INDEX OF SHEETS
SEE SHEET 2

TDLR INSPECTION NOT REQUIRED

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

DESIGN SPEED = 55 MPH
ADT = 27,324 (2023)
ADT = 42,228 (2043)

FED.RD. DIV.NO.	PROJECT NUMBER		SHEET NO.
6	C 967-7-16		1
STATE	STATE DIST.	COUNTY	
TEXAS	HOU	GALVESTON	
CONT.	SECT.	JOB	HIGHWAY NO.
0976	07	016	SH 96

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

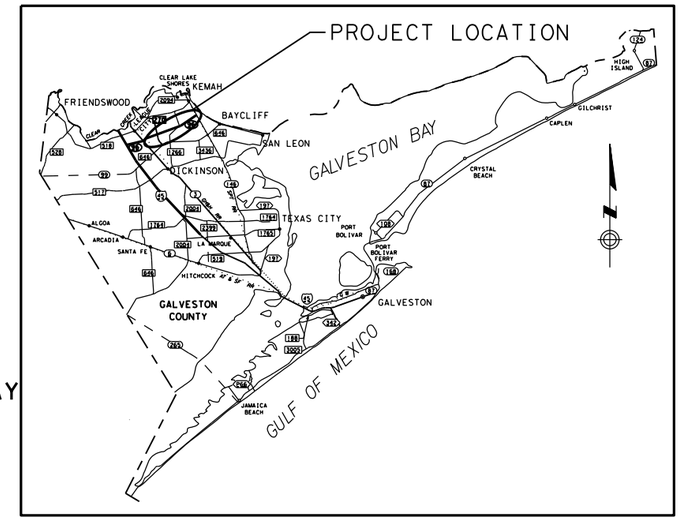
PROJECT: C 976-7-16
CONTROL: 0976-07-016
GALVESTON COUNTY

SH 96

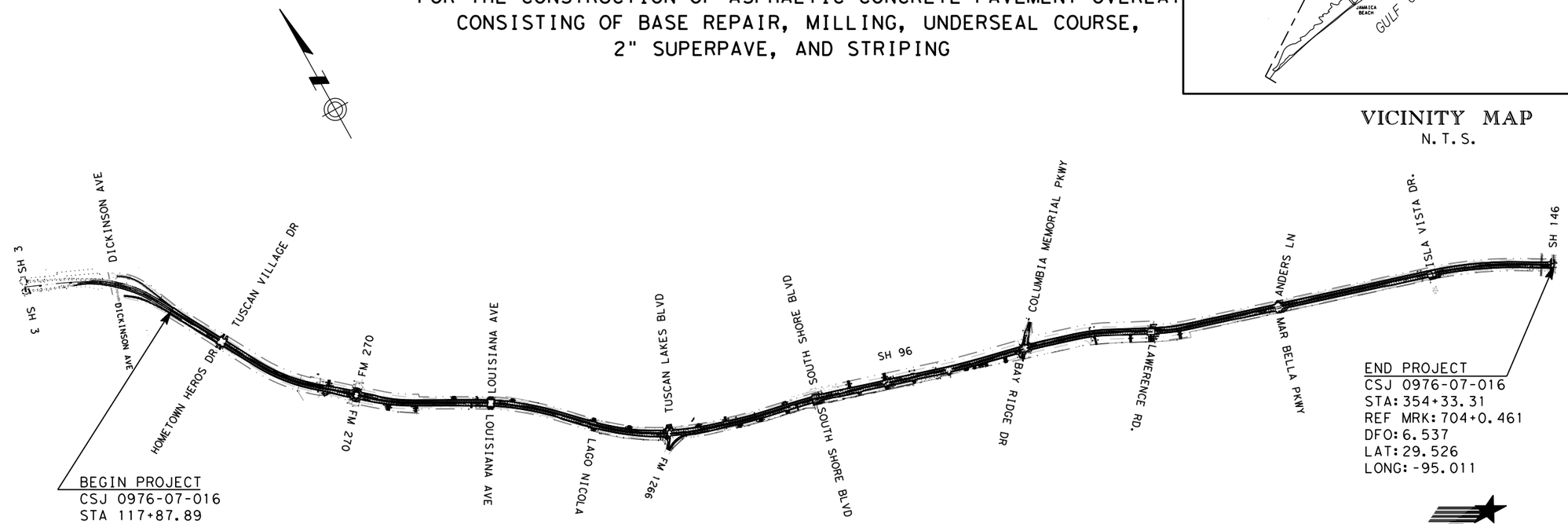
LIMITS: E OF SH 3 TO SH 146

NET LENGTH OF PROJECT: 23645.42 FT, 4.478 MILES

FOR THE CONSTRUCTION OF ASPHALTIC CONCRETE PAVEMENT OVERLAY
CONSISTING OF BASE REPAIR, MILLING, UNDERSEAL COURSE,
2" SUPERPAVE, AND STRIPING



VICINITY MAP
N. T. S.



BEGIN PROJECT
CSJ 0976-07-016
STA 117+87.89
REF MRK: 699+0.901
DFO: 1.99
LAT: 29.494
LONG: 95.074

END PROJECT
CSJ 0976-07-016
STA: 354+33.31
REF MRK: 704+0.461
DFO: 6.537
LAT: 29.526
LONG: -95.011

LOCATION MAP
N. T. S.

RR CROSSINGS: NONE
EQUATIONS: NONE
EXCEPTIONS: NONE

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

TEXAS DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR LETTING: 12-16-2022
AREA ENGINEER

12/19/2022
APPROVED FOR LETTING:
Larry W. Blackburn, P.E.
DISTRICT ENGINEER

COUNTY GALVESTON PROJ. NO. C 976-7-16
HWY. NO. SH 96 LETTING DATE FEBRUARY 2023
DATE ACCEPTED

INDEX OF SHEETS

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

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

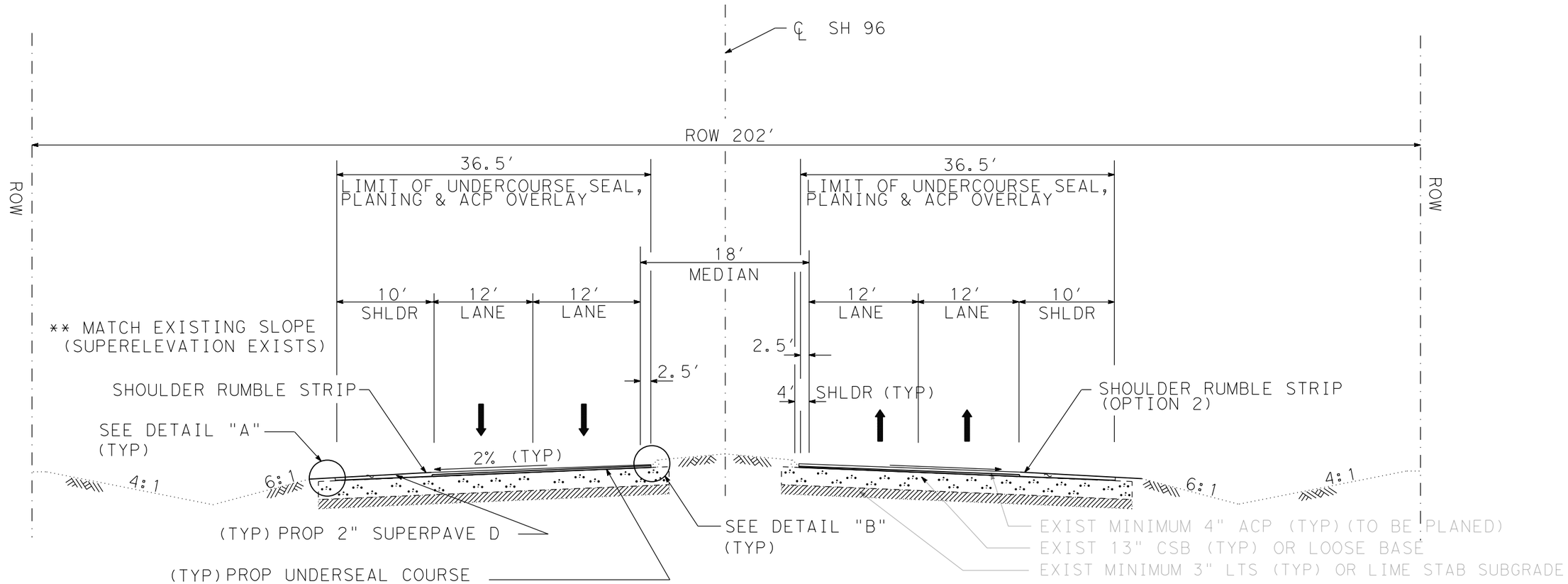
NAME _____ DATE 12-14-2022

Texas Department of Transportation
Galveston Area Office

SH 96
INDEX OF SHEET

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	FEDERAL AID PROJECT NUMBER		
12			
COUNTY			SHEET NO.
GALVESTON			2

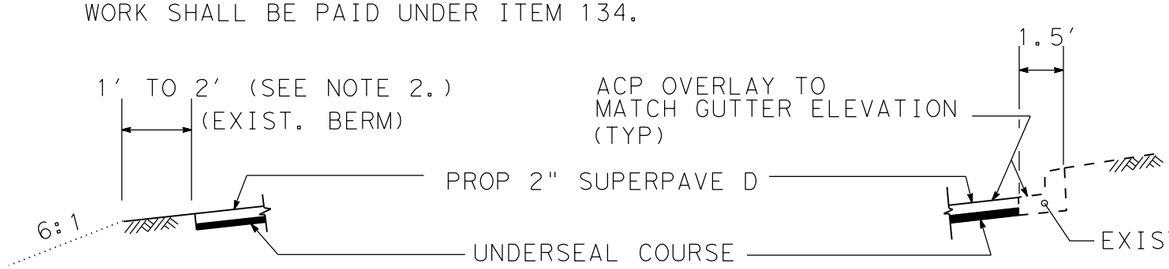
T:\DESIGN\0976070l6 SH 96\DGNS\001gix.dgn



NOTES:

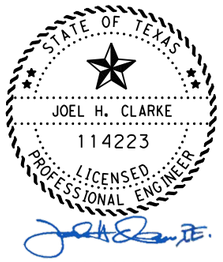
STA. 117+87.89 TO STA. 354+33.31

1. PROP CONSTRUCTION IS TYPICAL FOR BOTH SIDES OF THE ROADWAY.
2. CONTRACTOR SHALL PULL BACK EXISTING EDGE OF SHOULDER MATERIAL AND RE-USE, ALONG WITH ANY RAP MATERIAL NECESSARY, TO ELIMINATE ANY EDGE DROP-OFF. WORK SHALL BE PAID UNDER ITEM 134.



DETAIL "A"

DETAIL "B"



TEXAS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION SH 96

SCALE: N.T.S.

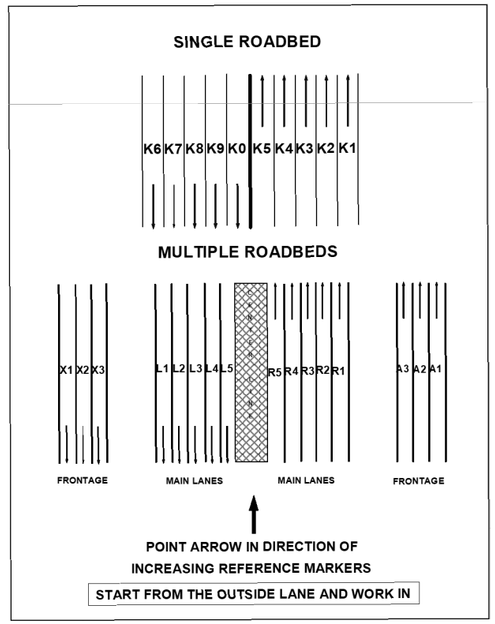
SHEET 1 OF 1 SHEET

DN: O	ORIGINAL DATE OF DRAWING: 0-00-00	FED.RD. DIV.NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
CK DN: O		6	TEXAS					SH96
DW: O	REVISIONS:	STATE DIST.NO	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK DW: O		12	GALVESTON		0976	07	016	3
TR:								
CK TR:								

NAME

INTERNATIONAL ROUGHNESS INDEX DATA

FY	MSEC	HIGHWAY	RDBD	REFERENCE MARKERS BEGIN			REFERENCE MARKERS END			LEN	PTYPE	IRI(IN/MI) TEST MM/DD/YY	IRI(IN/MI) DIST LEFT	IRI(IN/MI) DIST RIGHT	IRI(IN/MI) SI	COMMENTS
2022	03	SH0096	L	0699	+	0.598	0699	+	0.698	0.1	5	9/26/2021	130	127	3.2	
2022	03	SH0096	L	0701	+	0.947	0702	+	0.044	0.1	5	9/26/2021	57	40	4.8	
2022	03	SH0096	L	0702	+	0.144	0702	+	0.244	0.1	5	9/26/2021	113	101	3.5	
2022	03	SH0096	L	0702	+	0.244	0702	+	0.344	0.1	5	9/26/2021	75	68	4.2	
2022	03	SH0096	L	0702	+	0.344	0702	+	0.444	0.1	5	9/26/2021	67	44	4.6	
2022	03	SH0096	L	0702	+	0.644	0702	+	0.744	0.1	5	9/26/2021	66	51	4.5	
2022	03	SH0096	L	0702	+	0.744	0702	+	0.844	0.1	5	9/26/2021	116	156	3.1	
2022	03	SH0096	L	0702	+	0.844	0702	+	0.944	0.1	5	9/26/2021	69	63	4.4	
2022	03	SH0096	L	0702	+	0.944	0703	+	0.054	0.1	5	9/26/2021	98	70	4.0	
2022	03	SH0096	L	0704	+	0.065	0704	+	0.165	0.1	5	9/26/2021	58	63	4.5	
2022	03	SH0096	L	0704	+	0.365	0704	+	0.465	0.1	5	9/26/2021	173	166	2.6	
2022	03	SH0096	R	0700	+	0.200	0700	+	0.300	0.1	5	9/26/2021	85	78	4.0	
2022	03	SH0096	R	0701	+	0.402	0701	+	0.502	0.1	5	9/26/2021	115	154	3.1	
2022	03	SH0096	R	0703	+	0.509	0703	+	0.609	0.1	5	9/26/2021	59	70	4.4	
2022	03	SH0096	R	0703	+	0.809	0703	+	0.909	0.1	5	9/26/2021	56	75	4.4	



Pavement Types

Code	Description
01	Continuously Reinforced Concrete Pavement
02	Jointed Reinforced Concrete Pavement
03	Jointed Plain Concrete Pavement
04	Thick Asphaltic Concrete Pavement (greater than 5-1/2")
05	Intermediate Thickness Asphaltic Concrete Pavement (2-1/2" to 5-1/2")
06	Thin Surfaced Flexible Base Pavement (less than 2-1/2")
07	Asphalt Surfacing with Heavily Stabilized Base
08	Overlaid and/or Widened Old Concrete Pavement
09	Overlaid and/or Widened Old Flexible Pavement
10	Thin Surfaced Flexible Base Pavement (Surface Treatment-Seal Coat Combination)

Comment Code Descriptions:

1. Ride data error, speed below 12mph or IRIs > 500
2. Deep rutting data error
3. Rut data error, badcounts exceeded
4. Bridge
5. RMN
6. Railroad crossing
7. Intersection
8. Other

1) Ride/Rut equipment error

SH 96

INTERNATIONAL ROUGHNESS INDEX
DATA VALUE SHEET

SHEET 1 OF 1

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			4
STATE	DISTRICT	COUNTY	
TEXAS	HOU	GALVESTON	
CONTROL	SECTION	JOB	HIGHWAY NO.
0976	07	016	SH 96

FILE: T:\DESIGN\097607016 SH 96\IRI\IRI SH 96.dgn
DATE: 8/26/2022 9:59:01 AM

General Notes:

General:

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

Area Engineer: David R. Lazaro P.E., email: David.Lazaro@Txdot.gov
Assistant Area Engineer: Joel H. Clarke P.E., e-mail: Joel.Clarke@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 Houston, Construction, February2023, and 0976-07-016/C 976-7-16.

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.

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

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.

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.

County: Galveston

Control: 0976-07-016

Highway: SH 96

Any groundwater elevation information provided is representative of conditions existing on the day when and for the specific location where this information was collected. The actual groundwater elevation may fluctuate with time, climatic conditions, and construction activity.

General: Roadway Illumination and Electrical

For roadway illumination and electrical items, use materials from pre-qualified producers as shown on the Construction Division (CST) of the Department's material producers list. Check the latest link on the Department's website for this list. The category/item is "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials found on this list.

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

General: Traffic Signals

For traffic signal items, use materials from the Pre-Qualified Producers List (located at http://www.dot.state.tx.us/GSD/purchasing/supps.htm) and the materials pre-qualified for illumination and electrical items (located at http://ftp.dot.state.tx.us/pub/txdot-info/cmd/mpl/riaes.pdf) as shown on the Department's Material Producers List and the Roadway Illumination and Electrical Supplies List. Check the latest links on the Department's website for these lists. No substitutions will be allowed for materials found on these lists.

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.

Personal vehicles of employees are not permitted to park within the right of way, including sections closed to public traffic. Employees may park on the right of way at the Contractor's office, equipment, and materials storage yard sites.

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

General: Traffic Control and Construction

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.

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.

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.

Sheet

County: Galveston

Control: 0976-07-016

Highway: SH 96

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.

Item 5: Control of Work

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	Y	Y	Y	B	SD

	Designs Only,calcs reqd.)					
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.

Sheet

County: Galveston

Control: 0976-07-016

Highway: SH 96

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

Item 7: Legal Relations and Responsibilities

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.

No significant traffic generator events have been identified.

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.

Item 8: Prosecution and Progress

Working days will be computed and charged based on a *standard* workweek in accordance with Section 8.3.1.*4.* There's a 90 day delay due to Contractor Mobilization.

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 *90* days. The Engineer and the Contractor may mutually agree, in writing, to decrease this maximum number of days.

Item 134: Backfilling Pavement Edges

Quantity by station includes one side of each roadbed.

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 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 292: Asphalt Treatment (Plant-Mixed)

If using the iron ore topsoil as the primary aggregate, meaning 80 percent or more by weight of the total mixture, the requirements for the water susceptibility test are waived.

Mixtures containing the iron ore topsoil are exempted from test methods TEX-217-F (Part I, separation of deleterious material and Part II, decantation test for coarse aggregate) and TEX-203-F (Sand Equivalent Test).

Assume responsibility for proportioning the materials entering the asphalt mixture, regardless of the type of plant used.

Furnish the mix designs for approval.

Keep the removed depth as uniform as possible during each removal pass if the pavement depth being removed is composed of different asphalt layers. Stockpile the RAP of differing types of quality

separately by its intended use such as for asphalt treatment, cement treatment, lime treatment, or asphalt concrete pavement (level up). Break, crush, or mill the stockpiled materials so that 100 percent passes the 2-in. sieve.

Verify the depth of asphalt pavement to be removed before beginning the removal.

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.

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 *SH 146@ Attwater Ave*.

Items 360, 420, and 421: All Concrete Items

For the Department's concrete cylinder split samples, transport the test cylinders to the Houston District Laboratory located at 7600 Washington Avenue in Houston, or to the appropriate Area Laboratory, when applicable. Transporting the test cylinders is subsidiary to the various bid items.

Item 416: Drilled Shaft Foundations

Include the cost for furnishing and installing anchor bolts mounted in the drilled shafts in the unit bid price for the various diameter drilled shafts.

The Department may test using ultrasonic methods the anchor bolts for overhead sign supports, light standards, and traffic signal poles after they are installed. Replace faulty anchor bolts as directed. Do not weld the anchor bolts.

Item 420: Concrete Substructures

Unless otherwise noted, use Class C concrete with an ordinary surface finish for signal, lighting, or sign structure foundations.

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.

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.

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-Friday	09:00 AM - 04:00 PM	N/A	04:00 PM - 11:59AM 12:00 AM - 09:00 AM
Saturday	Emergency Only	Engineer's Permission Only	N/A
Sunday	Emergency Only	Engineer's Permission Only	N/A

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.

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.

Use Uneven Lane Signs (CW 8-11) during resurfacing operations for elevation differences between adjacent lanes of greater than 1 in.

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

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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.

Use appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area. Remove and dispose of materials in compliance with State and Federal laws.

Item 540: Metal Beam Guard Fence

The quantity of the metal beam guard fence is subject to change.

Provide a mow strip as shown on the plans, at metal beam guard fence locations, including any guardrail end treatments.

Galvanize the rail elements supplied for this project by using a Type II Zinc Coating.

At locations requiring attachment of Metal Beam Guard Fence (MBGF) to concrete railing or concrete traffic barrier, repair and fill any existing holes in the railing or barrier that are not in the correct location for attaching the new MBGF. Perform this work in accordance with the Item, "Concrete Structure Repair." Existing anchor bolt holes that cannot be utilized must be filled with an epoxy grout before drilling new holes. Then core-drill new holes in the correct locations and repair any resulting spalls at no expense to the Department. This work is considered subsidiary to the MBGF transition section (Item 540).

Item 542: Removing Metal Beam Guard Fence

Remove and assume ownership of unsalvageable metal beam guard fence rail elements and posts. Transport and store any functional, salvageable rail elements, including steel posts, which are not reused in this project, to the Department's stockpile located at *SH 146@ Attwater Ave*.

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.

For asphalt mainlanes, use Surface Test Type B and Pay Adjustment Schedule 2 except for outside lane. Use Surface Test Type B and Pay Adjustment Schedule 3 for the outside lane.

Item 618: Conduit
Item 620: Electrical Conductors

Item 628: Electrical Services

If the specifications for electrical items require UL-listed products, this means UL-listed or CSA-listed.

Item 618: Conduit

When backfilling bore pits, ensure that the conduit is not damaged during installation or due to settling backfill material. Compact select backfill in 3 equal lifts to the bottom of the conduit; or if using sand, place it 2 in. above the conduit. Ensure backfill density is equal to that of the existing soil. Prevent material from entering the conduit.

Construct bore pits a minimum of 5 ft. from the edge of the base or pavement. Close the bore pit holes overnight.

Unless otherwise shown on the plans, install underground conduit a minimum of 24 in. deep. Install the conduit in accordance with the latest National Electrical Code (NEC) and applicable Department standard sheets. Place conduit under driveways or roadways a minimum of 24 in. below the pavement surface.

If using casing to place bored conduit, the casing is subsidiary to the conduit.

If placing the conduit under existing pavement to reach the service poles, bore the conduit in place and extend it a minimum distance of 5 ft. beyond the edge of shoulder or the back of curb.

Item 620: Electrical Conductors

Test each wire of each cable or conductor after installation. Incomplete circuits or damage to the wire or the cable are cause for immediate rejection of the entire cable being tested. Remove and replace the entire cable at no expense to the Department. Also test the replacement cable after installation.

When pulling cables or conductors through the conduit, do not exceed the manufacturer's recommended pulling tensions. Lubricate the cables or conductors with a lubricant recommended by the cable manufacturer.

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holders as shown on the Department's Construction Division (CST) material producers list. Check the latest link on the Department's website for this list. The category is "Roadway Illumination and Electrical Supplies." The fuse holder is shown on the list under Items 610 and 620. Provide 10 Amp time delay fuses.

Ensure that circuits test clear of faults, grounds, and open circuits.

Split bolt connectors are allowed only for splices on the grounding conductors.

For Roadside Flashing Beacon Assemblies (Item 685) and Pedestal Pole Assemblies (Item 687) within the project, provide single-pole breakaway disconnects as shown on the Construction Division (CST) material producers list. Check the latest link on the Department's website for this list. The category is "Roadway Illumination and Electrical Supplies." The fuse holder is shown on the list under Item 685. For underground (hot) conductors, install a breakaway connector with a dummy fuse (slug). Provide dummy fuse (slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).

For electrical licensing and electrical certification requirements for this project, see Item 7 of the Standard Specifications and any applicable special provisions to Item 7.

Item 624: Ground Boxes

The ground box locations are approximate. Alternate ground box locations may be used as directed, to avoid placing in sidewalks or driveways.

Ground metal ground box covers. Bond the ground box cover and ground conductors to a ground rod located in the ground box and to the system ground.

Ground the existing metal ground box covers as shown on the latest standard sheet ED (4)-14.

During construction and until project completion, provide personnel and equipment necessary to remove ground box lids for inspection. Provide this assistance within 24 hours of notification.

Construct concrete aprons in accordance with the latest standard sheet ED (4)-14. Make the depth of the concrete apron the same as the depth of the ground box, except for Type 1 and Type 2 ground boxes. For Type 1 or Type 2 ground boxes, construct the concrete apron in accordance with details shown on the "Ground Box Details Installations" standard.

Item 662: Work Zone Pavement Markings

At the end of each workday, mark roadways that remain open to traffic during construction operations with standard pavement markings, in accordance with the latest "Texas Manual on Uniform Traffic Control Devices."

Using raised markers for removable work zone pavement markings on final concrete surfaces is optional.

Do not use raised pavement markers as optional work zone pavement markings on final asphalt surfaces.

For transition lane lines and detour lane lines, use raised pavement markers as shown for solid lines on the latest Barricade and Construction standard sheet for "Work Zone Pavement Marking Details."

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Item 662: Work Zone Pavement Markings
Item 666: Reflectorized Pavement Markings
Item 668: Prefabricated Pavement Markings

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.

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.

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Item 677: Eliminating Existing Pavement Markings and Markers

Remove existing pavement markings on concrete or asphalt surfaces by flail milling or as directed.

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 680: Highway Traffic Signals

Clearly mark or highlight on the shop drawings the items being furnished for this project.

Furnish labor, tools, equipment, and materials as shown on the plans and specifications for a complete and operating signal installation.

Furnish the type of controller cabinet specified on the plans. Refer to the table shown in the Departmental Material Specifications (DMS-11170, Fully Actuated, Solid-State Traffic Signal Controller Assembly), Section 11170.6.A, Type 2 cabinet, page 4 of 39, regarding the size of the cabinet, back panel configuration, and the size of the load bay. Use the following website to view this specification: http://www.txdot.gov/business/resources/dms.html

Complete traffic signal construction work, including correcting discrepancies shown on the Department inspector's "Traffic Signal Installation Inspection Report" before the beginning of the test period.

Provide a full-time qualified traffic signal technician responsible for installing, maintaining, or replacing traffic signal devices.

Staking in the field is subject to approval.

Adjust project construction, if needed, due to conflicts with underground utilities.

Do not aim the luminaire arms mounted on traffic signal poles into the intersection. Aim each arm perpendicular to the centerline of the roadway it is intended to cover, to develop the proper illumination pattern for the intersection.

Allow the electrical work is to be inspected by the City. Complying with the provisions and requirements of the City electrical ordinance is not required. Such inspection does not make the City a party to this contract.

Provide continuous conductors without splices from signal controller to signal heads. Route the conductors for luminaires to the service enclosure. Splices or attachments to the terminal block in the access compartment of the mast arm pole are not permitted except for the luminaire cable.

Abrasions to the conductor insulation caused while pulling cable for the traffic signal system are cause for immediate rejection. Remove and replace the entire damaged cable at no expense to the Department.

When pulling cables or conductors through conduit, do not exceed the manufacturer's recommended pulling tensions. Lubricate the cables or conductors with a lubricant as recommended by the cable manufacturer.

Bond the controller housing, signal poles, conduit, and spans to a minimum No. 6 AWG stranded copper conductor. An equipment grounding conductor is required in every conduit to form a continuous grounding system. Effectively connect the grounding system to ground rods or concrete encased grounding electrodes as indicated in the plans.

Wrap signal heads with dark plastic or suitable material to conceal the signal faces from the time of installation until placing into operation. Do not use burlap.

Furnish signal heads from the same manufacturer.

Use Type B (high intensity prismatic) or Type D (diamond grade) retroreflective sheeting for signs mounted under or adjacent to the signal heads.

Furnish solid conductors for traffic signal cable.

The Contractor may use ready mix concrete.

Apply membrane curing on concrete work in accordance with Section 420.4.10.3, "Membrane Curing."

The standard 4.5-in. galvanized pipe type poles, except the breakaway type, are subject only to the Engineer's inspection for their acceptance. Mill test reports or documentation will not be required.

Item 682: Vehicle and Pedestrian Signal Heads

Furnish black powder coated traffic signal poles. Apply powder coated finish over the galvanized surface. Prepare galvanized surfaces for powder coating in accordance with the powder coating manufacturer's recommendations. Do not water-quench or chromate-quench galvanized surfaces to be powder coated. After preparing galvanized surfaces, powder coat with a minimum of 2.0 mils dry film thickness (DFT) of urethane powder or triglycidyl isocyanurate (TGIC) polyester powder. Provide

powder coat adhesion meeting the 5A or 5B classifications of ASTM D3359. Ensure powder coating is uniform in appearance and free of scratches.

Item 686: Traffic Signal Pole Assemblies (Steel)

For a steel mast arm or steel strain pole assembly, hold the anchor bolts and conduits rigidly in place with a welded steel template.

Leave a minimum of one full diameter thread exposed on each anchor bolt securing a signal pole.

Set the anchor bolts for the steel strain poles so that two are in compression and two are in tension.

Use a Texas Cone Penetrometer reading of 10. The drilled shaft length is from the surface elevation to the bottom of the drilled shaft. Provide an additional length of the pole foundation from the surface level to the roadway level, if required for unusual locations. Provide the drilled shaft depth regardless of the length of the pole foundation. The pole foundation depth from the surface level to the roadway level is a maximum of 4 ft., or as approved.

Locate traffic signal pole assembly foundations a minimum of 4 ft. from the roadway curb or pavement edge, or as shown on the plans.

Place steel strain poles at a 10 ft. desirable minimum distance from the roadway curb or pavement edge.

After the traffic signal pole assembly is plumb and the nuts are tight, tack-weld each anchor bolt nut in two places to its washer. Tack-weld each washer to the base plate in two places. Do not weld components to the bolt. Perform tack-welding in accordance with the Item, "Steel Structures." After tack-welding, repair galvanizing damage on bolts, nuts, and washers in accordance with Section 445.3.5, "Repairs."

The Department may test the anchor bolts using ultrasonic methods for traffic signal poles after they are installed. Replace faulty anchor bolts as directed. Do not weld the anchor bolts.

Furnish black powder coated traffic signal poles. Apply powder coated finish over the galvanized surface. Prepare galvanized surfaces for powder coating in accordance with the powder coating manufacturer's recommendations. Do not water-quench or chromate-quench galvanized surfaces to be powder coated. After preparing galvanized surfaces, powder coat with a minimum of 2.0 mils dry film thickness (DFT) of urethane powder or triglycidyl isocyanurate (TGIC) polyester powder. Provide powder coat adhesion meeting the 5A or 5B classifications of ASTM D3359. Ensure powder coating is uniform in appearance and free of scratches.

Item 3077 Superpave Mixtures

The blending of aggerate and RAP a maximum of 5% will be allowed.

Item 3085: Underseal Course

Use only a Spray Applied Underseal Membrane or a single layer of Seal Coat. Either method is paid under Item 3085 by the gallon.

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.

Item 6306: Video Imaging Vehicle Detection System

Furnish the cable to operate the Video Imaging Vehicle Detection System (VIVDS) in accordance with the manufacturer's recommendations or purchase it from the same manufacturer as the VIVDS equipment.

Supply VIVDS equipment that can process up to a maximum of 6 camera inputs per intersection. Additional equipment to accommodate up to 6 camera inputs is subsidiary to the various bid items. No extra compensation will be allowed for additional equipment needed to make the VIVDS equipment fully operational under this Item.

Supply a laptop computer and a video monitor as described in this Special Specification Item.

Detector zone videotaping for this project will not be required.

Supply 2 video channel VIVDS processor cards equipped with a NEMA TS1 detector interface and a 332 cabinet detector interface for a minimum of 4 detector outputs that are compatible with the City of Houston COH 2070 traffic signal controller.

Special Specification 6306 Video Imaging Vehicle Detection System Requirements

Specification Items	Description	Not Required	Required	State Supplied
1	**Description**		**X**	
	Variable Focal Cameras		**X**	
	VIVDS Card Rack Processor System		**X**	
	Field Setup Computer (1 Required) (Laptop)	**X**		
	Field Setup Video Monitor (1 Ea. Controller)		**X**	
	Connectors and Camera Mounting Hardware		**X**	
3	**Functional Capabilities**			
	System Software		**X**	
4	**Vehicle Detection**			
	Detection Zone Video Taping	**X**		
5	**VIVDS Processor Unit**			
	Provide both TS1 and TS2 Environmental Requirements		**X**	
	12 Volt/5 Amp Power Supply		**X**	
6	**Camera Assembly**			
	Camera Interface Panel		**X**	
7	**Field Communications Link**			
	Lightning and Transient Surge Suppression Devices		**X**	
9	**Temporary Use and Retesting**		**X**	
10	**Operation from Central Control**	**X**		
	Telephone Interconnect	**X**		
	ISDN Interconnect	**X**		
11	**Installation and Training**		**X**	

Other items not specifically listed in this table are required. When shown in the plans, remove and deliver temporary VIVDS equipment to the Department's Signal Shop, 6810 Old Katy Rd., Houston, Texas, or as directed.

VIVDS devices covered under the Department's Purchasing Special Specification T.O.-6291 (http://www.dot.state.tx.us/gsd/purchasing/supps.htm#divspecs) will also be allowed for use.

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SHEET 5J

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
3077	Superpave Mixtures Asphalt Aggregate	100 Lb. / Sq. Yd.-In. 8 % by weight 92 % by weight	TON
3085	Underseal course Aggregate	 0.20 Gal./Sq.Yd	GAL

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

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0976-07-016 **DISTRICT** Houston **COUNTY** Galveston
HIGHWAY SH 96

ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	154.000	
	134-6004	BACKFILL (TY A OR B)	STA	404.000	
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	45,911.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	229,291.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	8.000	
	465-6240	INLET (COMPL)(TY C1)(STAGE II)	EA	2.000	
	496-6002	REMOV STR (INLET)	EA	2.000	
	500-6001	MOBILIZATION	LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	15.000	
	533-6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	24,643.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	175.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1.000	
	540-6022	MTL THRIE-BEAM GD FEN (STEEL POST)	EA	1.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	175.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	1.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	355.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	1,770.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	1,340.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	15.000	
	624-6028	REMOVE GROUND BOX	EA	23.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	1,101.000	
	662-6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF	88,152.000	
	662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	94,989.000	
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	34,800.000	
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF	10,130.000	
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	4,330.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA	202.000	
	662-6029	WK ZN PAV MRK NON-REMOV(W)(WORD)	EA	184.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	66,484.000	
	662-6041	WK ZN PAV MRK NON-REMOV (Y)24"(SLD)	LF	378.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	994.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	17,400.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	5,065.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	2,165.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	101.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	92.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	189.000	
	666-6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF	44,076.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	44,076.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	47,494.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	33,242.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0976-07-016 **DISTRICT** Houston **COUNTY** Galveston
HIGHWAY SH 96

ALT	BID CODE	D SCRIPTION	UNIT	EST.	FINAL
	672-6009	REFL PAV MRKR TY II-A-A	EA	113.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,406.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	1,107.000	
	677-6038	ELIM EXT PAV MRK & MRKRS(PLOWABLE RPMS)	EA	62.000	
	3077-6052	SP MIXESSP-DSAC-A PG70-22	TON	22,930.000	
	3085-6001	UNDERSEAL COURSE	GAL	73,375.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	422.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	210.000	
	6306-6009	VIVDS PROSR SYS (INSTALL ONLY)	EA	3.000	
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA	21.000	
	6306-6012	VIVDS CABLING (INSTALL ONLY)	LF	5,785.000	
	08	CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000	

MATERIALS FOR HIGHWAY TRAFFIC SIGNAL							
ITEM	DESC CODE	DESCRIPTION	UNIT	SH 96 AT FM 270	SH 96 AT TUSCAN LAKES BLVD	SH 96 AT BAY RIDGE DR	TOTAL
				QUANTITY	QUANTITY	QUANTITY	QUANTITY
618	6046	CONDT (PVC) (SCH 80) (2")	LF	155	80	120	355
618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	540	535	695	1770
620	6009	ELEC CONDR (NO.6) BARE	LF	455	385	500	1340
624	6010	GROUND BOX TY D (162922)W/APRON	EA	6	5	4	15
624	6028	REMOVE GROUND BOX	EA	6	7	10	23
6306	6009	VIVDS PROSR SYS (INSTALL ONLY)	EA	1	1	1	3
6306	6010	VIVDS CAM ASSY (INSTALL ONLY)	EA	8	6	7	21
6306	6012	VIVDS CABLING (INSTALL ONLY)	LF	2380	1400	2005	5785

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SH 96
AT VARIOUS
TRAFFIC SIGNAL
SUMMARY OF QUANTITIES

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		7

SUMMARY OF ROADWAY QUANTITIES

ITEM	**134**	351	354	432	**465**	**496**	502	**618**		**620**
CODE	6004	6004	6045	6045	6240	6002	6001	6046	6047	6009
DESCRIPTION	BACKFILL (TY A OR B)	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	PLANE ASPH CONC PAV (2")	RIPRAP (MOW STRIP) (4IN)	INLET (COMPL)(TY C1) (STAGE II)	REMOV STR (INLET)	BARRICADES, SIGNS AND TRAFFIC HANDLING	CONDT (PCV) (SCH 80)(2")	CONDT (PCV) (SCH 80)(2") (BORE)	ELEC CONCR (NO.6) BARE
UNIT	STA	SY	SY	CY	EA	EA	MO	LF	LF	LF
QUANTITY	404.000	45911.000	229291.000	8.000	2.000	2.000	14.000	355.000	1770.000	1340.000

624	**624**	636	3077	3085	6001	6185
6010	6028	6001	6072	6001	6001	6005
ELEC CONCR (NO.4) BARE	ELEC CONCR (NO.4) BARE INSULATED	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SUPERPAVE MIXTURES SP-D SAC-A PG70-22	UNDERSEAL COURSE	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
LF	LF	SF	TON	GAL	DAY	DAY
15.000	23.000	1101.000	22930.000	73375.000	422.000	210.000

SUMMARY OF PAVEMENT MARKINGS

ITEM	662								
CODE	6005	6008	6012	6014	6016	6017	6029	6037	6041
DESCRIPTION	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" (SLD)	WK ZN PAV MRK NON-REMOV (Y) 24" (SLD)
UNIT	LF	LF	LF	LF	LF	EA	EA	LF	LF
QUANTITY	88152.000	94989.000	34800.000	10130.000	4330.000	202.000	184.000	66484.000	378.000

ITEM	**666**										
CODE	6018	6036	6042	6048	6054	6078	6147	6162	6306	6309	6321
DESCRIPTION	REFL PAV MRK TY I (W) 6"(DOT)(100MIL)	REFL PAV MRK TY I (W) 8"(SLD)(100MIL)	REFL PAV MRK TY I (W) 12" (SLD) (100MIL)	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	REFL PAV MRK TY I (W) (ARROW) (100MIL)	REFL PAV MRK TY I (W) (WORD) (100MIL)	REFL PAV MRK TY I (Y) (24") (SLD) (100MIL)	REFL PAV MRK TY I (BLACK)6"(SHADOW) (100MIL)	RE PM W/RET REQ TY I (W) 6"(BRK)(100MIL)	RE PM W/RET REQ TY I (W) 6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL
UNIT	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF
QUANTITY	944.000	17400.000	5065.000	2165.000	101.000	92.000	189.000	44076.000	44076.000	47494.000	33242.000

ITEM	**672**		677		6306		
CODE	6009	6010	6005	6038	6009	6010	6012
DESCRIPTION	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	ELMIN EXT PAV MRK & MRKS (12")	ELMIN EXT PAV MRK & MRKS (PLOWABLE RPM)	VIVDS PROSR SYS (INSTALL ONLY)	VIVDS CAM ASSY (INSTALL ONLY)	VIVDS CABLING (INSTALL ONLY)
UNIT	EA	EA	LF	LF	EA	EA	
	113.000	1537.000	1107.000	62.000	3.000	21.000	5785.000

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Texas Department of Transportation
Galveston Area Office

SUMMARY OF ROADWAY AND PAVEMENT MARKINGS QUANTITIES

NTS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		8

SUMMARY OF ROADWAY QUANTITIES

SHEET NO.	CSJ	134	354	3085	3077
		6004	6045	6001	6052
		BACKFILL TY (A OR B)	PLANE ASPH CONC PAV (2")	UNDERSEAL COURSE	SUPERPAVE MIXTURES SAC-A PG70-22
	0976-03-105	STA	SY	GAL	TON
		404.000	229291.000	73375.000	22930.000
	SHEET NAME				
35	1 of 41				
36	2 of 41				
37	3 of 41				
38	4 of 41	110	599	**192**	60
39	5 of 41	1300	6621	**2119**	662
40	6 of 41	1016	7519	**2406**	752
41	7 of 41	1300	5547	**1775**	555
42	8 of 41	1302	5321	**1703**	532
43	9 of 41	1126	6329	**2025**	633
44	10 of 41	772	8256	**2642**	826
45	11 of 41	934	5319	**1702**	532
46	12 of 41	1300	5435	**1739**	544
47	13 of 41	1028	7075	**2264**	708
48	14 of 41	1286	5613	**1796**	561
49	15 of 41	1300	6220	**1991**	622
50	16 of 41	1000	6171	**1975**	617
51	17 of 41	1300	5731	**1834**	573
52	18 of 41	1156	8652	**2769**	865
53	19 of 41	1334	5582	**1786**	558
54	20 of 41	906	5397	**1727**	540
55	21 of 41	1166	6328	**2025**	633
56	22 of 41	1006	7577	**2425**	758
57	23 of 21	992	6164	**1972**	616
58	24 of 21	1082	6212	**1988**	621
59	25 of 41	1106	6403	**2049**	640
60	26 of 41	644	5642	**1806**	564
61	27 of 41	658	9719	**3110**	972
62	28 of 41	1300	5563	**1780**	556
63	29 of 41	1152	5394	**1726**	539
64	30 of 41	802	7519	**2406**	752
65	31 of 41	1086	5811	**1860**	581
66	32 of 41	1300	5435	**1739**	543
67	33 of 41	1300	6066	**1941**	607
68	34 of 41	882	7087	**2268**	709
69	35 of 41	1300	5369	**1718**	537
70	36 of 41	1300	5337	**1708**	534
71	37 of 41	1300	6340	**2029**	634
72	38 of 41	942	6841	**2189**	684
73	39 of 41	1290	5601	**1792**	560
74	40 of 41	1294	5573	**1783**	557
75	41 of 41	1550	1924	**616**	192
	TOTAL	404.000	229291.000	73375.000	22930.000
		STA	CY	GAL	TON

SH 96

SUMMARY OF ROADWAY, QUANTITIES

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			9
STATE	DISTRICT	COUNTY	
TEXAS	HOU	GALVESTON	
CONTROL	SECTION	JOB	HIGHWAY NO.
0976	03	105	SH 96

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TRAFFIC CONTROL SEQUENCE

1. SET UP PERIMETER BARRICADES, SIGNS, AND PERTINENT TRAFFIC CONTROL DEVICES PER BARRICADE AND CONSTRUCTION STANDARDS.
2. SET UP ALL NECESSARY SWP3 DEVICES.
3. REPAIR EXIST FLEXIBLE PAVEMENT STRUCTURE AS APPROVED BY THE ENGINEER.
4. MILL AND OVERLAY ONLY ONE LANE AT A TIME.
5. MILL CONSTANT 2"AND PLACE WORK ZONE PAVEMENT MARKINGS. DO NOT LEAVE THE MILLED SURFACE EXPOSED TO WEATHER NO MORE THAN 3 DAYS.
6. PLACE UNDERSEAL COURSE. IF PLACING SEAL COAT DO NOT LEAVE THE SEAL COAT EXPOSED TO WEATHER NO MORE THAN 3 DAYS.
7. PLACE AND 2"SUPERPAVE MIXTURE. IMMEDIATELY AFTER PLACING MEMBRANE UNDERSEAL PLACE WORK ZONE PAVEMENT MARKINGS.
8. PLACE PERMANENT STRIPING, REFLECTIVE PAVEMENT MARKINGS, VIVID CAMS, DRILLSHAFTS SIGNAL MAST POLES AND SIGNS.
9. REMOVE PERIMETER BARRICADES AND SIGNS, AND ANY SWP3 DEVICES.

NOTES:

1. UTILIZE POLICE OFFICERS FOR THE VARIOUS ITEMS OF WORK AS APPROVED BY THE ENGINEER, SHOULD TRAFFIC BACK-UPS WARRANT THEIR USE.
2. UTILIZE PERTINENT PAVEMENT MARKING STANDARDS AND THE TMUTCD TO REPLACE STRIPING AFFECTED BY CONSTRUCTION OPERATIONS.
3. THIS IS A SUGGESTED SEQUENCE OF WORK. THE CONTRACTOR MAY SUBMIT A REVISED SEQUENCE OF WORK TO THE ENGINEER FOR APPROVAL.

ALL WORK AND EQUIPMENT TO PERFORM TRAFFIC CONTROL OPERATIONS SHALL FOLLOW THE TMUTCD AND ARE SUBSIDIARY TO ITEM 502.

ORDER TRAFFIC SIGNAL ITEMS AT TIME OF WORK BEGIN

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED PROFESSIONAL ENGINEER

12-2-2022

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Texas Department of Transportation
Galveston Area Office

SH 96

SEQUENCE OF CONSTRUCTION

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	FEDERAL AID PROJECT NUMBER		
12			
COUNTY			SHEET NO.
GALVESTON			10

DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

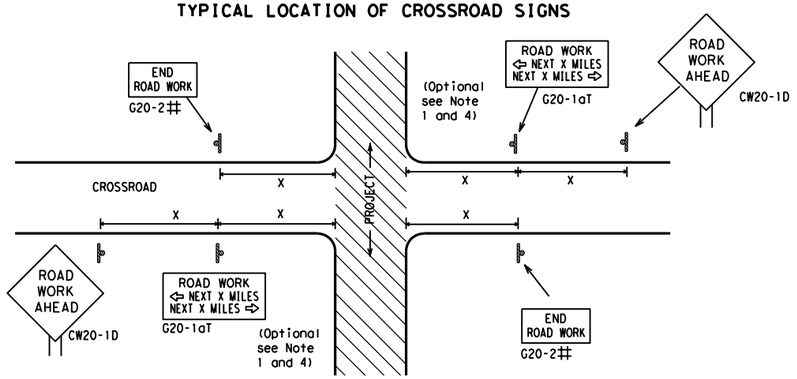
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0976	07	016	SH 96
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	12	GALVESTON		11
5-10 5-21				

DATE:
FILE:

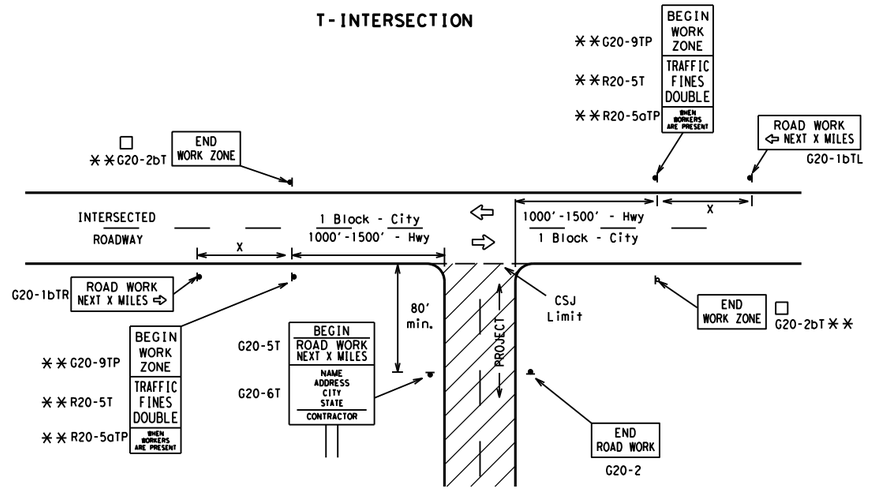
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

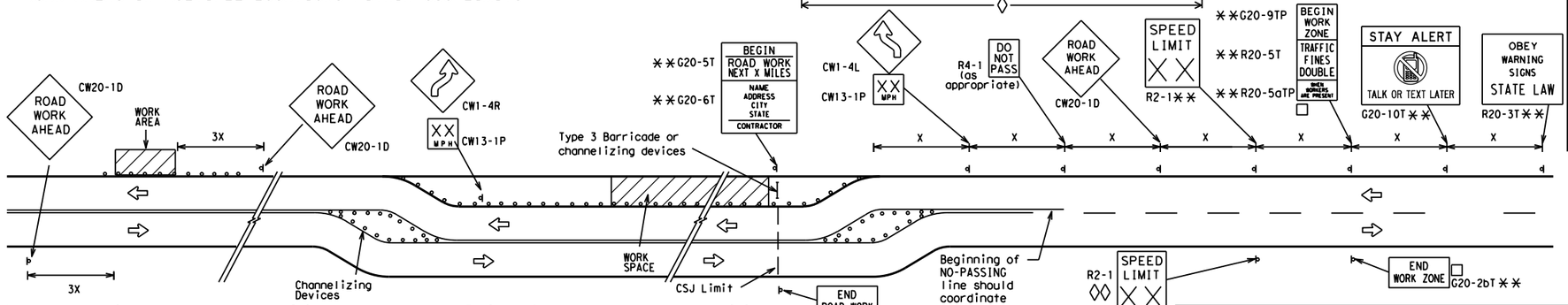
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

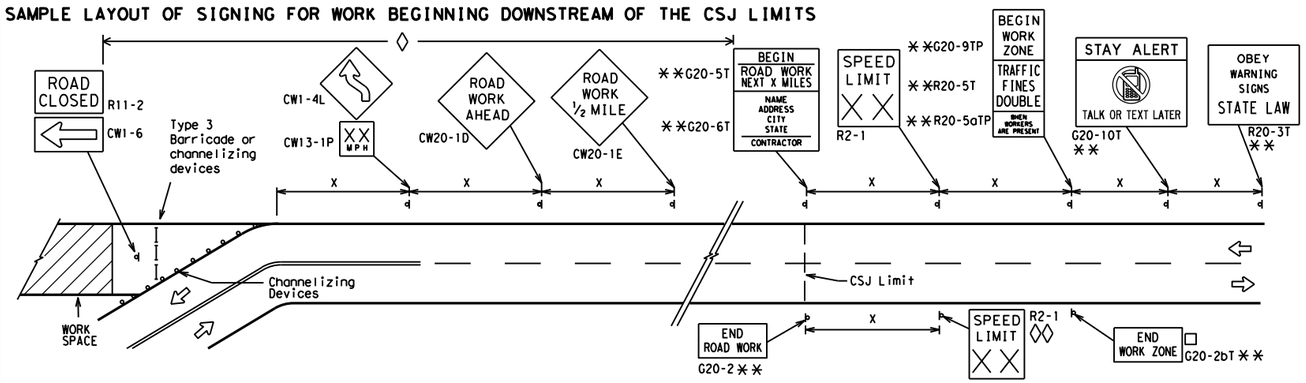
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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	0976	07	016	SH 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	12	GALVESTON		12

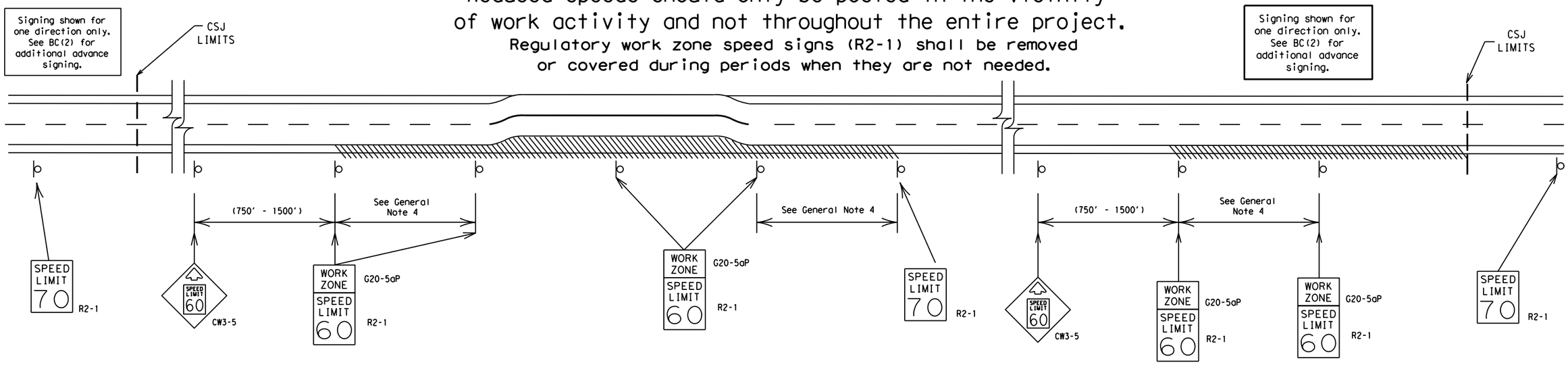
DATE:
FILE:

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
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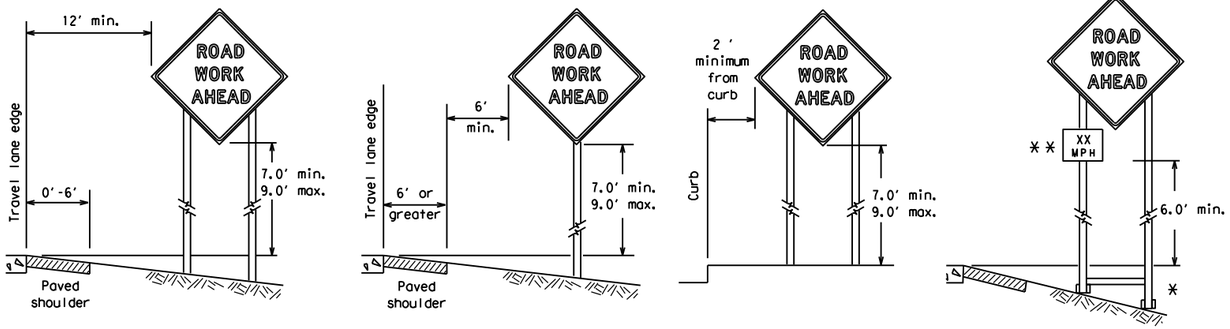
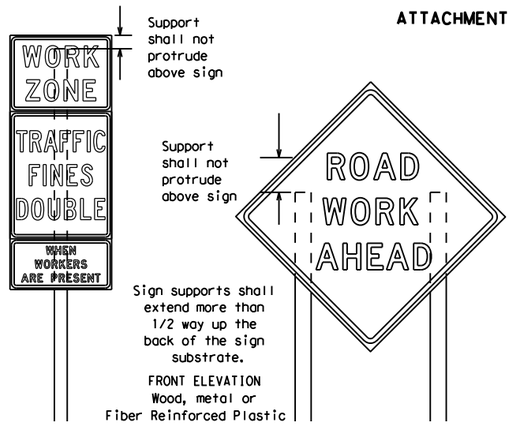
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

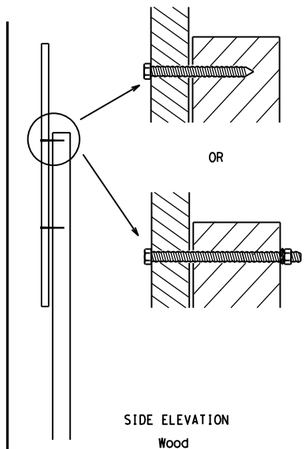


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





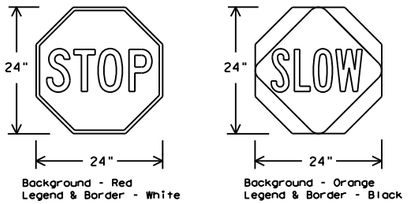
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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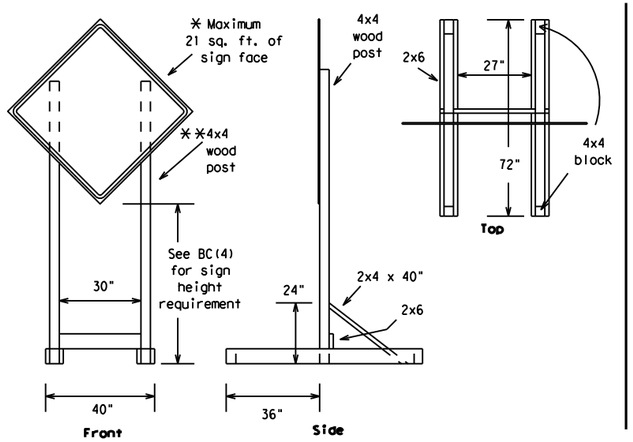
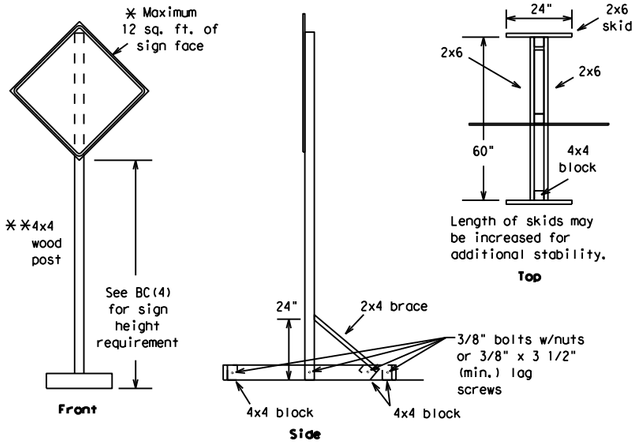
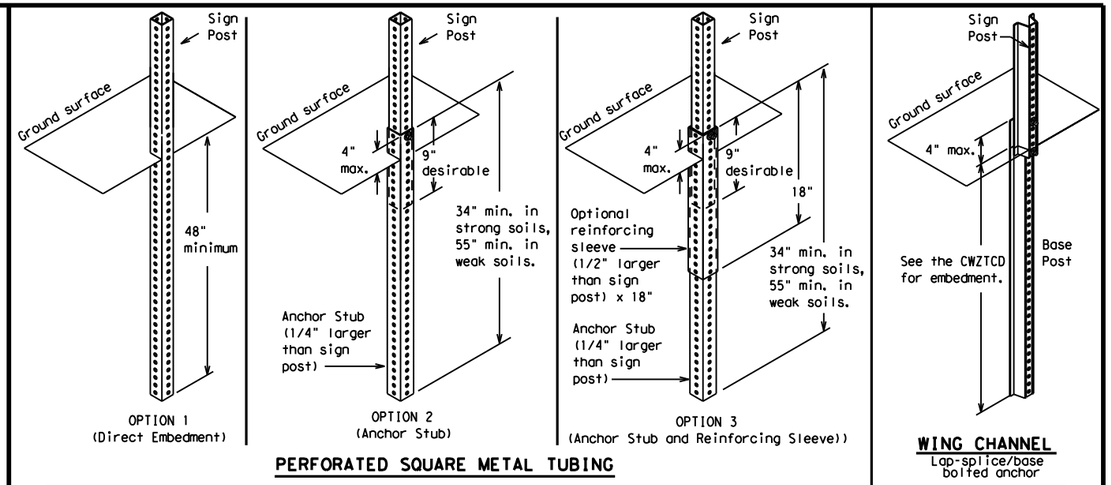




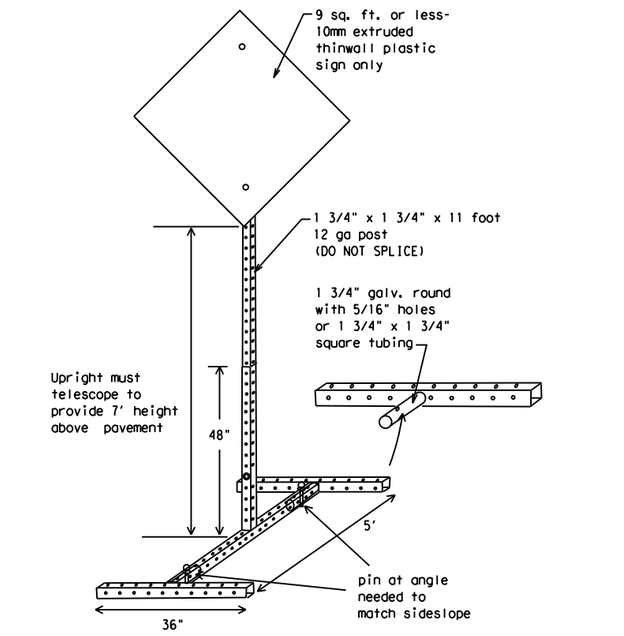
SKID MOUNTED WOOD SIGN SUPPORTS

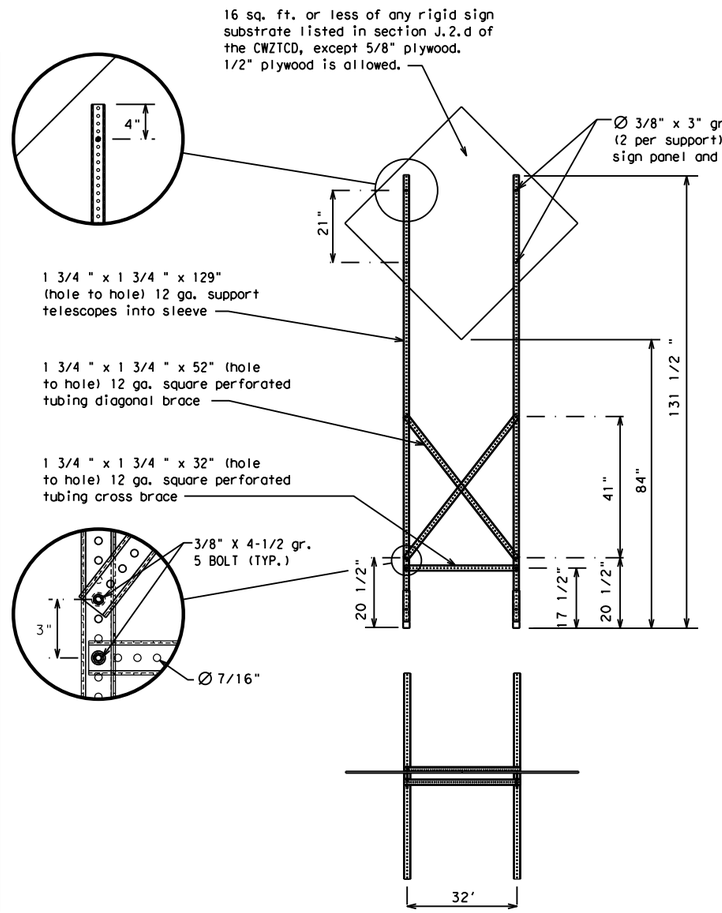
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

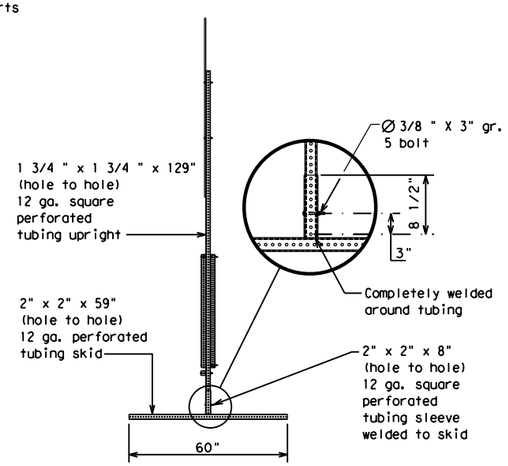


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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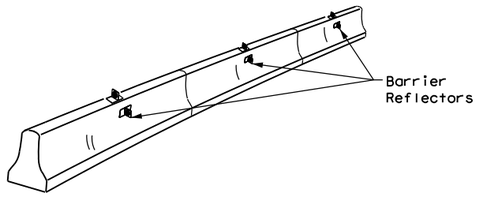
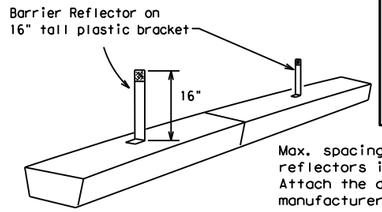
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

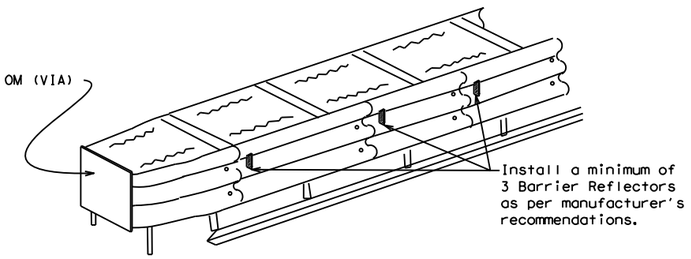


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.



