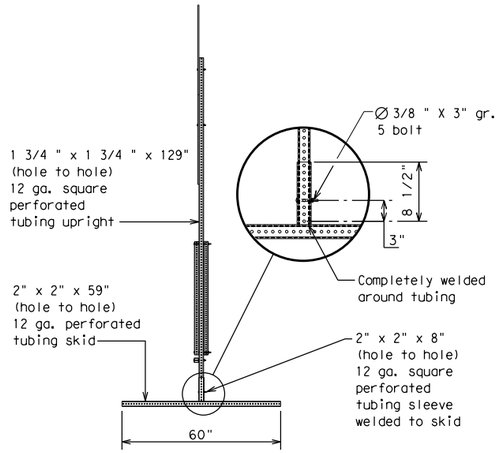


GROUND MOUNTED SIGN SUPPORTS

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	3570	01	012	FM 3503
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	ECTOR		24

DATE: 3/21/2023 4:17:24 PM
FILE: c:\bms\pwe101-01\bradley.krecemar\dms28985\bc-21.dgn

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

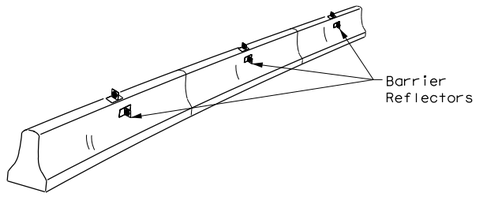
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	ECTOR		25

100

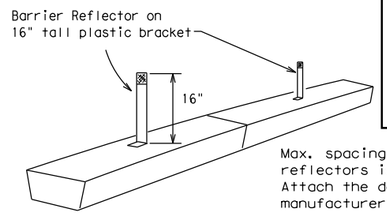
DATE: 3/21/2023 4:17:25 PM
FILE: c:\bms\pwe101-01\bradley.krecemar\dms28985\bc-21.dgn

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.



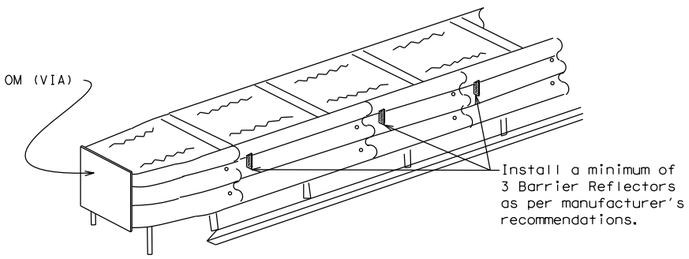
CONCRETE TRAFFIC BARRIER (CTB)

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)



DELINEATION OF END TREATMENTS

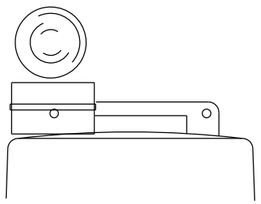
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

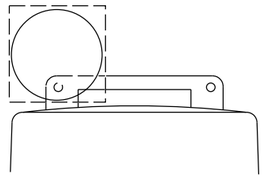
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

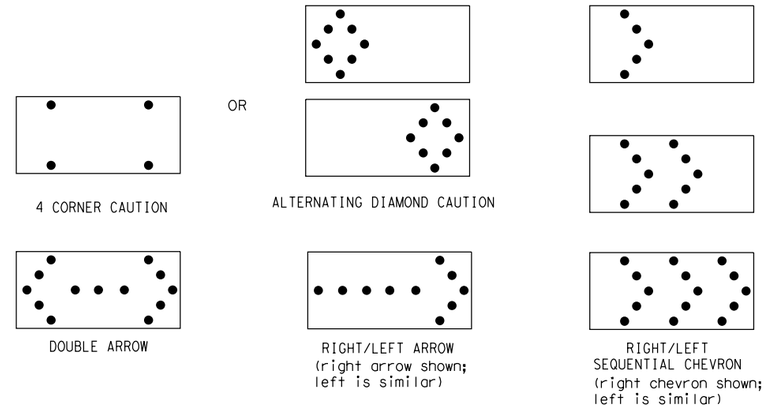
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	ECTOR		26

101

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:

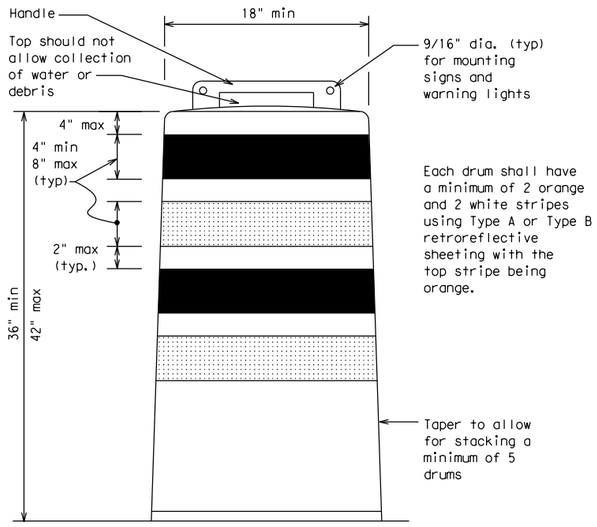
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

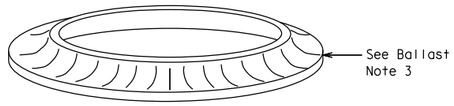
RETROREFLECTIVE SHEETING

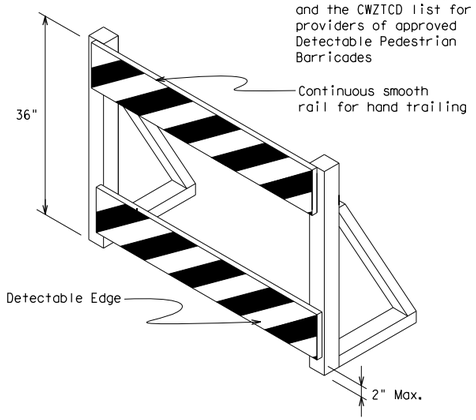
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

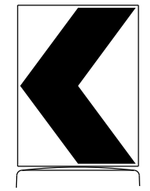




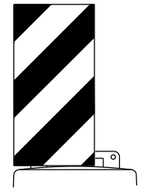


DETECTABLE PEDESTRIAN BARRICADES

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

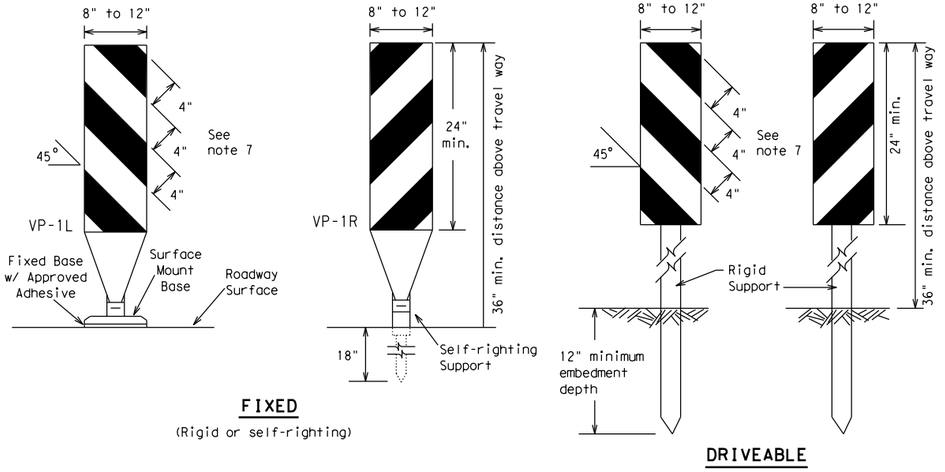
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	ODA	ECTOR		27
7-13				

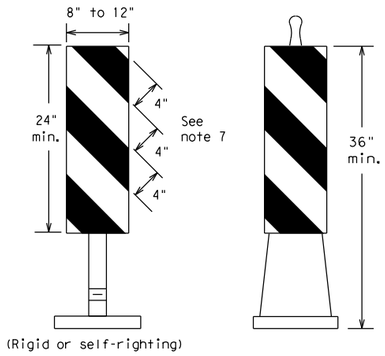
102

DATE: 3/21/2023 4:17:26 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\bc-21.dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

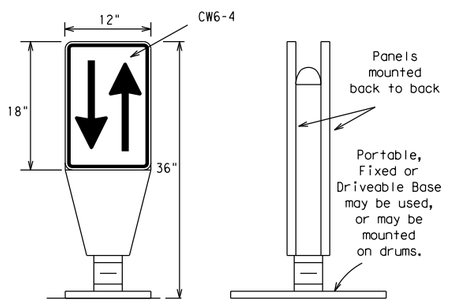


(Rigid or self-righting)

PORTABLE

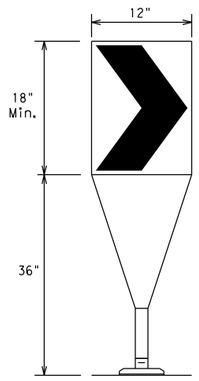
VERTICAL PANELS (VPs)

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.



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



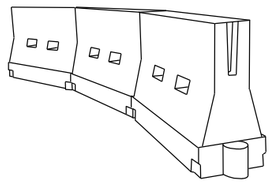
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

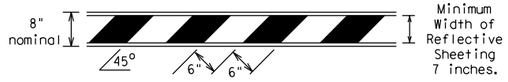
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	ECTOR		28

DATE: 3/21/2023 4:17:26 PM
FILE: c:\bms\pwe\101-01\bradley.kreceman\dms28985\bc-21.dgn

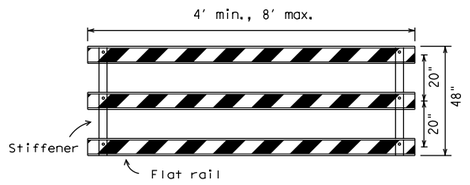
TYPE 3 BARRICADES

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.



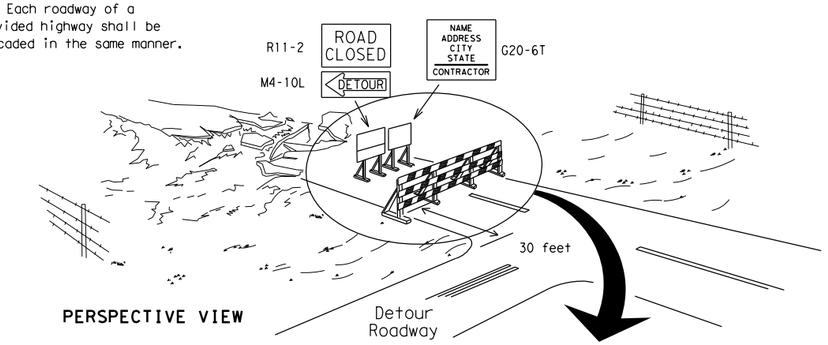
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

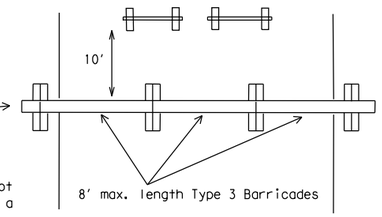
Each roadway of a divided highway shall be barricaded in the same manner.



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.

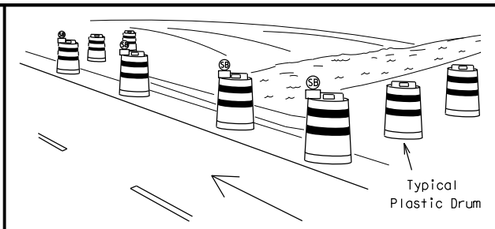
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

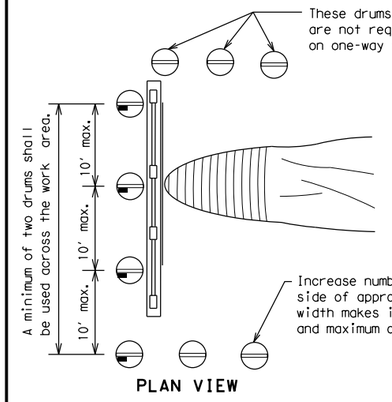
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

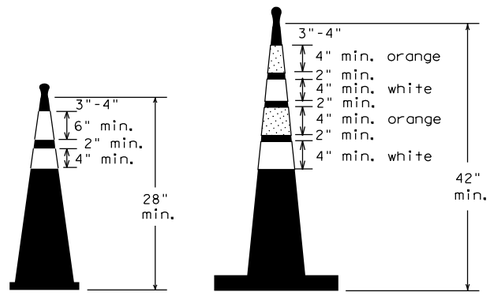
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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.



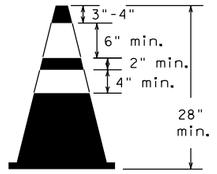
PLAN VIEW

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

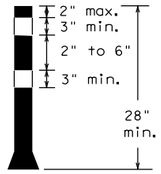
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

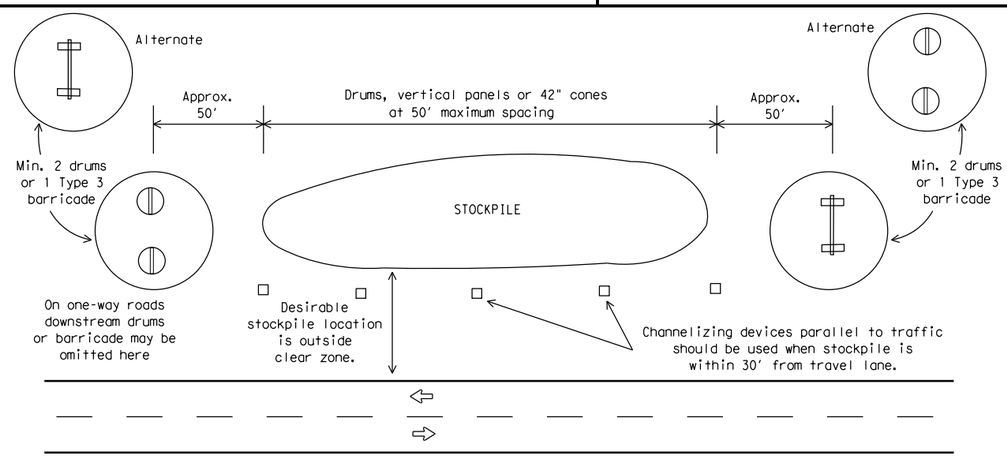


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

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	3570	01	012	FM 3503
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	ECTOR		29

104

DATE: 3/21/2023 4:17:27 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\bc-21.dgn

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.

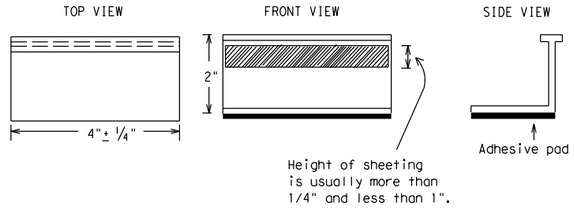
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

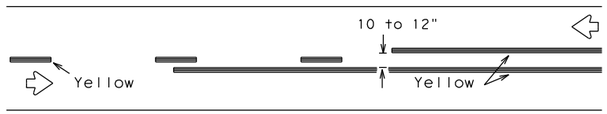
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	ODA	ECTOR		30
11-02 8-14				

105

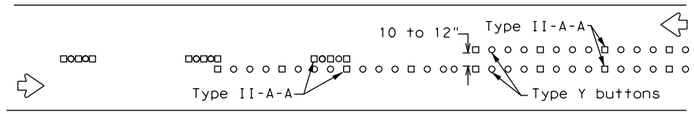
DATE: 3/21/2023 4:17:27 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\bc-21.dgn

DATE: 3/21/2023 4:17:28 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\bc-21.dgn

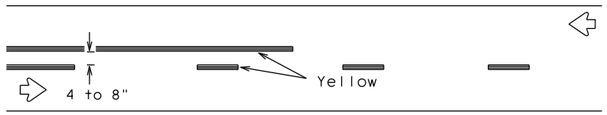
PAVEMENT MARKING PATTERNS



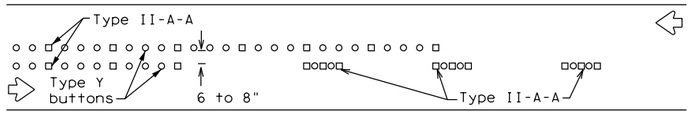
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



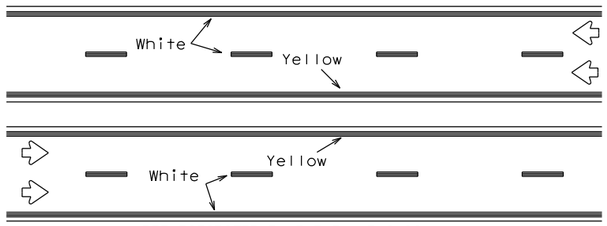
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



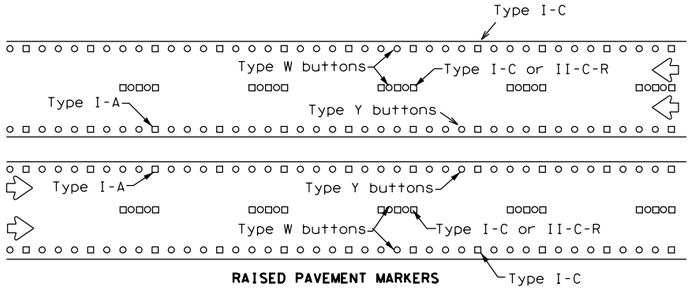
RAISED PAVEMENT MARKERS - PATTERN B

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

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



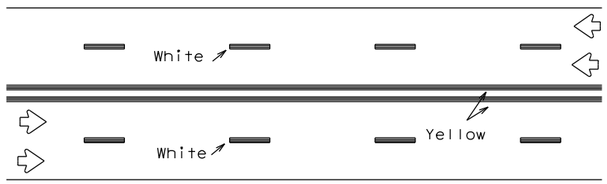
REFLECTORIZED PAVEMENT MARKINGS



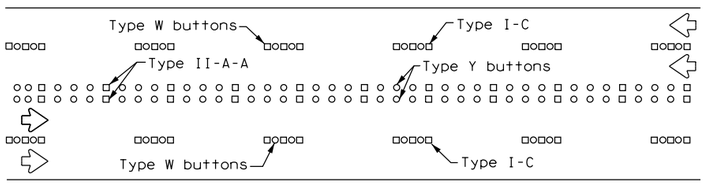
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



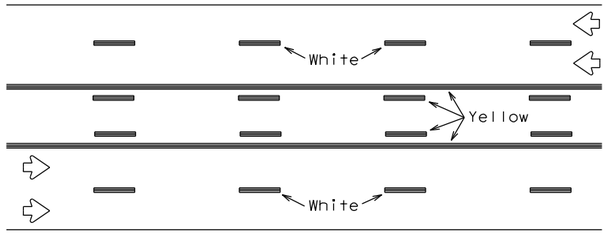
REFLECTORIZED PAVEMENT MARKINGS



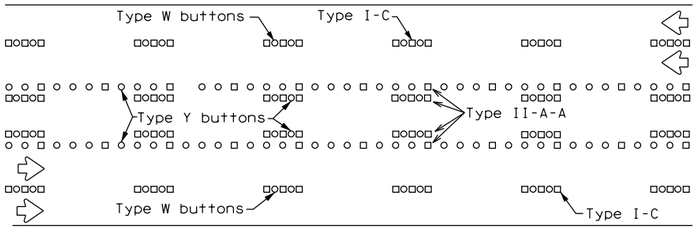
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

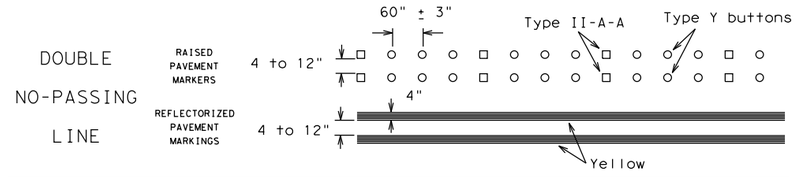
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

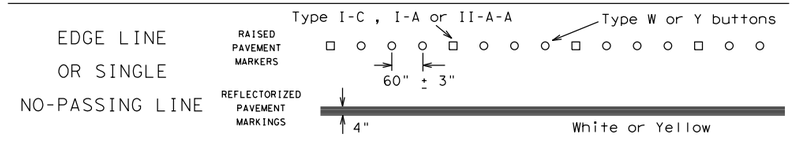
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

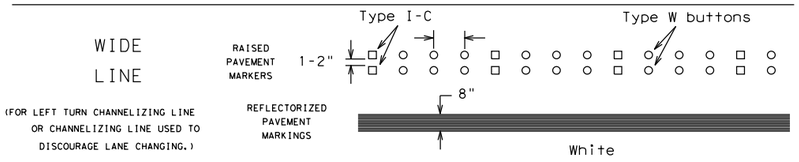


EDGE LINE OR SINGLE NO-PASSING LINE



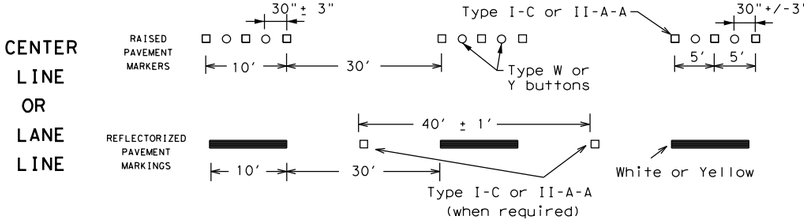
WIDE LINE

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

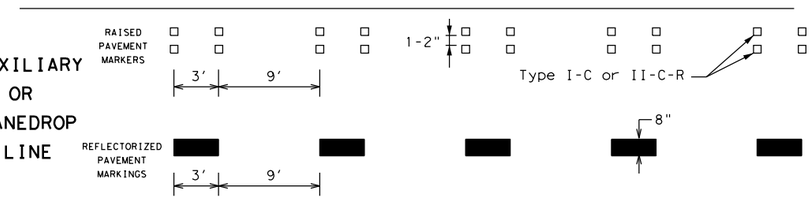


BROKEN LINES

CENTER LINE OR LANE LINE

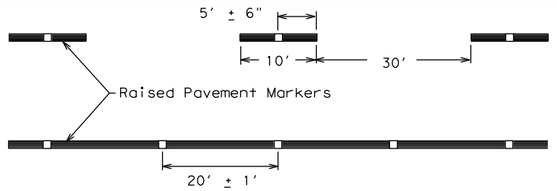


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

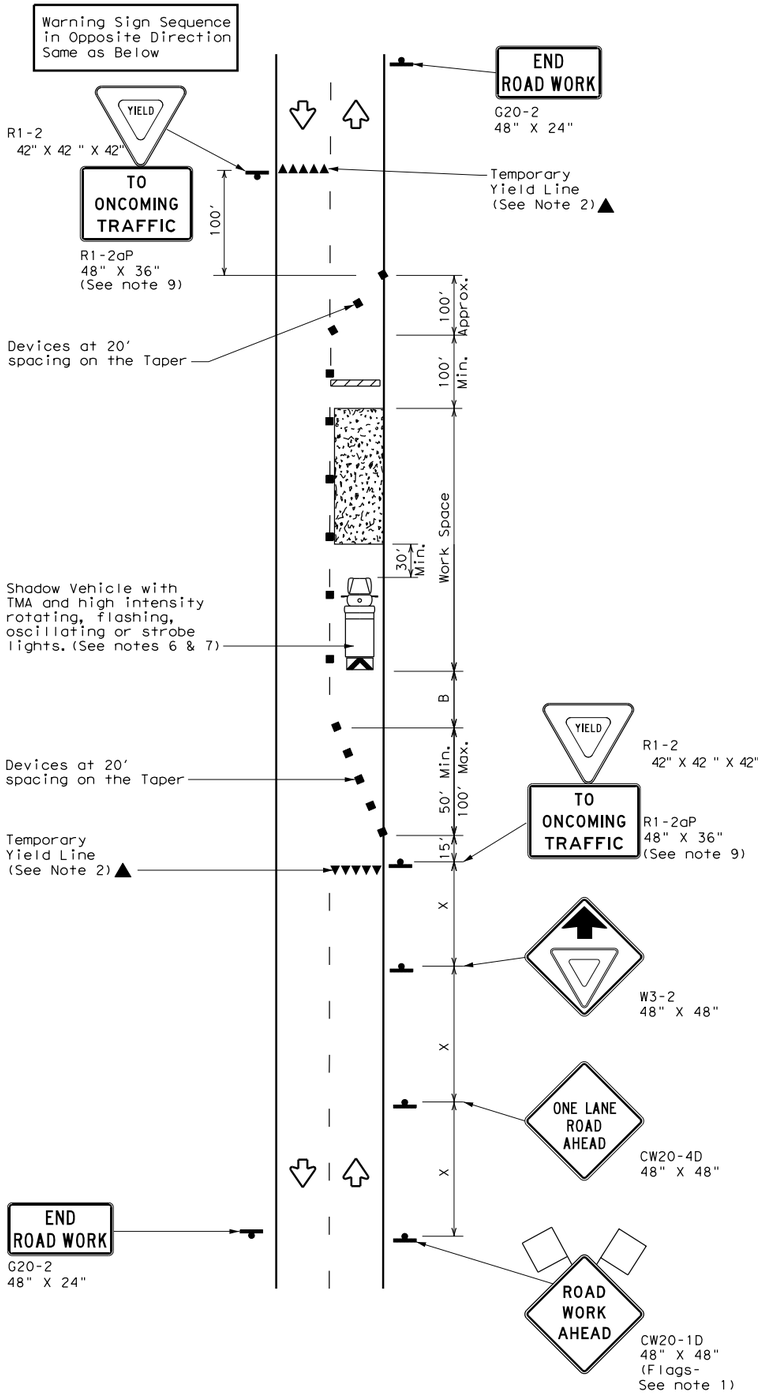
Texas Department of Transportation

Traffic Safety Division Standard

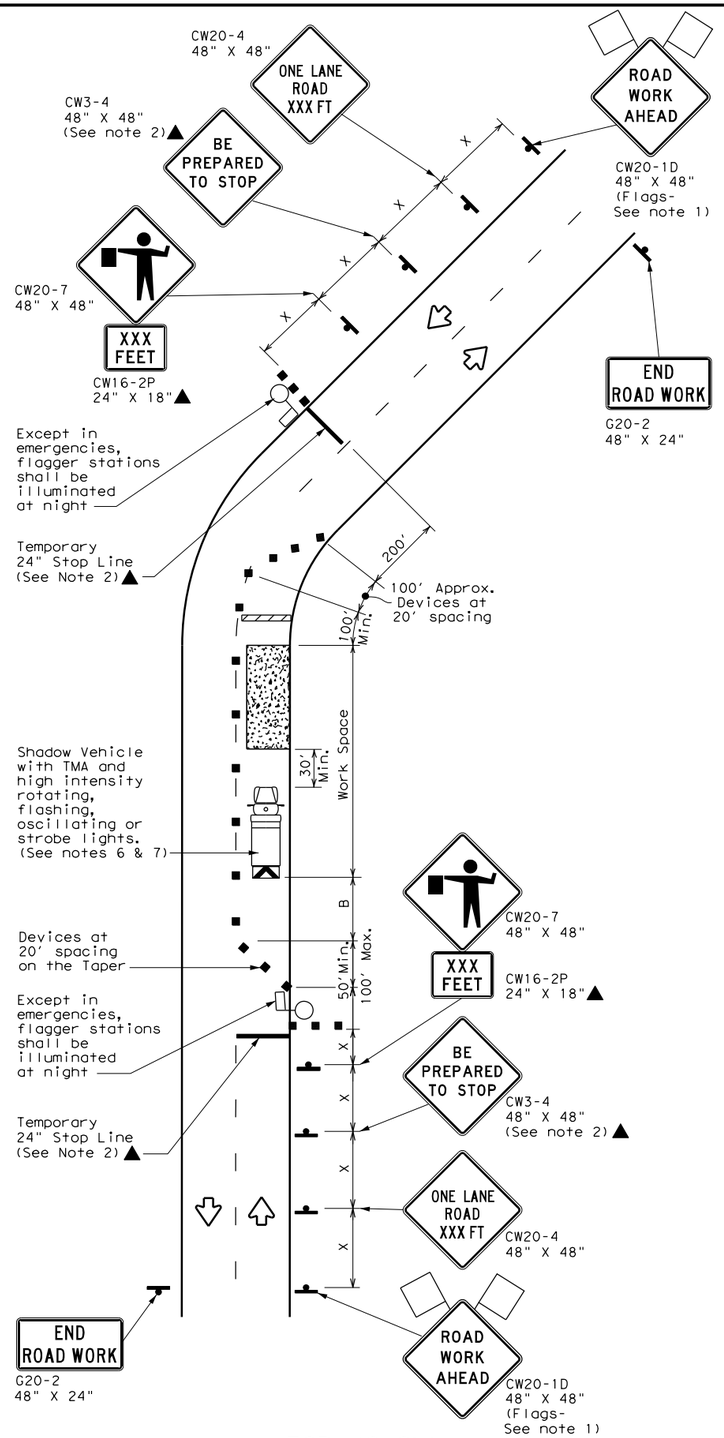
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		31



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

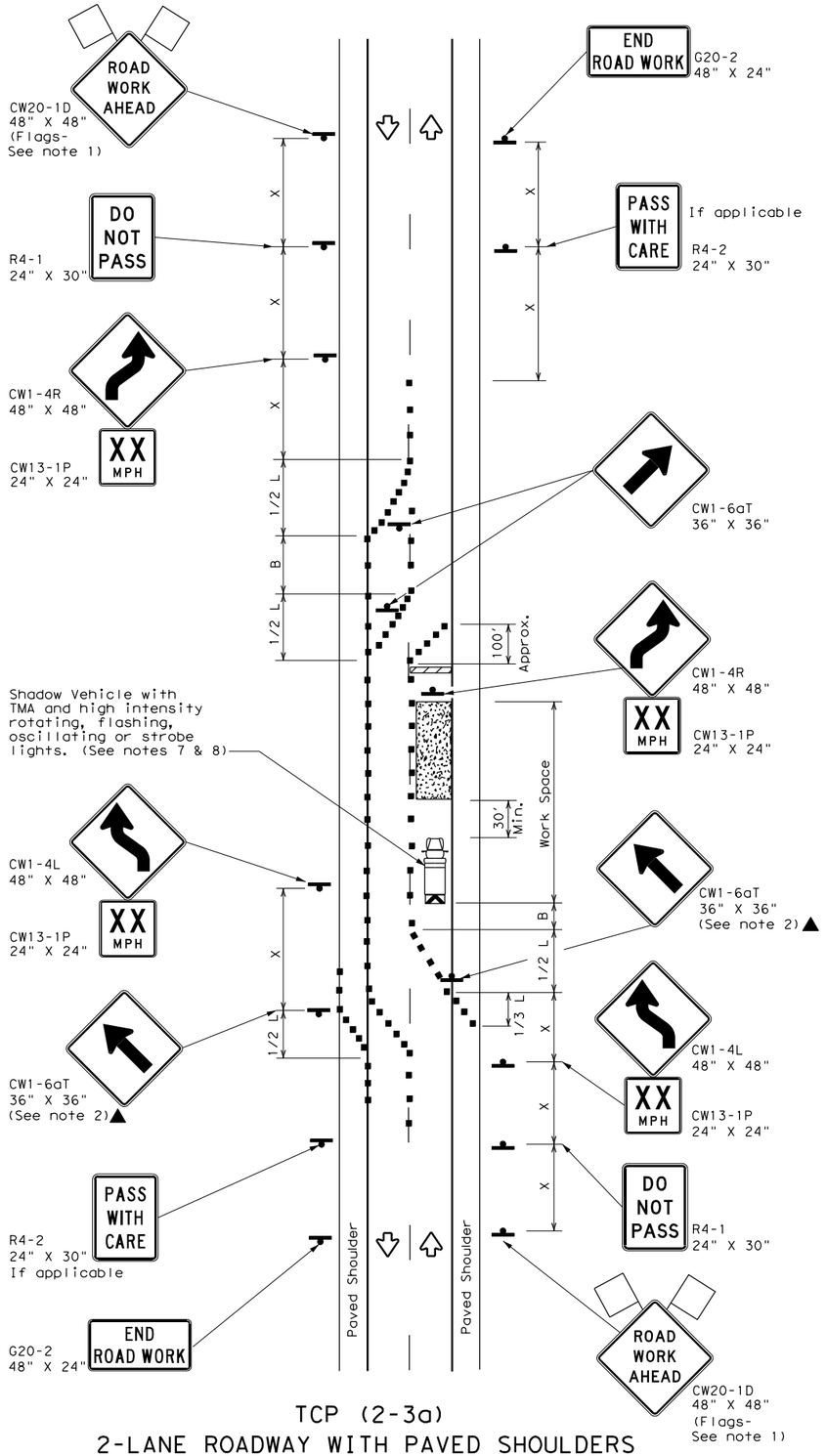
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

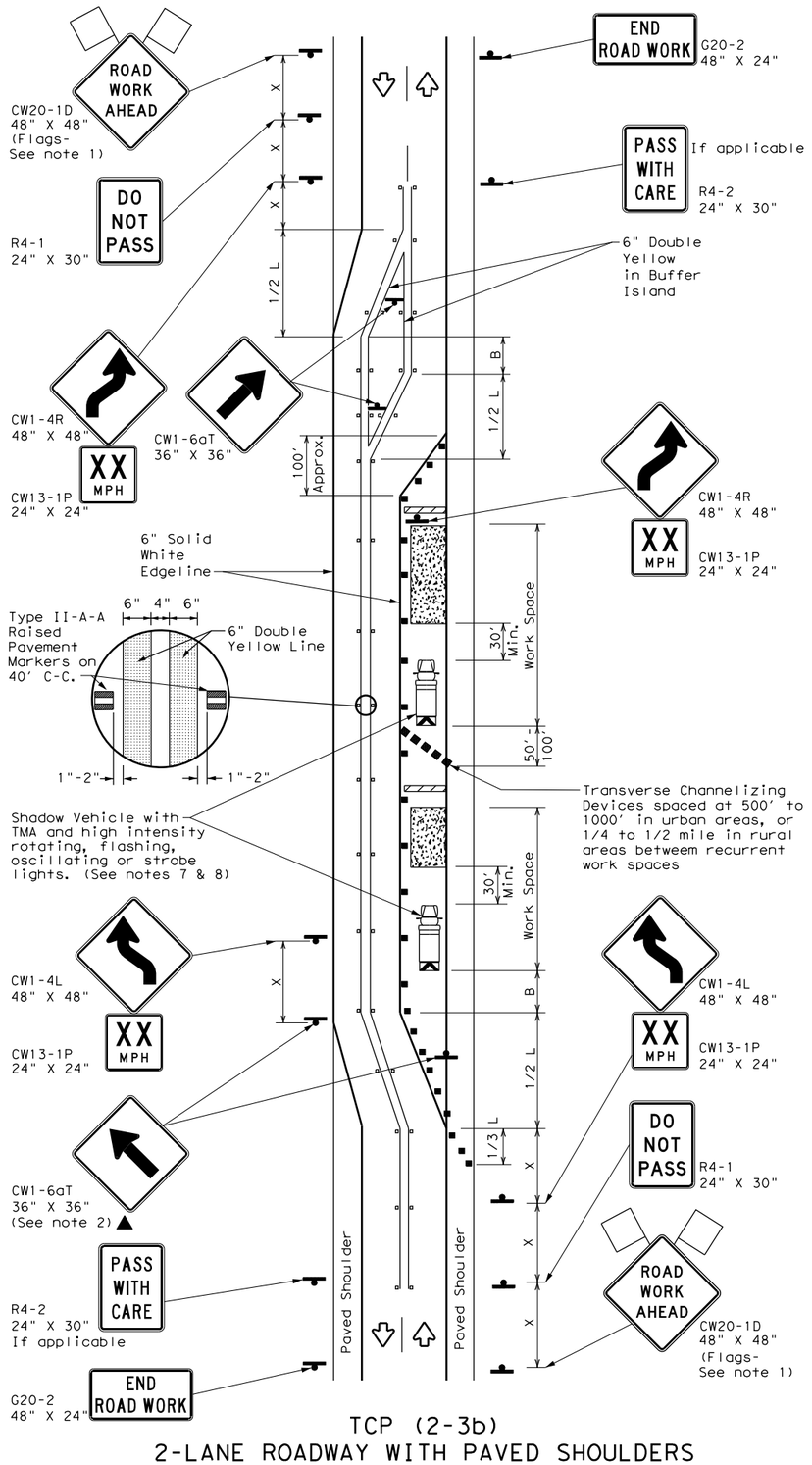
FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	3570	01	012	FM 3503
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	ODA	ECTOR		32

DATE: 3/21/2023 4:17:30 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\tcp2-2-18.dgn



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

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

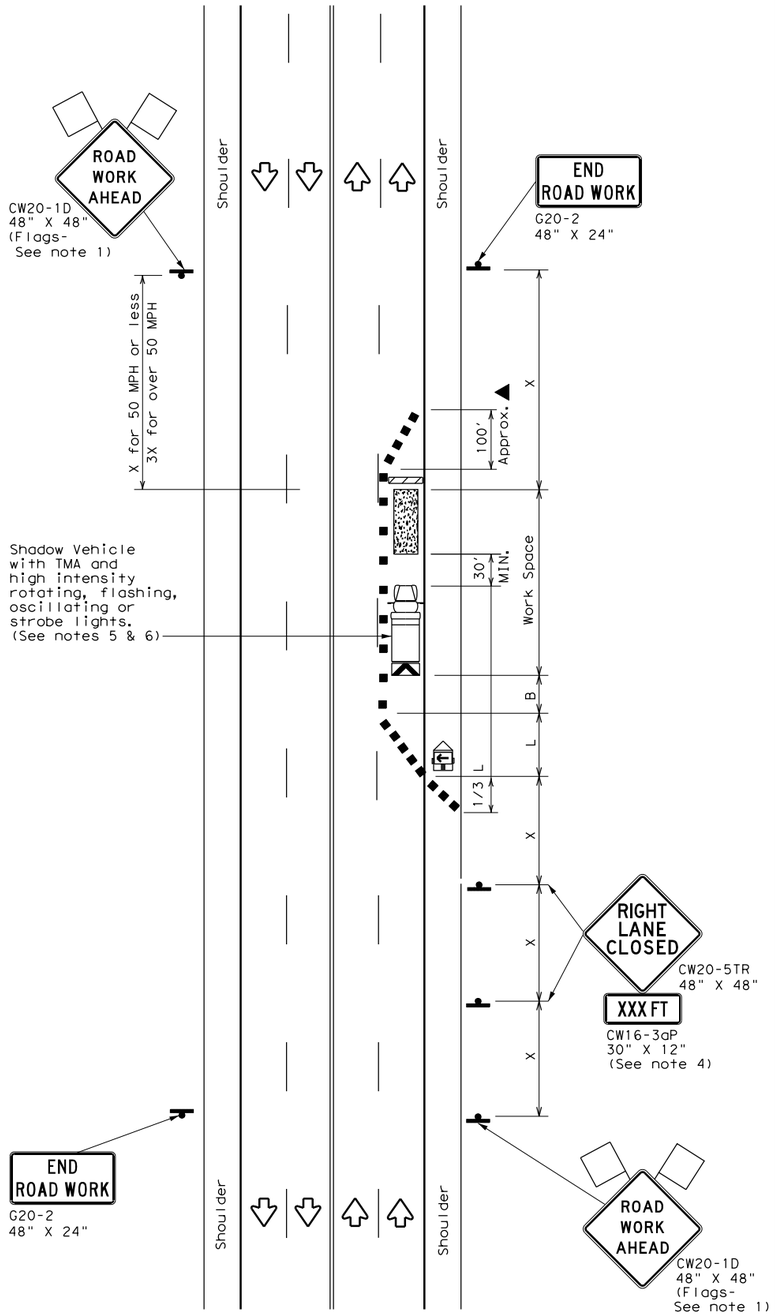
Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

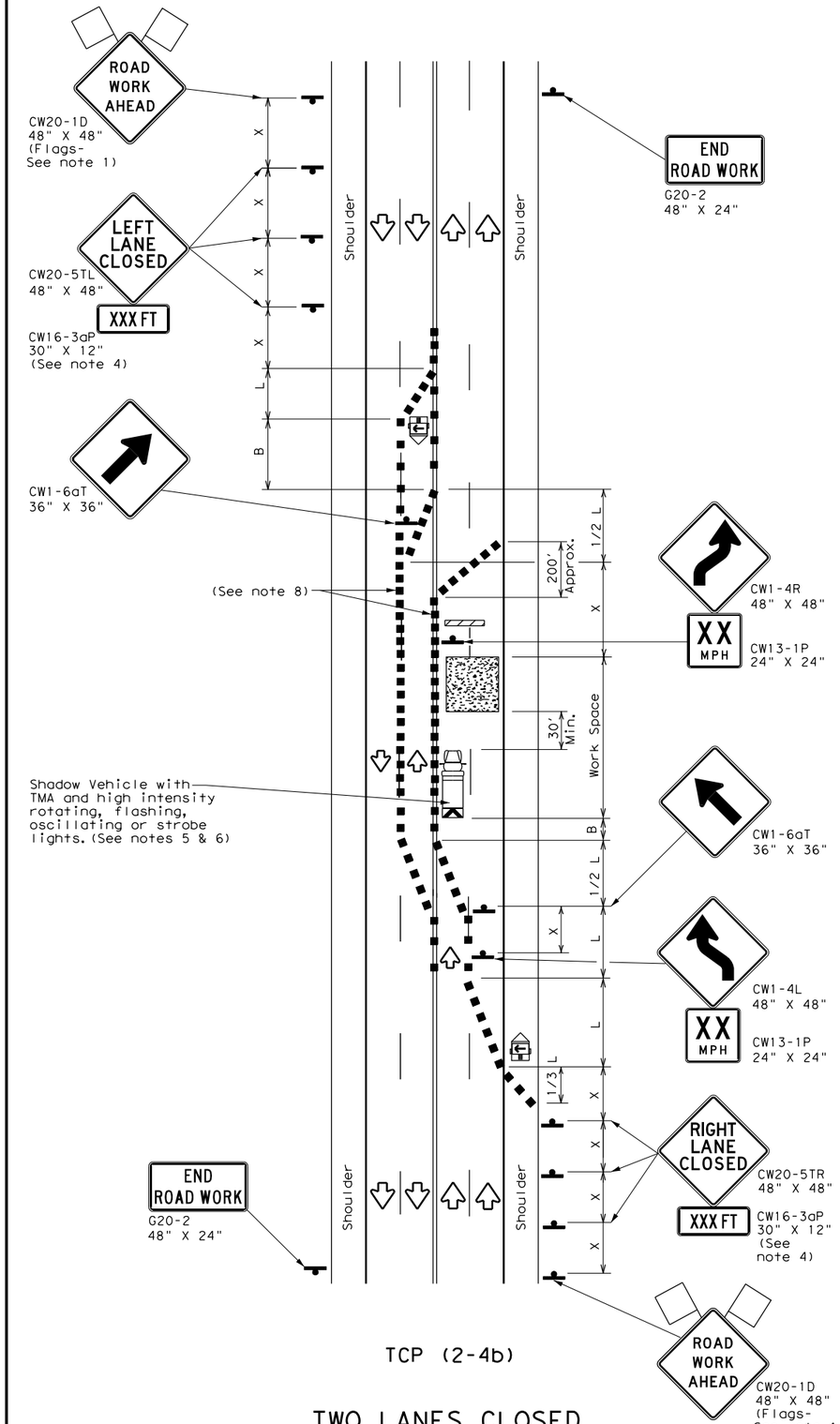
FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18	3570	01	012	FM 3503
8-95 3-03 4-23	DIST	COUNTY		SHEET NO.
1-97 2-12	ODA	ECTOR		33

DATE: 7/5/2023 4:00:44 PM
FILE: c:\bms\pwe101-01\mark,richardson\dms28985\tcp2-3-23.dgn



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

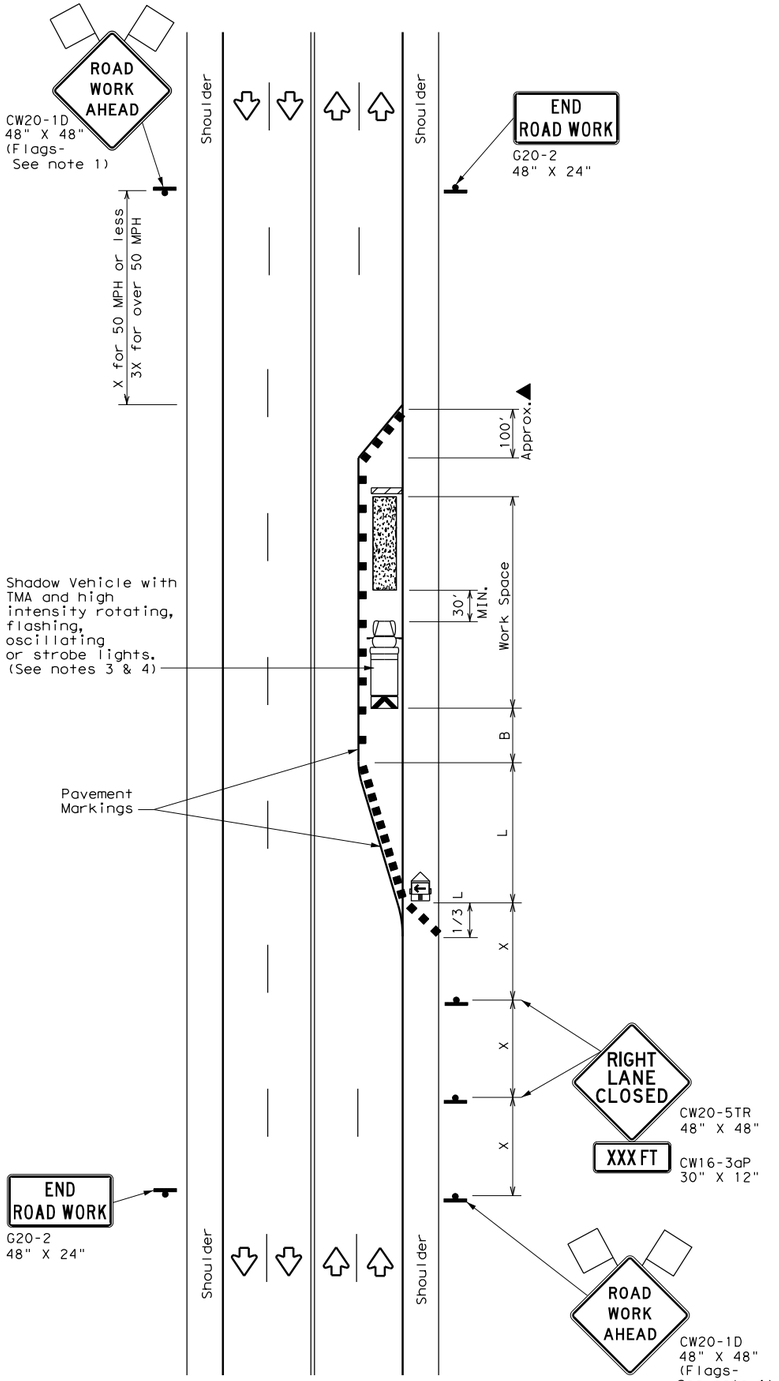
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

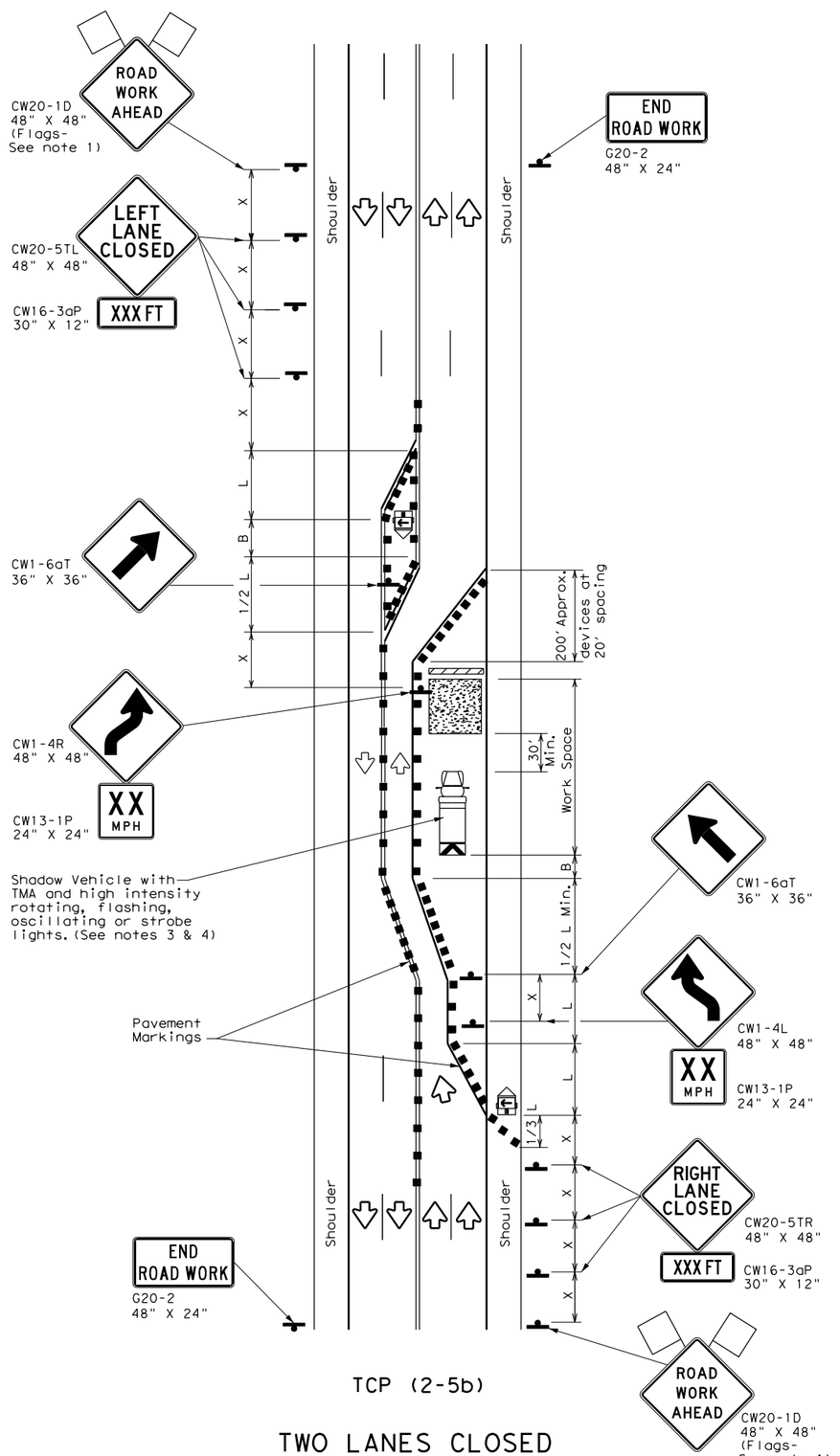
FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	3570	01	012	FM 3503
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	ODA	ECTOR		34

