SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. : C 1912-1-22

MONTGOMERY COUNTY

CSJ: 1912-01-022

FM 2090

FOR THE CONSTRUCTION OF MILL, OVERLAY AND
BASE REPAIR, CONSISTING OF MILL, 2 IN HMA LEVEL-UP
2 IN HMA SURFACE, PAVEMENT MARKINGS AND SIGNS.

CSJ	HIGHWAY	LIMITS	STATION	ROADWAY		BRIDGES		TOTAL	
				FT	MI	FT	MI	FT	MI
1912-01-022	FM 2090	FROM FM 3083 TO IH 69	10+45.00 TO 568+80.00	54,670	10.354	1165	0.220	55,835	10.575

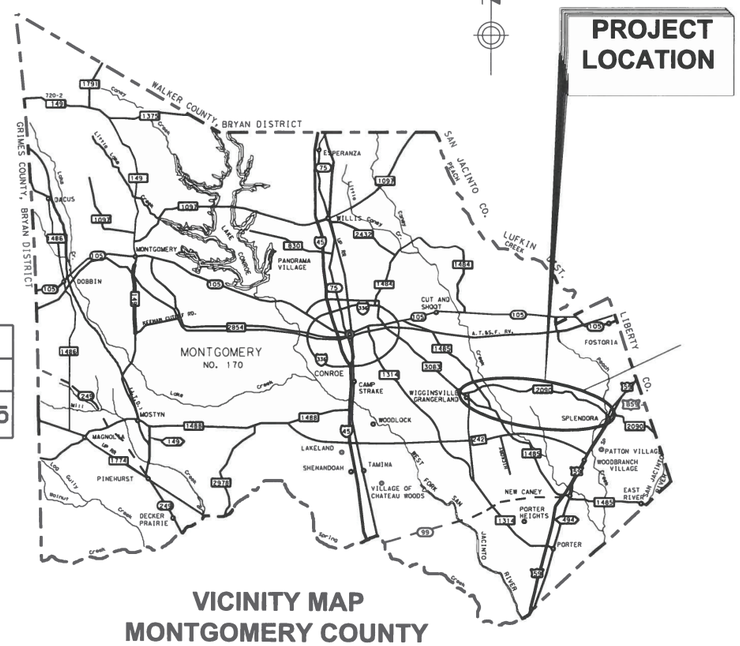
FM 2090
FUNCTION CLASSIFICATION:
RURAL MAJOR COLLECTOR

DESIGN SPEED		
MAINLANES .....60 MPH		
DESIGN ADT		
MAINLANES		
	2022	2042
FM 2090....	4,700	6,700

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 1912-1-22	FM 2090

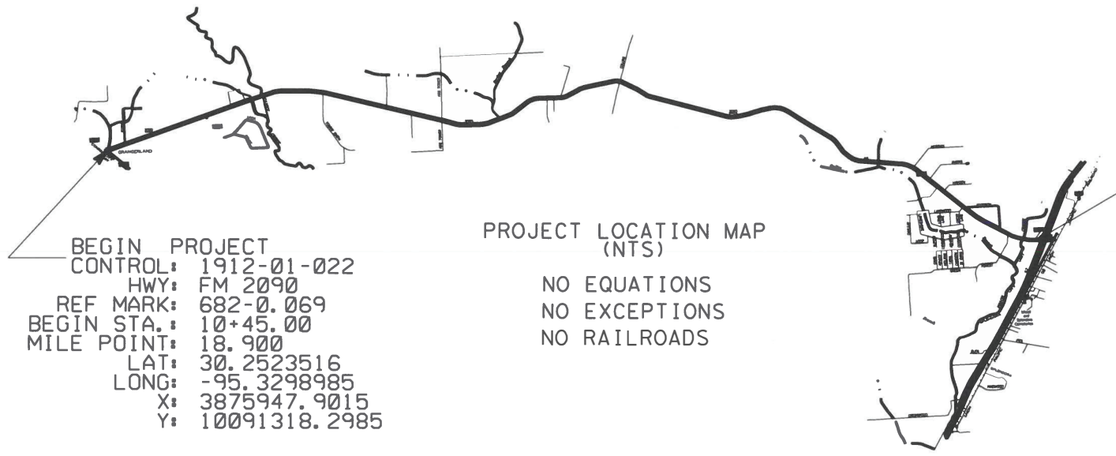
STATE	DISTRICT	COUNTY
TEXAS	HOU	MONTGOMERY

CONTROL	SECTION	JOB	SHEET NO.
1912	01	022	1



VICINITY MAP
MONTGOMERY COUNTY

NOT TO SCALE



PROJECT LOCATION MAP
(NTS)

NO EQUATIONS
NO EXCEPTIONS
NO RAILROADS

BEGIN PROJECT
CONTROL: 1912-01-022
HWY: FM 2090
REF MARK: 682-0.069
BEGIN STA.: 10+45.00
MILE POINT: 18.900
LAT: 30.2523516
LONG: -95.3298985
X: 3875947.9015
Y: 10091318.2985

END PROJECT
CONTROL: 1912-01-022
HWY: FM 2920
REF MARK: 692+0.709
END STA.: 568+80.00
MILE POINT: 29.517
LAT: 30.2324996
LONG: -95.1651582
X: 3927904.7613
Y: 10086482.1364

COUNTY MONTGOMERY PROJ. NO. C 1912-1-22
HWY. NO. FM 2090 LETTING DATE NOVEMBER 2022
CONTRACTOR NAME _____
CONTRACT BEGIN DATE _____
WORK COMPLETED DATE _____
DATE OF ACCEPTANCE _____

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND THE SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: REQUIRED LABOR PROVISION FOR STATE PROJECTS: SP000 - - - 008.

Texas Department of Transportation

SUBMITTED FOR LETTING: 8/29/2022

for _____, P.E.
AREA ENGINEER

APPROVED FOR LETTING: 9/2/2022

DocuSigned by:
James Koch , P.E.
8A2ACFA185D84C6...
FOR DISTRICT ENGINEER

	1	TITLE SHEET
	2	INDEX OF SHEETS
	3-5	FM 2090 EXISTING / PROPOSED TYPICAL SECTION
	6, 6A-G	GENERAL NOTES
	7, 7A	ESTIMATE & QUANTITY SHEET
	8	SUMMARY OF ROADWAY QUANTITIES
	9, 9A-D	DRIVEWAY & INTERSECTION QUANTITY SUMMARY
	9E	SUMMARY OF PROPOSED HIGH FRICTION CURVES
	10, 10A-B	SUMMARY OF PAVEMENT MARKING QUANTITIES
	11,11A-B	SUMMARY OF SMALL SIGNS

TRAFFIC CONTROL PLAN STANDARDS

*	12-23	BC (1) - 21 THRU BC (12) - 21
*	24	TCP (1-1) -18
*	25	TCP (1-2) -18
*	26	TCP (1-3) -18
*	27	TCP (2-1) -18
*	28	TCP (2-2) -18
*	29	TCP (2-3) -18
*	30	TCP (3-1) -13
*	31	TCP (3-3) -14
*	32	TCP (3-4) - 13
*	33	WZ (STPM) -13
*	34	WZ (BRK) - 13
*	35	WZ (BTS-1) - 13
*	36	WZ (BTS-2) - 13

ROADWAY DETAILS

	36A-D	FM 2090 HORIZONTAL ALIGNMENT DATA SHEETS
	37-79	FM 2090 ROADWAY AND PAVEMENT MARKING LAYOUT
	79A	FM 2090 SIGN DETAIL

ROADWAY DETAILS STANDARDS

*	80-82	DD (HOU DIST)

PAVEMENT MARKING AND DELINEATION STANDARDS

*	83	PM (1) - 20
*	84	PM (2) - 20
*	85	PM (3) - 20
*	86	SMD (FRP) - 08
*	87	SMD (GEN) - 08
*	88	SMD (TWT) - 08
*	89	PM (CLL) - 14
*	90	PM (WAS) - 07

ENVIRONMENTAL DATA

	91	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC
	91A	TXDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

TEMPORARY EROSION CONTROL STANDARDS

*	92	EC (1) - 16
*	93	EC (2) - 16
*	94	EC (3) - 16
*	95	EC (4) - 16
*	96-98	EC (9) - 16

THE STANDARD SHEETS SPECIFICALLY (*) IDENTIFIED ON THIS SHEET HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.
08.26.22

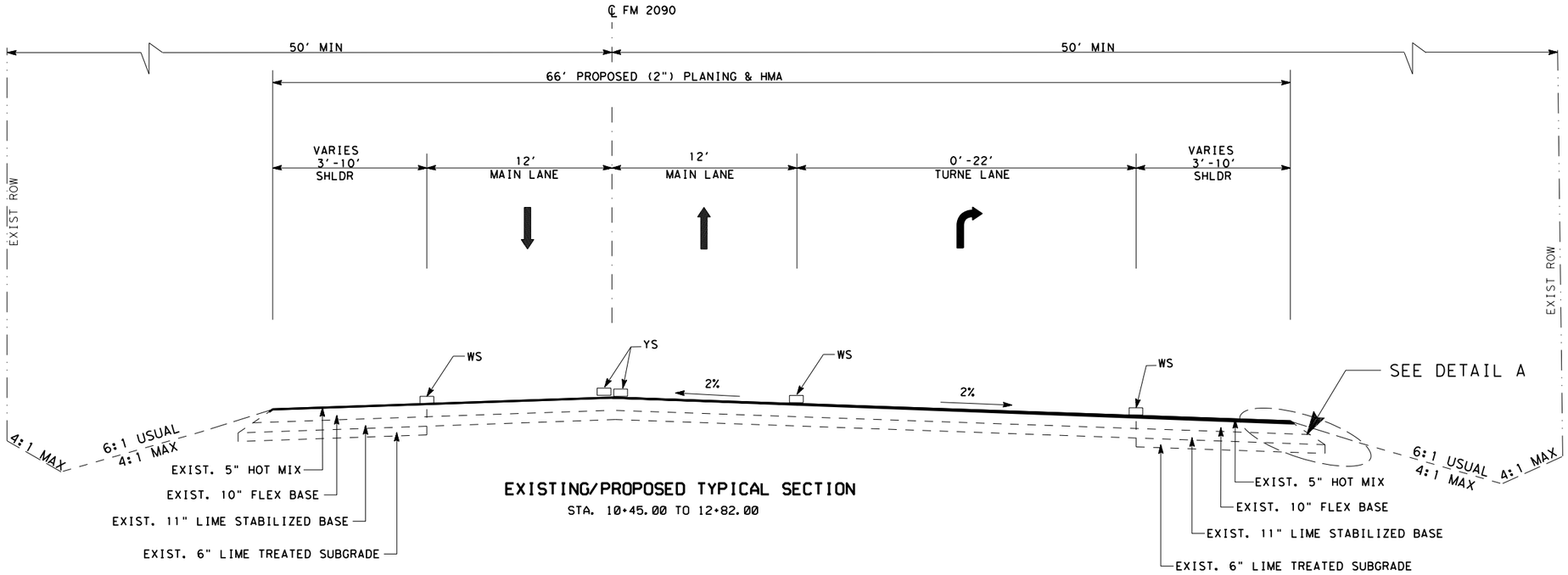
FM 2090
INDEX OF SHEETS

SHEET 1 OF 1

Texas Department of Transportation

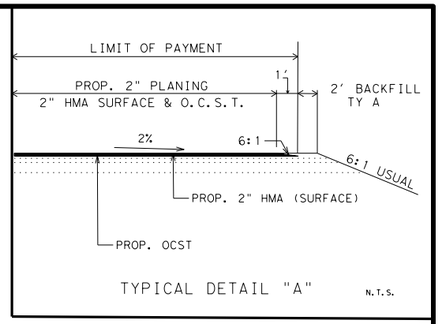
CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		2

DATE: 08/23/2022 03:03 PM
FILE:



EXISTING/PROPOSED TYPICAL SECTION

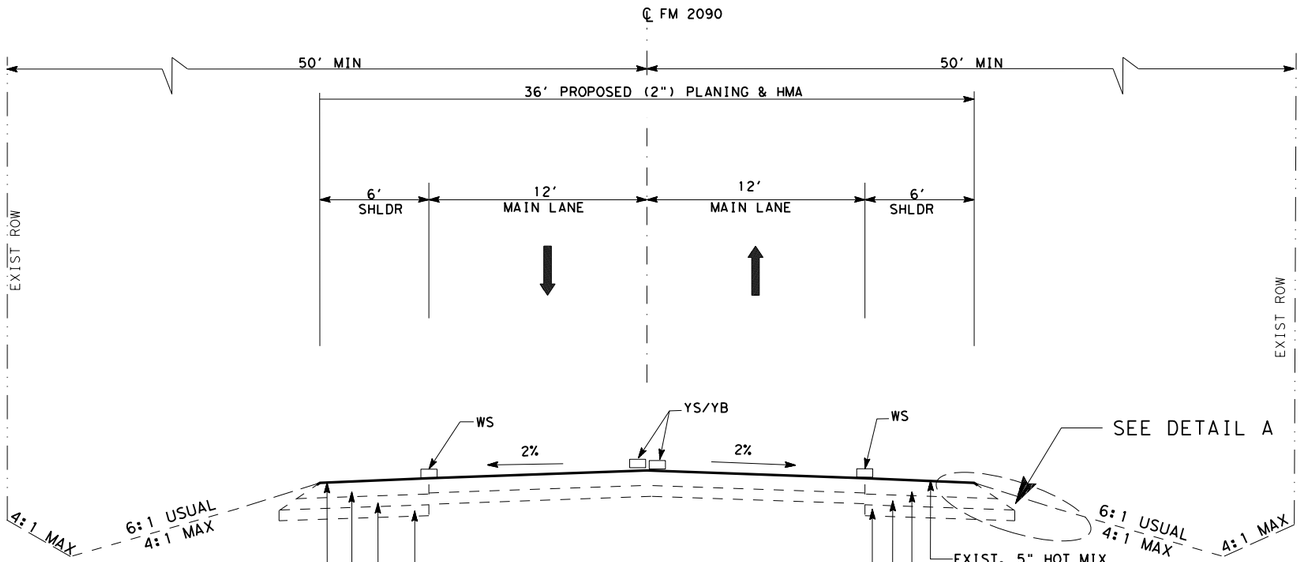
STA. 10+45.00 TO 12+82.00



TYPICAL DETAIL "A" N.T.S.

LEGEND:

YS = YELLOW SOLID STRIPING
YB = YELLOW BROKEN STRIPING
WB = WHITE BROKEN STRIPING
WS = WHITE SOLID STRIPING
ASB = AGREGATE SUBBASE
CTS = CEMENT TREATED SUBGRADE
LTS = LIME TREATED SUBGRADE



EXISTING/PROPOSED TYPICAL SECTION

STA. 12+82.00 TO STA. 56+93.00
STA.74+32.00 TO STA. 438+00.00
BRIDGES:
FM 2090 @ CANEY CREEK RELIEF STA. 93+78.00 TO 95+18.00
FM 2090 @ CANEY CREEK STA. 98+61.00 TO 102+06.00
FM 2090 @ SPRING BRANCH STA. 236+20.00 TO 239+00.00

STATE OF TEXAS
MICAH J. SCHLUTER
136908
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

08.26.22

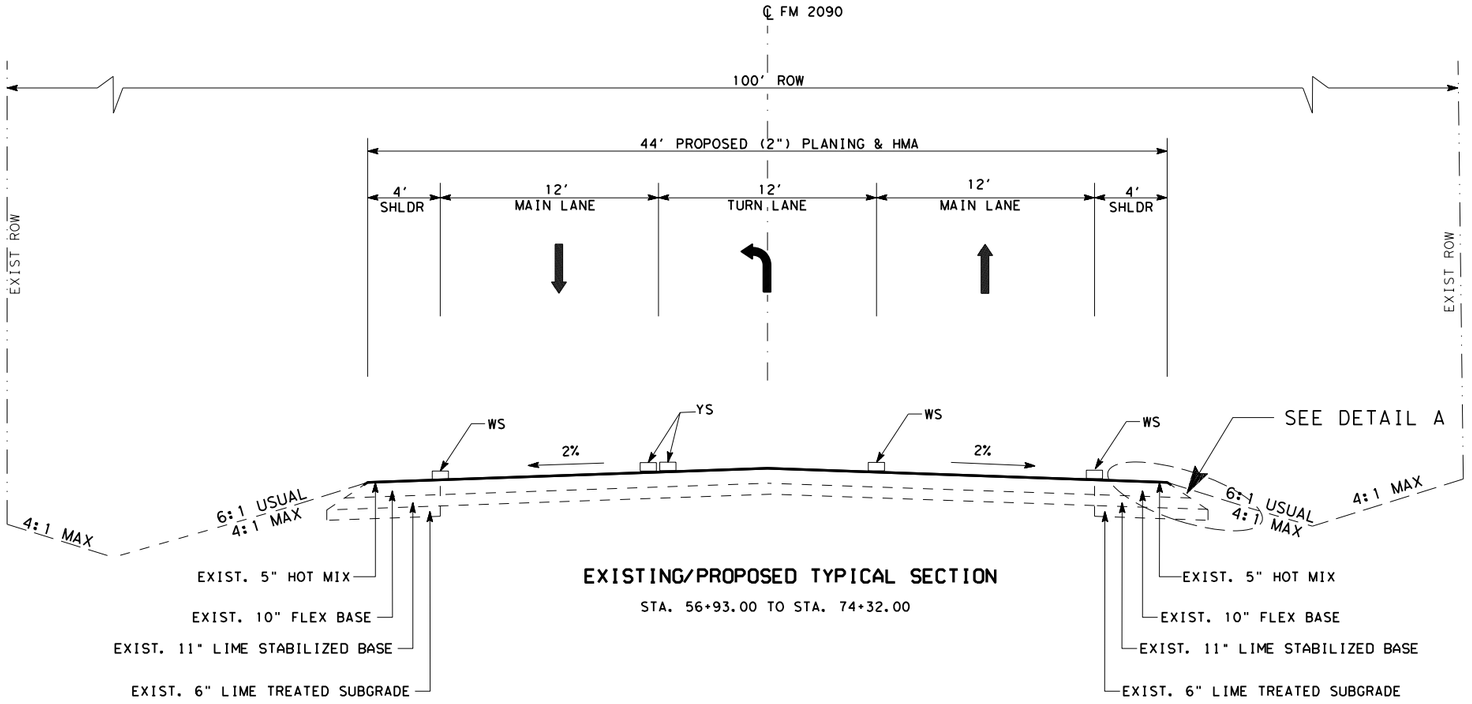
FM 2090
EXISTING/PROPOSED TYPICAL SECTION

SHEET 1 OF 3

Texas Department of Transportation

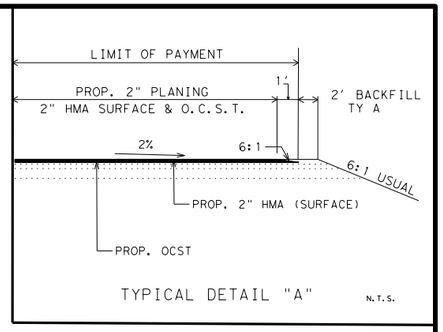
CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		3

DATE: 08/18/2022 03:15 PM
FILE:



EXISTING/PROPOSED TYPICAL SECTION

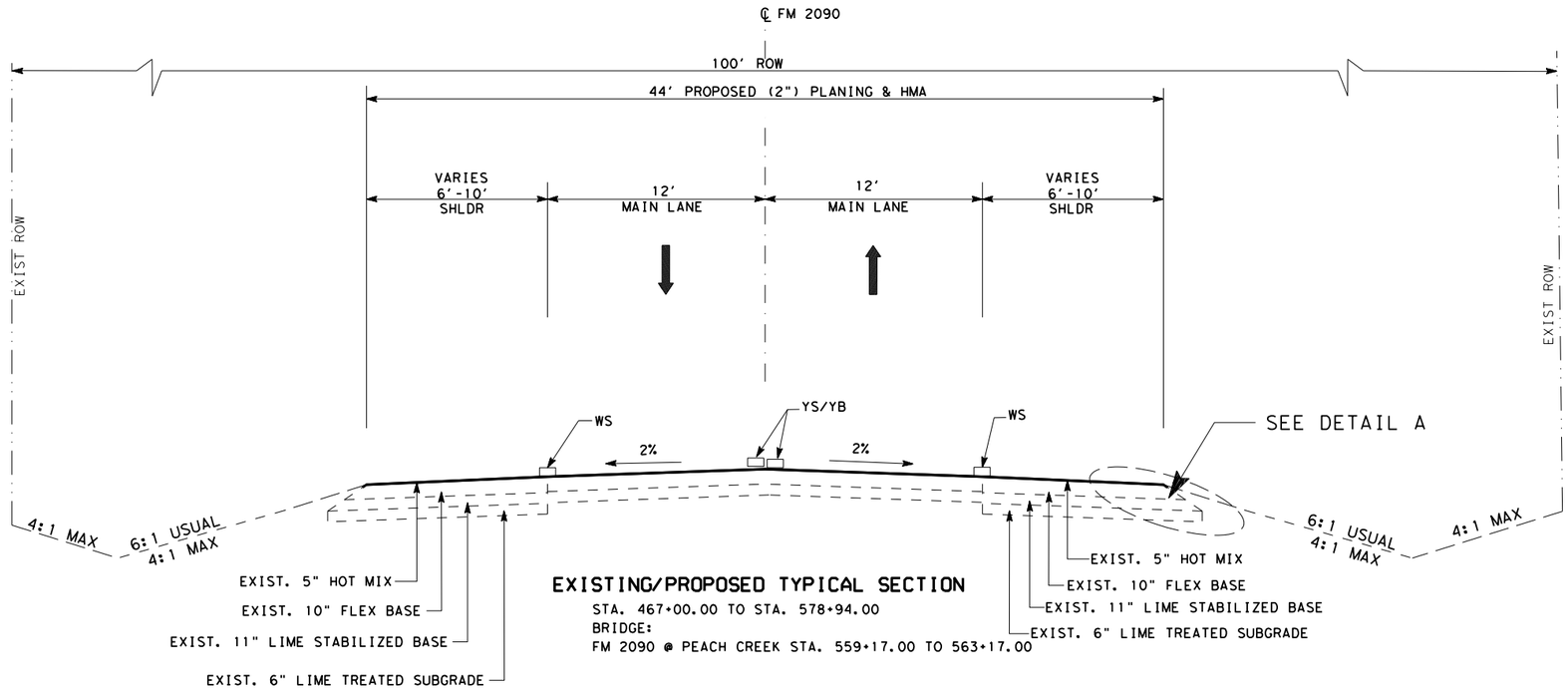
STA. 56+93.00 TO STA. 74+32.00



TYPICAL DETAIL "A" N.T.S.

LEGEND:

YS = YELLOW SOLID STRIPING
YB = YELLOW BROKEN STRIPING
WB = WHITE BROKEN STRIPING
WS = WHITE SOLID STRIPING
ASB = AGREGATE SUBBASE
CTS = CEMENT TREATED SUBGRADE
LTS = LIME TREATED SUBGRADE



EXISTING/PROPOSED TYPICAL SECTION

STA. 467+00.00 TO STA. 578+94.00
BRIDGE:
FM 2090 @ PEACH CREEK STA. 559+17.00 TO 563+17.00

STATE OF TEXAS
MICAH J. SCHLUTER
136908
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.
08.26.22

FM 2090
EXISTING/PROPOSED TYPICAL SECTION

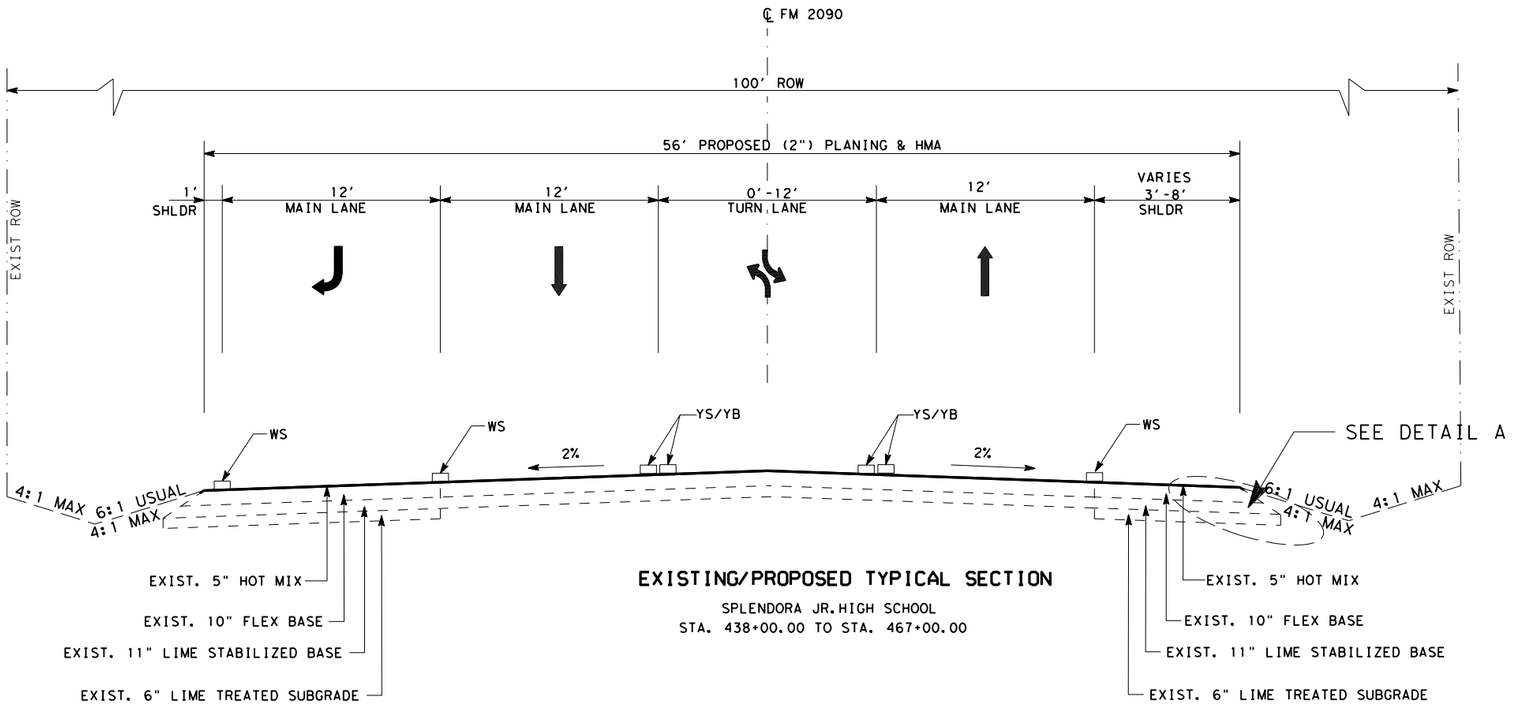
SHEET 2 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		4

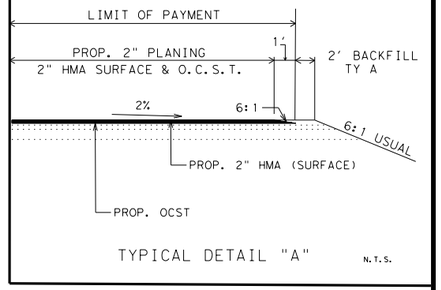
DATE: 08/24/2022 01:23 PM
FILE:

CK:
DW:
CK:
DN:



EXISTING/PROPOSED TYPICAL SECTION

SPLENDORA JR. HIGH SCHOOL
STA. 438+00.00 TO STA. 467+00.00



TYPICAL DETAIL "A" N.T.S.

LEGEND:

YS = YELLOW SOLID STRIPING
YB = YELLOW BROKEN STRIPING
WB = WHITE BROKEN STRIPING
WS = WHITE SOLID STRIPING
ASB = AGREGATE SUBBASE
CTS = CEMENT TREATED SUBGRADE
LTS = LIME TREATED SUBGRADE

STATE OF TEXAS
MICAH J. SCHLUTER
136908
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.
08.26.22

FM 2090
EXISTING/PROPOSED TYPICAL SECTION

SHEET 3 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		5

DATE: 08/05/2022 10:29 AM
FILE:

General Notes:

General:

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

Abraham M. Guzman, P.E. *Abe.Guzman@txdot.gov*
Matthew M. Connelly, P.E. *Matthew.Connelly@txdot.gov*

Contractor questions will be accepted through email, phone, and in person by the above individuals. Contractor questions will be reviewed by the Area Engineer or Assistant Area Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following address:

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

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

If fixed features require, the governing slopes shown may vary between the limits shown and to the extent determined by the Engineer.

Superelevate the curves to match the existing surface.

Notify the Engineer immediately if discrepancies are discovered in the horizontal control or the benchmark data.

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

The cost for materials, labor, and incidentals to provide for traffic across the roadway and for ingress and egress to private property in accordance with Section 7.2.4 of the standard specifications is subsidiary to the various bid items. Restore access roadways to their original condition upon completing construction.

Grade street intersections and median openings for surface drainage.

If a foundation is to be placed where a riprap surface or an asphalt concrete surface presently exists, use caution in breaking out the existing surface for placement. Break out no greater area than is required to place the foundation. After placing the foundation, wrap the periphery with 0.5 in. pre-molded mastic expansion joint. Then replace the remaining portion of the broken out surface with Class A or Class C concrete or cold mix asphalt concrete to the exact slope, pattern, and thickness of the existing riprap or asphalt. Payment for breaking out the existing surface, wrapping the foundation, and replacing the surface is subsidiary to the various bid items.

The lengths of the posts for ground mounted signs and the tower legs for the overhead sign supports are approximate. Verify the lengths before ordering these materials to meet the existing field conditions and to conform to the minimum sign mounting heights shown in the plans.

Furnish aluminum Type A signs instead of plywood signs for signs shown on the Summary of Small Signs sheet.

Clearly mark or highlight on the shop drawings, the items being furnished for this project. Submit required shop drawings in accordance with the shop drawing distribution list shown in the note for Item 5 for review and distribution.

Procure permits and licenses, which are to be issued by the City, County, or Municipal Utility District.

General: Site Management

Mow the grass and weeds within the project limits a maximum of 3 times a year as directed. This work is subsidiary to the various bid items.

Mark stations every 100 ft. and maintain the markings for the project duration. Remove the station markings at the completion of the project. This work is subsidiary to the various bid items.

Do not mix or store materials, or store or repair equipment, on top of concrete pavement or bridge decks unless authorized by the Engineer. Permission will be granted to store materials on surfaces if no damage or discoloration will result.

Assume ownership of debris and dispose of at an approved location. Do not dispose of debris on private property unless approved in writing by the District Engineer.

Control the dust caused by construction operations. For sweeping the base material in preparation for laying asphalt and for sweeping the finished concrete pavement, use one of the following types of sweepers or approved equal:

Tricycle Type	**Truck Type - 4 Wheel**
Wayne Series 900	M-B Cruiser II
Elgin White Wing	Wayne Model 945
Elgin Pelican	Mobile TE-3
	Mobile TE-4
	Murphy 4042

County: Montgomery **Control:** 1912-01-022

Highway: FM 2090

General: Traffic Control and Construction

Schedule construction operations such that preparing individual items of work follows in close sequence to constructing storm drains in order to provide as little inconvenience as practical to the businesses and residents along the project.

Schedule work so that the base placement operations follow the subgrade work as closely as practical to reduce the hazard to the traveling public and to prevent undue delay caused by wet weather.

This project requires extensive grading operations in an environmentally sensitive area.

If relocating mailboxes, place them with the post firmly in the ground at nearby locations. Upon completing the project, the Engineer will locate the final mailbox placement. Perform this work in accordance with the requirements of the Item, "Mailbox Assemblies," except for measurement and payment. This work is subsidiary to the various bid items.

If fences cross construction easements shown on the plans and work is required beyond the fences, remove and replace the fences as directed. This work and the materials are subsidiary to the various bid items.

When design details are not shown on the plans, provide signs and arrows conforming to the latest "Standard Highway Sign Designs for Texas" manual.

General: Utilities

Consider the locations of underground utilities depicted in the plans as approximate and employ responsible care to avoid damaging utility facilities. Depending upon scope and magnitude of planned construction activities, advanced field confirmation by the utility owner or operator may be prudent. Where possible, protect and preserve permanent signs, markers, and designations of underground facilities.

If the Contractor damages or causes damage (breaks, leaks, nicks, dents, gouges, etc.) to the utility, contact the utility facility owner or operator immediately.
At least 72 hours before starting work, make arrangements for locating existing Department-owned above ground and underground fiber optic, communications, power, illumination, and traffic signal cabling and conduit. Do this by calling the Department's Houston District Traffic Signal Operations Office at 713-802-5662, or by e-mailing the Department's Houston District Traffic Signal Operations Office at HOU-LocateRequest@txdot.gov, to schedule marking of underground lines on the ground. Use caution if working in these areas to avoid damaging or interfering with existing facilities.

Notify the Engineer at least 48 hours before constructing junction boxes at storm drain and utility intersections.

County: Montgomery **Control:** 1912-01-022

Highway: FM 2090

Install or remove poles and luminaires located near overhead or underground electrical lines using established industry and utility safety practices. Consult the appropriate utility company before beginning such work.

If overhead or underground power lines need to be de-energized, contact the electrical service provider to perform this work. Costs associated with de-energizing the power lines or other protective measures required are at no expense to the Department.

If working near power lines, comply with the appropriate sections of Texas State Law and Federal Regulations relating to the type of work involved.

Perform electrical work in conformance with the National Electrical Code (NEC) and Department's standard sheets.

Before beginning any underground work, notify the City of Conroe's Chief Inspector, Public Works and Engineering, to establish the locations of any existing electrical systems for lighting facilities within the limits of this project.

Item 5: Control of Work

Before contract letting, cross-section data for this project will be available to the prospective bidders in PDF format on the Department's Houston District website located at:

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/Houston%20District/Construction%20Projects/

The cross-section data provided above is for non-construction purposes only and it is the responsibility of the prospective bidder to validate the data with the appropriate plans, specifications, and estimates for the projects.

Submit shop drawings electronically for the fabrication of items as documented in Table 1 or Table 2 below. Information and requirements for electronic submittals can be viewed in the "Guide to Electronic Shop Drawing Submittal" which can be accessed through the following web link, ftp://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf. References to 11 in. x 17 in. sheets in individual specifications for structural items imply electronic CAD sheets.

Table 1
2014 Construction Specification Required Shop/Working Drawing Submittals - TxDOT Generated Plans

Spec Item No.'s	Product	Submittal Required	Approval Required (Y/N)	Contractor/ Fabricator P.E. Seal Required	Reviewing Party	Shop or Working Drawing (Note 1)
7.16.1&.2	Construction Load Analyses	Y	Y	Y	B	WD
400	Excavation and Backfill for Structures (cofferdams)	Y	N	Y	A	WD
403	Temporary Special Shoring	Y	N	Y	C	WD

420	Formwork/Falsework	Y	N	Y	A	WD
423	Retaining Walls, (calcs req'd.)	Y	Y	Y	C	SD
425	Optional Design Calculations (Prstrs Bms)	Y	Y	Y	B	SD
425	Prestr Concr Sheet Piling	Y	Y	N	B	SD
425	Prestr Concr Beams	Y	Y	N	B	SD
425	Prestr Concr Bent	Y	Y	N	B	SD
426	Post Tension Details	Y	Y	N	B	SD
434	Elastomeric Bearing Pads (All)	Y	Y	N	B	SD
441	Bridge Protective Assembly	Y	Y	N	B	SD
441	Misc Steel (various steel assemblies)	Y	Y	N	B	SD
441	Steel Pedestals (bridge raising)	Y	Y	N	B	SD
441	Steel Bearings	Y	Y	N	B	SD
441	Steel Bent	Y	Y	N	B	SD
441	Steel Diaphragms	Y	Y	N	B	SD
441	Steel Finger Joint	Y	Y	N	B	SD
441	Steel Plate Girder	Y	Y	N	B	SD
441	Steel Tub-Girders	Y	Y	N	B	SD
441	Erection Plans, including Falsework	Y	N	Y	A	WD
449	Sign Structure Anchor Bolts	Y	Y	N	T	SD
450	Railing	Y	Y	N	A	SD
462	Concrete Box Culvert	Y	Y	N	C	SD
462	Concrete Box Culvert (Alternate Designs Only,calcs reqd.)	Y	Y	Y	B	SD
464	Reinforced Concrete Pipe (Jack and Bore only; ONLY when requested)	Y	Y	Y	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets	Y	Y	N	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets (Alternate Designs Only, calcs req'd.)	Y	Y	Y	B	SD
466	Pre-cast Headwalls and Wingwalls	Y	Y	N	A	SD
467	Pre-cast Safety End Treatments	Y	Y	N	A	SD
495	Raising Existing Structure (calcs reqd.)	Y	Y	Y	B	SD
610	Roadway Illumination Supports (Non-Standard only, calcs reqd.)	Y	Y	Y	BRG	SD
613	High Mast Illumination Poles (Non-standard only, calcs reqd.)	Y	Y	Y	BRG	SD
627	Treated Timber Poles	Y	Y	N	T	SD
644	Special Non-Standard Supports (Bridge Mounts, Barrier Mounts, Etc.)	Y	Y	Y	T	SD
647	Large Roadside Sign Supports	Y	Y	Y	T	SD
650	Cantilever Sign Structure Supports - Alternate Design Calcs.	Y	Y	Y	T	SD
650	Sign Structures	Y	Y	N	T	SD
680	Installation of Highway Traffic Signals	Y	Y	N	T	SD
682	Vehicle and Pedestrian Signal Heads	Y	Y	N	T	SD
684	Traffic Signal Cables	Y	Y	N	T	SD

685	Roadside Flashing Beacon Assemblies	Y	Y	N	T	SD
686	Traffic Signal Pole Assemblies (Steel) (Non-Standard only)	Y	Y	Y	T	SD
687	Pedestal Pole Assemblies	Y	Y	N	T	SD
688	Detectors	Y	Y	N	A	SD
784	Repairing Steel Bridge Members	Y	Y	Y	B	WD
SS	Prestr Concr Crown Span	Y	Y	N	B	SD
SS	Sound Barrier Walls	Y	Y	Y	A	SD
SS	Camera Poles	Y	Y	Y	TMS	SD
SS	Pedestrian Bridge (Calcs req'd.)	Y	Y	Y	B	SD
SS	Screw-In Type Anchor Foundations	Y	Y	N	T	SD
SS	Fiber Optic/Communication Cable	Y	Y	N	TMS	SD
SS	Spread Spectrum Radios for Signals	Y	Y	N	T	SD
SS	VIVDS System for Signals	Y	Y	N	T	SD
SS	CTMS Equipment	Y	Y	N	TMS	SD

Notes:

1. Document flow for Working Drawings differs from Shop Drawings in that Working Drawings must be submitted to the Engineer rather than the Engineer of Record and they are for the information of the Engineer only; an approval stamp and distribution to all project offices is not required.

Key to Reviewing Party

A - Area Office

Area Office	Email Address
Brazoria Area Office	HOU-BRZAShpDrwgs@txdot.gov
Fort Bend Area Office	HOU-FBAShpDrwgs@txdot.gov
Galveston Area Office	HOU-GALVAShpDrwgs@txdot.gov
Montgomery Area Office	HOU-MONTAShpDrwgs@txdot.gov
North Harris Area Office	HOU-NHAShpDrwgs@txdot.gov
Southeast Area Office	HOU-SEHAShpDrwgs@txdot.gov
Traffic Systems Construction Office	HOU-TSCShpDrwgs@txdot.gov
West/Central Harris Area Office	HOU-WWCHAOShpDrwgs@txdot.gov

B - Houston Bridge Engineer

Bridge Design (Houston TxDOT)	HOU-BrgShpDrwgs@txdot.gov

BRG - Austin Bridge Division

Bridge Design (Austin TxDOT)	BRG_ShopPlanReview@txdot.gov

C - Construction Office

Construction	HOU-ConstrShpDrwgs@txdot.gov
Laboratory	HOU-LabShpDrwgs@txdot.gov

T - Traffic Engineer

Traffic Operations	HOU-TrfShpDrwgs@txdot.gov

TMS – Traffic Management System

Computerized Traffic Management Systems (CTMS)	HOU-CTMSShpDrwgs@txdot.gov

Item 7: Legal Relations and Responsibilities

Do not initiate activities in a Project Specific Location (PSL), associated with a U.S. Army Corps of Engineers (USACE) permit area, that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include those pertaining to, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here means materials are delivered to or from the PSL. The permit area includes the waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. Assume responsibility for consultations with the USACE regarding activities, including PSLs that have not been previously evaluated by the USACE. Provide the Department with a copy of consultations or approvals from the USACE before initiating activities.

The Contractor may proceed with activities in PSLs that do not affect a USACE permit area if a self-determination has been made that the PSL is non-jurisdictional or if proper USACE clearances have been obtained in jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. The Contractor is solely responsible for documenting any determinations that their activities do not affect a USACE permit area. Maintain copies of their determinations for review by the Department or any regulatory agency.

Document and coordinate with the USACE, if required, before hauling any excavation from or hauling any embankment to a USACE permit area by either 1 or 2 below:

1. **Restricted Use of Materials for the Previously Evaluated Permit Areas.** Document both the Project Specific Locations (PSL) and their authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:
   a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in the Item, “Excavation” is used for permanent or temporary fill (under the Item, “Embankment”) within a USACE permit area.
   b. Suitable embankment (under the Item, “Embankment”) from within the USACE permit area is used as fill within a USACE evaluated area.
   c. Unsuitable excavation or excess excavation, “Waste” (under the Item, “Excavation”), that is disposed of at a location approved within a USACE evaluated area.

2. **Contractor Materials from Areas Other than Previously Evaluated Areas.** Provide the Department with a copy of USACE coordination or approvals before initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:
   a. The Item, “Embankment” used for temporary or permanent fill within a USACE permit area.
   b. Unsuitable excavation or excess excavation, “Waste” (under the Item, “Excavation”), that is disposed of outside a USACE evaluated area.

This project does not require a U.S. Army Corps of Engineers (USACE) Section 404 Permit before letting, but if a permit is needed during construction, assume responsibility for preparing the permit application. Submit the permit application to the Department’s District Environmental Section for approval. Once the permit application is approved, the Department will submit it to the USACE. Assume responsibility for the requested revisions, in coordination with the Department’s District Environmental Section.

Maintain the roadway slope stability. Maintaining slope stability is subsidiary to the various bid items.

The nesting / breeding season for migratory birds is February 15 through September 30.

Conduct any tree removal outside of the migratory bird nesting season. If this is not possible due to scheduling, then exercise caution to remove only those trees with no active nests. Do not destroy nests on structures or in trees within the project limits during the nesting / breeding season.

Take measures to prevent the building of nests on any structures or trees within the project limits throughout the duration of the construction if work / removal will be performed during the nesting / breeding season. This can be accomplished by application of bird repellent gel, netting by hand every 3 to 4 days, or any other non-threatening method approved by the Houston District Environmental Section. Obtain this approval well in advance of the planned use. Contact the Houston District Environmental Section at 713-802-5244. The cost of this work is subsidiary to the various bid items.

No significant traffic generator events have been identified.

Item 8: Prosecution and Progress

The Department will not adjust the number of days for the project and milestones, if any, due to differences in opinion regarding any assumptions made in the preparation of the schedule or for errors, omissions, or discrepancies found in the time determination schedule.

Working days will be computed and charged based on a standard workweek in accordance with Section 8.3.3.2.2.

The maximum number of days the time charges on this contract may be suspended due to contractor mobilization, and material fabrication/accumulation or processing delays is 60 days. The Engineer and the Contractor may mutually agree, in writing, to decrease this maximum number of days.

The Lane Closure Assessment Fee is $100.00. This fee applies to the Contractor for closures or obstructions that overlap into restricted hour traffic for each hour or portion thereof, per lane, regardless of the length of lane closure or obstruction. For Restricted Hours subject to Lane Assessment Fee refer to the Item, “Barricades, Signs, and Traffic Handling.” The time increment for the Lane Closure Assessment fee for this project is one hour.

County: Montgomery **Control:** 1912-01-022

Highway: FM 2090

Item 134: Backfilling Pavement Edges

Quantity by station includes both sides of the roadway.

The Contractor has the option of selecting the type of backfill material consisting of Reclaimable Asphalt Pavement (RAP), Flex Base, or Crushed Concrete provided that it meets the requirements listed below.

If using salvaged asphalt concrete pavement, size it so that all the material, passes the 2-in. sieve. Use RAP that does not contain deleterious material such as clay or organic material.

Flex Base must meet the requirements of Item 247, Type A, Grade 1-2. Department Test Method Tex-117-E will not be required.

Crushed concrete must meet the requirements of Item 247, Grade 1-2. Department Test Methods Tex-116-E and Tex-117-E will not be required.

Place emulsified asphalt (SS-1, CSS-1, or CSS-1H) at an application rate of 0.25 gal/sq. yard.

Item 204: Sprinkling

Perform subsidiary sprinkling as required under various other items in accordance with the Item, "Sprinkling."

Sprinkling for dust control is subsidiary to the various bid items.

Item 210: Rolling

Use a medium pneumatic roller meeting the requirements of Item 210 as directed. This work is subsidiary to the various bid items. On every asphalt shot, use a minimum of 3 pneumatic rollers or as directed. Use approved rolling patterns. Successive asphalt shots will not be allowed until acceptable rolling has been accomplished on the preceding asphalt shot.

Item 316: Seal Coat

The asphalt application rate shown on the "Basis of Estimate" is an average rate for calculating asphalt quantities. Vary the rate based on the pavement conditions and other factors such as the type and grade of aggregate used, weather, and traffic.

Item 351: Flexible Pavement Structure Repair

Use asphalt stabilized base for the base material.

County: Montgomery **Control:** 1912-01-022

Highway: FM 2090

For base repair, place the asphalt stabilized base in compacted lifts of 4 in. maximum, unless otherwise directed.

Item 354: Planing and Texturing Pavement

Stockpile the material at The Department's Maintenance yard located at 901 N. FM 3083 E. Conroe, TX 77303 as directed by Abraham M. Guzman, P.E. at (936) 538-3300.

Item 502: Barricades, Signs, and Traffic Handling

Use a traffic control plan for handling traffic through the various phases of construction. Follow the phasing sequence unless otherwise agreed upon by the Area Engineer and the Project Manager. Ensure this plan conforms to the latest "Texas Manual on Uniform Traffic Control Devices" and the latest Barricade and Construction (BC) Standard Sheets. The latest versions of Work Zone Standard Sheets WZ (BTS-1) and WZ (BTS-2) are the traffic control plan for the signal installations.

Submit changes to the traffic control plan to the Area Engineer. Provide a layout showing the construction phasing, signs, striping, and signalizations for changes to the original traffic control plan.

Furnish and maintain the barricades and warning signs, including the necessary temporary and portable traffic control devices, during the various phases of construction. Place and construct these barricades and warning signs in accordance with the latest "Texas Manual on Uniform Traffic Control Devices" for typical construction layouts.

Cover work zone signs when work related to the signs is not in progress, or when any hazard related to the signs no longer exists.

Keep the delineation devices, signs, and pavement markings clean. This work is subsidiary to the Item, "Barricades, Signs, and Traffic Handling."

If a section is not complete before the end of the workday, pull back the base material to the existing pavement edge on a 6H: 1V slope. Edge drop-offs during the hours of darkness are not permitted.

Before detouring traffic onto the mainlane shoulders, remove dirt, debris, vegetation, and other deleterious material from the surface of the shoulders. Appropriately sign the detour in an approved manner. This work is subsidiary to the various bid items.

Coordinate and schedule the work with the appropriate Metro representative if requiring access to the High Occupancy Vehicle lanes.

Cover or remove the permanent signs and construction signs that are incorrect or that do not apply to the current situation for a particular phase.

Replace the overhead signs, informational signs, and exit signs to be removed, with temporary signs providing the correct information to the traveling public. Size the replacement signs and include them in the traffic control plan.

Do not mount signs on drums or barricades, except those listed in the latest Barricades and Construction standard sheets.

Use traffic cones for daytime work only. Replace the cones with plastic drums during nighttime hours.

Place positive barriers to protect drop-off conditions greater than 2 ft. within the clear zone that remain overnight.

Do not reduce the existing number of lanes open to traffic except as shown on the following time schedule:

One Lane Closure

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Monday	8:30 AM – 3:30 PM	9:00 PM – 12:00 AM	12:00 AM – 8:30 AM 3:30 PM – 9:00 PM
Tuesday	8:30 AM – 3:30 PM	12:00 AM – 5:00 AM 9:00 PM – 12:00 AM	12:00 AM – 8:30 AM 3:30 PM – 9:00 PM
Wednesday	8:30 AM – 3:30 PM	12:00 AM – 5:00 AM 9:00 PM – 12:00 AM	12:00 AM – 8:30 AM 3:30 PM – 9:00 PM
Thursday	8:30 AM – 3:30 PM	12:00 AM – 5:00 AM 9:00 PM – 12:00 AM	12:00 AM – 8:30 AM 3:30 PM – 9:00 PM
Friday	8:30 AM – 3:30 PM	12:00 AM – 5:00 AM 9:00 PM – 12:00 AM	12:00 AM – 8:30 AM 3:30 PM – 9:00 PM
Saturday/ Sunday	No Weekend Closures	No Weekend Closures	12:00 AM – 11:59 PM

The above times are approved for the traffic control conditions listed. The Area Engineer may approve other closure times if traffic counts warrant. The Area Engineer may reduce the above times for special events.

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Before payment will be made, complete the "Daily Report on Law Enforcement Force Account Work" (Form 318), provided by the Department and submit daily invoices that agree with this form for any day during the month in which approved services were provided.

Provide full-time, off-duty, uniformed, certified peace officers, as part of traffic control operations. The peace officers must be able to show proof of certification by the Texas Commission on Law Enforcement Officers Standards. The cost of the officers is paid for on a force account basis.

During construction, remove, cover, adjust, or replace overhead sign panels to correspond with each current traffic control phase. The desirable size of letters for freeways is 10 in., the minimum is 8 in. This work is subsidiary to Item 502.

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.

.Item 506: Temporary Erosion, Sedimentation and Environmental Controls

The use of hay bales is not permitted as Storm Water Pollution Prevention Plan (SWP3) measures.

The Storm Water Pollution Prevention Plan (SWP3) consists of temporary erosion control measures needed and provided for under this Item. The disturbed area is less than one acre and use of erosion control measures is not anticipated. If physical conditions encountered at the job site require necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per Articles 4.4 and 9.7. Since the disturbed area is less than 5 acres, a "Notice of Intent" (NOI) is not required.

Item 585: Ride Quality for Pavement Surfaces

To eliminate the need for corrective action due to excessive deviations in the final surface layers, exercise caution to ensure satisfactory profile results in the intermediate paving layers (mixture).

Milling will not be allowed as a corrective action for excessive deviations in the final surface layer of hot-mix asphalt.

Item 636: Signs

For design details not shown on the plans, provide signs and arrows conforming to the latest "Standard Highway Sign Designs for Texas" manual.

Item 644: Small Roadside Sign Assemblies

Sign locations shown on the plans are approximate. Before placing them, obtain approval of and then stake the exact locations for these signs.

Use the Texas Universal Triangular Slip Base with the concrete foundation for small ground mounted signs, unless otherwise shown in the plans.

Remove existing street name signs from existing stop signs and re-install them above the new stop signs. Removing and re-installing existing street name signs is subsidiary to the Item, "Small Roadside Sign Assemblies."

When design details are not shown on the plans, provide signs and arrows conforming to the latest "Standard Highway Sign Designs for Texas" manual.

Use Type E Super High Specific Intensity (Fluorescent Prismatic) yellow green reflective sheeting background to fabricate school signs (S1-1, S3-1, S4-3, S5-1, W16-2, SW16-9p, and SW16-7pL(R)).

Assume ownership of the removed existing signs.

Locations of the relocated signs are approximate. Before placing them, obtain approval of and then stake the exact locations for these signs.

Replace existing signs that become damaged during relocation at no expense to the Department.

Item 666: Reflectorized Pavement Markings
Item 6038: Multipolymer Pavement Markings (MPM)

Use Type III glass beads for thermoplastic and multipolymer pavement markings.

Use a 0.100 in. (100 mil) thickness for thermoplastic pavement markings, measured to the top of the thermoplastic, not including the exposed glass beads.

Use a 0.022 in. (22 mil) thickness for multipolymer pavement markings, measured to the top of the multipolymer, not including the exposed glass beads.

For roadways with asphalt surfaces to be striped with work zone or permanent thermoplastic markings, the Contractor has the option to apply paint and beads markings for a maximum 30-day period until

placing the thermoplastic markings, or until starting the succeeding phase of work on the striped area. Maintain the paint and beads markings, at no expense to the Department, until placing the thermoplastic markings or starting the succeeding phase of work on the striped area. The work zone markings, whether paint and beads or thermoplastic, are paid under the Item, "Work Zone Pavement Markings" and the markings are paid for only once for the given phase of construction.

If using paint and bead markings as described above, purchase the traffic paint from the open market.

If the Type II markings become dirty and require cleaning by washing, brushing, compressed air, or other approved methods before applying the Type I thermoplastic markings, this additional cleaning is subsidiary to the Item, "Reflectorized Pavement Markings."

Establish the alignment and layout for work zone striping and permanent striping.

Stripe all roadways before opening them to traffic.

Place pavement markings under these items in accordance with details shown on the plans, the latest "Texas Manual on Uniform Traffic Control Devices," or as directed.

When design details are not shown on the plans, provide pavement markings for arrows, words, and symbols conforming to the latest "Standard Highway Sign Designs for Texas" manual.

Item 672: Raised Pavement Markers

If other operations are complete on the project and if the curing time period is not yet elapsed, the contract time will be suspended until the curing is done.

Before placing the raised pavement markers on concrete pavement, blast clean the surface using an abrasive-blasting medium. This work is subsidiary to the Item, "Raised Pavement Markers."

Provide epoxy adhesive that is machine-mixed or nozzle-mixed and dispensed. Equip the machine or nozzle with a mechanism to ensure positive mix measurement control.

Item 678: Pavement Surface Preparation for Markings

Do not blast clean asphalt concrete pavement. Clean asphalt concrete pavement as required under the applicable specifications or as directed.

On new concrete pavement or on existing concrete pavement when placing a new stripe on a new location, remove the curing compounds and contamination from the pavement surface by flail milling or as directed. In addition, air-blast the surface with compressed air just before placing the new stripe.

On existing concrete pavement when placing a new stripe on an existing location, after removing the existing stripe under the Item, "Eliminating Existing Pavement Markings and Markers," air-blast the surface with compressed air just before placing the new stripe.

Do not clean concrete pavement by grinding.

Item 3076: Dense-Graded Hot Mix Asphalt

Taper the asphalt concrete pavement at the beginning and ending points.

Use a maximum 6H:1V slope for the asphalt concrete pavement edge.

Where the 6H:1V ACP edge taper extends over onto the unsurfaced shoulders, blade off the loose existing shoulder material to provide a solid base for the outside taper edge. After placing the ACP overlay, blade this material back against the edge taper. This work is subsidiary to the various bid items.

The stockpile will be the point of sampling of coarse aggregate for test method TEX-217-F (Part II, decantation).

Place the asphalt concrete pavement in courses as shown on the typical sections.

Do not use petroleum-based solvents in the beds of hot mix asphalt delivery vehicles.

Dilution of tack coat is not allowed.

Do not use Surface Aggregate Classification (SAC) C for this project.

For determining the Asphalt Content, only ignition ovens will be allowed.

The tack coat rate shown on the "Basis of Estimate" is an average rate for calculating tack coat quantities. Vary the rate based on the pavement conditions and other factors such as manufacturer's recommendations and weather.

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

A shadow vehicle with Truck Mounted Attenuators (TMAs) or Trailer Attenuators (TAs) is required as shown on the appropriate Traffic Control Plan (TCP) sheets. TMAs/TAs must meet the requirements of the Compliant Work Zone Traffic Control Device List.

Level 3 Compliant TMAs/TAs are required for this project.

A total of one (1) shadow vehicle with a TMA/TA is required for the work with the exception of Pavement Marking Operations. The Contractor is responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed on the project.

A total of three (3) shadow vehicles with a TMA/TA are required for Pavement Marking Operations. The Contractor is responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed on the project.