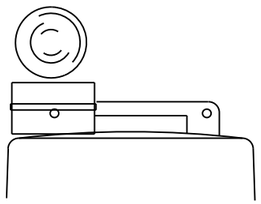
DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

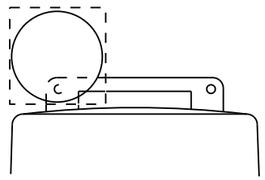
End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS



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

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

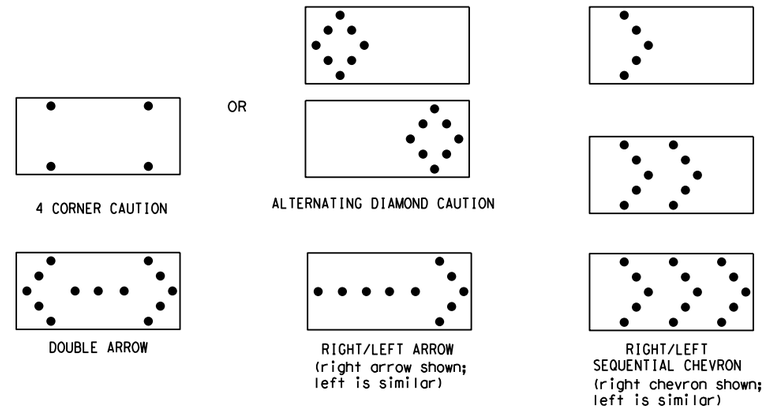
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0976	07	016	SH 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	12	GALVESTON		17

DATE:
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101

DATE:
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:

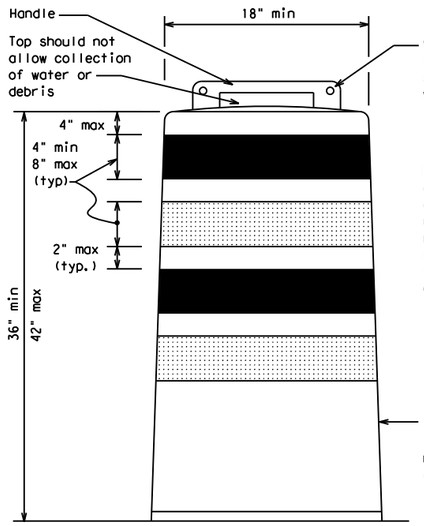
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

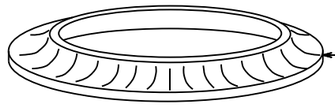
RETROREFLECTIVE SHEETING

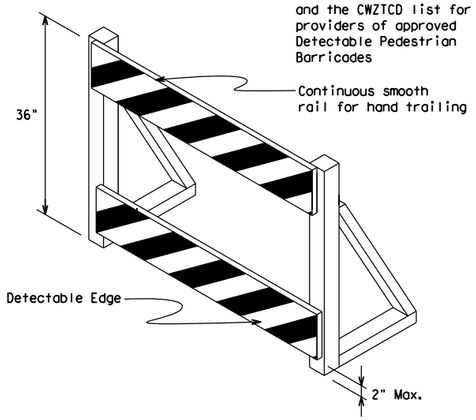
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

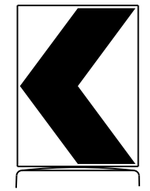




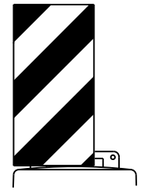


DETECTABLE PEDESTRIAN BARRICADES

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.

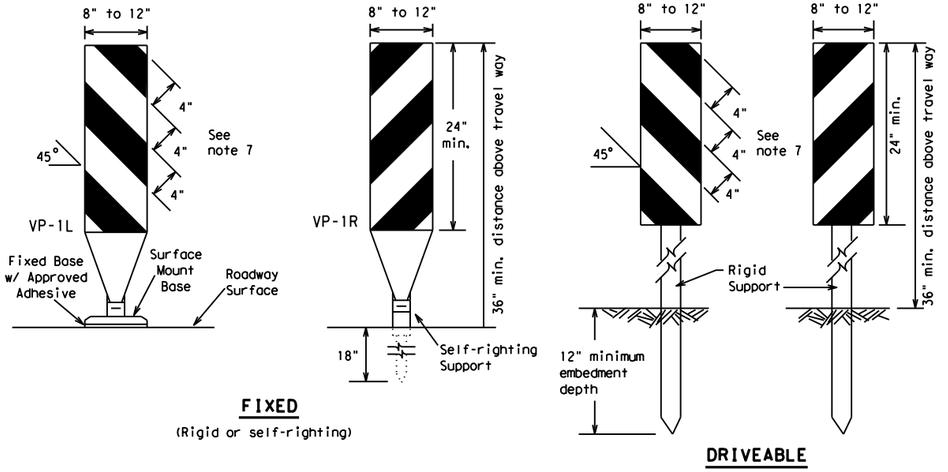
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

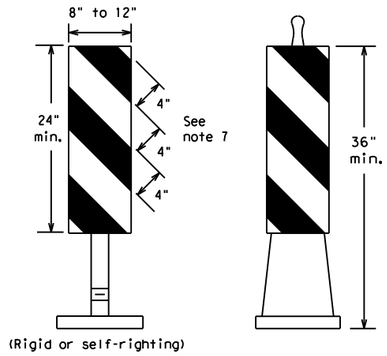
BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0976	07	016	SH 96
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	12	GALVESTON		18
7-13				



FIXED
(Rigid or self-righting)

DRIVEABLE

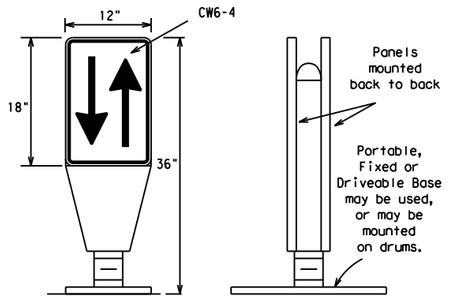


(Rigid or self-righting)

PORTABLE

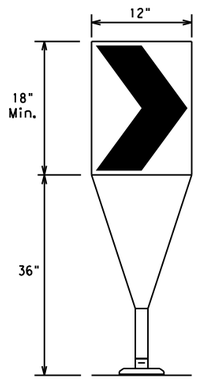
VERTICAL PANELS (VPs)

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)



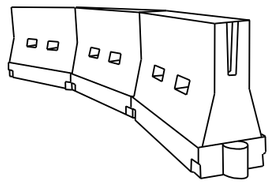
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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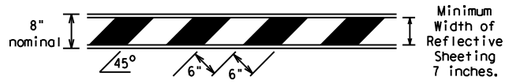
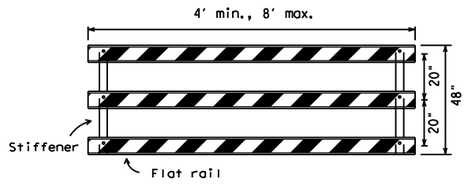
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



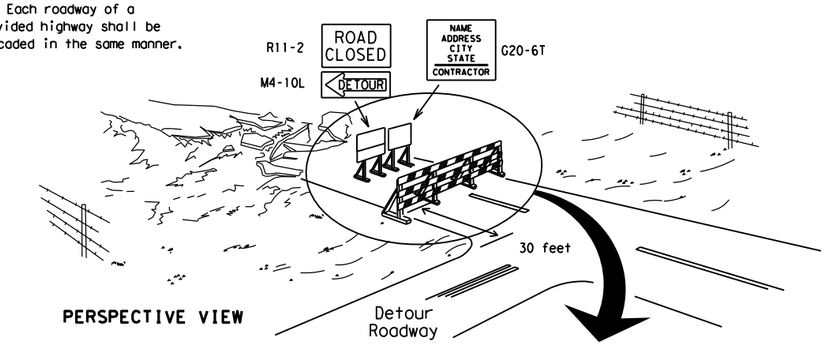
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

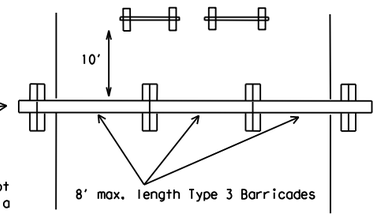
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

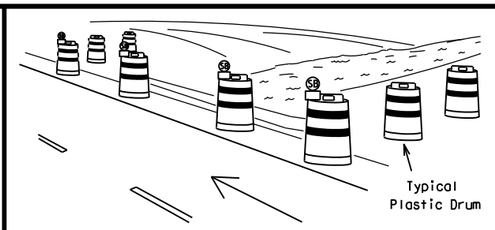
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

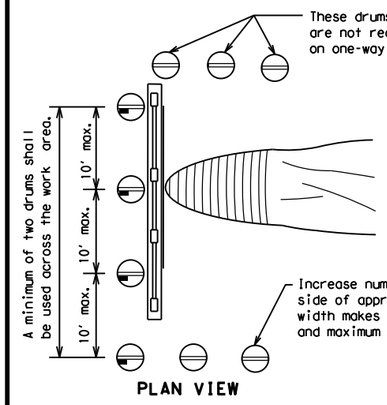
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

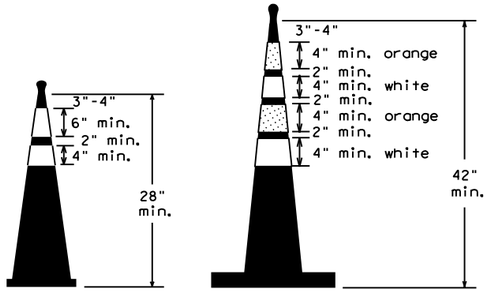
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



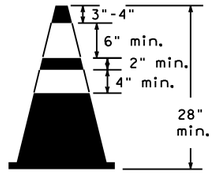
PLAN VIEW

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

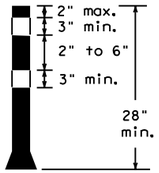
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

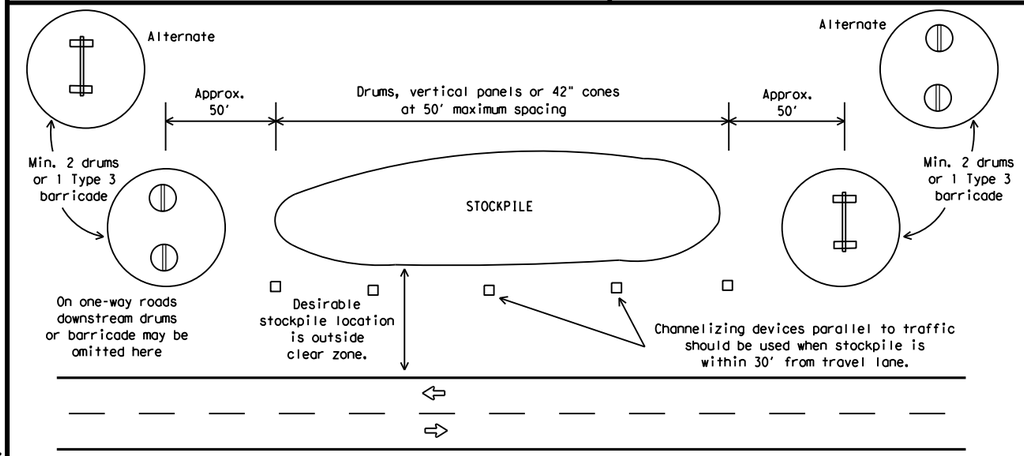


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

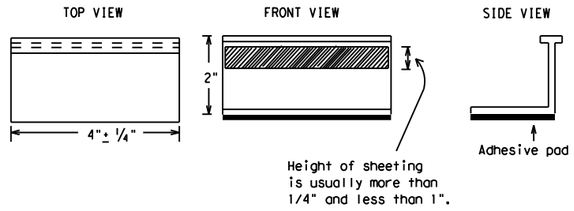
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

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Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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11-02 8-14				

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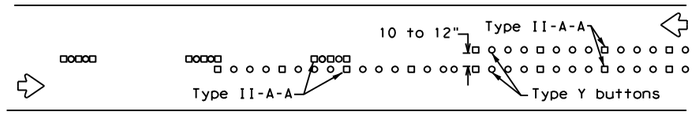
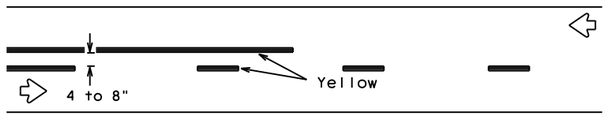
PAVEMENT MARKING PATTERNS

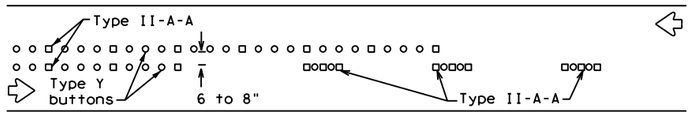
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



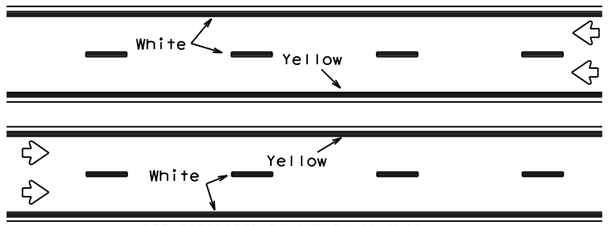
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



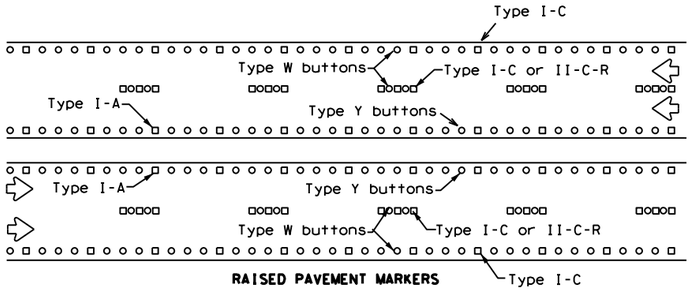
RAISED PAVEMENT MARKERS - PATTERN B

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

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



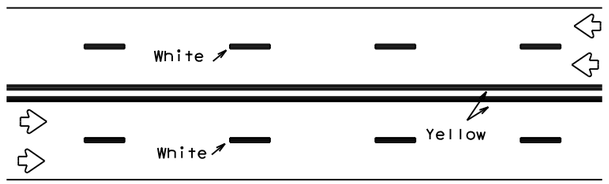
REFLECTORIZED PAVEMENT MARKINGS



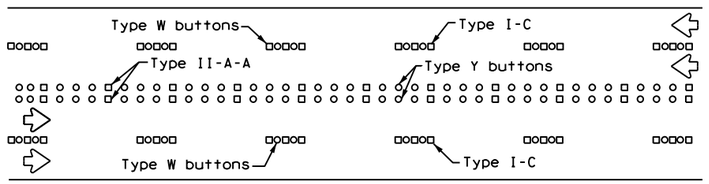
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



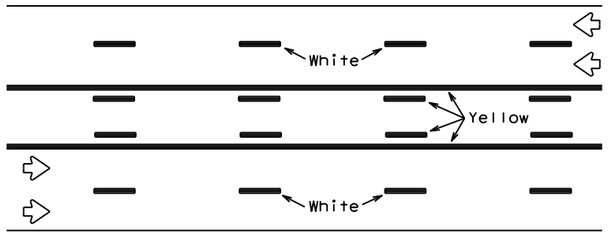
REFLECTORIZED PAVEMENT MARKINGS



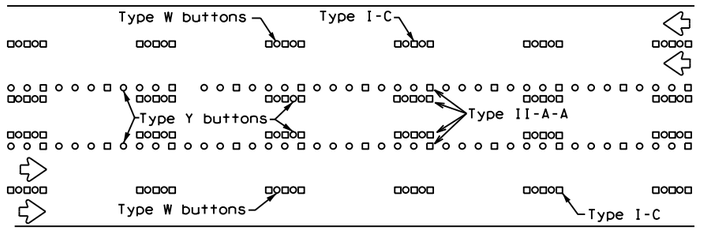
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

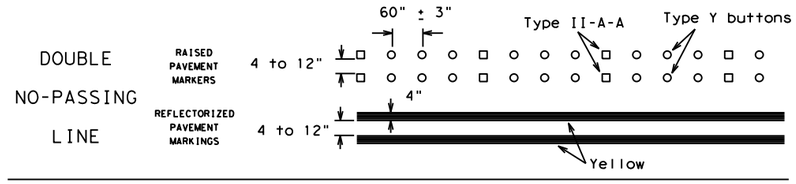
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

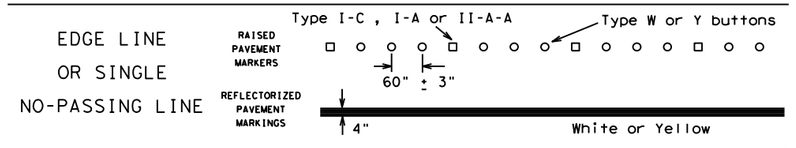
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

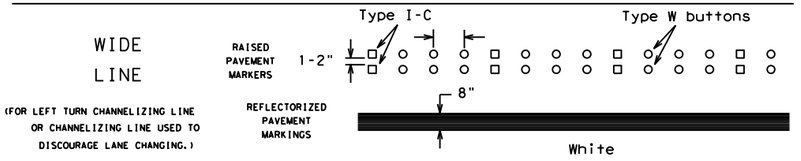


EDGE LINE OR SINGLE NO-PASSING LINE



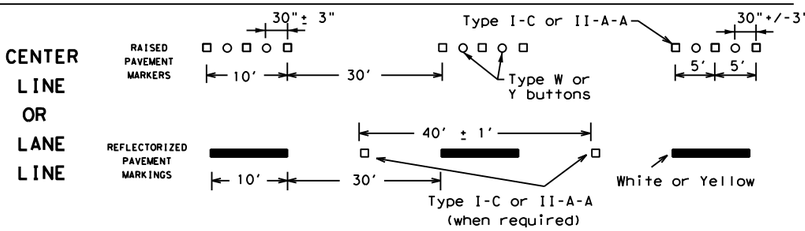
WIDE LINE

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

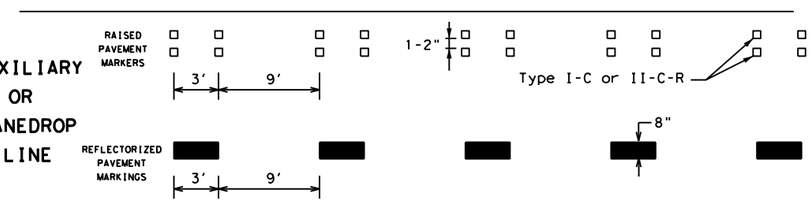


BROKEN LINES

CENTER LINE OR LANE LINE

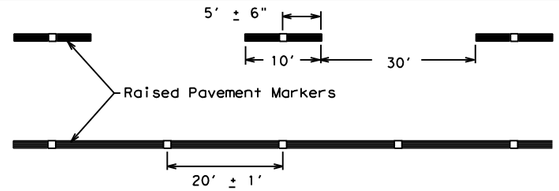


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

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BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0976	07	016	SH 96
	DIST	COUNTY		SHEET NO.
	12	GALVESTON		22

DATE:
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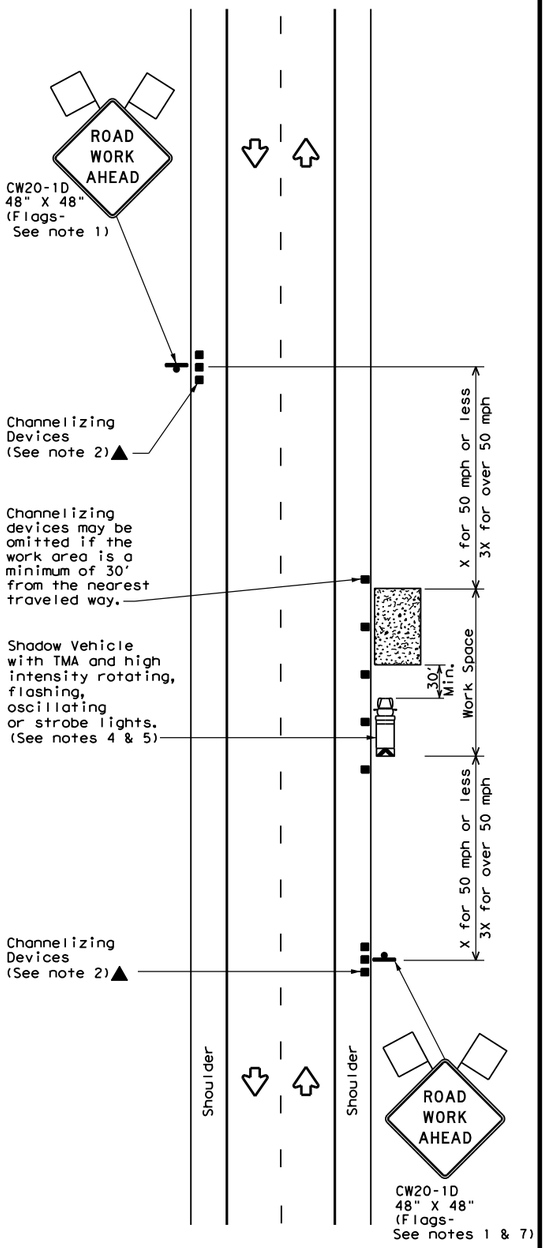
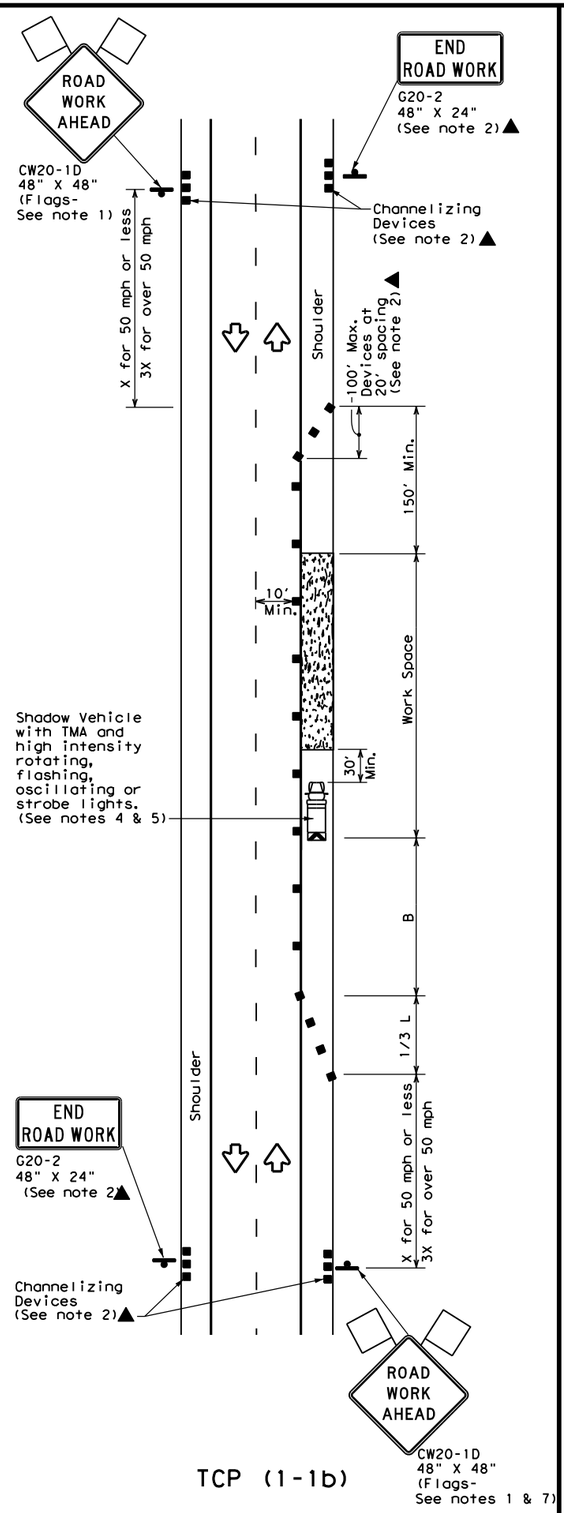


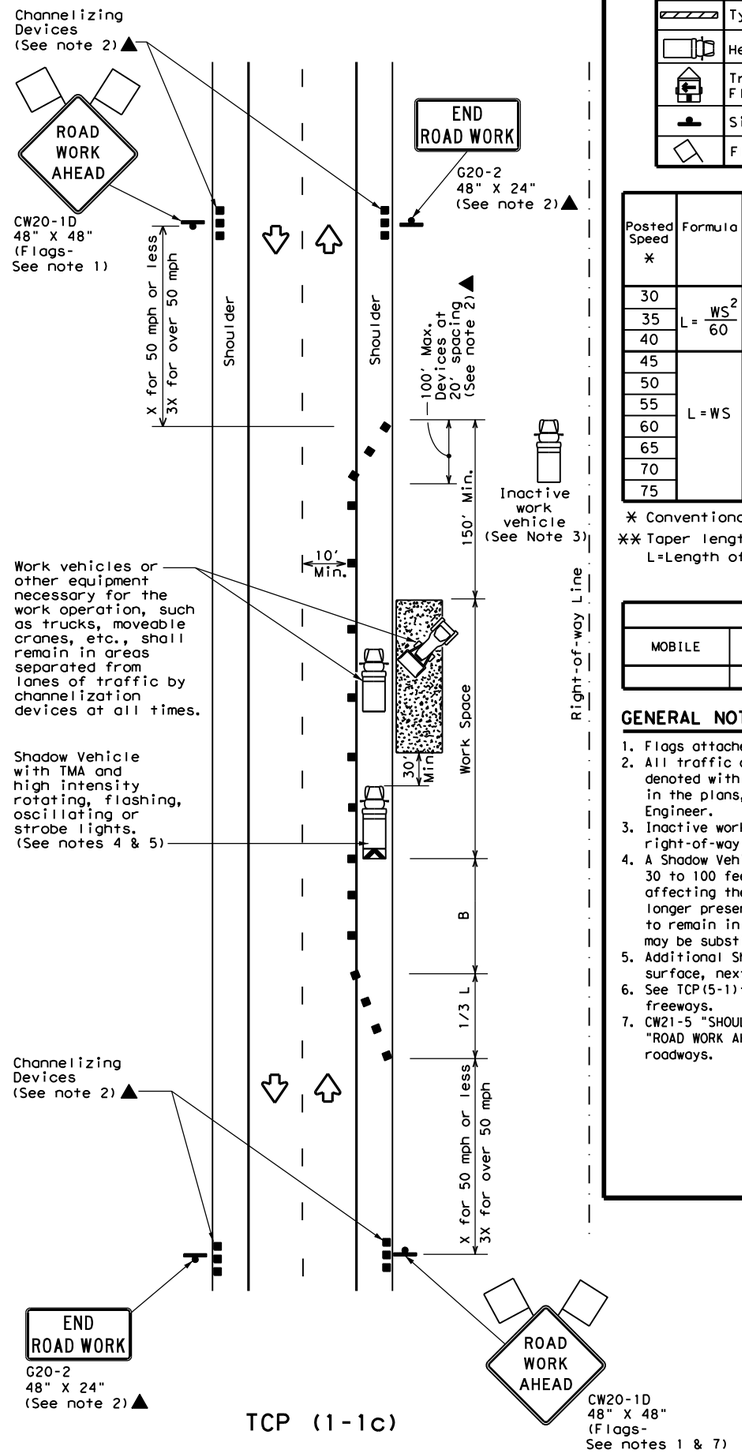
TCP (1-1a)

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:
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REVISIONS 2-94 4-98	0976	07	016	SH 96
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	HOU	GALVESTON		23

DATE:
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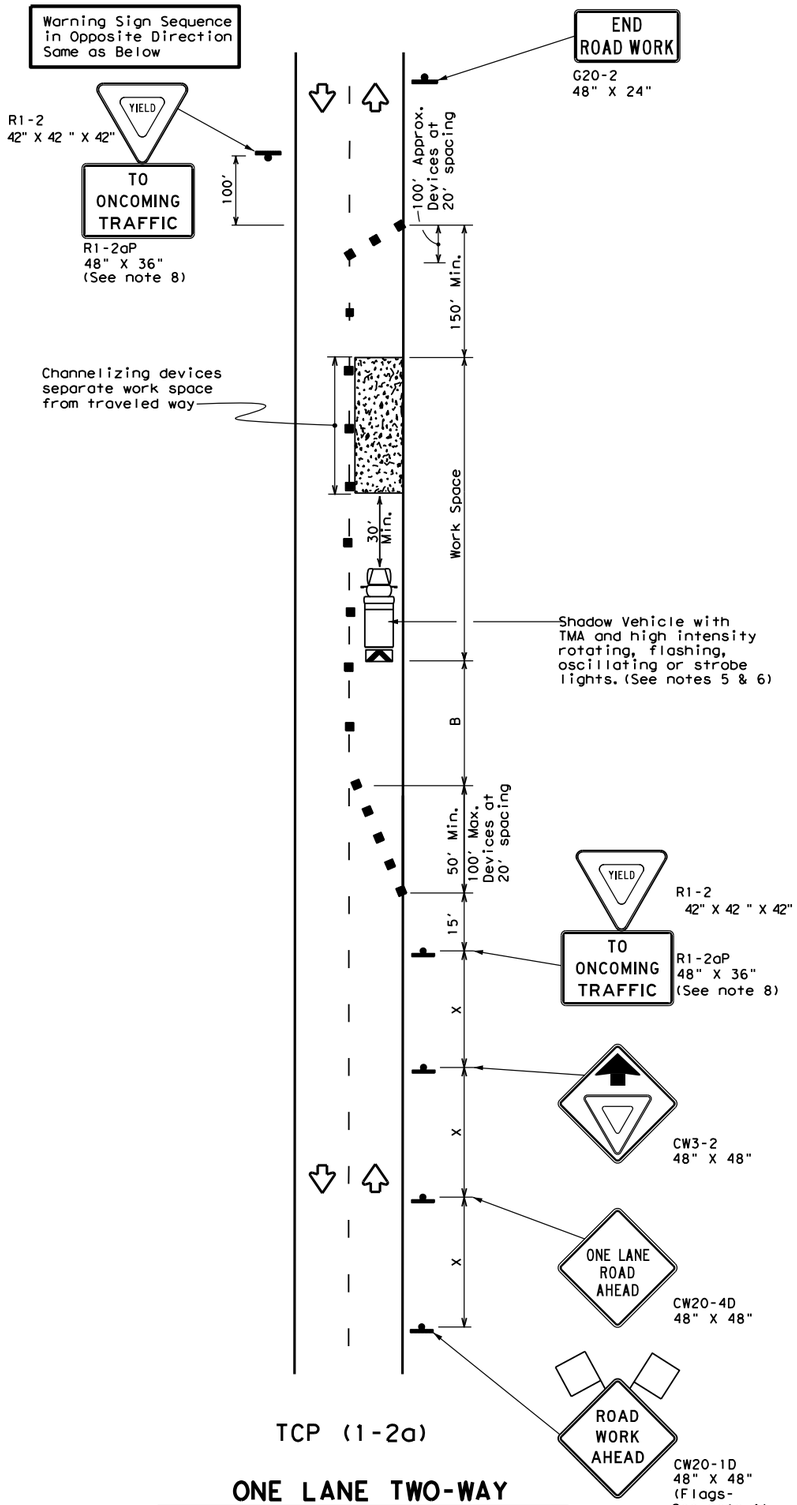
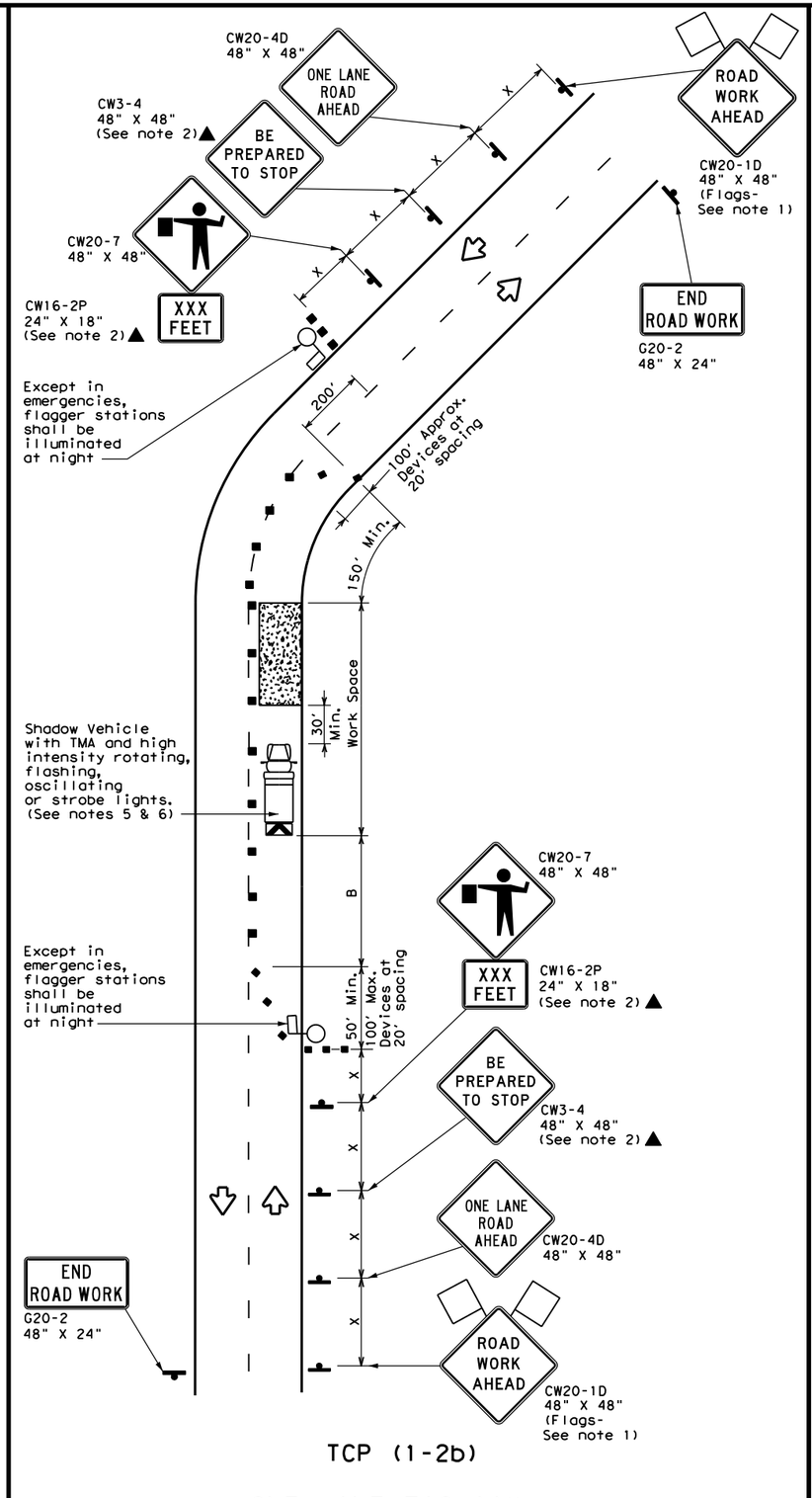


TCP (1-2a)

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 4-90 4-98	0976	07	016	SH 96
2-94 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	HOU	GALVESTON		24

DATE:
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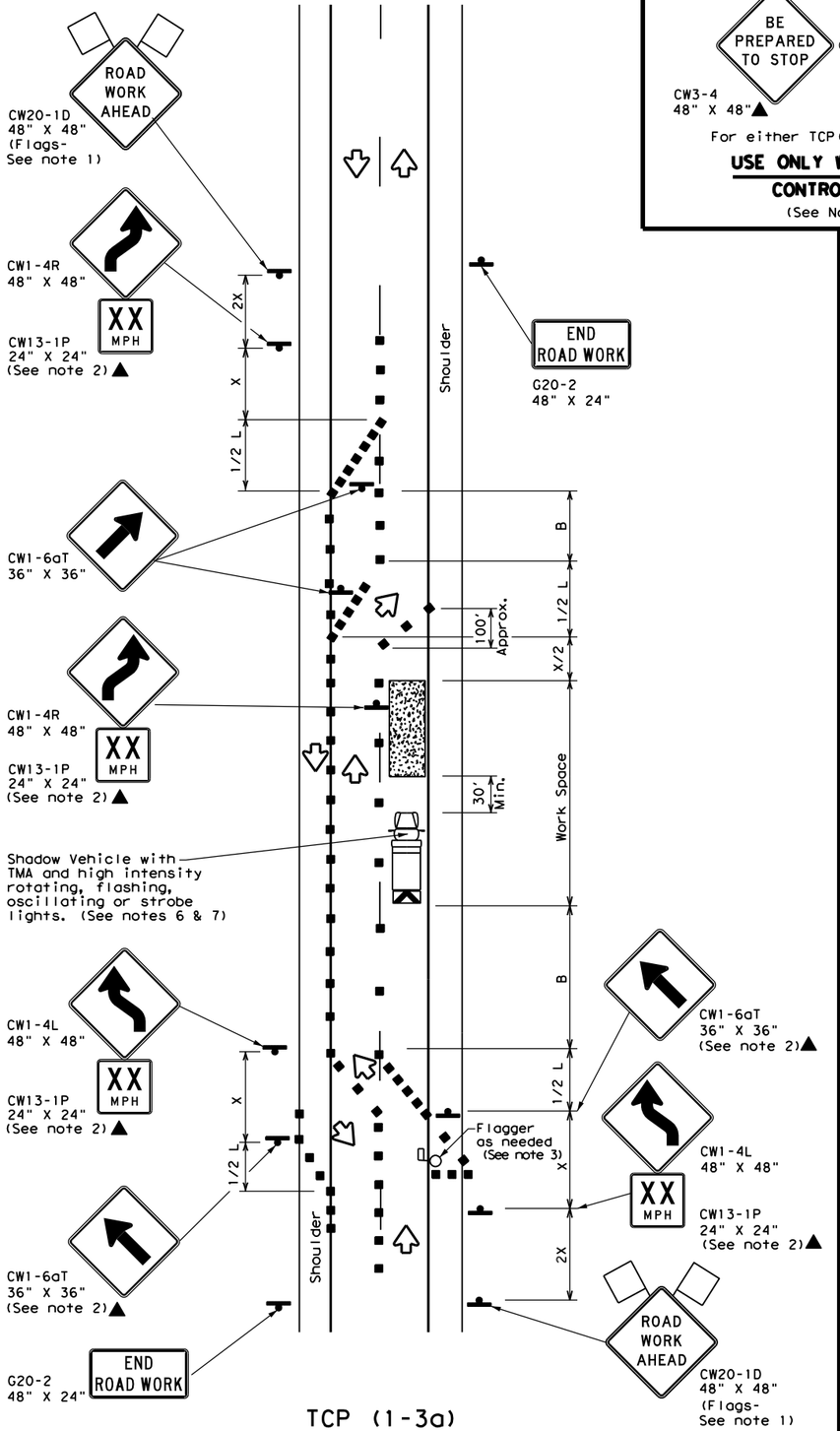


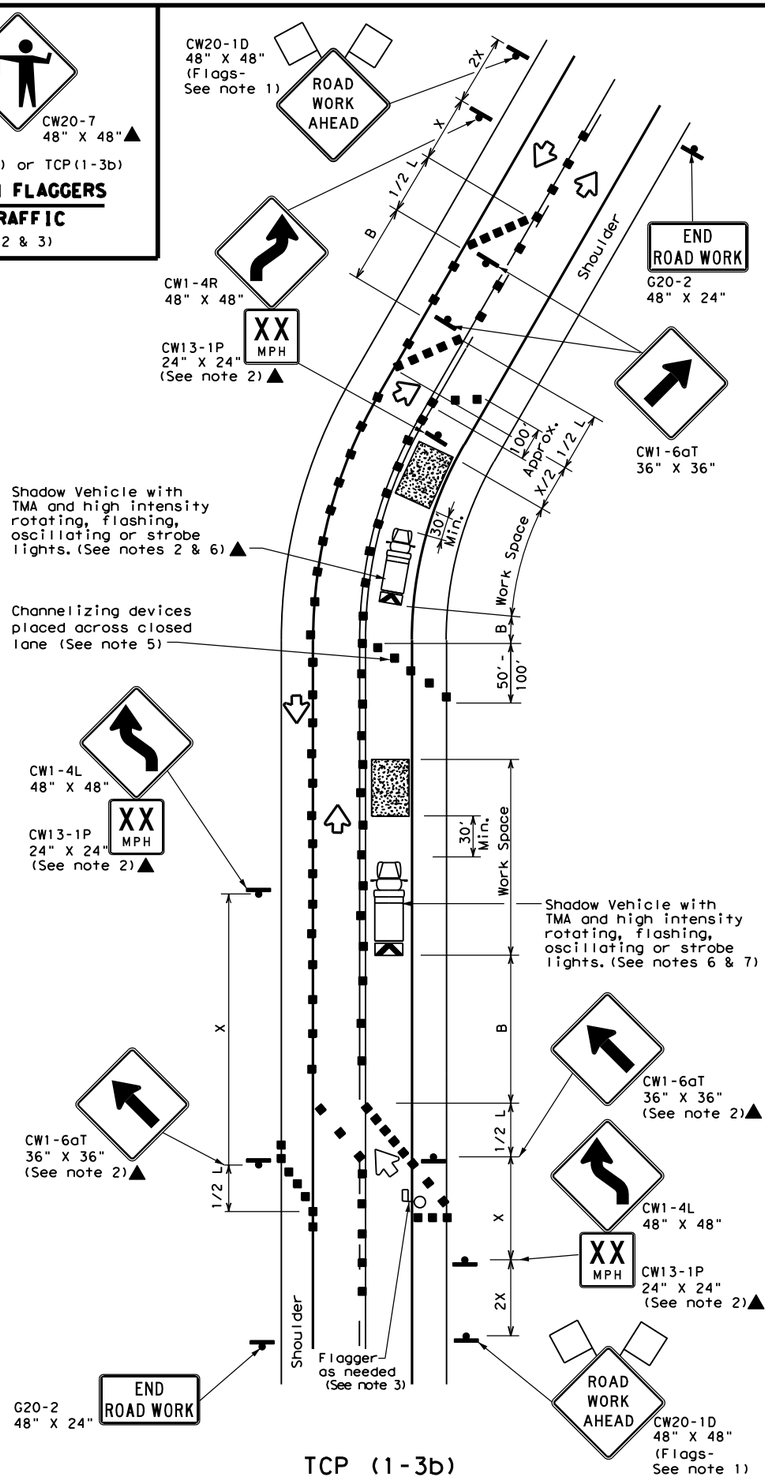
TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

BE PREPARED TO STOP
CW3-4 48" X 48"
CW20-7 48" X 48"

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

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC
(See Notes 2 & 3)



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

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	HOU	GALVESTON		25
1-97 2-18				

153

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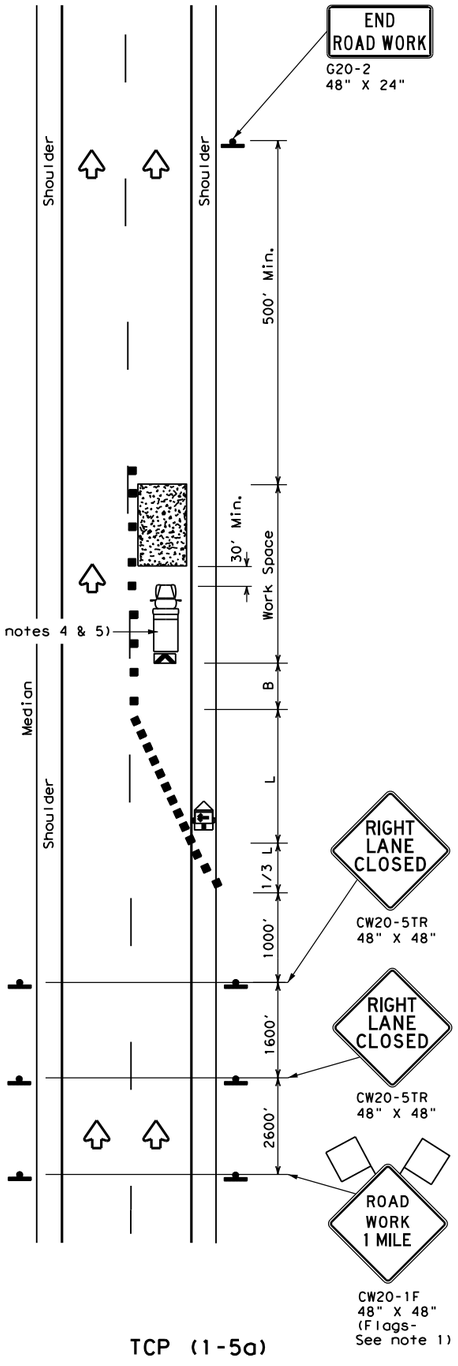
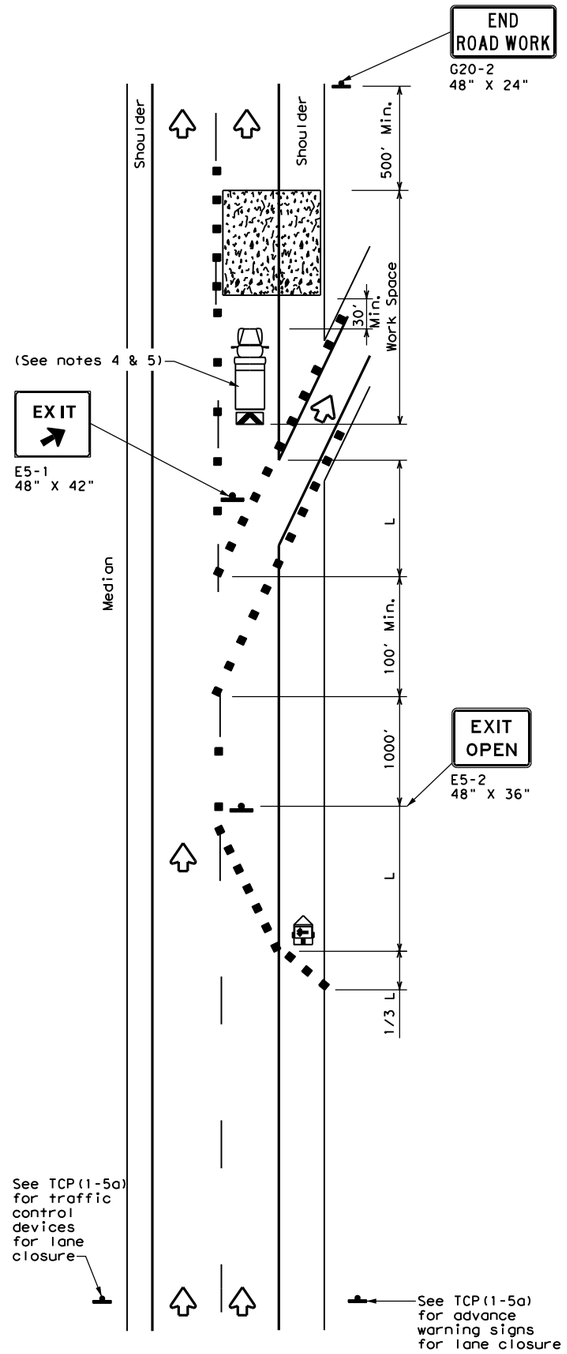


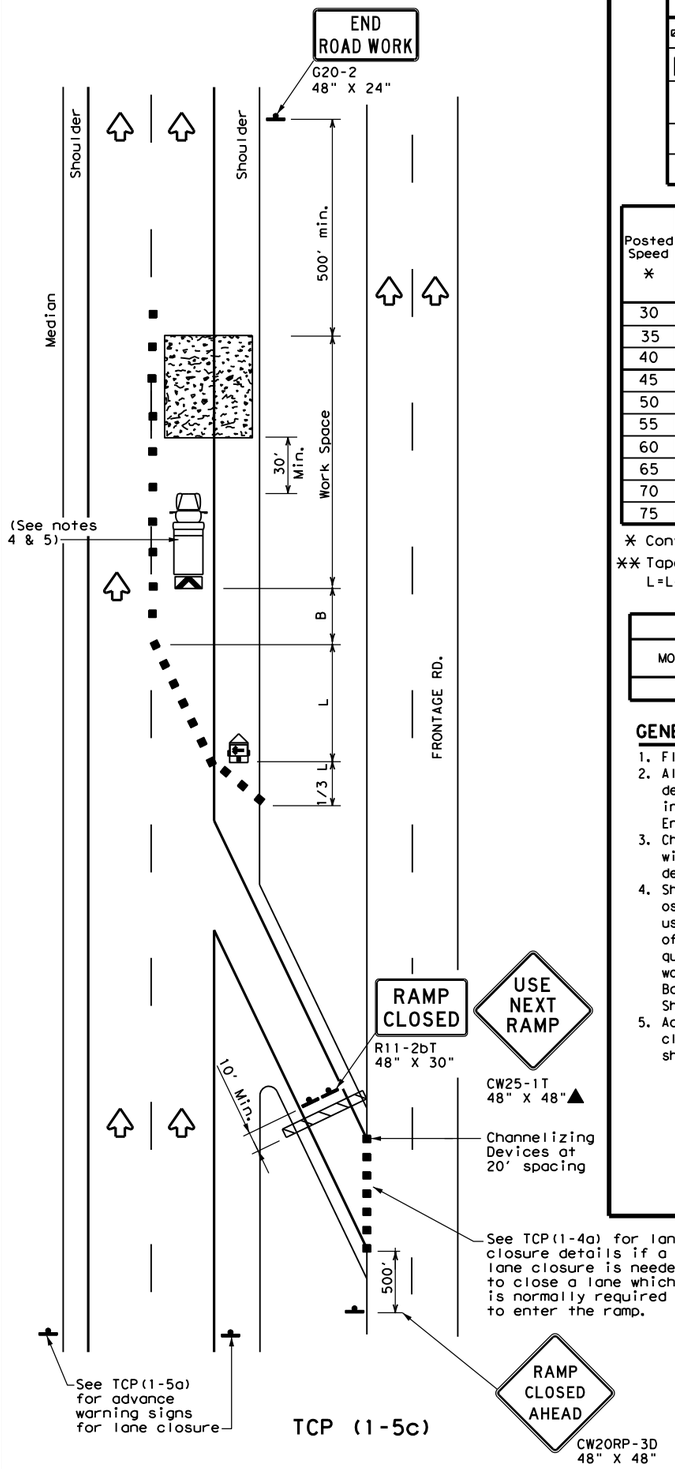
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
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 in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0976	07	016	SH 96
	DIST	COUNTY		SHEET NO.
	HOU	GALVESTON		26

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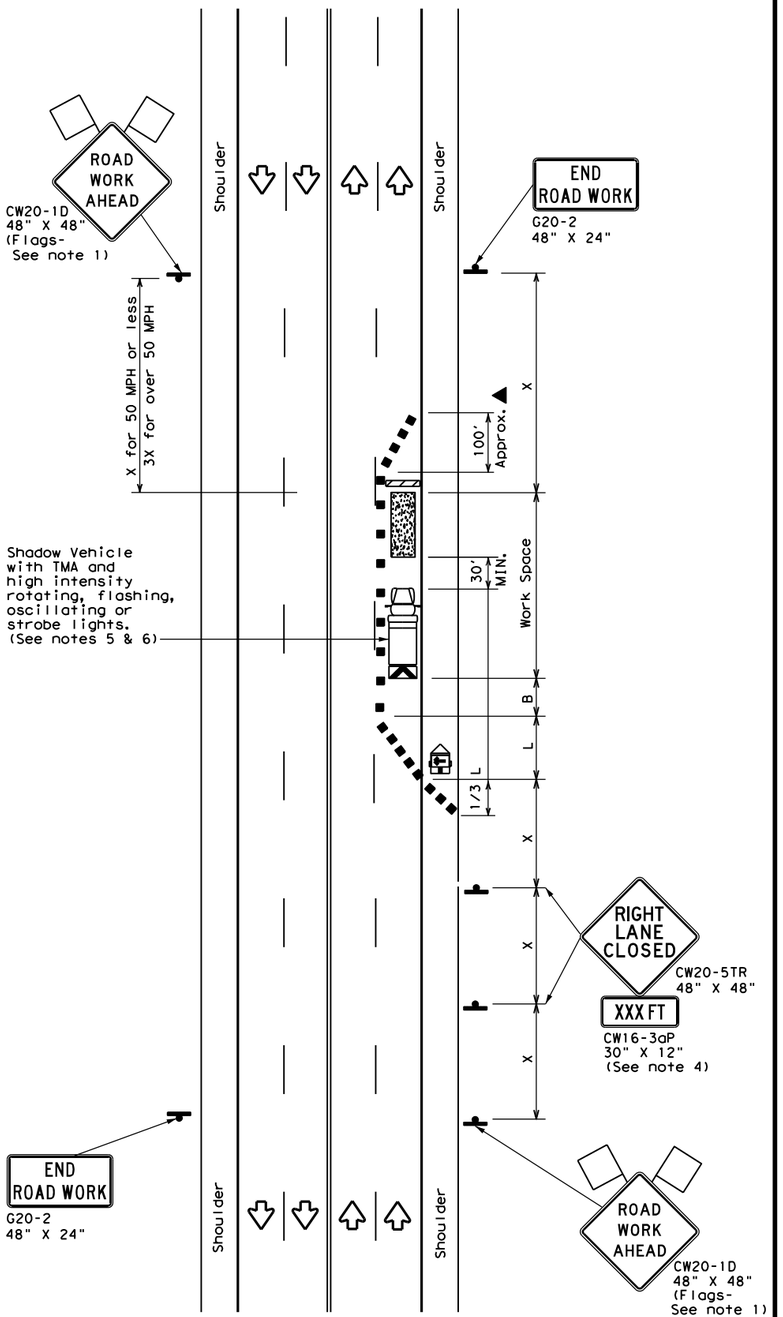
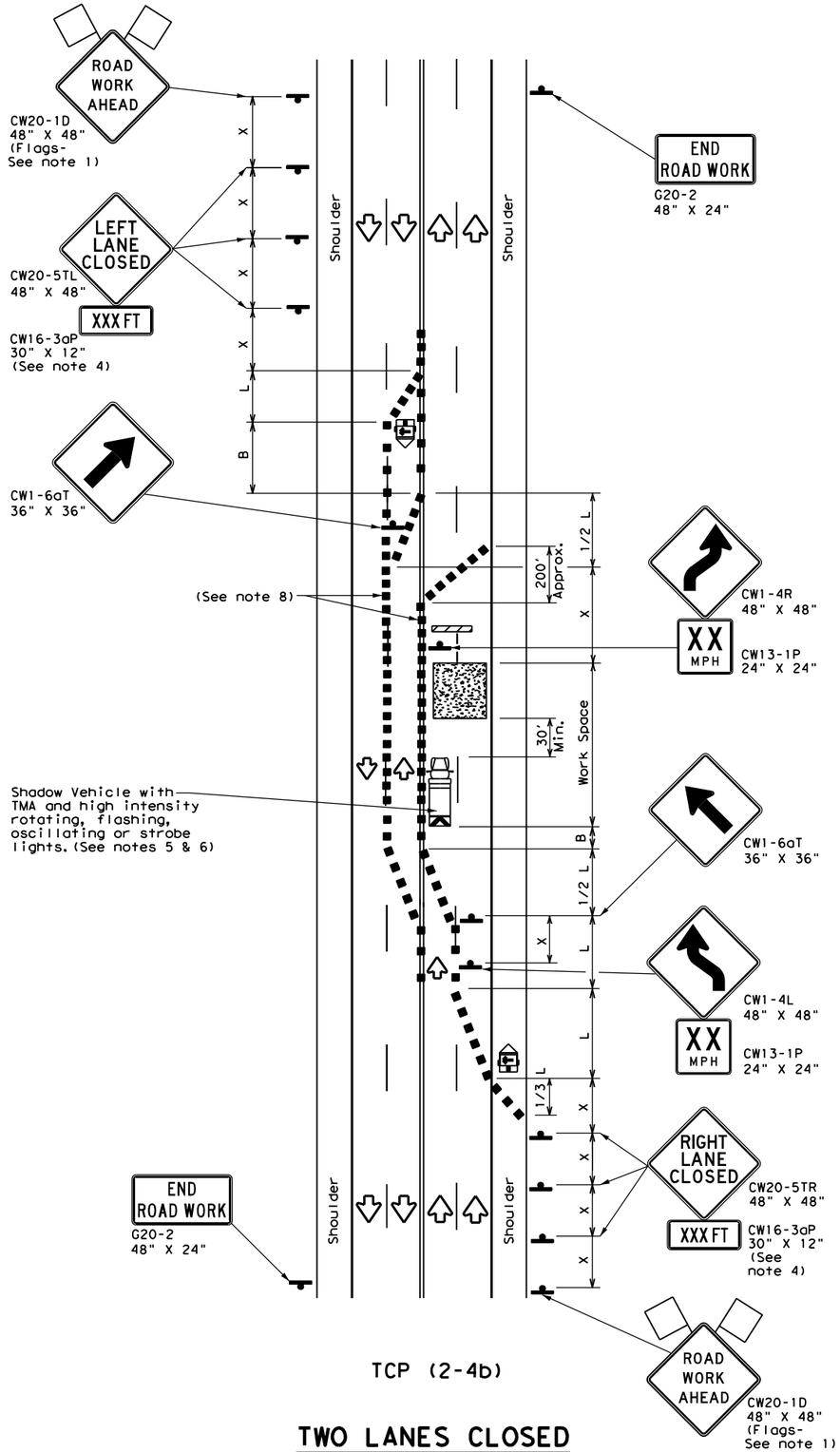


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
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REVISIONS 8-95 3-03	0976	07	016	SH 96
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	HOU	GALVESTON		27

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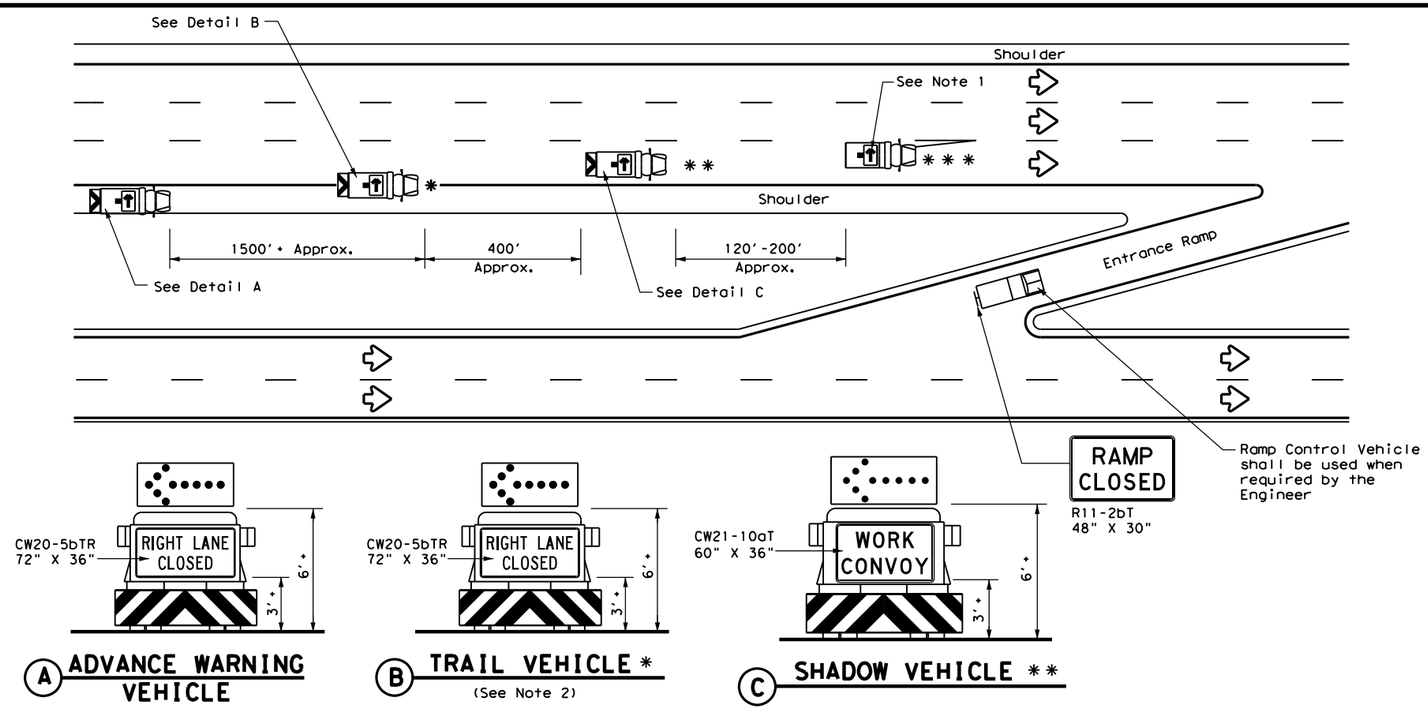
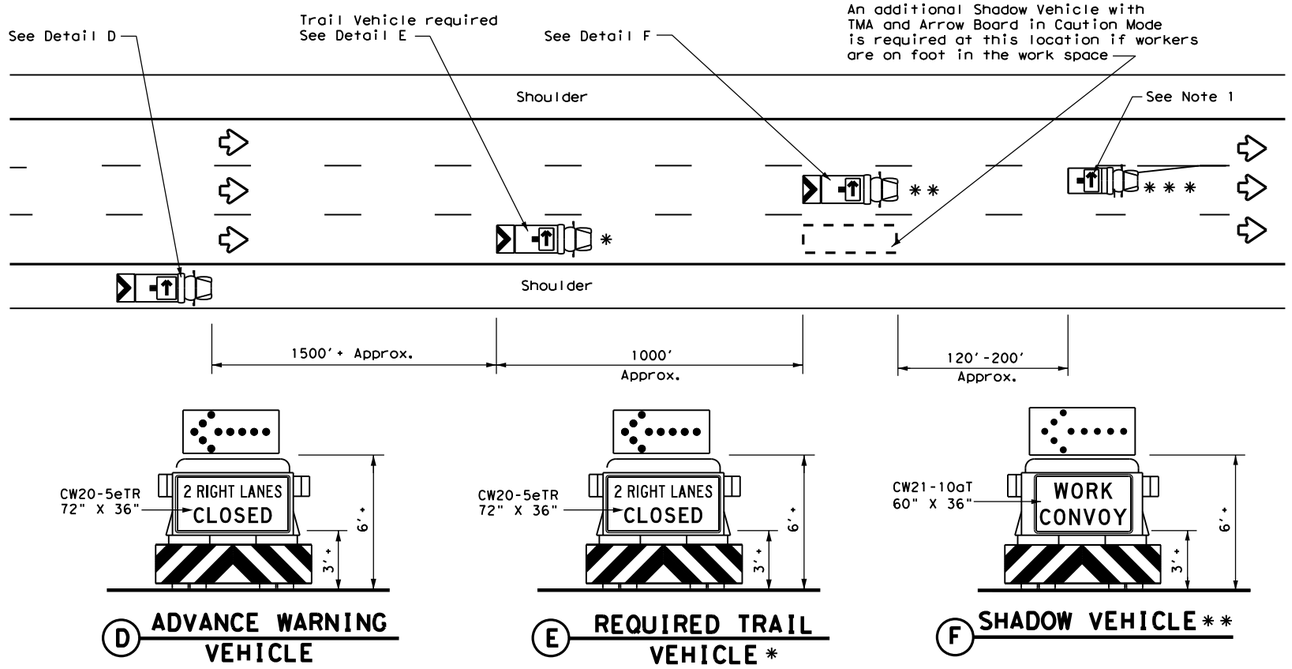