DATE: 3/21/2023 4:17:33 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\tcp2-4-18.dgn



TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

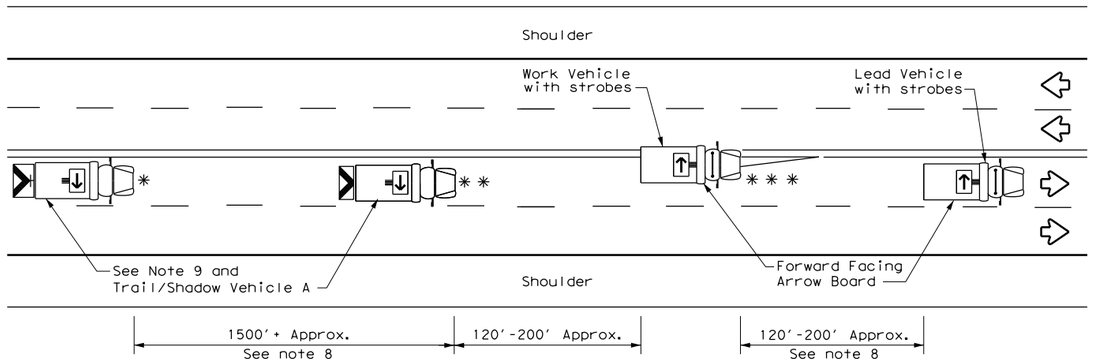
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

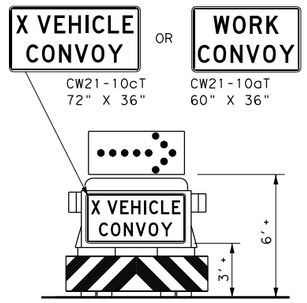
FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	3570	01	012	FM 3503
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	ODA	ECTOR		35

DATE: 3/21/2023 4:17:34 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\tcp2-5-18.dgn



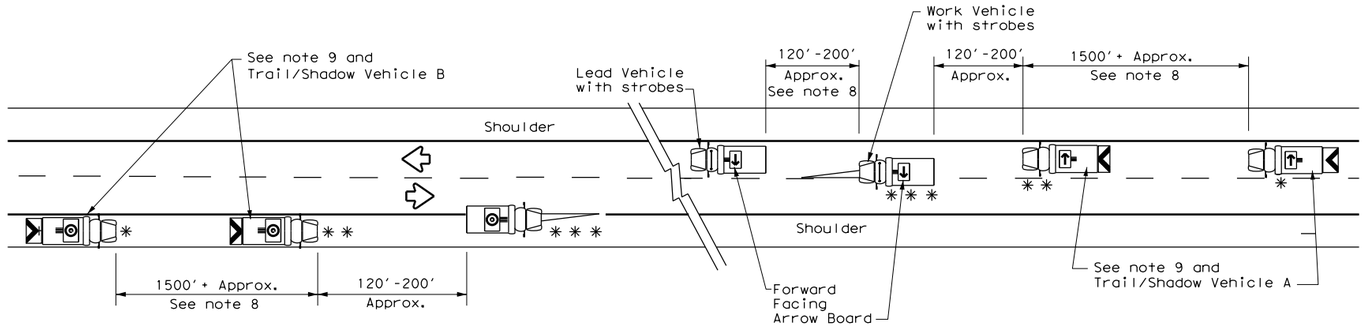
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

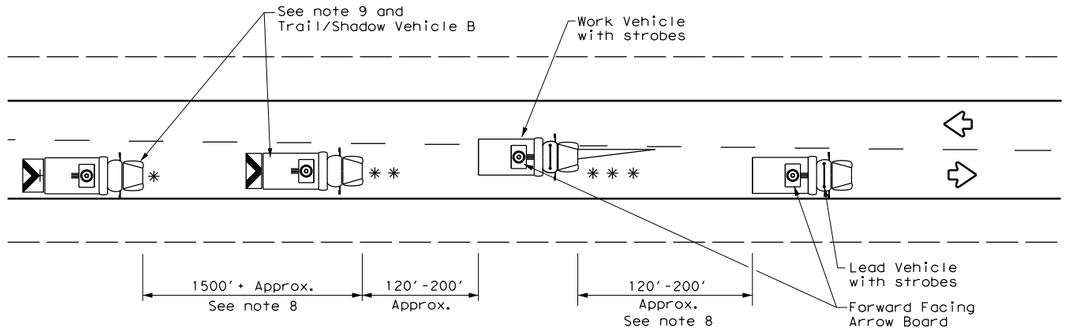


WORK ON SHOULDER

WORK ON TRAVEL LANE

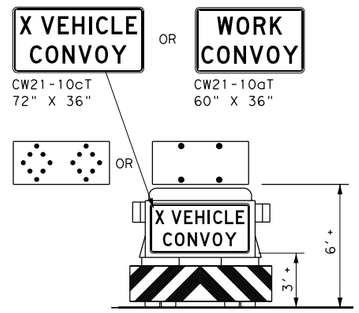
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

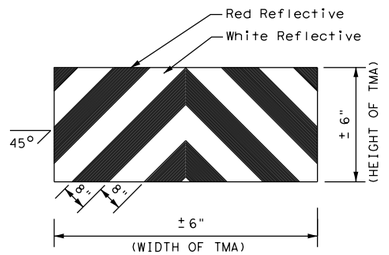
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

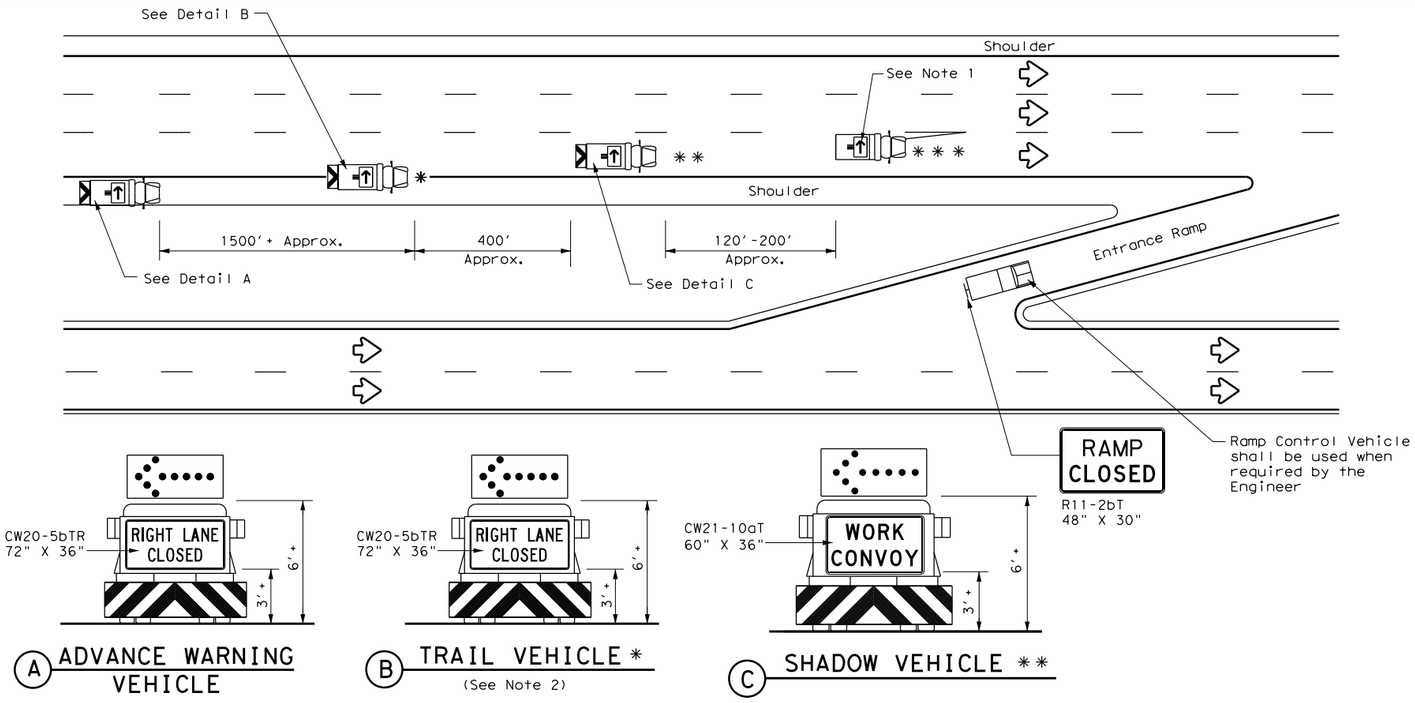
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

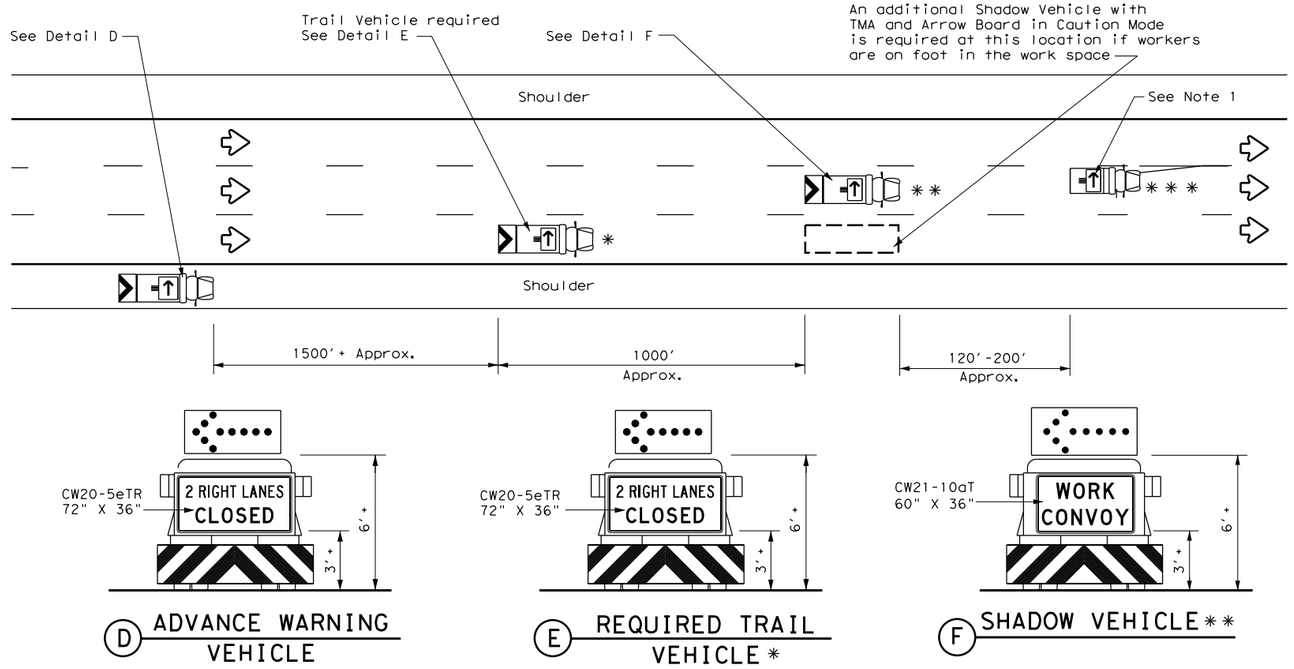
TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		36

DATE: 3/21/2023 4:17:36 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\tcp3-1.dgn



RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



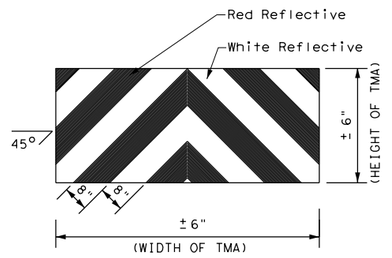
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

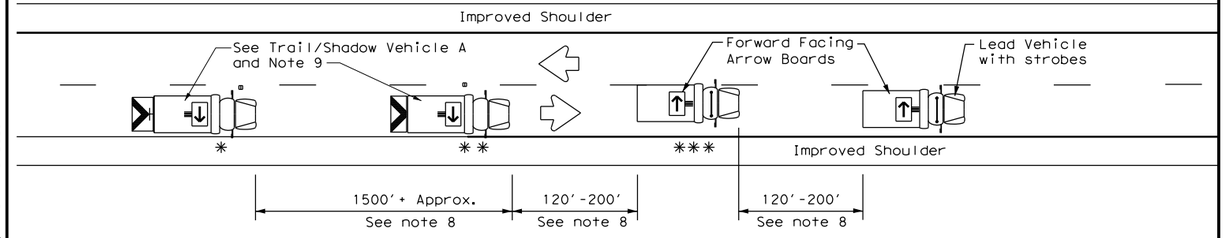
TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		37

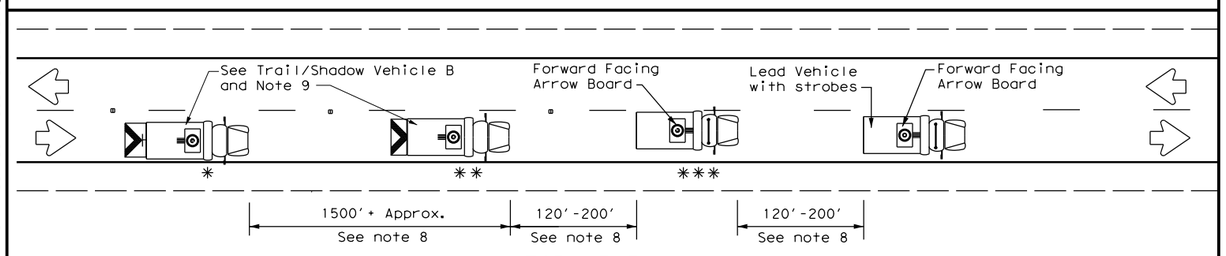
176

DATE: 3/21/2023 4:17:37 PM
FILE: c:\bms\pwe101-01\bradley.kreeman\dms28985\tcp3-2.dgn



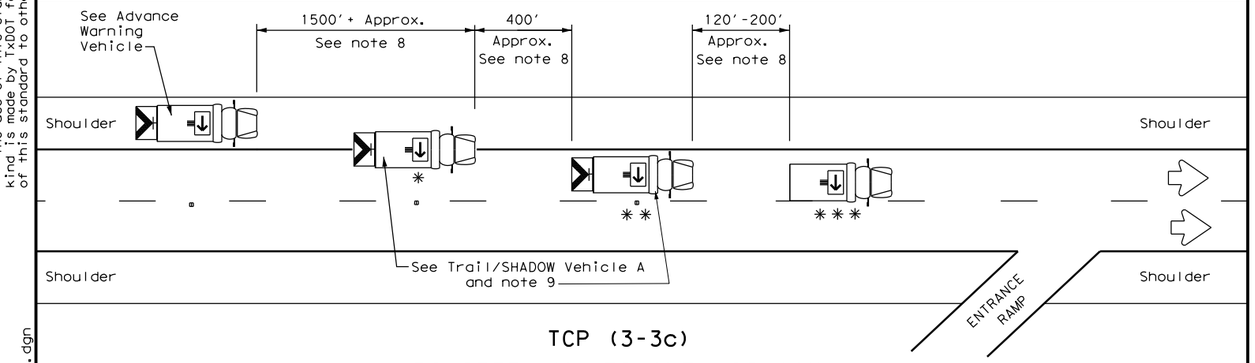
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



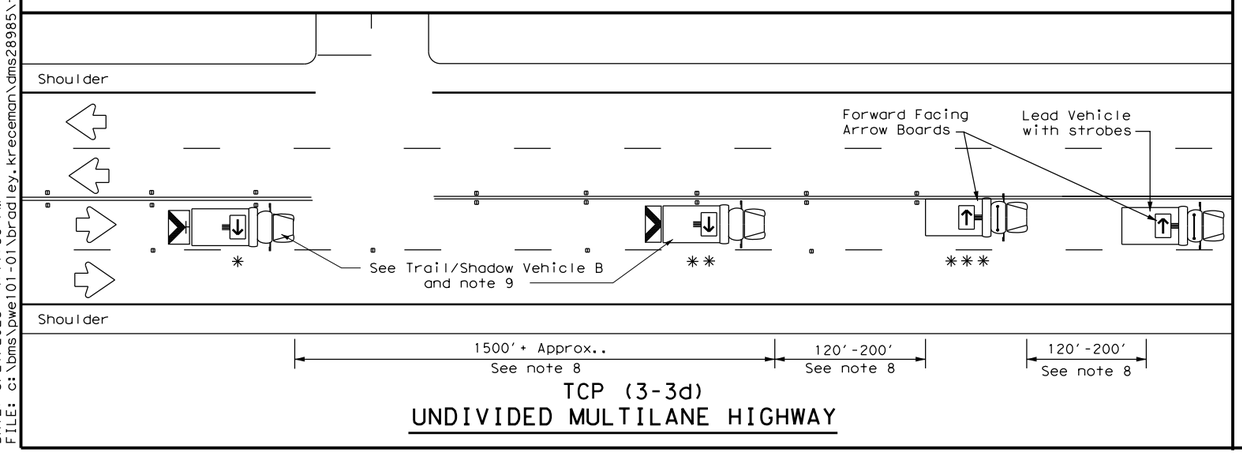
TCP (3-3b)

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



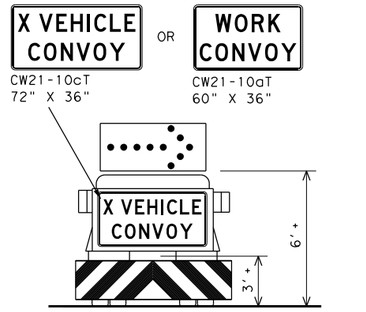
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



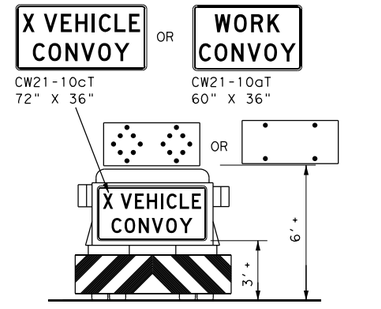
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



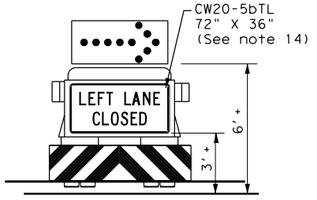
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

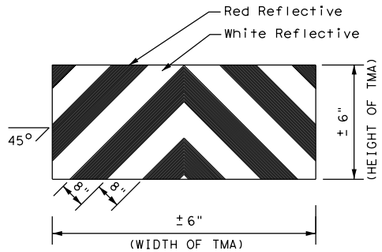


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

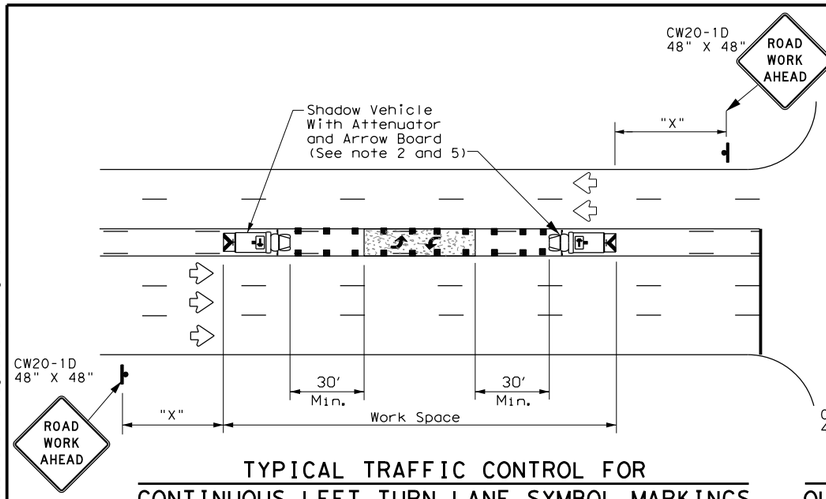
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

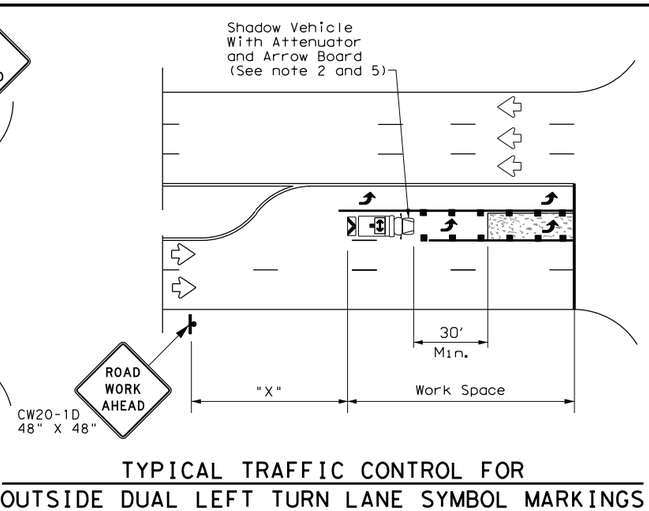
TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	ODA	ECTOR		38
1-97 7-14				

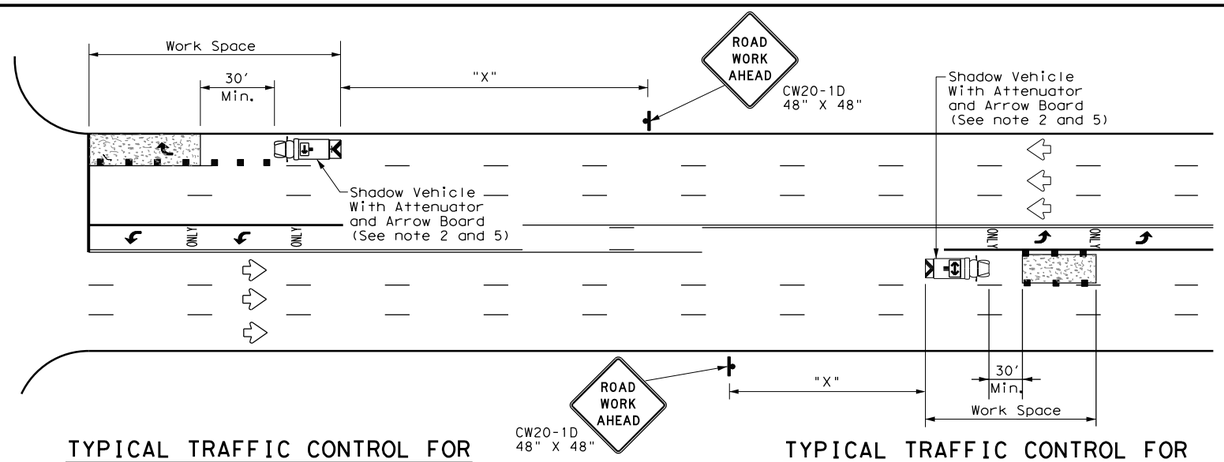
DATE: 3/21/2023 4:17:38 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\tcp3-3.dgn



TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

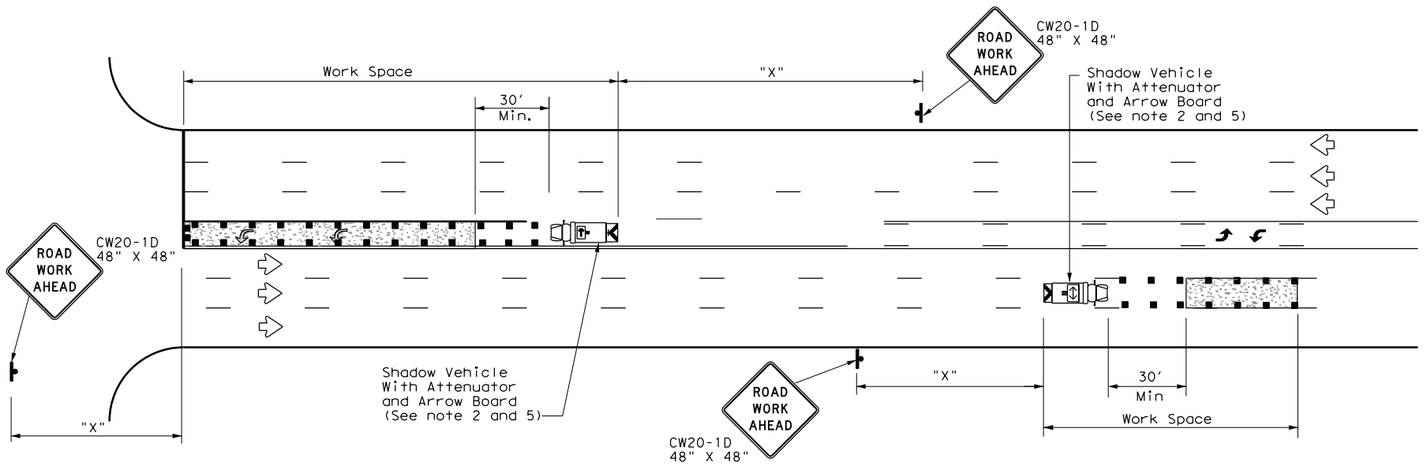


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

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

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

✳ Conventional Roads Only

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

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

GENERAL NOTES

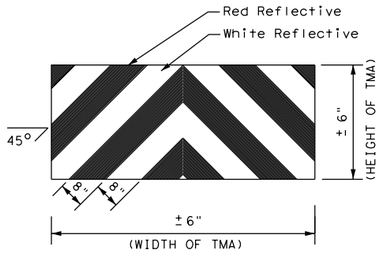
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.

2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.

3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.

4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.

5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

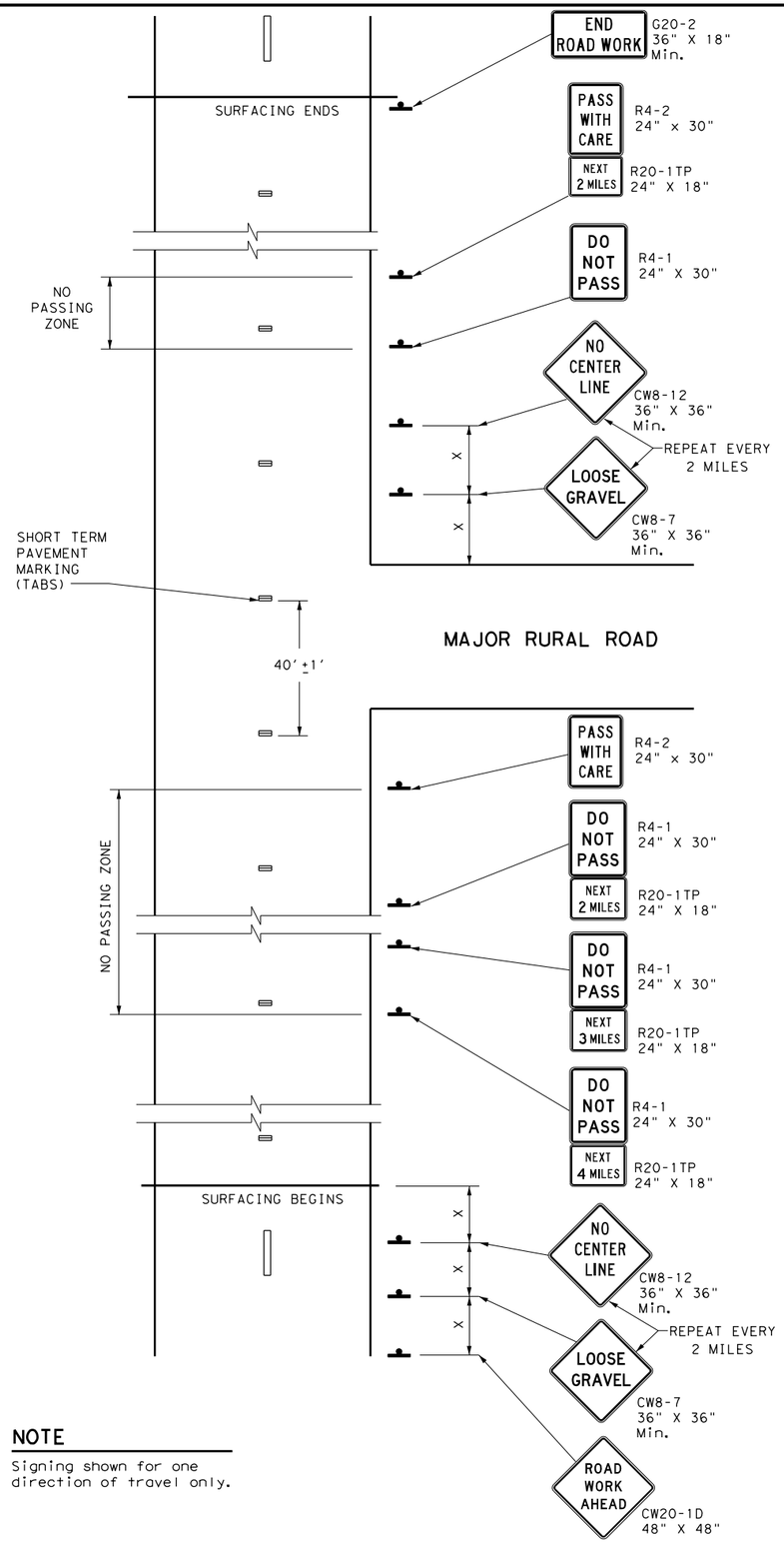
TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		39

DATE: 3/21/2023 4:17:40 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\tcp3-4.dgn

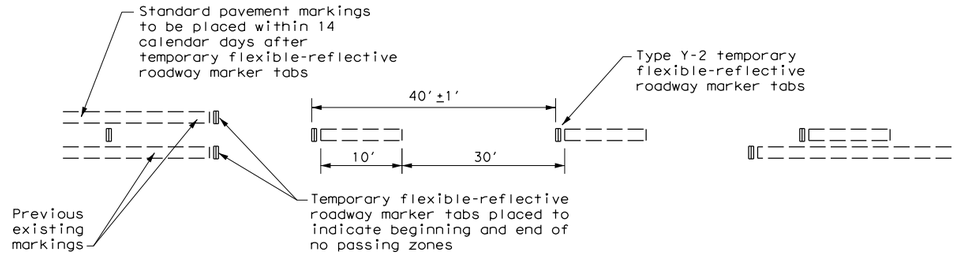
DATE: 3/21/2023 4:17:41 PM
FILE: c:\bms\pwe101-01\bradley.krecemann\dms28985\tcp7-1.dgn



NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

*** Conventional Roads Only**

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

GENERAL NOTES

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

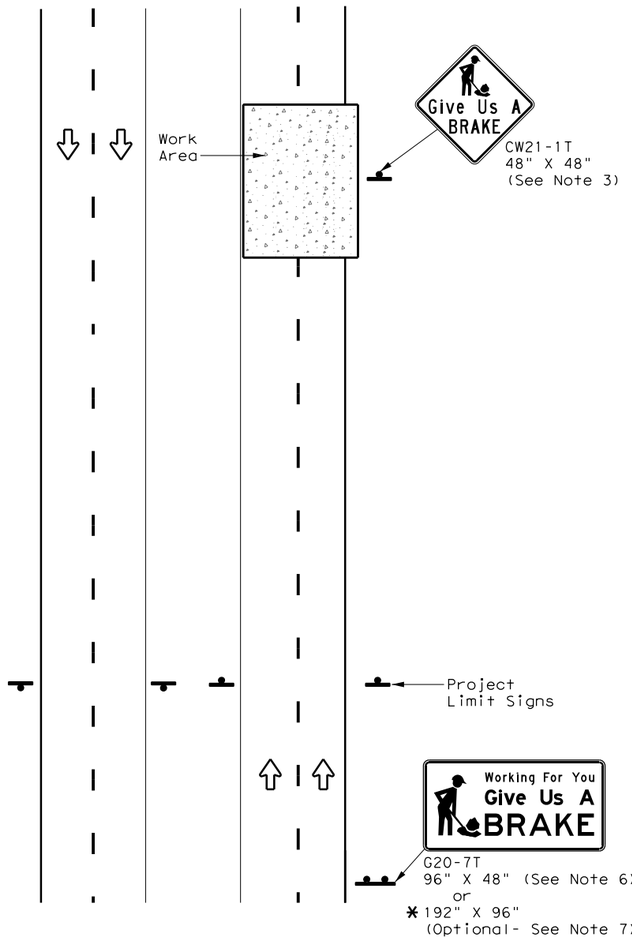
Texas Department of Transportation

Traffic Operations Division Standard

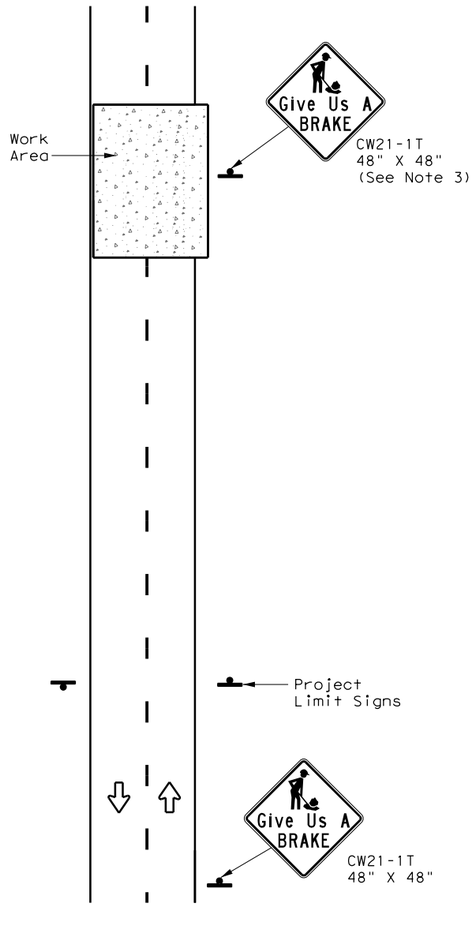
TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	ODA	ECTOR		40



DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

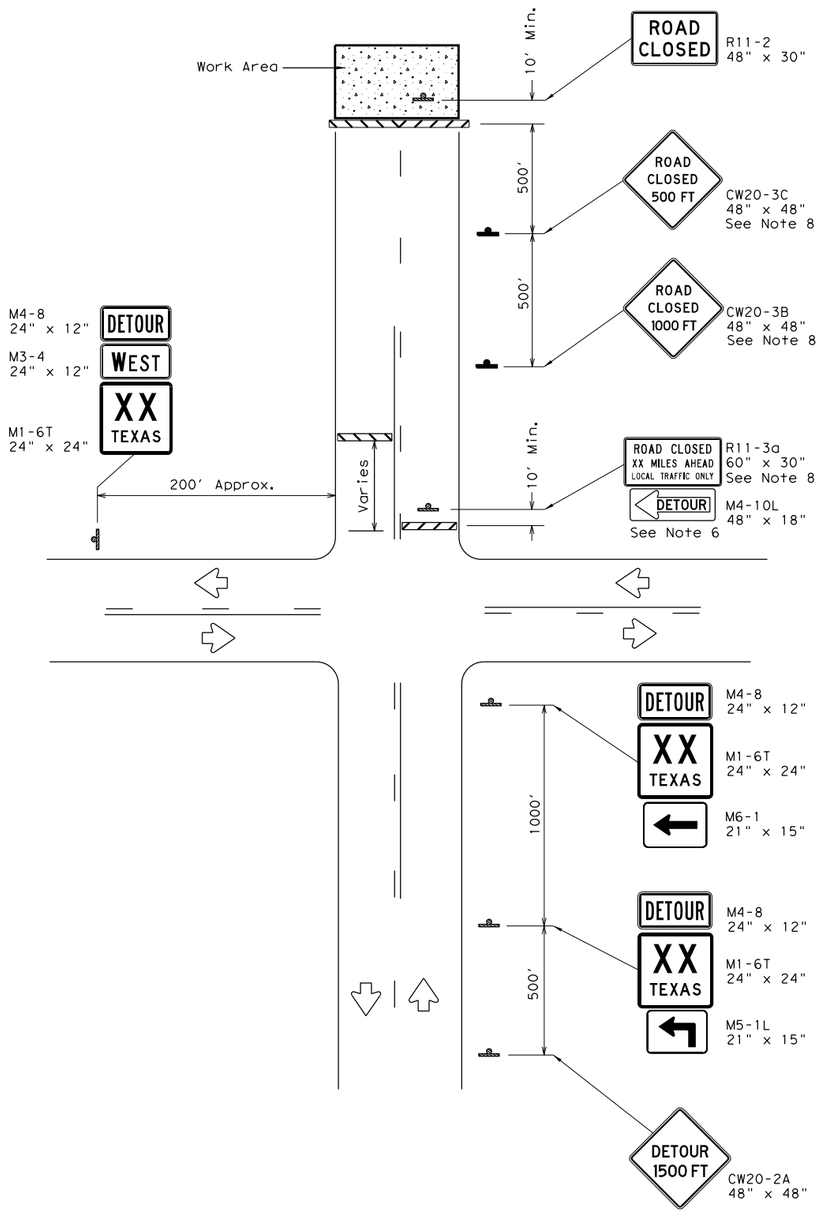
WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	ODA	ECTOR		41

116

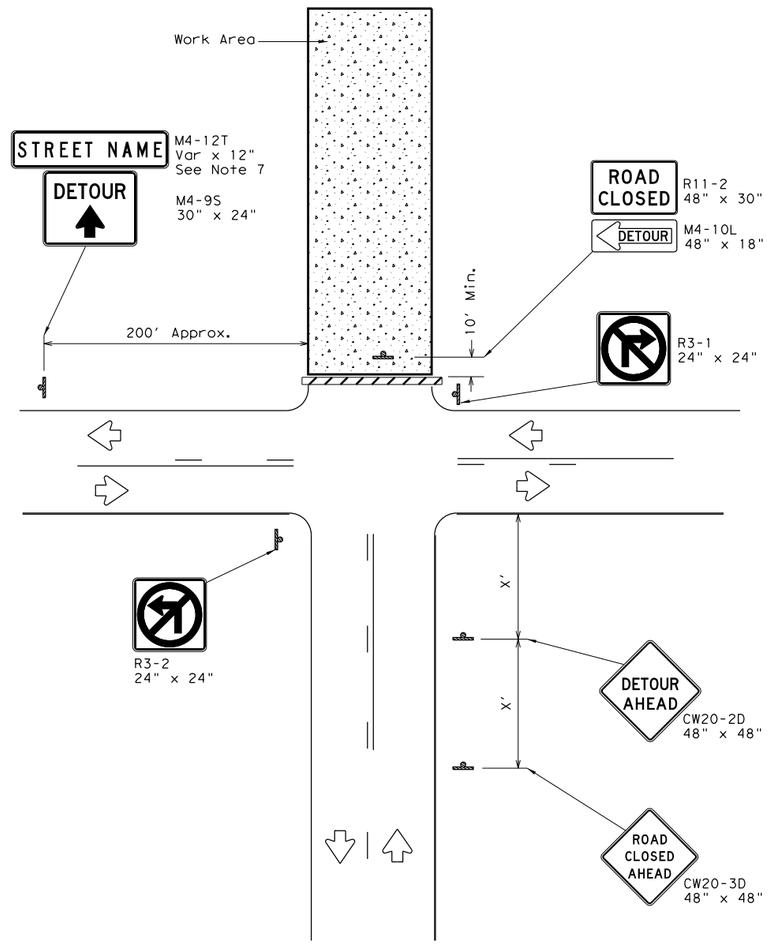
DATE: 3/21/2023 4:17:42 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\wzbrk-13.dgn

DATE: 3/21/2023 4:17:44 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28985\wzrcd-13.dgn



ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

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

LEGEND	
	Type 3 Barricade
	Sign

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

* Conventional Roads Only

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

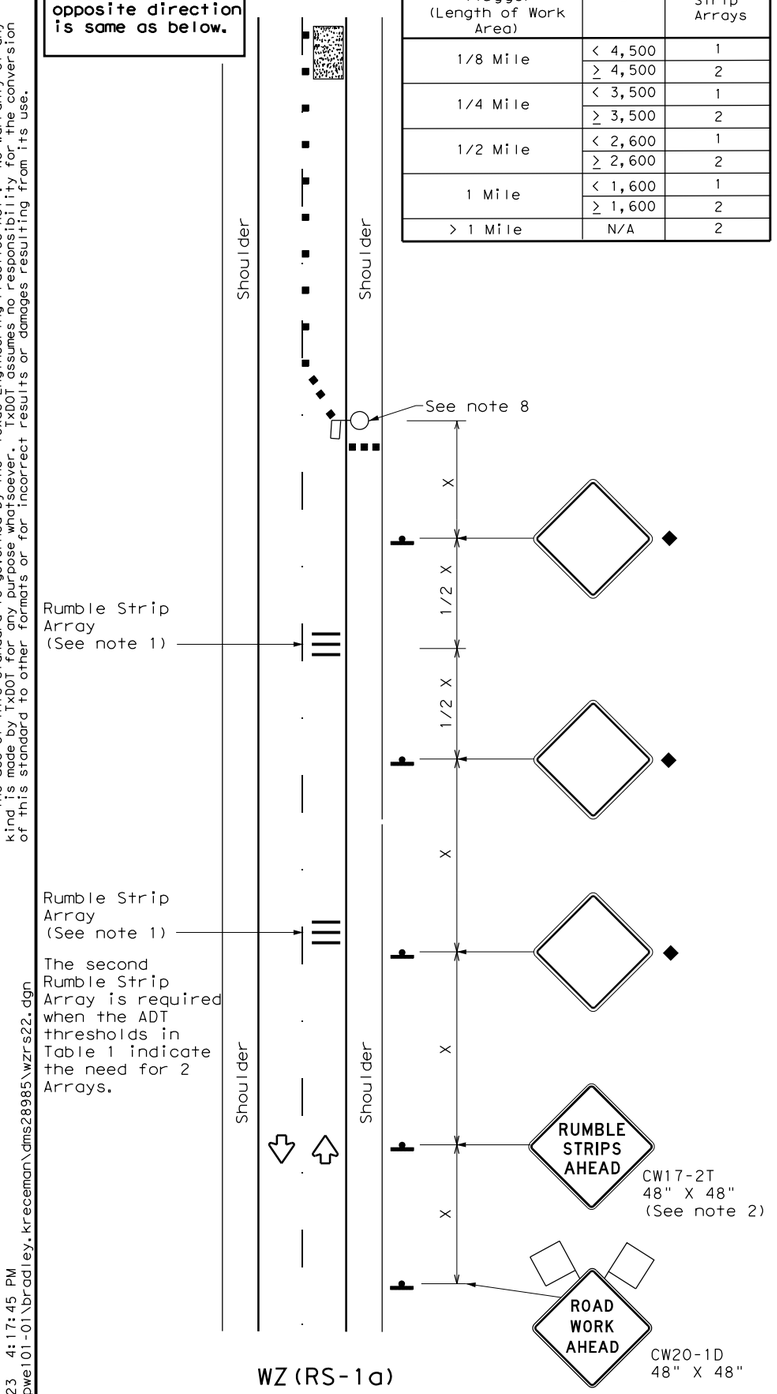
WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03	ODA	ECTOR		42

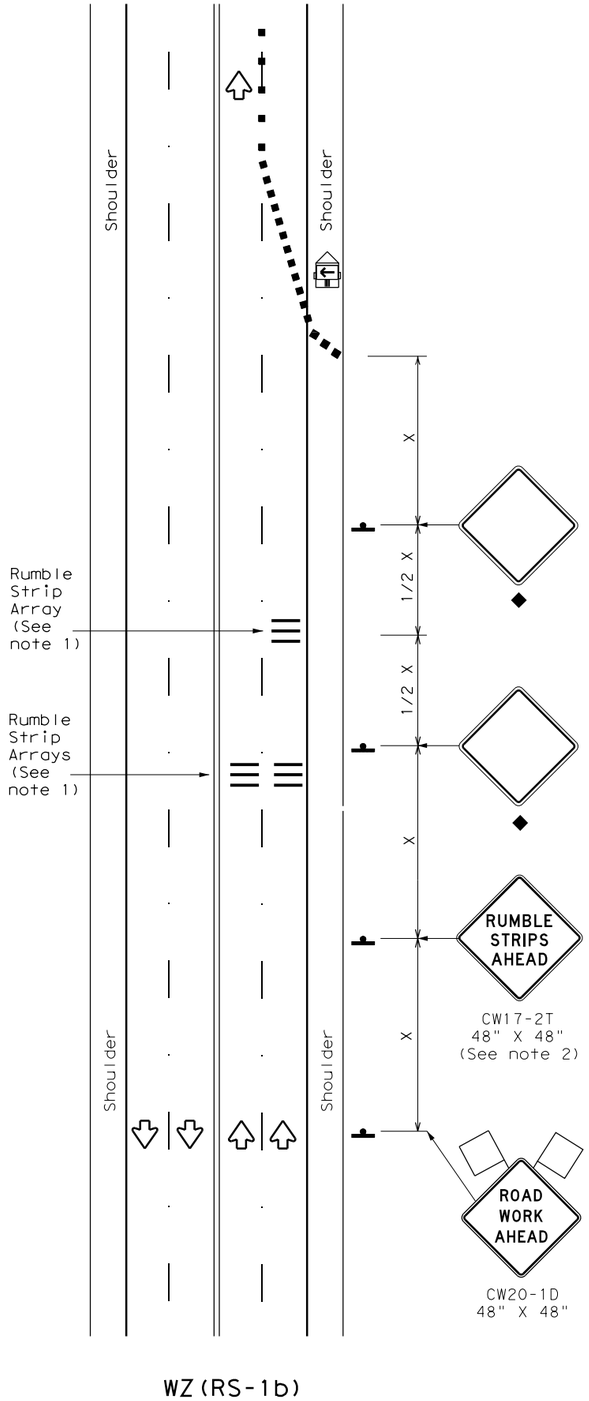
Warning sign and rumble strip sequence in opposite direction is same as below.