Basis of Estimate

Item	Description	Limit and Rate	Unit
134	Backfilling Pavement Edges • Asphalt Emulsion	 0.25 Gal. / Sq. Yd.	STA
292	Asphalt Treatment (Plant-Mixed) • Asphalt • Aggregate	110 Lb. / Sq. Yd.-In. 5 % by weight 95 % by weight	TON
316	Seal Coat • Asphalt • Aggregate (Gr 4) A-R Binder • Asphalt • Aggregate (Gr 4)	 0.32 Gal. / Sq. Yd. 1/130 Cu. Yd. / Sq. Yd. 0.42 Gal. / Sq. Yd. 1/130 Cu. Yd. / Sq. Yd.	 GAL CY GAL CY
3076	Dense-Graded Hot Mix Asphalt • Asphalt • Aggregate Tack Coat • Applied on new HMA • Applied on Existing HMA • Applied on Milled HMA	110 Lb. / Sq. Yd.-In. 6 % by weight 94 % by weight 0.06 Gal. / Sq. Yd. 0.09 Gal. / Sq. Yd. 0.11 Gal. / Sq. Yd.	TON

* If used in existing roadway base, rate will be determined on a case by case basis.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1912-01-022 **DISTRICT** Houston **COUNTY** Montgomery
HIGHWAY FM 2090

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**1912-01-022**			
		PROJECT ID		**A00124135**			
		COUNTY		**Montgomery**			
		HIGHWAY		**FM 2090**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	134-6001	BACKFILL (TY A)	STA	557.000		557.000	
	316-6001	ASPH (MULTI OPTION)	GAL	75,877.000		75,877.000	
	316-6434	AGGR (TY-PB GR-4 OR TY-PL GR-4 (SAC-B)	CY	1,824.000		1,824.000	
	351-6011	FLEXIBLE PAVEMENT STRUCTURE REPAIR(18")	SY	5,573.000		5,573.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	253,633.000		253,633.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	9.000		9.000	
	530-6002	INTERSECTIONS (ACP)	SY	3,736.000		3,736.000	
	530-6005	DRIVEWAYS (ACP)	SY	12,782.000		12,782.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)	LF	22,069.000		22,069.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	72.000		72.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	66.000		66.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	57.000		57.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	6.000		6.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	133.000		133.000	
	662-6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF	300.000		300.000	
	662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	324,690.000		324,690.000	
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	10,881.000		10,881.000	
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF	696.000		696.000	
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	1,992.000		1,992.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA	96.000		96.000	
	662-6029	WK ZN PAV MRK NON-REMOV(W)(WORD)	EA	78.000		78.000	
	662-6035	WK ZN PAV MRK NON-REMOV (Y)6"(BRK)	LF	23,640.000		23,640.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	228,030.000		228,030.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	3,387.000		3,387.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	232.000		232.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	664.000		664.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	100.000		100.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	105,940.000		105,940.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	LF	7,880.000		7,880.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	72,480.000		72,480.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	31.000		31.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	25.000		25.000	
	672-6007	REFL PAV MRKR TY I-C	EA	179.000		179.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,488.000		1,488.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	192,290.000		192,290.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	3,627.000		3,627.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1912-01-022 **DISTRICT** Houston **COUNTY** Montgomery
HIGHWAY FM 2090

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**1912-01-022**			
		PROJECT ID		**A00124135**			
		COUNTY		**Montgomery**			
		HIGHWAY		**FM 2090**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	678-6006	PAV SURF PREP FOR MRK (12")	LF	232.000		232.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	664.000		664.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	32.000		32.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	26.000		26.000	
	3037-6001	HIGH FRICTION SURFACE COURSE	SY	33,935.000		33,935.000	
	3076-6041	D-GR HMA TY-D SAC-A PG70-22	TON	26,083.000		26,083.000	
	3076-6066	TACK COAT	GAL	26,083.000		26,083.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	98.000		98.000	
	6038-6004	MULTIPOLYMER PAV MRK (W)(6")(SLD)	LF	2,360.000		2,360.000	
	6038-6007	MULTIPOLYMER PAV MRK (W)(8")(SLD)	LF	240.000		240.000	
	6038-6017	MULTIPOLYMER PAV MRK (Y)(6")(SLD)	LF	3,530.000		3,530.000	
	6038-6025	MULTIYPOLYMER PAV MRK (W) (ARROW)	EA	1.000		1.000	
	6038-6027	MULTIPOLYMER PAV MRK (W) (WORD)	EA	1.000		1.000	
	6185-6002	TMA (STATIONARY)	DAY	35.000		35.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	64.000		64.000	
	08	CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000		1.000	

LOCATION	134 6001 BACKFILL (TY A)	316 6001 ASPH (MULTI OPTION)	316 6434 AGGR (TY-PB GR-4 OR TY-PL GR-4 (SAC-B)	*351 6011 FLEXIBLE PAVEMENT STRUCTURE REPAIR (18")	354 6045 PLANE ASPH CONC PAV (2")	533 6002 RUMBLE STRIPS (CENTERLINE)	3076 6041 D-GR HMA TY-D SAC-A PG 70-22	3076 6066 TACK COAT	6001 6001 PORTABLE CHANGEABLE MESSAGE SIGN	6185 6002 TMA (STATIONARY)	6185 6003 TMA (MOBILE OPERATION)
CSJ 1912-01-022	STA	GAL	CY	SY	SY	LF	TON	GAL	DAY	DAY	HR
SHEET 1 OF 42	13	1834	44		5730	723	630	630			
SHEET 2 OF 43	13	1700	41		5313	288	584	584			
SHEET 3 OF 43	13	1683	40		5258		578	578			
SHEET 4 OF 43	13	1841	44		5754	316	633	633			
SHEET 5 OF 43	13	2070	50		6469	114	712	712			
SHEET 6 OF 43	13	1777	43		5554	1491	611	611			
SHEET 7 OF 43	13	141	3		440		48	48			
SHEET 8 OF 43	13	452	11		1413	36	155	155			
SHEET 9 OF 43	13	1716	41		5361	1041	590	590			
SHEET 10 OF 43	13	1719	41		5371		591	591			
SHEET 11 OF 43	13	1693	41		5290		582	582			
SHEET 12 OF 43	13	1670	40		5219		574	574			
SHEET 13 OF 43	13	1676	40		5237		576	576			
SHEET 14 OF 43	13	1697	41		5302		583	583			
SHEET 15 OF 43	13	1704	41		5325		586	586			
SHEET 16 OF 43	13	1661	40		5192	4900	571	571			
SHEET 17 OF 43	13	1642	39		5131		564	564			
SHEET 18 OF 43	13	1278	31		3995		439	439			
SHEET 19 OF 43	13	1699	41		5309		584	584			
SHEET 20 OF 43	13	1716	41		5363	268	590	590			
SHEET 21 OF 43	13	1740	42		5439	528	598	598			
SHEET 22 OF 43	13	1712	41		5349	3348	588	588			
SHEET 23 OF 43	13	1742	42		5443	1685	599	599			
SHEET 24 OF 43	13	1734	42		5419		596	596			
SHEET 25 OF 43	13	1732	42		5411		595	595			
SHEET 26 OF 43	13	1703	41		5322		585	585			
SHEET 27 OF 43	13	1703	41		5322		585	585			
SHEET 28 OF 43	13	1705	41		5329	394	586	586			
SHEET 29 OF 43	13	1728	42		5401		594	594			
SHEET 30 OF 43	13	1674	40		5231	766	575	575			
SHEET 31 OF 43	13	1799	43		5622	404	618	618			
SHEET 32 OF 43	13	2300	55		7188		791	791			
SHEET 33 OF 43	13	2671	64		8346		918	918			
SHEET 34 OF 43	13	2619	63		8183		900	900			
SHEET 35 OF 43	13	2483	60		7759		853	853			
SHEET 36 OF 43	13	1976	48		6175	2058	679	679			
SHEET 37 OF 43	13	2021	49		6315	270	695	695			
SHEET 38 OF 43	13	1952	47		6099		671	671			
SHEET 39 OF 43	13	1933	46		6042		665	665			
SHEET 40 OF 43	13	1934	47		6045	1600	665	665			
SHEET 41 OF 43	13	2006	48		6268		689	689			
SHEET 42 OF 43	13	1944	47		6076	481	668	668			
SHEET 43 OF 43	11	1698	41		5305	1358	584	584			
									98	35	64
PROJECT TOTALS	**557**	**75877**	**1824**	**5573**	**237115**	**22069**	**26083**	**26083**	**98**	**35**	**64**

*NOTE: REPAIR LOCATIONS/QUANTITIES ARE TO BE DETERMINED BY THE ENGINEER IN THE FIELD

DATE:
FILE:

FM 2090
SUMMARY OF ROADWAY QUANTITIES

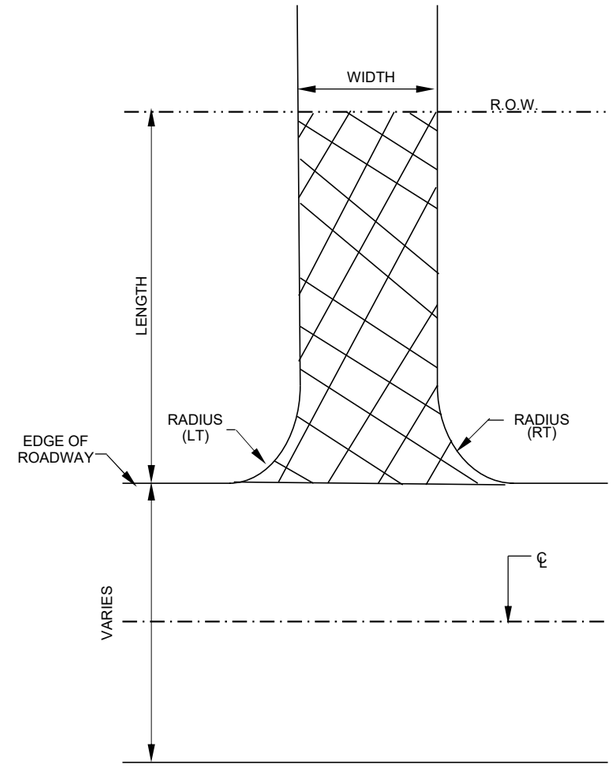
SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		8

SUMMARY OF DRIVEWAYS

			EXISTING DRIVEWAY		PROPOSED DRIVEWAY				
ROADWAY &	DRWY	APPROX	SURF	**ITEM 354**	LT	RT	LENGTH	WIDTH	**ITEM 530**
PAVEMENT MARKING	NO	RDWY STA	TYPE	**6045**	RADIUS	RADIUS			**6005**
LAYOUT		AT CL DRWY		PLANE ASPH					DRIVEWAYS
SHEET				CONC PAV					(ACP)
				2"					
				SY	FT	FT	FT	FT	SY
1	1	12+61.15 RT	ACP	59	19	21	33	11	59
1	2	12+24.58 LT	ACP	317	15	15	31	89	317
1	2A	13+06.53 LT	ACP	83	13	10	30	23	83
1	3	15+07.95 LT	ACP	54	8	8	33	14	54
1	4	15+18.27 RT	ACP	39	13	13	31	9	39
1	5	16+26.92 RT	ACP	44	15	15	30	10	44
1	6	16+37.27 LT	ACP	62	15	15	33	14	62
1	7	16+56.85 LT	ACP	55	15	15	33	12	55
1	8	17+29.51 RT	ACP	62	15	15	31	15	62
1	9	17+43.11 RT	ACP	63	10	10	33	16	63
1	10	18+02.46 RT	ACP	81	25	25	31	15	81
1	11	20+79.05 RT	ACP	52	15	15	31	12	52
1	12	22+27.82 LT	ACP	37	9	10	33	9	37
1	13	22+75.19 RT	ACP	50	10	10	29	14	50
2	14	24+31.58 LT	ACP	45	15	25	32	7	45
2	16	29+16.94 LT	ACP	54	14	15	33	12	54
2	17	29+88.63 RT	ACP	114	15	15	31	30	114
2	18	30+86.48 LT	ACP	57	12	10	33	14	57
2	19	31+07.73 RT	ACP	60	20	20	31	12	60
2	20	31+49.13 LT	ACP	51	15	15	33	11	51
2	21	32+74.61 RT	ACP	45	10	7	31	12	45
2	22	32+98.05 LT	ACP	46	13	8	33	11	46
2	23	33+28.76 LT	ACP	57	8	18	33	13	57
2	24	33+92.52 RT	ACP	45	14	10	31	11	45
2	25	34+54.18 RT	ACP	55	15	15	33	12	55
2	26	35+28.95 LT	ACP	42	6	20	32	9	42
2	27	35+83.98 LT	ACP	51	14	17	32	11	51
2	28	36+22.54 RT	ACP	59	20	20	30	12	59
3	29	38+23.76 LT	ACP	90	25	15	33	19	90
3	30	39+11.19 RT	ACP	49	15	15	31	11	49
3	31	40+37.70 RT	ACP	49	15	15	31	11	49
3	32	40+48.10 LT	ACP	52	8	16	33	12	52
3	34	43+40.73 RT	ACP	45	9	9	31	12	45
3	35	43+80.05 LT	ACP	50	12	12	32	12	50
3	36	44+55.12 LT	ACP	49	13	10	32	12	49
3	37	45+16.43 RT	ACP	54	10	15	32	13	54
3	38	48+21.48 RT	ACP	56	15	15	31	13	56
4	39	50+19.43 RT	ACP	54	20	20	31	10	54
4	40	51+94.22 RT	ACP	55	10	14	33	13	55
4	41	52+92.04 RT	ACP	60	20	20	31	12	60
4	42	54+33.70 LT	ACP	69	15	15	31	17	69
4	43	55+67.66 RT	ACP	112	20	20	31	27	112
4	44	58+33.13 RT	ACP	54	15	15	28	14	54
4	45	58+66.57 LT	ACP	489	20	20	151	28	489
4	46	59+57.92 LT	ACP	51	15	15	28	13	51
4	47	60+55.63 LT	ACP	51	15	15	28	13	51
4	48	60+58.49 RT	ACP	112	20	20	27	31	112
TOTAL				**3,440**					**3,440**



DIRECTION OF STATIONING

DRIVEWAY DETAIL

NTS

FM 2090 DRIVEWAY QUANTITIES

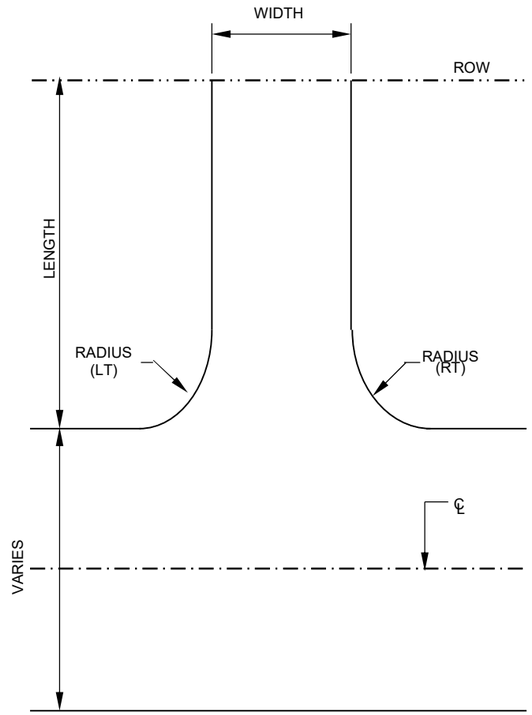
SHEET 1 OF 4

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			9
STATE	STATE DIST. NO.	COUNTY	
TEXAS	HOU	MONTGOMERY	
CONT.	SECT.	JOB	HIGHWAY NO.
1912	01	022	FM 2090

SUMMARY OF DRIVEWAYS

			EXISTING DRIVEWAY		PROPOSED DRIVEWAY				
ROADWAY &	DRWY	APPROX	SURF	**ITEM 354**	LT	RT	LENGTH	WIDTH	**ITEM 530**
PAVEMENT MARKING	NO	RDWY STA	TYPE	**6045**	RADIUS	RADIUS			**6005**
LAYOUT		AT CL DRWY		PLANE ASPH					DRIVEWAYS
SHEET				CONC PAV					(ACP)
				2"					
				SY	FT	FT	FT	FT	SY
5	49	62+50.38 LT	ACP	80	15	15	26	24	80
5	50	63+61.17 RT	ACP	131	15	15	27	40	131
5	50A	66+09.48 LT	ACP	47	15	15	27	12	47
6	51	81+94.48 RT	ACP	55	15	15	33	12	55
6	53	85+96.03 LT	ACP	62	15	15	31	15	62
7	54	88+50.13 LT	ACP	44	15	15	25	12	44
7	55	89+20.32 RT	ACP	84	30	30	31	12	84
7	56	90+43.54 RT	ACP	75	25	25	34	12	75
8	59	107+00.00 RT	ACP	43	15	15	24	12	43
8	60	109+99.00 LT	ACP	64	15	15	34	14	64
9	61	119+16.81 LT	ACP	59	20	15	33	12	59
9	62	120+81.24 RT	ACP	52	15	15	31	12	52
9	63	124+81.97 RT	ACP	62	15	15	31	15	62
9	64	125+86.39 LT	ACP	64	15	15	30	16	64
10	65	127+87.86 RT	ACP	61	15	15	32	14	61
10	66	129+52.56 LT	ACP	75	15	15	32	18	75
10	67	129+59.98 RT	ACP	46	10	10	31	12	46
10	67A	130+00.00 RT	ACP	73	15	15	31	18	73
10	68	130+70.50 RT	ACP	46	10	10	31	12	46
10	69	131+37.19 LT	ACP	53	10	10	31	14	53
10	70	133+33.28 RT	ACP	53	10	10	31	14	53
10	71	134+57.73 RT	ACP	53	10	10	31	14	53
10	73	138+90.10 LT	ACP	68	15	15	37	14	68
10	74	139+72.58 RT	ACP	61	15	15	32	14	61
10	75	140+29.15 LT	ACP	50	15	15	32	11	50
11	76	144+51.51 RT	ACP	104	25	25	32	21	104
11	77	146+30.84 LT	ACP	62	20	20	32	12	62
11	78	146+51.30 RT	ACP	62	20	20	32	12	62
11	79	148+24.93 LT	ACP	62	20	20	32	12	62
11	81	151+06.99 LT	ACP	54	20	20	31	10	54
12	82	153+73.83 RT	ACP	53	15	15	32	12	53
12	83	155+45.79 LT	ACP	56	15	15	31	13	56
12	84	155+96.07 RT	ACP	66	20	20	30	14	66
12	85	157+60.31 LT	ACP	67	20	20	31	14	67
12	86	157+84.46 RT	ACP	85	20	20	31	19	85
12	87	160+08.20 LT	ACP	65	20	20	32	13	65
12	88	160+38.95 RT	ACP	78	20	20	33	16	78
12	89	161+77.46 LT	ACP	61	20	20	34	11	61
12	90	165+00.00 LT	ACP	53	15	15	32	12	53
12	91	166+27.62 LT	ACP	53	15	15	32	12	53
13	92	166+85.39 LT	ACP	61	15	15	32	14	61
13	93	166+94.24 RT	ACP	55	10	10	32	14	55
13	94	169+32.10 LT	ACP	61	15	15	32	14	61
13	95	170+94.14 LT	ACP	55	10	10	32	14	55
13	96	172+29.53 LT	ACP	62	15	15	31	15	62
13	98	175+14.44 LT	ACP	75	15	20	32	17	75
13	99	178+06.78 LT	ACP	59	15	15	31	14	59
TOTAL				**2,970**					**2970**



DRIVEWAY DETAIL

NTS

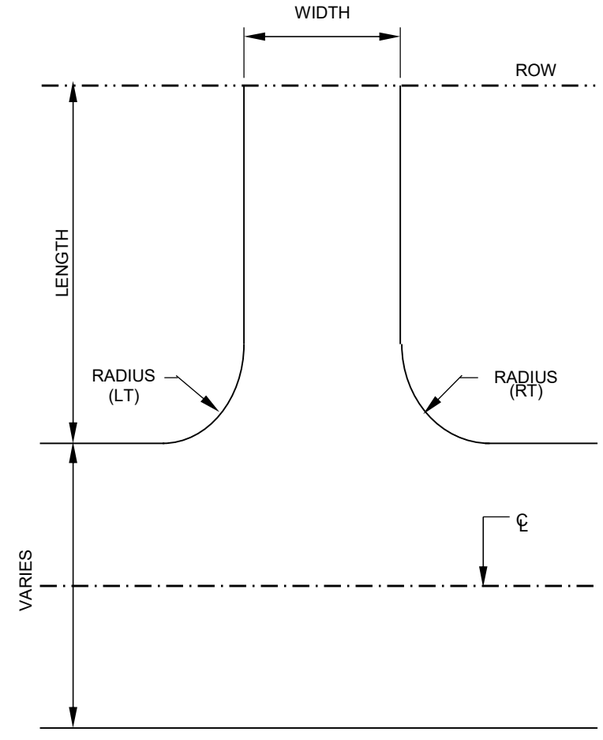
FM 2090 DRIVEWAY QUANTITIES

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			9A
STATE	STATE DIST. NO.	COUNTY	
TEXAS	HOU	MONTGOMERY	
CONT.	SECT.	JOB	HIGHWAY NO
1912	01	022	FM 2090

SUMMARY OF DRIVEWAYS

			EXISTING DRIVEWAY		PROPOSED DRIVEWAY				
ROADWAY &	DRWY	APPROX	SURF	**ITEM 354**	LT	RT	LENGTH	WIDTH	**ITEM 530**
PAVEMENT MARKING	NO	RDWY STA	TYPE	**6045**	RADIUS	RADIUS			**6005**
LAYOUT		AT CL DRWY		PLANE ASPH					DRIVEWAYS
SHEET				CONC PAV					(ACP)
				2"					
				SY	FT	FT	FT	FT	SY
14	100	181+66.89 RT	ACP	46	15	10	31	11	46
14	101	184+09.17 LT	ACP	50	15	15	32	11	50
14	102	187+89.67 LT	ACP	55	10	10	32	14	55
14	103	188+17.77 RT	ACP	45	15	15	28	11	45
14	104	191+88.53 LT	ACP	63	20	20	33	12	63
15	105	192+71.40 RT	ACP	50	15	15	32	11	50
15	106	194+78.57 RT	ACP	58	20	20	32	11	58
17	107	228+04.51 LT	ACP	61	13	14	43	11	61
17	108	231+04.17 RT	ACP	105	20	20	70	11	105
19	109	248+15.16 RT	ACP	69	15	15	33	16	69
20	110	262+70.38 LT	ACP	50	15	12	31	12	50
20	110A	264+75.35 LT	ACP	52	17	15	30	12	52
20	110B	264+70.00 RT	ACP	55	10	10	32	14	55
20	111	267+14.52 LT	ACP	56	15	15	31	13	56
20	112	268+68.82 LT	ACP	62	15	15	31	15	62
20	113	269+06.64 LT	ACP	47	15	13	31	11	47
20	114	269+40.07 RT	ACP	82	11	9	33	21	82
28	115	363+00.74 RT	ACP	52	15	15	31	12	52
28	116	371+60.64 RT	ACP	52	15	15	31	12	52
29	117	377+43.24 RT	ACP	51	15	15	30	12	51
29	118	378+09.02 LT	ACP	55	15	15	33	12	55
29	119	380+27.44 LT	ACP	76	24	28	33	12	76
29	120	382+49.93 RT	ACP	52	7	10	29	15	52
30	121	398+32.44 LT	ACP	55	10	16	32	13	55
32	122	424+96.67 LT	ACP	95	20	20	19	36	95
33	123	429+55.64 LT	ACP	100	25	25	17	37	100
33	124	434+17.82 LT	ACP	96	25	25	15	40	96
33	125	438+37.36 LT	ACP	159	30	35	18	54	159
34	126	441+02.76 LT	ACP	64	20	20	20	20	64
34	127	446+08.07 LT	ACP	80	20	20	22	25	80
34	128	449+11.48 LT	ACP	68	20	20	22	20	68
35	129	454+18.57 LT	ACP	74	21	10	23	24	74
35	130	454+72.54 LT	ACP	81	20	25	22	23	81
35	131	461+19.73 LT	ACP	83	20	25	22	24	83
36	132	471+88.32 RT	ACP	188	30	40	32	36	188
36	133	472+57.79 LT	ACP	78	25	25	29	15	78
37	134	481+86.65 LT	ACP	37	10	10	29	10	37
37	135	483+40.75 LT	ACP	56	18	16	29	13	56
37	136	483+99.46 LT	ACP	42	9	8	29	12	42
37	137	487+64.22 RT	ACP	128	15	11	30	36	128
37	138	489+11.51 RT	ACP	48	15	15	28	12	48
37	139	490+42.33 RT	ACP	89	20	20	30	21	89
37	140	490+95.61 RT	ACP	55	10	10	30	15	55
37	141	490+88.73 LT	ACP	53	16	20	26	13	53
37	142	492+09.21 LT	ACP	45	9	11	28	13	45
37	143	492+64.22 RT	ACP	45	15	15	31	10	45
TOTAL				**3163**					**3163**



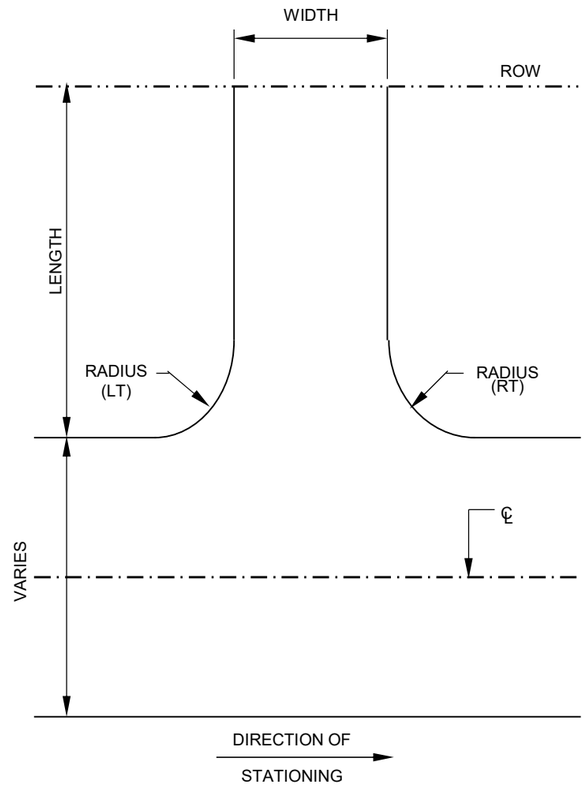
DRIVEWAY DETAIL
NTS

FM 2090 DRIVEWAY QUANTITIES

Texas Department of Transportation	FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
	6		9B
	STATE	STATE DIST. NO.	COUNTY
	TEXAS	HOU	MONTGOMERY
	CONT.	SECT.	JOB / HIGHWAY NO
	1912	01	022 / FM 2090

SUMMARY OF DRIVEWAYS

			EXISTING DRIVEWAY		PROPOSED DRIVEWAY				
ROADWAY &	DRWY	APPROX	SURF	**ITEM 354**	LT	RT	LENGTH	WIDTH	**ITEM 530**
PAVEMENT MARKING	NO	RDWY STA	TYPE	**6045**	RADIUS	RADIUS			**6005**
LAYOUT		AT CL DRWY		PLANE ASPH					DRIVEWAYS
SHEET				CONC PAV					(ACP)
				2"					
				SY	FT	FT	FT	FT	SY
38	144	493+68.01 RT	ACP	52	15	15	31	12	52
38	145	494+07.65 LT	ACP	50	15	15	27	13	50
38	146	494+60.93 RT	ACP	52	15	15	31	12	52
38	147	495+38.86 RT	ACP	52	15	15	31	12	52
38	148	496+23.47 RT	ACP	60	10	10	31	16	60
38	149	498+07.91 RT	ACP	59	15	15	31	14	59
38	150	500+98.58 RT	ACP	54	15	15	30	13	54
38	151	502+69.48 RT	ACP	57	20	18	30	12	57
38	152	503+22.20 RT	ACP	50	12	13	32	12	50
38	153	503+78.86 LT	ACP	69	15	15	29	18	69
38	154	505+22.07 RT	ACP	80	20	20	29	19	80
38	155	505+63.02 LT	ACP	51	5	20	31	12	51
39	156	509+30.03 RT	ACP	46	15	10	29	12	46
39	157	512+51.19 RT	ACP	48	10	13	29	13	48
39	158	512+97.43 RT	ACP	58	27	12	28	12	58
39	159	513+84.15 RT	ACP	43	11	7	29	12	43
39	160	516+03.51 LT	ACP	44	10	11	29	12	44
39	161	518+61.23 LT	ACP	60	21	20	30	12	60
40	162	519+68.10 RT	ACP	42	15	15	28	10	42
40	163	520+64.37 RT	ACP	51	15	15	30	12	51
40	164	523+71.06 LT	ACP	152	20	20	30	40	152
40	165	526+09.76 RT	ACP	81	9	8	28	25	81
40	166	527+53.28 RT	ACP	48	10	12	27	14	48
40	167	528+05.27 LT	ACP	240	40	35	31	50	240
40	168	530+74.18 RT	ACP	86	14	12	28	25	86
40	169	532+11.01 RT	ACP	82	15	15	28	23	82
41	170	536+20.39 LT	ACP	111	21	24	28	28	111
41	171	537+97.28 RT	ACP	51	15	15	30	12	51
41	172	538+42.89 LT	ACP	98	10	10	28	30	98
41	173	539+39.93 RT	ACP	87	35	15	26	18	87
41	174	542+35.29 RT	ACP	86	15	15	27	25	86
42	175	545+33.55 RT	ACP	42	13	10	27	12	42
42	176	545+76.04 RT	ACP	52	16	12	27	14	52
42	177	548+03.79 LT	ACP	102	17	14	29	28	102
42	178	548+88.57 RT	ACP	115	15	15	26	36	115
42	179	549+20.28 LT	ACP	117	15	17	27	35	117
42	180	549+71.28 LT	ACP	78	7	10	28	24	78
42	181	551+60.83 LT	ACP	47	10	8	30	13	47
42	182	552+09.00 RT	ACP	75	14	24	30	17	75
42	183	552+41.96 LT	ACP	99	20	10	28	28	99
42	184	552+86.49 LT	ACP	41	6	7	29	12	41
43	184A	563+04.20 LT	ACP	53	15	15	29	13	53
43	185	564+54.68 LT	ACP	52	15	15	31	12	52
43	186	565+91.53 LT	ACP	59	12	18	31	14	59
43	187	568+39.37 LT	ACP	77	21	10	16	36	77
SHEET TOTAL				**3209**					**3209**
GRAND TOTAL				**12782**					**12782**



DRIVEWAY DETAIL
NTS

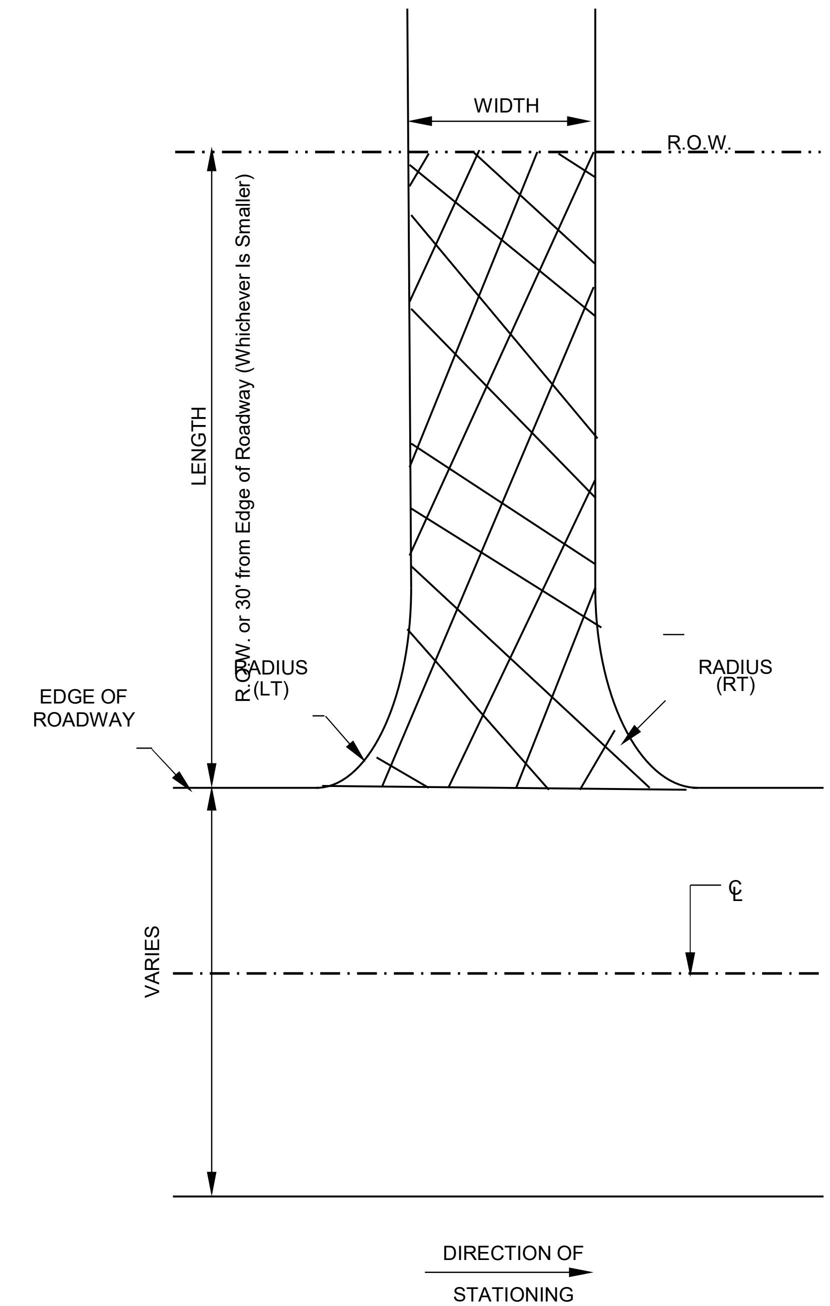
FM 2090 DRIVEWAY QUANTITIES

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			9C
STATE	STATE DIST. NO.	COUNTY	
TEXAS	HOU	MONTGOMERY	
CONT.	SECT.	JOB	HIGHWAY NO
1912	01	022	FM 2090

SUMMARY OF INTERSECTION

			EXISTING INTERSECTION		PROPOSED INTERSECTION				
RDWY PLAN & PROFILE SHEET	INTERSECTION	APPROX RDWY STA AT CL INTERSECTION	SURF TYPE	**ITEM 354** **6045** PLANE A.C.P. 2.0"	LT RADIUS	RT RADIUS	LENGTH	WIDTH	**ITEM 530** **6002** INTERSECTIONS (ACP) 2.0"
				SY	FT	FT	FT	FT	SY
1	LEE RD	14+60.36	ACP	74	15	15	33	17	74
1	STOWE RD	20+66.73 LT	ACP	87	20	20	33	18	87
2	GENTY RD	28+62.08 RT	ACP	114	35	30	30	17	114
3	GRANGERLAND RD	41+84.36 RT	ACP	114	20	20	31	27	114
5	FM 1485	68+81.59 LT	ACP	186	30	30	27	46	186
5	FM 1485	68+81.59 RT	ACP	216	30	30	27	56	216
6	PALACE	82+54.67 LT	ACP	79	15	15	30	20	79
7	BUCKINGHAM PL	91+04.13 LT	ACP	144	30	30	43	20	144
8	CROCKET MARTIN RD	104+13.42 LT	ACP	446	35	35	137	25	446
10	TOMMY SMITH RD	135+73.79 RT	ACP	173	40	40	30	26	173
11	CARLOS ST	150+91.69 RT	ACP	93	20	20	32	20	93
13	PHILMORE LN	172+29.53 LT	ACP	84	25	25	30	15	84
14	ROGILIO RD	186+71.65 RT	ACP	75	20	20	30	16	75
15	GOODMAN RD	204+04.67 LT	ACP	152	35	35	31	25	152
15	FIRETOWER RD	204+04.67 RT	ACP	168	35	35	34	27	168
20	VERA LN	265+08.44 RT	ACP	67	15	15	31	16	67
20	GONZALES LN	265+27.98 LT	ACP	70	20	20	31	14	70
20	GREEN HAW RD	268+32.72 RT	ACP	73	20	20	31	15	73
21	DOBB RD	274+69.30 LT	ACP	109	30	30	32	17	109
23	HUFF RD	308+99.00 RT	ACP	121	30	30	31	21	121
23	DAW COLLINS RD	309+04.56 LT	ACP	246	40	40	32	45	246
37	MORGAN DR	487+71.26 LT	ACP	120	25	25	30	26	120
38	MARKS RD	498+77.97 LT	ACP	87	20	25	28	19	87
39	DRIVERS RD	507+52.84 RT	ACP	70	15	15	29	18	70
39	HAYDEN RD	509+33.09 LT	ACP	89	20	20	29	21	89
40	LAKEWOOD DR	523+35.52 RT	ACP	144	35	35	28	25	144
40	GOODSON RD	523+79.63 LT	ACP	143		20	44	27	143
42	GOODSON RD	547+45.30 LT	ACP	115	26	17	31	26	115
42	DUKE RD	552+95.45 RT	ACP	151	30	40	29	26	151
TOTAL				**3,736**					**3736**



DRIVEWAY DETAIL

NTS

FM 2090 INTERSECTION QUANTITIES

SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			9D
STATE	STATE DIST. NO.	COUNTY	
TEXAS	HOU	MONTGOMERY	
CONT.	SECT.	JOB	HIGHWAY NO
1912	01	022	FM 2090

Texas Department of Transportation

							ITEM 3037
CURVE NO.	P.I. STA	P.C. STA	P.T. STA	RADIUS	RDWY WIDTH	CURVE LENGTH	6001
				FT	FT	FT	SY
C7	276+35.66	272+75.47	279+83.04	1534.5362	36	707.57	2830
C9	308+80.71	303+46.00	313+69.63	1434.1654	40	1023.63	4549
C11	377+49.65	372+19.11	382+54.57	1928.5693	36	1035.46	4142
C12	402+21.77	393+93.40	409+54.75	1889.138	36	1561.35	6245
C14	453+43.24	445+04.04	460+84.99	1904.9618	56	1580.95	9837
C15	485+25.33	480+80.57	489+42.84	1426.6508	40	862.27	3832
C18	566+27.34	563+86.58	568+65.13	1761.652	47	478.55	2499
TOTAL							**33935**

DATE: 07/19/2022 01:41 PM
FILE:

FM 2090
SUMMARY OF PROPOSED HIGH FRICTION CURVES

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		9E

CK:
DW:
CK:
DN:

SUMMARY OF PAVEMENT MARKING QUANTITIES

CSJ 1912-01-022	666 6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL)	666 6042 REFL PAV MRK TY I (W)12"(SLD)(100MIL)	666 6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)	666 6306 RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	666 6309 RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	666 6318 RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	666 6321 RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	668 6077 PREFAB PAV MRK TY C (W) (ARROW)	668 6085 PREFAB PAV MRK TY C (W) (WORD)	672 6007 REFL PAV MRKR TY I-C	672 6009 REFL PAV MRKR TY II-A-A	678 6002 PAV SURF PREP FOR MRK (6")
	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF
FM 2090												
SHEET 1 OF 43	52	0	60	0	2760	90	1900	1	1	0	33	4750
SHEET 2 OF 43	0	0	20	0	2760	330	0	0	0	0	16	3090
SHEET 3 OF 43	0	0	20	0	2620	330	0	0	0	0	16	2950
SHEET 4 OF 43	100	0	0	0	2540	110	1800	1	1	5	26	4450
SHEET 5 OF 43	320	0	44	0	2460	0	3560	3	3	17	88	6020
SHEET 6 OF 43	0	0	16	0	2620	0	2600	0	0	0	16	5220
SHEET 7 OF 43	0	0	16	0	1800	0	3470	0	0	8	115	8040
SHEET 8 OF 43	145	0	20	0	2360	0	3620	1	1	11	132	6300
SHEET 9 OF 43	0	0	0	0	2600	150	1400	0	0	0	25	4150
SHEET 10 OF 43	0	0	30	0	2680	330	0	0	0	0	17	3010
SHEET 11 OF 43	0	0	0	0	2560	330	0	0	0	0	17	2890
SHEET 12 OF 43	0	0	0	0	2600	330	0	0	0	0	17	2930
SHEET 13 OF 43	0	0	14	0	2680	330	0	0	0	0	17	3010
SHEET 14 OF 43	0	0	0	0	2640	330	0	0	0	0	17	2970
SHEET 15 OF 43	0	0	40	0	2680	310	0	0	0	0	15	2990
SHEET 16 OF 43	0	0	0	0	2600	270	1130	0	0	0	31	4000
SHEET 17 OF 43	0	0	0	0	2600	0	2600	0	0	0	33	5200
SHEET 18 OF 43	0	0	0	0	2000	0	2000	0	0	0	33	5200
SHEET 19 OF 43	0	0	0	0	2600	0	2600	0	0	0	33	5200
SHEET 20 OF 43	0	0	0	0	2740	0	2340	0	0	0	30	5080
SHEET 21 OF 43	0	0	24	0	2620	0	2460	0	0	0	31	5080
SHEET 22 OF 43	0	0	0	0	2600	0	2600	0	0	0	33	5200
SHEET 23 OF 43	0	0	40	0	2720	0	2360	0	0	0	30	5080
SHEET 24 OF 43	0	0	0	0	2600	0	2600	0	0	0	33	5200
SHEET 25 OF 43	0	0	0	0	2600	0	2600	0	0	0	0	5200
SHEET 26 OF 43	0	0	0	0	2600	330	30	0	0	0	34	2960
SHEET 27 OF 43	0	0	0	0	2600	330	0	0	0	0	17	2930
SHEET 28 OF 43	0	0	0	0	2600	290	1310	0	0	0	33	4200
SHEET 29 OF 43	0	0	0	0	2600	280	1380	0	0	0	31	4260
SHEET 30 OF 43	0	0	0	0	2600	140	2050	0	0	0	33	4790
SHEET 31 OF 43	0	0	0	0	2600	100	3200	0	0	0	70	5900
SHEET 32 OF 43	220	0	20	0	2240	420	3320	1	1	11	84	5980
SHEET 33 OF 43	700	0	75	100	1300	620	2460	6	4	35	5	4480
SHEET 34 OF 43	1300	0	15	0	1300	560	2440	10	8	65	20	4300
SHEET 35 OF 43	550	232	95	0	1300	580	2340	8	6	27	40	4220
SHEET 36 OF 43	0	0	0	0	2600	0	2600	0	0	0	33	5200
SHEET 37 OF 43	0	0	14	0	2600	70	2240	0	0	0	31	4910
SHEET 38 OF 43	0	0	10	0	2620	320	200	0	0	0	19	3140
SHEET 39 OF 43	0	0	20	0	2640	330	0	0	0	0	33	2970
SHEET 40 OF 43	0	0	36	0	2640	100	1800	0	0	0	28	4540
SHEET 41 OF 43	0	0	0	0	2600	120	1980	0	0	0	30	4700
SHEET 42 OF 43	0	0	35	0	2590	50	2090	0	0	0	30	4870
SHEET 43 OF 43	0	0	0	0	1870	0	1400	0	0	0	63	4730
PROJECT TOTALS	**3387**	**232**	**664**	**100**	**105940**	**7880**	**72480**	**31**	**25**	**179**	**1488**	**192290**

FM 2090
SUMMARY OF PAVEMENT MARKING QUANTITIES

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		10

DATE:
FILE:

SUMMARY OF PAVEMENT MARKING QUANTITIES

CSJ 1912-01-022	678 6004 PAV SURF PREP FOR MRK (8") LF	678 6006 PAV SURF PREP FOR MRK (12") LF	678 6008 PAV SURF PREP FOR MRK (24") LF	678 6009 PAV SURF PREP FOR MRK (ARROW) EA	678 6016 PAV SURF PREP FOR MRK (WORD) EA	6038 6004 MULTIPOLYMER PAV MRK (W)(6")(SLD) LF	6038 6007 MULTIPOLYMER PAV MRK (W)(8")(SLD) LF	6038 6017 MULTIPOLYMER PAV MRK (Y)(6")(SLD) LF	6038 6025 MULTIYPOLYMER PAV MRK (W) (ARROW) EA	6038 6027 MULTIPOLYMER PAV MRK (W) (WORD) EA
FM 2090										
SHEET 1 OF 43	52	0	60	1	1	0	0	0	0	0
SHEET 2 OF 43	0	0	20	0	0	0	0	0	0	0
SHEET 3 OF 43	0	0	20	0	0	0	0	0	0	0
SHEET 4 OF 43	100	0	0	1	1	0	0	0	0	0
SHEET 5 OF 43	320	0	44	3	3	0	0	0	0	0
SHEET 6 OF 43	0	0	16	0	0	0	0	0	0	0
SHEET 7 OF 43	160	0	16	1	1	800	160	1970	1	0
SHEET 8 OF 43	225	0	20	1	1	160	80	160	0	0
SHEET 9 OF 43	0	0	0	0	0	0	0	0	0	1
SHEET 10 OF 43	0	0	30	0	0	0	0	0	0	0
SHEET 11 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 12 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 13 OF 43	0	0	14	0	0	0	0	0	0	0
SHEET 14 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 15 OF 43	0	0	40	0	0	0	0	0	0	0
SHEET 16 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 17 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 18 OF 43	0	0	0	0	0	600	0	600	0	0
SHEET 19 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 20 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 21 OF 43	0	0	24	0	0	0	0	0	0	0
SHEET 22 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 23 OF 43	0	0	40	0	0	0	0	0	0	0
SHEET 24 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 25 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 26 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 27 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 28 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 29 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 30 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 31 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 32 OF 43	220	0	20	1	1	0	0	0	0	0
SHEET 33 OF 43	700	0	75	6	4	0	0	0	0	0
SHEET 34 OF 43	1300	0	15	10	8	0	0	0	0	0
SHEET 35 OF 43	550	232	95	8	6	0	0	0	0	0
SHEET 36 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 37 OF 43	0	0	14	0	0	0	0	0	0	0
SHEET 38 OF 43	0	0	10	0	0	0	0	0	0	0
SHEET 39 OF 43	0	0	20	0	0	0	0	0	0	0
SHEET 40 OF 43	0	0	36	0	0	0	0	0	0	0
SHEET 41 OF 43	0	0	0	0	0	0	0	0	0	0
SHEET 42 OF 43	0	0	35	0	0	70	0	70	0	0
SHEET 43 OF 43	0	0	0	0	0	730	0	730	0	0
										0
PROJECT TOTALS	**3627**	**232**	**664**	**32**	**26**	**2360**	**240**	**3530**	**1**	**1**

FM 2090
SUMMARY OF PAVEMENT MARKING QUANTITIES

SHEET 2 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		10A

DATE:
FILE:

SUMMARY OF PAVEMENT MARKING QUANTITIES

CSJ 1912-01-022	662	662	662	662	662	662	662	662	662
	6005	6008	6012	6014	6016	6017	6029	6035	6037
	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	WK ZN PAV MRK NON-REMOV (W)(ARROW)	WK ZN PAV MRK NON-REMOV(W)(WORD)	WK ZN PAV MRK NON-REMOV (Y)6"(BRK)	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)
	LF	LF	LF	LF	LF	EA	EA	LF	LF
FM 2090									
SHEET 1 OF 43	0	8280	156	0	180	3	3	270	5700
SHEET 2 OF 43	0	8280	0	0	60	0	0	990	0
SHEET 3 OF 43	0	7860	0	0	60	0	0	990	0
SHEET 4 OF 43	0	7620	300	0	0	3	3	330	5400
SHEET 5 OF 43	0	7380	960	0	132	9	9	0	10680
SHEET 6 OF 43	0	7860	0	0	48	0	0	0	7800
SHEET 7 OF 43	0	7800	480	0	48	3	3	0	16320
SHEET 8 OF 43	0	7560	675	0	60	3	0	0	11340
SHEET 9 OF 43	0	7800	0	0	0	0	3	450	4200
SHEET 10 OF 43	0	8040	0	0	90	0	0	990	0
SHEET 11 OF 43	0	7680	0	0	0	0	0	990	0
SHEET 12 OF 43	0	7800	0	0	0	0	0	990	0
SHEET 13 OF 43	0	8040	0	0	42	0	0	990	0
SHEET 14 OF 43	0	7920	0	0	0	0	0	990	0
SHEET 15 OF 43	0	8040	0	0	120	0	0	930	0
SHEET 16 OF 43	0	7800	0	0	0	0	0	810	3390
SHEET 17 OF 43	0	7800	0	0	0	0	0	0	7800
SHEET 18 OF 43	0	7800	0	0	0	0	0	0	7800
SHEET 19 OF 43	0	7800	0	0	0	0	0	0	7800
SHEET 20 OF 43	0	8220	0	0	0	0	0	0	7020
SHEET 21 OF 43	0	7860	0	0	72	0	0	0	7380
SHEET 22 OF 43	0	7800	0	0	0	0	0	0	7800
SHEET 23 OF 43	0	8160	0	0	120	0	0	0	7080
SHEET 24 OF 43	0	7800	0	0	0	0	0	0	7800
SHEET 25 OF 43	0	7800	0	0	0	0	0	0	7800
SHEET 26 OF 43	0	7800	0	0	0	0	0	990	90
SHEET 27 OF 43	0	7800	0	0	0	0	0	990	0
SHEET 28 OF 43	0	7800	0	0	0	0	0	870	3930
SHEET 29 OF 43	0	7800	0	0	0	0	0	840	4140
SHEET 30 OF 43	0	7800	0	0	0	0	0	420	6150
SHEET 31 OF 43	0	7800	0	0	0	0	0	300	9600
SHEET 32 OF 43	0	6720	660	0	60	3	3	1260	9960
SHEET 33 OF 43	300	3900	2100	0	225	18	12	1860	7380
SHEET 34 OF 43	0	3900	3900	0	45	30	24	1680	7320
SHEET 35 OF 43	0	3900	1650	696	285	24	18	1740	7020
SHEET 36 OF 43	0	7800	0	0	0	0	0	0	7800
SHEET 37 OF 43	0	7800	0	0	42	0	0	210	6720
SHEET 38 OF 43	0	7860	0	0	30	0	0	960	600
SHEET 39 OF 43	0	7920	0	0	60	0	0	990	0
SHEET 40 OF 43	0	7920	0	0	108	0	0	300	5400
SHEET 41 OF 43	0	7800	0	0	0	0	0	360	5940
SHEET 42 OF 43	0	7770	0	0	105	0	0	150	6480
SHEET 43 OF 43	0	7800	0	0	0	0	0	0	6390
PROJECT TOTALS	300	324690	10881	696	1992	96	78	23640	228030

FM 2090
SUMMARY OF PAVEMENT MARKING QUANTITIES

SHEET 3 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		10B

CK: DW: CK: DN:

DATE:
FILE:

SUMMARY OF SMALL SIGNS

LAYOUT SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS (IN)	PLYWOOD SIGNS	ALUMINUM SIGNS TYPE A	644 - INS SM RD SN SUP & AM						636 - REPLACE EXISTING SIGNS	
							TYPE OF MOUNT						TYPE OF SIGNS	
							6001 10BWG (1) SA (P) EA	6002 10BWG (1) SA (P-BM)	6004 10BWG (1) SA (T) EA	6005 10BWG (1) SA (T-2EXT)	6033 TYSBO (1) SA (U) EA	6076 REMOVE SM RD SN SUP&AM EA	6007 (TY A) SF	6009 (TY O) SF
1 OF 43	1	R1-1	STOP	36 X 36		X	X					X		
	2	M3-2	EAST	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
	3	R2-1	SPEED LIMIT (55)	36 X 48		X			X			X		
	4	R1-1	STOP	36 X 36		X	X					X		
	5	D3-1	GRANGERLAND	VARIES		X			X			X	16	
2 OF 43	6	M2-1	JCT	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
	7	R1-1	STOP	36 X 36		X	X					X		
3 OF 43	8	R1-1	STOP	36 X 36		X	X					X		
4 OF 43	9	M2-1	JCT	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
	10	W11-8R	EMERGENCY VEHICLE (SYMBOL)	36 X 36		X			X			X		
	11	S4-5	REDUCED SCHOOL SPEED LIMIT AHEAD	48 X 48		X			X			X		
		SW16-9P	AHEAD (PLAQUE)	36 X 24										
	12	R2-1	SPEED LIMIT (55)	36 X 48		X			X			X		
		S5-2aTP	END SCHOOL ZONE	36 X 18		X								
	13	S5-1	SCHOOL SPEED LIMIT WHEN FLASHING	48 X 24		X							8	
5 OF 43	14	W11-8R	EMERGENCY VEHICLE (SYMBOL)	36 X 36		X			X			X		
	15	M3-4	WEST	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
	16	S5-1	SCHOOL SPEED LIMIT WHEN FLASHING	48 X 24		X							8	
	17	R2-1	SPEED LIMIT (55)	36 X 48		X			X			X		
	18	M1-6F	FARM TO MARKET RD	24 X 24		X	X					X		
		M6-3	DIRECTIONAL ARROW	24 X 18		X								
		M1-6F	FARM TO MARKET RD	24 X 24		X								
		M6-4	DOUBLE ARROW	24 X 18										
	19	M1-6F	FARM TO MARKET RD	24 X 24		X	X					X		
		M6-3	DIRECTIONAL ARROW	24 X 18		X								
		M1-6F	FARM TO MARKET RD	24 X 24		X								
		M6-4	DOUBLE ARROW	24 X 18		X								
	20	M1-6F	FARM TO MARKET RD	24 X 24		X	X					X		
		M6-3	DIRECTIONAL ARROW	24 X 18		X								
		M1-6F	FARM TO MARKET RD	24 X 24		X								
		M6-4	DOUBLE ARROW	24 X 18		X								
	21	M1-6F	FARM TO MARKET RD	24 X 24		X	X					X		
		M6-3	DIRECTIONAL ARROW	24 X 18		X								
		M1-6F	FARM TO MARKET RD	24 X 24		X								
		M6-4	DOUBLE ARROW	24 X 18		X								
	22	M3-2	EAST	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
	23	S5-2aTP	END SCHOOL ZONE	24 X 12		X	X					X		
		R2-1	SPEED LIMIT (50)	36 X 48		X								
	24	S5-2aTP	END SCHOOL ZONE	24 X 12		X	X					X		
		S5-1	SCHOOL SPEED LIMIT WHEN FLASHING	48 X 24		X							8	
6 OF 43	25	S4-5	REDUCED SCHOOL SPEED LIMIT AHEAD	48 X 48		X			X			X		
		SW16-9P	AHEAD (PLAQUE)	36 X 24		X								
	26	R1-1	STOP	36 X 36		X	X					X		
7 OF 43	27	R1-1	STOP	36 X 36		X	X					X		
8 OF 43	28	R1-1	STOP	36 X 36		X	X					X		
	29	W1-7T	CHEVRON/TWO - DIRECTION LARGE ARROW	96 X 36		X			X			X		
9 OF 43	30	W1-2L	CURVE	48 X 48		X			X			X		
		W13-1P	ADVISORY SPEED(PLAQUE)	24 X 24		X								
10 OF 43	31	W1-2R	CURVE	48 X 48		X			X			X		
		W13-1P	ADVISORY SPEED(PLAQUE)	24 X 24		X								
	32	M3-4	WEST	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
	33	M3-2	EAST	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
11 OF 43	34	R2-1	SPEED LIMIT (60)	36 X 48		X			X			X		
	35	R2-1	SPEED LIMIT (50)	36 X 48		X			X			X		
13 OF 43	36	R2-1	SPEED LIMIT (60)	36 X 48		X			X			X		
	37	R1-1	STOP	48 X 48		X	X					X		
15 OF 43	38	R2-1	SPEED LIMIT (60)	36 X 48		X			X			X		
	39	M1-6F	FARM TO MARKET RD	24 X 24		X	X					X		
	40	R1-1	STOP	36 X 36		X	X					X		
	41	R1-1	STOP	36 X 36		X	X					X		
16 OF 43	42	M3-2	EAST	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X								
	43	D14-4T	ADOPT A HIGHWAY NEXT MILES	48 X 48		X					X	X		
	44	R2-1	SPEED LIMIT (60)	36 X 48		X			X			X		
	45	W1-5L	WINDING ROAD	48 X 48		X			X			X		
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X						X		
17 OF 43	46	M3-2	EAST	24 X 12		X	X					X		
		M1-6F	FARM TO MARKET RD	24 X 24		X						X		
	47	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48 X 48		X			X			X		
18 OF 43	48	I-3	SPRING BRANCH	VARIES		X	X					X		
	49	I-3	SPRING BRANCH	VARIES		X	X					X		
19 OF 43	50	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48 X 48		X			X			X		
20 OF 43	51	W1-4L	REVERSE CURVE	48 X 48		X			X			X		
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X						X		
21 OF 43	52	W1-5L	WINDING ROAD	48 X 48		X			X			X		
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X						X		
	53	R1-1	STOP	36 X 36		X	X					X		
			SUBTOTAL				29		21		2	55	40	

ALL SIGNS SHALL BE ERECTED ACCORDING TO THE LOCATION SHOWN ON THE LAYOUT SHEETS EXCEPT THAT THE ENGINEER MAY SHIFT A SIGN IN ORDER TO SECURE A MORE DESIRABLE LOCATION. THE CONTRACTOR WILL STAKE ALL SIGN LOCATIONS, AND NO CHANGES IN THOSE LOCATIONS SHALL BE MADE WITHOUT PRIOR APPROVAL OF THE ENGINEER.

ALUMINUM SIGN BLANKS(TY A)

Min. Thickness

0.080"
0.100"
0.125"

FM 2090 SUMMARY OF SMALL SIGNS SHEET

SHEET 1 OF 3

DISTRICT	FEDERAL REGION	PROJECT NO.	SHEET
HOU	6	C 1912-1-22	11
COUNTY		CONTROL SECTION JOB	HIGHWAY NO.
MONTGOMERY		1912 01 022	FM 2090

STD-N29

SUMMARY OF SMALL SIGNS

LAYOUT SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS (IN)	PLYWOOD SIGNS	ALUMINUM SIGNS TYPE A	644 - INS SM RD SN SUP & AM TYPE OF MOUNT									636 - REPLACE EXISTING SIGNS TYPE OF SIGNS									
							6001 10BWG (1) SA (P) EA	6002 10BWG (1) SA (P-BM)	6004 10BWG (1) SA (T) EA	6005 10BWG (1) SA (T-2EXT)	6033 TYS80 (1) SA (U) EA	6076 REMOVE SM RD SN SUP&AM EA				6007 (TY A) SF	6009 (TY O) SF								
22 OF 43	54	S3-1	SCHOOL BUS STOP AHEAD (SYMBOL)	36 X 36		X			X			X												
	55	W1-2L	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
	56	W1-2R	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
23 OF 43	57	W2-1	CROSSROAD	48 X 48		X			X			X												
	58	R1-1	STOP	36 X 36		X	X					X												
	59	R1-1	STOP	36 X 36		X	X					X												
24 OF 43	60	W2-1	CROSSROAD	48 X 48		X			X			X												
	61	W1-2L	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
	62	W1-2L	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
	63	D14-4T	ADOPT A HIGHWAY NEXT 2 MILES	48 X 48		X					X	X												
26 OF 43	64	W1-2R	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
28 OF 43	65	W1-2L	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
	66	W1-2R	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
	67	W1-2R	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
31 OF 43	68	W1-2L	CURVE	48 X 48		X			X			X												
		W13-1P	ADVISORY SPEED(PLAQUE)	24 X 24		X																		
32 OF 43	69	S5-2aTP	END SCHOOL ZONE	24 X 12		X			X			X												
		R2-1	SPEED LIMIT (60)	36 X 48		X																		
	70	W3-5	ADVANCE SPEED REDUCTION	48 X 48		X			X			X												
	71	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X			X			X												
	72	S5-1	SCHOOL SPEED LIMIT WHEN FLASHING	48 X 24		X						X				8								
	73	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
	74	W2-2L	SIDE ROAD - 90 DEGREE	48 X 48		X			X			X												
33 OF 43	75	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
	76	W1-4R	REVERSE CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
	77	D14-4T	ADOPT A HIGHWAY NEXT 2 MILES	48 X 48		X					X	X												
	78	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
	79	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
	80	M1-6F	FARM TO MARKET RD	36 X 36		X	X					X												
	81	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
	82	R1-1	STOP	36 X 36		X	X					X												
	83	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
	84	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
	85	R1-1	STOP	36 X 36		X	X					X												
	86	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
	87	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X			X			X												
		R3-9DP	END	24 X 8																				
	88	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
		R3-9cP	BEGIN	24 X 8		X																		
34 OF 43	89	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
	90	W2-2L	SIDE ROAD - 90 DEGREE	48 X 48		X			X			X												
	91	R1-1	STOP	36 X 36		X	X					X												
	92	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
	93	S1-1	SCHOOL ADVANCE	48		X			X			X												
	94	R1-1	STOP	36 X 36		X	X					X												
	95	S5-1	SCHOOL SPEED LIMIT WHEN FLASHING	48 X 24		X										8								
	96	S5-1	SCHOOL SPEED LIMIT WHEN FLASHING	48 X 24		X										8								
	97	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
35 OF 43	98	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
	99	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
		R3-9cP	BEGIN	24 X 8		X																		
	100	R1-1	STOP	36 X 36		X	X					X												
	101	R3-9b	TWO-WAY LEFT TURN ONLY	48 X 36		X	X					X												
		R3-9dP	END	24 X 8		X																		
	102	R3-7R	MANDATORY TURN SIGNS	36 X 36		X	X					X												
	103	S5-1	SCHOOL SPEED LIMIT WHEN FLASHING	48 X 24		X										8								
	104	S5-2aTP	END SCHOOL ZONE	24 X 12		X	X					X												
		R2-1	SPEED LIMIT (55)	36 X 48		X																		
	105	W1-4R	REVERSE CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
36 OF 43	106	W3-5	ADVANCE SPEED REDUCTION	48 X 48		X			X			X												
	107	W1-2R	CURVE	48 X 48		X			X			X												
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X																		
37 OF 43	108	W2-2R	SIDE ROAD	48 X 48		X			X			X												
	109	R2-1	SPEED LIMIT (55)	36 X 48		X			X			X												
	110	R1-1	STOP	36 X 36		X	X					X												
	111	R2-1	SPEED LIMIT (55)	36 X 48		X			X			X												
	112	W2-2L	SIDE ROAD - 90 DEGREE	48 X 48		X			X			X												
38 OF 43	113	S3-1	SCHOOL BUS STOP AHEAD (SYMBOL)	36 X 36		X	X					X												
	114	W1-2L	CURVE	48 X 48		X			X			X												
		W13-1P	ADVISORY SPEED(PLAQUE)	24 X 24		X																		
	115	R1-1	STOP	36 X 36		X	X					X												
39 OF 43	116	R1-1	STOP	36 X 36		X	X					X												
	117	R1-1	STOP	36 X 36		X	X					X												
			SUBTOTAL				30		28		2	61				32								

ALL SIGNS SHALL BE ERECTED ACCORDING TO THE LOCATION SHOWN ON THE LAYOUT SHEETS EXCEPT THAT THE ENGINEER MAY SHIFT A SIGN IN ORDER TO SECURE A MORE DESIRABLE LOCATION. THE CONTRACTOR WILL STAKE ALL SIGN LOCATIONS, AND NO CHANGES IN THOSE LOCATIONS SHALL BE MADE WITHOUT PRIOR APPROVAL OF THE ENGINEER.

ALUMINUM SIGN BLANK(TY A)

Min. Thickness

0.080"
0.100"
0.125"

FM 2090
SUMMARY OF SMALL SIGNS SHEET

SHEET 2 OF 3

DISTRICT	FEDERAL REGION	PROJECT NO.	SHEET
HOU	6	C 1912-1-22	11A
COUNTY		CONTROL SECTION JOB	HIGHWAY NO.
MONTGOMERY		1912 01 022	FM 2090

STD-N29

SUMMARY OF SMALL SIGNS

LAYOUT SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS (IN)	PLYWOOD SIGNS	ALUMINUM SIGNS TYPE A	644 - INS SM RD SN SUP & AM TYPE OF MOUNT						636 - REPLACE EXISTING SIGNS TYPE OF SIGNS	
							6001 10BWG (1) SA (P) EA	6002 10BWG (1) SA (P-BM)	6004 10BWG (1) SA (T) EA	6005 10BWG (1) SA (T-2EXT)	6033 TYS80 (1) SA (U) EA	6076 REMOVE SM RD SN SUP&AM EA	6007 (TY A) SF	6009 (TY O) SF
40 OF 43	118	R1-1	STOP	36 X 36		X	X					X		
	119	R1-1	STOP	36 X 36		X	X					X		
41 OF 43	120	M1-6F	FARM TO MARKET RD	24 X 24		X	X					X		
	121	D14-4T	ADOPT A HIGHWAY NEXT 2 MILES	48 X 48		X					X	X		
42 OF 43	122	W1-2L	CURVE	48 X 48		X			X			X		
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X								
	123	R1-1	STOP	36 X 36		X	X					X		
	124	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48 X 48		X			X			X		
	125	R1-1	STOP	36 X 36		X	X					X		
	126	W1-2R	CURVE	48 X 48		X			X			X		
		W13-1P	SPEED ADVISORY (PLAQUE)	24 X 24		X								
	127	R2-1	SPEED LIMIT (55)	36 X 48		X			X			X		
	128	R2-1	SPEED LIMIT (45)	36 X 48		X			X			X		
43 OF 43	129	I-3	PEACH CREEK	24 X 18		X	X					X		
	130	I-3	PEACH CREEK	24 X 18		X	X					X		
	131	R2-1	SPEED LIMIT (45)	36 X 48		X			X			X		
	132	W4-2R	RIGHT LANE END	48 X 48		X			X			X		
	133	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48 X 48		X			X			X		
	134	M3-1	NORTH	24 X 12		X					X	X		
		M1-4A3	INTERSTATE 59	36 X 36		X								
		M6-3	ARROW, STRAIGHT	24 X 18		X								
		M3-3	SOUTH	24 X 12		X								
		M1-4A3	INTERSTATE 59	36 X 36		X								
		M6-1R	ARROW, RIGHT	24 X 18		X								
			SUBTOTAL				7		8		2	17		
			SHEET 1 SUBTOTAL				29		21		2	55	40	
			SHEET 2 SUBTOTAL				30		28		2	61	32	
			SHEET 3 SUBTOTAL				7		8		2	17		
			PROJECT TOTAL				66		57		6	133	72	

ALL SIGNS SHALL BE ERECTED ACCORDING TO THE LOCATION SHOWN ON THE LAYOUT SHEETS EXCEPT THAT THE ENGINEER MAY SHIFT A SIGN IN ORDER TO SECURE A MORE DESIRABLE LOCATION. THE CONTRACTOR WILL STAKE ALL SIGN LOCATIONS, AND NO CHANGES IN THOSE LOCATIONS SHALL BE MADE WITHOUT PRIOR APPROVAL OF THE ENGINEER.