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



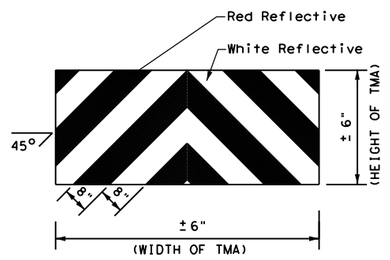
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

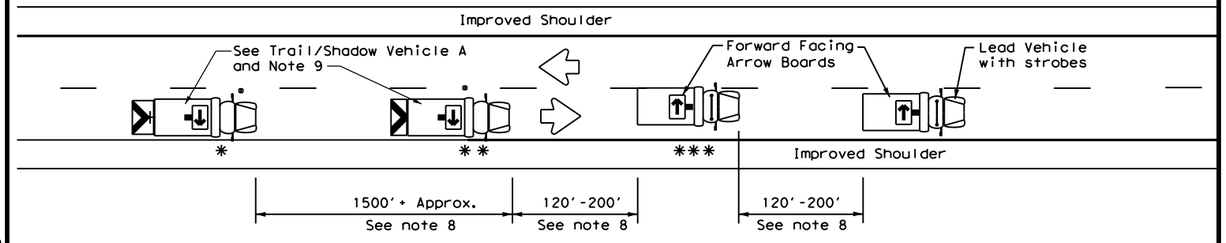
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

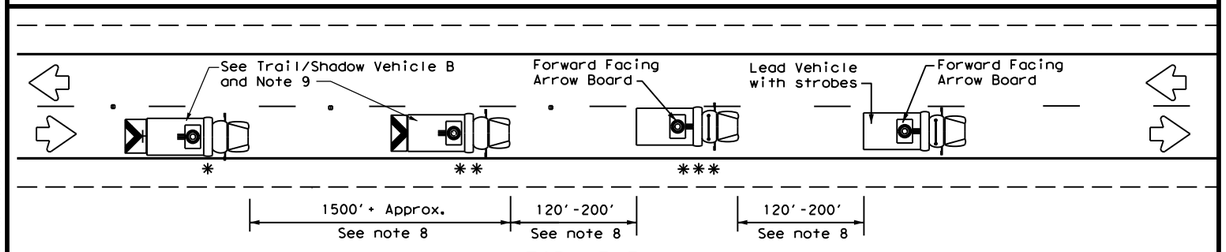
FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0976	07	016	SH 96
	DIST	COUNTY		SHEET NO.
	HOU	GALVESTON		28

176



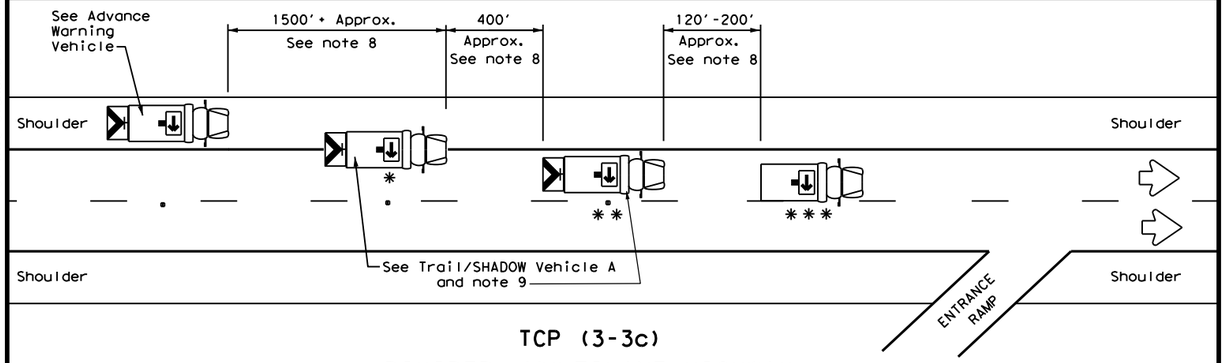
TCP (3-3a)

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



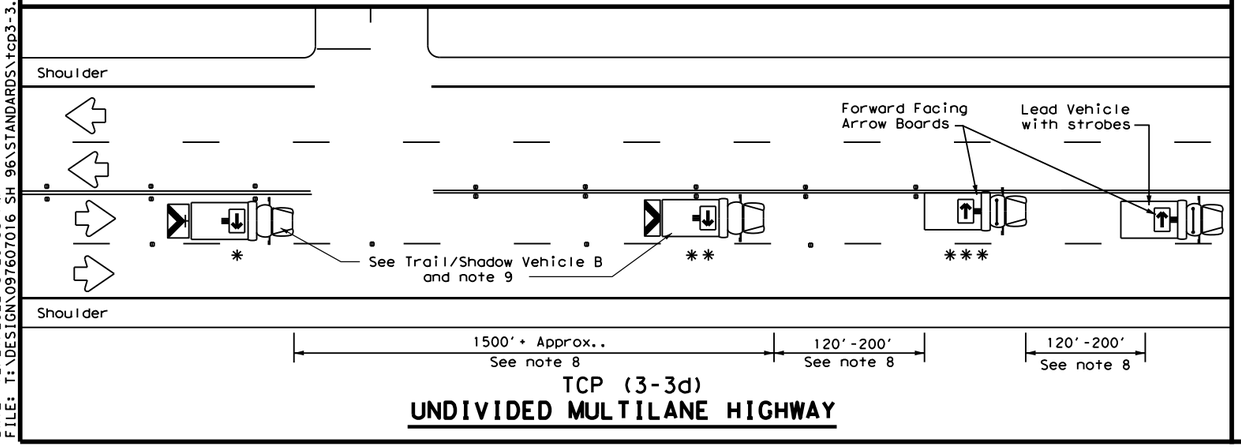
TCP (3-3b)

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



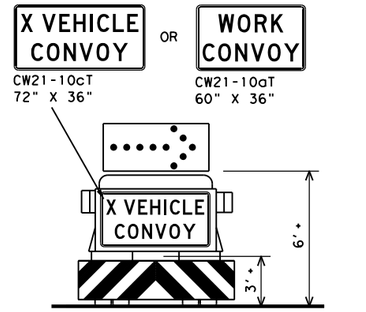
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



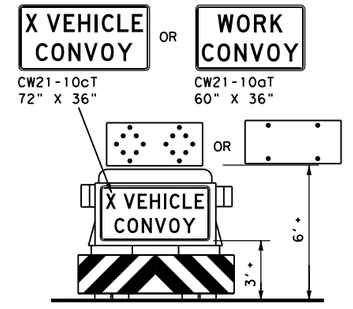
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



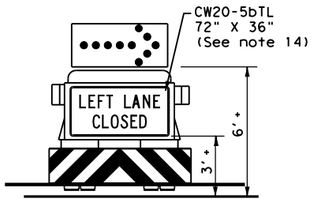
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

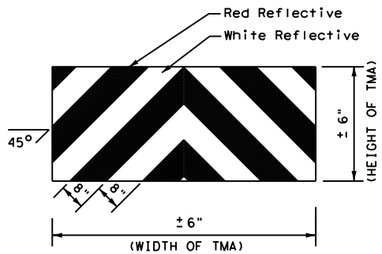


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0976	07	016	SH 96
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	HOU	GALVESTON		29
1-97 7-14				

DATE: 12/27/2022 3:20:33 PM
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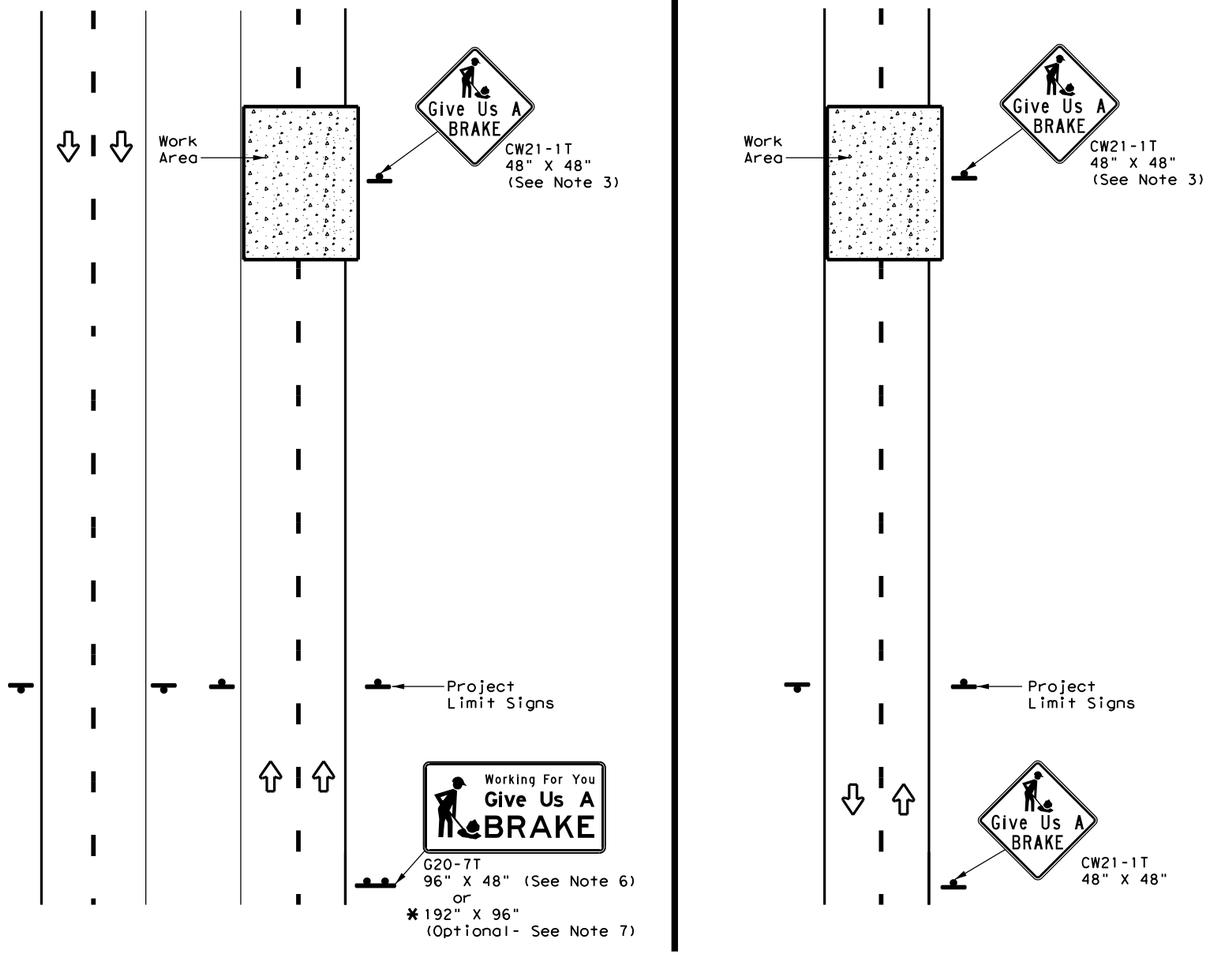

DIVIDED HIGHWAY

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	0916	07	016	SH 96
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	BRY	GALVESTON		30

116

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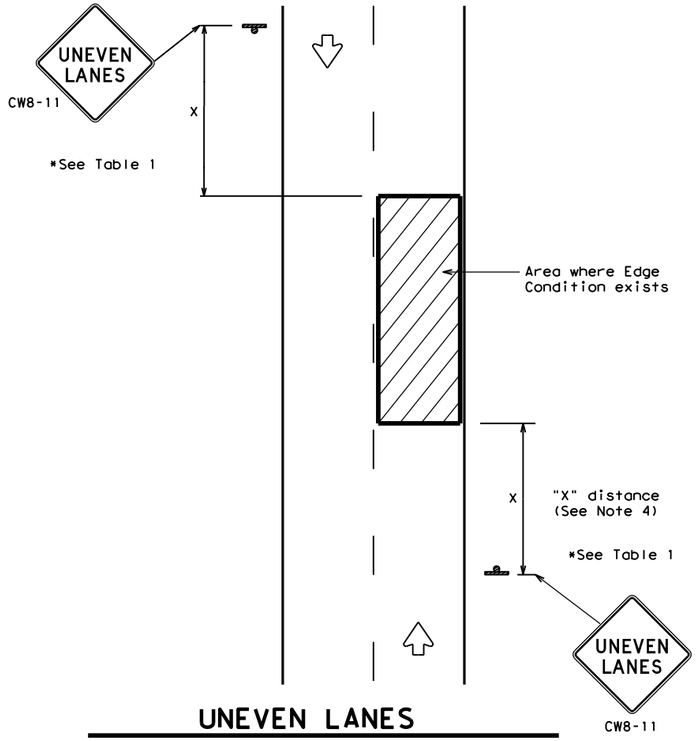
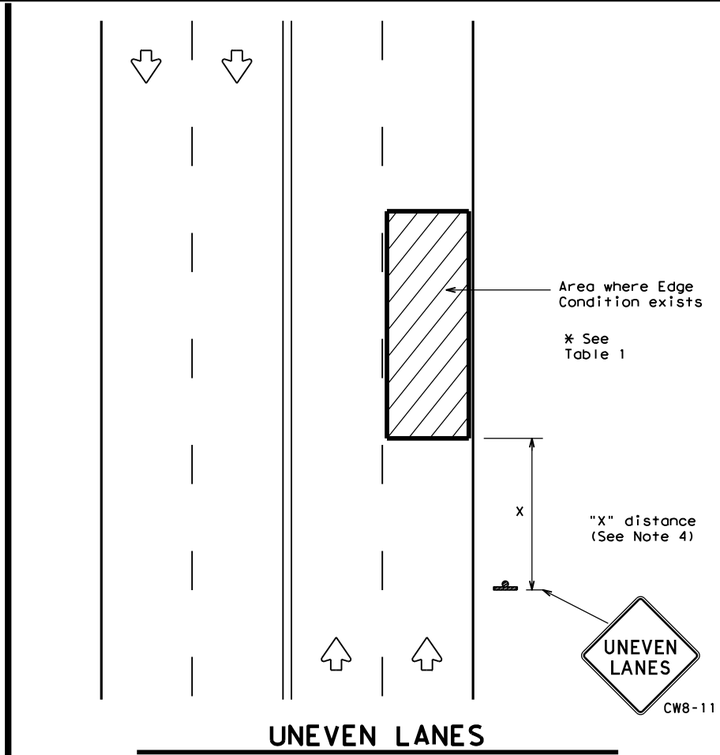
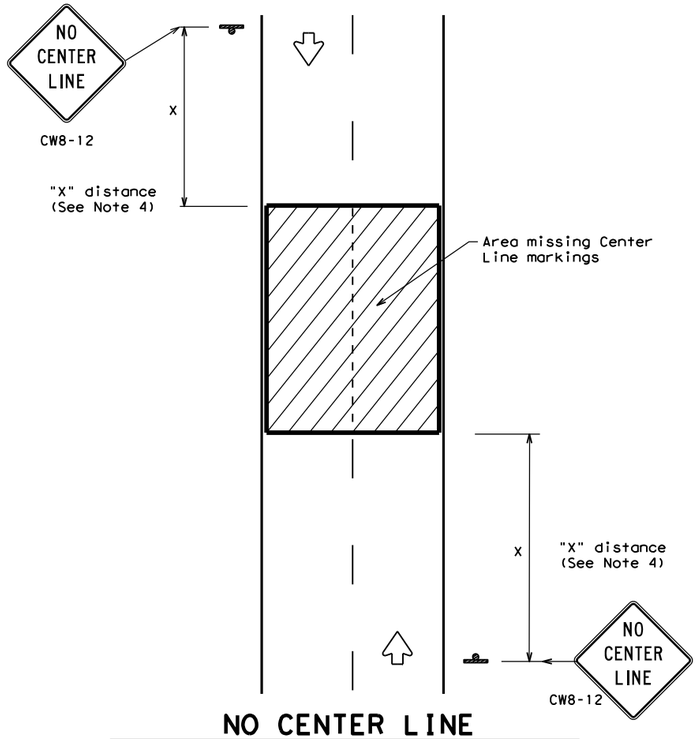


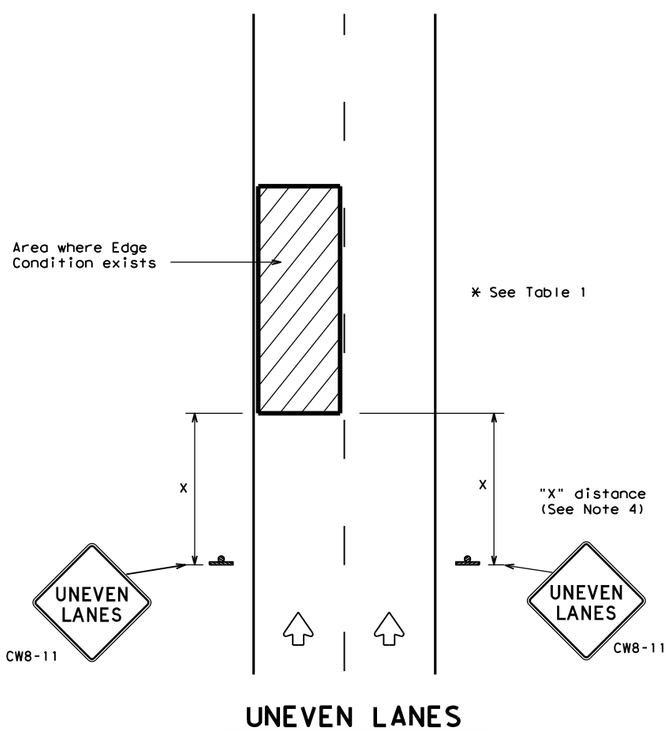
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

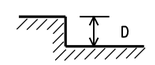
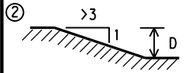
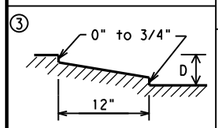
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE:	wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
	REVISIONS	0976	07	016	SH 96
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		HOU	GALVESTON		31

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: 6001 10BWG (1) SA (P) EA	6002 10BWG (1) SA (P-BM) EA	6004 10BWG (1) SA (T) EA	6005 10BWG (1) SA (T-2EXT) EA	6006 10BWG (1) SA (U) EA	6017 10BWG (2) SA (P) EA	6019 10BWG (2) SA (T-2EXT) EA	6027 S80 (1) SA (P) EA	6040 S80 (1) SA (P-BM) EA	6030 S80 (1) SA (T) EA	6031 S80 (1) SA (T-2EXT) EA	6033 S80 (1) SA (U) EA	6034 S80 (1) SA (U-1EXT) EA	6035 S80 (1) SA (U-2EXT) EA	6036 S80 (1) SA (U-BM) EA	6037 S80 (1) SA (U-WC) EA	6050 S80 (2) SA (P) EA	6052 S80 (2) SA (T-2EXT) EA
1		R5-1	DO NOT ENTER	36 X 36		✓																		
		R5-1	DO NOT ENTER	36 X 36		✓																		
		M3-3	SOUTH	24 X 12		✓																		
		M1-6T	TEXAS 3	24 X 24		✓																		
		M3-4	WEST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24		✓																		
		M6-3	THROUGH ARROW	21 X 15		✓																		
		M3-1	NORTH	24 X 12		✓																		
		M1-6T	TEXAS 3	24 X 24		✓																		
		R5-1A	WRONG WAY	42 X 30		✓																		
		R5-1A	WRONG WAY	42 X 30		✓																		
		M3-2B	EAST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24		✓																		
		R2-1	SPEED LIMIT 45	30 X 36		✓																		
2		M2-1	JCT	21 X 15		✓																		
		M1-6T	TEXAS 3	24 X 24		✓																		
		W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 X 36		✓																		
3		R5-1	DO NOT ENTER	36 X 36		✓																		
		R5-1	DO NOT ENTER	36 X 36		✓																		
		R1-1	STOP	36 X 36		✓																		
		R5-1A	WRONG WAY	42 X 30		✓																		
		R5-1A	WRONG WAY	42 X 30		✓																		
		R2-1	SPEED LIMIT 45	30 X 36		✓																		
		W8-23	NO SHOULDER AHEAD	36 X 36		✓																		
4		W3-1A	STOP AHEAD	30 X 30		✓																		
		E5-1	EXIT	TBD		✓																		
		W13-2	EXIT 35 MPH	24 X 30		✓																		
5		D1-2R	DICKINSON RD	VARIES X 30		✓																		
		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																		
		M2-2B	EAST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24		✓																		
		R2-1	SPEED LIMIT 45	30 X 36		✓																		
		R3-7R	RIGHT LANE MUST TURN RIGHT	36 X 36		✓																		
6		R2-1	SPEED LIMIT 45	30 X 36		✓																		
		R3-7R	RIGHT LN MUST TURN RT	36 X 36		✓																		
		R2-1	SPEED LIMIT 50	30 X 36		✓																		
7		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																		
8			N/A			✓																		
9		R2-1	SPEED LIMIT 50	30 X 36		✓																		
		M3-4	WEST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24		✓																		
		M2-1	JCT	21 X 15		✓																		
10		R2-1	YIELD	48 X 48		✓																		
		R3-7R	RIGHT LANE MUST TURN RIGHT	36 X 36		✓																		
		R1-2	YIELD	48 X 48		✓																		
		M3-2	EAST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24																				
		M6-1L	LEFT ARROW	21 X 15		✓																		
		M3-4	WEST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24		✓																		
		M6-1R	RIGHT ARROW	21 X 15		✓																		
		M3-4	WEST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24		✓																		
		M6-1L	LEFT ARROW	21 X 15		✓																		
		M3-2	EAST	24 X 12		✓																		
		M1-6T	TEXAS 96	24 X 24		✓																		
		M6-1R	RIGHT ARROW	21 X 15		✓																		
		R1-2	YIELD	48 X 48		✓																		
		M3-1	NORTH	24 X 12		✓																		
		M1-6T	RANCH ROAD FM 270	24 X 24		✓																		
		M1-6L	LEFT ARROW	21 X 15		✓																		
		M3-3	SOUTH	24 X 12		✓																		
		M1-6T	RANCH ROAD FM 270	24 X 24		✓																		
		M1-6R	RIGHT ARROW	36 X 36		✓																		
		R1-2	YIELD	48 X 48		✓																		
		M3-3	SOUTH	24 X 12		✓																		
		M1-6T	RANCH ROAD FM 270	24 X 24		✓																		
		M1-6L	LEFT ARROW	21 X 15		✓																		
		M3-1	NORTH	24 X 12		✓																		
		M1-6T	RANCH ROAD FM 270	24 X 24		✓																		
		M1-6R	RIGHT ARROW	21 X 15		✓																		

GENERAL NOTES:

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)

Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

SUMMARY OF SMALL SIGNS SH 96

 SHEET 1 OF 2

STATE DISTRICT	FEDERAL REGION	PROJECT NO.			SHEET
HOU	6	C 976 7 16			32
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
GALVESTON		0976	07	016	SH 96

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																		
							6001 10BWG (1) SA (P) EA	6002 10BWG (1) SA (P-BM) EA	6004 10BWG (1) SA (T) EA	6005 10BWG (1) SA (T-2EXT) EA	6006 10BWG (1) SA (U) EA	6017 10BWG (2) SA (P) EA	6019 10BWG (2) SA (T-2EXT) EA	6027 SB0 (1) SA (P) EA	6040 SB0 (1) SA (P-BM) EA	6030 SB0 (1) SA (T) EA	6031 SB0 (1) SA (T-2EXT) EA	6033 SB0 (1) SA (U) EA	6034 SB0 (1) SA (U-1EXT) EA	6035 SB0 (1) SA (U-2EXT) EA	6036 SB0 (1) SA (U-BM) EA	6037 SB0 (1) SA (U-WC) EA	6050 SB0 (2) SA (P) EA	6052 SB0 (2) SA (T-2EXT) EA	
10		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		M2-1	JCT	21 X 15		✓																			
		M1-6R	RANCH ROAD FM 270	24 X 24		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		W9-2L	LANE ENDS MERGE LEFT	36 X 36		✓																			
11		R1-1	STOP	36 X 36		✓																			
		R2-1	SPEED LIMIT 50	30 X 36		✓																			
12			N/A			✓																			
13		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		M3-2	EAST	24 X 12		✓																			
		M1-6T	RANCH ROAD FM 270	24 X 24		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
14			N/A			✓																			
15		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
16		R1-1	STOP	36 X 36		✓																			
		R6-2R	ONEWAY (RIGHT)	30 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		R1-1	STOP	36 X 36		✓																			
17		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		R2-1	SPEED LIMIT 50	30 X 36		✓																			
18		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R1-2	YIELD	48 X 48		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		R1-2	YIELD	48 X 48		✓																			
		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		M6-1L	LEFT ARROW	21 X 15		✓																			
		M3-2	EAST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		M6-1R	RIGHT ARROW	21 X 15		✓																			
		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R1-2	YIELD	48 X 48		✓																			
		M3-2	EAST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
19		R1-1	STOP	36 X 36		✓																			
		R2-1	SPEED LIMIT 50	30 X 36		✓																			
20			N/A			✓																			
21		R1-1	STOP	36 X 36		✓																			
		R1-1	STOP	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		M3-2	EAST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
22		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		R1-1	STOP	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
23		R6-1R	ONE WAY	54 X 18		✓																			
		R6-1R	ONE WAY	54 X 18		✓																			
		R1-1	STOP	36 X 36		✓																			
24		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		R1-1	STOP	36 X 36		✓																			
		R1-1	STOP	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
25		R2-1	SPEED LIMIT 50	30 X 36		✓																			
		R1-1	STOP	36 X 36		✓																			
26		R3-7L	LEFT LAN MUST TURN LEFT	36 X 36		✓																			
27		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R3-8R	OPTIONAL MOVEMENT	VARIES X 24		✓																			
		M3-2	EAST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			

GENERAL NOTES:

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)

Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

 SHEET 2 OF 2

SUMMARY OF SMALL SIGNS SH 96

DIST	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
HOU	GALVESTON	0976	07	016	SH 96

DISTRICT	TXDOT REGION	PROJECT NO.	SHEET
HOU	6	C 976 7 16	33

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																		
							6001 10BWG (1) SA (P) EA	6002 10BWG (1) SA (P-BM) EA	6004 10BWG (1) SA (T) EA	6005 10BWG (1) SA (T-2EXT) EA	6006 10BWG (1) SA (U) EA	6017 10BWG (2) SA (P) EA	6019 10BWG (2) SA (T-2EXT) EA	6027 SB0 (1) SA (P) EA	6040 SB0 (1) SA (P-BM) EA	6030 SB0 (1) SA (T) EA	6031 SB0 (1) SA (T-2EXT) EA	6033 SB0 (1) SA (U) EA	6034 SB0 (1) SA (U-1EXT) EA	6035 SB0 (1) SA (U-2EXT) EA	6036 SB0 (1) SA (U-BM) EA	6037 SB0 (1) SA (U-WC) EA	6050 SB0 (2) SA (P) EA	6052 SB0 (2) SA (T-2EXT) EA	
27		M6-1L	LEFT ARROW	21 X 15		✓																			
		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		M6-1R	RIGHT ARROW	21 X 15		✓																			
		R2-1	SPEED LIMIT 50	30 X 36		✓																			
		W4-2R	LANE MERGE RIGHT	36 X 36		✓																			
		R1-2	YIELD	48 X 48		✓																			
		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		R1-2	YIELD	48 X 48		✓																			
		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		M6-1L	LEFT ARROW	21 X 15		✓																			
		M3-2	EAST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		M6-1R	RIGHT ARROW	21 X 15		✓																			
		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
28		M3-2	EAST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		R2-1	SPEED LIMIT 55	30 X 36		✓																			
29		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		M3-2	EAST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
30		R3-7R	RIGHT LANE MUST TURN RIGHT	36 X 36		✓																			
31		W11-3	DEER CROSSING WARNING	36 X 36		✓																			
32			N/A			✓																			
33		R2-1	SPEED LIMIT 55	30 X 36		✓																			
		R2-1	SPEED LIMIT 55	30 X 36		✓																			
34		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R2-1	SPEED LIMIT 55	30 X 36		✓																			
35			N/A			✓																			
36		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
37		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
		R3-7R	RIGHT LN MUST TURN RIGHT	36 X 36		✓																			
38		R3-7L	LEFT LN MUST TURN LEFT	36 X 36		✓																			
39		W3-3	SIGNAL AHEAD WARNING	30 X 30		✓																			
40		M3-4	WEST	24 X 12		✓																			
		M1-6T	TEXAS 96	24 X 24		✓																			
		R2-1	SPEED LIMIT 55	30 X 36		✓																			
		M3-1	NORTH	24 X 12		✓																			
		M1-6T	TEXAS 146	24 X 24		✓																			
		M6-1L	LEFT ARROW	21 X 15		✓																			
		M3-3	SOUTH	24 X 12		✓																			
		M1-6T	TEXAS 146	24 X 24		✓																			
		M6-1R	RIGHT ARROW	21 X 15		✓																			
41			N/A																						

ALUMINUM SIGN BLANKSITY A)

Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

GENERAL NOTES:

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.

 SHEET 2 OF 2

SUMMARY OF SMALL SIGNS SH 96

DISTRICT	COUNTY	CONTROL	SECTION	JOB	SHEET NO.
HOU	GALVESTON	0976	07	016	SH 96

STD-N29

LEGEND:

– EXISTING TRAFFIC FLOW

WEST M3-4
96 TEXAS
M1-6T
M6-3
SOUTH M3-3
3 TEXAS
M1-6T
NORTH M3-1
3 TEXAS
M1-6T

DO NOT ENTER
R5-1

EXISTING SIGNAL GRD BOX

EXISTING SIGNAL GRD BOX

EXISTING DRAINAGE INLET

WRONG WAY
R5-1A

REMOVE EXISTING TERMINAL ANCHOR SECTION
PROP DOWNSTREAM ANCHOR TERMINAL (DAT)

PROP REMOVAL AND REPLACE TY C1 INLET COVER MATCH EXISTING INLET COVER

PROP REMOVAL EXISTING GUARDRAIL

PROP MBGF (STEEL POST)
PROP MOW STRIP

BEGIN PROJECT
STA. 92+43.11
CSJ 0976-07-016
CONTROL 976-03

DO NOT ENTER
R5-1

EXISTING DRAINAGE INLET

WRONG WAY
R5-1A

EXISTING DRAINAGE INLET

CSH96

95+00

PC 92+43.11

MATCHLINE STA. 98+93.11

EXISTING DRAINAGE INLETS

EXISTING DRAINAGE INLET

EXISTING DRAINAGE INLET

EAST M3-2B
96 TEXAS
M1-6T

EXISTING DRAINAGE INLET

SPEED LIMIT 45
R2-1

NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK) (100MIL)	(J) REFL PAV MRK TY I (Y) 24" (SLD) (100MIL)	(V) REFL PAV MRKR TY II-C-R
(B) REFL PAV MRK TY I (W) 6" (SLD) (100MIL)	(K) PREFAB PAV MRK TY C (W) (ARROW)	
(D) REFL PAV MRK TY I (Y) 6" (SLD) (100MIL)	(L) PREFAB PAV MRK TY C (W) (WORD)	
(E) REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	(M) REFL PAV MRK TY I (Y) 6" (BRK) (100MIL)	
(G) REFL PAV MRK TY I (W) 12" (SLD) (100MIL)	(T) REFL PAV MRKR TY I-C	
(I) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	(U) REFL PAV MRKR TY II-A-A	

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED PROFESSIONAL ENGINEER

12-14-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 1 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		35

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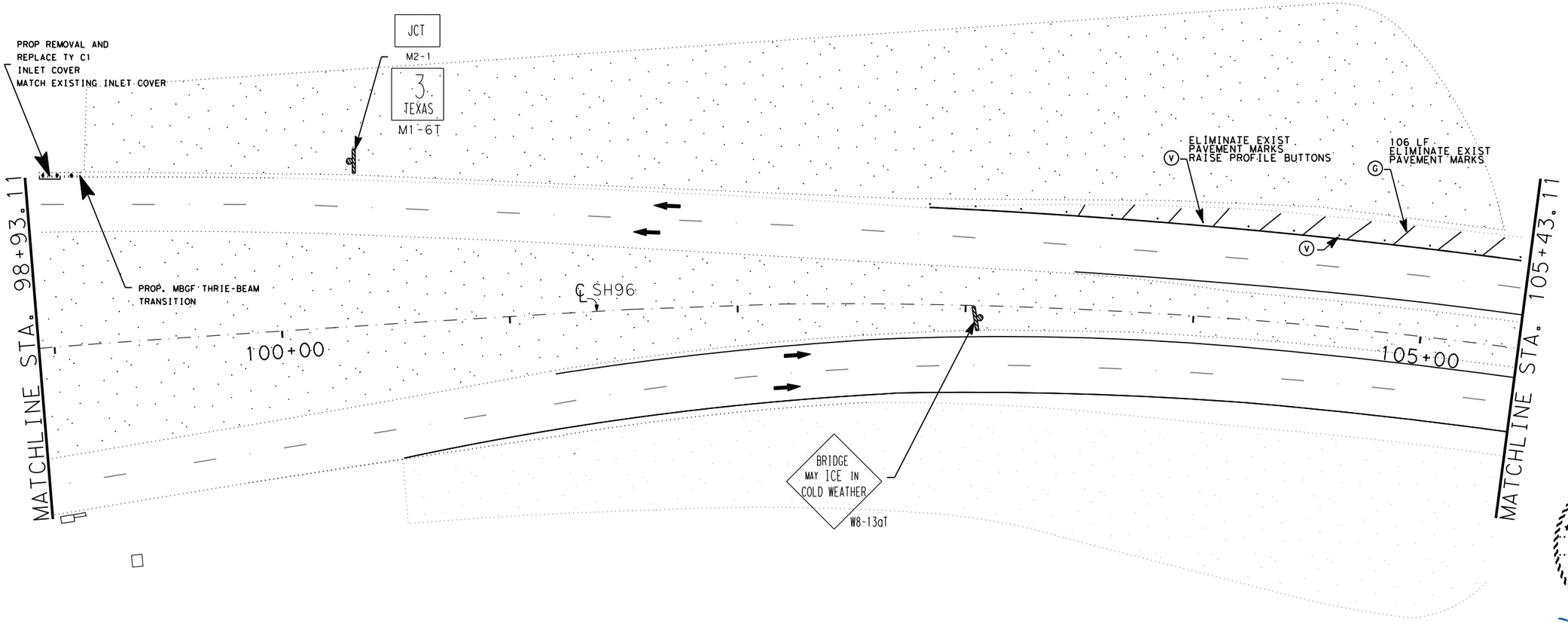
LEGEND:

– EXISTING TRAFFIC FLOW



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-14-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 2 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		36

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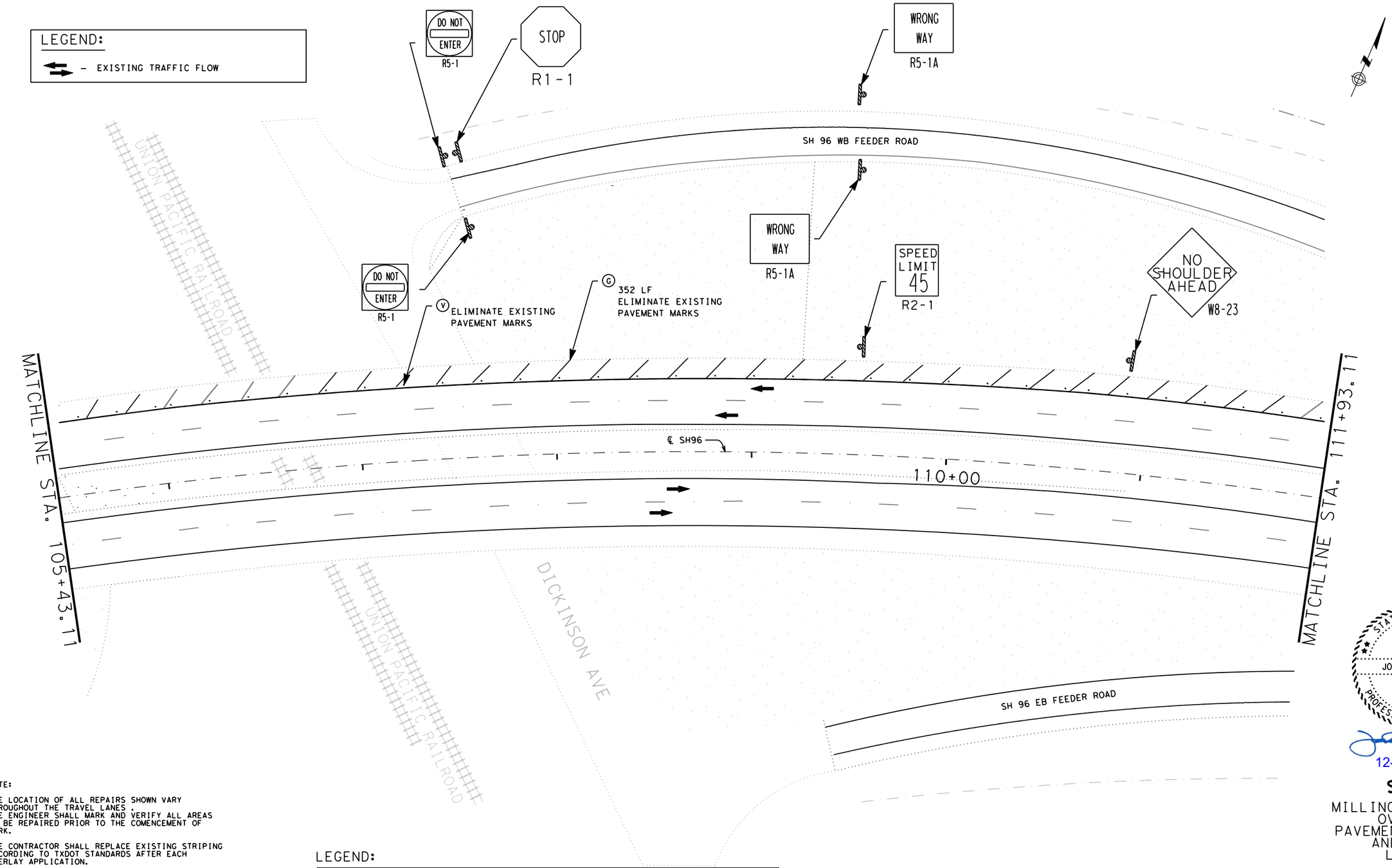
LEGEND:

– EXISTING TRAFFIC FLOW



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
(B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
(D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
(E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
(G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
(I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
(J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(K) PREFAB PAV MRK TY C (W) (ARROW)
(L) PREFAB PAV MRK TY C (W) (WORD)
(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(T) REFL PAV MRKR TY I-C
(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED PROFESSIONAL ENGINEER

12-14-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 3 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		37

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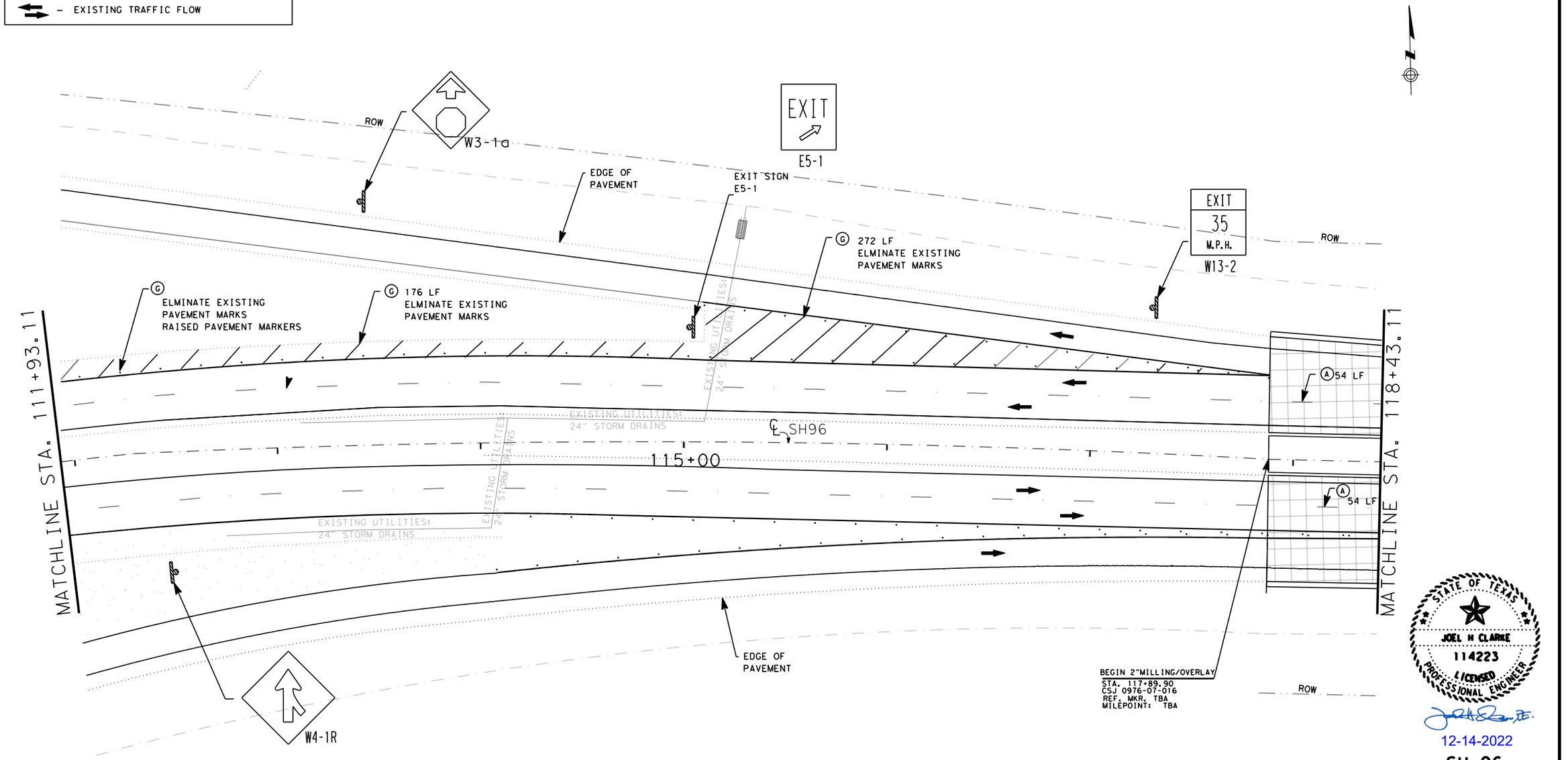
LEGEND:

– EXISTING TRAFFIC FLOW



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50

SCALE IN FEET

STATE OF TEXAS
JOEL H CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-14-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 4 OF 41

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Texas Department of Transportation

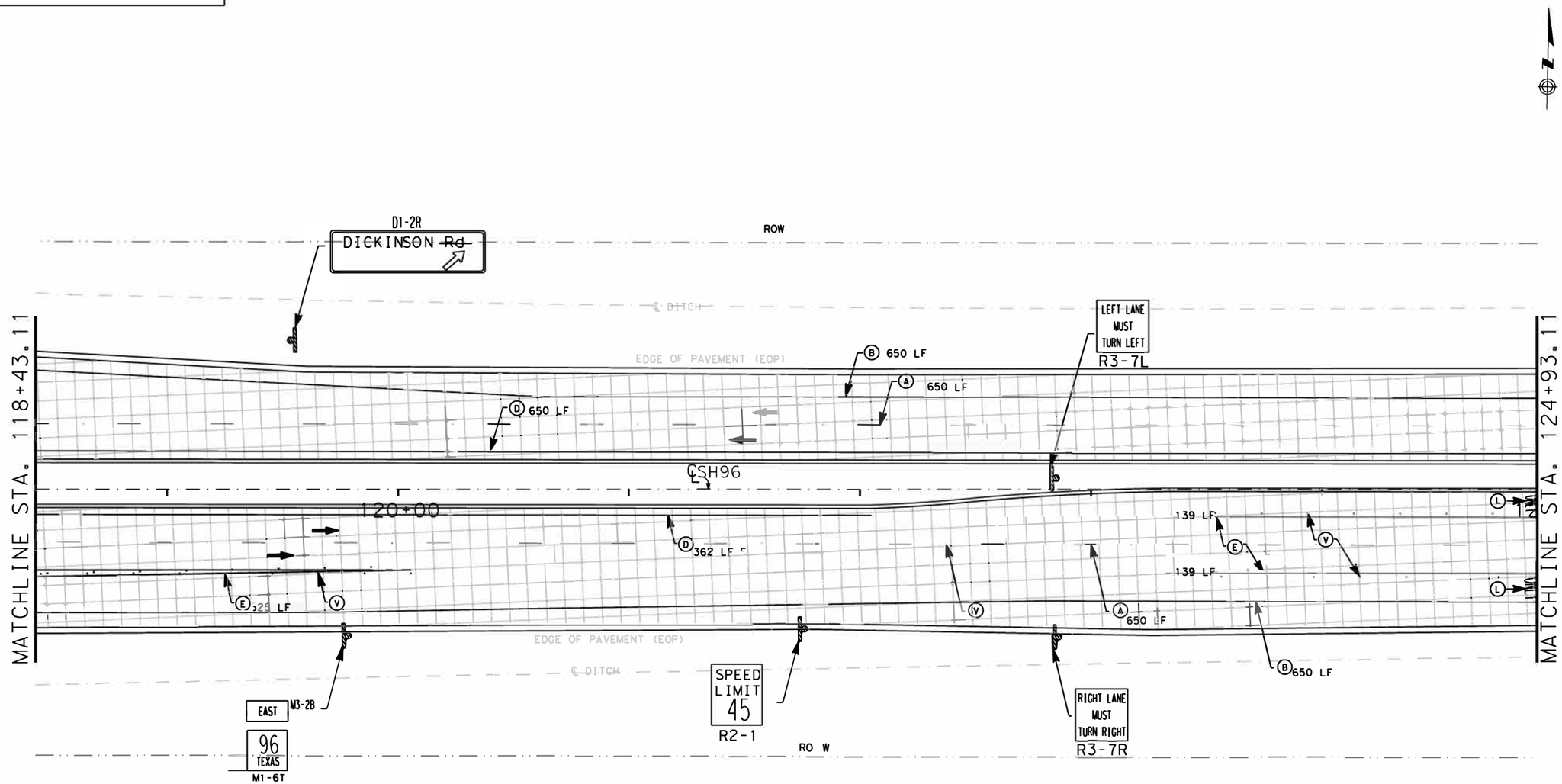
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		38

DATE: 12/14/2022 5:44:24 PM
FILE: T:\DESIGN\0976070I6 SH 96\LAYOUTS\Layout4.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

December 02 2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 5 OF 41

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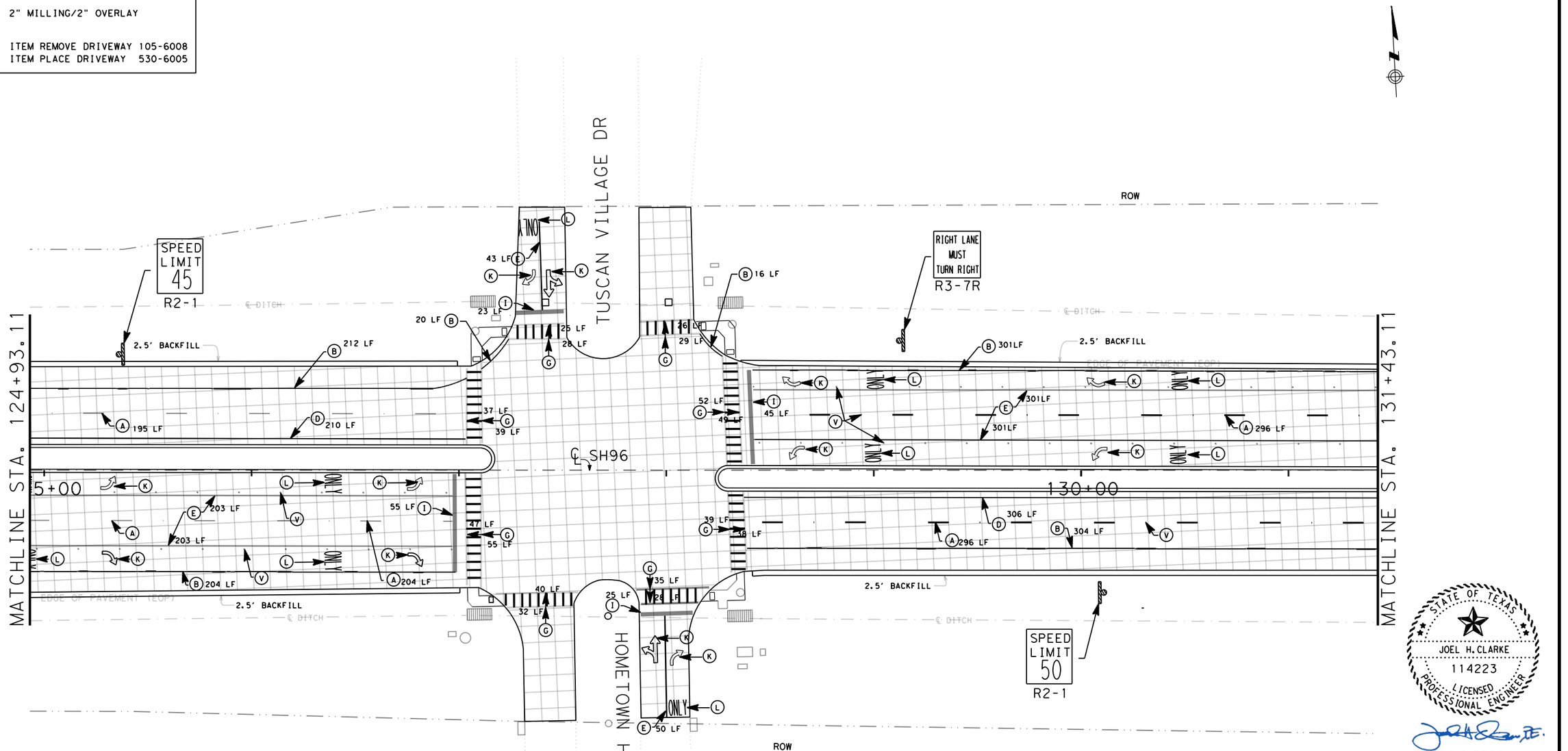
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		39

DATE: 11/15/2022 3:03:48 PM
FILE: T:\DESIGN\09760716 SH 96\LAYOUTS\Layout5.dgn

LEGEND:

- EXISTING TRAFFIC FLOW
- 2" MILLING/2" OVERLAY
- ITEM REMOVE DRIVEWAY 105-6008
  ITEM PLACE DRIVEWAY 530-6005



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 345.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED PROFESSIONAL ENGINEER

12-6-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 6 OF 41

Texas Department of Transportation

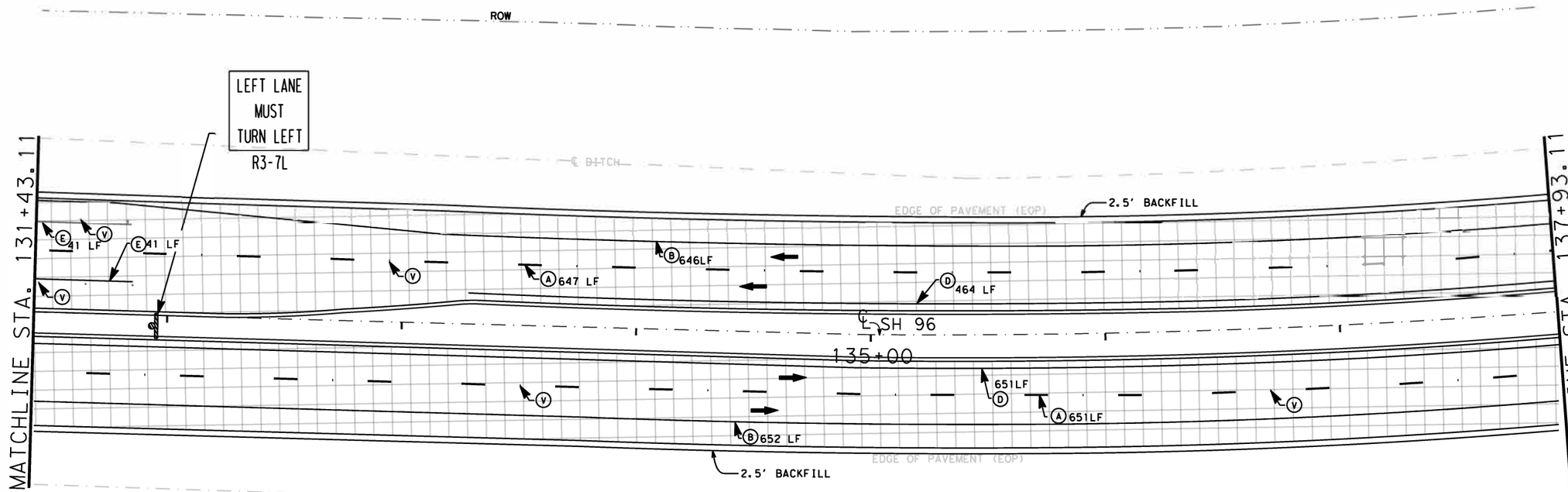
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		40

DATE: 11/15/2022 3:00:51 PM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout6.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



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ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

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- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 7 OF 41

Texas Department of Transportation

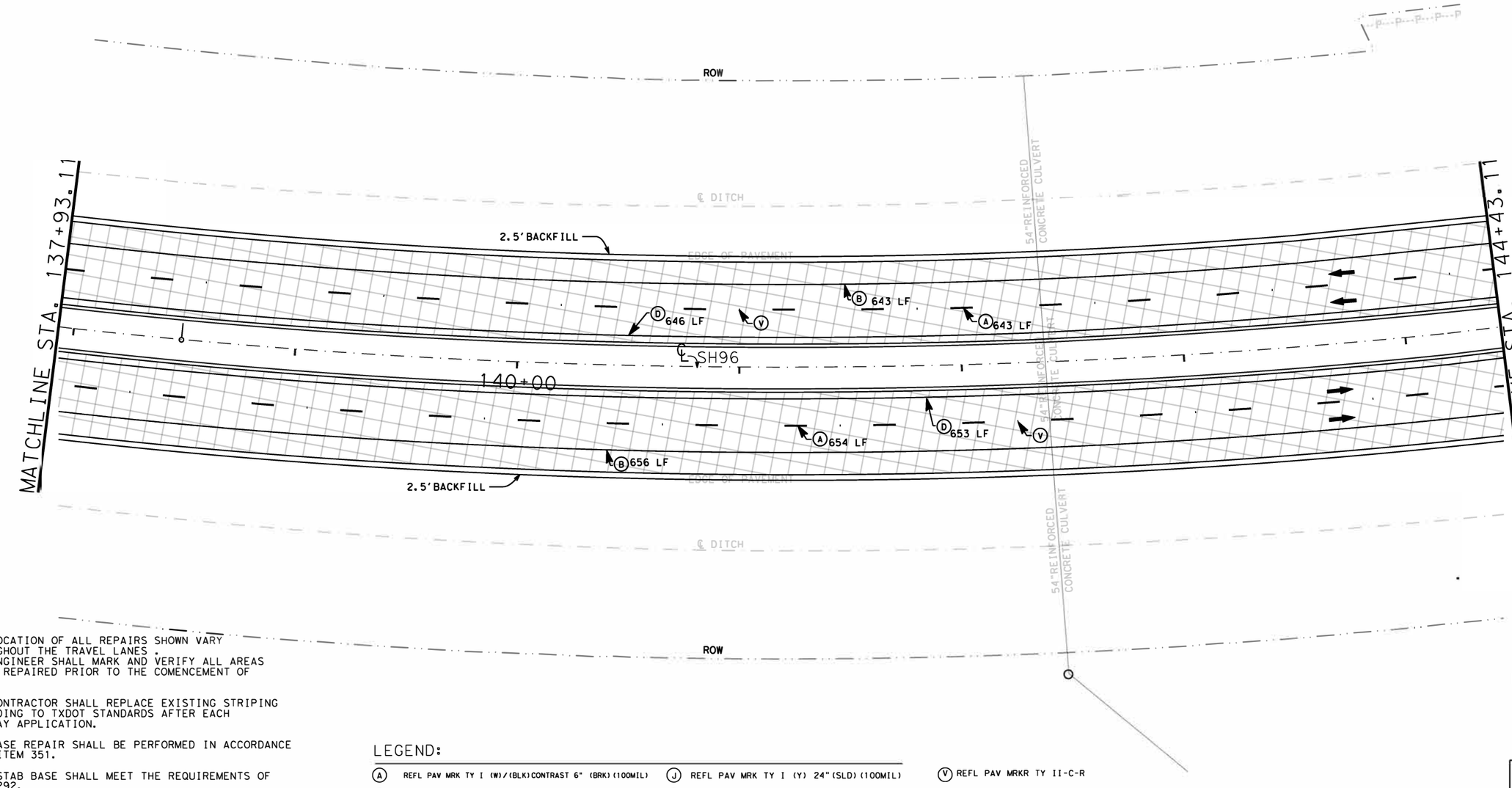
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		41

DATE: 11/15/2022 3:11:12 PM
FILE: T:\DESIGN\0976070I6 SH 96\LAYOUTS\Layout7.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



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LEGEND:

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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 8 OF 41

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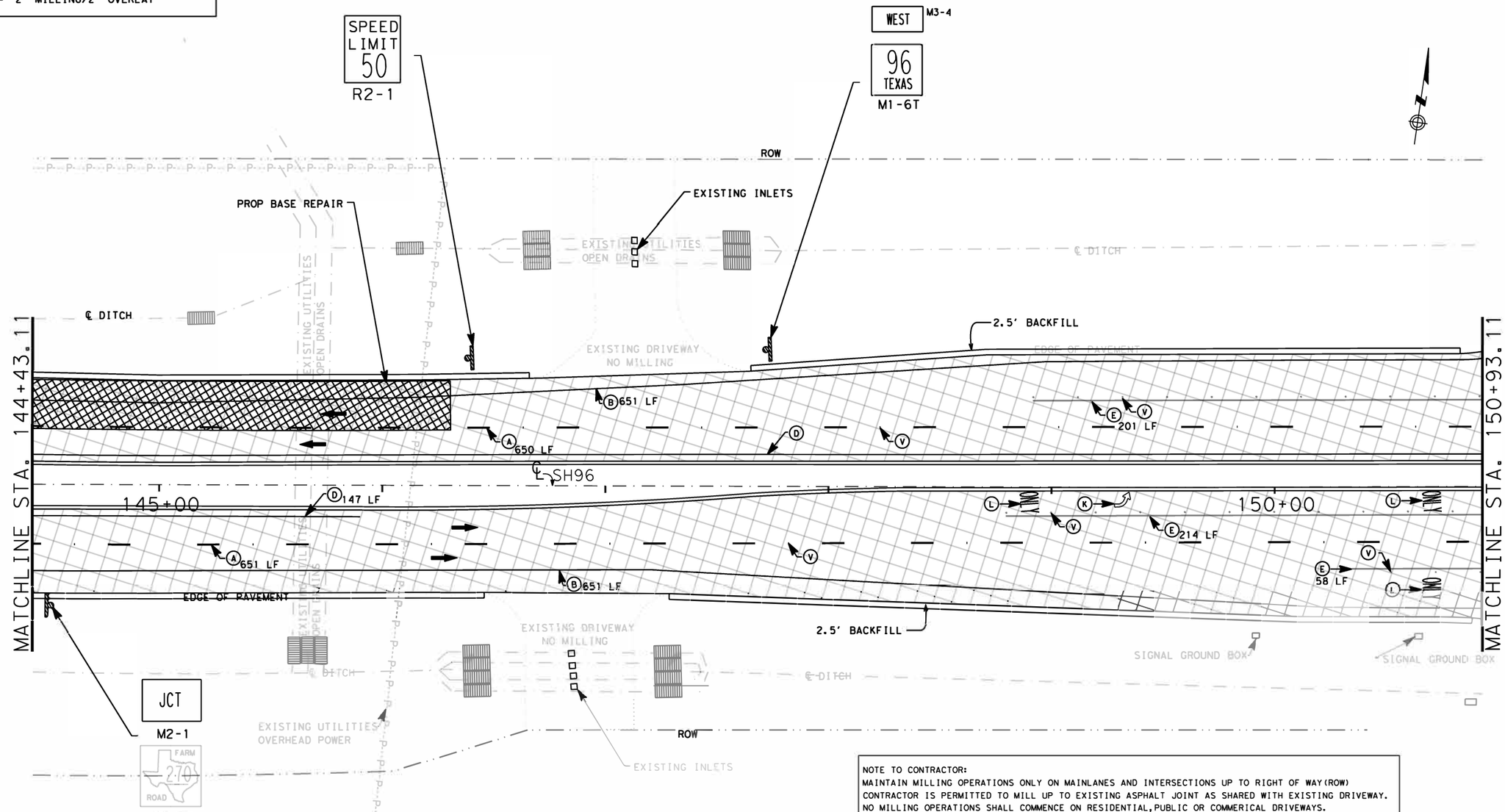
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		42

DATE: 11/15/2022 3:41:52 PM
FILE: T:\DESIGN\0976070016 SH 96\LAYOUTS\Layout8.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



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NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
NO MILLING OPERATIONS SHALL COMMENCE ON RESIDENTIAL,PUBLIC OR COMMERICAL DRIVEWAYS.