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

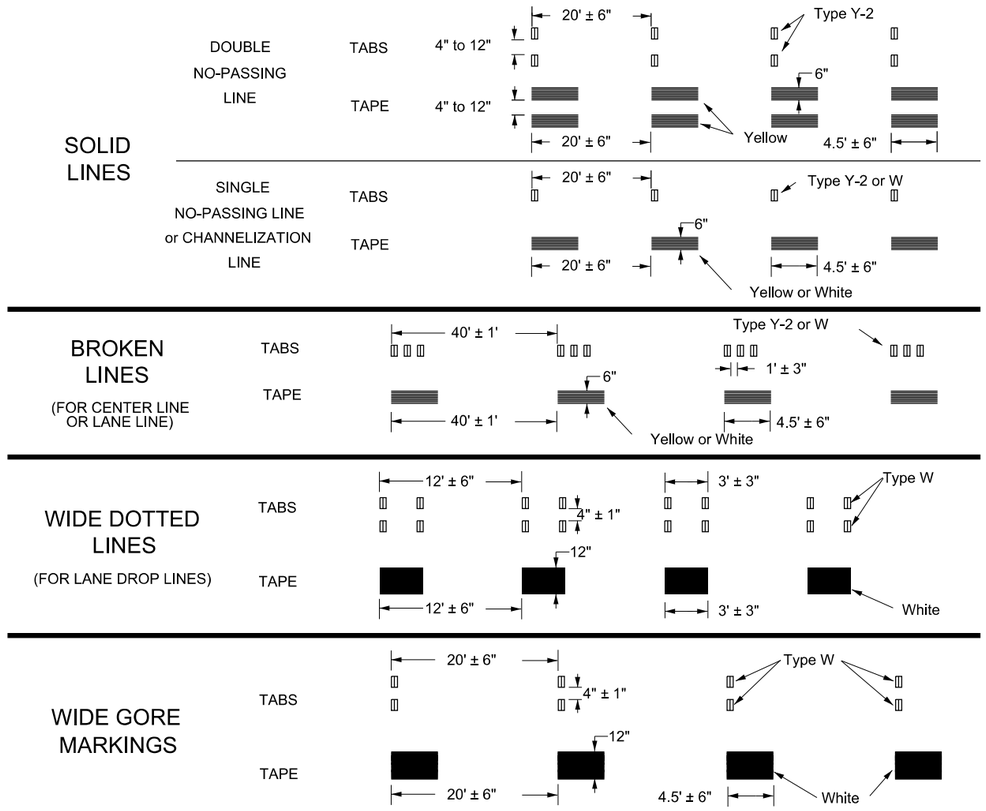
WZ(RS)-22

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	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		43

117

DATE: 3/21/2023 4:17:45 PM
FILE: c:\pw\pwe101-01\bradley.kreceman\dms28985\wzrs22.dgn

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



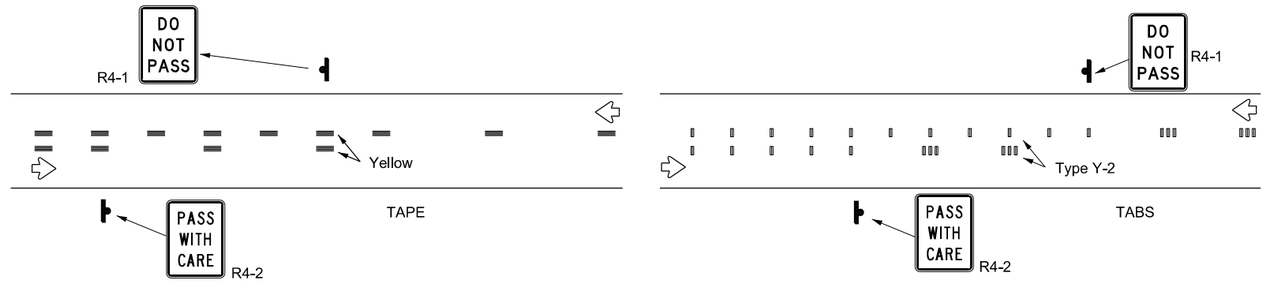
NOTES:

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

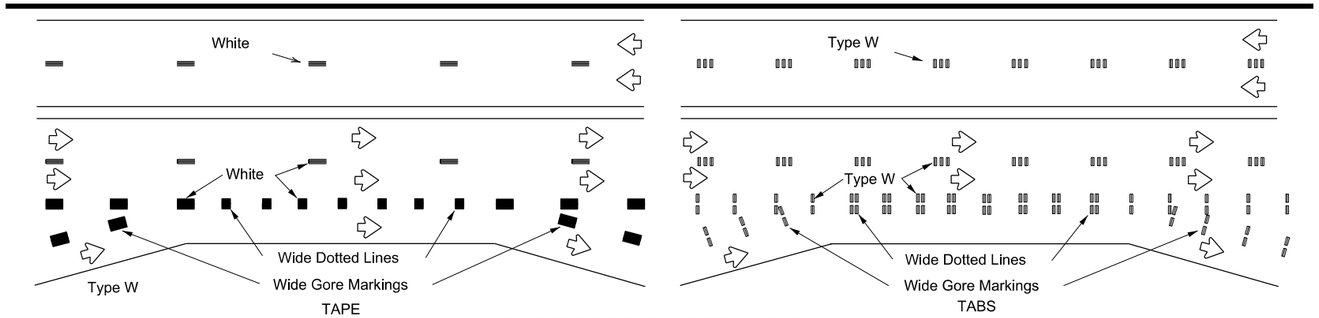
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

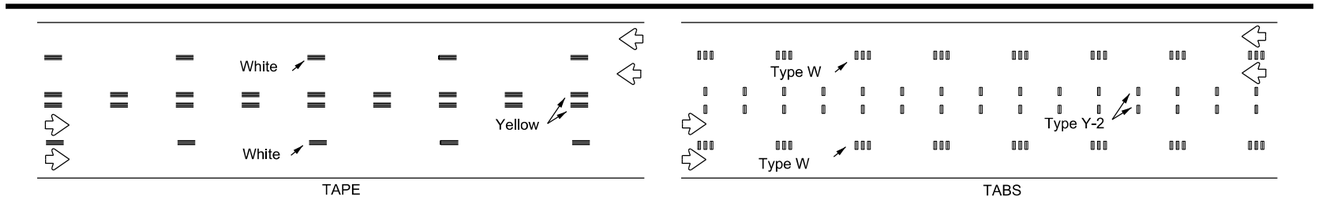
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



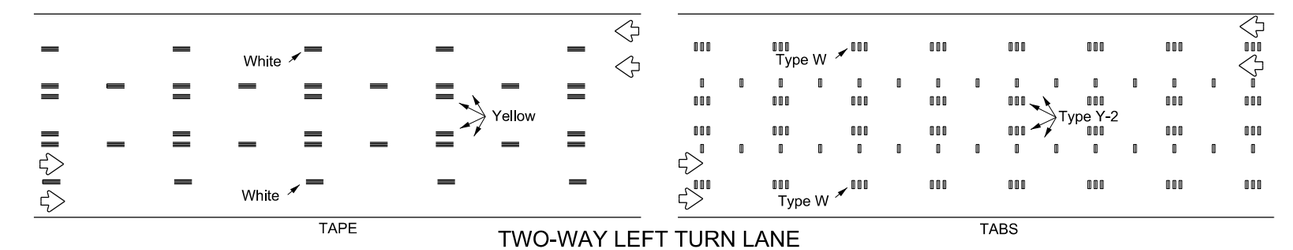
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



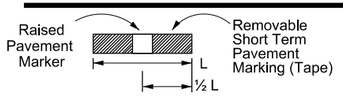
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

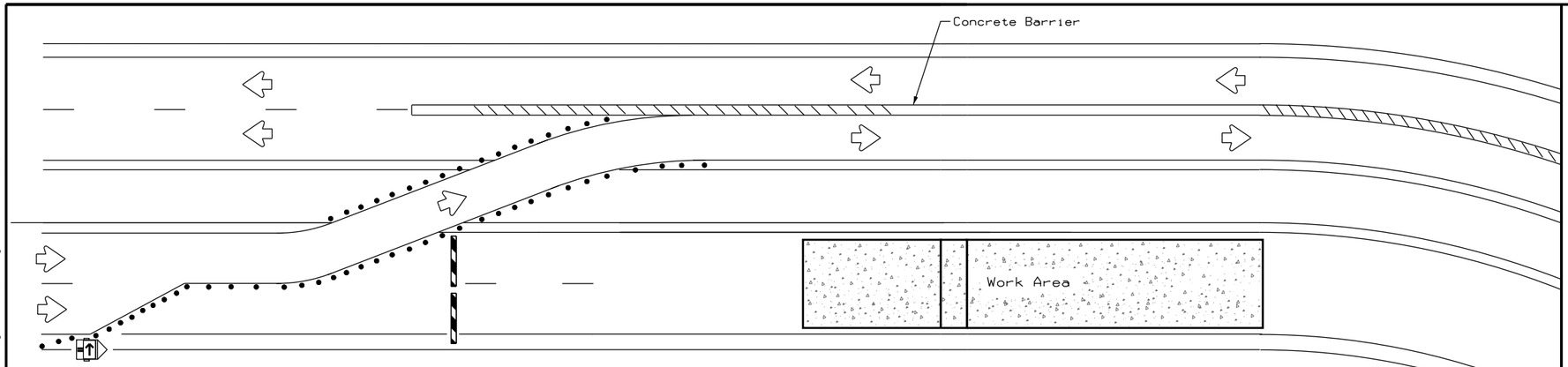
WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 7-13 1-97 2-23 3-03	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		44

111

DATE: 7/5/2023 4:00:46 PM
FILE: c:\bms\pwe101-01\mark.rtchardson\dms28985\wz(stpm)-23.dgn



NOTES:

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

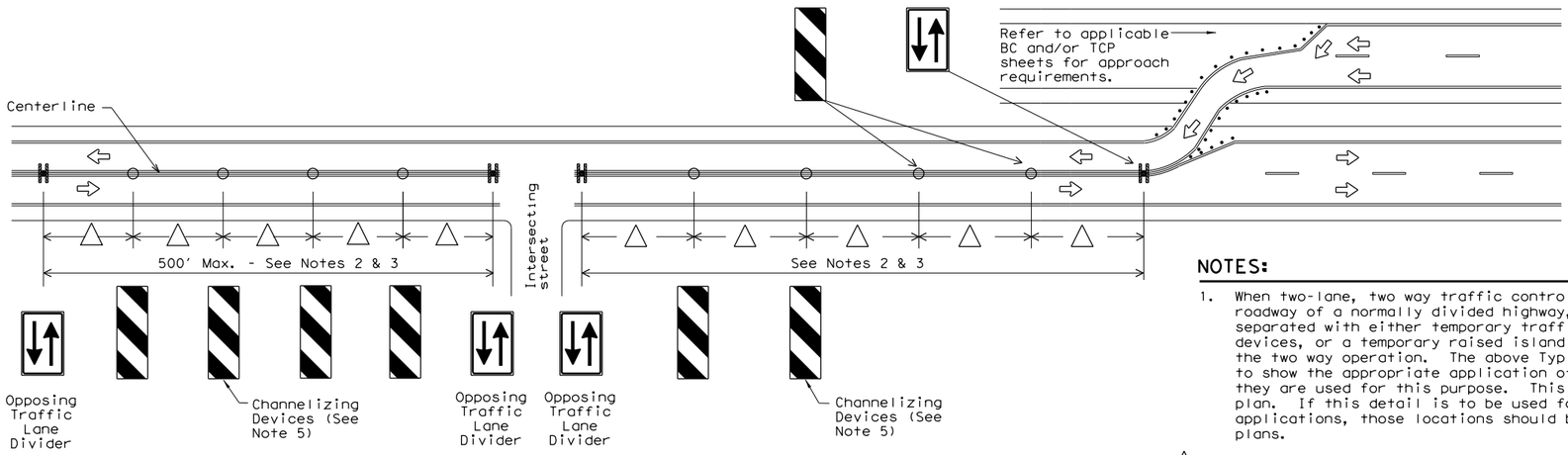
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

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

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

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

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



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

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.

△2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100′.

3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

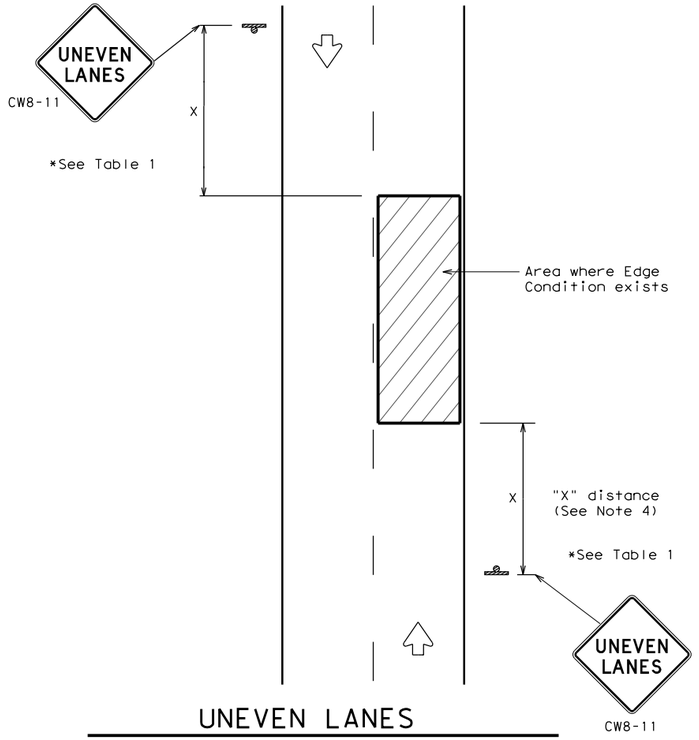
TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

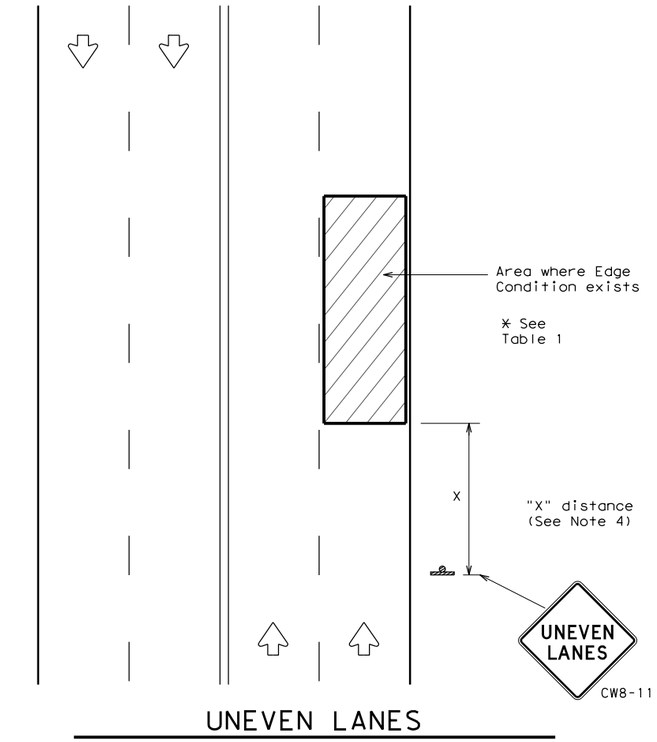
FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		45

110

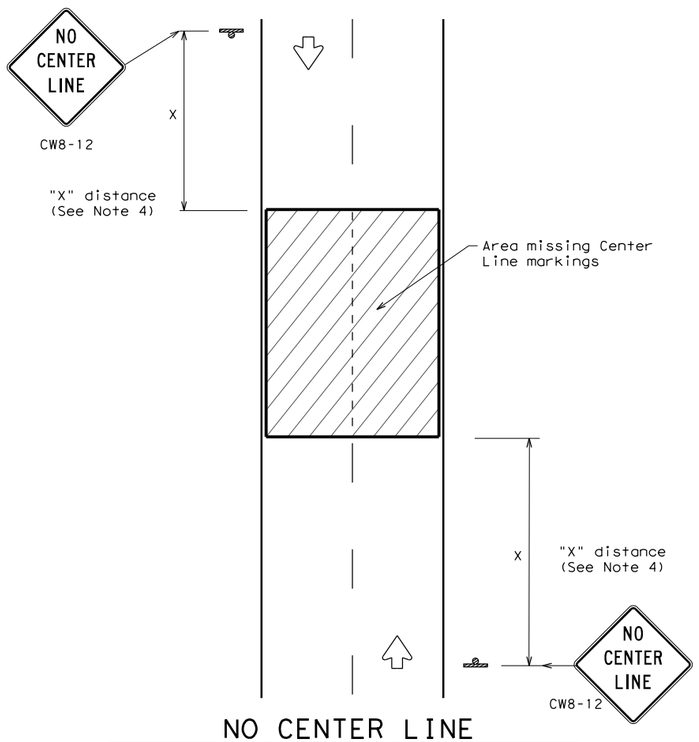
DATE: 3/21/2023 4:17:48 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms28985\wztd-17.dgn



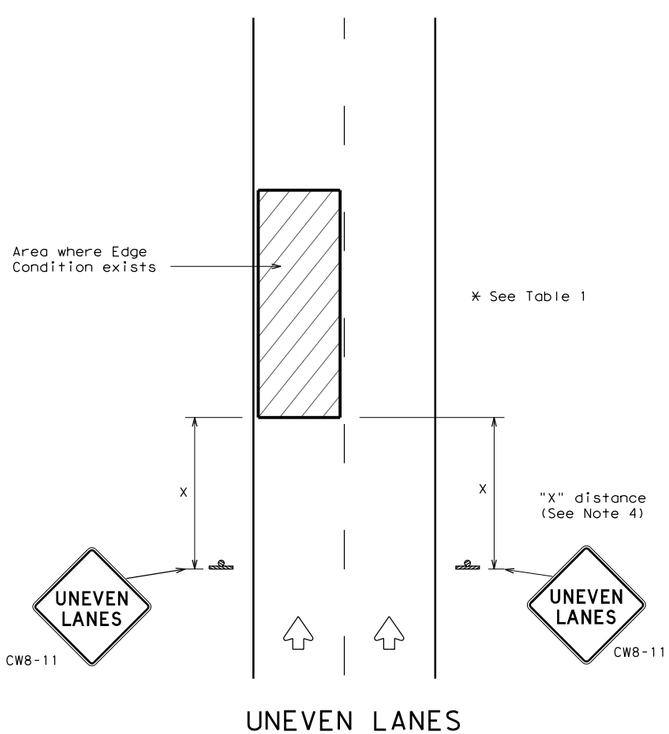
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

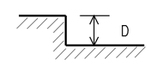
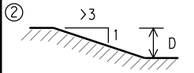
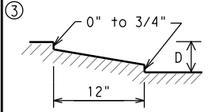
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

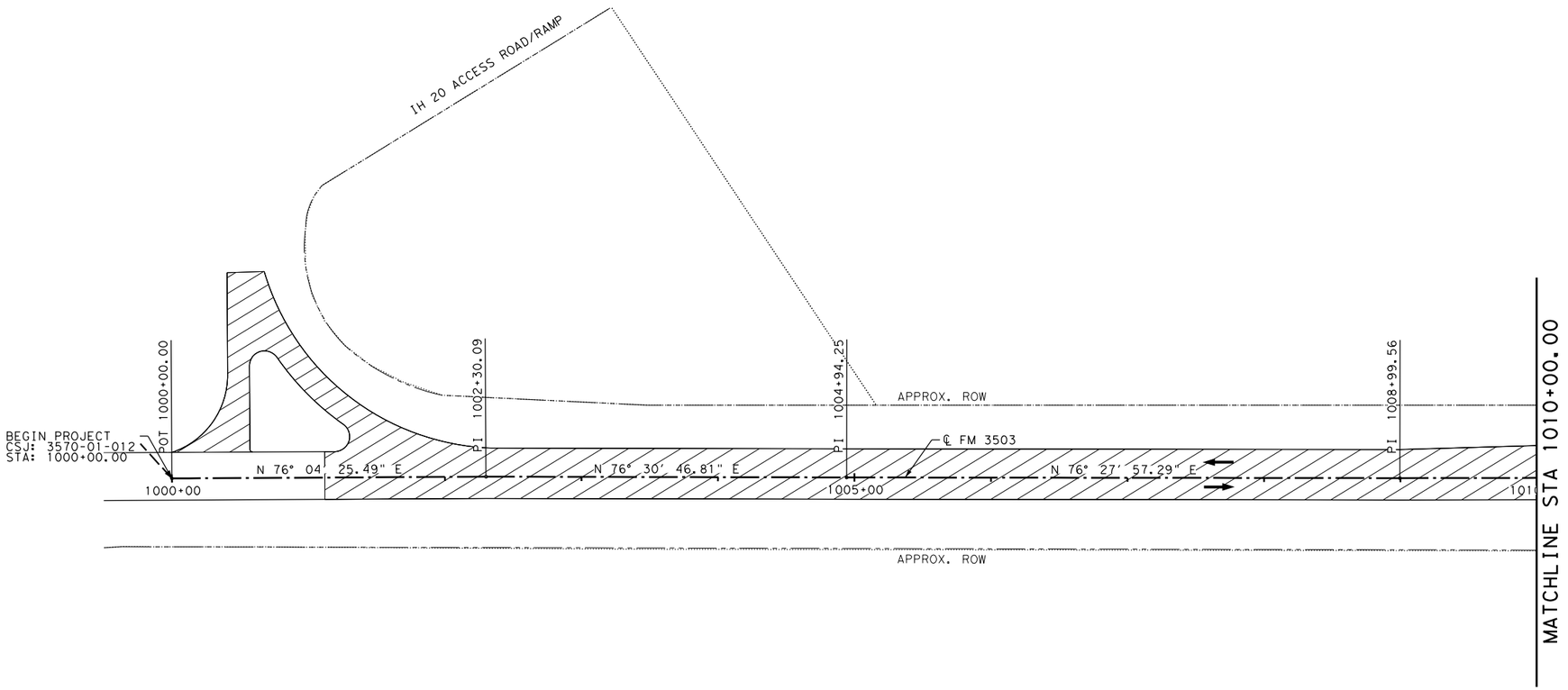
SIGNING FOR UNEVEN LANES

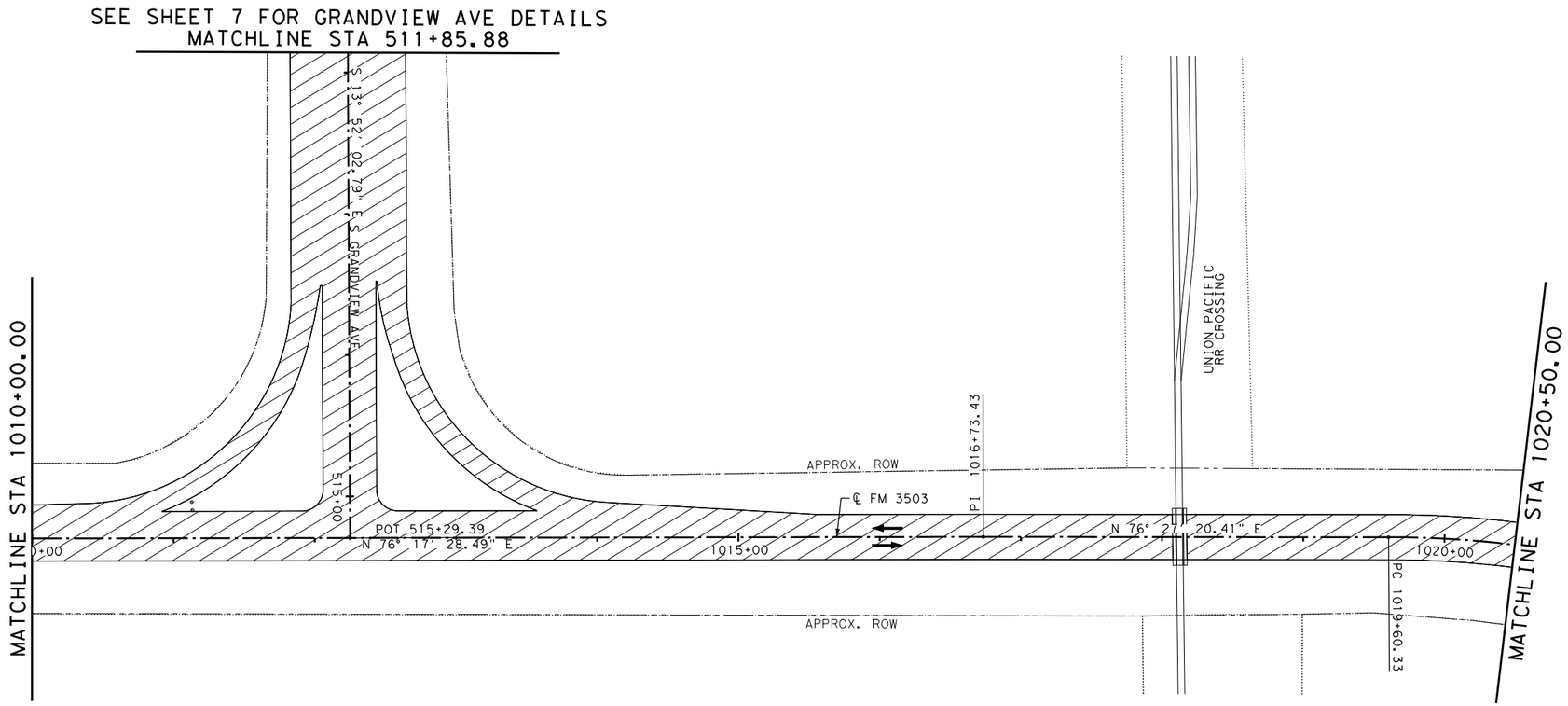
WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	ODA	ECTOR		46

112

DATE: 3/21/2023 4:17:49 PM
FILE: c:\bms\pwe\01-01\bradley.kreceman\dms28985\wzul-13.dgn





LEGEND:

- PROPOSED CONSTRUCTION
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

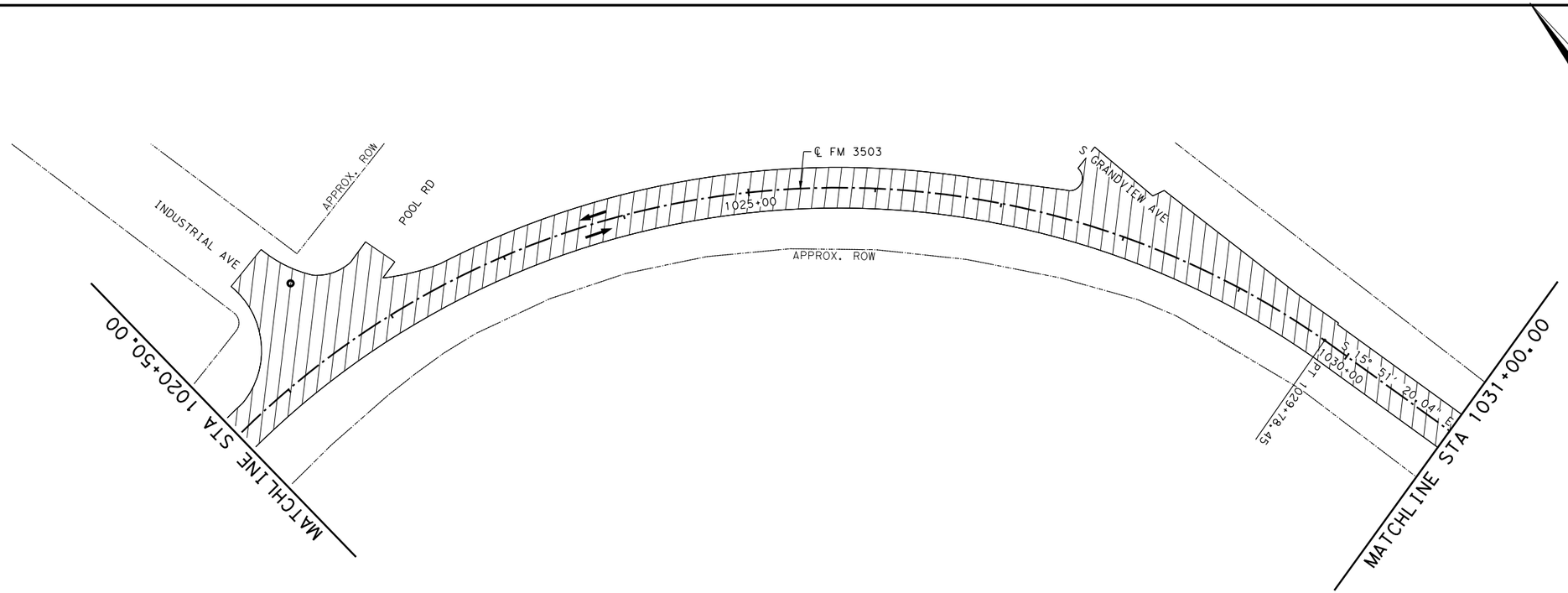
Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
REMOVAL
BEGIN TO STA 1020+50.00

SHEET 1 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	47
	CONT.	SECT.	JOB	
	3570	01	012	



LEGEND:

- PROPOSED CONSTRUCTION
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

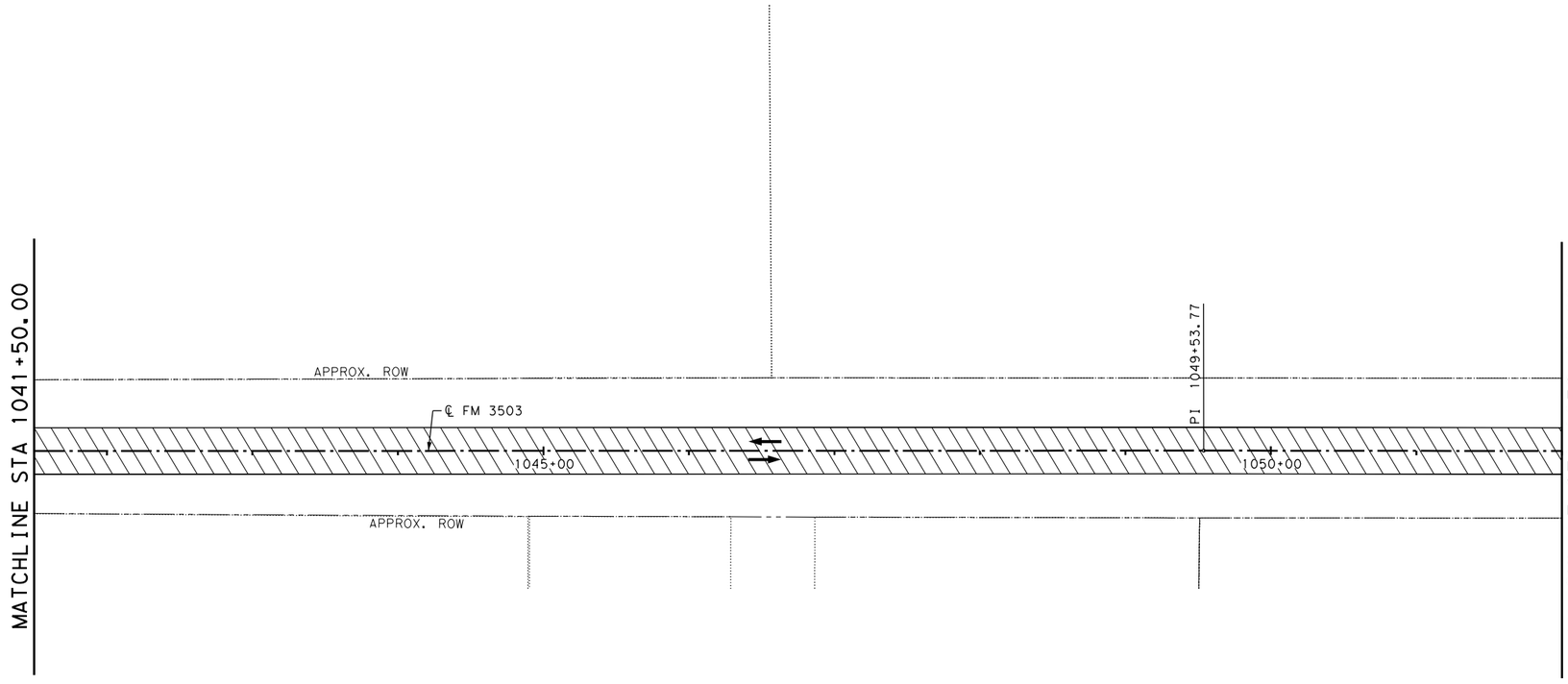
Texas Department of Transportation
©2023

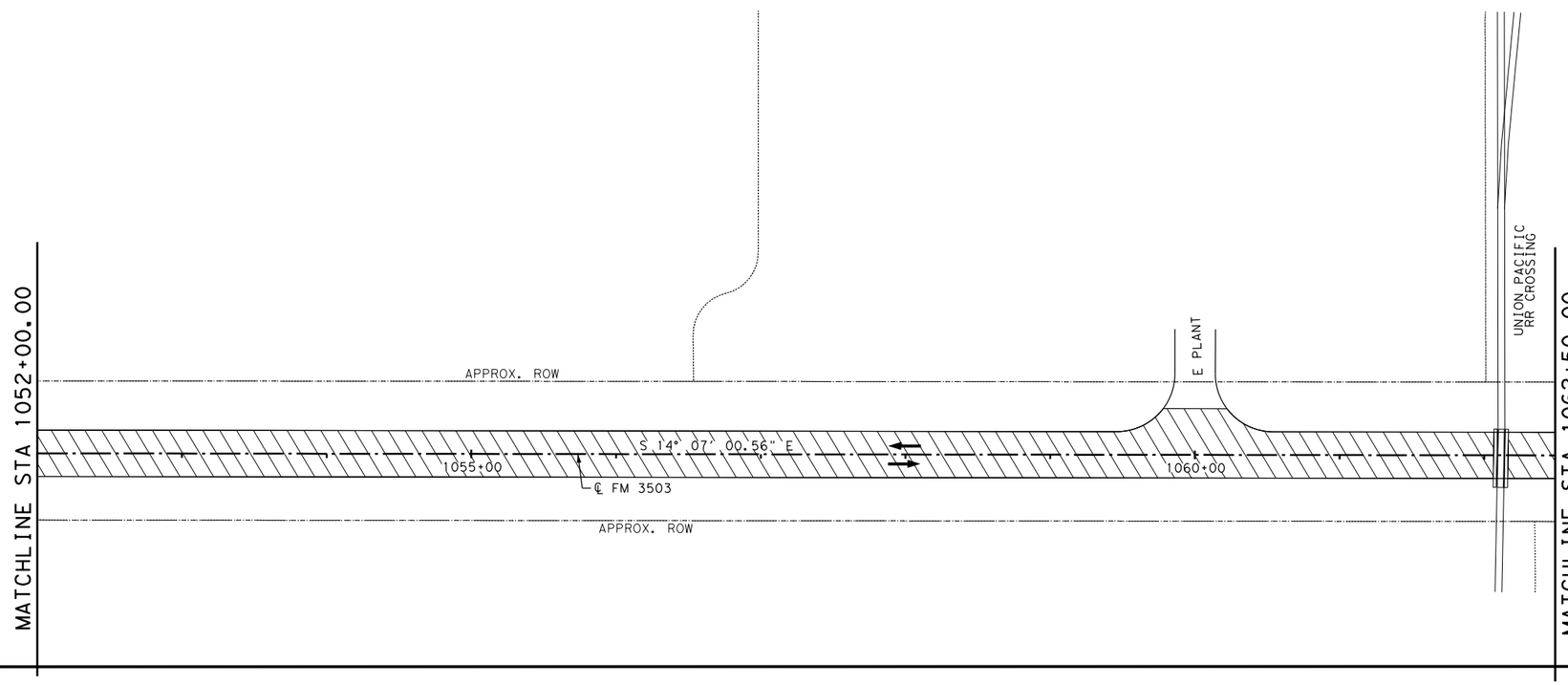
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

FM 3503
REMOVAL
STA 1020+50.00 TO STA 1041+50.00

SHEET 2 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	48
	CONT.	SECT.	JOB	
	3570	01	012	





LEGEND:

- PROPOSED CONSTRUCTION
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

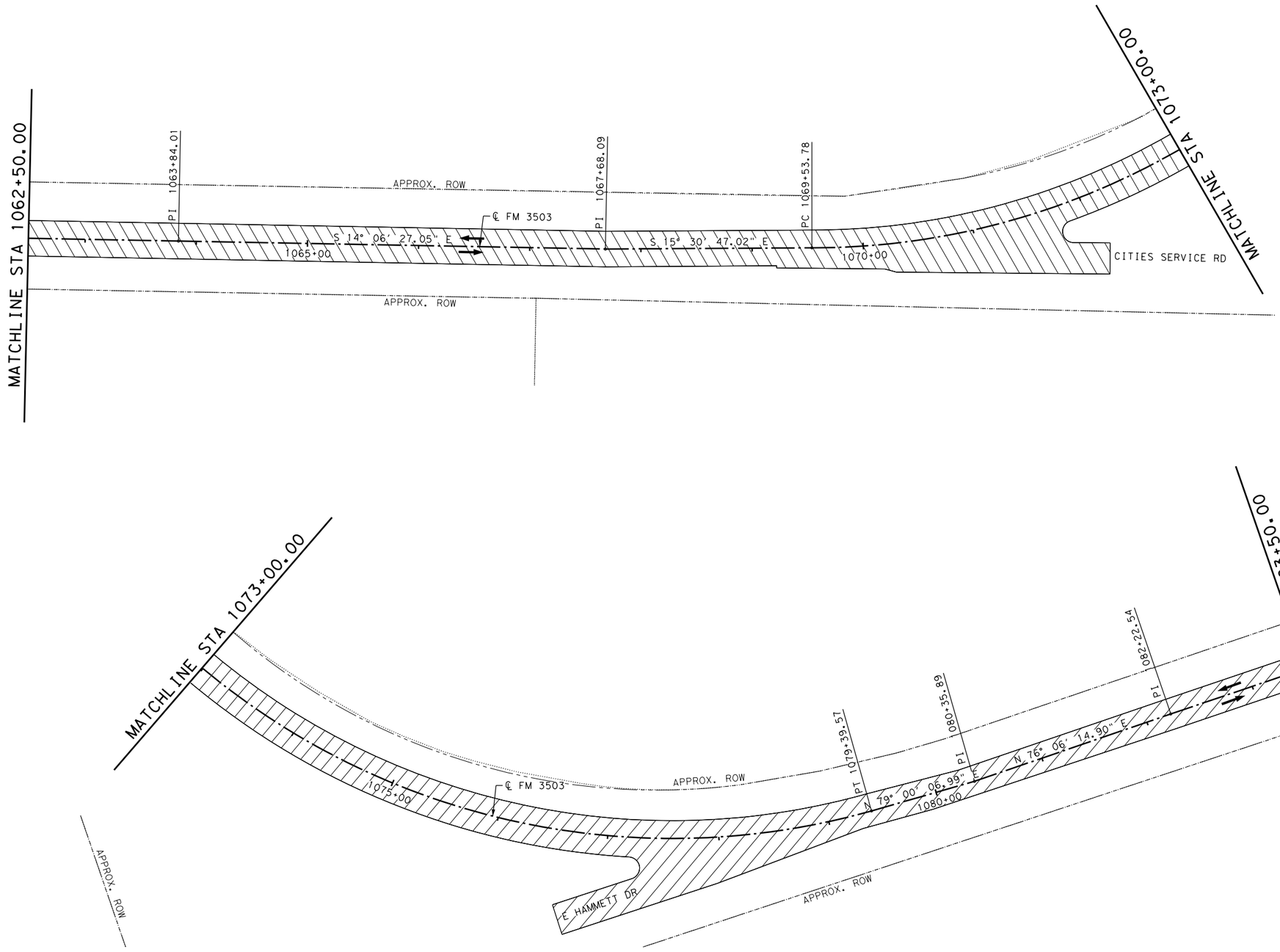
FM 3503 REMOVAL

STA 1041+50.00 TO STA 1062+50.00

SHEET 3 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	49
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

DATE:3/21/2023 4:18:04 PM USER:untitled
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Removal\FM3503_REMOVAL_03.dgn
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl



LEGEND:

- PROPOSED CONSTRUCTION
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

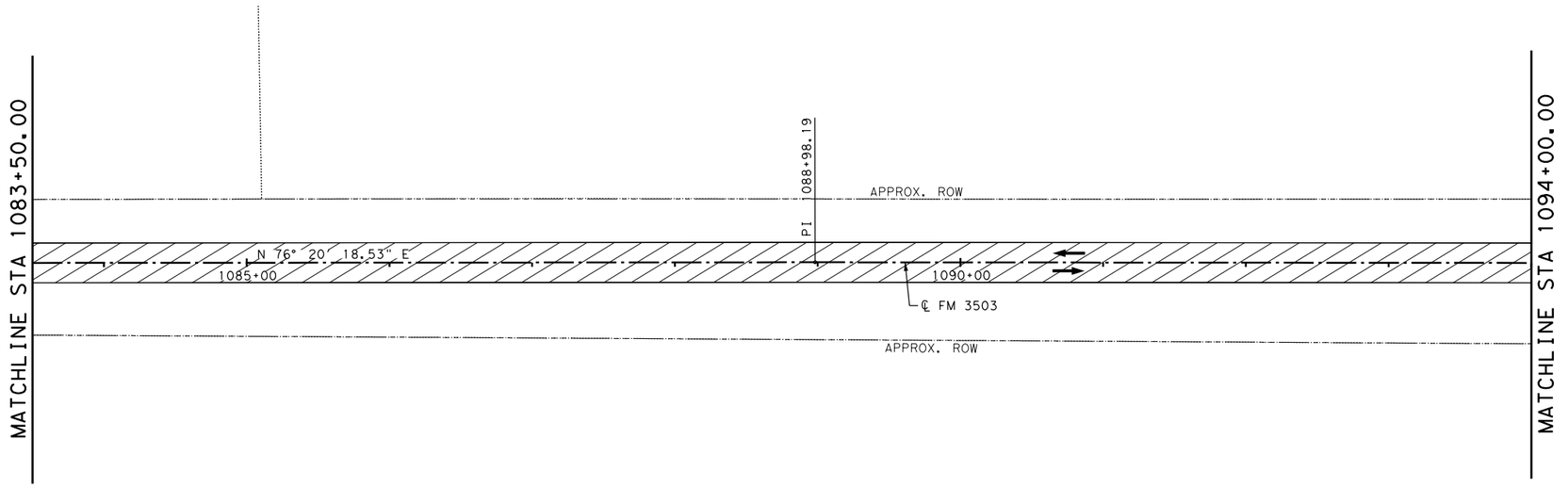
Texas Department of Transportation

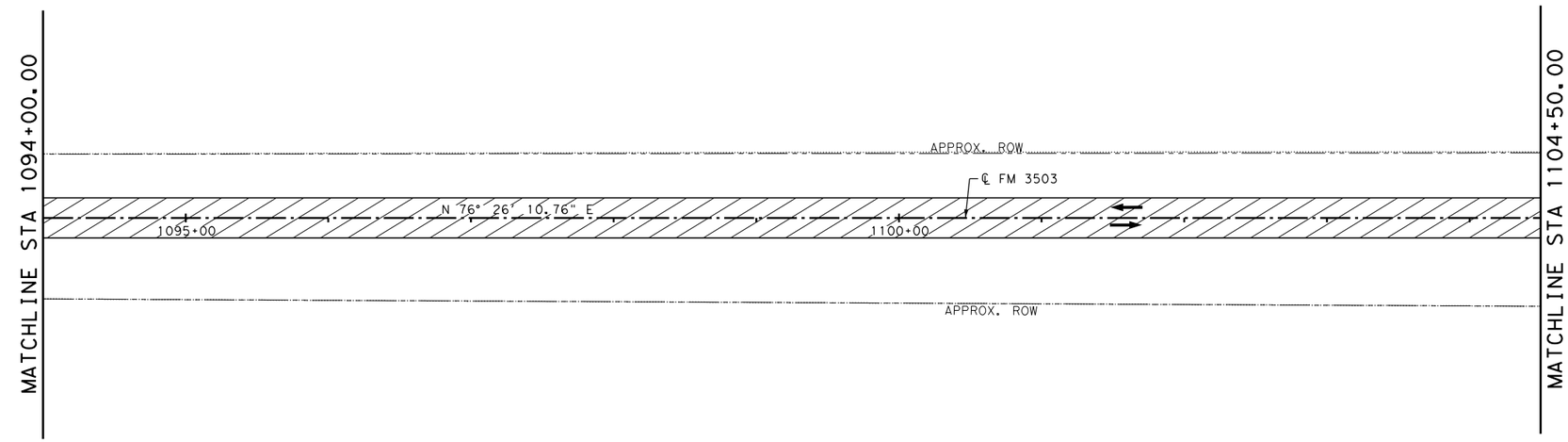
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
REMOVAL
STA 1062+50.00 TO STA 1083+50.00

SHEET 4 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	50
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	





LEGEND:

- PROPOSED CONSTRUCTION
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

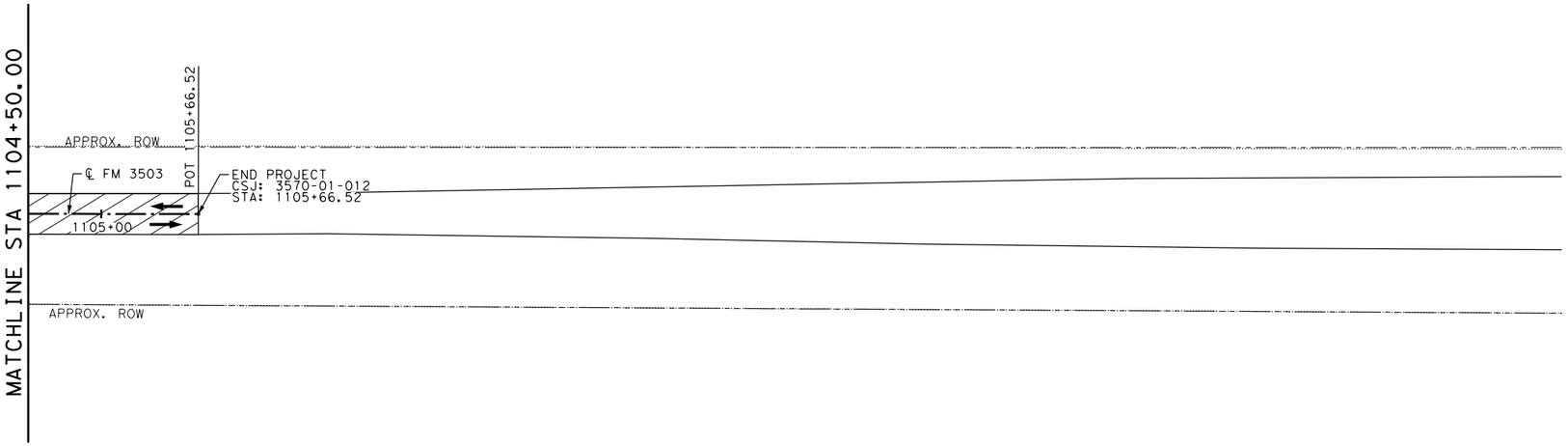
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
REMOVAL
STA 1083+50.00 TO STA 1104+50.00

SHEET 5 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	51
	CONT.	SECT.	JOB	
	3570	01	012	

PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl
USER:untitled
DATE:3/21/2023 4:18:14 PM
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Removal\FM3503_REMOVAL_05.dgn



LEGEND:

- PROPOSED CONSTRUCTION
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE

0′ 25′ 50′ 100′

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

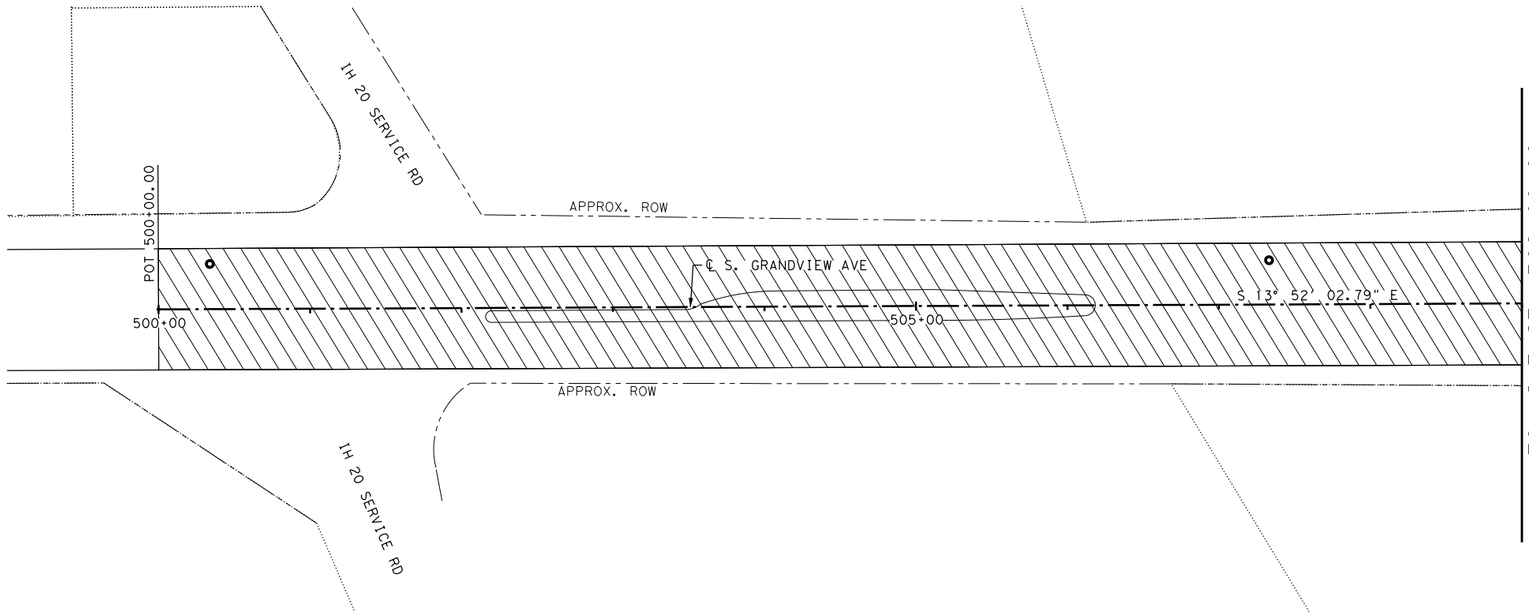
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

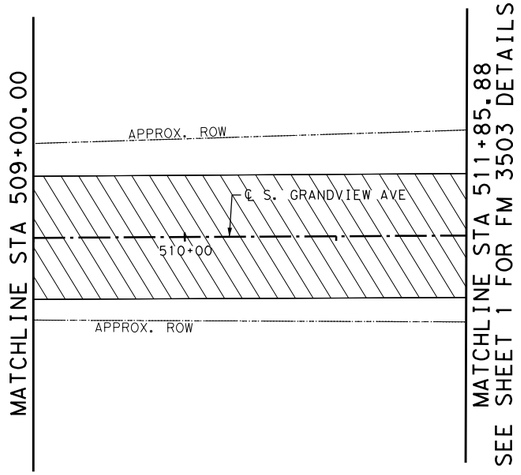
FM 3503
REMOVAL
STA 1104+50.00 TO END

SHEET 6 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	52
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl
USER:untitled
DATE:3/21/2023 4:18:19 PM
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Removal\FM3503_REMOVAL_06.dgn





LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

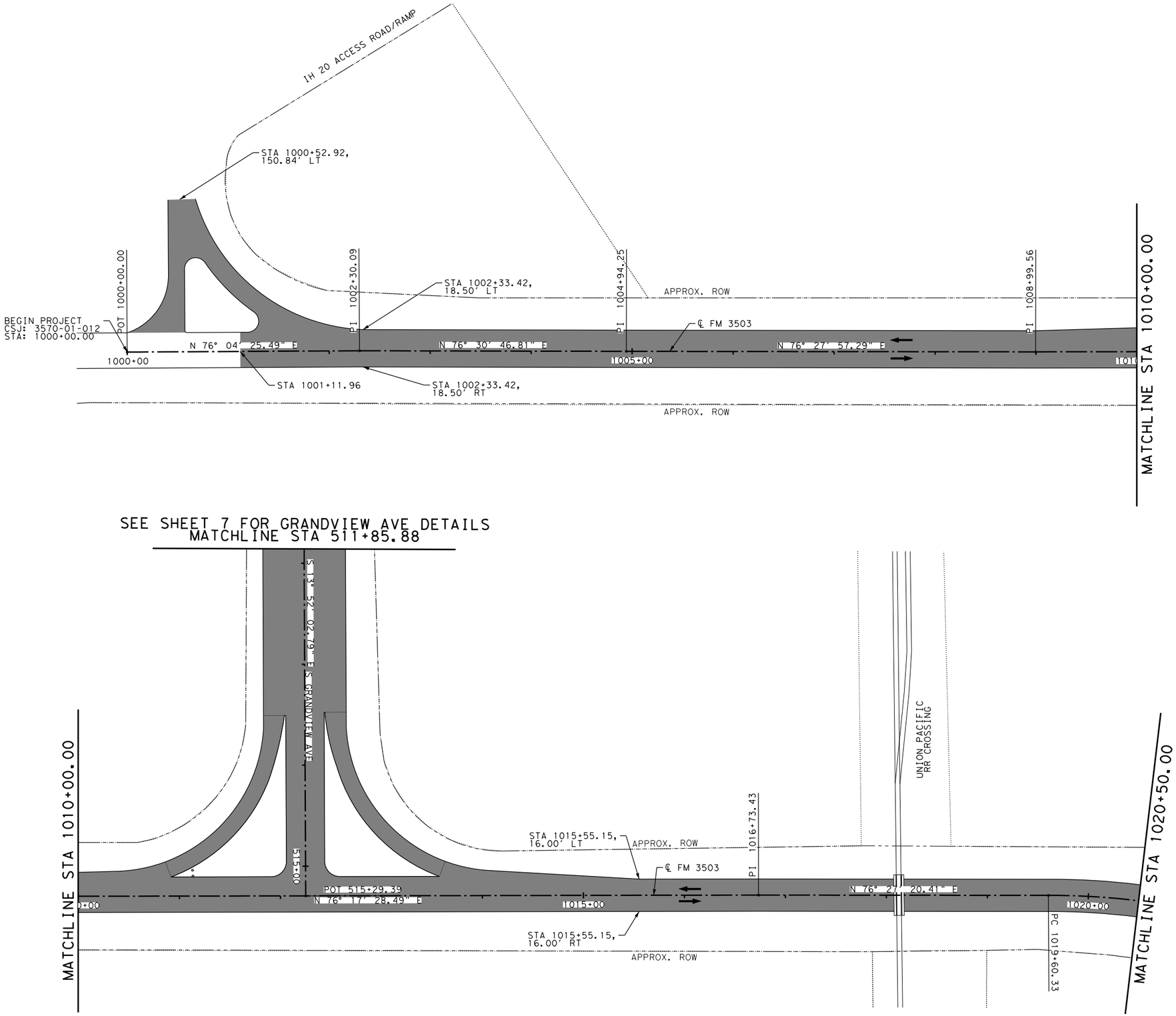
SOUTH GRANDVIEW AVE REMOVAL

BEGIN TO END

SHEET 7 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	53
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl
USER:untitled
4:18:23 PM
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Removal\FM3503_REMOVAL_GRANDVIEW.dgn
DATE:3/21/2023



LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

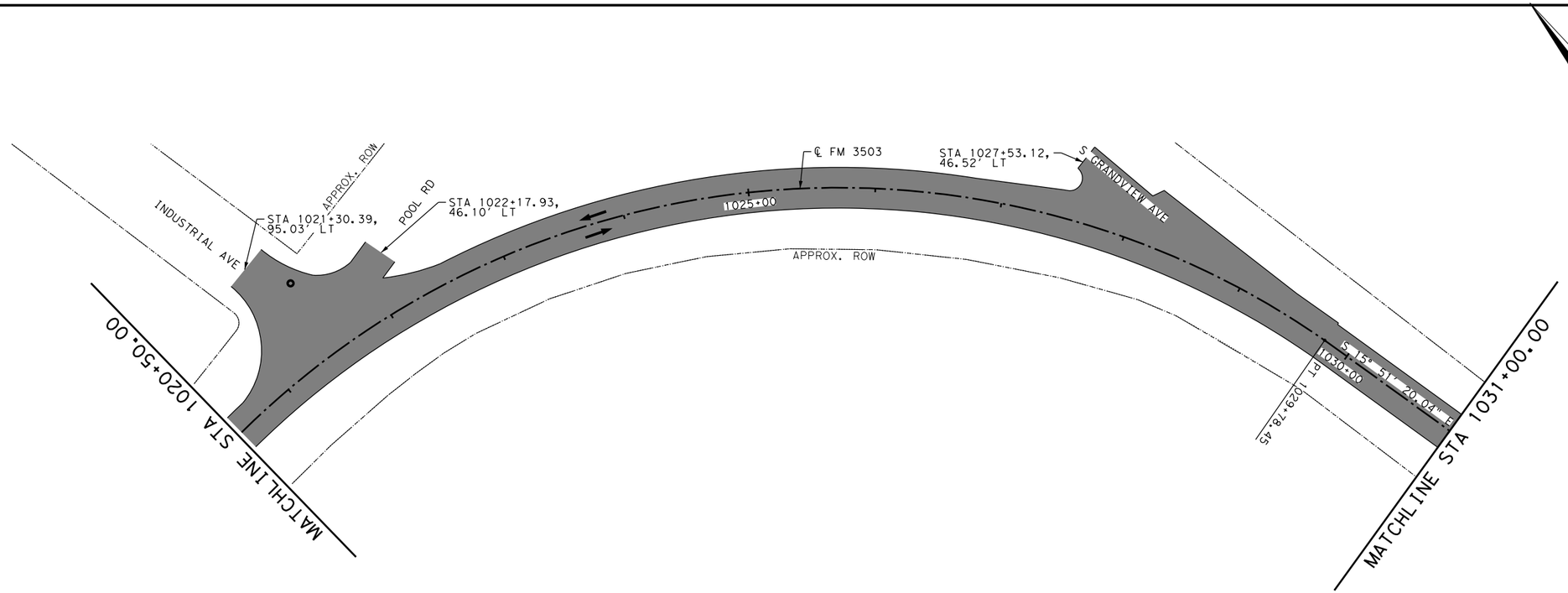
Texas Department of Transportation
©2023

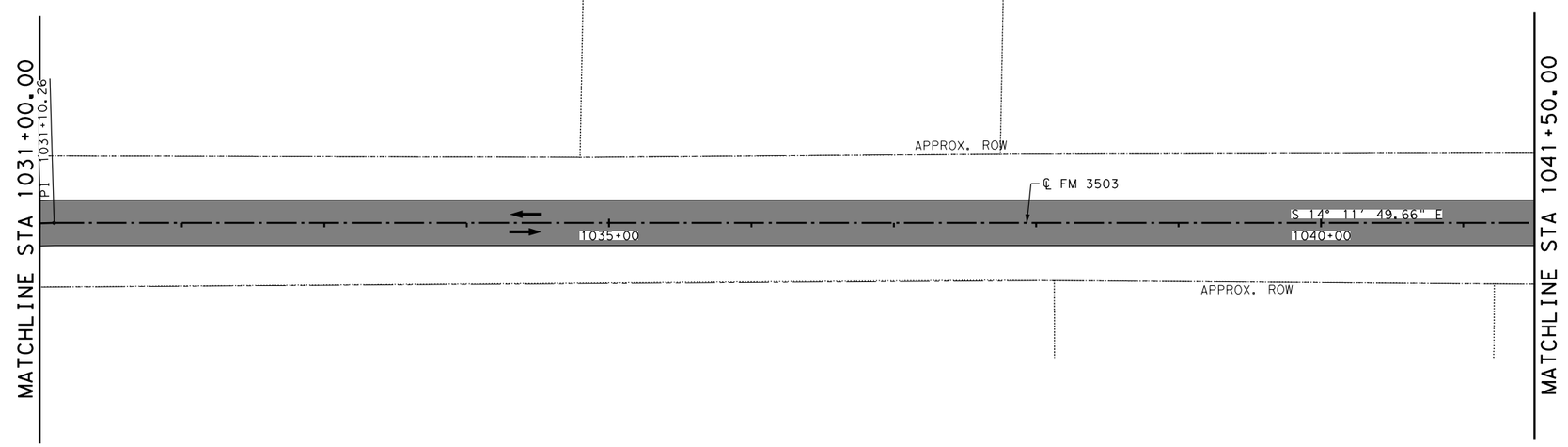
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PLAN
BEGIN TO STA 1020+50.00

SHEET 1 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	
CHECKED	CONT.	SECT.	JOB	54
	3570	01	012	
APPROVED				





LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

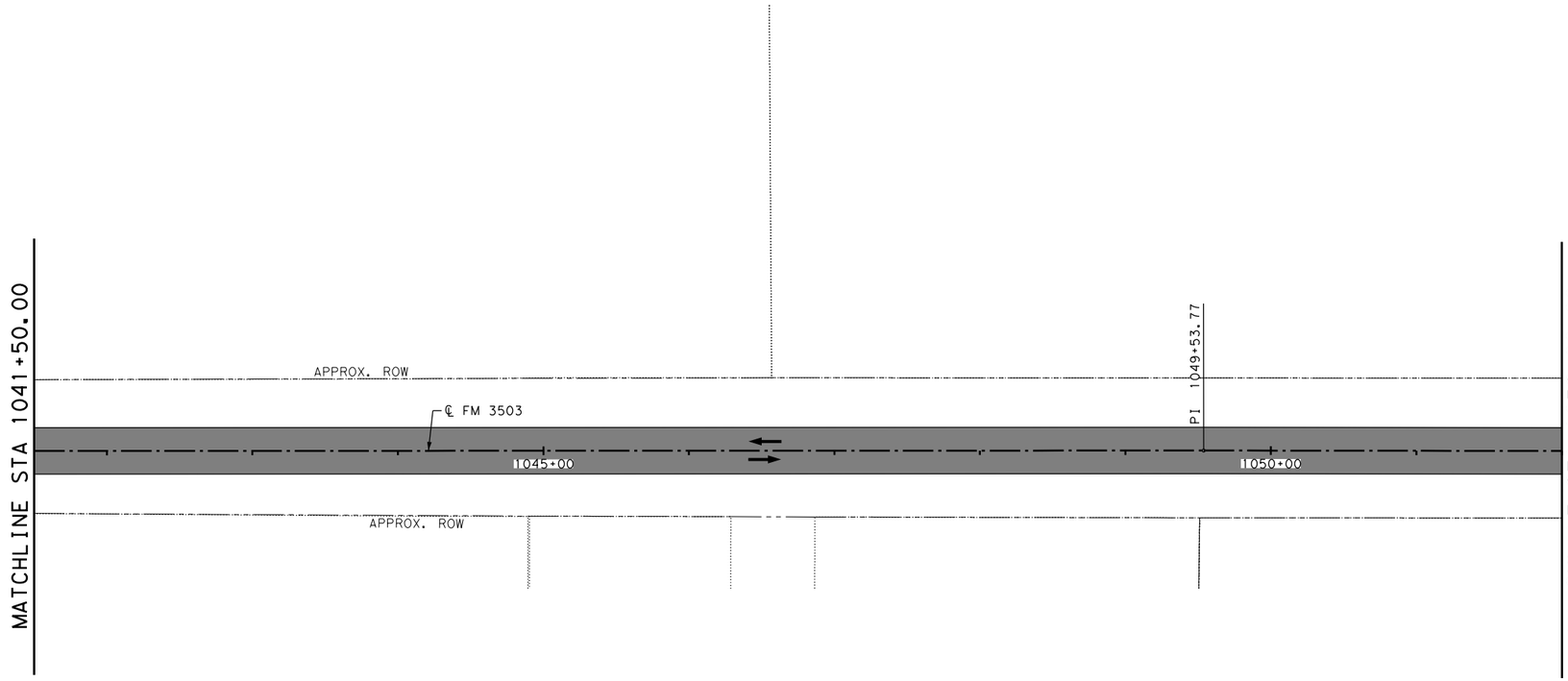
Texas Department of Transportation
©2023

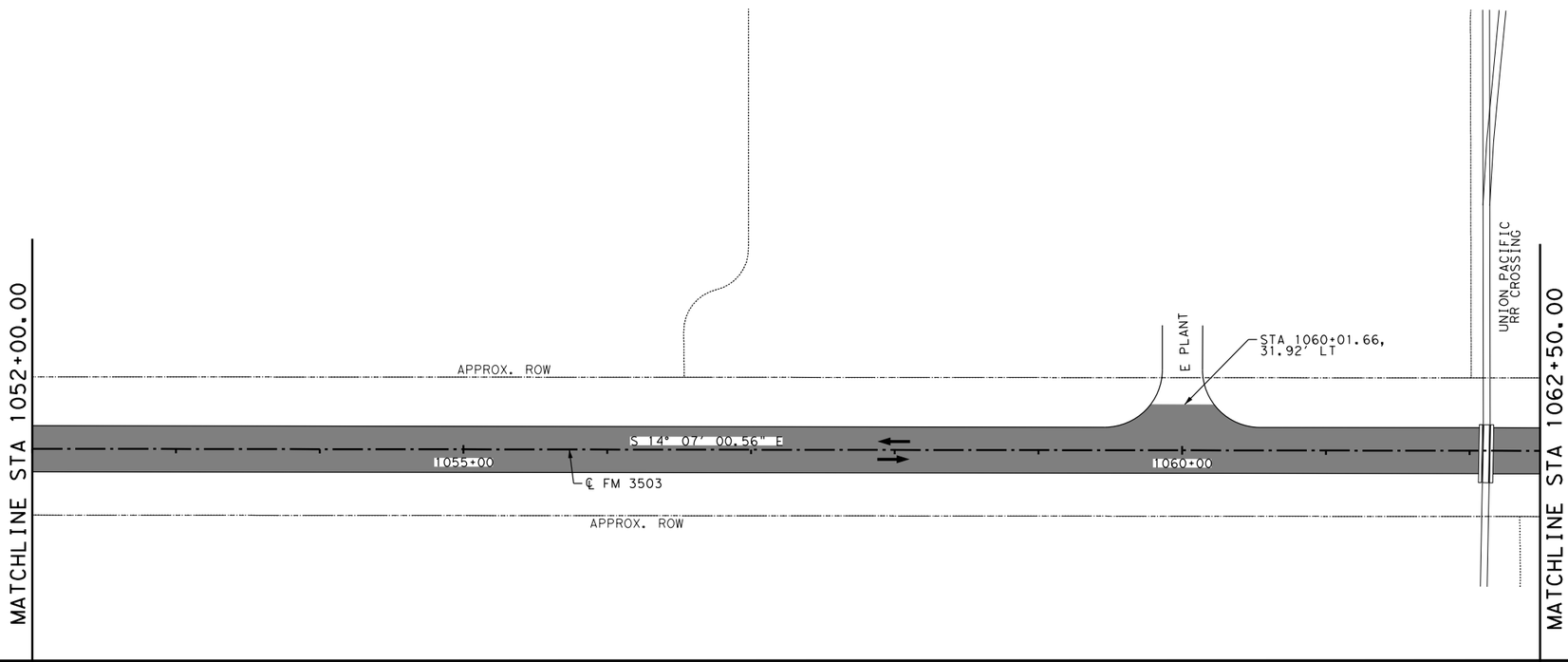
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

FM 3503
PLAN
STA 1020+50.00 TO STA 1041+50.00

SHEET 2 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	55
	CONT.	SECT.	JOB	
	3570	01	012	





LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

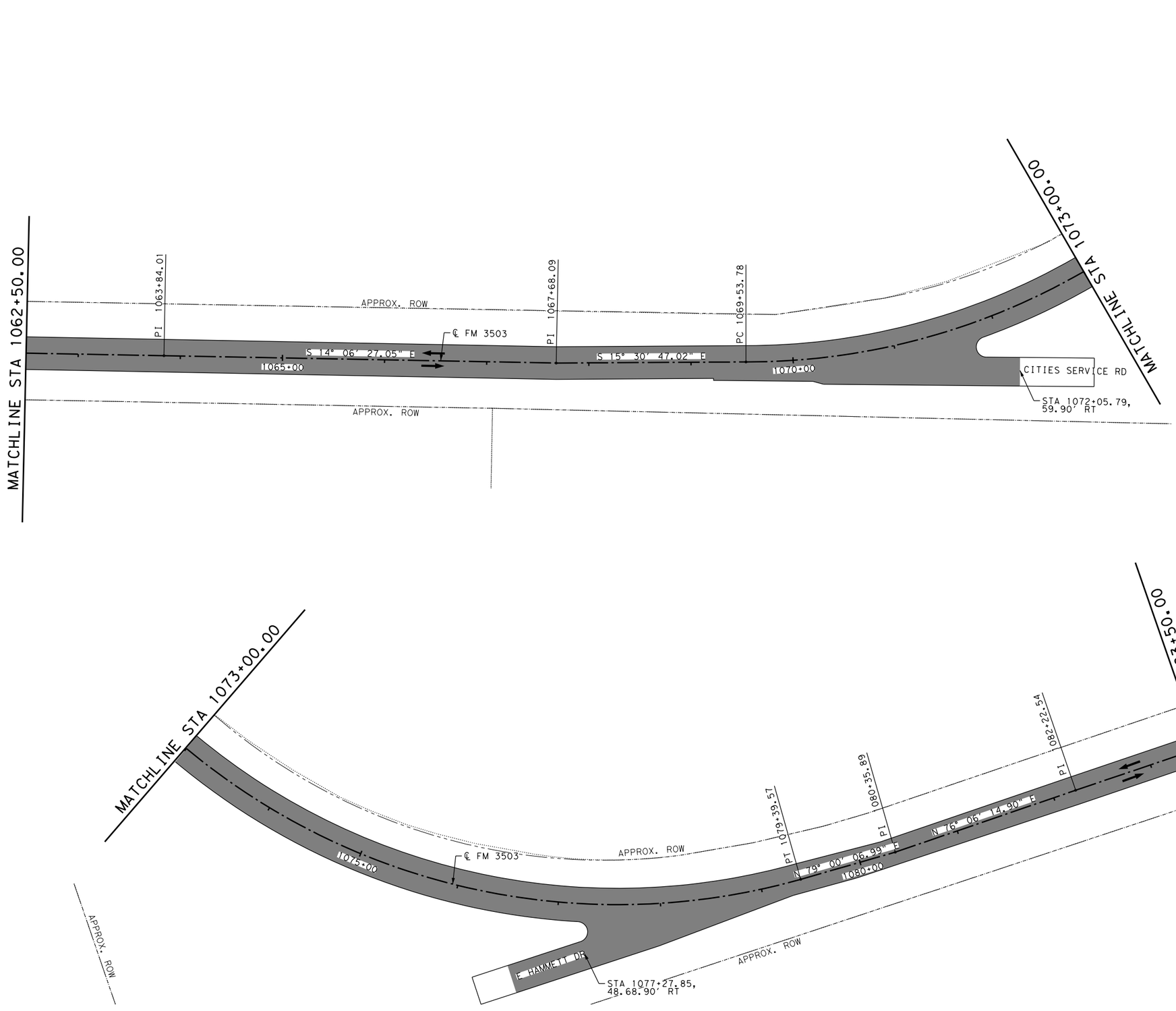
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PLAN
STA 1041+50.00 TO STA 1062+50.00

SHEET 3 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	56
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl
USER:untitled
DATE:3/21/2023 4:18:38 PM
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Roadway\FM3503_PLAN_03.dgn



LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

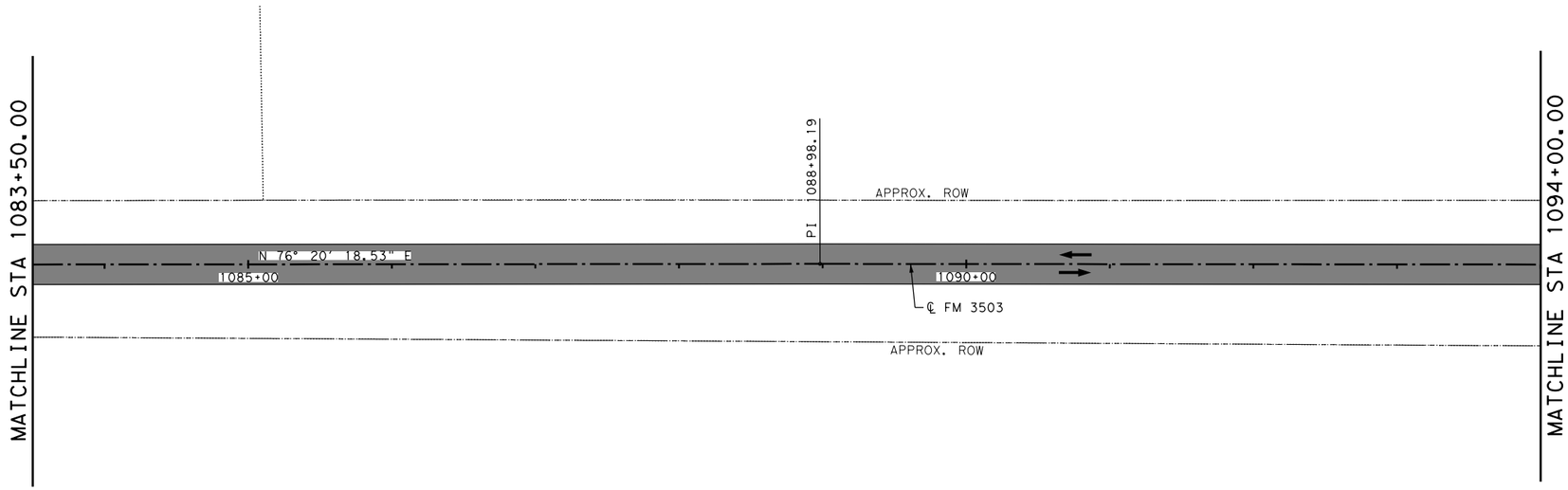
Texas Department of Transportation

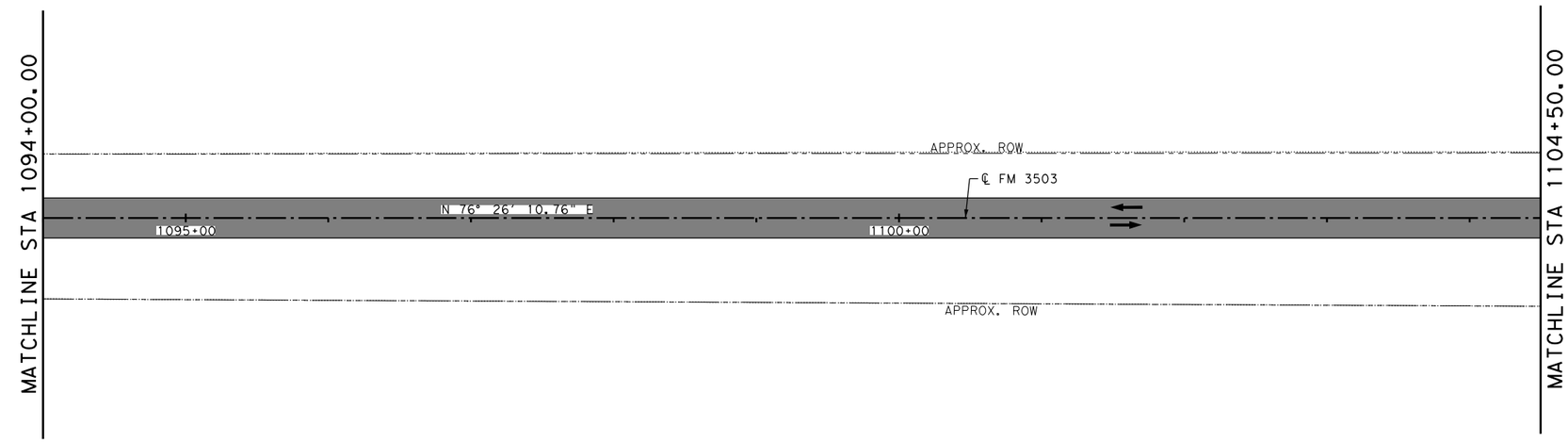
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PLAN
STA 1062+50.00 TO STA 1083+50.00

SHEET 4 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	57
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	





LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

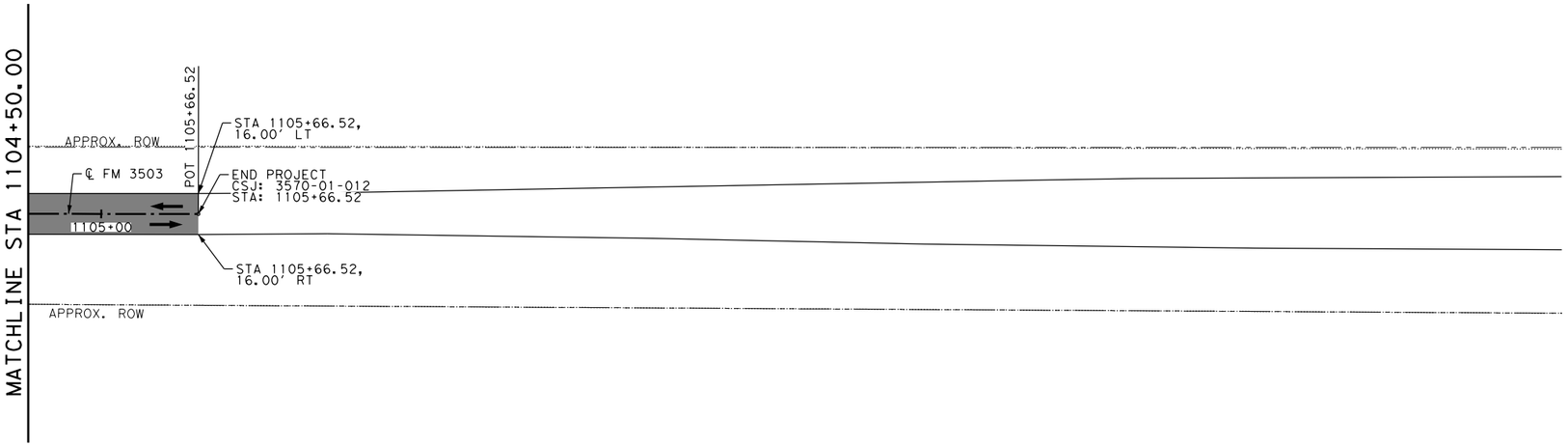
Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PLAN
STA 1083+50.00 TO STA 1104+50.00

SHEET 5 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	58
	CONT.	SECT.	JOB	
	3570	01	012	



LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

03/21/2023

Texas Department of Transportation
©2023

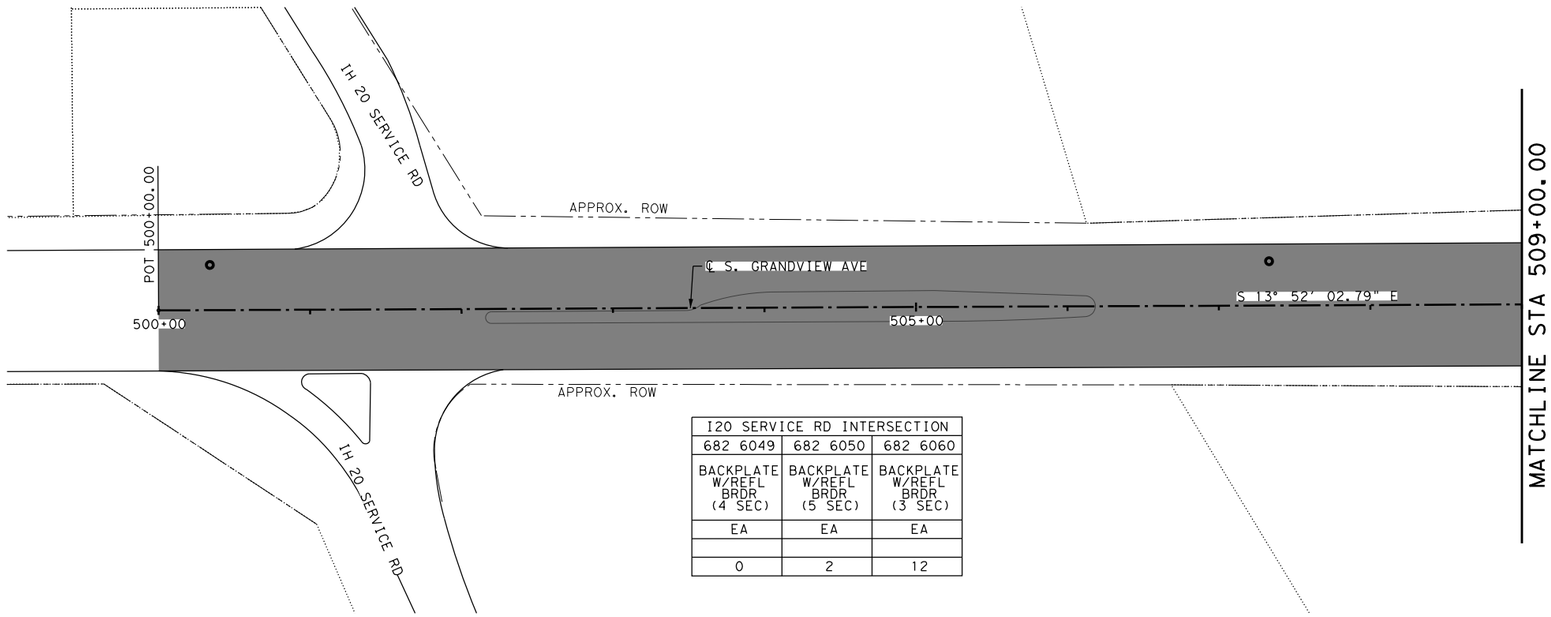
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PLAN
STA 1104+50.00 TO END

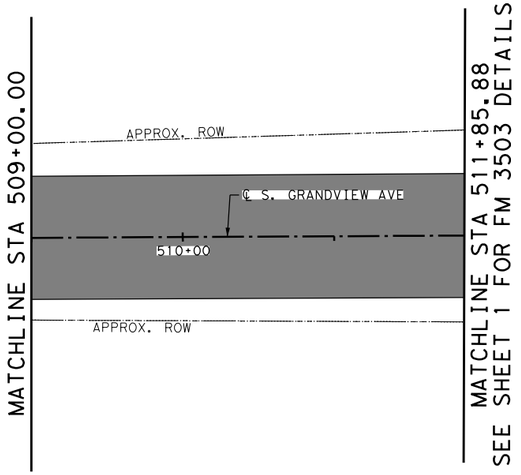
SHEET 6 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	59
CHECKED	CONT.	SECT.	JOB	
	3570	01	012	
APPROVED				

DATE:3/21/2023 4:18:53 PM USER:untitled PENTABLE:FM3503_PEN_TABLE.tbl
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Roadway\FM3503_PLAN_06.dgn PLOTDRIVER:BW_HALF_PDF.plt



I20 SERVICE RD INTERSECTION		
682 6049	682 6050	682 6060
BACKPLATE W/REFL BRDR (4 SEC)	BACKPLATE W/REFL BRDR (5 SEC)	BACKPLATE W/REFL BRDR (3 SEC)
EA	EA	EA
0	2	12



LEGEND:

- PROPOSED OVERLAY
- DIRECTION OF TRAVEL
- EXISTING ROW
- MANHOLES
- WATER VALVE
- CURB RAMP (TYPE 7)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-13290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

SOUTH GRANDVIEW AVE
PLAN
BEGIN TO END

SHEET 7 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	60
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

FM 1882 HORIZONTAL ALIGNMENT DATA

Beginning chain FM3503_ALGN description

Point 1 N 10,635,640.8071 E 1,673,102.7903 Sta 1000+00.00

Course from 1 to 2 N 76° 04′ 25.49" E Dist 230.0862

Point 2 N 10,635,696.1826 E 1,673,326.1133 Sta 1002+30.09

Course from 2 to 3 N 76° 30′ 46.81" E Dist 264.1638

Point 3 N 10,635,757.7921 E 1,673,582.9922 Sta 1004+94.25

Course from 3 to 4 N 76° 27′ 57.29" E Dist 405.3117

Point 4 N 10,635,852.6447 E 1,673,977.0488 Sta 1008+99.56

Course from 4 to 5 N 76° 17′ 28.49" E Dist 773.8728

Point 5 N 10,636,036.0421 E 1,674,728.8762 Sta 1016+73.43

Course from 5 to PC FM3503_ALGN1 N 76° 27′ 20.41" E Dist 286.8988

Curve Data

Curve FM3503_ALGN1

P.I. Station	1025+96.87	N	10,636,256.9616	E	1,675,625.4881
Delta =	87° 03′ 55.72" (RT)				
Degree =	8° 33′ 05.79"				
Tangent =	636.5342				
Length =	1,018.1181				
Radius =	670.0000				
External =	254.1622				
Long Chord =	922.9504				
Mid. Ord. =	184.2628				
P.C. Station	1019+60.33	N	10,636,103.2332	E	1,675,007.7961
P.T. Station	1029+78.45	N	10,635,647.9496	E	1,675,810.6374
C.C.		N	10,635,453.0660	E	1,675,169.6067
Back =	N 76° 01′ 27.89" E				
Ahead =	S 16° 54′ 36.39" E				
Chord Bear =	S 60° 26′ 34.25" E				

Course from PT FM3503_ALGN1 to 6 S 15° 51′ 20.04" E Dist 131.8112

Point 6 N 10,635,521.1534 E 1,675,846.6500 Sta 1031+10.26

Course from 6 to 7 S 14° 11′ 49.66" E Dist 1,843.5094

Point 7 N 10,633,733.9491 E 1,676,298.7869 Sta 1049+53.77

Course from 7 to 8 S 14° 07′ 00.56" E Dist 1,430.2336

Point 8 N 10,632,346.9079 E 1,676,647.6206 Sta 1063+84.01

Course from 8 to 9 S 14° 06′ 27.05" E Dist 384.0887

Point 9 N 10,631,974.4033 E 1,676,741.2392 Sta 1067+68.09

Course from 9 to PC FM3503_ALGN2 S 15° 30′ 47.02" E Dist 185.6878

Curve Data

Curve FM3503_ALGN2

P.I. Station	1075+64.71	N	10,631,205.7085	E	1,676,950.2803
Delta =	85° 34′ 39.34" (LT)				
Degree =	8° 40′ 52.24"				
Tangent =	610.9270				
Length =	985.7831				
Radius =	660.0000				
External =	239.3508				
Long Chord =	896.6731				
Mid. Ord. =	175.6506				
P.C. Station	1069+53.78	N	10,631,795.4802	E	1,676,790.9029
P.T. Station	1079+39.57	N	10,631,319.1347	E	1,677,550.5855
C.C.		N	10,631,967.6597	E	1,677,428.0483
Back =	S 15° 07′ 19.79" E				
Ahead =	N 79° 18′ 00.87" E				
Chord Bear =	S 57° 54′ 39.46" E				

Course from PT FM3503_ALGN2 to 10 N 79° 00′ 06.99" E Dist 96.3285

Point 10 N 10,631,337.5119 E 1,677,645.1448 Sta 1080+35.89

Course from 10 to 11 N 76° 06′ 14.90" E Dist 186.6443

Point 11 N 10,631,382.3360 E 1,677,826.3267 Sta 1082+22.54

Course from 11 to 12 N 76° 20′ 18.53" E Dist 675.6546

Point 12 N 10,631,541.9159 E 1,678,482.8657 Sta 1088+98.19

Course from 12 to 13 N 76° 26′ 10.76" E Dist 1,668.3265

Point 13 N 10,631,933.1816 E 1,680,104.6624 Sta 1105+66.52

Ending chain FM3503_ALGN description

S GRANDVIEW AVE HORIZONTAL ALIGNMENT DATA

Beginning chain S_GRANDVIEW_ALG description

Point 20 N 10,635,929.7693 E 1,674,293.2165 Sta 500+00.00

Course from 20 to 21 N 13° 52′ 02.79" W Dist 1,529.3900

Point 21 N 10,637,414.5819 E 1,673,926.6578 Sta 515+29.39

Ending chain S_GRANDVIEW_ALG description

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

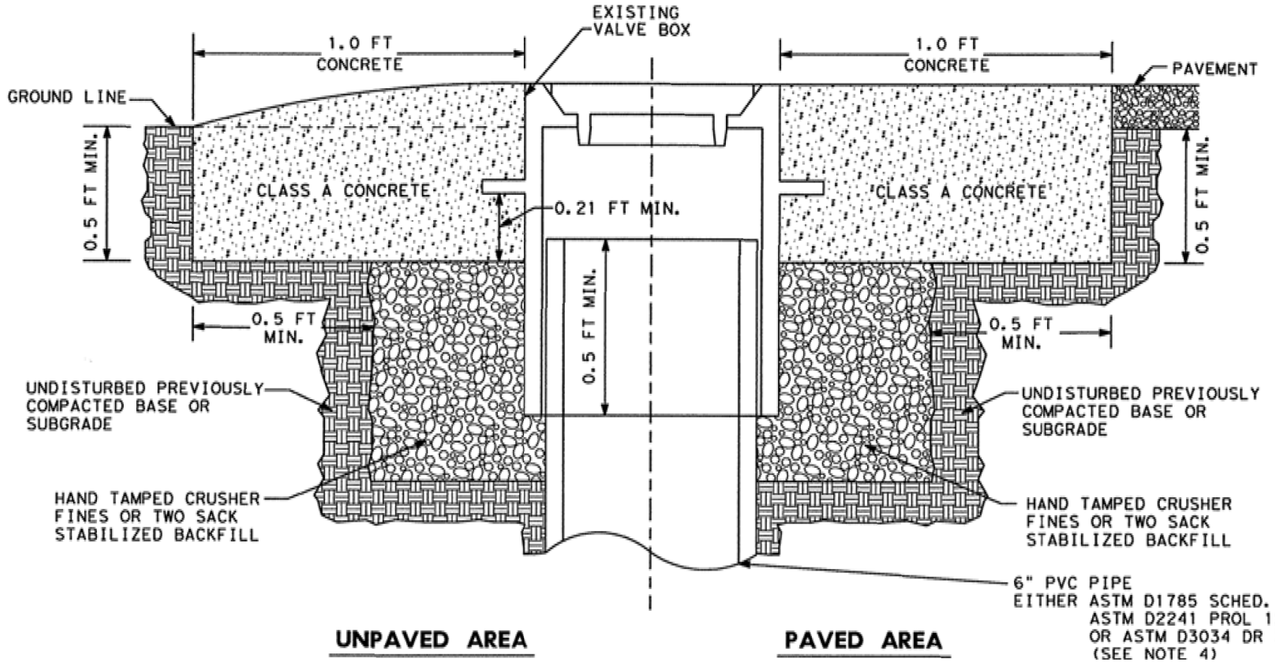
Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3580

FM 3503
HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	
CHECKED	CONT.	SECT.	JOB	61
	3570	01	012	
APPROVED				



DETAIL FOR ADJUSTING VALVE BOX

LOCATIONS FOUND ON PLAN-PLAN SHEETS

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

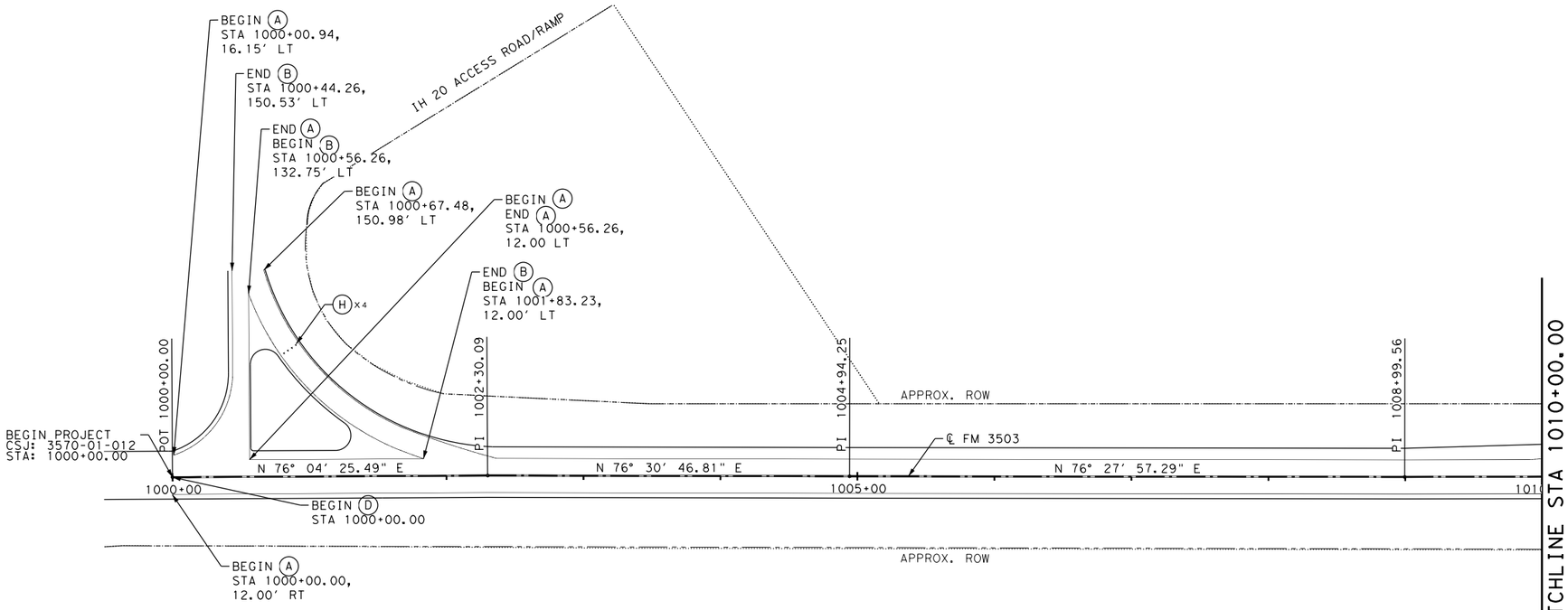
Texas Department of Transportation
©2023

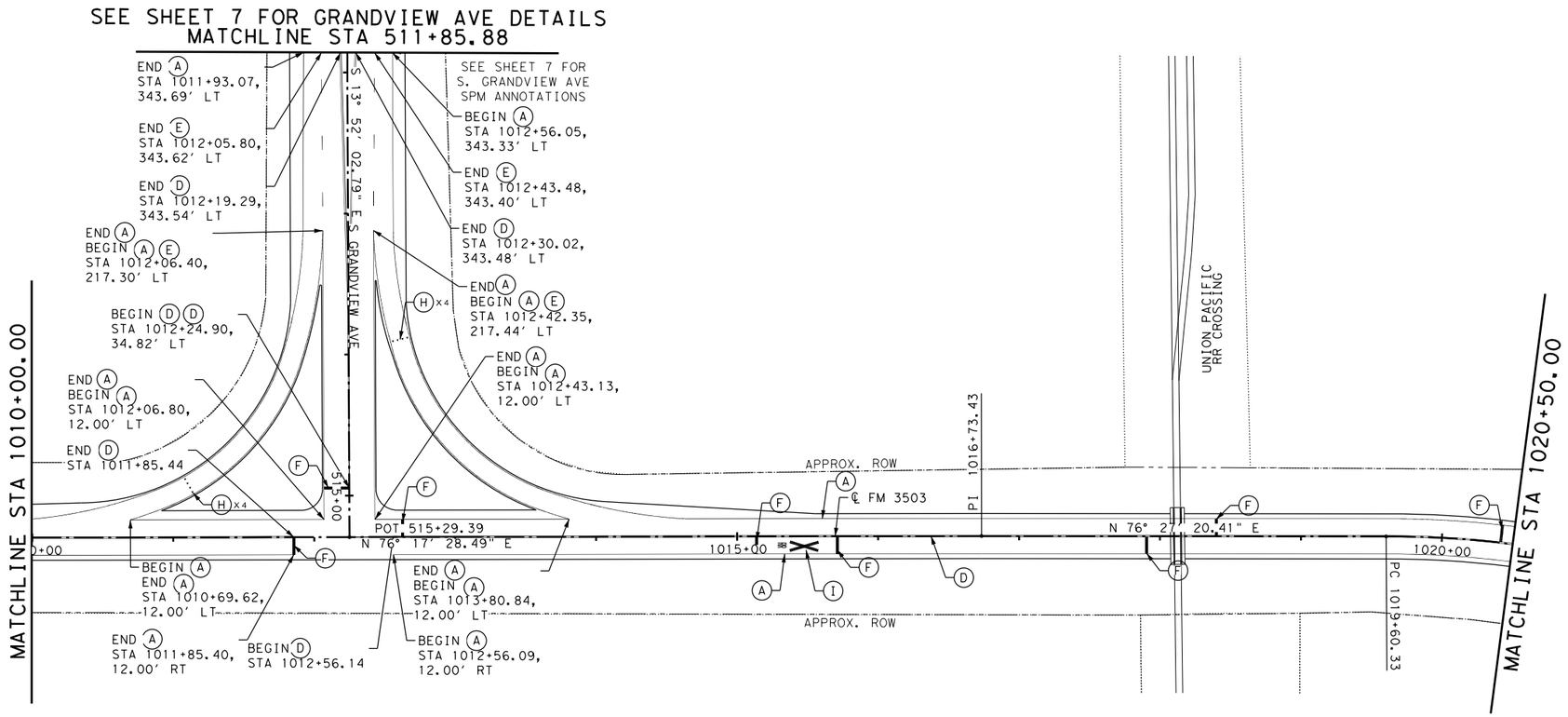
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3580

FM 3503
ADJUSTING VALVE BOX
DETAIL

SHEET 1 OF 1

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	
APPROVED	CONT.	SECT.	JOB	62
	3570	01	012	





LEGEND:

- (A) REFL PAV MRK TY II(6")(W)(SLD)
- (B) REFL PAV MRK TY II(6")(Y)(SLD)
- (C) REFL PAV MRK TY II(6")(Y)(BRK)
- (D) REFL PAV MRK TY II(6")(Y)(SLD)(DUAL)
- (E) REFL PAV MRK TY II(6")(W)(BRK)
- (F) REFL PAV MRK TY II(24")(W)(SLD)
- (G) REFL PAV MRK TY II (W) (ARROW)
- (H) REFL PAV MRK TY II (W) (WORD)
- (I) REFL PAV MRK TY I (W)(RRXING) (100MIL)
- (J) REFL PAV MRK TY I(18")(W) (YLD TRI)(100 MIL)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

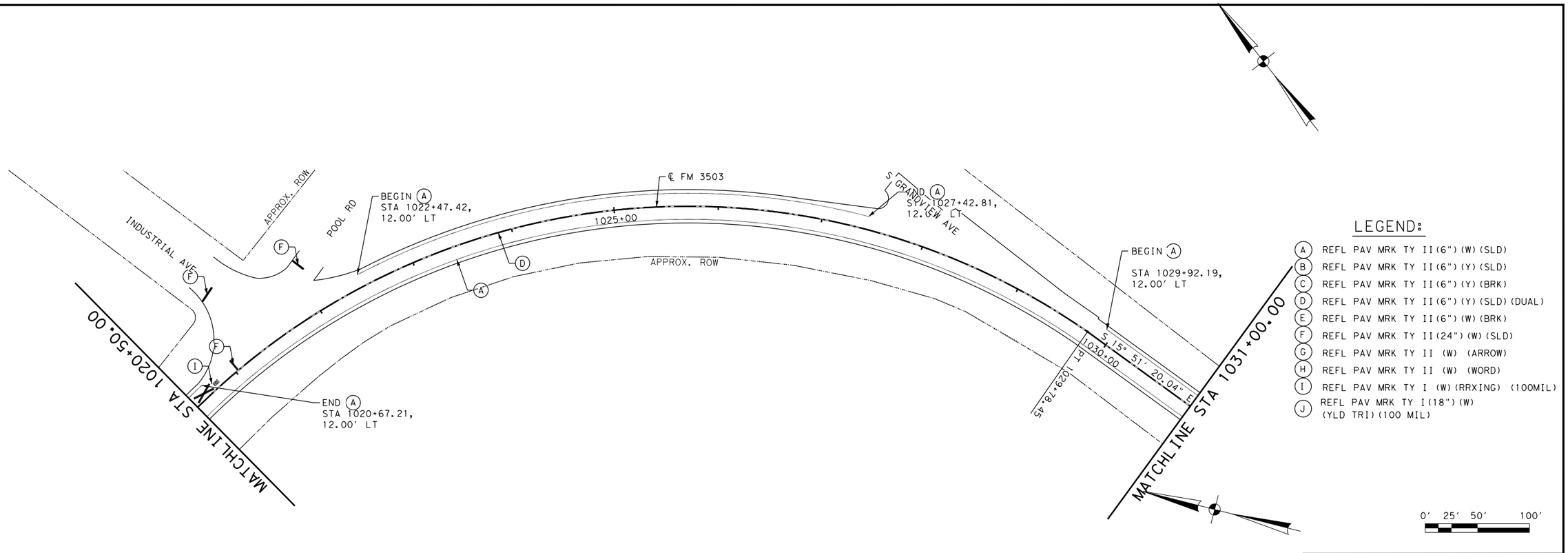
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PAVEMENT MARKINGS

BEGIN TO STA 1020+50.00

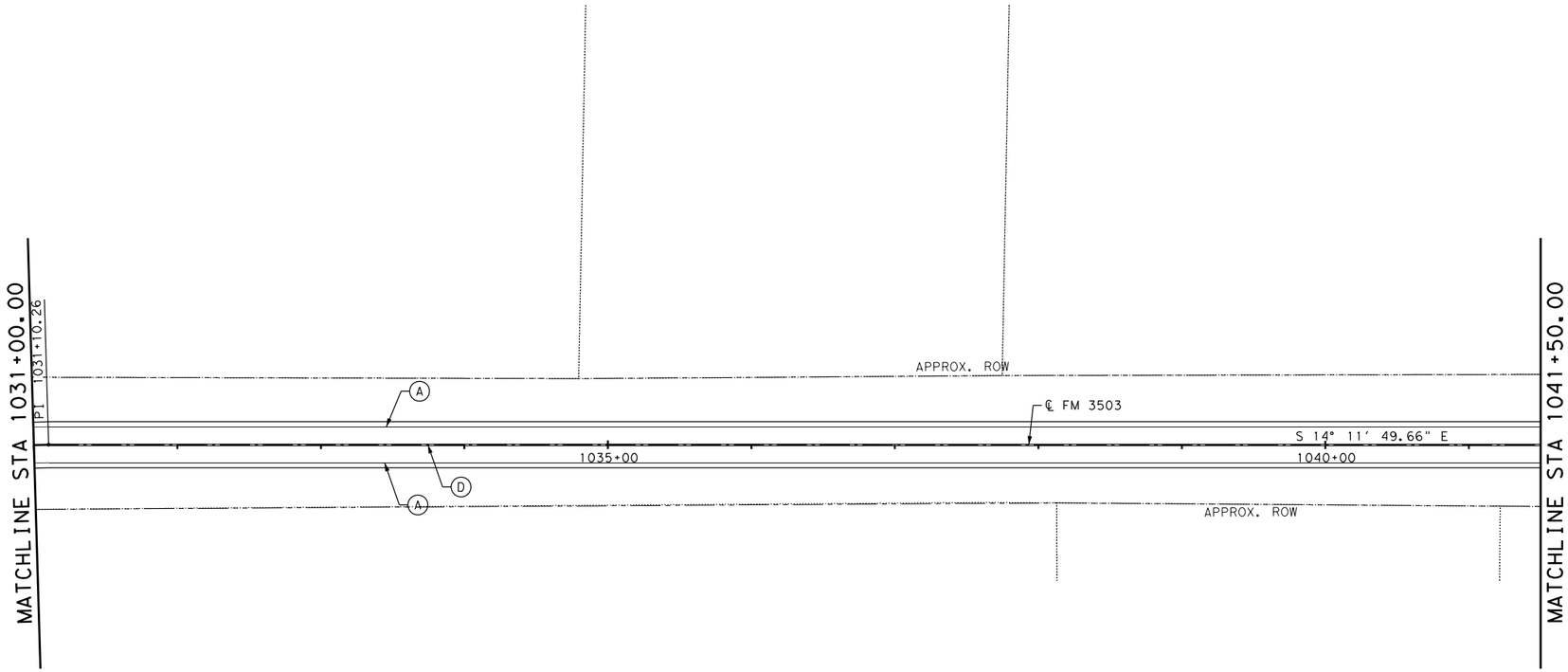
SHEET 1 OF 14

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	63
	CONT.	SECT.	JOB	
	3570	01	012	



LEGEND:

- (A) REFL PAV MRK TY II(6")(W)(SLD)
- (B) REFL PAV MRK TY II(6")(Y)(SLD)
- (C) REFL PAV MRK TY II(6")(Y)(BRK)
- (D) REFL PAV MRK TY II(6")(Y)(SLD)(DUAL)
- (E) REFL PAV MRK TY II(6")(W)(BRK)
- (F) REFL PAV MRK TY II(24")(W)(SLD)
- (G) REFL PAV MRK TY II (W) (ARROW)
- (H) REFL PAV MRK TY II (W) (WORD)
- (I) REFL PAV MRK TY I (W)(RRXING) (100MIL)
- (J) REFL PAV MRK TY I(18")(W) (YLD TRI)(100 MIL)



NO.	DATE	REVISION	APPROVED

DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

03/21/2023

Texas Department of Transportation

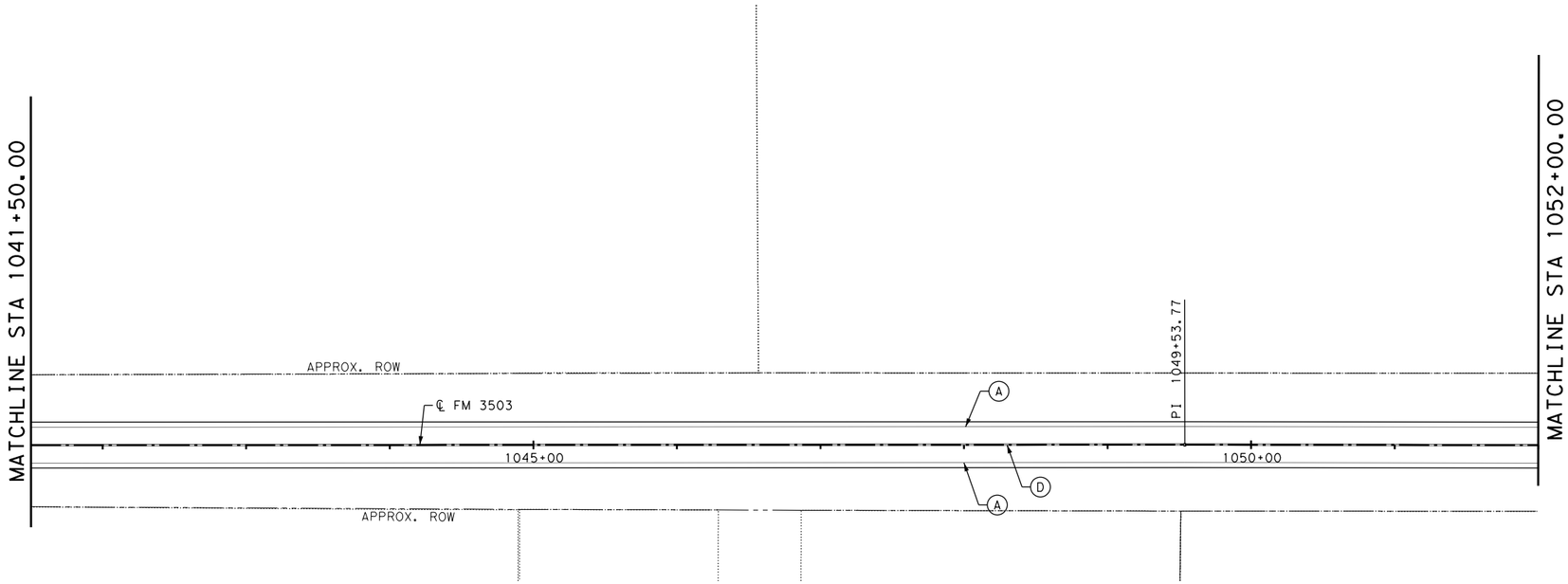
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
7805 Dallas Parkway, Suite 500 • Plano, Texas 75024 • 972.488.3680