ALUMINUM SIGN BLANKS(TY A)

Min. Thickness

0.080"
0.100"
0.125"

FM 2090 SUMMARY OF SMALL SIGNS SHEET

DISTRICT	FEDERAL REGION	PROJECT NO.	SHEET
HOU	6	C 1912-1-22	118
COUNTY		CONTROL SECTION JOB	HIGHWAY NO.
MONTGOMERY		1912 01 022	FM 2090

SHEET 3 OF 3

STD-N29

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

DATE: $DATE$ $TIME$
FILE: $FILE$

SHEET 1 OF 12

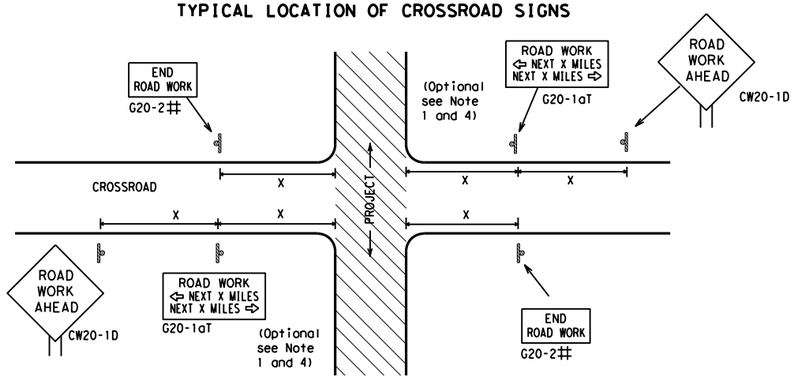
Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	HOU	MONTGOMERY		12
5-10 5-21				

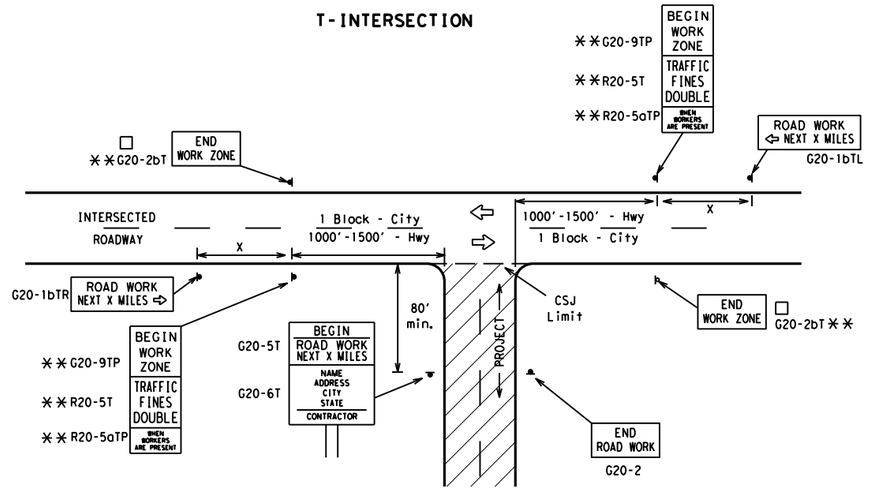
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

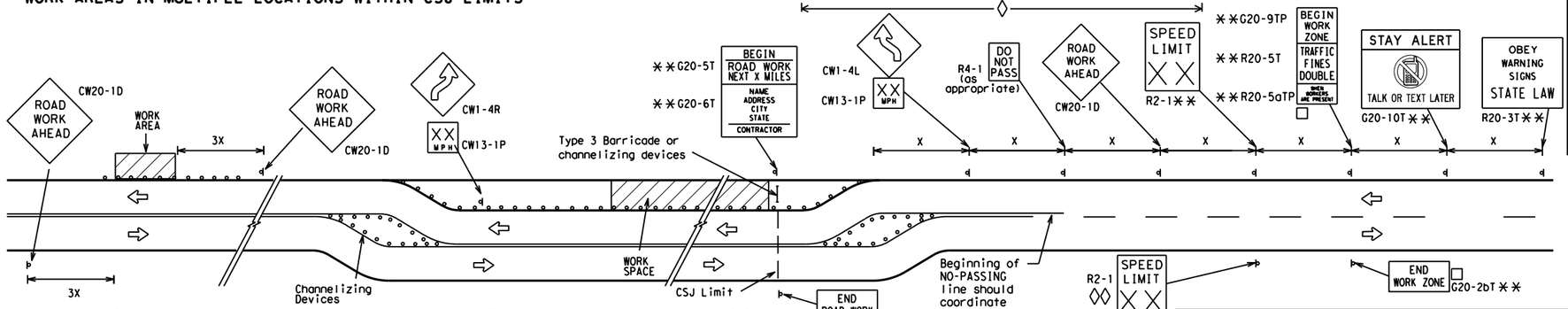
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

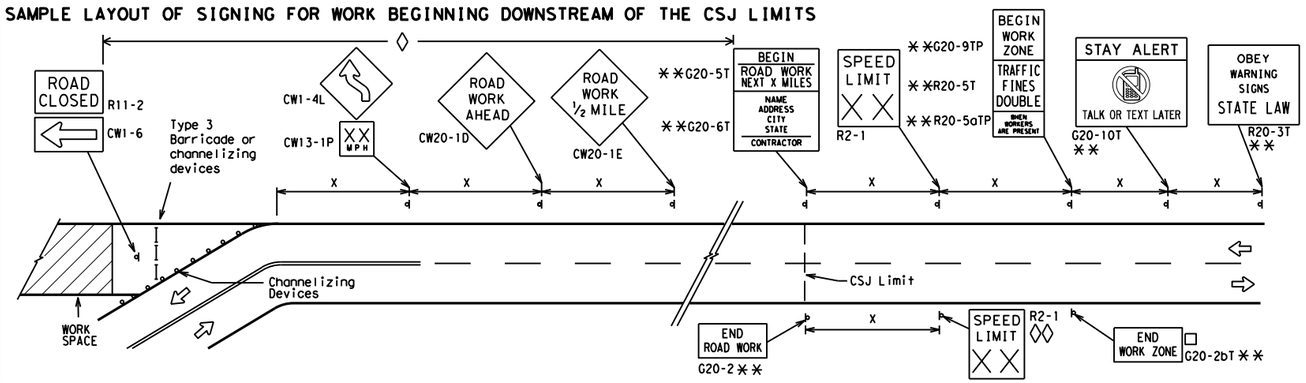
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	MONTGOMERY		13

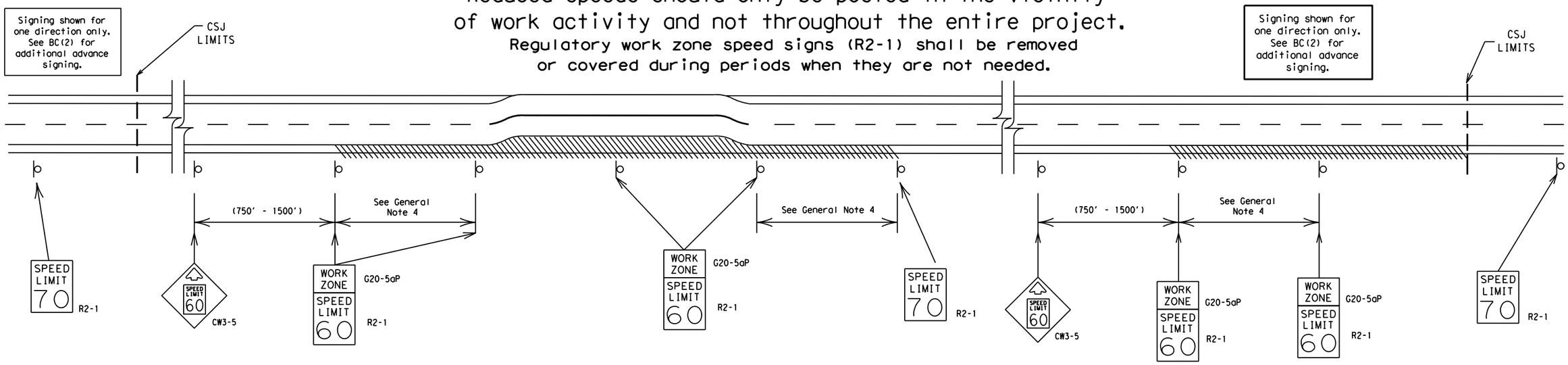
DATE: $DATE$ $TIME$
FILE: $FILE$

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

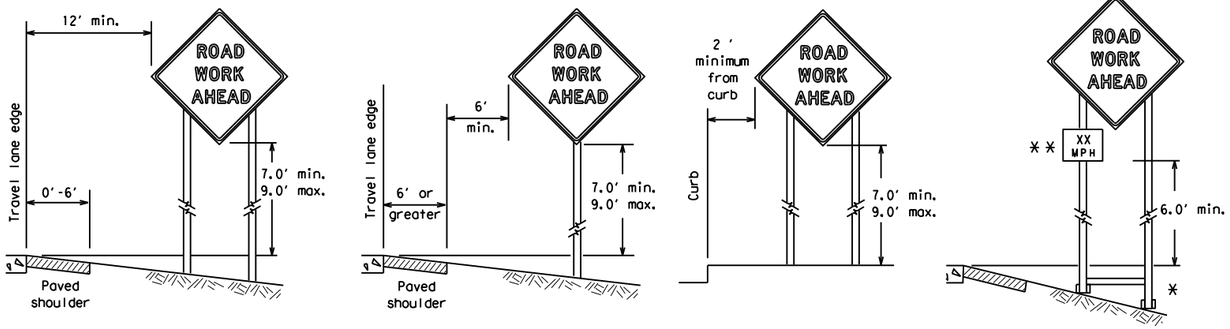
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	MONTGOMERY		14

DATE: $DATE$ $TIME$
FILE: $FILE$

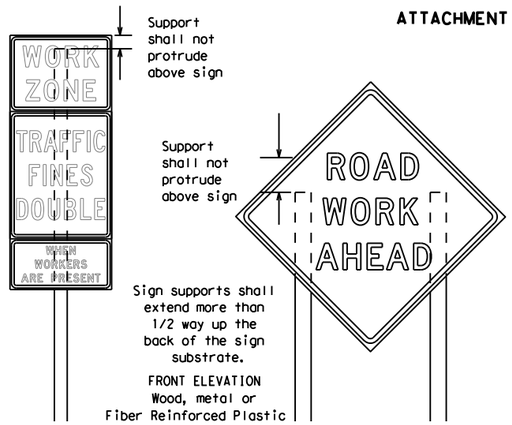
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



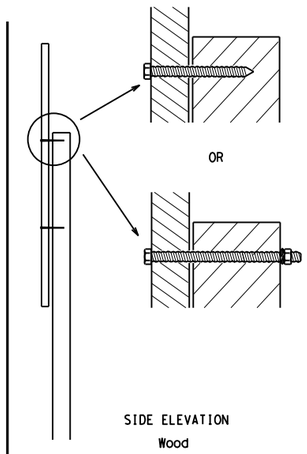
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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

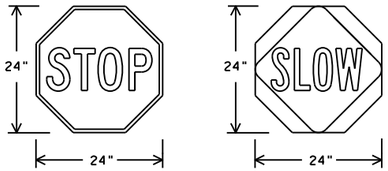
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

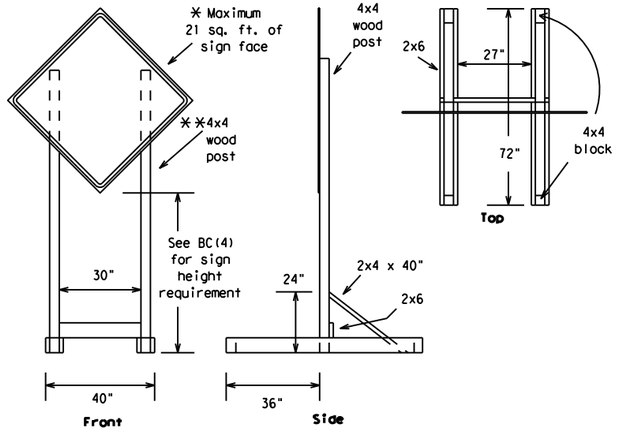
Traffic Safety Division Standard

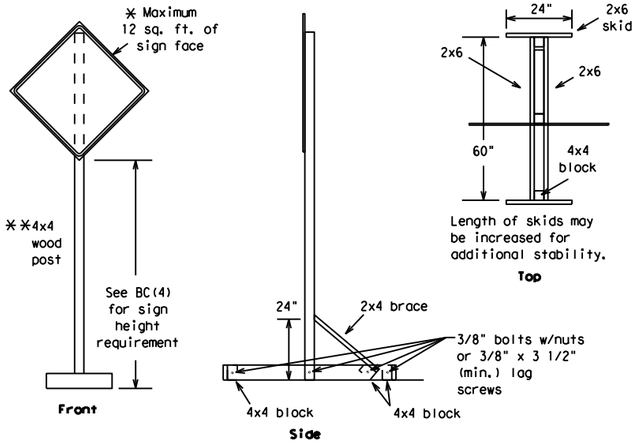
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	MONTGOMERY		15

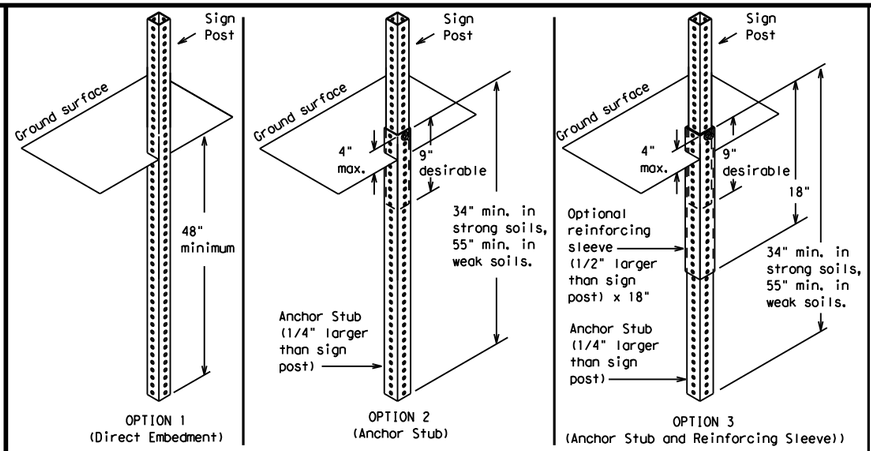
DATE: $DATE$ $TIME$
FILE: $FILE$





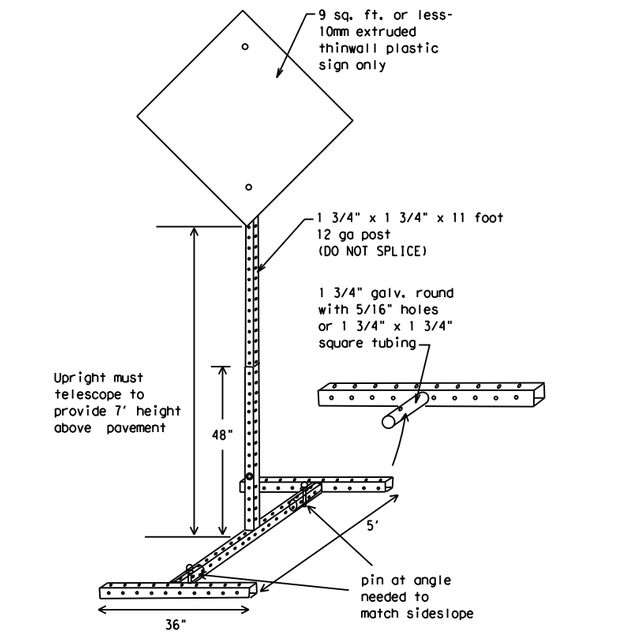
SKID MOUNTED WOOD SIGN SUPPORTS

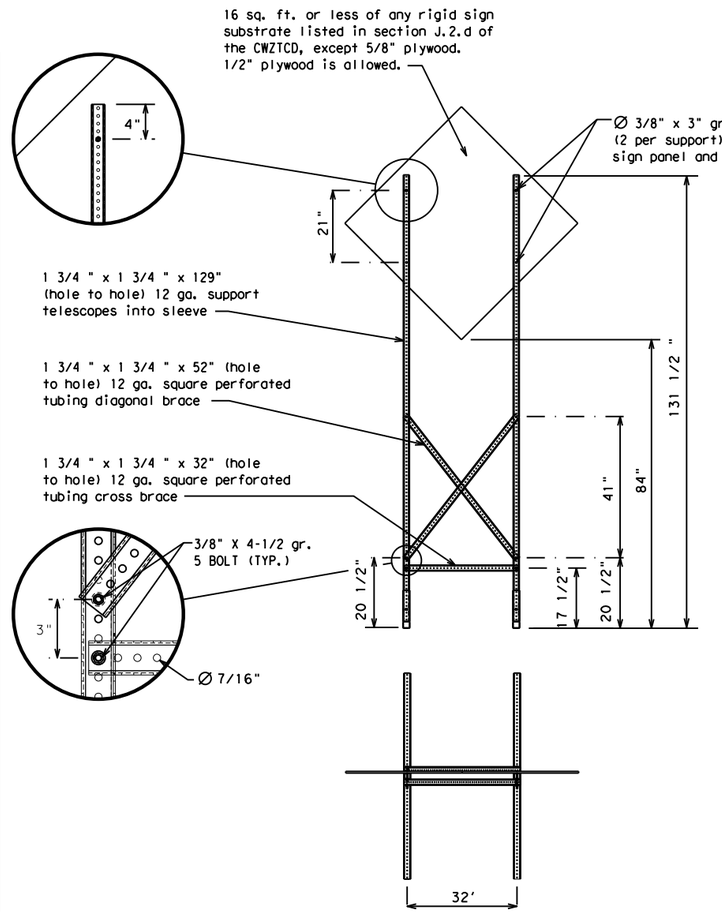
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

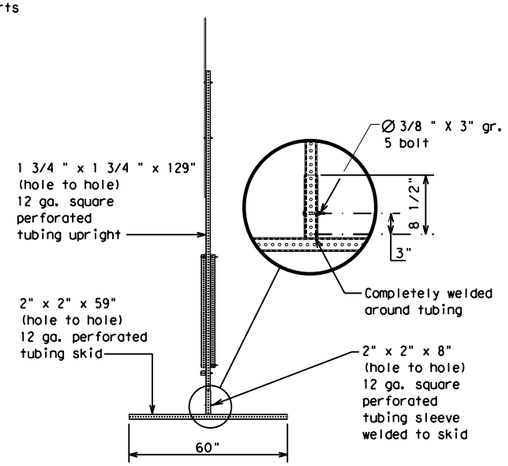


GROUND MOUNTED SIGN SUPPORTS

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	1912	01	022	FM 2090
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	MONTGOMERY		16

DATE: $DATE$ $TIME$
FILE: $FILE$

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: $DATE$ $TIME$
FILE: $FILE$

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

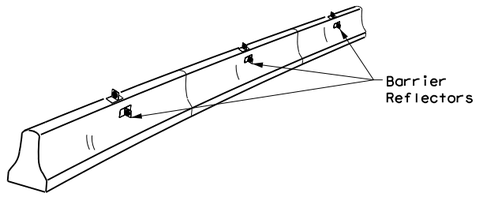
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		1912	01	022	FM 2090
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		HOU	MONTGOMERY		17

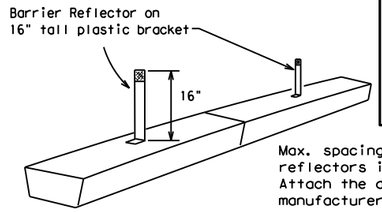
100

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



CONCRETE TRAFFIC BARRIER (CTB)

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

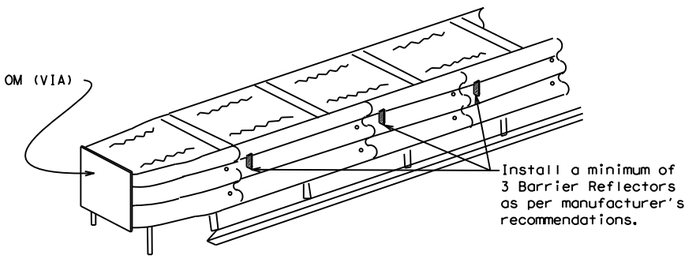


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

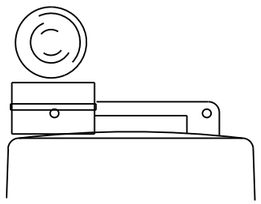


DELINEATION OF END TREATMENTS

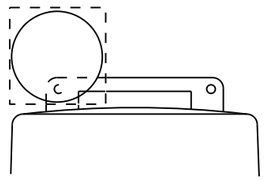
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

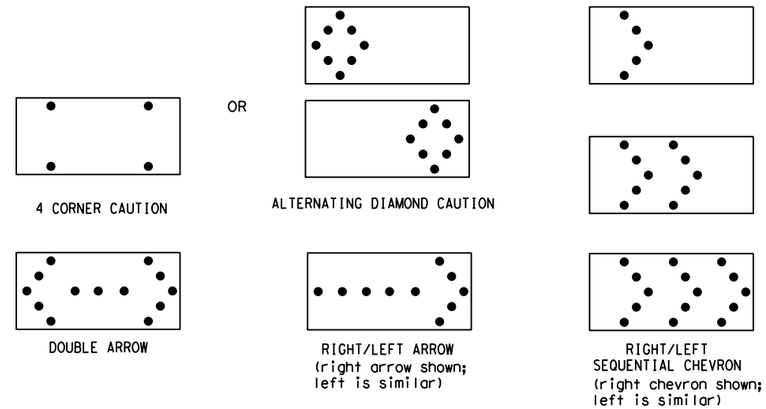
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

SHEET 7 OF 12

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	1912	01	022	FM 2090
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	MONTGOMERY		18

101

DATE: $DATE$ $TIME$
FILE: $FILE$

DATE: $DATE$ $TIME$
FILE: $FILE$

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:

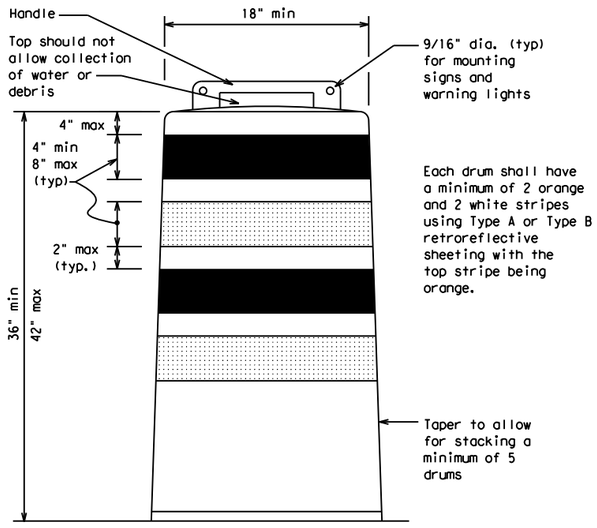
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

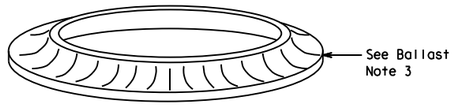
RETROREFLECTIVE SHEETING

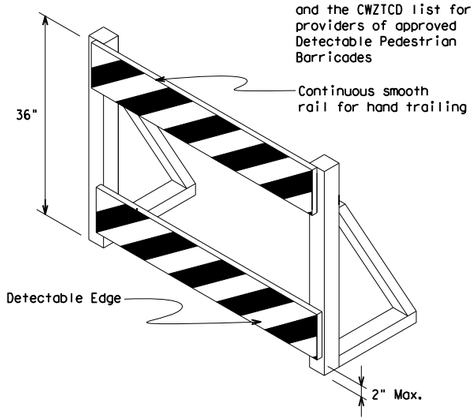
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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



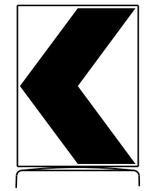




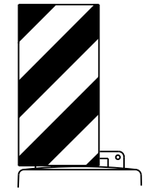
This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

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.

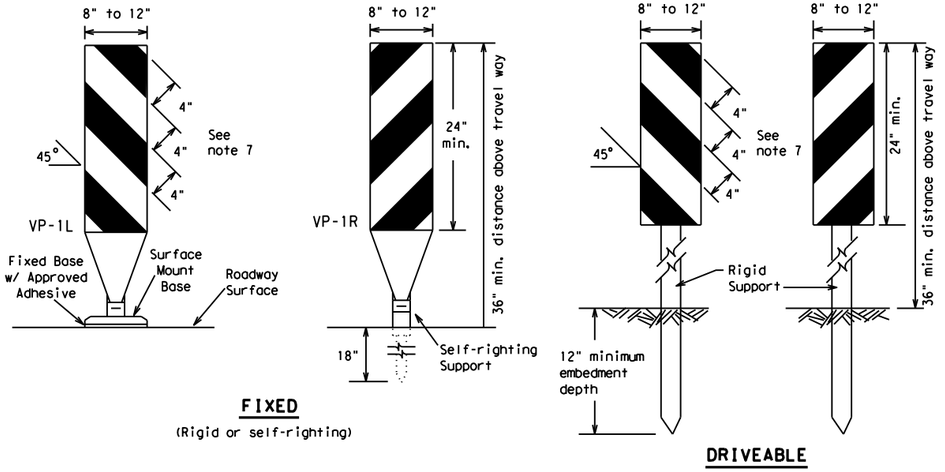
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

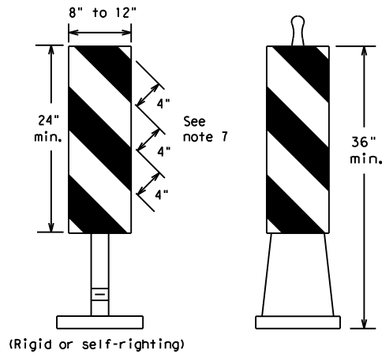
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	HOU	MONTGOMERY		19
7-13				

102



FIXED
(Rigid or self-righting)

DRIVEABLE

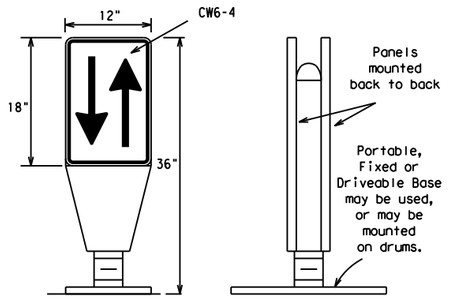


(Rigid or self-righting)

PORTABLE

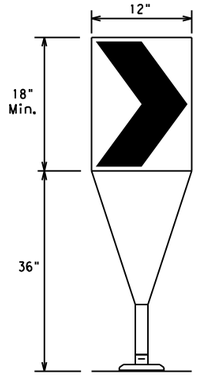
VERTICAL PANELS (VPs)

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)



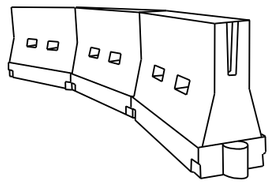
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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	1912	01	022	FM 2090
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	MONTGOMERY		20

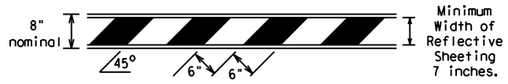
103

DATE: $DATE$ $TIME$
FILE: $FILE$

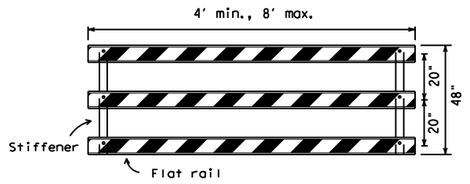
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



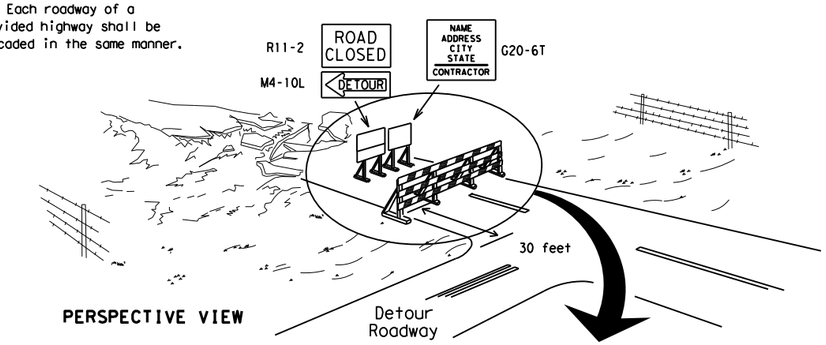
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

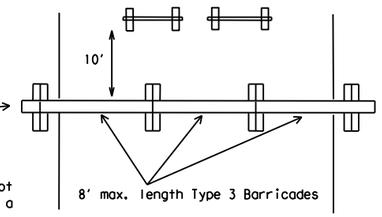
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

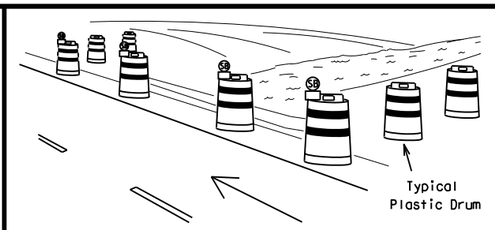
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

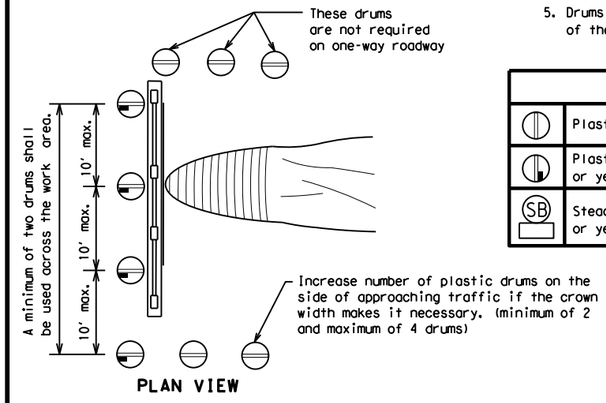
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

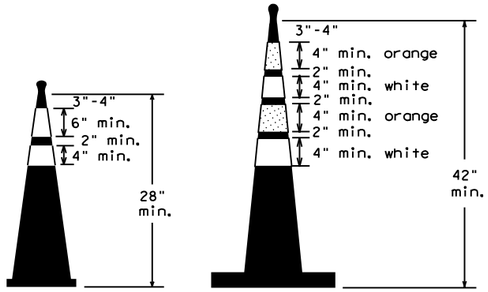
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

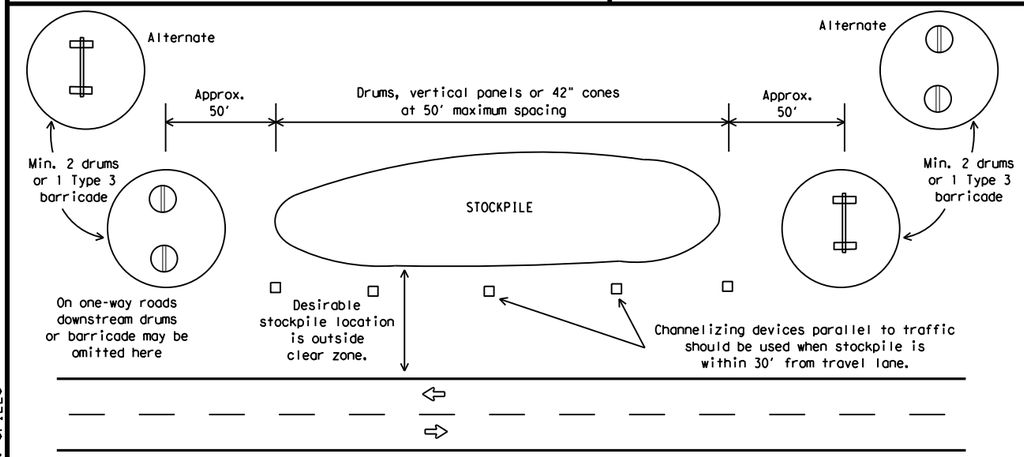
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

DATE: $DATE$ $TIME$
FILE: $FILE$

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	1912	01	022	FM 2090
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	MONTGOMERY		21

104

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.

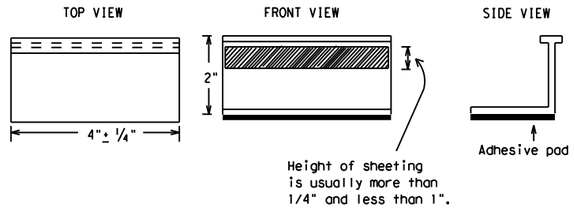
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

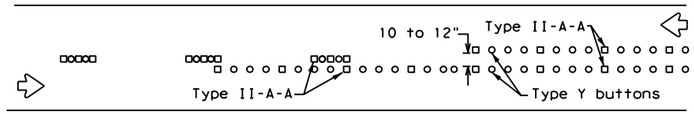
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	HOU	MONTGOMERY		22
11-02 8-14				

105

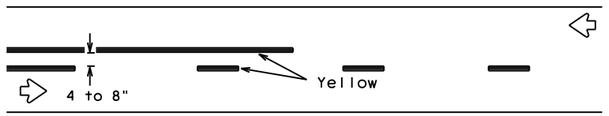
DATE: $DATE$ $TIME$
FILE: $FILE$

PAVEMENT MARKING PATTERNS

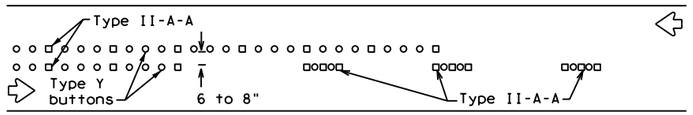
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



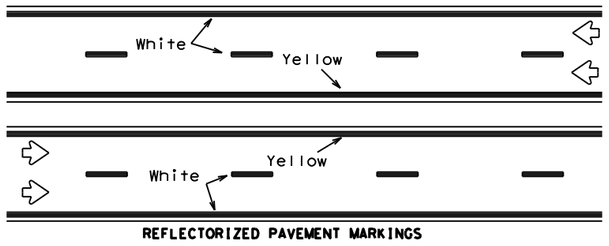
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



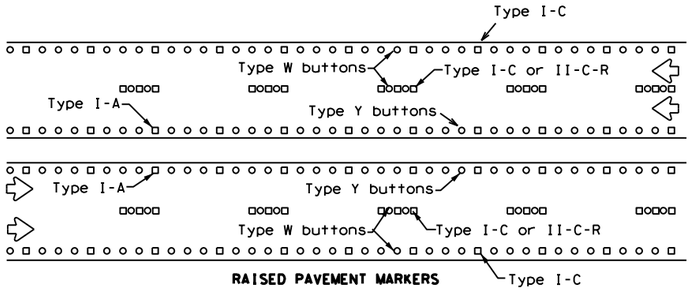
RAISED PAVEMENT MARKERS - PATTERN B

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



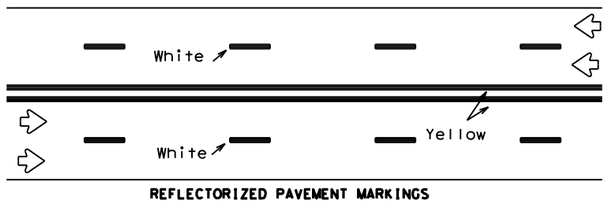
REFLECTORIZED PAVEMENT MARKINGS



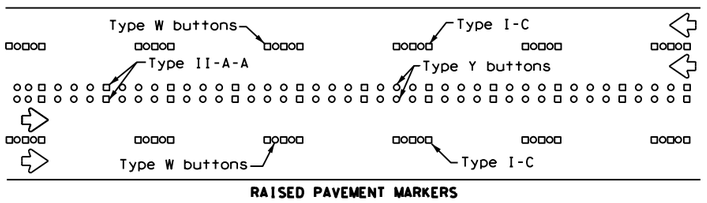
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



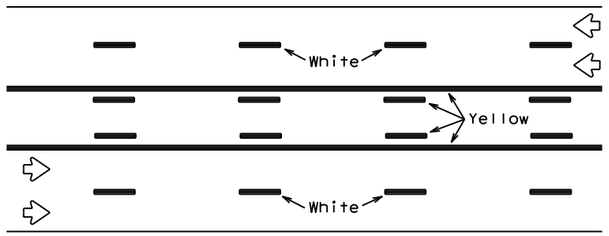
REFLECTORIZED PAVEMENT MARKINGS



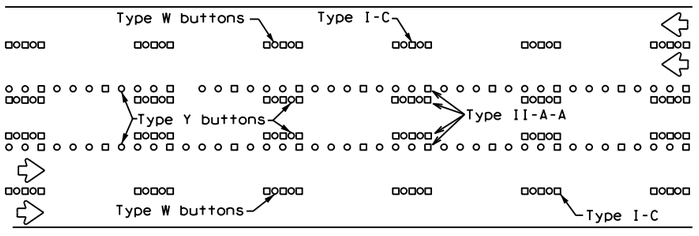
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

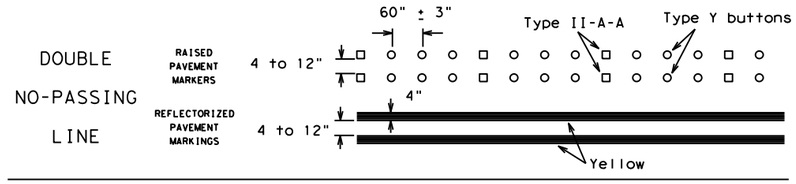
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

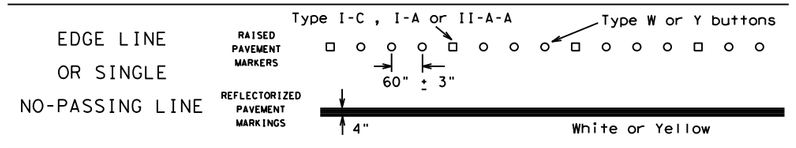
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

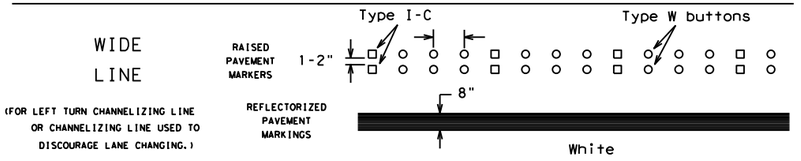


EDGE LINE OR SINGLE NO-PASSING LINE



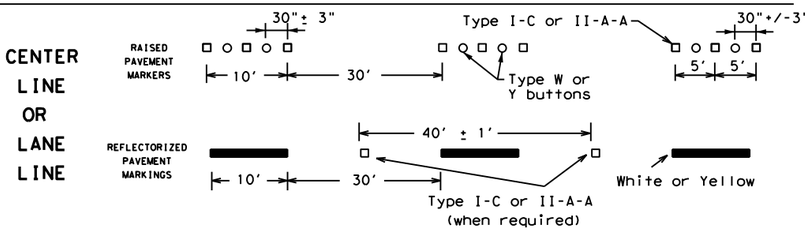
WIDE LINE

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

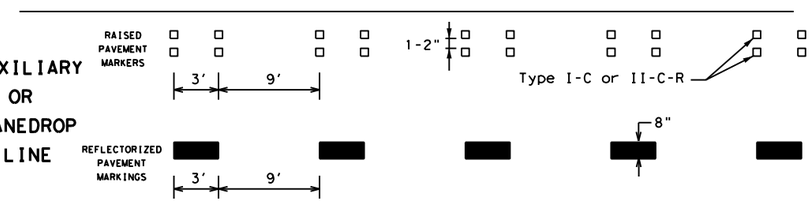


BROKEN LINES

CENTER LINE OR LANE LINE

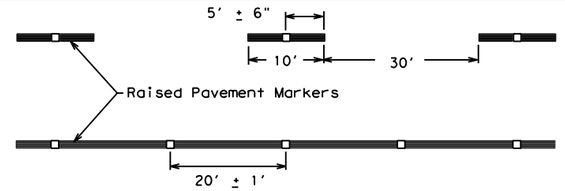


AUXILIARY OR LANEDROP LINE



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

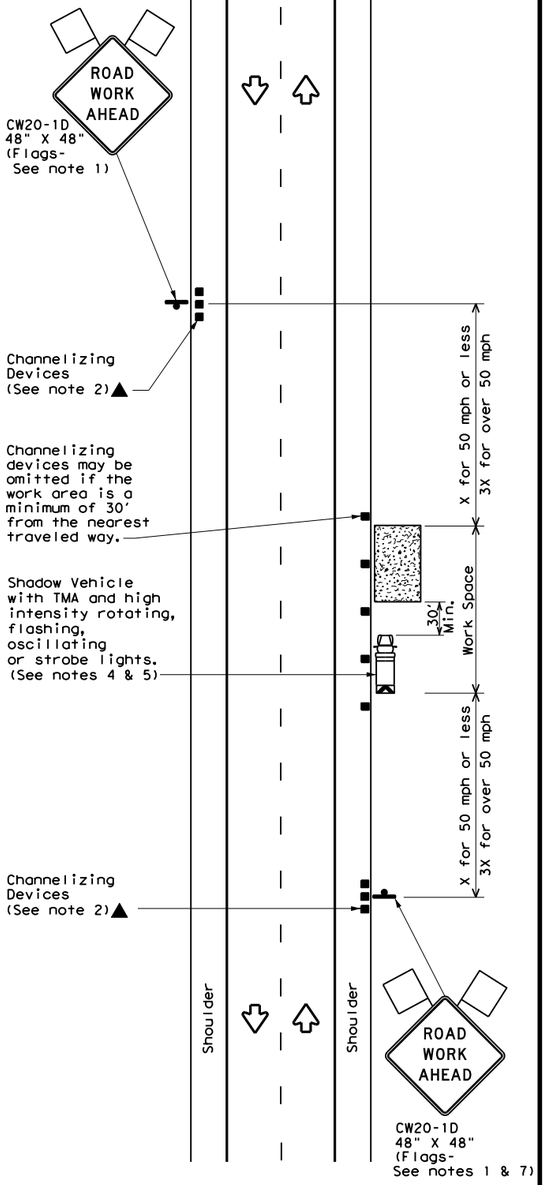
BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
1-97 9-07 5-21	DIST	COUNTY		SHEET NO.
2-98 7-13	HOU	MONTGOMERY		23
11-02 8-14				

106

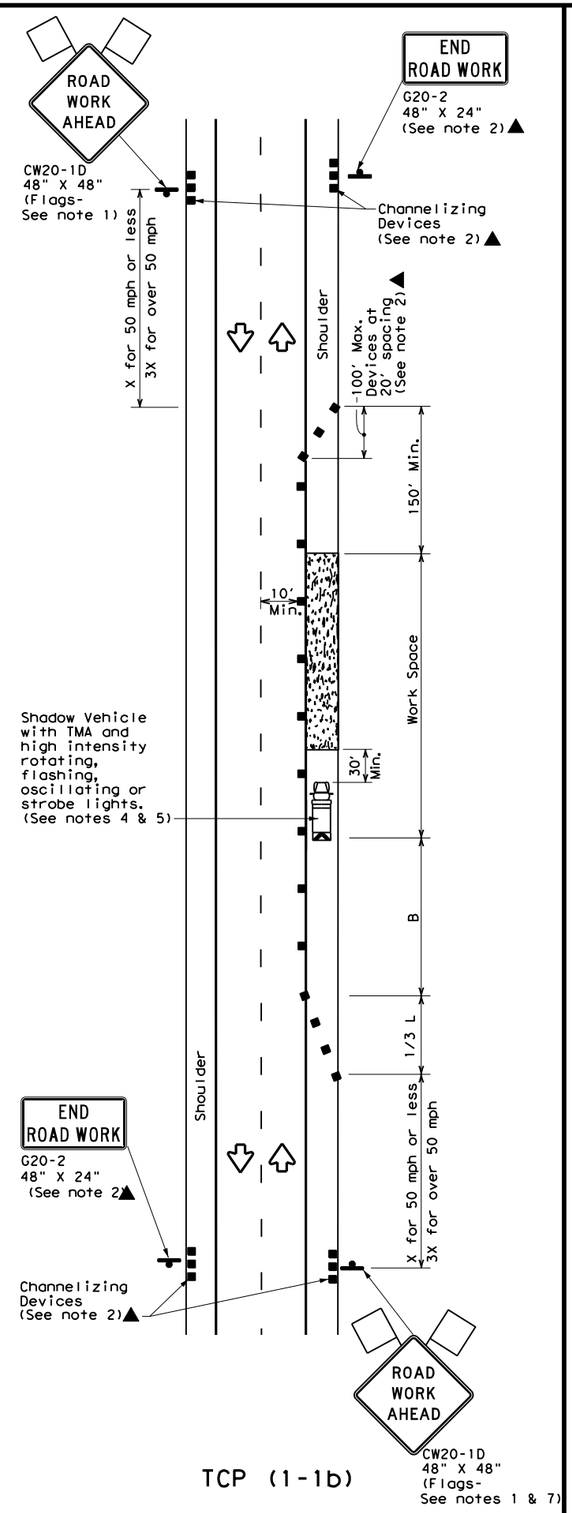
DATE: $DATE$ $TIME$
FILE: $FILE$

DATE: 06/01/2022 01:52 PM
FILE:



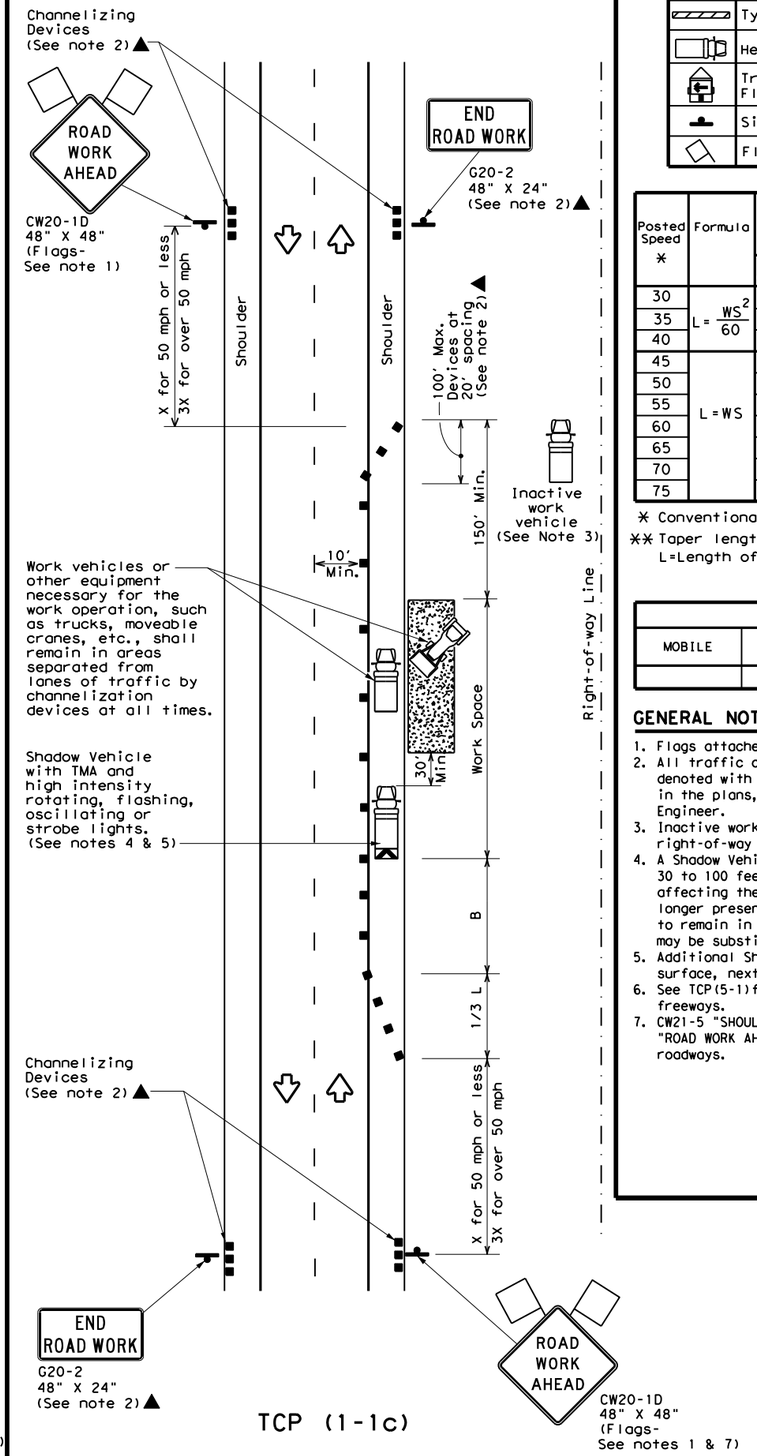
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

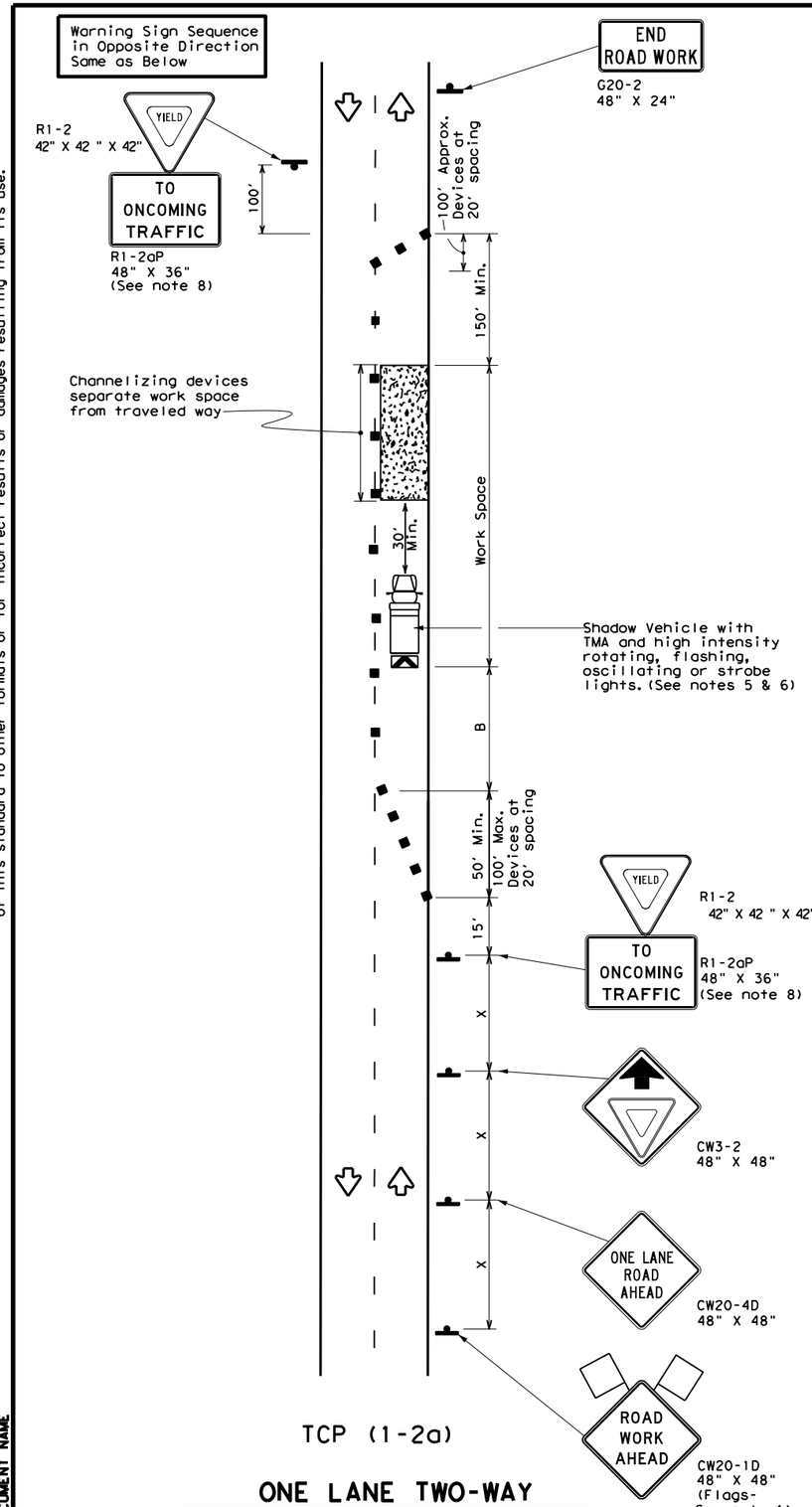
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98	1912	01	022	FM 2090
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	HOU	MONTGOMERY		24

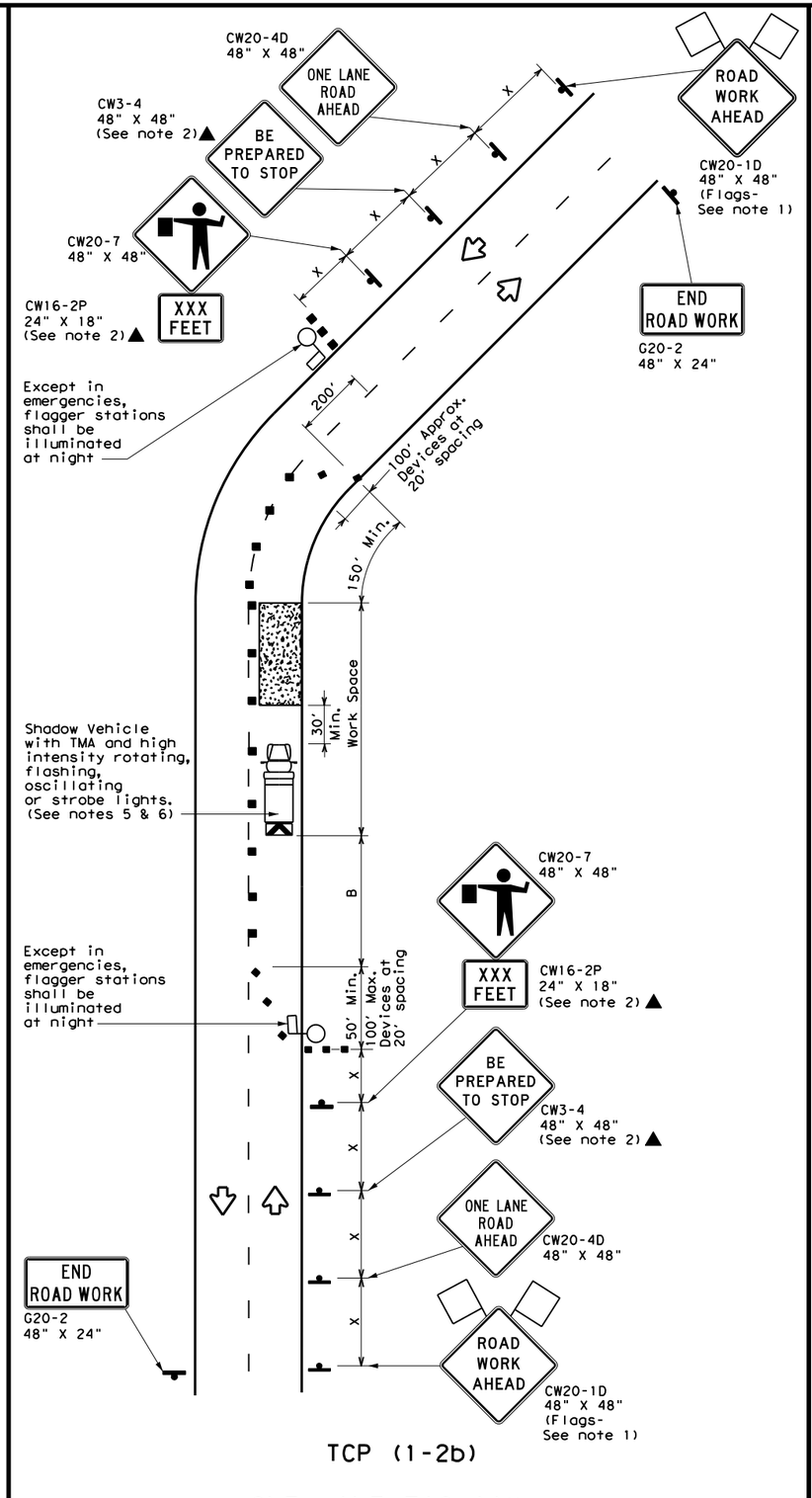
DATE: 06/01/2022 02:10 PM
FILE: DOCUMENT NAME



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

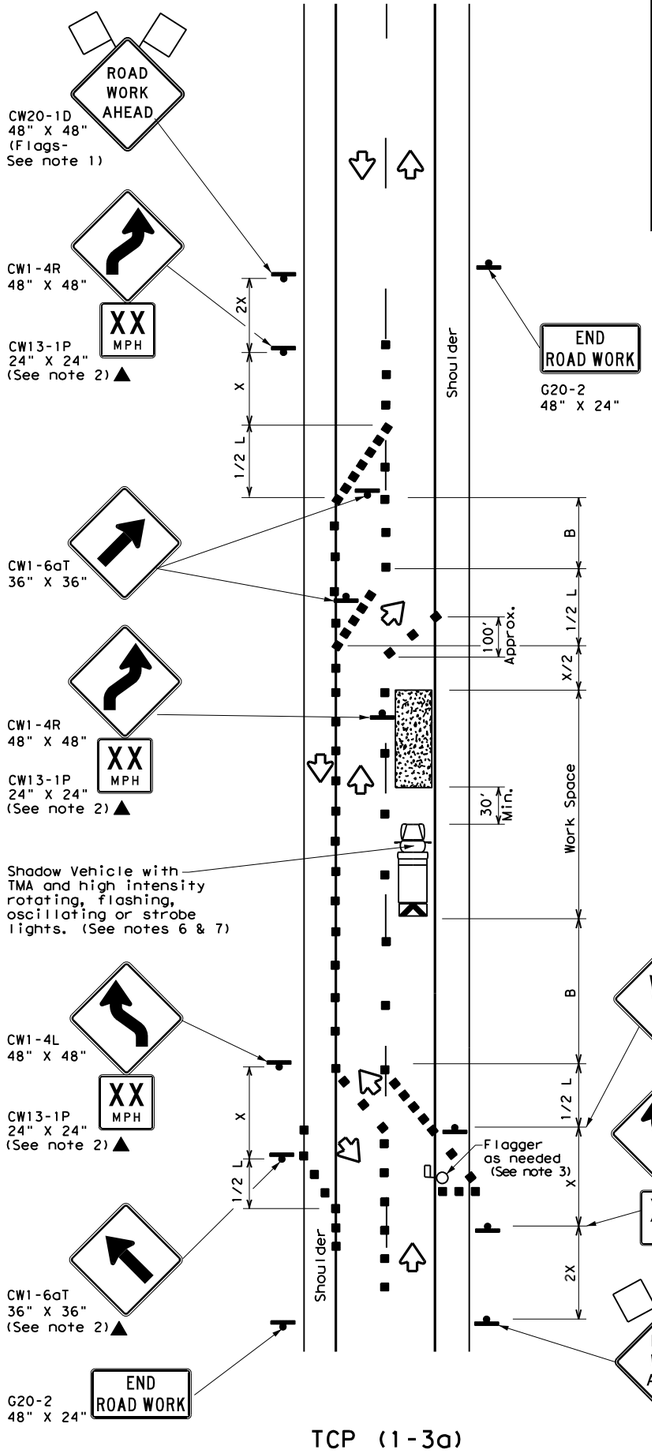
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

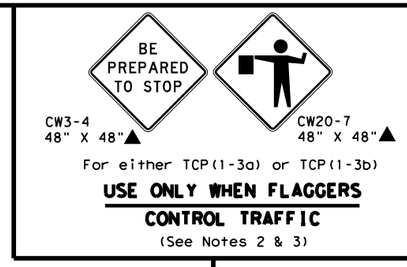
FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
4-90 4-98	DIST	COUNTY		SHEET NO.
2-94 2-12	HOU	MONTGOMERY		25
1-97 2-18				

DATE: 07/19/2022 11:45 AM
FILE: dwg:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\100985\Sheets\tcp1-3-18.dgn



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

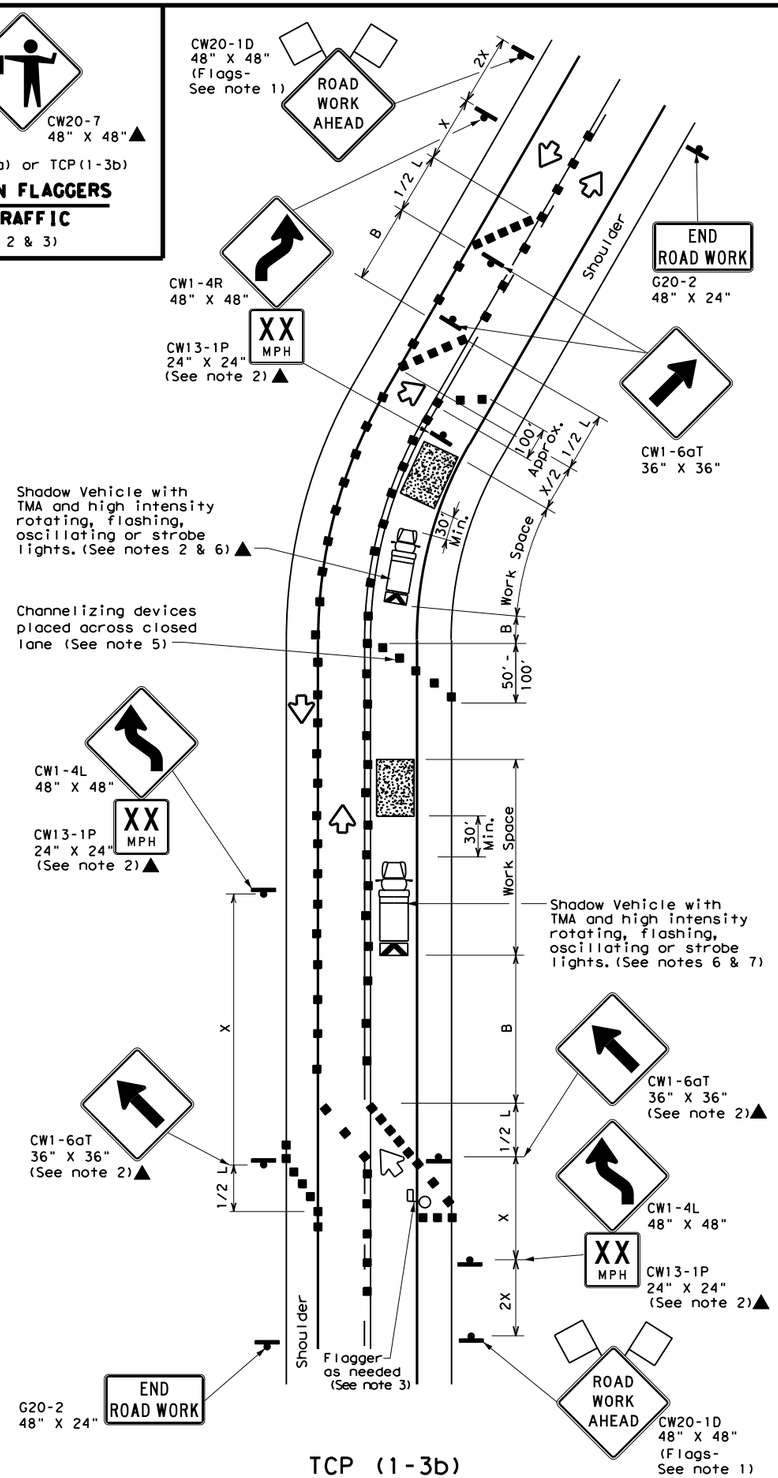
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

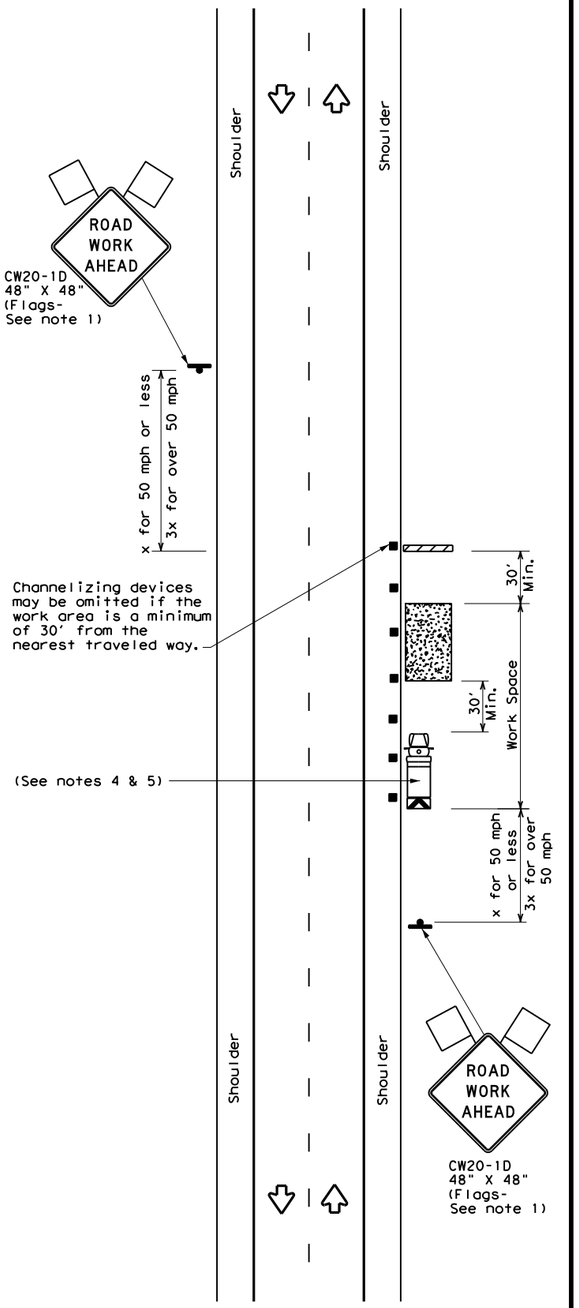
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

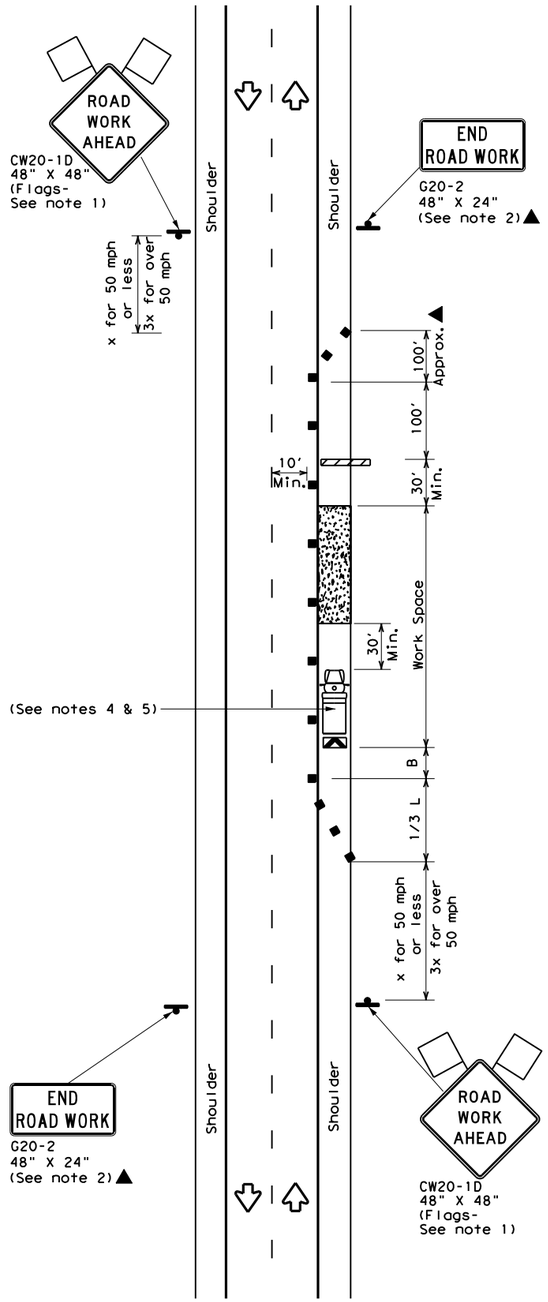
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	HOU	MONTGOMERY		26
1-97 2-18				

DATE: 07/19/2022 11:54 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\1900595\...



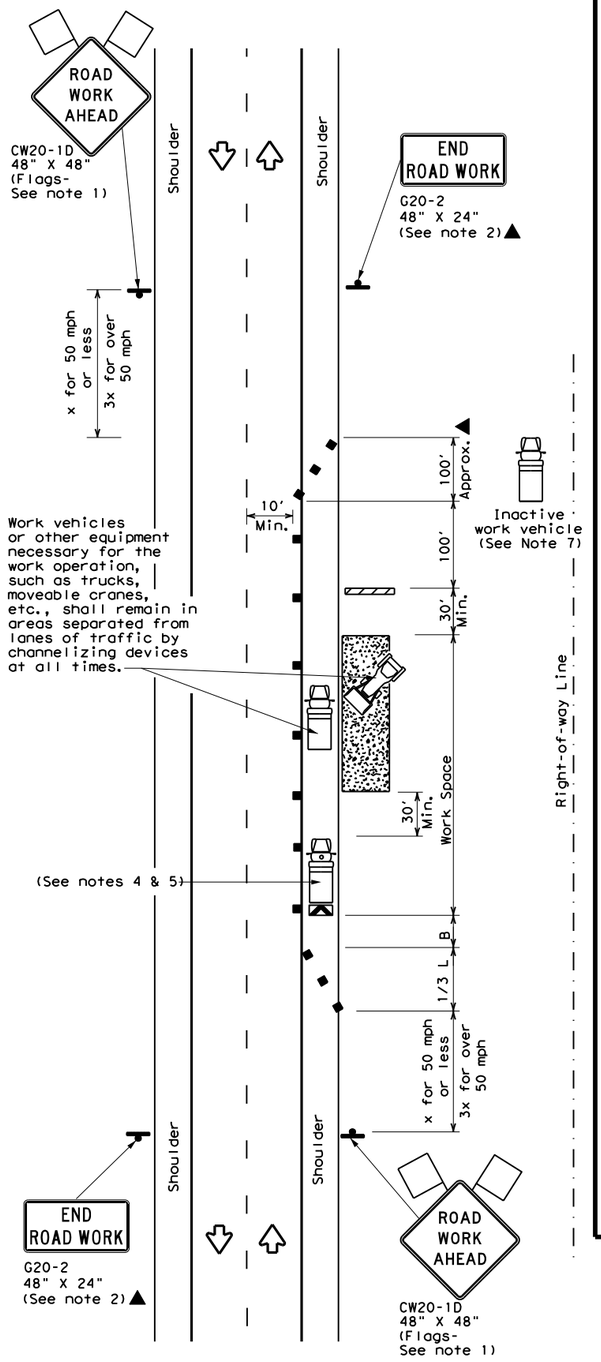
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

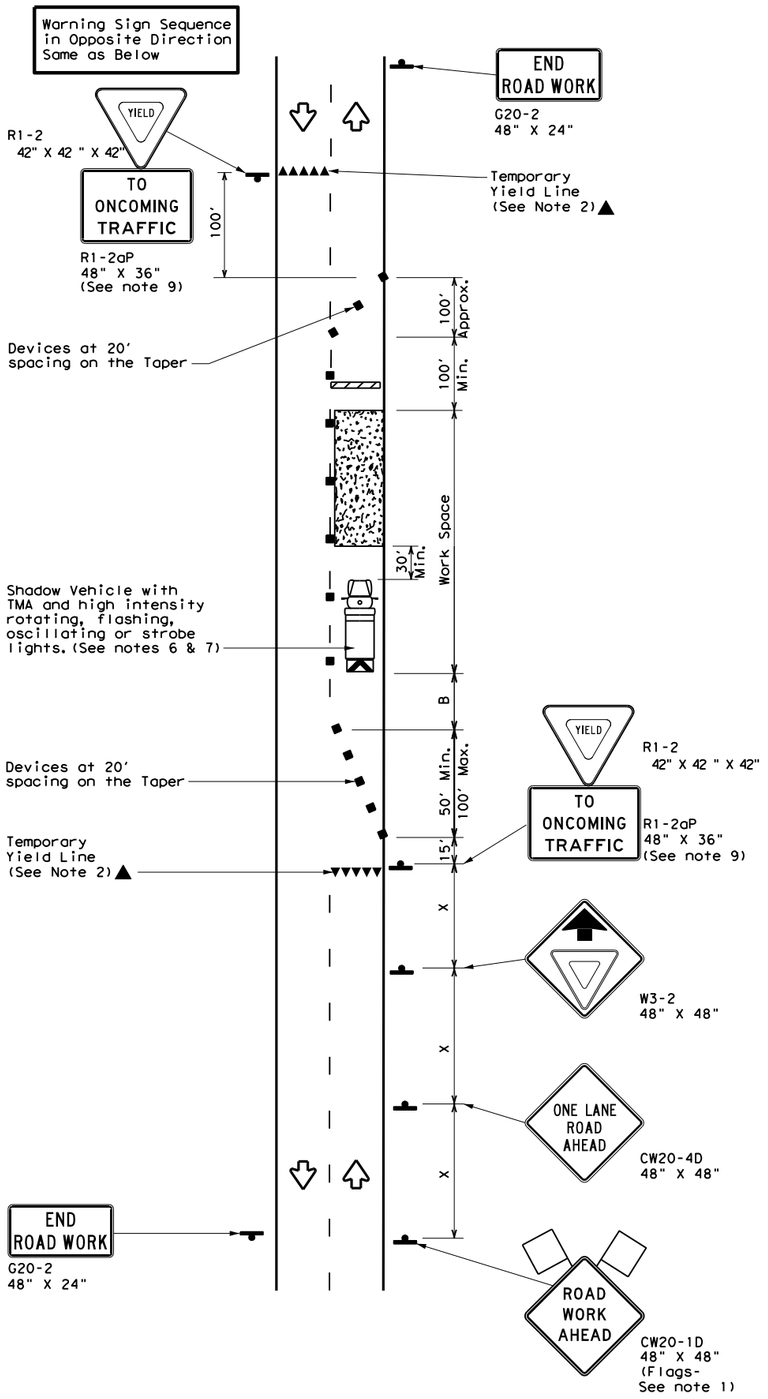
Texas Department of Transportation

Traffic Operations Division Standard

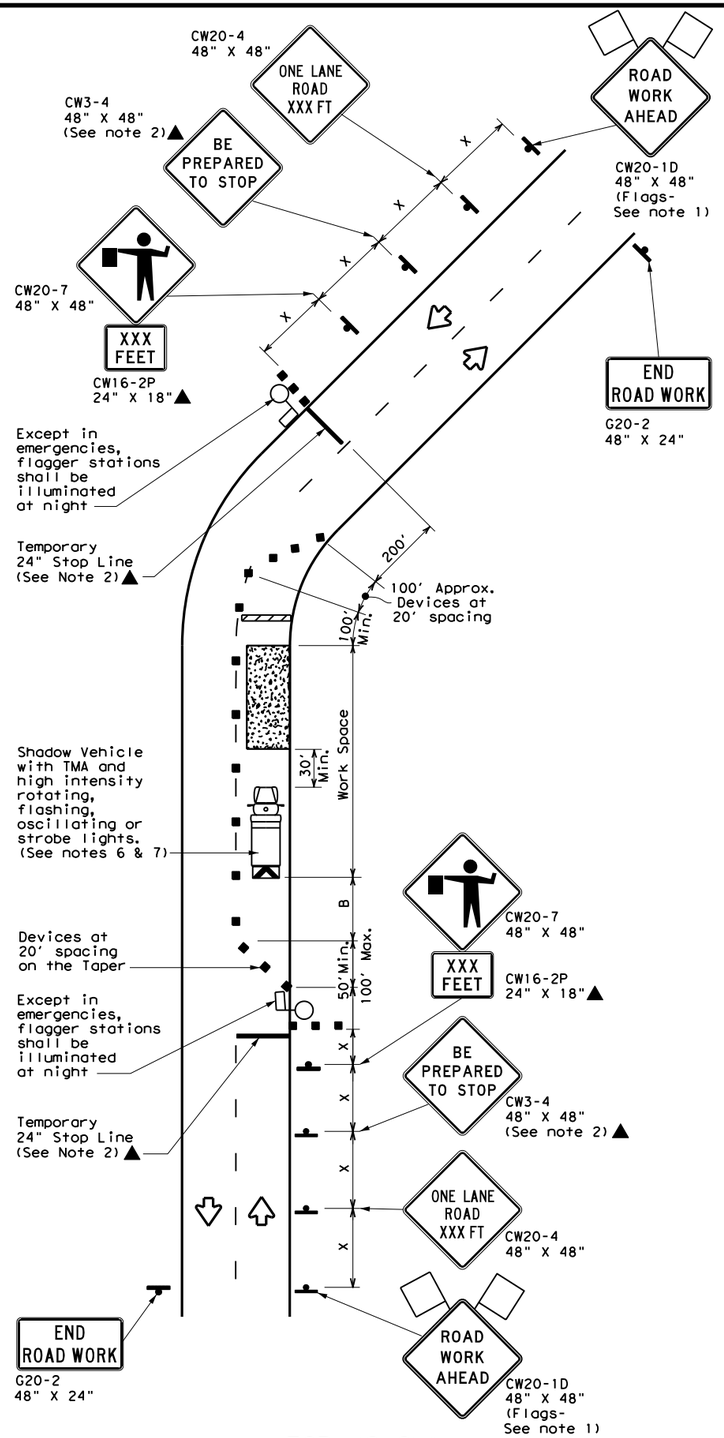
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	HOU	MONTGOMERY		27
1-97 2-18				



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.