WHERE THERE'S BRICK PAVERS,TAKE EXTRA CAUTION TO PREVENT DAMAGE TO EXISTING BRICK PAVERS.
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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 9 OF 41

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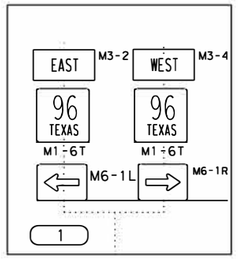
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		43

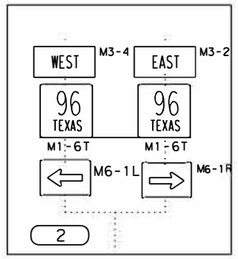
DATE: 11/15/2022 3:45:05 PM
FILE: T:\DESIGN\0976070I6 SH 96\LAYOUTS\Layout9.dgn

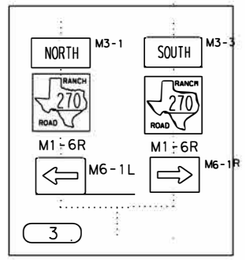
LEGEND:

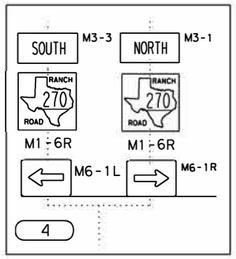
– EXISTING TRAFFIC FLOW

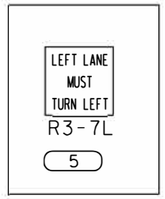
– 2" MILLING/2" OVERLAY

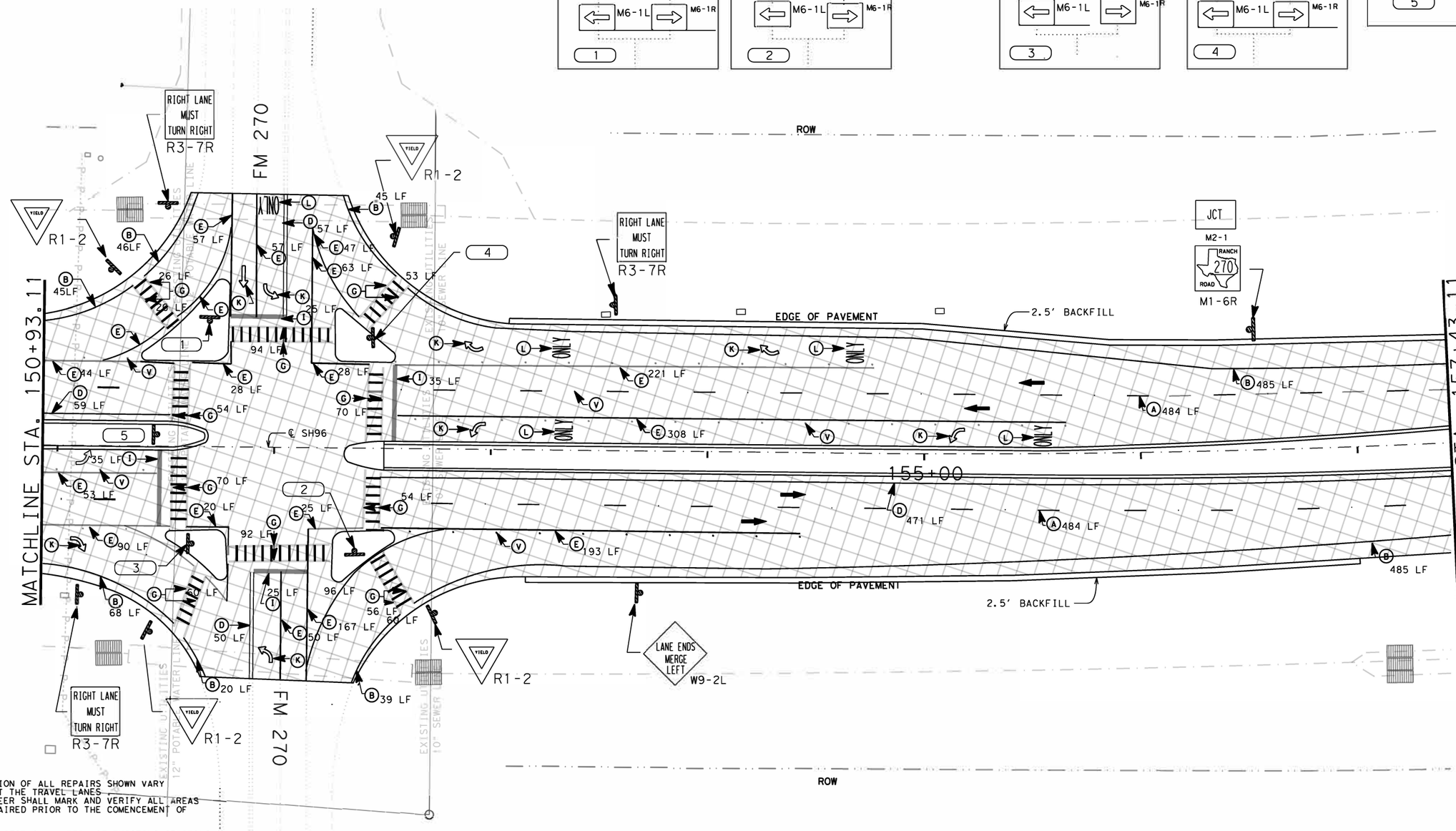












NOTE:

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THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

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ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
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0 50

SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKRINGS AND SIGNS LAYOUT

SHEET 10 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		44

DATE: DATE: 7/2022 3:51:24 PM
FILE: DGN: C:\Users\...\SH 96\LAYOUTS\Layout10.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
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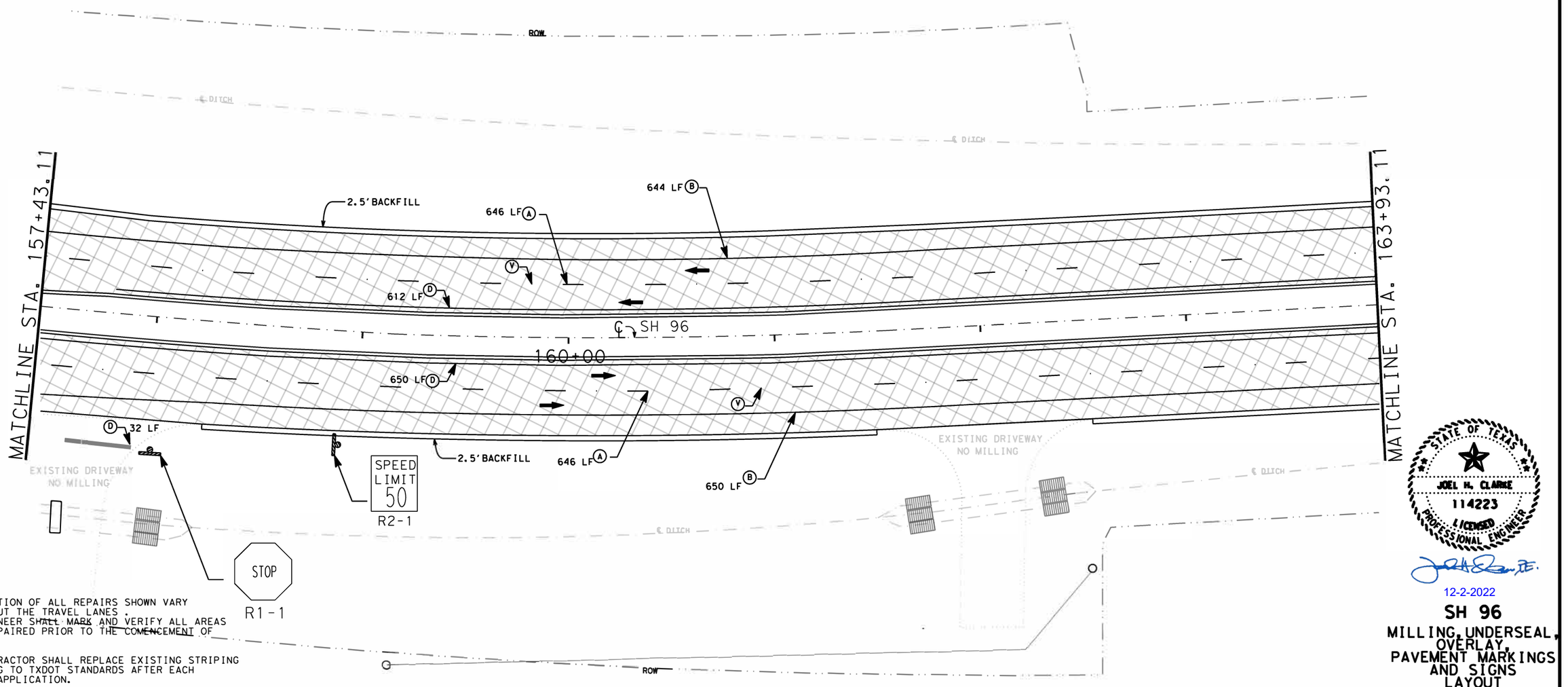

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LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)	(V)	REFL PAV MRKR TY II-C-R
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(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A		

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 11 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		45

DATE: 11/15/2022 3:54:45 PM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout11.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
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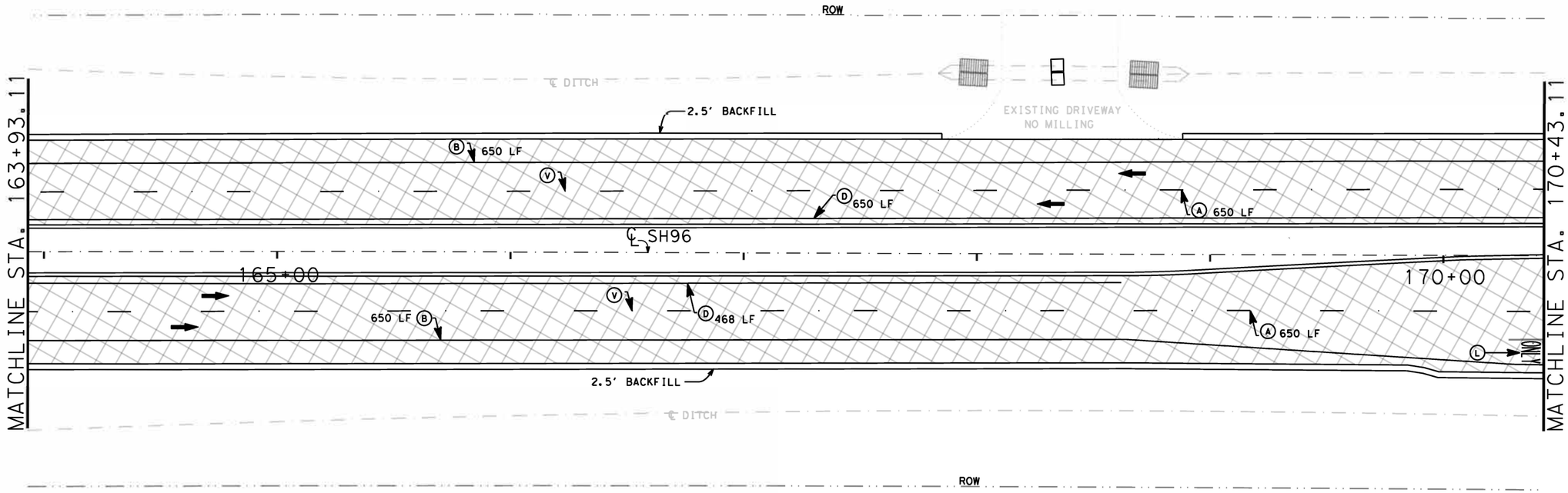

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(G) REFL PAV MRK TY I (W) 12" (SLD)(100MIL)
(I) REFL PAV MRK TY I (W) 24" (SLD)(100MIL)
(J) REFL PAV MRK TY I (Y) 24" (SLD)(100MIL)
(K) PREFAB PAV MRK TY C (W) (ARROW)
(L) PREFAB PAV MRK TY C (W) (WORD)
(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(T) REFL PAV MRKR TY I-C
(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVMENT MARKINGS AND SIGNS LAYOUT

SHEET 12 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		46

DATE: 11/15/2022 3:59:24 PM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout12.dgn

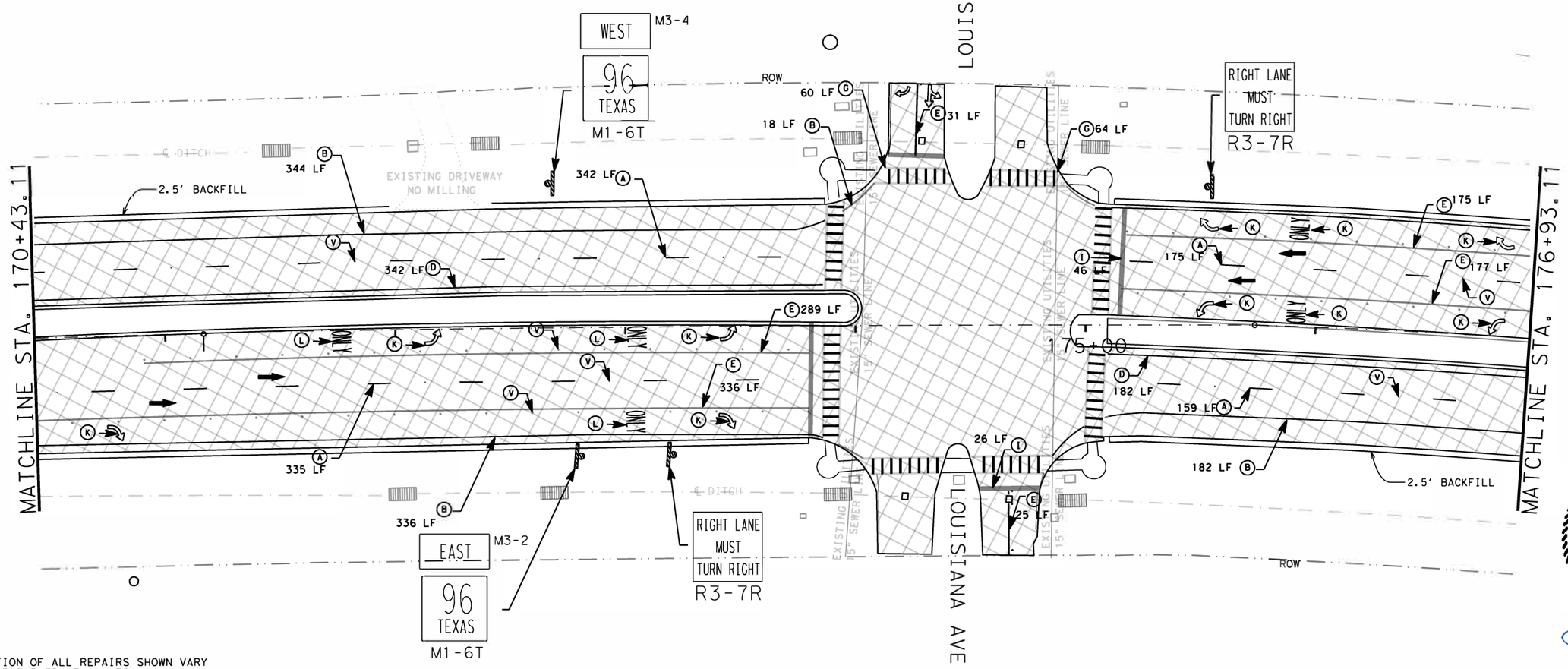
LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
NO MILLING OPERATIONS SHALL COMMENCE ON RESIDENTIAL,PUBLIC OR COMMERICAL DRIVEWAYS.

WHERE THERE'S BRICK PAVERS,TAKE EXTRA CAUTION TO PREVENT DAMAGE TO EXISTING BRICK PAVERS.
IF ASPHALT SPLASH CANNOT BE CLEANED OFF BRICK PAVERS BY TRADITIONAL METHODS, REPLACEMENT
COST WILL BE AT THE EXPENSE OF THE CONTRACTOR.



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 13 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		47

DATE: 11/15/2022 4:35:53 PM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout13.dgn

CK1 DW1 CK2 DW2

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
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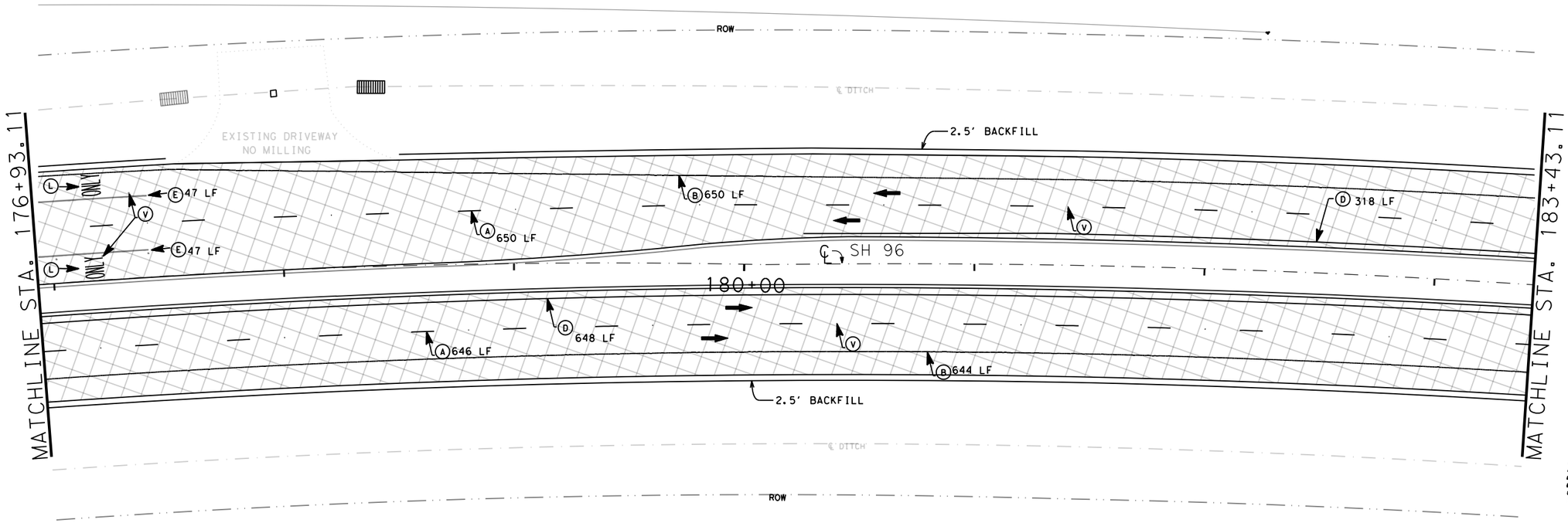
COST WILL BE AT THE EXPENSE OF THE CONTRACTOR.



NOTE:

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THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

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ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(B)	REFL PAV MRK TY I (W) 6" (SLD)(100MIL)	(K)	PREFAB PAV MRK TY C (W) (ARROW)
(D)	REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)	(L)	PREFAB PAV MRK TY C (W) (WORD)
(E)	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	(M)	REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(G)	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	(T)	REFL PAV MRKR TY I-C
(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A

(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 14 OF 41

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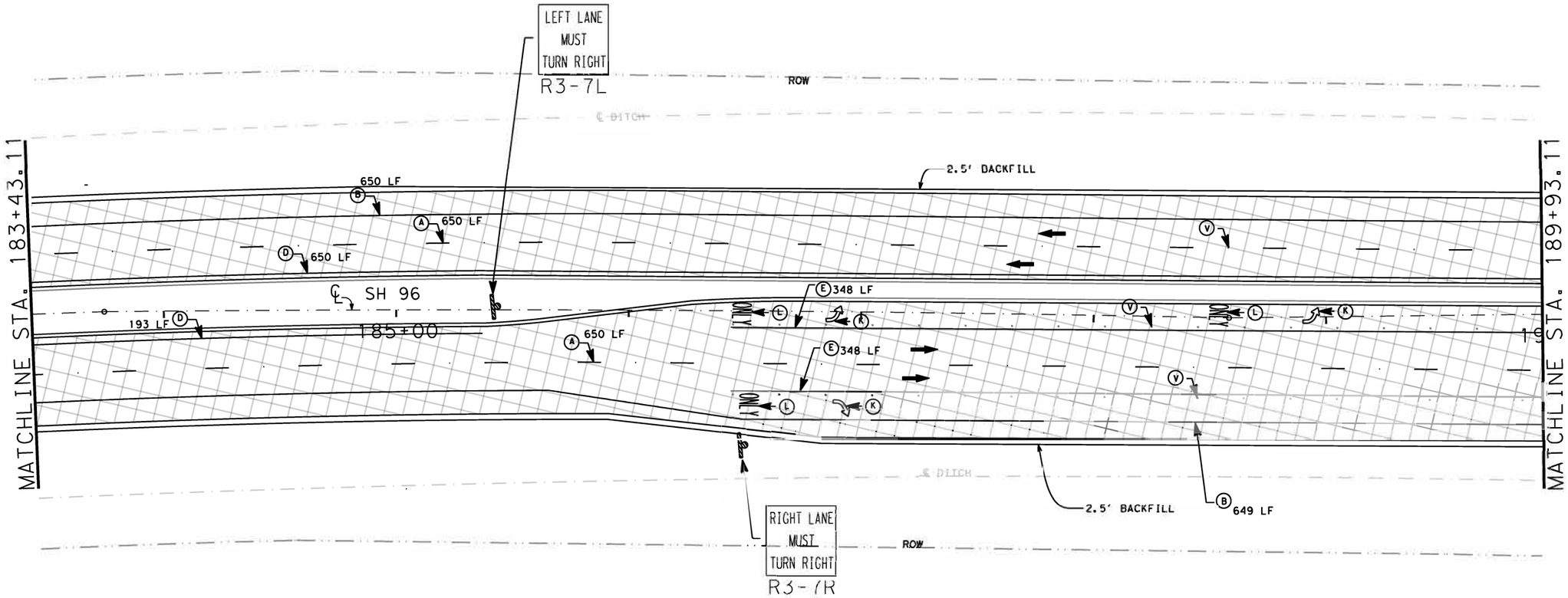
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		48

DATE: 11/15/2022 4:39:35 PM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout14.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



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LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
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(D)	REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)	(L)	PREFAB PAV MRK TY C (W) (WORD)
(E)	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	(M)	REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(G)	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	(T)	REFL PAV MRKR TY I-C
(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A

(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 15 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		49

DATE: 11/15/2022 4:43:16 PM
FILE: T:\DESIGN\0976070\16 SH 96\LAYOUTS\layout15.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
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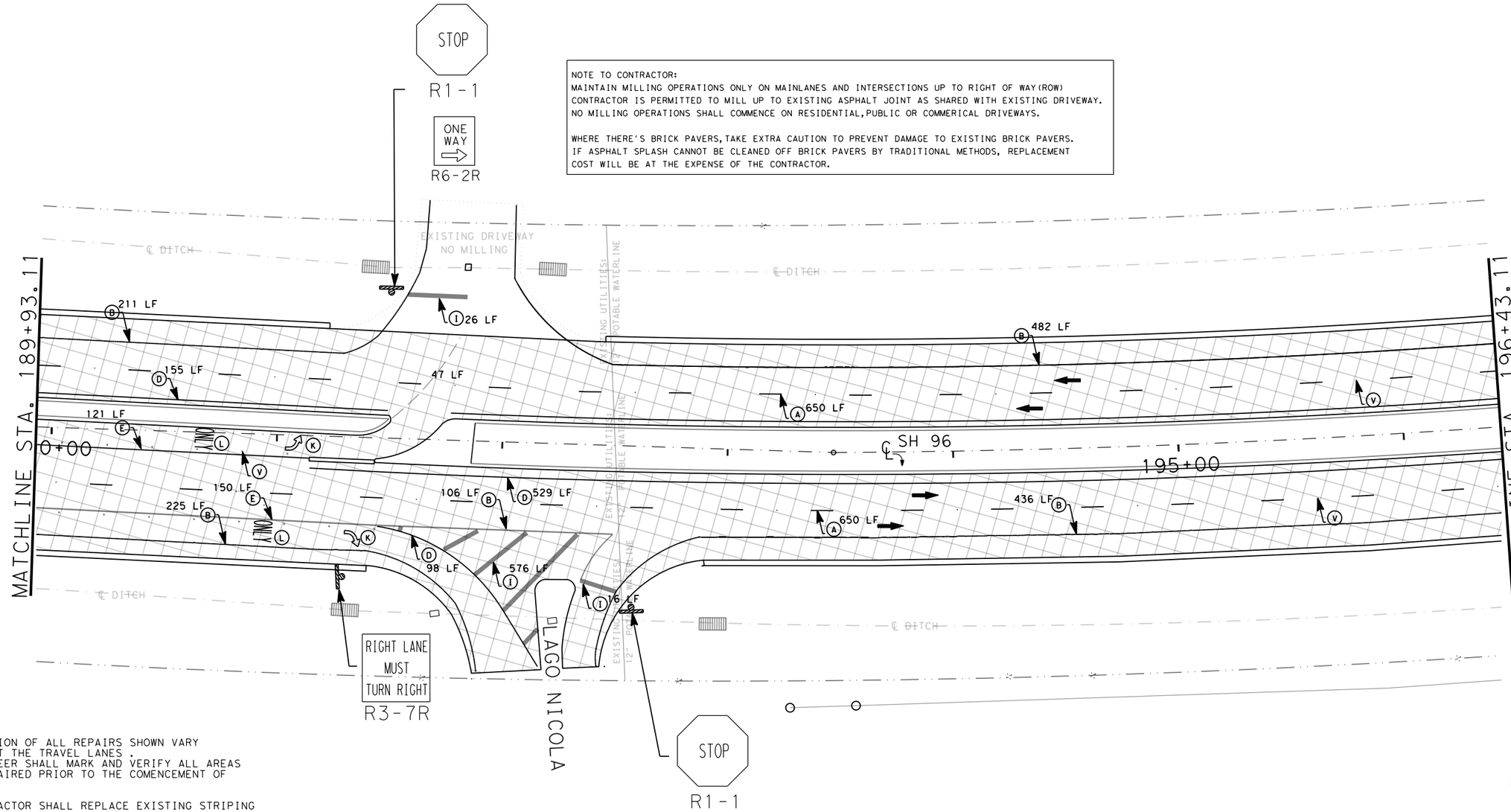

NOTE:

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LEGEND:

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- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 16 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		50

DATE: 11/8/2022 4:22:16 PM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout16.dgn

CK'
DW'
CK'
DW'

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
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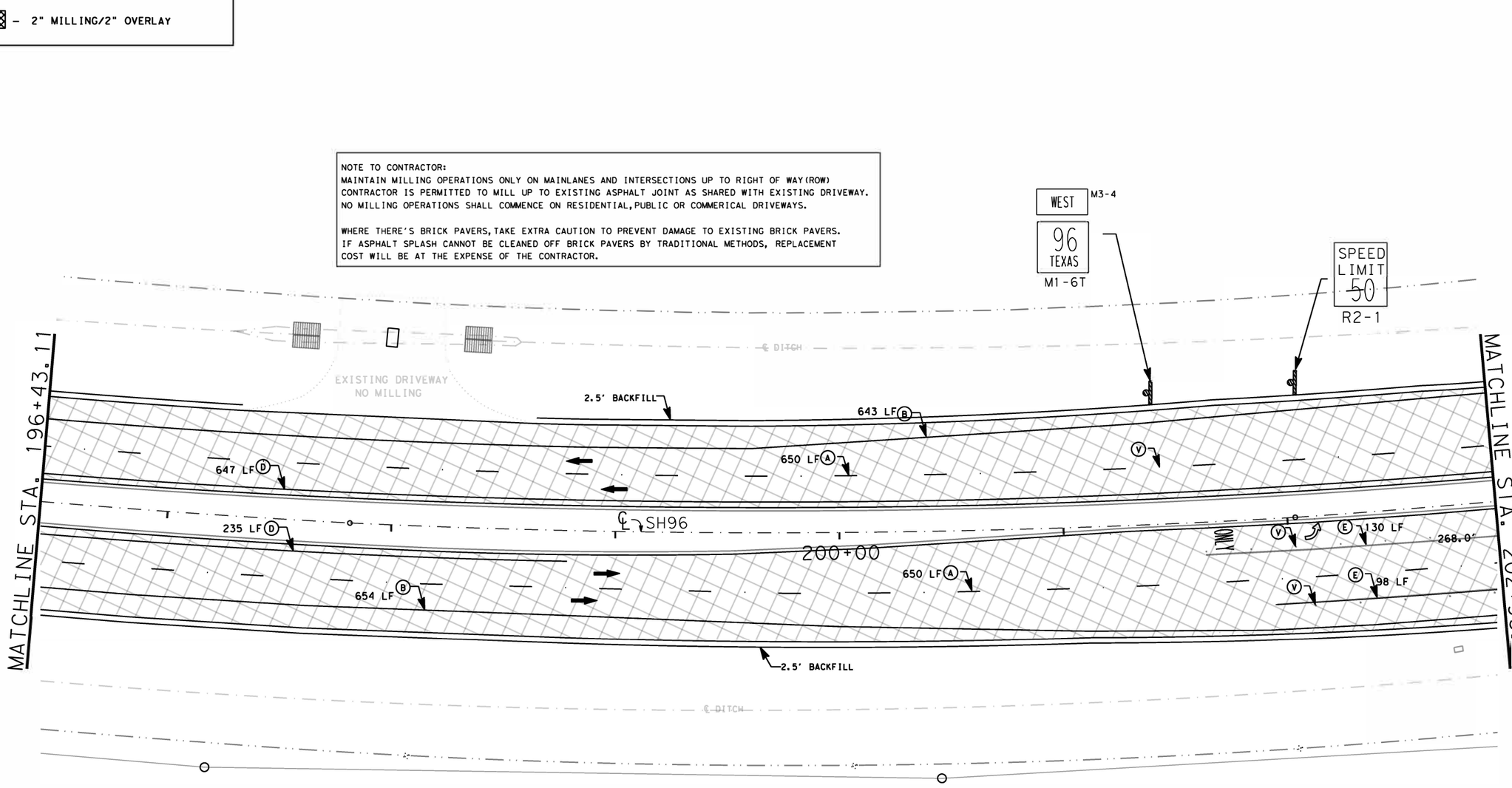

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(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 17 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		51

DATE: 11/15/2022 5:03:44 PM
FILE: T:\DESIGN\0976070016 SH 96\LAYOUTS\Layout17.dgn

CK:
DW:
CK:
DN:

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

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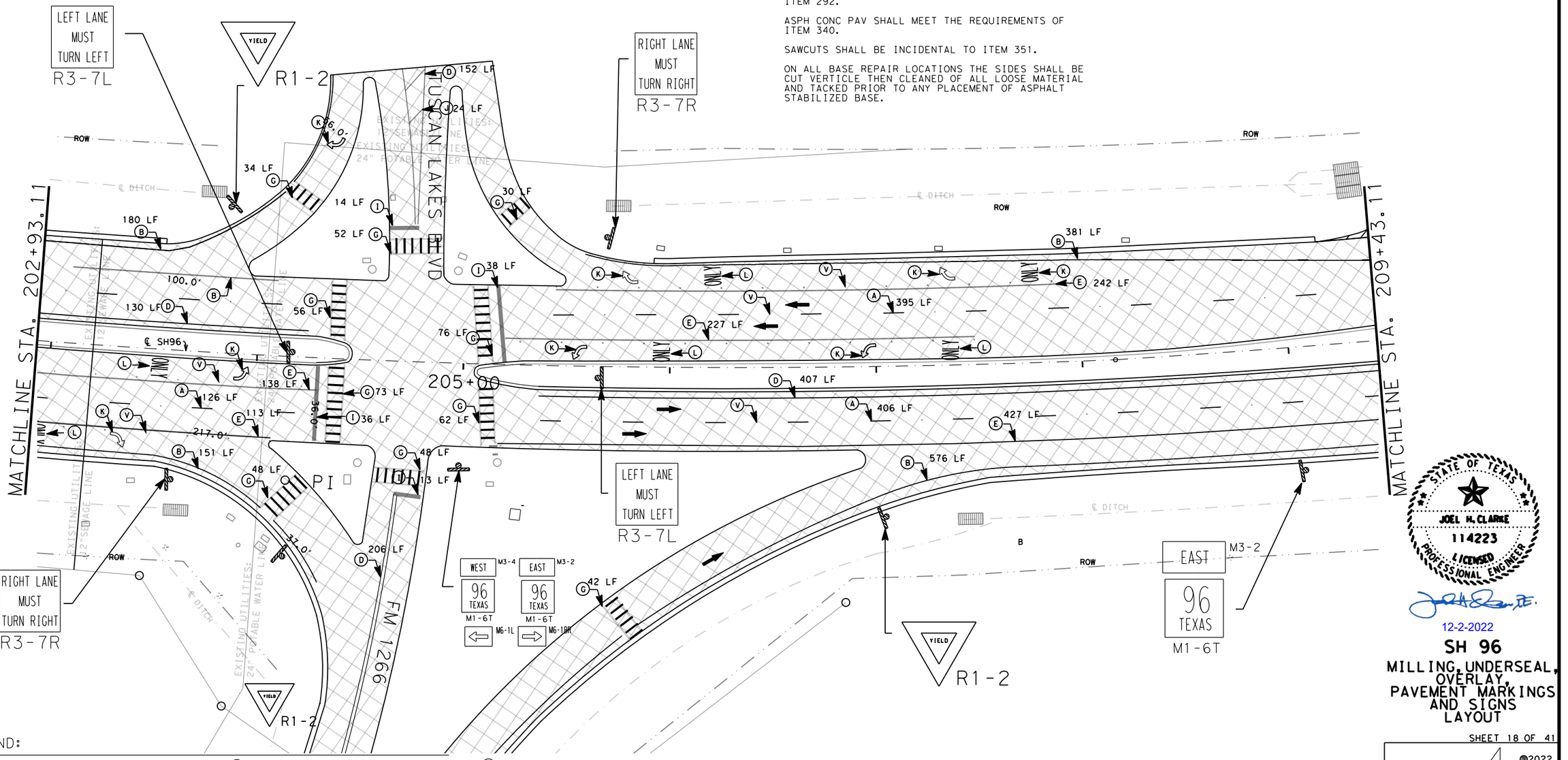

LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
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(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A
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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 18 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		52

DATE: 11/15/2022 5:10:00 PM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout18.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
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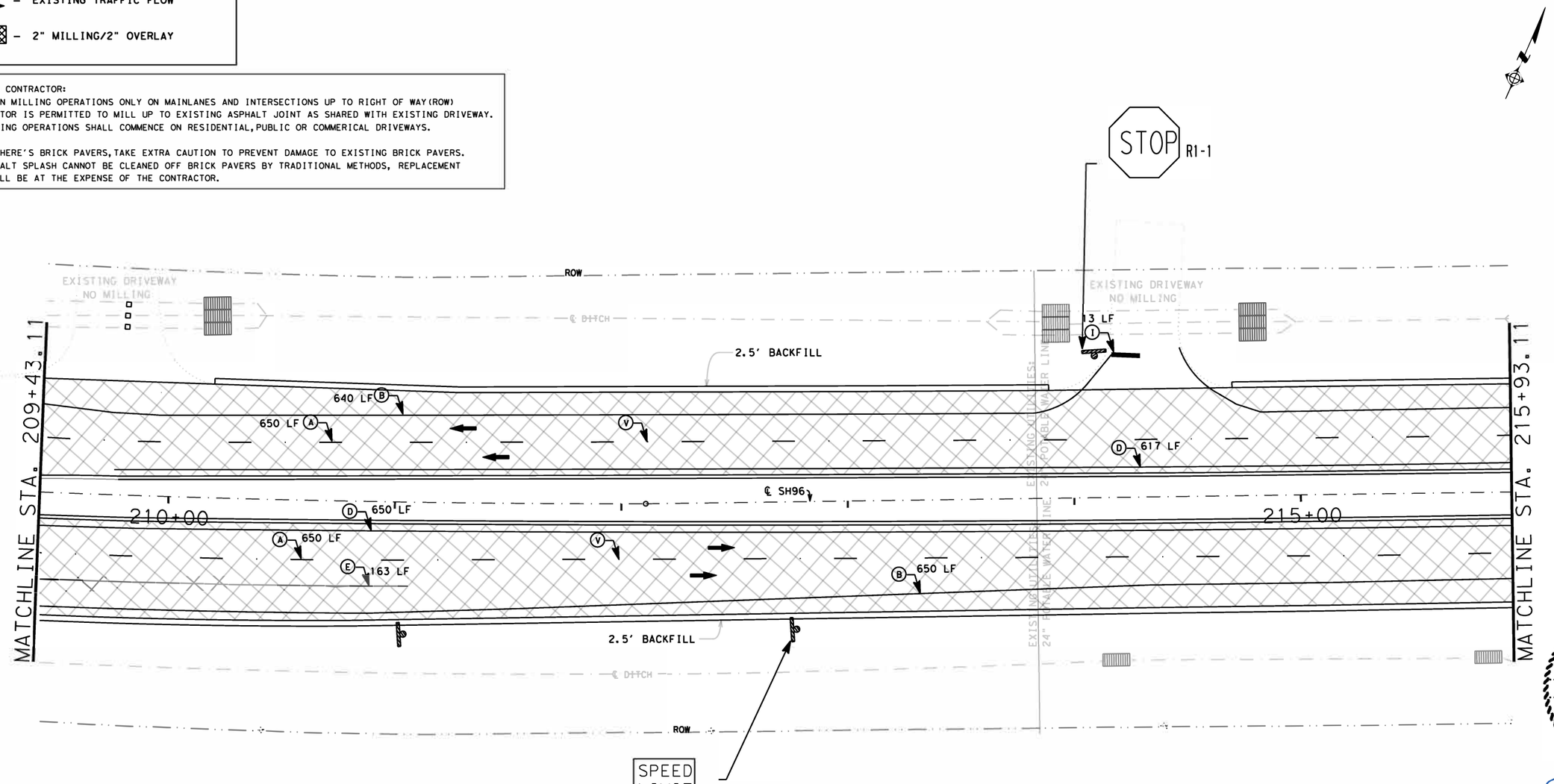

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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
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12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 19 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		53

DATE: 11/15/2022 5:16:25 PM
FILE: T:\DESIGN\0976070\6 SH 96\LAYOUTS\Layout19.dgn

CK:
DW:
CK:
DN:

LEGEND:

- EXISTING TRAFFIC FLOW
- 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
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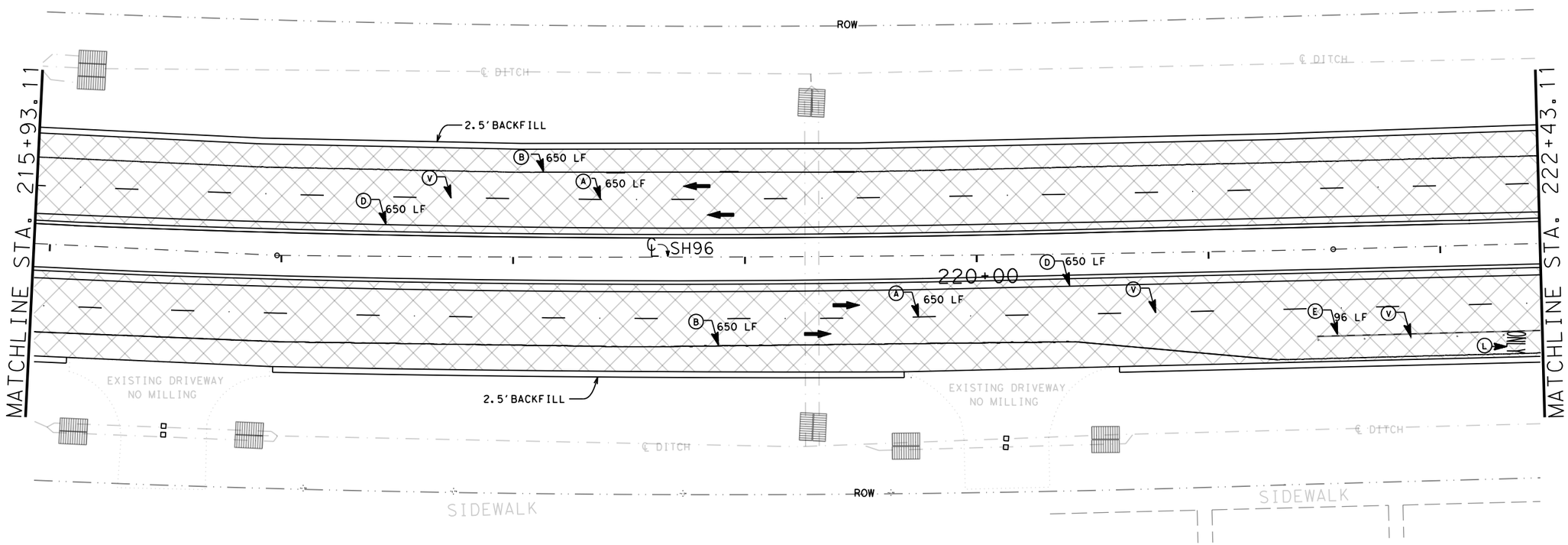

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SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING,UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 20 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		54

DATE: 11/15/2022 5:20:17 PM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout20.dgn

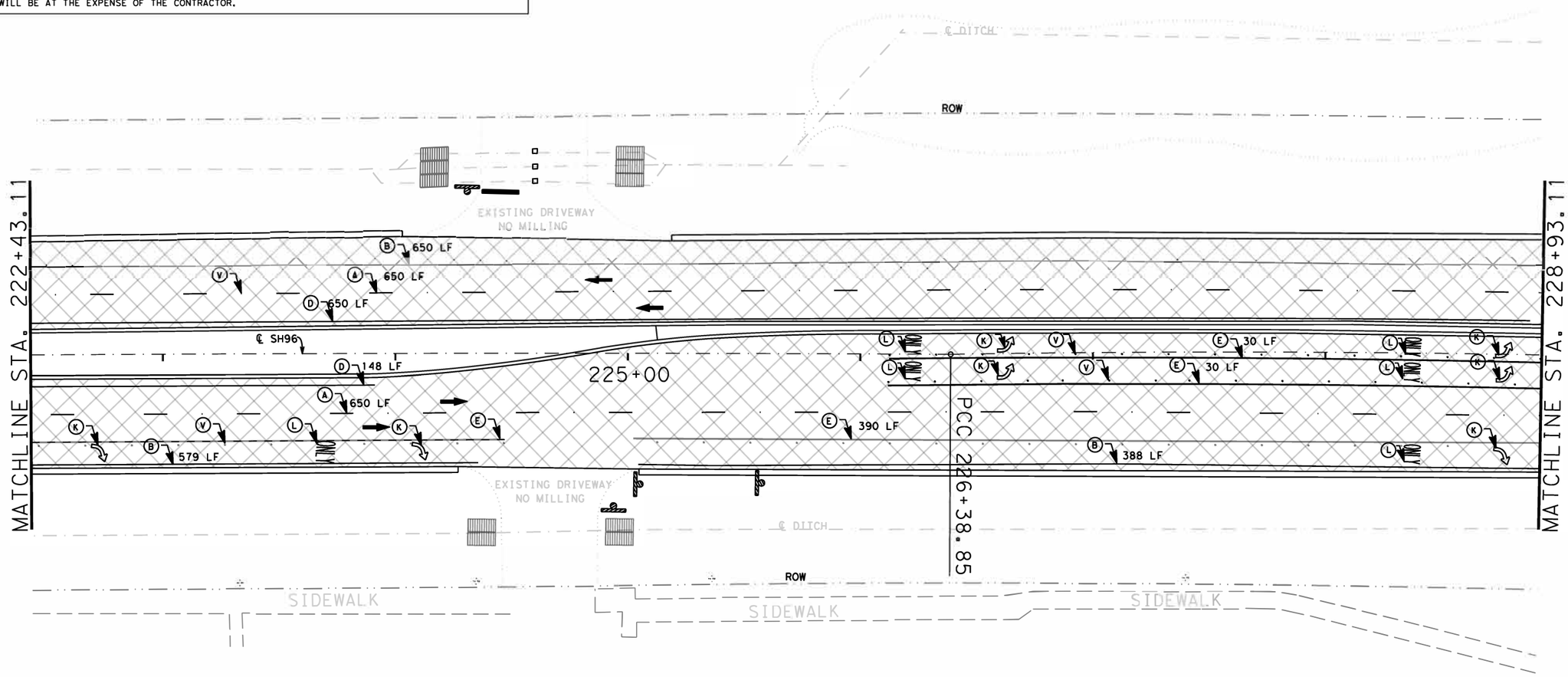
LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
NO MILLING OPERATIONS SHALL COMMENCE ON RESIDENTIAL,PUBLIC OR COMMERICAL DRIVEWAYS.

WHERE THERE'S BRICK PAVERS,TAKE EXTRA CAUTION TO PREVENT DAMAGE TO EXISTING BRICK PAVERS.
IF ASPHALT SPLASH CANNOT BE CLEANED OFF BRICK PAVERS BY TRADITIONAL METHODS, REPLACEMENT
COST WILL BE AT THE EXPENSE OF THE CONTRACTOR.



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
(B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
(D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
(E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
(G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
(I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
(J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(K) PREFAB PAV MRK TY C (W) (ARROW)
(L) PREFAB PAV MRK TY C (W) (WORD)
(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
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(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKRINGS AND SIGNS LAYOUT

SHEET 21 OF 41

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Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		55

DATE: 11/15/2022 5:25:22 PM
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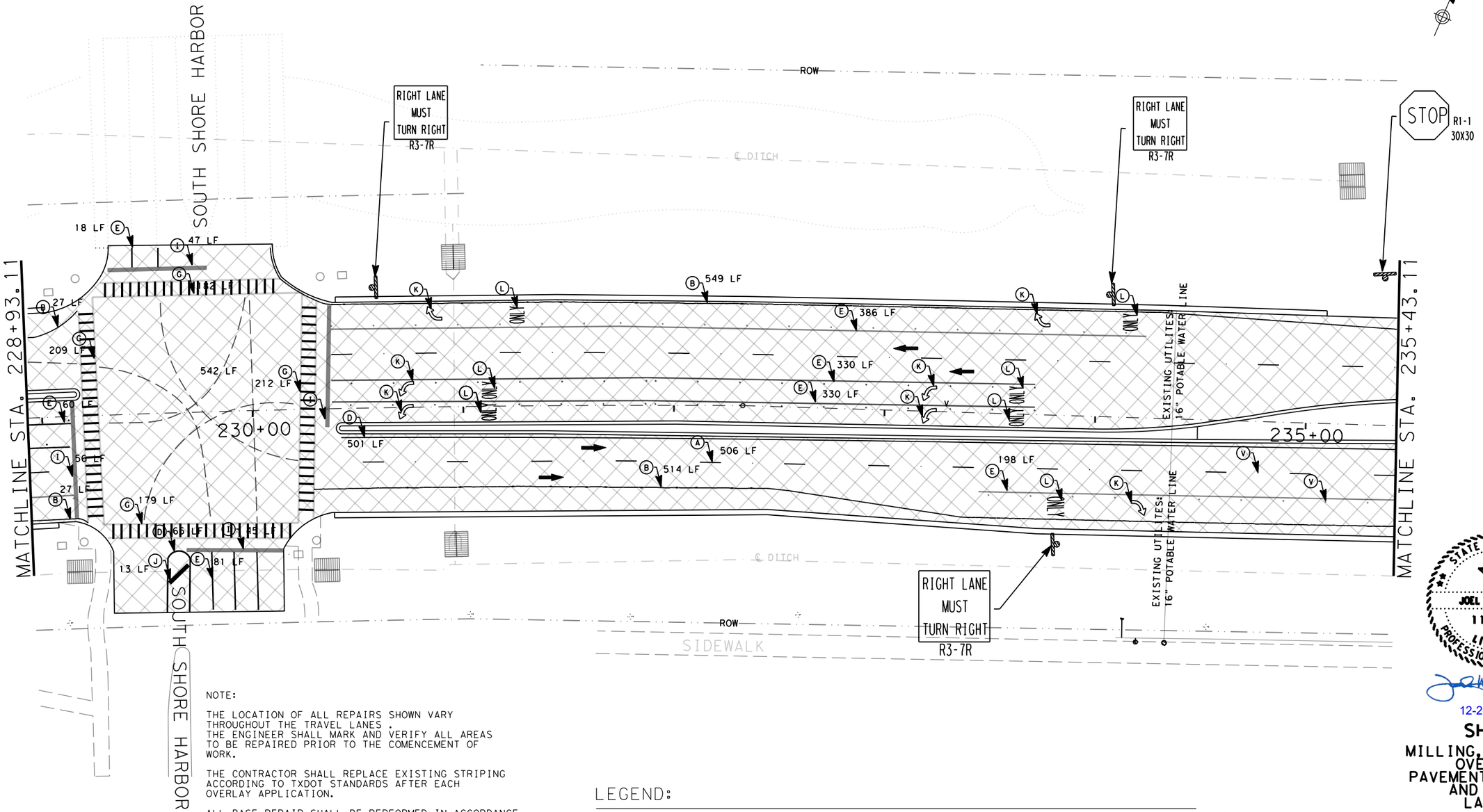
LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

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LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)

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(T) REFL PAV MRKR TY I-C

(U) REFL PAV MRKR TY II-A-A

(V) REFL PAV MRKR TY II-C-R

0 50

SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 22 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		56

DATE: 11/15/2022 5:28:18 PM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout22.dgn

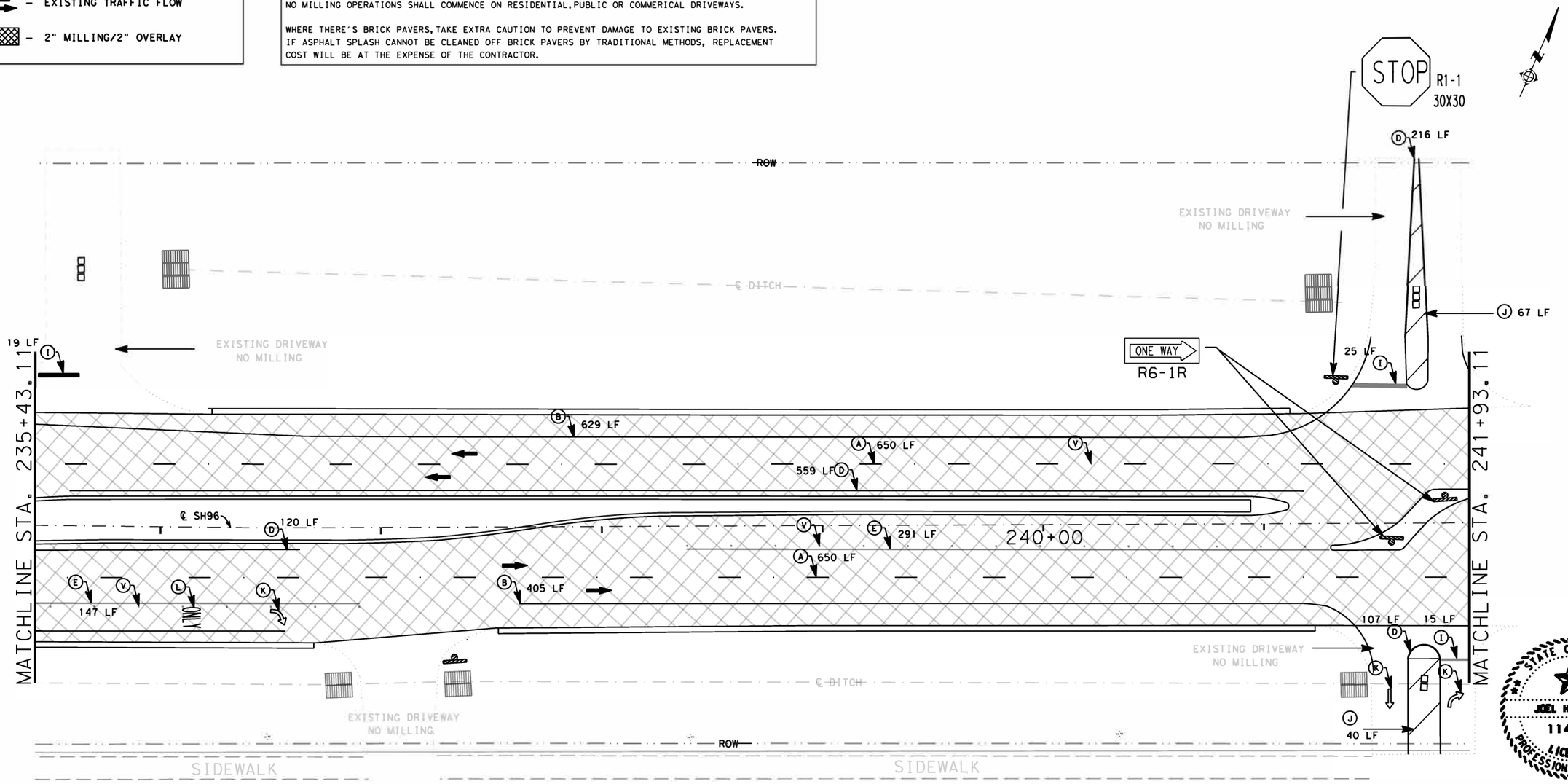
CK1 DW1 CK2 DW2

LEGEND:

- EXISTING TRAFFIC FLOW
- 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
NO MILLING OPERATIONS SHALL COMMENCE ON RESIDENTIAL,PUBLIC OR COMMERICAL DRIVEWAYS.

WHERE THERE'S BRICK PAVERS,TAKE EXTRA CAUTION TO PREVENT DAMAGE TO EXISTING BRICK PAVERS.
IF ASPHALT SPLASH CANNOT BE CLEANED OFF BRICK PAVERS BY TRADITIONAL METHODS, REPLACEMENT
COST WILL BE AT THE EXPENSE OF THE CONTRACTOR.



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

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ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

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LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
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- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
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- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 23 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		57

DATE: 11/16/2022 8:28:34 AM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout23.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
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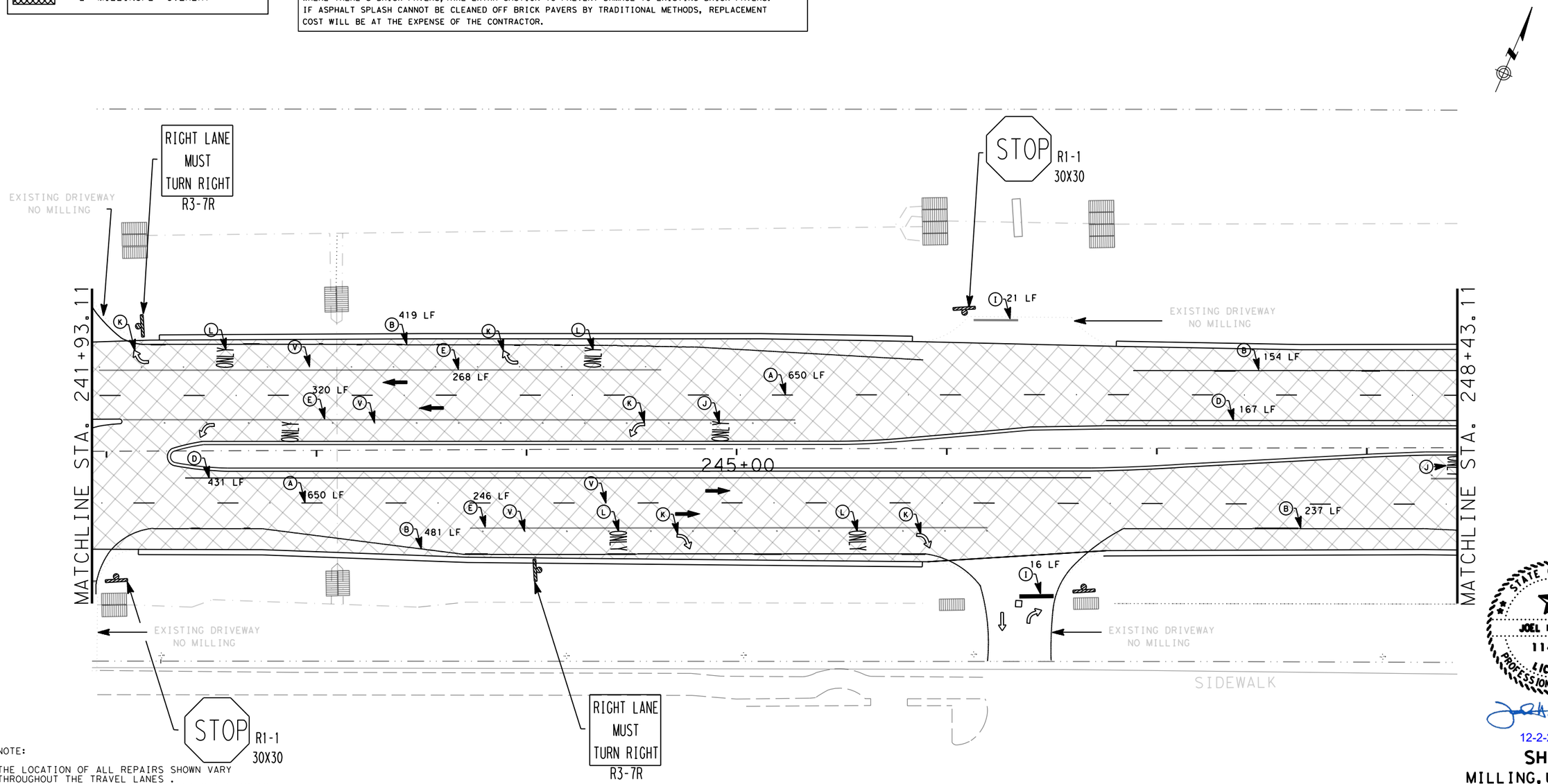

NOTE:

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(K) PREFAB PAV MRK TY C (W) (ARROW)
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(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
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(U) REFL PAV MRKR TY II-A-A
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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 24 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		58

DATE: 11/16/2022 8:59:55 AM
FILE: T:\DESIGN\0976070 16 SH 96\LAYOUTS\Layout24.dgn

LEGEND:

- EXISTING TRAFFIC FLOW
- 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
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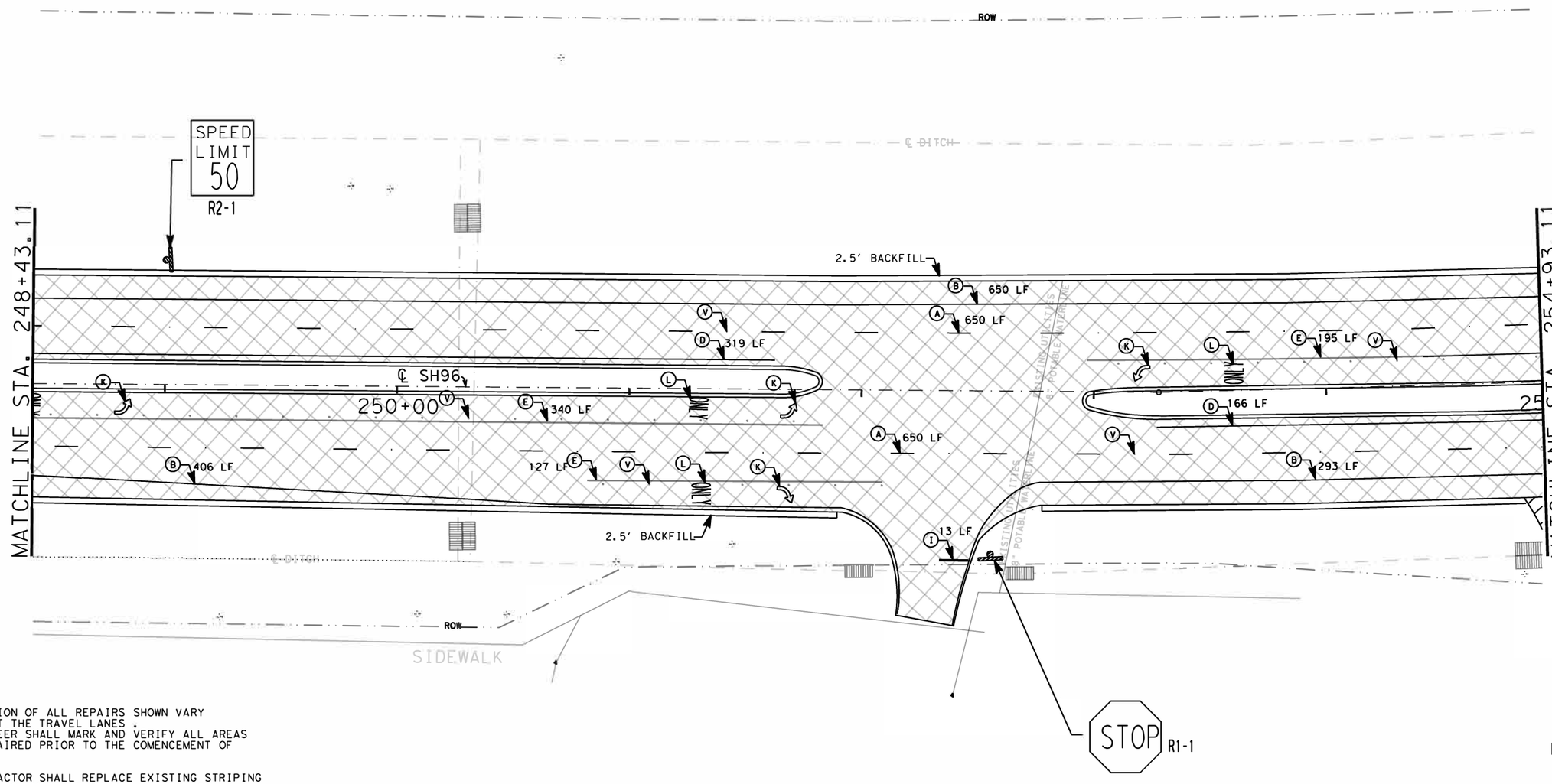

NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

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ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

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ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

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- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
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- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 25 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		59

DATE: 11/16/2022 9:05:52 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout25.dgn

CK:
DW:
CK:
DN:

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
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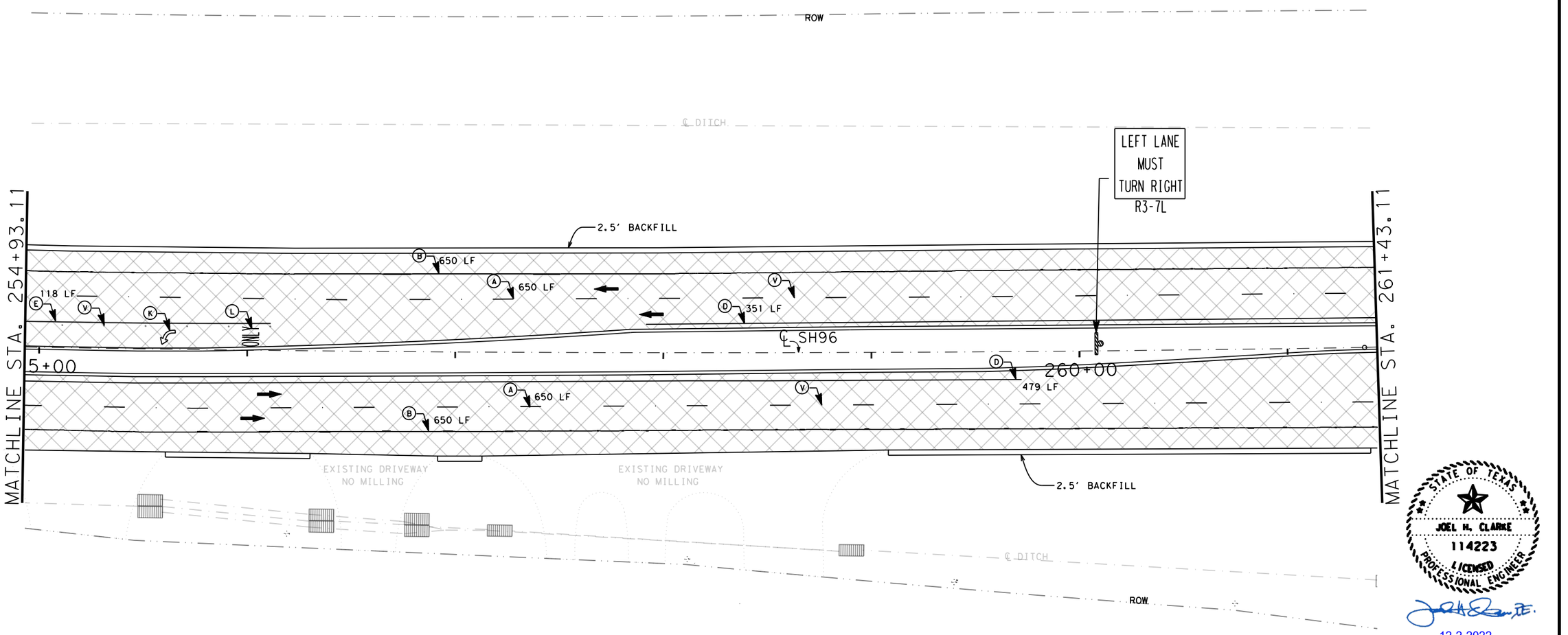

NOTE:

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ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 26 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		60

DATE: 11/16/2022 9:10:35 AM
FILE: T:\DESIGN\0976070I6 SH 96\LAYOUTS\Layout26.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
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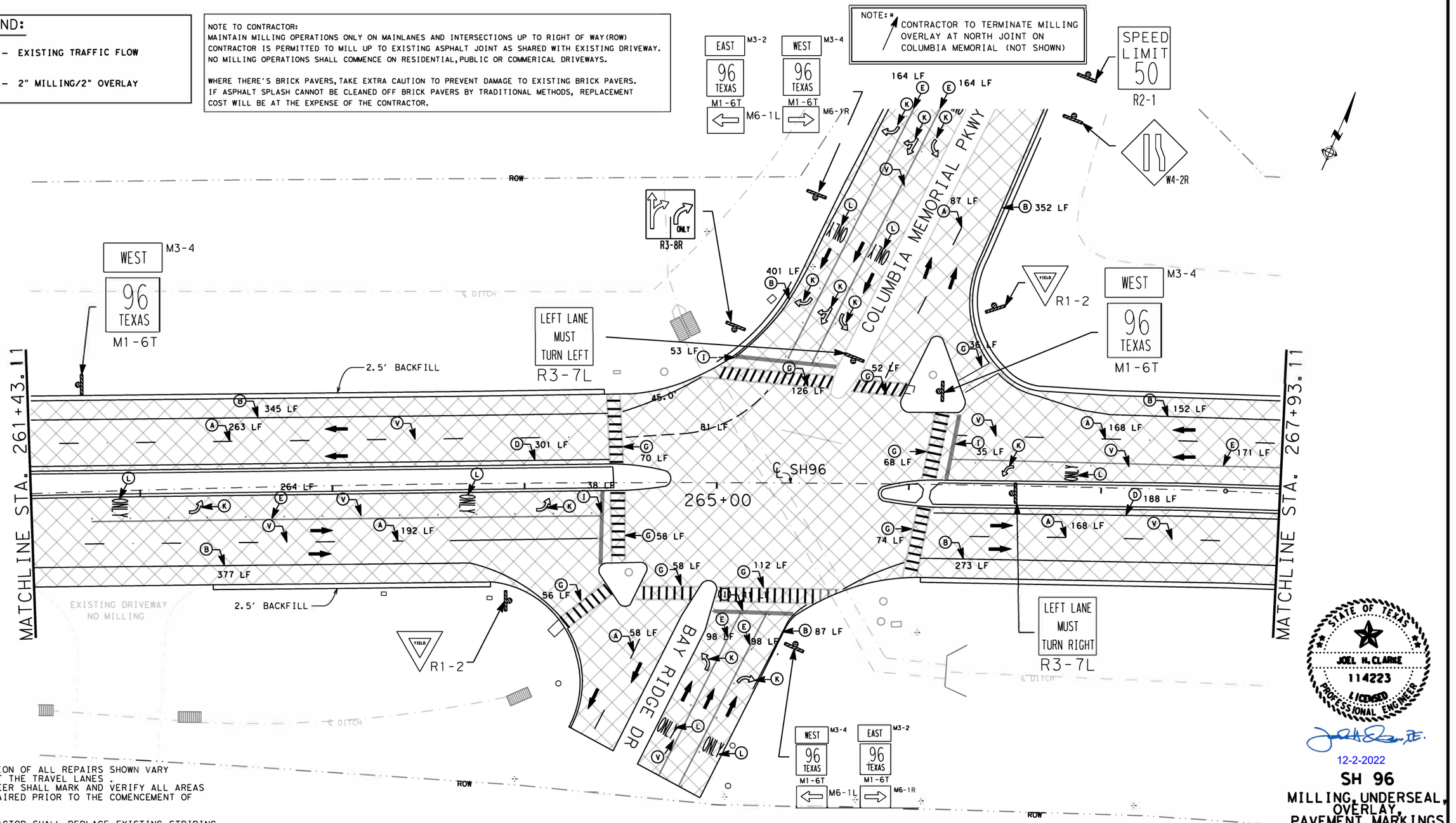
IF ASPHALT SPLASH CANNOT BE CLEANED OFF BRICK PAVERS BY TRADITIONAL METHODS, REPLACEMENT
COST WILL BE AT THE EXPENSE OF THE CONTRACTOR.