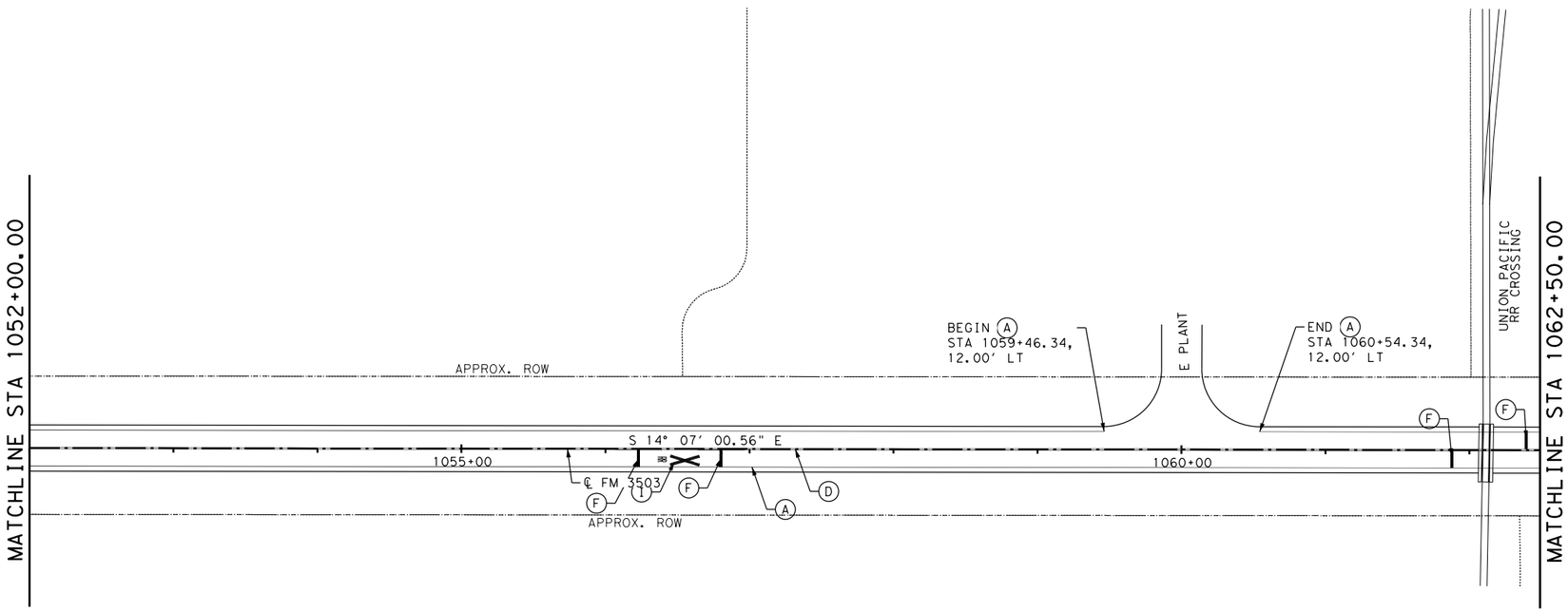
FM 3503
PAVEMENT MARKINGS

STA 1020+50.00 TO STA 1041+50.00

SHEET 2 OF 14

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	64
CHECKED	CONT.	SECT.	JOB	
	3570	01	012	
APPROVED				





LEGEND:

- (A) REFL PAV MRK TY II(6")(W)(SLD)
- (B) REFL PAV MRK TY II(6")(Y)(SLD)
- (C) REFL PAV MRK TY II(6")(Y)(BRK)
- (D) REFL PAV MRK TY II(6")(Y)(SLD)(DUAL)
- (E) REFL PAV MRK TY II(6")(W)(BRK)
- (F) REFL PAV MRK TY II(24")(W)(SLD)
- (G) REFL PAV MRK TY II (W) (ARROW)
- (H) REFL PAV MRK TY II (W) (WORD)
- (I) REFL PAV MRK TY I (W)(RRXING) (100MIL)
- (J) REFL PAV MRK TY I(18")(W) (YLD TRI)(100 MIL)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

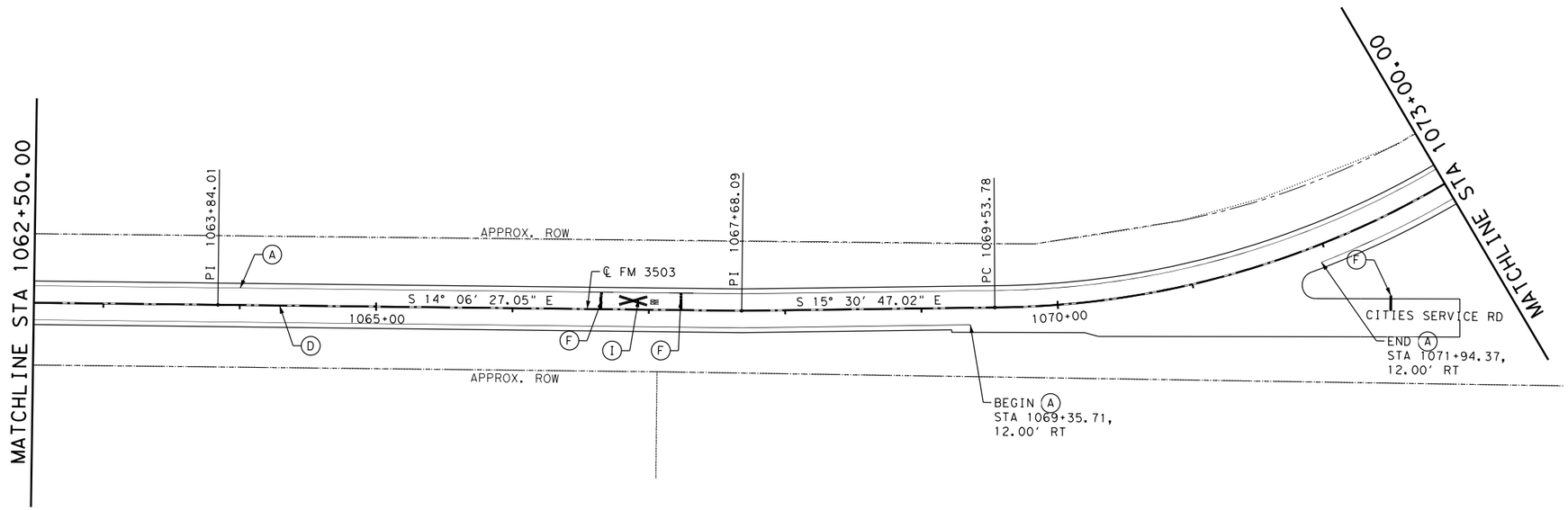
FM 3503
PAVEMENT MARKINGS

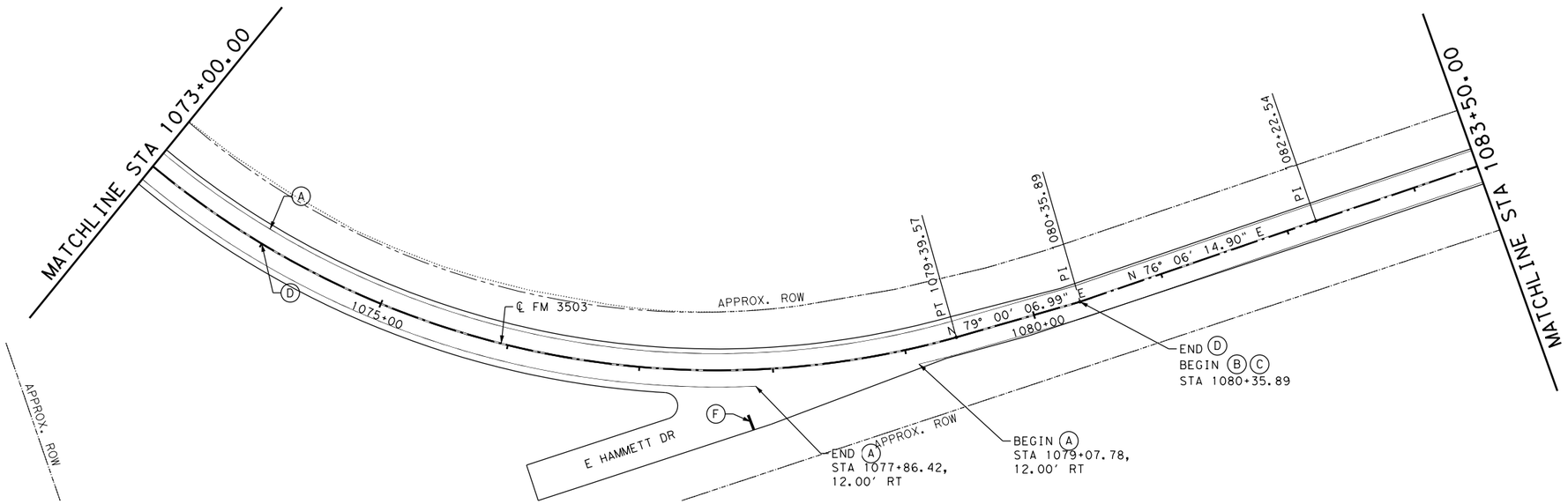
STA 1041+50.00 TO STA 1062+50.00

SHEET 3 OF 14

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	65
CHECKED	CONT.	SECT.	JOB	
	3570	01	012	
APPROVED				

DATE:3/21/2023 4:19:18 PM USER:untitled
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Signing & Pavement Markings\FM3503_SPM_03.dgn
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl





LEGEND:

- (A) REFL PAV MRK TY II(6")(W)(SLD)
- (B) REFL PAV MRK TY II(6")(Y)(SLD)
- (C) REFL PAV MRK TY II(6")(Y)(BRK)
- (D) REFL PAV MRK TY II(6")(Y)(SLD)(DUAL)
- (E) REFL PAV MRK TY II(6")(W)(BRK)
- (F) REFL PAV MRK TY II(24")(W)(SLD)
- (G) REFL PAV MRK TY II (W) (ARROW)
- (H) REFL PAV MRK TY II (W) (WORD)
- (I) REFL PAV MRK TY I (W)(RRXING) (100MIL)
- (J) REFL PAV MRK TY I(18")(W) (YLD TRI)(100 MIL)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

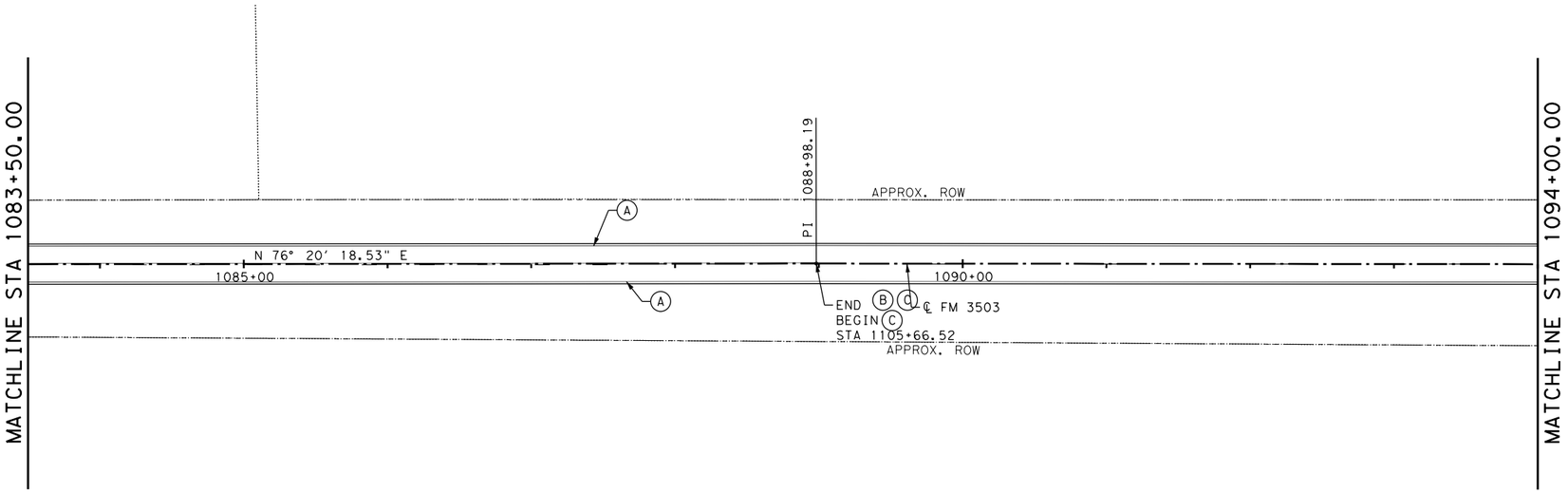
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-13290
2905 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

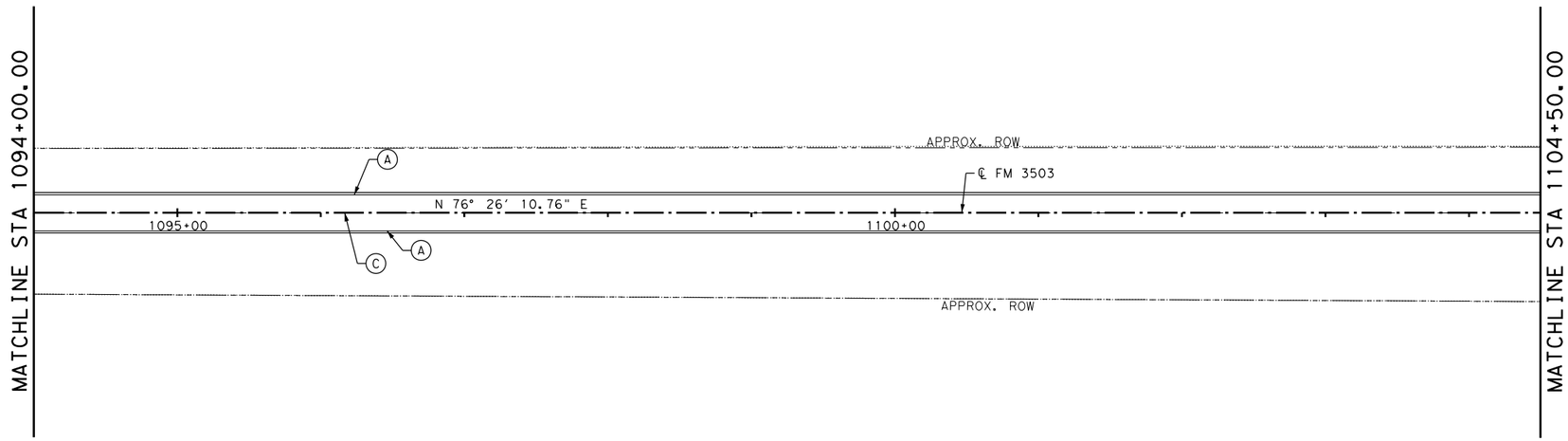
FM 3503
PAVEMENT MARKINGS

STA 1062+50.00 TO STA 1083+50.00

SHEET 4 OF 14

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	66
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	





LEGEND:

- (A) REFL PAV MRK TY II(6")(W)(SLD)
- (B) REFL PAV MRK TY II(6")(Y)(SLD)
- (C) REFL PAV MRK TY II(6")(Y)(BRK)
- (D) REFL PAV MRK TY II(6")(Y)(SLD)(DUAL)
- (E) REFL PAV MRK TY II(6")(W)(BRK)
- (F) REFL PAV MRK TY II(24")(W)(SLD)
- (G) REFL PAV MRK TY II (W) (ARROW)
- (H) REFL PAV MRK TY II (W) (WORD)
- (I) REFL PAV MRK TY I (W)(RRXING) (100MIL)
- (J) REFL PAV MRK TY I(18")(W) (YLD TRI)(100 MIL)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

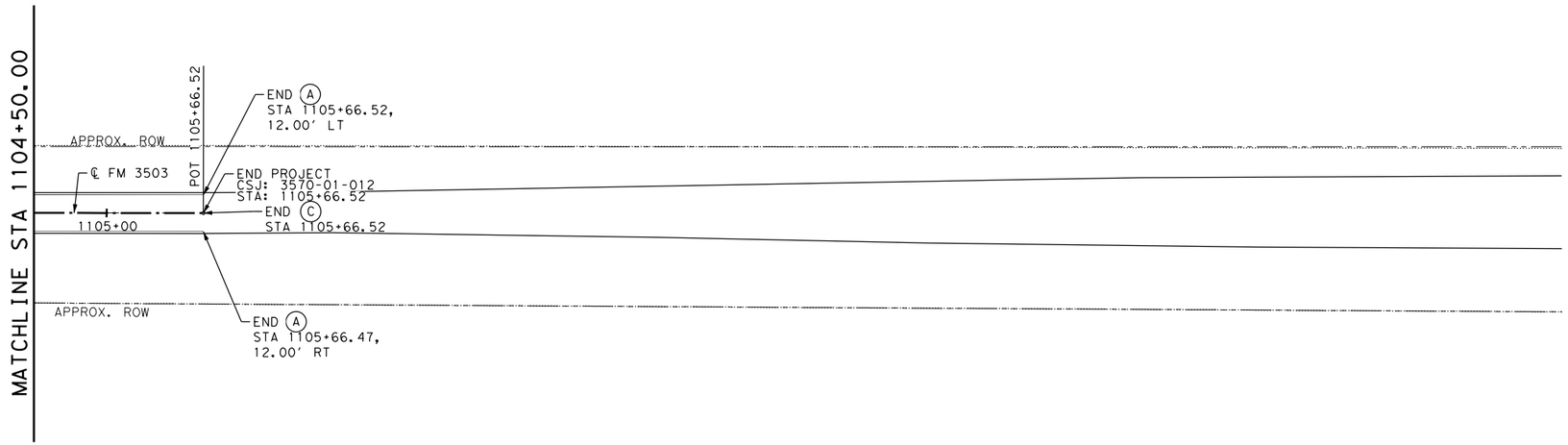
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
PAVEMENT MARKINGS

STA 1083+50.00 TO STA 1104+50.00

SHEET 5 OF 14

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	67
	CONT.	SECT.	JOB	
	3570	01	012	



LEGEND:

- (A) REFL PAV MRK TY II(6")(W)(SLD)
- (B) REFL PAV MRK TY II(6")(Y)(SLD)
- (C) REFL PAV MRK TY II(6")(Y)(BRK)
- (D) REFL PAV MRK TY II(6")(Y)(SLD)(DUAL)
- (E) REFL PAV MRK TY II(6")(W)(BRK)
- (F) REFL PAV MRK TY II(24")(W)(SLD)
- (G) REFL PAV MRK TY II (W) (ARROW)
- (H) REFL PAV MRK TY II (W) (WORD)
- (I) REFL PAV MRK TY I (W)(RRXING) (100MIL)
- (J) REFL PAV MRK TY I(18")(W) (YLD TRI)(100 MIL)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

03/21/2023

Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-13290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

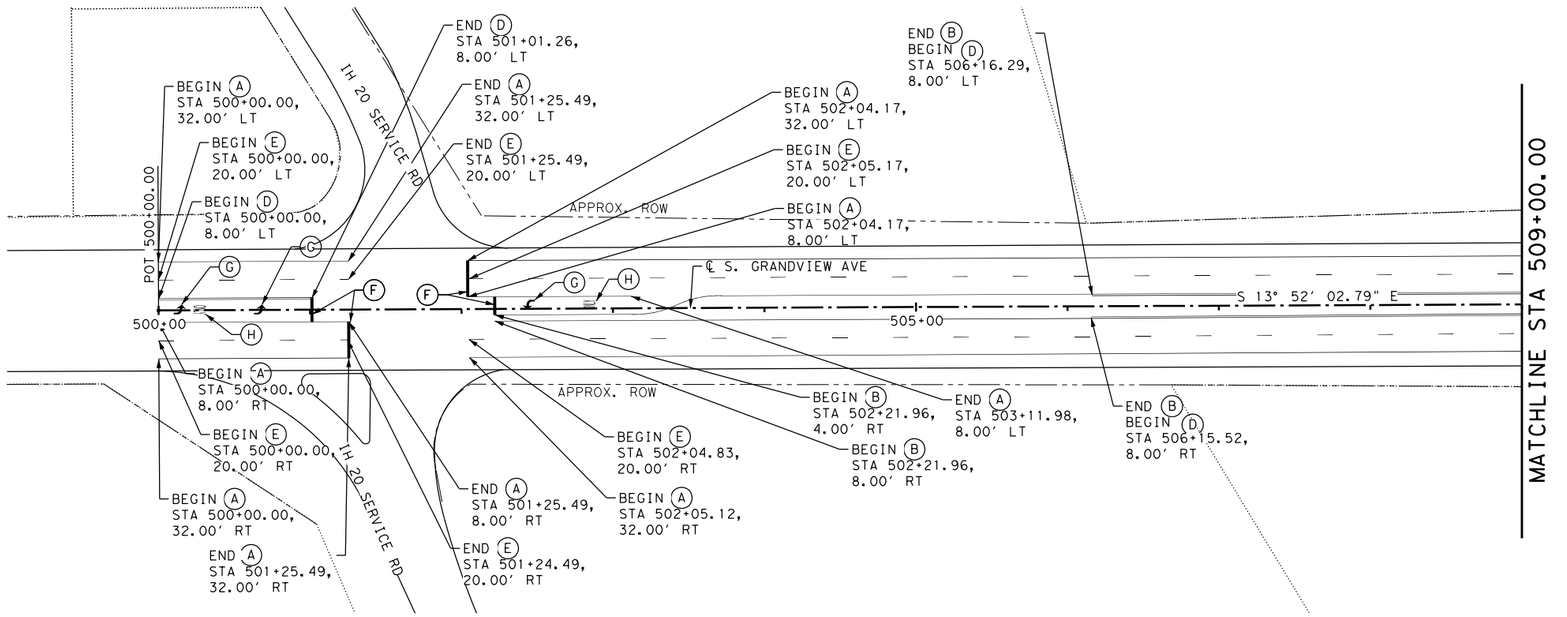
FM 3503
PAVEMENT MARKINGS

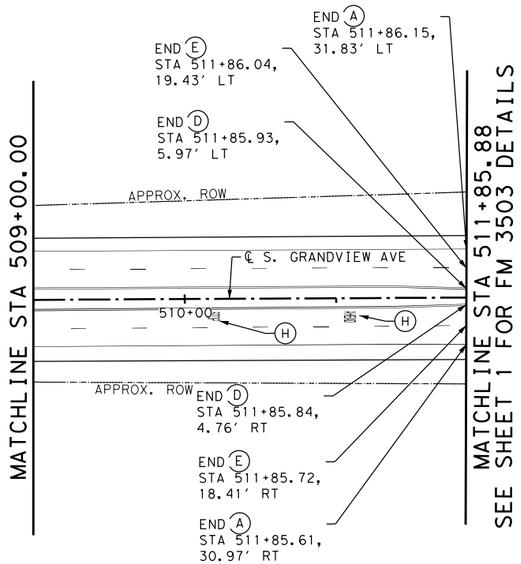
STA 1104+50.00 TO END

SHEET 6 OF 14

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	68
CHECKED	CONT.	SECT.	JOB	
	3570	01	012	
APPROVED				

DATE:3/21/2023 4:19:37 PM USER:untitled
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Signing & Pavement Markings\FM3503_SPM_06.dgn
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl





LEGEND:

- (A) REFL PAV MRK TY II(6")(W)(SLD)
- (B) REFL PAV MRK TY II(6")(Y)(SLD)
- (C) REFL PAV MRK TY II(6")(Y)(BRK)
- (D) REFL PAV MRK TY II(6")(Y)(SLD)(DUAL)
- (E) REFL PAV MRK TY II(6")(W)(BRK)
- (F) REFL PAV MRK TY II(24")(W)(SLD)
- (G) REFL PAV MRK TY II (W) (ARROW)
- (H) REFL PAV MRK TY II (W) (WORD)
- (I) REFL PAV MRK TY I (W)(RRXING) (100MIL)
- (J) REFL PAV MRK TY I(18")(W) (YLD TRI)(100 MIL)

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

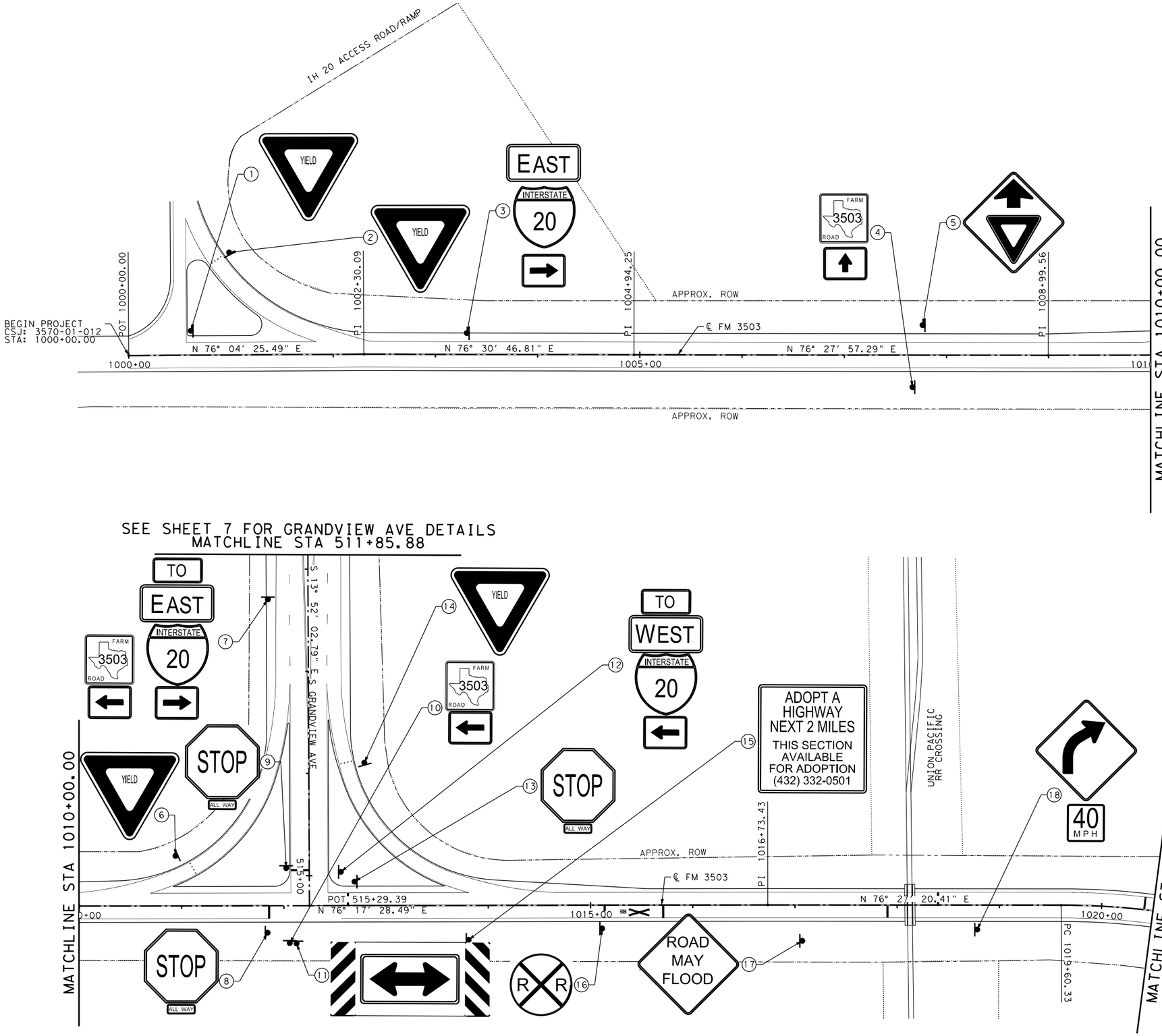
SOUTH GRANDVIEW AVE PAVEMENT MARKINGS

BEGIN TO END

SHEET 7 OF 14

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	69
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

DATE:3/21/2023 4:19:42 PM USER:untitled
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Signing & Pavement Markings\FM3503_SPM_07_GRANDVIEW.dgn
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

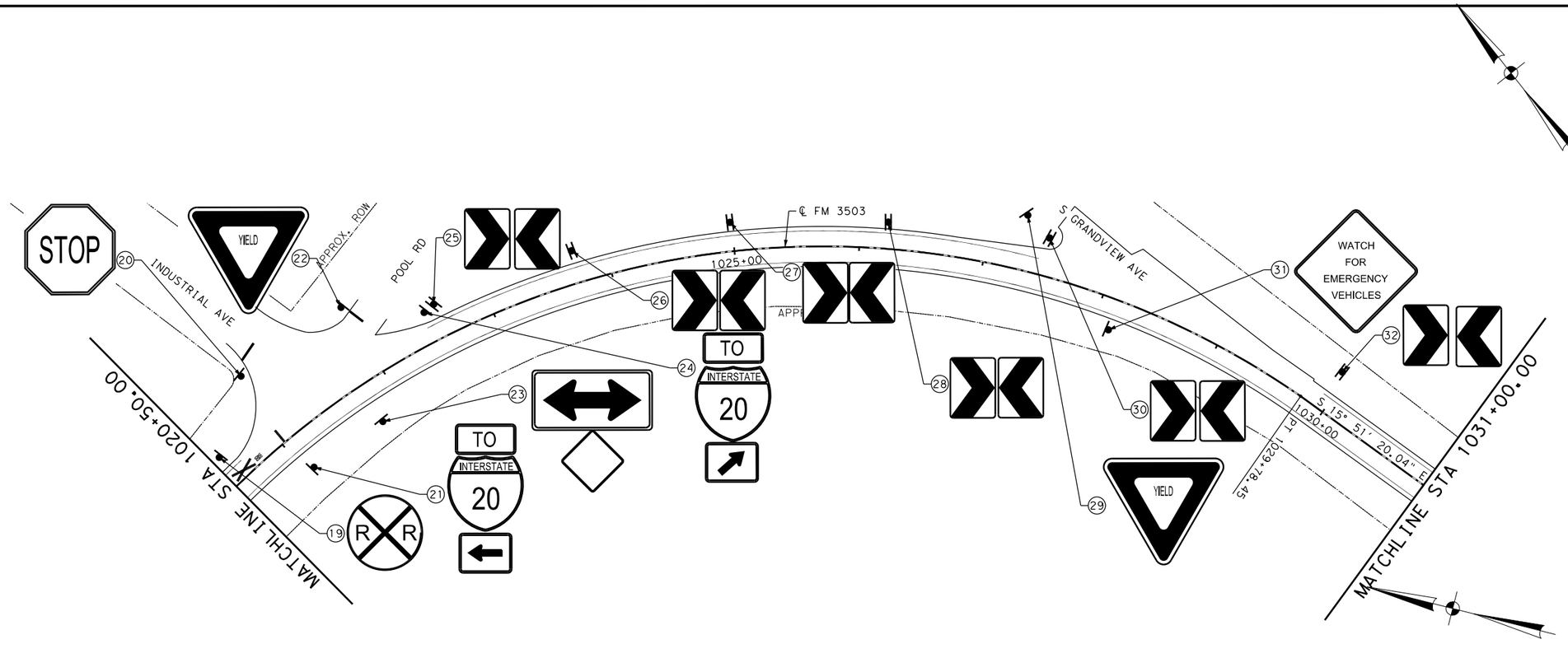
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
SIGNING

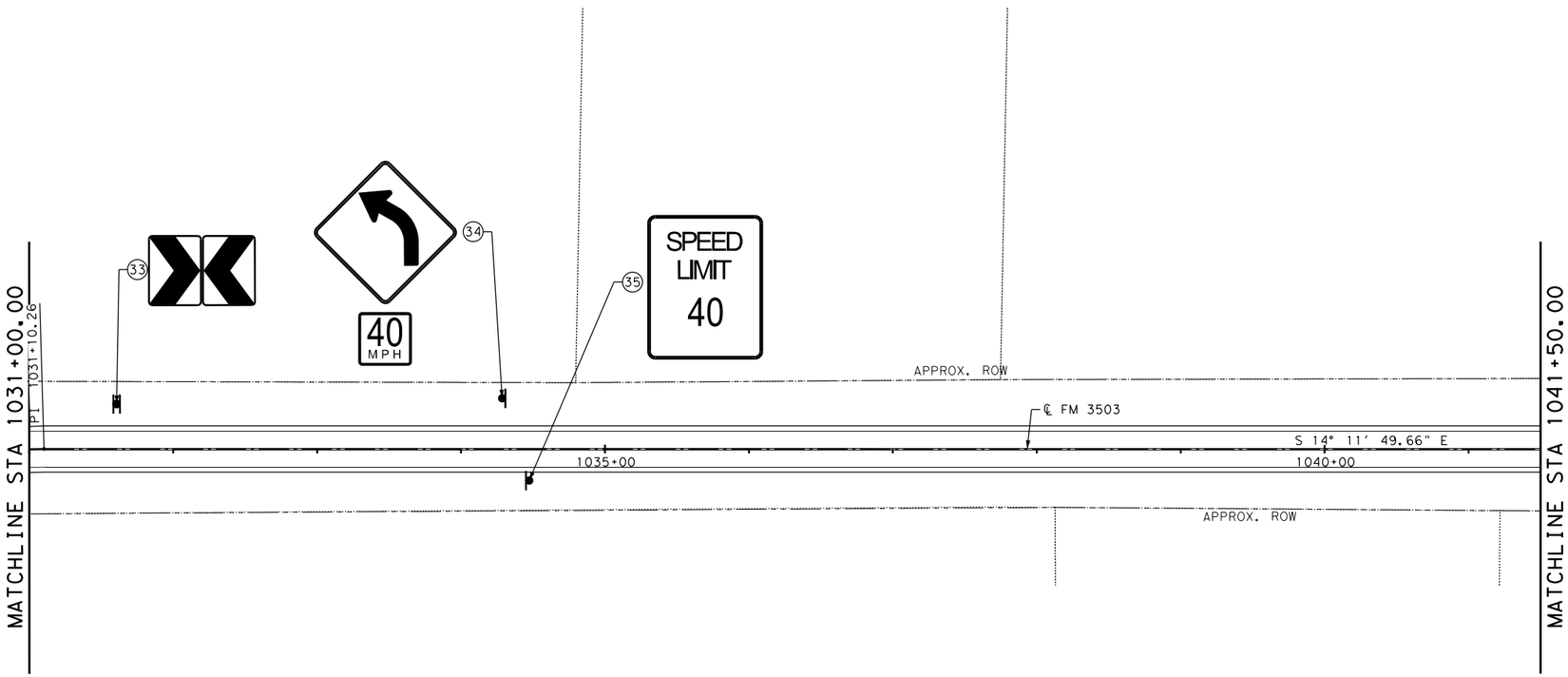
BEGIN TO STA 1020+50.00

SHEET 8 OF 14

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	70
	CONT.	SECT.	JOB	
	3570	01	012	



0' 25' 50' 100'



NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

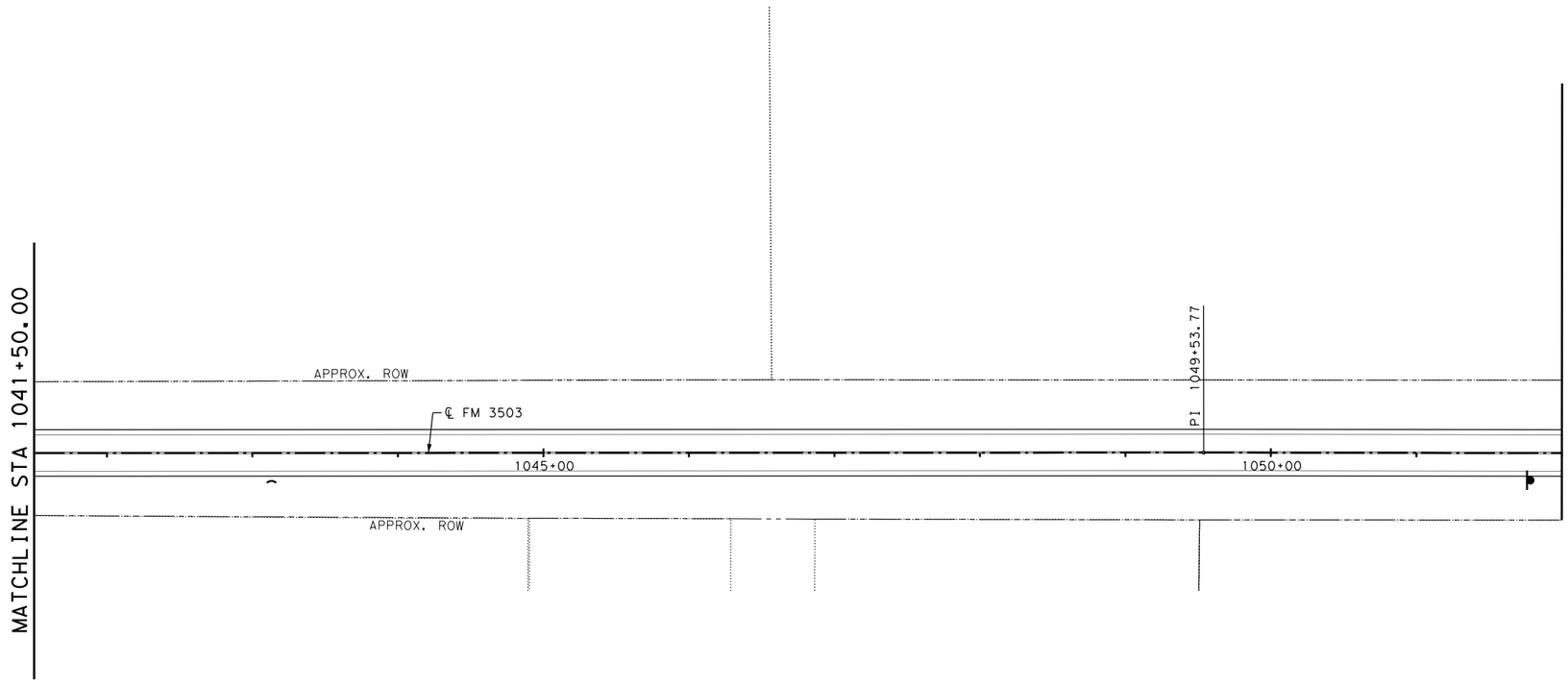
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
7805 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3680

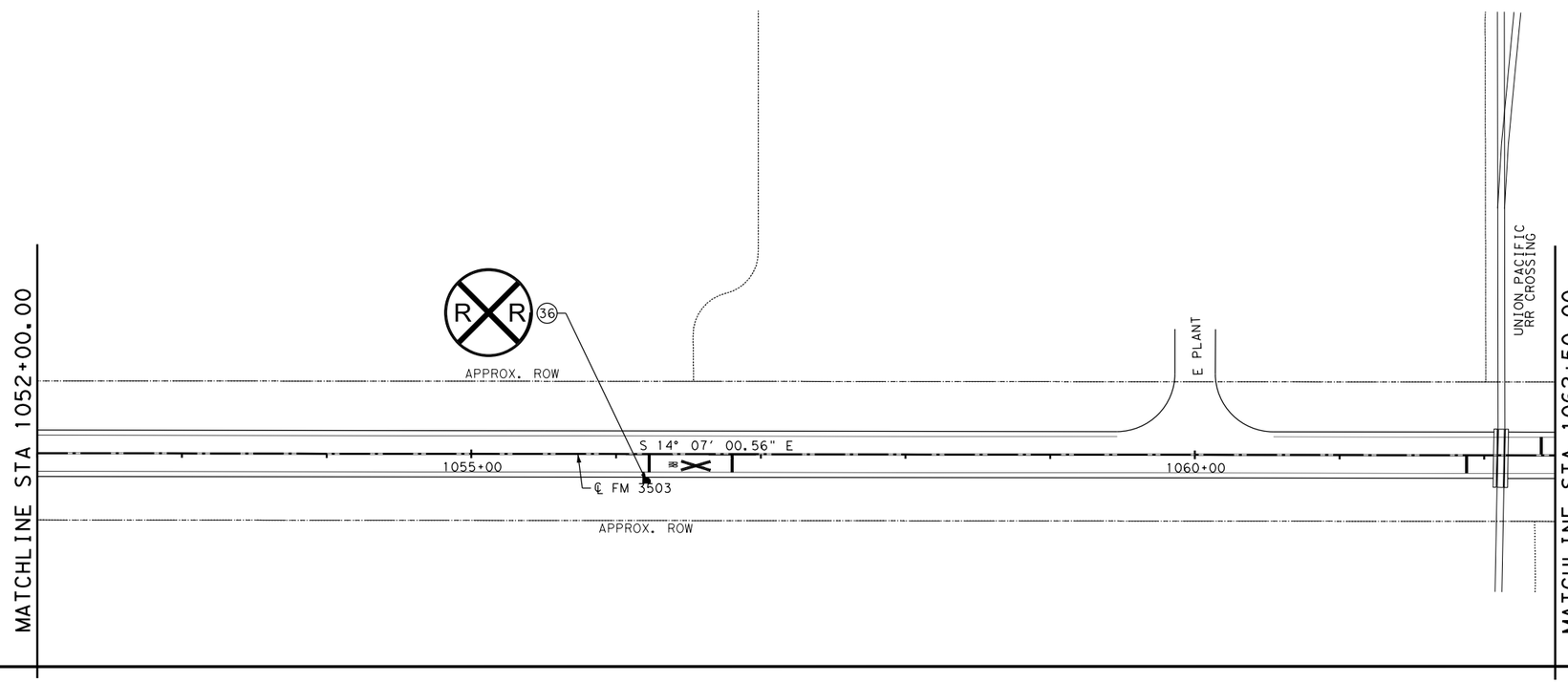
FM 3503
SIGNING

STA 1020+50.00 TO STA 1041+50.00

SHEET 9 OF 14

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	71
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	





0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

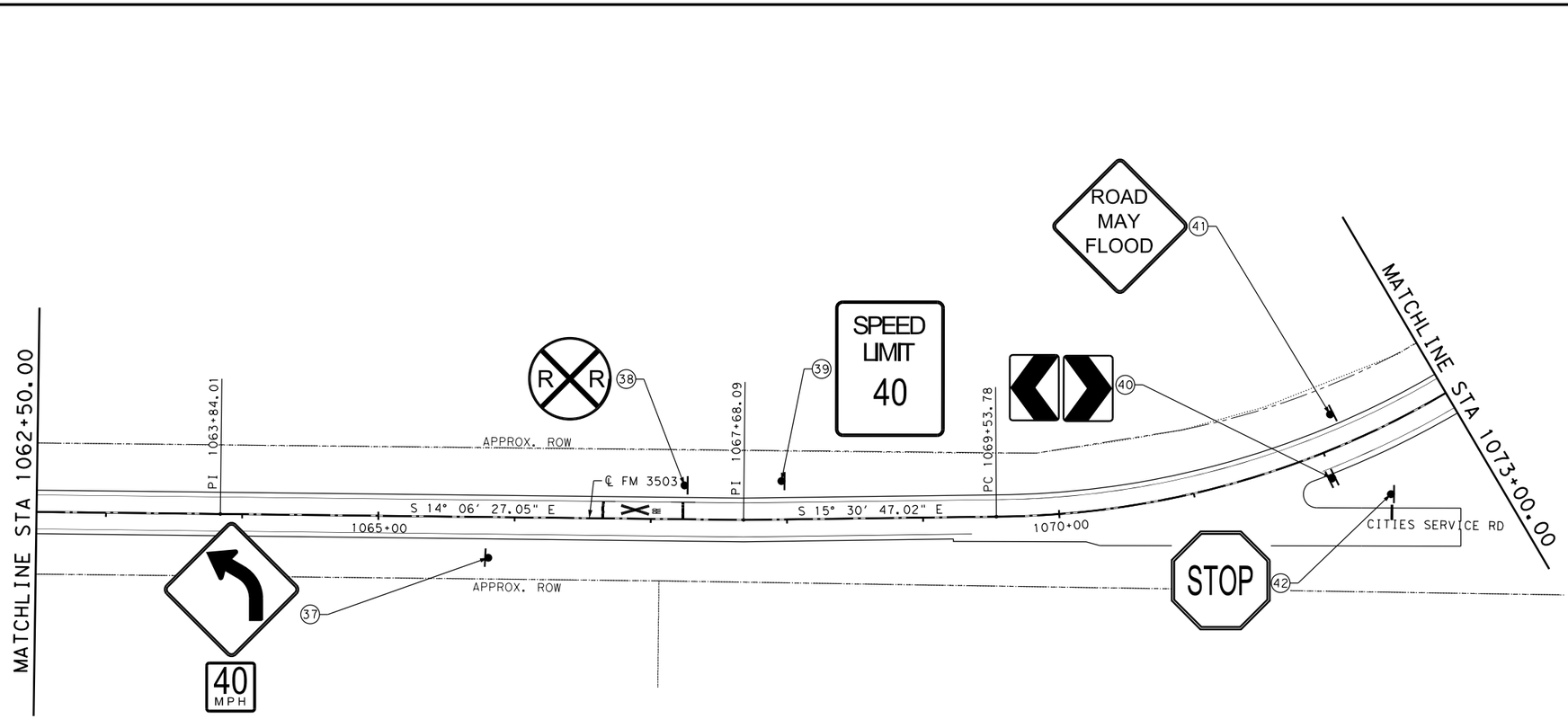
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

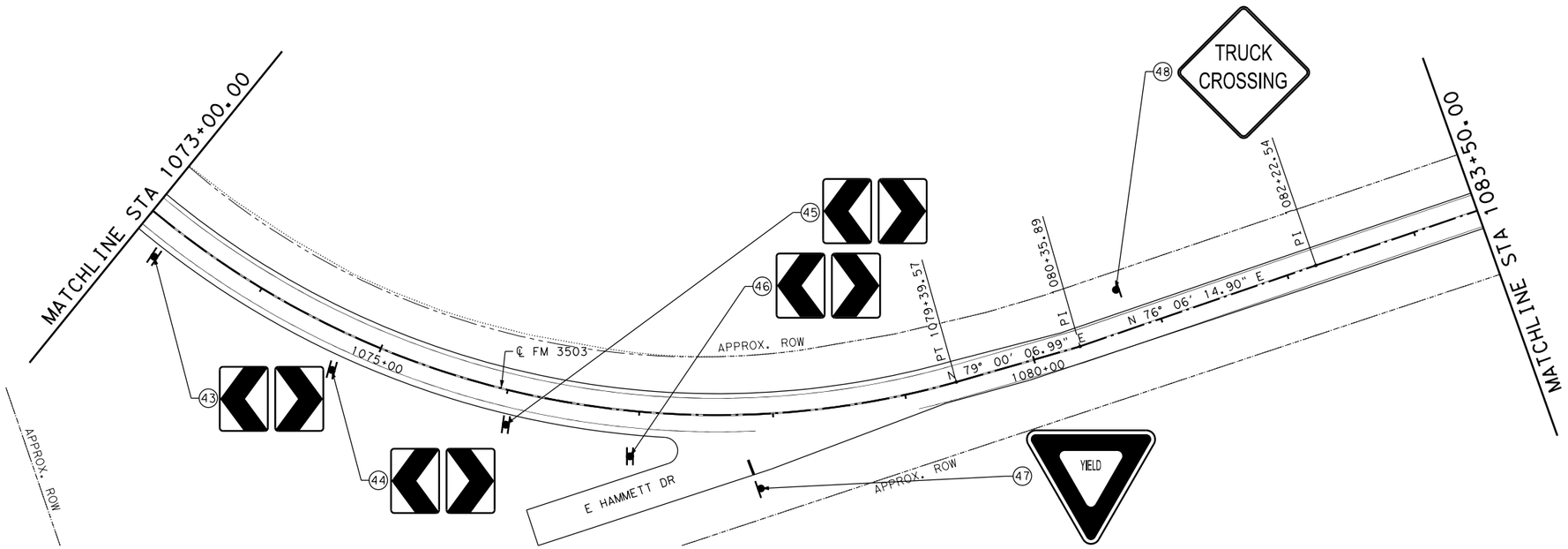
FM 3503 SIGNING

STA 1041+50.00 TO STA 1062+50.00

SHEET 10 OF 14

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	72
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	





0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
03/21/2023

Texas Department of Transportation
©2023

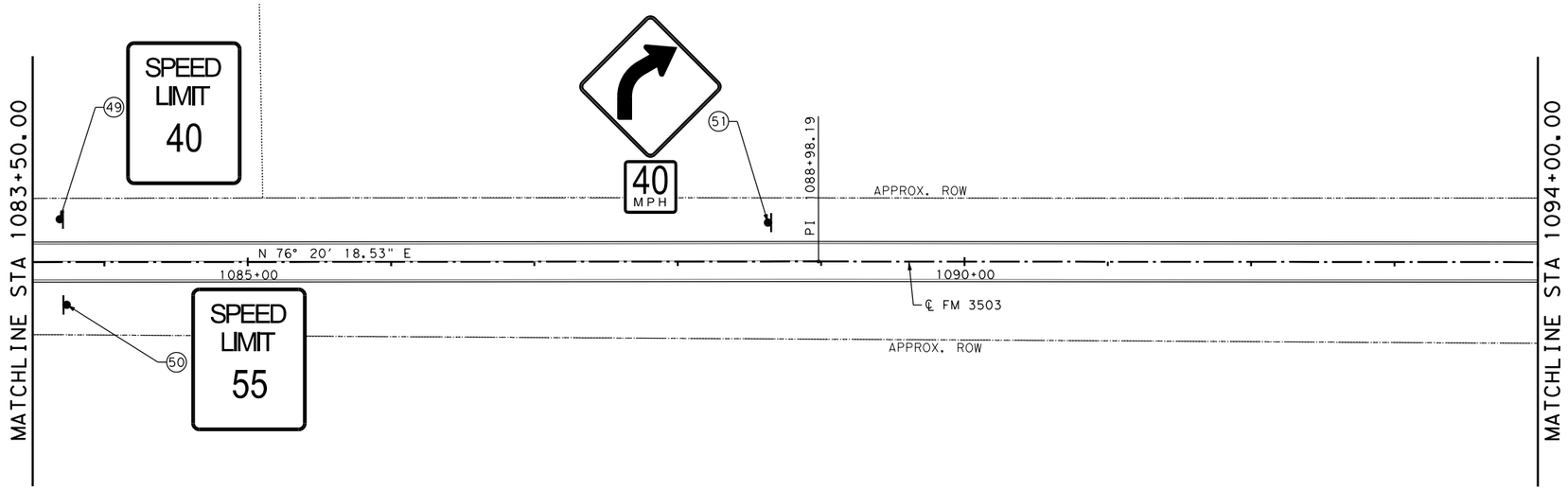
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-13290
2905 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