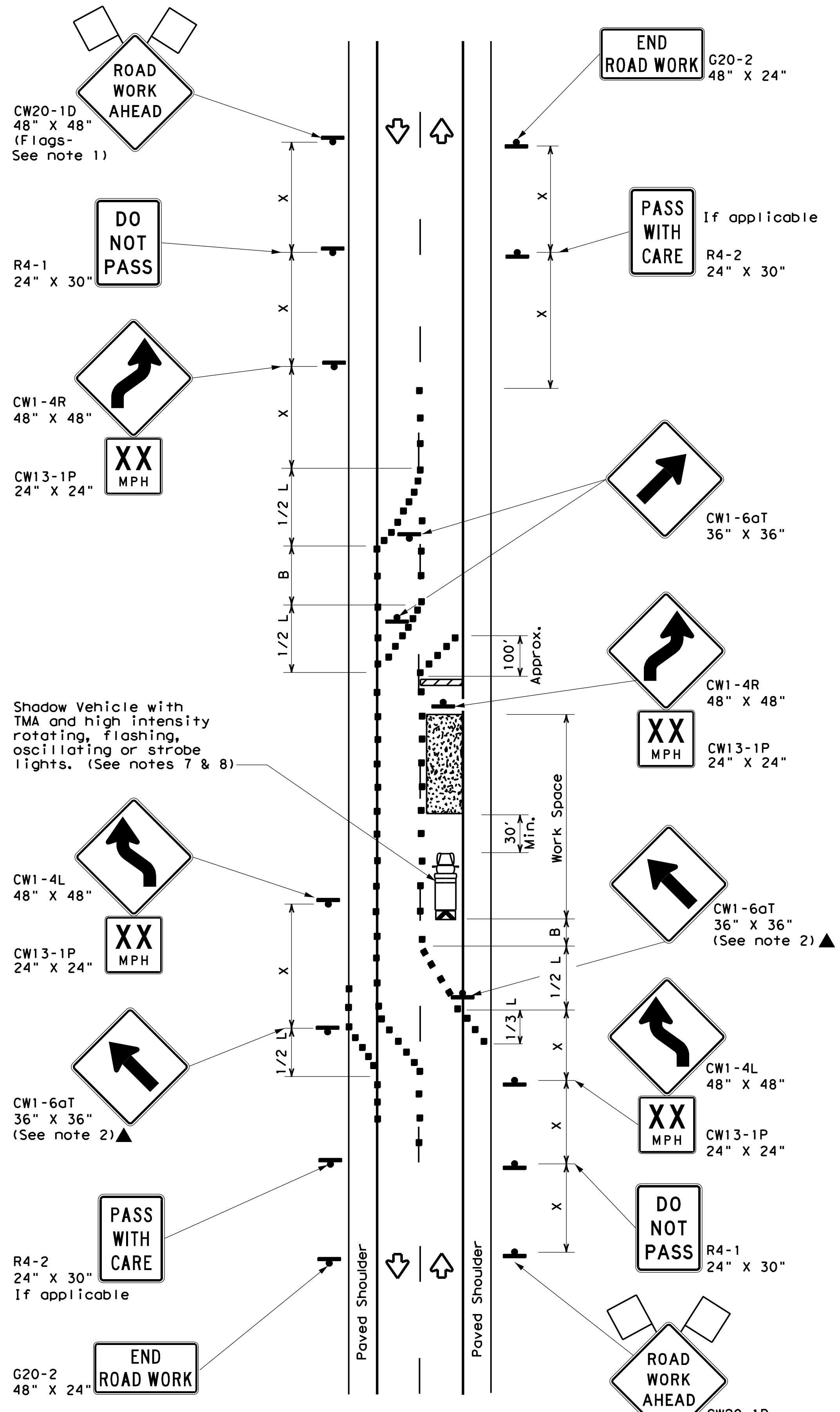
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

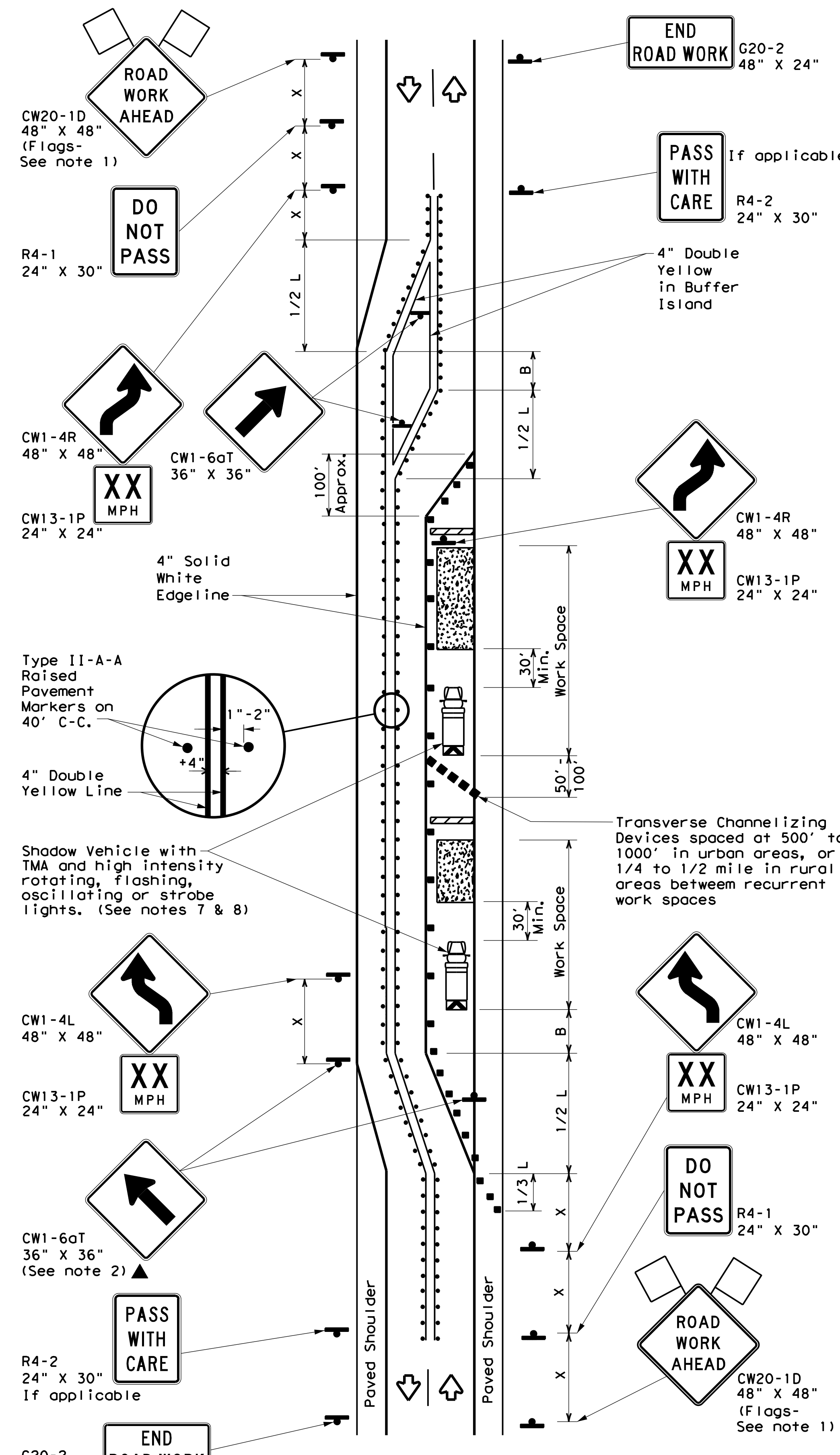
FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	HOU	MONTGOMERY		28
4-98 2-18				

DATE: 07/19/2022 11:57 AM
FILE: DOCUMENT NAME



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 **			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 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

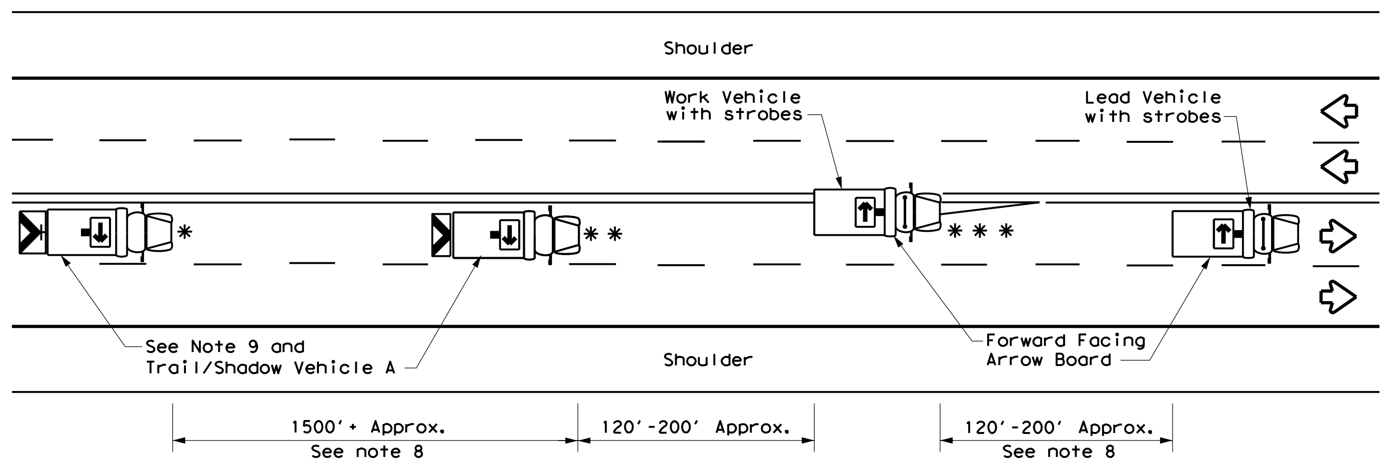
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

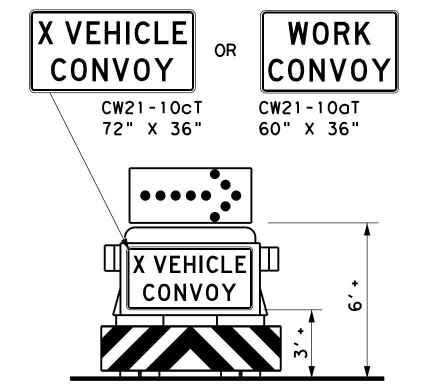
FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	1912	01	022	FM 2090
	DIST	COUNTY		SHEET NO.
	HOU	MONTGOMERY		29

163



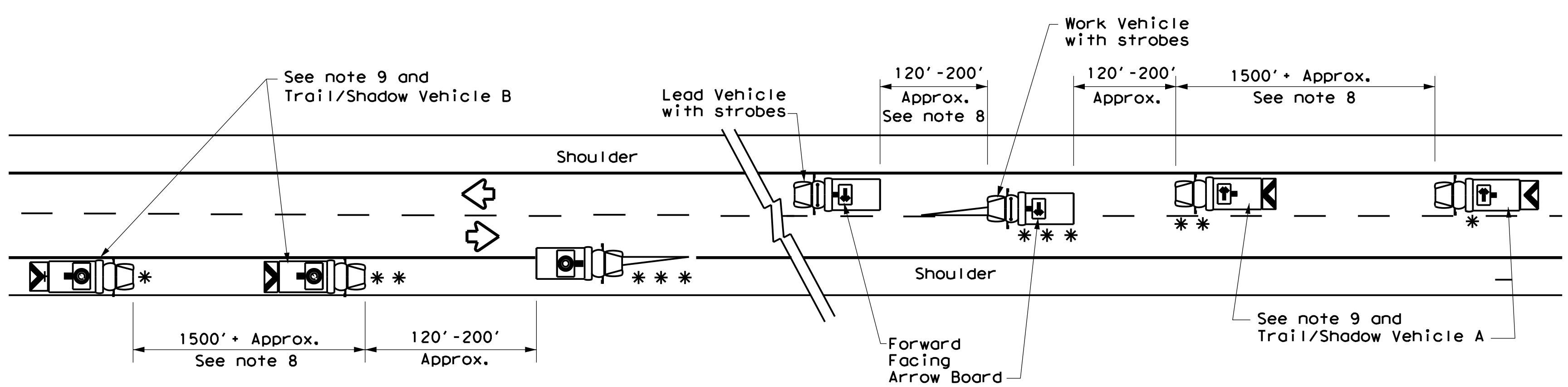
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

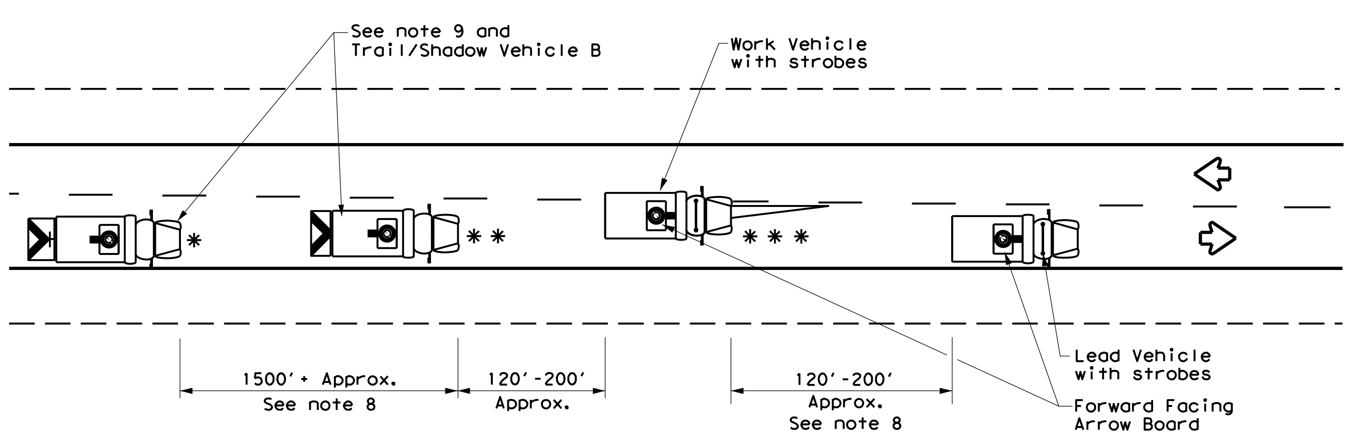


WORK ON SHOULDER

WORK ON TRAVEL LANE

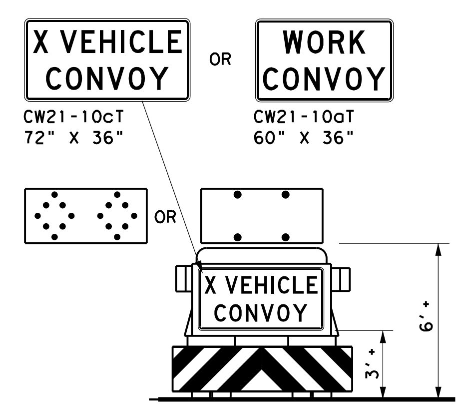
TCP (3-1b)

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

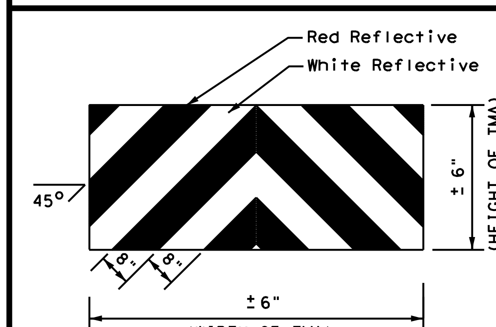
LEGEND

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used 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

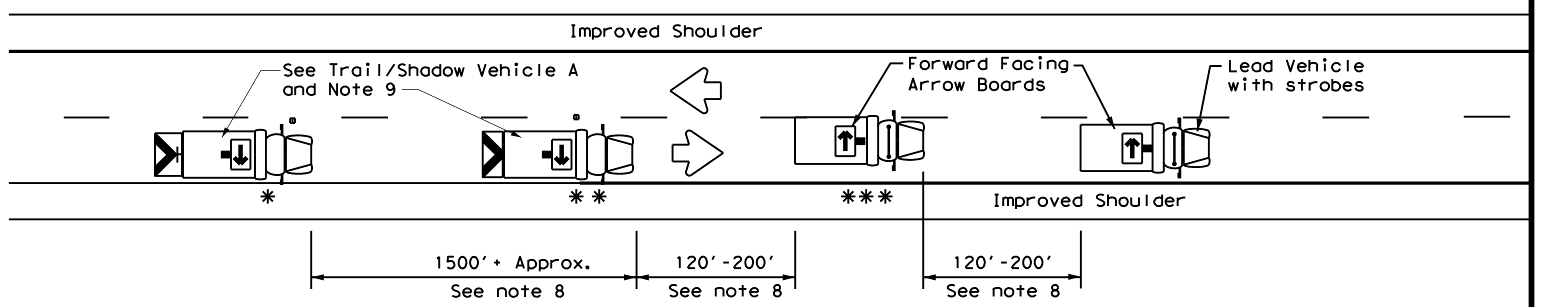
TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT 1912	SECT 01	JOB 022	HIGHWAY FM 2090
REVISIONS 2-94 4-98 8-95 7-13 1-97	DIST HOU	COUNTY MONTGOMERY		SHEET NO. 30

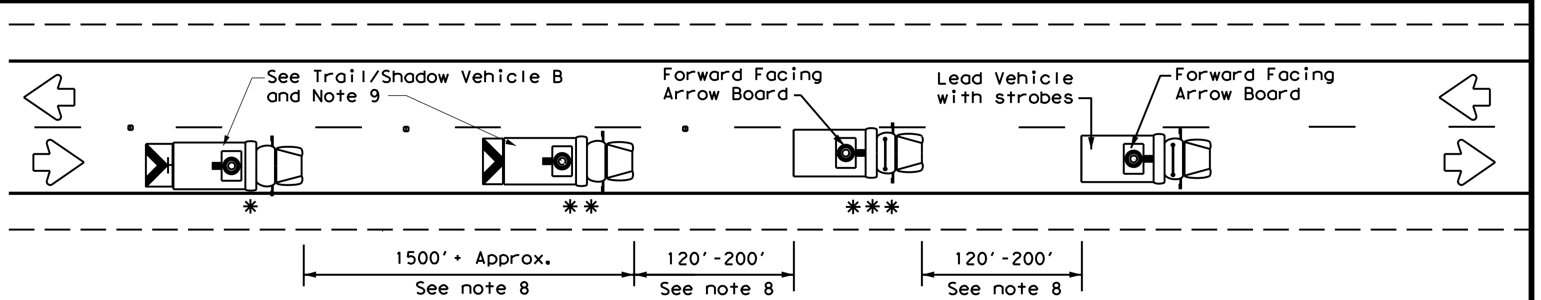
175

DATE: 06/01/2022 01:56 PM
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\...



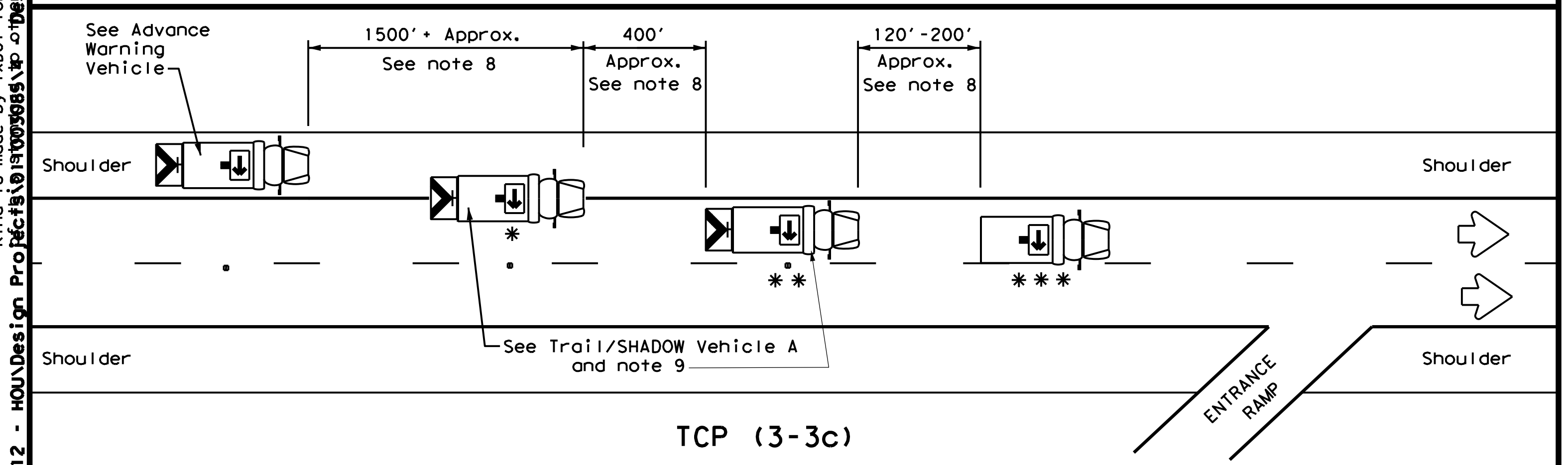
TCP (3-3a)

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



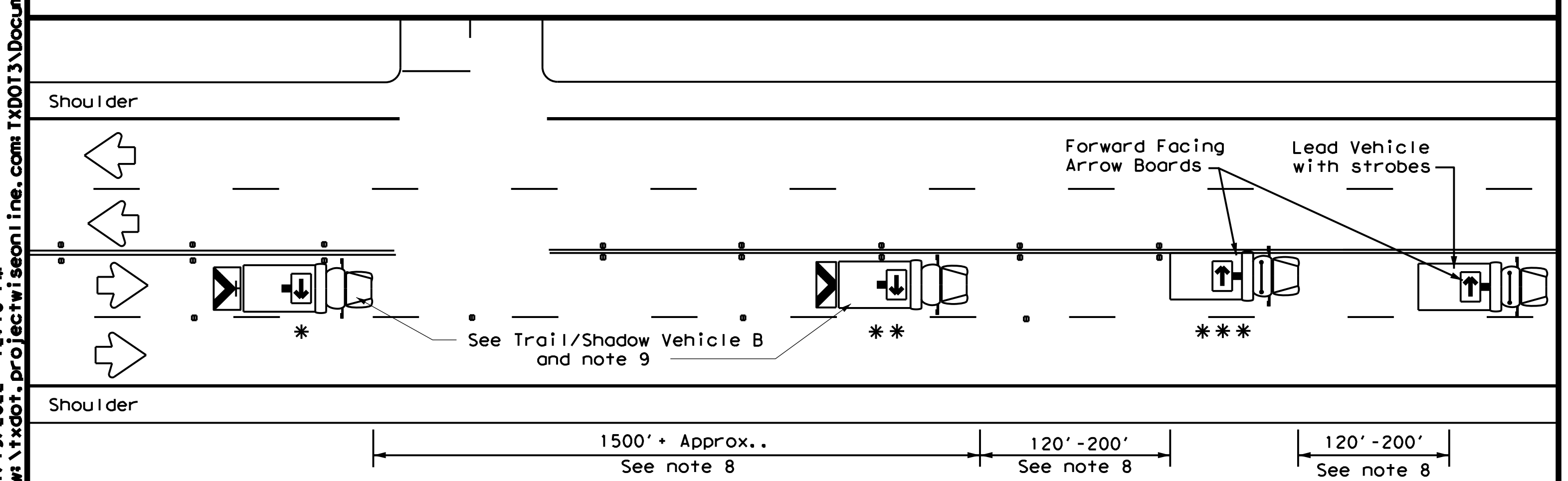
TCP (3-3b)

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



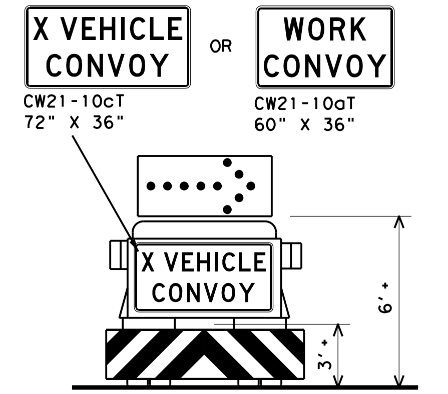
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



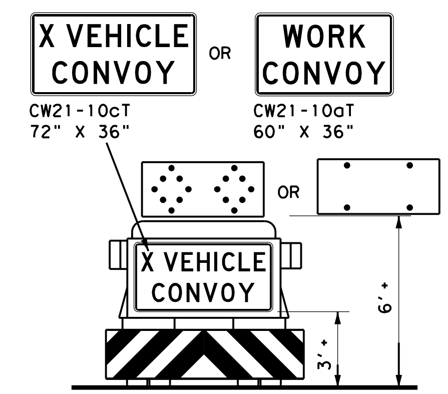
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



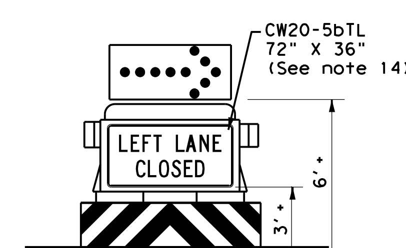
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

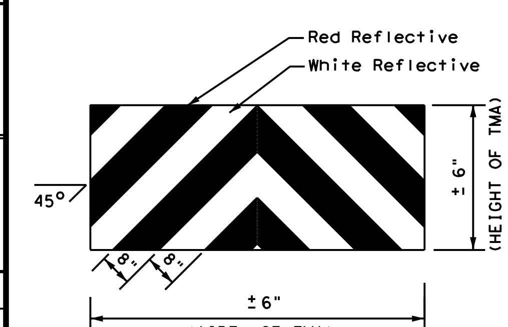


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND

Symbol	Description	ARROW BOARD DISPLAY	
*	Trail Vehicle		
**	Shadow Vehicle		
***	Work Vehicle	(symbol)	RIGHT Directional
(symbol)	Heavy Work Vehicle	(symbol)	LEFT Directional
(symbol)	Truck Mounted Attenuator (TMA)	(symbol)	Double Arrow
(symbol)	Traffic Flow	(symbol)	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.

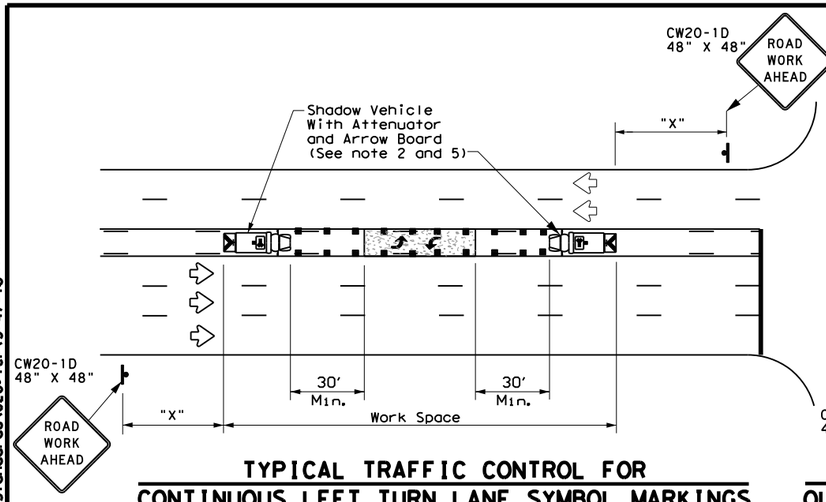
Texas Department of Transportation
Traffic Operations Division Standard

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

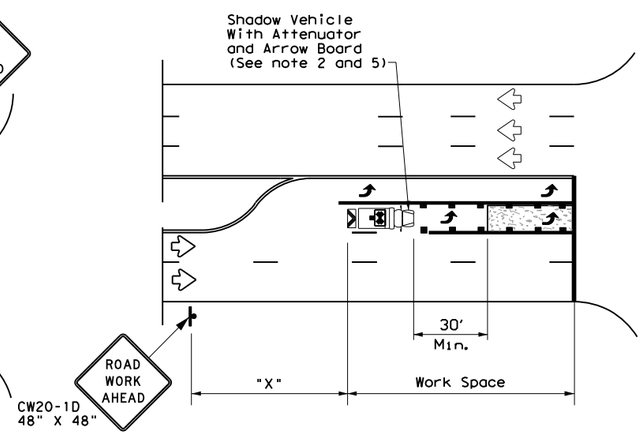
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT September 1987	CONT 1912	SECT 01	JOB 022	HIGHWAY FM 2090
REVISIONS 2-94 4-98 8-95 7-13 1-97 7-14	DIST HOU		COUNTY MONTGOMERY	SHEET NO. 31

DATE: 07/19/2022 12:10 PM
FILE: pw:\txdot.projectwiseonline.com:TxDOT13\Documents\12 - HOU\Design Projects\...

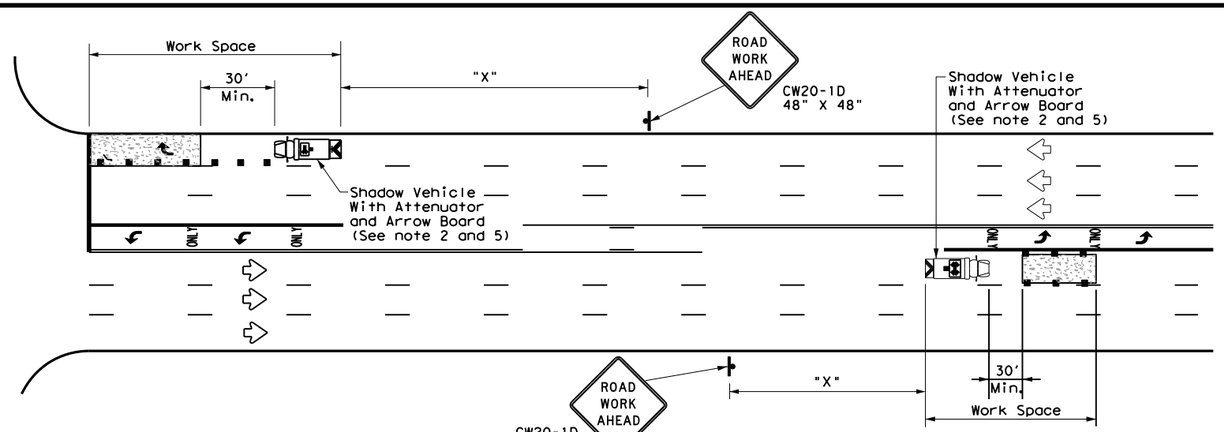
DATE: 07/19/2022 12:12 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\1900595\tcp3-4.dgn



TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

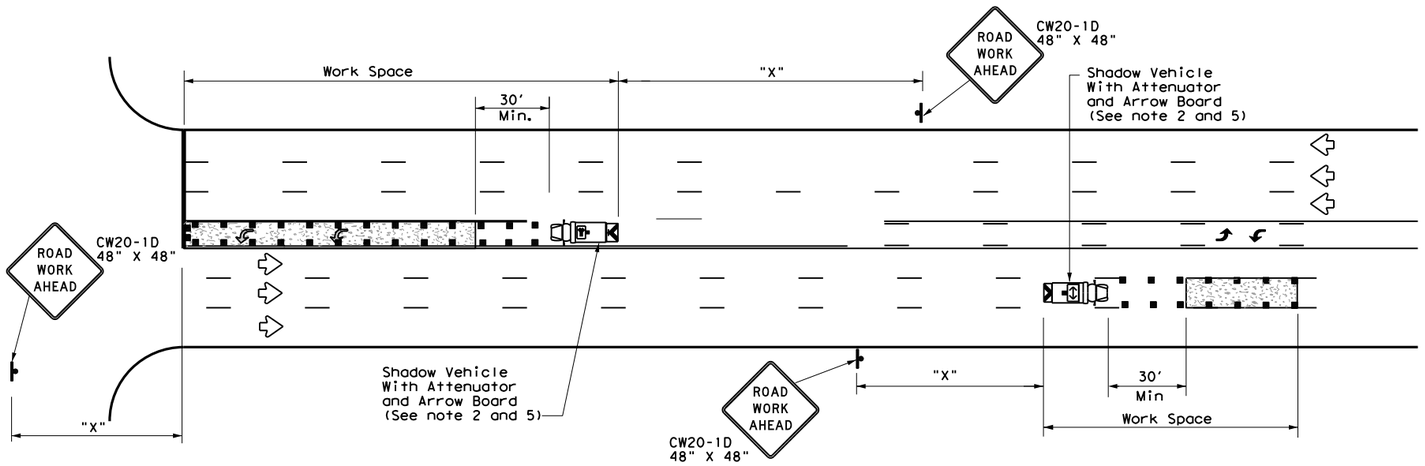


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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

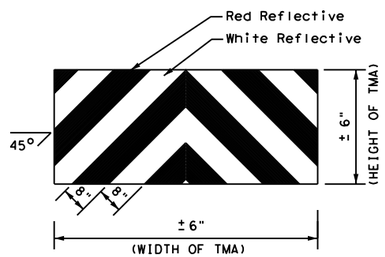
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take 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

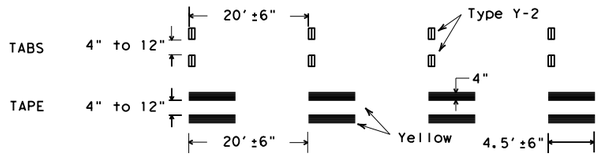
FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
	DIST	COUNTY		SHEET NO.
	HOU	MONTGOMERY		32

DATE: 07/19/2022 12:19 PM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\1900

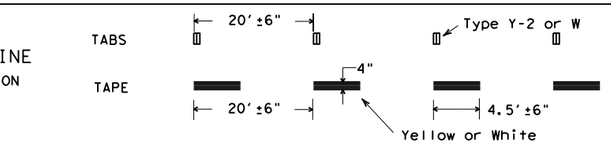
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

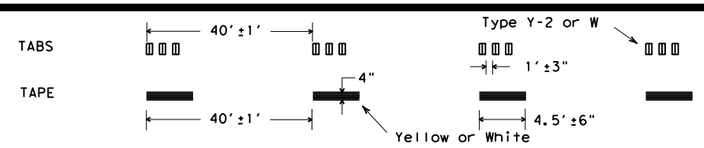


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



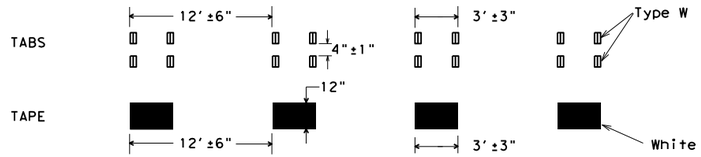
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

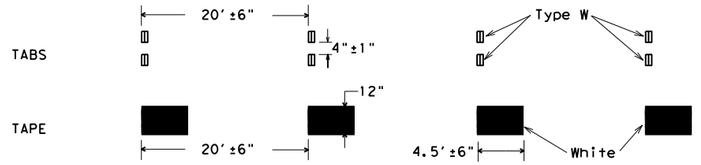


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



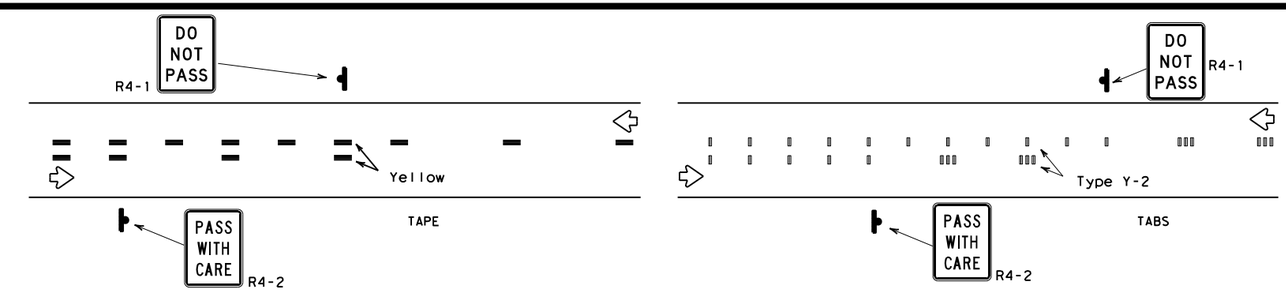
NOTES:

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.

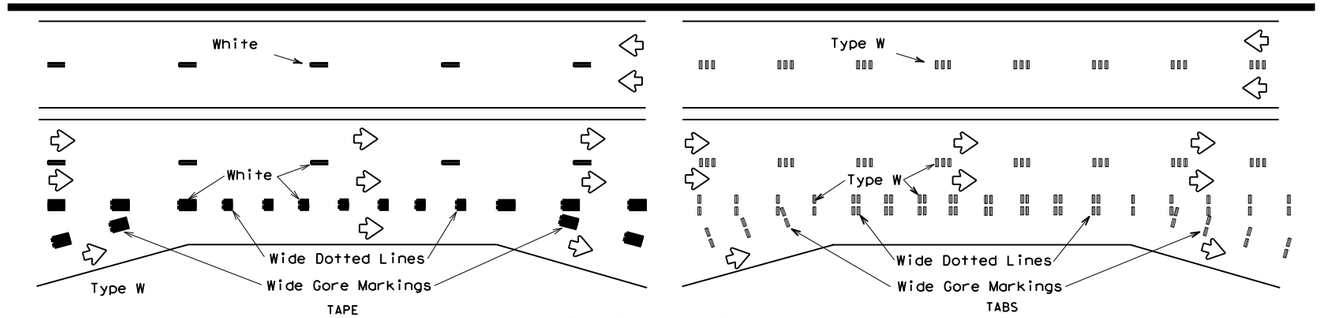
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

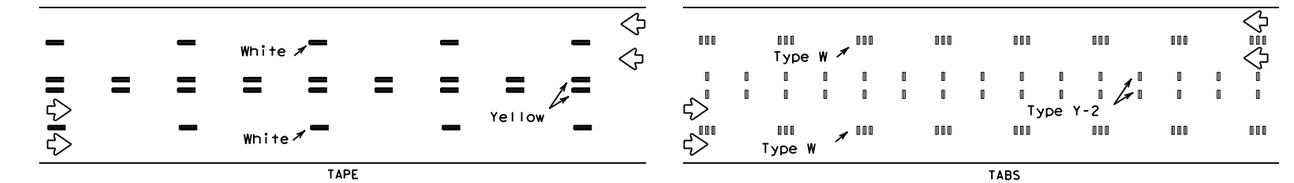
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



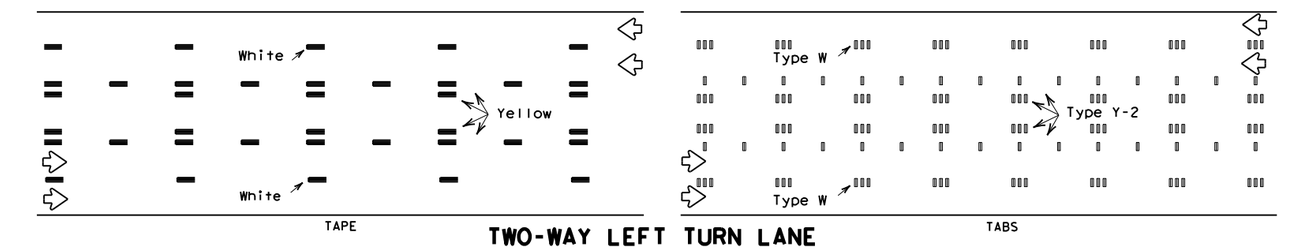
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



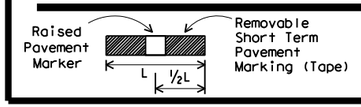
LANE LINES FOR DIVIDED HIGHWAY



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

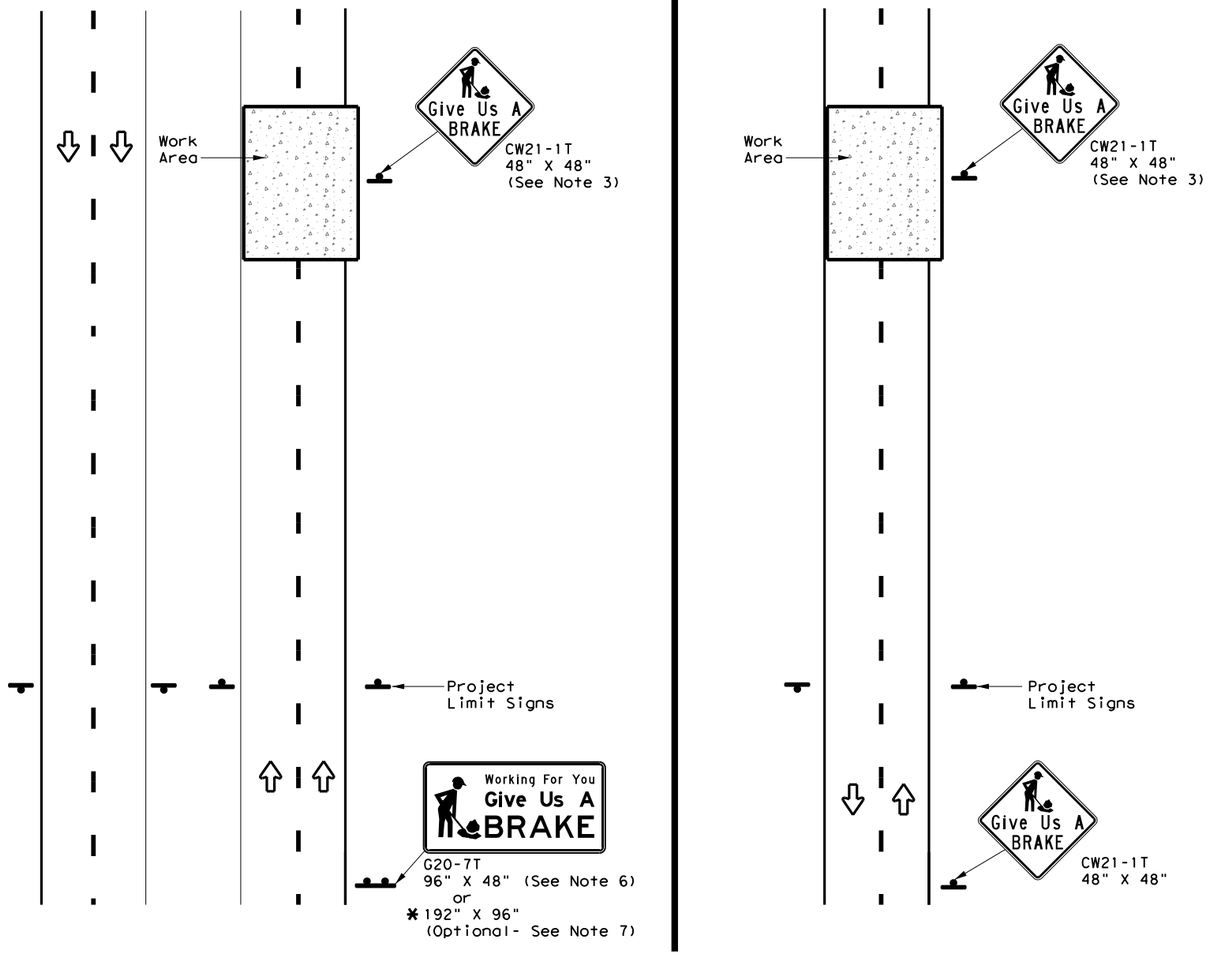
Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		1912	01	022	FM 2090
1-97		DIST	COUNTY		SHEET NO.
3-03		HOU	MONTGOMERY		33
7-13					



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

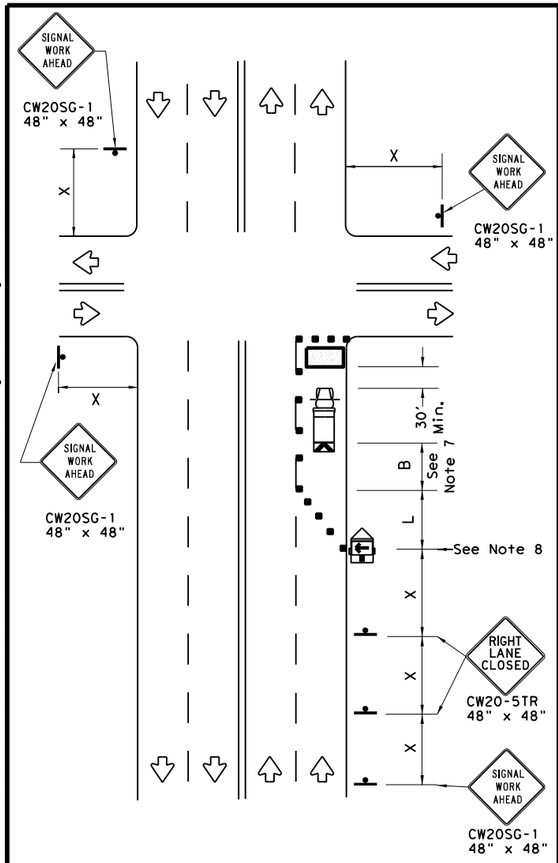
FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	HOU	MONTGOMERY		34

116

DATE: 06/01/2022 01:58 PM
FILE:

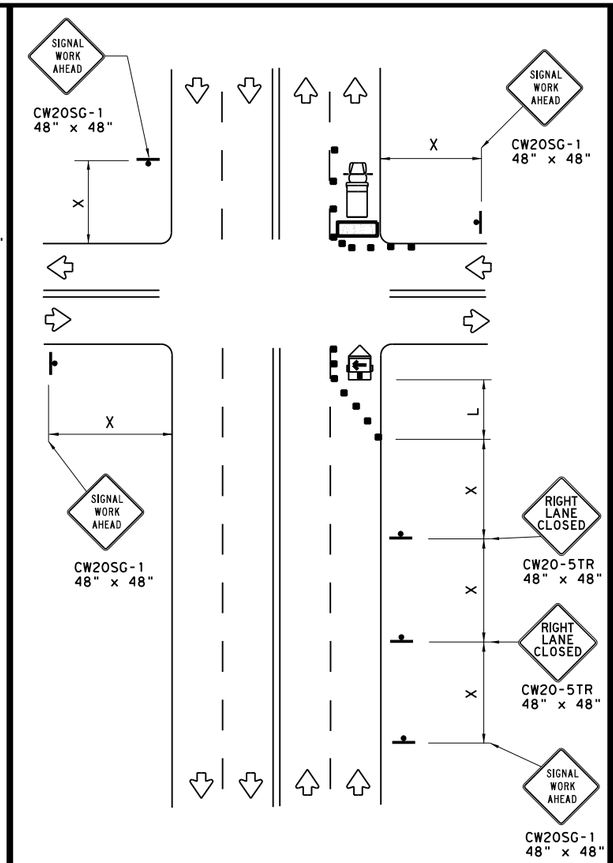
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



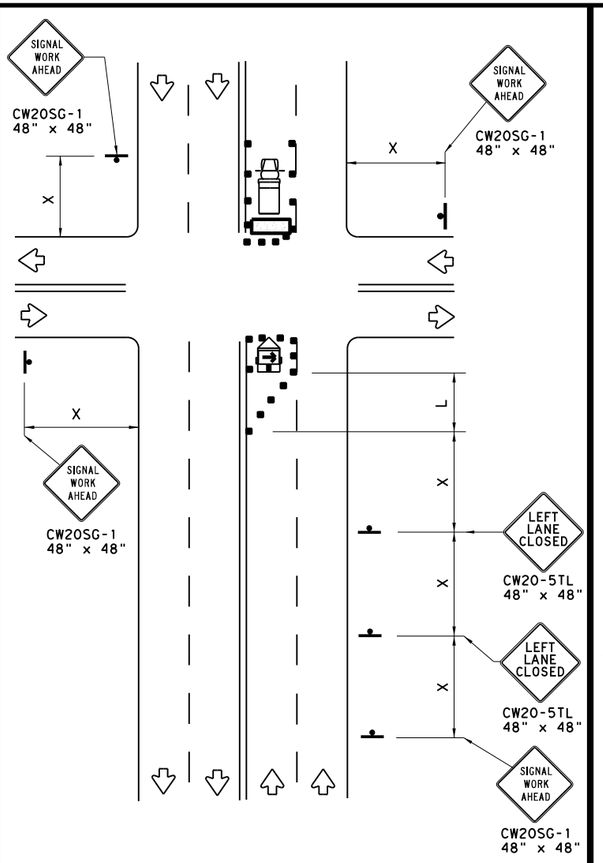
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



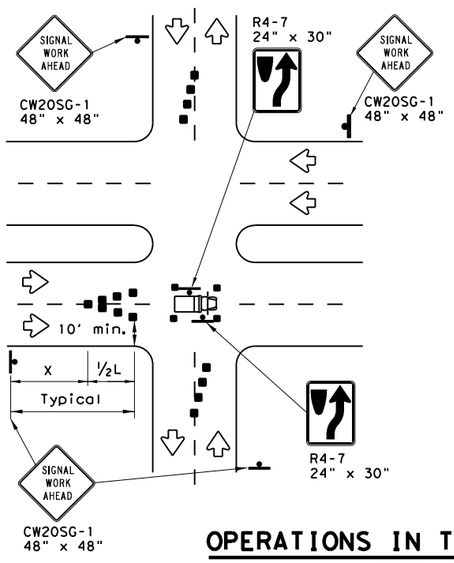
FAR SIDE RIGHT LANE CLOSURE

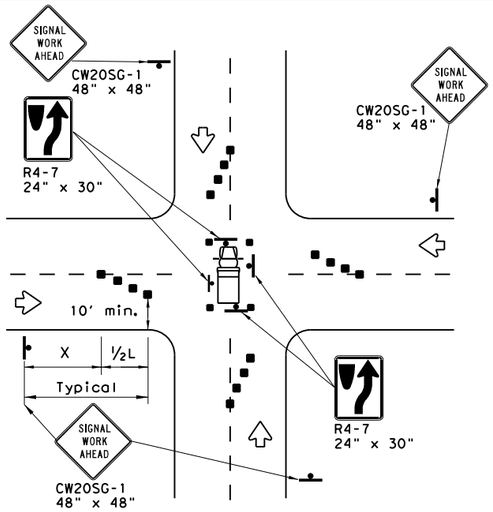
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

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)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

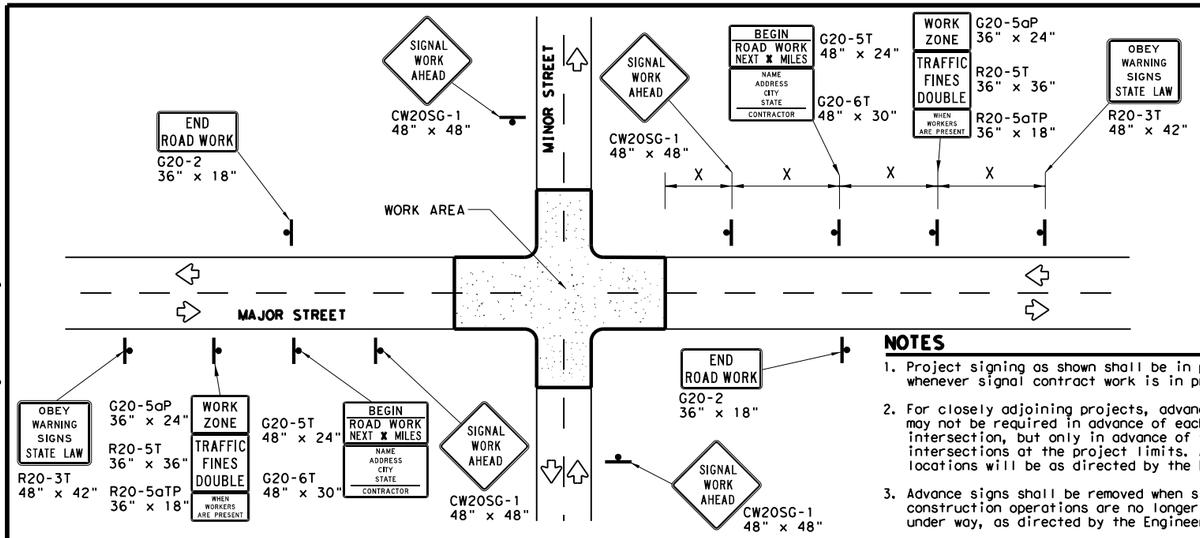
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	HOU	MONTGOMERY		35



TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. 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".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. 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. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

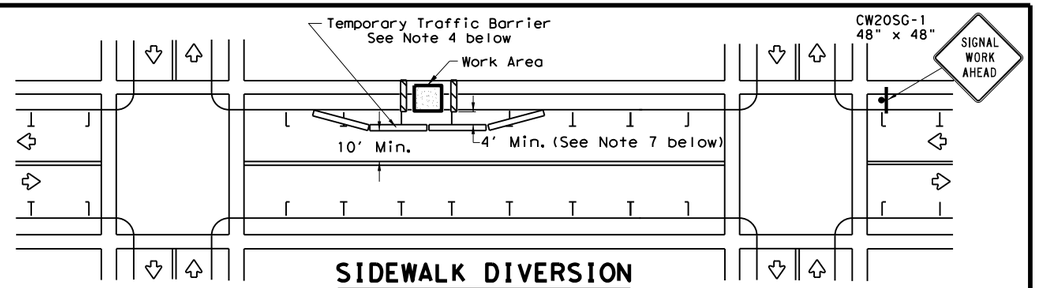
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support 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 fastners. 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.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

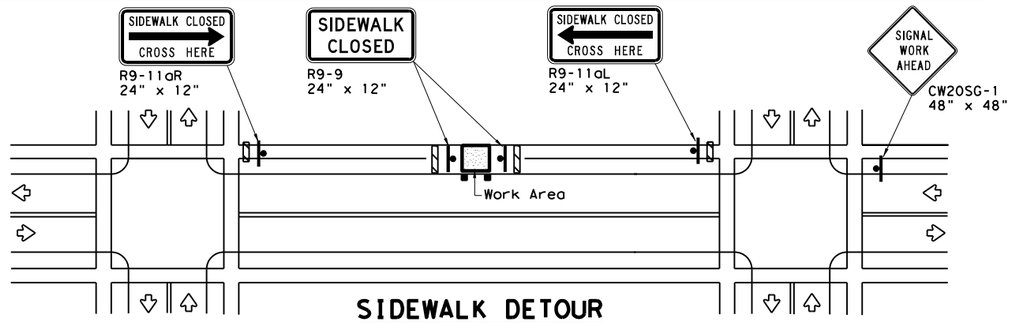
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

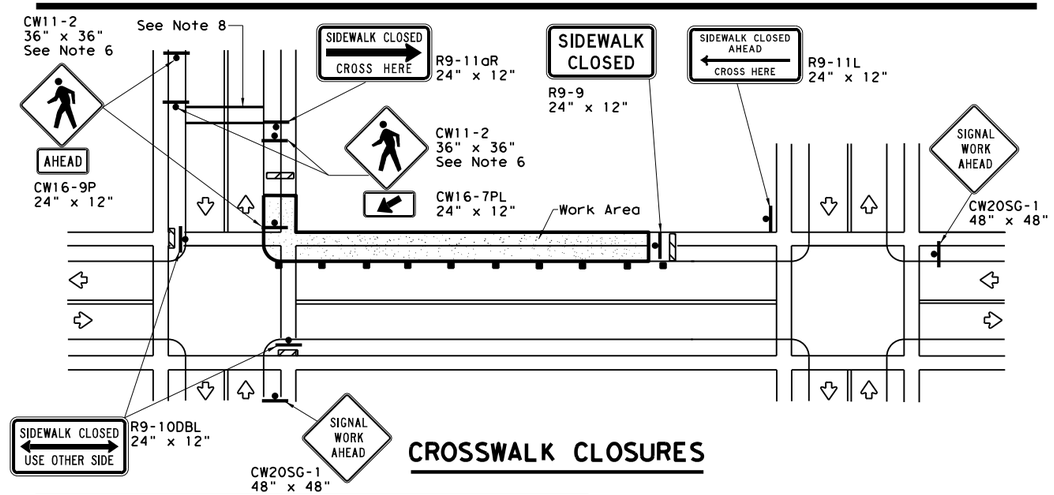
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE:	wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		1912	01	022	FM 2090
2-98 10-99 7-13		DIST	COUNTY		SHEET NO.
4-98 3-03		HOU	MONTGOMERY		36

DATE: 06/01/2022 01:59 PM
FILE:

Beginning chain BL description

Point 1000 X 3,875,928.6466 Y 10,091,328.7507 Sta 10+16.34

Course from 1000 to PC C1A N 70° 11′ 09.50" E Dist 7,195.8780

Curve Data

Curve C1A					
P.I. Station	83+99.49	X	3,882,874.6360	Y	10,093,831.5685
Delta =	1° 55′ 59.18" (LT)				
Degree =	0° 30′ 58.24"				
Tangent =	187.2694				
Length =	374.5033				
Radius =	11,100.0000				
External =	1.5796				
Long Chord =	374.4855				
Mid. Ord. =	1.5794				
P.C. Station	82+12.22	X	3,882,698.5129	Y	10,093,767.9251
P.T. Station	85+86.72	X	3,883,048.5120	Y	10,093,901.1168
C.C.		X	3,878,926.1854	Y	10,104,207.2520
Back = N	70° 07′ 56.30" E				
Ahead = N	68° 11′ 57.12" E				
Chord Bear = N	69° 09′ 56.71" E				

Course from PT C1A to PC C1B N 68° 11′ 57.12" E Dist 197.3616

Curve Data

Curve C1B					
P.I. Station	89+88.23	X	3,883,421.3079	Y	10,094,050.2305
Delta =	2° 06′ 26.35" (RT)				
Degree =	0° 30′ 58.24"				
Tangent =	204.1502				
Length =	408.2543				
Radius =	11,100.0000				
External =	1.8772				
Long Chord =	408.2313				
Mid. Ord. =	1.8769				
P.C. Station	87+84.08	X	3,883,231.7584	Y	10,093,974.4130
P.T. Station	91+92.34	X	3,883,613.5171	Y	10,094,119.0267
C.C.		X	3,887,354.0851	Y	10,083,668.2778
Back = N	68° 11′ 57.12" E				
Ahead = N	70° 18′ 23.48" E				
Chord Bear = N	69° 15′ 10.30" E				

Course from PT C1B to PC C1C N 70° 18′ 23.48" E Dist 162.7315

Curve Data

Curve C1C					
P.I. Station	93+58.16	X	3,883,769.6391	Y	10,094,174.9064
Delta =	0° 08′ 29.82" (LT)				
Degree =	2° 17′ 30.59"				
Tangent =	3.0896				
Length =	6.1792				
Radius =	2,500.0000				
External =	0.0019				
Long Chord =	6.1792				
Mid. Ord. =	0.0019				
P.C. Station	93+55.07	X	3,883,766.7302	Y	10,094,173.8652
P.T. Station	93+61.25	X	3,883,772.5454	Y	10,094,175.9547
C.C.		X	3,882,924.2600	Y	10,096,527.6375
Back = N	70° 18′ 23.48" E				
Ahead = N	70° 09′ 53.66" E				
Chord Bear = N	70° 14′ 08.57" E				

Course from PT C1C to PC C1E N 70° 09′ 53.66" E Dist 205.0425

Curve Data

Curve C1E					
P.I. Station	95+68.46	X	3,883,967.4669	Y	10,094,246.2657
Delta =	0° 05′ 58.48" (RT)				
Degree =	2° 17′ 30.59"				
Tangent =	2.1725				
Length =	4.3449				
Radius =	2,500.0000				
External =	0.0009				
Long Chord =	4.3449				
Mid. Ord. =	0.0009				
P.C. Station	95+66.29	X	3,883,965.4233	Y	10,094,245.5286
P.T. Station	95+70.64	X	3,883,969.5118	Y	10,094,246.9993
C.C.		X	3,884,813.7087	Y	10,091,893.8458
Back = N	70° 09′ 53.66" E				
Ahead = N	70° 15′ 52.14" E				
Chord Bear = N	70° 12′ 52.90" E				

Course from PT C1E to PC C1F N 70° 15′ 52.14" E Dist 139.4178

Curve Data

Curve C1F					
P.I. Station	97+14.23	X	3,884,104.6728	Y	10,094,295.4885
Delta =	0° 11′ 29.39" (RT)				
Degree =	2° 17′ 30.59"				
Tangent =	4.1779				
Length =	8.3557				
Radius =	2,500.0000				
External =	0.0035				
Long Chord =	8.3557				
Mid. Ord. =	0.0035				
P.C. Station	97+10.05	X	3,884,100.7404	Y	10,094,294.0777
P.T. Station	97+18.41	X	3,884,108.6099	Y	10,094,296.8861
C.C.		X	3,884,944.9373	Y	10,091,940.9242
Back = N	70° 15′ 52.14" E				
Ahead = N	70° 27′ 21.54" E				
Chord Bear = N	70° 21′ 36.84" E				

Course from PT C1F to PC C1G N 70° 27′ 21.54" E Dist 126.0802

Curve Data

Curve C1G					
P.I. Station	98+49.43	X	3,884,232.0827	Y	10,094,340.7169
Delta =	0° 14′ 34.89" (LT)				
Degree =	2° 27′ 32.57"				
Tangent =	4.9414				
Length =	9.8829				
Radius =	2,330.0000				
External =	0.0052				
Long Chord =	9.8829				
Mid. Ord. =	0.0052				
P.C. Station	98+44.49	X	3,884,227.4260	Y	10,094,339.0638
P.T. Station	98+54.37	X	3,884,236.7324	Y	10,094,342.3897
C.C.		X	3,883,447.9688	Y	10,096,534.8203
Back = N	70° 27′ 21.54" E				
Ahead = N	70° 12′ 46.65" E				
Chord Bear = N	70° 20′ 04.09" E				

Course from PT C1G to PC C1H N 70° 12′ 46.65" E Dist 477.5432

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter P.E.