NOTE: * CONTRACTOR TO TERMINATE MILLING OVERLAY AT NORTH JOINT ON COLUMBIA MEMORIAL (NOT SHOWN)



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SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

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LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(B)	REFL PAV MRK TY I (W) 6" (SLD)(100MIL)	(K)	PREFAB PAV MRK TY C (W) (ARROW)
(D)	REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)	(L)	PREFAB PAV MRK TY C (W) (WORD)
(E)	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	(M)	REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(G)	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	(T)	REFL PAV MRKR TY I-C
(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A
		(V)	REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 27 OF 41

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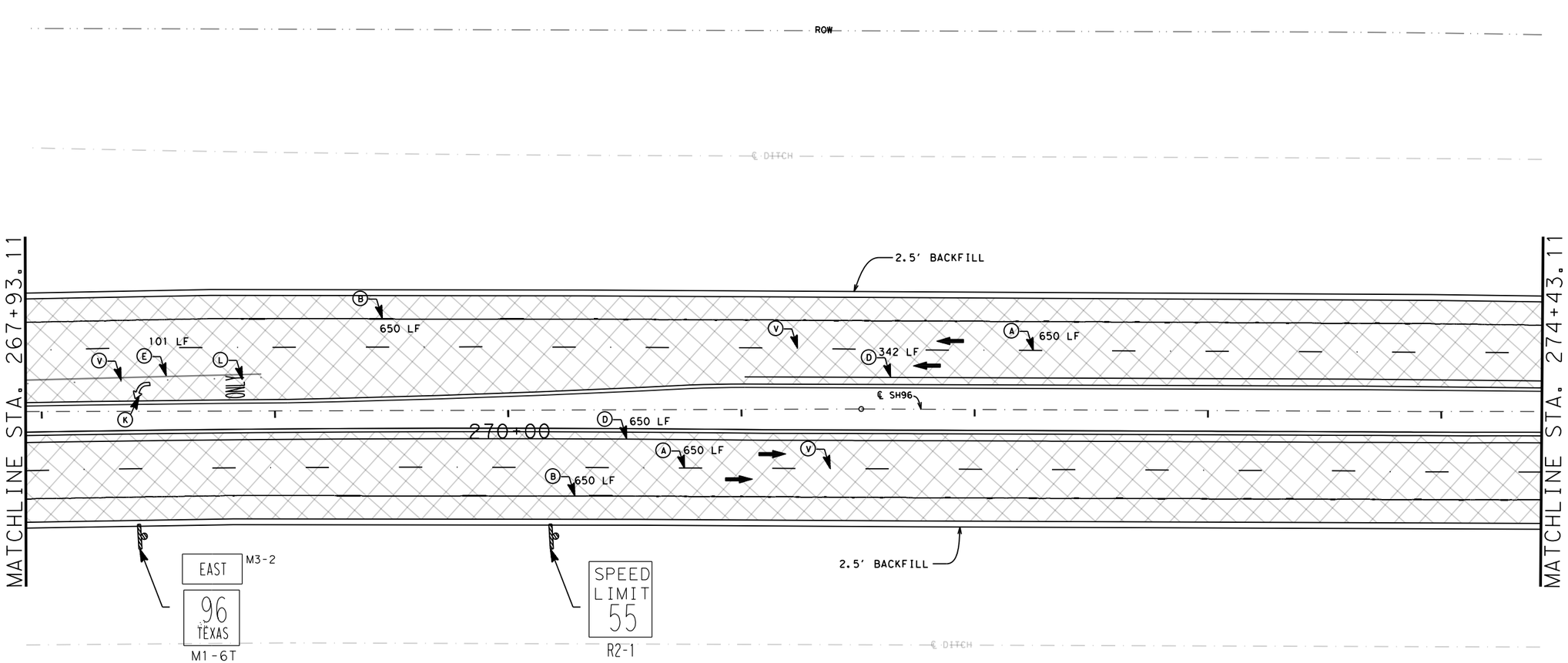
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		61

DATE: 11/16/2022 9:14:50 AM
FILE: T:\DESIGN\0976070I6 SH 96\LAYOUTS\Layout27.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
(B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
(D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
(E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
(G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
(I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
(J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(K) PREFAB PAV MRK TY C (W) (ARROW)
(L) PREFAB PAV MRK TY C (W) (WORD)
(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
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(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 28 OF 41

Texas Department of Transportation

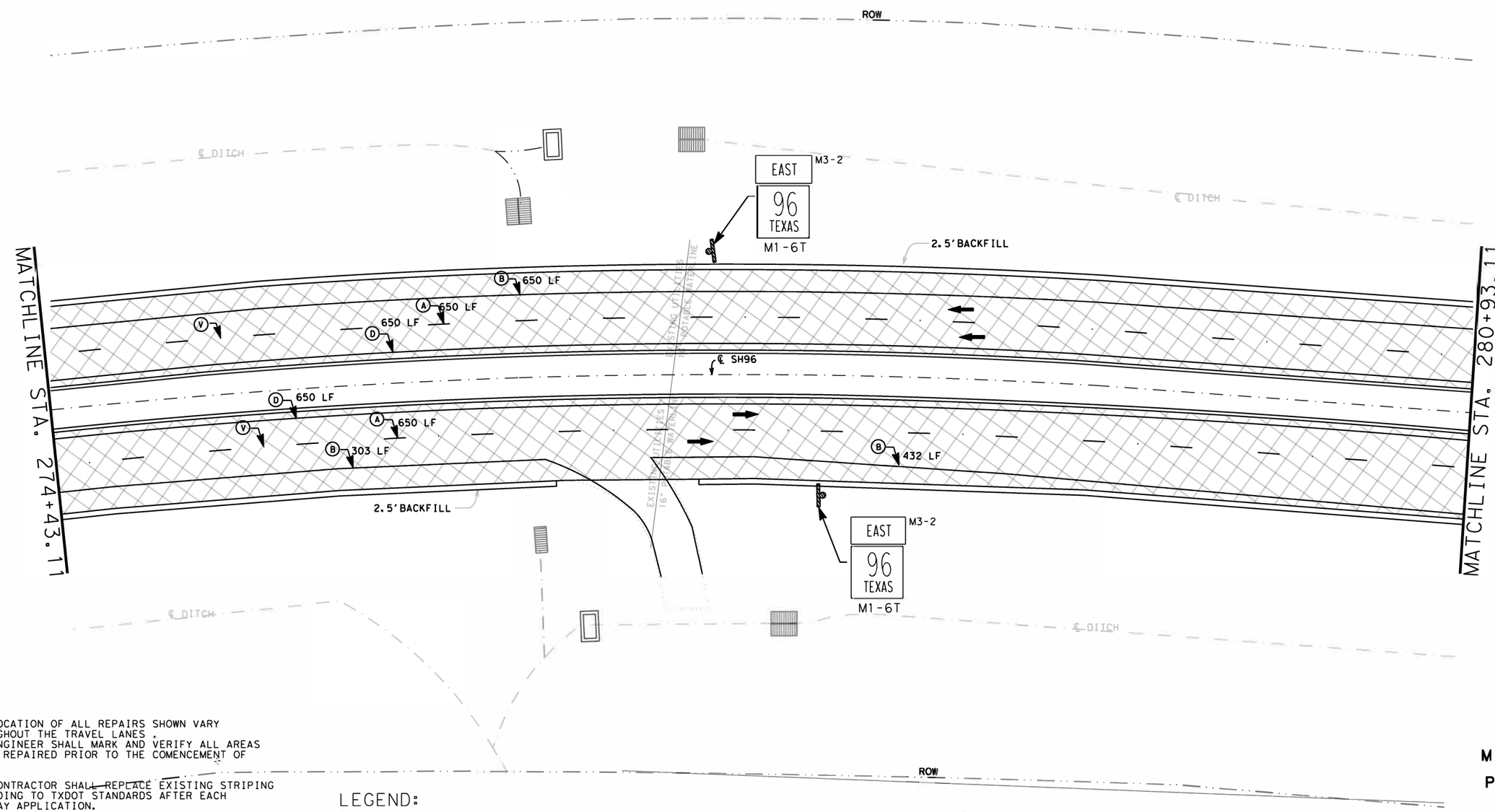
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		62

DATE: 11/16/2022 9:17:34 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout28.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



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LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(B)	REFL PAV MRK TY I (W) 6" (SLD)(100MIL)	(K)	PREFAB PAV MRK TY C (W) (ARROW)
(D)	REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)	(L)	PREFAB PAV MRK TY C (W) (WORD)
(E)	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	(M)	REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(G)	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	(T)	REFL PAV MRKR TY I-C
(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A

(V)

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 29 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		63

DATE: 11/16/2022 9:23:52 AM
FILE: T:\DESIGN\0976070I6 SH 96\LAYOUTS\Layout29.dgn

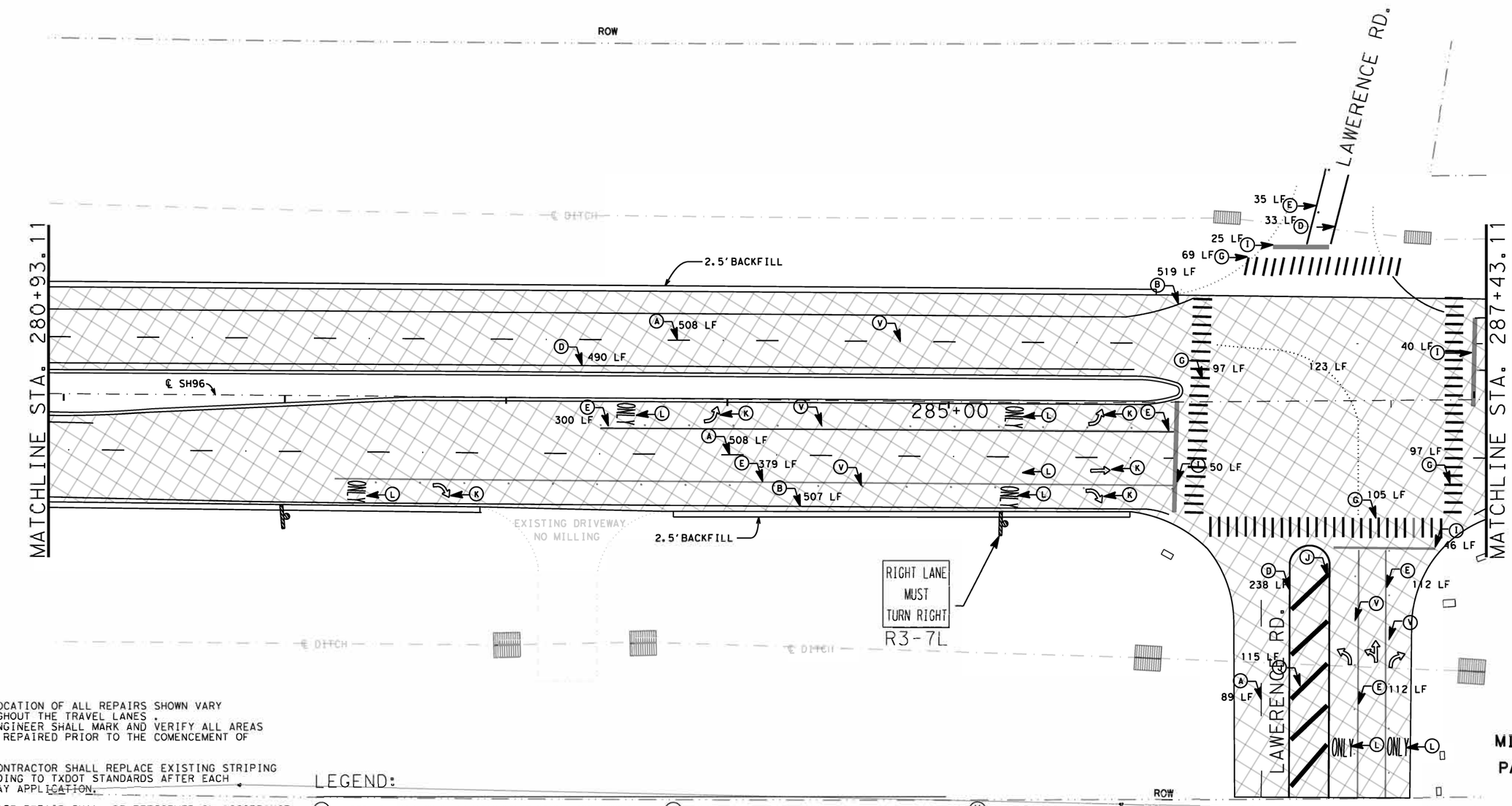
LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

NOTE TO CONTRACTOR:
MAINTAIN MILLING OPERATIONS ONLY ON MAINLANES AND INTERSECTIONS UP TO RIGHT OF WAY(ROW)
CONTRACTOR IS PERMITTED TO MILL UP TO EXISTING ASPHALT JOINT AS SHARED WITH EXISTING DRIVEWAY.
NO MILLING OPERATIONS SHALL COMMENCE ON RESIDENTIAL,PUBLIC OR COMMERICAL DRIVEWAYS.

WHERE THERE'S BRICK PAVERS,TAKE EXTRA CAUTION TO PREVENT DAMAGE TO EXISTING BRICK PAVERS.
IF ASPHALT SPLASH CANNOT BE CLEANED OFF BRICK PAVERS BY TRADITIONAL METHODS, REPLACEMENT COST WILL BE AT THE EXPENSE OF THE CONTRACTOR.



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

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LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)	(V)	REFL PAV MRKR TY II-C-R
(B)	REFL PAV MRK TY I (W) 6" (SLD)(100MIL)	(K)	PREFAB PAV MRK TY C (W) (ARROW)		
(D)	REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)	(L)	PREFAB PAV MRK TY C (W) (WORD)		
(E)	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	(M)	REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)		
(G)	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	(T)	REFL PAV MRKR TY I-C		
(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A		

0 50 SCALE IN FEET

0 50 SCALE IN FEET

STATE OF TEXAS
JOEL M. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 30 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		64

DATE: 11/16/2022 9:25:52 AM
FILE: I:\DESIGN\0976070I6 SH 96\LAYOUTS\Layout30.dgn

CKD
DWN
CKD
DWN

LEGEND:

- ⇄ – EXISTING TRAFFIC FLOW
- ▨ – 2" MILLING/2" OVERLAY

NOTE:

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- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
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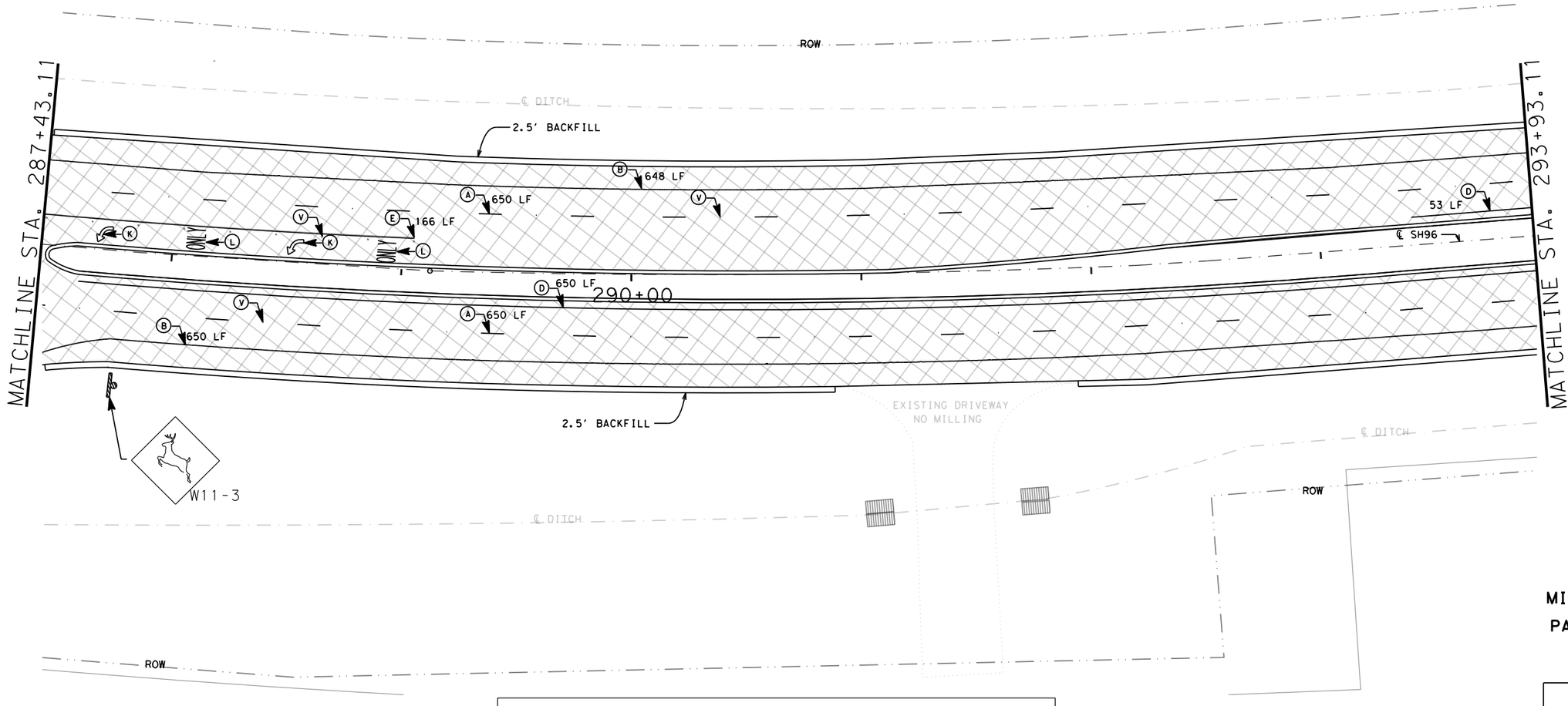

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COST WILL BE AT THE EXPENSE OF THE CONTRACTOR.

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

2-2022

SH 12 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 31 OF 41

Texas Department of Transportation

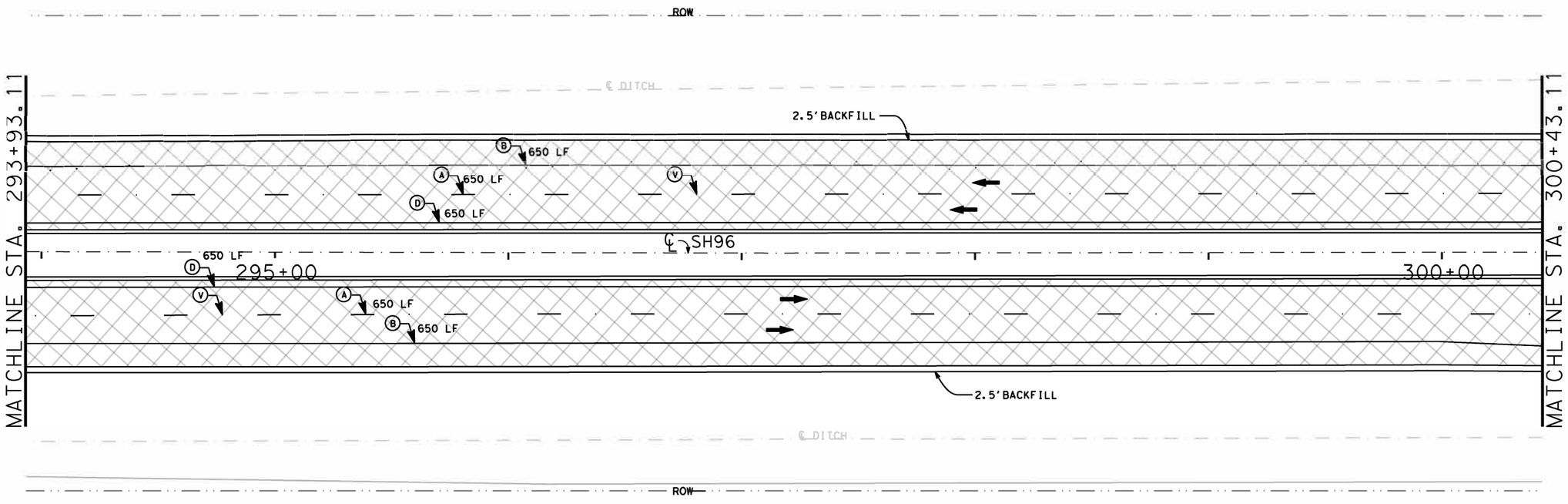
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		65

DATE: 11/16/2022 9:29:19 AM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout31.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



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LEGEND:

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- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 32 OF 41

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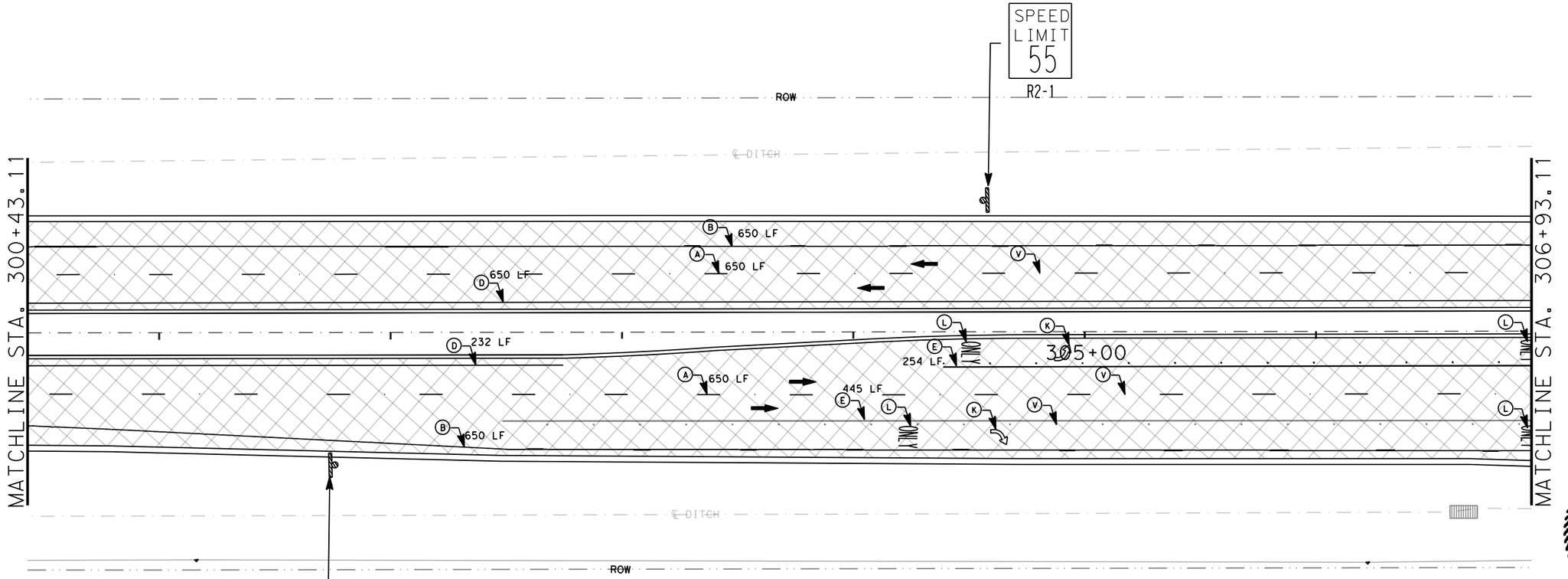
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		66

DATE: 11/16/2022 9:33:41 AM
FILE: T:\DESIGN\0976070l6 SH 96\LAYOUTS\Layout32.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

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LEGEND:

(A)	REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)	(J)	REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)	(V)	REFL PAV MRKR TY II-C-R
(B)	REFL PAV MRK TY I (W) 6" (SLD)(100MIL)	(K)	PREFAB PAV MRK TY C (W) (ARROW)		
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(E)	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	(M)	REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)		
(G)	REFL PAV MRK TY I (W) 12"(SLD)(100MIL)	(T)	REFL PAV MRKR TY I-C		
(I)	REFL PAV MRK TY I (W) 24"(SLD)(100MIL)	(U)	REFL PAV MRKR TY II-A-A		

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 33 OF 41

©YEAR Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		67

DATE: 11/16/2022 9:43:07 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout33.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
(B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
(D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
(E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
(G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
(I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
(J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
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(L) PREFAB PAV MRK TY C (W) (WORD)
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(T) REFL PAV MRKR TY I-C
(U) REFL PAV MRKR TY II-A-A
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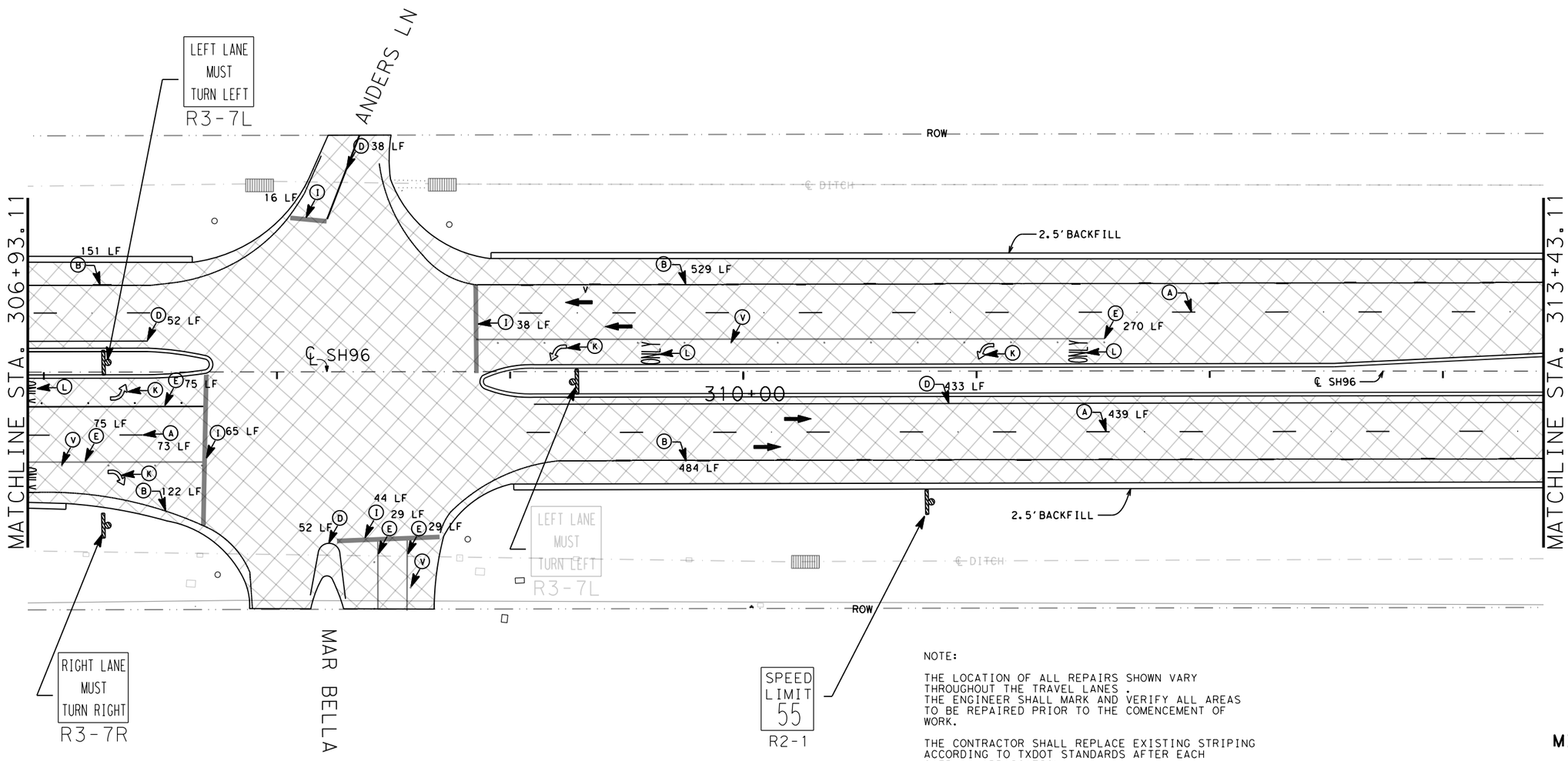

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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-27-2022

SH 96
MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 34 OF 41

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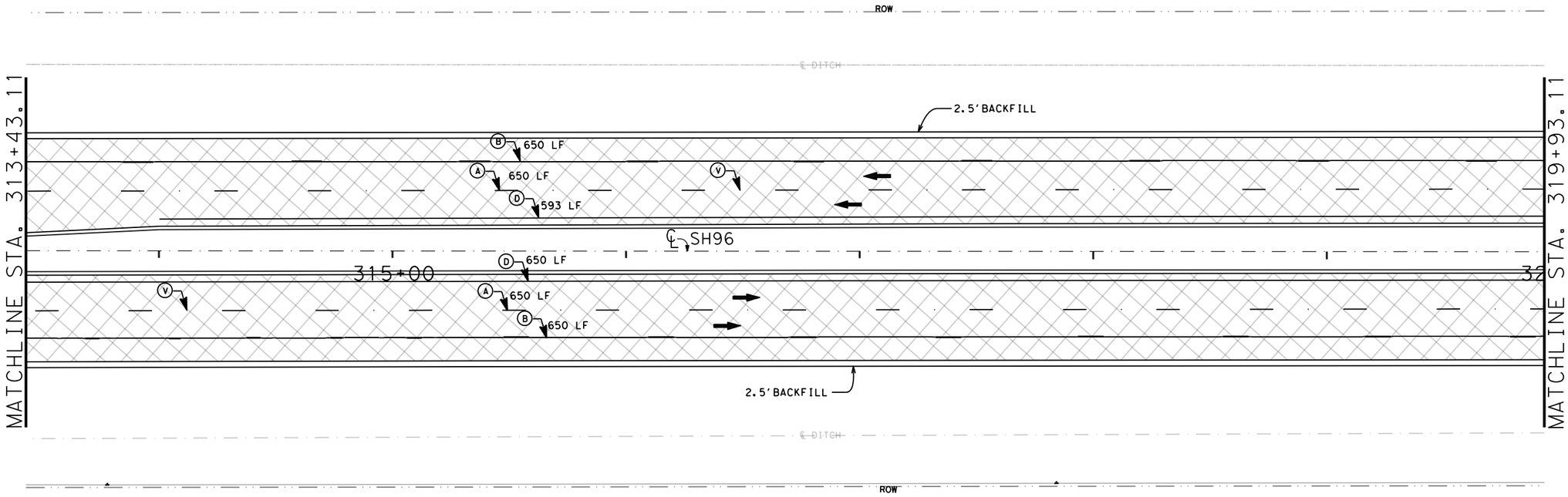
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		68

DATE: 11/16/2022 9:49:18 AM
FILE: T:\DESIGN\0976070\6 SH 96\LAYOUTS\Layout34.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



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0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 35 OF 41

Texas Department of Transportation

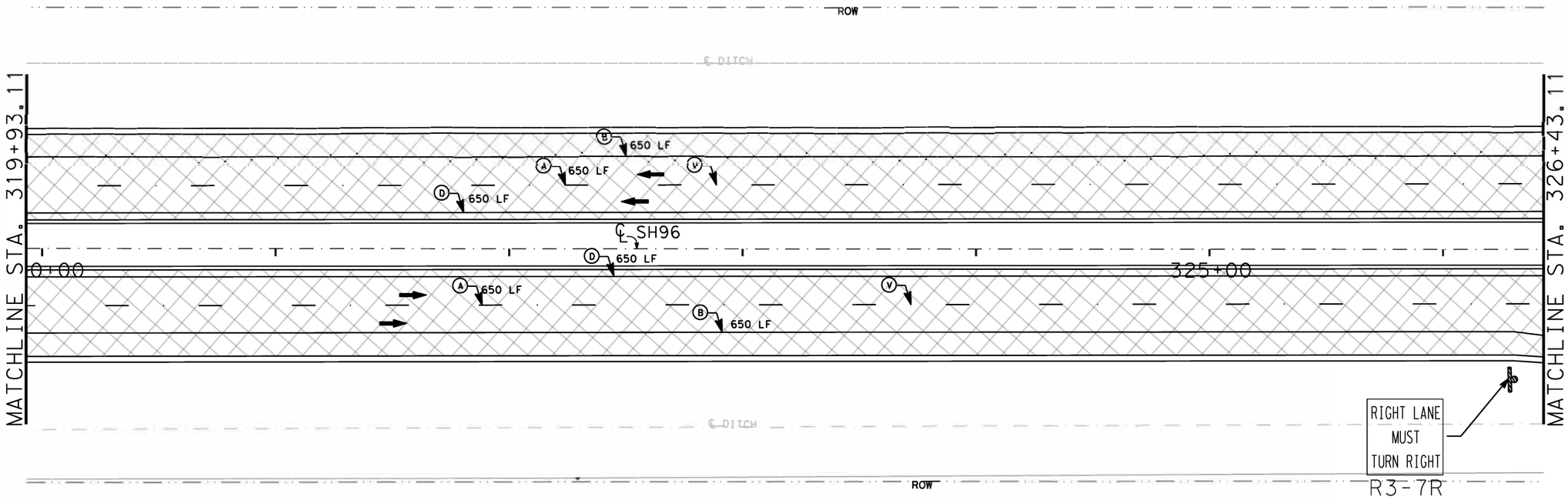
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		69

DATE: 11/16/2022 10:04:46 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout35.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

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(L) PREFAB PAV MRK TY C (W) (WORD)
(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(T) REFL PAV MRKR TY I-C
(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 36 OF 41

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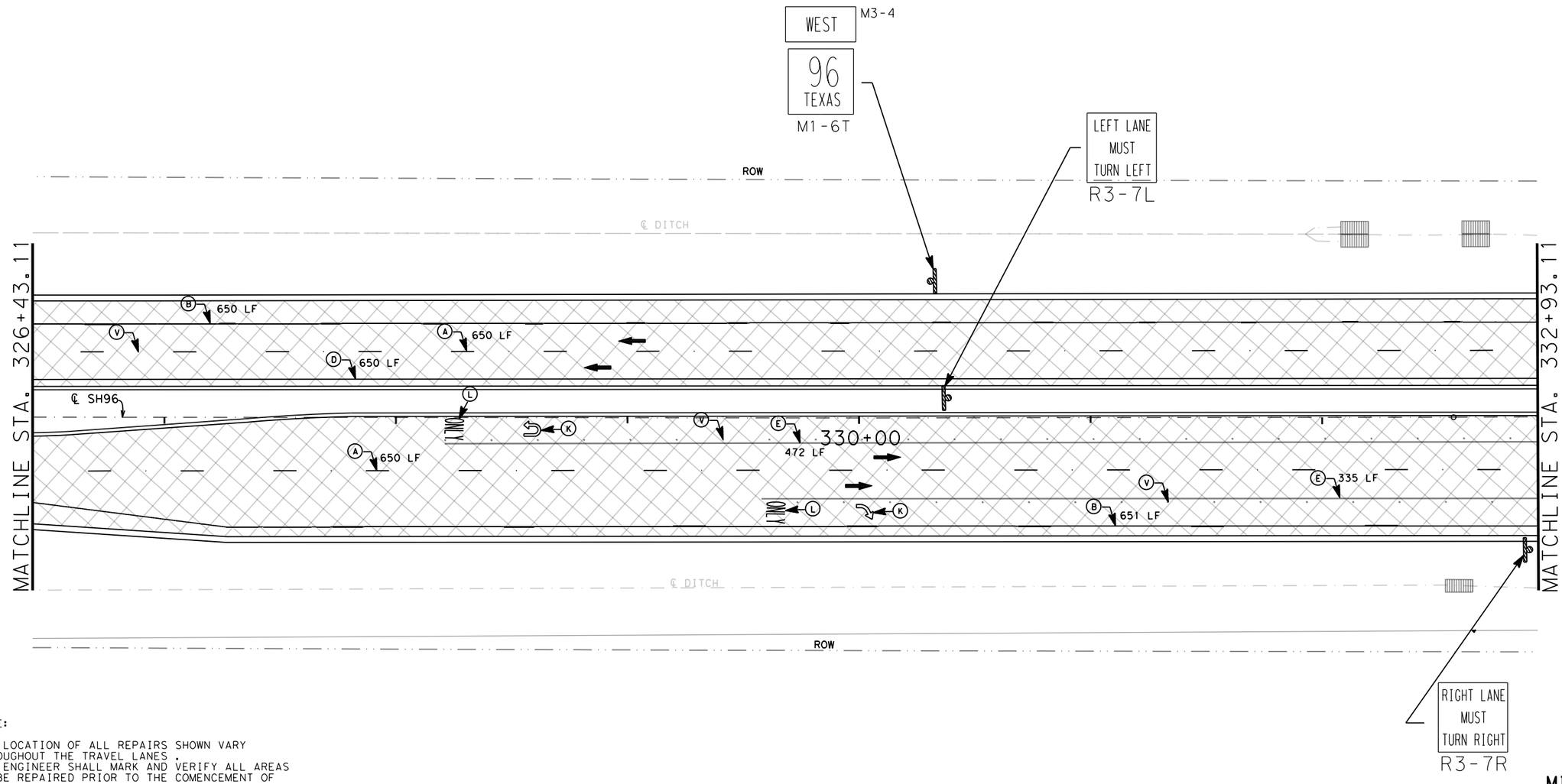
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		70

DATE: 11/16/2022 10:08:56 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout36.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50

SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 37 OF 41

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		71

DATE: 11/16/2022 10:13:44 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout*37.dgn

LEGEND:

- EXISTING TRAFFIC FLOW
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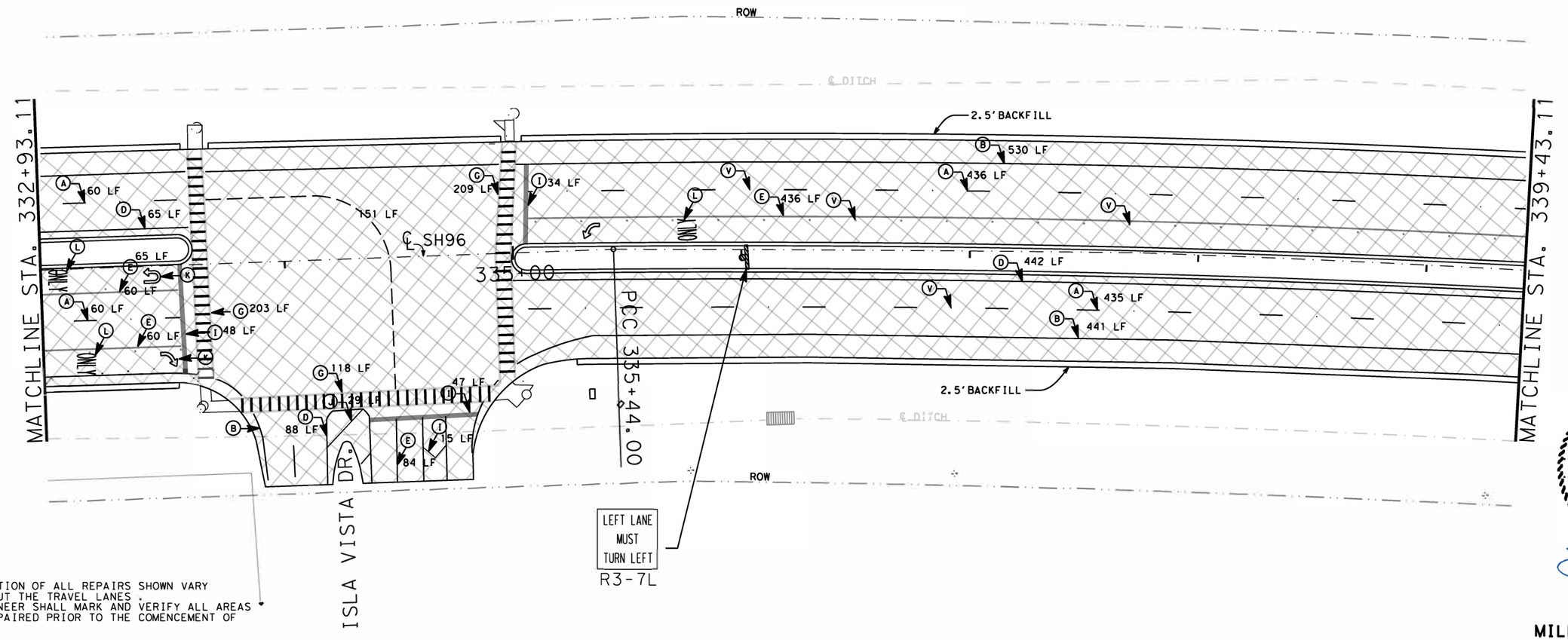

NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

- (A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
- (B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
- (E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
- (G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
- (I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
- (J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
- (K) PREFAB PAV MRK TY C (W) (ARROW)
- (L) PREFAB PAV MRK TY C (W) (WORD)
- (M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
- (T) REFL PAV MRKR TY I-C
- (U) REFL PAV MRKR TY II-A-A
- (V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
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12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 38 OF 41

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CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		72

DATE: 11/16/2022 10:17:31 AM
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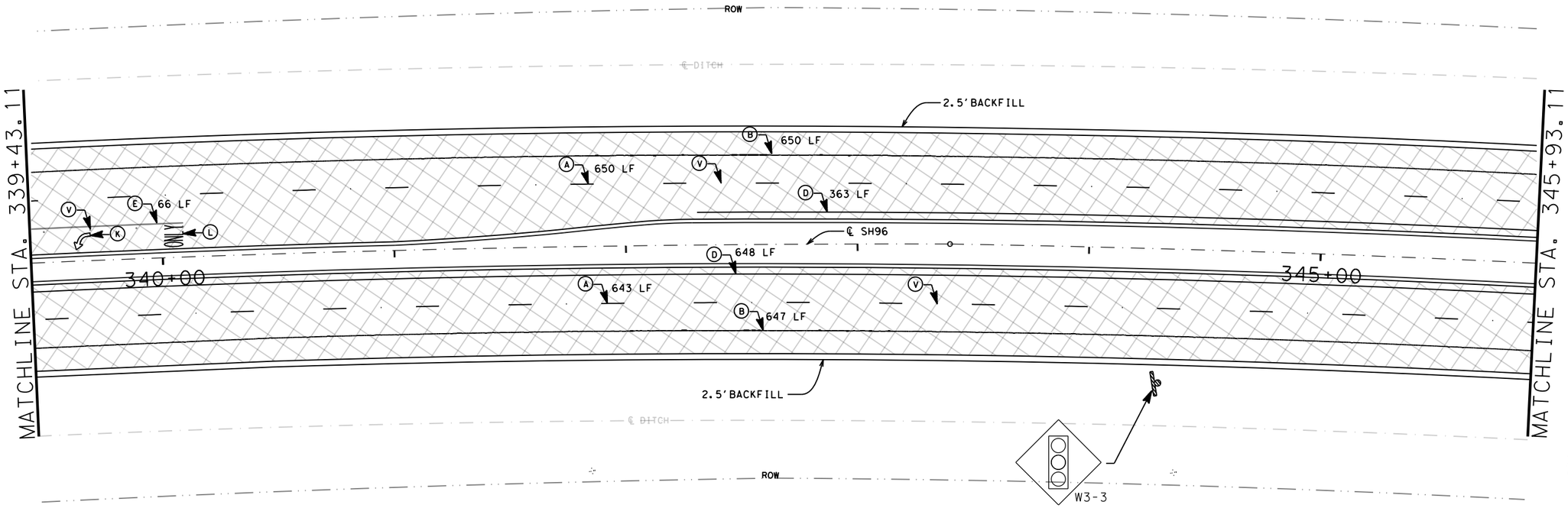
LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
(B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
(D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
(E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
(G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
(I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
(J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(K) PREFAB PAV MRK TY C (W) (ARROW)
(L) PREFAB PAV MRK TY C (W) (WORD)
(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(T) REFL PAV MRKR TY I-C
(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 39 OF 41

Texas Department of Transportation

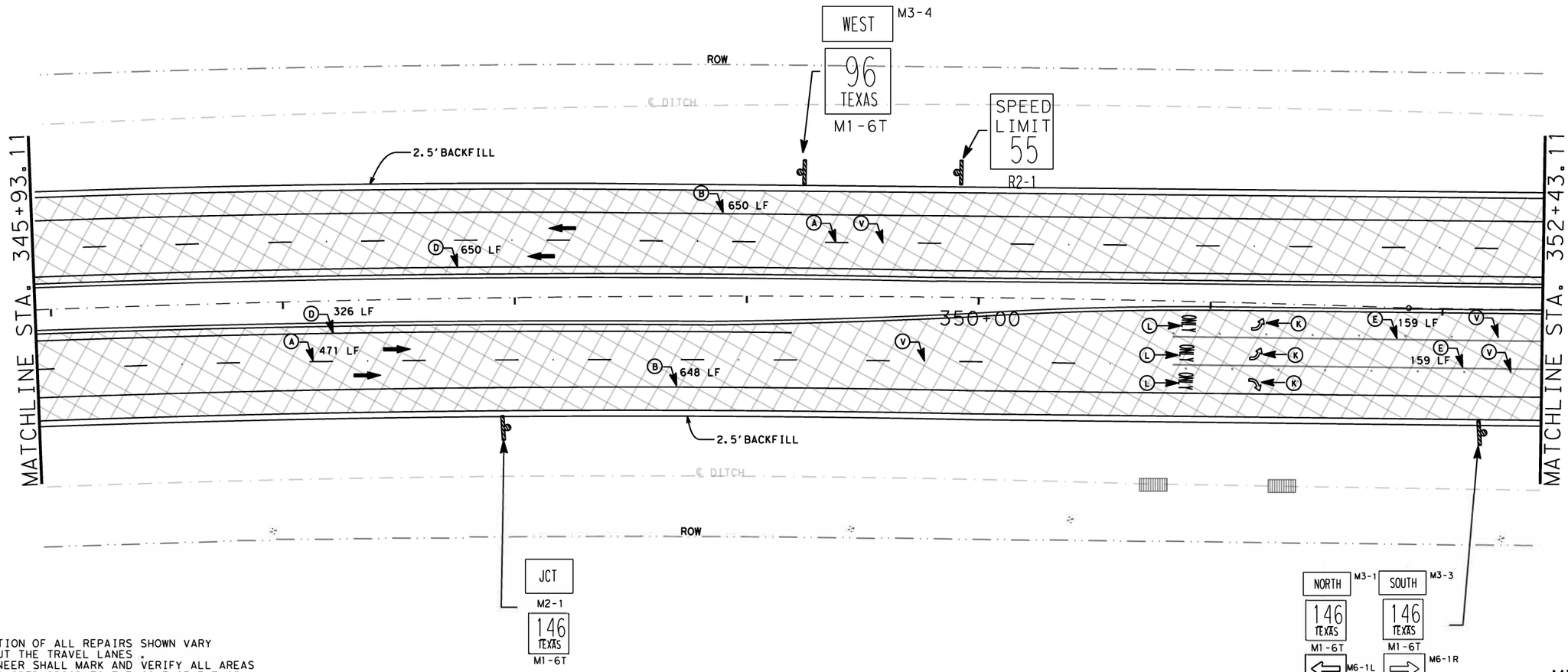
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		73

DATE: 11/16/2022 10:23:23 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\Layout39.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)
(B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)
(D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)
(E) REFL PAV MRK TY I (W) 8" (SLD)(100MIL)
(G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)
(I) REFL PAV MRK TY I (W) 24"(SLD)(100MIL)
(J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)
(K) PREFAB PAV MRK TY C (W) (ARROW)
(L) PREFAB PAV MRK TY C (W) (WORD)
(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)
(T) REFL PAV MRKR TY I-C
(U) REFL PAV MRKR TY II-A-A
(V) REFL PAV MRKR TY II-C-R

0 50
SCALE IN FEET

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 40 OF 41

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Texas Department of Transportation

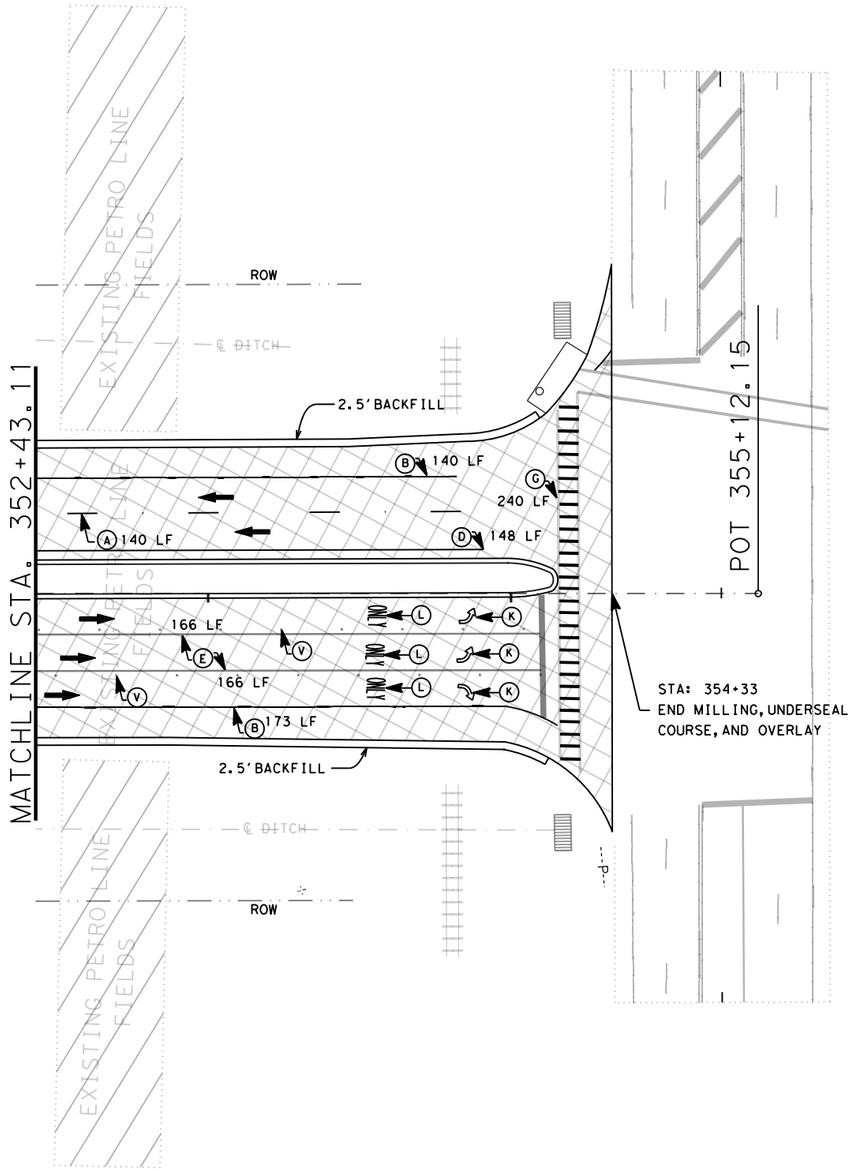
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		74

DATE: 12/2/2022 11:29:26 AM
FILE: T:\DESIGN\0976070\6 SH 96\LAYOUTS\Layout40.dgn

LEGEND:

– EXISTING TRAFFIC FLOW

– 2" MILLING/2" OVERLAY



NOTE:

THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES . THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMENCEMENT OF WORK.

THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION.

ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 340.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ON ALL BASE REPAIR LOCATIONS THE SIDES SHALL BE CUT VERTICLE THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.

LEGEND:

(A) REFL PAV MRK TY I (W)/(BLK)CONTRAST 6" (BRK)(100MIL)

(B) REFL PAV MRK TY I (W) 6" (SLD)(100MIL)

(D) REFL PAV MRK TY I (Y) 6" (SLD)(100MIL)

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

(G) REFL PAV MRK TY I (W) 12"(SLD)(100MIL)

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

(J) REFL PAV MRK TY I (Y) 24"(SLD)(100MIL)

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

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

(M) REFL PAV MRK TY I (Y) 6" (BRK)(100MIL)

(T) REFL PAV MRKR TY I-C

(U) REFL PAV MRKR TY II-A-A

(V) REFL PAV MRKR TY II-C-R

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER

12-2-2022

SH 96

MILLING, UNDERSEAL, OVERLAY, PAVEMENT MARKINGS AND SIGNS LAYOUT

SHEET 41 OF 41

©YEAR Texas Department of Transportation

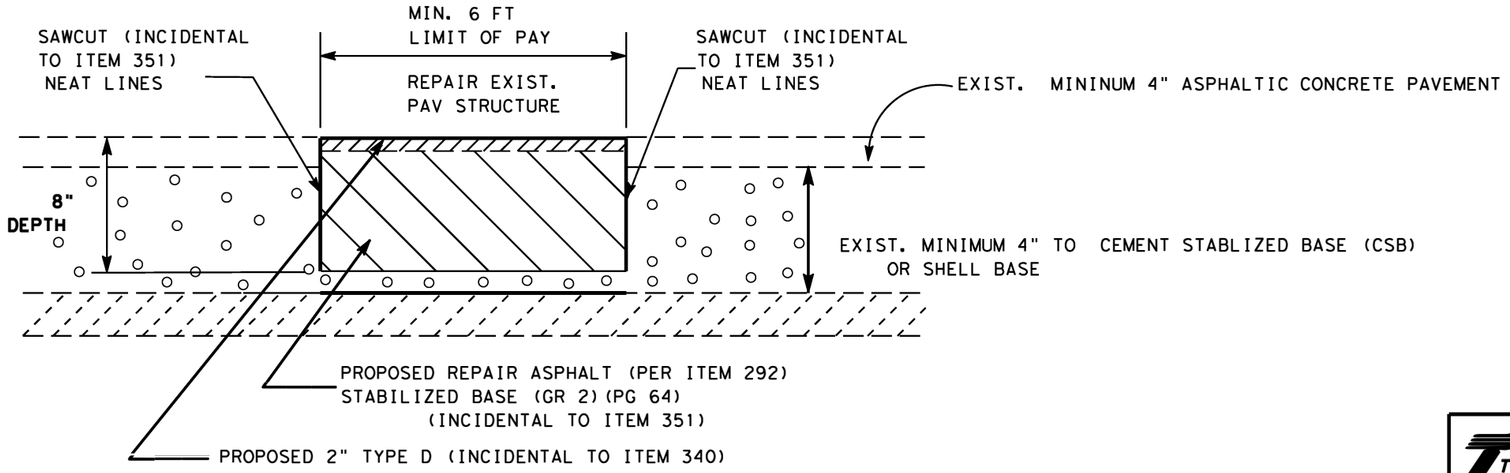
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		75

0 50
SCALE IN FEET

DATE: 11/16/2022 11:03:32 AM
FILE: T:\DESIGN\097607016 SH 96\LAYOUTS\layout41.dgn

NOTES:

1. THE LOCATION OF ALL REPAIRS SHOWN VARY THROUGHOUT THE TRAVEL LANES AND SHOULDERS. THE ENGINEER SHALL MARK AND VERIFY ALL AREAS TO BE REPAIRED PRIOR TO THE COMMENCEMENT OF WORK.
2. ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.
3. ASPHALT STABILIZED BASE SHALL MEET THE REQUIREMENT OF ITEM 292, "ASPHALT TREATMENT (PLANT MIX), " OR ITEM 340, "HOT MIX ASPHALT, " TO ACHIEVE REQUIRED SECTION.
4. TYPE D ASPHALT SHALL MEET THE REQUIREMENT OF ITEM 340.
5. SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.
6. ON ALL BASE REPAIR LOCATIONS, THE SIDES SHALL BE CUT VERTICAL, THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPHALT STABILIZED BASE.
7. THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TxDOT STANDARDS.
8. ALL MATERIAL REMOVED FROM THE REPAIR AREAS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. THIS WORK WILL BE INCIDENTAL TO ITEM 351.



BASE REPAIR DETAILS

N. T. S.

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED PROFESSIONAL ENGINEER

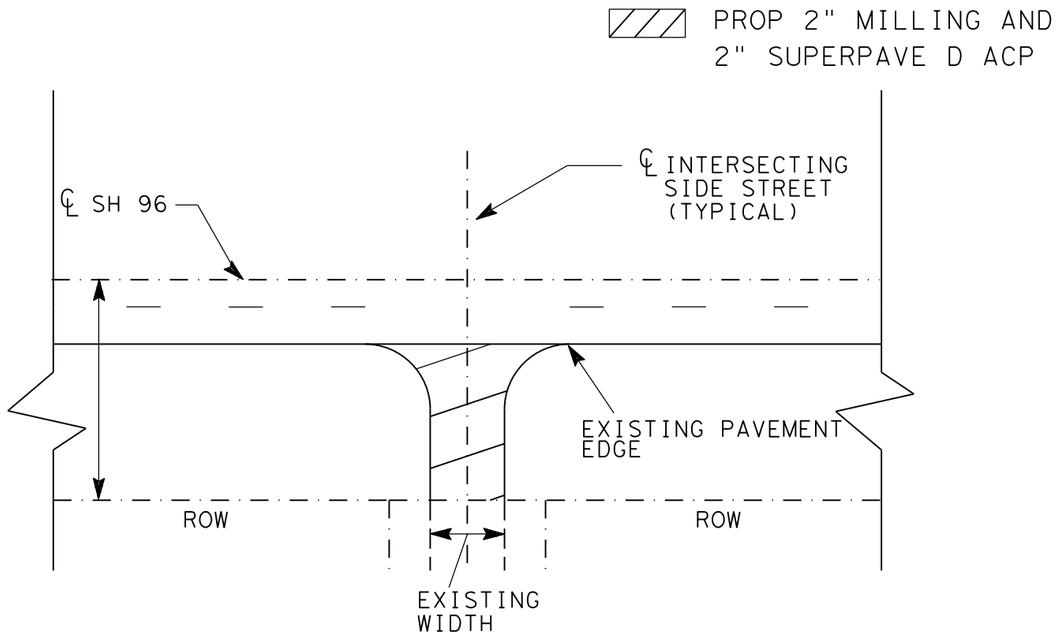
12-2-2022

TEXAS DEPARTMENT OF TRANSPORTATION

BASE REPAIR DETAIL

SCALE: N. T. S.

DN:	ORIGINAL DATE OF DRAWING:	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK DN:	REVISIONS:	6	TEXAS	C 976 7 16				SH 96
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK DW:		HOU	GALVESTON	0976	07	016		76
TR:								
CK TR:								



MILLING ACROSS INTERSECTION DETAIL

N. T. S.

NOTES:

1. THE CONTRACTOR SHALL REPLACE EXISTING STRIPING ACCORDING TO TXDOT STANDARDS AFTER EACH OVERLAY APPLICATION IN ACCORDANCE WITH ITEM 662 INCLUDING PAYMENT.