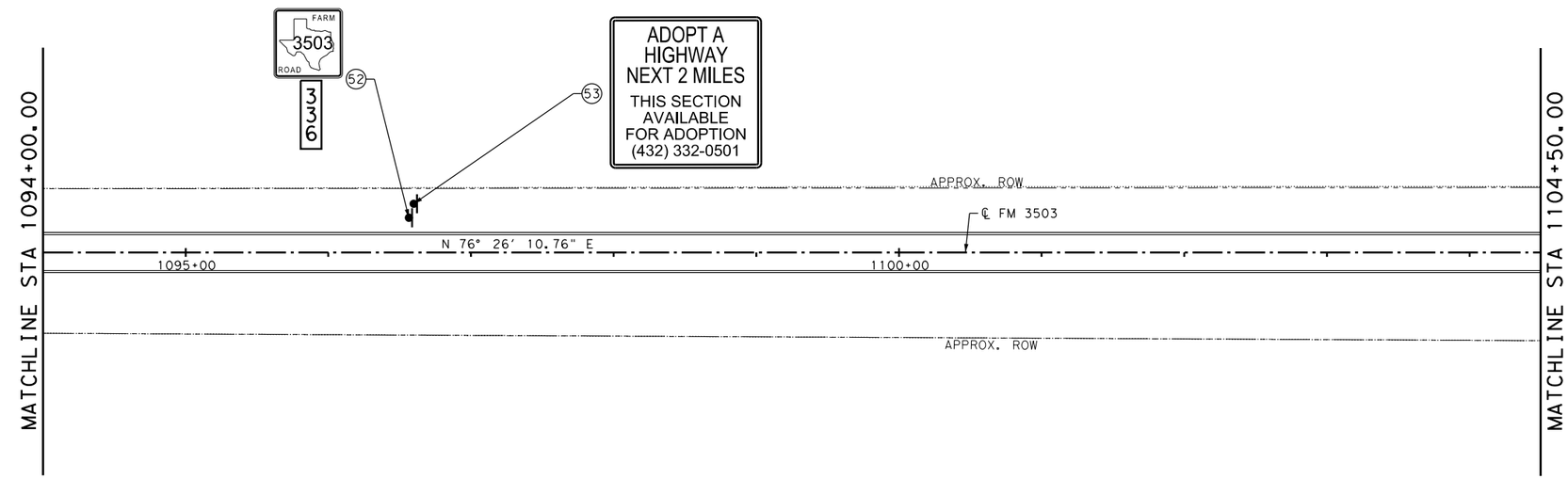
FM 3503
SIGNING

STA 1062+50.00 TO STA 1083+50.00

SHEET 11 OF 14

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	73
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	





0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

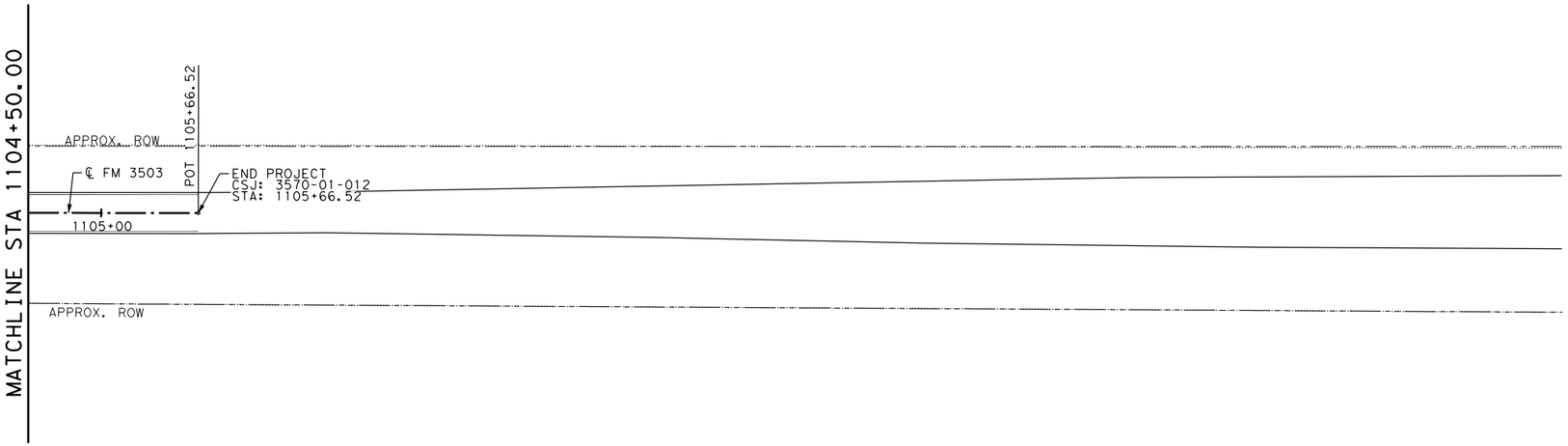
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
SIGNING

STA 1083+50.00 TO STA 1104+50.00

SHEET 12 OF 14

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	74
	CONT.	SECT.	JOB	
	3570	01	012	



0′ 25′ 50′ 100′

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

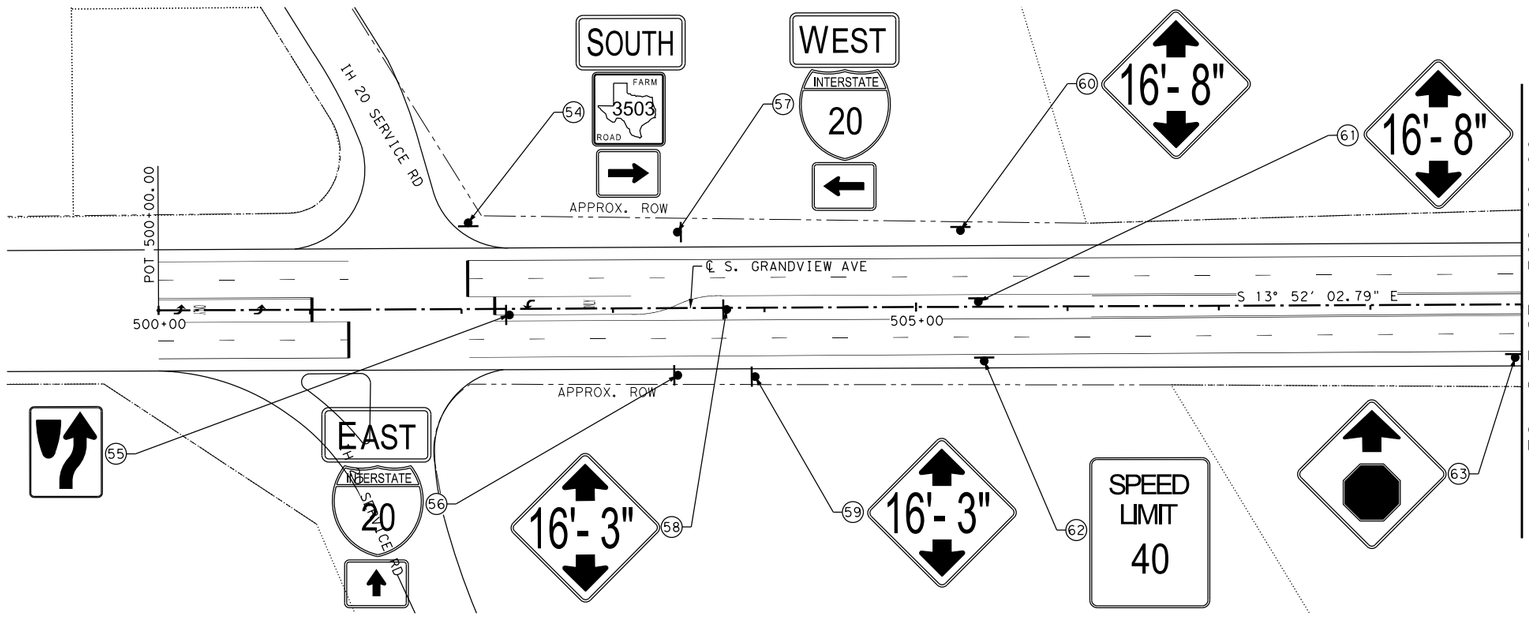
FM 3503
SIGNING

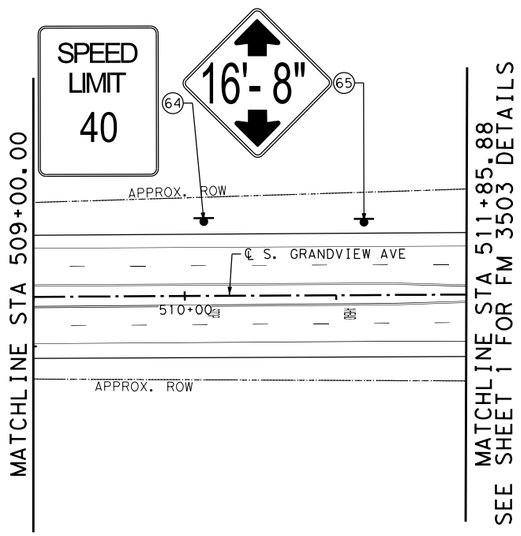
STA 1104+50.00 TO END

SHEET 13 OF 14

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	75
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

DATE:3/21/2023 4:20:16 PM USER:untitled
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Signing & Pavement Markings\FM3503_SPM_13.dgn
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl





0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.1680

SOUTH GRANDVIEW AVE SIGNING

BEGIN TO END

SHEET 14 OF 14

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	76
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX) Post Type: FRP = Fiberglass, TWT = Thin-wall, 10BWG = 10 BWG, S80 = Sched 80	Posts (1 or 2)	Anchor Type: * UA = Univer-Conc, UB = Univer-Bolt, SA = Slip-Conc, SB = Slip-Bolt, WS = Wedge Steel, WP = Wedge Pistic	Mounting Designation: * P = Prefb. "Plain", T = Prefab. "T", U = Prefab. "U"	Mounting Designation: * 1EXT or 2EXT = # of Ext. BM = Extruded Beam, WC = 1.12 #/ft Wing Chan., EXAL = Extruded Alum. Signs	BRIDGE MOUNT CLEARANCE SIGNS: * TY N = Type N, TY S = Type S
1 OF 6												
	1	R1-2	YIELD	36 x 36 x 36	X		10BWG	1	SA	P		
	2	R1-2	YIELD	36 x 36 x 36	X		10BWG	1	SA	P		
	3	M3-2	EAST <AUXILIARY SIGN>	24 x 12	X		10BWG	1	SA	P		
		M1-1 (2 dgt)	INTERSTATE (ROUTE 20)	24 x 24								
		M6-1R	<ARROW - RIGHT LEFT HORIZ. STRGHT> <	21 x 15	X							
	4	M1-6F	<FM SHIELD> FARM ROAD (ROUTE 3503)	24 x 24	X		10BWG	1	SA	P		
		M6-3	<ARROW - VERTICAL STRGHT> <AUX. SIGN>	21 x 15	X							
	5	W3-1	SYMBOL - STOP AHEAD	48 x 48	X		10BWG	1	SA	P		
	6	R1-2	YIELD	36 x 36 x 36	X		10BWG	1	SA	P		
	7	M1-6F	<FM SHIELD> FARM ROAD (ROUTE 3503)	24 x 24	X		10BWG	1	SA	U		
		M6-1L	<ARROW - LEFT HORIZ. STRGHT> < AUX.	21 x 15	X							
		M4-5	TO <AUXILIARY SIGN>	24 x 12	X							
		M3-2	EAST <AUXILIARY SIGN>	24 x 12	X							
		M1-1 (2 dgt)	INTERSTATE (ROUTE 20)	24 x 24	X							
		M6-1R	<ARROW - RIGHT LEFT HORIZ. STRGHT> <	21 x 15	X							
	8	R1-1	STOP	36 x 36	X		10BWG	1	SA	P		
		R1-3P	ALL WAY	18 x 6	X							
	9	R1-1	STOP	36 x 36	X		10BWG	1	SA	P		
		R1-3P	ALL WAY	18 x 6	X							
	10	M1-6F	<FM SHIELD> FARM ROAD (ROUTE 3503)	24 x 24	X		10BWG	1	SA	P		
		M6-1L	<ARROW - LEFT HORIZ. STRGHT> < AUX.	21 x 15	X							
	11	W1-7T	<BI-DIRECTIONAL LRG ARRW w/ CHEVRONS>	96 x 36	X		10BWG	1	SA	T		
	12	M4-5	TO <AUXILIARY SIGN>	24 x 12	X		10BWG	1	SA	P		
		M3-4	WEST AUXILIARY SIGN	24 x 12	X							
		M1-1 (2 dgt)	INTERSTATE (ROUTE 20)	24 x 24	X							
		M6-1R	<ARROW - RIGHT LEFT HORIZ. STRGHT> <	21 x 15	X							
	13	R1-1	STOP	36 x 36	X		10BWG	1	SA	P		
		R1-3P	ALL WAY	18 x 6	X							
	14	R1-2	YIELD	36 x 36 x 36	X		10BWG	1	SA	P		
	15	D14-4T	ADOPT A HWY NEXT (MI) MILES (GROUP NAME)	48 x 48	X		10BWG	1	SA	U		
	16	W10-1	SYMBOL - GRADE XING ADVANCED WARNING	36 diameter	X		10BWG	1	SA	P		
	17	W8-18	ROAD MAY FLOOD	36 x 36	X		10BWG	1	SA	P		
	18	W1-2R	SYMBOL - HORIZ CURVE RIGHT	36 x 36	X		10BWG	1	SA	P		
		W13-1P	(40) MPH <ADVISORY SPEED PLAQUE>	18 x 18	X							
2 OF 6												
	19	W10-1	SYMBOL - GRADE XING ADVANCED WARNING	36 diameter	X		10BWG	1	SA	P		
	20	R1-1	STOP	36 x 36	X		10BWG	1	SA	P		

*- SIGNS TO BE REPLACED. NO ANCHORS TO BE INSTALLED. REPLACE EXISTING MOUNTING HARDWARE AS DIRECTED BY ENGINEER. NO ADDITIONAL PAYMENTS FOR REPLACED MOUNTING HARDWARE.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 660 • Plano, Texas 75093 • 972.488.3880

FM 3503
SUMMARY OF
SMALL SIGNS

SHEET 1 OF 3

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	
APPROVED	CONT.	SECT.	JOB	77
	3570	01	012	

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX) Post Type: FRP = Fiberglass, TWT = Thin-wall, 10BWG = 10 BWG, S80 = Sched 80	Posts (1 or 2)	Anchor Type: * UA = Univer-Conc, UB = Univer-Bolt, SA = Slip-Conc, SB = Slip-Bolt, WS = Wedge Steel, WP = Wedge Pistic	Mounting Designation: * P = Prefb. "Plain", T = Prefab. "T", U = Prefab. "U"	Mounting Designation: * 1EXT or 2EXT = # of Ext. BM = Extruded Beam, WC = 1.12 #/ft Wing Chan., EXAL = Extruded Alum. Signs	BRIDGE MOUNT CLEARANCE SIGNS: * TY N = Type N, TY S = Type S
2 OF 6 CONT.												
	21	M4-5	TO <AUXILIARY SIGN>	24 x 12	X		10BWG	1	SA	P		
		M1-1(2 dgt)	INTERSTATE (ROUTE 20)	24 x 24	X							
		M6-1R	<ARROW - RIGHT LEFT HORIZ. STRGHT> < AUX. SIGN>	21 x 15	X							
	22	R1-2	YIELD	36 x 36 x 36	X		10BWG	1	SA	P		
	23	W1-7	<BI-DIRECTIONAL LARGE ARROW>	48 x 24	X		10BWG	1	SA	P		
		OM1-3	OBJECT MARKER	18 x 18 x 18	X							
	24	M4-5	TO <AUXILIARY SIGN>	24 x 12	X		10BWG	1	SA	P		
		M1-1(2 dgt)	INTERSTATE (ROUTE 20)	24 x 24	X							
		M6-2R	<ARROW - ANGLED UP RIGHT> <AUXILIARY SIGN>	21 x 15	X							
	25	W1-8R	<CHEVRON RIGHT>	18 x 24	X		10BWG	1	SA	P		
		W1-8L	<CHEVRON LEFT>	18 x 24	X							
	26	W1-8R	<CHEVRON RIGHT>	18 x 24	X		10BWG	1	SA	P		
		W1-8L	<CHEVRON LEFT>	18 x 24	X							
	27	W1-8R	<CHEVRON RIGHT>	18 x 24	X		10BWG	1	SA	P		
		W1-8L	<CHEVRON LEFT>	18 x 24	X							
	28	W1-8R	<CHEVRON RIGHT>	18 x 24	X		10BWG	1	SA	P		
		W1-8L	<CHEVRON LEFT>	18 x 24	X							
	29	R1-2	YIELD	36 x 36 x 36	X		10BWG	1	SA	T		
	30	W1-8R	<CHEVRON RIGHT>	18 x 24	X		10BWG	1	SA	P		
		W1-8L	<CHEVRON LEFT>	18 x 24	X							
	31	W11-12T	WATCH FOR EMERGENCY VEHICLES	36 x 36	X		10BWG	1	SA	P		
	32	W1-8R	<CHEVRON RIGHT>	18 x 24	X		10BWG	1	SA	P		
		W1-8L	<CHEVRON LEFT>	18 x 24	X							
	33	W1-8R	<CHEVRON RIGHT>	18 x 24	X		10BWG	1	SA	P		
		W1-8L	<CHEVRON LEFT>	18 x 24	X							
	34	W1-2L	SYMBOL - HORIZ CURVE LEFT	36 x 36	X		10BWG	1	SA	P		
		W13-1P	(40) MPH <ADVISORY SPEED PLAQUE>	18 x 18	X							
	35	R2-1	SPEED LIMIT (40)	30 x 36	X		10BWG	1	SA	P		
3 OF 6												
	36	W10-1	SYMBOL - GRADE XING ADVANCED WARNING	36 diameter	X		10BWG	1	SA	P		
4 OF 6												
	37	W1-2L	SYMBOL - HORIZ CURVE LEFT	36 x 36	X		10BWG	1	SA	P		
		W13-1P	(40) MPH <ADVISORY SPEED PLAQUE>	18 x 18	X							
	38	W10-1	SYMBOL - GRADE XING ADVANCED WARNING	36 diameter	X		10BWG	1	SA	P		
	39	R2-1	SPEED LIMIT (40)	30 x 36	X		10BWG	1	SA	P		

*- SIGNS TO BE REPLACED. NO ANCHORS TO BE INSTALLED. REPLACE EXISTING MOUNTING HARDWARE AS DIRECTED BY ENGINEER. NO ADDITIONAL PAYMENTS FOR REPLACED MOUNTING HARDWARE.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

FM 3503
SUMMARY OF
SMALL SIGNS

SHEET 2 OF 3

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	
APPROVED	CONT.	SECT.	JOB	78
	3570	01	012	

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX) Post Type: FRP = Fiberglass, TWT = Thin-wall 10BWG = 10 BWG, S80 = Sched 80	Posts (1 or 2)	Anchor Type: * UA = Univer-Conc, UB = Univer-Bolt, SA = Slip-Conc, SB = Slip-Bolt, WS = Wedge Steel, WP = Wedge Pistic	Mounting Designation: * P = Prefb. "Plain", T = Prefab. "T", U = Prefab. "U"	* 1EXT or 2EXT = # of Ext. BM = Extruded Beam, WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	BRIDGE MOUNT CLEARANCE SIGNS: * TY N = Type N, TY S = Type S
4 OF 6 CONT.												
	40	W1-8L	<CHEVRON LEFT>	18 x 24	X		10BWG	1	SA	P		
		W1-8R	<CHEVRON RIGHT>	18 x 24	X							
	41	W8-18	ROAD MAY FLOOD	36 x 36	X		10BWG	1	SA	P		
	42	R1-1	STOP	36 x 36	X		10BWG	1	SA	P		
	43	W1-8L	<CHEVRON LEFT>	18 x 24	X		10BWG	1	SA	P		
		W1-8R	<CHEVRON RIGHT>	18 x 24	X							
	44	W1-8L	<CHEVRON LEFT>	18 x 24	X		10BWG	1	SA	P		
		W1-8R	<CHEVRON RIGHT>	18 x 24	X							
	45	W1-8L	<CHEVRON LEFT>	18 x 24	X		10BWG	1	SA	P		
		W1-8R	<CHEVRON RIGHT>	18 x 24	X							
	46	W1-8L	<CHEVRON LEFT>	18 x 24	X		10BWG	1	SA	P		
		W1-8R	<CHEVRON RIGHT>	18 x 24	X							
	47	R1-2	YIELD	36 x 36 x 36	X		10BWG	1	SA	P		
	48	W8-6	TRUCK CROSSING	36 x 36	X		10BWG	1	SA	T		
5 OF 6												
	49	R2-1	SPEED LIMIT (40)	30 x 36	X		10BWG	1	SA	P		
	50	R2-1	SPEED LIMIT (55)	30 x 36	X		10BWG	1	SA	P		
	51	W1-2R	SYMBOL - HORIZ CURVE RIGHT	36 x 36	X		10BWG	1	SA	P		
		W13-1P	(SPEED) MPH <ADVISORY SPEED PLAQUE>	18 x 18	X							
	52	M1-6F	<FM SHIELD> FARM ROAD (ROUTE 3503)	24 x 24	X		10BWG	1	SA	P		
		D10-7aT	331	3 x 10	X							
	53	D14-4T	ADOPT A HWY NEXT (MI) MILES (GROUP NAME)	48 x 48	X		10BWG	1	SA	U		
6 OF 6												
S. GRANDVIEW												
	54	M3-3	SOUTH <AUXILIARY SIGN>	24 x 12	X		10BWG	1	SA	P		
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE 3503)	24 x 24	X							
		M6-1L	<ARROW - LEFT HORIZ. STRGHT> < AUX. SIGN>	21 x 15	X							
	55	R4-7	<SYMBOL - KEEP RIGHT OF FEATURE>	24 x 30	X		10BWG	1		P		
	56	M3-2	EAST <AUXILIARY SIGN>	24 x 12	X		10BWG	1	SA	P		
		M1-1(2 dgt)	INTERSTATE (ROUTE 20)	24 x 24	X							
		M6-3	<ARROW - VERTICAL STRGHT> <AUX. SIGN>	21 x 15	X							
	57	M3-4	WEST AUXILIARY SIGN	24 x 12	X		10BWG	1	SA	P		
		M1-1(2 dgt)	INTERSTATE (ROUTE 20)	24 x 24	X							
		M6-1L	<ARROW - LEFT HORIZ. STRGHT> < AUX. SIGN>	21 x 15	X							
	58	W12-2	SYMBOL - LOW CLEARANCE (16)-(3)	36 x 36	X		10BWG	1	SA	T		
	59	W12-2	SYMBOL - LOW CLEARANCE (16)-(3)	36 x 36	X		10BWG	1	SA	T		
	60	W12-2	SYMBOL - LOW CLEARANCE (16)-(8)	36 x 36	X		10BWG	1	SA	T		
	61	W12-2	SYMBOL - LOW CLEARANCE (16)-(8)	36 x 36	X		10BWG	1	SA	T		
	62	R2-1	SPEED LIMIT (40)	30 x 36	X		10BWG	1	SA	P		
	63	W3-1	SYMBOL - STOP AHEAD	30 x 30	X		10BWG	1	SA	P		
	64	R2-1	SPEED LIMIT (40)	30 x 36	X		10BWG	1	SA	P		
	65	W12-2	SYMBOL - LOW CLEARANCE (16)-(8)	36 x 36	X		10BWG	1	SA	P		

*- SIGNS TO BE REPLACED. NO ANCHORS TO BE INSTALLED. REPLACE EXISTING MOUNTING HARDWARE AS DIRECTED BY ENGINEER. NO ADDITIONAL PAYMENTS FOR REPLACED MOUNTING HARDWARE.

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

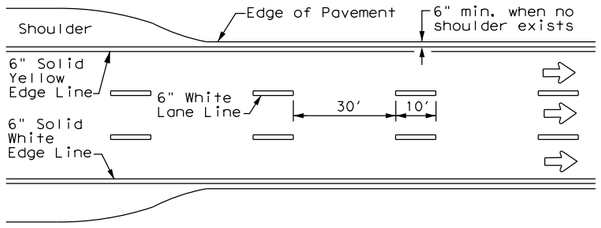
Texas Department of Transportation

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

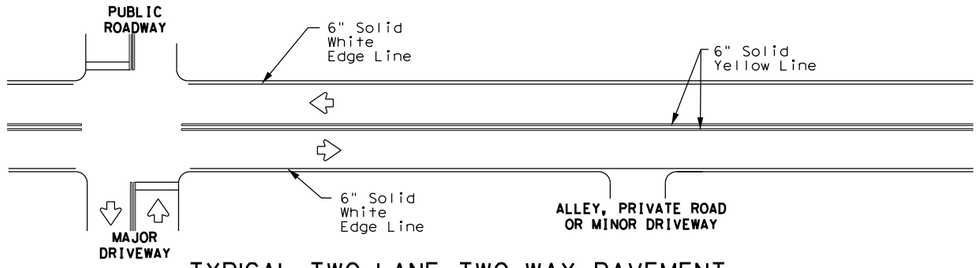
FM 3503
SUMMARY OF
SMALL SIGNS

SHEET 3 OF 3

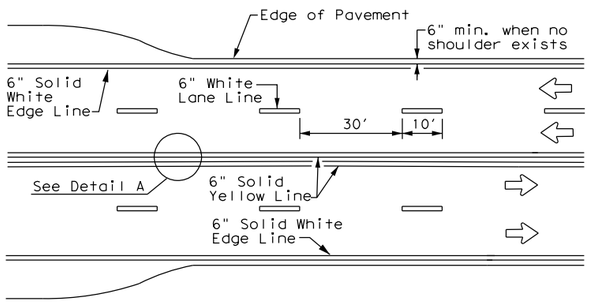
DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	79
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

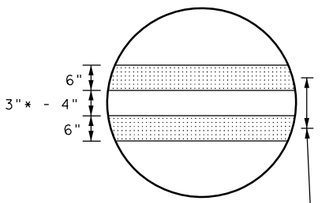


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS





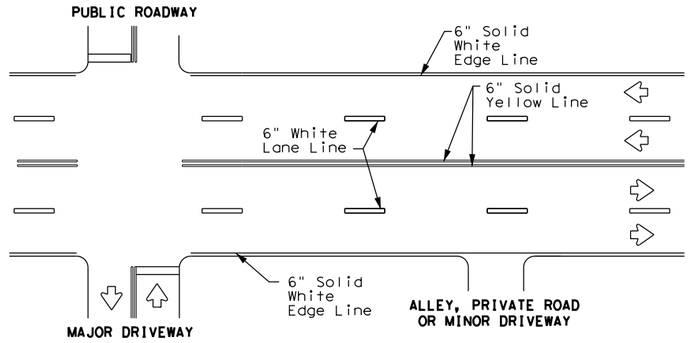
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

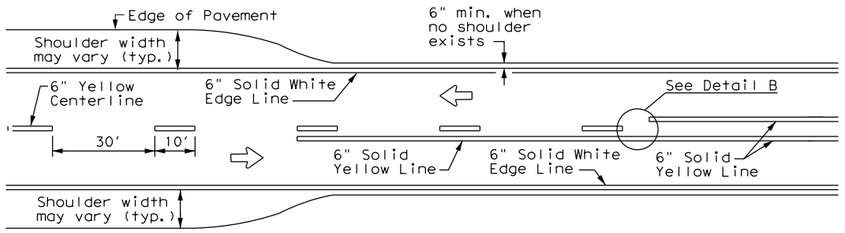
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

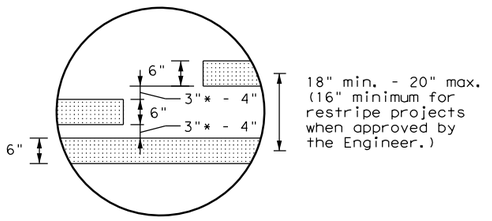
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

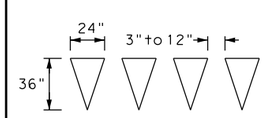


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



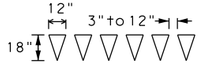
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.

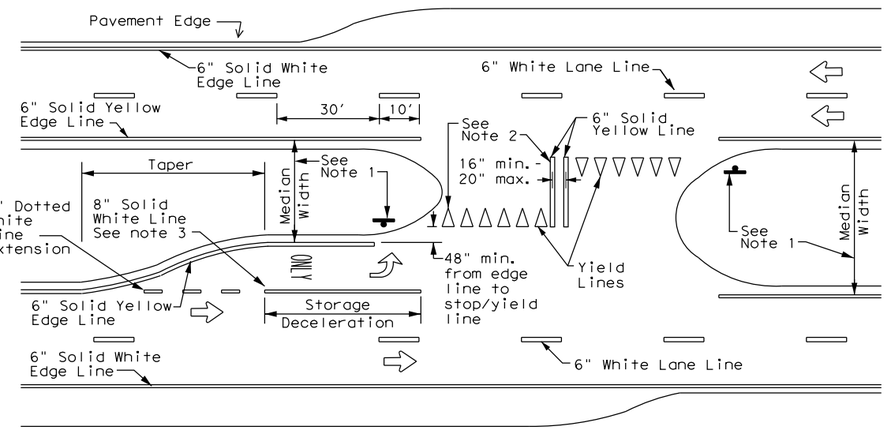


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



For posted speed on road being marked equal to or less than 40 MPH.



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

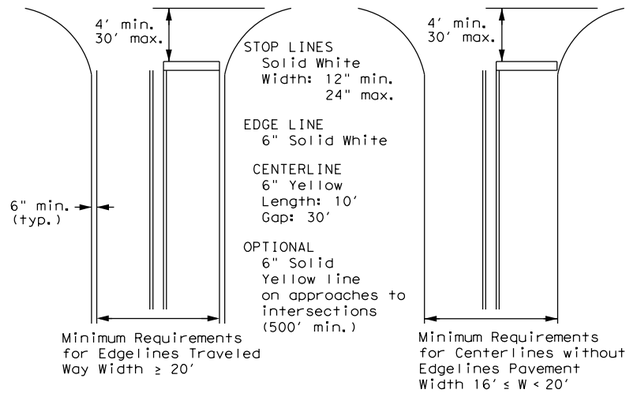
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

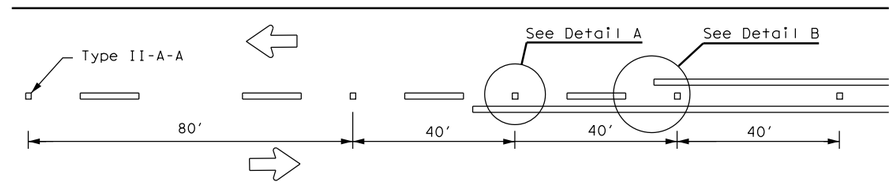
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	ODA	ECTOR		80
5-00 2-12				

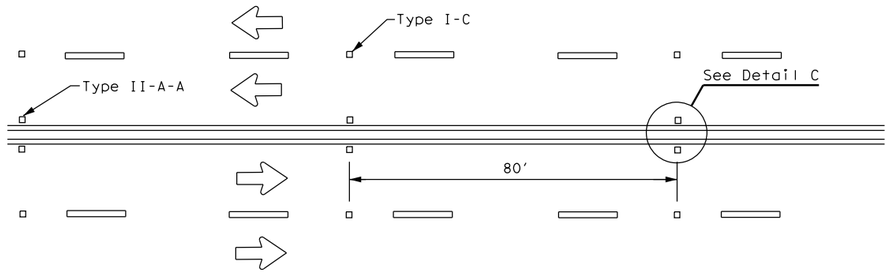
22A

DATE: 3/21/2023 4:20:30 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms29064\pm1-22.dgn

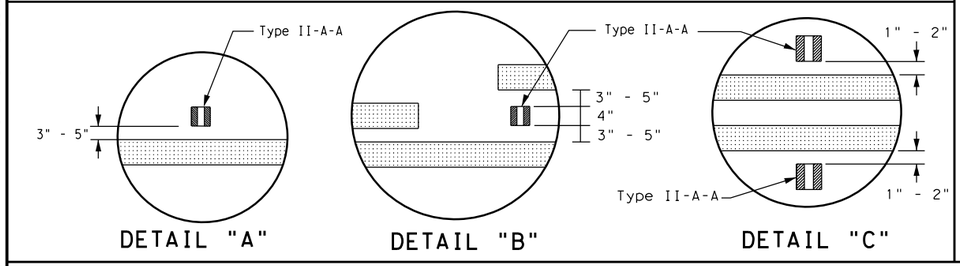
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

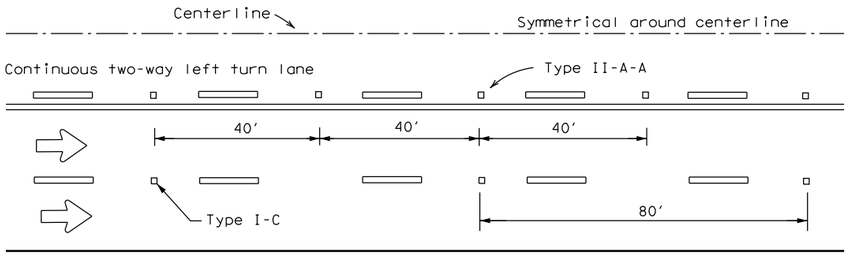


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

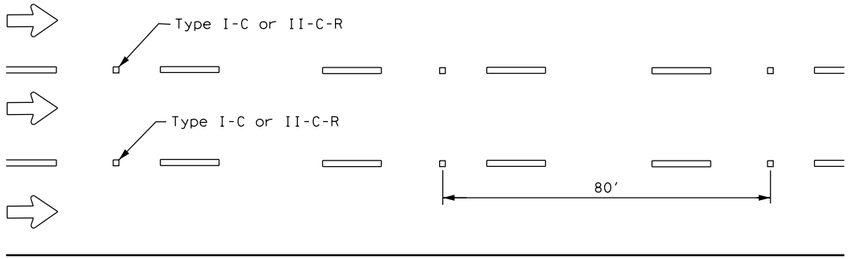


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



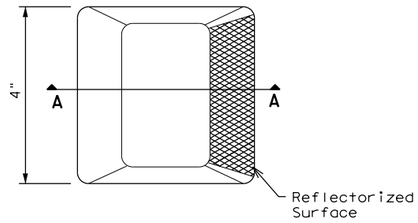
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

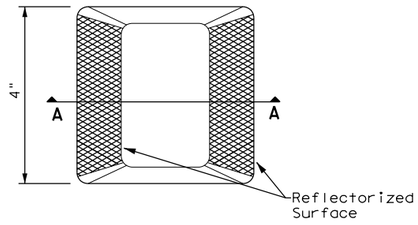
See Note 3.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

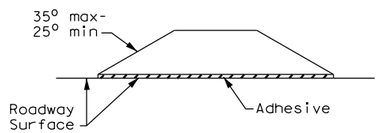
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

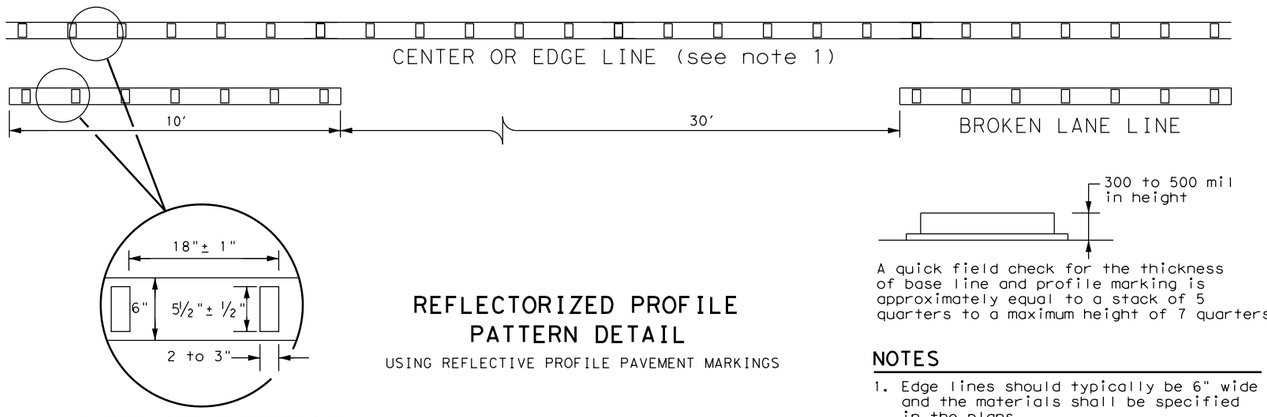


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

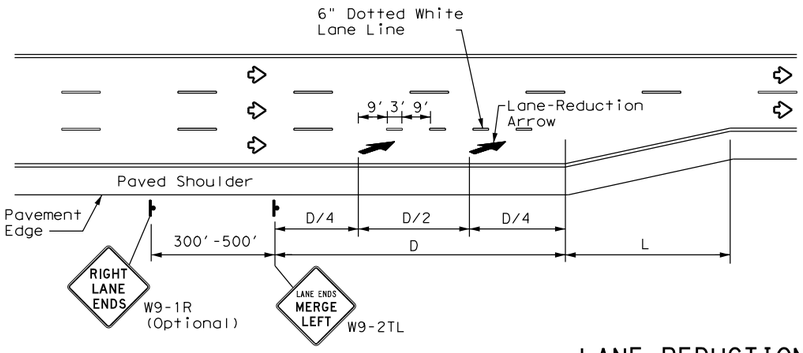
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	ODA	ECTOR		81
5-00 2-12				

22B

DATE: 3/21/2023 4:20:31 PM
FILE: c:\dms\pwe101-01\bradley.kreceman\dms29064\pm2-22.dgn



LANE REDUCTION

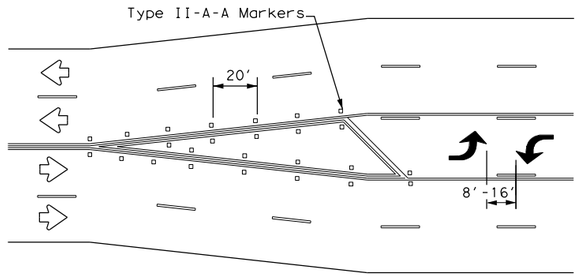
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

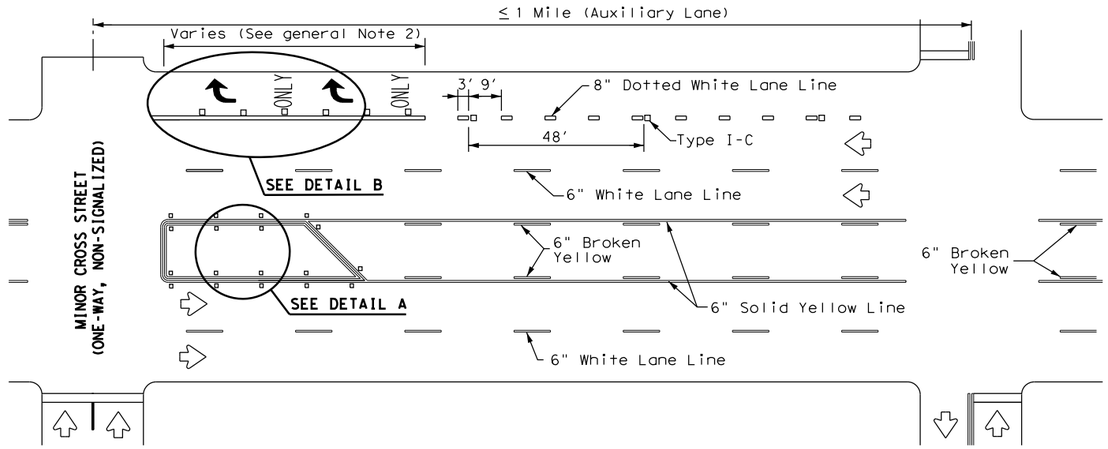


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

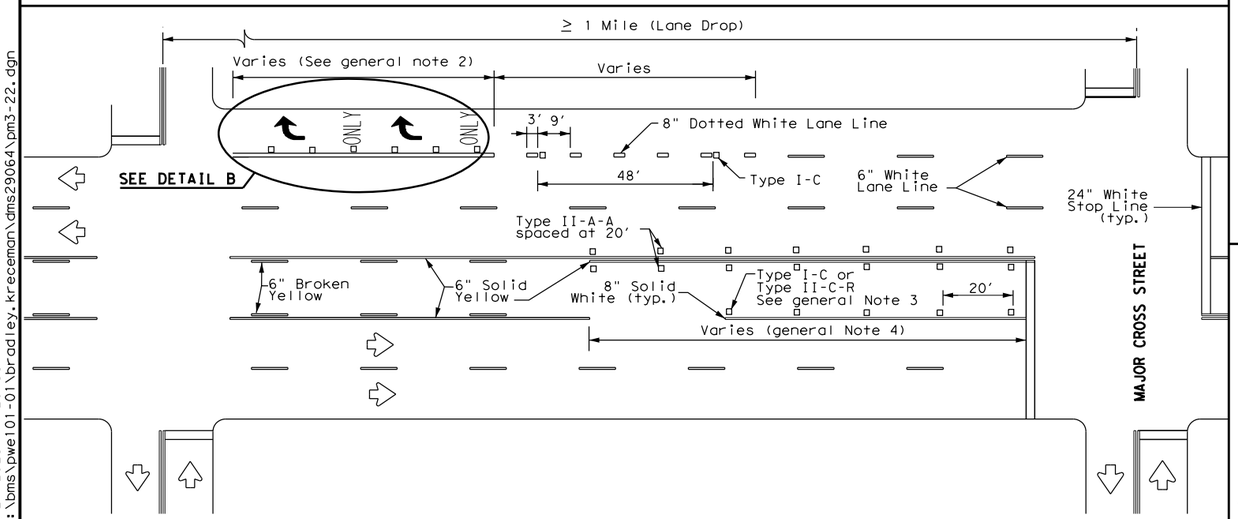
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

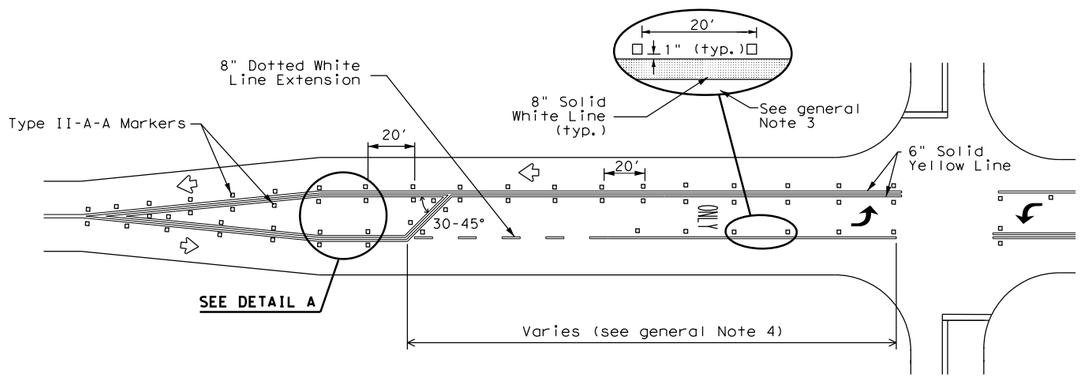
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



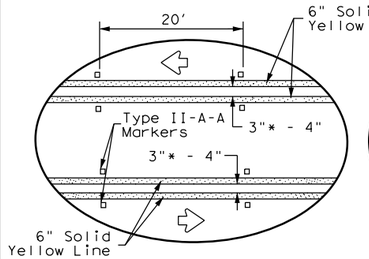
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



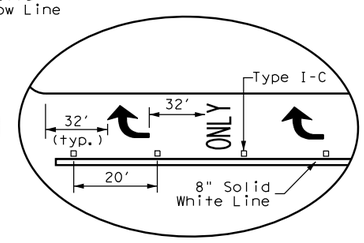
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

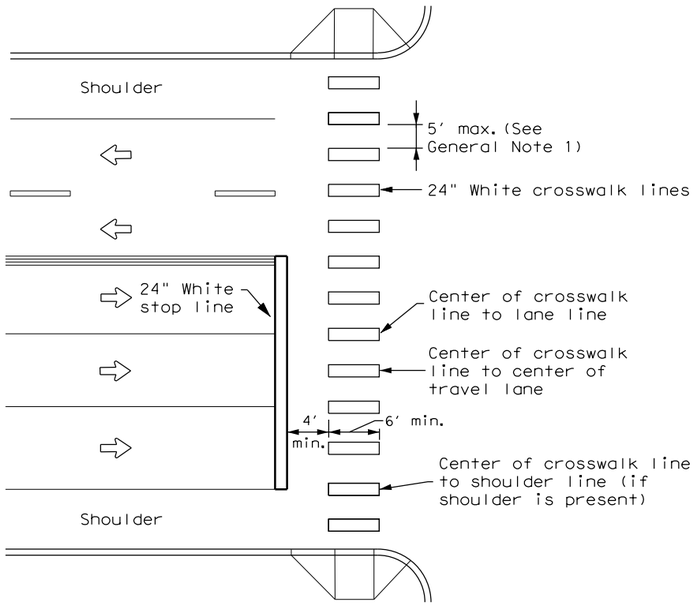
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		82

22C

DATE: 3/21/2023 4:20:33 PM
FILE: c:\bms\pwe101-01\bradley.kreeman\dms29064\pm3-22.dgn



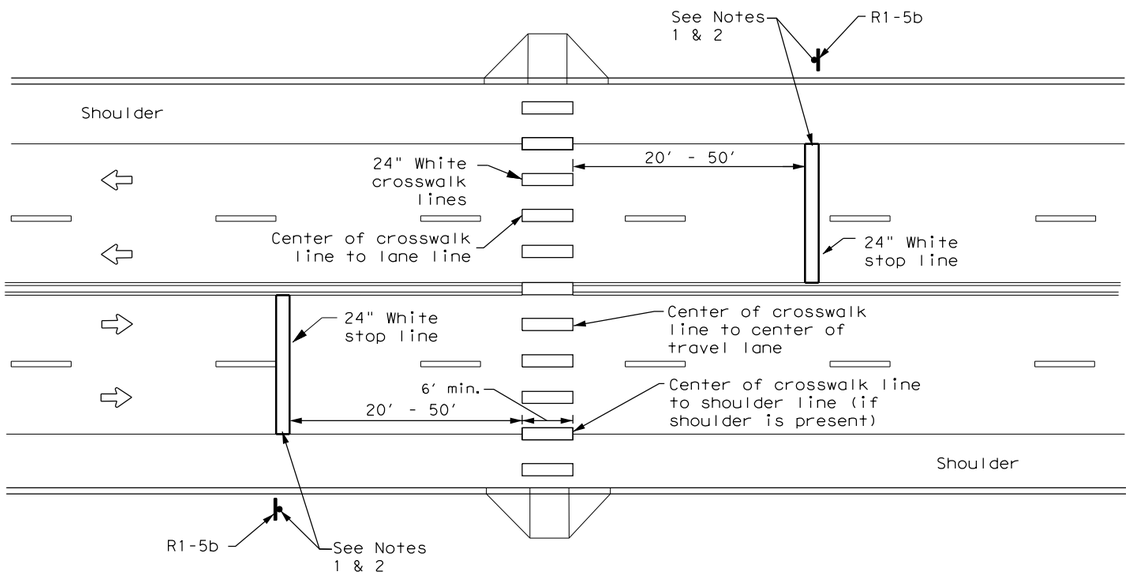
HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY
LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

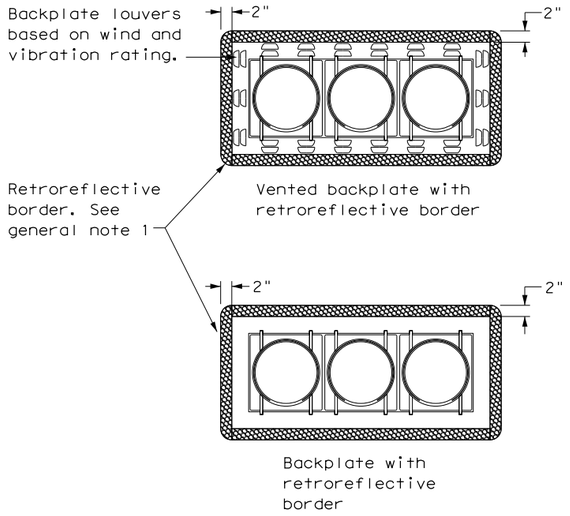
CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

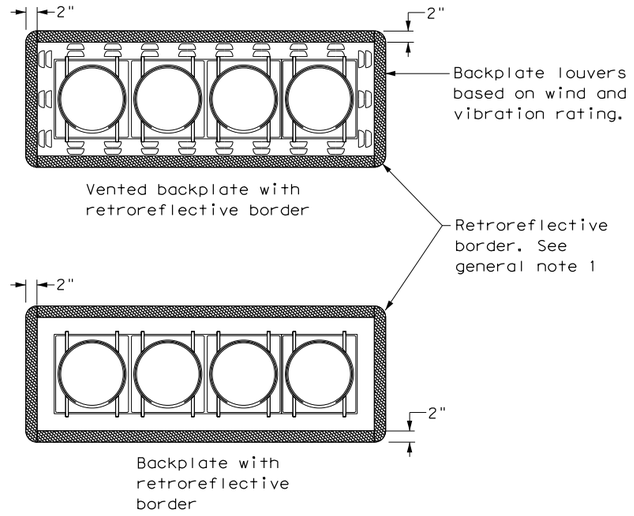
FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
6-20	DIST	COUNTY		SHEET NO.
6-22	ODA	ECTOR		83
12-22				
220				

DATE: 3/21/2023 4:20:35 PM
FILE: c:\bms\pwe\101-01\bradley.kreceman\dms29064\pm4a-22.dgn

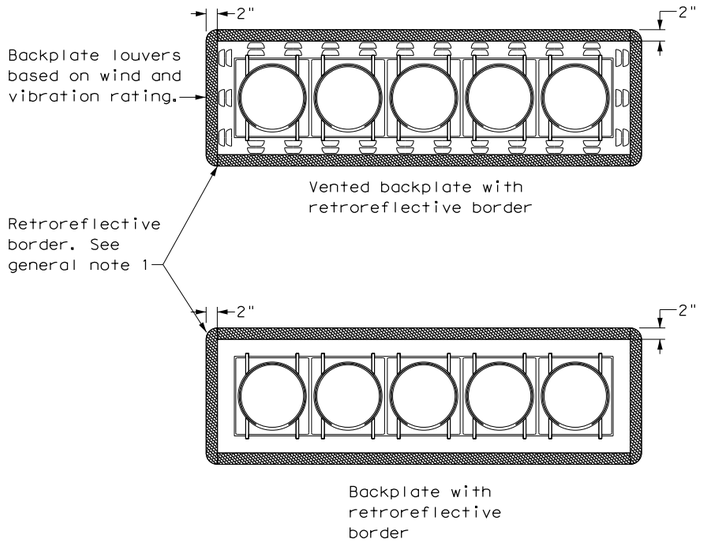
DATE: 3/21/2023 4:20:38 PM
FILE: c:\dms\pwe101-01\bradley.krecemen\dms28986\ts-bp-20.dgn



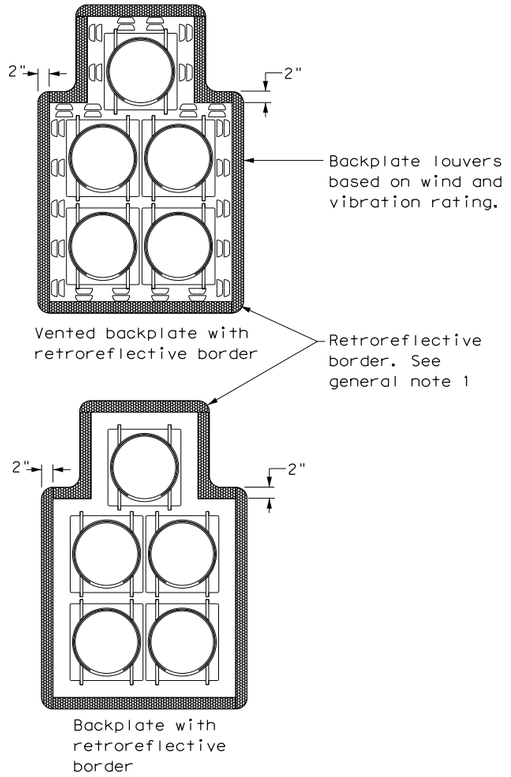
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



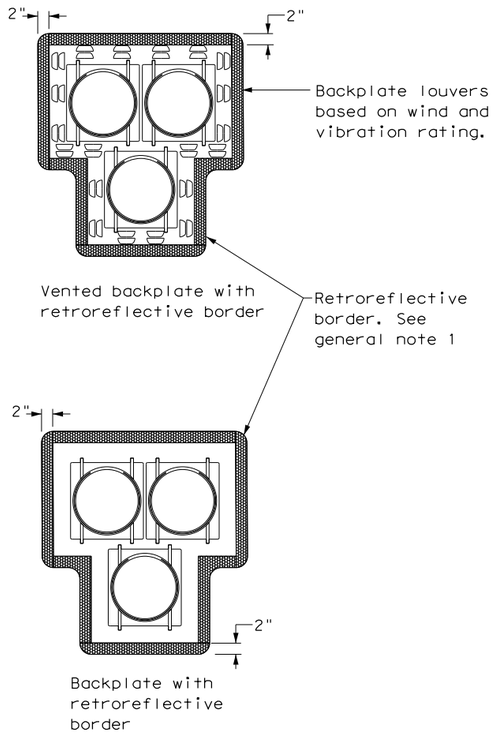
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		84

DATE: 3/21/2023
FILE: c:\bms\pwe101-01\bradley.krecemar\dms28612\FM3503_EPIC_NEW.dgn

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. City of Odessa

☐ 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

☒ No Action Required ☐ Required Action

Action No.