08.26.22

FM 2090
HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 4

®2022

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		36A

DATE: 06/02/2022 11:30 AM
FILE:

Curve Data

Curve C1H

P.I. Station	107+24.27	X	3,885,055.2731	Y	10,094,636.8734
Delta =	19° 07′ 01.98" (RT)				
Degree =	2° 27′ 32.57"				
Tangent =	392.3588				
Length =	777.4240				
Radius =	2,330.0000				
External =	32.8046				
Long Chord =	773.8228				
Mid. Ord. =	32.3491				
P.C. Station	103+31.91	X	3,884,686.0802	Y	10,094,504.0501
P.T. Station	111+09.34	X	3,885,447.6051	Y	10,094,641.4602
C.C.		X	3,885,474.8437	Y	10,092,311.6195

Back = N 70° 12′ 46.65" E
Ahead = N 89° 19′ 48.63" E
Chord Bear = N 79° 46′ 17.64" E

Course from PT C1H to 1300 N 89° 19′ 48.63" E Dist 1,093.2572

Point 1300 X 3,886,540.7876 Y 10,094,654.2408 Sta 122+02.60

Course from 1300 to PC C2 N 89° 17′ 14.74" E Dist 423.1004

Curve Data

Curve C2

P.I. Station	132+89.88	X	3,887,627.9824	Y	10,094,667.7627
Delta =	13° 32′ 34.26" (RT)				
Degree =	1° 01′ 27.45"				
Tangent =	664.1784				
Length =	1,322.1665				
Radius =	5,593.6939				
External =	39.2933				
Long Chord =	1,319.0908				
Mid. Ord. =	39.0192				
P.C. Station	126+25.70	X	3,886,963.8553	Y	10,094,659.5027
P.T. Station	139+47.86	X	3,888,275.5777	Y	10,094,520.2727
C.C.		X	3,887,033.4208	Y	10,089,066.2414

Back = N 89° 17′ 14.74" E
Ahead = S 77° 10′ 11.00" E
Chord Bear = S 83° 56′ 28.13" E

Course from PT C2 to PC C3 S 77° 10′ 11.00" E Dist 7,353.4406

Curve Data

Curve C3

P.I. Station	217+74.74	X	3,895,907.0294	Y	10,092,782.2078
Delta =	18° 32′ 33.58" (LT)				
Degree =	1° 58′ 32.16"				
Tangent =	473.4314				
Length =	938.5840				
Radius =	2,900.1717				
External =	38.3880				
Long Chord =	934.4934				
Mid. Ord. =	37.8865				
P.C. Station	213+01.30	X	3,895,445.4186	Y	10,092,887.3398
P.T. Station	222+39.89	X	3,896,378.1097	Y	10,092,829.3307
C.C.		X	3,896,089.4417	Y	10,095,715.1004

Back = S 77° 10′ 11.00" E
Ahead = N 84° 17′ 15.42" E
Chord Bear = S 86° 26′ 27.79" E

Course from PT C3 to PC C4 N 84° 17′ 15.42" E Dist 426.1265

Curve Data

Curve C4

P.I. Station	229+98.64	X	3,897,133.0942	Y	10,092,904.8530
Delta =	14° 59′ 54.14" (LT)				
Degree =	2° 16′ 03.01"				
Tangent =	332.6259				
Length =	661.4486				
Radius =	2,526.8218				
External =	21.7991				
Long Chord =	659.5617				
Mid. Ord. =	21.6126				
P.C. Station	226+66.01	X	3,896,802.1201	Y	10,092,871.7451
P.T. Station	233+27.46	X	3,897,444.2250	Y	10,093,022.4862
C.C.		X	3,896,550.6134	Y	10,095,386.0189

Back = N 84° 17′ 15.42" E
Ahead = N 69° 17′ 21.28" E
Chord Bear = N 76° 47′ 18.35" E

Course from PT C4 to PC C5 N 69° 17′ 21.28" E Dist 824.5138

Curve Data

Curve C5

P.I. Station	245+76.26	X	3,898,612.3184	Y	10,093,464.1225
Delta =	18° 58′ 42.51" (LT)				
Degree =	2° 15′ 26.03"				
Tangent =	424.2795				
Length =	840.7863				
Radius =	2,538.3234				
External =	35.2148				
Long Chord =	836.9478				
Mid. Ord. =	34.7329				
P.C. Station	241+51.98	X	3,898,215.4568	Y	10,093,314.0759
P.T. Station	249+92.76	X	3,898,938.8098	Y	10,093,735.0773
C.C.		X	3,897,317.7776	Y	10,095,688.3669

Back = N 69° 17′ 21.28" E
Ahead = N 50° 18′ 38.77" E
Chord Bear = N 59° 48′ 00.03" E

Course from PT C5 to PC C6 N 50° 18′ 38.77" E Dist 234.1299

Curve Data

Curve C6

P.I. Station	258+51.77	X	3,899,599.8302	Y	10,094,283.6571
Delta =	36° 04′ 49.78" (RT)				
Degree =	2° 59′ 10.92"				
Tangent =	624.8741				
Length =	1,208.1736				
Radius =	1,918.5781				
External =	99.1953				
Long Chord =	1,188.3097				
Mid. Ord. =	94.3188				
P.C. Station	252+26.89	X	3,899,118.9773	Y	10,093,884.5980
P.T. Station	264+35.07	X	3,900,223.4653	Y	10,094,322.9884
C.C.		X	3,900,344.2258	Y	10,092,408.2145

Back = N 50° 18′ 38.77" E
Ahead = N 86° 23′ 28.56" E
Chord Bear = N 68° 21′ 03.66" E

Course from PT C6 to PC C7 N 86° 23′ 28.56" E Dist 840.4019

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter P.E.

08.26.22

FM 2090
HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		36B

DATE: 06/02/2022 11:33 AM
FILE:

Curve Data

Curve C7

P.I. Station	276+35.66	X	3,901,421.6792	Y	10,094,398.5570
Delta =	26° 25′ 08.89" (LT)				
Degree =	3° 44′ 01.51"				
Tangent =	360.1926				
Length =	707.5760				
Radius =	1,534.5362				
External =	41.7062				
Long Chord =	701.3243				
Mid. Ord. =	40.6027				
P.C. Station	272+75.47	X	3,901,062.2009	Y	10,094,375.8855
P.T. Station	279+83.04	X	3,901,733.5275	Y	10,094,578.8050
C.C.		X	3,900,965.6131	Y	10,095,907.3789
Back =	N 86° 23′ 28.56" E				
Ahead =	N 59° 58′ 19.67" E				
Chord Bear =	N 73° 10′ 54.11" E				

Course from PT C7 to PC C8 N 59° 58′ 19.67" E Dist 390.6041

Curve Data

Curve C8

P.I. Station	286+97.06	X	3,902,351.7093	Y	10,094,936.1135
Delta =	18° 04′ 31.41" (RT)				
Degree =	2° 49′ 04.43"				
Tangent =	323.4114				
Length =	641.4493				
Radius =	2,033.2804				
External =	25.5601				
Long Chord =	638.7926				
Mid. Ord. =	25.2428				
P.C. Station	283+73.65	X	3,902,071.7055	Y	10,094,774.2716
P.T. Station	290+15.10	X	3,902,668.1091	Y	10,095,003.0921
C.C.		X	3,903,089.2021	Y	10,093,013.8938
Back =	N 59° 58′ 19.67" E				
Ahead =	N 78° 02′ 51.08" E				
Chord Bear =	N 69° 00′ 35.37" E				

Course from PT C8 to PC C9 N 78° 02′ 51.08" E Dist 1,330.9008

Curve Data

Curve C9

P.I. Station	308+80.71	X	3,904,493.2749	Y	10,095,389.4612
Delta =	40° 53′ 41.22" (RT)				
Degree =	3° 59′ 42.22"				
Tangent =	534.7121				
Length =	1,023.6336				
Radius =	1,434.1654				
External =	96.4382				
Long Chord =	1,002.0433				
Mid. Ord. =	90.3620				
P.C. Station	303+46.00	X	3,903,970.1555	Y	10,095,278.7221
P.T. Station	313+69.63	X	3,904,961.2054	Y	10,095,130.6987
C.C.		X	3,904,267.1717	Y	10,093,875.6498
Back =	N 78° 02′ 51.08" E				
Ahead =	S 61° 03′ 27.70" E				
Chord Bear =	S 81° 30′ 18.31" E				

Course from PT C9 to PC C10 S 61° 03′ 27.70" E Dist 1,160.9945

Curve Data

Curve C10

P.I. Station	327+89.32	X	3,906,203.5833	Y	10,094,443.6719
Delta =	14° 56′ 49.07" (LT)				
Degree =	2° 54′ 19.62"				
Tangent =	258.6916				
Length =	514.4456				
Radius =	1,972.0101				
External =	16.8954				
Long Chord =	512.9881				
Mid. Ord. =	16.7519				
P.C. Station	325+30.63	X	3,905,977.2004	Y	10,094,568.8602
P.T. Station	330+45.07	X	3,906,454.5957	Y	10,094,381.1092
C.C.		X	3,906,931.5125	Y	10,096,294.5809
Back =	S 61° 03′ 27.70" E				
Ahead =	S 76° 00′ 16.77" E				
Chord Bear =	S 68° 31′ 52.24" E				

Course from PT C10 to PC C11 S 76° 00′ 16.77" E Dist 4,174.0413

Curve Data

Curve C11

P.I. Station	377+49.65	X	3,911,019.5198	Y	10,093,243.3400
Delta =	30° 45′ 44.77" (LT)				
Degree =	2° 58′ 15.22"				
Tangent =	530.5364				
Length =	1,035.4600				
Radius =	1,928.5693				
External =	71.6428				
Long Chord =	1,023.0677				
Mid. Ord. =	69.0767				
P.C. Station	372+19.11	X	3,910,504.7322	Y	10,093,371.6465
P.T. Station	382+54.57	X	3,911,527.5006	Y	10,093,396.3902
C.C.		X	3,910,971.1432	Y	10,095,242.9670
Back =	S 76° 00′ 16.77" E				
Ahead =	N 73° 13′ 58.46" E				
Chord Bear =	N 88° 36′ 50.84" E				

Course from PT C11 to PC C12 N 73° 13′ 58.46" E Dist 1,138.8232

Curve Data

Curve C12

P.I. Station	402+21.77	X	3,913,411.0638	Y	10,093,963.8913
Delta =	47° 21′ 15.40" (RT)				
Degree =	3° 01′ 58.46"				
Tangent =	828.3747				
Length =	1,561.3500				
Radius =	1,889.1380				
External =	173.6386				
Long Chord =	1,517.2891				
Mid. Ord. =	159.0222				
P.C. Station	393+93.40	X	3,912,617.9071	Y	10,093,724.9201
P.T. Station	409+54.75	X	3,914,124.1750	Y	10,093,542.3737
C.C.		X	3,913,162.8893	Y	10,091,916.0983
Back =	N 73° 13′ 58.46" E				
Ahead =	S 59° 24′ 46.14" E				
Chord Bear =	S 83° 05′ 23.84" E				

Course from PT C12 to PC C13 S 59° 24′ 46.14" E Dist 2,410.6489

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.
08.26.22

FM 2090
HORIZONTAL ALIGNMENT DATA

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		36C

DATE: 06/02/2022 11:35 AM
FILE:

Curve Data

Curve C13

P.I. Station	437+33.20	X	3,916,516.0241	Y	10,092,128.5601
Delta =	20° 21′ 58.45" (RT)				
Degree =	2° 47′ 53.29"				
Tangent =	367.8059				
Length =	727.8500				
Radius =	2,047.6406				
External =	32.7712				
Long Chord =	724.0242				
Mid. Ord. =	32.2550				
P.C. Station	433+65.40	X	3,916,199.3963	Y	10,092,315.7178
P.T. Station	440+93.25	X	3,916,747.7242	Y	10,091,842.9096
C.C.		X	3,915,157.4567	Y	10,090,552.9943
Back = S	59° 24′ 46.14" E				
Ahead = S	39° 02′ 47.68" E				
Chord Bear = S	49° 13′ 46.91" E				

Course from PT C13 to PC C14 S 39° 02′ 47.68" E Dist 410.7936

Curve Data

Curve C14

P.I. Station	453+43.24	X	3,917,535.1635	Y	10,090,872.1178
Delta =	47° 33′ 01.77" (LT)				
Degree =	3° 00′ 27.77"				
Tangent =	839.2053				
Length =	1,580.9519				
Radius =	1,904.9618				
External =	176.6590				
Long Chord =	1,535.9706				
Mid. Ord. =	161.6666				
P.C. Station	445+04.04	X	3,917,006.5044	Y	10,091,523.8732
P.T. Station	460+84.99	X	3,918,372.8891	Y	10,090,822.3047
C.C.		X	3,918,485.9627	Y	10,092,723.9077
Back = S	39° 02′ 47.68" E				
Ahead = S	86° 35′ 49.45" E				
Chord Bear = S	62° 49′ 18.57" E				

Course from PT C14 to PC C15 S 86° 35′ 49.45" E Dist 1,995.5836

Curve Data

Curve C15

P.I. Station	485+25.33	X	3,920,808.9273	Y	10,090,677.4524
Delta =	34° 37′ 46.77" (RT)				
Degree =	4° 00′ 57.97"				
Tangent =	444.7574				
Length =	862.2700				
Radius =	1,426.6508				
External =	67.7192				
Long Chord =	849.2053				
Mid. Ord. =	64.6504				
P.C. Station	480+80.57	X	3,920,364.9541	Y	10,090,703.8520
P.T. Station	489+42.84	X	3,921,159.2450	Y	10,090,403.4331
C.C.		X	3,920,280.2718	Y	10,089,279.7167
Back = S	86° 35′ 49.45" E				
Ahead = S	51° 58′ 02.68" E				
Chord Bear = S	69° 16′ 56.07" E				

Course from PT C15 to PC C16 S 51° 58′ 02.68" E Dist 4,207.2591

Curve Data

Curve C16

P.I. Station	535+16.85	X	3,924,762.0060	Y	10,087,585.3464
Delta =	11° 40′ 06.20" (LT)				
Degree =	1° 35′ 46.79"				
Tangent =	366.7434				
Length =	730.9500				
Radius =	3,589.2147				
External =	18.6881				
Long Chord =	729.6875				
Mid. Ord. =	18.5913				
P.C. Station	531+50.10	X	3,924,473.1367	Y	10,087,811.3005
P.T. Station	538+81.05	X	3,925,090.6042	Y	10,087,422.4847
C.C.		X	3,926,684.4862	Y	10,090,638.3830
Back = S	51° 58′ 02.68" E				
Ahead = S	63° 38′ 08.88" E				
Chord Bear = S	57° 48′ 05.78" E				

Course from PT C16 to PC C17 S 63° 38′ 08.88" E Dist 1,244.1165

Curve Data

Curve C17

P.I. Station	554+19.63	X	3,926,469.1563	Y	10,086,739.2387
Delta =	13° 30′ 48.84" (LT)				
Degree =	2° 18′ 19.08"				
Tangent =	294.4643				
Length =	586.1959				
Radius =	2,485.3951				
External =	17.3830				
Long Chord =	584.8381				
Mid. Ord. =	17.2622				
P.C. Station	551+25.17	X	3,926,205.3194	Y	10,086,870.0031
P.T. Station	557+11.37	X	3,926,756.2451	Y	10,086,673.7469
C.C.		X	3,927,309.0223	Y	10,089,096.8907
Back = S	63° 38′ 08.88" E				
Ahead = S	77° 08′ 57.72" E				
Chord Bear = S	70° 23′ 33.30" E				

Course from PT C17 to PC C18 S 77° 08′ 57.72" E Dist 675.2097

Curve Data

Curve C18

P.I. Station	566+27.34	X	3,927,649.2745	Y	10,086,470.0255
Delta =	15° 33′ 52.56" (LT)				
Degree =	3° 15′ 08.60"				
Tangent =	240.7619				
Length =	478.5590				
Radius =	1,761.6520				
External =	16.3761				
Long Chord =	477.0889				
Mid. Ord. =	16.2253				
P.C. Station	563+86.58	X	3,927,414.5429	Y	10,086,523.5734
P.T. Station	568+65.13	X	3,927,889.7664	Y	10,086,481.4256
C.C.		X	3,927,806.3523	Y	10,088,241.1017
Back = S	77° 08′ 57.72" E				
Ahead = N	87° 17′ 09.72" E				
Chord Bear = S	84° 55′ 54.00" E				

Course from PT C18 to 4000 N 87° 17′ 09.72" E Dist 1,017.5526

Point 4000 X 3,928,906.1777 Y 10,086,529.6066 Sta 578+82.69

==========

Ending chain BL description

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

08.26.22

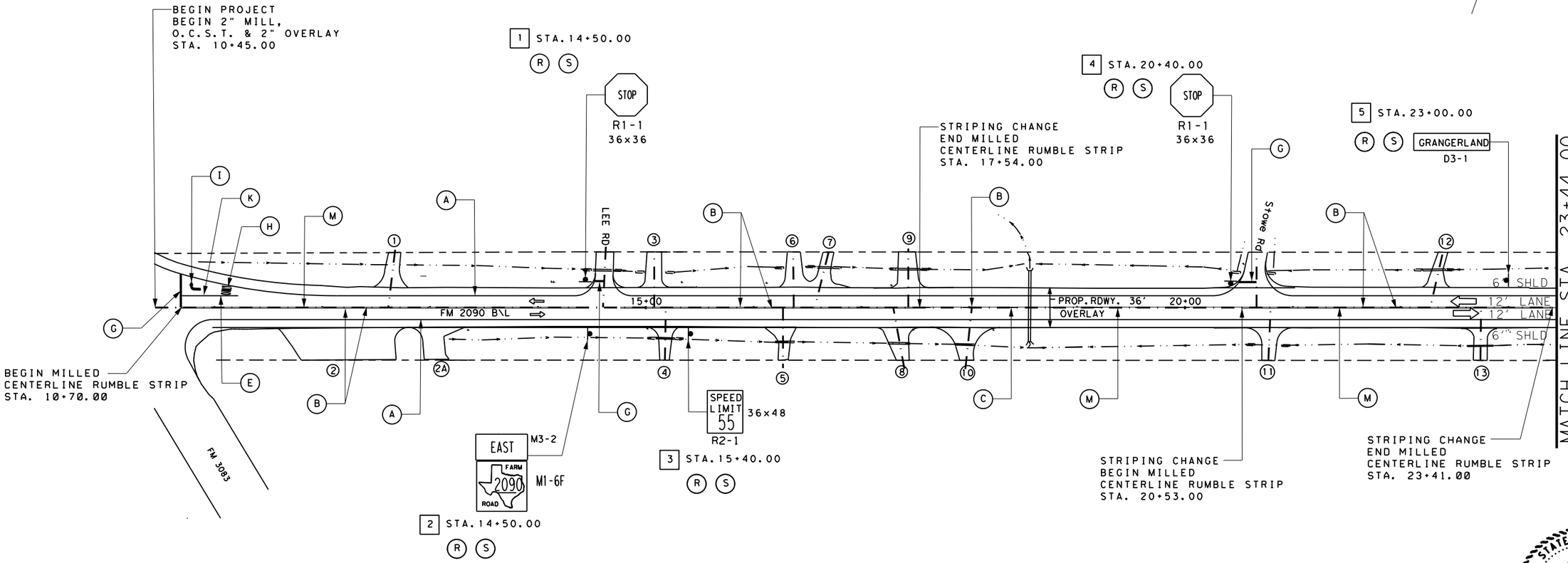
FM 2090
HORIZONTAL ALIGNMENT DATA

SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		36D

DATE: 06/02/2022 11:37 AM
FILE:



LEGEND

- PROP.RDWY.
- EXIST.ROW
- EXIST.RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(3Q) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: $DATE$2022 $TIME$ AM
FILE: $FILE$

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

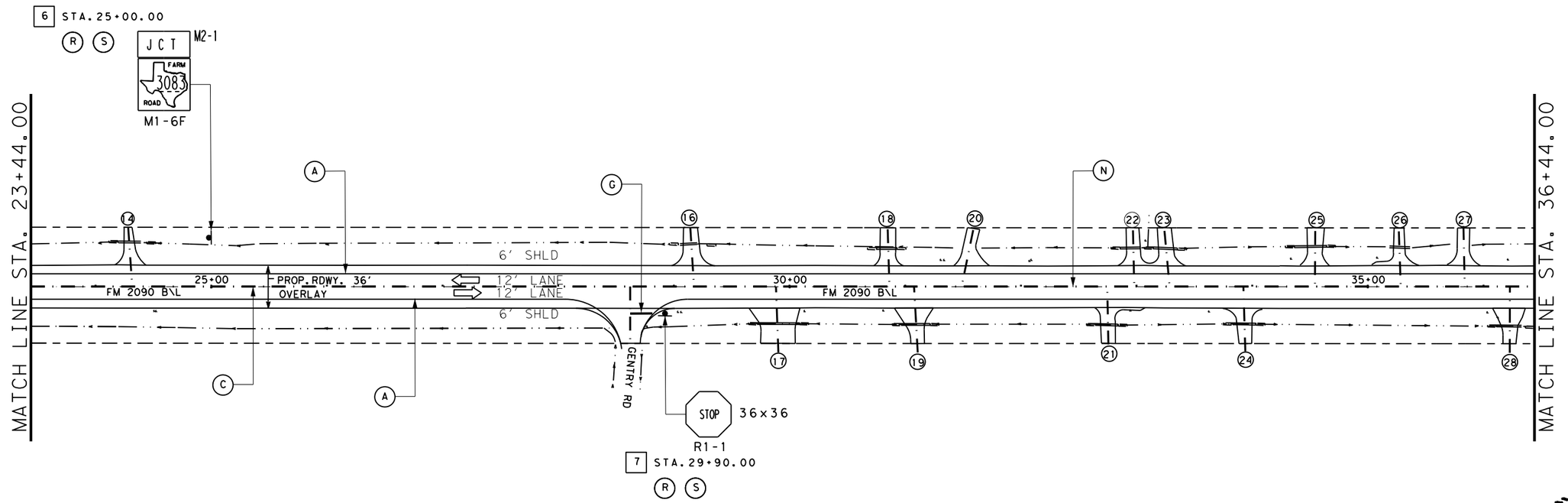
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 1 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		37



LEGEND

PROP. RDWY.

EXIST. ROW

EXIST. RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: $DATE$2022 $03WE$ AM
FILE: $FILE$

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

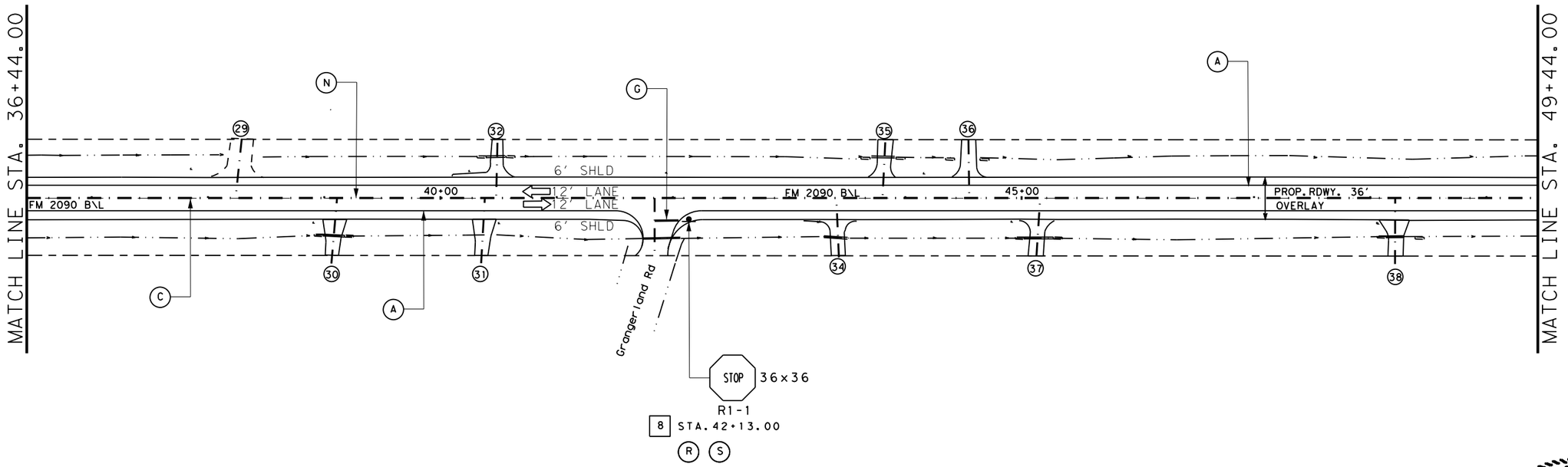
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 2 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		38



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(3Q) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: $DATE$2022 $01M$ PM
FILE: $FILE$

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

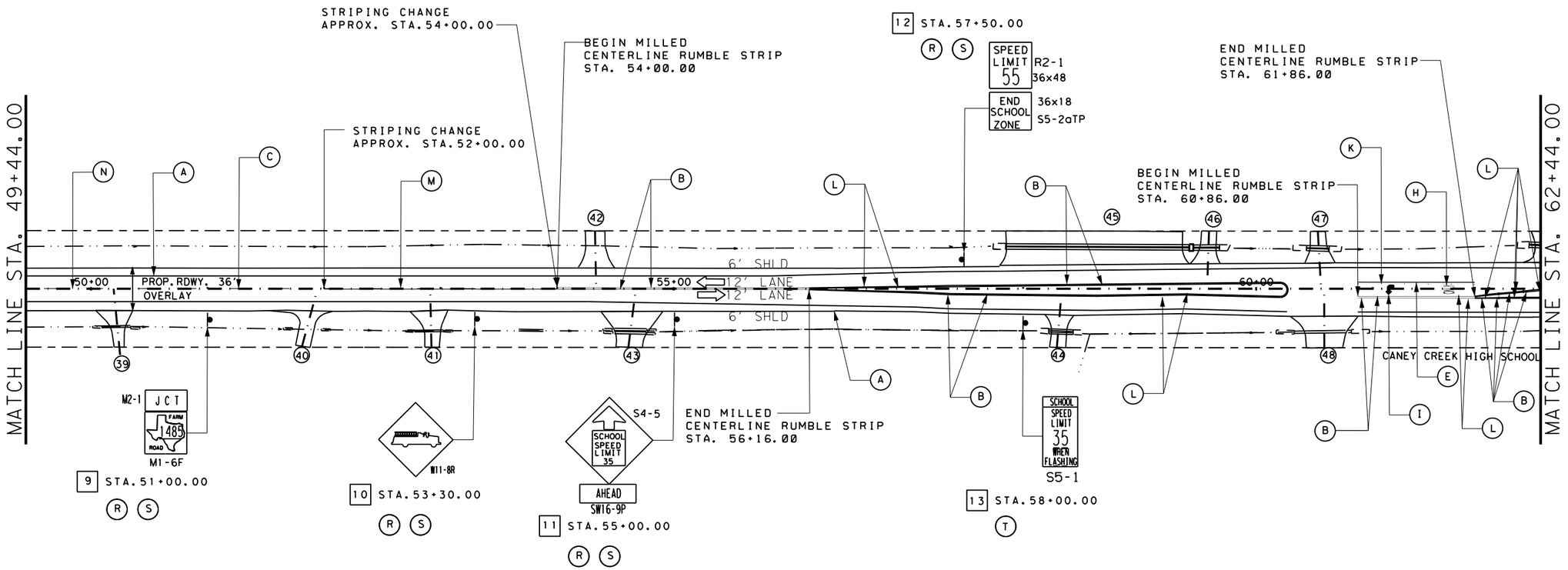
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 3 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		39



LEGEND

- PROP.RDWY.
- EXIST.ROW
- EXIST.RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W)(WORD)

(I) PREFAB PAV MRK TY C (W)(ARROW)

(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)

(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)

(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)

(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)

(QQ) MULTIPOLYMER PAV MRK (W)(WORD)

(30) MULTIPOLYMER PAV MRK (W)(ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/30/2022 11:42 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter P.E.

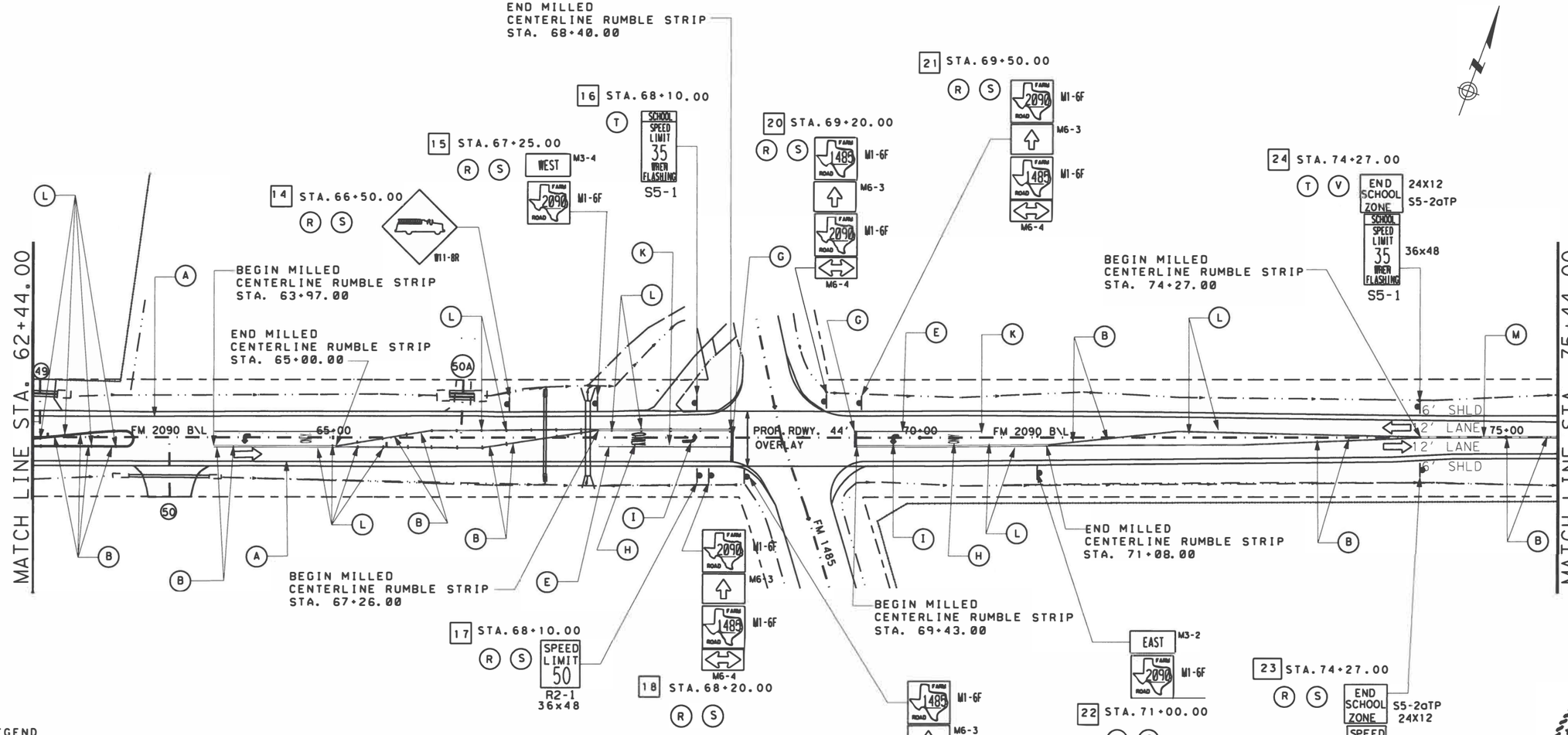
08.30.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 4 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		40



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(3Q) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/22/2022 10:20 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

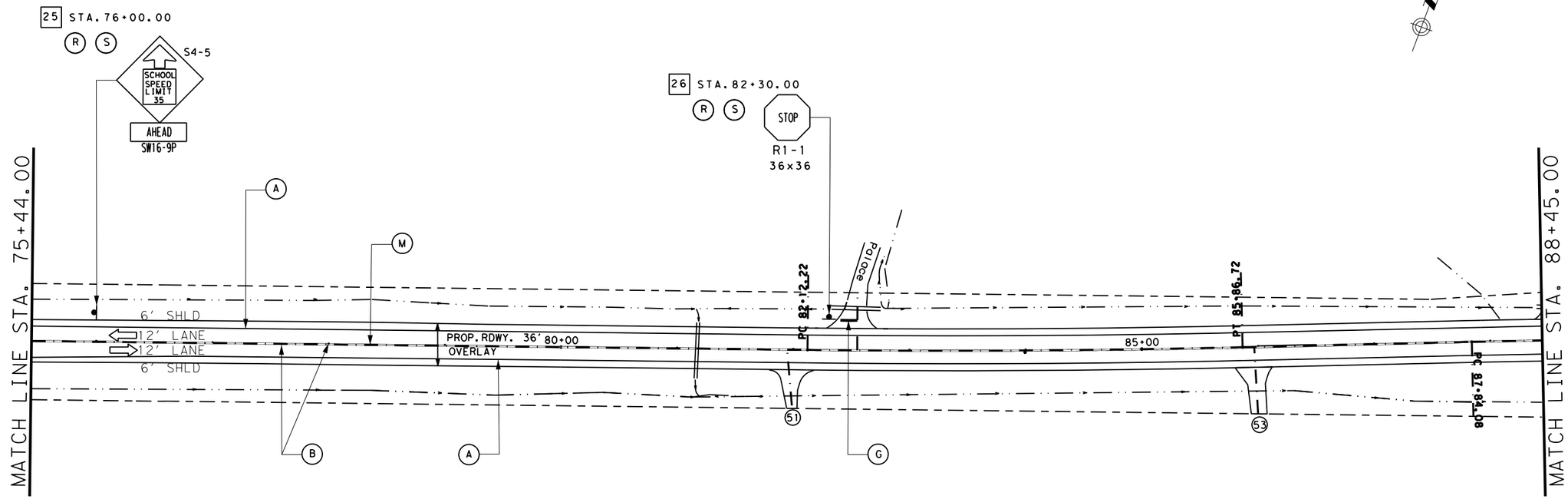
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 5 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		41



LEGEND

PROP. RDWY.

EXIST. ROW

EXIST. RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/22/2022 10:23 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

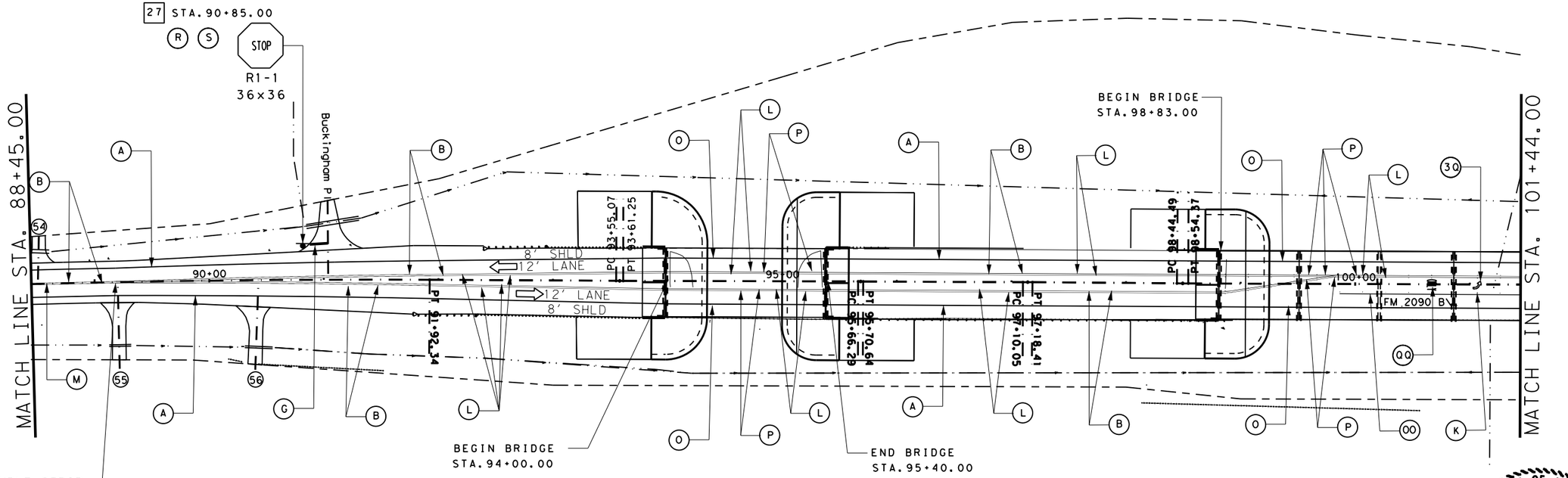
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 6 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		42



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/30/2022 10:55 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

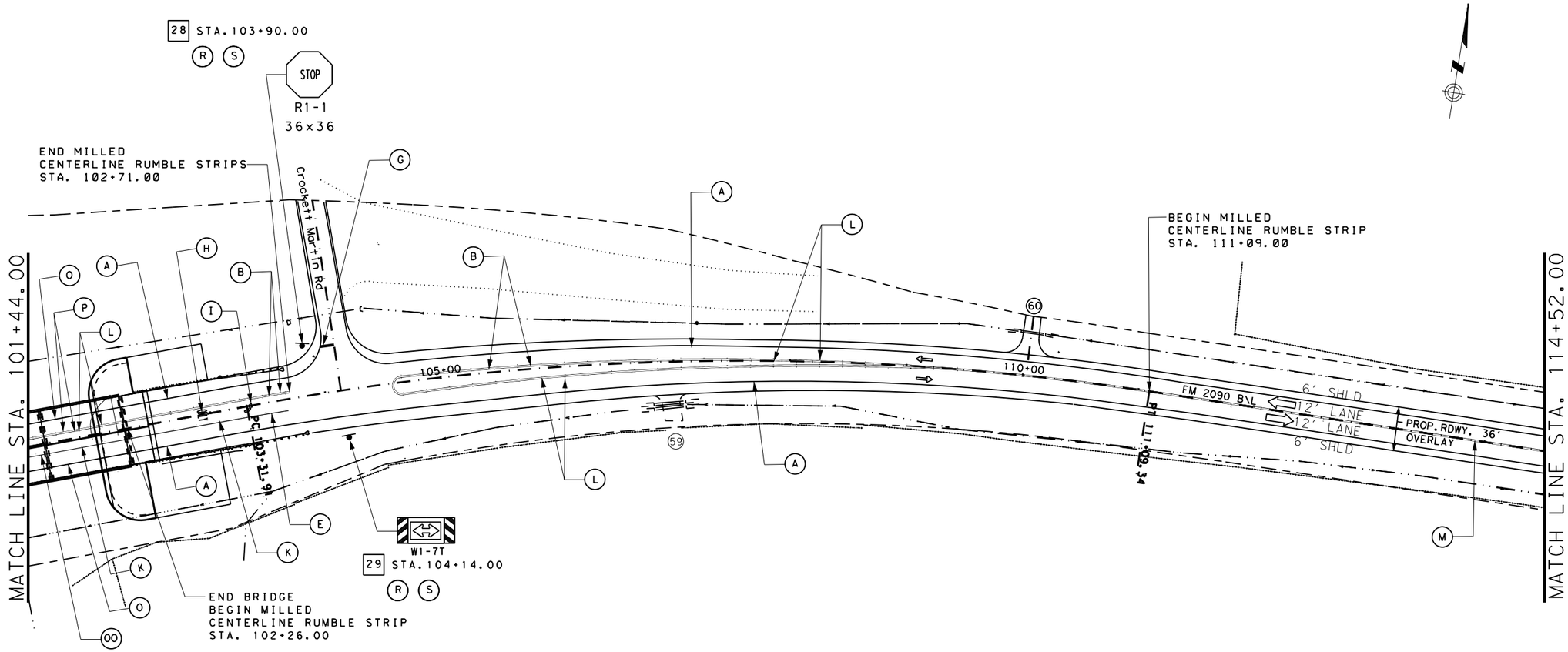
Micah J. Schluter, P.E.
08.30.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 7 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		43



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(30) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/26/2022 10:50 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

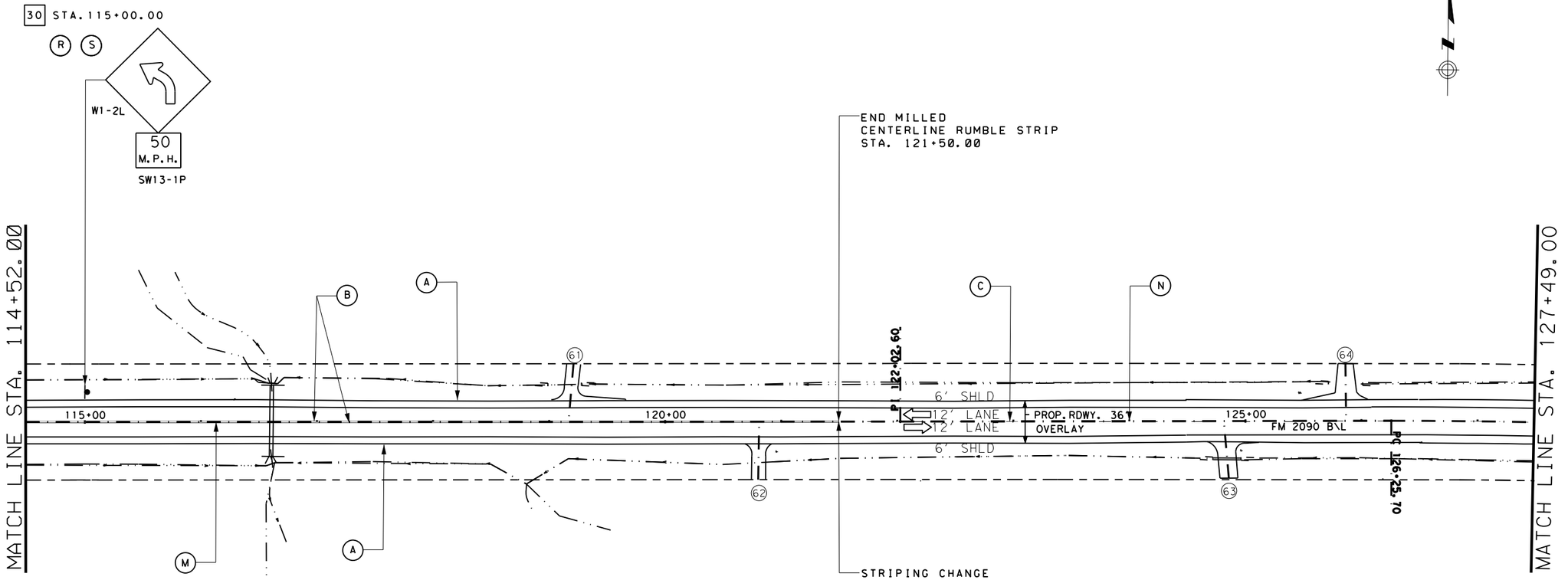
Micah J. Schluter, P.E.
08.30.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 8 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		44



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/22/2022 10:39 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

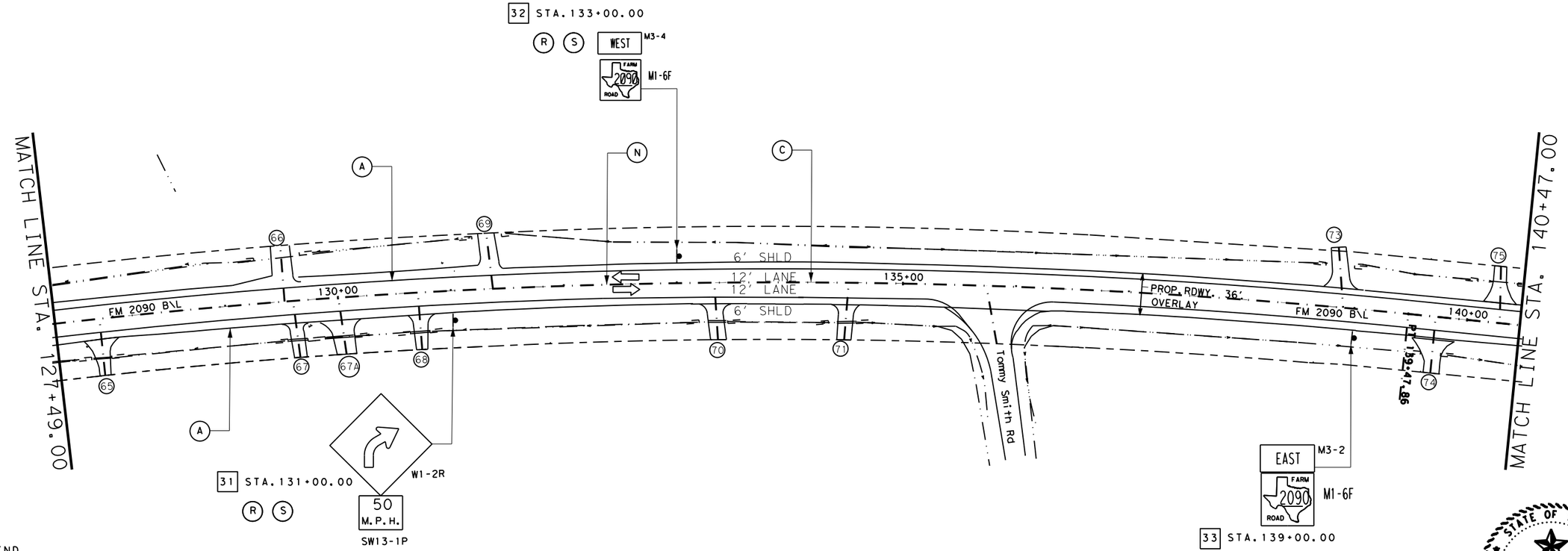
Micah J. Schluter P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 9 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		45



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(30) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/22/2022 10:53 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

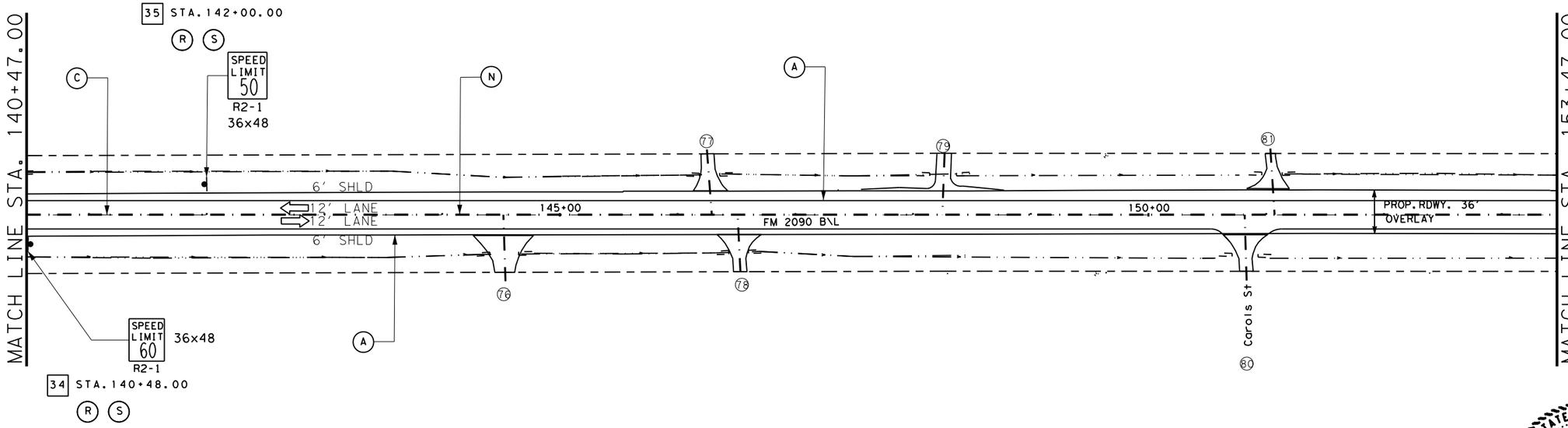
Micah J. Schluter P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 10 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		46



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW
- (A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
- (C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
- (D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
- (E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
- (F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
- (G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
- (H) PREFAB PAV MRK TY C (W) (WORD)
- (I) PREFAB PAV MRK TY C (W) (ARROW)
- (J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)
- (K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
- (L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
- (M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
- (N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
- (O) MULTIPOLYMER PAV MRK (W) (6") (SLD)
- (OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)
- (P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)
- (Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)
- (QQ) MULTIPOLYMER PAV MRK (W) (WORD)
- (30) MULTIPOLYMER PAV MRK (W) (ARROW)
- (R) PROP. SIGN
- (S) REMOVE SIGN
- (T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/25/2022 01:54 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

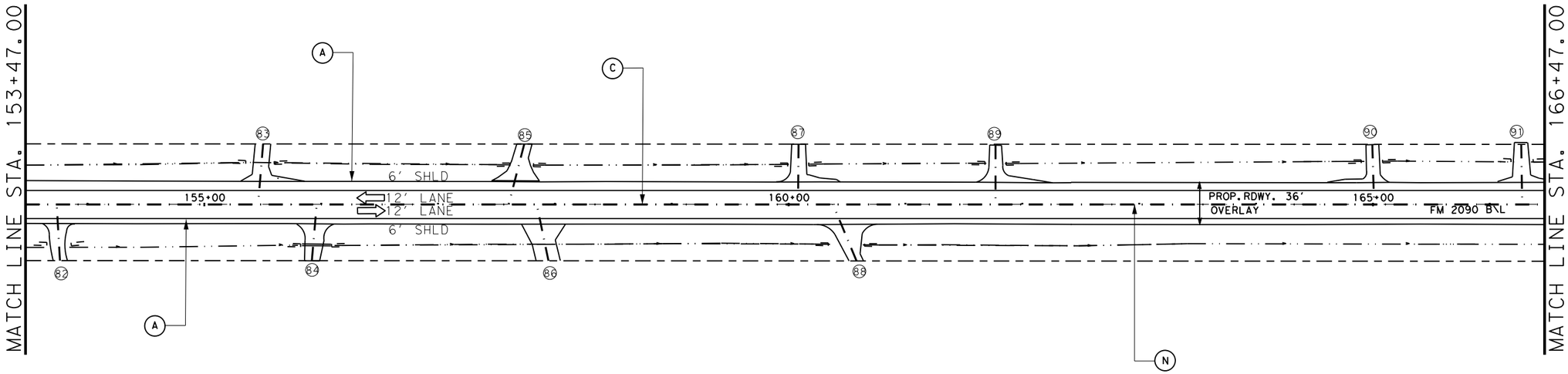
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 11 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		47



LEGEND

PROP. RDWY.
EXIST. ROW
EXIST. RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W) (WORD)
(I) PREFAB PAV MRK TY C (W) (ARROW)
(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)
(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)
(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)
(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)
(QQ) MULTIPOLYMER PAV MRK (W) (WORD)
(30) MULTIPOLYMER PAV MRK (W) (ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/05/2022 11:32 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

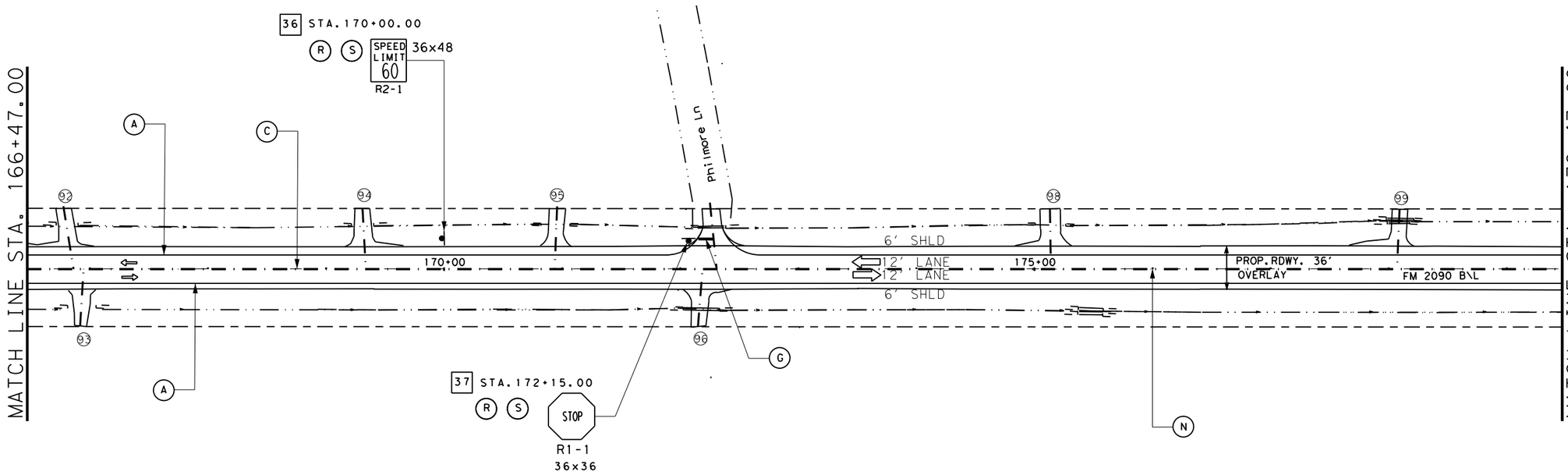
Micah J. Schluter P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 12 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		48



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/17/2022 07:35 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

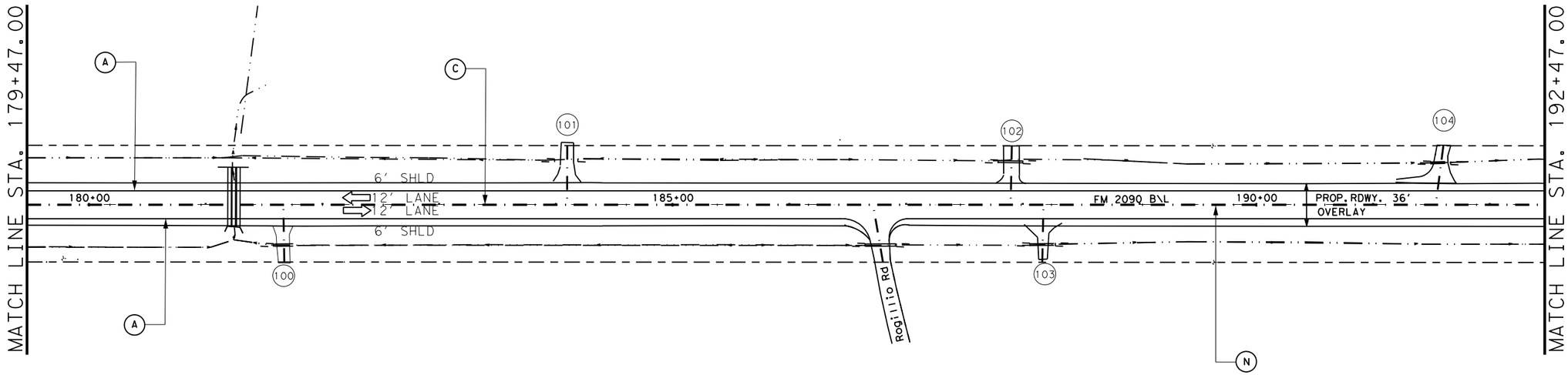
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 13 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		49



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(3Q) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/05/2022 11:36 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

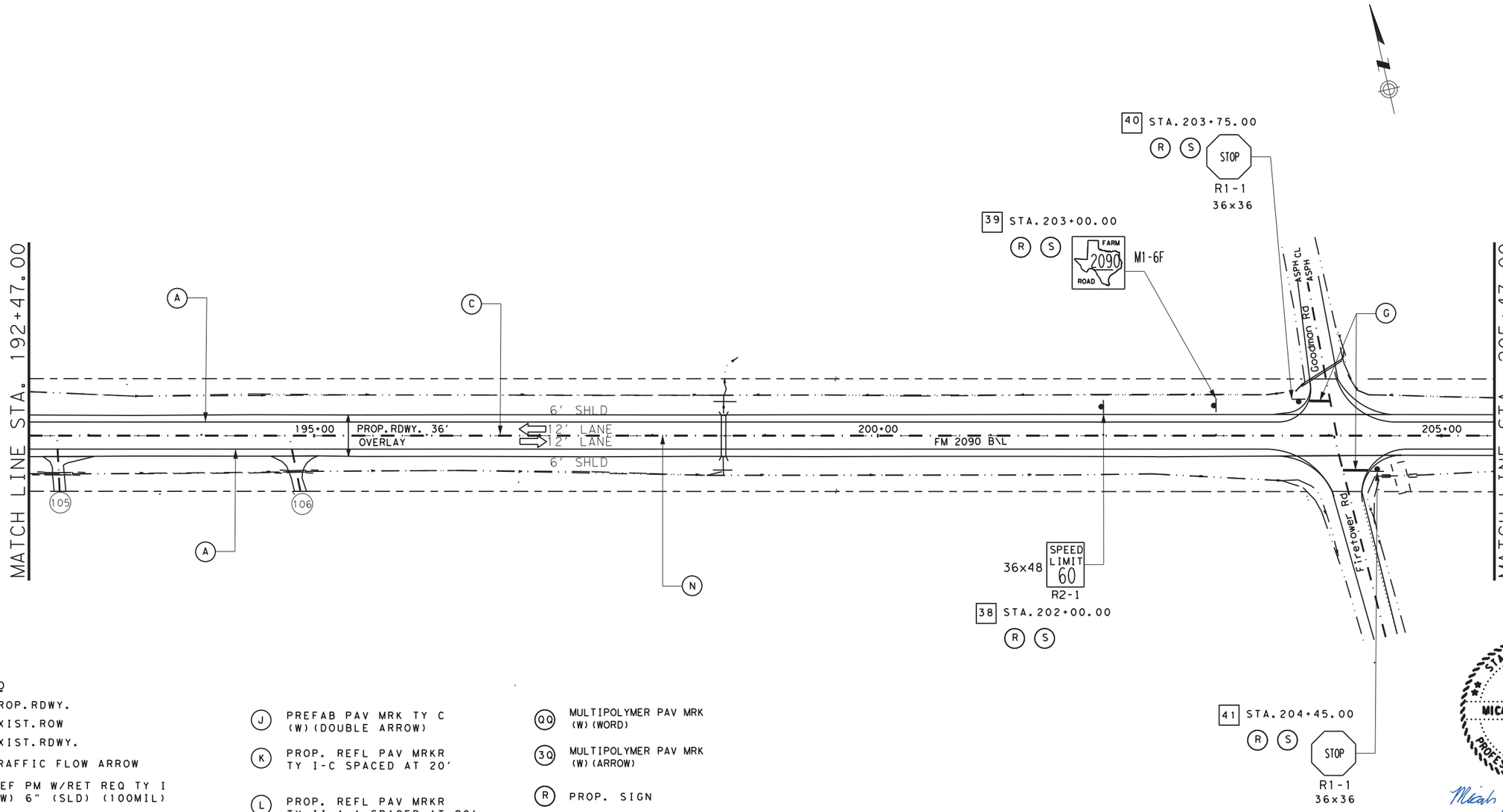
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 14 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		50



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(30) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/17/2022 01:47 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

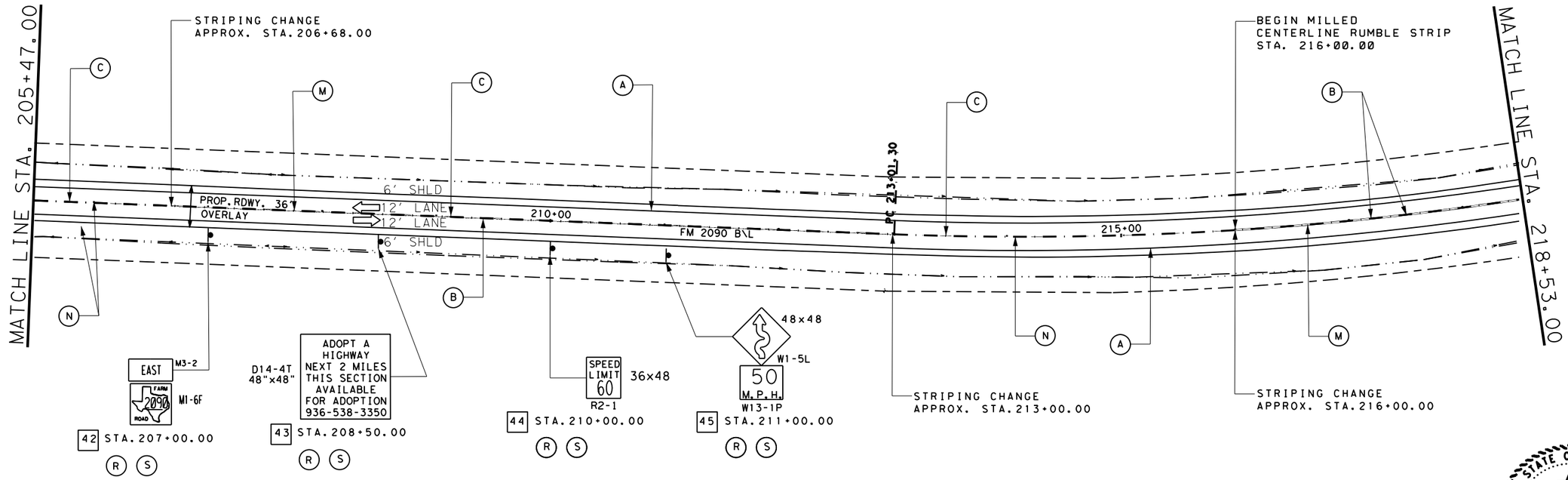
Micah J. Schluter, P.E.
09.01.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 15 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		51



LEGEND

- PROP.RDWY.
- EXIST.ROW
- EXIST.RDWY.
- TRAFFIC FLOW ARROW
- (A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
- (C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
- (D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
- (E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
- (F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
- (G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
- (H) PREFAB PAV MRK TY C (W)(WORD)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
- (K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
- (L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
- (M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
- (N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
- (O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
- (OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
- (P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- (Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- (QQ) MULTIPOLYMER PAV MRK (W)(WORD)
- (30) MULTIPOLYMER PAV MRK (W)(ARROW)
- (R) PROP. SIGN
- (S) REMOVE SIGN
- (T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/17/2022 01:52 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

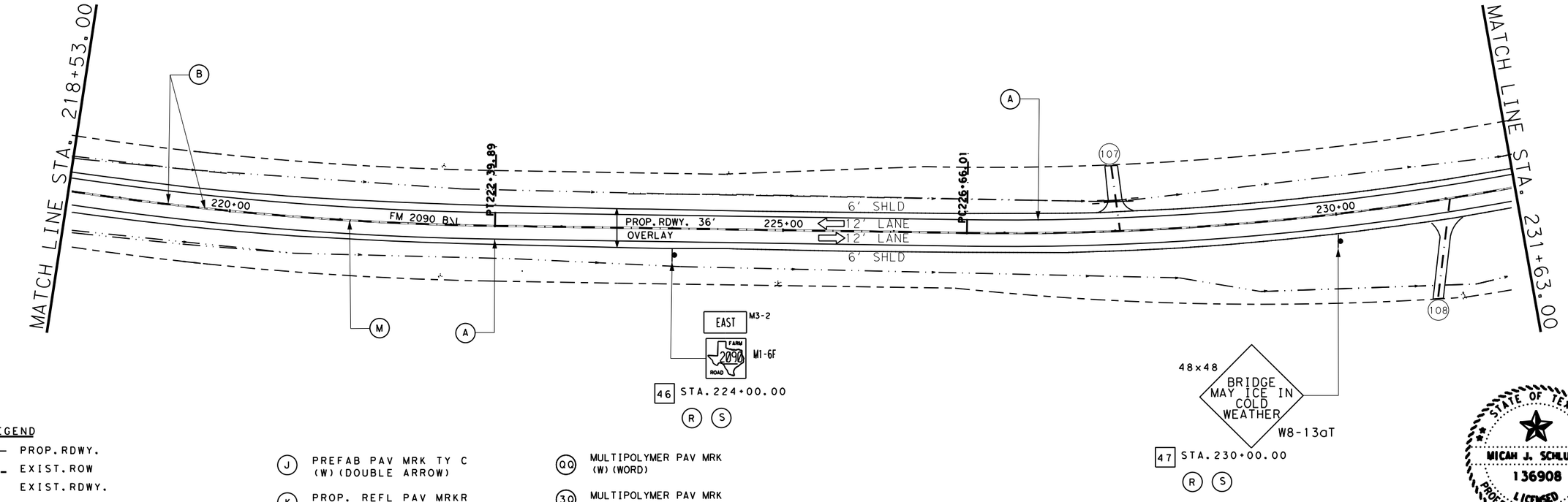
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 16 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		52



LEGEND

PROP. RDWY.
EXIST. ROW
EXIST. RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(3Q) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 02:24 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

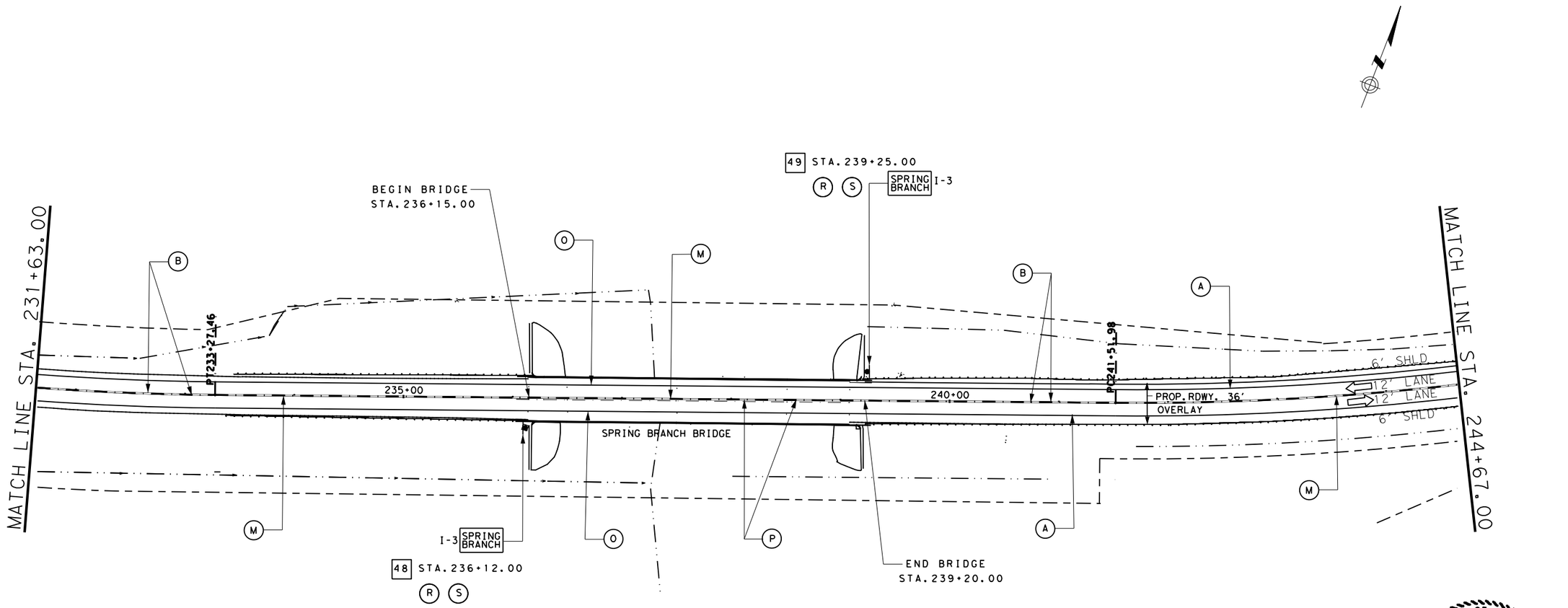
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 17 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		53



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW
- (A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
- (C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
- (D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
- (E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
- (F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
- (G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
- (H) PREFAB PAV MRK TY C (W) (WORD)
- (I) PREFAB PAV MRK TY C (W) (ARROW)
- (J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)
- (K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
- (L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
- (M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
- (N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
- (O) MULTIPOLYMER PAV MRK (W) (6") (SLD)
- (OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)
- (P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)
- (Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)
- (QQ) MULTIPOLYMER PAV MRK (W) (WORD)
- (30) MULTIPOLYMER PAV MRK (W) (ARROW)
- (R) PROP. SIGN
- (S) REMOVE SIGN
- (T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.
08.26.22

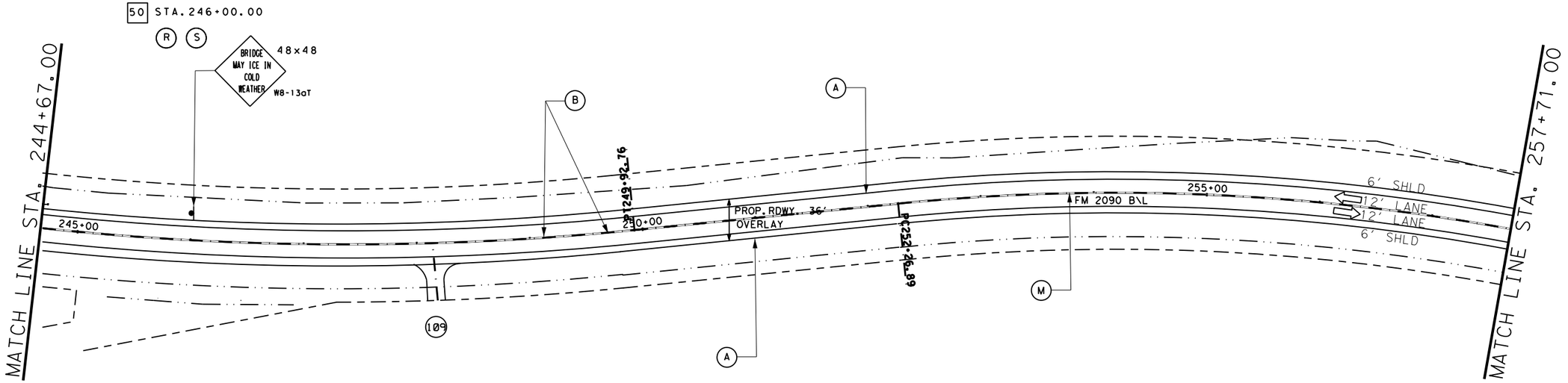
FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 18 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		54

DATE: 08/22/2022 11:13 AM
FILE:



LEGEND

PROP.RDWY.