2. FINAL STRIPING SHALL BE PLACED CONCURRENT WITH RAISED PAVEMENT MARKERS.

3. REPLACE SIDESTREETS AND UP TO THE ROW.

FILE: T:\DESIGN\0976070 16 SH 96\DGNS\Milling.dgn
DATE: 11/15/2022 10:43:50 AM

STATE OF TEXAS
JOEL H. CLARKE
114223
LICENSED
PROFESSIONAL ENGINEER
12-2022

2-2022

SH 96
DRIVEWAY AND
SIDE STREET
DETAILS

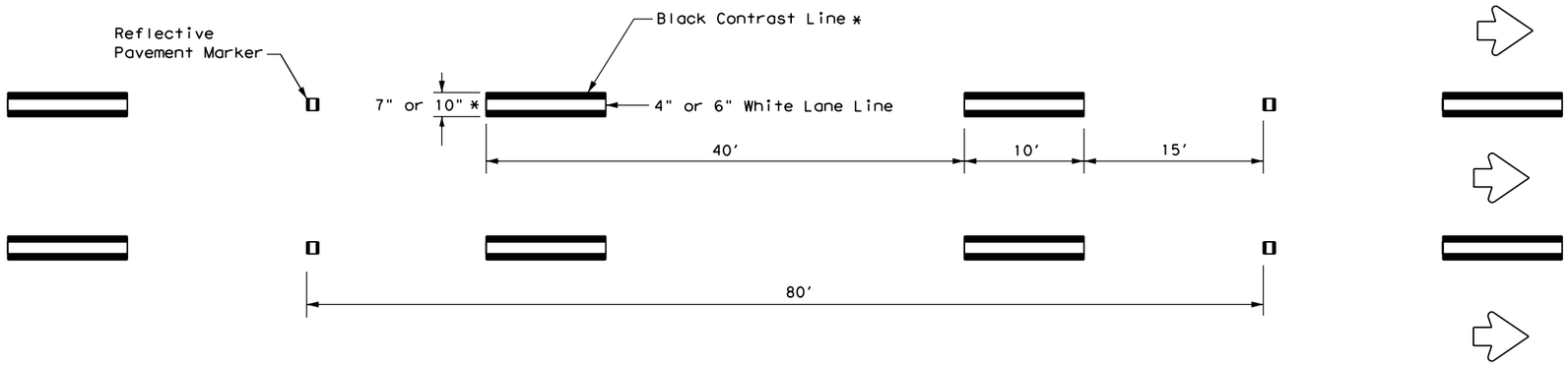
N. T. S.

Texas Department of Transportation

SHEET 1 OF 1

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			77

STATE	DISTRICT	COUNTY	
TEXAS	HOU	GALVESTON	
CONTROL	SECTION	JOB	HIGHWAY NO.
0976	07	016	SH 96



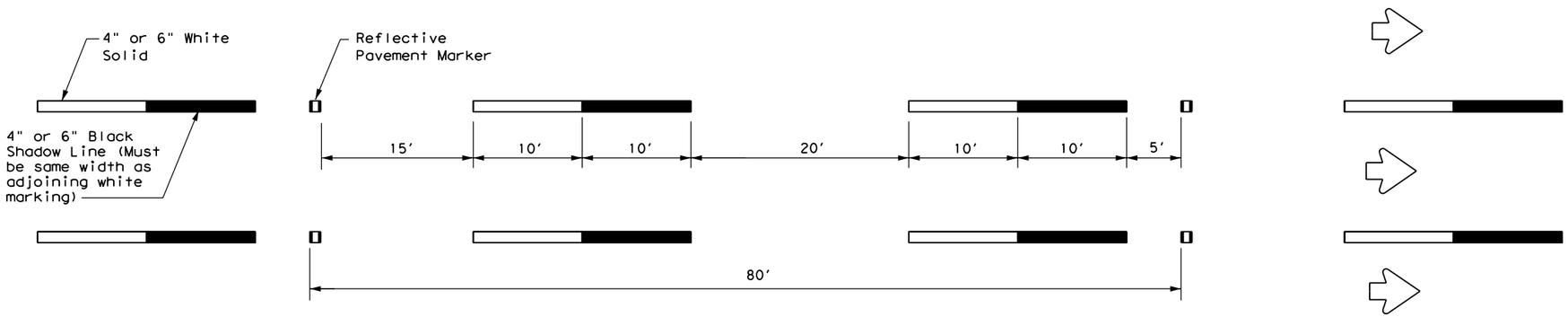
* See contrast line dimensions table for width of black line.

CONTRAST LANE LINE DESIGN

CONTRAST LINE DIMENSIONS		
White	Black (per side)	Total Width
4"	1.5"	7"
6"	2"	10"

GENERAL NOTES

1. Contrast and Shadow markings may only be used on concrete pavements.
2. Contrast and Shadow markings shall not be used on edge lines.
3. Contrast lane lines shall be permanent prefabricated pavement markings meeting DMS 8240.
4. Shadow lane line designs shall be a liquid markings system approved by TxDOT.
5. All raised reflective pavement markers placed in broken lines shall be placed in line with and midway between the white stripes.
6. See PM(2) for raised reflective pavement markings installation details.



SHADOW LANE LINE DESIGN

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.

Texas Department of Transportation

Traffic Operations Division Standard

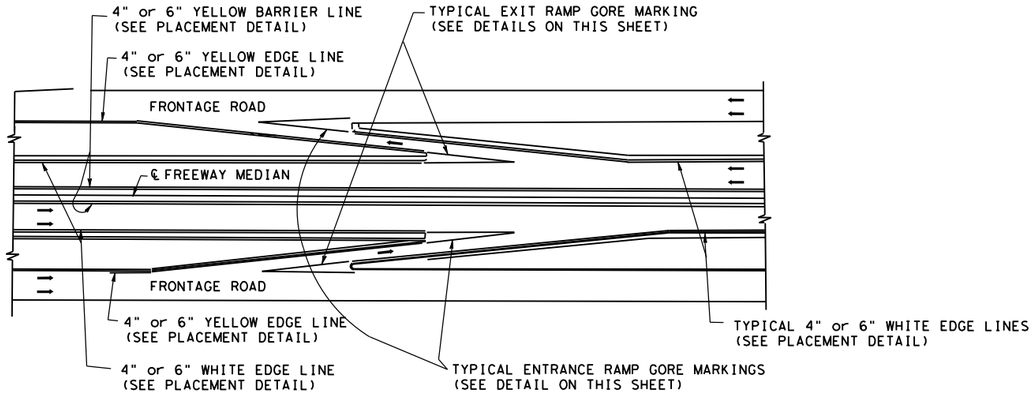
CONTRAST AND SHADOW PAVEMENT MARKINGS

CPM(1)-14

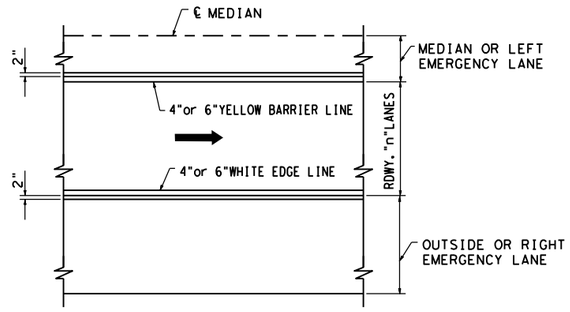
FILE: CPM(1)14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0976	07	016	SH 96
	DIST	COUNTY		SHEET NO.
	12	GALVESTON		78

22N

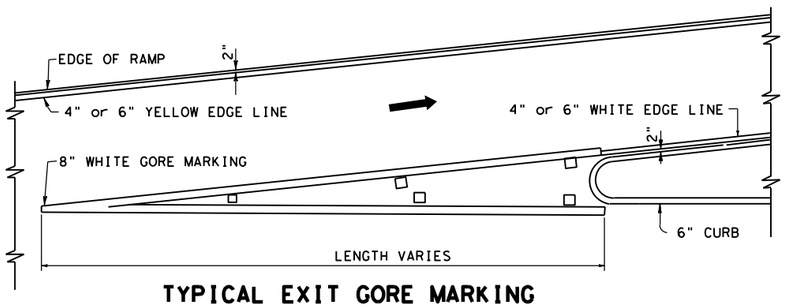
DATE:
FILE:



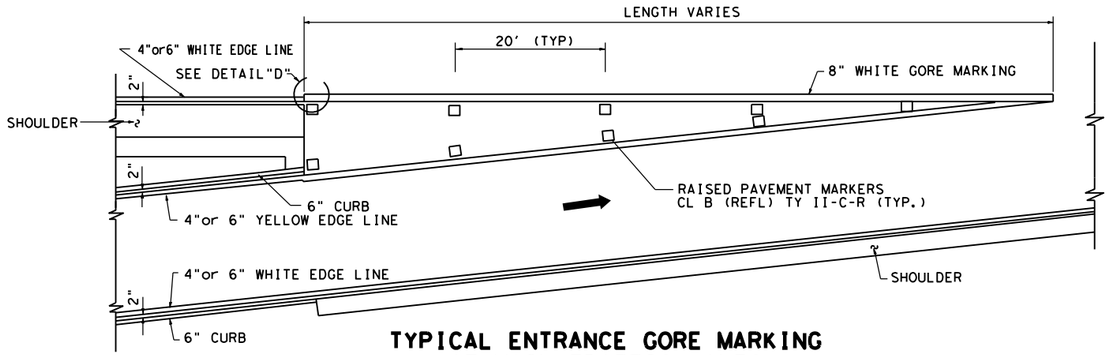
TYPICAL LAYOUT



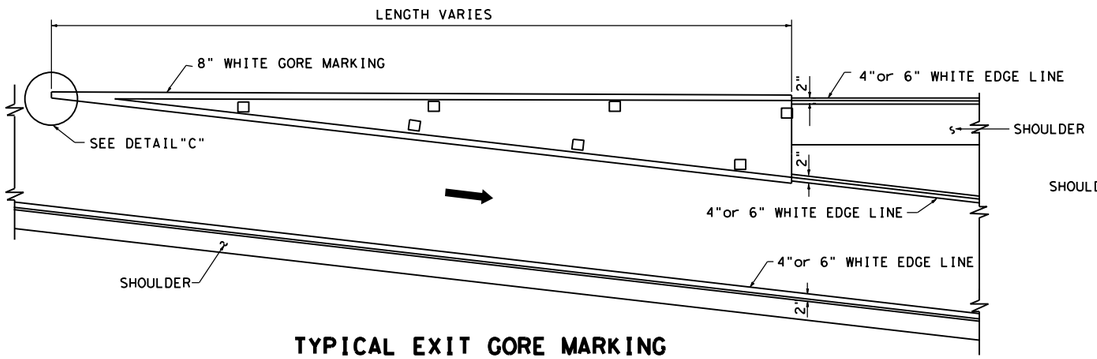
TYPICAL PLACEMENT FOR BARRIER AND EDGE LINES



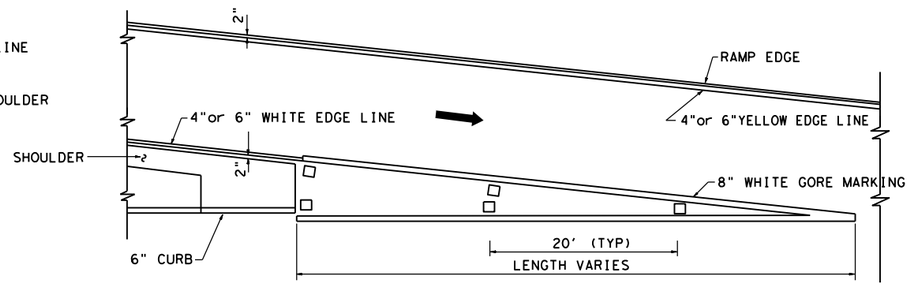
TYPICAL EXIT GORE MARKING AT FRONTAGE ROAD



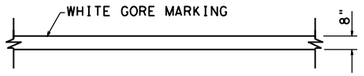
TYPICAL ENTRANCE GORE MARKING AT MAIN TRAFFIC LANES



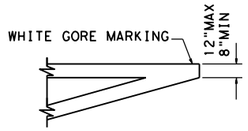
TYPICAL EXIT GORE MARKING AT MAIN TRAFFIC LANES



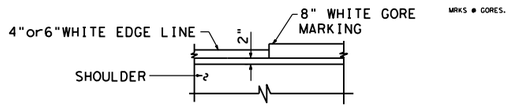
TYPICAL ENTRANCE GORE MARKING AT FRONTAGE ROAD



DETAIL "A"



DETAIL "C"



MRKS @ GORES.

DETAIL "D "

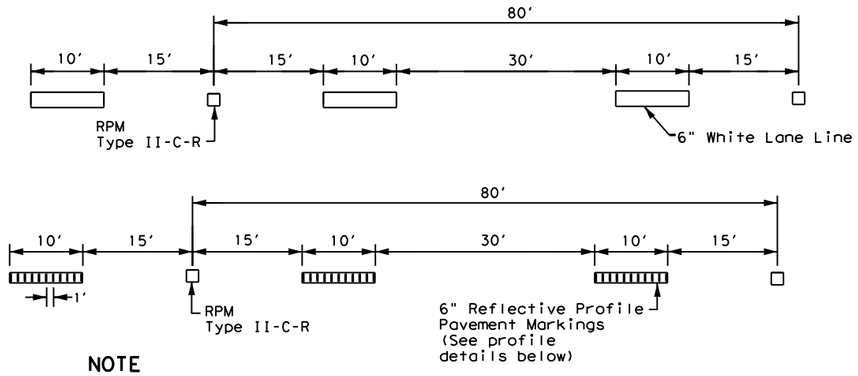
Texas Department of Transportation
Houston District

PAVEMENT MARKINGS
(RAMP AND GORE DETAILS)

PM(R&G)-10

FILE:	DN:	CK:	DW:	CK:	
© TxDOT 2010	DIST	FED REG	PROJECT NO.		SHEET
REVISIONS 4/2010	HOU	6	C 976-7-16		79
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	GALVESTON		0976	07	016	SH 96

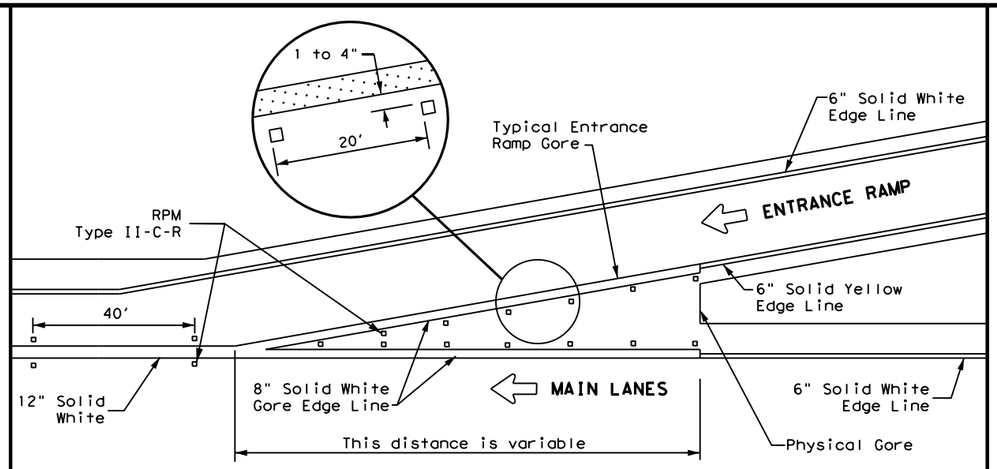
STD N-5



NOTE

Reflectorized raised pavement markers Type II-C-R shall be spaced on 80' centers with the clear face toward normal traffic and the red face toward wrong way traffic. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.

TRAFFIC LANE LINES PAVEMENT MARKING



TYPICAL ENTRANCE RAMP GORE MARKING

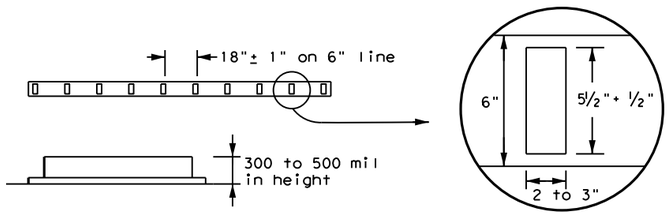
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R

GENERAL NOTE

On concrete pavements the raised pavement markers shall be placed to one side of the longitudinal joints.



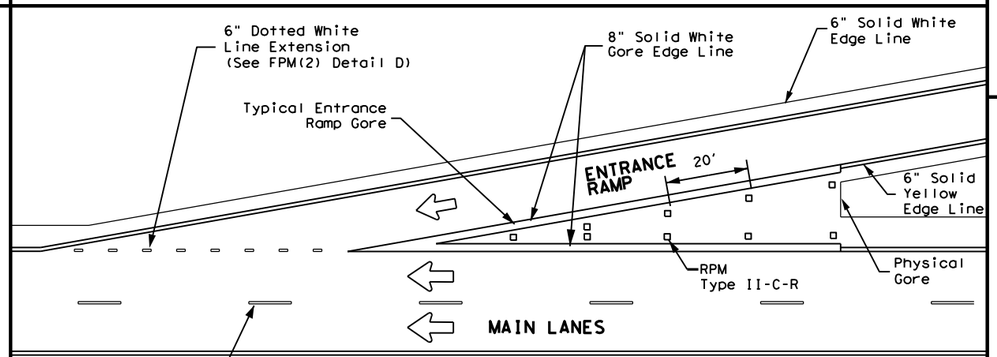
Reflective Profile Pavement Markings

Standard 6" Profile Detail

NOTE

Edge lines should typically be 6" wide and the materials shall be as specified in the plans. See details above if reflective profile pavement markings are to be used.

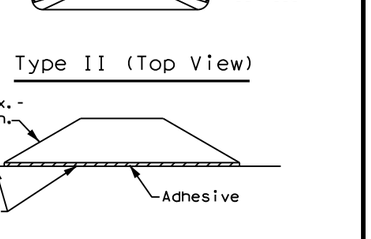
EDGE LINE PAVEMENT MARKINGS



NOTE

See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

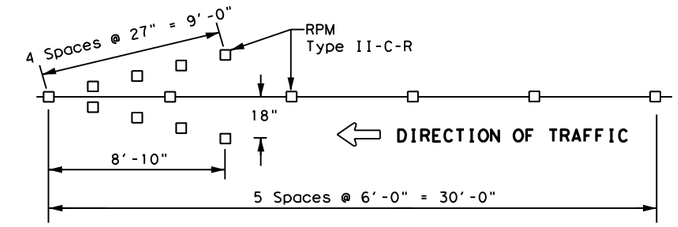
TAPERED ACCELERATION LANE



Type II (Top View)

SECTION A

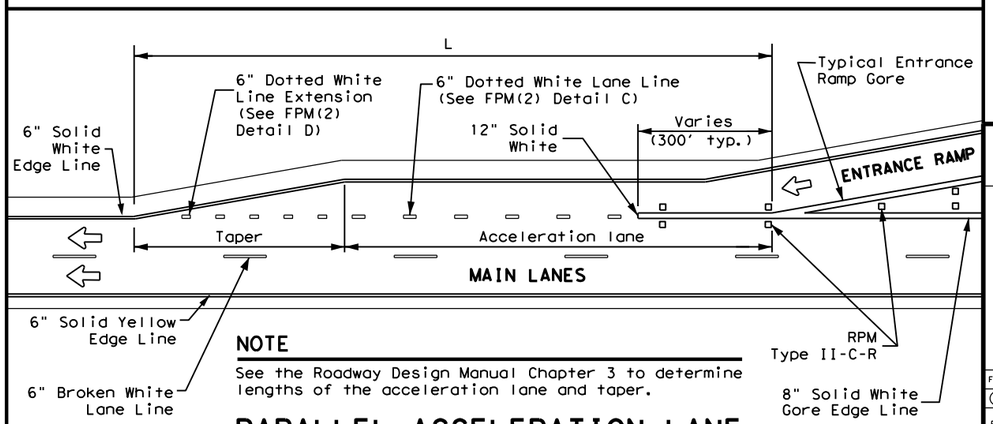
REFLECTORIZED RAISED PAVEMENT MARKER (RPM)



NOTES

1. Reflectorized raised pavement markers Type-II-C-R in the wrong way arrow shall have the clear face toward normal traffic and the red face toward the wrong way traffic.
2. Red reflectorized wrong way arrows, not to exceed two, may be placed on exit ramps. Locations of the arrows shall be as shown in the plans or as directed by the engineer.

WRONG WAY ARROW



NOTE

See the Roadway Design Manual Chapter 3 to determine lengths of the acceleration lane and taper.

PARALLEL ACCELERATION LANE

Texas Department of Transportation

Traffic Safety Division Standard

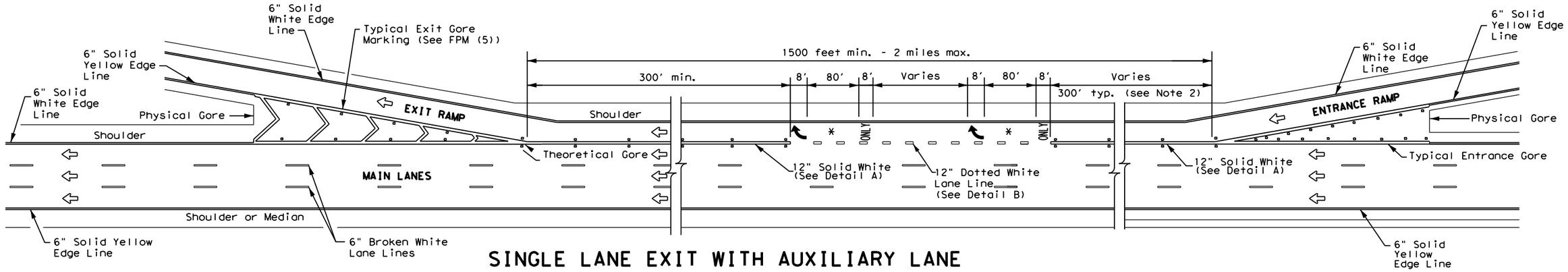
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

FILE: fpm(1)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0976	07	016	SH 96
5-74 8-00 2-12	DIST	COUNTY		SHEET NO.
4-92 2-08 10-22	HOU	GALVESTON		79A
5-00 2-10				

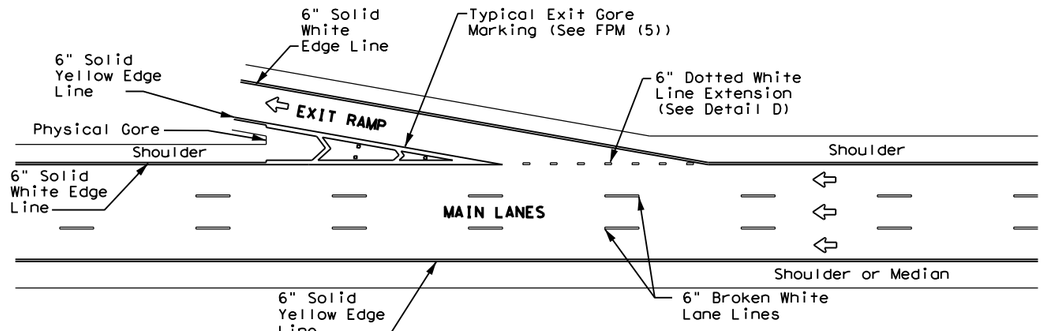
23A

DATE: 10/28/2022
FILE: I:\DESIGN\097607016 SH 96\STANDARDS\fpm(1)-22.dgn



SINGLE LANE EXIT WITH AUXILIARY LANE

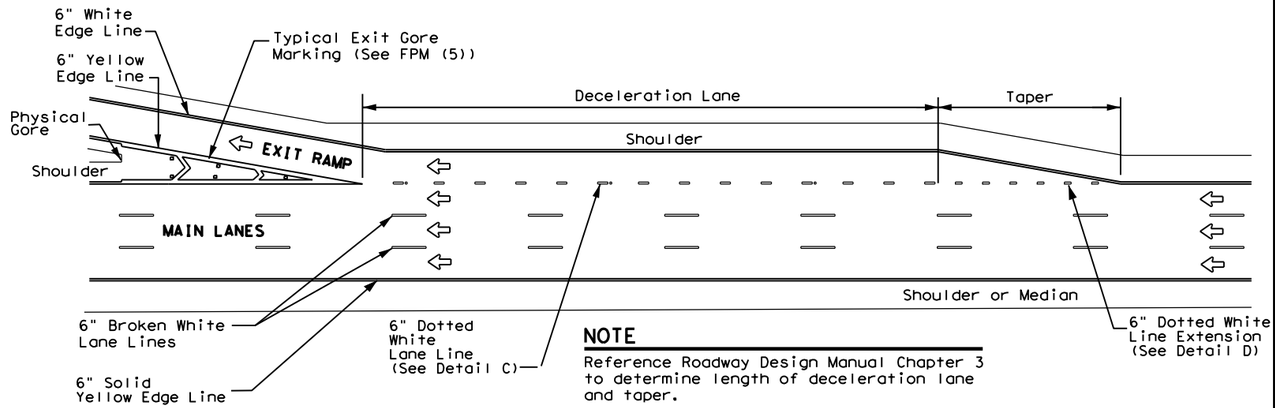
(See Note 2)



NOTE

Reference Roadway Design Manual Chapter 3 to determine if tapered deceleration lane may be used.

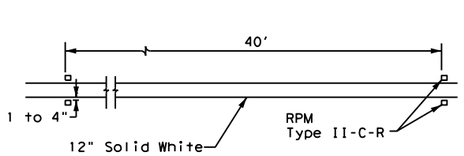
TAPERED DECELERATION LANE



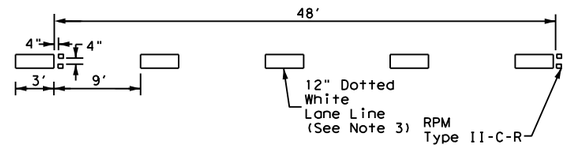
NOTE

Reference Roadway Design Manual Chapter 3 to determine length of deceleration lane and taper.

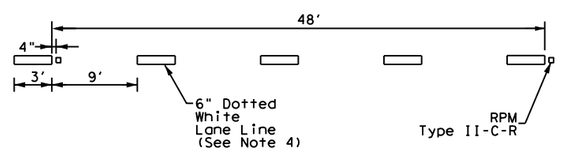
PARALLEL DECELERATION LANE



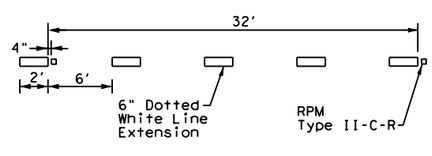
DETAIL A



DETAIL B



DETAIL C



DETAIL D

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Normal (6") dotted lane line (see Detail C) is used at parallel acceleration and deceleration lanes.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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.

Texas Department of Transportation

Traffic Safety Division Standard

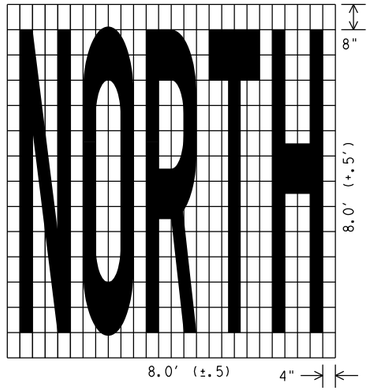
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

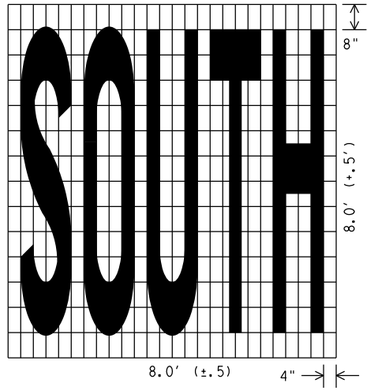
FPM(2)-22

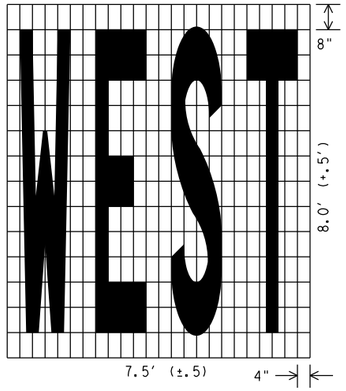
FILE: fpm(2)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-77 5-00 2-12 4-92 8-00 10-22 8-95 2-10	0976	07	016	SH 96
	DIST	COUNTY		SHEET NO.
	HOU	GALVESTON		79B

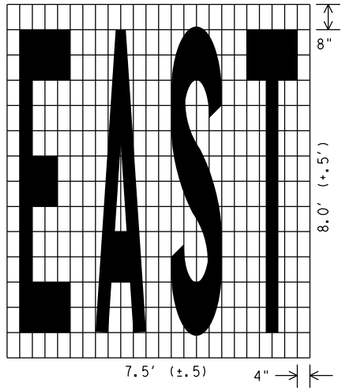
23B

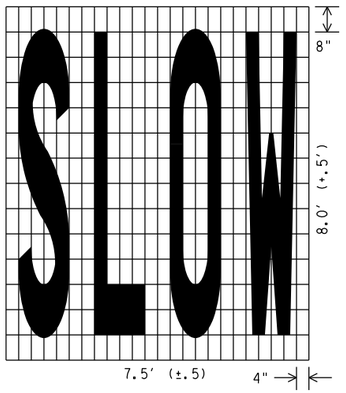
DATE: 10/28/2022
FILE: T:\DESIGN\097607016 SH 96\STANDARDS\fpm(2)-22.dgn

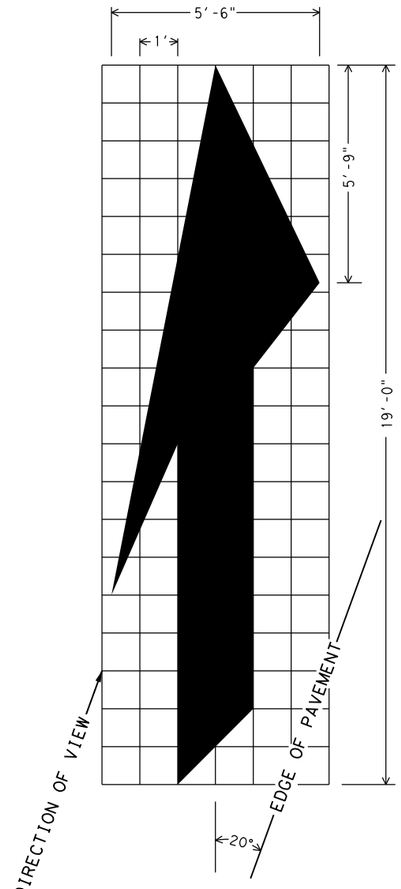






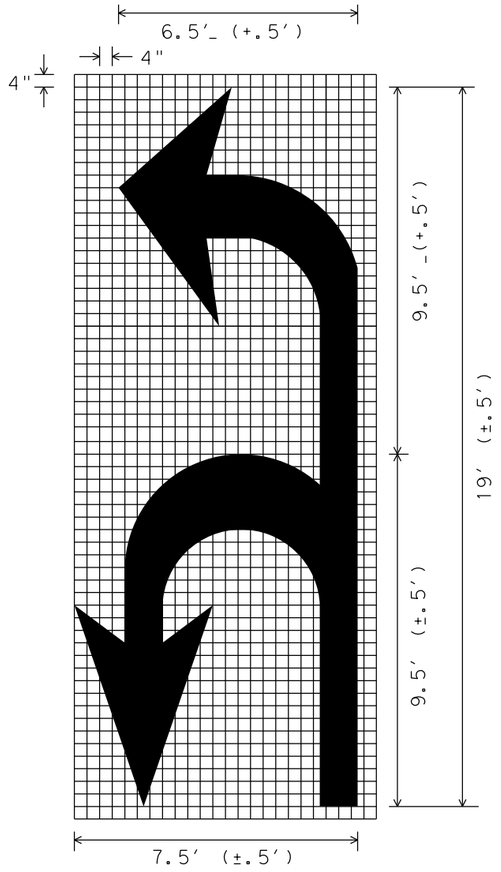




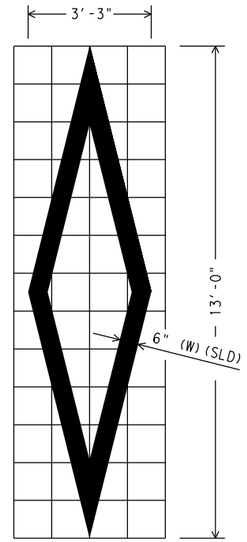


ISOMETRIC ARROW

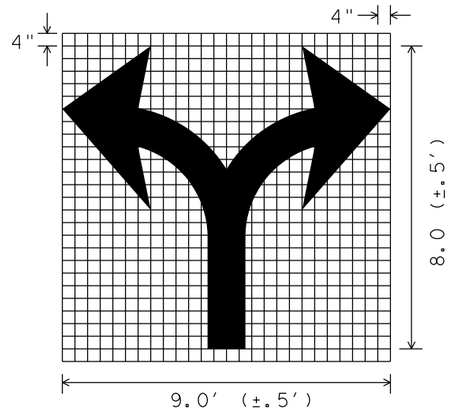
12 INCH GRID
AREA = 42 SQ. FT.
RIGHT LANE DROP ARROW
(FOR LEFT LANE, USE MIRROR IMAGE)



U-L ARROW



DIAMOND SYMBOL



SCALE 1/4" = 1′

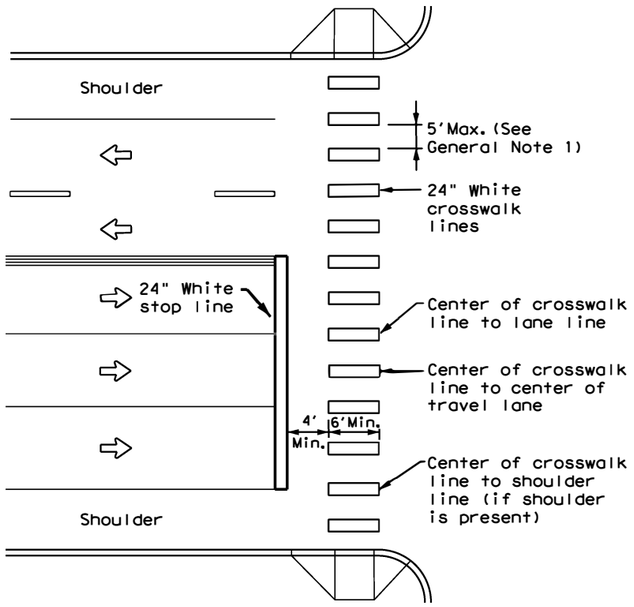
Texas Department of Transportation
Houston District

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		80
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	GALVESTON	0976	07	016	SH 96

STD-N31



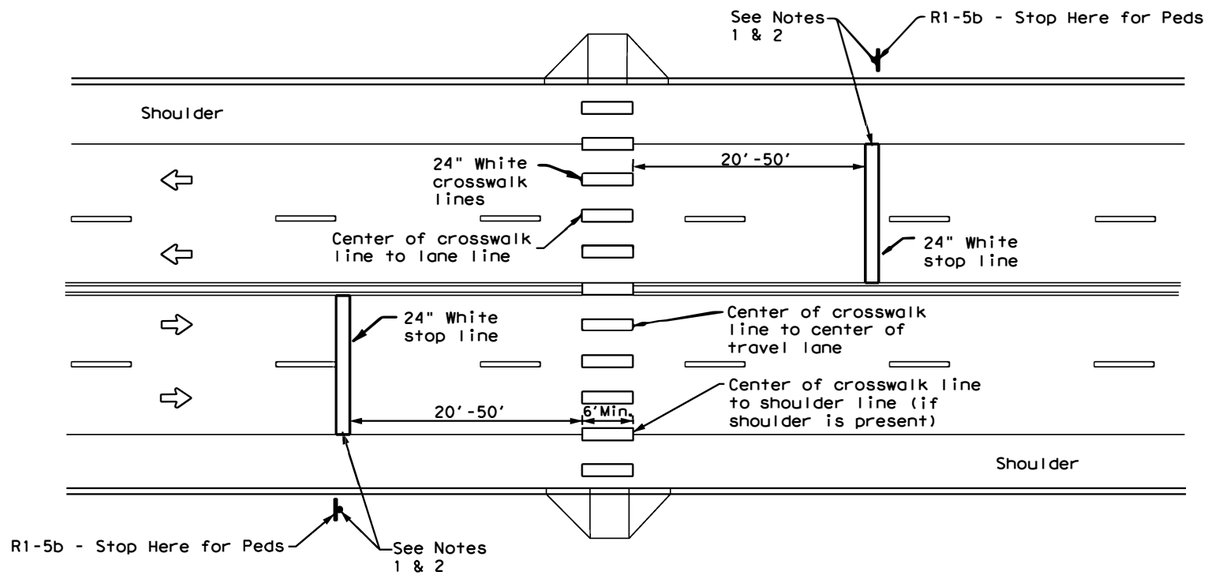
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

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

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with "Stop Here for Pedestrians" signs at unsignalized mid block cross walks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22

FILE: pm4-22.dgn	DN:	CK:	DW:	CK:
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 3-22	0976	07	016	SH 96
	DIST	COUNTY		SHEET NO.
	HOU	GALVESTON		81

22D

DATE: 11/29/2022 3:57:03 PM
FILE: T:\DESIGN\0976070I6 SH 96\STANDARDS\pm4-22.dgn

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

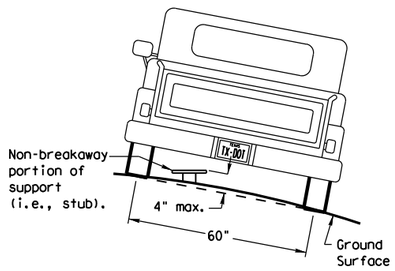
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

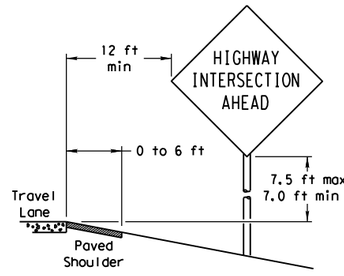
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

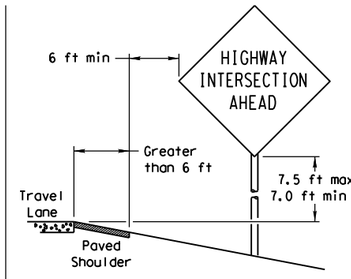
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

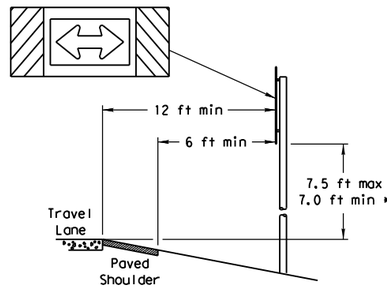
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



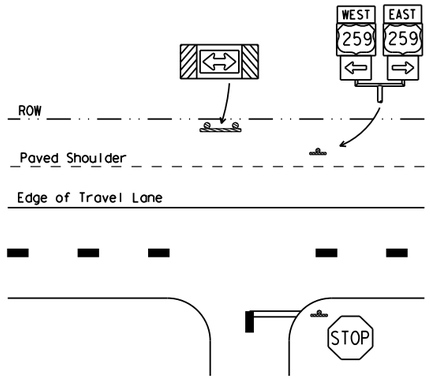
GREATER THAN 6 FT. WIDE

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

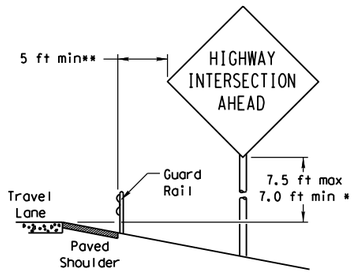
T-INTERSECTION



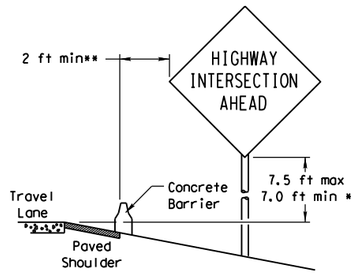
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**SIGN CLEARANCE BASED ON DISTANCE REQUIRED FOR PROPER GUARD RAIL OR CONCRETE BARRIER PERFORMANCE.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

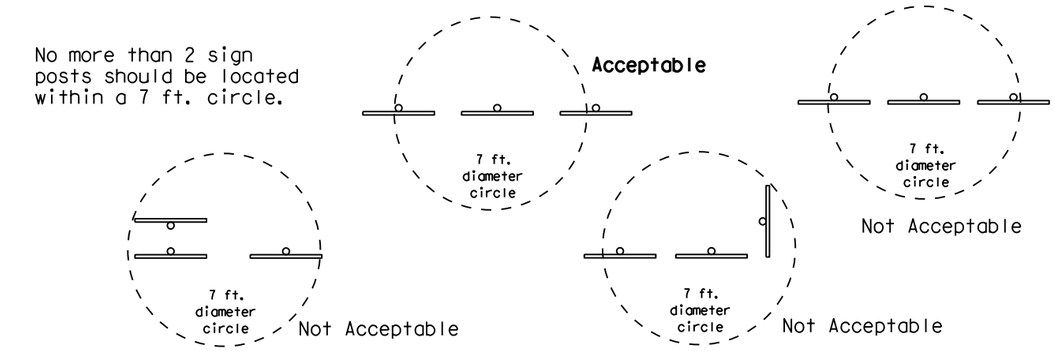
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(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.

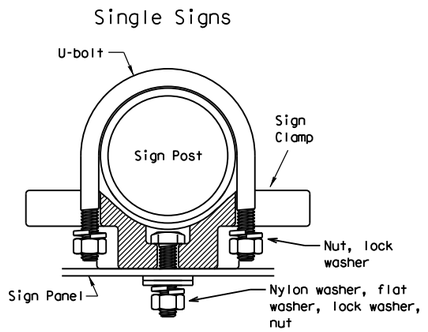
The maximum values may be increased when directed by the Engineer.

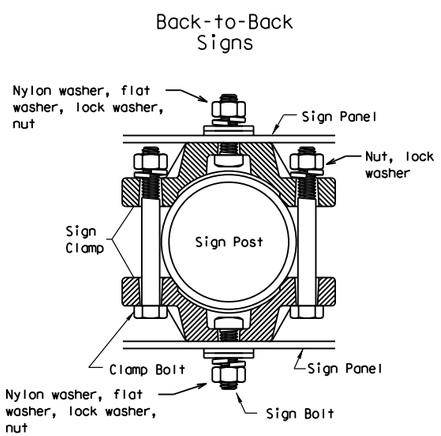
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm



TYPICAL SIGN ATTACHMENT DETAIL





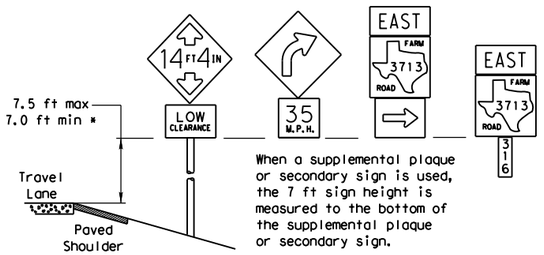
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

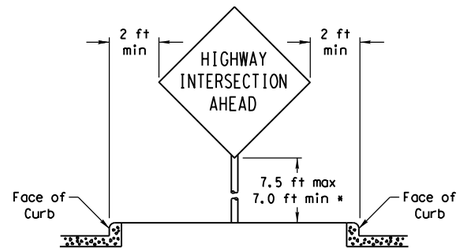
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



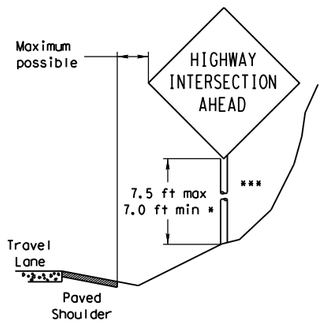
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

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
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
DIST	COUNTY		82

DATE:
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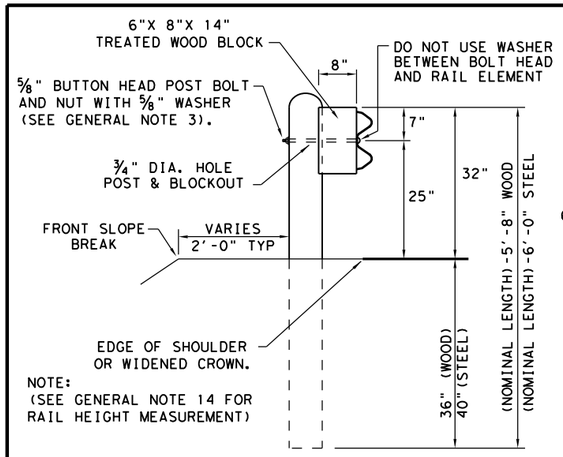
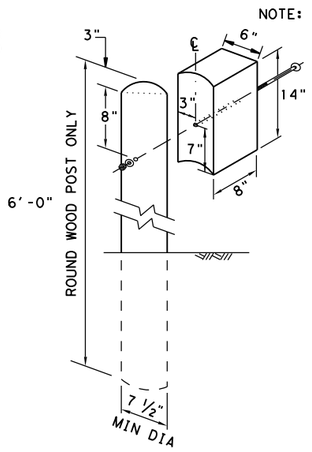
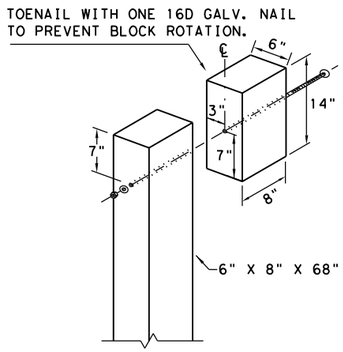


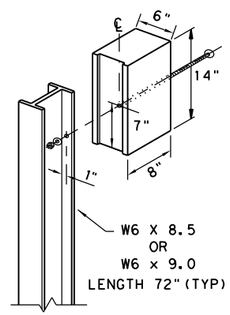
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

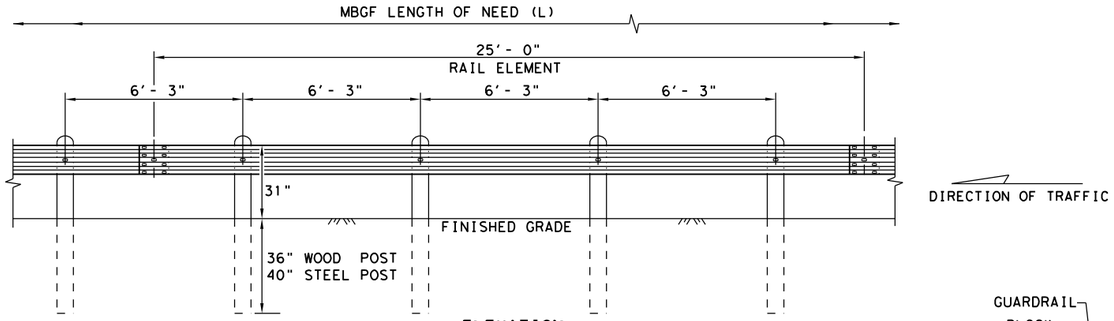


WOOD BLOCK TO RECTANGULAR WOOD POST



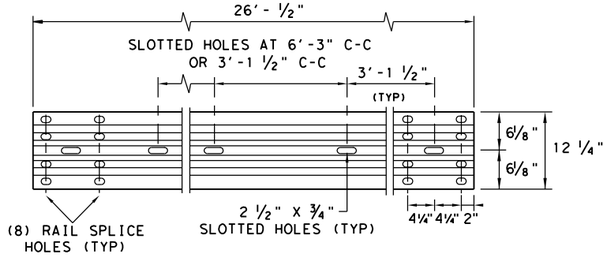
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



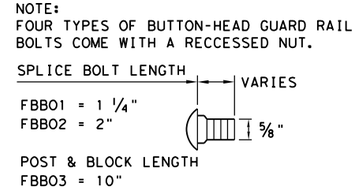
ELEVATION
MID-SPAN RAIL SPLICE

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



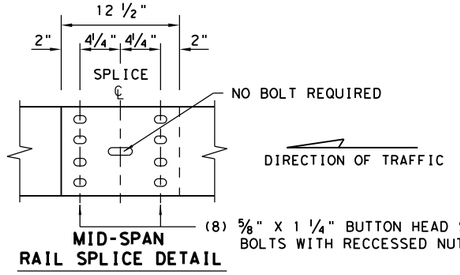
ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

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



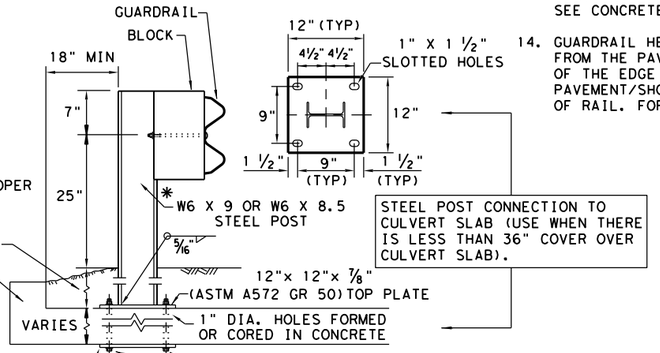
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

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

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0976	07	016	SH 96	
	DIST	COUNTY		SHEET NO.	
	HOU	GALVESTON		82A	

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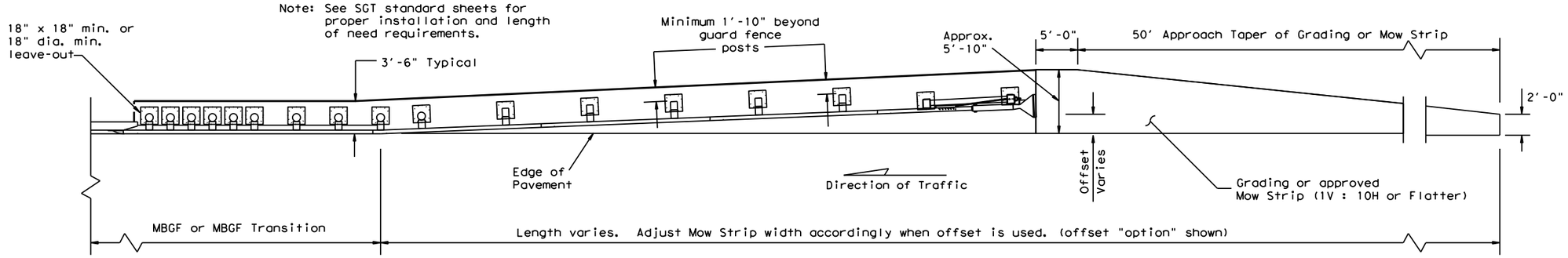
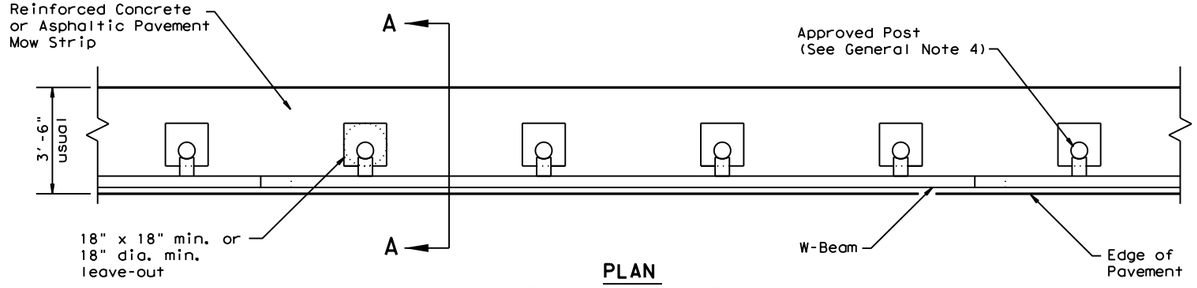
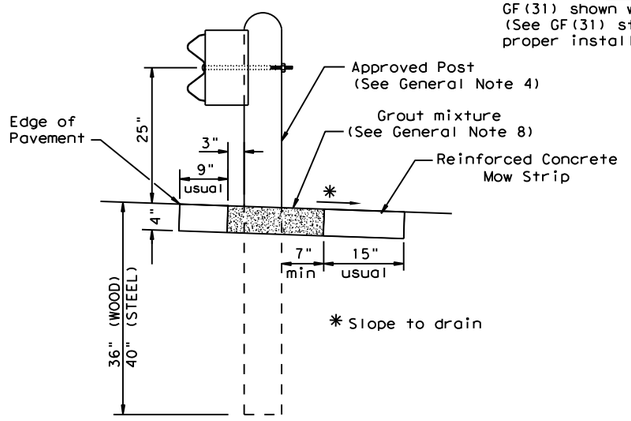


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



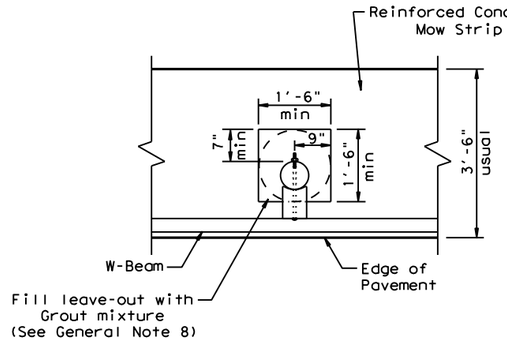
PLAN

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



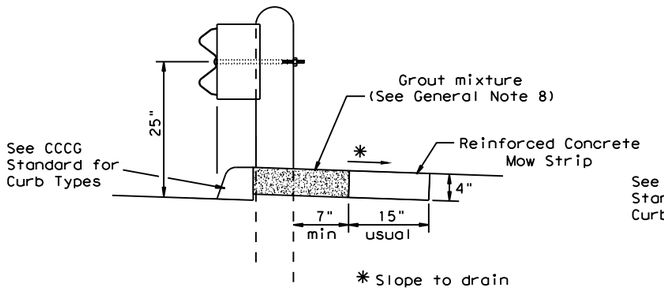
SECTION A-A

Typical



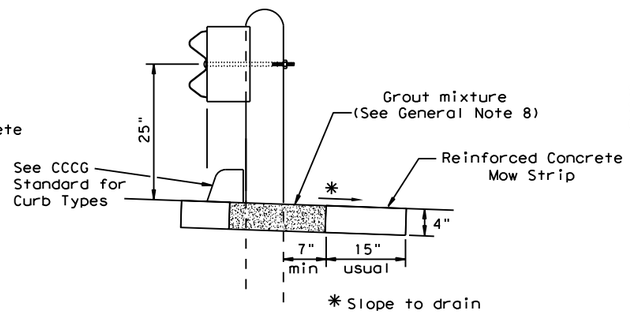
MOW STRIP DETAIL

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



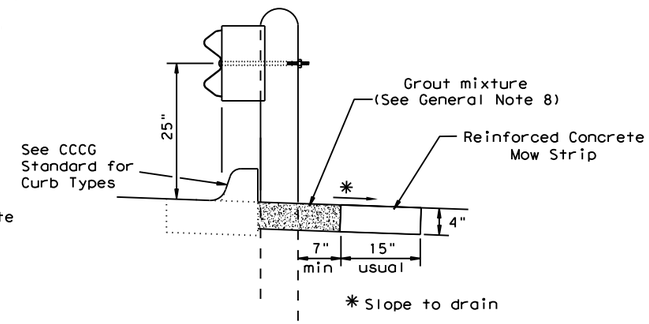
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

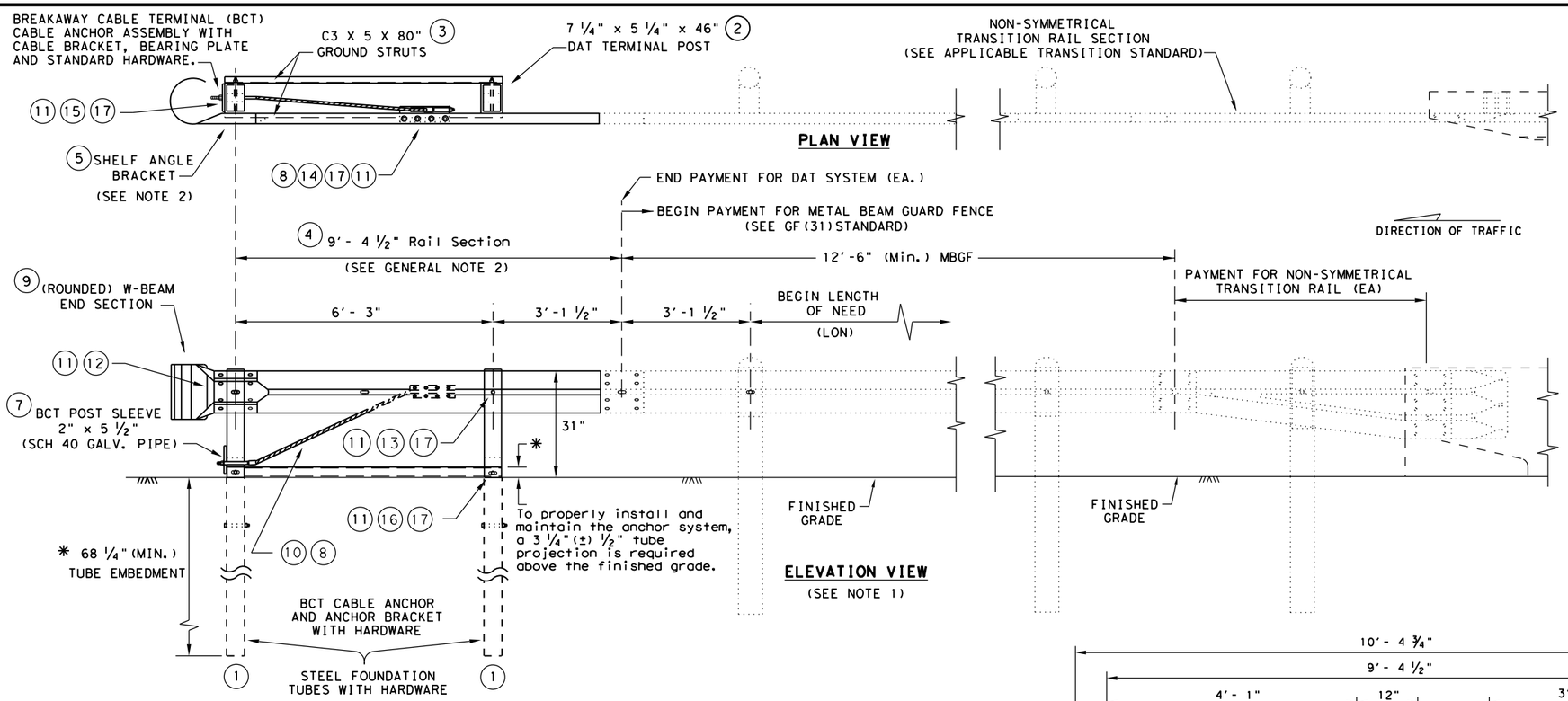
METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

82 B

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0976	07	016	SH 96	
	DIST	COUNTY		SHEET NO.	
	HOU	GALVESTON		82 B	

DATE: $DATE$
FILE: $FILE$



DOWNSTREAM ANCHOR TERMINAL (DAT)

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

GENERAL NOTES

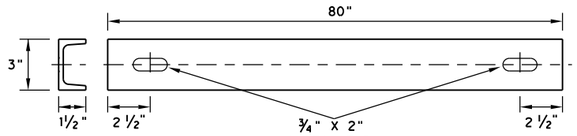
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN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

MOW STRIP INSTALLATION

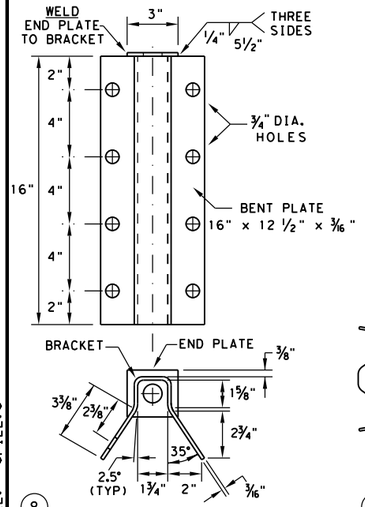
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

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

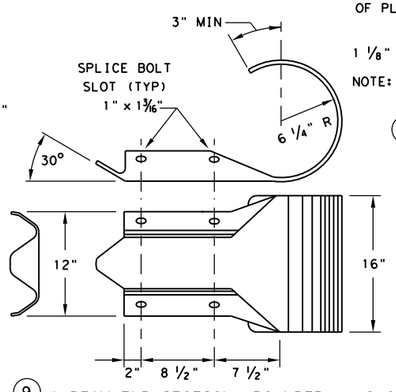
(4) TERMINAL RAIL ELEMENT FOR DAT



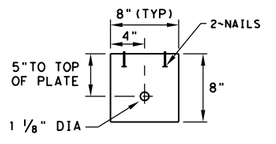
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

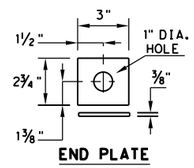


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

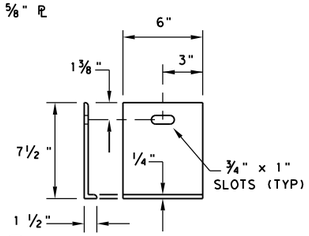


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

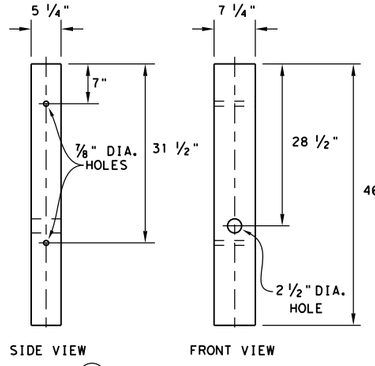
(6) BEARING PLATE
8"x 8"x 5/8" PL



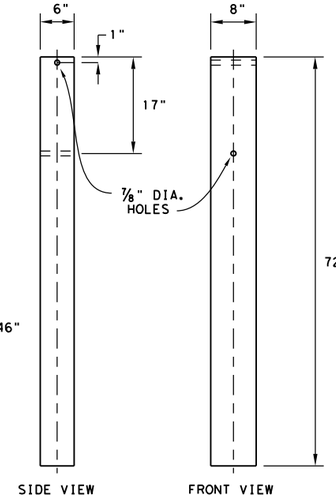
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0976	07	016	SH 96	
	DIST	COUNTY		SHEET NO.	
	HOU	GALVESTON		82 C	

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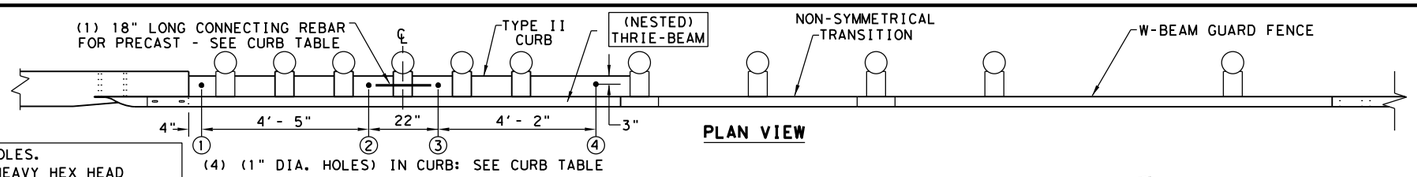


PLAN VIEW

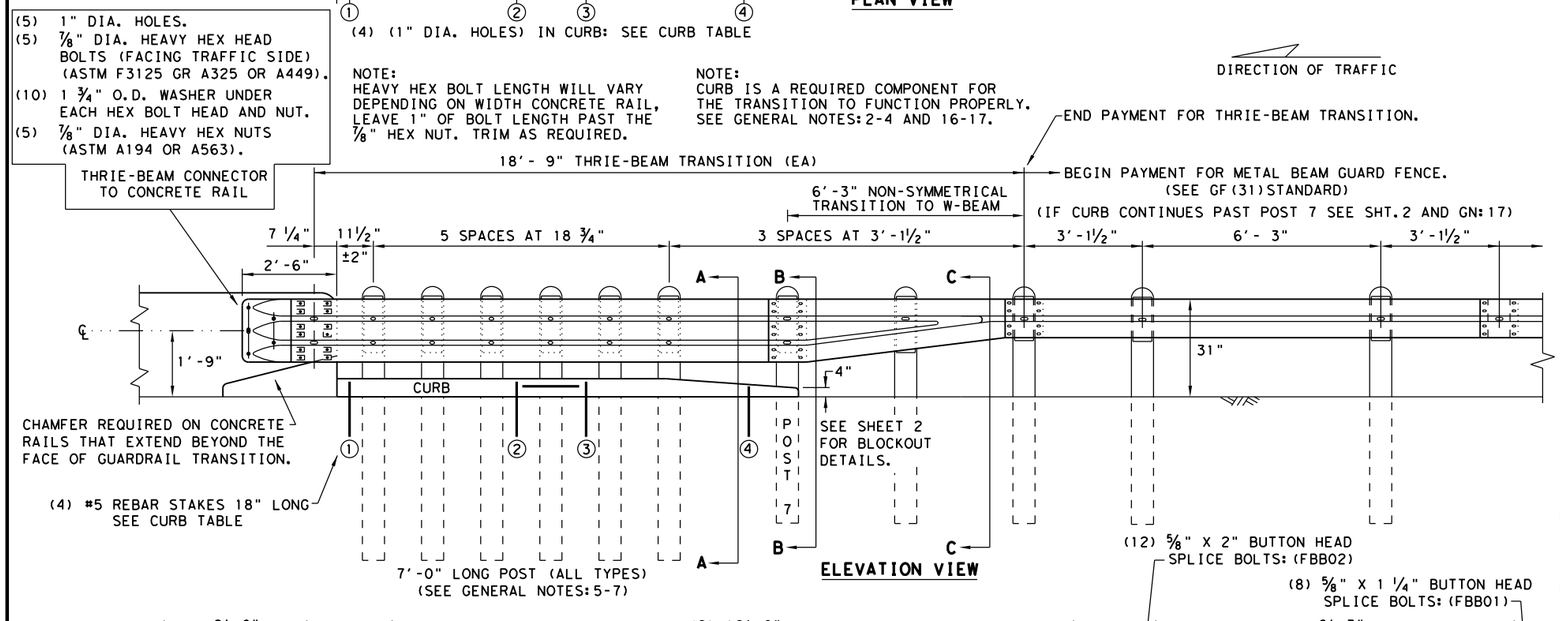
(4) (1" DIA. HOLES) IN CURB: SEE CURB TABLE

(5) 1" DIA. HOLES.
(5) ⅞" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
(10) 1 ¾" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
(5) ⅞" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

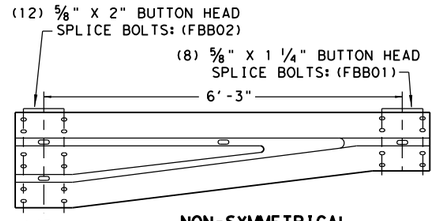
NOTE:
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE ⅞" HEX NUT. TRIM AS REQUIRED.