1. 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.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.
2.
3.
4.

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

☒ No Action Required ☐ Required Action

Action No.

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.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

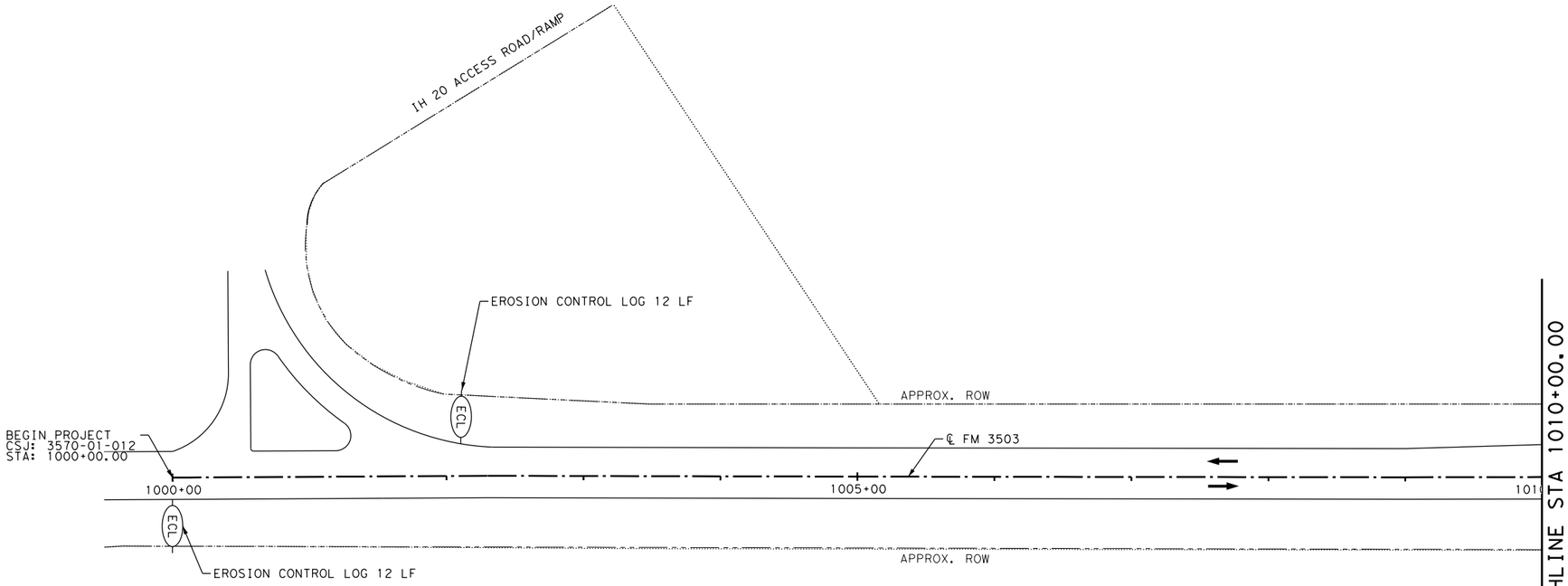
Action No.

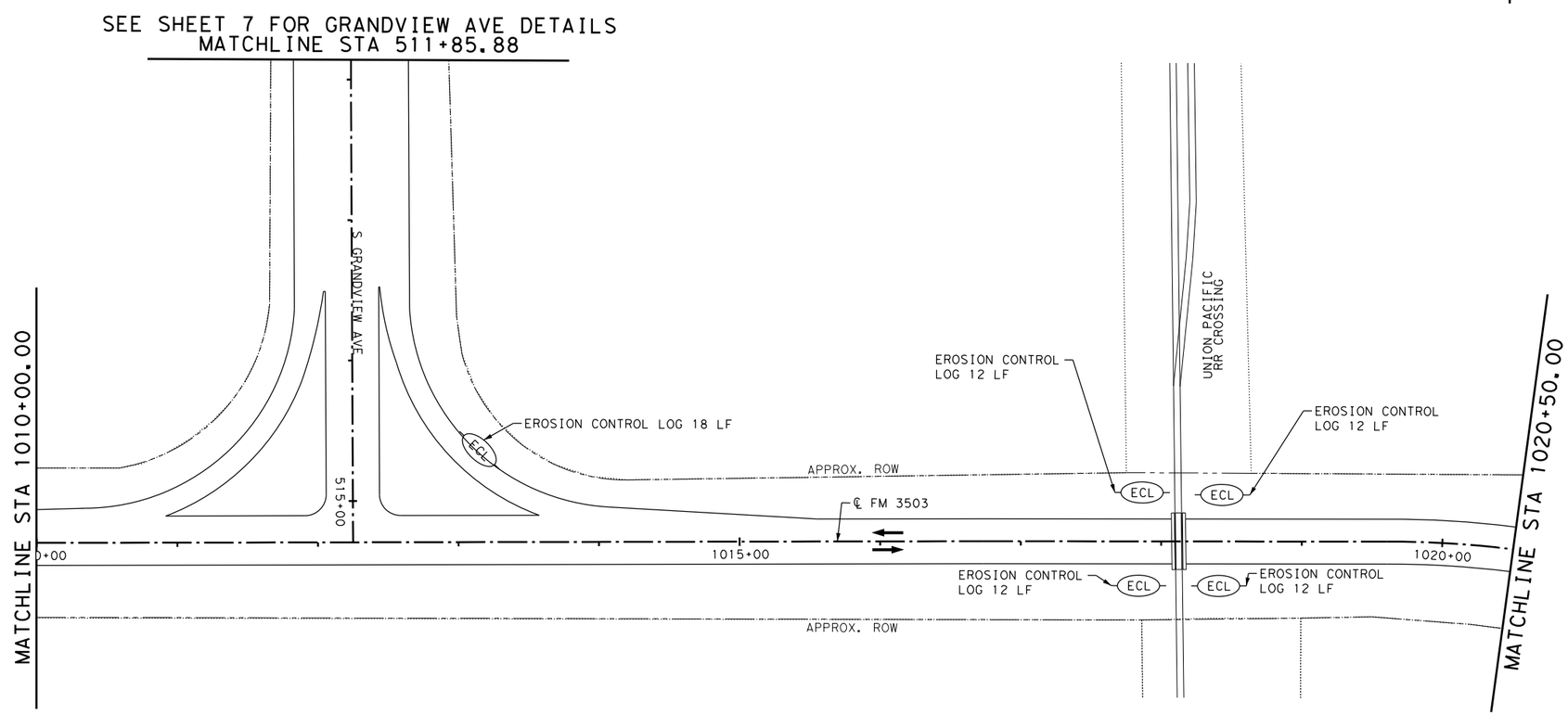
Texas Department of Transportation — Design Division Standard

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	3570	01	012	FM 3503	
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.	
05-07-14 ADDED NOTE SECTION IV.	ODA	ECTOR		85	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.					





LEGEND:

ECL — EROSION CONTROL LOG

0′ 25′ 50′ 100′

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

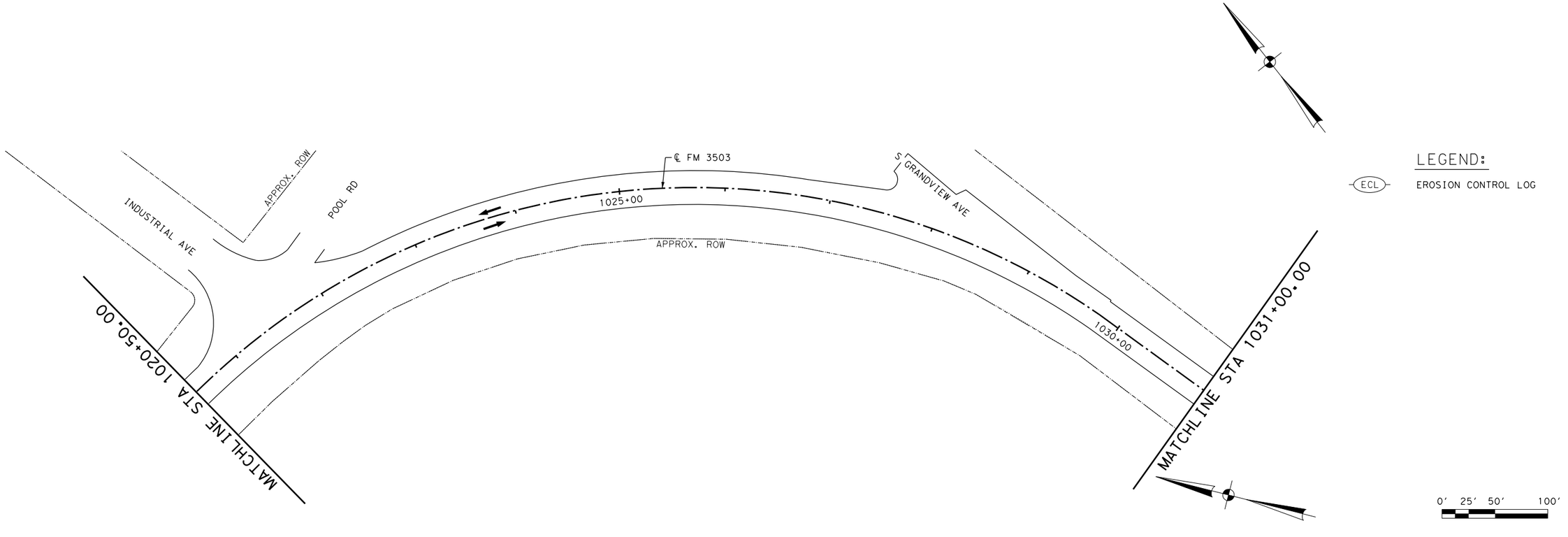
Texas Department of Transportation
©2023

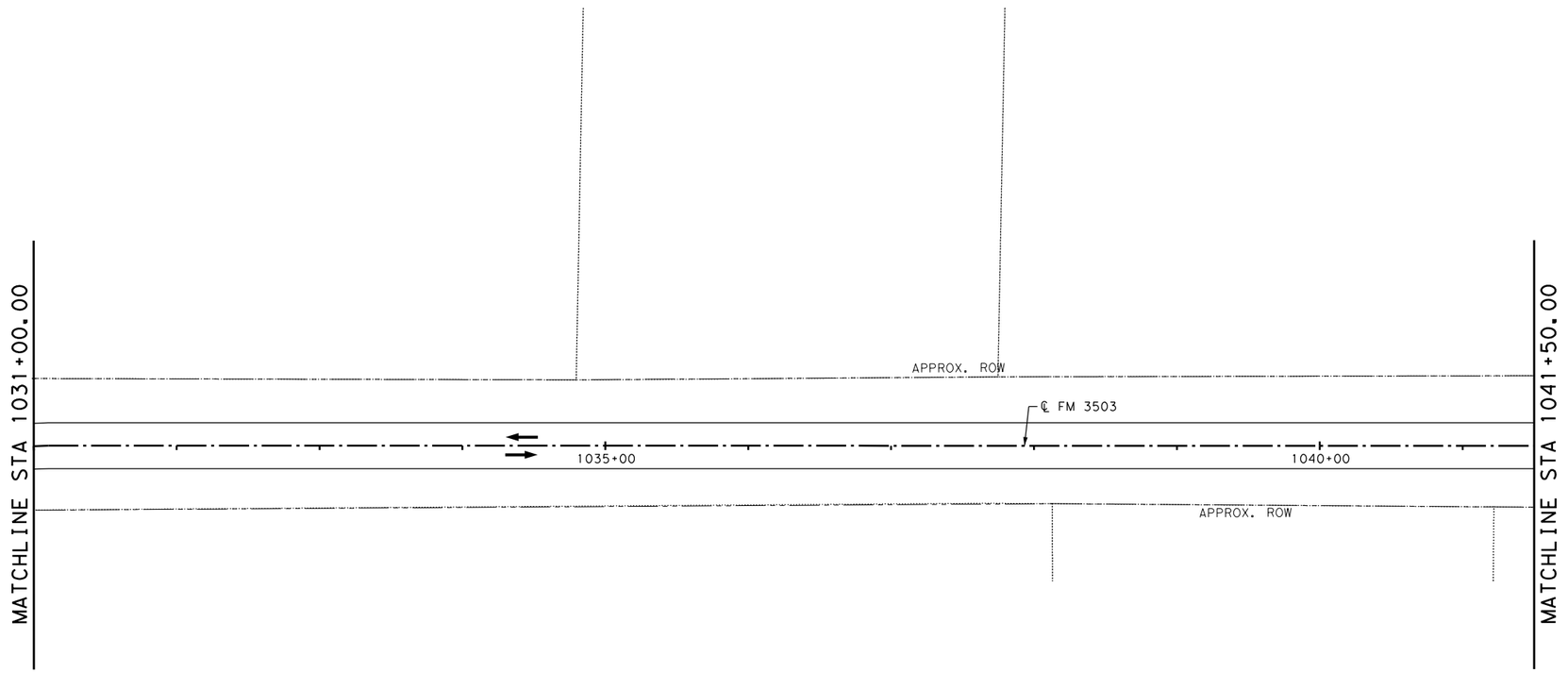
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
STORM WATER POLLUTION PREVENTION PLAN
BEGIN TO STA 1020+50.00

SHEET 1 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	86
	CONT.	SECT.	JOB	
	3570	01	012	





NO.	DATE	REVISION	APPROVED

DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

03/21/2023

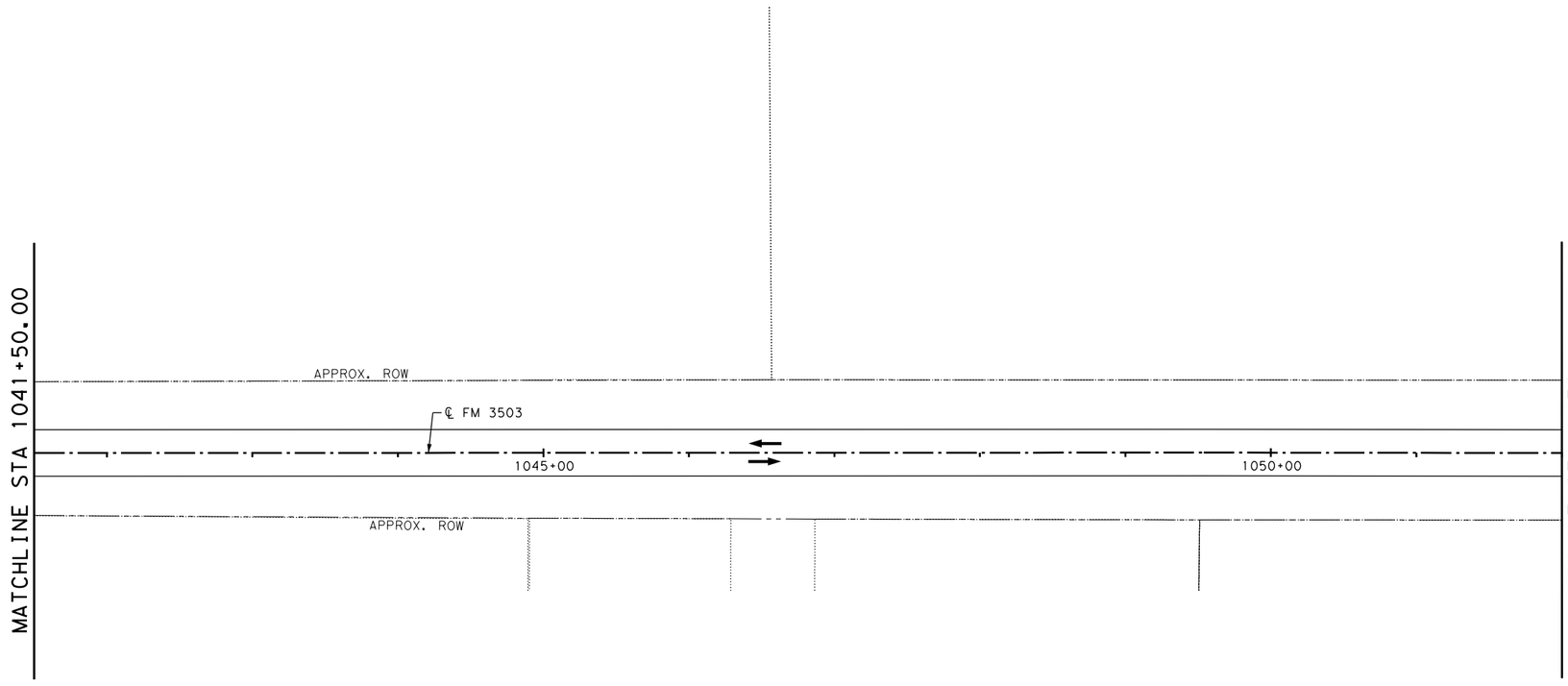
Texas Department of Transportation
©2023

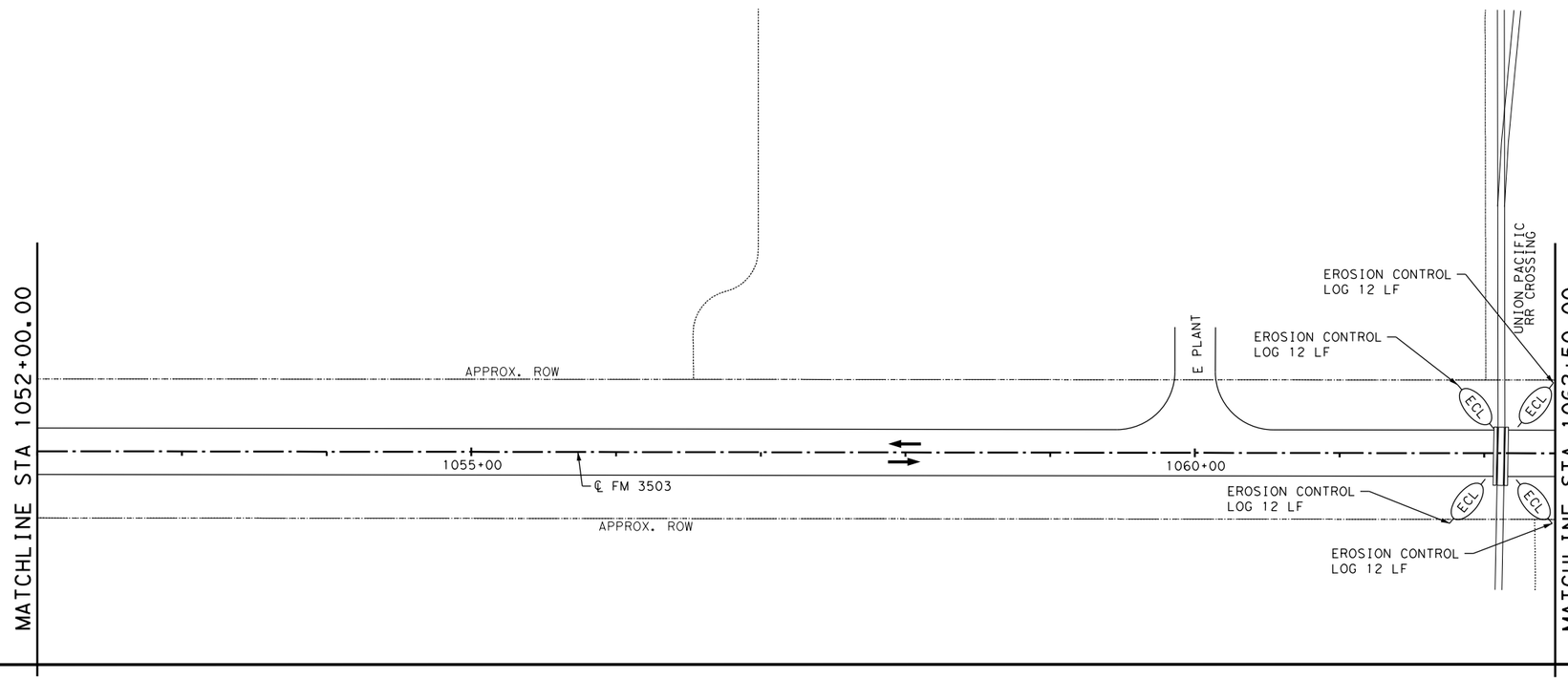
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
7805 Dallas Parkway, Suite 500 • Plano, Texas 75024 • 972.488.3680

FM 3503
STORM WATER POLLUTION PREVENTION PLAN
STA 1020+50.00 TO STA 1041+50.00

SHEET 2 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	87
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	





LEGEND:

ECL — EROSION CONTROL LOG

0′ 25′ 50′ 100′

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

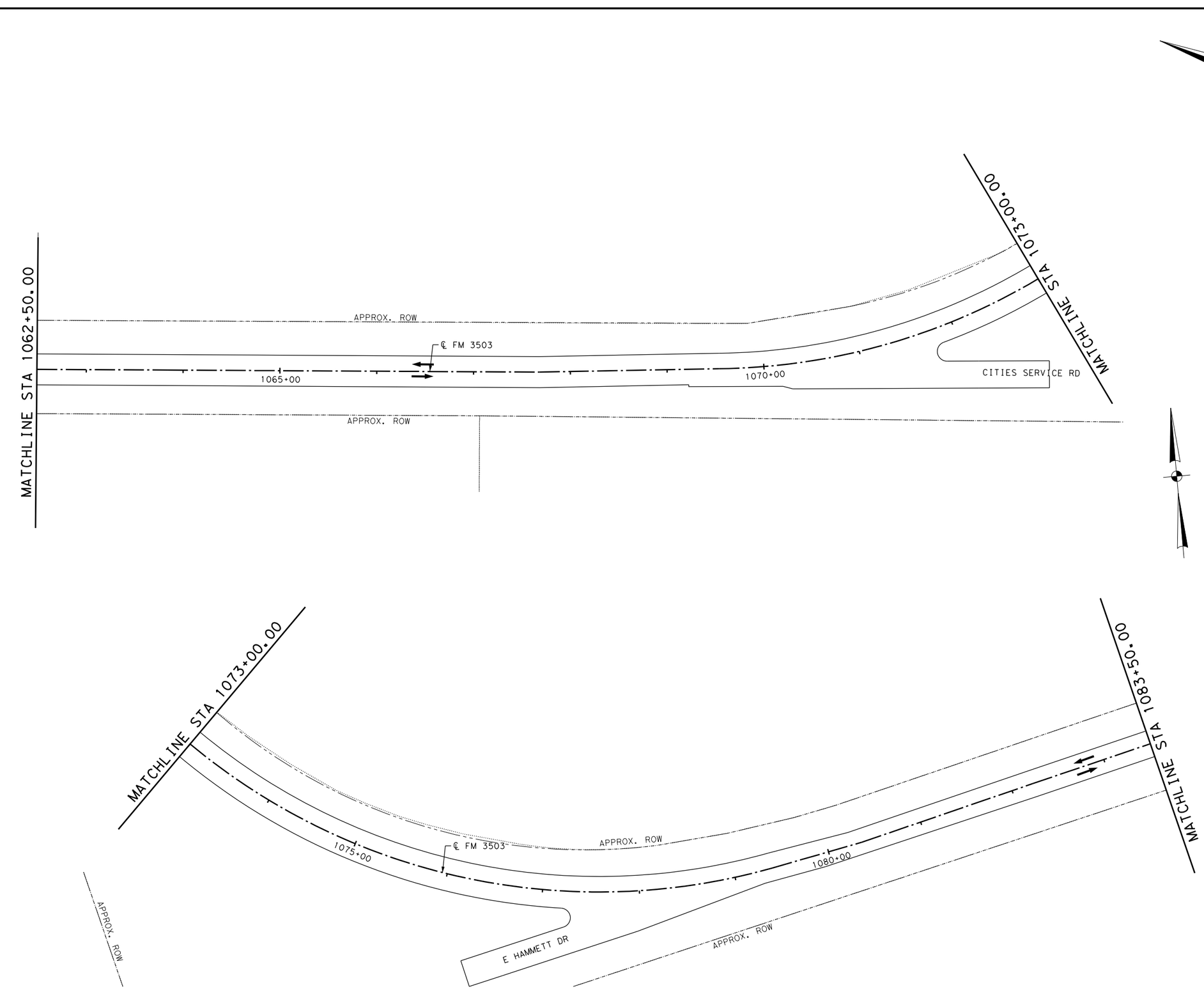
Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
7805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
STORM WATER POLLUTION PREVENTION PLAN
STA 1041+50.00 TO STA 1062+50.00

SHEET 3 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	
CHECKED	CONT.	SECT.	JOB	88
APPROVED	3570	01	012	



LEGEND:

ECL — EROSION CONTROL LOG

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

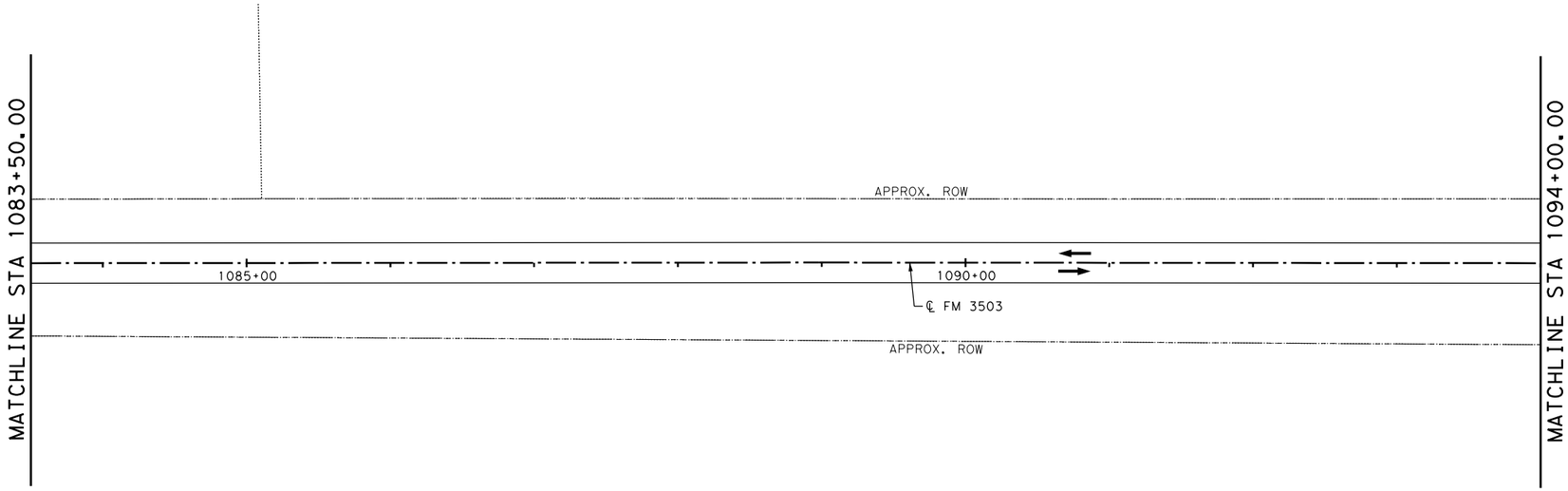
Texas Department of Transportation
©2023

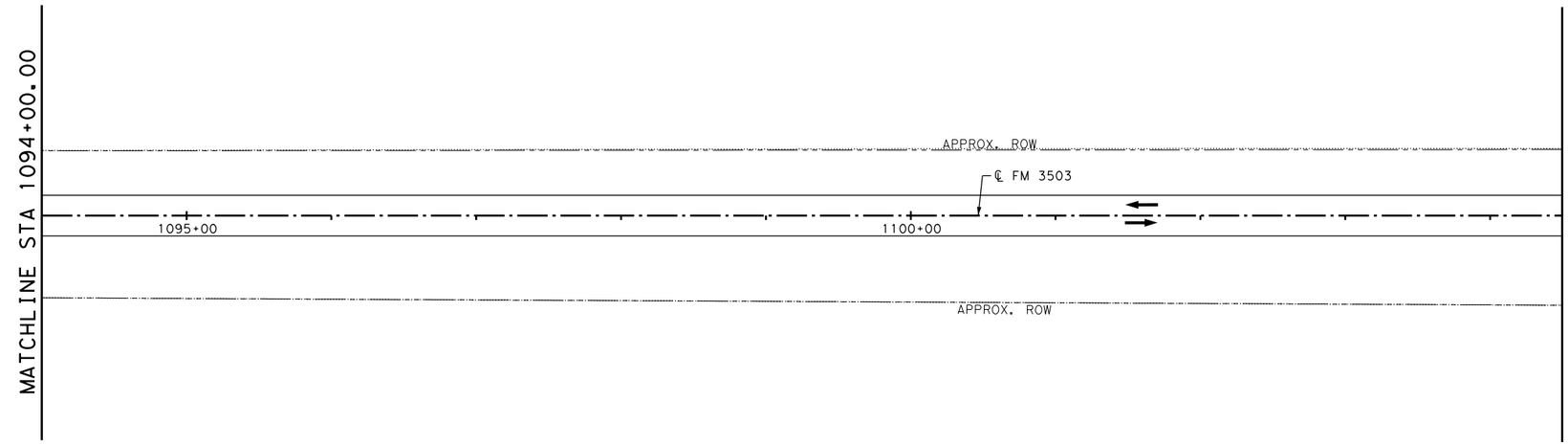
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3680

FM 3503
STORM WATER POLLUTION PREVENTION PLAN
STA 1062+50.00 TO STA 1083+50.00

SHEET 4 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	89
	CONT.	SECT.	JOB	
	3570	01	012	





LEGEND:

ECL — EROSION CONTROL LOG

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

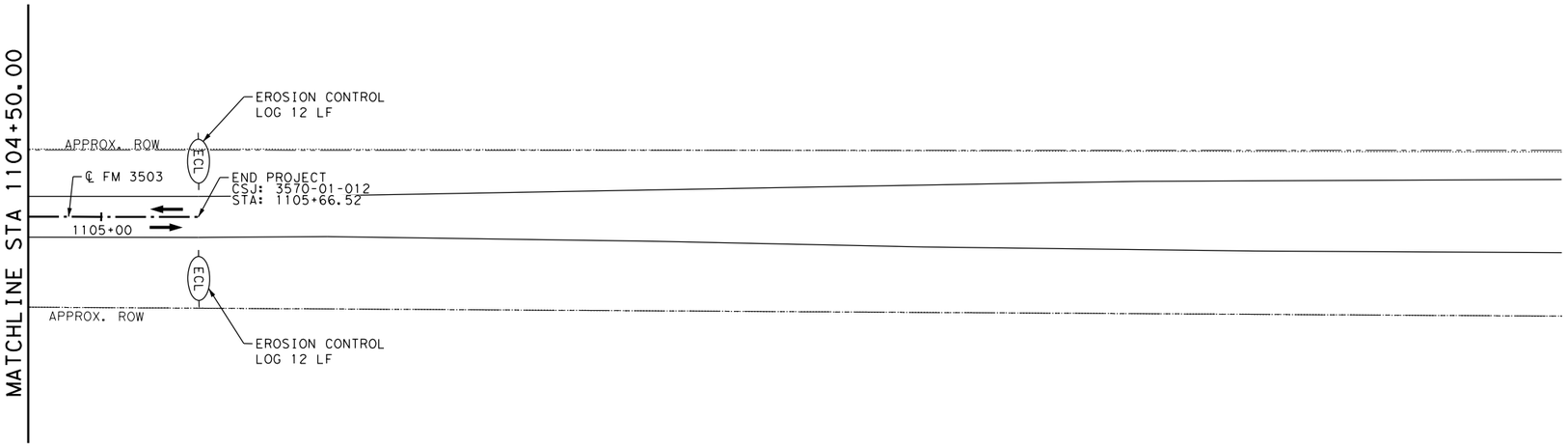
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
STORM WATER POLLUTION PREVENTION PLAN
STA 1083+50.00 TO STA 1104+50.00

SHEET 5 OF 7

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	90
	CONT.	SECT.	JOB	
	3570	01	012	

PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl
USER:untitled
DATE:3/21/2023 4:21:07 PM
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\SW3P\FM3503_SW3P_05.dgn



LEGEND:

ECL — EROSION CONTROL LOG

0′ 25′ 50′ 100′

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

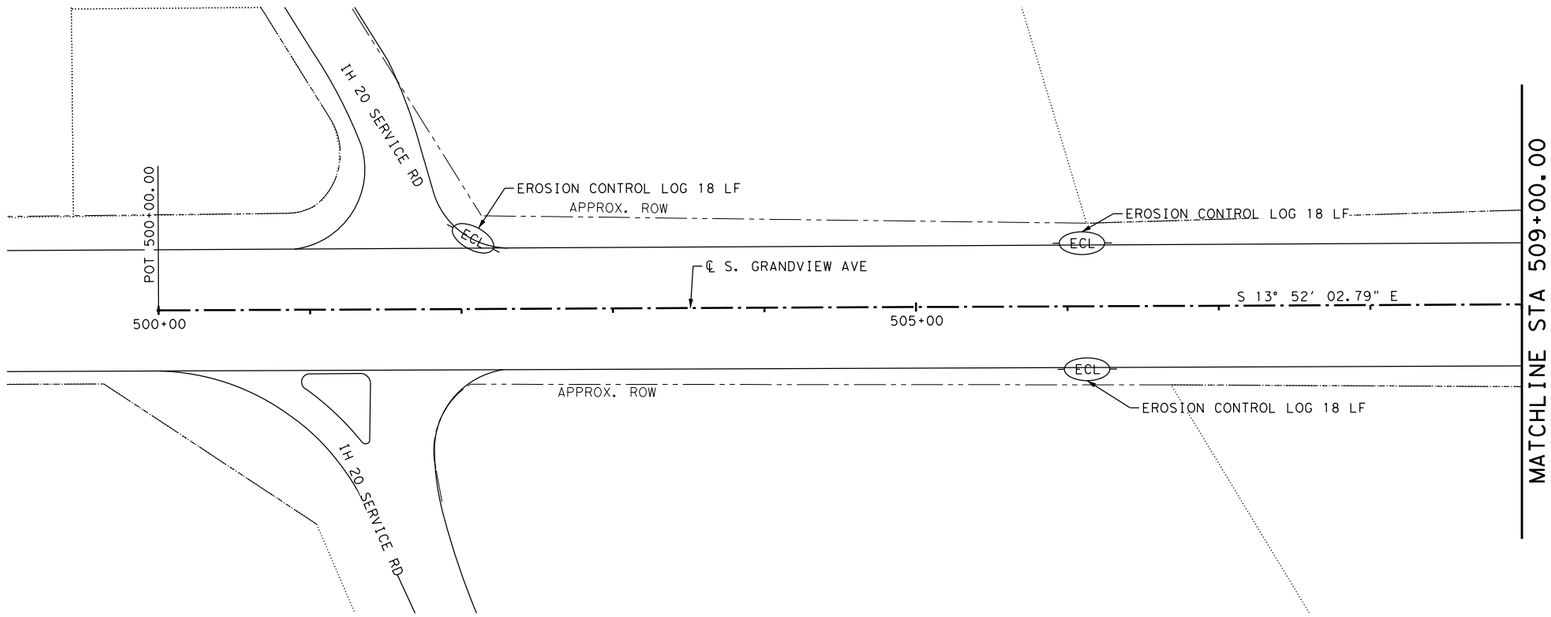
Texas Department of Transportation
©2023

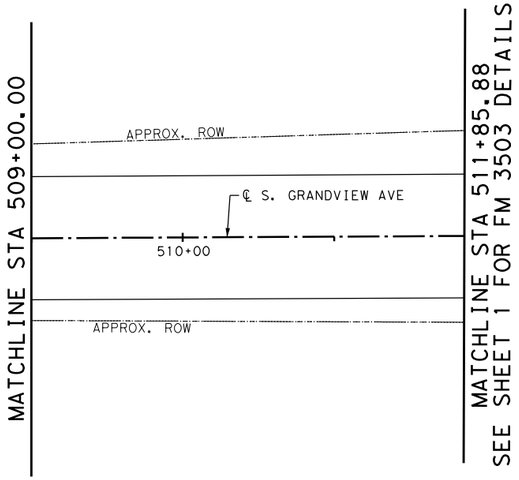
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

FM 3503
STORM WATER POLLUTION PROTECTION PLAN
STA 1104+50.00 TO END

SHEET 6 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	91
CHECKED	CONT.	SECT.	JOB	
	3570	01	012	
APPROVED				





LEGEND:

ECL — EROSION CONTROL LOG

0' 25' 50' 100'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2905 Dallas Parkway, Suite 500 • Plano, Texas 75093 • 972.488.3880

SOUTH GRANDVIEW AVE STORM WATER POLLUTION PREVENTION PLAN

BEGIN TO END

SHEET 7 OF 7

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	92
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

For 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 at the appropriate TxDOT Area Office.

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
3570-01-012

1.2 PROJECT LIMITS:
From: IH 20 EXIT

To: JBS PKWY

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 31.8327290 ,(Long) -102.3371370

END: (Lat) 31.8230459 ,(Long) -102.3136287

1.4 TOTAL PROJECT AREA (Acres): 10.47

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.00

1.6 NATURE OF CONSTRUCTION ACTIVITY:
CONSTRUCTION OF EXISTING ROADWAY REHABILITATION, CONSISTING ON PLANING, ASPHALT OVERLAY, AND PAVEMENT MARKINGS.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
N/A	

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
TBD	

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

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

☒ Mobilization
☒ Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☐ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☐ Place flex base
☐ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☐ Revegetation of unpaved areas
☐ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

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
N/A	

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☐ Development of plans and specifications
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		93
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	ECTOR	
CONT.	SECT.	JOB	HIGHWAY NO.
3570	01	012	FM 3503

DATE: 3/21/2023 4:21:20 PM
FILE: c:\bms\pwe101-01\bradley.krecemon\dms289987\swp3a22 FM 3503.dgn

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☐ ☐ Temporary Seeding
- ☐ ☐ Permanent Planting, Sodding or Seeding
- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☒ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☐ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
N/A		

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: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☒ Chemical Management
- ☐ Concrete and Materials Waste Management
- ☒ Debris and Trash Management
- ☐ Dust Control
- ☒ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
N/A		

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 2.3 of this SWP3 .

2.9 MAINTENANCE:

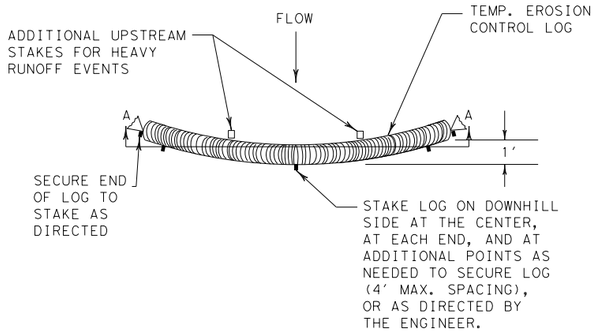
Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being 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 2.3 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

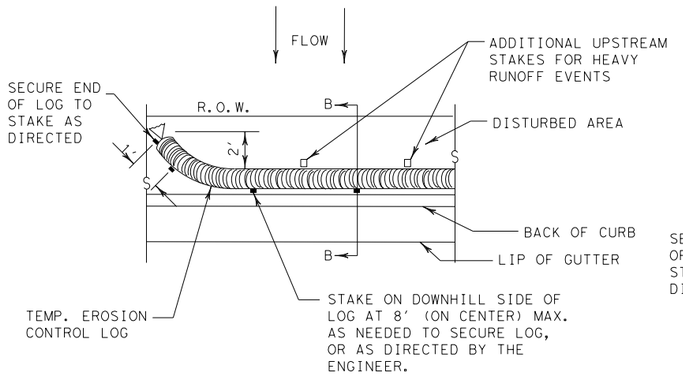
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		94
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	ECTOR	
CONT.	SECT.	JOB	HIGHWAY NO.
3570	01	012	FM 3503

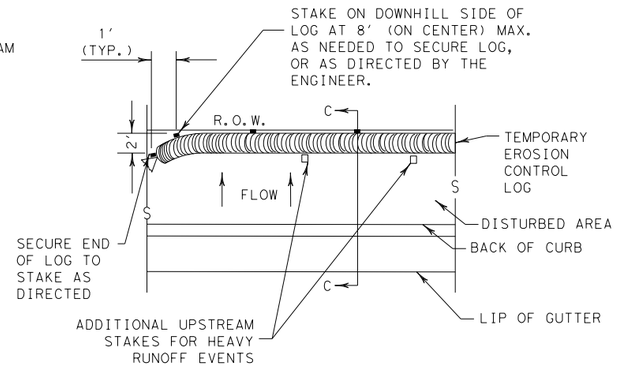
DATE: 3/21/2023
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28987\ec916.dgn



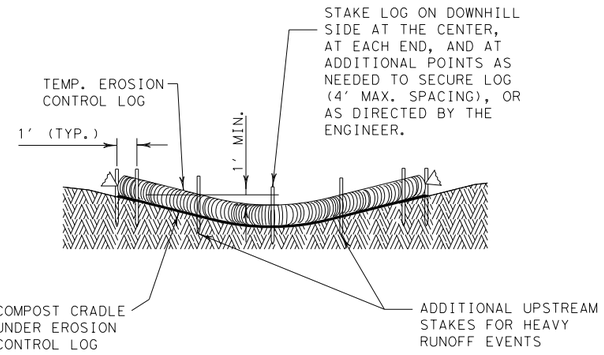
PLAN VIEW



PLAN VIEW



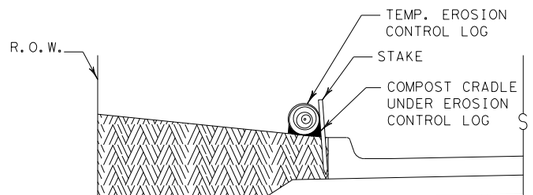
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

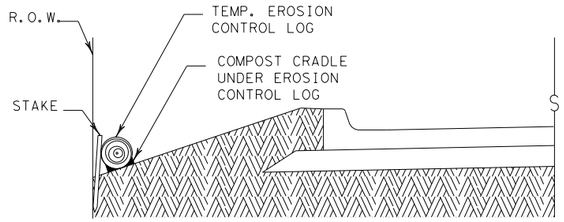
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

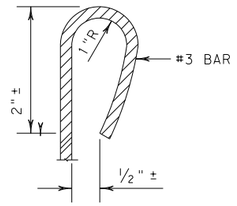
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



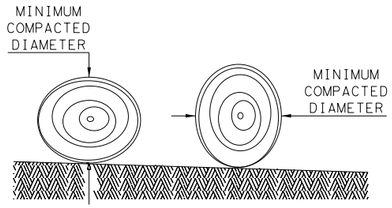
REBAR STAKE DETAIL

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.