EXIST.ROW

EXIST.RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W)(WORD)

(I) PREFAB PAV MRK TY C (W)(ARROW)

(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)

(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)

(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)

(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)

(QQ) MULTIPOLYMER PAV MRK (W)(WORD)

(3Q) MULTIPOLYMER PAV MRK (W)(ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 02:31 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

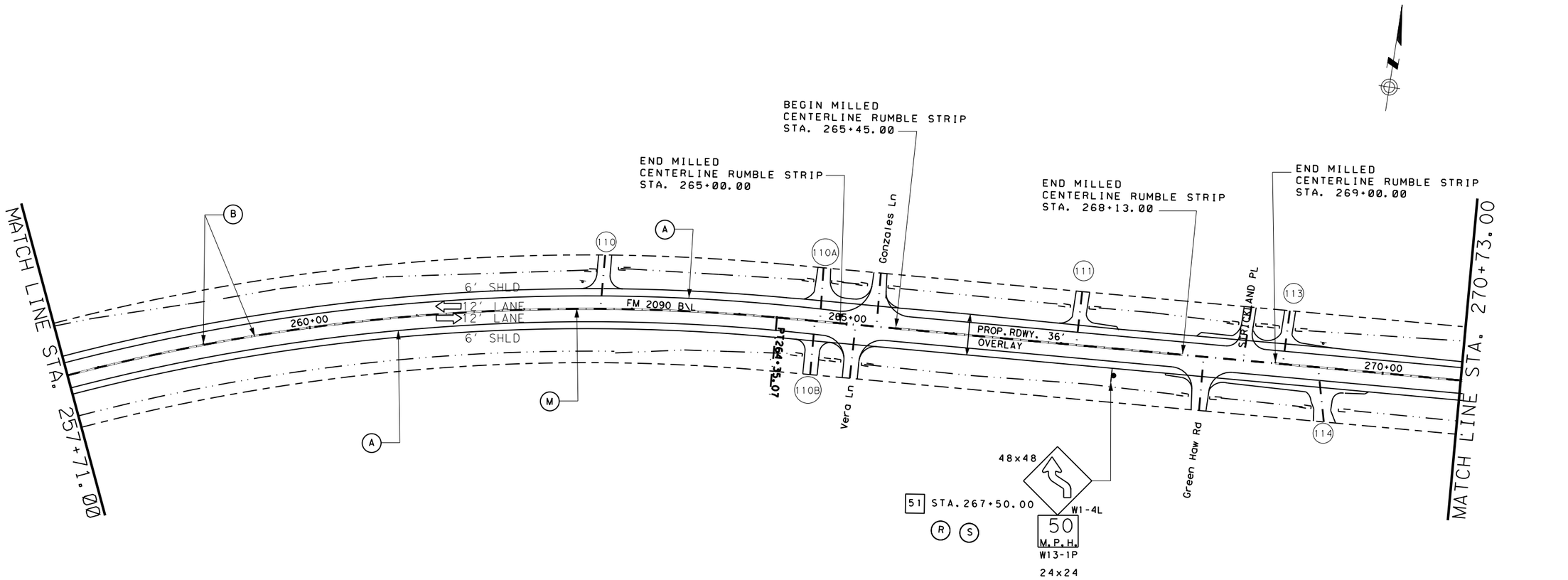
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 19 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		55



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(3Q) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/22/2022 11:14 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

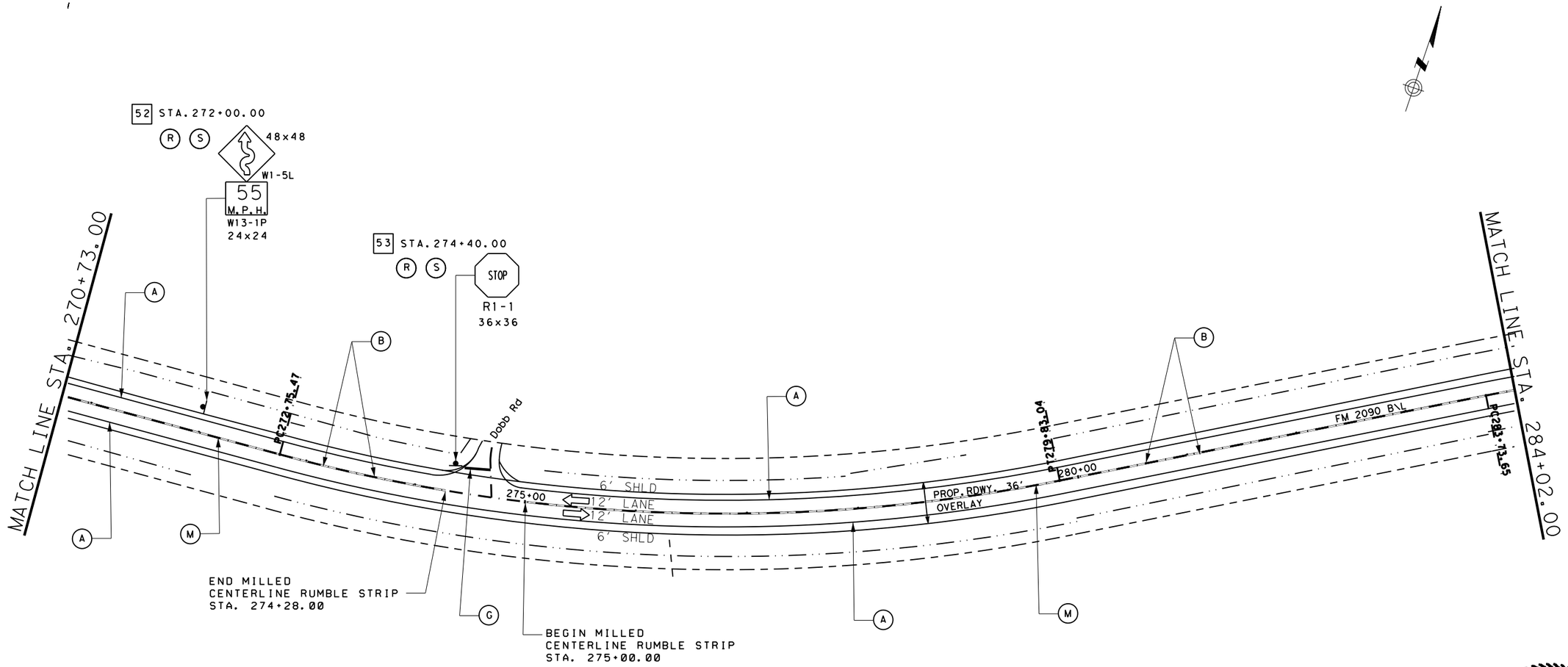
Micah J. Schluter, P.E.
08.30.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 20 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		56



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- ⇦ TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:01 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

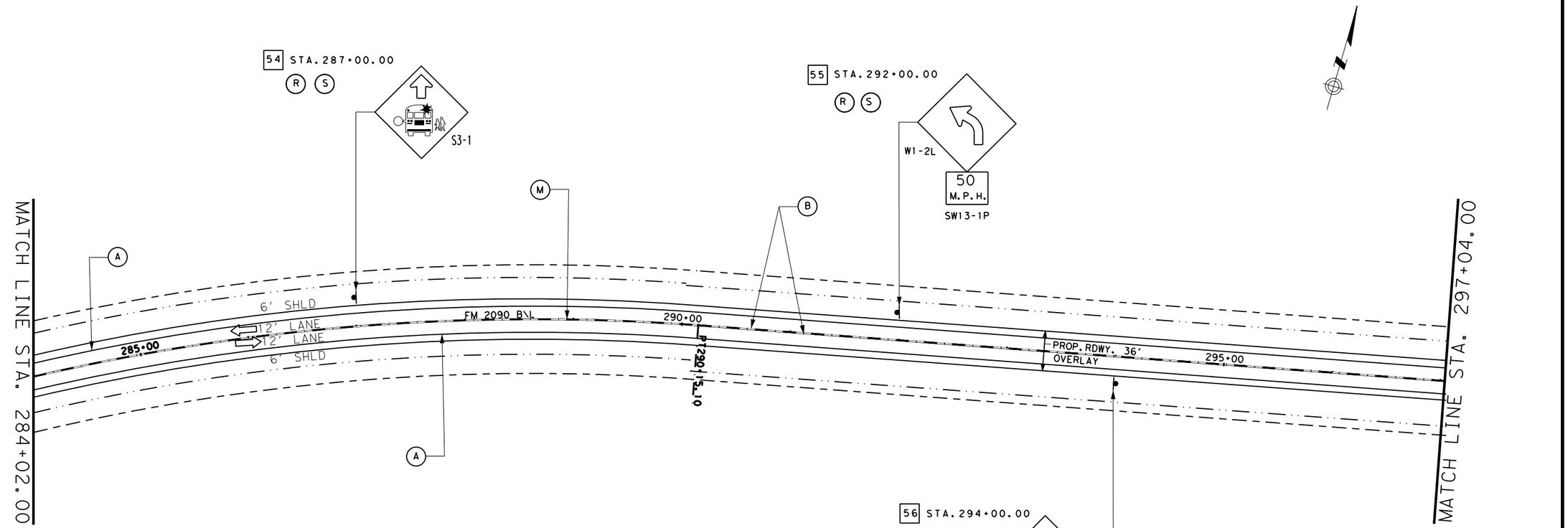
Micah J. Schluter P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 21 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		57



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(3Q) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:02 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

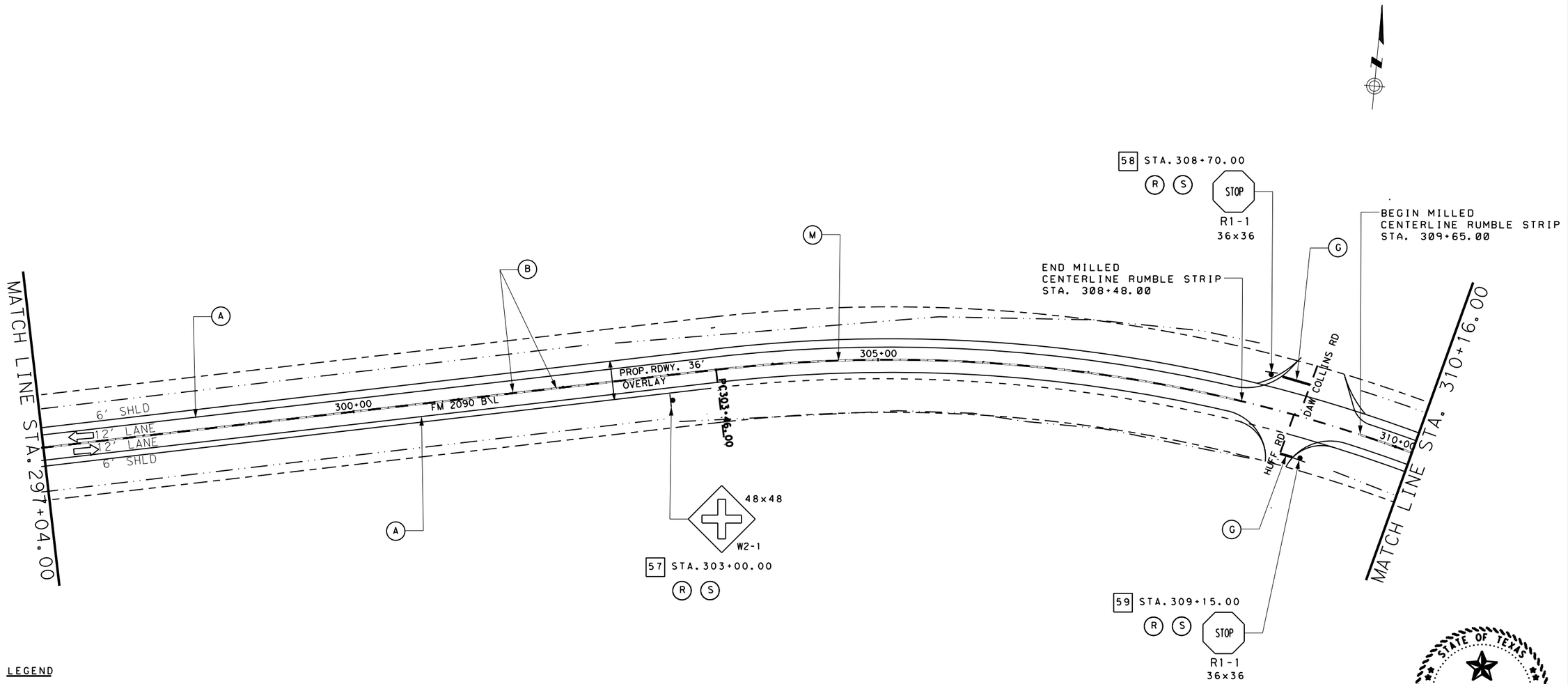
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 22 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		58



LEGEND

PROP. RDWY.
EXIST. ROW
EXIST. RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W) (WORD)
(I) PREFAB PAV MRK TY C (W) (ARROW)
(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)
(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)
(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)
(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)
(QQ) MULTIPOLYMER PAV MRK (W) (WORD)
(30) MULTIPOLYMER PAV MRK (W) (ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:05 PM
FILE:

CK:
DW:
CK:
DN:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter P.E.
08.26.22

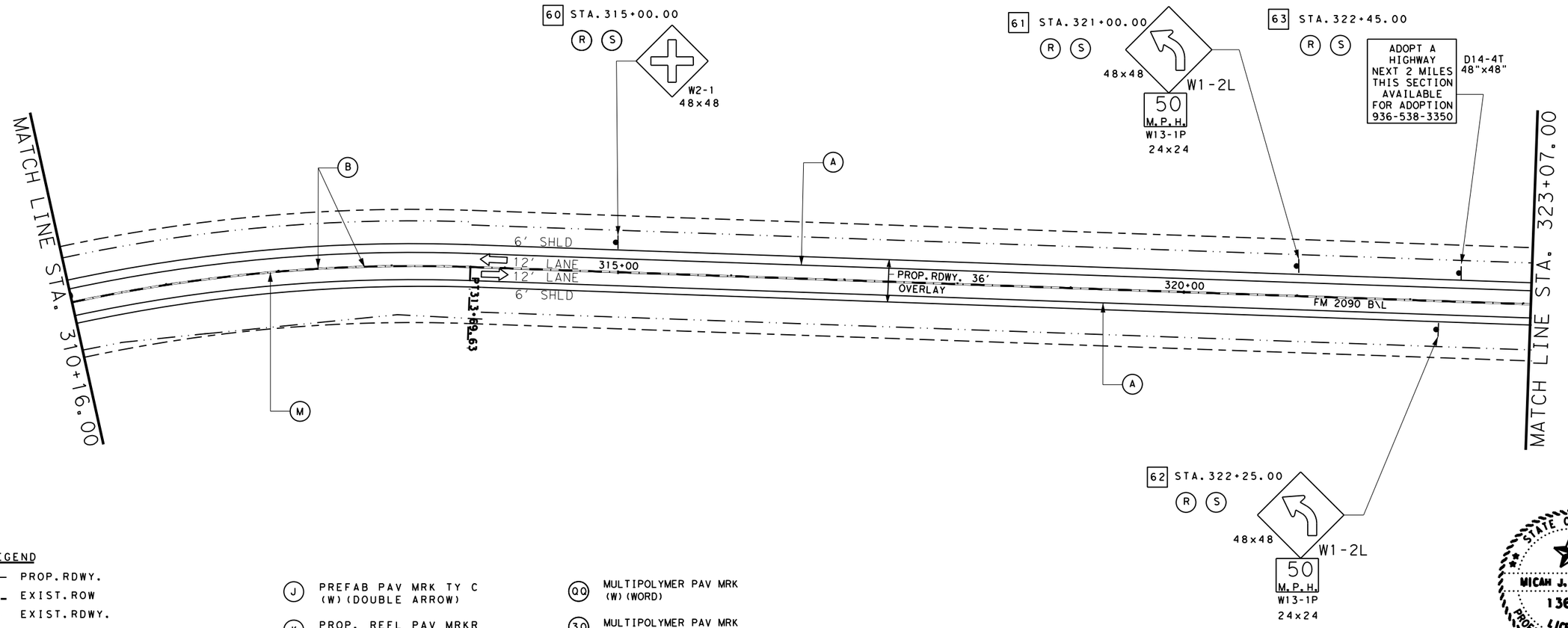
FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 23 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		59

CK:
DW:
CK:
DN:



LEGEND

PROP. RDWY.
EXIST. ROW
EXIST. RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W) (WORD)
(I) PREFAB PAV MRK TY C (W) (ARROW)
(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)
(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)
(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)
(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)
(QQ) MULTIPOLYMER PAV MRK (W) (WORD)
(30) MULTIPOLYMER PAV MRK (W) (ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:08 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

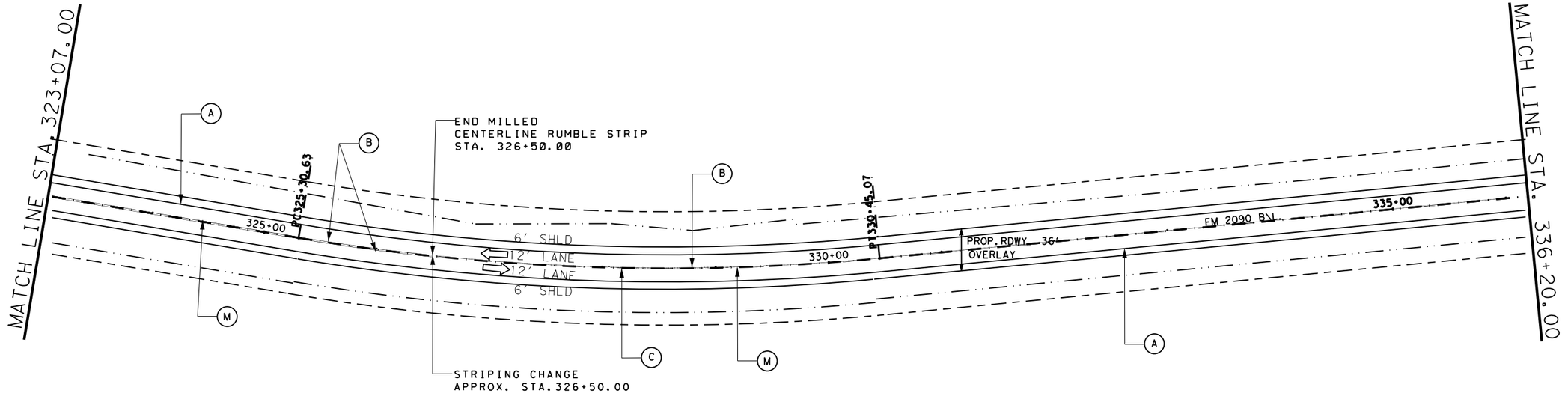
Micah J. Schluter P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 24 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		60



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- ⇦ TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(00) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.
08.26.22

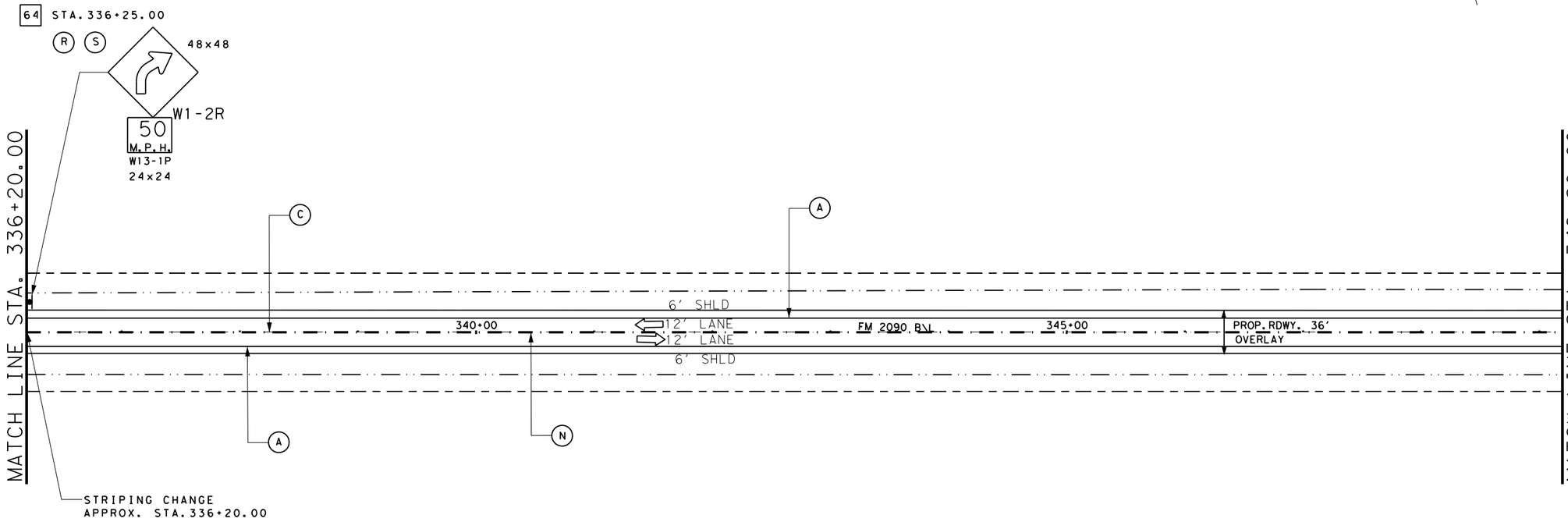
FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 25 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		61

DATE: 08/18/2022 03:09 PM
FILE:



LEGEND

PROP. RDWY.

EXIST. ROW

EXIST. RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/25/2022 03:08 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

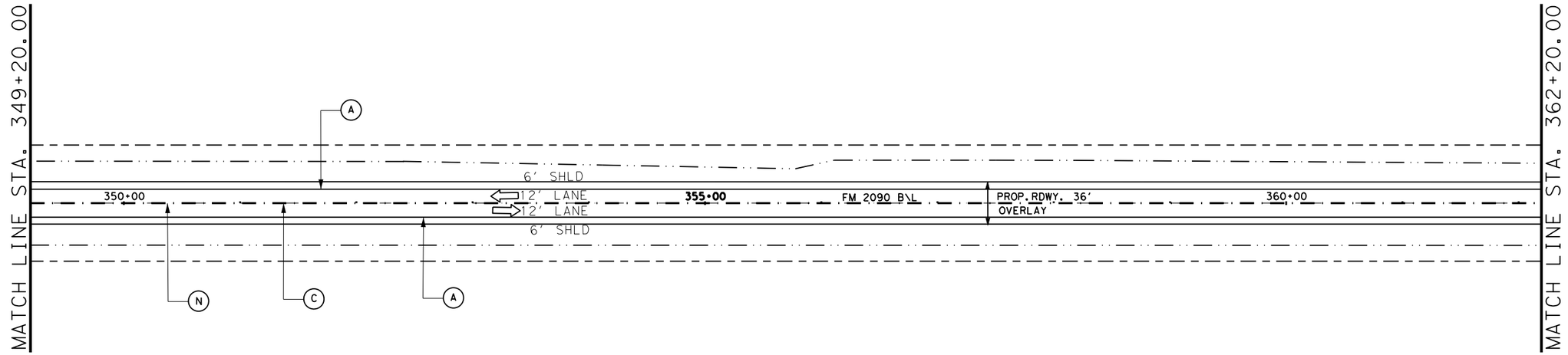
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 26 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		62



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW
- (A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
- (C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
- (D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
- (E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
- (F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
- (G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
- (H) PREFAB PAV MRK TY C (W) (WORD)
- (I) PREFAB PAV MRK TY C (W) (ARROW)
- (J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)
- (K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
- (L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
- (M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
- (N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
- (O) MULTIPOLYMER PAV MRK (W) (6") (SLD)
- (OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)
- (P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)
- (Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)
- (QQ) MULTIPOLYMER PAV MRK (W) (WORD)
- (3Q) MULTIPOLYMER PAV MRK (W) (ARROW)
- (R) PROP. SIGN
- (S) REMOVE SIGN
- (T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

08.26.22

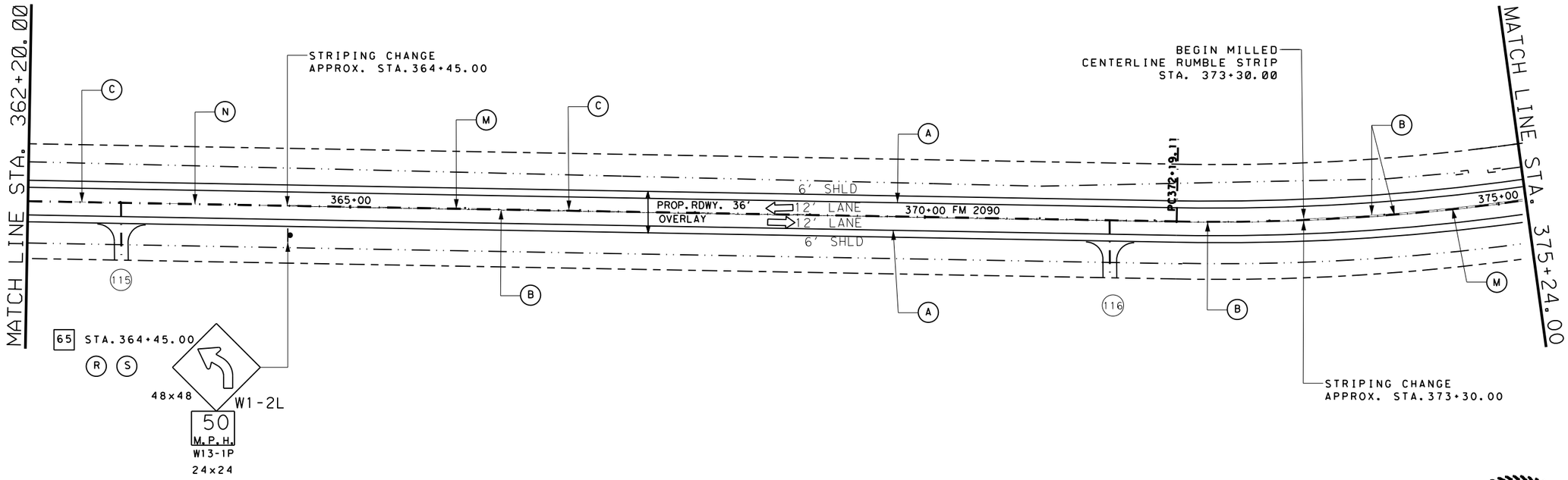
FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 27 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		63

DATE: 08/18/2022 09:52 AM
FILE:



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(3Q) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER
Micah J. Schluter, P.E.
08.26.22

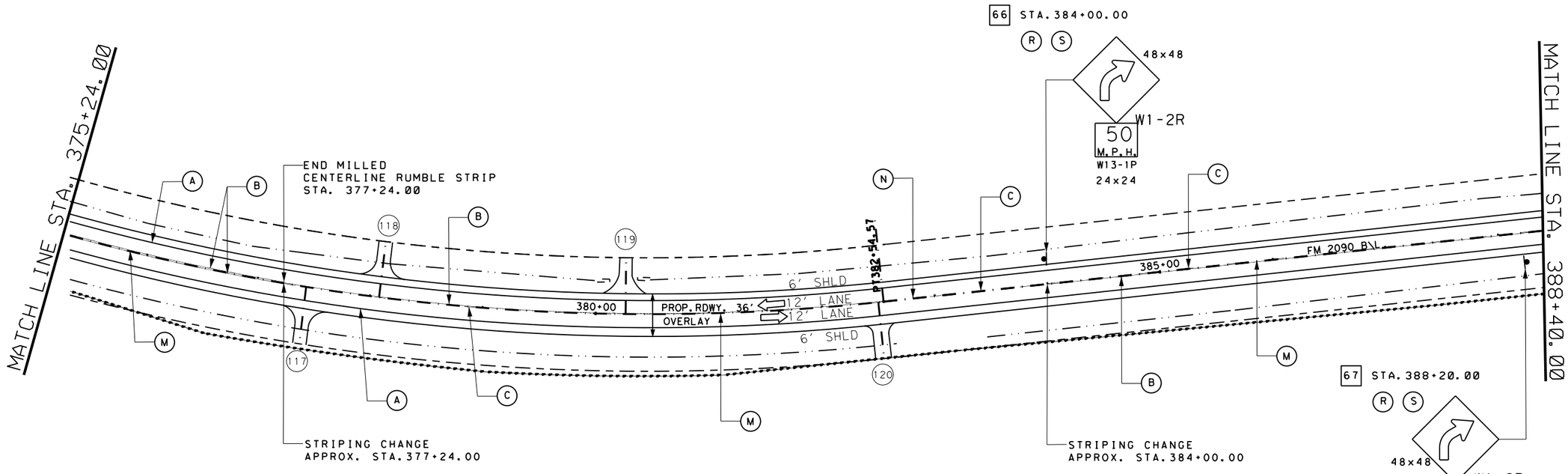
FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 28 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		64

DATE: 08/18/2022 03:11 PM
FILE:



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(30) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 11:40 AM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

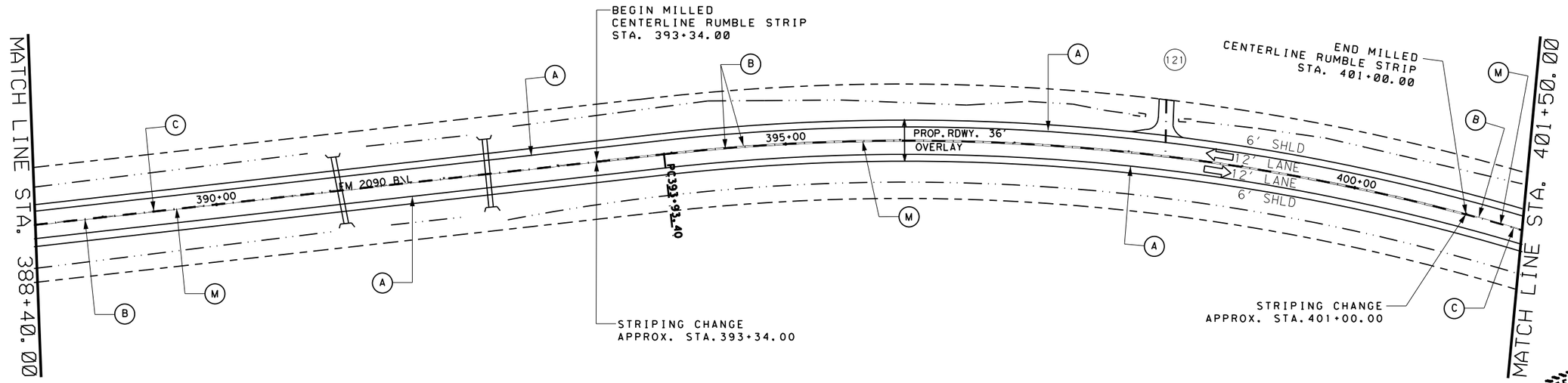
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 29 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		65



LEGEND

PROP. RDWY.

EXIST. ROW

EXIST. RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(3Q) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:20 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

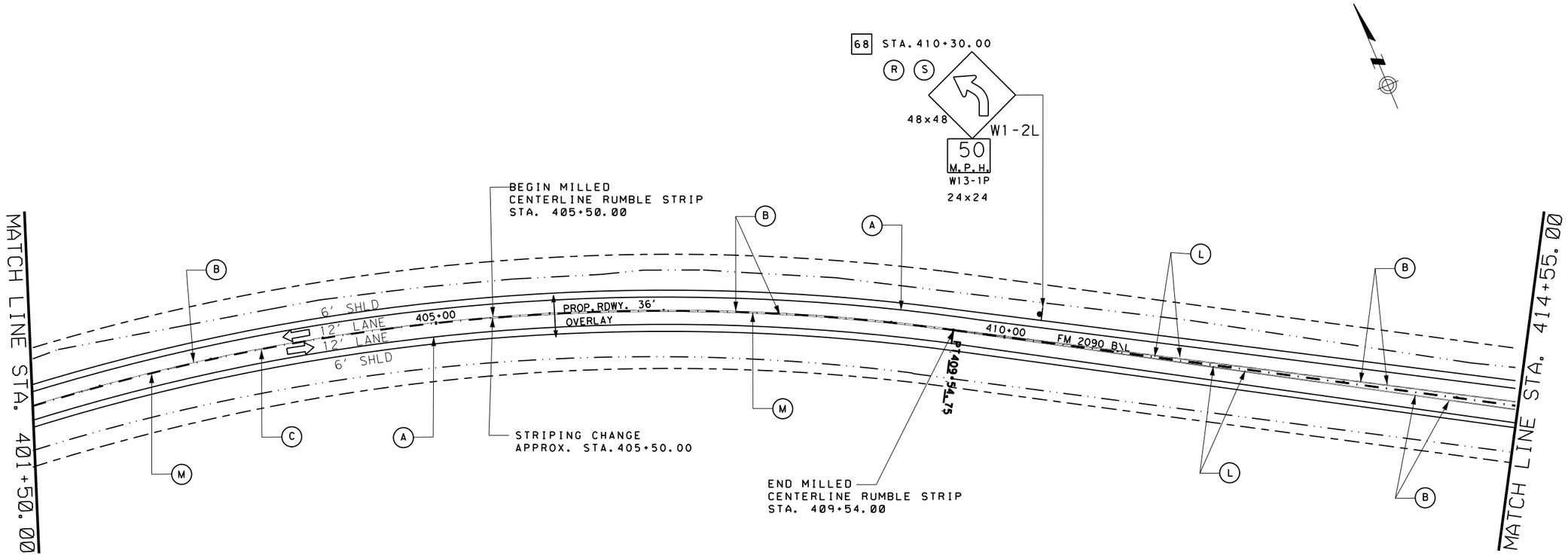
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 30 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		66



LEGEND

- PROP.RDWY.
- EXIST.ROW
- EXIST.RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W)(WORD)

(I) PREFAB PAV MRK TY C (W)(ARROW)

(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)

(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)

(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)

(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)

(QQ) MULTIPOLYMER PAV MRK (W)(WORD)

(30) MULTIPOLYMER PAV MRK (W)(ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:25 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

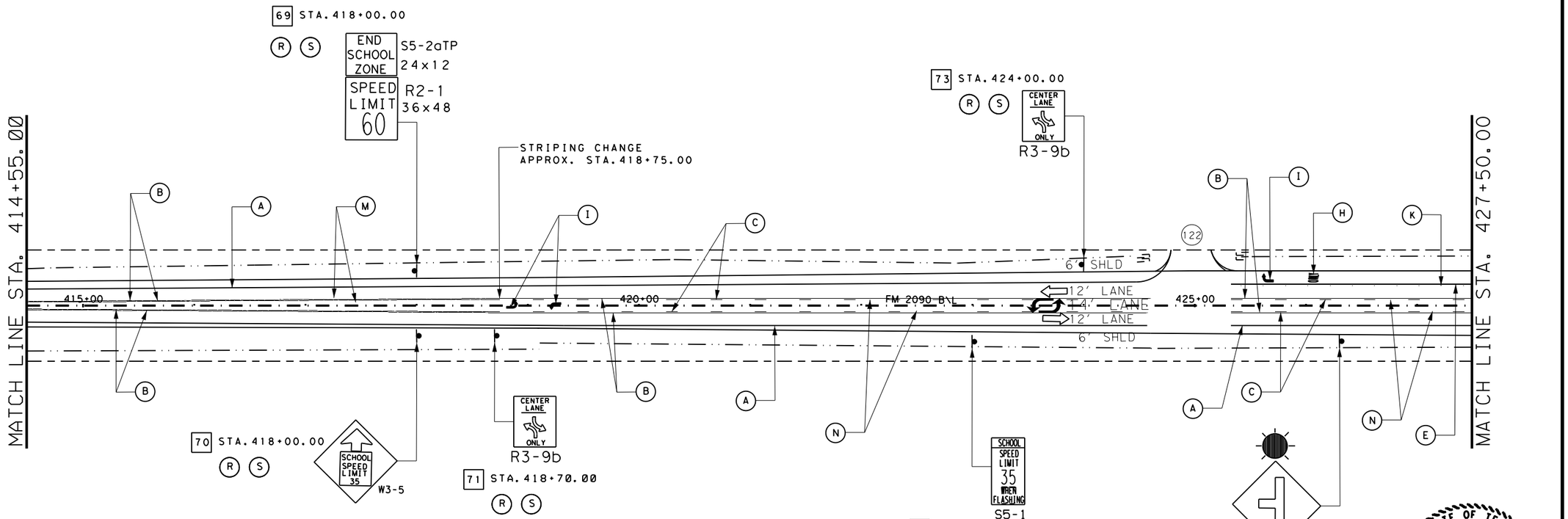
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 31 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		67



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:26 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

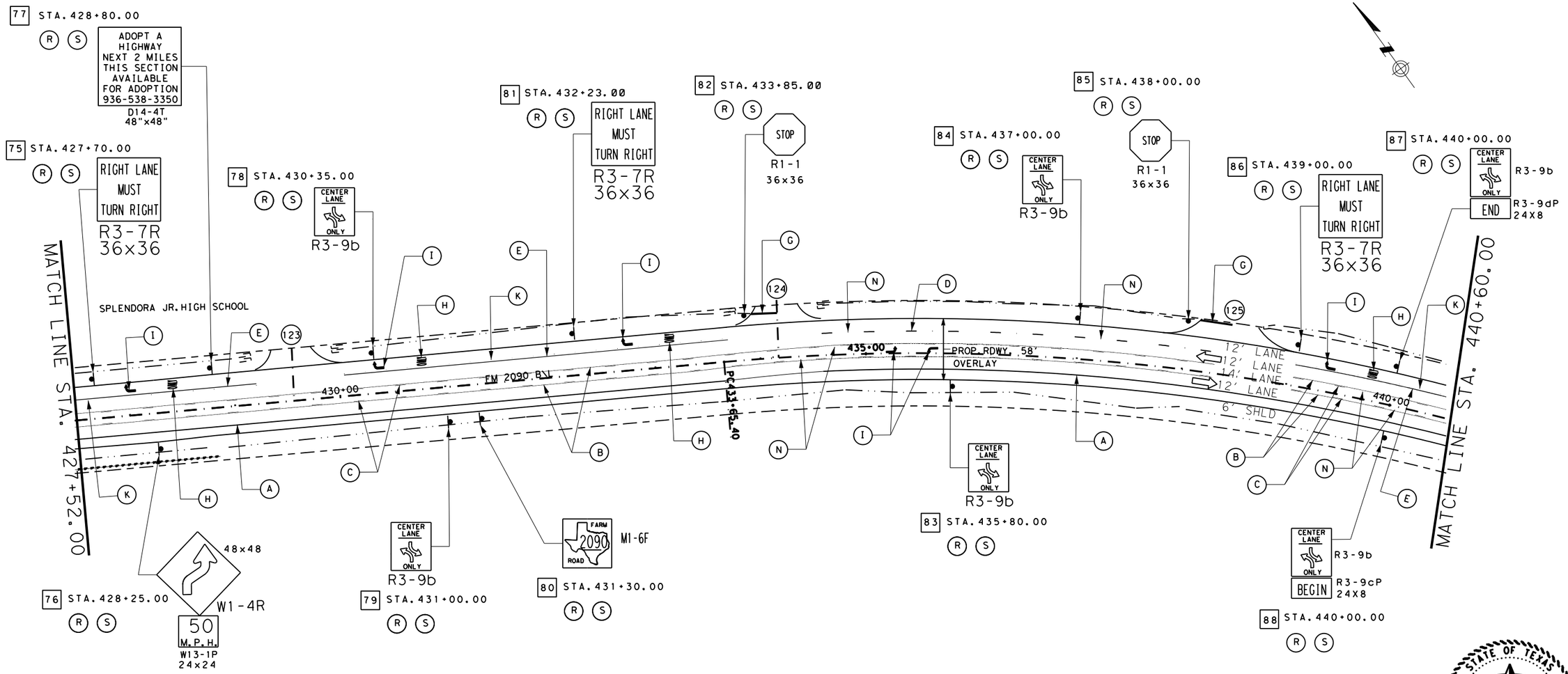
Micah J. Schluter P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 32 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		68



LEGEND

- PROP. RDWY.
- EXIST. ROW
- EXIST. RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(3Q) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:29 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

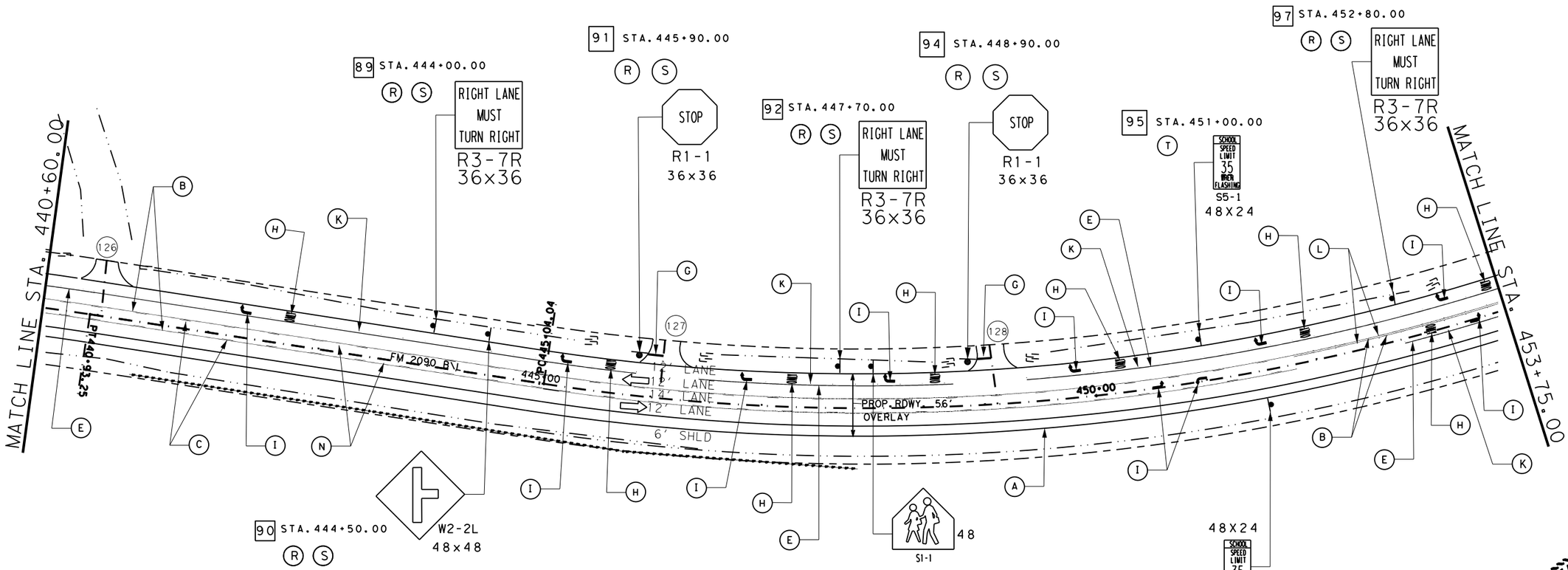
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 33 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		69



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W)(WORD)

(I) PREFAB PAV MRK TY C (W)(ARROW)

(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)

(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)

(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)

(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)

(QQ) MULTIPOLYMER PAV MRK (W)(WORD)

(30) MULTIPOLYMER PAV MRK (W)(ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:44 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

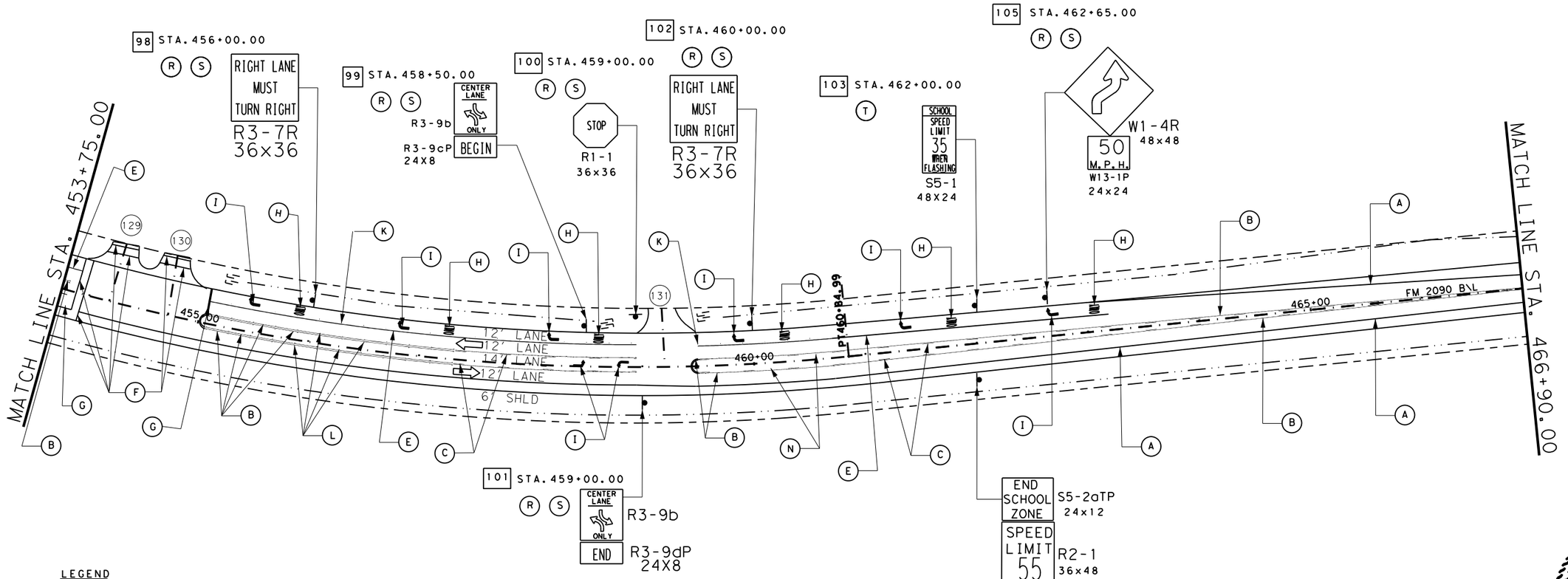
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 34 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		70



LEGEND

PROP. RDWY.

EXIST. ROW

EXIST. RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(3Q) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:55 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

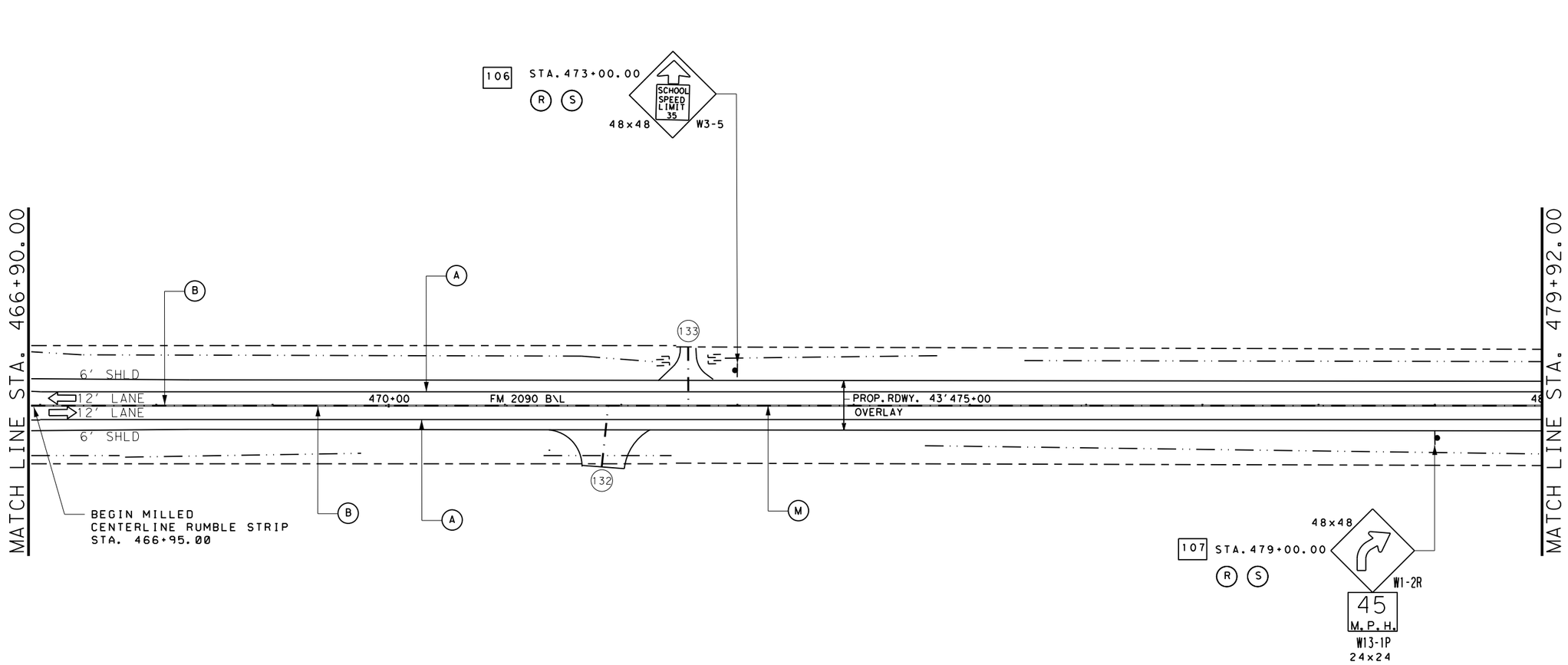
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 35 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		71



LEGEND

- PROP.RDWY.
- EXIST.ROW
- EXIST.RDWY.
- TRAFFIC FLOW ARROW
- (A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
- (C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
- (D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
- (E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
- (F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
- (G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
- (H) PREFAB PAV MRK TY C (W)(WORD)
- (I) PREFAB PAV MRK TY C (W)(ARROW)
- (J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
- (K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
- (L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
- (M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
- (N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
- (O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
- (OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
- (P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
- (Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
- (QQ) MULTIPOLYMER PAV MRK (W)(WORD)
- (3Q) MULTIPOLYMER PAV MRK (W)(ARROW)
- (R) PROP. SIGN
- (S) REMOVE SIGN
- (T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.
08.30.22

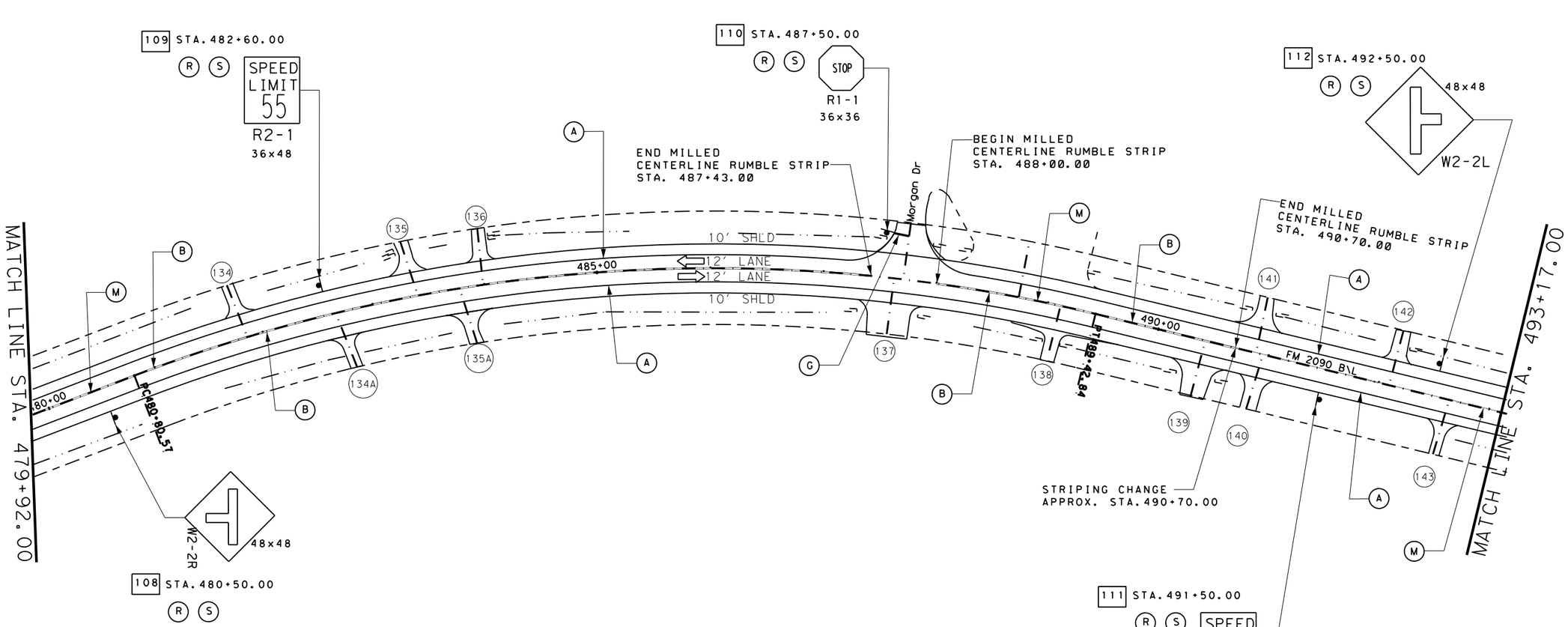
FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 36 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		72

DATE: 08/22/2022 02:20 PM
FILE:



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(30) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 03:59 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

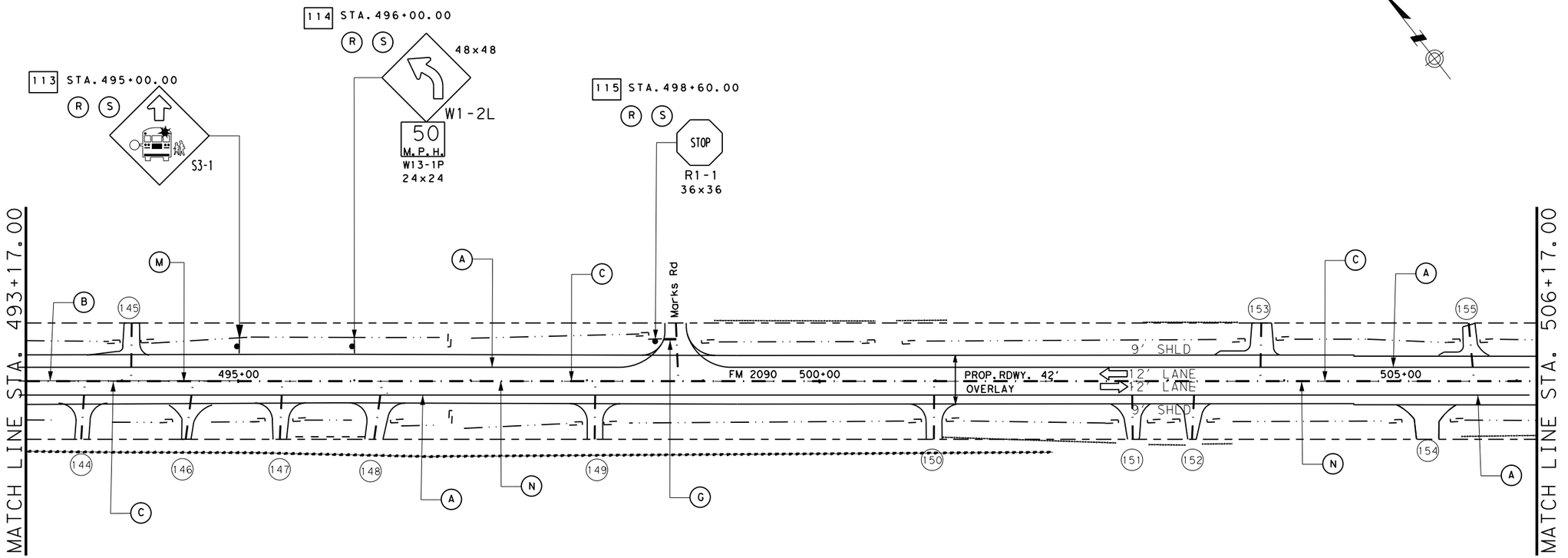
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 37 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		73



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(30) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 04:01 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

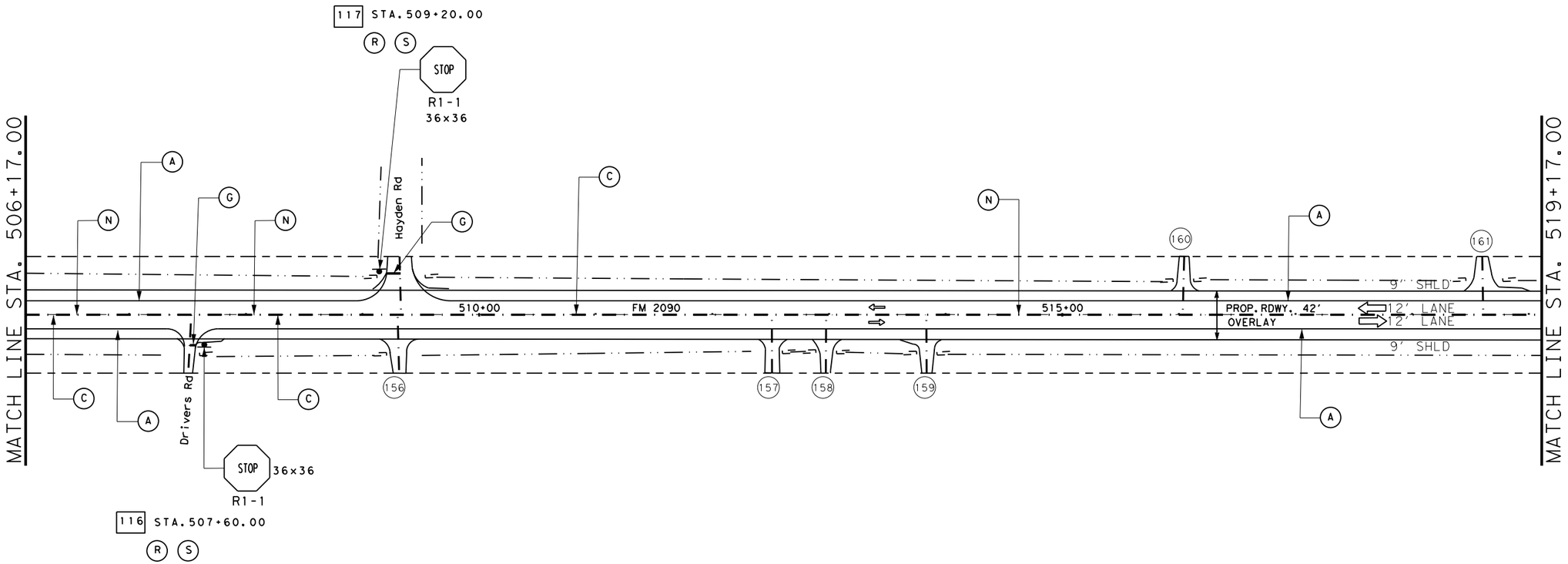
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 38 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		74



LEGEND

PROP. RDWY.

EXIST. ROW

EXIST. RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W) (WORD)

(I) PREFAB PAV MRK TY C (W) (ARROW)

(J) PREFAB PAV MRK TY C (W) (DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W) (6") (SLD)

(OO) MULTIPOLYMER PAV MRK (W) (8") (SLD)

(P) MULTIPOLYMER PAV MRK (Y) (6") (SLD)

(Q) MULTIPOLYMER PAV MRK (Y) (6") (BRK)

(QQ) MULTIPOLYMER PAV MRK (W) (WORD)

(30) MULTIPOLYMER PAV MRK (W) (ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20, PM(2)-20, PM(3)-20, PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 04:04 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

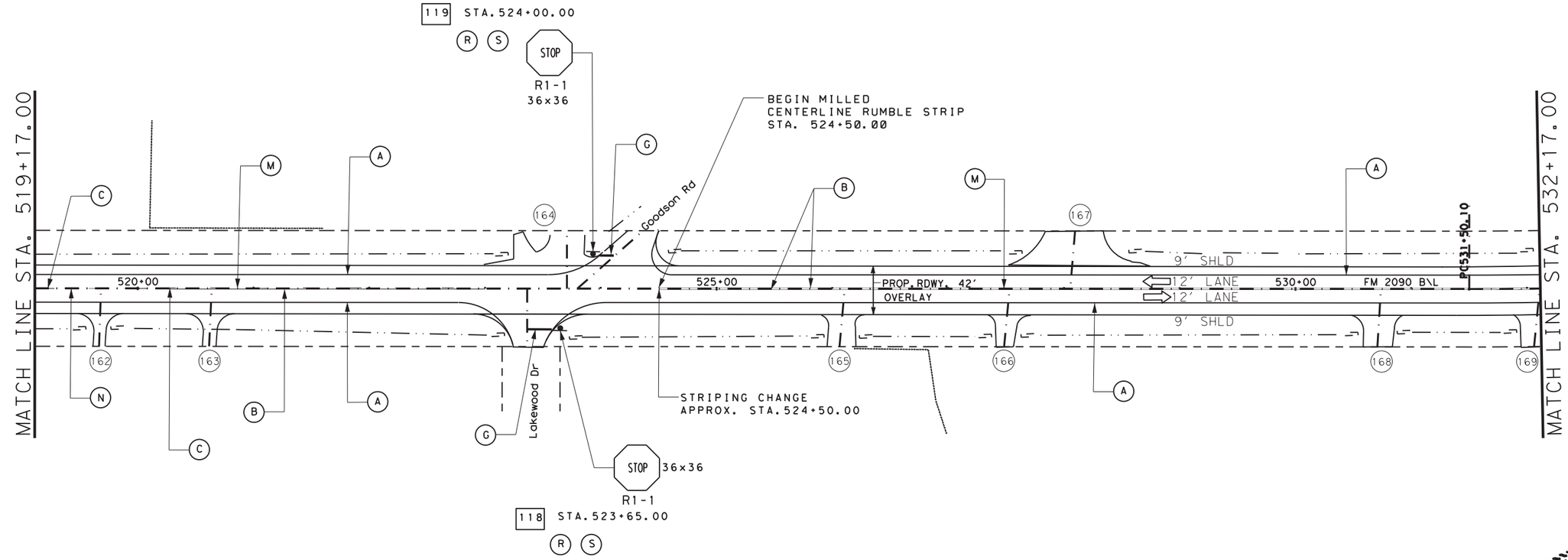
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 39 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		75



LEGEND

- PROP.RDWY.
- EXIST.ROW
- EXIST.RDWY.
- TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W)(WORD)

(I) PREFAB PAV MRK TY C (W)(ARROW)

(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)

(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)

(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)

(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)

(QQ) MULTIPOLYMER PAV MRK (W)(WORD)

(3Q) MULTIPOLYMER PAV MRK (W)(ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/22/2022 02:49 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

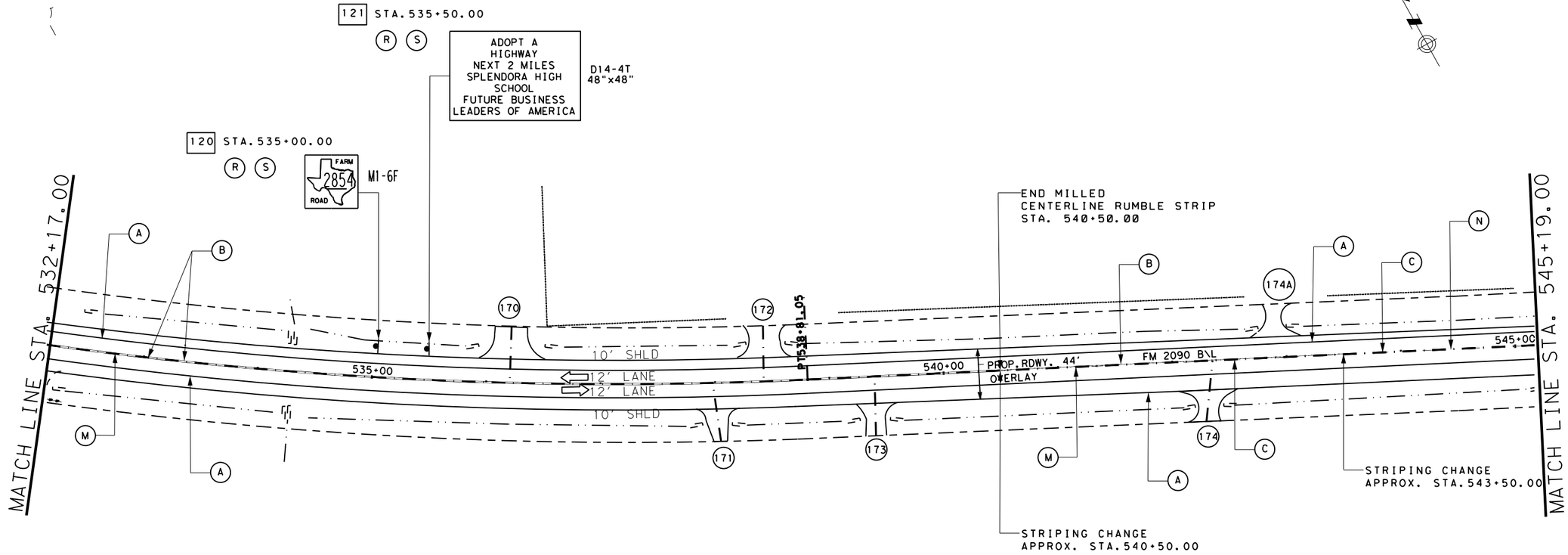
Micah J. Schluter, P.E.
08.31.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 40 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		76



LEGEND

PROP.RDWY.