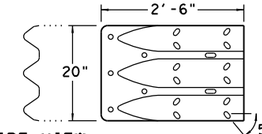
NOTE:
CURB IS A REQUIRED COMPONENT FOR THE TRANSITION TO FUNCTION PROPERLY. SEE GENERAL NOTES: 2-4 AND 16-17.

DIRECTION OF TRAFFIC



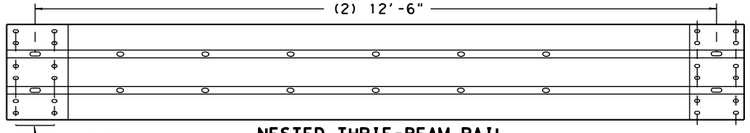
ELEVATION VIEW





SIDE-VIEW

THRIE-BEAM TERMINAL CONNECTOR 10GA.
PART DESIGNATOR RTE01b
NOTE: SEE GENERAL NOTE: 9



NESTED THRIE-BEAM RAIL
PART DESIGNATOR RTM10a

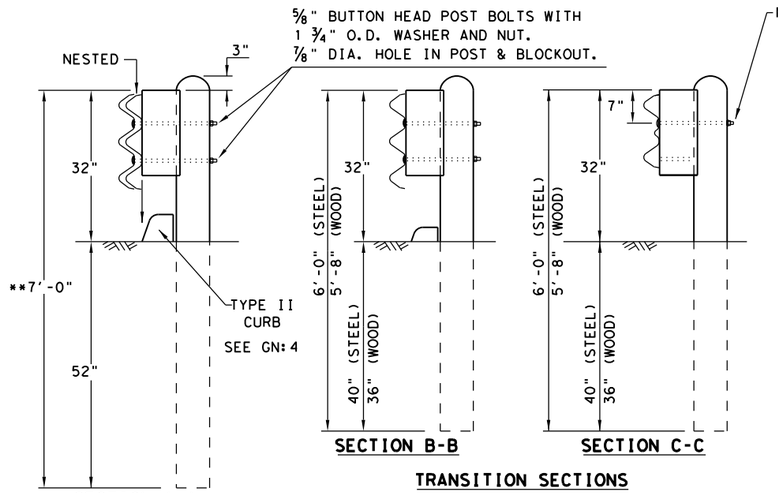
LAP DIRECTION

NON-SYMMETRICAL W-BEAM TO THRIE-BEAM TRANSISTION 10GA.
PART DESIGNATOR
RWT02a OR RWT02b

(12) ⅝" X 2" BUTTON HEAD SPLICE BOLTS WITH RECESSED NUTS: (FBB02)
(12) RECTANGULAR GUARDRAIL PLATE WASHERS: (FWR03)

PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE NESTED RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



SECTION A-A

SECTION B-B

SECTION C-C

TRANSITION SECTIONS

NOTE: ALL POST TYPES, SEE GENERAL NOTE: 5 & 6

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.

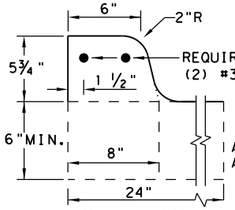
THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END.
USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16g) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION

Texas Department of Transportation | Design Division Standard

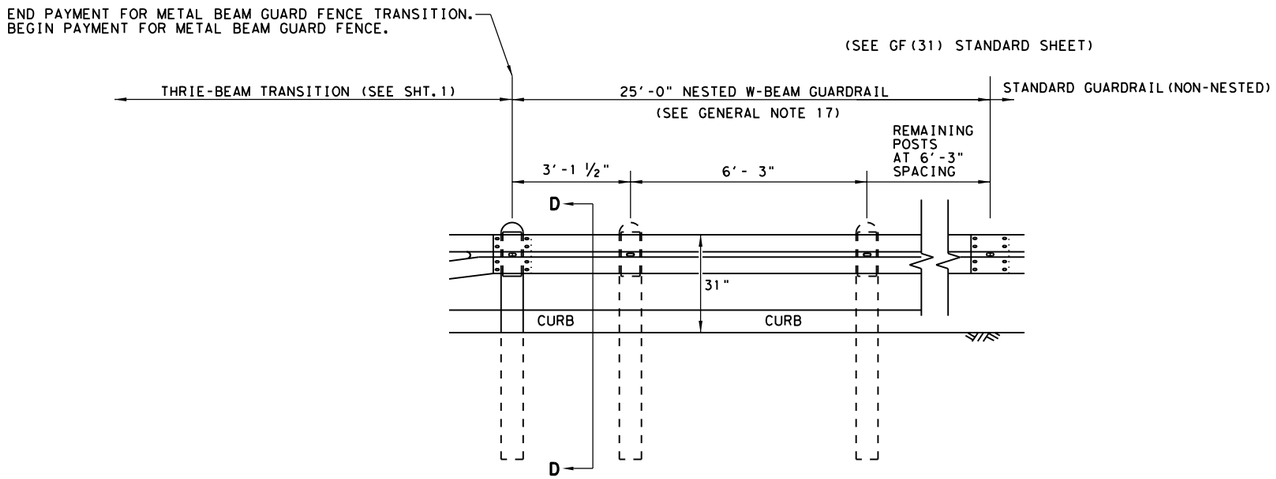
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

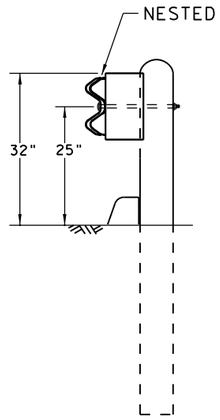
FILE: gf31trtl320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0976	07	016	SH 96	
	DIST	COUNTY		SHEET NO.	
	HOU	GALVESTON		82D	

DATE:
FILE:

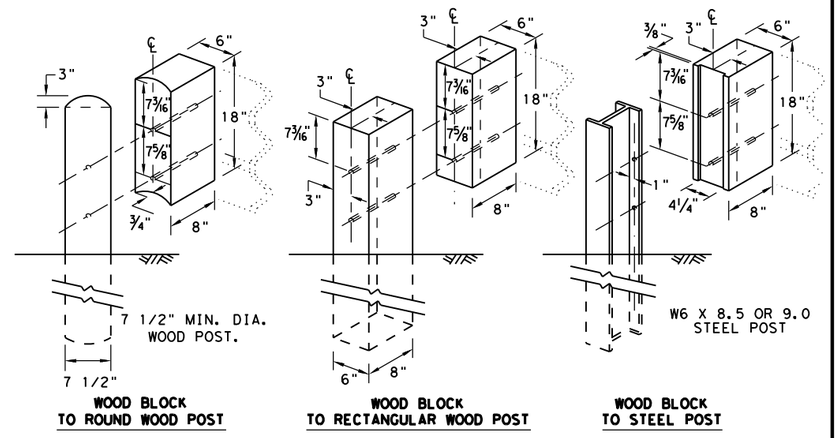
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

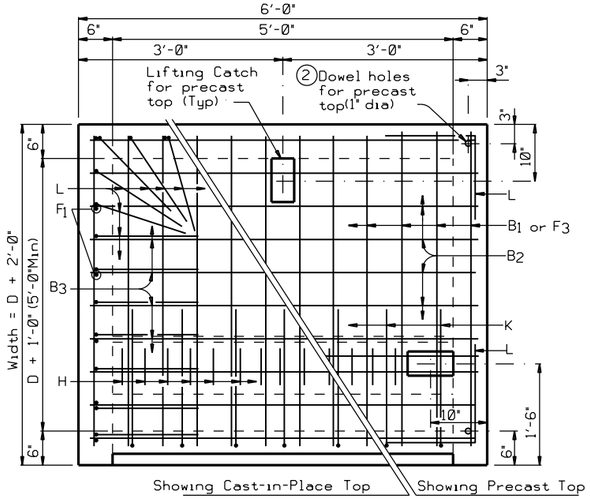
SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

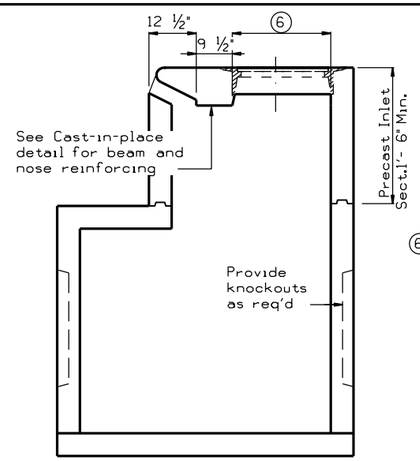
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

FILE: gf31trtl320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0976	07	016	SH 96	
	DIST	COUNTY		SHEET NO.	
	HOU	GALVESTON		82E	

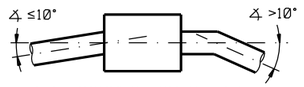


PLAN



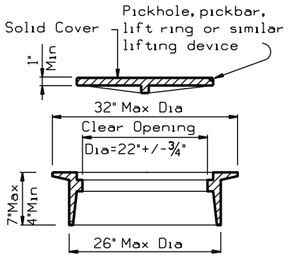
PREFABRICATED INLET

⑥ For reinforcing steel and dimensions not shown, see fabricator's shop drawings. Structure shall be of the size required to accommodate size of pipe shown elsewhere in the plans. Length of inlet = 5'-0"



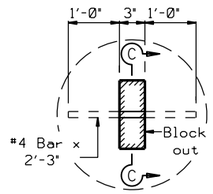
PIPE CONNECTION DETAIL

Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.

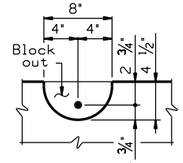


RING AND COVER DETAILS

EJIW No V-1814 or Neenah No R5900 FTX



PLAN

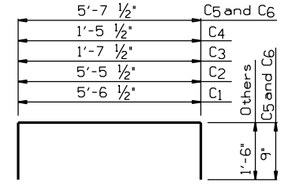


SECTION C-C

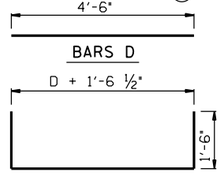
LIFTING CATCH

REINF STEEL		
Bar	Size	Spacing
B_1	#4	6"
B_2	#5	6"
B_3	#4	6"
C_{1-2}	#4	12"
C_{3-4}	#4	⑨
C_5	#6	⑨
C_6	#4	⑨
D	#4	⑨
E	#4	12"
F_{1-5}	#4	12"
G	#4	6"
H	#3	4"
K	#4	9"
L	#4	6"

⑨ As shown

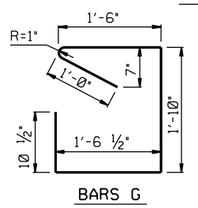


BARS C

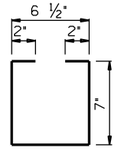


BARS D

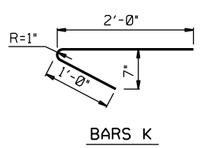
BARS E



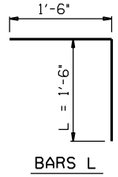
BARS G



BARS H



BARS K



BARS L

GENERAL NOTES:

No alternate designs nor alternate details shall be permitted for precast or cast in place inlets.

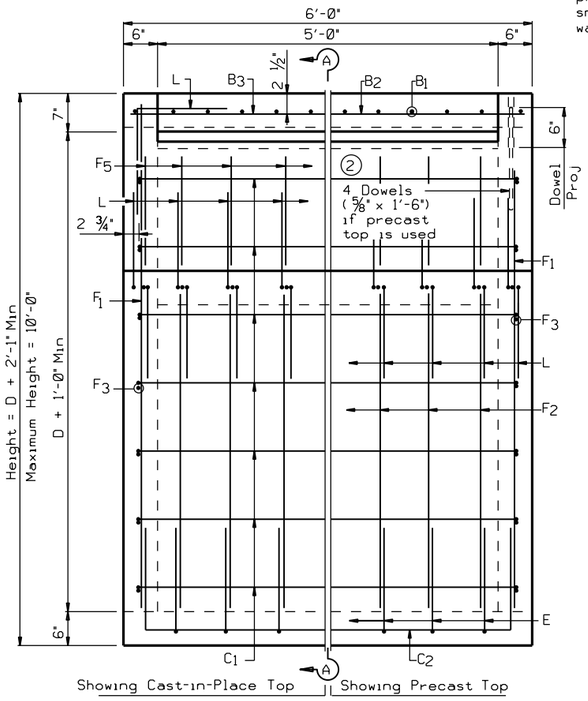
Quantities shown herein are for Contractor's information only. Unless otherwise shown in the plans, payment will be made for each inlet of the type specified and for each extension. Each five foot curb opening of extension is considered "one extension" regardless of whether placed monolithically or precast. Extension length shall be in multiples of 5 feet.

Engineer has the option of specifying cast-in-place top with ring and cover or removable precast top as specified elsewhere in plans.

Shop drawings will be required for precast construction of inlets.

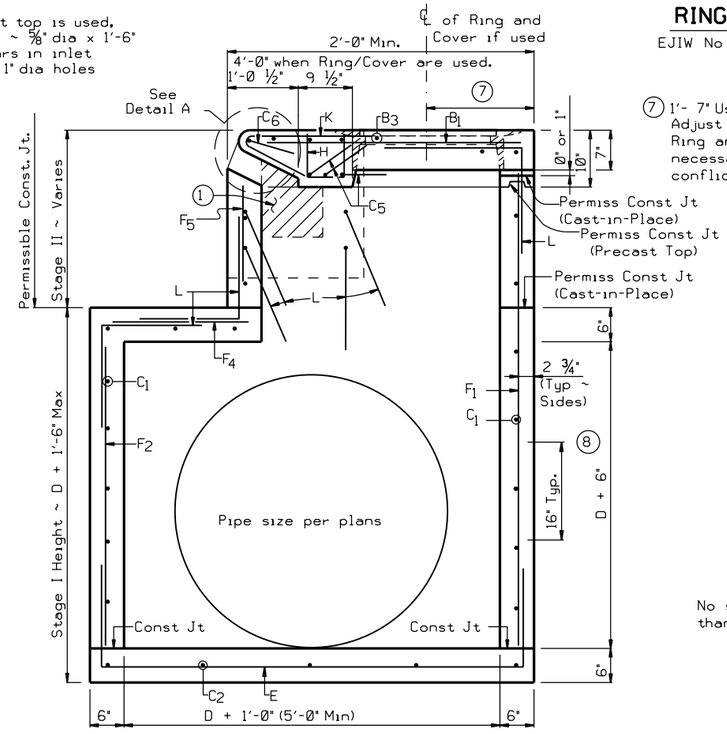
In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

Ring and cover shall conform to the requirements of AASHTO M306, "Standard Specification for Drainage Structure Castings". Materials shall conform to ASTM A48, Class 35B for gray iron castings or ASTM A536, Grade 65-45-12 for ductile iron castings. Aluminum alloy castings shall not be permitted.



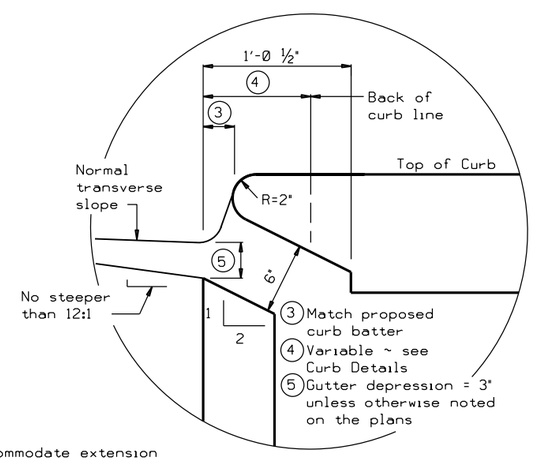
ELEVATION

② If precast top is used, provide 4 ~ ⅝" dia x 1'-6" smooth bars in inlet walls for 1" dia holes

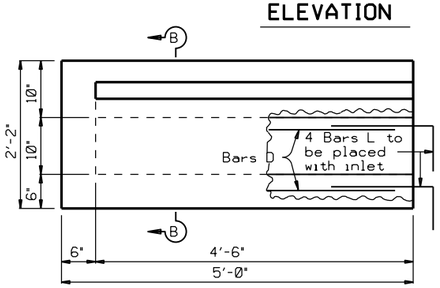


SECTION A-A

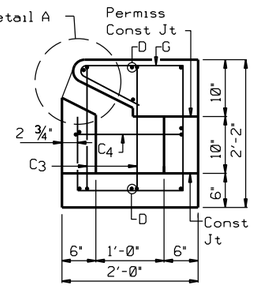
⑦ 1'- 7" Usual. Adjust placement of Ring and Cover as necessary to avoid conflict with Bars H.



DETAIL A

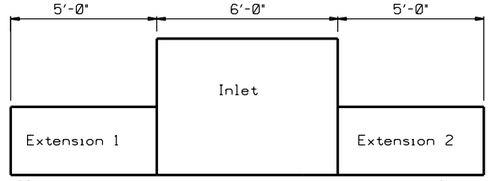


EXTENSION ELEVATION



SECTION B-B

① Block out to accommodate extension if used and to place 4 Bars L



Note: If more than one extension is required, they should be located as indicated above. No slope is required in flowline of extension.

EXTENSION PLACEMENT

INSTALL A 3 FT.(HORIZ.) x 6 IN.(VERT.) OPENING ON THE BACK OF THE INLET WHEN SPECIFIED ELSEWHERE ON THE PLANS. MOVE STEPS AS NEEDED. NO REINFORCING ON OPENING/ON 2 IN. ADJACENT TO OPENING.

DESIGNERS: CLARIFY FLOWLINE OF OPENING AND INCLUDE OPENING IN HYDRAULIC CALCULATIONS.

D = Diameter
R = Radius

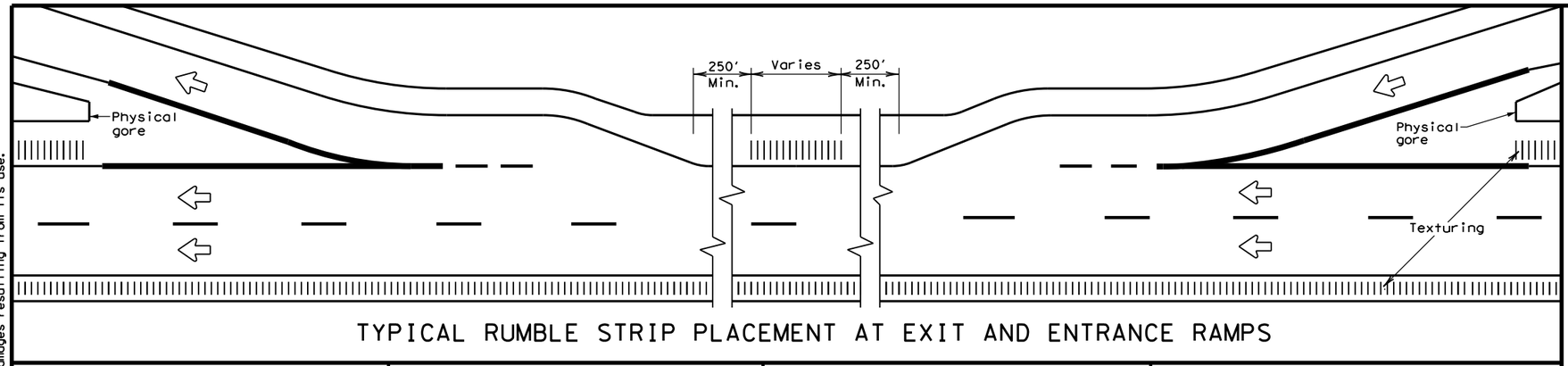
Texas Department of Transportation
Houston District

CURB INLET TYPE C1
(WITH OR WITHOUT EXTENSION)

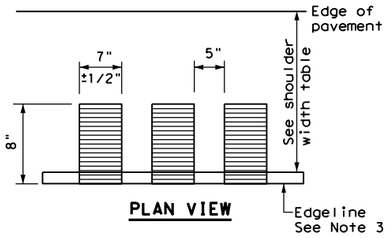
HIL-C1

FILE: STDD2.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:	
© TxDOT Feb 2010	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS 2/2010 Note for alternate design and opening on the back of inlet. 10/2016 Removed ladder rung and wordings.	HOUS	6	C 976-7-16			82 F
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	GALVESTON		0976	07	016	SH 96

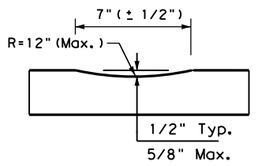
STDD2.DGN



TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMPS

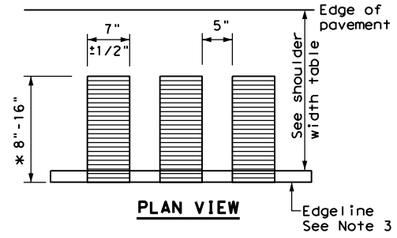


PLAN VIEW



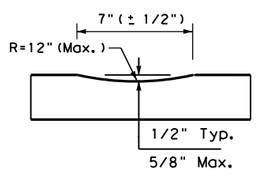
PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



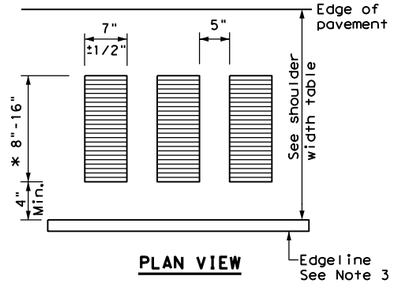
PLAN VIEW

* This distance may vary based on width of shoulder



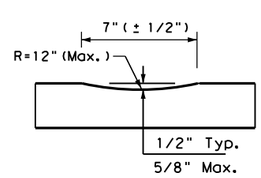
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



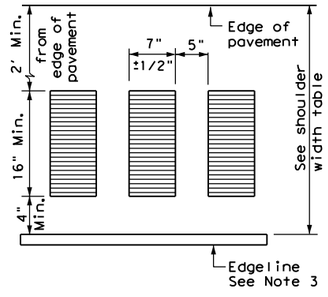
PLAN VIEW

* This distance may vary based on width of shoulder

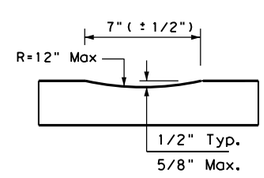


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW



PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

GENERAL NOTES

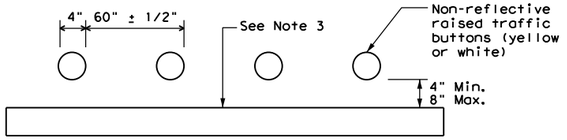
1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

5. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
6. Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
7. Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
8. Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
9. Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
10. On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

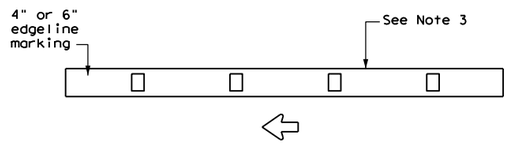
WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
15. The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
16. Raised profile thermoplastic markings used as edgelines may substitute for buttons.



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3, 5 or 6	Option 2, 4, 5 OR 6

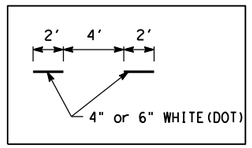
Texas Department of Transportation

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON FREEWAYS AND DIVIDED HIGHWAYS
RS(1)-13

FILE: rs(1)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-10 10-13	0976	07	016	SH 96
	DIST	COUNTY		SHEET NO.
	HOU	GALVESTON		83

DATE:
FILE:



DETAIL "A"

TYPICAL PLACEMENT OF DOTTED EXTENSION AT INTERSECTIONS

*4"or 6" WHITE(SLD) 40 LF EA.

Texas Department of Transportation
Houston District

PAVEMENT MARKINGS
(DOTTED EXTENSION DETAILS)

PM(DOT)-11

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 4/2010 4/2011	HOU	6		83A
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	GALVESTON	0976	07	016	SH 96

STD N-28

NOTES FOR PERMANENT TRAFFIC SIGNAL(S):

1. REPAIR OR REPLACE PAVEMENT AND SIDEWALKS DAMAGED BY THE CONTRACTOR'S FORCES DURING CONSTRUCTION AT NO COST TO THE DEPARTMENT.
2. SEAL ENDS OF ALL CONDUITS WITH DUCT SEAL, EXPANDABLE FOAM, OR BY OTHER METHODS APPROVED BY THE ENGINEER. SEAL CONDUIT IMMEDIATELY AFTER COMPLETION OF CONDUCTOR INSTALLATION AND PULL TESTS. DO NOT USE DUCT TAPE AS PERMANENT CONDUIT SEALANT. DO NOT USE SILICON CAULK AS A CONDUIT SEALANT.
3. PROVIDE CONTINUED OPERATION OF THE EXISTING SIGNAL(S) DURING CONSTRUCTION AND UNTIL THE PROPOSED OPERATION IS COMPLETED.
4. ONCE THE INTEGRITY AND/OR FUNCTION OF THE EXISTING TRAFFIC SIGNAL(S) IS ALTERED BY THE CONTRACTOR, MAINTAIN AND OPERATE THE EXISTING TRAFFIC SIGNAL(S) UNTIL THE TRAFFIC SIGNAL WORK IS ACCEPTED BY THE DEPARTMENT. DURING THE CONSTRUCTION OF THE PROPOSED TRAFFIC SIGNAL WORK, MAINTAIN THE EXISTING TRAFFIC SIGNAL(S) AND/OR TEMPORARY CONSTRUCTION TRAFFIC SIGNAL(S) IN CONFORMANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
5. MAINTAIN THE INTEGRITY AND FUNCTION OF EACH EXISTING SIGNALIZED INTERSECTION. ONCE THE INTEGRITY OR FUNCTION OF THE SIGNAL HAS BEEN ALTERED, PURSUE THE WORK AT THAT LOCATION WITHOUT DELAY OR INTERRUPTION TO RESTORE OPERATION TO ITS ORIGINAL OR FINAL OPERATIONAL DESIGN.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE SIGNAL CARRYING CAPABILITY AND PERFORMANCE OF THE CABLE. INSTALL EACH WIRE WITH A LIGHTNING PROTECTION DEVICE UNLESS OTHERWISE NOTED.
7. INSTALL VIDEO IMAGING VEHICLE DETECTION SYSTEM (VIVDS) CABLE PROVIDED BY TxDOT.
8. FOR VIVDS CAMERA(S) MOUNTED TO LUMINAIRE ARMS, STRAP THE VIVDS CABLE TO THE LUMINAIRE ARMS WITH A METAL CABLE STRAP (ALUMINUM OR STAINLESS STEEL), 3/4-IN MINIMUM WIDTH AND TWO WRAPS AT 8 IN. MAXIMUM SPACING.
9. THE LOCATION OF THE VIVDS DETECTION ZONE IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED BY THE ENGINEER AND/OR DEPARTMENT'S TRAFFIC OPERATIONS SECTION.
10. ONCE THE CONTRACT HAS BEEN EXECUTED OR DURING THE KICK-OFF MEETING, THE ENGINEER OR HIS/HER REPRESENTATIVE WILL COORDINATE OR ARRANGE FOR THE VIVDS EQUIPMENT TO BE PROVIDED BY THE DEPARTMENT.
11. THE ENGINEER OR HIS/HER REPRESENTATIVE WILL COORDINATE THE ORDERING OF THE VIVDS EQUIPMENT BY USING THE FORCE ACCOUNT. ENGINEER OR HIS/HER REPRESENTATIVE WILL CONTACT ARNOLD TREVINO AT (713) 866-7101 TO ORDER THE VIVDS EQUIPMENT.

10/25/2022

SH 96
AT VARIOUS
NOTES FOR PERMANENT
TRAFFIC SIGNAL

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		84

DATE: 10/21/2022
FILE: H:\TrfSignals\Luis Gonzalez\0976-07-016\NOTES FOR PERMANENT TRAFFIC SIGNAL.dgn

LEGEND:

- TRAFFIC DIRECTION
- EXISTING MAST ARM POLE
- A — EXISTING SIGNAL HEAD
- EXISTING MAST ARM SIGNS
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING PEDSTRIAN SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE POLE

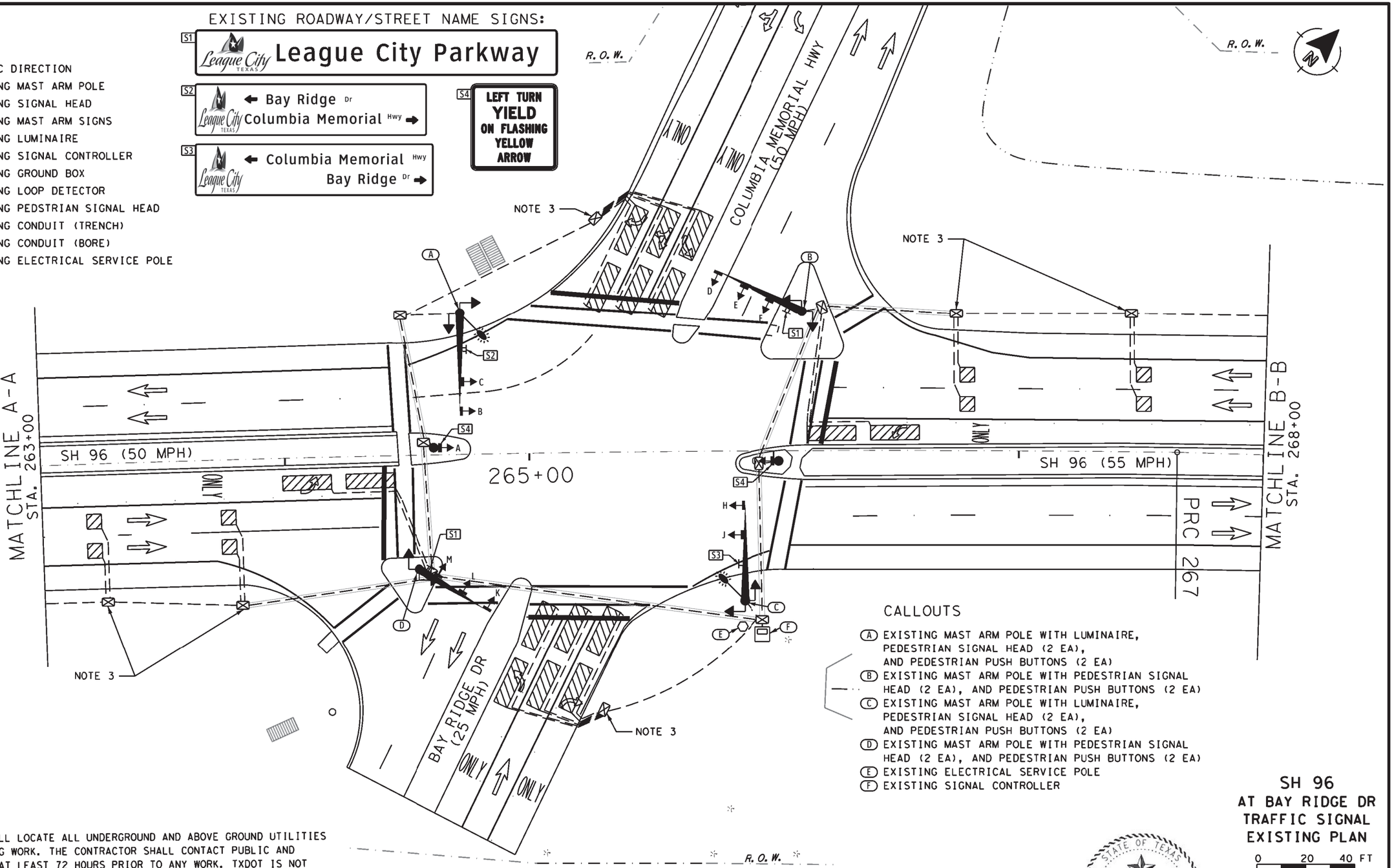
EXISTING ROADWAY/STREET NAME SIGNS:

S1: League City Parkway

S2: ← Bay Ridge Dr / Columbia Memorial Hwy →

S3: ← Columbia Memorial Hwy / Bay Ridge Dr →

S4: LEFT TURN YIELD ON FLASHING YELLOW ARROW



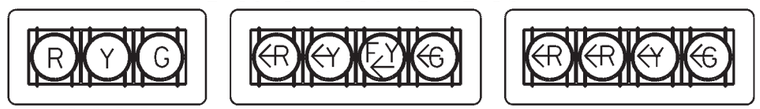
CALLOUTS

- (A) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (B) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (C) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (D) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (E) EXISTING ELECTRICAL SERVICE POLE
- (F) EXISTING SIGNAL CONTROLLER

NOTES:

1. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811. THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATE TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING (OR WE CAN JUST SAY EXISTING TXDOT UNDER AND ABOVE GROUND UTILITIES). TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV
2. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY CONTRACTOR S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES WHETHER UNDERGROUND OR ABOVE GROUND. UTILITIES ON THE PLANS ARE SHOWN IN APPROXIMATE LOCATIONS.
3. THE CONTRACTOR SHALL REMOVE GROUND BOXES, ABANDON CONDUIT AND CABLE THAT WILL NOT BE REUSED AS PART OF PROPOSED CAMERA SYSTEM INSTALLATION.

EXISTING SIGNAL HEADS:



STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED PROFESSIONAL ENGINEER
P.E.

10/25/2022

SH 96 AT BAY RIDGE DR TRAFFIC SIGNAL EXISTING PLAN

0 20 40 FT

SCALE: 1" = 40'

SHEET 1 OF 2

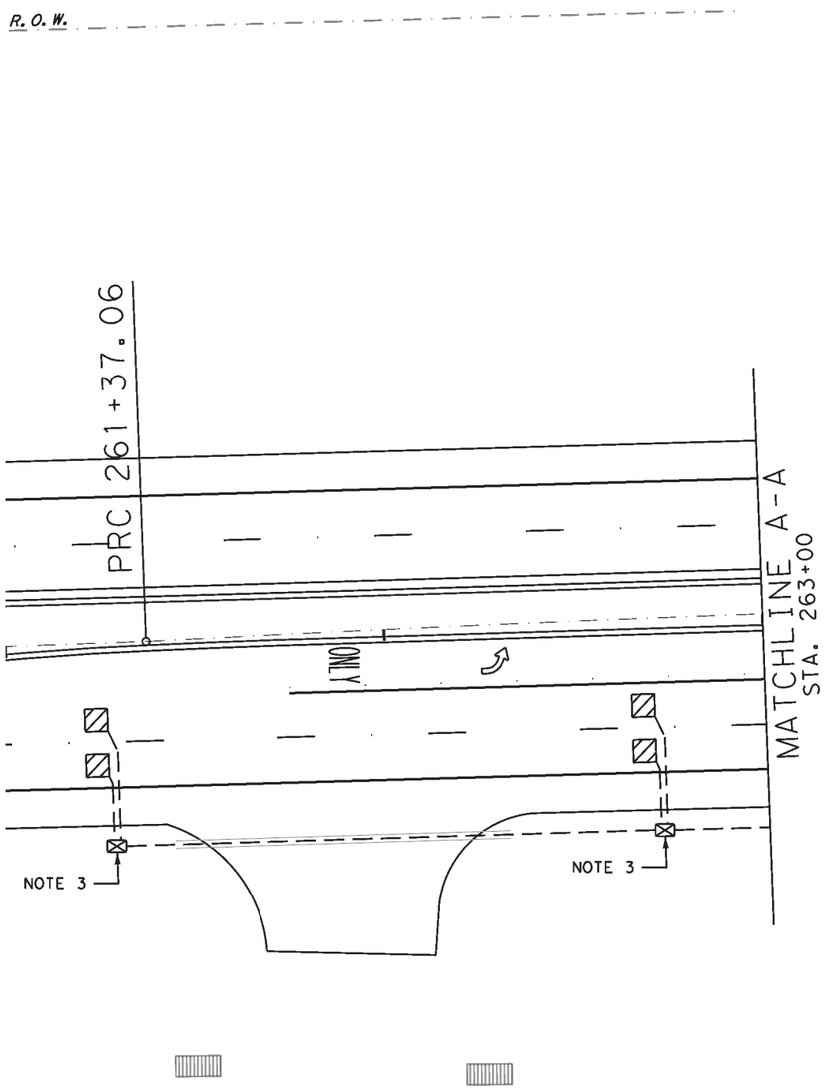
Texas Department of Transportation

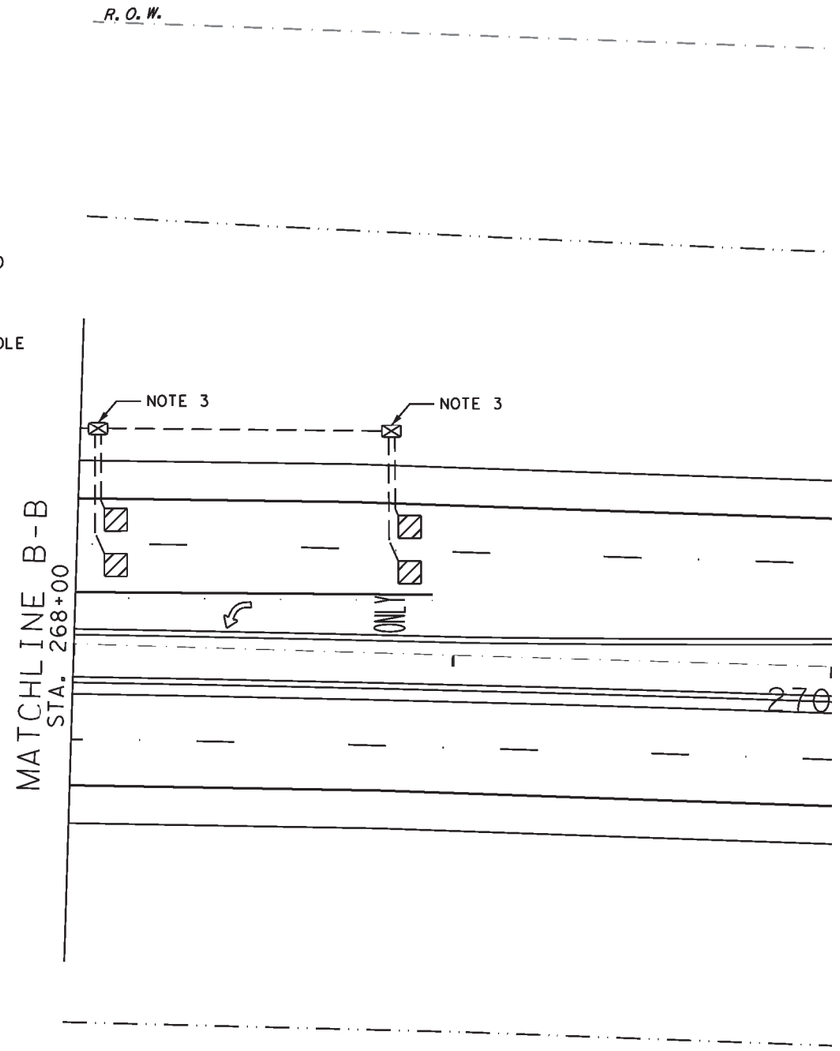
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		85

DATE: 10/24/2022
FILE: H:\Traffic\Signals\Luis Gonzalez\0976-07-016\SH 96 at BAY RIDGE DR.dgn

LEGEND:

- TRAFFIC DIRECTION
- EXISTING MAST ARM POLE
- A EXISTING SIGNAL HEAD
- EXISTING MAST ARM SIGNS
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING PEDSTRIAN SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE POLE





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STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER
P.E.

10/25/2022

SH 96
AT BAY RIDGE DR
TRAFFIC SIGNAL
EXISTING PLAN

0 20 40 FT
SCALE: 1" = 40'
SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		86

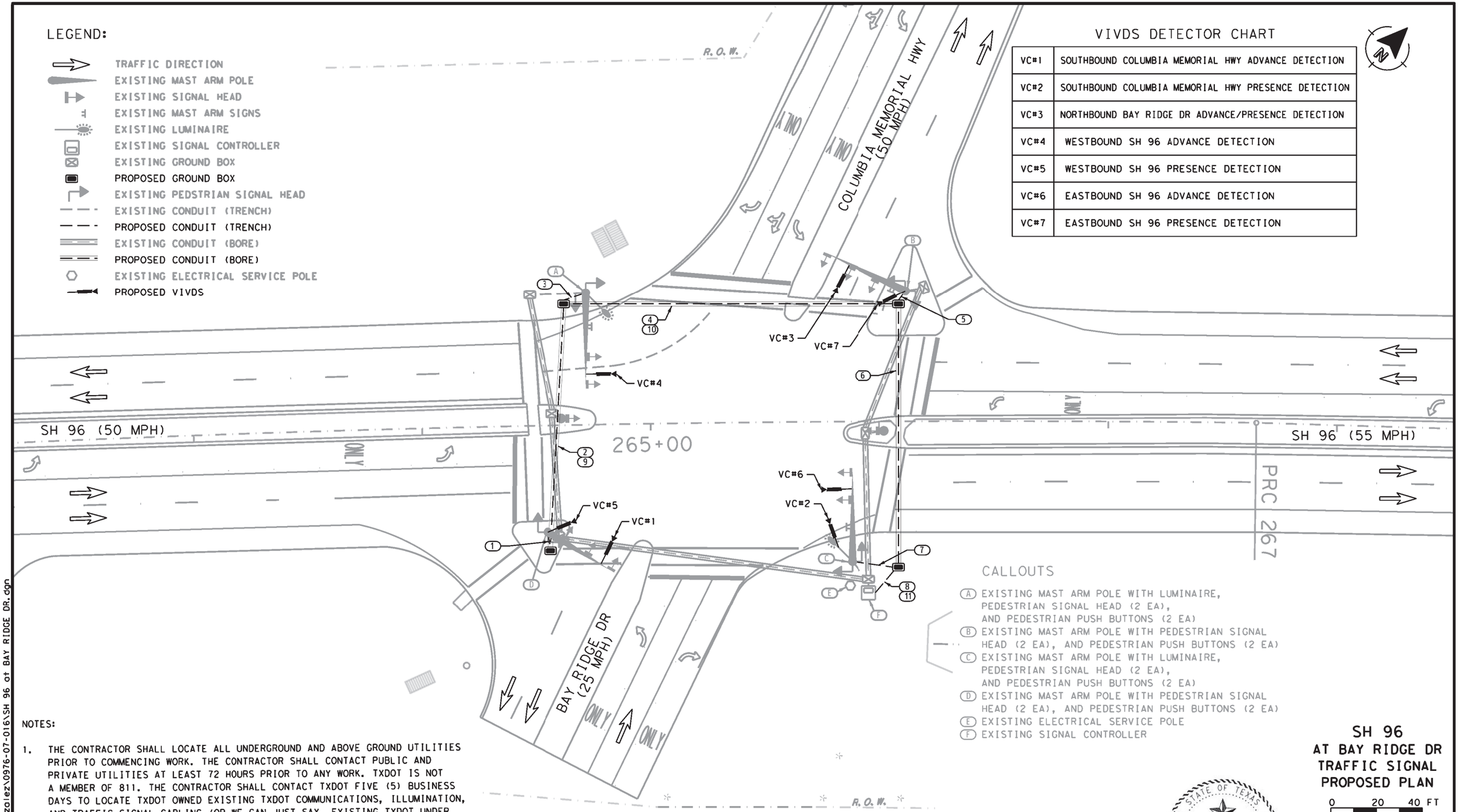
DATE: 10/24/2022
FILE: H:\Traffic\Signals\Luis Gonzalez\0976-07-016\SH 96 at BAY RIDGE DR.dgn

LEGEND:

- TRAFFIC DIRECTION
- EXISTING MAST ARM POLE
- EXISTING SIGNAL HEAD
- EXISTING MAST ARM SIGNS
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- PROPOSED GROUND BOX
- EXISTING PEDSTRIAN SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- PROPOSED CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- PROPOSED CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE POLE
- PROPOSED VIVDS

VIVDS DETECTOR CHART

VC#1	SOUTHBOUND COLUMBIA MEMORIAL HWY ADVANCE DETECTION
VC#2	SOUTHBOUND COLUMBIA MEMORIAL HWY PRESENCE DETECTION
VC#3	NORTHBOUND BAY RIDGE DR ADVANCE/PRESENCE DETECTION
VC#4	WESTBOUND SH 96 ADVANCE DETECTION
VC#5	WESTBOUND SH 96 PRESENCE DETECTION
VC#6	EASTBOUND SH 96 ADVANCE DETECTION
VC#7	EASTBOUND SH 96 PRESENCE DETECTION



CALLOUTS

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- (B) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (C) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (D) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (E) EXISTING ELECTRICAL SERVICE POLE
- (F) EXISTING SIGNAL CONTROLLER

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3. PROPOSED VIVDS CAMERA SYSTEM PROCURED BY TxDOT VIA FORCE ACCOUNT AND WILL BE PROVIDED TO CONTRACTOR FOR INSTALLATION.
4. VIVDS VEHICLE DETECTION SYSTEM MUST WORK WITH CITY OF LEAGUE CITY'S EXISTING ECONOLITE MOBILITY ADAPTIVE TRAFFIC CONTROL SYSTEM

DATE: 10/24/2022
FILE: H:\Traffic Signals\Luis Gonzalez\0976-07-016\SH 96 at BAY RIDGE DR.dgn

STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER
P.E.

10/25/2022

SH 96
AT BAY RIDGE DR
TRAFFIC SIGNAL
PROPOSED PLAN

0 20 40 FT
SCALE: 1" = 40'
SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		87

CONDUIT AND CONDUCTOR RUNS								
RUN NO.	CONDUIT (618)				CONDUCTORS (620)		VIVDS (6306)	
	PVC				GROUND		VIVDS	
	2" (SCHD 80)				#6 BARE		#14/3C (* 1000 FT)	
	(6046)		(6047)		(6009)		(Subsidiary)	
	NO.	TRENCH	NO.	BORE	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF
1	1	10			1	10	2	10
2			1	115	1	115	2	115
3	1	15			1	15	1	15
4			1	155	1	155	3	155
5	1	10			1	10	2	10
6			1	120	1	120	5	120
7	1	25			1	25	2	25
8	1	25			1	25	7	25
9 (SPARE)			1	115				
10 (SPARE)			1	155				
11 (SPARE)	1	25						
POLE A							1	25
MA							1	40
POLE B							2	25
MB							1	40
POLE C							2	25
MC							1	40
POLE D							2	25
MD							1	35
TOTAL (LF)		110		660		475		1905

EST. TOTAL		120		695		500		2005

DATE: 10/21/2022
FILE: H:\Traffic Signals\Luis Gonzalez\0976-07-016\SH 96 at BAY RIDGE DR.dgn

STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER

P.E.

10/25/2022

SH 96
AT BAY RIDGE DR
TRAFFIC SIGNAL
PROPOSED PLAN

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		88

LEGEND:

- TRAFFIC DIRECTION
- EXISTING MAST ARM POLE
- A EXISTING SIGNAL HEAD
- EXISTING MAST ARM SIGNS
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING PEDSTRIAN SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE POLE

EXISTING ROADWAY/STREET NAME SIGNS:

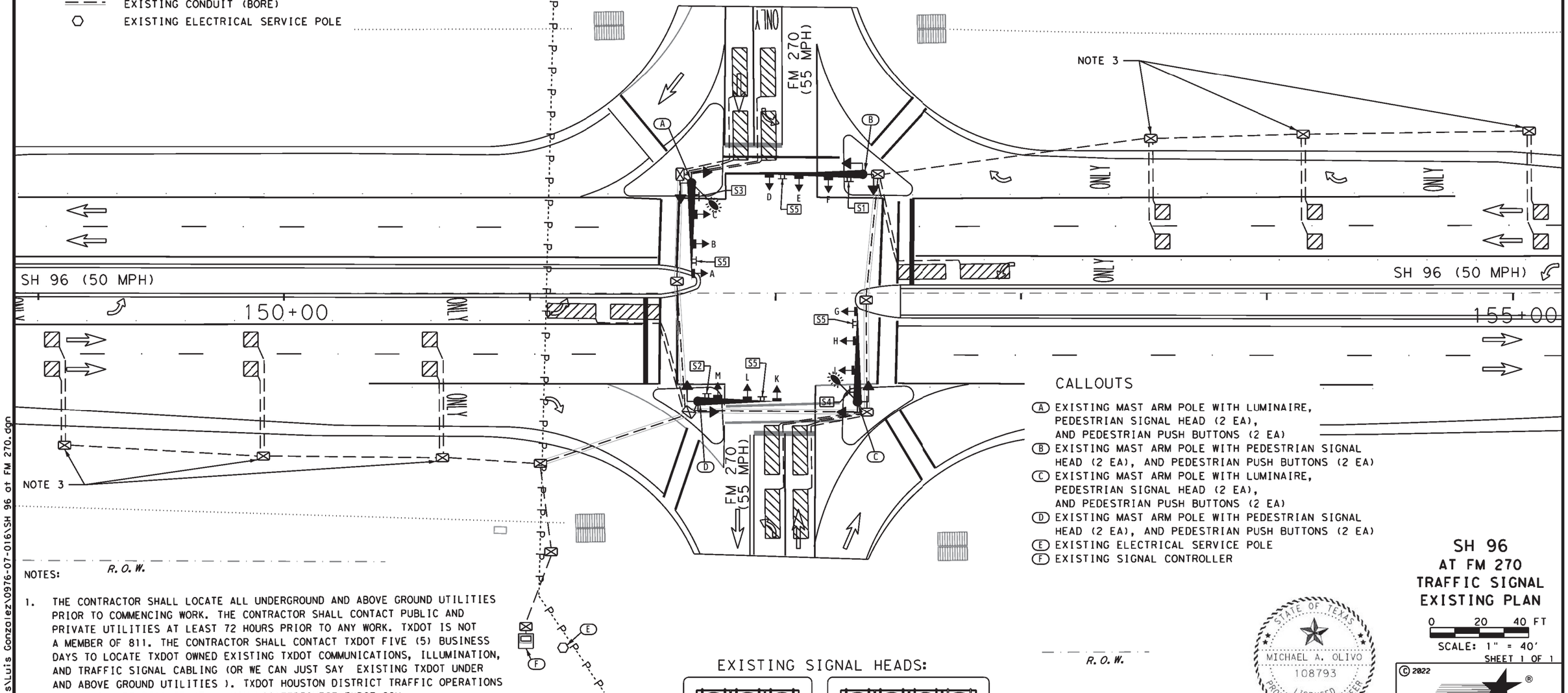
S1 League City TEXAS League City 1300 PKWY

S3 League City TEXAS S. Egret Bay 2000 Blvd

S2 League City TEXAS League City 1200 PKWY

S4 League City TEXAS S. Egret Bay 2100 Blvd

S5 LEFT TURN YIELD ON FLASHING YELLOW ARROW



CALLOUTS

- (A) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (B) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (C) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (D) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (E) EXISTING ELECTRICAL SERVICE POLE
- (F) EXISTING SIGNAL CONTROLLER

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EXISTING SIGNAL HEADS:

B, C, E, F, H, J, L, M

A, D, G, K

STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER
P.E.

10/25/2022

SH 96 AT FM 270 TRAFFIC SIGNAL EXISTING PLAN

0 20 40 FT

SCALE: 1" = 40'

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		89

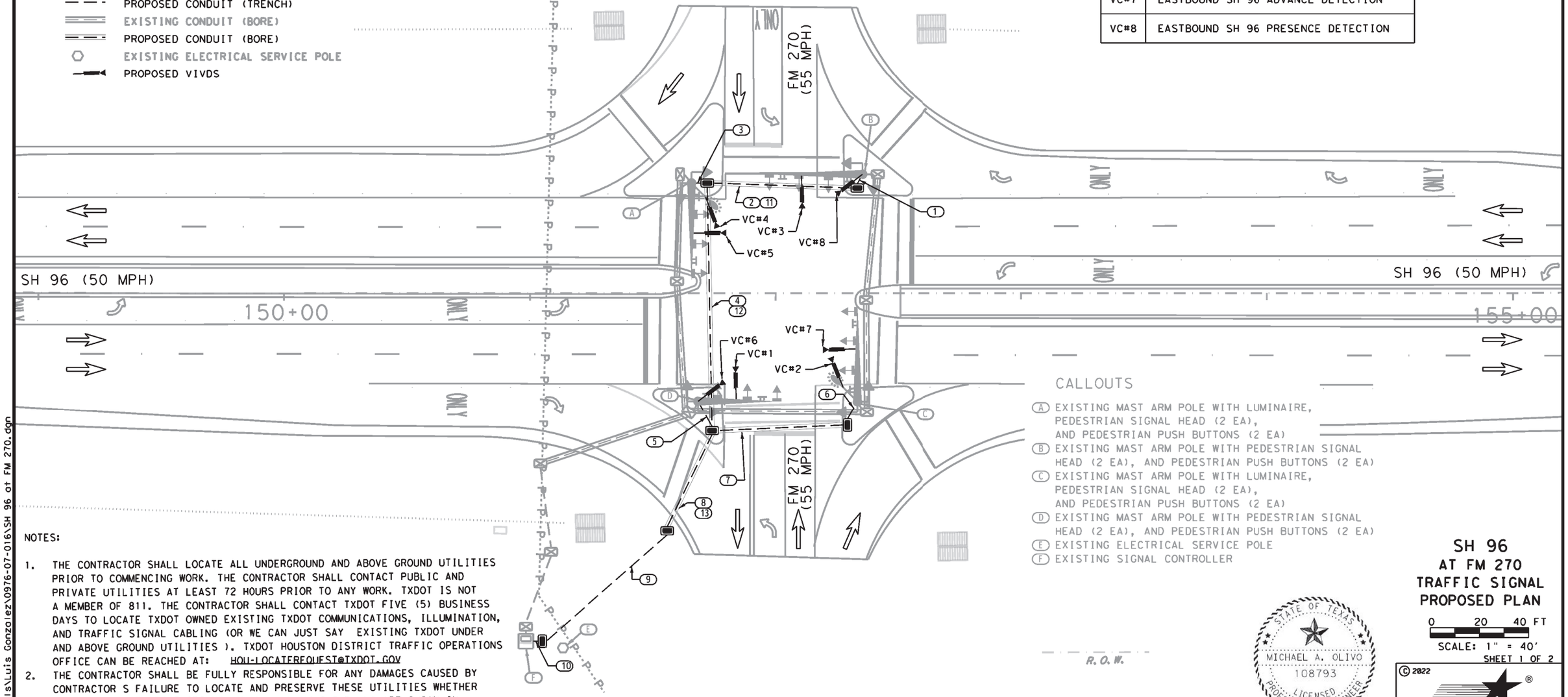
DATE: 10/24/2022
FILE: H:\Traffic\Signals\Luis Gonzalez\0976-07-016\SH 96 at FM 270.dgn

LEGEND:

- TRAFFIC DIRECTION
- EXISTING MAST ARM POLE
- EXISTING SIGNAL HEAD
- EXISTING MAST ARM SIGNS
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- PROPOSED GROUND BOX
- EXISTING PEDSTRIAN SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- PROPOSED CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- PROPOSED CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE POLE
- PROPOSED VIVDS

VIVDS DETECTOR CHART

VC#1	SOUTHBOUND FM 270 ADVANCE DETECTION
VC#2	SOUTHBOUND FM 270 PRESENCE DETECTION
VC#3	NORTHBOUND FM 270 ADVANCE DETECTION
VC#4	NORTHBOUND FM 270 PRESENCE DETECTION
VC#5	WESTBOUND SH 96 ADVANCE DETECTION
VC#6	WESTBOUND SH 96 PRESENCE DETECTION
VC#7	EASTBOUND SH 96 ADVANCE DETECTION
VC#8	EASTBOUND SH 96 PRESENCE DETECTION



CALLOUTS

- (A) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (B) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (C) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (D) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
- (E) EXISTING ELECTRICAL SERVICE POLE
- (F) EXISTING SIGNAL CONTROLLER

NOTES:

1. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811. THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATE TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING (OR WE CAN JUST SAY EXISTING TXDOT UNDER AND ABOVE GROUND UTILITIES). TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV
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3. PROPOSED VIVDS CAMERA SYSTEM PROCURED BY TxDOT VIA FORCE ACCOUNT AND WILL BE PROVIDED TO CONTRACTOR FOR INSTALLATION.
4. VIVDS VEHICLE DETECTION SYSTEM MUST WORK WITH CITY OF LEAGUE CITY'S EXISTING ECONOLITE MOBILITY ADAPTIVE TRAFFIC CONTROL SYSTEM

STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER
P.E.

10/25/2022

SH 96 AT FM 270 TRAFFIC SIGNAL PROPOSED PLAN

0 20 40 FT
SCALE: 1" = 40'
SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		90

DATE: 10/24/2022
FILE: H:\Traffic Signals\Luis Gonzalez\0976-07-016\SH 96 at FM 270.dgn

CONDUIT AND CONDUCTOR RUNS								
RUN NO.	CONDUIT (618)				CONDUCTORS (620)		VIVDS (6306)	
	PVC				GROUND		VIVDS	
	2" (SCHD 80)				#6 BARE		#14/3C (* 1000 FT)	
	(6046)		(6047)		(6009)		(Subsidiary)	
	NO.	TRENCH	NO.	BORE	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF
1	1	10			1	10	2	10
2			1	70	1	70	2	70
3	1	15			1	15	2	15
4			1	105	1	105	4	105
5	1	15			1	15	2	15
6	1	15			1	15	2	15
7			1	60	1	60	2	60
8			1	50	1	50	8	50
9	1	70			1	70	8	70
10	1	20			1	20	8	20
11 (SPARE)			1	70				
12 (SPARE)			1	105				
13 (SPARE)			1	50				
POLE A							2	25
MA							1	40
POLE B							2	25
MB							1	40
POLE C							2	25
MC							1	40
POLE D							2	25
MD							1	35
TOTAL (LF)		145		510		430		2265

EST. TOTAL		155		540		455		2380

DATE: 10/21/2022
FILE: H:\Traffic Signals\Luis Gonzalez\0976-07-016\SH 96 at FM 270.dgn

STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER

P.E.