SHEET 1 OF 3

Texas Department of Transportation

Design Division Standard

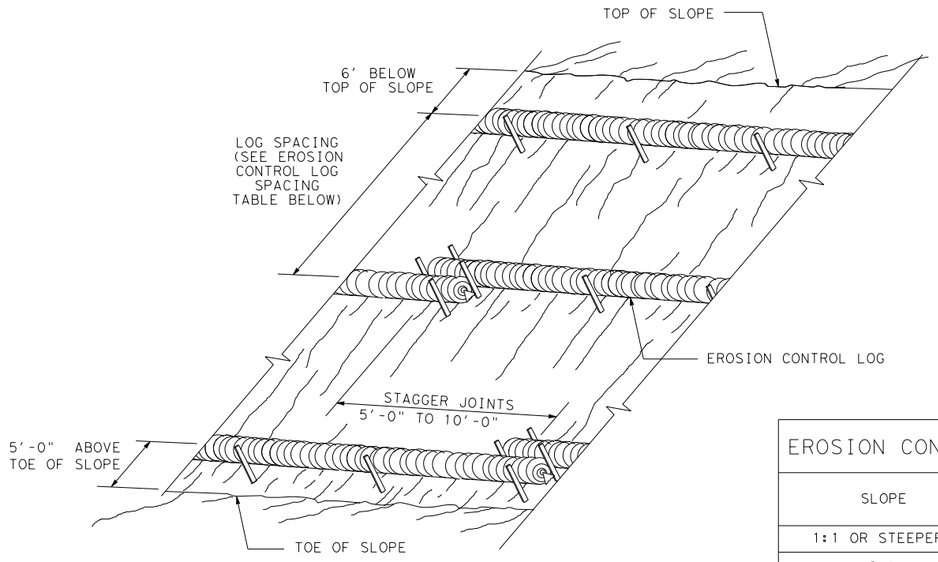
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

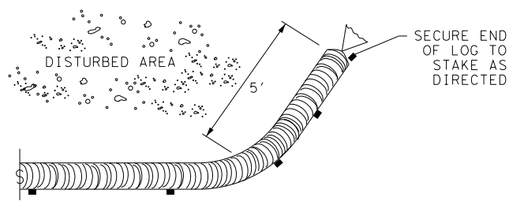
FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	3570	01	012		FM 3503		
	DIST	COUNTY			SHEET NO.		
	ODA	ECTOR			95		

DATE: 3/21/2023
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28987\ec916.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

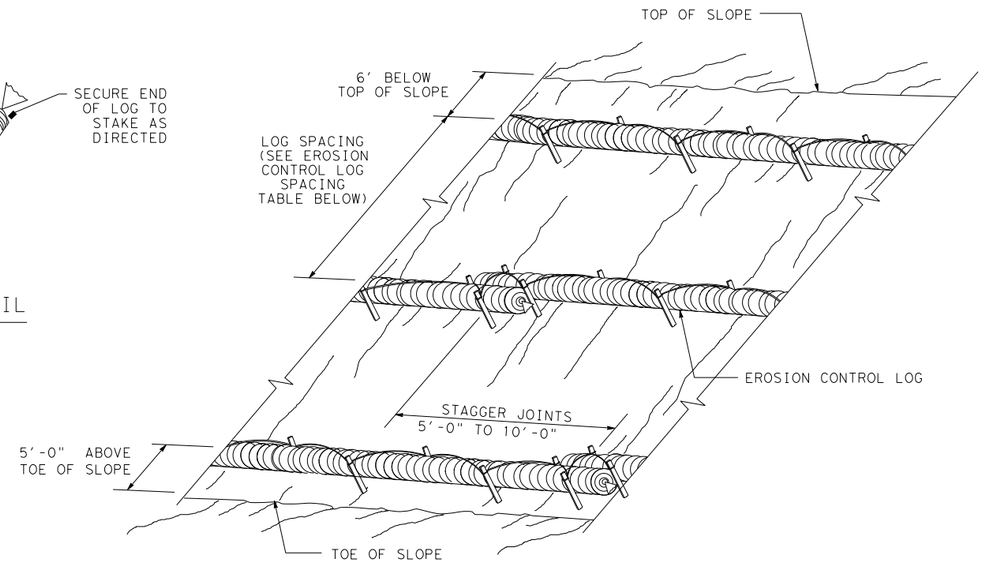
CL-SST



END SECTION RAP DETAIL

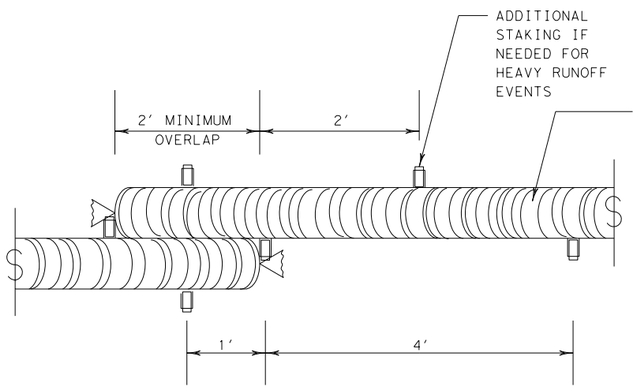
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

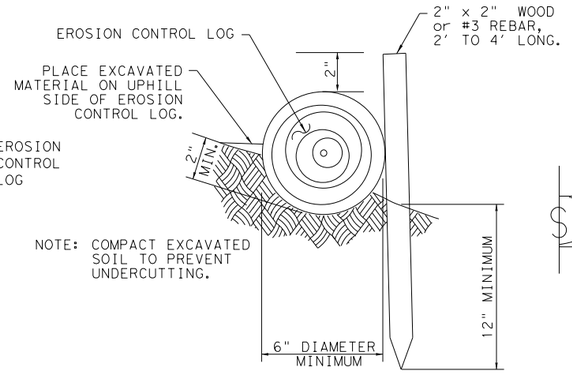
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

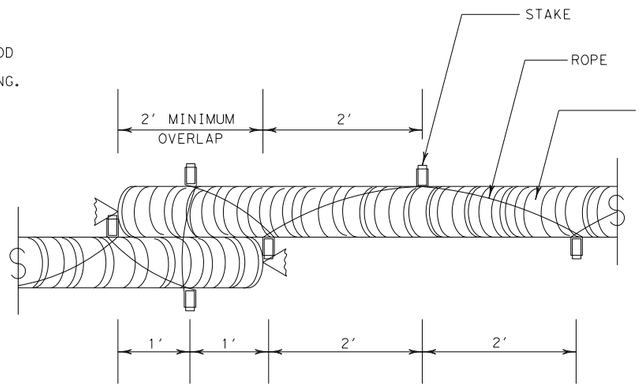


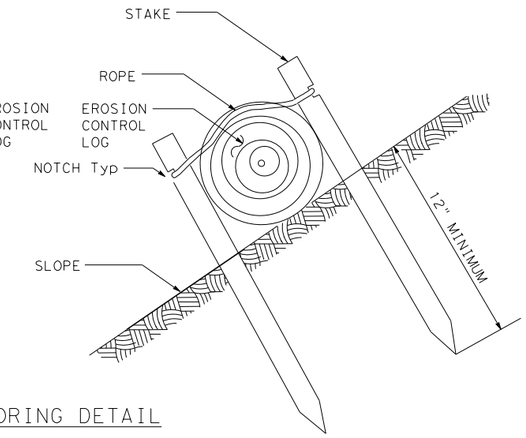


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

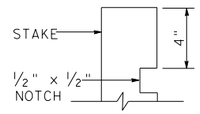
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

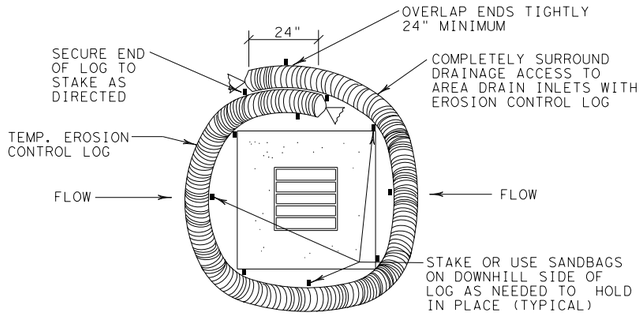
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

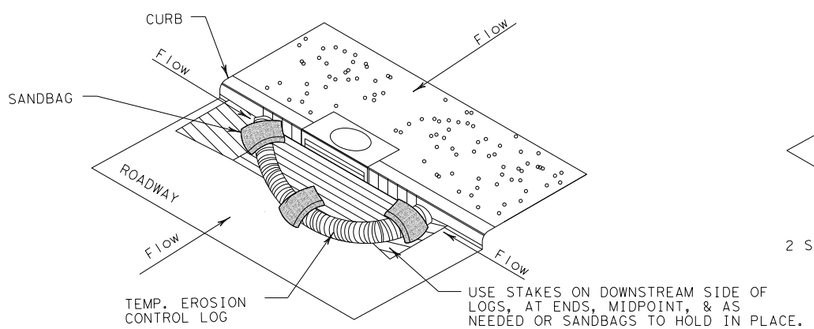
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	3570	01	012	FM 3503	
	DIST	COUNTY		SHEET NO.	
	ODA	ECTOR		96	

DATE: 3/21/2023
FILE: c:\bms\pwe101-01\bradley.kreceman\dms28987\ec916.dgn



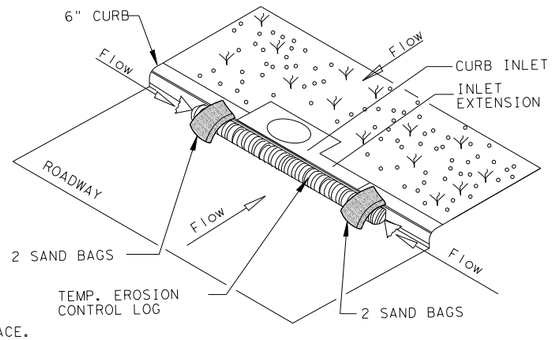
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

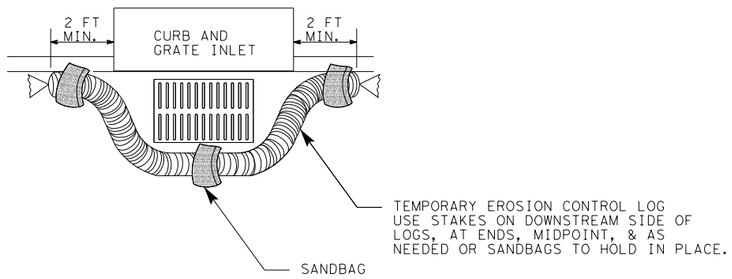
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

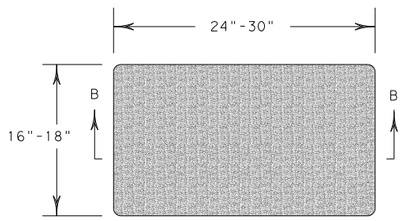
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

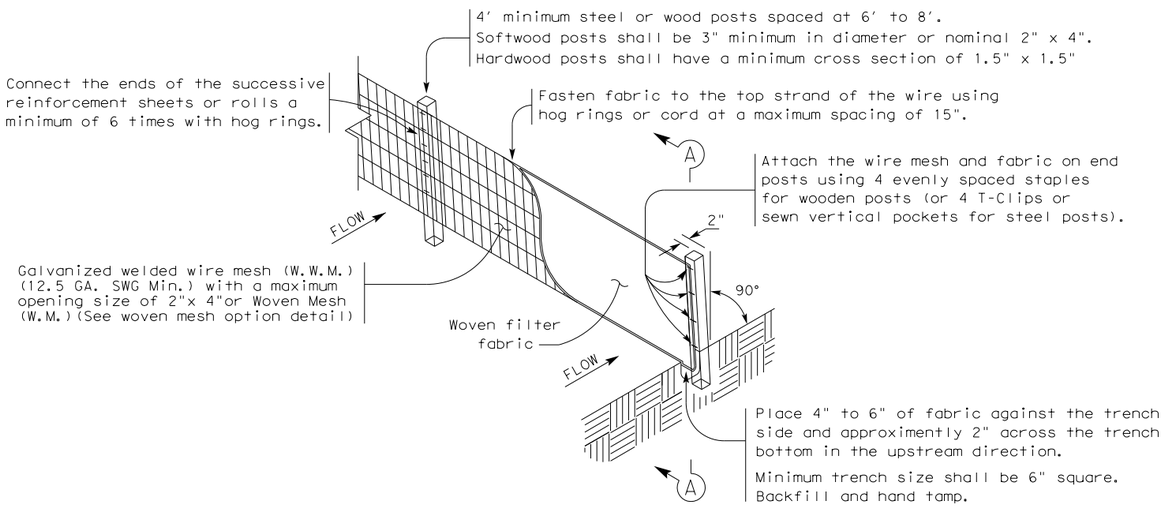
Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

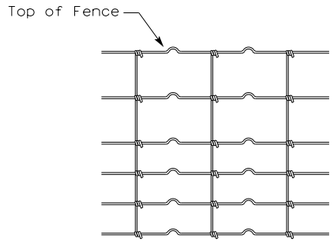
EC(9)-16

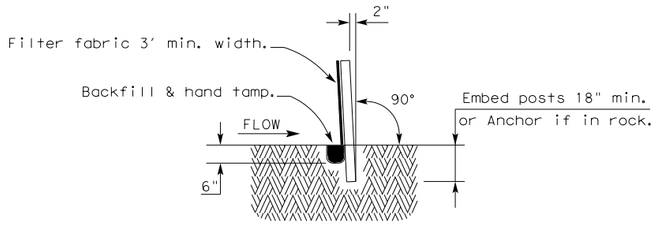
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		97



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

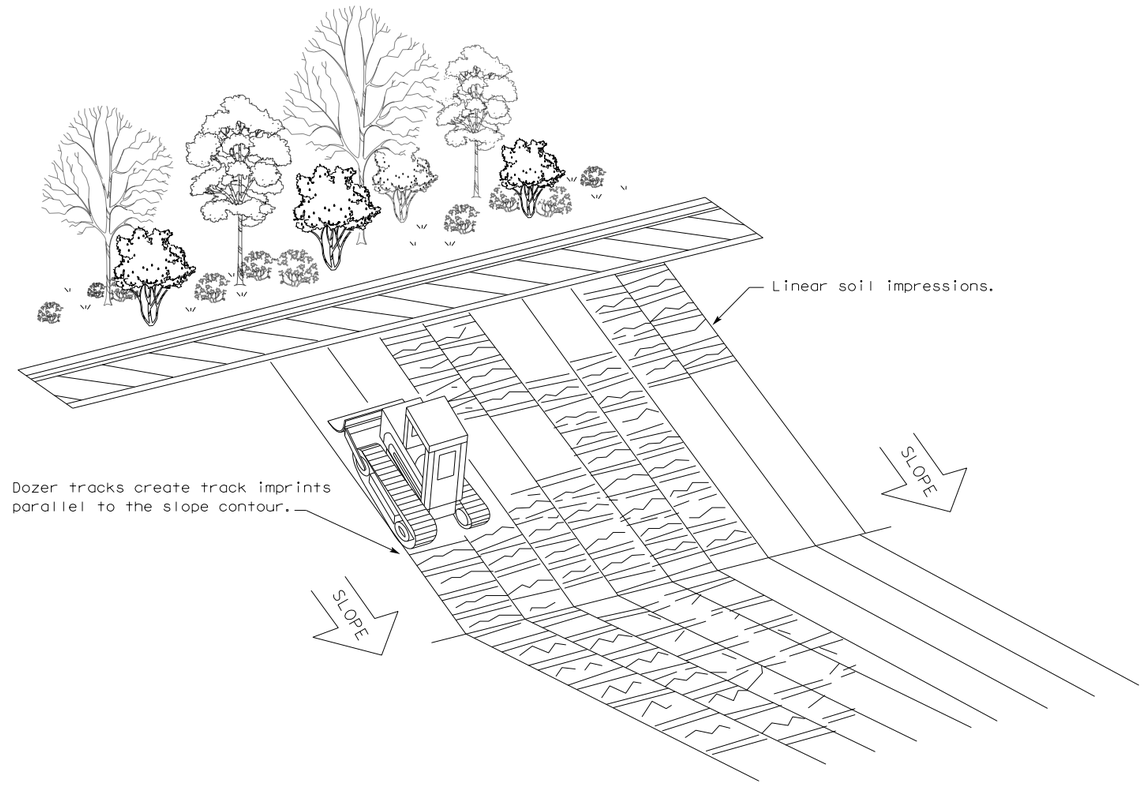
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

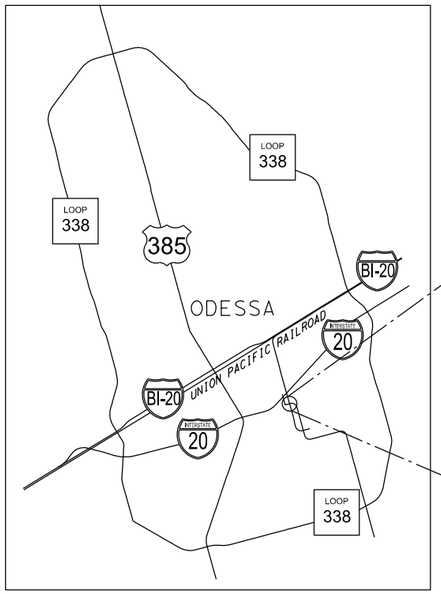
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3570	01	012		FM 3503	
	DIST	COUNTY			SHEET NO.	
	ODA	ECTOR			98	

3/31/2023
C:\Users\pwe101-01\bradley.kreceman\dms28987\ec116.dgn



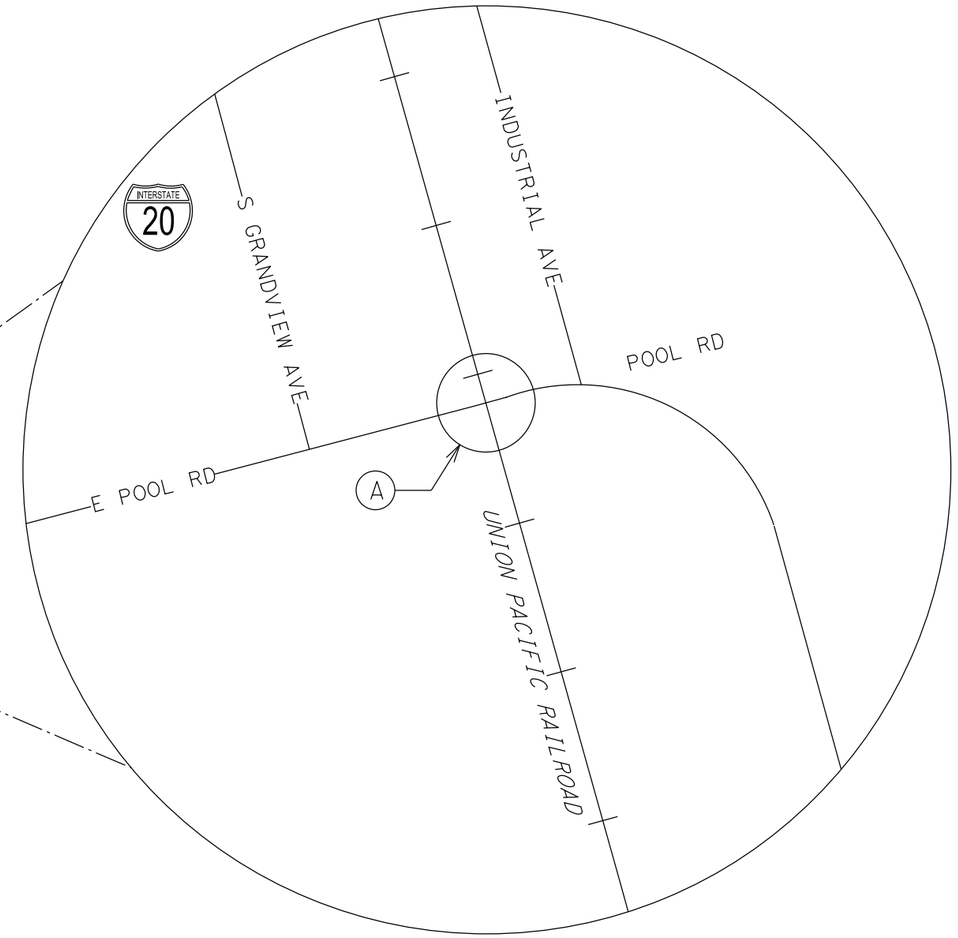


EXHIBIT A

RAILROAD COMPANY: UNION PACIFIC RAILROAD
DOT NO: 796299V
MP: 0571.640
COUNTY: ECTOR
CSJ: 3570-01-012
HIGHWAY: FM 3503

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

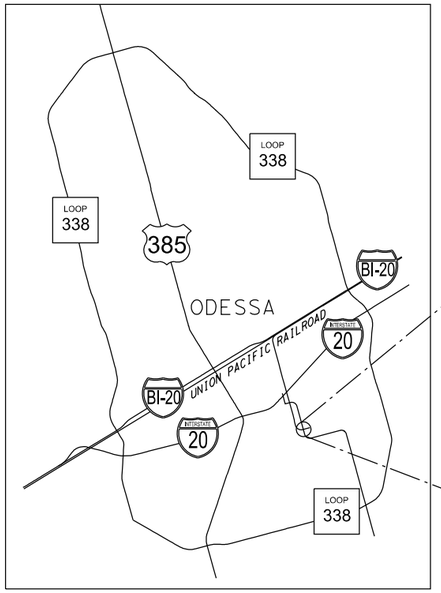
Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503
RAILROAD CROSSING LOCATION

SHEET 1 OF 2

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	99
	CONT.	SECT.	JOB	
	3570	01	012	



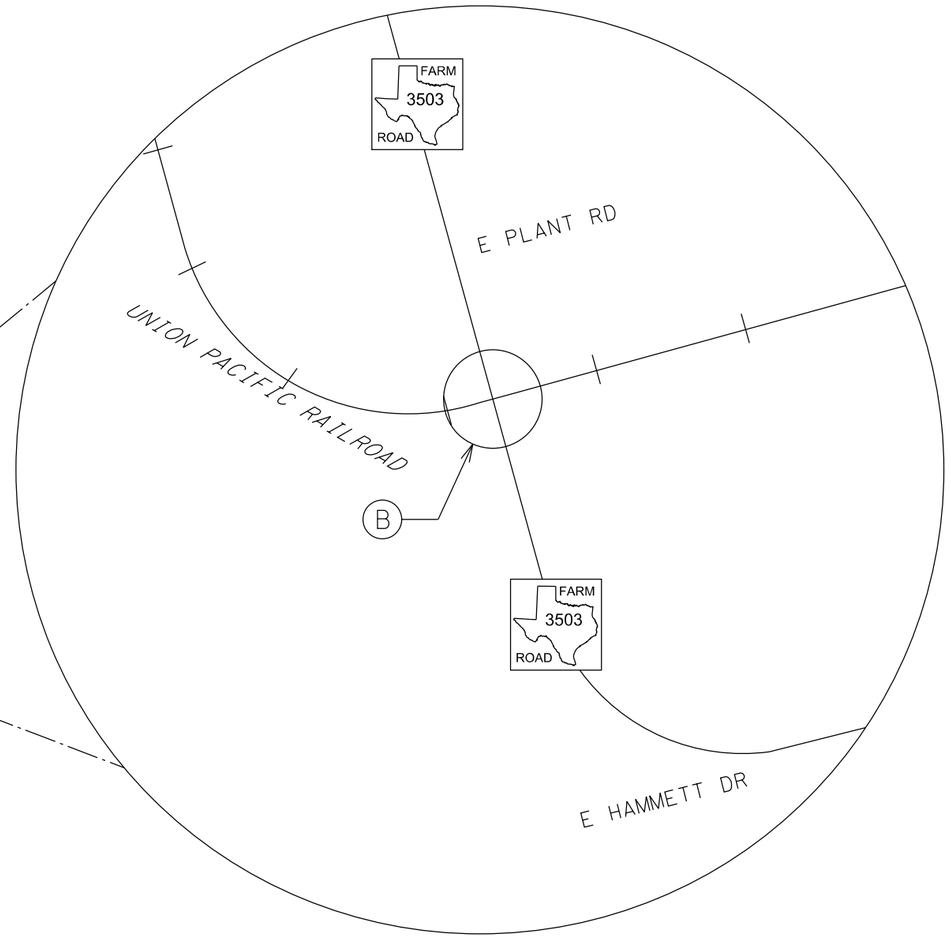


EXHIBIT B

RAILROAD COMPANY: UNION PACIFIC RAILROAD
DOT NO: 796303H
MP: 0574.230
COUNTY: ECTOR
CSJ: 3570-01-012
HIGHWAY: FM 3503

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation
©2023

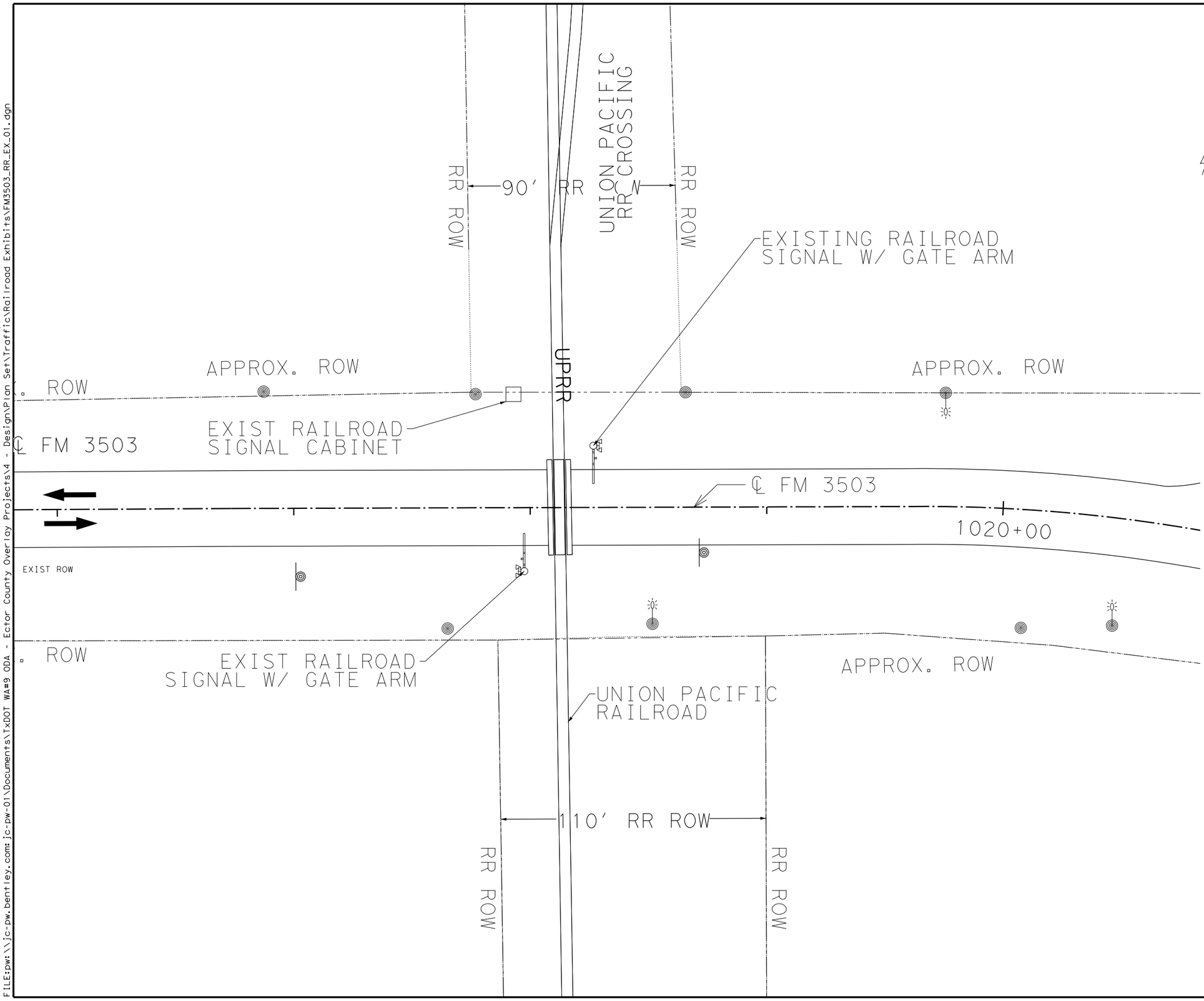
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3580

FM 3503
RAILROAD CROSSING
LOCATION

SHEET 2 OF 2

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
	TEXAS	ODESSA	ECTOR	
CHECKED	CONT.	SECT.	JOB	
	3570	01	012	100
APPROVED				

DATE:3/21/2023 4:21:32 PM USER:untitled
FILE:pw:\\jc-pw.bentley.com:jc-pw-01\Documents\TxDOT WA#9 ODA - Ector County Overlay Projects\4 - Design\Plan Set\Traffic\Railroad Exhibits\FM3503_RAILROAD_CROSSING_LOCATION_MAP_02.
PLOTDRIVER: BW_HALF_PDF.plt PENTABLE: FM3503_PEN_TABLE.tbl



LEGEND:

- EXIST. R.O.W.
- EXIST. LUMINAIRE
- EXIST. SIGNAL CONTROLLER
- EXIST. SIGNAL HEAD
- EXIST. GROUND MOUNTED SIGN
- EXIST. RAIL ROAD SIGNAL
- EXIST. RAIL ROAD SIGNAL W/ GATE
- EXIST. POWER POLE

0' 10' 20' 40'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

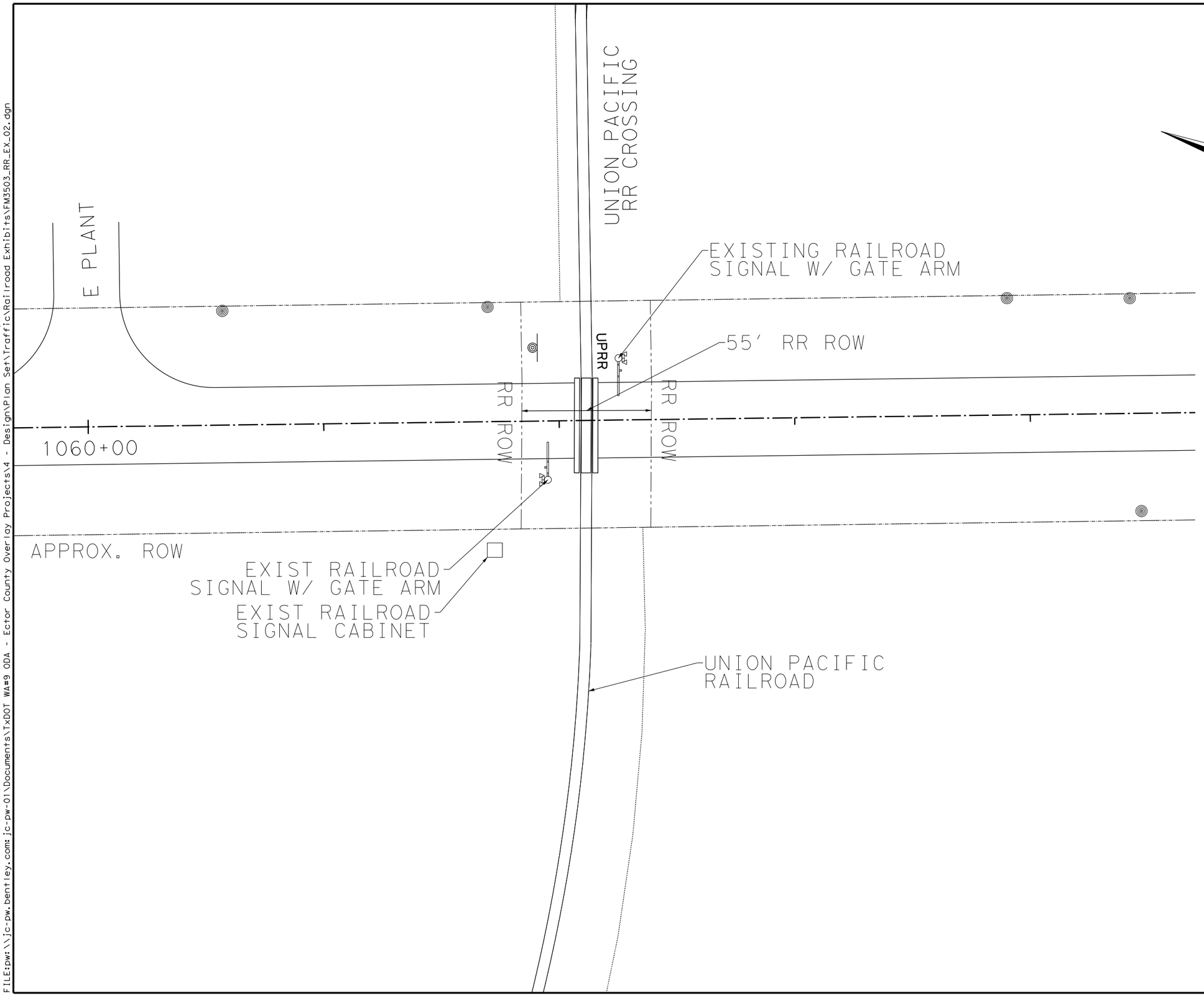
Texas Department of Transportation
©2023

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503 UNION PACIFIC RR GRADE CROSSING
EXISTING CONDITION LAYOUT
EXHIBIT "A"

SHEET 1 OF 2

DRAWN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		FM 3503
DESIGNED	STATE	DIST.	COUNTY	SHEET NO.
CHECKED	TEXAS	ODESSA	ECTOR	101
APPROVED	CONT.	SECT.	JOB	
	3570	01	012	



LEGEND:

- EXIST. R.O.W.
- EXIST. LUMINAIRE
- EXIST. SIGNAL CONTROLLER
- EXIST. SIGNAL HEAD
- EXIST. GROUND MOUNTED SIGN
- EXIST. RAIL ROAD SIGNAL
- EXIST. RAIL ROAD SIGNAL W/ GATE
- EXIST. POWER POLE

0' 10' 20' 40'

NO.	DATE	REVISION	APPROVED

STATE OF TEXAS
DALE A. VEHLEWALD
116649
LICENSED
PROFESSIONAL ENGINEER

03/21/2023

Texas Department of Transportation

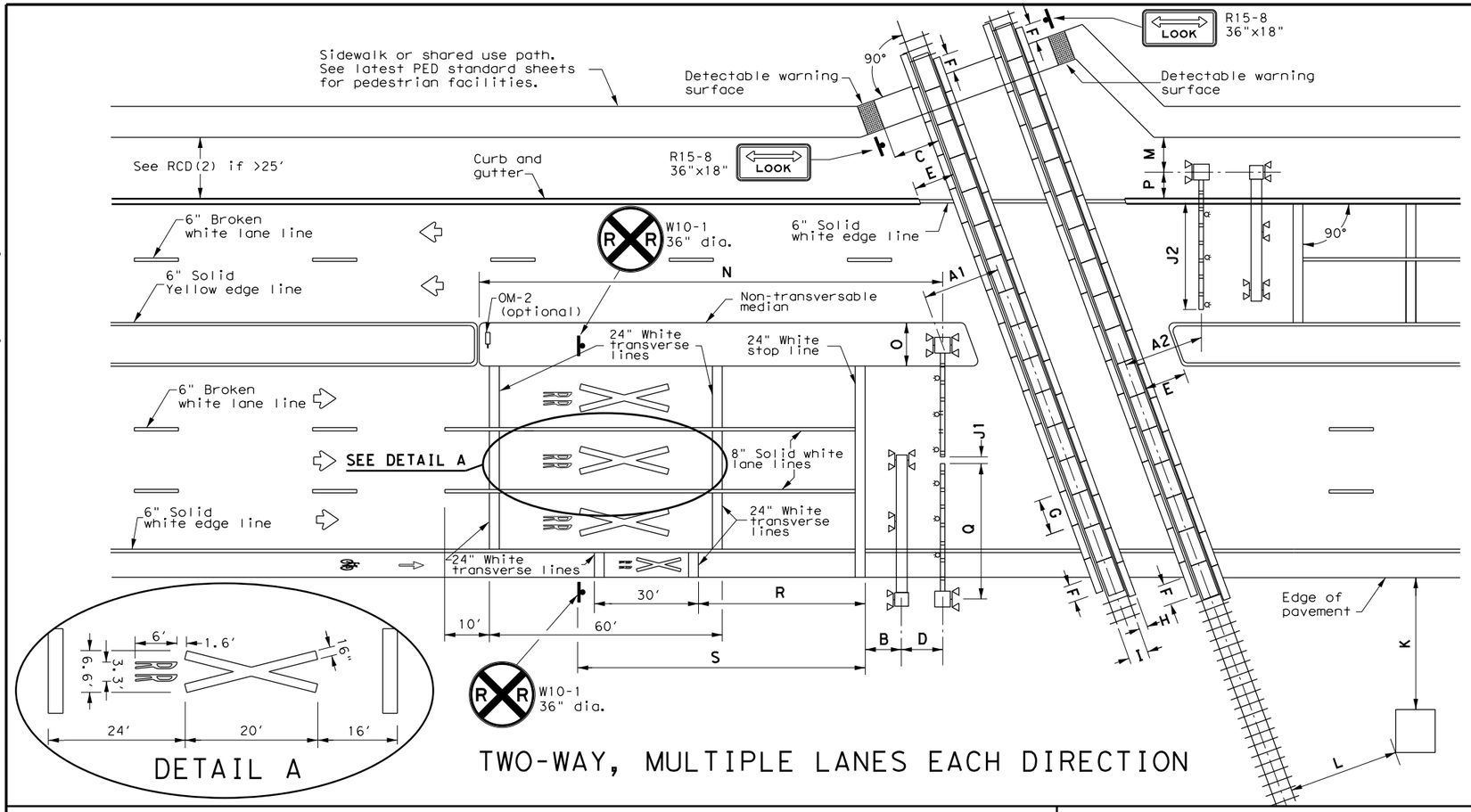
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2805 Dallas Parkway, Suite 600 • Plano, Texas 75093 • 972.488.3880

FM 3503 UNION PACIFIC RR GRADE CROSSING EXISTING CONDITION LAYOUT

EXHIBIT "A"

SHEET 2 OF 2

DRAWN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DESIGNED	6	SEE TITLE SHEET		FM 3503
CHECKED	STATE	DIST.	COUNTY	SHEET NO.
APPROVED	TEXAS	ODESSA	ECTOR	102
	CONT.	SECT.	JOB	
	3570	01	012	



NOTES

A1: Center of RR mast to center of rail: 12′ minimum, 15′ typical.

A2: Tip of gate to center of rail: 12′ minimum, 15′ typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8′ (NOTE: Stop line may be moved as needed, but should be at least 8′ back from gates, if present).

C: Near edge of detectable warning surface to nearest rail: 12′ minimum.

D: Center of gate mast to center of cantilever mast: 6′ typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10′ typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3′ minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8′ typical.

H: Width of field panel: 2′ typical (check with railroad company).

I: Distance between rails: 4′- 8′1/2".

J1: Tip of gate to tip of gate: 2′ maximum.

J2: 90% of traveled roadway to be covered by gate.

K: Nearest edge of RR cabinet from edge of pavement: 30′ typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabinet from nearest rail: 25′ typical.

M: Center of RR mast to edge of sidewalk: 6′ minimum.

N: Center of gate mast to leading edge of non-traversable median: 100′ minimum to qualify as a Quiet Zone SSM. NOTE: 60′will suffice if there is a street intersection within the 100′ and all street intersections within 60′ are closed.

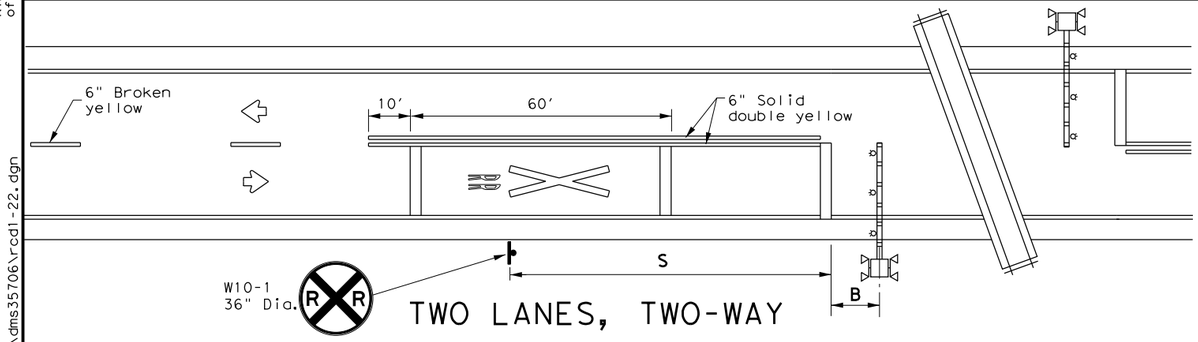
O: Width of median for RR gate assembly: 8′-6" minimum, 10′ typical when using median gates. NOTE: Center of gate mast minimum 4′-3" from face of curb.

P: Center of RR mast to face of curb: 5′-3" minimum. Center of RR mast to edge of pavement (with shoulder): 7′ minimum. Center of RR mast to edge of pavement (no shoulder): 9′-3" minimum. NOTE: Final location determined by the railroad company.

Q: Gate length: 28′ or less typical, but railroad company may allow up to 32′ under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50′ typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.



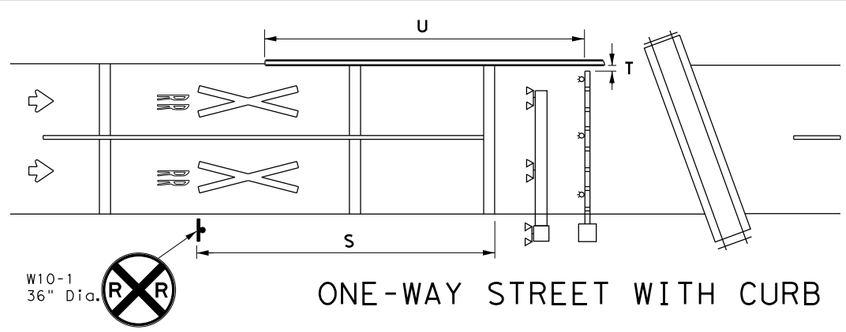
TWO LANES, TWO-WAY

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

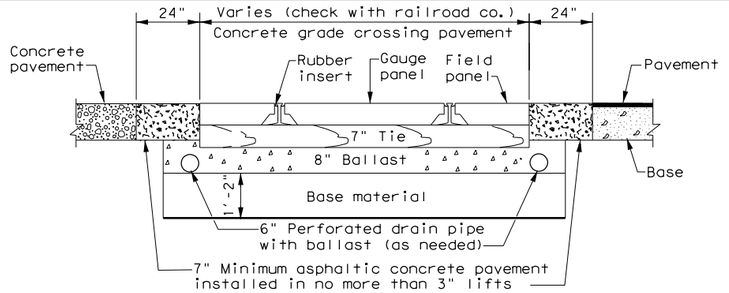


ONE-WAY STREET WITH CURB

NOTES

T: Tip of gate to edge of curb: 1′ maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.

U: Non-traversable curb length from gate: 100′ minimum for a Quiet Zone SSM, 10′ minimum for all other locations.



CROSSING SURFACE CROSS SECTION

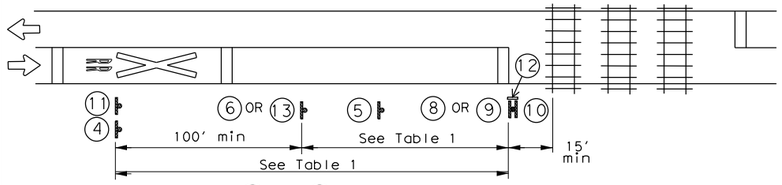
Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-22

FILE: rcd1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
2-16	DIST	COUNTY		SHEET NO.
11-22	ODA	ECTOR		103

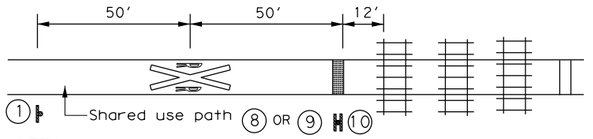
DATE: 7/21/2023 12:19:13 PM
FILE: c:\bms\pwe\101-01\mark,richardson\dms35706\rcd1-22.dgn



PASSIVE CROSSING

NOTES

1. STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for further details about sign mounting arrangements.



NOTES

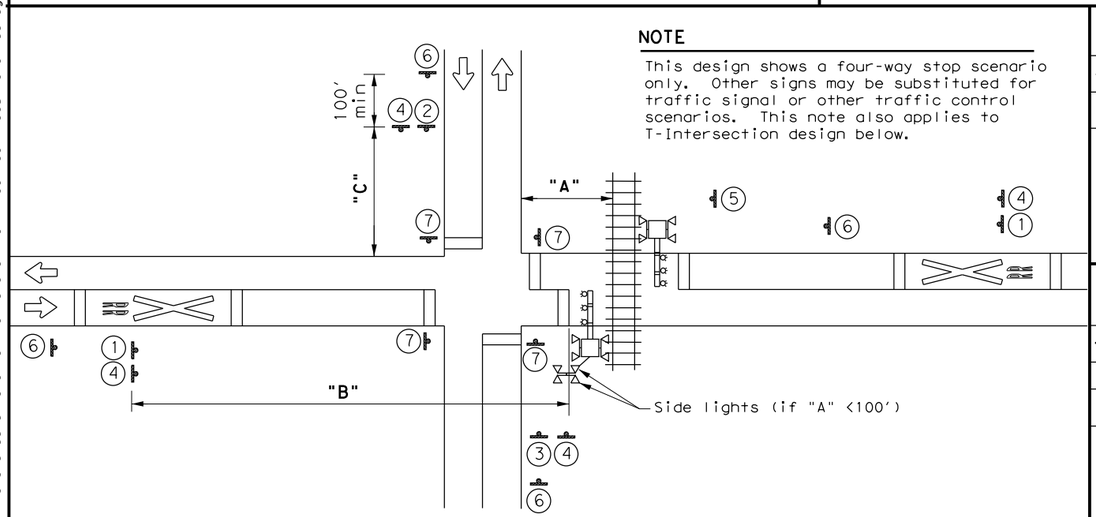
1. A shared use path is considered a separate pathway crossing when more than 25′ from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS (R15-2P) plaque (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

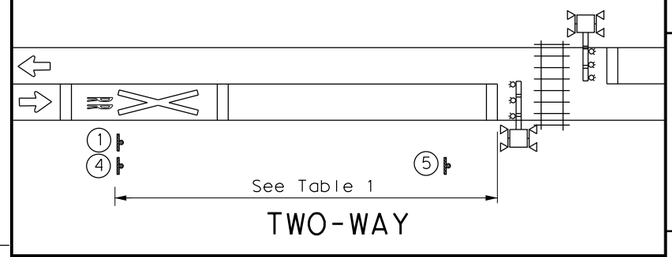


NOTE

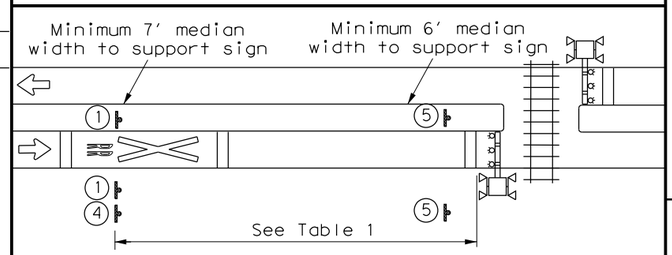
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

	"A" <100′	"A" ≥100′
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

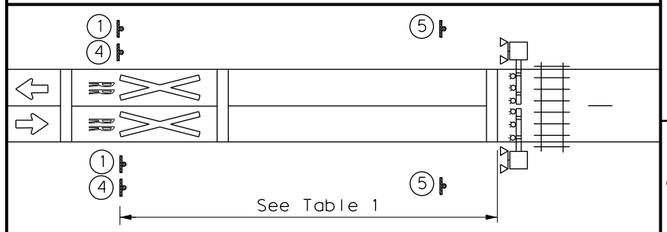
GRADE CROSSING NEAR A PARALLEL STREET



TWO-WAY

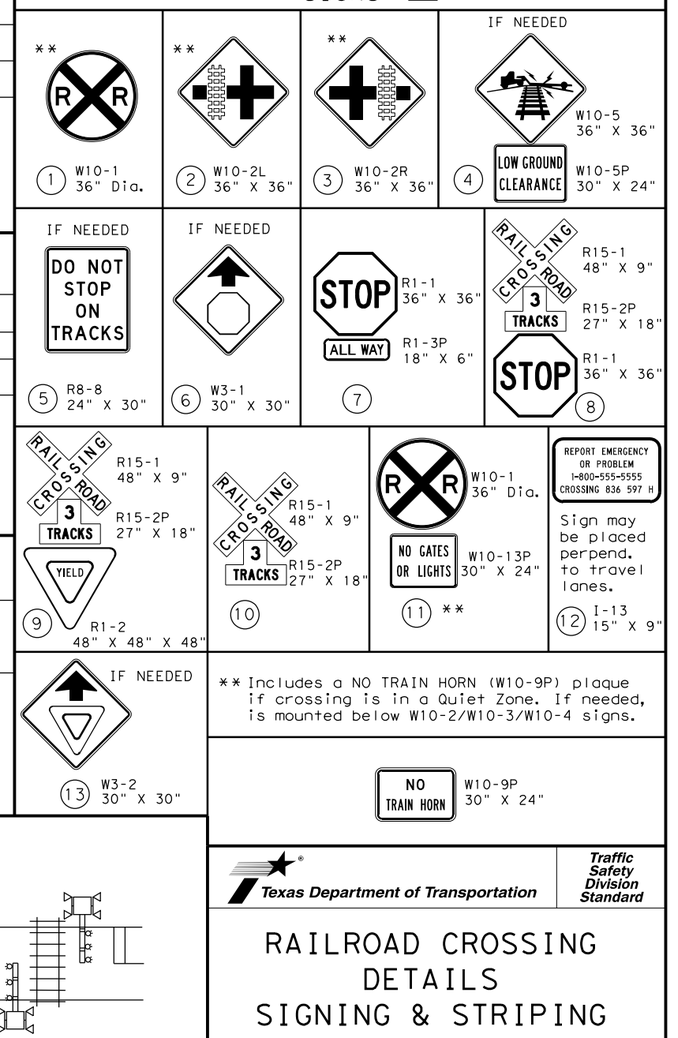


TWO-WAY WITH MEDIAN



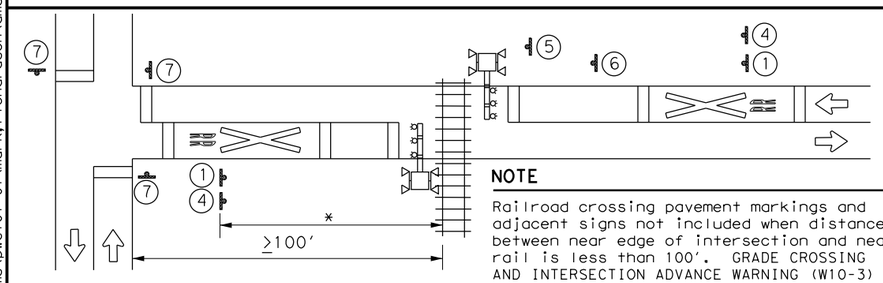
ONE-WAY

SIGNS



** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

NO TRAIN HORN W10-9P 30" X 24"

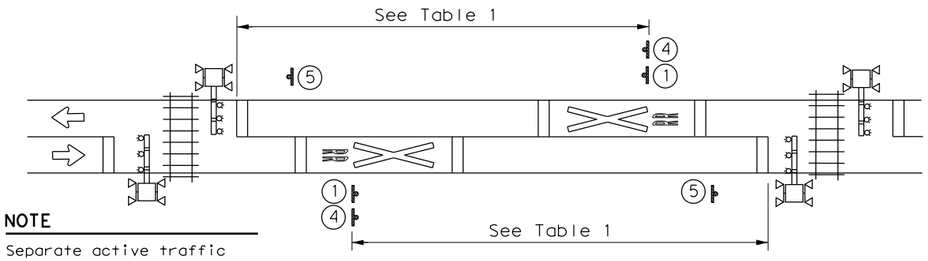


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100′. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100′ apart.

TWO ADJACENT CROSSINGS

Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-22

FILE: rcd2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
2-16 11-22	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		104

DATE: 7/21/2023 12:19:13 PM
FILE: c:\bms\pwe101-01\mark.richardson\dms35706\rcd2-22.dgn

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		105

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	3570	01	012	FM 3503
	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		106

DATE: 3/21/2023 4:21:50 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms29065\scope_crossing_01.dgn

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

DOT #: 796299V
Crossing Type: ** AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD COMPANY
Operating RR Company at Track: UNION PACIFIC RAILROAD COMPANY
RR MP: 0571.640
RR Subdivision: TOYAH
City: ODESSA
County: ECTOR
CSJ at this Crossing: 3570-01-012
Highway/Roadway name crossing the railroad: FM 3503
# of regularly scheduled trains per day at this crossing: 2
# of switching movements per day at this crossing: 2
% of estimated contract cost of work within railroad ROW: 1%

Scope of Work at this Crossing to Be Performed by State Contractor:
PAVEMENT MAINTENANCE TO INCLUDE MILLING OF EXISTING ASPHALT AT FULL-DEPTH OF PAVEMENT, SUBGRADE IMPROVEMENTS AND NEW PAVEMENT ADJACENT TO CROSSING SURFACE PANELS.

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

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

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

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 2

On this project, night or weekend flagging is:

☒ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☒ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

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

Contact Information for Flagging:

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

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

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

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

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

☐ Required
☒ Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

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

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

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

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

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

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

On this project, an ROE agreement is:

☐ Not Required
☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☒ Required: UPPR Maintenance Consent Letter. TxDOT CST to assist in obtaining.
☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

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

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

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

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☐ Not Required
☒ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific Railroad Company
Railroad Emergency Line at 888-877-7267
Location: DOT 796299V
RR Milepost: 0573.440
Subdivision: TOYAH

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
3/2020	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		107

DATE: 3/21/2023 4:21:53 PM
FILE: c:\bms\pwe101-01\bradley.kreceman\dms29065\scope_crossing_02.dgn

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

DOT #: 796303H
Crossing Type: ** AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD COMPANY
Operating RR Company at Track: UNION PACIFIC RAILROAD COMPANY
RR MP: 0574.230
RR Subdivision: TOYAH
City: ODESSA
County: ECTOR
CSJ at this Crossing: 3570-01-012
Highway/Roadway name crossing the railroad: FM 3503
# of regularly scheduled trains per day at this crossing: 2
# of switching movements per day at this crossing: 2
% of estimated contract cost of work within railroad ROW: 1%

Scope of Work at this Crossing to Be Performed by State Contractor:
PAVEMENT MAINTENANCE TO INCLUDE MILLING OF EXISTING ASPHALT AT FULL-DEPTH OF PAVEMENT, SUBGRADE IMPROVEMENTS AND NEW PAVEMENT ADJACENT TO CROSSING SURFACE PANELS.

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

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

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

NONE

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 2

On this project, night or weekend flagging is:

☒ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☒ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

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

Contact Information for Flagging:

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

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

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

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

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

☐ Required
☒ Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

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

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

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

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

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

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

On this project, an ROE agreement is:

☐ Not Required
☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☒ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist in obtaining.
☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

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

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

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

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☐ Not Required
☒ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific Railroad Company
Railroad Emergency Line at 888-877-7267
Location: DOT 796298N
RR Milepost: 0574.236
Subdivision: TOYAH

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3570	01	012	FM 3503
3/2020	DIST	COUNTY		SHEET NO.
	ODA	ECTOR		108