EXIST.ROW

EXIST.RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W)(WORD)

(I) PREFAB PAV MRK TY C (W)(ARROW)

(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)

(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)

(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)

(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)

(QQ) MULTIPOLYMER PAV MRK (W)(WORD)

(30) MULTIPOLYMER PAV MRK (W)(ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

08.26.22

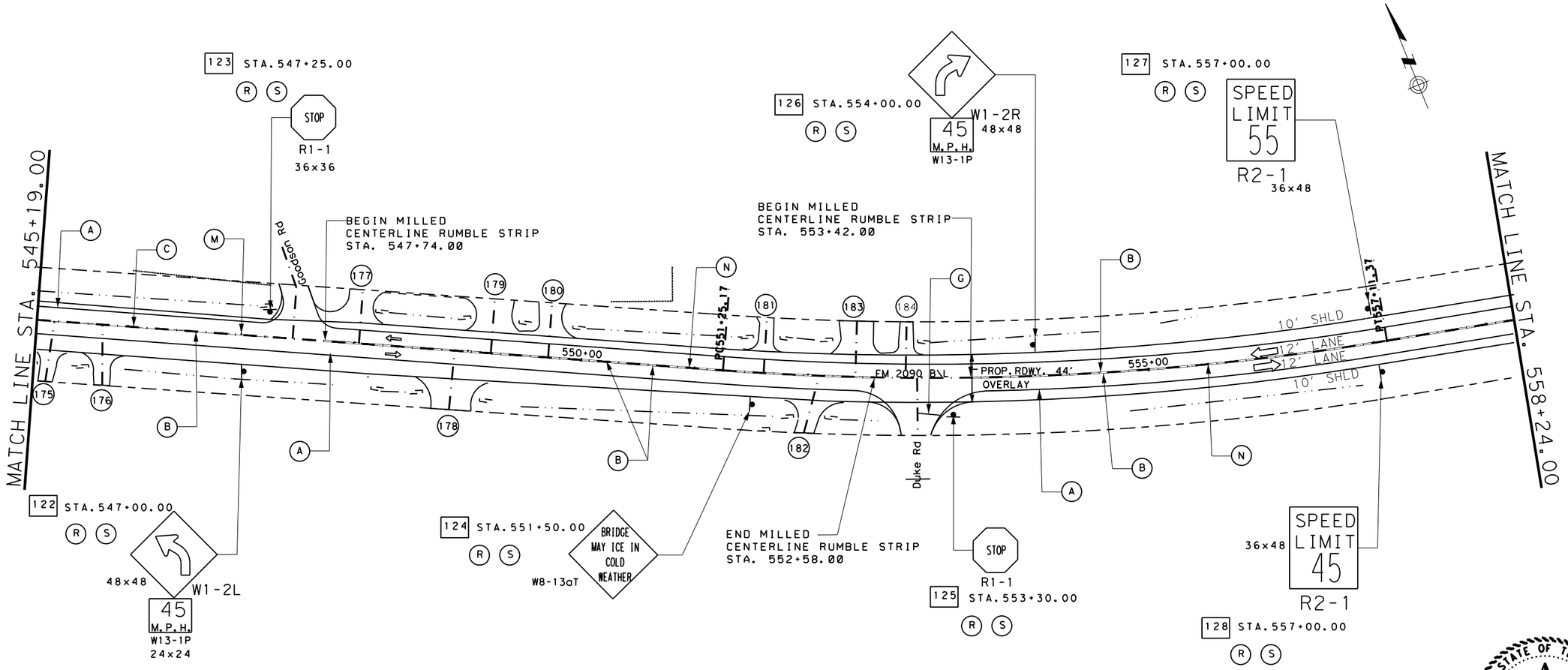
FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 41 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		77

DATE: 08/18/2022 04:07 PM
FILE:



LEGEND

PROP.RDWY.

EXIST.ROW

EXIST.RDWY.

TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)

(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)

(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)

(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)

(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)

(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)

(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)

(H) PREFAB PAV MRK TY C (W)(WORD)

(I) PREFAB PAV MRK TY C (W)(ARROW)

(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)

(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'

(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'

(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'

(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'

(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)

(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)

(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)

(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)

(QQ) MULTIPOLYMER PAV MRK (W)(WORD)

(30) MULTIPOLYMER PAV MRK (W)(ARROW)

(R) PROP. SIGN

(S) REMOVE SIGN

(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/18/2022 04:10 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter, P.E.

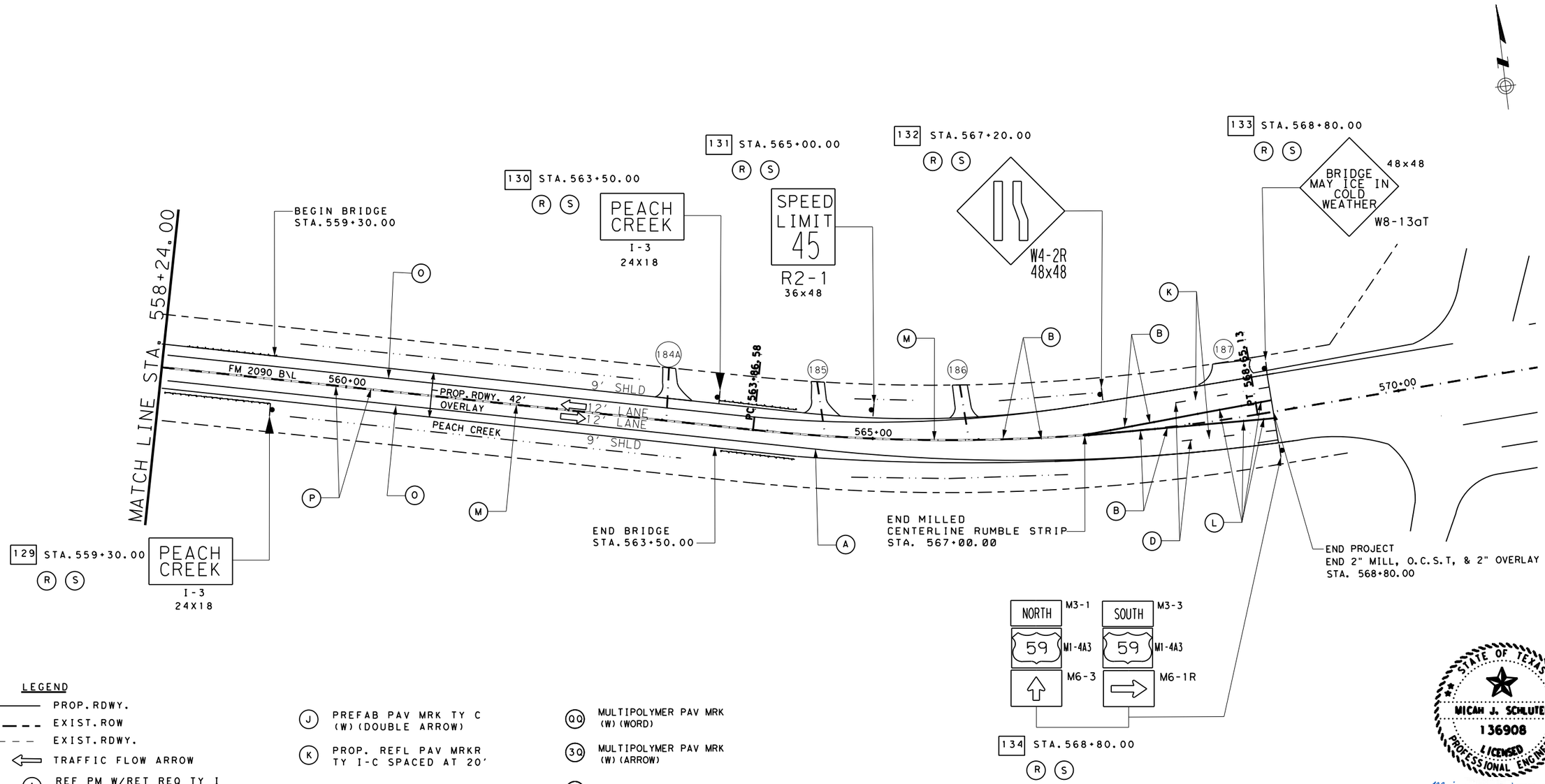
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

SHEET 42 OF 43

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		78



LEGEND

PROP.RDWY.
EXIST.ROW
EXIST.RDWY.
TRAFFIC FLOW ARROW

(A) REF PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
(B) REF PM W/RET REQ TY I (Y) 6" (SLD) (100MIL)
(C) REF PM W/RET REQ TY I (Y) 6" (BRK) (100MIL)
(D) REF PM W/RET REQ TY I (W) 6" (BRK) (100MIL)
(E) REF PAV MRK TY I (W) 8" (SLD) (100MIL)
(F) REF PAV MRK TY I (W) 12" (SLD) (100MIL)
(G) REF PAV MRK TY I (W) 24" (SLD) (100MIL)
(H) PREFAB PAV MRK TY C (W)(WORD)
(I) PREFAB PAV MRK TY C (W)(ARROW)
(J) PREFAB PAV MRK TY C (W)(DOUBLE ARROW)
(K) PROP. REFL PAV MRKR TY I-C SPACED AT 20'
(L) PROP. REFL PAV MRKR TY II-A-A SPACED AT 20'
(M) PROP. REFL PAV MRKR TY II-A-A SPACED AT 40'
(N) PROP. REFL PAV MRKR TY II-A-A SPACED AT 80'
(O) MULTIPOLYMER PAV MRK (W)(6")(SLD)
(OO) MULTIPOLYMER PAV MRK (W)(8")(SLD)
(P) MULTIPOLYMER PAV MRK (Y)(6")(SLD)
(Q) MULTIPOLYMER PAV MRK (Y)(6")(BRK)
(QQ) MULTIPOLYMER PAV MRK (W)(WORD)
(30) MULTIPOLYMER PAV MRK (W)(ARROW)
(R) PROP. SIGN
(S) REMOVE SIGN
(T) REPLACE SIGN ONLY

FOR PAVEMENT MARKINGS AND MARKERS SEE STANDARDS:
PM-20,PM(2)-20,PM(3)-20,PM(WAS)-07
FOR SMALL SIGN INSTALLATION, SEE SIGN MOUNTING DETAIL STANDARDS

DATE: 08/25/2022 03:11 PM
FILE:

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

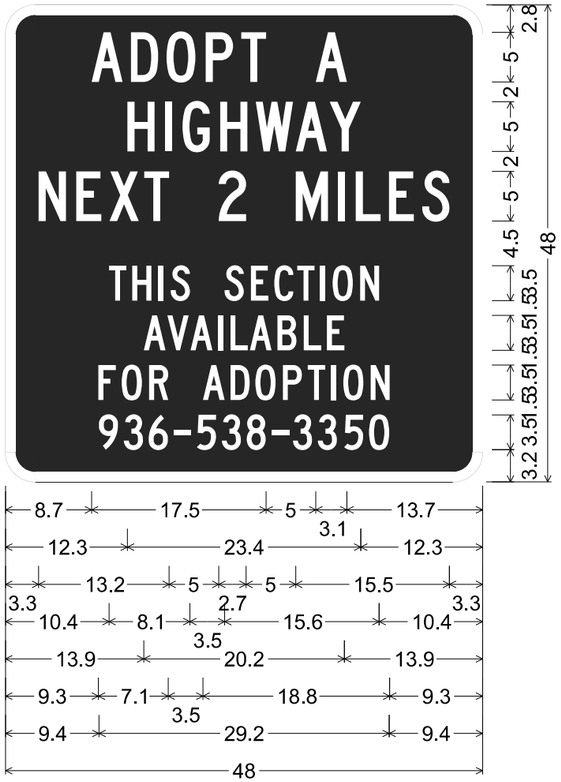
Micah J. Schluter, P.E.
08.26.22

FM 2090
ROADWAY AND PAVEMENT MARKING LAYOUT

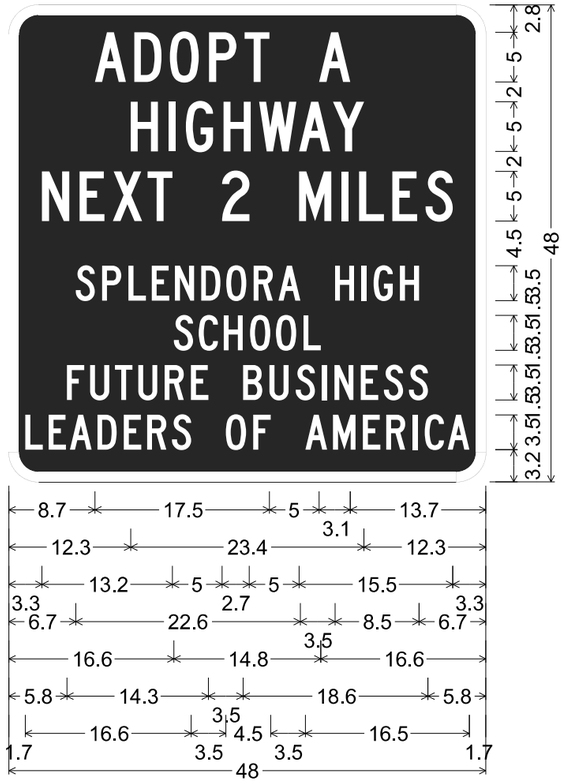
SHEET 43 OF 43

Texas Department of Transportation

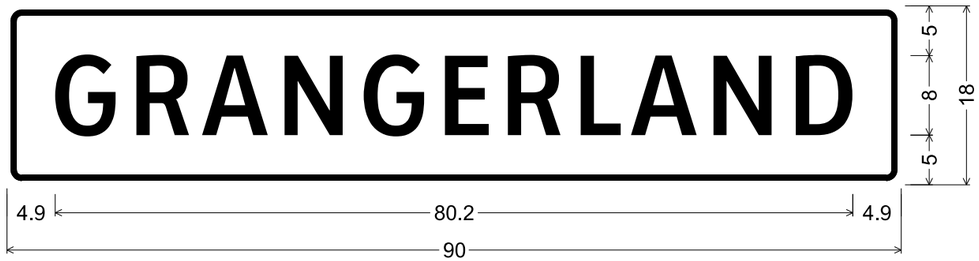
CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		79



3.0" Radius, 1.0" Border, White on Blue;
"ADOPT A ", C; "HIGHWAY", C;
"NEXT 2 MILES", C; "THIS SECTION", C;
"AVAILABLE", C; "FOR ADOPTION", C;
"936-538-3350", C;



3.0" Radius, 1.0" Border, White on Blue;
"ADOPT A ", C; "HIGHWAY", C;
"NEXT 2 MILES", C;
"SPLENDORA HIGH", C; "SCHOOL", C;
"FUTURE BUSINESS", C;
"LEADERS OF AMERICA", C;



1.5" Radius, 0.6" Border, 0.4" Indent, Black on White;
"GRANGERLAND", ClearviewHwy-3-W;

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER

Micah J. Schluter P.E.

08.26.22

FM 2090
SIGN
DETAIL

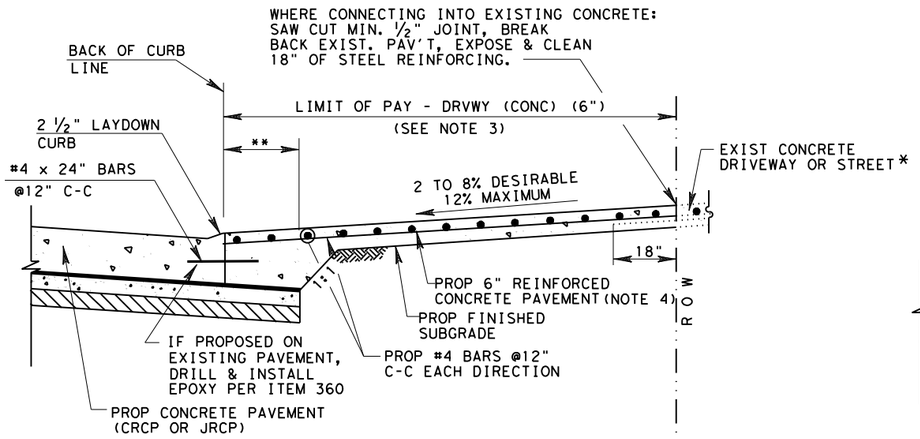
SHEET 1 OF 1

Texas Department of Transportation

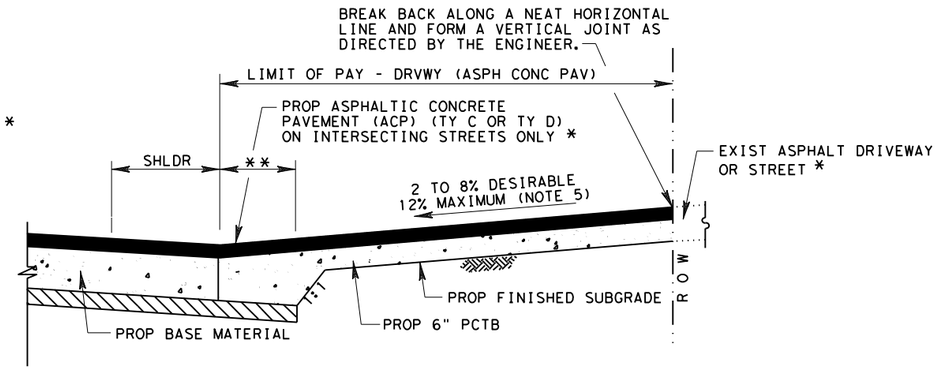
CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090
DIST	COUNTY		SHEET NO.
HOU	MONTGOMERY		79A

DATE: 08/08/2022 09:50 AM
FILE:

E TIME
UMENT NAME



PROPOSED DRIVEWAY DETAIL
REINFORCED CONCRETE AT CONCRETE
CURB AND GUTTER ROADWAY



PROPOSED DRIVEWAY DETAIL
ASPHALT W/ PCTB AT ASPHALT ROADWAY

NOTES:

1. ALSO SEE SHEET 2 OF 2 FOR DRIVEWAY SLOPES WITH PROPOSED SIDEWALKS.
2. FOR INTERSECTIONS BUILT WITH CRCP PAVEMENT SEE CRCP DETAIL.
3. FAST TRACK CONCRETE IS PAID AS DRVWY (CONC) (FAST TRACK).
4. THICKNESS OF DRIVEWAY IS 6 INCHES FOR REGULAR AND FAST TRACK CONCRETE.
5. MAXIMUM SLOPE IS: 12% RESIDENTIAL
   8% OTHERS

LEGEND:

PCTB- PORTLAND CEMENT TREATED BASE

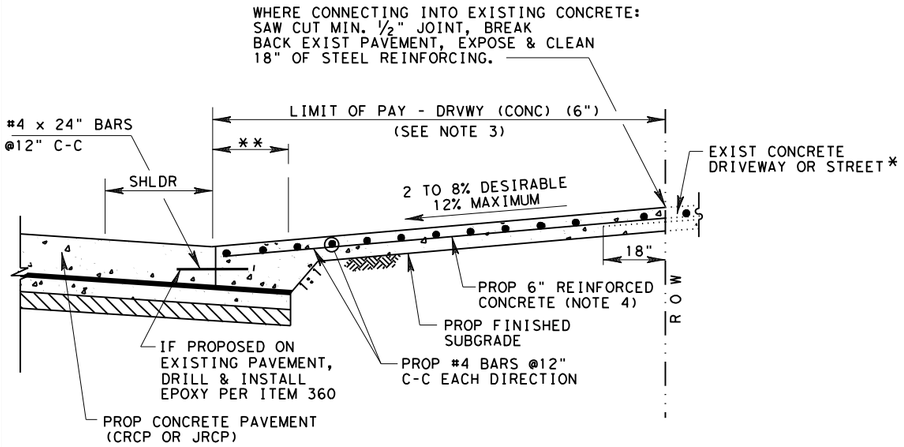
JRCP- JOINTED REINFORCED CONCRETE PAVEMENT

CRCP- CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

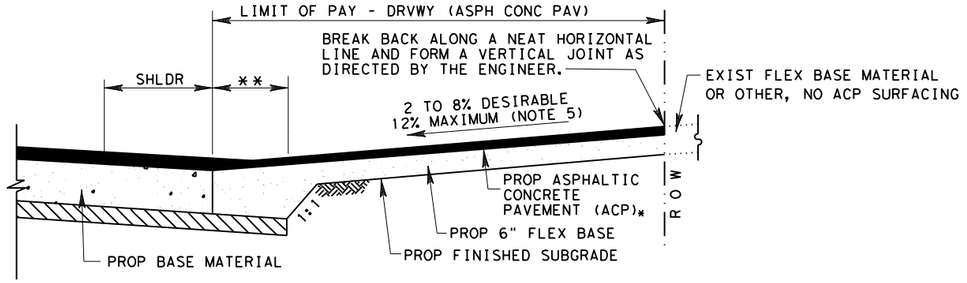
ACP- ASPHALTIC CONCRETE PAVEMENT

* FOR STREET INTERSECTIONS REFER TO PAVING DETAILS AND INTERSECTION DETAILS FOR REINFORCING STEEL AND SECTION REQUIREMENTS.

** PROPOSED LIMIT OF ROADWAY BASE AND/OR SUBGRADE



PROPOSED DRIVEWAY DETAIL
REINFORCED CONCRETE AT CONCRETE ROADWAY



PROPOSED DRIVEWAY DETAIL
ASPHALT W/ FLEX BASE AT ASPHALT ROADWAY

SHEET 1 OF 3

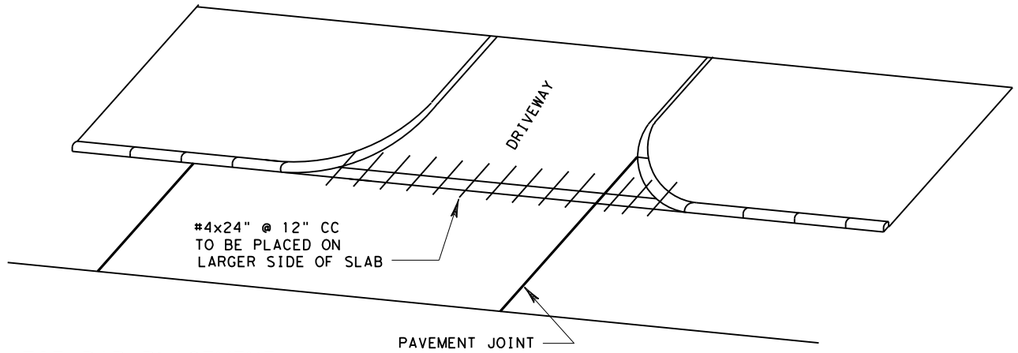
Texas Department of Transportation
Houston District

DRIVEWAY DETAILS

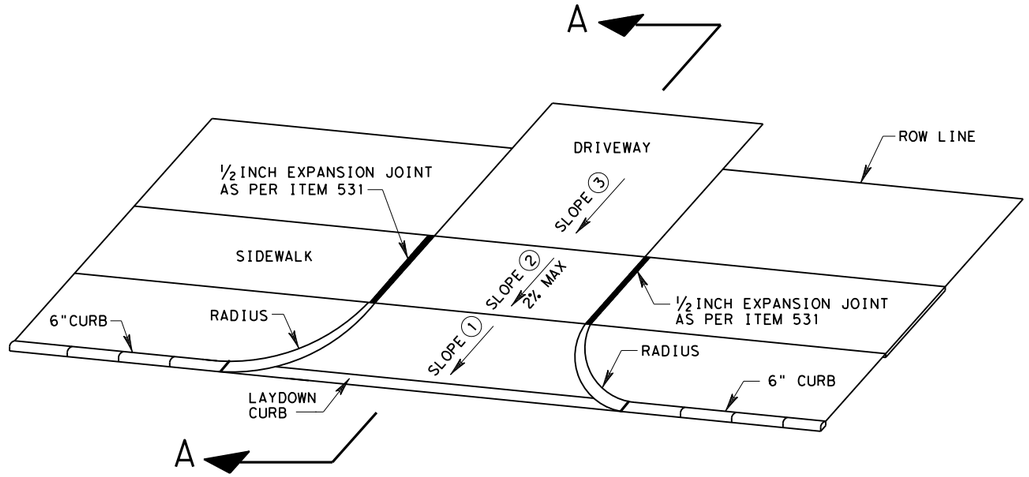
DD

FILE: STDB-8a.dgn	DN:	CK:	DW:	CK:		
© TxDOT SEPT. 2004	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS	HOU	6	C1912-1-22			80
11/15 ADDED NOTE FOR PCTB	COUNTY		CONTROL	SECT	JOB	HIGHWAY
3/17 MODIFIED PAVEMENT SLOPES	MONTGOMERY		1912	01	022	FM 2090

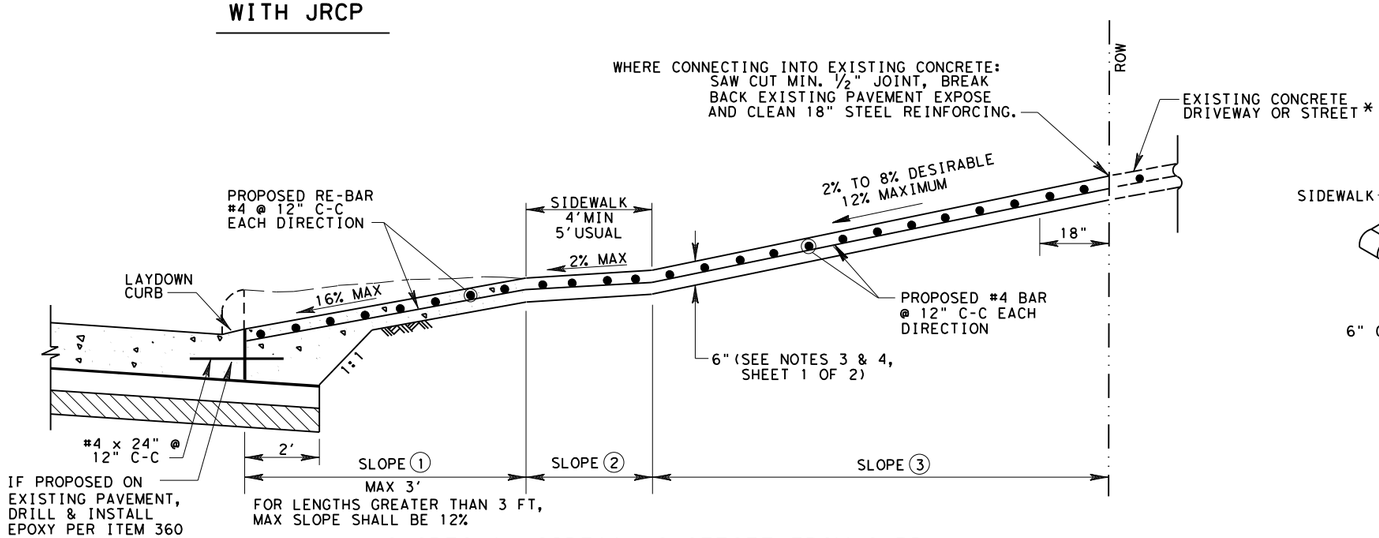
STDB8A



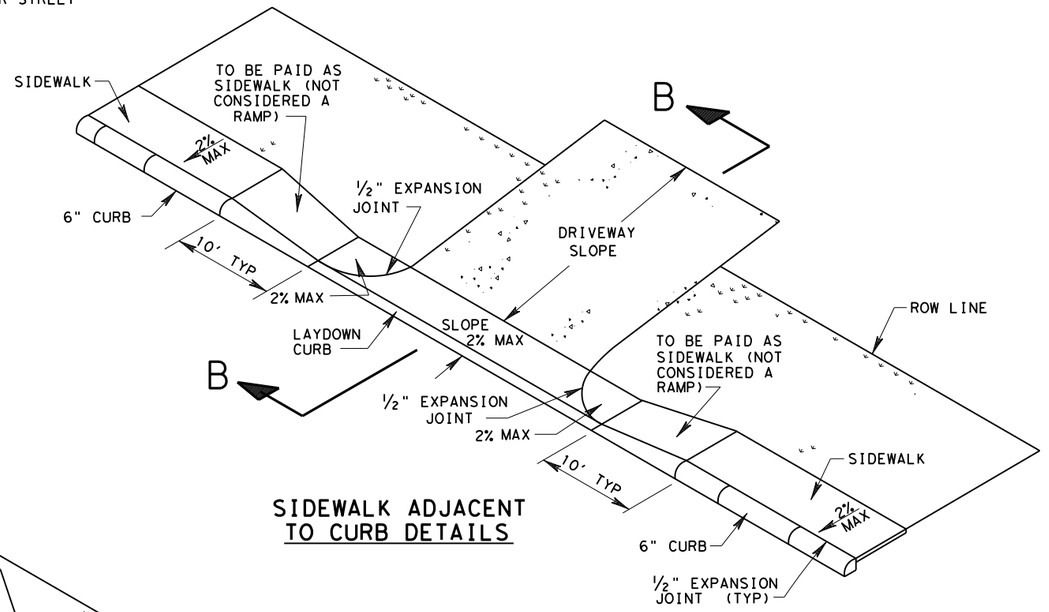
TIE BAR PLACEMENT WITH JRCP



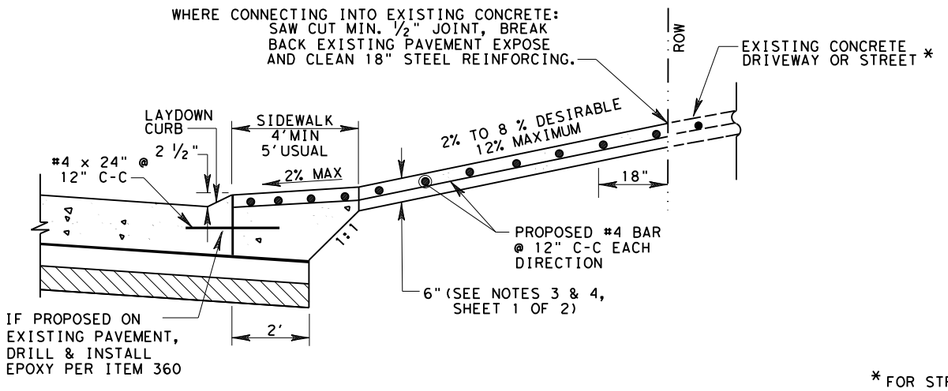
SIDEWALK OFFSET FROM CURB DETAILS



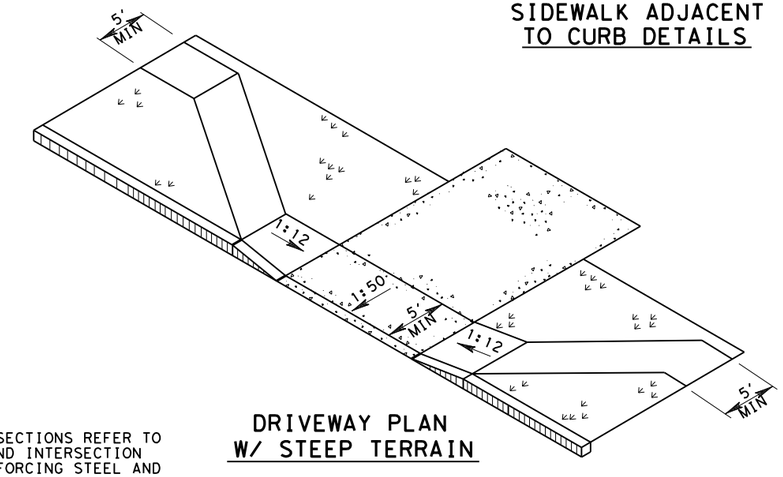
SLOPES W/ SIDEWALKS OFFSET FROM CURB (SECTION A-A)



SIDEWALK ADJACENT TO CURB DETAILS



DRIVEWAY SLOPES W/ SIDEWALKS ADJACENT TO CURB (SECTION B-B)



DRIVEWAY PLAN W/ STEEP TERRAIN

* FOR STREET INTERSECTIONS REFER TO PAVING DETAILS AND INTERSECTION DETAILS FOR REINFORCING STEEL AND SECTION REQUIREMENTS.

SHEET 2 OF 3

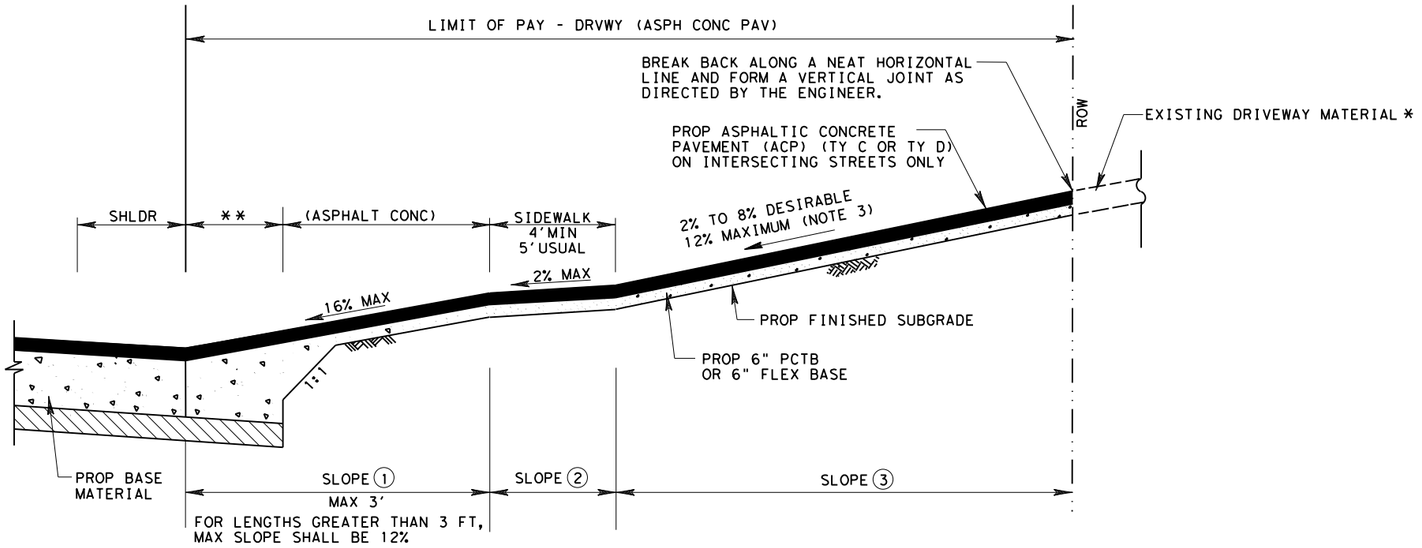
Texas Department of Transportation
Houston District

DRIVEWAY DETAILS

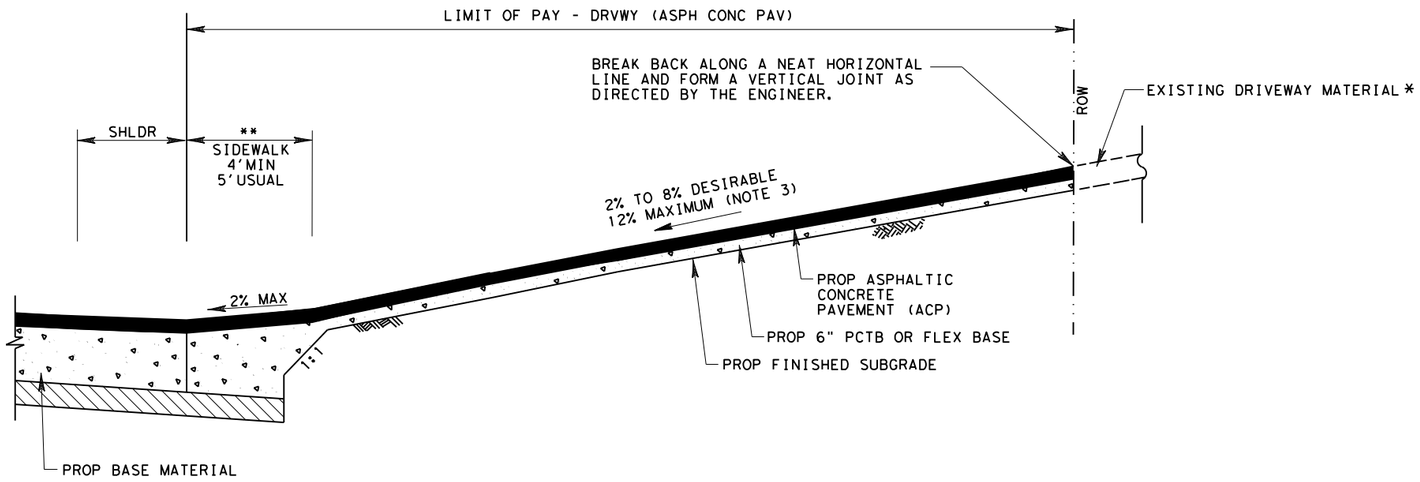
DD

FILE: STDB-8b.dgn	DN:	CK:	DW:	CK:
©TxDOT SEPT. 2004	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 9/09 ADDED NOTE FOR ITEM 360. 11/15 ADDED NOTE FOR PCTB	HOU	6	C1912-1-22	81
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	MONTGOMERY	1912	01 022	FM 2090

STDB8B



PROPOSED DRIVEWAY SLOPES
WITH SIDEWALKS OFFSET



PROPOSED DRIVEWAY SLOPES
WITH SIDEWALKS ADJACENT

NOTES:

1. ALSO SEE SHEET 2 OF 3 FOR DRIVEWAY SLOPES WITH PROPOSED SIDEWALKS.
2. FOR INTERSECTIONS BUILT WITH CRCP PAVEMENT SEE CRCP DETAIL.
3. MAXIMUM SLOPE IS: 12% RESIDENTIAL 8% OTHERS

LEGEND:

PCTB- PORTLAND CEMENT TREATED BASE

ACP- ASPHALTIC CONCRETE PAVEMENT

* FOR STREET INTERSECTIONS REFER TO PAVING DETAILS AND INTERSECTION DETAILS.

** PROPOSED LIMIT OF ROADWAY BASE AND/OR SUBGRADE

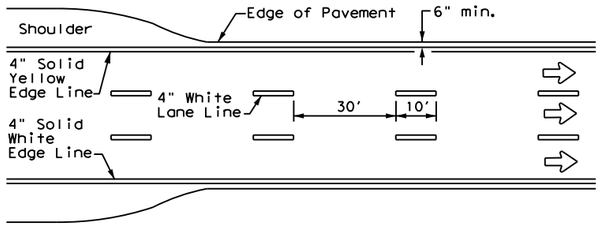
Texas Department of Transportation
Houston District

DRIVEWAY DETAILS

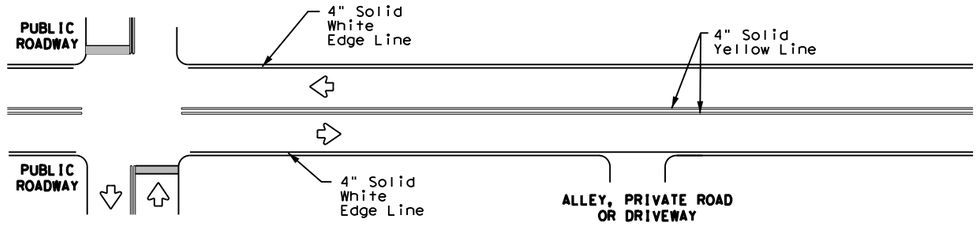
DD

FILE: STDB-8c.dgn	DN:	CK:	DW:	CK:		
© TxDOT SEPT. 2004	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS 11/15 ADDED NOTE FOR PCTB 3/17 MODIFIED PAVEMENT SLOPES	HOU	6	C1912-1-22			82
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	MONTGOMERY		1912	01	022	FM 2090

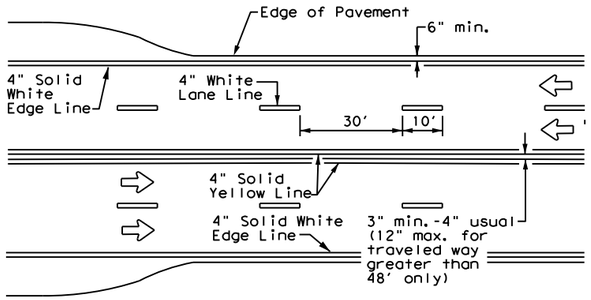
STDB8C



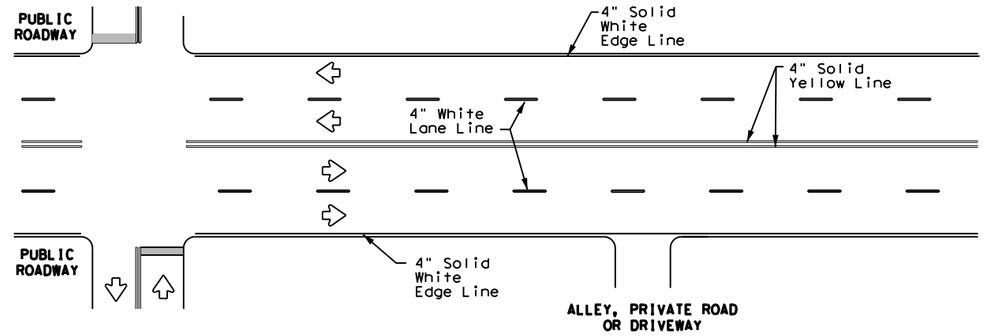
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



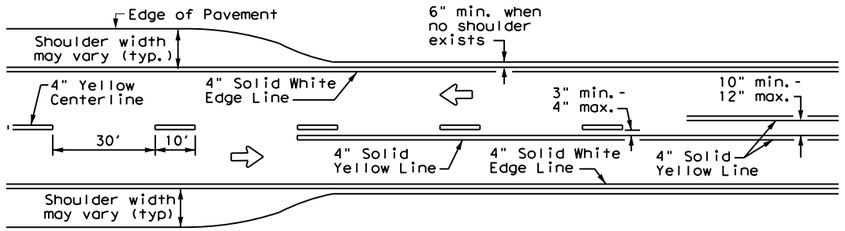
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



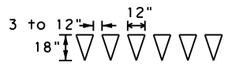
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



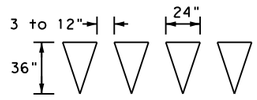
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

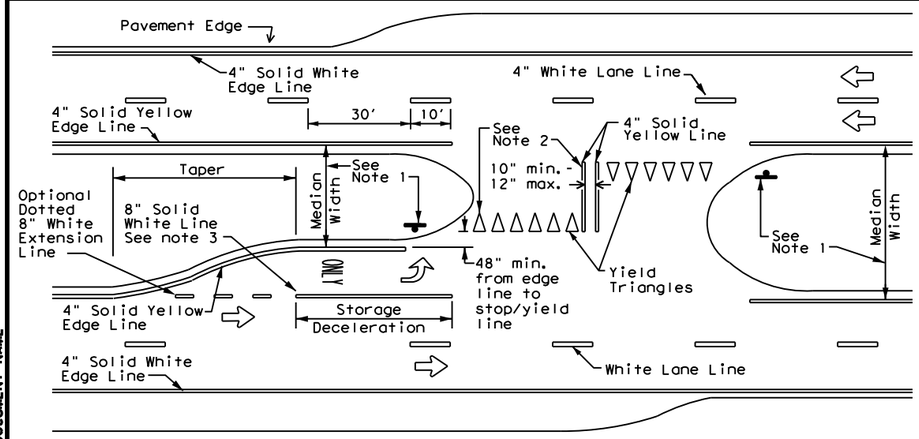


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



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 are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles 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.

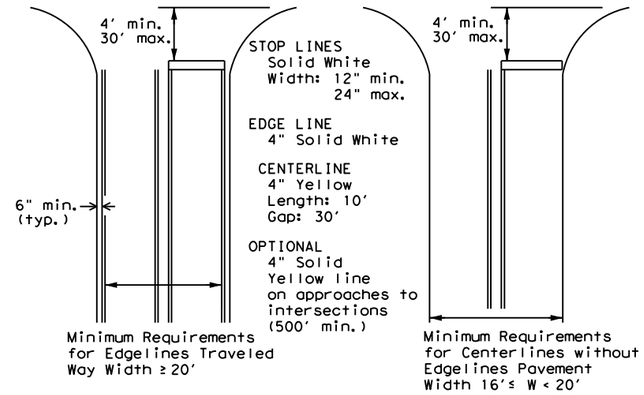
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

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 inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

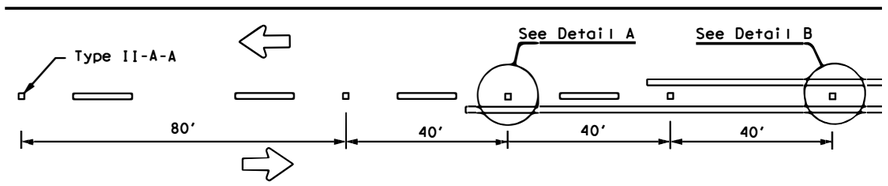
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1912	01	022	FM 2090
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	HOU	MONTGOMERY		83

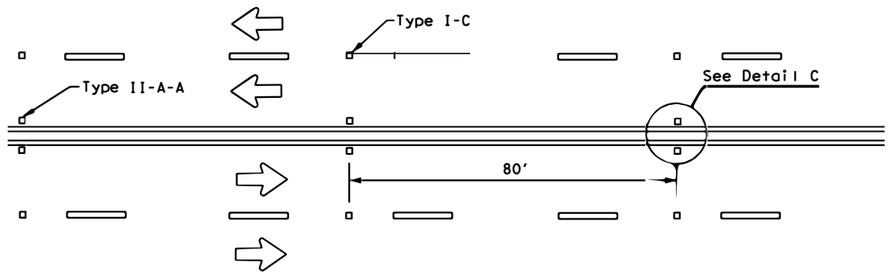
22A

DATE: 06/02/2022 09:51 AM
FILE: DOCUMENT NAME

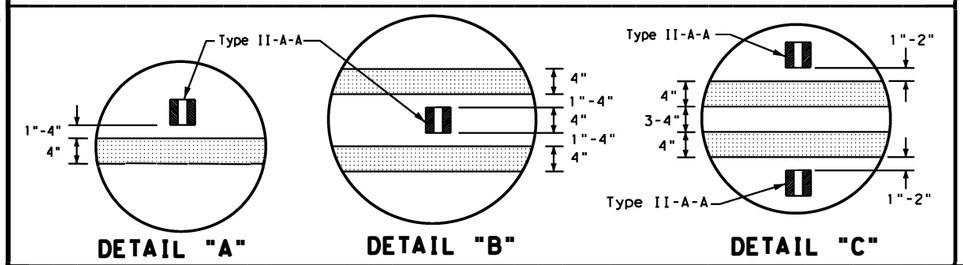
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



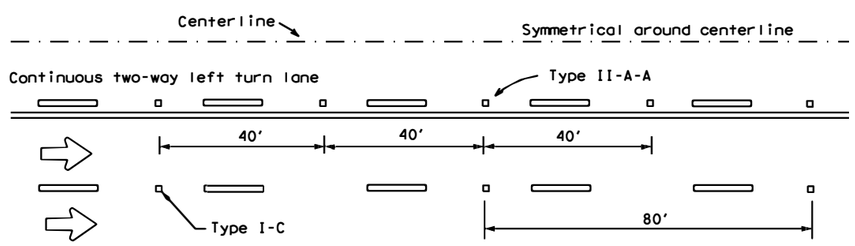
CENTERLINE FOR ALL TWO LANE ROADWAYS



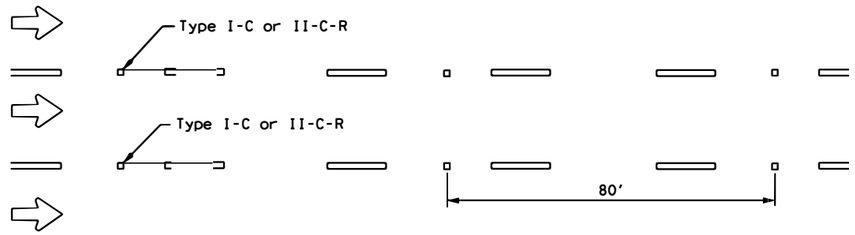
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

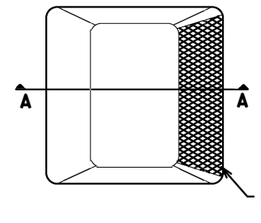


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

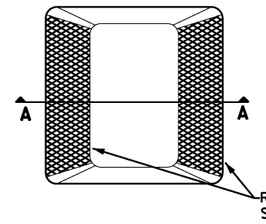
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

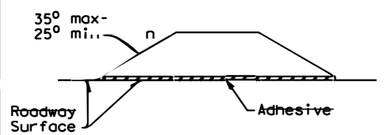
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

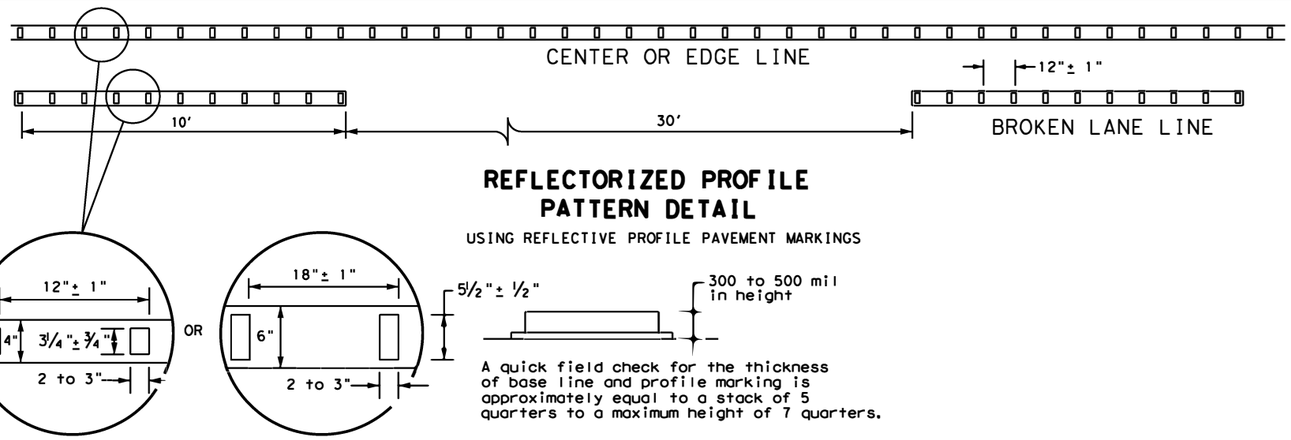


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



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.

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

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 in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

Texas Department of Transportation

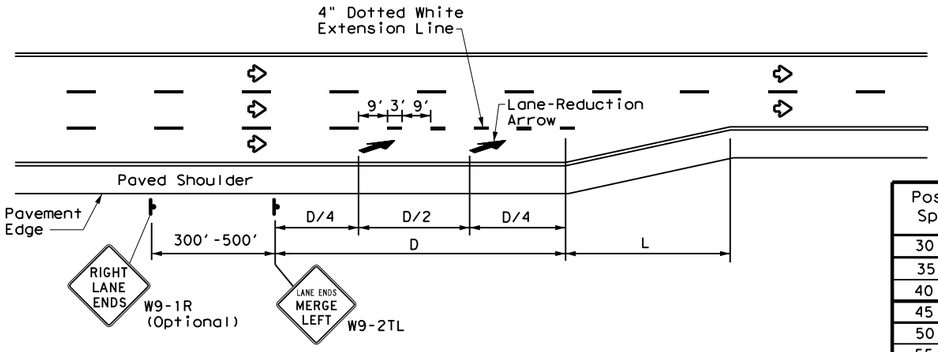
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	1912	01	022	FM 2090
	DIST	COUNTY		SHEET NO.
	HOU	MONTGOMERY		84

228

DATE: 06/02/2022 09:45 AM
FILE: DOCUMENT NAME

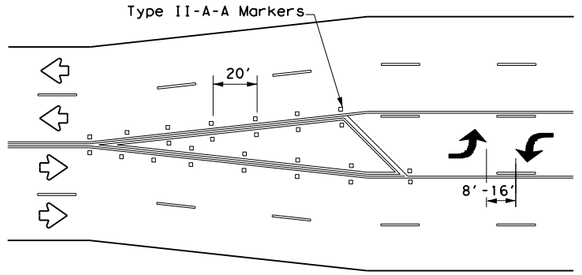


LANE REDUCTION

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	

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 W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
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.



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.

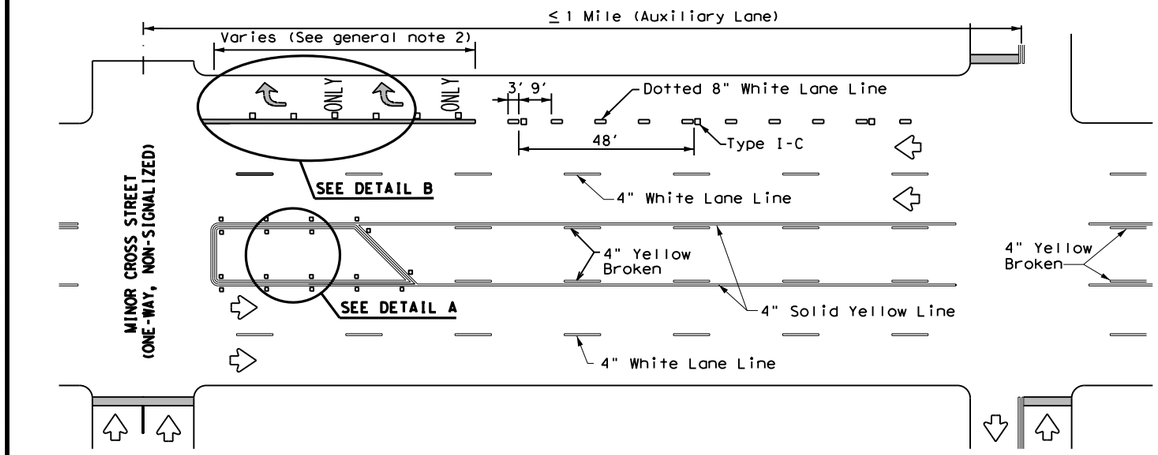
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

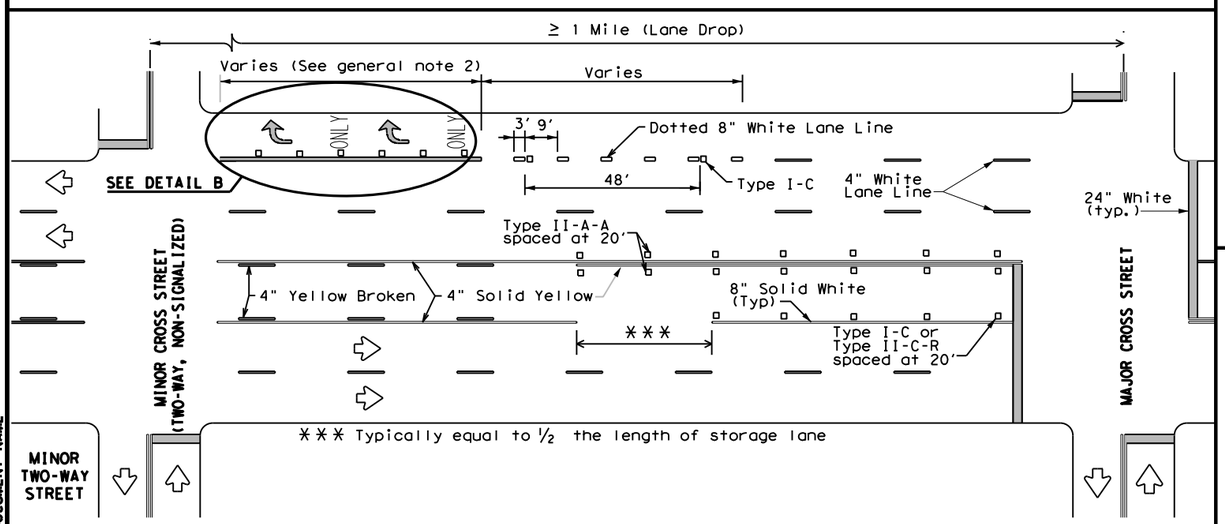
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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.