10/25/2022

SH 96
AT FM 270
TRAFFIC SIGNAL
PROPOSED PLAN

SHEET 2 OF 2

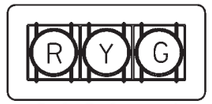
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		91

LEGEND:

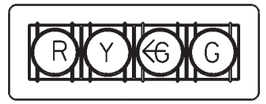
- TRAFFIC DIRECTION
- EXISTING MAST ARM POLE
- A — EXISTING SIGNAL HEAD
- EXISTING MAST ARM SIGNS
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING LOOP DETECTOR
- EXISTING PEDSTRIAN SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE POLE
- EXISTING WOOD POLE (D)

EXISTING SIGNAL HEADS:



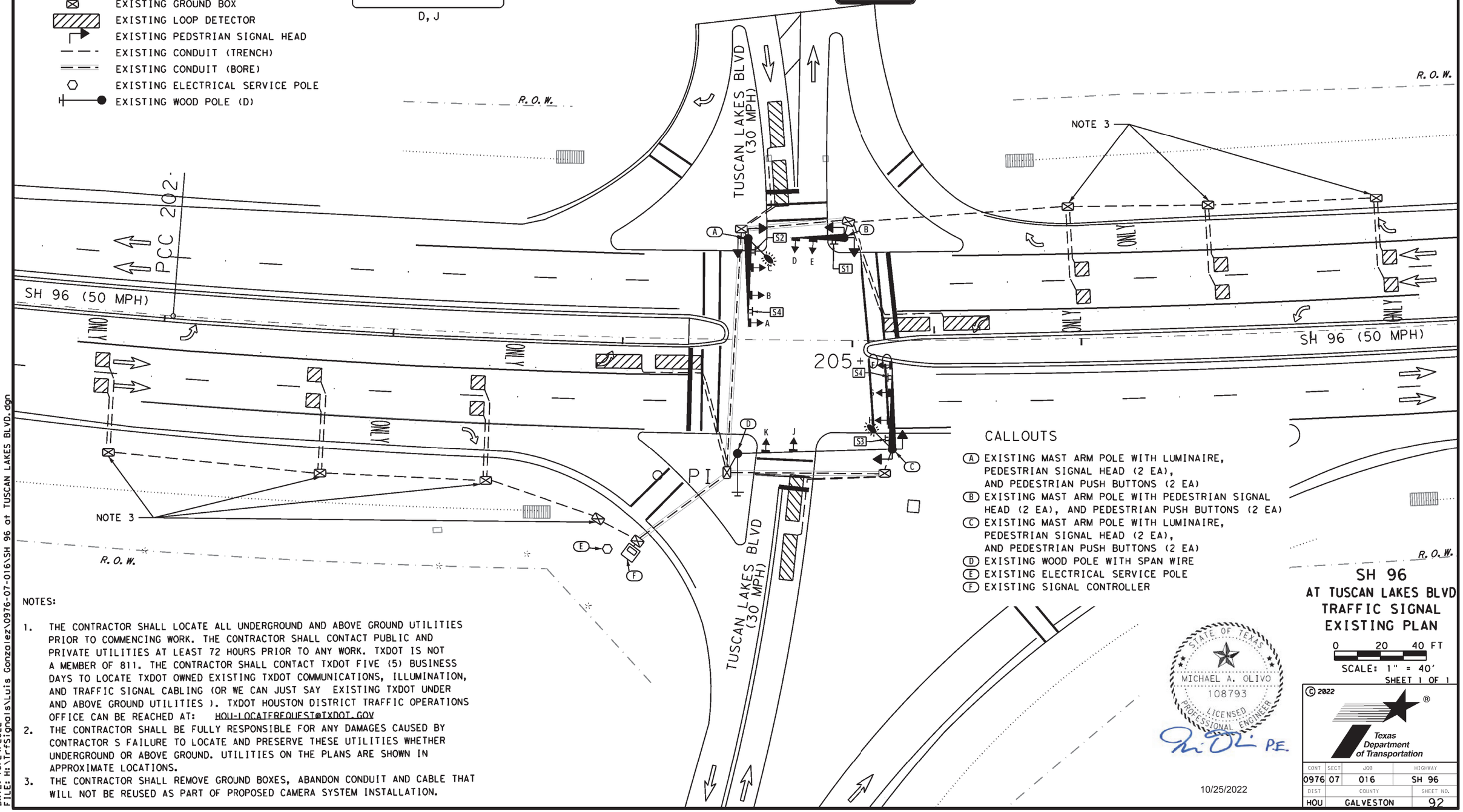
B, C, E, G, H, , K

A, F



D, J

EXISTING ROADWAY/STREET NAME SIGNS:



CALLOUTS

(A) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
(B) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
(C) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
(D) EXISTING WOOD POLE WITH SPAN WIRE
(E) EXISTING ELECTRICAL SERVICE POLE
(F) EXISTING SIGNAL CONTROLLER

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3. THE CONTRACTOR SHALL REMOVE GROUND BOXES, ABANDON CONDUIT AND CABLE THAT WILL NOT BE REUSED AS PART OF PROPOSED CAMERA SYSTEM INSTALLATION.

STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER
P.E.

10/25/2022

SH 96
AT TUSCAN LAKES BLVD
TRAFFIC SIGNAL
EXISTING PLAN

0 20 40 FT
SCALE: 1" = 40'
SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		92

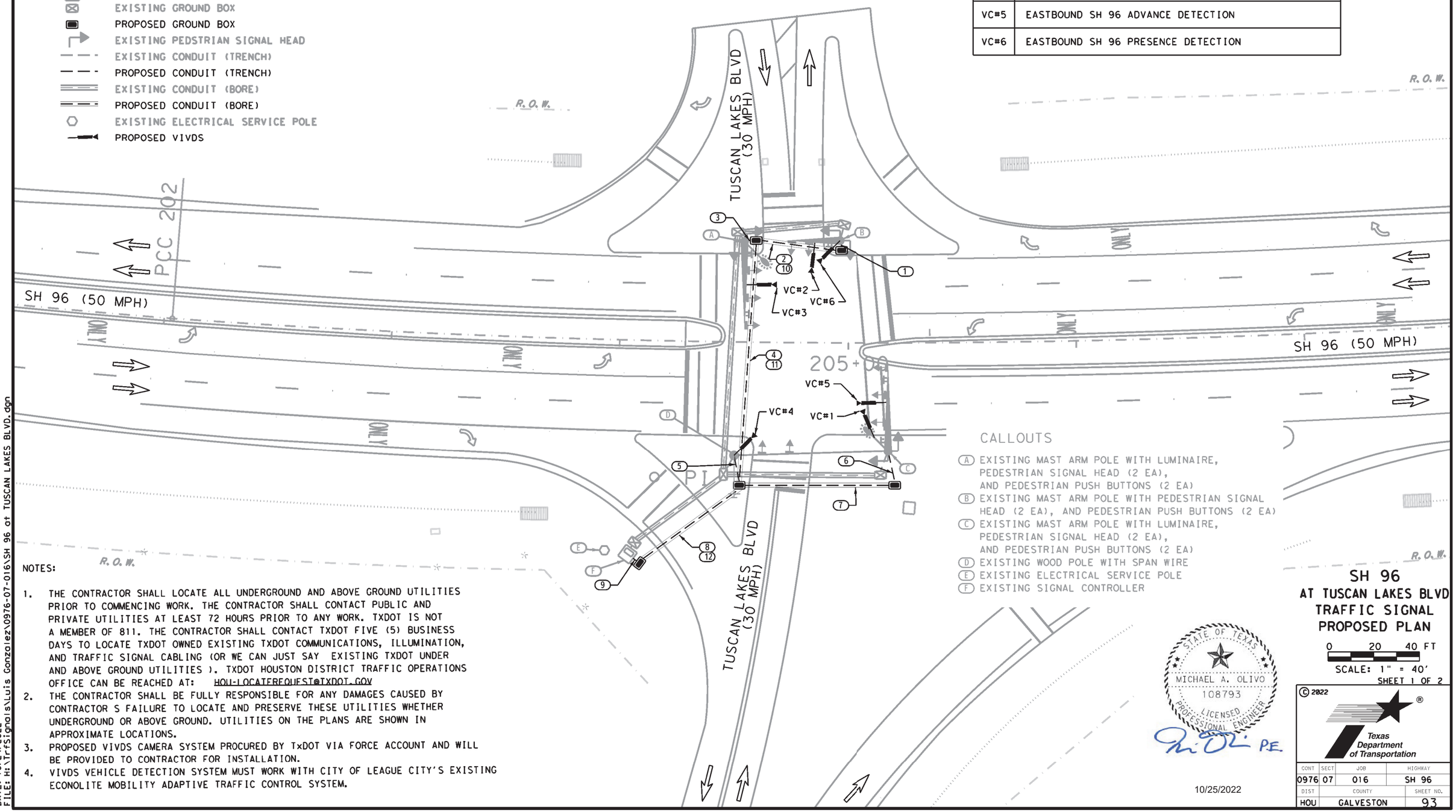
DATE: 10/24/2022
FILE: H:\Traffic Signals\Luis Gonzalez\0976-07-016\SH 96 at TUSCAN LAKES BLVD.dgn

LEGEND:

- TRAFFIC DIRECTION
- EXISTING MAST ARM POLE
- EXISTING SIGNAL HEAD
- EXISTING MAST ARM SIGNS
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- PROPOSED GROUND BOX
- EXISTING PEDSTRIAN SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- PROPOSED CONDUIT (TRENCH)
- EXISTING CONDUIT (BORE)
- PROPOSED CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE POLE
- PROPOSED VIVDS

VIVDS DETECTOR CHART

VC#1	SOUTHBOUND TUSCAN LAKES BLVD PRESENCE DETECTION
VC#2	NORTHBOUND TUSCAN LAKES BLVD ADVANCE/PRESENCE DETECTION
VC#3	WESTBOUND SH 96 ADVANCE DETECTION
VC#4	WESTBOUND SH 96 PRESENCE DETECTION
VC#5	EASTBOUND SH 96 ADVANCE DETECTION
VC#6	EASTBOUND SH 96 PRESENCE DETECTION



CALLOUTS

(A) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
(B) EXISTING MAST ARM POLE WITH PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
(C) EXISTING MAST ARM POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEAD (2 EA), AND PEDESTRIAN PUSH BUTTONS (2 EA)
(D) EXISTING WOOD POLE WITH SPAN WIRE
(E) EXISTING ELECTRICAL SERVICE POLE
(F) EXISTING SIGNAL CONTROLLER

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STATE OF TEXAS
MICHAEL A. OLIVO
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LICENSED
PROFESSIONAL ENGINEER

P.E.

10/25/2022

SH 96
AT TUSCAN LAKES BLVD
TRAFFIC SIGNAL
PROPOSED PLAN

0 20 40 FT
SCALE: 1" = 40'

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		93

DATE: 10/24/2022
FILE: H:\Traffic Signals\Luis Gonzalez\0976-07-016\SH 96 at TUSCAN LAKES BLVD.dgn

CONDUIT AND CONDUCTOR RUNS								
RUN NO.	CONDUIT (618)				CONDUCTORS (620)		VIVDS (6306)	
	PVC				GROUND		VIVDS	
	2" (SCHD 80)				#6 BARE		#14/3C (* 1000 FT)	
	(6046)		(6047)		(6009)		(Subsidiary)	
	NO.	TRENCH	NO.	BORE	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF
1	1	10			1	10	2	10
2			1	45	1	45	2	45
3	1	10			1	10	1	10
4			1	110	1	110	3	110
5	1	15			1	15	1	15
6	1	20			1	20	2	20
7			1	75	1	75	2	75
8			1	60	1	60	6	50
9	1	20			1	20	6	20
10 (SPARE)			1	45				
11 (SPARE)			1	110				
12 (SPARE)			1	60				
POLE A							1	25
MA							1	40
POLE B							2	25
MB							1	25
POLE C							2	25
MC							1	40
POLE D							1	25
TOTAL (LF)		75		505		365		1330

EST. TOTAL		80		535		385		1400

DATE: 10/21/2022
FILE: H:\TrfSignals\Luis Gonzalez\0976-07-016\SH 96 at TUSCAN LAKES BLVD.dgn

STATE OF TEXAS
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108793
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PROFESSIONAL ENGINEER
P.E.

10/25/2022

SH 96
AT TUSCAN LAKES BLVD
TRAFFIC SIGNAL
PROPOSED PLAN

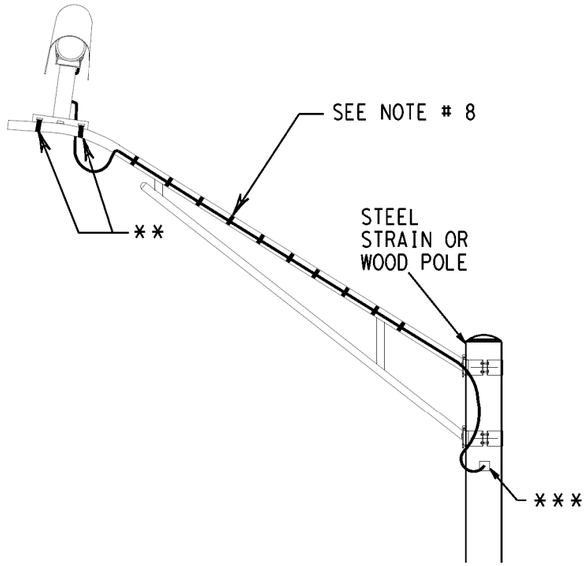
SHEET 2 OF 2

Texas Department of Transportation

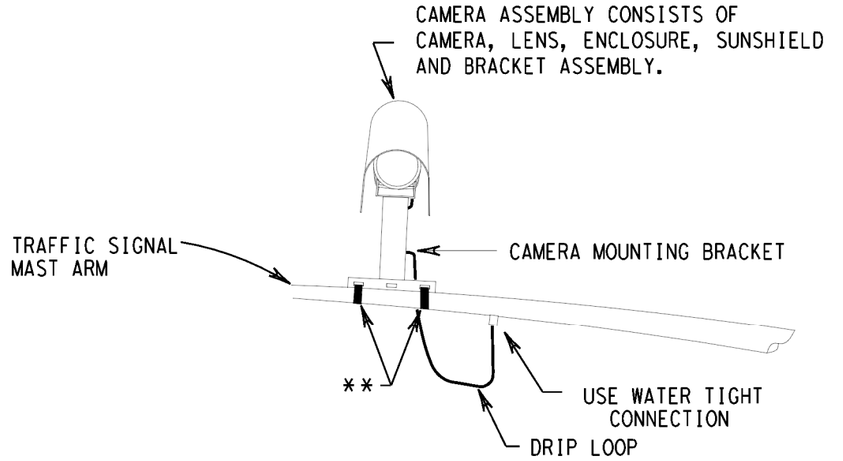
CONT	SECT	JOB	HIGHWAY
0976	07	016	SH 96
DIST	COUNTY		SHEET NO.
HOU	GALVESTON		94

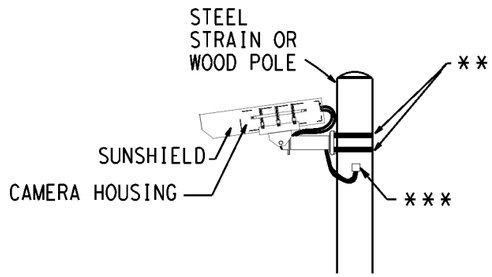
NOTES FOR VIDEO DETECTION:

1. INSTALL VIDEO DETECTION PROCESSOR UNIT INSIDE CONTROLLER CABINET.
2. INSTALL VIDEO DETECTION CAMERA & BRACKET AS DETAILED OR AS DIRECTED BY THE VIDEO DETECTION SUPPLIER.
3. MOUNT CAMERAS AS FAR OVER THE ROADWAY AS POSSIBLE.
4. USE ¾ IN. STAINLESS STEEL BANDING MATERIAL TO INSTALL CAMERA MOUNTS.
5. AIM CAMERA SO THAT HORIZON IS NOT VISIBLE IN THE FIELD OF VIEW.
6. INSTALL CAMERA ENCLOSURE ASSEMBLY SO THAT IT CAN ROTATE AFTER INSTALLATION TO PROVIDE PROPER ALIGNMENT.
7. PROVIDE WATER TIGHT CABLE ENTRY AND EXIT POINTS IN THE MAST ARM AND/OR POLES.
8. FOR VIVDS COAX AND POWER CABLES ATTACHED TO LUMINAIRE ARM, PROVIDE A METAL CABLE STRAP (ALUMINUM OR STAINLESS STEEL), 3/4-IN MINIMUM WIDTH AND TWO WRAPS AT 8 IN. MAXIMUM SPACING.

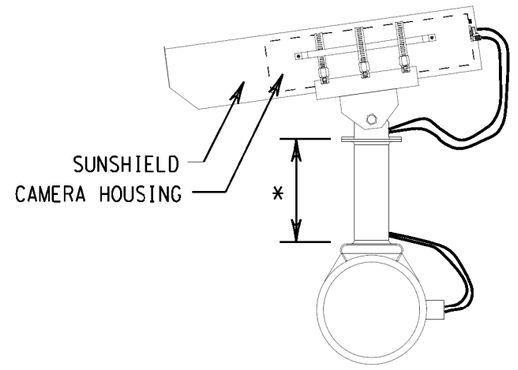


LUMINAIRE ARM MOUNT





POLE MOUNT

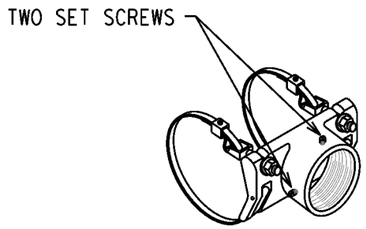


SIDE VIEW

* 4 FT. PIPE EXTENSION WHEN MOUNTED ON TRAFFIC SIGNAL MAST ARM.

** ¾ IN. (MIN) STAINLESS STEEL BANDING 2 PLACES MIN.

*** ENTRY INTO STEEL POLE OR CONDUIT WEATHERHEAD ON WOOD POLE



BAND MOUNT BRACKET DETAIL

Texas Department of Transportation
Houston District

SIGNAL DETAILS/STANDARDS VIVDS CAMERA MOUNTING DETAILS

VC/MD

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		95
02/2004 03/16/2006 09/2010	COUNTY	CONTROL	SECT JOB	HIGHWAY
	GALVESTON	0976	07 016	SH 96

STD-M13

DATE: 8/18/2022 10:01:14 AM
FILE: \\FS-HOUHQ.dot.state.tx.us\Data4\data\engdata\TrfSignals\Luis Gonzalez\0976-07-016\STANDARDS\ed1-14.dgn

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

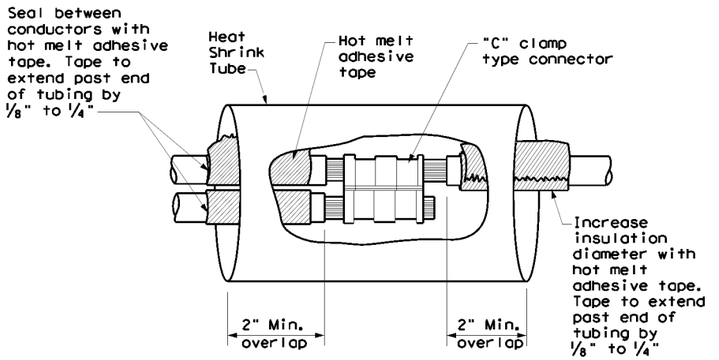
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

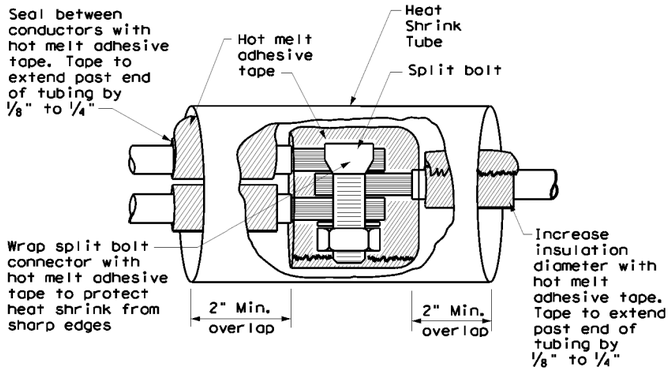
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

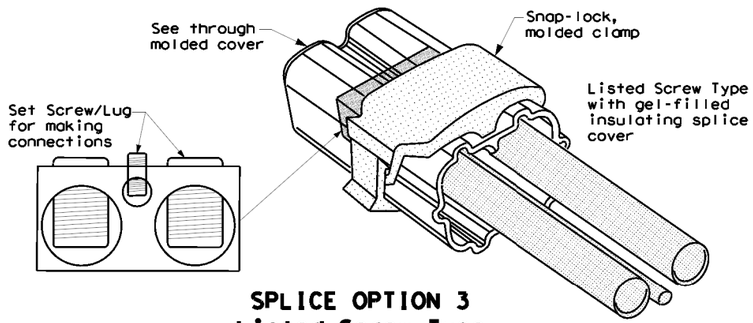
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation
Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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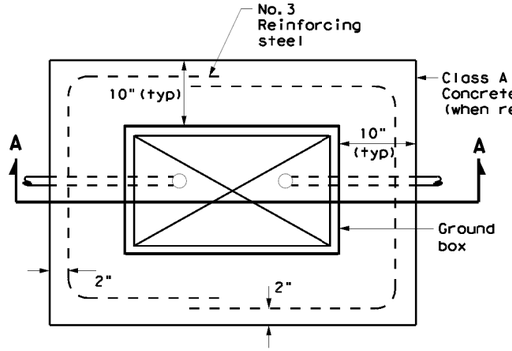
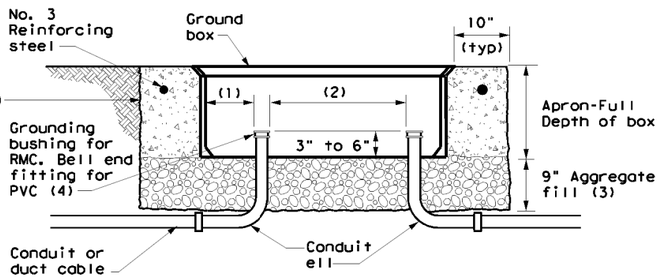


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

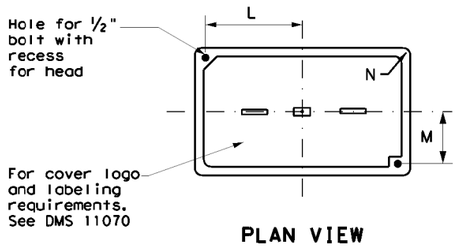
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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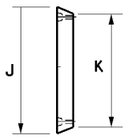
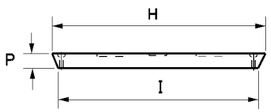


END



SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

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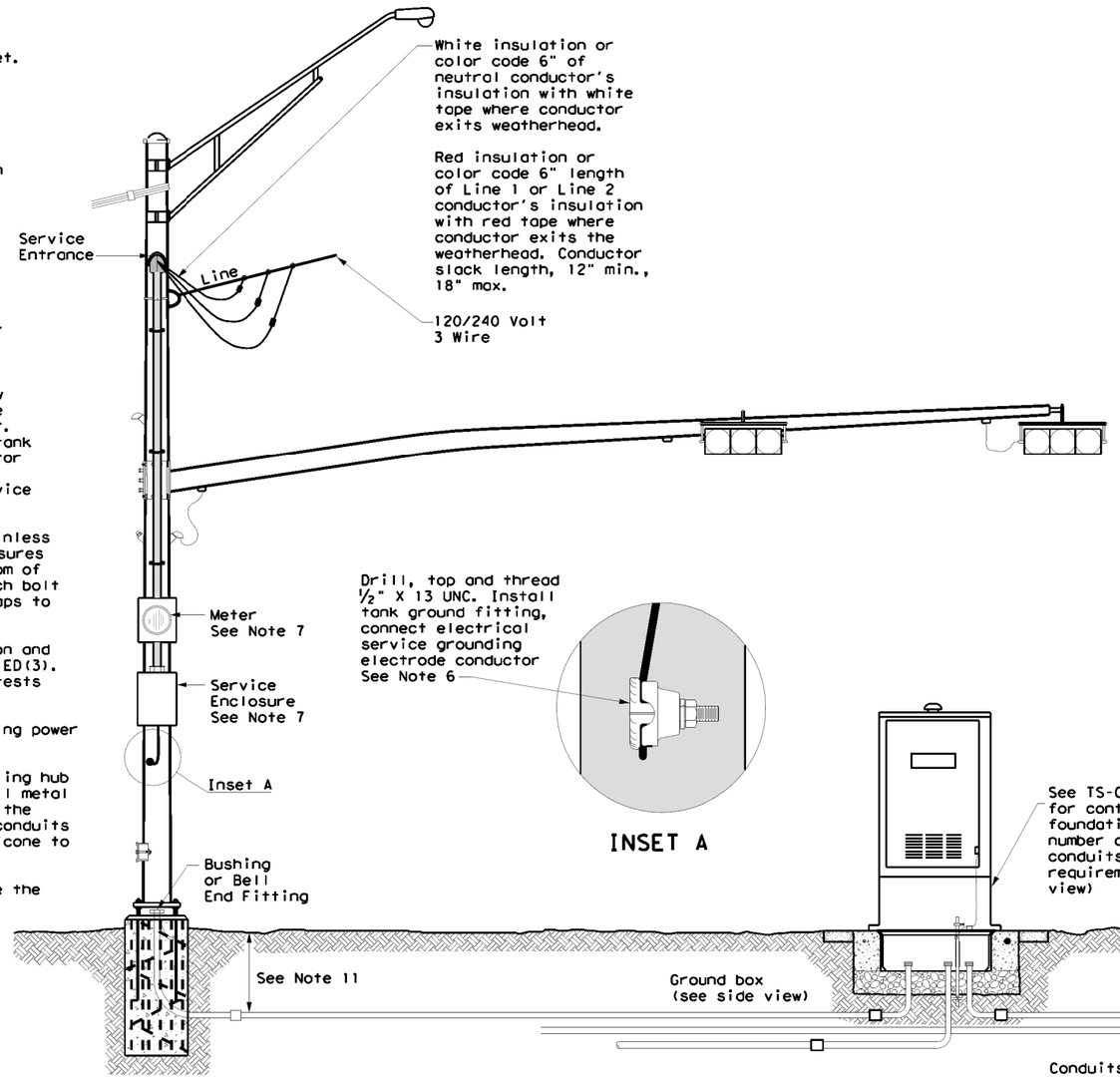
TRAFFIC SIGNAL NOTES

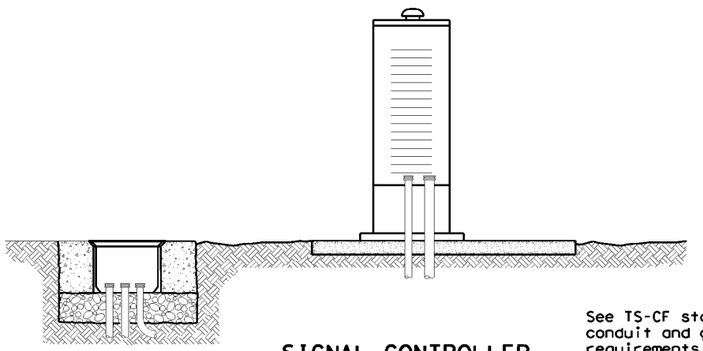
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

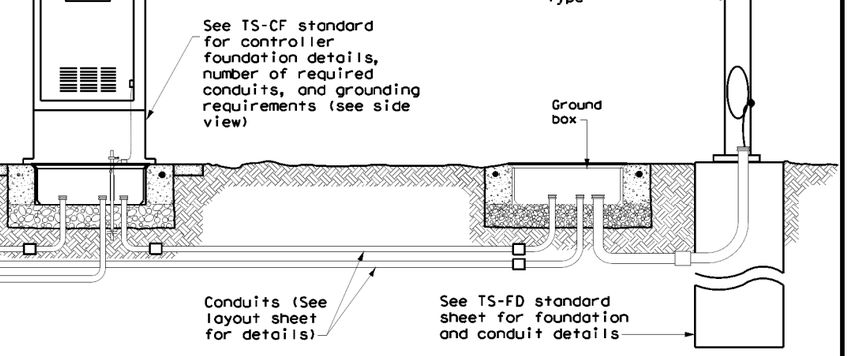
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

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DUCT CABLE & HDPE CONDUIT NOTES

1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.

2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.

3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.

4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.

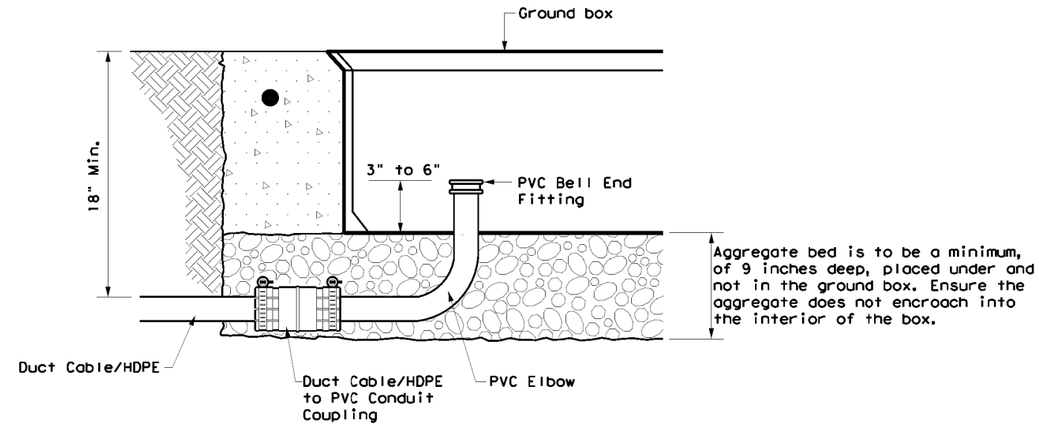
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."

6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.

7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.

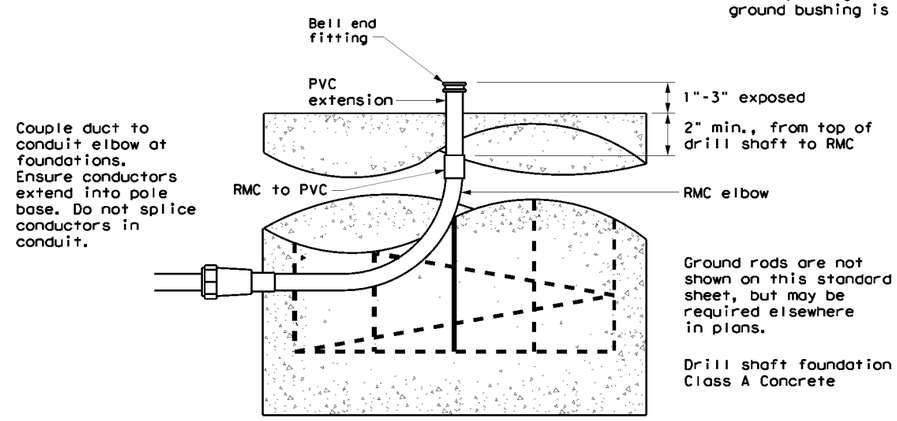
8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.

9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.

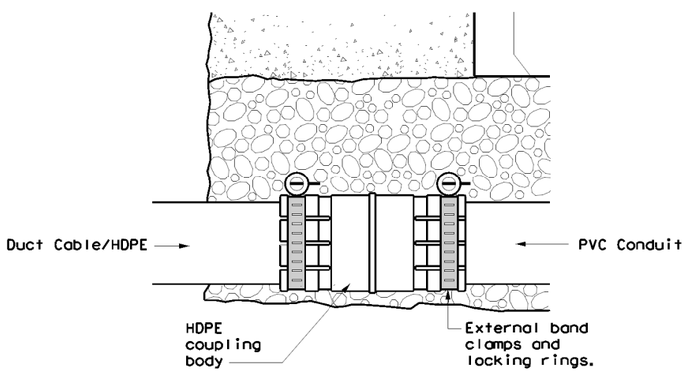


DUCT CABLE/HDPE AT GROUND BOX

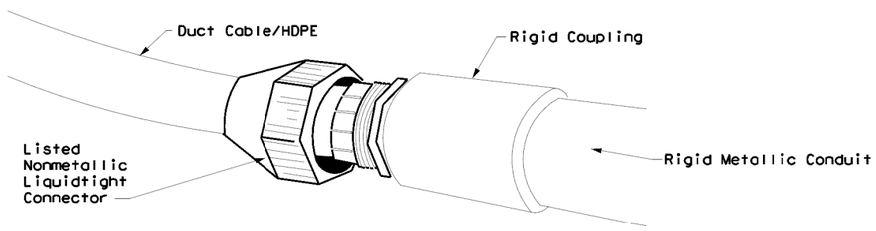
When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.



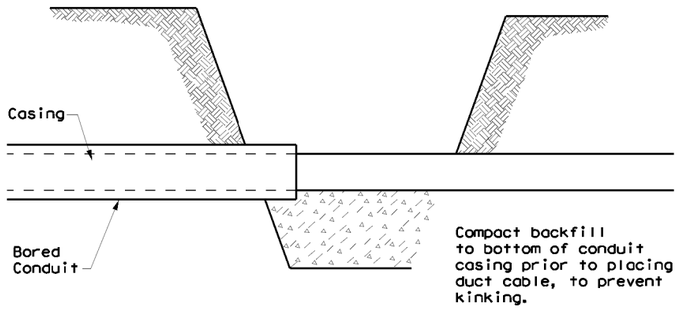
DUCT CABLE / HDPE AT FOUNDATION



DUCT CABLE/HDPE TO PVC



DUCT CABLE/HDPE TO RMC



BORE PIT DETAIL

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
DUCT CABLE/ HDPE CONDUIT

ED(11)-14

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	HOU	GALVESTON		100

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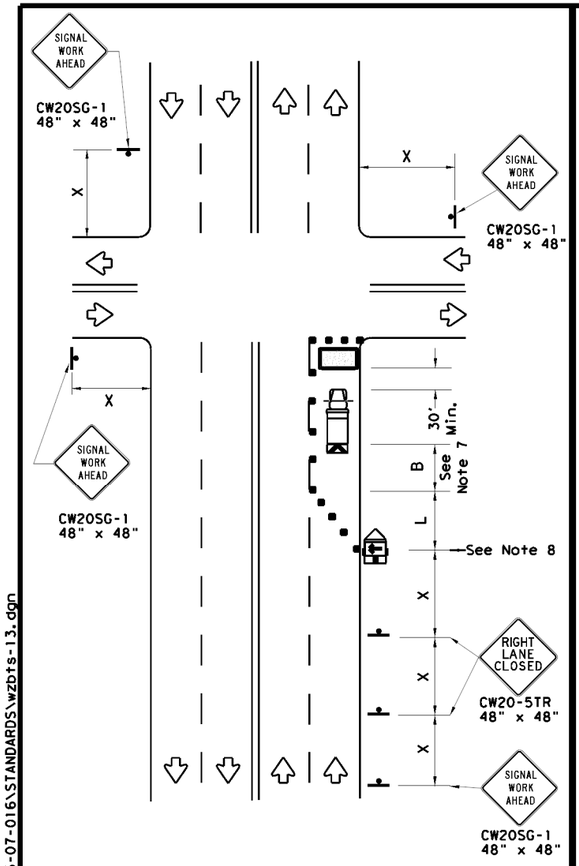
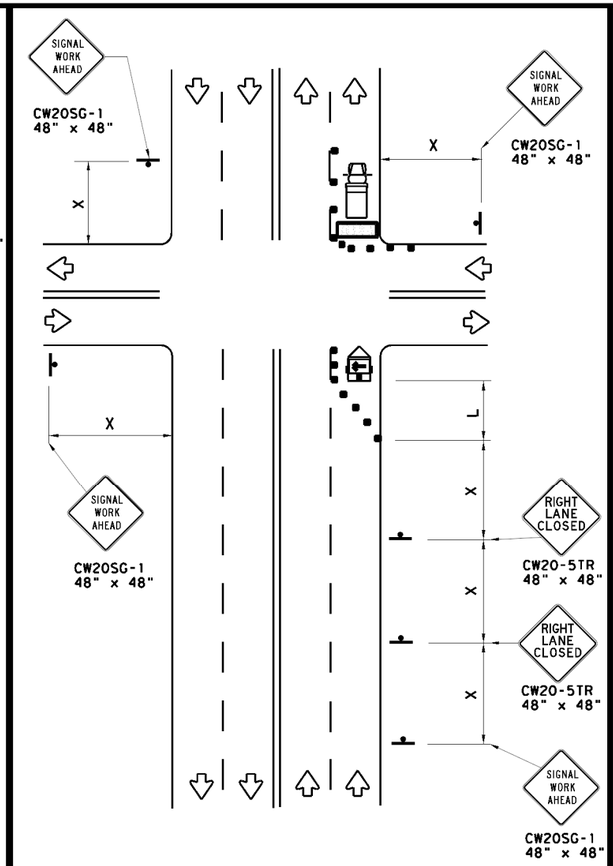


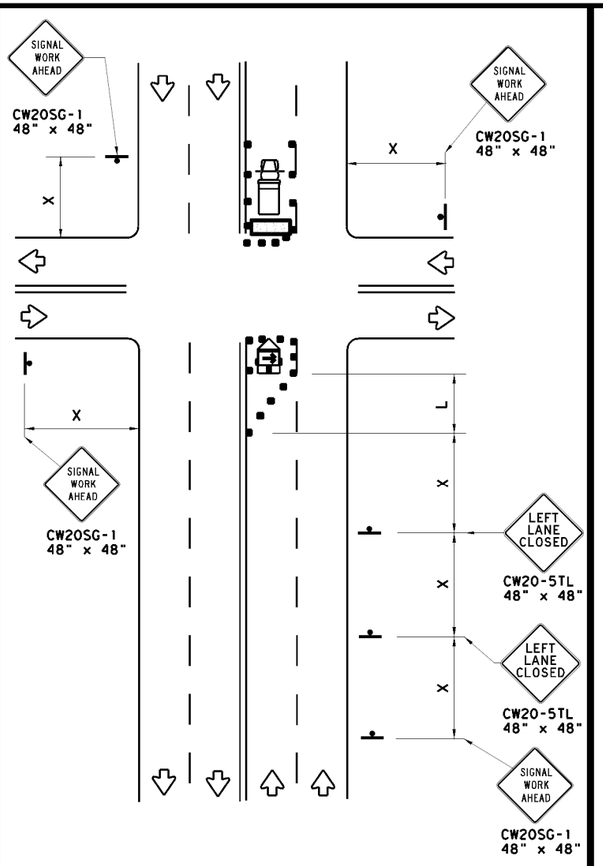
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



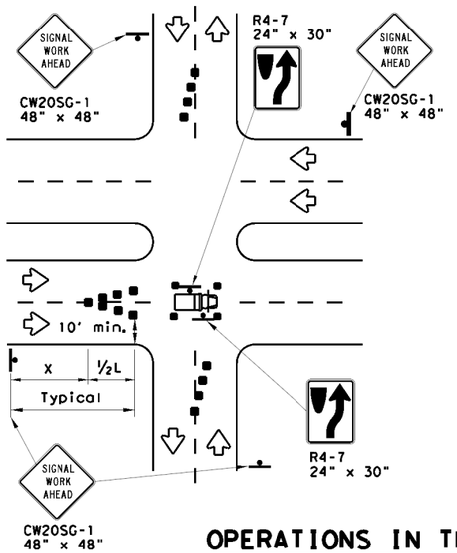
FAR SIDE RIGHT LANE CLOSURE

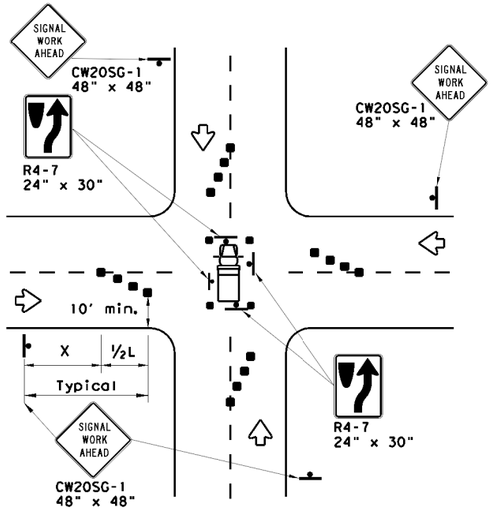
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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.

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.

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	0976	07	016	SH 96
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	HOU	GALVESTON		101

DATE: 8/18/2022 10:07:28 AM
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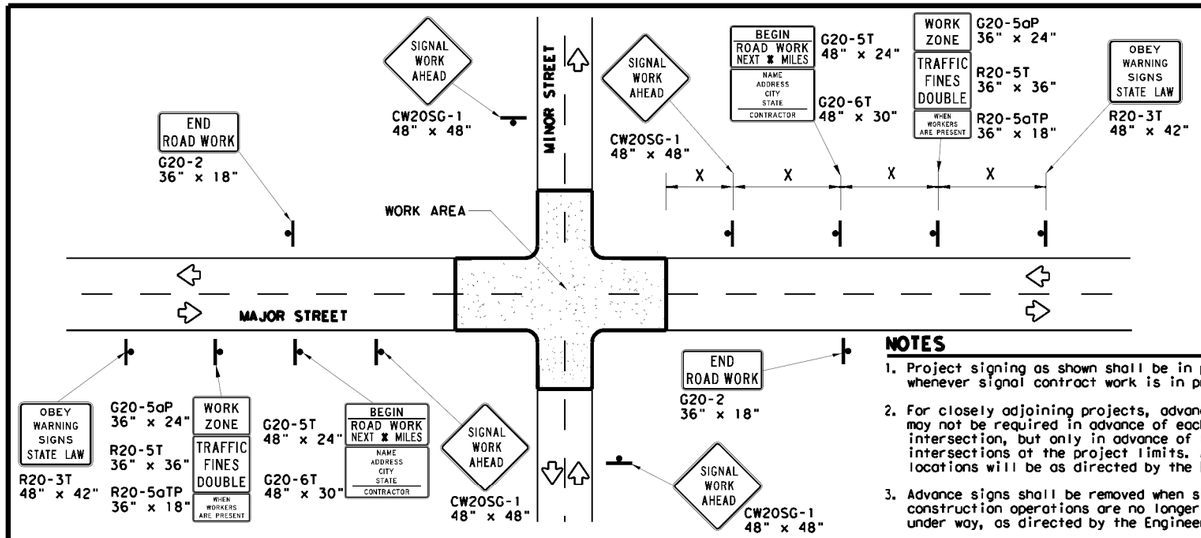


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

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

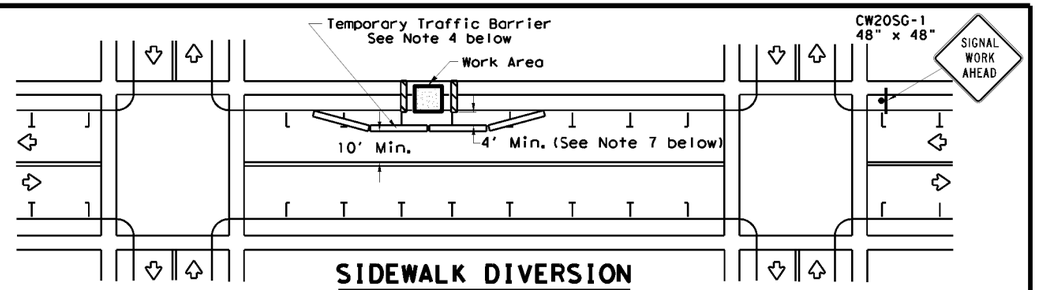
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

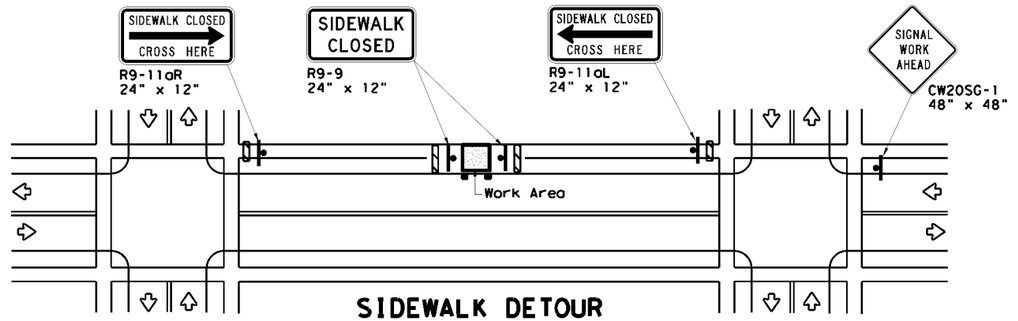
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

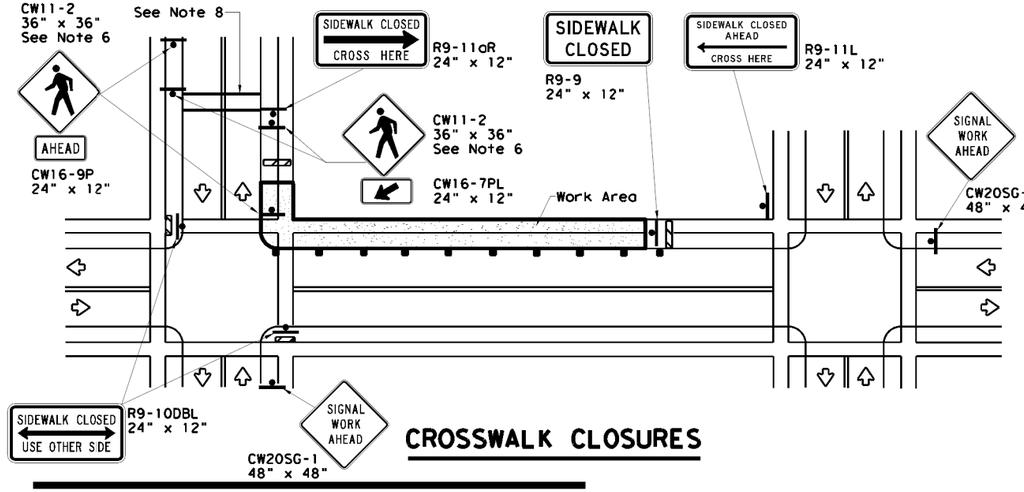
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



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.

SHEET 2 OF 2

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	0976	07	016	SH 96
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	HOU	GALVESTON		102

SITE DESCRIPTION

PROJECT LIMITS: E OF SH 3 TO SH 146

PROJECT DESCRIPTION: BASE REPAIR, MILLING 2", UNDERSEAL COURSE, SUPERPAVE D 2" AND STRIPING

MAJOR SOIL DISTURBING ACTIVITIES: N/A

TOTAL PROJECT AREA: 47.43 ACRES (OVERLAY OPERATIONS)

TOTAL AREA TO BE DISTURBED: 0.0 ACRES

WEIGHTED RUNOFF COEFFICIENT:
(AFTER CONSTRUCTION): ((Provide combined runoff coeff.))

EXISTING CONDITION OF SOIL & VEGETATIVE
COVER AND % OF EXISTING VEGETATIVE COVER: ((List existing soil types based on soil mapping and estimated vegetative cover))

NAME OF RECEIVING WATERS: SEGMENT ID: 2439 LOWER GALVESTON BAY

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

____ TEMPORARY SEEDING
____ PERMANENT PLANTING, SODDING, OR SEEDING
____ MULCHING
____ SOIL RETENTION BLANKET
____ BUFFER ZONES
____ PRESERVATION OF NATURAL RESOURCES

OTHER: N/A

STRUCTURAL PRACTICES:

____ SILT FENCES
____ HAY BALES
____ ROCK BERMS
____ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
____ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
____ DIVERSION DIKE AND SWALE COMBINATIONS
____ PIPE SLOPE DRAINS
____ PAVED FLUMES
____ ROCK BEDDING AT CONSTRUCTION EXIT
____ TIMBER MATTING AT CONSTRUCTION EXIT
____ CHANNEL LINERS
____ SEDIMENT TRAPS
____ SEDIMENT BASINS
____ STORM INLET SEDIMENT TRAP
____ STONE OUTLET STRUCTURES
____ CURBS AND GUTTERS
____ STORM SEWERS
____ VELOCITY CONTROL DEVICES
____ EROSION CONTROL LOGS

OTHER: N/A

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

N/A

STORM WATER MANAGEMENT:

STORM WATER RUNOFF WILL BE PROVIDED BY EXISTING DRAINAGE STRUCTURES (DITCHES). THIS WILL CARRY THE DRAINAGE TO THE EXISTING SEGMENT ID 2439.

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 calendar 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 regulations by a licensed sanitary waste management contractor.

OFFSITE VEHICLE TRACKING:

____ HAUL ROADS DAMPENED FOR DUST CONTROL
____ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
____ EXCESS DIRT ON ROAD REMOVED DAILY
____ STABILIZED CONSTRUCTION ENTRANCE

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
JOEL H. CLARKE
114223
LICENSED PROFESSIONAL ENGINEER

12-2-2022

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	HOU	6	C 976 7 16	103
9/2010 INSPECTION NOTE	COUNTY		CONTROL	SECT	JOB	HIGHWAY
9/2013 INSPECTION NOTE	GALVESTON		0976	07	016	SH 96
11/2013 SW3P TO SWP3						
03/2015 2014 SPECS						

STD G-1

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

[x] No Action Required [ ] Required Action

Action No.

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

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

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

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

[x] No Permit Required

[ ] Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

[ ] Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

[ ] Individual 404 Permit Required

[ ] Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

[x] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

[x] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

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

[x] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

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

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

[ ] Yes [x] No

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

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

[ ] Yes [ ] No

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

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

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

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

[x] No Action Required [ ] Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

[x] No Action Required [ ] Required Action

Action No.

1.

2.

3.

Texas Department of Transportation

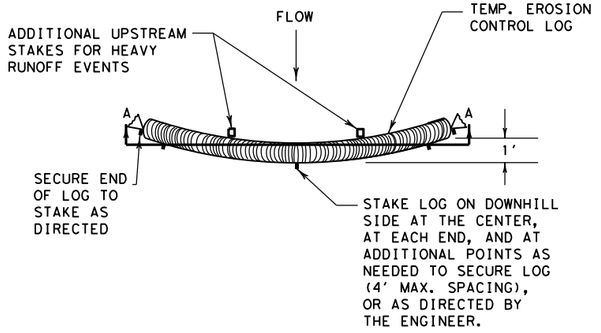
Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

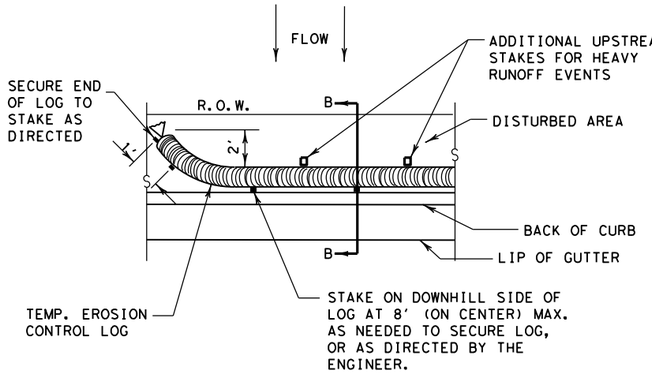
EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY	
REVISIONS 12-12-2011 (DS)	0976	07	016	SH 96	
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	HOU	GALVESTON		104	

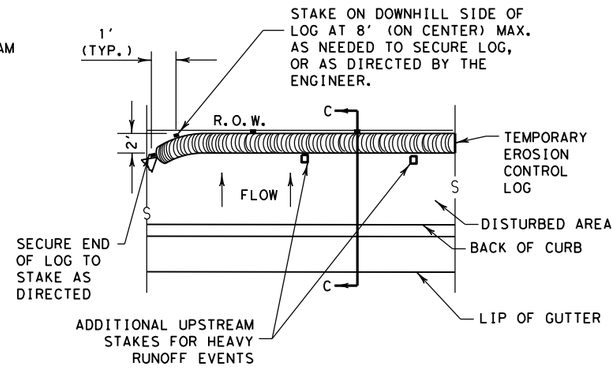
DATE:
FILE:



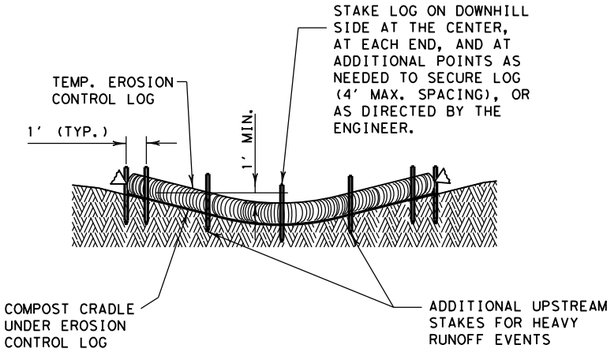
PLAN VIEW



PLAN VIEW



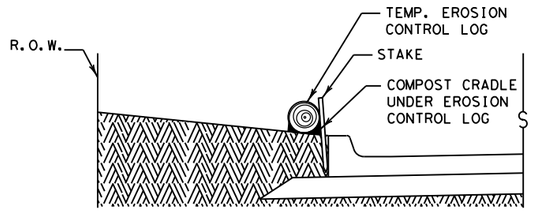
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

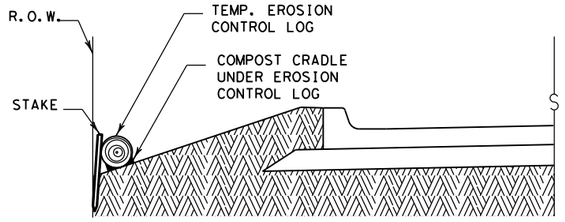
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

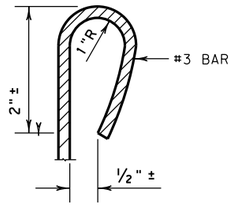
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

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.

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

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.

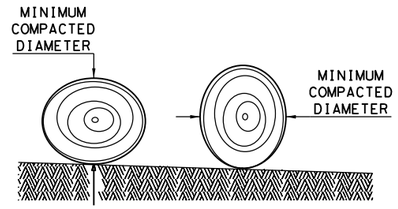
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

Texas Department of Transportation

Design Division Standard

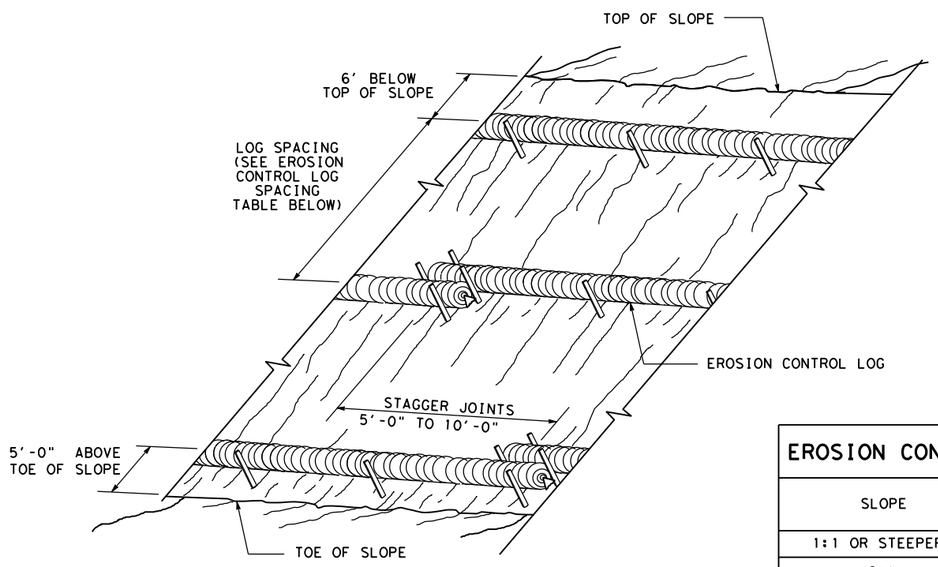
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

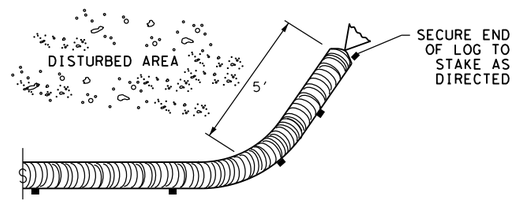
FILE: ec916		DN: TxDOT	CK: KM	DW: LS/PT	CK: LS		
© TxDOT: JULY 2016		CONT	SECT	JOB	HIGHWAY		
REVISIONS		0976	07	016	SH 96		
		DIST	COUNTY			SHEET NO.	
		HOU	GALVESTON			105	

DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

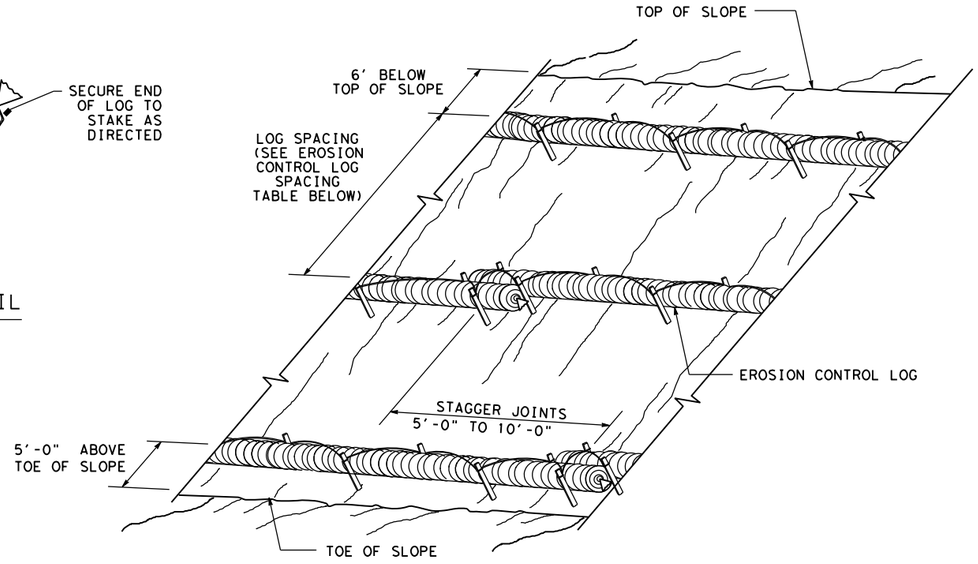
CL-SST



END SECTION RAP DETAIL

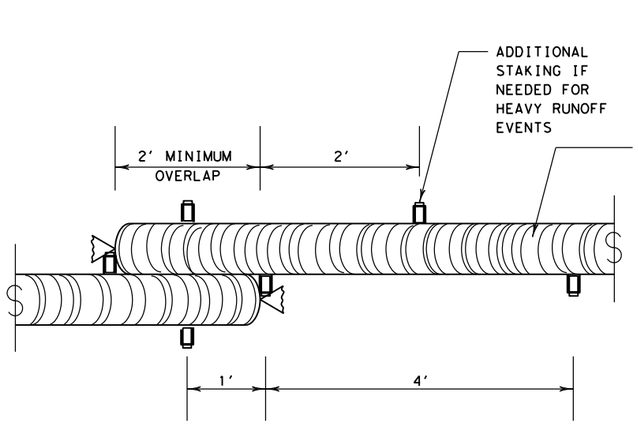
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

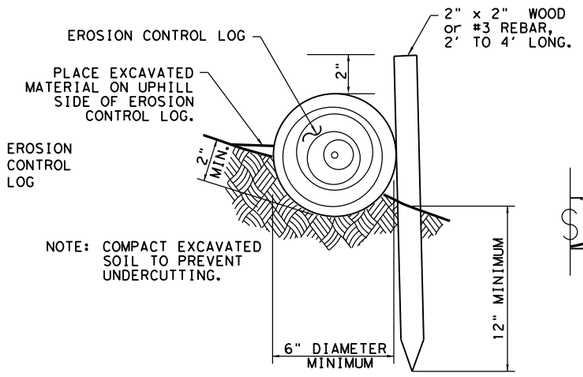
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

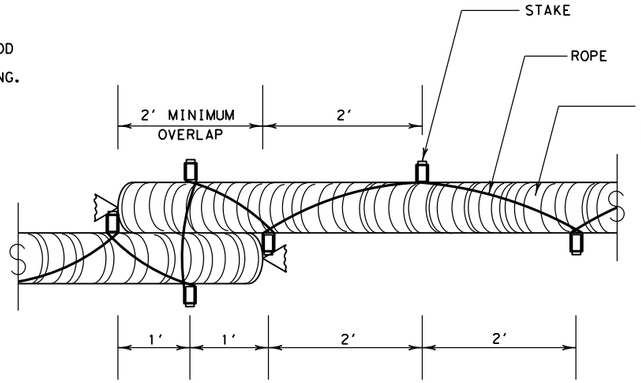


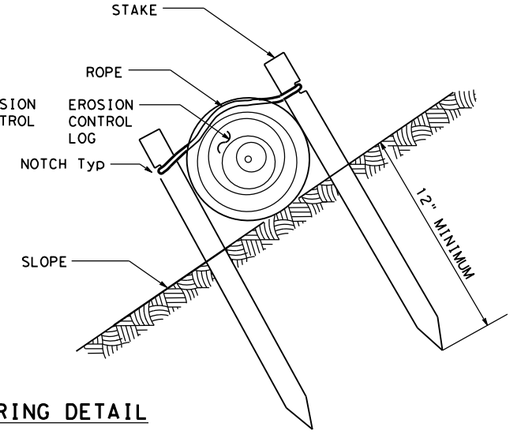


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

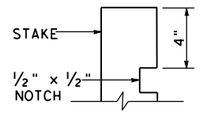
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

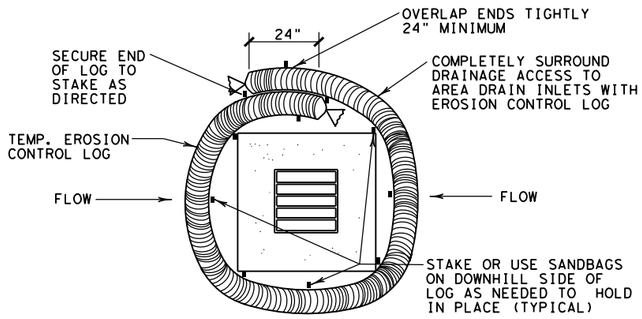
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

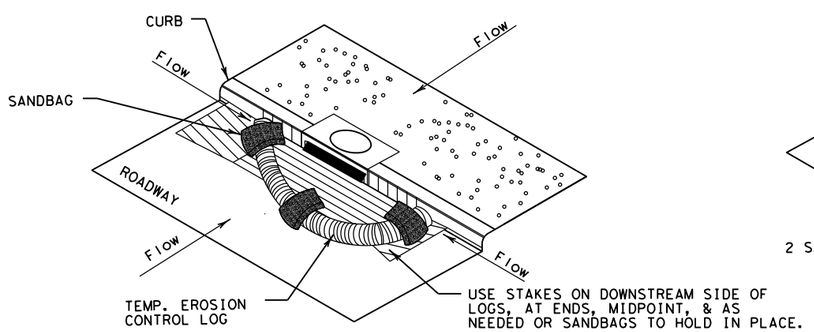
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0976	07	016		SH 96	
	DIST		COUNTY			SHEET NO.
	HOU		GALVESTON			106

DATE:
FILE:



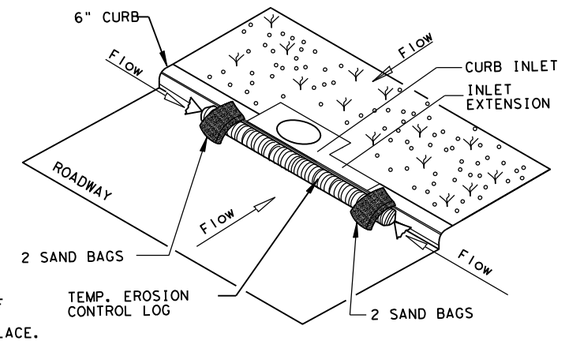
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

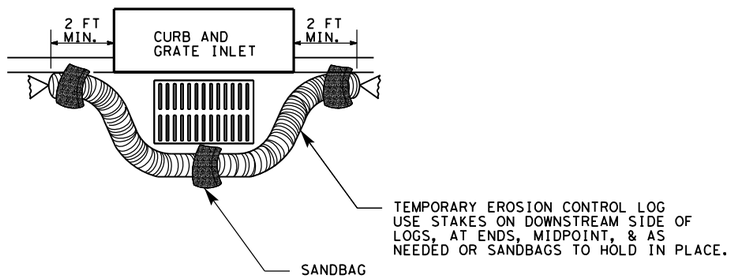
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

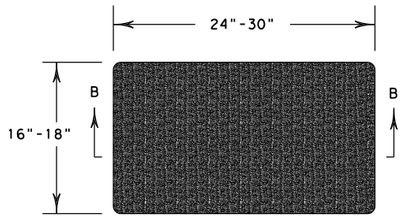
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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	0976	07	016		SH 96	
	DIST	COUNTY				SHEET NO.
	HOU	GALVESTON				107