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

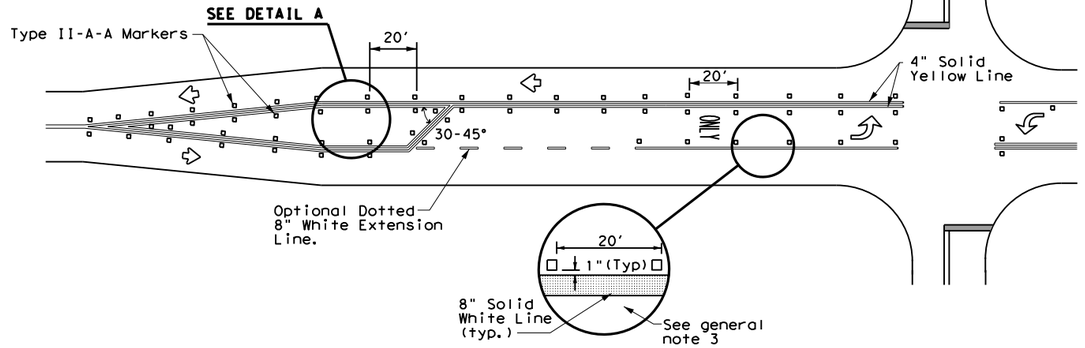
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



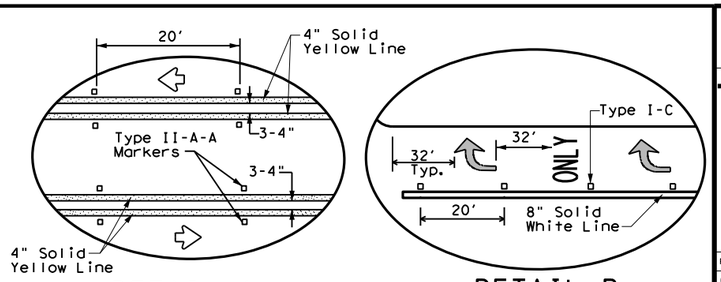
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

Traffic Safety Division Standard

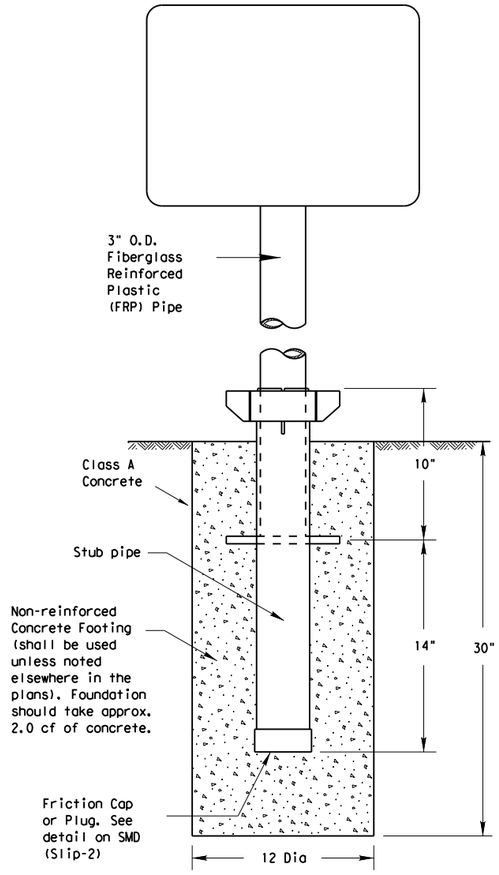
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

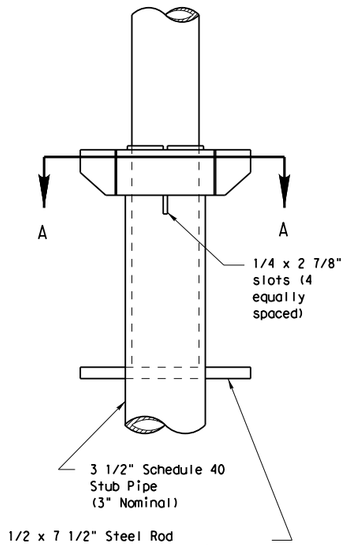
FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM2090
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	HOU	MONTGOMERY		85
3-03 6-20				

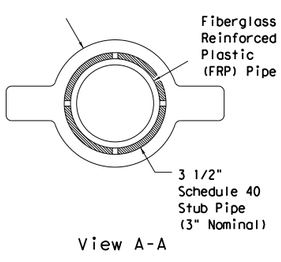
220

DATE: 06/02/2022 09:44 AM
FILE: DOCUMENT NAME

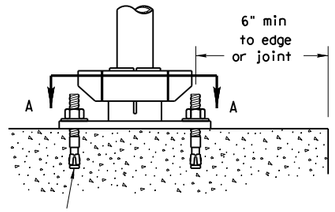
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post







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



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

BOLT-DOWN DETAILS

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

GENERAL NOTES:

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

FRP POST REQUIREMENTS

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

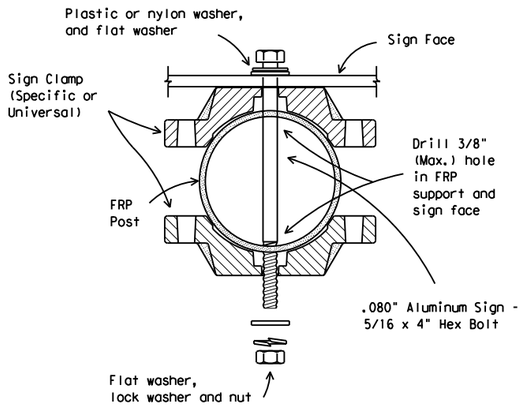
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

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

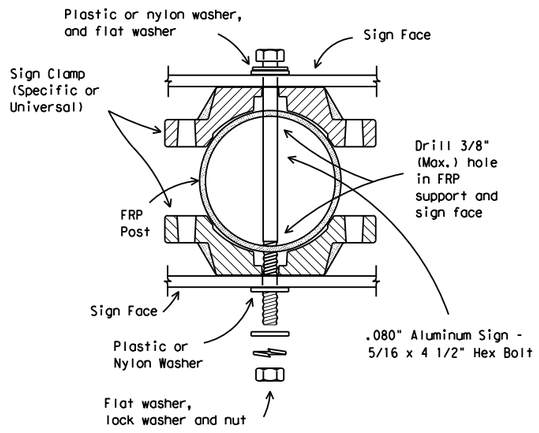
BOLT DOWN SIGN SUPPORT

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

Typical Sign Mounting Detail for FRP Support with Single Sign



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



DATE: $DATE$ $TIME$
FILE: $FILE$

Texas Department of Transportation
Traffic Operations Division

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

SMD(FRP)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090

DIST	COUNTY	SHEET NO.
HOU	MONTGOMERY	86

REVISIONS
9-08

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

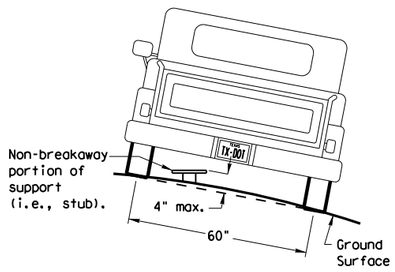
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

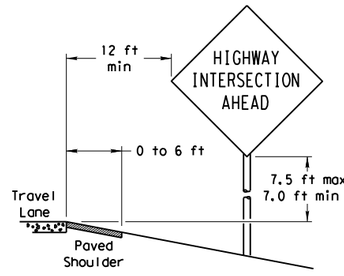
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

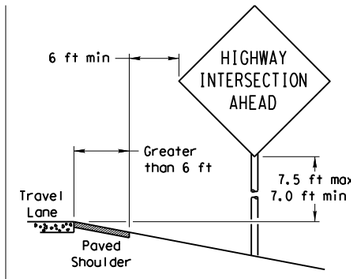
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

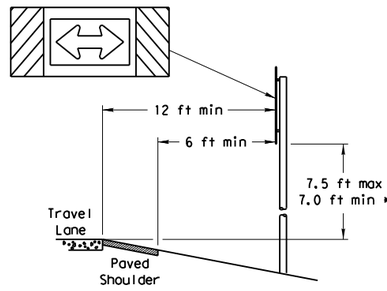
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



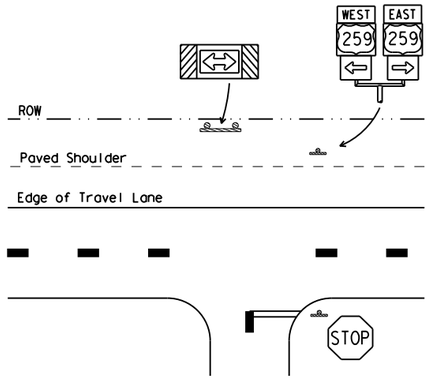
GREATER THAN 6 FT. WIDE

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

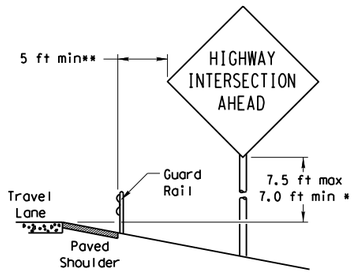
T-INTERSECTION



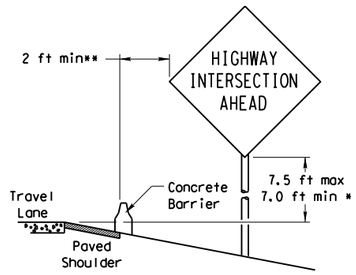
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



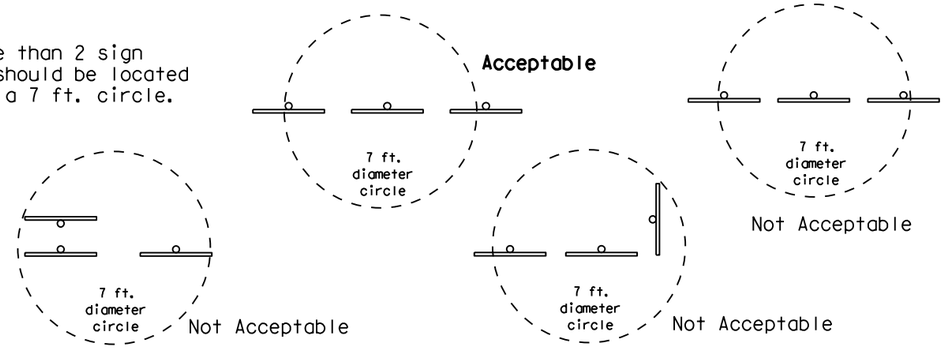
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

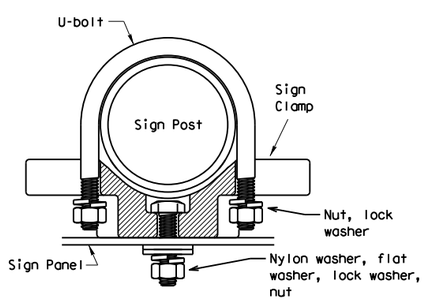
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

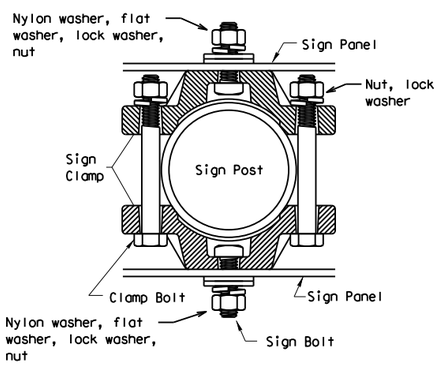


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

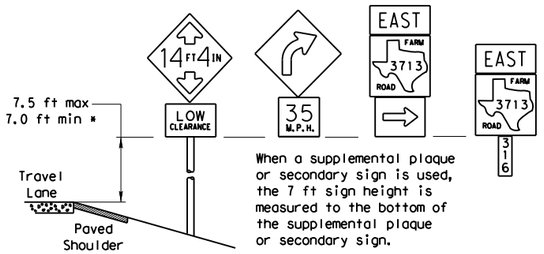
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



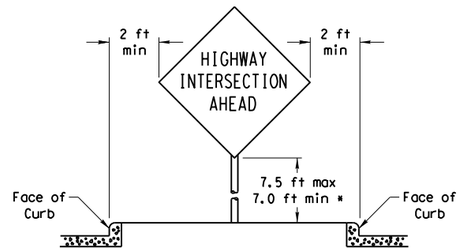
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



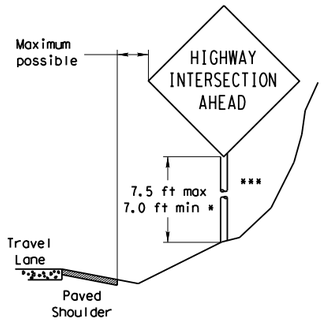
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

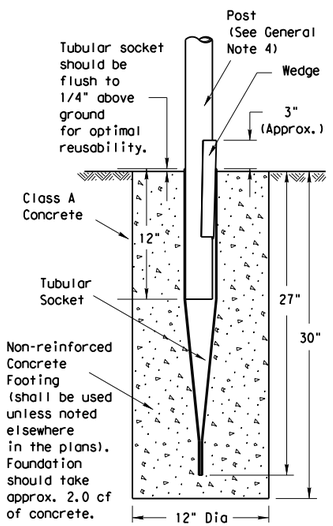
9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090

DIST	COUNTY	SHEET NO.
HOU	MONTGOMERY	87

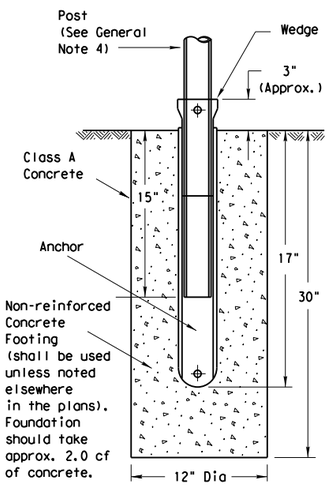
DATE: $DATE$ $TIME$
FILE: $FILE$

Wedge Anchor Steel System



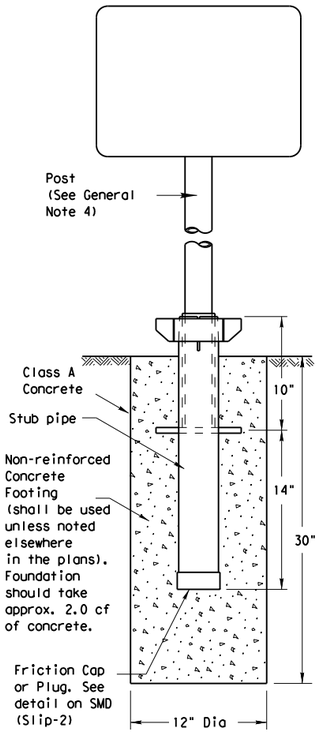
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

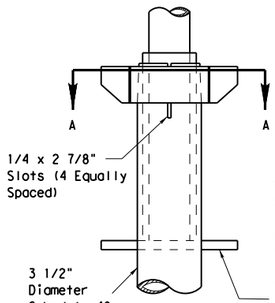


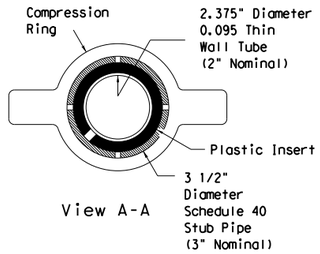
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



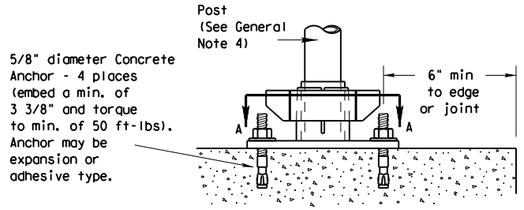
SM RD SGN ASSM TY TWT(X)UA(P)



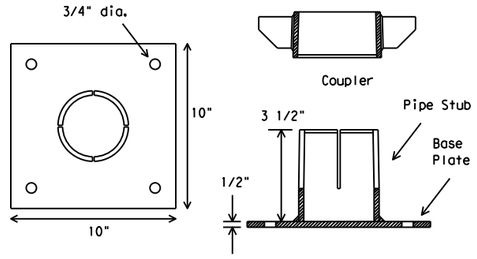


View A-A

Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

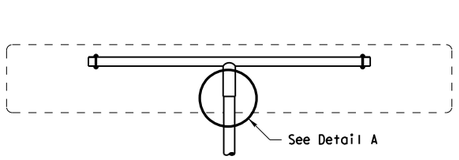


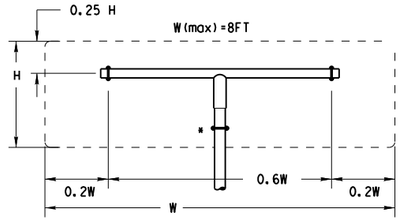
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized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



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

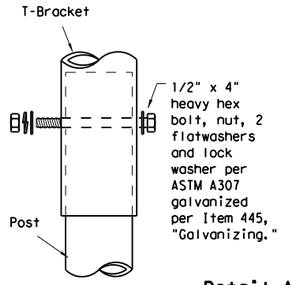
Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post





SM RD SGN ASSM TY TWT(X)XX(T)

(* - See General Note 6)



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

The devices shall be installed per manufacturer's recommendations.
Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximaely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

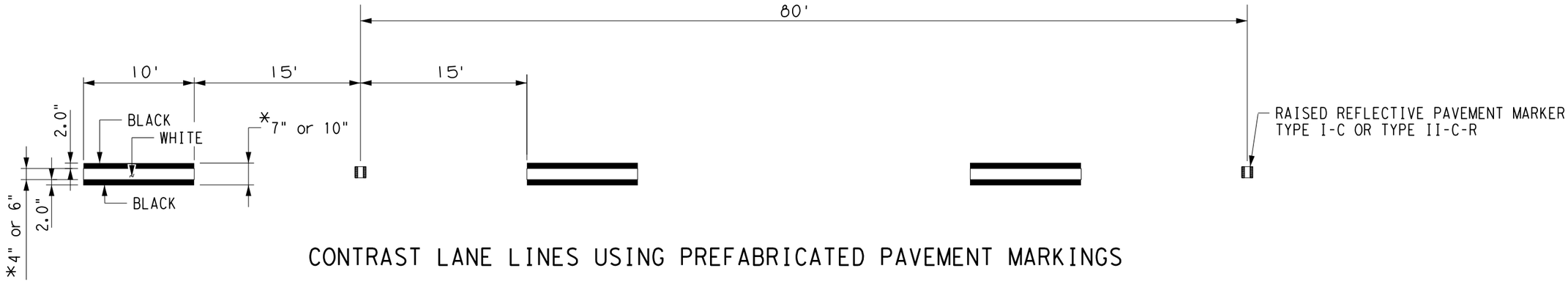
CONT	SECT	JOB	HIGHWAY
1912	01	022	FM 2090

DIST	COUNTY	SHEET NO.
HOU	MONTGOMERY	88

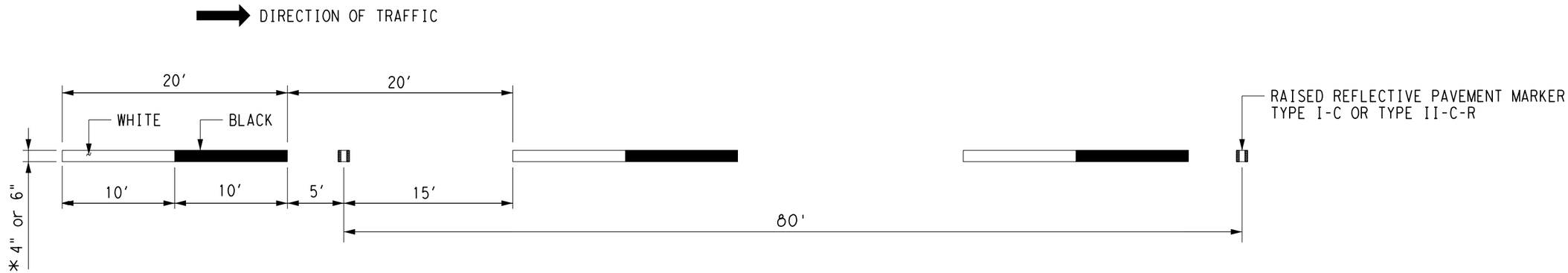
9-08 REVISIONS

DATE: $DATE$ $TIME$
FILE: $FILE$

26E



CONTRAST LANE LINES USING PREFABRICATED PAVEMENT MARKINGS



CONTRAST LANE LINES USING LIQUID APPLICATIONS
(MULTIPOLYMER, THERMOPLASTIC, ETC.)

* AS SHOWN ON THE PLANS.

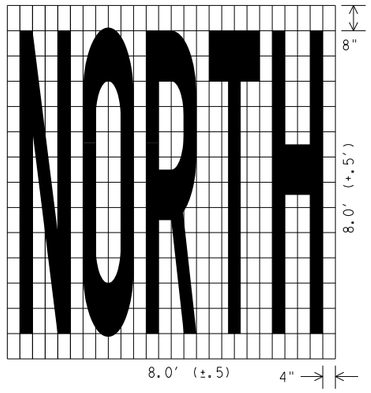
Texas Department of Transportation
Houston District

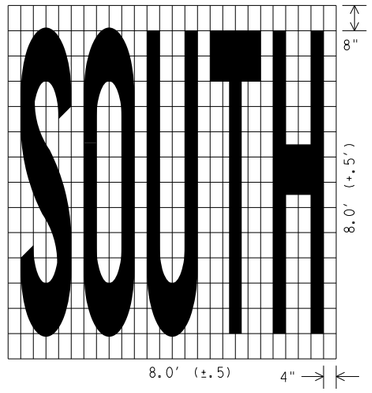
PAVEMENT MARKINGS
(CONTRAST LANE LINES)

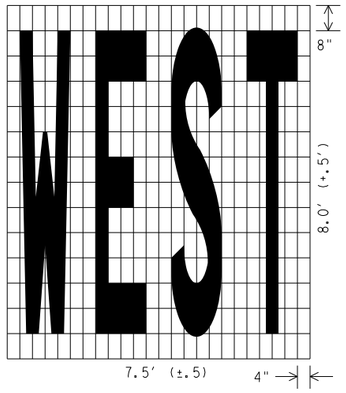
PM(CLL)-14

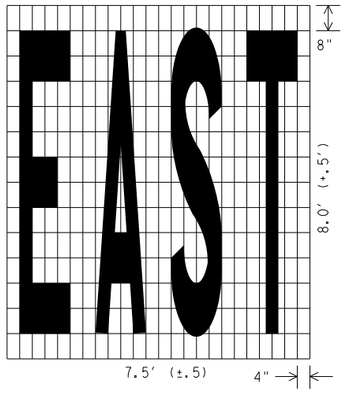
FILE:	DN:	CK:	DW:	CK:
© TxDOT 2003	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 01-10-06 02-12-08 10-2019 9" to 10"	HOU	6	C1912-1-22	89
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	MONTGOMERY	1912	01 022	FM 2090

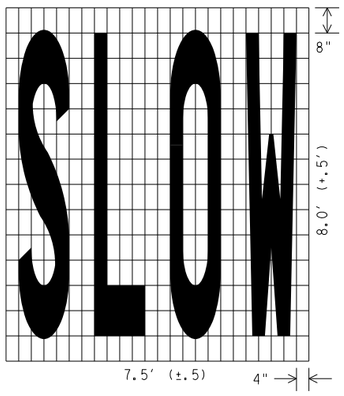
STD N-30

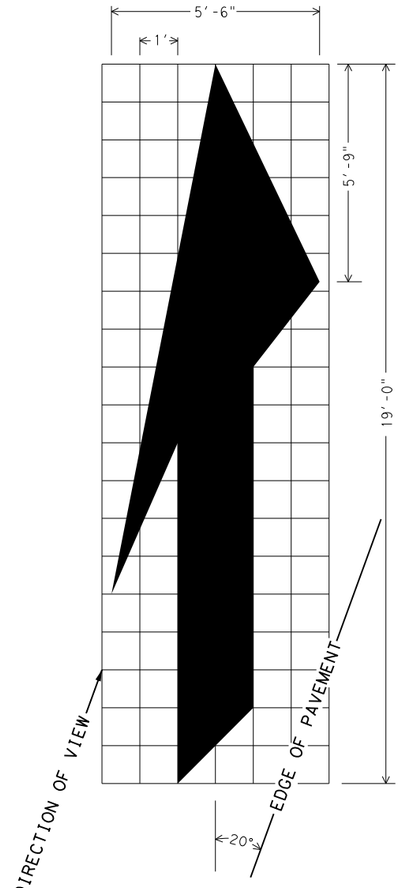






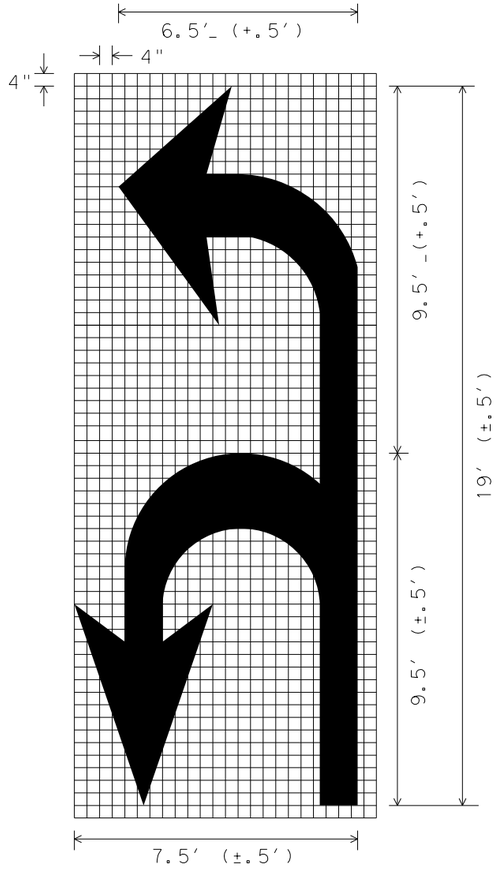




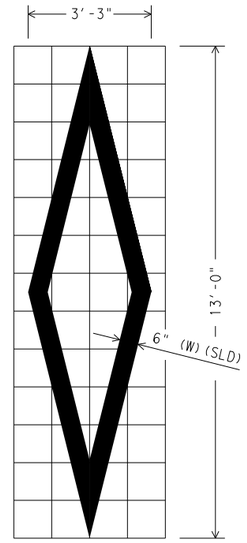


ISOMETRIC ARROW

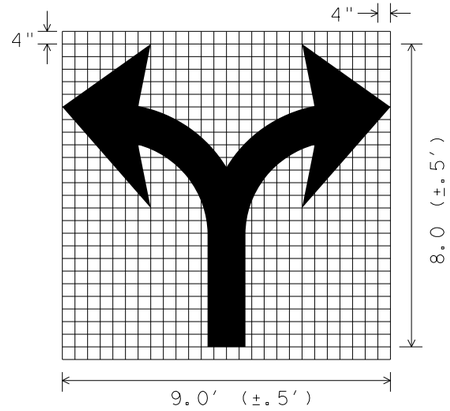
12 INCH GRID
AREA = 42 SQ. FT.
RIGHT LANE DROP ARROW
(FOR LEFT LANE, USE MIRROR IMAGE)



U-L ARROW



DIAMOND SYMBOL



SCALE 1/4" = 1′

Texas Department of Transportation
Houston District

PAVEMENT MARKINGS (WORDS, ARROWS & SYMBOLS)

PM(WAS)-07

FILE:	DN:	CK:	DW:	CK:	
© TxDOT 2007	DIST	FED REG	PROJECT NO.		SHEET
REVISIONS 03-19-07	HOU	6	C1912-1-22		90
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	MONTGOMERY		1912	01	022	FM 2090

STD-N31

I. STORMWATER POLLUTION PREVENTION

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit is 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. Refer to Storm Water Pollution Prevention Plan (SWP3) Houston District standard plan.

No Additional Comments

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS

United States Army Corps of Engineers (USACE) Permit is required for filling, dredging, excavating or other work in water bodies, rivers, creeks, streams, wetlands or wet areas. The Contractor must adhere to all of the terms and general conditions associated with the following permit(s). If additional work not represented in the plans is required, contact the Engineer immediately.

☒ No United States Army Corps (USACE) Permit Required

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Nationwide Permit (NWP) without a Pre-Construction Notification (PCN). Project specific permit was not issued by USACE, therefore is not in the plan set. The USACE general conditions are in the “General Notes."

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Nationwide Permit (NWP) with a Pre-Construction Notification (PCN). The project specific permit issued by the United States Army Corps of Engineers (USACE) is included in the plan set. The USACE general conditions are in the “General Notes."

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Individual Permit (IP). The project specific permit issued by the United States Army Corps of Engineers (USACE) is included in the plan set.

☐ Work would be authorized by the United States Army Corps of Engineers (USACE) permit. The project specific permit issued by the USACE will be provided to the contractor.

United States Coast Guard (USCG) Permit is required for projects that involve the construction or modification (including changes to lighting) of a bridge or causeway across a water body determined to be navigable by the United States Coast Guard (USCG) under Section 9 of the Rivers and Harbors Act. If additional work not represented in the plans is required, contact the Engineer immediately.

☒ No United States Coast Guard (USCG) Coordination Required

☐ United States Coast Guard (USCG) Permit

☐ United States Coast Guard (USCG) Exemption

Additional Comments

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the area and contact the Engineer immediately.

No Additional Comments

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Refer to TxDOT Standard Specifications in order to comply with requirements for invasive species, beneficial landscaping and tree/brush removal.

No Additional Comments

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

If any of the listed species below are observed, cease work in the area, do not disturb species or habitat and contact the Engineer immediately.

The work may not remove active nests (from bridges, structures, or vegetation adjacent to the roadway, etc.) during nesting season (February 15 to October 1). If removal of structures or vegetation is necessary during the nesting season, the Contractor shall conduct a bird survey no more than 3 days in advance of the clearing/demolish start date. All bird surveys shall be conducted by a Field Biologist and adhere to the guidance document “Avoiding Migratory Birds and Handling Potential Violations” found in the TxDOT Environmental Compliance Toolkits at the time of the survey. (See below for Field Biologist and Ornithologist qualifications)

No Additional Comments

Field Biologist, Ornithologist – a field biologist is defined as an individual qualified to perform field investigations, presence/absence surveys and habitat surveys for protected avian species or species of concern. A mandatory bachelor’s degree in biology or a related science is required. At a minimum, the Field Biologist, Ornithologist, shall have completed and reported a minimum of three presence/absence and habitat surveys for protected avian species in the past five years. A minimum of three projects must have been conducted in Texas. Surveys shall have been performed for documentation of species in accordance with a protocol approved by USFWS or TPWD, or following generally accepted methodologies.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

Refer to TxDOT Standard Specifications in the event potentially contaminated materials are observed, such as dead or distressed vegetation, trash disposal areas, drums, canisters, barrels, leaching or seepage of substances, unusual smells or odors, or stained soil, cease work in the area and contact the Engineer immediately.

No Additional Comments

VII. OTHER ENVIRONMENTAL ISSUES

Comments:

DATE: Jun 01, 2022
FILE:

Version 2.1

Texas Department of Transportation

TxDOT Houston District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: EPIC Sheet.dgn	DN:	CK:	DW:	CK:
© TxDOT: March 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
UPDATED section V. text and added definition (10/17) ADDED USCG and USACE notes in Section VII (04/18)	DIST	COUNTY		SHEET NO.
	HOU	Montgomery		91

SITE DESCRIPTION

PROJECT LIMITS: From FM 3083 to IH 69

PROJECT DESCRIPTION: Consisting of Mill, Overlay, Base Repair, Pavement Markings and Signs.

MAJOR SOIL DISTURBING ACTIVITIES: Backfill (TY A), Base Repairs and Milling

TOTAL PROJECT AREA: 63.08 AC

TOTAL AREA TO BE DISTURBED: 0.00 AC

WEIGHTED RUNOFF COEFFICIENT: (AFTER CONSTRUCTION): 0.9

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: Grassy
Project is limited to existing paved surface. Vegetation cover is 0% of the project.

NAME OF RECEIVING WATERS: Caney Creek
Peach Creek

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

____ TEMPORARY SEEDING
____ PERMANENT PLANTING, SODDING, OR SEEDING
____ MULCHING
____ SOIL RETENTION BLANKET
____ BUFFER ZONES
_X_ PRESERVATION OF NATURAL RESOURCES

OTHER:

STRUCTURAL PRACTICES:

_X_ SILT FENCES
____ HAY BALES
____ ROCK BERMS
____ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
____ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
____ DIVERSION DIKE AND SWALE COMBINATIONS
____ PIPE SLOPE DRAINS
____ PAVED FLUMES
____ ROCK BEDDING AT CONSTRUCTION EXIT
____ TIMBER MATTING AT CONSTRUCTION EXIT
____ CHANNEL LINERS
____ SEDIMENT TRAPS
____ SEDIMENT BASINS
____ STORM INLET SEDIMENT TRAP
____ STONE OUTLET STRUCTURES
____ CURBS AND GUTTERS
____ STORM SEWERS
____ VELOCITY CONTROL DEVICES
_X_ EROSION CONTROL LOGS

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

N/A

STORM WATER MANAGEMENT: Any devices required to minimize sediment runoff in the event of a storm will be placed in position before construction begins. The storm water drainage will be provided by the existing systems already in place. Water within the right of way will be carried by ditches to lows in the road profile where it will outfall into the receiving waters. Post construction storm water management there will be no devices installed during the construction process to control storm water discharges that will remain after construction operations have been completed.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: All erosion and sediment controls will be maintained in good working order. If a repair is necessary it will be done at the earliest date possible, but no later than 7 calender days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The area adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer inlets.

INSPECTION: All inspections will be performed by a TxDOT inspector per one of the options below as directed by the Area Engineer
1. At least every 7 calendar days
2. At least every 14 days or after 0.5 inches or more of rainfall
An inspection and maintenance report should be made for each inspection. Based on the inspection results, the controls shall be revised according to the inspection report.

WASTE MATERIALS: The dumpster used to store all waste material will meet all state and local city solid waste management regulations. All trash and construction debris will be deposited in the dumpster. The dumpster will be emptied as necessary or as required by local regulation and the trash will be hauled to a local dump. No construction waste material will be buried on site.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): In the event of a spill which may be considered hazardous, the Houston District Safety Office shall be contacted immediately at 713-802-5962.

SANITARY WASTE: All sanitary waste will be collected from the portable units as necessary or as required by local regulation by a licensed sanitary waste management contractor.

OFFSITE VEHICLE TRACKING:

_X_ HAUL ROADS DAMPENED FOR DUST CONTROL
_X_ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
_X_ EXCESS DIRT ON ROAD REMOVED DAILY
_X_ STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS: Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the sediment that may enter receiving waterways. Disposal areas shall not be located in any waterway, waterbody or streambed. Construction staging areas and vehicle maintenance areas shall be constructed by the contractor in a manner which minimizes the runoff of all pollutants. All waterways shall be cleared as soon as practical of temporary embankments, temporary bridges, matting, falsework, piling, debris, and other obstructions placed during construction operations that are not part of the finished work.

STATE OF TEXAS
MICAH J. SCHLUTER
136908
LICENSED
PROFESSIONAL ENGINEER
08/05/2022

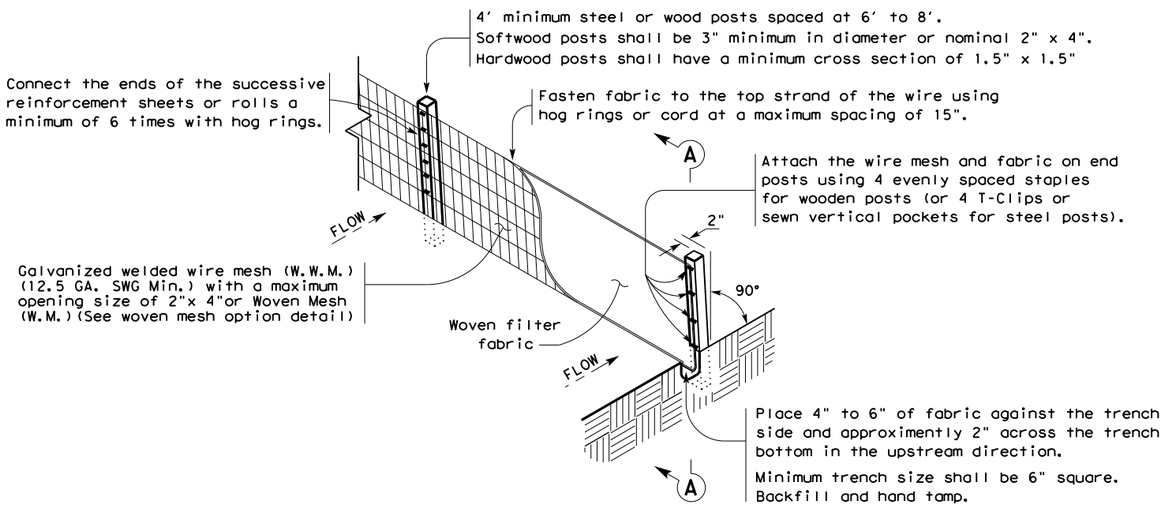
Texas Department of Transportation
Houston District

TxDOT STORM WATER POLLUTION PREVENTION PLAN

SWP3

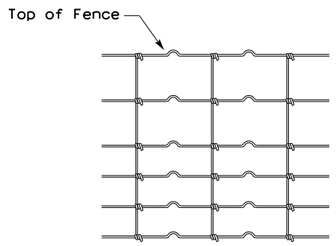
FILE: STDG1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
©TxDOT JANUARY 2007	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REV. 9/2010 INSPECTION NOTE REV. 9/2013 INSPECTION NOTE REV. 11/2013 SW3P TO SWP3	HOUSTON	6	C 1912-1-22	91A
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	MONTGOMERY		1912	01	022	FM 2090

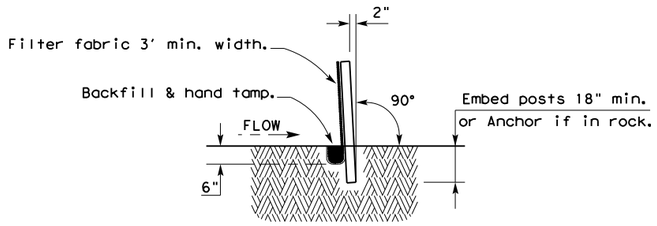
STD G-1



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.

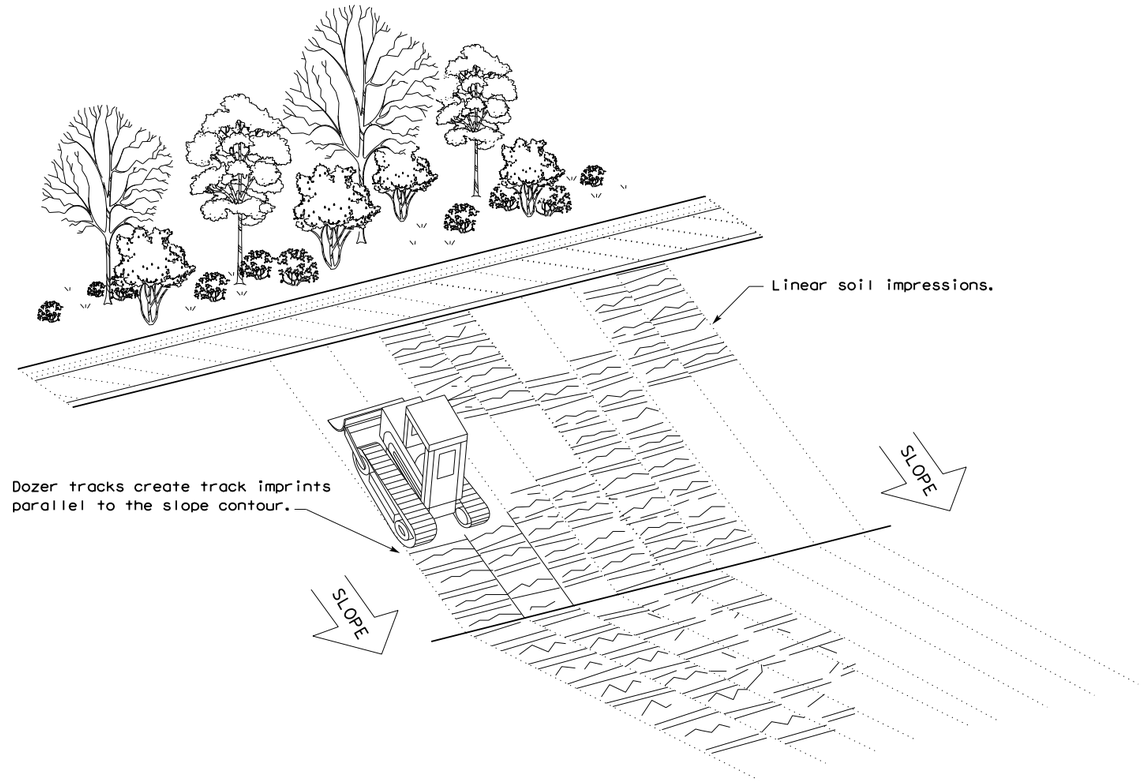
LEGEND

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

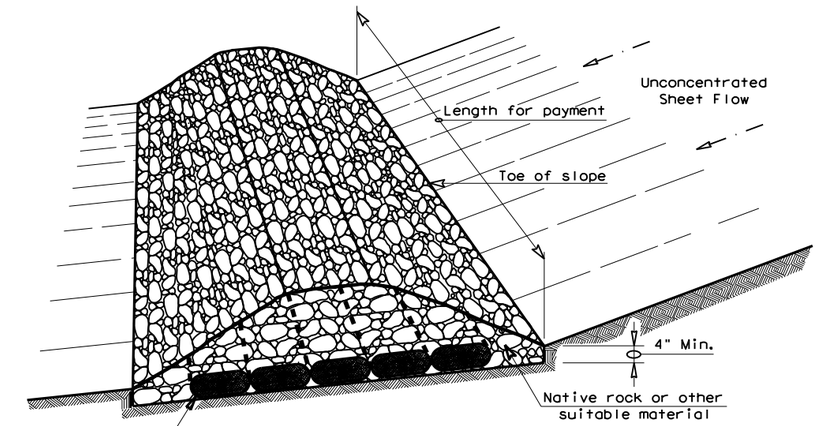
FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1912	01	022		FM 2090	
	DIST	COUNTY			SHEET NO.	
	HOU	MONTGOMERY			92	

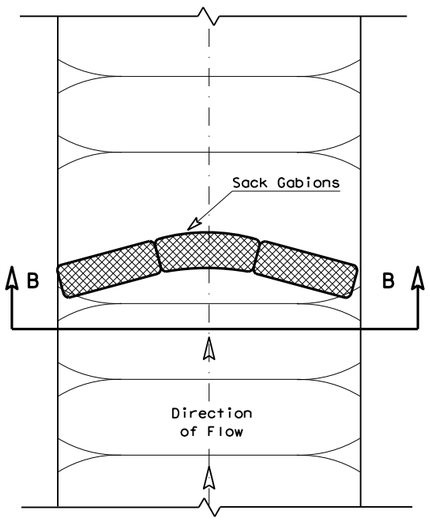
$DATE$
$FILE$

DATE: $DATE$
FILE: $FILE$

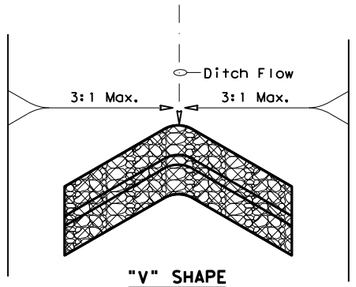


FILTER DAM AT TOE OF SLOPE

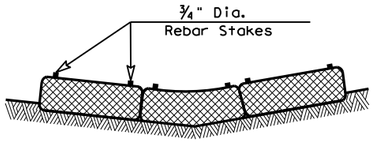
RFD1



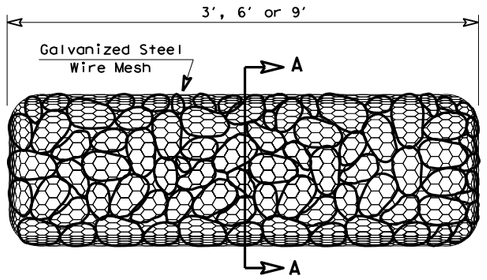
PLAN VIEW



"V" SHAPE PLAN VIEW

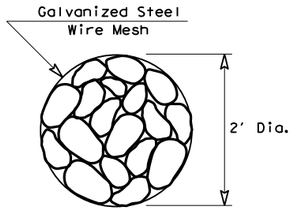


SECTION B-B

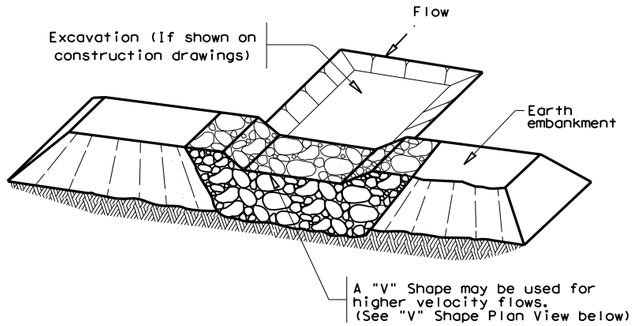


TYPE 4 (SACK GABIONS)

RFD4

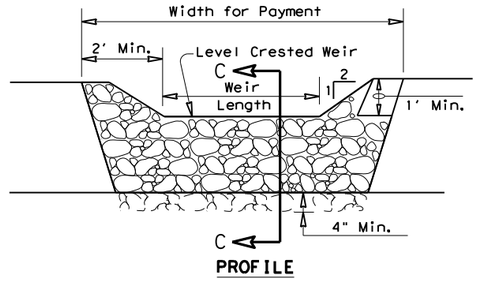


SECTION A-A

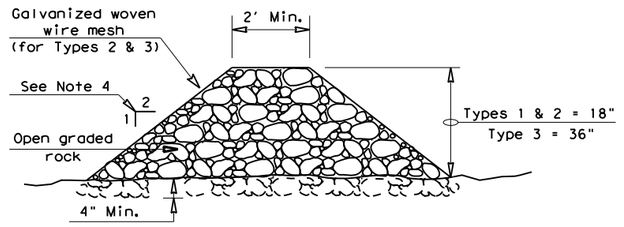


FILTER DAM AT SEDIMENT TRAP

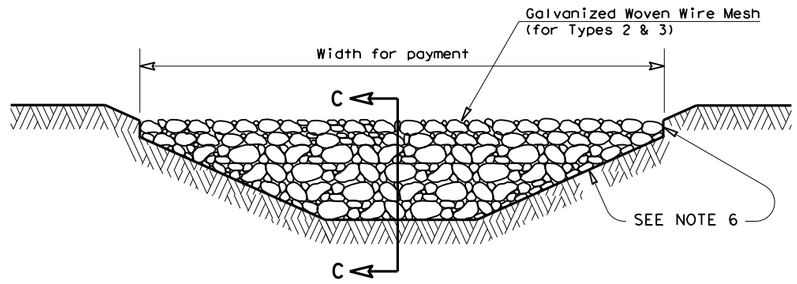
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

Design Division Standard

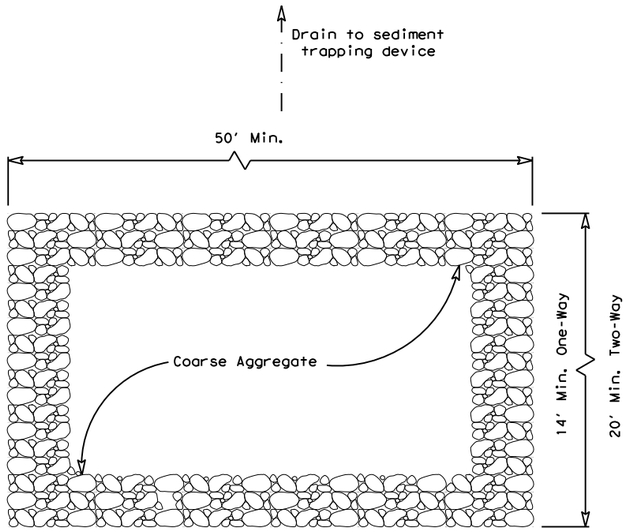
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

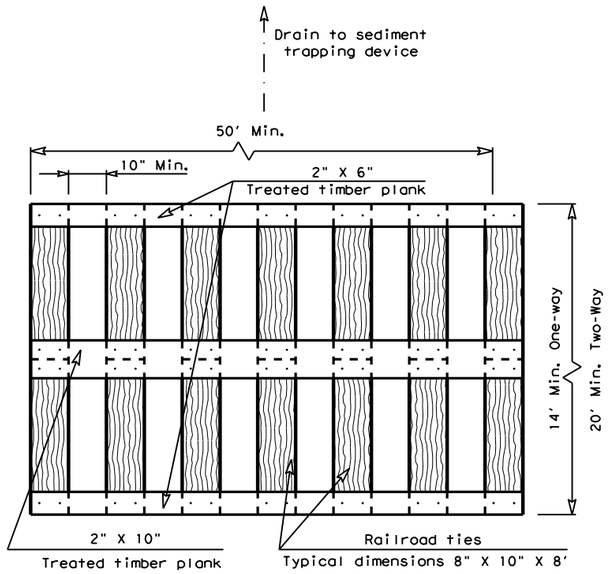
EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS		
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1912	01	022		FM 2090	
	DIST	COUNTY			SHEET NO.	
	HOU	MONTGOMERY			93	

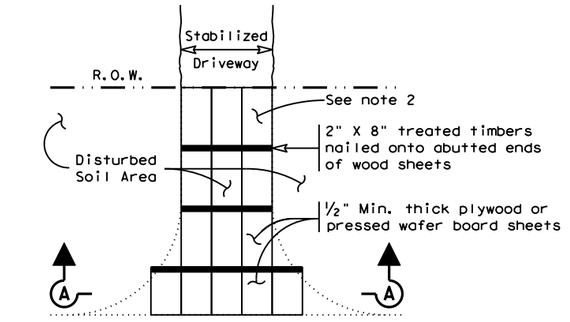
DATE:
FILE:



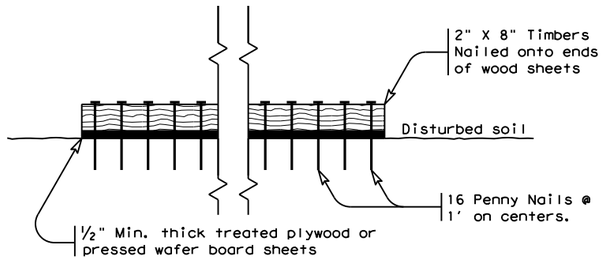
PLAN VIEW



PLAN VIEW



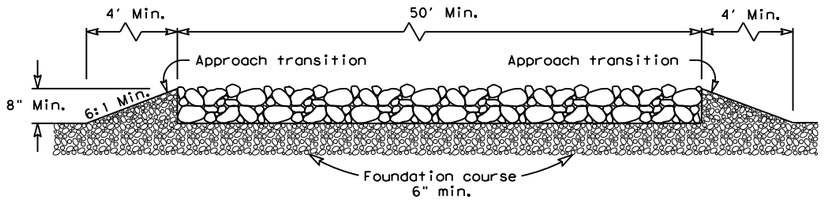
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

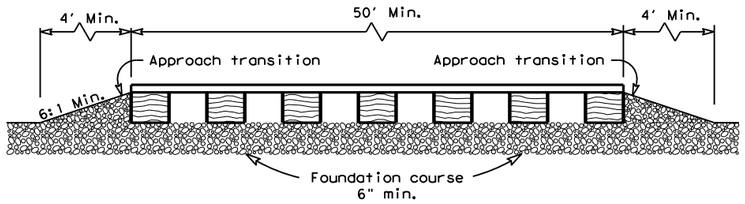
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

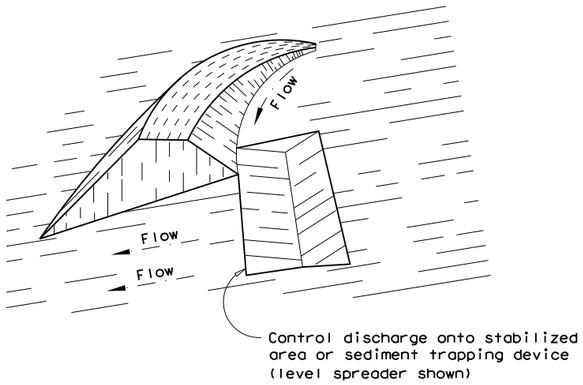
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

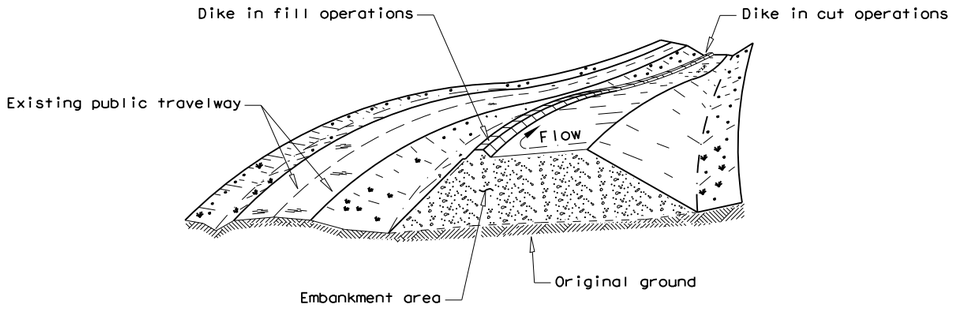
EC(3)-16

FILE: ec316	DN: TxDOT		CK: KM	DW: VP	DN/CK: LS
	CONT	SECT	JOB		HIGHWAY
REVISIONS	1912	01	022		FM2090
	DIST	COUNTY			SHEET NO.
	HOU	MONTGOMERY			94



PERIMETER DIKE

→(D)→

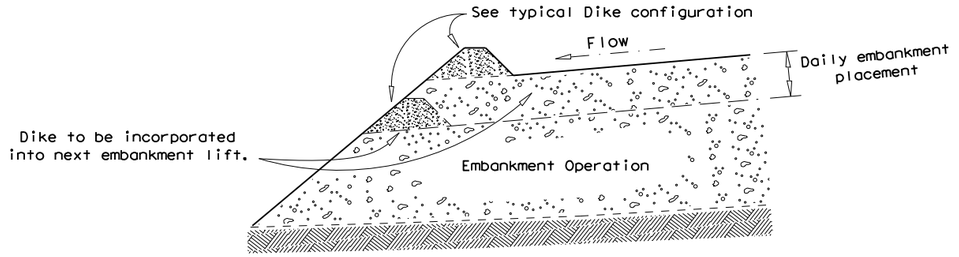


DIVERSION DIKE

→(D)→

GENERAL NOTE

1. Soil used in dike construction shall be machine compacted.
2. Top width and height of dike may be modified with prior approval of the Engineer.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter.
4. Grading shall be shown elsewhere in the plans or as directed by the Engineer.
5. The Engineer reserves the right to modify the dimensions shown for the dike dependent on runoff volume characteristics.
6. Dikes that are in place for more than 14 calendar days should be stabilized to prevent sediment runoff.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Remove sediment and debris when accumulation affects the performance of the devices, after a rain and when directed by the engineer.



EMBANKMENT SECTION - DIVERSION DIKE

→(D)→

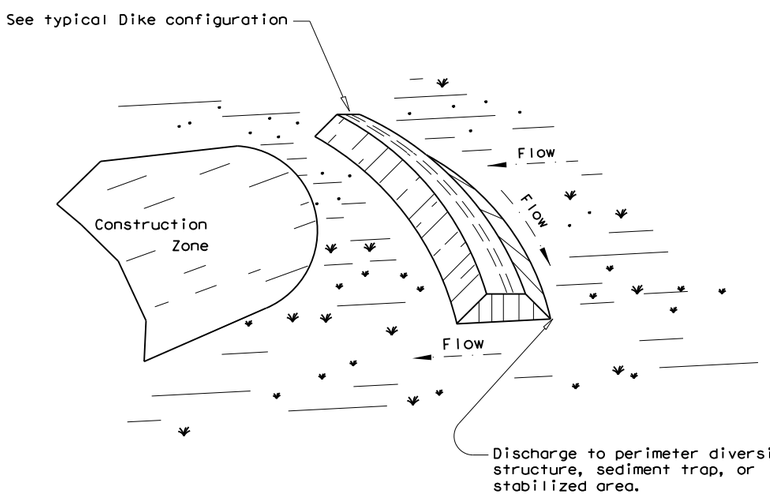
DIKE USAGE GUIDELINES

A Dike may be used to intercept runoff and divert it around unstabilized areas or to divert sediment laden runoff to an erosion control device (sediment basin or trap, rock filter dam, etc.).

The drainage area contributing runoff to a dike should not exceed 5 acres. The spacing of dikes should be as follows:

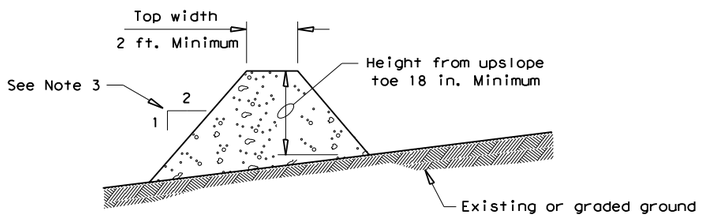
Slope of disturbed areas above dike	greater than 10%	5 - 10%	less than 5%
Maximum distance between dikes	100′	200′	300′

Intercepted runoff flowing along a dike should outlet to a stabilized area (vegetation, rock, etc.).



INTERCEPTOR DIKE

→(D)→



TYPICAL DIKE CONFIGURATION

→(D)→

PLANS SHEET LEGEND

DIKE →(D)→

Texas Department of Transportation

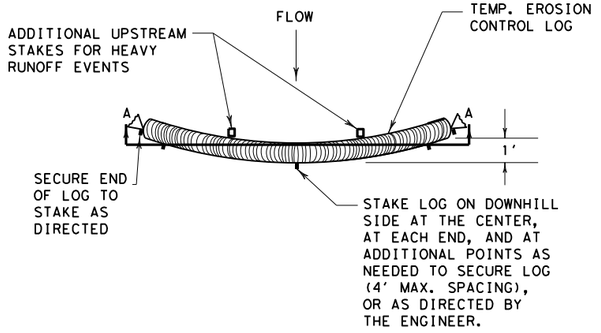
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES DIKES (EARTHWORK FOR EROSION CONTROL)

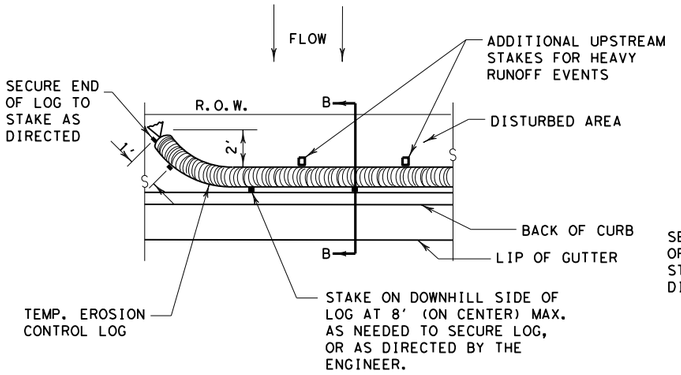
EC(4)-16

FILE: ec416	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1912	01	022	FM 2090
	DIST	COUNTY		SHEET NO.
	HOU	MONTGOMERY		95

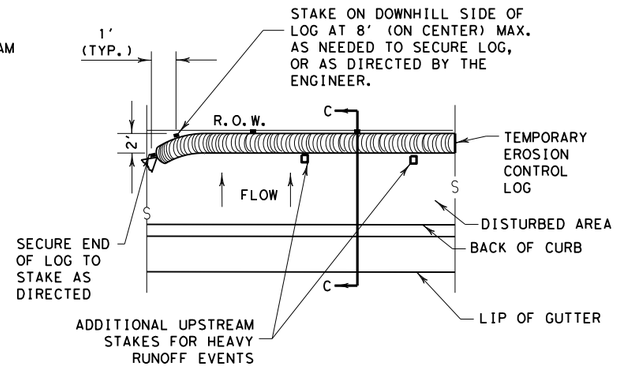
DATE: $DATE$
FILE: $FILE$



PLAN VIEW



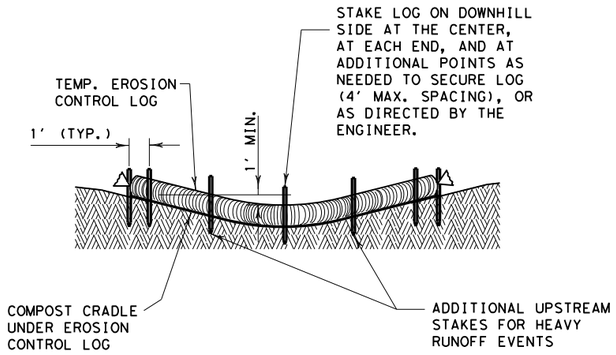
PLAN VIEW



PLAN VIEW

GENERAL NOTES:

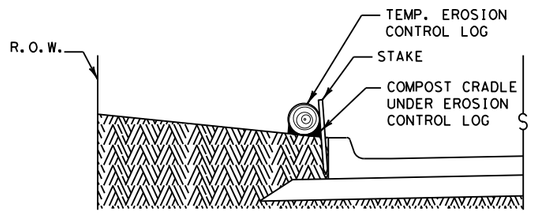
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE 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.



SECTION A-A

EROSION CONTROL LOG DAM

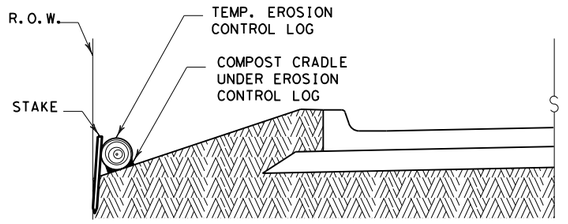
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



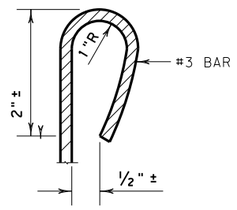
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

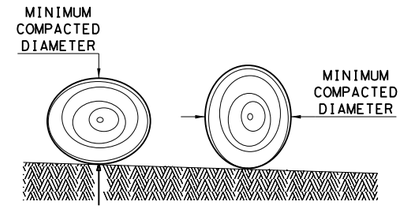
CL-ROW

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



REBAR STAKE DETAIL



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

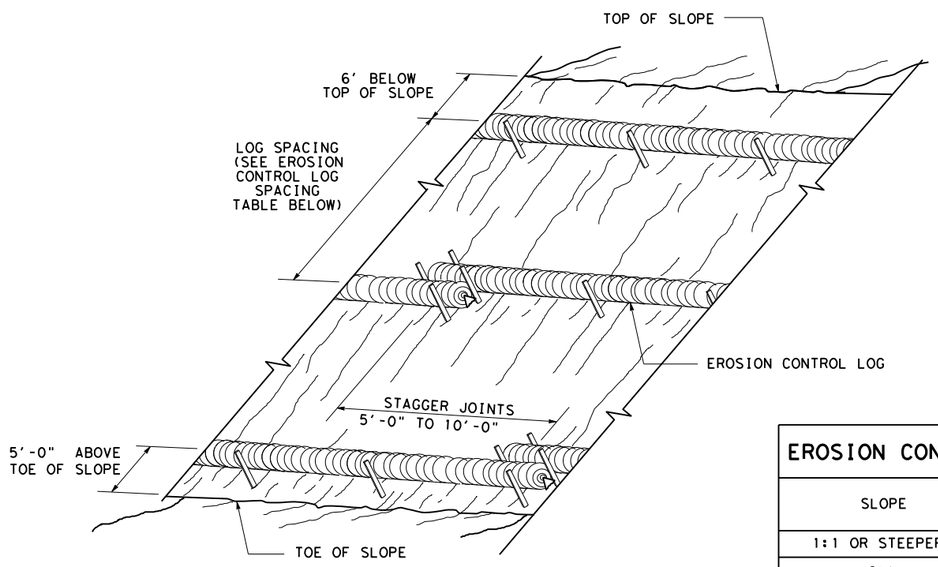
EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1912	01	022		FM 2090	
	DIST	COUNTY			SHEET NO.	
	HOU	MONTGOMERY			96	

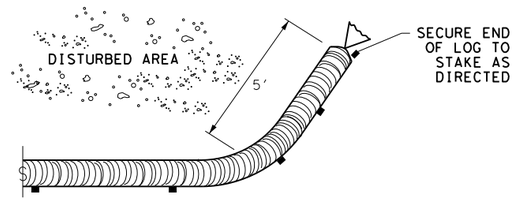
DATE: $DATE$
FILE: $FILE$

DATE: $DATE$
FILE: $FILE$



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

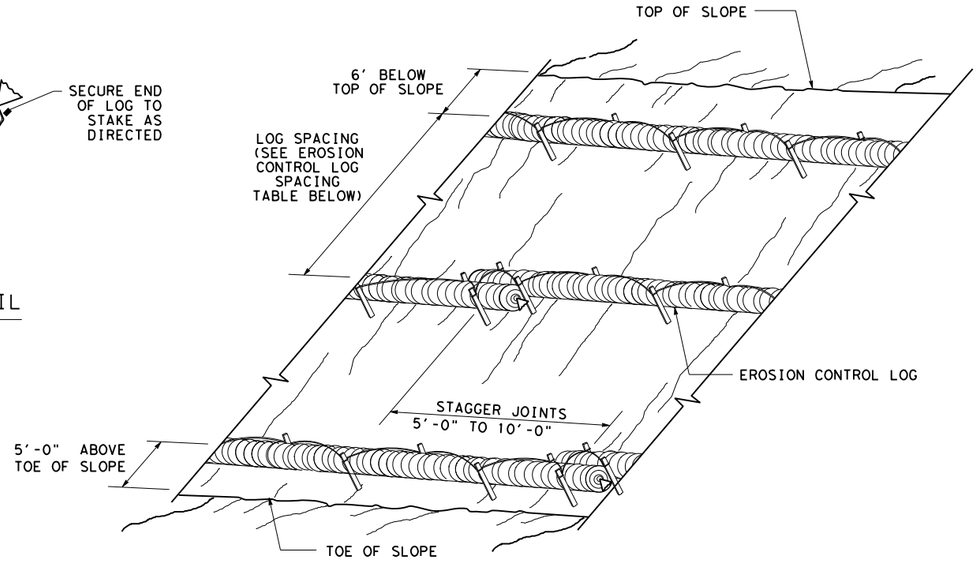
CL-SST



END SECTION RAP DETAIL

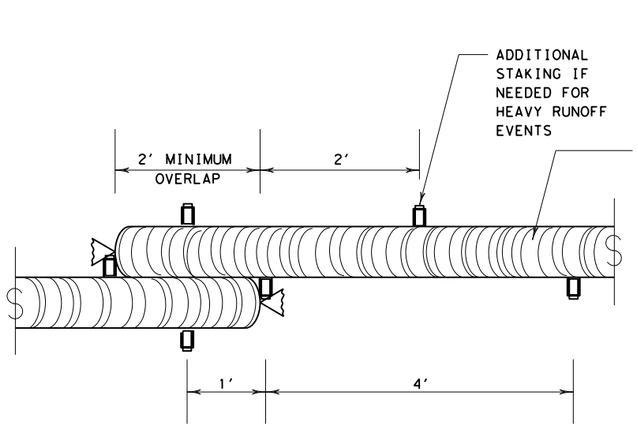
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

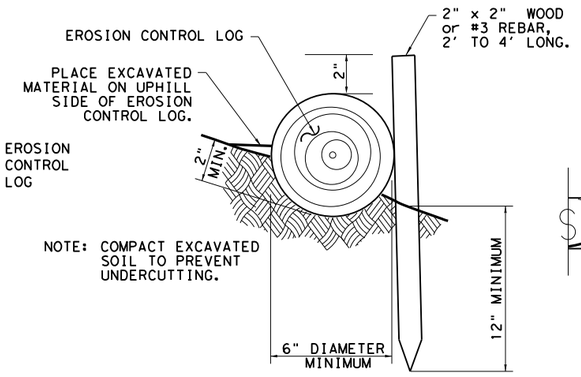
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

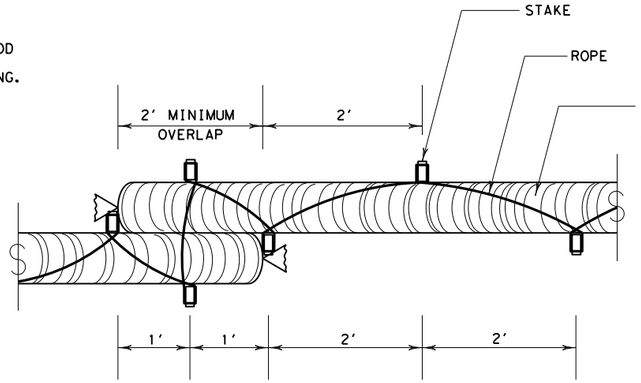


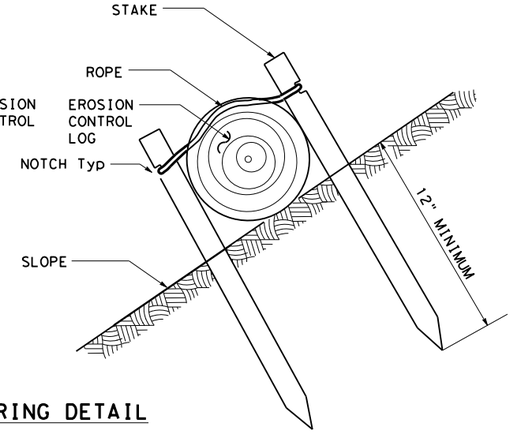


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

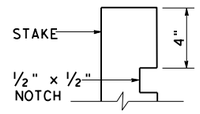
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL

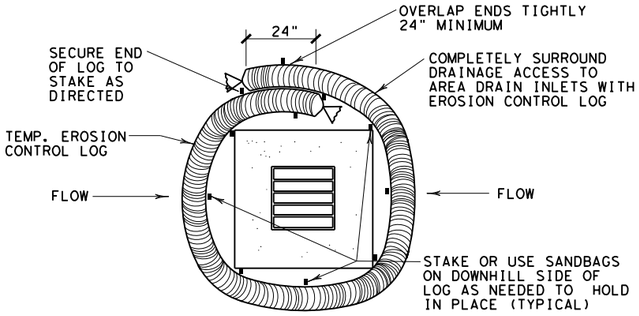


STAKE NOTCH DETAIL

Texas Department of Transportation | Design Division Standard

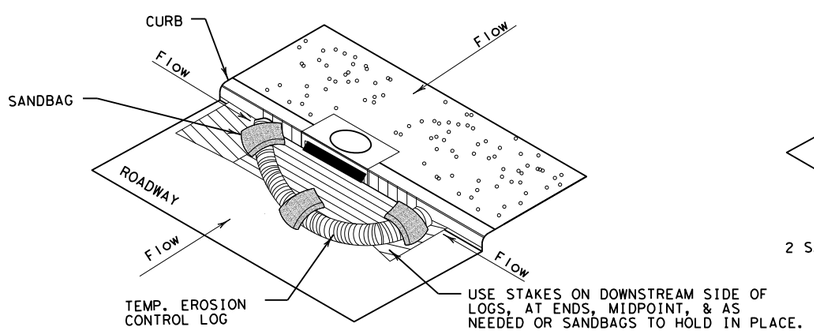
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1912	01	022		FM 2090	
	DIST	COUNTY			SHEET NO.	
	HOU	MONTGOMERY			97	



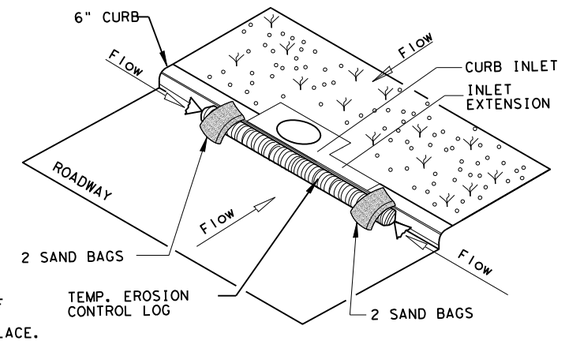
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

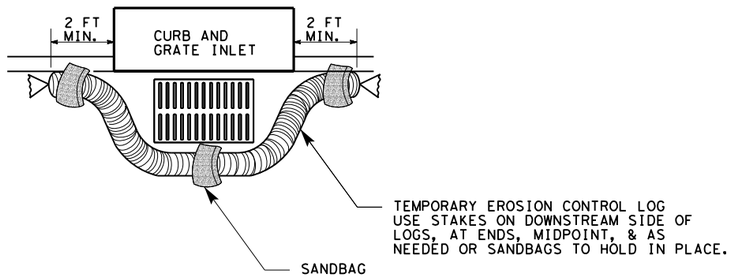
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

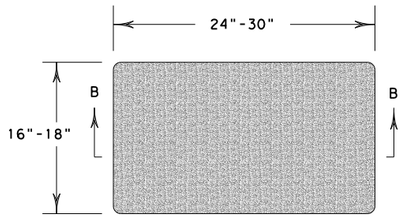
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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	1912	01	022	FM 2090
	DIST	COUNTY		SHEET NO.
	HOU	MONTGOMERY		98

DATE: $DATE$
FILE: $FILE$